INSTALLATION MANUAL





# TBL/TBS

## BELT DRIVE BLOWER COIL UNITS
## REDUCED FOOTPRINT, VERTICAL

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## Table of Contents

## Safety Symbols & Considerations:

The following symbols are used in this document to alert the reader to areas of potential hazard:

**danger**
indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**warning**
indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**caution**
identifies a hazard which could lead to damage to the machine, damage to other equipment and or environmental pollution. Usually an instruction will be given, together with a brief explanation.

**note**
is used to highlight additional information which may be helpful to you.

The equipment covered by this manual is designed for safe and reliable operation when installed and operated within its design specification limits. To avoid personal injury or damage to equipment or property while installing or operating this equipment, it is essential that qualified, experienced personnel perform these functions using good judgment and safe practices. See the following cautionary statements.


### ELECTRICAL SHOCK HAZARDS

All power must be disconnected prior to installation and serving this equipment. More than one source of power may be present. Disconnect all power sources to avoid electrocution or shock injuries.


### MOVING PARTS HAZARDS

Motor and Blower must be disconnected prior to opening access panels. Motors can start automatically, disconnect all power and control circuits prior to servicing to avoid serious crushing or dismemberment injuries.


### HOT PARTS HAZARDS

Electric Resistance heating elements must be disconnected prior to servicing. Electric Heaters may start automatically, disconnect all power and control circuits prior to servicing to avoid burns.


Check that the unit assembly and component weights can be safely supported by rigging and lifting equipment.


All assemblies must be adequately secured during lifting and rigging by temporary supports and restraints until equipment is permanently fastened and set in its final location.


All unit temporary and permanent supports must be capable of safely supporting the equipment's weight and any additional live or dead loads that may be encountered. All supports must be designed to meet applicable local codes and ordinances.


All fastening devices must be designed to mechanically lock the assembly in place without the capability of loosening or breaking away due to system operation, vibration, impact or seismic event.


Secure all dampers when servicing damper, actuator or linkages. Dampers may activate automatically, disconnect control circuits or pneumatic control systems to avoid injury.


Protect adjacent flammable materials when brazing, Use flame and heat protection barriers where needed. Have fire extinguisher available and ready for immediate use.

## Return / Exhaust Casing Extension:


### PRE START-UP

Improper installation, adjustment, alterations, service or maintenance can cause injury and property damage, as well as possible voiding of factory warranty. For assistance or additional information, consult a qualified contractor.

### RECEIVING AND INSPECTING

Thoroughly examine the exterior and interior of all units for transportation damage to the cabinet, piping, blower(s), motor(s), coil(s), electric heat and electrical components. Interior damage may occur, even with no visible exterior damage. If damage is found, immediately file a claim with the carrier. Note the damage on the bill of lading before signing for the shipment.

Check the bill of lading for verification that all items shown (including loose items) have been received. Notify the manufacturer's representative of any shortages or items shipped in error.

### UNIT RIGGING AND PLACEMENT

Install duct work to comply with ASHRAE Fundamentals Handbook, SMACNA, NFPA 90A and local code.

The installation must conform with local building codes and the National Electric Code.

Locate unit support in accordance with the mechanical and structural plans. If so equipped, locate the isolator placement and correct size as shown on the submittal drawing.

Ceiling suspension of horizontal units have factory provisions for thru bolt hanger rods, except double wall units (which require external rigging). If floor mount isolators are required for either horizontal or vertical units, then factory or field provisions must be made for isolator attachment. Vertical units can be mounted directly to the floor or on a base rail. For units with isolators but no base rail, 6" legs are required and will need to be mounted to the base of the unit. If a base rail is provided, isolators can be installed in mounting holes provided on this base rail.

Do not handle the unit using coil stubout connectors, as damage may occur at brazed joint(s).

### CLEARANCE

All units, including those with electric heat, are listed for zero clearance to combustibles.

Sufficient clearance for normal servicing of this equipment is recommended.


All electrical panels must have 36" working space in front of panel to meet National Electric Code; however, local inspectors may wave this requirement if the hinged cover has a 90° free swing.

### FIELD WIRING

Prior to installing any wiring, check the unit name plate for main power voltage, control voltage, transformer sizing and any fuse sizing. All field wiring must comply with National

### ELECTRIC CODE AND LOCAL CODE REQUIREMENTS.

Tighten all wiring lugs and terminals prior to connecting power to the unit, as they may loosen during transportation.

Route the power lines to the power distribution terminals inside the control enclosure. If a factory wired disconnect switch is installed, then connect the power lines to the line side of the switch.

Mount and wire any field installed items as indicated on the factory supplied wiring diagram. When mounting field installed components, do not jumper out or rewire any factory wiring without written approval from Johnson Controls. Violation will void warranty.

## Belts / Drives / Deflection

note

### BELTS, DRIVES, AND BEARINGS

For safety, please turn off all power before checking belt tension.

Prior to starting the unit, tighten all set screws on the fan(s), sheaves and bearings where applicable. Set screws may loosen during transportation.

Sheaves must be in line. Use a straight edge to verify.

### GENERAL BELT TENSION RULES FOR V-BELT DRIVES:

- Ideal tension is the lowest tension at which the belt will not slip under peak load conditions
- Check tension frequently during the first 24-48 hours of operation
- Over tensioning shortens belt and bearing life
- Keep belts free from foreign material which may cause slip
- Make V-Belt inspection on a periodic basis. Tension when slipping. Never apply belt dressing, as this will damage the belt and cause early failure.
- The resilient blower bearing must not deflect laterally once belt is tightened

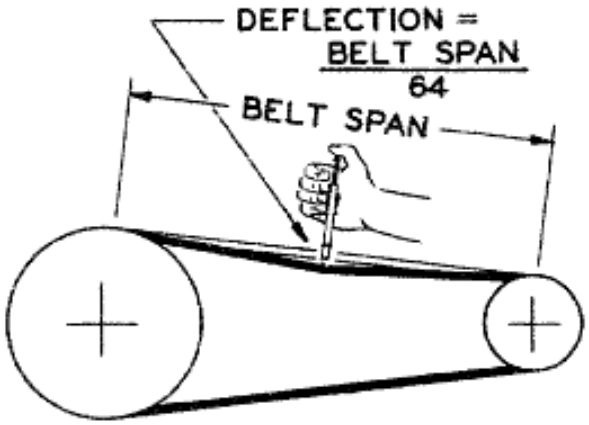



Figure 1 - Computing deflection force
See table below for deflection force in pounds

### DETERMINING DEFLECTION FORCE
(see Figure 2)

| Example | Solution |
|---|---|
| Belt Span = 20"<br>Belt Type - A, new, unnotched<br>RPM = 1000<br>Small Sheave Diameter = 4.0" | Deflection = 20/64 =<br>.313" (round to 5/16").<br>Referring to table below, deflection force at calculated deflection is 6.8lbs. |

