

PATHFINDER SYSTEMS Inc.

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MASTER MANUAL PACKAGE

2021

(To print you should fit to size in print settings)

Table of Contents

BLOWER INSTALLATION AND MAINTENCE	PG.1
QX SERIES BLOWER MANUAL	PG.9
OIL AND GREASE MANUAL.....	PG.50
MOTOR MANUALS 1HP-200HP	PG.58
SOUND ENCLOSURE SKELETAL TUBE	PG.171
➤ SOUND ENCLOSURE FAN INSTALLATION	PG.220
➤ SOUND ENCLOSURE FAN MOTOR MANUALS	PG.283
AIR INTAKE FILTER AND FILTER ELEMENTS MANUAL.....	PG.397
CVAC MANUAL.....	PG.398
WEIGHTED RELIEF VALVE MANUAL	PG.399
➤ PRESSURE WRV INSTALLATION AND OPERATION	PG.400
➤ VACUUM WRV INSTALLATION AND OPERATION.....	PG.402
CHECK VALVE MANUAL	PG.395

Safety Disclaimer

- It is your responsibility to work safely around this equipment. Pay attention to safety decals such as warnings, cautions, and electric hazards.
- Always work safely when installing metal products and use extreme caution on the roof at all times.
- Wear gloves and safety glasses to reduce the risk of injury, and use hearing protection when operating power tools.
- Safety harnesses or other special equipment may be required; be sure to consult OSHA guidelines for compliance with all safety requirements.
- Do NOT walk on panels until all the fasteners are installed. Metal roofing panels are slippery when wet, dusty, frosty, or oily -- Do NOT attempt to walk on a metal roof under these conditions.
- Only a qualified electrician must work on electrical motors and the motor must be disconnected from supply lines.
- Be sure to check the equipment regularly. Loose connections, damaged cables or wiring points that have not been closed correctly are a danger for the operating staff or the environment. The device has to be stopped and disconnected immediately from all supply lines and the damage must be repaired or replaced.

Receiving and Unpacking

Prior to unloading, compare the received goods to your packing slips for quantity and descriptions. Review the items received for any damage. This should include any punctured packaging, scratches, dents or other signs of distress. Record any discrepancies or damage on the packing slip prior to signing of the packing slip. Also, report any discrepancies or damage within 24 hours to the shipping company.

Installation and Operation

Extended or Outside Storage Guidelines

If you are NOT installing the equipment immediately (within 30 days), use the following as a **general guideline** to prepare and maintain the equipment during storage.

1. Coat internal surfaces of airbox and impellers with a petroleum based product (mineral oil). Fill the gear box and drive side sump completely with oil. (For Roots blowers, Dresser Roots recommends using their own brand of oil.)

IMPORTANT

Oil must be drained and refilled with the proper lubrication and level before operation.

2. Coat internal surfaces of air box and rotors with a petroleum based product.
3. Cover inlet and discharge with plastic (for long-term storage over 1 month)
4. Rotate the shaft 3-4 revolutions every 2 weeks.
5. Repeat steps 1 and 2 once per year or as conditions require.

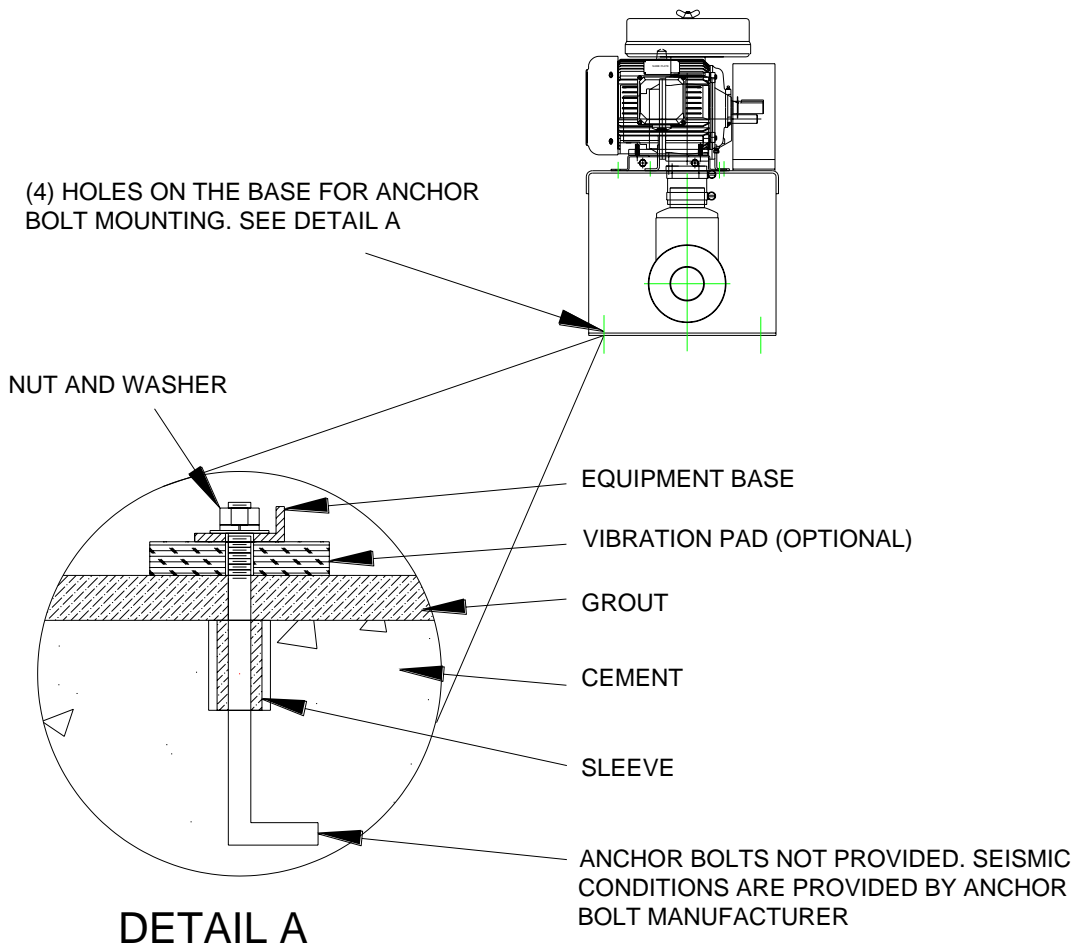
Blower Package Mounting Guidelines

Use the following as a **general guideline** to mount your blower package.

- Anchor Bolts – Expansion style bolts are not permitted. Shall be hook style or heavy duty epoxy style, such as the Hilti #HVA System, Red Head Concrete Anchoring Specialists, or the Chem-Stud® Anchor System. See the manufacturer's technical manual for specific information on these anchoring systems.
- Mounting Pads – A **general guideline** you can use is that the depth of inertia pad shall be twice the blower gear diameter and the pad's mass must be two times the mass of the blower, motor and drive. (Use 150 lbs/CF for concrete.) Housekeeping pads poured on top of finished floors are not acceptable.
- Leveling and Tensioning – Sometimes it is specified or desirable to use a second nut under the equipment base for purposes of leveling the base. UNDER NO CIRCUMSTANCES SHOULD THIS BE DONE. The result of doing so is complete lack of tension put on the anchor bolt. More equipment failures during this first year of operation are due to improper anchor bolt tension or selection than any other single thing.
- Grout – It is important to fill the area between the base and the pad (1" min. [25.4mm] fill) with grout and not concrete. Grout expands as it dries thus forming a tight fit whereas concrete shrinks and leaves a loose fit.

- Substructure – The inertia pad **guidelines** described herein are dependent upon having proper compacted soil substructure which will allow the inertia pad to remain flat, rigid, and free of resonant frequencies within the equipment operating range.

Blower Gear Size	Bolt Size			For Hook Style Bolt		
	Diameter	Length		Grade	Sleeves	
		Embedded	Total		I.D.	Length
2	1/2	6	9	5	2	4
3	1/2	6	9	5	2	4
4	1/2	6	9	5	2	4
4 1/2	1/2	8	11	5	2	6
5	1/2	8	11	5	2	6
6	1/2	10	13	5	2	7
7	5/8	12	15	5	3	10
8	5/8	14	17	5	3	10
10	3/4	18	21	8	3	15
12	3/4	18	21	8	3	15
14	3/4	18	21	8	3	15
16	1	24	27	8	3	18
18	1	24	27	8	3	18
20	1	24	27	8	3	18



Installation

1. Use a fork lift truck or crane to transport the Blower Package to the installation location. Make sure that loosely supplied parts also remain with the equipment during the transport so that they are available on site for installation.
2. Anchor both items to the mounting pad.
3. Have a licensed electrician wire the motor. Refer to the manufacturer's manual (included) for instructions or call your sales representative if you need assistance.
4. Verify all mounting bolts are tight.

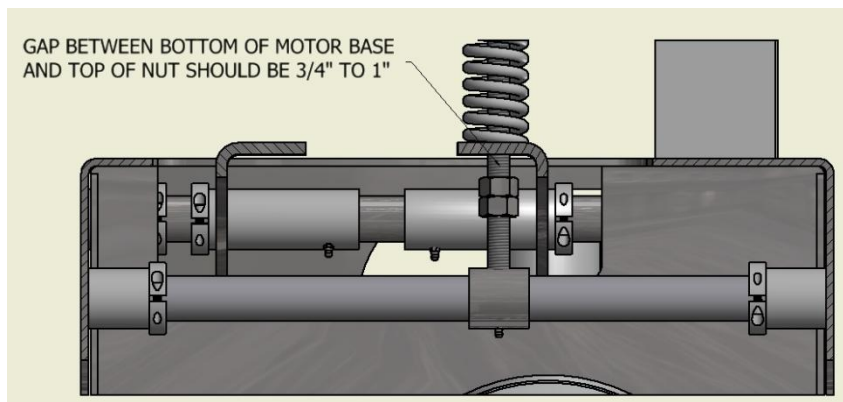
IMPORTANT

Blowers are shipped dry. Consult the manufacturer's manual (included) for lubrication information. Do NOT run the blower without oil.

5. Fill the blower with oil. Make sure to consult the manufacturer's manual (included) for lubrication information. Roots recommends using their own brand of oil.
6. Turn the blower shaft by hand. Verify it does not bind or make any unusual noise.
7. Verify the blower breather/filter plug is installed.
8. If necessary, install the relief valve per the manufacturer's manual (included). Verify the relief valve is unrestricted.
9. If necessary, zero out the pressure or vacuum gauge.
10. If necessary, set the pressure or vacuum switch per the manufacturer's manual (included).
11. Have a licensed electrician wire the motor for the appropriate rotation. Some blowers are unidirectional. Consult the manufacturer's manual (included) for instructions or call your sales representative if you need assistance.
12. Bump the motor and verify the rotation is correct.
13. Run the motor for 15-20 minutes with no load. Verify correct operation of all components. Shut off the motor. Allow the blower to cool to room temperature and check the oil level. If necessary, add oil.
14. Connect the load. Start the motor and observe operation for the first hour. Watch and listen for unusual noises, vibration, oil leaks, air leaks, etc.
15. After the first 8 hours, shut off the motor and check your belt tension. If you need to purchase a belt tension gauge, call your sales representative. Your belt tension settings are located in this manual on page 2. Make sure you replace the belt guard before starting the motor.

The Spring Loaded Motor Mount utilizes a spring system to control belt tension. It has been sized and set at the factory specifically for your system. Your blower package will operate at peak efficiency limiting belt slippage and excessive belt tension.

16. To tighten your belt tension, turn the adjustment screw on the spring clockwise to move the motor away from the blower. To loosen your belt tension, turn the adjustment screw counter-clockwise to move the motor closer to the blower.



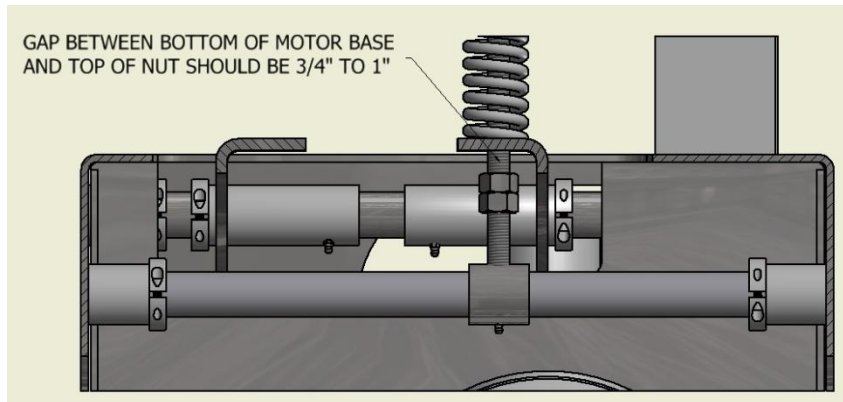
17. After the first 24 hours, shut off the motor and check your belt tension.
18. After the first 72 hours, shut off the motor and check your belt tension. Also, verify the intake filter/silencer is free of product.

Maintenance

1. Watch your oil levels in the blower. If possible, check your oil every day. Refer to the blower manufacturer's manual for the recommended lubrication schedule.

The Spring Loaded Motor Mount utilizes a spring system to control belt tension. It has been sized and set at the factory specifically for your system. Your blower package will operate at peak efficiency limiting belt slippage and excessive belt tension.

2. To tighten your belt tension, turn the adjustment screw on the spring clockwise to move the motor away from the blower. To loosen your belt tension, turn the adjustment screw counter-clockwise to move the motor closer to the blower.



3. Inspect the belts and check the belt tension every 3-6 months or more frequently depending on your operating conditions. If you need to purchase a belt tension gauge, call your sales representative. Your belt tension settings are located in this manual on page 2.

Experience with specific equipment is the best guide to how often to inspect belt drives. Drives operating at high speeds, heavy loads, frequent stop/start conditions and at temperature extremes or operating on critical equipment require frequent inspection.

Mark or note a point on the belt, or on one of the belts in a multiple V-belt drive. Wearing gloves, work around the belt(s), checking for cracks, frayed spots, cuts, or unusual wear patterns.

4. Check the sheave alignment every 720 hours. If using a straight edge (or string), line the straight edge along the outside face of both sheaves. If the drive is properly aligned, the straight edge or string will contact each sheave evenly. The straight edge or string (pulled tight) should touch the two outer edges of each sheave or pulley for a total of four points of contact. Misalignment of sheaves and shafts will show up as a gap between the outside face of the sheave and the straight edge. Check for tilting or shaft misalignment by using a bubble level. For proper alignment, the bubble should be in the same position as measured on each shaft.
5. Make sure you replace the belt guard before restarting the motor.
6. Inspect the intake filter/silencer every 40 hours or more depending on your operating conditions. The element should be clean and free of product. If you need replacement filter elements, contact your sales representative.

Blowers and Blower Package

Extended or Outside Storage Procedures

1) Coat internal surfaces of gearbox and drive side oil sumps with a petroleum based product. This can be accomplished by filling the oil sumps completely with oil. (For Roots blowers, Dresser Roots recommends using their own brand of oil.)

IMPORTANT: Oil must be drained and refilled with the proper lubrication and level before operation.

2) Coat internal surfaces of air box and rotors with a petroleum based product.

3) Cover inlet and discharge with plastic (for long-term storage over 6 months)

4) Rotate the shaft 3-4 revolutions every 2 weeks.

5) Repeat steps 1 and 2 once per year or as conditions require

Motor Drives

Direct Coupled

When installing the motor directly to the blower, align the shafts to the coupling according to the coupling manufacturer's instructions. Blowers shipped with the motor directly coupled and mounted on a common base have been aligned prior to shipment. Further alignment is not normally necessary, but be sure to check the alignment and make adjustments if necessary prior to starting the blower.

Coupling halves must correctly fit the blower and drive shafts so that only light tapping is required to install each half. The two shafts must be accurately aligned. A direct-coupled blower and motor must be aligned with the two shafts having no more than 0.005 in. (13 mm) Total Indicator Reading (TIR). Make sure the face is aligned within 0.002 in. (0.05 mm).

Establish proper gap between coupling halves according to the coupling manufacturer's instructions with the motor armature. Proper gap will minimize the chance for end thrust on the blower shaft. Re-align and grease all direct-coupled base-mounted blowers after field installation.

V-Belts

If the motor and blower are V-belt connected, the sheaves on both the motor and blower shafts should be as close to the shaft bearings as possible. Blower sheave is not more than 1/4 in. (6.5 mm) from the blower drive end cover. The drive sheave is as close to the driver bearing as possible. Take care when installing sheaves on the blower and motor shafts. Make sure the face is accurately in line to minimize belt wear.

Adjust the belt tension to the manufacturer's specifications using a belt tension tester. Check new belts for proper tension after 24 hours of run time. When manufacturer data is not available, industry guidelines recommend 1/64 in. deflection for each inch of span (0.157 mm deflection per centimeter of span) at 8 – 10 lb (3.6 – 4.5 kg) of force in the center of the belt.

Insufficient tensioning is often indicated by slipping (squealing) at start-up. Do not use belt dressing on V-belts. Keep sheaves and V-belts free of oil and grease. Remove tension from belts if the drive is to be inactive for an extended period of time. For more specific information, consult the drive manufacturer. In a V-belt drive, the blower sheave must fit its shaft accurately, run true, and be mounted as close to the bearing housing as possible to minimize bearing loads.

A tight or driving fit will force the drive shaft out of its normal position and cause internal damage. A loose fit will result in shaft damage or breaking. Make sure the motor sheave fits correctly and is properly aligned with the blower sheave.

Adjust the motor position on its sliding base so that belt tension is in accordance with drive manufacturer's instructions. Always avoid excessive belt tension. Recheck tension after the first 10 hours of operation and periodically thereafter to avoid slippage and loss of blower speed.

Check the blower after installation and before applying power by rotating the drive shaft by hand.

If the drive shaft does not rotate freely:

- Look for uneven mounting, piping strain, excessive belt tension, or coupling misalignment
- Check the blower to make sure oil was added to the reservoirs

Setting V-Belt Tension

Proper belt tension is essential to long blower life. Figure 5-4, Figure 5-5, and the following procedure are provided to aid in field-adjusting V-belts (when the blower is so equipped) for maximum performance. A visual inspection of the V-belt drive should yield the appearance shown in Figure 5-4.

Factors outside the control of the belt tensioning system used on an individual blower package assembly, such as environmental factors and quality of the belts installed, may contribute to decreased belt life. Such factors can cause wear of the belts beyond the ability of the tensioning system to compensate.

As such, it is recommended to check belt tension monthly and make any manual adjustments found necessary.

1. Turn off and lock out power.
2. Remove the belt guard fasteners (if equipped).
3. Remove the belt guard.
4. Check and adjust the belt tension as necessary. Tension should be 1/64 in. deflection per inch of span (0.157 mm deflection per centimeter of span) between sheaves, with 8 – 10 lb (3.6 – 4.5 kg) force applied at the center point of the top section of belt.
5. Install the belt guard, making sure that all drive components are free of contact with the guard.
6. Install the belt guard fasteners that were removed in step 2.
7. Unlock the power and start the blower.
8. Resume normal operation.

V-Belt Troubleshooting

PROBLEM	POSSIBLE CAUSES	SOLUTIONS
Belt slipping (sidewalls glazed)	Not enough tension	Replace belts; apply proper tension.
Drive squeals	Shock load	Apply proper tension.
	Not enough arc of contact	Increase center distance.
	Heavy starting load	Increase belt tension.
Belt(s) turned over	Broken cord caused by prying on sheave	Replace set of belts and install correctly.
	Overloaded drive	Redesign drive.
	Impulse loads	Apply proper tension.
	Misalignment of sheave and shaft	Re-align drive.
	Worn sheave grooves	Replace sheaves.
	Excessive belt vibration	Check drive design. Check equipment for solid mounting. Consider use of banded belts.
Mismatched belts	New belts installed with old belts	Replace belts in matched sets only.
Breakage of belt(s)	Shock loads	Apply proper tension; recheck drive.
	Heavy starting loads	Apply proper tension; recheck drive. Use compensator starting.
	Belt pried over sheaves	Replace set of belts correctly.
	Foreign objects in drives	Provide drive guard.
Rapid belt wear	Sheave grooves worn	Replace sheaves.
	Sheave diameter too small	Redesign drive.
	Mismatched belts	Replace with matched belts.
	Drive overloaded	Redesign drive.
	Belt slips	Increase tension.
	Sheaves misaligned	Align sheaves.
	Oil or heat condition	Eliminate oil. Ventilate drive.

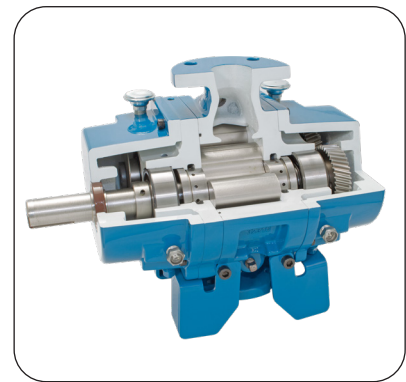
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WARNING: Do Not Operate Before Reading Manual

Qx OPERATOR'S MANUAL

Models

3200 4600 6000



Disclaimer Statement:

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Product information and specifications subject to change.

Table of Contents

Introduction 1

Safety 2

 Graphic Conventions Used in this Manual..... 2

 Safety Instructions..... 2

 Safety Precautions 3

 Protective Materials..... 4

Installation 5

 Operating Characteristics 5

 Operating Limitations 5

 Specifications Table 6

 Start-Up Checklist..... 7

 Foundation 8

 Location 8

 Soft Foot 8

 Mounting Stress 9

 Blower Air Intake 9

 Motor Drives 9

 Direct Coupled..... 9

 V-Belts 9

 Electrical Connections 10

 Relief Valves..... 10

 Piping 10

 Lubrication (Splash) 11

 Frequently Asked Questions Regarding Lubrication 12

Operation	13
Recommended Shutdown Procedure to Minimize Risk of Freezing or Corrosion	13
Long Term Storage	14
Maintenance	15
General	15
Regular Maintenance	15
Preventative Maintenance	16
Troubleshooting.....	17
Repair and Replacement Parts.....	19
Factory Service and Repair	19
Disassembly and Reassembly Instructions	20
Disassembly (3200 and 4600)	20
Disassembly (6000 Series)	22
Assembly (3200 and 4600).....	22
Gear End Assembly (3200 and 4600).....	23
Drive End (Free End) Assembly (3200 and 4600).....	23
Assembly (6000 Series)	24
Gear End Assembly (6000 Series).....	24
Drive End (Free End) Assembly (6000 Series).....	24
Assembly Clearances	25
Recommended Lubricants.....	26
Recommended Lubricants for Rotary Blowers and Vacuum Boosters	26
Cutaway Drawings and Parts Lists	28
Cutaway Drawing for Qx-3200 and Qx-4600 Series Blowers	28
Parts List for Qx-3200 and Qx-4600 Series Blowers	29
Cutaway Drawing for Qx-6000 Series Blowers	30
Parts List for Qx-6000 Series Blowers	31
Warranty – Blower Products	34
Operating Data Form / Product Registration.....	35

INTRODUCTION

CONGRATULATIONS on the purchase of a new **Qx® Rotary Positive Displacement Air Blower** from **M-D Pneumatics®**. Please examine the blower for shipping damage, and if any damage is found, report it immediately to the carrier. If the blower is to be installed at a later date, make sure it is stored in a clean, dry location and rotated regularly. Make sure covers are kept on all openings. If the blower is stored outdoors, be sure to protect it from weather and corrosion.

Qx blowers are built to exacting standards and, if properly installed and maintained, will provide many years of reliable service. Read and follow every step of these instructions when installing and maintaining the blower.



WARNING

Serious injury can result from operating or repairing this machine without first reading the operating manual and taking adequate safety precautions.

NOTE: Record the blower model and serial number of the machine in the **OPERATING DATA FORM** on the inside back cover of this manual. Use this identification on any replacement part orders, or if service or application assistance is required.

02

SAFETY

GRAPHIC CONVENTIONS USED IN THIS MANUAL

The following hazard levels are referenced within this manual:

**DANGER**

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING**

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

**CAUTION**

Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

Indicates a situation that can cause damage to the engine, personal property, and/or the environment or cause the equipment to operate improperly.

NOTE: Indicates a procedure, practice, or condition that should be followed in order for the equipment to function in the manner intended.

SAFETY INSTRUCTIONS

1. Do not operate before reading the enclosed operating manual.
2. Use adequate protection, warning and safety equipment necessary to protect against hazards involved in installation and operation of this equipment.

NOTICE

- *The safety instruction tags shown below were attached to your unit prior to shipment. Do not remove, paint over or obscure in any manner.*
- *Failure to heed these warnings could result in serious bodily injury to the personnel operating and maintaining this equipment.*

**WARNING**

Keep body and clothing away from machine openings.

! WARNING

Hearing protection required.

! CAUTION

Do not operate without guards in place.

! CAUTION

Do not touch hot surfaces.

! WARNING

- Keep hands and clothing away from rotating machinery, inlet and discharge openings.
- Blower and drive mounting bolts must be secured.
- Drive belts and coupling guards must be in place.
- Noise level may require ear protection.
- Blower heat can cause burns if touched.

Safety Precautions

For equipment covered specifically or indirectly in this operating manual, it is important that all personnel observe safety precautions to minimize the chances of injury. Among many considerations, the following should particularly be noted:

- Blower casing and associated piping or accessories may become hot enough to cause major skin burns on contact.
- Internal and external rotating parts of the blower and driving equipment can produce serious physical injuries. Do not reach into any opening in the blower while it is operating or while subject to accidental starting. Cover external moving parts with adequate guards.
- Disconnect power before doing any work, and avoid bypassing or rendering inoperative any safety or protective devices.
- If blower is operated with its piping disconnected, place a strong, coarse screen over the inlet and avoid standing in discharge air stream.
- Avoid extended exposure in close proximity to machinery with high intensity noise levels.
- Use proper care and good procedures in handling, lifting, installing, operating, and maintaining the equipment.
- Other potential hazards to safety may be associated with operation of this equipment. All personnel working in or passing through the area should be warned by signs and trained to exercise adequate general safety precautions.
- Hearing protection may be required depending on silencing capabilities.

⚠ CAUTION

Customers are cautioned to provide adequate protection, warning and safety equipment necessary to protect personnel against hazards involved in the installation and operation of this equipment in the system or facility.

⚠ WARNING

Do not use air blowers on explosive or hazardous gases. Each size blower has limits on pressure differential, running speed, and discharge temperature, which must not be exceeded. Consult *Specifications Table 3-1* on page 6.

PROTECTIVE MATERIALS

- Remove protective materials from the shaft.
- Remove the protective covers from the inlet and outlet ports, and inspect the interior for dirt and foreign material.

⚠ WARNING

Keep hands, feet, foreign objects, and loose clothing from inlet and outlet openings to avoid injury or damage if lobes are to be rotated at this point.

The blower housing and associated piping or accessories may become hot enough to cause major skin burns on contact. Internal and external rotating parts of the blower and driving equipment can produce serious physical injuries. Never run the blower with the inlet or discharge piping removed. If it becomes necessary to inspect the rotating parts of the blower or to change V-belts, be absolutely sure that all power to the motor controls has been shut off and that the motor controls are locked out and have been properly tagged before proceeding.

⚠ WARNING

Avoid extended exposure in close proximity to machinery with high intensity noise levels. Always wear adequate ear protection. Use proper care and good procedures in handling, lifting, installing, operating, and maintaining the equipment.

⚠ CAUTION

Use proper care and good procedures in handling, lifting, installing, operating and maintaining the equipment.

INSTALLATION

Operating Characteristics

Qx blowers are rotary positive displacement type units with tri-lobe rotors rotating in opposite directions within a housing closed at the ends by end plates. The pumping capacity is determined by size, operating speed, and differential pressure conditions.

The inlet to the discharge is sealed with operating clearances that are very small. Internal lubrication is not needed, as there is no moving contact.

Clearances between the rotors during rotation are maintained by a pair of accurately machined helical timing gears, mounted on the two shafts extended outside the air chamber. The two intermeshing rotary lobes are designed to rotate and trap air or gas between each rotor and the housing. As the rotor lobes rotate past the edge of the suction port, the trapped air or gas is essentially at suction pressure and temperature. Since the blower is a constant volume device, the trapped air remains at suction pressure until the leading rotor lobe opens into the discharge port. The close clearances between the rotors inhibit back slippage of the trapped volume from between the rotors, and the trapped volume is forced into the discharge piping. Compression occurs not internal to the blower but by the amount of restriction, either downstream of the blower discharge port or upstream of the blower inlet port.

Air moves not between the rotors but between the rotors and the side of the housing. Also, the machine is bi-directional, meaning that the direction of rotation of the blower can make either side the inlet or discharge. See also **Figure 3-1 on page 6**, Flow Direction by Rotation.

Protect the blowers with cut-in switches or bypass valving to limit differential pressure across the blower. **See Operating Limitations on page 5** for more information. When a belt drive is used, it is possible to adjust blower speed to obtain the desired capacity by changing the diameter of one or both sheaves, or by using a variable-speed motor pulley.

Operating Limitations

To permit continued satisfactory performance, a blower must be operated within certain conditions. The manufacturer's warranty is contingent on such operation. Maximum limits for temperature and speed are specified in **Table 3-1 on page 6** for various blower sizes when operated under the standard atmospheric conditions. Do not exceed these limits.

EXAMPLE: Seldom does the operation of a blower result in pressure differentials large enough to strain the blower drive train (bearings, gears, and seals). Typically, the maximum allowable temperature limit (the limit is a function of the temperature rise as well as the inlet temperature) for any particular blower may occur well before the maximum speed or allowable power rating is reached. Temperature rise then becomes the limiting condition. The operating limit is to be determined by the maximum rating reached first, and it can be any one of the following: temperature, speed, or horsepower.

Installation

NOTE: Specially ordered blowers with non-standard construction, or with rotor end clearances greater than shown in this manual, will not have the operating limits specified in *Specifications Table 3-1* on page 6. Contact your M-D Pneumatics sales representative for specific information.

Specifications Table

MODEL	SERIES	PORT SIZE	APPROXIMATE OIL CAPACITY		MAXIMUM ALLOWABLE DISCHARGE TEMPERATURE	MAXIMUM TEMPERATURE RISE	MAXIMUM PRESSURE	MAXIMUM VACUUM	MAXIMUM RPM
			VERTICAL FLOW	HORIZONTAL FLOW					
3203 3208	AA	2 in. (51 mm) 3 in. (76 mm) 4 in. (102 mm) 4 in. (102 mm)	0.68 qt (0.64 L)	0.38 qt (0.36 L)	445°F (229°C)	325°F (163°C)	18 psig	17 inch-Hg (576 mbar)	4,800
4606 4610	AA	4 in. (102 mm) 6 in. (152 mm) 6 in. (152 mm)	1.82 qt (1.1 L)	1.07 qt (1 L)	445°F (229°C)	325°F (163°C)	18 psig	17 inch-Hg/ (576 mbar)	4,000
6009 6015	AA	8 in. (203 mm) 8 in. (203 mm) 10 in. (254 mm)	4.68 qt (4.4 L)	2.63 qt (2.5 L)	445°F (229°C)	325°F (163°C)	18 psig	17 inch-Hg (576 mbar)	3,200

Table 3-1 – Specifications

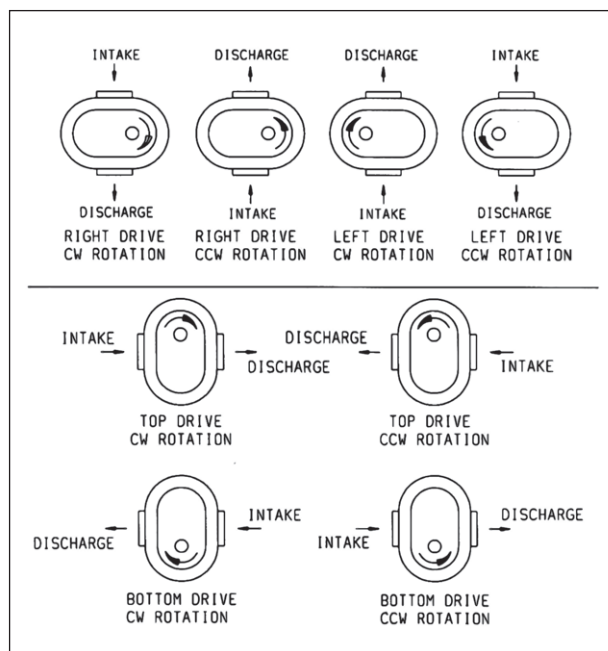


Figure 3-1 – Flow Direction by Rotation

START-UP CHECKLIST

It is recommended that these start-up procedures be followed in sequence and checked off (☒) in the boxes provided in any of the following cases.

<ul style="list-style-type: none"> • During initial installation • After any shutdown period 	<ul style="list-style-type: none"> • After maintenance work has been performed • After blower has been moved to a new location
DATES CHECKED:	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Check the unit for proper lubrication. Proper oil level is critical. See Lubrication (Splash) on page 11. See Recommended Lubricants on page 26 for information on acceptable lubricants for the product.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Check the V-belt drive for proper belt alignment and tension. See V-Belts on page 9.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Carefully turn the rotors by hand to be certain they do not bind.

WARNING

Disconnect power. Make certain power is off and locked out before touching any rotating element of the blower, motor, or drive components.

WARNING

When touching the blower or motor during operation, make certain that loose clothing, long hair, neckties, loose shoelaces, rags, etc. are secured snugly and cannot accidentally dangle into rotating elements such as shafts, belts, and sheaves.

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	"Bump"* the unit with the motor to check rotation (counterclockwise when facing the shaft) and to be certain it turns freely and smoothly.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Start the unit and operate it for 30 minutes at no load. During this time, feel the cylinder for hot spots. If minor hot spots occur, see Troubleshooting on page 17.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Apply the load and observe the operation of the unit for 1 hour.
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	If minor malfunctions occur, discontinue operation and see Troubleshooting on page 17.

* Start intermittently and then turn off immediately.

Installation

FOUNDATION

The blower does not need a special foundation. However, it does require a solid, level floor and adequate frame support.

LOCATION

Install the blower in a protected indoor location, if possible. An unprotected outdoor installation is satisfactory only when correct lubrication for the expected temperatures is provided. **See Recommended Lubricants on page 26.** Just before starting the installation, remove plugs or covers from inlet and discharge connections. Inspect for dirt or foreign objects inside machine, and then turn the drive shaft by hand to make sure it rotates freely. Mount in a level position. Use a baseplate that is rigid, solidly supported, and structurally sound. Make sure the feet rest evenly on the plate before fastening down. Twisting or cramping the blower during mounting will cause rotor contact and binding during operation.

SOFT FOOT

Soft foot is a condition in which one of the blower feet does not sit flat on the base. Usually, this is due to irregularities in the surface to which the blower is mounted. When you tighten the bolt on the foot, the blower will distort slightly, but enough to cause problems with bearing and seal life, and premature internal contact between the rotors and the housing.

1. Place blower on base.
2. Check each foot for gaps between foot and base (soft foot), shim as necessary to fill gap within .002 in. (.05 mm). Below are shown the two most common types of soft foot conditions. If either type is present, and measures more than .003 in. (.076 mm), the blower may fail prematurely.
3. Tighten all bolts.
4. Mount a dial indicator on base contacting one foot at 12 o'clock position.

5. Loosen bolt on that foot. Observe indicator travel and add shims as needed to reduce "spring" to less than .002 in. (.05 mm). Repeat steps 4 and 5 on remaining feet.

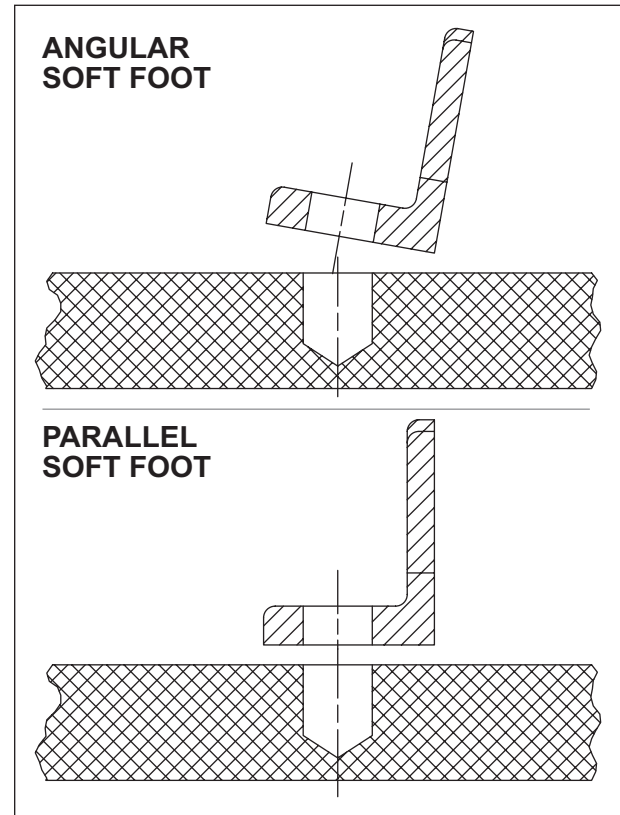


Figure 3-2 – Illustrations of Soft Foot

Transmission of small operating vibrations to a support structure may be objectionable in some applications. Use of vibration isolators or vibration-absorbing materials can be effective in overcoming this transmission. To avoid causing distortion, apply the treatment under the common motor/blower base or mounting plate rather than directly under the feet alone. Make sure piping is accurately squared with the blower and supported independently. Use only clean, new pipe, and make certain it is free of scale, cuttings, weld beads, dirt, or any other foreign material.

To guard against damage to the blower, make sure that an inlet filter is used. Clean the filter of collected debris after 3 hours of operation and periodically thereafter.

MOUNTING STRESS

Stress imparted from incorrectly aligned piping or mounting will create problems with bearing and seal life, possibly leading to premature internal contact. The blower should sit stress-free and evenly on its supporting surface. Take care to evenly tighten the mounting bolts to avoid imparting undue stress into the blower. Stress can be checked in a free state with feeler stock or verified on a previously installed blower with the aid of a dial indicator. Spring or gap should be less than 0.002 in. (0.05 mm).

BLOWER AIR INTAKE

To minimize maintenance, supply the blower with the cleanest air possible. The air must not contain any flammable or toxic gases, as the blower will concentrate these gases. This could result in damage to the blower and surrounding property and lead to personal injury or death.

WARNING

Do not use air blowers on explosive or hazardous gases. Each size blower has limits on pressure differential, running speed, and discharge temperature. These limits must not be exceeded.

If it is necessary to take air from a remote source, such as in a vacuum application, make sure the diameter of the piping is at least the equal to the diameter of the blower inlet. For distances greater than 20 ft (6 m), enlarge the pipe diameter to reduce inlet restriction. Excessive restriction will reduce the efficiency of the blower and elevate its discharge temperature.

The piping used should also be corrosion-resistant and free of scale and dirt. Keep the inlet covered to keep out foreign objects and rain.

MOTOR DRIVES

Two drive connections commonly used are direct drive and V-belt drive.

DIRECT COUPLED

When installing the motor directly to the blower, align the shafts to the coupling according to the coupling manufacturer's instructions.

Blowers shipped with motor directly coupled and mounted on a common base have been aligned prior to shipment. Further alignment is not normally necessary, but be sure to check the alignment and make adjustments if necessary prior to starting the blower.

V-BELTS

If the motor and blower are V-belt connected, the sheaves on both the motor and blower shafts should be as close to the shaft bearings as possible. Blower sheave is not more than 1/4 in. (6.5 mm) from the blower drive end cover. The drive sheave is as close to the driver bearing as possible. Take care when installing sheaves on the blower and motor shafts. Make sure the face is accurately in line to minimize belt wear.

Adjust the belt tension to the manufacturer's specifications using a belt tension tester. Check new belts for proper tension after 24 hours of run time. When manufacturer data is not available, industry guidelines recommend 1/64 in. deflection for each inch of span (0.157 mm deflection per centimeter of span) at 8 to 10 lb (3.6 – 4.5 kg) of force in the center of the belt. **See Figure 3-3.**

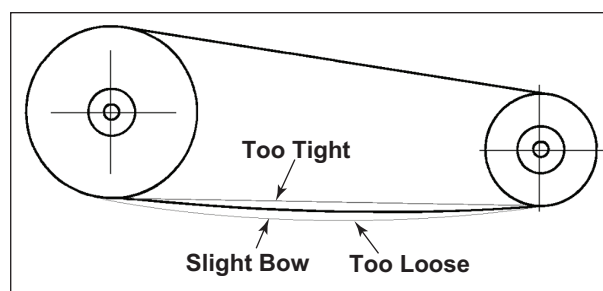


Figure 3-3 – General appearance of V-belt drive

Insufficient tensioning is often indicated by slipping (squealing) at start-up. Do not use belt dressing on V-belts. Keep sheaves and V-belts free of oil and grease. Remove tension from belts if the drive is to be inactive for an extended period of time. For more specific information, consult the drive manufacturer. In a V-belt drive, the blower sheave must fit its shaft accurately, run true, and be mounted as close to the bearing housing as possible to minimize bearing loads. **See Figure 3-4.**

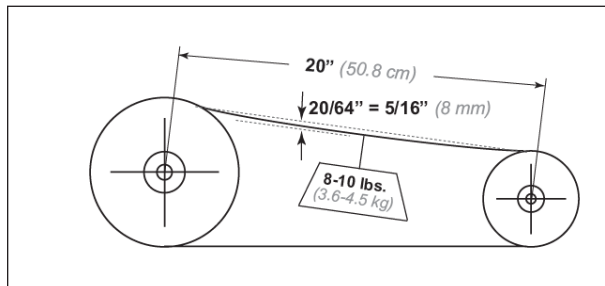


Figure 3-4 – Setting of proper tension for a V-belt drive

A tight or driving fit will force the drive shaft out of its normal position and cause internal damage. A loose fit will result in shaft damage or breaking. Make sure the motor sheave fits correctly and is properly aligned with the blower sheave.

Adjust the motor position on its sliding base so that belt tension is in accordance with the drive manufacturer's instructions. Always avoid excessive belt tension. Recheck tension after the first 10 hours of operation and periodically thereafter to avoid slippage and loss of blower speed.

Check the blower after installation and before applying power by rotating the drive shaft by hand. If the drive shaft does not rotate freely:

- Look for uneven mounting, piping strain, excessive belt tension, or coupling misalignment.
- Check the blower to make sure oil was added to the reservoirs.

ELECTRICAL CONNECTIONS

Wire the motor and other electrical devices, such as solenoid valves and temperature switch, to the proper voltage and amperage as indicated on the nameplate of each component being wired. Turn the blower by hand after wiring is completed to determine that there are no obstructions, and that the blower turns freely. Then, momentarily start the blower to check the direction of rotation. The airflow direction can be reversed by reversing the appropriate motor leads.

RELIEF VALVES

M-D Pneumatics recommends the use of relief valves to protect against excessive pressure or vacuum conditions. Test these valves at initial start-up to be sure they are properly adjusted to relieve at or below the maximum pressure differential rating of the blower.

CAUTION

Upon completion of the installation, and before applying power, rotate the drive shaft by hand. It must move freely. If it does not, look for uneven mounting, piping strain, excessive belt tension, coupling misalignment or any other cause for binding. If blower is removed and still does not rotate freely, check inside the blower housing for foreign material.

PIPING

- Ensure that inlet and outlet connections on all blowers are large enough to handle maximum volume with minimum friction loss. Inlet and outlet connections on all blowers are large enough to handle maximum volume with minimum friction loss.
- Maintain same-diameter piping.
- Do not support silencers by the blower.
- Avoid stress loads and bending moments.

Be certain all piping is clean internally before connecting to the blower. Place a 16-mesh wire screen backed with hardware cloth at or near the inlet connections for the first 50 hours of use until the system is clean. Clean the screen after 3 hours of operation and completely discard it once the system is clean, as it will eventually deteriorate and small pieces going into the blower can cause serious damage. A horizontal or vertical airflow piping configuration is easily achieved by rearranging the mounting feet position.

**WARNING**

Do not operate equipment without adequate silencing devices since high noise level may cause hearing damage. (Reference OSHA Standards).

LUBRICATION (SPLASH)

Before starting the unit, fill oil reservoirs as instructed below:

1. Remove fill plugs or breathers from the gear (drive) end and free (non-drive) end plates.
2. Pour oil through the fill hole until oil appears in the sight glass. Slowly bring oil up to center of glass. Repeat for both end plates. Fill each oil sump independently.
3. Re-seal plugs and reinstall in end plates.
4. Check oil levels frequently. Shut down the blower to properly check oil levels.

PLEASE NOTE THE FOLLOWING:

- Every M-D Pneumatics blower has been factory-tested, oil-drained, and shipped dry.
- Fill oil reservoirs to the proper level before operation.

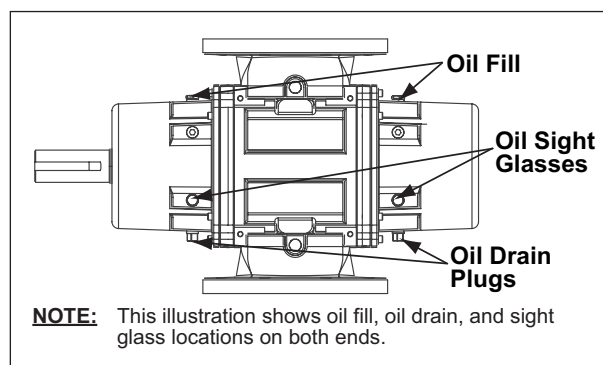


Figure 3-5 – Locations of Oil Fill, Oil Drain Plug, and Oil Sight Glass

- **See Recommended Lubricants on page 26** for lubricants approved for use in M-D Pneumatics blowers.
- Add oil in the quantity shown in **Specifications Table 3-1 on page 6**.
- Time lapse between oil changes will vary depending on operating conditions.
- Higher blower operating temperatures are directly related to higher oil temperatures.

FREQUENTLY ASKED QUESTIONS REGARDING LUBRICATION

What are the perceived modes of failure when blowers are run beyond the specified duty cycles?

Several things are happening as the lubricant goes through the unit. First, it is absorbing frictional energy in the form of heat. This heat has to be dissipated through either surface contact with cooler materials or in a volume of lubricant. While reducing the friction, the lubricant is also going through a shearing process and the molecular structure is broken down.

The result is that the lubricant will begin to thicken because of the shorter molecular chains and the drop out of additive packages. The thickened lubricant will cause more drag, increasing the friction and heat and further degrading the lubricant.

Operation of the blower (environment, run time, speed, and pressure) has a direct effect on duty cycles. The published cycles are based on worst-case conditions.

What is the functional detriment if the “wrong oil” is used?

The lubricant is selected based on bearing speed, gear speed, and operating temperature. If the lubricant is too light, it increases wear by not separating the sliding surfaces and it will not remove the heat adequately. If the lubricant is too thick, the drag in the bearings is increased, causing them to run hotter. Thicker lubricant will not flow as readily into the gears and it will reduce the available backlash. Lubricants at our conditions are incompressible.

What is the functional detriment if the oil is not serviced?

If the lubricant is not serviced at the proper interval, the shearing action in the bearing and the gears will begin to take its toll and the lubricant will thicken. The blower will run hotter and the wear on moving parts will increase. The lubricant will generally appear dirtier, caused by material rubbing off the components. The lubricant will discolor because of overheating. An indicator of the breakdown of a lubricant is the increase in the Total Acid Number (TAN) and a change of 10 percent in the base viscosity.

OPERATION

Before starting the blower for the first time under power, recheck the installation thoroughly to reduce the likelihood of difficulties. Use the following checklist as a guide, but consider any other special conditions in your installation.

1. Be certain no bolts, rags, or dirt have been left in the blower.
2. Be certain that inlet piping is free of debris. If an open outdoor air intake is used, be sure the opening is clean and protected by an inlet filter. This also applies to indoor use.
3. If installation is not recent, check blower leveling, drive alignment, belt tension, and tightness of all mounting bolts.
4. Be certain the proper volume of oil is in the oil reservoir chambers.
5. Be certain the driving motor is properly lubricated and connected through suitable electrical overload devices.
6. With electrical power off and locked out to prevent accidental starting, rotate the blower shaft several times by hand to make sure the blower is rotating freely. Unevenness or tight spots are indicators of a condition that should be corrected before progressing.
7. Check motor rotation by momentarily pushing the START button and then checking the flow direction of the blower. Reverse the motor connections if the flow is in the wrong direction.

Carry out initial operation under “no load” conditions by opening all valves and venting the discharge to atmosphere, if possible. Then, start the motor briefly, listen for unusual noises, and make sure the blower coasts freely to a stop. If no problem appears, repeat this check, and let the motor run slightly longer. If any questions exist, investigate before proceeding.

Assuming all tests are satisfactory, the blower will now be ready for continuous full-load operation. During the first several days, check periodically to make sure all conditions remain acceptable and steady. These checks may be particularly important if the blower is part of a process system where conditions may vary. At the first opportunity, stop the blower and clean or remove the inlet filter. Also recheck leveling, coupling alignment or belt tension, and mounting bolts for tightness.

RECOMMENDED SHUTDOWN PROCEDURE TO MINIMIZE RISK OF FREEZING OR CORROSION

When a blower is taken out of service, it may require internal protection against rusting or corrosion. The need for such protection must be a matter of judgment based on existing conditions as well as length of down time. Under atmospheric conditions producing rapid corrosion, the blower should be protected immediately. When an air piping system has high humidity or moisture, water condensation can occur after the blower is shut down and it begins to cool. Condensation creates an environment favorable to corrosion of

Operation

the iron internal surfaces and to ice formation in cold weather. Both of these conditions can close the operating clearances, causing the blower to fail upon future start-up.

The following shutdown procedure minimizes the risk of moisture condensation, corrosion, and freezing.

NOTICE

Care must be taken to avoid overloading or overheating.

1. Isolate the blower from the moist system piping, allowing the blower to intake atmospheric air.
2. Operate the blower under a slight load, allowing the blower to heat within safe limits. The heat generated by the blower will quickly evaporate residual moisture.
3. For carpet cleaning applications, after the work is completed, simply allow the blower to run 3 – 5 minutes with the suction hose and wand attached. The suction hose and wand will provide enough load to the blower to evaporate the moisture quickly.
4. For extended shutdown, inject a small amount of a light lubricating oil such as 3-in-One®* or a spray lubricant such as WD-40®* into the inlet of the blower just before shutdown. The lubricant will provide an excellent protective coating on the internal surfaces. If using a spray lubricant, take care to prevent the applicator tube from getting sucked into the blower. The applicator tube will damage the blower, likely to a degree where repair would be required.

* 3-in-One and WD-40 are registered trademarks of WD-40 Company.

LONG TERM STORAGE

1. Spray the interior (lobes, housing, and end plates) with rust preventative.
2. Apply a rust preventative grease to the drive shaft.
3. Attach a desiccant bag to either of the covers to prevent condensation from occurring inside the blower. Make sure any desiccant bag (or bags) is attached to the covers so that they will be removed before start-up of the blower.
4. Store the blower in an air conditioned and heated building if possible. If air conditioned and heated storage is not possible, make conditions as dry as possible.
5. If possible, rotate the drive shaft by hand at least monthly in order to prevent seals from setting in one position.

MAINTENANCE

GENERAL

Regular inspection of the blower and its installation, along with complete checks on operating conditions, will pay dividends in added life and usefulness. Also, service the drive per the manufacturer's instructions and lubricate the coupling or check the belt drive tension. Use thermometers and gauges to make sure that blower operating temperature and pressure remain within allowed limits.

REGULAR MAINTENANCE

A well-designed maintenance program will add years of service to the blower.

Check a newly installed blower frequently during the first month of operation, especially lubrication. With the blower at rest, check the oil level in both the gear (drive) end and free (non-drive) end of the blower and add oil as needed. Complete oil changes are recommended every 1,000 – 1,200 operating hours, or more frequently depending on the type of oil and operating temperature. Also change the oil more frequently if pumping corrosive vapors or where excessive operating temperatures are encountered.



DANGER



The blower and parts may contain hazardous media. Assure that pump and parts are evacuated of hazardous media prior to servicing.



CAUTION

The electrical service must be isolated and de-energized prior to maintenance. Apply appropriate procedures to assure electrical supply is de-energized and cannot be inadvertently energized during maintenance.

Assure piping and product is isolated prior to maintenance of blower. Apply appropriate procedures to assure piping and product is isolated and that inadvertent opening of valves cannot occur during maintenance.



CAUTION

During routine maintenance, inspect and assure that guards are in place and secure.

Maintenance

When a blower is taken out of service, it may require internal protection against rusting or corrosion. The need for such protection must be a matter of judgment based on existing conditions as well as length of downtime. Under atmospheric conditions producing rapid corrosion, protect the blower immediately. **See Long Term Storage on page 14.**

PREVENTATIVE MAINTENANCE

The following is recommended as a minimum maintenance program.

DAILY	WEEKLY	MONTHLY
<ol style="list-style-type: none"> 1. Check and maintain oil level, and add oil as necessary. 2. Check for unusual noise or vibration (See Troubleshooting on page 17). 	<ol style="list-style-type: none"> 1. Clean all air filters. A clogged air filter can seriously affect the efficiency of the blower and cause overheating and increased oil usage. Replace if necessary. 2. Check the relief valve to make sure it is operating properly. 	<ol style="list-style-type: none"> 1. Inspect the entire system for leaks. 2. Inspect the condition of oil and change if necessary. 3. Check drive belt tension and tighten if necessary.

NOTICE

Oil levels should be checked every 24 hours of operation.

Proper oil drain schedules require oil be changed before the contaminant load becomes so great that the lubricating function of the oil is impaired or heavy disposition of suspended contaminants occurs. To check the condition of the oil, drain a sample into a clean container and check for the presence of water or solids. Slight discoloration of the oil should not necessitate an oil change.

TROUBLESHOOTING

Although M-D Pneumatics blowers are well designed and manufactured, problems may occur due to normal wear and the need for readjustment. The following chart lists symptoms that may occur along with probable causes and remedies.

SYMPTOM	PROBABLE CAUSE	REMEDIES
Loss of oil	Gear housing not tightened properly	Tighten gear housing bolts.
	Lip seal failure	Disassemble and replace lip seal.
	Insufficient sealant	Remove gear housing and replace sealant. See <i>Disassembly (3200 and 4600)</i> on page 20.
	Loose drain plug	Tighten drain plug.
Excessive bearing or gear wear	Improper lubrication	Correct oil level. Replace dirty oil. See <i>Lubrication (Splash)</i> on page 11.
	Excessive belt tension	Check belt manufacturer's specifications for tension and adjust accordingly.
	Coupling misalignment	Check carefully, realign if necessary.
Lack of volume	Slipping belts	Check belt manufacturer's specifications for tension and adjust accordingly.
	Worn lobe clearances	Check for proper clearances. See <i>Assembly Clearances</i> on page 25.
	Speed too low	Increase blower speed within limits.
	Obstruction in piping	Check system to ensure an open flow path.
Knocking	Blower out of time	Re-time.
	Distortion due to improper mounting or pipe strains	Check mounting alignment and relieve pipe strains.
	Excessive pressure differential	Reduce to manufacturer's recommended pressure. Examine relief valve and reset if necessary.
	Worn gears	Replace timing gears. See <i>Disassembly (3200 and 4600)</i> on page 20.

SYMPTOM	PROBABLE CAUSE	REMEDIES
Excessive blower temperature	Too much or too little oil in gear reservoir	Check oil level. See <i>Lubrication (Splash)</i> on page 11.
	Too low operating speed	Increase blower speed within limits.
	Clogged filter or silencer	Remove cause of obstruction.
	Excessive pressure differential	Reduce pressure differential across the blower.
	Elevated inlet temperature	Reduce inlet temperature.
	Worn lobe clearances	Check for proper clearances. See <i>Assembly Clearances</i> on page 25.
Rotor end or tip drag	Insufficient assembled clearances	Correct clearances. See <i>Assembly Clearances</i> on page 25.
	Case or frame distortion	Check mounting and pipe strain.
	Excessive operating pressure	Reduce pressure differential.
	Excessive operating temperature	Reduce pressure differential or reduce inlet temperature.
Vibration	Belt or coupling misalignment	Check carefully. Realign if necessary.
	Lobes rubbing	Check cylinder for hot spots, and then check for lobe contact at these points. Correct clearances. See <i>Assembly Clearances</i> on page 25.
	Worn bearings or gears	Check condition of gears and bearings. Replace if necessary.
	Unbalanced or rubbing lobes	Possible buildup on casing or lobes, or inside lobes. Remove buildup and restore clearances.
	Driver or blower loose	Check mounting and tighten if necessary.
	Piping resonance	Check pipe supports, check resonance of nearby equipment, and check foundation.

REPAIR AND REPLACEMENT PARTS

Regular inspection of the blower and its installation, along with complete checks on operating conditions, will pay dividends in added life and usefulness. Pay special attention to lubrication of timing gears and bearings according to the information in **Lubrication (Splash)** on page 11. Also, service the drive per the manufacturer's instructions and lubricate the coupling or check the belt drive tension. Use thermometers and gauges to make sure that blower operating temperature and pressure remain within allowed limits.

Should adjustments or replacement be needed, repairs can often be performed locally as described in this manual after obtaining the required parts. Personnel should have a good background of mechanical experience and be thoroughly familiar with the procedures outlined in this manual. For major repairs not covered in this manual, contact the nearest M-D Pneumatics service representative. When ordering parts, give all nameplate information, plus the item numbers and names as taken from the appropriate assembly drawing in this manual.

When ordering parts, supply the blower nameplate information, as well as the item number and parts description as per the parts lists and assembly drawings. Repair kits are available for all models. Consult the factory.

FACTORY SERVICE AND REPAIR

With proper care, M-D Pneumatics blowers will give years of reliable service. The parts are machined to close tolerances and require special tools by mechanics who are skilled at this work. Should major repairs become necessary, contact the factory for the location of the nearest service facility.

NOTICE

Current regulations require Material Safety Data Sheet to be completed and forwarded to M-D Pneumatics on any unit being returned for any reason which has been handling or involved with hazardous gases or materials. This is for the protection of the employees of M-D Pneumatics who are required to perform service on this equipment. Failure to do so will result in service delays.

NOTICE

When returning a blower to the factory for repair, under warranty, please note the factory will not accept any unit that arrives without authorization. Contact the Service Department for return authorization.

06

DISASSEMBLY AND REASSEMBLY INSTRUCTIONS

DISASSEMBLY (3200 AND 4600)

1. Remove all oil drain plugs and vent plugs from both ends of the blower. Before removing any parts, match-mark each component with a punch. This will allow the blower to be reassembled with the components in the same position. Match-mark the covers, end plate, housing, and both rotors.
2. Remove the drive key from the drive shaft. Remove the gear end cover. Remove the drive end cover. This is best accomplished by using two small pry bars at the dowel pins. Tap on the cover with a mallet while putting pressure on the cover with the pry bar. The cover will slowly move off the dowel pins. Inspect the drive shaft for grooves and burrs. Remove the drive shaft seal from the drive end cover.
3. Carefully remove the drive seal wear ring from the drive shaft. The simplest method to do so is to use a cut-off wheel and a die grinder. The hardened ring will typically snap open once it is cut most of the way through.
4. Remove the washer from the rotor shafts on the gear end. Remove the oil slinger assemblies.
5. Rotate the blower. Remove bolts and washers from rotor shafts on the gear end. Remove the timing gear bolts completely from the driven rotor. Remove the timing gear from the rotor shaft by using a gear puller. **See Figure 6-1.** Rotate the gear as it is being removed to prevent binding. Inspect the gear teeth for wear and pitting. Inspect the rotor shaft keyway for wear and damage.
6. Remove the bolts from the free end of the end plate.

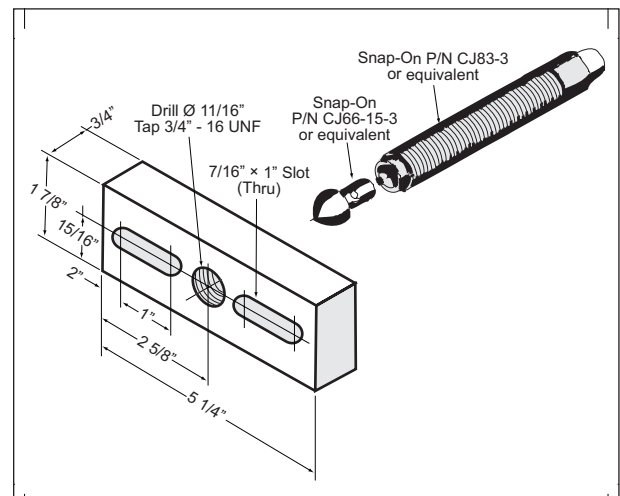


Figure 6-1 – Bar Puller

Disassembly and Reassembly Instructions

7. Use one of the following methods to remove the seal assembly from the drive end of the end plate:
 - Use 4 jacking screws on the end plate to apply even pressure to the jack screws to push the end plate from the housing. Remove the screws. Remove the retainer plate. Push the rotors out of the gear end end plate. Remove the bearings and bearing shield. Save the shims and measure for proper clearance for rebuilding the blower. Remove the seal assembly from the end plate.
 - Using a large arbor press, orient the blower drive shaft down, supported by the ports and use a straight bar (such as a puller bar shown in **Figure 6-1**) to put even pressure on the gear end of the rotors. Once the rotors are pressed to flush with the bearings, insert metric bolts into the rotor or use a spacer slightly smaller than the shaft diameter to press the rotors through the bearings. Save shims and measure for proper clearance for rebuilding the blower. Remove the seal assembly from the end plate.
 - Reverse the machine to drive the shaft up and press each rotor free from the drive end end plate.

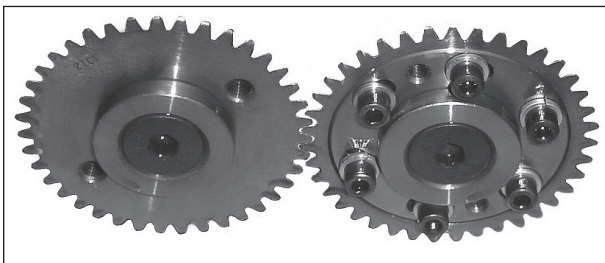


Figure 6-2 – Gear Alignment

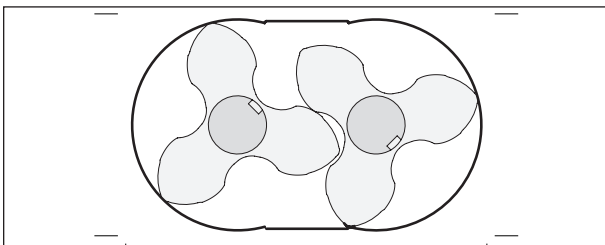


Figure 6-3 – Lobe Keyway Position

8. Remove the seals from the rotors with a plastic mallet or by tapping toward the end of the rotor shaft.
9. Remove the bearings, bearing shield, and seal assembly out of the free end end plates.

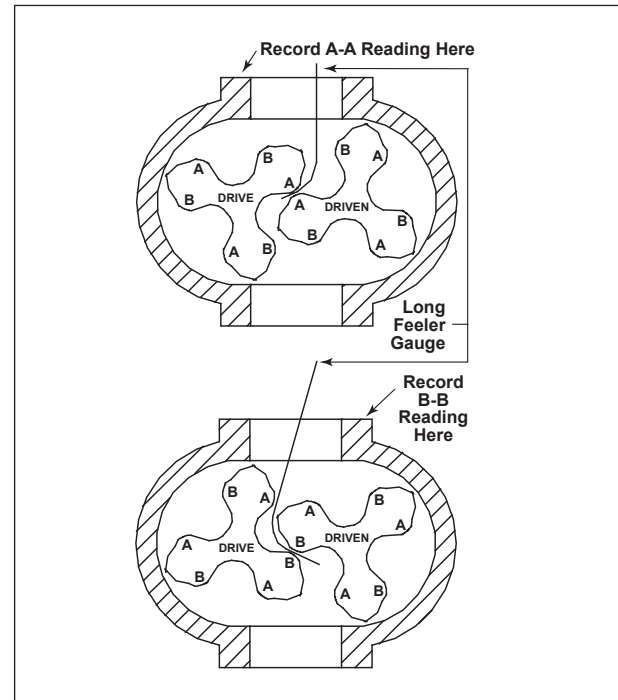


Figure 6-4 – Checking Rotor Interlobe Clearance

10. Use a hammer and brass bar to drive bearing and seal housing from end plates. Inspect bearing wear pattern and seal for wear and heat marks. Clean all parts before inspecting. Check the rotors' bearing and seal fits for bearing spinning along with the seal housing on the rotor shaft. Check the bearing bores and seal bores in the end plate for spinning of bearings and seal housing.

Disassembly and Reassembly Instructions

DISASSEMBLY (6000 SERIES)

1. Remove all oil drain plugs and vent plugs from both ends of the blower. Before removing any parts, match-mark each component with a punch. This will allow the blower to be reassembled with the components in the same position. Match-mark the covers, endplate, housing, and both rotors.
2. Remove drive key from drive shaft. Remove gear end cover. Remove drive end cover. This is best accomplished by using two small pry bars at the dowel pins. Tap on cover with a mallet while putting pressure on the cover with the pry bar. The cover will slowly move off the dowel pins. Inspect the drive shaft for grooves and burrs. Remove drive shaft seal from drive end cover.
3. Carefully remove the drive seal wear ring from the drive shaft. The simplest method to do so is to use a cut-off wheel and a die grinder. The hardened ring will typically snap open once it is cut most of the way through.
4. Remove washer from the rotor shaft on the drive end. Remove oil slinger assemblies. Remove bolts from drive end endplate.
5. Use 4 jacking screws on drive end endplate. Apply even pressure to jack screws to push the endplate from housing and rotor shafts. Remove shims from endplate. Remove bearings and seal assembly from endplate. Rotate unit. Remove bolts and washers from rotor shafts on the gear end. Remove the timing gear bolts completely from the driven rotor. Remove the timing gear from the rotor shaft by using a gear puller. **See Figure 6-1.** Rotate the gear as it is being removed to prevent binding. Inspect gear teeth for wear and pitting. Remove rotor key from keyways. Inspect rotor shaft keyway for wear and damage.
6. Remove bolts from gear end endplate.
7. Use 4 jacking screws on the gear end endplate. Apply even pressure to the jack screws to push the end plate from the housing. Remove screws. Remove retainer plate. Push rotors out of gear end endplate. Remove

bearings and remove bearing shield. Save shims and measure for proper clearance for rebuilding the unit. Remove seal assembly from the endplate. OR Using a large arbor press, orient the blower drive shaft down, supported by the ports and use a straight bar (such as a puller bar shown in **Figure 6-1**) to put even pressure on the gear end of the rotors. Once the rotors are pressed to flush with the bearings, insert metric bolts in to the rotor or use a spacer slightly smaller than the shaft diameter to press the rotors through the bearings. Save shims and measure for proper clearance for rebuilding the unit. Remove seal assembly from endplate.

8. Remove seals from the rotors with a plastic mallet or by tapping towards the end of the rotor shaft.
9. Use a hammer and brass bar to drive bearing and seal housing from endplates. Inspect bearing wear pattern and seal for wear and heat marks. Clean all parts before inspecting. Check the rotors' bearing and seal fits for bearing spinning along with seal housing on the rotor shaft. Check bearing bores and seal bores in the endplate for spinning of bearings and seal housing.

ASSEMBLY (3200 AND 4600)

A maintenance kit containing all the components that are replaced during a normal blower overhaul is available from M-D Pneumatics. Be sure to have these parts, at a minimum, on hand prior to assembly. Be certain to have your serial number available when you contact the factory.

Check all parts to make sure they are clean and free of burrs or nicks that may have occurred when the blower was being disassembled. Check the repair kit for the correct parts needed to complete the assembly of the blower. Make sure you have the proper tooling and training required to assemble the blower. Take the proper time to read the manual before you begin.

Gear End Assembly (3200 and 4600)

1. Seat the rotors on a fixture with the gear end of the rotors upward and in the "T" position. Make sure the drive rotor is in the correct location for the proper flow and rotation required for the application.
2. Install the end plate and housing assembly onto the rotors. Using a seal pressing tool, press the seal assembly onto the rotor shafts and into the bores of the end plates. Add shims as needed. Install the seal slinger. Add shims as needed. Press the oil shield onto the rotor shafts. The oil shield is part of the seal assembly, but it must be pressed on after the seal assembly is installed.
3. Install the bearings press until seated. Install the retainer and bolts. Install the keys into the shaft. Install the gear assembly. Install the solid gear onto the long-tail drive rotor and two-piece gear onto the driven rotor. Install the locks. Install the screws.

Drive End (Free End) Assembly (3200 and 4600)

1. Turn the blower over. Set on the face of the gears and with feeler gauges check the gear end for proper clearances.
2. **See Figure 6-5** regarding bearing bore stack up and seal measurement.
3. Put depth micrometer on the housing and measure the distance to the rotor face or use flat block and feeler gauge. Add shims to get proper free end clearances. Install O-ring into groove.
4. Install end plate onto dowels. Bolt down with screws. With feeler gauge, check free end clearance. Adjust with shims appropriately.
5. Install seal assembly onto rotor shafts and into end plates. Press the slinger onto the shaft. Press the oil shield onto the shaft. Install the bearings. Install the slingers. Tighten the set screws into the shaft. Install the washer and install flat-head cap screw into the end of the shaft.

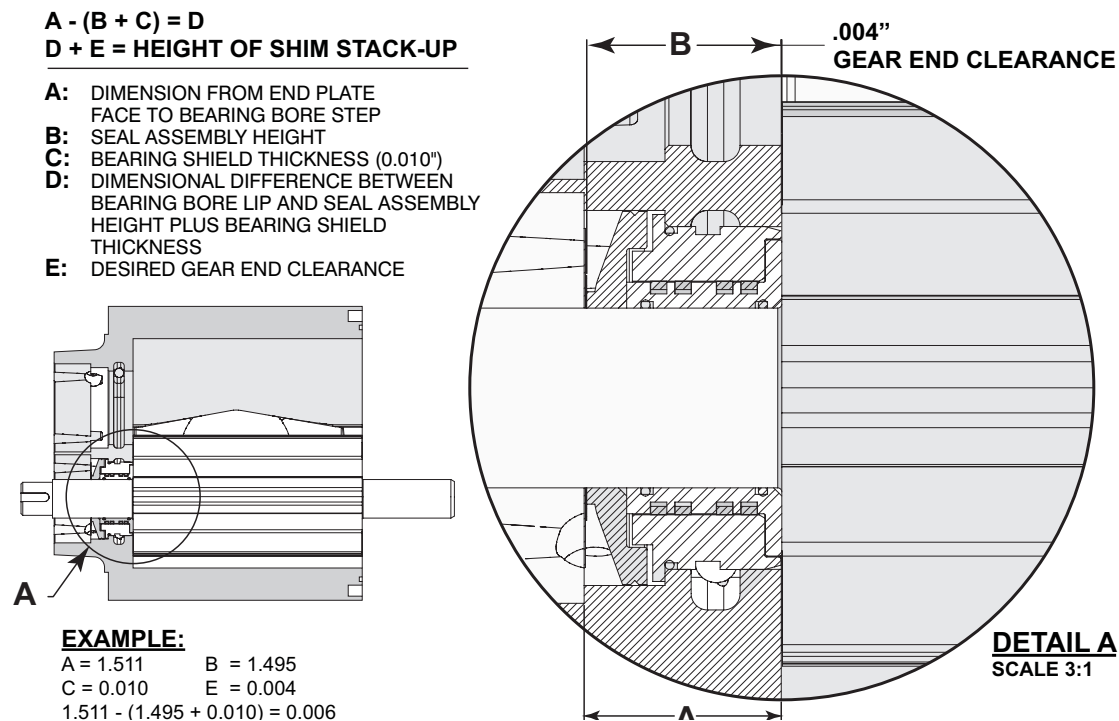


Figure 6-5 – Bearing Bore Stack-Up and Seal Measurement

Disassembly and Reassembly Instructions

ASSEMBLY (6000 SERIES)

A maintenance kit is available from M-D Pneumatics. This kit contains all the components that are replaced during a normal blower overhaul. As a minimum, these parts should be on hand prior to assembly. Be certain to have your serial number available when you contact the factory.

Check all parts to insure they are clean and free of burrs or nicks that may have occurred when the blower was being disassembled. Check the repair kit for the correct parts needed to complete the assembly of the unit. Make sure you have the proper tooling and training required to assemble the blower. Take the proper time to read the instruction manual before you begin.

Gear End Assembly (6000 Series)

1. Seat rotors on a fixture with the gear end of the rotors upward and with the rotor keyways pointing toward the 9 o'clock position. Make sure that the drive rotor is in the correct location for the proper flow and rotation required for the application.
2. **See Figure 6-5** regarding bearing bore stack-up and seal measurement.
3. Using a seal pressing tool, press the piston carrier onto the rotor shaft, and sleeves into the bores of endplates. Seat endplate over rotors. Install seal slingers and add shims as needed.
4. Install bearings and press until seated. Install retainer and bolts. Install gear spacer onto long-tail rotor.
5. Install keys into shaft. Install solid gear onto long-tail rotor and two-piece gear hub onto driven rotor. Install two-piece gear over hub. Install lock washers and screws into gear. Install rotor washers and screws over gears.
6. Check clearances. Add O-ring to housing. Add entire assembly to housing and bolt together.

Drive End (Free End) Assembly (6000 Series)

1. Turn unit over and set on face of gear and with feeler gauges check the free end for proper clearances. Add shims to get proper free end clearances. Install O-ring into groove.
2. Install piston carriers onto rotor shafts and sleeves into endplate bores.
3. Install endplate over rotor shafts and bolt to the housing.
4. With a feeler gauge, check free end clearance. Adjust with shims appropriately.
5. Install slingers onto each shaft and add .060 in. shims to each shaft. Install bearings.
6. Add bearing spacers. Install washers and bolts to hold bearing spacers. Add the inner race retainer to the drive rotor and tighten set screws.
7. Add spacers and oil slinger to the driven rotor and lock down using rotor washers.
8. Add wear ring to the drive rotor using wear ring tool.
9. Check all clearances and set timing. **See Figure 6-4 on page 21** to set Interlobe clearances.

ASSEMBLY CLEARANCES

MODEL	GEAR END	DRIVE END	TOTAL CLEARANCE	INTERLOBE	TIP TO DOWEL	TIP TO PORT
3203	0.003 – 0.006 in. 0.08 – 0.15 mm	0.005 – 0.007 in. 0.13 – 0.18 mm	0.008 – 0.013 in. 0.20 – 0.33 mm	0.004 – 0.008 in. 0.10 – 0.20 mm	0.002 – 0.005 in. 0.05 – 0.13 mm	0.005 – 0.007 in. 0.13 – 0.18 mm
3208	0.003 – 0.006 in. 0.08 – 0.15 mm	0.011 – 0.014 in. 0.28 – 0.36 mm	0.014 – 0.020 in. 0.36 – 0.51 mm	0.004 – 0.008 in. 0.10 – 0.20 mm	0.002 – 0.005 in. 0.05 – 0.13 mm	0.005 – 0.007 in. 0.13 – 0.18 mm
4606	0.003 – 0.006 in. 0.08 – 0.15 mm	0.009 – 0.012 in. 0.23 – 0.30 mm	0.012 – 0.019 in. 0.30 – 0.48 mm	0.005 – 0.011 in. 0.13 – 0.28 mm	0.002 – 0.005 in. 0.05 – 0.13 mm	0.006 – 0.008 in. 0.15 – 0.20 mm
4610	0.003 – 0.006 in. 0.08 – 0.15 mm	0.014 – 0.017 in. 0.36 – 0.43 mm	0.017 – 0.024 in. 0.43 – 0.61 mm	0.005 – 0.011 in. 0.13 – 0.28 mm	0.002 – 0.005 in. 0.05 – 0.13 mm	0.006 – 0.008 in. 0.15 – 0.20 mm
6009	0.002 – 0.005 in. 0.05 – 0.013 mm	0.018 – 0.022 in. 0.46 – 0.56 mm	0.022 – 0.025 in. 0.56 – 0.64 mm	0.015 – 0.016 in. 0.38 – 0.41 mm	0.004 – 0.007 in. 0.10 – 0.18 mm	0.007 – 0.009 in. 0.18 – 0.23 mm
6015	0.006 – 0.009 in. 0.05 – 0.013 mm	0.020 – 0.024 in. 0.51 – 0.61 mm	0.026 – 0.033 in. 0.61 – 0.69 mm	0.012 – 0.015 in. 0.38 – 0.41 mm	0.004 – 0.007 in. 0.10 – 0.18 mm	0.009 – 0.011 in. 0.18 – 0.23 mm

08

RECOMMENDED LUBRICANTS

RECOMMENDED LUBRICANTS FOR BLOWERS AND VACUUM BOOSTERS

Positive displacement blowers and vacuum boosters require proper lubrication for bearings, seals and gears to operate effectively and efficiently. Oil is distributed from the oil reservoir to the critical components by means of oil slingers that are attached to the rotor shaft. In certain models of CP Series blowers, a high-performance grease rated for high temperatures is used on the drive-end bearings.

MD full synthetic lubricants are recommended for blowers and vacuum boosters. MD lubricants are specifically formulated using unique additives that provide maximum protection and extend the life of your product over mineral oils or semi-synthetic lubricants.

**WARNING**

Do not overfill the oil sumps. Overfilling can result in gear damage or oil leaks.

**CAUTION**

Units are shipped without oil in the sumps. Ensure adequate oil has been added before operating.

MD oils are suitable for a wide range of operating temperatures that are based on model, operating speed and discharge temperature of the product.

FOR OXYGEN-ENRICHED SERVICE

Blowers and vacuum boosters operated in oxygen enriched applications should only use non-flammable, PFPE full synthetic lubricants. Blowers and vacuum boosters used in hydrogen service should only MD full synthetic oil

NOTE: Oxygen-enriched service only applicable for PD Plus blowers and vacuum boosters.

**CAUTION**

M-D Pneumatics and Kinney does not accept responsibility for damage caused by use of lubricants that are not recommended by M-D Pneumatics and Kinney.

MD BLOWER & BOOSTER LUBRICANTS SPECIFICATIONS				
PRODUCTS	MD ONE	MD PLUS	MD MAX	MD FG
VISCOSITY INDEX	150	154	157	141
@40°C, CST	99.1	231.7	340.9	99.3
@100°C, CST	14.4	27.6	37.2	13.9
FLASH POINT °F (°C)	510 (266)	480 (249)	491 (255)	515 (268)
POUR POINT °F (°C)	- 44 (-43)	-49 (-45)	-54 (-48)	-60 (-51)

NOTE: MD One Vapor Pressure: (mm Hg) 100°F <0.00004; 200°F <0.00018

MD BLOWER & BOOSTER LUBRICANTS OPTIONS					
MD OIL TYPE	1 QUART	1 GALLON	5 GALLON	55 GALLON BARREL	CASE 12 QUARTS
MD ONE	16444-MD1-Q	16444-MD1-G	16444-MD1-5G	16444-MD1-B	16444-MD1-Q-C
MD PLUS	16444-MD2-Q	16444-MD2-G	16444-MD2-5G	16444-MD2-B	16444-MD2-Q-C
MD MAX	16444-MD3-Q	16444-MD3-G	16444-MD3-5G	16444-MD3-B	16444-MD3-Q-C
MD FG	16444-MD1-Q-FG	16444-MD1-G-FG	16444-MD1-5G-FG	16444-MD1-B-FG	16444-MD1-Q-C-FG

CUTAWAY DRAWINGS AND PARTS LISTS

CUTAWAY DRAWING FOR QX-3200 AND QX-4600 SERIES BLOWERS

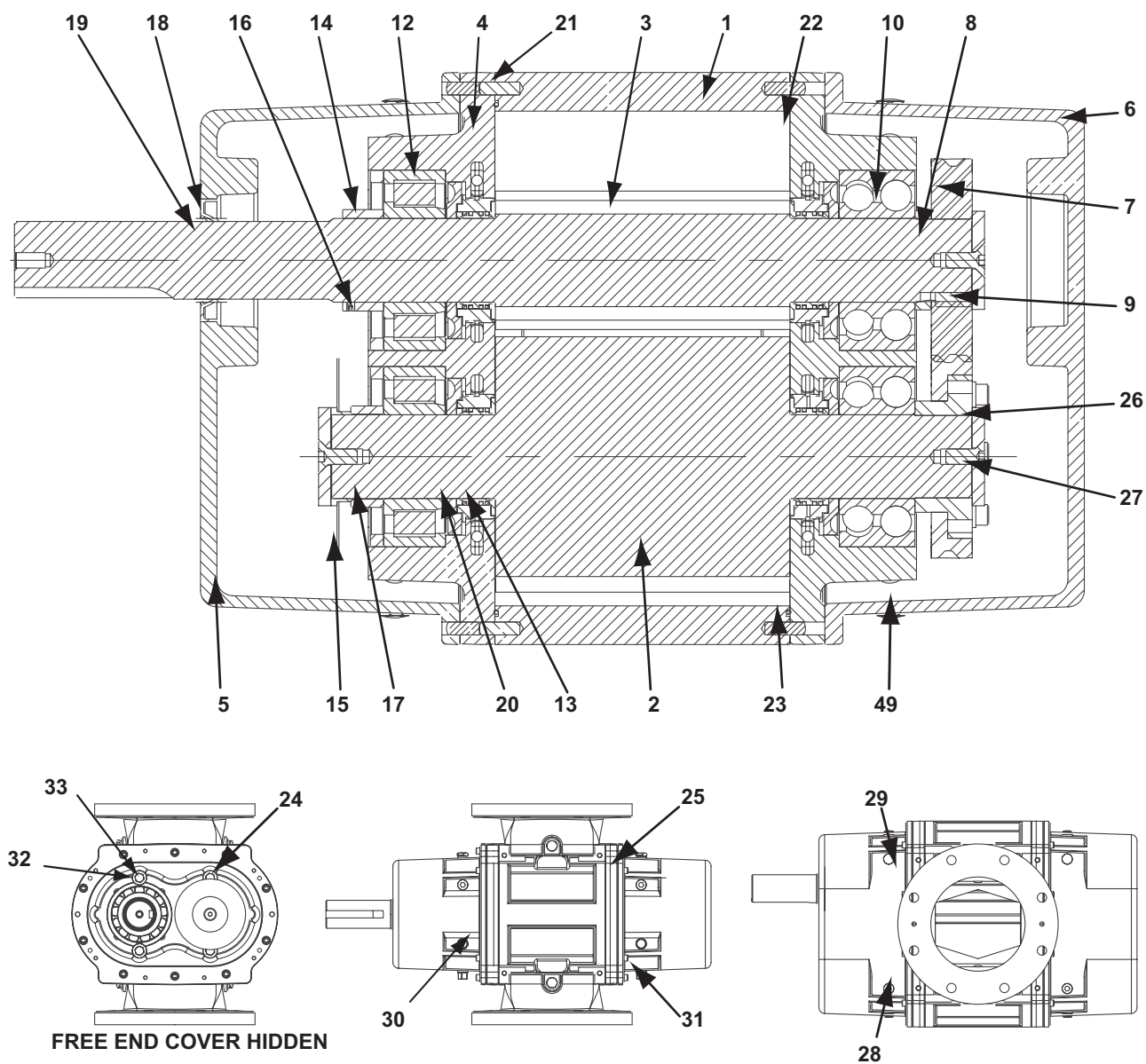


PARTS LIST FOR QX-3200 AND QX-4600 SERIES BLOWERS

ITEM NO.	PART DESCRIPTION	QTY
1	HOUSING	1
2	DRIVE ROTOR	1
3	DRIVEN ROTOR	1
4	ENDPLATE	1
5	DRIVE COVER	1
6	GEAR END COVER	1
7	GEAR ASSEMBLY	1
8	GEAR SPACER	1
9	GEAR KEY	2
10	BALL BEARING	2
12	CYLINDER BEARING	2
13	SEAL ASSEMBLY	4
14	DRIVE COLLAR	1
15	OIL SLINGER	1
16	LIP SEAL	1
17	SEAL WEAR RING	1

ITEM NO.	PART DESCRIPTION	QTY
18	BEARING SHIM	—
19	HOUSING SHIM	—
20	O-RING	1
21	DOWEL PIN	4
22	CAP SCREW	26
23	ROTOR WASHER	3
24	FLAT CAP SCREW	3
25	OIL SIGHT GLASS	4
26	HEX PIPE PLUG	2
27	OIL DRAIN PLUG	4
28	SOCKET PIPE PLUG	8
29	SQUARE PIPE PLUG	2
30	SET SCREW	2
31	WASHER	4
32	CAP SCREW	4

CUTAWAY DRAWING FOR QX-6000 SERIES BLOWERS



PARTS LIST FOR QX-6000 SERIES BLOWERS

ITEM NO.	PART DESCRIPTION	QTY
1	HOUSING	1
2	DRIVEN ROTOR	1
3	DRIVE ROTOR	1
4	ENDPLATE	2
5	DRIVE COVER	1
6	GEAR END COVER	1
7	GEAR ASSEMBLY	1
8	GEAR SPACER	1
9	TIMING GEAR KEY	2
10	BALL BEARING	2
12	CYLINDER BEARING	2
13	SEAL ASSEMBLY	4
14	DRIVE COLLAR	1
15	OIL SLINGER	1
16	SET SCREW	2
17	OIL SLINGER SPACER	1

ITEM NO.	PART DESCRIPTION	QTY
18	LIP SEAL	1
19	SEAL WEAR RING	1
20	BEARING SHIM	—
21	HOUSING SHIM	—
22	ORING	2
23	DOWEL PIN	6
24	CAP SCREW	16
25	CAP SCREW	20
26	ROTOR WASHER	3
27	FLAT CAP SCREW	3
28	SOCKET PIPE PLUG	8
29	HEX PIPE PLUG	6
30	OIL SIGHT GLASS	4
31	OIL DRAIN PLUG	2
32	WASHER	8
33	CAP SCREW	8

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WARRANTY – BLOWER PRODUCTS

Subject to the terms and conditions hereinafter set forth and set forth in General Terms of Sale, M-D Pneumatics (the Seller) warrants products and parts of its manufacture, when shipped, and its work (including installation and start-up) when performed, will be of good quality and will be free from defects in material and workmanship. This warranty applies only to Seller's equipment, under use and service in accordance with seller's written instructions, recommendations and ratings for installation, operating, maintenance and service of products, for a period as stated in the table below. Because of varying conditions of installation and operation, all guarantees of performance are subject to plus or minus 5% variation. (Non-standard materials are subject to a plus or minus 10% variation)

PRODUCT TYPE	TYPE OF APPLICATION	
	ATMOSPHERIC AIR OR PROCESS AIR WITHOUT LIQUIDS PRESENT	PROCESS GASES OTHER THAN AIR, OR ANY LIQUID INJECTED APPLICATION
New (Qx™ models only)	30 months from date of shipment, or 24 months after initial startup date, whichever occurs first.	Consult Factory
New (all other models)	24 months from date of shipment, or 18 months after initial startup date, whichever occurs first	18 months from date of shipment, or 12 months after initial startup date, whichever occurs first
Repair	12 months from date of shipment, or remaining warranty period, whichever is greater	12 months from date of shipment, or remaining warranty period, whichever is greater

THIS WARRANTY EXTENDS ONLY TO BUYER AND/OR ORIGINAL END USER, AND IN NO EVENT SHALL THE SELLER BE LIABLE FOR PROPERTY DAMAGE SUSTAINED BY A PERSON DESIGNATED BY THE LAW OF ANY JURISDICTION AS A THIRD PARTY BENEFICIARY OF THIS WARRANTY OR ANY OTHER WARRANTY HELD TO SURVIVE SELLER'S DISCLAIMER.

All accessories furnished by Seller but manufactured by others bear only that manufacturer's standard warranty.

All claims for defective products, parts, or work under this warranty must be made in writing immediately upon discovery and, in any event within one (1) year from date of shipment of the applicable item and all claims for defective work must be made in writing immediately upon discovery and in any event within one (1) year from date of completion thereof by Seller. Unless done with prior written consent of Seller, any repairs, alterations or disassembly of Seller's equipment shall void warranty. Installation and transportation costs are not included and defective items must be held for Seller's inspection and returned to Seller's Ex-works point upon request.

THERE ARE NO WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF PURPOSE.

After Buyer's submission of a claim as provided above and its approval, Seller shall at its option either repair or replace its product, part, or work at the original Ex-works point of shipment, or refund an equitable portion of the purchase price.

The products and parts sold hereunder are not warranted for operation with erosive or corrosive material or those which may lead to build up of material within the product supplied, nor those which are incompatible with the materials of construction. The Buyer shall have no claim whatsoever and no product or part shall be deemed to be defective by reason of failure to resist erosive or corrosive action nor for problems resulting from build-up of material within the unit nor for problems due to incompatibility with the materials of construction.

Any improper use, operation beyond capacity, substitution of parts not approved by Seller, or any alteration or repair by others in such manner as in Seller's judgment affects the product materially and adversely shall void this warranty.

No employee or representative of Seller other than an Officer of the Company is authorized to change this warranty in any way or grant any other warranty. Any such change by an Officer of the Company must be in writing.

The foregoing is Seller's only obligation and Buyer's only remedy for breach of warranty, and except for gross negligence, willful misconduct and remedies permitted under the General Terms of Sale in the sections on CONTRACT PERFORMANCE, INSPECTION AND ACCEPTANCE and the PATENTS Clause hereof, the foregoing is BUYER'S ONLY REMEDY HEREUNDER BY WAY OF BREACH OF CONTRACT, TORT OR OTHERWISE, WITHOUT REGARD TO WHETHER ANY DEFECT WAS DISCOVERED OR LATENT AT THE TIME OF DELIVERY OF THE PRODUCT OR WORK. In no event shall Buyer be entitled to incidental or consequential damages. Any action for breach of this agreement must commence within one (1) year after the cause of action has occurred.

May 2008

OPERATING DATA FORM / PRODUCT REGISTRATION

It is to the user's advantage to have the requested data filled in below and available in the event a problem should develop in the blower or the system. This information is also helpful when ordering spare parts.

Model No.	_____	V-Belt Size	_____	Length	_____
Serial No.	_____	Type of Lubrication	_____		
Startup Date	_____	_____			
Pump RPM	_____	Operating Vacuum	_____		
Pump Sheave Diameter	_____	Any other Special Accessories Supplied or in use:			
Motor Sheave Diameter	_____	_____			
Motor RPM	_____	HP	_____	_____	

NOTES:

IMPORTANT

All blowers manufactured by M-D Pneumatics are date coded at time of shipment. In order to assure you of the full benefits of the product warranty, please complete, tear out and return the product registration card. You may also register your product online at www.mdpneumatics.com or contact Customer Service.

M-D Pneumatics®

**For Service & Repair, Technical
Support, or Product Sales contact:**

M-D Pneumatics
4840 West Kearney Street
Springfield, Missouri USA 65803-8702
O 417.865.8715 800.825.6937
F 417.865.2950
www.mdpneumatics.com



Manual 2010 Rev B p/n 002010 0000
04/21

TUTHILL LUBRICANTS

POSITIVE DISPLACEMENT BLOWERS & BOOSTERS



TUTHILL LUBRICANTS

POSITIVE DISPLACEMENT BLOWERS & BOOSTERS



Tuthill positive displacement blowers and boosters are known worldwide for superior quality and performance. Tuthill's MD full synthetic lubricants are specifically formulated for use in Tuthill's high-performing blowers and boosters and is the only lubricant recommended. MD lubricants ensure the highest quality of operation, allowing you to achieve a longer life over mineral oil or semi-synthetic lubricants due to its specific formulation, especially in high temperature conditions. Improper lubrication is one of the main causes of blower and booster failures. Don't take a chance using anything other than MD lubricants by Tuthill.

BENEFITS

- Positive displacement blowers and boosters can often operate at temperatures near 300°F. These extreme operating temperatures require a full synthetic lubricant that is blended from synthetic hydrocarbon polyalphaolefin (PAO) to ensure maximum performance and product life.
- PAOs have greater thermal oxidative stability and a high viscosity index, allowing for greater film strength at higher temperatures and decreased viscosities at low temperatures for minimal friction and better lubrication.
- This PAO synthetic base fluid allows oil to demulsify water in high humidity and water conditions by easily separating water from the fluid. MD full synthetic lubricants provide better rust and corrosion protection for increased equipment life and has the highest 1A rating for copper corrosion under ASTM D130.
- MD full synthetic lubricants contain a formulation of anti-wear and anti-foaming additives that are specifically designed to prolong the life of Tuthill blowers and boosters.
- MD full synthetic lubricants can last up to 5 times longer than mineral oil and twice as long as many semi-synthetic lubricants, meaning fewer oil change intervals, reduced down time, and greater cost savings.
- MD full synthetic lubricants have an average oil life of 8,000-hours at temperatures up to 220°F. Mineral oils oxidize at temperatures as low as 160°F, resulting in an oil life of 1,500-hours.
- MD lubricants have a low coefficient of dynamic friction that substantially reduces power consumption by minimizing gear and bearing friction, resulting in improved efficiency.

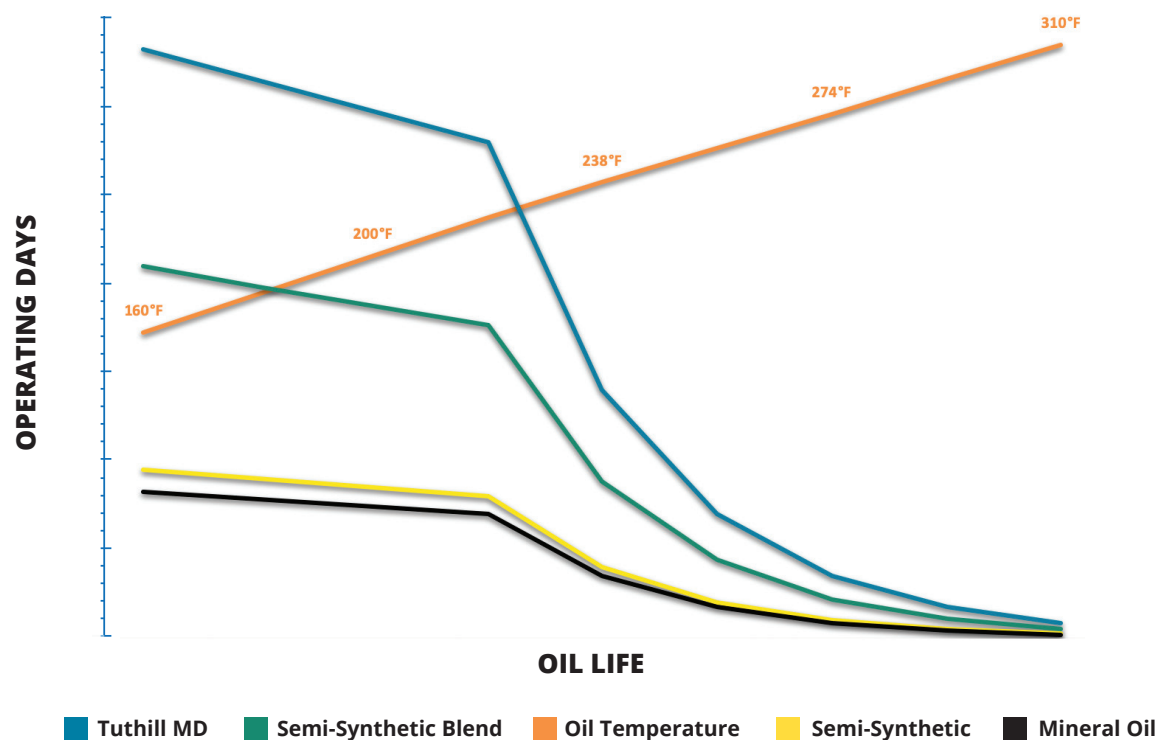
NOT ALL LUBRICANTS PERFORM THE SAME

Blowers and boosters can often operate at high temperatures. The lubricant can equal that of the discharge temperature. Oil life drops by half for every 18°F above 220°F. This is why it is important to use MD lubricants that are formulated to extend oil life, even at high temperatures.

MD LUBRICANTS VS. SEMI-SYNTHETIC & MINERAL OIL

MD LUBRICANTS	SEMI-SYNTHETICS & MINERAL OILS
Contains tailored list of additives for specific product application	Mineral oils do not contain any additional additives that protect the seals, bearings, or gears. Semi-Synthetics may only contain a small amount of additional additives
Higher oxidation resistance, improving lubricity	Lower oxidation resistance, increasing risk of sludge formation
Protects from oxidation at 220°F	Semi-synthetics begins to oxidize at 180°F and mineral oil start oxidizing at only 160°F
PAO based fluids provide higher anti-wear properties resulting in increased product life	Lack of anti-wear properties results in decreased product life
Up to a 30% reduction in cost of oil change intervals over the life of the product	Reduced oil life results in increased oil change intervals and higher overall maintenance cost
Environmentally friendly due to fewer oil changes	Increased disposal costs due to increased oil change intervals

OIL TEMPERATURE VS. OIL LIFE



COST SAVINGS OF USING MD ONE VS SEMI-SYNTHETIC AND MINERAL OIL

MD full synthetic lubricants not only better protect your product from premature failure but you will also save money in reoccurring maintenance costs. The example below shows an initial fill of MD One oil in a Tuthill PD Plus 5511 blower. In 8,000 hours of run time, using a mineral oil or semi-synthetics can cost you up to 3 times the expense.

TUTHILL 5511 BLOWER	MD ONE	SEMI-SYNTHETIC	MINERAL OIL
INITIAL FILL OF OIL (1 GALLON)	\$75	\$60	\$35
LUBE CHANGE INTERVAL	8,000 hrs	4,000 hrs	1,500 hrs
COST OF REPLACEMENT OIL	\$0	\$60	\$140
LABOR (\$50/CHANGE)	\$50	\$100	\$250
TOTAL COST	\$125	\$200	\$425

Savings will vary based on individual operating conditions.



MD ONE

MD ONE is a great all-purpose, full synthetic lubricant suited for most blower and booster applications, working well in low or high ambient conditions. It is formulated using synthesized hydrocarbon fluid and select additives to enhance oxidation resistance and provide maximum protection against wear, rust corrosion, and foaming.

MD PLUS

MD PLUS full synthetic lubricant provides significantly better thermal and oxidation stability at higher temperatures. Compared to mineral oil, MD PLUS contains specific additives that reduce oxidation, protect against breakdown of the lubricant, and greatly prolong the life of the oil.



MD MAX

MD MAX full synthetic lubricant provides the highest protection against maximum operating temperatures for blower and booster applications. The viscosity and the additive formulation of MD MAX creates an additional layer of protection for the gears, bearings, and seals to increase durability and maintain adequate endurance in extreme operating conditions.

MD FG (FOOD GRADE)

MD FG is a full synthetic lubricant that is approved by the CFIA and the USDA for H-1 applications that is compliant with FDA 21 CFR 178.3570 requirements. In addition, the MD FG is Halal Certified by the Islamic Food and Nutrition Council of America. MD FG oil is fortified with oxidation inhibitors, corrosion inhibitors, and anti-wear additives to enhance the superior qualities offered by the synthetic hydrocarbon base stock.



MD LITHIUM GREASE

MD LITHIUM GREASE is a multi-purpose grease that is recommended for use in select CP Series blower models. This grease is shear stable with extreme pressure characteristics and outperforms conventional greases. It satisfies nearly all grease requirements found in industrial blower applications.

TUTHILL LUBRICATION RECOMMENDATION

The selection of the correct lubricant is an important decision. The application and operating conditions must be taken into consideration to achieve maximum performance and life of the product. Determination of lubricant should not be decided solely on ambient temperature. Tuthill provides a recommendation tool for its MD lubricants based on discharge temperature, inlet temperature, RPM, and model to better safeguard that you are selecting the right lubricant. The chart below is for informational guidance only. Contact Tuthill or a Tuthill Representative for assistance in choosing the best lubricant for your specific application and operating conditions.

		DISCHARGE TEMPERATURE (°F)										
		150	170	190	210	230	250	270	290	310	330	350
RPM	1150	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX	MD MAX	MD MAX
	1395	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX	MD MAX	MD MAX
	1640	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX	MD MAX	MD MAX
	1885	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	2130	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	2375	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	2620	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	2865	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	3110	MD ONE	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	3355	MD ONE	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX
	3600	MD ONE	MD ONE	MD ONE	MD ONE	MD PLUS	MD PLUS	MD PLUS	MD MAX	MD MAX	MD MAX	MD MAX

MD BLOWER & BOOSTER LUBRICANTS SPECIFICATIONS:

PRODUCTS	MD ONE	MD PLUS	MD MAX	MD FG
VISCOSITY INDEX	150	154	157	141
@40°C, CST	99.1	231.7	340.9	99.3
@100°C, CST	14.4	27.6	37.2	13.9
FLASH POINT °F (°C)	510 (266)	480 (249)	491 (255)	515 (268)
POUR POINT °F (°C)	-44 (-43)	-49 (-45)	-54 (-48)	-60 (-51)

ORDERING MADE EASY

Tuthill lubricants are available in a variety of convenient quantities and sizes. Contact your local Tuthill Distributor or order at tvbsinquiries@tuthill.com.

	QUART	GALLON	5 GALLON	55 GALLON BARREL	CASE - 12 QUARTS
MD ONE	16444-MD1-Q	16444-MD1-G	16444-MD1-5G	16444-MD1-B	16444-MD1-Q-C
MD PLUS	16444-MD2-Q	16444-MD2-G	16444-MD2-5G	16444-MD2-B	16444-MD2-Q-C
MD MAX	16444-MD3-Q	16444-MD3-G	16444-MD3-5G	16444-MD3-B	16444-MD3-Q-C
MD FG	16444-MD1-Q-FG	16444-MD1-G-FG	16444-MD1-5G-FG	16444-MD1-B-FG	16444-MD1-Q-C-FG

OIL ANALYSIS

Anticipate complications and avoid downtime by using Tuthill's Oil Sampling Program that provides a comprehensive laboratory analysis of the physical and chemical characteristics of your oil over a select period of time. The analysis is designed to determine lubricant deterioration, suggest a frequency for lubricant renewal, and detect any mechanical complications prior to disrepair. These benefits can be realized through creation of your own trend analysis over a series of 3-4 samples.

Each oil sample kit contains supplies to collect four different oil samples. The provided packaging material makes sending your oil sample to the laboratory easy. You will receive timely results which will enable you to make prompt maintenance decisions regarding your equipment and oil. Purchase your Tuthill oil analysis kit by ordering part number 19266.

If you have any questions or concerns regarding your analysis, you may contact us at:

tvbsinquiries@tuthill.com



»» CONTACT US

TUTHILL SPRINGFIELD

4840 W. KEARNEY STREET

SPRINGFIELD, MO 65803

TEL: (800) 825-6937

TVBSINQUIRIES@TUTHILL.COM



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THE HEART IS THE ORIGINAL PUMP

All of us are born with a pump inside – our hearts. At Tuthill, we don't just make pumps, meters, and vacuum systems & blowers, we make an invitation for the original pump – the heart – to come alive.

We've always been a company with heart. From our beginnings as a brick maker, we made the bricks that made Chicago. As the horses hauled clay from the quarry, it was too much for their hearts to bear. So Tuthill created an oil pump to power a truck, an innovation that saved horses and led to our first manufactured pump – made from the heart.

Today, we pump our hearts into everything we do: every cut, drill, and cycle, and everything we bring to you. We invite you to join us and find what makes your heart beat a little faster. Because when we all come alive, the world comes along. Learn more at tuthill.com



PRODUCT INFORMATION PACKET

Model No: LM32796

Catalog No: LM32796

1 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 143T Frame, TEFC
Three Phase TEFC Motors



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REGAL

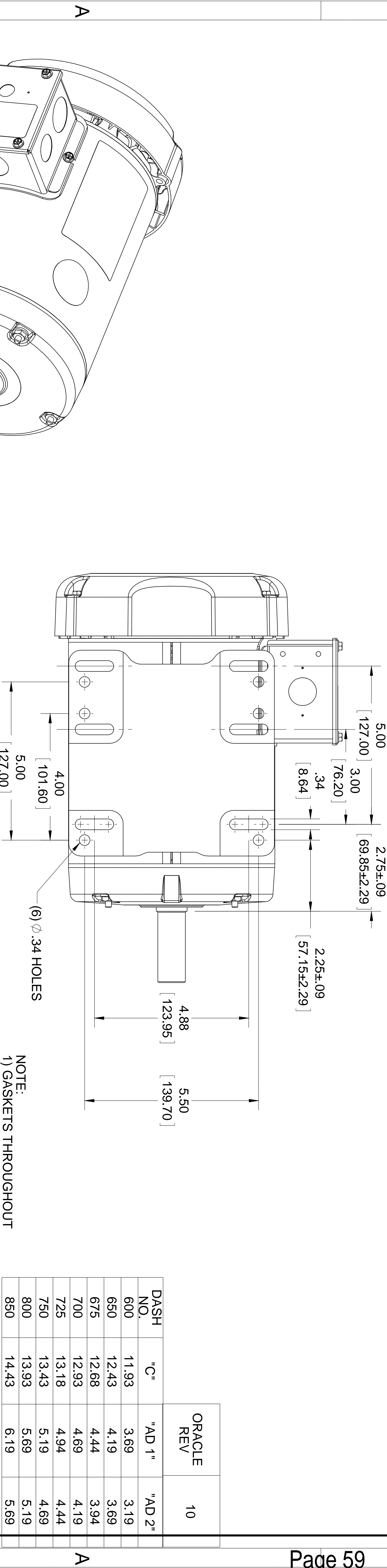
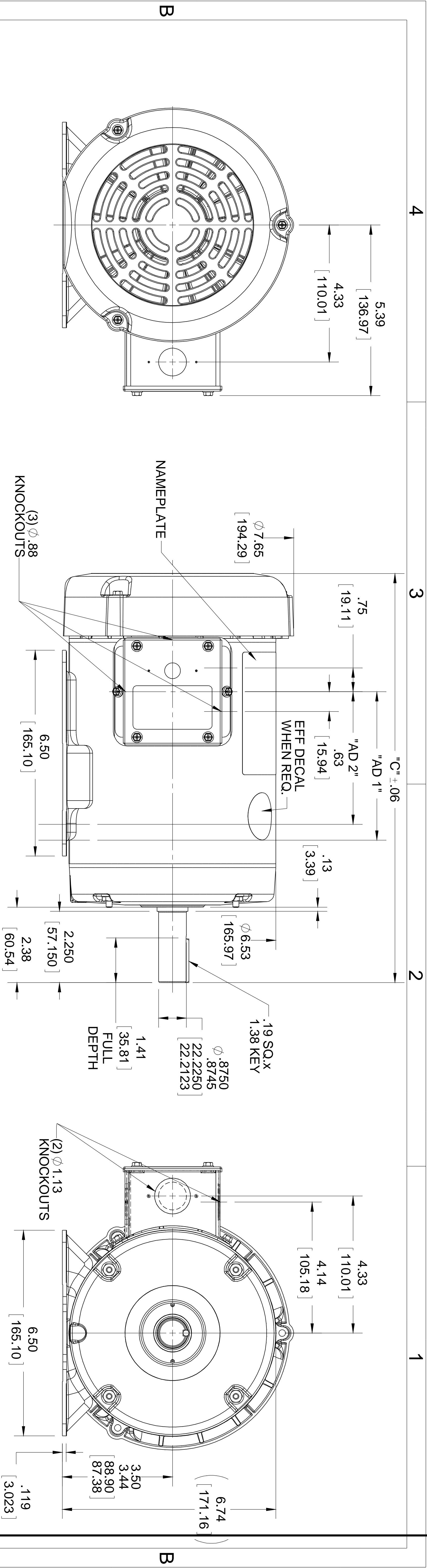
**Nameplate Specifications**

Output HP	1 Hp	Output KW	0.75 kW
Frequency	60 Hz	Voltage	230/460 V
Current	3.2-3.2/1.6 A	Speed	1760 rpm
Service Factor	1.25	Phase	3
Efficiency	85.5 %	Power Factor	68.5
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	N
Frame	143T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6205	Opp Drive End Bearing Size	6203
UL	Recognized	CSA	Y
CE	Y	IP Code	43

Technical Specifications

Electrical Type	Squirrel Cage Induction Run	Starting Method	Across The Line
Poles	4	Rotation	Reversible
Resistance Main	12.96 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Rolled Steel
Shaft Type	T	Overall Length	12.93 in
Frame Length	7.00 in	Shaft Diameter	0.875 in
Shaft Extension	2.25 in	Assembly/Box Mounting	F1 ONLY
Connection Drawing	005010.01LN	Outline Drawing	028765-700

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NOTE:
1) GASKETS THROUGHOUT

DASH NO.	"C"	"AD 1"	"AD 2"
600	11.93	3.69	3.19
650	12.43	4.19	3.69
675	12.68	4.44	3.94
700	12.93	4.69	4.19
725	13.18	4.94	4.44
750	13.43	5.19	4.69
800	13.93	5.69	5.19
850	14.43	6.19	5.69

DRAWING REVISION	REVISION BY	DATE	TOLERANCES UNLESS OTHERWISE SPECIFIED:	DRAWN BY	DATE
ECO H	LST	4/10/15	DEC. INCH mm ANGLE \pm 0.5°	JJK	06/13/07
ECO-0075607	APPROVED BY SK	8/17/2014	.XX \pm 0.03 [-0.76]	APPROVED BY	
ECO DESCRIPTION	UPDATE DASH TABLE		XXX \pm 0.005 [-0.127]	DATE	
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REMOVE BURRS & BREAK SHARP EDGES: .003/.015/.076/.381					
CORNER FILETICES: .02 [.51]					
MACHINED SURFACES: 125 INCH mm					
mm SHOWN IN [BRACKETS]					
REFERENCE 034941					
THIRD ANGLE PROJECTION					
SIZE B					
DRAWING NUMBER 028765					
1 OF 1					

OUTLINE

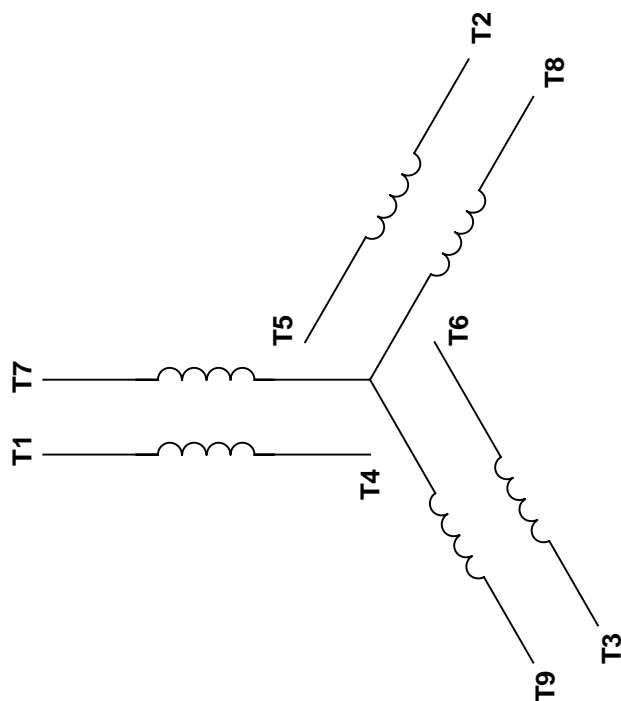
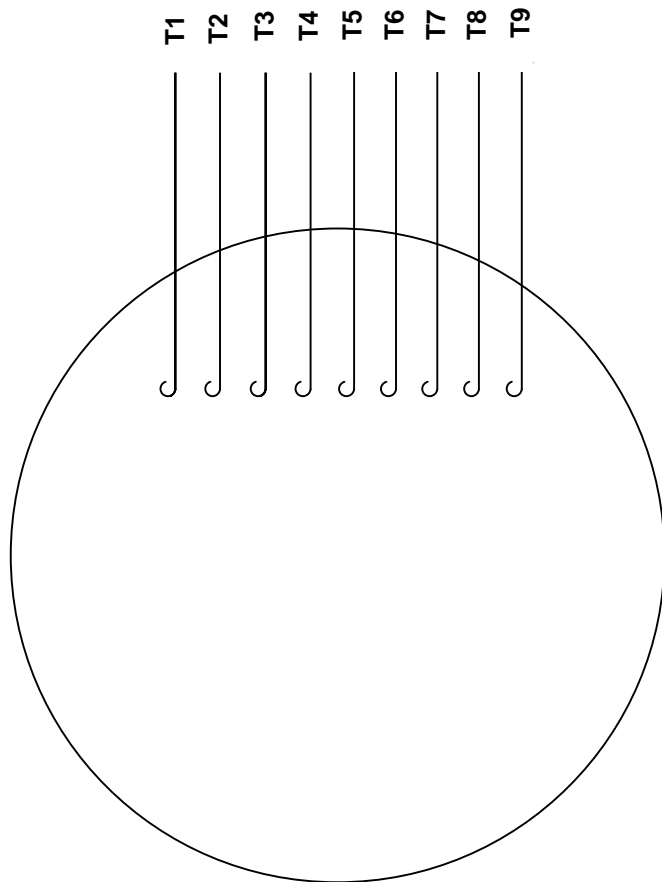
Regal Beloit America, Inc.

- RIGID

PROCESS/FINISH GENERAL PURPOSE

VIEW FROM OUTSIDE OF MOTOR AT SWITCH END.

LINE LEADS



VOLTAGE	L1	L2	L3	JOIN & INSULATE
HIGH	T1	T2	T3	(T4, T7) (T5, T8) (T6, T9)
LOW	T1, T7	T2, T8	T3, T9	T4, T5, T6

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[illegible]

Data Sheet

Date: 1/30/2018

LM32796



Data @ 460 V

Motor Load Data

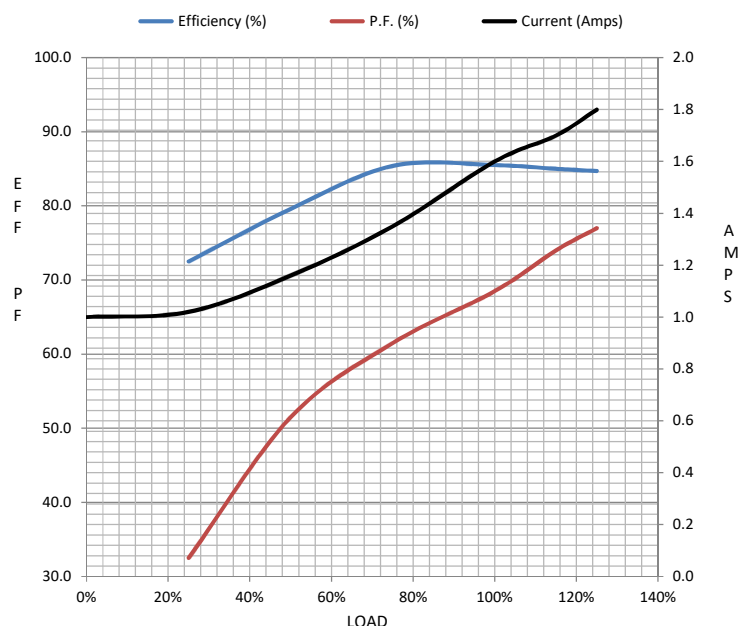
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	1.00	1.02	1.16	1.35	1.60	1.70	1.80	14.0	
Torque (ft-lb)	0.00	0.75	1.50	2.25	3.0	3.5	3.8	12.0	
RPM	1800	1789	1779	1769	1760	1750	1745	0	
Efficiency (%)		72.5	79.6	85.4	85.5	85.0	84.7		
P.F. (%)	8.0	32.5	51.5	61.5	68.5	74.0	77.0	41.0	

Motor Speed Data

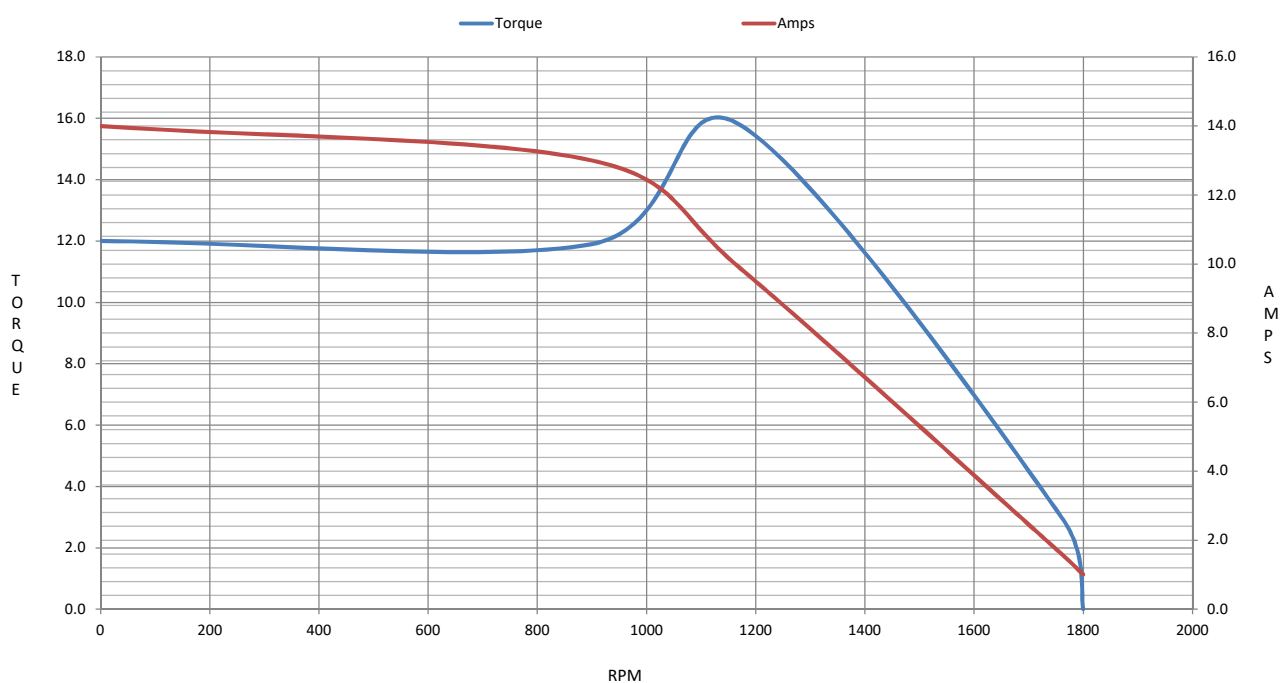
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1170	1760	1800
Current (Amps)	14.0	13.0	9.9	1.60	1.00
Torque (ft-lb)	12.0	11.9	15.8	3.0	0.00

Information Block

HP	1.0			
Sync. RPM	1800			
Frame	140			
Enclosure	TEFC			
Construction	TFR			
Voltage	230/460#190-208/380-415 V			
Frequency	60	Hz		
Design	B			
LR Code letter	N			
Service Factor	1.15			
Temp Rise @ FL	38	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk²	0.12	Lb-Ft²		
Ref Wdg	T634342 FR			
Sound Pressure @ 1M	65	dBA		
VFD Rating	NONE			
Outline Dwg	028765-700			
Conn. Diag	005010.01LN			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0000	0.0000	0.0000	0.0000	0.0000



Speed - Torque Curve



PRODUCT INFORMATION PACKET

Model No: LM33123
Catalog No: LM33123
1.50 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 145T Frame, TEFC
Three Phase TEFC Motors



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REGAL



Nameplate Specifications

Output HP	1.50 Hp	Output KW	1.1 kW
Frequency	60 Hz	Voltage	230/460 V
Current	4.8/2.4 A	Speed	1750 rpm
Service Factor	1.25	Phase	3
Efficiency	86.5 %	Power Factor	67.7
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	L
Frame	145T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6205	Opp Drive End Bearing Size	6203
UL	Recognized	CSA	Y
CE	N	IP Code	43

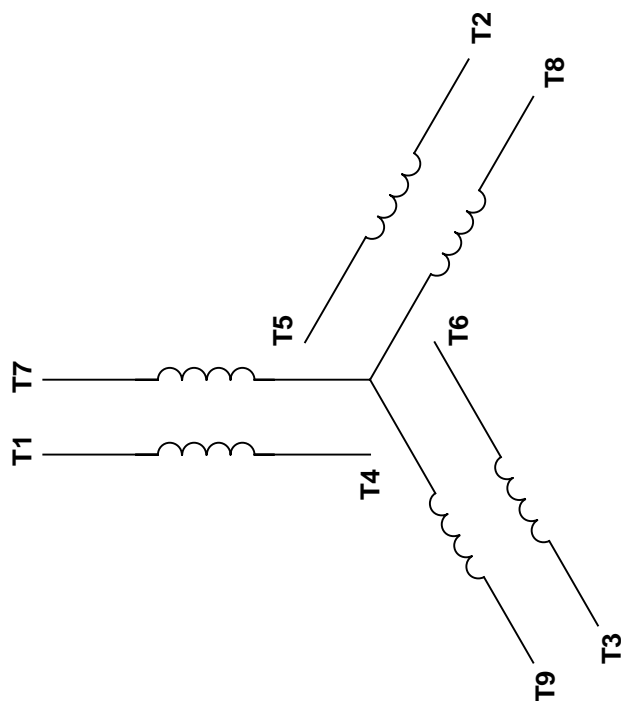
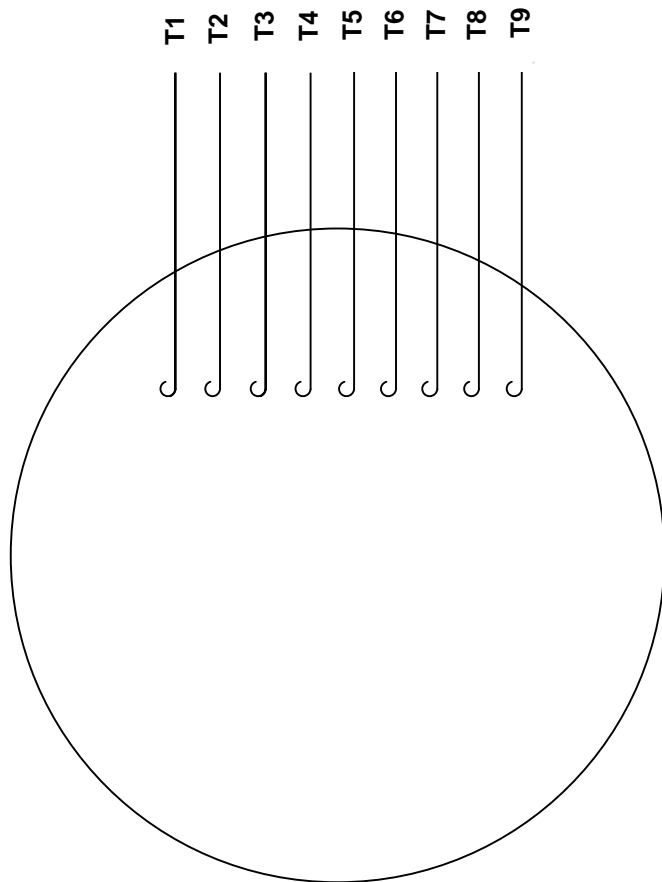
Technical Specifications

Electrical Type	Squirrel Cage Induction Run	Starting Method	Across The Line
Poles	4	Rotation	Reversible
Resistance Main	9.12 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Rolled Steel
Shaft Type	T	Overall Length	13.43 in
Frame Length	7.50 in	Shaft Diameter	0.875 in
Shaft Extension	2.25 in	Assembly/Box Mounting	F1 ONLY
Outline Drawing	028765-750	Connection Drawing	005010.01LN

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VIEW FROM OUTSIDE OF MOTOR AT SWITCH END.

LINE LEADS



VOLTAGE	L1	L2	L3	JOIN & INSULATE
HIGH	T1	T2	T3	(T4, T7) (T5, T8) (T6, T9)
LOW	T1, T7	T2, T8	T3, T9	T4, T5, T6

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4 of 6



P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311

DATA VOLTS: 460

CERTIFICATION DATA SHEET

CONN. DIAGRAM: 005010.01LN

CAT #: LM33123

OUTLINE: 028765-750

WINDING: T634341

FR 3

TYPICAL MOTOR PERFORMANCE DATA

HP	KW	SYNC RPM	FL RPM	FRAME	ENCLOSURE	TYPE	KVA CODE	DESIGN
1.5	1.1	1800	1750	145T	TEFC	TFR	L	B

PH	HZ	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB	ELEV.
3	60/50	230/460#190/380	4.3/2.15&3.6/1.8	ACROSS THE LINE	CONT	F	1.15	40	3300

F.L. EFF	86.5	3/4 LD EFF	87.2	1/2 LD EFF	84.0	GTD EFF	0.0	ELECT. TYPE	SQ CAGE IND RUN
F.L. PF	67.7	3/4 LD PF	63.0	1/2 LD PF	55.0				

F.L. TORQUE	LR AMPS @ 460 V	L.R. TORQUE	B.D. TORQUE	F.L. RISE (°C)
4.5 LB-FT	18.5	17.2 LB-FT 382%	20.4 LB-FT 453%	45

PRESSURE @ 3	POWER	ROTOR WK²	MAX. LOAD WK²	SAFE STALL TIME	STARTS/HOUR	MOTOR WGT
65 dBA	74 dBA	0.14 LB-FT²	0.1 LB-FT²	10 SEC.	3	0 LB.

*** SUPPLEMENTAL INFORMATION ***

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	MOTOR ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	NO	NONE	NO	NONE	GRAY - LINCOLN

BEARINGS	GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE ODE						
BALL BALL	POLYREX EM	T	NONE	NONE	1144 STRESSPROOF (C-223)	ROLLED STEEL
6205 6203						

THERMOSTATS	PROTECTORS	WDG RTD's	BRG RTD's	THERMISTORS	CONTROL	SPACE HEATERS
NONE	NOT	NONE	NONE	NONE	FALSE	NA

R1 (ohms/ph)	R2 (ohms/ph)	X1 (ohms/ph)	X2 (ohms/ph)	Xm (ohms/ph)	VIBRATION (in/sec)	FLOAT
0	0	0	0	0	0.150	ODE

* N O T E S *		INVERTER TORQUE: NONE INV. HP SPEED RANGE: NONE ENCODER: NONE NONE NONE NONE PPR

DATE: 1/29/2018

BRAKE: NONE
NONE
NONE
FT-LB: NA
VOLTAGE: NONE
HZ:
UL: Y-(LEESON UL REC)

Data Sheet

Date: 1/29/2018

LM33123



Data @ 460 V

Motor Load Data

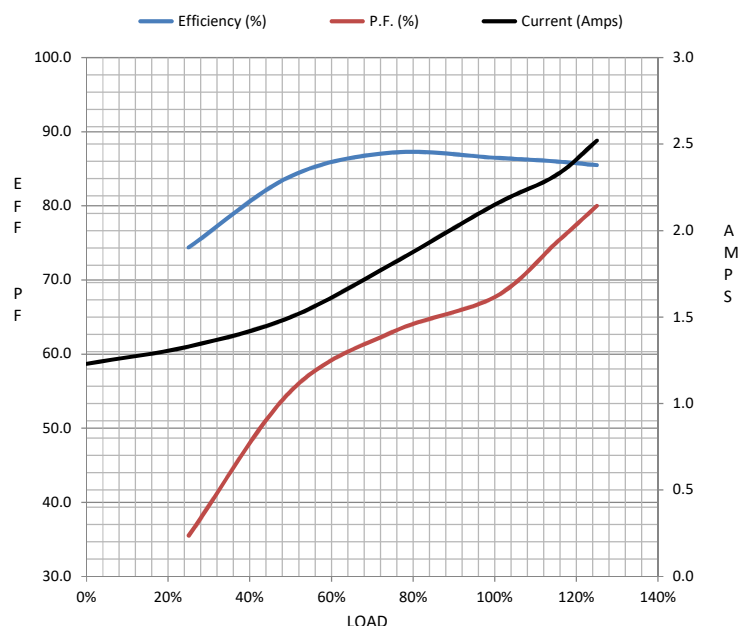
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	1.23	1.33	1.50	1.81	2.15	2.32	2.52	18.5	
Torque (ft-lb)	0.00	1.10	2.25	3.4	4.5	5.2	5.6	17.2	
RPM	1800	1785	1772	1760	1750	1.738	1732	0	
Efficiency (%)		74.4	84.0	87.2	86.5	86.0	85.5		
P.F. (%)	9.9	35.5	55.0	63.0	67.7	75.0	80.0	48.0	

Motor Speed Data

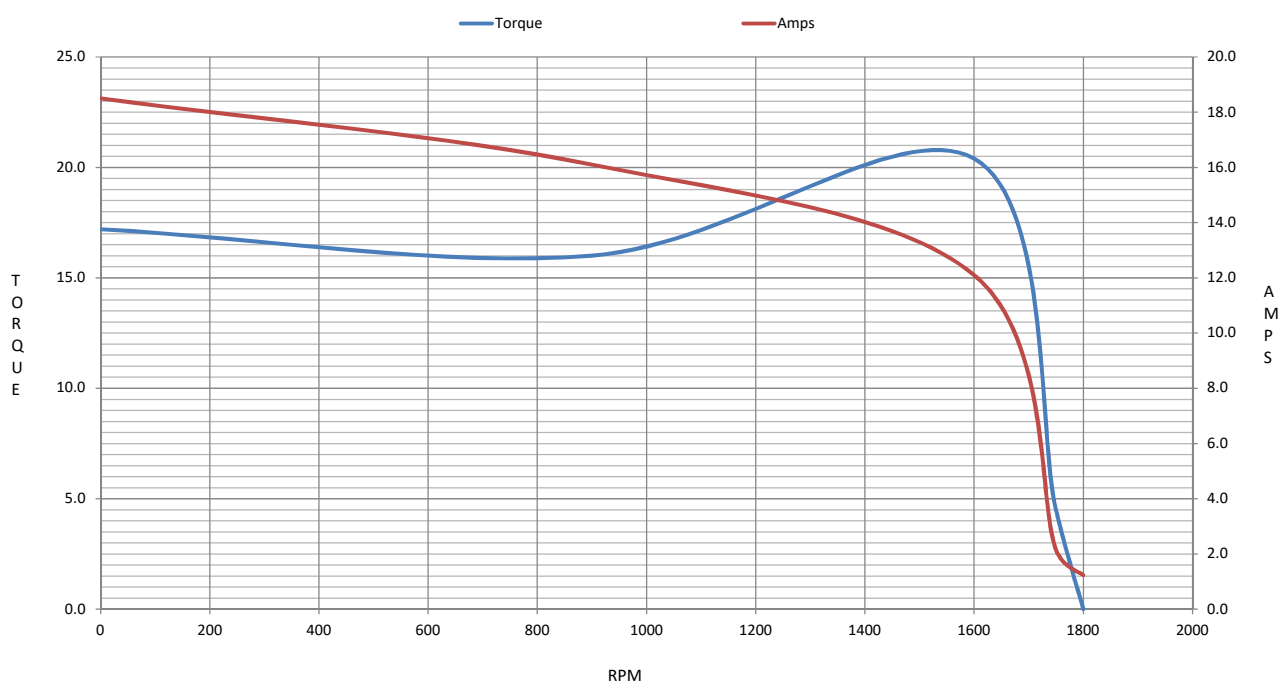
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1600	1750	1800
Current (Amps)	18.5	16.1	12.1	2.15	1.23
Torque (ft-lb)	17.2	16.0	20.4	4.5	0.00

Information Block

HP	1.5			
Sync. RPM	1800			
Frame	140			
Enclosure	TEFC			
Construction	TFR			
Voltage	230/460#190/380	V		
Frequency	60	Hz		
Design	B			
LR Code letter	L			
Service Factor	1.15			
Temp Rise @ FL	45	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk²	0.14	Lb-Ft²		
Ref Wdg	T634341 FR			
Sound Pressure @ 1M	65	dBA		
VFD Rating	NONE			
Outline Dwg	028765-750			
Conn. Diag	005010.01LN			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0000	0.0000	0.0000	0.0000	0.0000



Speed - Torque Curve



PRODUCT INFORMATION PACKET

Model No: LM33125

Catalog No: LM33125

2 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 145T Frame, TEFC
Three Phase TEFC Motors



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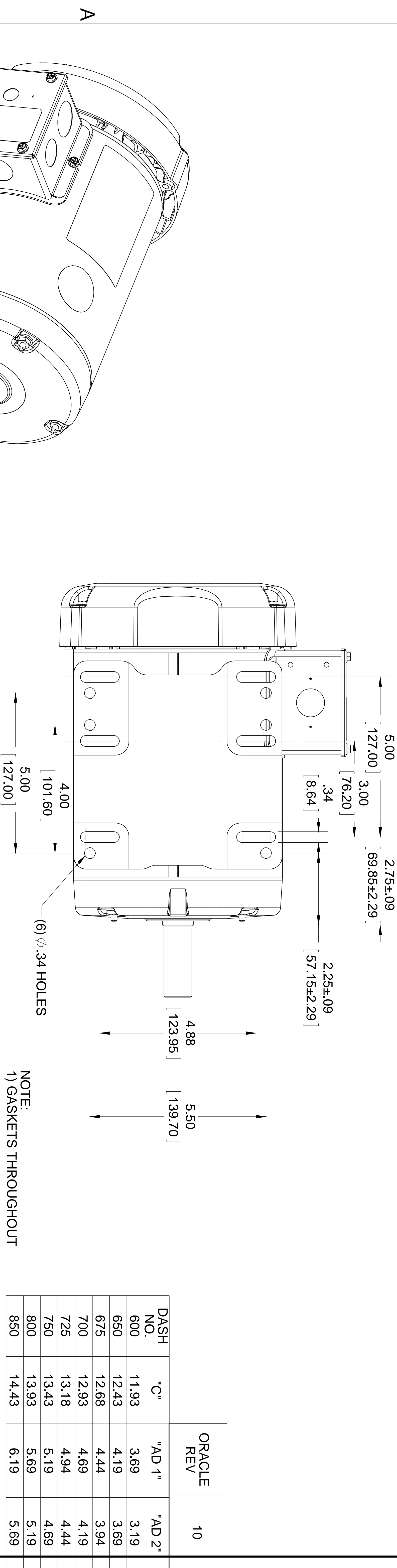
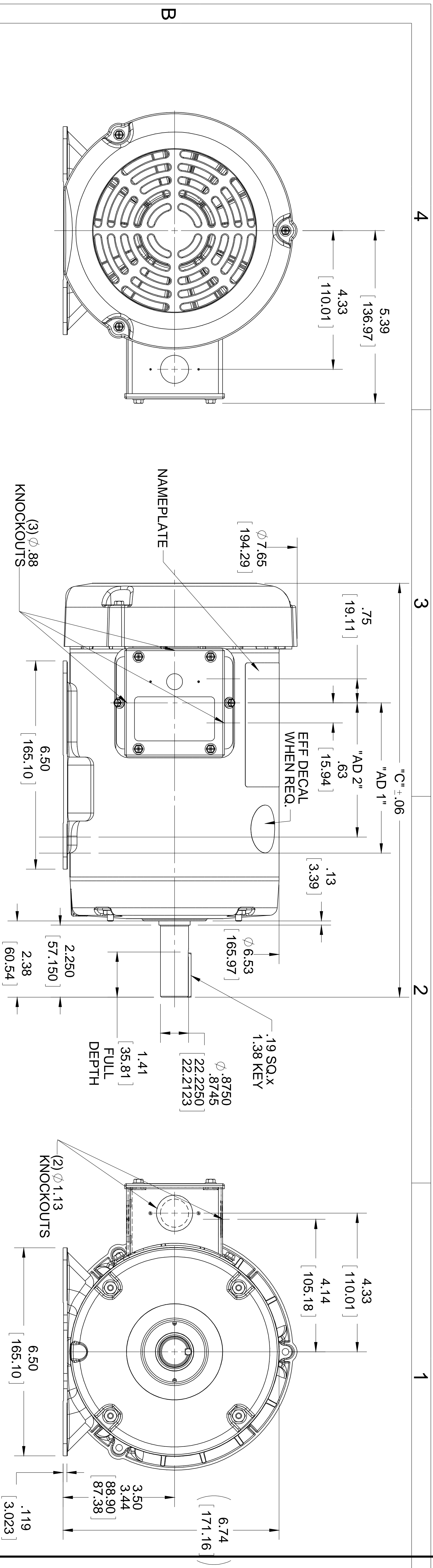
Nameplate Specifications

Output HP	2 Hp	Output KW	1.5 kW
Frequency	60 Hz	Voltage	230/460 V
Current	5.8/2.9 A	Speed	1725 rpm
Service Factor	1.15	Phase	3
Efficiency	86.5 %	Power Factor	75.6
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	L
Frame	145T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6205	Opp Drive End Bearing Size	6203
UL	Recognized	CSA	Y
CE	Y	IP Code	43


Technical Specifications

Electrical Type	Squirrel Cage Induction Run	Starting Method	Across The Line
Poles	4	Rotation	Reversible
Resistance Main	6 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Rolled Steel
Shaft Type	T	Overall Length	13.93 in
Frame Length	8.00 in	Shaft Diameter	0.875 in
Shaft Extension	2.25 in	Assembly/Box Mounting	F1 ONLY
Outline Drawing	028765-800	Connection Drawing	005010.01LN

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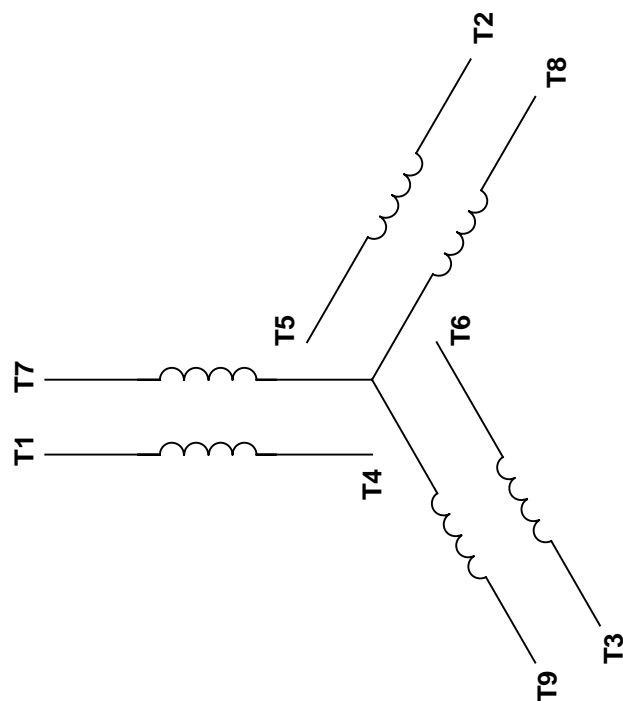


		ORACLE REV	10
DASH NO.	"C"	"AD 1"	"AD 2"
600	11.93	3.69	3.19
650	12.43	4.19	3.69
675	12.68	4.44	3.94
700	12.93	4.69	4.19
725	13.18	4.94	4.44
750	13.43	5.19	4.69
800	13.93	5.69	5.19
850	14.43	6.19	5.69

DRAWING REVISION		REVISION BY	DATE
H		LST	4/10/15
ECO	APPROVED BY	DATE	
ECO-0075607	SK	8/17/2014	
ECO DESCRIPTION			
UPDATE DASH TABLE			
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TOLERANCES UNLESS OTHERWISE SPECIFIED:			
DEC.	INCH	mm	ANGLE
.X	±0.1	[-2.5]	±0.5°
.XX	±0.03	[±0.76]	
XXX	±0.005	[±0.127]	
.XXXX	±0.0005	[±0.0127]	
REMOVE BURRS & BREAK SHARP EDGES. .003/.015 [.076/.381]			
CORNER FILETS: .02 [.51]			
MACHINED SURFACES: 125/ INCH 3.2/ mm			
mm SHOWN IN [BRACKETS]			
DRAWN BY		JJK	
DATE		06/13/07	
APPROVED BY			
DATE			
REFERENCE		034941	
MATERIAL		140T/56HZ FRAME TEFC - RIGID	
SIZE		DRAWING NUMBER	
B		028765	
THIRD ANGLE PROJECTION			
OUTLINE		PROCESS/FINISH	
GENERAL PURPOSE		SHEET	
		1 OF 1	

VIEW FROM OUTSIDE OF MOTOR AT SWITCH END.

LINE LEADS



VOLTAGE	L1	L2	L3	JOIN & INSULATE
HIGH	T1	T2	T3	(T4, T7) (T5, T8) (T6, T9)
LOW	T1, T7	T2, T8	T3, T9	T4, T5, T6

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[illegible]

Data Sheet

Date: 2/1/2018

LM33125



Data @ 460 V

Motor Load Data

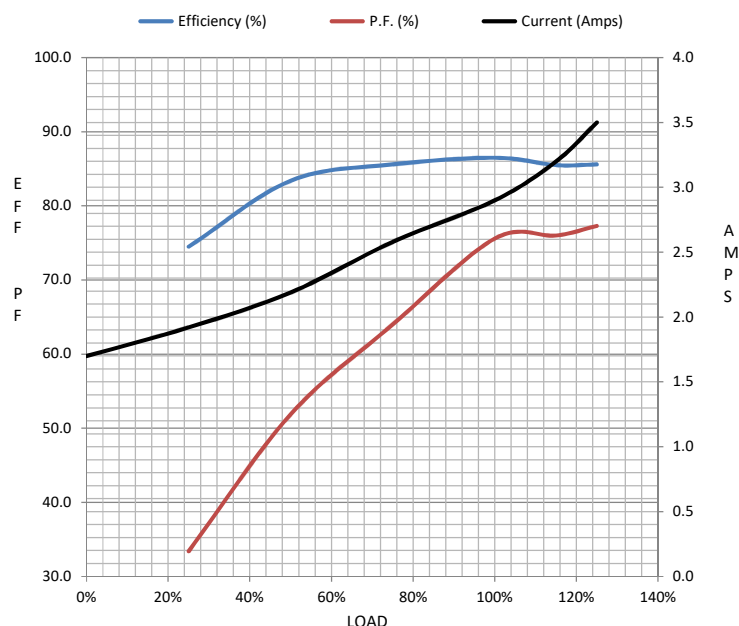
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	1.70	1.92	2.19	2.58	2.90	3.2	3.5	26.5	
Torque (ft-lb)	0.00	1.50	3.0	4.5	6.0	6.5	7.5	18.8	
RPM	1800	1787	1774	1763	1751	1.730	1732	0	
Efficiency (%)		74.5	83.4	85.6	86.5	85.5	85.6		
P.F. (%)	7.1	33.4	51.9	64.0	75.6	76.0	77.3	42.0	

Motor Speed Data

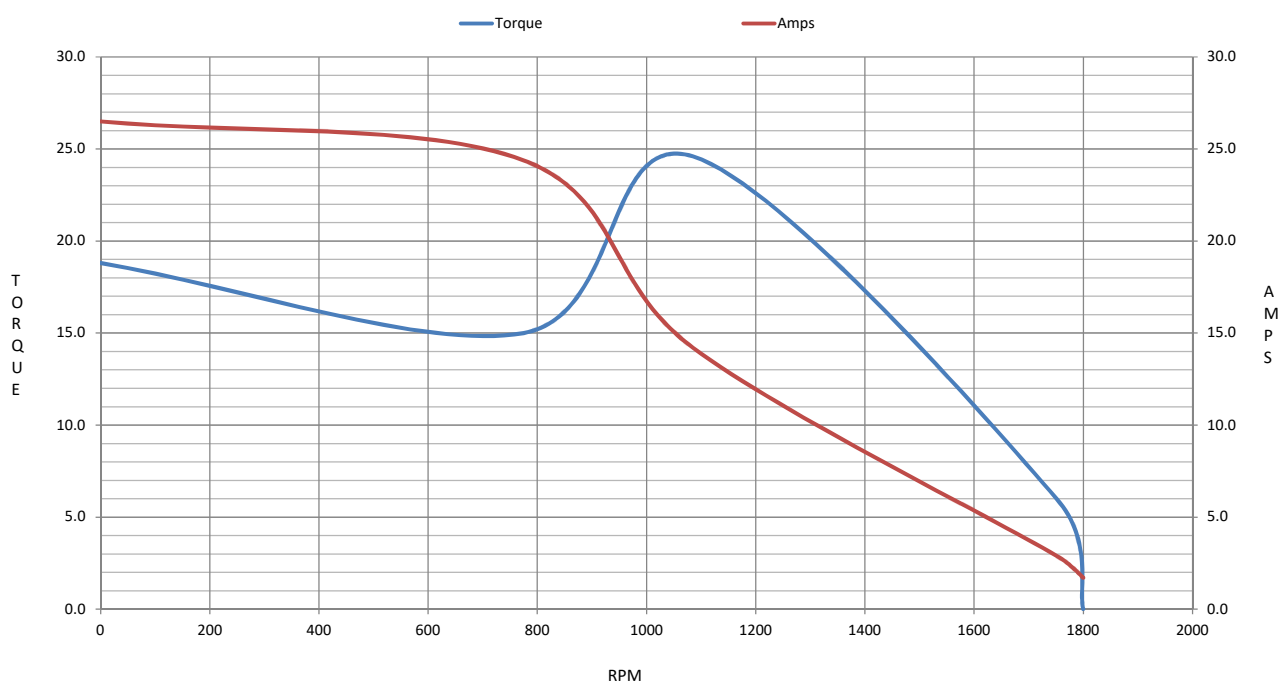
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	775	1085	1751	1800
Current (Amps)	26.5	24.4	14.2	2.90	1.70
Torque (ft-lb)	18.8	15.0	24.6	6.0	0.00

Information Block

HP	2.0			
Sync. RPM	1800			
Frame	140			
Enclosure	TEFC			
Construction	TFR			
Voltage	230/460#190-208/380-415 V			
Frequency	60		Hz	
Design	A			
LR Code letter	L			
Service Factor	1.15			
Temp Rise @ FL	53		° C	
Duty	CONT			
Ambient	40		° C	
Elevation	1,000		feet	
Rotor/Shaft wk²	0.16		Lb-Ft²	
Ref Wdg	T634340 FR			
Sound Pressure @ 1M	65		dBA	
VFD Rating	NONE			
Outline Dwg	028765-800			
Conn. Diag	005010.01LN			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0000	0.0000	0.0000	0.0000	0.0000



Speed - Torque Curve



PRODUCT INFORMATION PACKET

Model No: 182TTFCD6026

Catalog No: GT1010A

3 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 182T Frame, TEFC
Three Phase TEFC Motors





Nameplate Specifications

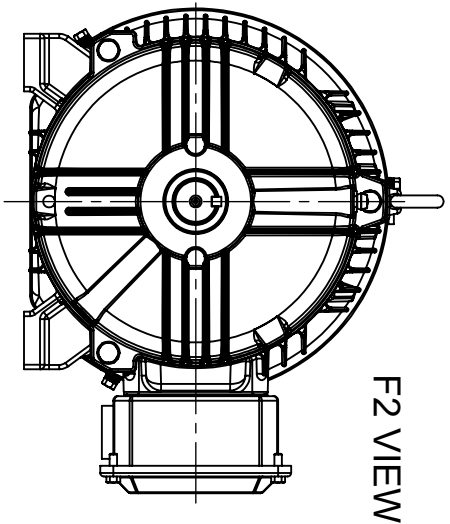
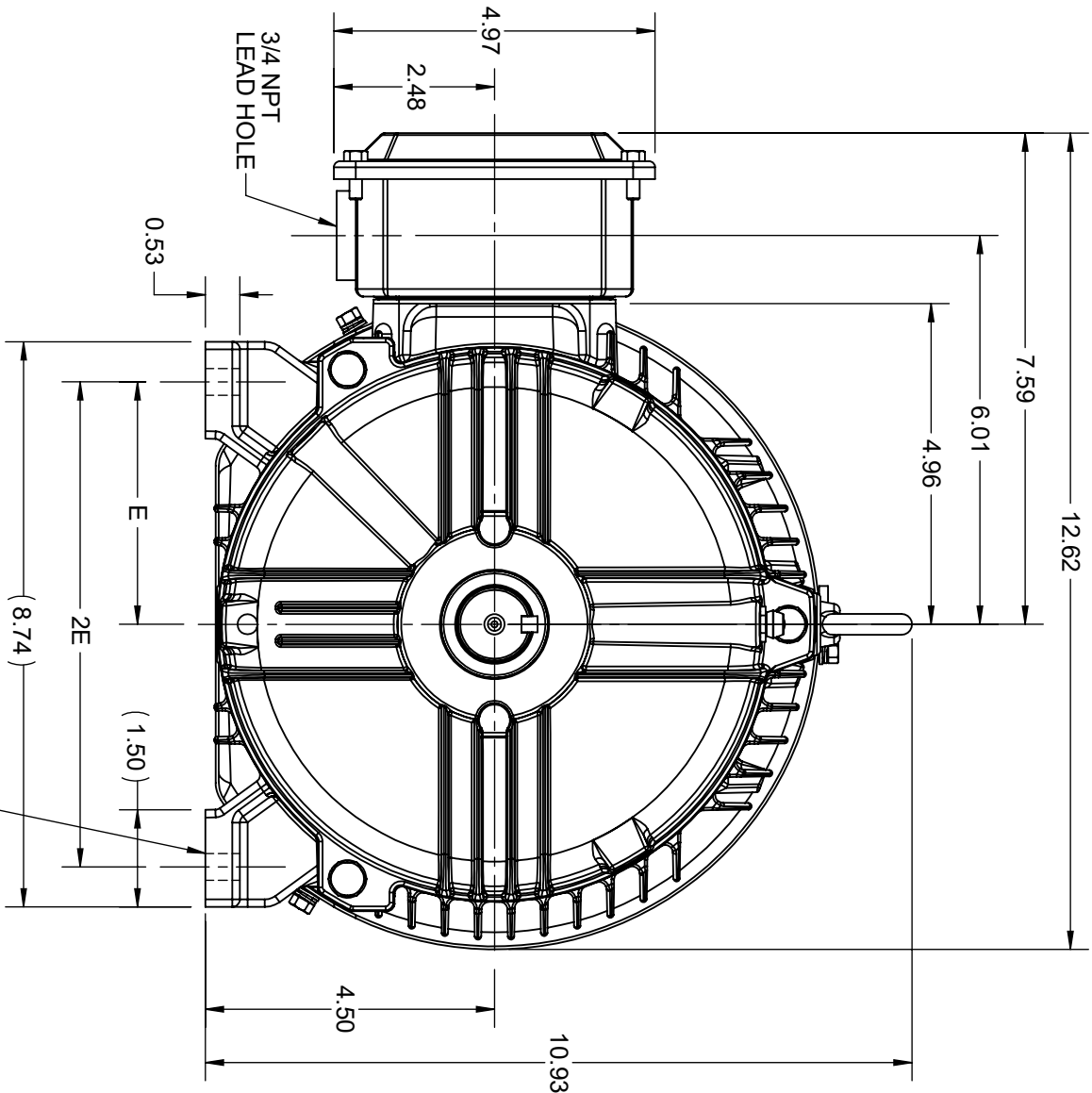
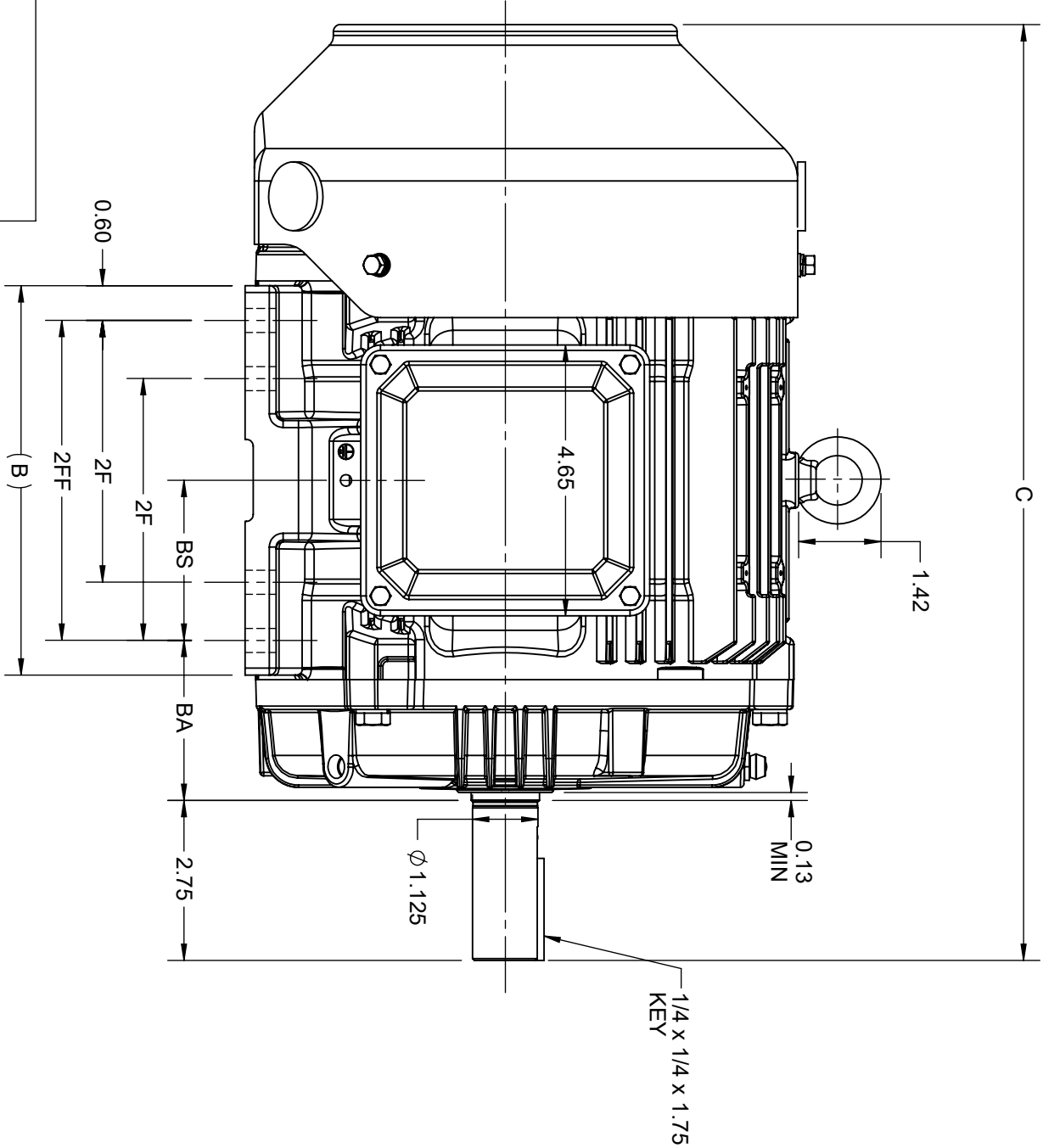
Output HP	3 Hp	Output KW	2.2 kW
Frequency	60 Hz	Voltage	208-230/460 V
Current	8-6-8.3/4.2 A	Speed	1770 rpm
Service Factor	1.15	Phase	3
Efficiency	89.5 %	Power Factor	76
Duty	Continuous	Insulation Class	F
Design Code	A	KVA Code	L
Frame	182T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6206	Opp Drive End Bearing Size	6205
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		


Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Line Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	3.85 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	15.08 in
Frame Length	5.85 in	Shaft Diameter	1.125 in
Shaft Extension	2.75 in	Assembly/Box Mounting	F1/F2 CAPABLE
Connection Drawing	EE7308	Outline Drawing	SS620855-100

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4										3			
DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME			
100	5.67	15.08	3.75	7.50	-	4.50	2.75	2.35	F1 OR F2	182T			
200	6.69	16.08			4.50	5.50		2.75		182/184T			



DRAWING REVISION B	REVISION BY BISWA	REV DATE/@ DATE 12/02/2021
ECO CR-0001146	APPROVED BY GNK	DATE 12/02/2021
DRAWING UPDATED		
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PRIMARY DIMENSIONS ARE INCH mm DIMENSIONS IN [BRACKETS] ARE FOR REFERENCE ONLY		
DRAWN BY WZ		
DATE 08/11/2017		
APPROVED BY WY		
DATE 08/11/2017		
REFERENCE		
THIRD ANGLE PROJECTION		
		
SIZE B		
DRAWING NUMBER SS620855		
SHEET 1 OF 1		





**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 182TTFCD6026 BB**CONN. DIAGRAM:** EE7308**CUSTOMER PART****#:****OUTLINE:** SS620855-182T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE31124021 3**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
3&2	2.24&1.49	1800	1762&1468	182T	TEFC	K	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	8/4&6.8/3.4	LINE OR INVERTER	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	89.5&85.5	3/4 LOAD EFF:	88.5	1/2 LOAD EFF:	86.5	GTD. EFF	ELEC. TYPE
FULL LOAD PF:	78&75	3/4 LOAD PF:	70	1/2 LOAD PF:	57	88.5	SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
9 LB-FT	64 / 32	20 LB-FT 220 %	29 LB-FT 320 %	60

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
50 dBA	60 dBA	- LB-FT^2	- LB-FT^2	15 SEC.	2	97 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6206	6205						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

*

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:50:05 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 7/16/2020
 Customer: _____
 Attention: _____
 Submitted by: _____

182TTFCD6026

marathon
 Motors

Submittal

Data @ 460 V

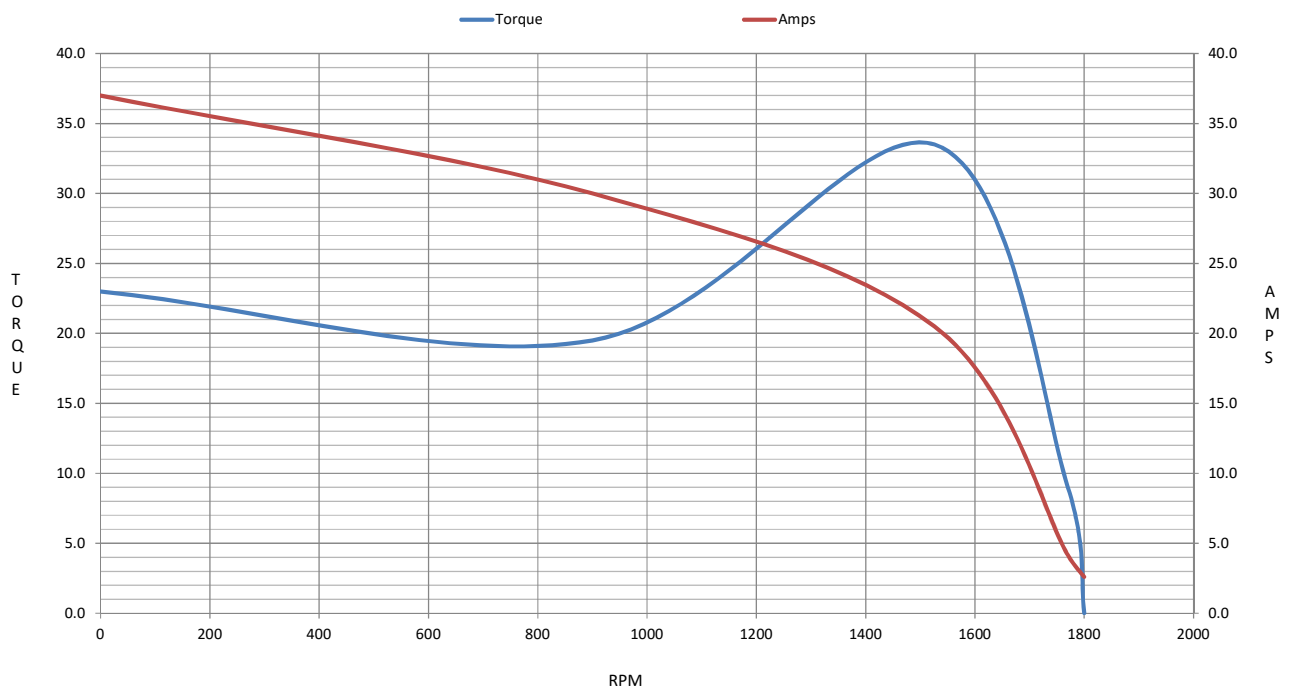
Motor Load Data

Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	2.60	2.70	3.0	3.5	4.2	4.6	4.9	37.0	
Torque (ft-lb)	0.00	2.20	4.4	6.7	9.0	10.3	11.2	23.0	
RPM	1800	1792	1785	1778	1770	1,766	1762	0	
Efficiency (%)		78.1	86.3	88.5	89.5	89.2	88.5		
P.F. (%)	7.3	33.3	54.0	67.5	76.0	80.0	81.0	50.0	

Motor Speed Data

	LR	Pull-Up	BD	Rated	Idle																													
Speed (RPM)	0	900	1526	1770	1800																													
Current (Amps)	37.0	30.0	20.5	4.2	2.60																													
Torque (ft-lb)	23.0	19.5	33.5	9.0	0.00																													
<div><div><div></div><div></div><div></div></div><div>Efficiency (%) P.F. (%) Current (Amps)</div><table border="1"><caption>Graph Data Points (Estimated)</caption><thead><tr><th>Load (%)</th><th>Efficiency (%)</th><th>P.F. (%)</th><th>Current (Amps)</th></tr></thead><tbody><tr><td>25</td><td>78</td><td>33</td><td>2.6</td></tr><tr><td>50</td><td>85</td><td>55</td><td>3.5</td></tr><tr><td>75</td><td>88</td><td>70</td><td>4.2</td></tr><tr><td>100</td><td>89</td><td>78</td><td>4.8</td></tr><tr><td>125</td><td>88</td><td>81</td><td>4.8</td></tr></tbody></table></div>						Load (%)	Efficiency (%)	P.F. (%)	Current (Amps)	25	78	33	2.6	50	85	55	3.5	75	88	70	4.2	100	89	78	4.8	125	88	81	4.8	Information Block				
						Load (%)	Efficiency (%)	P.F. (%)	Current (Amps)																									
						25	78	33	2.6																									
						50	85	55	3.5																									
						75	88	70	4.2																									
						100	89	78	4.8																									
						125	88	81	4.8																									
						HP		3.0																										
						Sync. RPM		1800																										
						Frame		182																										
						Enclosure		TEFC																										
						Construction		TFC																										
						Voltage		208-230/460#190/380 V																										
						Frequency		60 Hz																										
						Design		A																										
						LR Code letter		L																										
						Service Factor		1.15																										
						Temp Rise @ FL		55 ° C																										
						Duty		CONT																										
						Ambient		40 ° C																										
						Elevation		3,300 feet																										
						Rotor/Shaft wk²		0.00 Lb-Ft²																										
						Ref Wdg		HA31124026 R1																										
Sound Pressure @ 1M		62 dBA																																
VFD Rating		CONSTANT 10:1/VARIABLE 10:1																																
Outline Dwg		037898-912																																
Conn. Diag		EE7308																																
Additional Specifications:																																		
0																																		
0																																		
EQUIV CKT (OHMS / PHASE)																																		
R1	R2	X1	X2	Xm																														
2.1840	1.2480	4.9350	4.9160	103.3320																														

Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 184TTFC6D6026

Catalog No: GT1013A

5 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 184T Frame, TEFC
Three Phase TEFC Motors





Nameplate Specifications

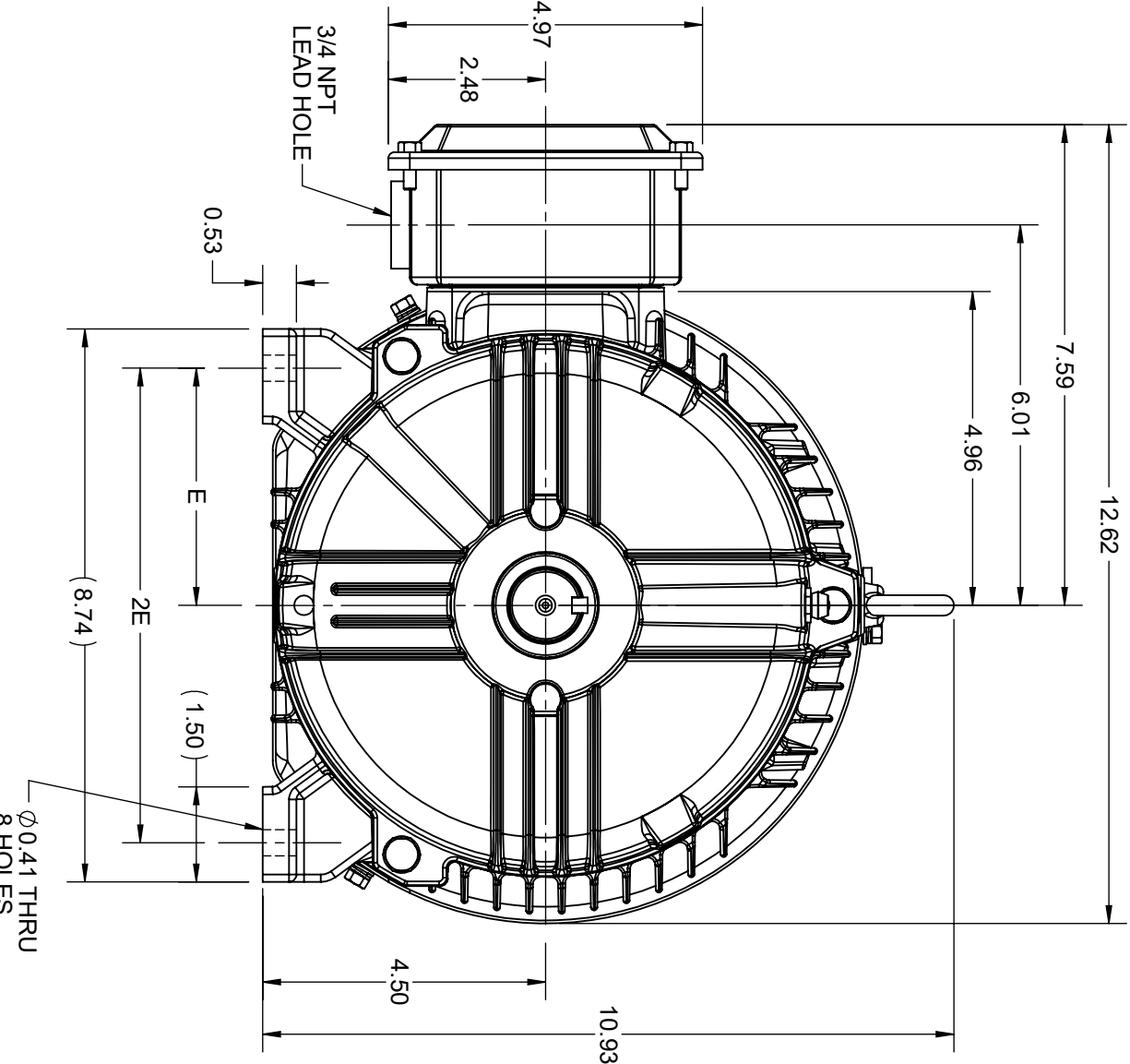
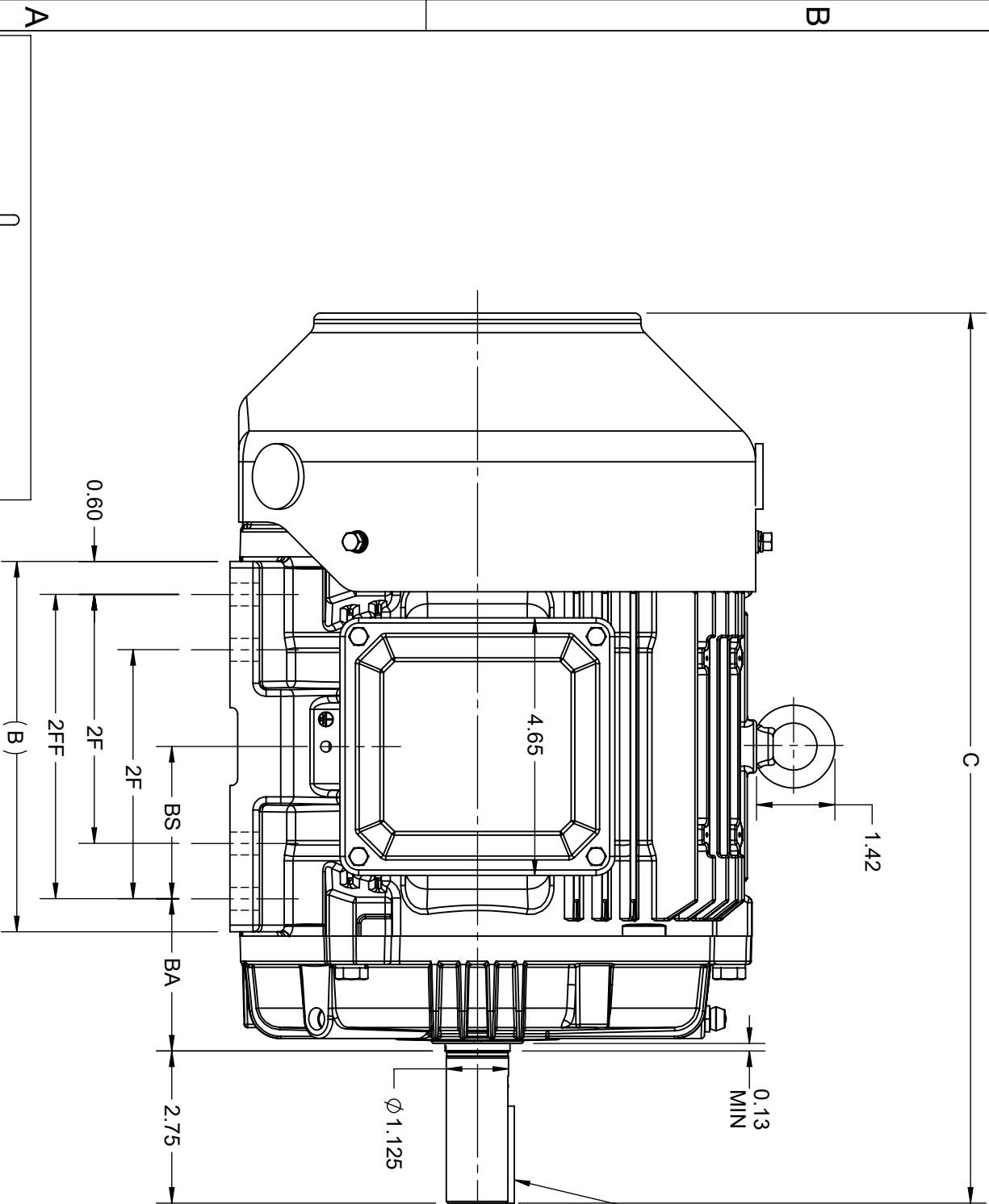
Output HP	5 Hp	Output KW	3.7 kW
Frequency	60 Hz	Voltage	230/460 V
Current	13.2/6.6 A	Speed	1765 rpm
Service Factor	1.15	Phase	3
Efficiency	89.5 %	Power Factor	80
Duty	Continuous	Insulation Class	F
Design Code	A	KVA Code	K
Frame	184T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6206	Opp Drive End Bearing Size	6205
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

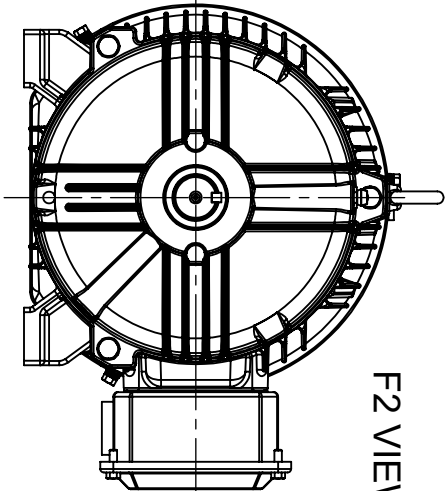
Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Line Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	2.75 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	16.08 in
Frame Length	6.85 in	Shaft Diameter	1.125 in
Shaft Extension	2.75 in	Assembly/Box Mounting	F1/F2 CAPABLE
Outline Drawing	SS620855-200	Connection Drawing	EE7308

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DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME
100	5.67	15.08	3.75	7.50	-	4.50	2.75	2.35	F1 OR F2	182T
200	6.69	16.08			4.50	5.50		2.75		182/184T




F2 VIEW



DRAWING REVISION	REVISION BY	REV DATE/@ DATE
B	BISWA	12/02/2021
ECO CR-0001146	APPROVED BY GNK	DATE 12/02/2021
ECO DESCRIPTION		
DRAWING UPDATED		
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DRAWN BY	WZ		<div><div>REGAL®</div><div>Regal Beloit America, Inc.</div></div>	OUTLINE		182/184T FR-NEMA TEFC CAST IRON	PROCESS/FINISH		
DATE	08/11/2017								
APPROVED BY	WY								
DATE	08/11/2017								
REFERENCE									
THIRD ANGLE PROJECTION			SIZE	DRAWING NUMBER				SHEET	
			B			SS620855		1 OF 1	





**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 184TTFCD6026 BB**CONN. DIAGRAM:** EE7308**CUSTOMER PART****#:****OUTLINE:** SS620855-184T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE31124020 3**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
5&3	3.70&2.24	1800	1755&1462	184T	TEFC	J	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	13/6.5&10.2/5.1	LINE OR INVERTER	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	89.5&86.5	3/4 LOAD EFF:	89.5	1/2 LOAD EFF:	88.5	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	80&77	3/4 LOAD PF:	75	1/2 LOAD PF:	64	88.5		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
15 LB-FT	99 / 49.5	33 LB-FT 220 %	42 LB-FT 290 %	60

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
50 dBA	60 dBA	- LB-FT^2	- LB-FT^2	15 SEC.	2	111 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL						
6206	6205	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON

THERMO-PROTECTORS	THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS PROTECTORS WDG RTDs BRG RTDs			
NONE	NOT	NONE	NONE
		NONE	FALSE
		NONE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:48:24 AM

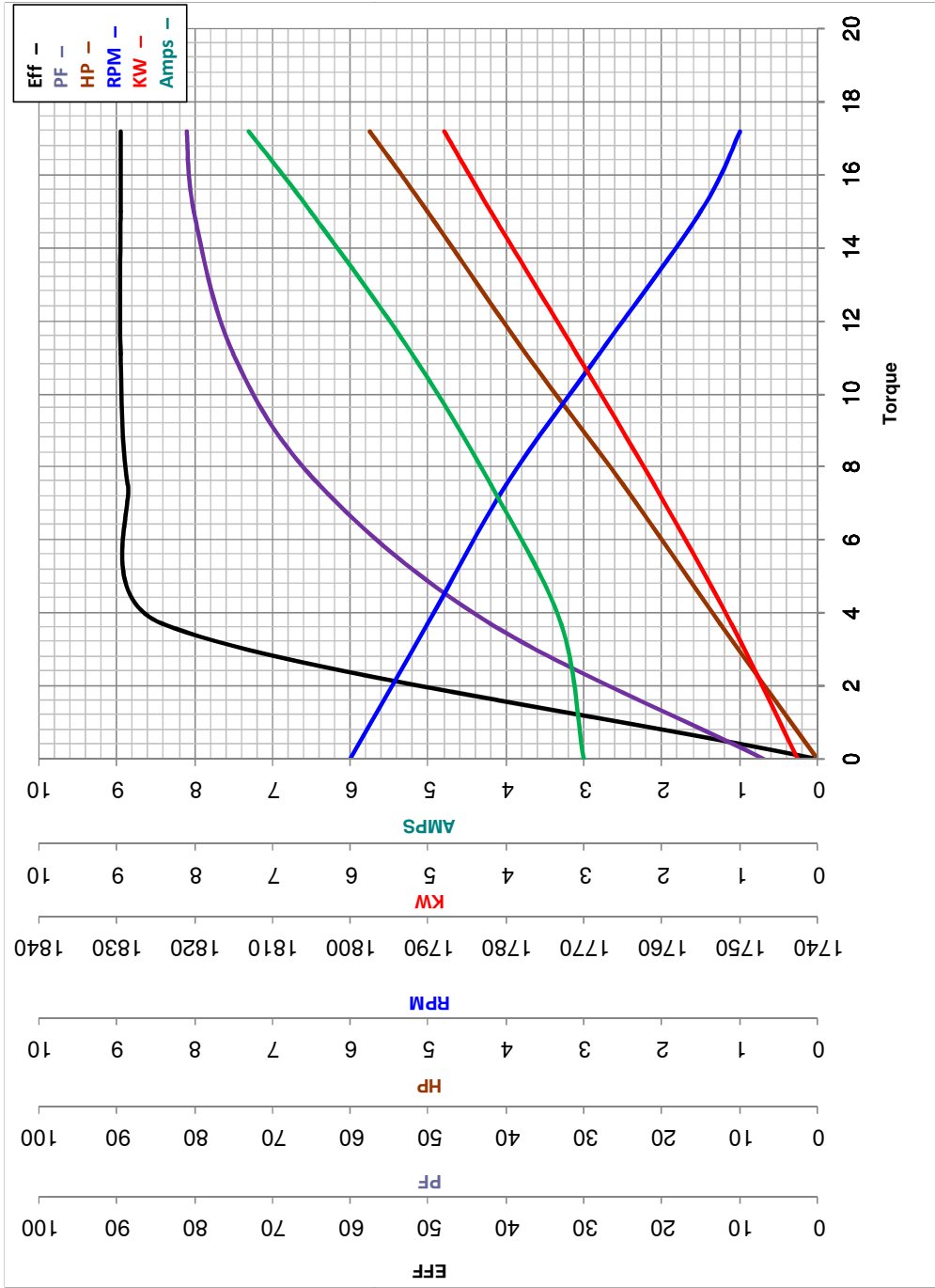
FORM 3531 REV.3 02/07/99

** Subject to change without notice.

MARATHON ELECTRIC CORPORATION

TYPICAL PERFORMANCE CURVE for AC MOTOR

Customer	Curve at		Volts	HP	PHASE
			460	5.3	3
			60		
Model No	184TIFCD6026		VOLTS 230/460&190/380		
			5	HP	
Catalog No	GT1013A		HZ 60&50		
			RPM 1755&1462		



Torque in Lb.Ft		
FL TORQUE	15	Lb.Ft
BD TORQUE	42.0	Lb.Ft
LR TORQUE	33	Lb.Ft
WINDING	HE31124020-3	Prepared By ANUSHA M
		Date 5/4/2018

PRODUCT INFORMATION PACKET

Model No: 213TTFCD6026
Catalog No: GT1016A
7.50 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 213T Frame, TEFC
Three Phase TEFC Motors





Nameplate Specifications

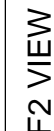
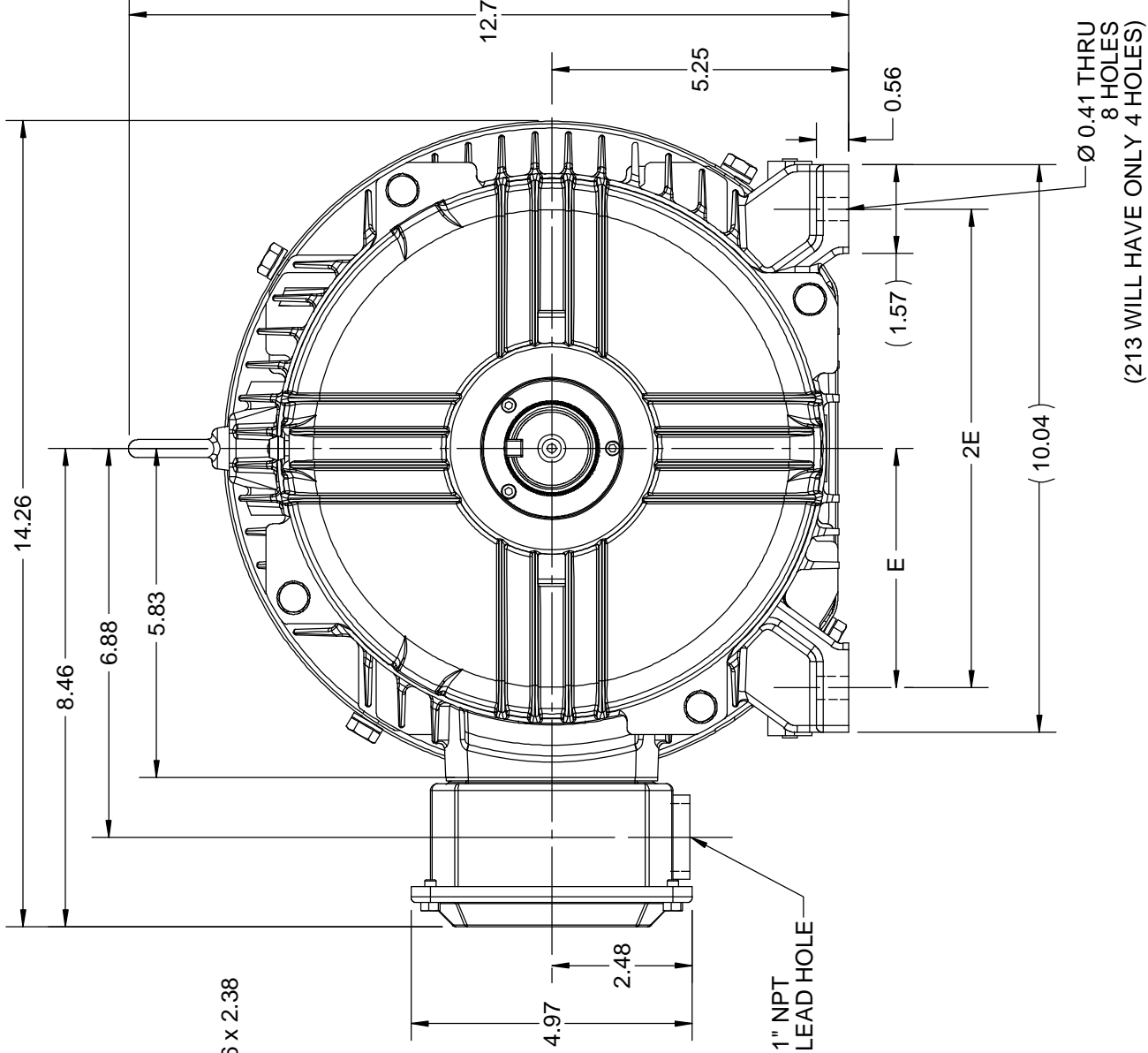
Output HP	7.50 Hp	Output KW	5.6 kW
Frequency	60 Hz	Voltage	208-230/460 V
Current	20.6-19.0/9.5 A	Speed	1768 rpm
Service Factor	1.15	Phase	3
Efficiency	91.7 %	Power Factor	79.3
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	H
Frame	213T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6308	Opp Drive End Bearing Size	6208
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		



Technical Specifications

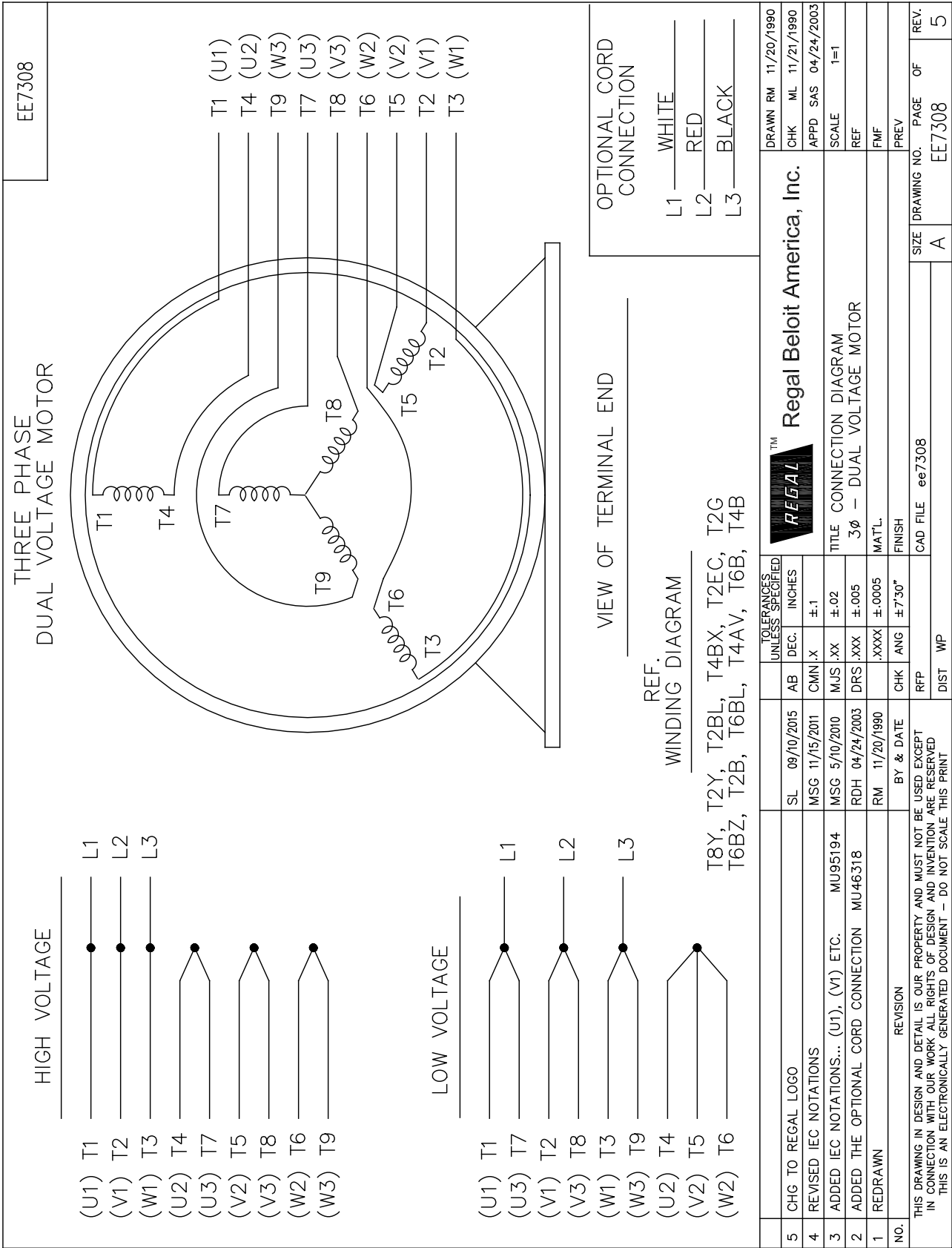
Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Line Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	1.473 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	18.53 in
Shaft Diameter	1.375 in	Shaft Extension	3.38 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308	Outline Drawing	SS620702-100

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PRIMARY DIMENSIONS ARE INCH mm DIMENSIONS IN [BRACKETS] ARE FOR REFERENCE ONLY	DRAWN BY JOY			Regal Beloit America, Inc.	
	DATE 04/05/2015				
	APPROVED BY SBD		DESCRIPTION	OUTLINE	
	DATE 04/05/2015		213/215T FR TEFC- CAST IRON		
	REFERENCE		MATERIAL	PROCESS/FINISH	
	THIRD ANGLE PROJECTION		SIZE B	DRAWING NUMBER	SS620702





**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 213TTFCD6026 BB**CONN. DIAGRAM:** A-EE7308**CUSTOMER PART****#:****OUTLINE:** SS620702-213T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE31324012 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
7 1/2&5	5.60&3.70	1800	1768&1475	213T	TEFC	H	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	19/9.5&16/8	LINE OR INVERTER	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	93.3&91	3/4 LOAD EFF:	91	1/2 LOAD EFF:	90	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	79.3&76.5	3/4 LOAD PF:	73.4	1/2 LOAD PF:	63.8	91		SQ CAGE INV RATED

F.L. TORQUE		LOCKED ROTOR AMPS		L.R. TORQUE		B.D. TORQUE		F.L. RISE°C
22.3	LB-FT	124 / 62		45	LB-FT 202 %	59	LB-FT 265 %	40

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
62 dBA	72 dBA	0.95 LB-FT^2	75 LB-FT^2	25 SEC.	2	167 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6308	6208						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 12:46:51 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 7/16/2020
 Customer: _____
 Attention: _____
 Submitted by: _____



213TTFCD6026

Submittal

Data @ 460 V

Motor Load Data

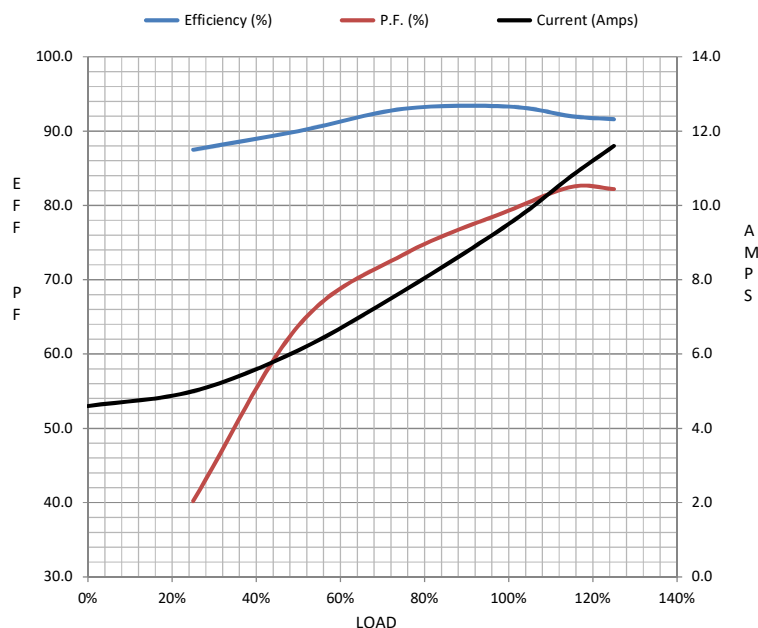
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	4.6	5.0	6.1	7.7	9.5	10.8	11.6	62.0	
Torque (ft-lb)	0.00	5.5	11.0	16.6	22.3	25.6	28.0	45.0	
RPM	1800	1792	1785	1775	1768	1,762	1758	0	
Efficiency (%)		87.5	90.0	93.0	93.3	92.0	91.6		
P.F. (%)	12.3	40.2	63.8	73.4	79.3	82.5	82.2	43.0	

Motor Speed Data

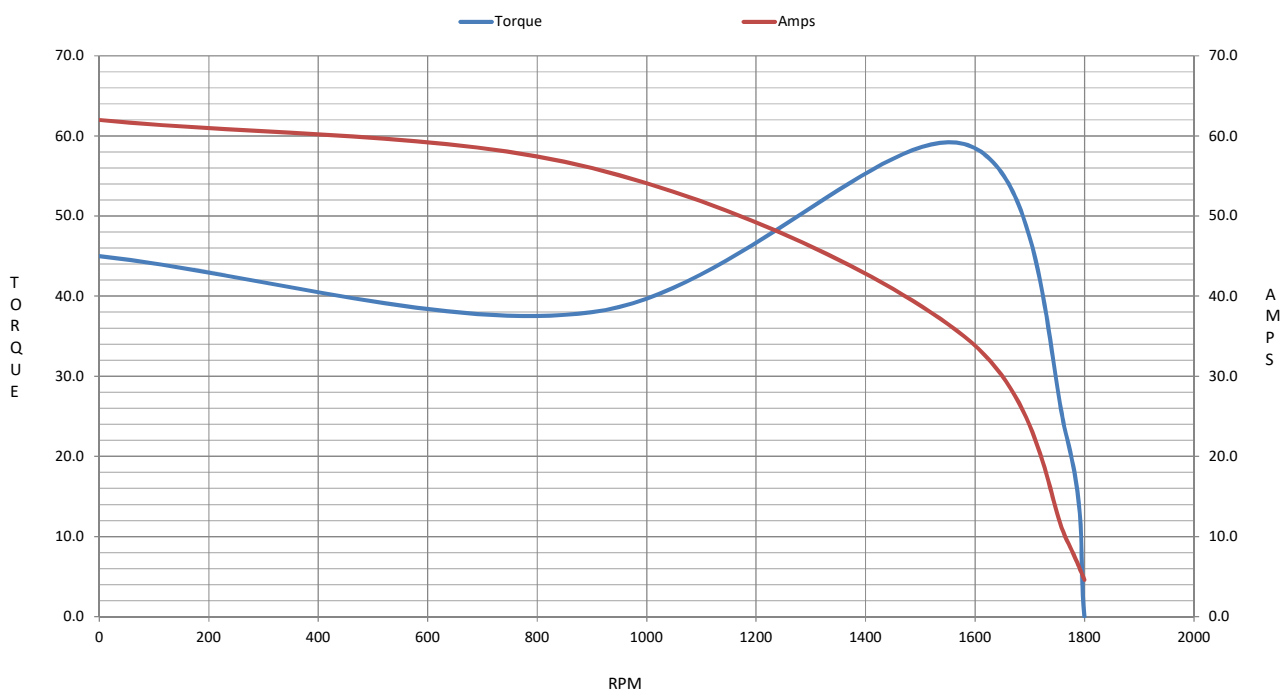
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1580	1768	1800
Current (Amps)	62.0	56.0	35.0	9.5	4.6
Torque (ft-lb)	45.0	38.0	59.0	22.3	0.00

Information Block

HP	7.5			
Sync. RPM	1800			
Frame	213			
Enclosure	TEFC			
Construction	TFC			
Voltage	208-230/460#190/380 V			
Frequency	60 Hz			
Design	B			
LR Code letter	H			
Service Factor	1.15			
Temp Rise @ FL	40 ° C			
Duty	CONT			
Ambient	40 ° C			
Elevation	3,300 feet			
Rotor/Shaft wk²	0.95 Lb-Ft²			
Ref Wdg	HA31324012 R2			
Sound Pressure @ 1M	62 dBA			
VFD Rating	CONSTANT 10:1/VARIABLE 10:1			
Outline Dwg	037898-912			
Conn. Diag	EE7308			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.9110	0.5480	2.6610	3.0810	56.8890



Speed - Torque Curve



PRODUCT INFORMATION PACKET

Model No: 215TTFCD6026

Catalog No: GT1019A

10 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 215T Frame, TEFC
Three Phase TEFC Motors





Nameplate Specifications

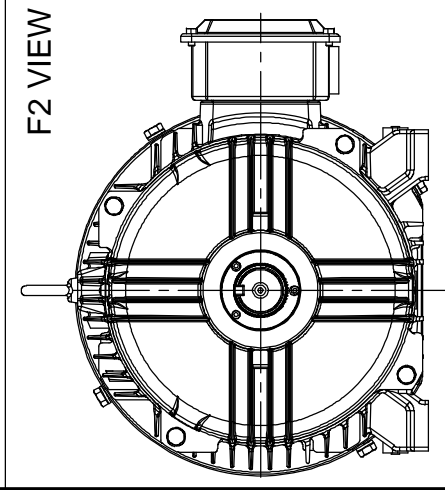
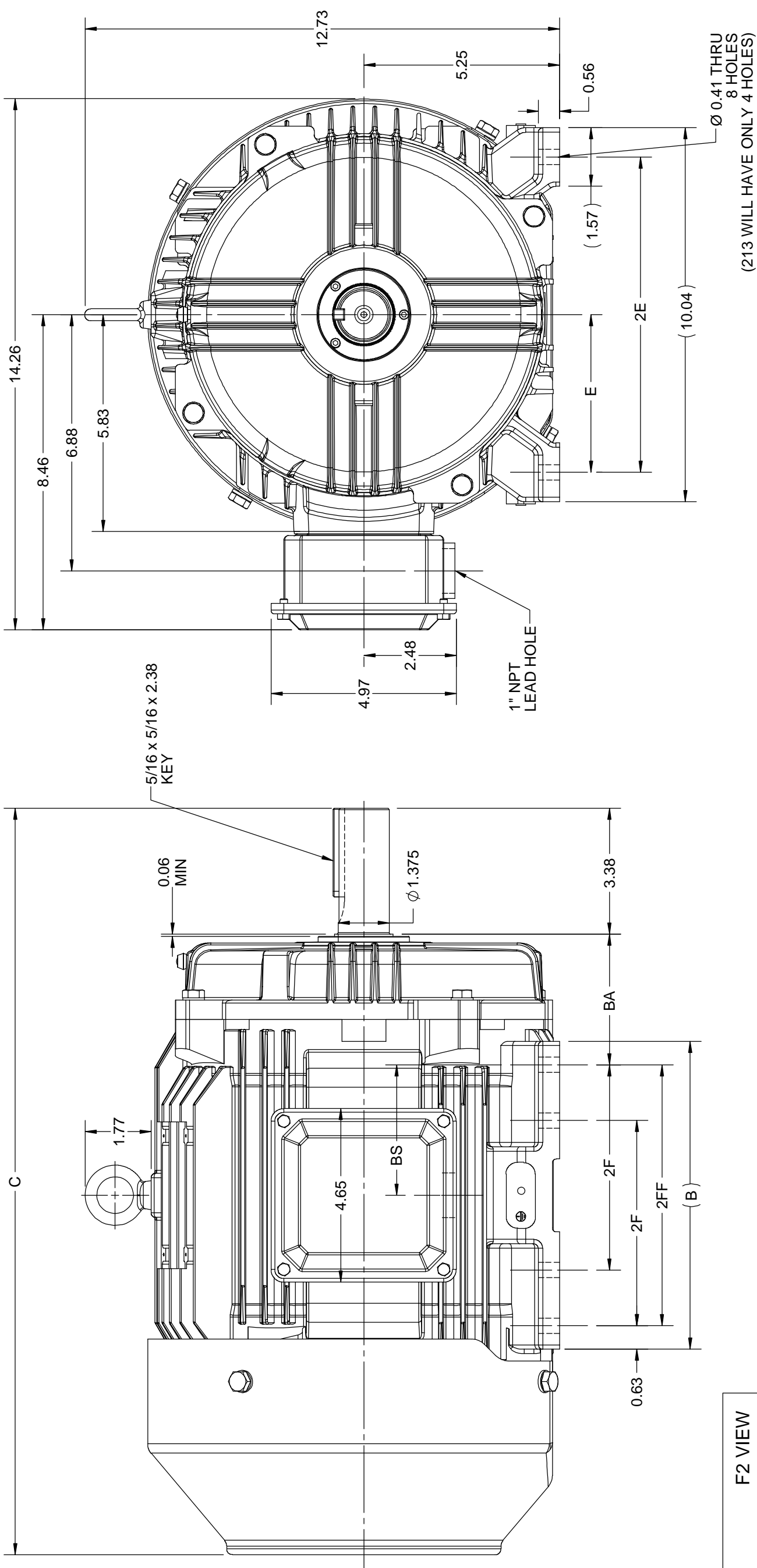
Output HP	10 Hp	Output KW	7.5 kW
Frequency	60 Hz	Voltage	208-230/460 V
Current	27.3-25.0/12.5 A	Speed	1762 rpm
Service Factor	1.15	Phase	3
Efficiency	91.7 %	Power Factor	81.3
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	H
Frame	215T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6308	Opp Drive End Bearing Size	6208
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Line Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	1.155 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	20.30 in
Shaft Diameter	1.375 in	Shaft Extension	3.38 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308	Outline Drawing	SS620702-200

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DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME
100	6.76	18.53	4.25	8.50	---	5.50	3.50	2.75	F1 OR F2	213T
200	8.26	20.03			5.50	7.00		3.50		213/215T



DRAWING REVISION C	REVISION BY VS	REV DATE/©DATE 30-09-2020
ECO ECO-0194527	APPROVED BY GNK	DATE 30-09-2020
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		DRAWN BY JOY	
		DATE 04/05/2015	
		APPROVED BY SBD	
		DATE 04/05/2015	
		REFERENCE	
PRIMARY DIMENSIONS ARE INCH mm DIMENSIONS IN [BRACKETS] ARE FOR REFERENCE ONLY			
OUTLINE		DESCRIPTION	
213/215T FR TEFC- CAST IRON			
MATERIAL		PROCESS/FINISH	
SIZE B		DRAWING NUMBER SS620702	
THIRD ANGLE PROJECTION		SHEET 1 OF 1	





P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311

DATA VOLTS: 460

CERTIFICATION DATA SHEET

CUSTOMER:
ORDER #:
CONN. DIAGRAM:
OUTLINE:
WINDING:
SPEED:

EE7308

SS620702-200

HA31324013

R1

2

CUSTOMER P.O. #:
REFERENCE MODEL #:
CAT #:
CUSTOMER PART #:
MOUNTING:

TYPICAL MOTOR PERFORMANCE DATA

HP	KW	SYNC RPM	FL RPM	FRAME	ENCLOSURE	TYPE	KVA CODE	DESIGN
10	7.5	1800	1762	215T	TEFC	TFC	H	B

PH	HZ	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB	ELEV.
3	60/50	208-230/460#190/380	27.3-25/12.5&23.2/11.6	LINE OR INVERTER	CONT	F	1.15	40	3300

F.L. EFF	91.7	3/4 LD EFF	91.6	1/2 LD EFF	90.8	GTD EFF	91.0	ELECT. TYPE	
F.L. PF	81.3	3/4 LD PF	76.6	1/2 LD PF	66.0			SQ CAGE INV RATED	

F.L. TORQUE	LR AMPS @ 460 V	L.R. TORQUE	B.D. TORQUE	F.L. RISE (° C)	
29.8 LB-FT	79.0	59.0 LB-FT	198%	74.0 LB-FT	248%

SOUND PRESSURE @ 3 FT.	SOUND	POWER	ROTOR WK ²	MAX. LOAD WK ²	SAFE STALL TIME	STARTS/HOUR	APROX.	MOTOR WGT
62 dBA	71 dBA		1.10 LB-FT ²	85 LB-FT ²	25 SEC.	2	210	LB.

*** SUPPLEMENTAL INFORMATION ***

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	MOTOR ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	NO	DIVISION 2 T2B	NO	NONE	BLUE (ENAMEL)

BEARINGS	GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE ODE						
BALL BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6308 6208						

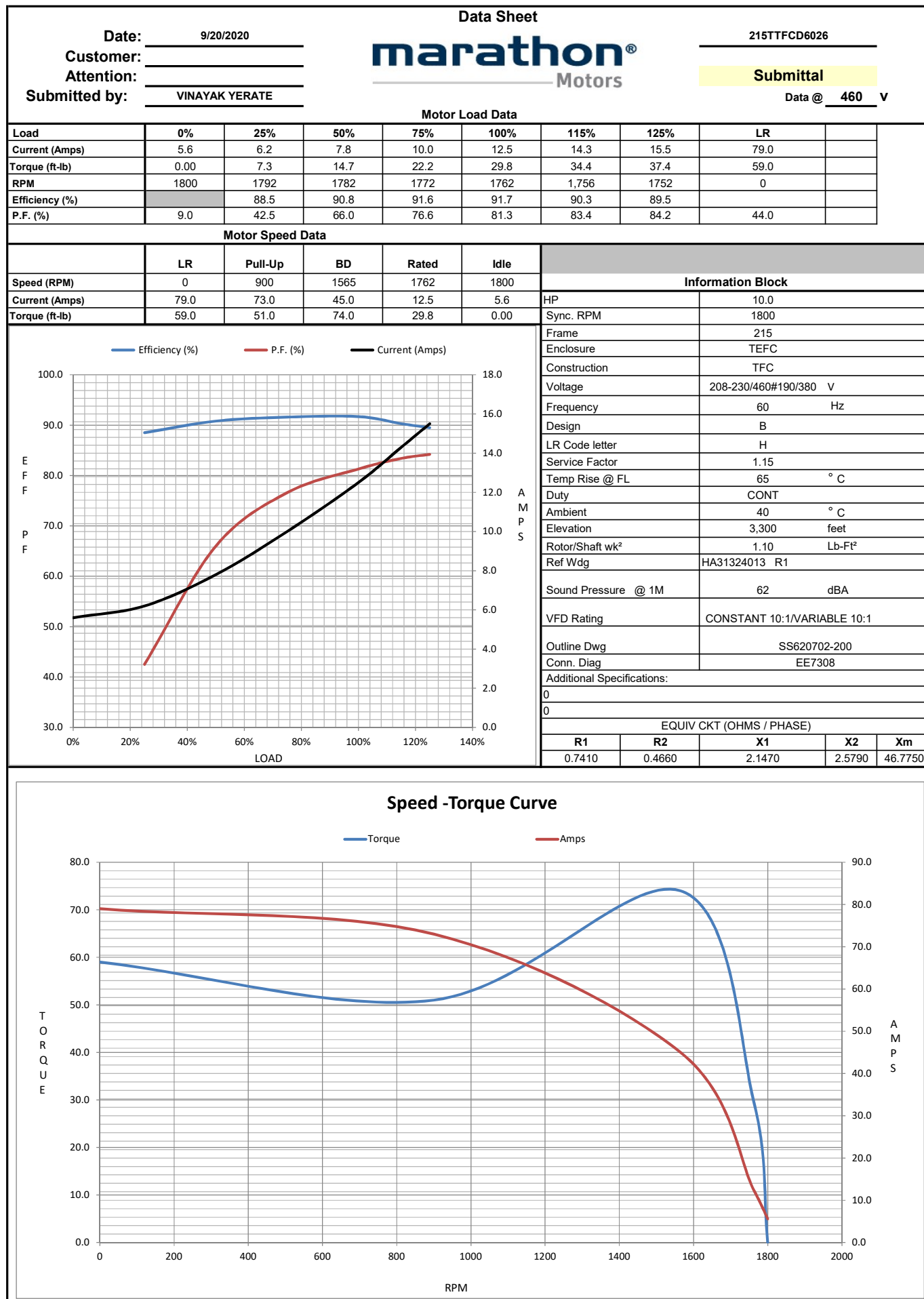
THERMOSTATS	PROTECTORS	WDG RTD's	BRG RTD's	THERMISTORS	CONTROL	SPACE HEATERS
NONE	NOT	NONE	NONE	NONE	FALSE	NA

R1 (ohms/ph)	R2 (ohms/ph)	X1 (ohms/ph)	X2 (ohms/ph)	Xm (ohms/ph)	VIBRATION (in/sec)	FLOAT
0.741	0.466	2.147	2.579	46.775	0.150	ODE

* N O T E s	INVERTER TORQUE: CONSTANT 10:1/VARIABLE 10:1 INV. HP SPEED RANGE: NONE	
	ENCODER: NONE NONE NONE PPR	
	BRAKE: NONE NONE NONE	
	FT-LB: NA VOLTAGE: NONE HZ: UL: NO LETTER - ME, WUXI TEFC BLUEWHALE CLASS 1 DIV. 2 UL LISTED	

PREPARED BY: VINAYAK YERATE
DATE: 9/22/2020

FORM: 3531 REV. 4 2/27/06



PRODUCT INFORMATION PACKET

Model No: 254TTFCD6026

Catalog No: GT1022A

15 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 254T Frame, TEFC
Three Phase TEFC Motors





Nameplate Specifications

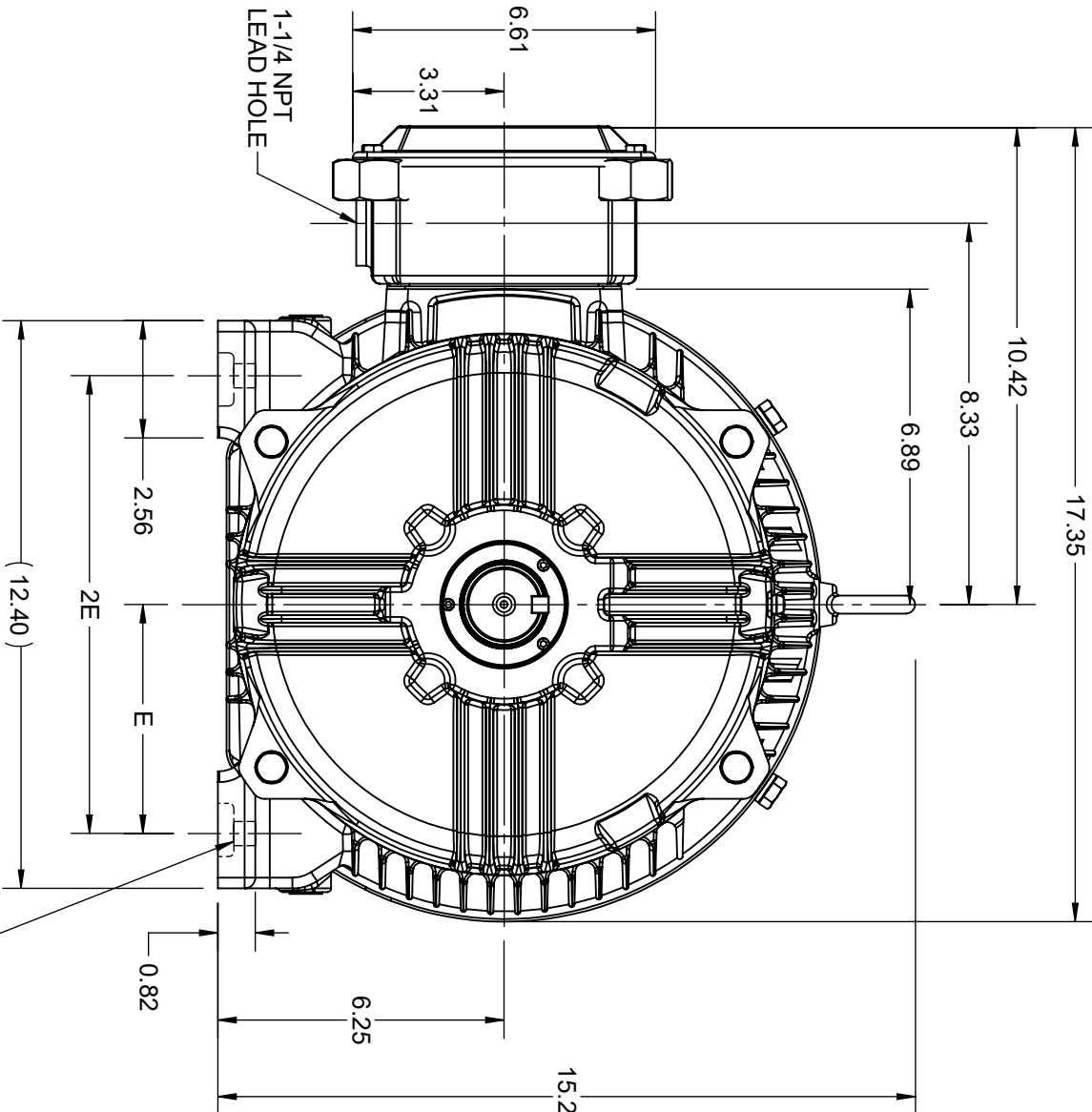
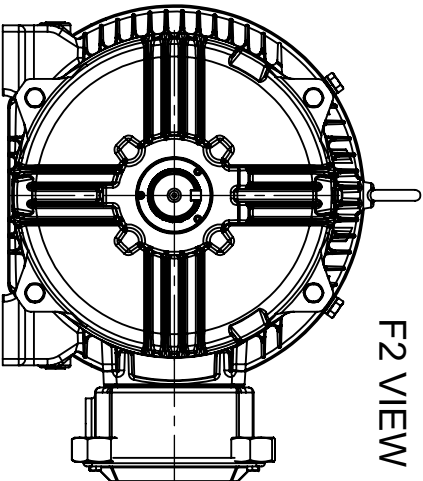
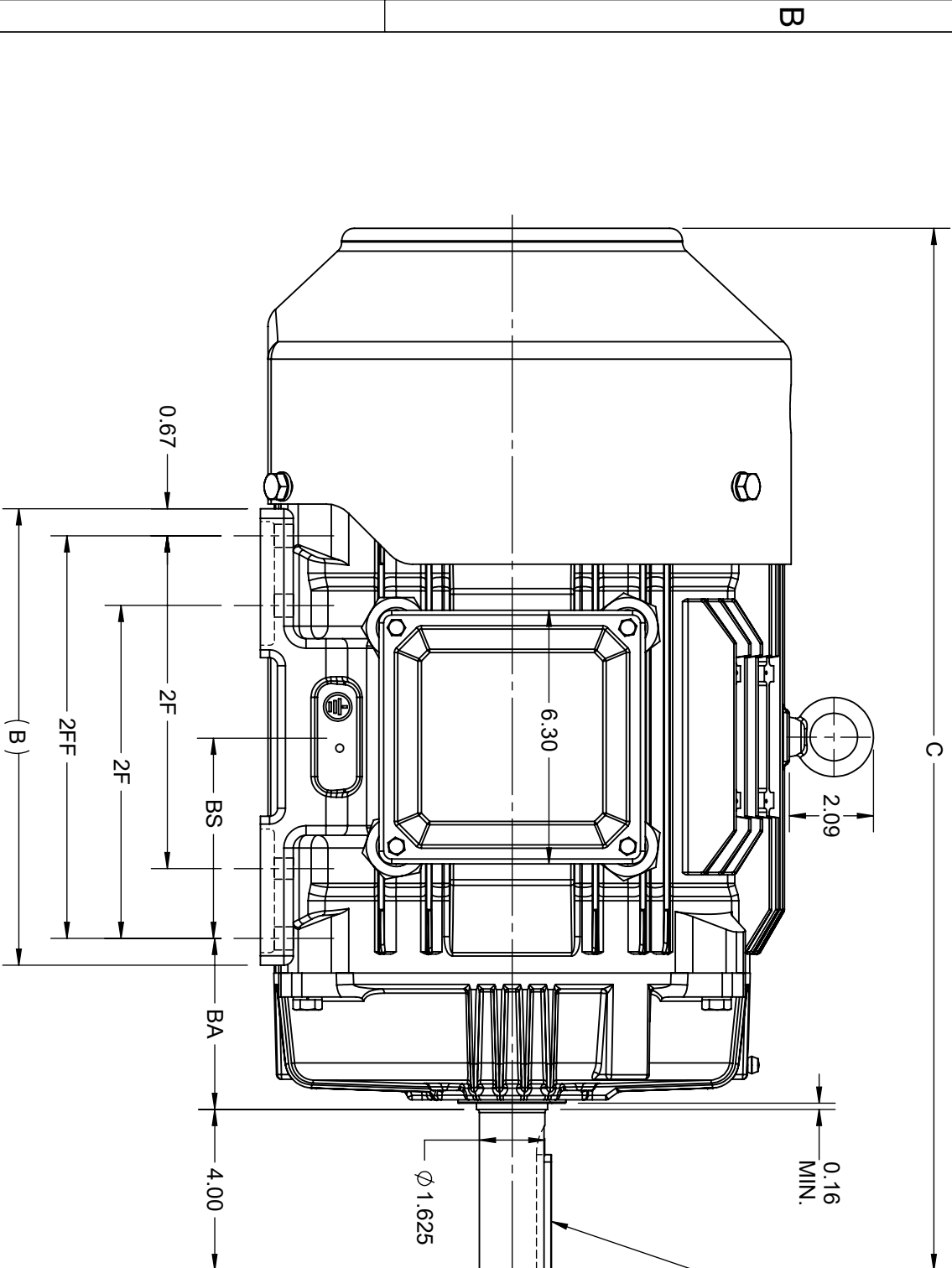
Output HP	15 Hp	Output KW	11.2 KW
Frequency	60 Hz	Voltage	208-230/460 V
Current	40.0-37.5/18.8 A	Speed	1772 rpm
Service Factor	1.15	Phase	3
Efficiency	92.4 %	Power Factor	82
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	254T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6309	Opp Drive End Bearing Size	6209
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Line Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.61 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	24.15 in
Shaft Diameter	1.625 in	Shaft Extension	4 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308K	Outline Drawing	SS620703-100

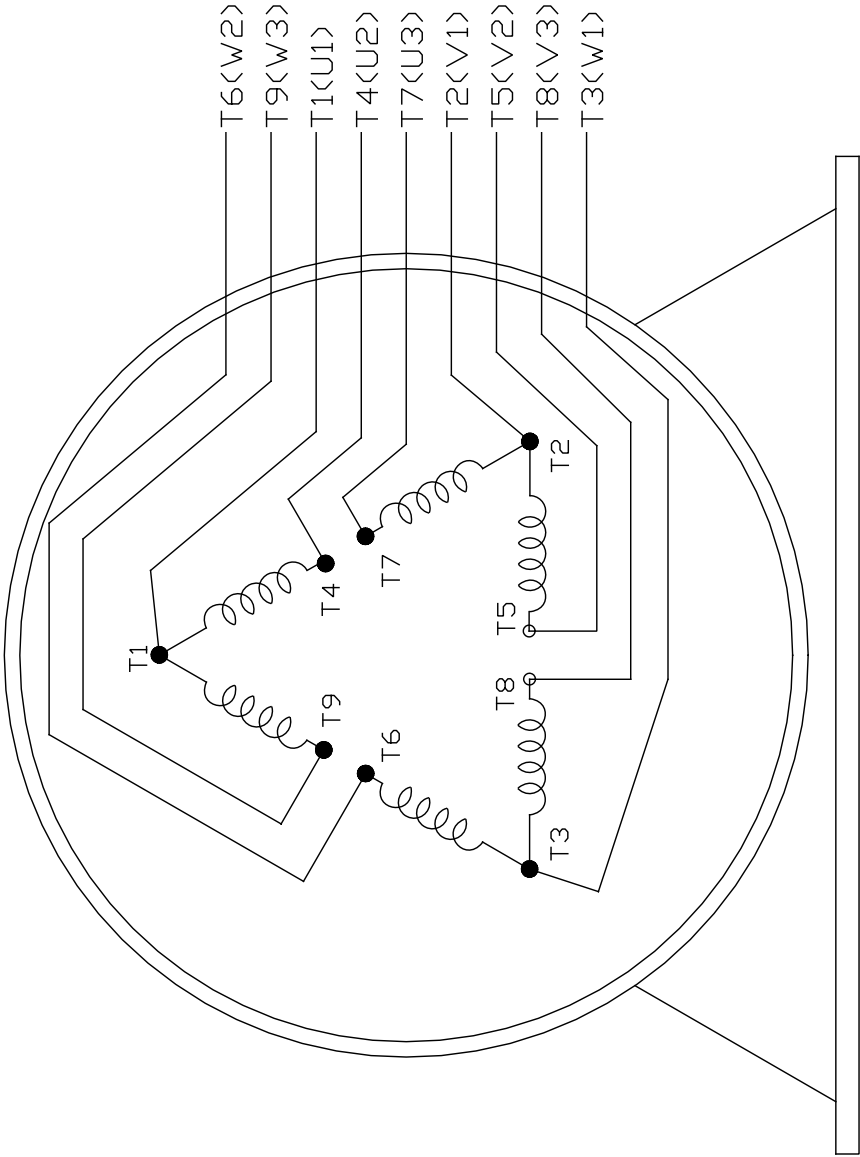
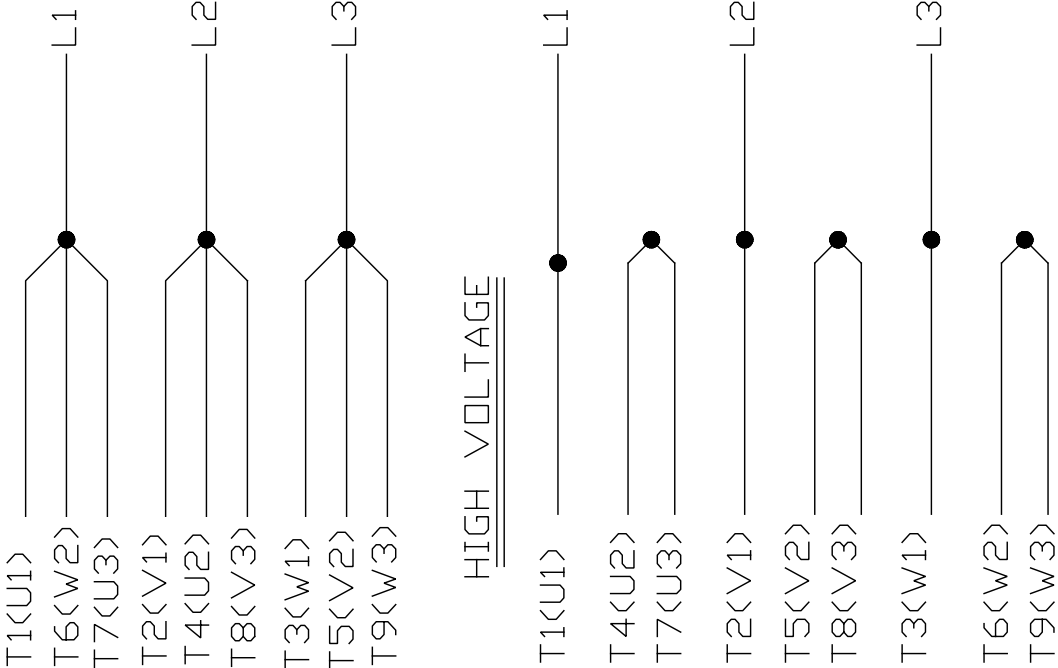
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4				3				2		1	
DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME	
100	9.60	24.15	5.00	10.00	-	8.25	4.25	4.13	F1 OR F2	254T	
200	11.34	25.89						5.00		254/256T	



DRAWING REVISION		REVISION BY		REV DATE/@ DATE	
D		SVP		04/06/2021	
ECO	APPROVED BY		DATE		
CR-0001991	AK		04/06/2021		
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DRAWN BY		MR		<div><div>REGAL[®]</div><div>Regal Beloit America, Inc.</div></div>	
DATE		4/5/2015			
APPROVED BY		KRK			
DATE		4/5/2015			
REFERENCE		MATERIAL		OUTLINE 254/256T FR-TEFC-CAST IRON	
THIRD ANGLE PROJECTION		SIZE			
		DRAWING NUMBER			
		B		SS620703	SHEET 1 OF 1
				PROCESS/FINISH	



VIEW OF TERMINAL END

REGAL		REGAL - BELOIT CORPORATION		DRAWN PGK 06-04-1997	
TITLE		CONNECTION DIAGRAM		CHK ML 06-05-1997	
DELTA CON. - 3Ø - 9 LEADS		SCALE		APPD GK 06-15-1997	
MAT'L.		REF		SCALE	
FINISH		FIMF		REF	
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		A		EE7308K	
				E	



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 254TTFC6026 BB**CONN. DIAGRAM:** A-EE7308K**CUSTOMER PART****#:****OUTLINE:** B-SS620703**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE31604011 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
15&10	11.2&7.50	1800	1772&1478	254T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	37.5/18.8&31.5/15.7	LINE OR INVERTER	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	92.4&92.1	3/4 LOAD EFF:	92.4	1/2 LOAD EFF:	91.7	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	82&78.5	3/4 LOAD PF:	76.5	1/2 LOAD PF:	65.5	91.7		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
44.5 LB-FT	226 / 113	91 LB-FT 204 %	118 LB-FT 265 %	50

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
65 dBA	75 dBA	2.4 LB-FT^2	110 LB-FT^2	20 SEC.	2	299 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6309	6209						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 20:1/VARIABLE 20:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:10:08 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 7/16/2020
 Customer: _____
 Attention: _____
 Submitted by: _____



254TTFCD6026

Submittal

Data @ 460 V

Motor Load Data

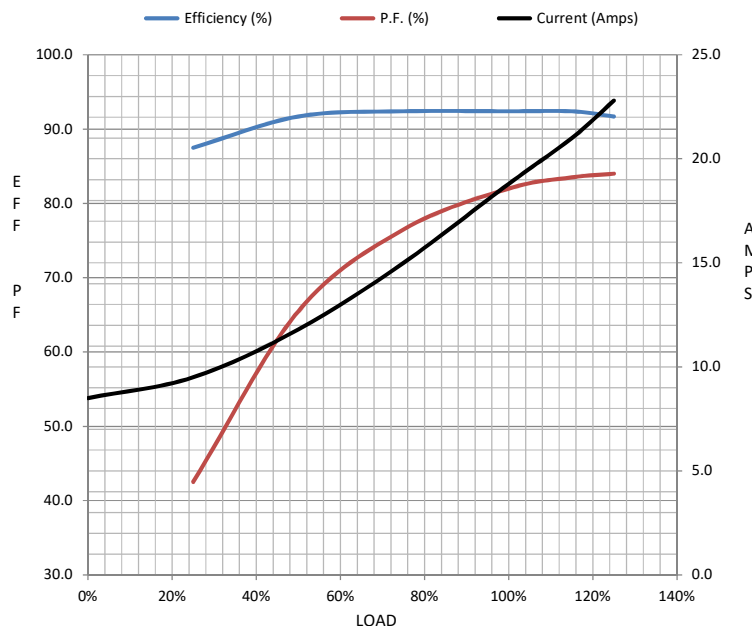
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	8.5	9.5	11.8	15.0	18.8	21.0	22.8	113	
Torque (ft-lb)	0.00	11.0	22.0	33.5	44.5	51.5	56.0	91.0	
RPM	1800	1792	1785	1780	1772	1,768	1762	0	
Efficiency (%)		87.5	91.7	92.4	92.4	92.4	91.7		
P.F. (%)	5.0	42.5	65.5	76.5	82.0	83.5	84.0	41.0	

Motor Speed Data

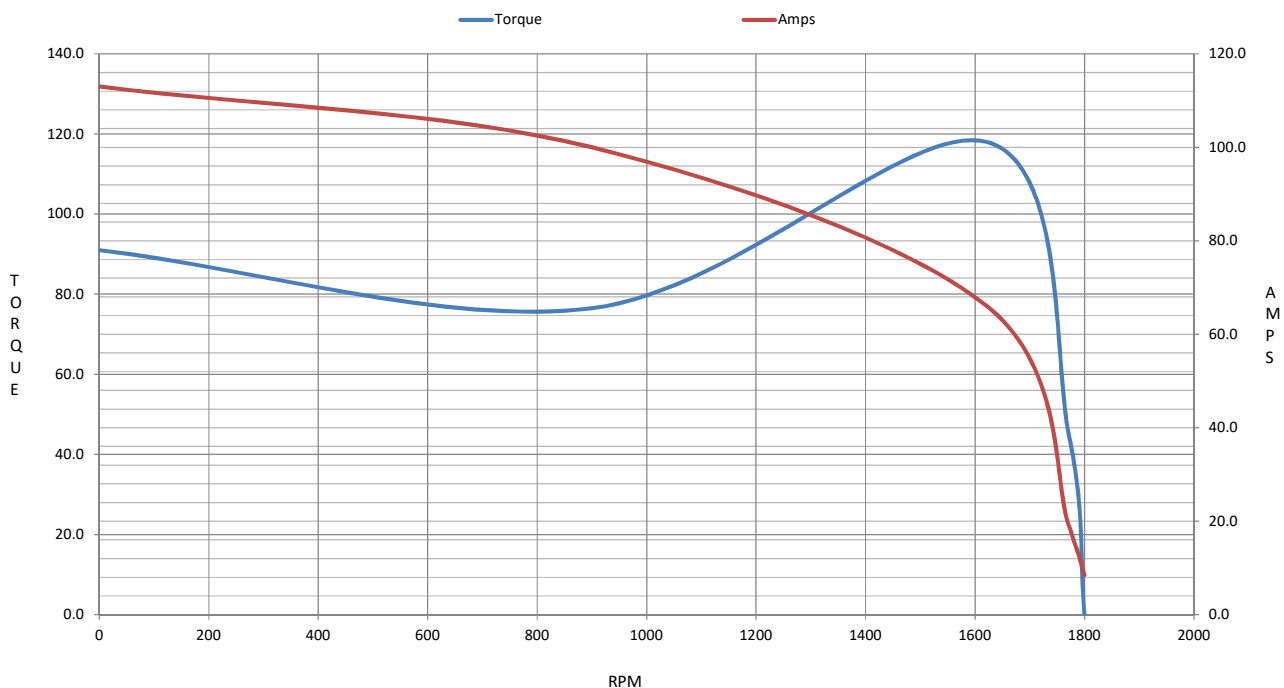
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1622	1772	1800
Current (Amps)	113	100	66.0	18.8	8.5
Torque (ft-lb)	91.0	76.5	118	44.5	0.00

Information Block

HP	15.0			
Sync. RPM	1800			
Frame	254			
Enclosure	TEFC			
Construction	TFC			
Voltage	208-230/460#190/380 V			
Frequency	60 Hz			
Design	B			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	50 ° C			
Duty	CONT			
Ambient	40 ° C			
Elevation	3,300 feet			
Rotor/Shaft wk²	2.40 Lb-Ft²			
Ref Wdg	HA31604019 NONE			
Sound Pressure @ 1M	65 dBA			
VFD Rating	CONSTANT 10:1/VARIABLE 10:1			
Outline Dwg	037898-912			
Conn. Diag	EE7308K			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.4400	0.2440	1.3040	1.4670	31.5630



Speed - Torque Curve



PRODUCT INFORMATION PACKET

Model No: 256TTFC6026

Catalog No: GT1025A

20 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 256T Frame, TEFC
Three Phase TEFC Motors





Nameplate Specifications

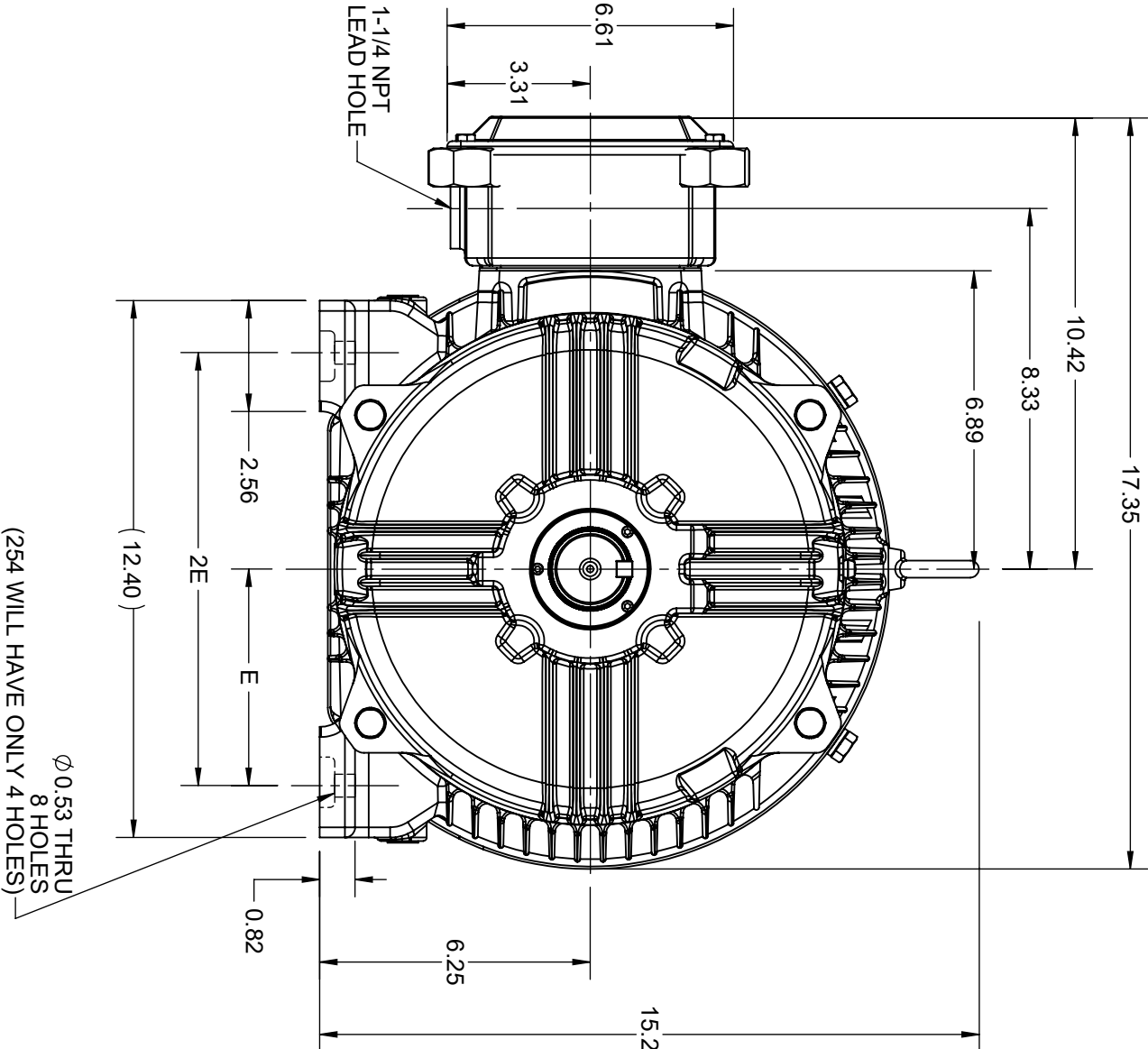
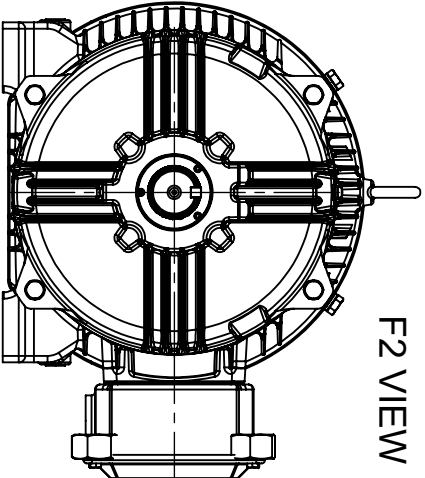
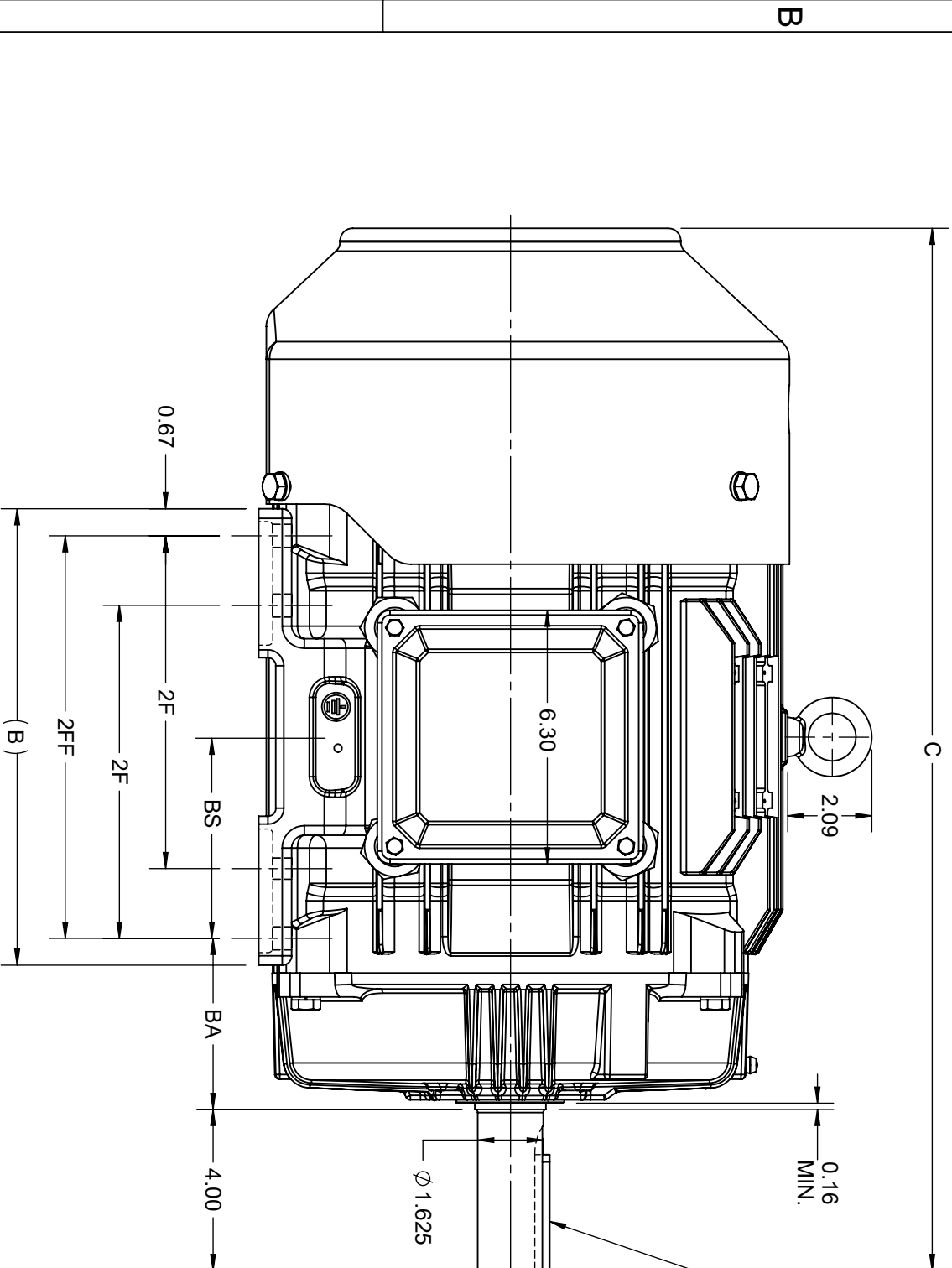
Output HP	20 Hp	Output KW	14.9 KW
Frequency	60 Hz	Voltage	208-230/460 V
Current	53.0-48.5/24.2 A	Speed	1768 rpm
Service Factor	1.15	Phase	3
Efficiency	93 %	Power Factor	83.5
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	256T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6309	Opp Drive End Bearing Size	6209
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Line Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.513 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	25.89 in
Shaft Diameter	1.625 in	Shaft Extension	4 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308K	Outline Drawing	SS620703-200

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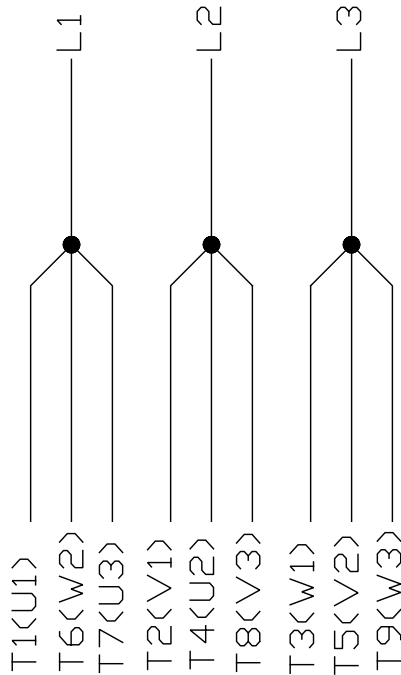
4				3				2		1	
DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME	
100	9.60	24.15	5.00	10.00	-	8.25	4.25	4.13	F1 OR F2	254T	
200	11.34	25.89						5.00		254/256T	



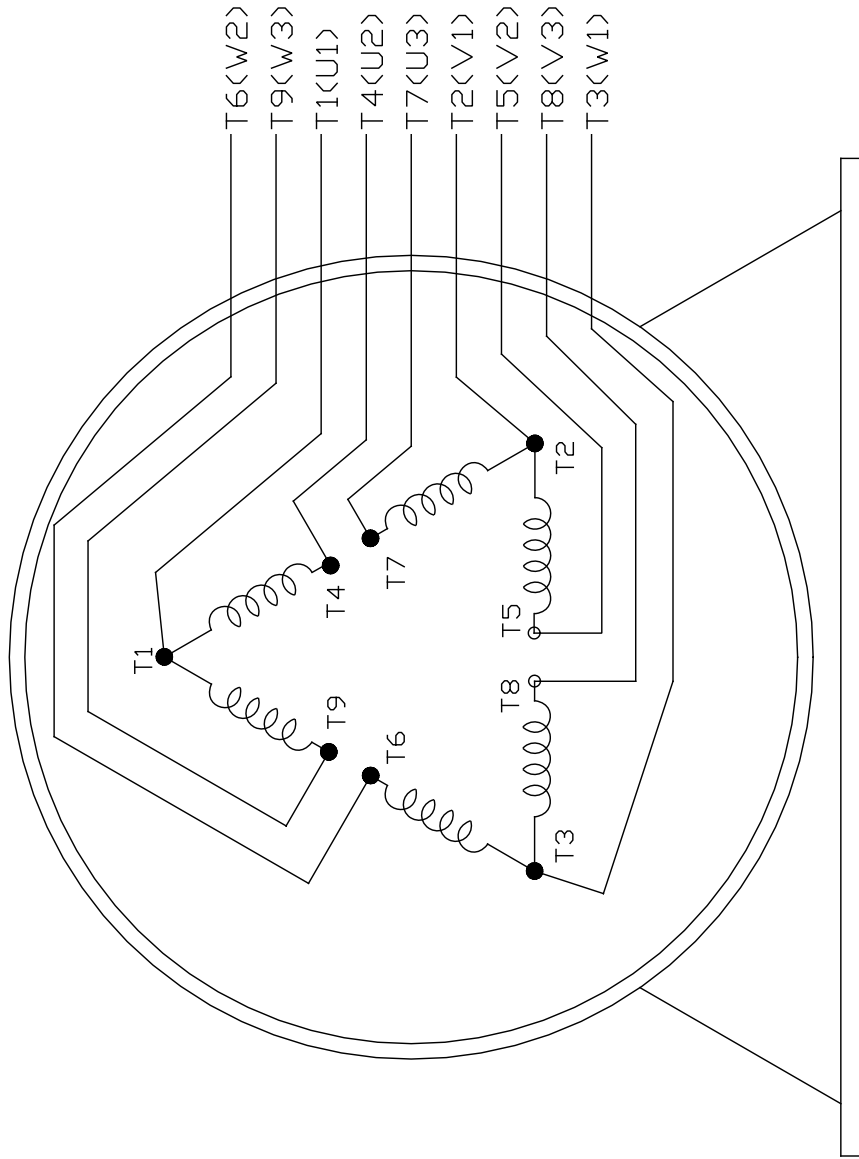
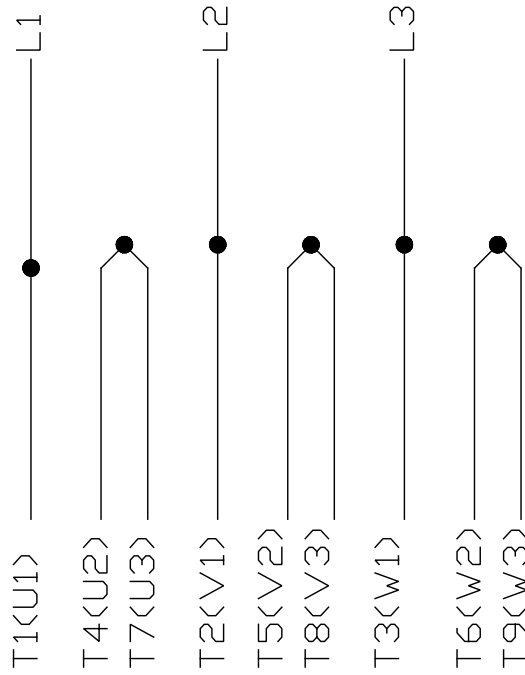
DRAWING REVISION		REVISION BY		REV DATE/@ DATE
D		SVP		04/06/2021
ECO	APPROVED BY	DATE		
CR-0001991	AK	04/06/2021		
ECO DESCRIPTION				
DXF FILE RELEASED TO IDS				
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DRAWN BY		MR		<div>REFAL®</div>		Regal Beloit America, Inc.	
DATE		4/5/2015					
APPROVED BY		KRK		DESCRIPTION			
DATE		4/5/2015		OUTLINE			
REFERENCE				MATERIAL		PROCESS/FINISH	
				254/256T FR-TEFC-CAST IRON			
THIRD ANGLE PROJECTION				SIZE		DRAWING NUMBER	
				B		SS620703	
						SHEET	
						1 OF 1	

LOW VOLTAGE



HIGH VOLTAGE



VIEW OF TERMINAL END

EE7308K

DRAWN PGK 06-04-1997				REGAL REGAL-BELOIT CORPORATION			
CHK ML 06-05-1997				SCALE			
APPD GK 06-15-1997				REF			
				FME			
				PREV			
TITLE				CONNECTION DIAGRAM			
				DELTA CON. - 3Ø - 9 LEADS			
				MAT'L.			
				FINISH			
				ANG ± 7/30°			
				RFP			
				DIST			
BY & DATE				CAD FILE EE7308K			
THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED THIS IS AN ELECTRONICALLY GENERATED DOCUMENT - DO NOT SCALE THIS PRINT				REV. REV. REV.			
E CORRECTED IEC MARKINGS ECO-0111208				PAGE DF			
D RE-DRAWN WITH REGAL LOGO ECO-0110493				EE7308K			
8 ADDED IEC DESIGNATIONS MU95020							
7 REVISED HIGH VOLTAGE L2 WAS L3 CN52600-354							
6 REDRAWN ON CADD							
NO. REVISION							



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****ORDER #:****PO#:****CONN. DIAGRAM:** A-EE7308K**MODEL #:** 256TTFC6026 BB**CUSTOMER PART****OUTLINE:** SS620703**#:****WINDING #:** HE31604010 2**MOUNTING:** F1/F2 CAPABLE**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
20&15	14.9&11.2	1800	1768&1472	256T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	208-230/460&190/380	53-48.5/24.2&44.5/22.3	LINE OR INVERTER	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	93&92.7	3/4 LOAD EFF:	93	1/2 LOAD EFF:	91.7	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	83.5&83	3/4 LOAD PF:	79	1/2 LOAD PF:	69		92.4	SQ CAGE INV RATED

F.L. TORQUE		LOCKED ROTOR AMPS		L.R. TORQUE		B.D. TORQUE		F.L. RISE°C
59.4 LB-FT		288 / 144		119 LB-FT 200 %		146 LB-FT 246 %		60

SOUND PRESSURE @ 3 FT.		SOUND POWER		ROTOR WK^2		MAX. WK^2		SAFE STALL TIME		STARTS / HOUR		APPROX. MOTOR WGT
65 dBA		75 dBA		3.8 LB-FT^2		125 LB-FT^2		20 SEC.		2		335 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6309	6209						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:18:37 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 12/13/2018

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA



256TTFCD6026

Submittal

Data @ 460 V

Motor Load Data

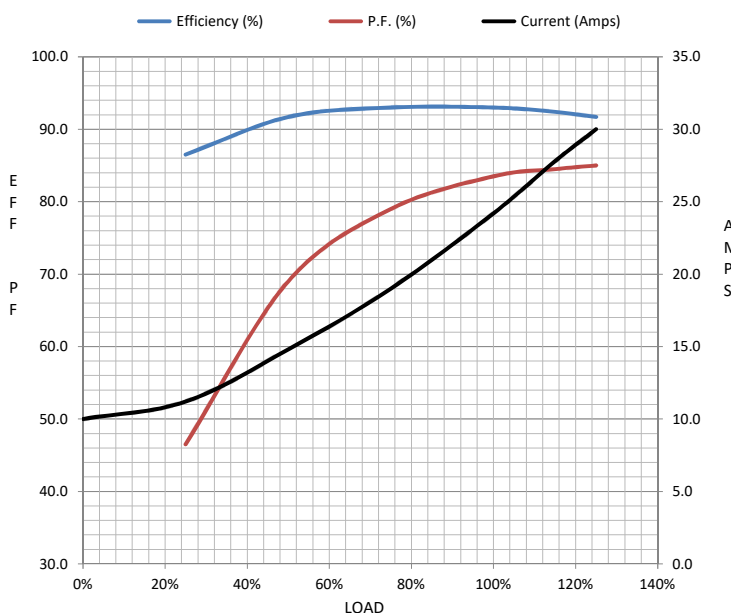
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	10.0	11.2	14.8	19.0	24.2	27.8	30.0	144	
Torque (ft-lb)	0.00	14.6	29.5	44.4	59.4	68.5	74.7	119	
RPM	1800	1792	1785	1778	1768	1,762	1760	0	
Efficiency (%)		86.5	91.7	93.0	93.0	92.4	91.7		
P.F. (%)	5.0	46.5	69.0	79.0	83.5	84.5	85.0	42.0	

Motor Speed Data

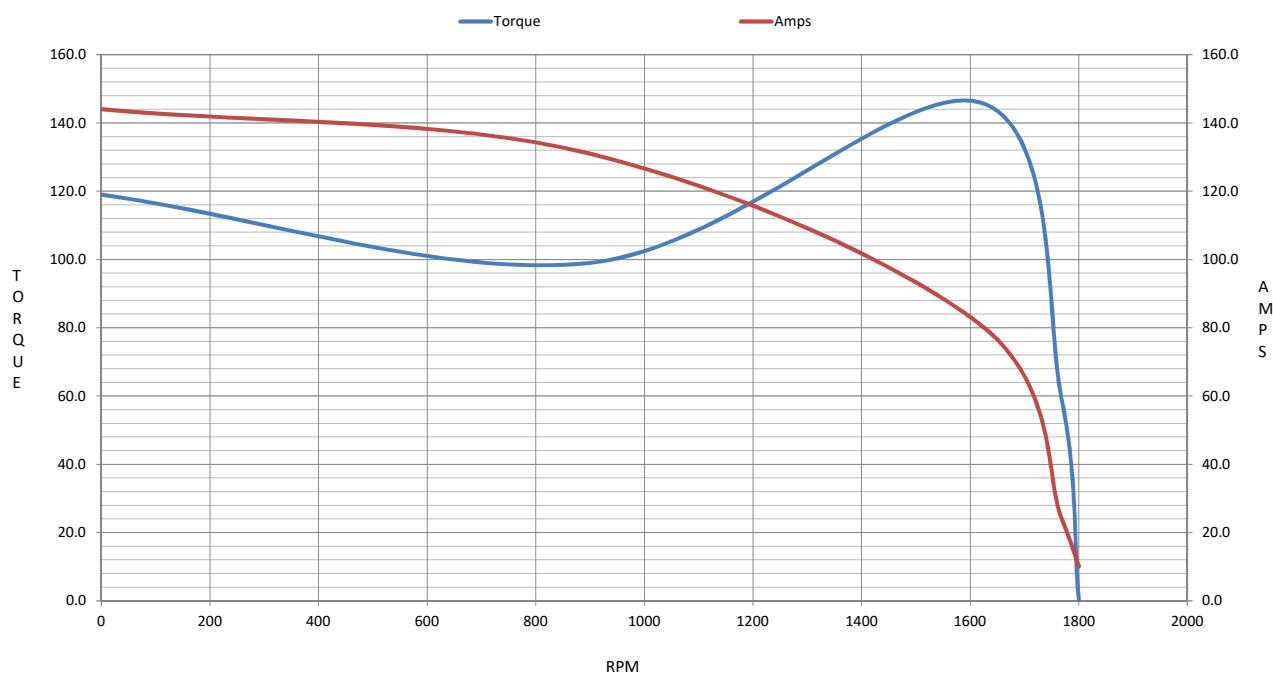
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1618	1768	1800
Current (Amps)	144	131	81.0	24.2	10.0
Torque (ft-lb)	119	99.0	146	59.4	0.00

Information Block

HP	20.0			
Sync. RPM	1800			
Frame	256			
Enclosure	TEFC			
Construction	TFC			
Voltage	208-230/460#190/380	V		
Frequency	60	Hz		
Design	B			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	60	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk²	3.8	Lb-Ft²		
Ref Wdg	HE31604010	NONE		
Sound Pressure @ 1M	65	dBA		
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS620703			
Conn. Diag	A-EE7308K			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.3410	0.2030	1.0370	1.2500	26.9800



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 284TTFCD6026

Catalog No: GT1028A

25 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 284T Frame, TEFC
Three Phase TEFC Motors





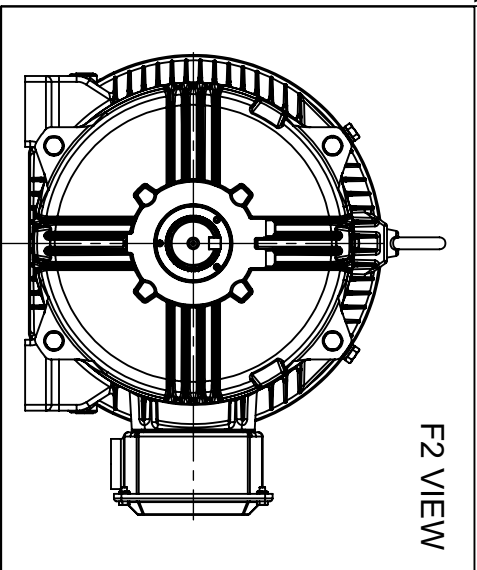
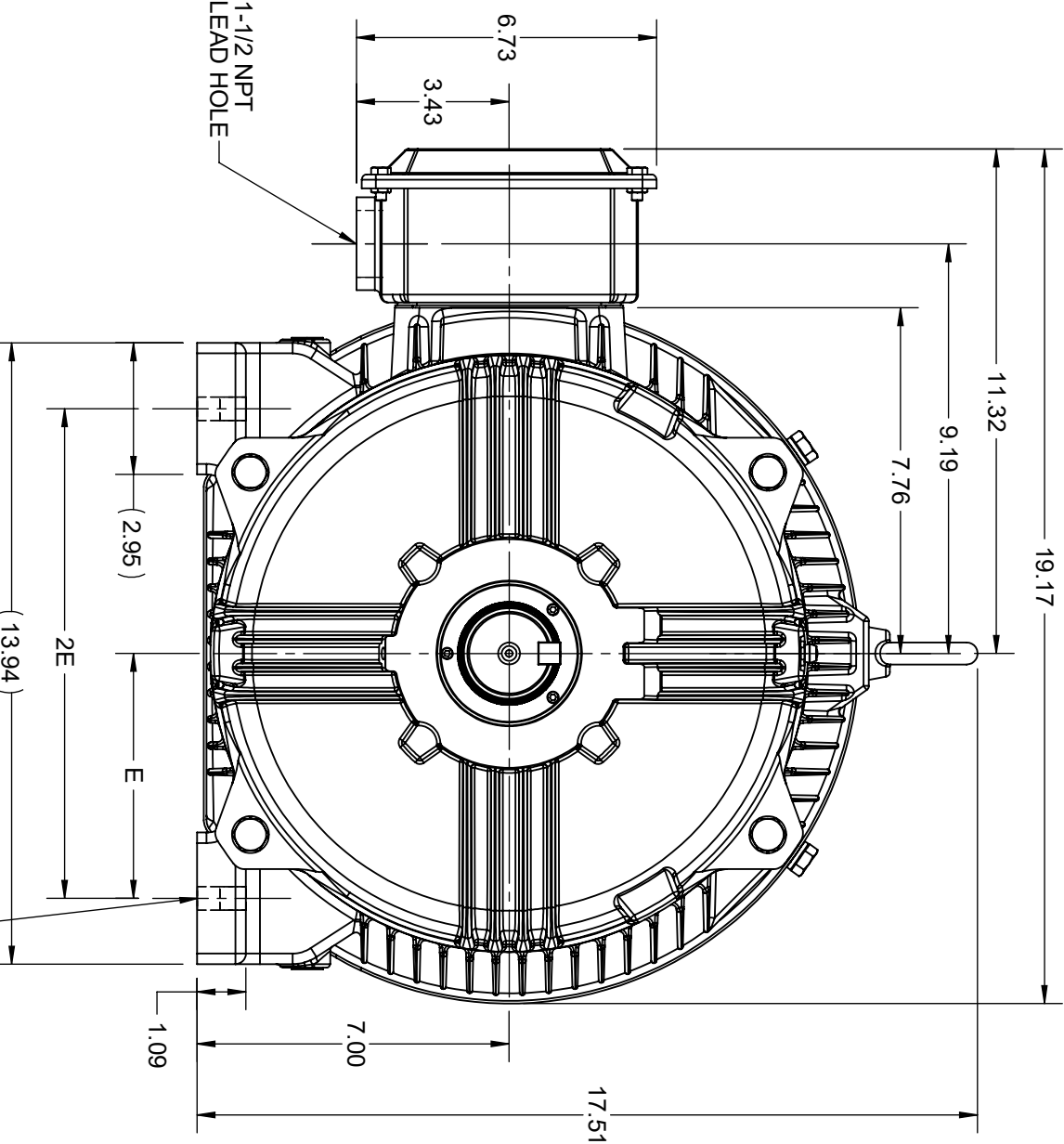
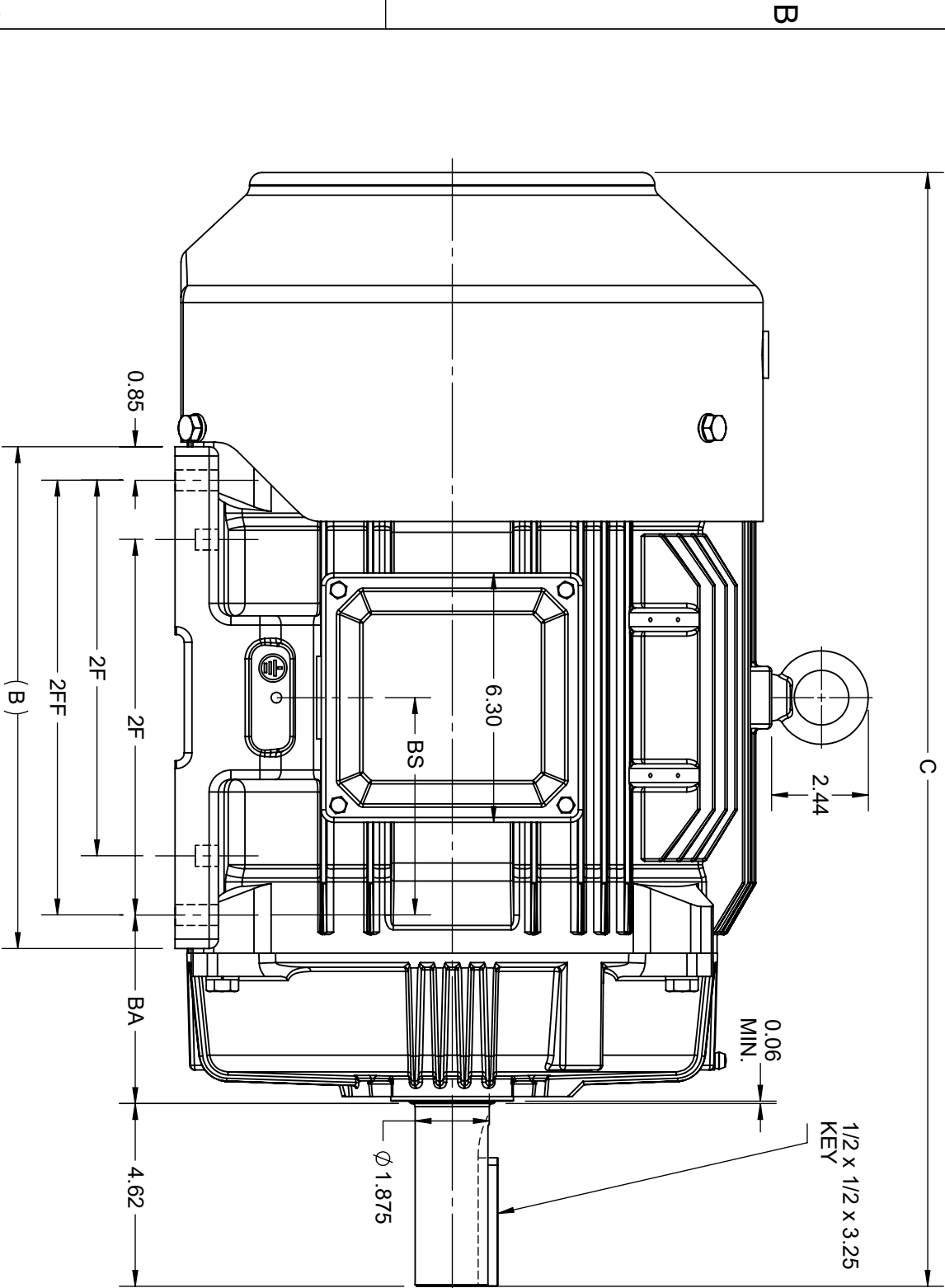
Nameplate Specifications

Output HP	25 Hp	Output KW	18.7 kW
Frequency	60 Hz	Voltage	208-230/460 V
Current	65.0-60.0/30.0 A	Speed	1772 rpm
Service Factor	1.15	Phase	3
Efficiency	93.6 %	Power Factor	83
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	284T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6311	Opp Drive End Bearing Size	6211
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications


Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.2988 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	26.65 in
Shaft Diameter	1.875 in	Shaft Extension	4.62 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308AA	Outline Drawing	SS620704-100

4				3			2		1	
DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME
100	10.83	26.64	5.50	11.00	---	9.50	4.75	4.75	F1 OR F2	284T
200	12.68	28.14								284/286T



DRAWING REVISION	REVISION BY	REV DATE/DATE
C	VS	27-10-2020
ECO CR-0000305	APPROVED BY GNK	DATE 27-10-2020
ECO DESCRIPTION		
DRAWING UPDATED		
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ARE FOR REFERENCE ONLY

DRAWN BY	MR		<div><div>REGAL®</div><div>Regal Beloit America, Inc.</div></div>					
DATE	4/5/2015							
APPROVED BY	KRK							
DATE	4/5/2015							
REFERENCE			MATERIAL	PROCESS/FINISH				
<div>THIRD ANGLE PROJECTION</div> <div></div>			SIZE			DRAWING NUMBER	SHEET	
			B		SS620704		1 OF 1	
			OUTLINE					
			284/286T FR-TEFC-CAST IRON					



4 of 6



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 284TTFCD6026 BB**CONN. DIAGRAM:** A-EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS620704-284**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE31804007 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
25&20	18.7&14.9	1800	1775&1476	284T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	61/30.5&60/30	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	93.6&93	3/4 LOAD EFF:	93.6	1/2 LOAD EFF:	93	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	83&81.5	3/4 LOAD PF:	77.5	1/2 LOAD PF:	66.5	93		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
74 LB-FT	364 / 182	144 LB-FT 195 %	192 LB-FT 260 %	55

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
75 dBA	85 dBA	5.2 LB-FT^2	175 LB-FT^2	20 SEC.	2	400 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6311	6211						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:21:07 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 7/16/2020
 Customer: _____
 Attention: _____
 Submitted by: _____

284TTFCD6026

marathon
 Motors

Submittal

Data @ 460 V

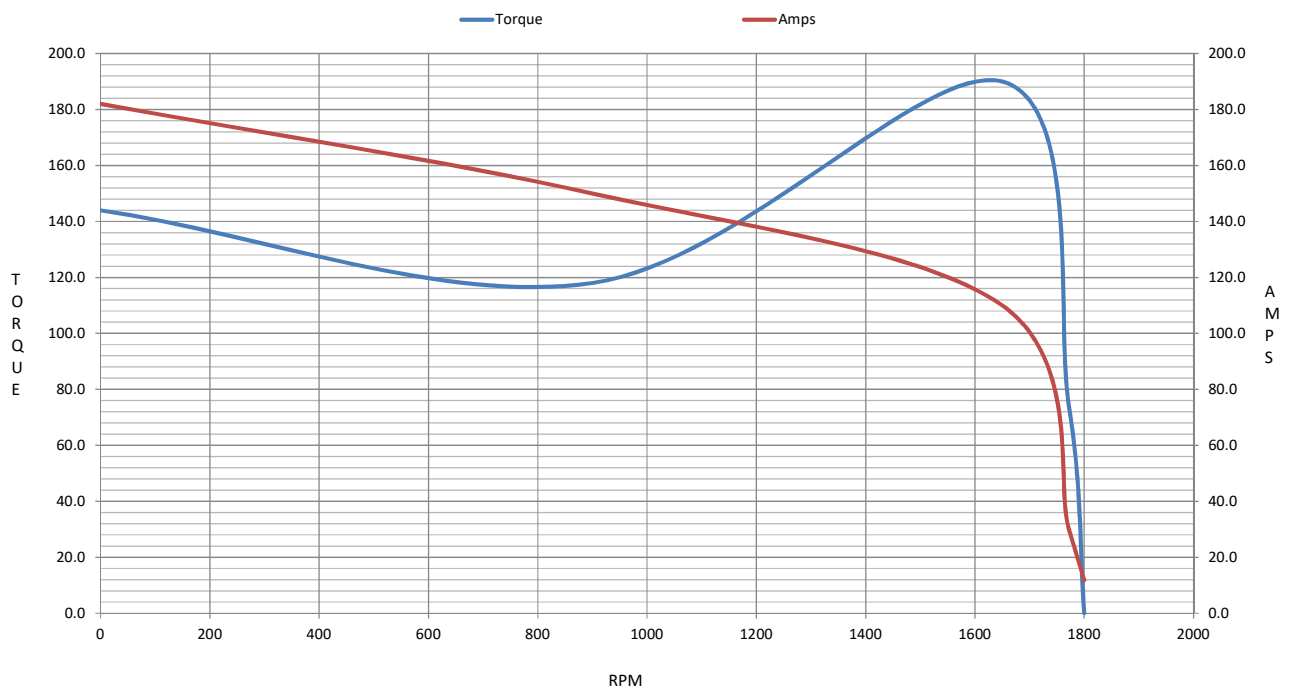
Motor Load Data

Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	11.8	13.6	17.8	23.4	30.0	34.0	37.0	182	
Torque (ft-lb)	0.00	18.3	36.7	55.2	74.0	85.2	93.0	144	
RPM	1800	1795	1788	1782	1772	1,768	1765	0	
Efficiency (%)		90.2	93.0	93.6	93.6	93.0	92.4		
P.F. (%)	4.5	48.0	69.0	79.0	83.0	85.0	85.0	36.0	

Motor Speed Data

	LR	Pull-Up	BD	Rated	Idle																																																												
Speed (RPM)	0	900	1650	1772	1800																																																												
Current (Amps)	182	150	110	30.0	11.8																																																												
Torque (ft-lb)	144	118	190	74.0	0.00																																																												
<div><div><div>— Efficiency (%)</div><div>— P.F. (%)</div><div>— Current (Amps)</div></div><div>EFFICIENCY (%)</div><div>P.F. (%)</div><div>CURRENT (AMPS)</div></div> <table><tr><td colspan="2">Information Block</td></tr><tr><td>HP</td><td>25.0</td></tr><tr><td>Sync. RPM</td><td>1800</td></tr><tr><td>Frame</td><td>284</td></tr><tr><td>Enclosure</td><td>TEFC</td></tr><tr><td>Construction</td><td>TFC</td></tr><tr><td>Voltage</td><td>208-230/460#190/380 V</td></tr><tr><td>Frequency</td><td>60 Hz</td></tr><tr><td>Design</td><td>B</td></tr><tr><td>LR Code letter</td><td>G</td></tr><tr><td>Service Factor</td><td>1.15</td></tr><tr><td>Temp Rise @ FL</td><td>60 ° C</td></tr><tr><td>Duty</td><td>CONT</td></tr><tr><td>Ambient</td><td>40 ° C</td></tr><tr><td>Elevation</td><td>3,300 feet</td></tr><tr><td>Rotor/Shaft wk²</td><td>5.2 Lb-Ft²</td></tr><tr><td>Ref Wdg</td><td>HA31804014 NONE</td></tr><tr><td>Sound Pressure @ 1M</td><td>75 dBA</td></tr><tr><td>VFD Rating</td><td>CONSTANT 10:1/VARIABLE 10:1</td></tr><tr><td>Outline Dwg</td><td>037898-912</td></tr><tr><td>Conn. Diag</td><td>EE7308AA</td></tr><tr><td colspan="2">Additional Specifications:</td></tr><tr><td colspan="2">0</td></tr><tr><td colspan="2">0</td></tr><tr><td colspan="2">EQUIV CKT (OHMS / PHASE)</td></tr><tr><td>R1</td><td>R2</td><td>X1</td><td>X2</td><td>Xm</td></tr><tr><td>0.2000</td><td>0.1250</td><td>0.7420</td><td>0.9720</td><td>19.4360</td></tr></table>						Information Block		HP	25.0	Sync. RPM	1800	Frame	284	Enclosure	TEFC	Construction	TFC	Voltage	208-230/460#190/380 V	Frequency	60 Hz	Design	B	LR Code letter	G	Service Factor	1.15	Temp Rise @ FL	60 ° C	Duty	CONT	Ambient	40 ° C	Elevation	3,300 feet	Rotor/Shaft wk²	5.2 Lb-Ft²	Ref Wdg	HA31804014 NONE	Sound Pressure @ 1M	75 dBA	VFD Rating	CONSTANT 10:1/VARIABLE 10:1	Outline Dwg	037898-912	Conn. Diag	EE7308AA	Additional Specifications:		0		0		EQUIV CKT (OHMS / PHASE)		R1	R2	X1	X2	Xm	0.2000	0.1250	0.7420	0.9720	19.4360
						Information Block																																																											
						HP	25.0																																																										
						Sync. RPM	1800																																																										
						Frame	284																																																										
						Enclosure	TEFC																																																										
						Construction	TFC																																																										
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						Service Factor	1.15																																																										
						Temp Rise @ FL	60 ° C																																																										
						Duty	CONT																																																										
						Ambient	40 ° C																																																										
						Elevation	3,300 feet																																																										
						Rotor/Shaft wk²	5.2 Lb-Ft²																																																										
Ref Wdg	HA31804014 NONE																																																																
Sound Pressure @ 1M	75 dBA																																																																
VFD Rating	CONSTANT 10:1/VARIABLE 10:1																																																																
Outline Dwg	037898-912																																																																
Conn. Diag	EE7308AA																																																																
Additional Specifications:																																																																	
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EQUIV CKT (OHMS / PHASE)																																																																	
R1	R2	X1	X2	Xm																																																													
0.2000	0.1250	0.7420	0.9720	19.4360																																																													

Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 286TTFCD6026
Catalog No: GT1031A
30 HP General Purpose Motor, 3 phase, 1800 RPM, 208-230/460 V, 286T Frame, TEFC
Three Phase TEFC Motors



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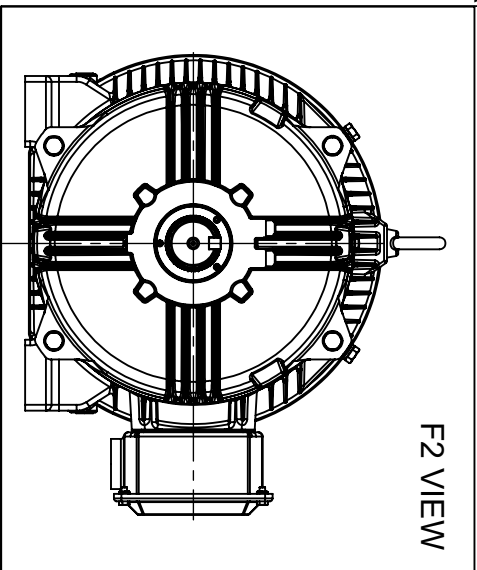
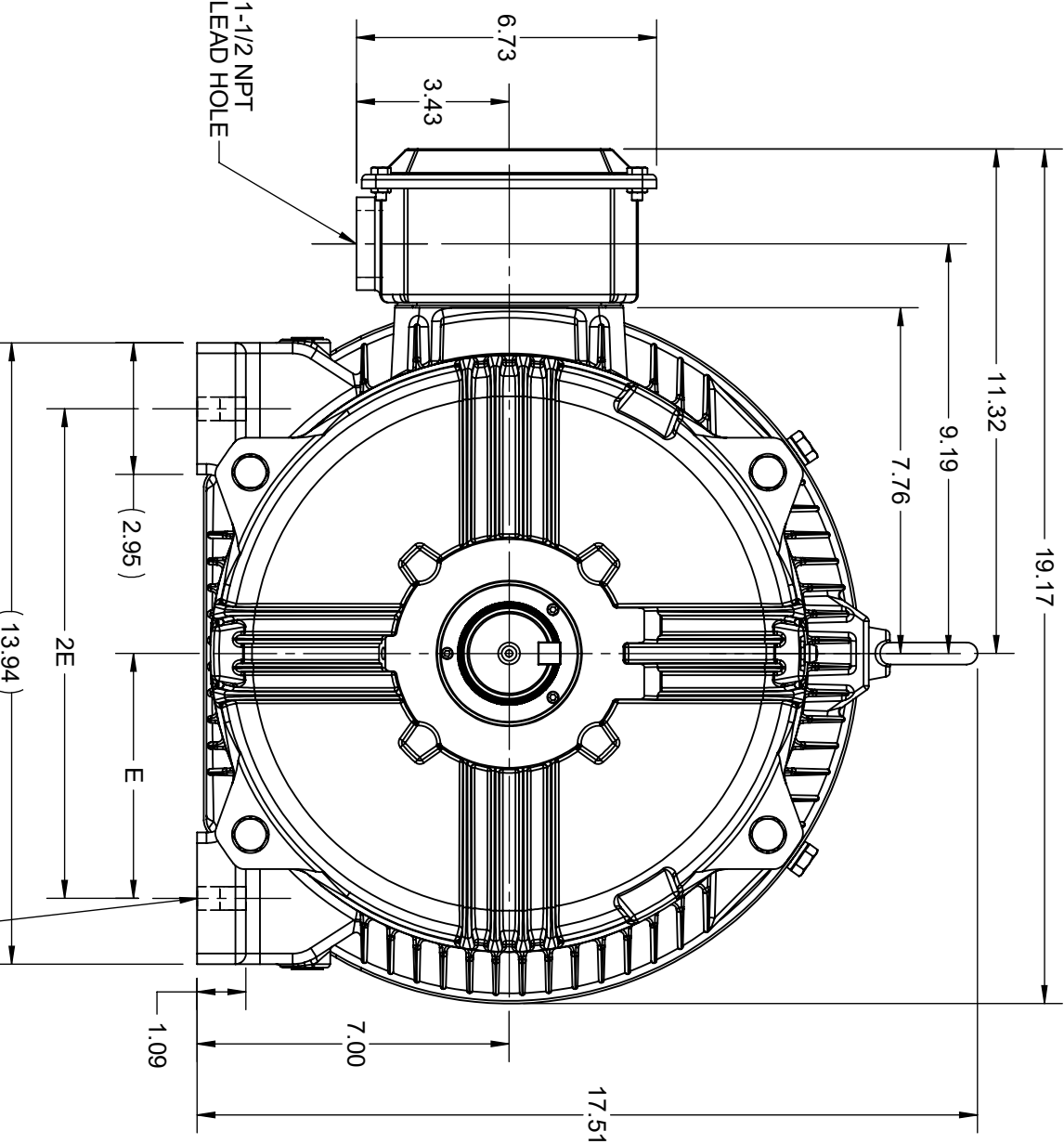
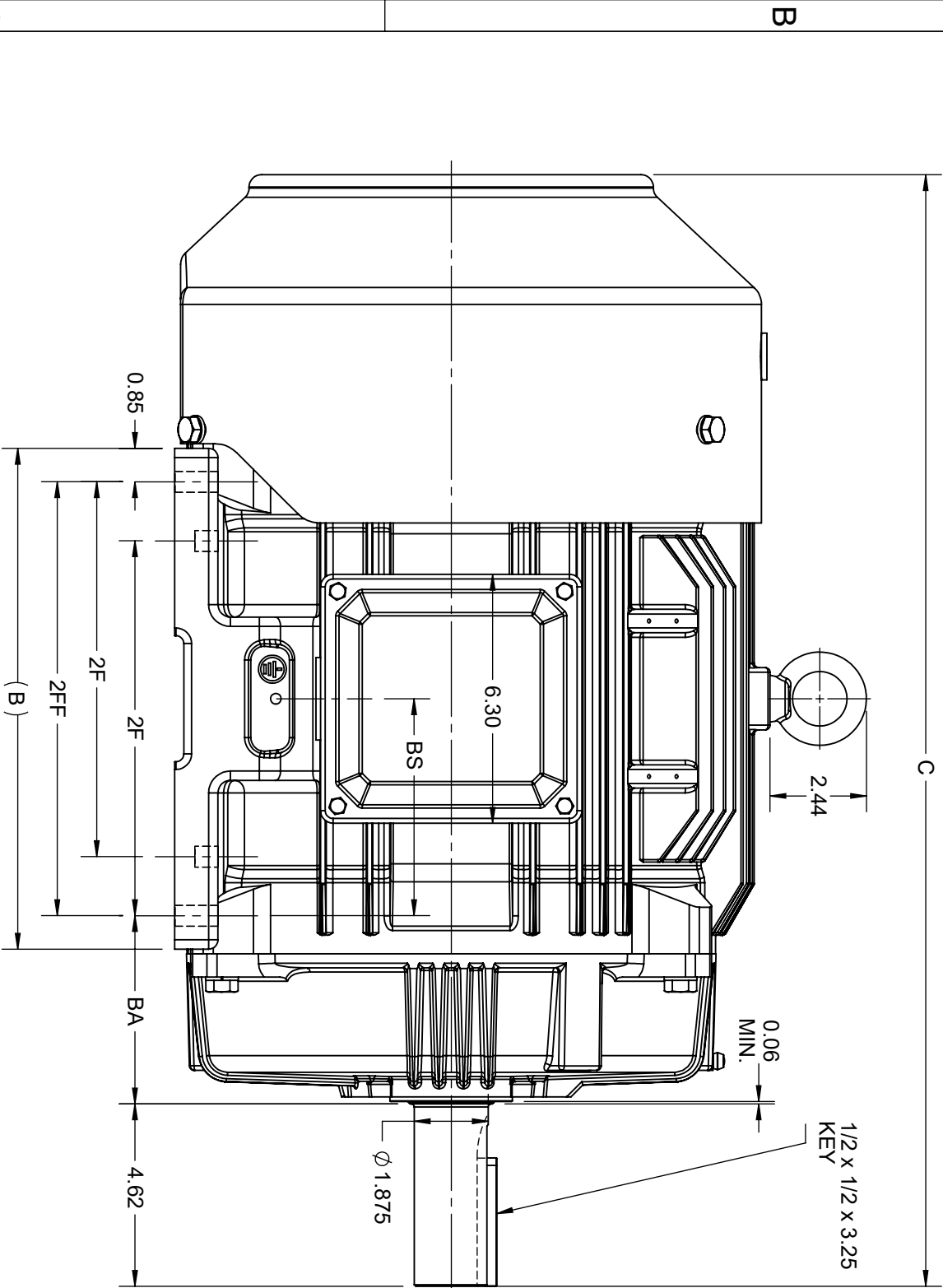
Nameplate Specifications

Output HP	30 Hp	Output KW	22.4 KW
Frequency	60 Hz	Voltage	208-230/460 V
Current	78.0-71.0/35.5 A	Speed	1770 rpm
Service Factor	1.15	Phase	3
Efficiency	93.6 %	Power Factor	84
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	286T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6311	Opp Drive End Bearing Size	6211
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications


Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.27 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	28.14 in
Shaft Diameter	1.875 in	Shaft Extension	4.62 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Outline Drawing	SS620704-200	Connection Drawing	EE7308AA

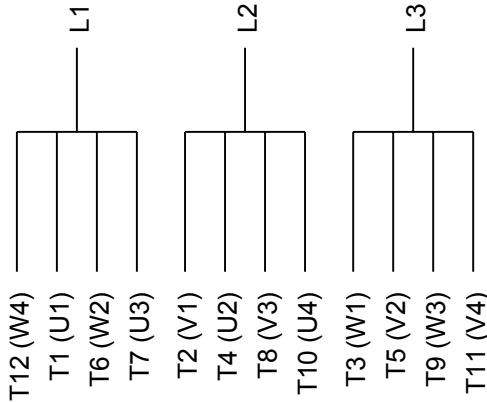
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DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME
100	10.83	26.64	5.50	11.00	---	9.50	4.75	4.75	F1 OR F2	284T
200	12.68	28.14								284/286T



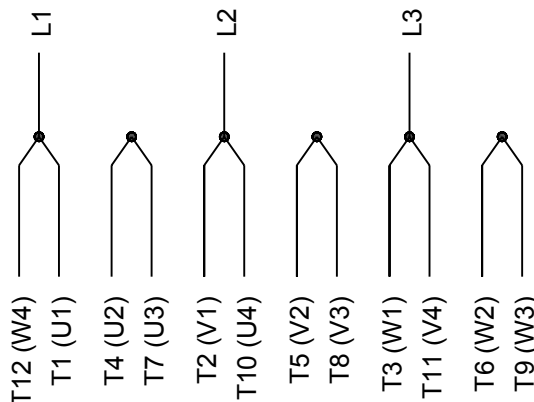
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C	VS	27-10-2020
ECO CR-0000305	APPROVED BY GNK	DATE 27-10-2020
ECO DESCRIPTION		
DRAWING UPDATED		
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mm DIMENSIONS IN [BRACKETS]
ARE FOR REFERENCE ONLY

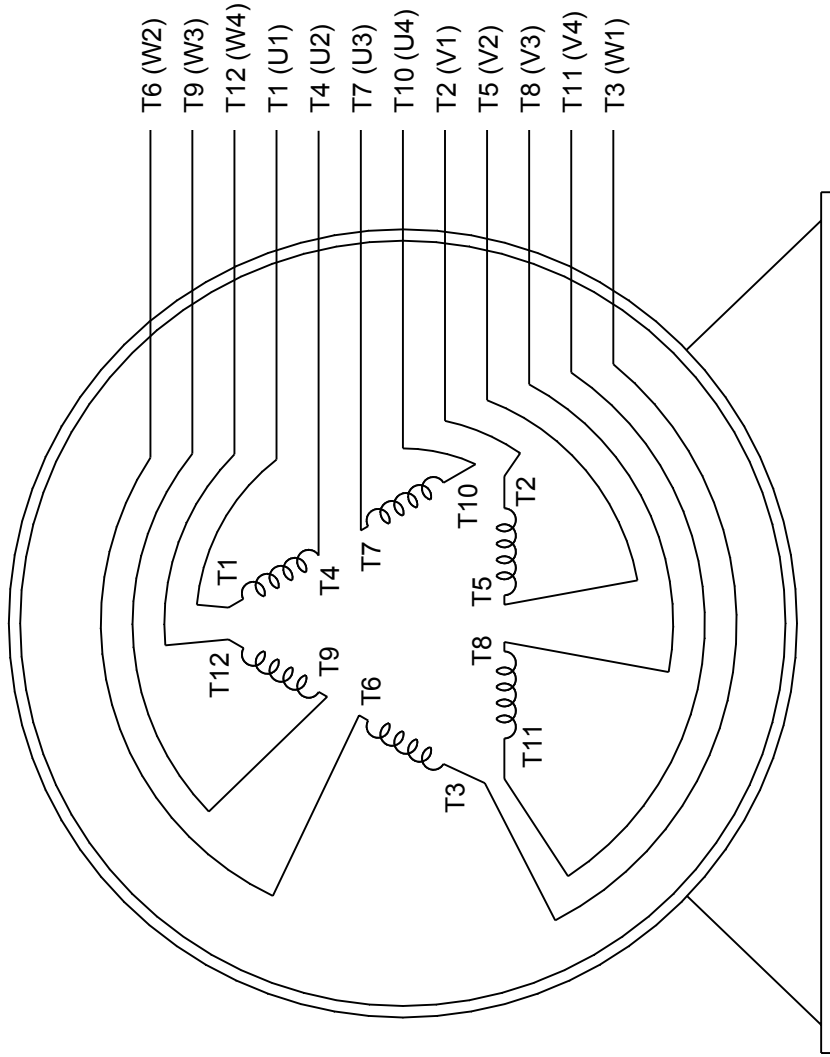
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DATE	4/5/2015							
APPROVED BY	KRK							
DATE	4/5/2015							
REFERENCE			MATERIAL	PROCESS/FINISH				
<div>THIRD ANGLE PROJECTION</div> <div></div>			SIZE			DRAWING NUMBER	SHEET	
			B				SS620704	1 OF 1





LOW VOLTAGE



HIGH VOLTAGE



VIEW OF TERMINAL END

DRAWING REVISION K			REVISION BY AJW	DATE 07-17-2015	<div>Regal Beloit America, Inc.</div>					
ECO-0081632			APPROVED BY T. VUE	DATE 07-17-2015						
ECO DESCRIPTION REV'D IEC MARKINGS PER IEC 60034-8										
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<div></div>					DRAWN BY LZ		THIRD ANGLE PROJECTION	SIZE A	DRAWING NUMBER EE7308AA	SHEET 1 OF 1
					DATE 01-12-1994					
					APPROVED BY GK					
					DATE 01-14-1994					
					REFERENCE	MATERIAL	PROCESS/FINISH			
CONN DIAGRAM-EXTERNAL 30-2/1 DELTA-12 LEADS										



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 286TTFCD6026 BB**CONN. DIAGRAM:** A-EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS620704-286**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE31804006 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
30&25	22.4&18.7	1800	1775&1475	286T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	72.5/36.5&73/36.5	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	93.6&93	3/4 LOAD EFF:	93.6	1/2 LOAD EFF:	93	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	83&84	3/4 LOAD PF:	78	1/2 LOAD PF:	67.5	93		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
89 LB-FT	434 / 217	178 LB-FT 200 %	227 LB-FT 255 %	65

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
68 dBA	78 dBA	5.7 LB-FT^2	225 LB-FT^2	20 SEC.	2	492 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6311	6211						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

*

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:38:34 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 7/16/2020
 Customer: _____
 Attention: _____
 Submitted by: _____

286TTFCD6026

marathon
 Motors

Submittal

Data @ 460 V

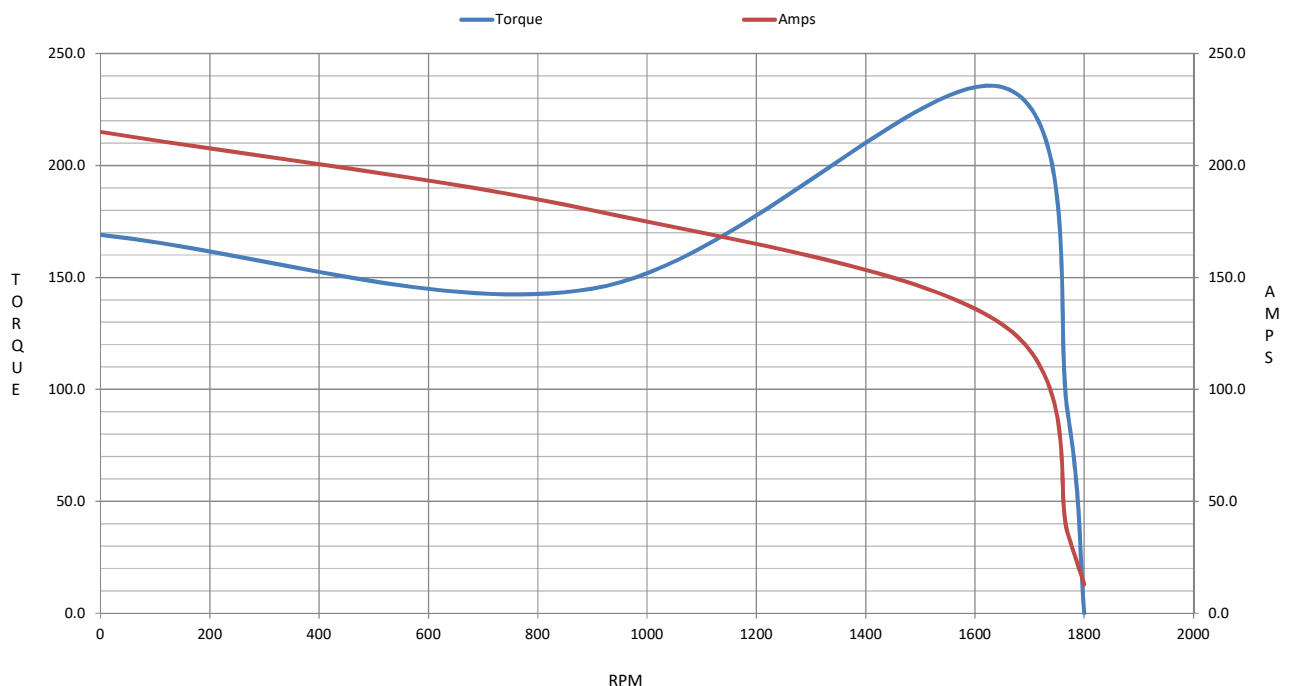
Motor Load Data

Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	13.0	15.2	20.5	27.5	35.5	40.5	44.0	215	
Torque (ft-lb)	0.00	22.0	44.0	66.5	89.0	103	112	169	
RPM	1800	1792	1785	1780	1770	1,765	1762	0	
Efficiency (%)		91.0	93.0	93.6	93.6	93.0	92.4		
P.F. (%)	4.5	50.0	72.0	81.0	84.0	85.0	86.0	36.0	

Motor Speed Data

	LR	Pull-Up	BD	Rated	Idle																																																												
Speed (RPM)	0	900	1650	1770	1800																																																												
Current (Amps)	215	180	129	35.5	13.0																																																												
Torque (ft-lb)	169	145	235	89.0	0.00																																																												
<div><div><div>— Efficiency (%)</div><div>— P.F. (%)</div><div>— Current (Amps)</div></div><div>EFFICIENCY (%) 30.0 40.0 50.0 60.0 70.0 80.0 90.0 100.0</div><div>P.F. (%) 30.0 35.0 40.0 45.0 50.0</div><div>LOAD 0% 20% 40% 60% 80% 100% 120% 140%</div><div>A M P S 0.0 5.0 10.0 15.0 20.0 25.0 30.0 35.0 40.0 45.0 50.0</div></div> <table><tr><td colspan="2">Information Block</td></tr><tr><td>HP</td><td>30.0</td></tr><tr><td>Sync. RPM</td><td>1800</td></tr><tr><td>Frame</td><td>286</td></tr><tr><td>Enclosure</td><td>TEFC</td></tr><tr><td>Construction</td><td>TFC</td></tr><tr><td>Voltage</td><td>208-230/460#190/380 V</td></tr><tr><td>Frequency</td><td>60 Hz</td></tr><tr><td>Design</td><td>B</td></tr><tr><td>LR Code letter</td><td>G</td></tr><tr><td>Service Factor</td><td>1.15</td></tr><tr><td>Temp Rise @ FL</td><td>65 ° C</td></tr><tr><td>Duty</td><td>CONT</td></tr><tr><td>Ambient</td><td>40 ° C</td></tr><tr><td>Elevation</td><td>3,300 feet</td></tr><tr><td>Rotor/Shaft wk²</td><td>5.7 Lb-Ft²</td></tr><tr><td>Ref Wdg</td><td>HA31804013 NONE</td></tr><tr><td>Sound Pressure @ 1M</td><td>75 dBA</td></tr><tr><td>VFD Rating</td><td>CONSTANT 10:1/VARIABLE 10:1</td></tr><tr><td>Outline Dwg</td><td>037898-912</td></tr><tr><td>Conn. Diag</td><td>EE7308AA</td></tr><tr><td colspan="2">Additional Specifications:</td></tr><tr><td colspan="2">0</td></tr><tr><td colspan="2">0</td></tr><tr><td colspan="2">EQUIV CKT (OHMS / PHASE)</td></tr><tr><td>R1</td><td>R2</td><td>X1</td><td>X2</td><td>Xm</td></tr><tr><td>0.1750</td><td>0.1250</td><td>0.6710</td><td>0.9400</td><td>20.3180</td></tr></table>						Information Block		HP	30.0	Sync. RPM	1800	Frame	286	Enclosure	TEFC	Construction	TFC	Voltage	208-230/460#190/380 V	Frequency	60 Hz	Design	B	LR Code letter	G	Service Factor	1.15	Temp Rise @ FL	65 ° C	Duty	CONT	Ambient	40 ° C	Elevation	3,300 feet	Rotor/Shaft wk ²	5.7 Lb-Ft ²	Ref Wdg	HA31804013 NONE	Sound Pressure @ 1M	75 dBA	VFD Rating	CONSTANT 10:1/VARIABLE 10:1	Outline Dwg	037898-912	Conn. Diag	EE7308AA	Additional Specifications:		0		0		EQUIV CKT (OHMS / PHASE)		R1	R2	X1	X2	Xm	0.1750	0.1250	0.6710	0.9400	20.3180
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R1	R2	X1	X2	Xm																																																													
0.1750	0.1250	0.6710	0.9400	20.3180																																																													

Speed -Torque Curve



PRODUCT INFORMATION PACKET

marathon®
Motors

Model No: 324TTFCD6026

Catalog No: GT1034A

40 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 324T Frame, TEFC
Three Phase TEFC Motors



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REGAL

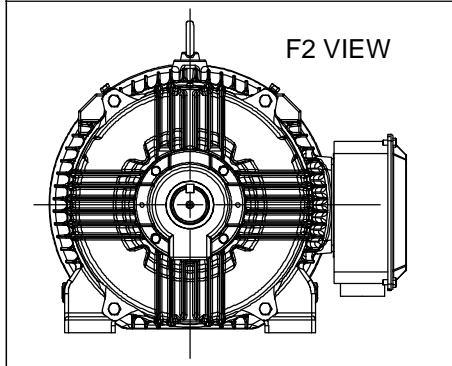
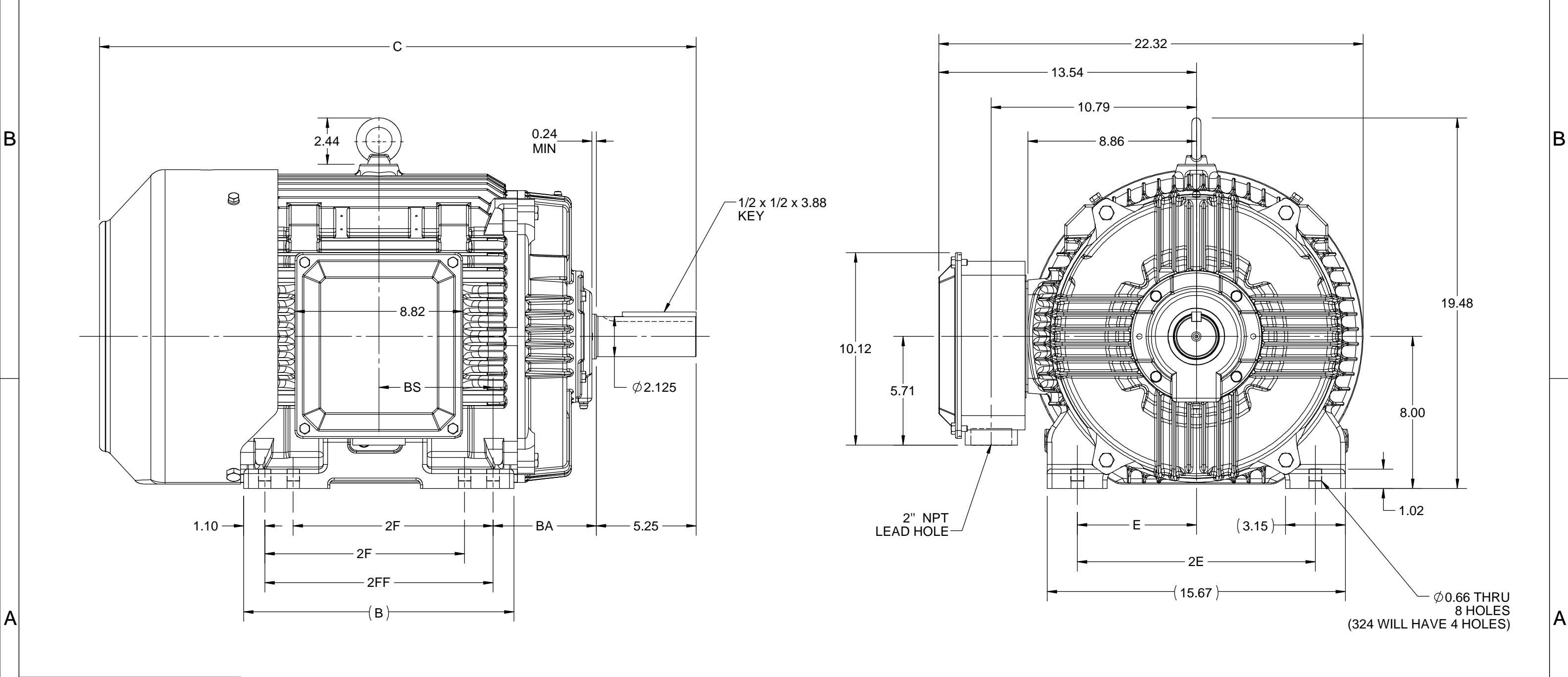
Nameplate Specifications

Output HP	40 Hp	Output KW	30.0 kW
Frequency	60 Hz	Voltage	230/460 V
Current	95.0/47.5 A	Speed	1782 rpm
Service Factor	1.15	Phase	3
Efficiency	94.1 %	Power Factor	84
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	324T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6312	Opp Drive End Bearing Size	6212
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications



Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.18 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	29.69 in
Shaft Diameter	2.125 in	Shaft Extension	5.25 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7358	Outline Drawing	SS312782-100

4				3				2			1
DASH NO.	B	C	E	2E	2F	2FF	BA	BS	MOUNTING	FRAME	
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200	14.21	31.19			10.50	12.00		6.00		324/326T	



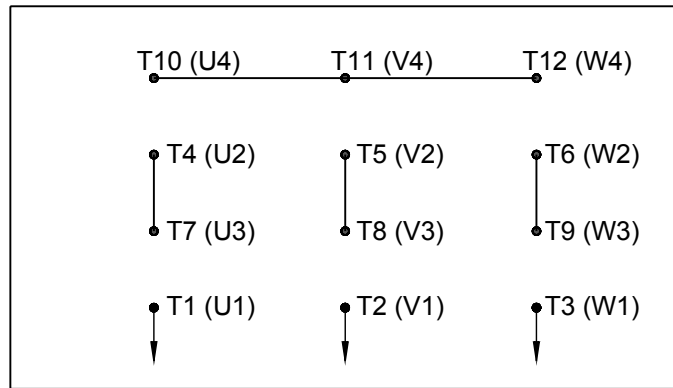
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ECO ECO-0194008	APPROVED BY GNK	DATE 14/10/2020
DRAWING UPDATED		
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mm DIMENSIONS IN [BRACKETS]
ARE FOR REFERENCE ONLY

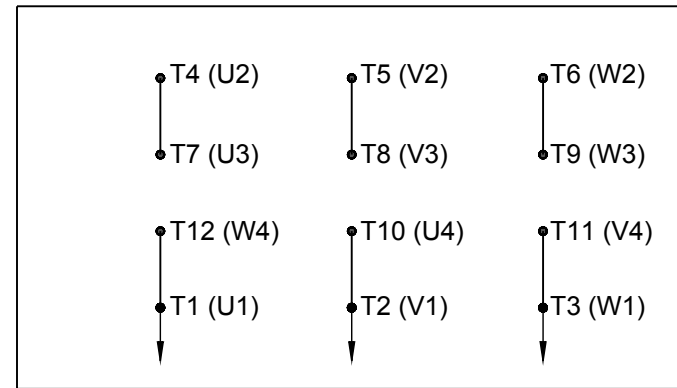
DRAWN BY NIV	 Regal Beloit America, Inc.	
DATE 25/03/2016		
APPROVED BY SBD	DESCRIPTION OUTLINE 324/326T FR-NEMA-TEFC	
DATE 25/03/2016		
REFERENCE	MATERIAL	PROCESS/FINISH
THIRD ANGLE PROJECTION 	SIZE B	DRAWING NUMBER SS312782
		SHEET 1 OF 1

HIGH VOLTAGE

WYE START

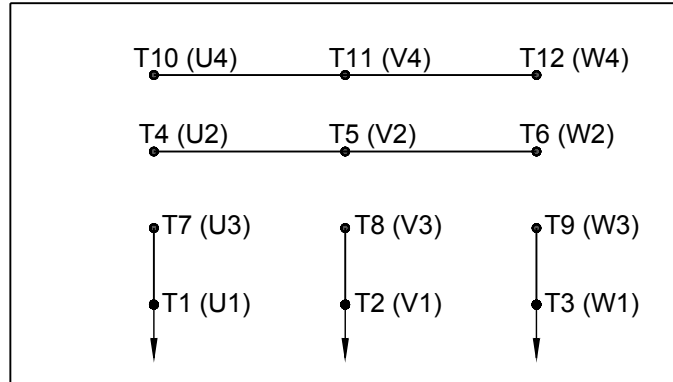


DELTA RUN

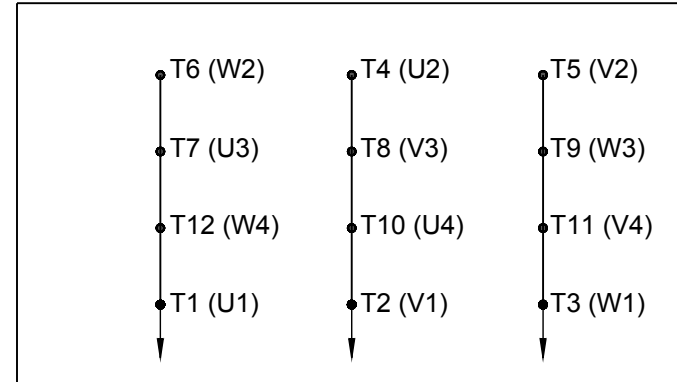




LOW VOLTAGE

WYE START



DELTA RUN

4/2 CKTY \triangle

DRAWING REVISION D	REVISION BY JWO	DATE 01-26-2016		DRAWN BY BLR	 Regal Beloit America, Inc.		
ECO ECO-0092547	APPROVED BY TB	DATE 01-26-2016		DATE 03-09-1998	DESCRIPTION CONN DIAGRAM-EXTERNAL 12 LEAD - DUAL VOLT. - WYE START - DELTA RUN		
ECO DESCRIPTION				APPROVED BY GK			
ADDED IEC MARKINGS				DATE 03-23-1998			
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				THIRD ANGLE PROJECTION 	SIZE A	DRAWING NUMBER EE7358	SHEET 1 OF 1



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 324TTFCD6026 BB**CONN. DIAGRAM:** EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS312782-324T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE32004007 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
40&30	30.0&22.4	1800	1782&1485	324T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	95/47.5&86/43	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	94.1&93.9	3/4 LOAD EFF:	94.1	1/2 LOAD EFF:	93.6	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	84&84	3/4 LOAD PF:	81	1/2 LOAD PF:	72.5	93.6		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
118 LB-FT	580 / 290	212 LB-FT 180 %	313 LB-FT 265 %	55

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
60 dBA	70 dBA	11.2 LB-FT^2	- LB-FT^2	20 SEC.	2	625 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6312	6212						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:20:44 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 12/14/2018

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA

324TTFCD6026



Submittal

Data @ 460 V

Motor Load Data

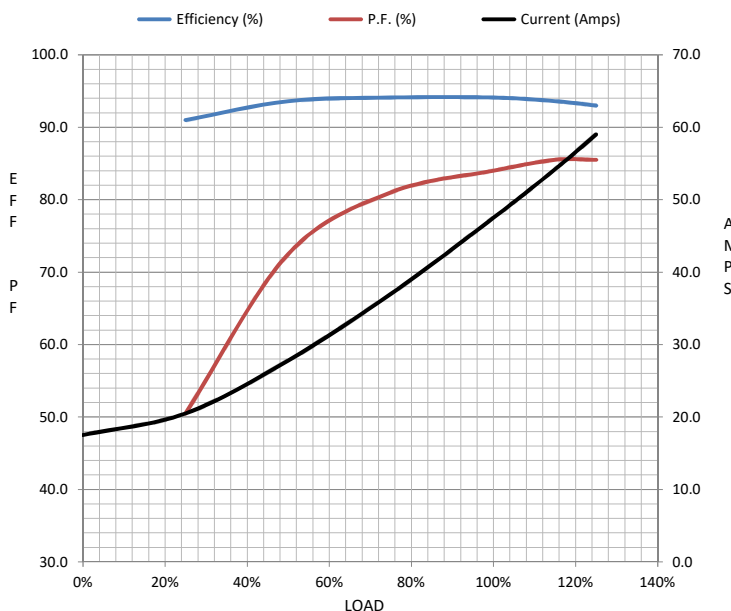
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	17.5	20.5	27.8	37.0	47.5	54.2	59.0	290	
Torque (ft-lb)	0.00	29.3	58.5	88.3	118	136	149	212	
RPM	1800	1795	1790	1788	1782	1,780	1778	0	
Efficiency (%)		91.0	93.6	94.1	94.1	93.6	93.0		
P.F. (%)	5.0	50.5	72.5	81.0	84.0	85.5	85.5	32.0	

Motor Speed Data

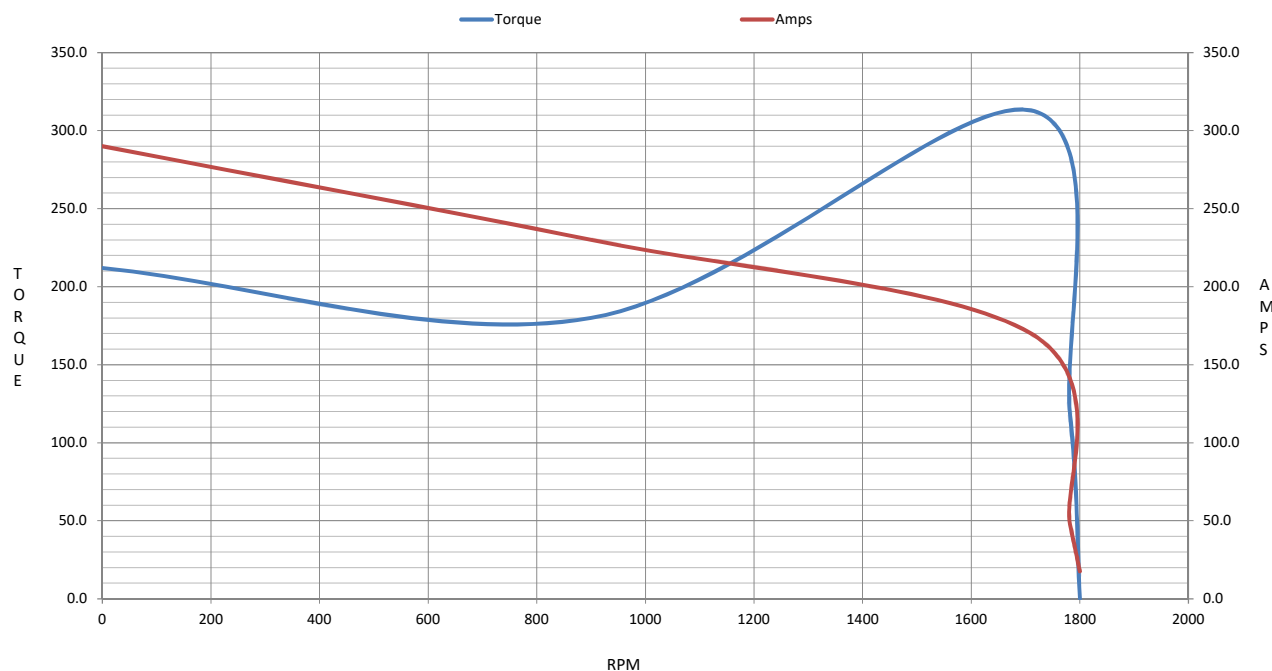
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1710	1782	1800
Current (Amps)	290	230	170	47.5	17.5
Torque (ft-lb)	212	180	313	118	0.00

Information Block

HP	40.0			
Sync. RPM	1800			
Frame	324			
Enclosure	TEFC			
Construction	TFC			
Voltage	230/460#190/380	V		
Frequency	60	Hz		
Design	B			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	55	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk²	11.2	Lb-Ft²		
Ref Wdg	HE32004007 NONE			
Sound Pressure @ 1M	60	dBA		
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS312782			
Conn. Diag	EE7308AA			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.1130	0.0610	0.4680	0.8300	15.3850



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 326TTFCD6026
Catalog No: GT1037A
50 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 326T Frame, TEFC
Three Phase TEFC Motors





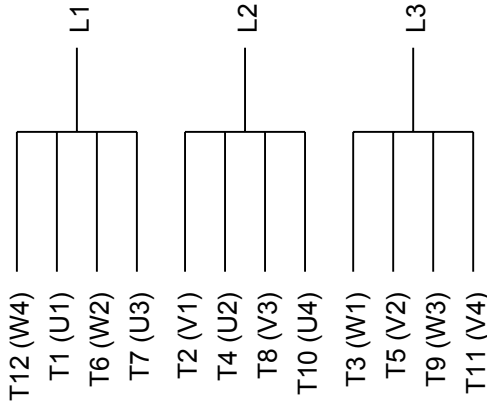
Nameplate Specifications

Output HP	50 Hp	Output KW	37.0 KW
Frequency	60 Hz	Voltage	230/460 V
Current	117.0/58.5 A	Speed	1782 rpm
Service Factor	1.15	Phase	3
Efficiency	94.5 %	Power Factor	85
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	326T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6312	Opp Drive End Bearing Size	6212
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

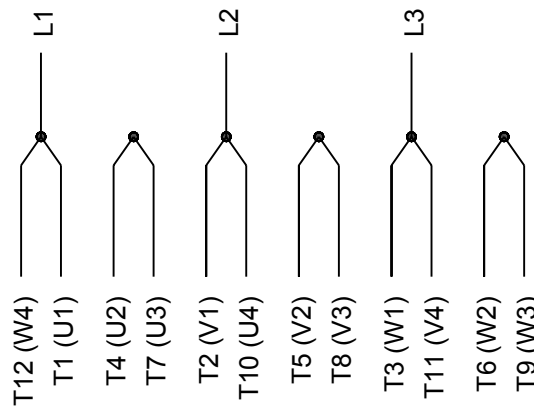
Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.127 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	31.19 in
Shaft Diameter	2.125 in	Shaft Extension	5.25 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308AA	Outline Drawing	SS312782-200

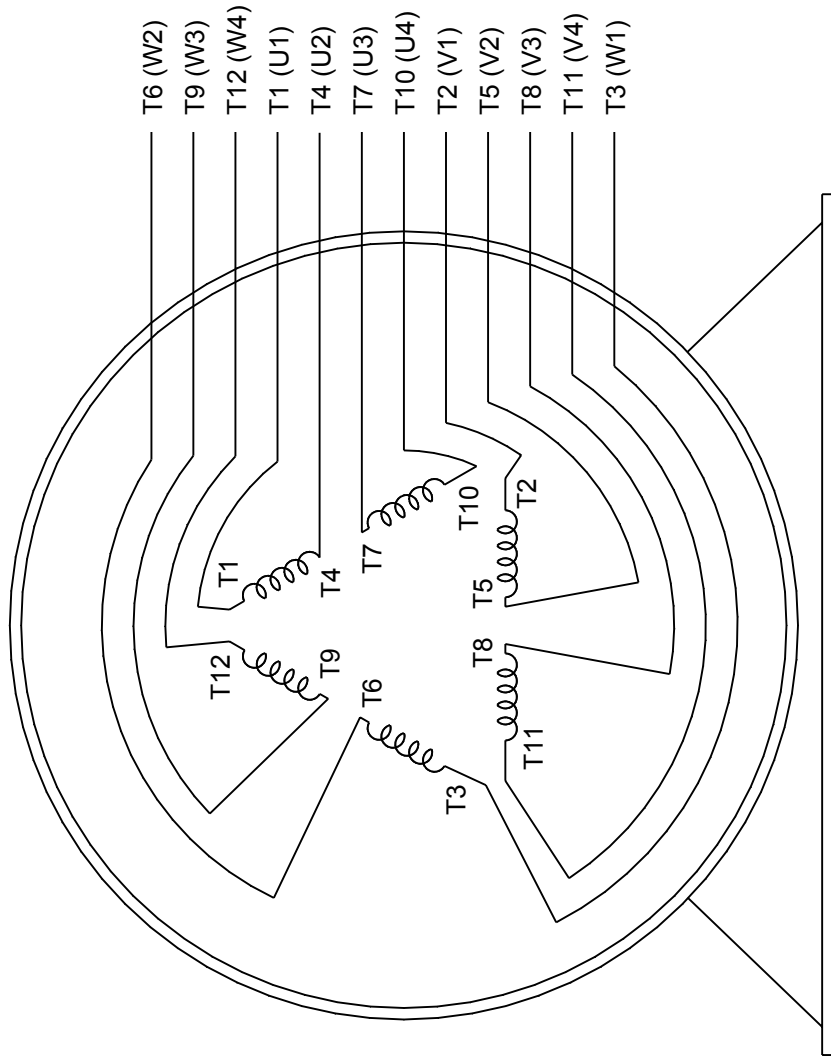
[illegible]




LOW VOLTAGE



HIGH VOLTAGE



VIEW OF TERMINAL END

DRAWING REVISION K			REVISION BY AJW	DATE 07-17-2015	<div></div>	DRAWN BY LZ		Regal Beloit America, Inc.			
ECO-0081632			APPROVED BY T. VUE	DATE 07-17-2015		DATE 01-12-1994					
ECO DESCRIPTION			APPROVED BY GK								
REV'D IEC MARKINGS PER IEC 60034-8			DATE 01-14-1994								
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**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 326TTFCD6026 BB**CONN. DIAGRAM:** EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS312782-326T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE32004006 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
50&40	37.0&30.0	1800	1780&1475	326T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	117/58.5&115/57.5	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	94.5&94.1	3/4 LOAD EFF:	94.5	1/2 LOAD EFF:	94.1	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	85&85	3/4 LOAD PF:	82	1/2 LOAD PF:	73.8	94.1		SQ CAGE INV RATED

F.L. TORQUE		LOCKED ROTOR AMPS		L.R. TORQUE		B.D. TORQUE		F.L. RISE°C
147.5	LB-FT	724 / 362		275	LB-FT 180 %	395	LB-FT 260 %	65

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
65 dBA	75 dBA	12 LB-FT^2	- LB-FT^2	20 SEC.	2	680 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6312	6212						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:39:53 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 19-06-2017

Customer:

Attention:

Submitted by: FAREEDA DUDEKULA



326TTFCD6026

Submittal

Data @ 460 V

Motor Load Data

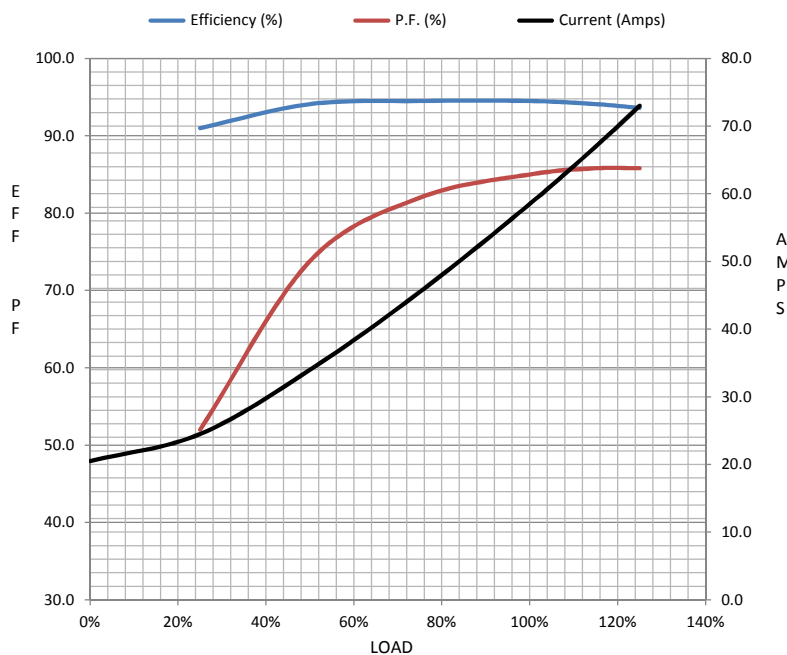
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	20.5	24.5	34.0	45.5	58.5	67.0	73.0	362	
Torque (ft-lb)	0.00	36.5	73.5	110	148	170	185	265	
RPM	1800	1795	1790	1788	1782	1,778	1775	0	
Efficiency (%)		91.0	94.1	94.5	94.5	94.1	93.6		
P.F. (%)	4.5	52.0	73.8	82.0	85.0	85.8	85.8	32.0	

Motor Speed Data

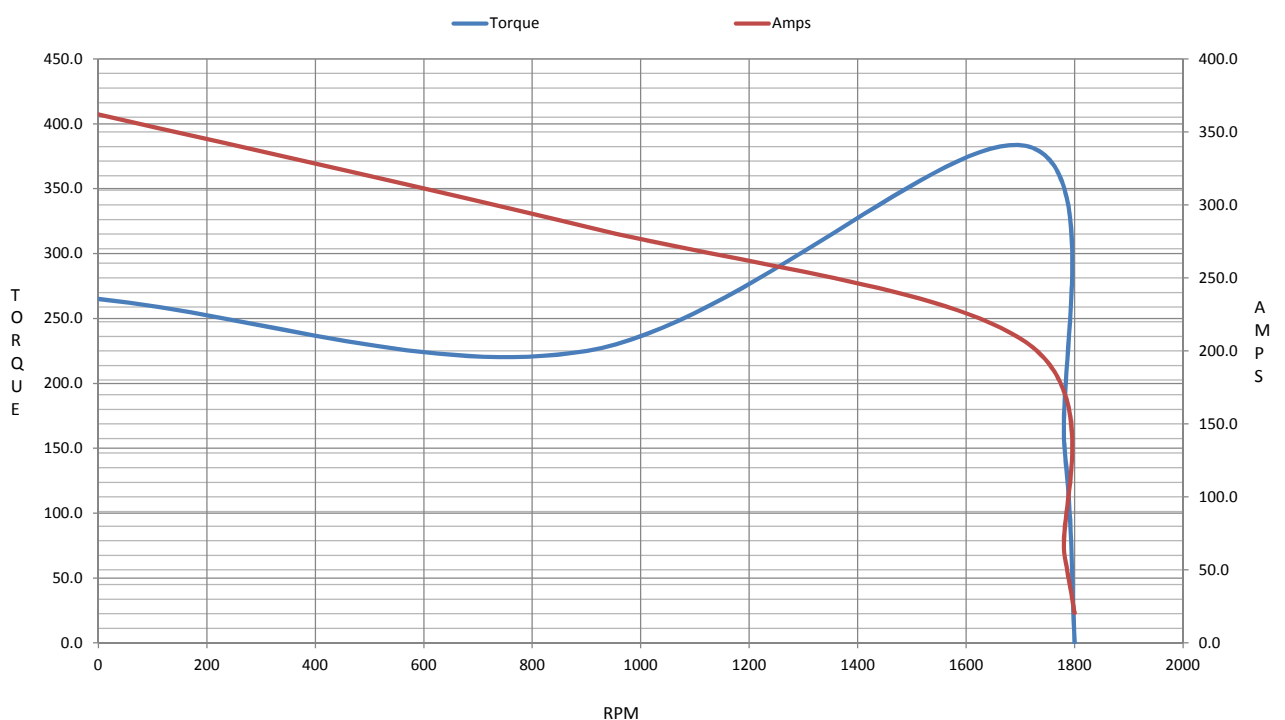
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1710	1782	1800
Current (Amps)	362	285	206	58.5	20.5
Torque (ft-lb)	265	225	383	148	0.00

Information Block

HP	50.0			
Sync. RPM	1800			
Frame	326			
Enclosure	TEFC			
Construction	TFC			
Voltage	230/460#190/38(V			
Frequency	60 Hz			
Design	B			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	65 ° C			
Duty	CONT			
Ambient	40 ° C			
Elevation	1,000 feet			
Rotor/Shaft wk ²	12.0 Lb-Ft ²			
Ref Wdg	HE32004006 NONE			
Sound Pressure @ 1M	65 dBA			
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS312782			
Conn. Diag	EE7308AA			
Additional Specifications:				
0				
365THFS8036				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0820	0.0490	0.3860	0.7030	13.0410



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 364TTFC6036
Catalog No: GT1040A
60 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 364T Frame, TEFC
Three Phase TEFC Motors



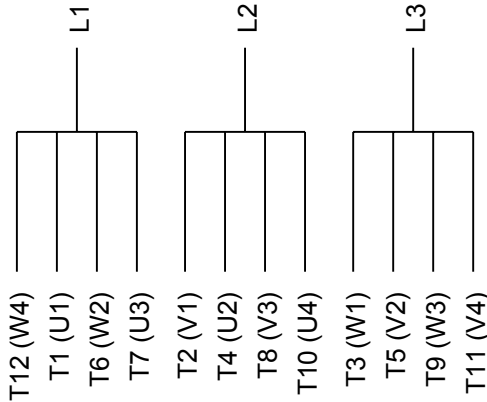


Nameplate Specifications

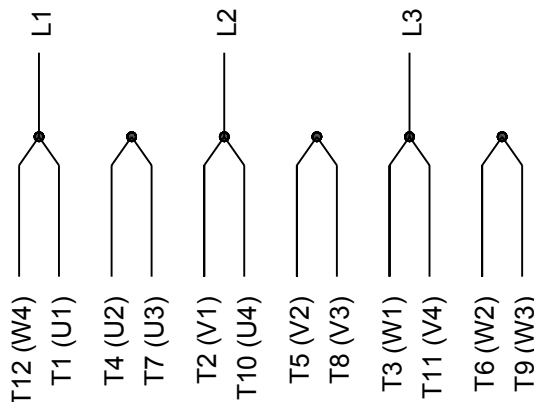
Output HP	60 Hp	Output KW	45.0 KW
Frequency	60 Hz	Voltage	230/460 V
Current	138.0/69.0 A	Speed	1782 rpm
Service Factor	1.15	Phase	3
Efficiency	95 %	Power Factor	85.5
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	364T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6313	Opp Drive End Bearing Size	6213
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

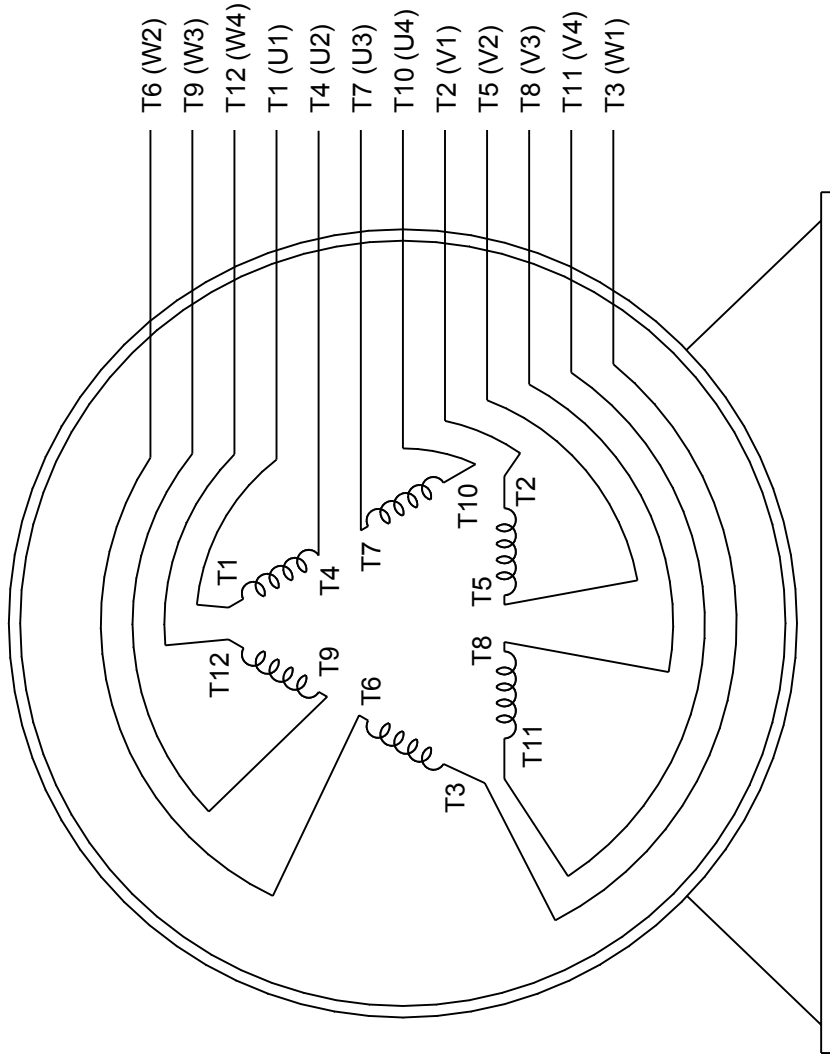
Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.103 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	33.32 in
Shaft Diameter	2.375 in	Shaft Extension	5.88 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308AA	Outline Drawing	SS556999-100





LOW VOLTAGE



HIGH VOLTAGE



VIEW OF TERMINAL END

DRAWING REVISION K			REVISION BY AJW	DATE 07-17-2015	<div></div>	DRAWN BY LZ		Regal Beloit America, Inc.	
ECO-0081632			APPROVED BY T. VUE	DATE 07-17-2015		DATE 01-12-1994			
ECO DESCRIPTION REV'D IEC MARKINGS PER IEC 60034-8			APPROVED BY GK						
			DATE 01-14-1994						
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MATERIAL						MATERIAL			
THIRD ANGLE PROJECTION							SIZE A	DRAWING NUMBER EE7308AA	SHEET 1 OF 1



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 364TTFC6036 BB**CONN. DIAGRAM:** EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS556999-364T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE32254010 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
60&50	45.0&37.0	1800	1782&1480	364T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	138/69&140/70	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	95&94.5	3/4 LOAD EFF:	95.4	1/2 LOAD EFF:	95	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	85.5&85.5	3/4 LOAD PF:	83	1/2 LOAD PF:	75.5	94.5		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
177 LB-FT	870 / 435	354 LB-FT 200 %	451 LB-FT 255 %	55

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
70 dBA	80 dBA	17.2 LB-FT^2	- LB-FT^2	25 SEC.	2	805 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6313	6213						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:42:15 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 12/13/2018

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA



364TTFCD6036

Submittal

Data @ 460 V

Motor Load Data

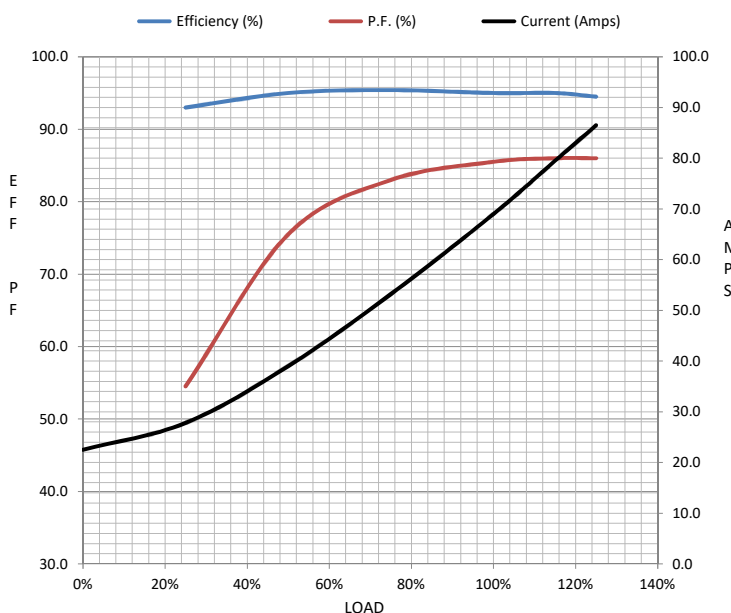
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	22.5	27.8	39.0	53.2	69.0	79.5	86.5	435	
Torque (ft-lb)	0.00	44.0	88.0	132	177	204	222	354	
RPM	1800	1795	1790	1785	1782	1,780	1775	0	
Efficiency (%)		93.0	95.0	95.4	95.0	95.0	94.5		
P.F. (%)	4.0	54.5	75.5	83.0	85.5	86.0	86.0	33.0	

Motor Speed Data

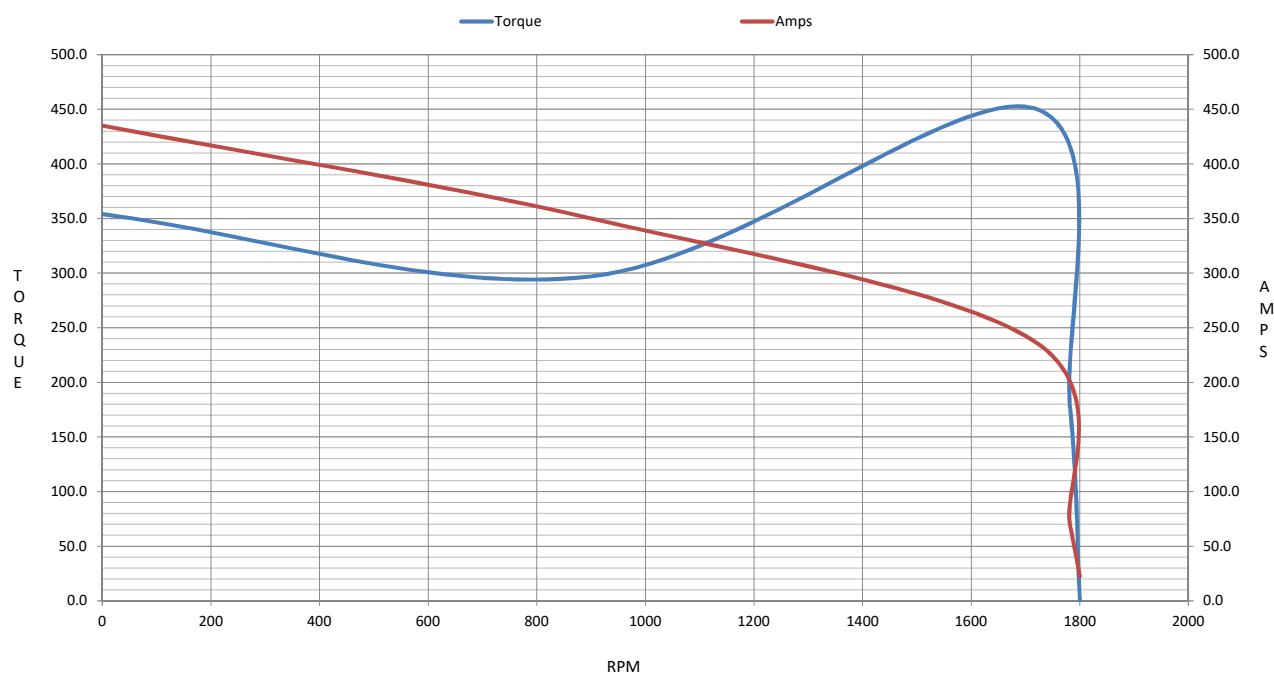
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1715	1782	1800
Current (Amps)	435	350	238	69.0	22.5
Torque (ft-lb)	354	297	451	177	0.00

Information Block

HP	60.0			
Sync. RPM	1800			
Frame	364			
Enclosure	TEFC			
Construction	TFC			
Voltage	230/460#190/380	V		
Frequency	60	Hz		
Design	A			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	55	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk²	17.2	Lb-Ft²		
Ref Wdg	HE32254010 NONE			
Sound Pressure @ 1M	70	dBA		
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS556999			
Conn. Diag	EE7308AA			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0640	0.0400	0.3640	0.4870	11.7230



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 365TTFC6036
Catalog No: GT1043A
75 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 365T Frame, TEFC
Three Phase TEFC Motors



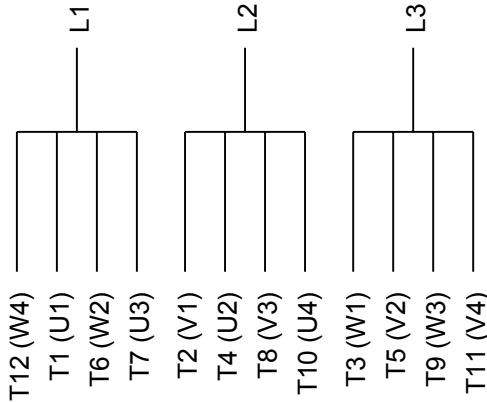


Nameplate Specifications

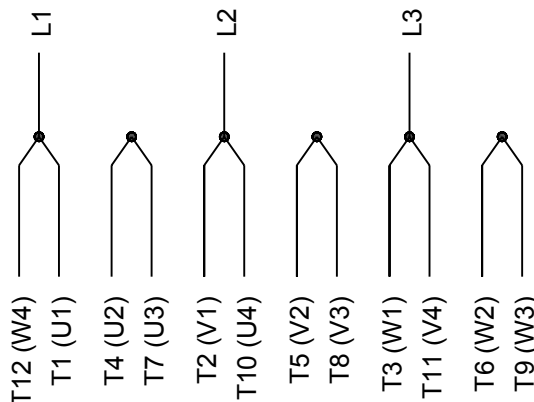
Output HP	75 Hp	Output KW	56.0 KW
Frequency	60 Hz	Voltage	230/460 V
Current	171.0/85.5 A	Speed	1782 rpm
Service Factor	1.15	Phase	3
Efficiency	95.4 %	Power Factor	86
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	365T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6313	Opp Drive End Bearing Size	6213
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

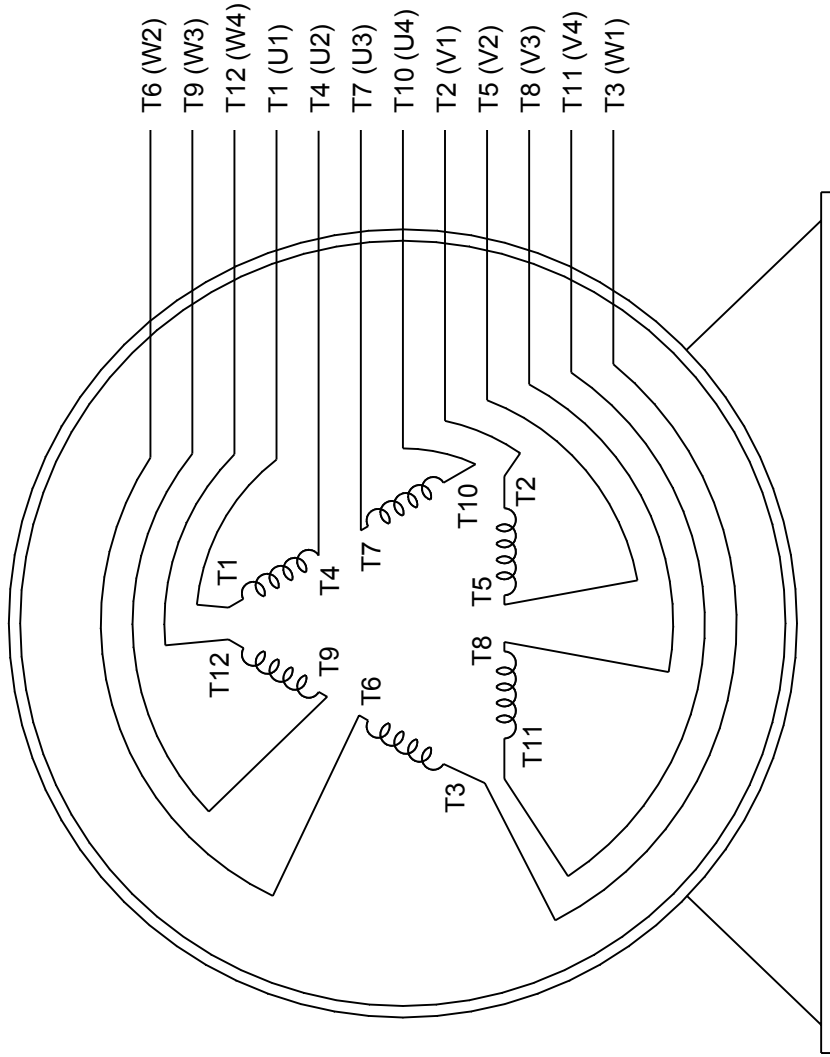
Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.072 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	34.30 in
Shaft Diameter	2.375 in	Shaft Extension	5.88 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7308AA	Outline Drawing	SS556999-200




LOW VOLTAGE



HIGH VOLTAGE



VIEW OF TERMINAL END

DRAWING REVISION K			REVISION BY AJW	DATE 07-17-2015	<div></div>	DRAWN BY LZ			Regal Beloit America, Inc.
ECO-0081632		APPROVED BY T. VUE	DATE 07-17-2015	DATE 01-12-1994					
ECO DESCRIPTION REV'D IEC MARKINGS PER IEC 60034-8				APPROVED BY GK					
				DATE 01-14-1994					
				REFERENCE					
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					THIRD ANGLE PROJECTION	SIZE A	DRAWING NUMBER EE7308AA	SHEET 1 OF 1	



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 365TTFC6036 BB**CONN. DIAGRAM:** EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS556999-365T**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE32254009 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
75&60	56.0&45.0	1800	1782&1482	365T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	171/85.5&166/83	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	95.4&95.2	3/4 LOAD EFF:	95.4	1/2 LOAD EFF:	95	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	86&86	3/4 LOAD PF:	83.5	1/2 LOAD PF:	76.2	95		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
221 LB-FT	1084 / 542	464 LB-FT 210 %	586 LB-FT 265 %	65

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
70 dBA	80 dBA	20.5 LB-FT^2	- LB-FT^2	20 SEC.	2	983 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6313	6213						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:37:53 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 12/14/2018

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA



365TTFC6036

Submittal

Data @ 460 V

Motor Load Data

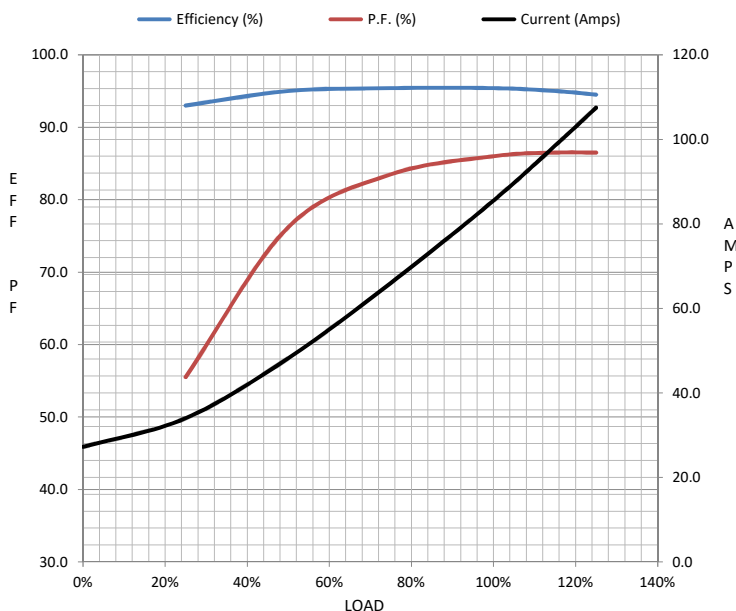
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	27.2	34.0	48.2	66.0	85.5	98.5	108	542	
Torque (ft-lb)	0.00	55.0	110	166	221	254	280	464	
RPM	1800	1795	1792	1788	1782	1,780	1775	0	
Efficiency (%)		93.0	95.0	95.4	95.4	95.0	94.5		
P.F. (%)	3.5	55.5	76.2	83.5	86.0	86.5	86.5	34.0	

Motor Speed Data

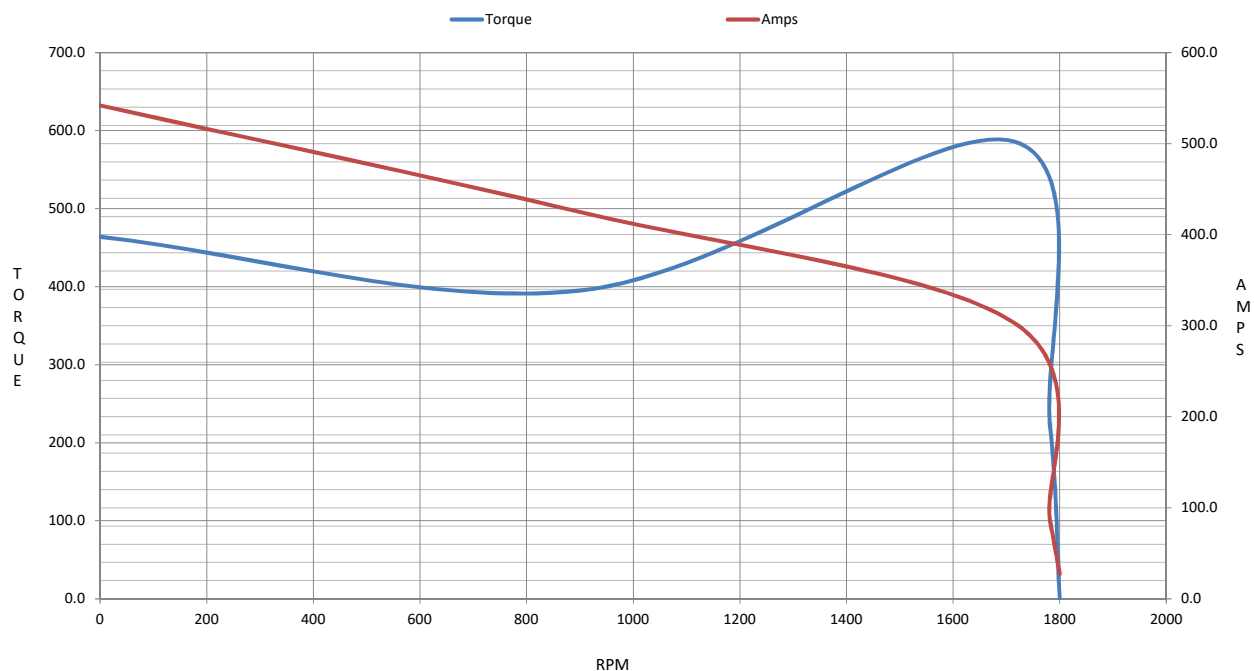
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1715	1782	1800
Current (Amps)	542	425	303	85.5	27.2
Torque (ft-lb)	464	395	586	221	0.00

Information Block

HP	75.0			
Sync. RPM	1800			
Frame	365			
Enclosure	TEFC			
Construction	TFC			
Voltage	230/460#190/380 V			
Frequency	60 Hz			
Design	A			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	65 ° C			
Duty	CONT			
Ambient	40 ° C			
Elevation	1,000 feet			
Rotor/Shaft wk ²	20.5 Lb-Ft ²			
Ref Wdg	HE32254009 NONE			
Sound Pressure @ 1M	70 dBA			
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS556999			
Conn. Diag	EE7308AA			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0450	0.0320	0.2720	0.4010	9.0720



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 405TTFC6036
Catalog No: GT1046A
100 HP General Purpose Motor, 3 phase, 1800 RPM, 230/460 V, 405T Frame, TEFC
Three Phase TEFC Motors



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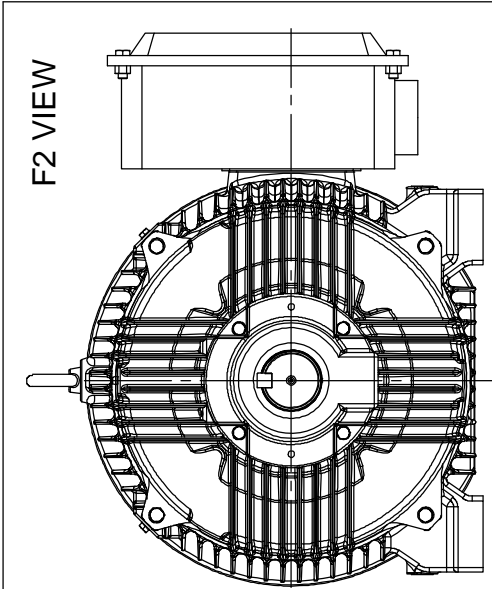
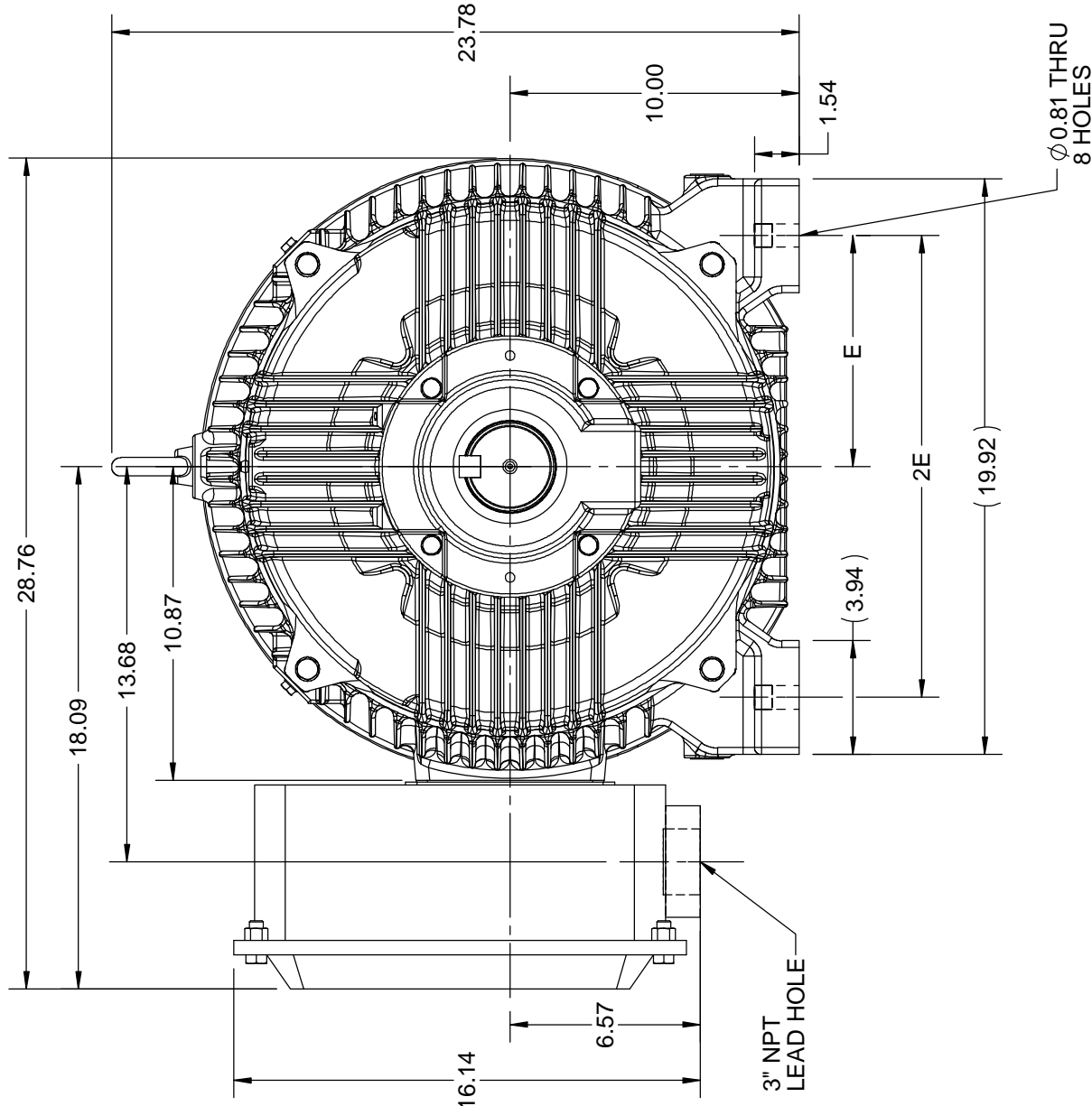


Nameplate Specifications

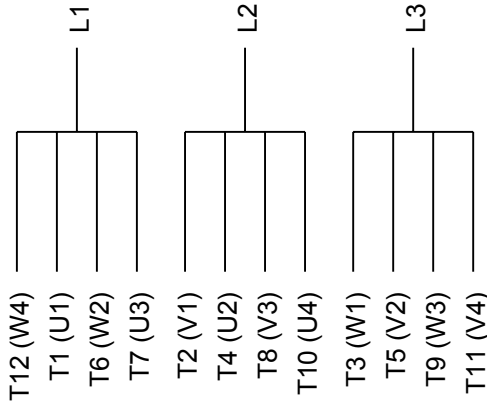
Output HP	100 HP	Output KW	75.0 KW
Frequency	60 Hz	Voltage	230/460 V
Current	226.0/113.0 A	Speed	1785 rpm
Service Factor	1.15	Phase	3
Efficiency	95.4 %	Power Factor	87
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	405T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6316	Opp Drive End Bearing Size	6314
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

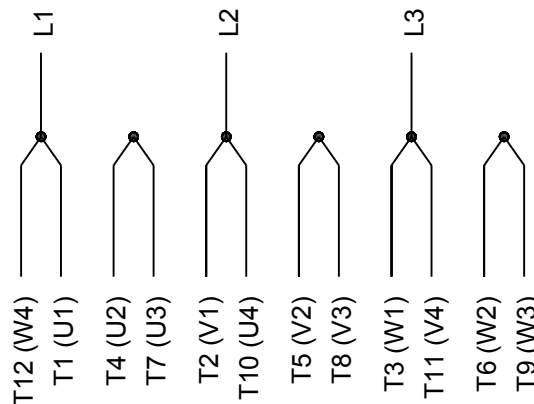
Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Low Volt Only & Wye Start Delta Run Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.0555 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	38.77 in
Shaft Diameter	2.875 in	Shaft Extension	7.25 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Outline Drawing	SS557005	Connection Drawing	EE7308AA



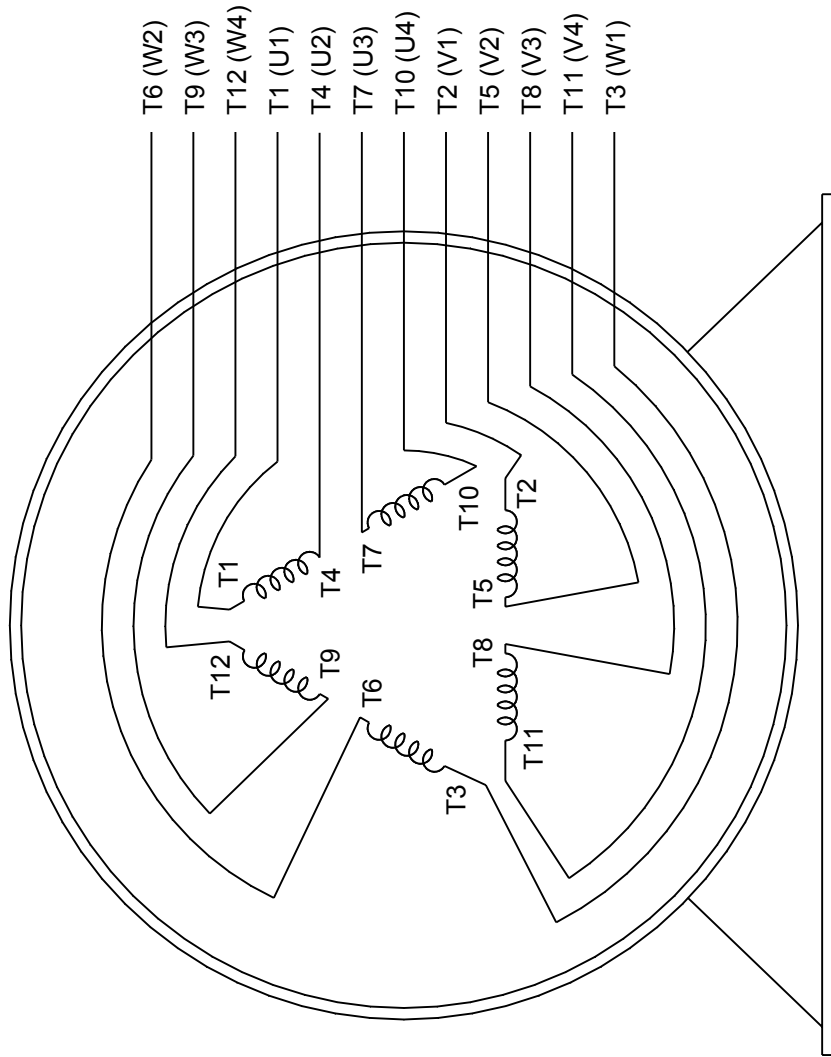
DRAWN BY	NIV	<div> Regal Beloit America, Inc.</div>			
DATE	25/03/2016				
APPROVED BY	SBD	DESCRIPTION			
DATE	25/03/2016	OUTLINE 404/405T FR-NEMA-TEFC			
REFERENCE		MATERIAL	PROCESS/FINISH		
THIRD ANGLE PROJECTION		SIZE	DRAWING NUMBER	SHEET	1 OF 1
		B	SS557005		




LOW VOLTAGE



HIGH VOLTAGE



VIEW OF TERMINAL END

DRAWING REVISION K			REVISION BY AJW	DATE 07-17-2015	<div></div>	DRAWN BY LZ			Regal Beloit America, Inc.	
ECO ECO-0081632			APPROVED BY T. VUE	DATE 07-17-2015		DATE 01-12-1994				
ECO DESCRIPTION REV'D IEC MARKINGS PER IEC 60034-8				APPROVED BY GK						
				DATE 01-14-1994						
COPYRIGHT REGAL BELOIT AMERICA, INC. ALL RIGHTS RESERVED. PROPRIETARY AND CONFIDENTIAL INFORMATION - THIS DOCUMENT IS THE PROPERTY OF REGAL BELOIT AMERICA, INC. (OWNER) AND CONTAINS OWNER'S PROPRIETARY INFORMATION. ANY PERSON, CORPORATION OR OTHER FIRM RECEIVING IT IS DEEMED, BY RECEIVING IT, TO AGREE THAT IT, AND/OR ANY PART OF IT, SHALL NOT BE DISCLOSED TO ANY PERSON, CORPORATION OR OTHER ENTITY, DUPLICATED, AND/OR USED, EXCEPT AS EXPRESSLY APPROVED IN WRITING IN ADVANCE BY OWNER. THIS DOCUMENT SHALL BE RETURNED TO OWNER UPON REQUEST. IT MAY BE SUBJECT TO CERTAIN RESTRICTIONS UNDER APPLICABLE EXPORT CONTROL LAWS AND REGULATIONS.					DESCRIPTION CONN DIAGRAM-EXTERNAL 3Ø-2/1 DELTA-12 LEADS		PROCESS/FINISH			
					MATERIAL	SIZE A		DRAWING NUMBER EE7308AA	SHEET 1 OF 1	



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 405TTFC6036 BB**CONN. DIAGRAM:** EE7308AA**CUSTOMER PART****#:****OUTLINE:** SS557005**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE32504006 2**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
100&75	75.0&56.0	1800	1785&1488	405T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	230/460&190/380	226/113&208/104	Y START D RUN OR INV	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	95.4&95	3/4 LOAD EFF:	95.4	1/2 LOAD EFF:	95	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	87&86	3/4 LOAD PF:	83.5	1/2 LOAD PF:	74.5	95		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
294 LB-FT	1450 / 725	529 LB-FT 180 %	764 LB-FT 260 %	65

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
75 dBA	85 dBA	35 LB-FT^2	550 LB-FT^2	25 SEC.	2	1325 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6316	6314						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:45:13 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 12/13/2018

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA



405TTFC6036

Submittal

Data @ 460 V

Motor Load Data

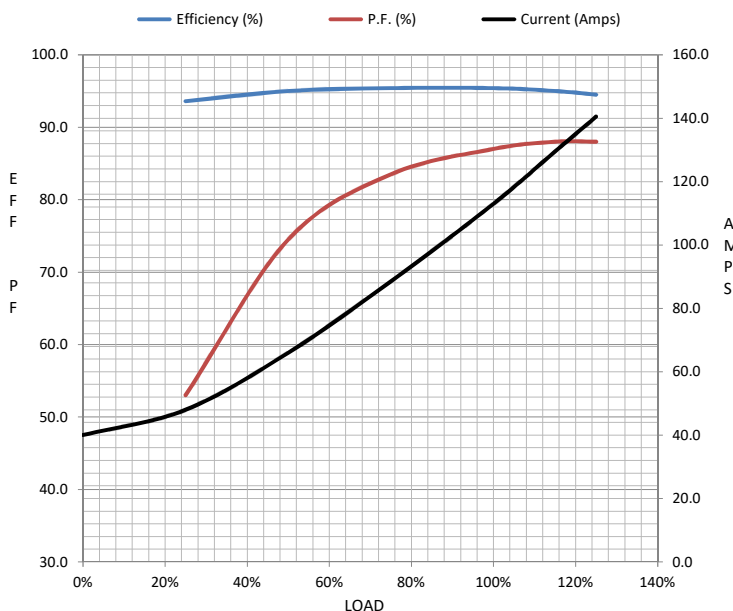
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	40.0	48.0	66.0	88.5	113	130	141	725	
Torque (ft-lb)	0.00	73.0	147	220	294	339	370	529	
RPM	1800	1796	1792	1790	1785	1,782	1780	0	
Efficiency (%)		93.6	95.0	95.4	95.4	95.0	94.5		
P.F. (%)	4.5	53.0	74.5	83.5	87.0	88.0	88.0	32.0	

Motor Speed Data

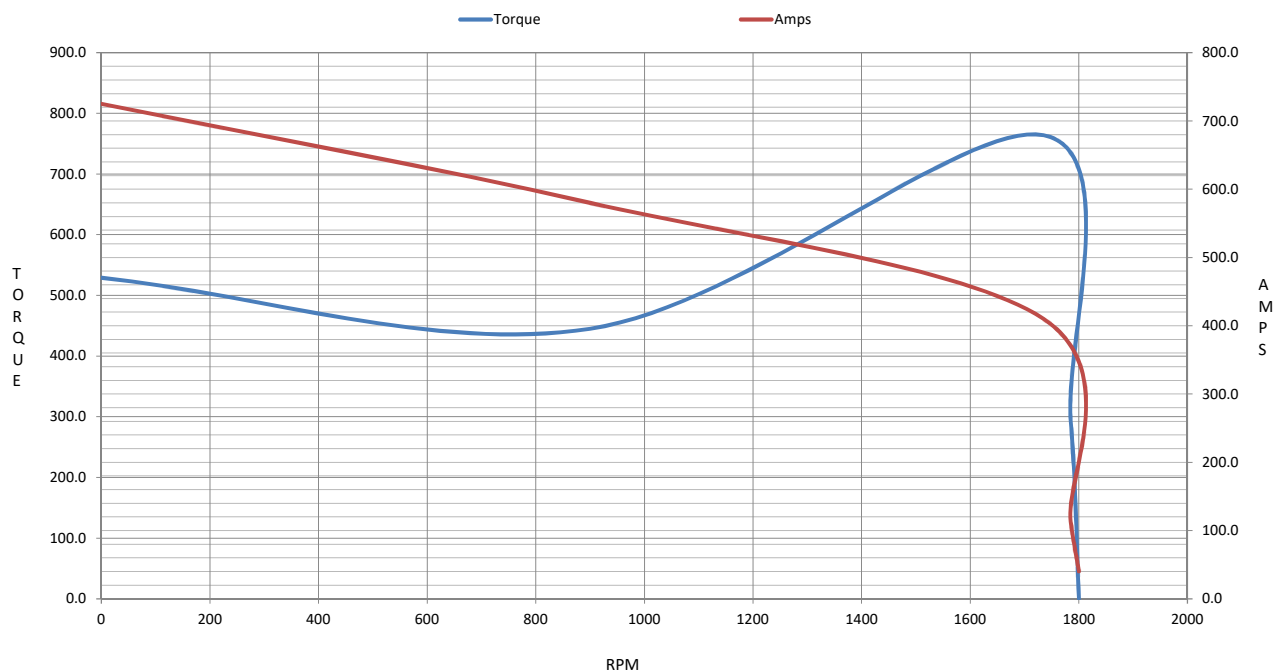
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1735	1785	1800
Current (Amps)	725	580	410	113	40.0
Torque (ft-lb)	529	445	764	294	0.00

Information Block

HP	100.0			
Sync. RPM	1800			
Frame	405			
Enclosure	TEFC			
Construction	TFC			
Voltage	230/460#190/380	V		
Frequency	60	Hz		
Design	A			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	65	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk²	35.0	Lb-Ft²		
Ref Wdg	HE32504006 NONE			
Sound Pressure @ 1M	75	dBA		
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS557005			
Conn. Diag	EE7308AA			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0330	0.0200	0.1700	0.2840	6.5320



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 444TTFCD6036
Catalog No: GT1049A
125 HP General Purpose Motor, 3 phase, 1800 RPM, 460 V, 444T Frame, TEFC
Three Phase TEFC Motors



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Nameplate Specifications

Output HP	125 Hp	Output KW	93.0 KW
Frequency	60 Hz	Voltage	460 V
Current	140.0 A	Speed	1790 rpm
Service Factor	1.15	Phase	3
Efficiency	95.4 %	Power Factor	87
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	444T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6319	Opp Drive End Bearing Size	6317
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.0374 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	46.71 in
Shaft Diameter	3.375 in	Shaft Extension	8.5 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7341C	Outline Drawing	SS557009

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THREE PHASE – PART WINDING START
DELTA – 6 LEADS

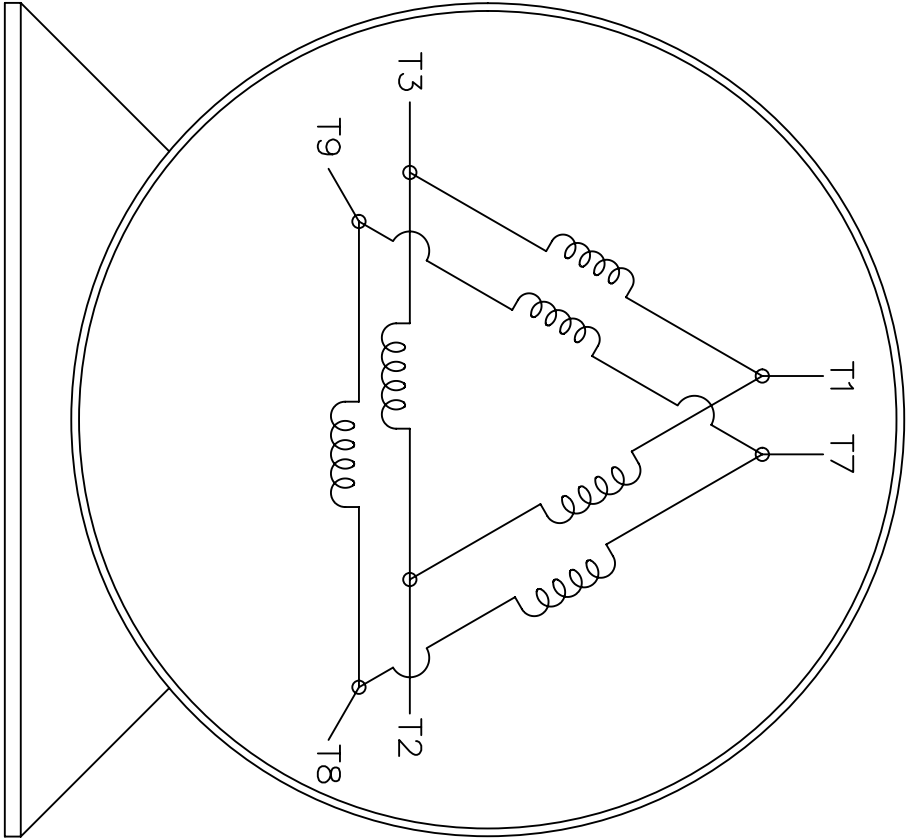
START
CONNECT T1 TO LINE 1
CONNECT T2 TO LINE 2
CONNECT T3 TO LINE 3
T7–T8–T9 OPEN

RUN
CONNECT T1&T7 TO LINE 1
CONNECT T2&T8 TO LINE 2
CONNECT T3&T9 TO LINE 3

IF MOTOR HAS 2 T'S

START
CONNECT T1,T1 TO LINE 1
CONNECT T2,T2 TO LINE 2
CONNECT T3,T3 TO LINE 3
T7,T7–T8,T8–T9,T9 OPEN

RUN
CONNECT T1,T1&T7,T7 TO LINE 1
CONNECT T2,T2&T8,T8 TO LINE 2
CONNECT T3,T3&T9,T9 TO LINE 3



VIEW OF TERMINAL END

			TOLERANCES UNLESS SPECIFIED		DRAWN/BLR 03-09-1998				
			DEC.	INCHES	CHK ML 03-23-1998				
			.X	± -	APPD GK 03-23-1998				
			.XX	± -	SCALE 1=1				
E	NOTE ADDED FOR 2 T'S	NAR 17-12-2020	RC	.XXX ± -	REF				
D	RE-DRAWN WITH REGAL LOGO ECO-0110493	WGJ 09-30-2016	EMH .XXXX ± -	MAT'L	FMF				
NO.	REVISION	BY & DATE	CHK ANG ± -	FINISH	PREV				
THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK. ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED. THIS IS AN ELECTRONICALLY GENERATED DOCUMENT -- DO NOT SCALE THIS PRINT			RFP	CAD FILE EE7341C	SIZE	DRAWING NO.	PAGE	OF	REV.
			DIST		A	EE7341C	E		

REGAL REGAL-BELOIT CORPORATION

CONNECTION DIAGRAM
3Ø – 6 LEADS



**P.O. BOX 8003
WAUSAU, WI 54401-8003
PH. 715-675-3311**

CERTIFICATION DATA SHEET**CUSTOMER:****CUSTOMER****PO#:****ORDER #:****MODEL #:** 444TTFC6036 BB**CONN. DIAGRAM:** EE7341C**CUSTOMER PART****#:****OUTLINE:** SS557009**MOUNTING:** F1/F2 CAPABLE**WINDING #:** HE32804010 1**TYPICAL MOTOR PERFORMANCE DATA**

HP	kW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
125&100	93.0&75.0	1800	1790&1490	444T	TEFC	G	B

PH	Hz	VOLTS	AMPS	START TYPE	DUTY	INSL	S.F.	AMB°C
3	60/50	460&380	140&136	PWS OR INVERTER	CONTINUOUS	F7	1.15/1.15	40

FULL LOAD EFF:	95.4&95.2	3/4 LOAD EFF:	95.4	1/2 LOAD EFF:	95	GTD. EFF		ELEC. TYPE
FULL LOAD PF:	87.5&87.5	3/4 LOAD PF:	84.2	1/2 LOAD PF:	77	95		SQ CAGE INV RATED

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
367 LB-FT	905	679 LB-FT 185 %	991 LB-FT 270 %	55

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS / HOUR	APPROX. MOTOR WGT
66 dBA	76 dBA	60 LB-FT^2	750 LB-FT^2	25 SEC.	2	1588 LBS.

***** SUPPLEMENTAL INFORMATION *****

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	ODE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6319	6317						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

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INVERTER**TORQUE:** CONSTANT 10:1/VARIABLE 10:1**INV. HP SPEED RANGE:** NONE**ENCODER:** NONE

NONE NONE

NONE NONE PPR

BRAKE: NONE NONE

NONE P/N NONE

NONE NONE

NONE FT-LB NONE V NONE Hz

PREPARED BY: Anusha Muthyala**DATE:** 09/24/2019 01:24:12 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.

Data Sheet

Date: 12/12/2018

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA



444TTFCD6036

Submittal

Data @ 460 V

Motor Load Data

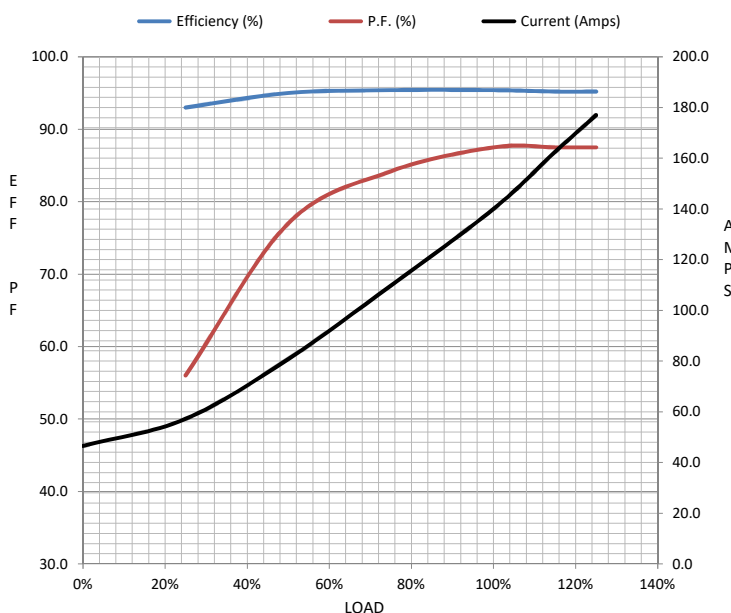
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	46.5	57.2	80.8	110	140	163	177	905	
Torque (ft-lb)	0.00	91.5	183	275	367	423	460	679	
RPM	1800	1796	1794	1792	1790	1,788	1786	0	
Efficiency (%)		93.0	95.0	95.4	95.4	95.2	95.2		
P.F. (%)	5.0	56.0	77.0	84.2	87.5	87.5	87.5	36.0	

Motor Speed Data

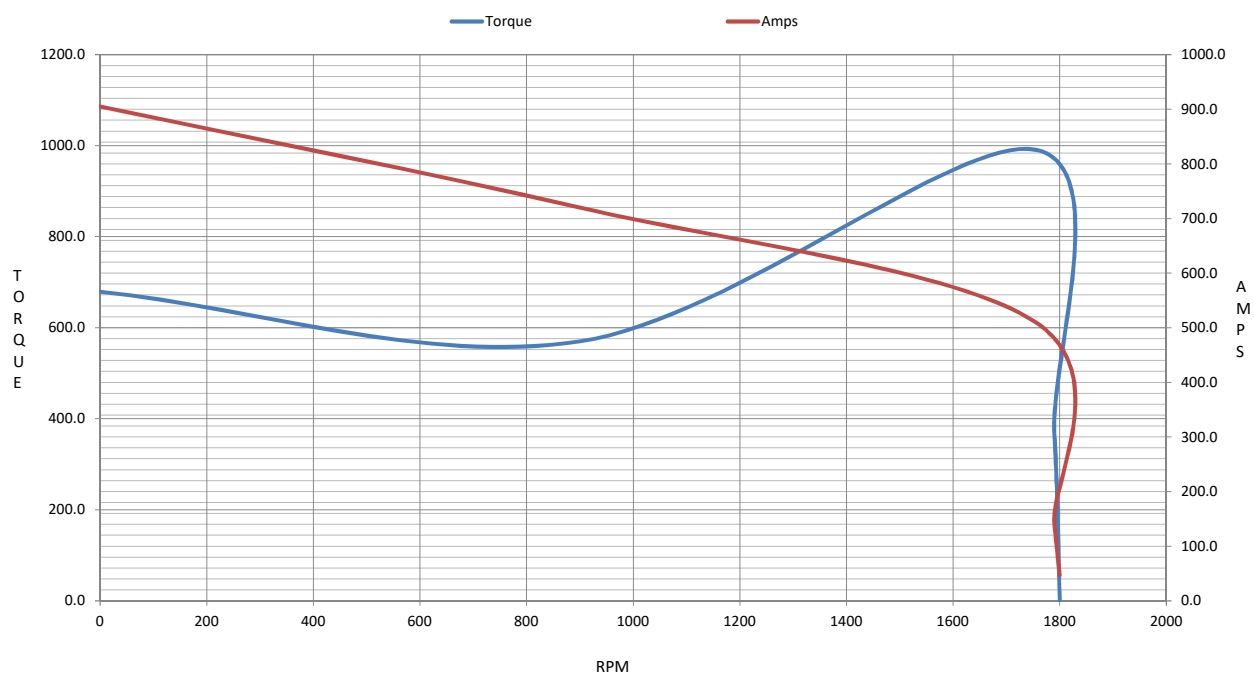
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1755	1790	1800
Current (Amps)	905	720	510	140	46.5
Torque (ft-lb)	679	570	991	367	0.00

Information Block

HP	125.0			
Sync. RPM	1800			
Frame	444			
Enclosure	TEFC			
Construction	TFC			
Voltage	460#380	V		
Frequency	60	Hz		
Design	A			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	55	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	1,000	feet		
Rotor/Shaft wk ²	60.0	Lb-Ft ²		
Ref Wdg	HE32804010 NONE			
Sound Pressure @ 1M	80	dBA		
VFD Rating	VARIABLE 10:1			
Outline Dwg	SS557009			
Conn. Diag	EE7341C			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0230	0.0110	0.1520	0.2790	5.7890



Speed -Torque Curve



PRODUCT INFORMATION PACKET

Model No: 445TTFCD6036
Catalog No: GT1052A
150 HP General Purpose Motor, 3 phase, 1800 RPM, 460 V, 445T Frame, TEFC
Three Phase TEFC Motors



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Nameplate Specifications

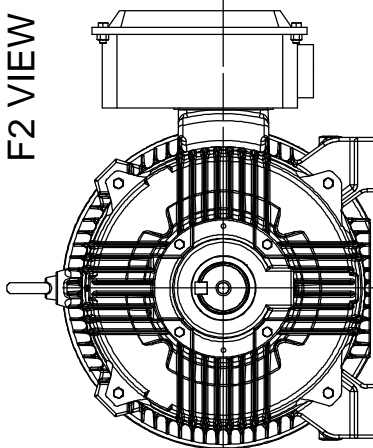
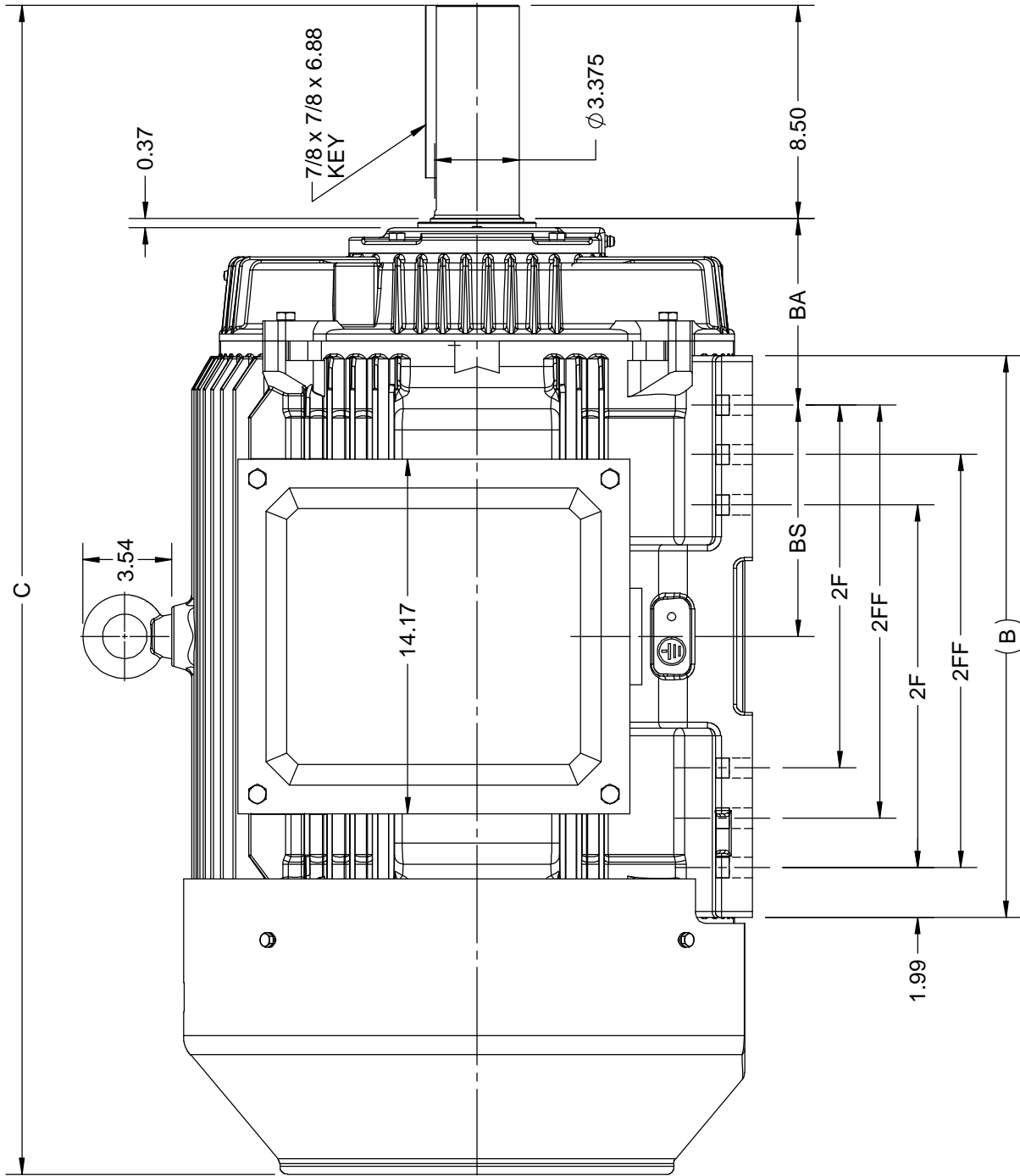
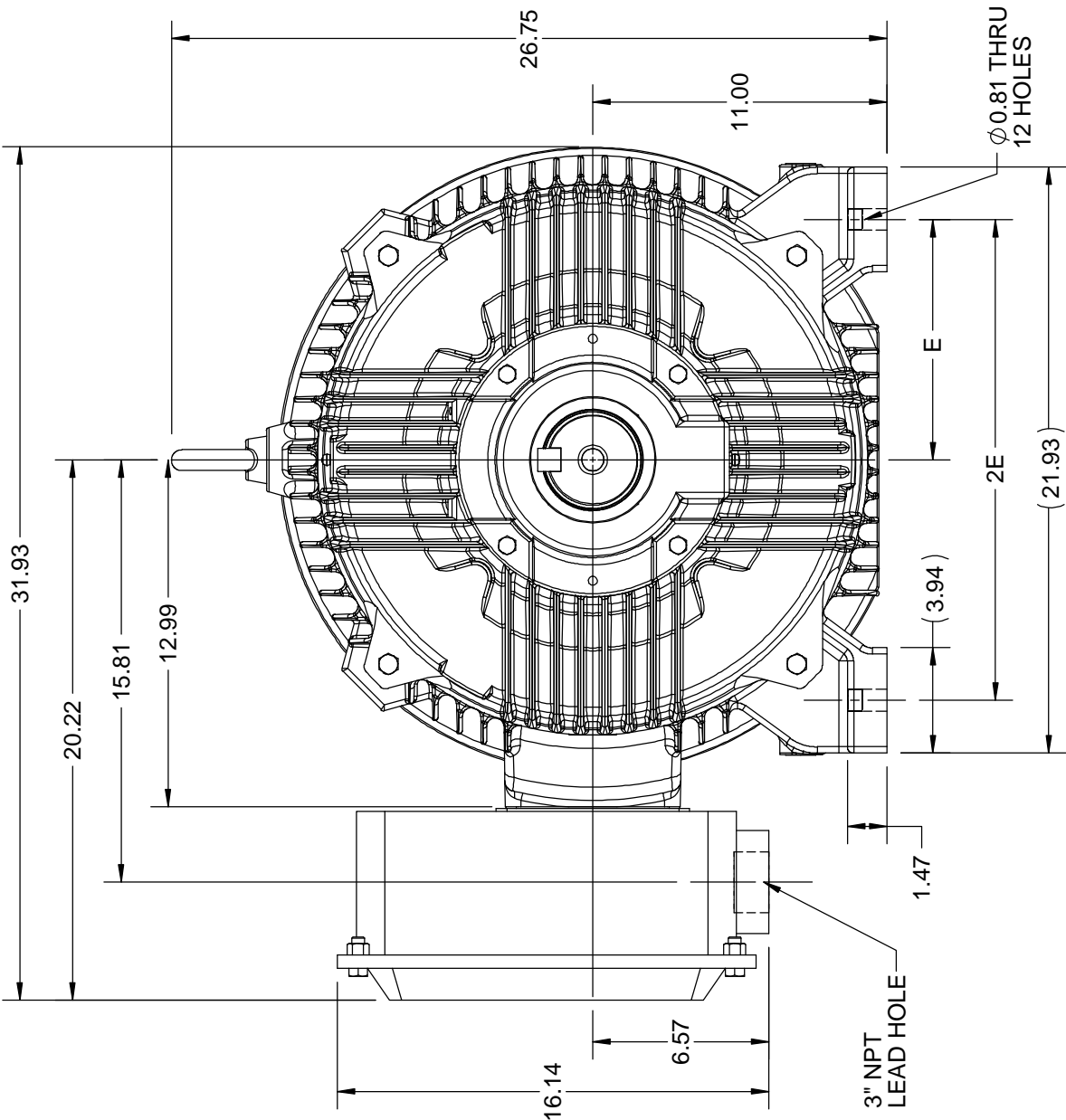
Output HP	150 Hp	Output KW	112.0 kW
Frequency	60 Hz	Voltage	460 V
Current	169.0 A	Speed	1790 rpm
Service Factor	1.15	Phase	3
Efficiency	95.8 %	Power Factor	87
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	445T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6319	Opp Drive End Bearing Size	6317
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		



Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.0294 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	46.71 in
Shaft Diameter	3.375 in	Shaft Extension	8.5 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Outline Drawing	SS557009	Connection Drawing	EE7341C

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	B	C	E	2E	2F	2FF	BA	BS	MOUNTING
	22.44	46.71	9.00	18.00	14.50	16.50	7.50	9.24	F1 OR F2



DRAWING REVISION E			REVISION BY BISWA	DATE 12/10/2020	<div></div>	DRAWN BY NIV		<div></div> <div>Regal Beloit America, Inc.</div>	DESCRIPTION <div>OUTLINE</div> <div>444/445T FR-TEFC</div>	PROCESS/FINISH
ECO-0195135			APPROVED BY GNK	DATE 12/10/2020		DATE 25/03/2016				
ECO DESCRIPTION			APPROVED BY SBD							
			DATE 25/03/2016							
DRAWING UPDATED					THIRD ANGLE PROJECTION					
COPYRIGHT REGAL BELOIT AMERICA, INC. ALL RIGHTS RESERVED. PROPRIETARY AND CONFIDENTIAL INFORMATION - THIS DOCUMENT IS THE PROPERTY OF REGAL BELOIT AMERICA, INC. (OWNER) AND CONTAINS OWNER'S PROPRIETARY INFORMATION. ANY PERSON, CORPORATION OR OTHER FIRM RECEIVING IT IS DEEMED, BY RECEIVING IT, TO AGREE THAT IT, AND/OR ANY PART OF IT, SHALL NOT BE DISCLOSED TO ANY PERSON, CORPORATION OR OTHER ENTITY, DUPLICATED, AND/OR USED, EXCEPT AS EXPRESSLY APPROVED IN WRITING IN ADVANCE BY OWNER. THIS DOCUMENT SHALL BE RETURNED TO OWNER UPON REQUEST. IT MAY BE SUBJECT TO CERTAIN RESTRICTIONS UNDER APPLICABLE EXPORT CONTROL LAWS AND REGULATIONS.					MATERIAL					
					THIRD ANGLE PROJECTION		SIZE	DRAWING NUMBER	SHEET	
					<div></div>		B	SS557009	1 OF 1	

THREE PHASE – PART WINDING START
DELTA – 6 LEADS

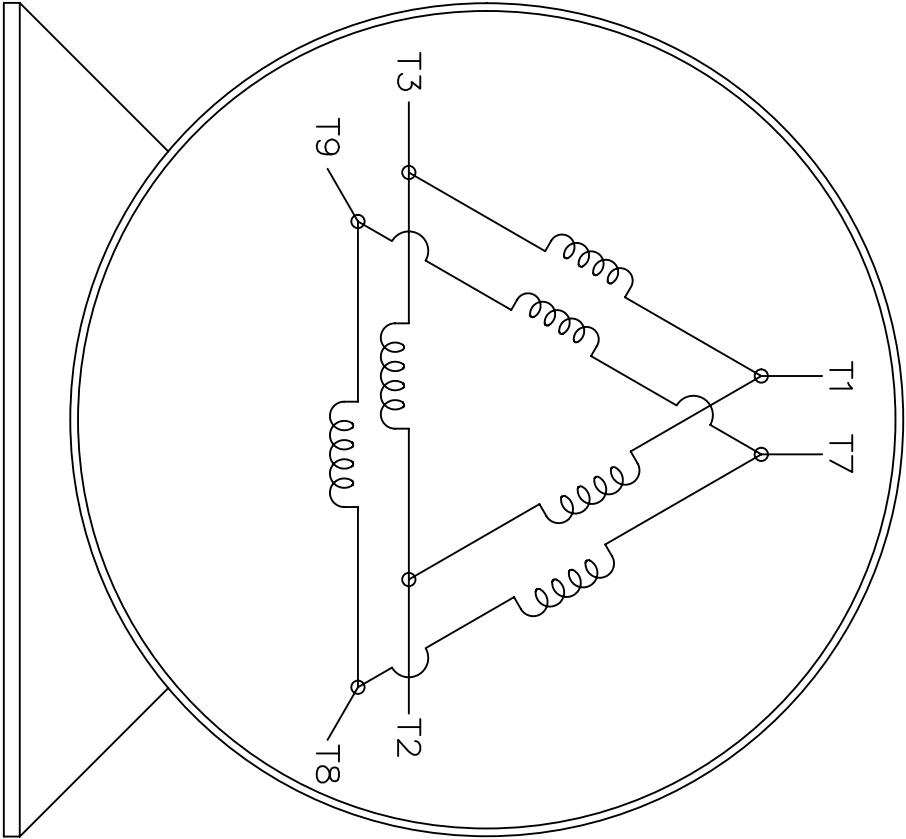
START
CONNECT T1 TO LINE 1
CONNECT T2 TO LINE 2
CONNECT T3 TO LINE 3
T7–T8–T9 OPEN

RUN
CONNECT T1&T7 TO LINE 1
CONNECT T2&T8 TO LINE 2
CONNECT T3&T9 TO LINE 3

IF MOTOR HAS 2 T'S

START
CONNECT T1,T1 TO LINE 1
CONNECT T2,T2 TO LINE 2
CONNECT T3,T3 TO LINE 3
T7,T7–T8,T8–T9,T9 OPEN

RUN
CONNECT T1,T1&T7,T7 TO LINE 1
CONNECT T2,T2&T8,T8 TO LINE 2
CONNECT T3,T3&T9,T9 TO LINE 3



VIEW OF TERMINAL END

			TOLERANCES UNLESS SPECIFIED		DRAWN/BLR 03-09-1998				
			DEC.	INCHES	CHK ML 03-23-1998				
			.X	± -	APPD GK 03-23-1998				
			.XX	± -	SCALE 1=1				
E	NOTE ADDED FOR 2 T'S	NAR 17-12-2020	RC	.XXX ± -	REF				
D	RE-DRAWN WITH REGAL LOGO ECO-0110493	WGJ 09-30-2016	EMH .XXXX ± -	MAT'L	FMF				
NO.	REVISION	BY & DATE	CHK ANG ± -	FINISH	PREV				
THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK. ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED. THIS IS AN ELECTRONICALLY GENERATED DOCUMENT -- DO NOT SCALE THIS PRINT			RFP	CAD FILE EE7341C	SIZE	DRAWING NO.	PAGE	OF	REV.
			DIST		A	EE7341C	E		

REGAL REGAL-BELOIT CORPORATION

CONNECTION DIAGRAM
3Ø – 6 LEADS

CERTIFICATION DATA SHEET

Model#: 445TTFC6036 AA

WINDING#: HE32804011 NONE 1

CONN. DIAGRAM: EE7341C

ASSEMBLY: F1/F2 CAPABLE

OUTLINE: SS557009

TYPICAL MOTOR PERFORMANCE DATA

HP	KW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
150&125	112&93	1800	1790&1490	445T	TEFC	G	B

PH	Hz	VOLTS	FL AMPS	START TYPE	DUTY	INSL	S.F	AMB°C	ELEVATION
3	60/50	460#380	169&169	PWS OR INVERTER	CONTINUOU S	F7	1.15/1.15	40	3300

FULL LOAD EFF: 95.8&95.8	3/4 LOAD EFF: 95.8	1/2 LOAD EFF: 95.4	GTD. EFF	ELEC. TYPE	NO LOAD AMPS
FULL LOAD PF: 87&87.5	3/4 LOAD PF: 84.5	1/2 LOAD PF: 77	95.4	SQ CAGE INV RATED	54

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
440 LB-FT	1085	926 LB-FT 210	1232 LB-FT 280	55

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS /HOUR	APPROX. MOTOR WGT
80 dBA	90 dBA	80 LB-FT^2	1000 LB-FT^2	25 SEC.	2	3025 LBS.

*** SUPPLEMENTAL INFORMATION ***

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	OPE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6319	6317						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE /n HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

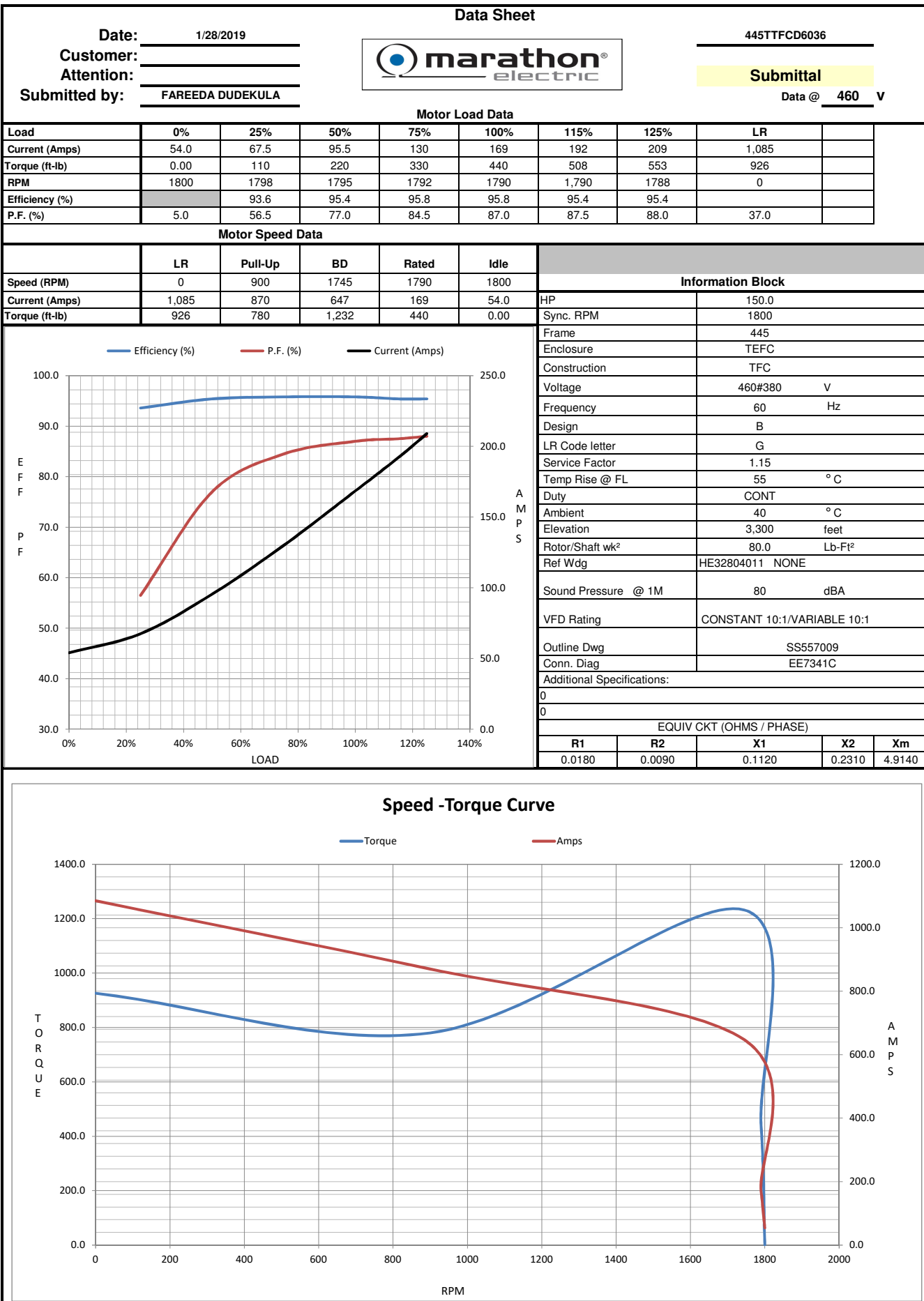
If Inverter equals NONE, contact factory for further information

* N O T E S *	INVERTER TORQUE: VARIABLE 10:1
	INV. HP SPEED RANGE: NONE
	ENCODER: NONE NONE NONE NONE NONE PPR
	BRAKE: NONE NONE NONE P/N NONE NONE NONE NONE FT-LB NONE V NONE Hz

DATE: 07/03/2017 02:10:43 AM

FORM 3531 REV.3 02/07/99

** Subject to change without notice.



PRODUCT INFORMATION PACKET

Model No: 447TTFCD6038
Catalog No: GT1055A
200 HP General Purpose Motor, 3 phase, 1800 RPM, 460 V, 447T Frame, TEFC
Three Phase TEFC Motors



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Nameplate Specifications

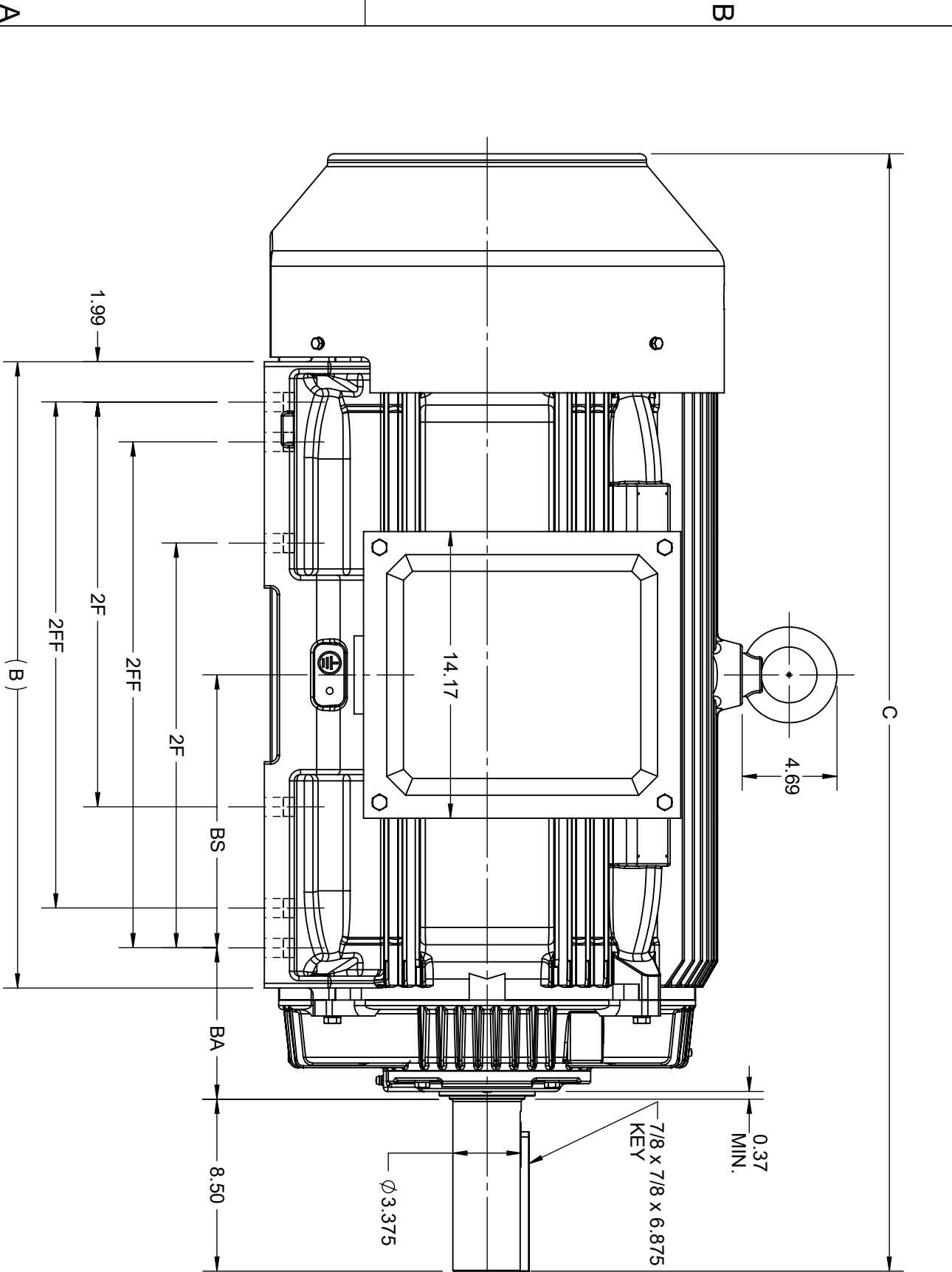
Output HP	200 Hp	Output KW	149.0 kW
Frequency	60 Hz	Voltage	460 V
Current	219.0 A	Speed	1790 rpm
Service Factor	1.15	Phase	3
Efficiency	96.5 %	Power Factor	89
Duty	Continuous	Insulation Class	F
Design Code	B	KVA Code	G
Frame	447T	Enclosure	Totally Enclosed Fan Cooled
Thermal Protection	No	Ambient Temperature	40 °C
Drive End Bearing Size	6319	Opp Drive End Bearing Size	6317
UL	Listed	CSA	Y
CE	Y	IP Code	55
Hazardous Location	DIVISION 2 T2B		

Technical Specifications

Electrical Type	Squirrel Cage Inverter Rated	Starting Method	Part Wdg Start Or Inverter
Poles	4	Rotation	Selective Clockwise
Resistance Main	.0184 Ohms	Mounting	Rigid Base
Motor Orientation	Horizontal	Drive End Bearing	Ball
Opp Drive End Bearing	Ball	Frame Material	Cast Iron
Shaft Type	T	Overall Length	55.21 in
Shaft Diameter	3.375 in	Shaft Extension	8.5 in
Assembly/Box Mounting	F1/F2 CAPABLE		
Connection Drawing	EE7341C	Outline Drawing	SS557013

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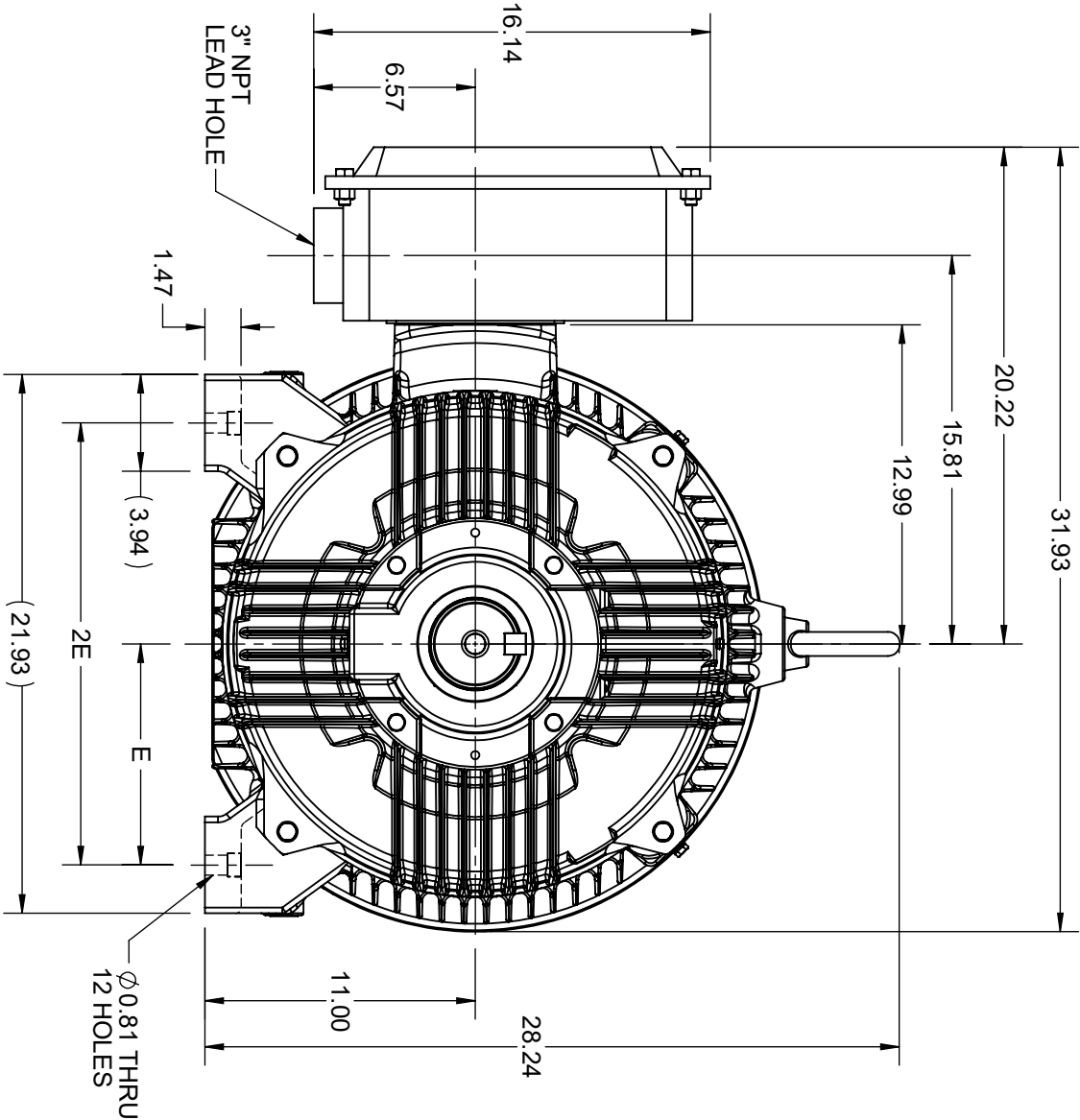
4				3		
B	C	E	2E	2F	2FF	BA
30.94	55.21	9.00	18.00	20.00	25.00	7.50
				BS	MOUNTING	
				13.48	F1 OR F2	



DRAWING REVISION	REVISION BY	REV DATE/DATE
D	BISWA	13/01/2021
ECO	APPROVED BY	DATE
CR-0000557	GNK	13/01/2021
ECO DESCRIPTION		
DRAWING UPDATED		
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PRIMARY DIMENSIONS ARE INCH
mm DIMENSIONS IN [BRACKETS]
ARE FOR REFERENCE ONLY

DRAWN BY	NIV	DESCRIPTION	Regal Beloit America, Inc.
DATE	23/05/2016	APPROVED BY	SBD
DATE	23/05/2016	REFERENCE	MATERIAL
THIRD ANGLE PROJECTION	SIZE	DRAWING NUMBER	PROCESS/FINISH
	B	SS557013	
			SHEET 1 OF 1



EE7341C

THREE PHASE - PART WINDING START
DELTA - 6 LEADS

START

CONNECT T1 TO LINE 1
CONNECT T2 TO LINE 2
CONNECT T3 TO LINE 3
T7-T8-T9 OPEN

RUN

CONNECT T1&T7 TO LINE 1
CONNECT T2&T8 TO LINE 2
CONNECT T3&T9 TO LINE 3

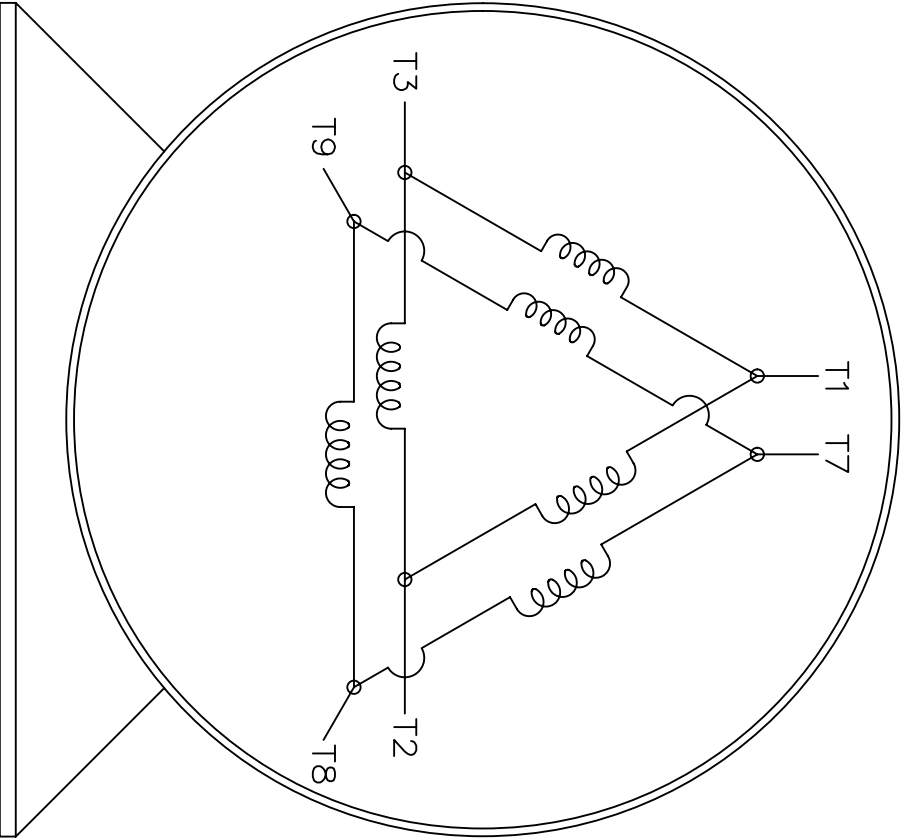
IF MOTOR HAS 2 T'S

START

CONNECT T1,T1 TO LINE 1
CONNECT T2,T2 TO LINE 2
CONNECT T3,T3 TO LINE 3
T7,T7-T8,T8-T9,T9 OPEN

RUN

CONNECT T1, T1&T7, T7	TO LINE 1
CONNECT T2, T2&T8, T8	TO LINE 2
CONNECT T3, T3&T9, T9	TO LINE 3



VIEW OF TERMINAL END

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CERTIFICATION DATA SHEET

Model#: 447TTFC6038 AA
 CONN. DIAGRAM: EE7341C
 OUTLINE: SS557013

WINDING#: HE32804009 NONE 1
 ASSEMBLY: F1/F2 CAPABLE

TYPICAL MOTOR PERFORMANCE DATA

HP	KW	SYNC. RPM	F.L. RPM	FRAME	ENCLOSURE	KVA CODE	DESIGN
200&150	149&112	1800	1790&1490	447T	TEFC	G	B

PH	Hz	VOLTS	FL AMPS	START TYPE	DUTY	INSL	S.F	AMB°C	ELEVATION
3	60/50	460#380	219&200	PWS OR INVERTER	CONTINUOU S	F7	1.15/1.15	40	3300

FULL LOAD EFF: 96.2&96	3/4 LOAD EFF: 96.2	1/2 LOAD EFF: 95.4	GTD. EFF	ELEC. TYPE	NO LOAD AMPS
FULL LOAD PF: 89&88.5	3/4 LOAD PF: 86.5	1/2 LOAD PF: 79.5	95.8	SQ CAGE INV RATED	69

F.L. TORQUE	LOCKED ROTOR AMPS	L.R. TORQUE	B.D. TORQUE	F.L. RISE°C
587 LB-FT	1450	1256 LB-FT 215	1656 LB-FT 285	60

SOUND PRESSURE @ 3 FT.	SOUND POWER	ROTOR WK^2	MAX. WK^2	SAFE STALL TIME	STARTS /HOUR	APPROX. MOTOR WGT
80 dBA	90 dBA	88 LB-FT^2	- LB-FT^2	25 SEC.	-	2675 LBS.

*** SUPPLEMENTAL INFORMATION ***

DE BRACKET TYPE	ODE BRACKET TYPE	MOUNT TYPE	ORIENTATION	SEVERE DUTY	HAZARDOUS LOCATION	DRIP COVER	SCREENS	PAINT
STANDARD	STANDARD	RIGID	HORIZONTAL	FALSE	DIVISION 2 T2B	FALSE	NONE	BLUE (ENAMEL)

BEARINGS		GREASE	SHAFT TYPE	SPECIAL DE	SPECIAL ODE	SHAFT MATERIAL	FRAME MATERIAL
DE	OPE						
BALL	BALL	POLYREX EM	T	NONE	NONE	1045 HOT ROLLED (C-204)	CAST IRON
6319	6317						

THERMO-PROTECTORS				THERMISTORS	CONTROL	SPACE /n HEATERS
THERMOSTATS	PROTECTORS	WDG RTDs	BRG RTDs			
NONE	NOT	NONE	NONE	NONE	FALSE	NONE VOLTS

If Inverter equals NONE, contact factory for further information

*
N
O
T
E
S
*

INVERTER TORQUE: VARIABLE 10:1
INV. HP SPEED RANGE: NONE
ENCODER: NONE
NONE NONE
NONE NONE PPR
BRAKE: NONE NONE
NONE P/N NONE
NONE NONE
NONE FT-LB NONE V NONE Hz

DATE: 07/03/2017 02:13:48 AM
 FORM 3531 REV.3 02/07/99
 ** Subject to change without notice.

Data Sheet

Date: 1/28/2019

Customer: _____

Attention: _____

Submitted by: FAREEDA DUDEKULA



447TTFCD6038

Submittal

Data @ 460 V

Motor Load Data

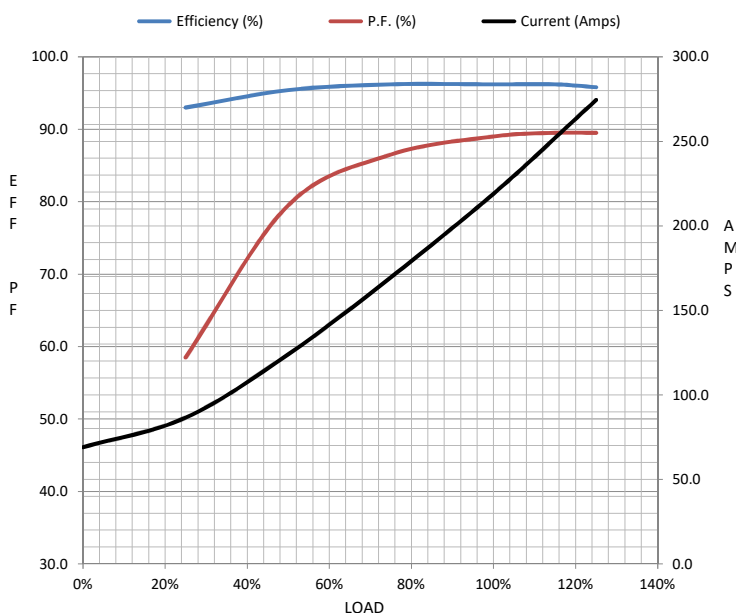
Load	0%	25%	50%	75%	100%	115%	125%	LR	
Current (Amps)	69.0	86.5	124	170	219	252	275	1,450	
Torque (ft-lb)	0.00	146	293	440	587	676	735	1,256	
RPM	1800	1798	1795	1792	1790	1,788	1788	0	
Efficiency (%)		93.0	95.4	96.2	96.2	96.2	95.8		
P.F. (%)	4.5	58.5	79.5	86.5	89.0	89.5	89.5	38.0	

Motor Speed Data

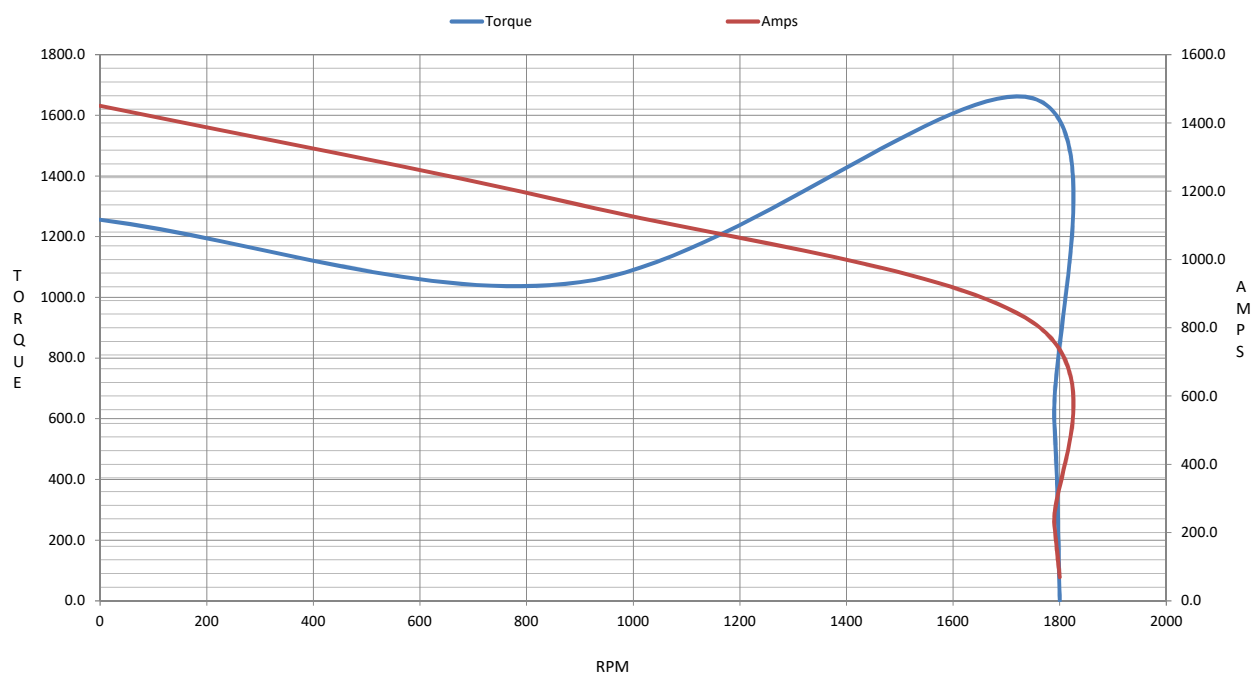
	LR	Pull-Up	BD	Rated	Idle
Speed (RPM)	0	900	1750	1790	1800
Current (Amps)	1,450	1,160	815	219	69.0
Torque (ft-lb)	1,256	1,050	1,656	587	0.00

Information Block

HP	200.0			
Sync. RPM	1800			
Frame	447			
Enclosure	TEFC			
Construction	TFC			
Voltage	460#380	V		
Frequency	60	Hz		
Design	B			
LR Code letter	G			
Service Factor	1.15			
Temp Rise @ FL	60	° C		
Duty	CONT			
Ambient	40	° C		
Elevation	3,300	feet		
Rotor/Shaft wk ²	88.0	Lb-Ft ²		
Ref Wdg	HE32804009 NONE			
Sound Pressure @ 1M	80	dBA		
VFD Rating	CONSTANT 10:1/VARIABLE 10:1			
Outline Dwg	SS557013			
Conn. Diag	EE7341C			
Additional Specifications:				
0				
0				
EQUIV CKT (OHMS / PHASE)				
R1	R2	X1	X2	Xm
0.0120	0.0070	0.0810	0.1850	3.8340



Speed -Torque Curve



Pathfinder Systems Sound Enclosure Installation Skeletal Tube

STARTS ON PAGE: 3

Sound Enclosure and Fan Installation

STARTS ON PAGE: 51

Pathfinder Fan motor manual 2021

STARTS ON PAGE: 114

Sound Enclosure Instructions

March 2014

Safety Disclaimer

- Always work safely when installing metal products and use extreme caution on the roof at all times.
- Wear gloves and safety glasses to reduce the risk of injury, and use hearing protection when operating power tools.
- Many of the panels are extremely heavy and awkward. Adhere to safe lifting procedures to avoid physical injury.
- Always be sure that ladders are safely positioned and properly secured.
- Safety harnesses or other special equipment may be required; be sure to consult OSHA guidelines for compliance with all safety requirements.
- Do NOT walk on panels until all the fasteners are installed. Metal roofing panels are slippery when wet, dusty, frosty, or oily -- Do NOT attempt to walk on a metal roof under these conditions.
- Wear soft-soled shoes to improve traction and to minimize damage to the paint finish (if applicable).

Before you Begin

Thank you for purchasing a sound enclosure. This manual provides general instructions to assemble or disassemble your sound enclosure. It is not specific to your unit and should be used as a guideline only.

Tools Required

You will need 3-4 people for installation and the following tools:

Forklift and fork extensions

Ladder or Similar

Pneumatic Air Driver

Various size Socket Drivers

Parts List

The sound enclosure has the following parts for each enclosure:

- 1/2-13 x 7" Bolts, nuts and washers
- Silicone Caulk
- 3/16" Self Drilling Screws for Fan
- Roof Panels
- Door Panels
- Air Box End Panel(s)
- End Panel(s)
- Wall Panel(s)
- Fan

Each panel is numbered. Where it meets another panel it is labeled with the same number so you would match 1 to 1, 2 to 2, etc.

Use the following pictures of the assembled enclosure to familiarize yourself with the different panels and how they fit together.

Assembly Instructions

The following is a guideline you can use to safely install the panels. You may decide to build the panels in a different sequence; however this is what we recommend. The pictures are not specific to your unit.

You will need at least 1-2 people for the next steps. If your unit came from the factory unassembled, each panel is numbered. Where it meets another panel it is labeled with the same number so you would match 1 to 1, 2 to 2, etc. The labels are removable and can be easily removed after assembly.

1. Locate (2) wall panels. Stand upright to form a corner. If provided, use silicone caulk between the panels.
2. Position one person inside and one outside. Use 1/2-13 x 7" bolts, nuts and washers to fasten the panels together.



3. Locate the next wall panel. Stand upright. If provided, use silicone caulk between the panels.
4. Use 1/2-13 x 7" bolts, nuts and washers to fasten the panels together.



5. Continue until you have fastened all wall panels together. You should have the entire bottom together. Now you will assemble the top.

6. Use a forklift and chains to lift a Roof Panel into place. The roof panels only fit one way so make sure you match the numbers on the corresponding wall panel.



7. If provided, use the silicone caulk between the roof panels and between the roof and the wall panels.
8. Use 1/2-13 x 7" bolts, nuts and washers to fasten the roof panels to the wall panels.



9. If necessary, install the doors. Depending on what type of hinge you have, you may have to fasten the bolts. Welded hinges allow for the door to lift off and on.

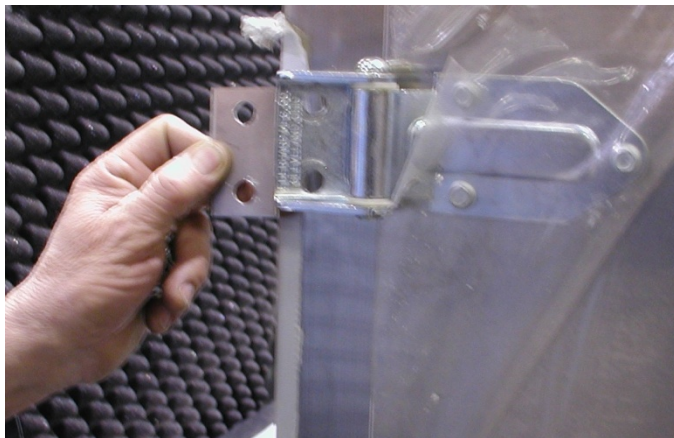
Do not lose the washers that come with the hinges or your doors will not work properly.



Bolt Hinges



Weld Hinges



10. Use a forklift to lift the fan on to the roof.
11. Use 1/8" self-tapping screws to secure the fan to the bracket on the Roof.
12. Have a certified electrician wire the fan and your sound enclosure is complete!

Knock Down Instructions

You will need at least 1-2 people for the next steps.

The following is a guideline you can use to safely take apart the sound enclosure.

1. Have a certified electrician remove power from the fan/unit.
2. Remove 1/8" self-tapping screws that secure the fan to the bracket on the Roof. If necessary, use a forklift to remove the fan.
3. Position one person inside and one outside. Remove 1/2-13 x 7" bolts, nuts and washers from the Roof. The nuts can be accessed from inside the unit.



4. Use a forklift and chains to remove the Roof Panel. It only fits one way so you might want to note how it is installed. There may be silicone caulk between the roof and top of the panels.



5. Remove the doors. Depending on what type of hinge you have, you may have to remove some bolts. Welded hinges lift off.

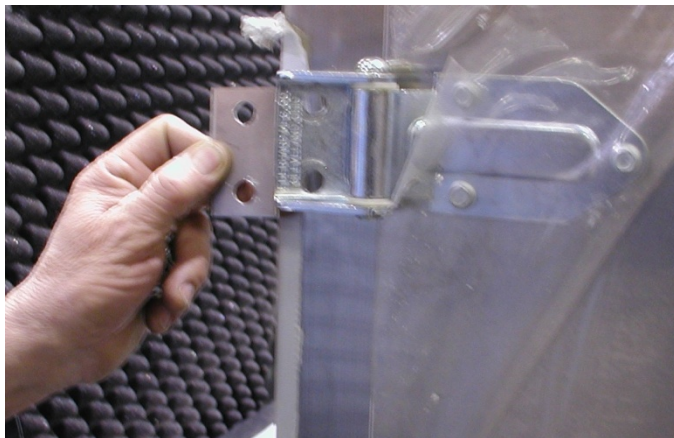
Do not lose the washers that come with the hinges or your doors will not work properly.



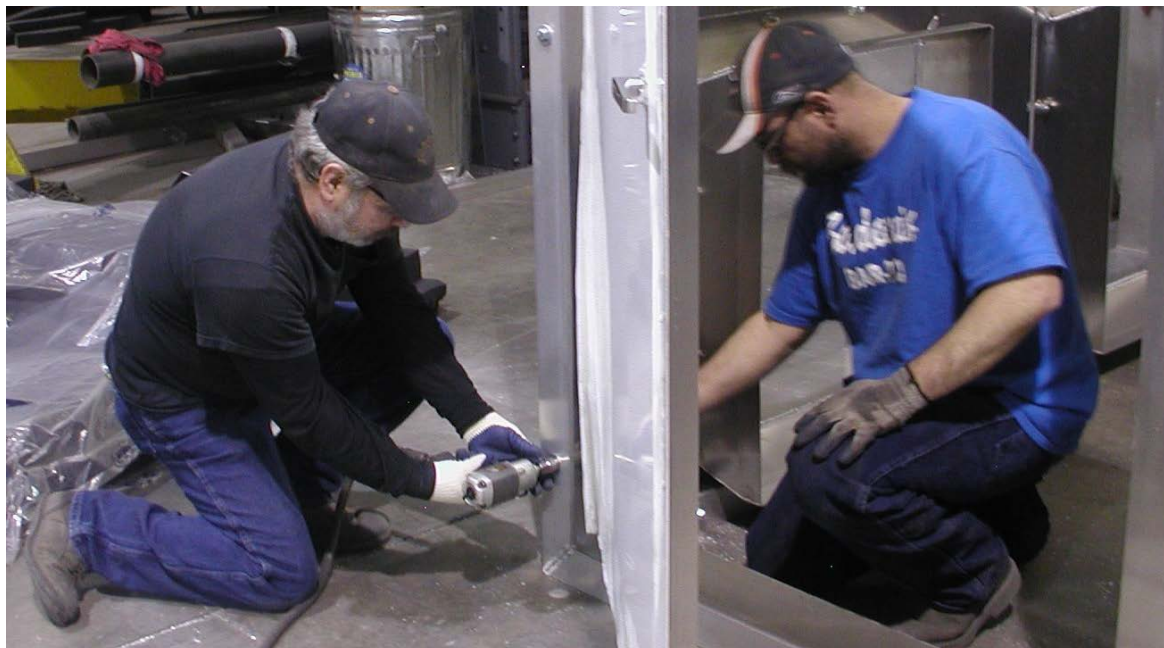
Bolt Hinge and Washer



Weld Hinge and Washer



6. Position one person inside and one outside. Remove 1/2-13 x 7" bolts, nuts and washers that fasten the panels together. There may be silicone caulk between the roof and top of the panels.



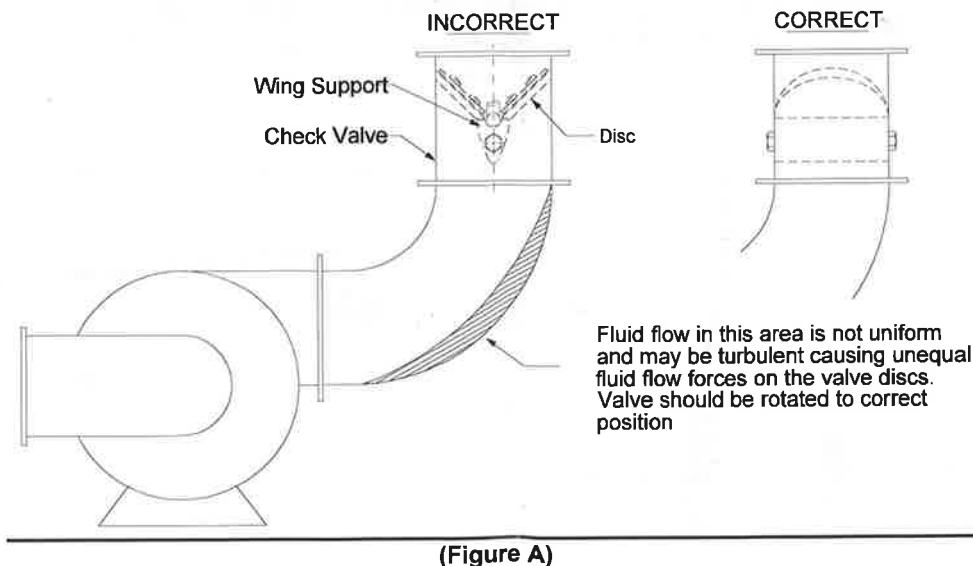
7. Continue until you have taken apart all panels.



INSTALLATION INSTRUCTIONS

VALVE INSTALLATION:

1. Remove check valve from packaging and inspect for any shipping damage or loose fasteners. All fasteners have been set with Loctite®. If damaged in shipping, save original box and box contents.
2. If check valve is to be painted or insulated, record the US Valve data on the valve identification tag.
3. If valves are being stored, they should be in a weather-protected area, preferably indoors.
4. Open and close the discs of your valve a few times by hand to assure freedom of movement.
5. **The flow arrow** on your valve indicates the direction of flow upon installation.
6. Use only a **strap type wrench** for installation to prevent distortion of the valve body.
7. The check valve is **not suitable for use on a discharge** of reciprocating compressors. Pulsating and cyclic flow will damage the valve.
8. **If this valve is installed in a horizontal line**, make sure the screws protruding through the top and bottom of the valve body are in the vertical position. Maintain at least 6 pipe diameters of straight length of piping between the check valve and any other line restriction, i.e. elbows, tees, valves, etc.
9. **If the valve installation is in a vertical line with upward flow**, the position of the wing support is not important. There should be at least 6 pipe diameters of straight unrestricted piping upstream and downstream of the check valve. If space conditions do not allow for this, the valve must be installed so that the flow is equally distributed across the two valve discs (see *figure A below*).



FOR REPLACEMENT OF INTERNALS, SEE REVERSE SIDE

PARTS REPLACEMENT INSTRUCTIONS

COMPLETE REPLACEMENT OF VALVE INTERNALS:

1. Carefully remove valve from pipeline. **USE ONLY A STRAP TYPE WRENCH.**
2. Hold the valve body in your hand or in a suitable vise to prevent distortion of the valve body.
NOTE: DO NOT EXERT UNDO FORCE ON THE VALVE BODY. This may permanently effect the valve operation.
3. Remove all valve internals by unscrewing the Wing Support screws (see Figure 1 below) and any other body support rods such as travel stop rods (only on large size valves).

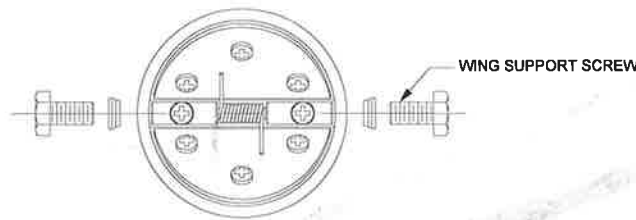
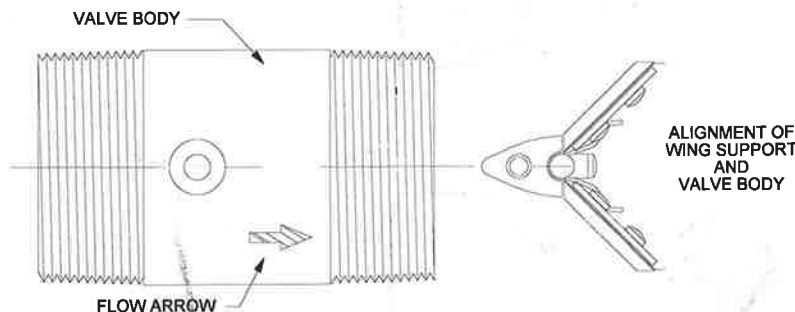


FIGURE 1

4. Inspect the body inside diameter to determine if the body is suitable and retains its original integrity i.e. surface finish is good and roundness apparent.
5. If valve body appears satisfactory and needs only minor cleanup, the valve is then suitable to replace the internals. **DO NOT SANDBLAST OR OTHERWISE DAMAGE THE VALVE BODY'S INNER SURFACE.**
6. Make sure when you order complete internal replacement assemblies that the new assemblies are identical to the original internals. Always reference your check valve's unique serial number when ordering replacements.
7. **Install the new assembly:**
 - (a) Put some water on the elastomer seal to act as a lubricant when installing the new wing support assembly into the valve body.
 - (b) Make sure you assemble the wing assembly correctly with the direction of flow.
 - (c) Align the wing support mounting screw holes and the valve body screw holes properly. (See Figure 2).



(Figure 2)

- (d) Push wing support assembly into the valve body until the holes line up properly. If you overshoot the hole alignment by half the screw hole diameter, just push the wing support assembly completely through the valve body and repeat the procedure.
- (e) When installing the wing support mounting screws, make sure you install a new Nylite® pressure seal and apply a sufficient amount of Loctite® #272 to the screw threads. The wing support screws should be torqued to 8-ft-lbs for 1/4-20 screws and 48 in-lbs for 10-32 screws. Never over tighten screws.
- (f) Allow Loctite® to dry 20 minutes, full cure in 24 hours.

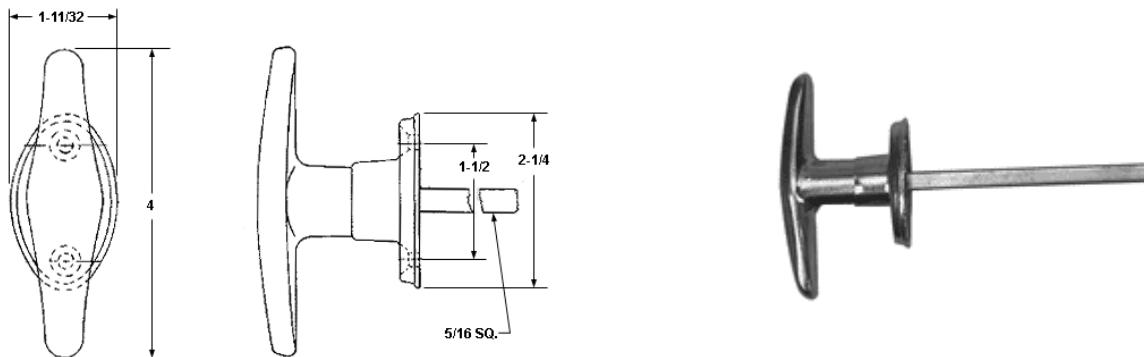
Sound Enclosure Hardware

Bill of Materials

Description	Part Number	Typical Qty
Handle	GD206	4
Rod	5611-5-48	8
Center for Rod	5611	4
Lifting Lugs	710-GZ	4
Bolt-On Hinge	5867	8
Convuluted Foam	PSI #618	N/A
Fan (Custom Sized)	Consult your quote	1
Grab Handle (Optional)	TH555	4
Weld Hinge, Lift Off Doors (Optional)	R194-0135AL	8

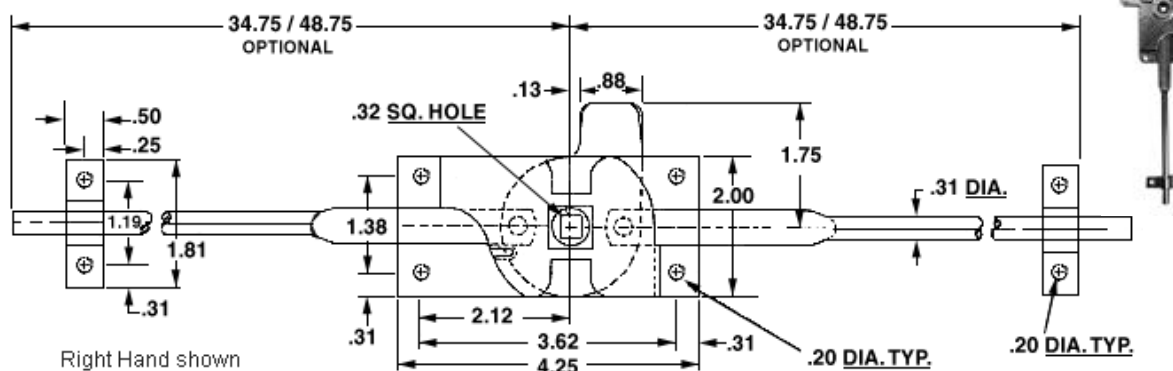
GD206 Handle

Plain 'T' Handle, with 4" shaft, 5/16 in. sq. 1-1/2" center to center mounting plate. Finish: bright chrome.



5611 Center and Rod

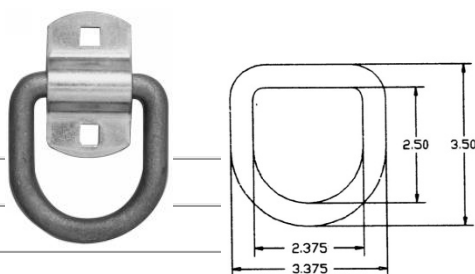
Three-point lock for metal or wood doors. All-steel construction, Available right/left hand. Finish: Zinc, 48" Rod



710-GZ Lifting Lug

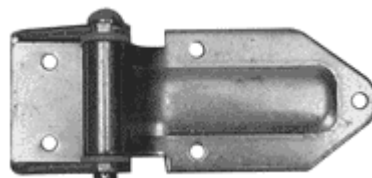
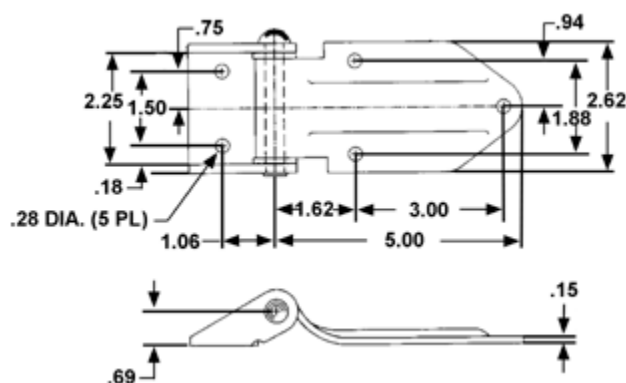
Tie down ring with bolt-on clip, gold zinc finish

Finish	Gold Zinc
Length	3-1/2"
Width	3-1/4"
Material	Steel
Diameter	1/2"
Breaking Strength	12,000 lbs.



5867 Bolt-On Hinge

5" Stamped Steel Hinge for flush mounting, Five mounting holes, 9/32" dia. Has nylon sleeve bearings for easier operation. Door movement 180 degrees. 7 gauge steel butt. 9 gauge steel strap.



R194-0135 Weld-On Hinge (Optional)

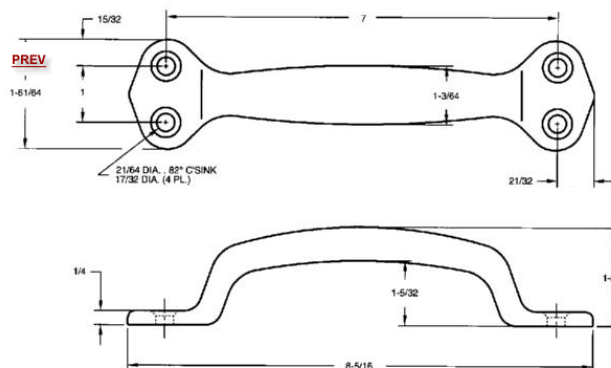
Weld-On Hinge, Lift off type, Aluminum, with a Stainless Steel Pin and Bearing Washer.



Length	5-1/4"
Material Thickness	13/16"
Pin Diameter	15/32"

TH555 Grab Handle (Optional)

Chrome plated, Solid die-cast, 8-15/16" overall length, 125/32" overall height, (4) #14 mtg. holes for oval head screws on 7" x 1" centers, 15/32" inside grab handle height



Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

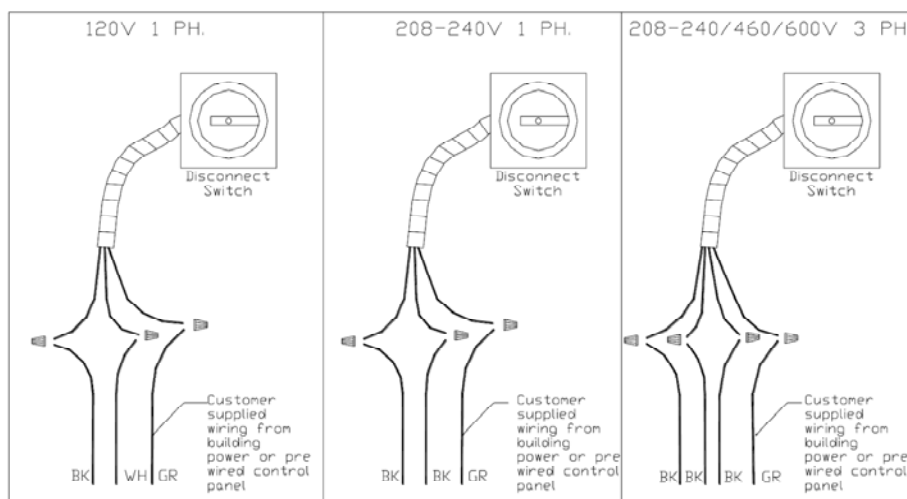
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

TABLE OF CONTENTS

WARRANTY.....	4
INSTALLATION.....	5
Mechanical	5
Site Preparation	5
Roof Mounting	5
Wall Mounting.....	6
Curb and Ductwork.....	6
Duct Routing Examples	7
Up-Blast Roof Mount Installation	7
Up-Blast Wall Mount Installation.....	8
Up-Blast Through Wall Mount Installation	9
Down-Blast Installation	10
Typical Hinge Kit – Centrifugal Upblast	11
Typical Grease Box Installation	11
Up-Blast Utility Set Installation.....	12
Up-Blast Utility Set Inlet Options.....	12
Up-Blast Utility Set.....	13
Up-Blast Utility Set Indoor Installation	14
Up-Blast Curb Mount Utility Set Installation.....	15
Up-Blast Curb Mounted Utility Set Hinging Instructions.....	15
Up-Blast Curb Mounted Utility Set Discharge Extension Option.....	16
Up-Blast Curb Mounted Utility Set Rain Cap Option.....	16
Square Inline Mounting Bracket Detail	17
Square Inline Mounting Configurations.....	18
Square Inline Discharge Options	19
Square Inline Discharge Configurations	19
Electrical.....	20
Copper Wire Ampacity.....	20
Motorized Damper	21
PSC (Permanent Split Capacitor) Motor Speed Control	21
ECM (Electronically Commutated Motor) Speed Control.....	22
Fan to Building Wiring Connection	24
Variable Frequency Drive (VFD) Installation Instructions	25
VFD Programming.....	26
ACTECH SMV VFD CROSS-REFERENCE TABLE	27
OPERATION	28
Start Up	28
Special Tools Required.....	28
Start Up Procedure	28
.....	28
Pulley Setscrew Torque.....	28
Pulley Alignment.....	29
Proper Belt Tension.....	29
Pulley Combination Chart.....	30
Troubleshooting.....	31
Troubleshooting Chart	31
MAINTENANCE	32
General Maintenance	32
Bearing Grease Charge.....	32
Bearing Grease Type	32
2 weeks after startup	33
Every 3 months	33
Yearly	33
Start-Up and Maintenance Documentation	34
Job Information.....	34
Fan Unit Information	34
Maintenance Record	35
Factory Service Department.....	35

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at **1-866-784-6900** for warranty and technical support issues.

Mechanical

WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.
5. Inline fans can be interior mounted, motors shall be located outside of the exhaust airstream.
6. Interior mounted fans must have a grease drain that is piped to an approved grease reservoir.
7. Interior mounted fans are considered part of the duct system. Clearance to combustibles must be maintained at all times. If needed the fan may be wrapped to maintain the duct system fire rating.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. If a backdraft damper is required, it should be secured within the curb using sheet metal screws, to the bottom of a damper box or damper support flanges located below the roof deck.
CAUTION: NFPA-96 RECOMMENDS THAT DAMPERS SHOULD NOT BE INSTALLED WHEN EXHAUSTER IS USED FOR REMOVAL OF SMOKE AND GREASE LADEN VAPORS FROM COMMERCIAL KITCHEN EQUIPMENT. CONSULT STATE AND LOCAL CODES FOR DETAILED REQUIREMENTS.
3. If an up-blast fan is used for kitchen hood exhaust, ensure discharge is at least 40 inches above the roof surface in accordance with NFPA96.
4. On an up-blast fan, normally the power cord is brought through the conduit tube located on the top skirt on the outside of the unit.
5. Secure ventilator curb through vertical portion of the ventilator base assembly flange using a minimum of eight (8) lug screws, anchor bolts, or other suitable fasteners (not furnished).
6. Before connecting fan motor to power source verify power line wiring is de-energized.
7. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
8. Before powering up fan check ventilator wheel for free rotation.
9. Check all fasteners for tightness.
10. Re-install motor dome.
11. A drain pipe is provided for single-point drainage of water and residue on up-blast fans. The drain pipe should be positioned towards the roof slope. Some means for collection of this residue must be provided, either a container directly under the trough or use of an adapter and pipe to carry the residue to a remote collection point. An optional down spout and grease collection box is available as an accessory item for up-blast fans.

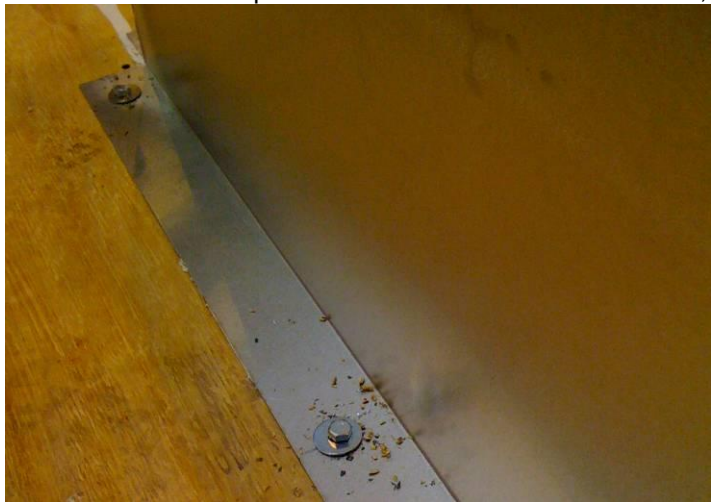
Wall Mounting

1. The same instructions, warnings and notes found under Roof Mounting section will apply. Refer to steps 2 and 3, and steps 5 through 8.
2. **Masonry Wall:** Around the wall opening install an angle iron frame at least 2" x 2" x 1/4". Frame should be approximately 1/2" smaller than the inside base dimension of the ventilator. Secure the lead cinch type anchors with non-ferrous bolts (3 per side). The ventilator should be mounted to the mounting angle with self-taping sheet metal screws (3 per side).
3. **Wood Siding:** Around the wall opening install a wooden frame 2" high x 2" wide. Frame should be approximately 1/2" smaller than the inside base dimension of the ventilator. Secure with counter-sunk expansion type lag bolts (3 per side). The ventilator should then be mounted to the mounting frame with the square head wood screws (3 per side) 3/8" minimum.
4. Steel wall mount brackets are also available as a factory option for the fan.
5. The mounting flange connections should be coated with a suitable caulking compound or an approved waterproof mastic sealer.
6. Wall mount application is not recommended from fans with wheels 30" or larger.

IMPORTANT: OSHA REGULATIONS REQUIRE THE VENTILATOR TO BE MOUNTED AT LEAST EIGHT (8) FEET ABOVE GROUND OR FLOOR LEVEL.

Curb and Ductwork

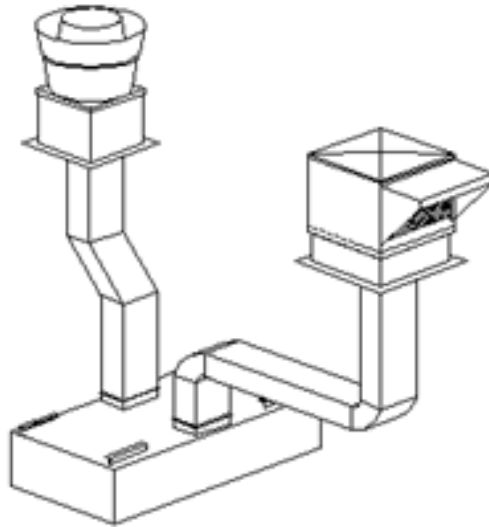
This fan was specified for a specific CFM and static pressure. The ductwork attached to this unit will significantly affect the airflow performance. Flexible ductwork and square elbows should not be used. Also, transitions and turns in ductwork near the fan inlet will cause system effect and will drastically increase the static pressure and reduce airflow. **Follow SMACNA guides and recommendations for the remaining duct run.** Fans designed for rooftop installation should be installed on a prefabricated or factory built roof curb. Follow curb manufacturer's instructions for proper curb installation. Curbs should be connected to structural roof members with at least four (3) lug screws, anchor bolts, or other suitable fasteners (not furnished) per curb flange. Curb flanges should be caulked to roof.



The fan should be installed on a curb and/or rail elevated not less than 14" above any surface. Be sure duct connection and fan outlet are properly aligned and sealed. Secure fan to curb through vertical portion of the ventilator base assembly flange using a minimum of eight (8) lug screws, anchor bolts, or other suitable fasteners (not furnished). Shims may be required depending upon curb installation and roofing material. Check all fasteners for tightness. The diagrams below show different mechanical installation configurations.

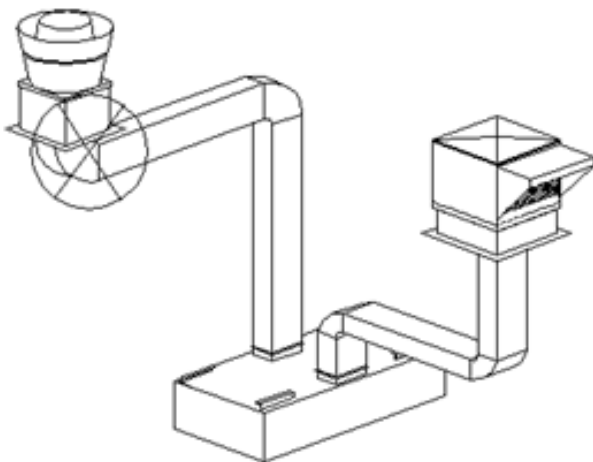
Duct Routing Examples

Proper Duct Routing

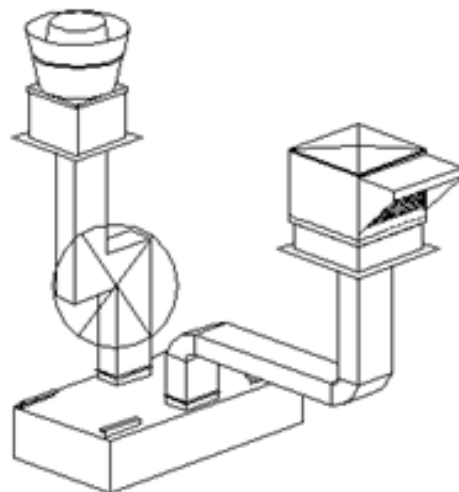


If duct cannot go straight up
use offsets

Improper Duct Routing



DO NOT connect Elbow Directly
to Fan Inlet.



DO NOT use square elbows

Up-Blast Roof Mount Installation

FEATURES:

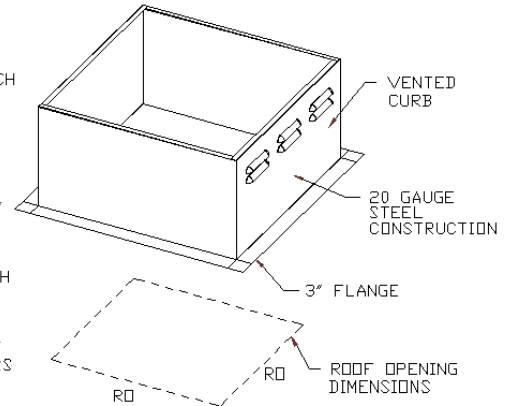
- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL762
- AMCA SOUND AND AIR CERTIFIED
- WIRING FROM MOTOR TO DISCONNECT SWITCH
- WEATHERPROOF DISCONNECT
- HIGH HEAT OPERATION 300°F (149°C)
- GREASE CLASSIFICATION TESTING

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY
WHILE EXHAUSTING AIR AT 300°F (149°C)
UNTIL ALL FAN PARTS HAVE REACHED
THERMAL EQUILIBRIUM, AND WITHOUT ANY
DETERIORATING EFFECTS TO THE FAN WHICH
WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY
WHILE EXHAUSTING BURNING GREASE VAPORS
AT 600°F (316°C) FOR A PERIOD OF
15 MINUTES WITHOUT THE FAN BECOMING
DAMAGED TO ANY EXTENT THAT COULD CAUSE
AN UNSAFE CONDITION.

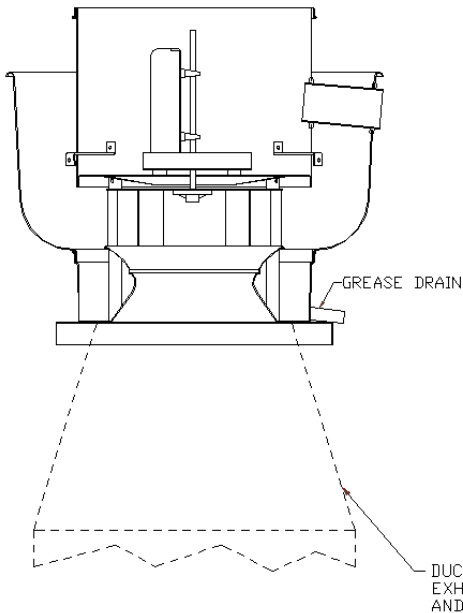
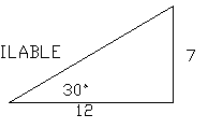
OPTIONS:

- GREASE BOX
- HINGED FAN
- PITCHED CURB
- INSULATED CURB



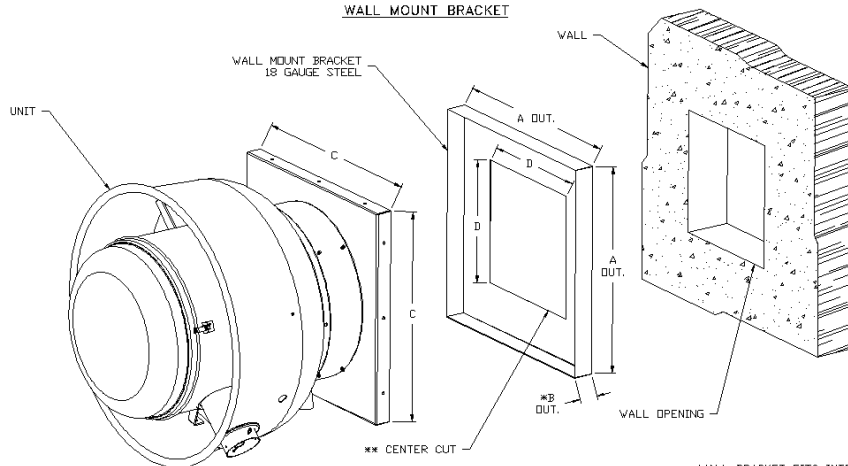
PITCHED CURBS ARE AVAILABLE
FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



Up-Blast Wall Mount Installation

WALL MOUNT BRACKET



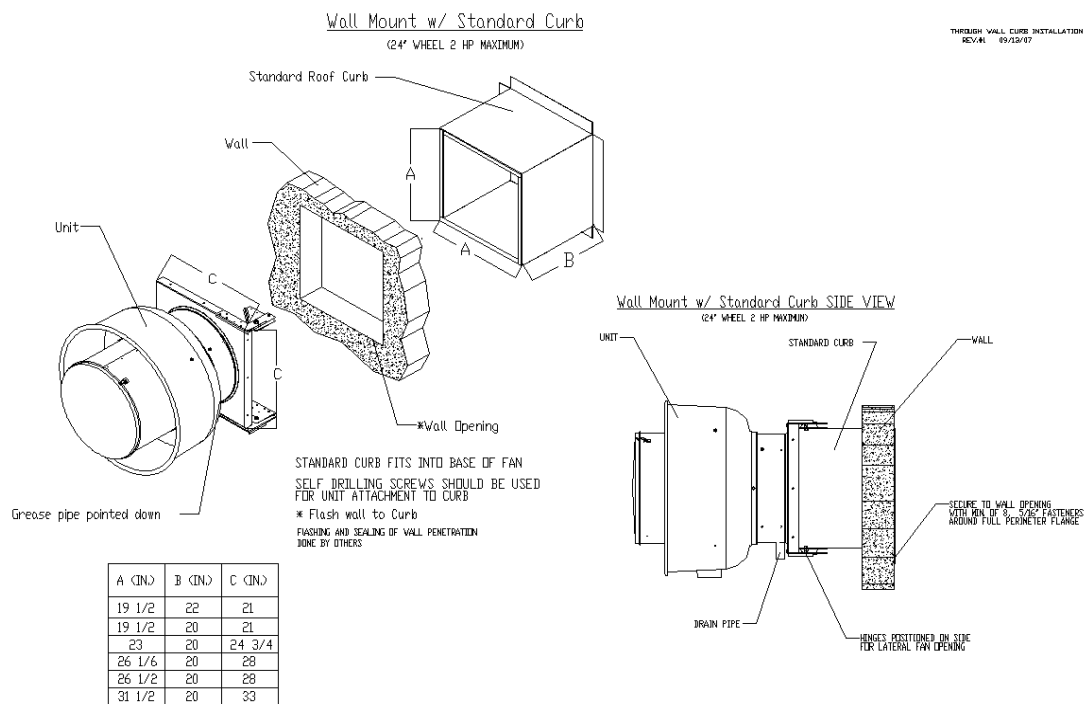
A OUT.	B OUT.	C	D
18 1/2	2	19	13
20 1/2	2	21	16
21 1/2	2	22	16
24 1/4	2	24 3/4	20
25 1/2	2	26	20
27 1/2	2	28	24
32 1/2	2	33	28

WALL BRACKET FITS INTO BASE OF FAN

SELF DRILLING SCREWS SHOULD BE USED
FOR UNIT ATTACHMENT TO WALL MOUNT BRACKET

* "B" DIMENSION = 5" WHEN USED WITH DAMPER
** CENTERED IN WALL MOUNT

Up-Blast Through Wall Mount Installation



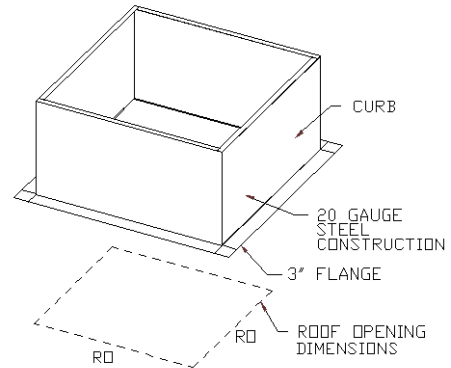
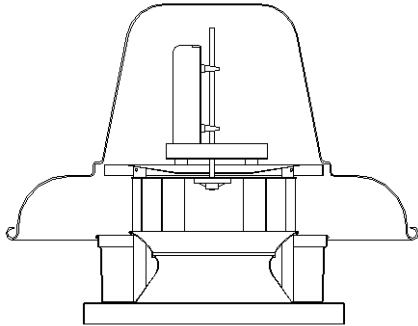
Down-Blast Installation

FEATURES:

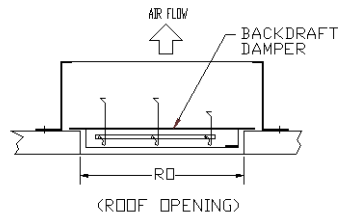
- ROOF MOUNTED FANS
- UL705
- AMCA SOUND AND AIR CERTIFIED
- WIRING FROM MOTOR TO DISCONNECT SWITCH
- DISCONNECT SWITCH
- STANDARD BIRD SCREEN

OPTIONS:

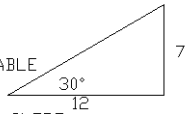
HINGED FAN
PITCHED CURB
INSULATED CURB
BACKDRAFT DAMPER



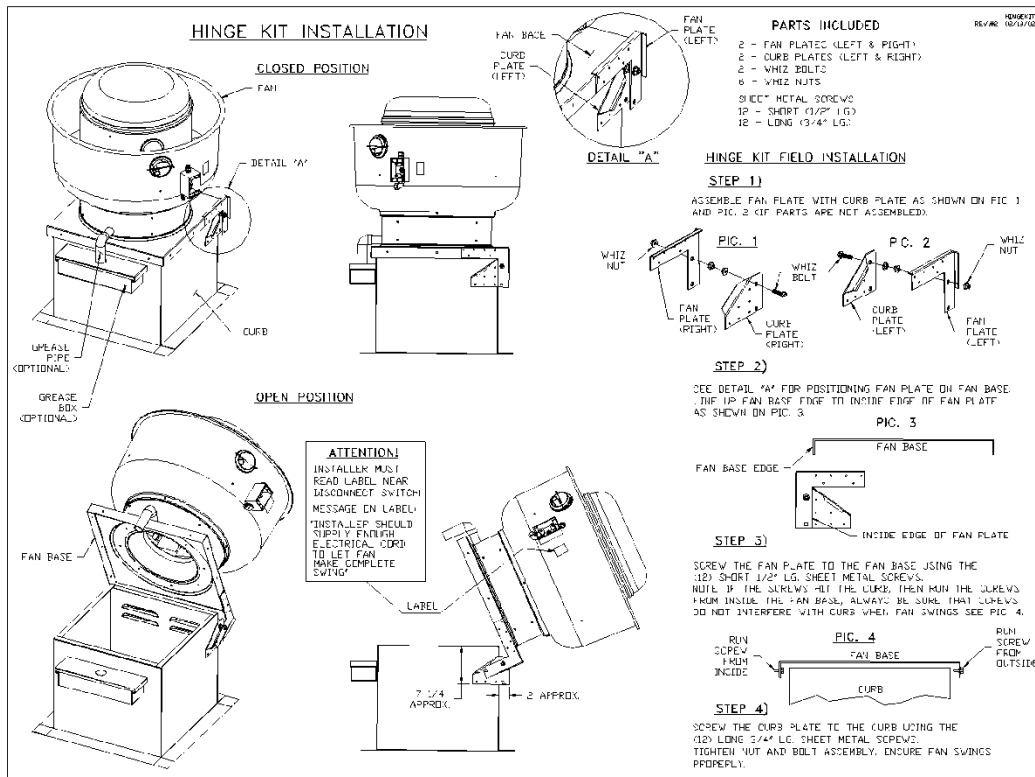
BACKDRAFT DAMPER INSTALLATION



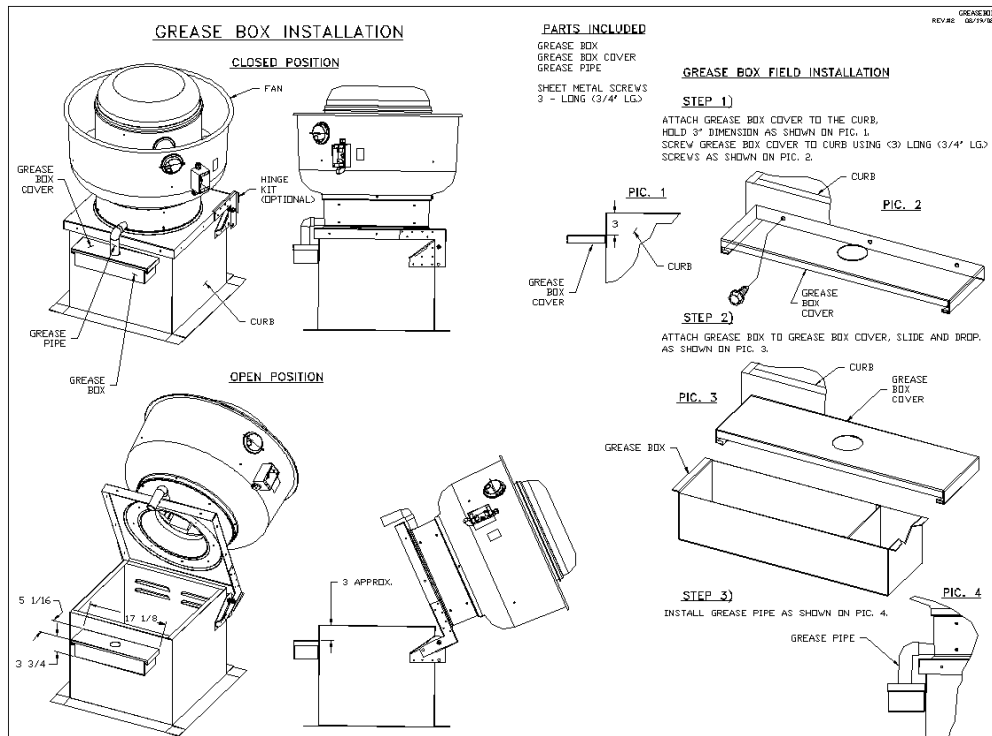
PITCHED CURBS ARE AVAILABLE
FOR PITCHED ROOFS.
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



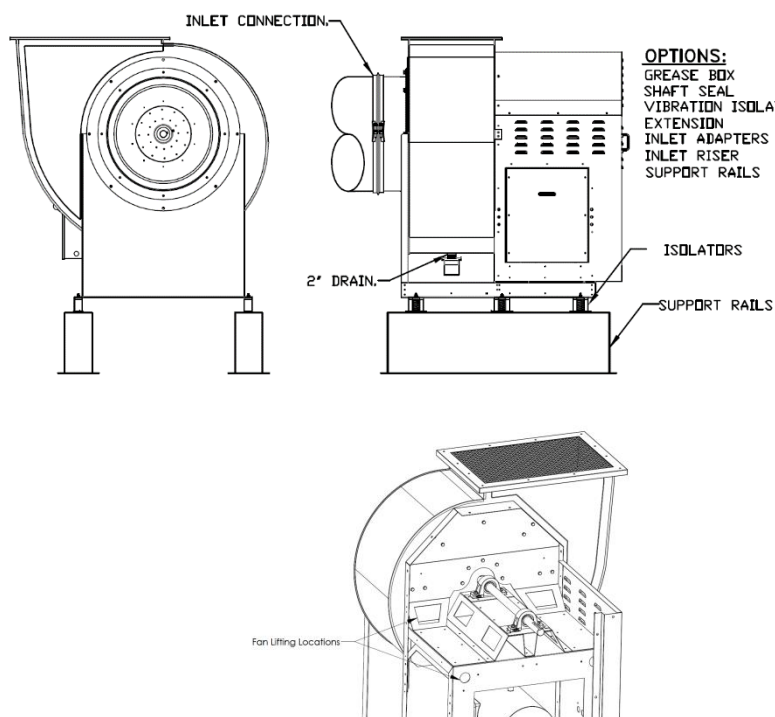
Typical Hinge Kit – Centrifugal Upblast



Typical Grease Box Installation



Up-Blast Utility Set Installation



OPTIONS:

GREASE BOX
SHAFT SEAL
VIBRATION ISOLATORS
EXTENSION
INLET ADAPTERS
INLET RISER
SUPPORT RAILS

FEATURES:

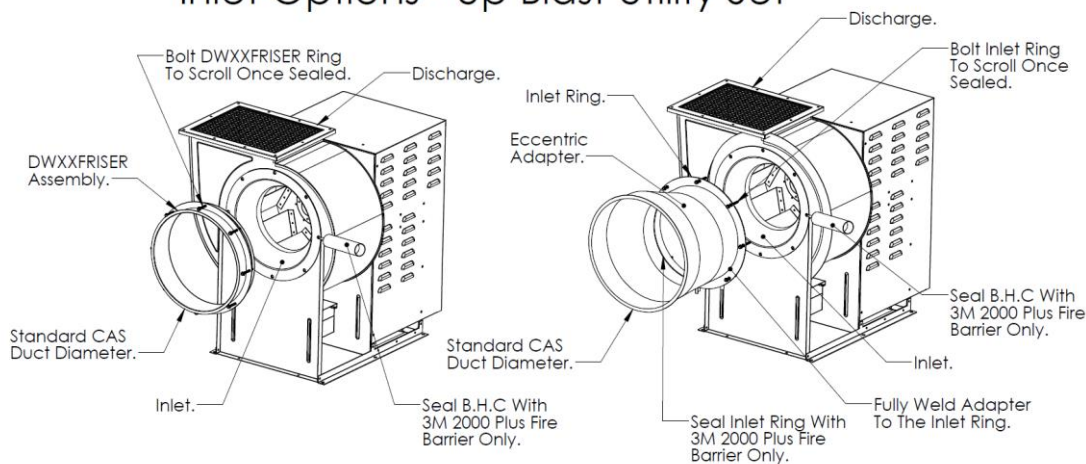
- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL705
- UL762
- HIGH HEAT OPERATION DIRECT DRIVE 350°F (176°C)
- HIGH HEAT OPERATION BELT DRIVE 350°F (176°C)
- HEAT SLINGER
- GREASE CLASSIFICATION TESTING
- 2" DRAIN
- MOTOR WEATHER COVER
- FULLY SEALED SCROLL HOUSING
- SCROLL ACCESS DOOR
- FLANGE 1 1/4" - 11 THRU 20.
- FLANGE 2" - 24 THRU 36.

NORMAL TEMPERATURE TEST BELT DRIVE
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 350°F (176°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

NORMAL TEMPERATURE TEST DIRECT DRIVE
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 350°F (176°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

Up-Blast Utility Set Inlet Options

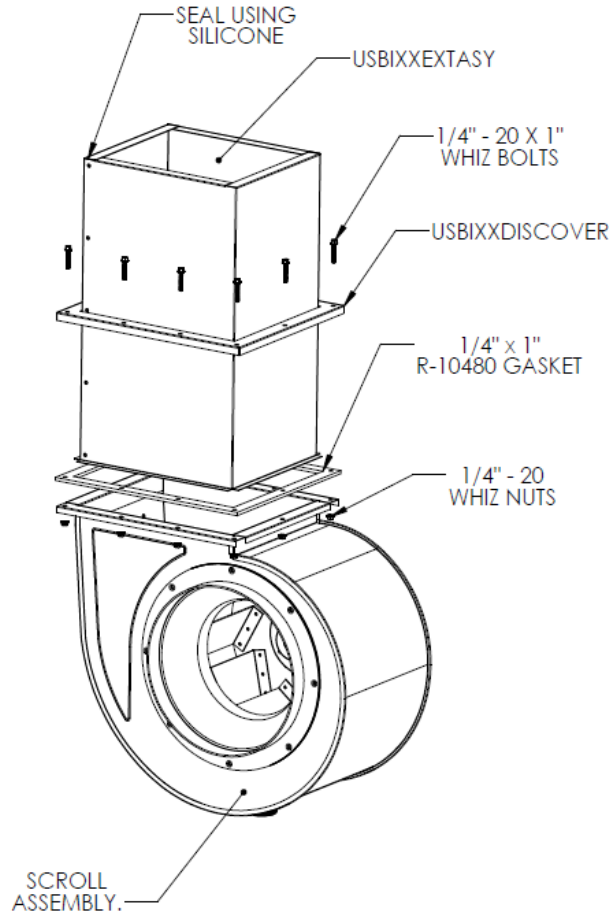
Inlet Options - Up Blast Utility Set



Inlet Connections						
Fan Size	Duct Diameter	Inlet Connection	B.H.C.	Inlet Ring OD	Hardware #	Hardware Qty
11	12"	DW12FRISER	13.375"	12.500"	1/4" - 20 x 1 1/2" (92323A523)	8
13	14"	DW14FRISER	15.375"	13.500"	1/4" - 20 x 1 1/2" (92323A523)	8
15	16"	DW16FRISER	17.375"	15.250"	1/4" - 20 x 1 1/2" (92323A523)	8
18	20"	DW20FRISER	21.375"	18.500"	1/4" - 20 x 1 1/2" (92323A523)	8
20	20"	DW20FRISERUSB120	22.375"	19.625"	1/4" - 20 x 1 1/2" (92323A523)	8
24	24"	DW24FRISERUSB124	28.000"	25.375"	3/8" - 16 X 1 1/2" (92323A558)	8
30	24"	DW24FRISERUSB130	26.962"	24.375"	3/8" - 16 X 1 1/2" (92323A558)	8
36	24"	DW307524ADPEC	N/A	30.500"	3/8" - 16 X 1 1/2" (92323A558)	8

Up-Blast Utility Set

Discharge Extension Options - Up Blast Utility Set



Hardware Counts

Hardware # Bolt / Nut	Hardware Qty
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	8
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	8
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	8
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	14

USBI - Discharge Extension

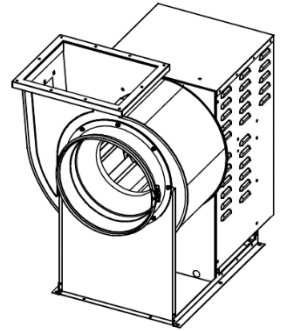
Fan Size	Extension #	"L"	"W"	"H"	Cover #
11	USB11EXTASY	12"	11"	24"	USB11DISCOVER
13	USB13EXTASY	14"	12"	24"	USB13DISCOVER
15	USB15EXTASY	16"	13"	24"	USB15DISCOVER
18	USB18EXTASY	19"	15"	24"	USB18DISCOVER
20	USB20EXTASY	21"	15"	24"	USB120DISCOVER
24	USB24EXTASY	26"	17"	24"	USB24DISCOVER
30	USB30EXTASY	32"	19"	24"	USB30DISCOVER
36	USB36EXTASY	39"	23"	24"	USB36DISCOVER

Up-Blast Utility Set Indoor Installation

Some situations prevent the installation of exhaust fans on the roof or other outdoor location. An indoor installation may be the only alternative.

Of the various types of fans that might be employed, utility sets seem most appropriate because they readily accommodate the inlet and outlet duct connections. Fans designed for curb mounting would present outlet duct connection difficulties.

Most jurisdictions having authority comply IMC, NFPA96 and with UL762 standards. Standard UL762 "Power Roof Ventilators for Restaurant Exhaust Appliances", covers the utility set high temperature and grease fire testing. NFPA96 "Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations", covers the installation of the duct connections to the inlet and out of the exhaust fan.



Standard UL762:

This standard has two primary tests. The first test has the fan exhaust air for several hours at the maximum temperature the manufacturer wishes to list the fan, such as 300 degrees F. The second part imitates a grease fire by igniting grease in a pan near an inlet duct. If the fan keeps running and does not display any unsafe results it passes those tests. They also examine the fan for any characteristics that might be unsuitable.

In the scope, section 1.1, it says "these requirements cover roof or wall-mounted ventilators for restaurant exhaust appliances". It would seem at first that the phrase "roof or wall mounted" would preclude applicability of the label indoors. However, in the very next paragraph it goes on to say "Power ventilators...covered by these requirements are intended for installation in accordance with ... NFPA 96". NFPA 96 clearly defines how to install a traditional ventilator indoors.

Standard NFPA 96 – 8.1.4* Utility Set Exhaust Fans.

8.1.4.2 Utility set exhaust fans installed within the building shall be located in an accessible area of adequate size to allow for service or removal.

8.1.4.3 Where the duct system connected to the fan is in an enclosure, the space or room in which the exhaust fan is located shall have the same fire resistance rating as the enclosure.

8.1.4.4 The fan shall be connected to the exhaust duct by flanges securely bolted as shown in Figure 8.1.3.2 (a) through Figure 8.1.3.2 (d) or by a system specifically listed for such use, such as UL1978 or UL2221 listed duct systems.

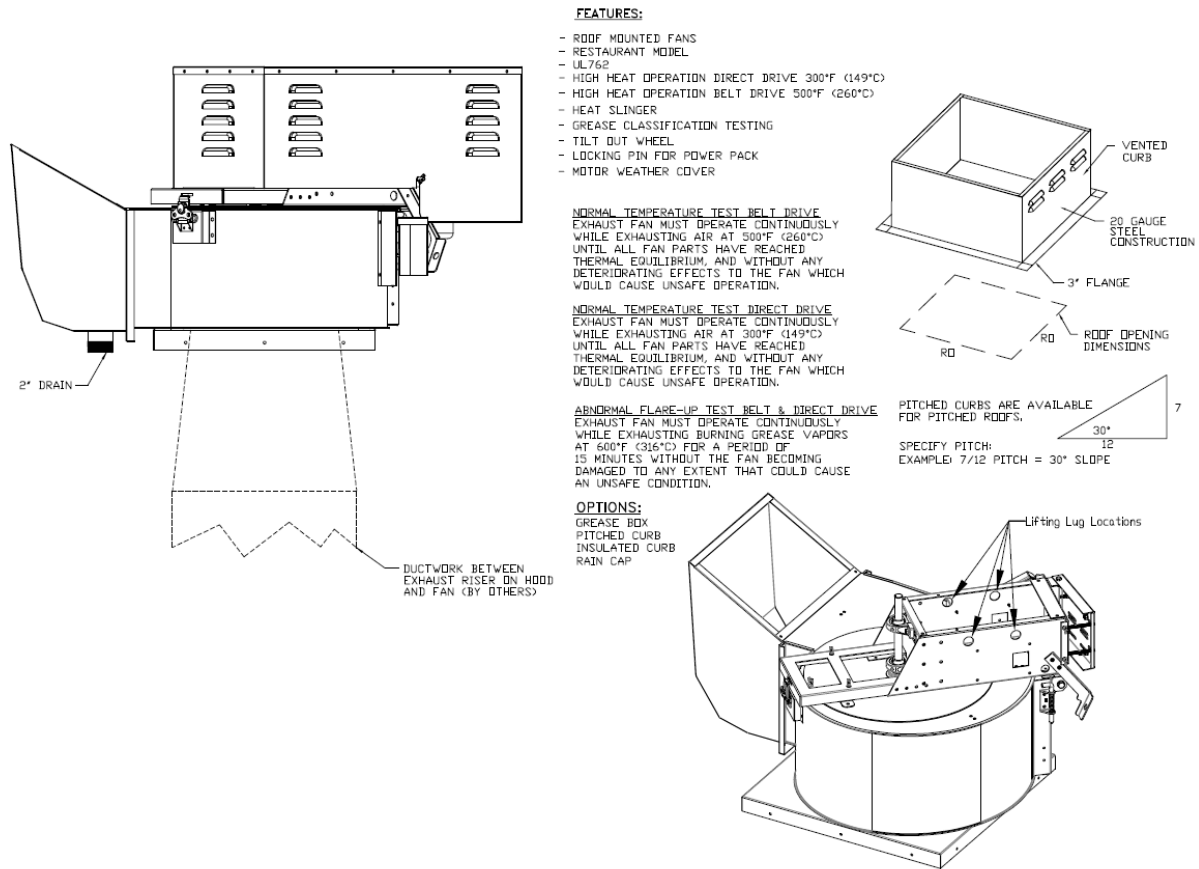
8.1.4.5 Flexible connectors shall not be used.

8.1.4.6 Exhaust fans shall have a drain directed to a readily accessible and visible grease receptacle not to exceed 3.8 L (1 gallon).

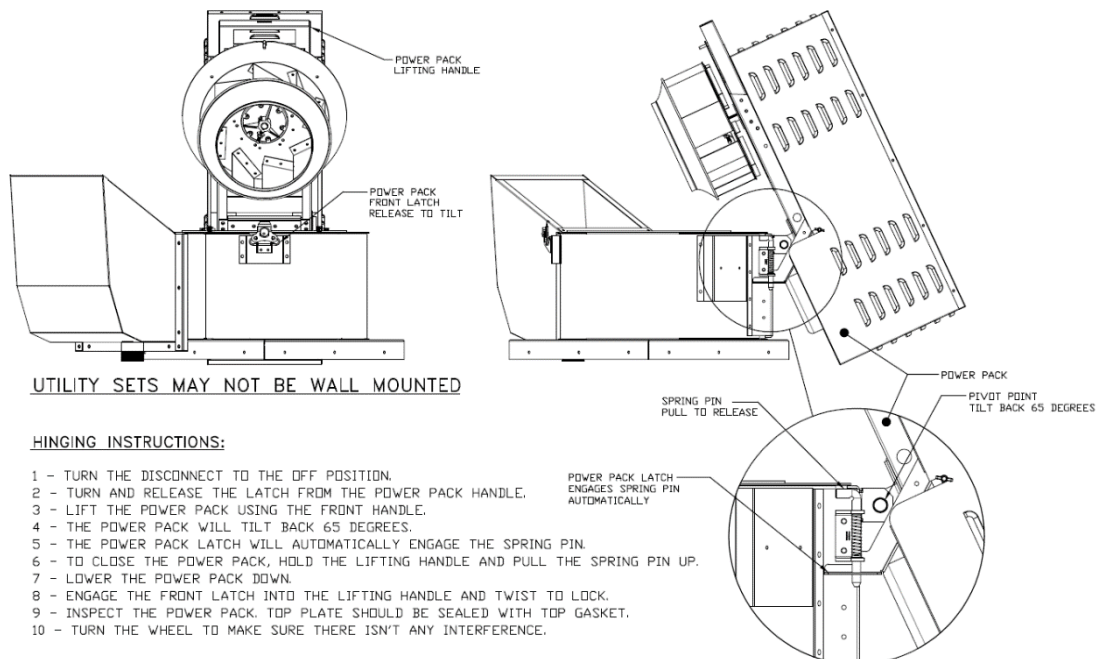
Manufactures Recommendations for Indoor Installation:

1. The fan inlet and outlet must be connected to the ducts using companion flanges and high temperature (1500F) gaskets or by a system specifically listed for such use, such as UL1978 or UL2221 listed duct systems.
2. Install the fan where there is room for service and removal.
3. Usually the duct to the fan is in a shaft and the shaft walls have a fire resistance rating. The space where the fan is located must have the same fire resistance rating as the shaft.
4. Flexible connectors are not allowed.
5. There must be a drain in the fan that is directed to a readily accessible and visible grease receptacle, ideally piped to the building grease trap.
6. The exhaust housing constructed of carbon steel not less than 1.52 mm (.060 in.), unless listed in accordance with the terms of the listing.
7. Inlet and outlet ducts will have access doors installed 3 feet from the fan for service and maintenance.
8. Minimum clearances are 18" inches to combustible, 3" inches to limited, 0" inches to non-combustibles.
9. All wiring and electrical equipment must comply with NFPA 70, National Electrical Code.

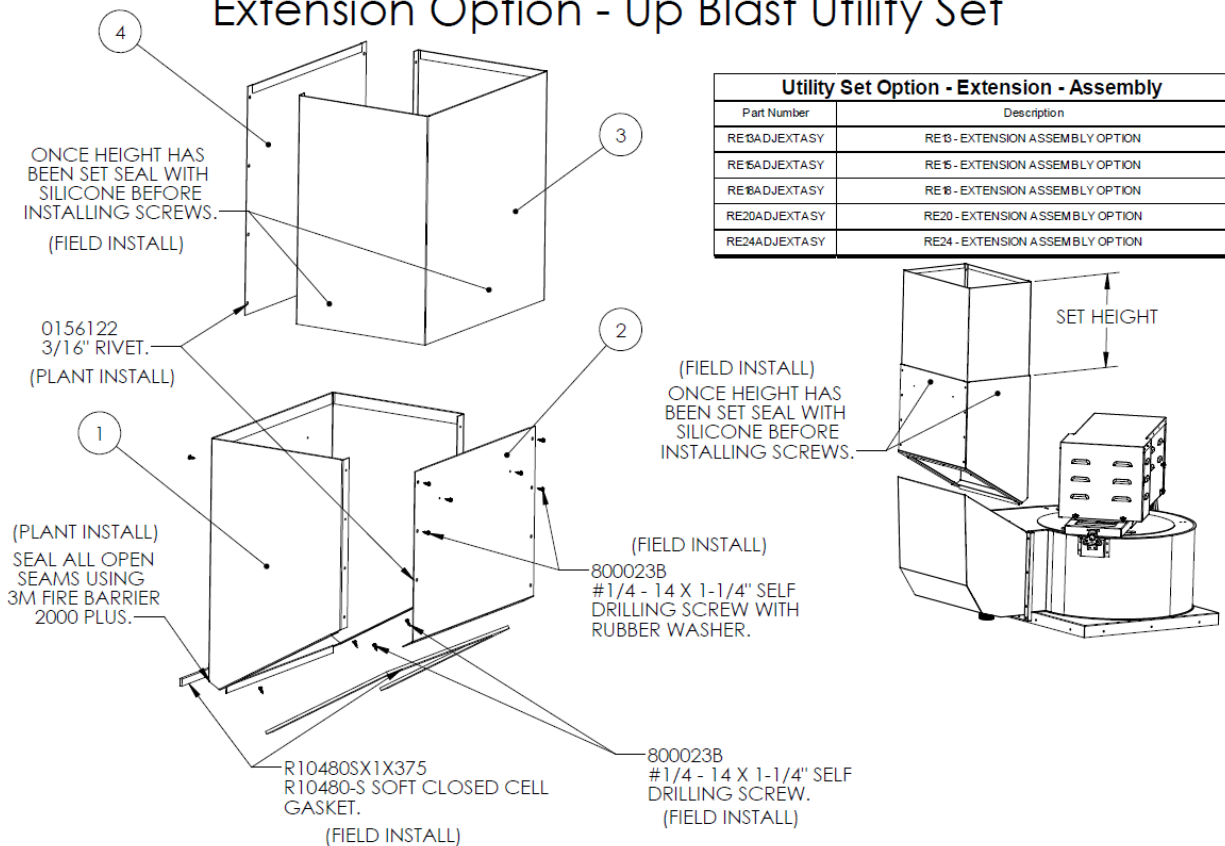
Up-Blast Curb Mount Utility Set Installation



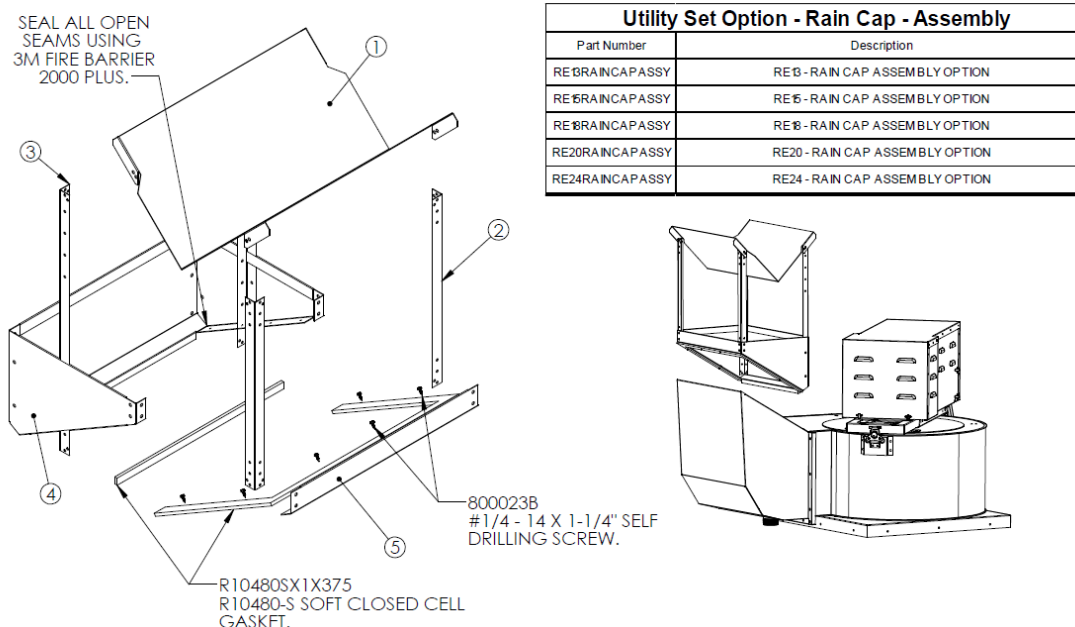
Up-Blast Curb Mounted Utility Set Hinging Instructions



Up-Blast Curb Mounted Utility Set Discharge Extension Option Extension Option - Up Blast Utility Set

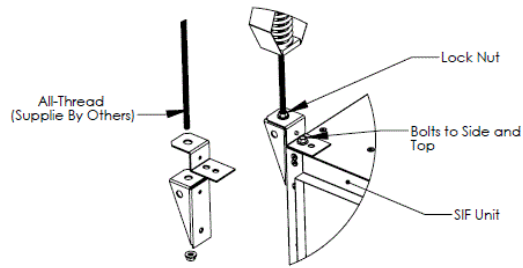


Up-Blast Curb Mounted Utility Set Rain Cap Option Rain Cap Option - Up Blast Utility Set

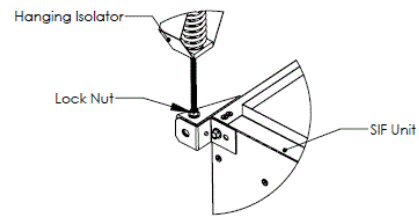


Square Inline Mounting Bracket Detail

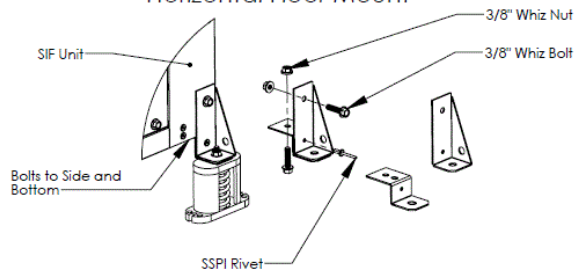
Horizontal Overhead Mount



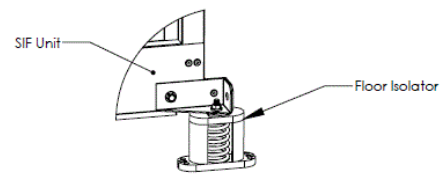
Vertical Overhead Mount



Horizontal Floor Mount

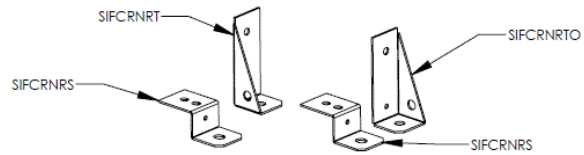


Vertical Floor Mount

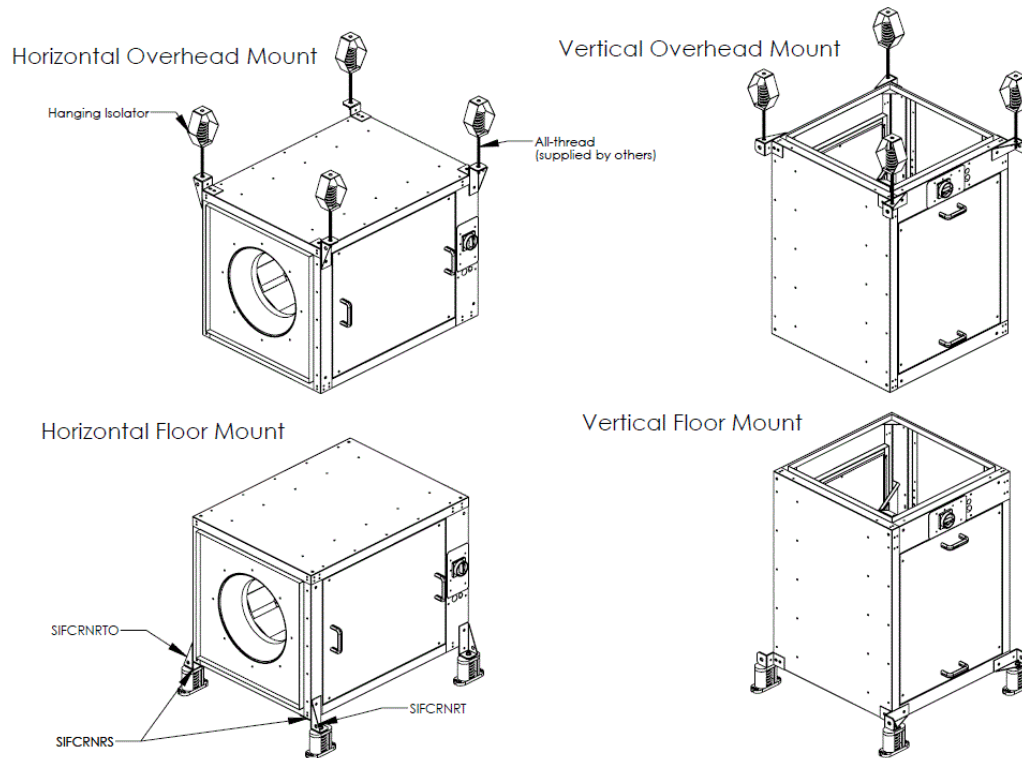


Each Mounting configuration requires:

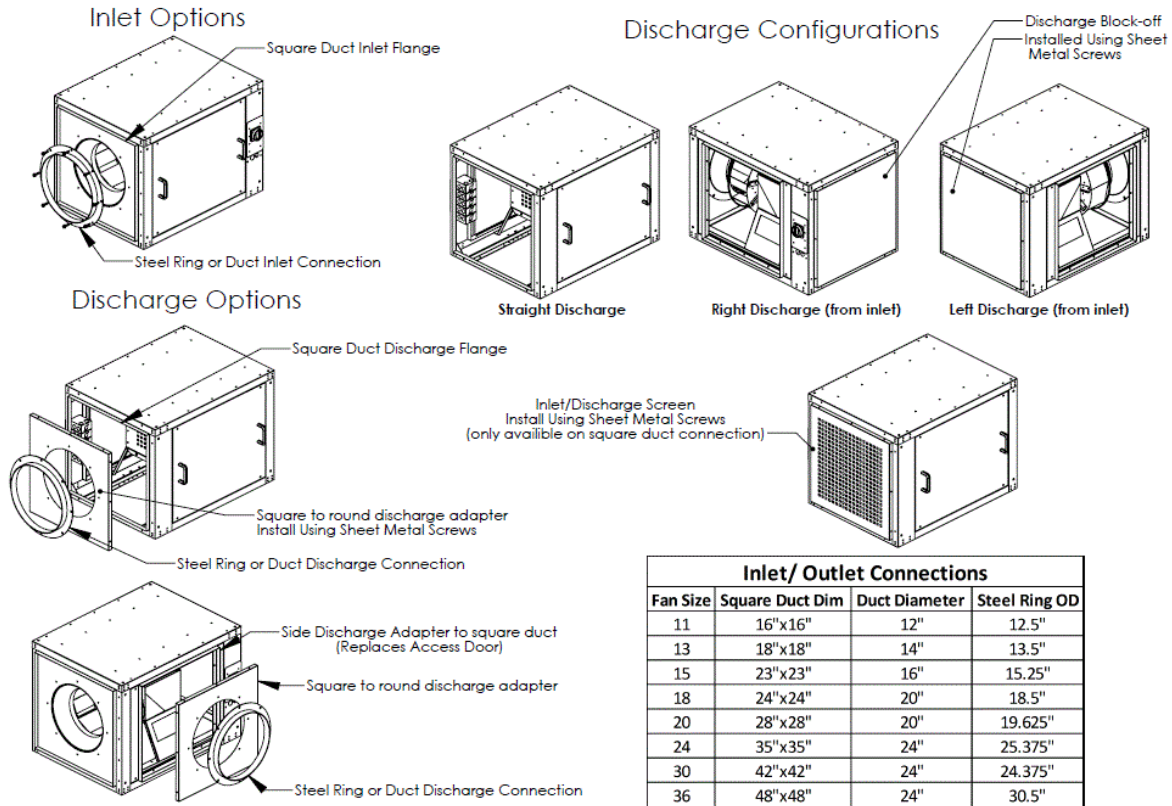
- (2) SIFCRNRT
- (2) SIFCRNRTO
- (4) SIFCRNRS



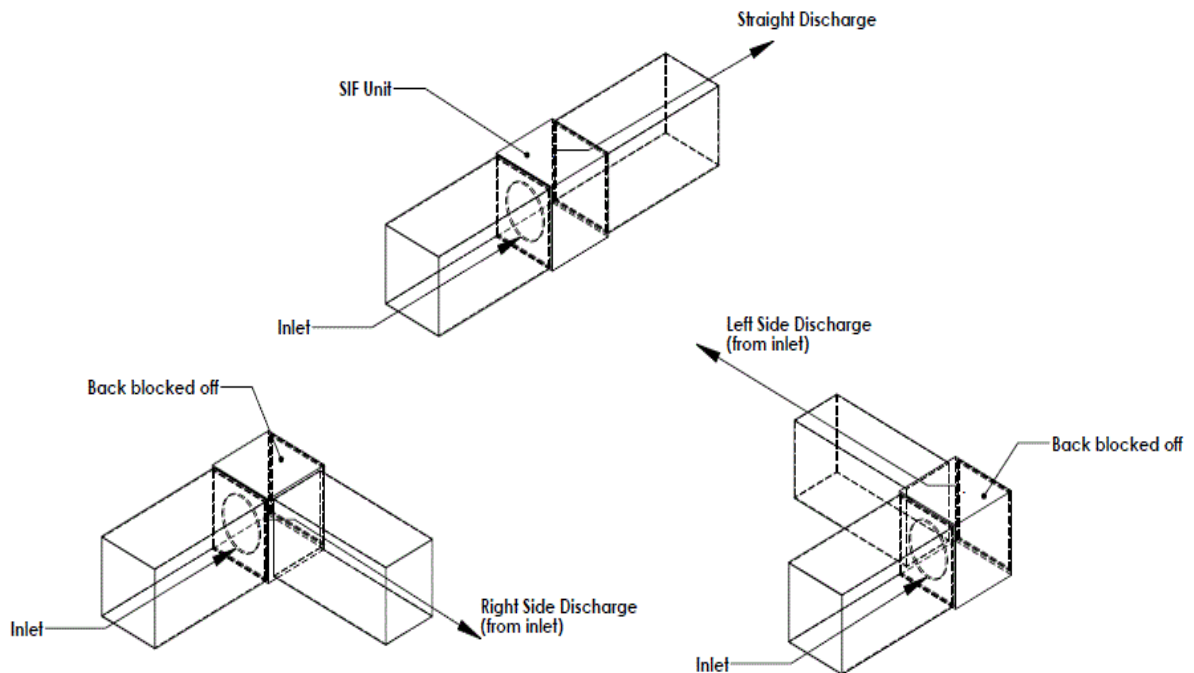
Square Inline Mounting Configurations



Square Inline Discharge Options



Square Inline Discharge Configurations



Electrical

Before connecting power to the fan, read and understand this entire section of this document. As-built wiring diagrams are available with each fan by the factory.

Electrical wiring and connections should be done in accordance with local ordinances and the National Electric Code, ANSI/NFPA70. Be sure the voltage and phase of the power supply and the wire amperage capacity is in accordance with the motor nameplate. For additional safety information refer to AMCA publication 410-96, *Recommended Safety Practices for Users and Installers of Industrial and Commercial Fans*.

1. Always **disconnect power** before working on or near a fan. Lock and tag the disconnect switch or breaker to prevent accidental power up.
2. A disconnect switch is shipped with every fan. The switch is located on the exterior of up-blast fans and in the interior of down-blast fans. On down-blast direct drive fans, the disconnect function is built into the speed controller.
3. A dedicated branch circuit should supply the motor circuit with short circuit protection according to the National Electric Code. This dedicated branch should be run to the junction box mentioned above and connected as shown in a following illustration labeled "Fan to Building Wiring Connection".
4. Make certain that the power source is compatible with the requirements of your equipment. The fan nameplate identifies the **proper phase and voltage** of the motor.
5. Before connecting fan to building power source, verify power line wiring is de-energized.
6. Secure the power cable to prevent contact with sharp objects.
7. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces or chemicals.
8. Before powering up fan check fan wheel for free rotation and make sure that the interior of the fan is free of loose debris or shipping materials.
9. If any of the original wire supplied with the fan must be replaced, it must be replaced with type TW wire or equivalent.

WARNING!!

Disconnect power before installing or servicing fan. High voltage electrical input is needed for this equipment. This work should be performed by a qualified electrician.

Copper Wire Ampacity

Wire Size AWG	Maximum Amps
14	15
12	20
10	30
8	50
6	65
4	85

IMPORTANT: FANS WITH HINGE KITS REQUIRE ENOUGH SLACK IN THE WIRING TO THE FAN TO ALLOW FAN TO TILT BACK TO THE OPEN POSITION. ELECTRICIAN MUST CHECK THIS AND ACCOUNT FOR THE RANGE OF MOTION OF THE FAN.

Motorized Damper

On units shipped with the optional motorized damper, power must be supplied to the damper according to the damper nameplate. The damper motor is controlled external to the fan. **External wiring to the damper motor is required.**

PSC (Permanent Split Capacitor) Motor Speed Control

Some single phase direct drive fans contain speed controls that regulate the amount of voltage going to the motor. Specific PSC motors must be used in conjunction with speed controls. The speed control has a knob with an off position, and high to low range. At high speed, the speed control allows all of the line voltage to pass right to the motor.



A minimum speed adjustment is provided to allow independent control of the minimum speed setting. Minimum speed adjustment ensures motor runs with sufficient torque to prevent stalling. To adjust this:

- 1) Motor must be in actual operating conditions to achieve proper speed adjustment. Motor will not slow down unless proper load is applied.
- 2) Turn main control knob to lowest speed position.
- 3) Locate and adjust minimum speed setting and adjust with small screw driver. This can be found under the speed control faceplate, (rotate clockwise to decrease minimum speed; counter-clockwise to increase minimum speed).
- 4) Motor will now operate from this preset minimum speed to full speed.

The lowest minimum voltage that may be applied to these motors is 65VAC. Running lower voltages to the motor can cause premature failure and overheating problems.

Electronically Commutated Motor (ECM) Speed Control

EC Motors and controls allow accurate manual adjustment of fan speed. The benefits of using an EC Motor are exceptional efficiency, performance, and motor life.

NOTE: To adjust the speed of 3 phase direct drive motors, a variable frequency drive is required.

EVO EC Motor Control

The control unit features a 4 digit LED numerical display. The knob on the unit allows the user to set the flow index with a screwdriver. Twenty seconds later, the display shows the motor RPM. Then, the display periodically alternates between the flow index and motor RPM. The flow index has a range of 0 to 100% and is typically linear with motor RPM.

The EC Motor control requires a **24VAC** input and can locally turn the motor on and off. The motor can be adjusted between 300 RPM and maximum speed with this control.



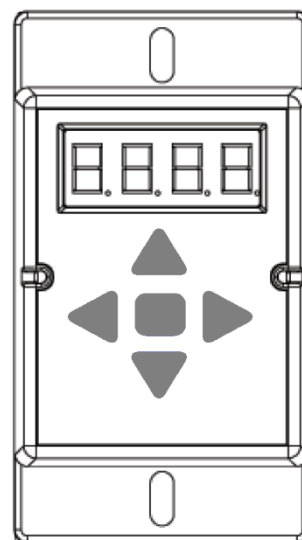
RTC FSC-1 Motor Control

The control unit features a 4 digit LED display, with a five button interface. All parameters can be accessed through the user menu. The percent of run speed can be changed by using the Up, and Down buttons, followed by pressing Enter (middle button) to save changes. Every **ten seconds** the display will toggle between current percentage of run speed, and current RPMs. The flow index has a range of **0-100%** and is typically linear with motor RPM.

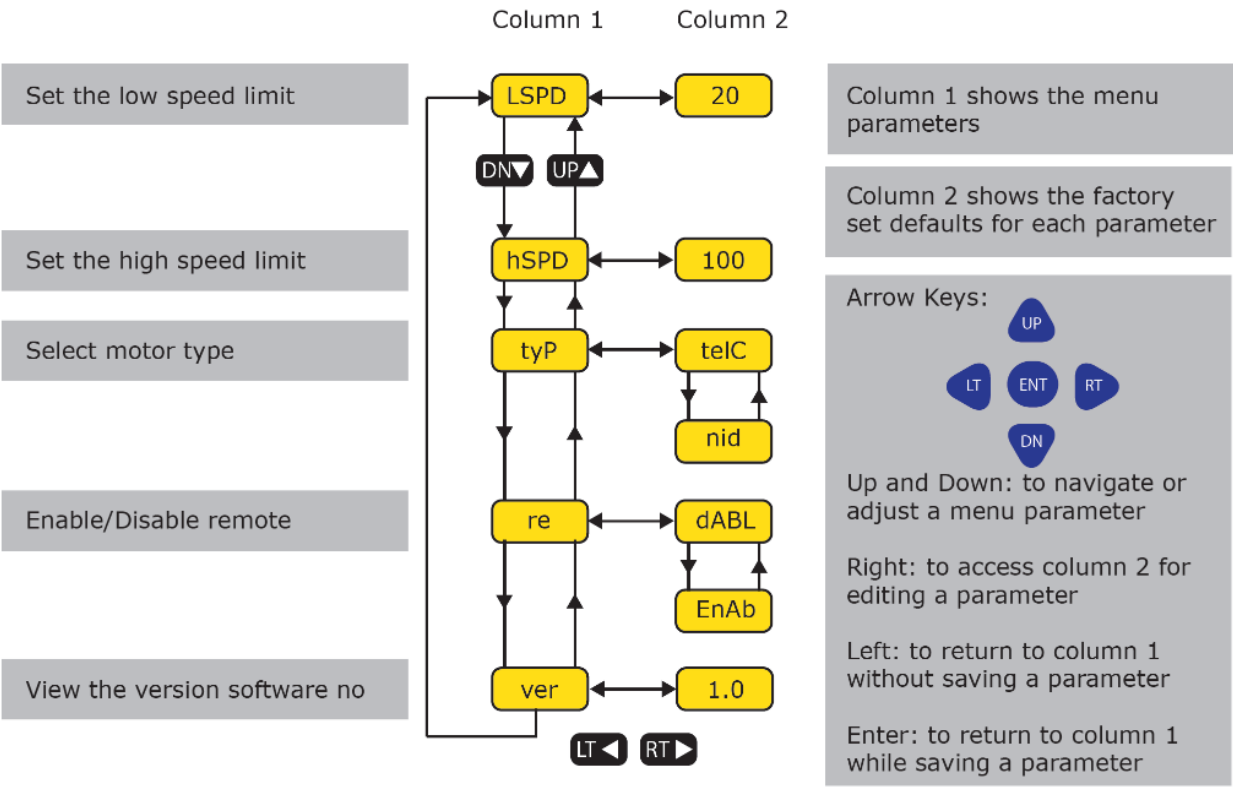
If the remote function (re) is enabled, the speed is controlled through a **0-10V** input. **0V = 0%** and **10V = 100%**, unless overridden by the low speed and high speed limits.

The EC Motor control requires a **24VAC** input and can locally turn the motor on and off. The motor RPM range is fully adjustable between the minimum and maximum set points, see LSPD and HSPD on the programming display. For more information see the control operating manual.

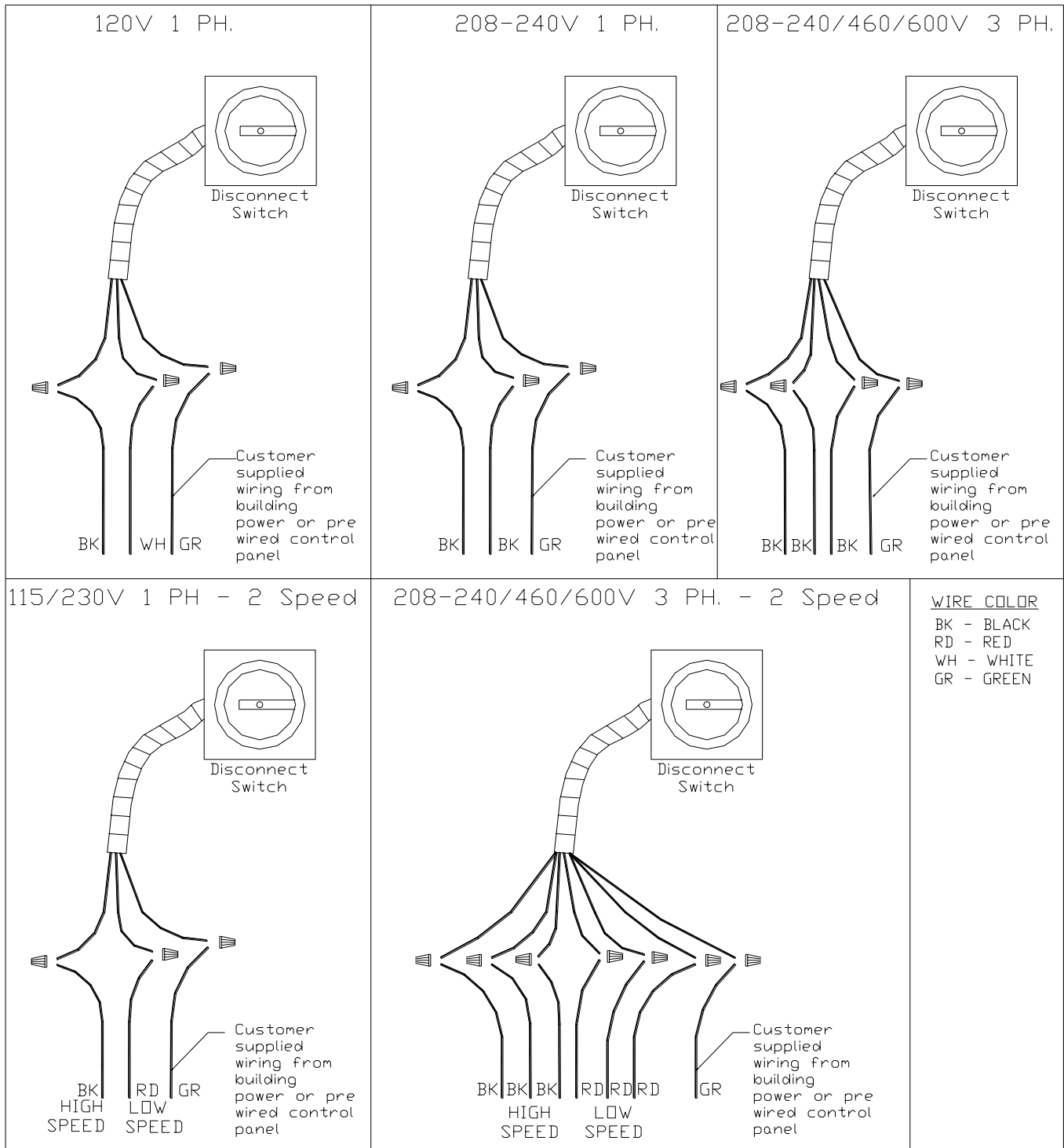
If “off” is being displayed, and the speed is set above 300 RPM, the ECM is not receiving RPM feedback. Check that the ECM is wired correctly. Check that the motor “tYP” in the settings matches the motor manufacturer.



Programming Map RTC FSC-1



Fan to Building Wiring Connection



Variable Frequency Drive (VFD) Installation Instructions

Input AC Power

1. Circuit breakers feeding the VFDs are recommended to be thermal-magnetic and fast acting. They should be sized based on the VFD amperage and according to the table below. Refer to the installation schematic for exact breaker sizing.
2. Each VFD should be fed by its own breaker. If multiple VFDs are to be combined on the same breaker, each drive should have its own protection measure (fuses or miniature circuit breaker) downstream from the breaker.
3. Input AC line wires should be run in conduit from the breaker panel to the drives. AC input power to multiple VFDs can be run in a single conduit if needed. **Do not combine input and output power cables in the same conduit.**
4. The VFD should be grounded on the terminal marked PE. A separate insulated ground wire must be provided to each VFD from the electrical panel. This will reduce the noise being radiated in other equipment.

ATTENTION!

DO NOT CONNECT INCOMING AC POWER TO OUTPUT TERMINALS U, V, W. SEVERE DAMAGE TO THE DRIVE WILL RESULT. INPUT POWER MUST ALWAYS BE WIRED TO THE INPUT L TERMINAL CONNECTIONS (L1, L2, L3)

VFD Output Power

1. Motor wires from each VFD to its respective motor **MUST** be run in a **separate steel** conduit away from control wiring and incoming AC power wiring to avoid noise and crosstalk between drives. An insulated ground must be run from each VFD to its respective motor. Do not run different fans output power cables in the same conduit.
2. Load reactors: If the distance between the VFD and the motor is great, a load reactor should be used between the VFD and the motor. The output reactor should be sized accordingly and installed within 10 feet of the output of the VFD. 208/230V – Load reactor should be used when distance exceeds 250 feet. 460/480V – Load reactor should be used when distance exceeds 50 feet. 575/600V – Load reactor should be used when distance exceeds 25 feet.
3. If the distance between the VFD and the motor is extremely long, up to 1000 FT, a dV/dT filter should be used and the VFD should be increased by 1 HP or to the next size VFD. The dV/dT filter should be sized accordingly and installed within 10 feet of the output of the VFD.
208/230V – dV/dT filter should be used when distance exceeds 400 feet.
460/480V – dV/dT filter should be used when distance exceeds 250 feet.
575/600V – dV/dT filter should be used when distance exceeds 150 feet.
4. No contactor should be installed between the drive and the motor. Operating such a device while the drive is running can potentially cause damage to the power components of the drive.
5. When a disconnect switch is installed between the drive and motor, the disconnect should only be operated when the drive is in a STOP state.

VFD Programming

Programming

1. The Drive should be programmed for the proper motor voltage. P107 is set to 0 (Low) if motor voltage is 120 VAC, 208 VAC or 400 VAC. P107 is set to 1 (High) if motor voltage is 230 VAC, 480 VAC or 575 VAC.
2. The Drive should be programmed for the proper motor overload value. P108 is calculated as $\text{Motor FLA} \times 100 / \text{Drive Output Rating}$ (available in table below).

To enter the PROGRAM mode to access the parameters:

1. Press the Mode (M) button. This will activate the password prompt (PASS).
2. Use the Up and Down buttons to scroll to the password value (the factory default password is "0225") and press the Mode (M) button. Once the correct password is entered, the display will read "P100", which indicates that the PROGRAM mode has been accessed at the beginning of the parameter menu.
3. Use the Up and Down buttons to scroll to the desired parameter number..
4. Once the desired parameter is found, press the Mode (M) button to display the present parameter setting. The parameter value will begin blinking, indicating that the present parameter setting is being displayed. The value of the parameter can be changed by using the Up and Down buttons.
5. Pressing the Mode (M) button will store the new setting and also exit the PROGRAM mode. To change another parameter, press the Mode (M) button again to re-enter the PROGRAM mode. If the Mode button is pressed within 1 minute of exiting the PROGRAM mode, the password is not required to access the parameters. After one minute, the password must be re-entered in order to access the parameters again.

P500 parameter provides a history of the last 8 faults on the drive. It can be accessed without getting into PROGRAM mode.

ACTECH SMV VFD CROSS-REFERENCE TABLE

Model Number	Volts	1Ø input	3Ø input	HP	Input Amps 1Ø 120VAC	Input Amps 1Ø 240VAC	Output Amps	Breaker 1Ø 120VAC	Breaker 1Ø 240VAC
ESV251N01SXB	120/240V	X		0.33	6.8	3.4	1.7	15	15
ESV371N01SXB	120/240V	X		0.5	9.2	4.6	2.4	15	15
ESV751N01SXB	120/240V	X		1	16.6	8.3	4.2	25	15
ESV112N01SXB	120/240V	X		1.5	20	10	6	30	20
					Input Amps 1Ø	input Amps 3Ø		Breaker 1Ø	Breaker 3Ø
ESV371N02YXB	240V	X	X	0.5	5.1	2.9	2.4	15	15
ESV751N02YXB	240V	X	X	1	8.8	5	4.2	15	15
ESV112N02YXB	240V	X	X	1.5	12	6.9	6	20	15
ESV152N02YXB	240V	X	X	2	13.3	8.1	7	25	15
ESV222N02YXB	240V	X	X	3	17.1	10.8	9.6	30	20
ESV402N02TXB	240V		X	5		18.6	16.5		30
ESV552N02TXB	240V		X	7.5		26	23		40
ESV752N02TXB	240V		X	10		33	29		50
ESV113N02TXB	240V		X	15		48	42		80
ESV153N02TXB	240V		X	20		59	54		90
ESV751N04TXB	480V		X	1		2.5	2.1		15
ESV112N04TXB	480V		X	1.5		3.6	3		15
ESV152N04TXB	480V		X	2		4.1	3.5		15
ESV222N04TXB	480V		X	3		5.4	4.8		15
ESV402N04TXB	480V		X	5		9.3	8.2		15
ESV552N04TXB	480V		X	7.5		12.4	11		20
ESV752N04TXB	480V		X	10		15.8	14		25
ESV113N04TXB	480V		X	15		24	21		40
ESV153N04TXB	480V		X	20		31	27		50
ESV183N04TXB	480V		X	25		38	34		70
ESV223N04TXB	480V		X	30		45	40		80
ESV303N04TXB	480V		X	40		59	52		100
ESV373N04TXB	480V		X	50		74	65		125
ESV453N04TXB	480V		X	60		87	77		150
ESV751N06TXB	600V		X	1		2	1.7		15
ESV152N06TXB	600V		X	2		3.2	2.7		15
ESV222N06TXB	600V		X	3		4.4	3.9		15
ESV402N06TXB	600V		X	5		6.8	6.1		15
ESV552N06TXB	600V		X	7.5		10.2	9		20
ESV752N06TXB	600V		X	10		12.4	11		20
ESV113N06TXB	600V		X	15		19.7	17		30
ESV153N06TXB	600V		X	20		25	22		40
ESV183N06TXB	600V		X	25		31	27		50
ESV223N06TXB	600V		X	30		36	32		60
ESV303N06TXB	600V		X	40		47	41		70
ESV373N06TXB	600V		X	50		59	52		90
ESV453N06TXB	600V		X	60		71	62		110

OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan **OFF** or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

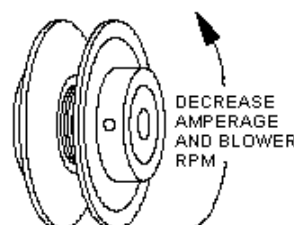
Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Check pulley alignment and belt tension as described below for belt drive fans.
3. Inspect the condition of the damper and damper linkage, if provided.
4. Inspect the air-stream for obstructions or debris in wheel.
5. Compare the supplied **voltage** with the fan's nameplate voltage. If this does not match, correct the problem.
6. Start the fan up, by turning the external disconnect to the **ON** position, and shut it **OFF** immediately to **check rotation of the wheel** with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
7. When the fan is started up, observe the operation and check for any unusual noises.
8. Switch the external disconnect back to the **ON** position and with the air system in full operation and all ducts attached, measure the system airflow. Motor sheave (pulley) is variable pitch, and allows for an increase or decrease of the fan RPM to adjust the airflow, as shown in the illustration below. For your convenience, a RPM chart is included in the following pages. If the fan is a direct drive version, it may have a speed control to adjust speed.
9. Once the proper airflow is achieved, measure and record the fan speed with a reliable tachometer. **Caution - Excessive speed will result in motor overloading or bearing failure. Do not set fan RPMs higher than specified in the maximum RPM chart.** See the troubleshooting guide for more information.
10. Measure and record the **voltage** and **amperage** to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.
11. Once the rpm of the ventilator has been properly set, disconnect power and recheck belt tension and pulley alignment as described below.

Pulley Setscrew Torque

Thread Size	Torque (IN/Lb)
No. 10 (bushing)	32
1/4" (bushing)	72
5/16"	130

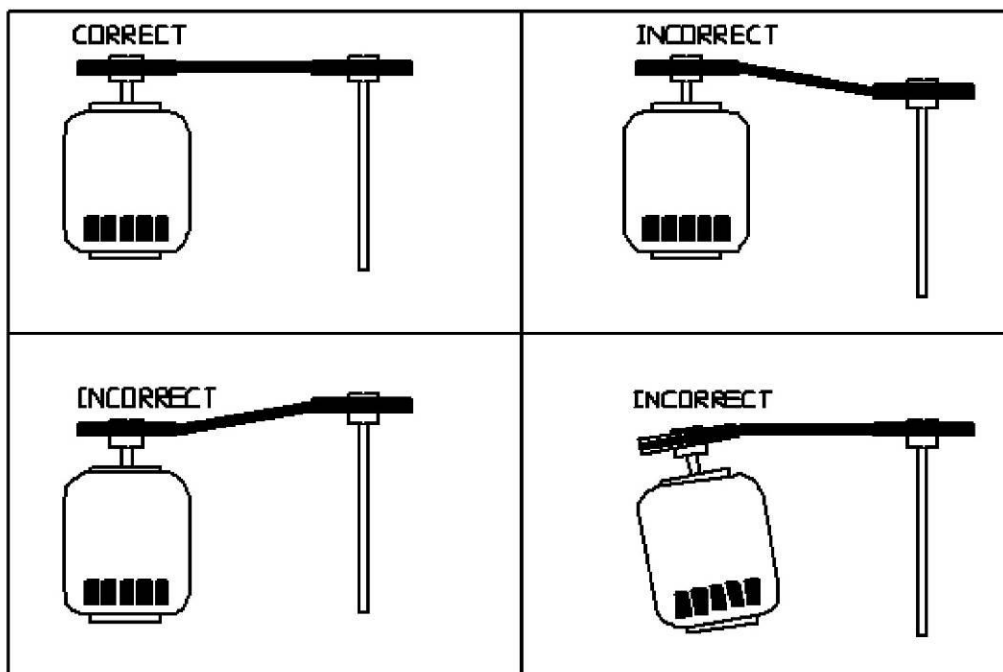
Pulley Adjustment Illustration



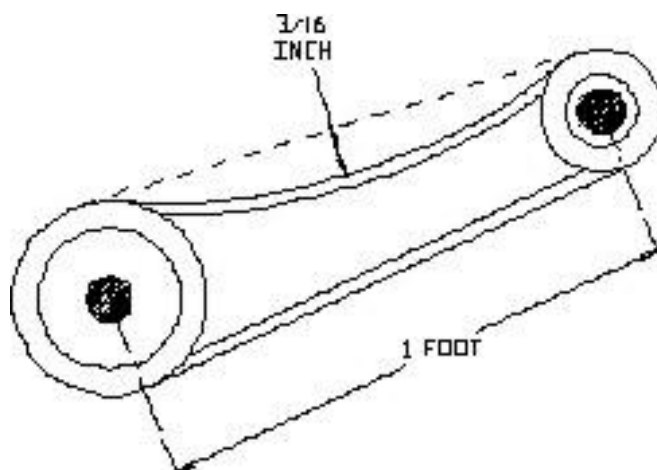
Pulley Adjustment (Belt Drive Fans)

The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor sheave. Two groove variable pitch pulleys must be adjusted an equal number of turns open or closed. Any increase in speed represents a substantial increase in horsepower required by the unit. Motor amperage should always be checked to avoid serious damage to the motor when the speed is varied. Always torque setscrews according to the setscrew torque chart.

Pulley Alignment



Proper Belt Tension



Pulley Combination Chart

Motor RPM			1725												
1/3 to 1-1/2 HP AX BELTS			MOTOR PULLEY 1VL34			Dd1 1.9	Dd2 2.9	Pd1 2	Pd2 3						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0		
AK114	11	11.2	308	323	339	354	370	385	400	416	431	447	462		
1/3 to 1-1/2 HP AX BELTS			MOTOR PULLEY 1VL40			Dd1 2.4	Dd2 3.4	Pd1 2.6	Pd2 3.6						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0		
AK114	11	11.2	400	416	431	447	462	477	493	508	524	539	554		
AK94	9	9.2	488	506	525	544	563	581	600	619	638	656	675		
AK79	7.5	7.7	582	605	627	650	672	694	717	739	762	784	806		
AK66	6.2	6.4	701	728	755	782	809	836	863	889	916	943	970		
AK54	5	5.2	863	896	929	962	995	1028	1062	1095	1128	1161	1194		
AK46	4.2	4.4	1019	1059	1098	1137	1176	1215	1255	1294	1333	1372	1411		
AK39	3.5	3.7	1212	1259	1305	1352	1399	1445	1492	1539	1585	1632	1678		
AK32	3	3.2	1402	1455	1509	1563	1617	1671	1725	1779	1833	1887	1941		
2 to 5 HP BX BELTS			MOTOR PULLEY 2VP42			Dd1 2.9	Dd2 3.9	Pd1 3	Pd2 4						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BK160H	15.4	15.7	330	339	348	357	366	375	385	394	403	412	421	430	439
2BK140H	13.4	13.7	378	388	399	409	420	430	441	451	462	472	483	493	504
2BK120H	11.4	11.7	442	455	467	479	491	504	516	528	541	553	565	577	590
2BK110H	10.4	10.7	484	497	511	524	537	551	564	578	591	605	618	631	645
2BK100H	9.4	9.7	534	548	563	578	593	608	622	637	652	667	682	697	711
2BK90H	8.4	8.7	595	611	628	644	661	677	694	710	727	744	760	777	793
2BK80H	7.4	7.7	672	691	709	728	747	765	784	803	821	840	859	877	896
2BK70H	6.4	6.7	772	794	815	837	858	880	901	923	944	965	987	1008	1030
2BK60H	5.4	5.7	908	933	958	984	1009	1034	1059	1084	1110	1135	1160	1185	1211
2BK55H	4.9	5.2	995	1023	1050	1078	1106	1133	1161	1189	1216	1244	1272	1299	1327
2BK50H	4.4	4.7	1101	1132	1162	1193	1223	1254	1285	1315	1346	1376	1407	1438	1468
7-1/2 to 10 HP BX BELTS			MOTOR PULLEY 2VP60			Dd1 4.3	Dd2 5.5	Pd1 4.7	Pd2 5.9						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BK160H	15.4	15.7	516	527	538	549	560	571	582	593	604	615	626	637	648
2BK140H	13.4	13.7	592	604	617	630	642	655	667	680	693	705	718	730	743
2BK120H	11.4	11.7	693	708	722	737	752	767	781	796	811	826	840	855	870
2BK110H	10.4	10.7	758	774	790	806	822	838	854	871	887	903	919	935	951
2BK100H	9.4	9.7	836	854	871	889	907	925	943	960	978	996	1014	1031	1049
2BK90H	8.4	8.7	932	952	972	991	1011	1031	1051	1071	1091	1110	1130	1150	1170
2BK80H	7.4	7.7	1053	1075	1098	1120	1143	1165	1187	1210	1232	1255	1277	1299	1322
3 to 5 HP BX BELTS			MOTOR PULLEY 2VP42			Dd1 2.9	Dd2 3.9	Pd1 3	Pd2 4						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BSV278	27.8	28.1	184	189	194	200	205	210	215	220	225	230	235	240	246
2BSV250	25	25.3	205	210	216	222	227	233	239	244	250	256	261	267	273
2BSV234	23.4	23.7	218	224	230	237	243	249	255	261	267	273	279	285	291
2BSV200	20	20.3	255	262	269	276	283	290	297	304	312	319	326	333	340
2BSV184	18.4	18.7	277	284	292	300	307	315	323	331	338	346	354	361	369
2BSV160	16	16.3	317	326	335	344	353	362	370	379	388	397	406	414	423
2BSV154	15.4	15.7	330	339	348	357	366	375	385	394	403	412	421	430	439
2BSV136	12.6	12.9	401	412	423	435	446	457	468	479	490	501	513	524	535
2BSV124	12.4	12.7	407	419	430	441	453	464	475	487	498	509	521	532	543
2BSV110	11	11.3	458	471	483	496	509	522	534	547	560	572	585	598	611
7-1/2 to 10 HP BX BELTS			MOTOR PULLEY 2VP60			Dd1 4.3	Dd2 5.5	Pd1 4.7	Pd2 5.9						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BSV278	27.8	28.1	289	295	301	307	313	319	325	331	338	344	350	356	362
2BSV250	25	25.3	320	327	334	341	348	355	361	368	375	382	389	395	402
2BSV234	23.4	23.7	342	349	357	364	371	378	386	393	400	408	415	422	429
2BSV200	20	20.3	399	408	416	425	433	442	450	459	467	476	484	493	501
2BSV184	18.4	18.7	434	443	452	461	470	480	489	498	507	517	526	535	544
2BSV160	16	16.3	497	508	519	529	540	550	561	571	582	593	603	614	624
2BSV154	15.4	15.7	516	527	538	549	560	571	582	593	604	615	626	637	648
2BSV136	12.6	12.9	628	642	655	669	682	695	709	722	735	749	762	776	789
2BSV124	12.4	12.7	638	652	666	679	693	706	720	733	747	761	774	788	801
2BSV110	11	11.3	717	733	748	763	779	794	809	824	840	855	870	885	901
15 to 25 HP BX BELTS			MOTOR PULLEY 2VP75			Dd1 5.8	Dd2 7	Pd1 6.2	Pd2 7.4						
			Open			TURNS ON MOTOR PULLEY							Closed		
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BSV278	27.8	28.1	381	387	393	399	405	411	417	424	430	436	442	448	454
2BSV250	25	25.3	423	430	436	443	450	457	464	470	477	484	491	498	505
2BSV234	23.4	23.7	451	459	466	473	480	488	495	502	509	517	524	531	539
2BSV200	20	20.3	527	535	544	552	561	569	578	586	595	603	612	620	629
2BSV184	18.4	18.7	572	581	590	600	609	618	627	636	646	655	664	673	683
2BSV160	16	16.3	656	667	677	688	698	709	720	730	741	751	762	773	783
2BSV154	15.4	15.7	681	692	703	714	725	736	747	758	769	780	791	802	813
2BSV136	12.6	12.9	829	842	856	869	883	896	909	923	936	949	963	976	990

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Broken fan belt	Replace belt
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Fan speed is too high	Reduce fan RPM
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
	Duct static pressure lower than design	Reduce fan RPM
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
	Duct static pressure higher than design	Improve ductwork to eliminate or reduce duct losses
	Blower speed too low	Increase fan RPM. Do not overload motor
	Belt slippage	Adjust belt tension
Excessive Airflow	Blower speed too high	Reduce fan RPM
	Duct static pressure lower than design	Reduce fan RPM
Excessive Vibration and Noise	Misaligned pulleys	Align pulleys
	Damaged or unbalanced wheel	Replace wheel
	Fan is operating in the unstable region of the fan curve	Refer to performance curve for fan
	Bearings need lubrication or replacement	Lubricate or replace
	Fan speed is too high	Reduce fan RPM
	Belts too loose, worn or oily	Inspect and replace if needed

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance.

Please record any maintenance or service performed on this fan in the documentation section located at the end of this manual.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. The type of grease and the amount of grease can is shown below. **Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.**
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

Bearing Grease Charge

Ball Bearings	
Shaft Size (Inches)	Grease Charge (Ounces)
1/2 to 3/4	0.03
7/8 to 1 3/16	0.10
1 1/4 to 1 1/2	0.15
1 11/16 to 1 15/16	0.20
2 to 2 7/16	0.30
2 1/2 to 2 15/16	0.50
3 to 3 7/16	0.85
3 1/2 to 4	1.50

Bearing Grease Type

Thickener	Lithium Complex
Oil	Petroleum
Thickness	NLGI 2
Operating Temperature	-20 F to 200 F Intermittent to 250 F

2 weeks after startup

1. Belt tension should be checked after the first 2 weeks of fan operation on belt drive fans. Belts tend to stretch and settle into pulleys after an initial start-up sequence. **Do not tension belts by changing the setting of the motor pulley**, this will change the fan speed and may damage the motor. To re-tension belts, turn the power to the fan motor OFF. Loosen the fasteners that hold the motor to the fan. Move the motor to the left or right to adjust the belt tension. Belt tension should be adjusted to allow 1/64" of deflection per inch of belt span. Exercise extreme care when adjusting V-belts as not to misalign pulleys. Any misalignment will cause a sharp reduction in belt life and produce squeaky noises. Over-tightening will cause excessive belt and bearing wear as well as noise. Too little tension will cause slippage at startup and uneven wear. **Whenever belts are removed or installed, never force belts over pulleys without loosening motor first to relieve belt tension.** When replacing belts, use the same type as supplied by the manufacturer. On units shipped with double groove pulleys, matched belts should always be used.
2. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

Every 3 months

1. Belt tension should be checked quarterly for belt drive fans. See instructions in the previous maintenance section. Over-tightening will cause excessive bearing wear and noise. Too little tension will cause slippage at startup and uneven wear.
2. Fans need to be cleaned quarterly, and more often in severe conditions.

Yearly

1. Inspect bearings for wear and deterioration. Replace/grease if necessary.
2. Inspect belt wear and replace torn or worn belts on belt drive fans.
3. Inspect bolts and set screws for tightness. Tighten as necessary.
4. Inspect motor for cleanliness. Clean exterior surfaces only. Remove dust and grease from the motor housing to ensure proper motor cooling. Remove dirt and grease from the wheel and housing to prevent imbalance and damage.

Start-Up and Maintenance Documentation

START-UP AND MEASUREMENTS SHOULD BE PERFORMED AFTER THE SYSTEM HAS BEEN AIR BALANCED (Warranty will be void without completion of this form)

Job Information

Job Name	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Purchase Date	

Service Company	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Start-Up Date	

Fan Unit Information

Refer to the start-up procedure in this manual to complete this section.

Name Plate and Unit Information	
Model Number	
Serial Number	
Volts	
Hertz	
Phase	
FLA	
HP	
Blower Pulley	
Motor Pulley	
Belt Number	

Field Measured Information	
Voltage	
Amperage**	
RPM	

Blower Rotation	Correct	
	Incorrect	

**If measured amps exceed the FLA rating on the nameplate, fan RPM must be reduced to decrease the measured amps below the nameplate FLA rating.

Maintenance Record

[illegible]

Factory Service Department

Phone: 1-866-784-6900

Fax: 1-919-554-9374

Sound Enclosure Installation Manual

REV 102017

Safety Disclaimer

- Always work safely when installing metal products and use extreme caution on the roof at all times.
- Wear gloves and safety glasses to reduce the risk of injury, and use hearing protection when operating power tools.
- Many of the panels are extremely heavy and awkward. Adhere to safe lifting procedures to avoid physical injury.
- Always be sure that ladders are safely positioned and properly secured.
- Safety harnesses or other special equipment may be required; be sure to consult OSHA guidelines for compliance with all safety requirements.
- Do NOT walk on panels until all the fasteners are installed. Metal roofing panels are slippery when wet, dusty, frosty, or oily -- Do NOT attempt to walk on a metal roof under these conditions.
- Wear soft-soled shoes to improve traction and to minimize damage to the paint finish (if applicable).

Pre-Installation

Thank you for purchasing a sound enclosure. This manual provides general assembly or disassembly instructions. It is not specific to your unit and should be used as a guideline only.

The labels are removable and may be removed after installation is complete.

Tools Required

You will need at least 1-2 people for installation and the following tools:

- Forklift and chains
- Ladder or Similar
- Pneumatic Air Driver
- 9/16 Socket Driver
- 5/16 Socket Driver
- (4) Clamps or similar

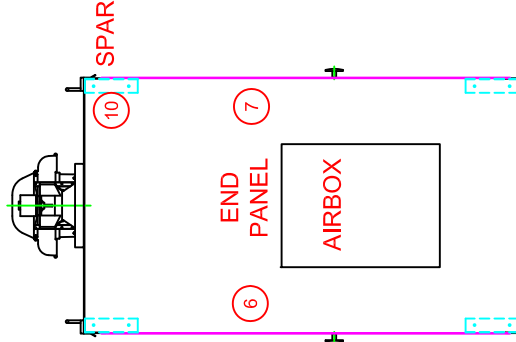
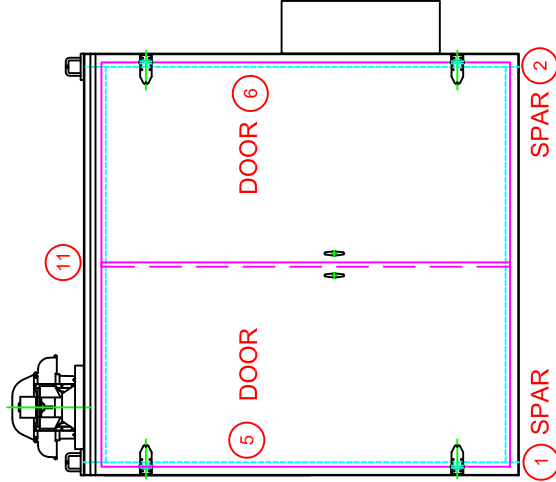
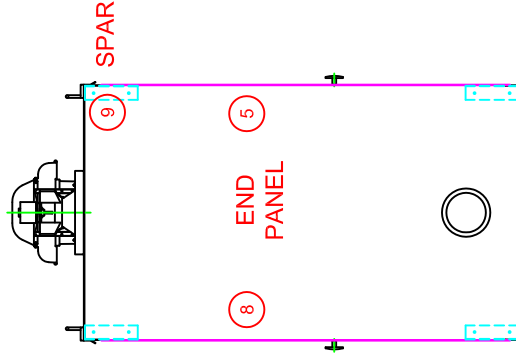
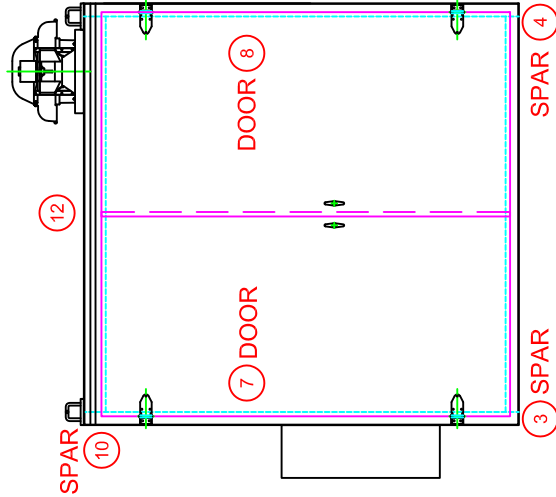
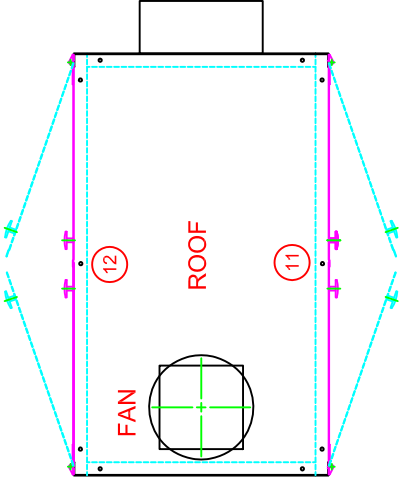
Parts List

A typical sound enclosure has the following parts:

- 3/8 x 1-1/4 Bolts and washers
- Self Tapping Screws for Fan installation
- (4) Door Panels #5/#6
- (8) Door Hinge Washers
- (1) Roof Panel #11/#12
- (1) Flat End Panel #5/#8
- (1) Air Box End Panel #6/#7
- (2) Top Spars #9/#10
- (2) Bottom Spars #1/#2 and #3/#4

If your unit shipped unassembled each panel will be numbered. Where it meets another panel it is labeled with the same number so you would match 1 to 1, 2 to 2, etc. The white PVC sheeting is to protect the unit during shipment and may be removed.

Use the following drawing of the assembled enclosure to familiarize yourself with the different panels and how they fit together.



APPROVAL REQUIRED

THIS JOB IS ON HOLD UNTIL
PATHFINDER SYSTEMS
RECEIVES WRITTEN APPROVAL

SIGNATURE:

DATE:

This material is the property of
Pathfinder Systems Inc. and should not
be reproduced, published, or disclosed
to others without authorization and shall
not be used in any way against or
detrimental to Pathfinder Systems Inc.,
Kansas City, MO.

CAD DRAWING: MANUAL CHANGES
TO THIS DRAWING ARE PROHIBITED.

PATHFINDER SYSTEMS INC.

6301 Deramus Avenue
Kansas City, MO 64120
816-741-0282
816-587-0282 FAX
mail@pathfindersystems.net
www.pathfindersystems.net

CUSTOMER:
CUSTOMER PO#:
PROJECT:
DESCRIPTION: SOUND ENCLOSURE

PATHFINDER JOB#:

REV 00

SCALE: 3/8" = 1"

DATE: 11/8/12

DRAWN BY: JASON

REV 0 ORIGINAL RELEASE

Installation

You will need 2 people for the next steps.

The following pictures are not specific to your unit and should be used as a guideline to assemble the panels.

1. Position an End Panel to meet the Bottom Spars #1 and #3.



2. Use (2) 3/8 bolts and washers on each side to fasten the Spars to the End Panel.



3. Position the Airbox End Panel to meet the Bottom Spars #2 and #4.



4. Use (2) 3/8 bolts and washers on each side to fasten the Spars to the End Panel.
5. Locate the Top Spars #9 and #10.
6. Install the spars as show below. You will not bolt anything at this time. The braces should fit snug.



7. Use (4) clamps to temporarily secure the Top Spars to the End Panels. See below.



8. Use a forklift and secure chains to the lifting lugs on the Roof Panel #11/#12 as shown below.



9. Lift the roof panel and install into place. Make sure you match the label #11 as the panel will only fit one way.



10. Use 3/8 Bolts to fasten the Roof Panel to the Top Spars.



11. Use 3/8 Bolts to fasten the Roof Panel to the End Panels.



12. Remove all (4) temporary clamps.

13. If necessary, install the doors. Depending on what type of hinge you have, you may have to fasten the bolts. Welded hinges allow for the door to lift off and on.

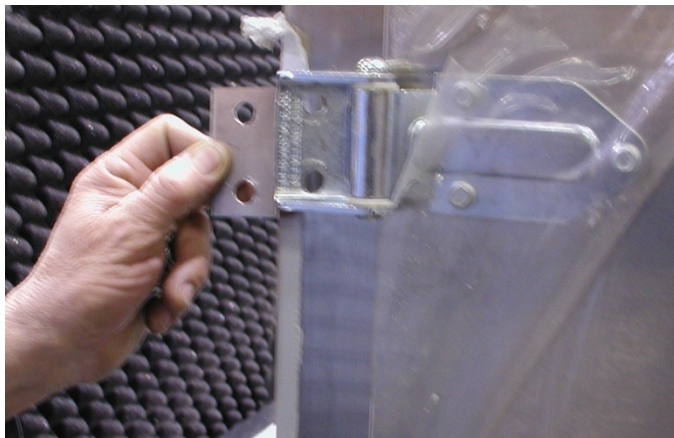
Do not lose the washers that come with the hinges or your doors will not work properly.



Bolt Hinges



Weld Hinges



14. Use a forklift to lift the fan on to the roof.
15. Use 1/8" self-tapping screws to secure the fan to the bracket on the Roof.
16. Have a certified electrician wire the fan and your sound enclosure is complete!

Knock Down Instructions

You will need at least 1-2 people for the next steps.

The following is a guideline you can use to safely take apart the sound enclosure.

1. Have a certified electrician remove power from the fan/unit.
2. Remove 1/8" self-tapping screws that secure the fan to the bracket on the Roof. If necessary, use a forklift to remove the fan.
3. Position one person inside and one outside. Remove 1/2-13 x 7" bolts, nuts and washers from the Roof. The nuts can be accessed from inside the unit.



4. Use a forklift and chains to remove the Roof Panel. It only fits one way so you might want to note how it is installed. There may be silicone caulk between the roof and top of the panels.

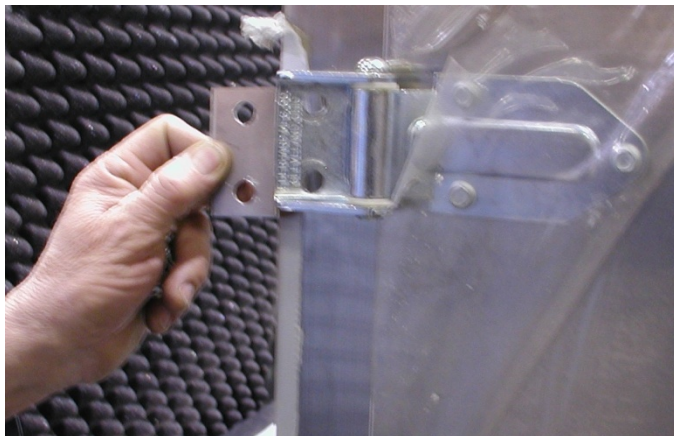




5. Remove the doors. Depending on what type of hinge you have, you may have to remove some bolts. Welded hinges lift off.



Do not lose the washers that come with the hinges or your doors will not work properly.

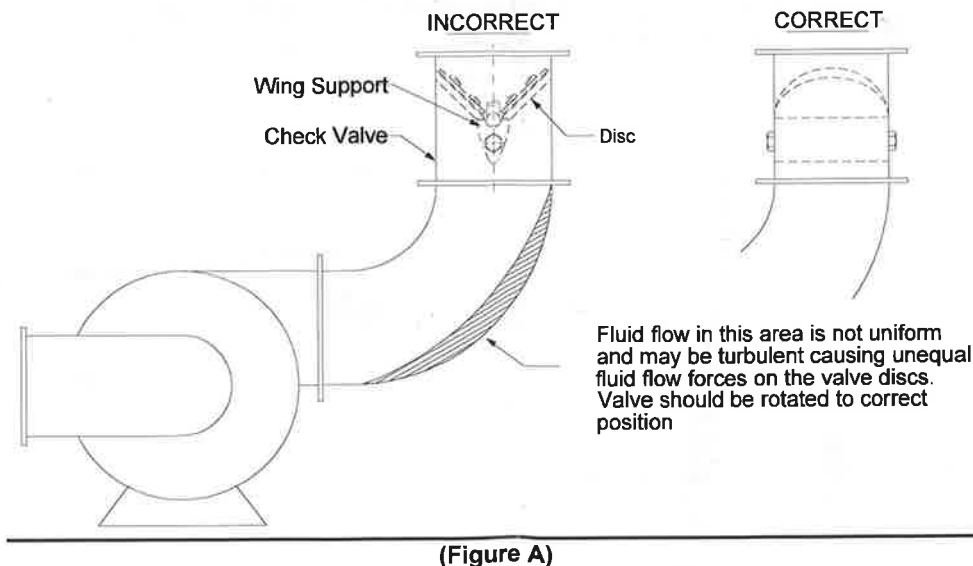




INSTALLATION INSTRUCTIONS

VALVE INSTALLATION:

1. Remove check valve from packaging and inspect for any shipping damage or loose fasteners. All fasteners have been set with Loctite®. If damaged in shipping, save original box and box contents.
2. If check valve is to be painted or insulated, record the US Valve data on the valve identification tag.
3. If valves are being stored, they should be in a weather-protected area, preferably indoors.
4. Open and close the discs of your valve a few times by hand to assure freedom of movement.
5. **The flow arrow** on your valve indicates the direction of flow upon installation.
6. Use only a **strap type wrench** for installation to prevent distortion of the valve body.
7. The check valve is **not suitable for use on a discharge** of reciprocating compressors. Pulsating and cyclic flow will damage the valve.
8. **If this valve is installed in a horizontal line**, make sure the screws protruding through the top and bottom of the valve body are in the vertical position. Maintain at least 6 pipe diameters of straight length of piping between the check valve and any other line restriction, i.e. elbows, tees, valves, etc.
9. **If the valve installation is in a vertical line with upward flow**, the position of the wing support is not important. There should be at least 6 pipe diameters of straight unrestricted piping upstream and downstream of the check valve. If space conditions do not allow for this, the valve must be installed so that the flow is equally distributed across the two valve discs (see figure A below).



PARTS REPLACEMENT INSTRUCTIONS

COMPLETE REPLACEMENT OF VALVE INTERNALS:

1. Carefully remove valve from pipeline. **USE ONLY A STRAP TYPE WRENCH.**
2. Hold the valve body in your hand or in a suitable vise to prevent distortion of the valve body.
NOTE: DO NOT EXERT UNDO FORCE ON THE VALVE BODY. This may permanently effect the valve operation.
3. Remove all valve internals by unscrewing the Wing Support screws (see Figure 1 below) and any other body support rods such as travel stop rods (only on large size valves).

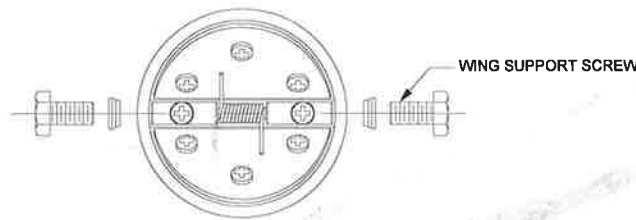
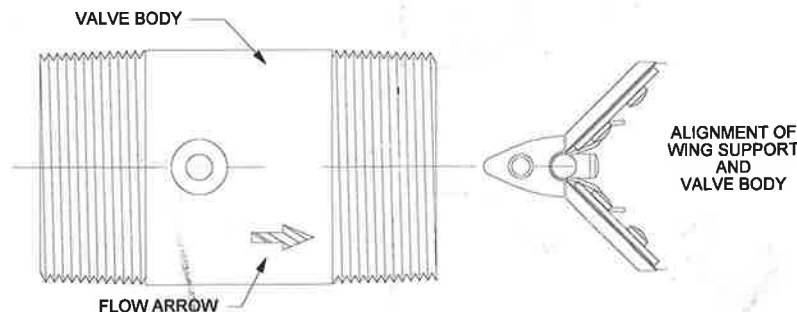


FIGURE 1

4. Inspect the body inside diameter to determine if the body is suitable and retains its original integrity i.e. surface finish is good and roundness apparent.
5. If valve body appears satisfactory and needs only minor cleanup, the valve is then suitable to replace the internals. **DO NOT SANDBLAST OR OTHERWISE DAMAGE THE VALVE BODY'S INNER SURFACE.**
6. Make sure when you order complete internal replacement assemblies that the new assemblies are identical to the original internals. Always reference your check valve's unique serial number when ordering replacements.
7. **Install the new assembly:**
 - (a) Put some water on the elastomer seal to act as a lubricant when installing the new wing support assembly into the valve body.
 - (b) Make sure you assemble the wing assembly correctly with the direction of flow.
 - (c) Align the wing support mounting screw holes and the valve body screw holes properly. (See Figure 2).



(Figure 2)

- (d) Push wing support assembly into the valve body until the holes line up properly. If you overshoot the hole alignment by half the screw hole diameter, just push the wing support assembly completely through the valve body and repeat the procedure.
- (e) When installing the wing support mounting screws, make sure you install a new Nylite® pressure seal and apply a sufficient amount of Loctite® #272 to the screw threads. The wing support screws should be torqued to 8-ft-lbs for 1/4-20 screws and 48 in-lbs for 10-32 screws. Never over tighten screws.
- (f) Allow Loctite® to dry 20 minutes, full cure in 24 hours.

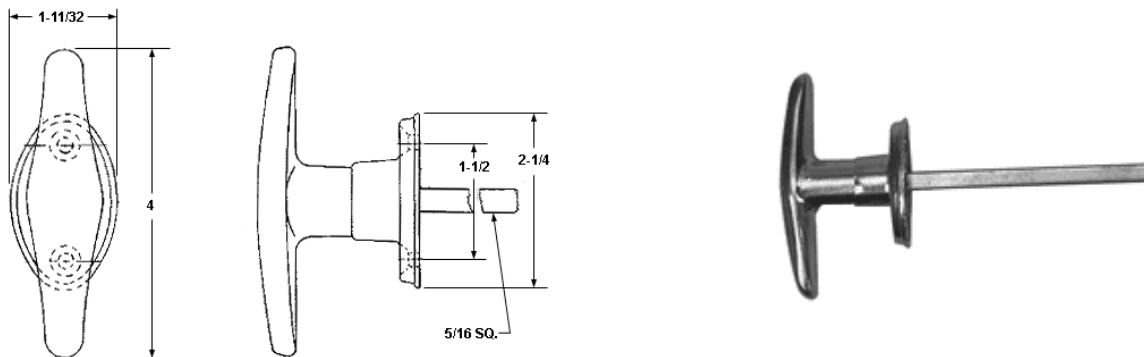
Sound Enclosure Hardware

Bill of Materials

Description	Part Number	Typical Qty
Handle	GD206	4
Rod	5611-5-48	8
Center for Rod	5611	4
Lifting Lugs	710-GZ	4
Bolt-On Hinge	5867	8
Convuluted Foam	PSI #618	N/A
Fan (Custom Sized)	Consult your quote	1
Grab Handle (Optional)	TH555	4
Weld Hinge, Lift Off Doors (Optional)	R194-0135AL	8

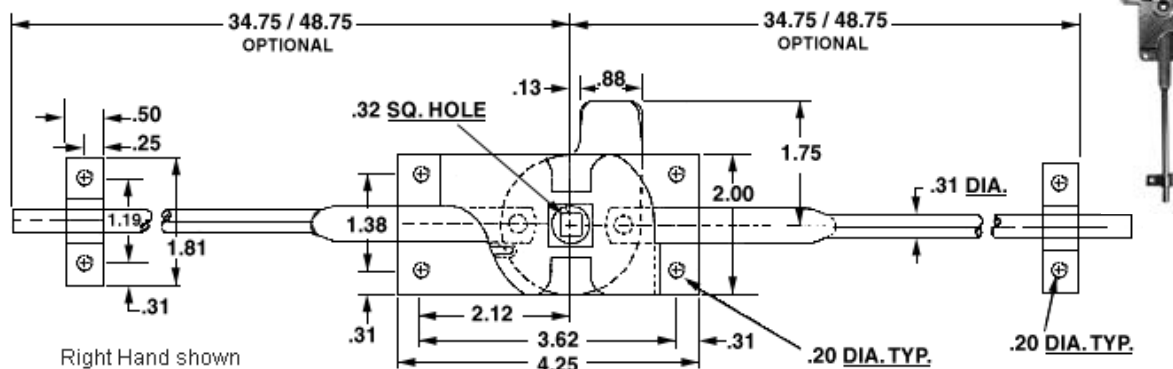
GD206 Handle

Plain 'T' Handle, with 4" shaft, 5/16 in. sq. 1-1/2" center to center mounting plate. Finish: bright chrome.



5611 Center and Rod

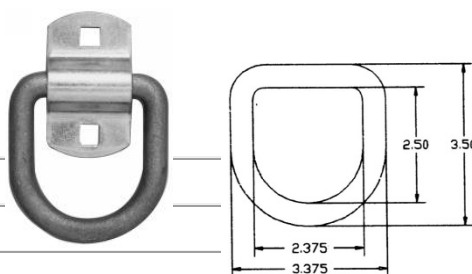
Three-point lock for metal or wood doors. All-steel construction, Available right/left hand. Finish: Zinc, 48" Rod



710-GZ Lifting Lug

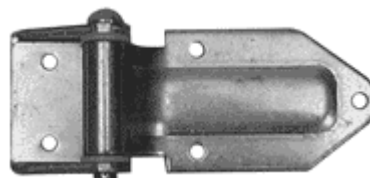
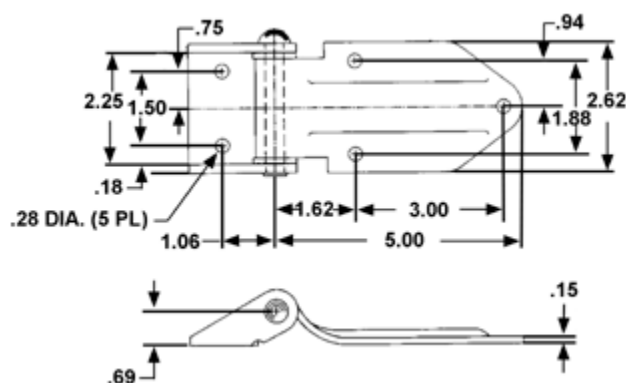
Tie down ring with bolt-on clip, gold zinc finish

Finish	Gold Zinc
Length	3-1/2"
Width	3-1/4"
Material	Steel
Diameter	1/2"
Breaking Strength	12,000 lbs.



5867 Bolt-On Hinge

5" Stamped Steel Hinge for flush mounting, Five mounting holes, 9/32" dia. Has nylon sleeve bearings for easier operation. Door movement 180 degrees. 7 gauge steel butt. 9 gauge steel strap.



R194-0135 Weld-On Hinge (Optional)

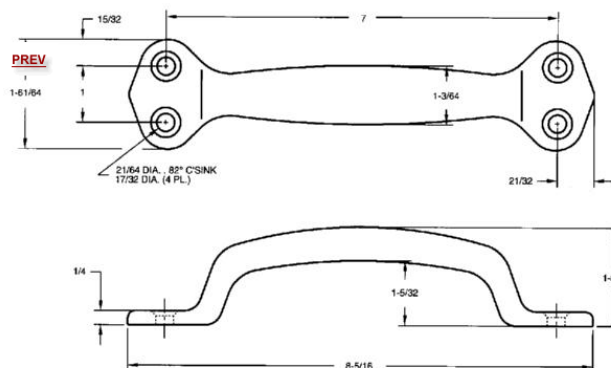
Weld-On Hinge, Lift off type, Aluminum, with a Stainless Steel Pin and Bearing Washer.



Length	5-1/4"
Material Thickness	13/16"
Pin Diameter	15/32"

TH555 Grab Handle (Optional)

Chrome plated, Solid die-cast, 8-15/16" overall length, 125/32" overall height, (4) #14 mtg. holes for oval head screws on 7" x 1" centers, 15/32" inside grab handle height



Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

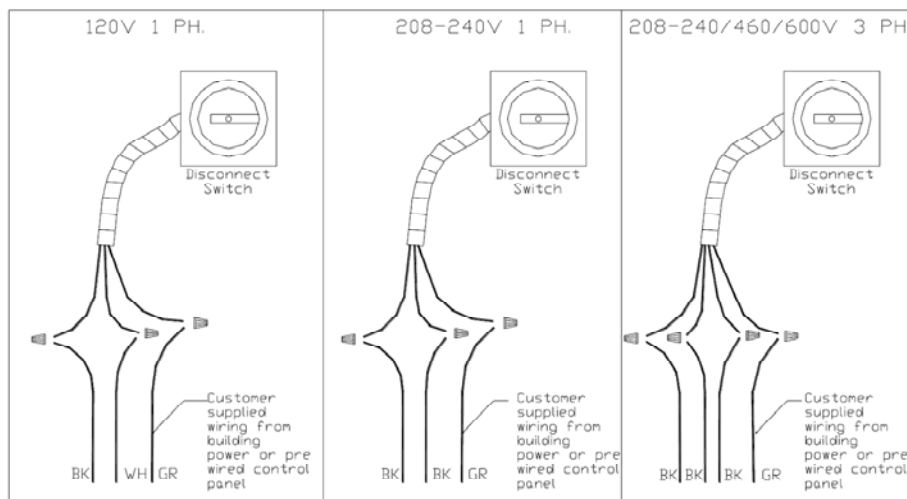
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

6. Position one person inside and one outside. Remove 1/2-13 x 7" bolts, nuts and washers that fasten the panels together. There may be silicone caulk between the roof and top of the panels.



7. Continue until you have taken apart all panels.
8. Reverse this procedure to assemble the enclosure. Remember to use silicone caulk between the panels for outdoor applications.

TABLE OF CONTENTS

WARRANTY.....	4
INSTALLATION.....	5
Mechanical	5
Site Preparation	5
Roof Mounting	5
Wall Mounting.....	6
Curb and Ductwork	6
Duct Routing Examples	7
Up-Blast Roof Mount Installation	7
Up-Blast Wall Mount Installation	8
Up-Blast Through Wall Mount Installation	9
Down-Blast Installation	10
Typical Hinge Kit – Centrifugal Upblast	11
Typical Grease Box Installation	11
Up-Blast Utility Set Installation.....	12
Up-Blast Utility Set Inlet Options.....	12
Up-Blast Utility Set.....	13
Up-Blast Utility Set Indoor Installation	14
Up-Blast Curb Mount Utility Set Installation	15
Up-Blast Curb Mounted Utility Set Hinging Instructions.....	15
Up-Blast Curb Mounted Utility Set Discharge Extension Option.....	16
Up-Blast Curb Mounted Utility Set Rain Cap Option.....	16
Square Inline Mounting Bracket Detail	17
Square Inline Mounting Configurations.....	18
Square Inline Discharge Options	19
Square Inline Discharge Configurations	19
Electrical.....	20
Copper Wire Ampacity.....	20
Motorized Damper	21
PSC (Permanent Split Capacitor) Motor Speed Control	21
ECM (Electronically Commutated Motor) Speed Control	22
Fan to Building Wiring Connection	24
Variable Frequency Drive (VFD) Installation Instructions	25
VFD Programming.....	26
ACTECH SMV VFD CROSS-REFERENCE TABLE	27
OPERATION	28
Start Up	28
Special Tools Required.....	28
Start Up Procedure	28
.....	28
Pulley Setscrew Torque	28
Pulley Alignment.....	29
Proper Belt Tension	29
Pulley Combination Chart	30
Troubleshooting.....	31
Troubleshooting Chart	31
MAINTENANCE	32
General Maintenance	32
Bearing Grease Charge.....	32
Bearing Grease Type	32
2 weeks after startup	33
Every 3 months	33
Yearly	33
Start-Up and Maintenance Documentation	34
Job Information.....	34
Fan Unit Information	34
Maintenance Record	35
Factory Service Department	35

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at **1-866-784-6900** for warranty and technical support issues.

Mechanical

WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.
5. Inline fans can be interior mounted, motors shall be located outside of the exhaust airstream.
6. Interior mounted fans must have a grease drain that is piped to an approved grease reservoir.
7. Interior mounted fans are considered part of the duct system. Clearance to combustibles must be maintained at all times. If needed the fan may be wrapped to maintain the duct system fire rating.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. If a backdraft damper is required, it should be secured within the curb using sheet metal screws, to the bottom of a damper box or damper support flanges located below the roof deck.
CAUTION: NFPA-96 RECOMMENDS THAT DAMPERS SHOULD NOT BE INSTALLED WHEN EXHAUSTER IS USED FOR REMOVAL OF SMOKE AND GREASE LADEN VAPORS FROM COMMERCIAL KITCHEN EQUIPMENT. CONSULT STATE AND LOCAL CODES FOR DETAILED REQUIREMENTS.
3. If an up-blast fan is used for kitchen hood exhaust, ensure discharge is at least 40 inches above the roof surface in accordance with NFPA96.
4. On an up-blast fan, normally the power cord is brought through the conduit tube located on the top skirt on the outside of the unit.
5. Secure ventilator curb through vertical portion of the ventilator base assembly flange using a minimum of eight (8) lug screws, anchor bolts, or other suitable fasteners (not furnished).
6. Before connecting fan motor to power source verify power line wiring is de-energized.
7. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
8. Before powering up fan check ventilator wheel for free rotation.
9. Check all fasteners for tightness.
10. Re-install motor dome.
11. A drain pipe is provided for single-point drainage of water and residue on up-blast fans. The drain pipe should be positioned towards the roof slope. Some means for collection of this residue must be provided, either a container directly under the trough or use of an adapter and pipe to carry the residue to a remote collection point. An optional down spout and grease collection box is available as an accessory item for up-blast fans.

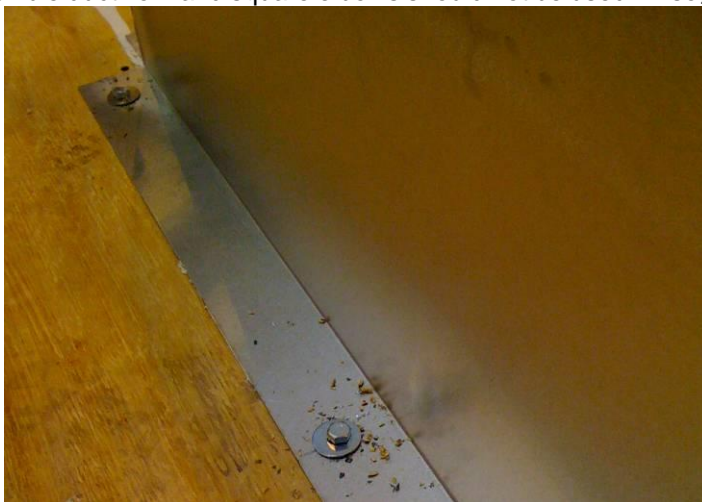
Wall Mounting

1. The same instructions, warnings and notes found under Roof Mounting section will apply. Refer to steps 2 and 3, and steps 5 through 8.
2. **Masonry Wall:** Around the wall opening install an angle iron frame at least 2" x 2" x 1/4". Frame should be approximately 1/2" smaller than the inside base dimension of the ventilator. Secure the lead cinch type anchors with non-ferrous bolts (3 per side). The ventilator should be mounted to the mounting angle with self-taping sheet metal screws (3 per side).
3. **Wood Siding:** Around the wall opening install a wooden frame 2" high x 2" wide. Frame should be approximately 1/2" smaller than the inside base dimension of the ventilator. Secure with counter-sunk expansion type lag bolts (3 per side). The ventilator should then be mounted to the mounting frame with the square head wood screws (3 per side) 3/8" minimum.
4. Steel wall mount brackets are also available as a factory option for the fan.
5. The mounting flange connections should be coated with a suitable caulking compound or an approved waterproof mastic sealer.
6. Wall mount application is not recommended from fans with wheels 30" or larger.

IMPORTANT: OSHA REGULATIONS REQUIRE THE VENTILATOR TO BE MOUNTED AT LEAST EIGHT (8) FEET ABOVE GROUND OR FLOOR LEVEL.

Curb and Ductwork

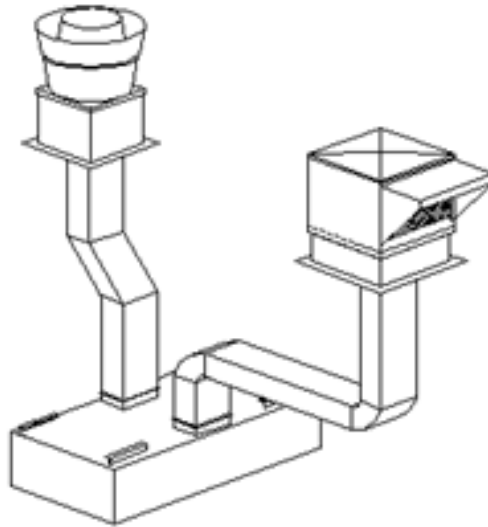
This fan was specified for a specific CFM and static pressure. The ductwork attached to this unit will significantly affect the airflow performance. Flexible ductwork and square elbows should not be used. Also, transitions and turns in ductwork near the fan inlet will cause system effect and will drastically increase the static pressure and reduce airflow. **Follow SMACNA guides and recommendations for the remaining duct run.** Fans designed for rooftop installation should be installed on a prefabricated or factory built roof curb. Follow curb manufacturer's instructions for proper curb installation. Curbs should be connected to structural roof members with at least four (3) lug screws, anchor bolts, or other suitable fasteners (not furnished) per curb flange. Curb flanges should be caulked to roof.



The fan should be installed on a curb and/or rail elevated not less than 14" above any surface. Be sure duct connection and fan outlet are properly aligned and sealed. Secure fan to curb through vertical portion of the ventilator base assembly flange using a minimum of eight (8) lug screws, anchor bolts, or other suitable fasteners (not furnished). Shims may be required depending upon curb installation and roofing material. Check all fasteners for tightness. The diagrams below show different mechanical installation configurations.

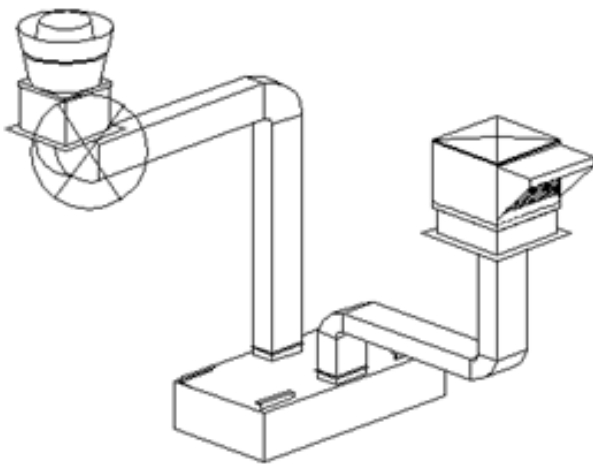
Duct Routing Examples

Proper Duct Routing

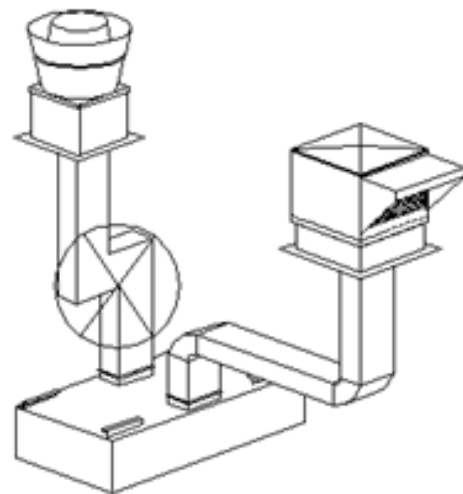


If duct cannot go straight up
use offsets

Improper Duct Routing



DO NOT connect Elbow Directly
to Fan Inlet.



DO NOT use square elbows

Up-Blast Roof Mount Installation

FEATURES:

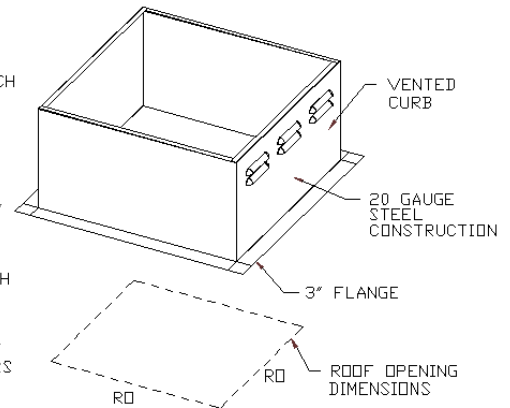
- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL762
- AMCA SOUND AND AIR CERTIFIED
- WIRING FROM MOTOR TO DISCONNECT SWITCH
- WEATHERPROOF DISCONNECT
- HIGH HEAT OPERATION 300°F (149°C)
- GREASE CLASSIFICATION TESTING

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY
WHILE EXHAUSTING AIR AT 300°F (149°C)
UNTIL ALL FAN PARTS HAVE REACHED
THERMAL EQUILIBRIUM, AND WITHOUT ANY
DETERIORATING EFFECTS TO THE FAN WHICH
WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY
WHILE EXHAUSTING BURNING GREASE VAPORS
AT 600°F (316°C) FOR A PERIOD OF
15 MINUTES WITHOUT THE FAN BECOMING
DAMAGED TO ANY EXTENT THAT COULD CAUSE
AN UNSAFE CONDITION.

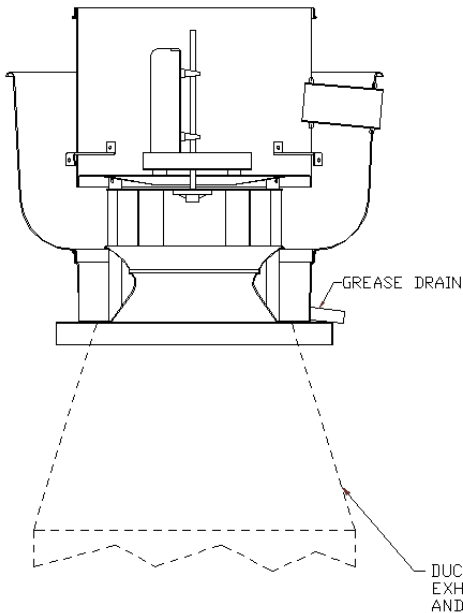
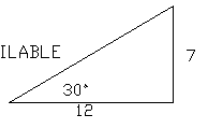
OPTIONS:

- GREASE BOX
- HINGED FAN
- PITCHED CURB
- INSULATED CURB



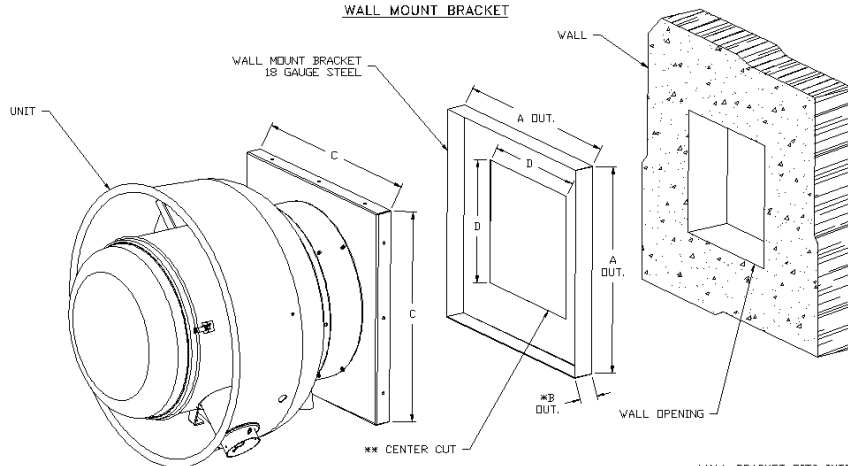
PITCHED CURBS ARE AVAILABLE
FOR PITCHED ROOFS.

SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



Up-Blast Wall Mount Installation

WALL MOUNT BRACKET



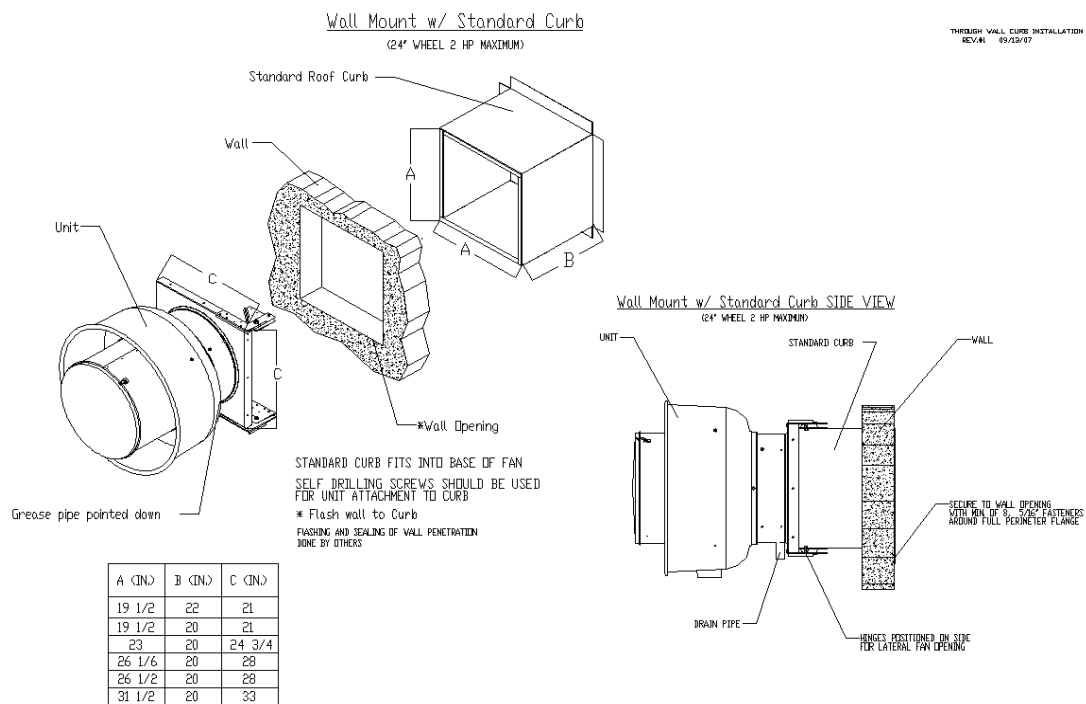
A OUT.	B OUT.	C	D
18 1/2	2	19	13
20 1/2	2	21	16
21 1/2	2	22	16
24 1/4	2	24 3/4	20
25 1/2	2	26	20
27 1/2	2	28	24
32 1/2	2	33	28

WALL BRACKET FITS INTO BASE OF FAN

SELF DRILLING SCREWS SHOULD BE USED
FOR UNIT ATTACHMENT TO WALL MOUNT BRACKET

* "B" DIMENSION = 5" WHEN USED WITH DAMPER
** CENTERED IN WALL MOUNT

Up-Blast Through Wall Mount Installation



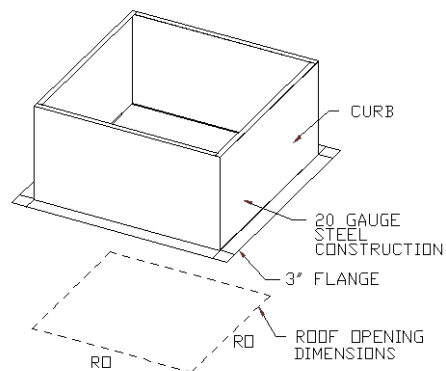
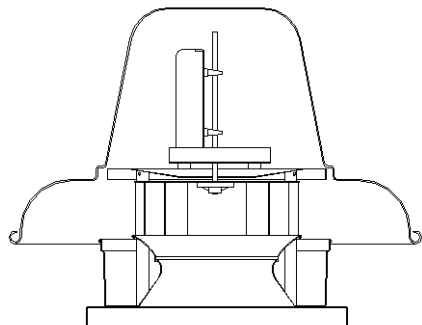
Down-Blast Installation

FEATURES:

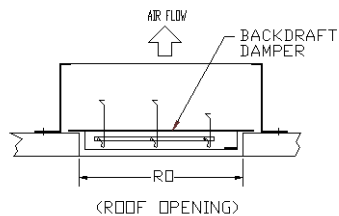
- ROOF MOUNTED FANS
- UL705
- AMCA SOUND AND AIR CERTIFIED
- WIRING FROM MOTOR TO DISCONNECT SWITCH
- DISCONNECT SWITCH
- STANDARD BIRD SCREEN

OPTIONS:

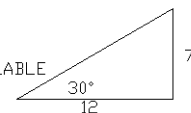
HINGED FAN
PITCHED CURB
INSULATED CURB
BACKDRAFT DAMPER



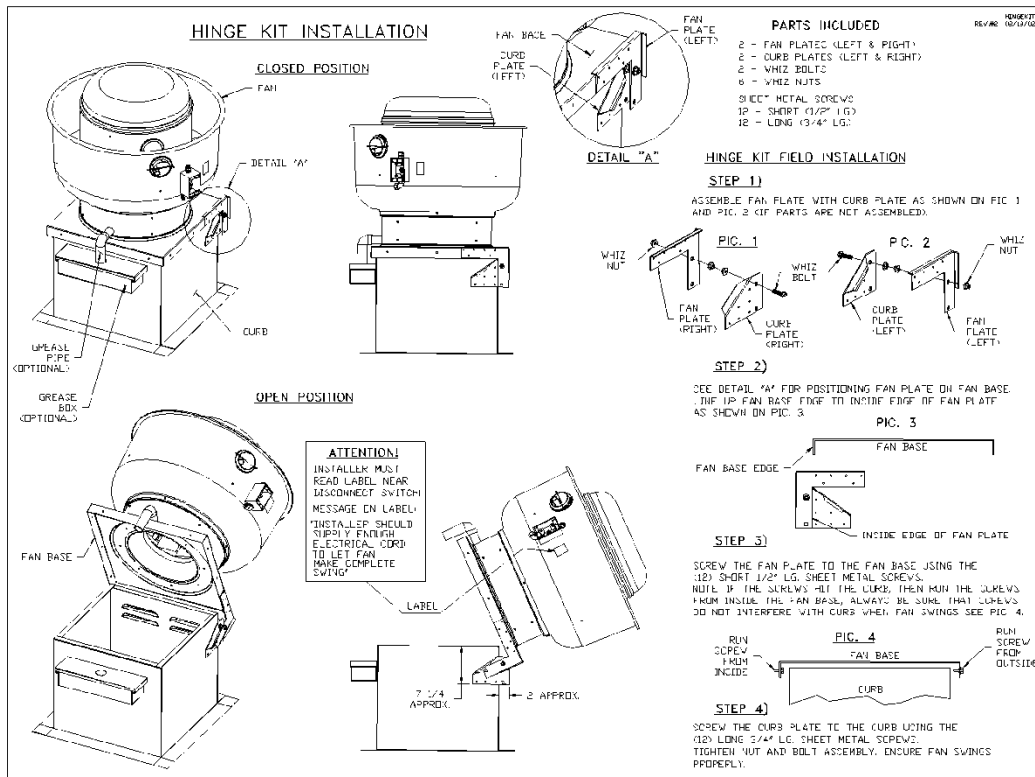
BACKDRAFT DAMPER INSTALLATION



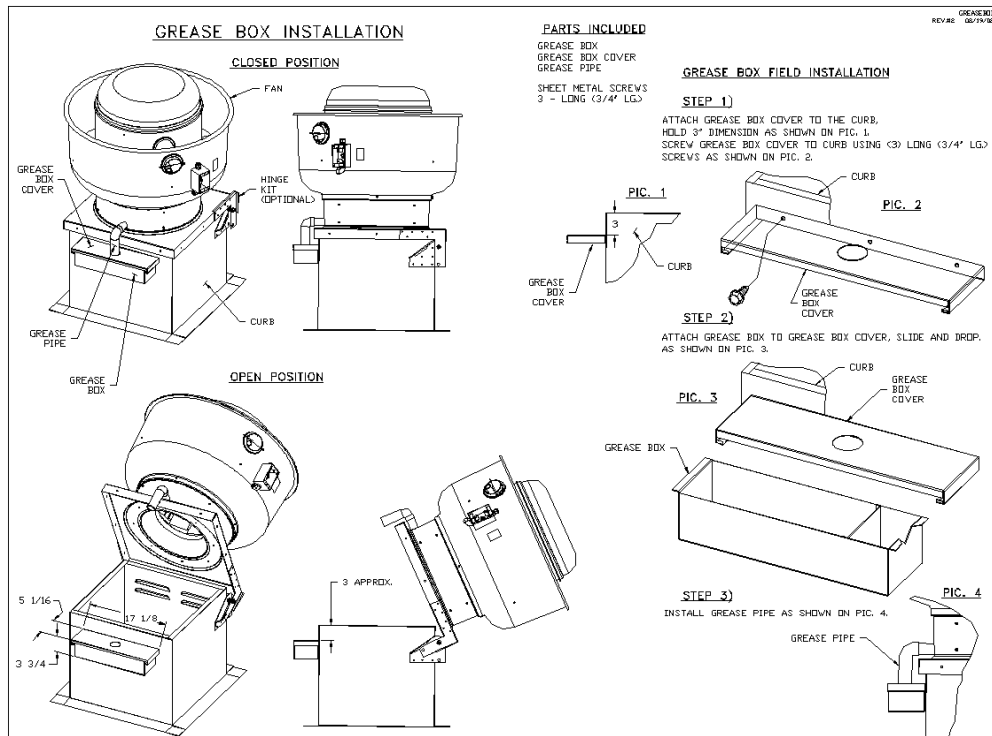
PITCHED CURBS ARE AVAILABLE
FOR PITCHED ROOFS.
SPECIFY PITCH:
EXAMPLE: 7/12 PITCH = 30° SLOPE



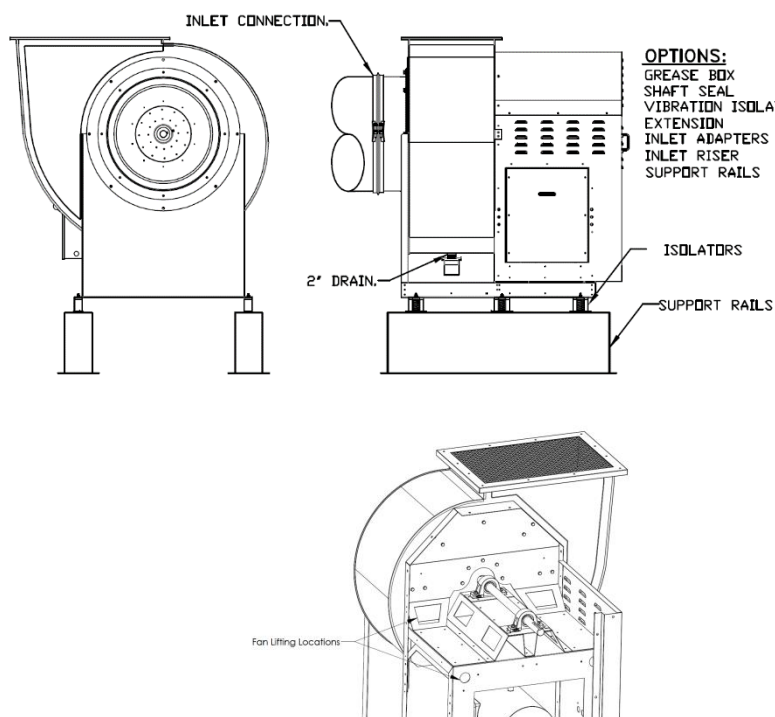
Typical Hinge Kit – Centrifugal Upblast



Typical Grease Box Installation



Up-Blast Utility Set Installation



OPTIONS:

GREASE BOX
SHAFT SEAL
VIBRATION ISOLATORS
EXTENSION
INLET ADAPTERS
INLET RISER
SUPPORT RAILS

FEATURES:

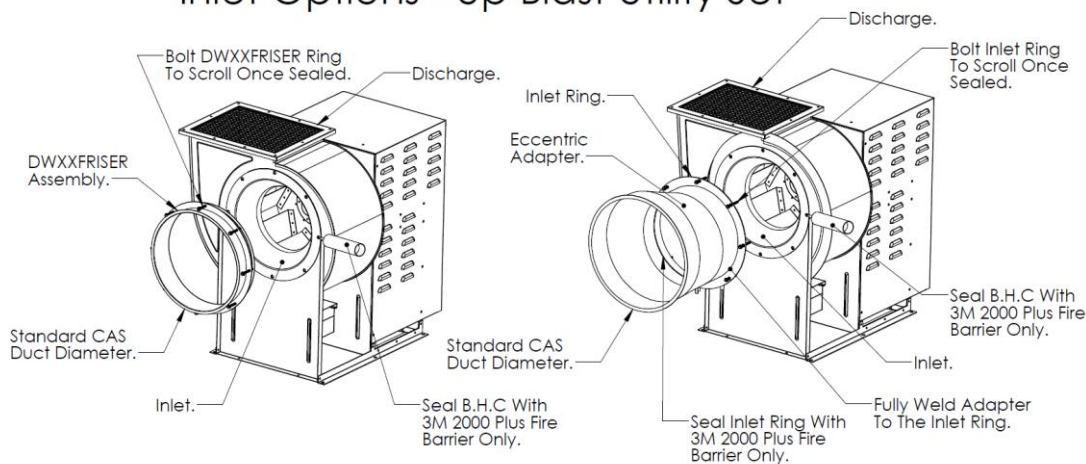
- ROOF MOUNTED FANS
- RESTAURANT MODEL
- UL705
- UL762
- HIGH HEAT OPERATION DIRECT DRIVE 350°F (176°C)
- HIGH HEAT OPERATION BELT DRIVE 350°F (176°C)
- HEAT SLINGER
- GREASE CLASSIFICATION TESTING
- 2" DRAIN
- MOTOR WEATHER COVER
- FULLY SEALED SCROLL HOUSING
- SCROLL ACCESS DOOR
- FLANGE 1 1/4" - 11 THRU 20.
- FLANGE 2" - 24 THRU 36.

NORMAL TEMPERATURE TEST BELT DRIVE
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 350°F (176°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

NORMAL TEMPERATURE TEST DIRECT DRIVE
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 350°F (176°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

Up-Blast Utility Set Inlet Options

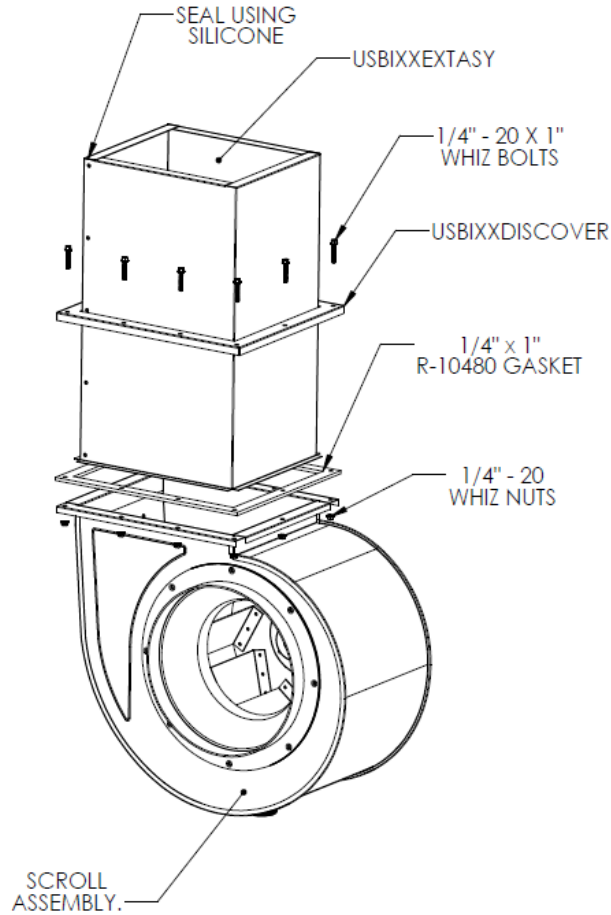
Inlet Options - Up Blast Utility Set



Inlet Connections						
Fan Size	Duct Diameter	Inlet Connection	B.H.C.	Inlet Ring OD	Hardware #	Hardware Qty
11	12"	DW12FRISER	13.375"	12.500"	1/4" - 20 x 1 1/2" (92323A523)	8
13	14"	DW14FRISER	15.375"	13.500"	1/4" - 20 x 1 1/2" (92323A523)	8
15	16"	DW16FRISER	17.375"	15.250"	1/4" - 20 x 1 1/2" (92323A523)	8
18	20"	DW20FRISER	21.375"	18.500"	1/4" - 20 x 1 1/2" (92323A523)	8
20	20"	DW20FRISERUSB120	22.375"	19.625"	1/4" - 20 x 1 1/2" (92323A523)	8
24	24"	DW24FRISERUSB124	28.000"	25.375"	3/8" - 16 X 1 1/2" (92323A558)	8
30	24"	DW24FRISERUSB130	26.962"	24.375"	3/8" - 16 X 1 1/2" (92323A558)	8
36	24"	DW307524ADPEC	N/A	30.500"	3/8" - 16 X 1 1/2" (92323A558)	8

Up-Blast Utility Set

Discharge Extension Options - Up Blast Utility Set



Hardware Counts

Hardware # Bolt / Nut	Hardware Qty
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	8
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	8
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	8
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	12
1/4" - 20 x 1" (92323A518) / 1/4" - 20 (94831A029)	14

USBI - Discharge Extension

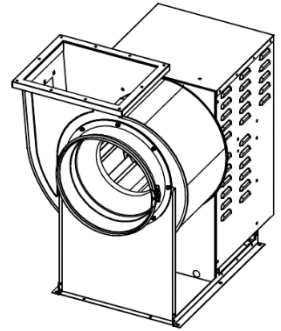
Fan Size	Extension #	"L"	"W"	"H"	Cover #
11	USB11EXTASY	12"	11"	24"	USB11DISCOVER
13	USB13EXTASY	14"	12"	24"	USB13DISCOVER
15	USB15EXTASY	16"	13"	24"	USB15DISCOVER
18	USB18EXTASY	19"	15"	24"	USB18DISCOVER
20	USB20EXTASY	21"	15"	24"	USB120DISCOVER
24	USB24EXTASY	26"	17"	24"	USB24DISCOVER
30	USB30EXTASY	32"	19"	24"	USB30DISCOVER
36	USB36EXTASY	39"	23"	24"	USB36DISCOVER

Up-Blast Utility Set Indoor Installation

Some situations prevent the installation of exhaust fans on the roof or other outdoor location. An indoor installation may be the only alternative.

Of the various types of fans that might be employed, utility sets seem most appropriate because they readily accommodate the inlet and outlet duct connections. Fans designed for curb mounting would present outlet duct connection difficulties.

Most jurisdictions having authority comply IMC, NFPA96 and with UL762 standards. Standard UL762 "Power Roof Ventilators for Restaurant Exhaust Appliances", covers the utility set high temperature and grease fire testing. NFPA96 "Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations", covers the installation of the duct connections to the inlet and out of the exhaust fan.



Standard UL762:

This standard has two primary tests. The first test has the fan exhaust air for several hours at the maximum temperature the manufacturer wishes to list the fan, such as 300 degrees F. The second part imitates a grease fire by igniting grease in a pan near an inlet duct. If the fan keeps running and does not display any unsafe results it passes those tests. They also examine the fan for any characteristics that might be unsuitable.

In the scope, section 1.1, it says "these requirements cover roof or wall-mounted ventilators for restaurant exhaust appliances". It would seem at first that the phrase "roof or wall mounted" would preclude applicability of the label indoors. However, in the very next paragraph it goes on to say "Power ventilators...covered by these requirements are intended for installation in accordance with ... NFPA 96". NFPA 96 clearly defines how to install a traditional ventilator indoors.

Standard NFPA 96 – 8.1.4* Utility Set Exhaust Fans.

8.1.4.2 Utility set exhaust fans installed within the building shall be located in an accessible area of adequate size to allow for service or removal.

8.1.4.3 Where the duct system connected to the fan is in an enclosure, the space or room in which the exhaust fan is located shall have the same fire resistance rating as the enclosure.

8.1.4.4 The fan shall be connected to the exhaust duct by flanges securely bolted as shown in Figure 8.1.3.2 (a) through Figure 8.1.3.2 (d) or by a system specifically listed for such use, such as UL1978 or UL2221 listed duct systems.

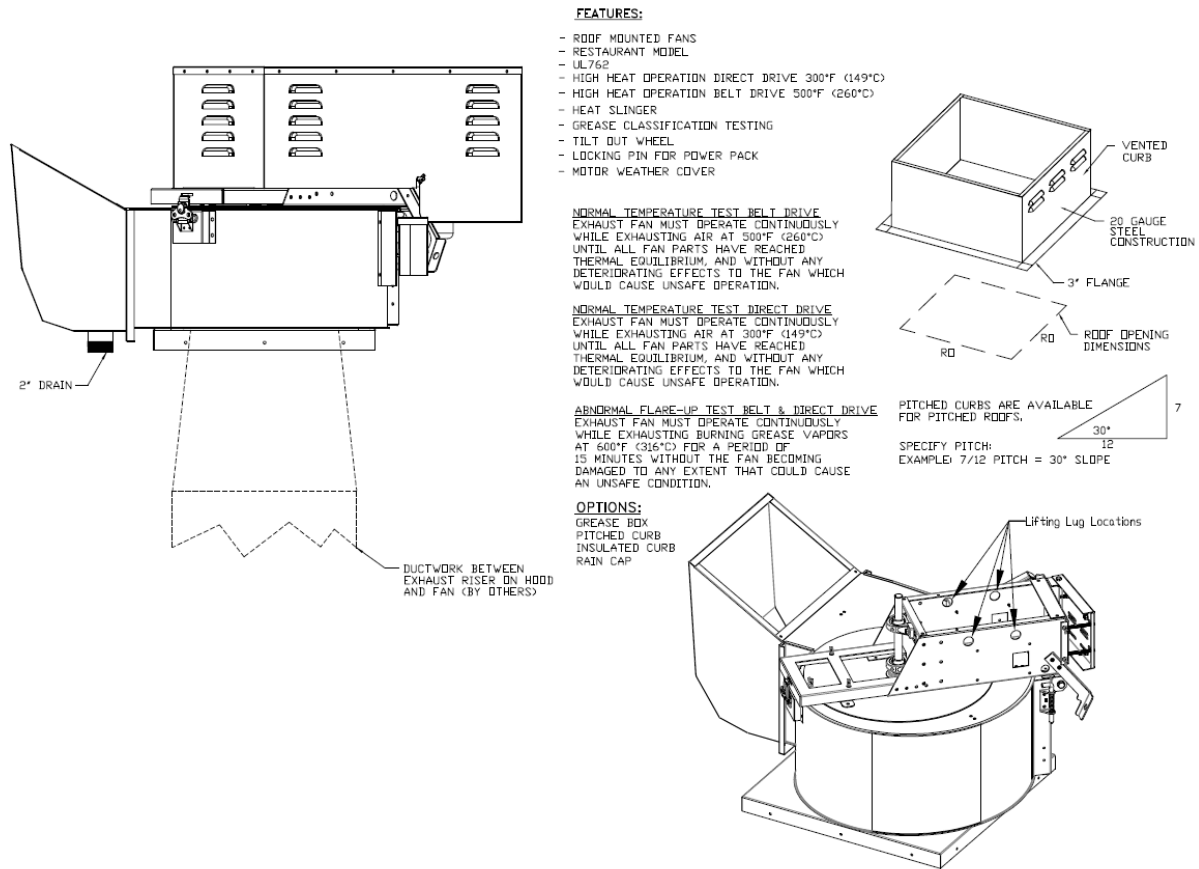
8.1.4.5 Flexible connectors shall not be used.

8.1.4.6 Exhaust fans shall have a drain directed to a readily accessible and visible grease receptacle not to exceed 3.8 L (1 gallon).

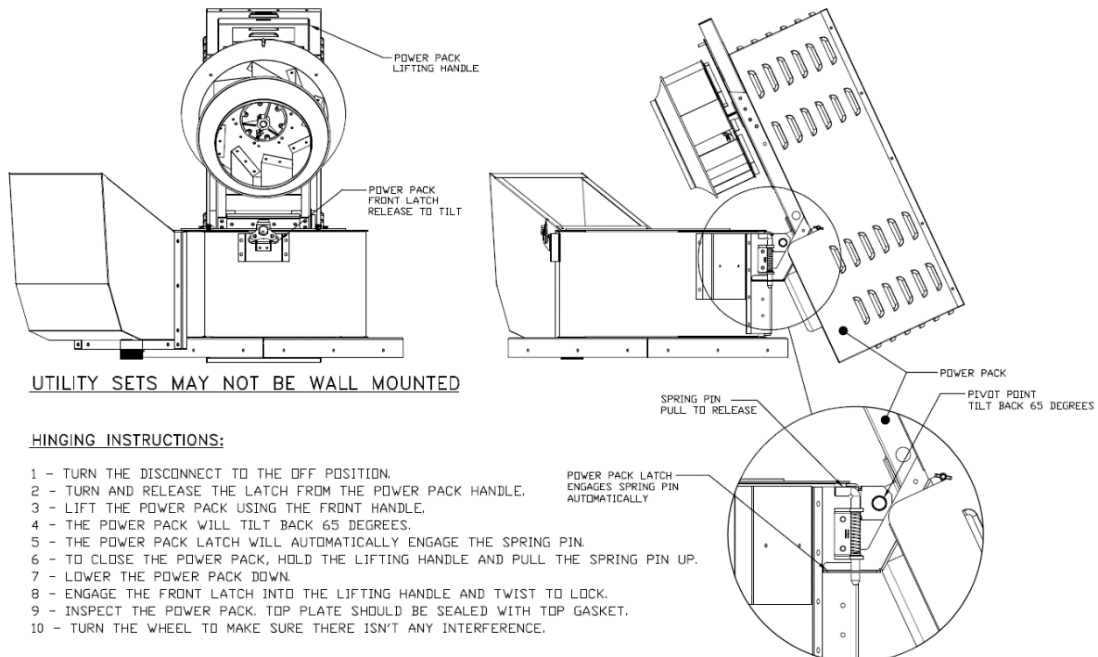
Manufactures Recommendations for Indoor Installation:

1. The fan inlet and outlet must be connected to the ducts using companion flanges and high temperature (1500F) gaskets or by a system specifically listed for such use, such as UL1978 or UL2221 listed duct systems.
2. Install the fan where there is room for service and removal.
3. Usually the duct to the fan is in a shaft and the shaft walls have a fire resistance rating. The space where the fan is located must have the same fire resistance rating as the shaft.
4. Flexible connectors are not allowed.
5. There must be a drain in the fan that is directed to a readily accessible and visible grease receptacle, ideally piped to the building grease trap.
6. The exhaust housing constructed of carbon steel not less than 1.52 mm (.060 in.), unless listed in accordance with the terms of the listing.
7. Inlet and outlet ducts will have access doors installed 3 feet from the fan for service and maintenance.
8. Minimum clearances are 18" inches to combustible, 3" inches to limited, 0" inches to non-combustibles.
9. All wiring and electrical equipment must comply with NFPA 70, National Electrical Code.

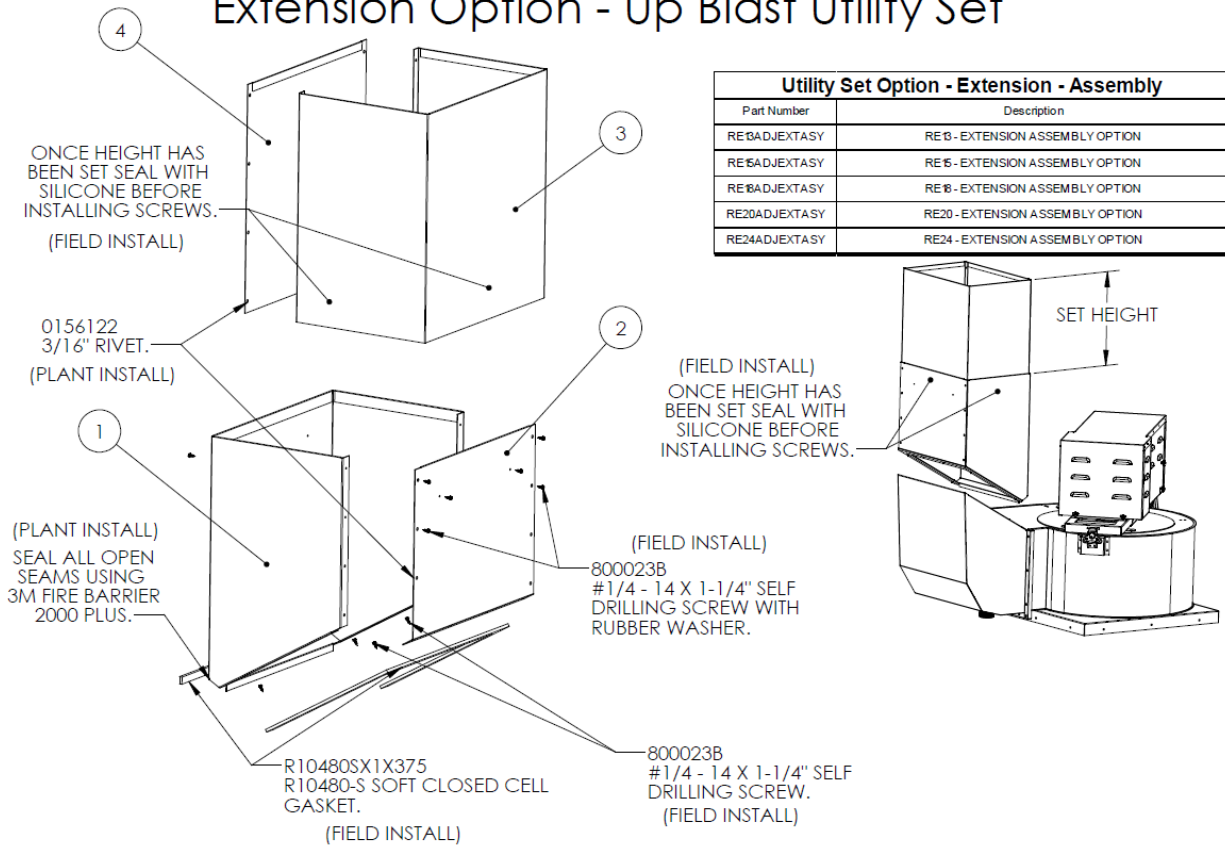
Up-Blast Curb Mount Utility Set Installation



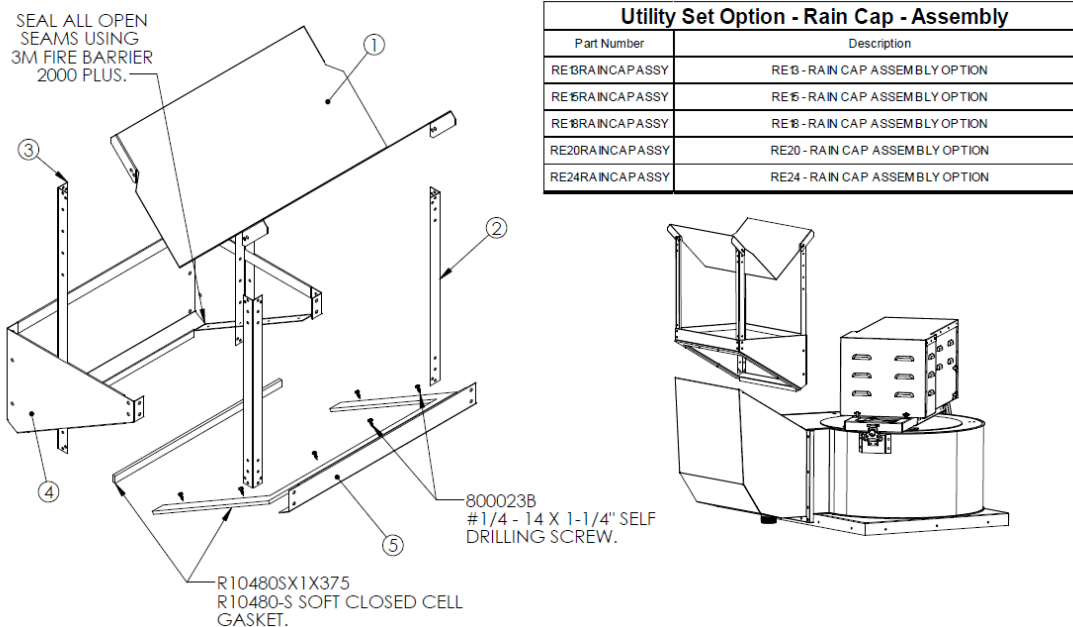
Up-Blast Curb Mounted Utility Set Hinging Instructions



Up-Blast Curb Mounted Utility Set Discharge Extension Option Extension Option - Up Blast Utility Set

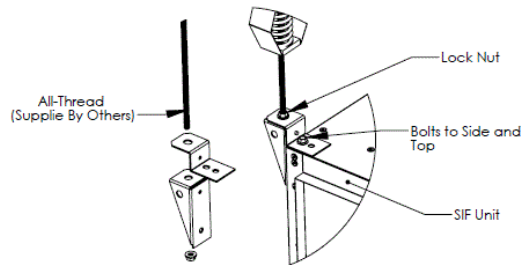


Up-Blast Curb Mounted Utility Set Rain Cap Option Rain Cap Option - Up Blast Utility Set

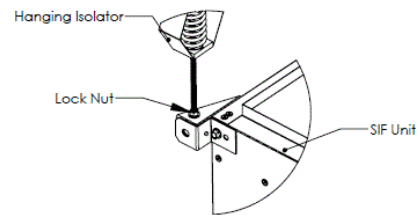


Square Inline Mounting Bracket Detail

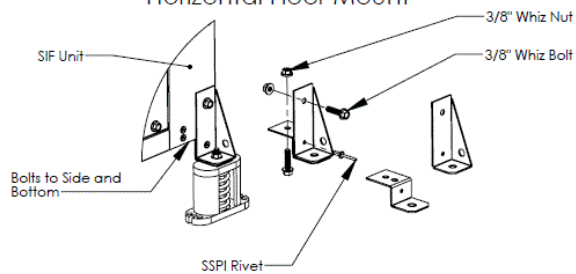
Horizontal Overhead Mount



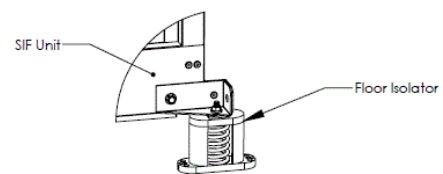
Vertical Overhead Mount



Horizontal Floor Mount

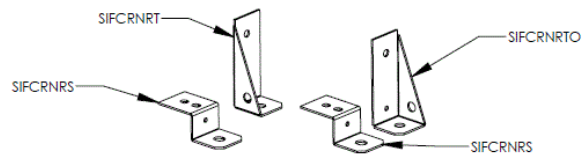


Vertical Floor Mount

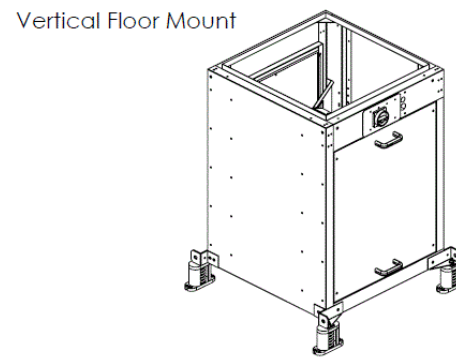
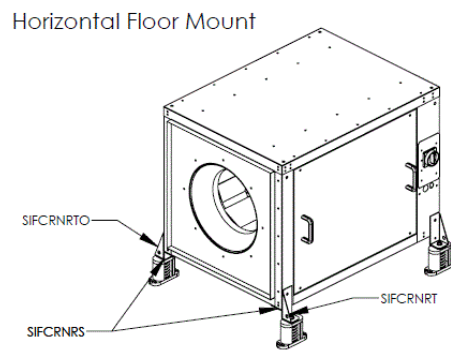
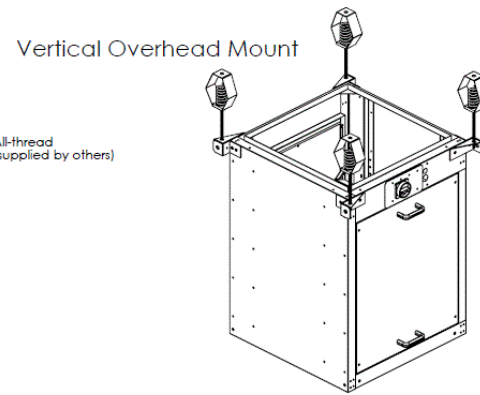
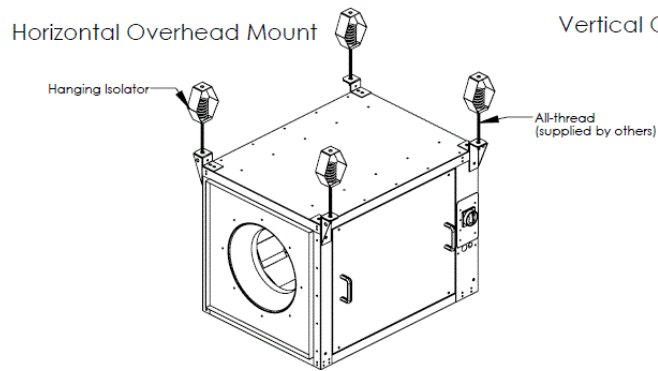


Each Mounting configuration requires:

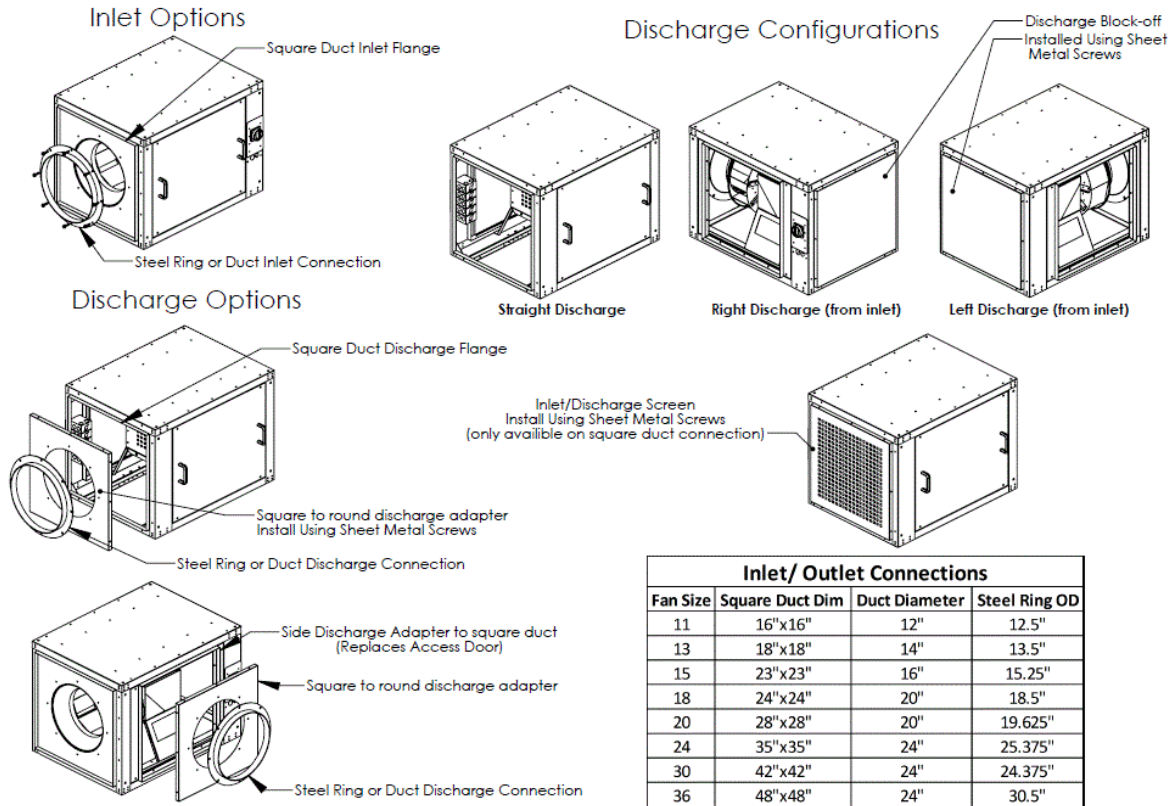
- (2) SIFCRNRT
- (2) SIFCRNRTO
- (4) SIFCRNRS



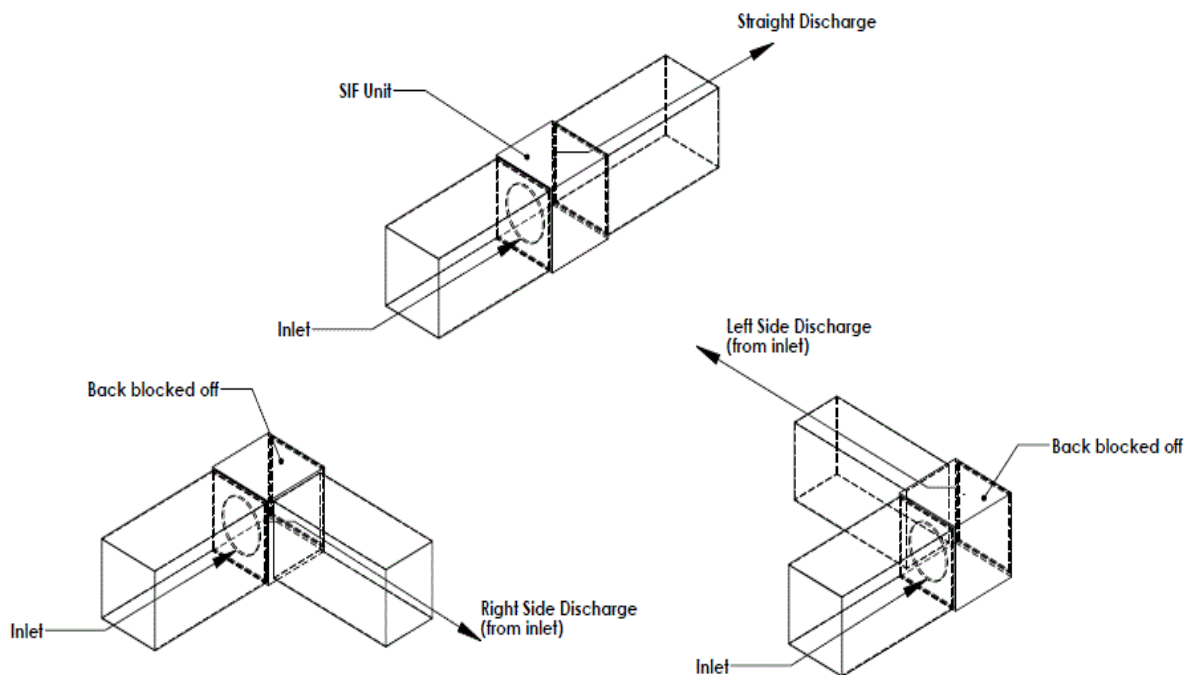
Square Inline Mounting Configurations



Square Inline Discharge Options



Square Inline Discharge Configurations



Electrical

Before connecting power to the fan, read and understand this entire section of this document. As-built wiring diagrams are available with each fan by the factory.

Electrical wiring and connections should be done in accordance with local ordinances and the National Electric Code, ANSI/NFPA70. Be sure the voltage and phase of the power supply and the wire amperage capacity is in accordance with the motor nameplate. For additional safety information refer to AMCA publication 410-96, *Recommended Safety Practices for Users and Installers of Industrial and Commercial Fans*.

1. Always **disconnect power** before working on or near a fan. Lock and tag the disconnect switch or breaker to prevent accidental power up.
2. A disconnect switch is shipped with every fan. The switch is located on the exterior of up-blast fans and in the interior of down-blast fans. On down-blast direct drive fans, the disconnect function is built into the speed controller.
3. A dedicated branch circuit should supply the motor circuit with short circuit protection according to the National Electric Code. This dedicated branch should be run to the junction box mentioned above and connected as shown in a following illustration labeled "Fan to Building Wiring Connection".
4. Make certain that the power source is compatible with the requirements of your equipment. The fan nameplate identifies the **proper phase and voltage** of the motor.
5. Before connecting fan to building power source, verify power line wiring is de-energized.
6. Secure the power cable to prevent contact with sharp objects.
7. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces or chemicals.
8. Before powering up fan check fan wheel for free rotation and make sure that the interior of the fan is free of loose debris or shipping materials.
9. If any of the original wire supplied with the fan must be replaced, it must be replaced with type TW wire or equivalent.

WARNING!!

Disconnect power before installing or servicing fan. High voltage electrical input is needed for this equipment. This work should be performed by a qualified electrician.

Copper Wire Ampacity

Wire Size AWG	Maximum Amps
14	15
12	20
10	30
8	50
6	65
4	85

IMPORTANT: FANS WITH HINGE KITS REQUIRE ENOUGH SLACK IN THE WIRING TO THE FAN TO ALLOW FAN TO TILT BACK TO THE OPEN POSITION. ELECTRICIAN MUST CHECK THIS AND ACCOUNT FOR THE RANGE OF MOTION OF THE FAN.

Motorized Damper

On units shipped with the optional motorized damper, power must be supplied to the damper according to the damper nameplate. The damper motor is controlled external to the fan. **External wiring to the damper motor is required.**

PSC (Permanent Split Capacitor) Motor Speed Control

Some single phase direct drive fans contain speed controls that regulate the amount of voltage going to the motor. Specific PSC motors must be used in conjunction with speed controls. The speed control has a knob with an off position, and high to low range. At high speed, the speed control allows all of the line voltage to pass right to the motor.



A minimum speed adjustment is provided to allow independent control of the minimum speed setting. Minimum speed adjustment ensures motor runs with sufficient torque to prevent stalling. To adjust this:

- 1) Motor must be in actual operating conditions to achieve proper speed adjustment. Motor will not slow down unless proper load is applied.
- 2) Turn main control knob to lowest speed position.
- 3) Locate and adjust minimum speed setting and adjust with small screw driver. This can be found under the speed control faceplate, (rotate clockwise to decrease minimum speed; counter-clockwise to increase minimum speed).
- 4) Motor will now operate from this preset minimum speed to full speed.

The lowest minimum voltage that may be applied to these motors is 65VAC. Running lower voltages to the motor can cause premature failure and overheating problems.

Electronically Commutated Motor (ECM) Speed Control

EC Motors and controls allow accurate manual adjustment of fan speed. The benefits of using an EC Motor are exceptional efficiency, performance, and motor life.

NOTE: To adjust the speed of 3 phase direct drive motors, a variable frequency drive is required.

EVO EC Motor Control

The control unit features a 4 digit LED numerical display. The knob on the unit allows the user to set the flow index with a screwdriver. Twenty seconds later, the display shows the motor RPM. Then, the display periodically alternates between the flow index and motor RPM. The flow index has a range of 0 to 100% and is typically linear with motor RPM.

The EC Motor control requires a **24VAC** input and can locally turn the motor on and off. The motor can be adjusted between 300 RPM and maximum speed with this control.



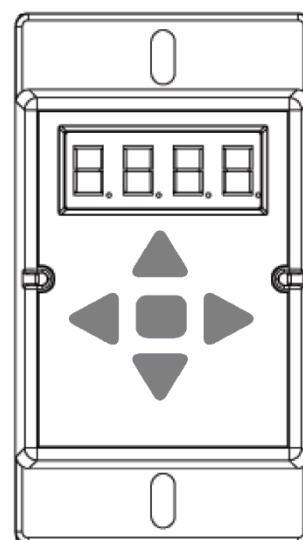
RTC FSC-1 Motor Control

The control unit features a 4 digit LED display, with a five button interface. All parameters can be accessed through the user menu. The percent of run speed can be changed by using the Up, and Down buttons, followed by pressing Enter (middle button) to save changes. Every **ten seconds** the display will toggle between current percentage of run speed, and current RPMs. The flow index has a range of **0-100%** and is typically linear with motor RPM.

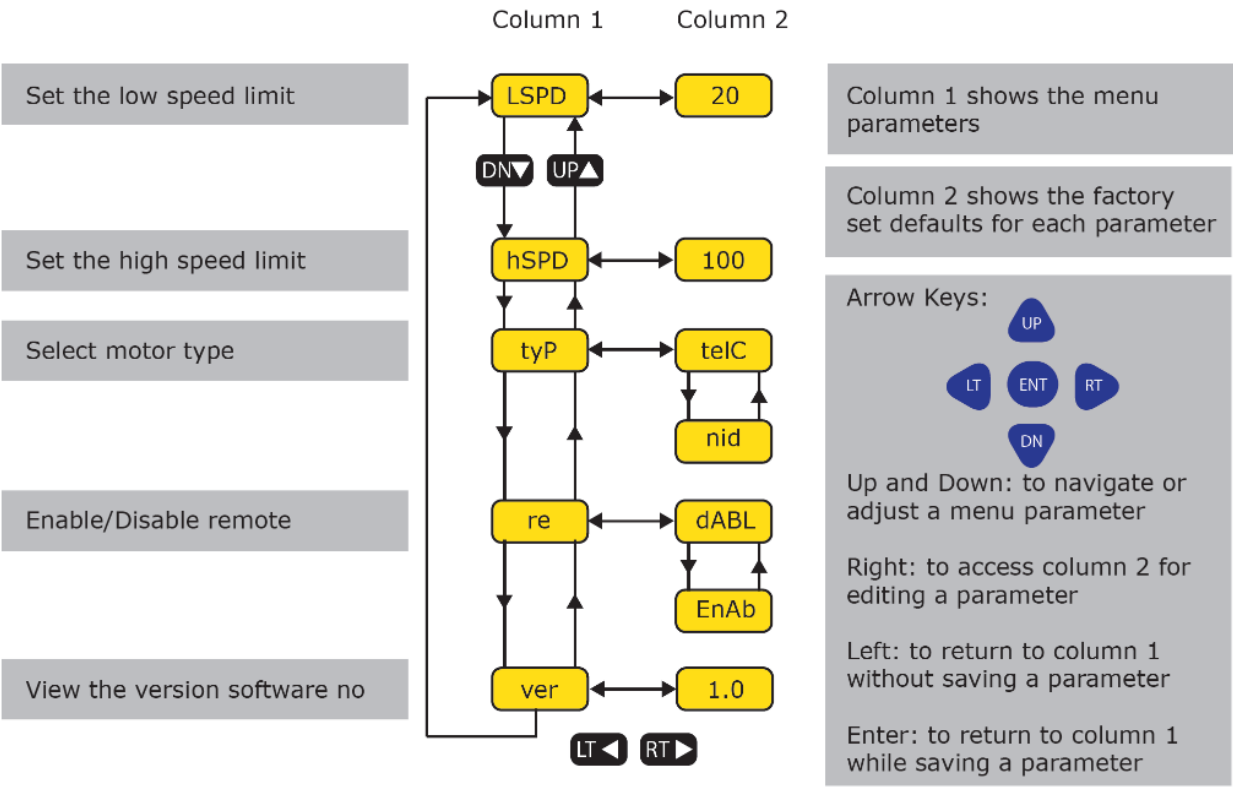
If the remote function (re) is enabled, the speed is controlled through a **0-10V** input. **0V = 0%** and **10V = 100%**, unless overridden by the low speed and high speed limits.

The EC Motor control requires a **24VAC** input and can locally turn the motor on and off. The motor RPM range is fully adjustable between the minimum and maximum set points, see LSPD and HSPD on the programming display. For more information see the control operating manual.

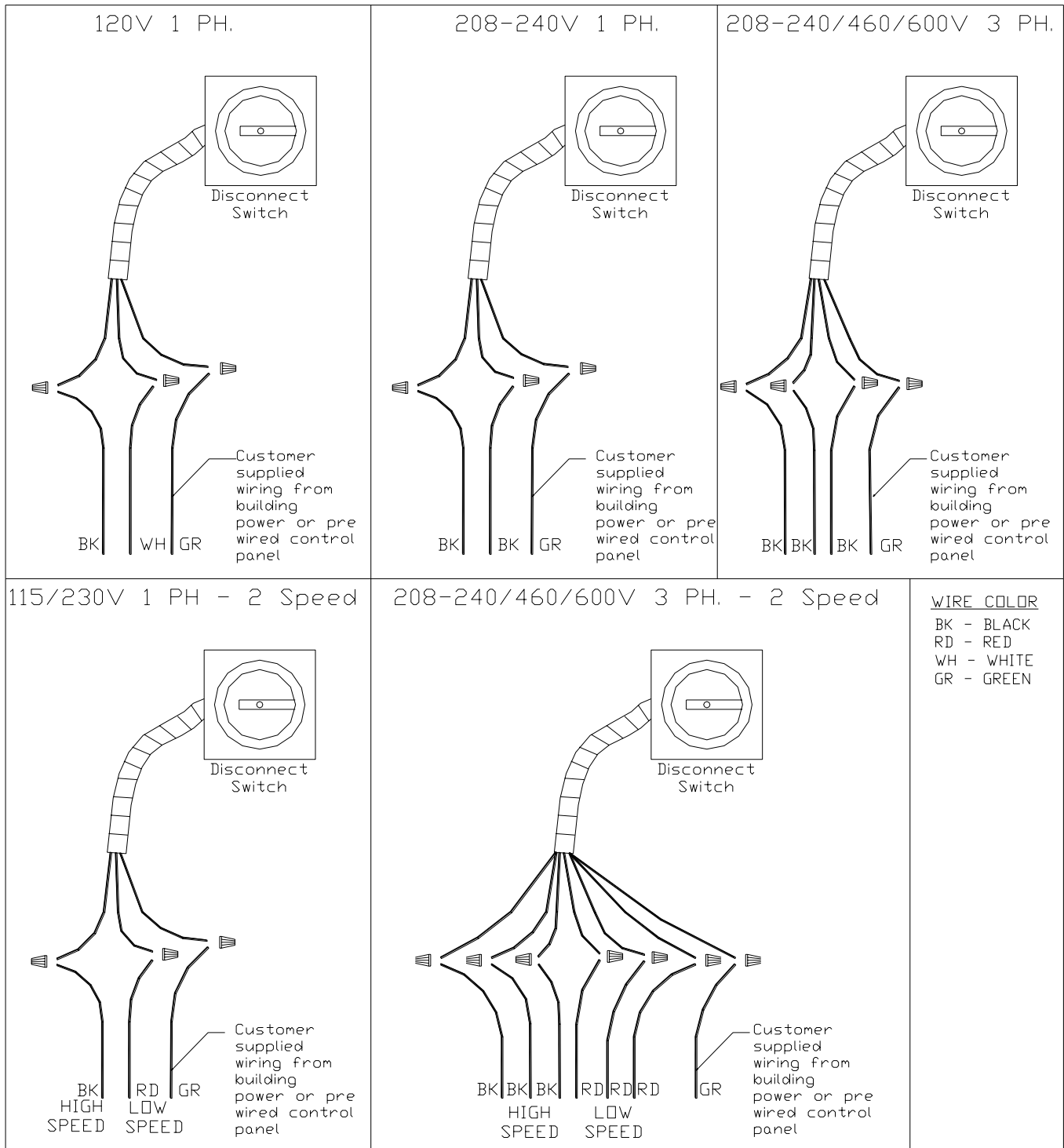
If “oFF” is being displayed, and the speed is set above 300 RPM, the ECM is not receiving RPM feedback. Check that the ECM is wired correctly. Check that the motor “tYP” in the settings matches the motor manufacturer.



Programming Map RTC FSC-1



Fan to Building Wiring Connection



Variable Frequency Drive (VFD) Installation Instructions

Input AC Power

1. Circuit breakers feeding the VFDs are recommended to be thermal-magnetic and fast acting. They should be sized based on the VFD amperage and according to the table below. Refer to the installation schematic for exact breaker sizing.
2. Each VFD should be fed by its own breaker. If multiple VFDs are to be combined on the same breaker, each drive should have its own protection measure (fuses or miniature circuit breaker) downstream from the breaker.
3. Input AC line wires should be run in conduit from the breaker panel to the drives. AC input power to multiple VFDs can be run in a single conduit if needed. **Do not combine input and output power cables in the same conduit.**
4. The VFD should be grounded on the terminal marked PE. A separate insulated ground wire must be provided to each VFD from the electrical panel. This will reduce the noise being radiated in other equipment.

ATTENTION!

DO NOT CONNECT INCOMING AC POWER TO OUTPUT TERMINALS U, V, W. SEVERE DAMAGE TO THE DRIVE WILL RESULT. INPUT POWER MUST ALWAYS BE WIRED TO THE INPUT L TERMINAL CONNECTIONS (L1, L2, L3)

VFD Output Power

1. Motor wires from each VFD to its respective motor **MUST** be run in a **separate steel** conduit away from control wiring and incoming AC power wiring to avoid noise and crosstalk between drives. An insulated ground must be run from each VFD to its respective motor. Do not run different fans output power cables in the same conduit.
2. Load reactors: If the distance between the VFD and the motor is great, a load reactor should be used between the VFD and the motor. The output reactor should be sized accordingly and installed within 10 feet of the output of the VFD. 208/230V – Load reactor should be used when distance exceeds 250 feet. 460/480V – Load reactor should be used when distance exceeds 50 feet. 575/600V – Load reactor should be used when distance exceeds 25 feet.
3. If the distance between the VFD and the motor is extremely long, up to 1000 FT, a dV/dT filter should be used and the VFD should be increased by 1 HP or to the next size VFD. The dV/dT filter should be sized accordingly and installed within 10 feet of the output of the VFD.
208/230V – dV/dT filter should be used when distance exceeds 400 feet.
460/480V – dV/dT filter should be used when distance exceeds 250 feet.
575/600V – dV/dT filter should be used when distance exceeds 150 feet.
4. No contactor should be installed between the drive and the motor. Operating such a device while the drive is running can potentially cause damage to the power components of the drive.
5. When a disconnect switch is installed between the drive and motor, the disconnect should only be operated when the drive is in a STOP state.

VFD Programming

Programming

1. The Drive should be programmed for the proper motor voltage. P107 is set to 0 (Low) if motor voltage is 120 VAC, 208 VAC or 400 VAC. P107 is set to 1 (High) if motor voltage is 230 VAC, 480 VAC or 575 VAC.
2. The Drive should be programmed for the proper motor overload value. P108 is calculated as $\text{Motor FLA} \times 100 / \text{Drive Output Rating}$ (available in table below).

To enter the PROGRAM mode to access the parameters:

1. Press the Mode (M) button. This will activate the password prompt (PASS).
2. Use the Up and Down buttons to scroll to the password value (the factory default password is "0225") and press the Mode (M) button. Once the correct password is entered, the display will read "P100", which indicates that the PROGRAM mode has been accessed at the beginning of the parameter menu.
3. Use the Up and Down buttons to scroll to the desired parameter number..
4. Once the desired parameter is found, press the Mode (M) button to display the present parameter setting. The parameter value will begin blinking, indicating that the present parameter setting is being displayed. The value of the parameter can be changed by using the Up and Down buttons.
5. Pressing the Mode (M) button will store the new setting and also exit the PROGRAM mode. To change another parameter, press the Mode (M) button again to re-enter the PROGRAM mode. If the Mode button is pressed within 1 minute of exiting the PROGRAM mode, the password is not required to access the parameters. After one minute, the password must be re-entered in order to access the parameters again.

P500 parameter provides a history of the last 8 faults on the drive. It can be accessed without getting into PROGRAM mode.

ACTECH SMV VFD CROSS-REFERENCE TABLE

Model Number	Volts	1Ø input	3Ø input	HP	Input Amps 1Ø 120VAC	Input Amps 1Ø 240VAC	Output Amps	Breaker 1Ø 120VAC	Breaker 1Ø 240VAC
ESV251N01SXB	120/240V	X		0.33	6.8	3.4	1.7	15	15
ESV371N01SXB	120/240V	X		0.5	9.2	4.6	2.4	15	15
ESV751N01SXB	120/240V	X		1	16.6	8.3	4.2	25	15
ESV112N01SXB	120/240V	X		1.5	20	10	6	30	20
					Input Amps 1Ø	input Amps 3Ø		Breaker 1Ø	Breaker 3Ø
ESV371N02YXB	240V	X	X	0.5	5.1	2.9	2.4	15	15
ESV751N02YXB	240V	X	X	1	8.8	5	4.2	15	15
ESV112N02YXB	240V	X	X	1.5	12	6.9	6	20	15
ESV152N02YXB	240V	X	X	2	13.3	8.1	7	25	15
ESV222N02YXB	240V	X	X	3	17.1	10.8	9.6	30	20
ESV402N02TXB	240V		X	5		18.6	16.5		30
ESV552N02TXB	240V		X	7.5		26	23		40
ESV752N02TXB	240V		X	10		33	29		50
ESV113N02TXB	240V		X	15		48	42		80
ESV153N02TXB	240V		X	20		59	54		90
ESV751N04TXB	480V		X	1		2.5	2.1		15
ESV112N04TXB	480V		X	1.5		3.6	3		15
ESV152N04TXB	480V		X	2		4.1	3.5		15
ESV222N04TXB	480V		X	3		5.4	4.8		15
ESV402N04TXB	480V		X	5		9.3	8.2		15
ESV552N04TXB	480V		X	7.5		12.4	11		20
ESV752N04TXB	480V		X	10		15.8	14		25
ESV113N04TXB	480V		X	15		24	21		40
ESV153N04TXB	480V		X	20		31	27		50
ESV183N04TXB	480V		X	25		38	34		70
ESV223N04TXB	480V		X	30		45	40		80
ESV303N04TXB	480V		X	40		59	52		100
ESV373N04TXB	480V		X	50		74	65		125
ESV453N04TXB	480V		X	60		87	77		150
ESV751N06TXB	600V		X	1		2	1.7		15
ESV152N06TXB	600V		X	2		3.2	2.7		15
ESV222N06TXB	600V		X	3		4.4	3.9		15
ESV402N06TXB	600V		X	5		6.8	6.1		15
ESV552N06TXB	600V		X	7.5		10.2	9		20
ESV752N06TXB	600V		X	10		12.4	11		20
ESV113N06TXB	600V		X	15		19.7	17		30
ESV153N06TXB	600V		X	20		25	22		40
ESV183N06TXB	600V		X	25		31	27		50
ESV223N06TXB	600V		X	30		36	32		60
ESV303N06TXB	600V		X	40		47	41		70
ESV373N06TXB	600V		X	50		59	52		90
ESV453N06TXB	600V		X	60		71	62		110

OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan **OFF** or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

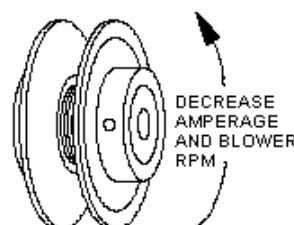
Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Check pulley alignment and belt tension as described below for belt drive fans.
3. Inspect the condition of the damper and damper linkage, if provided.
4. Inspect the air-stream for obstructions or debris in wheel.
5. Compare the supplied **voltage** with the fan's nameplate voltage. If this does not match, correct the problem.
6. Start the fan up, by turning the external disconnect to the **ON** position, and shut it **OFF** immediately to **check rotation of the wheel** with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
7. When the fan is started up, observe the operation and check for any unusual noises.
8. Switch the external disconnect back to the **ON** position and with the air system in full operation and all ducts attached, measure the system airflow. Motor sheave (pulley) is variable pitch, and allows for an increase or decrease of the fan RPM to adjust the airflow, as shown in the illustration below. For your convenience, a RPM chart is included in the following pages. If the fan is a direct drive version, it may have a speed control to adjust speed.
9. Once the proper airflow is achieved, measure and record the fan speed with a reliable tachometer. **Caution - Excessive speed will result in motor overloading or bearing failure. Do not set fan RPMs higher than specified in the maximum RPM chart.** See the troubleshooting guide for more information.
10. Measure and record the **voltage** and **amperage** to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.
11. Once the rpm of the ventilator has been properly set, disconnect power and recheck belt tension and pulley alignment as described below.

Pulley Setscrew Torque

Thread Size	Torque (IN/Lb)
No. 10 (bushing)	32
1/4" (bushing)	72
5/16"	130

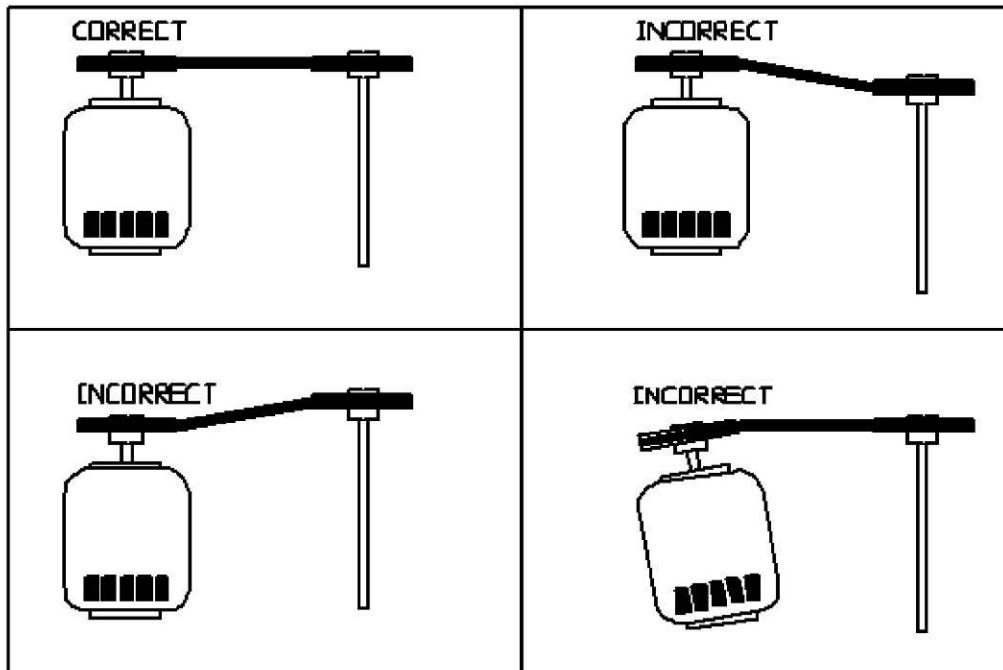
Pulley Adjustment Illustration



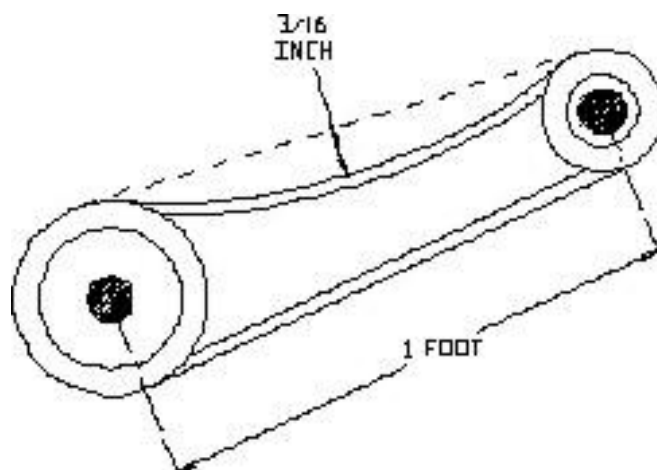
Pulley Adjustment (Belt Drive Fans)

The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor sheave. Two groove variable pitch pulleys must be adjusted an equal number of turns open or closed. Any increase in speed represents a substantial increase in horsepower required by the unit. Motor amperage should always be checked to avoid serious damage to the motor when the speed is varied. Always torque setscrews according to the setscrew torque chart.

Pulley Alignment



Proper Belt Tension



Pulley Combination Chart

Motor RPM 1725															
1/3 to 1-1/2 HP AX BELTS			MOTOR PULLEY 1VL34		Dd1 1.9	Dd2 2.9	Pd1 2	Pd2 3							
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0		
AK114	11	11.2	308	323	339	354	370	385	400	416	431	447	462		
1/3 to 1-1/2 HP AX BELTS															
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0		
AK114	11	11.2	400	416	431	447	462	477	493	508	524	539	554		
AK94	9	9.2	488	506	525	544	563	581	600	619	638	656	675		
AK79	7.5	7.7	582	605	627	650	672	694	717	739	762	784	806		
AK66	6.2	6.4	701	728	755	782	809	836	863	889	916	943	970		
AK54	5	5.2	863	896	929	962	995	1028	1062	1095	1128	1161	1194		
AK46	4.2	4.4	1019	1059	1098	1137	1176	1215	1255	1294	1333	1372	1411		
AK39	3.5	3.7	1212	1259	1305	1352	1399	1445	1492	1539	1585	1632	1678		
AK32	3	3.2	1402	1455	1509	1563	1617	1671	1725	1779	1833	1887	1941		
2 to 5 HP BX BELTS															
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BK160H	15.4	15.7	330	339	348	357	366	375	385	394	403	412	421	430	439
2BK140H	13.4	13.7	378	388	399	409	420	430	441	451	462	472	483	493	504
2BK120H	11.4	11.7	442	455	467	479	491	504	516	528	541	553	565	577	590
2BK110H	10.4	10.7	484	497	511	524	537	551	564	578	591	605	618	631	645
2BK100H	9.4	9.7	534	548	563	578	593	608	622	637	652	667	682	697	711
2BK90H	8.4	8.7	595	611	628	644	661	677	694	710	727	744	760	777	793
2BK80H	7.4	7.7	672	691	709	728	747	765	784	803	821	840	859	877	896
2BK70H	6.4	6.7	772	794	815	837	858	880	901	923	944	965	987	1008	1030
2BK60H	5.4	5.7	908	933	958	984	1009	1034	1059	1084	1110	1135	1160	1185	1211
2BK55H	4.9	5.2	995	1023	1050	1078	1106	1133	1161	1189	1216	1244	1272	1299	1327
2BK50H	4.4	4.7	1101	1132	1162	1193	1223	1254	1285	1315	1346	1376	1407	1438	1468
7-1/2 to 10 HP BX BELTS															
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BK160H	15.4	15.7	516	527	538	549	560	571	582	593	604	615	626	637	648
2BK140H	13.4	13.7	592	604	617	630	642	655	667	680	693	705	718	730	743
2BK120H	11.4	11.7	693	708	722	737	752	767	781	796	811	826	840	855	870
2BK110H	10.4	10.7	758	774	790	806	822	838	854	871	887	903	919	935	951
2BK100H	9.4	9.7	836	854	871	889	907	925	943	960	978	996	1014	1031	1049
2BK90H	8.4	8.7	932	952	972	991	1011	1031	1051	1071	1091	1110	1130	1150	1170
2BK80H	7.4	7.7	1053	1075	1098	1120	1143	1165	1187	1210	1232	1255	1277	1299	1322
3 to 5 HP BX BELTS															
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BSV278	27.8	28.1	184	189	194	200	205	210	215	220	225	230	235	240	246
2BSV250	25	25.3	205	210	216	222	227	233	239	244	250	256	261	267	273
2BSV234	23.4	23.7	218	224	230	237	243	249	255	261	267	273	279	285	291
2BSV200	20	20.3	255	262	269	276	283	290	297	304	312	319	326	333	340
2BSV184	18.4	18.7	277	284	292	300	307	315	323	331	338	346	354	361	369
2BSV160	16	16.3	317	326	335	344	353	362	370	379	388	397	406	414	423
2BSV154	15.4	15.7	330	339	348	357	366	375	385	394	403	412	421	430	439
2BSV136	12.6	12.9	401	412	423	435	446	457	468	479	490	501	513	524	535
2BSV124	12.4	12.7	407	419	430	441	453	464	475	487	498	509	521	532	543
2BSV110	11	11.3	458	471	483	496	509	522	534	547	560	572	585	598	611
7-1/2 to 10 HP BX BELTS															
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BSV278	27.8	28.1	289	295	301	307	313	319	325	331	338	344	350	356	362
2BSV250	25	25.3	320	327	334	341	348	355	361	368	375	382	389	395	402
2BSV234	23.4	23.7	342	349	357	364	371	378	386	393	400	408	415	422	429
2BSV200	20	20.3	399	408	416	425	433	442	450	459	467	476	484	493	501
2BSV184	18.4	18.7	434	443	452	461	470	480	489	498	507	517	526	535	544
2BSV160	16	16.3	497	508	519	529	540	550	561	571	582	593	603	614	624
2BSV154	15.4	15.7	516	527	538	549	560	571	582	593	604	615	626	637	648
2BSV136	12.6	12.9	628	642	655	669	682	695	709	722	735	749	762	776	789
2BSV124	12.4	12.7	638	652	666	679	693	706	720	733	747	761	774	788	801
2BSV110	11	11.3	717	733	748	763	779	794	809	824	840	855	870	885	901
15 to 25 HP BX BELTS															
			Open	TURNS ON MOTOR PULLEY										Closed	
BLOWER PULLEY	DATUM DIAMETER	PITCH DIAMETER	6	5 1/2	5	4 1/2	4	3 1/2	3	2 1/2	2	1 1/2	1	1/2	0
2BSV278	27.8	28.1	381	387	393	399	405	411	417	424	430	436	442	448	454
2BSV250	25	25.3	423	430	436	443	450	457	464	470	477	484	491	498	505
2BSV234	23.4	23.7	451	459	466	473	480	488	495	502	509	517	524	531	539
2BSV200	20	20.3	527	535	544	552	561	569	578	586	595	603	612	620	629
2BSV184	18.4	18.7	572	581	590	600	609	618	627	636	646	655	664	673	683
2BSV160	16	16.3	656	667	677	688	698	709	720	730	741	751	762	773	783
2BSV154	15.4	15.7	681	692	703	714	725	736	747	758	769	780	791	802	813
2BSV136	12.6	12.9	829	842	856	869	883	896	909	923	936	949	963	976	990

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Broken fan belt	Replace belt
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Fan speed is too high	Reduce fan RPM
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
	Duct static pressure lower than design	Reduce fan RPM
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
	Duct static pressure higher than design	Improve ductwork to eliminate or reduce duct losses
	Blower speed too low	Increase fan RPM. Do not overload motor
	Belt slippage	Adjust belt tension
Excessive Airflow	Blower speed too high	Reduce fan RPM
	Duct static pressure lower than design	Reduce fan RPM
Excessive Vibration and Noise	Misaligned pulleys	Align pulleys
	Damaged or unbalanced wheel	Replace wheel
	Fan is operating in the unstable region of the fan curve	Refer to performance curve for fan
	Bearings need lubrication or replacement	Lubricate or replace
	Fan speed is too high	Reduce fan RPM
	Belts too loose, worn or oily	Inspect and replace if needed

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance.

Please record any maintenance or service performed on this fan in the documentation section located at the end of this manual.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. The type of grease and the amount of grease can is shown below. **Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.**
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

Bearing Grease Charge

Ball Bearings	
Shaft Size (Inches)	Grease Charge (Ounces)
1/2 to 3/4	0.03
7/8 to 1 3/16	0.10
1 1/4 to 1 1/2	0.15
1 11/16 to 1 15/16	0.20
2 to 2 7/16	0.30
2 1/2 to 2 15/16	0.50
3 to 3 7/16	0.85
3 1/2 to 4	1.50

Bearing Grease Type

Thickener	Lithium Complex
Oil	Petroleum
Thickness	NLGI 2
Operating Temperature	-20 F to 200 F Intermittent to 250 F

2 weeks after startup

1. Belt tension should be checked after the first 2 weeks of fan operation on belt drive fans. Belts tend to stretch and settle into pulleys after an initial start-up sequence. **Do not tension belts by changing the setting of the motor pulley**, this will change the fan speed and may damage the motor. To re-tension belts, turn the power to the fan motor OFF. Loosen the fasteners that hold the motor to the fan. Move the motor to the left or right to adjust the belt tension. Belt tension should be adjusted to allow 1/64" of deflection per inch of belt span. Exercise extreme care when adjusting V-belts as not to misalign pulleys. Any misalignment will cause a sharp reduction in belt life and produce squeaky noises. Over-tightening will cause excessive belt and bearing wear as well as noise. Too little tension will cause slippage at startup and uneven wear. **Whenever belts are removed or installed, never force belts over pulleys without loosening motor first to relieve belt tension.** When replacing belts, use the same type as supplied by the manufacturer. On units shipped with double groove pulleys, matched belts should always be used.
2. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

Every 3 months

1. Belt tension should be checked quarterly for belt drive fans. See instructions in the previous maintenance section. Over-tightening will cause excessive bearing wear and noise. Too little tension will cause slippage at startup and uneven wear.
2. Fans need to be cleaned quarterly, and more often in severe conditions.

Yearly

1. Inspect bearings for wear and deterioration. Replace/grease if necessary.
2. Inspect belt wear and replace torn or worn belts on belt drive fans.
3. Inspect bolts and set screws for tightness. Tighten as necessary.
4. Inspect motor for cleanliness. Clean exterior surfaces only. Remove dust and grease from the motor housing to ensure proper motor cooling. Remove dirt and grease from the wheel and housing to prevent imbalance and damage.

Start-Up and Maintenance Documentation

START-UP AND MEASUREMENTS SHOULD BE PERFORMED AFTER THE SYSTEM HAS BEEN AIR BALANCED (Warranty will be void without completion of this form)

Job Information

Job Name	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Purchase Date	

Service Company	
Address	
City	
State	
Zip	
Phone Number	
Fax Number	
Contact	
Start-Up Date	

Fan Unit Information

Refer to the start-up procedure in this manual to complete this section.

Name Plate and Unit Information	
Model Number	
Serial Number	
Volts	
Hertz	
Phase	
FLA	
HP	
Blower Pulley	
Motor Pulley	
Belt Number	

Field Measured Information	
Voltage	
Amperage**	
RPM	

Blower Rotation	Correct	
	Incorrect	

**If measured amps exceed the FLA rating on the nameplate, fan RPM must be reduced to decrease the measured amps below the nameplate FLA rating.

Maintenance Record

[illegible]

Factory Service Department

Phone: 1-866-784-6900

Fax: 1-919-554-9374

Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

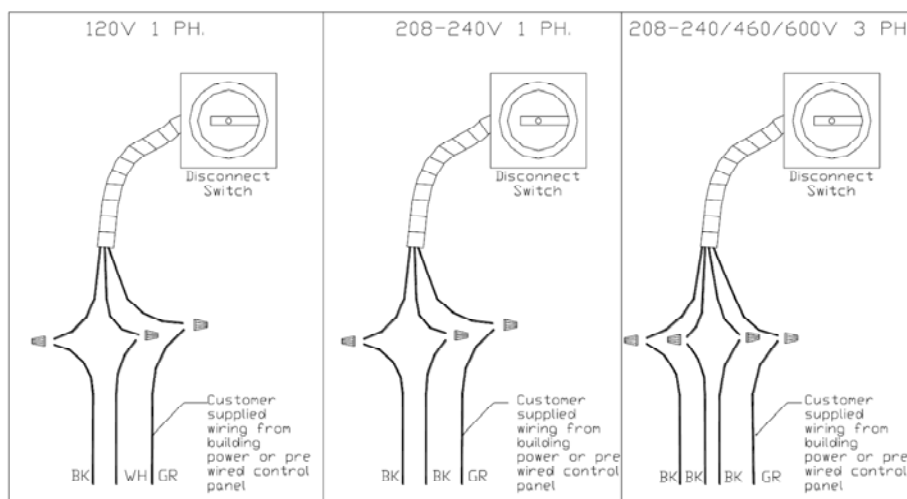
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.



F8

Power Roof Ventilator/Fans Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

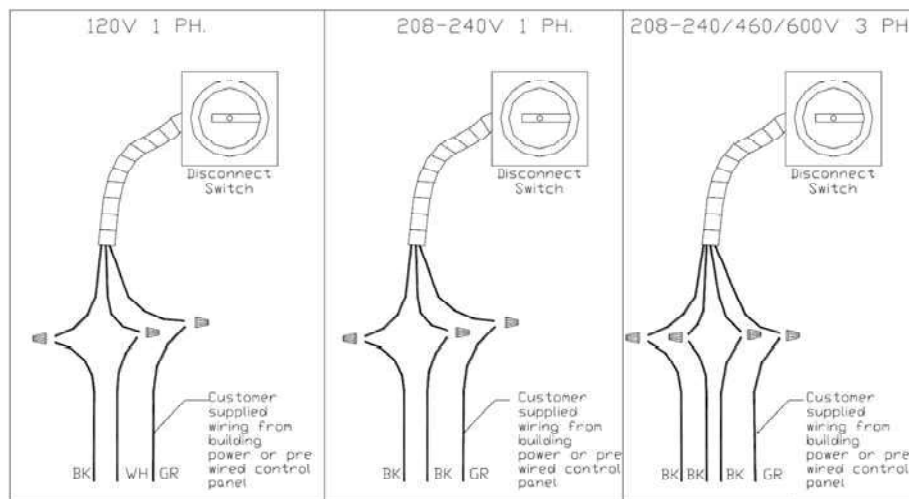
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
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OPERATION

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Start Up

Special Tools Required

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- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
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	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

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WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
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4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

PRODUCT INFORMATION PACKET



Model No: A4P17NR1H

Catalog No: 100803.00

1/4HP..1625RPM.48.TENV.115/230V.1PH.60HZ.AIROVER.AUTOMATIC.40C.1.0SF.RESILIENT BASE.AG -
FAN & BLOWER.A4P17NR1H

Agricultural



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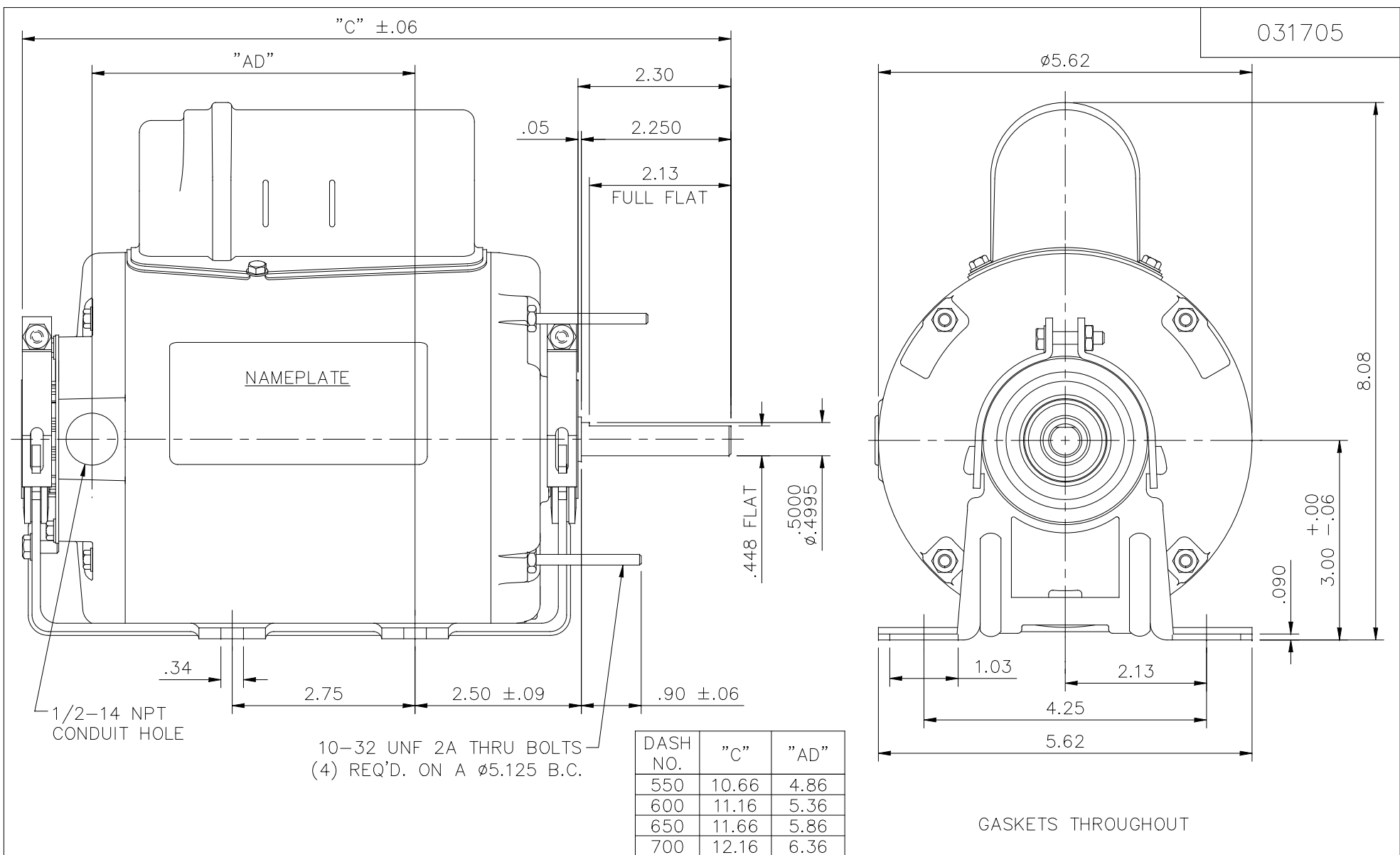



Nameplate Specifications

Output HP	0.25 Hp	Output KW	0.19 kW
Frequency	60 Hz	Voltage	115/230 V
Current	2.8/1.4 A	Speed	1625 rpm
Service Factor	1	Phase	1
Efficiency	70 %	Duty	Continuous
Insulation Class	B	Design Code	NO DESIGN CODE
KVA Code	D	Frame	48
Enclosure	Totally Enclosed Non Ventilated	Overload Protector	Automatic
Ambient Temperature	40 °C	Drive End Bearing Size	6203
Opp Drive End Bearing Size	6203	UL	Recognized
CSA	Y	CE	N
IP Code	43		

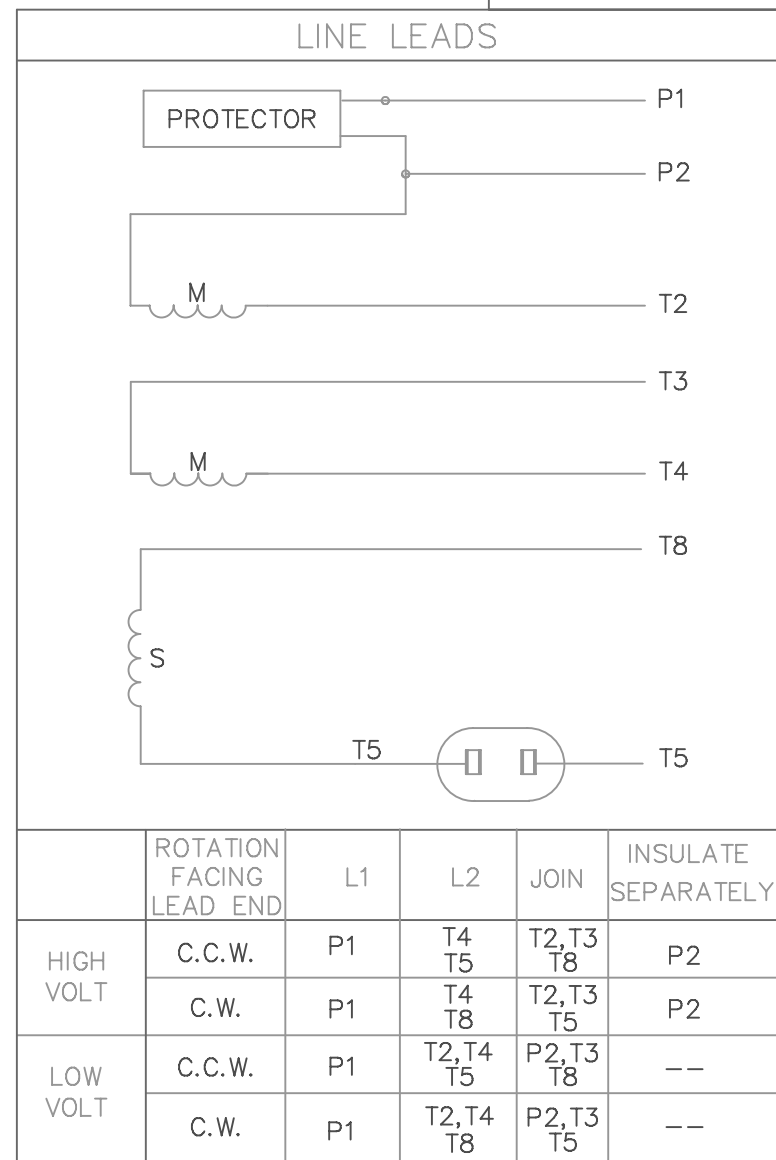
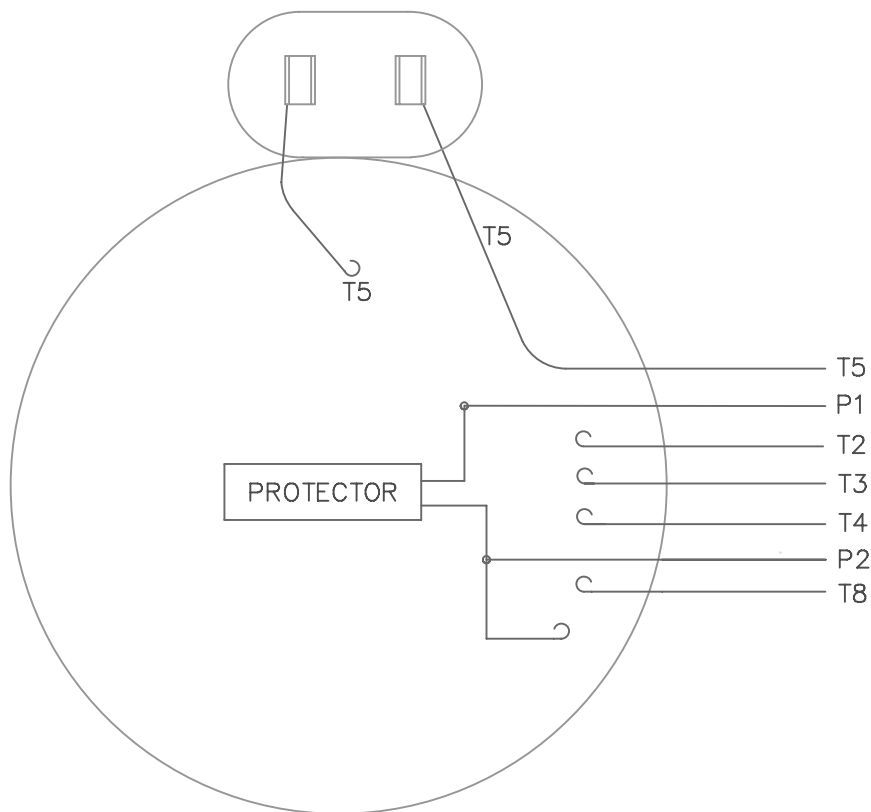
Technical Specifications


Electrical Type	Permanent Split Capacitor	Starting Method	Across The Line
Poles	4	Rotation	Selective Counterclockwise
Mounting	Resilient Base	Motor Orientation	HORIZONTAL
Drive End Bearing	BALL	Opp Drive End Bearing	BALL
Frame Material	Rolled Steel	Shaft Type	T
Overall Length	10.66 in	Frame Length	5.50 in
Shaft Diameter	0.500 in	Shaft Extension	2.25 in
Assembly/Box Mounting	F1 ONLY		
Outline Drawing	031705-550	Connection Diagram	005109.15



				TOLERANCES UNLESS SPECIFIED			ELECTRIC MOTORS GEARMOTORS AND DRIVES		DRAWN PG 7/24/02	
				DEC.	INCHES				CHK	
				.X	±.1				APPD	
				.XX	±.03				SCALE 1=2	
				.XXX	±.005	TITLE OUTLINE – 48Z FRAME RESILIENT MOUNT – ENCLOSED			REF 031079	
01	RESILIENT SCREW REVERSED AS PER ECO-0102363	KK 5/17/16	KK	.XXXX	±.0005				MAT'L.	FMF 100804.00
NO.	REVISION	BY & DATE	CHK	ANG	±1/2"	FINISH			PREV	
THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED THIS IS AN ELECTRONICALLY GENERATED DOCUMENT – DO NOT SCALE THIS PRINT			RFP		CAD FILE 031705		SIZE A	DRAWING NO. 031705		REV. 01
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VIEW FROM OUTSIDE OF MOTOR AT SWITCH END.



				TOLERANCES UNLESS SPECIFIED			ELECTRIC MOTORS GEARMOTORS AND DRIVES		DRAWN	PG 3/4/02	
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THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED THIS IS AN ELECTRONICALLY GENERATED DOCUMENT - DO NOT SCALE THIS PRINT			RFP		CAD FILE			00510915	SIZE	DRAWING NO.	REV.
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LEESON ELECTRIC CORPORATION

TYPICAL PERFORMANCE CURVE for AC MOTOR

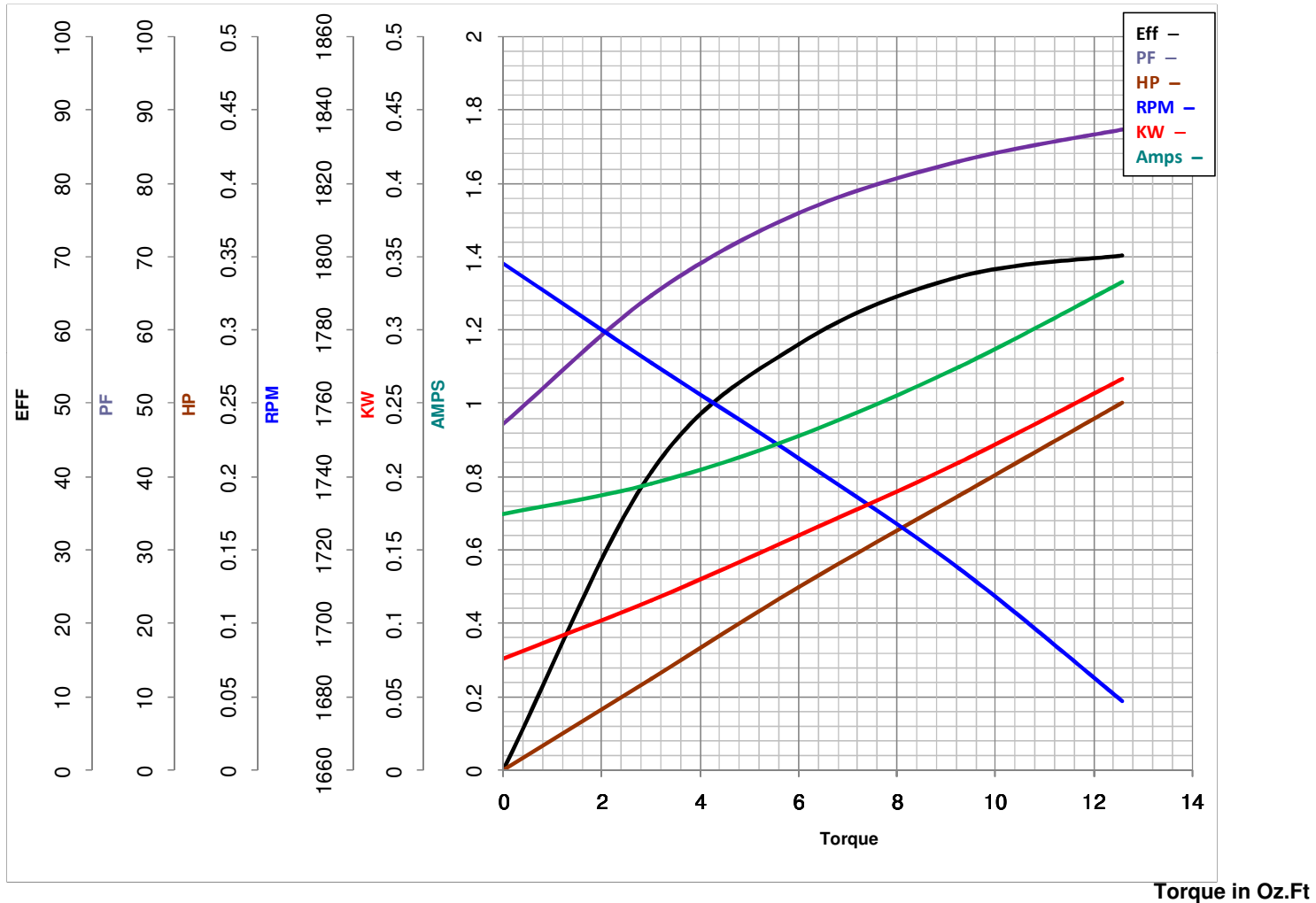
Model No 100803.00Catalog No 100803.00

Curve at 230
60
0.25

Volts
HZ
HP

HP 0.25

VOLTS 115/230

PHASE 1HZ 60RPM 1625

FL TORQUE 12.56 Oz.Ft
BD TORQUE 27.0 Oz.Ft
LR TORQUE 8 Oz.Ft

WINDING PE484448-3

FL AMPS 2.8/1.4
PU TORQUE 7.5 Oz.Ft
LR AMPS 5

Date 3/28/2018

F8-F12

Power Roof Ventilator/Fans Installation, Operation, and Maintenance Manual

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RECEIVING AND INSPECTION

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WARNING!!

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WARRANTY

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INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

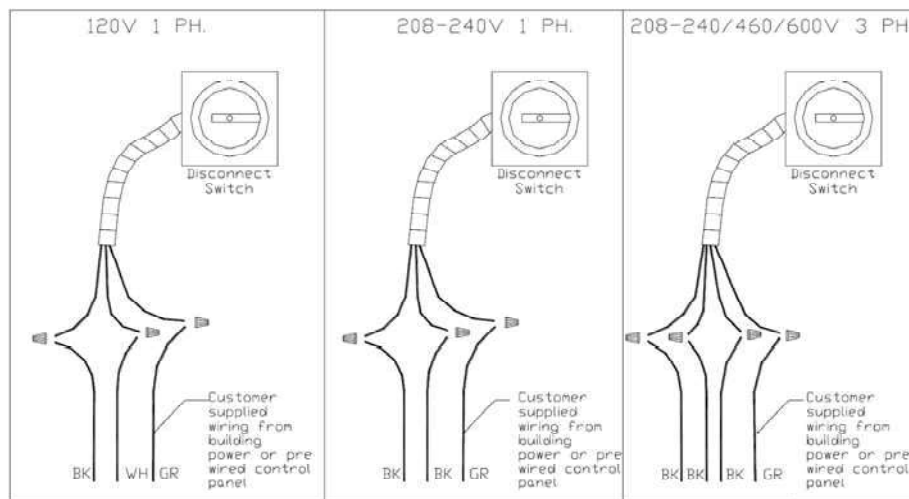
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Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
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5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
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Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

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Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
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	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
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4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

PRODUCT INFORMATION PACKET



Model No: A4P17NR2H

Catalog No: 100804.00

1/3HP..1625RPM.48.TENV.115/230V.1PH.60HZ.AIROVER.AUTOMATIC.40C.1.0SF.RESILIENT BASE.AG -
FAN & BLOWER.A4P17NR2H
Agricultural



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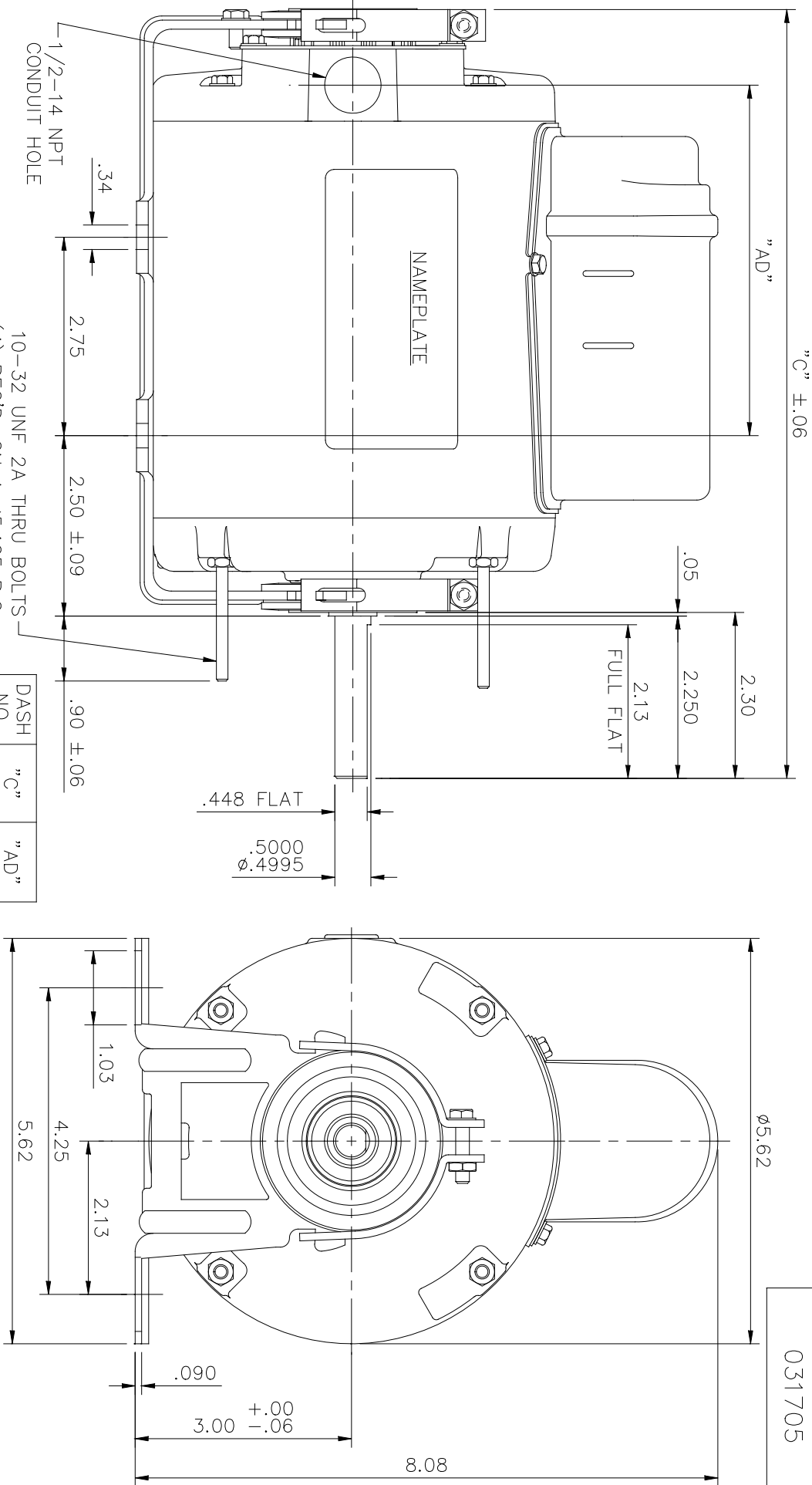
Nameplate Specifications

Output HP	0.33 Hp	Output KW	0.25 kW
Frequency	60 Hz	Voltage	115/230 V
Current	3.2/1.6 A	Speed	1625 rpm
Service Factor	1	Phase	1
Efficiency	72 %	Duty	Continuous
Insulation Class	B	Design Code	NO DESIGN CODE
KVA Code	D	Frame	48
Enclosure	Totally Enclosed Non Ventilated		
Ambient Temperature	40 °C	Overload Protector	Automatic
Opp Drive End Bearing Size	6203	Drive End Bearing Size	6203
CSA	Y	UL	Recognized
IP Code	43	CE	N

Technical Specifications

Electrical Type	Permanent Split Capacitor	Starting Method	Across The Line
Poles	4	Rotation	Selective Counterclockwise
Mounting	Resilient Base	Motor Orientation	HORIZONTAL
Drive End Bearing	BALL	Opp Drive End Bearing	BALL
Frame Material	Rolled Steel	Shaft Type	T
Overall Length	10.66 in	Frame Length	5.50 in
Shaft Diameter	0.500 in	Shaft Extension	2.25 in
Assembly/Box Mounting	F1 ONLY		
Outline Drawing	031705-550	Connection Diagram	005109.15

This is an uncontrolled document once printed or downloaded and is subject to change without notice. Date Created: 10/15/2018



DASH NO.	"C"	"AD"
550	10.66	4.86
600	11.16	5.36
650	11.66	5.86
700	12.16	6.36

TOLERANCES UNLESS SPECIFIED		ELECTRIC MOTORS GEARMOTORS AND DRIVES		DRAWN Pg 7/24/02	
DEC.		INCHES		CHK	
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MATERIAL		FINISH		PREV	
CAD FILE		031705		SIZE A	
RFP		CHK		DRAWING NO. 031705	
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BY & DATE		REVISION		THIS DRAWING IN DESIGN AND DETAIL IS OUR PROPERTY AND MUST NOT BE USED EXCEPT IN CONNECTION WITH OUR WORK. ALL RIGHTS OF DESIGN AND INVENTION ARE RESERVED. THIS IS AN ELECTRONICALLY GENERATED DOCUMENT - DO NOT SCALE THIS PRINT.	
5/17/16		KK		RESILIENT SCREW REVERSED AS PER ECO-0102363	
NO.		REV.		01	



OUTLINE - 48Z FRAME
RESILIENT MOUNT - ENCLOSED

005109-15



LESON

DRAWN	PG 3/4/02
CHK	
APPD	

SCALE	1=1
REF	005109-01

FMF	102675
PREV	

REV



LEESON ELECTRIC CORPORATION
TYPICAL PERFORMANCE CURVE for AC MOTOR

Curve at 230 Volts 60 HZ 0.34 HP 1 PHASE

Model No 100804.00

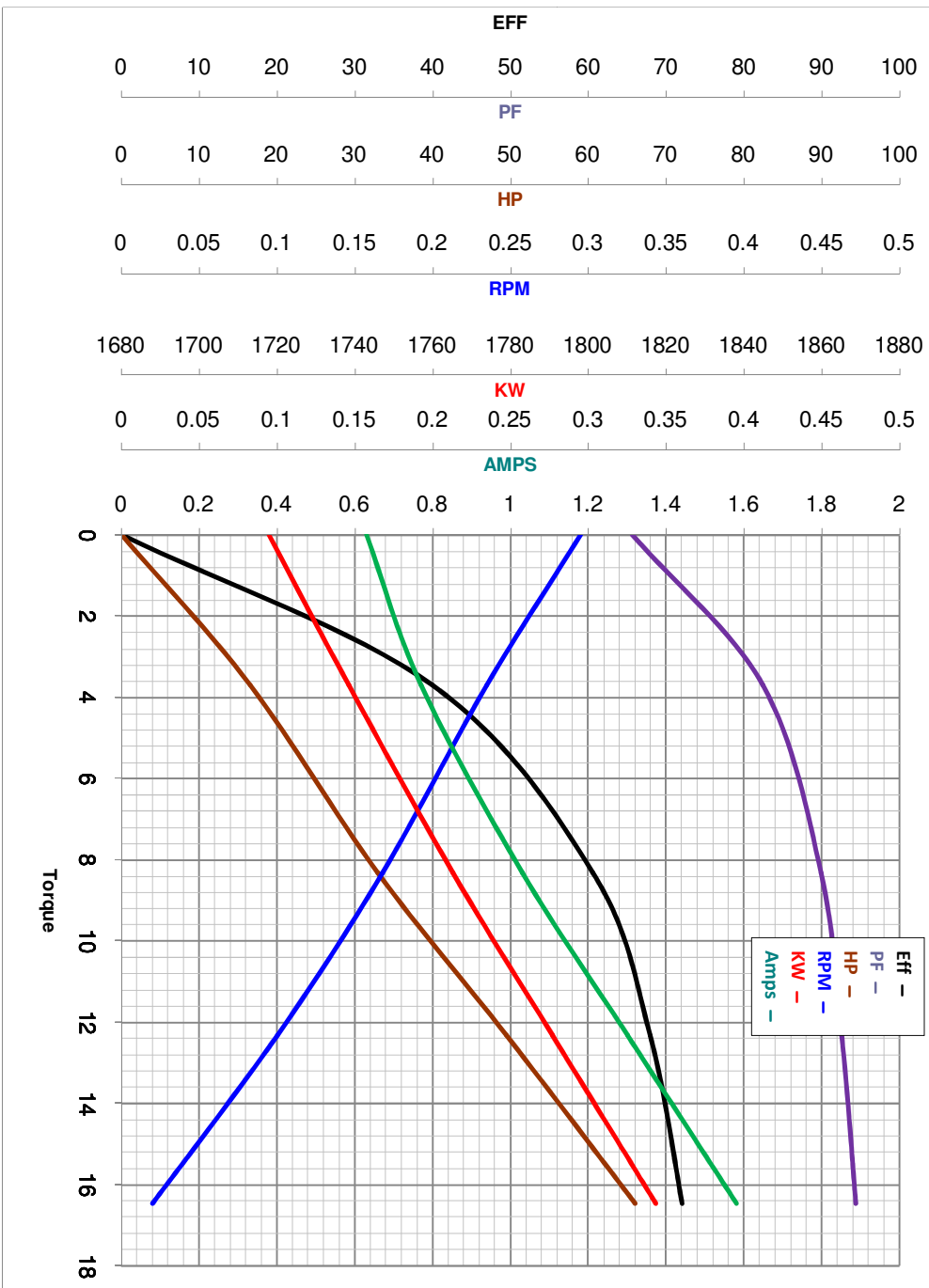
0.33 HP

VOLTS 115/230

Catalog No 100804.00

HZ 60

RPM 1625



Torque in Oz.Ft

FL TORQUE 16.48 Oz.Ft
BD TORQUE 34.0 Oz.Ft
LR TORQUE 10 Oz.Ft

FL AMPS 3.2/1.6
PU TORQUE 9.0 Oz.Ft
LR AMPS 6

WINDING PE484446-3

Date 3/13/2018

G10

Power Roof Ventilator/Fans Installation, Operation, and Maintenance Manual

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Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

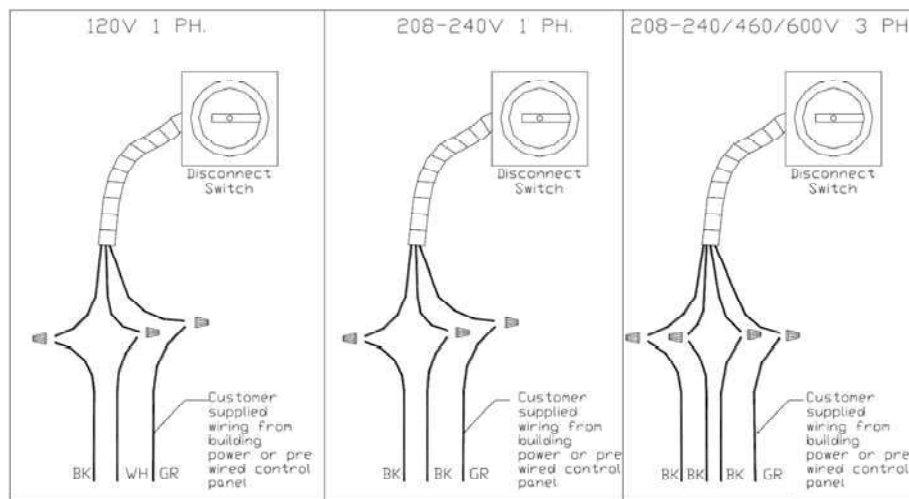
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.



DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : Rolled Steel Standard Efficiency Three-Phase Product code : 12895578
Catalog # : .5018ES3E56C-S

Frame	: 56C	Locked rotor time	: 36s (cold) 20s (hot)
Output	: 0.5 HP (0.37 kW)	Temperature rise	: 80 K
Poles	: 4	Duty cycle	: Cont.(S1)
Frequency	: 60 Hz	Ambient temperature	: -20°C to +40°C
Rated voltage	: 208-230/460 V	Altitude	: 1000 m.a.s.l.
Rated current	: 1.91-1.72/0.862 A	Protection degree	: IP55
L. R. Amperes	: 13.3-12.1/6.03 A	Cooling method	: IC411 - TEFC
LRC	: 7.0x(Code L)	Mounting	: F-1
No load current	: 1.03-1.20/0.600 A	Rotation ¹	: Both (CW and CCW)
Rated speed	: 1760 rpm	Noise level ²	: 52.0 dB(A)
Slip	: 2.22 %	Starting method	: Direct On Line
Rated torque	: 0.206 kgfm	Approx. weight ³	: 9.9 kg
Locked rotor torque	: 240 %		
Breakdown torque	: 300 %		
Insulation class	: F		
Service factor	: 1.15		
Moment of inertia (J)	: 0.0025 kgm ²		

Output	25%	50%	75%	100%	Foundation loads	
Efficiency (%)	65.4	68.0	74.0	77.0	Max. traction	: 18 kgf
Power Factor	0.28	0.48	0.61	0.70	Max. compression	: 28 kgf

		<u>Drive end</u>	<u>Non drive end</u>
Bearing type	:	6203 ZZ	6202 ZZ
Sealing	:	V'Ring	Without Bearing Seal
Lubrication interval	:	-	-
Lubricant amount	:	-	-
Lubricant type	:	Mobil Polyrex EM	

Notes
USABLE @208V SF 1.00

This revision replaces and cancel the previous one, which must be eliminated.

- (1) Looking the motor from the shaft end.
- (2) Measured at 1m and with tolerance of +3dB(A).
- (3) Approximate weight subject to changes after manufacturing process.
- (4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
Performed by				
Checked by				
Date	13/04/2021			

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line

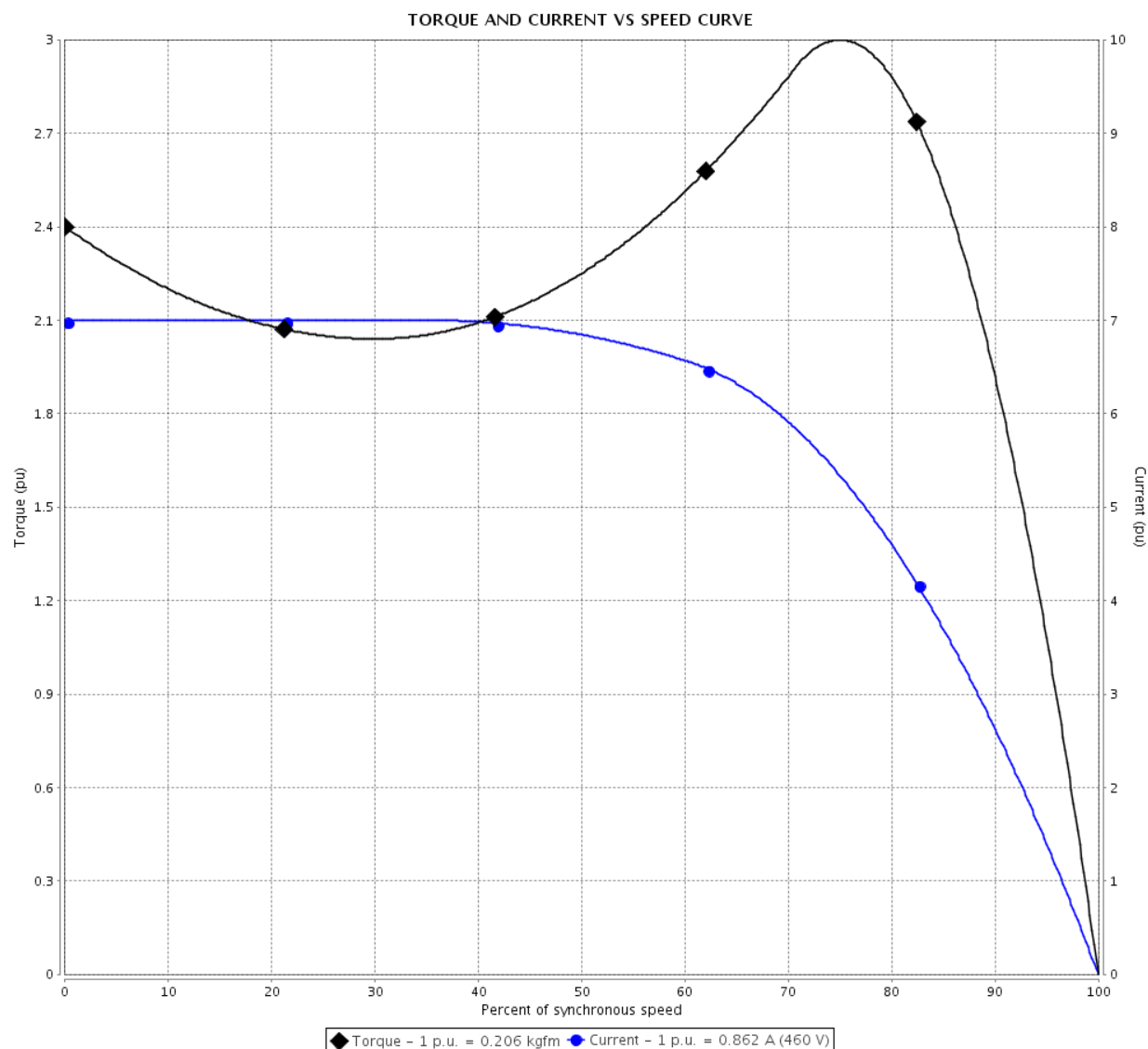
: Rolled Steel Standard Efficiency
Three-Phase

Product code :

12895578

Catalog # :

.5018ES3E56C-S



Performance : 208-230/460 V 60 Hz 4P

Rated current : 1.91-1.72/0.862 A
LRC : 7.0
Rated torque : 0.206 kgfm
Locked rotor torque : 240 %
Breakdown torque : 300 %
Rated speed : 1760 rpm

Moment of inertia (J) : 0.0025 kgm²
Duty cycle : Cont.(S1)
Insulation class : F
Service factor :
Temperature rise : 80 K

Locked rotor time : 36s (cold) 20s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page 2 / 5		
Checked by				
Date	13/04/2021			

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage

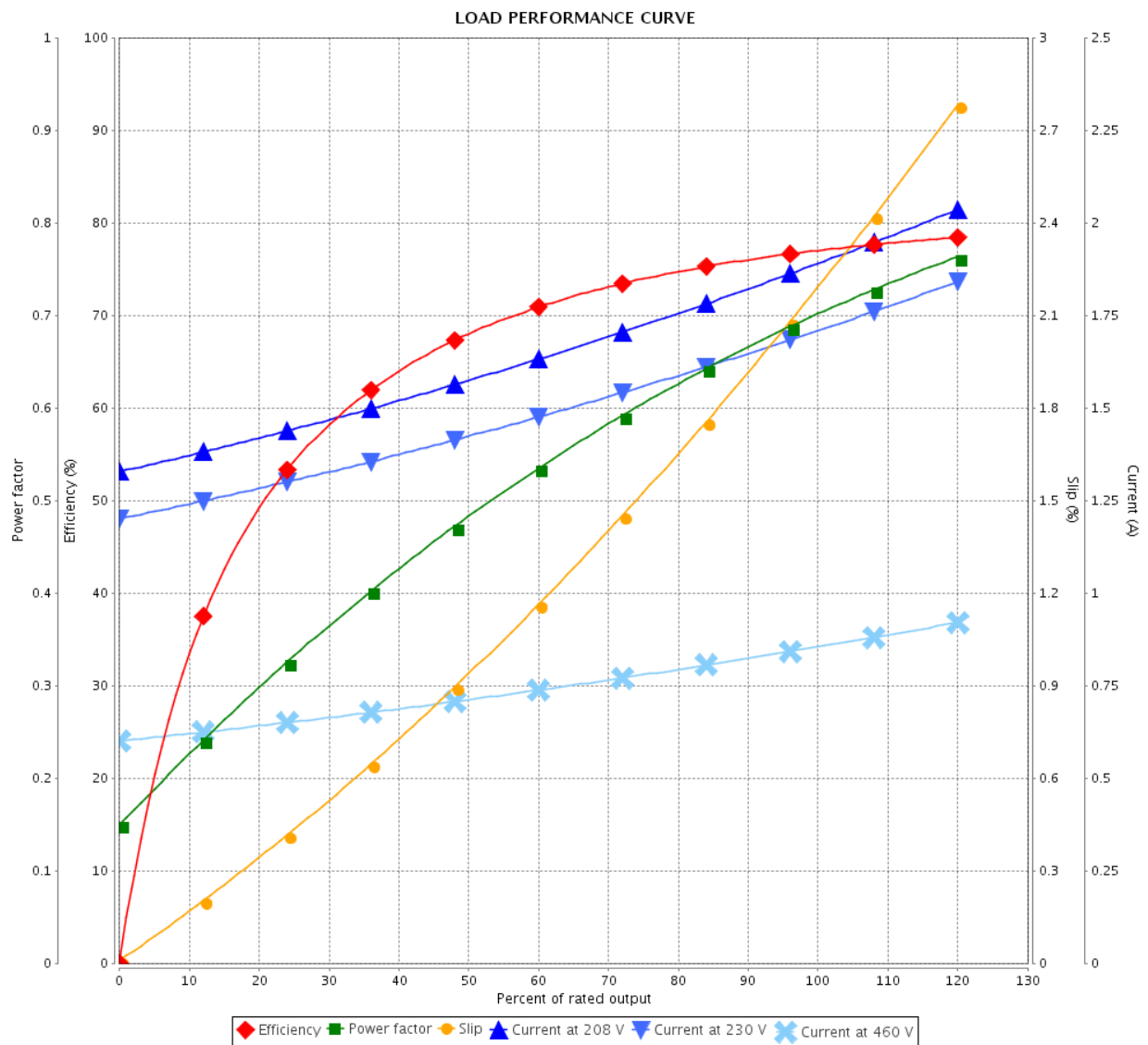


Customer :

Product line : Rolled Steel Standard Efficiency
Three-Phase

Product code : 12895578

Catalog # : .5018ES3E56C-S



Performance : 208-230/460 V 60 Hz 4P

Rated current : 1.91-1.72/0.862 A
LRC : 7.0
Rated torque : 0.206 kgfm
Locked rotor torque : 240 %
Breakdown torque : 300 %
Rated speed : 1760 rpm

Moment of inertia (J) : 0.0025 kgm²
Duty cycle : Cont.(S1)
Insulation class : F
Service factor :
Temperature rise : 80 K

Rev.	Changes Summary	Performed	Checked	Date
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Checked by				
Date	13/04/2021			

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage

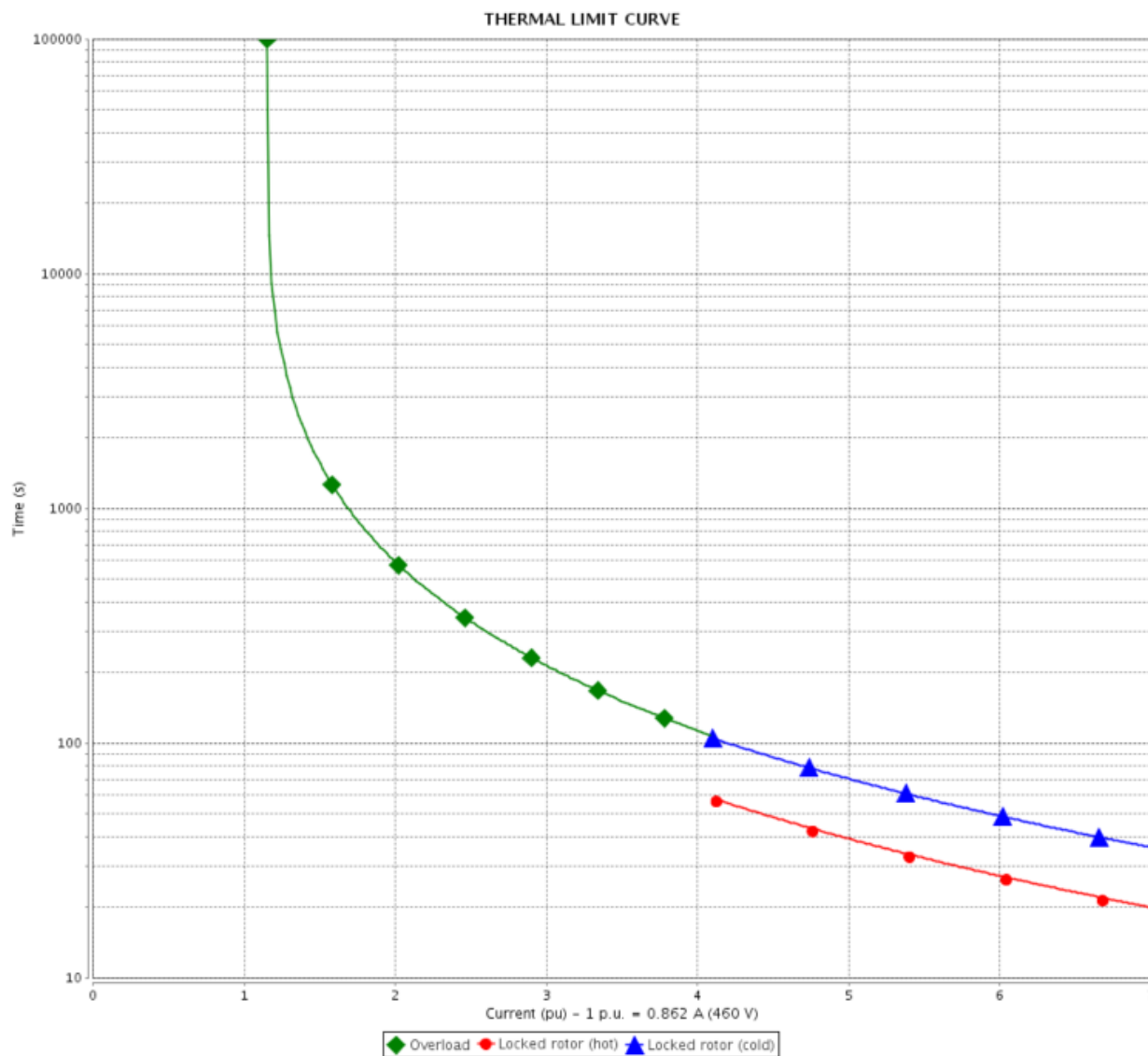


Customer :

Product line : Rolled Steel Standard Efficiency
Three-Phase

Product code : 12895578

Catalog # : .5018ES3E56C-S



Performance : 208-230/460 V 60 Hz 4P

Rated current : 1.91-1.72/0.862 A
 LRC : 7.0
 Rated torque : 0.206 kgfm
 Locked rotor torque : 240 %
 Breakdown torque : 300 %
 Rated speed : 1760 rpm

Moment of inertia (J) : 0.0025 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor :
 Temperature rise : 80 K

Heating constant

Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021			

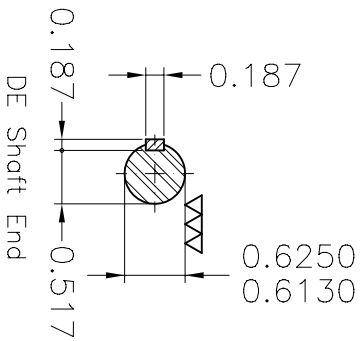
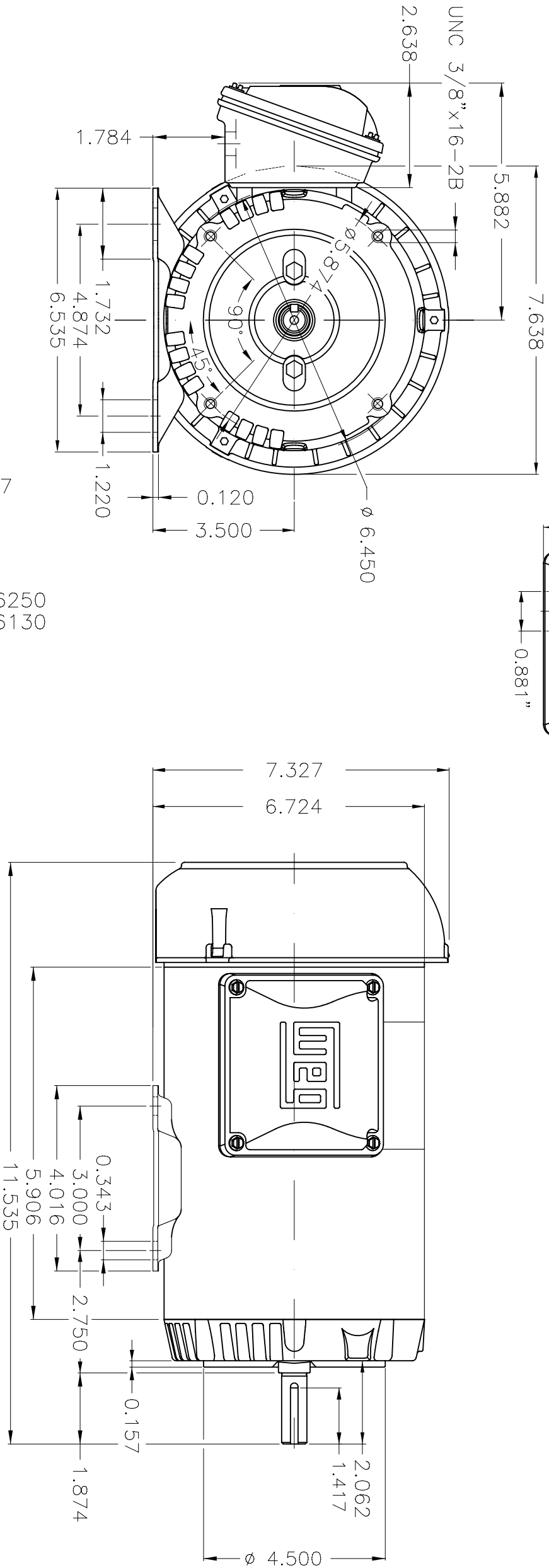
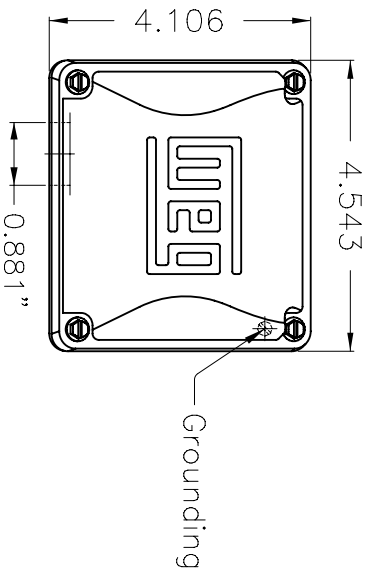
12

No reproduction of this drawing is allowed without written permission of WEG Motores

EXC	Dimensões em polegada
PAD	Dimensions in inches
OPC	
ESPECIAL	

56

THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.



Color Munsell N 1 matte black									
Painting plan 207N									
Mounting F-1/B34R(D)									



3PT9
C_{UL} US LISTED
FOR SAFE AREA



MADE IN BRAZIL

MAT: 12895578
W01.TE01C0X0X

For 60Hz: Class I, Zone 2, IIC
Class I, Div.2, Gr. A,B,C,D - T3
Div 2 Inverter Duty (SF1.00)
CT 2:1/VT 1000:1

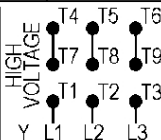
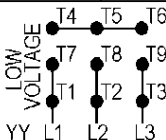
06MAR2021 B/N:

PH 3	Hz 60	HP 0.50
FR 56C		kW 0.37
DUTY CONT.		V 208-230/460
ALT 1000 m.a.s.l		A 1.91-1.72/0.862
INS CL F ΔT 80K	IP55	SFA 1.91-1.98/0.991
AMB 40°C	DES -	SF 1.15
ENCL TEFC	CODE L	PF 0.70
USABLE @ 208V SF1.00		RPM 1760
		NEMA NOM. EFF 77.0%

ALTERNATE RATING: 0.50HP 50Hz 190-220/380-415V SF1.15
1.90-1.81/0.950-0.962A 1445RPM EFF 75.4% (IE2) IEC 60034-1

For safe area-Inverter duty motor For 60Hz use on VPWM 1000:1 VT, 10:1 CT

DE 8203-ZZ	ODE 8202-ZZ	MOBIL POLYREX EM	
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T1-BLU T2-WHT
T3-ORG T4-YEL
T5-BLK T6-GRY
T7-PNK T8-RED
T9-BRK RED

INTERCHANGE ANY TWO LINE WIRES TO REVERSE THE ROTATION

WARNING: Motor must be grounded in accordance with local and national electrical codes to prevent serious electrical shocks. Disconnect power source before servicing unit.



AVERTISSEMENT: Le moteur doit être mis à la terre conformément aux codes électriques locaux et nationaux afin d'éviter tout choc électrique grave. Déconnectez l'alimentation avant l'entretien de la machine.

G10-XP

Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

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INSTALLATION

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Mechanical

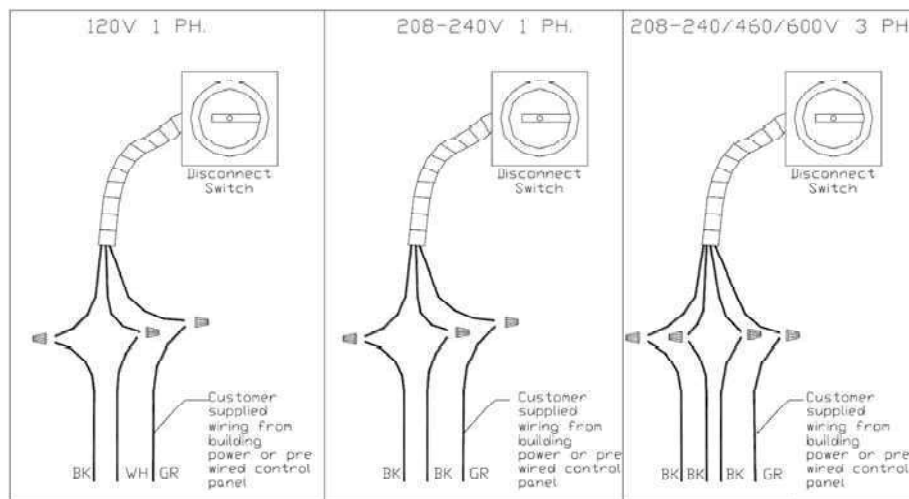
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Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.



Dealers Industrial Equipment

No.:

Date: 12-SEP-2016

DATA SHEET

Three-phase induction motor - Squirrel cage rotor

Customer :
Product line : Three-Phase: Fractional Explosion Proof Motors

Frame : 56
Output : 0.5 HP
Frequency : 60 Hz
Poles : 4
Full load speed : 1725 rpm
Slip : 4.17 %
Voltage : 208-230/460 V
Rated current : 1.77-1.60/0.802 A
Locked rotor current : 10.6/5.29 A
Locked rotor current (I_L/I_n) : 6.6
No-load current : 1.20/0.600 A
Full load torque : 1.50 lb.ft
Locked rotor torque : 290 %
Breakdown torque : 400 %
Design : A
Insulation class : F
Temperature rise : 80 K
Locked rotor time : 13 s (hot)
Service factor : 1.00
Duty cycle : S1
Ambient temperature : -20°C - +50°C
Altitude : 1000 m
Degree of Protection : IP55
Approximate weight : 24 lb
Moment of inertia : 0.01709 sq.ft.lb
Noise level : ---

	D.E.	N.D.E.	Load	Power factor	Efficiency (%)
Bearings	6203 ZZ	6203 ZZ	100%	0.75	77.2
Regreasing interval	---	---	75%	0.67	75.0
Grease amount	---	---	50%	0.55	69.0

Notes:

Generated for Model #.5018XS3E56C

Performed by

Checked



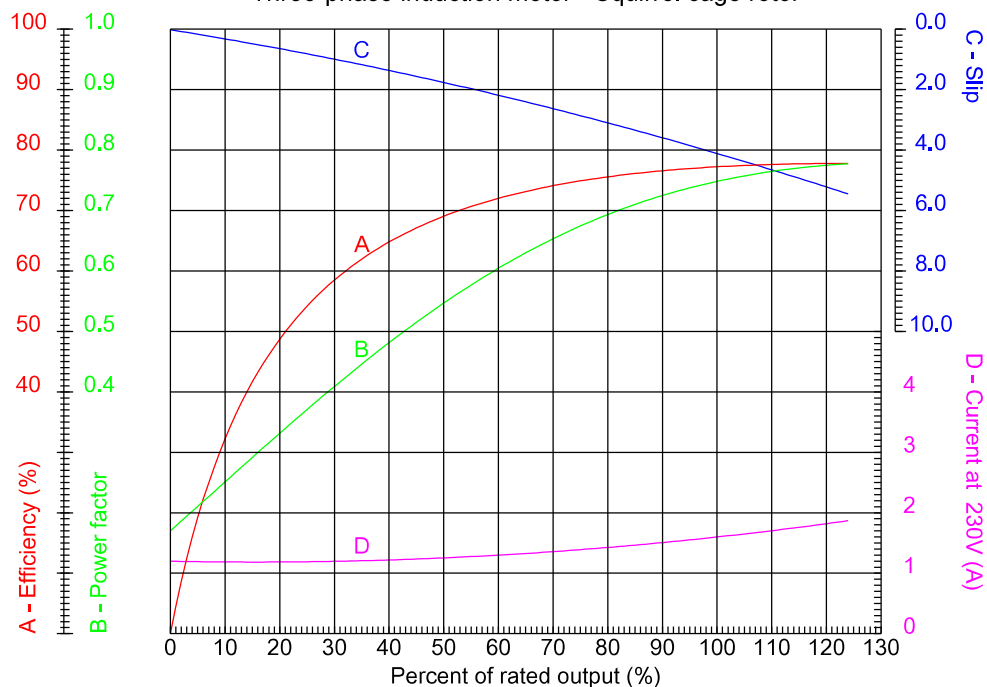
Dealers Industrial Equipment

No.:

Date: 12-SEP-2016

PERFORMANCE CURVES RELATED TO RATED OUTPUT

Three-phase induction motor - Squirrel cage rotor



Customer :
Product line : Three-Phase: Fractional Explosion Proof Motors

Frame	: 56	Locked rotor current (I _L /I _n)	: 6.6
Output	: 0.5 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.00
Full load speed	: 1725 rpm	Design	: A
Voltage	: 208-230/460 V	Locked rotor torque	: 290 %
Rated current	: 1.77-1.60/0.802 A	Breakdown torque	: 400 %
Insulation class	: F		

Notes:

Generated for Model #.5018XS3E56C

Performed by

Checked



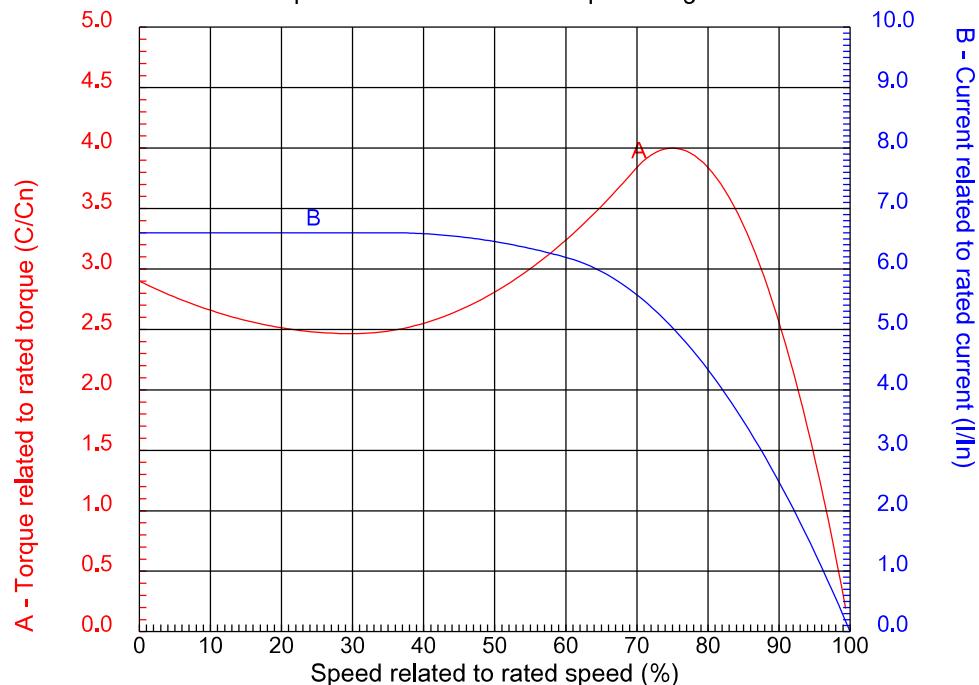
Dealers Industrial Equipment

No.:

Date: 12-SEP-2016

CHARACTERISTIC CURVES RELATED TO SPEED

Three-phase induction motor - Squirrel cage rotor



Customer :
Product line : Three-Phase: Fractional Explosion Proof Motors

Frame	: 56	Locked rotor current (I _L /I _n)	: 6.6
Output	: 0.5 HP	Duty cycle	: S1
Frequency	: 60 Hz	Service factor	: 1.00
Full load speed	: 1725 rpm	Design	: A
Voltage	: 208-230/460 V	Locked rotor torque	: 290 %
Rated current	: 1.77-1.60/0.802 A	Breakdown torque	: 400 %
Insulation class	: F		

Notes:

Generated for Model #.5018XS3E56C

Performed by

Checked

G12-G14-G16

Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

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It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

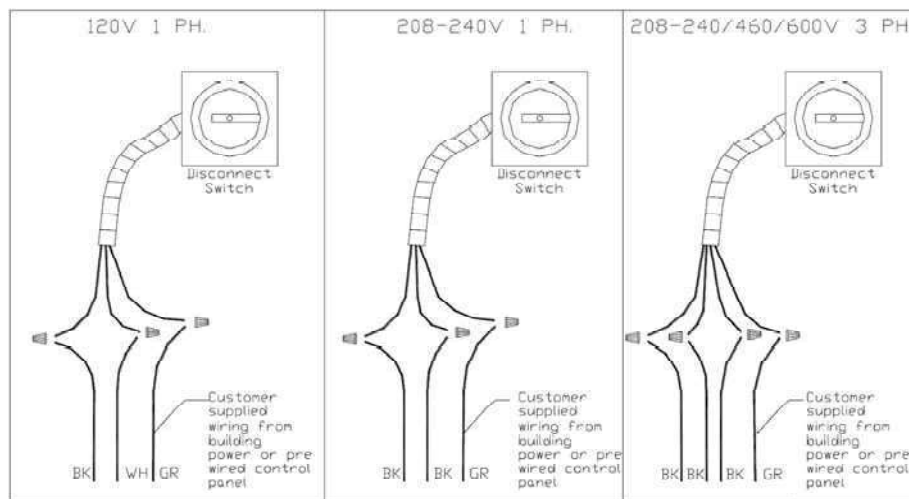
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

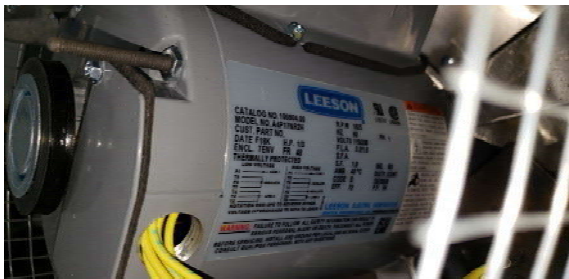
MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.



DATA SHEET



Three Phase Induction Motor - Squirrel Cage

Customer :					
Product line		: Rolled Steel Standard Efficiency Three-Phase		Product code : 12895579	
				Catalog # : .5012ES3E56C-S	
Frame : 56C Output : 0.5 HP (0.37 kW) Poles : 6 Frequency : 60 Hz Rated voltage : 208-230/460 V Rated current : 2.19-1.98/0.992 A L. R. Amperes : 11.8-10.7/5.36 A LRC : 5.4x(Code K) No load current : 1.33-1.54/0.772 A Rated speed : 1160 rpm Slip : 3.33 % Rated torque : 2.26 ft.lb Locked rotor torque : 210 % Breakdown torque : 300 % Insulation class : F Service factor : 1.15 Moment of inertia (J) : 0.1065 sq.ft.lb			Locked rotor time : 39s (cold) 22s (hot) Temperature rise : 80 K Duty cycle : Cont.(S1) Ambient temperature : -20°C to +40°C Altitude : 1000 m.a.s.l. Protection degree : IP55 Cooling method : IC411 - TEFC Mounting : F-1 Rotation ¹ : Both (CW and CCW) Noise level ² : 50.0 dB(A) Starting method : Direct On Line Approx. weight ³ : 26.6 lb		
Output	25%	50%	75%	100%	Foundation loads
Efficiency (%)	62.0	64.0	70.0	72.0	Max. traction : 52 lb
Power Factor	0.24	0.44	0.56	0.65	Max. compression : 78 lb
		<u>Drive end</u>		<u>Non drive end</u>	
Bearing type :		6203 ZZ		6202 ZZ	
Sealing :		V'Ring		Without Bearing Seal	
Lubrication interval :		-		-	
Lubricant amount :		-		-	
Lubricant type :		Mobil Polyrex EM			
Notes USABLE @208V SF 1.00					
This revision replaces and cancel the previous one, which must be eliminated. (1) Looking the motor from the shaft end. (2) Measured at 1m and with tolerance of +3dB(A). (3) Approximate weight subject to changes after manufacturing process. (4) At 100% of full load.				These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.	
Rev.	Changes Summary			Performed	Checked
Performed by					
Checked by				Page	Revision
Date	13/04/2021			175	

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage

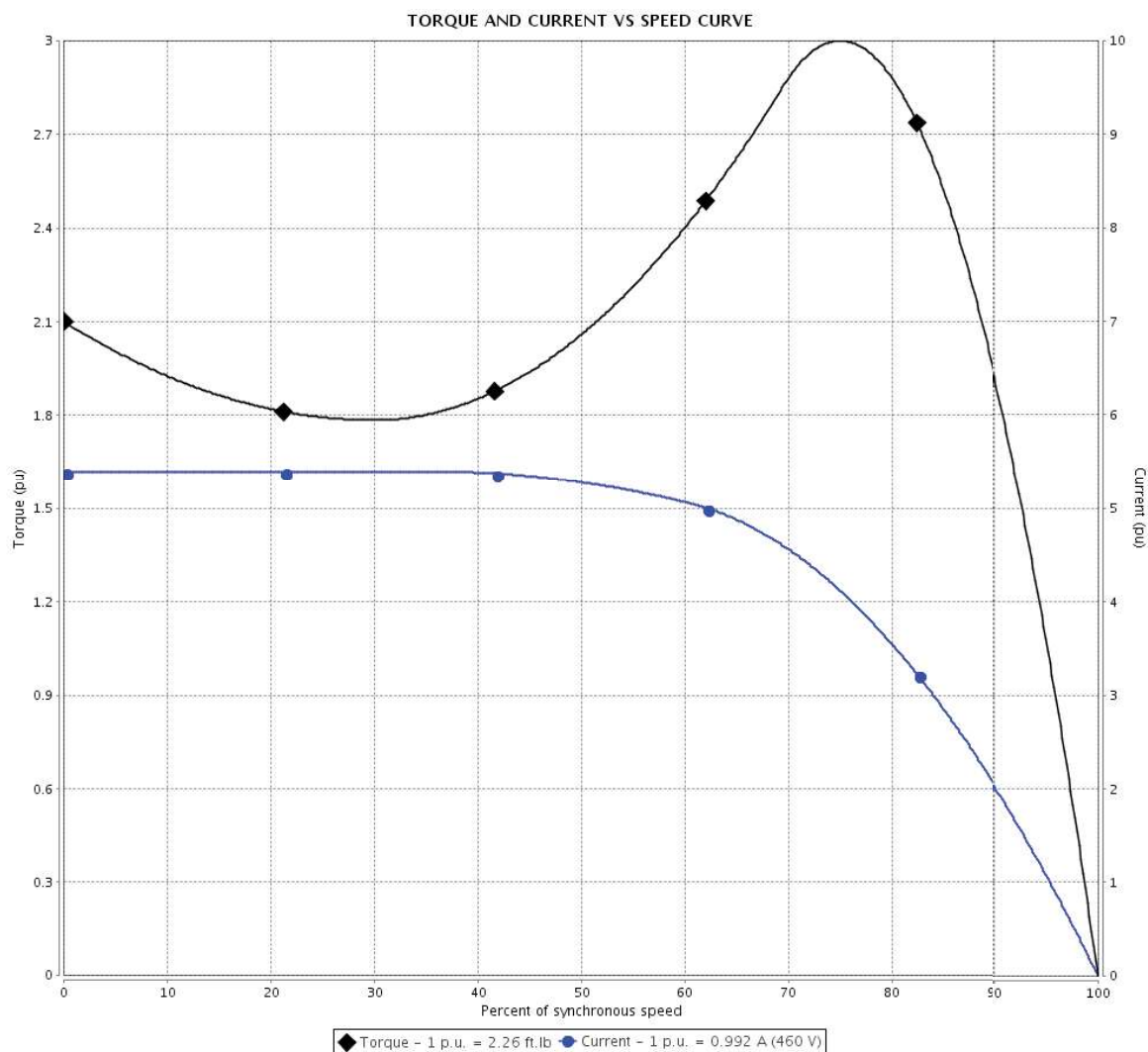


Customer :

Product line : Rolled Steel Standard Efficiency
Three-Phase

Product code : 12895579

Catalog # : .5012ES3E56C-S



Performance : 208-230/460 V 60 Hz 6P

Rated current : 2.19-1.98/0.992 A
LRC : 5.4
Rated torque : 2.26 ft.lb
Locked rotor torque : 210 %
Breakdown torque : 300 %
Rated speed : 1160 rpm

Moment of inertia (J) : 0.1065 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor :
Temperature rise : 80 K

Locked rotor time : 39s (cold) 22s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021			

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage

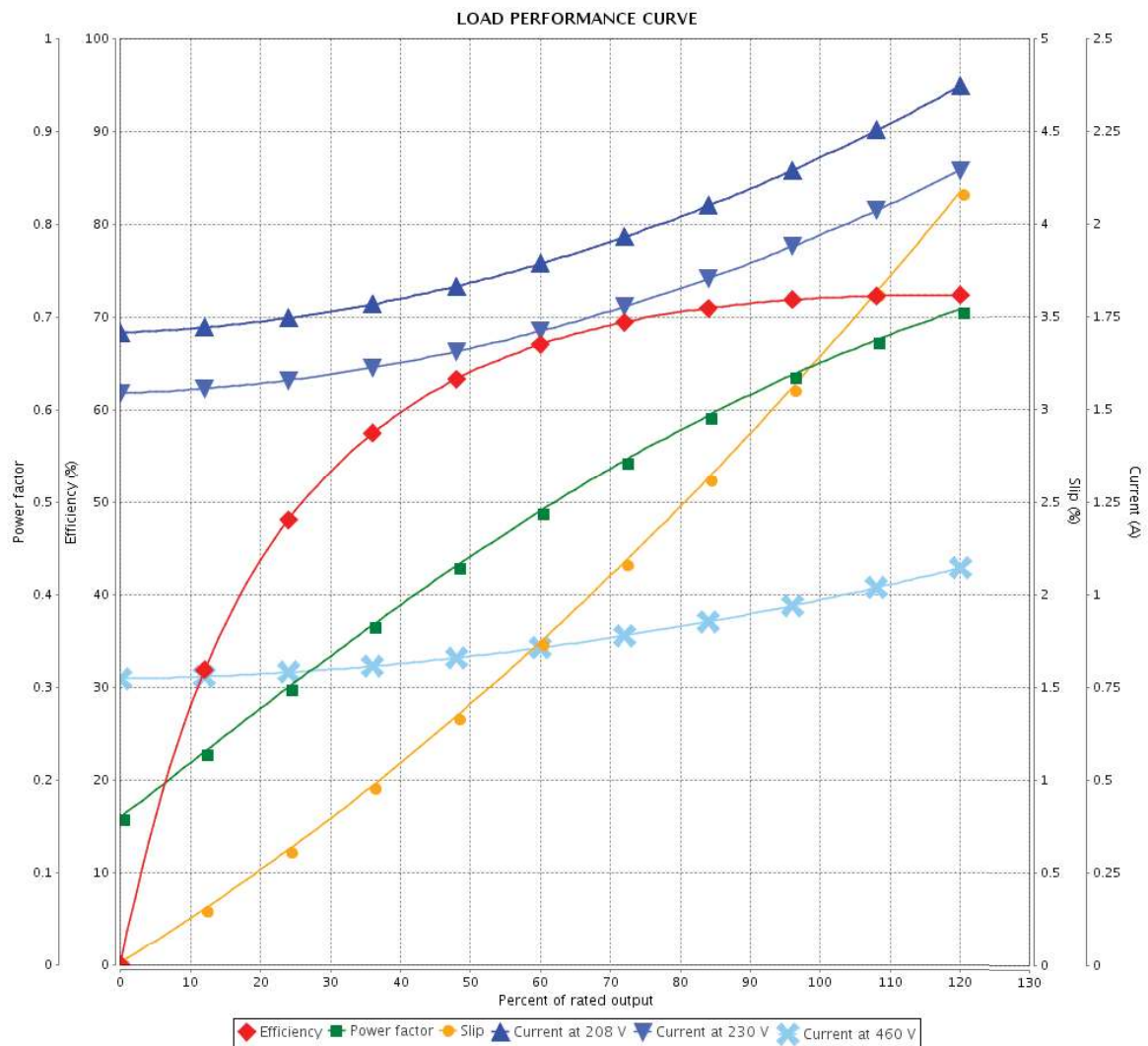


Customer :

Product line : Rolled Steel Standard Efficiency
Three-Phase

Product code : 12895579

Catalog # : .5012ES3E56C-S



Performance : 208-230/460 V 60 Hz 6P

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Moment of inertia (J) : 0.1065 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor :
Temperature rise : 80 K

Rev.	Changes Summary	Performed	Checked	Date
Performed by			Page	Revision
Checked by			375	
Date	13/04/2021			

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage

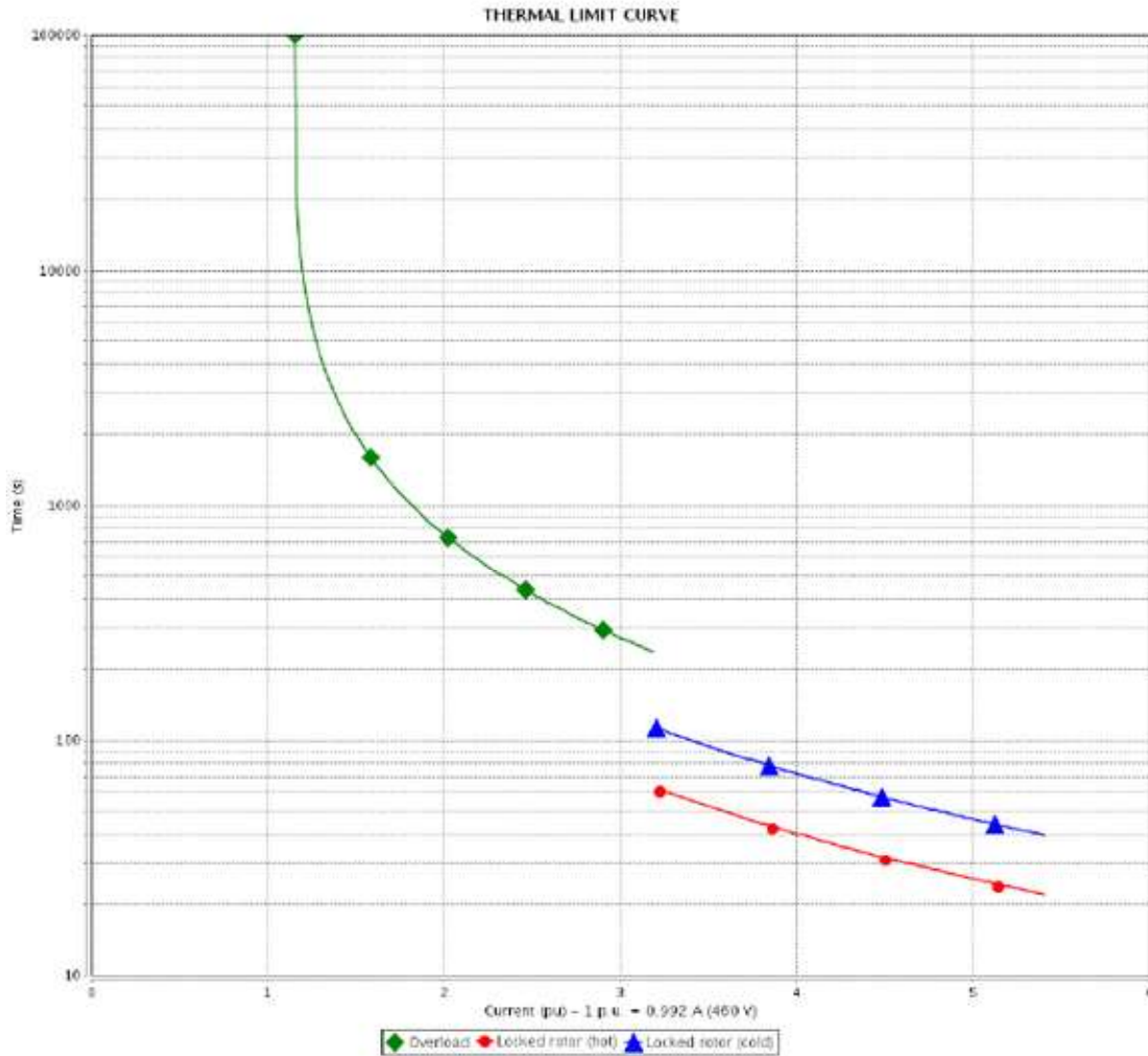


Customer :

Product line : Rolled Steel Standard Efficiency
Three-Phase

Product code : 12895579

Catalog # : .5012ES3E56C-S



Performance : 208-230/460 V 60 Hz 6P

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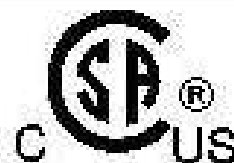
Heating constant

Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021	4 / 5		

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Page 326



MADE IN BRAZIL

MAT: 12895579
W01.TE0IC0X0X

For 60Hz: Class I, Zone 2, IIC
Class I, Div.2, Gr. A,B,C,D - T3
Div 2 Inverter Duty (SF1.00)

30OUT2019

CT 2:1/VT 1000:1

PH 3	FR	56C	HP(kW) 0.50(0.37)	Hz 60
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V 230/460	RPM 1160
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A 1.98/0.992	DUTY CONT.
---------------------	-------------------

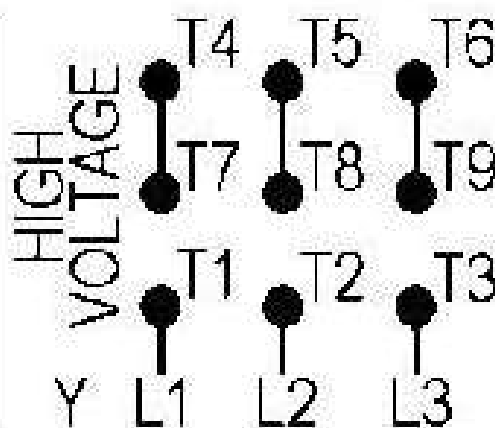
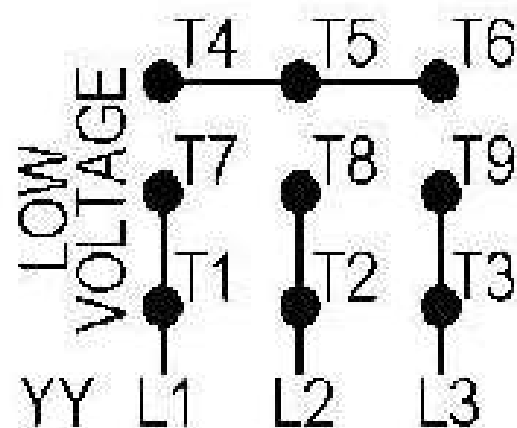
SFA 2.28/1.14	CODE K	DES -	IP55
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SF 1.15	INS CL F ΔT 80K	AMB 40°C	ENCL TEFC
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PF 0.65	NEMA NOM.EFF. 72.0%
----------------	----------------------------

ALT 1000 m.a.s.l.	USABLE @ 208V 2.19A SF1.00
--------------------------	-----------------------------------

ALTERNATE RATING: 0.50HP 50Hz 190-220/380-415V SF1.15
2.14-2.02/1.07-1.07A 945RPM EFF 69.8% (IE2) IEC 60034-1



T1-BLU T2-WHT
T3-ORG T4-YEL
T5-BLK T6-GRY
T7-PNK T8-RED
T9-RED BRK

For safe area-Inverter duty motor For 60Hz use on VPWM 1000:1 VT, 10:1 CT

DE: 6203-ZZ	ODE: 6202-ZZ	MOBIL POLYREX EM
--------------------	---------------------	-------------------------

WARNING: Motor must be grounded in accordance with local and national electrical codes to prevent serious electrical shocks. Disconnect power source before servicing unit.

AVERTISSEMENT: Le moteur doit être mis à la terre conformément aux codes électriques locaux et nationaux afin d'éviter tout choc électrique grave. Déconnectez l'alimentation avant l'entretien de la machine.



G12-XP - G14-XP - G16-XP - G24

Power Roof Ventilator/Fans Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

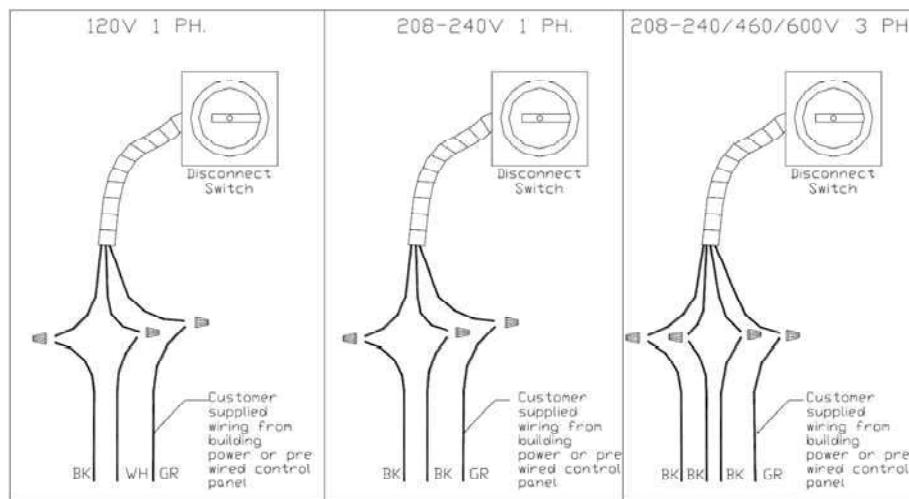
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : W21 Explosion-proof Motor NEMA Premium Efficiency Three-Phase Product code : 14281753
Catalog # : 00112XT3E145TC

Frame	: 143/5TC	Locked rotor time	: 50s (cold) 28s (hot)
Output	: 1 HP (0.75 kW)	Temperature rise	: 80 K
Poles	: 6	Duty cycle	: Cont.(S1)
Frequency	: 60 Hz	Ambient temperature	: -20°C to +40°C
Rated voltage	: 208-230/460 V	Altitude	: 1000 m.a.s.l.
Rated current	: 3.60-3.26/1.63 A	Protection degree	: IP55
L. R. Amperes	: 22.3-20.2/10.1 A	Cooling method	: IC411 - TEFC
LRC	: 6.2x(Code K)	Mounting	: F-1
No load current	: 1.75-2.04/1.02 A	Rotation ¹	: Both (CW and CCW)
Rated speed	: 1145 rpm	Noise level ²	: 50.0 dB(A)
Slip	: 4.58 %	Starting method	: Direct On Line
Rated torque	: 0.634 kgfm	Approx. weight ³	: 35.0 kg
Locked rotor torque	: 260 %		
Breakdown torque	: 300 %		
Insulation class	: F		
Service factor	: 1.15		
Design	: B		

Output	25%	50%	75%	100%	Foundation loads	
Efficiency (%)	0.000	77.0	82.0	82.5	Max. traction	: 36 kgf
Power Factor	0.00	0.51	0.63	0.70	Max. compression	: 71 kgf

		<u>Drive end</u>	<u>Non drive end</u>
Bearing type	:	6205 2RS	6204 2RS
Sealing	:	Oil Seal	Lip Seal
Lubrication interval	:	0 h	0 h
Lubricant amount	:	0 g	0 g
Lubricant type	:	Mobil Polyrex EM	

Notes

This revision replaces and cancel the previous one, which must be eliminated.

- (1) Looking the motor from the shaft end.
- (2) Measured at 1m and with tolerance of +3dB(A).
- (3) Approximate weight subject to changes after manufacturing process.
- (4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
Performed by				
Checked by				
Date	13/04/2021			

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer : _____

Thermal protection

ID	Application	Type	Quantity	Sensing Temperature
1	Winding	Thermostat - 2 wires	1 x Phase	155 °C

Rev.	Changes Summary		Performed	Checked	Date
Performed by				Page	Revision
Checked by					
Date	13/04/2021			2 / 6	

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage

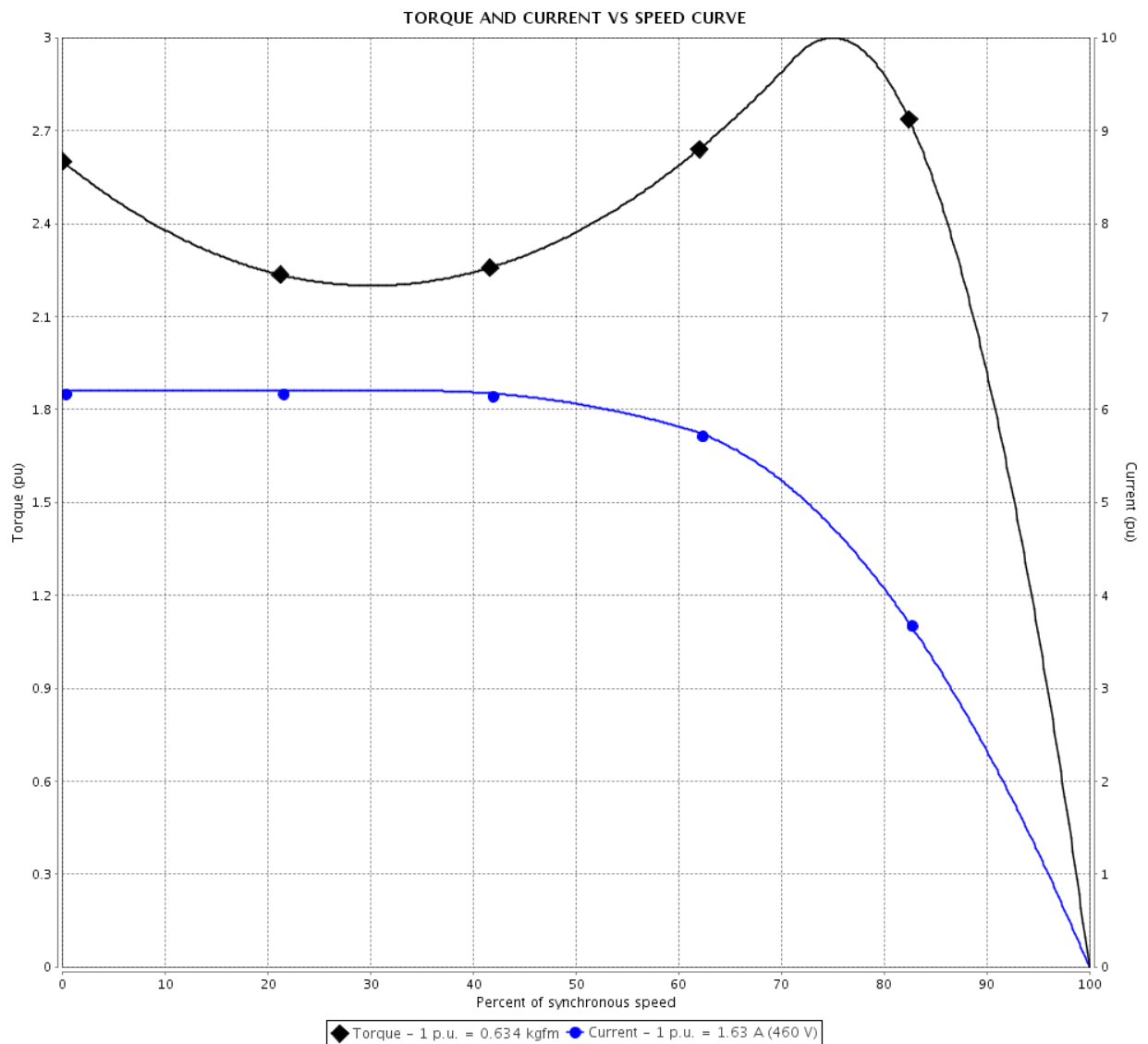


Customer :

Product line : W21 Explosion-proof Motor NEMA
Premium Efficiency Three-Phase

Product code : 14281753

Catalog # : 00112XT3E145TC



Performance : 208-230/460 V 60 Hz 6P

Rated current : 3.60-3.26/1.63 A
LRC : 6.2
Rated torque : 0.634 kgfm
Locked rotor torque : 260 %
Breakdown torque : 300 %
Rated speed : 1145 rpm

Moment of inertia (J)
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Locked rotor time : 50s (cold) 28s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by				Page
Checked by				
Date				
13/04/2021			3 / 6	Revision

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line

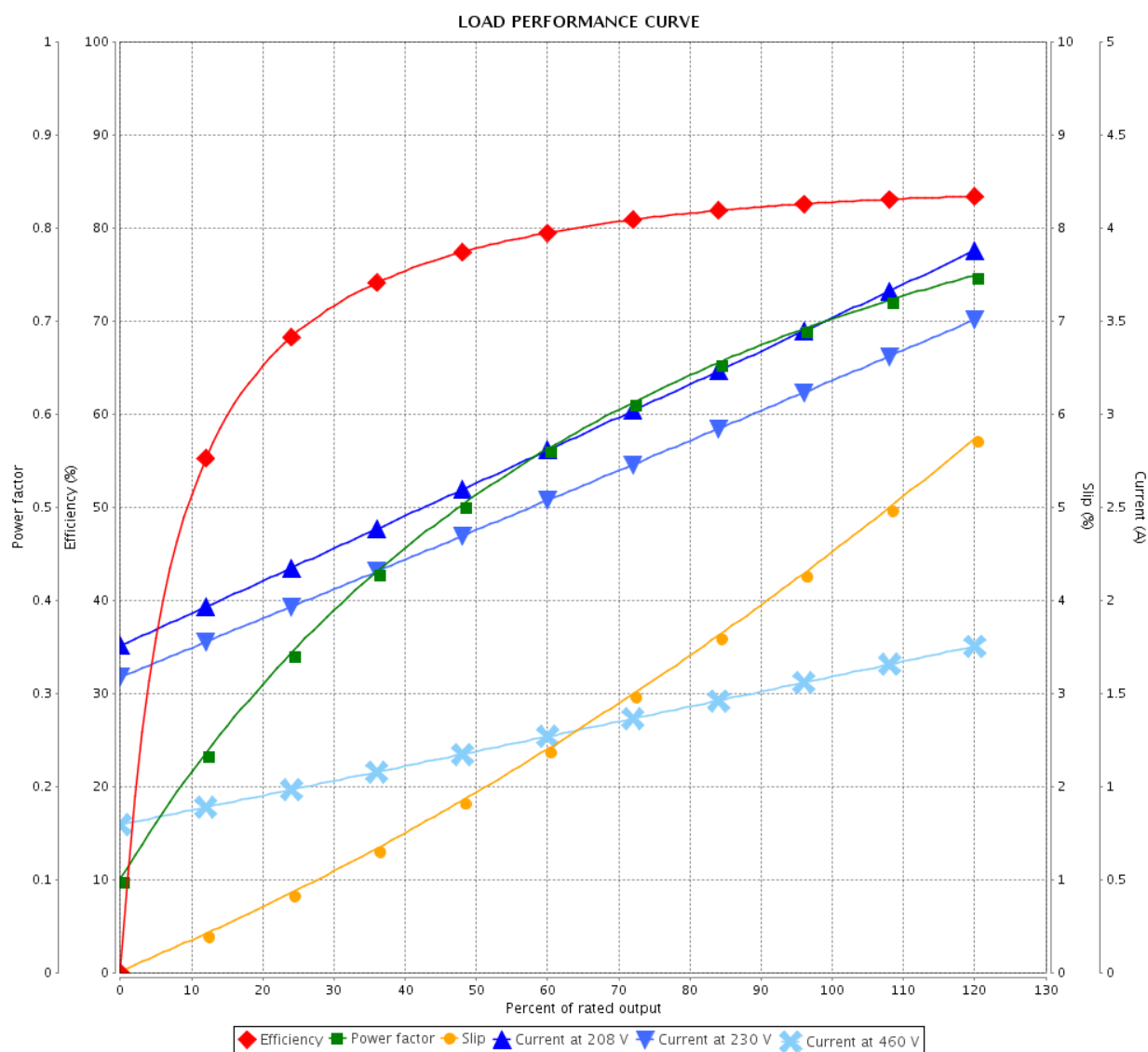
: W21 Explosion-proof Motor NEMA
Premium Efficiency Three-Phase

Product code :

14281753

Catalog # :

00112XT3E145TC



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Locked rotor torque : 260 %

Breakdown torque : 300 %

Rated speed : 1145 rpm

Moment of inertia (J)

Duty cycle : Cont.(S1)

Insulation class : F

Service factor : 1.15

Temperature rise : 80 K

Design : B

Rev.	Changes Summary		Performed	Checked	Date
Performed by					
Checked by					
Date	13/04/2021				

Page

Revision

4 / 6

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage

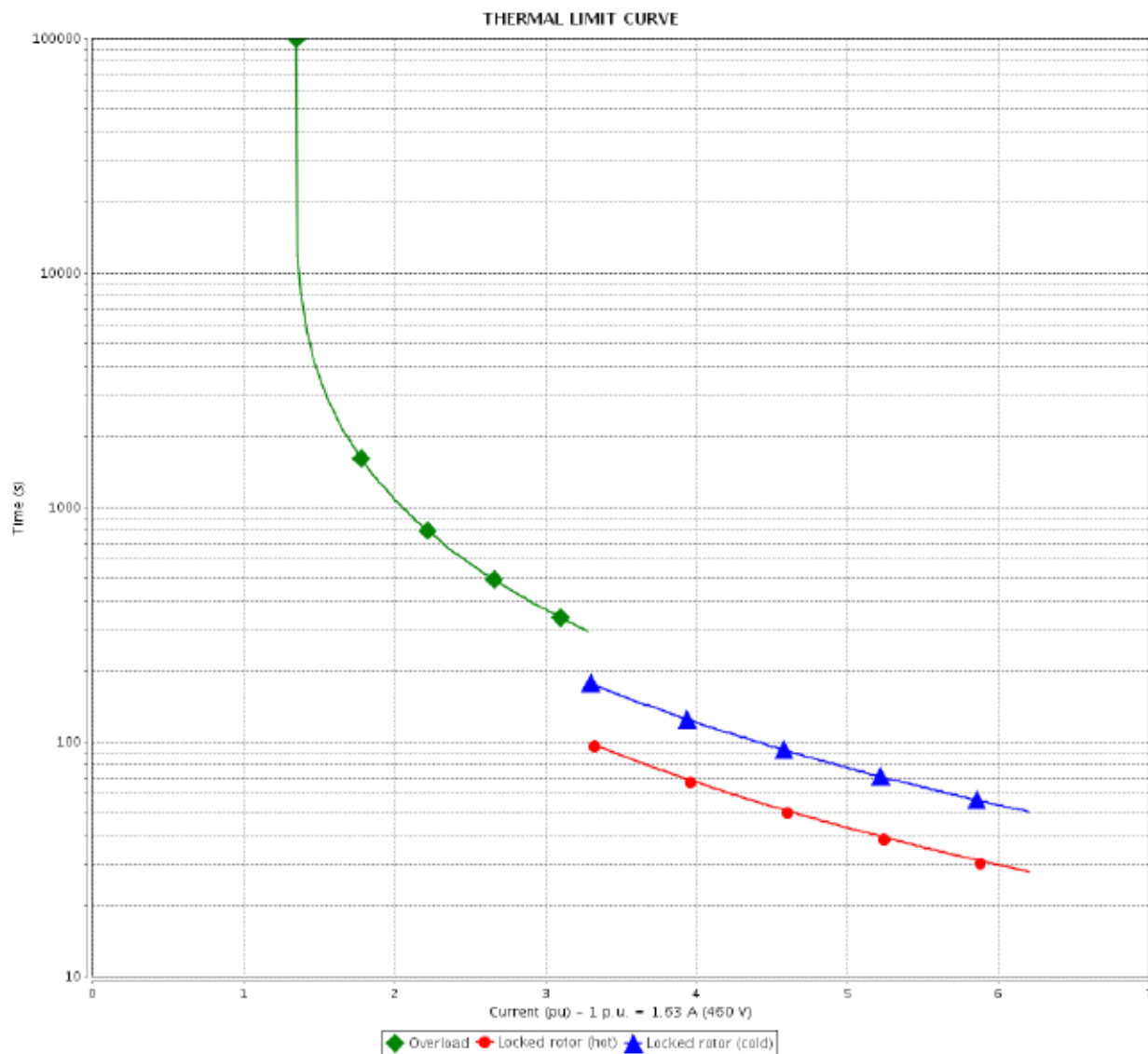


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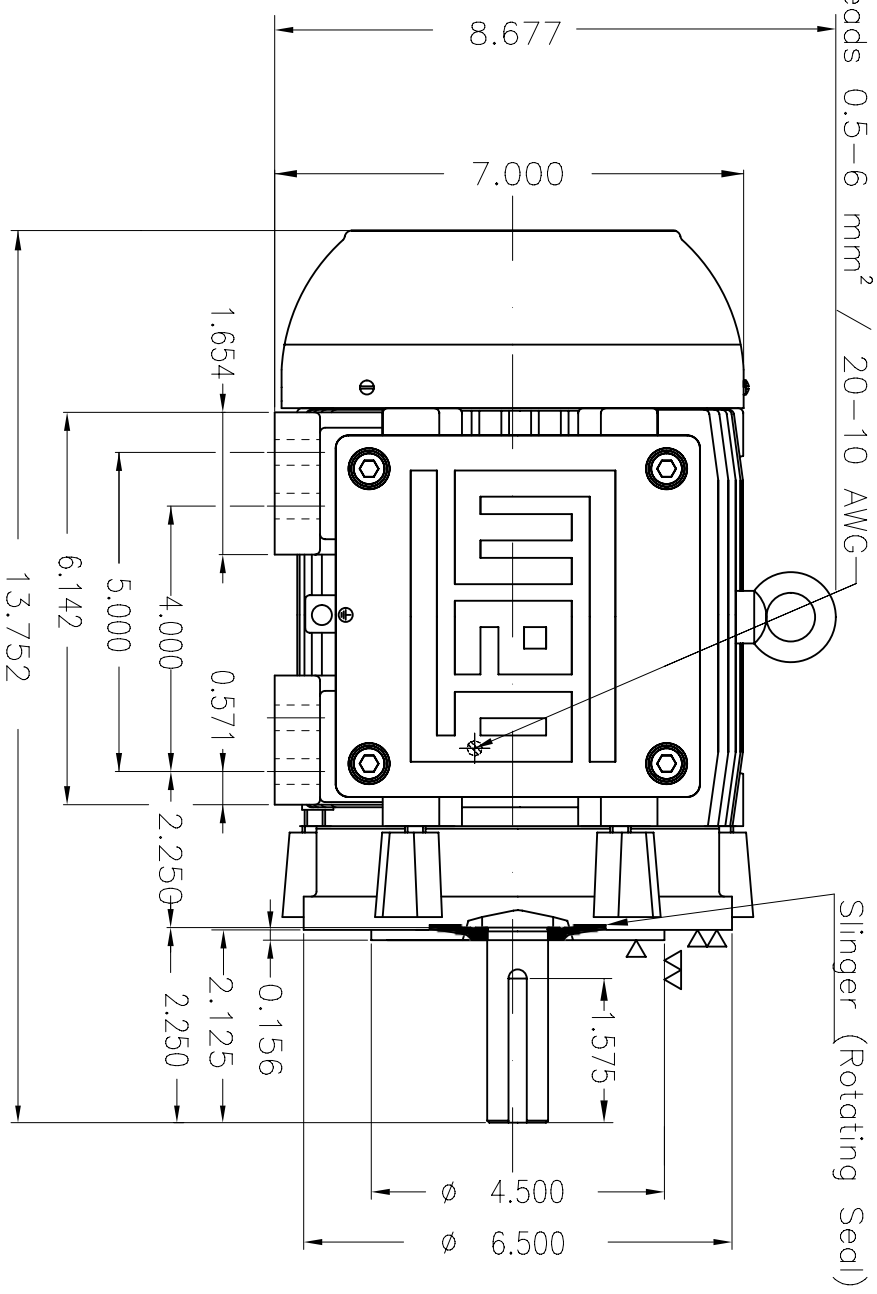
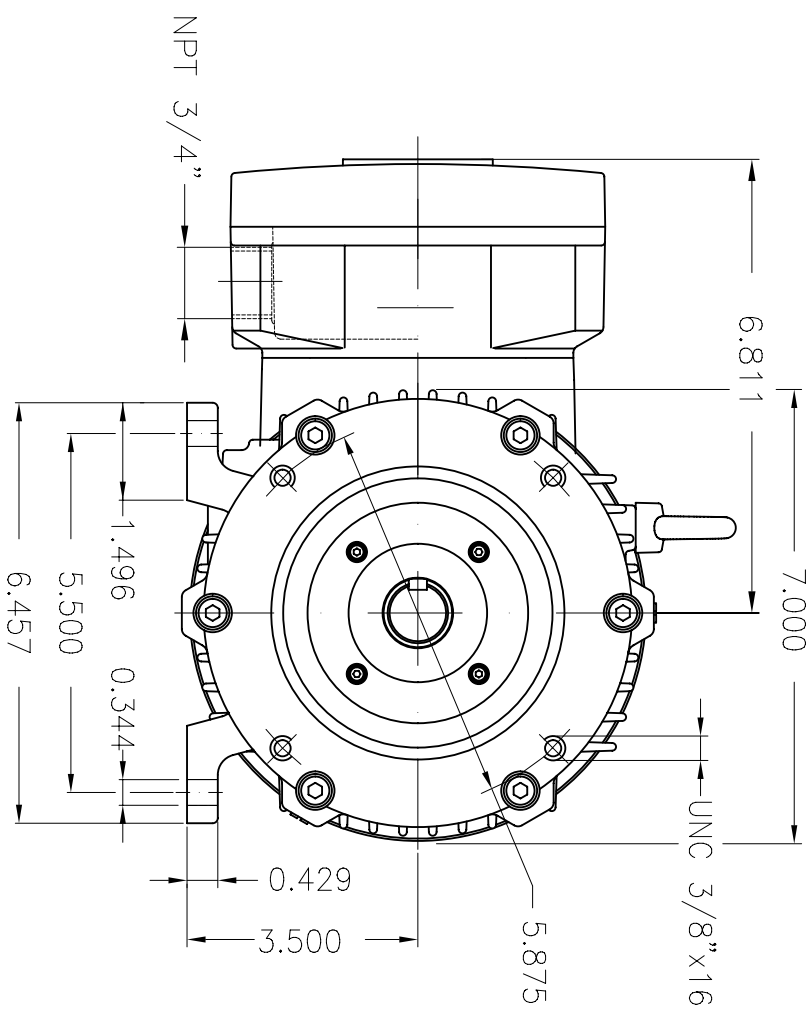
Heating constant

Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
Performed by				
Checked by				
Date	13/04/2021			

1	2
No reproduction of this drawing is allowed without written permission of WEG Motores	<div> <div>EXIB</div> <div>Dimensões em polegadas</div> <div>Dimensões in inches</div> </div>

5	6	THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.
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Color RAL 5009										
Painting plan 202P										
Mounting B34R(D)										


W21X NEMA
Premium

14281753

CC029A

Inverter Duty Motor
Severe Duty


LISTED

MODEL 00112XT3E145TC

PH 3 | FR 143/5TC

HP(kW) 1.0(0.75)

HZ 60

IP55

V 230/460

A 3.26/1.63

RPM 1145

NEMA NOM EFF 82.5%

PF 0.70

SFA 3.75/1.87

DES B

INS CL F ΔT 80 K | SF 1.15

ENCL TEFC

DUTY CONT.

CODE K

ALT 1000

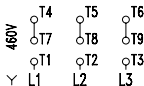
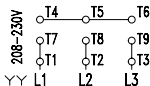
m.a.s.l.

AMB 40°C

USABLE \emptyset 208V

3.60 A

SF 1.00



→ 6205-2RS MOBIL POLYREX EM

→ 6204-2RS

79 Lbs


TEMP CODE T3C
 CSA/UL: Class I - Div. 1 - Groups C and D
 CSA: Class II - Div. 1 - Groups F and G
 CSA: Class I - Zone 1 - IIB
EXPLOSION PROOF MOTOR

FOR USE ON VPMW VFD 1000:1XT, 20:1CT, 1.0SF, T3C, AMB 40°C.

G24

Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

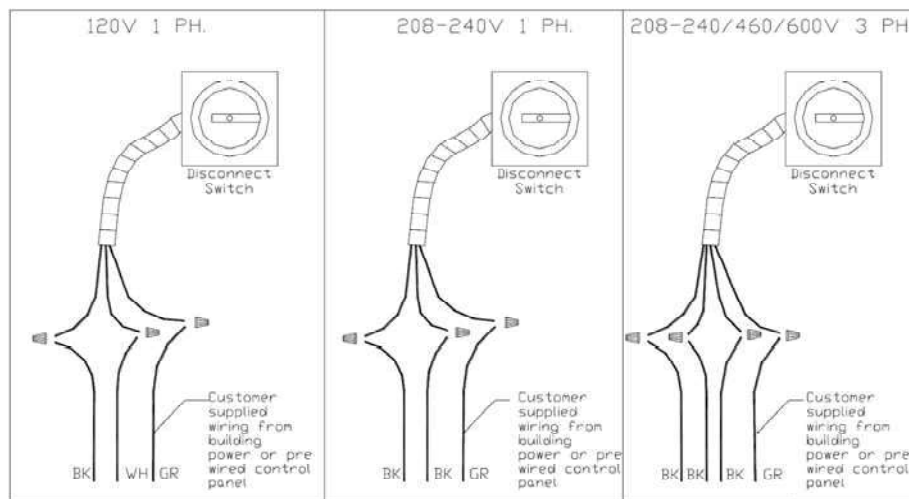
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : Rolled Steel Standard Efficiency Three-Phase Product code : 12894836
Catalog # : .7512ES3E56C-S

Frame	: 56HC	Locked rotor time	: 37s (cold) 21s (hot)
Output	: 0.75 HP (0.550 kW)	Temperature rise	: 80 K
Poles	: 6	Duty cycle	: Cont.(S1)
Frequency	: 60 Hz	Ambient temperature	: -20°C to +40°C
Rated voltage	: 208-230/460 V	Altitude	: 1000 m.a.s.l.
Rated current	: 2.96-2.68/1.34 A	Protection degree	: IP55
L. R. Amperes	: 17.2-15.5/7.77 A	Cooling method	: IC411 - TEFC
LRC	: 5.8x(Code K)	Mounting	: F-1
No load current	: 1.67-1.94/0.971 A	Rotation ¹	: Both (CW and CCW)
Rated speed	: 1155 rpm	Noise level ²	: 50.0 dB(A)
Slip	: 3.75 %	Starting method	: Direct On Line
Rated torque	: 3.41 ft.lb	Approx. weight ³	: 31.0 lb
Locked rotor torque	: 229 %		
Breakdown torque	: 300 %		
Insulation class	: F		
Service factor	: 1.15		
Moment of inertia (J)	: 0.1331 sq.ft.lb		
Design	: A		

Output	25%	50%	75%	100%	Foundation loads	
Efficiency (%)	68.4	70.0	74.0	75.5	Max. traction	: 79 lb
Power Factor	0.26	0.46	0.59	0.68	Max. compression	: 110 lb

		<u>Drive end</u>	<u>Non drive end</u>
Bearing type	:	6203 ZZ	6202 ZZ
Sealing	:	V'Ring	Without Bearing Seal
Lubrication interval	:	-	-
Lubricant amount	:	-	-
Lubricant type	:	Mobil Polyrex EM	

Notes
USABLE @208V SF 1.00

This revision replaces and cancel the previous one, which must be eliminated.

- (1) Looking the motor from the shaft end.
- (2) Measured at 1m and with tolerance of +3dB(A).
- (3) Approximate weight subject to changes after manufacturing process.
- (4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
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Checked by				
Date	13/04/2021			

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line

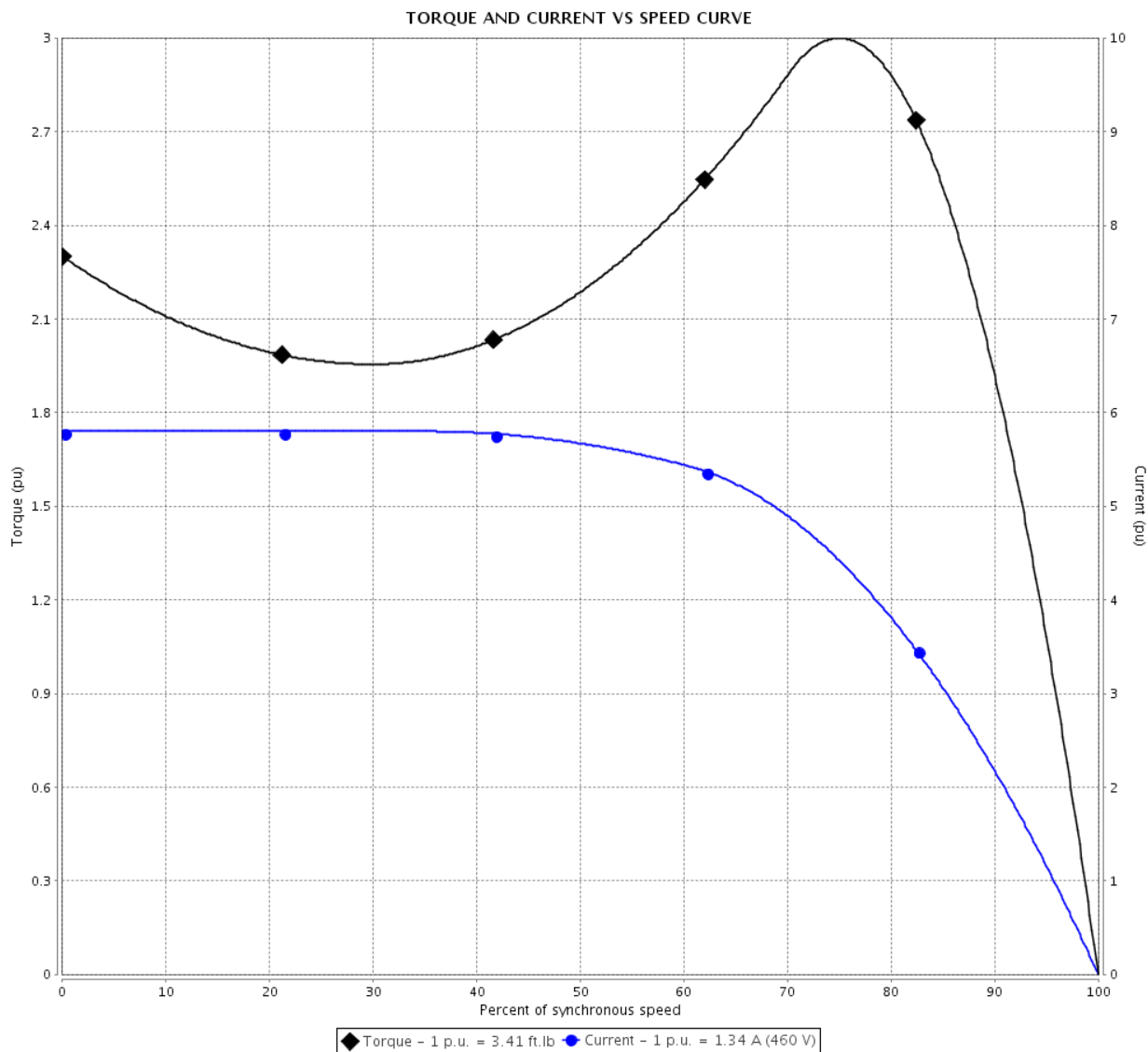
: Rolled Steel Standard Efficiency
Three-Phase

Product code :

12894836

Catalog # :

.7512ES3E56C-S



Performance : 208-230/460 V 60 Hz 6P

Rated current	: 2.96-2.68/1.34 A	Moment of inertia (J)	: 0.1331 sq.ft.lb
LRC	: 5.8	Duty cycle	: Cont.(S1)
Rated torque	: 3.41 ft.lb	Insulation class	: F
Locked rotor torque	: 229 %	Service factor	:
Breakdown torque	: 300 %	Temperature rise	: 80 K
Rated speed	: 1155 rpm	Design	: A

Locked rotor time : 37s (cold) 21s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021			

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage

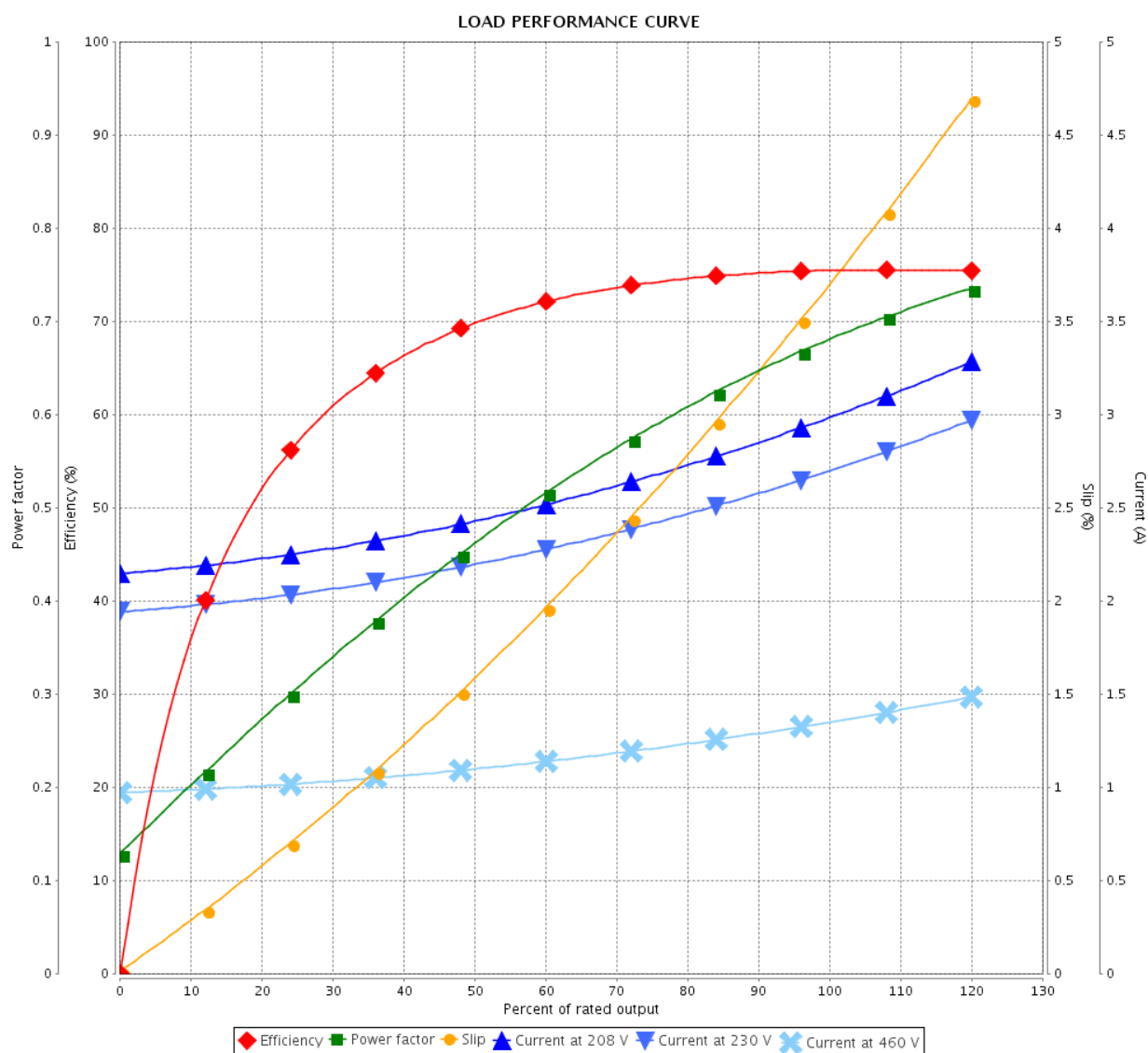


Customer :

Product line : Rolled Steel Standard Efficiency
Three-Phase

Product code : 12894836

Catalog # : .7512ES3E56C-S



Performance : 208-230/460 V 60 Hz 6P

Rated current : 2.96-2.68/1.34 A
LRC : 5.8
Rated torque : 3.41 ft.lb
Locked rotor torque : 229 %
Breakdown torque : 300 %
Rated speed : 1155 rpm

Moment of inertia (J) : 0.1331 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor :
Temperature rise : 80 K
Design : A

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021			

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line

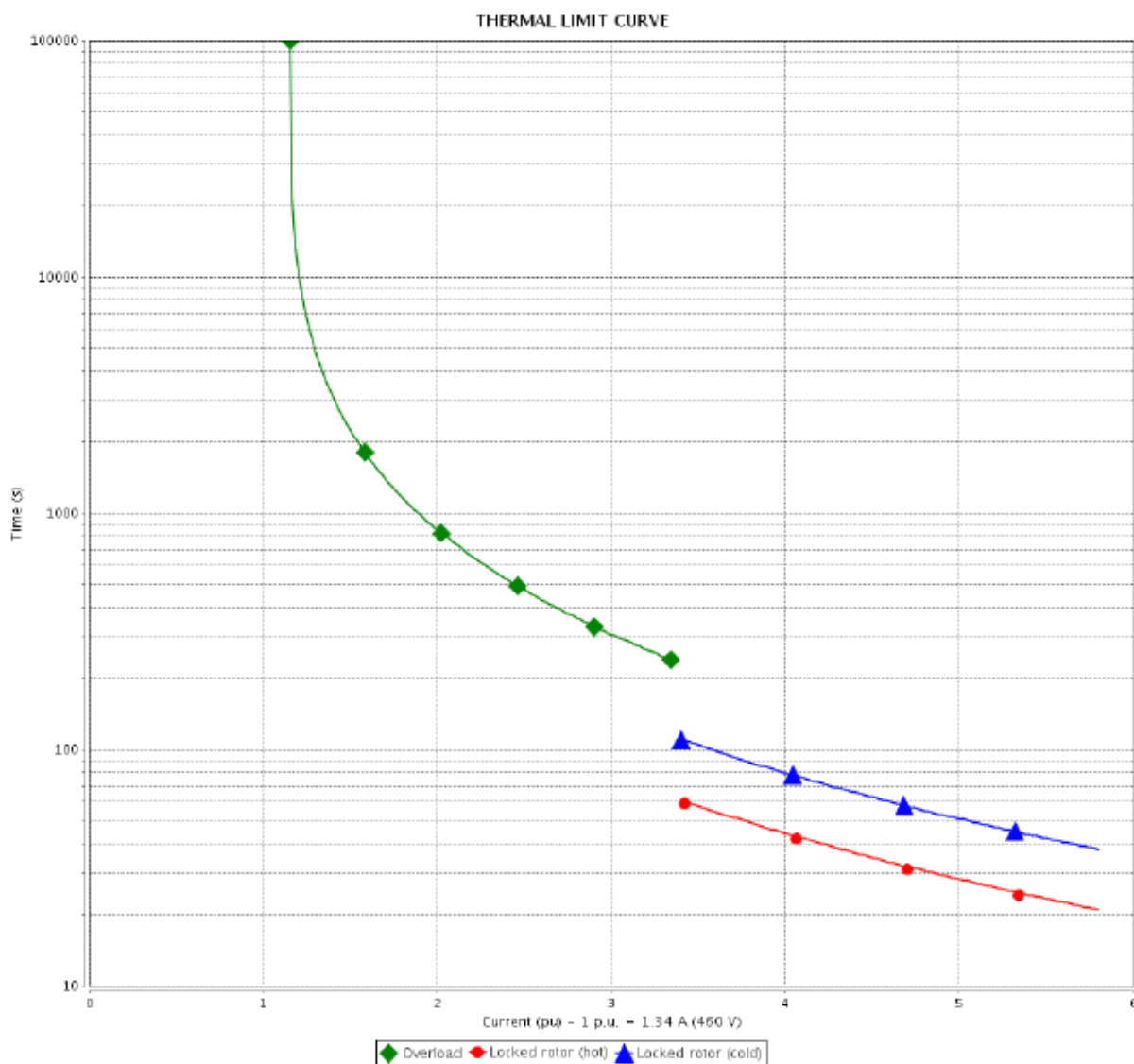
: Rolled Steel Standard Efficiency
Three-Phase

Product code :

12894836

Catalog # :

.7512ES3E56C-S



Performance : 208-230/460 V 60 Hz 6P

Rated current : 2.96-2.68/1.34 A
LRC : 5.8
Rated torque : 3.41 ft.lb
Locked rotor torque : 229 %
Breakdown torque : 300 %
Rated speed : 1155 rpm

Moment of inertia (J) : 0.1331 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor :
Temperature rise : 80 K
Design : A

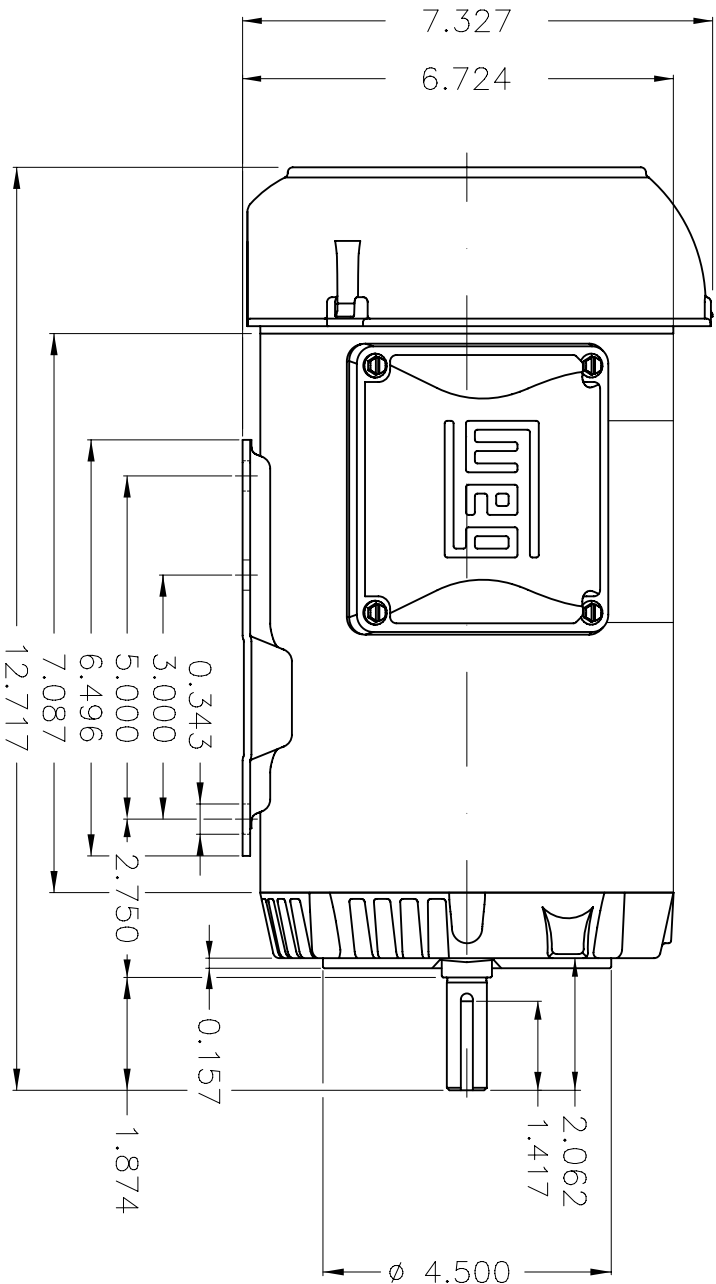
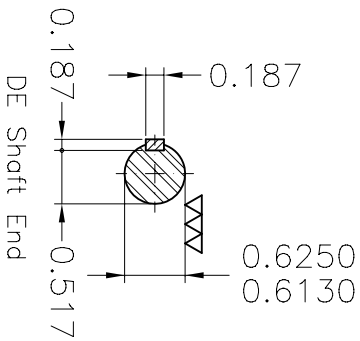
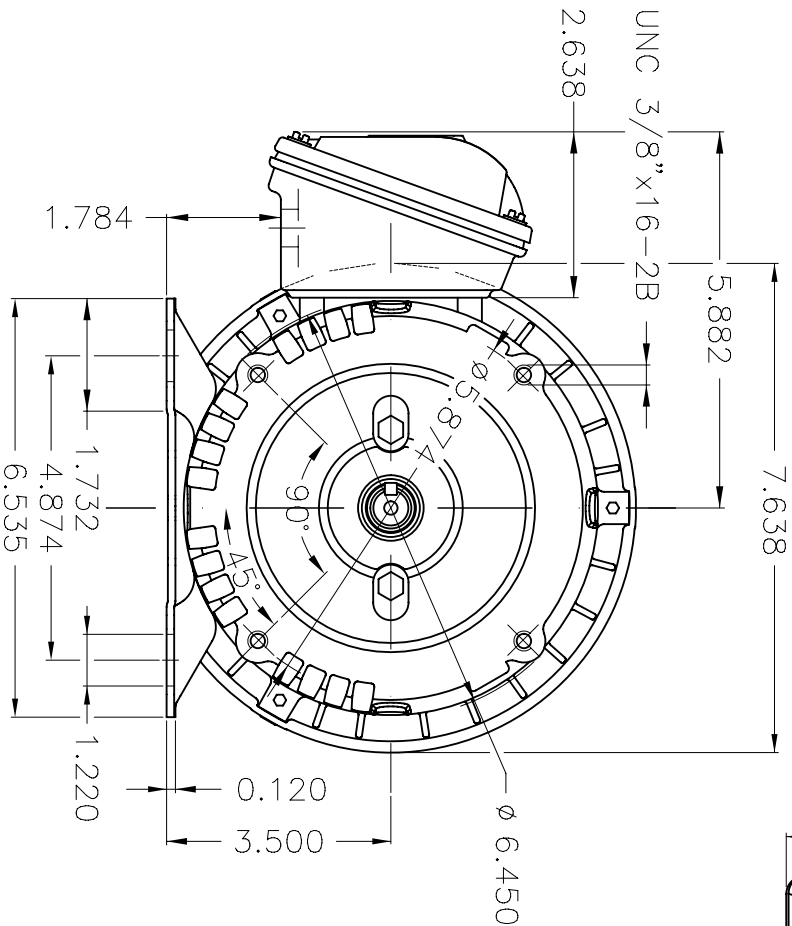
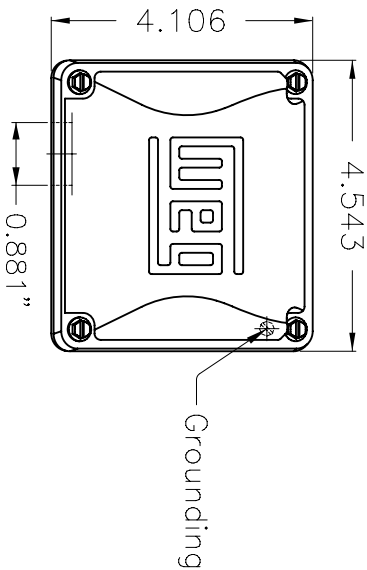
Heating constant

Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021	4 / 5		

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EXCETO
As dimensões em polegada
padrão
opcionais
dimensões in inches
ESPECIAL



THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.

Color Munsell N 1 matte black									
Painting plan 207N									
Mounting F-1/B34R(D)									



3PT9
C  US LISTED
FOR SAFE AREA



MADE IN MÉXICO

MAT: 12894836

W01.TE0IC0X0X

MODEL .7512ES3E56C-S

05JUL2019

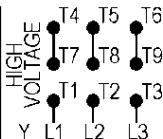
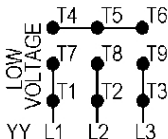
For 60Hz: Class I, Zone 2, IIC

Class I, Div.2, Gr. A,B,C,D - T3

Div 2 Inverter Duty (SF1.00)

CT 2:1/VT 1000:1

PH 3	FR	56HC	HP(kW) 0.75(0.55)	Hz	60
V 230/460			RPM 1155		
A 2.68/1.34			DUTY CONT.		
SFA 3.08/1.54			CODE K	DES A	IP55
SF 1.15	INS CL F ΔT 80K		AMB 40°C	ENCL TEFC	
PF 0.68		NEMA NOM.EFF. 75.5%			
ALT 1000 m.a.s.l.		USABLE @ 208V 2.96A SF1.00			
ALTERNATE RATING: 0.75HP 50Hz 190-220/380-415V SF1.00					
2.98-2.77/1.49-1.47A		935RPM		EFF 72.6% (IE1) IEC 60034-1	



T1-BLU T2-WHT
T3-ORG T4-YEL
T5-BLK T6-GRY
T7-PNK T8-RED
T9-RED BRK

INTERCHANGE ANY TWO LINE WIRES TO REVERSE THE ROTATION

For safe area-Inverter duty motor For 60Hz use on VPWM 1000:1 VT, 10:1 CT

DE: 6203-ZZ ODE: 6202-ZZ MOBIL POLYREX EM

WARNING: Motor must be grounded in accordance with local and national electrical codes to prevent serious electrical shocks. Disconnect power source before servicing unit.

AVERTISSEMENT: Le moteur doit être mis à la terre conformément aux codes électriques locaux et nationaux afin d'éviter tout choc électrique grave. Déconnectez l'alimentation avant l'entretien de la machine.



G26

Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
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INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

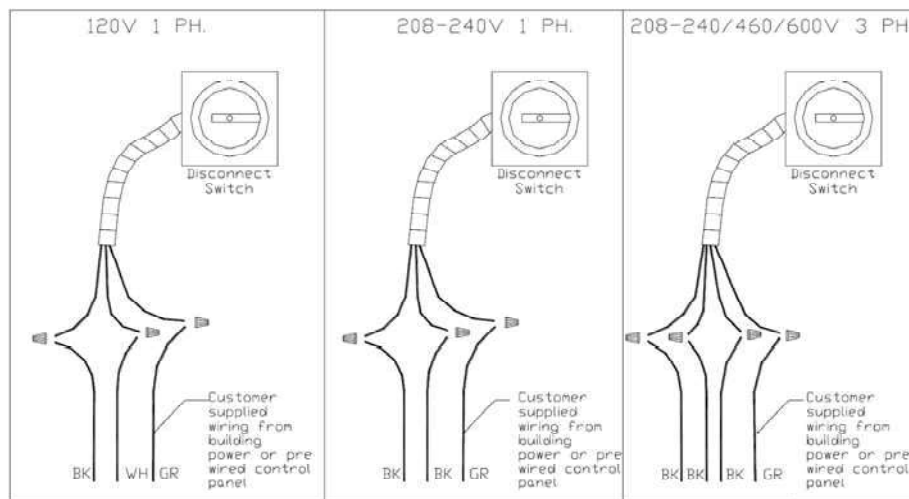
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code : 12675385

Catalog # : 00212ET3E184TC-S

Frame : 182/4TC
Output : 2 HP (1.5 kW)
Poles : 6
Frequency : 60 Hz
Rated voltage : 230/460 V
Rated current : 6.00/3.00 A
L. R. Amperes : 45.0/22.5 A
LRC : 7.5x(Code K)
No load current : 3.74/1.87 A
Rated speed : 1170 rpm
Slip : 2.50 %
Rated torque : 8.98 ft.lb
Locked rotor torque : 260 %
Breakdown torque : 370 %
Insulation class : F
Service factor : 1.15
Moment of inertia (J) : 0.3424 sq.ft.lb
Design : B

Locked rotor time : 79s (cold) 44s (hot)
Temperature rise : 80 K
Duty cycle : Cont.(S1)
Ambient temperature : -20°C to +40°C
Altitude : 1000 m.a.s.l.
Protection degree : IP55
Cooling method : IC411 - TEFC
Mounting : F-1
Rotation¹ : Both (CW and CCW)
Noise level² : 52.0 dB(A)
Starting method : Direct On Line
Approx. weight³ : 91.2 lb

Output	25%	50%	75%	100%
Efficiency (%)	82.0	84.0	86.5	88.5
Power Factor	0.28	0.50	0.62	0.71

Foundation loads
Max. traction : 178 lb
Max. compression : 269 lb

	Drive end	Non drive end
Bearing type	6206 ZZ	6205 ZZ
Sealing	V'Ring	Without Bearing Seal
Lubrication interval	-	-
Lubricant amount	-	-
Lubricant type	Mobil Polyrex EM	

Notes
USABLE @208V 6.63A SF 1.00 SFA 6.63A

This revision replaces and cancel the previous one, which must be eliminated.
(1) Looking the motor from the shaft end.
(2) Measured at 1m and with tolerance of +3dB(A).
(3) Approximate weight subject to changes after manufacturing process.
(4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021	1 / 5		

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage

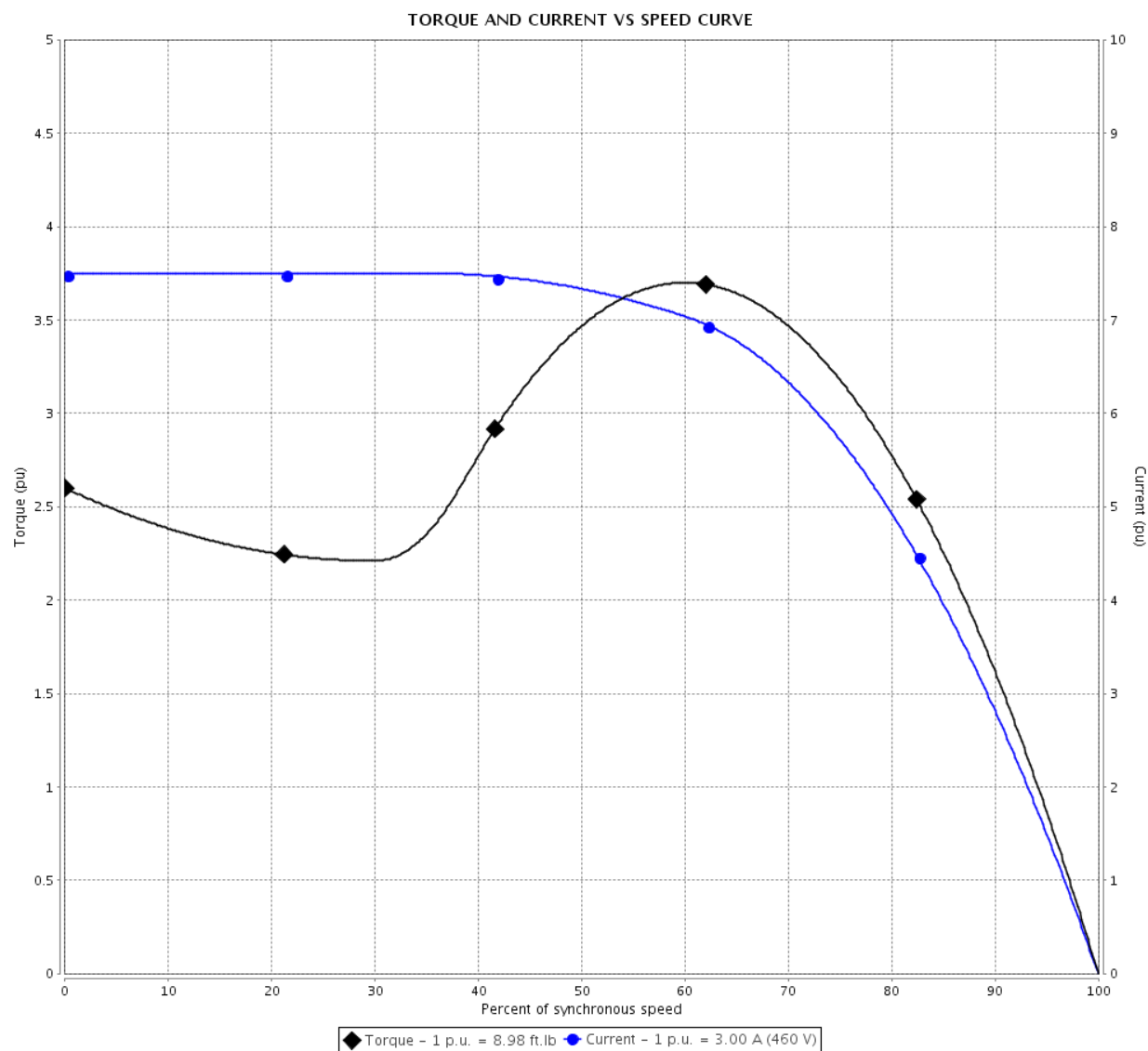


Customer :

Product line : Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code : 12675385

Catalog # : 00212ET3E184TC-S



Performance : 230/460 V 60 Hz 6P

Rated current : 6.00/3.00 A
LRC : 7.5
Rated torque : 8.98 ft.lb
Locked rotor torque : 260 %
Breakdown torque : 370 %
Rated speed : 1170 rpm

Moment of inertia (J) : 0.3424 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Locked rotor time : 79s (cold) 44s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page 2 / 5		
Checked by				
Date	13/04/2021			

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage

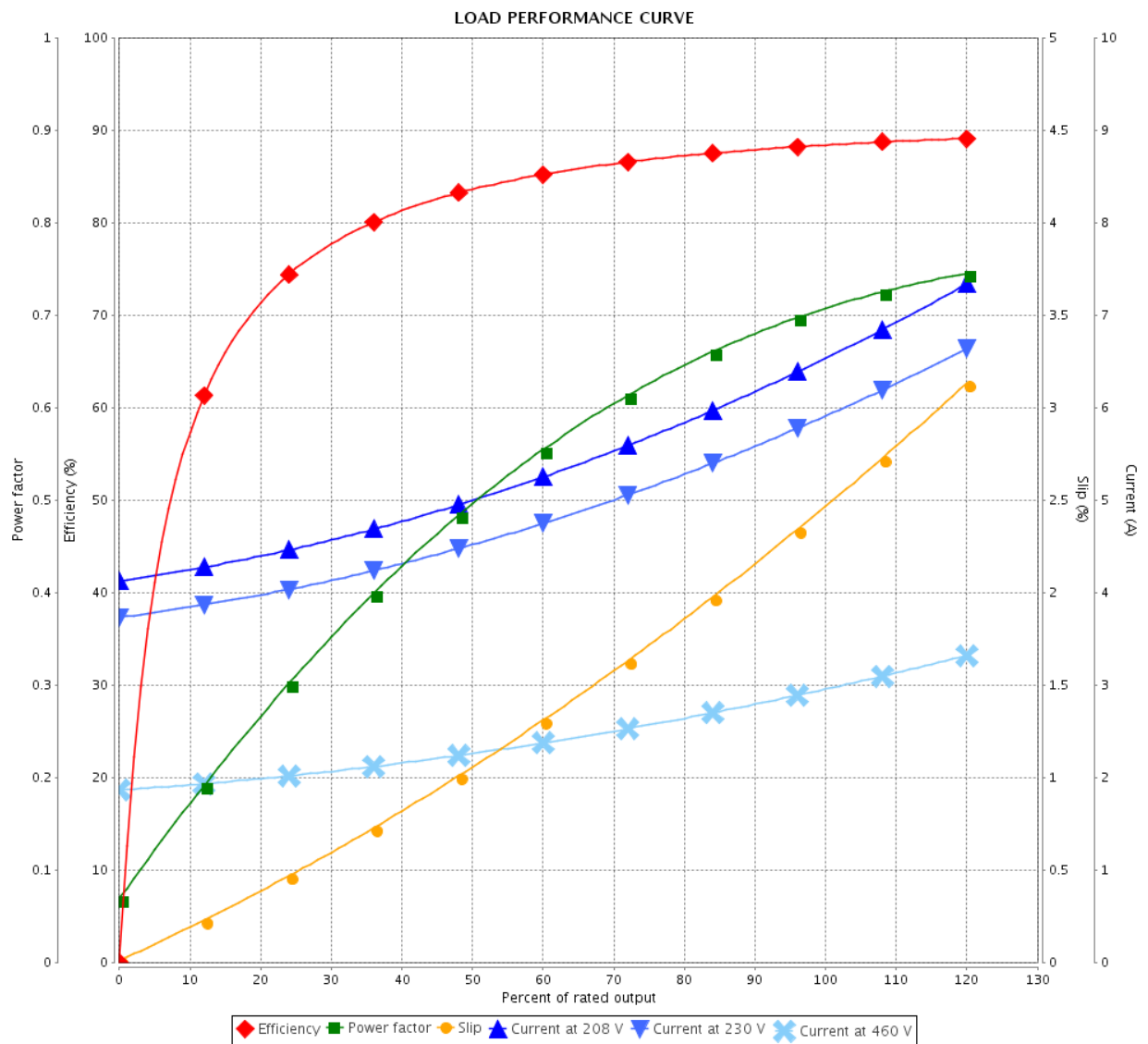


Customer :

Product line : Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code : 12675385

Catalog # : 00212ET3E184TC-S



Performance : 230/460 V 60 Hz 6P

Rated current : 6.00/3.00 A
LRC : 7.5
Rated torque : 8.98 ft.lb
Locked rotor torque : 260 %
Breakdown torque : 370 %
Rated speed : 1170 rpm

Moment of inertia (J) : 0.3424 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021			

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage

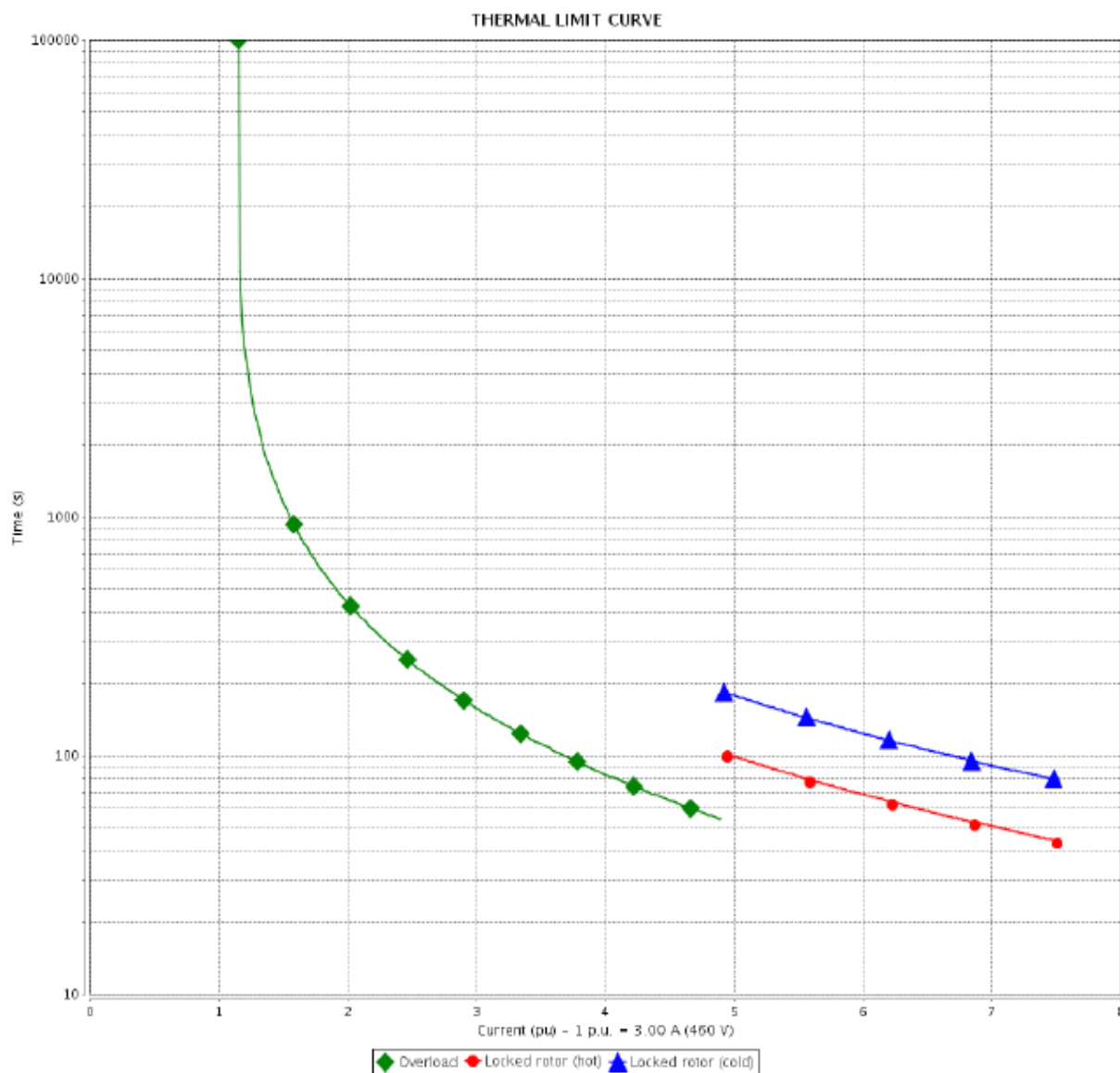


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Service factor : 1.15
Temperature rise : 80 K
Design : B

Heating constant

Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
Performed by				Page
Checked by				
Date				
13/04/2021			4 / 5	Revision

12

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EXCETO

PARA

OPÇÕES

ESPECIAL

em polegada

in inches

346

THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.

A

B

C

D

E

2 HP

06 Poles

60HZ

A

Color Munsell N 1 matte black									
Painting plan 207N									
Mounting F-1/B34R(D)									

**NEMA**
Premium3PT9
C_A US LISTED
FOR SAFE AREAC_{SP} US
Energy Verified

MADE IN MEXICO

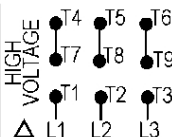
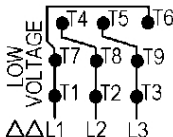
MAT: 12675385 CC029A**W01.TE0IC0X0N****MODEL 00212ET3E184TC-S****04FEV2021 S/N:****For 60Hz: Class I, Zone 2, IIC****Class I, Div.2, Gr. A,B,C,D - T3****Div 2 Inverter Duty (SF1.00)****CT 2:1/VT 1000:1**

PH 3	Hz 60	HP 2.0
FR 182/4TC		kW 1.5
DUTY CONT.		V 230/460
ALT 1000 m.a.s.l		A 6.00/3.00
INS CL F ΔT 80K	IP55	SFA 6.90/3.45
AMB 40°C	DES B	SF 1.15
ENCL TEFC	CODE K	PF 0.71
USABLE @ 208V 6.63A		RPM 1170
SF1.00		NEMA NOM. EFF 88.5%

ALTERNATE RATING: 2.0HP	50Hz	190-220/380-415V	SF1.15
7.00-6.43/3.50-3.41A	955RPM	EFF 85.7% (IE3)	IEC 60034-1

For safe area-Inverter duty motor For 60Hz use on VPWM 1000:1 VT, 4:1 CT

DE 8206-ZZ	ODE 8205-ZZ	MOBIL POLYREX EM	
------------	-------------	------------------	--



T1-BLU	T2-WHT
T3-ORG	T4-YEL
T5-BLK	T6-GRY
T7-PNK	T8-RED
T9-BRK	RED

INTERCHANGE ANY TWO LINE WIRES TO REVERSE THE ROTATION

WARNING: Motor must be grounded in accordance with local and national electrical codes to prevent serious electrical shocks. Disconnect power source before servicing unit.



AVERTISSEMENT: Le moteur doit être mis à la terre conformément aux codes électriques locaux et nationaux afin d'éviter tout choc électrique grave. Déconnectez l'alimentation avant l'entretien de la machine.

G26-XP

Power Roof Ventilator/Fans

Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

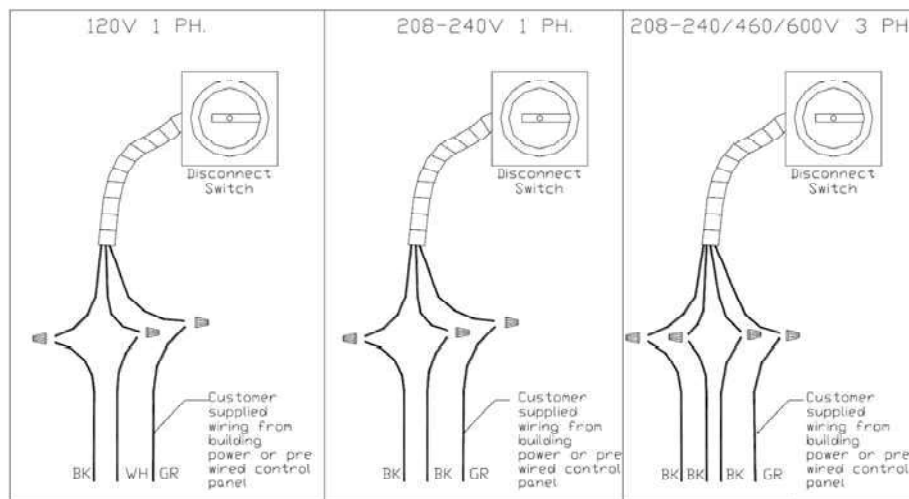
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
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Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.



DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : W21 Explosion-proof Motor NEMA Premium Efficiency Three-Phase Product code : 14281643
Catalog # : 00212XT3E184TC

Frame	: 182/4TC	Locked rotor time	: 63s (cold) 35s (hot)
Output	: 2 HP (1.5 kW)	Temperature rise	: 80 K
Poles	: 6	Duty cycle	: Cont.(S1)
Frequency	: 60 Hz	Ambient temperature	: -20°C to +40°C
Rated voltage	: 230/460 V	Altitude	: 1000 m.a.s.l.
Rated current	: 6.26/3.13 A	Protection degree	: IP55
L. R. Amperes	: 43.8/21.9 A	Cooling method	: IC411 - TEFC
LRC	: 7.0x(Code L)	Mounting	: F-1
No load current	: 4.20/2.10 A	Rotation ¹	: Both (CW and CCW)
Rated speed	: 1165 rpm	Noise level ²	: 52.0 dB(A)
Slip	: 2.92 %	Starting method	: Direct On Line
Rated torque	: 1.25 kgfm	Approx. weight ³	: 62.0 kg
Locked rotor torque	: 260 %		
Breakdown torque	: 330 %		
Insulation class	: F		
Service factor	: 1.15		
Moment of inertia (J)	: 0.0224 kgm ²		
Design	: B		

Output	25%	50%	75%	100%	Foundation loads	
Efficiency (%)	82.5	84.5	86.5	88.5	Max. traction	: 57 kgf
Power Factor	0.26	0.47	0.58	0.68	Max. compression	: 119 kgf

		<u>Drive end</u>	<u>Non drive end</u>
Bearing type	:	6307 2RS	6206 2RS
Sealing	:	Oil Seal	Lip Seal
Lubrication interval	:	-	-
Lubricant amount	:	-	-
Lubricant type	:	Mobil Polyrex EM	

Notes
USABLE @208V 6.92A SF 1.15 SFA 7.96A

This revision replaces and cancel the previous one, which must be eliminated.

- (1) Looking the motor from the shaft end.
- (2) Measured at 1m and with tolerance of +3dB(A).
- (3) Approximate weight subject to changes after manufacturing process.
- (4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
Performed by				
Checked by				
Date	13/04/2021			

DATA SHEET

Three Phase Induction Motor - Squirrel Cage

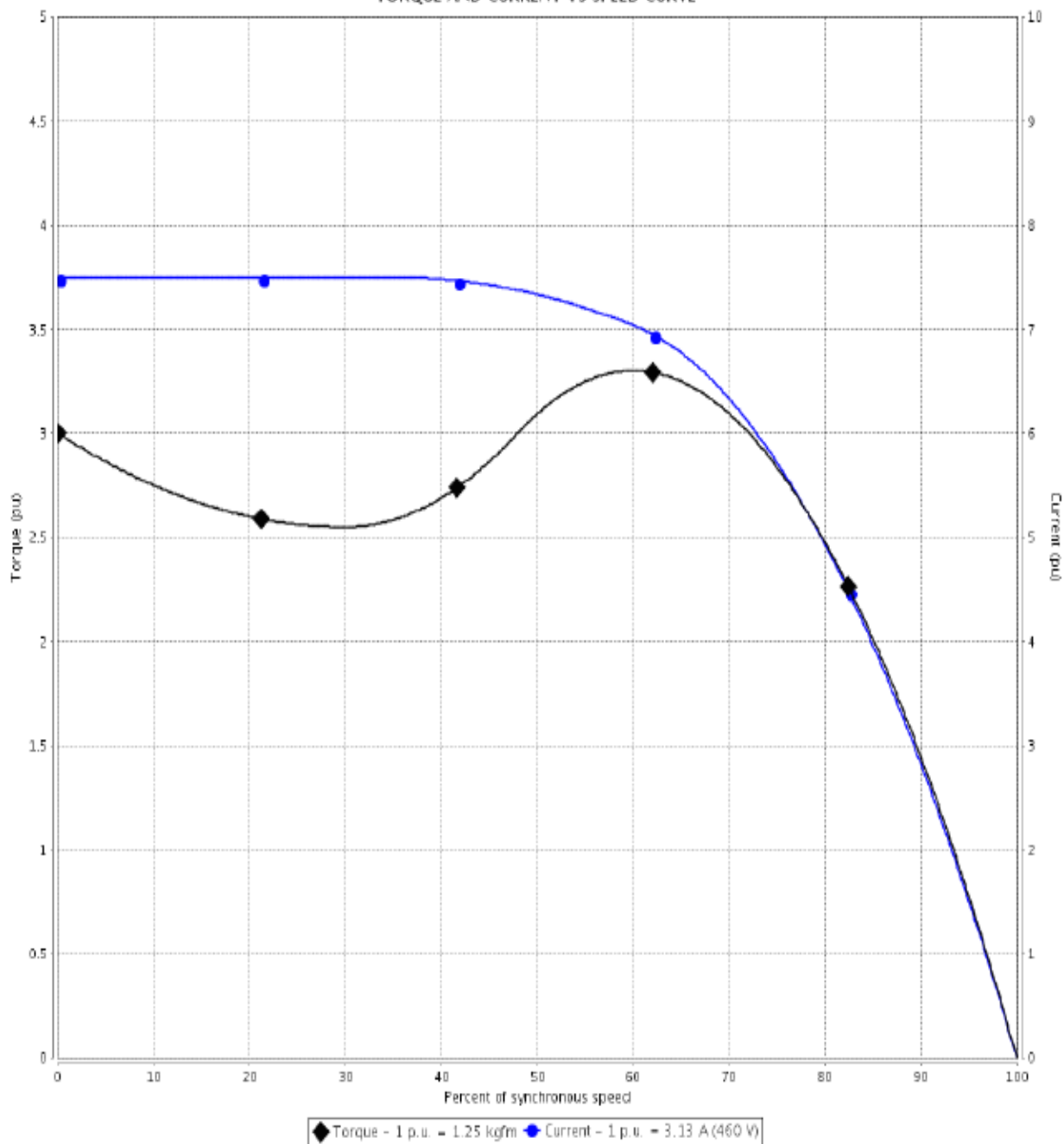


Customer : _____

Thermal protection

ID	Application	Type	Quantity	Sensing Temperature
1	Winding	Thermostat - 2 wires	1 x Phase	155 °C

TORQUE AND CURRENT VS SPEED CURVE



Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page 2 / 6		
Checked by				
Date	13/04/2021			

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage

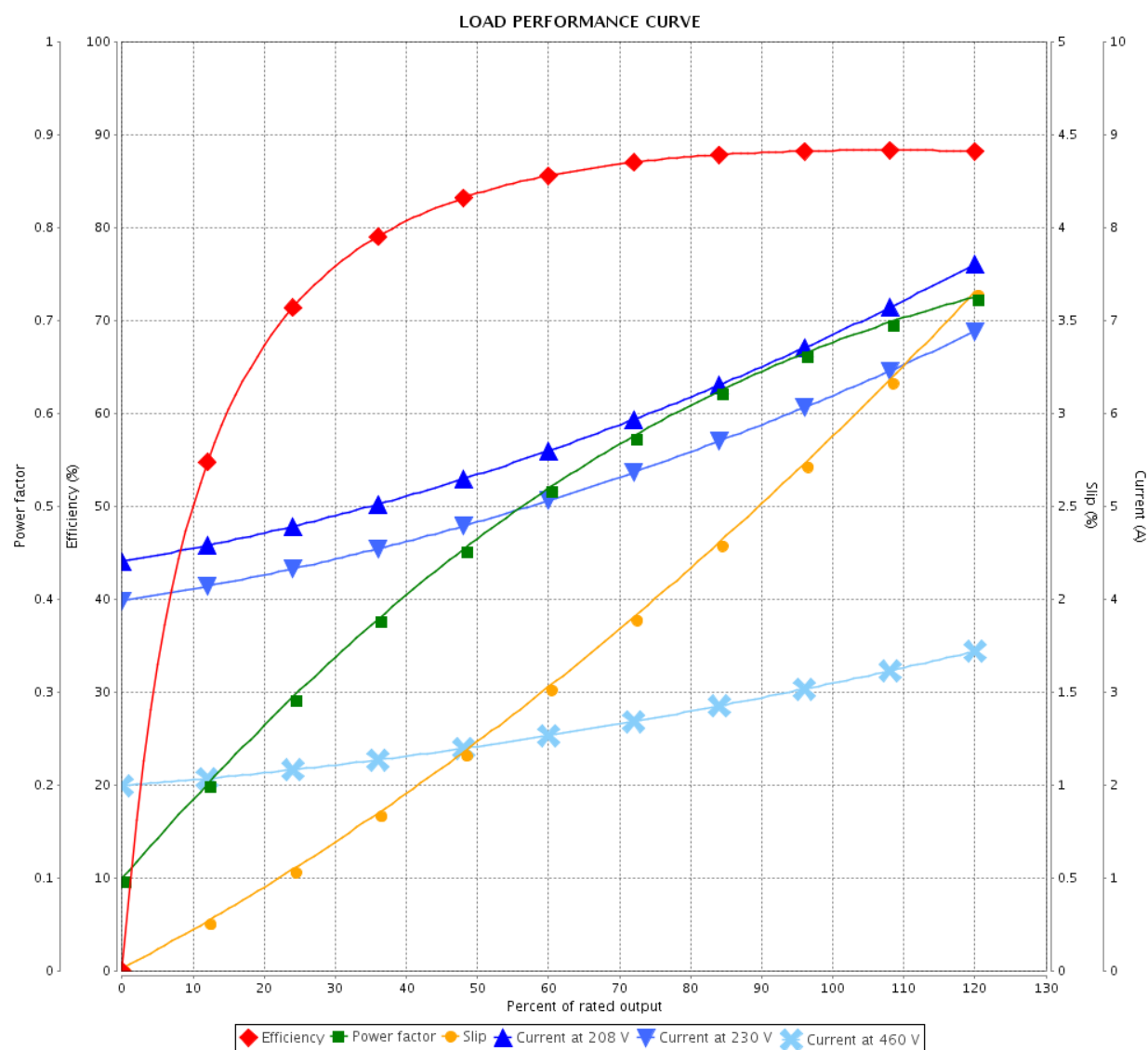


Customer :

Product line : W21 Explosion-proof Motor NEMA
Premium Efficiency Three-Phase

Product code : 14281643

Catalog # : 00212XT3E184TC



Performance : 230/460 V 60 Hz 6P

Rated current : 6.26/3.13 A
LRC : 7.0
Rated torque : 1.25 kgfm
Locked rotor torque : 260 %
Breakdown torque : 330 %
Rated speed : 1165 rpm

Moment of inertia (J) : 0.0224 kgm²
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Rev.	Changes Summary	Performed	Checked	Date
Performed by			Page	Revision
Checked by				
Date	13/04/2021		4 / 6	

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage

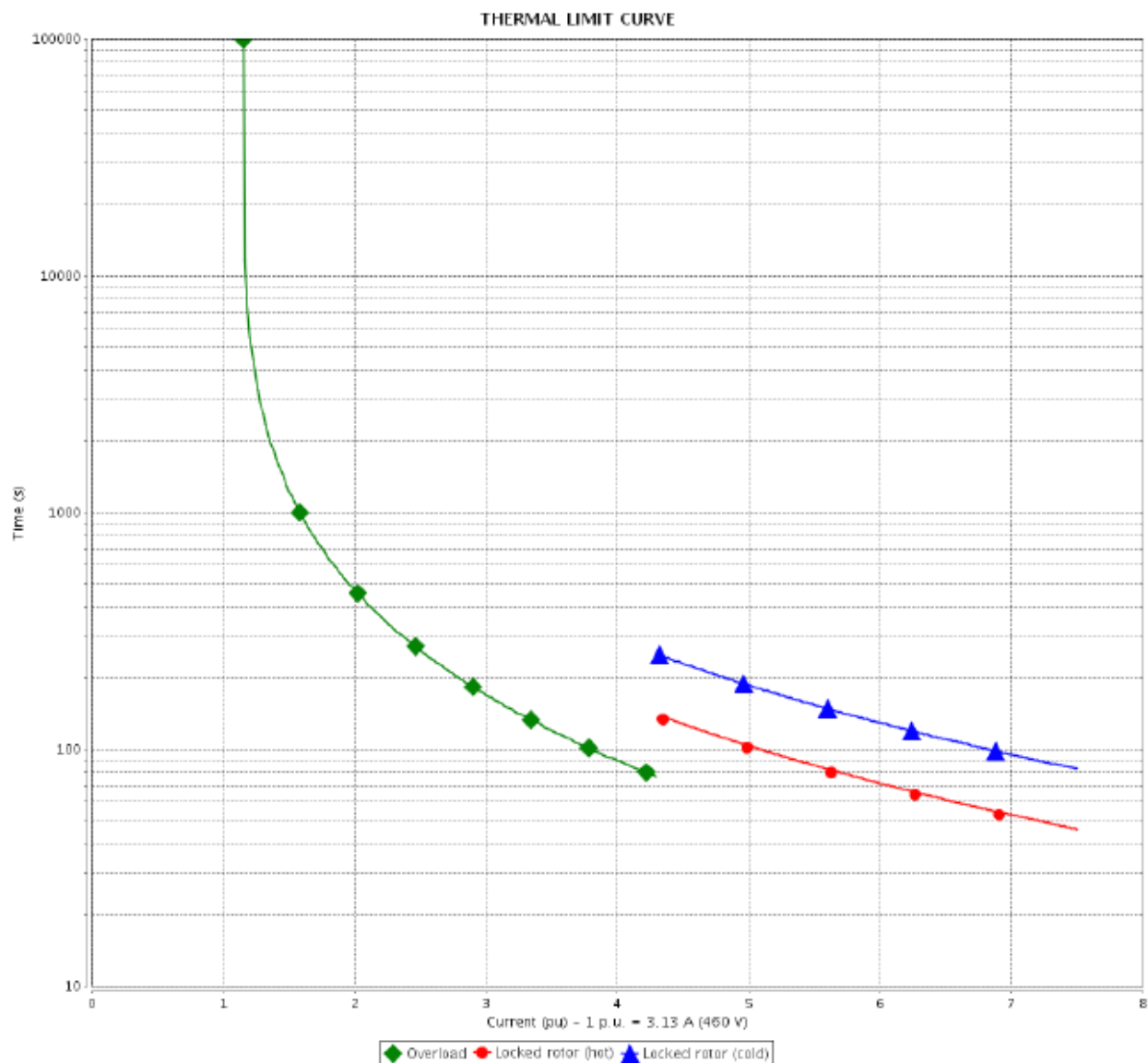


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Premium Efficiency Three-Phase

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Catalog # : 00212XT3E184TC



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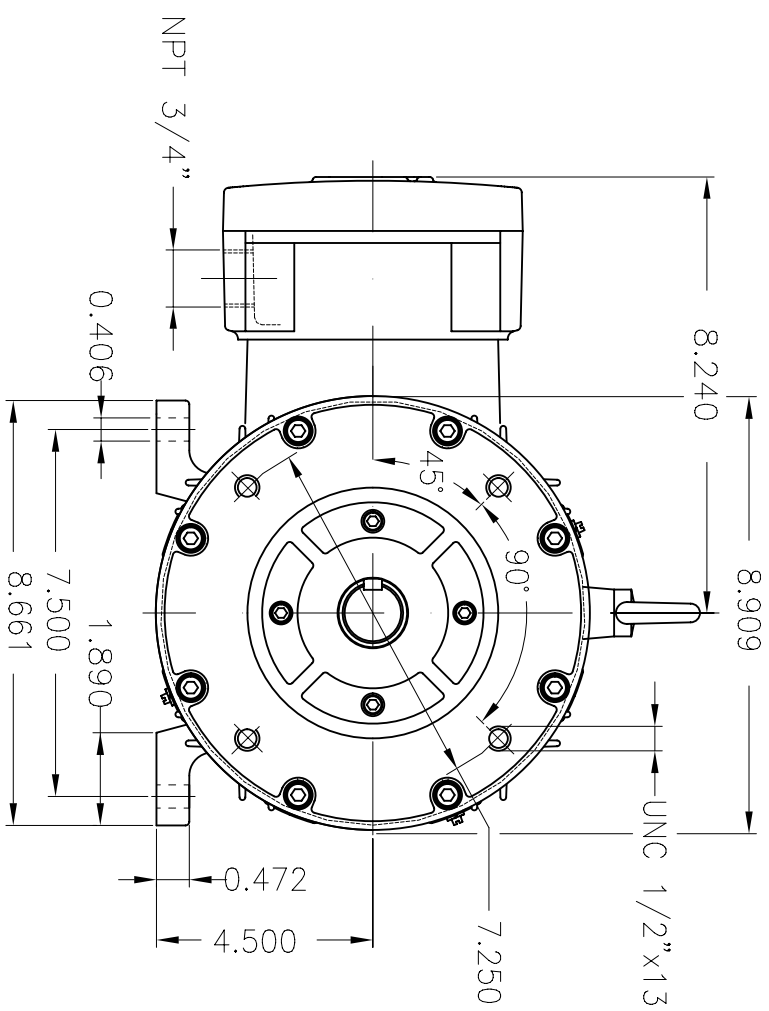
Heating constant

Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
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Date	13/04/2021			

1		2	
No reproduction of this drawing is allowed without permission of WEG Motores		EXO	Dimensões em polegada
		PADRÃO	
		opcional	
		ESPECIAL	

5	6	THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.
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W21X NEMA
Premium

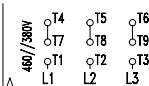
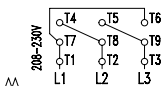
14281643

CC029A

Inverter Duty Motor
Severe Duty


MODEL 00212XT3E184TC

PH 3	FR 182/4TC	
HP(kW) 2.0(1.5)	HZ 60	IP55
V 230/460	A 6.26/3.13	
RPM 1165	NEMA NOM EFF 88.5%	
PF 0.68	SFA 7.20/3.60	DES B
INS CL F Δ T 80 K	SF 1.15	ENCL TEFC
DUTY CONT.	CODE K	ALT 1000 m.a.s.l.
AMB 40°C	USABLE \emptyset 208V 6.92 A	SF 1.15 SFA 7.96
AMB 55°C	SF1.0	
2.0HP 1.5kW 50Hz 380V 3.66A 950RPM SF1.00 EFF 86.5% (IE4)		



→ 6307-2RS MOBIL POLYREX EM
 → 6206-2RS

134 Lbs



TEMP CODE T3C
 CSA/UL: Class I - Div. 1 - Groups C and D
 CSA: Class II - Div. 1 - Groups F and G
 CSA: Class I - Zone 1 - IIB
EXPLOSION PROOF MOTOR

FOR USE ON VPMW VFD 1000:1XT, 20:1CT, 1.0SF, T3C, AMB 40°C.

G30

Power Roof Ventilator/Fans Installation, Operation, and Maintenance Manual

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Mechanical

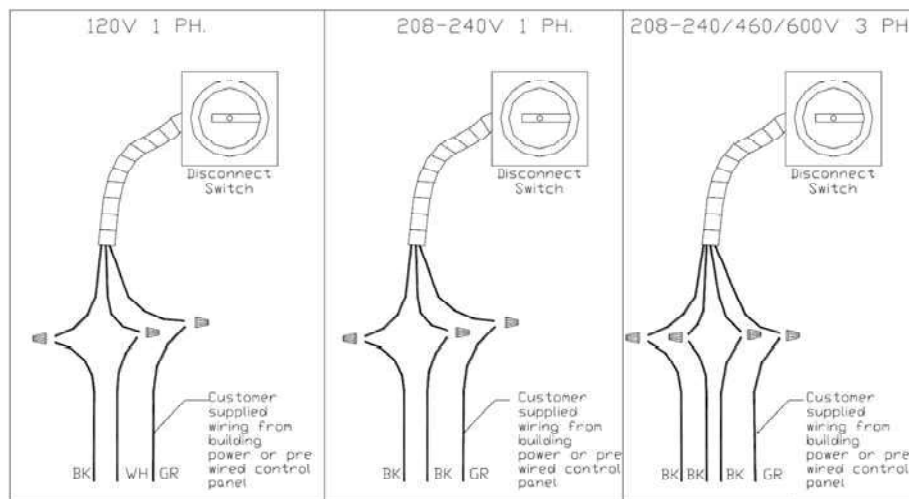
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Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
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	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
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	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
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4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code : 12675389

Catalog # : 00512ET3E215TC-S

Frame : 213/5TC
Output : 5 HP (3.7 kW)
Poles : 6
Frequency : 60 Hz
Rated voltage : 230/460 V
Rated current : 13.5/6.74 A
L. R. Amperes : 80.9/40.4 A
LRC : 6.0x(Code H)
No load current : 6.84/3.42 A
Rated speed : 1175 rpm
Slip : 2.08 %
Rated torque : 22.3 ft.lb
Locked rotor torque : 220 %
Breakdown torque : 250 %
Insulation class : F
Service factor : 1.15
Moment of inertia (J) : 1.26 sq.ft.lb
Design : B

Locked rotor time : 54s (cold) 30s (hot)
Temperature rise : 80 K
Duty cycle : Cont.(S1)
Ambient temperature : -20°C to +40°C
Altitude : 1000 m.a.s.l.
Protection degree : IP55
Cooling method : IC411 - TEFC
Mounting : F-1
Rotation¹ : Both (CW and CCW)
Noise level² : 55.0 dB(A)
Starting method : Direct On Line
Approx. weight³ : 155 lb

Output	25%	50%	75%	100%
Efficiency (%)	86.4	87.5	88.5	89.5
Power Factor	0.35	0.59	0.71	0.77

Foundation loads
Max. traction : 245 lb
Max. compression : 400 lb

		<u>Drive end</u>	<u>Non drive end</u>
Bearing type	:	6208 ZZ	6206 ZZ
Sealing	:	V'Ring	Without Bearing Seal
Lubrication interval	:	-	-
Lubricant amount	:	-	-
Lubricant type	:	Mobil Polyrex EM	

Notes
USABLE @208V 14.9A SF 1.00 SFA 14.9A

This revision replaces and cancel the previous one, which must be eliminated.
(1) Looking the motor from the shaft end.
(2) Measured at 1m and with tolerance of +3dB(A).
(3) Approximate weight subject to changes after manufacturing process.
(4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021	1 / 5		

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage

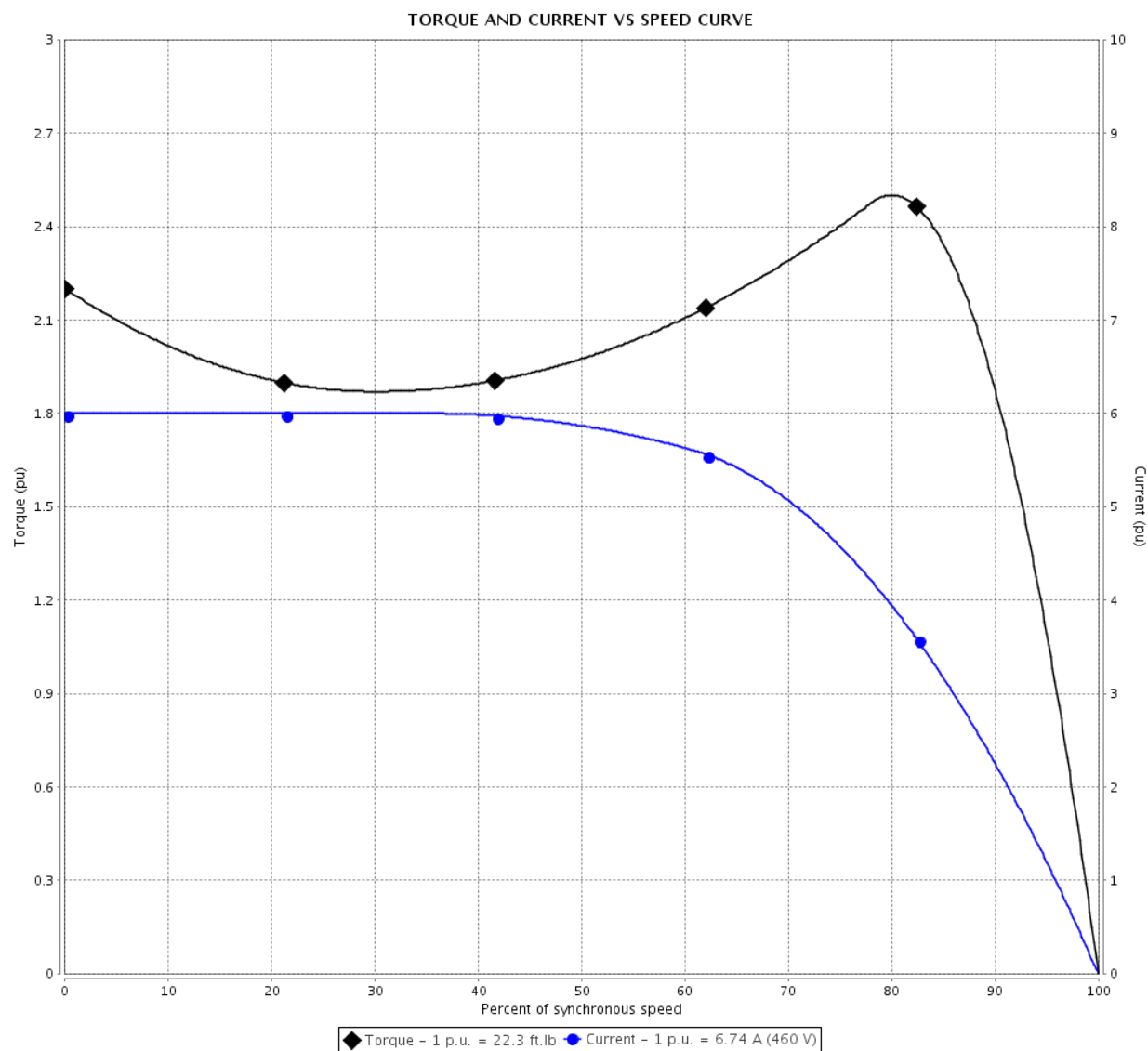


Customer :

Product line : Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code : 12675389

Catalog # : 00512ET3E215TC-S



Performance : 230/460 V 60 Hz 6P

Rated current : 13.5/6.74 A
LRC : 6.0
Rated torque : 22.3 ft.lb
Locked rotor torque : 220 %
Breakdown torque : 250 %
Rated speed : 1175 rpm

Moment of inertia (J) : 1.26 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Locked rotor time : 54s (cold) 30s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page 2 / 5		
Checked by				
Date	13/04/2021			

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage

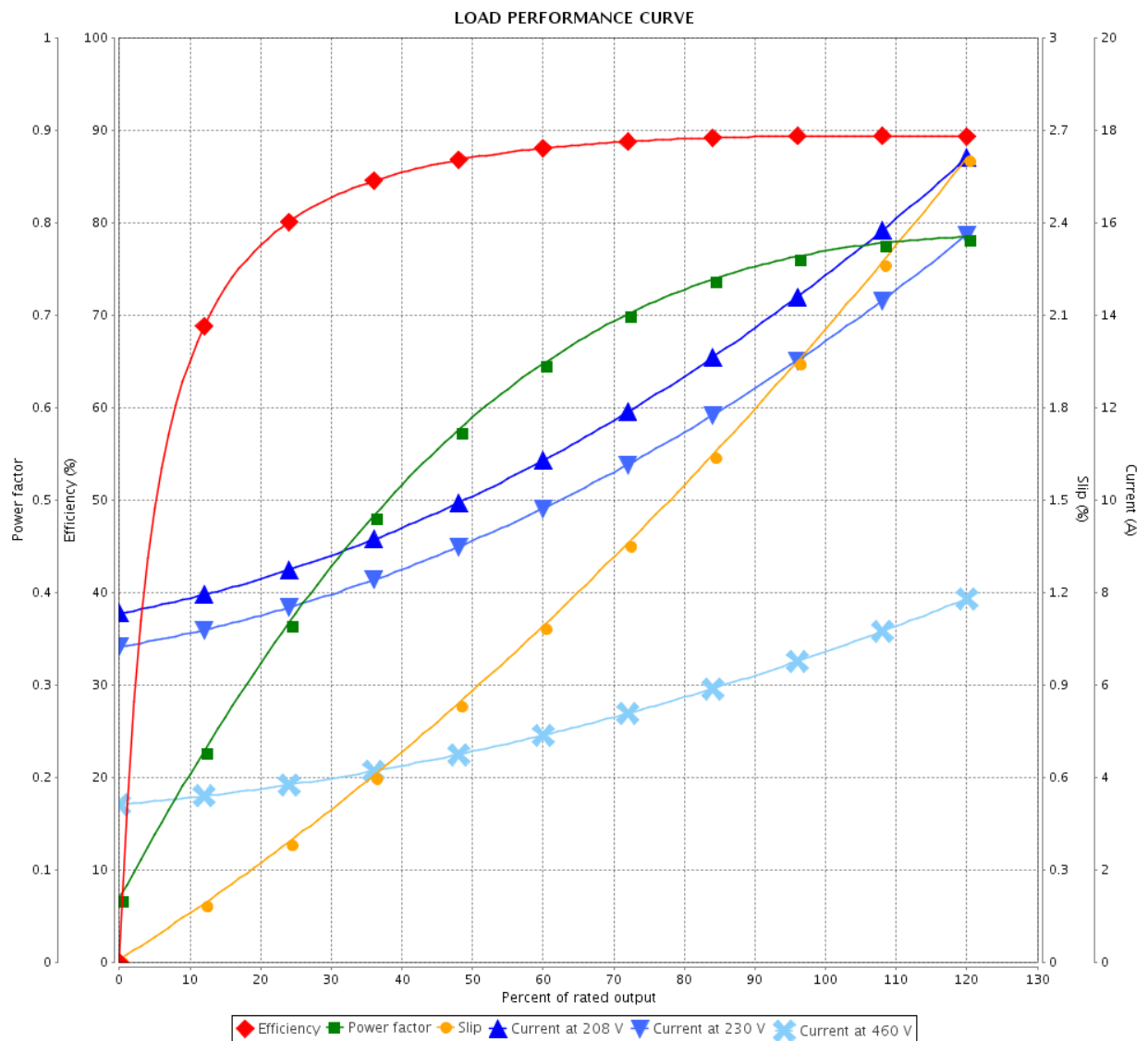


Customer :

Product line : Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code : 12675389

Catalog # : 00512ET3E215TC-S



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Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021			

THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line

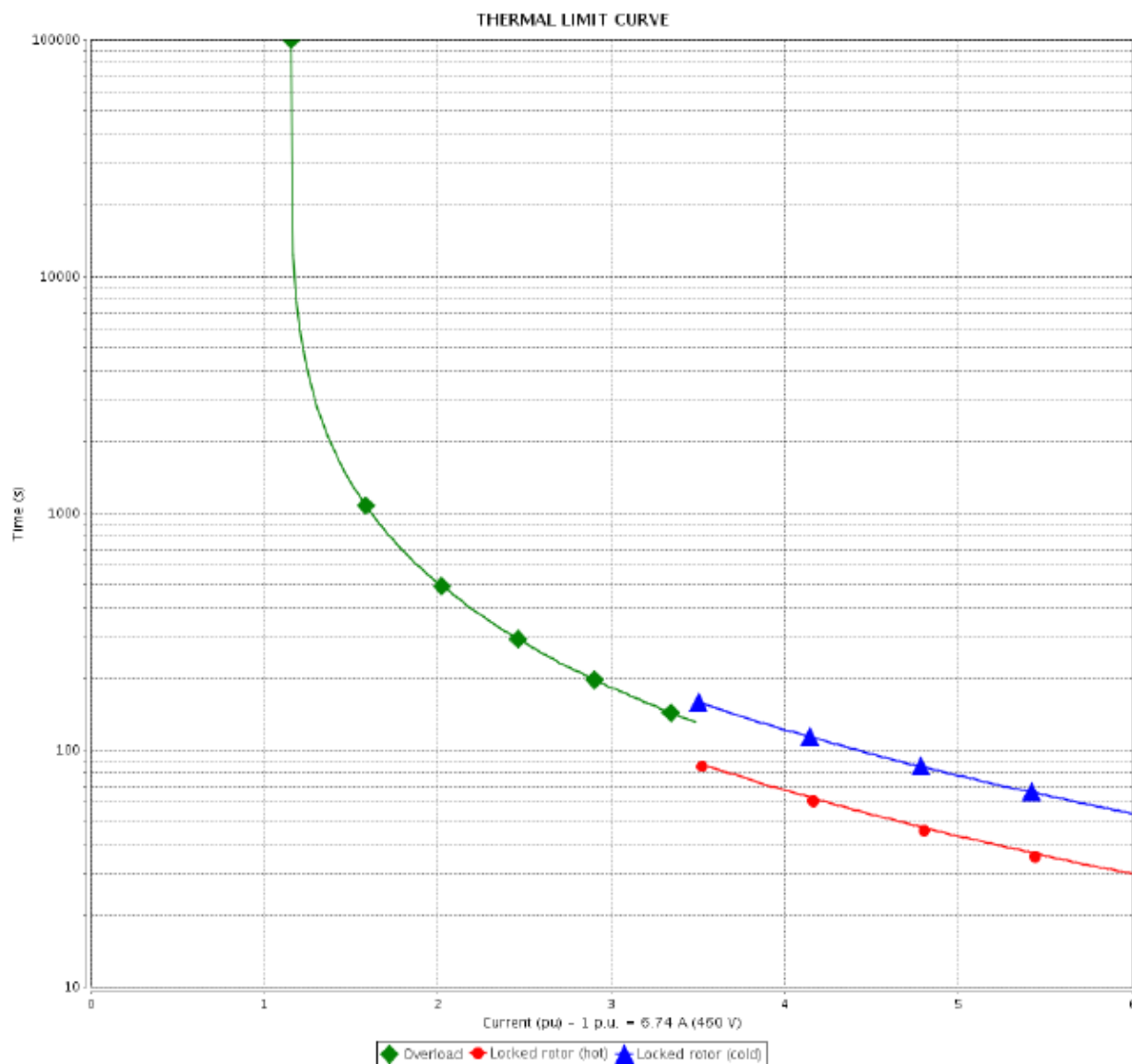
: Rolled Steel NEMA Premium
Efficiency Three-Phase

Product code :

12675389

Catalog # :

00512ET3E215TC-S



Performance : 230/460 V 60 Hz 6P

Rated current : 13.5/6.74 A
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Locked rotor torque : 220 %
Breakdown torque : 250 %
Rated speed : 1175 rpm

Moment of inertia (J) : 1.26 sq.ft.lb
Duty cycle : Cont.(S1)
Insulation class : F
Service factor : 1.15
Temperature rise : 80 K
Design : B

Heating constant

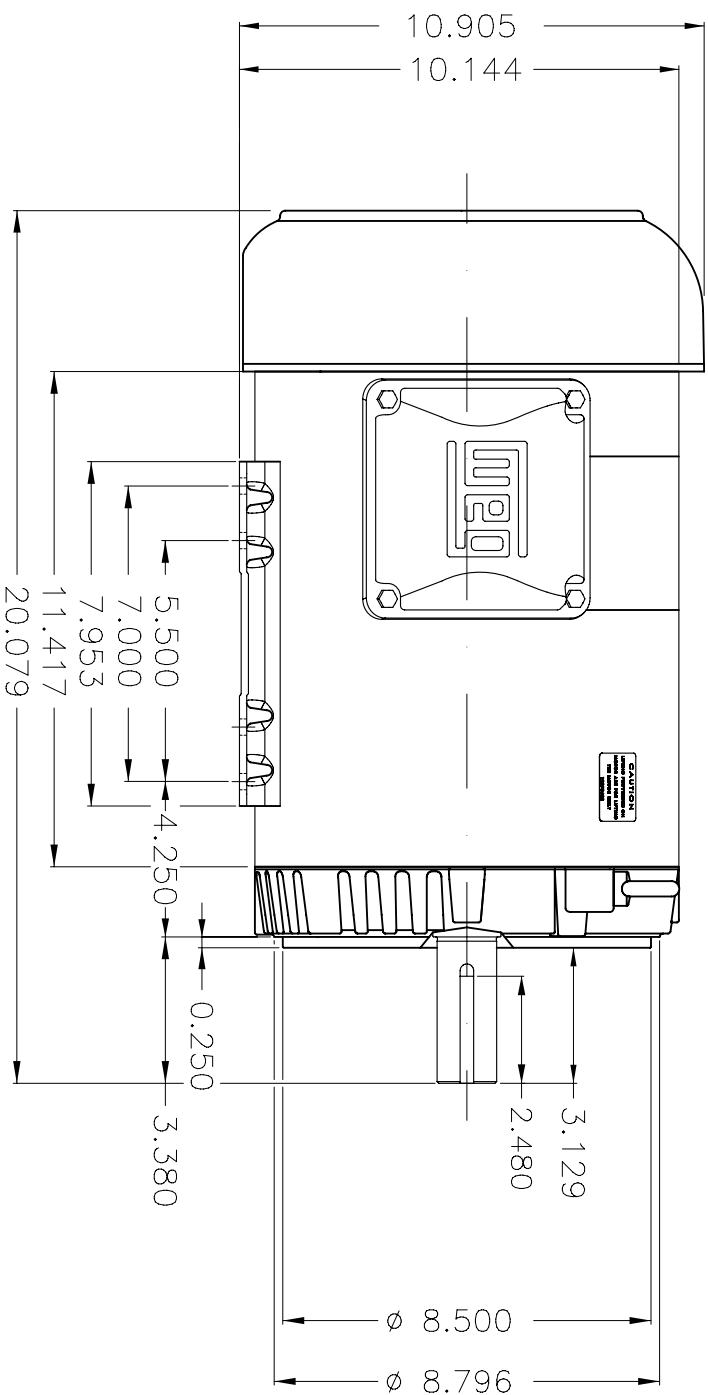
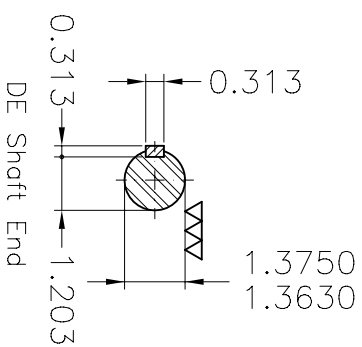
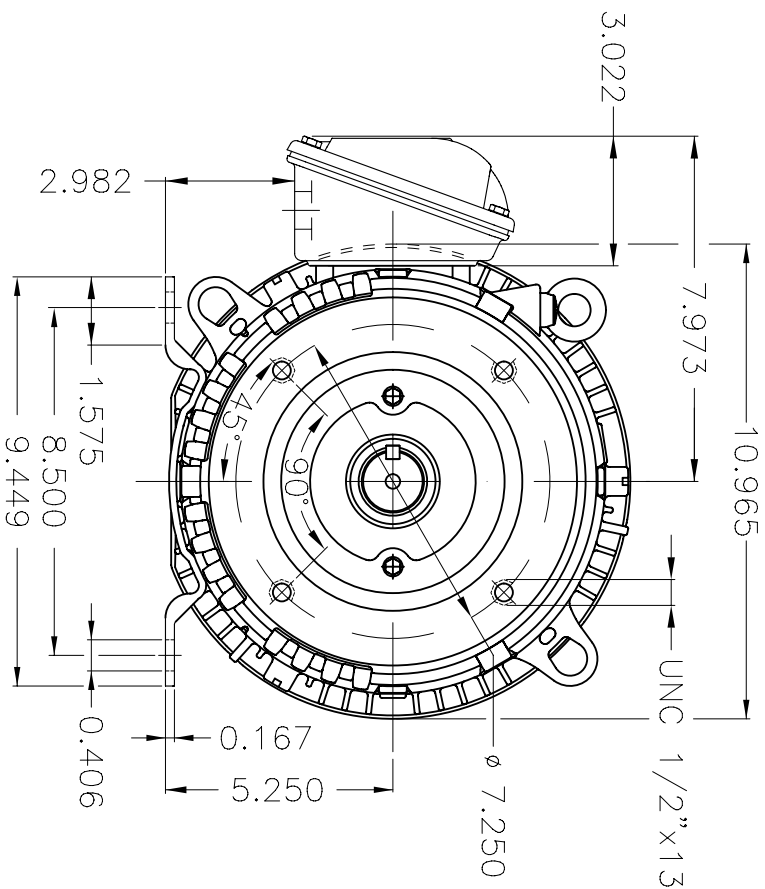
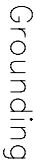
Cooling constant

Rev.	Changes Summary	Performed	Checked	Date
Performed by		Page Revision		
Checked by				
Date	13/04/2021	4 / 5		

• EIXO
PARÂMETROS em polegada
opcionalmente em inches
ESPECIAL

• EIXO
PARÂMETROS em polegada
opcional em inches
ESPECIAL

• EIXO
PARÂMETROS em polegada
opcionalmente em inches
ESPECIAL



THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.

[illegible]



NEMA
Premium

3PT9
C_{UL} US LISTED
FOR SAFE AREA

C_{SP} US
Energy Verified

MADE IN MÉXICO

MAT: 12675389 CC029A
W01.TE0IC0X0N
MODEL 00512ET3E215TC-S

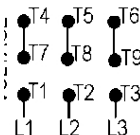
For 60Hz: Class I, Zone 2, IIC
Class I, Div.2, Gr. A,B,C,D - T3
Div 2 Inverter Duty (SF1.00)
CT 2:1/VT 1000:1

HP 5.0
kW 3.7
V 230/460
A 13.5/6.74
SFA 15.5/7.75
SF 1.15
PF 0.77
RPM 1175
NEMA
COM. EFF 89.5%

60Hz 190-220/380-415V SF1.00
100RPM EFF 85.4% (IE2) IEC 60034-1

or For 60Hz use on VPWM 1000:1 VT, 4:1 CT

MOBIL POLYREX EM



T1-BLU T2-WHT
T3-ORG T4-YEL
T5-BLK T6-GRY
T7-PNK T8-RED
T9-BRK RED

THERMAL LIMIT CURVE

IS TO REVERSE THE ROTATION

ded in accordance with local
s to prevent serious electrical
source before servicing unit.



moteur doit être mis à la terre
ix et nationaux afin d'éviter tout
ntation avant l'entretien de la machine.



G30-XP

Power Roof Ventilator/Fans Installation, Operation, and Maintenance Manual

Save these instructions. This document is the property of the owner of this equipment and is required for future maintenance. Leave this document with the owner when installation or service is complete.

RECEIVING AND INSPECTION

Upon receiving unit, check for any interior and exterior damage, and if found, report it immediately to the carrier. Also check that all accessory items are accounted for and are damage free. Turn the blower wheel by hand to verify free rotation and check the damper (if supplied) for free operation.

WARNING!!

Installation of this ventilator should only be performed by a qualified professional who has read and understands these instructions and is familiar with proper safety precautions. Improper installation poses serious risk of injury due to electric shock, contact with rotating equipment, and other potential hazards. Read this manual thoroughly before installing or servicing this equipment. ALWAYS disconnect power prior to working on fan.

WARRANTY

This equipment is warranted to be free from defects in materials and workmanship, under normal use and service, for a period of 12 months from date of shipment. This warranty shall not apply if:

1. The equipment is not installed by a qualified installer per the MANUFACTURER'S installation instructions shipped with the product,
2. The equipment is not installed in accordance with federal, state and local codes and regulations,
3. The equipment is misused or neglected,
4. The equipment is not operated within its published capacity,
5. The invoice is not paid within the terms of the sales agreement.

The MANUFACTURER shall not be liable for incidental and consequential losses and damages potentially attributable to malfunctioning equipment. Should any part of the equipment prove to be defective in material or workmanship within the 12-month warranty period, upon examination by the MANUFACTURER, such part will be repaired or replaced by MANUFACTURER at no charge. The BUYER shall pay all labor costs incurred in connection with such repair or replacement. Equipment shall not be returned without MANUFACTURER'S prior authorization and all returned equipment shall be shipped by the BUYER, freight prepaid to a destination determined by the MANUFACTURER.

INSTALLATION

It is imperative that this unit is installed and operated with the designed airflow and electrical supply in accordance with this manual. If there are any questions about any items, please call the service department at 1-800-828-0282 for warranty and technical support issues.

Mechanical

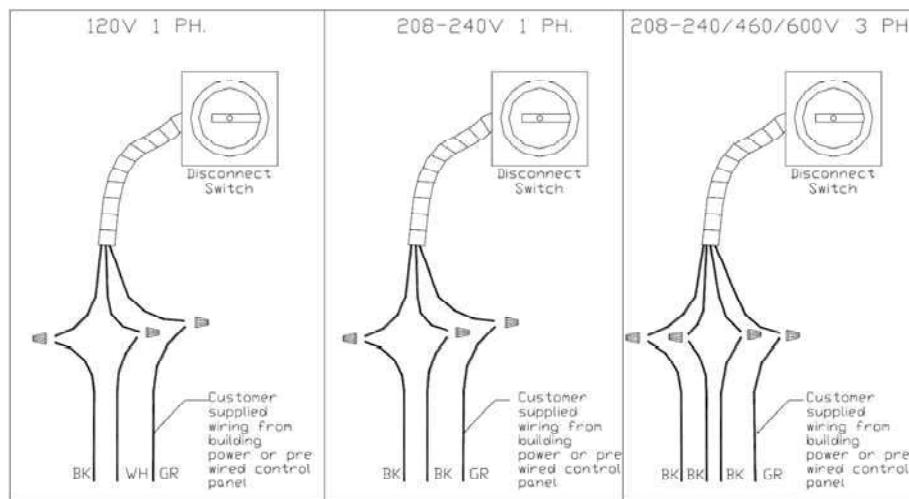
WARNING: DO NOT RAISE VENTILATOR BY THE HOOD, BLOWER OR MOTOR SHAFT, OR BEARINGS – USE LIFTING LUGS PROVIDED OR A SLING

Site Preparation

1. Provide clearance around installation site to safely rig and lift equipment into its final position. Supports must adequately support equipment. Refer to manufacturer's estimated weights.
2. Consider general service and installation space when locating unit.
3. Locate unit close to the space it will serve to reduce long, twisted duct runs.
4. The fan discharge must be located at least 10 feet away from any supply intakes. The fan discharge shall be located in accordance with the applicable building code provisions.

Roof Mounting

1. Ventilators are designed for installation atop a prefabricated or factory built roof curb. Follow manufacturer's instructions for proper curb installation.
2. Before connecting fan motor to power source verify power line wiring is de-energized.
3. Connect power supply wiring to the motor as indicated on the motor nameplate or terminal box cover. Make certain that the power source is compatible with the requirements of your equipment.
4. Before powering up fan check ventilator wheel for free rotation.
5. Check all fasteners for tightness.
6. Re-install motor dome.



OPERATION

Prior to starting up or operating the ventilator, check all fasteners for tightness. In particular, check the set screw in the wheel hub, bearings and the fan sheaves (pulleys). With power to the fan OFF or prior to connecting ventilator to power, turn the fan wheel by hand to be sure it is not striking the inlet or any obstacles. Re-center if necessary.

Start Up

Special Tools Required

- AC Voltage Meter
- Tachometer
- Amperage Meter
- Standard Hand Tools

Start Up Procedure

1. Check all electrical connections for tightness and continuity.
2. Inspect the air-stream for obstructions or debris in wheel.
3. Compare the supplied voltage with the fan's nameplate voltage. If this does not match, correct the problem.
4. Start the fan up, by turning the external disconnect to the ON position, and shut it OFF immediately to check rotation of the wheel with the directional arrow on the blower scroll. Reversed rotation will result in poor air performance, motor overloading and possible burnout. For units equipped with a single-phase motor check the motor wiring diagram to change rotation. For 3-phase motors, any two power leads can be interchanged to reverse motor direction.
5. When the fan is started up, observe the operation and check for any unusual noises.
6. Switch the external disconnect back to the ON position and with the air system in full operation and all ducts attached, measure the system airflow.
7. Measure and record the voltage and amperage to the motor and compare with the motor nameplate to determine if the motor is operating under safe load condition.

Troubleshooting

The following table lists causes and corrective actions for possible problems with the fan units. Review this list prior to consulting manufacturer.

Troubleshooting Chart

Problem Potential Cause Corrective Action

Problem	Potential Cause	Corrective Action
Fan Inoperative	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker and check amps
	Disconnect switch in "Off" position	Turn to "On" position
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Motor starter overloaded	Reset starter and check amps
Motor Overload	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Motor wired incorrectly	Check motor wiring to wiring diagram located on fan motor
	Overload in starter set too low	Set overload to motor FLA value
	Motor HP too low	Determine if HP is sufficient for job
Insufficient Airflow	Fan rotating in the wrong direction	Be sure fan is rotating in the direction shown on rotation label
	Poor inlet/outlet conditions	There should be a straight clear duct at the inlet/outlet
	Damper not fully open	Inspect damper linkage and replace damper motor if needed
Excessive Vibration and Noise	Damaged or unbalanced wheel	Replace wheel
	Bearings need lubrication or replacement	Lubricate or replace

MAINTENANCE

To guarantee trouble free operation of this fan, the manufacturer suggests following these guidelines. Most problems associated with fan failures are directly related to poor service and maintenance. Please record any maintenance or service performed.

WARNING: DO NOT ATTEMPT MAINTENANCE ON THE FAN UNTIL THE ELECTRICAL SUPPLY HAS BEEN COMPLETELY DISCONNECTED

General Maintenance

1. Fan discharge and approaches to ventilator should be kept clean and free from any obstruction.
2. Motors are normally permanently lubricated. Check bearings periodically. If they have grease fittings lubricate each season. Use caution when lubricating bearings, wipe the fittings clean, the unit should be rotated by hand while lubricating. Bearings should be lubricated every 2 months. Caution: Bearings are sealed and over-greasing bearings can cause damage to the bearings. Do not grease until grease comes out of seals. Only add the appropriate amount of grease.
3. All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.
4. Fans require very little attention when moving clean air. Occasionally oil and dust may accumulate causing imbalance. If the fan is installed in a corrosive or dirty atmosphere, periodically inspect and clean the wheel, inlet and other moving parts to ensure smooth and safe operation.

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line : W21 Explosion-proof Motor NEMA Premium Efficiency Three-Phase Product code : 14296347
Catalog # : 00512XT3E215TC

Frame	: 213/5TC	Locked rotor time	: 102s (cold) 57s (hot)
Output	: 5 HP (3.7 kW)	Temperature rise	: 80 K
Poles	: 6	Duty cycle	: Cont.(S1)
Frequency	: 60 Hz	Ambient temperature	: -20°C to +40°C
Rated voltage	: 230/460 V	Altitude	: 1000 m.a.s.l.
Rated current	: 13.7/6.83 A	Protection degree	: IP55
L. R. Amperes	: 92.9/46.4 A	Cooling method	: IC411 - TEFC
LRC	: 6.8x(Code J)	Mounting	: F-1
No load current	: 6.90/3.45 A	Rotation ¹	: Both (CW and CCW)
Rated speed	: 1170 rpm	Noise level ²	: 55.0 dB(A)
Slip	: 2.50 %	Starting method	: Direct On Line
Rated torque	: 3.10 kgfm	Approx. weight ³	: 99.2 kg
Locked rotor torque	: 170 %		
Breakdown torque	: 260 %		
Insulation class	: F		
Service factor	: 1.15		
Moment of inertia (J)	: 0.0620 kgm ²		
Design	: B		

Output	25%	50%	75%	100%	Foundation loads	
Efficiency (%)	88.2	88.5	89.5	89.5	Max. traction	: 123 kgf
Power Factor	0.34	0.58	0.70	0.76	Max. compression	: 222 kgf

		Drive end	Non drive end
Bearing type	:	6308 2RS	6207 2RS
Sealing	:	Oil Seal	Lip Seal
Lubrication interval	:	-	-
Lubricant amount	:	-	-
Lubricant type	:	Mobil Polyrex EM	

Notes
USABLE @208V 15.1A SF 1.15 SFA 17.4A

This revision replaces and cancel the previous one, which must be eliminated.

- (1) Looking the motor from the shaft end.
- (2) Measured at 1m and with tolerance of +3dB(A).
- (3) Approximate weight subject to changes after manufacturing process.
- (4) At 100% of full load.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in NEMA MG-1.

Rev.	Changes Summary	Performed	Checked	Date
Performed by				
Checked by				
Date	13/04/2021			

DATA SHEET

Three Phase Induction Motor - Squirrel Cage



Customer : _____

Thermal protection

ID	Application	Type	Quantity	Sensing Temperature
1	Winding	Thermostat - 2 wires	1 x Phase	155 °C

Rev.	Changes Summary		Performed	Checked	Date
Performed by				Page	Revision
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Date	13/04/2021			2 / 6	

TORQUE AND CURRENT VS SPEED CURVE

Three Phase Induction Motor - Squirrel Cage

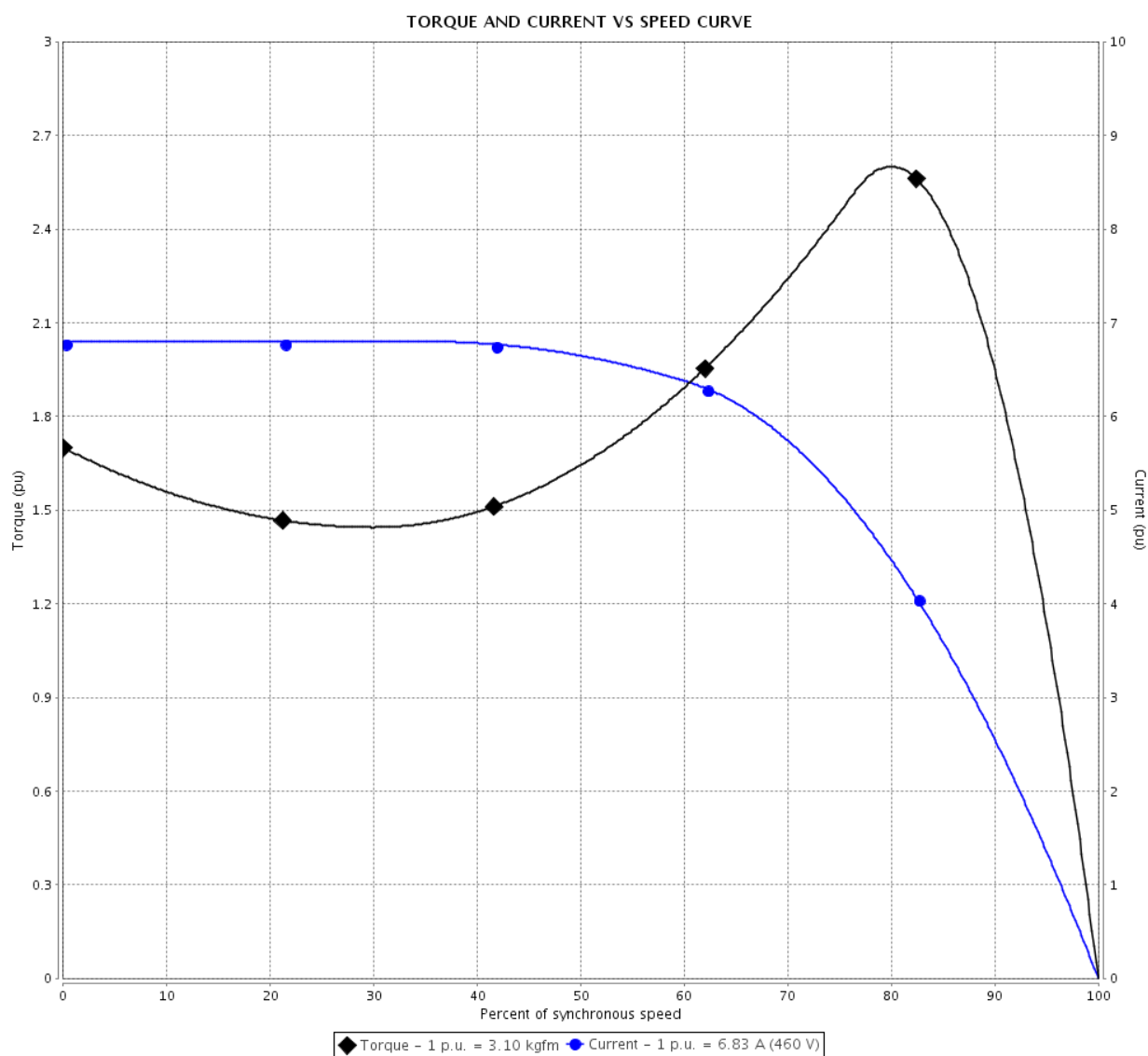


Customer :

Product line : W21 Explosion-proof Motor NEMA
Premium Efficiency Three-Phase

Product code : 14296347

Catalog # : 00512XT3E215TC



Performance : 230/460 V 60 Hz 6P

Rated current : 13.7/6.83 A
 LRC : 6.8
 Rated torque : 3.10 kgfm
 Locked rotor torque : 170 %
 Breakdown torque : 260 %
 Rated speed : 1170 rpm

Moment of inertia (J) : 0.0620 kgm²
 Duty cycle : Cont.(S1)
 Insulation class : F
 Service factor : 1.15
 Temperature rise : 80 K
 Design : B

Locked rotor time : 102s (cold) 57s (hot)

Rev.	Changes Summary	Performed	Checked	Date
Performed by				Page
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Date				
13/04/2021			3 / 6	Revision

LOAD PERFORMANCE CURVE

Three Phase Induction Motor - Squirrel Cage



Customer :

Product line

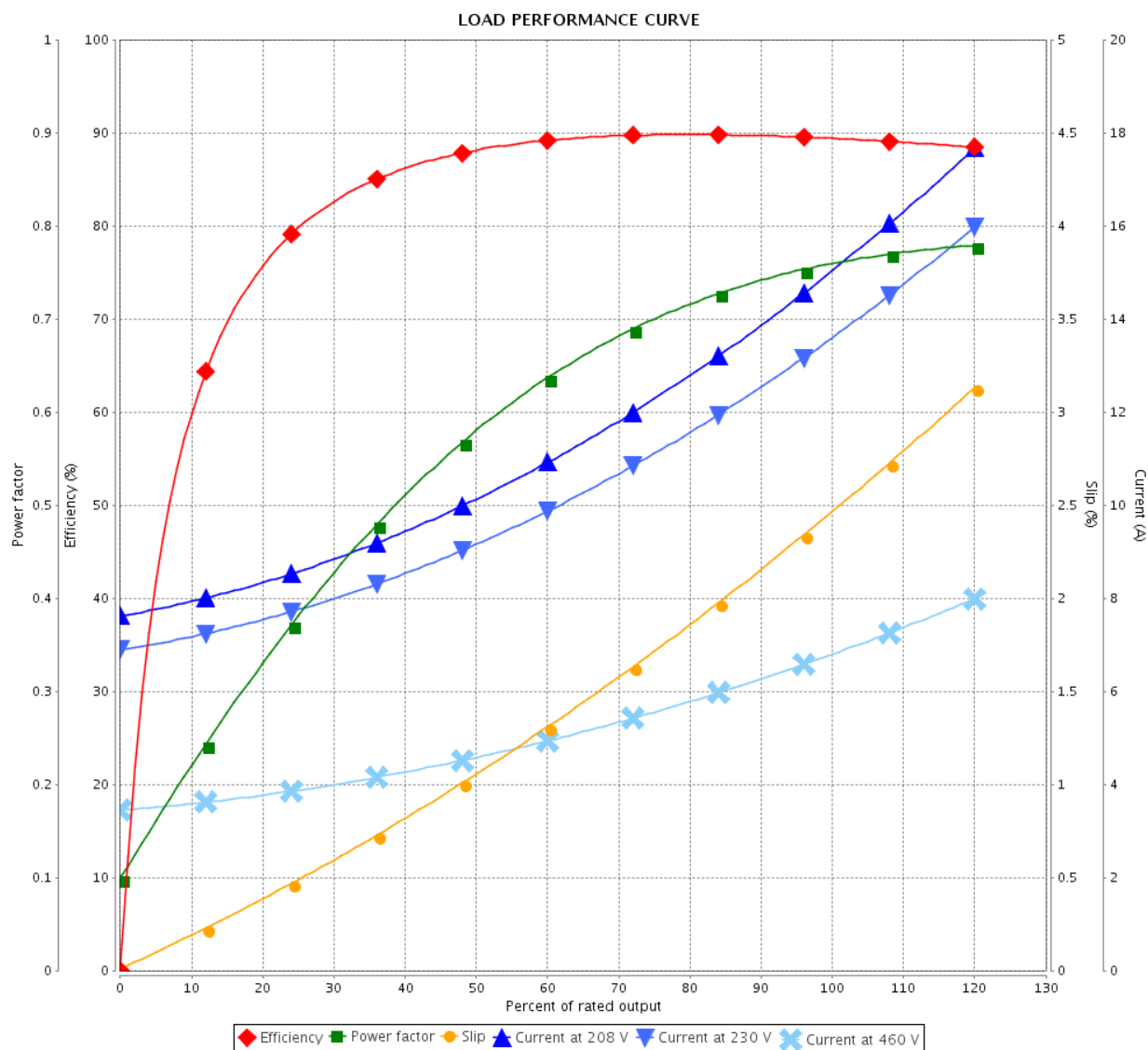
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Premium Efficiency Three-Phase

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14296347

Catalog # :

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Rev.	Changes Summary		Performed	Checked	Date
Performed by			Page Revision		
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Date					
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THERMAL LIMIT CURVE

Three Phase Induction Motor - Squirrel Cage

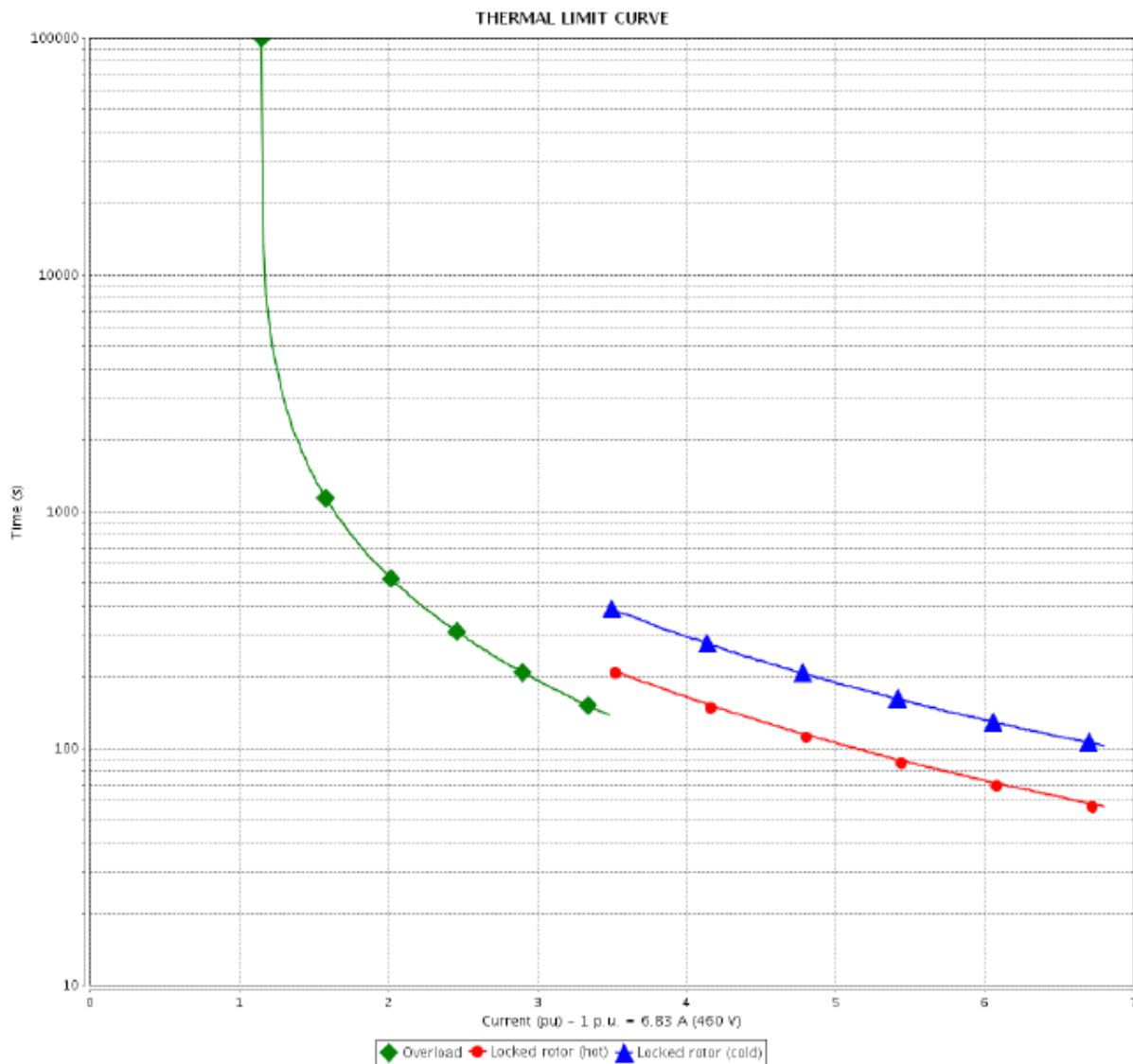


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Service factor : 1.15
Temperature rise : 80 K
Design : B

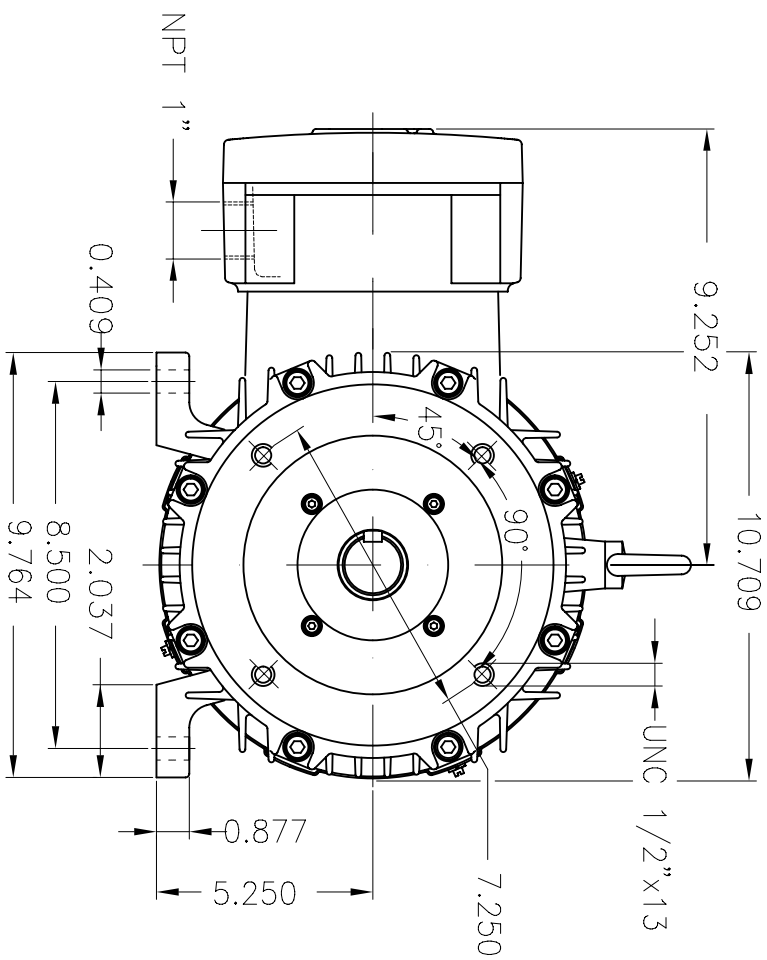
Heating constant

Cooling constant

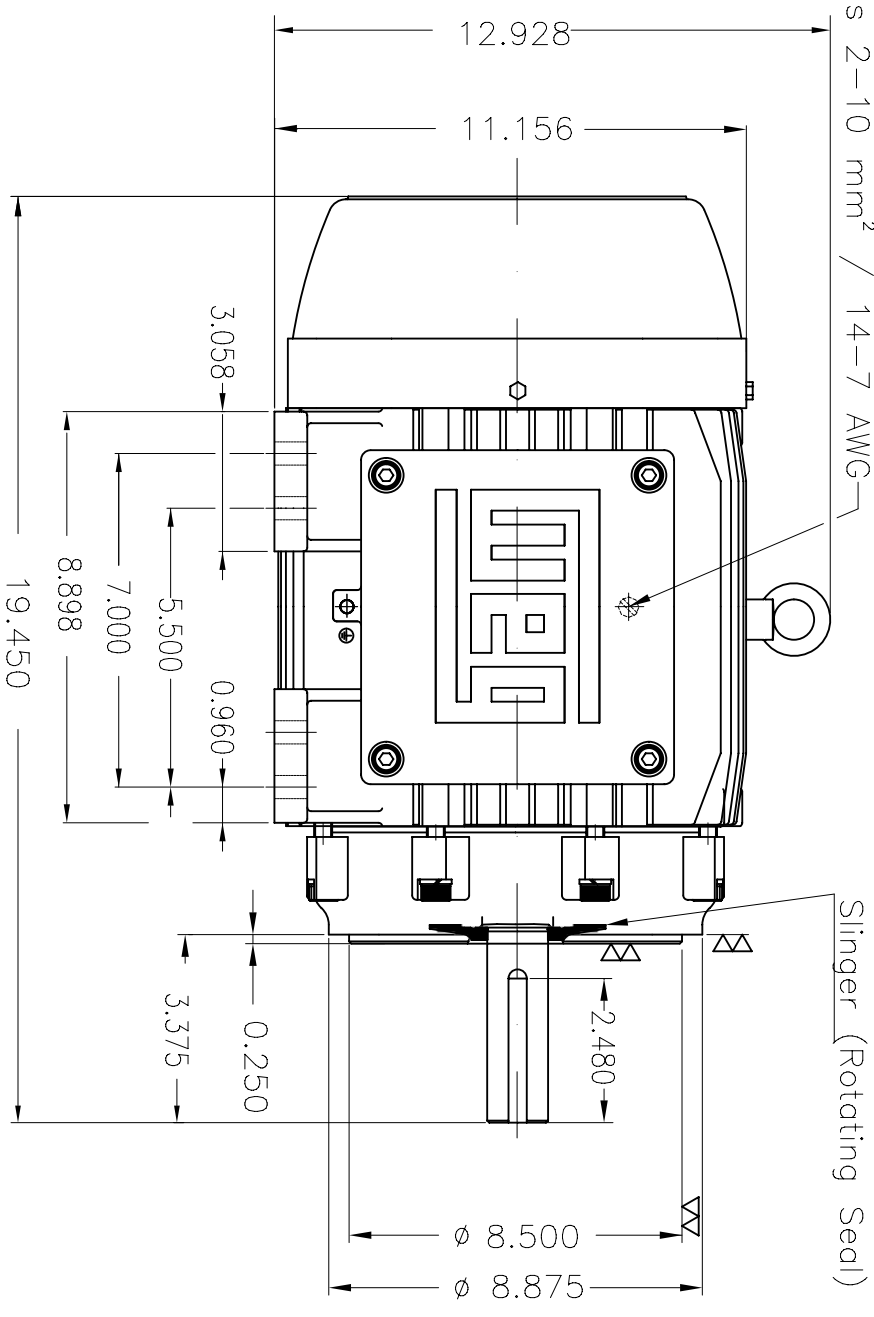
Rev.	Changes Summary	Performed	Checked	Date
Performed by				
Checked by				
Date	13/04/2021			

Page 5 / 6
Revision

1		2	
No reproduction of this drawing is allowed without permission of WEG Motores	EXO		Dimensões em polegada
	PABLO		
	DIMENSÕES		
	opcional		
	ESPECIAL		
		Dimensões in inches	



Grounding for leads 2-10 mm² / 14-7 AWG—

[illegible]


W21X NEMA
Premium

14296347

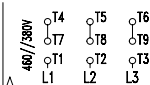
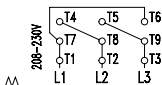
CC029A

Inverter Duty Motor
Severe Duty


LISTED

MODEL 00512XT3E215TC

PH 3	FR 213/5TC	
HP(kW) 5.0(3.7)	HZ 60	IP55
V 230/460	A 13.7/6.83	
RPM 1170	NEMA NOM EFF 89.5%	
PF 0.76	SFA 15.8/7.85	DES B
INS CL F Δ T 80 K	SF 1.15	ENCL TEFC
DUTY CONT.	CODE J	ALT 1000 m.a.s.l.
AMB 40°C	USABLE @208V 15.1 A	SF 1.15 SFA 17.4
AMB 55°C	SF1.0	
5.0HP 3.7kW 50Hz 380V 8.10A 960RPM SF1.00 EFF 86.8% (IE3)		



→ 6308-2RS MOBIL POLYREX EM
 → 6207-2RS

223 Lbs



TEMP CODE T3C
 CSA/UL: Class I - Div. 1 - Groups C and D
 CSA: Class II - Div. 1 - Groups F and G
 CSA: Class I - Zone 1 - IIB
EXPLOSION PROOF MOTOR

FOR USE ON VPMW VFD 1000:1XT, 20:1CT, 1.0SF, T3C, AMB 40°C.



816-741-0282

www.pathfindersystems.net

mail@pathfindersystems.net

orders@pathfindersystems.net

PATHFINDER INTAKE AIR FILTERS

Pathfinder Intake Air Filters use multiple sound cancelling and absorption methods to provide a heavy-duty industrial filter for PD blower applications.

Specifications:

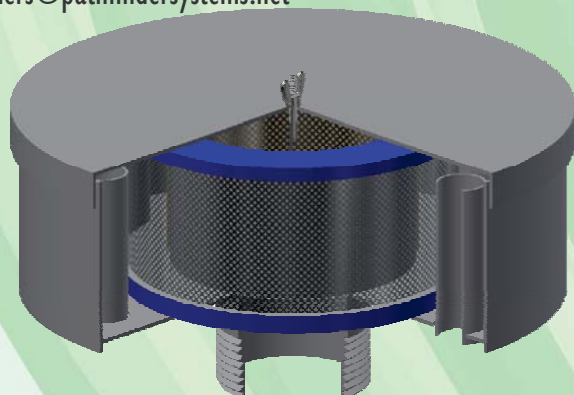
- Pleated media for maximum filter media area
- Optimum media area for each size of filter housing
- Pre-filter available as an option. Depending on environment, can increase filtration capacity between 40% to 55%.
- Standard filters are washable
- Temperature range: -20F to 250F.
- Recommended Pressure Differential for changing out filter elements: 10-15 inches H2O
- Durable
- Water Resistant
- **Superior noise attenuation**
- Steel silencing tubes, welded in place for durability.

Standard Polyester Element:

- Reinforced with epoxy coated steel wire mesh
- 5 micron at 99% efficiency
- Higher flow ratings
- Washable for longer life

Optional Paper Element:

- 2 micron at 99% efficiency
- Industrial strength paper element surrounded by galvanized expanded metal
- Single use disposable elements

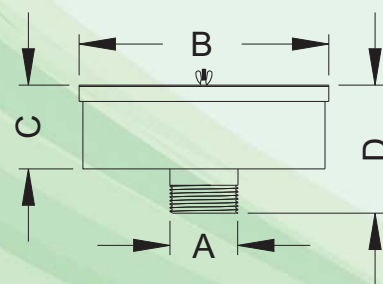


Pathfinder Inline Filter Housings (IFS)



Pathfinder Inlet Filter Housings (IFS)

Model	A	B	C	D	Rated CFM	Weight	Filter Element
IFS-1	1" NPT	10	4	7	35	9	FL01
IFS-1.5	1.5" NPT	10	4	7	80	9	FL01
IFS-2	2" NPT	10	4	7	135	10	FL01
IFS-2.5	2.5" NPT	10	4	7	180	10	FL01
IFS-3	3" NPT	16	5	8	285	20	FL03
IFS-4	4" NPT	16	5	8	520	20	FL03
IFS-5	5" NPT/FLG	16	5	8	750	23	FL03
IFS-6	6" Flange	20	5	8	1235	40	FL06
IFS-8	8" Flange	20	10	13	2125	50	FL08
IFS-10	10" Flange	26	15.5	20	3335	95	FL10
IFS-12	12" Flange	26	15.5	20	4675	100	FL10
IFS-14	14" Flange	26	15.5	20	5655	115	FL10



Pathfinder Replacement Filter Element	ID	OD	Height
FL01	4 3/4	6 7/8	4 3/16
FL03	7 1/8	10 3/16	5 1/8
FL06	9 1/2	12 9/16	4 7/8
FL08	9 1/2	12 9/16	10
FL10	15	19 1/2	14





816-741-0282

www.pathfindersystems.net

mail@pathfindersystems.net

orders@pathfindersystems.net

C-Vac Canister

This space saving unit contains the vacuum breaker valve, inline filter element, weighted relief valve, and gauge combined into one canister. All units are custom built to accomodate your preferred combination of valves, gauges, switches, etc. You won't find anything else like this on the market!

Features

Canister Includes:

- » Vacuum Breaker Valve
- » Weighted Relief Valve
- » Inline Filter Element, Paper
- » Vacuum Gauge
- MPT connection on the weighted relief valve
- Standard connection is compression fitting or flanged

- Multiple sizes available

- Compact space saver

Options Available:

- Differential pressure indicator
- Vacuum Switch
- Filter Element media
 - » Polyester
 - » Polyurethane
 - » Wire mesh

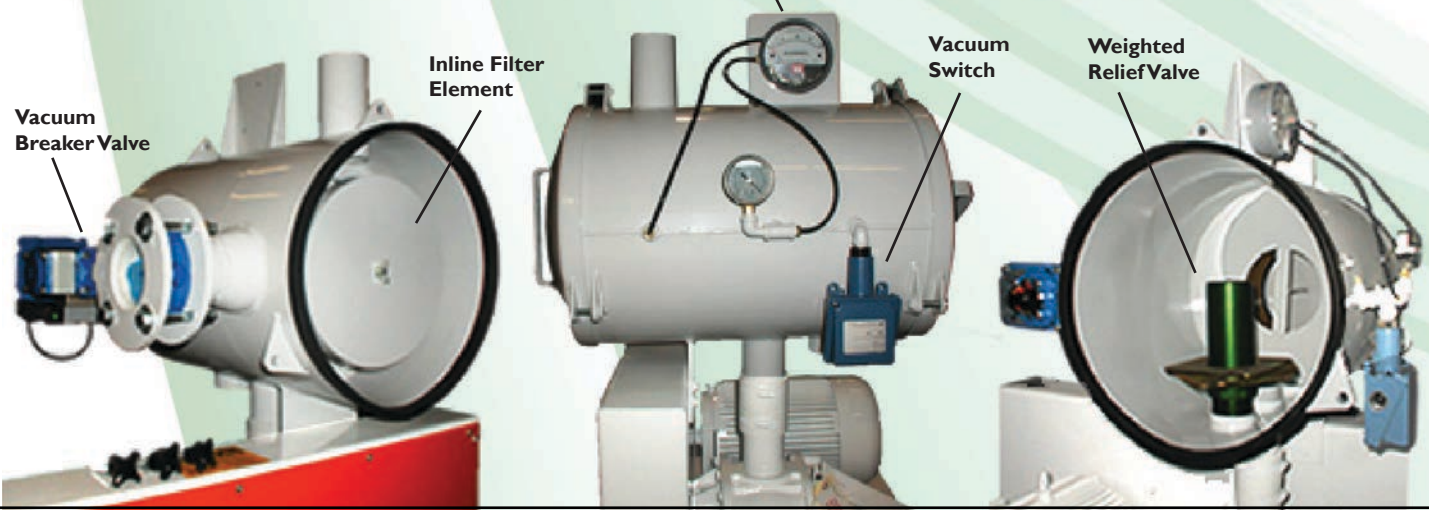


Paper elements are the recommended media for all blower applications since PD blower tolerances can be as small as 0.001 inches. The paper filter media has an efficiency of 99% on 1 micron particles compared to competing polyester elements at 10+ micron particles.

When the vacuum breaker valve opens, filtered air flows through the blower to release the vacuum.

Differential pressure gauge indicates when the filter element requires cleaning or replacement.

Vacuum relief from 2"Hg through 30"Hg: accurate from release back to the set point within 0.8"Hg



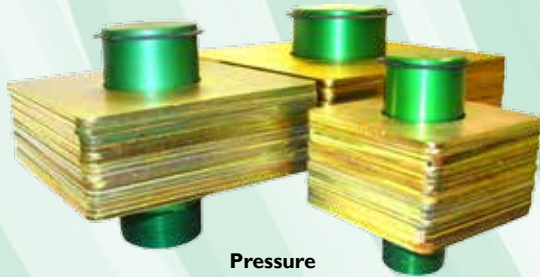


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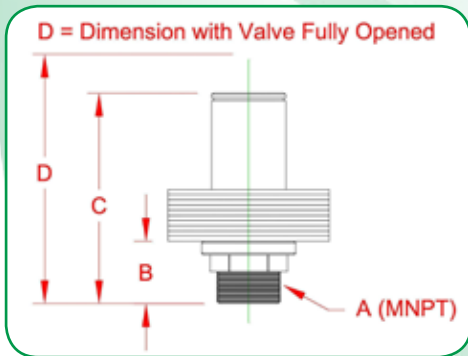
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Pressure



Retainer Ring



Valve Size (A)	2"	3"	4"
Dim B	2.31"	3.18"	3.31"
Dim C	7.81"	8.68"	8.75"
Dim D	9.25"	10"	11"

Weights	2"	3"	4"
0.5 PSIG	6" SQ	9.31" SQ	12" SQ
0.5 PSIG Diagonal	8.87"	12.62"	16.37"
1.0 PSIG	8.12" SQ	12.75" SQ	16.37" SQ
1.0 PSIG Diagonal	10.81"	17.43"	22.56"

Weighted Relief Valves

We offer our PRESSURE and VACUUM weighted relief valve in 2", 3", and 4" sizes for capacities through 3400 CFM. We couple an elementary design with a high quality anodized and heat-treated aluminum construction to offer reliable performance and simple calibration. Tamper-proof retainer ring provided. Proven design ensures years of reliable service.

Features

- Anodized Aluminum construction for years of trouble-free service;
- 2", 3", and 4" models;
- Pressure models have standard MPT connections. Available from 1 PSIG thru 29 PSIG with a calibrated 0.5 PSIG increment per removable disc;
- Vacuum canisters have standard FPT connections. Available from 2"Hg thru 30"Hg with a calibrated 1"Hg increment per removable disc;
- Minimal maintenance required;
- Simple method of opening and closing insures that the valve is virtually chatter-free;
- Simple operation. Line pressure naturally displaces the weighted cap upwards and off the valve seat. As the pressure increases, the valve exposes more vent area for higher flow;
- High flow-through capacity;
- Valve automatically seats itself when the pressure is removed;
- All operating surfaces are machined. The entire valve is heat treated and anodized for the highest quality;
- Retainer ring ensures valve settings are tamper resistance;
- STOCK item for quick shipping.

Manufactured locally in KC MO

Custom Spool Pieces Available



Vacuum Canister

Standard White
Custom colors available

Vacuum Canister	2"	3"	4"
Overall Diameter including Tabs	12.43	16.56	20.93
Dished Head Diameter	10"	14"	18"
Overall Unit Height - Top of Handle to Bottom of NPT Port	13.75"	16.25"	17.75"
Canister Height	11.68	13.75"	15.12"
NPT Ports	2"	3"	4"



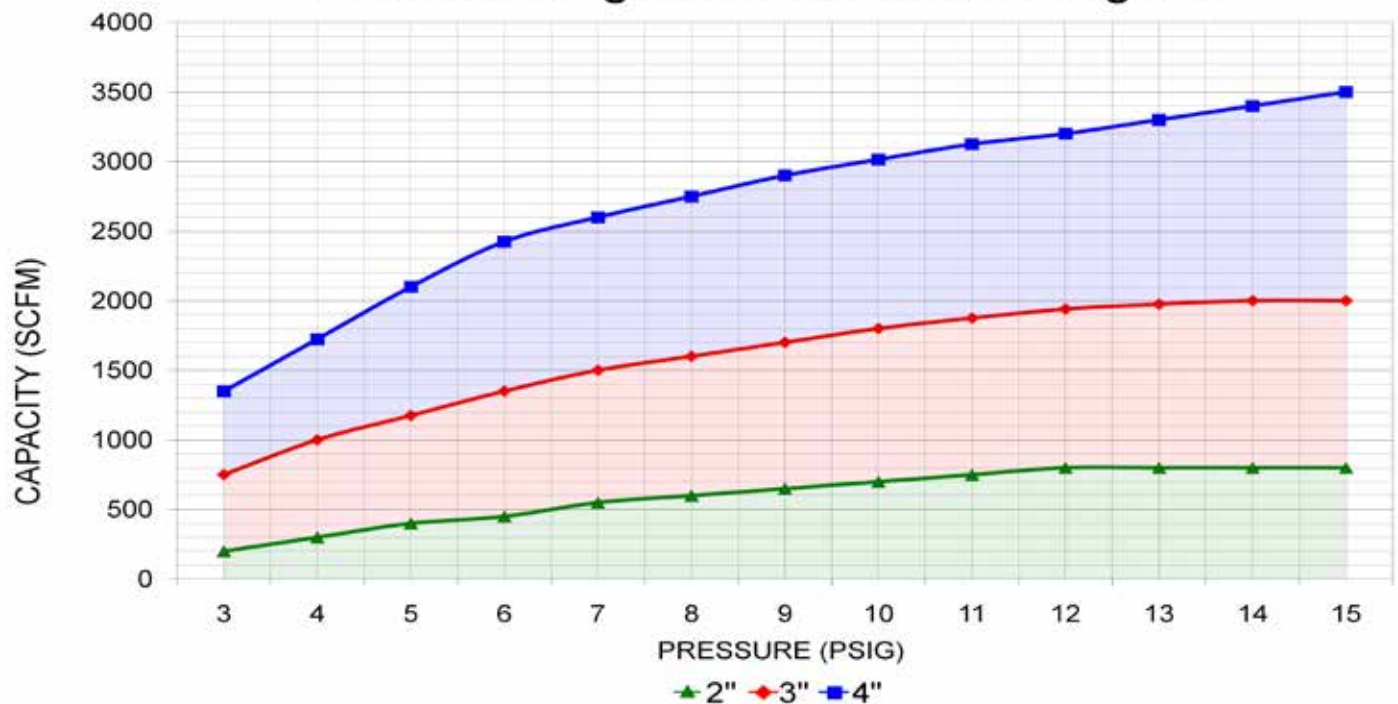
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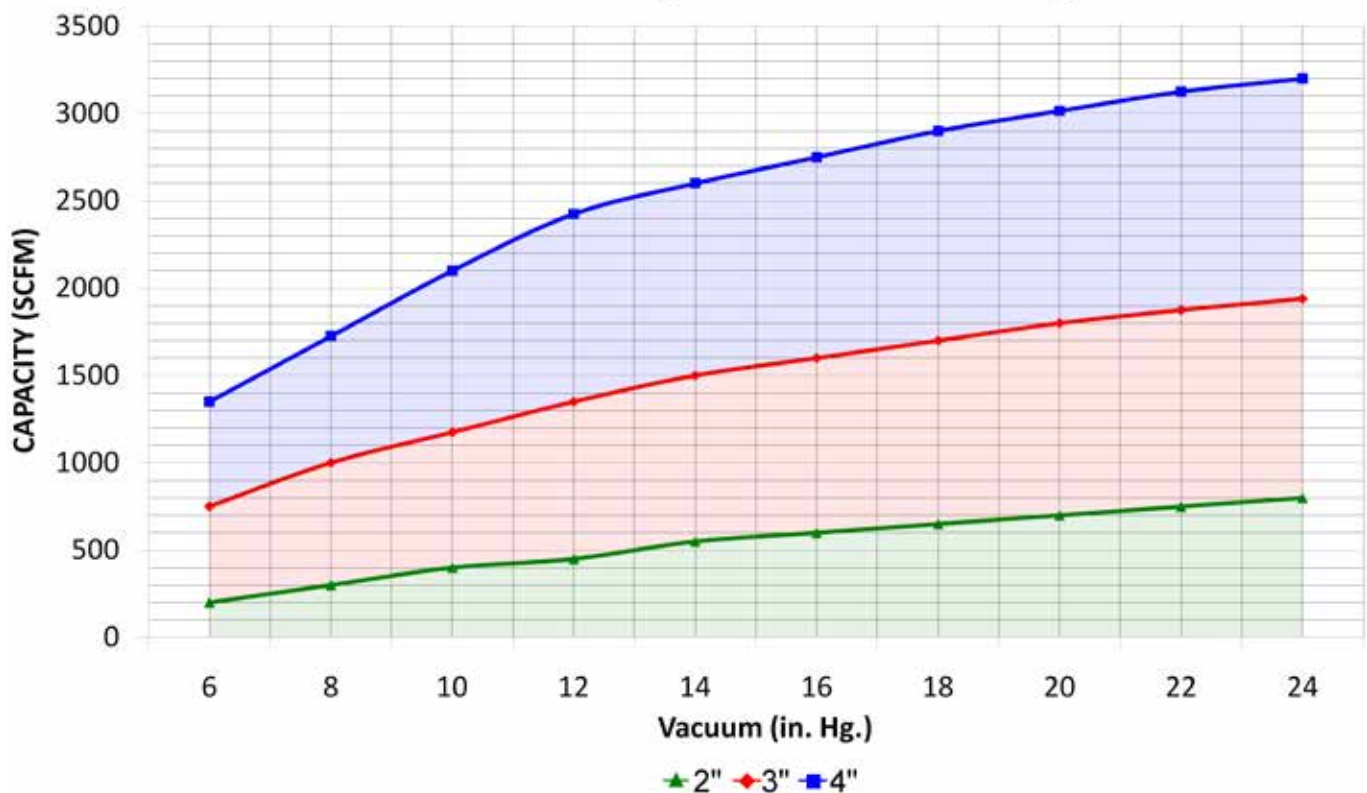
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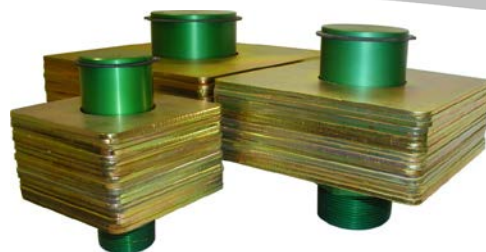
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Pressure Weighted Relief Valve Sizing Chart



Vacuum Weighted Relief Valve Sizing Chart





Weighted Relief Valve Installation and Operation

Pathfinder Systems would like to thank you for your purchase of a weighted relief valve. You should find that it provides years of trouble-free operation.

Warning

The weights may have sharp edges. It is recommended that you wear gloves when you are handling the weights. Protect your eyes. Do not look into the discharging valve.

1. Use Teflon tape on all threads. Hand tighten. Do not over tighten!
2. Mount vertical and plumb. Check regularly for proper operation and cleanliness.
3. We recommend lubricating mating surfaces with 30-weight oil. There should be a light film of oil on the plunger at all times.

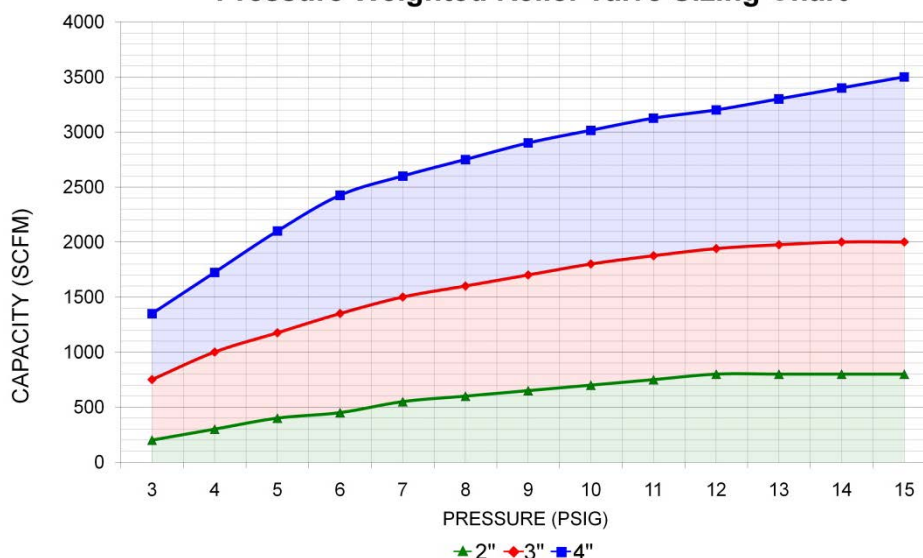
Each valve body is 1 PSI. The valve has available either 0.5 PSI incremental weights or 1.0 PSI increment weights. Each valve size can utilize a maximum of (28) 0.5 PSI or (28) 1.0 PSI weights.

For example, a 2" valve set at 15 PSI would require (28) 0.5 PSI weights. Divide 15 PSI by 0.5 PSI = 30 and subtract (2) 0.5 for the body (1 PSIG) for a total of (28) 0.5 weights. Another example, a 3" valve set at 17.5 PSI requires (16) 1.0 PSI weights and (1) 0.5 PSI with 1.0 PSI for the body.

4. To adjust the weights, use a snap ring pliers to remove the snap ring and then add or remove weights. The snap ring is not necessary for operation. It is provided so that once weights are set, the valve cannot be easily modified in the field. If necessary, you may install a wire with a lead seal to prevent the valve from being modified.



Pressure Weighted Relief Valve Sizing Chart





Canister Weighted Relief Valve Installation and Operation

Pathfinder Systems would like to thank you for your purchase of a weighted relief valve with canister. You should find that it provides years of trouble-free operation.

Warning

The weights may have sharp edges. It is recommended that you wear gloves when you are handling the weights.

Protect your eyes. Do not look into the discharging valve.

Please follow the instructions below:

1. If necessary, remove the cover.
2. Wrap Teflon tape on the plunger threads.
3. Install the plunger in the canister. Hand-tighten to prevent damage to the aluminum threads. Do not use a pipe wrench to tighten. **Do not over tighten!**

Mount vertical and plumb. Check regularly for proper operation and cleanliness.





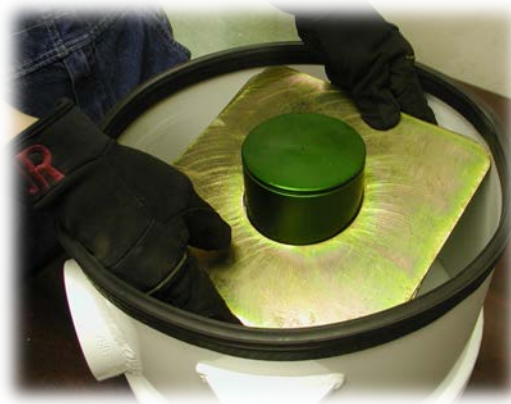
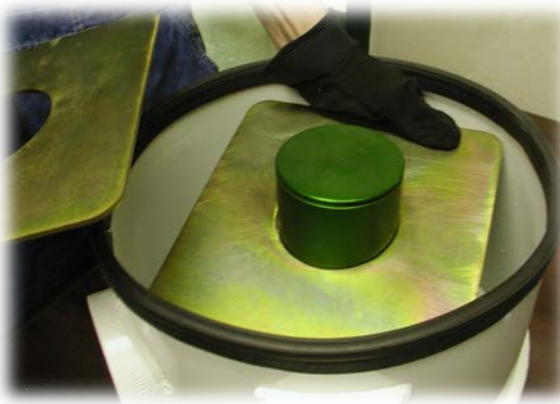
4. Place the bonnet, as shown, on the plunger. We recommend lubricating mating surfaces with 30-weight oil. There should be a light film of oil on the plunger at all times.



5. Place all of the provided weights on the bonnet as shown below.

Pressure – Each plunger/bonnet assembly is 1 PSI. The valve uses 0.5 PSI incremental weights. Each valve size can utilize a maximum of (28) 0.5 PSI weights. For example, a 2" valve set at 15 PSI would require (28) 0.5 PSI weights. Divide 15 PSI by 0.5 PSI = 30 and subtract (2) 0.5 for the body (1 PSIG) for a total of (28) 0.5 weights.

Vacuum – Each plunger/bonnet assembly is equal to 2 inHg. Each 0.5 weight is equal to 1 inHg. Each valve size can utilize a maximum of (28) 1 inHg weights. For example, 2" a valve set at 6 inHg would ship with the plunger/bonnet for 2 inHg and (4) 1 inHg weights. $2 + 4 = 6$.





6. Install the provided snap ring into the groove at the top of the bonnet. If you don't have a tool as shown in the picture, you can use a needle nose pliers or similar.

To adjust the weights, use a snap ring pliers to remove the snap ring and then add or remove weights. The snap ring is not necessary for operation. It is provided so that once weights are set, the valve cannot be easily modified in the field. If necessary, you may install a wire with a lead seal to prevent the valve from being modified.



7. Line up the tabs with the lid. Secure the handles.



8. Connect the canister to your equipment.



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**Flange Stub Adapters and
Custom Spool Pieces Available**



Approximate Dimensions in Inches

Valve Size	A	B	C	D	E
CV-3"	5-3/8	5/8	9/16	1-5/8	3/8
CV-4"	6-7/8	5/8	3/4	2-1/4	5/8
CV-5"	7-3/4	5/8	7/8	2-7/8	1-1/8
CV-6"	8-3/4	5/8	1-1/8	3-5/8	1-5/16
CV-8"	11	3/4	1-3/8	4-1/2	2
CV-10"	13-3/8	3/4	1-1/2	5-3/4	2-7/8

Check Valves

We offer our wafer check valves in 3" through 10". These lightweight aluminum valves are designed for installation between two flanges in vertical or horizontal piping systems. For use in the pneumatic and bulk material handling industries to stop flow reversal in air and gas applications. Features a balanced disc where only 33% of the disc area is unbalanced. This is considerably less than conventional check valves. This feature tends to reduce back-flow and eliminate slamming (a major factor in valve failure), and permits the disc to open with a minimum of pressure differential.

Features

Minimum Pressure Drop

- » Maximum flow due to the low profile, aerodynamic disc design;

Fast Delivery

- » Immediate shipment from our large in-house STOCK;

Simple Design

- » Only one moving part ensures long, trouble-free service;

One Piece thru Stem

- » Stainless steel for strength and durability;

Low Maintenance Cost

- » Seat is easily replaced;

Manufactured locally in KC MO

Stem Bushings

- » Teflon for an extended service life; rated to +500°F;

Aluminum Body and Disc

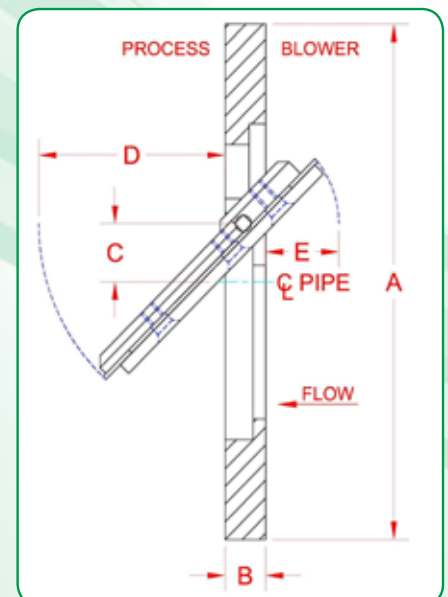
- » Lightweight for easy installation. High strength aluminum alloy for strength and extended service life;

Teflon Seal

- » Seal and stem bushings are standard with Teflon for a long service life;

Wafer Design

- » Fits between 150# flanges. Minimal space required for lightweight piping applications.



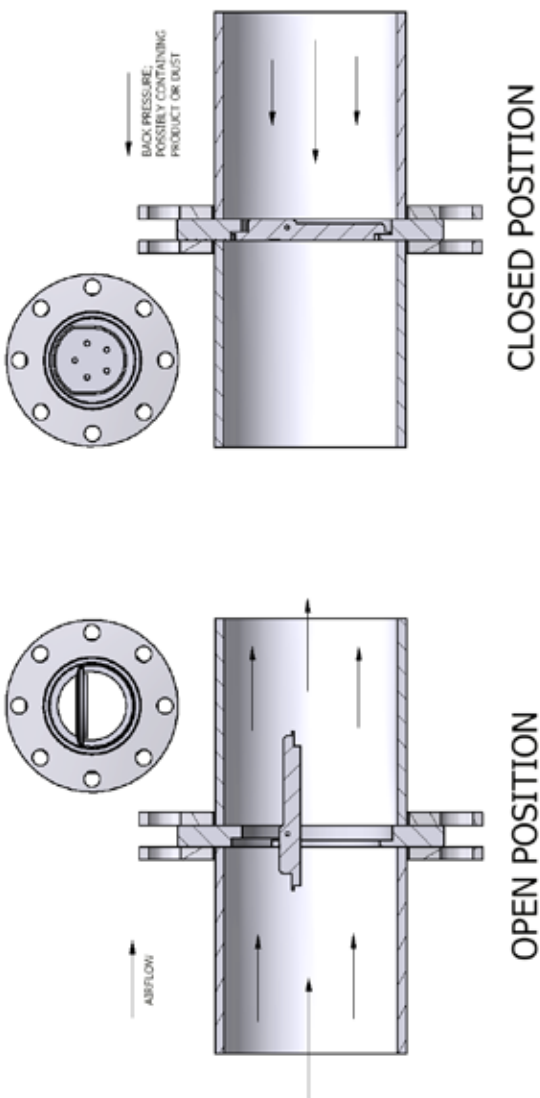


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Pathfinder Systems Swing Check Valve
Pressure Drop versus Flow (SCFM)

