

**HARMONY™ II
ZONE CONTROL SYSTEM**

HARMONY II

FOR VARIABLE AIR VOLUME HEATING/COOLING SYSTEMS

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Harmony II Zone Control System — Harmony II system is designed to provide up to four separate heating/cooling zones utilizing a single indoor unit (G21V/GSR21V or CB21/CBH21) and single outdoor unit (HS14 or HP21 two-speed). A single speed outdoor unit may be used for up to two zone applications. Two-speed outdoor unit may be used for two, three or four zone applications. The system consists of the Harmony control center, discharge air sensor, Harmony control panel, master thermostat and duct mounted zone dampers with a thermostat in each zone. The zone dampers are automatically controlled to supply air flow only to zones with a thermostat demand. At the same time, the variable speed motor (VSM) in the G21V/GSR21V furnace or CB21/CBH21 blower coil unit automatically adjusts the air volume to the zones as required. Because of the VSM motors' ability to vary system air volume as required, no bypass damper is required. Individual air volumes for heating or cooling are available to each zone. Dampers are available in either round or rectangular configuration. Each zone is sized for the heating/cooling load. Damper operation and blower air volume is controlled by the control center. The Harmony system saves energy by allowing temperature setback in unoccupied areas while maintaining comfort in occupied areas. System also results in lower equipment costs by eliminating the need for two separate heating/cooling systems. The Harmony Zone Control System may be used in conjunction with the FM21 Heat Pump Control System and may also be used in Smarthouse™ applications.

Control Center — Control center (16J95) contains all necessary relays and controls to operate the system. Control center cabinet is constructed of heavy gauge steel with a enamel paint finish and removeable latching cover. Solid-state circuit board features: low voltage output terminals for controlling up to four zones and indoor and outdoor unit connections. Also has low voltage input terminals for up to four zone thermostats, control panel, zone damper transformer, pressure switch and discharge air sensor. Board also has jumper selectors for "Zone Air Volume Selection" (25-95%), "Heating Air Reduction" (0%, 20% or 40%), "Continuous Air Reduction" (0%, 50% or 75%) and "Discharge Air Temperature" (+ or - 5°F heat or cool). LED's on circuit board indicate "Heating" (Red), "Cooling" (Green) for each zone and "Reversing Valve" (Amber). Additional LED's (Red) on board indicate "Zone Damper Operation", "Indoor Unit Operation", "Blower Operation" and "Outdoor Unit Operation". Four diagnostic LED's are furnished as an aid in servicing system. Board stores last two diagnostic codes for easy servicing. Built-in time delay function prevents short cycling of system. Holes for mounting are furnished and electrical inlets are provided in top, bottom and rear of panel. Dimensions: 13-1/4" x 10" x 1-3/4". Power requirements: 24VAC. Control center is powered by indoor unit transformer. Shipping weight: 6 lbs.

Control Panel — Touch sensitive panel (16J96) features: "Zone", "Central" or "System Off" control mode selection, "Cool", "Auto" or "Heat" mode selection and "Auto" or "On" fan control for continuous or intermittent blower operation. LED indicators show selected features at a glance. Panel is constructed of high impact Cyclocac. Dimensions: 3-1/2" x 4-3/4" x 1-5/16".

Discharge Air Sensor Probe — Probe (16J98) is required for field installation. Probe contains three sensors that monitor air temperature in the supply air stream. Sensors send a temperature average to the control center to control blower motor speed.

System Equipment Data — See flow charts on page 4 (gas heat) and page 5 (heat pump) for system equipment selection. For G21V/GSR21V series furnace data, see section Heating Units — Gas. For HS14 series two-speed or other single speed condensing units data, see Cooling Units — Condensing Units section. For add-on evaporator coil unit data, see section, Cooling Units — Coils-Blower Coil Units. For HP21 series two-speed or other single speed heat pump outdoor units data, see Heat Pumps — Matched Remote Systems section. For CB21/CBH21 blower-coil unit data, see section, Cooling Units — Coils-Blower Coil Units. For EMD14-65 or EMD14M-65 Economizer dampers, see Accessories section.

