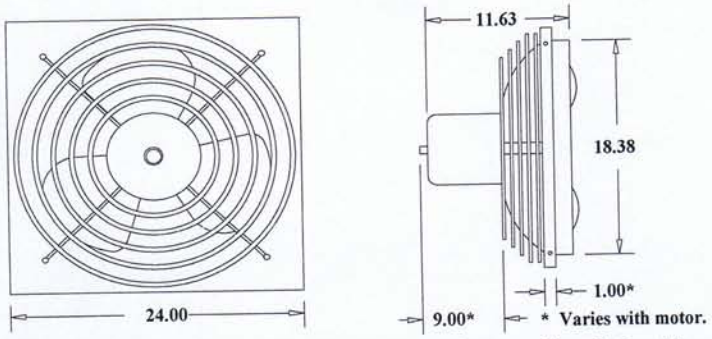
Soler & Palau USA

Propeller Wall Exhaust
Direct Drive

GED18-1/2
QTY: 1 Tag: EF-8

-----Standard Features-----
AMCA Air and Sound Licensed
OSHA Motor Side Guard Standard
Direct Drive for Low Maintenance
Heavy Gauge Welded Galvanized Construction
Statically and Dynamically Balanced Propeller
Speed Controllable Motors
1 Year Fan and Motor Warranty
Motors Rated for Continuous Duty
Integral Deep Spun Inlet



Metal Gauges	
Fan Panels	16
Wire Mesh	16
Motor/Bearing Plates	12
Brackets	12
Avg. Wt. (Lbs)	40

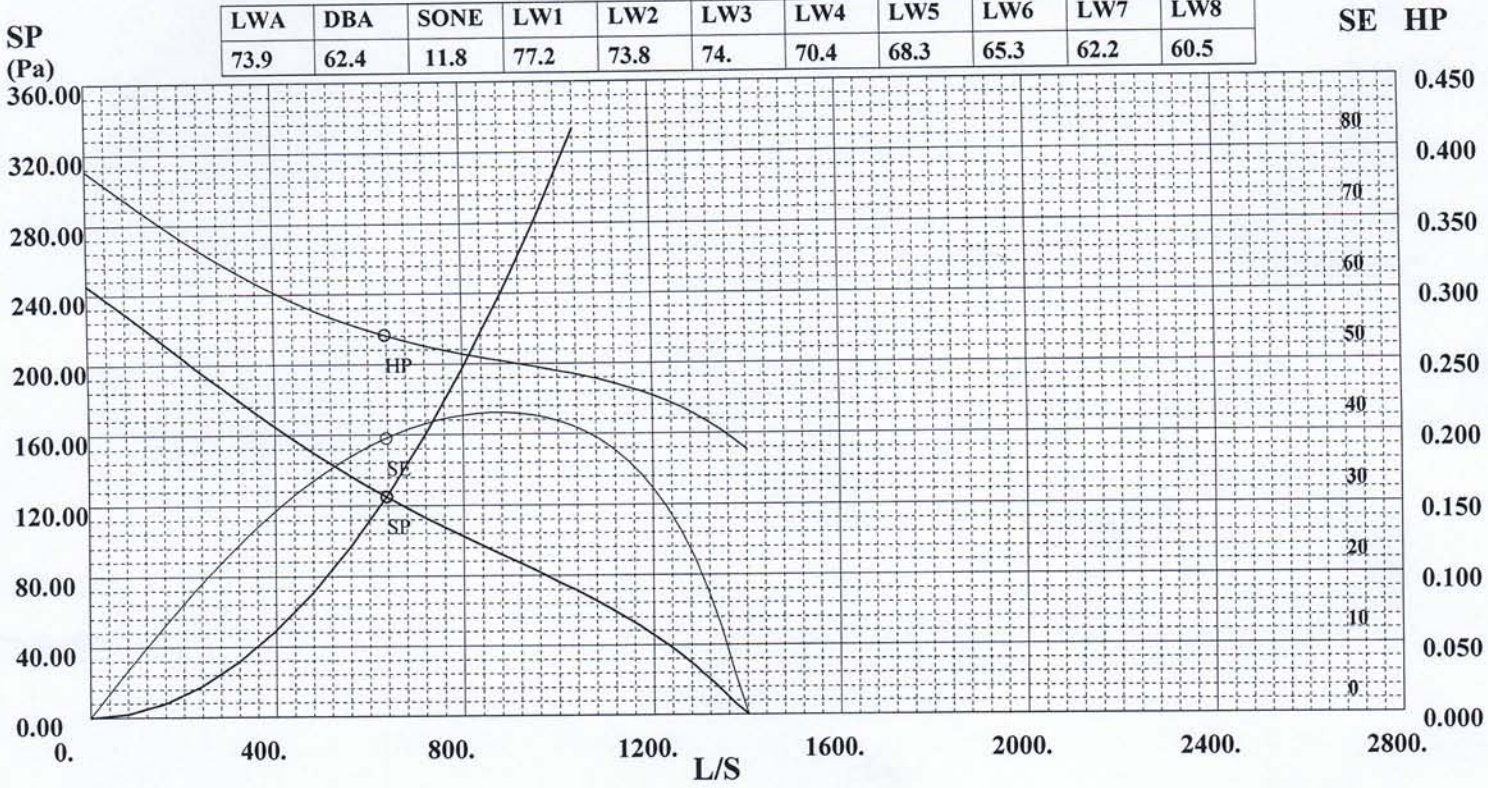
Dimensions shown in Inches. Dimensions are correct within limits for normal installation. They do not necessarily show actual construction.

1,323 RPM — **1/2HP (115/208-230)/1/60/ODP (1625rpm) [Wired for 115Volts]**

Q (Flow)	Pressure	Power
637.132 L/S	**124.985 Pa (SP)**	**0.270 HP**
0.075 Lb/Ft3	8.222 Pa (VP)	0.000 HP (Belt)
	133.207 Pa (Total P)	0.270 HP (Total)
39% SE	6236 FPM (TS)	728 FPM (OV)

Sound Power Levels - Octave Bands

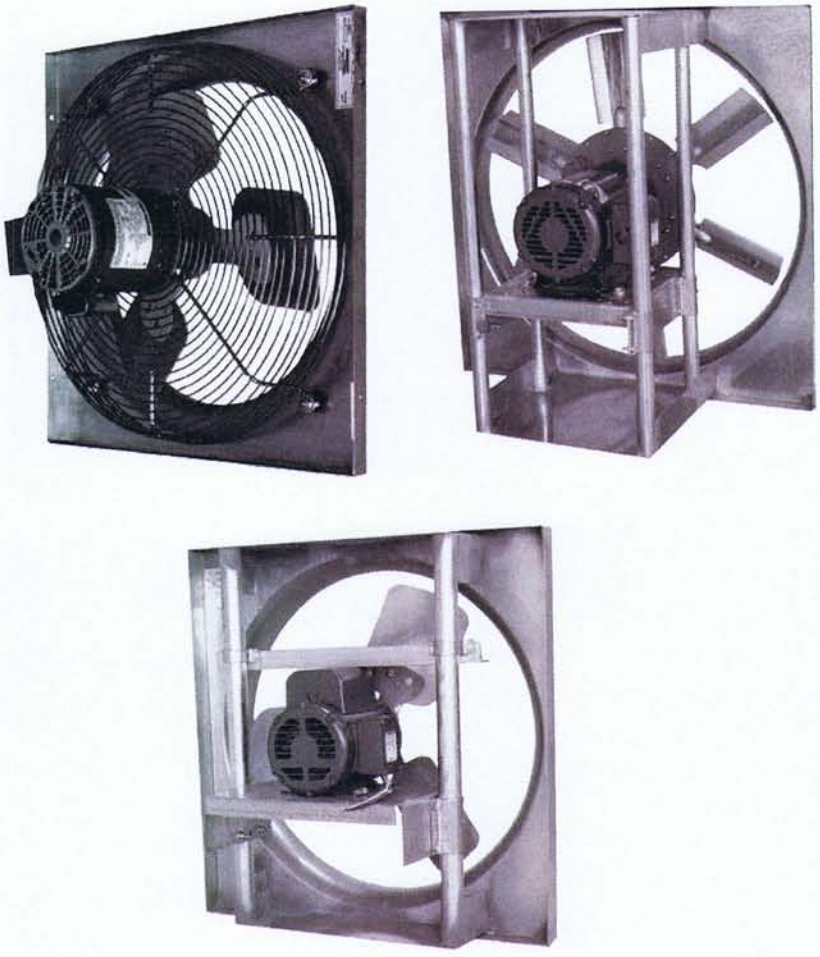
LWA	DBA	SONE	LW1	LW2	LW3	LW4	LW5	LW6	LW7	LW8
73.9	62.4	11.8	77.2	73.8	74.	70.4	68.3	65.3	62.2	60.5



GED/GSD, DFE/DFS, DDE/DDS Sidewall Propeller Fans

Direct Drive Exhaust & Supply

Catalog DD01-July 2007



The World's Leading Producer of
Air Movement Products

Soler&Palau Ventilation Group

COMMERCIAL PRODUCT LINE

Models GED/GSD, DFE/DFS & DDE/DDS Direct Drive Sidewall Propeller Fans

Applications

Soler & Palau USA direct driven sidewall propeller fans feature maximum efficiency, low maintenance and durable, economical designs. They are available in both exhaust (E) and supply (S) configurations to provide general ventilation for a wide variety of buildings and enclosed areas within buildings. Examples include factories, assembly plants, warehouses, gymnasiums, garages, jails, machine rooms and many others.

Models GED & GSD are available in 10 to 20 inch propeller sizes rated from 300 to 3,500 CFM and to 3/4" static pressure. They feature extremely quiet operation and an integral motorside guard as standard. Both single speed and variable speed motors are offered.

Models DFE & DFS are available in 10 to 30 inch propeller sizes rated from 500 to over 12,000 CFM and to 1" static pressure. These accept standard NEMA frame sizes for full range motor options.

Models DDE & DDS are available in 24 to 60 inch propeller sizes rated from 3,500 to over 55,000 CFM and to 1" static pressure. They are the heaviest duty direct drive fans for larger airflow requirements.

Construction/Specification Checklist
Models GED (Exhaust) & GSD (Supply)

Panel Assembly
- Galvanized steel, 16 or 18 gauge, G-90.
- One piece spun venturi for maximum efficiency.
- Prepunched mounting holes for easy installation.
- Formed flanges for added rigidity.
- Integral OSHA approved motorside guard.

Propeller
- Fabricated aluminum blades, precision pitch.
- Mounted directly on motor shaft for maximum efficiency.
- Separate exhaust and supply designs.
- Statically and dynamically balanced.

Motors
- Nationally recognized brands, locally serviced.
- Sealed ball bearings on larger fractionals.
- Sleeve bearings on smaller fractionals.
- Open drip-proof motor enclosures.

Entire Fan Unit
- Suitable for all-angle installation.
- Completely assembled and factory tested prior to shipment.

Construction/Specification Checklist
Models DFE (Exhaust) & DFS (Supply)

Panel Assembly
- Galvanized steel,16 or 18 gauge, G-90.
- Precision spun orifice for maximum performance.
- Prepunched mounting holes.
- Welded schedule 40 galvanized steel pipe support structure.

Propeller
- Precision pitched fabricated aluminum blades.
- Mounted directly on shaft for maximum efficiency.
- Cast aluminum and nonmetallic blade options on select sizes.
- Statically and dynamically balanced.

Motors
- Nationally recognized brands, locally serviced.
- Permanently lubricated sealed ball bearing type.
- Open drip-proof, totally enclosed and explosion proof options.
- Available 2 speed units in select models.

Entire Fan Unit
- Suitable for all-angle installation.
- Completely assembled and factory tested prior to shipment.

Construction/Specification Checklist
Models DDE (Exhaust) & DDS (Supply)

Panel Assembly
- Galvanized steel, 14 gauge, G-90, sizes 54 - 60.
- Galvanized steel, 16 gauge, G-90, sizes 24 - 48.
- Precision spun orifice for smooth performance.
- Prepunched mounting holes for convenient installation.
- Welded schedule 40 galvanized steel pipe support structure.

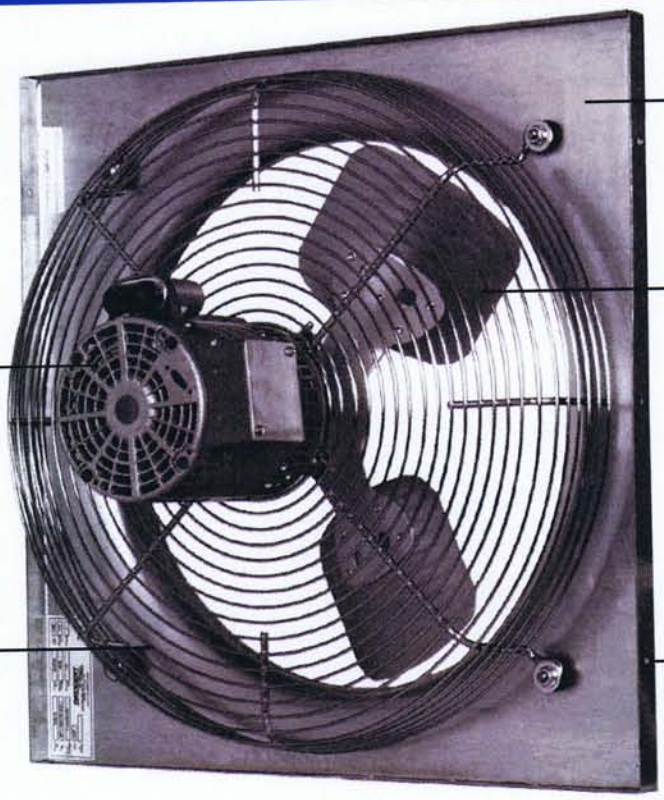
Propeller
- Aluminum airfoil blades, extruded or cast.
- Mounted directly on motor shaft for maximum efficiency.
- Steel hub plate with taper lock bushing as standard.
- Statically balanced.

Motors
- Nationally recognized brands, locally serviced.
- Sealed ball bearings on larger fractionals.
- 1/3 hp motor is the smallest available for the DDE/DDS.
- Open drip-proof, totally enclosed and explosion proof options.
- Available 2 speed units in select formats.

Entire Fan Unit
- Suitable for all-angle installation.
- Completely assembled and factory tested prior to shipment.

All specifications are subject to change without notice unless approved in submittal by Soler & Palau USA.

Model GED & GSD



Entire Unit
Suitable for all-angle installation.

Motor
Nationally recognized brands, locally serviced.

Motor Side Guard
Integral OSHA approved guard is standard.

Panel
Galvanized steel with spun venturi.

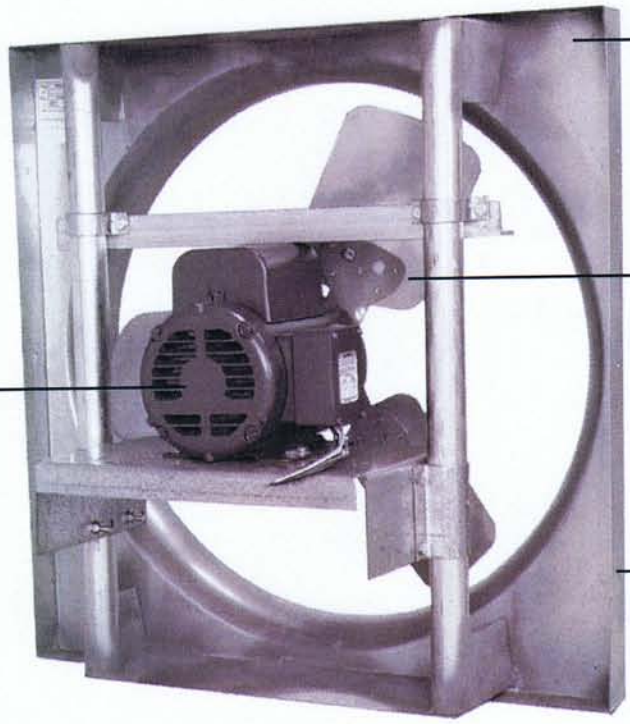
Propeller
Fabricated Aluminum blades.

Mounting Holes
Prepunched in panel for ease in installation.

c UL us

cULus Listed - Standard 705
(optional)

Model DFE & DFS



Entire Unit
Suitable for all-angle installation.

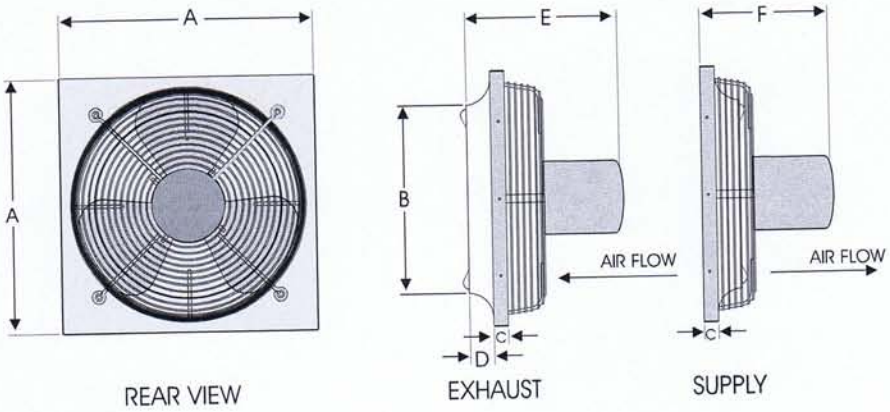
Motor
Nationally recognized brands, locally serviced.

Panel
Galvanized steel with spun venturi.

Propeller
Fabricated Aluminum blades.

Mounting Holes
Prepunched in panel for ease in installation.

Model GED (Exhaust) & GSD (Supply)



GED/GSD Size	Dimensions (in.)						Avg. Ship Wt. (lbs.)
	A	B	C	D	E*	F*	
10	16	10-1/2	1	2	11	9	30
12	16	12-1/2	1	2	14	12	30
14	20	14-1/2	1	2	14	12	34
16	20	16-1/2	1	2	14	12	37
18	24	18-1/2	1	2	15	13	45
20	24	20-1/2	1	2	15	13	50

A. Outside dimension of square panel.
B. Diameter of venturi.
C. Width of flange, 1" for all models.
D. Depth of venturi, 2" for all models.
E. Depth of fan (exhaust).
F. Depth of fan (supply).
*** Varies with motor selection.**

c UL us
Standard 705
(optional)

Model GED/ GSD	Motor		Sones @ 0" SP	CFM / BHP @ Static Pressure (Inches W.G.)							
	HP	RPM		0	1/10	1/8	1/4	3/8	1/2	5/8	3/4
10	1/10	1550	7.8	718/.04	611/.04	561/.04	391/.06	336/.07	290/.08	245/.10	197/.11
12	1/10	1550	12.9	1362/.09	1263/.10	1236/.10	990/.11	743/.13	628/.15	-	-
	1/4	1625	11.9	1489/.17	1410/.18	1386/.18	1228/.19	966/.20	794/.22	720/.25	660/.27
14	1/4	1625	13.1	1967/.20	1862/.22	1837/.23	1704/.24	1431/.26	1142/.29	-	-
	1/2	1625	17.1	2533/.36	2410/.38	2376/.38	2160/.40	1866/.41	1509/.42	1414/.46	1299/.50
16	1/4	1075	9.5	2467/.20	2245/.21	2159/.22	1734/.23	1347/.26	1102/.29	-	-
	1/3	1625	15.8	2634/.27	2516/.29	2482/.29	2287/.32	2050/.34	1719/.36	1477/.39	-
18	1/4	1075	10.7	3003/.20	2732/.21	2658/.21	2196/.23	1474/.24	1186/.26	929/.28	-
	1/4	1625	15.7	3091/.24	2930/.26	2886/.27	2653/.29	2388/.31	2097/.33	1535/.35	1282/.37
	1/2	1625	16.0	3816/.40	3640/.43	3593/.44	3352/.47	3098/.50	2803/.52	2371/.54	1872/.55
20	1/4	1075	12.2	3575/.21	3264/.23	3177/.24	2715/.26	1765/.27	-	-	-
	1/2	1625	14.1	3460/.23	3285/.27	3242/.27	3006/.31	2727/.35	2362/.39	1945/.45	1676/.53

Performance shown is for wall ventilators for installation type A: Free inlet, Free outlet. The power rating (BHP) does not include drive losses. Performance ratings do not include the effects of appurtenances in the airstream.

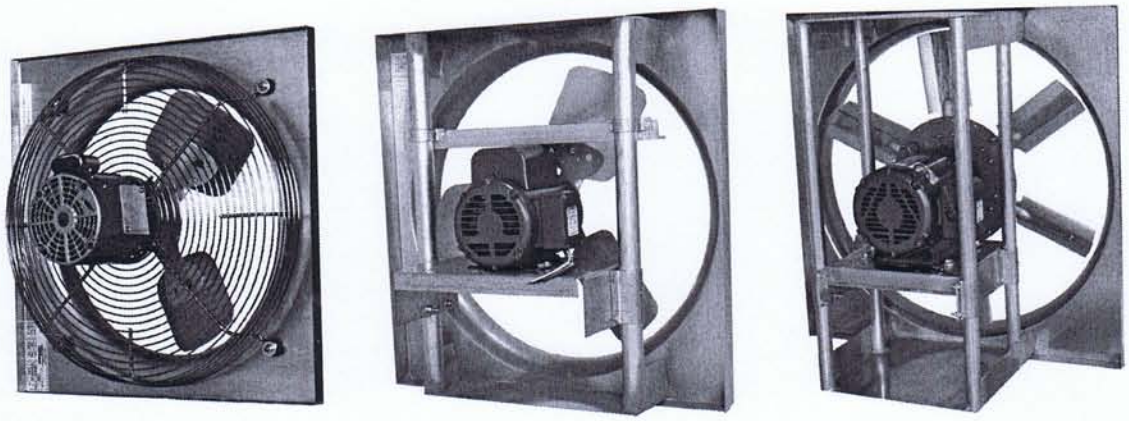
Sound ratings shown are loudness values in fan sones at 5 feet (1.5m) in a hemispherical free field calculated per AMCA Standard 301. Values are for installation type A: Free inlet fan sone levels. For additional sound data and for selections at other static pressures, please refer to the Optisizer Selection Program.
Available motor RPM's may vary from table.

Motors designed for use with optional solid state speed controller.

cULus available on most models (optional).

Supply performance is obtained by reversing the direction of the venturi.

Models GED/GSD, DFE/DFS & DDE/DDS
Installation, Operation, and Maintenance Manual



Direct Drive Sidewall Propeller Fans
(Exhaust and Supply)

READ AND SAVE THESE INSTRUCTIONS

The purpose of this manual is to aid in the proper installation and operation of fans manufactured by Soler & Palau USA. These instructions are intended to supplement good general practices and are not intended to cover detailed instruction procedures, because of the wide variety and types of fans manufactured by Soler & Palau USA.

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Jacksonville, FL 32217
P: 800.961.7370
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Soler&Palau Ventilation Group

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

INTRODUCTION:

DO NOT INSTALL, USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND UNDERSTOOD. READ AND SAVE THESE INSTRUCTIONS FOR FUTURE USE.

It is the responsibility of the purchaser to assure that the installation and maintenance of this equipment is handled by qualified personnel experienced in such work and equipment.

Contact your local representative should you need further information.

SHIPMENT AND RECEIVING:

Prior to shipment, all fans have been thoroughly inspected and tested.

All equipment shipped from Soler & Palau USA is skidded or crated to fully comply with trucking requirements. Inspect all shipments carefully for damage. **THE RECEIVER MUST NOTE ANY DAMAGE ON THE CARRIER'S BILL OF LADING AND FILE A CLAIM IMMEDIATELY WITH THE FREIGHT COMPANY, IN THE CASE OF ANY DAMAGE.** Keep a record of all equipment received, including inspection details and date of receipt, because of the possibility of partial shipments.

If you receive damaged goods, contact your S&P representative for repair or replacement service.

HANDLING:

Handle your equipment with caution. Some fans are provided with lifting lugs or holes for easy handling. Others must be handled using nylon straps that protect the fan's coating and housing. Spreader bars should be used when lifting large parts.

Fans should be lifted by using straps around the fan housing only. **DO NOT LIFT FANS BY THE MOTOR, BASE, PROP, WHEEL, OR FLANGES.**

Roof ventilators should be lifted by using straps around the fan housing or base only. Spreader bars should also be used to avoid damage to stack caps or hoods. **DO NOT LIFT ROOF VENTILATORS BY THE STACK CAP OR HOOD.** On hooded units, disassemble the stack from hood when lifting. Upblast models may be lifted assembled.

STORAGE:

If fans are stored for any length of time, they should be stored in a clean, dry location to prevent rust and corrosion. Outdoor storage is not recommended. When outdoor storage is necessary, they should be protected from the elements as best as possible. Cover the fan inlet and outlet and keep motors dry and clean.

For extended storage (more than 3 months), motor shafts should be rotated monthly. Storage records should be kept to assure proper maintenance. The factory can advise warranty centers to provide motor and bearing service if needed.

INSTALLATION:

Roof ventilators should always be mounted to a flat level, solid and rigid structure. Particular caution should be exercised when installing fans on metal buildings. Be sure wall or roofs are capable of supporting the fan(s). Walls/Roofs not supported correctly will cause vibration that could cause damage or injury.

Fans mounted off ground level should be rigidly mounted to a special platform and be placed as near as possible to, or over, a solid wall or column.

Supports for suspended fans must be crossbraced for live load support to prevent side sway.

Use guy wires to help secure root units if excessively windy conditions prevail.

1. **CAUTION!** This fan contains rotating parts and requires special service. Appropriate safety precautions should be taken during installation, operation and maintenance.

2. **WARNING!** Do not install or operate this fan in an environment or atmosphere where combustible or flammable materials, gasses or fumes are present, unless it was specifically designed and manufactured for use in that environment. Explosion or fire can result. Explosive, corrosive, high temperature, etc. conditions may require special construction, inspection and maintenance. It is necessary to observe the fan manufacturer's recommendations and limitation concerning the type of material to be handled by the fan and its application in special conditions.

3. When ventilator is designed to be mounted on a curb, the curb should be securely installed prior to fan installation.

4. A damper, if used, should be securely mounted within the curb or wall in a manner that allows free and unobstructed operation.

5. **CAUTION!** All electrical work must be done in accordance with local and/or national electrical codes as applicable. If you are unfamiliar with methods of installing electrical wiring, secure the services of a qualified electrician.

6. **WARNING!** This product must be grounded.

7. **DANGER!** Make sure power is turned off and locked in the **OFF** position at the service entrance before installing, wiring or servicing fan.

8. **CAUTION!** Before wiring the motor, check the supply voltage against the motor nameplate voltage. High or low voltage can damage the motor and void the motor warranty.

9. **WARNING!** Be sure to keep all wiring clear of rotating or moving parts.

10. **WARNING!** Before starting the fan, turn the wheel to assure it rotates freely. If needed, adjust the wheel/shaft/motor position as required to achieve necessary clearances.

11. **WARNING!** Check all setscrews and keys. Tighten as necessary prior to fan startup.

12. On roof units, anchor the fan securely to the curb. Anchoring through the vertical portion of the curb cap flange is recommended. Use a minimum of four lag bolts or other suitable fasteners.

13. Due to the general nature of its applications, the basic air mover is available with protective guards and/or other devices for required operating safety as with most installations of rotating machinery. Before operating the basic unit in any of its applications determine requirements for such guards and/or devices needed for protection against accidental contact with moving parts or against injury to nearby personnel or critical equipment due to accidental rupture of fast moving parts.

START-UP:

Lock out the power source.

Tighten all bolts and setscrews securely. **NOTE THAT ALL BOLTS AND SETSCREWS SHOULD BE TIGHTENED AFTER TWO DAYS OF INITIAL OPERATION.**

Clearance should be checked all around between wheel or propeller tips and the housing before starting up. The wheel or propeller should not strike the housing.

No initial lubrication is required. Motors have been pre-lubricated by motor manufacturer.

Arrows to show direction of rotation and airflow are attached to the fan housings.

After the electrical connections are completed, apply just enough power to start the impeller as indicated by the directional arrows on the unit. If the impeller is turning the wrong direction, it will not deliver rated airflow and the motor connections must be altered to correct rotation.

Lock out the power source before the installation of all accessories.

Fan electrical power can now be applied and special attention should be given to determine if motor is working properly. At this time, with air system in full operation, with guards attached, it is well for the electrician to measure the operating amperage of the motor and compare with the nameplate rating to determine that the motor is operating under safe load conditions.

The fan should not need balancing, as it was balanced at the factory to meet stringent vibration levels before shipment. However, there are several things that may cause vibration, such as rough handling in shipment and erection, weak foundations, and alignments.

MAINTENANCE:

1. Before performing any maintenance on the fan, be sure power is turned off and locked in the OFF position at the service entrance before servicing the fan.

2. Ventilators should be carefully checked at least once a year. For critical or rugged applications, a routine check every two or three months is suggested.

3. All motors supplied with Soler & Palau USA ventilators carry a one (1) year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your representative for additional warranty details.

4. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely.

5. Check sheave set screws to ensure tightness. Proper keys must be in keyways.

6. Do not readjust blade pitch or fan RPM. If sheaves are replaces, use only sheaves of identical size and type.

7. During the first few months of operation, it is recommended that the setscrews be checked to assure they are tight.

8. The rotating wheel or propeller requires particular attention in most applications since materials in the air being handled can build up on the blades to cause destructive vibration; and may also corrode and/or erode the blade metal to weaken the structure of the propeller. Regular inspection and corrective action at intervals determined by the severity of each application are essential to good service life.

MOTORS:

The fundamental principle of electrical maintenance is **KEEP THE MOTOR CLEAN AND DRY**. This requires periodic inspection of the motor. The frequency depends upon type of motor and the service.

We recommend periodic checks of voltage, frequency, and current of a motor while in operation. Such checks assure the correctness of frequency and voltage applied to the motor, and yield an indication of the fan load. Comparison of this data with previous data will give an indication of the fan performance. Any serious deviations should be investigated and corrected.

Lubricate integral horsepower motors per the motor manufacturer's recommendations. Lubrication frequency depends on the motor horsepower, speed, and service. Use compatible greases.

1. All motors carry a one (1) year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your representative for additional warranty details.

2. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely.

REPAIR PARTS:

3. Fan Blades – Repair of individual fan blades or propeller assemblies is not recommended. Contact factory with blade size, number of blades, bore size, motor HP, air flow direction, rotation, fan RPM or sheave sizes and any order/tag information that is available for replacement.

4. Misc. Parts – Not available from local trade channels should be returned for repair or replacement. Be sure to obtain return tags or authorization before shipment.

5. Electric Motors – Repair or replacement of motors is normally performed by a repair station authorized by the manufacturer. Contact your representative or the factory for locations nearest to you. **DO NOT** ship motor to the factory without specific authorization.

FAN TROUBLE-SHOOTING CHART

PROBLEM	POSSIBLE CAUSES
Excessive Vibration	Propeller, wheel or sheaves loose on shaft Out of balance propeller Excessive buildup of dirt/dust on propeller Bent shaft Weak mounting base for fan Fan mounting bolts loose Loose or worn bearings Bearing or drive misalignment Structures not crossbraced (wall fans) Curb not flat and level
Excessive Horsepower	Static pressure higher than design Wheel or propeller rotating in wrong direction Fan speed higher than design
Too Little Air	Restricted fan inlet or outlet Filters are dirty or clogged Wheel or propeller rotating in the wrong direction System is more restrictive (more static pressure) than expected Fan speed lower than design Inlet or Outlet screens clogged
Too Much Air	Filters not in place Fan speed higher than design System is less restrictive (less static pressure) than expected
Fan Does Not Operate	Wrong voltage Electricity turned off or note wired properly Blown fuses Overload protector has broken circuit
Excessive Noise	Propeller, wheel or sheaves loose Accumulation of material on propeller Worn or corroded propeller Wheel or propeller out of balance Wheel or propeller hitting housing Bent shaft Loose fan mounting bolts Rattle of components in high velocity airstream Electrical noise Noise from high velocity air system Vibrating parts not isolated from building Vibrating duct work

WARRANTY:

Soler & Palau USA warrants this equipment to be free from defects in material and workmanship for five (5) years from date of shipment. Any units or parts which prove to be defective and are reported during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Deterioration or wear by heat, abrasive action, chemicals, improper installation or operation or lack of normal maintenance shall not constitute defects, and are not covered by warranty.

The motor is warranted by the motor manufacturer for one (1) year. If the motor becomes defective in the warranty period, it should be taken to the nearest authorized motor service station. If this is not done, the motor manufacturer will not warrant the motor. Call the factory for instructions if authorized service station is not known.

Soler & Palau USA will not be responsible for any installation, removal or re-installation costs or any consequential damage resulting in failure to meet conditions of any warranty.

LIMITATION OF WARRANTY AND LIABILITY

This warranty does not apply to any such S&P product or parts which have failed as a result of faulty installation or abuse, or incorrect electrical connections or alterations, made by others, or use under abnormal operating conditions or misapplication of the products and parts.

Soler & Palau USA will not approve for payment any repairs made outside the factory without prior written consent of its Jacksonville, Florida office.

The foregoing shall constitute our sole and exclusive warranty and our sole and exclusive liability and is in lieu of all other warranties, whether written, oral, implied or statutory. There are no warranties which extend beyond the description of the page hereof. Seller does not warrant that said goods and articles are of merchantable quality or that they are fit for any particular purpose. The liability of seller on any claim of any kind, including negligence, for any loss or damage arising out of or connected with, or resulting from the sale and purchase of the products and parts covered by this proposal, acknowledgement, order or from the performance or breach of any contract pertaining to such sale or purchase, or from the design, manufacture, sale, delivery, resale, installation, technical direction of installation, inspection, repair, operation or use of any products or parts covered by this proposal, acknowledgement, order or furnished by seller shall, in no case exceed the price allocable to the products or parts thereof which give rise to the claim and shall terminate one (1) year after the shipment of said products and parts.

In no event, whether as a result of breach of contract, or warranty or alleged negligence, defects, incorrect advice or other causes, shall seller be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, down time costs, or claims of customers of the purchaser for such damages. Soler & Palau USA neither assumes nor authorizes any persons to assume for it any other liability in connection with the sale of its fan products and parts. Some states do not allow the exclusion or limitation of incidental or consequential damages, so all of the above limitations or exclusions may not apply to you.

SAFETY ACCESSORIES WARNING:

The responsibility for providing safety accessories for equipment supplied by Soler & Palau USA is that of the installer and user of this equipment. Soler & Palau USA sells its equipment with and without safety accessories, and accordingly it can supply such safety accessories upon receipt of order.

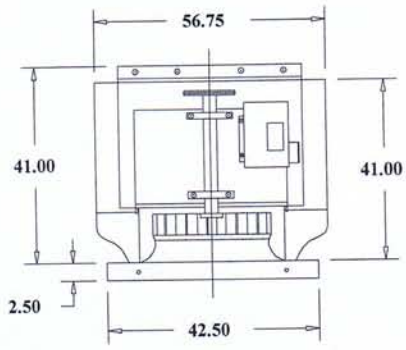
The user, in making its determination as to the appropriate safety accessories to be installed and any warning notices, should consider (1) the location of the installation, (2) the accessibility of employees and other persons to this equipment, (3) any adjacent equipment, (4) applicable building codes, and (5) requirements of the Federal Occupational Safety and Health Act. Users and installers of this equipment should read "RECOMMENDED SAFETY PRACTICES FOR AIR MOVING DEVICES" which is published by Air Movement and Control Association, 30 West University Drive, Arlington Heights, Illinois 60004.

Soler & Palau USA

Centrifugal Upblast Roof Exhauster Belt Drive

TXB30-5
QTY: 1 Tag: EF-9

-----Standard Features-----
AMCA Air and Sound Licensed
UL/UL-C 705 Certified (Optional)
Standard Disconnect and Birdscreen
Heavy Gauge Aluminum Construction
Non-Overloading Aluminum Backward Inclined Wheel
Drives Sized for a Minimum of 150% of Drive Horsepower
1 Year Fan and Motor Warranty - UL762
Heavy Duty 200,000 Hour Rated Pillow Block Bearings
Integral Deep Spun Inlet



Curb ID	37.75
Curb OD	40.75
AVG WT (lbs)	365

Metal Gauges	
Wind Band	.050
Motor Cover	.050
Shroud	.080
Base (STD/UL)	.090
Base (RHUL)	14GA
Curb Cap Flange	.080

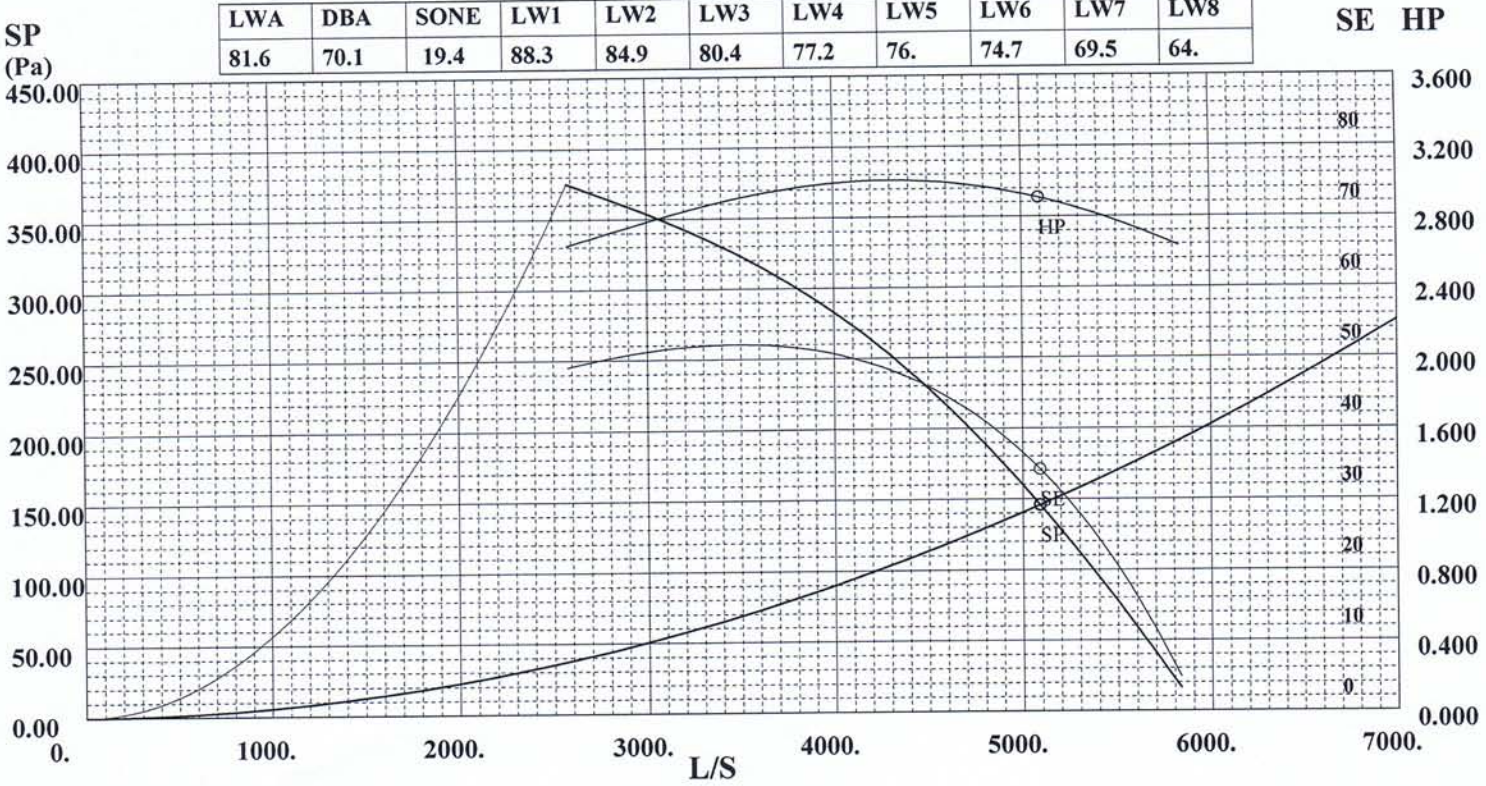
Dimensions shown in Inches. Dimensions are correct within limits for normal installation. They do not necessarily show actual construction.

736 RPM — **5HP (208/230)/3/60/ODP 2S2W 1800/1200 [Wired for 575Volts]**

Q (Flow)	Pressure	Power
5,090.925 L/S	**145.608 Pa (SP)**	**2.906 HP**
0.075 Lb/Ft3	51.835 Pa (VP)	0.000 HP (Belt)
	197.443 Pa (Total P)	2.906 HP (Total)
34% SE	5780 FPM (TS)	1828 FPM (OV)

Sound Power Levels - Octave Bands

LWA	DBA	SONE	LW1	LW2	LW3	LW4	LW5	LW6	LW7	LW8
81.6	70.1	19.4	88.3	84.9	80.4	77.2	76.	74.7	69.5	64.



TXB Centrifugal Roof Upblast Exhausters

Belt Drive

Catalog TXB01-July 2007

COMMERCIAL PRODUCT LINE

The World's Leading Producer of
Air Movement Products

Soler & Palau USA, Div. of Soler & Palau Ventilation Group, certifies that the Models TXB shown herein are licensed to bear the AMCA Seal. The ratings shown are based on test and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirement of the AMCA Certified Ratings Program.

Soler&Palau Ventilation Group

Model TXB Belt Drive Centrifugal Upblast Roof Exhausters

Application

Model TXB belt drive fans are roof mounted centrifugal upblast exhausters rated from 250 to 35,000 CFM with static pressure capabilities to 3-1/4 inches. Soler & Palau USA offers the widest horsepower and CFM selection in the industry. All fans are factory test run for quality assurance. Check our Quickship Program for your rapid delivery requirements.

The TXB was designed with serviceability in mind. The motor compartment can be serviced through the removable top, or the motor housing can be removed by loosening four nuts. Soler & Palau USA's optional "Grease Grabber" is an inexpensive and easy solution to grease containment. The Grease Grabber media allows water to drain away while grease is contained.

Isolation of motor and drive components from the airstream and the high velocity vertical air discharge make the Model TXB ideally suited for the removal of dirty contaminated and/or high temperature air from processes and buildings. Typical applications include restaurant hoods and similar kitchen exhaust ventilation, fume and smoke removal, laboratory fume hood exhaust and chemical process exhaust.

All TXB fans are designed and manufactured for high performance and long life. Soler & Palau USA covers the TXB with a 5 year fan warranty and a 1 year motor warranty. TXB-UL762 units have a 1 year fan and motor warranty. Heavy-gauge materials are used throughout the TXB. The spun inlet and shroud design provide excellent air moving efficiencies. The motor brackets are heavy-gauge steel, and isolated from the unit to eliminate unwanted vibration and noise transmission. For companion direct drive upblast fans, see the Model TXD with it's complementing design. There is no finer centrifugal upblast made period.

Construction/Specification Checklist

Housing

- Curb cap with integral deep single piece spun inlet for efficient performance and prevention of leakage into ductwork.
- Heavy-gauge aluminum housing and curb cap for strength and rigidity. Curb cap is galvanized steel on all UL 762 units.
- Adjustable motor base for proper belt tension and ease of adjustment.
- Enclosed ventilated motor/drive compartment isolates motor and drives from exhaust air.
- Neoprene isolators for reduction of vibration and sound.
- The motor compartment housing easily removes with a minimum of tools for complete maintenance access.
- Water-tight conduit tube for easy electrical connection without having to wire through the breather tube.
- Birdscreen and disconnect are included on standard models (Disconnects not included on 2 speed and explosion proof units).
- Birdscreen not included on UL762 units.

Centrifugal Wheel

- Backward inclined for efficiency at higher static pressure.
- Nonoverloading for safe operation in ducted systems.
- Heavy aluminum hub for extra strength.
- Close running tolerance between inlet cone and wheel inlet for maximum efficiency.
- Statically and dynamically balanced for smooth quiet operation.

Motors

- Brands are nationally recognized and locally serviced.
- Single speed drip-proof motors are provided on standard models.
- Disconnect switch is standard with single speed motors.
- Welded motor brackets designed for maximum strength.

Drives

- Sized for minimum 150% of drive horse power.
- Machined cast iron adjustable motor pulleys.
- Adjustable base for belt tensioning.
- Nonstatic oil resistant V-Belts.

