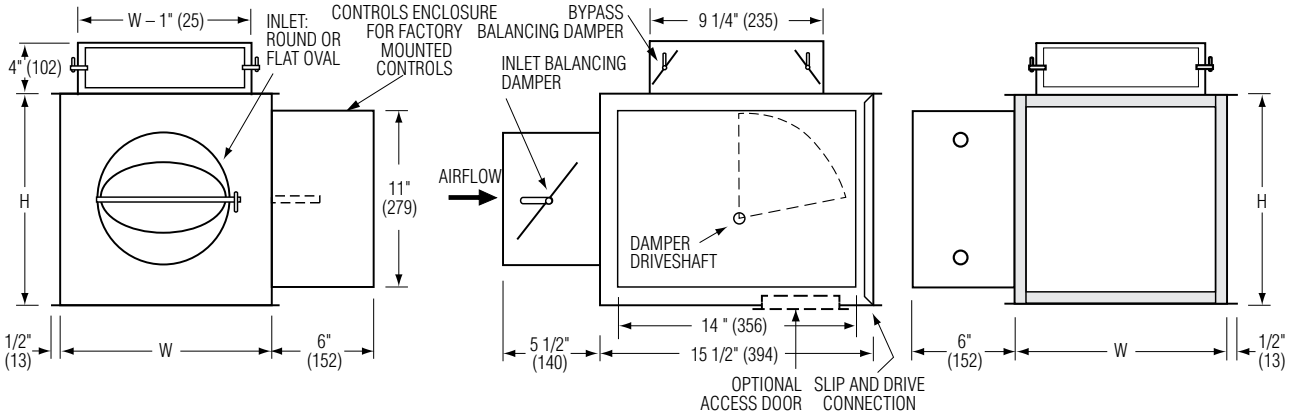
BYPASS TERMINAL UNIT
DIGITAL OR ANALOG CONTROLS
PRESSURE DEPENDENT
MODELS: D3400 AND A3400



Dimensional Data

Unit Size	Airflow Range cfm (l/s)	W	H	Inlet Size
6	0 – 400 (0 – 189)	10 (254)	12 1/2 (318)	5 7/8 (149) Round
8	0 – 700 (0 – 330)	12 (305)	12 1/2 (318)	7 7/8 (200) Round
10	0 – 1100 (0 – 519)	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	0 – 1600 (0 – 755)	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	0 – 2100 (0 – 991)	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	0 – 2750 (0 – 1298)	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval

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AHRI CERTIFIED™ www.ahridirectory.org
VAV Terminals
AHRI Standard 880

Standard Features:

• Casing – 22 ga. (0.86) galvanized steel with round or flat oval inlets. Outlets are rectangular with slip and drive connections.

• Damper – Heavy gauge steel cylindrical "Flow Diverter" valve design for reliable long term operation. 90° rotation. CW to close.

• 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.

• 3/4" (19) dual density insulation. Exposed edges are coated to prevent airflow erosion. Material meets requirement of NFPA 90A and UL 181 standards.

• Inlet balancing damper.

• Adjustable bypass port balancing dampers.

• Tested in accordance with ANSI/ ASHRAE Standard 130 and AHRI 880, in an independent test laboratory.

• Compact low profile design is ideally suited for installation in tight spaces.

• A full NEMA 1 type controls enclosure is provide for factory mounted controls. (Optional for field mounted controls).

• Right hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available when damper is CCW to close.

• Bypass port may be removed for ducted return applications.

• Gauge tap for system balancing.

Controls:

❑ Digital (by others).

❑ Analog (by Nailor).

See separate submittal.

Options and Accessories:

❑ Full electric controls enclosure for field mounted controls.

❑ Bottom access door.

❑ Round / Oval discharge collar.

❑ Integral attenuator (Casing length changes from 15 1/2" (394) to 51 1/2" (1308) long).

❑ AT Discharge Attenuator shipped loose.

❑ Multiple-outlet attenuator (see separate submittal).

❑ Special features:
_____.

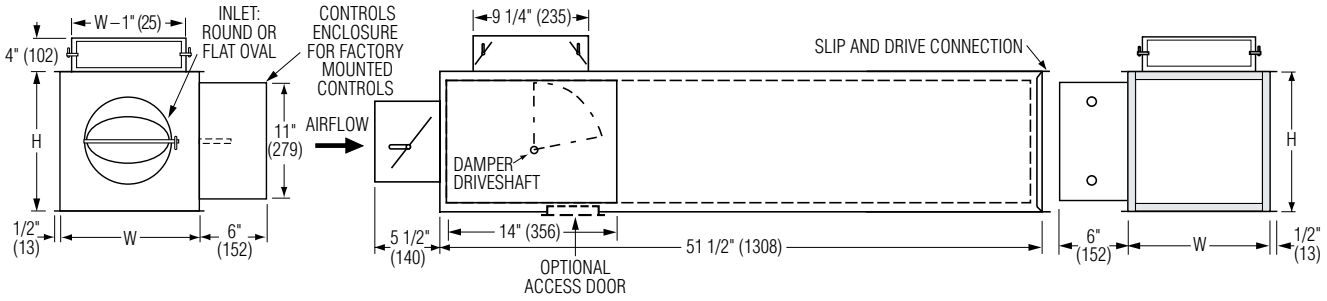
SCHEDULE TYPE:	Page 1 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**8 - 18 - 20**	**3400**	**7 - 16 - 18**	**D3400-1**

Nailor® Industries Inc.

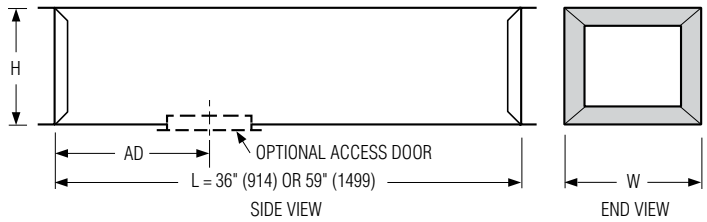
BYPASS TERMINAL UNIT
DIGITAL OR ANALOG CONTROLS
PRESSURE DEPENDENT
MODELS: D3400 AND A3400

❑ Integral Sound Attenuator

- Single continuous length terminal construction minimizes casing leakage.
- Continuous internal insulation reduces insulation seams and minimizes airflow disturbance.
- Supplied with same liner as basic unit.



❑ AT Discharge Sound Attenuator (loose)

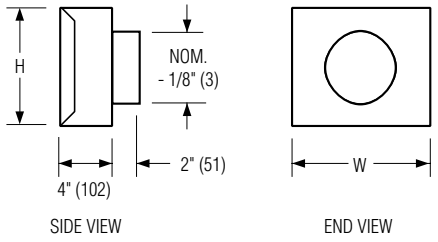


- 22 ga. (0.86) galvanized steel construction.
- Shipped loose for field attachment.
- Slip and drive connection.
- Supplied as standard with same liner as basic unit.
- **AT343** 3´ (914) Long.

❑ Special Features:

_____ .

❑ FF Round Discharge Collar

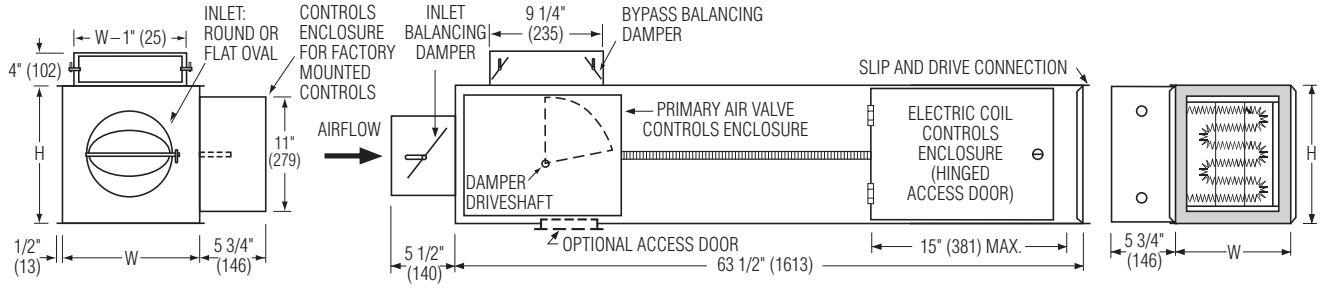


Dimensional Data

Unit Size	W	H	FF Nominal Outlet Size
6	10 (254)	12 1/2 (318)	6 (152)
8	12 (305)	12 1/2 (318)	8 (203)
10	14 (356)	12 1/2 (318)	10 (254)
12	18 (457)	12 1/2 (318)	12 (305)
14	24 (610)	12 1/2 (318)	14 (356)
16	28 (711)	12 1/2 (318)	16 (406)

SCHEDULE TYPE:	Page 2 of 2. Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**8 - 18 - 20**	**3400**	**7 - 16 - 18**	**D3400-1**

BYPASS TERMINAL UNIT WITH ELECTRIC REHEAT
DIGITAL OR ANALOG CONTROLS
PRESSURE DEPENDENT
MODELS: D34RE AND A34RE



Dimensional Data

Unit Size	Airflow Range cfm (l/s)	W	H	Inlet Size
6	0 – 400 (0 – 189)	10 (254)	12 1/2 (318)	5 7/8 (149) Round
8	0 – 700 (0 – 330)	12 (305)	12 1/2 (318)	7 7/8 (200) Round
10	0 – 1100 (0 – 519)	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	0 – 1600 (0 – 755)	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	0 – 2100 (0 – 991)	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	0 – 2750 (0 – 1298)	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval

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VAV Terminals
AHRI Standard 880

Standard Features:

• Casing – 22 ga. (0.86) galvanized steel with round or flat oval inlets. Outlets are rectangular with slip and drive connections.