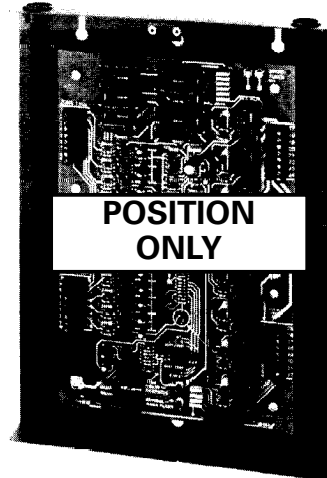
Sequence of Operation — Two modes of operation are available at the control panel — a "Central" control mode and a "Zone" control mode.

In the "central" mode, heating or cooling selection and temperature demand are controlled by the zone 1 (master) thermostat, all dampers remain open at mechanically preset openings and blower is controlled by the central control board (total zone air volume), delivering air to all zones.

In the "zone" mode, heating or cooling selection is controlled by the control panel (or by the individual zone thermostats if system is set for auto-changeover), temperature demand is controlled by the individual zone thermostats, zone dampers route air to appropriate zones and blower air volume is adjusted according to central control jumper setting and number of zones operating.

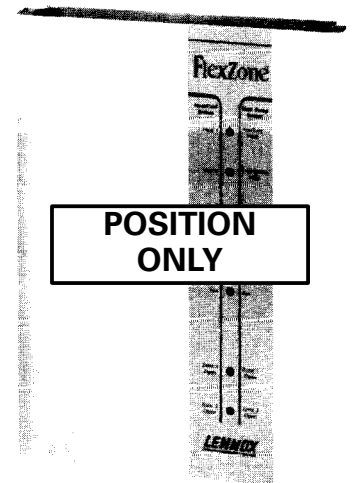
Individual air volume for each zone is preset at the control center and may be adjusted from 25% to 95% actual air volume. During heating mode, Heating Air Reduction jumpers allow a lower heating air volume to be selected (0%, 20% or 40% reduction of cooling air volume). During continuous ("On") blower operation, Continuous Air Reduction jumpers allow 0%, 50% or 75% air volume reduction. All dampers remain open if there is no demand from thermostats.

NOTE — Specifications, Ratings and Dimensions subject to change without notice.



POSITION ONLY

ZONE SYSTEM CONTROL CENTER (cover removed)



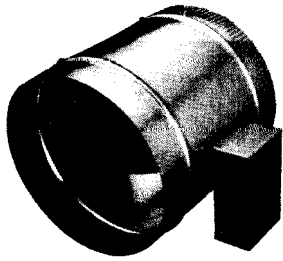
POSITION ONLY

ZONE SYSTEM CONTROL CENTER (cover in place)

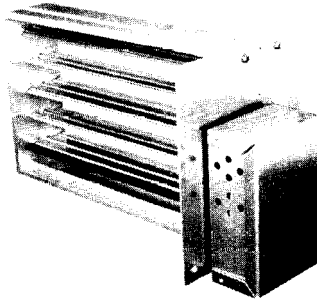


ZONE SYSTEM CONTROL PANEL

OPTIONAL EQUIPMENT (Must Be Ordered Extra)



ROUND
ZONE DAMPER



RECTANGULAR
ZONE DAMPER

Master (Zone 1) Thermostat (Optional) – Lennox recommends the use of a programmable thermostat for zone 1 master thermostat. See flowcharts on pages 4 and 5 for recommended thermostats. Also see Thermostats bulletin in Accessories section.

Zone Thermostats (Optional) – See flowcharts on pages 4 and 5 for recommended zone thermostats. Also see Thermostats bulletin in Accessories section.

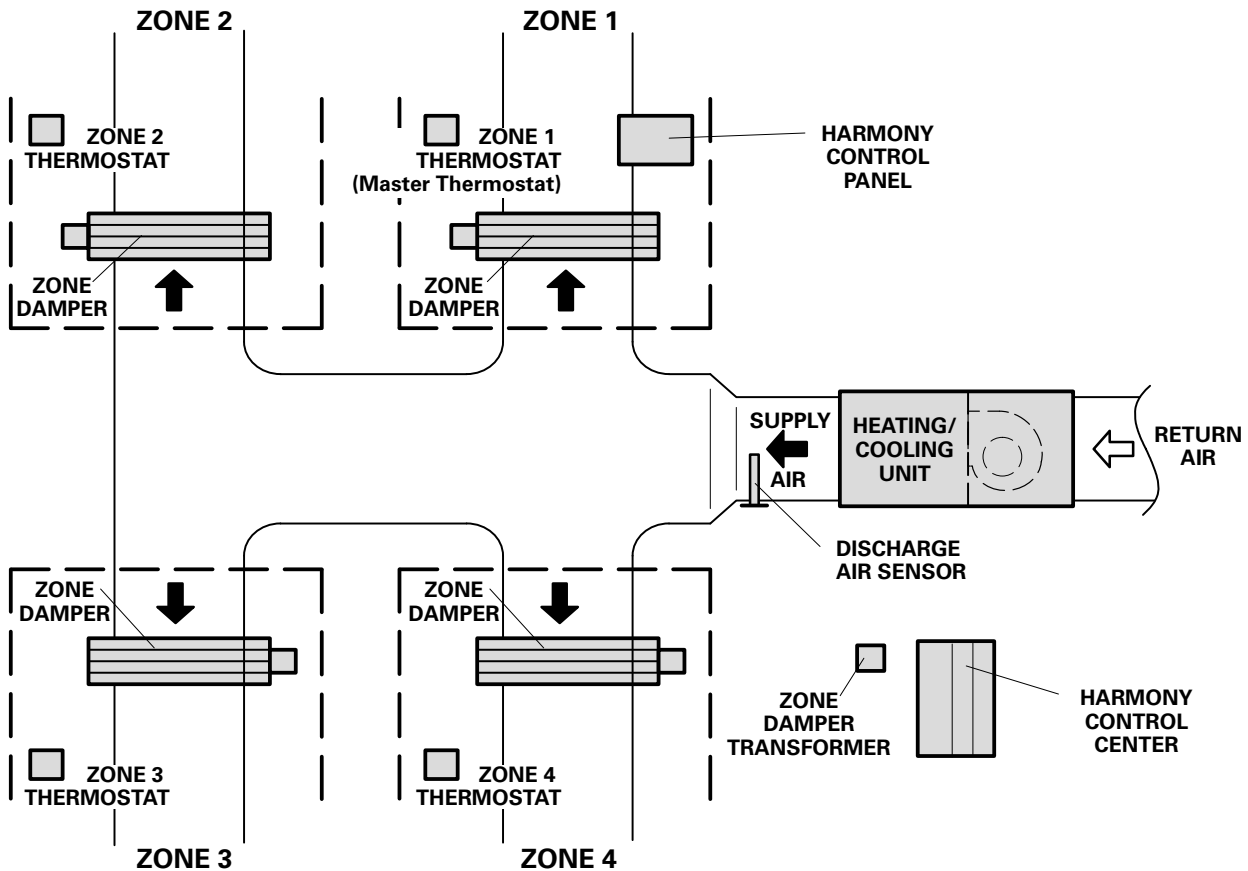
Round Zone Damper (Optional) – Round damper is constructed of heavy gauge galvanized steel. Damper shell is furnished with one straight end and one crimped end for ease of duct connection. Damper blade rotates smoothly in nylon bearings. Adjustable blade stop is furnished on damper blade for system balancing. Damper features factory installed, heavy duty, synchronous motor with spring return open. Heavy duty steel gearing provides long motor life. Damper springs open in case of power failure. See damper specifications table for sizes, air resistance and shipping weights. Power requirements: 24 VAC.

Rectangular Zone Damper (Optional) – Rectangular damper is constructed of heavy gauge aluminum and stainless steel. Damper is a slip-in, opposed blade type with duct mounting plate on one end for ease of duct connection. Damper rotates smoothly in nylon bearings. A rubber blade stop is furnished for installation on damper blade if system balancing is required. Damper features factory installed, heavy duty, synchronous motor with spring return open. Heavy duty steel gearing provides long motor life. Damper springs open in case of power failure. See damper specifications table for sizes, air resistance and shipping weights. Power requirements: 24 VAC.

Pressure Switch (Required for Heat Pump Operation) – Pressure Switch (21J18) is required for proper system operation in heat pump applications.

Transformer (Optional) – Transformer is required for operation of zone dampers. See flowcharts on pages 4 and 5.

TYPICAL SYSTEM LAYOUT



DAMPER SPECIFICATIONS

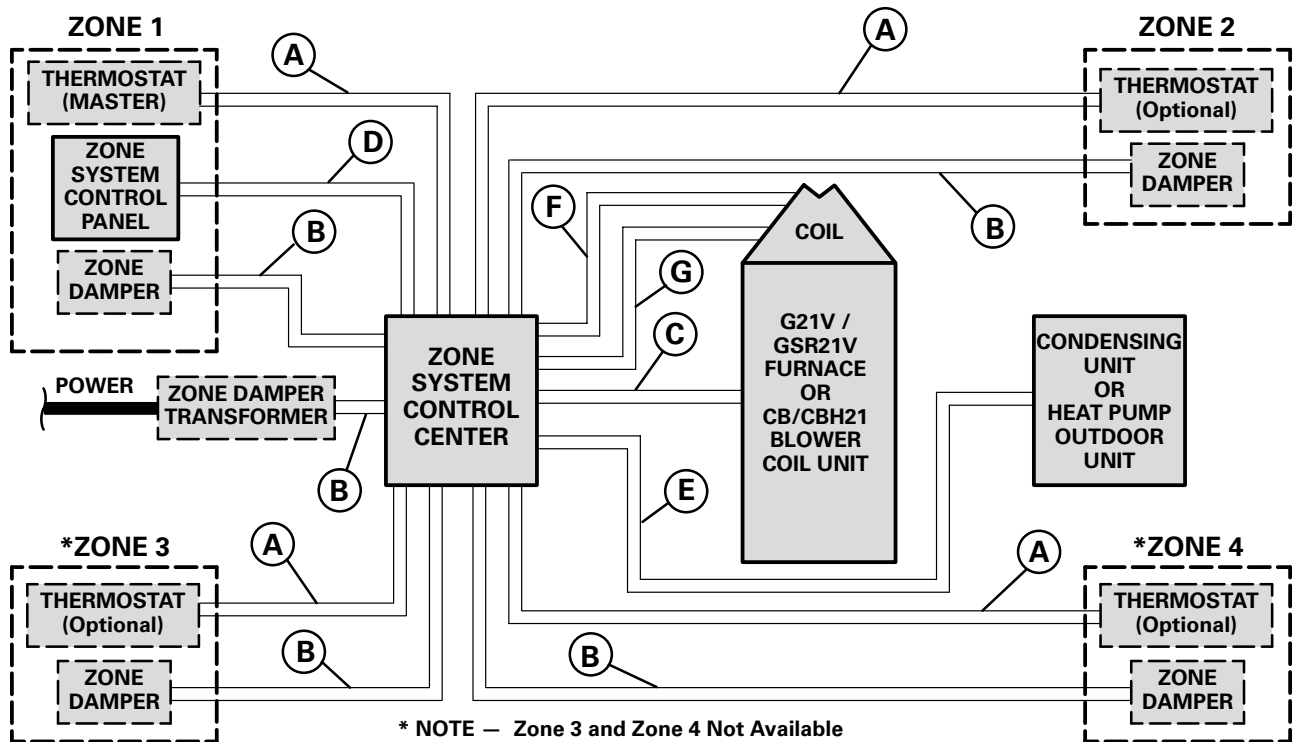
ROUND ZONE DAMPERS

Catalog No.	Dimensions Dia. (in.)	Air Volume (cfm)	Total Resistance (ln. wg.)	Shipping Weight (lbs.)
77G99	6	50	.01	2
		100	.04	
		110	.05	
78G00	8	100	.02	4
		150	.03	
		210	.05	
78G01	10	100	.01	6
		200	.02	
		325	.05	
78G02	12	200	.02	8
		350	.03	
		460	.05	
78G03	14	200	.01	10
		400	.02	
		640	.06	

