CKD Corporation

SM-9044-A

INSTRUCTION MANUAL

SELEX VALVE

3PA2 · 3PB2

M3PA2 · M3PB2

Please read this operation manual carefully before using this product, particularly the section describing safety.

Retain this operation manual with the product for further consultation whenever necessary.

[EV6-0FC35]

For Safety Use

To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, read this operation manual carefully for proper operation.

Observe the cautions on handling described in this manual, as well as the following instructions :

⚠ Precautions

- Do not touch electric wiring connections (exposed live parts) : this will cause an electric shock. During wiring, keep the power off. Also, do not touch these live parts with wet hands.

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Selex Valve
SM 9044-A

1. PRODUCTS

1-1. Specifications

1) 3P series

(1) Specifications

Model code / Item	3PA2	3PB2
Media	Air	
Type actuation	Direct type, Balanced poppet valve	
Min. Working pressure kPa {mmHg}	−100 {−750}	
Max. Working pressure MPa {kgf/cm²}	0.7 {7}	
Certified withstanding pressure MPa {kgf/cm²}	1.05 {10.7}	
Connecting port diam.	Rc 1/8 (φ6 · φ8Snap joint : optional)	
Effective sectional area mm² (Cv factor)	5 (0.28)	
Ambient temperature °C	−5~50 (Not to be frozen)	
Working fluid temp. °C	5~50	
Responding time ms	Less than 20	
Lubrication	Not required	
Protective structure	Dust proof (Varies depending on wiring type.)	
Manual operation device	Non-lock type, (Lock type optional)	
Mass g	127	176

(2) Electric Specifications

Rated voltage (V)	AC100V (50/60Hz)	AC200V (50/60Hz)	DC24V
Starting current (A)	0.046/0.042	0.023/0.021	—
Holding current (A)	0.028/0.022	0.014/0.011	0.075
Electricity consumption (W) (w/lamp)	1.6/1.3 (1.8/1.5)		1.8 (2.0)
Temperature rising (°C)	30		
Range of voltage fluctuation	±10%		
Class of insulation	Class B		
Wiring type	Grommet lead wire (Terminal box, C type connecter, D type connecter)		
Option	Surge killer · Lamp indicators		

※ Rc is equivalent to PT.
※ Responding time is measured in no lubrication operation.
There is a case some times that time is extended depending on lubricant.
Use turbine oil Class 1, ISO VG 32 if lubrication is prefered.

2) M3P series

(1) Specifications

Model / Item		M3PA2	M3PB2
Type of manifold		Consolidated subplate type	
Applicable solenoid valve		3PA219	3PB219
Effective sectional area mm² (Cv factor)		5 (0.28)	
Number of blocks		2~20 blocks	2~20 blocks (Individual or concentrated type is up to 10 blocks)
Kind of manifold		Port 2 individual, port 1 · 3 concentrated	Port 2 individual, port 1 · 3 concentrated (Ports 2 &·3 indiv. Port 1 concentrated Ports 1 & 2 indiv., Port 3 concentrated)
Wiring type		Grommet lead wire (Terminal box, C type connecter, D type connecter)	
Piping	Port 1	Rc 1/4	Concentrated Rc 1/4, Indiv. Rc 1/8
	Port 2	M5 (φ6 · φ8Snap joint)	Rc 1/8 (φ6 · φ8Snap joint : optional)
	Port 3	Rc 1/4	Concentrated Rc 1/4, Indiv. Rc 1/8
Manual operation device		Non-lock type, (Lock type optional)	

※ Rc is equivalent to PT.
※ Port Nos. 1, 2&3 specify as follows, respectively.
Port 1 ; P, NC
Port 2 ; A, Com.
Port 3 ; R, NO

2. CAUTION

2-1. Quality of Compressed air

Much sludge (such as condensed humidity, oxide oil, tarry compound and foreign particles) is apt to be contained within the compressed air which destructs the reliability of pneumatic equipment remarkably. Consider the following remedies of removing such sludge.

Improve the quality of compressed air by dehumidifying using after-cooler dryer.

1) How to purge drain (sludge)
   Dehumidifying the air by means of after-cooler dryer.
   Removal foreign particles and material by means of filter.
   Removal tarcarbide by means of tar-removing filter.
2) Super dry air
   Use DC drive solenoid valve in case of driving 3P series solenoid valve with super dry air or completely no lubrication operation.
   Servide life will be shortened comparing that of standard operation.

2-2. Cautions to build system with manifold

1) Direction of flow
   One each of Compressed air supply port is provided at both end of manifold block. Make use either one of them.
2) Connecting pipe diameter
   Use the pipe of diameter corresponding to P port size of manifold. Insufficient flow or pressure may cause either malfunction of valve or short propelling force of cylinders.
3) Malfunction of cylinder
   There is potential cause leading to malfunction of cylinder due to intrusion of exhausting pressure when other solenoid valve is actuated during driving single acting cylinder through manifold block.
   As for preventive measure of this trouble, use isolated driving solenoid valve or individual exhaust type manifold.

2
CAUTION

2-3. Range of Operation pressure

1) It is operable within the range from negative −100 kPa (−750mmHg) to positive pressure 0.7MPa (7kgf/cm2). Any port is able to be connected to either pressure or vacuum line due to its mechanism of balanced poppet.
2) This valve is principally different with that for vacuum holding
   Install a filter in between suction cup and valve, particularly when using the valve of this type to operate suction cups to keep foreign particle from intrusion into the system. Otherwise valve leakage may be caused.
3) This valve is principally different with that for emergency shut off valve. Responding time of starting may some time be extended when it is left pressurized for long duration.

2-4. Ambient Conditions

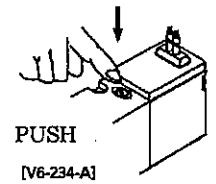
1) Dust
   Mount either silencer or elbow joint to R port keeping its open end downward within the area of much dust or floating foreign particles, to provide protective measurement of keeping those foreign particles from falling into R port.
2) Water drops and cutting coolant
   Instead of leaving water or cutting coolant dripping over the solenoid, either provide a cover or install the solenoid within enclosed panel as it may causes short circuit or coil burning. Prevent allowing cutting coolant drip over cylinder rod because it will result malfunction of solenoid valve due to penetrated coolant to secondary piping of solenoid through cylinder. Contact nearest CKD dealer if the case is as such.
3) Continuous charging
   When it is installed within enclosed control box or charging time is long, take some measure of ventilation or radiation. Otherwise it may cause rising temperature excessively.
4) Corrosive gas ambient
   Prevent installation the valve within the corrosive gas such as sulfurous acid gas. Contact nearest CKD dealer for installation valve in the ambient of sea breeze or splash of sea water.
5) Ambient temperature
   Contact nearest CKD dealer for installation valve in the ambient of high temperature higher than 50°C or such lower temperature as below 5°C.
6) Vibration and Shock
   Prevent installation of valve within the area of 5G or higher vibration and/or 30G or higher shock.