Bearings

- 5 year bearing warranty.
- Heavy-duty ball bearing type.
- Prelubricated and permanently sealed.
- Sized for a minimum L50 life in excess of 200,000 hours.

Certifications

- AMCA Air and Sound Licensed.
- cULus 705 Listed Power Roof Ventilator label assures electrical reliability.
- cULus 762 Listed for Restaurant Exhaust Appliance available for applications where required.
- cULus 705 and cULus 762 assure electrical reliability for Canadian use.
- cULus label must be specified when needed.
- NFPA - Model TXB is suitable for National Fire Protection Association installations. Contact factory for required accessories.

Options/Accessories

Roof Curb: Prefabricated heavy-gauge galvanized steel, welded construction, 12" high (other heights are also available) with 1-1/2" wood nailer. Assures perfect fit of exhauster to roof opening. Options include burglar bars, single or double pitch construction and hinged curbs for easy duct access.

Motor Operated Damper: Motor operated aluminum damper for positive closure against backdraft. (Not for UL 762 use).

Automatic Damper: Automatic aluminum damper for ease in installation and effective backdraft protection. (Not for UL 762 use).

Grease Grabber or Aluminum Grease Trough: Trap designed for fast and inexpensive replacement. Grease collects in a container for safe and sanitary disposal. Keeps roof clean with proper use.

Wall Mount Kit: Kit allows 8-24" fans to be wall mounted. Kit can be field installed or ordered assembled from the factory. See current submittal for details.

Special Coatings: Epoxy, Heresite and Eisenheiss are available when special coatings are required.

Birdscreen: Integral birdscreen provides protection from birds or other objects. Screen is horizontal with access to wheel provided.

Hinged Curb Cap: For easy access to ductwork.

Optisizer Selection Program

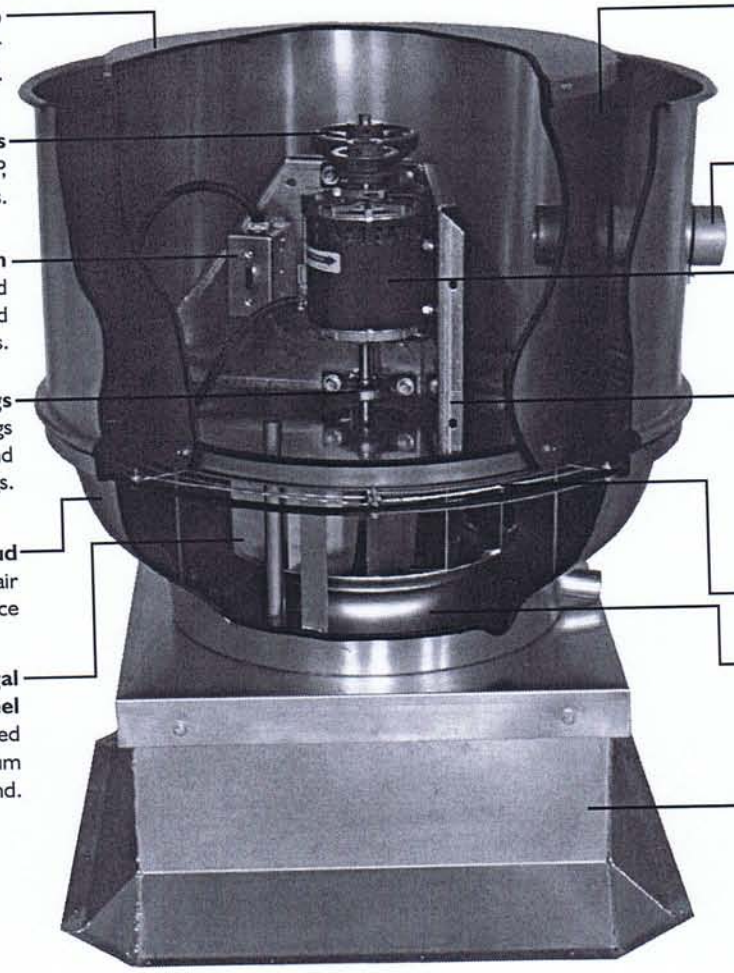
Please refer to Soler & Palau USA's Optisizer Program for fan curve, submittal information and other details of the TXB series and other Soler & Palau USA products. Contact your representative or factory for a copy. Visit Soler & Palau USA's website for additional information: www.solerpalau-usa.com.

Quickship Program

Most TXB Models and many optional accessories are available on the Quickship Program. This program provides rapid delivery of standard products so that tight project deadlines can be met and downtime on replacement work can be held to a minimum.

All specifications are subject to change without notice unless approved in submittal by Soler & Palau USA.

Model TXB



Spun Top
Easily removable for servicing.

Drives
Sized for 150% of drive HP, adjustable pitch sheaves.

Disconnect Switch
Standard with single speed drip-proof and totally enclosed motors.

Bearings
Air handling type ball bearings with cast iron housing and grease fittings.

Spun Shroud
Provides maximum air performance

All Aluminum Centrifugal Wheel
Nonoverloading, backward inclined tapered blades for maximum efficiency and minimum sound.

Enclosed Motor Compartment
Isolates motor and drives from exhaust air.

Oversized Vent Tube
For maximum motor cooling.

Motor
Open drip-proof construction standard. 1 year warranty.

Motor Base
Motor is adjustable for proper belt tension.

Neoprene Isolators
Reduce vibration and sound.

Birdscreen

Deep Spun One Piece Inlet
For optimum air and sound performance.

Prefabricated Roof Curb (Optional)

Stainless Steel Exterior Fasteners Standard.

TYPICAL SPECIFICATIONS

Roof exhaust fan shall be centrifugal belt drive upblast type. Unit shall be constructed of aluminum for corrosion resistance, durability and appearance. Fan windband shall have a rolled bead edge for rigidity. Units shall have a deep venturi inlet to prevent snow and rain entry. All external fasteners shall be stainless steel.

Fan wheels shall be of the centrifugal backward inclined type, constructed of all aluminum and containing a matching inlet venturi for optimum unit performance. Wheels shall be statically and dynamically balanced.

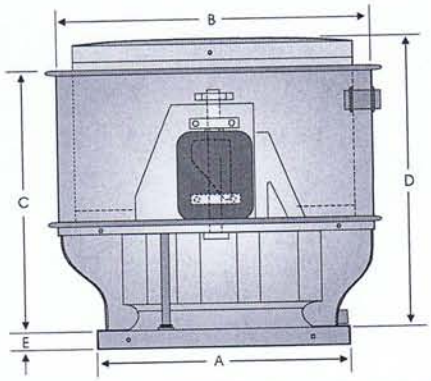
Motor and drive assembly shall be isolated from unit to eliminate vibration and noise transmission.

Motor and wheel assemblies shall be removable as a complete module without complete disassembly of the unit for service and maintenance. Motors shall be mounted out of the exhaust airstream and cooled by air separate from the exhaust. A wiring conduit shall be provided to allow motor wiring and fan servicing without using the breather tube as a wiring path. Fan shafts shall be precision ground and polished. Shafts shall not be pressed onto bearings. Bearings shall be of the one-piece, cast iron, pillow block type with relubrical zerk fittings. Bearings service shall be designed for a minimum L50 life in excess of 200,000 hours. Fan housing and drive assembly will have a 5 year warranty (UL762 unit has 1 year warranty).

Motors shall be from nationally recognized manufacturers and of the specified electrical power (volts/phase/Hz.) and enclosure type. Fans shall be AMCA licensed for Air and Sound performance.

Drive assembly shall be constructed of heavy-gauge galvanized steel and contain no welding. Drives shall be sized for a minimum of 150% of driven horsepower. Machined, cast iron motor sheaves shall be adjustable for final system balance.

Fans shall be Model TXB as manufactured by Soler & Palau USA, Jacksonville, Florida.



Dimensions (in.)				
A	B	C	D	E
42-1/2	56-3/4	41	45	2-1/2

Dimensional Data				Metal Thickness			Avg. Ship Wt. (lbs.)
Damper		Roof Opening	Curb OD	Curb Cap	Wind Band	Motor Cover	
ID	OD						
36	36	37-3/4	40-3/4	.090	.050	.050	365

SIZE 30

TXB 30

CFM / BHP @ Static Pressure / Sones															
1/8	1/4	3/8	1/2	5/8	3/4	1	1-1/4	1-1/2	1-3/4	2	2-1/4	Catalog Number	RPM	HP	Tip Speed
3720 0.16/3.8	-	-	-	-	-	-	-	-	-	-	-	TXB-30331	280	1/3	2236
4477 0.23/4.9	-	-	-	-	-	-	-	-	-	-	-	TXB-30332	315	1/3	2515
5280 0.32/6.2	4249 0.34/5.8	-	-	-	-	-	-	-	-	-	-	TXB-30333	355	1/3	2835
5572 0.36/6.7	4639 0.38/6.3	-	-	-	-	-	-	-	-	-	-	TXB-30501	370	1/2	2954
5860 0.41/7.2	5005 0.43/6.8	3594 0.41/6.3	-	-	-	-	-	-	-	-	-	TXB-30502	385	1/2	3074
6240 0.47/7.9	5466 0.50/7.5	4315 0.49/7.1	-	-	-	-	-	-	-	-	-	TXB-30503	405	1/2	3234
6615 0.54/8.6	5902 0.57/8.2	4931 0.58/7.8	3194 0.51/7.2	-	-	-	-	-	-	-	-	TXB-30751	425	3/4	3394
6987 0.62/9.3	6322 0.65/8.9	5474 0.67/8.5	4167 0.63/8.1	-	-	-	-	-	-	-	-	TXB-30752	445	3/4	3553
7356 0.70/10.0	6730 0.74/9.6	5973 0.76/9.3	4894 0.74/9.0	-	-	-	-	-	-	-	-	TXB-30753	465	3/4	3713
7631 0.77/10.7	7032 0.81/10.2	6328 0.83/9.8	5375 0.83/9.6	3866 .075/8.9	-	-	-	-	-	-	-	TXB-30101	480	1	3833
7904 0.84/11.3	7328 0.88/10.8	6671 0.91/10.4	5814 0.91/10.2	4598 0.86/9.7	-	-	-	-	-	-	-	TXB-30102	495	1	3952
8176 0.91/11.9	7622 0.96/11.5	7003 0.99/11.1	6221 1.00/10.7	5125 0.97/10.4	-	-	-	-	-	-	-	TXB-30103	510	1	4072
8628 1.05/13.1	8106 1.10/12.6	7534 1.13/12.2	6850 1.15/11.7	5959 1.15/11.5	4685 1.07/10.9	-	-	-	-	-	-	TXB-30151	535	1-1/2	4272
9078 1.20/14.2	8583 1.25/13.8	8050 1.29/13.3	7440 1.32/12.8	6682 1.32/12.5	5662 1.29/12.1	-	-	-	-	-	-	TXB-30152	560	1-1/2	4471
9525 1.36/15.3	9055 1.42/14.8	8555 1.46/14.4	8001 1.50/14.0	7334 1.51/13.6	6495 1.50/13.2	-	-	-	-	-	-	TXB-30153	585	1-1/2	4671
9881 1.50/16.2	9429 1.56/15.7	8951 1.61/15.2	8431 1.65/14.8	7824 1.67/14.4	7087 1.67/14.2	4766 1.50/13.1	-	-	-	-	-	TXB-30201	605	2	4831
10325 1.69/17.3	9894 1.75/16.8	9440 1.80/16.4	8954 1.85/15.9	8407 1.88/15.6	7758 1.89/15.2	5919 1.79/14.4	-	-	-	-	-	TXB-30202	630	2	5030
10680 1.85/18.1	10263 1.91/17.7	9827 1.97/17.3	9364 2.02/16.9	8855 2.05/16.5	8262 2.07/16.1	6658 2.02/15.4	-	-	-	-	-	TXB-30203	650	2	5190
11122 2.07/19.3	10721 2.13/18.8	10306 2.19/18.4	9868 2.25/18.1	9397 2.29/17.7	8860 2.31/17.3	7484 2.30/16.7	5245 2.08/15.6	-	-	-	-	TXB-30301	675	3	5390
11650 2.35/20	11268 2.42/20	10874 2.48/19.8	10462 2.54/19.5	10024 2.59/19.1	9545 2.62/18.8	8360 2.64/18.1	6643 2.52/17.2	-	-	-	-	TXB-30302	705	3	5629
12177 2.66/22	11812 2.73/22	11437 2.80/21	11047 2.86/20	10637 2.91/21	10199 2.96/20	9152 3.00/19.6	7730 2.94/19.0	5454 2.65/18.1	-	-	-	TXB-30303	735	3	5869
12966 3.17/24	12623 3.24/24	12273 3.32/23	11911 3.39/23	11535 3.45/23	11140 3.50/22	10244 3.57/22	9119 3.57/21	7571 3.44/21	-	-	-	TXB-305001	780	5	6228
13839 3.80/26	13518 3.89/26	13191 3.97/26	12856 4.04/25	12511 4.11/25	12152 4.17/25	11374 4.27/25	10439 4.32/24	9268 4.28/23	7696 4.09/23	-	-	TXB-305002	830	5	6627
14623 4.44/29	14319 4.53/28	14011 4.62/28	13696 4.70/27	13373 4.78/27	13040 4.85/27	12332 4.96/27	11522 5.04/26	10552 5.05/26	9325 4.97/25	7711 4.71/25	-	TXB-305003	875	5	6987
15752 5.50/32	15471 5.59/32	15185 5.69/31	14895 5.78/31	14599 5.86/30	14296 5.94/30	13661 6.08/30	12977 6.19/30	12187 6.26/29	11261 6.26/29	10120 6.17/29	8680 5.93/28	TXB-307501	940	7-1/2	7506
16792 6.60/36	16528 6.71/35	16261 6.81/35	15990 6.90/34	15715 7.00/34	15434 7.09/34	14854 7.25/34	14238 7.38/33	13564 7.49/33	12794 7.54/33	11905 7.54/32	10831 7.44/32	TXB-307502	1000	7-1/2	7985

Power Ratings (BHP) does not include drive losses.
Performance certified is for installation type A - free inlet, free outlet.
Performance ratings do not include the effects of birdscreen in the airstream.
The sound ratings shown are loudness values in fan sones @ 5' (1.5m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for free inlet fan sone levels.

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UL STANDARD 705 for Electrical
UL STANDARD 762 for Grease Removal

Models TXB & TXB-W

Installation, Operation, and Maintenance Manual

Belt Drive Centrifugal Upblast Roof/Sidewall Exhausters

READ AND SAVE THESE INSTRUCTIONS

The purpose of this manual is to aid in the proper installation and operation of fans manufactured by Soler & Palau USA. These instructions are intended to supplement good general practices and are not intended to cover detailed instruction procedures, because of the wide variety and types of fans manufactured by Soler & Palau USA.

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Soler&Palau Ventilation Group

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

INTRODUCTION:

DO NOT INSTALL, USE OR OPERATE THIS EQUIPMENT UNTIL THIS MANUAL HAS BEEN READ AND UNDERSTOOD. READ AND SAVE THESE INSTRUCTIONS FOR FUTURE USE.

It is the responsibility of the purchaser to assure that the installation and maintenance of this equipment is handled by qualified personnel experienced in such work and equipment.

Contact your local representative should you need further information.

SHIPMENT AND RECEIVING:

Prior to shipment, all fans have been thoroughly inspected and tested.

All equipment shipped from Soler & Palau USA is skidded or crated to fully comply with trucking requirements. Inspect all shipments carefully for damage. **THE RECEIVER MUST NOTE ANY DAMAGE ON THE CARRIER'S BILL OF LADING AND FILE A CLAIM IMMEDIATELY WITH THE FREIGHT COMPANY, IN THE CASE OF ANY DAMAGE.** Keep a record of all equipment received, including inspection details and date of receipt, because of the possibility of partial shipments.

If you receive damaged goods, contact your S&P representative for repair or replacement service.

HANDLING:

Handle your equipment with caution. Some fans are provided with lifting lugs or holes for easy handling. Others must be handled using nylon straps that protect the fan's coating and housing. Spreader bars should be used when lifting large parts.

Fans should be lifted by using straps around the fan housing only. **DO NOT LIFT FANS BY THE MOTOR, BASE, PROP, WHEEL, OR FLANGES.**

Roof ventilators should be lifted by using straps around the fan housing or base only. Spreader bars should also be used to avoid damage to stack caps or hoods. **DO NOT LIFT ROOF VENTILATORS BY THE STACK CAP OR HOOD.** On hooded units, disassemble the stack from hood when lifting. Upblast models may be lifted assembled.

STORAGE:

If fans are stored for any length of time, they should be stored in a clean, dry location to prevent rust and corrosion. Outdoor storage is not recommended. When outdoor storage is necessary, they should be protected from the elements as best as possible. Cover the fan inlet and outlet and keep motors dry and clean.

For extended storage (more than 3 months), motor shafts and bearings should be rotated monthly. If stored greater than 6 months, bearing grease in motor and fan should be purged and replaced with compatible grease. Re-check belts for proper tension. Storage records should be kept to assure proper maintenance. The factory can advise warranty centers to provide motor and bearing service if needed.

INSTALLATION:

Roof ventilators should always be mounted to a flat level, solid and rigid structure. Particular caution should be exercised when installing fans on metal buildings. Be sure wall or roofs are capable of supporting the fan(s). Walls/Roofs not supported correctly will cause vibration that could cause damage or injury.

Fans mounted off ground level should be rigidly mounted to a special platform and be placed as near as possible to, or over, a solid wall or column.

Supports for suspended fans must be crossbraced for live load support to prevent side sway.

Use guy wires to help secure root units if excessively windy conditions prevail.

1. **CAUTION!** This fan contains rotating parts and requires special service. Appropriate safety precautions should be taken during installation, operation and maintenance.

2. **WARNING!** Do not install or operate this fan in an environment or atmosphere where combustible or flammable materials, gasses or fumes are present, unless it was specifically designed and manufactured for use in that environment. Explosion or fire can result. Explosive, corrosive, high temperature, etc. conditions may require special construction, inspection and maintenance. It is necessary to observe the fan manufacturer's recommendations and limitation concerning the type of material to be handled by the fan and its application in special conditions.

3. When ventilator is designed to be mounted on a curb, the curb should be securely installed prior to fan installation.

4. A damper, if used, should be securely mounted within the curb or wall in a manner that allows free and unobstructed operation.

5. **CAUTION!** All electrical work must be done in accordance with local and/or national electrical codes as applicable. If you are unfamiliar with methods of installing electrical wiring, secure the services of a qualified electrician.

6. **WARNING!** This product must be grounded.

7. **DANGER!** Make sure power is turned off and locked in the **OFF** position at the service entrance before installing, wiring or servicing fan.

8. **CAUTION!** Before wiring the motor, check the supply voltage against the motor nameplate voltage. High or low voltage can damage the motor and void the motor warranty.

9. **WARNING!** Be sure to keep all wiring clear of rotating or moving parts.

10. **WARNING!** Before starting the fan, turn the wheel to assure it rotates freely. If needed, adjust the wheel/shaft/bearing/motor position as required to achieve necessary clearances.

11. **CAUTION!** On belt drive units, assure belts are tensioned and aligned properly. (See Maintenance section).

12. **WARNING!** Check all setscrews and keys. Tighten as necessary prior to fan startup.

13. On roof units, anchor the fan securely to the curb. Anchoring through the vertical portion of the curb cap flange is recommended. Use a minimum of four lag bolts or other suitable fasteners.

14. Due to the general nature of its applications, the basic air mover is available with protective guards and/or other devices for required operating safety as with most installations of rotating machinery. Before operating the basic unit in any of its applications determine requirements for such guards and/or devices needed for protection against accidental contact with moving parts or against injury to nearby personnel or critical equipment due to accidental rupture of fast moving parts.

START-UP:

Lock out the power source.

Tighten all bolts and setscrews securely and, on belt drive fans, check sheave alignment and belt tension. Tighten belts if necessary. **NOTE THAT ALL BOLTS, SETSCREWS AND BELTS SHOULD BE TIGHTENED AFTER TWO DAYS OF INITIAL OPERATION.**

Clearance should be checked all around between wheel or propeller tips and the housing before starting up. The wheel or propeller should not strike the housing.

No initial lubrication is required. Motors have been pre-lubricated by motor manufacturer and fan bearings by S&P.

Arrows to show direction of rotation and airflow are attached to the fan housings.

After the electrical connections are completed, apply just enough power to start the impeller as indicated by the directional arrows on the unit. If the impeller is turning the wrong direction, it will not deliver rated airflow and the motor connections must be altered to correct rotation.

Lock out the power source before the installation of all accessories.

Fan electrical power can now be applied and special attention should be given to determine if motor is working properly. At this time, with air system in full operation, with guards attached, it is well for the electrician to measure the operating amperage of the motor and compare with the nameplate rating to determine that the motor is operating under safe load conditions.

The fan should not need balancing, as it was balanced at the factory to meet stringent vibration levels before shipment. However, there are several things that may cause vibration, such as rough handling in shipment and erection, weak foundations, and alignments.

MAINTENANCE:

1. Before performing any maintenance on the fan, be sure power is turned off and locked in the OFF position at the service entrance before servicing the fan.

2. Ventilators should be carefully checked at least once a year. For critical or rugged applications, a routine check every two or three months is suggested.

3. All motors supplied with Soler & Palau USA ventilators carry a one-year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your representative for additional warranty details.

4. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely and the bearings run smoothly. The belt on belt driven units should be removed from the motor sheave.

5. When removing or installing a belt, do not force the belt over the sheave. Loosen the motor mount so that the belt can be easily slipped over the sheave.

6. The belt on belt driven units should be removed and carefully checked for radial cracks, ply separation or irregular wear. A small irregularity in the contact surface of the belt will result in noisy operation. If any of these defects are apparent, the belt should be replaced. Check the sheaves also for chipping, dents or rough surfaces, which could damage the belt.

7. The correct belt tension is important. If the belt is too tight it will result in excess bearing pressure on the motor bearings and shaft pillow block and may also overload the motor. If the belt is too loose it will result in slippage, which will quickly burn out belts. A belt should feel "live" when thumped, approximately ¼" belt deflection when subject to finger pressure (3-5 lb.) at midpoint between sheaves.

8. The belt alignment should also be checked to be sure the belt is running perpendicular to the rotating shafts. Motor and drive shafts must be parallel. Improper alignments will result in excessive belt wear.

9. Check sheave set screws to ensure tightness. Proper keys must be in keyways.

10. Do not readjust blade pitch or fan RPM. If sheaves are replaces, use only sheaves of identical size and type.

11. If unit is to be left idle for an extended period, it is recommended that belts be removed and stored in a cool, dry place to avoid premature belt failure.

12. The standard pillow block bearings on belt driven ventilators are factory lubricated and are provided with external grease fittings. Relubrication annually or more frequently, if required, is recommended.

13. During the first few months of operation, it is recommended that the setscrews be checked to assure they are tight.

14. The rotating wheel or propeller requires particular attention in most applications since materials in the air being handled can build up on the blades to cause destructive vibration; and may also corrode and/or erode the blade metal to weaken the structure of the propeller. Regular inspection and corrective action at intervals determined by the severity of each application are essential to good service life.

BEARINGS AND LUBRICATION:

All S&P belt drive fan bearings are heavy duty, self-aligning ball type and are relubricable for continuous service.

Selection of the correct bearing grease and greasing intervals depends on several things. Extreme high or low temperatures, dirty or damp surrounds, and vibration exceeding 1 or 2 mils are all things that will require more frequent greasing or special greases. For standard service, use a lithium base grease that conforms to NLGI grade 2 consistency.

The motor bearings and the fan bearings on the belt drive fans should be greased at regular intervals. Motor manufacturer's greasing instructions and recommendations should be followed closely. Avoid the use of a pressure greasing system which tends to fill the bearing chamber completely. Do not over grease. Use only 1 or 2 shots with a hand gun in most cases. Maximum hand gun rating 40 P.S.I. Rotate bearings during lubrication where good safety practice permits. NOTE: On motors with non-regreasable sealed bearings, no lubrication is required for the life of the bearings.

Some of the most frequent causes of bearing failure is not greasing often enough, using an excessive quantity of grease, or using incompatible greases. Excessive vibration, especially if the bearing is not rotating, will also cause bearings to fail. Bearings must also be protected from water and moisture to avoid internal corrosion.

BEARING REPLACEMENT:

Fan bearings on belt drive fans should not need to be replaced for many years if the above recommendations are strictly adhered to. However, use the following procedure when bearing replacement is necessary:

1. Gain access to the fan bearings. Remove the bearing cover, if any.
2. Loosen the belts by shifting the motor.
3. Remove the propeller and disconnect the remote lube tubes (if applicable).
4. Measure the location of the bearing to the propeller end of the shaft and the bearing spacing.
5. Remove the shaft and bearing assembly. Note the position of the bearings' shims (if applicable).
6. Loosen all bearing/shaft setscrews or other locking device.
7. Remove bearings (may have to be pressed off the shaft).
8. Polish the shaft with fine emery paper (240 Grit or finer) and file the setscrew dimples flat.
9. Install new bearings on the shaft, making sure that the collars are together, (i.e., facing each other on the shaft). Lightly seat one setscrew or eccentric locking collar on each bearing to hold in the approximate marked position.
10. Mount the shaft/bearing assembly in the fan, with bolts. Do not tighten yet. Just snug up. Loosen the setscrew.
11. Center the shaft in the house (both ends) as closely as possible. (The fan propeller may need to be temporarily installed to get its clearances equal).
12. Tighten the bearing mounting bolts.
13. Reinstall the lube tubes (if applicable).
14. Install bearing cover, propeller, and belts, and adjust the motor to get proper belt tension. Also, make sure that the sheaves are properly aligned.
15. If a new shaft is supplied, then ignore items #6 through #8.

V-BELTS:

V-belts on S&P belt drive fans are oil, heat and static resistant type, and oversized for continuous duty. With proper installation and maintenance, years of operating efficiency can be added to the life span of the V-belt drive.

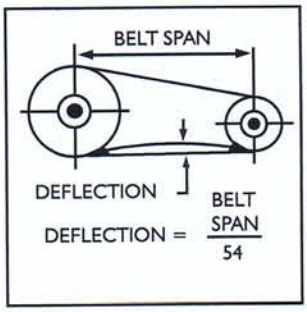
The condition of V-belts and the amount of belt tension should be checked prior to start-up. When it becomes necessary to adjust belt tension, do not over-tighten as bearing damage will occur. Recommended belt tension should permit 1/64" per inch of span deflection of the belt on each side of the belt measure half-way between the pulley centerline. Extreme care must be exercised when adjusting V-belt as not to misalign the pulleys. Any misalignment will cause a sharp reduction in belt life and will also produce squeaky, annoying noises. On units equipped with 2 or 3 groove pulleys, adjustments must be made so that there is equal tension on all belts.

1. Where tensioning rods are not provided, adjustment is easily obtained by loosening and adjusting one side of the motor bracket at a time.

2. Always loosen tension adjustment enough to place belts on sheaves without running belts over the edge of either sheave. A new belt may be seriously damaged internally by careless handling.

WARNING: Whenever belts are removed or installed, never force belts over pulleys without loosening motor first to relieve belt tension. The fan has been checked at the factory prior to shipment for mechanical noises. If mechanical noise should develop, some suggestions are offered as a guide to remedy the cause:

1. Check rotating members for adequate clearance.
2. Check proper belt tension and pulley alignment.
3. Check installation and anchoring
4. Check fan bearings



Two-groove variable pitch sheaves must be opened the same number of turns on both sides, otherwise slippage is induced, wearing belts rapidly.

Mount Belts Straight

Shafts must be parallel and sheaves in alignment to prevent unnecessary belt wear.

Eliminate Slack

Slack belts wear excessively, cause slippage and deliver less power. For longest belt life, always provide proper tension.

Don't Force Belt

Loosen the motor so that the belt can be slipped on sheave easily. Forcing the belt will break the cords and cause early belt failure.

MOTORS:

The fundamental principle of electrical maintenance is **KEEP THE MOTOR CLEAN AND DRY**. This requires periodic inspection of the motor. The frequency depends upon type of motor and the service.

We recommend periodic checks of voltage, frequency, and current of a motor while in operation. Such checks assure the correctness of frequency and voltage applied to the motor, and yield an indication of the fan load. Comparison of this data with previous data will give an indication of the fan performance. Any serious deviations should be investigated and corrected.

Fractional motors usually have prelubricated sealed bearings with no grease fittings and are lubricated for life.

Lubricate integral horsepower motors per the motor manufacturer's recommendations. Lubrication frequency depends on the motor horsepower, speed, and service. Use compatible greases.

1. All motors carry a one (1) year warranty from date of shipment. For repairs within the warranty period, the motor must be taken to the motor manufacturer's authorized service dealer. Contact your representative for additional warranty details.

2. A periodic motor check should consist of spinning the motor shaft with the power off to be sure the motor turns freely and bearings run smoothly. The belt on belt driven units should be removed from the motor pulley.

RECOMMENDED BALL AND ROLLER BEARING GREASES SUGGESTED REGREASING INTERVALS

INTERVAL	TYPES OF SERVICE
1-2 YEARS	INFREQUENT OPERATION OR LIGHT DUTY IN CLEAN ATMOSPHERE
1 YEAR	8-16 HRS/DAY IN CLEAN, RELATIVELY DRY ATMOSPHERE
6 MONTHS	12-24 HRS/DAY, HEAVY DUTY, OR IF MOISTURE IS PRESENT
3 MONTHS	HEAVY DUTY IN DIRTY, DUSTY LOCATIONS: HIGH AMBIENTS: MOISTURE LADEN ATMOSPHERE: VIBRATION

CAUTION

Greases by different soap bases (lithium, sodium, etc.) may not be compatible when mixed. Prevent such intermixing by completely purging the bearing of old greases.

Note: Use regreasing intervals and grease as noted in tables, unless a lubrication plate on motor indicates otherwise. Refer to motor lubrication plate for specific type and/or grade of lubricant to be used.

Example:

MANUFACTURER	GREASE (NLGI No. 2)
US Electric Motors	Grease No. 83343
Chevron USA Inc.	Grease SRI Grease No. 2
Mobile Oil Corp.	Mobilux 2
Texaco, Inc.	Premium BRB No. 2

REPAIR PARTS:

1. Belts – use only belts of the same type and size furnished.

2. Bearings – replacement adapter bearing units are available from trade channels for installation in pillow block housings when required.

3. Fan Blades – Repair of individual fan blades or propeller assemblies is not recommended. Contact factory with blade size, number of blades, bore size, motor HP, air flow direction, rotation, fan RPM or sheave sizes and any order/tag information that is available for replacement.

4. Misc. Parts – Not available from local trade channels should be returned for repair or replacement. Be sure to obtain return tags or authorization before shipment.

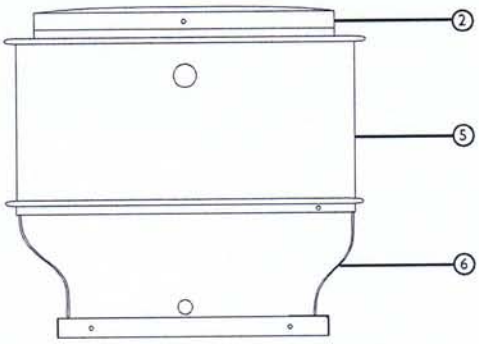
5. Electric Motors – Repair or replacement of motors is normally performed by a repair station authorized by the manufacturer. Contact your representative or the factory for locations nearest to you. **DO NOT** ship motor to the factory without specific authorization.

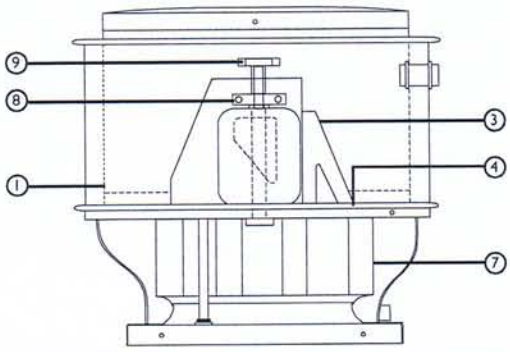
FAN TROUBLE-SHOOTING CHART

PROBLEM	POSSIBLE CAUSES
Excessive Vibration	Propeller, wheel or sheaves loose on shaft Belts loose or too tight Out of balance propeller Excessive buildup of dirt/dust on propeller Bent shaft Weak mounting base for fan Fan mounting bolts loose Loose or worn bearings Bearing or drive misalignment Mismatched belts Structures not crossbraced (wall fans) Curb not flat and level
Excessive Horsepower	Static pressure higher than design Wheel or propeller rotating in wrong direction Fan speed higher than design
Too Little Air	Restricted fan inlet or outlet Filters are dirty or clogged Wheel or propeller rotating in the wrong direction System is more restrictive (more static pressure) than expected Fan speed lower than design Inlet or Outlet screens clogged
Too Much Air	Filters not in place Fan speed higher than design System is less restrictive (less static pressure) than expected
Fan Does Not Operate	Wrong voltage Electricity turned off or note wired properly Loose pulleys Blown fuses Overload protector has broken circuit Broken belts
Excessive Noise	Propeller, wheel or sheaves loose Bearing or drive misalignment Accumulation of material on propeller Worn or corroded propeller Wheel or propeller out of balance Wheel or propeller hitting housing Bent shaft Defective or bad bearings Bearings need lubrication Loose bearing bolts Loose or worn bearings Mismatched belts Belts too loose or too tight Belts oily or dirty Belts worn Loose fan mounting bolts Rattle of components in high velocity airstream Electrical noise Noise from high velocity air system Vibrating parts not isolated from building Vibrating duct work

Replacement Parts

Model TXB
Sizes 6-48"





TXB Model	Motor Cover ①	Motor Cover Cap ②	Motor Mounting Plate ③	Vibration Isolators (4 Set) ④
	Part #	Part #	Part #	Part #
6	1001631	100004	100008 & 100019	100009 (3 pcs)
8	1001631	100004	100008 & 100019	100009 (3 pcs)
10	1001701	100301	100008 & 100019	100009 (3 pcs)
12	1001731	100193	100050 &100052	92126310 (3 pcs)
15	1001731	100193	100050 & 100052	92126310 (3 pcs)
16	1003721	100193	100050 & 100052	92126310 (3pcs)
18	1001831	100105	100050, 100052 & 1001216WM	92422410 (3pcs)
20	100173	100193	100050, 100052 & 1001216WM	92422410 (3 pcs)
24	1002031	100208	100108, 100219, 100214 & 100218WM	92422410 (4 pcs)
30 (#1 below)	100222	100125	100276 (2 pcs), 100299, 100298	92422410 (5 pcs)
36 (#2 below)	100244	100251	100276 (2 pcs), 100299, 100298	92422410 (5 pcs)
42	100268	100272	100274, 100276 (2 pcs) & 100277	92422410 (5 pcs)
48	100288	100145	100274, 100276 (2 pcs) & 100277	92422410 (5 pcs)

TXB Model	Windband ⑤	Shroud ⑥	Wheel ⑦	Bearings ⑧	Shaft ⑨
	Part #	Part #	Part #	Part #	Part #
6	1003041	100303	617070	703110 (2 pcs)	607380-2F
8	1003041	100303	600009	703110 (2 pcs)	607380-2F
10	1003051	100302	600003	703110 (2 pcs)	607380-2A
12	1001741	100258	600003	703110 (2 pcs)	707380-2
15	1001741	100258	617045	703110 (2 pcs)	707380-2
16	100325	100368	100380	703112 (2 pcs)	607370-2
18	100184	100320	617083	703112 (2 pcs)	607370-2
20	100184	100320	100198	703112 (2 pcs)	7073701
24	100204	100217	101332	703116 (2 pcs)	613505-2
30 (#1 below)	100225	100235	617063	703116 (2 pcs)	613524-2
36 (#2 below)	100241	100254	617064	703116 (2 pcs)	613524-2
42	100270	100259	617011	703124 (2 pcs)	613526-2
48	100290	100260	617010	703124 (2 pcs)	613529-2

TXB Model	Wheel ⑦	Bearings ⑧	Shaft ⑨
	Part #	Part #	Part #
#1 TXB 30 H.D. 5HP & UP	717063	703119	100379
#2 TXB 36 H.D. 5HP & UP	717064	703119	100379

WARRANTY:

Soler & Palau USA warrants this equipment to be free from defects in material and workmanship for five (5) years from date of shipment. Any units or parts which prove to be defective and are reported during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Deterioration or wear by heat, abrasive action, chemicals, improper installation or operation or lack of normal maintenance shall not constitute defects, and are not covered by warranty.

The motor is warranted by the motor manufacturer for one year. If the motor becomes defective in the warranty period, it should be taken to the nearest authorized motor service station. If this is not done, the motor manufacturer will not warrant the motor. Call the factory for instructions if authorized service station is not known.

Soler & Palau USA will not be responsible for any installation, removal or re-installation costs or any consequential damage resulting in failure to meet conditions of any warranty.

LIMITATION OF WARRANTY AND LIABILITY

This warranty does not apply to any such S&P product or parts which have failed as a result of faulty installation or abuse, or incorrect electrical connections or alterations, made by others, or use under abnormal operating conditions or misapplication of the products and parts.

Soler & Palau USA will not approve for payment any repairs made outside the factory without prior written consent of its Jacksonville, Florida office.

The foregoing shall constitute our sole and exclusive warranty and our sole and exclusive liability and is in lieu of all other warranties, whether written, oral, implied or statutory. There are no warranties which extend beyond the description of the page hereof. Seller does not warrant that said goods and articles are of merchantable quality or that they are fit for any particular purpose. The liability of seller on any claim of any kind, including negligence, for any loss or damage arising out of or connected with, or resulting from the sale and purchase of the products and parts covered by this proposal, acknowledgement, order or from the performance or breach of any contract pertaining to such sale or purchase, or from the design, manufacture, sale, delivery, resale, installation, technical direction of installation, inspection, repair, operation or use of any products or parts covered by this proposal, acknowledgement, order or furnished by seller shall, in no case exceed the price allocable to the products or parts thereof which give rise to the claim and shall terminate one (1) year after the shipment of said products and parts.

In no event, whether as a result of breach of contract, or warranty or alleged negligence, defects, incorrect advice or other causes, shall seller be liable for special or consequential damages, including, but not limited to, loss of profits or revenue, loss of use of the equipment or any associated equipment, cost of capital, cost of substitute equipment, facilities or services, down time costs, or claims of customers of the purchaser for such damages. Soler & Palau USA neither assumes nor authorizes any persons to assume for it any other liability in connection with the sale of its fan products and parts. Some states do not allow the exclusion or limitation of incidental or consequential damages, so all of the above limitations or exclusions may not apply to you.

SAFETY ACCESSORIES WARNING:

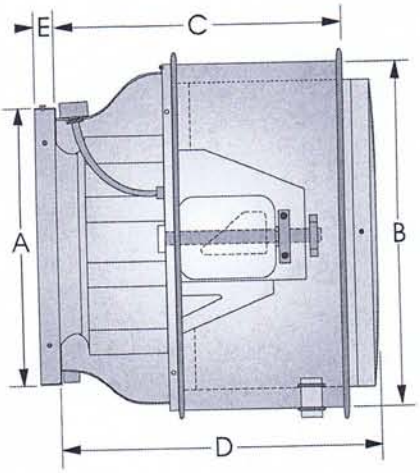
The responsibility for providing safety accessories for equipment supplied by Soler & Palau USA is that of the installer and user of this equipment. Soler & Palau USA sells its equipment with and without safety accessories, and accordingly it can supply such safety accessories upon receipt of order.

The user, in making its determination as to the appropriate safety accessories to be installed and any warning notices, should consider (1) the location of the installation, (2) the accessibility of employees and other persons to this equipment, (3) any adjacent equipment, (4) applicable building codes, and (5) requirements of the Federal Occupational Safety and Health Act. Users and installers of this equipment should read "RECOMMENDED SAFETY PRACTICES FOR AIR MOVING DEVICES" which is published by Air Movement and Control Association, 30 West University Drive, Arlington Heights, Illinois 60004.

MODEL TXBW
BELT DRIVE CENTRIFUGAL SIDEWALL MOUNT EXHAUSTER

6393 Powers Avenue
Jacksonville, Florida 32217-2298
P: 800.961.7370 / F: 800.961.7379
www.solerpalau-usa.com

Soler&Palau Ventilation Group



amca CERTIFIED RATINGS SOUND and AIR PERFORMANCE

c UL us OPTIONAL (Must be specified)

cULus 705
cULus 762 (Grease)

SIZE	DIMENSIONS (IN.)						AVG. SHIP WT. (LBS)	METAL GAUGES				
	A	B	C	D	E	F		WIND BAND	MOTOR COVER	SHROUD	BASE	
											STD/UL	RHUL
8	16-1/2	24	24	27	1-3/4	16	69	.050	.050	.063	.063	16GA
10	16-1/2	27	26	29	1-3/4	16	69	.050	.050	.063	.063	16GA
12/15/16	24	31-1/2	26	29	2-1/2	23-1/2	93	.050	.050	.063	.063	16GA
18/20	29-1/2	37-3/4	28	32	2-1/2	29	120	.050	.050	.063	.080	16GA
24	35-1/2	47-1/4	33-1/2	41	2-1/2	35	245	.050	.050	.100	.080	16GA

A - Inside dimension of fan base.
B - Outside diameter of windband.
C - Length of shroud and windband.
D - Length of fan with motor cover.
E - Depth of mounting flange.
F - Recommended wall opening.

NOTE: Unit comes with disconnect and birdscreen.
UL 762 grease unit does not have birdscreen.