### DEFLECTION FORCE - LBS

| Belt Type | Smallest Sheave Diameter Range | RPM Range | Super Grip belts and Unnotched Gripbands | | Grip notch Belts and Notched Grip bands | |
|---|---|---|---|---|---|---|
| | | | Used Belts | New Belts | Used Belts | New Belts |
| A, AX | 3.0 - 3.6" | 1000 - 2500 | 3.7 | 5.5 | 4.1 | 6.1 |
| | 3.8 - 4.8" | 1000 - 2500 | 4.5 | 6.8 | 5.0 | 7.4 |
| | 5.0 - 7.0" | 1000 - 2500 | 5.4 | 8.0 | 5.7 | 9.4 |
| B, BX | 3.4 - 4.2" | 860 - 2500 | Not Recommended | | 4.9 | 7.2 |
| | 4.4 - 5.6" | 860 - 2500 | 5.3 | 7.9 | 7.1 | 10.5 |
| | 5.8 - 8.6" | 860 - 2500 | 6.3 | 9.4 | 8.5 | 12.6 |

## Replacement Parts / Piping

### REPLACEMENT PARTS

Replacement parts may be ordered from the Titus representative. Factory replacement parts should be used wherever possible to maintain agency listings. Should replacement parts not be purchased from the factory, use only parts duplicating the exact type, size, voltage and other operating characteristics of the original part. Contact the Titus representative before using any substitute part or making unit modifications. Any substitutions and/or modifications not authorized by the factory will void the unit warranty and could result in personal injury and/or property damage.

When ordering parts, the following information must be supplied to ensure proper part identification:

1. Complete unit model number
2. CO number from the unit nameplate
3. Complete parts description, including any identification numbers

### PIPING

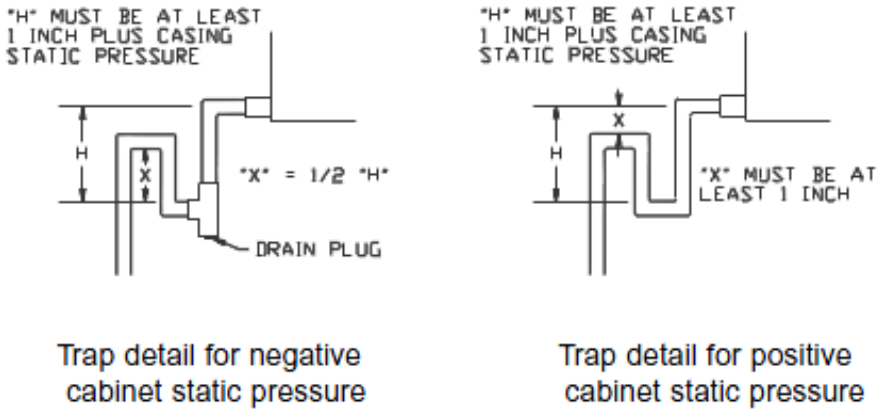
- All piping must comply with applicable state and local codes
- On water coils, the piping must be in a counter flow configuration; water inlet on the leaving air side of the coil and at the bottom of the coil to provide the necessary purging of air
- All water piping should be designed and installed to meet the job requirements
- Where applicable, freeze protection should be used
- Supply and return water piping should be supported
- Do not suspend piping, controls, and/or shutoff valves from coil headers
- All refrigerant piping (split systems) should be designed and installed in accordance with AHRI and ASHRAE. Leak testing should be performed before any startup procedures are initiated. On refrigeration systems, follow recommended system evacuation from the condenser unit manufacturer.

## Condensate Drain and Traps

### CONDENSATE DRAIN AND TRAPS

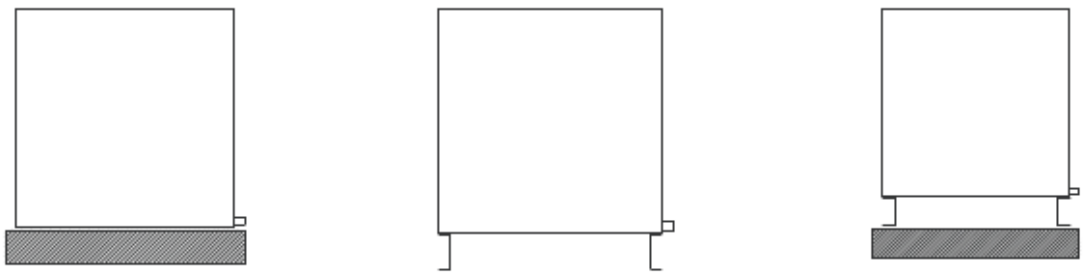
Drain lines should be at least the same size as the drain pan connection. Properly sized traps should be used to allow the condensate from the coils to drain from the drain pan. See Fig. 2.

Figure 3
Condensate drain & traps




Trap detail for negative cabinet static pressure

Trap detail for positive cabinet static pressure



**NO BASE RAIL**

Housekeeping pad Required to accommodate trap height

**WITH BASE RAIL**

Depending on static pressure, housekeeping pad may not be needed for trap installation

**WITH BASE RAIL AND HOUSEKEEPING PAD**

## General Belt and Bearing Maintenance

Frequency of bearing re-lubrication depends upon the operating conditions. The proper amount of lubricant in the bearings is very important. Both excessive and inadequate lubrication may cause failure. The bearings should be re-lubricated while they are rotating (if it is safe to do so); the grease should be pumped in slowly until a slight bead forms around the seals. It is solely the owner's responsibility for maintaining a proper lubrication schedule. Failure to do so may cause substantial unit damage and voiding of the factory warranty. Note that only those bearings equipped with a grease fitting can be re-lubricated.

The following is a generic guide intended for standard equipment used in common situations.