3. OPERATION

3-1. Manual Operation Devices

1) Non-lock type manual operation device

Press manual operation axis till it hits the bottom. Valve will be shifted to the same position as if solenoid coil is energized and returns when axis is released.

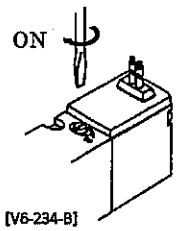


Actuates while button is pressed.

2) Lock type manual operation device

The valve is shifted to the position as if coil is energized when button is turned approx. 90° and is locked. There is only right turn provided. Prevent try to turn further forcively beyond locked point to eliminate possible damage of valve.

Make sure to release manual operation locking before starting normal operation.



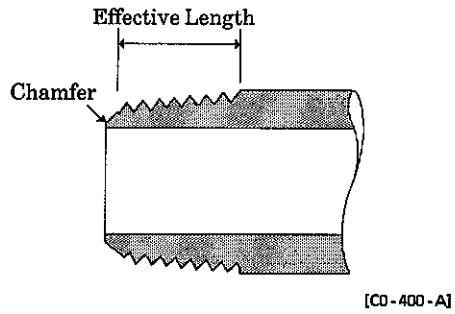
Actuates when turned to direction ON. Keep it OFF for normal operation.

4. INSTALLATION

4-1. Piping

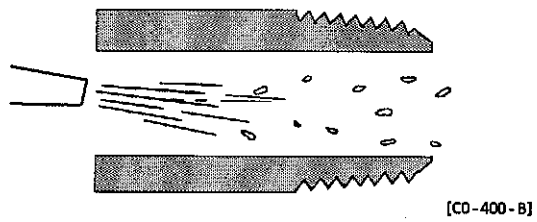
1) For piping beyond the filter, use pipes that hardly get corroded such as galvanized pipes, nylon tubes, rubber tubes, etc.

2) Strictly observe the effective thread length of gas pipe and give a chamfer of approx. 1/2 pitch from the threaded end.



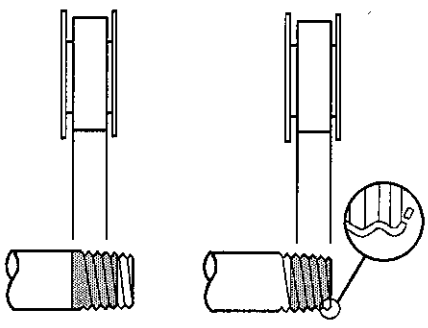
3) Removal of foreign particles.
Rust scales or foreign particles cause malfunction or valve seat leakage. Install an air filter of 5μm mesh preferably adjacent upper-stream to solenoid valve for eliminating rust, foreign substance

4) Flushing
Flush air into the pipe to blow out foreign substances and chips before piping.

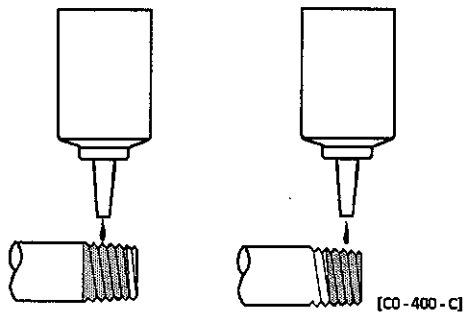


5) Application of sealant
Carefully apply it so as to prevent it from flowing into pipe but sufficient to prevent air leakage.

● Seal Tape



● Sealant (Paste or liquid)



When applying the seal tape of Fluorine resin over threaded pipe, apply it 1~2 layers leaving blank 1~2 pitches of thread off the end of pipe and press it with finger nail to make it stick to thread. Leave the same blank of thread when applying sealant sufficiently but not excessive to prevent it from falling into pipe. Never apply sealant to female threaded part.

6) Tightening torque

Apply appropriate torque referring to the following table for the purpose of preventing leakage and damage.

Connecting thread	Appropriate torque N·m {kgf·cm}
M5	1~1.5 {10~15}
Rc 1/8	3~5 {30~50}
Rc 1/4	6~8 {60~80}

Gasket (Model code : FGS) is used to seal M5. Avoid additional tightening while pressure is on. Design and build the system to provide ample room around piping for hand tools at later maintenance work.

4-2. Applicable tubes

1) Appropriate tubes

Select tubes specified by CKD for solenoid valves with snap joint fittings.

Soft nylon tube (F-1500 series)

Urethane (U-9500 series)

Carefully examine its Outside Diameter accuracy as well as its wall thickness and hardness when selecting commercially available tubes. As for urethane tube hardness, select 93° or over (Rubber hardness gage). There may be slip off trouble or difficulties to slide it over, in case diameter accuracy or hardness of tubes is not met satisfactorily.

OD tolerance

Soft · hard nylon	±0.1mm
Urethane φ4, 6	+0.1mm
	−0.15mm
φ8, 10	+0.1mm
	−0.2mm

Wall thickness of tube

OD mm	ID mm	
	Nylon	Urethane
φ4	φ2.5	φ2
φ6	φ4	φ4
φ8	φ5.7	φ5
φ10	φ7.2	φ6.5

2) Bending radius of tube

Apply tube bending radius more than the least bending radius posted in the table below. Otherwise it may cause slipping off or leakage.

