



TECHNICAL GUIDE

Echelon

MODELS: FC8T-UH/LC8T-UH

**GAS-FIRED
HIGH EFFICIENCY TWO STAGE
UPFLOW/HORIZONTAL FURNACES**

STANDARD & Low NOx

80% 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 high efficiency, compact units employ induced combustion, reliable hot surface ignition and high heat transfer tubular heat exchangers. The units are factory shipped for installation in upflow or horizontal applications.

These furnaces are designed for residential installation in a basement, closet, alcove, attic, recreation room or garage and are also ideal for commercial applications. All units are factory assembled, wired and tested to assure safe dependable and economical installation and operation.

These units are Category I listed and may be common vented with another gas appliance as allowed by the National Fuel Gas Code.

WARRANTY

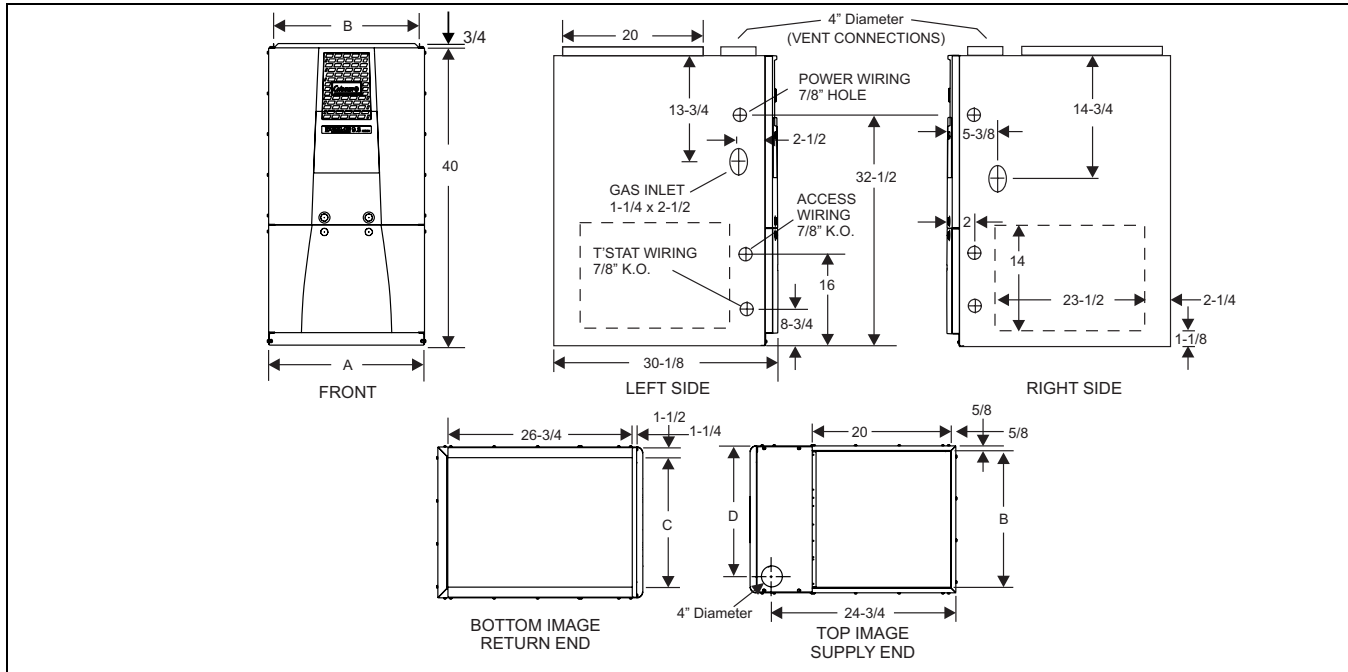
20-year limited warranty on the heat exchanger.

10-year heat exchanger warranty on commercial applications.

5-year limited parts warranty.

