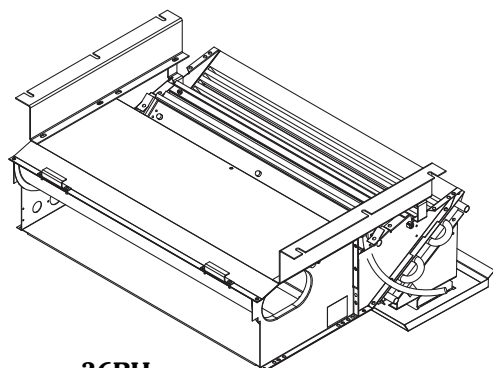




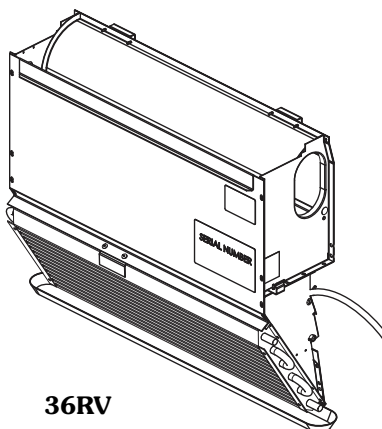
## Product Data

# WEATHERMASTER® 36R,T Bypass Control Induction Air Terminals

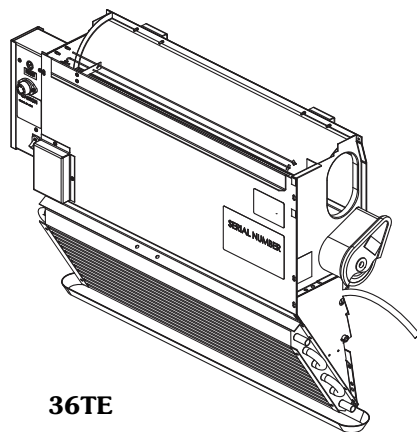
19.4 to 131.9 cfm (1880 to 7100 Btuh)



**36RH**



**36RV**



**36TE**

Induction bypass air terminals offer:

- Low installation costs
- Low maintenance costs
- Valuable space savings
- Combined cooling/heating capability
- Zone control flexibility
- Reduced space requirements

## Features/Benefits

**Weathermaster induction systems with 36R,T series bypass air terminals provide economical operation with space saving installation**

### Design flexibility

Bypass control Weathermaster induction systems use 36R and 36T bypass air terminals for economical air conditioning in office buildings, hotels, schools, and apartments to provide year-round comfort in each room. Bypass air terminals are available in horizontal and vertical configurations. The vertical bypass air terminals are available with electric heat to match the building application. Each terminal comes in 4 sizes with a choice of 5 different nozzle arrangements to provide desired air flow. Terminals may be furred-in or enclosed in optional, decorator-styled cabinets.

# Features/Benefits (cont)



## Lower cost

When 36R,T terminals are specified, the users are able to match the equipment closely to the job requirements. Carrier's optimized computer selection assures that the terminals meet the performance and sound criteria needed, without causing additional operating expense or energy waste as a result of improperly sized components.

Low central station air-handling system costs help the building owner save on installation costs by minimizing building service connections for electricity, water, and drainage. The owner saves on operating, maintenance, and control costs since high-efficiency air cleaning equipment can be used to realize decorating cost savings, while at the same time improving odor and pollen control. Sprayed-coil dehumidifiers can also be used for more effective quality air supply and winter humidification.

## High quality construction

The 36R,T Series terminals are built to exacting standards governing product quality. Units are rated in accordance with the Air Conditioning and Refrigeration Institute (ARI) Standard 445.

## Energy savings

The 36R,T air terminals provide heating and cooling from a single terminal. The heating can be provided in the most economical central station way to heat, either hot water, steam, or electric.

The 36RM,RP,RV air terminals also provide energy savings with gravity

heat on vertical units. The building owner can shut down the air distribution system and save fan horsepower. Hot water circulates to maintain the temperature in unoccupied rooms. This provides simple, economical convector heating.

The induction system allows for heat reclaim and energy conservation. The building owner can easily adapt an economizer cycle along with other reclaim/energy conservation methods such as double-bundle condensers, etc. to a 36R,T induction system.

Automatic actual load adjustment helps lower system operating costs since they are not materially affected by the excess capacity of the system. The terminals automatically adjust to actual loads, thus allowing the building owner a wide design latitude without paying the penalty of high operating costs.

The 36R,T terminals provide positive year-round humidity control. The exterior zone humidity can be easily controlled by dehumidifying the constant air supply in the summer and humidifying during the winter.

## Quiet, reliable operation

Each terminal has a specially designed balancing damper, acoustical plenum insulation, and high efficiency nozzles and coils to ensure a reliable, quiet operation. There are no moving parts to break down or wear out.

Mechanical equipment is located remote from the room occupants. The central system approach removes the

sound-generating components from the building occupants.

## Positive ventilation

The induction system is a positive ventilation system. The primary air is always provided with a positive amount of outside ventilation air directly added to every module served by a 36R,T air terminal.

There is constant air movement throughout the system. The primary air source provides continuous air motion and circulation throughout the room.

Reliable temperature control is provided as each room is its own zone. Room occupants can have the temperature as they like it, and the unit responds to individual room requirements.

## Greater rentable area

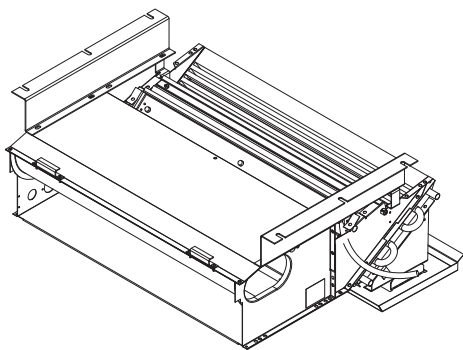
Typically, units are wall-hung or ceiling mounted so the building design can make maximum use of rentable floor area. The reduced floor-to-floor height requirements can mean great savings in the overall height of the building itself. The smaller, high-velocity air ducts used in these systems, along with small water pipes reduce the space needed.

Since 36R,T air terminals require no cumbersome ductwork that robs valuable space, building height requirements can be less, an important factor in lowering total building cost.

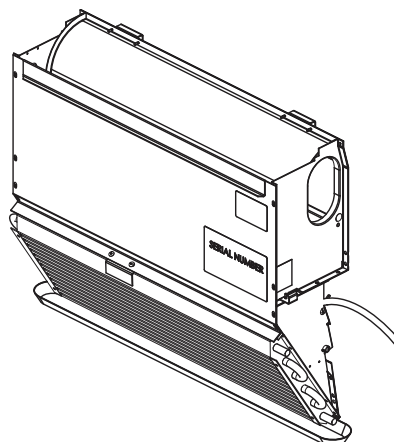
# Table of contents

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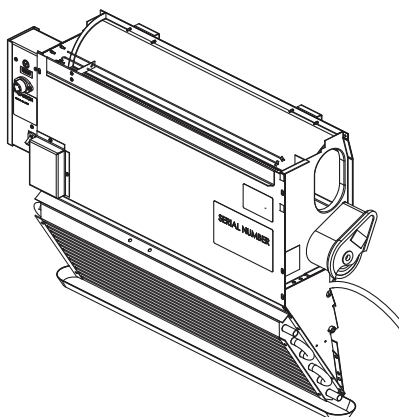
## 2-PIPE BYPASS CONTROL INDUCTION AIR TERMINALS



**36RH Bypass Air Terminal**  
Standard horizontal unit with ceiling mounting to save valuable floor space



**36RM,RP,RV Bypass Air Terminal**  
Single coil vertical unit for wall-hung mounting. Available with standard, pneumatic, and manual controls.



**36TE Bypass Air Terminal**  
Single coil vertical unit with electric heat for wall-hung mounting

# Model number nomenclature



| 36RV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | 1 | 0 | F | R | 0                                                                                                                                                                                                   | 1 | -- | 0 | - | - |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|---|---|---|
| <b>36RH</b> – Horizontal Bypass Unit<br><b>36RM</b> – Vertical Bypass Unit with Manual Control<br><b>36RP</b> – Vertical Bypass Unit with Pneumatic Control<br><b>36RV</b> – Vertical Bypass Unit<br><b>36TE</b> – Vertical Bypass Unit with Electric Heater                                                                                                                                                                                                                                                                             |  |   |   |   |   | <b>Electric Heater Size (36TE only)</b><br>- – None<br><b>A</b> – 1.0 KW<br><b>B</b> – 1.5 KW<br><b>C</b> – 2.0 KW<br><b>D</b> – 2.5 KW<br><b>E</b> – 3.0 KW                                        |   |    |   |   |   |
| <b>Unit Size – Plenum Length (in.)</b><br><b>1</b> – 24 <b>3</b> – 40<br><b>2</b> – 32 <b>4</b> – 52                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |   |   |   |   | <b>Electric Heater Voltage (36TE only)</b><br>- – None<br><b>1</b> – 208 V<br><b>2</b> – 240 V<br><b>3</b> – 277 V                                                                                  |   |    |   |   |   |
| <b>Control Packages</b><br><b>0</b> – No Controls<br><b>1</b> – Changeover with Unit-Mounted Thermostat (36RV, RH only)<br><b>2</b> – Changeover for use with Field-Supplied Thermostat (36RV, RH only)<br><b>3</b> – Non-Changeover with Unit-Mounted Thermostat (36RH, RV, TE only)<br><b>4</b> – Non-Changeover for use with Field-Supplied Thermostat (36RH, RV, TE only)<br><b>6</b> – Damper with Manual Adjustment on Right Hand of Unit (36RM only)<br><b>7</b> – Damper with Manual Adjustment on Left Hand of Unit (36RM only) |  |   |   |   |   | <b>E-Z Sell Options</b><br><b>0</b> – None<br><b>1</b> – Includes Transition Fitting, Lint Screen, and Mounting Strip<br><b>2</b> – Includes 2 Transition Fittings, Lint Screen, and Mounting Strip |   |    |   |   |   |
| <b>Nozzle Arrangement*</b><br><b>F</b> – Gray <b>J</b> – Black and Blue Gray<br><b>G</b> – Red <b>K</b> – Blue Gray<br><b>H</b> – Black                                                                                                                                                                                                                                                                                                                                                                                                  |  |   |   |   |   | <b>Condensate Pan</b><br><b>1</b> – Non-Drainable<br><b>2</b> – Drainable                                                                                                                           |   |    |   |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |   |   | <b>Coil Connections</b><br><b>0</b> – ½-in. ODF Sweat<br><b>1</b> – ½-in. ODF Sweat with Vent<br><b>2</b> – ½-in. ODM Flare<br><b>3</b> – ½-in. ODM Flare with Vent                                 |   |    |   |   |   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |   |   |   |   | <b>Hand (Coil Side Connection Facing Unit)</b><br><b>L</b> – Left Hand<br><b>R</b> – Right Hand                                                                                                     |   |    |   |   |   |

\* Nozzles are designed to optimize the thermal efficiency at minimum sound power generation. They are suitable for handling up to 175 F supply air. Primary air quantity is controlled by the number and diameter of the holes in the nozzle. Nozzle styles are as follows:

F — Provides highest coil capacity per cfm of primary air. Used where sensible cooling is high in relation to ventilation requirements.

G — Provides performance between H and F.

H — Provides nominal coil capacity per cfm of primary air. Used for average office builds with normal lighting loads and glass areas.

J — Provides performance between H and K.

K — Provides highest coil capacities per unit size and highest air quantities. Used for high ventilation and high total loads.

# Ratings and capacities



## PRIMARY COIL COOLING CAPACITY RATINGS (Btuh)

| UNIT SIZE | NOZZLE TYPE | PRIMARY AIR (cfm) | COIL COOLING CAPACITY (Btuh) |      |
|-----------|-------------|-------------------|------------------------------|------|
|           |             |                   | 36RV,RH                      | 36TE |
| 1         | F           | 19.4              | 1960                         | 1880 |
|           | G           | 27.2              | 2570                         | 2440 |
|           | H           | 38.9              | 3090                         | 2910 |
|           | J           | 50.8              | 3380                         | 3160 |
|           | K           | 62.8              | 3590                         | 3340 |
| 2         | F           | 25.3              | 2600                         | 2500 |
|           | G           | 35.4              | 3370                         | 3200 |
|           | H           | 50.5              | 4030                         | 3790 |
|           | J           | 64.9              | 4350                         | 4070 |
|           | K           | 81.6              | 4610                         | 4290 |
| 3         | F           | 31.1              | 3290                         | 3160 |
|           | G           | 43.5              | 4220                         | 4010 |
|           | H           | 62.2              | 5010                         | 4710 |
|           | J           | 81.3              | 5380                         | 5030 |
|           | K           | 100.5             | 5680                         | 5280 |
| 4         | F           | 40.8              | 4210                         | 4040 |
|           | G           | 57.1              | 5330                         | 5060 |
|           | H           | 81.6              | 6330                         | 5950 |
|           | J           | 105.5             | 6730                         | 6290 |
|           | K           | 131.9             | 7100                         | 6600 |

NOTE: Units are rated in accordance with ARI (Air Conditioning and Refrigeration Institute) Standard 445, under the following conditions: 1.5 gpm of 50 F water, 8 ft of water pressure drop thru coil (16 ft for

36ST), 75 F dry bulb and 57 F wet bulb air entering coil and 1.5 in. wg nozzle static pressure.

## SOUND SELECTION GUIDE\*

| ROOM EFFECT (Lw - Lp) | NC LEVEL | NOZZLE PRESSURE (in. wg) |     |     |     |     |
|-----------------------|----------|--------------------------|-----|-----|-----|-----|
|                       |          | UNIT NOZZLE ARRANGEMENT  |     |     |     |     |
|                       |          | F                        | G   | H   | J   | K   |
| 8 dB                  | 30       | 2.4                      | 2.2 | 2.0 | 1.8 | 1.5 |
|                       | 35       | 3.0                      | 2.7 | 2.5 | 2.4 | 2.0 |
|                       | 40       | 3.5                      | 3.5 | 3.2 | 3.1 | 2.6 |
|                       | 45       | 3.5                      | 3.5 | 3.5 | 3.5 | 3.5 |
| 10 dB                 | 30       | 2.6                      | 2.4 | 2.2 | 2.1 | 1.7 |
|                       | 35       | 3.3                      | 3.1 | 2.9 | 2.7 | 2.3 |
|                       | 40       | 3.5                      | 3.5 | 3.5 | 3.4 | 3.0 |
|                       | 45       | 3.5                      | 3.5 | 3.5 | 3.5 | 3.5 |

### LEGEND

Lw — Sound Power Level (dB)  
Lp — Sound Pressure Level (dB)  
NC — Noise Criteria

\*Based upon size 2 units with 1.5 in. wg damper pressure drop.