FAN SPECIFICATIONS									MOTOR SPECIFICATIONS				
Line	Qty.	Model No.	Tag	CFM	SP	Fan RPM	BHP	Sones	HP	Volts	Phase	Hertz	Encl
1													
2													
3													
4													
5													

ACCESSORY ITEMS	1	2	3	4	5	ACCESSORY ITEMS	1	2	3	4	5
	☐	☐	☐	☐	☐		☐	☐	☐	☐	☐
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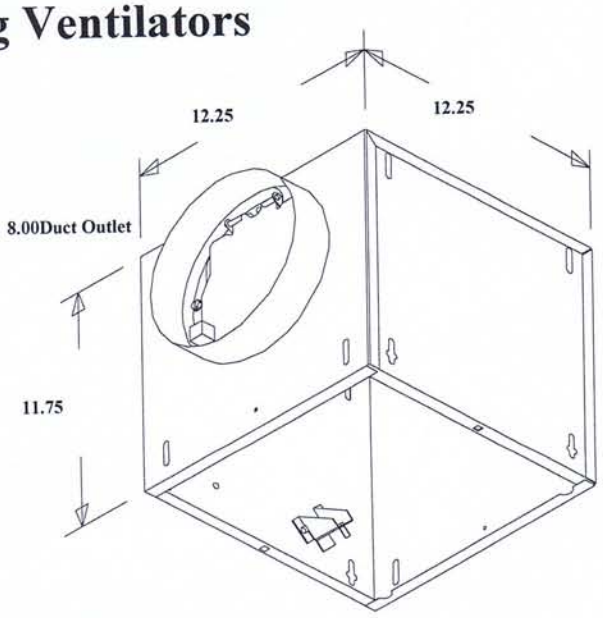
Project: _____ Submitted: _____
Customer: _____ Approved: _____
Location: _____

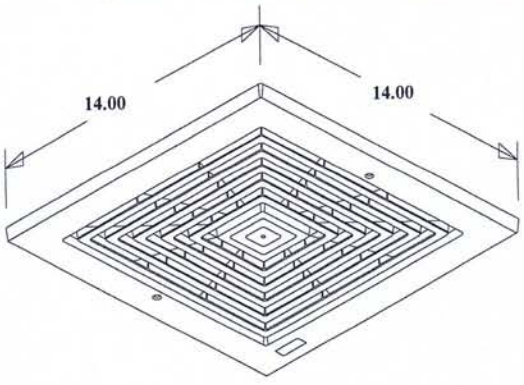
Soler & Palau USA

Ceiling Ventilators

FF200
QTY: 1 Tag: EF-10

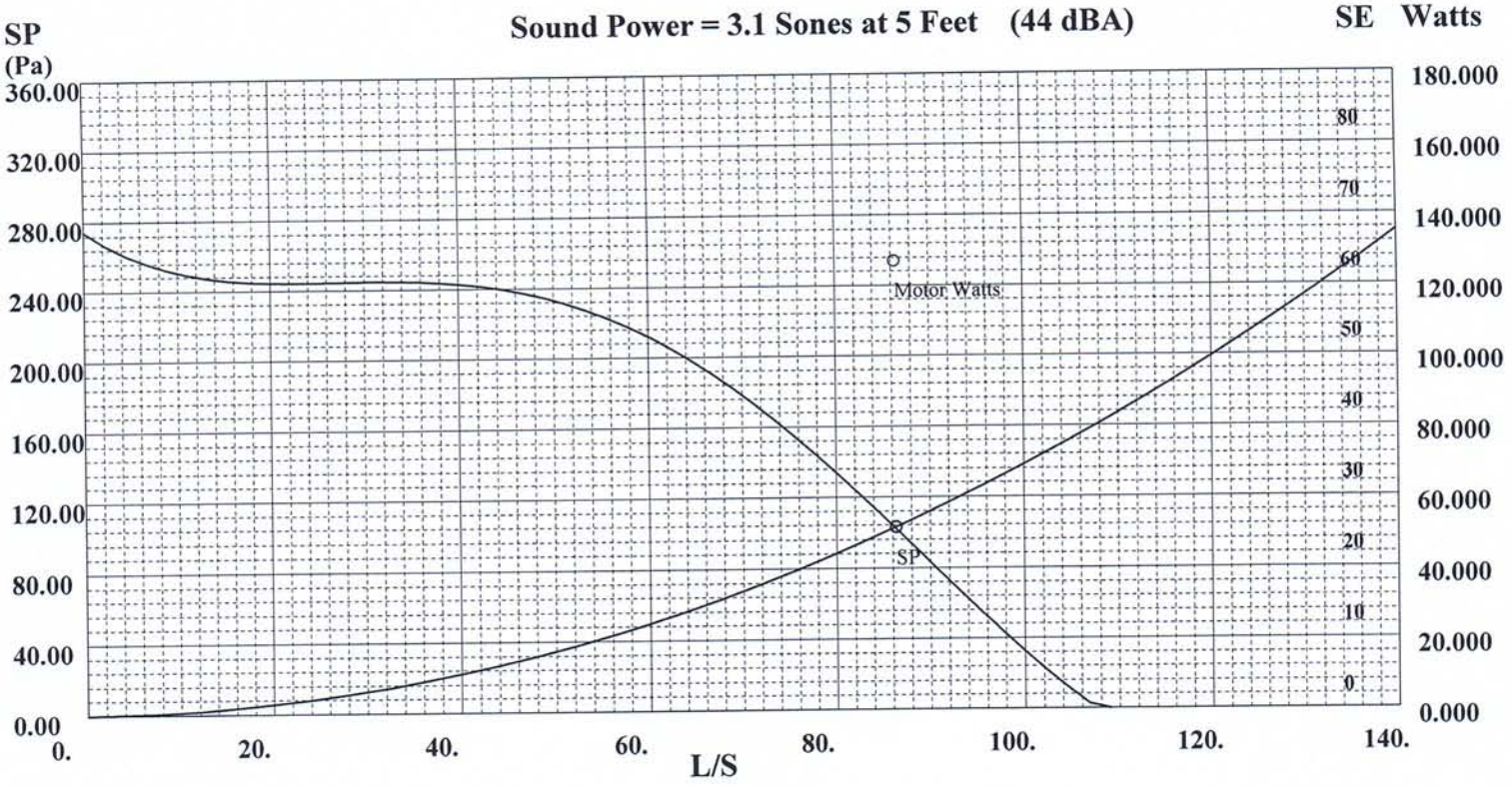
-----Standard Features-----
Low RPM Speed controllable motor
F.C. centrifugal fan wheel (except size 50 & 80)
AMCA Air and Sound Licensed
UL and cUL listed for electrical reliability
Permanently lubricated & thermally protected motor
Low profile white ceiling grill
20 Gauge galvanized steel cabinet
Integral backdraft damper
Resilient Blower/Motor mounts (except sizes 50 & 80)
Convertible to inline cabinet fan (sizes 100 thru 1500)





Dimensions shown in Inches. Dimensions are correct within limits for normal installation. They do not necessarily show actual construction.

740 RPM	127W 120/60/1	
Q (Flow)	**Pressure**	**Power**
86.367 L/S	**102.874 Pa (SP)**	**127W Motor Watts**
0.075 Lb/Ft3	0.519 Pa (VP)	
	103.393 Pa (Total P)	
	194 FPM (TS)	183 FPM (OV)

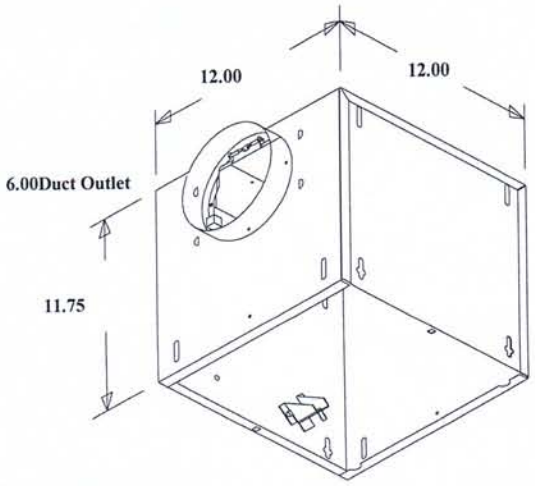


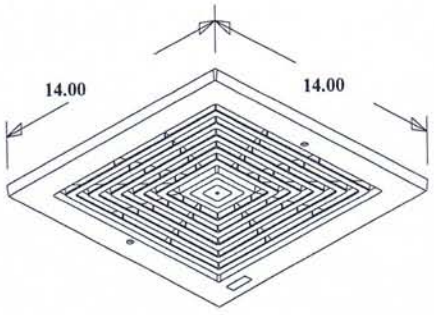
Soler & Palau USA

Ceiling Ventilators

FF150S
QTY: 1 Tag: TF-1

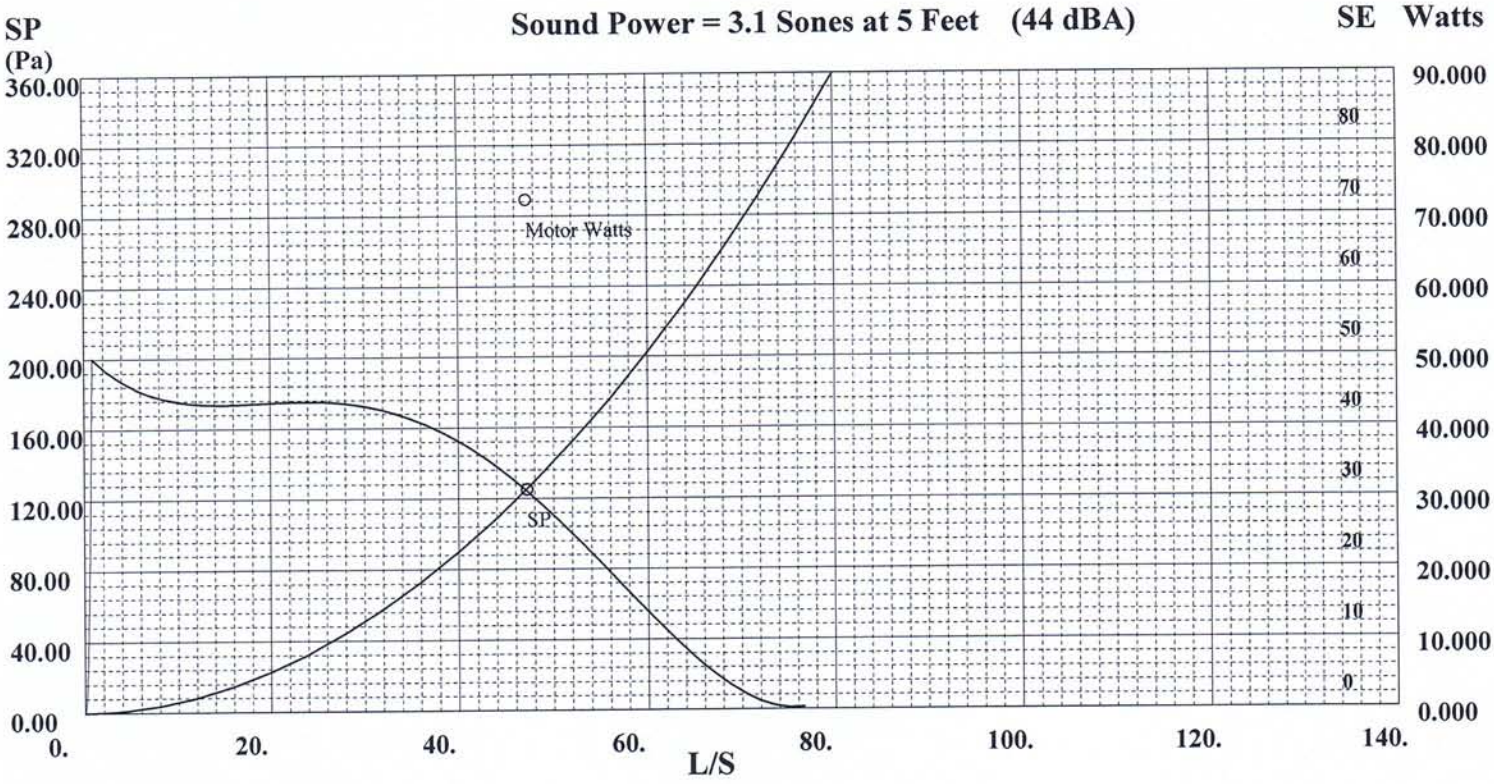
-----Standard Features-----
Low RPM Speed controllable motor
F.C. centrifugal fan wheel (except size 50 & 80)
AMCA Air and Sound Licensed
UL and cUL listed for electrical reliability
Permanently lubricated & thermally protected motor
Low profile white ceiling grill
20 Gauge galvanized steel cabinet
Integral backdraft damper
Resilient Blower/Motor mounts (except sizes 50 & 80)
Convertible to inline cabinet fan (sizes 100 thru 1500)





Dimensions shown in Inches. Dimensions are correct within limits for normal installation. They do not necessarily show actual construction.

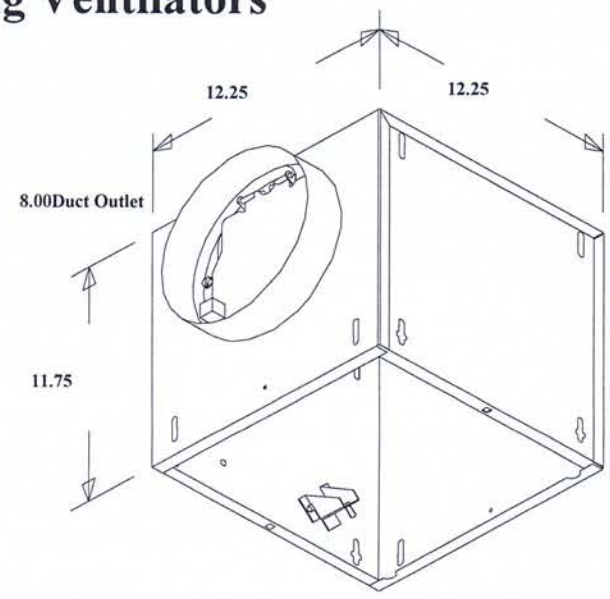
637 RPM	100W 120/60/1	
Q (Flow)	**Pressure**	**Power**
47.195 L/S	**124.997 Pa (SP)**	**72W Motor Watts**
0.075 Lb/Ft3	0.155 Pa (VP)	
	125.152 Pa (Total P)	
	167 FPM (TS)	100 FPM (OV)



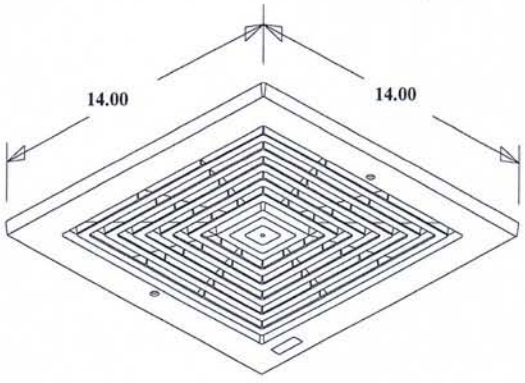
Soler & Palau USA

Ceiling Ventilators

FF200
QTY: 1 Tag: TF-2

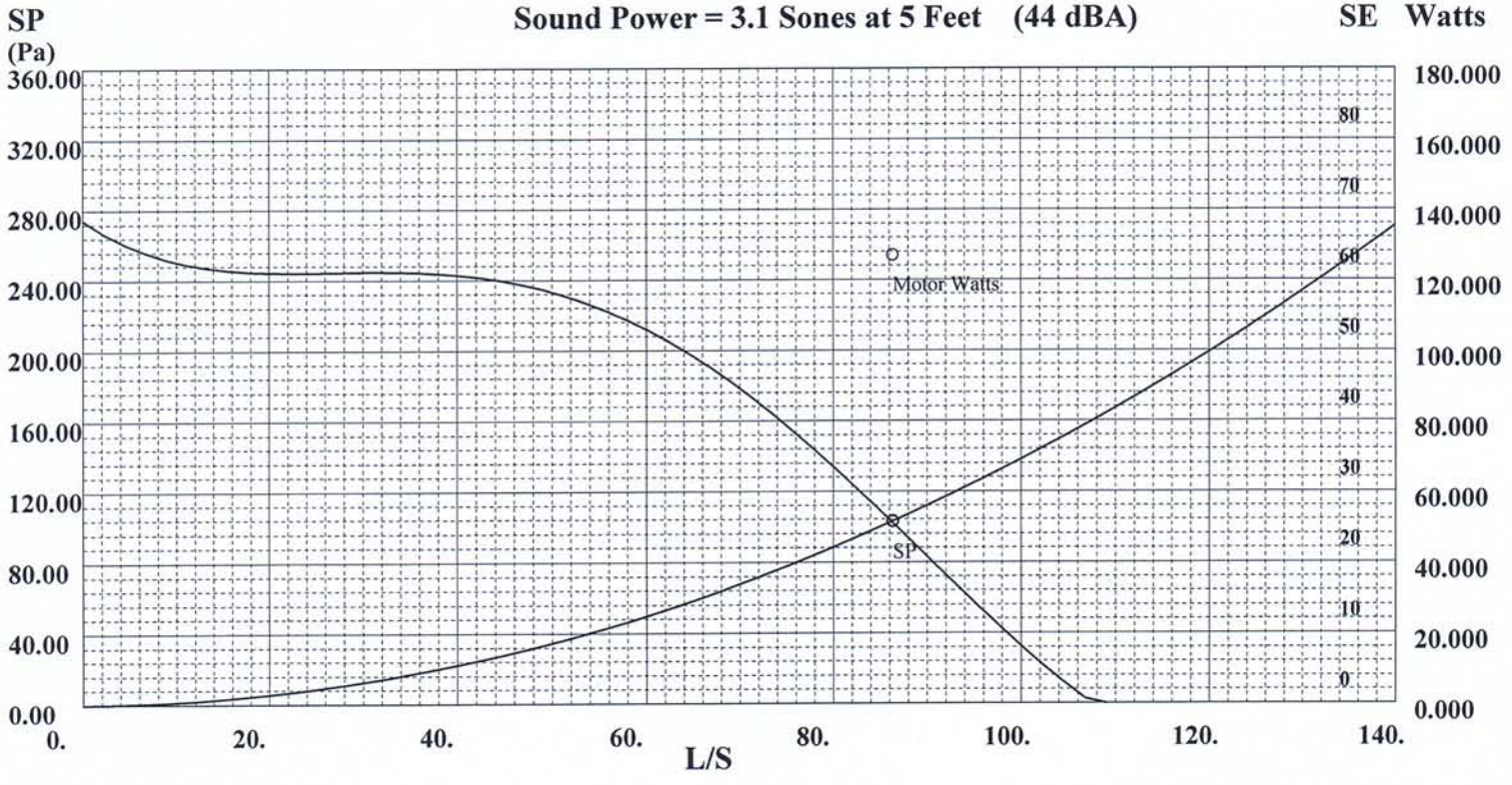


-----Standard Features-----
Low RPM Speed controllable motor
F.C. centrifugal fan wheel (except size 50 & 80)
AMCA Air and Sound Licensed
UL and cUL listed for electrical reliability
Permanently lubricated & thermally protected motor
Low profile white ceiling grill
20 Gauge galvanized steel cabinet
Integral backdraft damper
Resilient Blower/Motor mounts (except sizes 50 & 80)
Convertible to inline cabinet fan (sizes 100 thru 1500)



Dimensions shown in Inches. Dimensions are correct within limits for normal installation. They do not necessarily show actual construction.

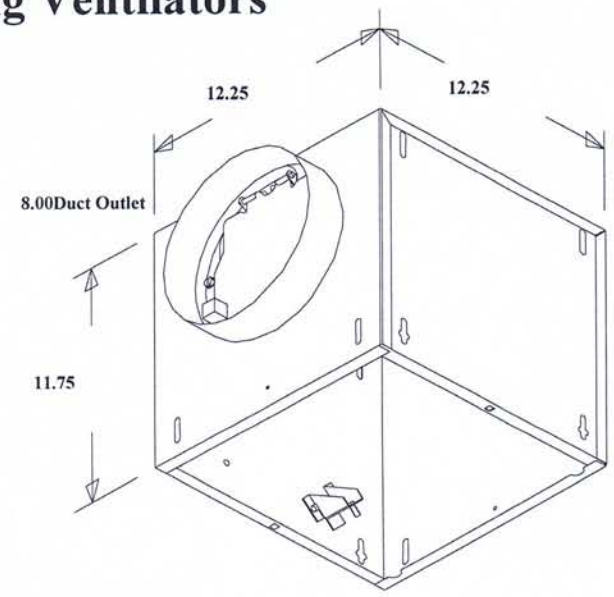
740 RPM	**127W 120/60/1**	
Q (Flow)	**Pressure**	**Power**
86.367 L/S	**102.874 Pa (SP)**	**127W Motor Watts**
0.075 Lb/Ft3	0.519 Pa (VP)	
	103.393 Pa (Total P)	
	194 FPM (TS)	183 FPM (OV)



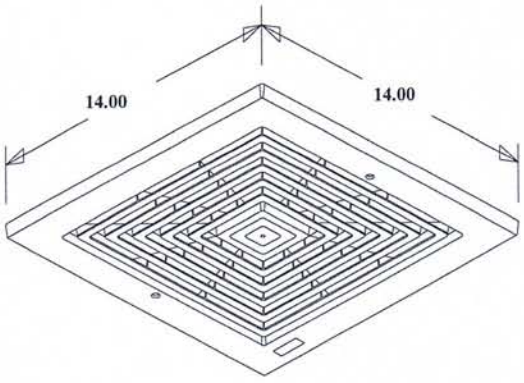
Soler & Palau USA

Ceiling Ventilators

FF200
QTY: 1 Tag: TF-3

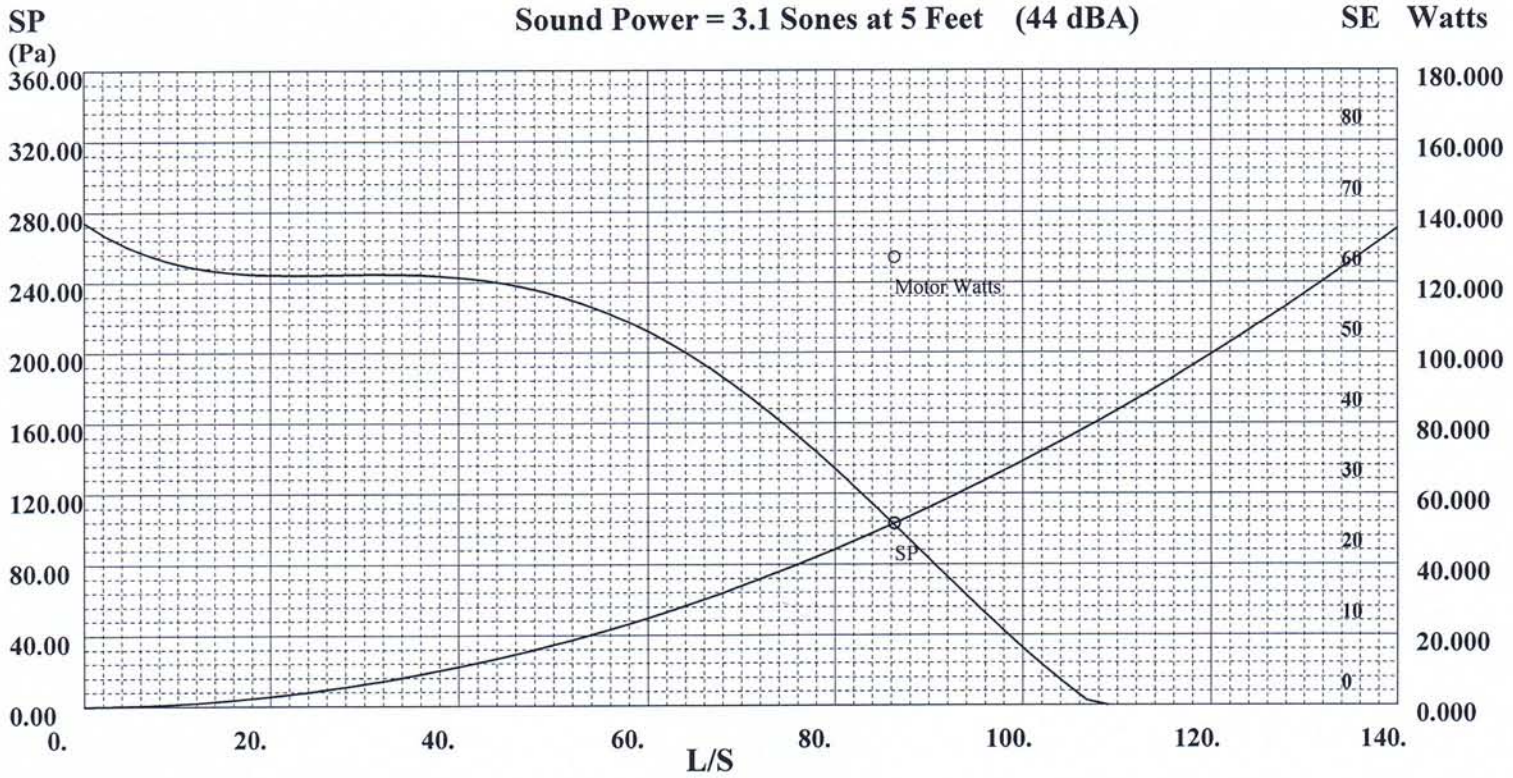


-----Standard Features-----
Low RPM Speed controllable motor
F.C. centrifugal fan wheel (except size 50 & 80)
AMCA Air and Sound Licensed
UL and cUL listed for electrical reliability
Permanently lubricated & thermally protected motor
Low profile white ceiling grill
20 Gauge galvanized steel cabinet
Integral backdraft damper
Resilient Blower/Motor mounts (except sizes 50 & 80)
Convertible to inline cabinet fan (sizes 100 thru 1500)



Dimensions shown in Inches. Dimensions are correct within limits for normal installation. They do not necessarily show actual construction.

740 RPM	**127W 120/60/1**	
Q (Flow)	**Pressure**	**Power**
86.367 L/S	**102.874 Pa (SP)**	**127W Motor Watts**
0.075 Lb/Ft3	0.519 Pa (VP)	
	103.393 Pa (Total P)	
	194 FPM (TS)	183 FPM (OV)



FF & FFC Ceiling & Inline/Cabinet Ventilators

Catalog FF/FFC01-July 2007

COMMERCIAL PRODUCT LINE

The World's Leading Producer of

Air Movement Products

Soler&Palau Ventilation Group

FF/FFC Application

The extremely quiet FF and FFC ventilators are available from 50 to 3600 CFM, with static pressure capabilities to 1". All units have centrifugal blower wheels (except FF50) and low RPM motors on resilient mounts (except FF50 and FF80). These units are used to exhaust air from a variety of commercial and institutional applications, such as restrooms, conference rooms, offices, storage areas, restaurants, retail stores, schools, and similar buildings...anywhere quiet, high-capacity ventilation is needed.

The forward curved centrifugal wheel with its high static pressure capability makes these ventilators suitable for either ducted or nonducted applications. They include removable blower assemblies and plug-in permanently lubricated motors for ease of servicing and cleaning.

A complete selection of accessories including speed controls, wall and roof caps, duct transitions, inline adaptors, metal grill kits and radiation dampers simplify installation.

Features

Grill

- Conceals interior.
- Low profile styling, blends with any decor.
- White polymeric (FF50 - FF300).
- Metal finished with white enamel finish (FF400-FF1500).

Blower

- Low RPM for quiet operation, speed controllable.
- Resilient anti-vibration mounts (FF50 & FF80 rigid mount).
- Balanced, polymeric, centrifugal blower wheel for quiet, efficient performance. (Metal wheel on FFC2000 & FFC3500).
- Permanently lubricated, thermally protected motor.
- Plug-in motor.
- Designed for continuous operation.

Housing

- Rugged, 20 gauge galvanized steel.
- Duct connector.
- 1/2" acoustic insulation inside (except FF50, FF80 & FFC's).
- Integral automatic backdraft damper.
- Easy inline conversion available (FF100-FF1500).
- May be installed in ceiling or wall.
- Mounting brackets for easy installation and adaptability to numerous mounting requirements.
- Factory-shipped in horizontal discharge position - easily converted to vertical discharge.
- FFC inline units have a removable panel which allows for easy motor access without disturbing ductwork.

AMCA Seal

- AMCA Air and Sound Licensed

UL Label

- cULus listed
  (except FF50 & FF80 which are UL only).

Options/Accessories

Roof Cap and Wall Cap

- Weather resistant duct termination.

Inline Adapter Kit

- Converts FF units into inline units.
- Available for FF100 through FF1500

Radiation Damper

- UL rated for use in 1, 2, or 3 hour rated floor-ceiling, roof-ceiling design.
- Mounts directly to the fan, screws provided.
- Galvanized steel frame.
- High temperature, non-asbestos, reinforced fiber thermal fabric.
- 212°F fusible link.
- Stainless steel negator-type closure spring.
- Available for FF100 through FF1500.

Metal Grill Kit

- White enamel painted steel.
- Mounting screws included.
- Available for FF100, FF300, FFC2000 and FFC3500.

Duct Transition

- Allows for quick transition to round ducting.
- Galvanized steel construction.

Vibration Dampening Hangers

- Rubber in shear.
- Heavy-gauge steel construction with neoprene vibration dampening cushion.
- For use with 3/8" threaded rod (by others).

Damper Kit (for FFC 2000 and FFC 3500)

- Twin damper flaps and mounting hardware.
- Foam cushion and magnetic catch assure quiet backdraft prevention.

Quickship Program

Most FF and FFC Models and optional accessories are available on the Quickship Program. This program provides rapid delivery of standard products so that tight project deadlines can be met and downtime on replacement work can be held to a minimum.

Typical Specifications

FF50 & FF80

Ventilator shall have galvanized steel housing with double-strength mounting flanges. It shall be ducted vertically (horizontally) to a roof cap (wall cap).

Motor assembly shall be removable and permanently lubricated.

Air delivery shall be no less and sound levels no greater than listed. All air and sound ratings shall be certified by AMCA. Units shall be U.L. listed.

FF100 - FF1500

Ventilator shall have galvanized steel housing insulated with at least 1/2" of acoustic insulation. Housing to have adjustable mounting brackets.

Automatic backdraft damper to be located within duct connector. Duct connector, blower assembly and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower assembly shall be removable from installed housing and will have a polymeric, dynamically balanced centrifugal-type blower wheel. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be cULus listed.

FFC100 - FFC 1500

Ventilator shall have galvanized steel housing. Housing to have adjustable mounting brackets and removable panel to allow access to motor without disturbing ductwork.

Automatic backdraft damper to be located within duct connection. Duct connector, blower assembly and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower unit shall be removable from housing and will have a polymeric, dynamically balanced centrifugal-type blower wheel. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be cULus listed.

FFC2000 & FFC3500

Ventilator shall have galvanized steel housing lined with acoustic insulation. Housing to have adjustable mounting brackets.

Automatic backdraft dampers to be located within duct connector (optional). Duct connector, blower assembly and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower unit shall be removable from housing and will have a metal, centrifugal-type blower wheels. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be cULus listed.

Optisizer Selection Program

Please refer to Soler & Palau's Optisizer Program for fan curve, submittal information and other details of the FF/FFC series and other Soler & Palau products. Contact your representative or factory for a copy. Visit Soler & Palau's website for additional information at: www.solerpalaucanada.com.

All specifications are subject to change without notice unless approved in submittal by Soler & Palau.

SOLER & PALAU USA LIMITED WARRANTY

Soler & Palau USA (manufacturer), 6393 Powers Avenue, Jacksonville, Florida 32217, warrants equipment of its manufacture to be free from defects in design, materials and workmanship (exclusive of abrasion, corrosion or erosion) for one (1) year from the date of receipt or the date of shipment to the original purchaser or the date of notification of readiness to ship. Motor warranty is one (1) year. In order to claim the benefit of this warranty, buyer must notify manufacturer in writing of the claimed defect within ten (10) days after discovering it and return this equipment or parts to the factory with transportation prepaid. In the event of on-site repair, no service technician will be dispatched until manufacturer receives your written purchase order. If any of the following conditions exist, the warranty will be null and void: **(1)** Buyer has permitted other persons not approved or authorized by manufacturer to alter, adjust, replace or repair the equipment or any part there of. **(2)** Buyer has not followed instructions or other directions given in the contract documents or our maintenance manual. **(3)** When breakage or other loss or damage is the result of any negligence, misuse or fault on the part of any operator or other person not under our supervision or control. **(4)** The defect is the result of designs or drawings made, furnished or specified by others. **(5)** In the case of goods not manufactured but supplied by the manufacturer as part of a contract, manufacturer shall only be liable to the same extent that our supplier is to manufacturer, not to exceed any liability manufacturer would have for warranty on our own equipment. **(6)** Buyer has not paid in full any invoices submitted to buyer which are due for payment. **(7)** Unusual wear and tear of the equipment. Statements relating to the product, its use or installation made prior to the execution of the agreement, are not warranties except to the extent that the contrary is expressly set forth herein. It is understood that such statements were not intended to, and did not, form a part of the agreement; they were merely made in the course of negotiations of the parties. **THIS WARRANTY IS IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. OUR SOLE AND EXCLUSIVE OBLIGATION UNDER THIS WARRANTY IS TO REPAIR OR REPLACE DEFECTIVE EQUIPMENT OR PARTS OR, AT OUR OPTION, TO PAY THE REASONABLE COST OF REPAIR OR REPLACEMENT. BUYER AGREES THAT NO OTHER REMEDY (INCLUDING, BUT NOT LIMITED TO, INCIDENTAL OR CONSEQUENTIAL DAMAGES, DAMAGES FOR LOST PROFITS OR SALES, OR DAMAGES FOR INJURIES TO PERSON OR PROPERTY) SHALL BE AVAILABLE. NOTWITHSTANDING THE ABOVE, THE TOTAL AMOUNT THAT MAY IN ANY EVENT BE PAYABLE IN SETTLEMENT OF LIABILITY, HOWEVER INCURRED, SHALL NOT EXCEED THE CONTRACT PRICE.**

Model FF Performance Data

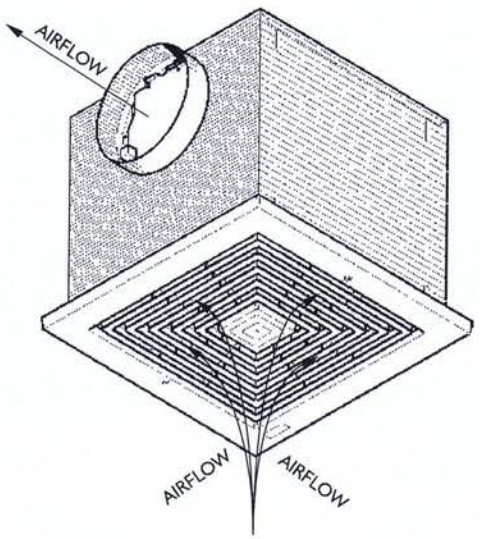
FF CEILING VENTILATORS

MODEL FF	CFM / Sones at Static Pressure (PS - Inches of H_2O)										AMPS @ 60HZ/ WATTS	RPM @ 1/8	Voltage	Average Ship Wt. Lbs
	0	1/10	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1				
100	136	115	109	93	80	65	44	-	-	-	1.1/87	640	120	23
	0.5	0.8	0.9	1.3	1.8	2.3	3.0	-	-	-				
150	181	161	157	141	132	124	114	94	62	-	1.3/100	710	120	23
	1.3	1.4	1.5	2.2	2.6	3.1	3.6	4.1	4.6	-				
200	231	214	210	196	186	177	165	144	113	51	1.8/127	740	120	23
	1.6	1.8	1.7	2.3	2.9	3.5	4.1	4.9	5.3	5.3				
250	272	261	259	250	242	233	218	201	165	99	2.1/166	830	120	23
	2.1	2.3	2.2	2.9	3.3	3.9	4.4	4.8	5.5	5.8				
300	312	309	308	303	296	287	273	254	219	125	2.6/212	905	120	23
	2.8	2.9	2.9	3.3	3.5	3.9	4.3	4.7	5.1	5.6				
400	480	442	434	388	344	299	229	182	114	-	1.4/146	735	120	34
	2.0	2.4	2.3	2.8	3.3	3.8	4.5	4.8	5.4	-				
500	538	520	514	491	463	434	389	339	282	186	2.2/232	810	120	34
	3.0	3.1	3.3	3.6	4.0	4.4	5.0	5.7	6.2	6.7				
700	722	704	701	667	640	607	571	534	453	333	2.9/313	960	120	34
	4.5	4.6	4.7	4.8	5.0	5.2	5.6	6.2	7.1	7.2				
900	918	905	901	877	842	793	725	636	536	390	3.0/306	650	120	64
	3.8	4.0	4.1	4.0	4.2	4.3	4.4	4.9	4.5	5.3				
1500	1578	1526	1513	1438	1371	1285	1198	1103	1000	816	5.0/468	955	120	64
	8.6	8.4	8.4	8.1	7.5	7.0	6.7	6.2	5.8	5.8				

COMPACT FF CEILING VENTILATORS

MODEL FF	CFM / Sones at Static Pressure (PS - Inches of H_2O)										AMPS @ 60HZ/ WATTS	RPM @ 1/8	Voltage	Average Ship Wt. Lbs
	0	1/10	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1				
50	52	49	47	42	29	-	-	-	-	-	0.8/48	1870	120	4
	3.9	4.3	4.4	4.6	5.5	-	-	-	-	-				
80	89	81	80	68	36	-	-	-	-	-	0.75/48	1280	120	7
	3.9	3.8	3.8	3.8	3.9	-	-	-	-	-				

Performance ratings include the effects of inlet grill and backdraft damper. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5' (1.5m) in a hemispherical free field calculated per AMCA Standard 301. Values shown are for installation Type B: free inlet fan sone levels. Performance certified is for installation Type B: Free inlet, Ducted outlet.



Soler & Palau USA, Div. of Soler & Palau Ventilation Group, certifies that the Models FF/FFC shown herein are licensed to bear the AMCA Seal. The ratings shown are based on test and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirement of the AMCA Certified Ratings Program.

FFC INLINE/CABINET VENTILATORS

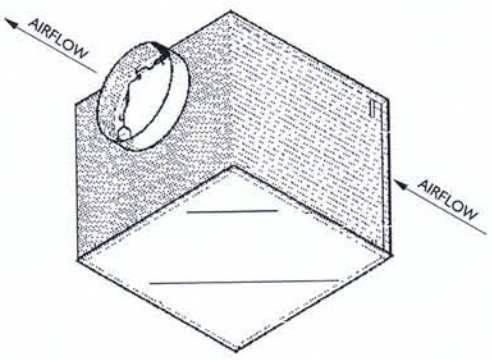
MODEL FFC	CFM / Sones at Static Pressure (PS - Inches of H_2O)										AMPS @ 60HZ/ WATTS	RPM @ 1/8	Voltage	Average Ship Wt. Lbs.
	0	1/10	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1				
100	121	108	106	97	93	86	70	44	-	-	1.0/87	760	120	23
	0.5	0.7	0.7	1.1	1.4	1.8	2.1	2.4	-	-				
150	153	148	147	140	134	125	111	91	54	-	1.3/100	920	120	23
	0.9	1.0	1.1	1.4	1.6	1.9	2.1	2.2	2.4	-				
200	205	196	195	190	185	175	158	135	96	47	1.8/127	865	120	23
	1.7	1.9	1.9	2.1	2.3	2.4	3.0	3.3	3.4	3.4				
250	248	245	245	241	235	224	208	183	141	84	2.1/166	1005	120	23
	2.0	2.3	2.3	2.8	2.8	3.2	3.4	3.6	3.9	3.8				
300	300	294	293	285	274	259	243	214	168	113	2.6/212	1145	120	23
	2.9	3.0	3.1	3.3	3.4	3.5	3.6	3.7	4.0	3.9				
400	450	415	406	360	313	271	223	167	90	6.0	1.4/146	775	120	34
	1.4	1.6	1.6	1.9	2.2	2.6	2.9	3.4	3.6	3.9				
500	546	526	519	496	472	447	407	364	306	232	2.2/232	890	120	34
	2.4	2.4	3.4	3.7	3.9	3.8	3.9	4.0	4.3	4.3				
700	704	686	681	656	631	604	575	533	480	412	2.9/313	1090	120	34
	3.6	3.8	3.7	3.9	4.0	4.2	4.3	4.4	4.7	5.0				
900	930	902	894	853	807	754	685	587	442	300	3.0/306	810	120	64
	3.7	3.8	3.8	3.8	3.7	3.8	3.9	4.0	4.0	4.1				
1500	1275	1228	1214	1152	1092	1029	958	871	764	631	5.0/468	1055	120	64
	6.8	6.8	6.7	6.5	6.3	6.0	6.0	6.0	6.0	6.1				

Performance ratings include the effects of backdraft damper. Speed (RPM) shown is nominal. Performances based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5" (1.5m) in a hemispherical free field calculated per AMCA Std. 301. Values shown are for installation Type D: ducted inlet fan sone levels. Ratings do not include the effect of duct end correction. Performance ratings include the effects of 18 feet of round inlet duct and, if needed, a rectangular to round duct transition in the airstream. Performance certified is for Installation Type D; Ducted inlet, Ducted outlet.

FFC CABINET VENTILATORS

MODEL FFC	CFM / Sones at Static Pressure (PS - Inches of H_2O)										AMPS @ 60HZ/ WATTS	RPM @ 1/8	Voltage	Average Ship Wt. Lbs.
	0	1/10	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1				
2000	1891	1803	1791	1657	1508	1347	1165	808	-	-	5.8/590	965	120	92
	10.3	9.8	9.4	9.0	8.6	9.1	8.9	7.0	-	-				
3500	3605	3498	3452	3278	3073	2983	2679	2429	2093	1693	5.4/1205	1105	240	139
	15.3	14.8	14.5	14.1	13.1	12.8	12.1	11.8	11.9	10.8				

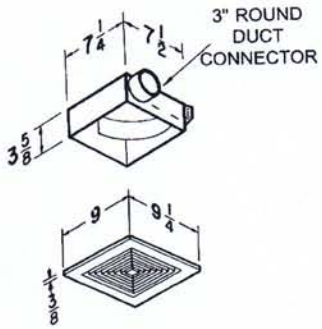
Performance ratings do not include the effects of appurtenances (accessories). Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5' (1.5m) in a hemispherical free field calculated per AMCA Std. 301. Values shown are for installation Type D: ducted inlet fan sone levels. Ratings do not include the effect of duct end correction. Performance certified is for Installation Type D: Ducted inlet, Ducted outlet.



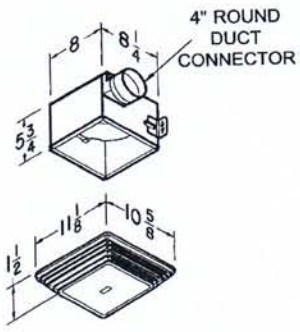
Soler & Palau USA, Div. of Soler & Palau Ventilation Group, certifies that the Models FF/FFC shown herein are licensed to bear the AMCA Seal. The ratings shown are based on test and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirement of the AMCA Certified Ratings Program.

