

# CONTROLS® BASyC® Systems

Model ABMV



THERMOSTATIC MIXING VALVES

## APPLICATION:

**ACORN CONTROLS® BASyC®** is ideal for any facility's recirculating domestic hot water system where optimal bather safety is desired. It provides distributed control and monitoring of **ACORN CONTROLS® MV17** mixing valves and a wide variety of temperature, pressure and flow sensors. Utilizing Niagara software, the **ACORN CONTROLS® BASyC®** can aggregate information (real-time data, history, alarms, etc.) from an array of sensors. **ACORN CONTROLS® BASyC®** can connect to a facility's local area network and/or the existing BAS via industry standard network protocols.

## FEATURES/BENEFITS:

- ▶ **ACORN CONTROLS®** Electronically Actuated Thermostatic Mixing Valve and Multi-Valve Assemblies.
  - Able to control any combination of up to (4) MV17 valves in one or two separate temperature loops.
  - Valves certified by IAPMO to ASSE 1017 standards with Hi/Low performance.
  - Maintains thermostatic control of set point during power, temperature probe, valve or actuator failure.
  - Provides Redundant Control.
- ▶ Honeywell/Niagara hardware/software.
  - The industry standard in building automation.
  - Non-proprietary platform.
  - Estimated flow and energy usage; no need for a costly flow meter.
  - Plug and play makes start-up quick and simple.
- ▶ **ACORN CONTROLS®** unique algorithms and system design provide temperature regulation that exceeds the requirements set forth in ASSE 1017. When tested in accordance with ASSE 1017, BASyC® regulates temperature to within ±2°F with and without Power.
- ▶ Effectively shuts off hot or cold water during supply failure.
- ▶ Alarms and Alerts with with relay outputs and e-mail notifications if connected to the facilities Ethernet.
- ▶ Expandable.
  - 18 (10 digital, 8 analog) programmable outputs to drive a wide variety of devices.
  - 16 universal inputs will accept a wide variety of input sensors.
  - Up 100 data points.
- ▶ Programmable/automated sanitization mode helps to minimize a facilities Legionella risks and when combined with **ACORN CONTROLS®** valves, simplifies the process
- ▶ Sensors and controls devices are labeled and keyed to eliminate potential mistakes.
- ▶ Water tight connectors improve sensor and control device reliability and makes replacements easier



- ▶ Primary Ethernet Adapter allows connection to BASyC® via the facilities LAN.
- ▶ Secondary Ethernet Adapter is independent of the primary LAN or BAS and is reserved for support of the BASyC® system.
- ▶ Password protection allows levels of secure access.
- ▶ Sanitization includes a 'safe start' feature that automatically goes back to the previous setting upon completion.
- ▶ Sanitization screen logs times and temperatures for a recorded of the process with e-mail acknowledgment.
- ▶ History retention for data points allow customizable reports that can be saved and/or exported.
- ▶ Each controller is able to communicate via two separate RS-485 networks with no external gateway.
- ▶ Numerous RS-485 communication protocols available (BACnet, Modbus or user specified).



Acorn ConTrols® assumes no responsibility for use of void or superseded data. Acorn ConTrols®, Lake Bluff, IL, a member of Morris Group International®. Please visit [www.acorn-controls.com](http://www.acorn-controls.com) for most current specifications.

Submittal: **BASyC®**  
Rev: 06/24/2025

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### Certifications:



ASSE 1017  
CSA B125.3



Acorn ConTrols®  
42 Sherwood Terrace, Suite #5  
Lake Bluff, IL 60044  
Phone: (847) 604-4773  
[www.acorn-controls.com](http://www.acorn-controls.com)

