First Co VMBE Series Variable Speed High Efficiency Variable Speed Motor Instruction Manual

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The **VMBE** Series includes a programmable, high efficiency motor that redefines comfort and energy savings.

The **VMBE** Series includes a programmable, high efficiency motor that redefines comfort and energy savings. The **VMBE** motor automatically adjusts its torque and speed to maintain a preprogrammed level of constant airflow over a wide range of external static pressures. This variable speed technology offers better indoor air quality, more precise humidity control, quieter operation, consistent indoor air temperature, and lower utility bills.

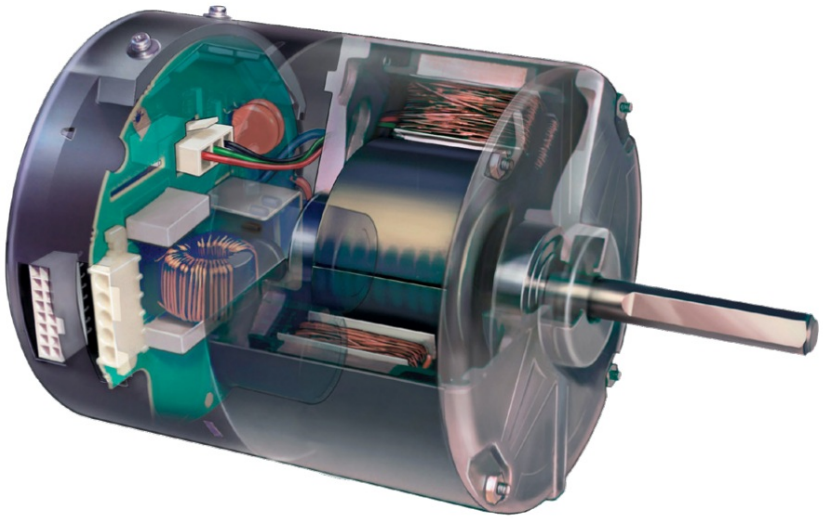
High Efficiency – At full load conditions the **VMBE** motor is 20% more efficient than an induction motor and at constant fan speed it consumes only 60-80 watts of power compared to 400 watts for a standard induction motor

Quiet Operation – The versatile **VMBE** motor quietly “ramps up” when the unit is turned on and “ramps down” when the thermostat is satisfied, eliminating the annoying sounds of changing airflow.

Self-Regulating Constant Airflow – The **VMBE** motor is factory programmed to maintain a predetermined level of airflow over a wide range of external static pressures, ensuring optimum system performance and whole-house comfort. The benefits of constant fan operation are:

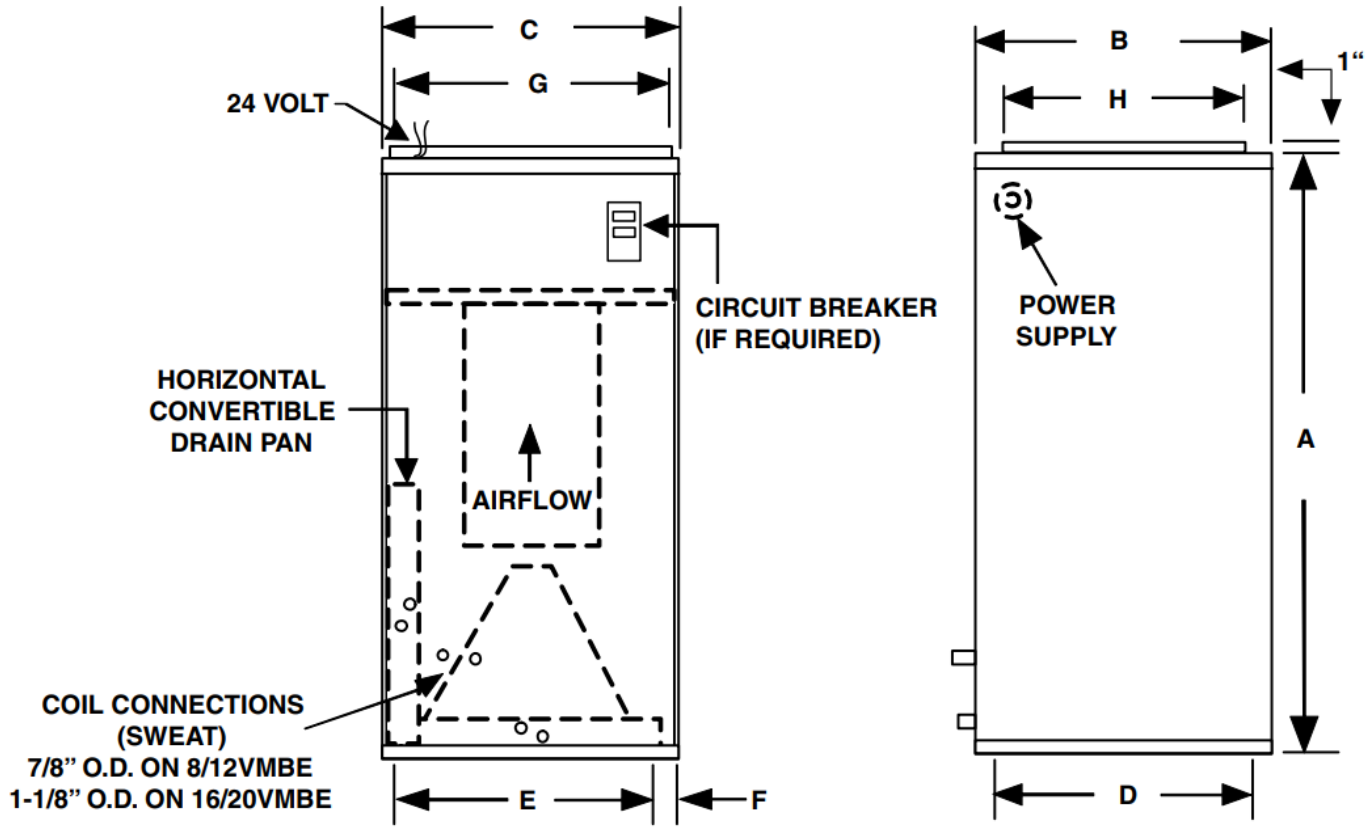
- **Consistent air distribution** (and temperature) throughout the home
- **Better indoor air quality** (further improved with the addition of high efficiency filter) – This allows the air to be filtered without excessive drafts and without sacrificing efficiency.
- **Better humidity control –** The VMBE is designed to extract much more moisture from the air than a conventional system by slowing the airflow over the cooling coil. The result is an improved summer comfort level at higher indoor temperatures.

Variable Speed ECM Motor



Variable Speed ECM Motor

PHYSICAL DIMENSIONS									
UNIT MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**FILTER SIZE**
8VMBE	40	20	20	18-1/2	16	2	18	16	18 X 20 X 1
12VMBE	42	23	20	21-1/2	16	2	18	17	20 X 22 X 1
16/20VMBE	48	28	21-1/4	26-1/4	17-1/4	2	19-1/4	18	20 X 25 X 1



AIR FLOW DATA (see "heating select taps" below eac h table for proper field set-up)	

MODEL	OPERATING MODE	THERMOSTAT TERMINALS			CONTROL BOARD SELECT TAPS								
		"X" ENERGIZED TERMI- NALS			COOL TAP				HEAT TAP (See notes below)				
		Y1	G	W1	A	B	C	D	A	B	C	D	
8VMBE	COOLING	X	X		800	720	600	525					
	CONTINUOUS BLOWER		X		400	360	300	265					
	ELECTRIC HEAT			X					790	730	660	600	

Heating Select Taps

A 800 CFM unit with 0 – 15kW electric heat

B 800 CFM unit with 0 – 5kW max. electric heat

C 600 CFM unit with 0 – 10kW electric heat

D 600 CFM unit with 0 – 5kW max. electric heat

	COOLING	X	X		1200	1050	950	850					

12 VMBE	CONTINUOUS BLOW-ER		**X**		600	525	475	425					
	ELECTRIC HEAT			**X**					1130	1000	875	790	
Heating Select Taps **A** 1200 CFM unit with 0 – 15kW electric heat **B** 1200 CFM unit with 0 – 10kW max. electric heat **C** 950 CFM unit with 0 – 10kW electric heat **D** 950 CFM unit with 0 – 5kW max. electric heat													
16 VMBE	COOLING	**X**	**X**		1600	1400	1250	1100					
	CONTINUOUS BLOW-ER		**X**		800	700	625	550					
	ELECTRIC HEAT			**X**					1500	1360	1190	1060	
Heating Select Taps **A+10%** 1600 CFM unit with 20kW electric heat **A** 1600 CFM unit with 10 – 20kW max. electric heat **B** 1600 CFM unit with 0 – 10kW max. electric heat **C** 1250 CFM unit with 10 – 15kW electric heat **D** 1250 CFM unit with 0 – 10kW max. electric heat													

