AIR HANDLERS

B SERIES

R-410A or R-22 - Multi-Position - 50HZ/60HZ (Export Only)

ENGINEERING DATA

Bulletin No. 490137
September 2009

FEATURES

CABINET

Enhanced grommets - secure & tight.

Multi-position available from factory and field convertible.

Side return right- or left-hand capable on 12 to 30 and 36 size models.

All air handlers are basiloid packaged with bar coding and full description on label.

Magnetic filter rack door makes for easy filter replacement and a tight seal for less air leakage.

Fiberglass air filter comes with every air handler and filter racks accepts readily available size filters.

Rigid beige painted cabinets constructed of heavy gauge steel to prevent corrosion and are lined with high quality

9.5 mm (5/8 in.) foil faced insulation to prevent sweating.

EVAPORATOR COIL

Patented lanced fin design and internally enhanced copper tubing.

Suitable for use with R-22 and R-410A.

Dual 19 mm (3/4 in.) FPT left and right condensate drain connections.

Drain pans are molded of corrosion proof high temperature engineering polymer.

Coils are air pressure tested at 72 kPa (500 PSI), pressure tested with Helium, sealed and then charged with dry air.

Florator, non-bleed A/C or HP TXV's available factory installed. Screw-on TXV's also available for field installation.

HOT WATER HEAT

Suitable for potable water systems.

Hot Water Heat Kits available both factory and field installed.

Easy to replace hot water coil. Remove one screw and slide out.

Optional factory installed circulating pump fully encased in cabinet.

Purge valve on hot water coil allows for manual release of any air trapped in coil during installation or servicing.

Water connections 7/8 in. ODF (for 3/4 in. water pipe) on 12 to 30, and 36 size models and 1-1/8 in. ODF (for 1 in. water pipe) on 31, and 37 - 60 size models.

Control board comes standard factory installed on all Air Handlers and includes the following features:

Features are compatible with both factory and field installed circulating pumps.



3.5 to 17.6 kW (1 to 5 Tons)
Optional Electric Heat - 2.5 to 25 kW
Optional Hot Water Heat -
2.6 to 36.3 kW (9,000 to 124,000 Btuh)

1. Pump timer activates pump for 1 minute every 6 hours eliminating stagnant water in hot water coil.
2. 24 VAC isolation valve control-allows for zoning control.
3. Auxiliary contacts for water heater or boiler activation.
4. Freeze protection- standard factory installed, activates at 4°C (40°F) and deactivates at 21°C (70°F).
5. Thermostat connections.
6. Time delay for blower activation:
   - 60 seconds (tap in OFF position)
   - 54°C (130°F) Aquastat (tap in ON position)

Note: Aquastat tap only included if ordered

FEATURES

VARIABLE-SPEED MOTOR

Variable-speed control board includes dry contacts for thermostat connections.

Constant air circulation feature runs airflow at 50% of cooling airflow, improves indoor air quality and eliminates stratification.

Control Board LED Lights display operation mode and when dehumidification is activated.

Dehumidification - cutting dehumidification resistor on variable-speed control board reduces cooling airflow by 10%.

Choose your own cooling/heating airflow settings, by selecting taps A-D on the variable-speed control board.

Fine tune your airflow setting by selecting (+) tap to increase airflow by 10% and (-) tap to decrease airflow by 12%.

Soft start feature runs airflow at 82% of cooling airflow for first 7.5 minutes of operation.

Time Delay- 1.5 minute blower off delay at the end of a call for cooling.

ELECTRICAL FEATURES

Blower door safety switch on all models.

Dynamically balanced high efficiency three-speed motors for project flexibility.

Easy to adjust blower speeds for fine tuning customer comfort.

Electrical connections can be made on top or both sides of cabinet.

Electric heat kits available factory installed for 2.5 & 5 kW. Higher kW heat kits available for field installation.

Factory installed fan time delay postpones blower shutoff 30 seconds in heating mode and 45 seconds in cooling mode.

MODEL NUMBER IDENTIFICATION

B	C	R	M	A1	2	24	S	2P	3

B = Beige Painted Cabinet

MOTOR TYPE

C = Three-Speed

V = Variable-Speed***

Horizontal Drain Pan Position*

L = Left-Hand

R = Right-Hand

O = No Cooling Coil

AIRFLOW CONFIGURATION

V = Vertical Only

M = Multi-position

SLAB NUMBER

A1 Thru **Z9**

00 = No Cooling Coil, Heating Only

METERING DEVICE

0 = No Cooling Coil

1 = Piston R-410A

2 = Piston R-22

3 = Bleed TXV (R-22)

4 = Non-Bleed A/C TXV (R-22)

5 = Non-Bleed HP-A/C TXV (R-22)

6 = Non-Bleed A/C TXV (R-410A)

9 = Non-Bleed HP-A/C TXV (R-410A)

UNIT SIZE

12, 18, 24, 25, 30, 36	31, 37, 42, 48, 60
Slant Coil	'A' Coil

(side return capable)

VOLTAGE [1]

1 = 208/240 V, 60 Hz, 1 ph. with time delay

2 = 208/240 V, 60 Hz, 1 ph. w/ time delay & 130°F Aquastat

3 = 120 V, 60 Hz, 1 ph. with time delay

4 = 120 V, 60 Hz, 1 ph. w/ time delay & 130°F Aquastat

5 = 220 V, 50 Hz, 1 ph. with time delay (Only available in three-speed blower options and 2N, 3N, & 4N Heat options)

HEAT

0 = No Heat

2 = 3 Kw ELEC.**

5 = 5 Kw ELEC.**

Hot Water Coil with Pump & Valve Assembly

2P = 2 Row hot water coil [sizes 12-30,36]

3P = 3 Row hot water coil [all sizes]

4P = 4 Row hot water coil [sizes 31,37-60]

Hot Water Coil without Pump & Valve Assembly

2N = 2 Row hot water coil [sizes 12-30,36]

3N = 3 Row hot water coil [all sizes]

4N = 4 Row hot water coil [sizes 31,37-60]

LINE VOLTAGE CONNECTION

S = Stripped Wire

T = Terminal Block

[1] Electric heat models not available in 120V, 60 Hz.
*** Horizontal Drain Pans can be field installed as an accessory in Vertical Only Air Handlers for multi-position configuration.**
**** Elec. Heat Kits higher than 5 Kw only available as field installed kits.**
*****Variable-Speed Motor Option available only in 25-31 and 37-60 size models.**
Note: Horizontal Drain Pan Position for slant coil models indicate that the opposing side of the cabinet is side air return capable.
All Air Handlers with slant coils can be field converted to allow for either left or right side air return.

SPECIFICATIONS

General Data	**Size**	**12**	**18**	**24**	**25**	**30**	**31**
	Nominal kW (tons)	3.5 (1)	5.3 (1.5)	7.0 (2)	7.0 (2)	8.8 (2.5)	8.8 (2.5)
Connections	Suction line (o.d.) - mm (in.) sweat	19 (3/4)	19 (3/4)	19 (3/4)	19 (3/4)	19 (3/4)	26 (7/8)
	Liquid line (o.d.) - mm (in.) sweat	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)
	Condensate - in. fpt	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4
	Circulating pump connection size - in.	7/8	7/8	7/8	7/8	7/8	7/8
Florator Piston Size	R-22	0.041	0.053	0.059	0.059	0.067	0.067
	R-410A	0.041	0.049	0.053	0.053	0.059	0.059
Three Speed Blower	Wheel nominal diameter x width - mm (in.)	229 x 152 (9 x 6)			254 x 203 (10 x 8)		
	Blower motor output - W (hp)	149 (1/5)	187 (1/4)		224 (1/3)		
	Nominal air volume - L/s (cfm)	190 (400)	285 (600)	380 (800)	380 (800)	470 (1000)	470 (1000)
Variable Speed Blower	Wheel nominal diameter x width - mm (in.)	- - -	- - -	- - -	229 x 152 (9 x 6)	254 x 203 (10 x 8)	254 x 203 (10 x 8)
	Blower motor output - W (hp)	- - -	- - -	- - -	224 (1/3)	373 (1/2)	373 (1/2)
	Cooling range - L/s (cfm)	- - -	- - -	- - -	285 - 470 (600 - 1000)	285 - 565 (600 - 1200)	285 - 565 (600 - 1200)
	Heating range L/s (cfm)	- - -	- - -	- - -	285 - 470 (600 - 1000)	520 - 565 (1100 - 1200)	520 - 565 (1100 - 1200)
Filters	Size of filter - mm (in.)	305 x 508 (12 x 20)	305 x 508 (12 x 20)	305 x 508 (12 x 20)	406 x 508 (16 x 20)	406 x 508 (16 x 20)	406 x 635 (16 x 25)
Shipping Data -1 package - kg (lbs.) less hot water coil		54 (120)	54 (120)	54 (120)	59 (130)	64 (140)	68 (150)

ELECTRICAL DATA

Available Voltage (three speed)	[1] 120V or 208/240V, 60Hz, 1 ph or 220V, 50Hz, 1 ph					
Full load amps at 120V	2.0	3.2	3.2	5.3	5.3	7.1
Full load amps at 240V	1.4	1.4	1.8	2.2	2.2	2.6
Available Voltage (variable speed)	- - -	- - -	- - -	[1] 120V or 208/240V, 60Hz, 1 ph		
Full load amps at 120V	- - -	- - -	- - -	4.8	5.4	5.4
Full load amps at 240V	- - -	- - -	- - -	2.4	2.7	2.7
Transformer size and type	40VA, Class 2					
Voltage (hot water circulating pump)	120V or 208/240V					
Amps	0.52					

[1] Electric heat models not available in 120 V, 60 Hz.