• Damper – Heavy gauge steel cylindrical "Flow Diverter" valve design for reliable long term operation. 90° rotation. CW to close.

• 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.

• 3/4" (19) dual density insulation. Exposed edges are coated to prevent airflow erosion. Material meets requirement of NFPA 90A and UL 181 standards.

• Inlet balancing damper.

• Adjustable bypass port balancing dampers.

• Tested in accordance with ANSI/ ASHRAE Standard 130 and AHRI 880, in an independent test laboratory.

• Compact low profile design is ideally suited for installation in tight spaces.

• A full NEMA 1 type controls enclosure is provide for factory mounted controls. (Optional for field mounted controls).

• Right hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available when damper is CCW to close.

• Bypass port may be removed for ducted return applications.

• Gauge tap for system balancing.

Controls:

Digital (supplied by others):

- ❑ Factory mounted.
- ❑ Field installed.

❑ Analog (by Nailor). Factory mounted. See separate submittal.

Electric Coil Features:

• Primary auto-reset high limit thermal cut-out (one per coil in control circuit).

• Secondary manual reset high limit thermal cut-outs (one per element).

• Positive pressure airflow switch.

• Class A 80/20 Ni/Cr wire.

• Magnetic or safety contactors as required.

• 24 Vac Class II control transformer.

• Line terminal block.

• ETL Listed.

Voltage:

Single phase, 60 Hz.

❑ 120V ❑ 208V ❑ 240V
❑ 277V ❑ 347V

Three phase, 60 Hz.

❑ 208V ❑ 480V ❑ 600V
❑ _____ .

Options and Accessories:

- ❑ Controls enclosure for field mounted controls.
- ❑ Mercury contactor.
- ❑ Toggle type disconnect switch.
- ❑ Door interlock disconnect switch.
- ❑ Power circuit fusing.
- ❑ Dust tight construction.
- ❑ SCR control.
- ❑ Bottom access door.
- ❑ Special Features:

_____ .

Note:

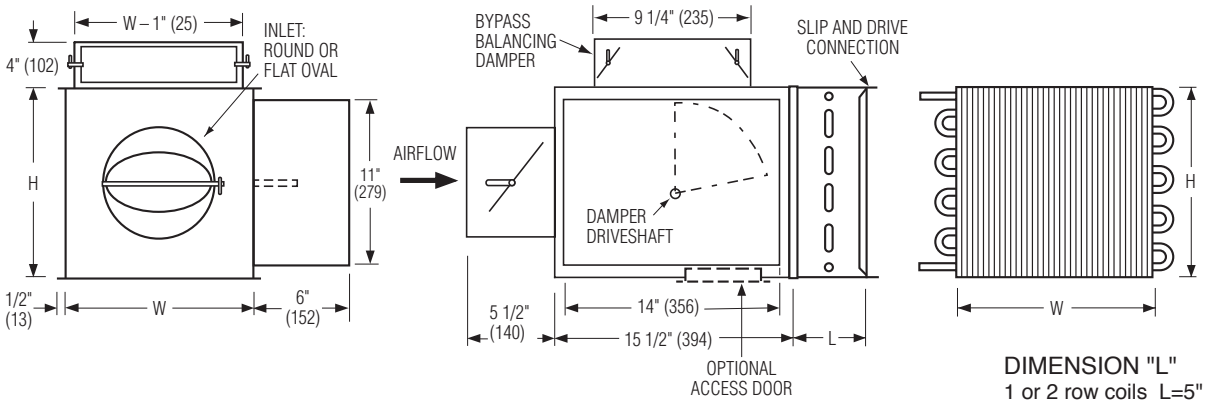
Minimum air volume must be field set to maintain or exceed minimum required flow over coil to eliminate nuisance tripping. Minimum airflow is 70 cfm (33 l/s) per kW.

Dimensions are in inches (mm)

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	7 - 16 - 18	3400	5 - 15 - 18	D34RE-1

BYPASS TERMINAL UNIT WITH HOT WATER REHEAT

DIGITAL OR ANALOG CONTROLS
PRESSURE DEPENDENT
MODELS: D34RW AND A34RW



DIMENSION "L"
1 or 2 row coils L=5" (127)
3 or 4 row coils L=7 1/2" (191)

Dimensional Data

Unit Size	Airflow Range cfm (l/s)	W	H	Inlet Size
6	0 – 400 (0 – 189)	10 (254)	12 1/2 (318)	5 7/8 (149) Round
8	0 – 700 (0 – 330)	12 (305)	12 1/2 (318)	7 7/8 (200) Round
10	0 – 1100 (0 – 519)	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	0 – 1600 (0 – 755)	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	0 – 2100 (0 – 991)	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	0 – 2750 (0 – 1298)	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval

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VAV Terminals
AHRI Standard 880

Standard Features:

• Casing – 22 ga. galvanized steel with round or flat oval inlets. Outlets are rectangular with slip and drive connections.

• Damper – Heavy gauge steel cylindrical "Flow Diverter" valve design for reliable long term operation. 90° rotation. CW to close.

• 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.

• 3/4" (19) dual density insulation. Exposed edges are coated to prevent airflow erosion. Material meets requirement of NFPA 90A and UL 181 standards.

• Inlet balancing damper.

• Adjustable bypass port balancing dampers.

• Tested in accordance with ANSI / ASHRAE Standard 130 and AHRI 880, in an independent test laboratory.

• Compact low profile design is ideally suited for installation in tight spaces.

• A full NEMA 1 type controls enclosure is provide for factory mounted controls.

(Optional for field mounted controls).

• Right hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available when damper is CCW to close.

• Bypass port may be removed for ducted return applications.

• Gauge tap for system balancing.

Hot Water Coil Section:

• 1/2" (13) Copper tubes and aluminum ripple fins, 10 per inch.

• 1, 2, 3 or 4 Row.

• Left or right hand connection. Determined by looking in direction of airflow (RH illustrated).

• Sweat connections: One row size 6 through 14, 1/2" (13) O. D. male solder. Size 16 one row and all two, three and four row, 7/8" (22) O.D. male solder.

Controls:

Digital (by others).
- ❑ Factory mounted.
- ❑ Field installed.

❑ Analog (by Nailor). Factory mounted.

See separate submittal.

Options and Accessories:

- ❑ Controls enclosure for field mounted controls.
- ❑ Bottom access door.
- ❑ Hanger brackets.
- ❑ Round / Oval discharge collar.
- ❑ Integral attenuator (Casing length changes from 15 1/2" (394) to 51 1/2" (1308) long).
- ❑ Multiple-outlet attenuator (see separate submittal).
- ❑ Special features:

_____.

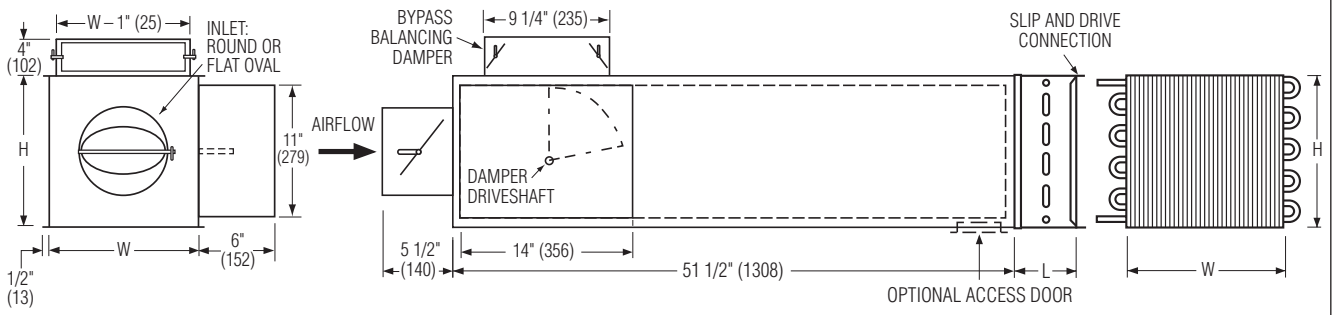
SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**7 - 16 - 18**	**3400**	**5 - 22 - 18**	**D34RW-1**

Dimensions are in inches (mm)

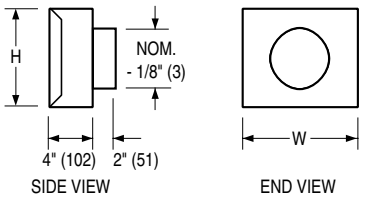
BYPASS TERMINAL UNIT
WITH HOT WATER REHEAT
DIGITAL OR ANALOG CONTROLS
PRESSURE DEPENDENT
MODEL: D34RW AND A34RW

❑ Integral Sound Attenuator plus Hot Water Coil

- Single continuous length terminal construction minimizes casing leakage.
- Continuous internal insulation reduces insulation seams and minimizes airflow disturbance.
- Supplied with same liner as basic unit.