Tube diam.	Least bending radius mm	
	Nylon	Urethane
φ4	10	10
φ6	20	20
φ8	30	30
φ10	40	40

4-3. Electric wiring

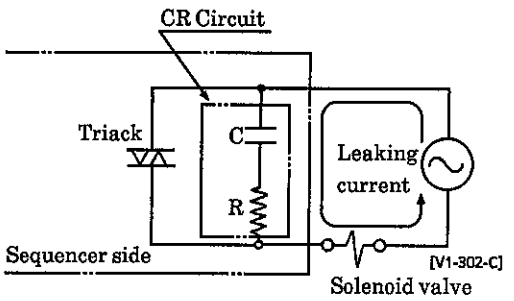
1) Cautions of wiring
   (1) Install a 0.5 ~1A fuse in the circuit to provide a protection.
   (2) It is recommended the use of snap action switch(es) such as relay or magnetic switch to build a circuit.
   (3) Use connector type (C, C1, C2 & C3) in the area with least amount of dust and where no splashing water or oil takes place.
   (4) Maintain voltage within the variation of± 10% of the rated voltage.

2) Limitation of leaking current

Be extremely careful that it apt to give some undesirable effect to the function of product due to the leaking current through the CR element, when attempting to make use of the sequencer which has built-in CR circuit for absorbing surge voltage from the switching element.

Regulate the residual leaking current within the limitations as shown in the following table.

Lead current	Unit : mA
AC 200V	1.5
AC 100V	3
DC 24V	1.8



3) Polarity of solenoid coil

Confirm the electric circuit as there are some models of DC solenoid with lamp and surge killer.

4-4. Cautions of terminal box wiring

1) Connect the wire to 1 & 2 for wiring to the terminals. Use the wire of core sectional area 0.5 ~0.75mm^2. (Use cabtyre cable of OD ϕ4.5~7 where water-proof or dust-proof is required.)

2) Comply with the wiring steps (1)~(3) referring to the illustration below.

(1) Insert Cable⑦ through Cable grand④, washer⑤ and rubber packing⑥ then housing②.

(2) When crimping terminals are to be used, process the ends of cable⑦ per illustrated with appropriate length then crimp terminal⑨ on the tip of wire.

(3) By removing the set screw⑩ from the terminal stand③, insert it through crimp terminal⑨ (When terminal metal is Y-terminal, insert it underneath the washer of loosened set screw⑩), then tighten the terminal screw⑩.

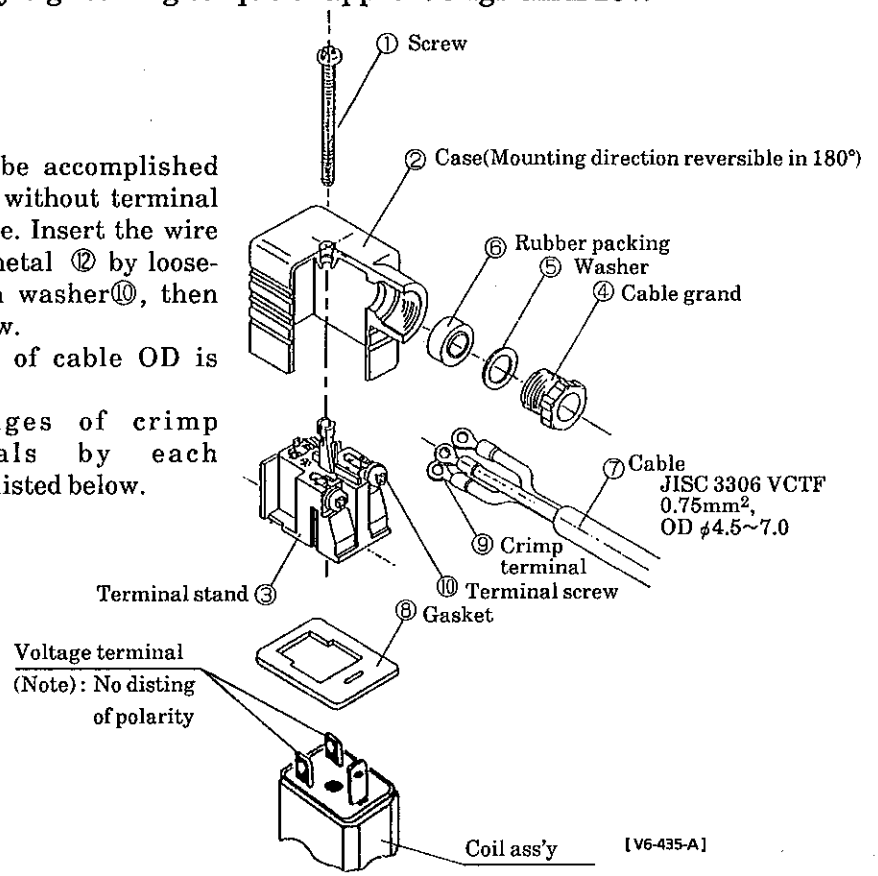
(Note) : Apply tightening torque of approx. 5kgf-cm±15%

Remarks

a. Wiring is able to be accomplished with peeled wire tip without terminal metal. Insert the wire. Insert the wire tip underneath the metal ⑫ by loosening set screw with washer⑩, then tighten back the screw.

