CAT-SUHC-2008(1)

SARAVEL UNIT HEATERS

(Classic Models)

Hot water
Steam
Electrical

SUHC 10 TO 20
(200 to 3500 CFM)

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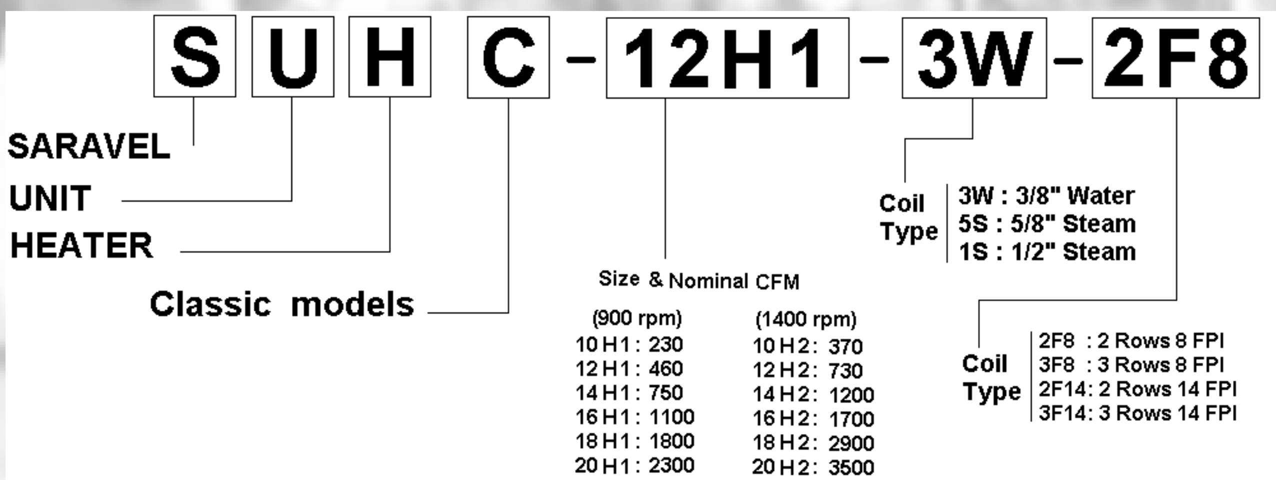
NOMENCLATURE



SARAVEL

FEATURES & BENEFITS

SARAVEL Unit Heaters may be selected for hot water or steam or hot oil applications from 12 different models in two categories, namely: 1) Standard 2) High Capacity. Standard capacity features 3/8” copper coils but High capacity features 1/2" steel coil. For various range of required airflow, 900 RPM or 1400 RPM motors can be mounted on units. With these features Saravel unit heaters covers the entire range of commercial, industrial and institutional applications with a wide choice of capacities which permit tremendous versatility in design and engineering application.
Units are designed for 10 to 240 kBtu/hr capacity for hot water applications and 20 to 540 kBtu/hr for steam applications.
Units are designed for optimum air throw through individually adjustable louvers to permit altering the direction of air flow. The provisions for lifting and hoisting the units also serve as installation features. The unit casing can be easily dismantled allowing access to the coil for cleaning purpose. I addition the following design features are incorporated into the construction of Saravel Unit Heaters:

UNIT CASING

Unit casing is fabricated from heavy gage galvanized steel sheet and finished with air dried hammer paint.

COILS

Standard models feature 3/8” O.D. seamless copper tube expanded into die-formed aluminum fin plates.
Standard models are recommended for hot water applications with temperature not exceeding 130°C. For steam applications 5/8” copper tubes with aluminum crimped spiral fins are available for pressure less than 30 PSIG.

High capacity models feature 1/2" O.D. seamless steel tubes with spirally wound aluminum fins. Steel coils are recommended for hot water or hot oil applications with temperature exceeding 130°C up to 200°C and for steam applications with pressures greater than 20 PSIG up to 200 PSIG.

Choices of aluminum or copper fins are offered in fin arrangements.

All coils are leak tested under water with 325 Psig air in accordance with ANSI/ASHRAE 15 Safety Code for Mechanical Refrigeration.

Electrical coils could also be mounted in units. They shall be protected against overheating.

FANS

All fans are direct driven propeller tube fabricated of aluminum or galvanized steel sheets. All fan blades are statically balanced. Fan blades are suited in a drawn collar which allows uniform air intake and distribution onto the coils.

MOTORS

Electric motors are 3 phase-380V-50Hz or single phase-220-50Hz available at 1400 RPM or 900 RPM. Spark proof motors are offered as optional items for applications where flammable or volatile gases might leak into area.

PACKING

Units finally shall be wrapped up with plastic tissue, fastened with polyethylene belts and placed on wooden palette, although they should be stored in an indoor storage.

+ All components in SARAVEL Unit Heaters are selected of reliable and recognized international brand names or designed and constructed and checked under the standard of the air-conditioning and refrigeration industry.

+ The units are manufactured under Saravel’s own Quality Assurance System and also Saravel Standard Engineering Specification (SES).

+ *For any special applications please consult* ***Saravel Sale Office*.**

NOTE: All specifications & dimensions subject to change without notice.

