



TECHNICAL GUIDE

Affinity

MODELS: PS9*DH

**GAS-FIRED
CONDENSING / HIGH EFFICIENCY
DOWNFLOW/HORIZONTAL
SINGLE STAGE FURNACES**

92% TO 94% AFUE

**NATURAL GAS
40 - 120 MBH INPUT**



Due to continuous product improvement, specifications are subject to change without notice.

Visit us on the web at www.york.com for the most up-to-date technical information.

Additional rating information can be found at www.gamanet.org.

DESCRIPTION

These Category IV, highly efficient, compact, condensing type furnaces are designed for residential and commercial installations in a basement, closet, alcove, recreation room or garage where the ambient temperature is above 32°F, or higher. They may be either side wall or thru-roof vented using approved plastic type combustion air and vent piping. All units are factory assembled, wired and tested to assure dependable and economical installation and operation.

WARRANTY

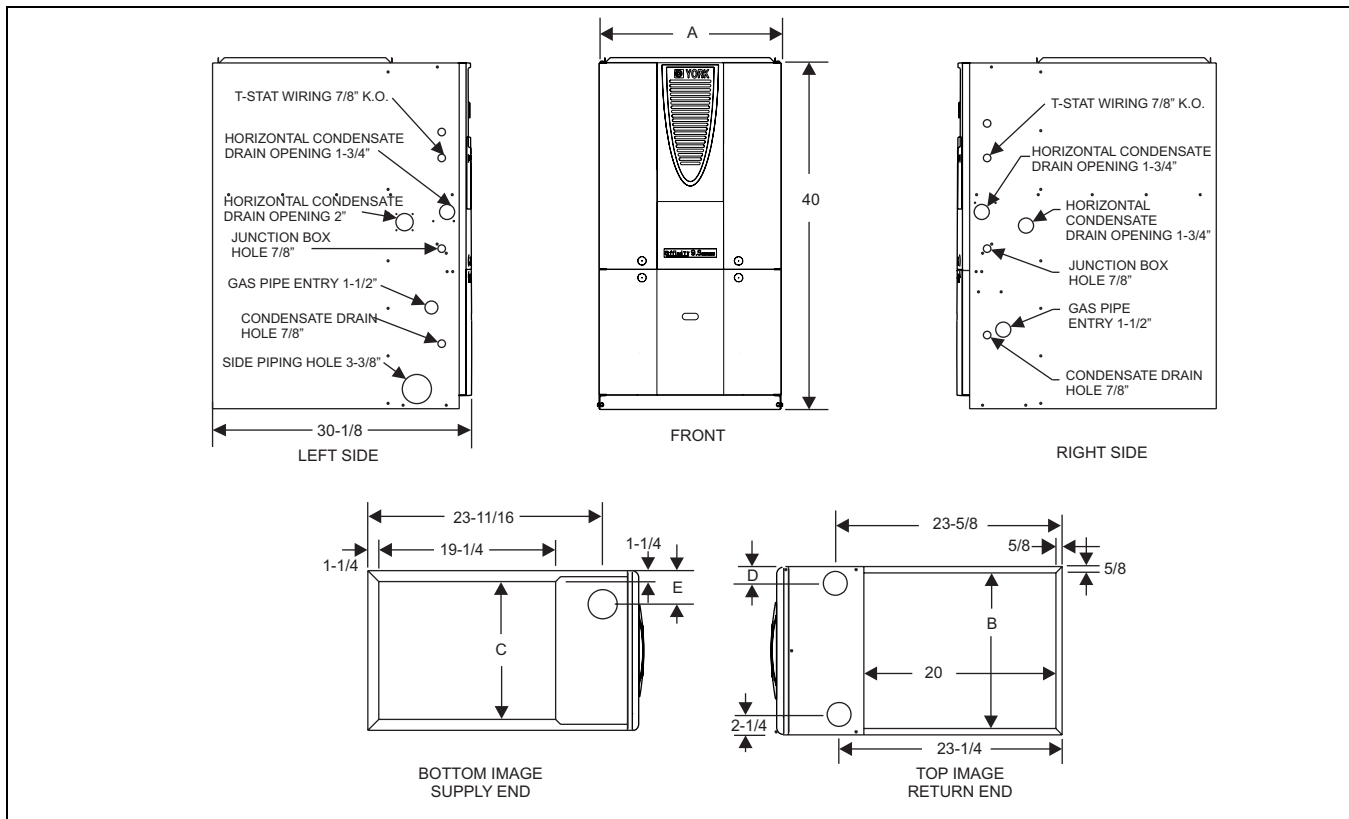
Lifetime limited warranty on both heat exchangers to the original purchaser; a 20-year limited warranty from original installation date to subsequent purchaser.