❑ FF Round Discharge Collar



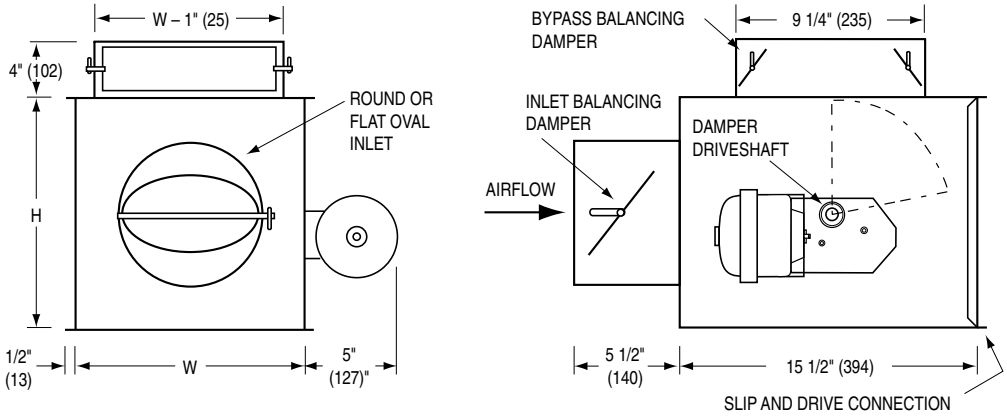
Dimensional Data

Unit Size	W	H	Hot Water Coil		FF Nominal Outlet Size
			L (1 & 2 row)	L (3 & 4 row)	
6	10 (254)	12 1/2 (318)	5 (127)	7 1/2 (191)	6 (152)
8	12 (305)	12 1/2 (318)	5 (127)	7 1/2 (191)	8 (203)
10	14 (356)	12 1/2 (318)	5 (127)	7 1/2 (191)	10 (254)
12	18 (457)	12 1/2 (318)	5 (127)	7 1/2 (191)	12 (305)
14	24 (610)	12 1/2 (318)	5 (127)	7 1/2 (191)	14 (356)
16	28 (711)	12 1/2 (318)	5 (127)	7 1/2 (191)	16 (406)

Dimensions are in inches (mm)

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**7 - 16 - 18**	**3400**	**5 - 22 - 18**	**D34RW-1**

BYPASS TERMINAL UNIT
PNEUMATIC CONTROL
MODEL: P3400



Dimensional Data

Unit Size	Airflow Range cfm (l/s)	W	H	Inlet Size
6	0 – 400 (0 – 189)	10 (254)	12 1/2 (318)	5 7/8 (149) Round
8	0 – 700 (0 – 330)	12 (305)	12 1/2 (318)	7 7/8 (200) Round
10	0 – 1100 (0 – 519)	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	0 – 1600 (0 – 755)	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	0 – 2100 (0 – 991)	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	0 – 2750 (0 – 1298)	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval

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AHRI Standard 880

Standard Features:

- Casing – 22 ga. (0.86) galvanized steel with round or flat oval inlets. Outlets are rectangular with slip and drive connections.
- Damper – Heavy gauge steel cylindrical "Flow Diverter" valve design for reliable long term operation. 90° rotation. CW to close.
- 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.
- 3/4" (19) dual density insulation. Exposed edges are coated to prevent airflow erosion. Material meets requirement of NFPA 90A and UL 181 standards.
- Inlet balancing damper.
- Adjustable bypass port balancing dampers.
- Tested in accordance with ANSI / ASHRAE Standard 130 and AHRI 880, in an independent test laboratory.
- Compact low profile design is ideally suited for installation in tight spaces.
- Right hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available when damper is CCW to close.
- Bypass port may be removed for ducted return applications.
- Gauge tap for system balancing.

Controls:

❑ Pressure dependent pneumatic by Nailor. Direct drive rotary actuator MCP-3631 Series. Factory supplied and mounted (see separate submittal).

❑ By Others.

Options and Accessories:

❑ Bottom access door.

❑ Round / Oval discharge collar.

❑ Integral attenuator (casing length changes from 51 1/2" (394) to 51 1/2" (1308) long).

❑ Multiple-outlet attenuator (see separate submittal).

❑ Special features:

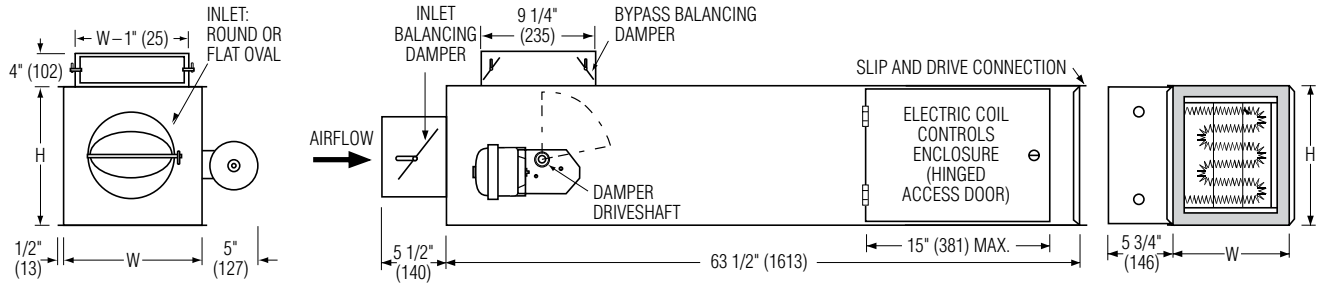
_____.

SCHEDULE TYPE:	Dimensions are in inches (mm).			
PROJECT:				
ENGINEER:	**DATE**	**B SERIES**	**SUPERSEDES**	**DRAWING NO.**
CONTRACTOR:	**3 - 30 - 17**	**3400**	**8 - 20 - 08**	**P3400-1**

BYPASS TERMINAL UNIT WITH ELECTRIC REHEAT

PNEUMATIC CONTROL

MODEL: P34RE MK II



Dimensional Data

Unit Size	Airflow Range cfm (l/s)	W	H	Inlet Size
6	0 – 400 (0 – 189)	10 (254)	12 1/2 (318)	5 7/8 (149) Round
8	0 – 700 (0 – 330)	12 (305)	12 1/2 (318)	7 7/8 (200) Round
10	0 – 1100 (0 – 519)	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	0 – 1600 (0 – 755)	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	0 – 2100 (0 – 991)	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	0 – 2750 (0 – 1298)	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval

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AHRI Standard 880

Standard Features:

• Casing – 22 ga. (0.86) galvanized steel with round or flat oval inlets. Outlets are rectangular with slip and drive connections.

• Damper – Heavy gauge steel cylindrical "Flow Diverter" valve design for reliable long term operation. 90° rotation. CW to close.

• 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.

• 3/4" (19) dual density insulation. Exposed edges are coated to prevent airflow erosion. Material meets requirement of NFPA 90A and UL 181 standards.

• Inlet balancing damper.

• Adjustable bypass port balancing dampers.

• Tested in accordance with ANSI/ ASHRAE Standard 130 and AHRI 880, in an independent test laboratory.

• Compact low profile design is ideally suited for installation in tight spaces.

• Right hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available when damper is CCW to close.

• Bypass port may be removed for ducted return applications.

• Gauge tap for system balancing.

Controls:

❑ Pressure dependent analog electronic by Nailor. Factory supplied and mounted (see separate submittal).

❑ By Others.

Electric Coil Features:

• Primary auto-reset high limit thermal cut-out (one per coil in control circuit).

• Secondary manual reset high limit thermal cut-outs (one per element).

• Positive pressure airflow switch.

• Class A 80/20 Ni/Cr wire.

• PE switch per stage. Back-up contactors as required.

• Line terminal block.

• ETL Listed.

Voltage:

Single phase, 60 Hz.

❑ 120V ❑ 208V ❑ 240V
❑ 277V ❑ 347V

Three phase, 60 Hz.

❑ 208V ❑ 480V ❑ 600V

❑ _____ .

Options and Accessories:

❑ Toggle type disconnect switch.

❑ Door interlock disconnect switch.

❑ Mercury contactor.

❑ Power circuit fusing.

❑ Dust tight construction.

❑ Special Features:

_____ .

Note:

Minimum air volume must be field set to maintain or exceed minimum required flow over coil to eliminate nuisance tripping. Minimum airflow is 70 cfm (33 l/s) per kW.

Dimensions are in inches (mm)

SCHEDULE TYPE:				
PROJECT:				
ENGINEER:	DATE	B SERIES	SUPERSEDES	DRAWING NO.
CONTRACTOR:	4 - 30 - 20	3400	7 - 12 - 17	P34RE-1

Performance Data • AHRI Certification and Performance Notes

3400 Series • Bypass • AHRI Certification Rating Points

Fiberglass Liner

Inlet Size	Airflow		Min. Inlet ΔPs		Discharge Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs						Radiated Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs					
					Octave Band						Octave Band					
	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7
6	400	189	0.01	2	63	59	55	50	42	40	42	37	33	24	20	20
8	700	330	0.01	2	61	58	52	48	38	32	47	41	34	28	26	20
10	1100	519	0.01	2	63	57	50	48	43	42	52	49	46	37	32	23
12	1600	755	0.01	2	64	58	53	49	44	36	48	51	47	37	35	29
14	2100	991	0.20	50	70	64	58	53	50	45	54	58	56	49	49	41
16	2750	1298	0.12	29	69	64	60	56	52	45	64	63	59	49	46	37

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VAV Terminals
AHRI Standard 880

Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge sound power is the noise emitted from the unit discharge into the downstream duct. Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls.
3. Sound power levels are in decibels, dB re 10^{-12} watts.
4. All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
5. Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880.
6. Minimum discharge ΔPs is the static pressure loss through the unit with 100% airflow through discharge outlet.
7. Minimum bypass ΔPs is the static pressure loss through the unit with 100% airflow through the bypass outlet.

Performance Data • NC Level Application Guide

3400 Series

Inlet Size	Airflow		Min. Discharge ΔPs		Min. Bypass ΔPs		NC Levels		
							DISCHARGE	RADIATED	
	cfm	l/s	"w.g.	Pa	"w.g.	Pa		Bypass Closed	Bypass Open
6	400	189	0.01	2	0.14	35	-	-	26
	300	142	0.01	2	0.08	20	-	-	-
	200	94	0.01	2	0.04	10	-	-	-
	100	47	0.01	2	0.01	2	-	-	-
8	700	330	0.01	2	0.21	52	-	-	30
	500	236	0.01	2	0.11	27	-	-	20
	350	165	0.01	2	0.05	12	-	-	-
	200	94	0.01	2	0.02	5	-	-	-
10	1100	519	0.01	2	0.43	107	-	20	37
	800	378	0.01	2	0.23	57	-	-	26
	500	236	0.01	2	0.09	22	-	-	-
	200	94	0.01	2	0.01	3	-	-	-
12	1600	755	0.01	2	0.50	124	-	21	41
	1200	566	0.01	2	0.28	70	-	-	33
	800	378	0.01	2	0.13	32	-	-	23
	400	189	0.01	2	0.03	7	-	-	-
14	2100	991	0.20	50	0.50	124	21	31	43
	1550	731	0.10	25	0.27	68	-	23	35
	1000	472	0.04	10	0.11	28	-	-	24
	450	212	0.01	2	0.02	5	-	-	-
16	2750	1298	0.12	29	0.50	124	21	34	47
	2050	967	0.06	16	0.28	70	-	24	38
	1350	637	0.03	8	0.12	30	-	-	28
	650	307	0.01	2	0.03	7	-	-	-

Performance Notes:

1. NC levels are calculated from the published raw data and based on procedures outlined in Appendix E, AHRI Standard 885.
2. Discharge sound attenuation deductions are based on environmental effect, duct lining, branch power division, insulated flex duct, end reflection and space effect and are as follows:

Discharge attenuation	Octave Band					
	2	3	4	5	6	7
< 300 cfm	24	28	39	53	59	40
300 – 700 cfm	27	29	40	51	53	39
> 700 cfm	29	30	40	51	52	39

3. Radiated sound attenuation deductions are based on a mineral tile ceiling and environmental effect and are as follows:

Radiated attenuation	Octave Band					
	2	3	4	5	6	7
Total dB reduction	18	19	20	26	31	36

4. Minimum discharge ΔPs is the static pressure loss through the unit with 100% airflow through discharge outlet.
5. Minimum bypass ΔPs is the static pressure loss through the unit with 100% airflow through the bypass outlet.
6. Dash (–) in space denotes an NC level of less than 20.
7. For a complete explanation and details on NC calculations, refer to page E14 and the engineering section of this catalog.

Performance Data Explanation

Sound Power Levels vs. NC Levels

The **Nailor Models: 3400, 34RW and 34RE** bypass terminal unit performance data is presented in two forms.

The laboratory obtained discharge and radiated sound power levels in octave bands 2 through 7 (125 through 4000 Hz) center frequency for each unit size at various flow rates and inlet static pressures is presented. This data is derived in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880. This data is raw with no attenuation deductions and includes AHRI Certification standard rating points.

Nailor also provides an NC Level table as an application aid in terminal selection, which includes attenuation allowances as explained below. The suggested attenuation allowances are typical not representative of specific job site conditions. It is recommended that the sound power level data be used and a detailed NC calculation be performed using the procedures outlined in AHRI Standard 885, Appendix E for accurate space sound levels.

Explanation of NC Levels

Tabulated NC levels are based on attenuation values as outlined in AHRI Standard 885 "Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets". AHRI Standard 885, Appendix E provides typical sound attenuation values for air terminal discharge sound and air terminal radiated sound.

As stated in AHRI Standard 885, Appendix E, "These values can be used as a quick method of estimating space sound levels when a detailed evaluation is not available. The attenuation values are required for use by manufacturers to catalog application sound levels. In product catalogs, the end user environments are not known and the following factors are provided as typical attenuation values. Use of these values will allow better comparison between manufacturers and give the end user a value which will be expected to be applicable for many types of space."

Radiated Sound

Table E1 of Appendix E provides radiated sound attenuation values for three types of ceiling: Type 1 – Glass Fiber; Type 2 – Mineral Fiber; Type 3 – Solid Gypsum Board.

Since Mineral Fiber tile ceilings are the most common construction used in commercial buildings, these values have been used to tabulate Radiated NC levels.

The following table provides the calculation method for the radiated sound total attenuation values based on AHRI Standard 885.

	Octave Band					
	2	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
Ceiling/Space Effect	16	18	20	26	31	36
Total Attenuation Deduction	**18**	**19**	**20**	**26**	**31**	**36**

The ceiling/space effect assumes the following conditions:

1. 5/8" (16) tile, 20 lb/ft^3 (320 kg/m^3) density.
2. The plenum is at least 3 feet (914) deep.
3. The plenum space is either wide (over 30 feet [9 m]) or lined with insulation.
4. The ceiling has no significant penetration directly under the unit.

Discharge Sound

Table E1 of Appendix E provides typical discharge sound attenuation values for three sizes of terminal unit.

1. Small box; Less than 300 cfm (142 l/s) (Discharge Duct 8" x 8" [203 x 203]).
2. Medium box; 300 – 700 cfm (142 - 330 l/s) (Discharge Duct 12" x 12" [305 x 305]).
3. Large box; Greater than 700 cfm (330 l/s) (Discharge Duct 15" x 15" [381 x 381]).

These attenuation values have been used to tabulate Discharge NC levels applied against the terminal airflow volume and not terminal unit size.

The following tables provide the calculation method for the discharge sound total attenuation values based on AHRI Standard 885.

Small Box	Octave Band					
<300 cfm	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	6	12	25	29	18
Branch Power Division (1 outlet)	0	0	0	0	0	0
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	**24**	**28**	**39**	**53**	**59**	**40**

Medium Box	Octave Band					
300 – 700 cfm	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	4	10	20	20	14
Branch Power Division (2 outlets)	3	3	3	3	3	3
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	**27**	**29**	**40**	**51**	**53**	**39**

Large Box	Octave Band					
>700 cfm	**2**	**3**	**4**	**5**	**6**	**7**
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	3	9	18	17	12
Branch Power Division (3 outlets)	5	5	5	5	5	5
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	**29**	**30**	**41**	**51**	**52**	**39**

1. Flexible duct is non-metallic with 1" (25) insulation.
2. Space effect (room size and receiver location) 2500 ft.^{3} (69 m^3) and 5 ft. (1.5 m) distance from source.

For a complete explanation of the attenuation factors and the procedures for calculating room NC levels, please refer to the acoustical engineering guidelines at the back of this catalog and AHRI Standard 885.

Electric Heating Coils Selection, Capacities and Features

Model: 34RE

Nailor manufactures its own electric heating coils. They have been specifically designed and tested for use with pressure dependent, single duct bypass units.

Nailor electric coils are factory mounted as an integral part of the terminal unit in an insulated extended plenum section, located sufficiently downstream to ensure even airflow over the coil elements. Total length of the casing including heater terminal is only 31" (787), providing a compact, easy to handle unit. Freight costs are therefore also reduced. The unique inclined opposed blade damper design provides improved and more even airflow over the coil elements compared with round butterfly damper designs, which helps to minimize air stratification, avoid nuisance tripping of the thermal cut-outs and maximize heat pick-up.

For dimensional data, see page E8.

Selection Guidelines:

The table below provides a general guideline as to the voltages and maximum kiloWatts available for each terminal unit size. Up to three stages of heat are available. A minimum of 0.5 kW/stage is required.

For optimum diffuser performance and maximum thermal comfort, ASHRAE recommends that discharge temperatures do not exceed 15°F (8°C) above room set point, as stratification and short circuiting may occur. ASHRAE Standard 62.1 limits discharge temperatures to 90°F (32°C) or increasing the ventilation rate when heating from the ceiling. Never select kW to exceed a discharge temperatures of 115°F (46°C).

$$\Delta T \text{ (Air Temp. Rise, °F)} = \frac{kW \times 3160}{cfm}$$

The coil ranges listed are restricted to a maximum of 48 amps and do not require circuit fusing to meet NEC code requirements. Total pressure at the airflow switch should be at least 0.07" w.g. (17 Pa) to ensure correct coil operation and avoid possible nuisance tripping of the thermal cutouts due to insufficient airflow over the coil elements. Check that desired minimum airflow is within recommended operating range.

Standard Features:

- Primary auto-reset high limit thermal cut-out (one per coil in control circuit).
- Secondary manual reset high limit thermal cut-outs (one per element).
- Positive pressure airflow switch.
- Class A 80/20 nickel-chrome alloy heating elements.
- Magnetic or safety contactors and/or PE switches as required.
- Control transformer. Class II, 24 Vac for digital and analog controls.
- Line terminal block.
- Hinged door control enclosure.
- High grade rib type ceramic insulator.
- Slip and drive discharge connection.
- Class A 80/20 wire.

Electric Heater

Options:

- Quiet contactors.
- Mercury contactors.
- Toggle type disconnect switch.
- Door interlock disconnect switch.
- Power circuit fusing.
- Dust tight construction.
- SCR control.

Electric Coil Limitations

Unit Size	Heating Range* cfm	Maximum kW						
		Single Phase				Three phase		
		120V	208V	277V	377V	208V	480V	600V
6	Min - 400	5.5	7.5	7.5	7.5	7.5	7.5	7.5
8	Min - 700	5.5	9.5	13.0	13.0	13.0	13.0	13.0
10	Min - 1100	5.5	9.5	13.0	16.5	17.0	21.0	21.0
12	Min - 1600	5.5	9.5	13.0	16.5	17.0	30.0	30.0
14	Min - 2100	5.5	9.5	13.0	16.5	17.0	31.0	38.5
16	Min - 2750	5.5	9.5	13.0	16.5	17.0	31.0	38.5

* Minimum required airflow is 70 cfm per kilowatt (33 l/s/kW)
The minimum airflow requires field setting using the mechanical minimum stop on the damper actuator.

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Intertek

Tested and approved to the following standards:

ANSI/UL 1996, 4th ed.

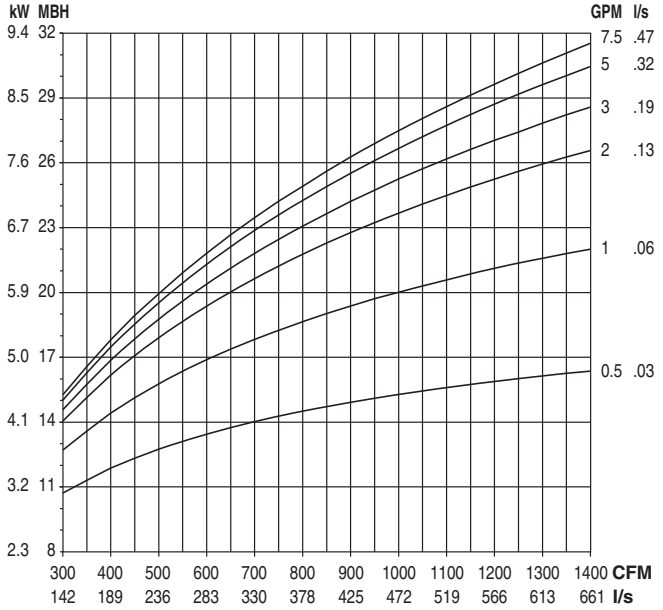
CSA C22.2 No. 155-M1986.

Performance Data • Hot Water Coil

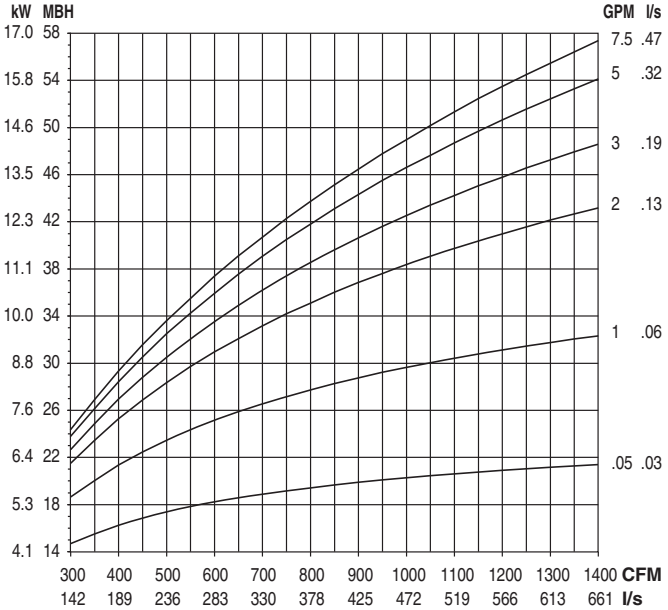
Model: 34RW

Unit Size 10

1 Row (single circuit)

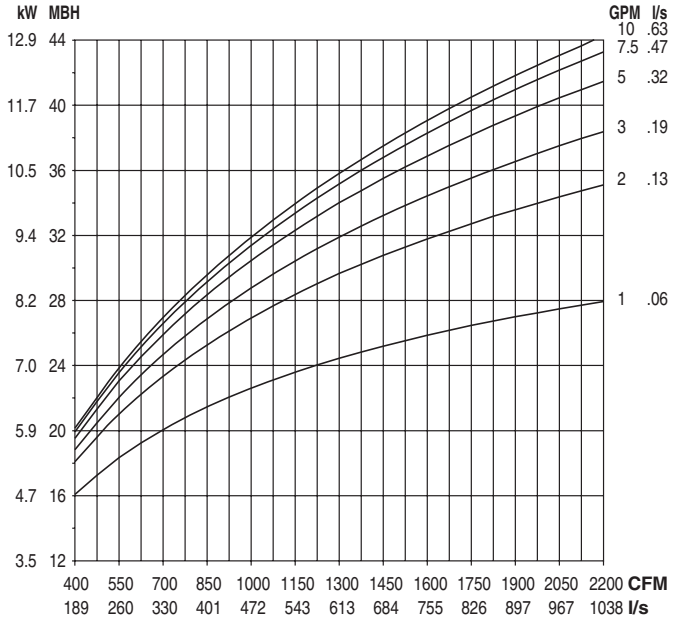


2 Row (multi-circuit)

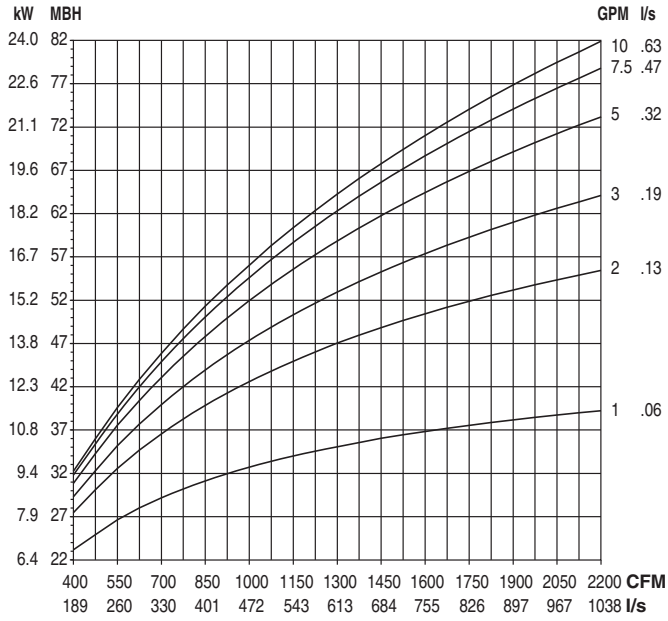


Unit Size 12

1 Row (single circuit)



2 Row (multi-circuit)



NOTES:

1. Capacities are in MBH (kW), ***thousands of Btu per hour (kiloWatts)***.
2. MBH (kW) values are based on a Δt (temperature difference) of 125°F (69°C) between entering air and entering water. For other Δt's; multiply the MBH (kW) values by the factors below.
3. Air Temperature Rise.
   ATR (°F) = 927 x $\frac{\text{MBH}}{\text{cfm}}$, ATR (°C) = 829 x $\frac{\text{kW}}{\text{l/s}}$
4. Water Temp. Drop.
   WTD (°F) = 2.04 x $\frac{\text{MBH}}{\text{GPM}}$, WTD (°C) = .224 x $\frac{\text{kW}}{\text{l/s}}$
5. Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

Correction factors at other entering conditions:

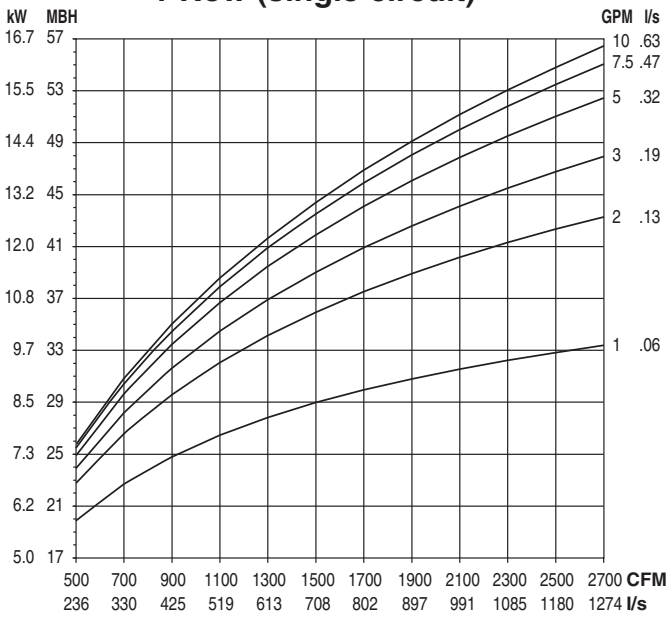
Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.320 (.319)	.400 (.406)	.480 (.478)	.560 (.565)	.640 (.638)	.720 (.725)	.800 (.812)	.880 (.884)	1.00 (1.00)	1.12 (1.13)	1.28 (1.29)	1.44 (1.45)

Performance Data • Hot Water Coil

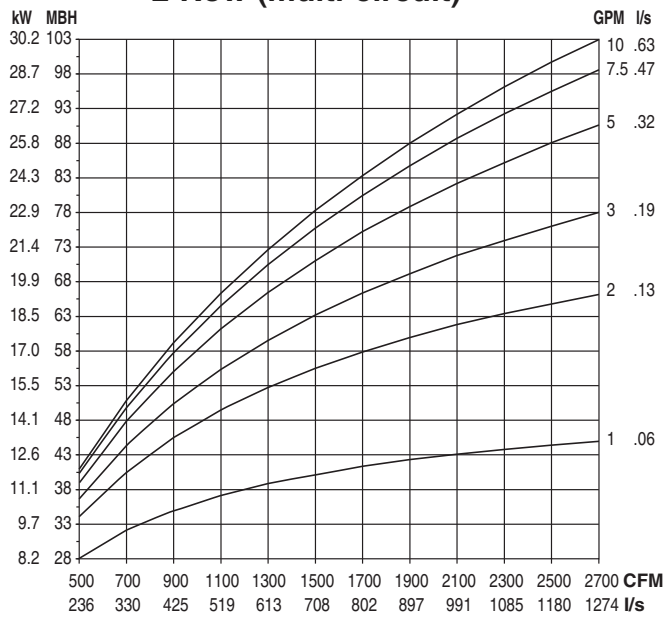
Model: 34RW

Unit Size 14

1 Row (single circuit)

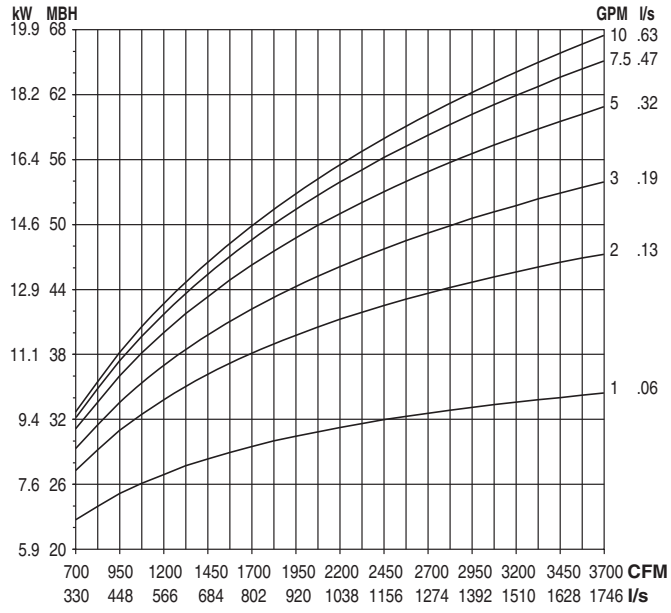


2 Row (multi-circuit)

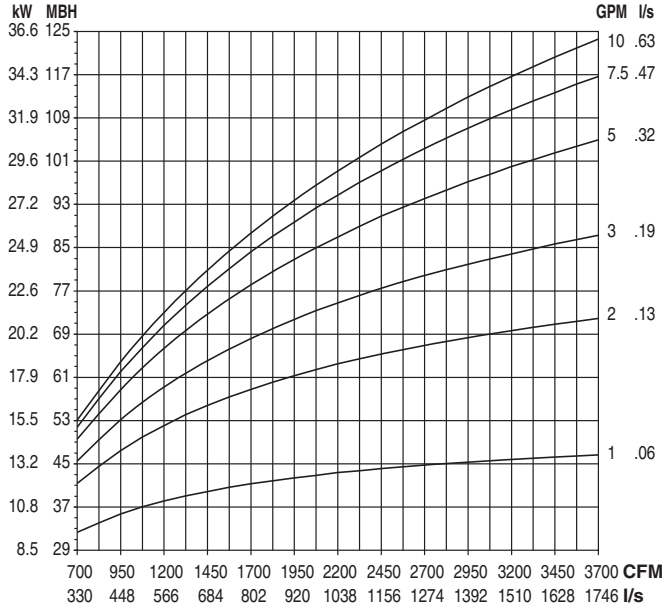


Unit Size 16

1 Row (single circuit)



2 Row (multi-circuit)



NOTES:

1. Capacities are in MBH (kW), ***thousands of Btu per hour (kiloWatts)***.
2. MBH (kW) values are based on a Δt (temperature difference) of 125°F (69°C) between entering air and entering water. For other Δt's; multiply the MBH (kW) values by the factors below.
3. Air Temperature Rise.
   ATR (°F) = 927 x $\frac{\text{MBH}}{\text{cfm}}$, ATR (°C) = 829 x $\frac{\text{kW}}{\text{l/s}}$
4. Water Temp. Drop.
   WTD (°F) = 2.04 x $\frac{\text{MBH}}{\text{GPM}}$, WTD (°C) = .224 x $\frac{\text{kW}}{\text{l/s}}$
5. Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder (Unit Size 14). 1, 2, 3 and 4 Row 7/8" (22); O.D. male solder (Unit Size 16)

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

Correction factors at other entering conditions:

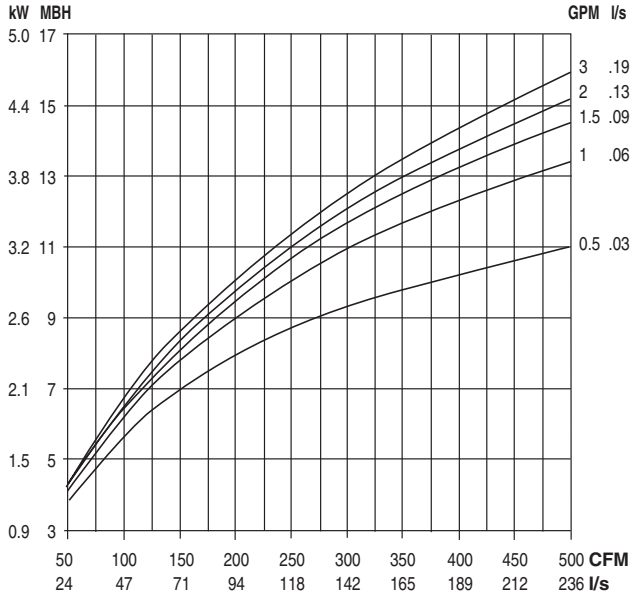
Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.320 (.319)	.400 (.406)	.480 (.478)	.560 (.565)	.640 (.638)	.720 (.725)	.800 (.812)	.880 (.884)	1.00 (1.00)	1.12 (1.13)	1.28 (1.29)	1.44 (1.45)

Performance Data • Hot Water Coil

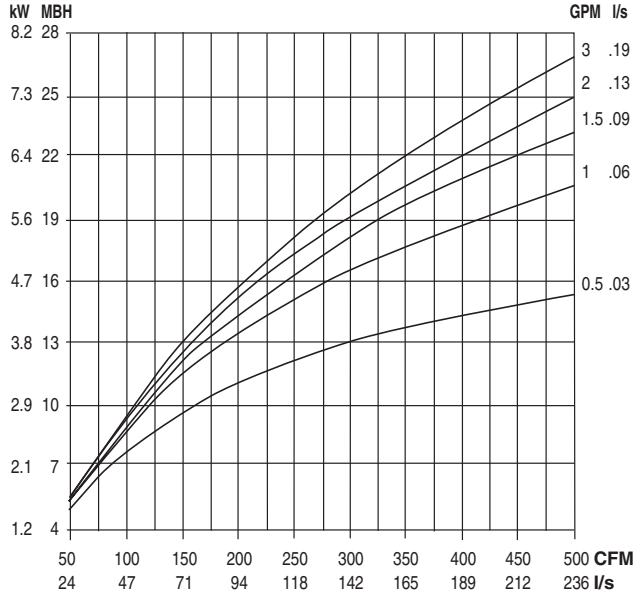
Model: 34RW

Unit Size 6

1 Row (single circuit)

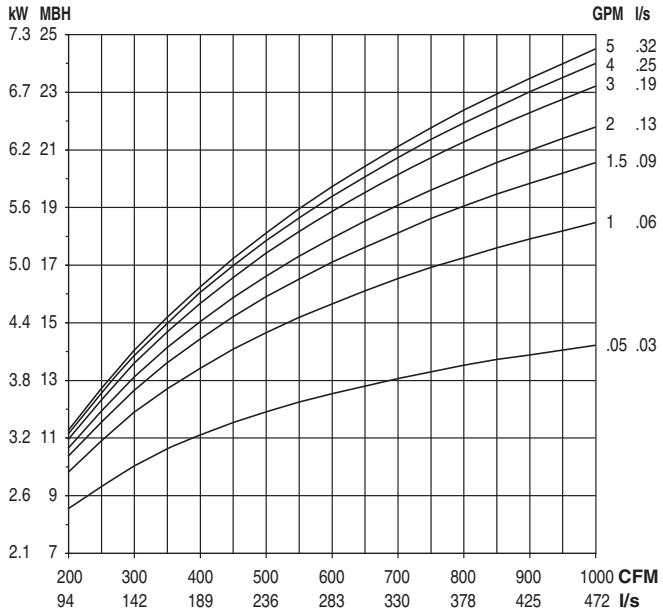


2 Row (multi-circuit)

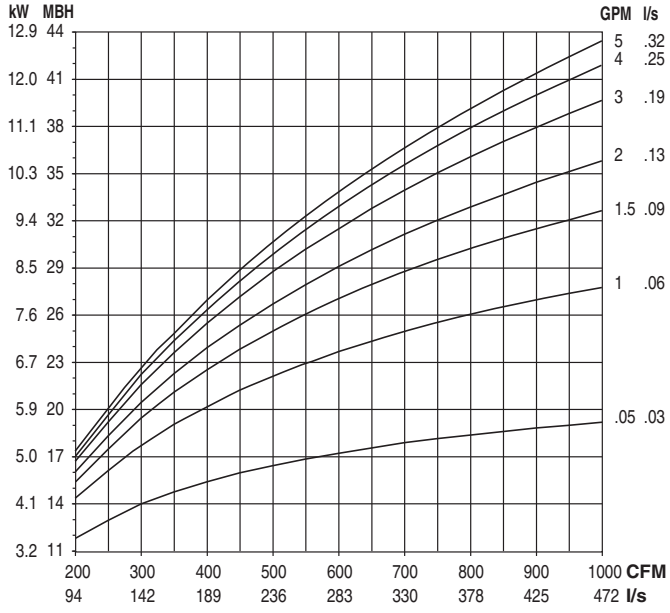


Unit Size 8

1 Row (single circuit)



2 Row (multi-circuit)



NOTES:

1. Capacities are in MBH (kW), ***thousands of Btu per hour (kiloWatts)***.
2. MBH (kW) values are based on a Δt (temperature difference) of 125°F (69°C) between entering air and entering water. For other Δt's; multiply the MBH (kW) values by the factors below.
3. Air Temperature Rise.
   ATR (°F) = 927 x $\frac{\text{MBH}}{\text{cfm}}$, ATR (°C) = 829 x $\frac{\text{kW}}{\text{l/s}}$
4. Water Temp. Drop.
   WTD (°F) = 2.04 x $\frac{\text{MBH}}{\text{GPM}}$, WTD (°C) = .224 x $\frac{\text{kW}}{\text{l/s}}$
5. Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

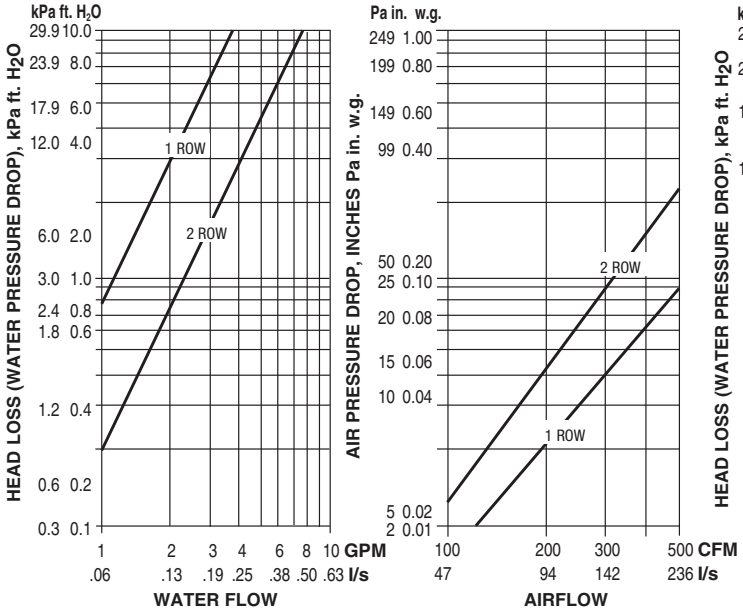
Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.320 (.319)	.400 (.406)	.480 (.478)	.560 (.565)	.640 (.638)	.720 (.725)	.800 (.812)	.880 (.884)	1.00 (1.00)	1.12 (1.13)	1.28 (1.29)	1.44 (1.45)

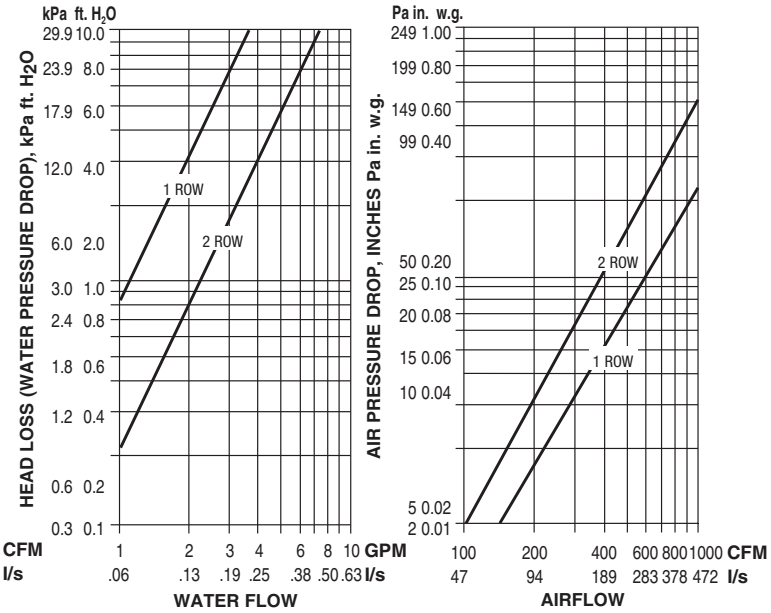
Performance Data • Hot Water Coil • Pressure Drops

Model: 34RW

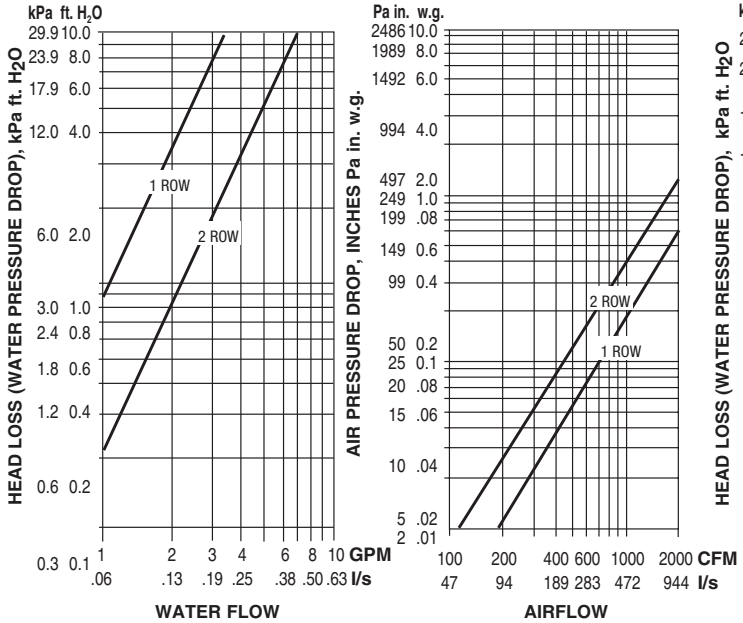
Unit Size 6



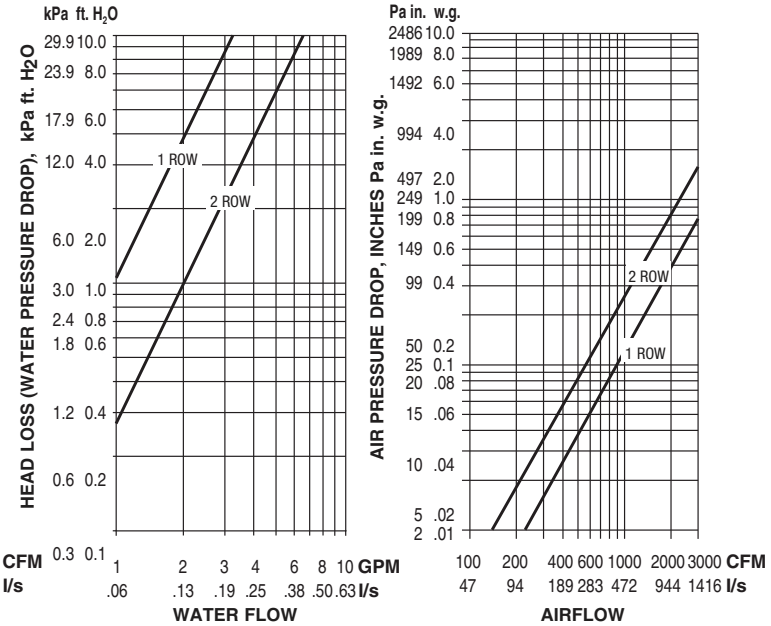
Unit Size 8



Unit Size 10



Unit Size 12

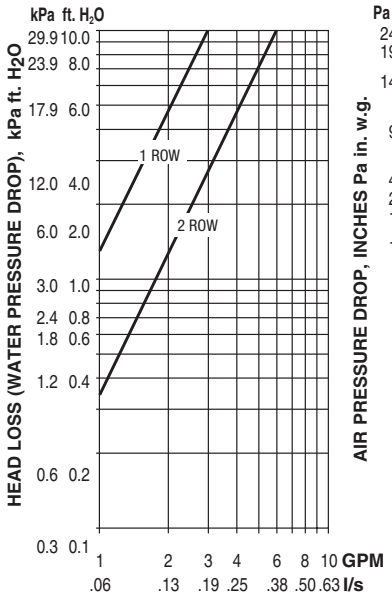


Performance Data • Hot Water Coil • Pressure Drops

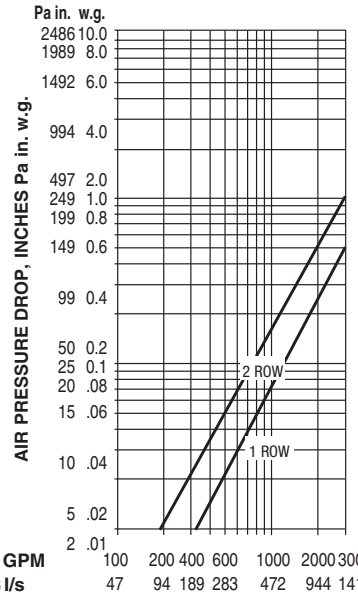
Models: 34RW

Unit Size 14

Water Pressure Drop

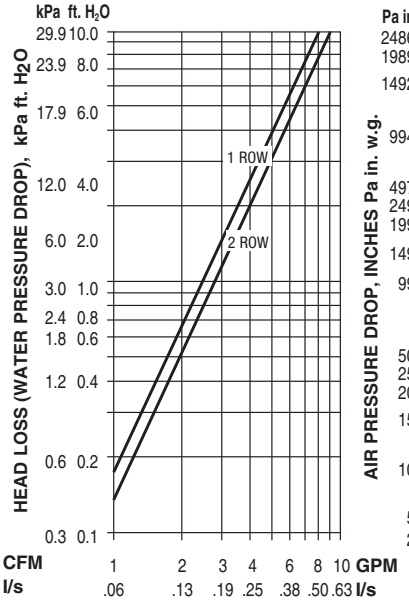


Air Pressure Drop

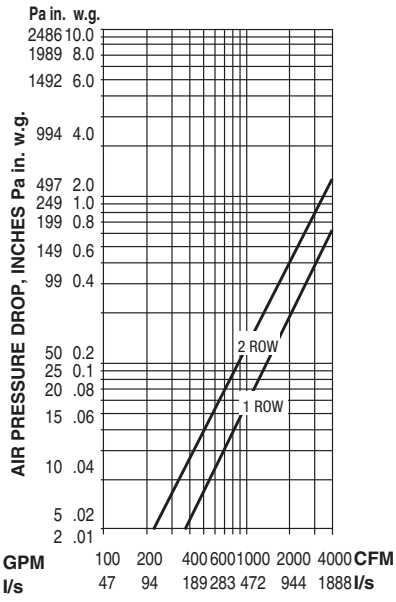


Unit Size 16

Water Pressure Drop



Air Pressure Drop



Metric Conversion Factors:

1. Water Flow (liters per second)
   l/s = gpm x 0.6309
2. Water Head Loss (kilopascals):
   kPa = ft. w.g. x 2.9837
3. Airflow Volume (liters per second)
   l/s = cfm x 0.472
4. Air Pressure Drop (Pascals):
   Pa = in. w.g. x 248.6
5. Heat (kiloWatts):
   kW = MBH x 0.293

Performance Data • Sound Power Levels

3400 Series • Bypass

Fiberglass Liner

AHRI CERTIFIED™ www.ahridirectory.org
VAV Terminals
AHRI Standard 880

Inlet Size	Airflow		Min. Discharge ΔPs		Min Bypass ΔPs		Sound Power Octave Bands															
							Discharge						Radiated									
													Bypass Closed						Bypass Open			
	cfm	l/s	"w.g.	Pa	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7
6	400	189	0.01	2	0.14	35	63	59	55	50	42	40	42	37	33	24	20	20	54	55	52	52	51	37
	300	142	0.01	2	0.08	20	58	52	48	43	34	31	-	34	25	-	-	-	47	48	45	47	37	26
	200	94	0.01	2	0.04	10	56	46	41	34	23	20	-	-	-	-	-	-	-	38	34	32	-	-
	100	47	0.01	2	0.01	2	55	43	27	-	-	-	-	-	-	-	-	-	-	34	29	-	-	-
8	700	330	0.01	2	0.21	52	61	58	52	48	38	32	47	41	34	28	26	20	60	59	55	53	48	41
	500	236	0.01	2	0.11	27	57	49	43	38	27	20	43	34	27	-	-	-	52	50	46	43	30	28
	350	165	0.01	2	0.05	12	56	44	34	28	-	-	-	32	-	-	-	-	47	40	37	32	25	-
	200	94	0.01	2	0.02	5	56	43	-	-	-	-	-	-	-	-	-	-	43	30	-	-	-	-
10	1100	519	0.01	2	0.43	107	63	57	50	48	43	42	52	49	46	37	32	23	65	64	62	60	56	52
	800	378	0.01	2	0.23	57	59	50	44	40	35	33	49	43	39	28	26	-	56	55	52	50	46	41
	500	236	0.01	2	0.09	22	55	43	33	23	-	-	43	35	29	-	-	-	47	45	43	41	34	-
	200	94	0.01	2	0.01	3	53	42	-	-	-	-	-	-	-	-	-	-	42	30	-	-	-	-
12	1600	755	0.01	2	0.50	124	64	58	53	49	44	36	48	51	47	37	35	29	69	69	66	63	60	56
	1200	566	0.01	2	0.28	70	58	52	44	41	34	24	43	41	38	29	25	-	61	60	58	56	52	46
	800	378	0.01	2	0.13	32	54	44	33	28	-	-	40	33	29	-	-	-	50	49	49	46	39	31
	400	189	0.01	2	0.03	7	51	40	-	-	-	-	-	-	25	-	-	-	44	40	41	35	28	-
14	2100	991	0.20	49	0.50	124	70	64	58	53	50	45	54	58	56	49	49	41	69	69	67	65	61	57
	1550	731	0.10	25	0.27	68	62	55	50	45	41	33	48	50	49	42	40	29	62	62	60	57	53	48
	1000	472	0.04	10	0.11	28	56	45	37	32	26	-	44	40	38	29	-	-	51	50	50	45	40	31
	450	212	0.01	2	0.02	5	53	42	-	-	-	-	-	31	26	-	-	-	-	37	36	29	-	-
16	2750	1298	0.12	29	0.50	124	69	64	60	56	52	45	64	63	59	49	46	37	73	73	71	69	65	61
	2050	967	0.06	16	0.28	70	64	57	51	47	42	33	57	54	50	41	36	25	65	65	63	61	56	50
	1350	637	0.03	8	0.12	30	57	48	40	35	27	-	45	41	38	27	-	-	54	53	53	50	44	34
	650	307	0.01	2	0.03	7	54	44	32	28	22	-	-	-	-	-	-	-	40	35	33	25	-	-

For performance table notes, see page E13; highlighted numbers indicate embedded AHRI certification points.