20VMBE	COOLING	**X**	**X**		1825	1700	1600	1400				
	CONTINUOUS BLOWER		**X**		900	850	800	700				
	ELECTRIC HEAT			**X**					1825	1700	1500	1300
Heating Select Taps **A** 2000 CFM unit with 15 – 20kW electric heat **B** 2000 CFM unit with 0 – 15kW max. electric heat **C** 1600 CFM unit with 10 – 20kW electric heat **D** 1600 CFM unit with 0 – 10kW max. electric heat												

Airflow shown are dry coil at 230 volts.
Max. ext. static pressure is 0.50″ wtr

Notes: The cooling and heating speed taps are factory set on “A”. The delay profile is factory set on “A” (Arid setting). The adjust profile is factory set on Normal. If humidistat function is activated the cooling CFM will be reduced by 20%. Adjust profile (+) will increase airflow by 10%, while tap (-) will decrease airflow by 10%.

For additional sales and technical information on variable speed motors visit: **www.thedealertoolbox.com**

Digital thermostats for these units must have a “C” terminal.

In keeping with its policy of continuous progress and product improvement, First Operations reserves the right to make changes without notice. Maintenance for all First Co. products is available under “Product Maintenance” at **www.firstco.com.**

PERFORMANCE DATA – 230V	**CIRCUIT 1**	**CIRCUIT 2**	**CIRCUIT 3**

UNIT MODEL	kW (@ 230V)	MOTOR AMPS	MOTOR HP	L1 – L2 TOTAL AMPS 230V/208V	L1 – L2 MIN. CIR. AMPACITY 230V/208V	L1 – L2 MAX. CIR. PROTECTION 230V/208V	L3 – L4 TOTAL AMPS 230V/208V	L3 – L4 MIN. CIR. AMPACITY 230V/208V	L3 – L4 MAX. CIR. PROTECTION 230V/208V	L5 – L6 TOTAL AMPS 230V/208V	L5 – L6 MIN. CIR. AMPACITY 230V/208V	L5 – L6 MAX. CIR. PROTECTION 230V/208V
8VMBE0	0	1.9	1/3	1.9	3/3	15/15	—	—	—	—	—	—
8VMBE3	3	1.9	1/3	15/13	18/16	20/20	—	—	—	—	—	—
8VMBE4	4	1.9	1/3	17/15	24/20	25/20	—	—	—	—	—	—
8VMBE5	5	1.9	1/3	21/18	29/25	30/25	—	—	—	—	—	—
8VMBE6	6	1.9	1/3	25/22	36/30	40/30	—	—	—	—	—	—
8VMBE8	8	1.9	1/3	33/29	46/39	50/40	—	—	—	—	—	—
8VMBE10	10	1.9	1/3	42/36	55/48	60/50	—	—	—	—	—	—
12VMBE0	0	2.8	1/2	2.8	4/4	15/15	—	—	—	—	—	—
12VMBE5	5	2.8	1/2	24/21	30/26	30/30	—	—	—	—	—	—
12VMBE8	8	2.8	1/2	36/32	46/40	50/40	—	—	—	—	—	—
12VMBE10	10	2.8	1/2	45/39	56/49	60/50	—	—	—	—	—	—
12VMBE15	15	2.8	1/2	45/39	56/49	60/50	21/18	27/23	30/25	—	—	—

16VM BE0	0	4.7	3/4	4.7	6/6	15/15	—	—	—	—	—	—
16VM BE5	5	4.7	3/4	26/23	32/29	35/30	—	—	—	—	—	—
16VM BE8	8	4.7	3/4	33/29	48/42	50/45	—	—	—	—	—	—
16VM BE10	10	4.7	3/4	46/41	58/50	60/50	—	—	—	—	—	—
16VM BE15	15	4.7	3/4	46/41	58/50	60/50	21/18	27/23	30/25	—	—	—
16VM BE20	20	4.7	3/4	46/41	58/50	60/50	42/36	53/46	60/50	—	—	—
20VM BE0	0	7.1	1	7.1	9/9	15/15	—	—	—	—	—	—
20VM BE5	5	7.1	1	28/26	36/32	40/35	—	—	—	—	—	—
20VM BE8	8	7.1	1	41/36	52/46	60/50	—	—	—	—	—	—
20VM BE10	10	7.1	1	47/42	59/53	60/60	—	—	—	—	—	—
20VM BE15	15	7.1	1	47/42	59/53	60/60	21/18	27/23	30/25	—	—	—
20VM BE20	20	7.1	1	47/42	59/53	60/60	42/36	53/46	60/50	—	—	—