This manual is not intended to supplant regulations or local codes having jurisdiction. It is recommended that these items be reviewed and completed prior to initiating equipment start-up.

| Maintenance to be Performed | Every 3 Months of Operation | Every Fall |
|---|---|---|
| Filters (as required) | x | |
| Grease Bearings | x | |
| Inspect & Clean Blower Wheel | | x |
| Lubricate Fan Motor (if applicable) | | x |
| Check Belt Tension | x | |
| Check Electrical Connections | | x |
| Check Bearings, Drives & Blower Wheel for Tightness | | x |

Normal operation is based on 8 hours a day. If unit runs more than this, adjust accordingly.

| Recommended Torque for Tightening SetScrews | | |
|---|---|---|
| Set Screw Diameter | Minimum Recommended Torque | |
| #10 | Inch lbs. | Foot lbs. |
| | 28 | 2.3 |
| ¼ | 66 | 5.5 |
| 5/16 | 126 | 10.5 |
| 3/8 | 228 | 19.0 |
| 7/16 | 348 | 29.0 |
| ½ | 504 | 42.0 |
| 5/8 | 1104 | 92.0 |

## Motor and Unit Weight Data

### MOTOR ELECTRICAL DATA

| Horsepower | Maximum Motor Amperage | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Voltage | | | | | | | |
| | 115/1 | 208/1 | 230/1 | 277/1 | 208/3 | 230/3 | 460/3 | 575/3 |
| 1/3 | 6.3 | 3.5 | 3.2 | 2.6 | 1.7 | 1.5 | 0.8 | - |
| ½ | 7.8 | 4.3 | 3.9 | 3.6 | 2.2 | 2.1 | 1.1 | 0.9 |
| ¾ | 10.6 | 5.4 | 5.3 | 5.0 | 3.2 | 3.0 | 1.5 | 1.2 |
| 1 | 15.0 | 8.3 | 7.5 | 5.5 | 4.0 | 3.6 | 1.8 | 1.4 |
| 1 ½ | - | - | - | - | 5.3 | 5.0 | 2.5 | 1.9 |
| 2 | - | - | - | - | 7.0 | 6.4 | 3.2 | 2.5 |
| 3 | - | - | - | - | 9.1 | 9.0 | 4.5 | 3.2 |

### UNIT WEIGHT DATA

| Component | | Unit Size | | | | | |
|---|---|---|---|---|---|---|---|
| | | 08 | 12 | 16 | 20 | 30 | 40 |
| Base Unit | | 125 [ 57] | 131 [60] | 160 [73] | 167 [76] | 231 [105] | 236 [107] |
| Damper Section | | 42 [19] | 53 [24] | 59 [27] | 73 [33] | 91 [41] | 91 [41] |
| Blow Thru Electric Heater | | 42 [19] | 42 [19] | 42 [19] | 50 [23] | 55 [25] | 55 [25] |
| Discharge Coil Section | | 35 [16] | 37 [17] | 49 [22] | 53 [24] | 76 [35] | 80 [36] |
| Supply Plenum | | 22 [10] | 26 [12] | 35 [16] | 38 [17] | 76 [35] | 76 [35] |
| Return Plenum ACB | | 29 [13] | 30 [14] | 33 [15] | 35 [16] | 44 [20] | 44 [20] |
| Coil Rows | 1 Row - Dry | 12 [5] | 14 [6] | 17 [8] | 21 [10] | 23 [10] | 27 [12] |
| | 1 Row - Wet | 14 [6] | 17 [8] | 21 [10] | 26 [12] | 28 [13] | 34 [15] |
| | 2 Row - Dry | 17 [8] | 21 [10] | 26 [12] | 32 [15] | 37 [17] | 43 [20] |
| | 2 Row - Wet | 21 [10] | 27 [12] | 33 [15] | 42 [19] | 48 [22] | 56 [25] |
| | 4 Row - Dry | 29 [13] | 36 [16] | 45 [20] | 57 [26] | 65 [30] | 76 [35] |
| | 4 Row - Wet | 37 [17] | 47 [21] | 58 [26] | 75 [34] | 86 [39] | 101 [46] |
| | 6 Row - Dry | 40 [18] | 51 [23] | 64 [29] | 81 [37] | 93 [42] | 109 [50] |
| | 6 Row - Wet | 52 [24] | 66 [30] | 84 [38] | 109 [50] | 124 [56] | 146 [66] |

Notes:

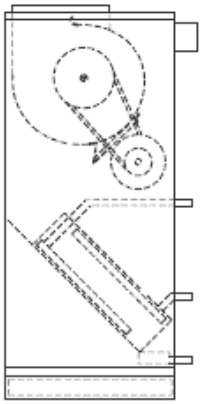
1. Unit weight data is shipping weight in pounds (kilograms)
2. Discharge section includes a 2-row coil

### MOTOR/DRIVE WEIGHT DATA

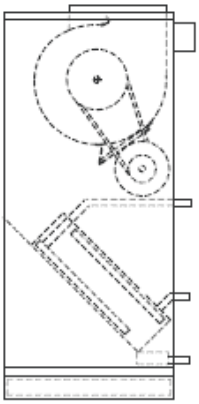
| Type | Motor HP | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1/3 | ½ | ¾ | 1 | 1 ½ | 2 | 3 |
| Single Phase | 37 [17] | 37 [17] | 45 [20] | 47 [21] | - | - | - |
| Three Phase | 34 [15] | 34 [15] | 40 [18] | 43 [20] | 46 [21] | 53 [24] | 81 [37] |

## Arrangements

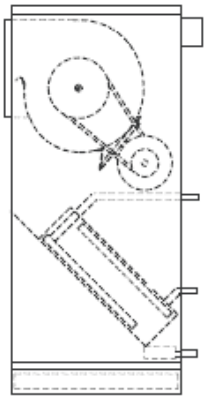
### Model TBL Arrangements



**Reverse Rotation Arrangement 1**

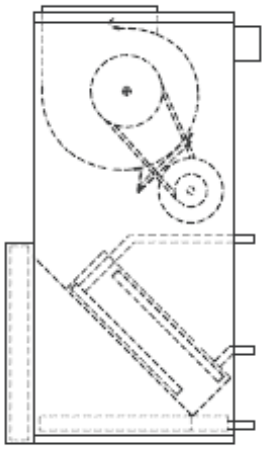


**Standard Rotation Arrangement 2**

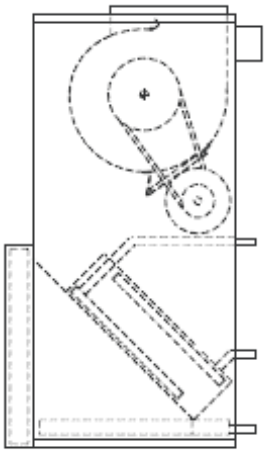


**Horizontal Rear Discharge Arrangement 7**

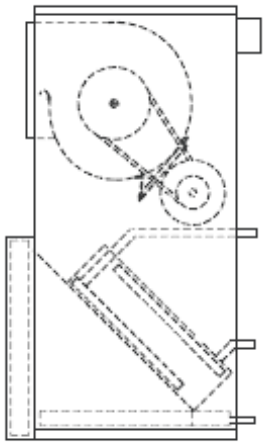
### Model TBS Arrangements



**Reverse Rotation Arrangement 1**



**Standard Rotation Arrangement 2**



**Horizontal Rear Discharge Arrangement 7**

Notes:

1. Refer to Dimensional Data for unit dimensions
2. Fan arrangements are also available with inlet damper section (Model TBS) and return plenum section (Model TBL)
3. Side access filter rack standard on arrangement 7 (Model TBS)
4. Discharge heating coil section and supply plenum are not available with arrangement 7
5. All drawings subject to change without prior notice

