



ACTUATOR

MBV Series (Electrical Quarter-turn Actuator)

Model Number: MBV Series

FEATURES

MBV Series Electric Actuator are design in superior quality that features high intelligence, high protection, small size, high integration, long service life and stable performance. It can be controlled either locally or remotely and is applicable for all kinds of 90-degree turn equipments such as ball valves, butterfly valves and air door baffles, satisfying all requirements of industrial automatic control pipelines.



DESCRIPTION OF CHARACTERSTICS

1. **Housing:** Aluminum alloy Housing processed by hard anodizing and polyester powder finishing at a protection degree of IP67 (Namur &6) or IP68 has light weight, strong anticorrosive ability and applies to all kinds of harsh working conditions.
2. **Motor:** The specially designed squirrel-cage inductive motor has high startup torque and can reach top the maximum value soon after the start. It has overheat and overload protection unit set inside and boosts the high output efficiency, high accuracy and low noise.
3. **PCU:** High-performance integrated microprocessor saves complicated setting on site of installation. Its one-push automatic correction and self-debugging functions bring customers much convenience.
4. **Sealing:** Double O rings are used to realize two-way seal.
5. **Manual Operation Mechanism:** The manual operation is carried out by wrenching lever of clutch which will automatically restore to electrical control position upon power on. In addition, the handwheel is designed to drive the actuator easily, fast and conveniently, with its size determined according to the torque required to open the actuator.
6. **Gear and Self-locking Device:** The double-worm wheel and worm system and secondary reduction gearbox can avoid inaccurate valve position caused by instant counter rotation of actuator and guarantee correct and sound valve position when power off. In addition, the device features high output efficiency and low noise.
7. **Limit Switch:** The limit switch with high accuracy can be easily used to adjust the open and close limit of the valve. Overload protection is provided against overlarge torque of valve to protect both the valve and actuator.
8. **Anti-condensation Heater:** Switch on at the temperature of $20^{\circ}\text{C} \pm 3^{\circ}\text{C}$ to avoid internal water condensation and switch off at the temperature of $30^{\circ}\text{C} \pm 3^{\circ}\text{C}$. The power is off automatically when the temperature is too high.
9. **Limit Bolts:** The limit bolts control the stroke of actuator through the open and close positions of the actuator to avoid the worm and worm wheel off the way.
10. **Indicator:** The operator can watch the accurate open position of the valve in distance by the relatively big indicating window.
11. **Terminal Board:** The plug and play terminal board can be installed easily and conveniently. Each terminal compressed by spring guarantees firm wiring and can be used in shaky environment.
12. **Wiring:** The internal wiring is simple and clear and is easy for connection.
13. **Connecting Shaft Sleeve:** The connecting shaft sleeve can be dismantled for individual processing based on reality. The mounting base meets ISO5211 Standard and can be connected with valve easily.
14. **Lubrication:** All gears and transmission shafts apply CIATM221 grease and are lubrication and maintenance free for 5 years.
15. **Anti-interruption Magnetic Ring:** Effectively prevent the circuit being interrupted by the external magnetic field to guarantee stable and reliable operation of the electrical actuator.



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MBV series electrical actuators have all gone through strict quality inspection before delivery which guarantees the stability and reliability of the products. In addition, there are senior intelligent products of various control forms and modes for option:

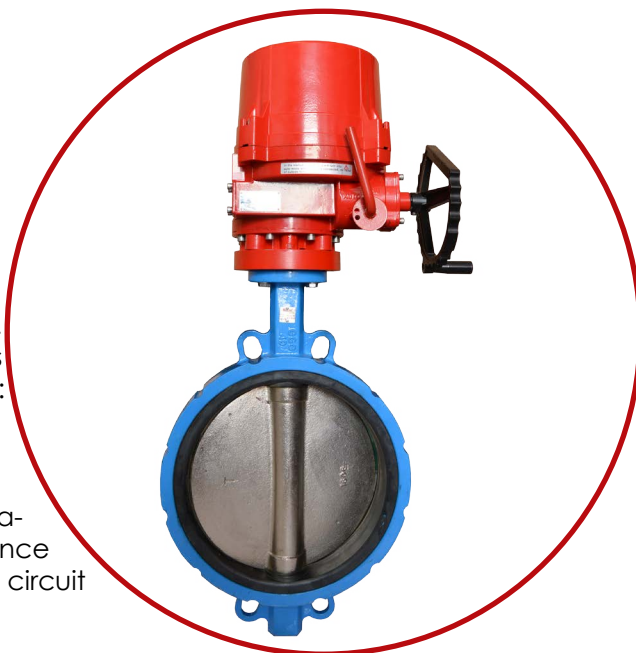
(1) The digital integrated chip with ultra large specification has powerful function and high accuracy rate. Once the actuator is electrified, the chip will test the control circuit automatically to ensure correct operation.