FEATURES

- Two stage heating operation includes:
 - Two stage gas valve
 - Two stage inducer operation
 - Two speed blower operation
- Provides increased comfort level & very quiet unit operation
- Adjustable delay timer allows two stage operation with single stage thermostat
- 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.
- Electronic Hot Surface Ignition saves fuel cost with increased dependability and reliability.
- Induced combustion system with inshot main burners for quiet, efficient operation.
- 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.
- Timed on, adjustable off blower capability for maximum comfort.
- Solid removable bottom panel allows easy application.
- Easy access from front of unit for cleaning, maintenance or service.
- Insulated blower compartment for quiet operation.
- Independent door removal for greater durability and ease of access.
- Low NOx models have been designed to meet specific code requirements.
- Low NOx models may not be converted to propane unless screens are removed.



CABINET AND DUCT DIMENSIONS

Models	CFM	Cabinet Size	Cabinet Dimension			
			A	B	C	D
FC8T040A12UH11	1200	A	14 1/2	13 1/4	11 1/2	10 1/8
(F,L)C8T060A12UH11	1200	A	14 1/2	13 1/4	11 1/2	10 1/8
(F,L)C8T080A12UH11	1200	A	14 1/2	13 1/4	11 1/2	10 1/8
(F,L)C8T080B16UH11	1600	B	17 1/2	16 1/4	14 1/2	11 5/8
(F,L)C8T080C16UH11	1600	C	21	19 3/4	18	13 3/8
FC8T100B12UH11	1200	B	17 1/2	16 1/4	14 1/2	11 5/8
(F,L)C8T100C20UH11	2000	C	21	19 3/4	18	13 3/8
FC8T120C16UH11	1600	C	21	19 3/4	18	13 3/8
(F,L)C8T120C20UH11	2000	C	21	19 3/4	18	13 3/8

RATINGS & PHYSICAL / ELECTRICAL DATA

Models	Input/Cabinet High/Low	Output BTU/H High/Low	Nominal Airflow	Cabinet Width	AFUE	Blower		Blower Size
	MBH	MBH	CFM	In		Hp	Amps	In
FC8T040A12UH11	40/26	32/21	1200	14-1/2	80.0	1/2	7.7	10 x 8
(F,L)C8T060A12UH11	57/42	46/34	1200	14-1/2	80.0	1/2	7.7	10 x 8
(F,L)C8T080A12UH11	80/59	64/48	1200	14 1/2	80.0	1/2	7.7	10 x 8
(F,L)C8T080B16UH11	80/59	64/48	1600	17-1/2	80.0	3/4	11.5	10 x 10
(F,L)C8T080C16UH11	80/59	64/48	1600	21	80.0	3/4	11.5	10 x 10
FC8T100B12UH11	100/65	80/53	1200	17 1/2	80.0	1/2	11.5	10 x 10
(F,L)C8T100C20UH11	100/65	80/53	2000	21	80.0	1	14	11 x 10
FC8T120C16UH11	120/78	96/64	1600	21	80.0	3/4	11.5	11 x 10
(F,L)C8T120C20UH11	120/78	96/64	2000	21	80.0	1	14	11 x 11

Models	Input/Cabinet High/Low	Max. Outlet Air Temp	Low Fire Air Temp. Rise	High Fire Air Temp. Rise	Unit Amps	Max Over-Current Protect	Min. wire Size (awg) @ 75 ft one way	Operation Weight
	MBH	°F	°F	°F				Lbs
FC8T040A12UH11	40/26	150	15-45	20-50	9.0	20	14	107
(F,L)C8T060A12UH11	57/42	160	25-55	35-65	9.0	20	14	107
(F,L)C8T080A12UH11	80/52	175	30-60	40-70	9.0	20	14	117
(F,L)C8T080B16UH11	80/59	160	25-55	25-55	12.0	20	14	129
(F,L)C8T080C16UH11	80/59	160	25-55	25-55	12.0	20	14	130
FC8T100B12UH11	100/65	170	25-55	40-70	12.0	20	14	128
(F,L)C8T100C20UH11	100/65	170	25-55	40-70	12.0	20	14	145
FC8T120C16UH11	120/78	180	25-55	45-75	12.0	20	14	145
(F,L)C8T120C20UH11	120/78	170	25-55	35-65	14.0	20	12	147

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.