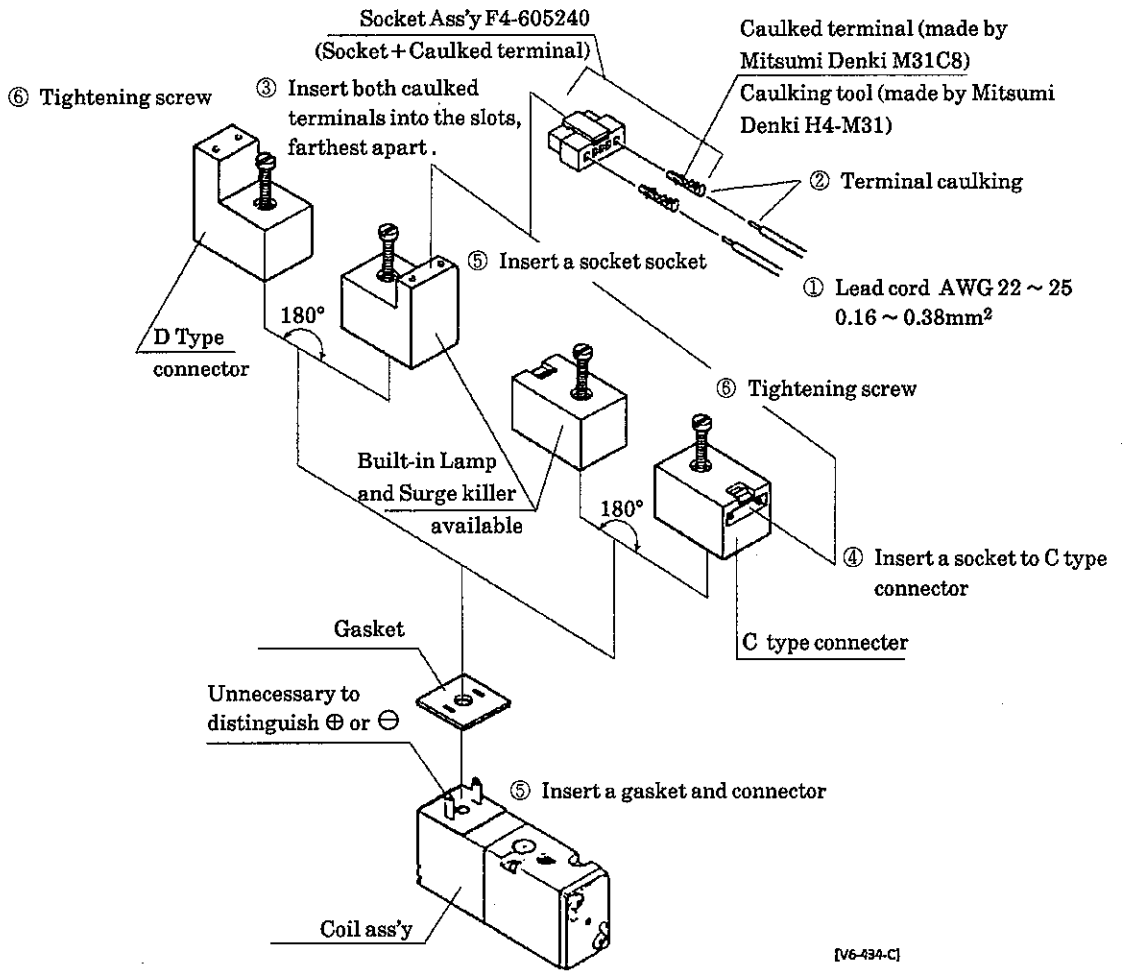
b. Serviceable range of cable OD is ϕ4.5~7.0mm

c. Serviceable ranges of crimp terminal⑨ metals by each manufacturer are as listed below.



Nichifu Terminal Industries		Fuji Terminal Industries		Nippon Crimp Terminal Industries	
O Terminal	Y terminal	O Terminal	Y terminal	O Terminal	Y terminal
0.3 - 3	0.3 - 3	1.25 - 3	1.25 - YAS3	0.5 - 3	1.25 - B3A
1.25 - 3	1.25Y - 3		1.25 - YAS3.5	1.25 - 3	1.25 - C3A
1.25 - 3S	1.25Y - 3S				

3) Wiring of C type and D type connecter
Wire in the sequence of ①~⑤.



4-5. Installation of Peripheral equipments

1) Air filter

Select the air filter with a filter element of 5μm mesh or smaller.(Refer to CKD's SELEX air filter catalog.) Also, periodically purge drain.

2) Lubricator

Models 3P series are serviceable with no lubrication. It is recommended, if lubrication is preferred due to peripheral equipment, to use Turbine oil, Class 1, ISO VG32 (Additive free) or equivalent, but maintain volume only to the extent of reasonable.

Specified factor of responding time is when charged at pressure of 0.5MPa (5 kgf/cm^2).

5. MAINTENANCE

5-1. Periodic Inspection

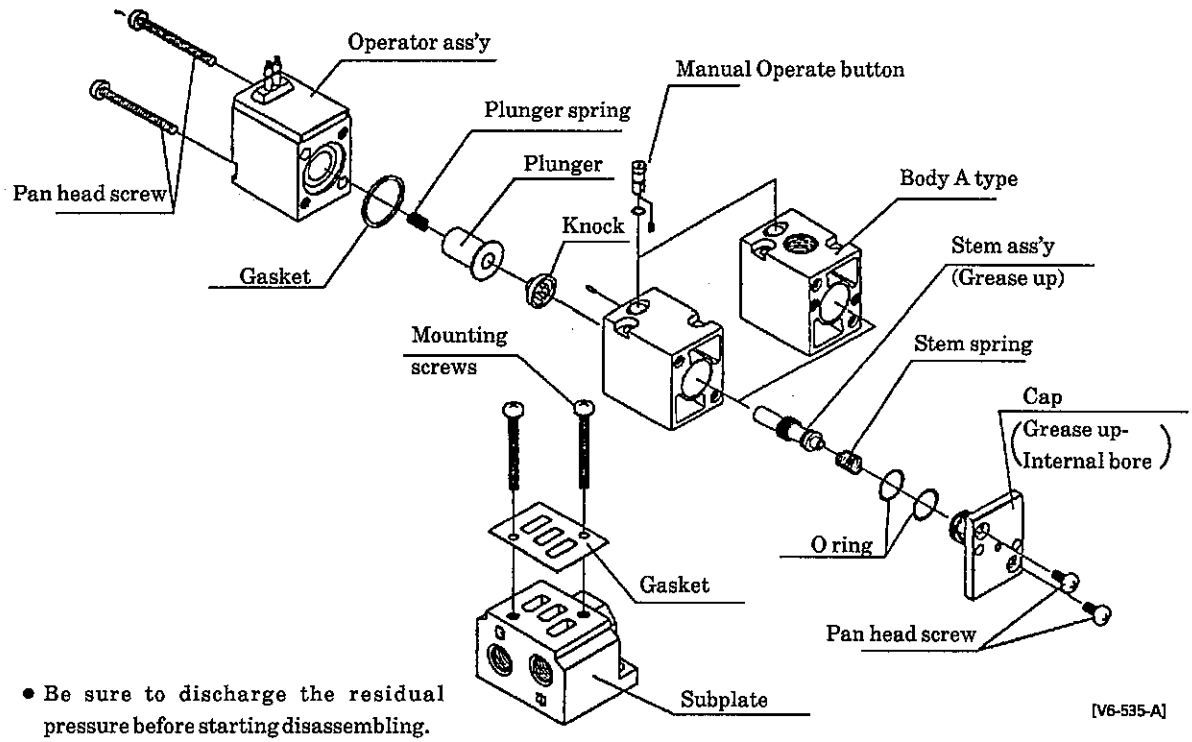
1) Conduct periodic inspection(s) once or twice per annum for the best service condition of solenoid valves.
2) Items to inspect
   (a) Inspect for dust or foreign particle and high viscosity substitute within valve. Disassemble valve and remove them if their existence is realized.
   (b) Principally eliminate trying to disassemble neither coil nor valve. Refer the disassembling drawing in the case when doing so is mandatorily required.

