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Operation	Model	Motion (PT.JIS 10K FF) Connection size (inches)									Temp. Range		Pressure range kg*f/cm ²	Page Nos.
		N,C	N,O	1/8	1/4	3/8	1/2	3/4	1	1 1/4 ~ 2	Min °C	Max °C		
Direct acting	MS-NL	○			△						0	60	0~8	6
	MK2-POM	○			△					0	60	0~8	7	
	MK2-S	○		△						-5	90	0~20	8	
	MK2-08(10)	○			△	△				-5	90	Vacuum~30	9	
	MK2A-08(10)	○			△	△				-5	90	Vacuum~50	10	
	MK2B-08(10)	○			△					0	90	Vacuum~100	11	
	MG-10	○				△				0	60	Vacuum~1	12	
	MK2-08(10)C		○	△	△	△				-5	90	Vacuum~12	13	
	MK2B-10C		○			△				-5	90	Vacuum~40	14	
Kick pilot	MA-10~15	○				△	△			-5	90	Vacuum~20	15	
	MD-10~50	○				△	△	△	△	-5	90	Vacuum~10	18~19	
	MK-10~25	○				△	△	△	△	△⊗	-20	180	Vacuum~10	24~25
Pilot operated	MD-10~50C		○			△	△	△	△	△	-5	90	0.1~10	20~21
	MA-10~15P	○				△	△			-5	90	0.1~16	16	
	MA-10~15P-EX	○				△	△			-5	90	0.1~16	17	
	MD-P10~25	○						△	△	-5	90	0.3~16	22	
	MD-P10~25EX	○						△	△	-5	90	0.3~16	23	
	MT-15~50	○							△	-20	180	0.3~10	26~27	
	MT-32~50F	○								⊗	-20	180	0.3~10	26~27
	MT-32~50F(S)	○								⊗	-20	180	0.3~10	26~27
	MT-32~50(F)C		○							⊗	-20	180	0.3~10	26~27
	Mk3						△	△	△	△	-5	120	Vacuum~10	28~29
Motor valves	MK 7						△	△		⊗	-5	120	Vacuum~10	30~32

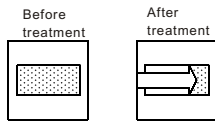
△ NPT △ PT ⊗ Flange

Specifications

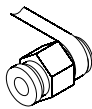
Electrical voltage	AC 24 , 100 , 110 , 120 , 200 , 220 , 240 V 50/60Hz DC 12 , 24 V
Coil permissible time	Continuous duty 1 year / 10,000 hrs.
Permissible voltage deviation	±10%
Insulation resistance	500V 100MΩ
Permissible test voltage for coil insulation	1500V at 60 seconds holding
Ambient temperature	-20~50%
Permissible pressure for the valve body	When < 10kg*f/cm ² , permissible pressure for the valve body is equal to 2 times of operating pressure. When > 10kg*f/cm ² , permissible pressure for the valve body is equal to 1.5 times of operating pressure
Warranty lifetime	1 year or 500,000 cycles.

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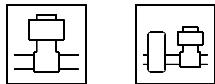
Installation instruction



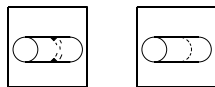
1. Dust, metal chip and tape seal in the pipes should be removed before installation.



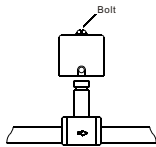
2. When using seal tape on the connector or fittings, do not wrap the front two pitch of teeth by seal tape to prevent the seal tape from entering internal of solenoid valve.



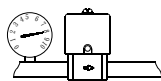
3. For long-standing and normal operation, when the fluid is Air, Air filter should be installed before valve, when the medium is Steam or Water, 80 mesh Y-strainer should be installed before S/V.



4. For preventing frozen liquid and malfunction of S/V, pipes should be equipped with heater when the ambient temperature reaches 0°C below 0°C at freezing condition.



5. Make sure the bolt on the coil bonnet is tight properly to avoid making noise of cause the solenoid coil burned out when re-assembly or turning the coil enclosures.



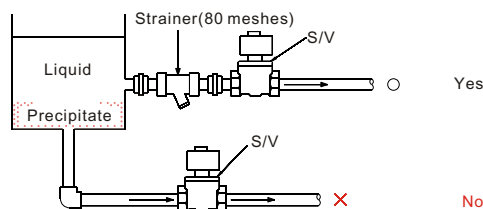
6. Do not use media pressure over the specified pressure range in the catalogue. Please peruse the specified working pressure for different model numbers in the product's catalogue.

7. The voltage at range of $\pm 10\%$ is allowed.

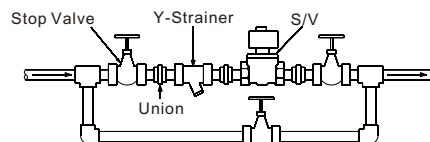
For protecting the solenoid coil, do not use the voltage over 10% or less 10%.

8. Don't exceed or lower the maximum and minimum pressure rage when operating.

9. When valves are installed in the piping for liquid transfer, be sure to keep a certain height from bottom for tank nozzles thus the precipitation can be avoided passing through S/V.

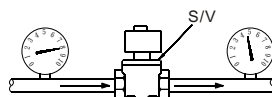


10. A by-pass is essential for the maintenance of S/V installed in pipe. Please refer to the sketch below as reference.



11. The following condition are necessary for using 2/2 pilot operated solenoid valves.

1. Minimum operating differential pressure.
2. Minimum operating flow rate.



12. To install kick pilot 2/2 solenoid valve the installation angle at vertical angle or $\pm 15^\circ$ is required. (solenoid coil's location on the top)

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The calculation for flow rate

✘The relationship between S/V and flow rate

1. Main factors for flow rate, pressure difference and Cv value.
2. The selection of solenoid valve should be determined by requested flow rate, proper port size and pressure will perform well.
3. Oversized dimension will cause waste of energy.
(Unstable acting for pilot operated valves, if flow in pipe is smaller than the essential minimum flow, valves can't be actuated)
4. If port size of the valve is too small, the essential flow can not be reached.

✘Calculation of Cv value

1. Liquid such as Water and Oil :

$$Q = 14.28 C_v \frac{\sqrt{P_1 - P_2}}{\sqrt{G}}$$

2. Gases such as Air and Inert gases :

$$(A) P_2 \leq \frac{1}{2} P_1 \quad (B) P_2 > \frac{1}{2} P_1$$

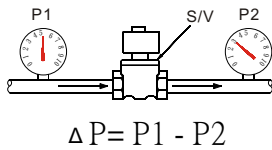
$$Q = 198.3 C_v \frac{P_1}{\sqrt{G}} \quad Q = 396.5 C_v \sqrt{(P_1 - P_2) P_2} \frac{1}{\sqrt{G}}$$

3. Steam :

$$(A) P_2 \leq \frac{1}{2} P_1 \quad (B) P_2 > \frac{1}{2} P_1$$

$$Q = 11.8 C_v \frac{P_1}{K} \quad Q = 13.6 C_v \frac{\sqrt{\Delta P \times (P_1 + P_2)}}{K}$$

✘Calculation by performance chart



(Exa) When MD-15 is used in Water piping the inlet pressure is 5 Kg*f/cm² and outlet pressure is 3Kg*f/cm² .Please calculate the Water flow rate?

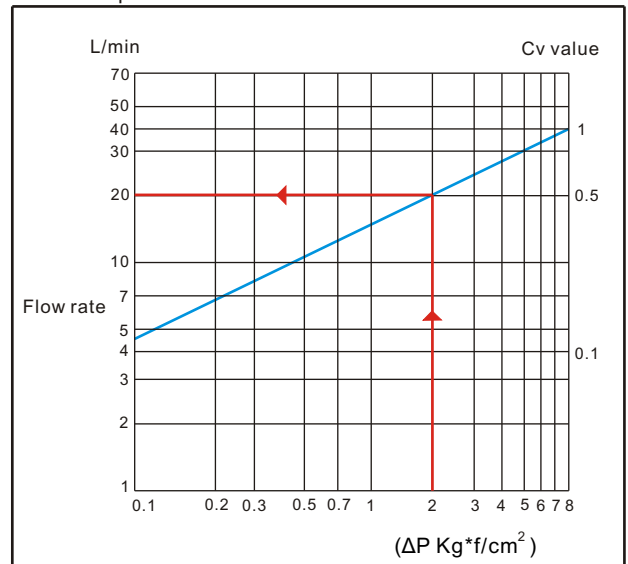
(Sol) From performance chart on right .
 $\Delta P = 2$ and Cv value is 1. The corresponding flow rate is 20.2 L/min.
 Then from performance chart of valve.
 The Cv value of MD-15 is 3.7 so the flow rate in pipe is $Q = 20.2 \times 3.7$
 ≈ 74.8 L/min

Q : Flow rate
 L/min(Air, Water, Oil)
 Kg/h(steam)

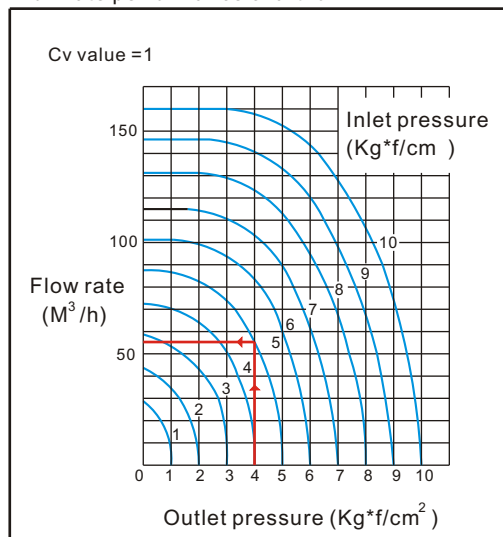
P1 : Abs. pressure of valve inlet Kg*f/cm² abs
 P2 : Abs. pressure of valve outlet Kg*f/cm² abs
 Abs. Pressure = Gauge pressure + 1.03

G : Specific Gravity
 K : 1+0.0013 ts ts : Superheated temp. °C
 (For saturated steam, K=1)

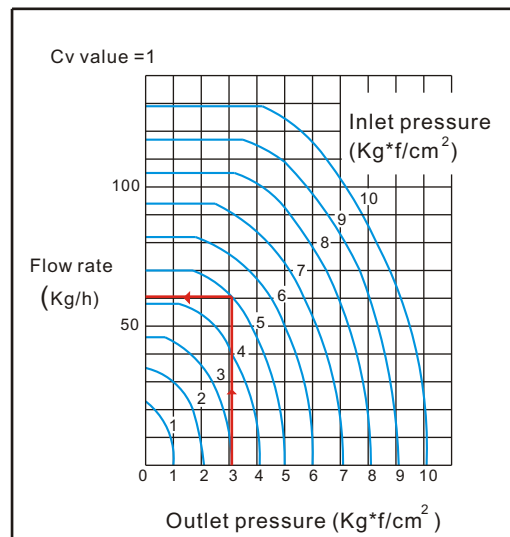
Flow rate performance chart for Water



Flow rate performance chart for Air



Flow rate performance chart for Saturated Steam



Steam table

Abs. Steam Pressure (kg*f/cm ²)	Steam Temp. (°C)	Saturated Water 1 kg/liter	Specific Weight Saturated Steam 1 kg/m ³	Specific Volume Saturated Steam 1 m ³ /kg	Enthalpy 1 Kcal/kg		
					Saturated Water h	Latent Heat L	Saturated Steam H=h+L
1.20	104.3	1.0471	1.454	0.6875	104.4	536.3	640.7
1.40	108.7	1.0508	1.259	0.7942	108.9	533.5	642.4
1.60	112.7	1.0542	1.111	0.8999	112.9	530.8	643.7
1.80	116.3	1.0573	0.9952	1.005	116.6	528.4	645.0
2.00	119.6	1.0603	0.9018	1.109	119.9	526.3	646.2
3.00	132.9	1.0728	0.6168	1.621	133.4	517.2	650.6
4.00	142.9	1.0831	0.4708	2.124	143.7	510.0	653.7
5.00	151.1	1.0920	0.3816	2.620	152.1	503.9	656.0
6.00	158.1	1.1000	0.3213	3.112	159.3	498.6	657.9
7.00	164.2	1.1072	0.2778	3.600	165.7	493.8	659.5
8.00	169.6	1.1140	0.2448	4.086	171.3	489.5	660.8
9.00	174.5	1.1203	0.2188	4.570	176.5	485.4	661.9
10.00	179.0	1.1262	0.1979	5.052	181.3	481.6	662.9
11.00	183.2	1.1319	0.1807	5.533	185.6	478.1	663.7
12.00	187.1	1.1373	0.1663	6.014	189.8	474.7	664.5
13.00	190.7	1.1425	0.1540	6.494	193.6	471.5	665.1
14.00	194.1	1.1476	0.1434	6.974	197.3	468.4	665.7
15.00	197.4	1.1524	0.1342	7.454	200.7	465.5	666.2
16.00	200.4	1.1572	0.1260	7.934	204.1	462.6	666.7

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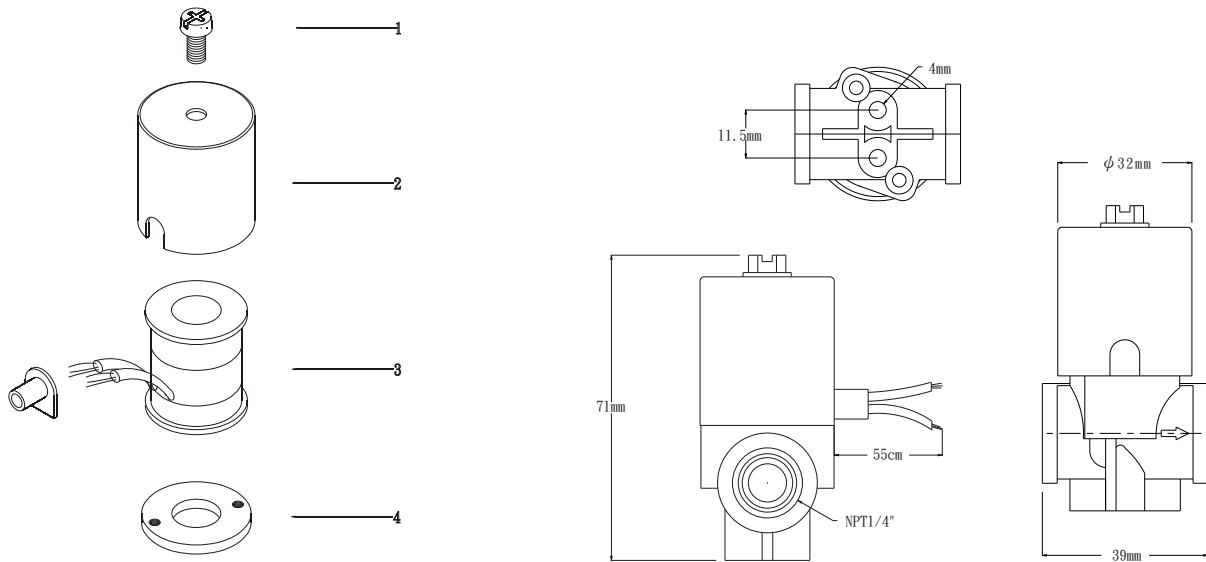
Direct acting 2-way solenoid valves normally closed, energized to open



Features:

1. Suitable for water, carbonated water (special design for home-used reverse osmosis water filtration system).
2. Direct acting 2-way solenoid valve fast response and long life.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)	Cv Value	Max. Media Temp.
			Water		
MS-0825-8NL	NPT 1/4"	2.5	8	0.22	60°C