BLOWER PERFORMANCE CFM - UPFLOW (WITHOUT FILTER) - BOTTOM RETURN

Models	Speed	Bottom Airflow Data (SCFM)									
		Ext. Static Pressure (in. H2O)									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
FC8T040A12UH11	High	1610	1540	1460	1360	1290	1200	1110	1020	900	760
	Medium High	1430	1390	1330	1250	1190	1110	1030	940	840	710
	Medium Low	1200	1180	1140	1100	1050	1000	930	850	750	620
	Low	980	980	960	920	890	840	790	720	620	530
(F,L)C8T060A12UH11	High	1570	1490	1420	1340	1250	1180	1090	990	870	700
	Medium High	1410	1360	1310	1250	1190	1090	1020	920	810	650
	Medium Low	1200	1180	1150	1100	1050	990	920	830	700	580
	Low	960	960	950	930	900	840	800	720	610	500
(F,L)C8T080A12UH11	High	1590	1520	1460	1380	1300	1240	1150	1050	930	800
	Medium High	1400	1360	1310	1260	1200	1140	1070	960	860	740
	Medium Low	1180	1160	1130	1090	1040	990	920	840	750	640
	Low	940	940	940	920	880	840	790	710	630	530
(F,L)C8T080B16UH11	High	1850	1820	1790	1750	1690	1630	1570	1500	1430	1330
	Medium	1470	1450	1440	1430	1390	1360	1310	1270	1220	1150
	Low	1260	1260	1260	1260	1250	1200	1150	1110	1070	1010
(F,L)C8T080C16UH11	High	2077	1992	1922	1830	1727	1617	1507	1355	1219	1050
	Medium	1729	1673	1631	1581	1507	1421	1293	1187	1053	907
	Low	1448	1452	1432	1390	1324	1264	1176	1058	939	774
FC8T100B12UH11	High	1700	1620	1560	1480	1390	1300	1210	1110	970	820
	Medium High	1430	1400	1350	1300	1230	1160	1080	980	870	710
	Medium Low	1180	1170	1160	1130	1080	1030	1000	860	750	510
	Low	950	950	930	920	880	840	790	720	620	530
(F,L)C8T100C20UH11	High	2590	2500	2400	2280	2180	2080	1970	1840	1720	1560
	Medium High	2180	2120	2040	1980	1900	1810	1720	1600	1480	1320
	Medium Low	1750	1720	1680	1640	1580	1520	1440	1350	1220	1060
	Low	1450	1420	1380	1330	1300	1240	1160	1070	970	860
FC8T120C16UH11	High	2020	1930	1820	1730	1640	1540	1400	1250	1090	920
	Medium	1750	1710	1650	1590	1490	1390	1290	1160	1010	810
	Low	1540	1500	1460	1410	1350	1260	1180	1060	910	750
(F,L)C8T120C20UH11	High	2500	2400	2320	2220	2110	2000	1870	1750	1610	1450
	Medium High	2130	2070	1990	1920	1840	1760	1660	1570	1460	1320
	Medium Low	1700	1680	1650	1620	1560	1500	1410	1320	1210	1070
	Low	1420	1390	1360	1330	1290	1240	1150	1060	950	840

NOTES:

1. Airflow expressed in standard cubic feet per minute.
2. Motor voltage at 115 V.

BLOWER PERFORMANCE CFM - UPFLOW (WITHOUT FILTER) - LEFT SIDE RETURN

Models	Speed	Left Side Airflow Data (SCFM)									
		Ext. Static Pressure (in. H2O)									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
FC8T040A12UH11	High	1810	1730	1660	1570	1480	1390	1300	1200	1090	930
	Medium High	1390	1390	1350	1320	1270	1210	1150	1080	970	790
	Medium Low	1120	1120	1120	1110	1080	1080	1020	930	830	690
	Low	880	910	920	920	910	870	820	740	650	510
(F,L)C8T060A12UH11	High	1770	1690	1630	1560	1490	1390	1290	1190	1050	920
	Medium High	1400	1380	1350	1320	1280	1230	1160	1060	930	780
	Medium Low	1120	1130	1150	1130	1120	1080	1000	950	790	630
	Low	880	900	900	900	880	850	790	730	660	530
(F,L)C8T080A12UH11	High	1790	1720	1670	1590	1530	1450	1350	1260	1140	1000
	Medium High	1420	1370	1350	1320	1280	1230	1170	1090	990	840
	Medium Low	1080	1120	1110	1100	1080	1040	1000	920	820	690
(F,L)C8T080B16UH11	Low	N/A	900	900	890	870	850	800	730	670	560
	High	2000	1960	1930	1900	1800	1760	1710	1640	1550	1460
	Medium	1440	1440	1430	1420	1400	1380	1340	1300	1220	1150
	Low	1220	1230	1230	1230	1200	1190	1170	1160	1110	1050
(F,L)C8T080C16UH11	High	2172	2101	2028	1943	1854	1732	1621	1503	1344	1144
	Medium	1640	1633	1626	1584	1518	1480	1378	1276	1125	965
	Low	1388	1404	1412	1396	1362	1311	1222	1144	1001	827
FC8T100B12UH11	High	1780	1710	1640	1560	1490	1390	1290	1180	1030	820
	Medium High	1430	1410	1370	1340	1280	1220	1140	1040	890	730
	Medium Low	1140	1170	1150	1120	1080	1040	970	890	760	630
	Low	920	940	950	940	920	890	850	770	660	560
(F,L)C8T100C20UH11	High	2770	2670	2610	2540	2450	2340	2210	2070	1890	1730
	Medium High	2120	2060	2030	2000	1950	1880	1810	1720	1580	1370
	Medium Low	1690	1660	1630	1610	1560	1490	1420	1350	1240	1070
	Low	1390	1370	1330	1290	1250	1200	1120	1010	910	850
FC8T120C16UH11	High	2160	2070	1990	1900	1800	1690	1580	1430	1260	1000
	Medium	1760	1720	1690	1630	1560	1480	1390	1250	1080	890
	Low	1510	1490	1470	1440	1380	1300	1210	1110	950	780
(F,L)C8T120C20UH11	High	2740	2650	2560	2480	2380	2280	2170	1990	1840	1650
	Medium High	2120	2090	2040	2000	1940	1870	1780	1680	1550	1370
	Medium Low	1690	1670	1650	1610	1560	1510	1440	1310	1160	1030
	Low	1390	1360	1330	1300	1250	1190	1100	1020	940	840

NOTES:

1. Airflow expressed in standard cubic feet per minute.
2. Return air is through side opposite motor (left side).
3. Motor voltage at 115 V.
4. Airflow through motor side return (right side) maybe slightly less than shown above.

HORIZONTAL SIDEWALL VENTING

For applications where vertical venting is not possible, the only approved method of horizontal venting is the use of an auxiliary power vent. Approved power venters are Fields Controls Model SWG-4Y or the appropriate Tjernlund GPAK model. Follow all application and installation details provided by the manufacturer of the power vent. This unit may be horizontally vented using 4" (10.2 cm) diameter pipe with a minimum length of 4.5 feet (1.37 m) and a maximum length of 34.5 feet (10.82 m) with up to 4 elbows.

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 below.

NOTE: The filter pressure drop values in the "Filter Performance" table shown below 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

Cabinet Size	Side (in)	Bottom (in)
A	16 x 25	14 x 25
B	16 x 25	16 x 25
C	(2) 16 x 25	20 x 25

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.
2. Air flows above 1800 CFM require either return from two sides or one side plus bottom.