5-2. Trouble Shooting

Motion troubles	Suspected cause	Remedies
Does not actuate	No electric signals	Turn on the power
	Damage to signal wiring system	Repair the control circuit
	Excessive fluctuating range of current or voltage	Reaffirm the power capacity. (within ±10% of voltage pressure fluctuation)
Malfunctions	Excessive leaking current	Correct control circuit and/or set a bleed circuit
	Chattering	Inspect switching system and/or tighten each loosen terminal screw
	Voltage deviates than specified on the name plate	Rectify the voltage to meet the specification
	Damaged or short circuited coil	Replace the coil
	Erroneous shut off pressure source	Turn on the power source
	Insufficient pressure	Reset the pressure reducer valve or install a pressure raising valve
	Insufficient flow of fluid	Rectify the size of pipe or install a surge tank
	Erroneous piping, erroneous omitting some piping	Rectify the piping system
	Speed control valve completely closed by error	Reset the needle valve
	Sticky stem Sticking tarry or liquid jelly substitute	Carry out pipe dressing Operate it periodically
	Valve is frozen	Add remedies of avoiding freezing (Heating system or dehumidifying system etc.)
	Delayed return of a plunger (Excessive oil, existence of tar)	Check the quality of the lubricant. (Turbine oil class 1, ISO VG 32 or equivalent)
	〃	Rectify the quantity of lubricant drip
	〃	Install a tar removing filter
	Clogged-up exhausting port with dust	Install a cover or silencer and clean it regularly.
Internal leakage	Bulged or decomposed packings Initial lubricant is washed off or excessive lubricants	Check the quality of the lubricant. (Turbine oil class 1, ISO VG 32 or equivalent)
	〃	Relocate the valves away from splashing area of cutting coolant
	〃	Keep organic chemicals away from valves.
	Initial lubricant is washed off or drain contamination.	Change the piping to an external pilot system. Install dryer, Filter or grease up. Grease it up
	Foreign particles cut into packing lips.	Remove the foreign particle away from the packing Install a filter.
Malfunctions when manifold is used.	Delayed response when multiple blocks are used. Insufficient air supply flow.	Install Sup.(P) piping to P ports on both sides of manifold block
	Delayed response when multiple blocks are used. Insufficient exhaust air flow.	Connect Exh.(R) piping to R ports on both sides of manifold block so as to exhaust to an open air through
	Adjacent cylinder pops out. Intrusion of exhaust air.	Rewire to have the solenoid valve in question is actuated prior to others sequentially. Increase exhaust air Change type to individual exhaust

5-3. Disassembl

1) 3PA210, 3PB210



• Be sure to discharge the residual pressure before starting disassembling.

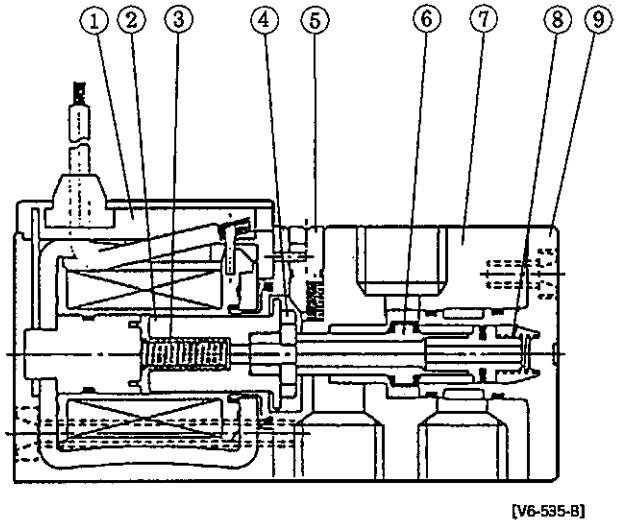
2) Disassembling and assembling Operator ass'y
- Operator ass'y can be taken out by removing pan head screws. It is to be carried out when Noise at charge is generated, malfunction and/or broken wire.
- Wash parts or blow coil inside or replace it with a new one.
- Carefully avoid slipping gasket out and contamination with foreign particles.

3) Disassembling and assembling Poppet valve component
- Poppet component can be taken out by removing pan head screws. It is to be carried out when delayed functioning or leakage taken place.
- Wash parts or blow coil inside or replace it with a new one.
- Carefully avoid giving striking indentation because each part is vitally important component for sealing effect.
- Eliminate of using organic solvent. There is potentiality of deterioration of rubber parts or malfunction due to swollen rubber parts.

- Take the reversed sequence of disassembling to assemble it back. Avoid minor assembling forgotten, O ring getting out of place or leaving loosen screws. (Tightening torque : 0.7~0.9N · m)
- Apply our recommending Fluorine grease, Denum TM Grease L200 (product of Daikin Co., Ltd.) over sliding parts, body guide part and packing of stem ass'y.

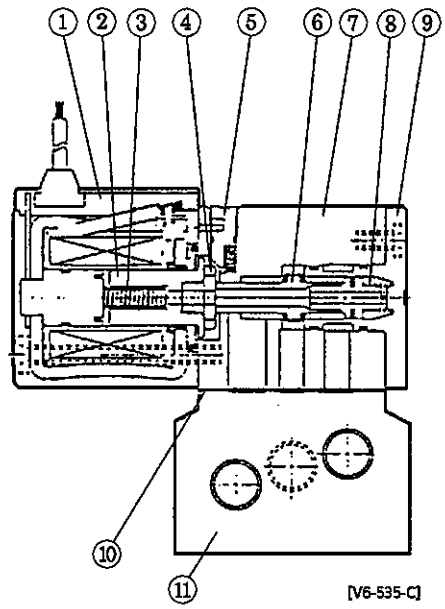
5-4. Internal Structure and Parts List

- 3PA210



No.	Parts	Material	
①	Coil ass'y		
②	Plunger	SUS405	Stainless steel
③	Spring	SUS304	Stainless steel
④	Knock pin	POM	Polyacetal
⑤	Manual operation	POM	Polyacetal
⑥	Stem ass'y		
⑦	Body	ADC12	Die casted aluminum
⑧	Spring	SUS304	Stainless steel
⑨	Cap	PPS	Polyphenilene Sulphate