CEILING VENTILATOR

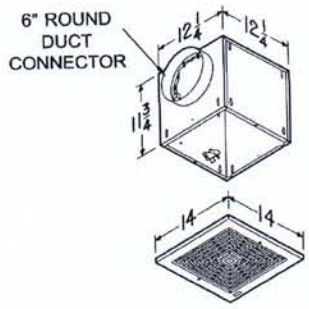
FF50



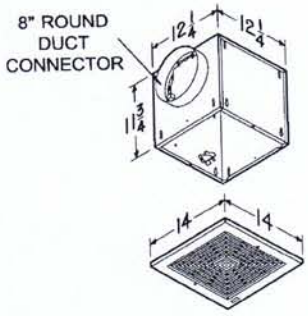
FF80



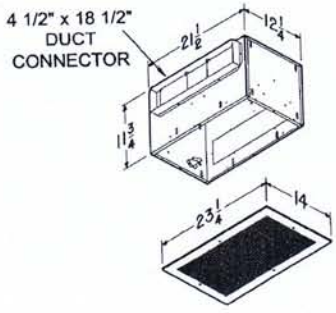
FF100 & 150



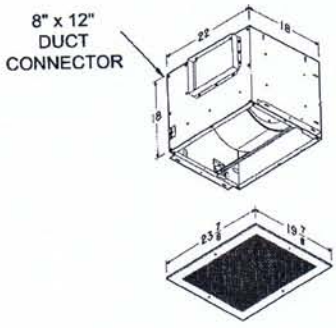
FF200, 250 & 300



FF400, 500 & 700

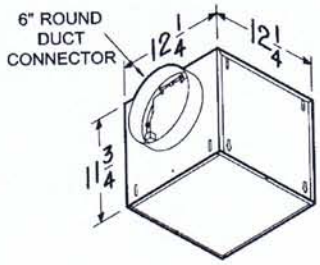


FF900 & 1500

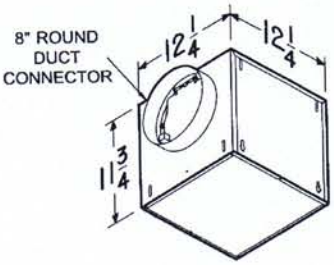


Inline/Cabinet Ventilator

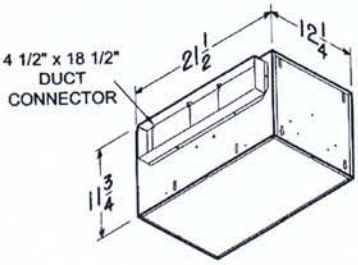
FFC100 & 150



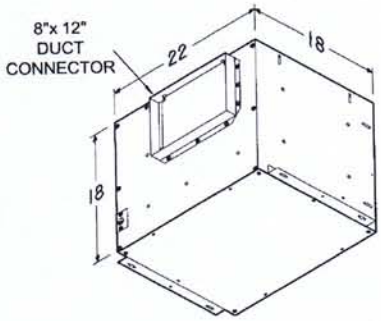
FFC200, 250 & 300



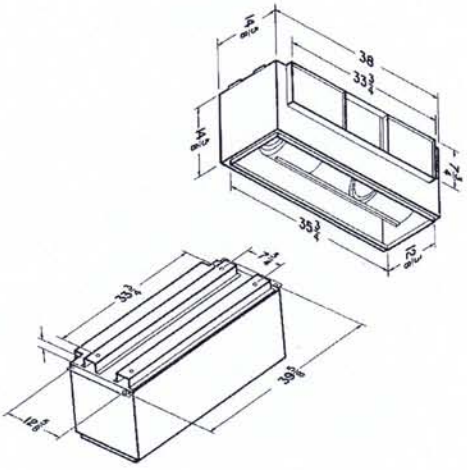
FFC400, 500 & 700



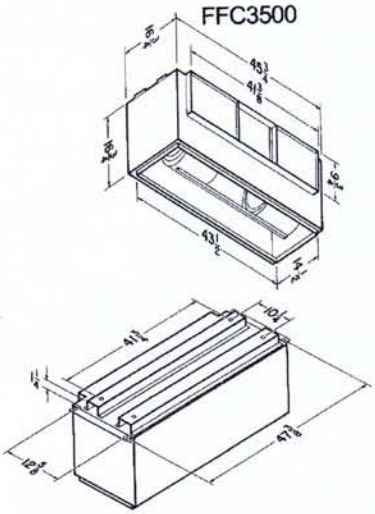
FFC900 & 1500



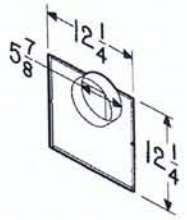
FFC2000



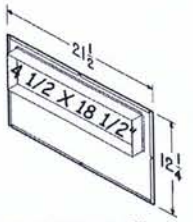
FFC3500



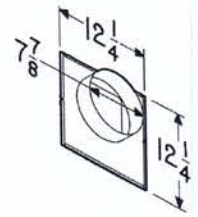
Accessories



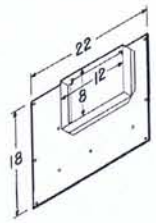
961L In-Line Adaptor Kit
- Galvanized steel
- Fits FF100 & FF150
- For 6" round duct intake



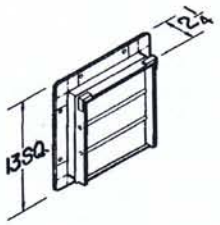
982L In-Line Adaptor Kit
- Galvanized steel
- Fits FF400, FF500 & FF700
- 4 1/2 x 18 1/2" duct intake



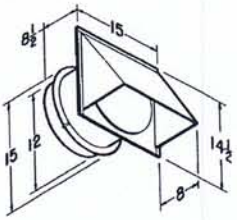
981L In-Line Adaptor Kit
- Galvanized steel
- Fits FF200, FF250 & FF300
- For 8" round duct intake



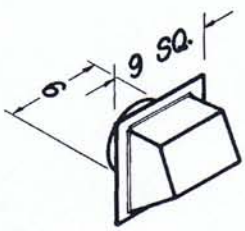
983 In-Line Adaptor Kit
- Galvanized steel
- Fits FF900 & FF1500
- 8" x 12" round duct intake



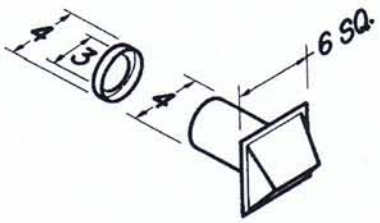
Model 441 Wall Cap
- Gravity dampers
- Collar with birdscreen for attaching 10" round duct
- Steel construction with aluminum louvers



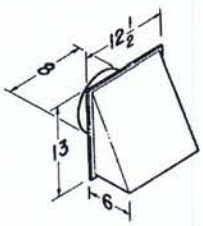
Model 613 Wall Cap
- High Capacity
- Built-in backdraft damper & birdscreen
- Aluminum natural finish
- For 12" round duct



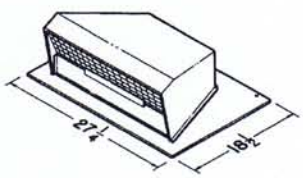
Model 641 Wall Cap
- Aluminum natural finish
- Built-in backdraft damper & birdscreen
- For 6" round duct



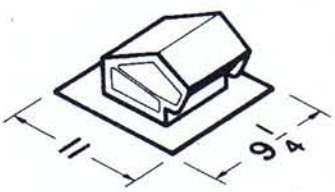
Model 642 Wall Cap
- Aluminum natural finish
- Built-in backdraft damper & birdscreen
- For 3" or 4" round duct
  (4" to 3" transition included)



Model 643 Wall Cap
- Aluminum natural finish
- Built-in backdraft damper
- For 8" round duct

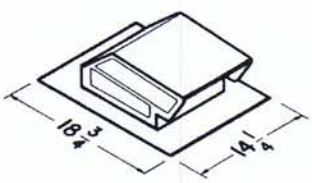


Model 437 Roof Cap
- High capacity design - up to 1200 CFM
- Built-in birdscreen
- Steel, black electrically - bonded epoxy finish



Model 636 Roof Cap
- Black electrically - bonded epoxy finish
- Built-in backdraft damper & birdscreen
- For 3" or 4" round duct

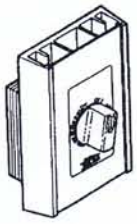
Model 636AL - Aluminum



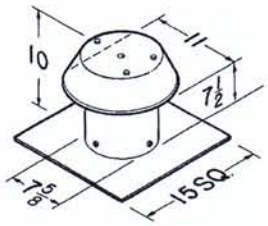
Model 634 Roof Cap
- Black electrically - bonded epoxy finish
- Built-in backdraft damper & birdscreen
- For 3 1/4" x 10" or up to 8" round duct

Model 644 - Aluminum

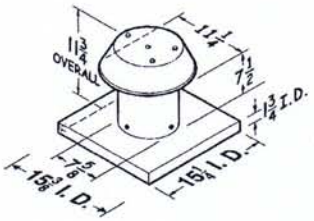
Accessories (Cont.)



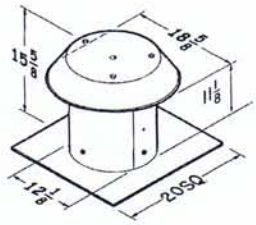
Speed Control
- Adjust speed from 100 to 50%
- 5 amp & 10 amp - 120V
- 6 amp - 240V
- 6 amp - 277V



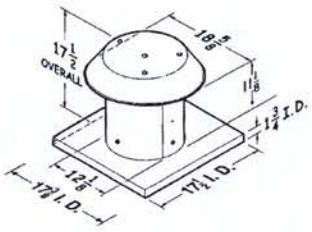
Model 611 Flat Roof Cap
- For flat roof installation
- Aluminum - natural finish
- Built-in birdscreen
- For up to 8" round duct



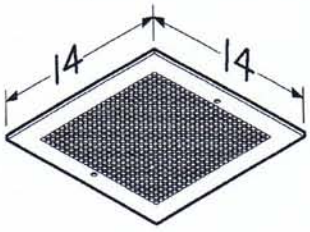
Model 611CM
Curb Mount Roof Cap
- For curb mount installation
- Aluminum - natural finish
- Built-in birdscreen
- For up to 8" round duct



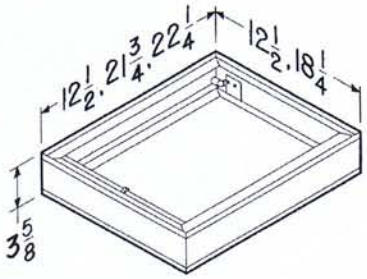
Model 612 Flat Roof Cap
- For flat roof installation
- Aluminum - natural finish
- Built-in birdscreen
- For up to 12" round duct



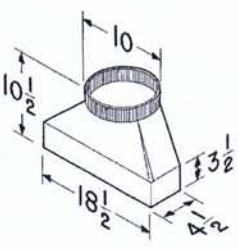
Model 612CM
Curb Mount Roof Cap
- For curb mount installation
- Aluminum - natural finish
- Built-in birdscreen
- For up to 12" round duct

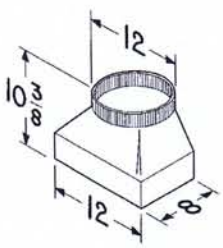


Model MG 1 Metal Grill Kit
- White enamel painted steel
- Mounting screws included
- Fits FF100, FF150, FF200, FF250 & FF300

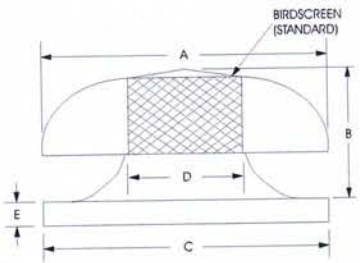


Models 423 & T81212 Duct Transitions
- Galvanized steel
- Allows for quick transition to easy-to-obtain-and-install round ducting
- 423 (4 1/2" x 18" to 10 round) for use with FF400 thru FF700
- T81212 (8" x 12" to 12" round) for use with FF900 and FF1500





Models RD1, RD2 & RD3 Radiation Dampers
- UL rated for use in 1, 2 or 3 hour rated floor-ceiling, roof-ceiling design
- Galvanized steel frame
- High temperature, non-asbestos, reinforced fiber thermal fabric
- 212°F fusible link
- Stainless steel negator-type closure spring
- RD1 (12 1/4' x 12 1/4") fits FF100 - FF300
- RD2 (211/2" x 18") fits FF400 - FF700
- RD3 (22" x 18") fits FF900 - FF1500



Model RCXII - 18" and 20" units

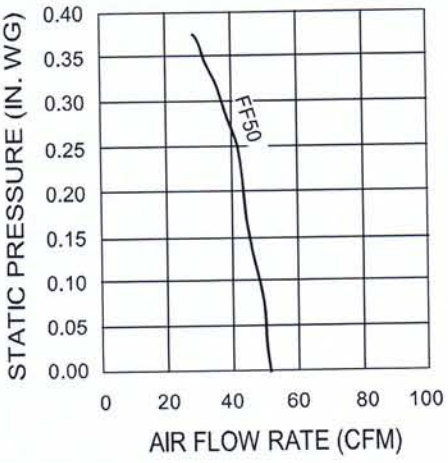
Size	A	B	C	D	E	Est. Wt.
18	32 3/4	12 1/2	29 1/2	18 5/8	2	35
20	32 3/4	12 1/2	29 1/2	20	2	35

Optional Accessory Compatibility Chart

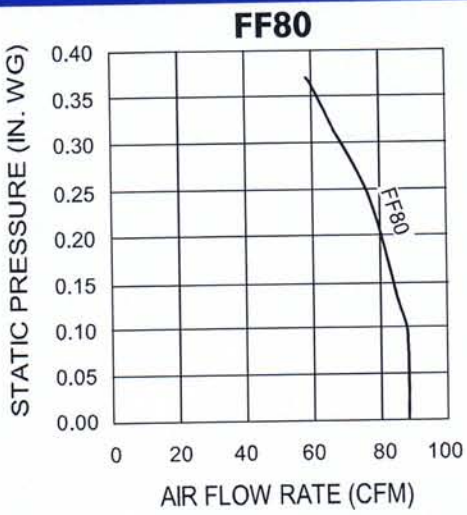
	CEILING MOUNT MODEL FF							IN-LINE/CABINET MODEL FFC						
VARIABLE SPEED CONTROLS	FF50 FF80	FF100 FF150	FF200 FF250 FF300	FF400 FF500	FF700	FF900	FF1500	FFC100 FFC150	FFC200 FFC250 FFC300	FFC400 FFC500 FFC700	FFC900	FFC1500	FFC2000	FFC3500
2727.1 (5 AMP 120V)	X	X	X	X			X	X						
2828.1 (10AMP 120V)		X	X	X	X	X	X	X	X	X	X	X	X	
80L **in-unit** speed control (3 Amp 120 Volt) Ships separately for field mounting		X	X	X	X	X		X	X	X	X			
75V (240V)		X	X	X	X	X								X
277V (277V)		X	X	X	X	X	X							
ROOF CAPS														
437				X	X					X				
611,611 CM	X	X	X					X	X					
612,612CM		X	X	X	X	X	X	X	X	X	X	X	X	
634M		X						X						
634,644		X	X					X	X					
636, 636AL	X													
RCX II - 18													X	
RCX II - 20														X
WALL CAPS														
441				X	X					X				
613						X	X				X	X		
641		X						X						
642	X													
643			X						X					
IN-LINE ADAPTERS														
961L		X												
981L			X											
982L				X	X									
983L						X	X							
UL RADIATION DAMPERS														
RD1		X	X											
RD2				X	X									
RD3						X	X							
METAL GRILL KIT														
G102													X	
G103														X
MG1		X	X											
DUCT TRANSITIONS														
423				X	X					X				
T81212						X	X				X	X		
DAMPER KITS														
D100													X	
D101														X
VIBRATION DAMPENING HANGERS (4)														
V102	X	X	X	X	X	X	X	X	X	X	X			
V104		X	X	X	X	X	X	X	X	X	X	X	X	X

FF Ceiling Ventilators Quick Selection Guide

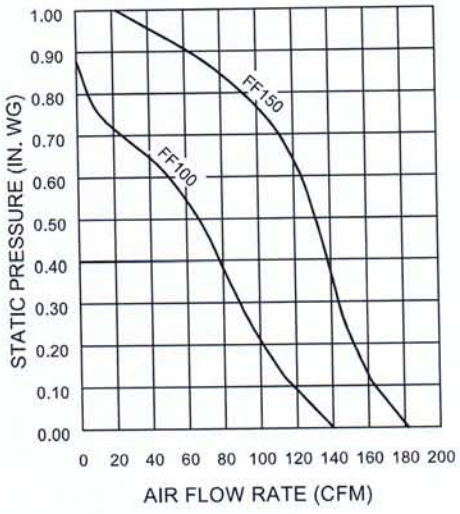
FF50



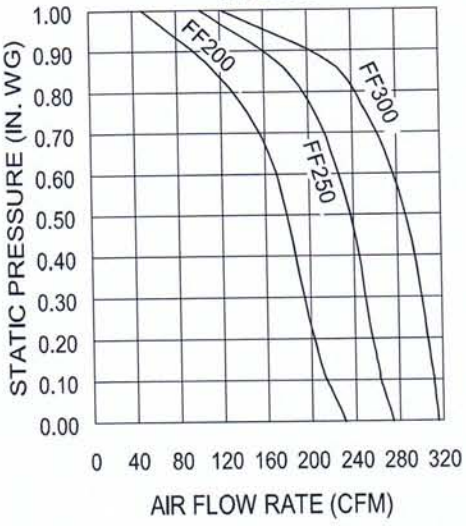
FF80



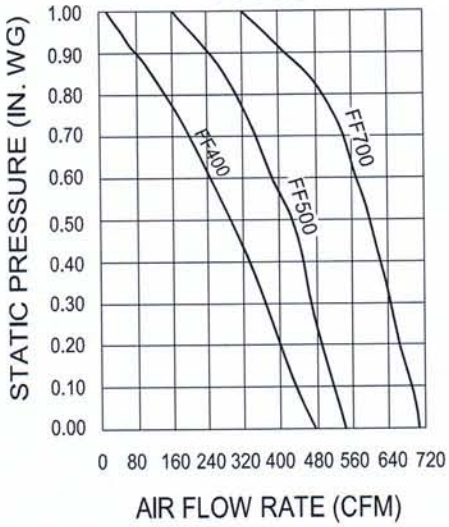
FF100, FF150



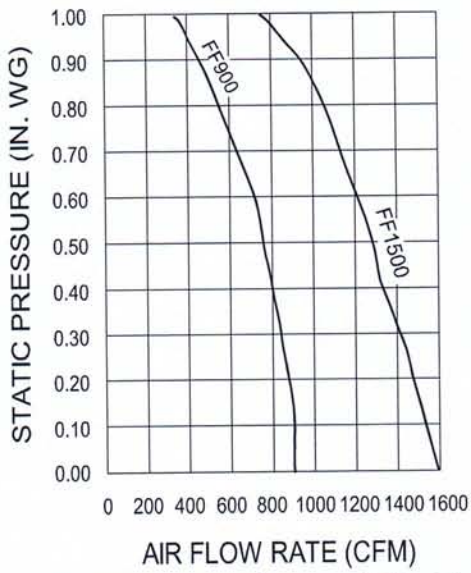
FF200, FF250, FF300



FF400, FF500, FF700

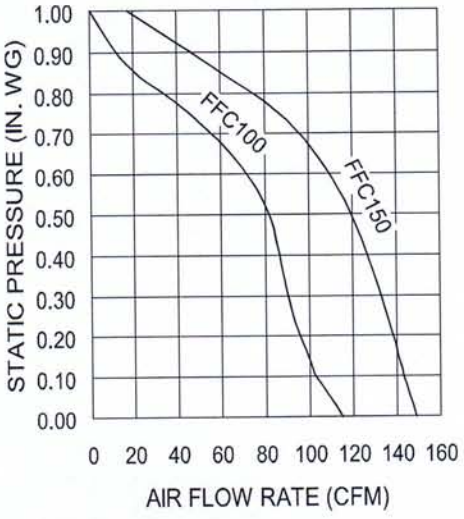


FF900, FF1500

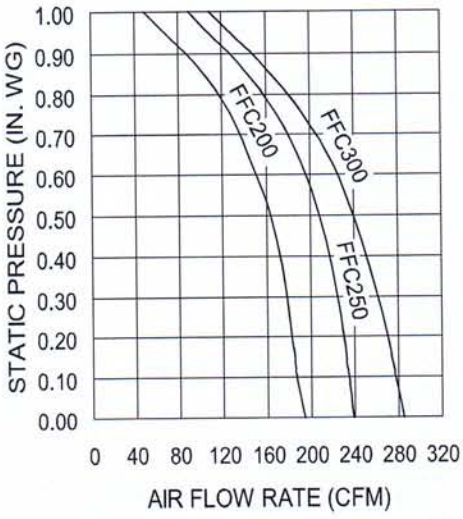


Models FF50, 80, 100, 150, 200, 250, 300, 400, 500, 700, 900, and 1500 Performance certified is for installation type B: Free inlet, Ducted outlet. Performance ratings include the effects of inlet grille and backdraft damper.

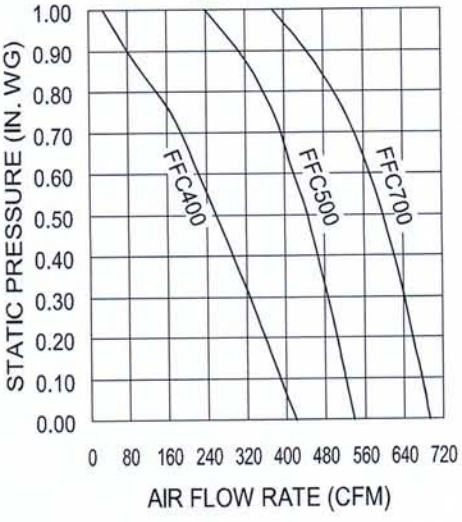
FFC100, FFC150



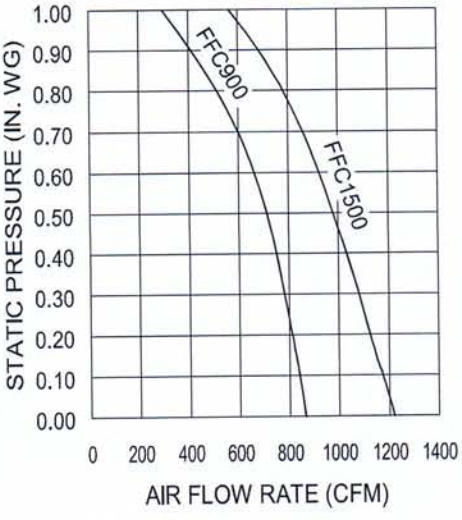
FFC200, FFC250, FFC300



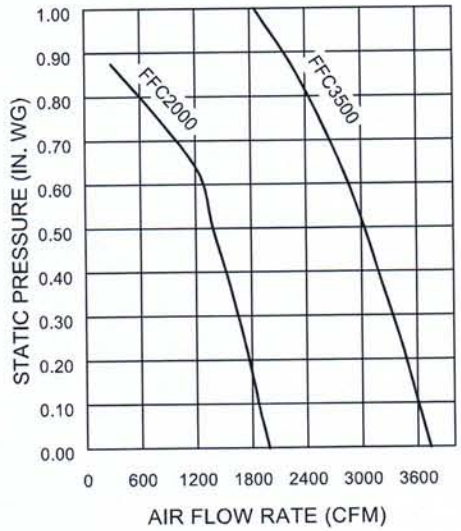
FFC400, FFC500, FFC700



FFC900, FFC1500



FFC2000, FFC3500



FF & FFC QUICK SELECTION GUIDELINES

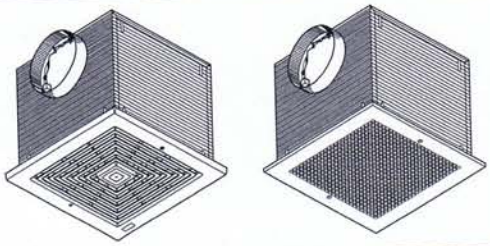
1. Locate desired CFM on bottom horizontal axis of graph.
2. Locate system static pressure on left vertical axis of graph.
3. Determine intersection of CFM and static pressure.
4. Select fan curve to the right of this intersection.
5. Solid state speed control may be used for selections left of curve, up to 50% CFM reduction.

Models FFC100, 150, 200, 250, 300, 400, 500, 700, 900 and 1500 Performance certified is for installation type D: Ducted inlet, Ducted outlet. Performance ratings include the effects of back-draft damper, 18 feet of round inlet duct and, if needed, a rectangular to round duct transition.

Models FFC2000 and 3500 Performance certified is for installation type D: Ducted inlet, Ducted outlet. Performance ratings do not include the effects of appurtenances (accessories).

BROAN® LoSone Select® SPECIFICATION SHEET

LOSONE SELECT®
CEILING MOUNT VENTILATORS
L100 SERIES & L150 SERIES



Incredibly reliable. Unbelievably quiet. Offering the CFM choices you need at the lowest sound levels in the industry.

FEATURES

GRILLE:
- Conceals interior
- Low profile styling blends with any decor
- White polymeric ("MG" models - metal, finished with white painted enamel)

BLOWER:
- Low RPM for quiet operation
- Resilient anti-vibration mounts
- Dynamically-balanced, polymeric, centrifugal blower wheel for quiet, efficient performance
- Permanently lubricated, thermally protected motor
- Plug-in motor rated at 120 VAC
- Designed for continuous operation

HOUSING:
- Rugged, 20 gauge galvanized steel
- 6" round duct connector
- 1/2" acoustic insulation inside
- May be installed in ceiling or wall (size permitting)
- 8-position mounting brackets for easy installation and greater adaptability to various mounting requirements
- Automatic backdraft damper located within duct connector
- Factory-shipped in horizontal discharge position - easily converted to vertical discharge
- May be installed as an in-line ventilator with addition of accessory kit Model 961L (see "Accessories")

ACCESSORIES (purchase all separately):
- Model 57V (Ivory) / 57W (White) Electronic Variable Speed Control
- Model 59V (Ivory) / 59W (White) 60-Minute Time Control
- Model 61V (Ivory) / 61W (White) 15-Minute Time Control
- Model 71V (Ivory) / 71W (White) 12-Hour Time Control
- Electronic Variable Speed Controls – Model 72V (120 VAC)
- Model 961L In-line Adapter Plate
- Model RD1 Radiation Damper

TYPICAL SPECIFICATION

Ventilator shall be Broan Model L100, (L100MG), (L150), (L150MG).

Ventilator shall have galvanized steel housing insulated with at least 1/2" of acoustic insulation. Housing to have adjustable mounting brackets.

Automatic backdraft damper to be located within duct connector. Duct connector, blower assembly and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower unit shall be removable from housing and will have a polymeric, dynamically balanced centrifugal-type blower wheel. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be UL and cUL listed.

"Broan-NuTone LLC certifies that the models shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 (and AMCA Publication 311 if sound is also certified) and comply with the requirements of the AMCA Certified Ratings Program"

UL c UL

UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

REFERENCE	QTY.	REMARKS

Project	
Location	
Architect	
Engineer	
Contractor	
Submitted by	**Date**

PERFORMANCE RATINGS - LOSONE SELECT® CEILING MOUNT VENTILATORS L100 SERIES & L150 SERIES

AMCA LICENSED PERFORMANCE

MODEL NO.	NOMINAL VOLTAGE	CFM / SONES - AT STATIC PRESSURES (Ps - inches of H_2O)	0.0" Ps	.10" Ps	.125" Ps	.250" Ps	.375" Ps	.50" Ps	.625" Ps	.750" Ps	.875" Ps	1.0" Ps	NOMINAL RPM	AMPS @60 Hz	WATTS
L100	120 VAC	CFM Hor.	136	115	109	93	80	65	44	12			640	1.1	87
		SONES Hor.	0.5	0.8	0.9	1.3	1.8	2.3	3.0	3.2					
		CFM Ver.	138	117	112	94	80	67	46	13			650	1.1	87
		SONES Ver.	0.7	0.9	1.0	1.3	1.8	2.2	2.8	3.0					
L100MG	120 VAC	CFM Hor.	144	121	115	97	83	68	46	12			630	1.1	87
		SONES Hor.	0.5	0.8	0.9	1.2	1.8	2.4	3.0	3.3					
		CFM Ver.	142	119	115	95	80	67	45	13			640	1.1	87
		SONES Ver.	0.5	0.8	0.9	1.4	1.8	2.3	2.9	3.1					
L150	120 VAC	CFM Hor.	181	161	157	141	132	124	114	94	62		710	1.3	100
		SONES Hor.	1.3	1.4	1.5	2.2	2.6	3.1	3.6	4.1	4.6				
		CFM Ver.	179	163	160	149	142	133	122	105	73	23	750	1.3	100
		SONES Ver.	1.4	1.6	1.6	2.0	2.5	3.0	3.3	3.6	3.9	4.2			
L150MG	120 VAC	CFM Hor.	184	165	161	148	141	135	126	108	74	19	710	1.3	100
		SONES Hor.	1.1	1.4	1.4	1.9	2.3	2.8	3.2	3.8	4.1	4.5			
		CFM Ver.	183	165	162	151	143	135	124	107	76	26	725	1.3	100
		SONES Ver.	1.4	1.6	1.6	2.0	2.5	3.0	3.3	3.6	4.0	4.4			

Performance ratings include the effects of inlet grille and backdraft damper in the airstream. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5' (1.5m) in a hemispherical free field calculated per AMCA Std. 301. Values shown are for Installation Type B: Free inlet fan sone levels. Performance shown is for Installation Type B: Free inlet, Ducted outlet.

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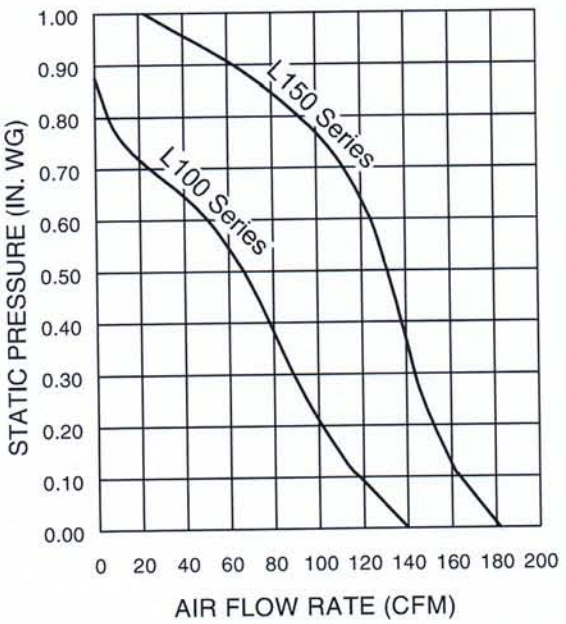
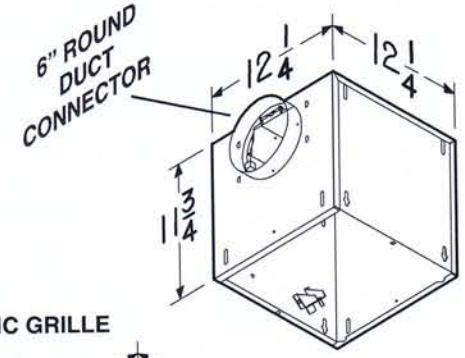
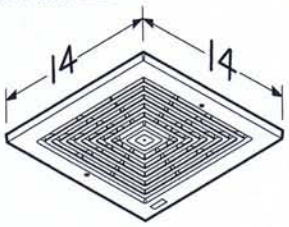
UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

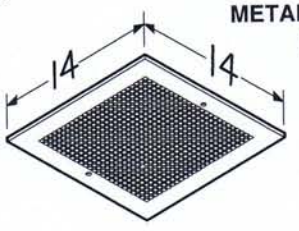




POLYMERIC GRILLE MODELS
L100
L150



METAL GRILLE MODELS
L100MG
L150MG



WEIGHT

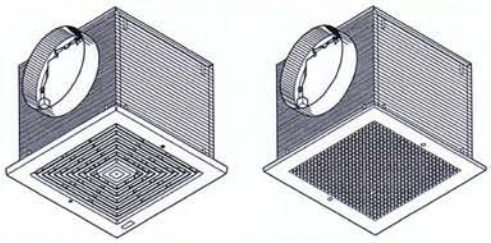
MODEL NO.	SHIPPING WT.
L100	22.8 lbs.
L100MG	23.7 lbs.
L150	23.1 lbs.
L150MG	23.7 lbs.

BROAN®

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

BROAN® LoSone Select® SPECIFICATION SHEET

LOSONE SELECT®
CEILING MOUNT VENTILATORS
L200, L250, L300 SERIES, L300KMG



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FEATURES

GRILLE:
- Conceals interior
- Low profile styling blends with any decor
- White polymeric ("MG" models - metal, finished with white painted enamel)

BLOWER:
- Low RPM for quiet operation
- Resilient anti-vibration mounts
- Dynamically-balanced, polymeric, centrifugal blower wheel for quiet, efficient performance (Model L300KMG-metal wheel)
- Permanently lubricated, thermally protected motor
- Plug-in motor rated at 120 VAC
- Designed for continuous operation

HOUSING:
- Rugged, 20 gauge galvanized steel
- 8" round duct connector
- 1/2" acoustic insulation inside (Model L300KMG - no insulation - for kitchen applications)
- May be installed in ceiling or wall (size permitting)
- 8-position mounting brackets for easy installation and greater adaptability to various mounting requirements
- Automatic backdraft damper located within duct connector
- Factory-shipped in horizontal discharge position - easily converted to vertical discharge
- May be installed as an in-line ventilator with addition of accessory kit Model 981L (purchase separately)

ACCESSORIES (purchase all separately):
- Model 57V (Ivory) / 57W (White) 3-Amp, Electronic Variable Speed Control
- Model 59V (Ivory) / 59W (White) 60-Minute Time Control
- Model 61V (Ivory) / 61W (White) 15-Minute Time Control
- Model 71V (Ivory) / 71W (White) 12-Hour Time Control
- 6-Amp, Electronic Variable Speed Controls Model 72V/72W (120 VAC)
- Model 981L In-line Adapter Kit
- Model RD1 Radiation Damper
- Model LAF1 Grease Filter (for Model L300KMG)
- Model 80L Electronic Speed Control (Internal)

TYPICAL SPECIFICATION

Ventilator shall be Broan Model L200, (L200MG), (L250), (L250MG), (L300), (L300KMG).

Ventilator shall have galvanized steel housing insulated with at least 1/2" of acoustic insulation (with no insulation - Model L300KMG). Housing to have adjustable mounting brackets.

Automatic backdraft damper to be located within duct connector. Duct connector, blower assembly, and wiring plate shall be adjustable for either horizontal or vertical installation.

Blower unit shall be removable from housing and will have a polymeric, dynamically balanced centrifugal-type blower wheel. Motor to be permanently lubricated and mounted with resilient anti-vibration mounts. RPM not to exceed number listed for each model.

Air delivery shall be no less and sound levels no greater than listed for each model. All air and sound ratings shall be certified by AMCA. Units to be UL and cUL listed.

"Broan-NuTone LLC certifies that the models shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 (and AMCA Publication 311 if sound is also certified) and comply with the requirements of the AMCA Certified Ratings Program"

Models L200, L250, and L300 are UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

Broan-NuTone LLC, 926 West State Street, Hartford, Wisconsin 53027 (1-800-637-1453)
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

REFERENCE	QTY.	REMARKS	
			Project
			Location
			Architect
			Engineer
			Contractor
			Submitted by Date

PERFORMANCE RATINGS - LOSONE SELECT® CEILING MOUNT VENTILATORS L200, L250, L300 SERIES, L300KMG

AMCA LICENSED PERFORMANCE

MODEL NO.	NOMINAL VOLTAGE	CFM / SONES - AT STATIC PRESSURES (Ps - inches of H_2O)	0.0" Ps	.10" Ps	.125" Ps	.250" Ps	.375" Ps	.50" Ps	.625" Ps	.750" Ps	.875" Ps	1.0" Ps	NOMINAL RPM	AMPS @60 Hz	WATTS
L200	120 VAC	CFM Hor.	231	214	210	196	186	177	165	144	113	51	740	1.8	127
		SONES Hor.	1.6	1.8	1.7	2.3	2.9	3.5	4.1	4.9	5.3	5.3			
		CFM Ver.	224	210	207	197	187	179	167	144	99	41	760	1.8	127
		SONES Ver.	1.5	1.8	2.0	2.3	2.7	3.4	4.0	4.5	5.1	5.2			
L200MG	120 VAC	CFM Hor.	237	218	215	199	190	180	167	144	108	47	715	1.8	127
		SONES Hor.	1.4	1.8	1.9	2.4	3.0	3.6	4.2	5.1	5.6	5.5			
		CFM Ver.	228	213	209	198	190	182	168	145	105	56	730	1.8	127
		SONES Ver.	1.5	1.7	1.8	2.3	2.8	3.4	4.1	4.6	5.1	5.2			
L250	120 VAC	CFM Hor.	272	261	259	250	242	233	218	201	165	99	830	2.1	166
		SONES Hor.	2.1	2.3	2.2	2.9	3.3	3.9	4.4	4.8	5.5	5.8			
		CFM Ver.	269	261	259	253	248	239	224	203	171	101	860	2.1	166
		SONES Ver.	2.3	2.6	2.7	3.0	3.3	3.7	4.2	4.7	5.4	5.6			
L250MG	120 VAC	CFM Hor.	280	267	265	254	246	238	224	209	172	105	805	2.1	166
		SONES Hor.	2.1	2.5	2.5	2.9	3.4	3.9	4.3	4.6	5.6	5.9			
		CFM Ver.	275	263	262	255	250	241	229	210	178	105	830	2.1	166
		SONES Ver.	2.2	2.6	2.7	3.0	3.4	3.8	4.3	4.8	5.5	5.8			
L300	120 VAC	CFM Hor.	312	309	308	303	296	287	273	254	219	125	905	2.6	212
		SONES Hor.	2.8	2.9	2.9	3.3	3.5	3.9	4.3	4.7	5.1	5.6			
		CFM Ver.	319	314	313	306	299	288	274	251	219	120	940	2.6	212
		SONES Ver.	2.6	2.9	3.0	3.4	3.6	3.9	4.4	4.7	5.0	5.5			
L300MG	120 VAC	CFM Hor.	323	317	316	312	305	298	283	266	235	153	860	2.6	212
		SONES Hor.	3.0	2.8	3.0	3.2	3.5	3.9	4.3	4.8	5.2	5.7			
		CFM Ver.	322	315	314	308	302	292	278	259	227	119	885	2.6	212
		SONES Ver.	2.4	2.7	2.8	3.3	3.5	3.9	4.3	4.7	5.1	5.5			
L300KMG	120 VAC	CFM Hor.	286	279	277	272	268	261	253	241	222	173	790	2.6	212
		SONES Hor.	2.8	3.0	3.1	3.4	3.8	4.4	4.8	5.1	5.5	6.1			
		CFM Ver.	287	280	277	273	266	259	247	231	208	164	815	2.6	212
		SONES Ver.	3.3	3.6	3.7	4.1	4.7	5.2	5.6	6.3	6.8	6.9			

Performance ratings include the effects of inlet grille and backdraft damper in the airstream. Speed (RPM) shown is nominal. Performance is based on actual speed of test. The sound ratings shown are loudness values in fan sones at 5' (1.5m) in a hemispherical free field calculated per AMCA Std. 301. Values shown are for Installation Type B: Free inlet fan sone levels. Performance shown is for Installation Type B: Free inlet, Ducted outlet.

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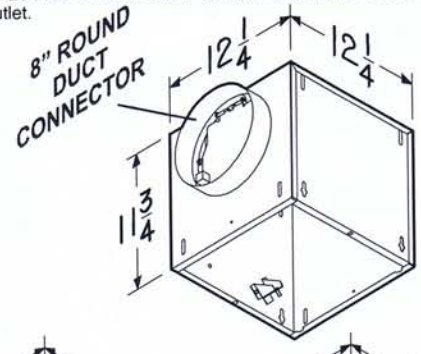
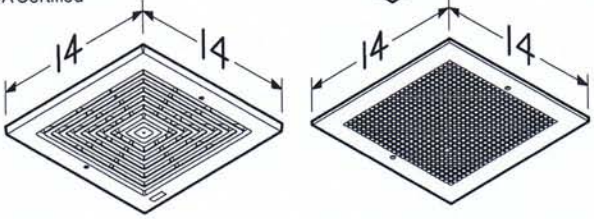
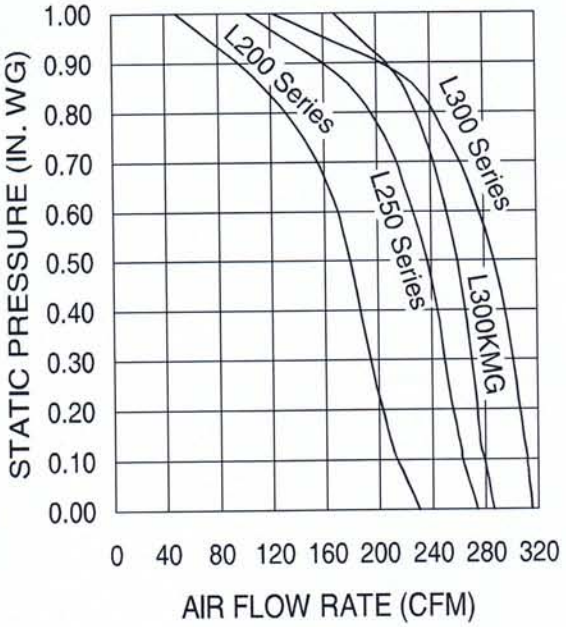




POLYMERIC GRILLE MODELS L200, L250, L300

METAL GRILLE MODELS L200MG, L250MG, L300MG, L300KMG



Models L200, L250, and L300 are UL listed for use over bathtubs and showers when connected to a GFCI-protected branch circuit.

WEIGHT

MODEL NO.	SHIPPING WT.
L200	23.0 lbs.
L250, L300	23.1 lbs.
L200MG	23.9 lbs.
L250MG, L300MG	24.0 lbs.
L300KMG	25.2 lbs.

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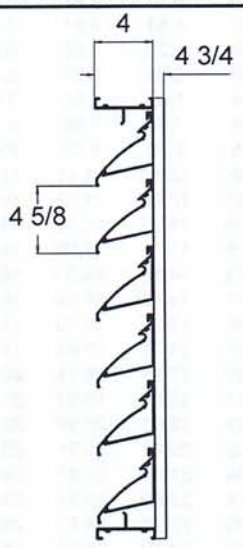
Broan-NuTone Canada, 1140 Tristar Drive, Mississauga, Ontario, L5T 1H9 (1-888-882-7626)

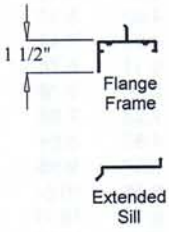
VENTEX ©

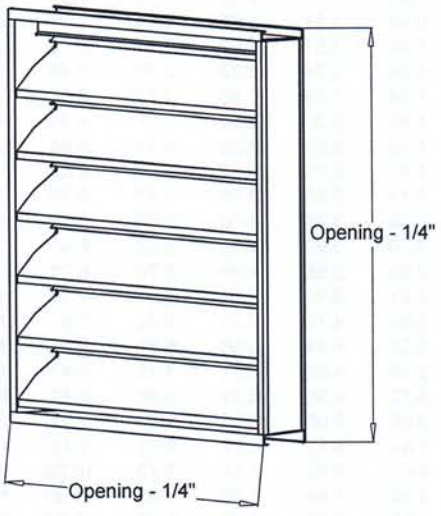
LOUVERS & DAMPERS

NEW 2420 & 2425 HI-PRO 4 INCH EXTRUDED ALUMINIUM STATIONARY STORMPROOF LOUVER



Blade Carrier Detail





Quantity	Ref. #	Width (W)*	Height (H)*	Frame	Accessories
1	L-6	35-5/8"	70-7/8"	2425 Flange Frame	
1	L-7	35-5/8"	70-7/8"	2425 Flange Frame	
1	L-8	15-3/4"	23-5/8"	2425 Flange Frame	
Project Name:					**Engineer:**
Contractor:					**Date:**

STANDARD CONSTRUCTION

Depth: 4 Inches (100 mm)
Frame Style: Specify 2420 For Channel Frame
Specify 2425 For Flange Frame
Frame Thickness: .081" (2.06 mm) 6063-T5 Aluminium
Blade Thickness: .081" (2.06 mm) 6063-T5 Aluminium
Blade Centres: 4 7/8 Inches (124 mm)
Blade Angle: 45 Degrees
Minimum Height: 12 Inches (305 mm)
Maximum Panel Width: 120 Inches (3048 mm)
Maximum Panel Height: 120 Inches (3048 mm)
Standard Finish: Mill
Standard Birdscreen: ½" x ½" Galvanized
Free Area of 48" x 48" Unit: 8.49 Sq. ft. Free Area
Free Area Percentage: 53% Percent

*Louver will be manufactured ¼" smaller than given opening dimensions, unless otherwise specified.