NO.	Descriptions	Material
1.	Bolt	SWRM
2.	Coil bonnet	SPC
3.	Solenoid coil	B Class
4.	Spacer	SPC
5.	Plunger tube unit	SUS304 KM-31
6.	Spring	SUS 304
7.	Plunger	KM-31
8.	O ring	EPDM
9.	Valve body	NYLON 66
10.	Bolt	SUS304

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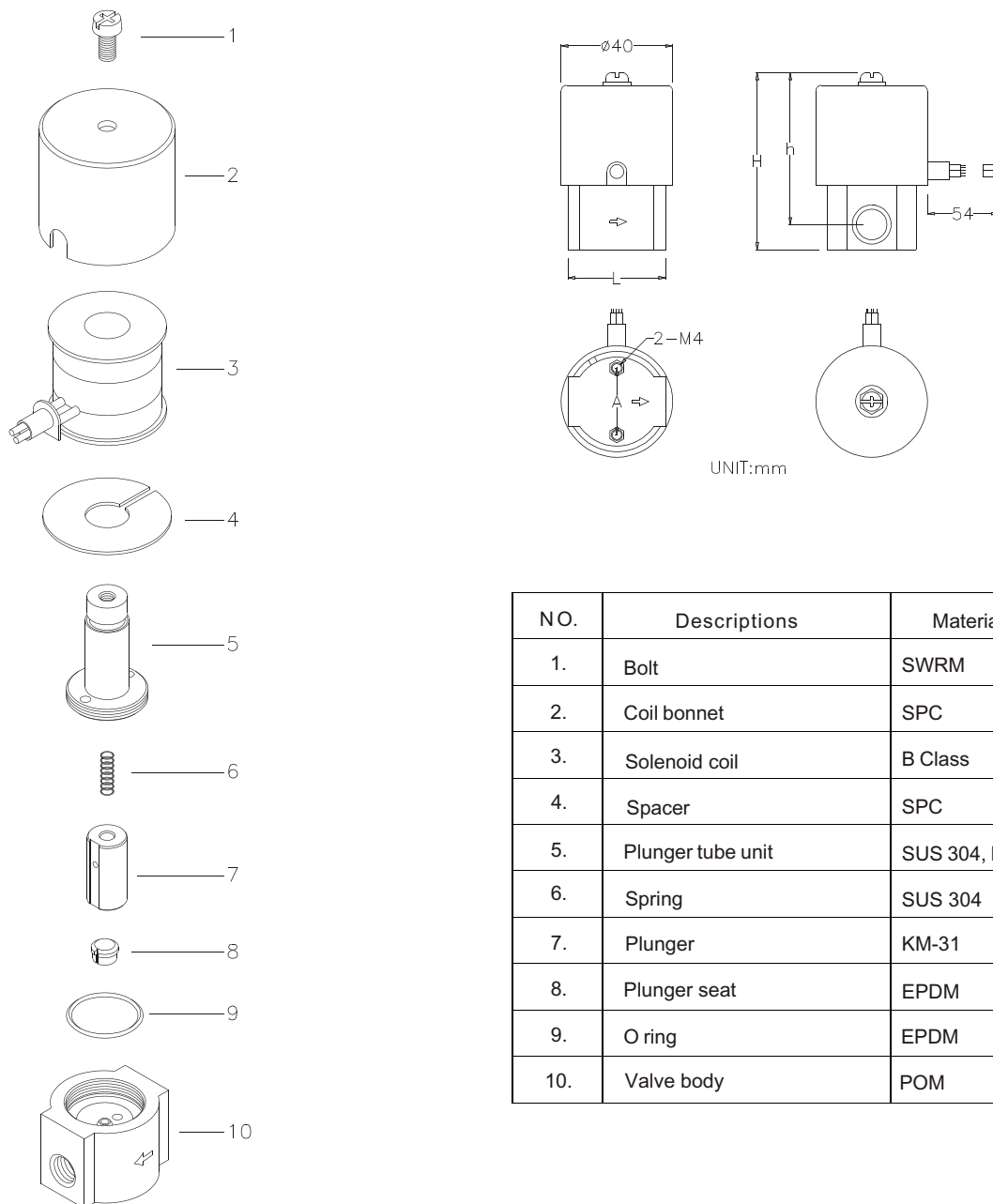
Direct acting 2-way solenoid valves normally closed, energized to open



Features:

1. Suitable for water, carbonated water (special design for home-used reverse osmosis water filtration system).
2. Direct acting 2-way solenoid valve, fast response and long life.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)	Power Consumption VA	Cv Value	Max. Media Temp.	Size (mm)			Mounting hole (mm)	
			Water				L	H	h	A	
MK2-0825-8POM	NPT 1/4"	2.5	8	15	0.22	60°C	35	64	53	24	2-M4



NO.	Descriptions	Material
1.	Bolt	SWRM
2.	Coil bonnet	SPC
3.	Solenoid coil	B Class
4.	Spacer	SPC
5.	Plunger tube unit	SUS 304, KM-31
6.	Spring	SUS 304
7.	Plunger	KM-31
8.	Plunger seat	EPDM
9.	O ring	EPDM
10.	Valve body	POM

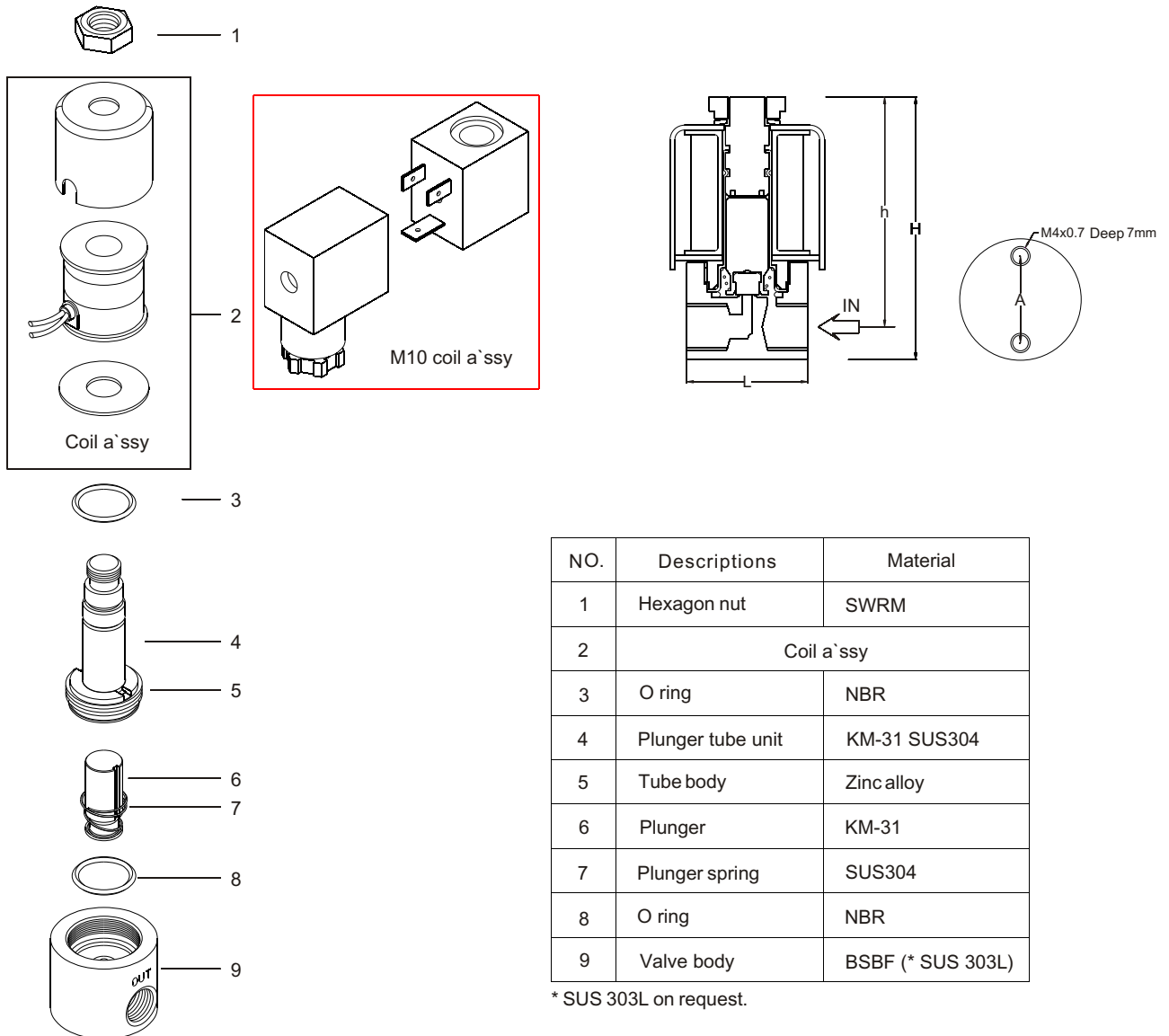


Features:

1. Suitable for air, Inert gases, vacuum (10TORR), water, kerosene oil, and oil (Below 50cst).
2. Direct acting, wide operating pressure range from 10 TORR up to 20kg/cm², fast response and excellent service life.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)		Power Consumption VA	Cv Value	Max. Media Temp.	Size (mm)			Mounting hole (mm)		Weight (g)
			Air	Water Oil				L	H	h	A		
MK2S-2015-6(M10)	PT 1/8"	1.5	20	15	5	0.04	90 °C	25	54	49	18	2-M4	130
MK2S-1020-6(M10)		2	10	7		0.07							155 (M10)
MK2S-0725-6 (M10)		2.5	7	5		0.15							

* NPT on request.
* M10 (Molding coil)



Features:

1. Suitable for air, inert gases, vacuum (10TORR), water, kerosene oil, and oil (Below 50 cst).
2. Direct acting, wide operating pressure range from 10 TORR up to $30\text{kg}/\text{cm}^2$, fast response and excellent servicelife. ($50\text{kg}/\text{cm}^2$ on request.)
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)		Power Consumption VA	Cv Value	Max. Media Temp.	Size (mm)			Mounting hole (mm)	
			Air	Water Oil				L	H	h	A	
MK2-3016-8-(M13)	PT 1/4"	1.6	30	21	15	0.09	90 °C	35	65	54	18	2-M4
MK2-2020-8-(M13)		2	20	14		0.15						
MK2-1030-8-(M13)		3	10	7		0.25						
MK2-0445-8-(M13)		4.5	4	2.5		0.35						

* 1/8" on request.

* NPT on request.

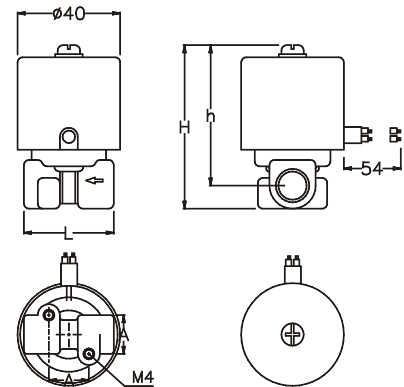
* M13 (Molding coil).



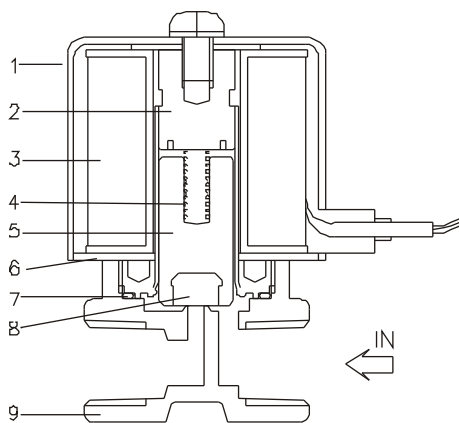
MK2-0445-8



MK2-1030SS-8-M13



MK2-
3016
2020
1030
0445
-8(6)



NO.	Descriptions	Material
1	Coil bonnet	SPC
2	Plunger tube unit	SUS 304, KM-31
3	Solenoid coil	B Class
4	Plunger spring	SUS 304
5	Plunger	KM-31
6	Spacer	SPC
7	O ring	NBR
8	Plunger seat	H NBR
9	Valve body	BSBF (* SUS303L)

* SUS 303L on request.

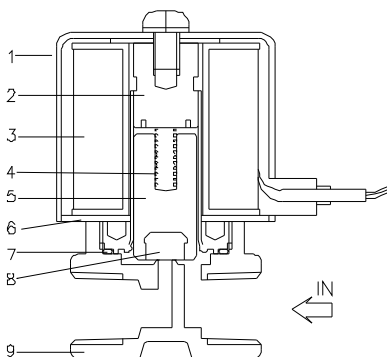
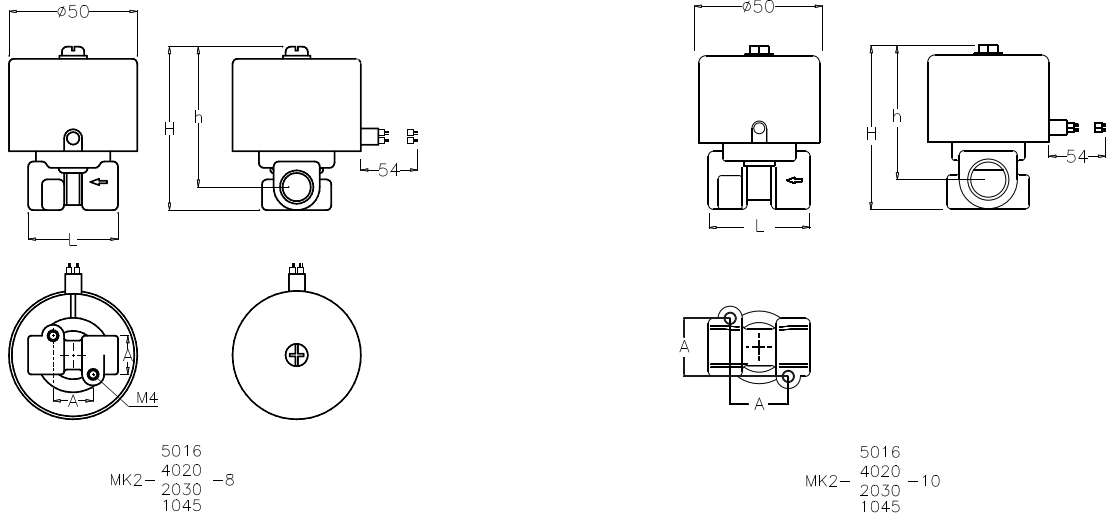


Features:

1. Suitable for air, inert gases, vacuum (10TORR), water, kerosene oil, and oil (Below 50cst).
2. Direct acting, wide operating pressure range from 10 TORR up to 30kg²/cm², fast response and excellent service life.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg ² /cm ²)		Power Consumption VA	Cv Value	Max. Media Temp.	Size (mm)			Mounting hole (mm)	
			Air	Water Oil				L	H	h	A	
MK2A-5016-8(10)	PT 1/4"	1.6	50	30	22	0.09	90 °C	35	65	54	18	2-M4 (1/4")
MK2A-4020-8(10)		2	40	25		0.15						
MK2A-2030-8(10)	PT 3/8"	3	20	14		0.25						
MK2A-1045-8(10)		4.5	10	7		0.35		42	67	56	24	2-M5 (3/8")

- * 1/4" on request.
- * NPT on request.
- * SUS304 valve body on request.



NO.	Descriptions	Material
1	Coil bonnet	SPC
2	Plunger tube unit	SUS304, KM-31
3	Solenoid coil	B Class
4	Plunger spring	SUS304
5	Plunger	KM-31
6	Spacer	SPC
7	O ring	NBR
8	Plunger seat	H NBR
9	Valve body	BSBF(* SUS303L)

* SUS303L on request.