- 3PB210



No	Parts	Material	
①	Coil ass'y		
②	Plunger	SUS405	Stainless steel
③	Spring	SUS304	Stainless steel
④	Knock pin	POM	Polyacetal
⑤	Man. opr. button	POM	Polyacetal
⑥	Stem ass'y		
⑦	Body	ADC12	Die casted aluminum
⑧	Spring	SUS304	Stainless steel
⑨	Cap	PPS	Polyphenilene Sulphate
⑩	Gasket	NBR	Nitril rubber
⑪	Subplate	ADC12	Die casted aluminum

Expendable Spare Parts

No. and parts / Model Code	①②③④ Coil ass'y ※
3PB210	3P2 - © Wiring option mark - (No marking for grommet lead wire) Coil - Voltage

※1 Plunger ass'y is attached to Coil ass'y. Avoid changing combination with other plunger as there is restriction.

※2 Specified model of connecter type is assembled to small terminal box of Coil ass'y and delivered with.

※3 Contact to the nearest CKD dealer when intending to build coil ass'y in the valve because a precise care is required.

6. HOW TO ORDER

6-1. 3PA2series

Direct Piping 3PA210 – (06) – ( ) (C2) (P) – (3)
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Ⓐ Connecting port diam	
Symbol	Ports 1, 2 & 3
06	06
GS6	φ6 Snap joint
GS8	φ8 Snap joint

GS6 is build up by screwing snap joint GMS6-6 into Ports 1, 2 & 3.
GS8 is build up by screwing snap joint GSS8-6 into Ports 1, 2 & 3.

Ⓑ Manual Operation Device	
Symbol	Content
No code	Non-lock type Man. Opr. Dev.
M1	Lock type Man. Opr. Dev.

Ⓒ Wiring types	
Symbol	Content
No code	Grommet lead wire (standard)
B	Terminal box
L	Terminal box w/lamp
L2	Terminal box w/lamp and lead wire
C	C type connecter w/300mm lead wire
C1	C type connecter without lead wire
C2	C type connecter w/300mm lead wire, surge killer and lamp
C3	C type connecter w/surge killer and lamp but lead wire
D	D type connecter w/300mm lead wire
D1	D type connecter without lead wire
D2	D type connecter w/300mm lead wire, surge killer and lamp
D3	D type connecter w/surge killer and lamp but lead wire

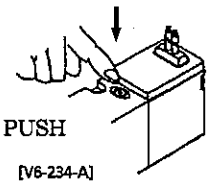
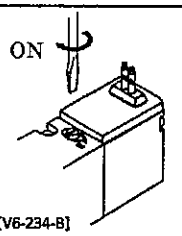
Ⓓ Other options	
Symbol	Content
No code	without Mounting board
P	w/Mounting board
S	Surge killer attached

S: Only Surge killer attached to DC grommet lead wire is subression type (diode)

Ⓔ Voltage		
Symbol	Content	
1	AC100V 50/60Hz	Standard
2	AC200V 50/60Hz	
3	DC24V	
AC110V	AC110V 50/60Hz	Option
AC220V	AC220V 50/60Hz	
DC12V	DC12V	

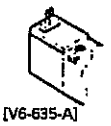
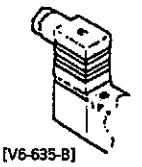
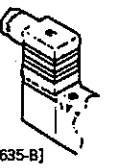
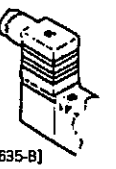
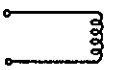
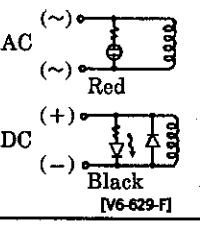
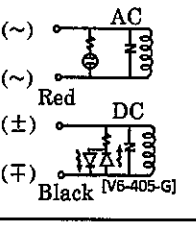
Detailed explanations of Models Ⓑ, Ⓒ & Ⓓ

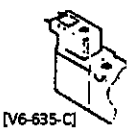
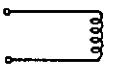
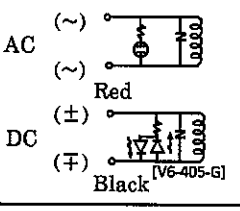
Ⓑ Manual Operation Device

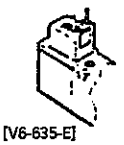
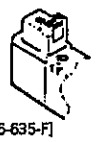
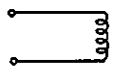
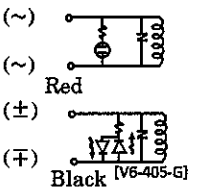
Name	Non-locking type manually operating device	Locking type manually operating device
Option marking	No code	M1
Type	 [V6-234-A] Keeps actuating while holding it down.	 [V6-234-B]

It actuates by setting it ON. Keep it OFF position normally.

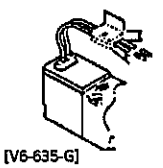
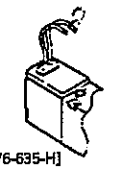
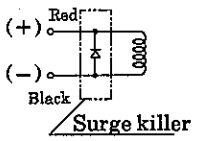
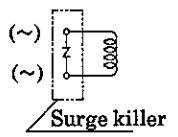
Ⓒ Wiring types

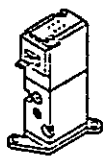
Name	Grommet Lead cord (Standard)	terminal box	Terminal box w/Lamp	Terminal box w/lamp and lead wire
Option marking	No code	B	L (L2)	LS
Type	 [V6-635-A]	 [V6-635-B]	 [V6-635-B]	 [V6-635-B]
Circuit	 [V6-405-E]	 [V6-629-F]	 [V6-405-G]	

Name	C type connecter w/300mm lead wire	C type connecter without lead wire	C type connecter w/300mm lead wire, surge killer and lamp	C type connecter w/surge killer and lamp but lead wire
Option marking	C	C1	C2	C3
Type	 [V6-635-C]	 [V6-635-D]	 [V6-635-C]	 [V6-635-D]
Circuit	 [V6-405-E]	 [V6-405-G]		