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 (ALL DIMENSIONS IN INCHES, AND ALL SURFACES IDENTIFIED WITH THE UNIT IN AN UPFLOW CONFIGURATION)

Application	Top	Front	Rear	Left Side	Right Side	Flue	Floor/Bottom	Closet	Alcove	Attic	Line Contact
Upflow	1	6	0	0	3	6	Combustible	Yes	Yes	Yes	No
Upflow B-Vent	1	3	0	0	0	1	Combustible	Yes	Yes	Yes	No
Horizontal	1	6	0	0	3	6	Combustible	No	Yes	Yes	Yes ¹
Horizontal B-Vent	1	3	0	0	0	1	Combustible	No	Yes	Yes	Yes ¹

- ¹ 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.

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. Select the number of return air openings or calculate the return opening size in square inches to determine the proper filter pressure drop.
3. Determine the External System Static Pressure (ESP) without the filter.
4. 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.
5. If total system static matches a ESP value in the airflow table (i.e. 0.20 w.c. (50 Pa), 0.60 w.c. (150 Pa), etc.) the system airflow corresponds to the intersection of the ESP column and Model/Blower Speed row.
6. If the total system static falls between ESP values in the table (i.e. 0.58 w.c. (144 Pa), 0.75 w.c. (187 Pa), 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 60,000 BTUH (17.58 kW) furnace with a bottom return opening and 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:

Obtain the airflow values at 0.50 w.c. (125 Pa) & 0.60 w.c. (150 Pa) ESP.

Airflow @ 0.50": 1250 CFM (35.4 m³/min)

Airflow @ 0.60": 1180 CFM (33.4 m³/min)

Subtract the airflow @ 0.50 w.c. (125 Pa) from the airflow @ 0.60 w.c. (150 Pa) to obtain airflow difference.

1180 - 1250 = -70 CFM (-12 m³/min)

Subtract the total system static from 0.50 w.c. (125 Pa) and divide this difference by the difference in ESP values in the table, 0.60 w.c. (150 Pa) - 0.50 w.c. (125 Pa), to obtain a percentage.

$(0.58 - 0.50) / (0.60 - 0.50) = 0.8$

Multiply percentage by airflow difference to obtain airflow reduction.

$(0.8) \times (-70) = -56$

Subtract airflow reduction value to airflow @ 0.50 w.c. (125 Pa) to obtain actual airflow @ 0.58 in. w.c. (144 Pa) ESP.

1250 - 56 = 1194

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.

SIDE RETURN FILTER -

1SR0302 - All Models

1SR0200 - All Models

BOTTOM RETURN FILTER -

1BR0114 or 1BR0214 - For 14-1/2" cabinets

1BR0117 or 1BR0217 - For 17-1/2" cabinets

1BR0121 or 1BR0221 - For 21" cabinets

1BR0124 or 1BR0224 - For 24-1/2" cabinets

INTERNAL FILTER WITH FIBER FILTER -

1HF0801 - All Models

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.

