



TECHNICAL GUIDE

Echelon

MODELS: FC9M*DH

**GAS-FIRED
CONDENSING / HIGH EFFICIENCY
DOWNFLOW / HORIZONTAL MODULATING
FURNACES
WITH PSC MOTOR**

NATURAL GAS
60 - 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

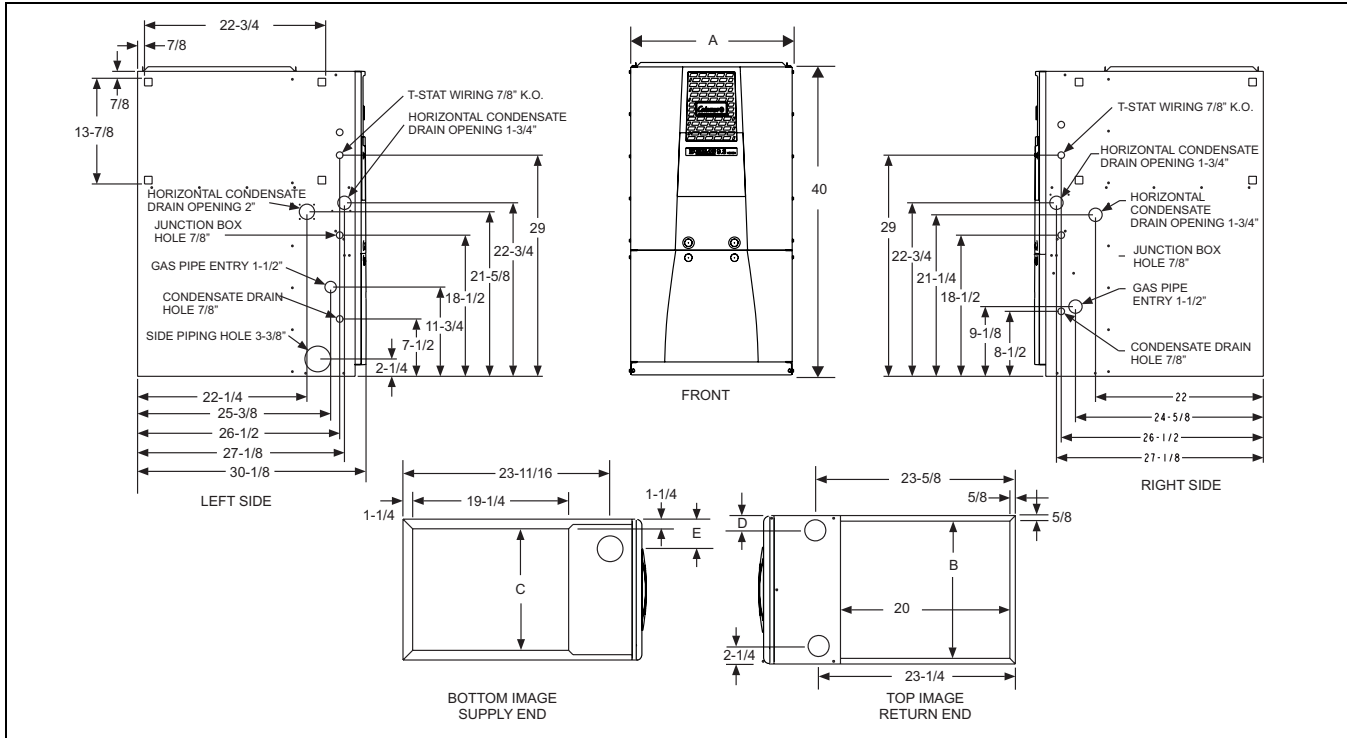
Lifetime limited warranty on both heat exchangers to the original purchaser; a 20-year limited warranty from original installation date to subsequent purchaser.

10-year warranty on the heat exchanger in commercial applications.

5-year limited parts warranty.