**SPECIFICATIONS:**

- ▶ Valve: See MV17 Series submittal at [www.acorn-control.com](http://www.acorn-control.com)
- ▶ Actuator:
  - Brushless DC Motor.
  - Capable of pushing 340 lbs.
  - Manual override allows valve adjustment without power.
  - Auto-Adaptable and two cap screws attach to valve making replacement fast and easy.
  - Pre-wired connector eliminates wiring in field.
- ▶ Agency Listings: ASSE, CSA, UPC, UL, Nema, CE.
- ▶ Controller:
  - Powered by Niagara framework.
  - Ambient temperature: 32° - 122°F (0° - 50°C).
  - 5% - 95% RH (non-condensing).
  - Web Browser enabled.
- ▶ Communication (optional):
  - BACnet & Modbus.
  - Others quoted upon request.
- ▶ Handheld Touchscreen Display (optional).
- ▶ Sensors: Prewired with water tight connectors.
  - 10K Thermistor temperature probes.
  - 0-150 psi pressure transducers.
  - 4-20mA Flow Meter.
- ▶ Recirculation Pumps (optional):
  - Relay controlled.
  - Return temperature adjustment.
  - Lead/Lag pump control.



**ABMV-4400-2**

**ABMV-5500-2**



**Handheld Touchscreen**



**Controller Box**

**GUIDE SPECIFICATION:**

The Digital Tempering System shall be based on a **ACORN CONTROLS®** controller based on Honeywell/Niagara hardware/software and a electrically controlled thermostatic mixing valve/actuator. Outlet temperature sensor shall be provided and enable local & remote set point adjustment. Shall be capable of optionally providing temperature, pressure and flow sensors. System must be redundant and provide set point control in the event of a power, actuator, valve or outlet temperature sensor failure. Auto-adapting control based on advanced algorithms must be provided to improve control accuracy. Temperature, pressure, flow usage and energy data must be displayed and stored. System shall provide user adjustable alerts and alarms, optionally tied to a relay output and capable of sending e-mail notification. The I/O module shall have 16 inputs and 18 outputs. The Digital Tempering System shall be **ACORN CONTROLS®** model ABMV and the system shall be BASyC®.

## ORDERING CODE FOR BASyC<sup>®</sup> Systems

<b>ABMV</b>	<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>		<b>-</b>
		1st Cell		2nd		3rd		4th		5th	
Complete cells 6 - 11 on next page											

**INSTRUCTIONS:** Create your custom ABMV ordering code using this guide to complete **11 cells**, the first 5 on this page, the rest on the next page. Single temp. (Zone One) systems require a "0" response to digits that apply to Zone Two.

### 1st CELL - 4 DIGITS

**Valve(s) Sizes**

Use 0, 00, or 000 as needed (see examples)

0
2
3
4
5

Up to 4 Valves, One or Two Temp. Zones, IN ANY COMBINATION

**EXAMPLES FOR CELLS 1 and 2**

One MV17-4 Valve, Single Zone System.....	<b>4000</b> - 2nd position = <u>1</u>
Two MV17-4 Valves, both in Zone One.....	<b>4400</b> - 2nd position = <u>2</u>
Two MV17-4 Valves, 1 in each Zone.....	<b>4004</b> - 2nd position = <u>1</u>
Three MV17-4 Valves in Zone One.....	<b>4440</b> - 2nd position = <u>3</u>
Three MV17-4 Valves, (2) Zone One, (1) Zone Two...	<b>4404</b> - 2nd position = <u>2</u>
Four MV17-4 Valves, 2 in each Zone.....	<b>4444</b> - 2nd position = <u>2</u>
Four MV17-4 Valves, (3) Zone One, (1) Zone Two.....	<b>4444</b> - 2nd position = <u>3</u>
Four MV17-4 Valves in Zone One.....	<b>4444</b> - 2nd position = <u>4</u>

### 2nd CELL - 1 DIGIT

**Number of Valves in Zone One**

One (1)	1
Two (2)	2
Three (3)	3
Four (4)	4

If you include recirculation pump (4th digit is 1,2 or 3) then return pipe size

If you include a recirculation pump (4th digit is 1,2 or 3) then return pipe size must be provided.

Return piping includes check valves, ball valves, drain valve and circuit setter.