(2) The actuator adopts Hall sensor as its displacement sensor which conducts digital quantization treatment to pulse signals; the Hall Effect magnetic pulse system can accurately measure and control the stroke of actuator.

(3) Since the IA infrared ray system was successfully used, IA now has been supported the communication compatible with IrDA. The functional parameter setting, debugging and local electrical operation of actuator can all be settled by handheld infrared ray remote control without opening the housing to expose the internal control circuit (non-intrusive design).

(4) The actuator adopts LCD screen with high-resolution LCD digital, identifiers to show the percentage of valve openness in real time. The backlight of LCD screen provides great convenience to the user for night operation. The hi-lite LED red and green lights respectively indicate full close and full open of the actuator. In case of power off, the backup battery will support screen display.

(5) The actuator is equipped with remote/ local (on/off) control function with relevant pilot lamps: full close- red light on, be closing- red light flickers, torque switch on- yellow light on, torque switch failure- yellow light flickers, full open- green light on, being opening- green light flickers. The electronic contactor and transmitter have automatic phase adjustment and correction function. 24-48 terminals on the terminal board for option. The position relay and the local LCD display are used to monitor remote position indicator and are compatible with PROFIBUS communication system.



STANDARD CONFIGURATION

1	Protection Degree	Water-proof IP 67, NAMUR 4 and 6, (IP 68 Optional)
2	Voltage of Power Supply	110/220-230V AC/ 1Ph/50/60Hz±10% 380/400/440/V AC/3Ph/50/60Hz±10%
3	Control Power Supply	110/220-230V AC/ 1Ph/50/60Hz±10%
4	Working Duty (On-off Type)	S2: 10Min~30Min/S4:20~50%
5	Working Duty (Modulating Type)	S4: 30~50%, 300~1,200 Starts/Hour
6	Motor	Whole Sealing Squirrel-cage Inductive Motor of F Degree
7	Limit Switch	2 for Each Open/Close Switch (SPDT 250VAC/10A Rating) (More Available)
8	Torque Switch	1 for Each Open/Close Switch (SPDT 250VAC/10A Rating) (More Available)
9	Thermal Protection and Temperature Setting	Thermal Protection Switch Set Inside (Max. 150°C±5°C, Min97°C±15°C)
10	Stroke	90°±5°(0°~100°)



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STANDARD CONFIGURATION Continue...

11	Position Indicator	Continuous Mechanical Position Indication
12	Manual Operation Mechanism	Attached
13	Self-locking Function	Attached
14	Mechanical Limit	Attached (External Adjustment Available)
15	Anti-condensation Heater	5W (110/220-230VA C)
16	Cable Interface	2 PF 3/4"
17	Ambient Temperature	Basic Type: -20°C~+70°C Optional Type: -40°C~+100°C
18	Ambient Humidity	Min. Relative Humidity 10%, Max. Relative Humidity 100%, No Condensation
19	Anti-shock	XYZ 10g. 02~34Hz, 30 minutes
20	Housing	Aluminum Alloy Housing Processed of Hard Anodizing and Polyester Painting

OPTIONS

Code	Remark	Note
EX	Explosive-proof Type	Exd II BT4, BT6, CT4, CT6
WT	Watertight Type (IP68)	Continuous work underwater for 100 hours
ALS	Auxiliary Limit Switch	4 ones at most
ATS	Auxiliary Limit Switch	4 ones at most
SV	Variable torque and switch speed	Please contact this company before making an order.
PK	Potentiometer (0~1Kohm)	High precision and integrated design guarantee correct output of valve position
CT	Current Transformer (Output Signal 4~20mA)	0 Point and Stroke Adjustable (4-line and 2-line systems for option)
PCU	Intelligent Central Processing Unit (4~20mA Signal Input and Output)	Intellectualized one-push automatic correction and adjustment function
LCU	Local Control Unit	Remote control/ open/ stop/ close switch
LCD	Liquid Crystal Display	Watch the valve position clearly
LPA	Horizontal Installation	Control air door baffle; Output connecting lever, support and spherical linkage attached