RECTANGULAR ZONE DAMPERS

Catalog No.	Dimensions W x H (in.)	Air Volume (cfm)	Total Resistance (ln. wg.)	Shipping Weight (lbs.)
78G04	10 X 8	100	.01	4
		200	.02	
		325	.05	
78G05	12 X 8	120	.01	3
		240	.02	
		395	.05	
78G06	14 X 8	200	.02	3
		350	.03	
		460	.05	
78G07	16 X 8	225	.02	4
		395	.03	
		520	.05	
78G08	18 X 8	185	.01	4
		375	.02	
		600	.06	
78G09	20 X 8	210	.01	4
		415	.02	
		665	.06	

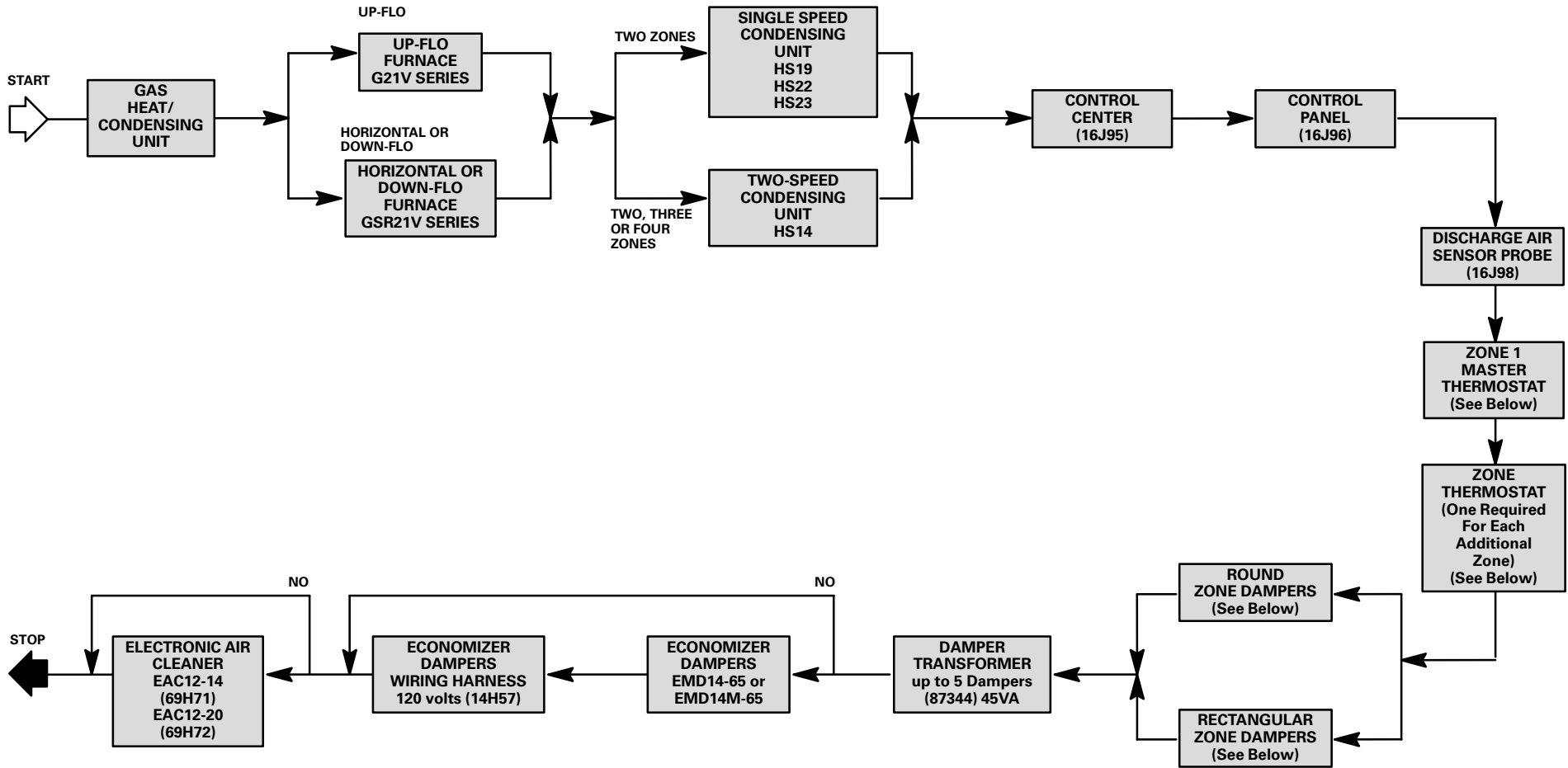
FIELD WIRING



- A — Three wire low voltage (gas heat systems) — 18 ga. minimum
Five wire low voltage (heat pump systems) — 18 ga. minimum
- B — Two wire low voltage — 18 ga. minimum
- C — Seven wire low voltage — 18 ga. minimum
- D — Six wire low voltage — 18 ga. minimum
- E — Two wire low voltage (single speed condensing unit) 18 ga. minimum
Three wire low voltage (two speed condensing unit) 18 ga. minimum
Four wire low voltage (single speed heat pump outdoor unit) 18 ga. minimum
Five wire low voltage (two speed heat pump outdoor unit) 18 ga. minimum
- F — Two wire low voltage (discharge air sensor) 18 ga. minimum
- G — Two wire low voltage — pressure switch (heat pump only) — 18 ga. minimum

— Field Wiring Not Furnished —

CONTROL SYSTEM COMPONENT SELECTION (Gas Heat/Condensing Unit Systems)



RECOMMENDED MASTER THERMOSTATS

(For a complete selection of alternate thermostats, see Thermostats Bulletin in Accessories section.)

Description	Catalog No.
*1 Htg.-1 Clg. 5-1-1 Day Programmable	27H31
1 Htg.-1 Clg. 5-2 Day Programmable	18H10
1 Htg.-1 Clg. 7 Day Programmable	18H11

*Recommended master thermostat.

RECOMMENDED ZONE THERMOSTATS

(For a complete selection of alternate thermostats, see Thermostats Bulletin in Accessories section.)

Description	Catalog No.
*1 Htg.-1 Clg. Electro-Mech. w/ subbase (Off-Auto)	86H23
**1 Htg.-1 Clg. 5-2 Day Programmable	18H10
1 Htg.-1 Clg. Electro-Mech. w/ subbase	12F99
Subbase for 12F99 (Off-Auto)	13F18
1 Htg.-1 Clg. Electro-Mech. w/ subbase	38234
1 Htg.-1 Clg. Electro-Mech. w/ subbase	17G17
1 Htg.-1 Clg. Electro-Mech. w/ subbase	17G18
1 Htg.-1 Clg. Electro-Mech. w/ subbase	78H22
1 Htg.-1 Clg. Electro-Mech.	12F99
Subbase for 12F99	13F17

*Recommended electro-mechanical zone thermostat.