# Inspection & Start-Up Checklist

## RECEIVING & INSPECTION

- [ ] Unit Received Undamaged
- [ ] Unit Arrangement/Hand Correct

## HANDLING & INSTALLATION

- [ ] Unit Mounted Level & Square
- [ ] Proper Electrical Service Provided
- [ ] Proper Service Switch/Disconnect Provided
- [ ] Proper Chilled Water Line Size to Unit
- [ ] Proper Refrigerant Line Sizes to Unit
- [ ] Proper Steam Condensate Trap on Return Line
- [ ] All Services to Unit in Code Compliance

## COOLING/HEATING CONNECTIONS

- [ ] Protect Valve Package Components from Heat
- [ ] Connect Field Piping to Unit
- [ ] Install Drain Line & Traps as Required
- [ ] Install Condensate Pan under Piping as Required

## DUCTWORK CONNECTIONS

- [ ] Install Duct work, Fittings & Grilles as Required
- [ ] Control Outside Air for Freeze Protection

## ELECTRICAL CONNECTIONS

- [ ] Refer to Unit Wiring Diagram
- [ ] All Field Wiring in Code Compliance

## UNIT STARTUP

- [ ] General Visual Unit & System Inspection
- [ ] Record Ambient Temperature
- [ ] Close All Unit Isolation Valves
- [ ] Fill Systems with Water/Refrigerant
- [ ] All Duct work & Grilles in Place
- [ ] Start Fans, etc
- [ ] Check All Duct work & Units for Air Leaks
- [ ] Record All Final Settings for Future Use
- [ ] Check All Dampers for Proper Operation
- [ ] Verify Proper Heating Operation

## BLOWER/MOTOR

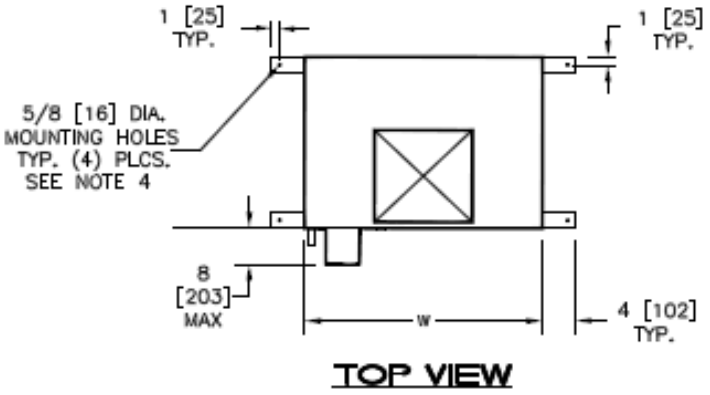
- [ ] Check Sheave Set Screw Tightness
- [ ] Check Blower Wheel Set Screw Tightness
- [ ] Adjust Blower Speed as Necessary for Balancing Airflow
- [ ] Check/Adjust Sheave Alignment
- [ ] Check/Adjust Belt Tension
- [ ] Unit Received Complete as Ordered
- [ ] Unit Structural Support Complete & Correct
- [ ] Proper Access Provided for Unit & Accessories
- [ ] Proper Overcurrent Protection Provided
- [ ] Proper Hot Water Line to Unit
- [ ] Proper Steam Line Sizes to Unit
- [ ] Proper Steam Supply Pressure to Unit (15psi Max)
- [ ] All Shipping Screws & Braces Removed
- [ ] Proper Mechanical Fasteners Used for all Horizontal Ceiling Hung Units
- [ ] Mount Valve Packages
- [ ] Pressure Test All Piping for Leaks
- [ ] Insulate All Piping as Required
- [ ] Proper Supply & Return Grille Type & Size Used
- [ ] Insulate All Duct work as Required
- [ ] Connect Incoming Power Service or Services
- [ ] Record Electrical Supply Voltage
- [ ] Check All Wiring for Secure Connections
- [ ] Flush Water Systems
- [ ] Vent Water Systems as Required
- [ ] All Unit Panels & Filters in Place
- [ ] Check for Overload Condition of All Units
- [ ] Balance Air Systems as Required
- [ ] Check Piping & Duct work for Vibration
- [ ] Verify Proper Cooling Operation
- [ ] Reinstall All Covers & Access Panels

## Dimensions

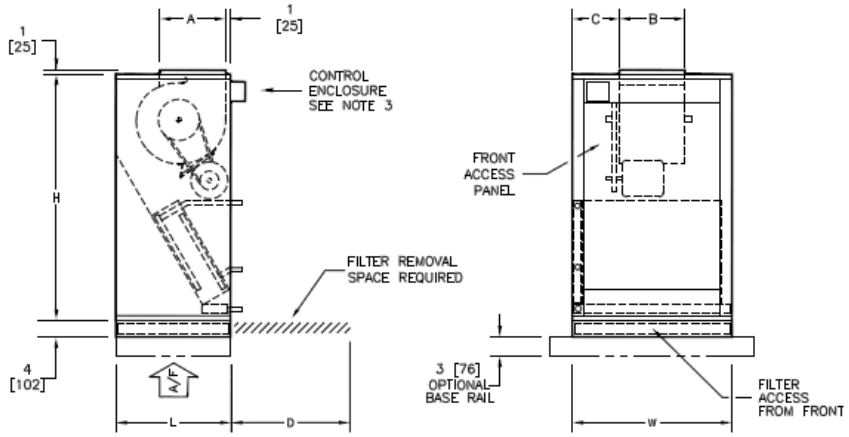
### Model TBL Basic Unit – Discharge Arrangement 2

Notes:

1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm]. Metric values are soft conversions
2. Left-hand unit shown. Motor/drive location may be specified left-hand or right-hand. Standard-control enclosure location matches motor/drive position. Enclosure size varies with options.
3. Provide sufficient clearance to permit access to electrical controls and comply with applicable codes and ordinances
4. Optional base rail designed for use with floor mount vibration isolators