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ACTUATOR SELECTION TABLE

Model	MBV60	MBV100	MBV160	MBV240	MBV350	MBV500	MBV800	MBV1100	MBV1500	MBV2000	MBV3000
Output Torque (Nm)	60	100	160	240	350	500	800	1100	1500	2000	3000
Working Duty (%)	40	40	30	30	30	30	30	30	30	30	30
Operating Time	50Hz	13	21	26	26	31	31	39	39	93	117
	60Hz	11	18	22	22	26	26	32	32	78	97
	Round (Φ)		22	25	25	40	40	48	48	75	75
	Square (Φ)	14	20	23	23	34	34	40	40	64	64
Rated Current (A)											
1 Phase/ 110V	50Hz	0.98	0.98	1.60	1.62	1.72	3.60	3.90	3.90	3.60	3.80
	60Hz	1.10	1.10	1.70	1.72	1080	3.90	4.20	4.30	3.90	4.20
1 Phase/ 220V	50Hz	0.52	0.52	0.85	0.87	0.92	1.50	2.05	2.15	1.50	2.05
	60Hz	0.58	0.58	0.90	0.90	0.95	1.60	2.20	2.30	1.60	2.20
3 Phase/ 380V	50Hz	0.43	0.43	0.30	0.32	0.32	0.52	0.82	0.84	0.52	0.82
	60Hz	0.33	0.33	0.30	0.32	0.32	0.56	0.88	0.90	0.56	0.88
3 Phase/ 440V	50Hz	0.59	0.59	0.30	0.32	0.32	0.55	0.82	0.84	0.55	0.82
	60Hz	0.42	0.42	0.32	0.35	0.35	0.58	0.88	0.88	0.58	0.88
Motor Degree	F	F	F	F	F	F	F	F	F	F	F
Motor Power	15W	15W	40W	40W	40W	90W	180W	180W	90W	180W	180W
Flange of Connection Standard ISO5211	F03/ F05	F07	F07/F10	F10/F12	F10/F12	F12/F14	F12/F14	F12/F14	F16	F16	F16
Weight (Kg)	3.5	7	15	15	20	20	25	25	65	75	75
Rounds of Rotation of Handwheel	10	10	12	12	14	14	17	17	65	70	70

ACTUATOR SELECTION GUIDE

Model	Torque	Voltage of Power Supply	Control Type	Protection Grade	Explosiveproof Grade	Switching Time	Others
MBV	60NM	(1) 24V DC (2) 220V AC (3) 380V AC (4) Others	(1) On/Off Type (2) Modulating Type (3) Others	(1) IP67 (2) IP68	(0) Nil (1) Grade EXB (2) Grade EEC	(0) With No Requirement (1) With Requirement	(0) Non (1) Connecting Lever and Spherical Linkage (2) Local Control Unit LCU (3) Safe Return: FS (4) LCD (5) Infrared Ray (6) Fieldbus
	100NM						
	160NM						
	240NM						
	350NM						
	500NM						
	800NM						
	1100NM						
	1500NM						
	2000NM						
	3000NM						