NOTE: Shaded values are the commonly accepted sound levels for an office space.

## 36TE ELECTRIC HEATER CAPACITIES

| HEATER kW | UNIT SIZES | BTUH   |
|-----------|------------|--------|
| 1.0       | 1,2,3,4    | 3,412  |
| 1.5       | 1,2,3,4    | 5,118  |
| 2.0       | 1,2,3,4    | 6,824  |
| 2.5       | 3,4        | 8,530  |
| 3.0       | 4          | 10,236 |

## 36RM,RP,RV GRAVITY HEATING CAPACITIES (Btuh)

| UNIT SIZE | TEMPERATURE DIFFERENCE (ENTERING WATER - ROOM TEMPERATURE) |       |       |      |      |
|-----------|------------------------------------------------------------|-------|-------|------|------|
|           | 140 F                                                      | 120 F | 100 F | 80 F | 60 F |
| 1         | 4080                                                       | 3400  | 2755  | 2110 | 1495 |
| 2         | 5440                                                       | 4535  | 3675  | 2815 | 1995 |
| 3         | 6800                                                       | 5665  | 4590  | 3515 | 2495 |
| 4         | 8840                                                       | 7365  | 5965  | 4570 | 3240 |

NOTE: For capacities other than 1.50 gpm use the following multipliers: 0.75 for 0.60 gpm, 0.84 for 1.00 gpm and 1.15 for 2.00 gpm.

# Physical data



## UNIT OPERATING WEIGHTS (lb)

| UNIT       | UNIT SIZE |    |    |    |
|------------|-----------|----|----|----|
|            | 1         | 2  | 3  | 4  |
| 36RH       | 38        | 47 | 54 | 66 |
| 36RM,RP,RV | 33        | 42 | 48 | 59 |
| 36TE       | 39        | 48 | 54 | 65 |

NOTE: Weights include water in the coil but do not include field-supplied control valve packages.

## COIL WATER QUANTITIES

| UNIT             | SIZE | QUANTITY |      |
|------------------|------|----------|------|
|                  |      | Gallons  | lb   |
| 36RH,RM,RP,RV,TE | 1    | 0.13     | 1.10 |
|                  | 2    | 0.17     | 1.40 |
|                  | 3    | 0.21     | 1.70 |
|                  | 4    | 0.26     | 2.20 |

## ACCESSORY LINT SCREEN DIMENSIONS (in.)

| LOCATION               | UNIT SIZE   |             |             |             |
|------------------------|-------------|-------------|-------------|-------------|
|                        | 1           | 2           | 3           | 4           |
| Directly on Coil       | 25 1/8 x 10 | 33 x 10     | 41 x 10     | 53 x 10     |
| Over Return-Air Grille | 35 x 11 1/2 | 43 x 11 1/2 | 51 x 11 1/2 | 63 x 11 1/2 |

# Options and accessories



| ITEM                                                                           | FACTORY-INSTALLED<br>OPTIONS | FIELD-INSTALLED<br>ACCESSORIES |
|--------------------------------------------------------------------------------|------------------------------|--------------------------------|
| Drainable Condensate Pan                                                       | X                            |                                |
| E-Z Sell Option (contains transition fitting, lint screen, and mounting strip) | X                            |                                |
| Enclosures                                                                     |                              | X                              |
| Coil Connections                                                               | X                            |                                |
| Electric Heat (36TE only)                                                      | X                            |                                |
| Wall Mounting Strip                                                            |                              | X                              |
| Air Transition Fitting                                                         |                              | X                              |
| Lint Screen                                                                    |                              | X                              |

## Factory-installed options

**Control options** — Self-contained control packages are available for the 36RV and 36RH units for changeover and non-changeover systems. The non-changeover control package is also used on 36TE units. All control units have a washable filter contained in an easily accessible housing, a changeover element sensing coil temperature (changeover package only), and all necessary interconnecting tubing for use with a wall-mounted thermostat.

When a unit-mounted thermostat is desired on the 36RV, RH, and TE units, tubing is provided to sample room air and direct it across the unit-mounted thermostat. Additional tubing is also provided to connect the thermostat to the damper.

Unit-mounted thermostats for the 36RH model are available as an option. A wall-mounted thermostat with control tubing is also available and may be purchased as an accessory.

The control package for the 36RM manual control units consists of a manual adjusting lever connected by linkage to the bypass damper blade.

Pneumatic (36RP) control units are also available.

**Drainable condensate pan** — This special condensate pan, with  $1\frac{1}{16}$ -in. OD drain connection is available for applications such as hotels or apartments that may have periodic high-latent loads.

**Coil connections** — Four types of connections are available on the base unit.

- $\frac{1}{2}$ -in. ODF sweat on both supply and return
- $\frac{1}{2}$ -in. ODF sweat with manual air vent on return and  $\frac{1}{2}$ -in. ODF sweat on supply

- $\frac{1}{2}$ -in. ODM flare on both supply and return
- $\frac{1}{2}$ -in. ODM flare with manual air vent on return and  $\frac{1}{2}$ -in. ODM flare on supply

The specified connection is factory mounted on the unit.

**Electric heat** — Electric heat is available on 36TE bypass air terminals. Electric heat is available from 1 to 3 kW and in 3 different voltages to meet the heating needs of every application.

## Field-installed accessories

**Lint screen** — This special galvanized screen and frame attaches to the coil with four clips provided with the base unit. Screen protects coil from dirt and lint and can easily be removed for cleaning, thus ensuring maximum coil efficiency.

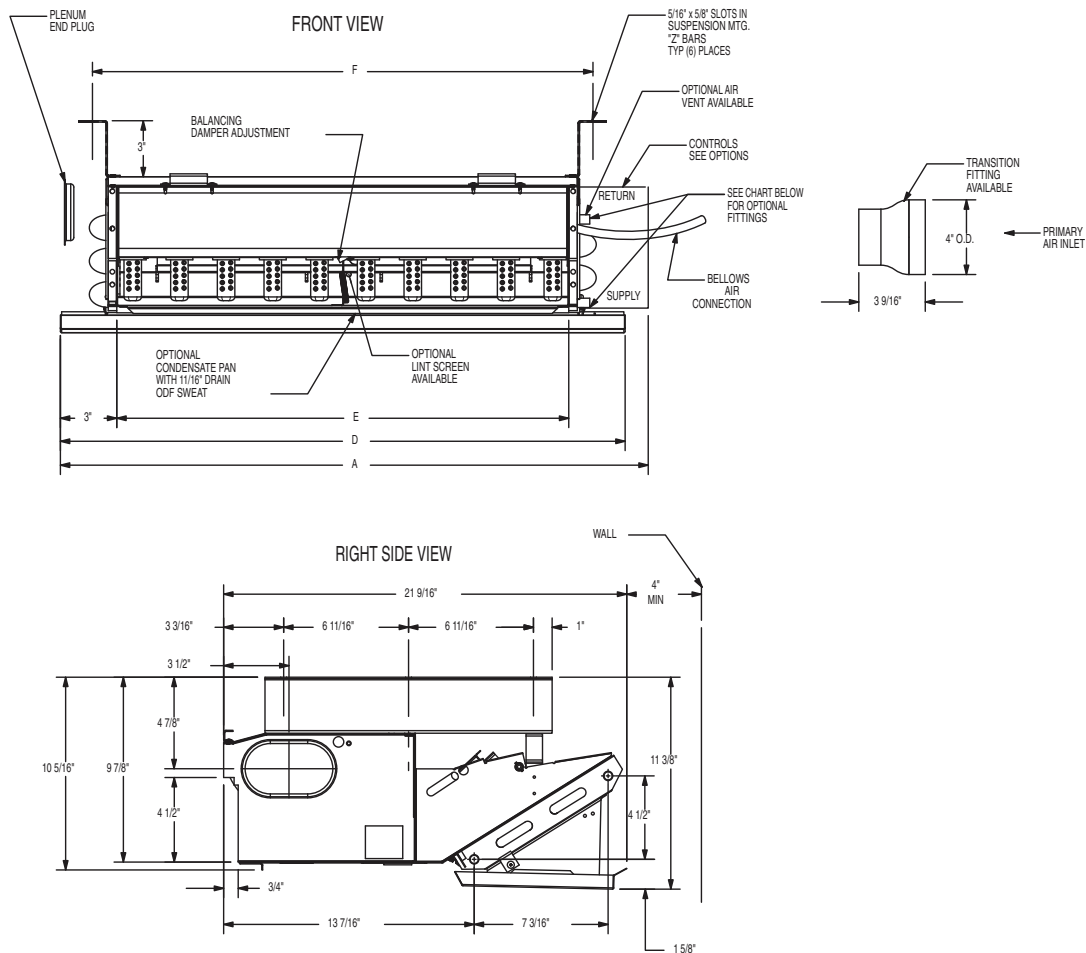
**Wall mounting strip** — Wall mounting strip is made of 14-gage galvanized steel and is required for hanging all vertical base units, enclosures and enclosure accessories. Base unit and its enclosures can be mounted on same strip. Strips are available in either 5 or 8-ft lengths.

**Primary air transition fitting** — Primary air transition fitting can provide air transition from the oval entrance on unit to a standard 4-in. round duct.

**Enclosures** — All enclosures are shipped assembled and include side, top and removable front panel (for vertical enclosures) and removable bottom panel (for horizontal enclosures). The enclosures have recoatable baked enamel parchment beige finish and are fabricated from 16 gage steel.

Standard grilles are included with enclosure. Grilles are one-piece aluminum, linear-bar style with a clear anodized etched finish. Other colors are available.

# Dimensions — 36RH



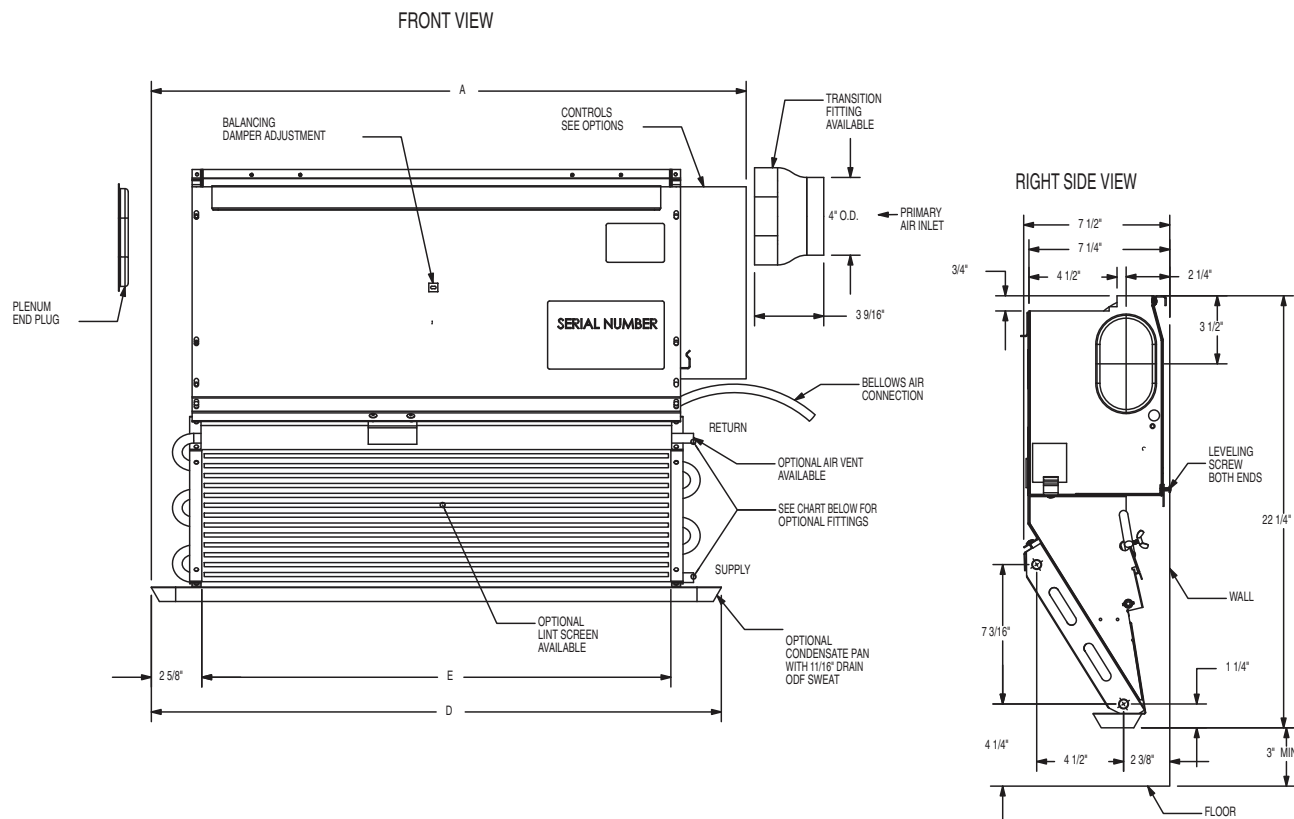
## NOTES:

1. Thermostat is mounted on the right side only on on the wall.
2. Slave units are dimensionally the same, except without controls.
3. Non-changeover units do not have changeover valve.
4. A 4-in. minimum distance from the wall is required to obtain rated capacity.  
An 8 1/2 in. minimum clearance is required for screen removal.
5. Condensate connection is mounted on the same side as the coil connection.
6. The unit is shipped with two Z brackets for mounting the unit and a hardware kit including the following: 8 mounting screws, 8 tinnerman nuts, and 1 lint screen clip.
7. Shipping weight includes packaging.