EXAMPLES

Example 1:

An industrial building

Given:

Building Length ……………………..…150 Ft (45.7m)
Building Width …………………...…. 75 Ft (22.9m)
Building Height ………..………………. 30 Ft (9.1m)
Total Heat Loss from Building …..1,400,000 Btu/hr
Indoor Temperature …………..……………...70°F
Outdoor Temperature ………..………………... 30°F
Entering Air Temperature …...………………...70°F

Solution:

ASHRAE recommends 3 CFM/ft² of floor area for industrial environments (manufacturing).
(ASHRAE Pocket Guide 2005)

So obtaining floor area:
A = 150 × 75 = 11250 ft²
Required CFM = 11250 ft² × 3 CFM/ft² = 33750 CFM

Assuming 15 unit heaters for the building gives:
33750 / 15 = 2250 CFM (each unit heater)
1,400,000 / 15 = 93, 300 Btu/hr = 93.3 kBtu/hr

Referring to Table 2, we can find:
Model 20H: 2300 CFM
14 FPI, 3 Rows: 98.7 kBtu/hr

So **15×SUH 16H** will be enough (6% overload)

Another choice:
20 unit heaters for the building give:
33750 / 20 = 1690 CFM
1,400,000 / 20 = 70 000 Btu/hr = 70 kBtu/hr

Referring to Table 2, we can find:
Model 16H: 1700 CFM
8 FPI, 3 Rows: 84 kBtu/hr

So 20 **× SUH 16H** will be enough.
(SUHC-16H2-3W-3F8)

Example 2:

A Heating Design Requirement

Given:

Altitude ……………….……..……………………… 3000m
Steam Line Pressure …………………….………. 15 Psi
Total Heat Loss from Building …………3,500,000 Btu/hr
Entering Air Temperature …..........………………... 60°F
Required Air Flow ………………..………... 40,000 CFM

Solution:

It should be considered that unit heaters have the same air flow in any altitude. That's because of the fan laws that indicate that a fan is a constant volume machine and will handle the same air flow regardless of air density. But of course in load calculation the unit provides, there is a load decrease in the case of air density reduction. That's why correction factors apply to the ratings of the tables.

Assuming 30 Unit heaters:
40,000 / 30 = 1330 CFM (each unit heater)

The steam working pressure is less than 20 Psi so copper tubes can be used.

Referring to Table 3, we can find:
(If silence is important in a special place, 900 rpm motors should be considered).
Model 16H: 1700 CFM
14 FPI, 2 Rows: 192 kBtu/hr

Checking for 24 unit heaters gives:
24 × 1700 CFM = 40,800 CFM

Correction Factors for altitude:
Referring to Table 5 for Steam Correction Factor:
(Entering Temp. 60°F: Steam Correction Factor=1.07)

Referring to Table 7, Altitude Correction Factor = 0.88

Real Load = Load from Table 3 × Correction Factors
= 192 kBtu/hr × 1.07 × 0.88 = 181 kBtu/hr

So for 24 Unit heaters:
24 × 181 kBtu/hr = 4,344,000 Btu/hr

4,344,000 Btu/hr > 3,500,000 Btu/hr (Required)
40,800 CFM > 40,000 CFM (Required)

So **24 × SUH 16H** (**SUHC-16H2-5S-2F14)** will be enough.

Table 1 – PHYSICAL DATA and SOUND RATINGS

Physical Data and Sound Ratings

Model	Nominal CFM		Coil					Motor				Sound Ratings (dB) (Sound Pressure Level at 1 m)		Unit Weight (kg)
	H1 (900 rpm)	H2 (1400 rpm)	Face area (ft²)	Finned Length (mm)	Tube High 3/8"	Tube High 5/8" (steam)	Tube High 1/2" (steam)	H1 (900) HP	H1 (900) Amper	H2 (1400) HP	H2 (1400) Amper	H1 (900)	H2 (1400)	
10H	230	370	0.95	290	12	7	6	0.12	1.0	0.25	1.7	61	65	29
12H	460	730	1.62	370	16	10	9	0.12	1.0	0.25	1.7	61	65	35
14H	750	1200	2.41	440	20	13	11	0.12	1.0	0.25	1.7	61	65	51
16H	1100	1700	3.13	520	22	14	12	0.25	1.6	0.33	2	63	67	60
18H	1800	2900	5.05	660	28	18	16	0.33	2.1	0.50	2.25	70	73	72
20H	2300	3500	6.65	760	32	21	18	0.50	2.3	0.75	3.5	71	74	83

Table 2 – HOT WATER RATINGS 3/8" COPPER TUBES (Half Circuit)

(Ent. Wat. Temp. 180°F, Leav. Wat. Temp. 160°F) (Entering Air Temp. 70°F)