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Direct acting 2-way solenoid valves normally closed, energized to open

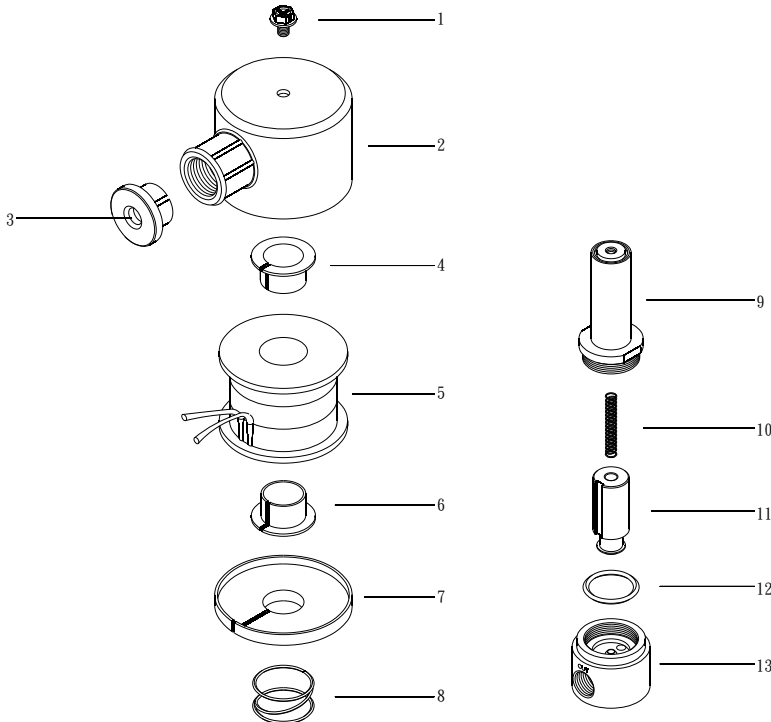
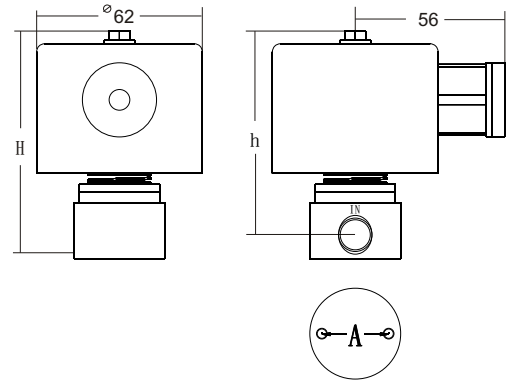


Features:

1. Suitable for air, inert gases, vacuum (10TORR), water, kerosene oil, and oil (Below 50cst).
2. Direct acting, wide operating pressure range from 10 TORR up to 100kg*/cm², fast response and excellent service life.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)		Power Consumption VA	Cv Value	Max. Media Temp.	Size (mm)			Mounting hole (mm)		Weight (g)
			Air	Water Oil				L	H	h	A		
MK2B-5030-8-SCS13	PT 1/4"	3	50	40	26	0.35	90 °C	34	85	76	25	2-M4X0.8	800
MK2B-10020-8-SCS13		2	100	80									

* 1/4" on request.
* NPT on request.



NO.	Descriptions	Material
1	Hexagon bolt	SWRM
2	Coil bonnet	SPC
3	Lead Cap	ABS
4	Bobbin sleeve	SPC
5	Coil	B Class
6	Bobbin sleeve	SPC
7	Spacer	SPC
8	Coil spring	SWP2
9	Packless a'ssy	SUS304, KM-31
10	Plunger spring	SUS 304
11	Plunger	KM-31
12	O ring	NBR
13	Valve body	SUS303L

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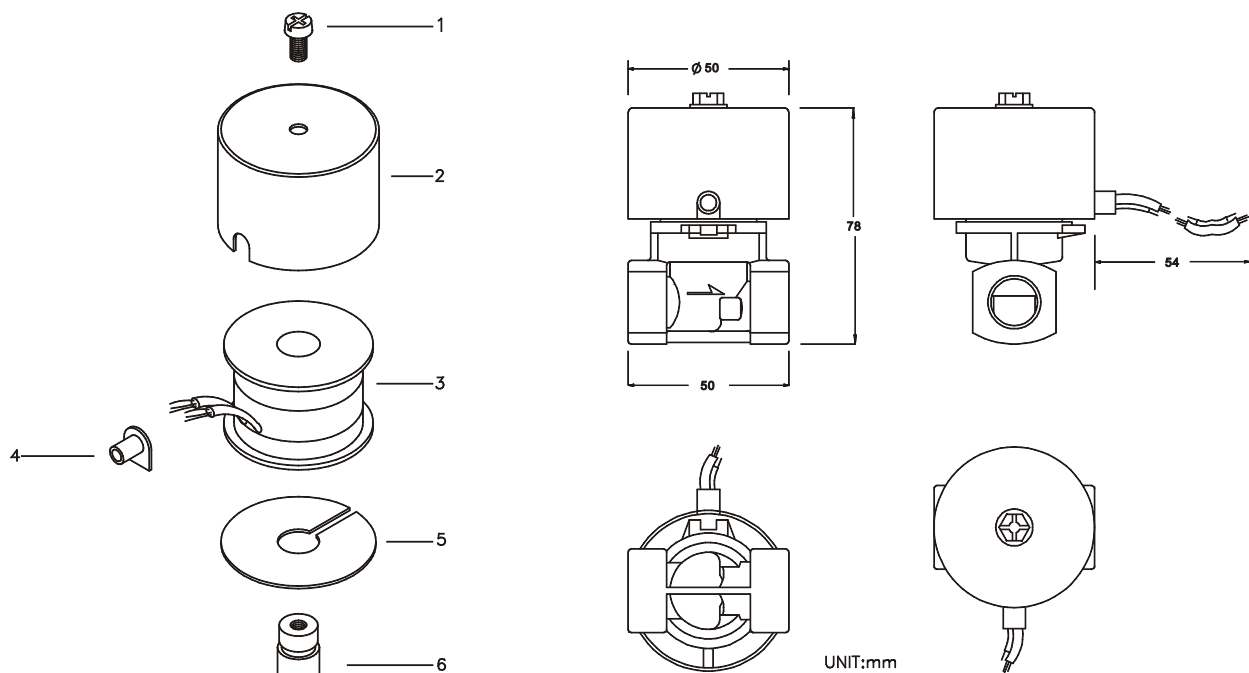
Direct acting 2-way solenoid valves normally closed, energized to open



Features:

1. Suitable for LPG gas, low vacuum air.
2. Direct acting valve with high flow rate at low pressure.
3. Can be mounted in vertical position or vertical $\pm 15^\circ$ is allowed.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)	Power Consumption VA	Cv Value	Max. Media Temp.
			LPG GAS			
MG-10	PT 3/8"	10	0-1	22	1.7	60 °C



NO.	Descriptions	Material
1	Bolt	SWRM
2	Coil bonnet	SPC
3	Solenoid coil	B Class
4	Lead collar	NBR
5	Spacer	SPC
6	Plunger tube set	SUS 304, KM-31
7	Plunger spring	SUS 304
8	Plunger	KM-31
9	Plunger seat	H NBR, Silicon
10	O ring	NBR
11	Valve body	Zinc alloy

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Direct acting 2-way solenoid valves normally open, energized to close

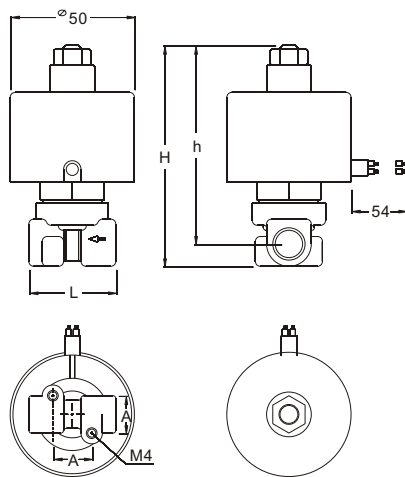
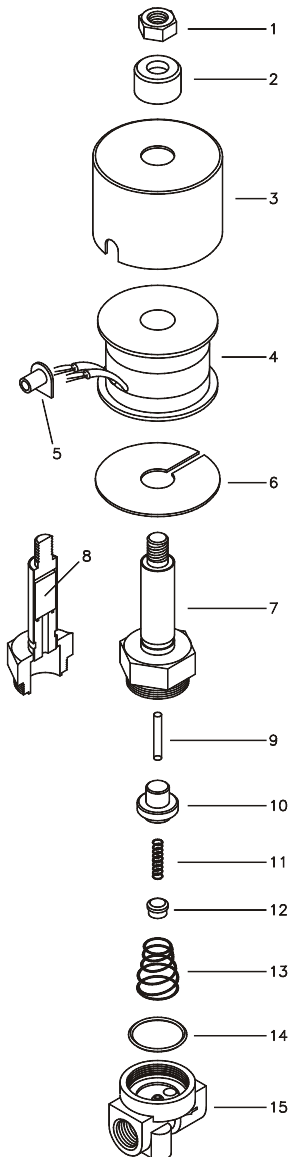


Features:

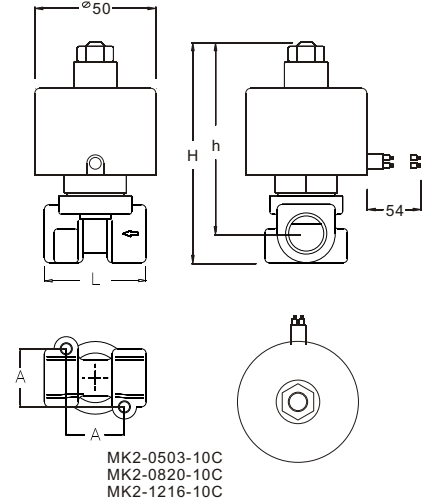
1. Suitable for air, inert gases, vacuum (10 TORR), water, kerosene oil, and oil (Below 50 cst).
2. Direct acting solenoid valves, normally open.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)		Power Consumption VA	Cv Value	Max. Media Temp.	Size (mm)			Mounting hole (mm)	
			Air	Water Oil				L	H	h	A	
MK2A-0530-8(10)C	PT 1/4"	3	4	3	22	0.25	90°C	35	89	80	18	2-M4 (1/4")
MK2A-0820-8(10)C		2	8	6		0.15						
MK2A-1216-8(10)C	PT 3/8"	1.6	12	8		0.095		42	91	88	24	2-M5 (3/8")

- * 1/8" on request.
- * NPT on request.
- * SUS304 valve body on request.



MK2-0503-8(6)C
MK2-0820-8(6)C
MK2-1216-8(6)C



MK2-0503-10C
MK2-0820-10C
MK2-1216-10C

NO.	Descriptions	Material	NO.	Descriptions	Material
1	NUT	SUS 304	9	Needle stem	SUS 304
2	Washer	SUS 304	10	Sleeve of plug	SUS 304
3	Coil bonnet	SPC	11	Spring	SUS 304
4	Solenoid coil	B Class	12	Plunger seat	H NBR
5	Lead collar	NBR	13	Spring	SUS 304
6	Spacer	SPC	14	O ring	NBR
7	Plunger tube unit	SUS 304, KM-31	15	Valve body	BSBF (* SUS303L)
8	Plunger	KM-31			

* SUS 303L on request.

Queen

Direct acting 2-way solenoid valves normally open, energized to close



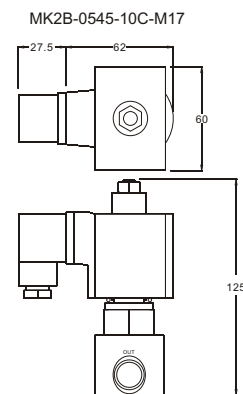
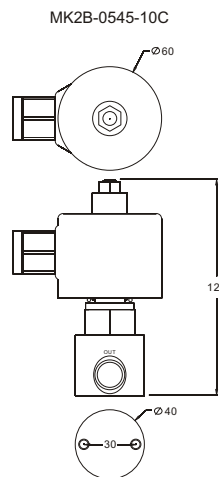
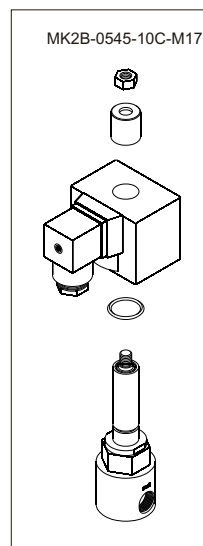
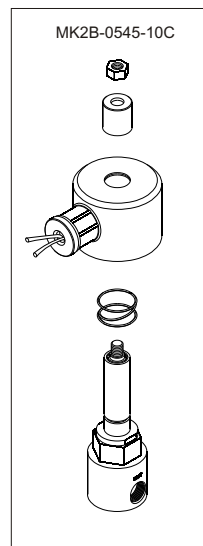
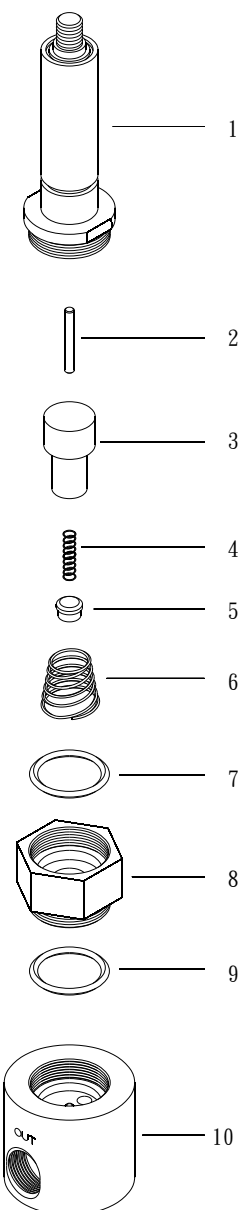
Features:

1. Suitable for air, inert gases, vacuum (10 TORR).
2. Direct acting solenoid valves, normally open.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Max. (Kg*f/cm ²)	Power Consumption VA	Cv Value	Max. Media Temp.	Mounting hole (mm)
			Air				A
MK2B-0545-10C(M17)	PT 3/8"	4.5	5	26	0.42	90°C	2-M6
MK2B-1230-10C(M17)		3.0	12		0.3		
MK2B-2520-10C(M17)		2.0	25		0.18		
MK2B-4016-10C(M17)		1.6	40		0.11		

* NPT on request.

* M17 (Molding coil).



NO.	Descriptions	Material
1	Plunger tube unit	SUS 304, KM-31
2	Needle stem	SUS 304
3	Sleeve of plug	SUS 304
4	Spring	SUS 304
5	Plunger seat	H NBR
6	Spring	SUS 304
7	O ring	NBR
8	Hexagon bushing nut	BSBF
9	O ring	NBR
10	Valve body	BSBF

* SUS 303L on request.