**EXAMPLES FOR CELL 3**

Include Return 1" Piping in Zone One, Single Zone System.....	<b>E0</b>
Include Return 1" Piping in Zone One and Zone Two.....	<b>EE</b>

### 3rd CELL - 2 DIGITS

**Return Pipe Size - Zone One and Zone Two**

Do Not Include Return Piping	0
1/2"	C
3/4"	D
1"	E
1-1/4"	F
1-1/2"	G
2"	H

### 4th CELL - 2 DIGITS

**Recirc Pump, Pump Cntrl, Zone One & Zone Two**

No Pump and No Pump Control Pump	0
Pump and Pump Control Relay Pump	2
Pump with No Control	3
No Pump, Include Pump Control Relay	4

**EXAMPLES FOR CELL 4**

Incl. Pump, Cntrl Relay, Single Zone.....	<b>20</b>
Incl. Cntrl Relay Only, Two Zones.....	<b>44</b>

**PUMP DETAILS:**

MAKE/MODEL \_\_\_\_\_

OR

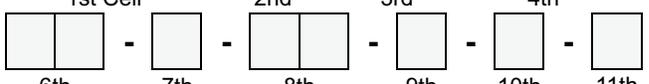
\_\_\_\_\_ GPM @ \_\_\_\_\_ FT. HEAD

### 5th CELL - 2 DIGITS

**Not used**

Not Used	00
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## ORDERING CODE FOR BASyC® Systems (Continued)

<b>ABMV</b>	-	Complete cells 1 - 5 on previous page	-
		1st Cell      2nd      3rd      4th      5th 	
		6th      7th      8th      9th      10th      11th	

**INSTRUCTIONS:** Create your custom ABMV ordering code using this guide to complete 11 cells, the first 5 on this page, the rest on the next page. Single temp. (Zone One) systems require a "0" response to digits that apply to Zone Two.

<b>6th CELL - 2 DIGITS</b>			
<b>Flow/BTU Data - Zone One and Zone Two</b>			
Do Not Include	<b>0</b>	<b>EXAMPLES FOR CELL 6</b> Calculated Flow/BTU, Single Zone System..... <b>80</b> Flowmeter for Flow/BTU Data, Both Zones..... <b>99</b>	Choosing 8 for either zone, requires choice "C" for 7th digit. Choosing "9" eliminates the choice of "C" for 7th digit.
Calculated BTU and Flow Data	<b>8</b>		
Flowmeter with Flow/BTU Data	<b>9</b>		
<b>7th CELL - 1 DIGIT</b>			
<b>Inlet Temperature and/or Pressure Sensors</b>			
Standard Outlet Sensor(s) only	<b>0</b>	Outlet temp. sensor is included on all systems. With multi-valve systems, outlet temp. sensor for each valve and another for their common outlet is standard. Inlet temp. sensors are installed on the supply piping common to all valves in a multi-valve system as well as multi-zone systems utilizing a single mixing station. See note for cell 6 regarding limitations affecting this selection.	
Inlet Temp. Sensors	<b>B</b>		
Inlet Temp. and Inlet/Outlet Press. Sensors	<b>C</b>		
<b>8th CELL - 2 DIGITS</b>			
<b>Return Temp Data - Zone One and Zone Two</b>			
Do Not Include	<b>0</b>	If ordered, the Return Sensor temp. data typically controls the pump relay based on a target temperature. This is configurable within BASyC™. Please contact your local <b>CONTROLS®</b> Representative for more information and a quote on the Final Fixture Sensor.	
Sensor on Return Line at Recirc Pump	<b>1</b>		
Lead/Lag Pump Control	<b>3</b>		
<b>9th CELL - 1 DIGIT</b>			
<b>Touchscreen Display</b>			
Do Not Include	<b>0</b>	The Touchscreen display is portable. It can be used with multiple BASyC™ systems.	
Include	<b>T</b>		
<b>10th CELL - 1 DIGIT</b>			
<b>BAS Protocol Adapter</b>			
Do Not Include	<b>0</b>	Rs485, RS232, Primary LAN & Secondary LAN are standard with BASyC™	
BACNet I/P	<b>M</b>		
BACNET MTSP	<b>N</b>		
Modbus MSTP	<b>P</b>		
Lonworks MSTP	<b>R</b>		
OBIX	<b>S</b>		
<b>11th CELL</b>			
<b>SPECIAL FEATURES</b> - If applicable			
Includes Special Features	<b>SP</b>	If <b>SP</b> is selected, the Special Features included with this system must be <u>detailed below.</u>	
No Special Features Included	<b>Blank</b>		