Model	Nominal Air CFM	Fin Arrangement (Fin Per Inch)	2 Rows				3 Rows			
			Total Heating Capacity kBtu/hr	Leaving Air Dry Bulb Temp. (°F)	Water Flow GPM	Water Pressure Drop Ft water	Total Heating Capacity kBtu/hr	Leaving Air Dry Bulb Temp. (°F)	Water Flow GPM	Water Pressure Drop Ft water
10H	**230** (900 rpm)	8 FPI	10.3	113	1.1	0.07	13.9	129	1.4	0.15
		14 FPI	13.9	129	1.4	0.11	17.9	147	1.8	0.24
	370 (1400 rpm)	8 FPI	13.9	106	1.4	0.11	19.4	121	2.0	0.28
		14 FPI	19.3	121	2.0	0.21	25.7	139	2.6	0.37
12H	**460** (900 rpm)	8 FPI	19.9	112	2.1	0.18	27.1	128	2.8	0.29
		14 FPI	27.3	128	2.8	0.21	35.2	146	3.6	0.46
	730 (1400 rpm)	8 FPI	26.7	105	2.7	0.20	37.3	119	3.8	0.50
		14 FPI	37.7	120	3.9	0.38	49.9	137	5.1	0.86
14H	**750** (900 rpm)	8 FPI	32.1	111	3.3	0.22	43.6	127	4.5	0.53
		14 FPI	44.1	127	4.5	0.38	56.8	145	5.9	0.85
	1200 (1400 rpm)	8 FPI	43.1	104	4.4	0.37	60.0	118	6.2	0.94
		14 FPI	60.9	119	6.2	0.69	80.9	136	8.3	1.41
16H	**1100** (900 rpm)	8 FPI	45.7	110	4.7	0.39	62.2	125	6.4	0.94
		14 FPI	63.5	126	6.5	0.72	81.9	144	8.4	1.35
	1700 (1400 rpm)	8 FPI	60.1	104	6.2	0.66	83.5	118	8.6	1.41
		14 FPI	85.5	119	8.8	1.03	113	136	11.6	2.42
18H	**1800** (900 rpm)	8 FPI	75.8	110	7.8	0.65	103	126	10.5	1.56
		14 FPI	105	127	10.8	1.17	135	144	13.9	2.60
	2900 (1400 rpm)	8 FPI	102	104	10.5	1.11	142	117	14.5	2.63
		14 FPI	146	119	15.0	1.94	193	135	19.8	4.62
20H	**2300** (900 rpm)	8 FPI	98.7	111	10.1	0.92	133	127	13.7	2.22
		14 FPI	137	128	14.0	1.66	175	146	18.0	3.39
	3500 (1400 rpm)	8 FPI	129	105	13.2	1.49	177	119	18.2	3.46
		14 FPI	183	121	18.8	2.55	240	138	24.7	5.89

\+ The Ratings in the table are calculated at altitude 0 (Sea Level) with Aluminium fins (corrugated plate fins). For other Altitude or Fin Material please refer to Correction Factor Tables at the end of this guide.

Table 3 – STEAM RATINGS 5/8” COPPER TUBES (Full circuit)

(Steam Pressure: 5 psi) (Entering Air Temp. 70°F)

Model	Nominal Air CFM	Fin Arrangement (Fin Per Inch)	2 Rows			3 Rows		
			Total Heating Capacity kBtu/hr	Leaving Air Dry Bulb Temp. (°F)	Condensate (lb/hr)	Total Heating Capacity kBtu/hr	Leaving Air Dry Bulb Temp. (°F)	Condensate (lb/hr)
10H	**230** (900 rpm)	8 FPI	24.3	167	25.3	30.0	190	31.3
		14 FPI	31.8	197	33.1	36.1	214	37.5
	370 (1400 rpm)	8 FPI	32.6	151	33.9	41.9	174	43.6
		14 FPI	45.1	182	47.0	53.5	203	55.7
12H	**460** (900 rpm)	8 FPI	47.0	164	48.9	58.6	187	61.0
		14 FPI	62.3	195	64.8	71.2	212	74.1
	730 (1400 rpm)	8 FPI	62.3	149	64.8	80.6	172	83.8
		14 FPI	86.9	180	90.4	104	201	108
14H	**750** (900 rpm)	8 FPI	75.1	162	78.2	94.1	185	97.9
		14 FPI	100	193	104	115	211	120
	1200 (1400 rpm)	8 FPI	99.8	147	104	130	169	135
		14 FPI	140	177	146	168	199	175
16H	**1100** (900 rpm)	8 FPI	104	157	109	132	181	138
		14 FPI	142	188	147	165	208	172
	1700 (1400 rpm)	8 FPI	135	143	141	177	166	184
		14 FPI	192	174	199	233	196	242
18H	**1800** (900 rpm)	8 FPI	171	157	178	216	181	225
		14 FPI	231	188	241	270	208	281
	2900 (1400 rpm)	8 FPI	226	142	235	297	164	309
		14 FPI	322	172	335	393	195	409
20H	**2300** (900 rpm)	8 FPI	222	159	231	281	182	292
		14 FPI	300	190	312	348	209	362
	3500 (1400 rpm)	8 FPI	286	145	297	372	168	388
		14 FPI	403	176	419	487	198	506

+ The Ratings in the table are calculated at altitude 0 (Sea Level) with Aluminium fins (corrugated plate fins).
For other Altitude or Fin Material please refer to Correction Factor Tables at the end of this guide.