FEATURES

- Modulating heating operation includes:
 - Modulating gas valve
 - Modulating inducer operation
- Provides increased comfort level & very quiet unit operation
- 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 filter available for easy field installation.
- May be installed as either two-pipe (direct vent) 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.
- Independent door removal for greater durability and ease of access.
- Easy access from front of unit for cleaning, maintenance or service.
- Protection from intake, exhaust or condensate blockage.
- Insulated blower compartment for quiet operation.
- 3-way transition facilitates fresh air piping.



DIMENSIONS

Models	CFM	Cabinet Size	Cabinet Dimension				
			A (in.)	B (in.)	C (in.)	D (in.)	E (in.)
FC9M060B12DH11	1200	B	17-1/2	16-1/4	15	1-3/4	2-3/8
FC9M080B12DH11	1200	B	17-1/2	16-1/4	15	1-3/4	2-3/8
FC9M080C16DH11	1600	C	21	19-3/4	18-1/2	2-1/8	2-3/4
FC9M100C16DH11	1600	C	21	19-3/4	18-1/2	2-1/8	2-3/4
FC9M100C20DH11	2000	C	21	19-3/4	18-1/2	2-1/8	2-3/4
FC9M120D20DH11	2000	D	24-1/2	23-1/4	22	2-1/2	3

ELECTRICAL AND PERFORMANCE DATA

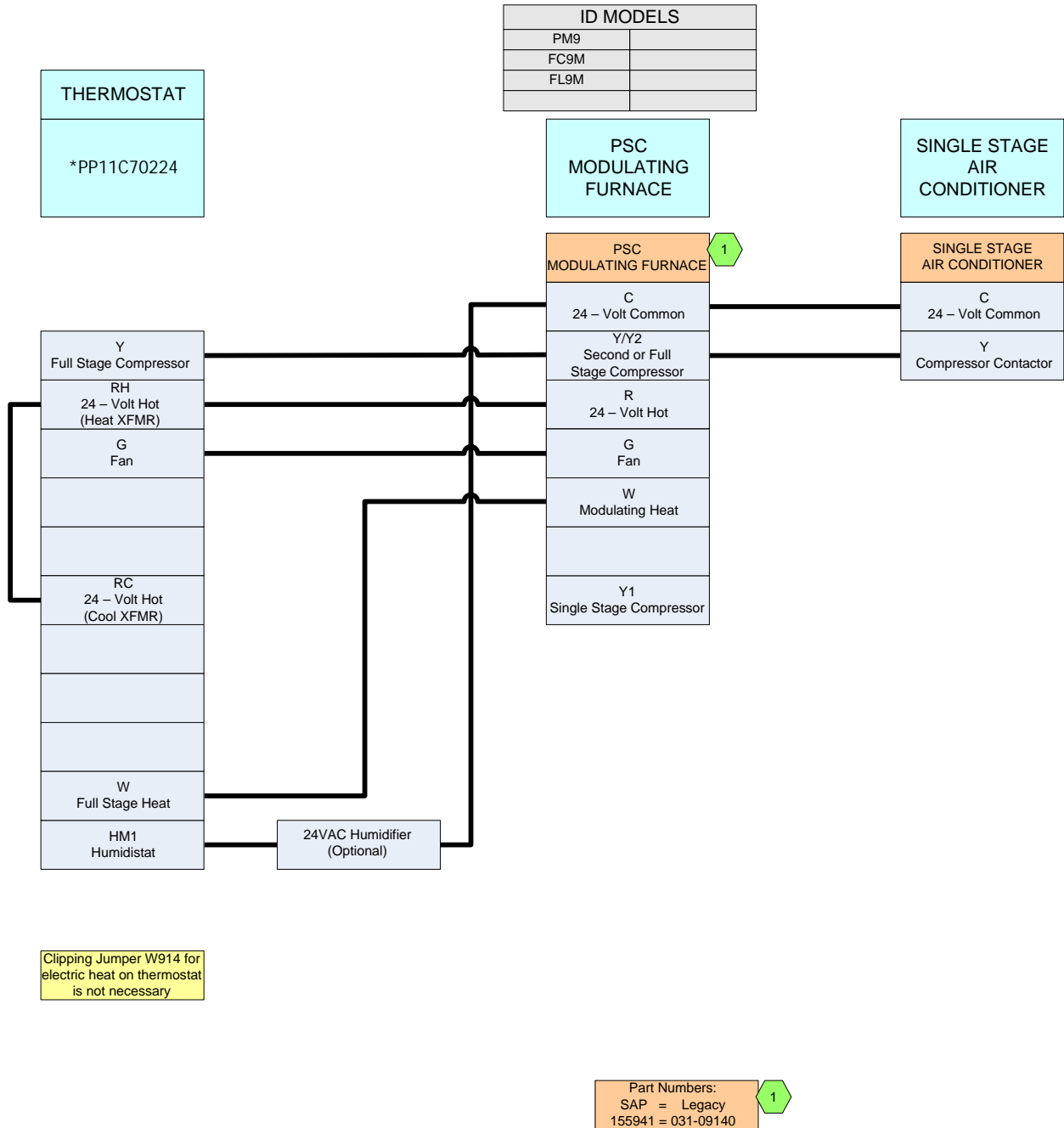
Models	Input Max/Min	Output Max/Min	Nominal Airflow	Cabinet Width	AFUE	Air Temp. Rise Maximum Input	Air Temp. Rise Minimum Input
	MBH	MBH	CFM	In.	%	°F	°F
FC9M060B12DH11	60 / 21	57 / 20	1200	17-1/2	95.0	40 - 70	20 - 50
FC9M080B12DH11	80 / 28	76 / 26	1200	17-1/2	95.0	40 - 70	20 - 50
FC9M080C16DH11	80 / 28	76 / 26	1600	21	95.0	40 - 70	20 - 50
FC9M100C16DH11	100 / 35	95 / 33	1600	21	95.0	40 - 70	20 - 50
FC9M100C20DH11	100 / 35	95 / 33	2000	21	95.0	40 - 70	20 - 50
FC9M120D20DH11	120 / 42	115 / 39	2000	24-1/2	95.0	40 - 70	20 - 50