NOTES:

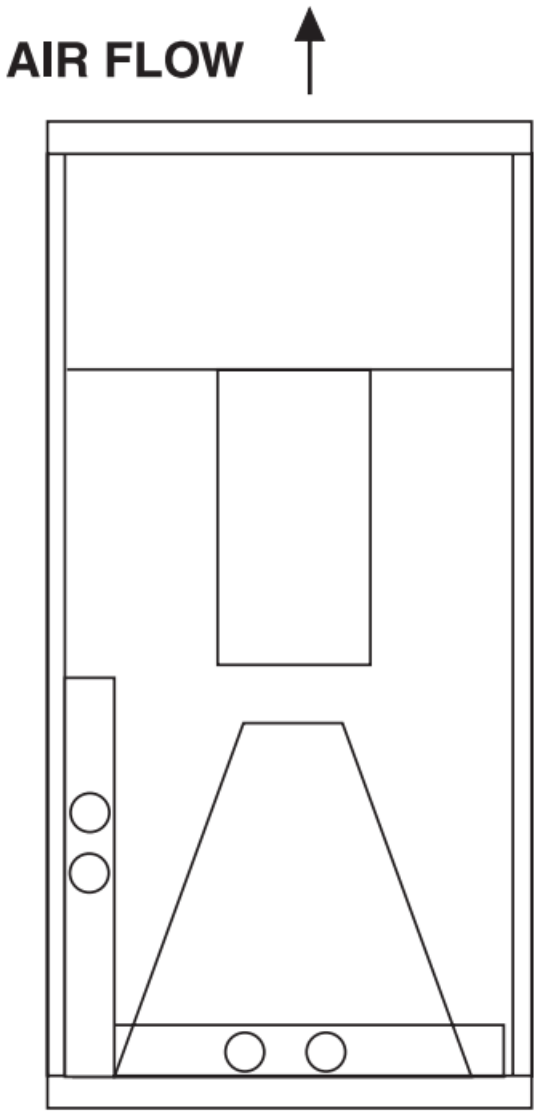
1. 15kW and 20kW models require 2 supply circuits.
2. Units suitable for installation with 0” clearance to combustible material.

CHILLED WATER COOLING CAPACITY – 4 ROW

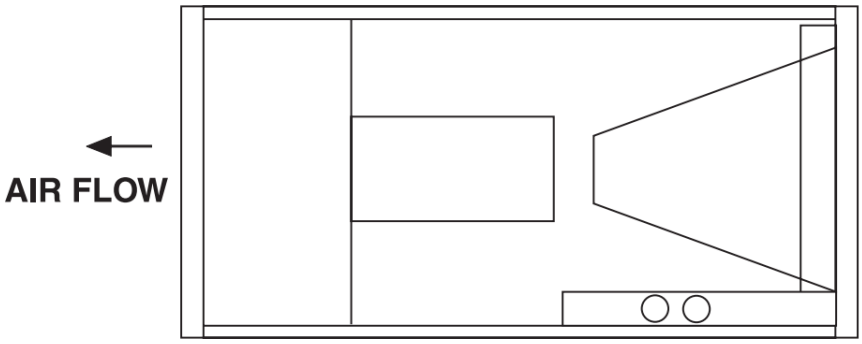
UNIT MODEL	CFM	GPM	P.D. (FT. WTR.)	45°F ENTERING WATER						42°F ENTERING WATER					
				80°F DB/67°F WB ENT. AIR			75°F DB/63°F WB ENT. AIR			80°F DB/67°F WB ENT. AIR			75°F DB/63°F WB ENT. AIR		
				TOTAL MBH	SENS. MBH	TEMP. RISE	TOTAL MBH	SENS. MBH	TEMP. RISE	TOTAL MBH	SENS. MBH	TEMP. RISE	TOTAL MBH	SENS. MBH	TEMP. RISE
8VMBE	600	3.0	2.5	19.0	13.8	12.7	14.5	12.1	9.7	20.7	14.4	13.8	15.8	12.6	10.5
		4.5	5.5	22.4	15.1	9.9	17.1	13.1	7.6	24.4	15.9	10.8	18.6	13.7	8.3
		6.0	9.5	24.4	15.9	8.2	18.7	13.7	6.2	26.6	16.8	8.9	20.3	14.4	6.8
	800	3.5	3.4	23.1	17.3	13.2	17.6	15.2	10.1	25.2	18.1	14.4	19.2	15.8	11.0
		5.0	6.7	26.9	18.7	10.7	20.5	16.3	8.2	29.3	19.6	11.7	22.4	17.1	8.9
		6.5	11.0	29.2	19.6	9.0	22.3	17.0	6.9	31.8	20.6	9.8	24.3	17.8	7.5
12VMBE	1000	4.0	2.4	28.3	21.6	14.1	21.6	19.0	10.8	30.8	22.5	15.4	23.6	19.7	11.8
		6.0	4.8	33.9	23.7	11.3	25.9	20.6	8.6	36.9	24.8	12.3	28.2	21.6	9.4
		8.0	7.9	37.3	25.0	9.3	28.5	21.7	7.1	40.6	26.3	10.2	31.0	22.7	7.8
	1200	5.0	3.5	33.7	25.5	13.5	25.8	22.4	10.3	36.8	26.6	14.7	28.1	23.3	11.3
		6.5	5.5	38.0	27.1	11.7	29.1	23.7	8.9	41.5	28.4	12.8	31.7	24.7	9.7
		8.0	7.9	41.0	28.2	10.3	31.3	24.6	7.8	44.7	29.6	11.2	34.1	25.7	8.5
	1400	4.5	2.0	36.2	29.2	16.1	27.7	25.8	12.3	39.5	30.3	17.5	30.1	26.7	13.4
		6.0	3.3	42.4	31.4	14.1	32.4	27.6	10.8	46.2	32.8	15.4	35.3	28.7	11.8
		7.5	4.8	46.9	33.1	12.5	35.8	28.9	9.6	51.1	34.7	13.6	39.0	30.2	10.4