SPECIFICATIONS

General Data	**Size**	**36**	**37**	**42**	**48**	**60**
	Nominal kW (tons)	10.5 (3)	10.5 (3)	12.3 (3.5)	14.1 (4)	17.6 (5)
Connections	Suction (vapor) line (o.d.) - mm (in.) sweat	19 (3/4)	26 (7/8)	26 (7/8)	26 (7/8)	26 (7/8)
	Liquid line (o.d.) - mm (in.) sweat	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)	9.5 (3/8)
	Condensate - in. fpt	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4
	Circulating pump connection size - in.	7/8	7/8	7/8	7/8	7/8
Florator Piston Size	R-22	0.073	0.073	0.080	0.084	0.093
	R-410A	0.067	0.067	0.073	0.076	0.093
Three Blower Blower	Wheel nominal diameter x width - mm (in.)	254 x 203 (10 x 8)				254 x 254 (10 x 10)
	Blower motor output - W (hp)	224 (1/3)	224 (1/3)	373 (1/2)	560 (3/4)	560 (3/4)
	Nominal L/s (cfm)	565(1200)	565 (1200)	660 (1400)	755 (1600)	945 (2000)
Variable Speed Blower	Wheel nominal diameter x width - mm (in.)	- - -	254 x 203 (10 x 8)	254 x 203 (10 x 8)	254 x 203 (10 x 8)	254 x 254 (10 x 10)
	Blower motor output - W (hp)	- - -	373 (1/2)	373 (1/2)	560 (3/4)	746 (1)
	Cooling range - L/s (cfm)	- - -	285 - 565 (600 - 1200)	470 - 710 (1000 - 1500)	660 - 850 (1400 - 1800)	800 - 895 (1700 - 1900)
	Heating range L/s (cfm)	- - -	520 - 565 (1100 - 1200)	565 - 710 (1200 - 1500)	755 - 850 (1600 - 1800)	800 - 895 (1700 - 1900)
Filters	Size of filter - mm (in.)	406 x 508 (16 x 20)	406 x 635 (16 x 25)	406 x 635 (16 x 25)	406 x 635 (16 x 25)	457 x 635 (18 x 25)
Shipping Data -1 package - kg (lbs.) less hot water coil		64 (140)	68 (150)	95 (210)	104 (230)	109 (240)

ELECTRICAL DATA

Available Voltage (three speed)	[1] 120V or 208/240V, 60Hz, 1 ph or 220V, 50Hz, 1 ph				
Full load amps at 120V	7.1	7.1	8.5	7.5	10.5
Full load amps at 240V	2.6	2.6	3.0	4.4	4.3
Available Voltage (variable speed)	- - -	120V or 208/240V, 60Hz, 1 ph			
Full load amps at 120V	- - -	6.0	6.0	7.2	10.2
Full load amps at 240V	- - -	3.0	3.0	3.5	5.1
Transformer size and type	40VA, Class 2				
Voltage (hot water circulating pump)	120V or 208/240V				
Amps	0.52				

[1] Electric heat models not available in 120 V, 60 Hz.

BLOWER DATA

THREE-SPEED BLOWER PERFORMANCE

Unit Size	Fan Speed Setting	Electric Heat Models										Water Heat Models									
		Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.	Pa	In. w.g.
		25	0.10	50	0.20	75	0.30	100	0.40	125	0.50	25	0.10	50	0.20	75	0.30	100	0.40	125	0.50
12	*Low	235	499	233	493	222	470	206	437	189	401	216	458	210	445	203	431	190	402	174	368
	Med	317	671	300	636	288	611	263	557	231	490	298	631	288	611	274	581	256	543	229	485
	High	343	727	337	715	319	675	298	631	255	540	342	725	326	691	307	650	284	602	257	544
18	Low	235	499	233	493	222	470	206	437	189	401	216	458	210	445	203	431	190	402	174	368
	*Med	317	671	300	636	288	611	263	557	231	490	298	631	288	611	274	581	256	543	229	485
	High	343	727	337	715	319	675	298	631	255	540	342	725	326	691	307	650	284	602	257	544
24	Low	324	687	276	584	273	579	259	549	230	487	277	588	274	580	266	564	253	537	222	471
	*Med	420	889	400	847	375	795	345	731	314	666	364	771	353	747	335	710	317	671	283	600
	High	449	952	423	896	400	847	368	780	329	697	421	893	400	848	378	801	337	714	302	639
25	*Low	386	819	383	812	380	805	369	782	347	735	369	781	367	777	365	773	359	760	350	741
	Med	479	1015	474	1004	465	986	453	961	439	930	467	989	467	989	464	983	456	967	445	942
	High	545	1155	542	1149	529	1122	514	1090	490	1039	517	1095	514	1089	506	1072	495	1049	481	1020
30	Low	386	819	383	812	380	805	369	782	347	735	369	781	367	777	365	773	359	760	350	741
	*Med	479	1015	474	1004	465	986	453	961	439	930	467	989	467	989	464	983	456	967	445	942
	High	545	1155	542	1149	529	1122	514	1090	490	1039	517	1095	514	1089	506	1072	495	1049	481	1020
31	*Low	529	1121	524	1110	519	1099	503	1065	483	1023	528	1118	524	1111	518	1097	500	1060	478	1013
	Med	614	1302	603	1278	582	1233	565	1197	540	1144	602	1275	595	1261	577	1222	551	1168	525	1112
	High	683	1448	656	1391	641	1359	613	1298	577	1223	639	1355	628	1330	621	1317	598	1267	564	1196
36	Low	529	1121	524	1110	519	1099	503	1065	483	1023	528	1118	524	1111	518	1097	500	1060	478	1013
	*Med	614	1302	603	1278	582	1233	565	1197	540	1144	602	1275	595	1261	577	1222	551	1168	525	1112
	High	683	1448	656	1391	641	1359	613	1298	577	1223	639	1355	628	1330	621	1317	598	1267	564	1196
37	Low	562	1190	530	1122	496	1052	485	1028	473	1003	506	1072	477	1011	447	947	437	926	426	903
	*Med	678	1437	639	1355	599	1270	586	1241	572	1212	638	1351	601	1274	563	1194	551	1167	537	1139
	High	684	1449	674	1429	655	1389	634	1344	613	1298	642	1361	633	1342	616	1305	596	1263	575	1219
42	Low	635	1345	628	1331	614	1302	605	1282	593	1257	544	1153	540	1144	540	1144	536	1135	536	1135
	*Med	793	1681	762	1615	749	1587	718	1521	702	1487	705	1494	682	1445	675	1431	658	1395	633	1342
	High	844	1788	815	1727	790	1674	756	1603	722	1529	786	1666	750	1590	741	1571	713	1511	693	1469
48	Low	740	1568	721	1527	709	1502	676	1433	659	1397	716	1518	680	1440	665	1409	653	1383	631	1338
	*Med	838	1775	814	1724	789	1672	738	1563	710	1505	780	1652	743	1575	727	1541	711	1506	689	1459
	High	888	1881	865	1834	833	1765	799	1693	754	1597	819	1736	787	1668	762	1614	738	1564	719	1524
60	Low	784	1662	779	1650	775	1643	762	1614	740	1568	777	1646	775	1642	773	1639	769	1630	758	1606
	*Med	874	1853	868	1840	856	1813	824	1746	790	1675	865	1833	862	1826	859	1820	833	1766	803	1702
	High	984	2085	490	1038	939	1990	904	1916	868	1839	974	2065	957	2029	935	1981	905	1918	872	1847

* Factory speed setting for heating and cooling.