| SPECIFICATION                                | UNIT SIZE |        |        |        |
|----------------------------------------------|-----------|--------|--------|--------|
|                                              | 1         | 2      | 3      | 4      |
| Base Unit Dimension A (in.)                  | 31        | 39     | 47     | 59     |
| Drain Pan Dimension D (in.)                  | 30 1/4    | 38 1/4 | 46 1/4 | 58 1/4 |
| Coil Dimension E (in.)                       | 24 1/8    | 32     | 40     | 52     |
| Hanger Dimension F (in.)                     | 27 1/8    | 35     | 43     | 55     |
| Minimum Height from Floor (in.)              | 3         | 3      | 3      | 3      |
| Clearance from Discharge Grille (sq in.)     | 81        | 108    | 135    | 175    |
| Clearance from Recirculation Grille (sq in.) | 234       | 288    | 343    | 439    |
| Shipping Weight (lb)                         | 38        | 47     | 54     | 66     |

| OPTIONAL FITTINGS |                                  |
|-------------------|----------------------------------|
| CODE              | DESCRIPTION                      |
| 0                 | 1/2" ODF Sweat Fitting           |
| 1                 | 1/2" ODF Sweat Fitting with Vent |
| 2                 | 1/2" ODM Flare Fitting           |
| 3                 | 1/2" ODM Flare Fitting with Vent |

# Dimensions — 36RM,RP,RV



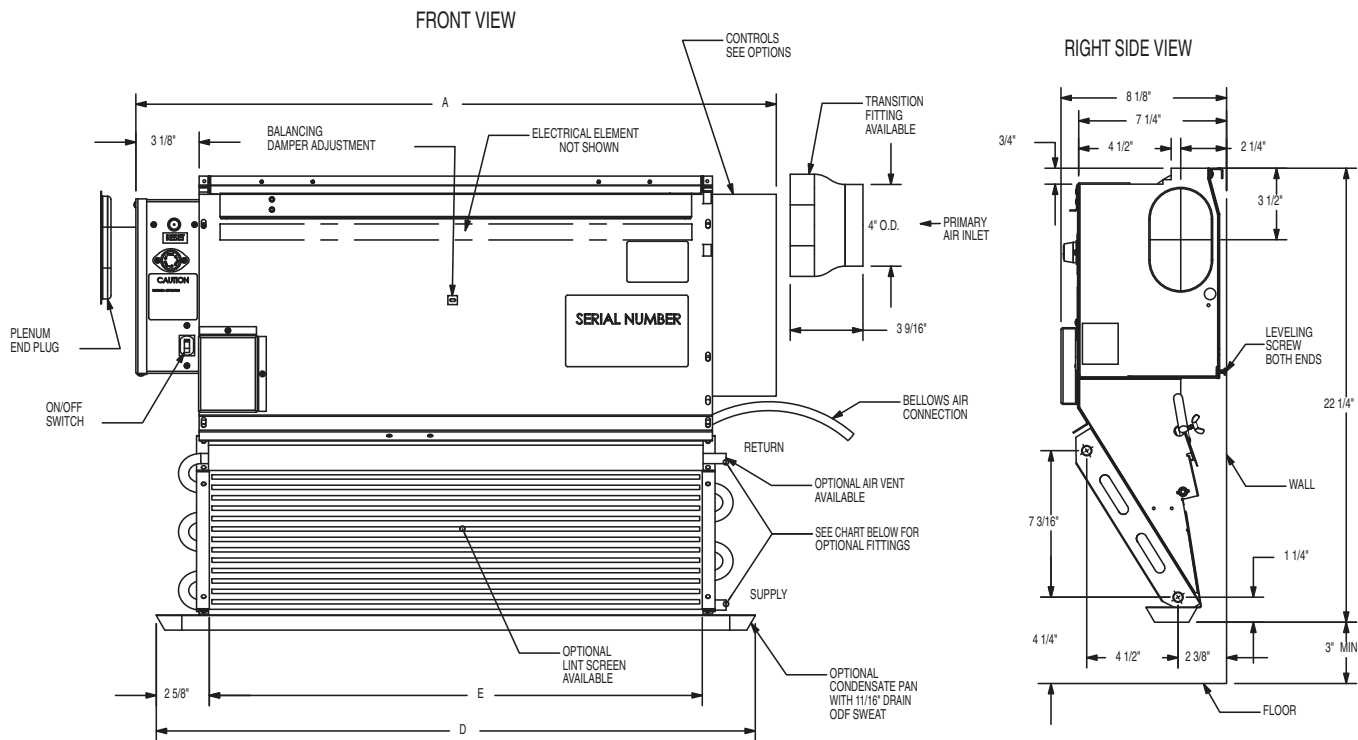
## NOTES:

1. Thermostat is wall mounted or unit mounted on the right side only.
2. Slave units are dimensionally the same, except without controls.
3. Non-changeover units do not have changeover valve.
4. Condensate connection is mounted on the same side as the coil connection.
5. The unit is shipped with a hardware kit including the following: 2 leveling screws, 2 leveling screw clips, 4 lint screen clips, and 2 coil condensate plates with clips.
6. Shipping weight includes packaging.

| SPECIFICATION                                | UNIT SIZE |        |        |        |
|----------------------------------------------|-----------|--------|--------|--------|
|                                              | 1         | 2      | 3      | 4      |
| Base Unit Dimension A (in.)                  | 30 5/8    | 38 1/2 | 46 1/2 | 58 1/2 |
| Drain Pan Dimension D (in.)                  | 29 1/2    | 37 1/2 | 45 1/2 | 57 1/2 |
| Coil Dimension E (in.)                       | 24 1/8    | 32     | 40     | 52     |
| Minimum Height from Floor (in.)              | 3         | 3      | 3      | 3      |
| Clearance from Discharge Grille (sq in.)     | 81        | 108    | 135    | 175    |
| Clearance from Recirculation Grille (sq in.) | 234       | 288    | 343    | 439    |
| Shipping Weight (lb)                         | 33        | 42     | 48     | 59     |

| OPTIONAL FITTINGS |                                  |
|-------------------|----------------------------------|
| CODE              | DESCRIPTION                      |
| 0                 | 1/2" ODF Sweat Fitting           |
| 1                 | 1/2" ODF Sweat Fitting with Vent |
| 2                 | 1/2" ODM Flare Fitting           |
| 3                 | 1/2" ODM Flare Fitting with Vent |

# Dimensions — 36TE



## NOTES:

1. Thermostat is wall mounted or unit mounted on the right side only.
2. Slave units are dimensionally the same, except without controls.
3. Non-changeover units do not have changeover valve.
4. Condensate connection is mounted on the same side as the coil connection.
5. The unit is shipped with a hardware kit including the following: 2 leveling screws, 2 leveling screw clips, 4 lint screen clips, and 2 coil condensate plates with clips.
6. Shipping weight includes packaging.

| SPECIFICATION                                | UNIT SIZE |        |        |        |
|----------------------------------------------|-----------|--------|--------|--------|
|                                              | 1         | 2      | 3      | 4      |
| Base Unit Dimension A (in.)                  | 31        | 39     | 47     | 59     |
| Drain Pan Dimension D (in.)                  | 30 1/4    | 38 1/4 | 46 1/4 | 58 1/4 |
| Coil Dimension E (in.)                       | 24 1/8    | 32     | 40     | 52     |
| Clearance from Discharge Grille (sq in.)     | 81        | 108    | 135    | 175    |
| Clearance from Recirculation Grille (sq in.) | 234       | 288    | 343    | 439    |
| Shipping Weight (lb)                         | 36        | 45     | 52     | 64     |

| OPTIONAL FITTINGS |                                  |
|-------------------|----------------------------------|
| CODE              | DESCRIPTION                      |
| 0                 | 1/2" ODF Sweat Fitting           |
| 1                 | 1/2" ODF Sweat Fitting with Vent |
| 2                 | 1/2" ODM Flare Fitting           |
| 3                 | 1/2" ODM Flare Fitting with Vent |

# Selection procedure



## General unit selection criteria

Two parameters must be satisfied in selecting an induction air terminal, the unit must have enough capacity to maintain proper room temperature and the unit must supply air at an acceptable sound level.

After room air conditioning loads have been calculated and the primary air quantity determined, the induction air terminals can be selected. To calculate coil loads for the units, the primary air cooling capacity is subtracted from the room load.

Primary air cooling capacity depends upon the exposure and type of system being designed. The air quantity should satisfy the ventilation and dehumidification requirements of the conditioned space as well as other system requirements.

These system requirements are discussed in detail in the Carrier System Design manual. Both this manual and the Engineering Guide for Weathermaster® Induction Systems should be consulted for a more complete explanation of system requirements.

## Cooling

The cooling capacity of the induction unit is determined by the combined secondary coil and primary air cooling capacities at design conditions. In 4-pipe applications, the heating coil is assumed to be neutral for selection purposes.

### I Determine job requirements.

Given:

|                                                                  |             |
|------------------------------------------------------------------|-------------|
| Type of unit.....                                                | 36RV        |
| Total room sensible cooling load .....                           | 5645 Btuh   |
| Design room temperature ( $t_{rm}$ ) .....                       | 76 F        |
| Entering primary air temperature ( $t_{pa}$ ) .....              | 56 F        |
| Minimum primary air quantity .....                               | 60 cfm      |
| Entering water temperature.....                                  | 52 F        |
| Maximum desired room sound level<br>( $L_w - L_p$ ) and NC ..... | 8 and 35 dB |

### II Determine primary air capacity.

Since the room, temperature minus the primary air temperature (76 F – 56 F) is 20° F, use the 36RV Cooling Coil Capacities table directly to read the capacity for 60 cfm of primary air:

Primary air capacity at 60 cfm = 1296 Btuh

NOTE: For other temperature differences, use the following formula to determine the primary air capacity:

Capacity = min. primary air cfm x 1.08 x ( $t_{rm} - t_{pa}$ )

### III Determine required coil capacity.

Subtract the primary air capacity from total cooling load to determine required coil capacity.

Required coil capacity = 5645 – 1296 = 4349 Btuh

Since the room temperature minus the entering water temperature (76 F – 52 F) is 24° F and the Cooling Coil Capacities table is based upon 25° F temperature difference, the required coil capacity must be corrected for the 24° F temperature difference.

Use formula:

$$\begin{aligned}\text{Corrected coil capacity} &= (25 \text{ F}/24 \text{ F}) \times 4349 \text{ Btuh} \\ &= 4523 \text{ Btuh}\end{aligned}$$

### IV Determine unit size, water flow nozzle arrangement, and noise pressure.

Enter the 36RV Cooling Coil Capacities table at 60 cfm. Select a size 2, nozzle arrangement H unit with a rated coil capacity 4469 Btuh. Since rated unit capacity is below the required capacity, more than the table base of 1.50 gpm is required. The Coil Capacity Multipliers For Flow Rates table must be used. The required capacity must be divided by unit rating at 1.50 gpm to obtain a factor for use with this table.

Factor = required capacity/rated capacity

$$\text{Factor} = 4523 \text{ Btuh}/4469 \text{ Btuh} = 1.01$$

The table indicates that a flow rate of 1.60 gpm will be necessary to obtain the required capacity. Nozzle pressure is 2.11 in. wg.

### V Select unit size to meet sound level requirements specified.

Refer to Sound Selection Guide table on page 5. Verify that nozzle pressure of selected unit is acceptable from a sound standpoint. Since maximum desired room sound level at ( $L_w - L_p$ ) and NC is 8 and 35, an H nozzle arrangement has a maximum allowable nozzle pressure of 2.50 in. wg (which is above the calculated value of 2.11 in. wg). The selected unit will be satisfactory.

### VI Final selection

The unit selected is a 36RV2H unit.

## Heating

The total heating load required is the combined room heating load (transmission) and the load required to temper the primary air to room temperature (primary air heating load).

### I Determine job requirements for unit selected.

Given:

|                                                   |           |
|---------------------------------------------------|-----------|
| Room heating load (transmission) .....            | 5200 Btuh |
| Design room temperature ( $t_{rm}$ ) .....        | 76 F      |
| Design primary air temperature ( $t_{pa}$ ) ..... | 50 F      |
| Primary air quantity .....                        | 60 cfm    |
| Entering water flow .....                         | 1.60 gpm  |
| Unit selected for cooling .....                   | 36RV2H    |

### II Determine primary air heating load.

Use formula:

$$\begin{aligned}\text{Primary air heating load} &= \text{cfm} \times 1.08 \times (t_{rm} - t_{pa}) \\ &= 60 \times 1.08 \times (76 - 50) \\ &= 1685 \text{ Btuh}\end{aligned}$$

### III Determine total unit heating load.

Use formula:

$$\text{Unit heating load} = \text{primary air heating load} + \text{room heating load}$$

$$\text{Unit heating load} = 1685 + 5200$$

$$\text{Unit heating load} = 6885 \text{ Btuh}$$

# Selection procedure (cont)



## IV Determine entering water temperature required to meet required total heating load.

### FOR HOT WATER HEAT

Use formula:

Total heating load =  $(t_{ew} - t_{rm})/25 \times \text{coil corr. at } 25 \text{ F}$

$t_{ew} = t_{rm} + (\text{total heating load/coil corr. at } 25\text{F}) \times 25$

$t_{ew} = 76 + (6885/4469) \times 25$

$t_{ew} = 114.5 \text{ F}$

### FOR ELECTRIC HEAT (36TE UNITS ONLY)

From the 36TE Electric Heater Capacities table on page 5, select the heater size (kW) that best meets the total unit heating load from Step III.

## Gravity heating (36RM,RP,RV Terminals Only)

### I Determine job requirements for unit selected.

Given:

Gravity heating load .....3500 Btuh  
Design room temperature (during shutdown)....60 F

### II Adjust load to coil water flow rate.

Since the Gravity Heating Capacities table is based upon 1.50 gpm and the coil has a gpm of 1.60, the load must be adjusted to an equivalent 1.50 gpm to use the table. Use the following formula:

Corrected heating load = actual heating load/correction factor

Corrected heating load =  $3500/1.03$

Corrected heating load = 3400

### III Determine entering water temperature required to meet required gravity heating load.

From the 36RV Gravity Heating Capacities table, read the temperature difference for the selected unit at the required capacity. By interpolation, the temperature difference for a 36RV2H unit with a gravity heating capacity of 3400 Btuh is 93.6 F.