Table 4 – STEAM RATINGS 1/2" STEEL TUBES (Full circuit)

(Steam Pressure: 5 psi) (Entering Air Temp. 70°F)

Model	Nominal Air CFM	Fin Arrangement (Fin Per Inch)	2 Rows			3 Rows		
			Total Heating Capacity kBtu/hr	Leaving Air Dry Bulb Temp. (°F)	Condensate (lb/hr)	Total Heating Capacity kBtu/hr	Leaving Air Dry Bulb Temp. (°F)	Condensate (lb/hr)
10H	230 (900 rpm)	8 FPI	21.8	157	22.7	27.6	181	28.8
		14 FPI	29.5	188	30.7	34.4	208	35.8
	370 (1400 rpm)	8 FPI	28.9	142	30.1	37.9	164	39.5
		14 FPI	41.0	172	42.7	50.0	195	52.1
12H	460 (900 rpm)	8 FPI	43.2	156	45.0	54.8	180	57.1
		14 FPI	58.6	187	61.0	68.5	207	71.3
	730 (1400 rpm)	8 FPI	56.6	141	59.0	74.4	164	77.5
		14 FPI	80.6	172	83.9	98.5	194	102
14H	750 (900 rpm)	8 FPI	67.5	153	70.2	86.4	176	89.9
		14 FPI	92.6	184	96.4	109	204	114
	1200 (1400 rpm)	8 FPI	88.4	138	92.0	117	160	122
		14 FPI	127	168	132	157	190	163
16H	1100 (900 rpm)	8 FPI	94.0	149	97.8	122	172	126
		14 FPI	131	179	136	156	201	163
	1700 (1400 rpm)	8 FPI	120	135	125	160	157	167
		14 FPI	174	164	181	217	188	226
18H	1800 (900 rpm)	8 FPI	156	150	163	201	173	210
		14 FPI	217	181	225	258	202	269
	2900 (1400 rpm)	8 FPI	205	135	213	273	157	284
		14 FPI	297	164	309	370	187	385
20H	2300 (900 rpm)	8 FPI	201	150	209	258	174	270
		14 FPI	278	181	289	331	202	344
	3500 (1400 rpm)	8 FPI	256	137	266	339	159	353
		14 FPI	368	167	383	456	190	474

+ The Ratings in the table are calculated at altitude 0 (Sea Level) with Aluminium fins (corrugated plate fins).
For other Altitude or Fin Material please refer to Correction Factor Tables at the end of this guide.

Table 5 – Steam Coil Correction Factors for Different Working Pressure

Entering Air Dry Bulb Temp. (°F)	5 psi			15 psi			30 psi			60 psi		
	Total Heating	Leaving Air Dry Bulb Temp.	Steam Flow	Total Heating	Leaving Air Dry Bulb Temp.	Steam Flow	Total Heating	Leaving Air Dry Bulb Temp.	Steam Flow	Total Heating	Leaving Air Dry Bulb Temp.	Steam Flow
32	1.26	0.90	1.27	1.41	0.97	1.42	1.54	1.05	1.60	1.75	1.17	1.86
60	1.07	0.97	1.07	1.21	1.04	1.23	1.35	1.12	1.39	1.55	1.24	1.65
70	1.00	1.00	1.00	1.14	1.07	1.15	1.27	1.14	1.32	1.49	1.26	1.57
80	0.93	1.01	0.93	1.07	1.10	1.08	1.21	1.17	1.25	1.42	1.30	1.50

Corrected Load = Load from Table 3 or 4 × Correction Factor from Table 5

UNIT RATINGS & CORRECTION FACTORS

Table 6 – ELECTRICAL COIL

Model	Nominal Air CFM	Air Temperature Rise* (ΔT) 10°F					20°F					40°F				
		Heating Capacity (kW)	Phase	Line Curr. (Amp.)	No. of Cont. Steps	Prepesed No. and Cap. (kw) of Elem.	Heating Capacity (kW)	Phase	Line Curr. (Amp.)	No. of Contr. Steps	Proposed No. and Cap. (kw) of Elem.	Heating Capacity (kW)	Phase	Line Curr. (Amp.)	No. of Contr. Steps	Proposed No. and Cap. (kw) of Elem.
10H	230	0.7	1	3.2	1	1×0.7	1.5	3	2.3	1	3×0.5	2.9	3	4	1	3×1
	370	1.2	1	5.5	2	2×0.6	2.3	3	3	1	3×0.8	4.7	3	7	1	3×1.5
12H	460	1.5	3	2	1	3×0.5	2.9	3	4	1	3×1	5.8	3	9	2	3×1+3×1
	730	2.3	3	3	1	3×0.8	4.6	3	7	1	3×1.5	9.2	3	14	3	3×1+3×1+3×1
14H	750	2.4	3	4	1	3×0.8	4.7	3	7	1	3×1.5	9.5	3	14	3	3×1+3×1+3×1
	1200	3.7	3	6	1	3×1.2	7.6	3	12	2	3×1.0+3×1.5	15.2	3	23	3	3×2+3×2+3×1
16H	1100	3.5	3	5	1	3×1.2	7.0	3	11	1	3×2	14.0	3	21	2	3×2+3×2.5
	1700	5.4	3	8	1	3×2	10.8	3	16	2	3×2+3×1.5	21.5	3	33	3	3×2.5+3×2.5+3×2
18H	1800	5.7	3	9	1	3×2	11.4	3	17	2	3×2+3×2	23.0	3	35	3	3×3+3×3+3×2
	2900	9.2	3	14	2	3×1.5+3×1.5	18.4	3	28	3	3×2+3×2+3×2	37.0	3	56	3	3×4+3×4+3×4
20H	2300	7.3	3	11	2	3×1.5+3×1	14.6	3	22	2	3×3+3×2	29.0	3	44	3	3×4+3×3+3×3
	3500	11.1	3	17	2	3×2+3×2	22.2	3	34	3	3×3+3×2+3×2	44.3	3	67	3	3×5+3×5+3×5