TOP VIEW




SIDE VIEW FRONT VIEW

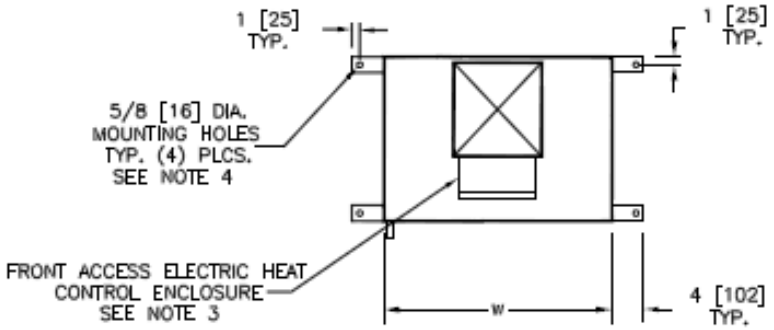
| Unit Size | Filter Size | QTY | H | W | L | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|
| 08 | 16 x 20 x 2 [406 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 19 [483] | 6½ [165] | 6 7/8 [175] | 9 9/16 [243] | 16 [406] |
| 12 | 20 x 20 x 2 [508 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 21 [533] | 7½ [190] | 8¼ [210] | 8 7/8 [225] | 20 [508] |
| 16 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 25 [635] | 7½ [190] | 10¼ [260] | 9 3/8 [238] | 24 [610] |
| 20 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 28 [711] | 11 3/8 [289] | 13¼ [337] | 7 7/8 [200] | 24 [610] |
| 25 | 24 x 24 x 2 [610 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 16 [406] | 12 7/8 [327] | 13 1/16 [332] | 24 [610] |
| 30 | 12 x 24 x 2 [305 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 16 [406] | 15 [381] | 12 [305] | 24 [610] |

## Dimensions

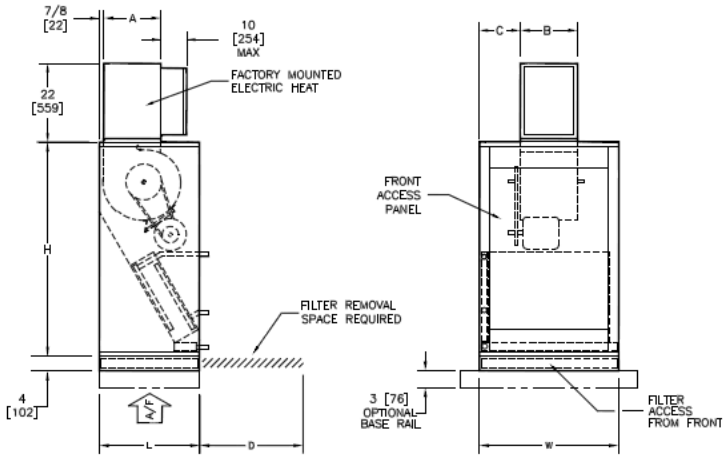
### Model TBL Basic Unit – Discharge Arrangement 1 with Blow-Thru Electric Heat

Notes:

1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm]. Metric values are soft conversions
2. Left-hand unit shown. Motor/drive location may be specified left-hand or right-hand. Standard-control enclosure location matches motor/drive position. Enclosure size varies with options.
3. Provide sufficient clearance to permit access to electrical controls and comply with applicable codes and ordinances
4. Optional base rail designed for use with floor mount vibration isolators
5. Blow-thru electric heat may not be combined with supply plenum or discharge section




TOP VIEW




SIDE VIEW

FRONT VIEW

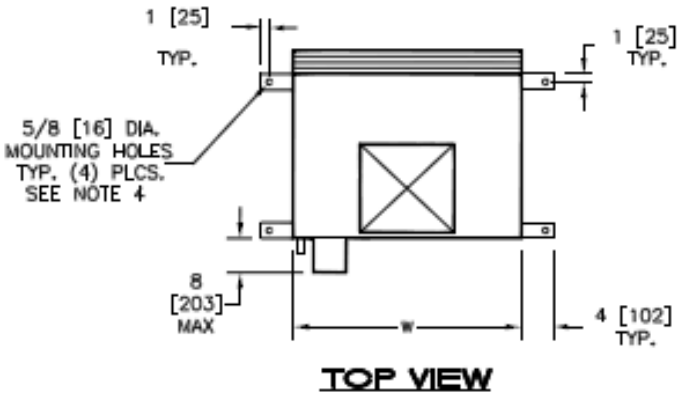
| Unit Size | Filter Size | QTY | H | W | L | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|
| 08 | 16 x 20 x 2 [406 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 19 [483] | 87/8 [226] | 117/8 [302] | 71/16 [180] | 16 [406] |
| 12 | 20 x 20 x 2 [508 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 21 [533] | 87/8 [226] | 117/8 [302] | 71/16 [180] | 20 [508] |
| 16 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 25 [635] | 107/8 [277] | 12 [305] | 8½ [216] | 24 [610] |
| 20 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 28 [711] | 137/8 [353] | 14 [356] | 7½ [190] | 24 [610] |
| 25 | 24 x 24 x 2 [610 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 137/8 [353] | 165/8 [422] | 111/16 [281] | 24 [610] |
| 30 | 12 x 24 x 2 [305 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 137/8 [353] | 165/8 [422] | 111/16 [281] | 24 [610] |

## Dimensions

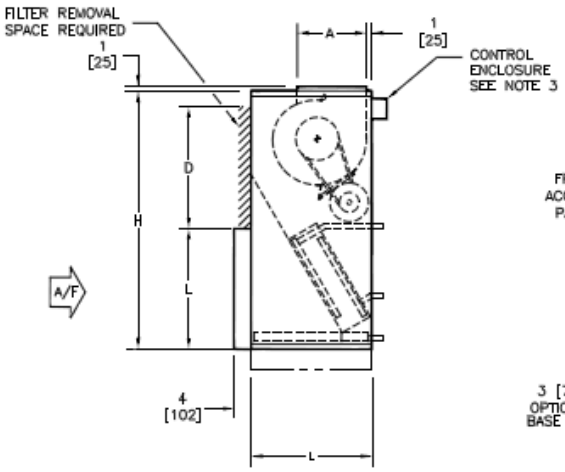
### Model TBS Basic Unit – Discharge Arrangement 2

Notes:

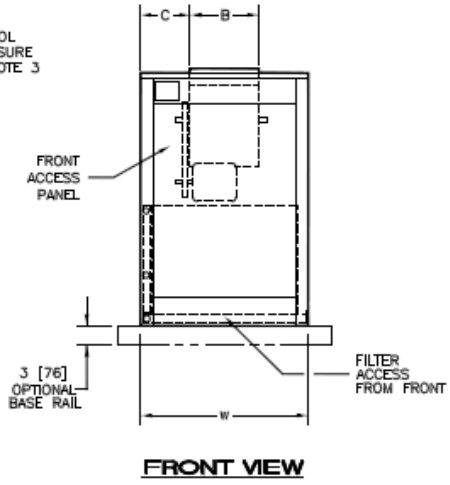
1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm]. Metric values are soft conversions
2. Left-hand unit shown. Motor/drive location may be specified left-hand or right-hand. Standard-control enclosure location matches motor/drive position. Enclosure size varies with options.
3. Provide sufficient clearance to permit access to electrical controls and comply with applicable codes and ordinances
4. Optional base rail designed for use with floor mount vibration isolators