Use formula:

$t_{ew} = \text{temperature difference} + \text{design room temperature}$

$t_{ew} = 93.6 \text{ F} + 60 \text{ F} = 153.6 \text{ F}$

# Performance data



## COIL CAPACITY MULTIPLIERS FOR FLOW RATES

| GPM | NOZZLE ARRANGEMENT |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|     | F                  |      |      |      | G    |      |      |      | H    |      |      |      | J    |      |      |      | K    |      |      |      |
|     | Unit Size          |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|     | 1                  | 2    | 3    | 4    | 1    | 2    | 3    | 4    | 1    | 2    | 3    | 4    | 1    | 2    | 3    | 4    | 1    | 2    | 3    | 4    |
| 0.6 | 0.91               | 0.90 | 0.85 | 0.82 | 0.88 | 0.85 | 0.82 | 0.79 | 0.85 | 0.84 | 0.80 | 0.77 | 0.83 | 0.82 | 0.78 | 0.76 | 0.84 | 0.82 | 0.78 | 0.76 |
| 0.8 | 0.94               | 0.92 | 0.90 | 0.88 | 0.91 | 0.89 | 0.86 | 0.84 | 0.90 | 0.88 | 0.85 | 0.83 | 0.87 | 0.85 | 0.83 | 0.81 | 0.89 | 0.86 | 0.83 | 0.80 |
| 1.0 | 0.96               | 0.95 | 0.94 | 0.93 | 0.95 | 0.93 | 0.92 | 0.91 | 0.94 | 0.93 | 0.91 | 0.90 | 0.93 | 0.92 | 0.90 | 0.89 | 0.93 | 0.92 | 0.90 | 0.88 |
| 1.2 | 0.98               | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.96 | 0.96 | 0.97 | 0.96 | 0.96 | 0.95 | 0.96 | 0.96 | 0.95 | 0.94 | 0.96 | 0.96 | 0.95 | 0.94 |
| 1.4 | 0.99               | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.98 | 0.99 | 0.99 | 0.99 | 0.98 |
| 1.5 | 1.00               | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1.6 | 1.01               | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.01 | 1.02 |
| 1.8 | 1.02               | 1.02 | 1.02 | 1.03 | 1.02 | 1.03 | 1.03 | 1.03 | 1.03 | 1.03 | 1.04 | 1.04 | 1.03 | 1.03 | 1.04 | 1.04 | 1.03 | 1.03 | 1.04 | 1.04 |
| 2.0 | 1.03               | 1.03 | 1.04 | 1.04 | 1.04 | 1.04 | 1.05 | 1.05 | 1.04 | 1.05 | 1.05 | 1.06 | 1.04 | 1.05 | 1.06 | 1.06 | 1.04 | 1.05 | 1.06 | 1.07 |
| 2.2 | 1.04               | 1.05 | 1.05 | 1.06 | 1.04 | 1.05 | 1.06 | 1.06 | 1.05 | 1.06 | 1.07 | 1.07 | 1.05 | 1.06 | 1.07 | 1.08 | 1.05 | 1.06 | 1.07 | 1.08 |

NOTE: For capacities not at 1.50 gpm, multiply capacities from Coil Cooling Capacities tables by the above multipliers.

## COIL WATER PRESSURE DROP (ft of water)

| GPM  |      |      |      |      |      |      |       |       |       |
|------|------|------|------|------|------|------|-------|-------|-------|
| 0.60 | 0.80 | 1.00 | 1.20 | 1.40 | 1.50 | 1.60 | 1.80  | 2.00  | 2.20  |
| 1.60 | 2.70 | 3.90 | 5.40 | 7.20 | 8.00 | 9.00 | 11.00 | 13.40 | 15.70 |

# Performance data (cont)



## 36RH, RM, RP, RV COOLING COIL CAPACITIES

| PRIMARY AIR |                               | NOZZLE ARRANGEMENT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
|-------------|-------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|--|--|--|--|--|--|----------------|--|--|----------------|----------------|
| cfm         | Capacity<br>20 F ΔT<br>(Btuh) | F                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                | G              |                |                |                | H              |                |                |                | J              |                |                |                | K              |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
|             |                               | Unit Size          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
|             |                               | 1                  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3              | 4              | 1              | 2              | 3              | 4              | 1              | 2              | 3              | 4              | 1              | 2              | 3              | 4              | 1              | 2              | 3              | 4              |  |  |  |  |  |  |  |                |  |  |                |                |
| 15          | 324                           | 1537<br>(0.89)     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 20          | 432                           | 2022<br>(1.59)     | 2080<br>(0.94)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                | 2098<br>(0.81) |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 25          | 540                           | 2501<br>(2.48)     | 2573<br>(1.47)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2620<br>(0.97) |                | 2443<br>(1.26) | 2669<br>(0.74) |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 30          | 648                           | 2976<br>(3.57)     | 3062<br>(2.11)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3118<br>(1.39) |                | 2767<br>(1.82) | 3022<br>(1.07) | 3227<br>(0.71) |                | 2639<br>(0.89) |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 35          | 756                           |                    | 3546<br>(2.88)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3611<br>(1.90) | 3592<br>(1.10) | 3074<br>(2.48) | 3357<br>(1.46) | 3585<br>(0.97) |                | 2902<br>(1.21) | 3204<br>(0.71) |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 40          | 864                           |                    | 4028<br>(3.76)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4101<br>(2.48) | 4080<br>(1.44) | 3367<br>(3.24) | 3678<br>(1.91) | 3927<br>(1.26) | 4163<br>(0.73) | 3152<br>(1.58) | 3479<br>(0.94) |                |                | 2940<br>(0.92) |                |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 45          | 972                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4588<br>(3.14) | 4564<br>(1.82) |                | 3986<br>(2.42) | 4256<br>(1.60) | 4511<br>(0.93) | 3389<br>(2.01) | 3742<br>(1.19) | 4030<br>(0.78) |                | 3137<br>(1.17) | 3555<br>(0.72) |                |                |                |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 50          | 1080                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 5073<br>(3.88) | 5046<br>(2.25) |                | 4283<br>(2.99) | 4573<br>(1.97) | 4847<br>(1.14) | 3617<br>(2.48) | 3993<br>(1.46) | 4300<br>(0.96) | 4612<br>(0.56) | 3324<br>(1.45) | 3767<br>(0.89) |                |                | 3169<br>(0.95) |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 55          | 1188                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                | 5526<br>(2.72) |                | 4570<br>(3.62) | 4880<br>(2.39) | 5173<br>(1.39) | 3836<br>(3.00) | 4235<br>(1.77) | 4561<br>(1.17) | 4892<br>(0.68) | 3503<br>(1.75) | 3970<br>(1.07) | 4289<br>(0.68) |                | 3328<br>(1.15) |                |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 60          | 1296                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                | 6004<br>(3.24) |                |                | 5179<br>(2.85) | 5489<br>(1.65) | 4048<br>(3.57) | 4469<br>(2.11) | 4812<br>(1.39) | 5162<br>(0.81) | 3674<br>(2.09) | 4164<br>(1.28) | 4499<br>(0.81) |                | 3479<br>(1.36) | 3939<br>(0.81) |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 65          | 1405                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                | 5470<br>(3.34) | 5797<br>(1.94) |                | 4695<br>(2.48) | 5056<br>(1.63) | 5423<br>(0.95) | 3839<br>(2.45) | 4352<br>(1.50) | 4072<br>(0.95) |                | 3625<br>(1.60) | 4104<br>(0.95) |                |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 70          | 1512                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6098<br>(2.25) |                | 4915<br>(2.87) | 5293<br>(1.90) | 5677<br>(1.10) | 3999<br>(2.84) | 4533<br>(1.74) | 4897<br>(1.11) |                | 3765<br>(1.86) | 4263<br>(1.10) | 4683<br>(0.72) |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 75          | 1620                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6392<br>(2.58) |                | 5128<br>(3.30) | 5523<br>(2.18) | 5924<br>(1.26) | 4154<br>(3.26) | 4708<br>(2.00) | 5086<br>(1.27) | 5586<br>(0.75) | 3901<br>(2.13) | 4416<br>(1.26) | 4852<br>(0.83) |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 80          | 1730                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6680<br>(2.94) |                | 5337<br>(3.76) | 5747<br>(2.48) | 6164<br>(1.44) | 4304<br>(3.71) | 4878<br>(2.27) | 5270<br>(1.45) | 5788<br>(0.86) | 4032<br>(2.43) | 4564<br>(1.44) | 5015<br>(0.95) |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 85          | 1838                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6962<br>(3.32) |                |                | 5966<br>(2.80) | 6399<br>(1.62) |                | 5043<br>(2.57) | 5449<br>(1.63) | 5984<br>(0.97) | 4159<br>(2.74) | 4709<br>(1.62) | 5173<br>(1.07) |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 90          | 1942                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                | 6181<br>(3.14) | 6629<br>(1.82) |                | 5204<br>(2.88) | 5622<br>(1.83) | 6175<br>(1.09) | 4283<br>(3.06) | 4849<br>(1.82) | 5327<br>(1.20) | 5866<br>(0.69) |  |  |  |  |  |  |  |                |  |  |                |                |
| 95          | 2055                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                | 6390<br>(3.50) | 6854<br>(2.03) |                | 5361<br>(3.21) | 5792<br>(2.04) | 6361<br>(1.21) | 4403<br>(3.43) | 4985<br>(2.03) | 5746<br>(1.34) | 6030<br>(0.77) |  |  |  |  |  |  |  |                |  |  |                |                |
| 100         | 2160                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7074<br>(2.25) |                | 5514<br>(3.56) | 5958<br>(2.26) | 6543<br>(1.34) | 4521<br>(3.80) | 5118<br>(2.25) | 5622<br>(1.48) | 6191<br>(0.86) |  |  |  |  |  |  |  |                |  |  |                |                |
| 105         | 2265                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7290<br>(2.48) |                | 5664<br>(3.92) | 6120<br>(2.50) | 6721<br>(1.48) |                | 5247<br>(2.48) | 5765<br>(1.63) | 6348<br>(0.95) |  |  |  |  |  |  |  |                |  |  |                |                |
| 110         | 2375                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7503<br>(2.72) |                |                | 6278<br>(2.74) | 6895<br>(1.63) |                | 5374<br>(2.72) | 5904<br>(1.79) | 6501<br>(1.04) |  |  |  |  |  |  |  |                |  |  |                |                |
| 115         | 2482                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7711<br>(2.97) |                |                | 6433<br>(2.99) | 7065<br>(1.78) |                | 5498<br>(2.97) | 6040<br>(1.96) | 6651<br>(1.14) |  |  |  |  |  |  |  |                |  |  |                |                |
| 120         | 2590                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7917<br>(3.24) |                |                | 6586<br>(3.26) | 7332<br>(1.94) |                | 5619<br>(3.24) | 6173<br>(2.13) | 6797<br>(1.24) |  |  |  |  |  |  |  |                |  |  |                |                |
| 125         | 2700                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 8119<br>(3.51) |                |                | 6735<br>(3.54) | 7396<br>(2.10) |                | 5378<br>(3.51) | 6303<br>(2.32) | 6941<br>(1.34) |  |  |  |  |  |  |  |                |  |  |                |                |
| 130         | 2810                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                | 7558<br>(2.27) |                | 5854<br>(3.80) | 6431<br>(2.51) | 7082<br>(1.45) |  |  |  |  |  |  |  |                |  |  |                |                |
| 135         | 2918                          |                    | <div>NOTES:</div> <div>1. Numbers in parenthesis ( ) indicate nozzle pressure (in. wg).</div> <div>2. Ratings are based on Δt = 25°F, 1.50 gpm, 8 ft water coil pressure drop.</div> <div>3. Δt = t<sub>rm</sub> - t<sub>ew</sub> where t<sub>rm</sub> = room temperature and t<sub>ew</sub> = entering water temperature.</div> <div>4. All ratings include allowance for lint screen.</div> <div>5. For coil capacity at Δt not equal to 25°F, then use the formula:<br/>( t<sub>rm</sub> - t<sub>ew</sub> )/25 x rating at 25°F Δt.</div> <div>6. For primary air capacity at other than 20 F Δt use the formula:<br/>Btuh = cfm x 1.08 x ( t<sub>rm</sub> - t<sub>pa</sub> ) where t<sub>pa</sub> = primary air temperature.</div> <div>7. For capacities other than 1.50 gpm, see Coil Capacity Multipliers for Flow Rates table on page 13.</div> <div>8. To facilitate balanced water systems, all units regardless of size have the same pressure drop.</div> |                |                |                |                |                |                |                |                |                |                |                |                |                | 7716<br>(2.45) |                |                | 6557<br>(2.70) | 7220<br>(1.57) |  |  |  |  |  |  |  |                |  |  |                |                |
| 140         | 3022                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  | 7872<br>(2.64) |  |  | 6680<br>(2.91) | 7356<br>(1.69) |
| 145         | 3130                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  | 8025<br>(2.83) |  |  | 6802<br>(3.12) | 7490<br>(1.81) |
| 150         | 3240                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  | 8176<br>(3.03) |  |  | 6921<br>(3.34) | 7621<br>(1.94) |
| 155         | 3350                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  | 8325<br>(3.23) |  |  | 7038<br>(3.56) | 7750<br>(2.07) |
| 160         | 3460                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |  |  |  |  |  | 8471<br>(3.44) |  |  | 7154<br>(3.80) | 7877<br>(2.20) |
| 165         | 3565                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                | 8002<br>(2.34) |                |  |  |  |  |  |  |  |                |  |  |                |                |
| 170         | 3675                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                | 8126<br>(2.49) |                |  |  |  |  |  |  |  |                |  |  |                |                |

### NOTES:

1. Numbers in parenthesis ( ) indicate nozzle pressure (in. wg).
2. Ratings are based on  $\Delta t = 25^\circ\text{F}$ , 1.50 gpm, 8 ft water coil pressure drop.
3.  $\Delta t = t_{rm} - t_{ew}$  where  $t_{rm}$  = room temperature and  $t_{ew}$  = entering water temperature.
4. All ratings include allowance for lint screen.
5. For coil capacity at  $\Delta t$  not equal to  $25^\circ\text{F}$ , then use the formula:  
 $(t_{rm} - t_{ew})/25 \times \text{rating at } 25^\circ\text{F } \Delta t$ .
6. For primary air capacity at other than 20 F  $\Delta t$  use the formula:  
 $\text{Btuh} = \text{cfm} \times 1.08 \times (t_{rm} - t_{pa})$  where  $t_{pa}$  = primary air temperature.
7. For capacities other than 1.50 gpm, see Coil Capacity Multipliers for Flow Rates table on page 13.
8. To facilitate balanced water systems, all units regardless of size have the same pressure drop.