2-way kick pilot operated diaphragm solenoid valves normally closed, energized to open

Features:

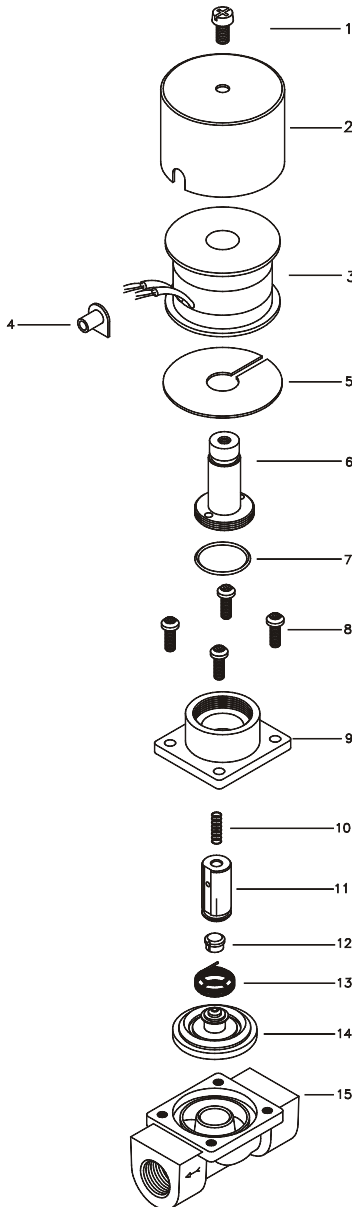
1. Suitable for air, inert gases, vacuum (10 TORR), water, kerosene oil, and oil (Below 50 cst).
2. Diaphragm-operated pressure rang from vacuum (10 TORR) up to 10kg*f/cm², quick acting.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)		Leakage	Max. Media Temp.	Power Consumption	
				Air, Inert gases Water	Oil (Below 50cst)			DC	AC
MA-10-(M13)	PT3/8"	12	2.4	0-10	0-7	≤0.1kg*f/cm ² 2cc/min	90°C	(M13)	DC 18W
MA-15-(M13)	PT1/2"		M13 1.6						AC 22VA

* Pressure : 0~15 , 0~20kg*f/cm² on request

* Pressure : 0-10kg*f/cm², AC110V/DC24V coil common use.

* M13 (Molding coil).

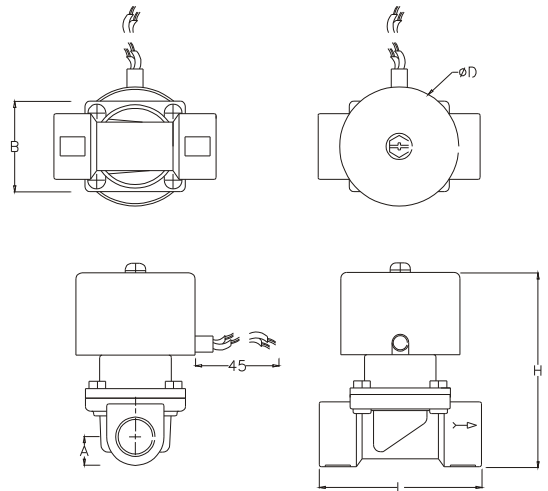


MA-15



MA-15-M13

Model	Conne ction	L (mm)	H (mm)	A (mm)	D (mm)	B (mm)
MA-10	PT3/8"	68	87	13.5	φ50	42
MA-15	PT1/2"					

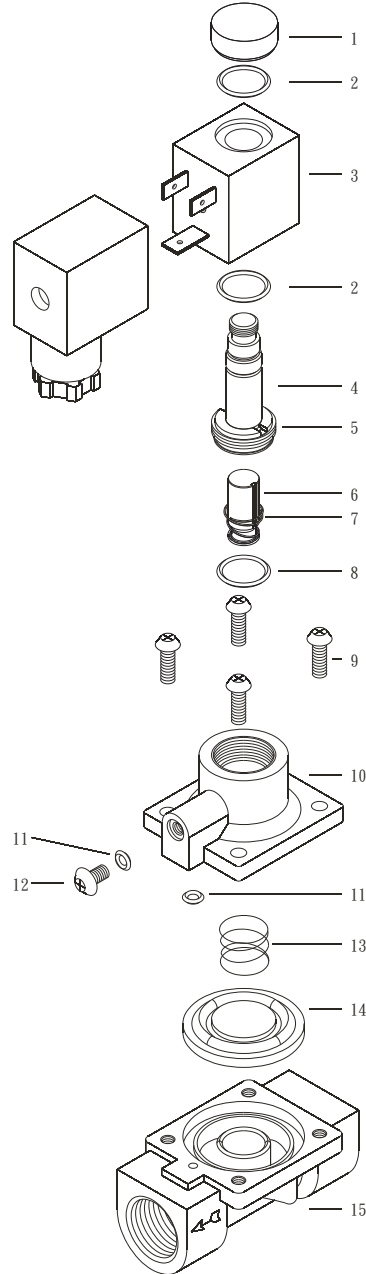
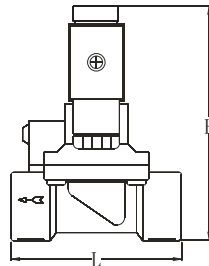
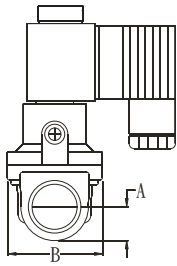


Unit:mm

NO.	Descriptions	Material	NO.	Descriptions	Material
1	Bolt	SWRM	9	Valve bonnet	C3771BE
2	Coil bonnet	SPC	10	Plunger spring	SUS304
3	Solenoid coil	B Class	11	Plunger	KM-31
4	Lead collar	NBR	12	Plunger seat	H NBR (EPDM)
5	Spacer	SPC	13	Spring	SUS304
6	Plunger tube unit	SUS304, KM-31	14	Diaphragm a'ssy	SUS304, BSBF
7	O ring	NBR(EPDM)	15	Diaphragm a'ssy	H NBR (EPDM)
8	Bolt	SUS304	16	Valve body	C3771BE

Features:

1. Pilot Operated, high flow rate and low electric power consumption only 5 watts.
2. Suitable for Air, Inert gases, Water, Kerosene oil, Light oil (Below 50 cst).
3. Operating pressure range from 0.1 kgf/cm² ~ 16 kgf/cm², quick acting, durable usage.
4. Piping is simple and convenient, applicable to the upright pipe or a horizontal pipe connected unrestricted.



Parts , Material Table

No.	Parts	Material Specifications
1	Nut	Aluminium
2	O Ring	NBR
3	Coil's Ass'y	
4	Plunger's Tube	SUS304, KM-31
5	Plunger's Tube Nut	Zn
6	Plunger	KM-31
7	Plunger Spring	SUS 304
8	O Ring	NBR EPDM VITON
9	Bolt	SUS304
10	Valve Bonnet	BSBF or SCS14
11	O Ring	NBR EPDM VITON
12	Screw	SUS304
13	Diaphragm Spring	SUS 304
14	Diaphragm	NBR EPDM VITON
15	Valve body	BSBF or SCS14

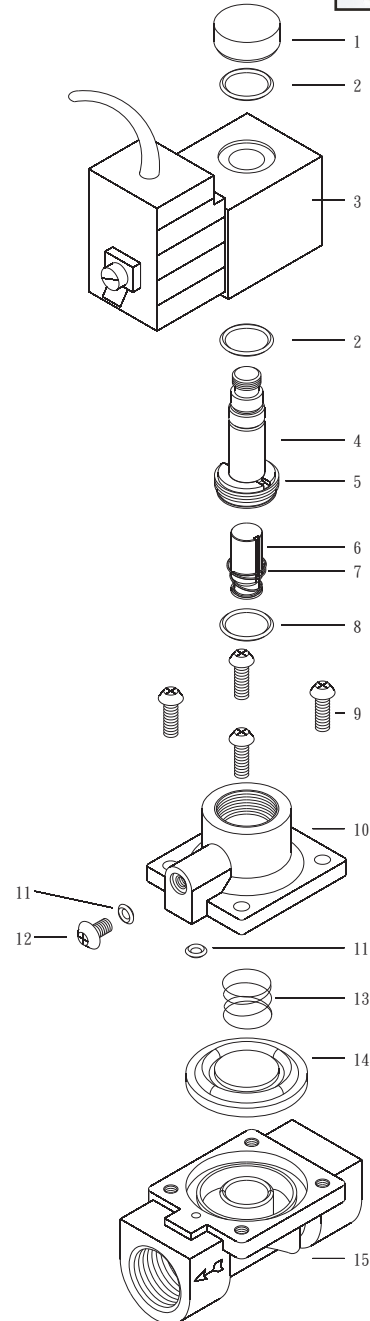
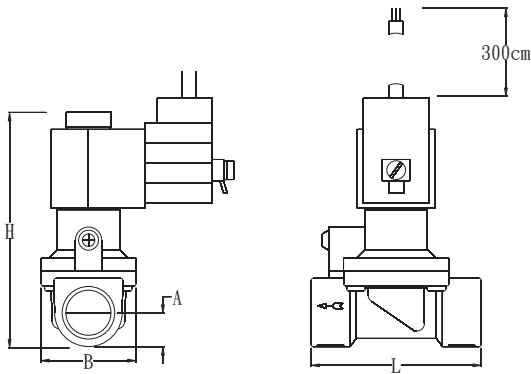
Valve Selection and Performance Chart

Model	Port Size	Orifice (mm)	Maximum Using Pressure (kg*f/cm ²)		Power Consumption	Cv Value	Maximum Fluid Temp	Dimensions (mm)				Weight (g)
			Inert Gases	Water Kerosene oil /Light oil				L	H	B	A	
MA-P10-M10	PT 3/8"	12	16	15	5	2.6	90 °C	69	92	38	13.5	430
MA-P15-M10	PT 1/2"											

*NPT thread on request.

Features:

1. Explosion proof : Ex mb 11 T4, Ex mD 21 T135 .
2. Pilot operated, high flow rate and low electric power consumption only 5.2 watts.
3. Suitable for Air, Inert gases, Water, Kerosene oil, Light oil (Below 50 cst).
4. Operating pressure range from 0.1 kgf/cm² ~ 16 kgf/cm² quick acting, durable usage.
5. Piping is simple and convenient, applicable to the upright pipe or a horizontal pipe connected unrestricted.



Parts , Material Table

No.	Parts	Material Specifications
1	Nut	Aluminium
2	O Ring	NBR
3	Coil's Ass'y	
4	Plunger's Tube	SUS304, KM-31
5	Plunger's Tube Nut	Zn
6	Plunger	KM-31
7	Plunger Spring	SUS 304
8	O Ring	NBR EPDM VITON
9	Bolt	SUS304
10	Valve Bonnet	BSBF or SCS14
11	O Ring	NBR EPDM VITON
12	Screw	SUS304
13	Diaphragm Spring	SUS 304
14	Diaphragm	NBR EPDM VITON
15	Valve body	BSBF or SCS14

Valve Selection and Performance Chart

Model	Port Size	Orifice (mm)	Maximum Using Pressure (kg*f/cm ²)		Power Consumption	Cv Value	Maximum Fluid Temp	Dimensions (mm)				Weight (g)
			Inert Gases	Water Kerosene oil /Light oil				L	H	B	A	
MA-P10-EXP	PT 3/8"	12	16	15	5.2	2.6	90 °C	69	92	38	13.5	685
MA-P15-EXP	PT 1/2"											

*NPT thread on request.

2-way kick pilot operated diaphragm solenoid valves normally closed, energized to open



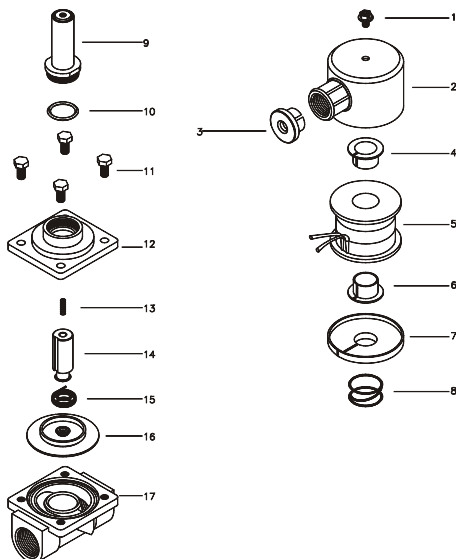
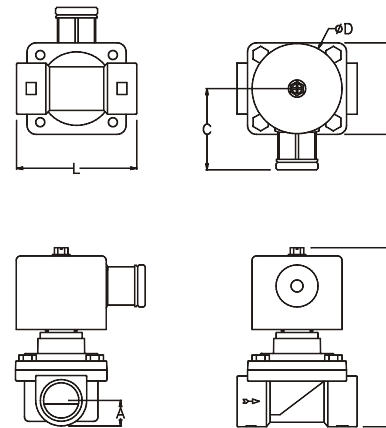
Features:

1. Suitable for air, inert gases, vacuum (10 TORR), water, kerosene oil, and oil (Below 50 cst).
2. Diaphragm-operated, pressure range from vacuum (10 TORR) up to 10kg*f/cm², quick acting.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)		Max. Media Temp.	Power Consumption VA
				Air, Water Inert gases	Oil (Below 50cst)		
MD-10WAG	PT 3/8"	16	3.7	0-10	0-7	90°C	26(AC) 21(DC)
MD-15WAG(SCS ¹³ ₁₄)	PT 1/2"	16	3.7				
MD-20WAG(SCS ¹³ ₁₄)	PT 3/4"	23	6.3				
MD-25WAG(SCS ¹³ ₁₄)	PT 1"	28	8				
MD-32WAG(SCS ¹³ ₁₄)	PT 1 1/4"	32	13				
MD-40WAG(SCS ¹³ ₁₄)	PT 1 1/2"	40	20.3				
MD-50WAG(SCS ¹³ ₁₄)	PT 2"	50	32				

* NPT on request. *(SCS13)(SCS14) Valve bonnet, Valve body material(SCS13)(SCS14).

Model	Connection	L (mm)	H (mm)	A (mm)	B (mm)	C (mm)	D (mm)
MD-10WAG	PT 3/8"	70	112	15	52	56	φ62
MD-15WAG (SCS ¹³ ₁₄)	PT 1/2"	70	112	15	52		
MD-20WAG (SCS ¹³ ₁₄)	PT 3/4"	80	122	17.5	62		
MD-25WAG (SCS ¹³ ₁₄)	PT 1"	90	132	23	72		
MD-32WAG (SCS ¹³ ₁₄)	PT 1 1/4"	120	130	26	83		
MD-40WAG (SCS ¹³ ₁₄)	PT 1 1/2"	136	140	32	97		
MD-50WAG (SCS ¹³ ₁₄)	PT 2"	160	150	37	112		



NO.	Descriptions	Material	NO.	Descriptions	Material
1	Bolt	SWRM	10	O ring	NBR
2	Coil bonnet	SPC	11	Bolt	SUS 304
3	Lead cap	ABS	12	Valve bonnet	3/8"-1"(C3771BE) 1-1/4"-2"(BC 6) 1/2"-2"(SCS13/SCS14)
4	Bobbin sleeve	SPC	13	Plunger spring	SUS 304
5	Solenoid coil	B Class	14	Plunger	KM-31
6	Bobbin sleeve	SPC	15	Spring	SUS 304
7	Spacer	SPC	16	Diaphragm a'ssy	SUS304, BSBF(SUS304) NBR (EPDM) (VITON)
8	Coil spring	SWP2	17	Valve body	3/8"-1"(C3771BE) 1-1/4"-2"(BC 6) 1/2"-2"(SCS13/SCS14)
9	Plunger tube unit	SUS 304, KM-31			

*(SCS13) Valve bonnet, Valve body material SCS13.

*(SCS14) Valve bonnet, Valve body material SCS14.