Models	Max. Outlet Air Temp.	Blower		Blower Size	Total Unit	Max. Over-current Protect	Min. Wire Size (awg) @ 75 ft. One Way	Approximate Operating Weight	Power Supply (Voltage-PH-Hz)
	°F	HP	Amps	In.	Amps				
FC9M060B12DH11	170	1/2	7.0	11 x 8	9	20	14	136	115-1-60
FC9M080B12DH11	170	1/2	7.0	11 x 8	9	20	14	143	115-1-60
FC9M080C16DH11	170	3/4	10.2	11 x 10	12	20	14	159	115-1-60
FC9M100C16DH11	170	3/4	10.2	11 x 10	12	20	14	163	115-1-60
FC9M100C20DH11	170	1	12.7	11 x 11	14	20	12	165	115-1-60
FC9M120D20DH11	170	1	12.7	11 x 11	14	20	12	182	115-1-60

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.

For additional connection diagrams for all UPG equipment refer to "Line Voltage System Wiring" document available on-line at www.upgnet.com in the Product Catalog Section.

AC 11A Single Stage Air Conditioner – PSC Modulating Furnace

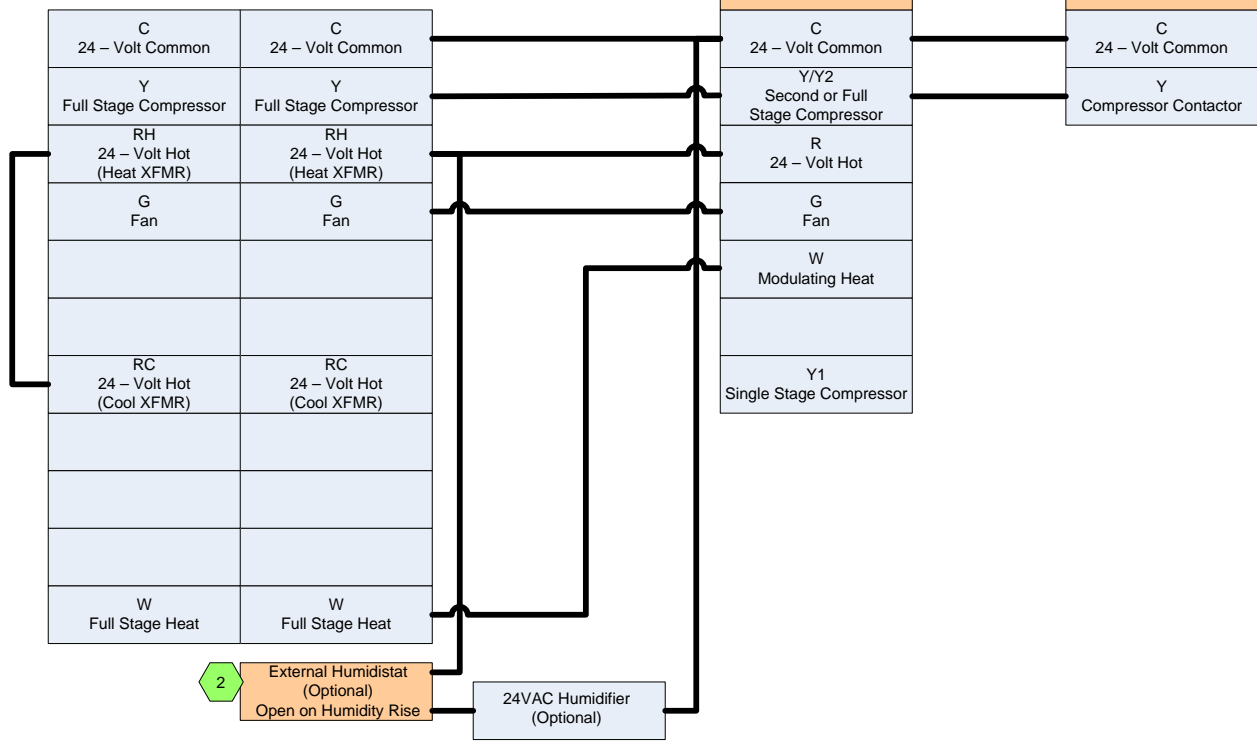


Thermostat Chart - PSC Modulating Furnace/Single Stage Air Conditioner

AC 11B Single Stage Air Conditioner – PSC Modulating Furnace

ID MODELS	
PM9	
FC9M	
FL9M	

THERMOSTAT	THERMOSTAT
*BN11C00124	*BP11C50124 *BN11C01124 *DP11C40124 *DN11C00124

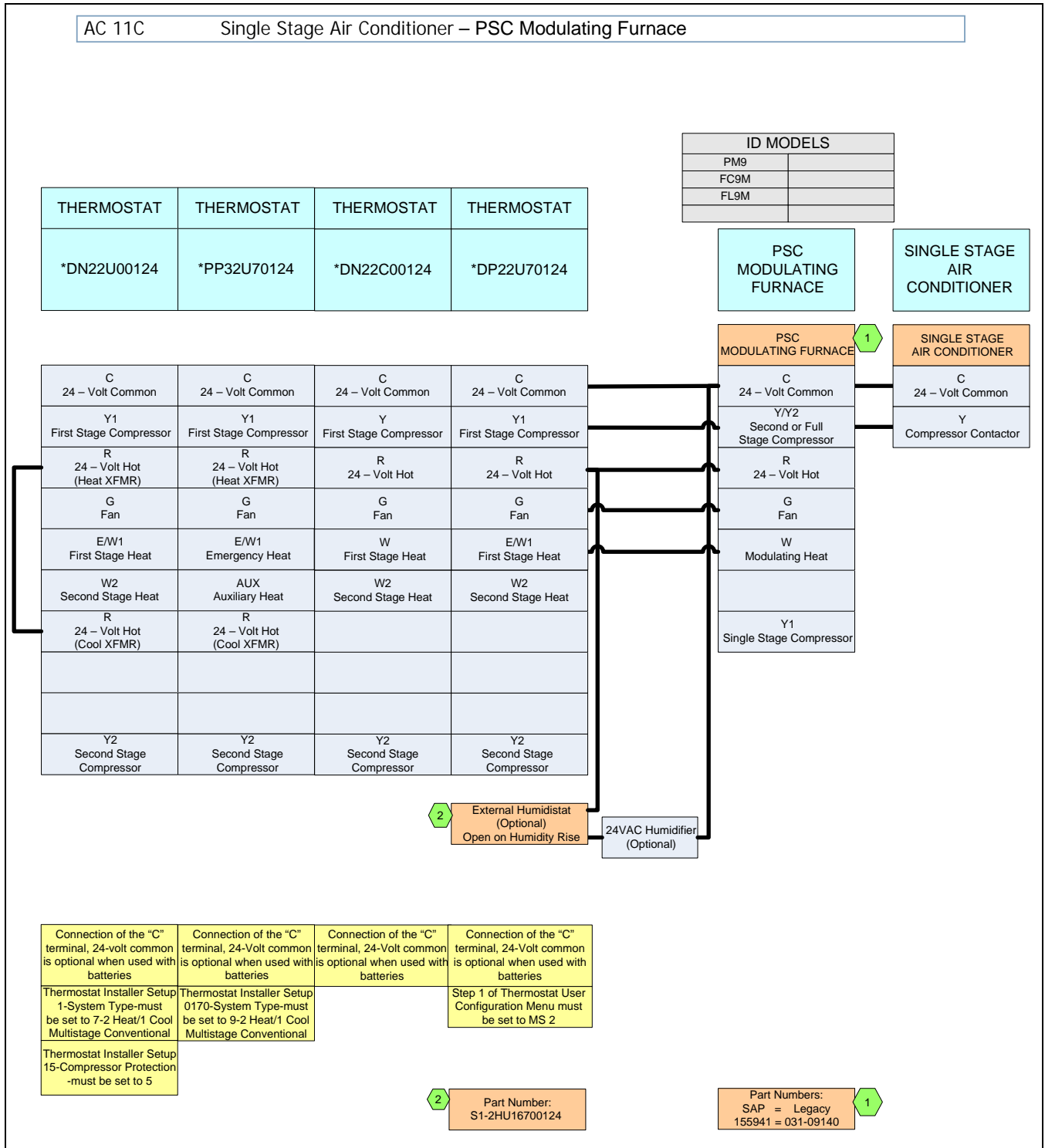


Thermostat Installer Setup 1-System Type-must be set to 0	Selection of GAS/ELEC switch on thermostat is not necessary
Thermostat Installer Setup 15-Compressor Protection must be set to 5	