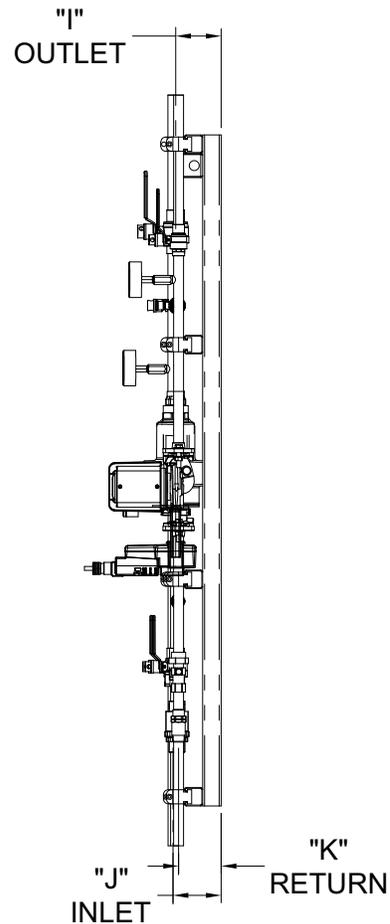
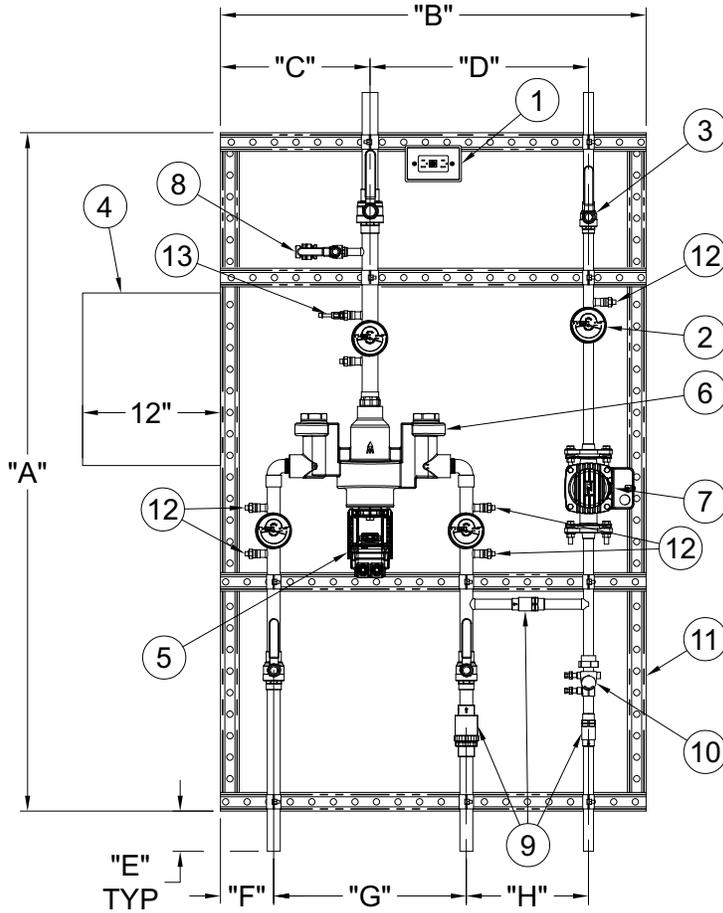
Details on Special Features:

# CONTROLS® BASyC® Systems

## Single BASyC® Valve System Shown



THERMOSTATIC MIXING VALVES

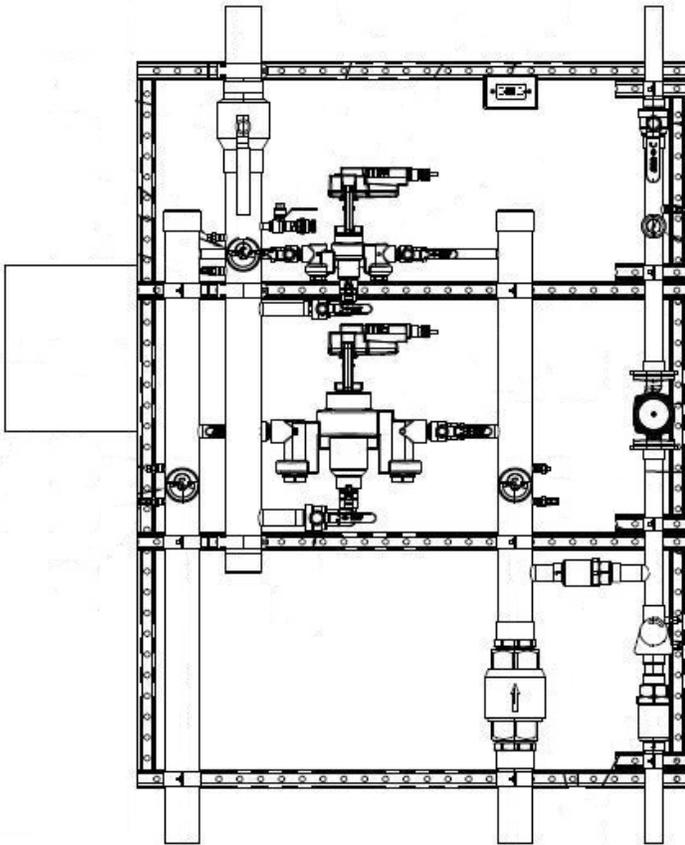


- ① 120V GFCI RECEPTACLE
- ② TEMPERATURE/PRESSURE GAUGE
- ③ LOCKABLE BALL VALVES (TYPICAL)
- ④ CONTROLLER & I/O MODULE(S)
- ⑤ ACTUATOR
- ⑥ MIXING VALVE
- ⑦ OPTIONAL RECIRCULATION PUMP SHOWN, MUST PROVIDE SPECIFICATIONS OR MODEL NUMBER BELOW IF REQUIRED
- ⑧ 1/2" LOCKABLE BALL VALVE WITH 3/4" HOSE CONNECTION AND VACUUM BREAKER
- ⑨ CHECK VALVES
- ⑩ CIRCUIT SETTER
- ⑪ MOUNTING FRAME
- ⑫ SENSOR PORTS FOR **CONTROLS® BASyC™** SYSTEM
- ⑬ OUTLET TEMPERATURE PROBE

Overall dimensions shown are for Single Valve System only.  
Contact Factory for dimensional data on Multi-Valve System configurations.

	INLET	OUTLET	"A"	"B" 1	"C"	"D"	"E"	"F"	"G"	"H"	"I"	"J"	"K"
ABMV-2	3/4" NCT	1" NCT	52-1/2" (1336)	30-1/2" (775)	9-1/2" (241)	15" (381)	3-1/2" (89)	4-1/4" (108)	10-1/2" (267)	9-3/4" (248)	2-1/4" (57)	2-1/4" (57)	2-1/4" (57)
ABMV-3	1" NCT	1-1/4" NCT	59" (1500)	37" (940)	13" (330)	19" (483)	3-1/2" (89)	4-5/8" (117)	16-3/4" (425)	10-5/8" (270)	4" (102)	4" (102)	3-3/4" (95)
ABMV-4	1-1/4" NCT	1-1/2" NCT	59" (1500)	37" (940)	13" (330)	19" (483)	3-1/2" (89)	4-3/8" (111)	17-1/4" (438)	10-3/8" (264)	3-3/4" (95)	3-3/4" (95)	3-3/4" (95)
ABMV-5	1-1/2" NCT	2" NCT	59" (1500)	37" (940)	13" (330)	18-3/4" (476)	3-1/2" (89)	4" (102)	17-7/8" (454)	9-7/8" (251)	4" (102)	4" (102)	3-3/4" (95)