10-year warranty on commercial applications.

5-year limited parts warranty.

FEATURES

- Compact, easy to install, ideal height 40" cabinet
- Blower-off delay for cooling SEER improvement.
- Easy to connect power/control wiring.
- Built-in, high level self diagnostics with fault code display.
- Low unit amp requirement for easy replacement application.
- Integrated control module for reliable, economical operation.
- High velocity filters and filter rack available for field installation.
- May be installed as either two-pipe (sealed combustion) or single pipe vent (using indoor combustion air)
- Top intake & vent connection allows installation in narrow locations.
- Electronic Hot Surface Ignition saves fuel cost with increased dependability and reliability.
- Induced combustion system with inshot main burners for quiet, efficient operation.
- No special vent termination kit required.
- 100% shut off main gas valve for extra safety.
- PSC four speed, direct drive motor with large, quiet blower.
- 24V, 40 VA control transformer and blower relay supplied for add-on cooling.
- Hi-tech tubular aluminized steel primary heat exchanger.
- Secondary (condensing) heat exchanger of 29-4C high-grade stainless steel.
- Timed on, adjustable off blower capability for maximum comfort.
- Easy access from front of unit for cleaning, maintenance or service.
- Protection from intake, exhaust or condensate blockage.
- Insulated blower compartment for quiet operation.
- Independent door removal for greater durability and ease of access.
- 3-way transition facilitates fresh air piping.



CABINET AND DUCT DIMENSIONS

Models	CFM	Cabinet Size	Cabinet Dimension				
			A (in.)	B (in.)	C (in.)	D (in.)	E (in.)
PS9A12N040DH11	1200	A	14-1/2	13-1/4	12	1-3/4	2-3/8
PS9B12N060DH11	1200	B	17-1/2	16-1/4	15	1-3/4	2-3/8
PS9B12N080DH11	1200	B	17-1/2	16-1/4	15	1-3/4	2-3/8
PS9C16N080DH11	1600	C	21	19-3/4	18-1/2	2-1/8	2-3/4
PS9C16N100DH11	1600	C	21	19-3/4	18-1/2	2-1/8	2-3/4
PS9C20N100DH11	2000	C	21	19-3/4	18-1/2	2-1/8	2-3/4
PS9D20N120DH11	2000	D	24-1/2	23-1/4	22	2-1/2	3

ELECTRICAL AND PERFORMANCE DATA

Models	Input/ Cabinet	Output	Nominal Airflow	Cabinet Width	Total Unit	AFUE	Air Temp. Rise
	MBH	MBH	CFM	In.	Amps	%	°F
PS9A12N040DH11	40/A	37	1200	14-1/2	9	94	35 - 65
PS9B12N060DH11	60/B	55	1200	17-1/2	9	92	35 - 65
PS9B12N080DH11	80/B	74	1200	17-1/2	9	92	35 - 65
PS9C16N080DH11	80/C	74	1600	21	12	92	35 - 65
PS9C16N100DH11	100/C	93	1600	21	12	92	35 - 65
PS9C20N100DH11	100/C	93	2000	21	14	92	35 - 65
PS9D20N120DH11	120/D	112	2000	24-1/2	14	92	35 - 65

Models	Input/ Cabinet	Max. Outlet Air Temp.	Blower		Blower Size	Max. Over-current Protect	Min. Wire Size (awg) @ 75 ft. One Way	Operation Weight
	MBH	°F	HP	Amps	In.			Lbs.
PS9A12N040DH11	40/A	165	1/2	7.0	11 x 8	20	14	120
PS9B12N060DH11	60/B	165	1/2	7.0	11 x 8	20	14	130
PS9B12N080DH11	80/B	165	1/2	7.0	11 x 8	20	14	145
PS9C16N080DH11	80/C	165	3/4	10.2	11 x 10	20	14	155
PS9C16N100DH11	100/C	165	3/4	10.2	11 x 10	20	14	170
PS9C20N100DH11	100/C	165	1	12.7	11 x 11	20	12	175
PS9D20N120DH11	120/D	165	1	12.7	11 x 11	20	12	180

Annual Fuel Utilization Efficiency (AFUE) numbers are determined in accordance with DOE Test procedures.

Wire size and over current protection must comply with the National Electrical Code (NFPA-70-latest edition) and all local codes.