### 36TE COOLING COIL CAPACITIES

| PRIMARY AIR |                               | NOZZLE ARRANGEMENT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
|-------------|-------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--|--|----------------|--|--|--|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| cfm         | Capacity<br>20 F ΔT<br>(Btuh) | F                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                | G              |                |                |                | H              |                |                |                | J              |                |                |                | K              |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
|             |                               | Unit Size          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
|             |                               | 1                  | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 3              | 4              | 1              | 2              | 3              | 4              | 1              | 2              | 3              | 4              | 1              | 2              | 3              | 4              | 1              | 2              | 3              | 4              |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 15          | 324                           | 1475<br>(1.04)     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 20          | 432                           | 1941<br>(1.86)     | 1966<br>(1.03)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                | 1993<br>(0.98) |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 25          | 540                           | 2400<br>(2.90)     | 2470<br>(1.63)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2515<br>(1.07) |                | 2320<br>(1.50) | 2535<br>(0.82) |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 30          | 648                           | 2856<br>(4.15)     | 2939<br>(2.33)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 2993<br>(1.55) |                | 2628<br>(2.15) | 2870<br>(1.17) | 3065<br>(0.79) |                | 2480<br>(1.04) |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 35          | 756                           |                    | 3404<br>(3.15)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3466<br>(2.10) | 3448<br>(1.17) | 2920<br>(2.90) | 3189<br>(1.60) | 3405<br>(1.07) |                | 2727<br>(1.44) | 3011<br>(0.80) |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 40          | 864                           |                    | 3866<br>(4.10)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3936<br>(2.73) | 3916<br>(1.54) | 3198<br>(3.80) | 3494<br>(2.10) | 3730<br>(1.40) | 3954<br>(0.78) | 2962<br>(1.86) | 3270<br>(1.03) |                |                | 2748<br>(1.10) |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 45          | 972                           |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4404<br>(3.45) | 4381<br>(1.83) |                | 3786<br>(2.61) | 4043<br>(1.78) | 4285<br>(0.98) | 3185<br>(2.37) | 3517<br>(1.30) | 3788<br>(0.86) |                | 2933<br>(1.40) | 3323<br>(0.82) |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 50          | 1080                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 4870<br>(4.20) | 4844<br>(2.83) |                | 4068<br>(3.25) | 4344<br>(2.20) | 4604<br>(1.20) | 3399<br>(2.90) | 3753<br>(1.63) | 4042<br>(1.07) | 4335<br>(0.59) | 3107<br>(1.75) | 3522<br>(0.99) |                |                | 2947<br>(1.13) |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 55          | 1188                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                | 5304<br>(2.85) |                | 4341<br>(3.90) | 4636<br>(2.65) | 4914<br>(1.48) | 3605<br>(3.50) | 3980<br>(1.95) | 4287<br>(1.30) | 4598<br>(0.72) | 3275<br>(2.10) | 3711<br>(1.20) | 4010<br>(0.76) |                | 3095<br>(1.35) |                |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 60          | 1296                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                | 5763<br>(3.40) |                |                | 4920<br>(3.15) | 5214<br>(1.75) | 3805<br>(4.15) | 4200<br>(2.33) | 4523<br>(1.53) | 4852<br>(0.86) | 3435<br>(2.45) | 3893<br>(1.43) | 4206<br>(0.92) |                | 3235<br>(1.63) | 3663<br>(0.89) |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 65          | 1405                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                | 5196<br>(3.70) | 5507<br>(2.05) |                | 4413<br>(2.73) | 4752<br>(1.80) | 5097<br>(1.00) | 3589<br>(2.90) | 4069<br>(1.68) | 4396<br>(1.08) |                | 3371<br>(1.90) | 3816<br>(1.05) |                |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 70          | 1512                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 5793<br>(2.38) |                | 4620<br>(3.15) | 4975<br>(2.10) | 5336<br>(1.17) | 3739<br>(3.40) | 4238<br>(1.95) | 4578<br>(1.24) |                | 3501<br>(2.20) | 3964<br>(1.23) | 4355<br>(0.80) |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 75          | 1620                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6072<br>(2.73) |                | 4820<br>(3.65) | 5191<br>(2.40) | 5568<br>(1.33) | 3883<br>(3.90) | 4401<br>(2.23) | 4755<br>(1.43) | 5222<br>(0.82) | 3267<br>(2.53) | 4106<br>(1.39) | 4512<br>(0.93) |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 80          | 1730                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6346<br>(3.08) |                | 5016<br>(4.10) | 5402<br>(2.73) | 5794<br>(1.54) | 4024<br>(4.40) | 4560<br>(2.55) | 4927<br>(1.63) | 5411<br>(0.90) | 3749<br>(2.89) | 4244<br>(1.60) | 4663<br>(1.05) |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 85          | 1838                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                | 6613<br>(3.45) |                |                | 5608<br>(3.07) | 6015<br>(1.70) |                | 4715<br>(2.85) | 5094<br>(1.83) | 5595<br>(1.05) | 3867<br>(3.25) | 4379<br>(1.80) | 4810<br>(1.17) |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 90          | 1942                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                | 5810<br>(3.45) | 6231<br>(1.83) |                | 4865<br>(3.23) | 5256<br>(2.05) | 5773<br>(1.17) | 3983<br>(3.60) | 4509<br>(2.00) | 4954<br>(1.34) | 5455<br>(0.74) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 95          | 2055                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                | 6006<br>(3.85) | 6442<br>(2.15) |                | 5012<br>(3.60) | 5415<br>(2.30) | 5947<br>(1.30) | 4094<br>(3.85) | 4636<br>(2.25) | 5092<br>(1.47) | 5607<br>(0.82) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 100         | 2160                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 6649<br>(2.38) |                | 5155<br>(3.95) | 5570<br>(2.54) | 6117<br>(1.45) | 4204<br>(4.00) | 4759<br>(2.45) | 5228<br>(1.65) | 5757<br>(0.91) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 105         | 2265                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 6852<br>(2.60) |                | 5295<br>(4.40) | 5722<br>(2.80) | 6284<br>(1.60) |                | 4879<br>(2.70) | 5361<br>(1.85) | 5903<br>(1.00) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 110         | 2375                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7052<br>(2.85) |                |                | 5869<br>(3.03) | 6446<br>(1.75) |                | 4997<br>(3.00) | 5490<br>(2.00) | 6045<br>(1.10) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 115         | 2482                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7248<br>(3.15) |                |                | 6014<br>(3.33) | 6605<br>(1.90) |                | 5113<br>(3.30) | 5617<br>(2.17) | 6185<br>(1.23) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 120         | 2590                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7441<br>(3.40) |                |                | 6157<br>(3.65) | 6761<br>(2.05) |                | 5225<br>(3.60) | 5740<br>(2.37) | 6321<br>(1.32) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 125         | 2700                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                | 7631<br>(3.85) |                |                | 6297<br>(3.90) | 6915<br>(2.25) |                | 5336<br>(3.80) | 5861<br>(2.60) | 6455<br>(1.43) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 130         | 2810                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                | 7066<br>(2.40) |                | 5444<br>(3.95) | 5980<br>(2.75) | 6586<br>(1.54) |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 135         | 2918                          |                    | <div>NOTES:</div> <div>1. Numbers in parenthesis ( ) indicate nozzle pressure (in. wg).</div> <div>2. Ratings are based on Δt = 25°F, 1.50 gpm, 8 ft water coil pressure drop.</div> <div>3. Δt = t<sub>rm</sub> – t<sub>ew</sub> where t<sub>rm</sub> = room temperature and t<sub>ew</sub> = entering water temperature.</div> <div>4. All ratings include allowance for lint screen.</div> <div>5. For coil capacity at Δt not equal to 25°F, then use the formula:<br/>( t<sub>rm</sub> – t<sub>ew</sub> )/25 x rating at 25°F Δt.</div> <div>6. For primary air capacity at other than 20 F Δt use the formula:<br/>Btuh = cfm x 1.08 x ( t<sub>rm</sub> – t<sub>pa</sub> ) where t<sub>pa</sub> = primary air temperature.</div> <div>7. For capacities other than 1.50 gpm, see Coil Capacity Multipliers for Flow Rates table on page 13.</div> <div>8. To facilitate balanced water systems, all units regardless of size have the same pressure drop.</div> |                |                |                |                |                |                |                |                |                |                |                |                | 7214<br>(2.60) |                |                | 6098<br>(3.04) | 6714<br>(1.67) |                |  |  |                |  |  |  |  |                |                |                |                |                |                |                |                |
| 140         | 3022                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  | 7360<br>(2.80) |                |                | 6212<br>(3.25) | 6841<br>(1.80) |                |                |                |
| 145         | 3130                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                | 7503<br>(3.05) |                |                | 6325<br>(3.45) | 6965<br>(1.93) |                |                |
| 150         | 3240                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                | 7644<br>(3.25) |                |                | 6436<br>(3.75) | 7087<br>(2.05) |                |
| 155         | 3350                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                | 7783<br>(3.45) |                |                | 6545<br>(3.95) | 7207<br>(2.20) |
| 160         | 3460                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  |                |  |  |  |  |                |                |                |                | 7920<br>(3.60) |                |                | 6653<br>(4.25) |
| 165         | 3565                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  | 7441<br>(2.50) |  |  |  |  |                |                |                |                |                |                |                |                |
| 170         | 3675                          |                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |  |  | 7557<br>(2.62) |  |  |  |  |                |                |                |                |                |                |                |                |

**NOTES:**

1. Numbers in parenthesis ( ) indicate nozzle pressure (in. wg).
2. Ratings are based on  $\Delta t = 25^\circ\text{F}$ , 1.50 gpm, 8 ft water coil pressure drop.
3.  $\Delta t = t_{rm} - t_{ew}$  where  $t_{rm}$  = room temperature and  $t_{ew}$  = entering water temperature.
4. All ratings include allowance for lint screen.
5. For coil capacity at  $\Delta t$  not equal to  $25^\circ\text{F}$ , then use the formula:  
 $(t_{rm} - t_{ew})/25 \times \text{rating at } 25^\circ\text{F } \Delta t$ .
6. For primary air capacity at other than 20 F  $\Delta t$  use the formula:  
 $\text{Btuh} = \text{cfm} \times 1.08 \times (t_{rm} - t_{pa})$  where  $t_{pa}$  = primary air temperature.
7. For capacities other than 1.50 gpm, see Coil Capacity Multipliers for Flow Rates table on page 13.
8. To facilitate balanced water systems, all units regardless of size have the same pressure drop.

## Sequence of operation

After a mixture of outdoor and return air is conditioned by the central station air-handling unit, it is distributed through a high-velocity, high-pressure duct system to the Weather-master® air terminal units. Here the conditioned primary (supply) air enters the unit's acoustical plenum, passes through the balancing damper and exits through the induction nozzles. The balancing damper handles up to a 3.0 in. wg pressure drop without adverse effect on the unit sound power level.

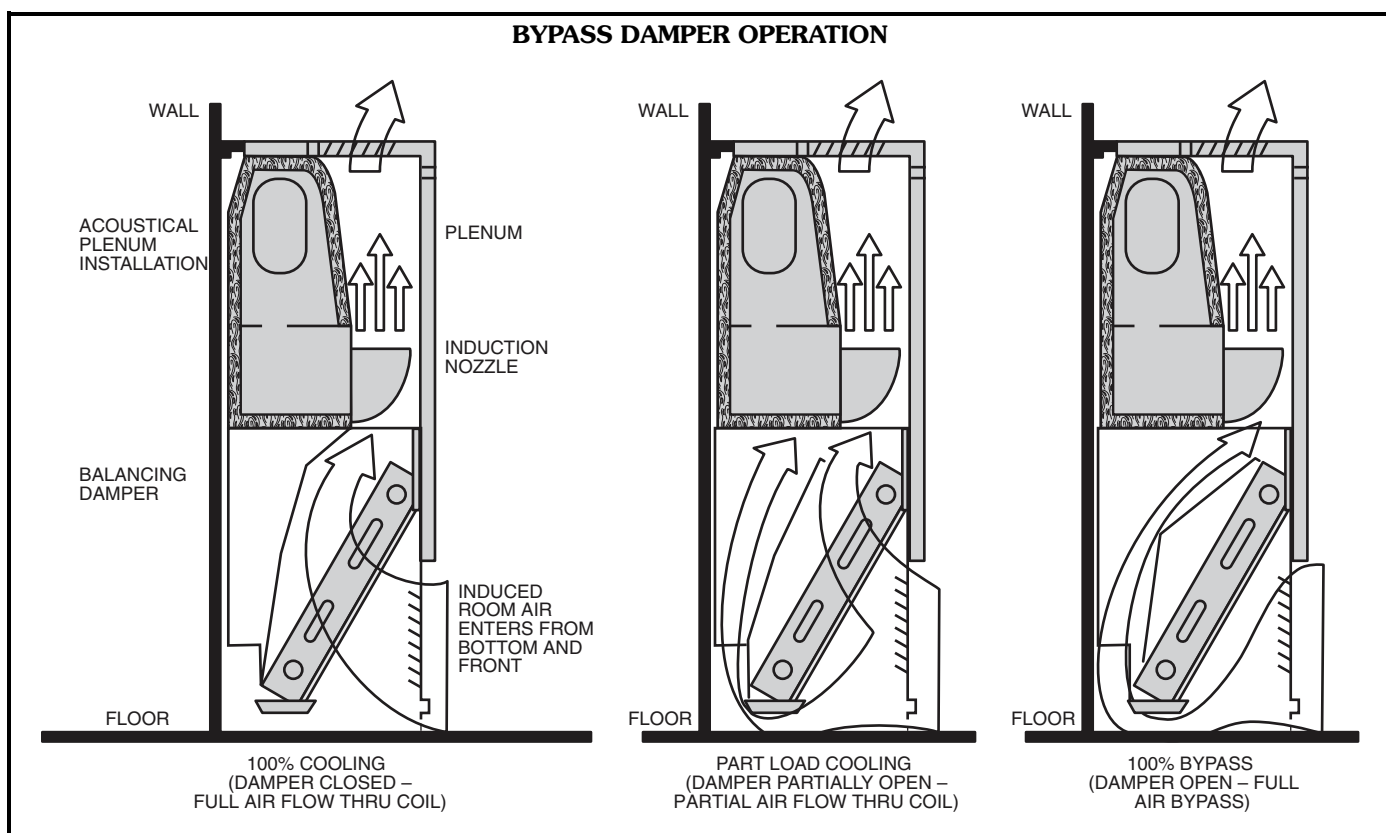
As the primary air leaves the nozzles, it induces a constant amount of secondary (room) air through the unit's coil. The secondary air is cooled or heated, depending upon the temperature of the water flowing thru the coil. Primary and

secondary air mix and enter the room through the steel discharge grille.