2 Part Number:
S1-2HU16700124

Part Numbers:
SAP = Legacy
155941 = 031-09140 1

Thermostat Chart - PSC Modulating Furnace/Single Stage Air Conditioner



Thermostat Chart - PSC Modulating Furnace/Single Stage Air Conditioner

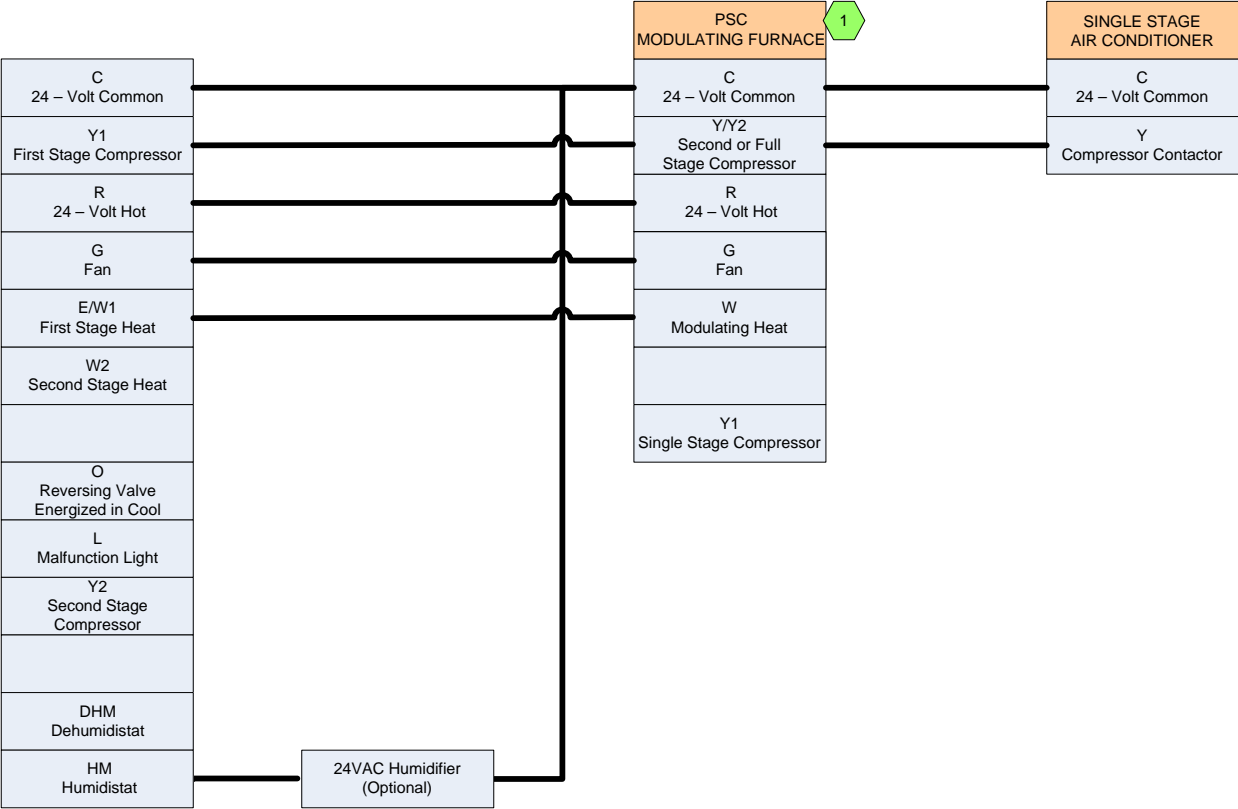
AC 11D Single Stage Air Conditioner – PSC Modulating Furnace

ID MODELS	
PM9	
FC9M	
FL9M	

THERMOSTAT
*PP32U71124
*PP32U72124

PSC MODULATING FURNACE

SINGLE STAGE AIR CONDITIONER



Step 1 of the Thermostat Installer Table must be set to MTLI STG
Step 5 of Thermostat User Configuration Menu must be set to "ON" for Dehumidification
E2/P Switch must be in the E2 position

Part Numbers:
SAP = Legacy
155941 = 031-09140

Thermostat Chart - PSC Modulating Furnace/Single Stage Air Conditioner

HP 17A Single Stage Heat Pump – PSC Modulating Furnace (With Hot Heat Pump Operation)