NOTE - All data is measured while air handler is operating with a dry DX coil and air filter installed.
Cooling speeds should not be reduced below factory setting.

BLOWER DATA

VARIABLE-SPEED BLOWER PERFORMANCE & ADJUSTMENT TABLE

Unit Size	Operating Mode	Control Board Taps															
		Cooling								Heating							
		A		B		C		D		A		B		C		D	
		L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm
25	Cooling	400	850	330	700	285	600	235	500								
	HP Heating									400	850	320	675	285*	600*	235*	500*
	Continuous	200	425	165	350	140	300	120	250								
	Aux. Heat	**	**	**	**	**	**	**	**	400	850	330	700	285*	600*	235*	500*
	Emer. Heat	**	**	**	**	**	**	**	**	400	850	330	700	285*	600*	235*	500*
30, 31	Cooling	565	1200	470	1000	380	800	285	600								
	HP Heating									565	1200	470	1000	380*	800*	285*	600*
	Continuous	285	600	235	500	190	400	165	350								
	Aux. Heat	**	**	**	**	**	**	**	**	565	1200	470	1000	380*	800*	285*	600*
	Emer. Heat	**	**	**	**	**	**	**	**	565	1200	470	1000	380*	800*	285*	600*
37	Cooling	660	1400	580	1230	520	1100	470	1000								
	HP Heating									660	1400	580	1230	520*	1100*	470*	1000*
	Continuous	330	700	290	615	260	550	235	500								
	Aux. Heat	**	**	**	**	**	**	**	**	660	1400	580	1230	520*	1100*	470*	1000*
	Emer. Heat	**	**	**	**	**	**	**	**	660	1400	580	1230	520*	1100*	470*	1000*
42	Cooling	660	1400	580	1230	520	1100	470	1000								
	HP Heating									660	1400	580	1230	520*	1100*	470*	1000*
	Continuous	330	700	290	615	260	550	235	500								
	Aux. Heat	**	**	**	**	**	**	**	**	660	1400	580	1230	520*	1100*	470*	1000*
	Emer. Heat	**	**	**	**	**	**	**	**	660	1400	580	1230	520*	1100*	470*	1000*
48	Cooling	755	1600	685	1450	635	1350	590	1250								
	HP Heating									755	1600	685	1450	635*	1350*	590*	1250*
	Continuous	375	800	340	725	320	675	295	625								
	Aux. Heat	**	**	**	**	**	**	**	**	755	1600	685	1450	635*	1350*	590*	1250*
	Emer. Heat	**	**	**	**	**	**	**	**	755	1600	685	1450	635*	1350*	590*	1250*
60	Cooling	895	1900	875	1850	850	1800	800	1700								
	HP Heating									895	1900	875	1850	850	1800	800	1700
	Continuous	450	950	435	925	425	900	400	850								
	Aux. Heat	**	**	**	**	**	**	**	**	895	1900	875	1850	850	1800	800	1700
	Emer. Heat	**	**	**	**	**	**	**	**	895	1900	875	1850	850	1800	800	1700

* This air volume is not approved for use with the highest kW heater size.

**Airflow is the greater of the COOL and HEAT values when both electric heat and heat pump are operating.

NOTES: The heating and cooling taps are factory set on “A” except model 37 is set on “B”

Adjust tap (+) will increase airflow by 10%, while tap (-) will decrease airflow by 12%.

Adjust tap “test” will cause motor to run at 70% of full airflow. Use this for troubleshooting only.

At the start of a call for cooling there is a short run at 82% of airflow for 7.5 minutes.

At the end of a call for cooling there is a blower off delay of 1.5 minutes.

If humidistat is used it will reduce cooling airflow by 10% in high humidity.

Special Note for Units Equipped with Humidistat: If using a humidistat, the Dehumidify resistor located on the bottom right of the control board must be removed.

ELECTRICAL DATA

Air Handler Size (mBtuh)	Electric Heat Capacity		Three Speed Blower				Variable Speed Blower			Circuit Breaker Amps Per Stage		
	kW	Btuh	Minimum Heat Settings	Amps		Three Speed Blower Minimum Circuit Ampacity	Amps		Minimum Circuit Ampacity			
	[1] 240V	[1] 240V		120V	240V	240 V	120V	240V	240 V	1	2	3
12 Water Heat	0	0	Low	2.0	1.4	1.8	- - -	- - -	- - -	15	- - -	- - -
12 No Heat	0	0	Low	2.0	1.4	1.8	- - -	- - -	- - -	15	- - -	- - -
12 Elec. Heat	2.5	8,530	Low	- - -	1.4	14.8	- - -	- - -	- - -	15	- - -	- - -
12 Elec. Heat	5	17,065	Low	- - -	1.4	27.8	- - -	- - -	- - -	30	- - -	- - -
18 Water Heat	0	0	Low	3.2	1.4	1.8	- - -	- - -	- - -	15	- - -	- - -
18 No Heat	0	0	Low	3.2	1.4	1.8	- - -	- - -	- - -	15	- - -	- - -
18 Elec. Heat	2.5	8,530	Low	- - -	1.4	14.8	- - -	- - -	- - -	15	- - -	- - -
18 Elec. Heat	5	17,065	Low	- - -	1.4	27.8	- - -	- - -	- - -	30	- - -	- - -
18 Elec. Heat	7.5	25,598	Med	- - -	1.4	40.8	- - -	- - -	- - -	45	- - -	- - -
18 Elec. Heat	10	34,130	Med	- - -	1.4	53.8	- - -	- - -	- - -	60	- - -	- - -
24 Water Heat	0	0	Low	3.2	1.8	2.3	- - -	- - -	- - -	15	- - -	- - -
24 No Heat	0	0	Low	3.2	1.8	2.3	- - -	- - -	- - -	15	- - -	- - -
24 Elec. Heat	2.5	8,530	Low	- - -	1.8	15.3	- - -	- - -	- - -	30	- - -	- - -
24 Elec. Heat	5	17,065	Low	- - -	1.8	28.3	- - -	- - -	- - -	30	- - -	- - -
24 Elec. Heat	7.5	25,598	Low	- - -	1.8	41.3	- - -	- - -	- - -	45	- - -	- - -
24 Elec. Heat	10	34,130	Med	- - -	1.8	54.3	- - -	- - -	- - -	60	- - -	- - -
24 Elec. Heat	**12.5**	42,663	Med	- - -	1.8	67.4	- - -	- - -	- - -	45	30	- - -
25 Water Heat	0	0	Low	5.3	2.2	2.8	4.8	2.4	3.0	15	- - -	- - -
25 No Heat	0	0	Low	5.3	2.2	2.8	4.8	2.4	3.0	15	- - -	- - -
25 Elec. Heat	2.5	8,530	Low	- - -	2.2	15.8	- - -	2.4	16.0	30	- - -	- - -
25 Elec. Heat	5	17,065	Low	- - -	2.2	28.8	- - -	2.4	29.0	30	- - -	- - -
25 Elec. Heat	7.5	25,598	Low	- - -	2.2	41.8	- - -	2.4	42.1	45	- - -	- - -
25 Elec. Heat	10	34,130	Low	- - -	2.2	54.8	- - -	2.4	55.1	60	- - -	- - -
25 Elec. Heat	**12.5**	42,663	Low	- - -	2.2	67.9	- - -	2.4	68.1	45	30	- - -
30 Water Heat	0	0	Low	5.3	2.2	2.8	5.4	2.7	3.4	15	- - -	- - -
30 No Heat	0	0	Low	5.3	2.2	2.8	5.4	2.7	3.4	15	- - -	- - -
30 Elec. Heat	2.5	8,530	Low	- - -	2.2	15.8	- - -	2.7	16.4	30	- - -	- - -
30 Elec. Heat	5	17,065	Low	- - -	2.2	28.8	- - -	2.7	29.4	45	- - -	- - -
30 Elec. Heat	7.5	25,598	Low	- - -	2.2	41.8	- - -	2.7	42.4	45	- - -	- - -
30 Elec. Heat	10	34,130	Low	- - -	2.2	54.8	- - -	2.7	55.5	60	- - -	- - -
30 Elec. Heat	**12.5**	42,663	Med	- - -	2.2	67.9	- - -	2.7	68.5	45	30	- - -
30 Elec. Heat	**15**	51,195	Med	- - -	2.2	80.9	- - -	2.7	81.5	60	30	- - -
30 Elec. Heat	**17.5**	59,728	Med	- - -	2.2	93.9	- - -	2.7	94.5	60	45	- - -
31 Water Heat	0	0	Low	7.1	2.6	3.3	5.4	2.7	3.4	15	- - -	- - -
31 No Heat	0	0	Low	7.1	2.6	3.3	5.4	2.7	3.4	15	- - -	- - -
31 Elec. Heat	2.5	8,530	Low	- - -	2.6	16.3	- - -	2.7	16.4	30	- - -	- - -
31 Elec. Heat	5	17,065	Low	- - -	2.6	29.3	- - -	2.7	29.4	45	- - -	- - -
31 Elec. Heat	7.5	25,598	Low	- - -	2.6	42.3	- - -	2.7	42.4	45	- - -	- - -
31 Elec. Heat	10	34,130	Low	- - -	2.6	55.3	- - -	2.7	55.5	60	- - -	- - -
31 Elec. Heat	**12.5**	42,663	Low	- - -	2.6	68.4	- - -	2.7	68.5	45	30	- - -
31 Elec. Heat	**15**	51,195	Low	- - -	2.6	81.4	- - -	2.7	81.5	60	30	- - -
31 Elec. Heat	**17.5**	59,728	Low	- - -	2.6	94.4	- - -	2.7	94.5	60	45	- - -