The furnace shall be installed so that the electrical components are protected from water.

Wire size and overcurrent protection must comply with the National Electric Code.

NOTES:

1. For altitudes above 2000 ft. reduce capacity 4% for each 1000 ft. above sea level.
2. Wire size based on copper conductors, 60°C, 3% voltage drop.
3. Continuous return air temperature must not be below 55°F.
4. All filters must be high velocity cleanable type.

BLOWER PERFORMANCE CFM

AIRFLOW WITH TOP RETURN - WITHOUT FILTERS (CFM)											
Models	Speed Tap	External Static Pressure, Inches W.C.									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
PS9A12N040DH11	High	1635	1590	1535	1480	1415	1340	1280	1185	NR	NR
	Medium High	1179	1171	1160	1140	1135	1098	1048	1026	NR	NR
	Medium Low	969	967	967	959	938	905	860	802	NR	NR
	Low	774	753	745	726	698	674	652	612	NR	NR
PS9B12N060DH11	High	1687	1652	1631	1595	1557	1511	1456	1382	1313	1211
	Medium High	1193	1183	1173	1162	1142	1115	1076	1036	982	950
	Medium Low	933	933	921	911	902	872	825	793	771	712
	Low	752	745	731	718	698	652	602	580	536	496
PS9B12N080DH11	High	1686	1658	1623	1572	1534	1465	1391	1305	1202	1091
	Medium High	1257	1223	1218	1203	1177	1142	1094	1026	939	874
	Medium Low	977	982	976	955	934	899	843	791	738	686
	Low	775	777	757	733	698	663	627	584	549	490
PS9C16N080DH11	High	2071	2026	1981	1935	1864	1796	1713	1625	1532	1401
	Medium High	1583	1590	1569	1554	1532	1502	1457	1409	1327	1221
	Medium Low	1256	1275	1275	1288	1275	1265	1232	1187	1126	1023
	Low	937	939	936	945	942	936	912	874	810	726
PS9C16N100DH11	High	1996	1961	1938	1896	1836	1779	1707	1625	1531	1399
	Medium High	1449	1480	1495	1488	1488	1449	1417	1368	1299	1208
	Medium Low	1167	1192	1192	1187	1202	1192	1182	1140	1097	1018
	Low	932	900	871	840	805	761	710	663	641	623
PS9C20N100DH11	High	2404	2320	2225	2138	2034	1924	1816	1692	1559	1422
	Medium High	2018	1955	1883	1815	1750	1670	1586	1497	1394	1246
	Medium Low	1626	1581	1531	1488	1418	1363	1291	1225	1123	964
	Low	1336	1291	1249	1205	1155	1091	1018	951	884	759
PS9D20N120DH11	High	2520	2432	2353	2251	2152	2042	1947	1815	1701	1525
	Medium High	2018	1979	1945	1911	1863	1779	1705	1599	1493	1353
	Medium Low	1586	1545	1501	1457	1407	1351	1287	1216	1081	926
	Low	1321	1266	1213	1163	1111	1071	987	864	763	700

NOTES:

1. Airflow expressed in standard cubic feet per minute (CFM).
2. Motor voltage at 115 V.
3. NR = Operation at this static pressure is not recommended.

FILTER PERFORMANCE

The airflow capacity data published in the “Blower Performance” table listed above represents blower performance WITHOUT filters. To determine the approximate blower performance of the system, apply the filter drop value for the filter being used or select an appropriate value from the “Filter Performance” table shown.

NOTE: The filter pressure drop values in the “Filter Performance” table shown are typical values for the type of filter listed and should only be used as a guideline. Actual pressure drop ratings for each filter type vary between filter manufacturer.

RECOMMENDED FILTER SIZES

CFM	Cabinet Size	Top Return Filter in
1200	A	(2) 14 x 20
1200	B	(2) 14 x 20
1600	C	(2) 14 x 20
2000	C	(2) 14 x 20
2000	D	(2) 14 x 20

NOTES:

1. Air velocity through throwaway type filters may not exceed 300 feet per minute. All velocities over this require the use of high velocity filters.