Name	D type connecter w/300mm lead wire	D type connecter without lead wire	D type connecter w/300mm lead wire, surge killer and lamp	D type connecter w/surge killer and lamp but lead wire
Option marking	D	D1	D2	D3
Type	 [V6-635-E]	 [V6-635-F]	 [V6-635-E]	 [V6-635-F]
Circuit	 [V6-405-E]		AC (~) (~) Red DC (±) (∓) Black  [V6-405-G]	

Ⓓ Other options

Name	Surge killer attached	
Option marking	S	
Type	 [V6-635-G]	 [V6-635-H]
Circuit	Polarities exists on surge killer.  (+) Red (−) Black Surge killer [V6-629-L]	 (~) (~) Surge killer [V6-629-M]

Name	Mounting plate
Option marking	P
Type	 [V6-634-A]

6-2. M3PA2 series

※ Solenoid valve alone for manifold

3PA219 – 06 – ◯ C2 ◯ ——— 3

Manifold

M3PA2 8 0 – 06 – ◯ C2 ◯ – 2 – 3

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ

Ⓐ Shifting position	
Symbol	Content
1	2-position, single
8	Mixd manifold

Ⓑ Connecting port diam.			
Symbol	Port 2 Individual	Port 1	Port 3
06	06	Rc1/4 concentrated	
GS6	ϕ6 Snap joint		
GS8	ϕ8 Snap joint		

GS6 is built up by screwing snap joint GMS6-6 into Ports 1, 2 & 3.
GS8 is built up by screwing snap joint GSS8-8 into Ports 1, 2 & 3.

Ⓒ Manual Operation Device	
Symbol	Content
No code	Non-lock type Man. Opr. Dev.
M1	Lock type Man. Opr. Dev.

Ⓓ Wiring types	
Symbol	Content
No code	Grommet lead wire (standard)
B	Terminal box
L	Terminal box w/lamp
L2	Terminal box w/lamp and lead wire
C	C type connecter w/300mm lead wire
C1	C type connecter without lead wire
C2	C type connecter w/300mm lead wire, surge killer and lamp
C3	C type connecter w/surge killer and lamp but lead wire
D	D type connecter w/300mm lead wire
D1	D type connecter without lead wire
D2	D type connecter w/300mm lead wire, surge killer and lamp
D3	D type connecter w/surge killer and lamp but lead wire

Ⓔ Other options	
Symbol	Content
S	Surge killer attached

S: Only Surge killer attached to DC grommet lead wire is subression type (diode)

Ⓕ Number of blocks	
Symbol	Content
2	2 blocks
⟆	⟆
20	20 blocks

Ⓔ Voltage		
Symbol	Content	
1	AC100V 50/60Hz	Standard
2	AC200V 50/60Hz	
3	DC24V	
AC110V	AC110V 50/60Hz	Option
AC220V	AC220V 50/60Hz	
DC12V	DC12V	

When building a system using one kind of manifold

M3PA210-06-7-1

It denotes to be a 3PA2 manifold: 2-position, single solenoid, port 2, Rc 1/8 size piping, 7 blocks, AC100V, 50/60Hz.

Mixed Manifold

- Describing procedure of Combination concept

When ordering mixed combined manifold (marking 8 in column of Ⓐ), affix the solenoid valve information (type of function, quantity intended and sequential location in combination). An example of coding description depending upon individual function (marking left block No.1) and its sequential location is shown in the last line of this note.

When function list is as follows :

Symbol	Function
S1	2-positon, Single
MP	Masking plate

1	2-positon, Single, (S1)
2	2-positon, Single, (S1)
3	2-positon, Single, (S1)
4	2-positon, Single, (S1)
5	2-positon, Single, (S1)
6	MP
7	MP

Model code indication for connecting port 06, AC100V with lay-out as above table (right) is ;

Example of model code

M3PA280-M5-7-2-[5][2]

S1 MP

(S1=1, 2, 3, 4, 5 MP=6, 7)

Use alphabetic letters in sequence when anticipating to use more than blocks of same model to build up mix manifolds.

Number of actuators scheduled	10	11	12	13	14	15	16	17	18	19
Alphabettic marking	A	B	C	D	E	F	G	H	I	J

6-3. 3PB2 series

Direct Piping 3PB210 – (06) – ( ) (C2) (P) – (3)
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Ⓐ Connecting port diam	
Symbol	Ports 1, 2 & 3
06	Rc 1/8
08	Rc 1/4

Ⓑ Manual Operation Device	
Symbol	Content
No code	Non-lock type Man. Opr. Dev.
M1	Lock type Man. Opr. Dev.

Ⓒ Wiring types	
Symbol	Content
No code	Grommet lead wire (standard)
B	Terminal box
L	Terminal box w/lamp
L2	Terminal box w/lamp and lead wire
C	C type connecter w/300mm lead wire
C1	C type connecter without lead wire
C2	C type connecter w/300mm lead wire, surge killer and lamp
C3	C type connecter w/surge killer and lamp but lead wire
D	D type connecter w/300mm lead wire
D1	D type connecter without lead wire
D2	D type connecter w/300mm lead wire, surge killer and lamp
D3	D type connecter w/surge killer and lamp but lead wire

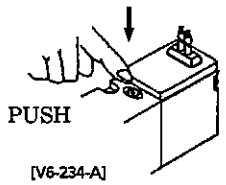
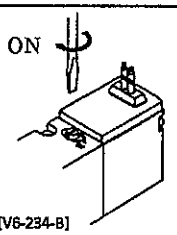
Ⓓ Other options	
Symbol	Content
S	Surge killer attached

S: Only Surge killer attached to DC grommet lead wire is subression type (diode)

Ⓔ Voltage		
Symbol	Content	
1	AC100V 50/60Hz	Standard
2	AC200V 50/60Hz	
3	DC24V	
AC110V	AC110V 50/60Hz	Option
AC220V	AC220V 50/60Hz	
DC12V	DC12V	

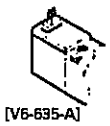
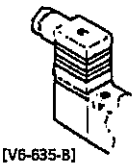
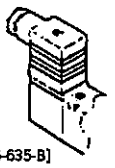
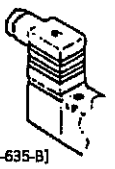
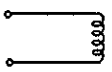
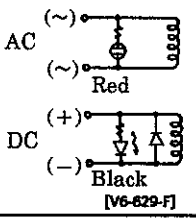
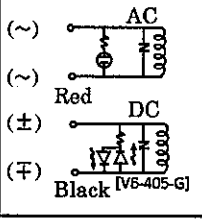
Detailed explanations of Models Ⓑ, Ⓒ & Ⓓ