NOTE - Electric heat capacity (kW) in **bold** indicates that heat packages require and include circuit breakers. Optional for others.
[1] For 208 Volts use 0.751 correction factor for kW & Btuh.

ELECTRICAL DATA

Air Handler Size (mBtuh)	Electric Heat Capacity		Three Speed Blower				Variable Speed Blower			Circuit Breaker Amps Per Stage		
	kW	Btuh	Minimum Heat Settings	Amps		Three Speed Blower Minimum Circuit Ampacity	Amps		Minimum Circuit Ampacity			
	[1] 240V	[1] 240V		120V	240V	240 V	120V	240V	240 V	1	2	3
36 Water Heat	0	0	Low	7.1	2.6	3.3	- - -	- - -	- - -	15	- - -	- - -
36 No Heat	0	0	Low	7.1	2.6	3.3	- - -	- - -	- - -	15	- - -	- - -
36 Elec. Heat	2.5	8,530	Low	- - -	2.6	16.3	- - -	- - -	- - -	30	- - -	- - -
36 Elec. Heat	5	17,065	Low	- - -	2.6	29.3	- - -	- - -	- - -	30	- - -	- - -
36 Elec. Heat	7.5	25,598	Low	- - -	2.6	42.3	- - -	- - -	- - -	45	- - -	- - -
36 Elec. Heat	10	34,130	Low	- - -	2.6	55.3	- - -	- - -	- - -	60	- - -	- - -
36 Elec. Heat	**12.5**	42,663	Med	- - -	2.6	68.4	- - -	- - -	- - -	45	30	- - -
36 Elec. Heat	**15**	51,195	Med	- - -	2.6	81.4	- - -	- - -	- - -	60	30	- - -
36 Elec. Heat	**17.5**	59,728	Med	- - -	2.6	94.4	- - -	- - -	- - -	60	45	- - -
36 Elec. Heat	**20**	68,260	Med	- - -	2.6	107.4	- - -	- - -	- - -	60	60	- - -
37 Water Heat	0	0	L	7.1	2.6	3.3	6	3.0	3.8	15	- - -	- - -
37 No Heat	0	0	L	7.1	2.6	3.3	6	3.0	3.8	15	- - -	- - -
37 Elec. Heat	5	17,065	L	- - -	2.6	29.3	- - -	3.0	29.8	45	- - -	- - -
37 Elec. Heat	10	34,130	L	- - -	2.6	55.3	- - -	3.0	55.8	45	30	- - -
37 Elec. Heat	**12.5**	42,663	M	- - -	2.6	68.4	- - -	3.0	68.9	60	30	- - -
37 Elec. Heat	**15**	51,195	M	- - -	2.6	81.4	- - -	3.0	81.9	60	30	- - -
37 Elec. Heat	**20**	68,260	M	- - -	2.6	107.4	- - -	3.0	107.9	60	45	30
42 Water Heat	0	0	L	8.5	3.0	3.8	6	3.0	3.8	15	- - -	- - -
42 No Heat	0	0	L	8.5	3.0	3.8	6	3.0	3.8	15	- - -	- - -
42 Elec. Heat	5	17,065	L	- - -	3.0	29.8	- - -	3.0	29.8	45	- - -	- - -
42 Elec. Heat	10	34,130	L	- - -	3.0	55.8	- - -	3.0	55.8	45	30	- - -
42 Elec. Heat	**12.5**	42,663	L	- - -	3.0	68.9	- - -	3.0	68.9	45	30	- - -
42 Elec. Heat	**15**	51,195	M	- - -	3.0	81.9	- - -	3.0	81.9	60	30	- - -
42 Elec. Heat	**20**	68,260	M	- - -	3.0	107.9	- - -	3.0	107.9	60	45	30
48 Water Heat	0	0	L	7.5	4.4	5.5	7	3.5	4.4	15	- - -	- - -
48 No Heat	0	0	L	7.5	4.4	5.5	7	3.5	4.4	15	- - -	- - -
48 Elec. Heat	5	17,065	L	- - -	4.4	31.5	- - -	3.5	30.4	45	- - -	- - -
48 Elec. Heat	10	34,130	L	- - -	4.4	57.6	- - -	3.5	56.5	60	- - -	- - -
48 Elec. Heat	**12.5**	42,663	L	- - -	4.4	70.6	- - -	3.5	69.5	45	30	- - -
48 Elec. Heat	**15**	51,195	L	- - -	4.4	83.6	- - -	3.5	82.5	60	45	- - -
48 Elec. Heat	**20**	68,260	L	- - -	4.4	109.7	- - -	3.5	108.5	60	45	30
48 Elec. Heat	**25**	85,325	M	- - -	4.4	135.7	- - -	4.3	135.6	60	60	30
60 Water Heat	**0**	0	L	10.5	4.3	5.4	10.2	5.1	6.4	15	- - -	- - -
60 No Heat	0	0	L	10.5	4.3	5.4	10.2	5.1	6.4	15	- - -	- - -
60 Elec. Heat	5	17,065	L	- - -	4.3	31.4	- - -	5.1	32.4	45	- - -	- - -
60 Elec. Heat	10	34,130	L	- - -	4.3	57.5	- - -	5.1	58.5	60	- - -	- - -
60 Elec. Heat	**12.5**	42,663	L	- - -	4.3	70.5	- - -	5.1	71.5	45	30	- - -
60 Elec. Heat	**15**	51,195	L	- - -	4.3	83.5	- - -	5.1	84.5	60	30	- - -
60 Elec. Heat	**20**	68,260	L	- - -	4.3	109.5	- - -	5.1	110.5	60	60	- - -
60 Elec. Heat	**25**	85,325	M	- - -	4.3	135.6	- - -	4.3	135.6	60	60	30

NOTE - Electric heat capacity (kW) in **bold** indicates that heat packages require and include circuit breakers. Optional for others.
[1] For 208 Volts use 0.751 correction factor for kW & Btuh.

WATER HEATING CAPACITY

WATER HEATING CAPACITY KW (BTUH)

12, 18 and 24

Coil Size No.of rows	Entering Water Temp.		3.7 LPM (1 GPM)							7.4 LPM (2 GPM)								11.1 LPM (3 GPM)							
			Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm
	°C	°F	Pa	in. ft.	190	400	285	600	375	800	Pa	in. ft.	190	400	285	600	375	800	Pa	in. ft.	190	400	285	600	375	800
2	49	120	50	0.2	2.64	9,004	3.22	10,979	3.49	11,914	149	0.6	3.41	11,639	4.10	13,997	4.60	15,683	348	1.4	3.67	12,536	4.51	15,396	5.14	17,522
	60	140	50	0.2	3.87	13,209	4.57	15,600	4.97	16,942	149	0.6	4.82	16,452	5.81	19,823	6.52	22,240	323	1.3	5.18	17,683	6.38	21,757	7.27	24,793
	71	160	50	0.2	5.17	17,628	5.95	20,302	6.47	22,065	149	0.6	6.25	21,316	7.54	25,727	8.45	28,834	323	1.3	6.70	22,872	8.26	28,184	9.42	32,151
	82	180	50	0.2	9.59	32,738	7.35	25,065	7.99	27,260	149	0.6	7.68	26,217	9.29	31,687	10.44	35,621	323	1.3	8.23	28,091	10.16	34,659	11.60	39,573
3	49	120	75	0.3	3.31	11,286	4.04	13,771	4.38	14,944	224	0.9	4.26	14,528	5.22	17,826	5.91	20,160	472	1.9	4.57	15,582	5.75	19,636	6.64	22,659
	60	140	50	0.2	4.81	16,401	5.72	19,506	6.21	21,177	224	0.9	6.01	20,495	7.38	25,194	8.36	28,524	472	1.9	6.43	21,942	8.12	27,701	9.38	32,004
	71	160	50	0.2	6.39	21,792	7.42	25,320	8.06	27,500	224	0.9	7.77	26,511	9.57	32,641	10.84	36,991	448	1.8	8.31	28,343	10.50	35,833	12.15	41,442
	82	180	50	0.2	7.89	26,908	9.14	31,193	9.93	33,891	224	0.9	9.54	32,564	11.77	40,145	13.34	45,532	448	1.8	10.19	34,771	12.90	44,014	14.93	50,947