16V MBE	1600	6.0 8.0 10.0	3.3 5.4 7.9	44.2 51.0 55.7	34.1 36.6 38.4	14.7 12.7 11.1	33.8 38.9 42.5	30.0 32.0 33.4	11.3 9.7 8.5	48.2 55.5 60.7	35.5 38.3 40.3	16.1 13.9 12.1	36.8 42.4 46.3	31.2 33.4 34.9	12.3 10.6 9.3
	1600	6.5 8.5 10.5	3.8 6.0 8.6	46.1 52.3 46.6	34.8 37.1 38.7	14.2 12.3 10.8	35.2 39.9 43.2	30.6 32.4 33.7	10.8 9.4 8.2	50.3 57.0 61.7	36.3 38.8 40.7	15.5 13.4 11.8	38.4 43.5 47.1	31.8 33..8 35.2	11.8 10.2 9.0
20V MBE	2000	7.0 10.0 13.0	4.3 7.9 12.5	52.4 61.7 67.5	40.9 44.3 46.5	15.0 12.3 10.4	40.0 47.1 51.6	36.1 38.8 40.5	11.4 9.4 7.9	57.1 67.3 73.6	42.6 46.4 48.8	16.3 13.5 11.3	43.6 51.4 56.2	37.4 40.5 42.4	12.5 10.3 8.6

