

GENERAL SPECIFICATIONS



GS-M1020E-05

Electrical Signal-Operated(MBA Series) EMERGENCY SHUTOFF VALVE

Overview

An emergency shutoff valve is a mandatory component in various types of industrial equipment, as required by the High Pressure Gas Safety Law and the Fire Defense Law. EMERGENCY SHUTOFF VALVE (MBA Series) utilizes a CO₂ gas cartridge as its drive source, taking advantage of the high initial torque and a ball valve as an optimal safety and accident prevention device for emergency shutoff in various kinds of fluid pipelines.

Features

● Highly Reliable Activation by CO₂ Gas Cartridge

The CO₂ gas cartridge utilized is the same compact, highly reliable type as is used for fire extinguishers or self-inflating life jackets. Initial torque at the drive source is sufficiently high to provide reliable activation.

● No Incidental Equipment Required

Using a CO₂ gas cartridge as the drive source means that no incidental equipment, such as a compressor and pneumatic piping, is required. This reduces installation cost.

● Proven Performance

More than 20,000 installations by both domestic and overseas customers requiring accident prevention emergency shutoff valves for hazardous fluid pipelines, in such fields as city gas, chemicals, pharmaceuticals, fuel oils, etc.

● Manual Open-close Operations Enabled

The ball valve-type shutoff valve has its open-close status clearly indicated on the top surface, for easy confirmation.

● Horizontal and Vertical Installations

Adoption of a power cylinder-type ball valve enables installation in both horizontal and vertical piping.

● Retrofitting of Existing Valves Enabled

It is possible to make an emergency shutoff valve by installing an MBA Type actuator in a specialty ball valve, such as a lining valve.



Standard Specifications

Applicable fluids		City gas, natural gas, LP gas, petroleum, etc.
Fluid temperature		-5~80℃
Max. working pressure		Max.0.99 MPa (Note)
Connection size		25mm (1B)~400mm (16B)
Flange rating		JIS 10K FF or RF ANSI · JPI 150 RF
Materials	Body	SCPH2 (standard) or SCS13
	Trim	Ball: SCS13; Seat: Teflon
Actuator		Power cylinder type
Power unit	Solenoid power supply	24V DC ±10% or 100V AC ±10% 50/60 Hz
	Power consumption	24V DC ... 30W, or 100V AC ... 35VA
	Signal	One shot signal (on-time: 0.5 to 3 sec.)
	Structure	Flame-proof (d2G4)
Reset operation		Resetting by manual handle
Ambient temperature		-20~40℃
Installation piping		Horizontal or vertical piping
Painting color		Red: Munsell 5R 3.5/13

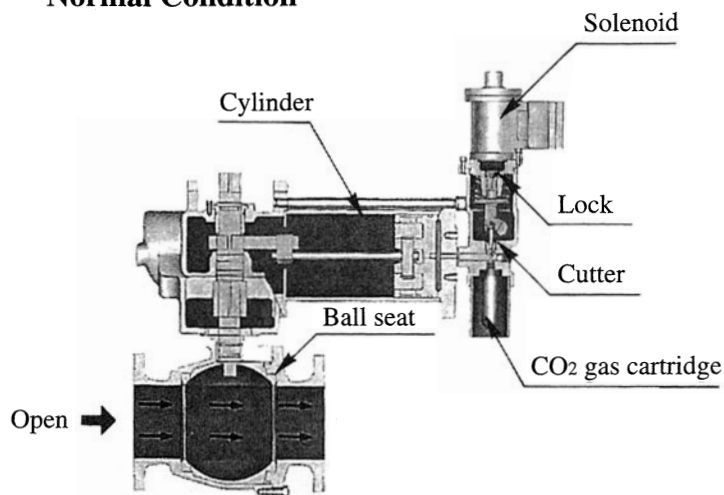
Note) Please inquire when fluid pressure is greater than 0.99MPa.