The unit capacity is controlled either manually or by a room thermostat that varies the amount of induced room air recirculating through the coil by means of a bypass damper. In the illustrations below, the recirculated air is shown bypassing the coil during part load cooling and 100% bypass.

In units with self-contained controls, the thermostat and damper are powered by system duct pressure from the unit plenum. The self-contained controls require a minimum of 1.5 in. wg plenum pressure for satisfactory control operation.

Depending upon the modular flexibility desired, the building owner can control up to three damper coils with one thermostat.



# Application data



## Controls and control systems

### 36R series terminal units

The 36R Series units are available with system-powered, self-contained controls. These controls operate with wall or unit-mounted, bi-metallic, bleed-type thermostats having a 65 to 85 F operating range and a throttling range of  $\pm 1.5$  F.

The power source for system powered controls is plenum pressure. The minimum pressure for satisfactory operation is 1.5-in. wg. System-powered controls can be used in either changeover or non-changeover system applications.

**Changeover system** — This system automatically switches from cooling to heating mode and reverse, depending upon the coil water temperature.

Control air from the plenum passes thru a final filter and restrictor tee to the common port of a changeover valve. Here, a bimetallic element determines whether the control air will flow to the cooling bleed port or the heating bleed port of the thermostat.

In the Cooling mode, the unit coil contains water at 65 F or below. At these temperatures, the bimetallic element in the changeover valve blocks off the heating port and allows control air to flow to the cooling bleed port of the thermostat. When the thermostat calls for cooling, the thermostat opens up the cooling bleed port. Control air now bleeds from the system. The bellows begins to deflate and the bypass damper is allowed to modulate open.

More room air circulates over the cooling coil and room temperature lowers as required. When the thermostat is

satisfied, the thermostat again restricts the cooling bleed port. The bellows begins to inflate, closing down the damper and allowing less room air to circulate over the cooling coil.

In the Heating mode, the unit coil contains warm (85 F or above) water. The changeover valve bimetal blocks off the cooling port and allows control air to flow to the heating bleed port of the thermostat. On call for heating, the thermostat opens up the heating bleed port. Control air bleeds from the system. The bellows deflates and the bypass damper opens up. More room air circulates over the warm coil, raising the room temperature as required.

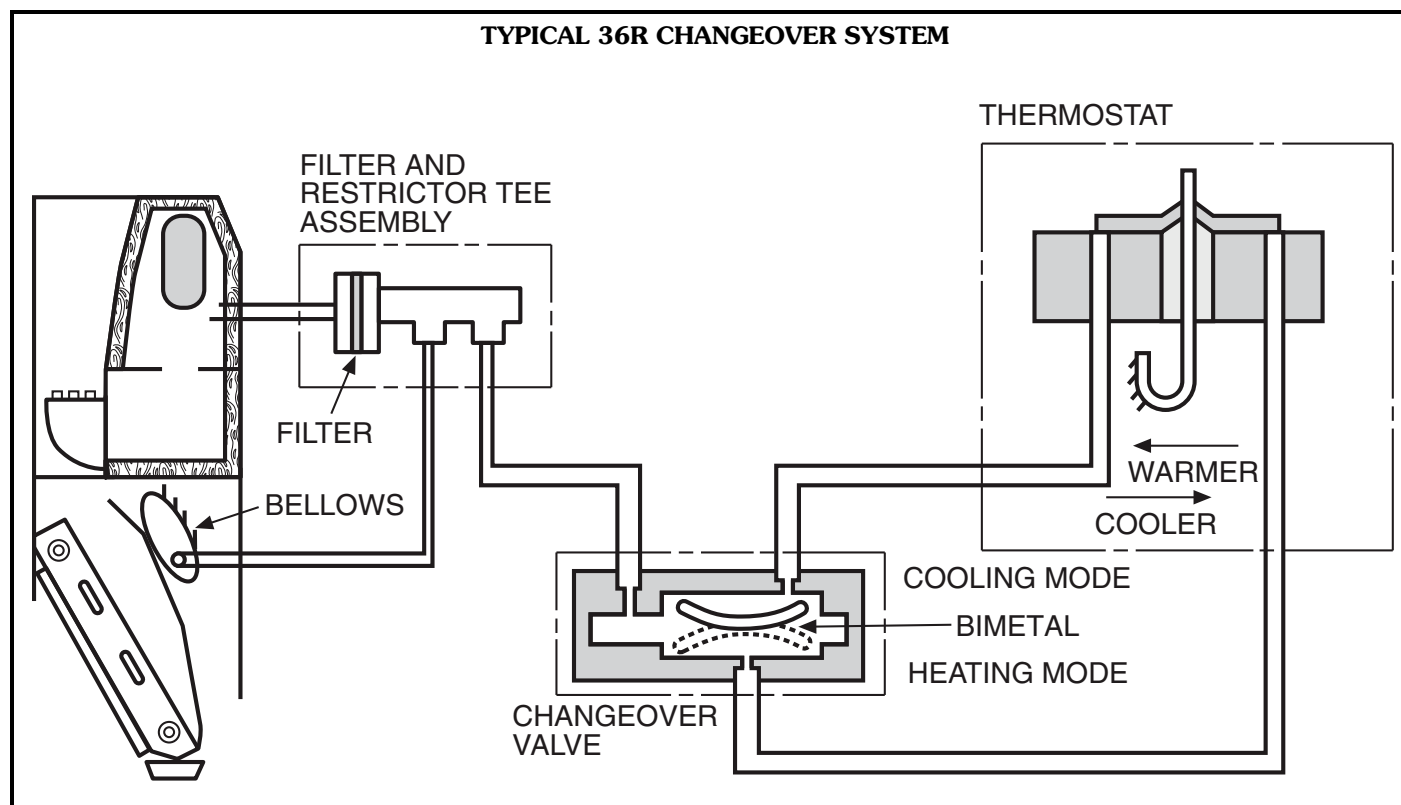
**Non-changeover system** — In this system, the unit operates in a manner similar to the changeover system except that control air passes directly from the restrictor tee to the cooling bleed port of the thermostat.

### 36TE terminal units

These units operate in the same manner as the non-changeover system of 36R units. The 36TE units, however, also have electric heat.

When the thermostat drops below its  $-1.5$  F throttling range, causing the bypass damper to close completely, the damper actuates a microswitch that energizes the electric heater.

The heaters are designed to operate at 208, 240 or 277 volts as specified. As a fail-safe, the electric heater is deactivated whenever the supply air fan shuts off and the bypass damper reverts to its normally open position.

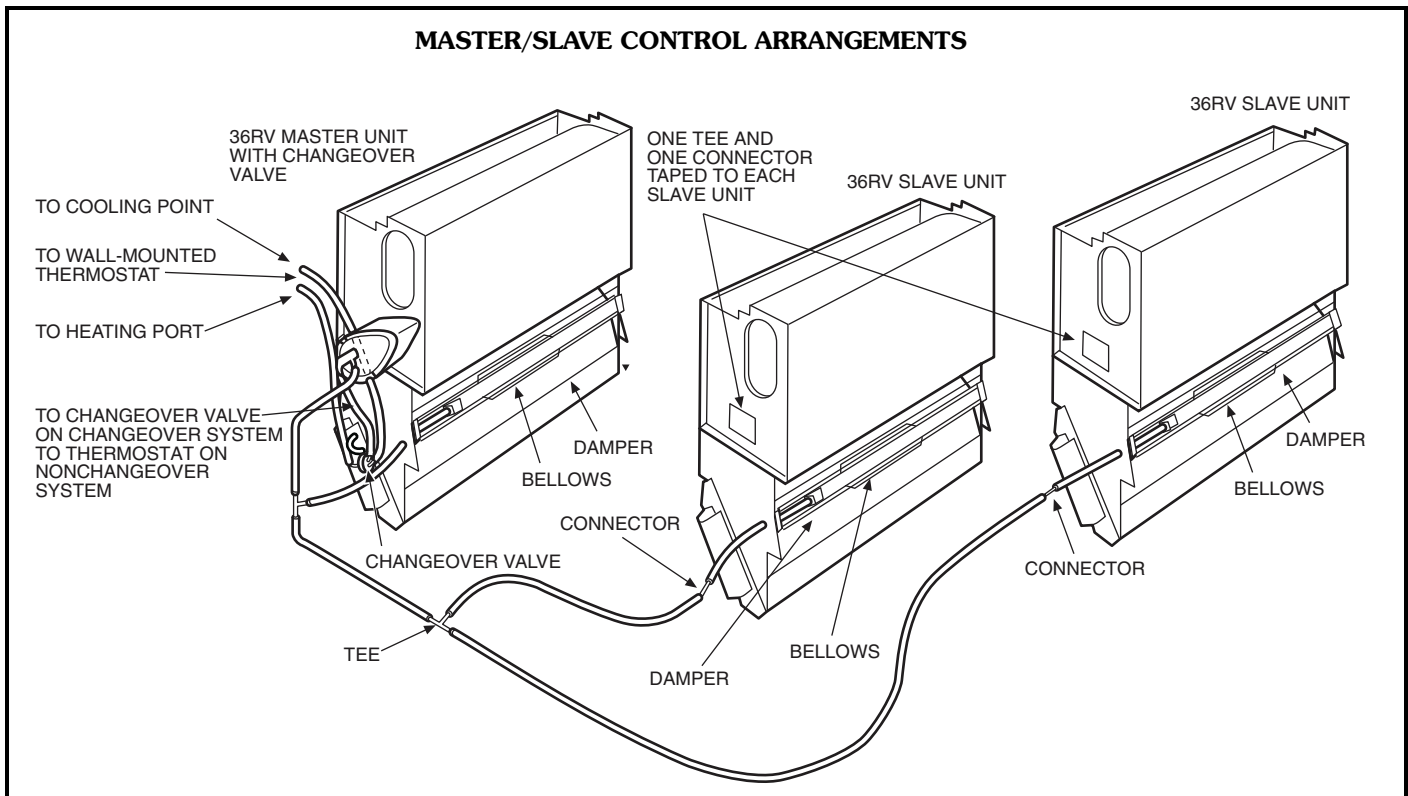


## Application data (cont)



Master (control) units are factory supplied. On slave units, however, the damper must be field connected to the master unit by control tubing, plastic tees and connectors. A typical master/slave arrangement is shown here.

A maximum of three units can be controlled by a single thermostat. Care must be taken in locating slave units and the wall thermostat. For proper control the control tubing run must be limited to 25 ft and no more than four 90-degree bends should be made in the tubing.





# UNIT SOUND POWER LEVEL RATINGS

| NOZZLE<br>PRESSURE<br>(in. wg) | DAMPER<br>PRESSURE<br>DROP<br>(in. wg) | NOZZLE<br>TYPE | UNIT SIZE 1                                       |     |      |      |      |      |
|--------------------------------|----------------------------------------|----------------|---------------------------------------------------|-----|------|------|------|------|
|                                |                                        |                | Sound Power Level (dB at 10 <sup>-12</sup> watts) |     |      |      |      |      |
|                                |                                        |                | Octave Band Mid-Frequency (Hz)                    |     |      |      |      |      |
|                                |                                        |                | 250                                               | 500 | 1000 | 2000 | 4000 | 8000 |
| 0.5                            | 1.5                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | H              | 32                                                | —   | —    | —    | —    | —    |
|                                |                                        | J              | 34                                                | 29  | 25   | 24   | 21   | —    |
|                                |                                        | K              | 36                                                | 31  | 27   | 28   | 24   | 23   |
|                                | 3.0                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | H              | 32                                                | —   | —    | 23   | 21   | —    |
|                                |                                        | J              | 34                                                | 29  | 26   | 27   | 25   | —    |
|                                |                                        | K              | 36                                                | 31  | 28   | 31   | 29   | 27   |
| 1.5                            | 0.0                                    | F              | —                                                 | 34  | 29   | 26   | 26   | 27   |
|                                |                                        | G              | 40                                                | 36  | 31   | 28   | 27   | 29   |
|                                |                                        | H              | 42                                                | 38  | 33   | 30   | 29   | 30   |
|                                |                                        | J              | 45                                                | 40  | 35   | 31   | 30   | 32   |
|                                |                                        | K              | 47                                                | 42  | 36   | 33   | 31   | 33   |
|                                | 1.5                                    | F              | 38                                                | 34  | 30   | 27   | 26   | 27   |
|                                |                                        | G              | 39                                                | 36  | 31   | 29   | 28   | 29   |
|                                |                                        | H              | 41                                                | 38  | 34   | 32   | 31   | 32   |
|                                |                                        | J              | 44                                                | 40  | 37   | 35   | 33   | 34   |
|                                |                                        | K              | 46                                                | 42  | 39   | 38   | 36   | 37   |
|                                | 3.0                                    | F              | 38                                                | 34  | 30   | 27   | 27   | 28   |
|                                |                                        | G              | 39                                                | 36  | 32   | 30   | 29   | 30   |
|                                |                                        | H              | 41                                                | 38  | 35   | 34   | 34   | 33   |
|                                |                                        | J              | 43                                                | 40  | 38   | 38   | 36   | 36   |
|                                |                                        | K              | 45                                                | 42  | 40   | 41   | 39   | 39   |
| 2.5                            | 0.0                                    | F              | 42                                                | 40  | 36   | 34   | 35   | 37   |
|                                |                                        | G              | 44                                                | 41  | 38   | 36   | 36   | 38   |
|                                |                                        | H              | 47                                                | 43  | 39   | 37   | 38   | 40   |
|                                |                                        | J              | 49                                                | 45  | 41   | 39   | 39   | 41   |
|                                |                                        | K              | 52                                                | 47  | 42   | 40   | 40   | 43   |
|                                | 1.5                                    | F              | 42                                                | 40  | 36   | 34   | 35   | 37   |
|                                |                                        | G              | 44                                                | 41  | 38   | 36   | 36   | 39   |
|                                |                                        | H              | 46                                                | 43  | 40   | 39   | 39   | 41   |
|                                |                                        | J              | 48                                                | 45  | 42   | 41   | 41   | 42   |
|                                |                                        | K              | 50                                                | 47  | 45   | 44   | 43   | 44   |
|                                | 3.0                                    | F              | 42                                                | 40  | 36   | 34   | 35   | 37   |
|                                |                                        | G              | 44                                                | 41  | 38   | 37   | 37   | 39   |
|                                |                                        | H              | 46                                                | 43  | 40   | 40   | 40   | 41   |
|                                |                                        | J              | 48                                                | 45  | 43   | 43   | 43   | 43   |
|                                |                                        | K              | 50                                                | 47  | 45   | 45   | 45   | 46   |
| 3.5                            | 0.0                                    | F              | 45                                                | 43  | 40   | 39   | 40   | 44   |
|                                |                                        | G              | 47                                                | 45  | 42   | 41   | 42   | 45   |
|                                |                                        | H              | 40                                                | 47  | 44   | 42   | 43   | 47   |
|                                |                                        | J              | 52                                                | 49  | 45   | 44   | 45   | 48   |
|                                |                                        | K              | 54                                                | 50  | 47   | 45   | 46   | 49   |
|                                | 1.5                                    | F              | 45                                                | 43  | 40   | 39   | 40   | 44   |
|                                |                                        | G              | 47                                                | 45  | 42   | 41   | 42   | 45   |
|                                |                                        | H              | 49                                                | 47  | 44   | 43   | 44   | 47   |
|                                |                                        | J              | 51                                                | 49  | 46   | 45   | 46   | 48   |
|                                |                                        | K              | 53                                                | 50  | 48   | 48   | 48   | 50   |
|                                | 3.0                                    | F              | 45                                                | 43  | 41   | 39   | 41   | 44   |
|                                |                                        | G              | 47                                                | 45  | 42   | 41   | 42   | 45   |
|                                |                                        | H              | 49                                                | 47  | 44   | 45   | 45   | 47   |
|                                |                                        | J              | 51                                                | 49  | 47   | 47   | 47   | 49   |
|                                |                                        | K              | 53                                                | 50  | 49   | 49   | 50   | 51   |