1PS0313 - 040, 060, 080, 100 MBH

1PS0314 - 120 MBH

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

1 Heat Stage only, manual, mechanical thermostat. Add sub-base for 1H/1C.

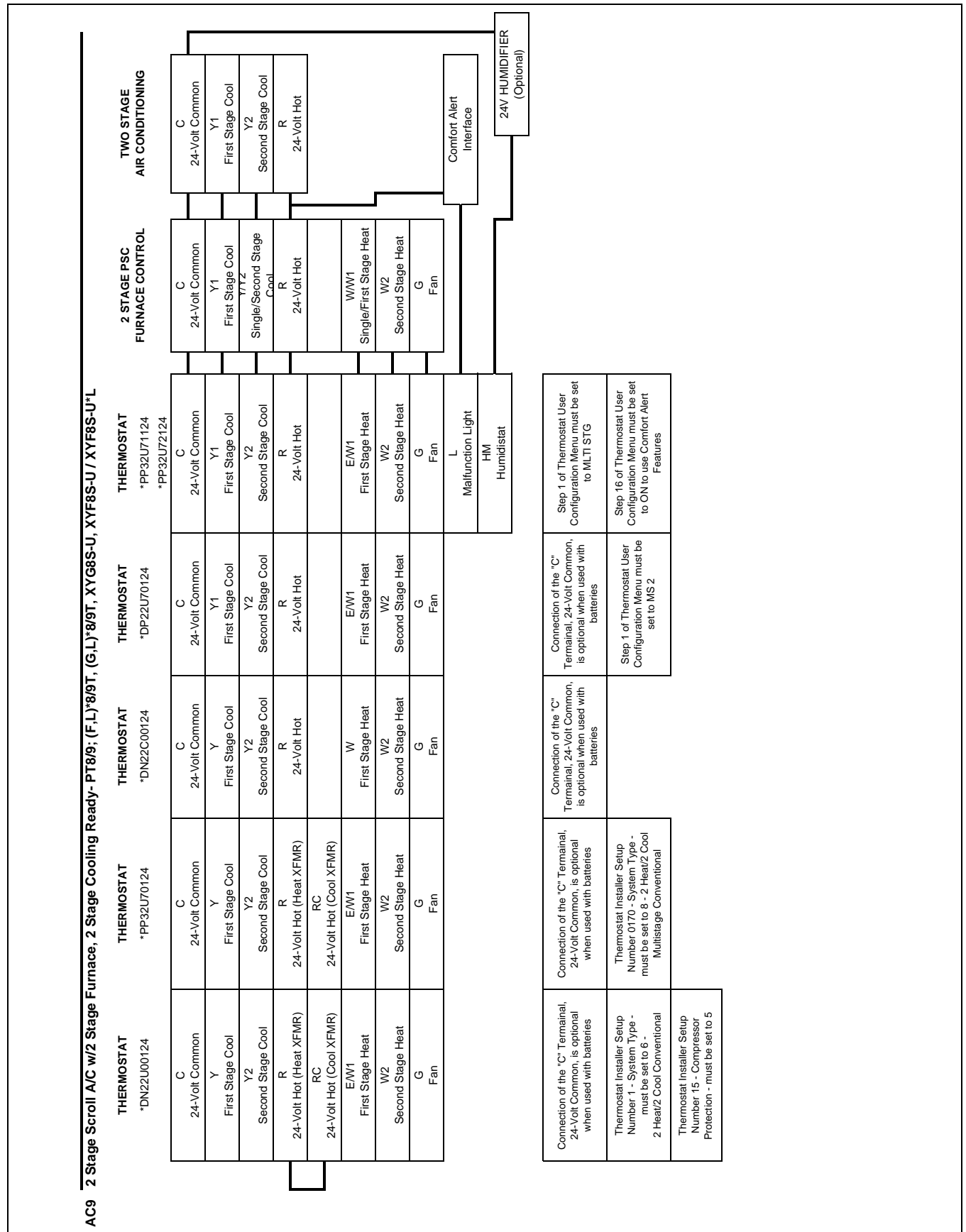
1H/1C, manual change-over electronic non-programmable thermostat.