Optional Specifications

Limit switch	Structure	Flame-proof: Exde II CT6
	Contact	Bipolar double-throw (C-contact x 2)
	Contact capacity	AC250V 5A DC125V 0.4A DC250V 0.2A

Principle of Operation

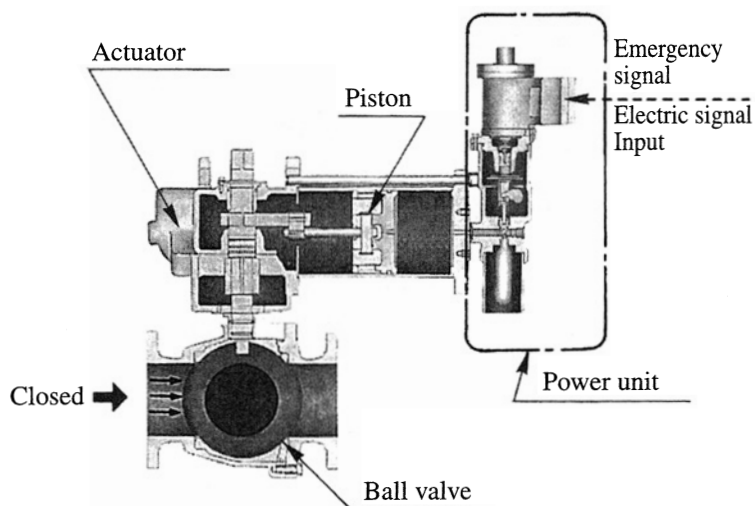
Normal Condition



Normal condition

with cutter locked and ball valve held open.

Emergency Shutoff



In an emergency shutoff

When an electrical signal is given to the solenoid, the cutter lock is disengaged so that the cutter can pierce the disk in the CO₂ gas cartridge, causing gas injection into the cylinder that propels the piston to close the ball valve.

After an emergency shutoff

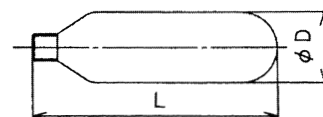
CO₂ gas gradually dissipates into the air through the orifice, and the pressure in the cylinder returns to the ambient level, enabling simple manual resetting.

CO₂ Gas Cartridge Specifications

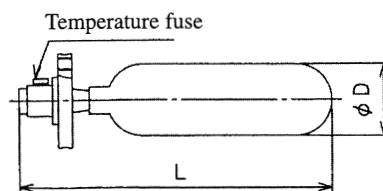
Model No.	Volume (cc)	Dimension (mm)		Weight (g)	Applicable actuator	Applicable diameter (mm) JIS 10K
		L	D			
10C	10	65	19	33	01 type	25, 50
28C	28	94	25	82	02 type	80, 100
92C	92	134	40	290	03 type	150, 200
700C	700	330	76	3,280	04 type	250, 300
700CS				3,460	05 type	350, 400

Note) CO₂ gas cartridge pressure is approx. 5.68 MPa at 20 degrees Celsius (Centigrade).

Model No. : 10C, 28C, 92C



Model No. : 700C, 700CS



Basic Model

1	2	3	4	5	6	7	8	9	10	Contents
Product category	Type	Structure	Conn. size	Capacity type	Pressure	Materials				
						Body	Trim			
M	B									Ball valve type
		A								Electrical signal operated type
			B 8	B 8						25mm (1B)
			1	1						1
			4 0	4 0						400mm (16B)
							B			0.99 MPa
								N		SCPH2
								O		SCS13
								R		Ball: SCS13; Seat: Teflon
								Z		Special specification

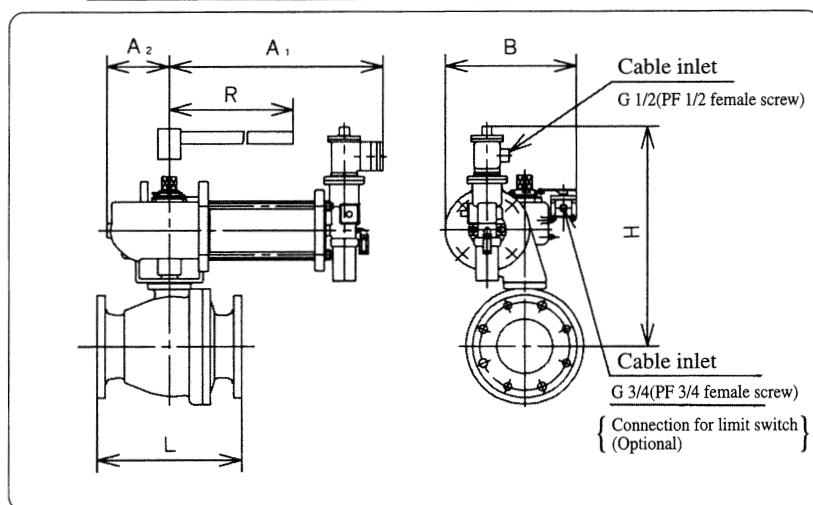
Note) Conn. size is the nominal flange size, and Capacity type is the nominal ball size.