25, 30 and 36

Coil Size No.of rows	Entering Water Temp.		7.4 LPM (2 GPM)							11.1 LPM (3 GPM)								14.8 LPM (4 GPM)							
			Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm
	°C	°F	Pa	in. ft.	378	800	472	1000	566	1200	Pa	in. ft.	378	800	472	1000	566	1200	Pa	in. ft.	378	800	472	1000	566	1200
2	49	120	124	0.5	5.06	17,277	5.29	18,048	5.60	19,124	249	1.0	5.74	19,588	6.01	20,523	6.45	21,997	423	1.7	6.15	20,990	6.46	22,035	6.96	23,750
	60	140	124	0.5	7.19	24,529	7.51	25,619	7.96	27,164	249	1.0	8.13	27,747	8.52	29,072	9.13	31,155	423	1.7	8.70	29,682	9.13	31,163	9.85	33,616
	71	160	124	0.5	9.35	31,899	9.76	33,313	10.36	35,341	249	1.0	10.55	36,013	11.06	37,734	11.86	40,464	398	1.6	11.27	38,472	11.84	40,396	12.78	43,602
	82	180	99	0.4	11.53	39,359	12.04	41,098	12.78	43,622	224	0.9	13.00	44,360	13.62	46,482	14.62	49,872	398	1.6	13.87	47,332	14.57	49,705	15.73	53,678
3	49	120	174	0.7	6.25	21,309	6.68	22,783	15.88	54,179	348	1.4	7.18	24,501	7.67	26,156	8.25	28,137	597	2.4	7.52	25,648	8.26	28,187	8.96	30,578
	60	140	149	0.6	8.84	30,149	9.45	32,261	10.04	34,255	323	1.3	9.96	33,970	10.84	36,982	11.67	39,809	572	2.3	10.60	36,180	11.66	39,801	12.66	43,208
	71	160	149	0.6	11.46	39,095	12.27	41,866	13.03	44,472	323	1.3	12.89	43,988	14.05	47,928	15.13	51,621	547	2.2	13.72	46,799	15.10	51,526	16.40	55,970
	82	180	149	0.6	14.10	48,121	15.11	51,564	16.06	54,794	323	1.3	15.85	54,077	17.28	58,963	18.62	63,537	547	2.2	16.85	57,481	18.56	63,331	20.17	68,827

31 and 37

Coil Size No.of rows	Entering Water Temp.		11.1 LPM (3 GPM)							14.8 LPM (4 GPM)								18.5 LPM (5 GPM)							
			Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm
	°C	°F	Pa	in. ft.	472	1000	519	1100	566	1200	Pa	in. ft.	472	1000	519	1100	566	1200	Pa	in. ft.	472	1000	519	1100	566	1200
3	49	120	199	0.8	8.42	28,726	8.77	29,931	9.09	31,014	348	1.4	9.10	31,055	9.53	32,522	9.92	33,856	497	2	9.55	32,602	10.04	34,260	10.49	35,779
	60	140	199	0.8	11.90	40,610	12.41	42,329	12.86	43,874	323	1.3	12.85	43,847	13.46	45,937	14.02	47,838	497	2	13.48	45,986	14.17	48,344	14.80	50,505
	71	160	199	0.8	15.42	52,624	16.08	54,869	16.67	56,888	323	1.3	16.63	56,759	17.43	59,485	18.16	61,965	472	1.9	17.43	59,479	18.33	62,550	19.16	65,366
	82	180	199	0.8	18.97	64,735	19.79	67,541	20.52	70,015	323	1.3	20.44	69,759	21.43	73,130	22.33	76,197	472	1.9	21.41	73,051	22.52	76,844	23.54	80,323
4	49	120	249	1.0	9.81	33,478	10.25	34,963	10.65	36,329	423	1.7	10.61	36,193	11.15	38,058	11.65	39,751	646	2.6	11.12	37,946	11.74	40,069	12.31	42,015
	60	140	249	1.0	13.85	47,246	14.47	49,386	15.03	51,301	423	1.7	14.95	51,024	15.73	53,674	16.44	56,080	646	2.6	15.66	53,450	16.55	56,462	17.36	59,224
	71	160	249	1.0	17.92	61,139	18.73	63,925	19.47	66,420	423	1.7	19.33	65,969	20.34	69,416	21.26	72,548	622	2.5	20.24	69,055	21.39	72,970	22.44	76,562
	82	180	249	1.0	22.02	75,121	23.02	78,563	23.93	81,645	398	1.6	23.74	80,995	24.11	82,250	26.12	89,117	597	2.4	24.83	84,734	26.25	89,561	27.55	93,993

All capacities are based on 21°C (70°F) entering air temperature.
For entering air temperatures other than 21°C (70°F) use the following capacity correction factors:
22.2°C (72°F) x 0.982, 20°C (68°F) x 1.02, 18.8°C (66°F) x 1.04.
Glycol correction factors: (10% X 0.98), (20% X 0.95), (30% X 0.92), (40% X 0.88)

WATER HEATING CAPACITY

42 and 48

Coil Size No.of rows	Entering Water Temp.		11.1 LPM (3 GPM)							14.8 LPM (4 GPM)								18.5 LPM (5 GPM)							
			Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm
	°C	°F	Pa	in. ft.	661	1400	708	1500	755	1600	Pa	in. ft.	661	1400	708	1500	755	1600	Pa	in. ft.	661	1400	708	1500	755	1600
3	49	120	199	0.8	9.64	32,883	9.87	33,695	10.09	34,441	348	1.4	10.61	36,190	10.91	37,221	11.19	38,173	497	2.0	11.27	38,464	11.62	39,660	11.93	40,722
	60	140	199	0.8	13.64	46,541	13.98	47,701	14.29	48,766	323	1.3	15.00	51,167	15.44	52,686	15.82	53,996	497	2.0	15.92	54,329	16.42	56,032	16.89	57,617
	71	160	199	0.8	17.69	60,372	18.14	61,888	18.55	63,279	323	1.3	19.43	66,310	20.00	68,229	20.52	70,004	472	1.9	20.62	70,350	21.27	72,572	21.87	74,640
	82	180	224	0.9	21.78	74,330	22.33	76,209	22.84	77,933	323	1.3	23.91	81,575	24.60	83,951	25.25	86,149	472	1.9	25.35	86,486	26.15	89,234	26.90	91,792
4	49	120	249	1.0	11.32	38,636	11.61	39,631	11.88	40,540	423	1.7	12.52	42,707	12.90	44,006	13.25	45,204	646	2.6	13.32	45,457	13.77	46,988	14.19	48,409
	60	140	249	1.0	16.00	54,582	16.41	55,996	16.79	57,288	423	1.7	17.67	60,284	18.21	62,131	18.71	63,834	646	2.6	18.79	64,115	19.43	66,290	20.02	68,310
	71	160	249	1.0	20.72	70,692	21.26	72,535	21.75	74,216	423	1.7	22.87	78,023	23.57	80,428	24.22	82,647	622	2.5	24.30	82,925	25.13	85,756	25.90	88,386
	82	180	249	1.0	25.47	86,924	26.14	89,200	26.75	91,276	398	1.6	28.10	95,879	28.97	98,851	29.77	101,592	597	2.4	29.85	101,845	30.87	105,340	31.82	108,588