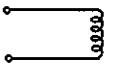
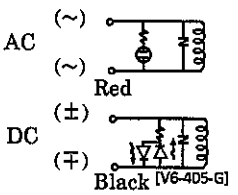
Ⓑ Manual Operation Device

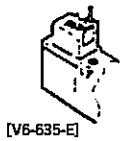
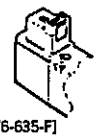
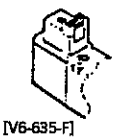
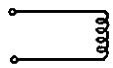
Name	Non-locking type manually operating device	Locking type manually operating device
Option marking	No code	M1
Type	 [V6-234-A] Keeps actuating while holding it down.	 [V6-234-B]

It actuates by setting it ON. Keep it OFF position normally.

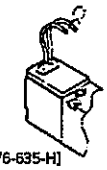
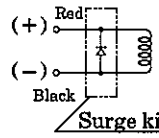
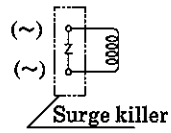
Ⓒ Wiring types

Name	Grommet Lead cord (Standard)	terminal box	Terminal box w/Lamp	Terminal box w/lamp and lead wire
Option marking	No code	B	L (L2)	LS
Type	 [V6-635-A]	 [V6-635-B]	 [V6-635-B]	 [V6-635-B]
Circuit	 [V6-405-E]	 [V6-629-F]		 [V6-405-G]

Name	C type connecter w/300mm lead wire	C type connecter without lead wire	C type connecter w/300mm lead wire, surge killer and lamp	C type connecter w/surge killer and lamp but lead wire
Option marking	C	C1	C2	C3
Type	 [V6-635-C]	 [V6-635-D]	 [V6-635-C]	 [V6-635-D]
Circuit	 [V6-405-E]	 [V6-405-G]		

Name	D type connecter w/300mm lead wire	D type connecter without lead wire	D type connecter w/300mm lead wire, surge killer and lamp	D type connecter w/surge killer and lamp but lead wire
Option marking	D	D1	D2	D3
Type	 [V6-635-E]	 [V6-635-F]	 [V6-635-E]	 [V6-635-F]
Circuit	 [V6-405-E]		AC (~) (~) Red DC (±) (∓) Black [V6-405-G]	

Ⓓ Other options

Name	Surge killer attached	
Option marking	S	
Type	 [V6-635-G]	 [V6-635-H]
Circuit	Polarities exists on surge killer.  [V6-629-L]	 [V6-629-M]

6-4. M3PB2 series

※ Solenoid valve for manifold: 3PB219 - 00 – ( ) C2 ( ) ——— 3

Manifold: M3PB2 8 0 – 06 – ( ) B ( ) – 2 – 3

Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ Ⓖ

Ⓐ Shifting position

Symbol	Content
1	2-position, single
8	Mixd manifold

Ⓑ Connecting port diam.

Symbol	Port 2 Individual	Port 1	Port 3
06	Rc 1/8	Rc1/4 concentrated	
GS6	ϕ6 Snap joint		
GS8	ϕ8 Snap joint		
06Y	Rc 1/8 Rear		
06A	Rc 1/8	Rc1/4 concentrated	Rc1/4 concentrated
06B	Rc 1/8	Rc1/8 Individual	Rc1/8 Individual

GS6 is built up by screwing snap joint GMS6-6 into Ports 1, 2 & 3.
GS8 is built up by screwing snap joint Gss8-6 into Ports 1, 2 & 3.
Contact the nearest CKD dealer as for special base order.

Ⓒ Manual Operation Device

Symbol	Content
No code	Non-lock type Man. Opr. Dev.
M1	Lock type Man. Opr. Dev.

Ⓓ Wiring types

Symbol	Content
No code	Grommet lead wire (standard)
B	Terminal box
L	Terminal box w/lamp
L2	Terminal box w/lamp and lead wire
C	C type connecter w/300mm lead wire
C1	C type connecter without lead wire
C2	C type connecter w/300mm lead wire, surge killer and lamp
C3	C type connecter w/surge killer and lamp but lead wire
D	D type connecter w/300mm lead wire
D1	D type connecter without lead wire
D2	D type connecter w/300mm lead wire, surge killer and lamp
D3	D type connecter w/surge killer and lamp but lead wire

Ⓔ Other options

Symbol	Content
S	Surge killer attached

S: Only Surge killer attached to DC grommet lead wire is subression type (diode)

Ⓕ Number of blocks

Symbol	Content
2	2 blocks
⟆	⟆
20	20 blocks

Ⓖ Voltage

Symbol	Content	
1	AC100V 50/60Hz	Standard
2	AC200V 50/60Hz	
3	DC24V	
AC110V	AC110V 50/60Hz	Option
AC220V	AC220V 50/60Hz	
DC12V	DC12V	

When building a system using one kind of manifold

M3PB210-06-7-1

It denotes to be a 3PB2 manifold: 2-position, single solenoid, Port 2, Rc 1/8 side piping, 7 blocks, AC100V, 50/60Hz.

Mixed Manifold

- Describing procedure of Combination concept

When ordering mixed combined manifold (marking 8 in column of Ⓐ), affix the solenoid valve information (type of function, quantity intended and sequential location in combination). An example of coding description depending upon individual function (marking left block No.1) and its sequential location is shown in the last line of this note.

When function list is as follows :

Symbol	Function
S1	2-positon, Single
MP	Masking plate

1	2-positon, Single, (S1)
2	2-positon, Single, (S1)
3	2-positon, Single, (S1)
4	2-positon, Single, (S1)
5	2-positon, Single, (S1)
6	MP
7	MP

Model code indication for connecting port M5, AC100V with lay-out as above table (right) is ;

Example of model code

M3PB280-06-7-2- [5][2]

S1 MP

(S1=1, 2, 3, 4, 5 MP=6, 7)

Use alphabetic letters in sequence when anticipating to use more than blocks of same model to build up mix manifolds.

Number of actuators scheduled	10	11	12	13	14	15	16	17	18	19
Alphabettic marking	A	B	C	D	E	F	G	H	I	J