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

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

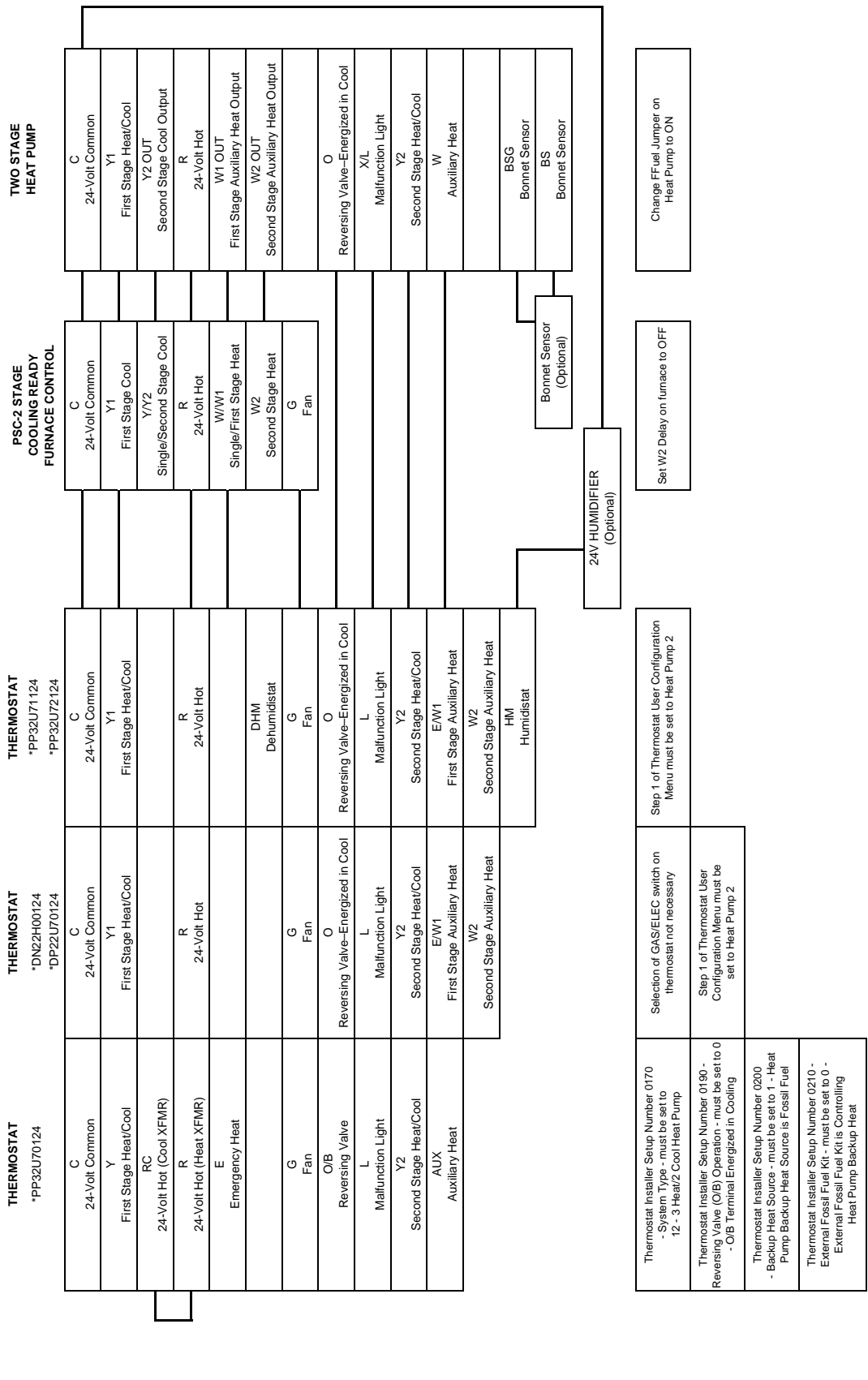
* For the most current accessory information, refer to the price book or consult factory.

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.



Thermostat Chart - AC

**HP23 Two Stage H/P - H*5B, YZE - w/Two Stage Furnace, 2 Stage Cooling Ready - PT8/9, (F,L)*8/9T, (G,L)*8/9T, XYG8S-U, XYF8S-U / XYF8S-U*
W/031-01996- Series Demand Control; Hot Heat Pump Mode OR Conventional**



Thermostat Chart - HP

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246756-CTG-C-0407
Supersedes: 246756-CTG-B-0806