60

Coil Size No.of rows	Entering Water Temp.		11.1 LPM (3 GPM)							14.8 LPM (4 GPM)								18.5 LPM (5 GPM)							
			Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm	Water Pressure Drop		L/s	cfm	L/s	cfm	L/s	cfm
	°C	°F	Pa	in. ft.	849	1800	897	1900	944	2000	Pa	in. ft.	849	1800	897	1900	944	2000	Pa	in. ft.	849	1800	897	1900	944	2000
3	49	120	298	1.2	10.93	37,308	11.12	37,936	11.29	38,521	522	2.1	12.20	41,636	12.44	42,459	12.67	43,229	796	3.2	13.09	44,672	13.38	45,650	13.65	46,570
	60	140	298	1.2	15.47	52,797	15.74	53,693	15.98	54,526	522	2.1	17.25	58,874	17.60	60,047	17.92	61,145	796	3.2	18.50	63,115	15.97	54,508	19.29	65,818
	71	160	298	1.2	20.07	68,481	20.41	69,650	20.73	70,737	497	2.0	22.36	76,308	22.81	77,839	23.23	79,273	771	3.1	23.96	81,747	24.49	83,564	24.99	85,273
	82	180	298	1.2	24.71	84,309	25.13	85,756	25.53	87,101	497	2.0	27.52	93,886	28.07	95,781	28.59	97,555	771	3.1	29.46	100,517	30.12	102,764	30.74	104,879
4	49	120	274	1.1	12.80	43,662	13.01	44,406	13.22	45,095	472	1.9	14.39	49,104	14.69	50,118	14.97	51,065	721	2.9	15.50	52,882	15.86	54,114	16.20	55,271
	60	140	274	1.1	18.07	61,666	18.38	62,721	18.67	63,698	472	1.9	20.32	69,318	20.74	70,759	21.13	72,104	696	2.8	21.86	74,605	22.38	76,356	22.86	77,999
	71	160	274	1.1	23.40	79,853	23.80	81,224	24.18	82,492	448	1.8	26.30	89,723	26.84	91,598	27.36	93,347	696	2.8	28.29	96,514	23.09	78,793	29.58	100,931
	82	180	274	1.1	28.77	98,172	29.27	99,863	29.73	101,427	448	1.8	32.32	110,265	32.99	112,579	33.63	114,739	671	2.7	34.75	118,557	35.57	121,369	36.34	124,009

All capacities are based on 21°C (70°F) entering air temperature.
For entering air temperatures other than 21°C (70°F) use the following capacity correction factors:
22.2°C (72°F) x 0.982, 20°C (68°F) x 1.02, 18.8°C (66°F) x 1.04.
Glycol correction factors: (10% X 0.98), (20% X 0.95), (30% X 0.92), (40% X 0.88)

Hydronic System Design

Includes: Heating coil selection, line sizing and selected pump supplied by other

Sample Application

10.5 kW Cooling Load
82°C Water Temp
40% Glycol Mixture
17.6 kW Heat Required

(1) From the 10.5 kW heating capacity tables select a hot water coil that supplies at least 17.6 kW at 565 L/s, 82°C water temperature

The 3 row coil supplies 20.2 kW @ 14.8 LPM, 0.5 kPa pressure drop		20.2
Correct capacity for 40% glycol (correction factors found below capacity chart)	**X**	0.88
Corrected coil heating capacity (kW)	**=**	**17.7**

(2) Determine total equivalent line length

Note: Use the following line sizes as a guide for initial selection

1 - 11.1 LPM, 19 mm	4 - 18.5 LPM, 25 mm	6 - 29.6 LPM, 32 mm

Line size 25 mm	Quantity		Equiv. length of pipe **(Table 3)**				
Total number of fittings							
90° SR elbows	20	**X**	0.79 m	**=**	16.4 m		16.4 m
90° LR elbows	0	**X**	0	**=**	0	**+**	0
45° elbows	0	**X**	0	**=**	0	**+**	0
gate valves	2	**X**	533 mm	**=**	1.2 m	**+**	1.1 m
Total supply and return line length						**+**	56.7 m
Total equivalent line length						**=**	**74.3 m**

(3) Determine total pump head required

			Press. Drop/Pa **(Table 1)**				
Total equivalent line length	74.3 m	**X**	3.7	**=**	2.75		1.1 m
Total pressure drop through coil (found on capacity chart)						**+**	0.67 m
Line length correction factor for 40% glycol @ 82°C **(Table 2)**						**X**	1.12
Total pump head required							**2.0 m**

(4) Now select a pump that supplies 14.8 LPM with at least 2.0 m head capability.
Note: If desired, recalculation can be done with another line size to vary pump requirement.

Table 1 — Piping Pressure Loss, mm/25 mm (type K copper)

Nominal Pipe Size	LPM 1	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.25	3.5	3.75	4	4.5	5	6	7	8
1/2 in.	.030	.048	.065	.083	.100	.125	.150	.175	.200	-	-	-	-	-	-	-	-	-
3/4 in.	.005	.009	.012	.016	.019	.024	.029	.034	.039	.045	.050	.056	.062	.077	.092	.130	-	-
1 in.	-	-	-	-	.005	.006	.007	.008	.009	.011	.012	.014	.015	.019	.023	.033	.042	.053
1-1/4 in.	-	-	-	-	-	-	-	-	-	-	-	-	.005	.007	.008	.011	.015	.018

Table 2 — Pressure Drop Correction

% Glycol	60°C	71°C	82°C
10	1.04	1.04	1.02
20	1.08	1.07	1.04
30	1.13	1.11	1.08
40	1.19	1.16	1.12
50	1.24	1.21	1.17

Table 3 — Equivalent ft. of pipe

Pipe Size	90° SR el	90° LR el	45° el	gate valve
1/2"	1.5	0.8	1	1
3/4"	2	1	1.4	1.4
1"	2.7	1.3	1.9	1.9
1 1/4"	3.6	1.8	2.5	2.5

MAXIMUM LINE LENGTHS FOR HEATING COILS

Maximum Line Lengths for Heating Coils Using Furnished Pump

All line lengths are total for supply and return

Air Handler Size	Water Coil Size (rows)	Nominal Pipe Size (ID)		Maximum Supply Pipe Length - m (ft.) type K copper																																			
		LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM	LPM	GPM
		mm	in.	3.7	1	5	1.3	5.5	1.5	6.6	1.8	7.4	2	8.5	2	9	2.5	10	3	11	3	12	3.3	13	3.5	14	3.8	15	4	16	4.3	16.5	4.5	18	4.8	18.5	5
12, 18, 24	2	13	1/2	**78**	**256**	45	149	30	100	22	71	16	53	11	35	7	23	5	15	2	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		19	3/4	---	---	---	---	---	---	**141**	**464**	**110**	**361**	**80**	**263**	**60**	**198**	46	152	36	118	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
	3	25	1/2	**78**	**256**	45	148	30	98	21	70	16	51	10	33	6	20	4	12	2	5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		19	3/4	---	---	---	---	---	---	**138**	**454**	**107**	**351**	**77**	**251**	**57**	**186**	43	140	32	105	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
30, 36	2	25	1/2	---	---	---	---	---	---	---	---	17	55	11	37	8	25	5	16	3	10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		19	3/4	---	---	---	---	---	---	---	---	**113**	**372**	**83**	**273**	**63**	**208**	49	162	39	128	30	99	23	76	18	58	13	43	---	---	---	---	---	---	---	---	---	---
		25	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**154**	**504**	**122**	**401**	**98**	**321**	**78**	**257**	---	---	---	---	---	---	---	---	---	---
	3	13	1/2	---	---	---	---	---	---	---	---	16	53	11	35	7	23	4	14	2	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
		19	3/4	---	---	---	---	---	---	---	---	110	361	80	263	57	188	46	152	36	118	27	89	20	66	15	48	10	33	---	---	---	---	---	---	---	---	---	---
		25	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	141	461	109	359	85	280	66	217	---	---	---	---	---	---	---	---	---	---
31, 37, 42 , 48	3	19	3/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	41	134	32	104	25	81	19	63	15	48	11	35	8	25	5	16	3	9
		25	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**160**	**526**	**129**	**422**	**104**	**341**	**84**	**277**	**67**	**221**	**54**	**177**	43	141	34	111
		32	1 1/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	576	142	467	115	378
	4	19	3/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	38	126	30	97	23	75	17	57	13	43	9	30	6	19	3	11	1	4
		25	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**151**	**497**	**121**	**397**	**97**	**319**	**78**	**257**	**61**	**200**	48	156	37	120	27	90
		32	1 1/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	**514**	**123**	**405**	**96**	**315**
60	3	19	3/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	37	121	28	92	21	69	16	51	11	37	7	23	4	12	1	3	---	---
		25	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**144**	**473**	**113**	**372**	**89**	**293**	**70**	**230**	**52**	**172**	39	127	27	90	18	59
		32	1 1/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**430**	**97**	**318**	**69**	**228**
	4	19	3/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	37	123	29	94	22	72	16	54	12	40	8	27	5	16	2	8	---	---
		25	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**148**	**485**	**116**	**382**	**93**	**306**	**74**	**244**	**57**	**187**	44	143	32	106	23	77
		32	1 1/4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	**476**	**112**	**367**	**85**	**278**