2-Way Kick Pilot Operated Diaphragm Solenoid Valves Normally Closed, Energized to Open



MD-15SCS14-M16

Features:

1. Suitable for air, inert gases, vacuum (10 TORR), water, kerosene oil, and oil (Below 50 cst).
2. Diaphragm-operated, pressure range from vacuum (10 TORR) up to 10kg*f/cm², quick acting.
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)		Max. Media Temp.	Power Consumption VA	H	L	B
				Air, Water Inert gases	Oil (Below 50cst)					
MD-10WAG-M16	PT 3/8"	16	3.7	0-10	0-7	90°C	26(DC) 35(AC)	80	70	57
MD-15WAG(SCS ¹³ ₁₄)-M16	PT 1/2"	16	3.7							
MD-20WAG(SCS ¹³ ₁₄)-M16	PT 3/4"	23	6.3							
MD-25WAG(SCS ¹³ ₁₄)-M16	PT 1"	28	8							
MD-32WAG(SCS ¹³ ₁₄)-M16	PT 1-1/4"	32	13							
MD-40WAG(SCS ¹³ ₁₄)-M16	PT 1-1/2"	40	20.3							
MD-50WAG(SCS ¹³ ₁₄)-M16	PT 2"	50	32							

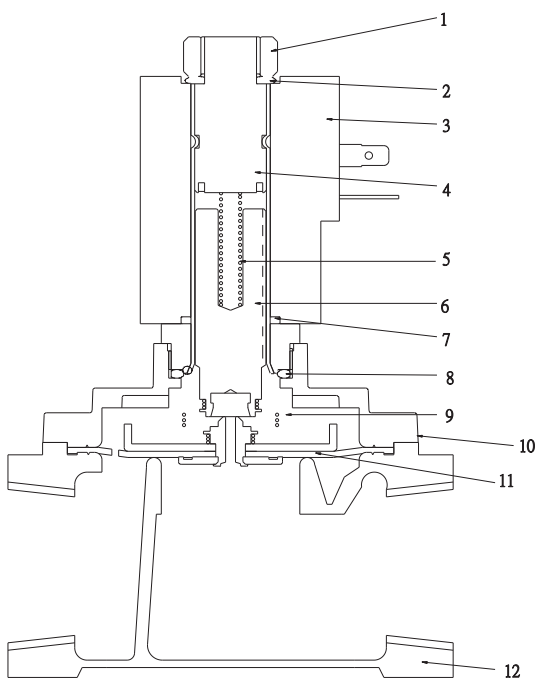
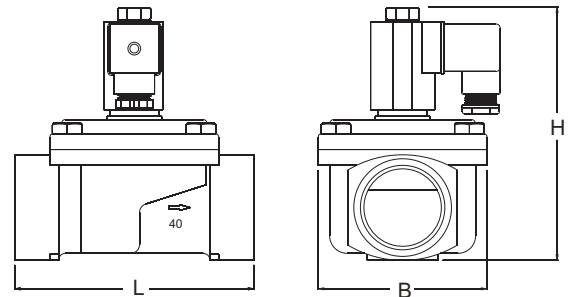
* NPT On request. * (SCS13) Valve bonnet, Valve body material SCS13.
* (SCS14) Valve bonnet, Valve body material SCS14.



MD-15WAG-M16



MD-40WAG-M16



NO.	Descriptions	Material
1	NUT	Aluminium
2	O ring	NBR
3	IP 65 molding coil	
4	Packless a'ssy	SUS304, KM-31
5	Plunger spring	SUS304
6	Plunger	KM-31
7	O ring	NBR
8	O ring	NBR
9	Spring	SUS304
10	Valve bonnet	3/8"-1"(C3771BE) 1-1/4"-2"(BC 6) 1/2"-2"(SCS13,SCS14)
11	Diaphragm a'ssy	SUS304, BSBF(SUS304) NBR(EPDM)(VITON)
12	Valve body	3/8"-1"(C3771BE) 1-1/4"-2"(BC 6) 1/2"-2"(SCS13,SCS14)

* (SCS14) Valve bonnet, Valve body material SCS14.

2-way pilot operated diaphragm solenoid valves normally open, energized to close

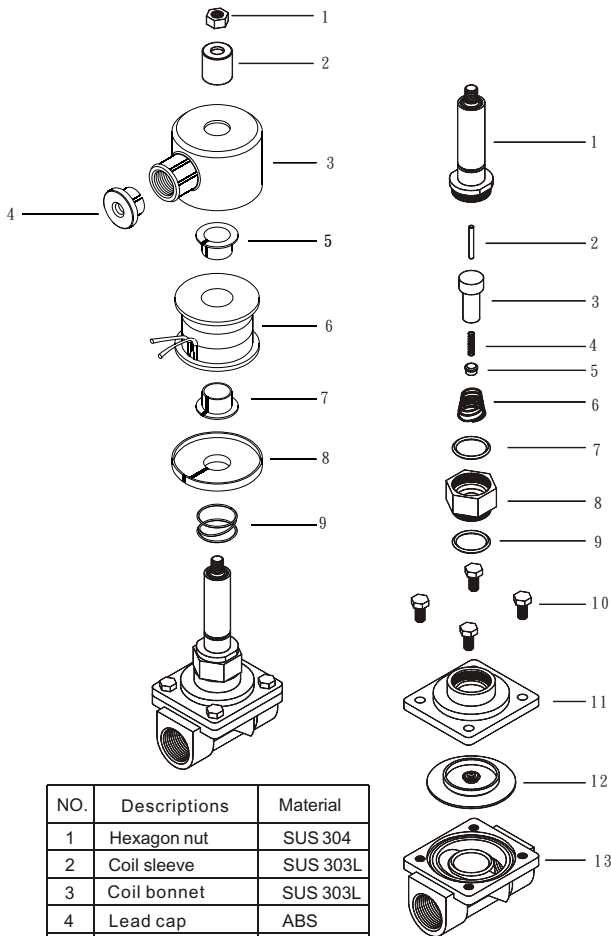


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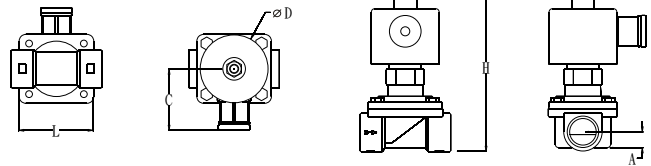
1. Suitable for air, inert gases, vacuum (10 TORR), water, kerosene oil, and oil (Below 50 cst).
2. Pilot operated, pressure range from 0.3kg*f/cm² to 10kg*f/cm².
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)		Max. Media Temp.	Power Consumption VA
				Air, Water Inert gases	Oil (Below 50cst)		
MD-10C	PT 3/8"	16	3.7	0.3-10	0.3-7	90°C	26
MD-15C(SCS ¹³ ₁₄)	PT 1/2"	16	3.7				
MD-20C(SCS ¹³ ₁₄)	PT 3/4"	23	6.3				
MD-25C(SCS ¹³ ₁₄)	PT 1"	28	8				
MD-32C(SCS ¹³ ₁₄)	PT 1 1/4"	32	13				
MD-40C(SCS ¹³ ₁₄)	PT 1 1/2"	40	20.3				
MD-50C(SCS ¹³ ₁₄)	PT 2"	50	32				

* NPT on request. * (SCS13) Valve bonnet, Valve body material SCS13.
(SCS14) Valve bonnet, Valve body material SCS14.



NO.	Descriptions	Material
1	Hexagon nut	SUS 304
2	Coil sleeve	SUS 303L
3	Coil bonnet	SUS 303L
4	Lead cap	ABS
5	Bobbin sleeve	SPC
6	Coil	B class
7	Bobbin sleeve	SPC
8	Spacer	SPC
9	Coil spring	SWP2



Model	Connection	L (mm)	H (mm)	A (mm)	∅D (mm)	C (mm)
MD-10C	PT 3/8"	70	147	15	62	56
MD-15C(SCS13) / (SCS14)	PT 1/2"	70	147	15		
MD-20C(SCS13) / (SCS14)	PT 3/4"	80	157	17.5		
MD-25C(SCS13) / (SCS14)	PT 1"	90	167	23		
MD-32C(SCS13) / (SCS14)	PT 1 1/4"	120	149	26		
MD-40C(SCS13) / (SCS14)	PT 1 1/2"	136	159	32		
MD-50C(SCS13) / (SCS14)	PT 2"	160	169	37		

NO.	Descriptions	Material
1	Plunger tube unit	SUS 304, KM-31
2	Needle stem	SUS 303L
3	Seat sleeve	SUS 303L
4	Plunger spring	SUS 304
5	Plunger seat	H NBR
6	Spring	SUS 304
7	O ring	NBR
8	Hexagon bushing nut	SUS 303L
9	O ring	NBR
10	Hexagon bolt	SUS 304
11	Valve bonnet	3/8" ~ 1" (C3771BE) 1-1/4" ~ 2"(BC 6) 1/2" ~ 2"(SCS13/SCS14)
12	Diaphragm a'ssy	SUS304, BSBF(SUS304) NBR(EPDM)(VITON)
13	Valve body	3/8" ~ 1" (C3771BE) 1-1/4" ~ 2"(BC 6) 1/2" ~ 2"(SCS13/SCS14)

* (SCS14) Valve bonnet, Valve body material SCS14.

2-way pilot operated diaphragm solenoid valves normally open, energized to close

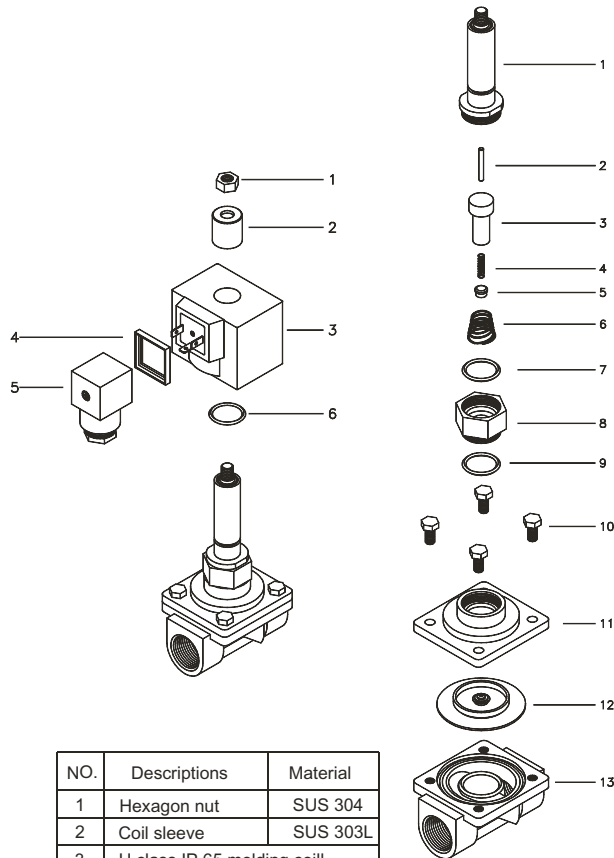
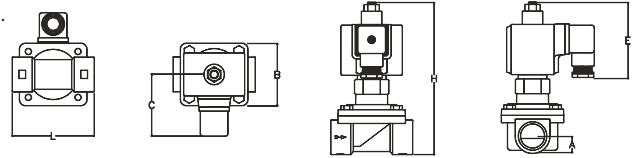


Features:

1. Suitable for air, inert gases, vacuum (10 TORR), water, kerosene oil, and oil (Below 50 cst).
2. Pilot operated, pressure range from 0.3kg*f/cm² to 10kg*f/cm².
3. Can be mounted in vertical and horizontal position.

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)		Max. Media Temp.	Power Consumption VA
				Air, Water Inert gases	Oil (Below 50cst)		
MD-10C-M17	PT 3/8"	16	3.7	0.1-10	0.1-7	90°C	26
MD-15C(SCS ¹³ ₁₄)-M17	PT 1/2"	16	3.7				
MD-20C(SCS ¹³ ₁₄)-M17	PT 3/4"	23	6.3				
MD-25C(SCS ¹³ ₁₄)-M17	PT 1"	28	8				
MD-32C(SCS ¹³ ₁₄)-M17	PT 1 1/4"	32	13				
MD-40C(SCS ¹³ ₁₄)-M17	PT 1 1/2"	40	20.3				
MD-50C(SCS ¹³ ₁₄)-M17	PT 2"	50	32				

* NPT on request. * (SCS13) Valve bonnet, Valve body material SCS13.
(SCS14) Valve bonnet, Valve body material SCS14.



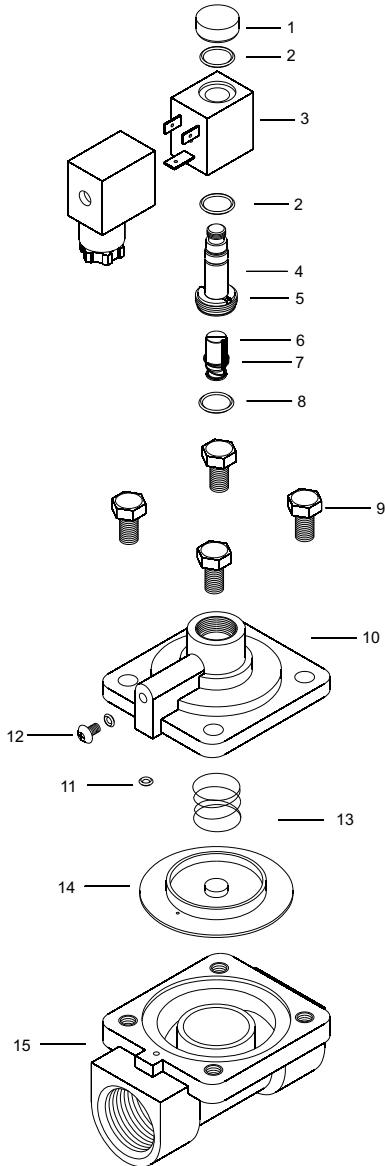
NO.	Descriptions	Material
1	Hexagon nut	SUS 304
2	Coil sleeve	SUS 303L
3	H class IP 65 molding coil	
4	Terminal box packing pad	
5	Terminal box	
6	O ring	NBR

Model	Connection	L (mm)	H (mm)	A (mm)	B (mm)	C (mm)	E (mm)
MD-10C -M17	PT 3/8"	70	147	15	52	65	73
MD-15C(SCS ¹³ ₁₄)-M17	PT 1/2"	70	147	15	52		
MD-20C(SCS ¹³ ₁₄)-M17	PT 3/4"	80	157	17.5	62		
MD-25C(SCS ¹³ ₁₄)-M17	PT 1"	90	167	23	72		
MD-32C(SCS ¹³ ₁₄)-M17	PT 1 1/4"	120	149	26	83		
MD-40C(SCS ¹³ ₁₄)-M17	PT 1 1/2"	136	159	32	97		
MD-50C(SCS ¹³ ₁₄)-M17	PT 2"	160	169	37	112		

NO.	Descriptions	Material
1	Plunger tube unit	SUS 304, KM-31
2	Needle stem	SUS 303L
3	Seat sleeve	SUS 303L
4	Plunger spring	SUS 304
5	Plunger seat	H NBR
6	Spring	SUS 304
7	O ring	NBR
8	Hexagon bushing nut	SUS 303L
9	O ring	NBR
10	Hexagon bolt	SUS 304
11	Valve bonnet	3/8" ~1" (C3771BE) 1-1/4" ~2"(BC 6) 1/2" ~2"(SCS13/SCS14)
12	Diaphragm a'ssy	SUS304, BSBF(SUS304) NBR(EPDM)(VITON)
13	Valve body	3/8" ~1" (C3771BE) 1-1/4" ~2"(BC 6) 1/2" ~2"(SCS13/SCS14)

Features:

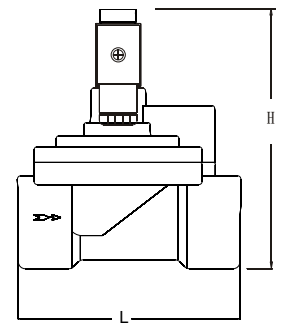
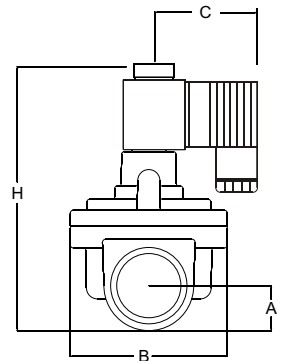
1. Pilot operated, high flow rate and low electric power consumption only 5.2 watts.
2. Suitable for Air, Inert gases, Water, Kerosene oil, Light oil (Below 50 cst).
3. Operating pressure range from 0.1 kgf/cm² ~ 16 kgf/cm², quick acting, durable usage.
4. Piping is simple and convenient, applicable to the upright pipe or a horizontal pipe connected unrestricted.