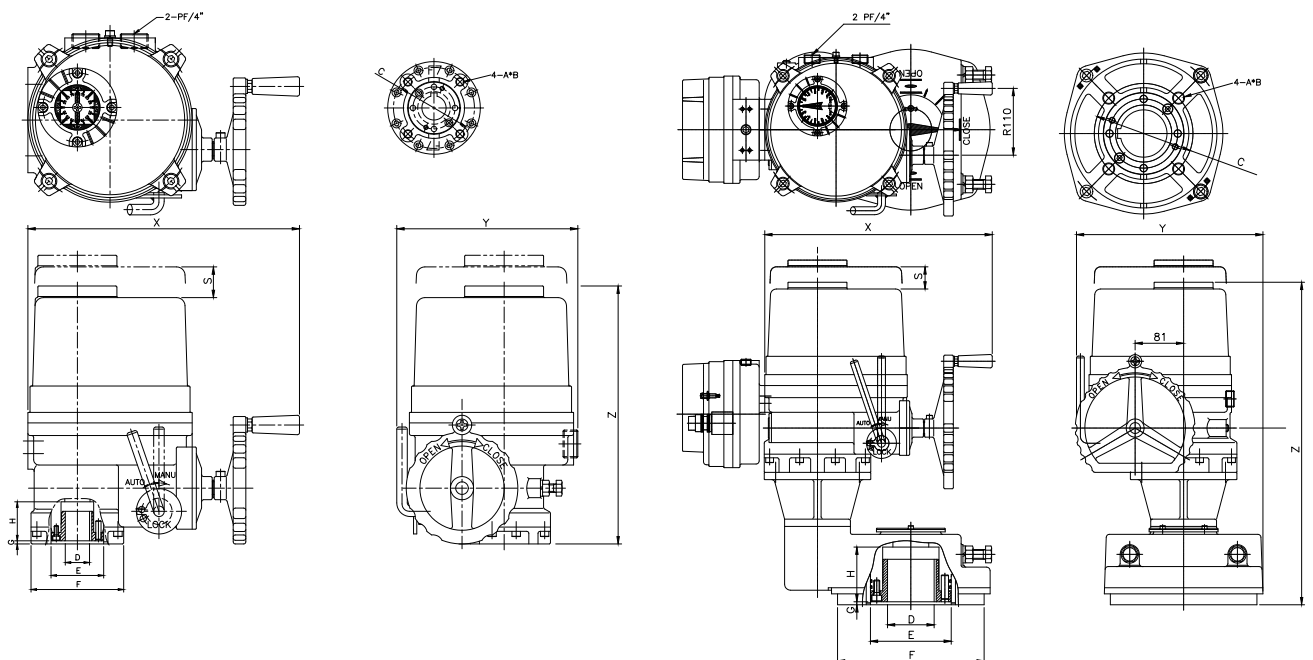
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Type	MBV100	MBV160	MBV240	MBV350	MBV500	MBV800	MBV1100	MBV1500	MBV2000	MBV3000
Without Gear Box								With Gear Box		
Flange	F07	F07	F07	F10	F10	F12	F12	F16	F16	F16
ISO5211		F10	F10	F12	F12	F14	F14			
C	Ø 70	Ø 70	Ø 70	Ø 102	Ø 102	Ø 125	Ø 125	Ø 165	Ø 165	Ø 165
		Ø 102	Ø 102	Ø 125	Ø 125	Ø 140	Ø 140			
A	M8	M8/M10	M8/M10	M10/M12	M10/M12	M12/M16	M12/M16	M20	M20	M20
B	14	14/7	14/7	17/21	17/21	20/25	20/25	32	32	32
D (Key)	Ø 22	Ø 25	Ø 25	Ø 40	Ø 40	Ø 48	Ø 48	Ø 75	Ø 75	Ø 75
D(Squ.)	20	23	23	34	34	40	40	64	64	64
E	Ø 50	Ø 58.5	Ø 58.5	Ø 80	Ø 80	Ø 95	Ø 95	Ø 135	Ø 135	Ø 135
F	Ø 88	Ø 125	Ø 125	Ø 148	Ø 148	Ø 178	Ø 178	Ø 245	Ø 245	Ø 245
G	3	3	3	3	3	3	3	5	5	5
H	37	57	57	62	62	67	67	90	90	90
S	100	115	115	145	145	170	170	145	170	170
X	258	338	338	357	357	380	380	368	380	380
Y	172	229	229	244	244	287	287	293	312	312
Z	220	259	259	288	288	313	313	506	531	531





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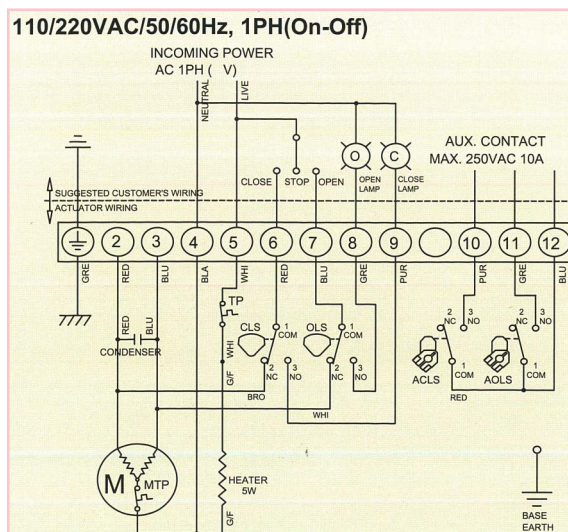
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ACTUATOR SELECTION TABLE(ON REQUEST)

Model		MBV4000		MBV5000		MBV6000		MBV8000		MBV10000	
		220VAC	380VAC	220VAC	380VAC	220VAC	380VAC	220VAC	380VAC	220VAC	380VAC
Output Torque(NM)		4000	4000	5000	5000	6000	6000	8000	8000	10000	10000
Working duty (100%)		40	40	30	30	30	30	30	30	30	30
Max.travel angle		90°	90°	90°	90°	90°	90°	90°	90°	90°	90°
Operation time Travel 90°	50HZ	48	30	132	36	132	36	195	36	245	39
	60HZ	40	25	110	30	110	30	162	30	123	33
Max.stem diameter	round	60	48	70	60	70	60	70	70	90	90
Motor Class		F	F	F	F	F	F	F	F	F	F
Motor power		800	680	370	680	370	680	370	1050	370	1050
ISO 5211 flange		F25	F16	F25	F25	F25	F25	F25	F25	F30	F30

Model		MBV12000		MBV15000		MBV20000		MBV30000		MBV40000	
		220VAC	380VAC	220VAC	380VAC		380VAC		380VAC		380VAC
Output Torque(NM)		12000	12000	15000	15000		20000		30000		40000
Working duty (100%)		40	40	30	30		30		30		30
Max.travel angle		90°	90°	90°	90°		90°		90°		90°
Operation time Travel 90°	50HZ	195	42	245	42		50		50		50
	60HZ	162	35	123	35		42		42		42
Max.stem diameter	round	70	100	70	100		120		120		120
Motor Class		F	F	F	F		F		F		F
Motor power		800	2100	800	2100		2750		4500		4800
ISO 5211 flange		F25	F35	F35	F35		F48		F48		F48

WIRING DIAGRAM MBV100 (10/220 VAC/50/60Hz, 1PH, On/ Off Actuators)



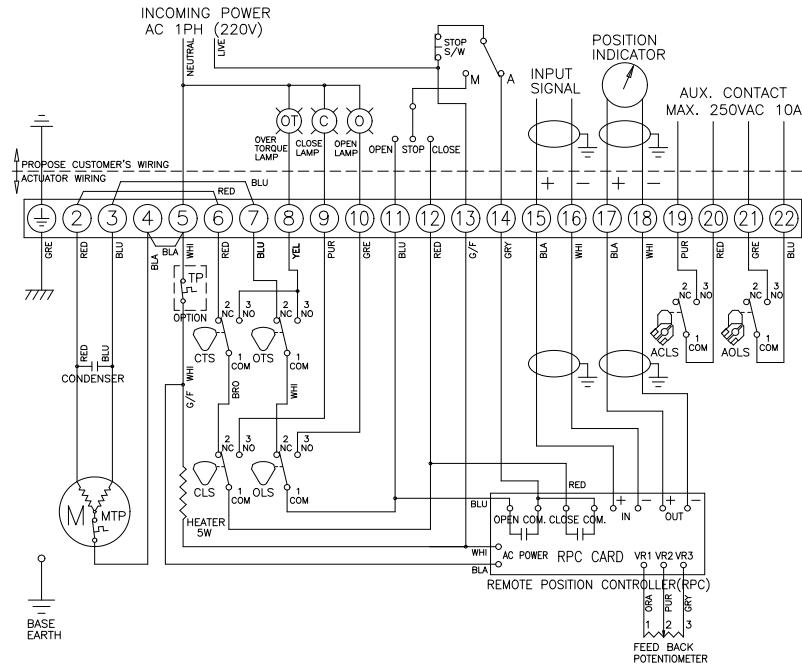


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WIRING DIAGRAM MBV160- MBV3000 (10/220 VAC/50/60Hz, 1PH, Modulating Actuators)



WIRING DIAGRAM MBV160- MBV3000 (10/220 VAC/50/60Hz, 1PH, On/ Off Actuators)