Diameter / Capacity Code

4	5	6	7	Contents
Conn. size	Capacity type			
B 8	B 8	25mm (1 B)		
0 4	0 4	40mm (1 1/2 B)		
0 5	0 5	50mm (2 B)		
0 8	0 8	80mm (3 B)		
1 0	1 0	100mm (4 B)		
1 5	1 5	150mm (6 B)		
2 0	2 0	200mm (8 B)		
2 5	2 5	250mm (10 B)		
3 0	3 0	300mm (12 B)		
3 5	3 5	350mm (14 B)		
4 0	4 0	400mm (16 B)		

Dimension Drawing

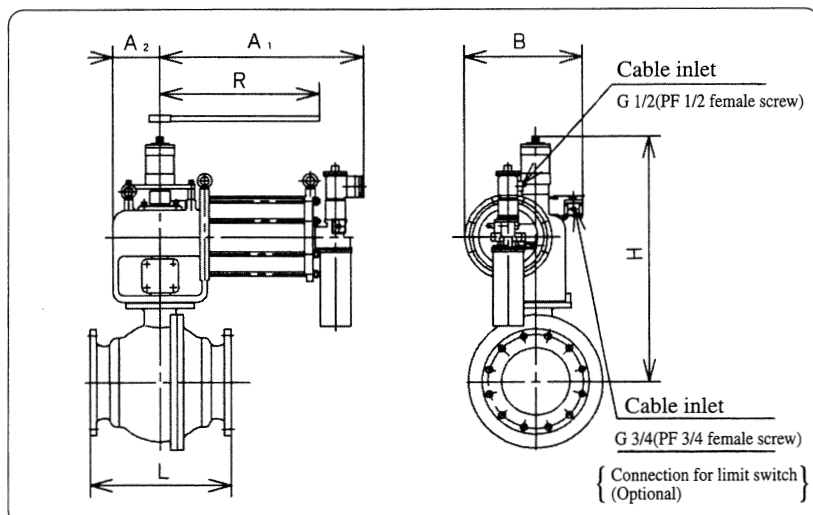
Small to Medium Sizes (25~200mm)



Dimensions for JIS 10kgf/cm² application

Conn. size mm	Dimensions mm						Approx. Weight kg
	L	A1	A2	B	H	R	
25	127				477		18
40	165	296	50	182	498	210	25
50	178				452		24
80	203	424	100	255	491	600	43
100	229				505		53
150	394	571	170	350	599	800	130
200	457				639	1,200	170

Large Sizes (250~400mm)



Dimensions for JIS 10kgf/cm² application

Conn. size mm	Dimensions mm						Approx. Weight kg
	L	A1	A2	B	H	R	
250	533	743	177	438	930	677	320
300	610				977		450
350	686	900	220	505	1,268	1,002	650
400	762				1,273		850