TOP VIEW




SIDE VIEW




FRONT VIEW

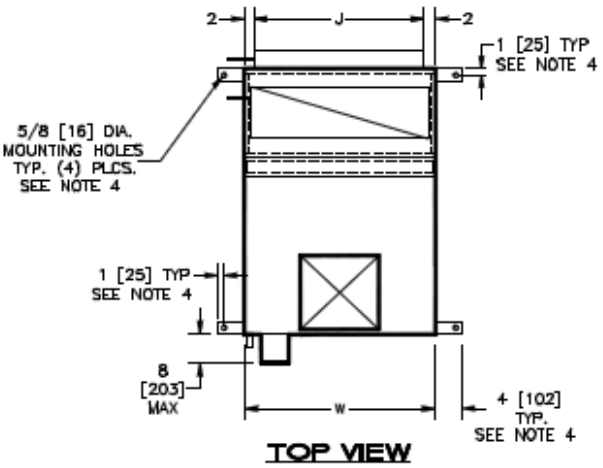
| Unit Size | Filter Size | QTY | H | W | L | A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|
| 08 | 16 x 20 x 2 [406 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 19 [483] | 6½ [165] | 6 7/8 [175] | 9 9/16 [243] | 16 [406] |
| 12 | 20 x 20 x 2 [508 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 21 [533] | 7½ [190] | 8¼ [210] | 8 7/8 [225] | 20 [508] |
| 16 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 25 [635] | 7½ [190] | 10¼ [260] | 9 3/8 [238] | 24 [610] |
| 20 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 28 [711] | 11 3/8 [289] | 13¼ [337] | 7 7/8 [200] | 24 [610] |
| 25 | 24 x 24 x 2 [610 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 16 [406] | 12 7/8 [327] | 13 1/16 [332] | 24 [610] |
| 30 | 12 x 24 x 2 [305 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 16 [406] | 15 [381] | 12 [305] | 24 [610] |

## Dimensions

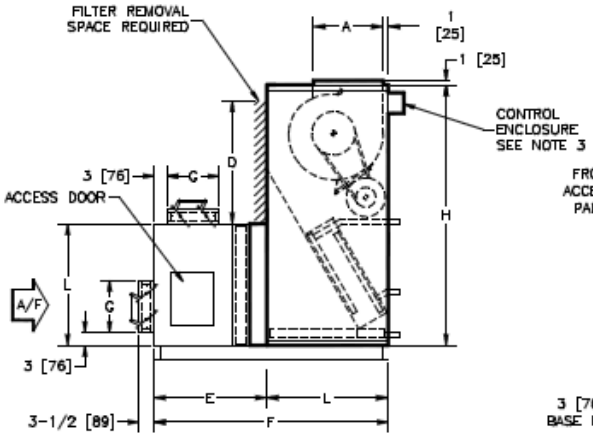
### Models TBL/TBS with Mixing Box & Inlet Damper Section (Requires Base Rail) – Discharge

Notes:

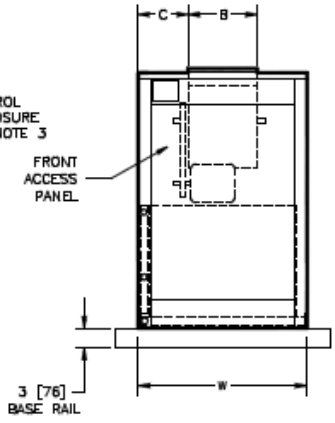
1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm]. Metric values are soft conversions
2. Left-hand unit shown. Motor/drive location may be specified left-hand or right-hand. Standard-control enclosure location matches motor/drive position. Enclosure size varies with options.
3. Provide sufficient clearance to permit access to electrical controls and comply with applicable codes and ordinances
4. Base rail designed for use with floor mount vibration isolators. See page 16 for base rail details.




TOP VIEW




SIDE VIEW



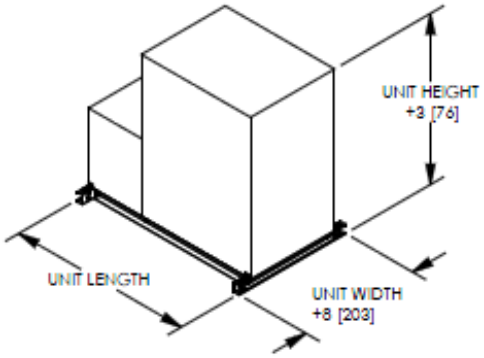

FRONT VIEW

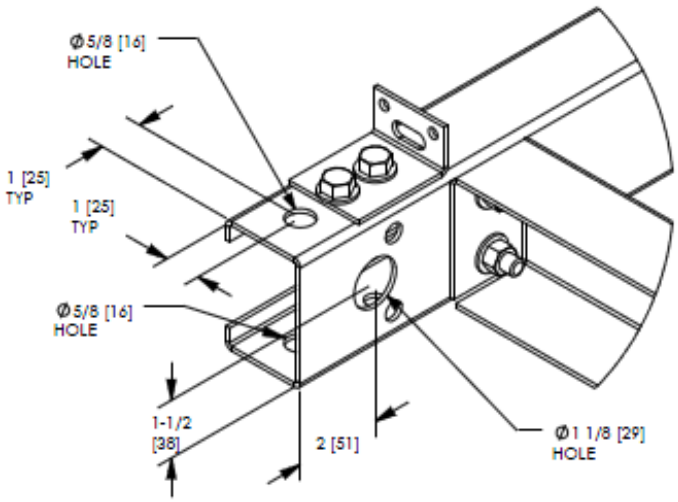
| Unit Size | Filter Size | QTY | H | W | L | A | B | C | D | E | F | G | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08 | 16 x 20 x 2 [406 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 19 [483] | 6½ [165] | 6 7/8 [175] | 9 9/16 [243] | 16 [406] | 15 [381] | 35 [889] | 6 [152] | 22 [559] |
| 12 | 20 x 20 x 2 [508 x 508 x 51] | 1 | 46 [1168] | 26 [660] | 21 [533] | 7½ [190] | 8¼ [210] | 8 7/8 [225] | 20 [508] | 18 [457] | 40 [1016] | 9 [229] | 22 [559] |
| 16 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 25 [635] | 7½ [190] | 10¼ [260] | 9 3/8 [238] | 24 [610] | 18 [457] | 44 [1118] | 9 [229] | 25 [635] |
| 20 | 24 x 24 x 2 [610 x 610 x 51] | 1 | 54 [1372] | 29 [737] | 28 [711] | 11 3/8 [289] | 13¼ [337] | 7 7/8 [200] | 24 [610] | 21 [533] | 50 [1270] | 12 [305] | 25 [635] |
| 25 | 24 x 24 x 2 [610 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 16 [406] | 12 7/8 [327] | 13 1/16 [332] | 24 [610] | 21 [533] | 50 [1270] | 12 [305] | 35 [889] |
| 30 | 12 x 24 x 2 [305 x 610 x 51] | 1 Each | 60 [1524] | 39 [991] | 28 [711] | 16 [406] | 15 [381] | 12 [305] | 24 [610] | 21 [533] | 50 [1270] | 12 [305] | 35 [889] |