AVAILABLE ACCESSORIES

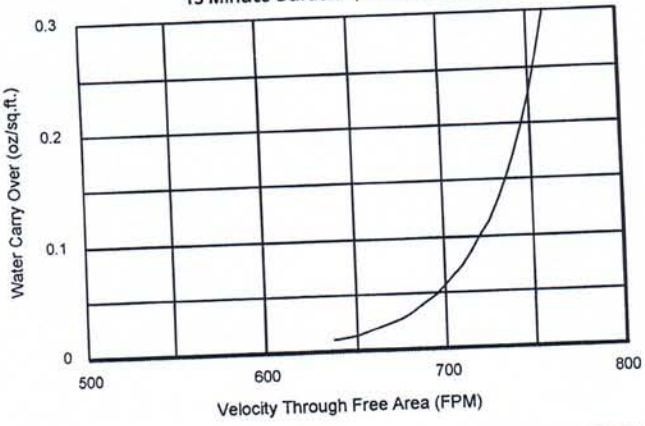
Bird Screen: ¼ x ¼ Inter Crimped Aluminium
½ x ½ Inter Crimped Aluminium
Insect Screen: 18 x 14 Mesh
Finish: Mill Finish (Standard)
Paint Color #: V
Anodized Finish: Clear Light Bronze
Medium Bronze Dark Bronze
Accessories: Aluminium Blank Off Panel
1" or 2" Insulated Blank Off Panel
Hinged Frame
Assembled with Stainless Steel Fasteners
Hinged Frame and Louvered Access Door
Security Bars
Extended Sills
Extended Sleeves
Filter Racks
Custom Geometric Shapes

VENTEX

Hi-Pro 2000 Model 2420 and Model 2425
Free Area in Square Feet

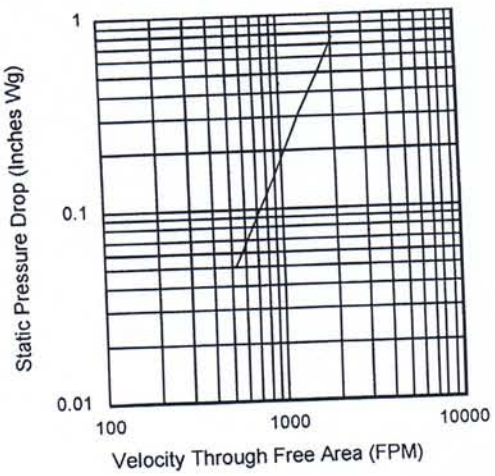
HEIGHT Inches	WIDTH IN INCHES 12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72
12	0.24	0.33	0.43	0.52	0.61	0.70	0.79	0.89	0.98	1.07	1.16	1.26	1.35	1.44	1.53	1.62
16	0.41	0.56	0.72	0.87	1.03	1.18	1.34	1.50	1.65	1.81	1.96	2.12	2.27	2.43	2.58	2.74
20	0.58	0.79	1.01	1.23	1.45	1.67	1.89	2.11	2.33	2.55	2.77	2.99	3.21	3.42	3.64	3.86
24	0.81	1.12	1.42	1.73	2.04	2.35	2.66	2.97	3.27	3.58	3.89	4.20	4.51	4.81	5.12	5.43
28	0.95	1.31	1.67	2.04	2.40	2.76	3.12	3.48	3.85	4.21	4.57	4.93	5.29	5.66	6.02	6.38
32	1.09	1.51	1.92	2.34	2.75	3.17	3.59	4.00	4.42	4.83	5.25	5.66	6.08	6.50	6.91	7.33
36	1.26	1.74	2.22	2.70	3.18	3.66	4.14	4.62	5.10	5.58	6.06	6.54	7.02	7.50	7.98	8.46
40	1.34	1.85	2.36	2.87	3.38	3.88	4.39	4.90	5.41	5.92	6.43	6.94	7.45	7.96	8.47	8.98
44	1.67	2.30	2.94	3.57	4.20	4.84	5.47	6.11	6.74	7.38	8.01	8.65	9.28	9.92	10.55	11.19
48	1.92	2.65	3.38	4.11	4.84	5.57	6.30	7.03	7.76	8.49	9.22	9.95	10.68	11.41	12.14	12.87
52	1.97	2.72	3.47	4.22	4.97	5.73	6.48	7.23	7.98	8.73	9.48	10.23	10.98	11.73	12.48	13.23
56	2.13	2.95	3.76	4.57	5.39	6.20	7.01	7.83	8.64	9.45	10.26	11.08	11.89	12.70	13.52	14.33
60	2.36	3.26	4.16	5.06	5.96	6.86	7.76	8.66	9.56	10.46	11.36	12.26	13.16	14.06	14.96	15.86
64	2.60	3.60	4.59	5.58	6.57	7.56	8.56	9.55	10.54	11.53	12.53	13.52	14.51	15.50	16.49	17.49
68	2.66	3.68	4.69	5.70	6.72	7.73	8.74	9.76	10.77	11.79	12.80	13.81	14.83	15.84	16.86	17.87
72	2.81	3.87	4.94	6.01	7.08	8.15	9.22	10.29	11.35	12.42	13.49	14.56	15.63	16.70	17.77	18.83
76	3.01	4.16	5.31	6.46	7.61	8.76	9.90	11.05	12.20	13.35	14.50	15.64	16.79	17.94	19.09	20.24
80	3.22	4.44	5.66	6.89	8.11	9.34	10.56	11.79	13.01	14.24	15.46	16.69	17.91	19.14	20.36	21.59
84	3.35	4.63	5.91	7.19	8.47	9.74	11.02	12.30	13.58	14.86	16.14	17.41	18.69	19.97	21.25	22.53
88	3.52	4.86	6.21	7.55	8.89	10.23	11.57	12.92	14.26	15.60	16.94	18.28	19.63	20.97	22.31	23.65
92	3.66	5.06	6.46	7.85	9.25	10.64	12.04	13.43	14.83	16.22	17.62	19.02	20.41	21.81	23.20	24.6
96	3.84	5.31	6.77	8.23	9.70	11.16	12.62	14.09	15.55	17.02	18.48	19.94	21.41	22.87	24.33	25.8
100	4.07	5.62	7.18	8.73	10.28	11.83	13.38	14.93	16.49	18.04	19.59	21.14	22.69	24.24	25.80	27.35
104	4.12	5.69	7.26	8.83	10.40	11.97	13.54	15.11	16.68	18.25	19.82	21.39	22.96	24.52	26.09	27.66
108	4.25	5.87	7.49	9.12	10.74	12.36	13.98	15.60	17.22	18.84	20.46	22.08	23.70	25.32	26.94	28.56
112	4.38	6.05	7.72	9.39	11.05	12.72	14.39	16.06	17.73	19.40	21.07	22.73	24.40	26.07	27.74	29.41
116	4.54	6.27	8.00	9.73	11.45	13.18	14.91	16.64	18.37	20.10	21.83	23.56	25.29	27.01	28.74	30.47
120	4.71	6.50	8.29	10.09	11.88	13.68	15.47	17.26	19.06	20.85	22.64	24.44	26.23	28.02	29.82	31.61

2420 - 2425 Stormproof Water Penetration
15 Minute Duration, Test Size (48x48)



Beginning point of water penetraion at 0.01 oz/sp.ft. is 638 FPM

Pressure Drop - Intake



Test Results Do Not Include the Effects of Birdscreen

Certified Ratings

Ventex certifies that the Models 2420/2425 show n here are licensed to bear the AMCA seal. The ratings show n are based on tests and procedures performed in accordance w ith AMCA Standard 511 and comply w ith the requirments of the AMCA Certified Ratings Program. The Certified Ratings Seal applies to air performance and w ater penetration ratings.

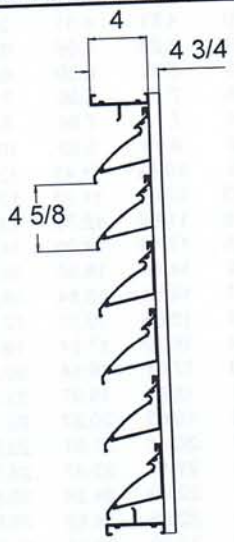
Recommended Specification

Furnish and install stationary louver models 2420/2425 as manufactured by Ventex, Bolton Ontario. Louvers must be licencsed to bear the AMCA seal. Louvers shall be 4" (100 mm) deep. Blades shall be 0.081" (2.06 mm) and frame shall be 0.081" (2.06 mm) extruded aluminium alloy 6063-T5. Louvers shall have a 19 gauge galvanized birdscreen. All materials shall be factory finished w ith Polyester Baking Enamel in a color selected from the Ventex Color Chart. The louver manufacturer shall submit test data on a 48" x48" unit show ing that the louver conforms to the data on this page.

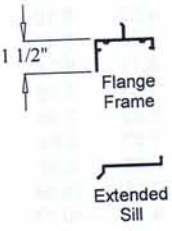
VENTEX ©

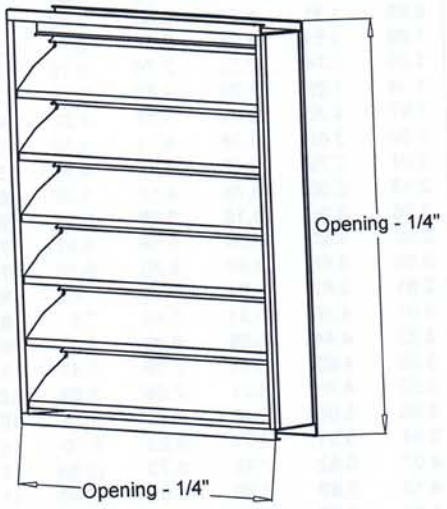
LOUVERS & DAMPERS

NEW 2420 & 2425 HI-PRO 4 INCH EXTRUDED ALUMINIUM STATIONARY STORMPROOF LOUVER




Blade Carrier Detail





Quantity	Ref. #	Width (W)*	Height (H)*	Frame	Accessories
1	L-9	23-5/8"	23-5/8"	2425 Flange Frame	
1	L-10	7-7/8"	7-7/8"	2425 Flange Frame	
1					
Project Name:					**Engineer:**
Contractor:					**Date:**

STANDARD CONSTRUCTION

Depth: 4 Inches (100 mm)
Frame Style: Specify 2420 For Channel Frame
Specify 2425 For Flange Frame
Frame Thickness: .081" (2.06 mm) 6063-T5 Aluminium
Blade Thickness: .081" (2.06 mm) 6063-T5 Aluminium
Blade Centres: 4 7/8 Inches (124 mm)
Blade Angle: 45 Degrees
Minimum Height: 12 Inches (305 mm)
Maximum Panel Width: 120 Inches (3048 mm)
Maximum Panel Height: 120 Inches (3048 mm)
Standard Finish: Mill
Standard Birdscreen: ½" x ½" Galvanized
Free Area of 48" x 48" Unit: 8.49 Sq. ft. Free Area
Free Area Percentage: 53% Percent

*Louver will be manufactured ¼" smaller than given opening dimensions, unless otherwise specified.

AVAILABLE ACCESSORIES

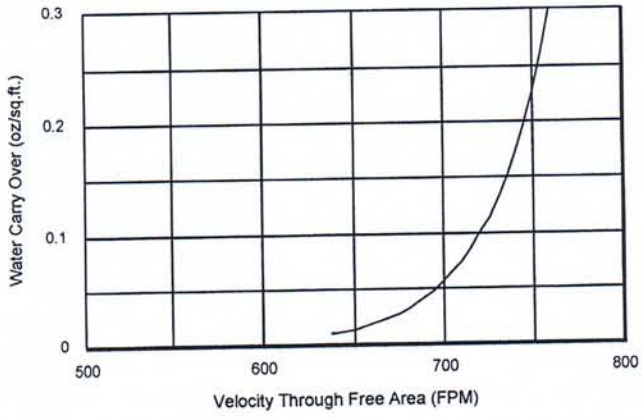
Bird Screen: ¼ x ¼ Inter Crimped Aluminium
½ x ½ Inter Crimped Aluminium
Insect Screen: 18 x 14 Mesh
Finish: Mill Finish (Standard)
Paint Color #: V
Anodized Finish: Clear Light Bronze
Medium Bronze Dark Bronze
Accessories: Aluminium Blank Off Panel
1" or 2" Insulated Blank Off Panel
Hinged Frame
Assembled with Stainless Steel Fasteners
Hinged Frame and Louvered Access Door
Security Bars
Extended Sills
Extended Sleeves
Filter Racks
Custom Geometric Shapes

DWG 2420-1 Date: Aug 2005

Hi-Pro 2000 Model 2420 and Model 2425
Free Area in Square Feet

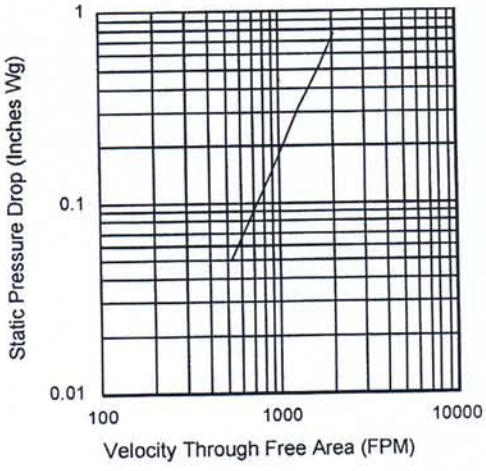
HEIGHT Inches	WIDTH IN INCHES 12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72
12	0.24	0.33	0.43	0.52	0.61	0.70	0.79	0.89	0.98	1.07	1.16	1.26	1.35	1.44	1.53	1.62
16	0.41	0.56	0.72	0.87	1.03	1.18	1.34	1.50	1.65	1.81	1.96	2.12	2.27	2.43	2.58	2.74
20	0.58	0.79	1.01	1.23	1.45	1.67	1.89	2.11	2.33	2.55	2.77	2.99	3.21	3.42	3.64	3.86
24	0.81	1.12	1.42	1.73	2.04	2.35	2.66	2.97	3.27	3.58	3.89	4.20	4.51	4.81	5.12	5.43
28	0.95	1.31	1.67	2.04	2.40	2.76	3.12	3.48	3.85	4.21	4.57	4.93	5.29	5.66	6.02	6.38
32	1.09	1.51	1.92	2.34	2.75	3.17	3.59	4.00	4.42	4.83	5.25	5.66	6.08	6.50	6.91	7.33
36	1.26	1.74	2.22	2.70	3.18	3.66	4.14	4.62	5.10	5.58	6.06	6.54	7.02	7.50	7.98	8.46
40	1.34	1.85	2.36	2.87	3.38	3.88	4.39	4.90	5.41	5.92	6.43	6.94	7.45	7.96	8.47	8.98
44	1.67	2.30	2.94	3.57	4.20	4.84	5.47	6.11	6.74	7.38	8.01	8.65	9.28	9.92	10.55	11.19
48	1.92	2.65	3.38	4.11	4.84	5.57	6.30	7.03	7.76	8.49	9.22	9.95	10.68	11.41	12.14	12.87
52	1.97	2.72	3.47	4.22	4.97	5.73	6.48	7.23	7.98	8.73	9.48	10.23	10.98	11.73	12.48	13.23
56	2.13	2.95	3.76	4.57	5.39	6.20	7.01	7.83	8.64	9.45	10.26	11.08	11.89	12.70	13.52	14.33
60	2.36	3.26	4.16	5.06	5.96	6.86	7.76	8.66	9.56	10.46	11.36	12.26	13.16	14.06	14.96	15.86
64	2.60	3.60	4.59	5.58	6.57	7.56	8.56	9.55	10.54	11.53	12.53	13.52	14.51	15.50	16.49	17.49
68	2.66	3.68	4.69	5.70	6.72	7.73	8.74	9.76	10.77	11.79	12.80	13.81	14.83	15.84	16.86	17.87
72	2.81	3.87	4.94	6.01	7.08	8.15	9.22	10.29	11.35	12.42	13.49	14.56	15.63	16.70	17.77	18.83
76	3.01	4.16	5.31	6.46	7.61	8.76	9.90	11.05	12.20	13.35	14.50	15.64	16.79	17.94	19.09	20.24
80	3.22	4.44	5.66	6.89	8.11	9.34	10.56	11.79	13.01	14.24	15.46	16.69	17.91	19.14	20.36	21.59
84	3.35	4.63	5.91	7.19	8.47	9.74	11.02	12.30	13.58	14.86	16.14	17.41	18.69	19.97	21.25	22.53
88	3.52	4.86	6.21	7.55	8.89	10.23	11.57	12.92	14.26	15.60	16.94	18.28	19.63	20.97	22.31	23.65
92	3.66	5.06	6.46	7.85	9.25	10.64	12.04	13.43	14.83	16.22	17.62	19.02	20.41	21.81	23.20	24.6
96	3.84	5.31	6.77	8.23	9.70	11.16	12.62	14.09	15.55	17.02	18.48	19.94	21.41	22.87	24.33	25.8
100	4.07	5.62	7.18	8.73	10.28	11.83	13.38	14.93	16.49	18.04	19.59	21.14	22.69	24.24	25.80	27.35
104	4.12	5.69	7.26	8.83	10.40	11.97	13.54	15.11	16.68	18.25	19.82	21.39	22.96	24.52	26.09	27.66
108	4.25	5.87	7.49	9.12	10.74	12.36	13.98	15.60	17.22	18.84	20.46	22.08	23.70	25.32	26.94	28.56
112	4.38	6.05	7.72	9.39	11.05	12.72	14.39	16.06	17.73	19.40	21.07	22.73	24.40	26.07	27.74	29.41
116	4.54	6.27	8.00	9.73	11.45	13.18	14.91	16.64	18.37	20.10	21.83	23.56	25.29	27.01	28.74	30.47
120	4.71	6.50	8.29	10.09	11.88	13.68	15.47	17.26	19.06	20.85	22.64	24.44	26.23	28.02	29.82	31.61

2420 - 2425 Stormproof Water Penetration
15 Minute Duration, Test Size (48x48)



Beginning point of water penetraion at 0.01 oz/sp.ft. is 638 FPM

Pressure Drop - Intake



Test Results Do Not Include the Effects of Birdscreen

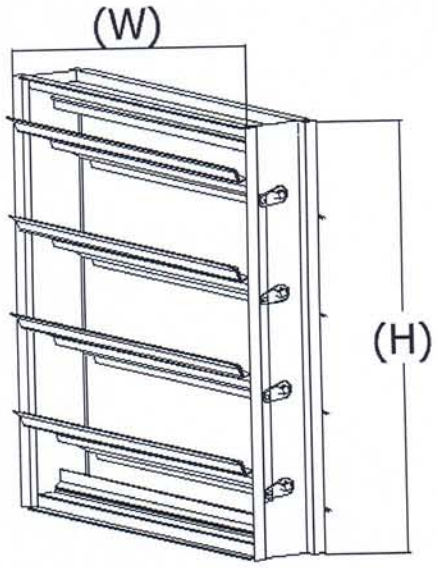
Certified Ratings

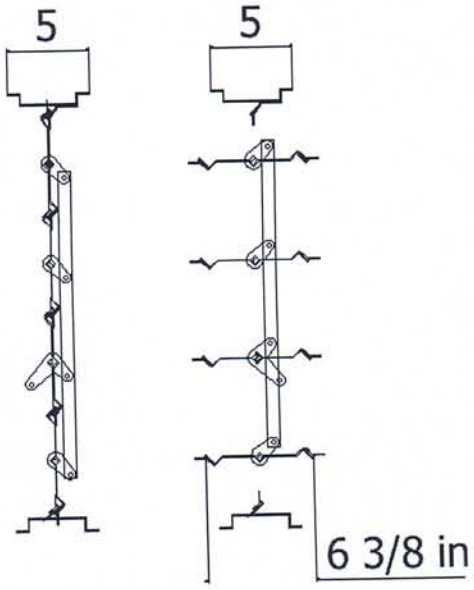
Ventex certifies that the Models 2420/2425 show n here are licensed to bear the AMCA seal. The ratings show n are based on tests and procedures performed in accordance w ith AMCA Standard 511 and comply w ith the requirments of the AMCA Certified Ratings Program. The Certified Ratings Seal applies to air performance and w ater penetration ratings.

Recommended Specification

Furnish and install stationary louver models 2420/2425 as manufactured by Ventex, Bolton Ontario. Louvers must be licencsed to bear the AMCA seal. Louvers shall be 4" (100 mm) deep. Blades shall be 0.081" (2.06 mm) and frame shall be 0.081" (2.06 mm) extruded aluminium alloy 6063-T5.
Louvers shall have a 19 gauge galvanized birdscreen. All materials shall be factory finished w ith Polyester Baking Enamel in a color selected from the Ventex Color Chart. The louver manufacturer shall submit test data on a 48" x48" unit show ing that the louver conforms to the data on this page.

MODEL: 4100 Low Leakage Steel Control Damper





Quantity	Ref. #	Width (W)*	Height (H)*	Frame	Accessories
1	MD-6	35-3/8"	70-7/8"	DM Duct Mount Frame	Vertical Jack Shaft Aux. Switch Honeywell 120V Actuator
1	MD-7	35-3/8"	70-7/8"	DM Duct Mount Frame	Vertical Jack Shaft Aux. Switch Honeywell 120V Actuator
1	MD-8	15-3/4"	23-5/8"	DM Duct Mount Frame	Honeywell 120V Actuator Aux. Switch
Project Name: Caledon East Arena					**Engineer:**
Contractor:					**Date:**

STANDARD CONSTRUCTION

Depth: 5 Inches (127 mm)
Depth Blades Open: 6 3/8 Inches (162 mm)
Frame Thickness: 16 gauge Galvanized Steel
Blade Thickness: 16 gauge Galvanized Steel
Blade Seals: Co-extruded santoprene vinyl
Jamb Seals: Stainless steel compression spring
Bearings: Molded synthetic
Axles: 3/8" Plated Bar
Frame Style: Duct Mount Frame
Minimum Height: 8 Inches (203 mm) Single Blade

Maximum Panel Width: 14 Inches (356 mm) Single Blade 48 Inches (1219 mm) Multiple
Maximum Panel Height: 72 Inches (1829 mm)
Maximum System Pressures: 4" w.g.
Leakage: Does not exceed 10 cfm/ft² (34l/s/m²) against 4"w.g.(1 kPa) differential static pressure at -40° F(-40° C).
Linkage: Concealed in Frame
Standard Finish: Mill Galvanized
Standard Motor Installation: Side Shaft Direct Drive extendable up tp 12"

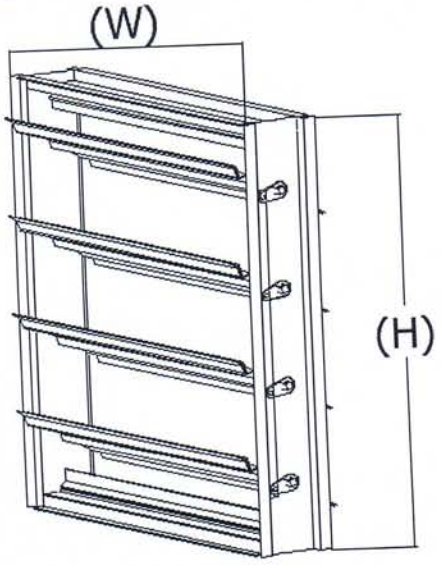
AVAILABLE ACCESSORIES

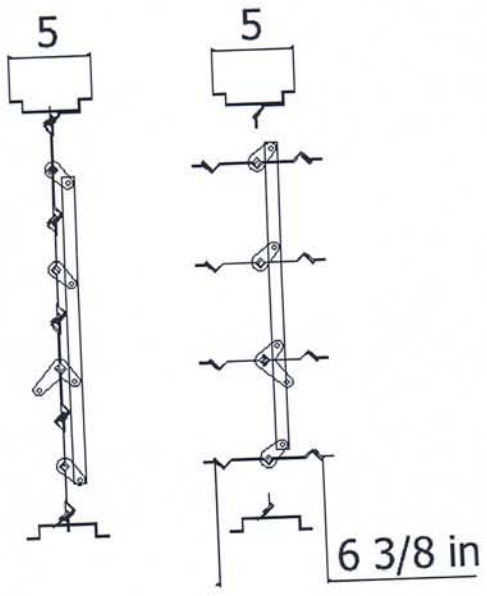
Belimo and Honeywell Motors available Consult Factory
Jack shafts
End Switch for signalling peripheral devices
Hand Quadrants
Chain Operation for manual operation spring closed

* Damper will be manufactured ¼" smaller than given opening dimensions, unless otherwise specified.

DWG 4100-1 Date Aug 2005

MODEL: 4100 Low Leakage Steel Control Damper





Quantity	Ref. #	Width (W)*	Height (H)*	Frame	Accessories
1	MD-9	23-5/8"	23-5/8"	DM Duct Mount Frame	Honeywell 120V Actuator Aux. Switch
1	MD-10	35-3/8"	70-7/8"	DM Duct Mount Frame	Honeywell 120V Actuator Aux. Switch
Project Name: Caledon East Arena					**Engineer:**
Contractor:					**Date:**

STANDARD CONSTRUCTION

Depth: 5 Inches (127 mm)
Depth Blades Open: 6 3/8 Inches (162 mm)
Frame Thickness: 16 gauge Galvanized Steel
Blade Thickness: 16 gauge Galvanized Steel
Blade Seals: Co-extruded santoprene vinyl
Jamb Seals: Stainless steel compression spring
Bearings: Molded synthetic
Axles: 3/8" Plated Bar
Frame Style: Duct Mount Frame
Minimum Height: 8 Inches (203 mm) Single Blade

Maximum Panel Width: 14 Inches (356 mm) Multiple Blade
Maximum Panel Height: 72 Inches (1829 mm)
Maximum System Pressures: 4" w.g.
Leakage: Does not exceed 10 cfm/ft² (34l/s/m²) against 4"w.g.(1 kPa) differential static pressure at -40° F(-40° C).
Linkage: Concealed in Frame
Standard Finish: Mill Galvanized
Standard Motor Installation: Side Shaft Direct Drive extendable up tp 12"

AVAILABLE ACCESSORIES

Belimo and Honeywell Motors available Consult Factory
Jack shafts
End Switch for signalling peripheral devices
Hand Quadrants
Chain Operation for manual operation spring closed

* Damper will be manufactured ¼" smaller than given opening dimensions, unless otherwise specified.

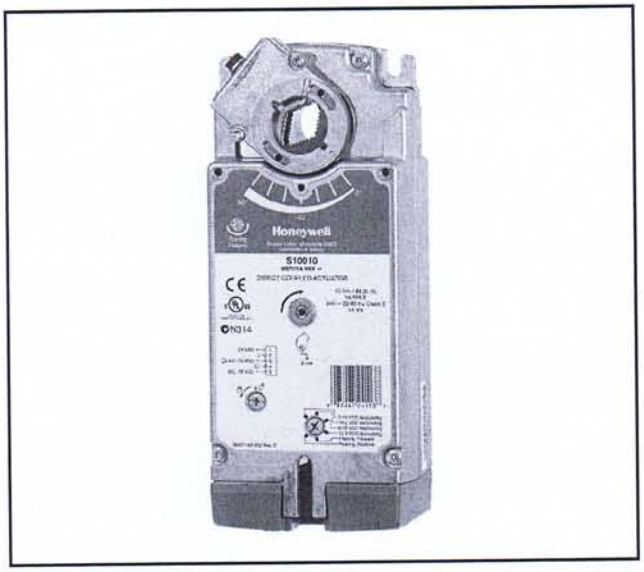
DWG 4100-1 Date Aug 2005

Honeywell

S05, S10, S20 Series Spring Return Direct Coupled Actuators

MS4105, MS4110, MS4120, MS71XX, MS7505, MS7510, MS7520, MS8105, MS8110, MS8120

PRODUCT DATA



APPLICATION

MS41XX, MS71XX, MS75XX, MS81XX Spring Return Direct Coupled Actuators (DCA) are used within heating, ventilating, and air-conditioning (HVAC) systems. They can drive a variety of quarter-turn, final control elements requiring spring return fail-safe operation.

Applications include:

- Volume control dampers, mounted directly to the drive shaft or remotely (with the use of accessory hardware).
- Quarter-turn rotary valves, such as ball or butterfly valves mounted directly to the drive shaft.
- Linear stroke globe or cage valves mounted with linkages to provide linear actuation.

FEATURES

- **Brushless DC submotor with electronic stall protection for floating/modulating models.**
- **Brush DC submotor with electronic stall protection for 2-position models.**
- **Self-centering shaft adapter (shaft coupling) for wide range of shaft sizes.**
- **Models available with three torque ratings: 44 lb-in. (5 N•m), 88 lb-in. (10 N•m), and 175 lb-in. (20 N•m).**
- **Models available for use with two-position, single pole single throw (spst), line- (Series 40) or low- (Series 80) voltage controls.**
- **Models available for use with floating or switched single-pole, double-throw (spdt) (Series 60) controls.**
- **Models available for use with proportional current or voltage (Series 70) controls.**
- **Models available with combined floating/modulating control in a single device.**
- **Models available with adjustable zero and span.**
- **Models available with line-voltage internal end switches.**
- **Access cover to facilitate connectivity.**
- **Metal housing with built-in mechanical end limits.**
- **Spring return direction field-selectable.**
- **Shaft position indicator and scale.**
- **Manual winding capability with locking function.**
- **UL (cUL) listed and CE compliant.**
- **All Models are plenum-rated per UL873.**

c UL US LISTED CE

SPECIFICATIONS

Models: See Tables 1 and 6.

NOTE: This document also covers the MS7110K and MS7106K.

Dimensions: See Fig. 1.

Device Weight: 7 lb (3.2 kg).

Temperature Ratings:
Ambient: -40°F to 140°F (-40°C to 60°C).
Shipping and Storage: -40°F to 158°F (-40°C to 70°C).

Humidity Ratings: 5% to 95% RH noncondensing.

Electrical Connections:
Field wiring 14 to 22 AWG (2.0 to 0.344 mm sq) to screw terminals, located under the removable access cover.

Electrical Ratings: See Table 2.

End Switches (Two SPDT):
Settings (fixed): 7° nominal stroke, 85° nominal stroke.
Ratings (maximum load):
Low-Voltage Models: 250 Vac, 5A resistive, 3A inductive.
Line-Voltage Models: 250 Vac, 5A resistive.

Mounting: Self-centering shaft adapter (shaft coupling).
Round Damper Shafts: 0.375 to 1.06 in. (10 to 27 mm).
Square Damper Shafts: 1/2 to 3/4 in. (13 to 19 mm).
Actuator can be mounted with shaft in any position.

NOTE: For 175 lb-in. (20 N•m) models: 3/4 in. or greater shaft diameter recommended.

Minimum Damper Shaft Length:
1 in. (25 mm); 3 in. (76 mm) recommended.

Timing (At Rated Torque and Voltage):
Drive Open (typical):
Floating, Modulating Models: 90 seconds.
Two-Position Models: 45 seconds ±5 seconds.
Spring Close: 20 seconds typical.

Design Life (at Rated Voltage):
Two-position models: 50,000 full stroke cycles; 50,000 full stroke spring returns.
Floating and Modulating models: 60,000 full stroke cycles; 1,500,000 repositions; 60,000 full stroke spring returns.

Controller Type:
S05, S10, S20: See Table 1.
S05, S10, S20: Modulating (Series 70) or Floating (Series 60); controlled by selector switch.
MS71XX: Modulating Voltage Input.
Input Impedance: 95K ohms minimum.
Feedback Signal: 0 or 2-10 Vdc; Driving current is 3 mA minimum.

Stroke: 95° ±3°, mechanically limited.

Approvals: See Table 3.

Torque Ratings:
Typical Holding, Driving, Spring Return:
S05: 44 lb-in. (5 N•m).
S10: 88 lb-in. (10 N•m).
S20: 175 lb-in. (20 N•m).
Stall Maximum (fully open at 75°F):
S05: 100 lb-in. (11.3 N•m).
S10: 200 lb-in. (22.6 N•m).
S20: 350 lb-in. (39.6 N•m).

Table 1. Actuator Catalog Numbering (see Table 6 also).

S	Spring Return Fail Safe Mode			
N	Non-Spring Return Fail Safe Mode			
	05	44 lb-in. (5 N•m); Spring Return Only		
	10	88 lb-in. (10 N•m); Spring Return Only		
	20	175 lb-in. (20 N•m)		
	34	300 lb-in. (34 N•m); Non-Spring Return Only		
		24	24 Vac Floating (Series 60) Control	
		24-2POS	24 Vac Two-Position Control	
		120-2POS	120 Vac Two-Position Control	
		230-2POS	230 Vac Two-Position Control	
		010	24 Vac Modulating and Floating Control	
				Fixed Zero/Span, No End Switches
			-SW2	Internal End Switches
			-SER[a]	Enhanced Modulating; Adjustable Zero/Span

S	**10**	**24-2POS**	**-SW2**

[a] Enhanced models include two internal end switches.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
   1885 Douglas Drive North
   Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.
International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

Table 2. Electrical Ratings.

Model(s)	Power Input		Power Consumption (VA)					
			44 lb-in. (5 N•m)		88 lb-in. (10 N•m)		175 lb-in. (20 N•m)	
	Voltage	Frequency	Driving	Holding	Driving	Holding	Driving	Holding
Floating, Modulating	24 Vac ±20% (Class 2), 24 Vdc	50/60 Hz.	13	5	14	5	16	5
Two-Position, Low-voltage	24 Vac ±20% (Class 2), 24 Vdc	50/60 Hz.	25	8	30	8	40	8
Two-Position, Line-voltage	100-250 Vac	50/60 Hz.	45	13	45	13	60	13

Noise Rating at 1m (Maximum):
Holding: 20 dBA (no audible noise).
Two-position models:
Driving: 50 dBA.
Spring Return: 65 dBA.
Floating and Modulating models:
Driving: 40 dBA.
Spring Return: 50 dBA.

Table 3. Approvals.

	S05, S10, S20 Series	MS7110, MS7106
UL/cUL	X	X
UL873 Plenum Rating, File No. E4436; Guide No. XAPX.	X	X
CE	X	
C-TICK	X	

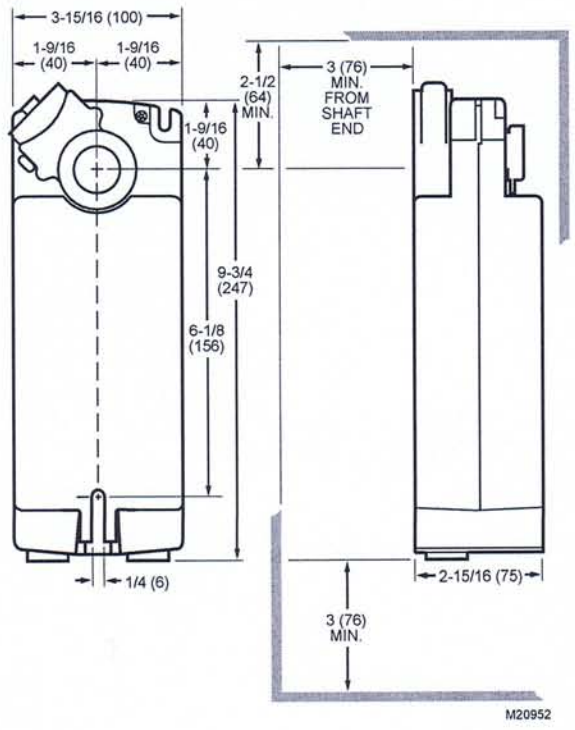


Fig. 1. Dimensional drawing of actuator in in. (mm).

Environmental Protection Ratings:
NEMA2 (US Models) or IP54 (European Models) when mounted on a horizontal shaft with access cover below the shaft.

Accessories:
27518 Balljoint (5/16 in.).
103598 Balljoint (1/4 in.).
205649 Anti-Rotation Bracket (supplied with actuator).
205860 Electronic Minimum Position Potentiometer.
27520A-E,G,H-L,Q Pushrod (5/16 in. diameter).
32000085-001 Water-tight Cable Gland/Strain-relief Fitting (10 pack).
32003036-001 Weather Enclosure.
32004254-002 Self-Centering Shaft Adapter (supplied with actuator).
50001194-001 Foot Mount Kit.
SW2-US Auxiliary Switch Package.
See also Form 62-0203.

Sizing

Required Torque

In lieu of data from a Specification Engineer or Manufacturer, required torque for a given damper load can be determined using the following method: $T_R = T_D \times A_D$

Where:
— T_R = Required torque for the damper load.
— T_D = Damper torque rating from the manufacturer, expressed in either (lb-in.)/(sq ft) or (N•m)/(sq m). the damper load.
— A_D = Damper area expressed in either sq ft or sq m.

Actuators Required

In lieu of data from a Specification Engineer or Manufacturer, the number of required actuators for a given damper load can be determined using the following method:

$$N = \frac{T_R}{T_A \times SF}$$

Where:
— N = Number of actuators.
— T_R = Required torque for the damper load. (See above.)
— T_A = Actuator torque rating.
— SF = Safety factor.

NOTE: The safety factor accounts for variables such as misalignments, aging of the damper, etc. 0.8 is a typical safety factor.

INSTALLATION

When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. After installation is complete, check out product operation as provided in these instructions.

⚠ CAUTION

Electrical Shock or Equipment Damage Hazard.
Low voltage can shock individuals or short equipment circuitry.
Disconnect power supply before installation.

IMPORTANT

All wiring must agree with applicable codes, ordinances and regulations.

Location

These actuators are designed to mount directly to a damper external drive shaft. The shaft coupling fastens to the drive shaft. The actuator housing includes slots which, along with an anti-rotation bracket, secure the actuator to the damper frame or duct work (see Fig. 8).

NOTES:

— When mounted correctly, these slots allow the actuator to *float* without rotating relative to the damper shaft.
— Using other brackets or linkages, the actuator can be foot-mounted or tandem-mounted.

⚠ CAUTION

Motor Damage Hazard.
Deteriorating vapors and acid fumes can damage metal parts.
Install motor in areas free of acid fumes and other deteriorating vapors.

⚠ CAUTION

Equipment Damage Hazard.
Tightly securing actuator to damper housing can damage actuator.
Mount actuator to allow it to float along its vertical axis.

Preparation

Before mounting the actuator onto the damper shaft, determine the:
— Damper/valve opening direction for correct spring return rotation. The actuator can be mounted to provide clockwise or counterclockwise spring return.
— Damper shaft size (see the Specifications section).

Determine Appropriate Mounting Orientation

The actuators are designed to open a damper by driving the damper shaft in either a clockwise ↷ or counterclockwise ↶ direction (see Fig. 2).

NOTES:

— Actuators are shipped in the fully closed (spring return) position.
— An arrow molded into the hub points to tick marks on the label to indicate the hub rotary position.

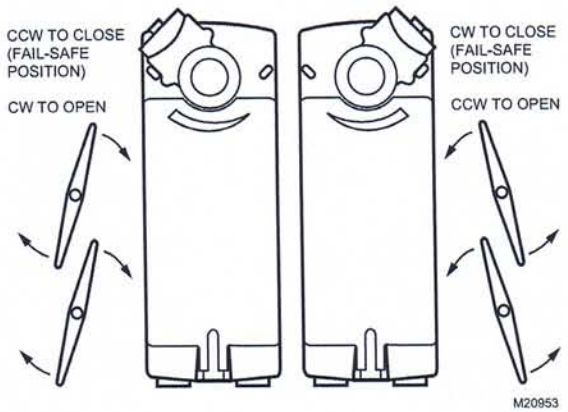


Fig. 2. Spring Return DCA mounting orientation.

Measure Damper/Valve Shaft Length

If the shaft is less than three inches in length, the shaft coupling must be located between the damper/valve and actuator housing. If the shaft length is more than three inches, the shaft coupling may be located on either side of the actuator housing.

If the coupling must be moved from one side of the actuator to the reverse, follow these instructions (see Fig. 3):

1. Remove the retainer clip from the shaft coupling and set it aside for later use.
2. Remove shaft coupling from one side of the actuator.
3. Replace the shaft coupling on the opposite side of the actuator aligning it based on the stroke labelling.
4. Replace the retainer clip on the shaft coupling using the groove of the coupling.

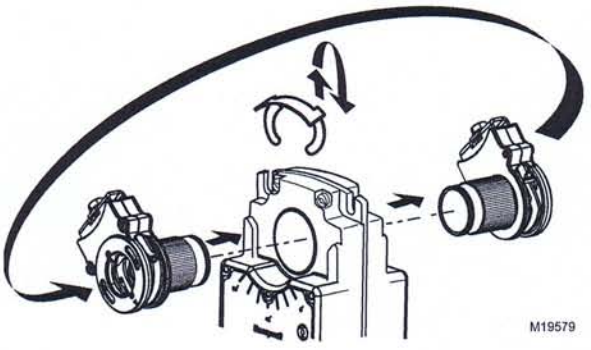


Fig. 3. Mounting shaft coupling to actuator opposite side.

Select Actuator Control Signal

These actuators are available in two control types:
— Standard: includes mode selection dial to select the desired input signal.
— Enhanced: includes different mode selection dial to select the desired input signal. Also includes dials for adjusting the input signal zero and span.

NOTE: Selections are made using a dial that appears on both the front and back of the actuator (see Fig. 4). For available options, see Table 4.

Select the control signal as follows:
- Simply turn the mode selection dial to the desired control signal (as indicated on the device label).

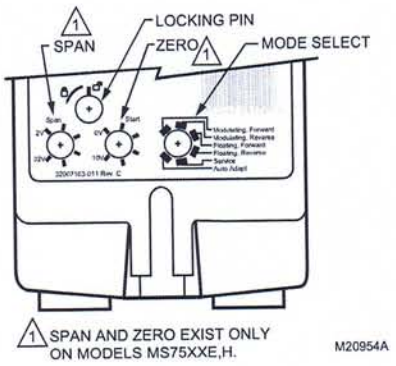


Fig. 4. Dials for control signal and zero/span.

Table 4. Actuator Control Signal Selections.

Mode Options	Standard	Enhanced	Details
Floating: forward	X[a]	X[a]	Series 60 control. Power to terminal 4 drives toward spring return position.
Floating: reverse	X[b]	X[b]	Series 60 control. Power to terminal 3 drives toward spring return position.
Modulating: 0-10 Vdc	X[c]		Series 70 control. 0 Vdc signal drives toward spring return position.
Modulating: 10-0 Vdc	X[c]		Series 70 control. 10 Vdc signal drives toward spring return position.
Modulating: 2-10 Vdc	X[c]		Series 70 control. 2 Vdc signal drives toward spring return position.
Modulating: 10-2 Vdc	X[c]		Series 70 control. 10 Vdc signal drives toward spring return position.
Modulating: forward		X	Voltage input with adjustable zero and span. Minimum signal drives toward spring return position.
Modulating: reverse		X	Voltage input with adjustable zero and span. Maximum signal drives toward spring return position.
Service		X	Actuator hub stops in place and ignores control signal changes.
Auto-adapt		X	For setup only. Rescales to allow full input signal over mechanically limited stroke.

[a] Feedback: MS75XXA,H and U.S. S... models are 2-10 Vdc, MS75XXB,E and European S... models are 0-10 Vdc.

[b] Feedback: MS75XXA,H and U.S. S... models are 10-2 Vdc, MS75XXB,E and European S... models are 10-0 Vdc.

[c] When operating in Modulating mode, the feedback signal matches the control signal.

Non-Standard Stroke

Mechanical Stroke Limit Reduction

For applications requiring a span less than 95 degrees, a simple adjustment can be made. When the rotational mounting of the shaft coupling is changed, the actuator drives less than the full 95 degrees stroke.

The stroke is adjustable in 5 degree increments. Once adjusted, the actuator drives until the shaft coupling reaches the mechanical stop (part of the housing). The stop causes the motor to discontinue driving and the shaft coupling drives no farther. When the actuator returns, it stops at the fail-safe position.

To set the fail-safe position, proceed as follows:

1. Remove the retainer clip from the shaft coupling and set it aside for later use.
2. Remove shaft coupling from the actuator.
3. Rotate the coupling to the desired fail-safe position, aligning it based on the stroke labelling. See Fig. 5.

   NOTE: The shaft coupling location determines the travel span.

   EXAMPLE: Setting shaft coupling to an approximate fail-safe position of 35 degrees (as indicated on the housing) limits stroke to 60 degrees. (See Fig. 5)

4. Install the shaft coupling at this position.
5. Replace the retainer clip on the shaft coupling using the groove of the coupling.
6. If necessary, replace the holder and position indicator on the shaft coupling.

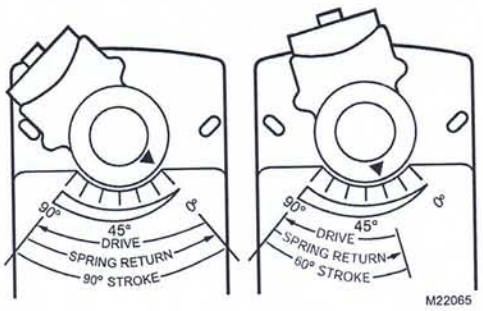


Fig. 5. Stroke reduction.

Adjustable Zero and Span (Enhanced Modulating Models *only*)

These actuators have the capability of adjustable zero and span. Fig. 4 shows the dials. These dials are present only on the Enhanced Modulating models. A basic description of these dials follows:

— Zero: Sets input voltage to define the 0% angle of rotation. It is factory set to 0 Vdc, and can be adjusted up to 10 Vdc.

— Span: Adjusts motor response to travel full stroke through the selected input span. It is factory set to 10 Vdc, and is adjustable from 2 to 32 Vdc.

SET ADJUSTABLE ZERO AND SPAN

1. Apply 24 Vac to the actuator.
2. Turn the zero dial (see Fig. 4) past the desired start point.
3. Using either a controller or signal generator, apply an input signal equal to the start point signal.
4. Slowly adjust zero toward the minimum setting until the actuator hub begins to move.
5. Turn the span dial (see Fig. 4) to the minimum setting (2 Vdc).
6. Using either a controller or signal generator, apply an input signal equal to the desired end point signal.
7. Allow the actuator to open fully.
8. Slowly adjust span toward the maximum setting until the actuator hub moves slightly from fully open.
9. Carefully adjust span knob toward minimum until the actuator hub returns to fully open.

Auto-Adapt

When using these actuators for standard stroke applications, this function can be ignored. When it is desirable to use a mechanically limited stroke (see Mechanical Stroke Limit Adjustment section), it is possible to use the Auto-Adapt feature to rescale the input signal over the new limited stroke.

1. Rotate actuator control signal dial to Auto-Adapt.

   NOTE: The actuator will drive open, then closed to establish the new open and closed positions.

2. Return the actuator control signal dial to the desired input signal position.

Manual Positioning

The actuator can be operated with no power present. Use this feature during installation or to move and lock the damper or valve shaft position when there is no power.

To operate the manual positioning:

1. If the power is on, turn it off.
2. Insert supplied hex wrench (key) as shown in Fig. 6.
3. Rotate key in the direction indicated on the cover.
4. Once the desired position is reached, hold the key to prevent the spring return from moving the actuator.
5. With the key held in place, use a screwdriver to turn the gear train lock pin in the indicated direction until the detent is reached.

   NOTE: At the detent, the pin resists further rotation.

6. Remove the key without rotating it further.

To release the manual positioning with no power present:

1. Insert supplied key.
2. Turn key 1/4 turn in the direction indicated on the cover.
3. Remove key without engaging the gear train lock pin.
4. The spring will return actuator to the fail-safe position.

   NOTE: Once power is restored, the actuator will return to normal automated control.

