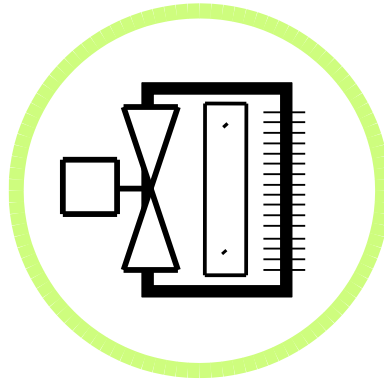


UNIT HEATERS



TECHNICAL CATALOG



MANUFACTURERS OF HYDRONIC HEATING AND COOLING
COMMERCIAL & INDUSTRIAL

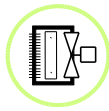
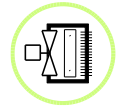


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1. PRODUCT OVERVIEW

Overview

Sigma horizontal and vertical propeller unit heaters feature a wide performance range for both hot water and steam applications. The performance range is consolidated to reduce the number of different models, simplifying the selection, ordering and installation activities.

All single-phase models may be ordered with a low-cost speed-reducer permitting units to be field tuned. Side entry coil connections on model H units permit installation in clearance-critical low ceiling environments.

Performance

All units are designed for maximum airflow and for optimum air distribution. As a result, outlet temperatures are reduced, avoiding unwanted “hot spots”.

Configuration

All horizontal units are equipped with horizontal louvers for simple vertical air distribution adjustment. Optional Louvre Fin Diffusers on horizontal units permit enhanced air distribution adjustment with either a wide spread of warmth or focused warm air for greater unit throw. Optional Louvre Cone Diffusers are available on vertical units to permit airflow distribution adjustment to best suit the site conditions.

Cabinets

Cabinets are constructed from heavy-duty, cold-rolled, corrosion-resistant steel finished in grey baked enamel.

Coils

All standard coils have Copper tubes with Aluminum fins, designed and tested to have a high working pressure rating and long operational life.

Fans

Unit fans are statically and dynamically balanced and all motors are resilient-mounted resulting in quiet operation. Model H motors are mounted onto sturdy mounts, which also act as fan guards.

Blade & Diffusers

Inherently stable blades on the model V Louvre Cone Diffuser permit louvre blades to be set at any position without flutter. The louvers cone diffuser on the type V model consists of radially positioned, individually adjustable blades for maximum air distribution adaptability.

All louvre blades have rugged retaining springs keeping blades at their set position. These springs permit unlimited blade adjustment over the unit’s life without decreasing the blade holding force.

2. FEATURES & BENEFITS

CABINETS

Cabinets are constructed from 18 gauge Galvanneal corrosion-resistant steel with a durable grey baked on powder coat finish. Enhanced corrosion protection options are available. These include Stainless Steel or enhanced coating such as Heresite.

Back panels on the air-inlet side have integral fan inlet collars for additional stiffness and enhanced air-side performance.

LOUVRES

All louvre blades have rugged retaining springs keeping blades at their set position. These springs permit unlimited blade adjustment over the unit's life without decreasing the blade holding force.

COILS

Coils are constructed from heavy-duty minimum 1/2" diameter copper tubes with mechanically bounded aluminum fins. All coils are pressure-tested at no less than 450 psig and are rated for design pressures of up to 360 psig across all standard models.

FANS

All Fans are statically and dynamically balanced. The entire fan-motor assembly on horizontal unit heaters with standard motors 1/2 horse power and smaller are supported by a sturdy wire-form mount, which in itself is a fan guard that meets OSHA standard. The fan blades are aluminum and as such all units comply with AMCA Type C spark-resistant construction.

MOTORS

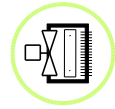
Standard 120/1/60 motors are of TEAO (Totally-Enclosed Air-Over) construction, with up to 1/2 horse power motors having built-in automatic thermal overload protection. All other motor types and sizes will require an external overload feature. Standard motors are resilient mounted for quiet, low-vibration operation and are ideally suited for long trouble-free life. Air-Over implies that the motor requires air movement provided by other means for its cooling. Since all Unit Heaters inherently draw ambient air over the motor via its driven axial fan, ample motor cooling is achieved without requiring a more expensive and energy consuming TEFC (totally-enclosed fan-cooled) motor. Explosion-Proof motors are optional. NEMA 4/4X or washdown rated motors are available.

OPTIONAL CONTROL ACCESSORIES

All units come equipped with an electrical junction box for simple field electrical hook-up. Optional unit mounted or remote control accessories include but are not limited to the following:

- Disconnect switch
- Manual starter switch with overload
- Thermostat
- Aquastat
- Speed control
- Low voltage motor rated relay with or without transformer





3. PRODUCT OPTIONS

3.1 MODEL NUMBER BREAKDOWN

Sample Product Number:

SUH-D.0-015H-STD-TEAO-1-NSPD-UT-UAQS-UDSC-OSHA-STDLV-24R-WSC
 1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. Product

2. Generation

3. Size

Horizontal Unit Heater

015H, 025H, 030H, 040H, 047H
 058H, 062H, 084H, 105H, 133H
 200H, 245H, 260H, 325H

Vertical Unit Heater

039V, 050V, 054V, 067V, 078V
 100V, 145V, 210V, 300V, 370V
 480V

4. Application

STD- Standard Temp. Output

5. Motor Style

TEAO - Totally Enclosed Air Over (NEMA 1)
 XPFC- Explosion Proof

6. Voltage/Phases/Frequency

1 - 120/1/60
 2 - 208-230/1/60
 3 - 208-230/3/60
 4 - 460/3/60
 5 - 575/3/60

(Not all V/P/F available for all Unit Heaters)

7. Fan Speed Control

NSPD- No Speed Controls
 USPD- Unit Mounted Speed Controls
 RSPD- Remote/Field Installed Speed Controls

8. Thermostat

NT- No Thermostat
 UT- Unit Mounted Thermostat
 RT- Field Installed Thermostat

9. Aquastat

NAQS- No Aquastat
 UAQS - Unit Mounted Aquastat

10. Disconnect Switch

NDSC - No Disconnect
 UTSW - Unit Mounted Toggle Switch - Not Lockable
 UDSC - Unit Mounted Disconnect - Lockable
 UMSOL - Unit Mounted Manual Starter with
 Overload - Lockable
 UMSOL PL- Unit Mounted Manual Starter with
 Overload and Pilot Light- Lockable
 RDSC - Field Mounted Disconnect - Lockable
 RMSOL - Field Mounted Manual Starter with
 Overload - Lockable
 UMSOL PL- Field Mounted Manual Starter with
 Overload and Pilot Light- Lockable

11. Fan/Motor Guard

OSHA - OSHA Guard
 STDWF- Standard Wire Form

12. Discharge

STDLV - Standard Louver (Horizontal Only)
 LFD - Extra V Type Louver Fin Diffuser (Horizontal
 Only)
 NOLCD - No LCD—Louver Cone Diffuser (Vertical
 Only)
 LCD - Louver Cone Diffuser (Vertical Unit)

13. Low Voltage Control Options

N - None Selected
 24R - Unit mounted 24VAC relay for motor control
 (non wetted)
 24RW - Unit mounted 24VAC relay with 120/24VAC
 40VA transformer

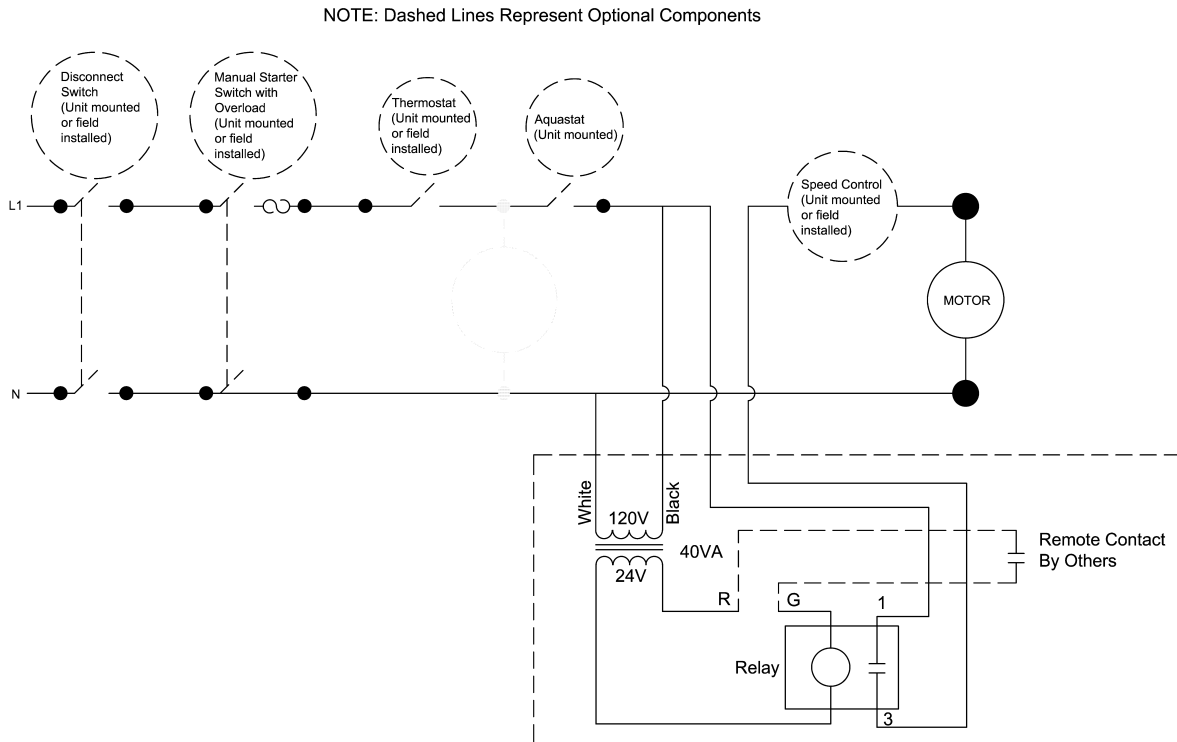
14. Coil Type

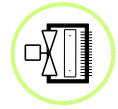
WSC- Water/Low Pressure (< 15PSI) Steam Coil
 (Consult Factory for High Pressure Steam)

3. PRODUCT OPTIONS

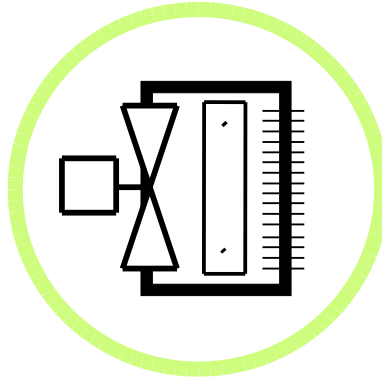
3.2 WIRING DIAGRAM

Typical Single Phase Wiring Diagram





UNIT HEATERS



4. HORIZONTAL UNIT HEATERS



4. HORIZONTAL UNIT HEATERS

4.1 Dimensions - Horizontal Unit w/ Direct Mount Motor (Standard 1 Phase Motor)

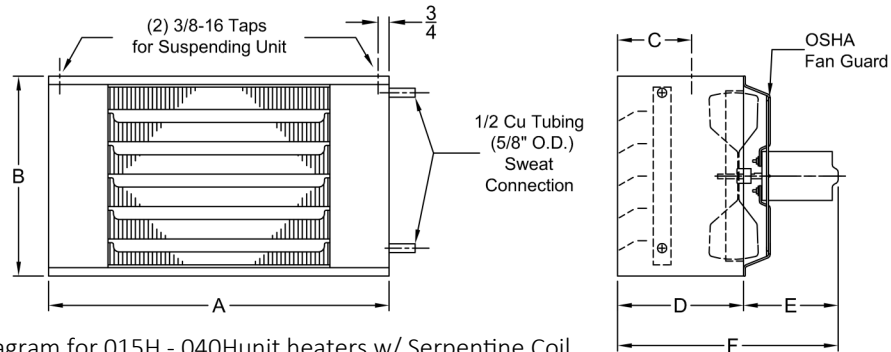


Figure 4.1
Dimension Diagram for 015H - 040H unit heaters w/ Serpentine Coil

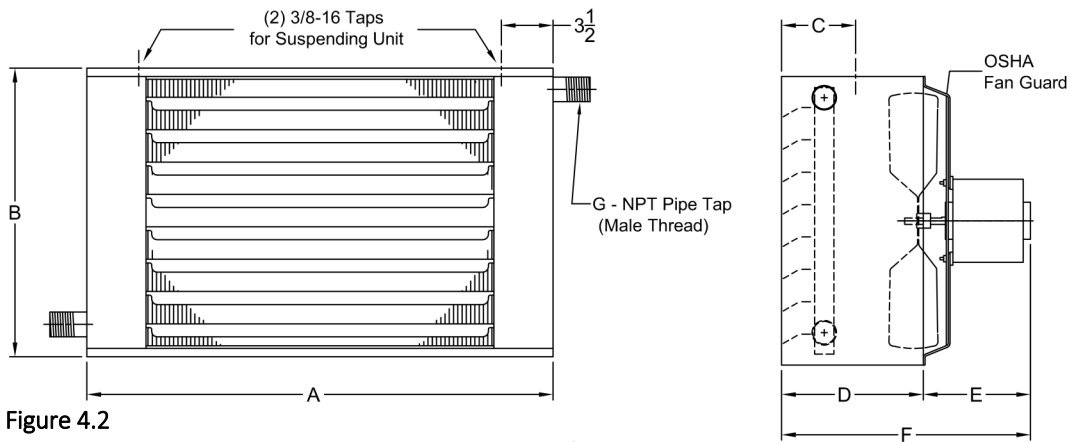
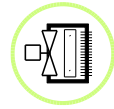


Figure 4.2
Dimension Diagram for 047H - 260H Unit Heaters w/ Multi Circuit Coil

Table 4.1 - Horizontal Unit Heater Specifications

Model	Figure Ref.	Dimensions							Dry Wt (lb)	Coil Volume (cu in)
		A	B	C	D	E	F	G		
015H	4.1	19	13.5	4.750	8.0	6.50	14.50	FIG. 4.1	29	26
025H	4.1	22.0	13.5	4.750	8.0	6.50	14.50	FIG. 4.1	34	40
030H	4.1	22.0	13.5	4.750	8.0	6.50	14.50	FIG. 4.1	34	40
040H	4.1	22.0	13.5	4.750	8.0	6.50	14.50	FIG. 4.1	34	40
047H	4.2	27.0	16.5	5.000	8.5	7.75	16.25	1.25	45	75
058H	4.2	27.0	16.5	5.000	8.5	7.75	16.25	1.25	45	75
062H	4.2	31.5	16.5	5.625	10.0	6.50	16.50	1.25	60	120
084H	4.2	31.5	19.5	5.625	10.0	7.50	17.50	1.25	66	120
105H	4.2	31.5	19.5	5.625	10.0	7.50	17.50	1.25	66	120
133H	4.2	37.0	24.0	5.875	10.0	7.50	17.50	1.50	81	170
200H	4.2	42.5	28.5	5.875	10.0	9.50	19.50	1.50	116	245
245H	4.2	46.5	31.5	5.625	10.0	10.00	20.00	1.50	134	300
260H	4.2	46.5	31.5	5.625	10.0	10.00	20.00	1.50	134	300
325H	Comes with Base Mount Motor - Refer to Figure 4.4 for details									

Sigma reserve the rights to make changes in dimension or otherwise due to continuous product improvement.



4. HORIZONTAL UNIT HEATERS

4.2 Dimensions - Horizontal Unit w/ Base Mount Motor (3 Phase Motor, Washdown, Explosion Proof Motors)

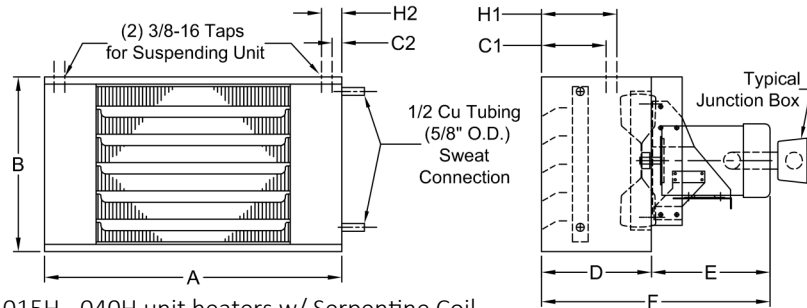


Figure 4.3
Dimension Diagram for 015H - 040H unit heaters w/ Serpentine Coil

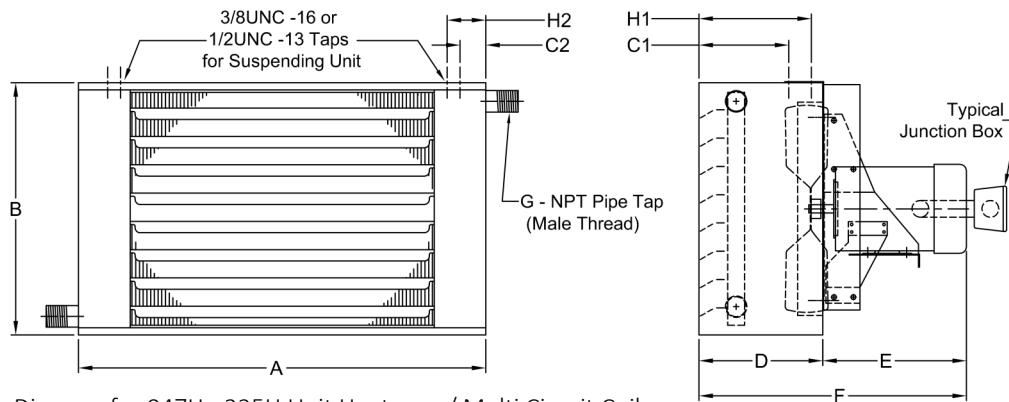


Figure 4.4
Dimension Diagram for 047H - 325H Unit Heaters w/ Multi Circuit Coil

Table 4.2 - Horizontal Unit Heater Specifications													
Model	Figure Ref.	Dimensions										DRY WT (LB)	Coil Volume (cu in)
		A	B	C1	C2	D	E	F	G	H1	H2		
015H	4.3	19	13.5	4.750	0.75	8.0	6.50	14.50	FIG. 4.1	7.375	0.75	52	26
025H	4.3	22.0	13.5	4.750	0.75	8.0	6.50	14.50	FIG. 4.1	7.375	0.75	61	40
030H	4.3	22.0	13.5	4.750	0.75	8.0	6.50	14.50	FIG. 4.1	7.375	0.75	65	40
040H	4.3	22.0	13.5	4.750	0.75	8.0	6.50	14.50	FIG. 4.1	7.375	0.75	65	40
047H	4.4	27.0	16.5	5.000	3.50	8.5	7.75	16.25	1.25	7.875	3.50	73	75
058H	4.4	27.0	16.5	5.000	3.50	8.5	7.75	16.25	1.25	7.875	3.50	73	75
062H	4.4	31.5	16.5	5.625	4.50	10.0	6.50	16.50	1.25	9.000	4.50	96	120
084H	4.4	31.5	19.5	5.625	4.50	10.0	7.50	17.50	1.25	9.000	4.50	101	120
105H	4.4	31.5	19.5	5.625	4.50	10.0	7.50	17.50	1.25	9.000	4.50	121	120
133H	4.4	37.0	24.0	5.875	3.50	10.0	7.50	17.50	1.50	N/A	N/A	133	170
200H	4.4	42.5	28.5	5.500	3.50	10.0	9.50	19.50	1.50	8.750	5.25	173	245
245H	4.4	46.5	31.5	5.500	3.50	10.0	10.00	20.00	1.50	8.750	7.25	197	300
260H	4.4	46.5	31.5	5.500	3.50	10.0	10.00	20.00	1.50	8.750	7.25	215	300
325H	4.4	46.5	31.5	5.500	3.50	10.0	15.00	19.50	1.50	8.750	7.25	255	530

Sigma reserve the rights to make changes in dimension or otherwise due to continuous product improvement.

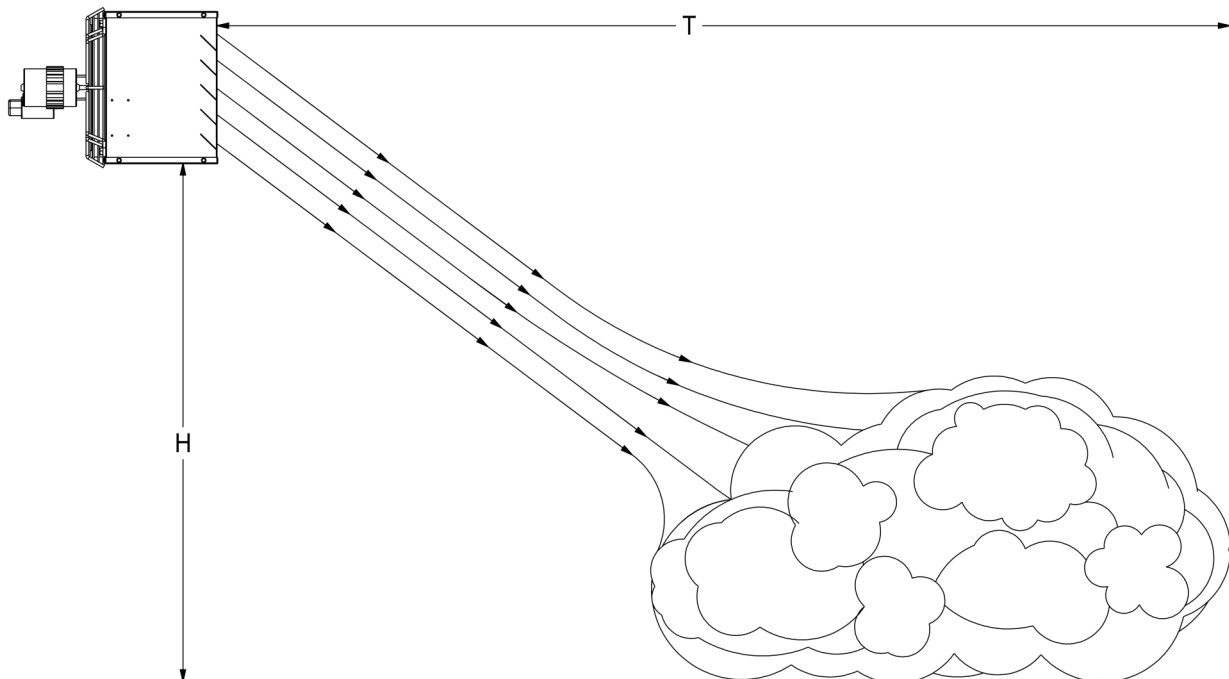
Note: This arrangement includes following motor types:

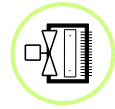
- Three phase totally enclosed motor
- Wash-down rated motor, single or three phase
- Explosion-Proof rated motor, single or three phase
- OSHA guard not shown for simplicity.

4. HORIZONTAL UNIT HEATERS

4.3 Horizontal Heat Throw

Table 4.3		Maximum Throw "T" [ft]	
Unit Size	Maximum Mounting Height "H" [ft]	W/ HORIZ. LOUVERS	W/ VERT. LOUVERS
015H	9	16	19
025H	9	19	24
030H	9	18	23
040H	10	23	29
047H	10	23	29
058H	10	28	35
062H	10	25	30
084H	12	32	40
105H	12	38	48
133H	13	40	50
200H	15	50	64
245H	16	54	68
260H	16	56	70
325H	16	60	75

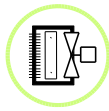




4. HORIZONTAL UNIT HEATERS

4.4 Horizontal Unit Performance Data

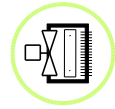
Table 4.4 - Standard Horizontal Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
0.15H	10	16.4	3.4	97.8	0.8	21	21.7
CFM 400	20	15.0	1.6	94.6	0.2		
RPM 1050	30	13.7	1.0	91.6	0.1		
1/20 HP	40	12.3	0.6	88.4	0.1		
0.68 A	50	11.0	0.5	85.4	0.1		
015H	10	16.0	3.3	103.4	0.8	20.1	20.8
CFM 340	20	14.3	1.5	98.8	0.2		
RPM 900	30	12.7	0.9	94.5	0.1		
1/20 HP	40	11.0	0.6	89.9	0.1		
0.68 A	50	8.9	0.4	84.2	0.1		
015H	10	14.2	2.9	106.8	0.7	18	18.7
CFM 280	20	12.8	1.3	102.2	0.2		
RPM 750	30	11.4	0.8	97.6	0.1		
1/20 HP	40	9.8	0.5	92.3	0.1		
0.68 A	50	8.0	0.3	86.4	0.1		
025H	10	27.2	5.6	102.5	5.0	32.5	33.7
CFM 590	20	25.0	2.6	99.1	1.3		
RPM 1050	30	22.7	1.6	95.5	0.5		
1/20 HP	40	20.5	1.1	92.1	0.3		
0.68 A	50	18.3	0.8	88.6	0.2		
025H	10	25.4	5.2	106.9	2.8	30.6	31.8
CFM 500	20	23.5	2.4	103.4	0.8		
RPM 900	30	21.5	1.5	99.7	0.3		
1/20 HP	40	19.4	1.0	95.8	0.2		
0.68 A	50	17.6	0.7	92.5	0.1		
025H	10	23.0	4.8	110.5	2.5	27.7	28.8
CFM 420	20	21.2	2.2	106.6	0.6		
RPM 750	30	19.4	1.3	102.6	0.3		
1/20 HP	40	17.7	0.9	98.9	0.1		
0.68 A	50	15.9	0.7	94.9	0.1		
030H	10	29.7	6.1	125.2	5.9	36.6	38.1
CFM 420	20	27.2	2.8	119.7	1.5		
RPM 850	30	24.6	1.7	114.0	0.6		
1/20 HP	40	22.1	1.1	108.5	0.3		
0.68 A	50	19.6	0.8	103.0	0.2		
030H	10	33.9	7.0	120.1	7.4	40.3	41.9
CFM 520	20	30.9	3.2	114.8	1.8		
RPM 1050	30	28.0	1.9	109.6	0.8		
1/20 HP	40	25.2	1.3	104.7	0.4		
0.68 A	50	22.3	0.9	99.5	0.2		
040H	10	37.5	7.7	115.7	8.9	43.8	45.6
CFM 620	20	34.2	3.5	110.8	2.2		
RPM 1150	30	31.0	2.1	106.1	0.9		
1/8 HP	40	27.8	1.4	101.3	0.5		
1.35 A	50	24.7	1.0	96.7	0.3		



4. HORIZONTAL UNIT HEATERS

4.4 Horizontal Unit Performance Data

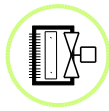
Table 4.4 (continued) - Standard Horizontal Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
040H	10	40.9	8.4	111.6	10.5	47.1	49.1
CFM 730	20	37.4	3.9	107.2	2.6		
RPM 1350	30	33.9	2.3	102.8	1.1		
1/8 HP	40	30.4	1.6	98.4	0.5		
1.35 A	50	27.0	1.1	94.1	0.3		
040H	10	44.0	9.1	108.3	11.9	50.1	52.2
CFM 840	20	40.2	4.1	104.1	3.0		
RPM 1550	30	36.4	2.5	100.0	1.2		
1/8 HP	40	32.7	1.7	95.9	0.6		
1.35 A	50	29.1	1.2	91.9	0.3		
047H	10	45.8	9.4	123.0	2.8	56.3	58.6
CFM 670	20	41.3	4.3	116.8	0.7		
RPM 850	30	37.0	2.5	110.9	0.3		
1/20 HP	40	32.7	1.7	105.0	0.1		
0.68 A	50	28.4	1.2	99.1	0.1		
047H	10	52.0	10.7	117.7	3.5	62.0	64.6
CFM 830	20	46.9	4.8	112.1	4.8		
RPM 1050	30	42.0	2.9	106.6	0.3		
1/20 HP	40	37.0	1.9	101.1	0.2		
0.68 A	50	32.3	1.3	95.9	0.1		
058H	10	54.8	11.3	115.5	3.8	64.7	67.4
CFM 910	20	49.4	5.1	110.0	0.9		
RPM 1150	30	44.2	3.0	104.8	0.4		
1/8 HP	40	39.0	2.0	99.5	0.2		
1.35 A	50	34.0	1.4	94.4	0.1		
058H	10	59.9	12.4	111.6	4.5	69.6	72.5
CFM 1070	20	54.0	5.6	106.5	1.1		
RPM 1350	30	48.2	3.3	101.5	0.4		
1/8 HP	40	42.6	2.2	96.7	0.2		
1.35 A	50	37.1	1.5	92.0	0.1		
058H	10	64.1	13.2	108.4	5.1	74.1	77.2
CFM 1220	20	57.8	6.0	103.7	1.2		
RPM 1550	30	51.6	3.5	99.0	0.5		
1/8 HP	40	45.6	2.4	94.4	0.2		
1.35 A	50	39.7	1.6	90.0	0.1		
062H	10	59.3	12.2	130.1	6.5	76.6	79.8
CFM 780	20	54.3	5.6	124.2	1.6		
RPM 850	30	49.5	3.4	118.5	0.7		
1/20 HP	40	44.6	2.3	112.7	0.3		
0.68 A	50	39.8	1.6	107.0	0.2		
062H	10	68.3	14.1	124.9	8.5	83.2	86.7
CFM 970	20	62.6	6.5	119.5	2.1		
RPM 1050	30	57.0	3.9	114.2	0.9		
1/20 HP	40	51.4	2.6	108.8	0.4		
0.68 A	50	45.9	1.9	103.6	0.3		



4. HORIZONTAL UNIT HEATERS

4.4 Horizontal Unit Performance Data

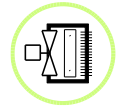
Table 4.4 (continued) - Standard Horizontal Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
084H	10	75.4	15.5	121.0	10.1	89.5	93.2
CFM 1140	20	69.1	7.1	115.9	2.5		
RPM 1150	30	62.9	4.3	110.9	1.1		
1/6 HP	40	56.7	2.9	105.8	0.5		
1.8 A	50	50.7	2.1	101.0	0.3		
084H	10	82.4	17.0	117.1	11.9	96.2	100.2
CFM 1330	20	75.5	7.8	112.3	3.0		
RPM 1350	30	68.8	4.7	107.7	1.2		
1/6 HP	40	62.0	3.2	103.0	0.6		
1.8 A	50	55.5	2.3	98.5	0.4		
084H	10	91.5	18.9	112.4	14.4	104.7	109.1
CFM 1610	20	83.9	8.6	108.0	3.6		
RPM 1625	30	76.4	5.3	103.7	1.5		
1/6 HP	40	68.9	3.6	99.4	0.8		
1.8 A	50	61.6	2.5	95.3	0.4		
105H	10	114.3	23.6	107.9	3.4	131.0	136.5
CFM 2200	20	105.0	10.8	104.0	0.8		
RPM 1625	30	95.4	6.6	100.0	0.3		
1/6 HP	40	86.1	4.4	96.1	0.2		
1.8 A	50	76.9	3.2	92.2	0.1		
133H	10	127.7	26.3	117.4	13.0	149.0	155.2
CFM 2050	20	117.2	12.1	112.7	3.3		
RPM 850	30	106.8	7.3	108.0	1.4		
1/4 HP	40	96.5	5.0	103.4	0.7		
3.3 A	50	86.4	3.6	98.8	0.4		
133H	10	145.4	30.0	111.5	16.5	165.8	172.7
CFM 2600	20	133.4	13.8	107.3	4.1		
RPM 1075	30	121.6	8.4	103.1	1.7		
1/4 HP	40	109.9	5.7	99.0	0.9		
3.3 A	50	98.5	4.1	94.9	0.5		
200H	10	196.0	40.4	113.4	5.8	227.7	237.2
CFM 3380	20	177.5	18.3	108.4	1.4		
RPM 850	30	159.6	11.0	103.5	0.6		
1/2 HP	40	141.9	7.3	98.7	0.3		
5.6 A	50	124.6	5.1	94.0	0.2		
200H	10	221.7	45.7	107.7	7.3	253.4	264.0
CFM 4280	20	200.8	20.7	103.2	1.8		
RPM 1075	30	180.4	12.4	98.8	0.7		
1/2 HP	40	160.5	8.3	94.6	0.4		
5.6 A	50	140.9	5.8	90.3	0.2		
245H	10	224.4	46.3	115.2	13.9	268.7	279.9
CFM 3750	20	215.7	22.2	113.0	7.8		
RPM 850	30	198.4	13.6	108.8	3.3		
1/2 HP	40	181.1	9.3	104.5	1.7		
5.6 A	50	164.0	6.8	100.3	1.0		



4. HORIZONTAL UNIT HEATERS

4.4 Horizontal Unit Performance Data

Table 4.4 (continued) - Standard Horizontal Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
245H	10	254.9	52.6	109.6	17.5	298.8	311.3
CFM 4740	20	245.0	25.3	107.6	9.8		
RPM 1075	30	225.5	15.5	103.8	4.1		
1/2 HP	40	205.9	10.6	100.0	2.1		
5.6 A	50	186.8	7.7	96.3	1.2		
260H	10					322.0	335.4
CFM 4900	20	260.0	26.8	108.9	12.5		
RPM 1075	30	236.1	16.2	104.4	4.8		
1/2 HP	40	213.2	11.0	100.1	2.1		
5.6 A	50	190.4	7.9	95.8	1.3		
325H	10					403.0	419.8
CFM 5500	20	325.0	33.5	114.5	4.5		
RPM 1075	30	295.1	20.3	109.5	1.9		
3/4 HP	40	266.5	13.7	104.7	1.0		
10.6 A	50	237.9	9.8	99.9	0.6		

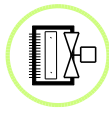


4. HORIZONTAL UNIT HEATERS

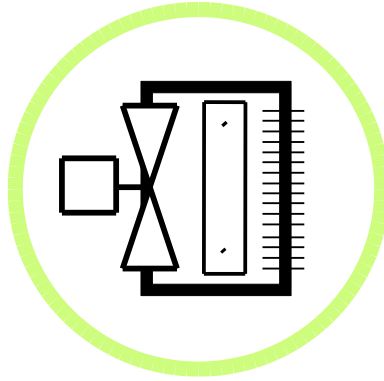
4.5 Horizontal Unit Sound Class

Type	Model	Sound Class
Horizontal	015H	I
	025H	II
	030H	III
	040H	III
	047H	III
	058H	III
	062H	III
	084H	III
	105H	IV
	133H	IV
	200H	V
	245H	V
	260H	V
	325H	V

Sound Class Rating	Location Description
I	Hospitals, Museums, Schools, Offices, Foyers, Restrooms
II	Department Stores, Showrooms, Commercial Dining Facilities
III	Gymnasiums, Bars, Warehouse Storage, Grocery Stores
II-IV	Garages, Factories, Stadiums Common Areas

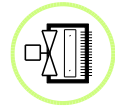


UNIT HEATERS



5. VERTICAL UNIT HEATERS





5. VERTICAL UNIT HEATERS

5.1 Vertical Unit Dimensions

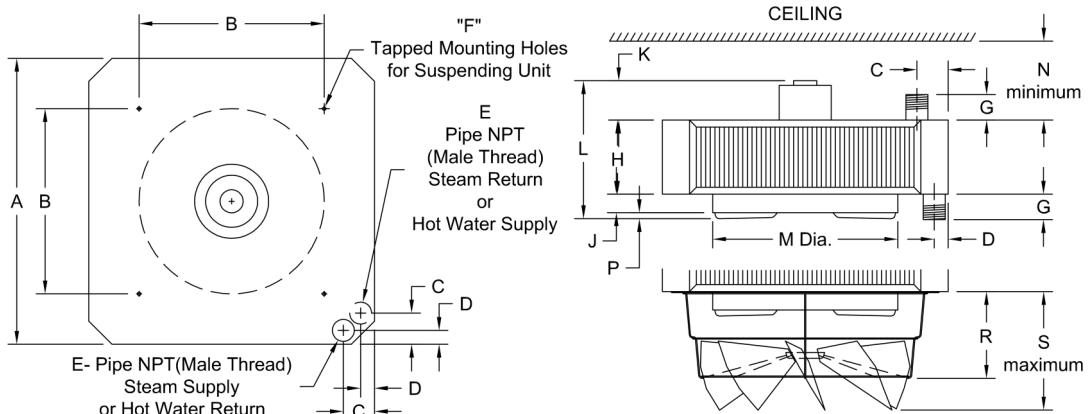


Figure 5.1 - Dimension Diagram For Vertical Unit Heater

Table 5.1 - Vertical Unit Heater Specifications									
Model	DIMENSIONS (IN)								
	A	B	C	D	E	F	G	H	J
039V	18.500	10	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.250
050V	18.500	10	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.250
054V	22.000	13	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.500
067V	22.000	13	2.625	1.25	1.5	3/8-16 UNC	2.75	6.125	1.500
078V	26.500	16	2.625	1.25	1.5	3/8-16 UNC	2.75	7.625	1.625
100V	26.500	16	2.625	1.25	1.5	3/8-16 UNC	2.75	7.625	1.625
145V	30.875	20	3.375	1.50	2.0	3/8-16 UNC	2.75	7.625	2.000
210V	36.875	25	3.375	1.50	2.0	3/8-16 UNC	2.75	7.625	2.375
300V	44.125	30	4.125	2.00	2.5	1/2-13 UNC	3.00	9.125	3.000
370V	44.125	30	4.125	2.00	2.5	1/2-13 UNC	3.00	13.625	3.000
375V	44.125	30	4.125	2.00	2.5	1/2-13 UNC	3.00	9.125	3.000
480V	44.125	30	4.125	2.00	2.5	1/2-13 UNC	3.00	13.625	3.000

Table 5.1 (continued) – Vertical Unit Heater Specification									
Model	DIMENSIONS (IN)							Dry Wt (lb)	Coil Volume (cu in)
	K	L	M	N	P	R	S		
039V	3.000	11.500	12.250	6	1.125	6.25	8.875	49	90
050V	3.000	11.500	12.250	6	1.125	6.25	8.875	50	90
054V	3.000	11.875	14.375	6	1.250	7.00	10.000	62	105
067V	3.000	11.875	14.375	6	1.250	7.00	10.000	63	105
078V	2.000	12.250	16.375	7	1.000	7.25	10.625	85	155
100V	2.000	12.250	16.375	7	1.000	7.25	10.625	90	155
145V	2.375	13.500	20.375	7	1.500	9.00	13.250	118	210
210V	4.000	15.250	24.500	7	1.250	8.50	11.875	146	245
300V	3.000	15.875	30.500	7	0.750	9.50	13.750	200	370
370V	1.875	19.250	30.500	7	0.750	9.50	13.750	265	470
375V	4.500	17.375	30.500	8	0.750	9.50	13.750	205	470
480V	2.500	19.875	30.500	8	0.750	9.50	13.750	270	470

Sigma reserve the rights to make changes in dimension or otherwise due to continuous product improvement.

5. VERTICAL UNIT HEATERS

5.2 Vertical Heat Throw

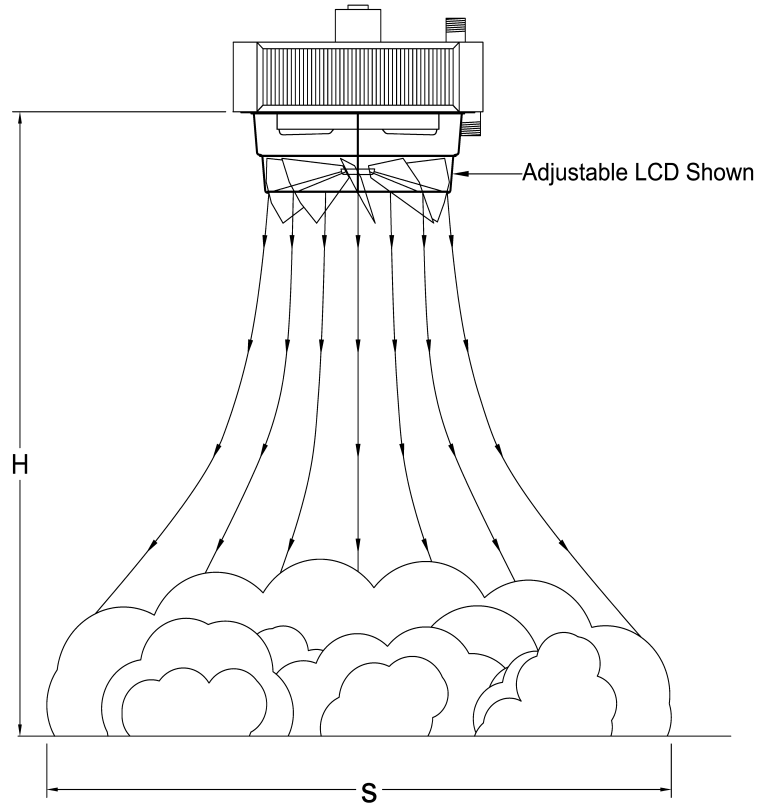
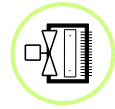


Figure 5.2 - Vertical Unit Heater with LCD

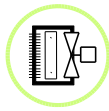
Table 5.3 - Maximum Mounting Height and Spread						
Unit Size	Without LCD		With LCD		With LCD	
	Height (ft)	Spread (ft)	Height (ft)	Spread (ft)	Height (ft)	Spread (ft)
039V	12	17	16	14.5	9	21.5
050V	17	23	22	20	12.75	29
054V	13	17	16	15	9.75	21.5
067V	19	23	23	21	14.25	29.5
078V	14	17.5	17	16	10.5	23
100V	21	25	25	23	15.75	32
145V	23	28	28	25.5	17.25	36.5
210V	26	32.5	32	29	19.5	41.5
300V	26	34.5	32	31	19.5	45
370V	28	35	34	32	21	46
480V	42	52	52	47	31.5	67.5



5. VERTICAL UNIT HEATERS

5.4 Vertical Unit Performance Data

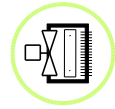
Table 5.4 - Standard Vertical Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
039V	10	40.3	8.3	125.2	0.3	51.0	53.1
CFM 570	20	34.9	3.6	116.4	0.1		
RPM 850	30	29.6	2.0	107.9	0.0		
1/20 HP	40	23.2	1.2	97.5	0.0		
0.68 A	50	20.6	0.8	93.3	0.0		
039V	10	46.3	9.5	120.1	0.4	56.1	58.4
CFM 710	20	40.0	4.1	111.9	0.1		
RPM 1150	30	33.9	2.3	104.0	0.0		
1/20 HP	40	27.2	1.4	95.3	0.0		
0.68 A	50	24.1	1.0	91.3	0.0		
050V	10	49.0	10.1	117.9	0.5	58.4	60.9
CFM 780	20	42.3	4.4	110.0	0.1		
RPM 1150	30	35.8	2.5	102.3	0.0		
1/8 HP	40	28.9	1.5	94.1	0.0		
1.35 A	50	25.6	1.1	90.3	0.0		
050V	10	53.5	11.0	114.2	0.6	62.8	65.4
CFM 910	20	46.1	4.8	106.7	0.1		
RPM 1350	30	39.0	2.7	99.5	0.0		
1/8 HP	40	31.7	1.6	92.1	0.0		
1.35 A	50	28.1	1.2	88.5	0.0		
050V	10	57.6	11.9	111.0	0.6	66.9	69.7
CFM 1040	20	49.6	5.1	104.0	0.1		
RPM 1550	30	41.9	2.9	97.1	0.1		
1/8 HP	40	34.2	1.8	90.3	0.0		
1.35 A	50	29.8	1.2	86.4	0.0		
054V	10	53.3	11.0	126.4	0.7	66.1	68.9
CFM 740	20	47.1	4.9	118.7	0.2		
RPM 850	30	41.1	2.8	111.2	0.1		
1/20 HP	40	35.0	1.8	103.6	0.0		
0.68 A	50	26.7	1.1	93.3	0.0		
054V	10	61.2	12.6	121.3	0.9	72.8	75.8
CFM 920	20	54.0	5.6	114.1	0.2		
RPM 1050	30	47.1	3.2	107.2	0.1		
1/20 HP	40	40.2	2.1	100.3	0.0		
0.68 A	50	31.8	1.3	91.9	0.0		
067V	10	64.4	13.3	119.4	1.0	75.6	78.8
CFM 1000	20	56.8	5.9	112.4	0.2		
RPM 1150	30	49.4	3.4	105.5	0.1		
1/8 HP	40	42.2	2.2	98.9	0.0		
1.35 A	50	33.7	1.4	91.1	0.0		
067V	10	70.8	14.6	115.3	1.2	81.4	84.8
CFM 1180	20	62.4	6.4	108.7	0.3		
RPM 1350	30	54.3	3.7	102.4	0.1		
1/8 HP	40	46.3	2.4	96.2	0.1		
1.35 A	50	37.6	1.6	89.4	0.0		



5. VERTICAL UNIT HEATERS

5.4 Vertical Unit Performance Data

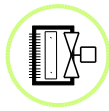
Table 5.4 (continued) - Standard Vertical Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
039V CFM 570 RPM 850 1/20 HP 0.68 A	10	40.3	8.3	125.2	0.3	51.0	53.1
	20	34.9	3.6	116.4	0.1		
	30	29.6	2.0	107.9	0.0		
	40	23.2	1.2	97.5	0.0		
	50	20.6	0.8	93.3	0.0		
039V CFM 710 RPM 1150 1/20 HP 0.68 A	10	46.3	9.5	120.1	0.4	56.1	58.4
	20	40.0	4.1	111.9	0.1		
	30	33.9	2.3	104.0	0.0		
	40	27.2	1.4	95.3	0.0		
	50	24.1	1.0	91.3	0.0		
050V CFM 780 RPM 1150 1/8 HP 1.35 A	10	49.0	10.1	117.9	0.5	58.4	60.9
	20	42.3	4.4	110.0	0.1		
	30	35.8	2.5	102.3	0.0		
	40	28.9	1.5	94.1	0.0		
	50	25.6	1.1	90.3	0.0		
050V CFM 910 RPM 1350 1/8 HP 1.35 A	10	53.5	11.0	114.2	0.6	62.8	65.4
	20	46.1	4.8	106.7	0.1		
	30	39.0	2.7	99.5	0.0		
	40	31.7	1.6	92.1	0.0		
	50	28.1	1.2	88.5	0.0		
050V CFM 1040 RPM 1550 1/8 HP 1.35 A	10	57.6	11.9	111.0	0.6	66.9	69.7
	20	49.6	5.1	104.0	0.1		
	30	41.9	2.9	97.1	0.1		
	40	34.2	1.8	90.3	0.0		
	50	29.8	1.2	86.4	0.0		
054V CFM 740 RPM 850 1/20 HP 0.68 A	10	53.3	11.0	126.4	0.7	66.1	68.9
	20	47.1	4.9	118.7	0.2		
	30	41.1	2.8	111.2	0.1		
	40	35.0	1.8	103.6	0.0		
	50	26.7	1.1	93.3	0.0		
054V CFM 920 RPM 1050 1/20 HP 0.68 A	10	61.2	12.6	121.3	0.9	72.8	75.8
	20	54.0	5.6	114.1	0.2		
	30	47.1	3.2	107.2	0.1		
	40	40.2	2.1	100.3	0.0		
	50	31.8	1.3	91.9	0.0		
067V CFM 1000 RPM 1150 1/8 HP 1.35 A	10	64.4	13.3	119.4	1.0	75.6	78.8
	20	56.8	5.9	112.4	0.2		
	30	49.4	3.4	105.5	0.1		
	40	42.2	2.2	98.9	0.0		
	50	33.7	1.4	91.1	0.0		
067V CFM 1180 RPM 1350 1/8 HP 1.35 A	10	70.8	14.6	115.3	1.2	81.4	84.8
	20	62.4	6.4	108.7	0.3		
	30	54.3	3.7	102.4	0.1		
	40	46.3	2.4	96.2	0.1		
	50	37.6	1.6	89.4	0.0		



5. VERTICAL UNIT HEATERS

5.4 Vertical Unit Performance Data

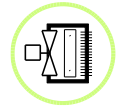
Table 5.4 (continued) - Standard Vertical Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
067V	10	76.3	15.7	112.1	1.4	86.7	90.3
CFM 1350	20	67.2	6.9	105.9	0.3		
RPM 1550	30	58.4	4.0	99.9	0.1		
1/8 HP	40	49.8	2.6	94.0	0.1		
1.35 A	50	40.8	1.7	87.9	0.0		
078V	10	75.2	15.5	132.2	1.1	96.6	100.6
CFM 960	20	67.6	7.0	124.9	0.3		
RPM 850	30	60.1	4.1	117.7	0.1		
1/20 HP	40	52.7	2.7	110.6	0.1		
0.68 A	50	44.2	1.8	102.4	0.0		
078V	10	87.3	18.0	127.6	1.5	106.4	110.8
CFM 1190	20	78.3	8.1	120.6	0.4		
RPM 1050	30	69.6	4.8	113.9	0.1		
1/20 HP	40	60.9	3.1	107.2	0.1		
0.68 A	50	51.9	2.1	100.2	0.0		
100V	10	92.4	19.1	125.5	1.7	110.7	115.3
CFM 1300	20	82.9	8.5	118.8	0.4		
RPM 1150	30	73.6	5.1	112.2	0.2		
1/6 HP	40	64.5	3.3	105.7	0.1		
1.8 A	50	55.1	2.3	99.1	0.0		
100V	10	101.9	21.0	121.8	2.0	119.1	124.0
CFM 1520	20	91.4	9.4	115.4	0.5		
RPM 1350	30	81.1	5.6	109.2	0.2		
1/6 HP	40	71.0	3.7	103.1	0.1		
1.8 A	50	61.0	2.5	97.0	0.0		
100V	10	113.7	23.4	117.3	2.4	129.6	135.0
CFM 1830	20	101.9	10.5	111.3	0.6		
RPM 1625	30	90.4	6.2	105.5	0.2		
1/6 HP	40	79.0	4.1	99.8	0.1		
1.8 A	50	68.0	2.8	94.2	0.1		
145V	10	143.0	29.5	116.3	4.3	159.9	166.6
CFM 2340	20	129.2	13.3	110.9	1.1		
RPM 850	30	115.9	8.0	105.6	0.4		
1/4 HP	40	102.6	5.3	100.4	0.2		
3.3 A	50	89.8	3.7	95.4	0.1		
145V	10	162.4	33.5	110.6	5.5	177.9	185.3
CFM 2960	20	146.8	15.1	105.7	1.3		
RPM 1075	30	131.5	9.0	100.9	0.5		
1/4 HP	40	116.6	6.0	96.3	0.3		
3.3 A	50	101.9	4.2	91.7	0.1		
210V	10	203.2	41.9	111.6	10.2	220.9	230.1
CFM 3630	20	185.4	19.1	107.1	2.5		
RPM 850	30	167.9	11.5	102.6	1.0		
1/2 HP	40	150.7	7.8	98.3	0.5		
5.6 A	50	133.9	5.5	94.0	0.3		



5. VERTICAL UNIT HEATERS

5.4 Vertical Unit Performance Data

Table 5.4 (continued) - Standard Vertical Unit Heater Performance Data at 60 °F Entering Air Temperature							
Model	Water TD (°F)	200 °F EWT				2 PSIG Steam	
		Cap (MBH)	Flow (GPM)	LAT (°F)	WPD (Ft)	Cap (MBH)	Flow (lb/Hr)
210V CFM 4590 RPM 1075 1/2 HP 5.6 A	10	229.2	47.3	106.0	12.7	245.7	256.0
	20	209.0	21.5	102.0	3.1		
	30	189.4	13.0	98.0	1.3		
	40	170.1	8.8	94.2	0.7		
	50	151.1	6.2	90.3	0.4		
300V CFM 5030 RPM 850 1/2 HP 5.6 A	10	287.8	59.3	112.7	16.4	311.6	324.6
	20	264.1	27.2	108.4	4.1		
	30	240.9	16.6	104.1	1.7		
	40	217.8	11.2	99.9	0.9		
	50	195.4	8.1	95.8	0.5		
300V CFM 6360 RPM 1075 1/2 HP 5.6 A	10	325.0	67.0	107.1	20.5	346.7	361.2
	20	298.3	30.8	103.2	5.1		
	30	272.1	18.7	99.4	2.1		
	40	246.3	12.7	95.7	1.1		
	50	221.0	9.1	92.0	0.6		
370V CFM 5320 RPM 850 1/2 HP 5.6 A	10	354.5	73.1	121.4	11.5	399.0	415.6
	20	325.3	33.5	116.4	2.9		
	30	296.7	20.4	111.4	1.2		
	40	268.2	13.8	106.5	0.6		
	50	240.1	9.9	101.6	0.3		
370V CFM 6730 RPM 1075 1/2 HP 5.6 A	10	405.7	83.6	115.6	14.7	443.9	462.4
	20	372.3	38.4	111.0	3.7		
	30	339.6	23.3	106.5	1.5		
	40	307.0	15.8	102.0	0.8		
	50	275.2	11.3	97.7	0.4		
480V CFM 10800 RPM 1075 2 HP 7.4 A	10					550.3	573.2
	20	475.9	49.1	100.6	5.7		
	30	434.1	29.8	97.0	2.4		
	40	393.1	20.3	93.6	1.2		
	50	352.7	14.5	90.1	0.7		

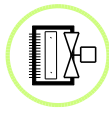


5. VERTICAL UNIT HEATERS

5.5 Vertical Unit Sound Class

Type	Model	Sound Class
Vertical	039V (040V)	II
	050V	II
	054V	II
	067V	II
	078V	II
	100V	II
	145V	III
	210V	IV
	300V	V
	370V	V
	480V	VI

Sound Class Rating	Location Description
I	Hospitals, Museums, Schools, Offices, Foyers, Restrooms
II	Department Stores, Showrooms, Commercial Dining Facilities
III	Gymnasiums, Bars, Warehouse Storage, Grocery Stores
II-IV	Garages, Factories, Stadiums Common Areas



6. SELECTION PROCEDURE

6.1 Steam Application

Design Conditions

Heating Load = 210 MBH

Entering Air Temperature = 50°F

Steam Pressure = 15 psi

Mounting Height = 12 feet

1. Capacity Evaluation

From Table 6.1, the correction factor for 15 psig steam and 50°F entering air is 1.275. Equivalent capacity at standard conditions (2 psig steam and 60°F entering air) is:

$$Cap_{\text{equivalent}} = \frac{210}{1.275} = 164.7 \text{ MBH}$$

2. Unit Selection

From Table 4.4, model 133H delivers 165.8 MBH at standard conditions and at 1075 rpm has a maximum mounting height of 13 feet (Table 4.3).

Thus, Model 133H should be selected.

3. Actual Performance

Actual capacity :

$$Cap_{\text{actual}} = 165.8 \times 1.275 = 211.4 \text{ MBH}$$

Or expressed as Equivalent Direct Radiation (EDR):

$$\text{Sq. ft of radiation} = \frac{\text{Cap (Btu)}}{240} = \frac{211,400}{240} = 880.8 \text{ EDR}$$

The amount of condensate is:

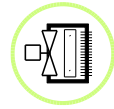
$$\text{Lbs of condensate} = \frac{\text{Sq. ft of radiation}}{4} = \frac{880.8}{4} = 220.2 \text{ lbs per hour.}$$

4. Determining Final Temperature

The air temperature rise through the unit heater can be determined by:

$$\Delta T_{\text{air}} = \frac{\text{Cap (Btu)}}{\text{scfm} \times 1.085} = \frac{211,400}{2600 \times 1.085} = 74.9 \text{ °F}$$

$$\begin{aligned} \text{Leaving Air Temperature} &= \text{Inlet Air Temperature} + \Delta T_{\text{air}} \\ &= 70 + 74.9 \text{ °F} = 144.9 \text{ °F} \end{aligned}$$



6. SELECTION PROCEDURE

6.1 Steam Application

Table 6.1 - Correction Factors For Horizontal Unit Heaters At Various Steam Condition

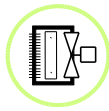
STEAM PRESSURE (PSIG)	-10	0	10	20	30	40	50	60	70	80	90	100
0	1.542	1.451	1.363	1.277	1.194	1.113	1.034	0.957	0.883	0.810	0.740	0.671
2	1.587	1.496	1.406	1.320	1.236	1.155	1.075	0.998	0.923	0.850	0.779	0.710
5	1.647	1.554	1.464	1.377	1.293	1.210	1.130	1.053	0.977	0.903	0.831	0.761
10	1.733	1.639	1.547	1.459	1.373	1.290	1.209	1.130	1.053	0.979	0.906	0.835
15	1.805	1.710	1.618	1.528	1.441	1.357	1.275	1.196	1.118	1.043	0.969	0.897
20*	1.867	1.771	1.678	1.588	1.500	1.415	1.333	1.252	1.174	1.098	1.024	0.951
25*	1.924	1.827	1.734	1.643	1.554	1.468	1.385	1.304	1.225	1.148	1.073	1.000
30*	1.973	1.875	1.781	1.689	1.600	1.514	1.430	1.348	1.269	1.191	1.116	1.042
40*	2.061	1.962	1.866	1.774	1.683	1.596	1.511	1.428	1.347	1.269	1.193	1.118
50*	2.138	2.038	1.941	1.847	1.756	1.667	1.581	1.497	1.416	1.337	1.260	1.184
60*	2.202	2.101	2.003	1.909	1.816	1.727	1.640	1.556	1.474	1.394	1.316	1.240
70*	2.265	2.163	2.064	1.968	1.876	1.785	1.698	1.613	1.530	1.449	1.370	1.294
75*	2.292	2.190	2.090	1.994	1.901	1.811	1.723	1.637	1.554	1.473	1.394	1.317
80*	2.320	2.218	2.118	2.022	1.928	1.837	1.749	1.663	1.579	1.498	1.419	1.342
90*	2.369	2.266	2.165	2.068	1.974	1.882	1.793	1.707	1.623	1.541	1.461	1.384
100*	2.417	2.313	2.212	2.114	2.019	1.927	1.837	1.750	1.666	1.583	1.503	1.425

Table 6.2 - Correction Factors For Vertical Unit Heaters And Various Steam Conditions

STEAM PRESSURE (PSIG)	-10	0	10	20	30	40	50	60	70	80	90	100
0	1.488	1.408	1.329	1.251	1.176	1.101	1.029	0.957	0.887	0.819	0.751	0.684
2	1.526	1.445	1.366	1.288	1.213	1.139	1.066	0.994	0.924	0.856	0.788	0.721
5	1.575	1.494	1.415	1.337	1.262	1.187	1.115	1.043	0.973	0.904	0.836	0.770
10	1.645	1.564	1.484	1.407	1.331	1.257	1.184	1.112	1.042	0.973	0.905	0.839
15	1.704	1.622	1.543	1.465	1.389	1.315	1.242	1.170	1.100	1.031	0.963	0.896
20*	1.754	1.673	1.593	1.516	1.439	1.365	1.292	1.220	1.150	1.081	1.013	0.946
25*	1.800	1.719	1.639	1.561	1.485	1.410	1.337	1.265	1.195	1.126	1.058	0.991
30*	1.839	1.758	1.678	1.600	1.524	1.449	1.376	1.304	1.233	1.164	1.096	1.029
40*	1.910	1.828	1.748	1.670	1.593	1.518	1.445	1.373	1.302	1.233	1.165	1.098
50*	1.971	1.889	1.808	1.730	1.653	1.578	1.505	1.433	1.362	1.292	1.224	1.157
60*	2.022	1.939	1.859	1.781	1.704	1.629	1.555	1.483	1.412	1.342	1.274	1.207
70*	2.071	1.989	1.908	1.829	1.753	1.677	1.603	1.531	1.460	1.390	1.322	1.254
75*	2.092	2.010	1.929	1.851	1.774	1.698	1.624	1.552	1.481	1.411	1.342	1.275
80*	2.115	2.032	1.952	1.873	1.796	1.720	1.646	1.574	1.503	1.433	1.364	1.297
90*	2.153	2.070	1.989	1.910	1.833	1.758	1.684	1.611	1.540	1.470	1.401	1.334
100*	2.190	2.107	2.026	1.947	1.870	1.794	1.720	1.648	1.576	1.506	1.437	1.370

Note:

- To determine steam heat output of a horizontal/vertical unit heater at other than standard conditions (2 psig steam and 60°F entering air temperature), multiply unit capacity by the correction factor for the desired conditions from the above tables.
- *Contact factory for steam pressures greater than 15 PSI.



6. SELECTION PROCEDURE

6.2 Hot Water Applications

Design Conditions

Heating Load = 240 MBH
 Entering Air Temperature = 75°F
 Entering Water Temperature = 195°F
 Water Temperature Drop = 15°F
 Mounting Height = 22 ft
 Configuration = Standard Vertical Projection unit Heater (Model V)

1. Capacity Evaluations.

From Table 6.3, since there are no factors for 75°F entering air nor any for 215°F entering water, hence the correction factor must be interpolated across the pertinent downward diagonal as follows:

Factor at 70°F EAT & 190°F EWT = 0.845
 Factor at 80°F EAT & 200°F EWT = 0.838
 Factor at 75°F EAT & 195°F EWT (Average) = 0.8415

There is no need to utilize the factors along the upward diagonal (i.e., 70°EAT-200°EWT & 80°EAT-190°EWT). A first approximation of the equivalent capacity at standard conditions (200°F water and 60°F entering air) is:

$$Cap_{\text{first approximation}} = \frac{240}{0.8415} = 285.2 \text{ MBH}$$

2. Adjust Water Temperature Drop

The adjusted water temperature is: $\Delta T_{\text{adjusted}} = \frac{15}{0.8415} = 17.8 \text{ }^\circ\text{F}$

3. Unit Selection and Equivalent Capacity

From Table 5.4, Model V Hot Water Capacities, at 200°F EWT and 1075 rpm, model 300V delivers 298.3 MBH at 20°F DT and 325.0 MBH at 10°F DT and thus meets the capacity requirements of our first approximation. From Table 5.2, model 300V may be mounted up to 26 feet above floor level without the need for a louvre cone diffuser and thus complies with the mounting height requirements. Interpolating for 17.8°F DT, the equivalent performance at 200°F EWT is:

$$Cap_{\text{equivalent}} = \frac{325.0 - 298.3}{(20 - 10)} \times (17.8 - 15) + 298.3 = 305.7 \text{ MbH}$$

4. Actual Performance

To obtain the actual capacity, multiply the equivalent capacity by the correction factor as follows:

$$Cap_{\text{actual}} = Cap_{\text{equivalent}} \times 0.8415 = 305.7 \times 0.8415 = 257.2 \text{ MbH}$$

5. Determination of GPM and Water Pressure Drop

The required water flow can be found by:

$$Q_{\text{actual}} = \frac{Cap_{\text{actual}} \text{ (MbH)}}{0.485 \times \Delta T_{\text{actual}}} = \frac{257.2}{0.485 \times 15.0} = 35.4 \text{ GPM}$$

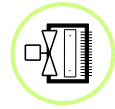
The water pressure drop may be interpolated at 200 °F resulting in: **Pressure Drop_{actual} = 6.8 feet of water**

6. Determination of Final Temperature

Lastly, the final air temperature leaving the unit heater can be determined by:

$$FAT_{\text{actual}} = EAT + \Delta T_{\text{air}} = EAT + \frac{Cap_{\text{actual}} \text{ (Btu/hr)}}{CFM \times 1.085}$$

$$= 75^\circ + \frac{257,200}{6360 \times 1.085} = 112.3^\circ \text{ F}$$



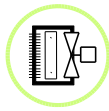
6. SELECTION PROCEDURE

6.2 Hot Water Applications

ENTERING WATER TEMP. (°F)	ENTERING AIR TEMP. (°F)							
	30	40	50	60	70	80	90	100
100	0.518	0.439	0.361	0.286	0.212	0.140	0.069	0.000
110	0.592	0.513	0.434	0.358	0.283	0.210	0.139	0.069
120	0.666	0.585	0.506	0.429	0.353	0.279	0.207	0.137
130	0.740	0.659	0.579	0.501	0.424	0.349	0.277	0.205
140	0.814	0.731	0.651	0.571	0.494	0.419	0.345	0.273
150	0.889	0.805	0.724	0.643	0.566	0.489	0.415	0.341
160	0.962	0.880	0.795	0.715	0.634	0.568	0.484	0.410
170	1.036	0.954	0.869	0.785	0.704	0.628	0.552	0.478
180	1.110	1.024	0.940	0.859	0.774	0.698	0.622	0.546
190	1.182	1.100	1.011	0.929	0.845	0.768	0.690	0.615
200	1.259	1.171	1.085	1.000	0.917	0.838	0.760	0.684
210	1.331	1.249	1.158	1.071	0.988	0.908	0.829	0.753
220	1.408	1.318	1.230	1.141	1.058	0.978	0.898	0.820
230	1.482	1.391	1.301	1.215	1.129	1.048	0.967	0.889
240	1.554	1.468	1.374	1.285	1.200	1.118	1.036	0.957
250	1.627	1.539	1.448	1.359	1.270	1.188	1.106	1.025
260	1.702	1.612	1.520	1.429	1.340	1.258	1.173	1.095
270	1.780	1.686	1.590	1.500	1.410	1.328	1.244	1.161
280	1.850	1.759	1.664	1.571	1.482	1.398	1.311	1.230
290	1.925	1.831	1.735	1.642	1.552	1.468	1.380	1.300
300	2.000	1.909	1.809	1.715	1.622	1.538	1.450	1.368

Note:

- Use above table to determine correction factors at specified entering air and water temperatures and apply to the capacity at 200 °F entering water and 60 °F entering air temperatures.
- The flow rate (GPM) at 200 °F entering water temperature remains the same for the derated capacity (MBH). The delta T (°F) will need to be calculated for the derated capacity and given GPM.



6. SELECTION PROCEDURE

6.2 Hot Water Applications

Table 6.4 - Elevation Correction Factor		
Altitude	Ferrous Unit (Steel)	Non-Ferrous (Cu/Al)
Sea Level	1	1
1,000 Ft	0.984	0.969
2,000 Ft	0.968	0.938
3,000 Ft	0.952	0.908
4,000 Ft	0.936	0.878
5,000 Ft	0.920	0.850
6,000 Ft	0.904	0.822
7,000 Ft	0.889	0.795
8,000 Ft	0.874	0.768
9,000 Ft	0.859	0.743
10,000 Ft	0.844	0.718
15,000 Ft	0.771	0.603
20,000 Ft	0.703	0.502

Note: Apply correction factor from above Table 6.4 to BTU at design condition to determine capacity at given elevation.

Table 6.5 - Glycol correction factors		
Solution	Ethylene Glycol	Propylene Glycol
20% Solution	0.95	0.98
30% Solution	0.91	0.96
40% Solution	0.88	0.93
50% Solution	0.84	0.9
Pressure Drop	1.23	1.23
GPM	1.14	1.1

Note: Apply correction factor from above Table 6.5 to BTU at design condition to determine capacity at specified glycol and water mix ratio.