Model	Connection	L (mm)	H (mm)	A (mm)	B (mm)	C (mm)
MD-P10WAG-M10	PT 3/8"	80	98	15	52	50
MD-P15WAG-M10	PT 1/2"	80	98	15	52	
MD-P20WAG-M10	PT 3/4"	90	108	17.5	62	
MD-P25WAG-M10	PT 1"	100	118	23	72	

Parts , Material Table

No.	Parts	Material Specifications
1	Nut	Aluminium
2	O Ring	NBR
3	Coil's Ass'y	
4	Plunger's Tube	SUS304, KM-31
5	Plunger's Tube Nut	Zn
6	Plunger	KM-31
7	Plunger Spring	SUS 304
8	O Ring	NBR EPDM VITON
9	Bolt	SUS304
10	Valve Bonnet	BSBF
11	O Ring	NBR EPDM VITON
12	Screw	SUS304
13	Diaphragm Spring	SUS 304
14	Diaphragm A'ssy	NBR EPDM VITON
15	Valve body	BSBF



Valve Selection and Performance Chart

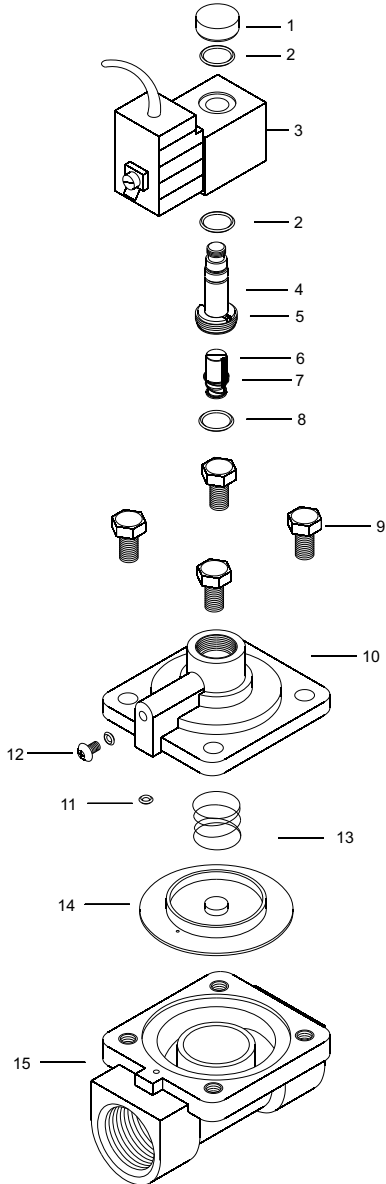
Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)			Max. Media Temp.	Power Consumption
				Air Inert gases	Water	Oil (Below 50cst)		
MD-P10WAG-M10	PT 3/8"	16	4.5	0.3-16	0.5-16	0.5-12	90°C	5W
MD-P15WAG-M10	PT 1/2"	16	4.5					
MD-P20WAG-M10	PT 3/4"	23	7.6					
MD-P25WAG-M10	PT 1"	28	9.6					

* NPT on request.

QUEEN Explosion Proof, Piloted Solenoid Valve, Normally Closed.

Features:

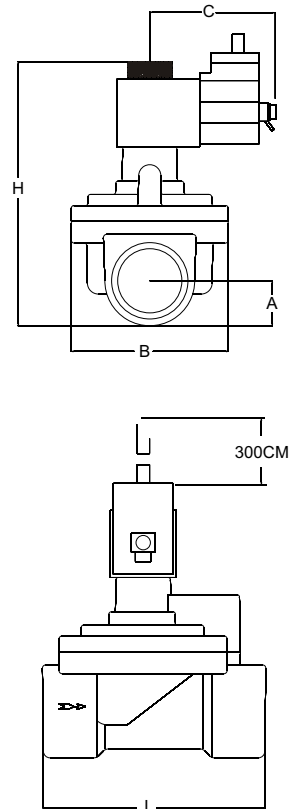
1. Explosion proof : Ex mb 11 T4, Ex mD 21 T135 .
2. Pilot operated, high flow rate and low electric power consumption only 5.2 watts.
3. Suitable for Air, Inert gases, Water, Kerosene oil, Light oil (Below 50 cst).
4. Operating pressure range from 0.3 kgf/cm² ~ 16 kgf/cm², quick acting, durable usage.
5. Piping is simple and convenient, applicable to the upright pipe or a horizontal pipe connected unrestricted.



Model	Conne ction	L (mm)	H (mm)	A (mm)	B (mm)	C (mm)
MD-P10WAG-EXP	PT 3/8"	80	98	15	52	60
MD-P15WAG-EXP	PT 1/2"	80	98	15	52	
MD-P20WAG-EXP	PT 3/4"	90	108	17.5	62	
MD-P25WAG-EXP	PT 1"	100	118	23	72	

Parts , Material Table

No.	Parts	Material Specifications
1	Nut	Aluminium
2	O Ring	NBR
3	Coil's Ass'y	
4	Plunger's Tube	SUS304, KM-31
5	Plunger's Tube Nut	Zn
6	Plunger	KM-31
7	Plunger Spring	SUS 304
8	O Ring	NBR EPDM VITON
9	Bolt	SUS304
10	Valve Bonnet	BSBF
11	O Ring	NBR EPDM VITON
12	Screw	SUS304
13	Diaphragm Spring	SUS 304
14	Diaphragm A'ssy	NBR EPDM VITON
15	Valve body	BSBF



Valve Selection and Performance Chart

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)			Max. Media Temp.	Power Consumption
				Air Inert gases	Water	Oil (Below 50cst)		
MD-P10WAG-EXP	PT 3/8"	16	4.5	0.3-16	0.5-16	0.5-12	90°C	5W
MD-P15WAG-EXP	PT 1/2"	16	4.5					
MD-P20WAG-EXP	PT 3/4"	23	7.6					
MD-P25WAG-EXP	PT 1"	28	9.6					

* NPT on request.

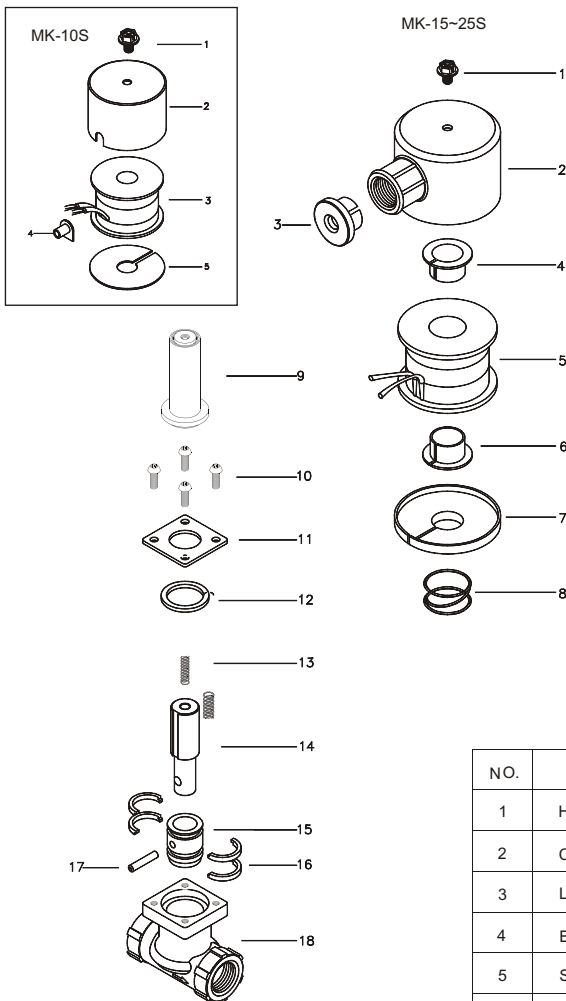


Features:

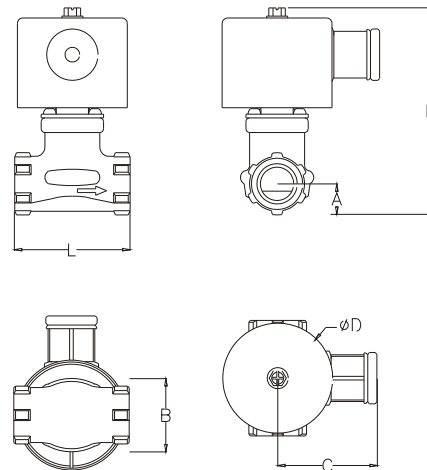
1. Suitable for steam, air, vacuum, inert gases, water, and oil (Below 50 cst).
2. Kick pilot operated, wide operating pressure range from 10 TORR to 10kg*f/cm, fast response, long life constructive device.
3. Can be mounted in vertical position or vertical ±15 is allowed.
4. Fluid temperature from -10 °C (non-freezing) to 180 °C

Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)			Max. Media Temp.	Power Consumption VA
				Steam	Water	Oil (Below 50cst)		
MK-10S	PT3/8"	10	1.3	0-10	0-8	0-7	180 °C	22
MK-15S	PT1/2"	14	3.0					26
MK-20S	PT3/4"	19	4.9					
MK-25S	PT1"	25	6.2					

* MK-10S on request.
* NPT on request.



Model	Connection	L (mm)	H (mm)	A (mm)	B (mm)	C (mm)	φ D (mm)
MK-10S	PT3/8"	53	90	13	24	56	62
MK-15S	PT1/2"	63	114	17	30		
MK-20S	PT3/4"	74	122	19	33		
MK-25S	PT1"	88	127	24	41		



NO.	Descriptions	Material	NO.	Descriptions	Material
1	Hexagon bolt	SWRM	10	Bolt	SUS 304
2	Coil bonnet	SPC	11	Plate	SPC
3	Lead cap	ABS	12	Packing	TEFLON
4	Bobbin sleeve	SPC	13	Plunger spring	SUS 304
5	Solenoid coil	H Class	14	Plunger	KM-31
6	Bobbin sleeve	SPC	15	Main valve	BC 6
7	Spacer	SPC	16	Piston ring	TEFLON
8	Coil spring	SWP2	17	Sleeve pin	SUS 303L
9	Plunger tube unit	SUS 304, KM-31	18	Valve body	BC 6



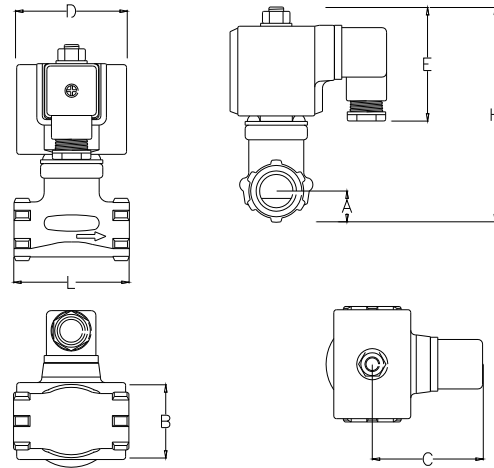
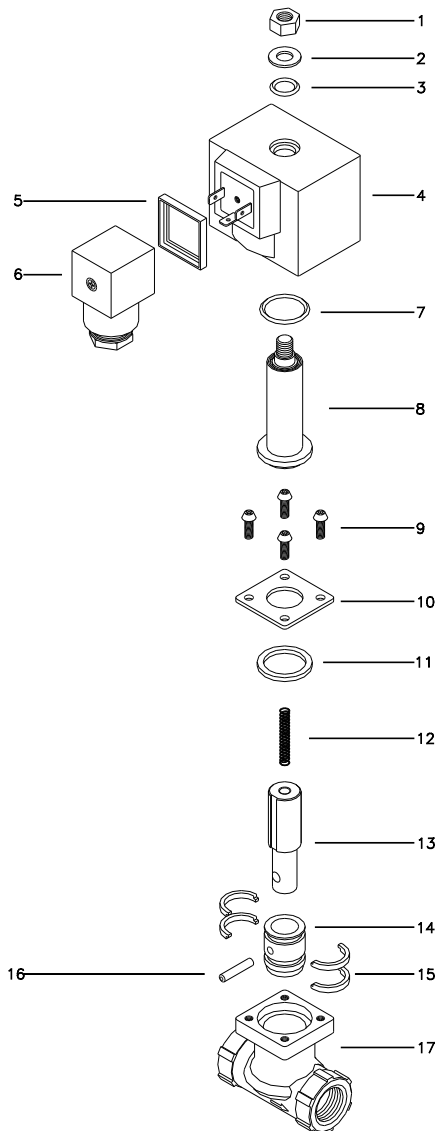
Features:

1. Suitable for steam, air, vacuum, inert gases, water, and oil (Below 50 cst).
2. Kick pilot operated, wide operating pressure rang from 10 TORR to 10kg*f/cm² , fast response, long life constructive device.
3. Can be mounted in vertical position or vertical ±15° is allowed.
4. Fluid temperature from -10°C (non-freezing) to 180 °C.
5. Valve seat : non-leakage.

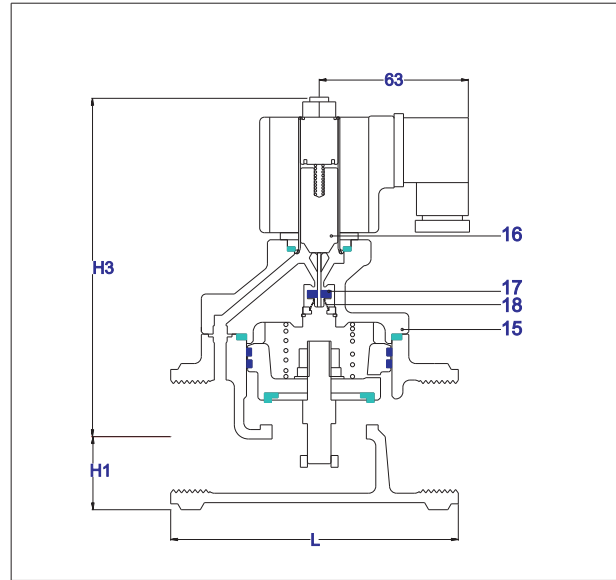
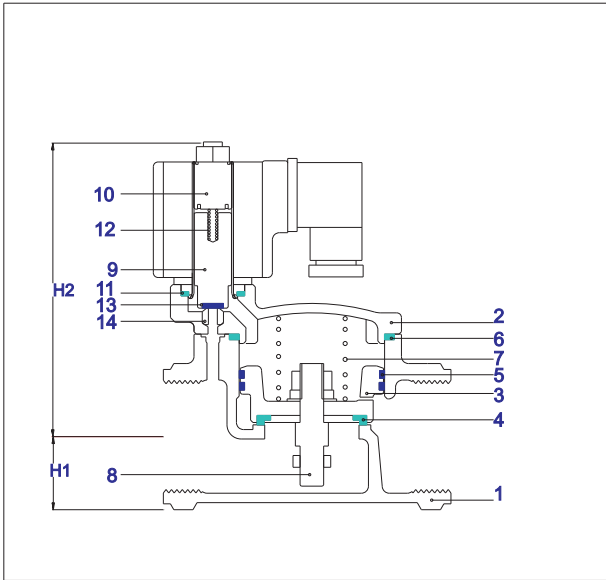
Model	Connection	Orifice (mm)	Cv Value	Operating pressure (kg*f/cm ²)			Max. Media Temp.	Power Consumption VA
				Steam	Water	Oil (Below 50cst)		
MK-15S-M17	PT1/2"	15	3.0	0-10	0-8	0-7	180°C	26
MK-20S-M17	PT3/4"	20	4.9					
MK-25S-M17	PT1"	25	6.2					

* NPT on request.