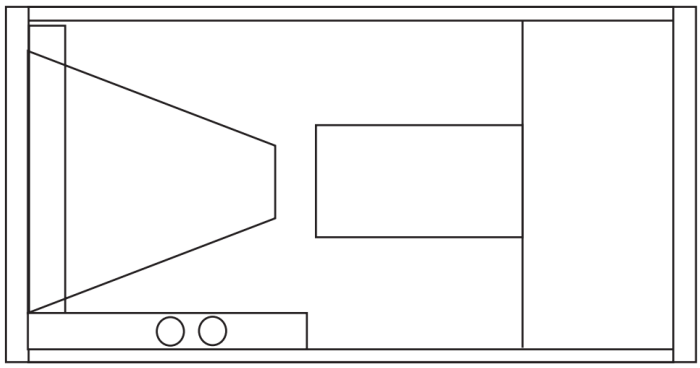
3-WAY AIRFLOW



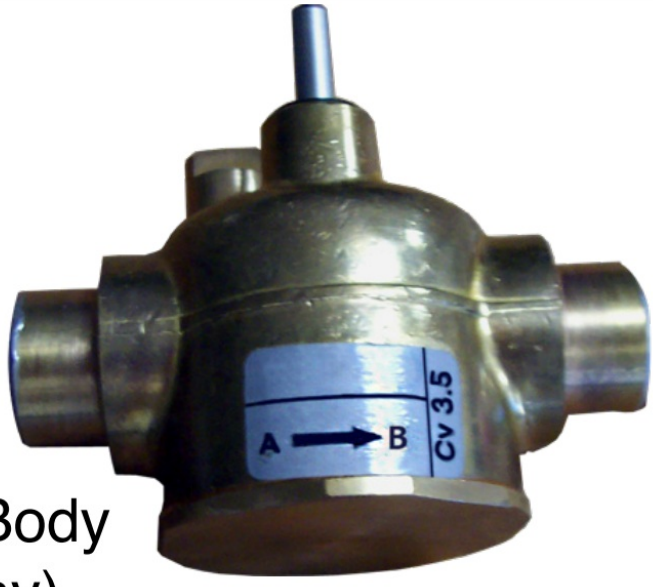
(Standard Harizontal Position)



(Alternate Horiziontal Position) (Field convertible)



Power Head



Valve Body
(2-way)

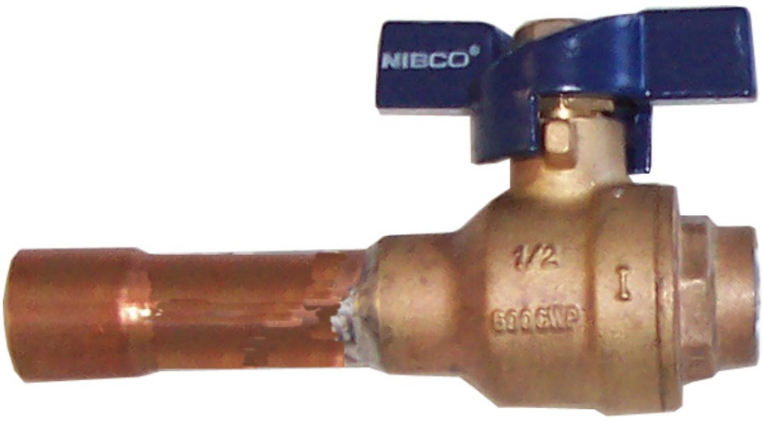
ACCESSORIES: (for chilled water coil)	
Power Heads:	
E50131180	24V
Separate Valve Bodies: (order power heads separately) (mount outside cabinet)	
E421317 E431317 E421417 E431417	3/4″ 2-way – For 8-12VMBE-2773/4″ 3-way – For 8-12VMBE-2771″ 2-way – For 16-20VMBE-2771″ 3-way – For 16-20VMBE-277
Hand Valves: (Combination balance / shut-off) (2 usually req'd per coil)	
CP90 CP905	For 8-12VMBE-277 For 16-20VMBE-277

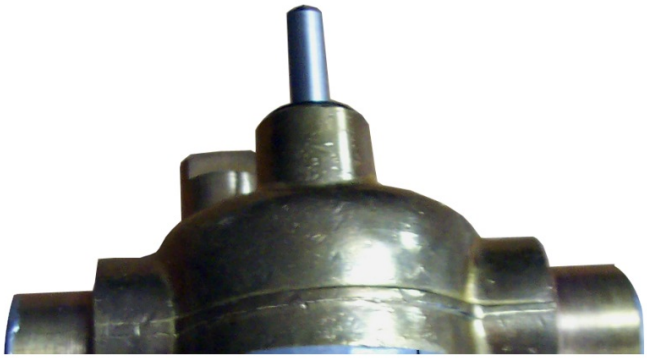
NOTE:

1. Power head leads are 18".

WARNING AVERTISSEMENT ADVERTENCIA Cancer and Reproductive Harm Cancer et Troubles de l'appareil reproducer Cancer y Dart° Reproductivo **www.P65Warnings.ca.flOVLOYOOS7**

Power Head





Valve Body
(2-way)

ACCESSORIES: (field installed) (all components mount outside the cabinet)	
POWER HEADS:	
E50131180	24V
SEPARATE VALVE BODIES: (order power heads separately)	
E421317 E431317 E421417 E431417	3/4″ 2-way – For 8-12VMB3/4″ 3-way – For 8-12VMB1″ 2-way – For 16-20VMB1″ 3-way – For 16-20VMB
HAND VALVES: (Combination balance / shut-off) (2 usually req'd per coil)	
CP90 CP905	3/4″ – For 8-12VMB1″ – For 16-20VMB

NOTE:

1. Power head leads are 18”.

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References

- Firstco