Notes:

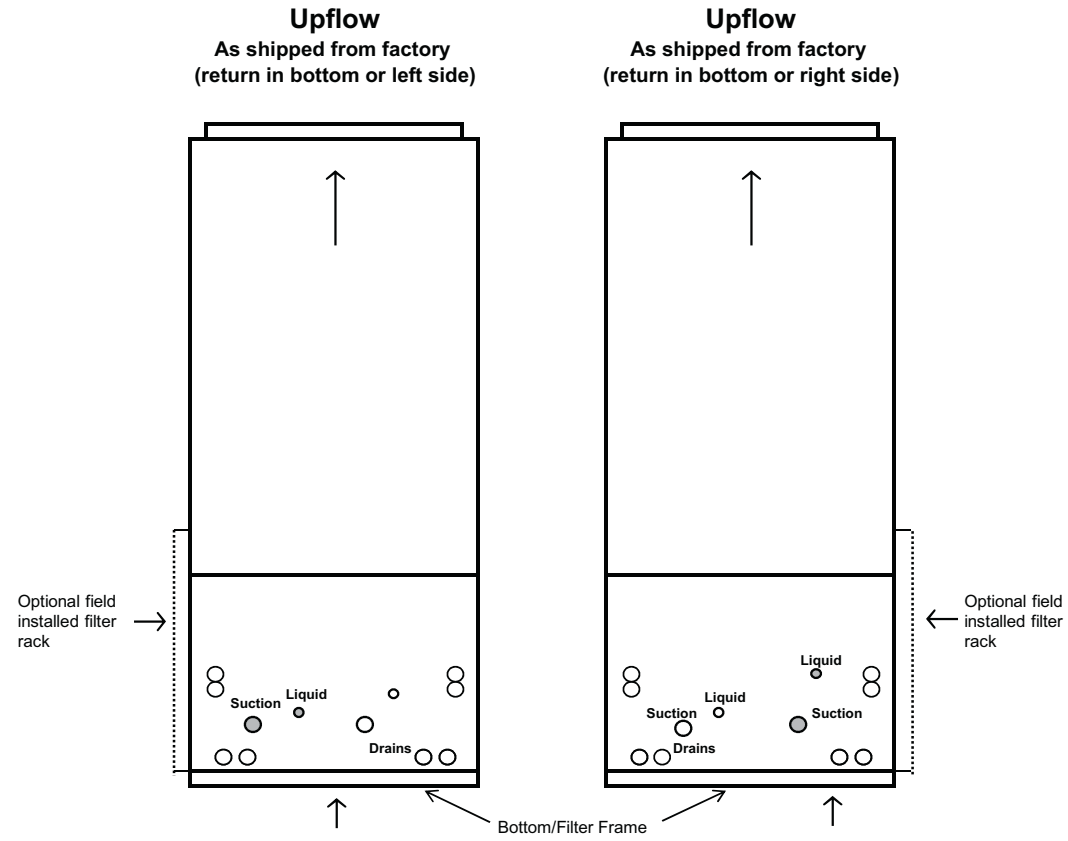
1. Line lengths are based on water only. To adjust maximum line lengths for glycol, divide length by the factors shown in Table 2.
2. IMPORTANT: Glycol should never be used in a potable water system.
3. All lengths are based on closed loop systems.
4. Line lengths in **bold** should not be used when a water heater is the source of heat. When using a boiler for these line lengths, excessive line temperature loss will occur and must be accounted for.
5. Supply and return lines must be properly insulated to reduce temperature loss and to prevent freezing when passing through an unconditioned space.
6. All lengths include (12) 90° short radius elbows. To adjust for extra or fewer fittings, use the factors in Table 1.
7. Always use full flow ball or gate valves to minimize pressure drop.

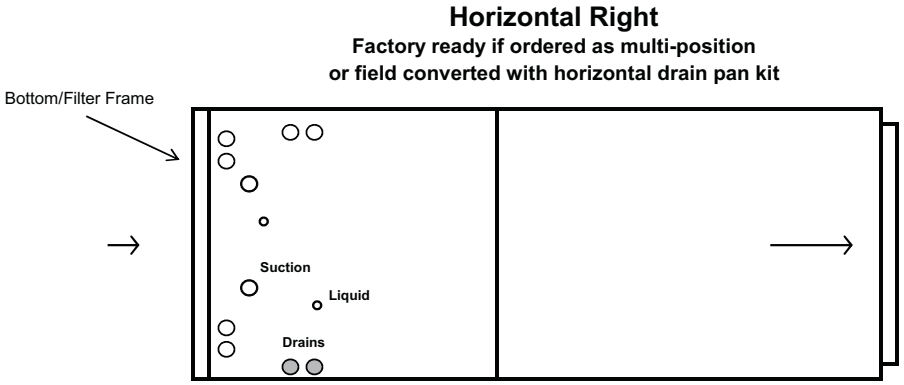
MAXIMUM LINE LENGTHS FOR HEATING COILS

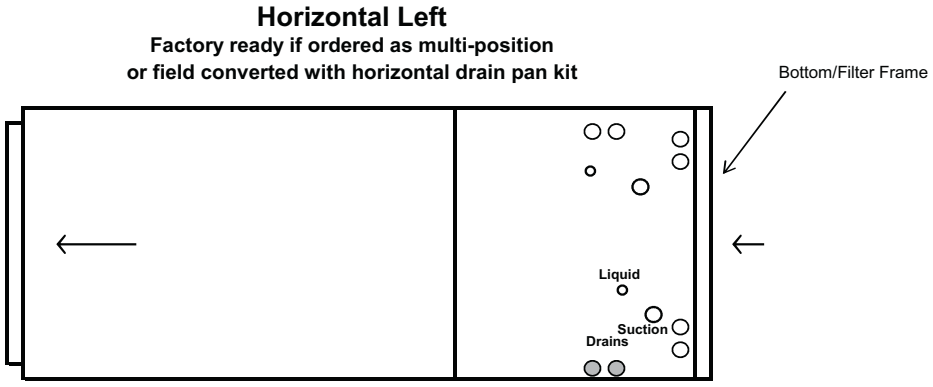
TABLE 1		Equivalent length of pipe							
Pipe size		90° SR el		90° LR el		45° el		Gate Valve	
mm	in.	mm	ft.	mm	ft.	mm	ft.	mm	ft.
13	1/2	457	1.5	244	0.8	254	1	254	1
19	3/4	610	2	254	1	427	1.4	427	1.4
25	1	822	2.7	396	1.3	579	1.9	579	1.9
32	1-1/4	1097	3.6	549	1.8	762	2.5	762	2.5

TABLE 2	Fluid Temperature		
% Glycol	60°C (140°F)	71°C (160°F)	82°C (180°F)
10	1.04	1.04	1.02
20	1.08	1.07	1.04
30	1.13	1.11	1.08
40	1.19	1.16	1.12
50	1.24	1.21	1.17