Model	Connection	L (mm)	H (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
MK-15S-M17	PT1/2"	63	120	17	30	65	60	60
MK-20S-M17	PT3/4"	74	128	19	33			
MK-25S-M17	PT1"	88	133	24	41			



NO.	Descriptions	Material	NO.	Descriptions	Material
1	Hexagon Nut	BSBM	10	Plate	SPC
2	Washer	SPC	11	Packing	TEFLON
3	O ring	NBR	12	Plunger spring	SUS304
4	H Class IP65 molding solenoid coil		13	Plunger	KM-31
5	Terminal boxpackingpad		14	Main valve	BC 6
6	Terminal box		15	Piston ring	TEFLON
7	O ring	NBR	16	Sleeve pin	SUS303L
8	Plunger tube unit	SUS304, KM-31	17	Valve body	BC 6
9	Bolt	SUS304			



Main Parts List

No.	Descriptions	Materials	
		Max.Temp.90° C	Max.Temp.200° C
1	Valve body	BC6	BC6
2	Valve bonnet	BC6	BC6
3	Main valve	BC6	BC6
4	Main valve seat	Teflon	Teflon
5	Main valve ring	Carbon Resin	Carbon Resin
6	Packing	NBR	Teflon
7	Spring	SUS304	SUS304
8	Main valve guide rod	SUS303L	SUS303L
9	Plunger	KM-31	KM-31

No.	Descriptions	Materials	
		Max.Temp.90° C	Max.Temp.200° C
10	Plunger tube unit	SUS304,KM-31	SUS304,KM-31
11	Packing	NBR	Teflon
12	Spring	SUS304	SUS304
13	Plunger Seat	Viton	Teflon
14	Pilot hole seat	SUS303L	SUS303L
15	Valve bonnet	BC6	BC6
16	Plunger	KM-31	KM-31
17	Need le seat	Viton	Teflon
18	Spring	SUS304	SUS304

Valve Specifications

Model	Connection		Orifice (mm)	Min.Operating Pressure ΔP kgf/cm ²	Pressure Range kgf/cm ²	Power Consumption (VA \pm 10)		Cv Value	Dimensions(mm)				Weight (kg)
	Inches	Type				F Class	H Class		L	H1	H2	H3	
MT-20	3/4"	20	80	18	120	130	1.7						
MT-25	1"	25	120	24	122	133	2.2						
MT-32	1 1/4"	32	150	28	122	138	2.5						
MT-40	1 1/2"	40	200	31	125	144	3.1						
MT-50	2"	50	330	38	132	156	4.1						
MT-32F	1 1/4"	Flange JIS10K	32	0.3	0.3 ~10 (Oil 0.3 ~7)	35	15.0	150	68	122	138	6.5	
MT-40F	1 1/2"		40					160	70	125	144	7.3	
MT-50F	2"		50					170	78	132	156	9.4	

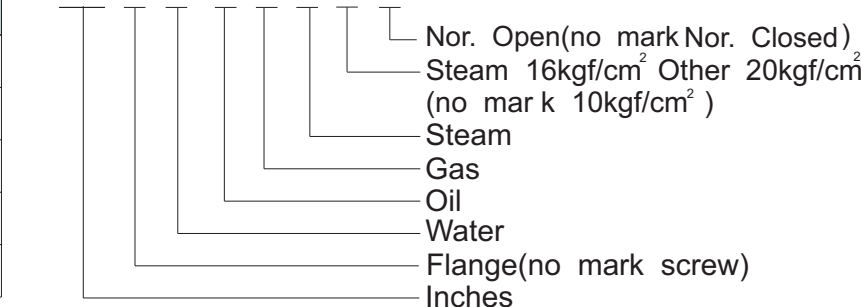
*NPT on request

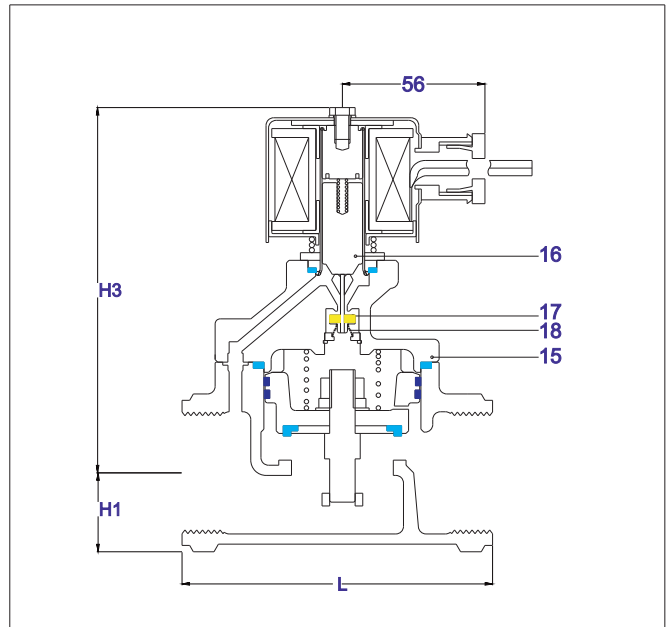
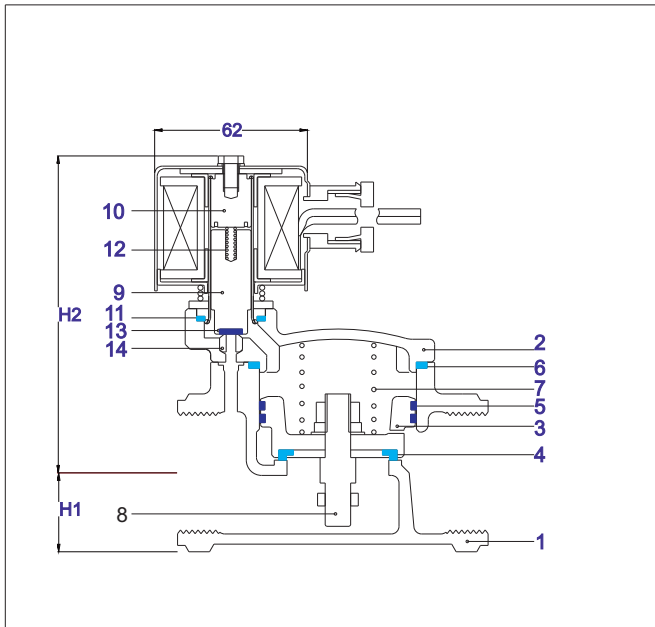
*Nor.Closed:0.3 ~16kgf/cm², 0.3 ~20kgf/cm² on request. Nor.Open:0.3 ~12kgf/cm² on request

Fluids & Coil Specifications

Item	Description
Fluids	Steam Water Air Oil(below 50cSt)
Fluids Temperature	Water Air Oil Max. 90° C Steam Max. 200° C
Coil Data	Voltage
	Power Consumption
	Class

MT-50 F W A G S H C M17





Main Parts List

No.	Descriptions	Materials	
		Max.Temp.90° C	Max.Temp.200° C
1	Valve body	BC6	BC6
2	Valve bonnet	BC6	BC6
3	Main valve	BC6	BC6
4	Main valve seat	Teflon	Teflon
5	Main valve ring	Carbon Resin	Carbon Resin
6	Packing	NBR	Teflon
7	Spring	SUS304	SUS304
8	Main valve guide rod	SUS303L	SUS303L
9	Plunger	KM-31	KM-31

No.	Descriptions	Materials	
		Max.Temp.90° C	Max.Temp.200° C
10	Plunger tube unit	SUS304,KM-31	SUS304,KM-31
11	Packing	NBR	Teflon
12	Spring	SUS304	SUS304
13	Plunger Seat	Viton	Teflon
14	Pilot hole seat	SUS303L	SUS303L
15	Valve bonnet	BC6	BC6
16	Planger	KM-31	KM-31
17	Need le seat	Viton	Teflon
18	Spring	SUS304	SUS304

Valve Specifications

Model	Connection		Orifice (mm)	Min.Operating Pressure ΔP kgf/cm ²	Pressure Range kgf/cm ²	Power Consumption (VA±10)		Cv Value	Dimintions(mm)				Weight (kg)
	Inches	Type				F Class	H Class		L	H1	H2	H3	
MT-20	3/4"	20	7.4	80	18	120	130	1.7					
MT-25	1"	25	12.0	100	24	122	133	2.2					
MT-32	1 1/4"	32	15.0	110	28	122	138	2.5					
MT-40	1 1/2"	40	20.0	120	31	125	144	3.1					
MT-50	2"	50	33.0	140	38	132	156	4.1					
MT-32F	1 1/4"	Flange JIS10K	32	0.3	0.3 ~10 (Oil 0.3 ~7)	35	15.0	150	68	122	138	6.5	
MT-40F	1 1/2"		40				20.0	160	70	125	144	7.3	
MT-50F	2"		50				33.0	170	78	132	156	9.4	

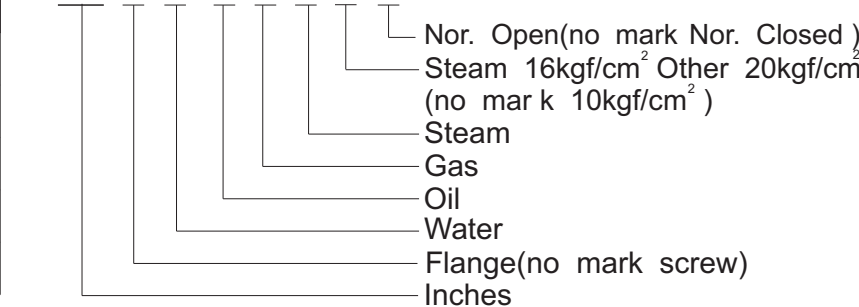
*NPT on request

*Nor.Closed:0.3 ~16kgf/cm² ,0.3 ~ 20kg/cm² on request. Nor.Open :0.3 ~12kgf/cm² on request

Fluids & Coil Specifications

Item	Description
Fluids	Steam Water Air Oil(below 50cSt)
Fluids Temperature	Water Air Oil Max. 90° C Steam Max. 200° C
Coil Data	Voltage
	Power Consumption
	Class

MT-50 F W A G S H C



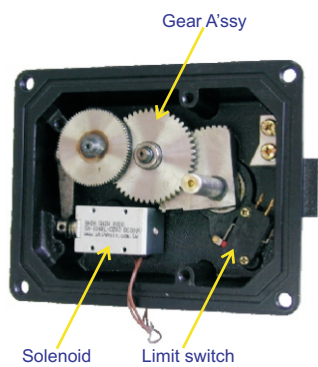
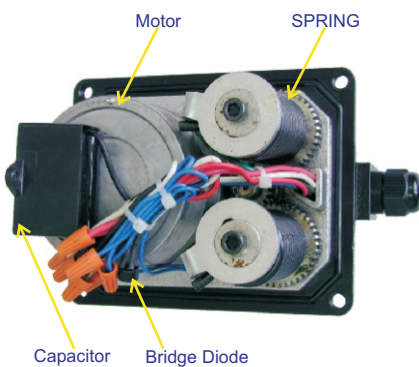
Queen

MK3 Spring return electric actuator



Features

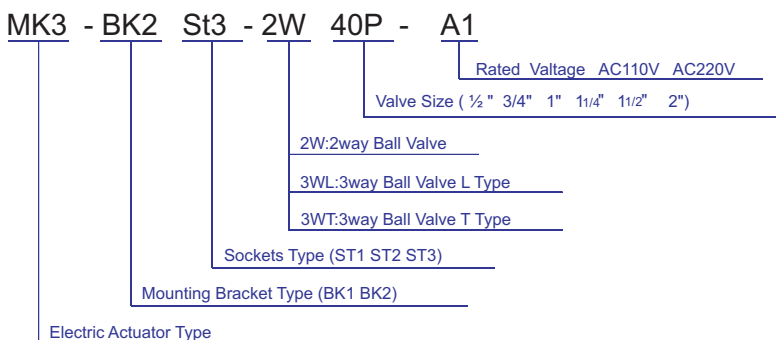
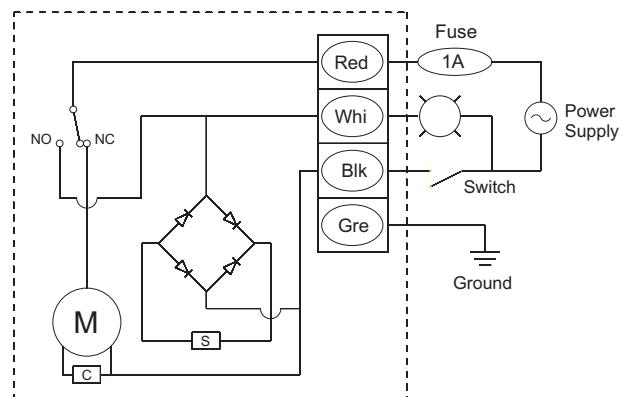
1. Two power cords wiring . (Same wiring sketch as Solenoid Valve).
2. MK3 Actuator are fit for assembling with 2 way or 3 way ball valves.
3. MK3 Actuator can set it as emergence shut-off (power on to open) or set it as emergence open (power off to close).
4. MK3 are suit to pressure range from 0 ~ 10 kg*f/cm² .
5. Acting time 2.5 seconds from close position to open position , vice versa.
6. Power failure or electric outage , MK3 are available for manual operation.
7. With water proof dust proof aluminum housing.