* air temperature leaving the electrical coil = games enternig air temperature (before the coil) + ΔT (10 / 20 / 40 °F)
+ Saravel does not provide any control device for electrical heater except air flow switch.

TABLE 7- ALTITUDE CORRCTION FACTOR (C1)

ft	m	Capacity Factor
0	0	1
2500	760	0.97
5000	1500	0.94
7500	2300	0.91
10000	3050	0.88

TABLE 8- FIN MATERIAL CORRECTION FACTOR (C2)

Fin Material	Correction Factor
Al	**1**
Cu	**1.05**

+ Use these correction factors as multipliers to the capacity ratings offered in the tables.

$$\text{Real Capacity KBtu/hr} = \left(\text{Table Ratings KBtu/hr}\right) \times C1 \times C2 \times C3$$

Table Ratings: Capacity from Tables 2 ~ 5 (pages 5~7)
C1: (C_A) Altitude Correction Factor from Table 7
C2: Fin Material Correction Factor from Table 8
C3: (C_{WB}) Entering Water Temperature Correction Factor from figure 1

Or

+ Divide your required capacity by these correction factors before you go through the tables.

All correction factors are based on entering air dry bulb=70°F and entering water=180°F

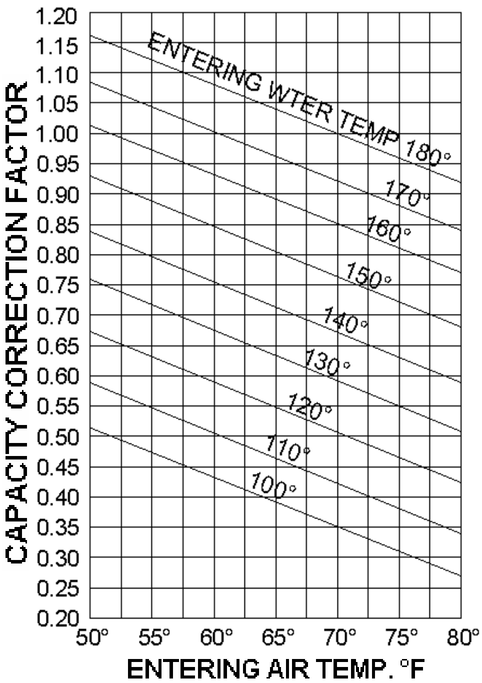
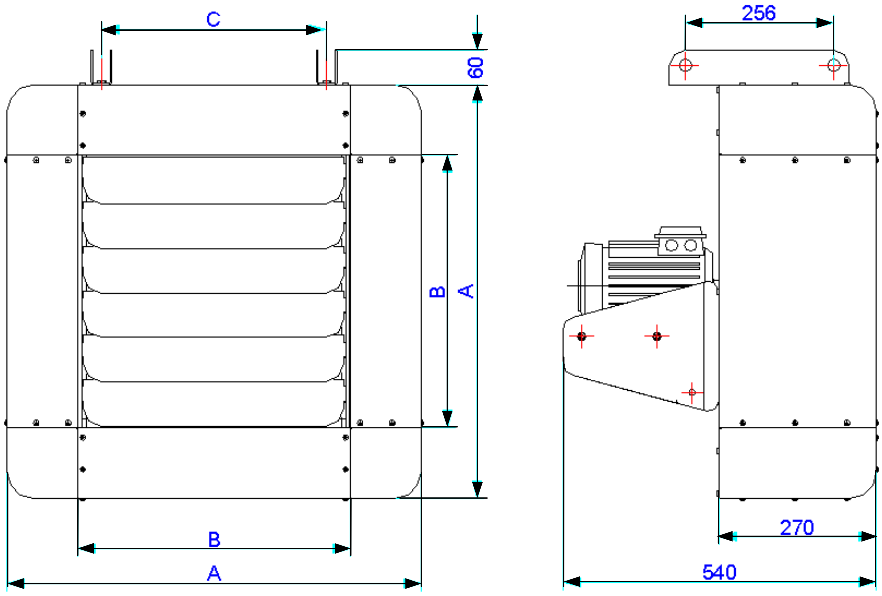
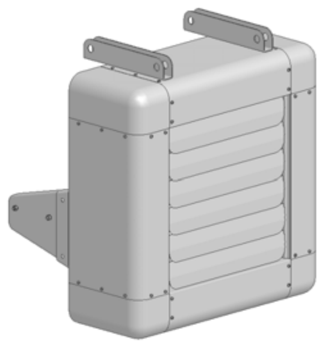
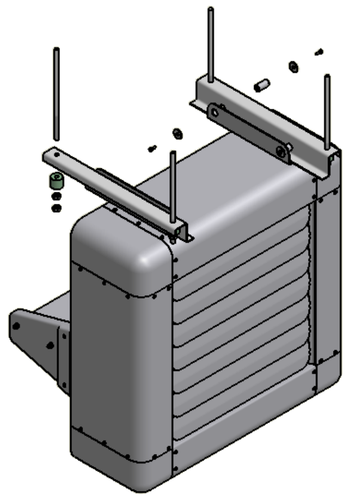