## 3-inch Baserail Assembly

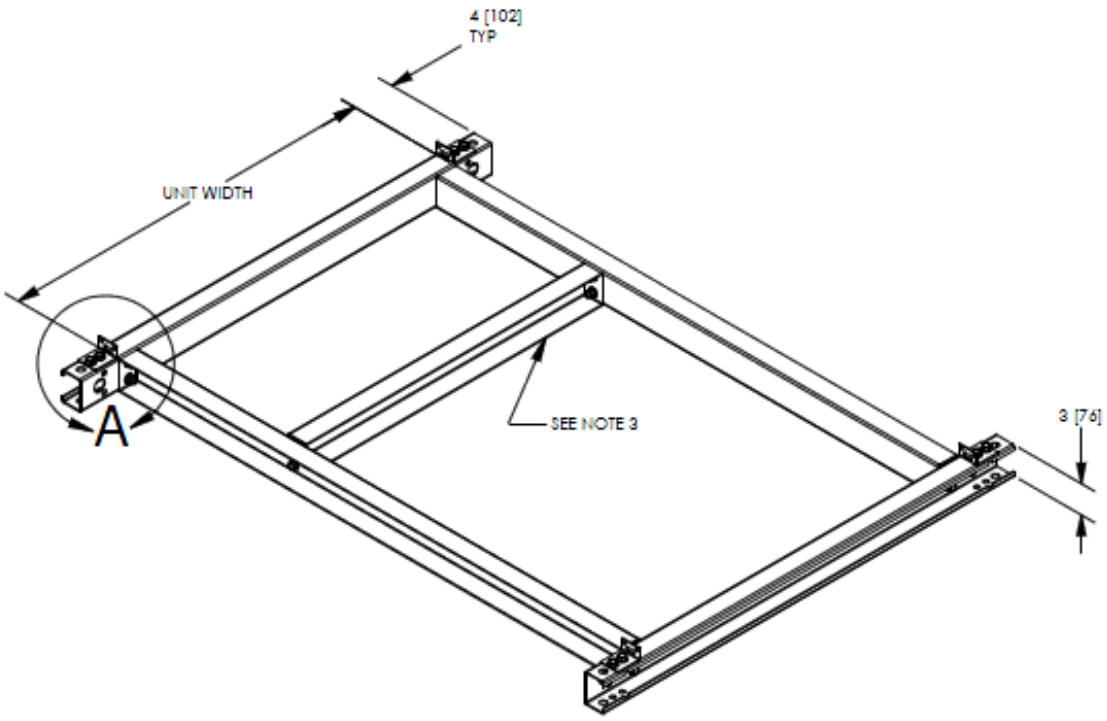
Notes:

1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm].
2. Vertical unit shown, typical for both vertical and horizontal units
3. Support used on units with length over 50 [1270]



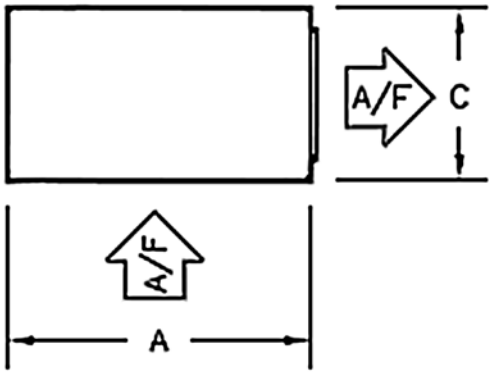




**DETAIL A**

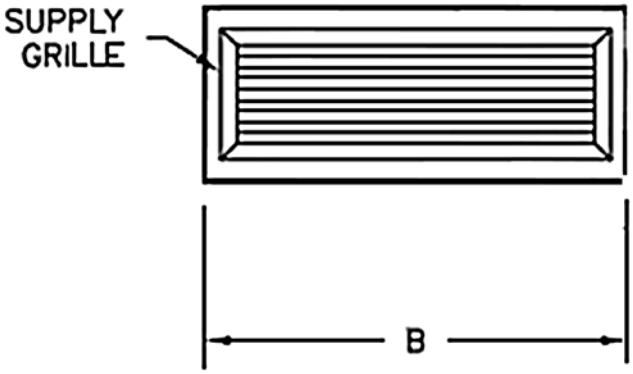


## Discharge Plenum

### Models TBL/TBS Discharge Plenum, Sizes 08 – 30




Side View




Front View

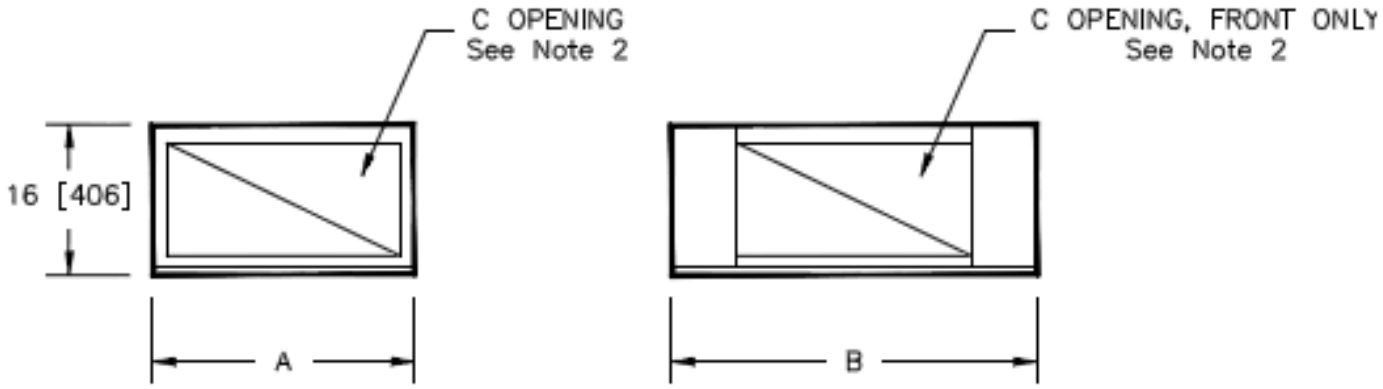
Notes:

1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm]. Metric values are soft conversions
2. Discharge plenum shipped attached to unit
3. Discharge plenum includes a double deflection discharge grille, location is front as shown
4. Discharge plenum may not be combined with blow-thru electric heat

| Unit Size | A | B | C | Supply Grille |
|---|---|---|---|---|
| 08 | 19 [483] | 26 [660] | 12 [305] | 18 x 8 [457 x 203] |
| 12 | 21 [533] | 26 [660] | 12 [305] | 22 x 8 [559 x 203] |
| 16 | 25 [635] | 29 [737] | 14 [356] | 24 x 10 [610 x 254] |
| 20 | 28 [711] | 29 [737] | 16 [406] | 24 x 12 [610 x 305] |
| 25 | 28 [711] | 39 [991] | 16 [406] | 30 x 12 [762 x 305] |
| 30 | 28 [711] | 39 [991] | 16 [406] | 36 x 12 [914 x 305] |

## Return Plenum

### Model TBL Return Plenum, Sizes 08 – 30



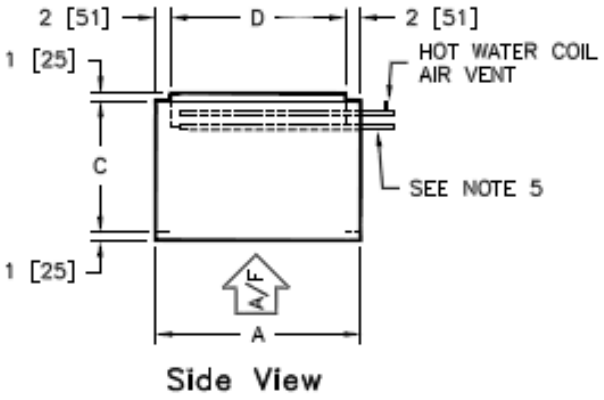

Notes:

1. All dimensions are inches [mm]. All dimensions are +/- ¼" [6mm]. Metric values are soft conversions
2. Standard plenum is provided with removable covers on side openings, and plenum is installed on unit for front inlet. Covers may be relocated, and plenum may be rotated in the field for alternate inlet locations.

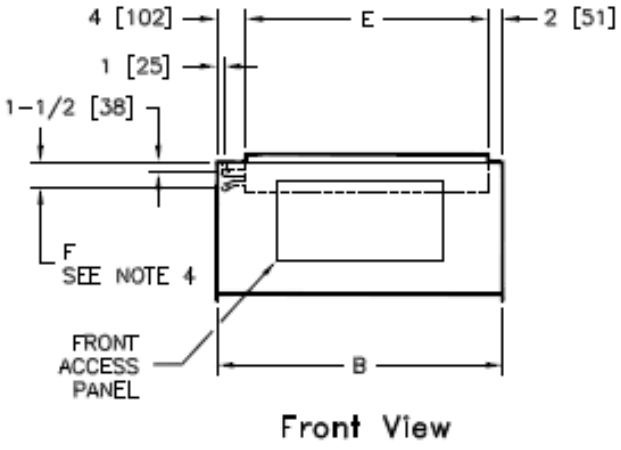
| Unit Size | A | B | C Opening |
|---|---|---|---|
| 08 | 19 [483] | 26 [660] | 9 x 16 [229 x 406] |
| 12 | 21 [533] | 26 [660] | 9 x 18 [229 x 457] |
| 16 | 25 [635] | 29 [737] | 9 x 22 [229 x 559] |
| 20 | 28 [711] | 29 [737] | 12 x 22 [305 x 559] |
| 25 | 28 [711] | 39 [991] | 12 x 25 [305 x 635] |
| 30 | 28 [711] | 39 [991] | 12 x 25 [305 x 635] |

## Discharge Section with Heating Coil

# Models TBL/TBS Discharge Section with Heating Coil, Sizes 08 – 30



Side View



Front View

| Unit Size | A | B | C | D | E | F (4) | | | | WGT. (3) lbs. [kg] |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Hot Water | | Steam | | |
| | | | | | | 1 Row | 2 Row | 1 Row | 2 Row | |
| 08 | 19 [483] | 26 [660] | 12 [305] | 15 [381] | 20 [508] | 2¾ [70] | 2¾ [70] | 2¾ [70] | 2¾ [70] | 35 [16] |
| 12 | 21 [533] | 26 [660] | 12 [305] | 17 [432] | 20 [508] | 2¾ [70] | 2¾ [70] | 2¾ [70] | 2¾ [70] | 37 [17] |
| 16 | 25 [635] | 29 [737] | 14 [356] | 21 [533] | 23 [584] | 2¾ [70] | 3 [76] | 2¾ [70] | 3¼ [83] | 49 [22] |
| 20 | 28 [711] | 29 [737] | 16 [406] | 24 [610] | 23 [584] | 2¾ [70] | 3 [76] | 3¼ [83] | 3¼ [83] | 53 [24] |
| 25 | 28 [711] | 39 [991] | 16 [406] | 24 [610] | 33 [838] | 2¾ [70] | 3 [76] | 3¼ [83] | 3¾ [95] | 76 [35] |
| 30 | 28 [711] | 39 [991] | 16 [406] | 24 [610] | 33 [838] | 3 [76] | 3¼ [83] | 3¾ [95] | 3¾ [95] | 80 [36] |

## COIL CONNECTION SIZES

| Unit Size | Hot Water | | Steam | | | |
|---|---|---|---|---|---|---|
| | 1 Row | 2 Row | 1 Row | | 2 Row | |
| | | | Supply | Condensate | Supply | Condensate |
| 08 | 5/8 [16] | 5/8 [16] | 1 1/8 [29] | 7/8 [22] | 1 1/8 [29] | 7/8 [22] |
| 12 | 5/8 [16] | 5/8 [16] | 1 1/8 [29] | 7/8 [22] | 1 1/8 [29] | 7/8 [22] |
| 16 | 5/8 [16] | 5/8 [16] | 1 1/8 [29] | 7/8 [22] | 1 3/8 [35] | 1 1/8 [29] |
| 20 | 5/8 [16] | 5/8 [16] | 1 3/8 [35] | 1 1/8 [29] | 1 3/8 [35] | 1 1/8 [29] |
| 25 | 5/8 [16] | 7/8 [22] | 1 3/8 [35] | 1 1/8 [29] | 1 5/8 [41] | 1 1/8 [29] |
| 30 | 7/8 [22] | 7/8 [22] | 1 5/8 [41] | 1 1/8 [29] | 1 5/8 [41] | 1 1/8 [29] |

Notes:

1. All dimensions are +/- ¼" [6mm]
2. This section required with 6 row cooling in conjuction with hot water and all steam heating
3. Weight with 2 row dry coil
4. Coil connection dimension +/- ½" [13mm]
5. Hot water coils: Supply - bottom, Return - top. Steam coils: Supply - top, Condensate - bottom.
6. Discharge section may not be combined with blow-thru electric heat

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