# Application data (cont)



## UNIT SOUND POWER LEVEL RATINGS (cont)

| NOZZLE<br>PRESSURE<br>(in. wg) | DAMPER<br>PRESSURE<br>DROP<br>(in. wg) | NOZZLE<br>TYPE | UNIT SIZE 2                                       |     |      |      |      |      |
|--------------------------------|----------------------------------------|----------------|---------------------------------------------------|-----|------|------|------|------|
|                                |                                        |                | Sound Power Level (dB at 10 <sup>-12</sup> watts) |     |      |      |      |      |
|                                |                                        |                | Octave Band Mid-Frequency (Hz)                    |     |      |      |      |      |
|                                |                                        |                | 250                                               | 500 | 1000 | 2000 | 4000 | 8000 |
| 0.5                            | 1.5                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | H              | 33                                                | —   | —    | —    | —    | —    |
|                                |                                        | J              | 35                                                | 29  | 25   | 23   | 21   | —    |
|                                |                                        | K              | 36                                                | 31  | 27   | 27   | 24   | —    |
|                                | 3.0                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | H              | 33                                                | 27  | 23   | 22   | 21   | —    |
|                                |                                        | J              | 34                                                | 29  | 26   | 26   | 25   | 23   |
|                                |                                        | K              | 36                                                | 31  | 29   | 30   | 29   | 27   |
| 1.5                            | 0.0                                    | F              | 39                                                | 35  | 31   | 27   | 27   | 28   |
|                                |                                        | G              | 41                                                | 37  | 32   | 29   | 28   | 30   |
|                                |                                        | H              | 43                                                | 39  | 34   | 31   | 30   | 31   |
|                                |                                        | J              | 45                                                | 40  | 35   | 32   | 31   | 32   |
|                                |                                        | K              | 47                                                | 42  | 37   | 33   | 32   | 34   |
|                                | 1.5                                    | F              | 39                                                | 35  | 31   | 28   | 27   | 28   |
|                                |                                        | G              | 40                                                | 37  | 32   | 30   | 29   | 30   |
|                                |                                        | H              | 42                                                | 39  | 35   | 32   | 31   | 32   |
|                                |                                        | J              | 44                                                | 40  | 37   | 35   | 33   | 34   |
|                                |                                        | K              | 46                                                | 42  | 39   | 38   | 36   | 37   |
|                                | 3.0                                    | F              | 39                                                | 35  | 31   | 28   | 27   | 28   |
|                                |                                        | G              | 40                                                | 37  | 32   | 30   | 30   | 30   |
|                                |                                        | H              | 42                                                | 39  | 35   | 34   | 34   | 33   |
|                                |                                        | J              | 44                                                | 40  | 38   | 37   | 38   | 36   |
|                                |                                        | K              | 46                                                | 42  | 40   | 40   | 40   | 39   |
| 2.5                            | 0.0                                    | F              | 43                                                | 41  | 37   | 35   | 36   | 38   |
|                                |                                        | G              | 45                                                | 42  | 39   | 37   | 37   | 40   |
|                                |                                        | H              | 47                                                | 44  | 40   | 38   | 39   | 41   |
|                                |                                        | J              | 49                                                | 45  | 41   | 39   | 39   | 42   |
|                                |                                        | K              | 52                                                | 47  | 43   | 41   | 41   | 44   |
|                                | 1.5                                    | F              | 43                                                | 41  | 37   | 35   | 36   | 38   |
|                                |                                        | G              | 45                                                | 42  | 39   | 37   | 37   | 40   |
|                                |                                        | H              | 47                                                | 44  | 41   | 39   | 39   | 41   |
|                                |                                        | J              | 48                                                | 45  | 42   | 41   | 41   | 42   |
|                                |                                        | K              | 50                                                | 47  | 45   | 44   | 43   | 45   |
|                                | 3.0                                    | F              | 43                                                | 41  | 37   | 35   | 36   | 38   |
|                                |                                        | G              | 45                                                | 42  | 39   | 37   | 38   | 40   |
|                                |                                        | H              | 47                                                | 44  | 41   | 40   | 40   | 42   |
|                                |                                        | J              | 48                                                | 45  | 43   | 43   | 43   | 43   |
|                                |                                        | K              | 50                                                | 47  | 45   | 45   | 45   | 46   |
| 3.5                            | 0.0                                    | F              | 46                                                | 44  | 42   | 40   | 41   | 45   |
|                                |                                        | G              | 48                                                | 46  | 43   | 42   | 43   | 46   |
|                                |                                        | H              | 50                                                | 48  | 45   | 43   | 45   | 48   |
|                                |                                        | J              | 52                                                | 49  | 46   | 44   | 45   | 48   |
|                                |                                        | K              | 54                                                | 51  | 47   | 46   | 47   | 50   |
|                                | 1.5                                    | F              | 46                                                | 44  | 42   | 40   | 42   | 45   |
|                                |                                        | G              | 48                                                | 46  | 43   | 42   | 43   | 46   |
|                                |                                        | H              | 50                                                | 48  | 45   | 44   | 45   | 48   |
|                                |                                        | J              | 51                                                | 49  | 46   | 45   | 46   | 49   |
|                                |                                        | K              | 53                                                | 51  | 49   | 48   | 48   | 51   |
|                                | 3.0                                    | F              | 46                                                | 44  | 42   | 40   | 42   | 45   |
|                                |                                        | G              | 48                                                | 46  | 43   | 42   | 43   | 46   |
|                                |                                        | H              | 50                                                | 48  | 45   | 44   | 45   | 48   |
|                                |                                        | J              | 51                                                | 49  | 47   | 47   | 47   | 49   |
|                                |                                        | K              | 53                                                | 51  | 49   | 49   | 50   | 51   |



# UNIT SOUND POWER LEVEL RATINGS (cont)

| NOZZLE<br>PRESSURE<br>(in. wg) | DAMPER<br>PRESSURE<br>DROP<br>(in. wg) | NOZZLE<br>TYPE | UNIT SIZE 3                                       |     |      |      |      |      |
|--------------------------------|----------------------------------------|----------------|---------------------------------------------------|-----|------|------|------|------|
|                                |                                        |                | Sound Power Level (dB at 10 <sup>-12</sup> watts) |     |      |      |      |      |
|                                |                                        |                | Octave Band Mid-Frequency (Hz)                    |     |      |      |      |      |
|                                |                                        |                | 250                                               | 500 | 1000 | 2000 | 4000 | 8000 |
| 0.5                            | 1.5                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | H              | 33                                                | 28  | —    | —    | —    | —    |
|                                |                                        | J              | 35                                                | 30  | 25   | 23   | 21   | —    |
|                                |                                        | K              | 37                                                | 31  | 27   | 26   | 24   | 24   |
|                                | 3.0                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | H              | 33                                                | 28  | 23   | 21   | 21   | 19   |
|                                |                                        | J              | 35                                                | 30  | 26   | 26   | 25   | 24   |
|                                |                                        | K              | 36                                                | 31  | 29   | 29   | 29   | 27   |
| 1.5                            | 0.0                                    | F              | 40                                                | 36  | 31   | 28   | 28   | 29   |
|                                |                                        | G              | 41                                                | 38  | 33   | 30   | 29   | 31   |
|                                |                                        | H              | 43                                                | 39  | 35   | 31   | 31   | 32   |
|                                |                                        | J              | 45                                                | 41  | 36   | 33   | 32   | 34   |
|                                |                                        | K              | 47                                                | 43  | 37   | 34   | 33   | 35   |
|                                | 1.5                                    | F              | 40                                                | 36  | 31   | 28   | 28   | 29   |
|                                |                                        | G              | 41                                                | 38  | 33   | 30   | 30   | 31   |
|                                |                                        | H              | 43                                                | 39  | 35   | 33   | 32   | 33   |
|                                |                                        | J              | 45                                                | 41  | 37   | 35   | 34   | 35   |
|                                |                                        | K              | 46                                                | 43  | 39   | 38   | 36   | 37   |
|                                | 3.0                                    | F              | 40                                                | 36  | 32   | 29   | 28   | 29   |
|                                |                                        | G              | 41                                                | 38  | 33   | 31   | 30   | 31   |
|                                |                                        | H              | 43                                                | 39  | 35   | 34   | 34   | 34   |
|                                |                                        | J              | 45                                                | 41  | 38   | 37   | 36   | 36   |
|                                |                                        | K              | 46                                                | 43  | 40   | 40   | 39   | 39   |
| 2.5                            | 0.0                                    | F              | 44                                                | 42  | 38   | 36   | 37   | 39   |
|                                |                                        | G              | 46                                                | 43  | 40   | 38   | 38   | 41   |
|                                |                                        | H              | 48                                                | 45  | 41   | 39   | 40   | 42   |
|                                |                                        | J              | 50                                                | 46  | 43   | 41   | 41   | 43   |
|                                |                                        | K              | 52                                                | 48  | 44   | 42   | 42   | 45   |
|                                | 1.5                                    | F              | 44                                                | 42  | 38   | 36   | 37   | 39   |
|                                |                                        | G              | 46                                                | 43  | 40   | 38   | 38   | 41   |
|                                |                                        | H              | 47                                                | 45  | 42   | 40   | 40   | 42   |
|                                |                                        | J              | 49                                                | 46  | 43   | 42   | 42   | 44   |
|                                |                                        | K              | 51                                                | 48  | 45   | 44   | 43   | 45   |
|                                | 3.0                                    | F              | 44                                                | 42  | 38   | 36   | 37   | 39   |
|                                |                                        | G              | 46                                                | 43  | 40   | 38   | 38   | 41   |
|                                |                                        | H              | 47                                                | 45  | 42   | 40   | 41   | 43   |
|                                |                                        | J              | 49                                                | 46  | 44   | 43   | 43   | 44   |
|                                |                                        | K              | 50                                                | 48  | 45   | 45   | 45   | 46   |
| 3.5                            | 0.0                                    | F              | 47                                                | 45  | 42   | 41   | 42   | 46   |
|                                |                                        | G              | 49                                                | 47  | 44   | 43   | 44   | 47   |
|                                |                                        | H              | 51                                                | 48  | 46   | 44   | 45   | 49   |
|                                |                                        | J              | 53                                                | 50  | 47   | 46   | 47   | 50   |
|                                |                                        | K              | 55                                                | 51  | 48   | 47   | 48   | 51   |
|                                | 1.5                                    | F              | 47                                                | 45  | 42   | 41   | 42   | 46   |
|                                |                                        | G              | 49                                                | 47  | 44   | 43   | 44   | 47   |
|                                |                                        | H              | 50                                                | 48  | 46   | 45   | 46   | 49   |
|                                |                                        | J              | 52                                                | 50  | 47   | 46   | 47   | 51   |
|                                |                                        | K              | 54                                                | 51  | 49   | 48   | 49   | 51   |
|                                | 3.0                                    | F              | 47                                                | 45  | 42   | 41   | 42   | 46   |
|                                |                                        | G              | 49                                                | 47  | 44   | 44   | 44   | 47   |
|                                |                                        | H              | 50                                                | 48  | 46   | 45   | 46   | 49   |
|                                |                                        | J              | 52                                                | 50  | 48   | 47   | 48   | 50   |
|                                |                                        | K              | 53                                                | 51  | 49   | 49   | 50   | 52   |