FILTER PERFORMANCE - PRESSURE DROP INCHES W.C. AND (KPA)

Airflow Range	Minimum Opening Size	Filter Type		
		Disposable	Washable Fiber	Pleated
CFM	in ²	In W.C.	In W.C.	In W.C.
0 - 750	230	0.01	0.01	0.15
751 - 1000	330	0.05	0.05	0.20
1001 - 1250	330	0.10	0.10	0.20
1251 - 1500	330	0.10	0.10	0.25
1501 - 1750	380	0.15	0.14	0.30
1751 - 2000	380	0.19	0.18	0.30
2001 & Above	463	0.19	0.18	0.30

UNIT CLEARANCES TO COMBUSTIBLES

Application	Top	Front	Rear	Left Side	Right Side	Flue	Floor/ Bottom	Closet	Alcove	Attic	Line Contact
Downflow	1	3	0	0	0	0	1”*	Yes	Yes	Yes	No
Horizontal	0	3	0	1	1	0	Combustible	No	Yes	Yes	Yes†

* Special floor base or air conditioning coil required for use on combustible floor.

† Line contact only permitted between lines formed by the intersection of the rear panel and side panel (top in horizontal position) of the furnace jacket and building joists, studs or framing.

For additional connection diagrams for all UPG equipment refer to “Low Voltage System Wiring” document available online at www.upgnet.com in the Product Catalog Section.

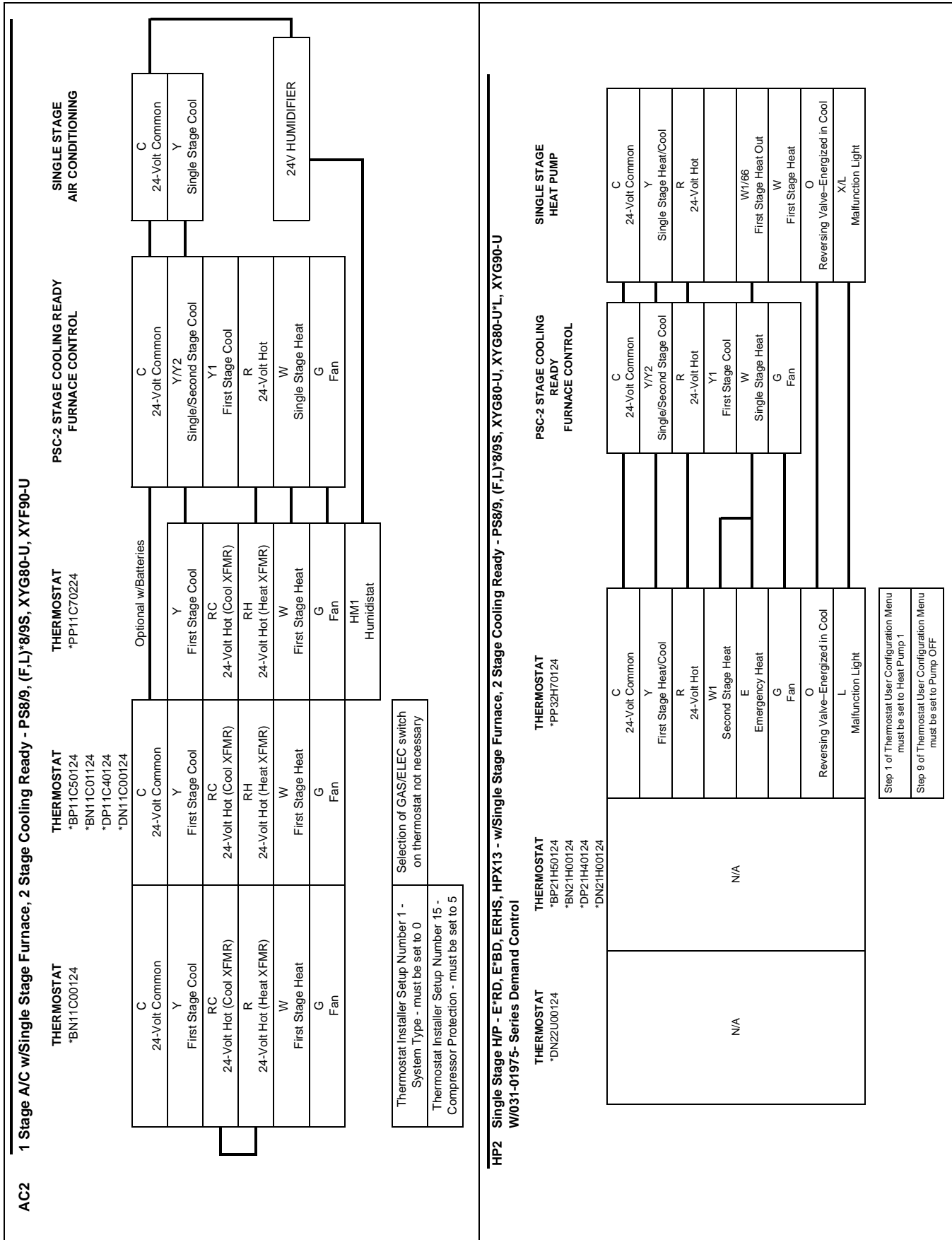


FIGURE 1: Thermostat Chart

APPLYING FILTER PRESSURE DROP TO DETERMINE SYSTEM AIRFLOW

To determine the approximate airflow of the unit with a filter in place, follow the steps below:

1. Select the filter type.
2. Determine the External System Static Pressure (ESP) without the filter.
3. Select a filter pressure drop from the table based upon the number of return air openings or return air opening size and add to the ESP from Step 3 to determine the total system static.
4. If total system static matches a ESP value in the airflow table (i.e. 0.20, 0.60, etc.) the system airflow corresponds to the intersection of the ESP column and Model/Blower Speed row.
5. If the total system static falls between ESP values in the table (i.e. 0.58, 0.75, etc.), the static pressure may be rounded to the nearest value in the table determining the airflow using Step 5 or calculate the airflow by using the following example.

Example: For a 120,000 Btuh furnace operating on high speed blower, it is found that total system static is 0.58" w.c. To determine the system airflow, complete the following steps:

1. Obtain the airflow values at 0.50" & 0.60" ESP.
Airflow @ 0.50": 2152 CFM
Airflow @ 0.60": 2042 CFM
2. Subtract the airflow @ 0.50" from the airflow @ 0.60" to obtain airflow difference.
 $2042 - 2152 = -110$ CFM
3. Subtract the total system static from 0.50" and divide this difference by the difference in ESP values in the table, 0.60" - 0.50", to obtain a percentage.
 $(0.58 - 0.50) / (0.60 - 0.50) = 0.8$
4. Multiply percentage by airflow difference to obtain airflow reduction.
 $(0.8) \times (-110) = -88$
5. Subtract airflow reduction value to airflow @ 0.50" to obtain actual airflow @ 0.58" ESP.
 $2152 - 88 = 2064$

ACCESSORIES

PROPANE (LP) CONVERSION KIT -

1NP0347 - All units

This accessory conversion kit may be used to convert natural gas (N) units for propane (LP) operation. Conversions must be made by qualified distributor or dealer personnel.

CONCENTRIC VENT TERMINATION -

1CT0302 (2")

1CT0303 (3")

For use through rooftop, sidewall. Allows combustion air to enter and exhaust to exit through single common hole. Eliminates unsightly elbows for a cleaner installation.

SIDEWALL VENT TERMINATION KIT -

1HT0901 (3")

1HT0902 (2")

For use on sidewall, two-pipe installations only. Provide a more attractive termination for locations where the terminal is visible on the side of the home.

COMBUSTIBLE FLOOR BASE -

1CB0314 - 14 1/2" Cabinet

1CB0317 - 17 1/2" Cabinet

1CB0321 - 21" Cabinet

1CB0324 - 24" Cabinet

COIL TRANSITION KIT -

1TK0914 - 14" Furnace

1TK0917 - 17" Furnace

1TK0921 - 21" Furnace

1TK0924 - 24" Furnace

These kits are required in downflow application when using G*F* series coils. These kits are not required with MC/FC series coils, but please ensure that the coil and furnace are secured and that there are no air leaks.

CONDENSATE NEUTRALIZER KIT - 1NK0301

Neutralizer cartridge has a 1/2" plastic tube fittings for installation in the drain line. Calcium carbonate refill media is also available from the Source 1 Parts (p/n 026-30228-000).

HIGH ALTITUDE PRESSURE SWITCHES -

For installation where the altitude is less than 8,000 feet it is not required that the pressure switch be changed. For altitudes above 8,000 feet see kits below. Conversion must be made by qualified distributor or dealer personnel.

1PS0901 - 060, 100, 120 MBH

1PS0902 - 080/1200 MBH

1PS0903 - 080/1600 MBH

1PS0904 - 040 MBH

ROOM THERMOSTATS - A wide selection of compatible thermostats are available to provide optimum performance and features for any installation.

1H/1C, manual change-over electronic non-programmable thermostat.

1H/1C, auto/manual changeover, electronic programmable, deluxe 7-day, thermostat.

1H/1C, auto/manual changeover, electronic programmable.

* For the most current accessory information, refer to the price book or consult factory.

NOTES