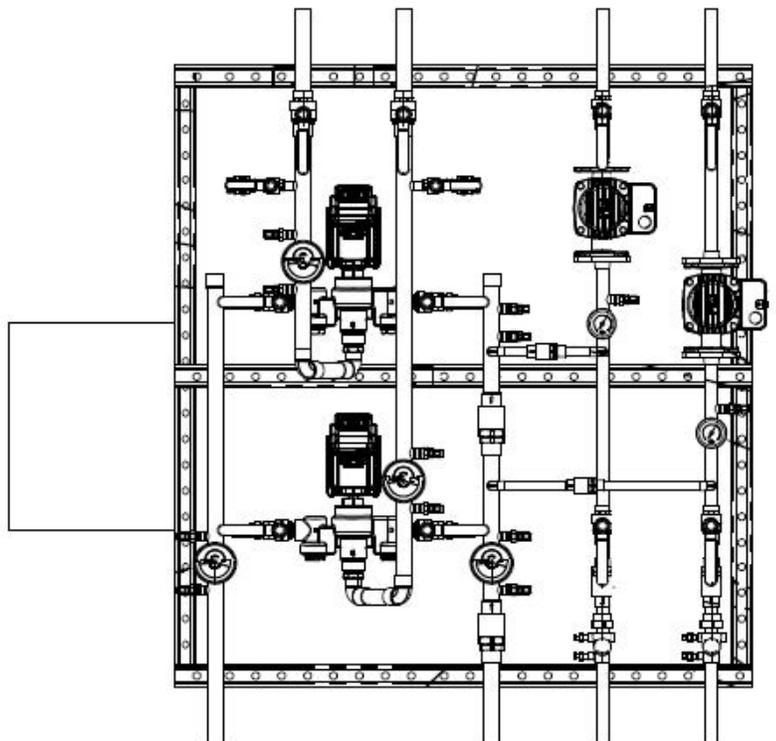
### TwoValve/Single Loop System



**ABMV-2300-1-G0-20-00-00-C-10-N-SP**  
(Special inlet/outlet sizes)

System details shown for reference only. Layouts may differ based upon configuration and components selected. Overall dimensions are subject to change based on selection criteria. Contact Factory for dimensional data on specific system configurations.

### TwoValve/Two Loop System



**ABMV-2002-1-DD-22-00-CC-C-11-N**

# CONTROLS® BASyC® Systems



Lead-Free Multi-Valve Supply Fixture  
Based On The MV17 Master Mixing Valves

THERMOSTATIC MIXING VALVES

## FLOW CHART:

NOTE: 0.1 GPM Minimum flow when the valve is installed at or near hot water source with re-circulating tempered water using a properly sized, continuously operating Pump.