# Application data (cont)



## UNIT SOUND POWER LEVEL RATINGS (cont)

| NOZZLE<br>PRESSURE<br>(in. wg) | DAMPER<br>PRESSURE<br>DROP<br>(in. wg) | NOZZLE<br>TYPE | UNIT SIZE 4                                       |     |      |      |      |      |
|--------------------------------|----------------------------------------|----------------|---------------------------------------------------|-----|------|------|------|------|
|                                |                                        |                | Sound Power Level (dB at 10 <sup>-12</sup> watts) |     |      |      |      |      |
|                                |                                        |                | Octave Band Mid-Frequency (Hz)                    |     |      |      |      |      |
|                                |                                        |                | 250                                               | 500 | 1000 | 2000 | 4000 | 8000 |
| 0.5                            | 1.5                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | 33                                                | 27  | —    | —    | —    | —    |
|                                |                                        | H              | 35                                                | 29  | 23   | 20   | —    | —    |
|                                |                                        | J              | 36                                                | 30  | 25   | 23   | 21   | —    |
|                                |                                        | K              | 38                                                | 32  | 27   | 26   | 24   | 23   |
|                                | 3.0                                    | F              | —                                                 | —   | —    | —    | —    | —    |
|                                |                                        | G              | 33                                                | 27  | —    | —    | —    | —    |
|                                |                                        | H              | 34                                                | 29  | 22   | 21   | 21   | —    |
|                                |                                        | J              | 36                                                | 30  | 26   | 25   | 25   | 23   |
|                                |                                        | K              | 37                                                | 32  | 29   | 29   | 29   | 27   |
| 1.5                            | 0.0                                    | F              | 41                                                | 37  | 33   | 29   | 29   | 30   |
|                                |                                        | G              | 42                                                | 39  | 34   | 31   | 30   | 32   |
|                                |                                        | H              | 44                                                | 40  | 36   | 33   | 32   | 33   |
|                                |                                        | J              | 46                                                | 42  | 47   | 34   | 33   | 34   |
|                                |                                        | K              | 48                                                | 43  | 38   | 35   | 34   | 36   |
|                                | 1.5                                    | F              | 41                                                | 37  | 33   | 30   | 29   | 30   |
|                                |                                        | G              | 42                                                | 39  | 34   | 31   | 31   | 32   |
|                                |                                        | H              | 44                                                | 40  | 36   | 33   | 33   | 34   |
|                                |                                        | J              | 45                                                | 42  | 38   | 35   | 34   | 35   |
|                                |                                        | K              | 47                                                | 43  | 40   | 38   | 37   | 37   |
|                                | 3.0                                    | F              | 41                                                | 37  | 33   | 30   | 29   | 30   |
|                                |                                        | G              | 42                                                | 39  | 34   | 32   | 31   | 32   |
|                                |                                        | H              | 44                                                | 40  | 36   | 34   | 34   | 34   |
|                                |                                        | J              | 45                                                | 42  | 48   | 47   | 46   | 46   |
|                                |                                        | K              | 47                                                | 43  | 40   | 40   | 39   | 39   |
| 2.5                            | 0.0                                    | F              | 45                                                | 43  | 39   | 37   | 38   | 40   |
|                                |                                        | G              | 47                                                | 44  | 41   | 39   | 39   | 42   |
|                                |                                        | H              | 49                                                | 46  | 42   | 40   | 41   | 43   |
|                                |                                        | J              | 50                                                | 47  | 43   | 41   | 42   | 44   |
|                                |                                        | K              | 52                                                | 49  | 45   | 43   | 43   | 46   |
|                                | 1.5                                    | F              | 45                                                | 43  | 39   | 37   | 38   | 40   |
|                                |                                        | G              | 47                                                | 44  | 41   | 39   | 39   | 42   |
|                                |                                        | H              | 49                                                | 46  | 43   | 41   | 41   | 43   |
|                                |                                        | J              | 50                                                | 47  | 44   | 42   | 42   | 45   |
|                                |                                        | K              | 51                                                | 49  | 46   | 44   | 44   | 46   |
|                                | 3.0                                    | F              | 45                                                | 43  | 39   | 37   | 38   | 40   |
|                                |                                        | G              | 47                                                | 44  | 41   | 39   | 40   | 42   |
|                                |                                        | H              | 48                                                | 46  | 43   | 41   | 42   | 44   |
|                                |                                        | J              | 50                                                | 47  | 44   | 43   | 43   | 45   |
|                                |                                        | K              | 51                                                | 49  | 46   | 46   | 46   | 47   |
| 3.5                            | 0.0                                    | F              | 48                                                | 46  | 44   | 42   | 44   | 47   |
|                                |                                        | G              | 50                                                | 48  | 45   | 44   | 45   | 48   |
|                                |                                        | H              | 52                                                | 50  | 47   | 45   | 47   | 50   |
|                                |                                        | J              | 53                                                | 51  | 48   | 46   | 48   | 51   |
|                                |                                        | K              | 54                                                | 52  | 49   | 48   | 49   | 52   |
|                                | 1.5                                    | F              | 48                                                | 46  | 44   | 42   | 44   | 47   |
|                                |                                        | G              | 50                                                | 48  | 45   | 44   | 45   | 48   |
|                                |                                        | H              | 51                                                | 50  | 47   | 46   | 47   | 50   |
|                                |                                        | J              | 53                                                | 51  | 48   | 47   | 48   | 51   |
|                                |                                        | K              | 54                                                | 52  | 50   | 49   | 50   | 53   |
|                                | 3.0                                    | F              | 48                                                | 46  | 44   | 42   | 44   | 47   |
|                                |                                        | G              | 50                                                | 48  | 45   | 44   | 45   | 48   |
|                                |                                        | H              | 51                                                | 50  | 47   | 46   | 47   | 50   |
|                                |                                        | J              | 53                                                | 51  | 48   | 48   | 48   | 51   |
|                                |                                        | K              | 54                                                | 52  | 50   | 50   | 51   | 53   |

# Electrical data



## ELECTRIC HEATER ELECTRICAL DATA (36TE ONLY)

| HEATER<br>(V-Ph-Hz) | WATTS | FLA   | FUSE AMPS | WIRE SIZE<br>(AWG) | ALLOWABLE<br>AMPERAGE/FT* | MINIMUM CFM |
|---------------------|-------|-------|-----------|--------------------|---------------------------|-------------|
| 208-1-60            | 1000  | 4.81  | 15        | 14                 | 332                       | 32          |
|                     | 1500  | 7.22  | 15        | 12                 | 527                       | 51          |
|                     | 2000  | 9.63  | 15        | 10                 | 834                       | 67          |
|                     | 2500  | 12.10 | 15        | 8                  | 1328                      | 82          |
|                     | 3000  | 14.41 | 15        | 6                  | 2061                      | 108         |
| 240-1-60            | 1000  | 4.17  | 15        | 14                 | 383                       | 32          |
|                     | 1500  | 6.25  | 15        | 12                 | 609                       | 51          |
|                     | 2000  | 8.33  | 15        | 10                 | 962                       | 67          |
|                     | 2500  | 10.40 | 15        | 8                  | 1533                      | 82          |
|                     | 3000  | 12.50 | 15        | 6                  | 2378                      | 108         |
| 277-1-60            | 1000  | 3.62  | 15        | 14                 | 442                       | 32          |
|                     | 1500  | 5.42  | 15        | 12                 | 702                       | 51          |
|                     | 2000  | 7.23  | 15        | 10                 | 1111                      | 67          |
|                     | 2500  | 9.03  | 15        | 8                  | 1769                      | 82          |
|                     | 3000  | 10.85 | 15        | 6                  | 2745                      | 108         |

### LEGEND

**AWG** — American Wire Gage  
**FLA** — Full Load Amps

\* Copper wire sizes based upon 60 C. Use latest NEC (National Electrical Code) standards for wire lengths (allow 3% voltage drop) and fuse sizes. Follow all local codes required. To obtain maximum wire length, divide allowable amperage per ft by FLA.



# Guide specifications



## Water Control Induction Bypass Air Terminals

### HVAC Guide Specifications

Size Range: **19.4 to 131.9 nominal cfm**

Carrier Model Number: **36RH, 36RM, 36RP, 36RV, 36TE**

#### Part 1 — General

##### 1.01 SYSTEM DESCRIPTION

- A. Water control induction system for ventilation, cooling, and heating.
- B. Equipment shall be completely assembled and piped.

##### 1.02 QUALITY ASSURANCE

All units shall be fully quality tested by factory run testing under normal operating conditions and water flow rates.

#### Part 2 — Product

##### 2.01 EQUIPMENT

###### A. General:

1. Base unit assembly shall consist of an air inlet, air plenum, bypass damper assembly, induction nozzles, water coil assembly, lint screen, air transition fitting, air plug, non-drainable condensate pan, and electric heater (36TE only).
2. Runout enclosure and panel sections shall be constructed of not lighter than 18 gage cold-rolled steel, bonderized, recoatable baked prime finish.
3. Overhead horizontal enclosure for 36RH unit shall be complete with support brackets for base unit, hinged bottom panel, and single-blade discharge grille.
4. For vertical furred-in installations:
  - a. Discharge grille assembly shall consist of grille frame with integral mounting collar and removable plastic grille sections, designed for individual 4-way adjustment of air flow.
  - b. Grille frames shall be constructed of not lighter than 18-gage cold-rolled steel, bonderized, recoatable baked prime finish, with rolled edges and corners.
  - c. Frame shall be provided with mounting holes for securing to window stool.
  - d. Recirculating grille panel shall be constructed of not lighter than 18-gage cold-rolled steel, bonderized, recoatable baked prime finish.
  - e. Panel shall have louvered section with free area not less than indicated on plans and shall be designed for easy removal from frame for routine inspection and servicing.
  - f. Panel shall fit securely in a frame and be provided with necessary stiffener channels to prevent warping.

- g. The frame shall be constructed of black iron angles, welded at corner sections, bonderized and finished in recoatable prime coat.
- h. Frame shall be provided with holes or suitable devices for attachment to metal lath or tile block.
- i. All custom enclosures must meet published minimum free area requirements.

###### B. Air Plenum:

1. Air plenum shall be constructed of galvanized steel.
2. Internal areas shall be acoustically and thermally insulated with neoprene-coated fiberglass.
3. Plenum shall be designed for series connection or feed-thru, and shall contain primary air balancing damper arranged for independent manual adjustment of primary air volume.
4. Recovery stack and outlet collar where required shall be cold-rolled steel painted black.

###### C. Bypass Damper Assembly:

Assembly shall consist of galvanized steel blade damper with coil springs and neoprene bellows.

###### D. Induction nozzles:

1. Shall be heat resistant, pliable plastic.
2. Shall be designed for minimum noise generation.
3. Nozzle arrangement shall be selected to provide capacities as specified.

###### E. Water coil assembly:

1. Assembly shall consist of a single-row reversible coil with copper tubing mechanically expanded to aluminum plate fins. (Two separate coils shall be furnished for 4-pipe operation.)
2. Coil connections shall be 1/2-in. ODF sweat, 1/2-in. ODM flare, 1/2-in. ODF sweat with vent, or 1/2-in. ODM flare with vent.
3. Coil shall be suitable for working pressures up to 250 psig.
4. Nondrainable (drainable) galvanized steel condensate pan shall be provided.

###### F. Primary air transition fitting:

1. Fitting shall be for connection to 4-in. runout duct.
2. Fitting shall be die-formed, streamlined and interchangeable with removable air plug.

###### G. Electric Heater (36TE Only):

1. Heater shall consist of a single finned cartridge wired with a control package.
2. Control package shall consist of relays, microswitch, toggle switch, terminal blocks, and thermal cutouts.
3. Electric heater shall be available in 208, 230, and 277 V power supply.

4. Heater and control package shall be UL labeled.
5. Electric heater shall be activated by the bypass damper contacting microswitch when damper forces recirculated air to completely bypass the coil.

#### H. Controls:

1. For 36R type units, changeover or non-changeover controls shall be available.
2. For 36TE units, nonchangeover controls shall be standard.
3. Changeover control components shall consist of dual cooling and heating thermostats, bypass damper with bellows, and field-supplied accessory control air filter, tubing, and changeover control for summer and winter operation.
4. Non-changeover control components shall consist of a thermostat, bypass damper assembly with bellows, and field supplied accessory control air filter and tubing.
5. Individual room temperature control shall be obtained by means of a coil bypass damper that shall modulate the flow of recirculated room air through or around the secondary coil.
6. All controls shall be accessible for servicing and adjustment through the front access panel.
7. One thermostat shall be able to control up to three units.
8. Bypass damper units shall be modulated by means of a bellows powered by control air pressure from the primary air plenum of the base unit. Bellows pressure shall be controlled in response to room temperature by a bleed port type thermostat.
9. For 36RP units with pneumatic bypass controls, the bypass damper shall be actuated by means of a field-installed pneumatic motor connected to the extended damper shaft and controlled by a unit or wall mounted thermostat. Mounting plate for left or right-hand installation of motor and thermostat shall be separately supplied and field mounted.
10. For 36RM units with manual bypass controls, the bypass damper shall be controlled by a manual operator. Mounting plate and manual operator shall be factory mounted on the right-hand end of the unit.
11. Controls and interconnecting tubing shall be factory installed on the base unit and shall be calibrated before shipment.
12. Controls shall be suitable for operation with primary air plenum pressures between 1.50 and 5.00 in. wg.

13. Thermostat shall have an operating range between 65 and 85 F with a throttling range not greater than 1.5 F.
14. Unit-mounted thermostat shall be factory installed on the right-hand end of the unit. Thermostat adjustment shall be easily accessible beneath discharge grille.
15. Wall-mounted thermostat shall be connected to the base unit by not more than 25 ft of control tubing of not less than  $\frac{5}{16}$ -in. ID with a minimum bending radius of 1  $\frac{1}{2}$ -inches.

#### I. Special Features:

1. Drainable Condensate Pan:  
The factory-installed condensate pan, with  $\frac{11}{16}$ -in. OD drain connection shall be available for applications such as hotels or apartments that may have periodic high-latent loads.
2. Coil Connections:  
Four types of connections are available factory-installed on the base unit:  $\frac{1}{2}$ -in. ODF sweat on both supply and return;  $\frac{1}{2}$ -in. ODF sweat with manual air vent on return and  $\frac{1}{2}$ -in. ODF sweat on supply;  $\frac{1}{2}$ -in. ODM flare on both supply and return; and  $\frac{1}{2}$ -in. ODM flare with manual air vent on return and  $\frac{1}{2}$ -in. ODM flare on supply. The specified connection shall be factory mounted on the unit.
3. Accessory Lint Screen:  
Accessory lint screen shall be of fine mesh, properly supported readily removable for servicing.
4. Wall Mounting Strip:  
Accessory wall mounting strip shall be made of 14-gage galvaneal steel and is required for hanging all vertical base units, enclosures and enclosure accessories. Base unit and its enclosures shall be mounted on same strip. Strips shall be available in either 5 or 8-ft lengths.
5. Primary Air Transition Fitting:  
Accessory primary air transition fitting shall provide air transition from the oval entrance on unit to a standard 4-in. round duct.
6. Enclosure:  
Base unit enclosure shall be constructed of not lighter than 18 gage, cold-rolled steel, bonderized, recoatable baked prime finish. Enclosure shall consist of removable front access panel with snap-in fasteners to permit easy removal for routine inspection and servicing of unit and controls, removable plastic discharge grille sections designed for 4-way adjustment of airflow, mounting brackets and suitable accessories for base unit assembly as shown on the plans.