Auxiliary Equipments

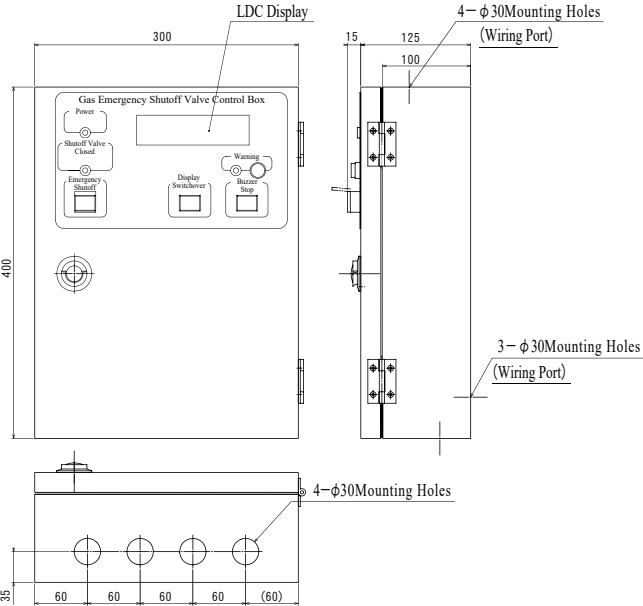
Control Box for Emergency Shutoff Valve

Control Box for Electrical Signal-Operated Emergency Shutoff Valve (MBA Type) has the following functions: emergency shutoff in direct conjunction with an input signal from an external sensor; emergency shutoff commanded by switches on the control box; indication of the valve open or closed status; auxiliary power supply in case of power failure.

Model	MEC103,MEC203	
Structure	Wall-mounted Type (Non-explosion Proof)	
Input Voltage	AC100V±10%, 50/60Hz	
Output Voltage	DC24V or 12V one shot	
Batteries Back-up	Battery System (Emergency shutoff can be activated 3 times within an hour after a power failure.)	
LCD Display	Status and various alarms are displayed. Battery Voltage, Shut Off, Disconnection, Power Failure	
Power Consumption	Normal 15W, Max. 60W	
External Signal	Emergency Shutoff Signal	(Non-voltage Contact Output)
	Warning Signal	(Non-voltage Contact Output)
	Shutoff Valve Opening/Closing	(Non-voltage Contact Output)
	Instant Shutoff Signal	(Non-voltage Contact Input)
	Gas Leak Signal	(Non-voltage Contact Input)
	Pressure Drop Signal	(Non-voltage Contact Input)
Valve Closure	External Shutoff Signal(Contact)	Board Closed Button
	Indicator Light	Valve Closed, Alarm, Power
Push Button	Valve Closed, Buzzer Reset, Display Switching	
Paint Color	Munsell 2. 5Y9/2 (ivory)	
Approx. Weight	8.5kg	