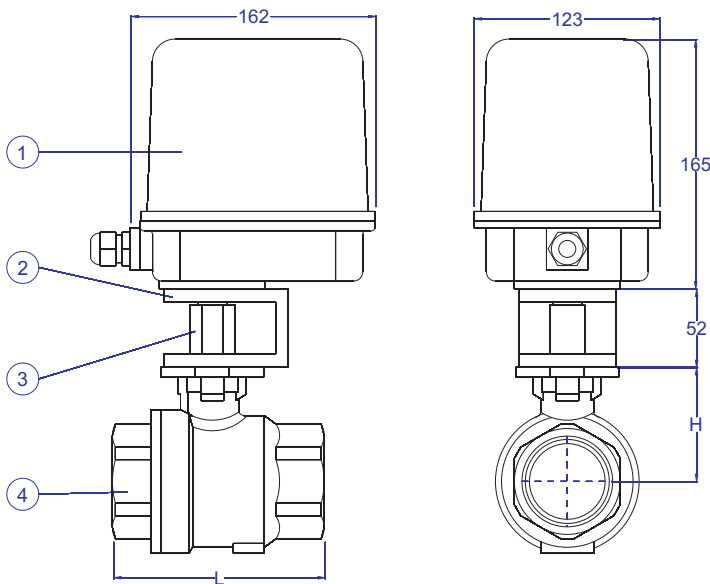


Motor Valve Performance Chart

Fluid	Water, Air, Oil
Fluid Temp.	-5°~120° None Freezing
Max. Pressure Diff.	20kg*f/cm ²
Max. Pressure	10kg*f/cm ²
Fluid Direction	No limitation
Rated Voltage	AC100,110V 50/60Hz AC200,220 50/60Hz
Power Consumption	80VA(Motor) 8VA(Solenoid)
Time For 90°	About 2.5 seconds
Ambient Temp.	0~50°
Installation	Vertical ± 15°
Insulation	IP 65

Wiring Sketch of Actuator





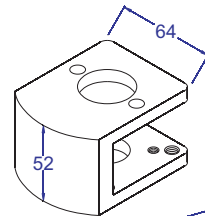
Parts Lists and Material Specifications

No.	Descriptions	Material
1	Motor Actuator	Assembly
2	Mounting bracket	FC20
3	Socket	50BV30 Carbon Steel
4	Ball Valve	CF8M Stainless Steel

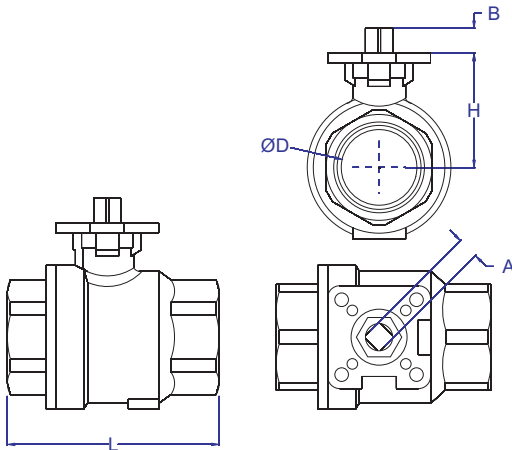
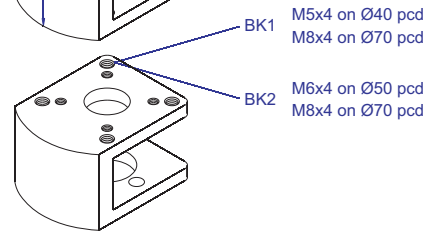
Socket's Dimensions



Type	ST1	ST2	ST3
Connect with Actuator	19	19	19
Connect with Valve stem	9	11	14

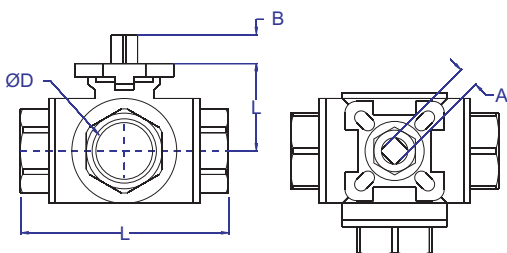


Mounting Bracket Dimensions



2Way Full Port Ball Valve Dimensions

Size	ØD (mm)	L (mm)	H (mm)	A (mm)	B (mm)	ISO 5211	Weight (kg)
1/2"	15	69	35	9	10	F03-F04	0.4
3/4"	20	80	39	9	10	F03-F04	0.5
1"	25.4	90	45	11	14	F04-F05	0.9
1 1/4"	32	106	56	11	14	F04-F05	1.4
1 1/2"	38	120	63	14	19.5	F05-F07	2
2"	50	140	75	14	19.5	F05-F07	3.4



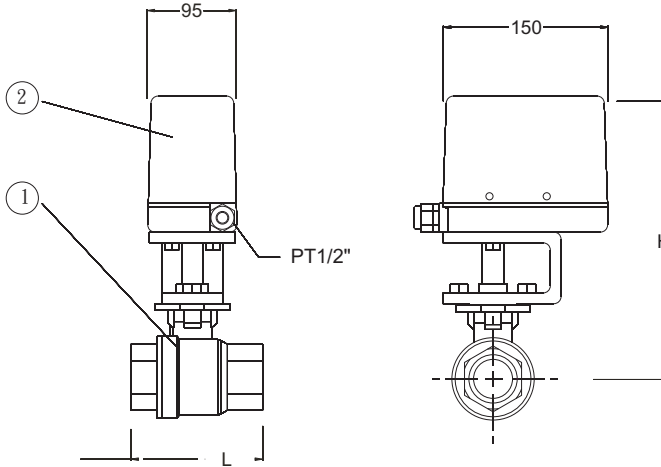
3Way Full Port Ball Valve(L-type or T-type) Dimensions

Size	ØD (mm)	L (mm)	H (mm)	A (mm)	B (mm)	ISO 5211	Weight (kg)
1/2"	15	75	38	9	10	F03-F04	0.9
3/4"	20	86	41	9	10	F03-F04	1.1
1"	25.4	110	47	11	14	F04-F05	1.7
1 1/2"	38	137	68	14	19.5	F05-F07	3.4
2"	50	158	80	14	19.5	F07	6.8



Features:

1. MK 7 actuator is fit for assembling with 2 way / 3 way ball valves.
2. Material of ball valve can be SCS 13 or SCS 14.
3. Acting time is 7 seconds from close position to open position.
4. Pressure range from 0 to 10 kg*f/cm².
5. Potentiometer unit 1K Ohm.(Optional accessories)

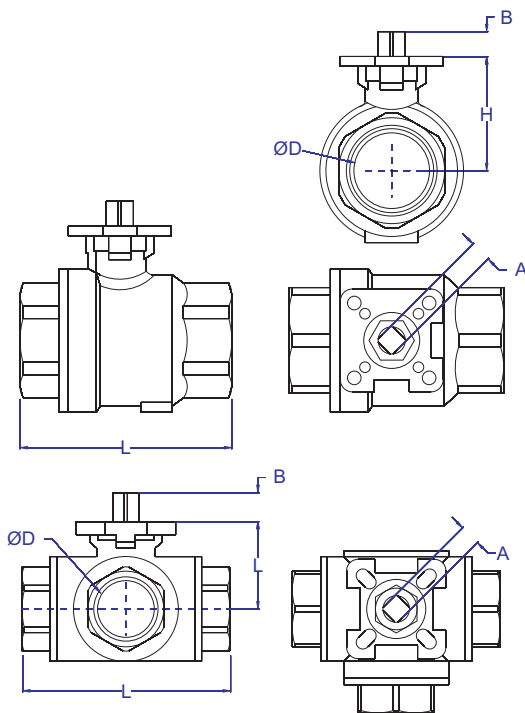


Parts Lists & material specifications

No.	Descriptions	Material
1	Ball Valve	SCS13 OR SCS14
2	Motor Actuator	Assembly

Dimensions (2Way Full Port Ball Valve)

Model	Size	L (mm)	H (mm)	(kg)
MK7-SSP15	15A	69	223	3.5
MK7-SSP20	20A	80	228	3.6
MK7-SSP25	25A	90	233	3.8
MK7-SSP32	32A	106	240	4.2
MK7-SSP40	40A	120	250	5.5
MK7-SSP50	50A	140	260	8.5



Valve performance chart

Fluid	Air, Oil, and Water
Fluid Temp.	-5° ~ 120°
Max. pressure Diff.	10 kg*f/cm ²
Max. Pressure	10 kg*f/cm ²
Test pressure	20 kg*f/cm ²
Fluid direction	No limitation
Rated voltage	AC 100, 110V 50/60Hz
	AC 200, 220V 50/60Hz
Power consumption	80VA
Acting time	7 / seconds (60Hz)
	7.5 / seconds (50Hz)
Ambient Temp.	0 ~ 50°
Installation	Vertical ± 15°
Insulation	Indoor / Outdoor

2Way Full Port Ball Valve Dimensions

Size	ØD (mm)	L (mm)	H (mm)	A (mm)	B (mm)	ISO 5211	Weight (kg)
1/2"	15	69	35	9	10	F03-F04	0.4
3/4"	20	80	39	9	10	F03-F04	0.5
1"	25.4	90	45	11	14	F04-F05	0.9
1 1/4"	32	106	56	11	14	F04-F05	1.4
1 1/2"	38	120	63	14	19.5	F05-F07	2
2"	50	140	75	14	19.5	F05-F07	3.4

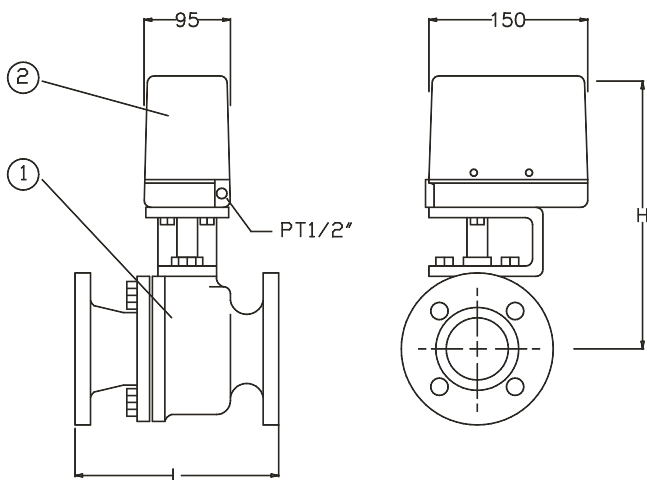
3Way Full Port Ball Valve(L-type or T-type) Dimensions

Size	ØD (mm)	L (mm)	H (mm)	A (mm)	B (mm)	ISO 5211	Weight (kg)
1/2"	15	75	38	9	10	F03-F04	0.9
3/4"	20	86	41	9	10	F03-F04	1.1
1"	25.4	110	47	11	14	F04-F05	1.7
1 1/2"	38	137	68	14	19.5	F05-F07	3.4
2"	50	158	80	14	19.5	F07	6.8



Features:

1. MK 7 actuator is fit for assembling with 2 way / 3 way ball valves.
2. Material of ball valve can be FC 20, SCS13, or SCS14.
3. Acting time is 7 seconds from close position to open position.
4. Pressure range from 0 to 10 kg*f/cm².
5. Potentiometer unit 1K Ohm.(Optional accessories)



Parts Lists & material specifications

NO.	Descriptions	Material
1	Ball valve	FC 20, SCS13, SCS14
2	Motor actuator	Assembly

Dimensions

Model	Size	JIS 10K	L (mm)	H (mm)	Weight (kg)
MK7-20F	20A	FF	120	247	6.5
MK7-25F	25A	FF	130	247	7.5
MK7-32F	32A	FF	140	254	8.9
MK7-40F	40A	FF	165	267	10.0
MK7-50F	50A	FF	180	272	11.5
MK7-65F	65A	FF	190	290	15.5
MK7-80F	80A	FF	200	303	17.0

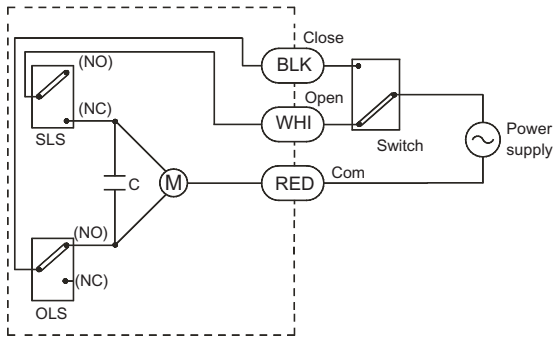
Valve performance chart

Fluid	Air, Oil, and Water
Fluid Temp.	-5° ~ 120°
Max. pressure Diff.	10 kg*f/cm ²
Max. Pressure	10 kg*f/cm ²
Test pressure	20 kg*f/cm ²
Fluid direction	No limitation
Rated voltage	AC 100, 110V 50/60Hz
	AC 200, 220V 50/60Hz
Power consumption	80VA
Acting time	7 / seconds (60Hz)
	7.5 / seconds (50Hz)
Ambient Temp.	0 ~ 50°
Installation	Vertical ± 15°
Insulation	Indoor / Outdoor

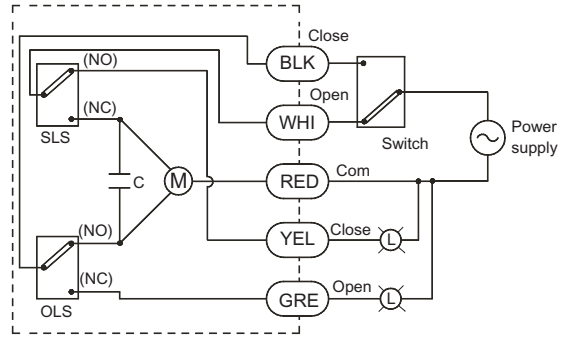


Wiring Sketch of Actuator

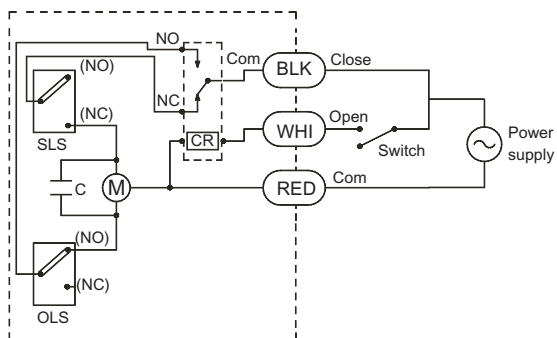
3 wires



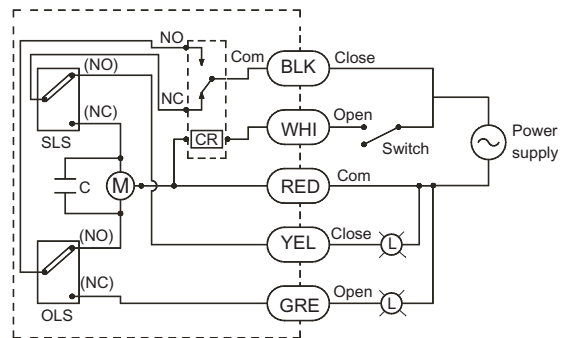
5 wires



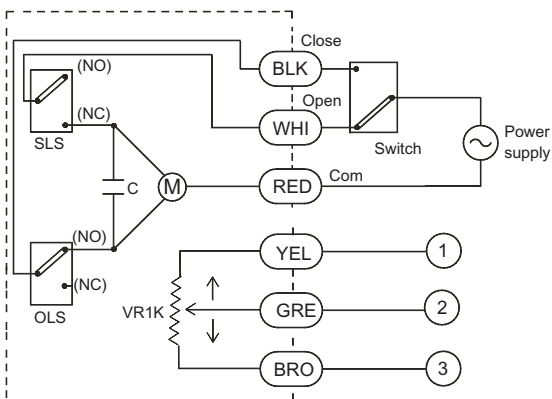
3 wires with relay



5 wires with relay



Potentiometer unit 1k Ohm.(Optional accessories)





Direct acting solenoid valves :

In a direct acting solenoid valves do not require a minimum pressure limitation or minimum flow rate limitation. Pressure range from 0 kgf/cm to catalogue's specified maximum.

Pilot operated solenoid valves :

In a pilot operated solenoid valves with a minimum operating pressure differential (P) and minimum flow rate limitation are necessary.

This is the minimum operating pressure different (P) and minimum flow rate required to operate

the valve and maintain it in full open position. Please refer to catalogue information to match the required condition.

Pilot kick operated solenoid valves :

For pilot kick operated solenoid valves do not require the limitations of the operating pressure differential (P) and minimum flow rate. This series are suitable for using in low pressure location or media supply pressure changed frequently.

Pressure range from 0 kgf/cm to catalogue's specified maximum pressure.