**Recommended programmable zone thermostat.

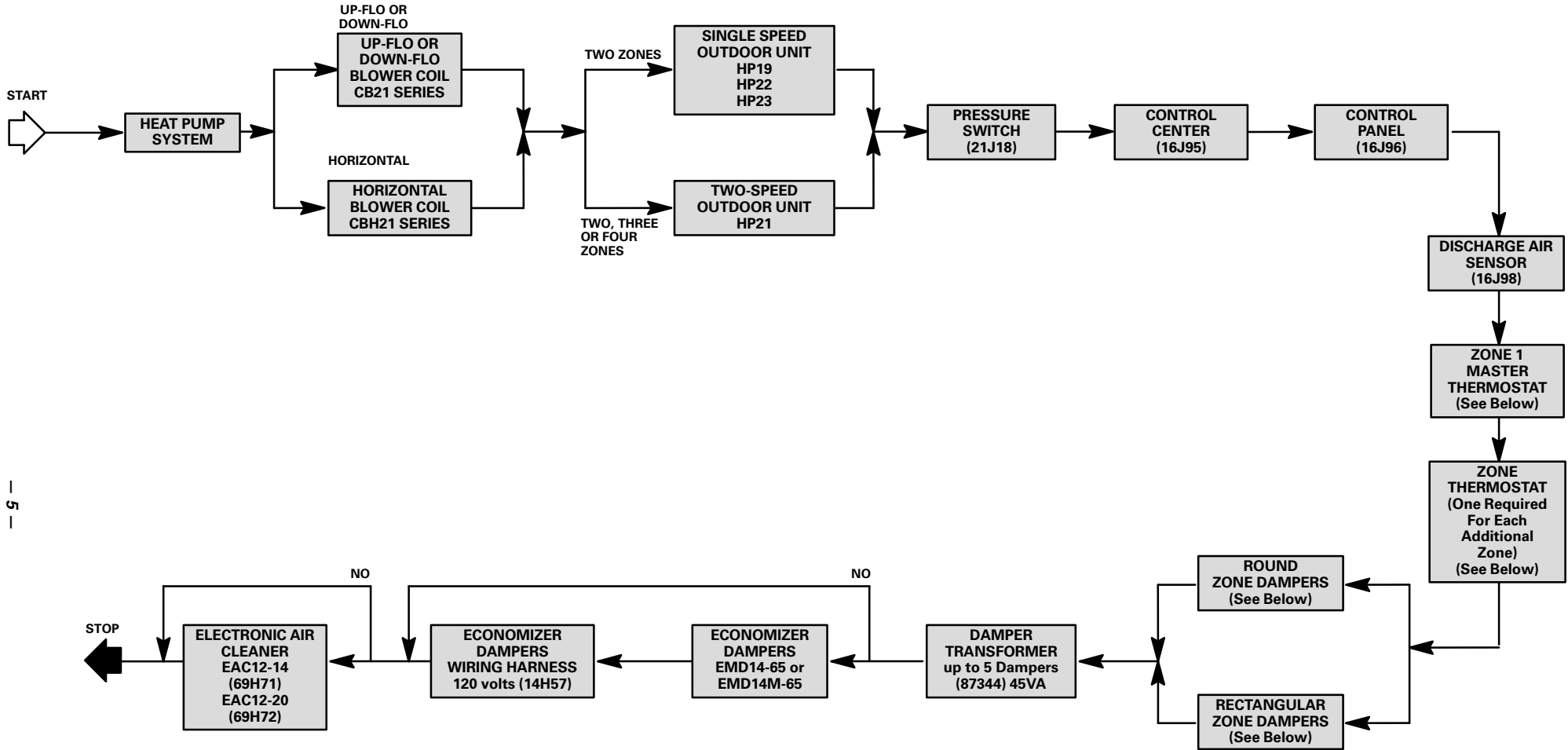
ZONE DAMPERS ROUND DAMPERS

Description	Catalog No.
6" dia.	77G99
8" dia.	78G00
10" dia.	78G01
12" dia.	78G02
14" dia.	78G03

RECTANGULAR DAMPERS

Description	Catalog No.
10" x 8"	78G04
12" x 8"	78G05
14" x 8"	78G06
16" x 8"	78G07
18" x 8"	78G08
20" x 8"	78G09

CONTROL SYSTEM COMPONENT SELECTION (Heat Pump Systems)



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RECOMMENDED THERMOSTATS (For a complete selection of alternate thermostats, see Thermostats Bulletin in Accessories section.)

Description	Catalog No.
*2 Htg.-1 Clg. 7 Day Programmable	91H72
3 Htg.-2 Clg. 7 Day Programmable	18H13
2 Htg.-2 Clg. Digital Setpoint	43H98
2 Htg.-1 Clg. 5-1-1 Day Programmable	27H30
**2 Htg.-1 Clg. Electro-Mechanical w/ Subbase	51H40

*Recommended programmable master thermostat or zone thermostat.

**Recommended electro-mechanical zone thermostat.

ZONE DAMPERS ROUND DAMPERS

Description	Catalog No.
6" dia.	77G99
8" dia.	78G00
10" dia.	78G01
12" dia.	78G02
14" dia.	78G03

RECTANGULAR DAMPERS

Description	Catalog No.
10" x 8"	78G04
12" x 8"	78G05
14" x 8"	78G06
16" x 8"	78G07
18" x 8"	78G08
20" x 8"	78G09