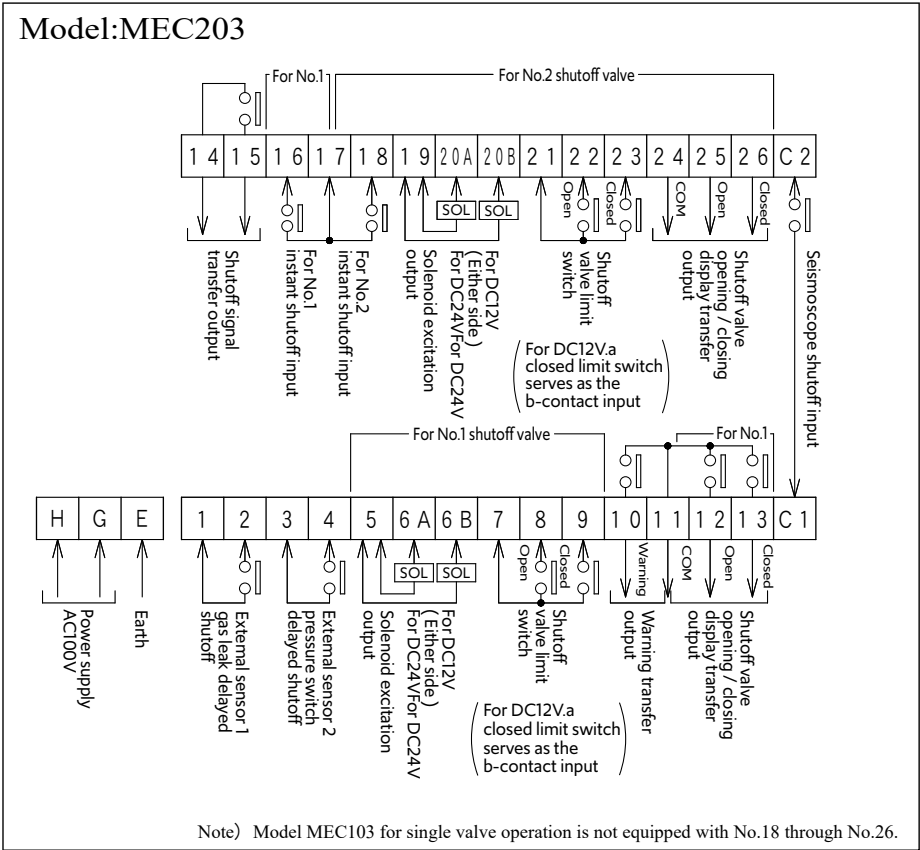
Dimension Drawing

MEC Model

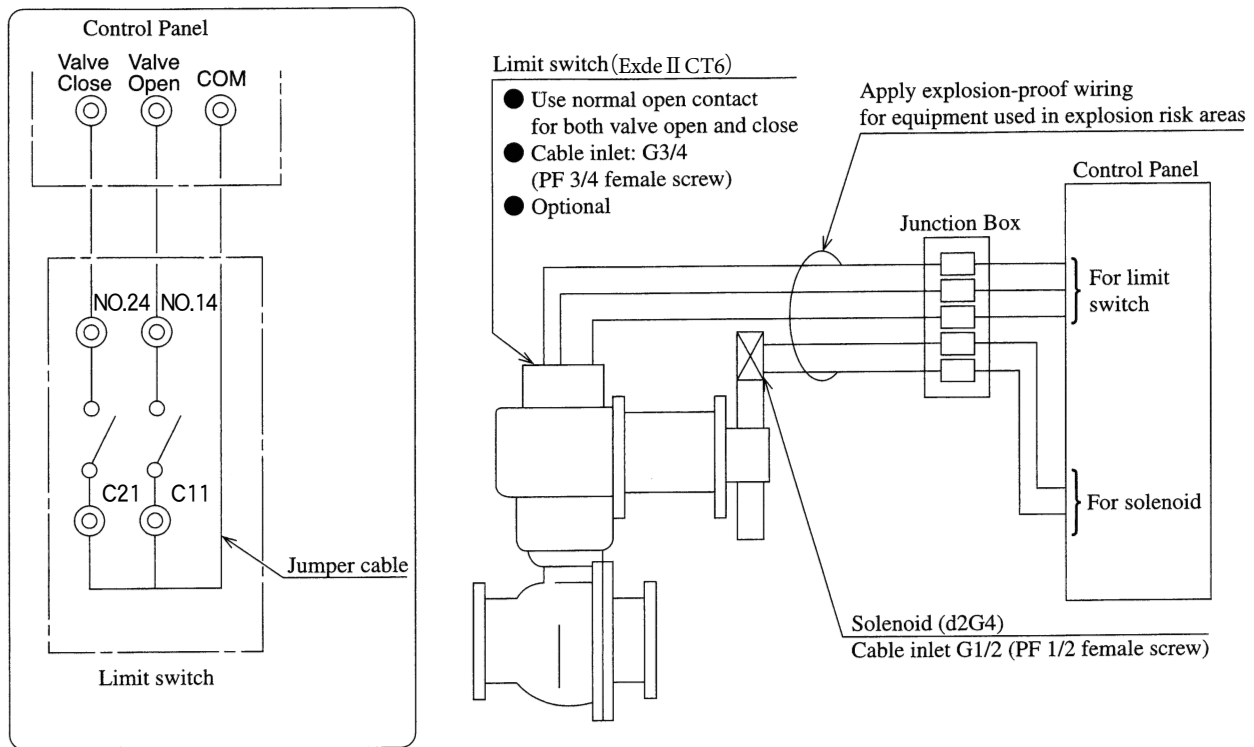


Note) The above illustrates control for single valve operation.

Terminal Schematic



Wiring Diagram

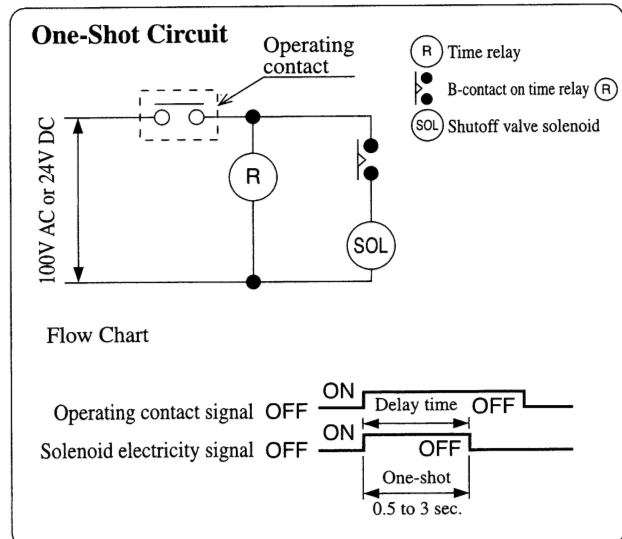


- Note) 1. To connect control panel with limit switch, use a-contact for both valve-open and -close, and COM cable connect C1 and C2 in the limit switch.
2. For wiring between the valve solenoid and control panel, follow the plan shown below, in consideration of a voltage drop. For components other than the solenoid, i.e., limit switch, emergency signal, etc., no consideration for voltage drop is necessary. Consider physical strength and use 2mm², or thicker, wiring.

Wiring distance (one way)	Lead wire core sectional area
130 m max.	2 mm ² min.
230 m max.	3.5 mm ² min.
360 m max.	5.5 mm ² min.

3. Apply adequate protection against rain to the cable inlet.

4. The solenoid for emergency shutoff is discontinuous rating, therefore install a one-shot circuit with on-time of 0.5 ~ 3 sec. (TOKICO standard control panel does not require a circuit, as illustrated here.)



Seismic Sensing System

MWS Type Seismoscope is designed to protect various processes against the risk of earthquake damage. MWS Type Seismoscope Box is a relay equipment which processes signals from seismoscopes to output an earthquake signal when 2 out of 3 seismoscopes transmit

such signals. This provides improved reliability in earthquake protection and safety operations by eliminating system malfunction caused by erratic signals from a seismoscope.

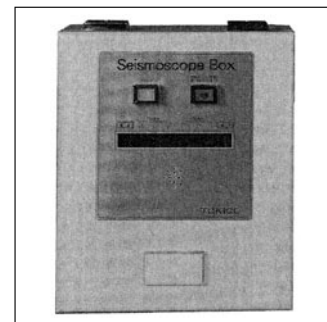
MWS Type Seismoscope

Model no.	MWS15S5, MWS25S2, MWS40S2
Seismic sensor	Ball-drop type
150 Gal seismoscope	Acceleration range 100~170 Gal
250 Gal seismoscope	Acceleration range 215~265 Gal
Output contact	Normal close (b-contact)
No. of installation	3 units as a set to be used (standard)
Installation structure	In house, wall hanging

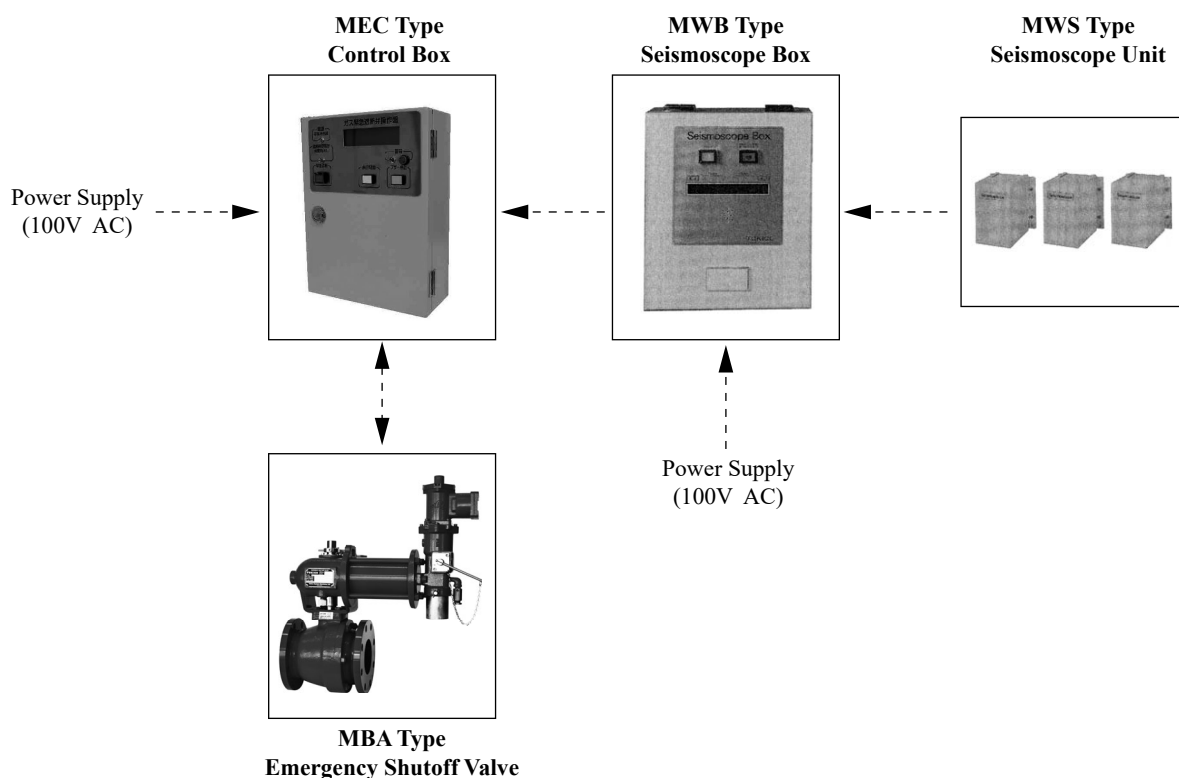


MWB Type Seismoscope Box (Seismoscope relay equipment)

Model no.	MWB06S1
Power supply	100V AC $\pm 10\%$ 50/60 Hz
At sensing 150 Gal	When 2 out of 3 seismoscopes transmit signals, a buzzer is activated and an alarm signal is output. (Non-voltage a- or b-contact: 1 point)
At sensing 250 Gal	When 2 out of 3 seismoscopes transmit signals, a buzzer is activated and an emergency shutoff signal is output. (Non-voltage a- or b-contact: 6 points)
Backup for power failure	One seismic signal operation is available within 3 hours of a power failure
Installation structure	In-house, wall hanging



Seismic Shutoff System Example

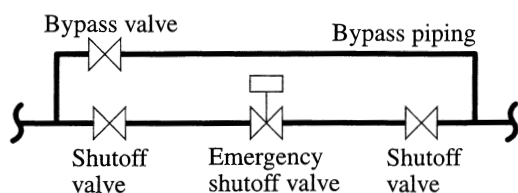


Note) Dotted lines between units illustrate electrical wiring lines.



Caution!

- When installing, take care to secure operating and maintenance areas.
- Be sure to install bypass piping and shutoff valve on both inlet and outlet side for maintenance inspection, repair and replacement of emergency shutoff valve.
- Do not install in hazardous environments or areas prone to flooding.
- Keep CO₂ gas cartridges in the upright position. Set the cutter before replacing the cartridges.
- Perform an activation test at least once every 6 months.
- Apply adequate waterproofing at the pipe connection point to keep out rainwater.



Ordering Instructions

No.	Items	Contents
1	Applications	Emergency shutoff or open
2	Applicable fluid	Name
3	Fluid temperatures	Max., normal and min. (°C)
4	Fluid pressures	Max., normal and min. (MPa)
5	Connection rate	Pipe bore size, flange rating, etc.
6	Installation piping	Horizontal or vertical piping
7	Materials used	Materials for body, ball, etc.
8	Applicable laws and regulations	Name of laws and regulations
9	Power supply	(Solenoid power supply)
10	Others	Additional customer requirements

*Be sure to read the instruction manual carefully before you use this meter to ensure you use it correctly.

*Note that the contents may be subject to change without notice.

● Contact

Tokico System Solutions, Ltd.

Global Business Div.

Sales Management Headquarters

Parale Mitsui Bldg, 8, Higashida-cho, Kawasaki-ku,
Kawasaki-shi, Kanagawa 210-0005 Japan

TEL . 81-50-3852-5336

FAX . 81-44-222-7155

URL : <https://www.tokicosys.com/en/>