### Flow (GPM)Vs. Pressure Drop Chart (PSI):

Model # Prefix	Min Flow	Certified Min Flow	Pressure Drop (PSI)								
			Cv	1	5	10	15	20	30	45	60
ABMV17-2000	0.1	1	6.7	15	21	26	30	37	45	52	60
ABMMV17-2200	0.1	2	13.4	30	42	52	60	74	90	104	120
ABMV17-3000	0.1	2	13.4	30	42	52	60	74	90	104	120
ABMMV17-2300	0.1	3	20.1	45	64	78	90	110	135	156	180
ABMV17-4000	0.1	3	22.4	50	71	87	100	122	150	173	200
ABMMV17-3300	0.1	4	26.8	60	85	104	120	147	180	208	240
ABMMV17-2400	0.1	4	29.1	65	92	113	130	159	195	225	260
ABMV17-5000	0.1	4	33.5	75	106	130	150	184	225	260	300
ABMMV17-3400	0.1	5	35.8	80	113	139	160	196	240	277	320
ABMMV17-2500	0.1	5	40.3	90	127	156	180	220	270	312	360
ABMMV17-4400	0.1	6	44.7	100	141	173	200	245	300	346	400
ABMMV17-4500	0.1	7	55.9	125	177	216	250	306	375	433	500
ABMMV17-5500	0.1	8	67.1	150	212	260	300	367	450	520	600
ABMMV17-4450	0.1	10	78.3	175	247	303	350	429	525	606	700
ABMMV17-3550	0.1	10	80.5	180	255	312	360	441	540	624	720
ABMMV17-4550	0.1	11	89.4	200	283	346	400	490	600	693	800
ABMMV17-5550	0.1	12	100.6	225	318	390	450	551	675	779	900
ABMMV17-4455	0.1	14	111.8	250	354	433	500	612	750	866	1000
ABMMV17-4555	0.1	15	123.0	275	389	476	550	674	825	953	1100
ABMMV17-5555	0.1	16	134.2	300	424	520	600	735	900	1039	1200

### Flow (LPM)Vs. Pressure Drop Chart (kPa):

Model # Prefix	Min Flow	Certified Min Flow	Pressure Drop (δ kPa)								
			Cv	6.9	34	69	103	138	207	310	414
ABMV17-2000	0.4	4	25.4	149	80	98	114	139	170	197	227
ABMMV17-2200	0.4	8	50.8	298	161	197	227	278	341	393	454
ABMV17-3000	0.4	8	50.8	298	161	197	227	278	341	393	454
ABMMV17-2300	0.4	11	76.2	447	241	295	341	417	511	590	681
ABMV17-40000	0.4	11	84.6	497	268	328	378	464	568	656	757
ABMMV17-3300	0.4	15	101.6	596	321	393	454	556	681	787	909
ABMMV17-2400	0.4	15	110.0	646	348	426	492	603	738	852	984
ABMV17-5000	0.4	15	126.9	745	401	492	568	695	852	983	1135
ABMMV17-3400	0.4	19	135.4	795	428	525	606	742	908	1049	1211
ABMMV17-2500	0.4	19	152.3	895	482	590	681	834	1022	1180	1363
ABMMV17-4400	0.4	23	169.3	994	535	656	757	927	1135	1311	1514
ABMMV17-4500	0.4	26	211.6	1242	669	819	946	1159	1419	1639	1892
ABMMV17-5500	0.4	30	253.9	1491	803	983	1135	1391	1703	1967	2271
ABMMV17-4450	0.4	38	296.2	1739	937	1147	1325	1622	1987	2294	2649
ABMMV17-3550	0.4	38	304.7	1789	964	1180	1363	1669	2044	2360	2725
ABMMV17-4550	0.4	42	338.5	1988	1071	1311	1514	1854	2271	2622	3028
ABMMV17-5550	0.4	45	380.8	2236	1204	1475	1703	2086	2555	2950	3406
ABMMV17-4455	0.4	53	423.2	2485	1338	1639	1892	2318	2839	3278	3785
ABMMV17-4555	0.4	57	465.5	2733	1472	1803	2082	2550	3123	3606	4163
ABMMV17-5555	0.4	61	507.8	2982	1606	1967	2271	2781	3406	3933	4542

SELECTION SUMMARY  
& APPROVAL FOR  
MANUFACTURING

Model Number & Options \_\_\_\_\_ Quantity \_\_\_\_\_

Company \_\_\_\_\_

Contact \_\_\_\_\_ Title \_\_\_\_\_

Signature (Approval for Manufacturing) \_\_\_\_\_ Date \_\_\_\_\_

AcornConTrols®  
42 Sherwood Terrace, Suite #5  
Lake Bluff, IL 60044  
Phone: (847) 604-4773  
[www.acorn-controls.com](http://www.acorn-controls.com)