FIGURE 1. HOT WATER COIL CORRECTION FACTOR

DIMENSIONS, WEIGHT & MOUNTING INST.

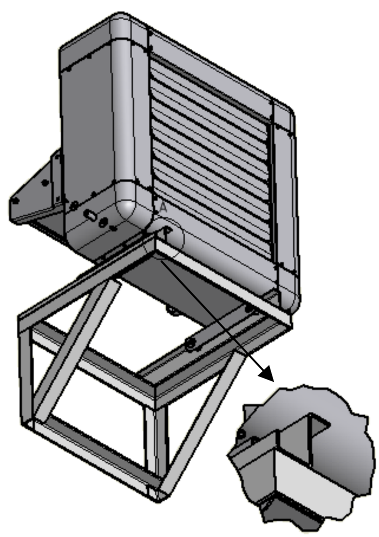






Model	A (mm)	B (mm)	C (mm)	Conection (inch)	Weight (kg)
10H	560	315	235	1	
12H	640	395	310	1	
14H	715	470	390	1 1/4	
16H	790	550	465	1 1/4	
18H	930	690	605	1 1/2	
20H	1030	785	700	1 1/2	

* All dimensions ± 5mm
* All dimensions in mm except as specified.
* All dimensions are subject to change without notice.



SYMBOL DEFINITIONS

CFM................. (Cubic Foot per Minute) (ft^3/min)
FPI...Fins Per Inch
FPM .... Air Velocity (ft/min)
GPM .... Volumetric Water Flow Rate (gal/min)
RPM.................................. Revolution Per Minute
W.G. ....Water Gauge
PSIG ..... Pressure measured in PSI on a Gauge

NUMERICAL SIMULATION

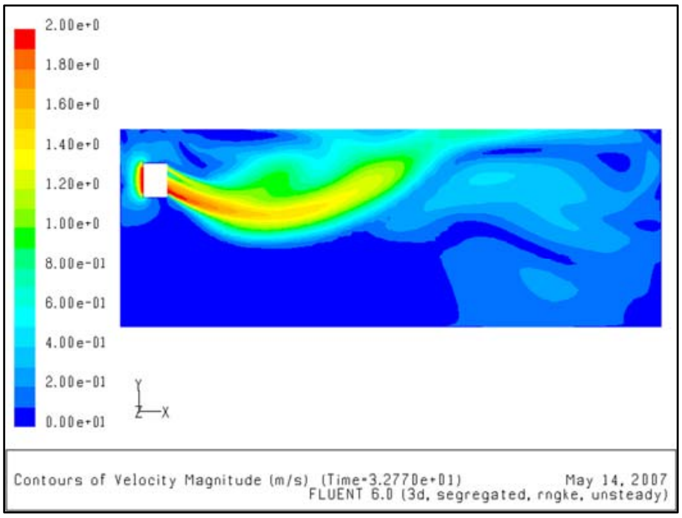
One of the most important problems in air conditioning industry is knowing about how air is being distributed through air opening of devices in ventilated spaces.

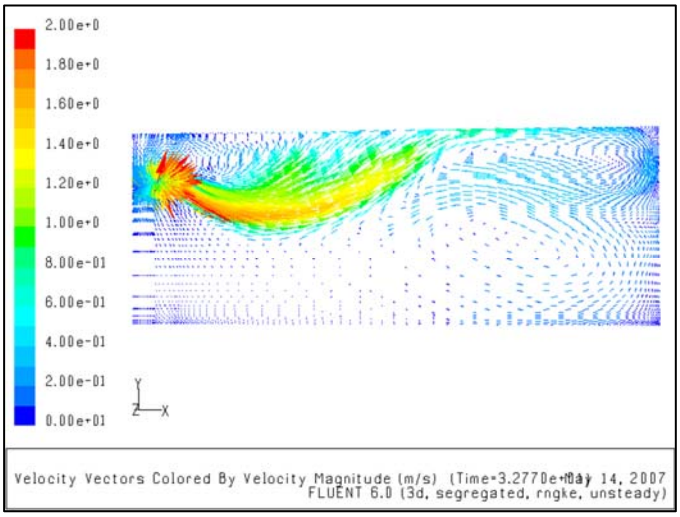
This air distribution affects comfort condition of occupants by influencing air velocity, air temperature and quality of air ventilation to avoid air traps and air temperature stratifications. It could be observed that also temperature and relative humidity were desired in some spaces, too high or too low velocity of air has caused discomfort for the occupants. For example excessive air velocity causes draft which is a localized feeling of warmth of a portion of the body. In the other hand, too low velocities cause temperature stratification (domination of buoyancy forces and forming different temperature layers). It also causes air traps and undesirable increase in concentration of Co_2 or odors in some locations of ventilated space.

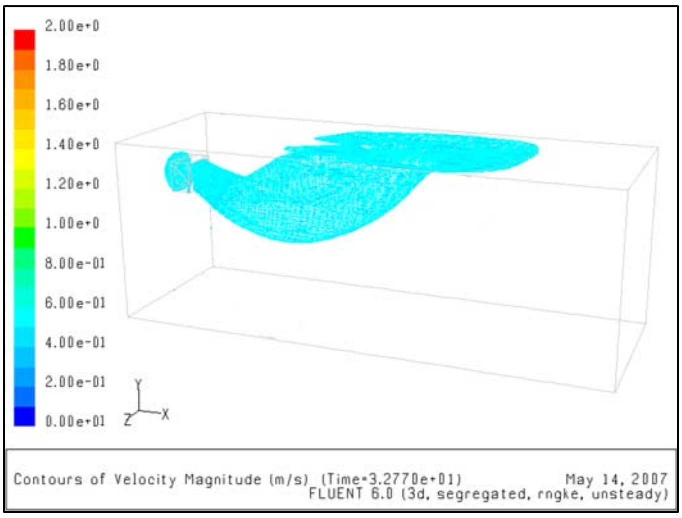
For predicting the air movement of unit heater devices numerical simulations as long as many experimental measurements were performed. Using hot-wire thermal anemometry air velocity was measured in many points in space around unit heaters. Numerical analysis in 3-D full scale simulation using RNG k-ε turbulence model were performed to predict behavior of air flow in different location of ventilated spaces. CFD results were validated against experimental measured data and simulations and grids were refined till a satisfactory compliance was achieved. The final results can be observed in figures and tables of this page and the following page.

The results of these simulations and measurements can be used to optimize the ventilation design to avoid drafts, temperature stratification and excessive energy consumption. Moreover, air velocity can be controlled to be under maximum acceptable level of 50 fpm in occupied zone in order not to cause occupant discomfort. For this reason the occupied zone should be outside the sketched zone of the air jet in the following page (defined by z and x`s).

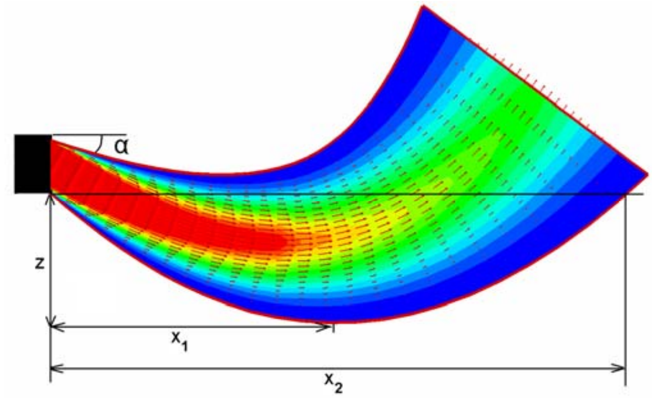
The global pattern of air distribution is depending on air initial velocity, air temperature difference with the environment it enters and the geometry of the ventilated space. However if there is no block in nearby zone that affects the air flow considerably, the behavior of the air jet is very similar to free jets. The results of air flow behavior can be predicted using the table in the following page.