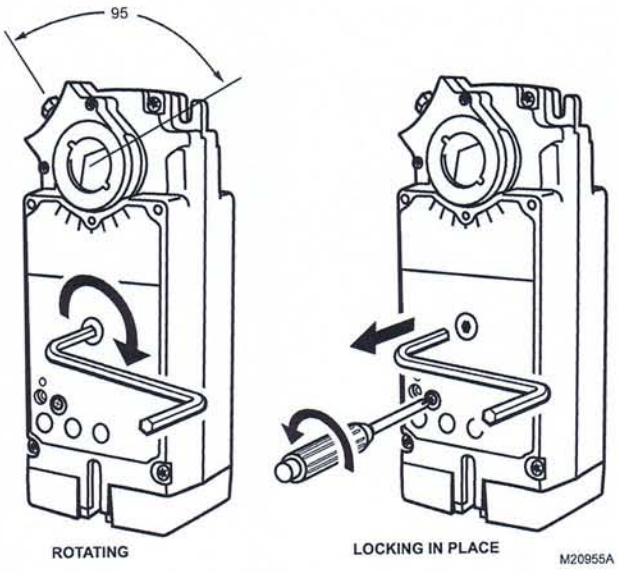


Fig. 6. Manual positioning.

Mounting

⚠ CAUTION

Device Malfunction Hazard.
Improper shaft coupling tightening causes device malfunction.
Tighten shaft coupling with proper torque to prevent damper shaft slippage.

⚠ CAUTION

Actuator Damage Hazard.
Using actuator as shaft bearing causes device damage.
Use actuator only to supply rotational torque. Avoid any side loads to actuator output coupling bearings.

⚠ CAUTION

Equipment Damage Hazard.
Can damage the motor beyond repair.
Never turn the motor shaft by hand or with a wrench. Forcibly turning the motor shaft can damage the gear train.

To mount the actuator to an external drive shaft of a damper, proceed as follows:

1. Place actuator over damper shaft; and hold mounting bracket in place. See Fig. 8.
2. Mark screw holes on damper housing.
3. Remove actuator and mounting bracket.
4. Drill or center-punch holes for mounting screws (or use no.10 self-tapping sheet metal screws).
5. Turn damper blades to desired normal (closed) position.
6. Place actuator and mounting bracket back into position and secure bracket to damper box with sheet metal screws.
7. Using 10 mm wrench, tighten shaft coupling securely onto damper shaft using minimum 120 lb-in. (13.6 N•m), maximum 180 lb-in. (20.3 N•m) torque.

NOTE: See Fig. 7 for proper mounting to a square damper shaft.

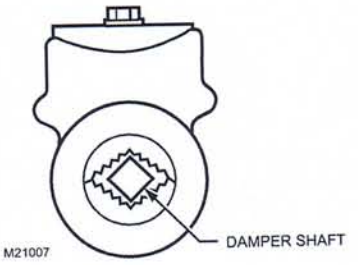


Fig. 7. Proper mounting to square damper shaft.

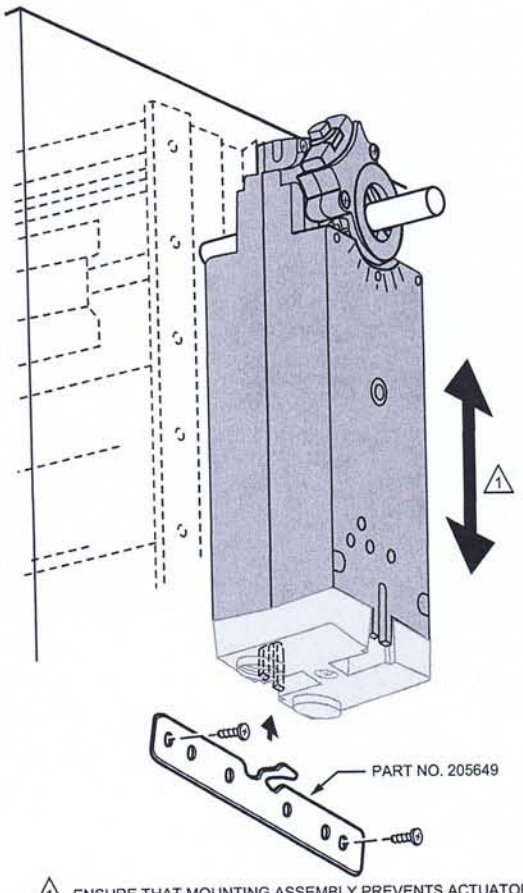


Fig. 8. Mounting actuator to damper housing.

WIRING

⚠ CAUTION

Electrical Shock or Equipment Damage Hazard.
Disconnect all power supplies before installation.
Motors with auxiliary switches can have more than one disconnect.

IMPORTANT

All wiring must comply with local electrical codes, ordinances and regulations.

Access Cover Removal (Fig. 9)

⚠ CAUTION

Equipment Damage Hazard.
Improper cover removal can damage electric connections.
Pull the cover along the axis of the actuator.
The cover contains contact sockets that must connect to actuator contact pins.
Bending these pins can permanently damage the device.

NOTE: This cover can be removed before or after actuator mounting.

In order to wire the device, the access cover must be removed as follows:

1. Remove the screw from the center of the cover, set the screw aside.
2. Pull the cover along the long axis of the actuator.
3. If the actuator is not yet mounted, set it aside.
4. Remove conduit dust covers as necessary.
5. Thread wire through conduit holes.
6. Connect wires as appropriate to the terminal block(s). (See Fig. 10 and 11.)

NOTE: With US Models, use 1/2 in. NPS strain relief gland or 1/2 in. conduit adapters. Recommend using flex conduit.
With European Models, use M16 strain relief gland.

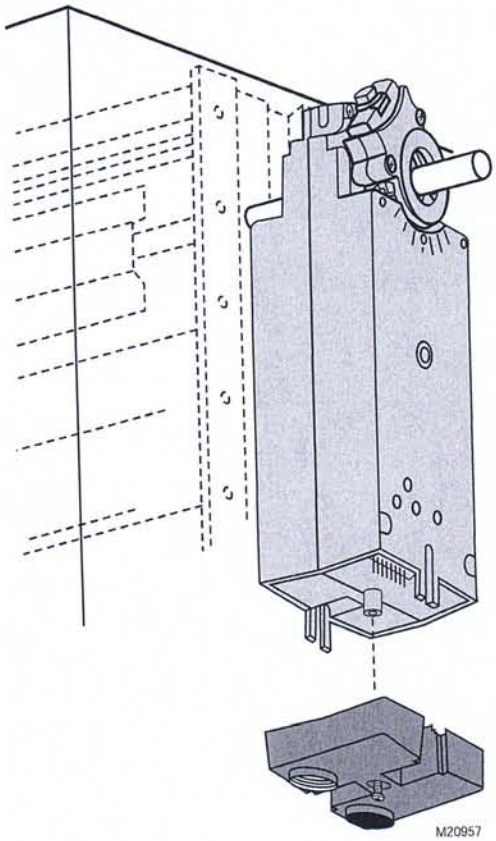


Fig. 9. Removing access cover.

Typical Wiring

See Fig. 10 through 26 for typical wiring details.

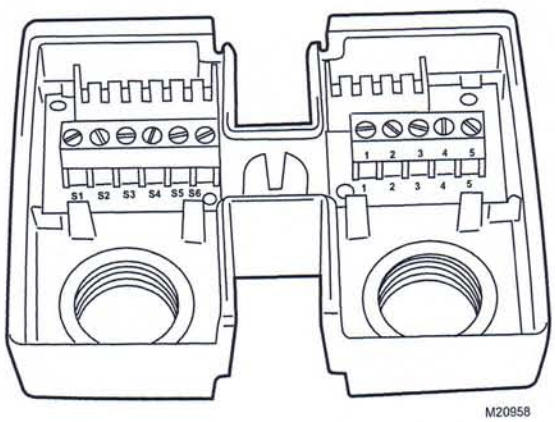


Fig. 10. Terminal block details.

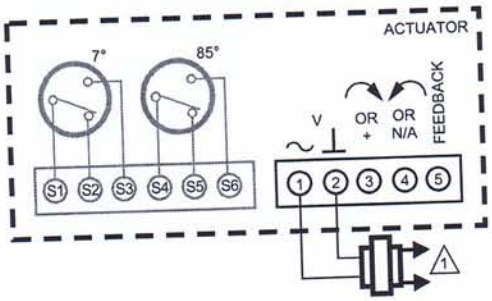


Fig. 11. Terminal block details.

Table 5. Wiring details.

Terminal	Floating	Modulating	Two-Position		Color[a]
			24 Vac	120 Vac 240 Vac	
1 ~	power	power	power	power	Red
2 ⊥	common	common	common	neutral	Black
3	cw	input	—	—	White
4 →	ccw	—	—	—	—
5 ←	feedback	feedback	—	—	Brown

[a] Only applies to models with wires.

Sxx24-2POS Models

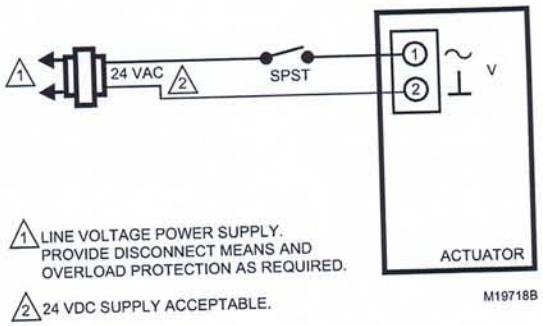


Fig. 12. Wiring for low-voltage two-position control.

Sxx120-2POS, Sxx230-2POS Models

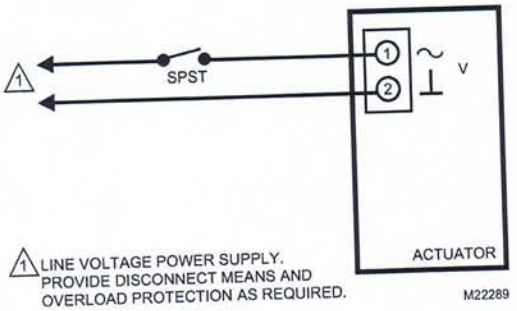


Fig. 13. Wiring for line-voltage two-position control.

Sxx010 Models

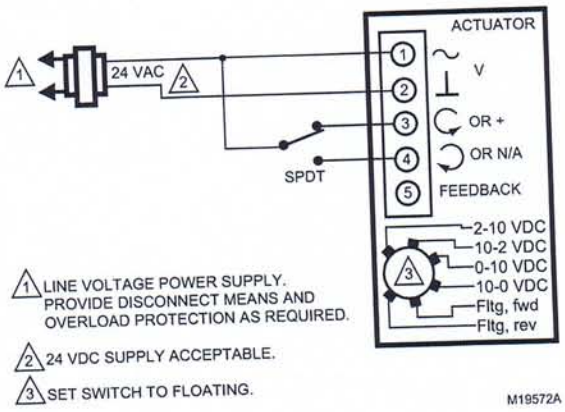


Fig. 14. Wiring for SPDT on/off control.

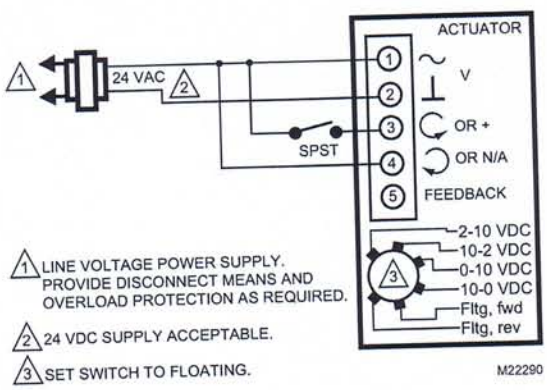


Fig. 15. Wiring for SPST on/off control.

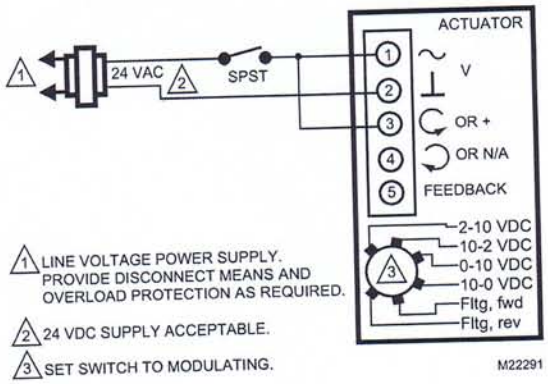


Fig. 16. Wiring for two-wire SPST on/off control.

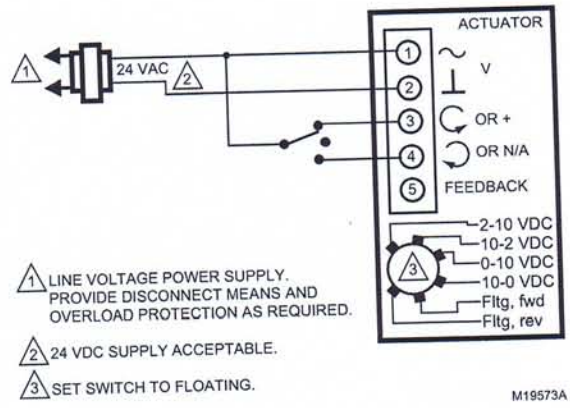


Fig. 17. Wiring for floating control.

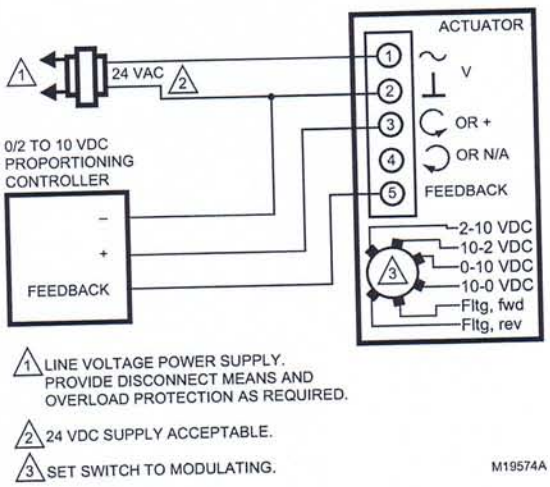


Fig. 18. Wiring for 0/2-10 Vdc proportioning controllers.

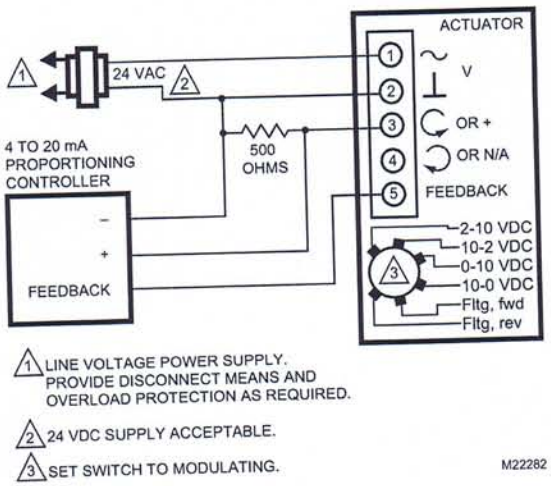


Fig. 19. Wiring for 4-20 mA proportioning controllers.

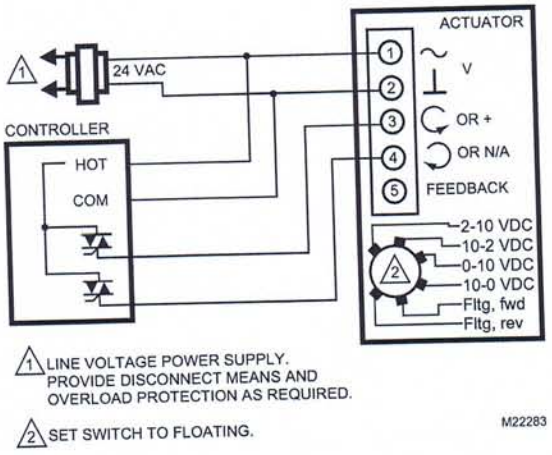


Fig. 20. Wiring for high side (triac source) floating control.

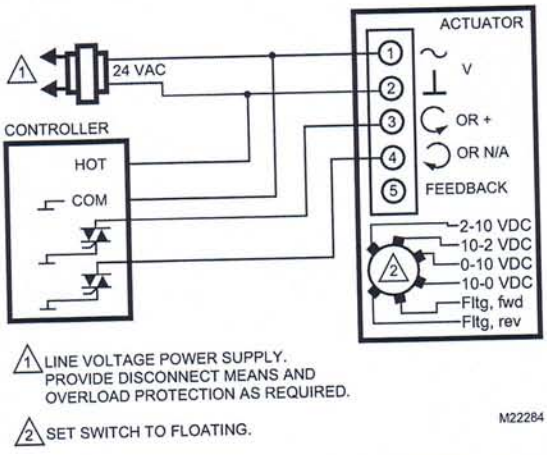


Fig. 21. Wiring for low side (triac sink) floating control.

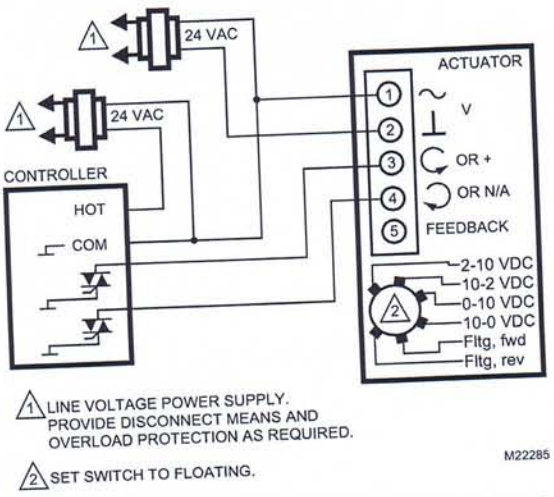


Fig. 22. Wiring for low side (triac sink) floating control using separate transformers.

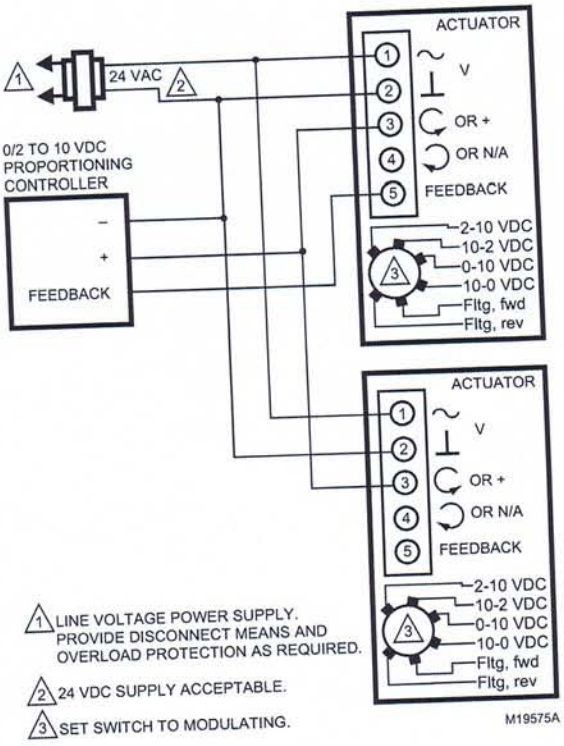


Fig. 23. Wiring for 0/2-10 Vdc proportioning controller operating multiple actuators.

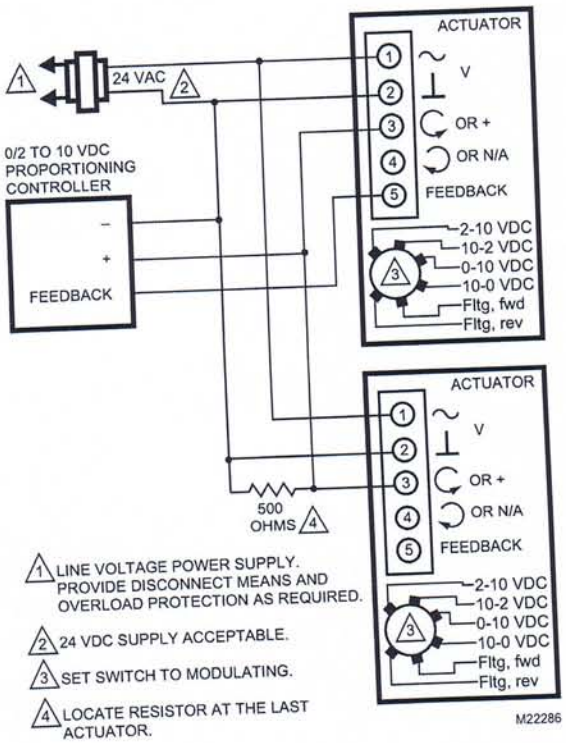


Fig. 24. Wiring for 4-20 mA proportioning controller operating multiple actuators.

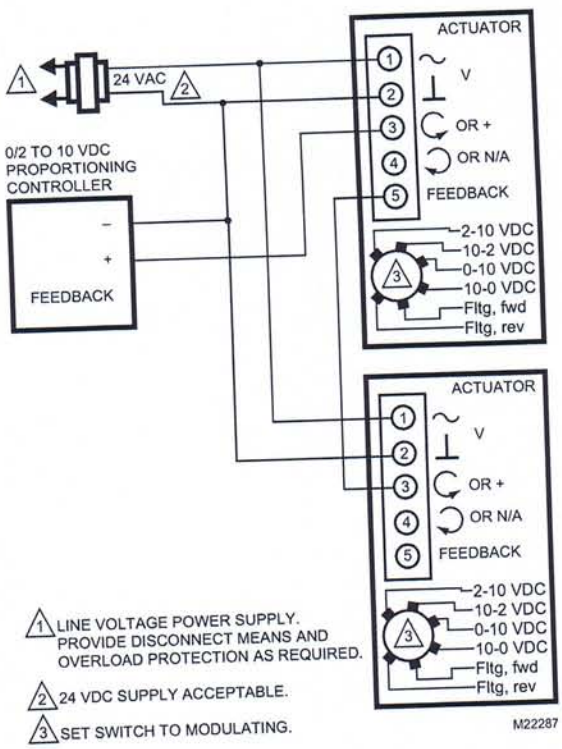


Fig. 25. Wiring for 0/2-10 Vdc proportioning controller operating multiple actuators as master/drone.

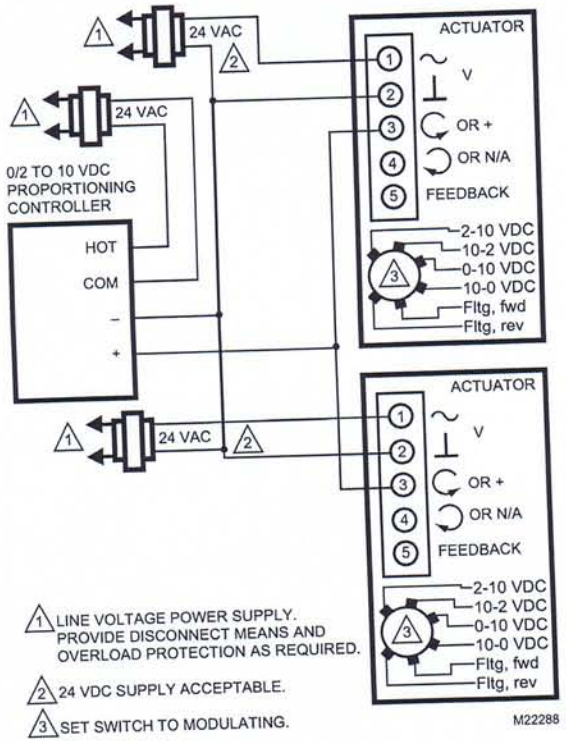


Fig. 26. Wiring for 0/2-10 Vdc proportioning controller operating multiple actuators with separate transformers.

OPERATION

The actuator is designed to be used in ventilating and air conditioning installations to operate valves, dampers, ventilation flaps and louvers requiring torque up to the rating. (For ratings, see the Specifications section.) If the power fails, the actuator will spring return to the start position.

The actuator is operated by a proportional controller. When using a proportional controller, the actuator drives toward its fully open position when the input signal increases; the actuator drives toward the fully closed position when the input signal decreases. The actuator stops when the input signal reaches the desired proportional control point.

IMPORTANT

The actuator is designed to respond to DDC Controller instantaneous contact closures. Take care not to short cycle the actuator. Unstable damper control can cause premature actuator failure.

Actuator Override

To override the control signal (for freeze protection or similar applications):

1. Override to full open:
   a. Disconnect the input signal (from terminal 3).
   b. Apply 24 Vac to terminal 3.
   c. See Fig. 27.
2. Override to full closed:
   a. Disconnect the input signal (from terminal 3).
   b. See Fig. 28.

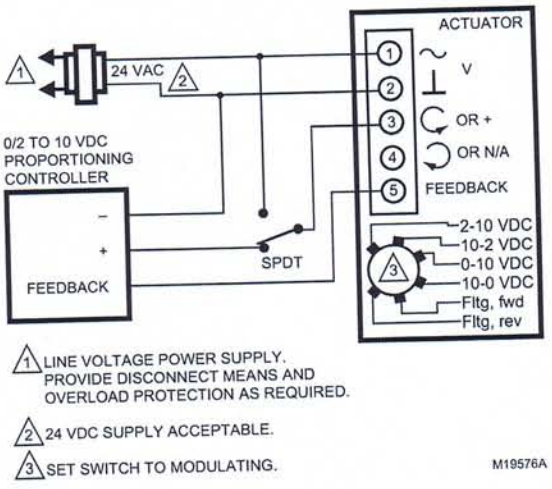


Fig. 27. Override to full open.

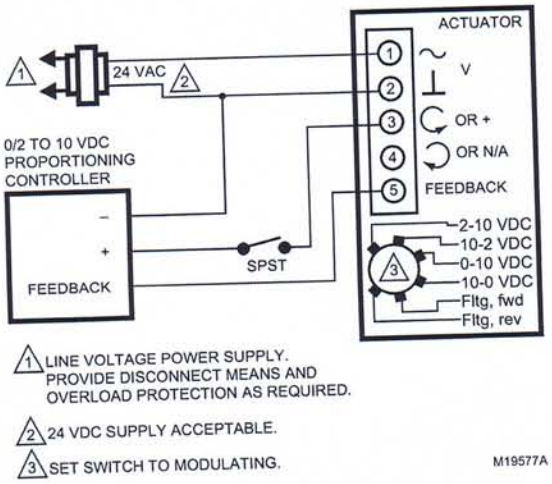


Fig. 28. Override to full close.

End Switches

Some models include end switches (see Table 6). For wiring details, see Fig. 11.

SPDT Switches (Fig. 29)

For SPDT end switch wiring, see Fig. 11.

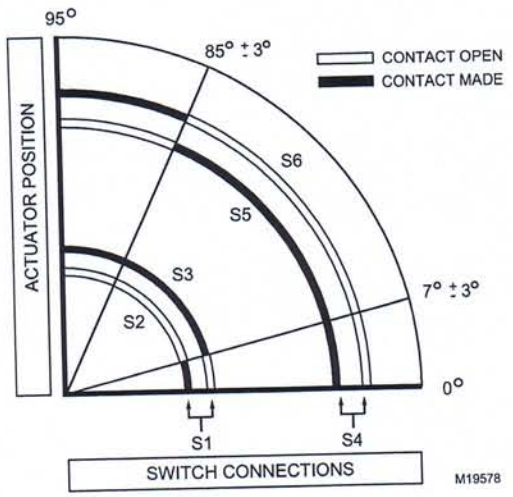


Fig. 29. SPDT End Switch Operation.

CHECKOUT

Modulating/Floating Operation

1. Mount actuator for required application (either clockwise ↷ or counterclockwise ↶ rotation to open the damper).
2. Connect power to terminals 1 and 2. (See Fig. 11 and Table 5.)
3. Set "Mode Select" dial to desired control signal. (See Fig. 4 and Table 4.)
4. Apply control signal for actuator 100% position. (See Fig. 11 and Table 5.)
   a. (0)2-10 Vdc: apply 10 Vdc signal to terminal 3.
   b. 10-(0)2 Vdc: apply (0)2 Vdc signal to terminal 3.
   c. (0)4-20 mA: apply 20 mA signal to terminal 3.
   d. 20-(0)4mA: apply (0)4 mA signal to terminal 3.
   e. Floating: apply 24 Vac to appropriate CW (3) or CCW (4) terminal.
5. Actuator drives to 100% position.
6. Apply control signal for actuator 0% position. (See Fig. 11 and Table 5.)
   a. (0)2-10 Vdc: apply (0)2 Vdc signal to terminal 3.
   b. 10-(0)2 Vdc: apply 10 Vdc signal to terminal 3.
   c. (0)4-20 mA: apply (0)4 mA signal to terminal 3.
   d. 20-(0)4mA: apply 20 mA signal to terminal 3.
   e. Floating: apply 24 Vac to appropriate CW (3) or CCW (4) terminal.
7. Actuator drives to 0% position.

Spring Return Operation

1. Mount actuator for required application (either clockwise ↷ or counterclockwise ↶ rotation to open the damper).
2. Connect power to terminals 1 and 2. (See Fig. 11 and Table 5.)

   NOTE: For two-position models skip to step 5.

3. Set "Mode Select" dial to desired control signal. (See Fig. 4 and Table 4.)
4. Apply control signal for actuator 50% position. (See Fig. 11 and Table 5.)
   a. Vdc Input Signal: apply 5-6 Vdc signal to terminal 3.
   b. mA Input Signal: apply 10-12 mA signal to terminal 3.
   c. Floating: apply 24 Vac to appropriate CW (3) or CCW (4) terminal.
5. Allow the actuator to drive to 50% position.
6. Disconnect wire from terminal 1.
7. Actuator spring returns to 0% position.
8. Re-connect wire to terminal 1, actuator drives towards 100% position.

Feedback Operation

1. Connect a multi-meter, set for Vdc, to terminals 2 and 5.
2. Apply the same signal as in step 4 of Modulating Operation.
3. The multi-meter reading increases to match the input signal as actuator drives towards 100% position.
4. Apply the same signal as in step 6 of Modulating Operation.
5. The multi-meter reading decreases to match the input signal as actuator drives towards 0% position.

Direct Checkout

1. Mount actuator for required application (either clockwise ↷ or counterclockwise ↶ rotation to open the damper).
2. Check damper position and make sure that 24 Vac is present at the appropriate connections. (See Fig. 10.)
3. Apply control signal to the appropriate connections to move the damper to the opposite position. The actuator should drive the damper.
4. If actuator does not run, verify that the actuator is properly installed for either clockwise ↷ or counterclockwise ↶ rotation.
5. If actuator is correctly installed and still does not run, replace the actuator.

Two-Position Checkout

1. Mount actuator for required application (either clockwise ↷ or counterclockwise ↶ rotation to open the damper).
2. Check damper position and make sure that power is present at terminals 1 and 2.
3. Actuator drives to 100% position.
4. Disconnect power from terminals 1 and 2.
5. Actuator spring-returns to 0% position.
6. If actuator is correctly installed and does not run, replace the actuator.

Table 6. O.S. Number Selection (see Table 1 also).

M	Electrical Motor						
	S	Fail Safe Function (Spring Return)					
		41	120 Vac Two-Position Control; Reversible Mount				
		71	24 Vac Modulating Control; Reversible Mount				
		75	24 Vac Modulating and Floating Control; Reversible Mount				
		81	24 Vac Two-Position Control; Reversible Mount				
			05	44 lb-in. (5 N•m)			
			10	88 lb-in. (10 N•m)			
			20	175 lb-in. (20 N•m)			
				A[a]	Standard U.S. Model		
				B[b]	Standard European Model		
				E[a]	Selectable control signal; Adjustable zero and span; Includes service and auto-adapt modes		
				H[b]			
					1	No Feedback	
					2	Voltage Feedback Signal	
						0	No End Switches
						2	Two End Switches
							XX System Controlled Numbers

M	S	75	20	A	2	0	XX

[a] Model manufactured for sale in the United States.

[b] Model manufactured for sale in Europe.

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- Natural Gas and LPG
- Configurations of U and L
  - horizontal or 45°
- Separated Controls Compartment
  - electronics out of air stream
  - burner can run during servicing
- Self diagnostic ignition module
- Parabolic Aluminum Reflectors
  - most efficient in the industry
- Direct Spark Ignition
- Vented or unvented
- Hinged service cover on UA
- Jet Stream Burner
  - improved heat distribution
  - better combustion
- Heavy Duty Couplings
  - no leaks
  - cannot be over tightened
- Operating Status Light
- UX model features
  - totally enclosed construction
  - 10 year warranty on optional aluminized heat exchanger

SUPERIOR RADIANT PRODUCTS

SUPERIOR TECHNOLOGY • SUPERIOR PERFORMANCE

SPECIFICATIONS
Series UA and UX Infrared Heaters

MODEL		RATE BTU/HR (Nat. Gas or LPG)	SHIP WT.	STD. LENGTH Ft
UA (X)	-40	40,000	80 lbs (37 kg)	10
UA (X)	-60	60,000	120 lbs (55 kg)	20
UA (X)	-80	80,000	120 lbs (55 kg)	20
UA (X)	-100	100,000	120 lbs (55 kg)	20
UA (X)	-125	125,000	160 lbs (73 kg)	30
UA (X)	-150	150,000	200 lbs (91 kg)	40
UA (X)	-175	175,000	240 lbs (109 kg)	50
UA (X)	-205	205,000	280 lbs (127 kg)	60
UA (X)	-220	220,000	280 lbs (127 kg)	60

Extension Options Available

ELECTRICAL RATING
120 VAC 60 Hz 1A plug connector

GAS CONNECTION
1/2" NPT

TUBE DIAMETER
Combustion air 4"
Flue 4"

MINIMUM GAS INLET
Nat gas 5.0" W.C.
LPG 11" W.C.

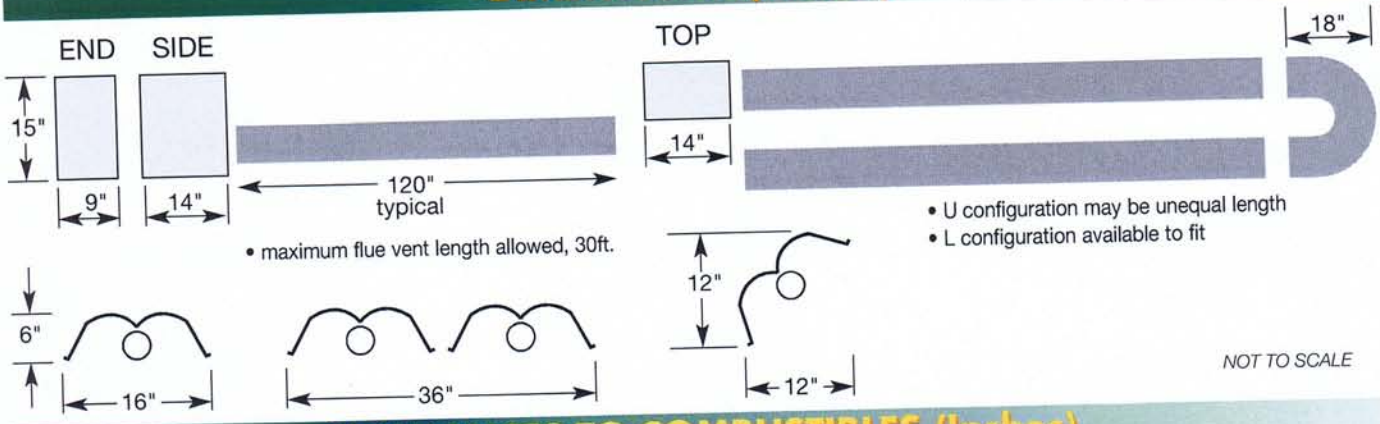
STANDARD EQUIPMENT INCLUDES

- Burner housing assembly
- Aluminized combustion tube with gasket
- Combustion air inlet collar
- Turbulators when required
- All tube, reflectors, coupling and hanging accessories per specified length

OPTIONAL EQUIPMENT

- U or L bends for specific layouts
- Side reflector and brackets
- Lower shield and brackets
- Thermostats, 24v or 120v
- Termination vent
- Hot rolled or aluminized tube

DIMENSIONS (Inches)



CLEARANCES TO COMBUSTIBLES (Inches)

MODEL	UA or UX 60			UA or UX 100			UA or UX 125			UA or UX 175			UA or UX 205			UA or UX 220		
Configuration	Top	Side	Below	Top	Side	Below	Top	Side	Below	Top	Side	Below	Top	Side	Below	Top	Side	Below
Straight - Horizontal	2	25	58	2	30	67	4	33	71	6	40	78	6	44	80	6	46	83
Straight - 45° Tilt	4	4-46	50	4	4-58	67	6	4-63	70	8	4-67	74	8	4-72	78	8	4-77	81
U-Tube Horizontal	2	25	59	2	30	71	4	34	74	6	40	78	6	45	82	6	46	88

- Other layout configurations are approved
- Side reflectors and lower shields are available
- Lower clearances are allowable at 25' from burner
- See installation manual for complete information

SUPERIOR RADIANT PRODUCTS

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Email: sales@superiorradiant.com

DISTRIBUTOR

Submittal Data

Model UA

Low Intensity Infrared Heaters

SUPERIOR RADIANT PRODUCTS

Project: Caledon East Arena
Engineer:
Contractor: Cyclone Ventilation

Date: Dec 11 2009
Submitted by: Gary Dummer

General Specification

Fuel Type *(Check one)*	**Heat Exchanger** *(Check one)*
X Natural Gas	X Heat Treated Aluminized Steel
___ LPG	___ Hot Rolled
Inlet Gas Pressure	**Electrical:** *(Select thermostat)*
Minimum Natural Gas @ 5" W.C.	120VAC, 60 Hz, 1A
LPG @ 11" W.C.	30" long, 3 Prong Power Lead
Maximum Natural Gas & LPG @ 14"	___Line Voltage ___ 24v Thermostat

Manifold Gas Pressure	**Flue/Air Connections**
Nat. Gas 3.5" W.C.	4" Diameter Connection
LPG 10.5" W.C.	Maximum Vent Length = 30 feet
Gas Connection	Maximum fresh Air Length = 30 feet
½" NPT (female)	Vent + Fresh Air = 50 feet max.

Accessories *(Check all that apply)*
___ Thermostat
___ Vent Terminal
___ Wall Thimble
X Rubber Gas Flex Connectors
___ Shut Off Valve
1 U Bend Pkg.
X Side Reflectors
Flue Connecting Tee (4x4x6)

MODEL	RATE BTUH	HEATER LENGTH *(Check length - feet)*	TILT	CLEARANCE to COMBUSTIBLES		
				Top	*Bottom*	*Sides*
UA-40	40,000	10 - 20	0 degree	2	45	18
			45 degree	4	40	4, 38
UA-60	60,000	15 - 30	0 degree	2	58	25
			45 degree	4	50	4, 46
UA-80	80,000	20 - 40	0 degree	2	62	26
			45 degree	4	58	4, 50
UA-100	100,000	20 - 40	0 degree	2	67	30
			45 degree	4	67	4, 58
UA-125	125,000	1 30 - 50	0 degree	4	71	33
			45 degree	6	70	4, 63
UA-150	150,000	40 - 60	0 degree	4	74	36
			45 degree	6	71	4, 64
UA-175	175,000	50 - 60	0 degree	6	78	40
			45 degree	8	74	4, 67
UA-205	205,000	50 - 70	0 degree	6	80	44
			45 degree	8	78	4, 72
UA-220	220,000	60 - 70	0 degree	6	83	46
			45 degree	8	81	4, 77

Series UA

Superior Radiant Products
Series UA
Specification for Radiant Heating Equipment

General

1) A Radiant Heater Unit System shall be provided that is;
   - CSA approved
   - Fitted for Natural Gas or Propane operation
   - Complete with hangers, thermostats, vent terminals, and/or other accessories as noted on the plan.
2) Heaters shall be manufactured in Canada by Superior Radiant Products, Series UA, with a firing rate and heat exchanger length as specified.
3) A manufacturer's published warranty covering all components for a period of 36 months and covering the heat exchanger for a period of at least 60 months shall be supplied.
4) Clearance to combustibles shall be as specified.
5) Flexible gas connectors of approved type shall be provided.
6) The Heater Unit shall operate at a minimum inlet gas pressure of 5 in. W.C. for Natural Gas and 11 in. W.C. for Propane and draw no more than 1A @120VAC, 60Hz.

Equipment Components

1) Ignition shall be direct spark with ignition taking place within the burner cup for reliability.
2) Ignition control shall
   - Make 3 ignition attempts before lockout
   - Shall recycle again in one hour with 3 ignition attempts
   - Shall have a lighted diagnostic display capability
   - Shall have openly accessible sense current measurement contacts within the housing
   - Shall have a blower post purge function
   - Shall accept 24V thermostat wiring
3) Air blower motor shall be totally enclosed, requiring no oiling and shall be equipped with a thermal overload switch.
4) Gas and electric controls shall be separated from the combustion air stream.
5) The burner shall be serviceable from either side while in operation.
6) Gas valve shall be of the slow opening type.
7) Air pressure proving switch shall be an integral part of burner safety control system.
8) Burner housing shall be constructed of 18ga corrosion resistant steel and coated with powder epoxy paint.
9) Outside air adapters and flue connectors shall be provided as standard equipment.
10) Burner box surface temperature shall not exceed 27 C (80 F) at any point during operation.
11) Burner shall be equipped with a flame sight port safely useable while the unit is running during service.
12) Reflectors shall be mill-finished aluminum, ASTM 1100, with 10 reflective surfaces.
13) Reflector material shall be at least 0.024 inches thick (per CGA code).
14) Reflector end caps shall be provided as standard and shall be fitted to the end of each reflector run to reduce convective heat loss.
15) Reflectors shall extend below the bottom surface of the radiant tube.
16) Directing of radiant pattern shall be accomplished through use of side shields or bottom shields only.
17) Couplings shall be of aluminized steel, be twelve inches in length with two draw bands of 2 inch wide by 0.0625 (16ga) aluminized steel.
18) Radiant heat exchanger tubing shall be seamless welded 16ga thick either hot rolled steel or heat-treated aluminized steel.

Installation

1) Installation must comply with manufacturer supplied Instruction Manual, all applicable local codes and/or gas utility requirements. In the absence of any of the former, reference should be made to ANSI Z223.1 (NFPA 54) and CAN 1-B149.1 and B149.2 Installation Codes.
2) Heater units must be wired in accordance with ANSI/NFPA 70 and CSA C22.1and local ordinances.
3) Heater Units shall be suspended in accordance with manufacturer's instruction with chain and turnbuckles exceeding 150lb pull test. (3/8 – 4 inch turnbuckles and 2/0 chain).

SUPERIOR RADIANT PRODUCTS

UA/UX/UXR Fact Sheet

Rate (1000 btuh)	40	60	80	100	125	150	175	205	220
Lengths (min-max ft.)	10-20	15-30	20-40	20-40	30-50	40-60	50-60	50-70	60-70

- Emitter tube: 1st tube is aluminized heat treated—balance can be aluminized heat treated or hot rolled
- Venting: Maximum total vent length: 30 ft.
  Maximum total fresh air allowed: 30 ft.
  Total vent length plus outside air cannot exceed 50 ft.
- Special configurations: 60,000 BTU—15 ft heat exchanger with 6 ft stainless steel baffle Nat. Gas only.
  80,000 BTU—40 ft. heat exchanger with no baffle.
  100,000 BTU—40 ft. or 50 ft. heat exchanger with no baffle.
  205,000 BTU— 50 ft. heat exchanger with 4 ft. baffle at 40 ft. and an 8 ft. baffle at 50 ft.
- Gas connection: 1/2" N.P.T. (female) @ heater
  Minimum inlet pressure: Natural—5" W.C. Propane—11" W.C.
- Electrical: Each heater—120 V AC 60 Hz 1 AMP, 36" long power lead

FEATURES

UA

- Hinged door cover (easy to service)
- Unit can continue running while servicing
- Self diagnostic module
- DSI, 3 try ignition (direct spark) pre purge
- Operation light
- 24v control option
- Deep reflector design is 99% efficient
- Separated components in burner box (electrical components are not in air stream)
- Three year warranty on all components
- Five year warranty on hot rolled heat exchanger without post purge, seven years **with** post purge feature.
- Seven year warranty on aluminized heat exchanger without post purge, ten years **with** post purge feature.

UX

- Burner box completely gasket sealed
- Unit can continue running while servicing
- Self diagnostic module
- DSI, 3 try ignition (direct spark) with pre purge
- Operation light
- Low voltage controls
- Deep reflector design is 99% efficient
- Separated components in burner box (electrical components are not in air stream)
- Three year warranty on all components
- Seven year warranty on hot rolled heat exchanger with **post purge** feature
- Ten year warranty on aluminized heat exchanger with **post purge** feature.