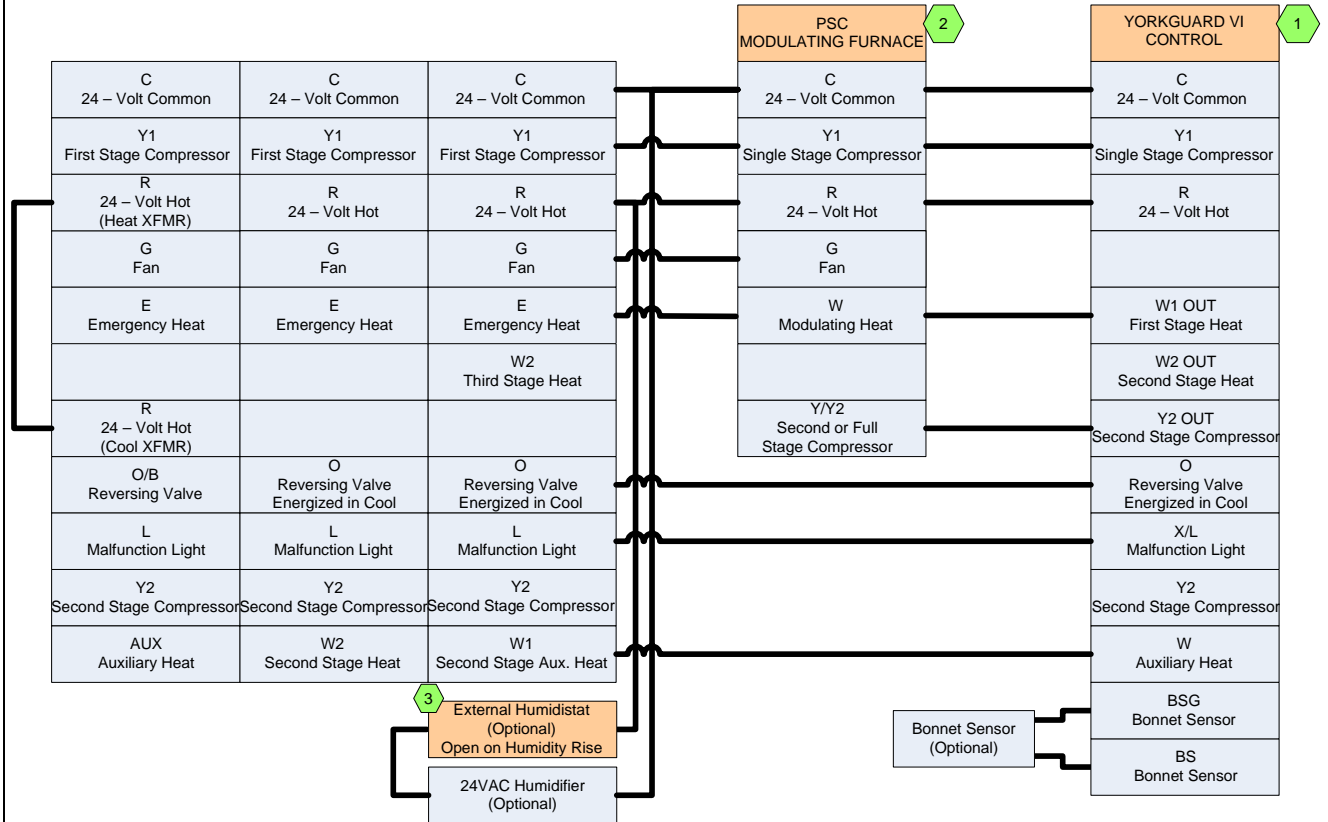
THERMOSTAT	THERMOSTAT	THERMOSTAT
*DN22U00124	*BP21H50124 *BN21H00124 *DP21H40124 *DN21H00124	*DP32H70124

ID MODELS	
PM9	
FC9M	
FL9M	

OD MODELS	
YZB	
YMB	
H*3	

PSC MODULATING FURNACE

SINGLE STAGE HEAT PUMP



Thermostat Installer Setup
1-System Type-must be set to 5 – 2 Heat/1 Heat Pump
Thermostat Installer Setup
2-Changeover Valve-must be set to 0 – O/B terminal Energized in Cooling

B/O Switch on Thermostat must be in the O position

Step 1 of Thermostat Installer / Configuration Menu must be set to Heat Pump 1

Change FFuel jumper on the heat pump control to "ON"
Change Hot Heat Pump jumper on the heat pump control to "ON"