NUMERICAL SIMULATION



Entering Water temp.=180° F, Entering Air Temp.=70° F (ARI)																
Model	CFM	Water flow (GPM)	Pressure drop (Ft water)	Total Load (kBtu/hr)	$T_{water\ out}$ (°F)	$T_{air\ out}$ (°F)	$T_{air\ out}$ (°C)	Z (m) Throw Angle (α°) 15	30	45	X_1 (m) Throw Angle (α°) 15	30	45	X_2 (m) Throw Angle (α°) 15	30	45
SUHC-10H	230	0.5	0.02	9.6	140	110	(43.3)	0.21	0.55	1.13	0.86	1.23	1.61	1.57	2.48	3.51
		1.1	0.07	13.0	155	125	(51.7)	0.16	0.44	0.93	0.63	0.97	1.37	1.26	2.01	2.85
		2.9	0.20	16.3	168	140	(60.0)	0.13	0.37	0.75	0.59	0.86	1.18	1.07	1.74	2.45
	370	1.0	0.07	15.4	148	110	(43.3)	0.42	1.04	2.16	1.51	2.16	2.91	2.99	4.37	5.95
		0.9*	0.07*	21.1*	133*	125*	(51.7)	0.33	0.85	1.71	1.21	1.81	2.43	2.38	3.60	5.10
		1.6*	0.19*	26.3*	146*	140*	(60.0)	0.28	0.72	1.45	1.03	1.56	2.12	2.05	3.11	4.43
SUHC-12H	460	0.9	0.05	19.2	137	110	(43.3)	0.28	0.74	1.49	1.12	1.61	2.17	2.15	3.24	4.35
		2.0	0.26	26.0	154	125	(51.7)	0.22	0.59	1.15	0.88	1.32	1.78	1.68	2.71	3.74
		6.5	0.78	32.6	170	140	(60.0)	0.18	0.50	0.93	0.70	1.15	1.52	1.43	2.29	3.15
	730	1.8	0.21	30.5	146	110	(43.3)	0.55	1.36	2.82	2.01	2.86	3.75	3.88	5.67	7.81
		5.1	0.5	41.2	163	125	(51.7)	0.44	1.11	2.29	1.65	2.31	3.09	3.13	4.70	6.55
		3.0*	0.22*	52.1*	144*	140*	(60.0)	0.37	0.95	1.94	1.41	2.02	2.71	2.67	4.08	5.68
SUHC-14H	750	1.4	0.12	31.3	135	110	(43.3)	0.34	0.89	1.81	1.31	1.96	2.34	2.58	3.94	5.48
		3.2	0.18	42.4	153	125	(51.7)	0.26	0.71	1.41	1.08	1.60	2.16	2.04	3.25	4.49
		11.6	1.10	53.1	171	140	(60.0)	0.22	0.60	1.15	0.91	1.37	1.83	1.72	2.77	3.48
	1200	2.9	0.15	50.0	145	110	(43.3)	0.67	1.66	3.42	2.44	3.44	4.54	4.70	6.92	9.25
		2.6*	0.14*	67.8*	127*	125*	(51.7)	0.53	1.35	2.81	1.96	2.84	3.77	3.83	5.74	7.93
		4.7*	0.44*	85.3*	143*	140*	(60.0)	0.45	1.15	2.39	1.66	2.49	3.31	3.31	4.98	6.92
SUHC-16H	1100	2.1	0.27	46.6	135	110	(43.3)	0.42	1.10	2.29	1.64	2.44	3.18	3.14	4.85	6.45
		4.8	0.39	62.1	153	125	(51.7)	0.33	0.89	1.78	1.29	1.96	2.64	2.56	3.95	5.06
		3.4*	0.23*	78.5*	133*	140*	(60.0)	0.27	0.75	1.46	1.13	1.66	2.22	2.17	3.40	4.73
	1700	4.0	0.27	71.1	144	110	(43.3)	0.79	1.95	4.04	2.83	3.99	5.30	5.55	8.13	11.2
		3.6*	0.26*	96.9*	125	125*	(51.7)	0.63	1.58	3.28	2.37	3.33	4.48	4.42	6.69	9.16
		6.5*	0.79*	121*	142*	140*	(60.0)	0.53	1.35	2.79	2.04	2.89	3.85	3.80	5.77	8.15
SUHC-18H	1800	3.0	0.15	75.0	129	110	(43.3)	0.45	1.20	2.46	1.74	2.66	3.53	3.38	5.42	7.57
		7.1	0.36	102	151	125	(51.7)	0.36	0.96	1.92	1.42	2.24	2.97	2.78	4.37	6.17
		5.0*	0.45*	128*	128*	140*	(60.0)	0.29	0.81	1.54	1.22	1.91	2.52	2.29	3.73	5.16
	2900	6.3	0.63	121	141	110	(43.3)	0.92	2.27	4.70	3.29	4.78	6.32	6.51	9.57	13.1
		5.6*	0.55*	164*	120*	125*	(51.7)	0.73	1.85	3.88	2.75	3.86	5.13	5.25	7.86	11.0
		10*	0.86*	206*	138*	140*	(60.0)	0.61	1.57	3.28	2.29	3.45	4.32	4.50	6.83	9.23
SUHC-20H	2300	3.6	0.21	96.0	126	110	(43.3)	0.45	1.20	2.42	1.80	2.76	3.60	3.45	5.37	7.52
		8.2	0.45	130	148	125	(51.7)	0.35	0.96	1.88	1.36	2.19	2.98	2.72	4.50	6.12
		6.0*	0.60*	162*	124*	140*	(60.0)	0.29	0.81	1.51	1.15	1.87	2.53	2.38	3.87	5.25
	3500	6.7	0.70	146	136	110	(43.3)	0.84	2.11	4.45	3.12	4.51	6.02	6.06	9.00	12.6
		6.3*	0.68*	198*	116*	125*	(51.7)	0.66	1.71	3.59	2.57	3.74	4.99	4.94	7.44	10.4
		11*	0.92*	248*	134*	140*	(60.0)	0.55	1.45	3.02	2.12	3.17	4.32	4.20	6.40	8.97

The data in the table is calculated for 2 row coils with 8 FPI fin arrangement (except data signed by * (shaded regions)). To obtain Z, X_1 and X_2 for 3 row coils or 14 FPI fin arrangement or other 5/8" or 1/2" steam coils, use the data in this table considering that air flow (CFM) won't change much but Z, X_1 and X_2 should be estimated according to predicted leaving air temperature ($T_{air_{out}}$). This parameter should be predicted from tables 2~4.

Interpolation and extrapolation (in cases there is no any other way) is allowed in the table.

* Represents a 3 row coil rating (14 FPI).

SARAVEL CORP.
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Manufacturer reserves the right to make changes in design and construction, without notice.

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