UXR

- Same as UX Model plus...
- Burner box is sealed for outdoor conditions
- Rubber gaskets are used instead of fiber
- Silicone used to seal corners and joints
- Weather resistant electrical components used for exterior connections
- Heat exchanger is standard heat treated aluminized steel tubing
- Stainless Steel burner boxes available as well as tubing and reflectors
- Units are wind resistant
- Ten year warranty on aluminized heat exchanger with **post purge** feature.

CAUTION: FIRE OR EXPLOSION HAZARD

Maintain clearance to combustible constructions as further specified in this manual. Failure to do so could result in a serious fire hazard. Heaters should not be located in hazardous atmospheres containing flammable vapors or combustible dusts. Signs should be provided in storage areas specifying maximum safe stacking height.

CAUTION: MECHANICAL HAZARD

This equipment expands and contracts with each operating cycle. The gas connection, suspension hardware and the installation itself must safely allow this movement. Failure to do so could result in serious fire or explosion hazard.

CAUTION: FIRE OR EXPLOSION HAZARD

This heater is equipped with an automatic ignition device. Do not attempt to light the burner by hand. Failure to comply could result in a serious fire and personal injury hazard.

CAUTION: MECHANICAL HAZARD

Do not use high pressure (above 1/2 psi) to test the gas supply system with the burners connected. Failure to do so could result in damage to the burner and its control components requiring replacement.

CAUTION: SERVICE LIFE RISK

Do not install equipment in atmospheres containing halogenated hydrocarbons or other corrosive chemicals. Failure to do so may lead to premature equipment failure and invalidation of the warranty. Additionally, it is recommended that the equipment be installed with a slope downward and away from the burner of ¼" inch in 10' feet to allow start-up condensate drainage.

Introduction

Superior Radiant Products is a company in the infrared heating industry founded on the principles of product quality and customer commitment.

Quality commitments are evidenced by superior design, a regard for design detail and an upgrade of materials wherever justifiable.

Customer commitment is apparent through our ready responses to market demands and a never ending training and service support program for and through our distributor network.

Superior Radiant offers its 15 years of infrared expertise in a cost effective unitary heater design as culmination of that commitment. Series UA/UX/UXR models are field assembled, low intensity infrared heaters that are easy to install and maintain, and which were engineered with significant input from our customers. They are designed to provide economical operation and trouble-free service for years to come.

Important

These instructions, the layout drawing, local codes and ordinances, and applicable standards such as apply to gas piping and electrical wiring comprise the basic information needed to complete the installation, and must be thoroughly understood along with general building codes before proceeding.

Only personnel who have been trained and understand all applicable codes should undertake the installation. SRP Representatives are Factory Certified in the service and application of this equipment and can be called on for helpful suggestions about installation.

Installation Codes

Installations must comply with local building codes, or in their absence, the latest edition of the national regulations and procedures as listed below.

General Installation and Gas Codes

Heaters must be installed only for use with the type of gas appearing on the rating plate, and the installation must conform to the *National Fuel Gas Code*, ANSI Z223.1 (NFPA 54) in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada.

Aircraft Hangar Installation

Installation in aircraft hangars must conform to the *Standard for Aircraft Hangars,* ANSI/NFPA 409 in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada.

Public Garage Installation

Installation in public garages must conform to the *Standard for Parking Structures*, NFPA-88A or *Standard for Repair Garages*, NFPA 88B, in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada.

Parking Structures

Technical requirements are outlined in ANSI/NFPA 88B (USA)

Gas Supply Lines

Gas supply pipe sizing must be in accordance with the *National Fuel Gas Code,* ANSI Z223.1 (NFPA 54) in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada.

A 1/8" inch NPT plugged tap must be installed in the gas line connection immediately upstream of the burner farthest from the gas supply meter to allow checking of system gas pressure.

Electrical

All heaters must be electrically grounded in accordance with the *National Electric Code,* ANSI/NFPA 70 in the US, and the *Canadian Electric Code,* CSA C22.1 in Canada, and must comply with all local requirements.

Venting

Refer to the *National Fuel Gas Code,* ANSI Z223.1 (NFPA 54) in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada for proper location, sizing and installation of vents as well as information on clearance requirements when penetrating combustible walls for venting purposes.

General Specifications

Gas Supply

Inlet Pressure

Natural Gas:	Minimum	5.0" W.C	Propane Gas:	Minimum	11.0" W.C
	Maximum	14.0" W.C.		Maximum	14.0" W.C.

Manifold Pressure

Natural Gas:	3.5" W.C.	Propane Gas:	10.5" W.C.

Inlet Connection

Natural Gas Or Propane Gas: 1/2" female NPT

Electric Supply

120 VAC, 60 HZ, 1 Amp: 36" cord with grounded 3 prong plug

Flue and Outside Air Connection

4" inch O.D. male connection for flue adapter and outside air (optional) provided at the heater

Dimensional Charts

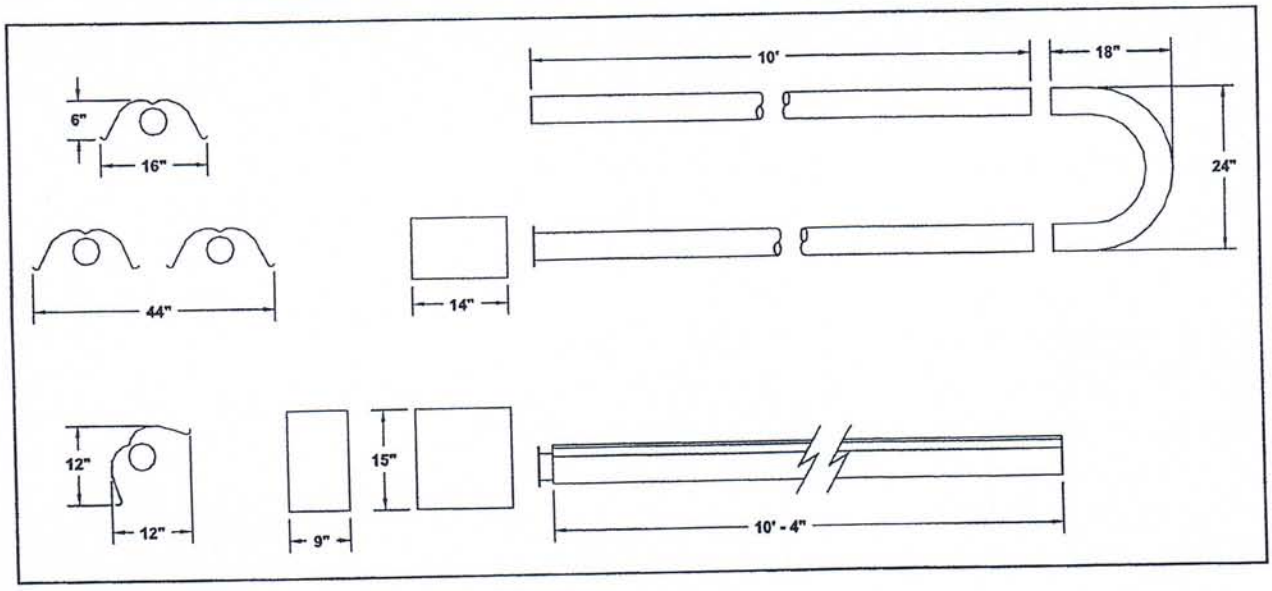


Figure 1: Overall Dimensional Information

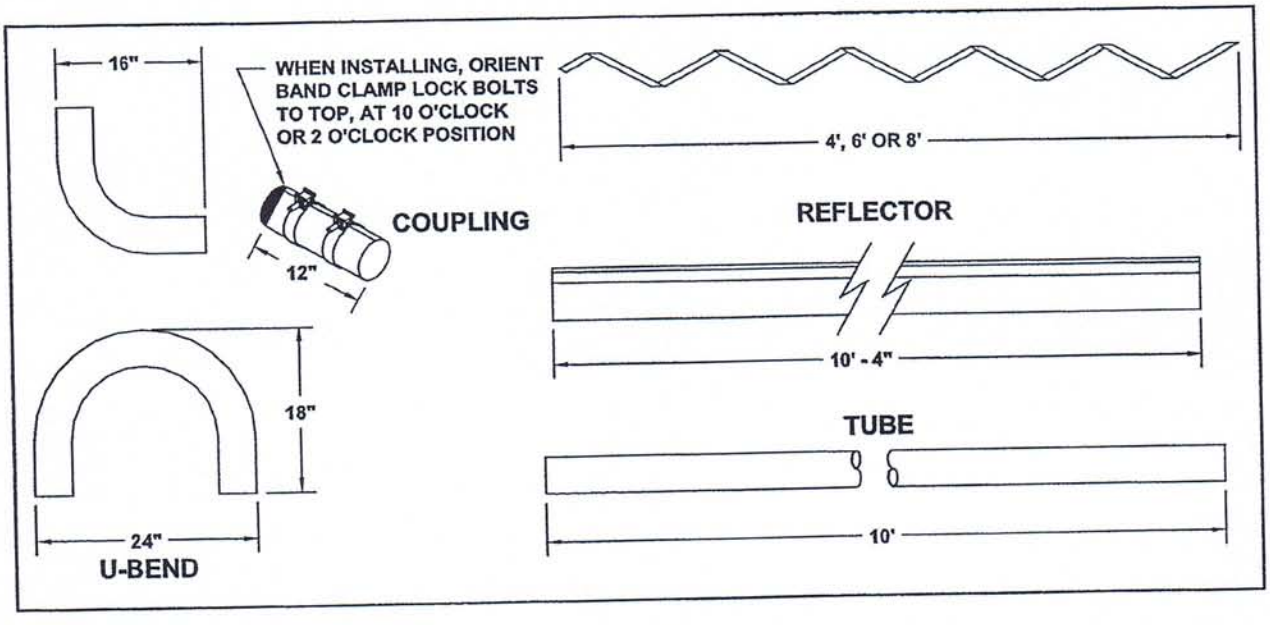


Figure 2: Component Dimensional Information

Model	Rate (BTU/Hr)	Heat Exchanger Length (ft.)		Baffle Length (ft.)
		Minimum	Maximum	
UA/UX/UXR-40	40,000	10'	20'	6'
UA/UX/UXR-60	60,000	20'	30'	6'
UA/UX/UXR-80	80,000	20'	30'	12'
UA/UX/UXR-100	100,000	20'	30'	12'
UA/UX/UXR-125	125,000	30'	50'	12'
UA/UX/UXR-150	150,000	40'	60'	6'
UA/UX/UXR-175	175,000	50'	60'	-
UA/UX/UXR-205	205,000	60'	70'	-
UA/UX/UXR-220	220,000	60'	70'	-

Table1: Configuration Information

Note:

- Baffles are always placed in the last section of radiant tube.
- Baffles are either aluminized or stainless steel sections 6' ft. long.
- When only 6' ft. is required an aluminized steel baffle is installed, except on the UA/UX/UXR-40 where a special 6' ft. baffle must be installed.
- When 12' ft. is required the aluminized steel baffle is lengthened forward *(toward the burner)* with a 6' ft. stainless steel section.

Part numbers for reference are:

CT016 Baffle for UA/UX/UXR-40 only
CT007 Baffle 6' ft. long, aluminized steel
CT006 Baffle extension, 6' ft. long stainless steel.

The following special configurations are also approved:

60,000 BTU/Hr, 15' ft. heat exchanger with 6' Stainless steel baffle (Natural Gas only)
80,000 BTU/Hr, 40' ft. heat exchanger with no baffle or 6' aluminized baffle
100,000 BTU/Hr, 40' ft. or 50' ft. heat exchanger with no baffle or 6' aluminized baffle
205,000 BTU/Hr, 50' ft. heat exchanger with a 4' ft. baffle at 40' ft., and a 8' ft. baffle at 50'-ft. (see Figure 3)

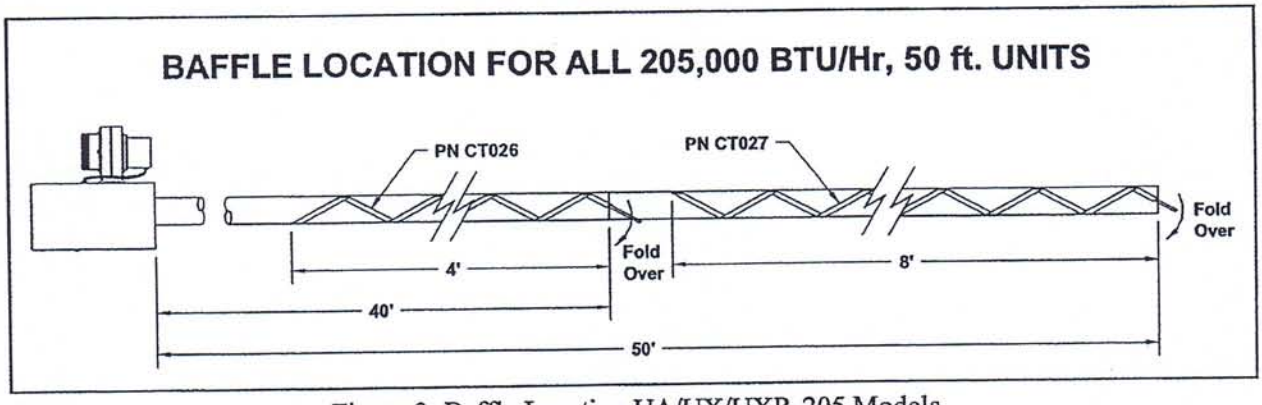


Figure 3: Baffle Location UA/UX/UXR-205 Models

Clearance To Combustibles

It is important to observe minimum clearance to combustibles at all times to avoid any possibility of property damage or personal injury. Clearances must be maintained from vehicles parked beneath heaters. Signs should be posted identifying any possible violation of the clearance distances from the heater in vehicle areas. Also, maximum allowable stacking height in storage areas should be identified with signs or appropriate markings. Table 2 lists minimum clearance to combustible materials corresponding to the installation configuration.

Approved reflector configurations include the standard *(with or without decorative grille)*, the 45° tilt reflector, single and dual side extension shields, standard U tube mounting and opposite 45° U tube reflector mounting.

Bottom shields are also approved. The "below" clearance dimension for the horizontal configuration *(dimension "C" in Table 2)* may be reduced by 25% when an approved bottom shield is used.

Reduced clearances downstream from the burner are approved for all configurations, except those with the U-bend. Dimensions "B", "C", and "D" can be reduced by 50% for locations 25' feet or more downstream from the burner box.

Elbows and U-bends are un-heat-treated aluminized material and are typically installed without reflectors. Clearance to combustibles is 18" inches above and from the end in all cases. When elbows or U-bends must be reflectored due to the proximity of combustible material inside this 18" inch area, a mitered reflector kit is available from your SRP dealer. Clearances in the case where mitered reflector kits are used are the same as the previous section of reflector.

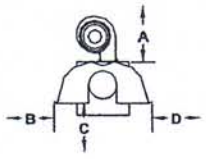
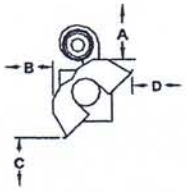
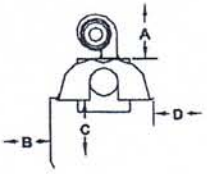
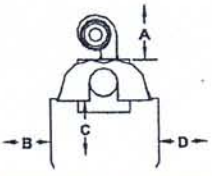
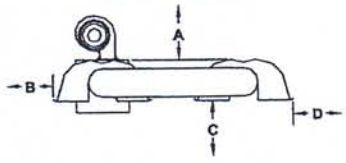
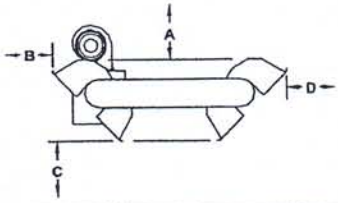
Reflector Configurations	Dim	Model No.: UA / UX / UXR								
		40	60	80	100	125	150	175	205	220
Horizontal 	A	2"	2"	2"	2"	4"	4"	6"	6"	6"
	B	18"	25"	26"	30"	33"	36"	40"	44"	46"
	C	45"	58"	62"	67"	71"	74"	78"	80"	83"
	D	18"	25"	26"	30"	33"	36"	40"	44"	46"
45° Reflector Tilt 	A	4"	4"	4"	4"	6"	6"	8"	8"	8"
	B	4"	4"	4"	4"	4"	4"	4"	4"	4"
	C	40"	50"	58"	67"	70"	71"	74"	78"	81"
	D	38"	46"	50"	58"	63"	64"	67"	72"	77"
One Side Extension 	A	2"	2"	2"	2"	4"	4"	6"	6"	6"
	B	4"	4"	4"	4"	4"	4"	6"	6"	6"
	C	50"	58"	63"	73"	76"	78"	80"	84"	84"
	D	35"	38"	42"	45"	50"	52"	54"	56"	58"
Two Side Extension 	A	2"	2"	2"	4"	4"	4"	6"	6"	6"
	B	9"	16"	18"	18"	22"	24"	26"	29"	31"
	C	50"	58"	64"	71"	78"	80"	82"	86"	88"
	D	9"	16"	18"	18"	22"	25"	26"	29"	31"
U-Tube, Horizontal 	A	-	2"	2"	2"	4"	4"	6"	6"	6"
	B	-	25"	28"	30"	34"	37"	40"	45"	46"
	C	-	59"	62"	71"	74"	76"	78"	82"	88"
	D	-	22"	26"	30"	33"	36"	40"	44"	46"
U-Tube, Opposite 45° 	A	-	4"	4"	4"	4"	4"	8"	10"	10"
	B	-	46"	50"	54"	63"	64"	67"	72"	74"
	C	-	51"	54"	64"	69"	71"	74"	78"	81"
	D	-	16"	18"	18"	22"	24"	26"	29"	32"
Un-Vented	Above	12"	12"	18"	18"	18"	18"	18"	18"	18"
	End	26"	26"	26"	26"	26"	32"	32"	32"	32"
Vented	End	18"	18"	18"	18"	18"	18"	18"	18"	18"

Table 2: Minimum Clearance to Combustibles

Installation Detail

Installation Sequence

Generally, there is no unique sequence for installation of the burner or heat exchanger. A review of the job site will usually indicate a logical installation order. However, time and expense can be saved if installation is begun at the most critical dimension, watching for interference from overhead doors, cranes, auto lifts etc. Figure 4 provides a general overview of the components utilized in the installation, as well as their general relationship.

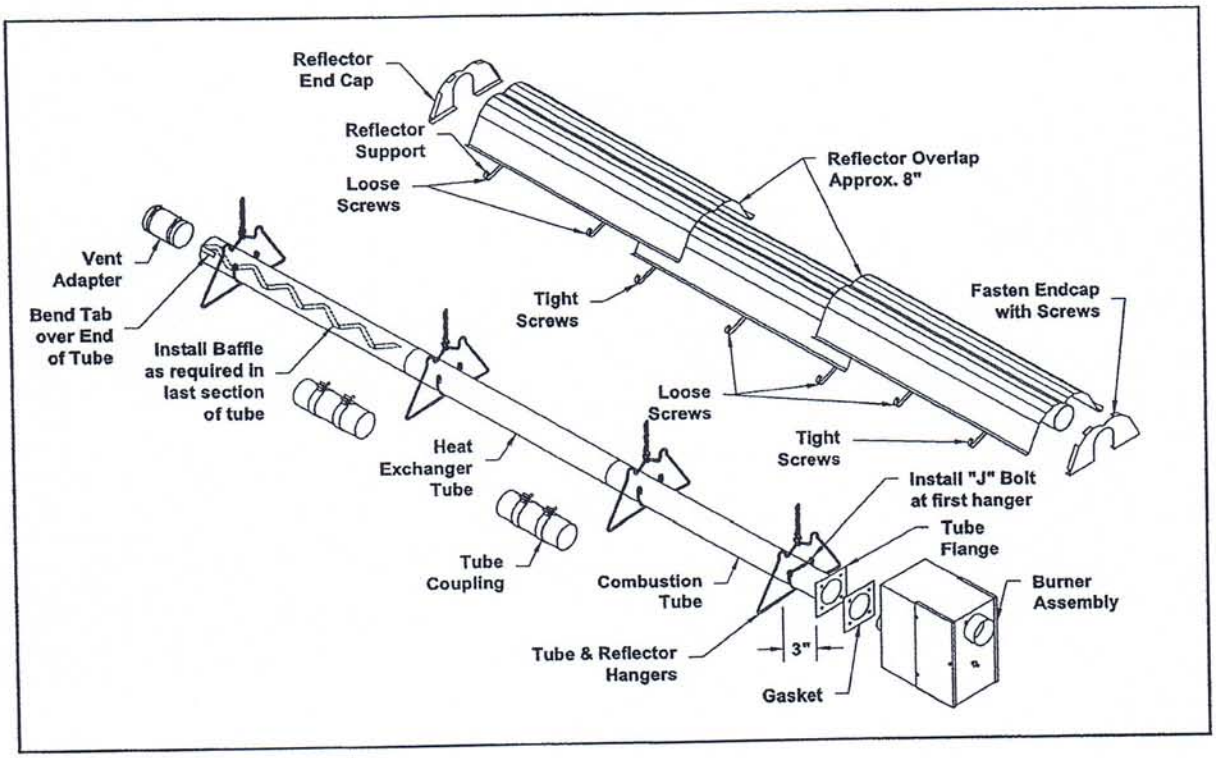


Figure 4:General Overview of Installation

A general ordered sequence for installation is provided below for reference.

- Locate hanging chain at predetermined suspension points in the structure. **It is required that the first hanging point be 2" inches to 8" inches from the burner mounting flange**, the second hanging point should be about 8' feet to 9' feet away. Thereafter, 10' feet apart on average is acceptable for the remainder of the heat exchanger. At no time should hangers be more than 12' feet apart.
- Always use all the hangars supplied. As a rule the combustion tube (first tube) utilizes 2 hangers and there after 1 hanger per 10' section

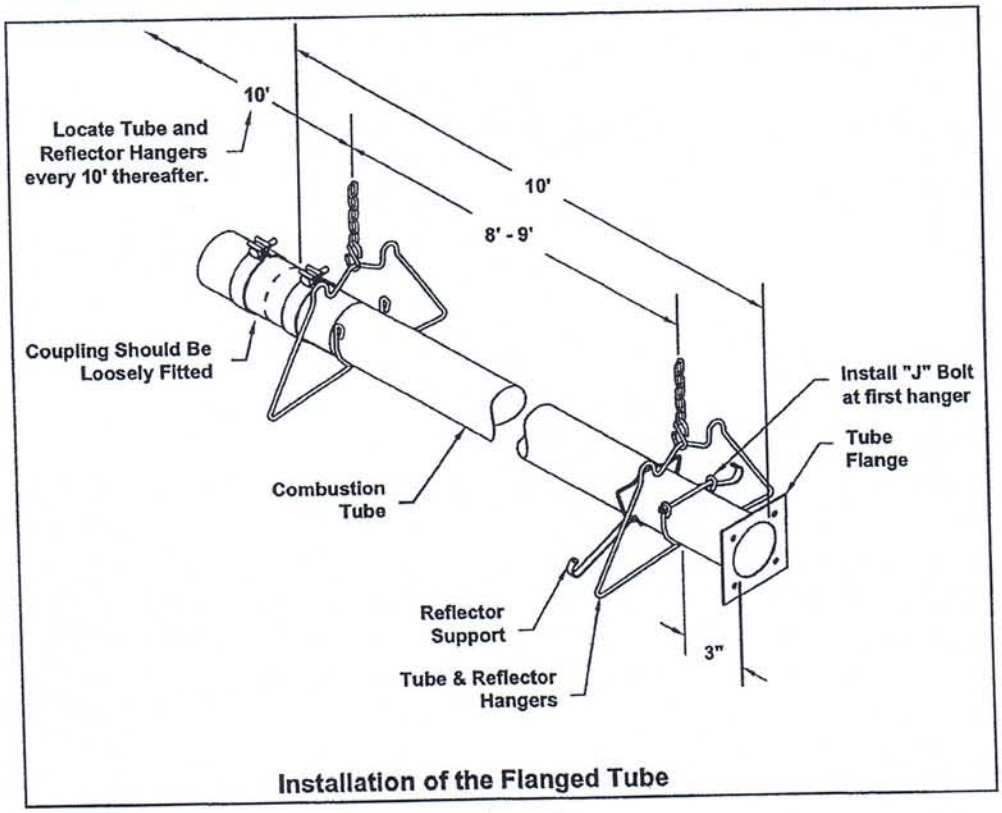


Figure 5

- Suspension mechanism must allow for lateral tubing expansion. A minimum 12" inch length welded link chain with a working load limit of at least 200 lbs. is recommended.

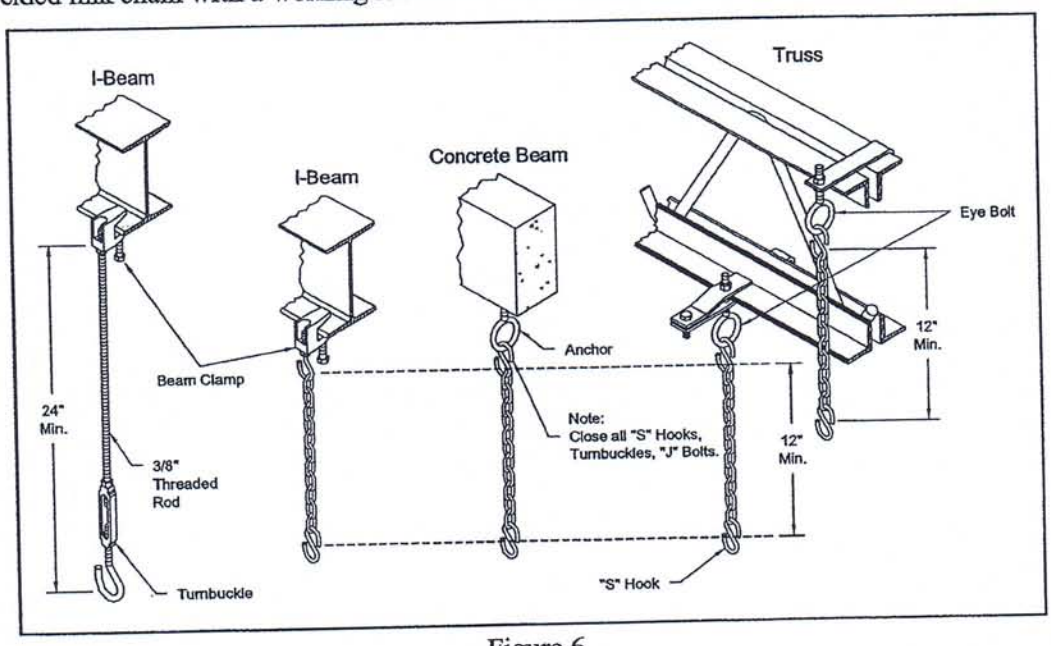


Figure 6

Installation sequence

- Install the tube and reflector support hanger on the chain with "S-hooks".
- Place the first *(flanged, aluminized)* tube in the first two hangers. Be sure the flange is toward the intended burner location. The other end of the tube should have the first coupling already loosely fitted. Tighten the cradle loops of the first hanger with the "J-Bolt" found in the burner box to snugly hold the combustion tube from rotating.

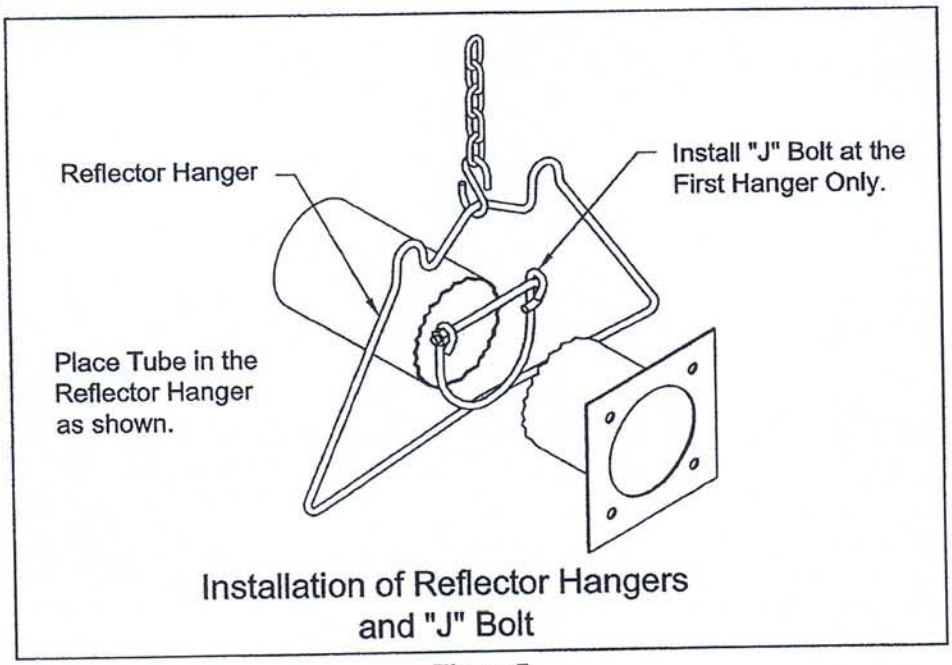


Figure 7

Note: For all coupling joints, ensure that the tube joint is in the center of the coupling length, and that the overlap joint of the coupling is above the centerline of the tube. Also ensure that the weld seam on ALL tubes is facing down.

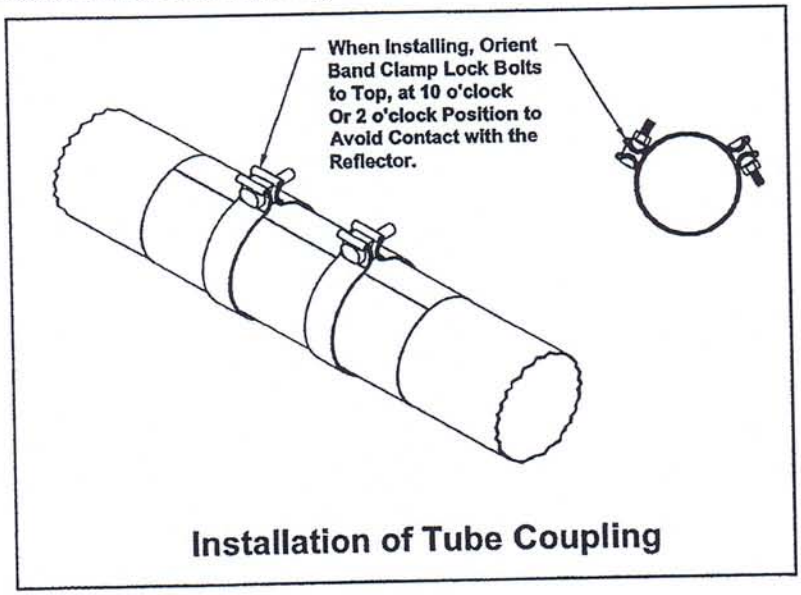


Figure 8

- Locate the burner gasket provided, bolt the burner in place on the tube flange with provided hardware. Burner must never be installed in a tilted position. The sense electrode of the burner cup should be in the 12 o'clock position.
- Slide a reflector section into place within the support hanger.

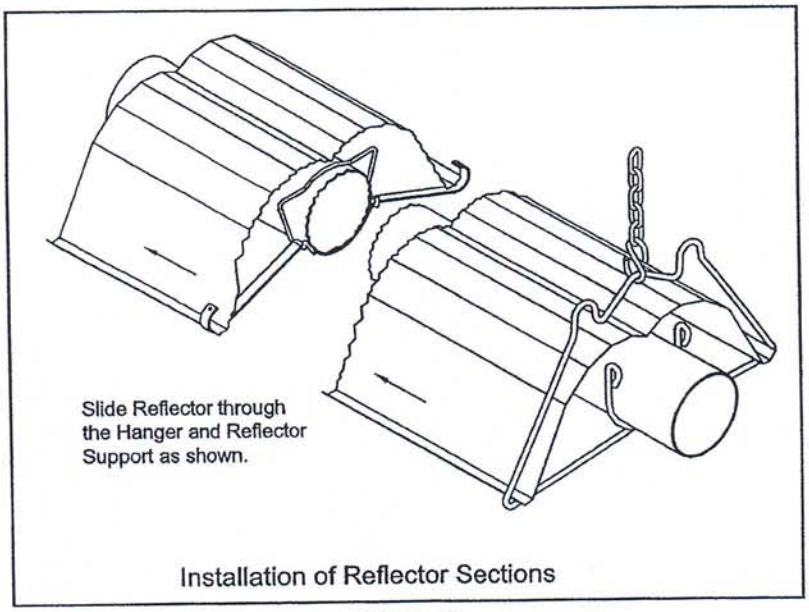


Figure 9

- Continue placing tubes, couplings and reflectors to complete the heater assembly. Ensure heat exchanger sections line up straight. Couplings should be tightened as heat exchanger is placed, since it is more difficult to do so once the reflector is in position. Reflectors should overlap adjacent reflectors 4" to 6" inches.

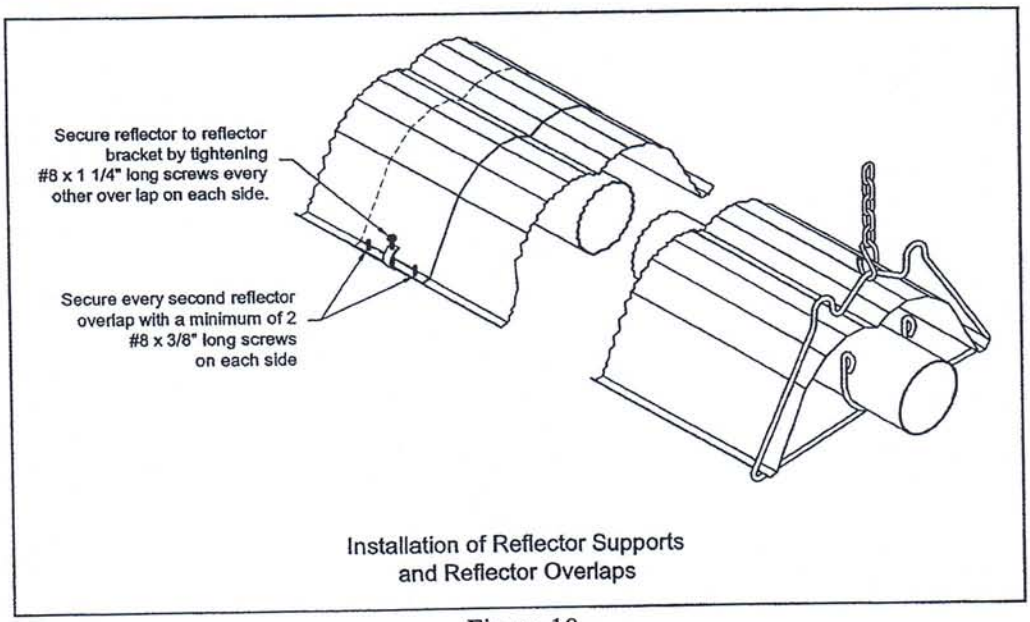


Figure 10

Note: In order to obtain smoothly sealed coupling liners, tighten each of the coupling bands progressively and alternately. Tightening one band completely before the other may result in an undesirable wrinkle in the liner.

Note: Be sure not to tile reflector sections; that is, reflector sections must be either above both adjacent reflector sections, or below both adjacent reflector sections.

- Install reflector support brackets, one at each reflector overlap position, and one in the middle of each 10' foot reflector length.

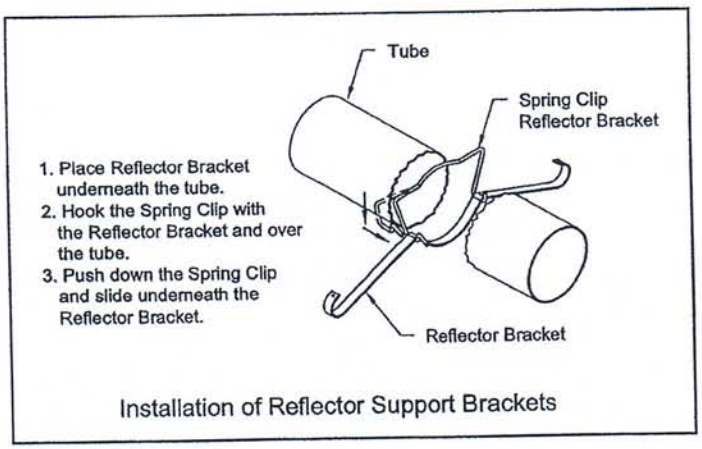


Figure 11

- Secure every second reflector overlap together with a minimum of 2 - #8 x 3/8" inch long screws (not supplied), and secure reflector to the reflector bracket at this point by tightening down #8 x 1¼" inch screws supplied with reflector brackets. The remaining reflector overlap joints and reflector brackets are left loose to accommodate system movement.
- If required for your heater model (refer to Table 1), install the baffle at the end of the heat exchanger. The small tab on the baffle is folded over the end of the tube and clamped in place by the vent connector and vent system.

Note: Baffles are always placed at the end of the last heat exchanger tube length, with the exception of the special configuration 205,000 BTUH with a 50' ft. tube length.

Note: Baffles are either one or two sections (each section is 6' feet in length). Multiple sections are simply clipped together. Where stainless and aluminized sections are supplied, always place the stainless steel section closest to the burner. The easiest installation method is to pull the baffle through the tube using a long wire.

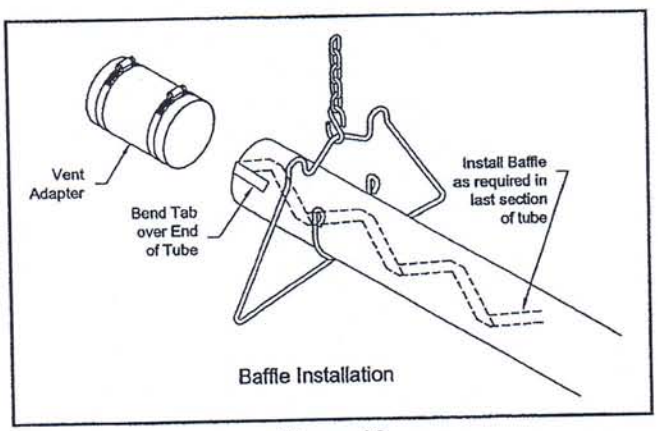


Figure 12

- If required by the heater layout, install 90° elbows or U-tube where indicated. Refer to Figure 13 for details.

  Note: *Elbows or U-bends are typically installed without reflectors. To reduce the above clearance to combustibles distance use miter reflectors (see figure 15) and refer to Clearance to Combustibles information.*

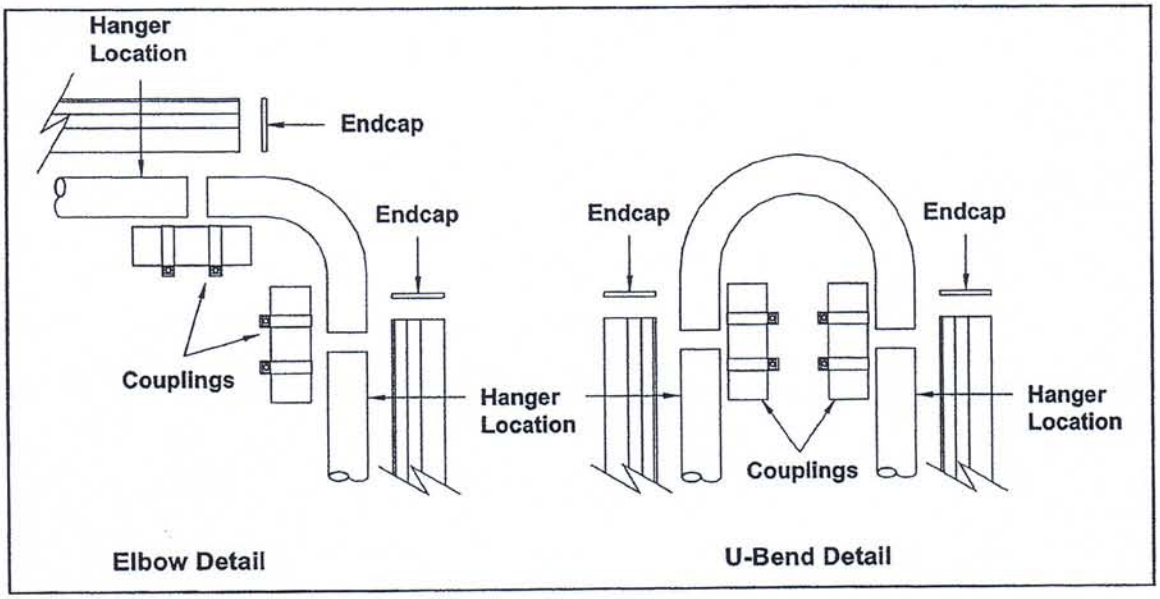


Figure 13: 90° Elbow and U-Tube Assembly Detail

- Elbows or U Tubes must be located not less than 10' feet from the burner in UA/UX/UXR-100 and smaller models, not less than 15' feet from the burner in UA/UX/UXR-125 to UA/UX/UXR-150, and not less than 20' feet from the burner in UA/UX/UXR-175 and larger models.
- Install End Cap as shown in Figure 4 and the figure below.

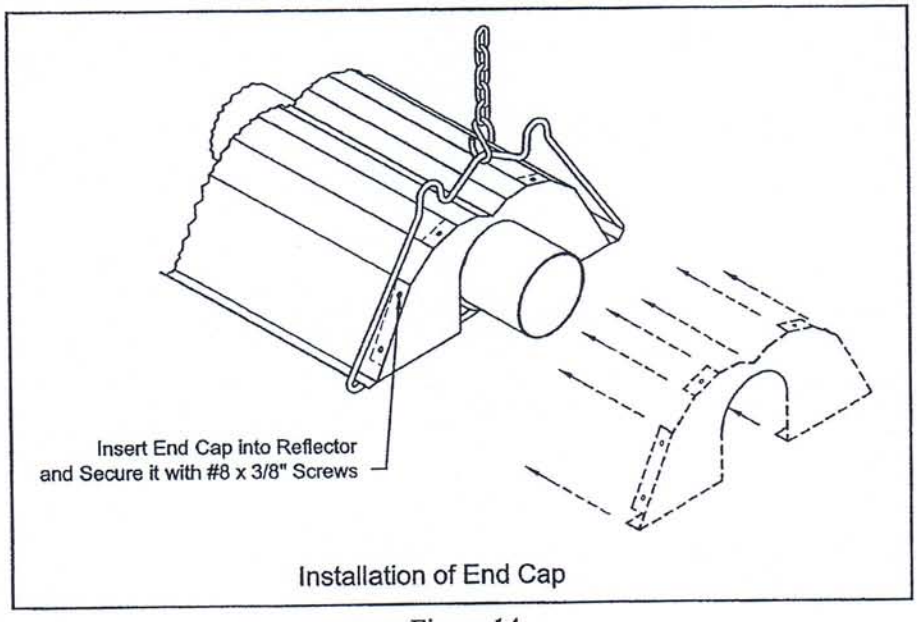


Figure 14

Installation sequence

- If used, install the Mitered reflector as shown below.

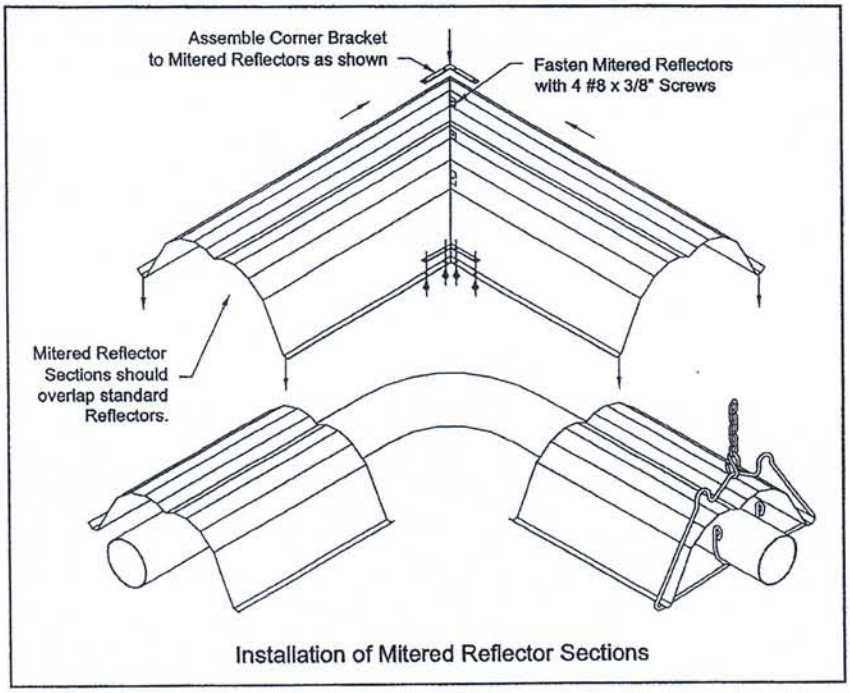


Figure 15

- If used, install side shields (reflectors) and/or bottom shield as required. Refer to Figures 16-18 for details.