3 Part Number: S1-2HU16700124

2 Part Numbers: SAP = Legacy 155941 = 031-09140

1 Part Numbers: SAP = Legacy 126768 = 031-09137 18395 = 031-01996 340512 = 031-09178

Thermostat Chart - PSC Modulating Furnace/Single Stage Heat Pump

BLOWER PERFORMANCE CFM - COOLING

COOLING AIRFLOW											
Models	Speed Tap	EXTERNAL STATIC PRESSURE, INCHES W.C. (kPa)									
		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
		CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM	CFM
FC9M060B12DH11 FC9M080B12DH11	A	1650	1605	1570	1525	1465	1410	1350	1275	1170	1060
	B	1165	1185	1175	1165	1150	1140	1100	1050	970	875
	C	895	915	935	940	940	920	905	860	815	750
	D	710	725	725	725	720	700	685	660	625	560
FC9M080C16DH11 FC9M100C16DH11	A	1960	1955	1925	1890	1830	1765	1695	1615	1600	1485
	B	1565	1560	1560	1575	1545	1530	1475	1425	1365	1260
	C	1230	1275	1285	1300	1310	1300	1280	1245	1190	1070
	D	930	945	965	975	975	975	975	950	910	850
FC9M100C20DH11	A	2300	2210	2120	2020	1930	1830	1715	1595	1480	1350
	B	1950	1900	1830	1755	1680	1595	1500	1390	1270	1155
	C	1610	1545	1490	1440	1390	1315	1230	1155	1050	920
	D	1325	1270	1225	1175	1105	1045	990	905	890	790
FC9M120D20DH11	A	2560	2485	2410	2320	2220	2135	2035	1920	1785	1650
	B	2090	2050	1990	1970	1885	1820	1760	1675	1545	1405
	C	1695	1675	1665	1615	1565	1510	1460	1385	1285	1140
	D	1175	1150	1135	1110	1085	1055	1005	980	970	845

NOTE: Low cool (W1) airflow is 65% of high cool airflow.

⚠ CAUTION

Blower speed adjustments should be done by moving the COOL jumper on the control board. DO NOT move the motor wires to different positions on the furnace control board.

NOTES:

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

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.

FILTER SIZES

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

NOTE: All filters must be high velocity cleanable type.

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

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": 2220CFM
Airflow @ 0.60": 2135 CFM
2. Subtract the airflow @ 0.50" from the airflow @ 0.60" to obtain airflow difference.
 $2135 - 2220 = -85$ CFM
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.
 $(0.58 - 0.50) / (0.60 - 0.50) = 0.8$
3. Multiply percentage by airflow difference to obtain airflow reduction.
 $(0.8) \times (-85) = -68$
4. Subtract airflow reduction value to airflow @ 0.50" to obtain actual airflow @ 0.58" ESP.
 $2120 - 68 = 2152$

UNIT CLEARANCES TO COMBUSTIBLES

Application	Top	Front	Rear	Left Side	Right Side	Flue	Floor/Bottom	Closet	Alcove	Attic	Line Contact
	In.	In.	In.	In.	In.	In.	In.				
Downflow	1	3	0	0	0	0	1*	Yes	Yes	Yes	NA
Horizontal	0	3	0	1	1	0	0	Yes	Yes	Yes	Yes†

* Combustible 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.

ACCESSORIES

PROPANE (LP) CONVERSION KIT -

1NP0680 - 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")

CONDENSATE NEUTRALIZER KIT - 1HT0901

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).

SIDEWALL VENT TERMINATION -

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 -

1CB0317 - 17 1/2" Cabinet

1CB0321 - 21" Cabinet

1CB0324 - 24-1/2" Cabinet

COIL TRANSITION -

1TK0917 - 17 1/2" Cabinet

1TK0921 - 21" Cabinet

1TK0924 - 24-1/2" Cabinet

Required in downflow applications when using G*FD series coils.

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

NOTES

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