Shading Indicates Proper Line Connections



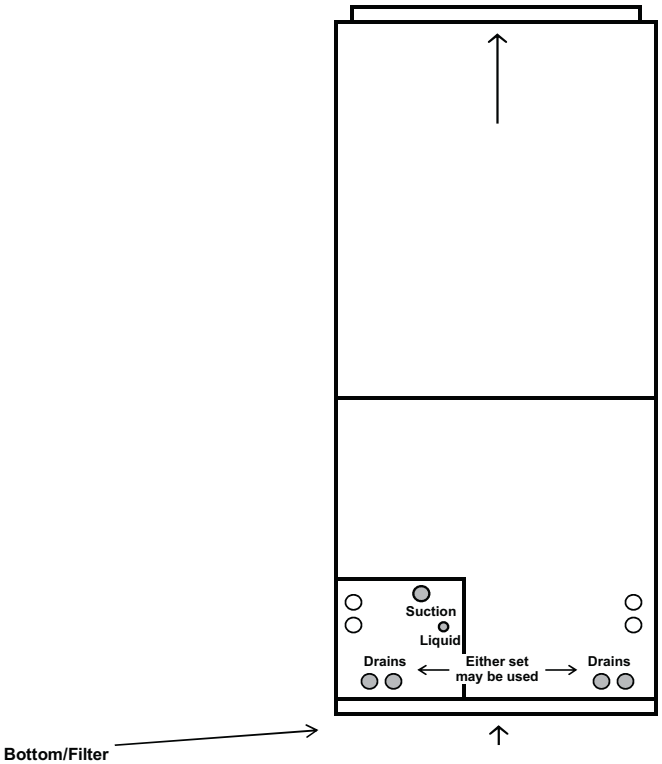




Shading Indicates Proper Line Connections

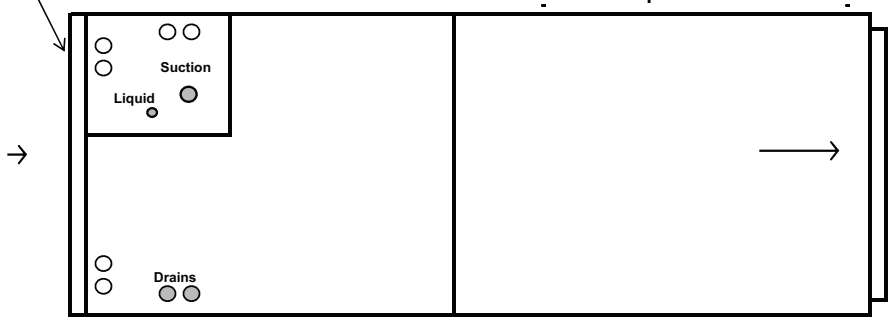
Upflow

As shipped from factory
(return in bottom)



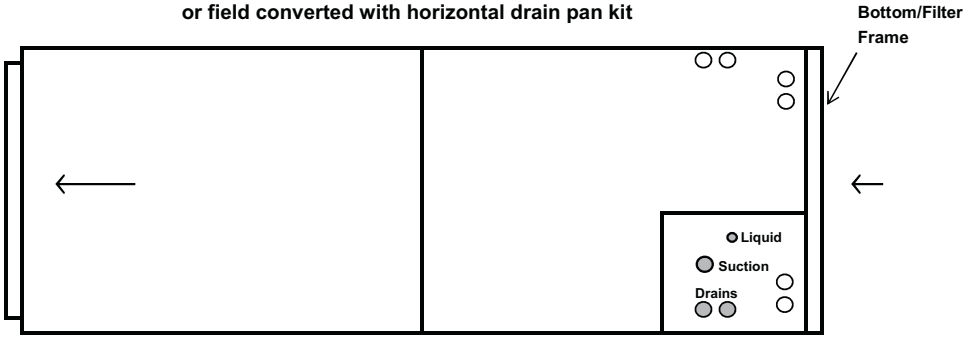
Horizontal Right

Factory ready if ordered as multi-position
or field converted with horizontal drain pan kit



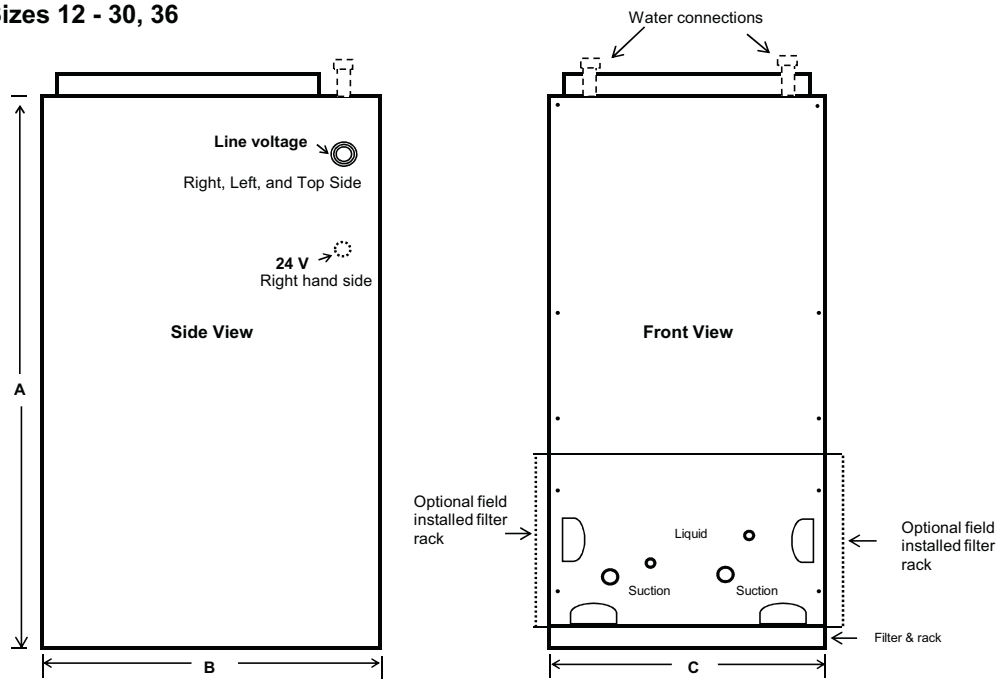
Horizontal Left

Factory ready if ordered as multi-position
or field converted with horizontal drain pan kit



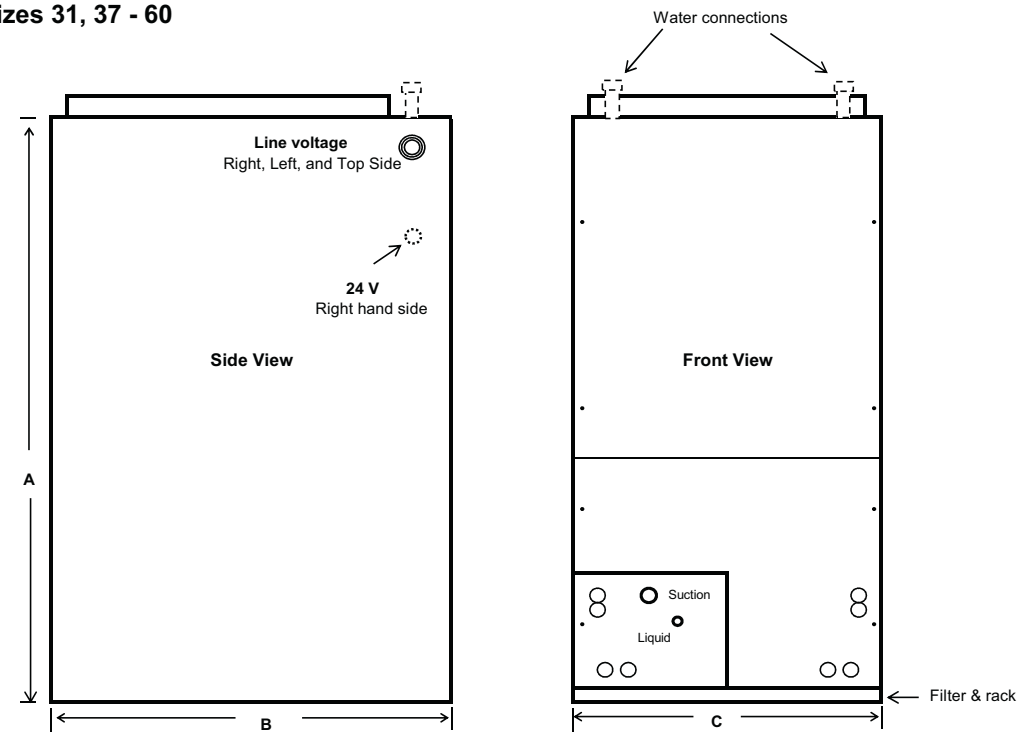
DIMENSIONS - MM (INCHES)

Sizes 12 - 30, 36



Unit Size	A		B		C		Supply Duct Opening				Return Duct Opening			
							Depth X Width				Depth X Width			
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
12, 18 & 24	1118	44	559	22	381	15	432	17	343	13-1/2	438	17-1/4	260	10-1/4
25, 30 & 36	1219	48	559	22	470	18-1/2	432	17	432	17	438	17-1/4	356	14

Sizes 31, 37 - 60



Unit Size	A		B		C		Supply Duct Opening				Return Duct Opening			
							Depth X Width				Depth X Width			
	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
31, 37, 42 & 48	1244	49	660	26	508	20	533	21	470	18-1/2	559	22	400	15-3/4
60	1346.2	53	660	26	559	22	533	21	521	20-1/2	559	22	451	17-3/4



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