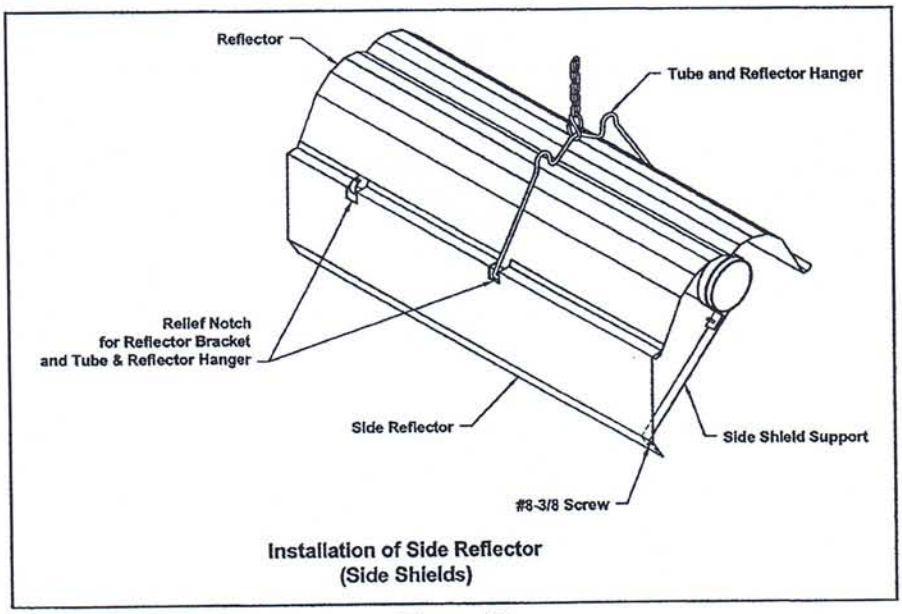


Figure 16

- Side shields are 124" inches long. Fasten one side shield per reflector with #8 x 3/8" inch screws. Use three side shield brackets per side shield. Space about 48" inches apart.

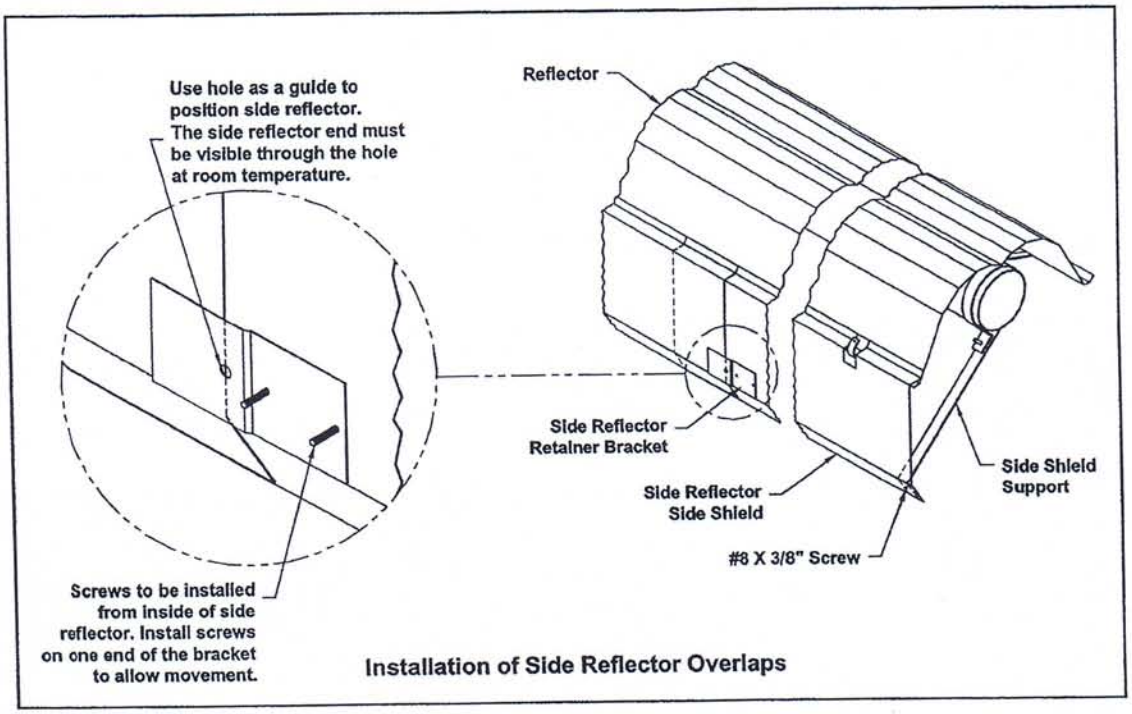


Figure 17

- Bottom shields need not overlap. Each 5' feet section is held with two support brackets.

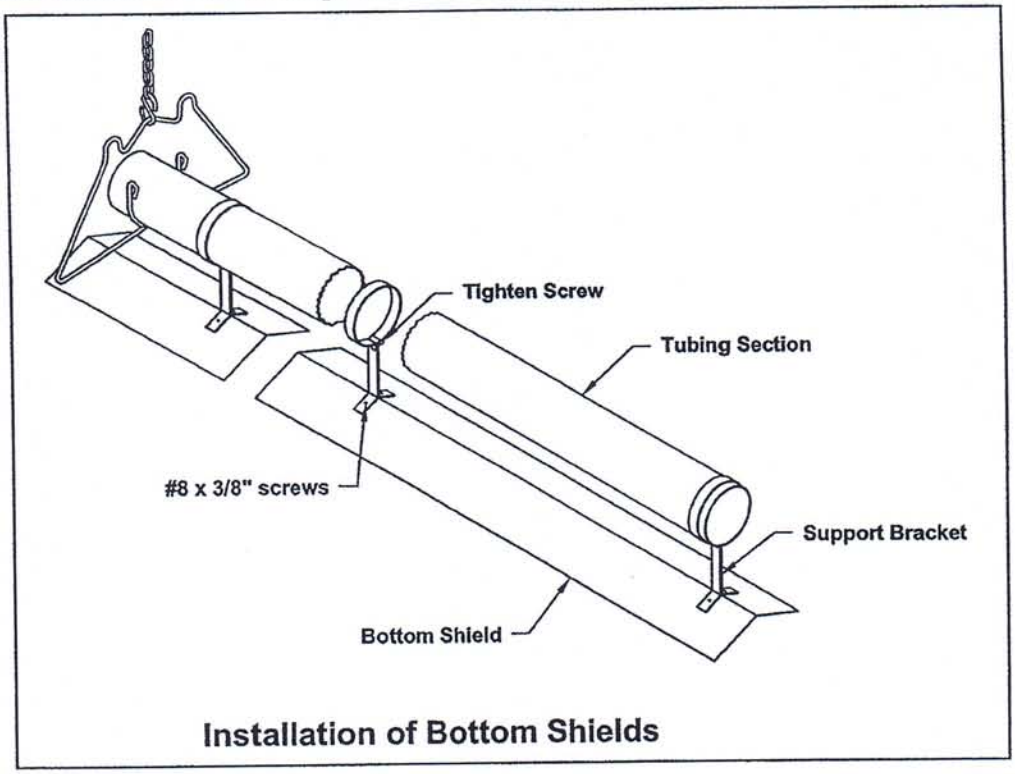


Figure 18

Deco-Grille Option

Series UA/UX/UXR heaters are approved for the addition of Deco-Grille either directly to the heater reflector or as part of a T-Bar installation where the heater is above the ceiling structure. Refer to figures 19 and 20 below for details.

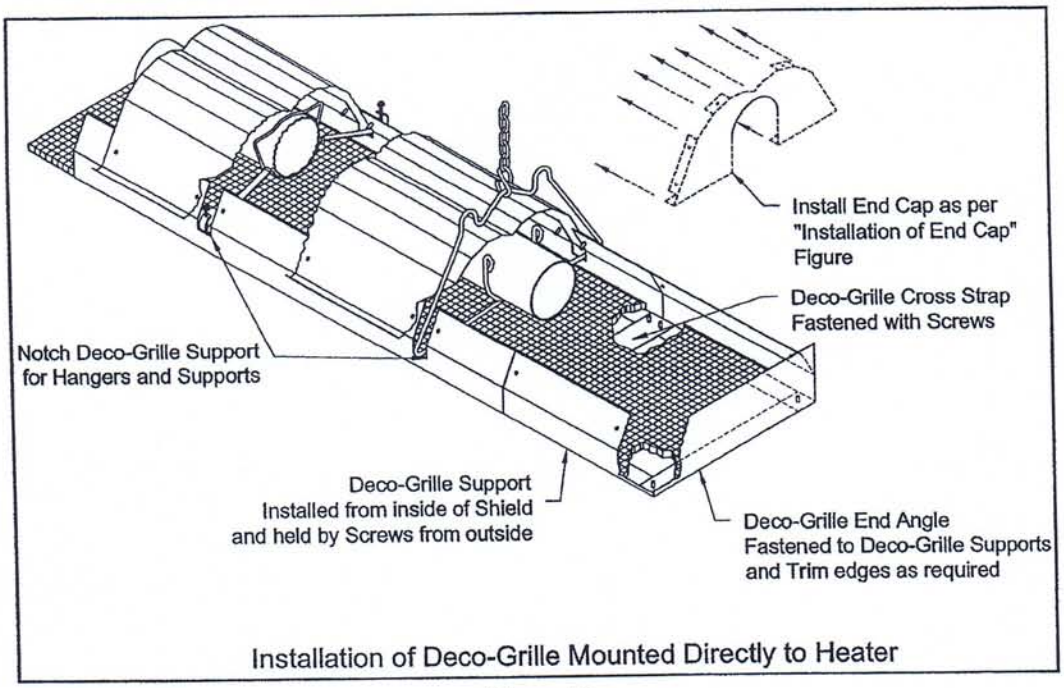


Figure 19

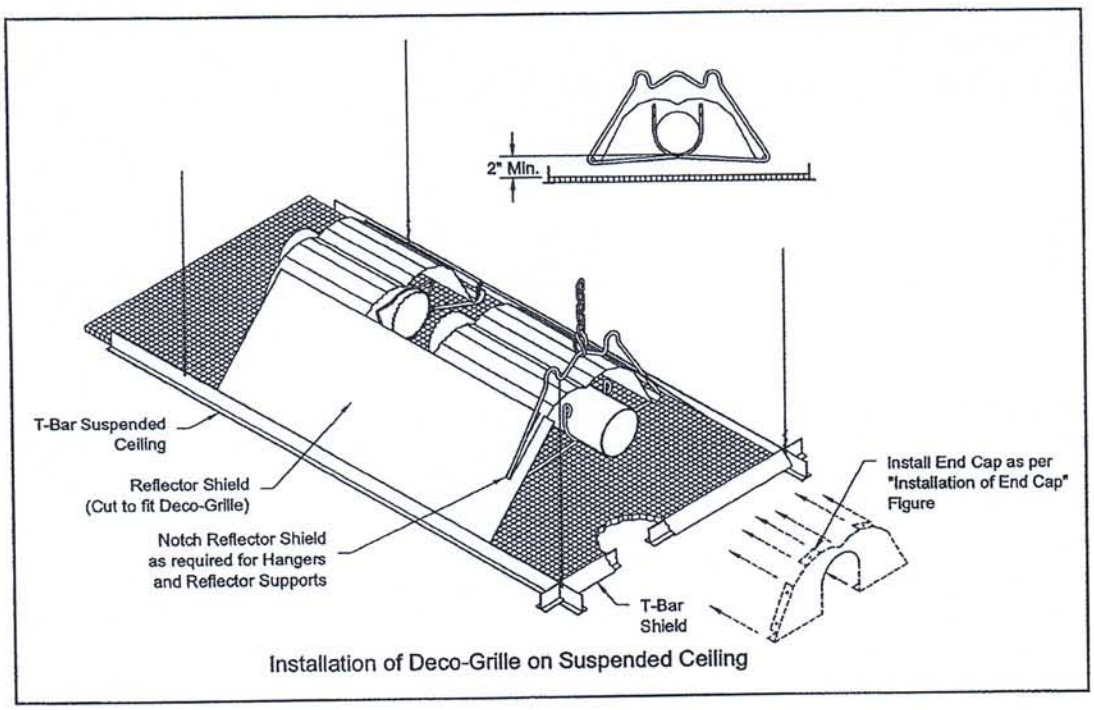


Figure 20

General Requirements

- The gas meter and service must be sufficiently large to supply gas to the connected building gas load including the heating equipment and any other gas fired equipment. Additionally, the gas distribution piping must be designed according to local and national ordinances. Generally (low pressure) systems designed with a maximum ½" inch w.c. total pressure drop meet this requirement.
- Gas supply pipe sizing must be in accordance with the *National Fuel Gas Code,* ANSI Z223.1 (NFPA 54) in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada.
- Before connecting burners to the gas supply system, verify that high pressure testing of the system has been completed. Failure to do so may expose the burner components to damaging high pressure, requiring replacement of key components.

Flexible gas connectors of approved type must be installed as shown in Figure 24, in one plane, and without sharp bends, kinks or twists. A smooth loop of approximately 12" inches in diameter is best. Failure to install the gas connection in the approved manner will result in a hazardous and potentially deadly situation due to the movement of the heat exchanger and burner in the normal course of operation. The gas shut off valve must be installed parallel to the burner gas inlet connection.

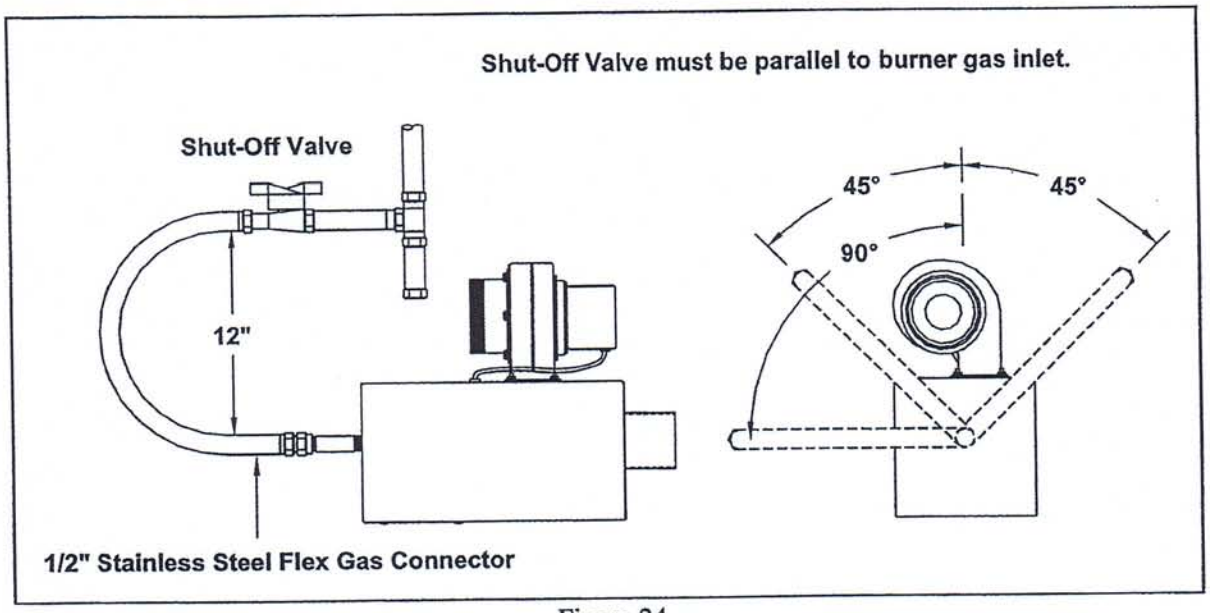


Figure 24

General Requirements

- Refer to the *National Fuel Gas Code,* ANSI Z223.1 (NFPA 54) in the US and CAN/CGA B149.1 and B149.2 *Installation Codes* in Canada, as well as all local requirements for general venting guidance.
- Series UA/UX/UXR Infrared Heaters may be installed vented or unvented.
- Series UA/UX/UXR Infrared Heaters may be vented horizontally or vertically using conventional venting materials.
- If heater is to be vented horizontally, the vent from building must:
  - Be not less than seven feet above grade when located adjacent to public walkways.
  - Terminate at least three feet above any forced air inlet located within ten feet.
  - Terminate at least four feet below, four feet horizontally from or one foot above any door, window, or gravity inlet into any building.
  - Be located at least 12" inches from any opening through which vent gases could enter a building.
  - Be beyond any combustible overhang.
  - Be installed at a height sufficient to prevent blockage by snow.
- Optional outside air supply may be directed to the heater horizontally or vertically.

Important

Maximum total vent length allowed for any model heater is 30' feet.

Maximum total fresh air inlet duct length allowed for any model heater is 30' feet.

Total of vent length plus outside air supply duct length cannot exceed 50' feet for any heater with maximum heat exchanger length.

If condensation in the vent pipe or outside air supply duct is a problem, shorten or adequately insulate the section

Note: The above stated requirements assume a maximum of 2 elbows in the total combination of vent and air supply duct. Subtract 5' feet of allowable length for each elbow if 3 or more elbows are used.

Un-Vented Operation

- In general, where heaters are installed without direct outside combustion air, fresh air ventilation must be provided to the building space (4 cfm per 1000 BTU/Hr in USA, 3 cfm per 1000 BTU/Hr in Canada). Verify applicable codes.
- Optional outside air supply is not recommended for unvented heaters due to possible pressure imbalances in the building space.
- Ensure that minimum combustible clearances are maintained for unvented heaters. Refer to Table 2, for required clearance dimensions.

Vented Operation

In all cases, be sure vent pipes and outside air supply ducts are sealed with approved sealant, such as high temperature RTV silicone. Double wall venting (B vent) may not require sealant.

Horizontal Venting

- When venting through combustible walls, use approved vent terminal Tjernlund VH1-4, or SRP supplied deflector terminal with an approved insulating thimble.
- When venting through non-combustible walls, use SRP supplied deflector vent terminal. Recommended extension of the terminal past the outside wall surface is 18" inches minimum.

Vertical Venting

- Minimum vent pipe size is 4" inch for an individual heater. Additional vent pipe sizes as required to accommodate multiple heaters venting through a common roof vent are defined in the appropriate gas installation code. (Refer to common venting section below).
- Use of an approved thimble to pass through combustible roof materials is required.
- Use of an approved vent cap is required.
- Check local codes for vertical vent size for fan assisted appliances.

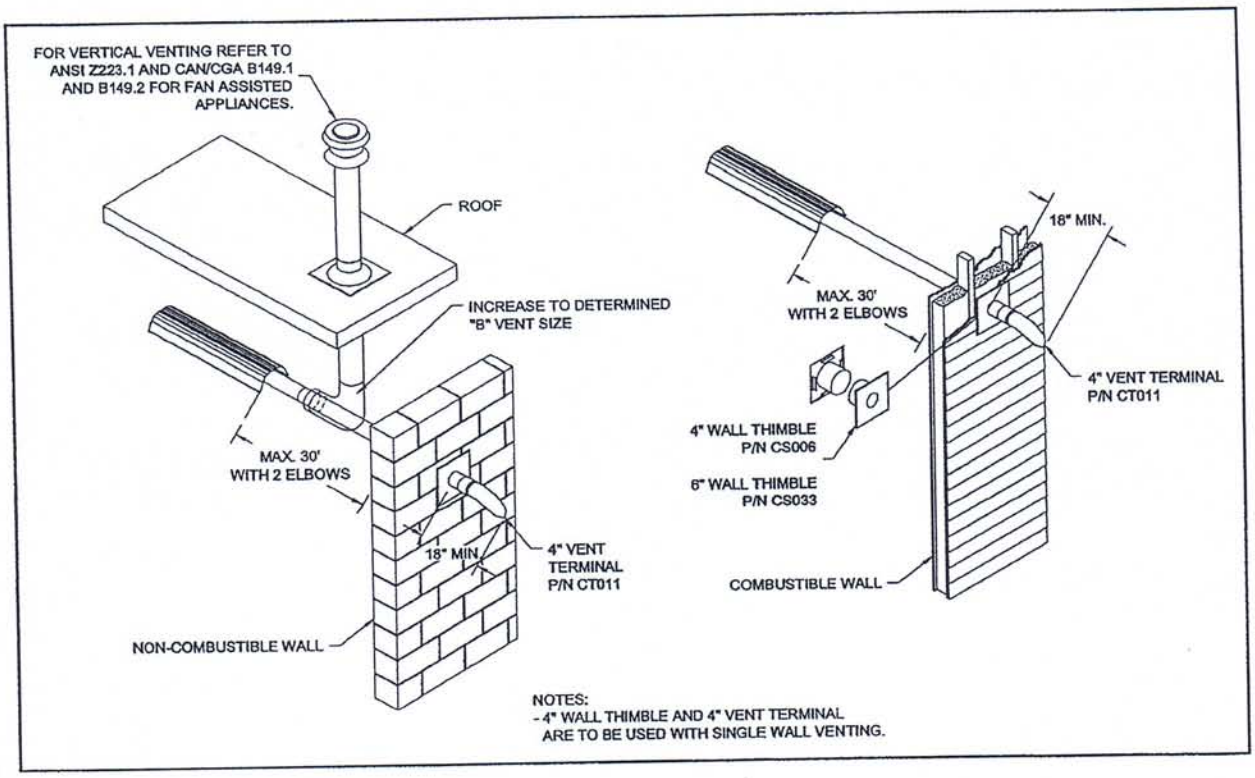


Figure 21

Common Roof Venting

- A maximum of 4 heaters can be vented through a common vertical stack. Common vent sizing information is defined in the appropriate gas installation code (Refer to ANSI Z223.1 and CAN/CGA B149.1 and B149.2 for sizes and installation information). Copies can be obtained from your local SRP representative or directly from Superior Radiant Products.
- Use of an approved thimble to pass through combustible roof materials is required. Additionally, B type vent materials are required for stacks above the roof line.
- Use of an approved vent cap is required.
- The open area of the common vent must equal the sum of the open areas of each of the flue pipes connected to the common vent.
- Connection locations to the common vent should be offset to avoid pressure interferences between heaters.
- All heaters connected to a common vent must operate at the same time. Connect the electrical circuit to the same thermostat to ensure simultaneous operation.

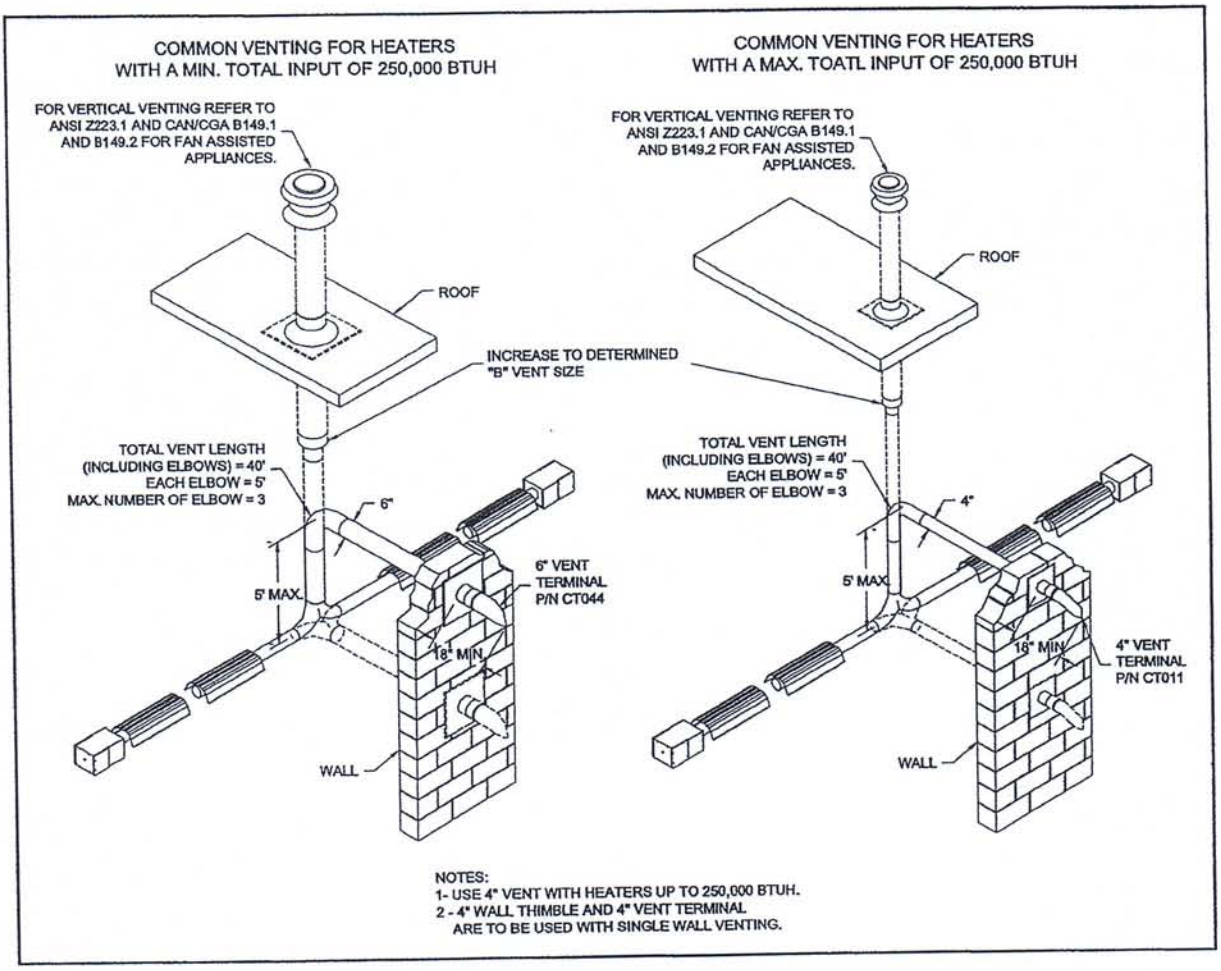


Figure 22

Combustion Air Supply (Optional)

- An outside combustion air supply is strongly recommended if the building space encloses a negative pressure due to exhaust etc. or if the building contains materials which would expose the heater to halogenated hydrocarbon atmospheres.
- The outside air terminal must be of an approved type, and should be located at an elevation equal to or below the vent terminal elevation to prevent back-venting of flue gases into the burner compartment.

Outdoor Installation (UXR Models Only)

When a heater is to be mounted outdoors it must be installed in such a way that wind will have minimum effect on its movement. This consideration is intended to eliminate undue stress on the gas flex connector. In all cases a fresh air hood must be used in conjunction with a vent terminal of the approved type, and all connections must be sealed with a high temperature sealant that can withstand 400°F.

Note that this heater is a sealed construction. If any services or repair is conducted in the future, gasket materials should be inspected and replaced if found to be deteriorated.

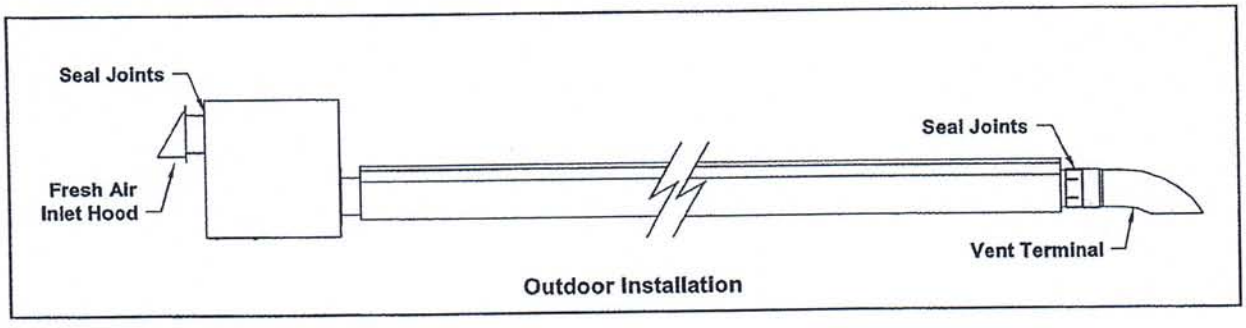


Figure 23

Electrical Wiring

General Requirements

Heaters are normally controlled by line voltage or low voltage (24V) thermostats. Line voltage thermostats are wired directly while low voltage thermostats use a relay. In all cases, heaters must be grounded in accordance with the *National Electric Code,* ANSI/NFPA 70 in the US, and the *Canadian Electric Code,* CSA C22.1 in Canada, and must comply with all local requirements. Heaters may also be controlled with a manual line switch or timer switch in place of the thermostat. Refer to Figures 25 and 26 for guidance on electrical wiring of heaters.

If any of the original wire as supplied with the heater must be replaced, it must be replaced with wiring having a rating of at least 105°C temperature service and 600 volts capability.

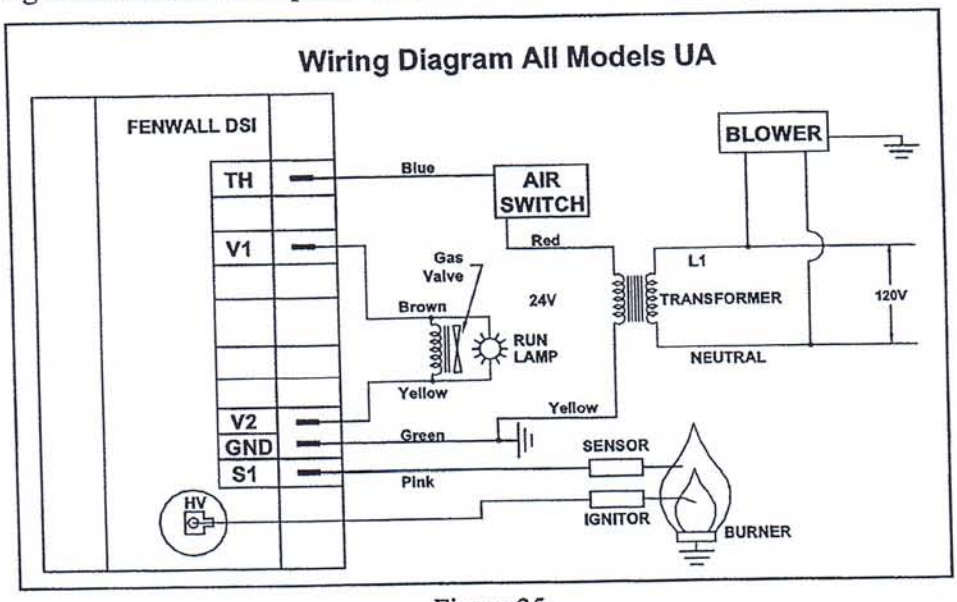


Figure 25

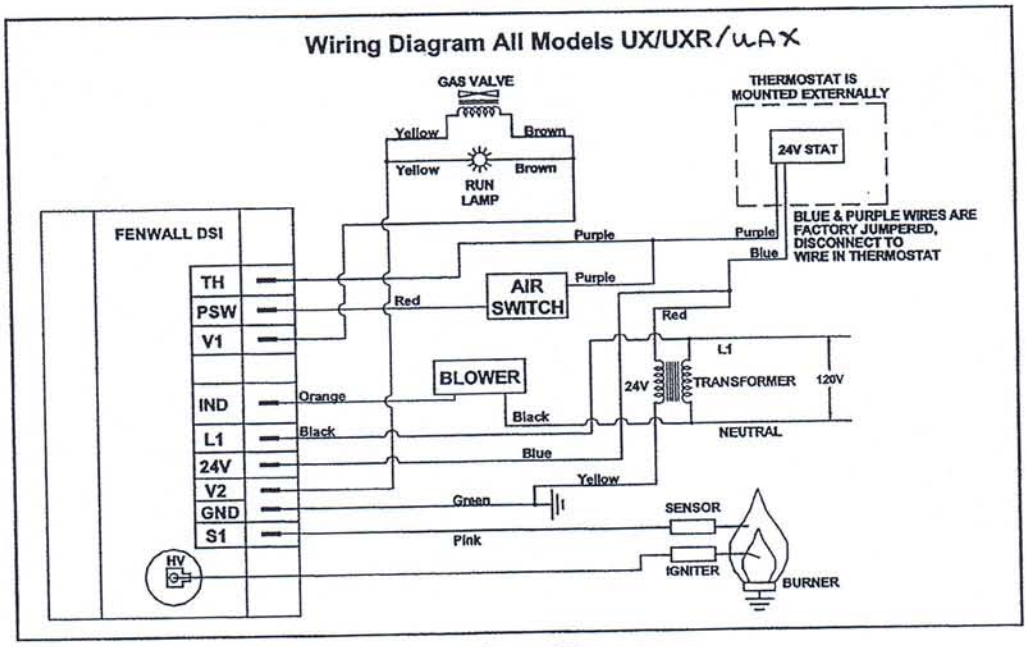
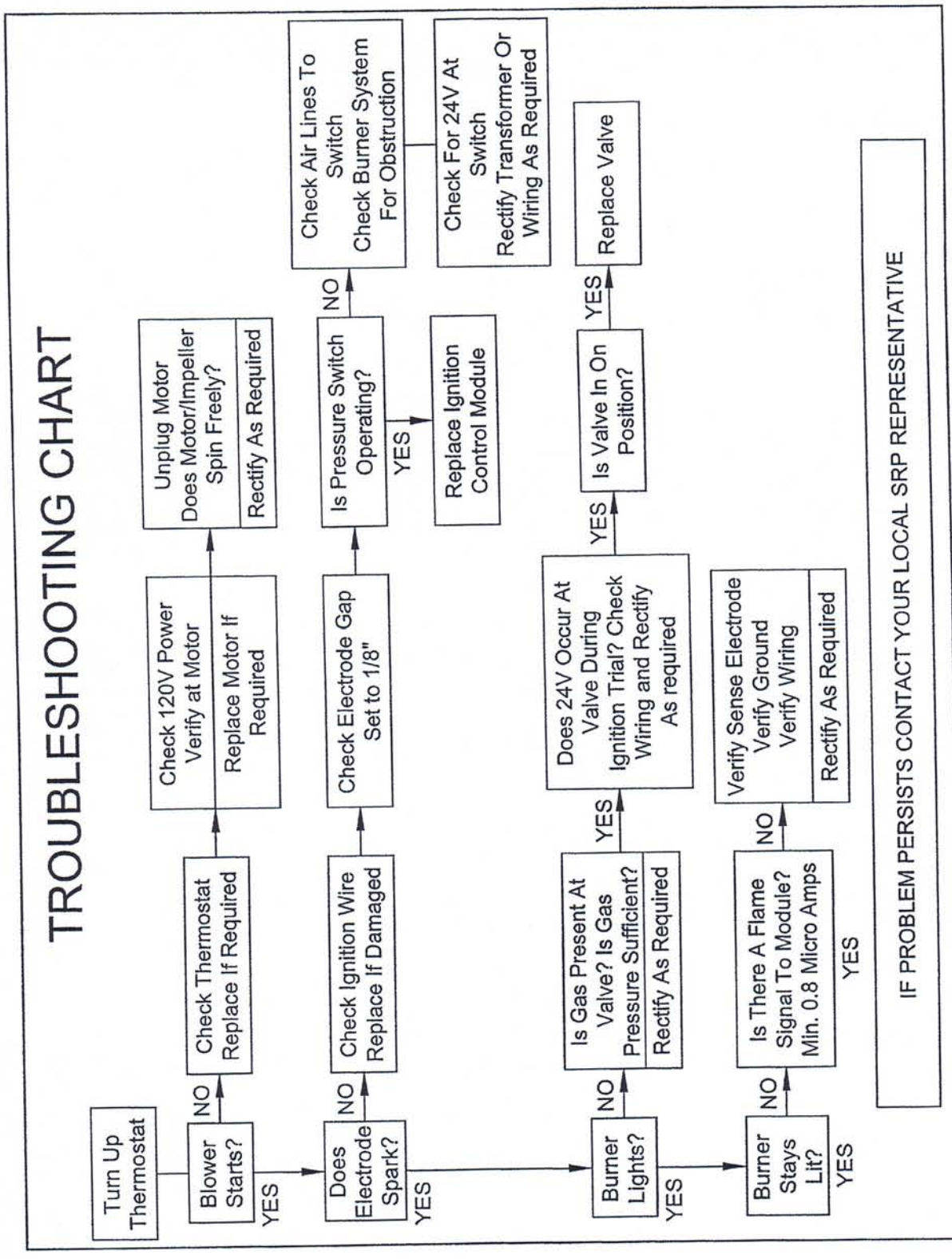


Figure 26


TROUBLESHOOTING CHART
Turn Up Thermostat
Blower Starts?
NO
Check Thermostat Replace If Required
Check 120V Power Verify at Motor
Replace Motor If Required
Unplug Motor Does Motor/Impeller Spin Freely?
Rectify As Required
YES
Does Electrode Spark?
NO
Check Ignition Wire Replace If Damaged
Check Electrode Gap Set to 1/8"
Is Pressure Switch Operating?
NO
Check Air Lines To Switch Check Burner System For Obstruction
YES
Replace Ignition Control Module
Check For 24V At Switch Rectify Transformer Or Wiring As Required
YES
Burner Lights?
NO
Is Gas Present At Valve? Is Gas Pressure Sufficient?
Rectify As Required
Does 24V Occur At Valve During Ignition Trial? Check Wiring and Rectify As required
Is Valve In On Position?
YES
Replace Valve
YES
Burner Stays Lit?
NO
Is There A Flame Signal To Module? Min. 0.8 Micro Amps
Verify Sense Electrode Verify Ground Verify Wiring
Rectify As Required
NO
YES
IF PROBLEM PERSISTS CONTACT YOUR LOCAL SRP REPRESENTATIVE

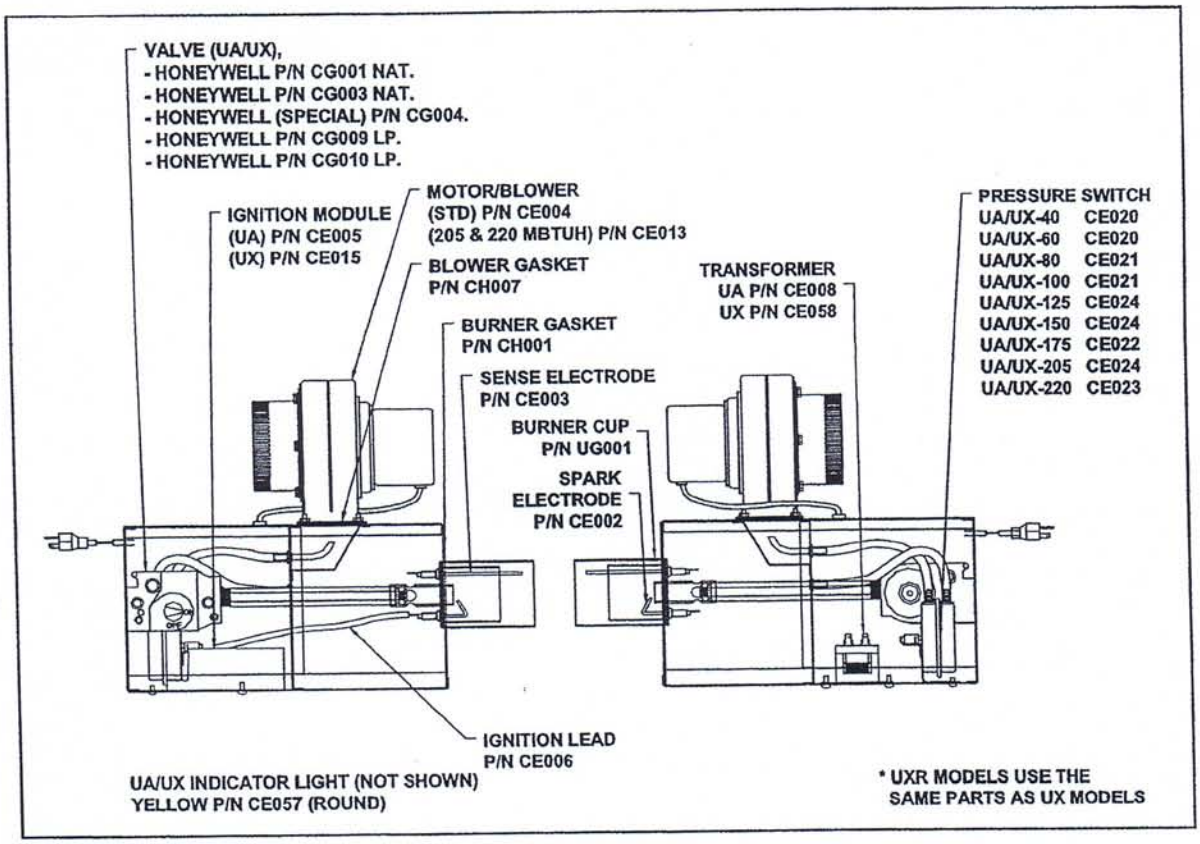

VALVE (UA/UX),
- HONEYWELL P/N CG001 NAT.
- HONEYWELL P/N CG003 NAT.
- HONEYWELL (SPECIAL) P/N CG004.
- HONEYWELL P/N CG009 LP.
- HONEYWELL P/N CG010 LP.
IGNITION MODULE
(UA) P/N CE005
(UX) P/N CE015
MOTOR/BLOWER
(STD) P/N CE004
(205 & 220 MBTUH) P/N CE013
BLOWER GASKET
P/N CH007
BURNER GASKET
P/N CH001
SENSE ELECTRODE
P/N CE003
BURNER CUP
P/N UG001
SPARK
ELECTRODE
P/N CE002
TRANSFORMER
UA P/N CE008
UX P/N CE058
PRESSURE SWITCH
UA/UX-40 CE020
UA/UX-60 CE020
UA/UX-80 CE021
UA/UX-100 CE021
UA/UX-125 CE024
UA/UX-150 CE024
UA/UX-175 CE022
UA/UX-205 CE024
UA/UX-220 CE023
IGNITION LEAD
P/N CE006
UA/UX INDICATOR LIGHT (NOT SHOWN)
YELLOW P/N CE057 (ROUND)
* UXR MODELS USE THE
SAME PARTS AS UX MODELS

Figure 27

SERIES UA, UX and UXR INFRARED HEATERS WARRANTY

The manufacturer warrants to the original owner that the product will be free of defects in material and workmanship as described below.

Series	Component	Warranty Period			
		3 Years	5 Years	7 Years	10 Years
UA, LA, MA	Burner & Controls	*			
	Hot Rolled Heat Exchanger		*		
	Aluminized Heat Exchanger			*	
UX, UXR MX, MXR LX, LXR	Burner & Controls	*			
	Hot Rolled Heat Exchanger w/o Post Purge		*		
	Aluminized Heat Exchanger w/o Post Purge			*	
	Hot Rolled Heat Exchanger with Post Purge			*	
	Aluminized Heat Exchanger with Post Purge				*

The Manufacturer's obligation under this warranty is limited to repair or replacement, F.O.B. its facility, of the defective part. In the case of replacement parts, the warranty period shall be the longer of the original warranty or a period of 12 months from the date of purchase. In no event shall the Manufacturer be liable for incidental expense or consequential damages of any kind.

This warranty does not cover any shipping, installation or other costs incurred in the repair or replacement of the product. No materials will be accepted for return without authorization.

This warranty will not apply if in the judgment of the Manufacturer, the equipment has been improperly installed, unreasonably used, damaged or modified.

This warranty will not apply to damage to the product when used in corrosive atmospheres and in particular atmospheres containing halogenated hydrocarbons. No person is authorized to assume for the Manufacturer any other warranty, obligation or liability.

THE REMEDIES PROVIDED FOR IN THE ABOVE EXPRESS WARRANTIES ARE THE SOLE AND EXCLUSIVE REMEDIES. NO OTHER EXPRESS OR IMPLIED WARRANTIES ARE MADE INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE.