F

MODULES

SEWON'S Modular Valves are stack type valves, and require on piping. They not only rationalise system build, but they also meet the technical requirements for a variety of hydraulic systems. Stacking systems is a new era in hydraulics.
The valves have standardized mounting surface conforming to ISO4401 and optimum thickness for each size. Any hydraulic circuits can be easily composed by stacking the valves with mounting bolts. The valves can be used widely for hydraulic systems for various industries such as machine tools, special purpose machines, ships and steel mill equipment

Valve Type	Max. Operating Pressure MPa {kgf/cm²}	Maximum Flow L/min (1 2 3 5 7 10 20 30 50 70 100 200 300 500 700 1000)	Page
01 Series Modular Valves	31.5 {321}	01 01★	F-7
03 Series Modular Valves	25 {255}	03 03★	F-27
06 Series Modular Valves	25 {255}	06	F-45

★Maximum Flow for Throttle and Check Modular Valves.

Hydraulic Fluies

1. Fluid Type

Any type of hydraulic fluid listed in the table below can be used.

Petroleum Base Oils	Use fluies equivalent to ISO VG 32 or VG 46.
Synthetic Fluids	Use phosphate ester or polyol ester fluids. When phosphate ester fluid is used, prefix "F-" to the model number because seals (fluororubber) are required to be used.
Water-containing Fluids	Use water-glycol fluid.

Note: For use with hydraulic fluids other than those listed above, please consult your SEWON representatives in advance.

2. Recommended Fluid Viscosity and Temperature

Use hydraulic fluids which satisfy the both recommended viscosity and oil temperatures given in the table below.

Name	Viscosity	Temperature
01 Series Modular Valves 03 Series Modular Valves 06 Series Modular Valves	15~400mm²/s	-15℃~+70℃

3. Control of Contamination

Due caution must be paid to mainatining control over contamination of the hydraulic fluids which may otherwise lead to breakdowns and shorten the life of the valve.

Name	Contamination	Nominal Filtration
01 Series Modular Valves 03 Series Modular Valves 06 Series Modular Valves	Within NAS1638-Grade 12	25 μm or less

High Pressure, High Flow Rate Modular Valves

Features

1. Installation and mounting space can be minimized.
2. No special skill is required for assembly and any addition or alteration of the hydraulic circiut can be made quickly and easily.
3. Problems such as oil-leaks, vibration and noise which may be caused by piping are minimized, increasing the reliability of the hydraulic system.
4. Maintenance and system check-ups can be easily carried out as they are normally installed in stackable units.

Specifications

Series	Valve Size	Max. Operating Pressure MPa{kgf/cm²}	Max.Flow L/min	Number★2 of Stack
01 Series Modular Valve	1/8	31.5 {321}	35(60)★1	1~5★3
03 Series Modular Valve	3/8	25 {255}	70(120)★1	1~5
06 Series Modular Valve	3/4	25 {255}	500	

★1. The values in parentheses represent the max.flow rates for throttle modular valves(MSP) and throttle check modular valves(MSA/MSB/MAW).
★2. Solenoid operated directional valve is included in the number of stack.
★3. Solenoid operated directional valve is included in the number of stack. If the working pressure is above 25 MPa {255kgf/cm²}, the maximum number of larers in a stack is 4 including the solenoid operated directional valve.

Mounting Surface

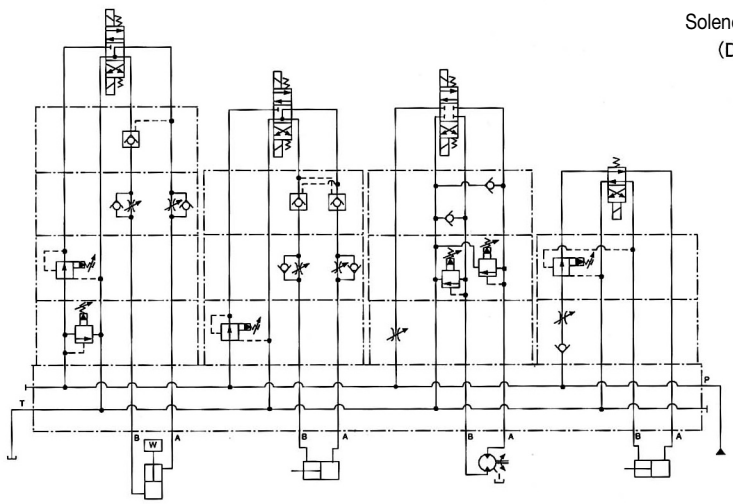
●01~10 Series

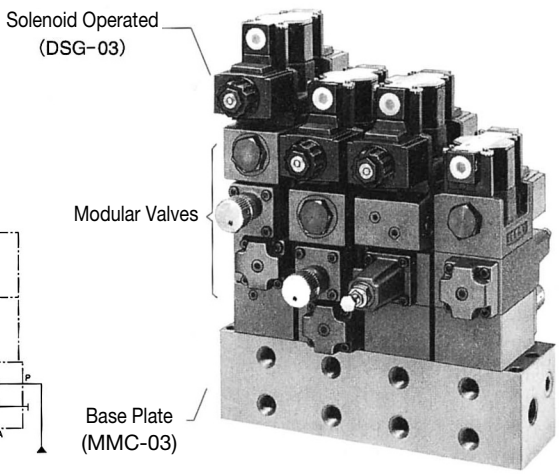
Mounting surface dimensions conform to ISO 4401(Hydraulic fluid power four port directional control valves mounting surface) as listed in the table below.

Name of Valve	ISO Mtg.Surface Code No.
01 Series Modular Valve	ISO 4401-AB-03-4-A
03 Series Modular Valve	ISO 4401-AC-05-4-A
06 Series Modular Valve	ISO 4401-AE-08-4-A

Stacking Example

●03 Series





Instructions

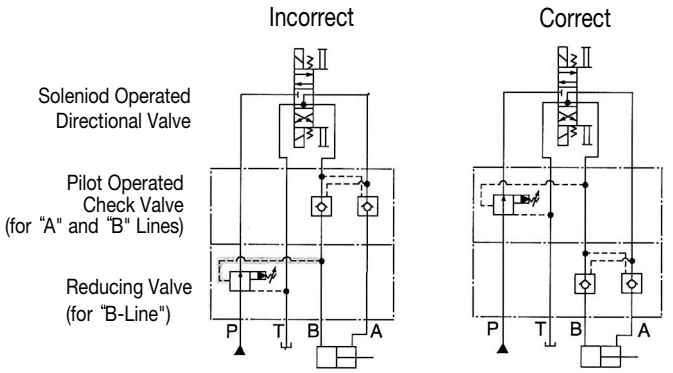
Caution in the selection of valves and circuit designing

The selection of modular valves, to suit a particular function or hydraulic circuit, are made in exactly the same way as conventional valves, taking into account of the flow and pressure of each valve to be used. In some cases, the stacking system may be restricted, so please refer to the following instructions for stacking sequence. Please note, that when designing a system using modular stacking valves, due consideration should be given to working space for future maintenance.

●Stacking sequence when using reducing valves (for "A" or "B" line) and pilot operated check valves.

Because reducing valves are spool type, there is an internal leakage. In the stacking sequence shown in the drawing left (incorrect), the cylinder moves due to leakage through the pilot pressure line .

Consequently, retaining the position of the cylinder using a pilot operated check valve becomes impossible. The stacking sequence shown in the drawing right (correct) is required in order to retain the cylinder position.

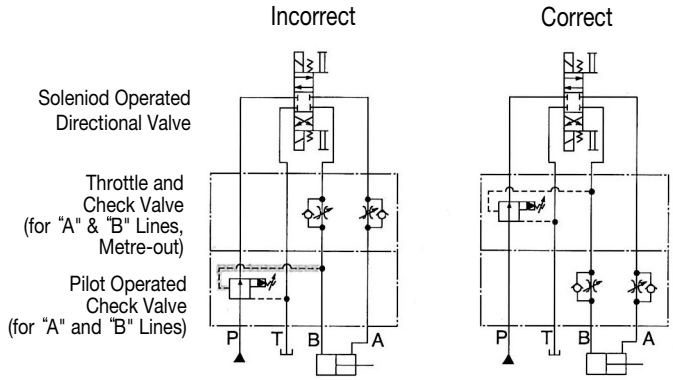


●Stacking sequence when using reducing valves (for "A" or "B" line) and throttle and check valves (for metre-out).

In B to T flow in the drawing left (incorrect). pressure is generated at part with a throttle effect of the throttle and check valve.

Depending upon the pressure reducing function which causes a shortage of output power of the cylinder and spoils the smooth operation of the cylinder.

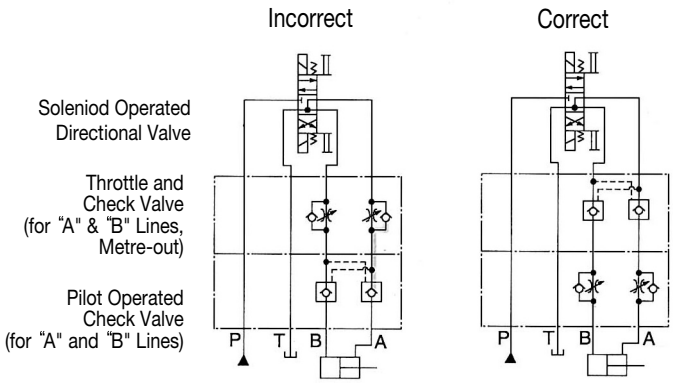
Therefore, stacking sequence in the drawing right(correct) is required in this combination



●Stacking sequence when using pilot operated check valves and throttle and check valves (for metre-out).

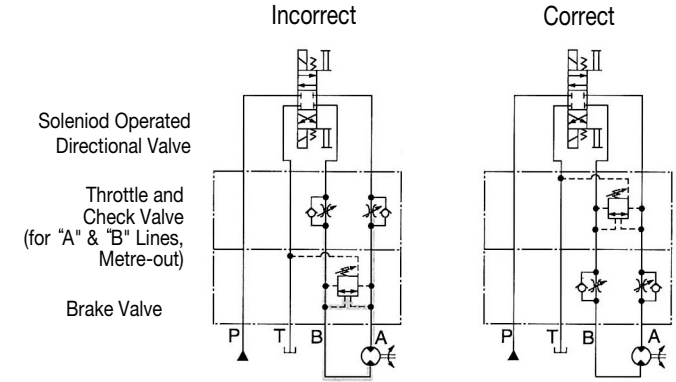
In A to T flow in the drawing left (incorrect). pressure is generated at part with a throttle effect of the throttle and check valve.

The pressure so generated acts to shut the pilot operated check valve and eventually creates an open and shut operation of the valve repeatedly which may cause the cylinder to have a knocking effect (the same effect will occur in the case of B to T flow). Therefore, the stacking sequence in the drawing right (correct) is required in this combination.



●Stacking sequence when using brake valves and throttle and check valves.

In the drawing left (incorrect), pressure is generated an part (a load pressure and a back pressure from throttle effect). For structual reasons of the breke valve, the load pressure and back pressure act to open the valve, therefore, the setting pressure should be more than the pressure equal to the load pressure plus back pressure (Pa+Pb). If the setting pressure is less than Pa+Pb, the brake valve acts and brakes the movement of the actuator in operation,this eventually reduces the speed of the actuator. On the contrary, if the setting pressure is made than Pa+Pb, shock may occur when braking the actuator since the setting pressure is too high against the load pressure. Therefore, the stacking sequence in the drawing right (cottect) is required in this combination.



Base Plates and Sub-Plates

When mounting the modular valves, use base plates and sub-plates specified below. If these base plates and the sub-plates are not used, ensure that the mounting surface has a good machined finish.

Series	Base Plates		Sub-Plates	
	Model Numbers	Page	Model Numbers	Page
01 Series	MMC-01-※-40	F-24	DSGM-01※-30	F-18
03 Series	MMC-03-T-※-21	F-42	DSGM-03※-40	F-32
06 Series		-	DHGM-06※-50	E-52

Mounting Bolts

Modular valves are mounted using stud bolts which are supplied in a kit form. When mounting, see the following table for tightening torque. After the test run, be sure to tighten again firmly within the specified torque.

Series	Bolt Kit Model Numbers	Tightening Torque Nm (in.lbs.)
01 Series	MBK-01-※-30	5~6 {0.5~0.6} (6~7 {0.6~0.7}) ★
03 Series	MBK-03-※-10	12~15 {1.2~1.5}
06 Series	MBK-06-※-30	50~60 {5.1~6.1}

★The valve range in parentheses represents the tightening torque requirements if the operating pressure is above 25 MPa{255kgf/cm²}

Assembly

Assembly should be carried out in clean conditions and in acciodance with the following procedure. Caetious attention should be paid to ensure that the interface of the valves are clean and free from dirt or other foreign materials.

●Assumbly Procedure:

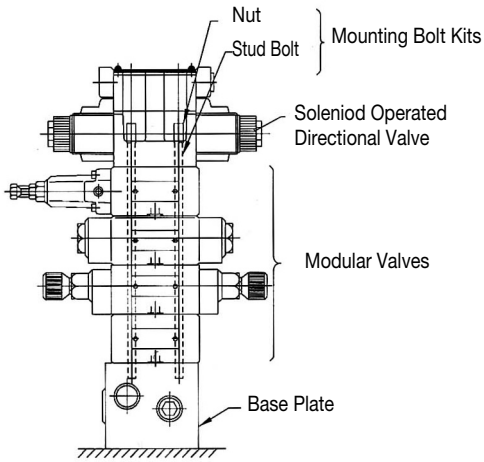
· 01-06 Series

1) Screw-in the four stud bolts (06 series: six stud bolts).fully into the tapped holes on the mounting surface of the specified base plate, sub- plate or manifold.

2) Stack the modular valves and solenoid operated directional valves in accordance with the hydraulic circuit, place the O-ring inserted surface face onto the base plate and make sure that the port arrangement of the modular valves are in the correct position before stacking the valves onto the stud bolts.

3) Align both the end of the valves stacked.

4)Screw-in the four nuts(06 series: six nuts) onto the stud bolts and tighten with the specified torque. After the test run, be sure to re-tighten the nuts firmly within the specified torque.



03 Series Modular Valves

Pressure Drop

Pressure Drop

Pressure drop curves of the modular valves are those based on viscosity of 35㎟/s and specific gravity of 0.850.
When using the modular valves in conditions other than the above mentioned, find the appropriate values referring to the following table and formula.

●For any other viscosity, multiply the factors in the table below.

Viscosity	mm²/s{cSt}	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
Factor		0.81	0.87	0.96	1.03	1.09	1.14	1.19	1.23	1.27	1.30

●For any other specific gravity(G′), the pressure drop(⊿P′) may be obtained from the following formula.

$$\Delta P' = \Delta P\ (G'/0.850)$$

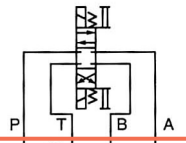
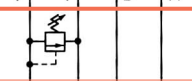
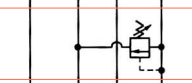
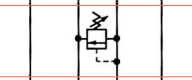
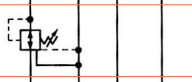
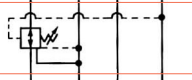
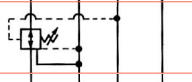
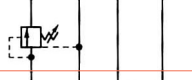
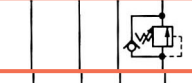
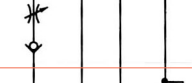
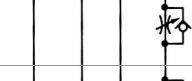
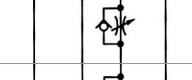
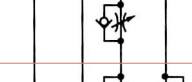
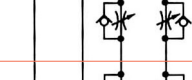
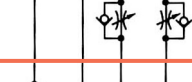
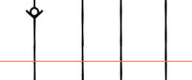
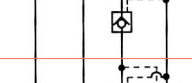
Interchangeability in Installation between Current and Design

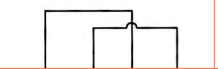
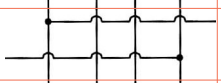
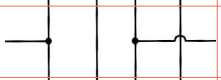
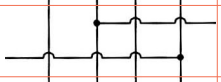
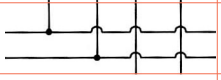
The model changed for the following models have been made.

Models		Model Numbers		Mtg. Inter-changeability	Main changes
		Current	New		
01 Series	Throttle Modular Valves	MSP-01-30	MSP-01-50	○	Modification for large flow use.
	Throttle and Check Modular Valves	MSB-01-※※-$\begin{matrix}A\\W\end{matrix}$ $\begin{matrix}40\\50\end{matrix}$	MSB-01-※※-$\begin{matrix}A\\W\end{matrix}$60	○	Improved Controllability and Operatability.
06 Series	Reducing Modular Valves	MR※-06-※-10	MR※-06-※-30	○	Modification for large flow use.
	Throttle and Check Modular Valves	MS※-06-※$\begin{matrix}L\\H\end{matrix}$-10	MS※-06-※-30	○	Modification for large flow use.
	Pilot Check and Modular Valve	MP※-06※-※-※-10	MP※-06※-※-※-30	○	Modification for large flow use.

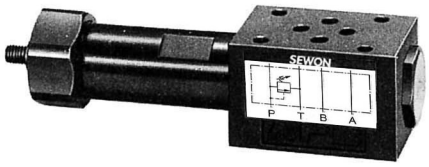
1/8 Modular Valves

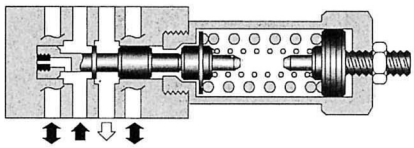
Type of Modular Valve

Class	Model Numbers	Graphic Symbols	Page
	Solenoid Operated Directional Valve DSG-01-※※※-80		E-9
Pressure Control Valves	Relief Valves (for "P-Line") MBP-01-※-30		F-8
	Relief Valves (for "A-Line") MBA-01-※-30		F-8
	Relief Valves (for "B-Line") MBB-01-※-30		F-8
	Reducing Valves (for "P-Line") MRP-01-※-30		F-10
	Reducing Valves (for "A-Line") MRA-01-※-30		F-10
	Reducing Valves (for "B-Line") MRB-01-※-30		F-10
	Sequence Valves (for "P-Line") MHP-01-※-30		F-15
	Counterbalance Valves (for "A-Line") MHA-01-※-30		F-15
Flow Control Valves	Throttle Valves (for "P-Line") MSP-01-50		F-17
	Throttle and Check Valves (for "P-Line") MSCP-01-30		F-18
	Throttle and Check Valves (for "A-Line", Meter-out) MSA-01-X-60		F-19
	Throttle and Check Valves (for "A-Line", Meter-in) MSA-01-Y-60		F-19
	Throttle and Check Valves (for "B-Line", Meter-out) MSB-01-X-60		F-19
	Throttle and Check Valves (for "B-Line", Meter-in) MSB-01-Y-60		F-19
	Throttle and Check Valves (for "A&-Line", Meter-out) MSW-01-X-60		F-19
	Throttle and Check Valves (for "A&B-Line", Meter-in) MSW-01-Y-60		F-19
Directiond Control Valves	Check Valves (for "P-Line") MCP-01-※-30		F-21
	Check Valves (for "T-Line") MCT-01-※-30		F-21
	Pilot Operated Check Valves (for "A-Line") MPA-01-※-40		F-22
	Pilot Operated Check Valves (for "B-Line") MPB-01-※-40		F-22
	Pilot Operated Check Valves (for "A&B-Line") MPW-01-※-40		F-22

Class	Model Numbers	Graphic Symbols P T B A	Page
Modular Plates and Mounting Bolts	End Plates (Blocking Plates) MDC-01-A-30		F-23
	End Plates (By pass plates) MDC-01-B-30		F-23
	Connecting Plates (for "P&A-Line") MDS-01-PA-30		F-23
	Connecting Plates (for "P&B-Line") MDS-01-PB-30		F-23
	Connecting Plates (for "A&T-Line") MDS-01-AT-30		F-23
	Base Plates MMC-01-※-40		F-24
	Belt Kits MBK-01-※-30		F-26

Relief Modular Valves





Ratings

Model Numbers	Max. Operating Pressure Mpa{kgf/cm²}	Max.Flow L/min
MB ※-01- ※-30	21{214}	35

Model Number Designation

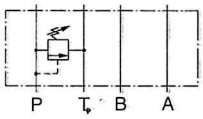
MBP	-01	-C	-30
Series Number	Valve Size	Pres. Adj. Range MPa{kgf/cm²}	Design Number
MBP : Relief Valve for P-Line **MBA** : Relief Valve for A-Line **MBB** : Relief Valve for B-Line	**01**	**C** : ★~14 {★~143} **H** : 7~21 {71.4~214}	**30**

★See the "Minimum Adjustment Pressure"

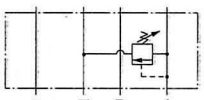
Instructions

- The minimum adjustment pressure equals the valve obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of this page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base side of the modular valve.
- To make pressure adjustment, loosen the lock nut and turn the pressure adjustment screw clockwise or anti-clockwise. For an increase of pressure, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.
- In case of a small flow, the setting pressure may become unstable. To avoid this, refer to the minimum flow characteristic curve of the next page and use the valve within a range as shown with .

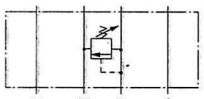
Graphic Symbols



MBP-01



MBA-01

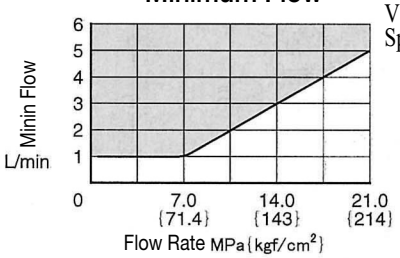


MBB-01

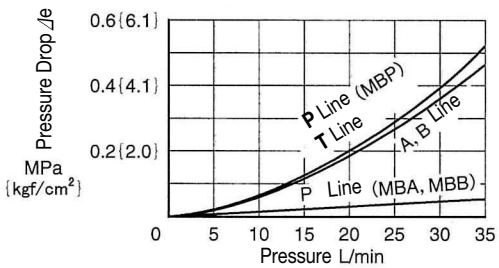
Typical Performance Characteristics

Minimum Flow

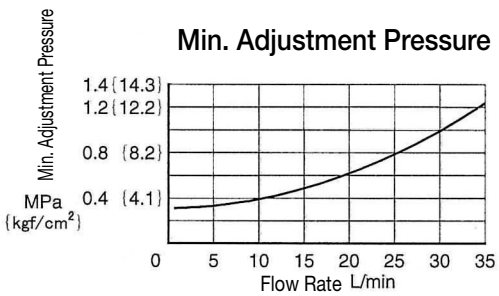
Hydraulic Fluid:
Viscosity 35mm²/s
Specific Gravity 0.850



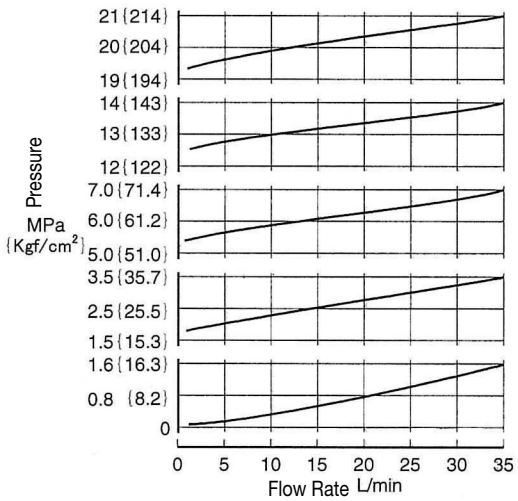
Pressure Drop



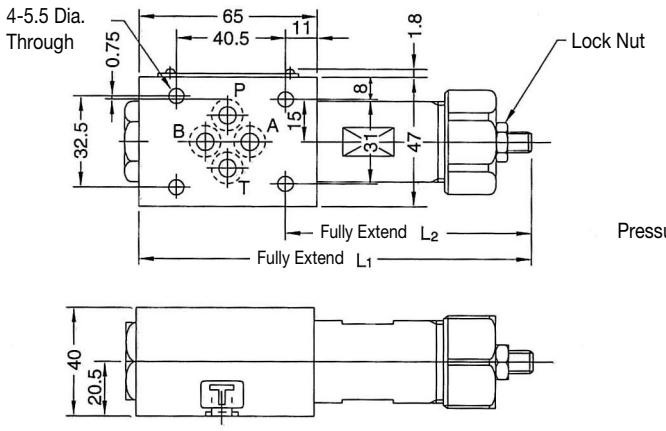
Min. Adjustment Pressure



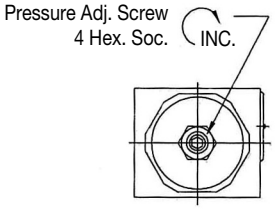
Nominal Override Characteristics



MBP-01
MBB-01

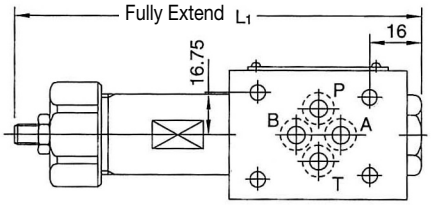


Model No.	L_1	L_2
MB ※-01-C	151	92
MB ※-01-H	166.5	107.5



Approx. Mass. ····· 1.1kg

MBA-01



Approx. Mass. ····· 1.1kg

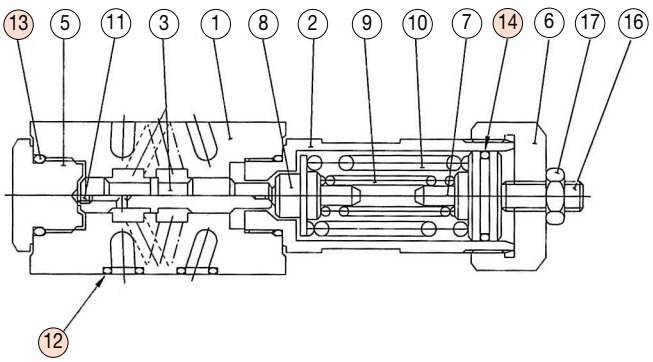
For other dimensions, refer to above(MBP-01)drawing.

CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

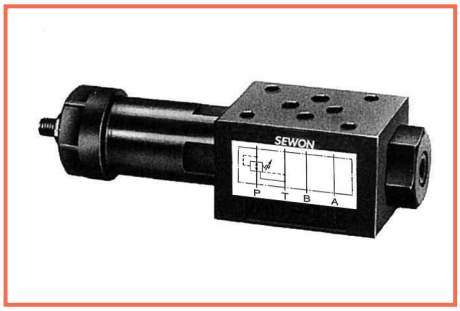
List of Seals

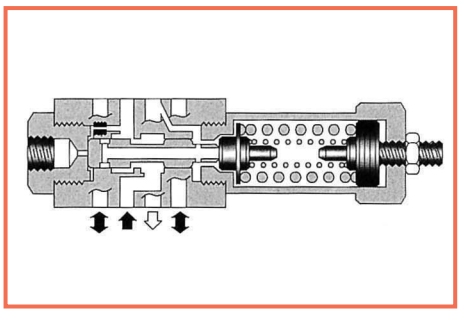
MBP-01
MBA-01
MBB-01



Item	Name of Parts	Parts of Numbers	Qty.
12	O-Ring	JIS B 2401-1B-P9	4
13	O-Ring	JIS B 2401-1B-P18	2
14	O-Ring	JIS B 2401-1A-P20	1

Reducing Modular Valves





Ratings

Model Numbers	Max.Operating Pressure MPa{kgf/cm²}	Max.Flow L/min
MR ※-01- ※-30	31.5{321}	35★

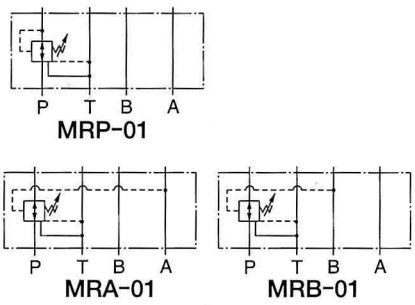
★If the pressure is set below 1.9MPa{19.4kgf/cm2}, the maximum flow is limited. See the minimum adjustment pressure vs. maxsimum flow characteristics and during use, stay within the shaded zone on the graph.

Model Number Designation

MRP	-01	-B	-30
Series Number	Value Size	Pres. Adj. Range MPa{kgf/cm²}	Design Number
MRP : Reducing Valve for P-Line **MRA** : Reducing Valve for A-Line **MRB** : Reducing Valve for B-Line	**01**	**B**: ★~7 {★~71.4} **C**:3.5~14 {35.7~143} **H**:7~21 {71.4~214}	30 (Standard) 3019(Special Handle / Opposite Side Handle) 3028(Opposite Side Handle) 3045(Low Pressure) 3055(Low Pressure) / Opposite Side Handle)

★ See the "Minimum Adjustment Pressure vs. Maxsimum Flow"

KS Graphic Symbols



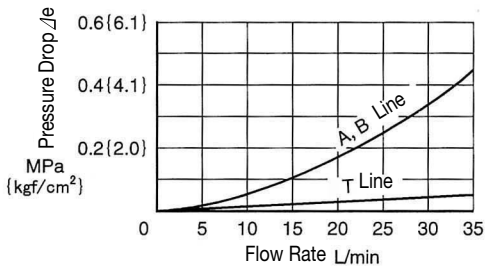
Instructions

- The minimum adjustment pressure equals the valve obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of this page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base side of the modular valve.
- To make pressure adjustment, loosen the lock nut and turn the pressure adjustment screw clockwise or anti-clockwise. For an increase of pressure, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.

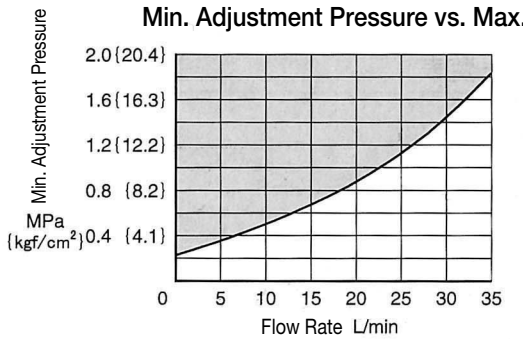
Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850

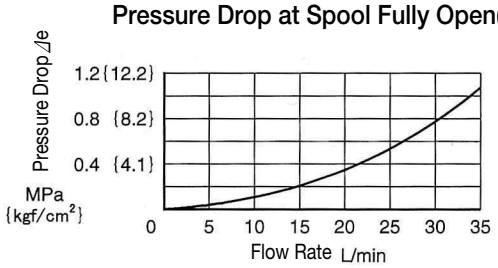
Pressure Drop



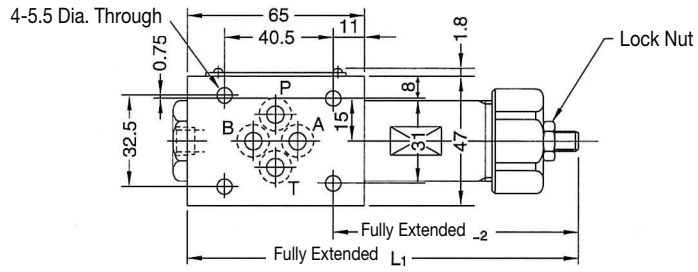
Min. Adjustment Pressure vs. Max.Flow



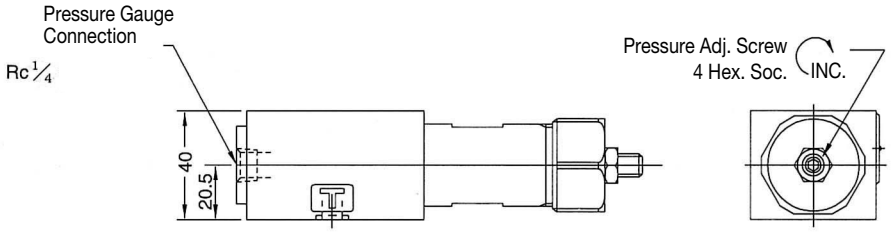
Pressure Drop at Spool Fully Open(P-Line)



MRP-01
MRA-01
MRB-01



Model Number	L_1	L_2
MR ※-01-$\frac{B}{C}$	158	92
MR ※-01-H	173.5	107.5



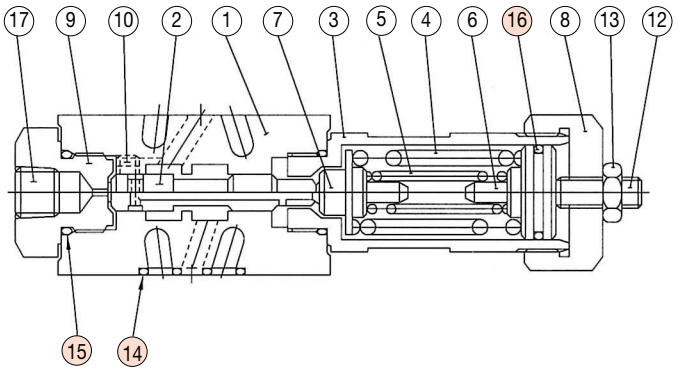
Approx. Mass. ····· 1.1kg

CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

List of Seals

MRP-01
MRA-01
MRB-01

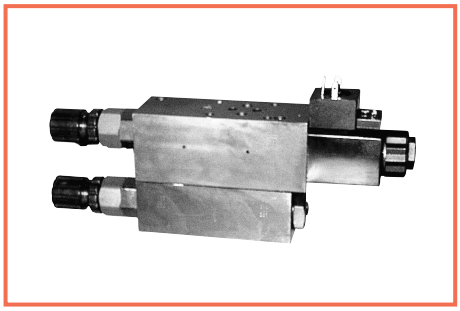


Item	Name of Parts	Parts of Numbrs	Qty.
14	O-Ring	JIS B 2401-1B-P9	4
15	O-Ring	JIS B 2401-1B-P18	2
16	O-Ring	JIS B 2401-1A-P20	1

Two Pressure Control Reducing Modular Valves

Features

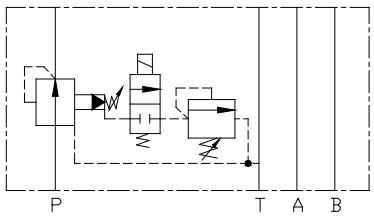
1. When the pressure in part of the circuit is lower than the main circuit, this modular valve controls pressure by switching the low pressure to secondary pressure (high pressure, low pressure)
2. Even when pressure changes in the primary main circuit, the reduced secondary pressure is maintained at a constant level.



Ratings

Model Numbers	Max. Operating Pressure MPa{kgf/cm²}	Max. Flow L/min	Pres.Adj.Range MPa{kgf/cm²}
SCA-002-※-※-10	7{71.4}	40	Low Pressure 0.2~3.5{2~35.7} High Pressure 0.2~3.5{2~35.7}
SCA-002-※-※-20			Low Pressure 0.2~3.5{2~35.7} High Pressure 0.8~7{8.2~71.4}

Graphic Symbols



Model Number Designation

SCA	-002	- L	- A1	- 10
Model Number	Series Number	HANDLE	VOLTAGE	Design Number
SCA SEWON CONTROL VALVE	Two Pressure Reducing Valve	L : LEFT R : RIGHT	A1 : AC 100V A2 : AC 200V D1 : DC 12V D2 : DC 24V	10 : Low Pressure Control 20 : High Pressure Control

Solenoid Specifications

Electric Source	Frequency(Hz)	VOLTAGE		Current		Power(W)
		Source Rating	Serviceable Rating	Inrush	Holding	
AC100V	50	100	80~100	2.38	0.46	–
	60	110	100~120	2.33	0.39	
AC200V	50	200	160~200	1.21	0.25	
	60	220	200~240	1.17	0.19	
DC12V	–	12	10.8~13.2	–	2.2	26
DC24V		24	21.6~26.4		1.1	

Instructions

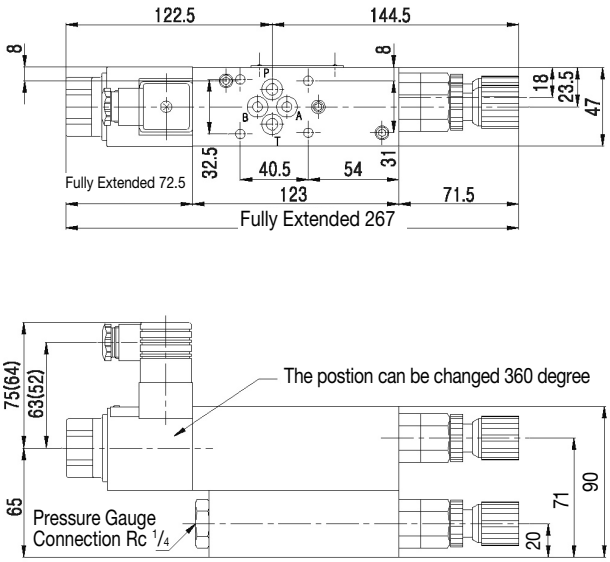
- To make pressure adjustment, loosen the lock nut and turn the pressure adjustment screw clockwise or anti-clockwise. For an increase of pressure, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.

Spare Parts

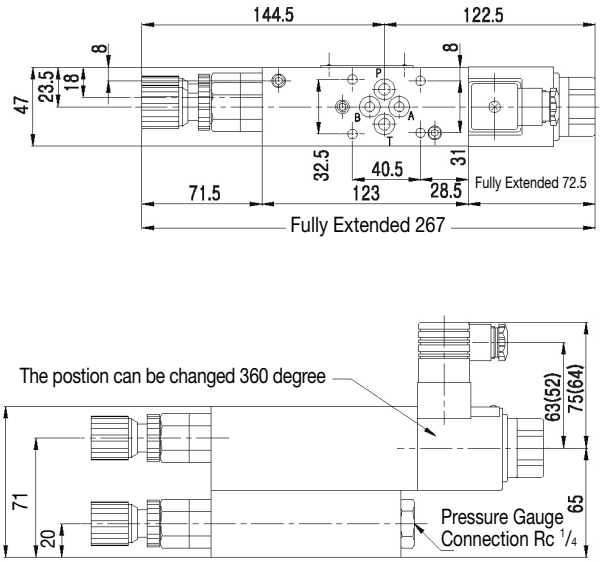
- Use allowed base plate or sub plate at tightening
- Use bolt kits and check ightening torque at assembly

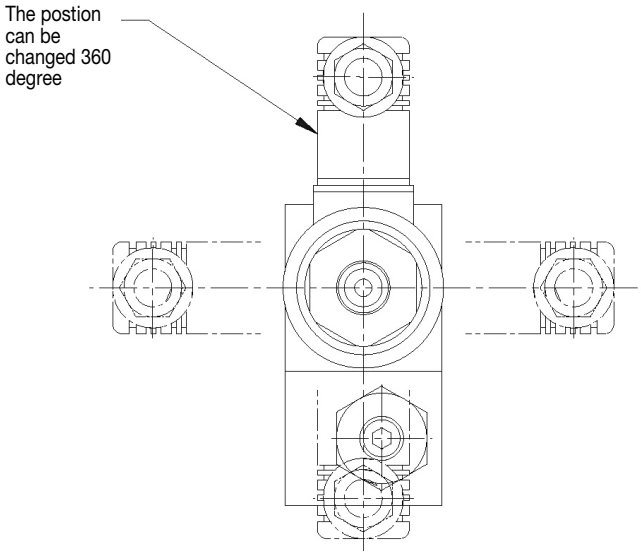
Base Plate	Sub Plate	Bolt Kits	Tightening Torque
MMC-01-※-40	DSGM-01※-30	MBK-01-※-30	5~6 [Nm]

SCA-002-R



SCA-002-L



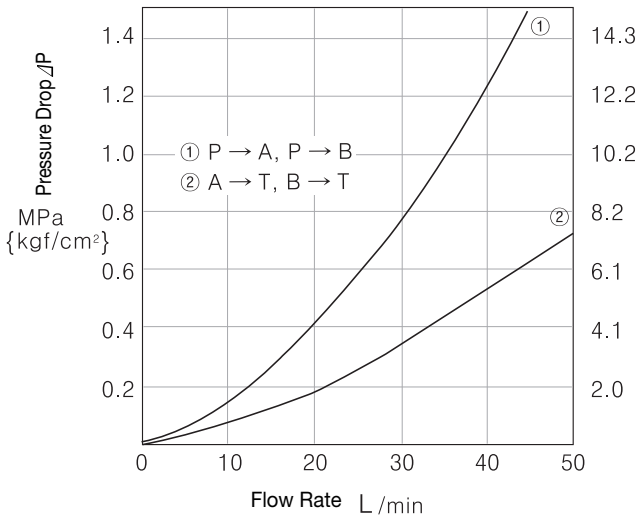


* *The postion of the Plug-in connector can be changed 360 degree
* Port size is Rc 1/8
* Surface Size is agreemented ISO 4401-AB-03-4-A

Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850

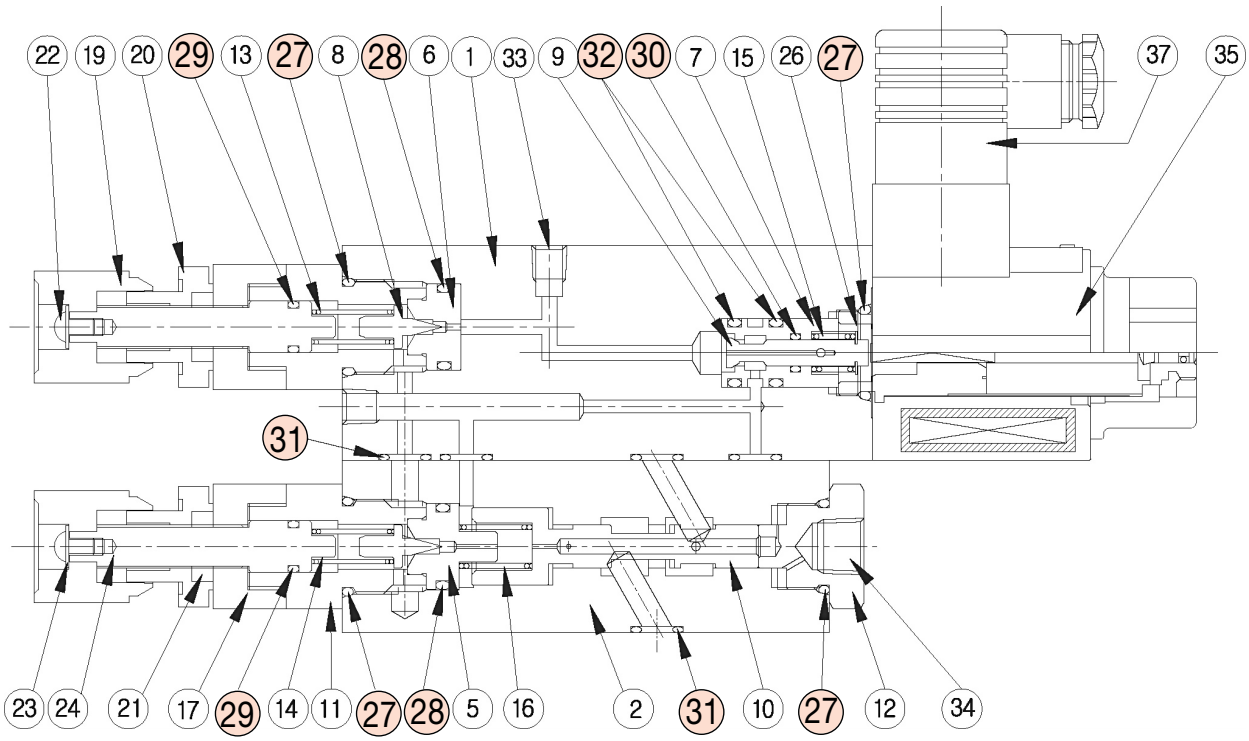
Pressure Drop



List of Seals

CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

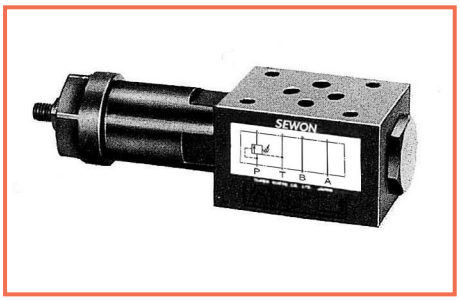


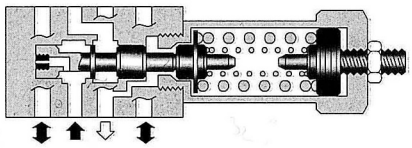
Item	Name of Parts	Part Numbers	Qty.
27	O-Ring	JIS B 2401-1B-P18	4
28	O-Ring	JIS B 2401-1B-P16	2
29	O-Ring	JIS B 2401-1A-P9	2
30	O-Ring	JIS B 2401-4D-P6	1
31	O-Ring	JIS B 2401-1B-P9	11
32	O-Ring	JIS B 2401-1B-P12	2

Sequence Modular Valves/ Counterbalance Modular Valves

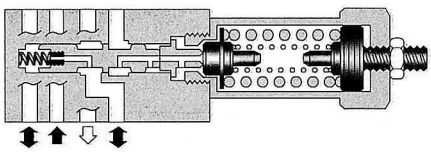
Ratings

Model Numbers	Max.Operating Pressure MPa{kgf/cm²}	Max.Flow L/min	Free Flow L/min
MHP-01-※-30	25 {255}	35	—
MHA-01-※-30			35





MHP-01



MHA-01

Model Number Designation

MHP	-01	-C	-30
Series Number	Valve Size	Pres. Adj. Range MPa{kgf/cm²}	Design Number
MHP : Sequence Valve for P-Line	01	**C**:★~14 {★~143}	30
MHA : Counterbalance Valve for A-Line		**H**:7~21 {71.4~214}	30

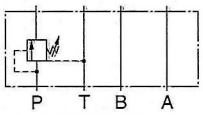
★See the "Minimum Adjustment Pressure"

Instructions

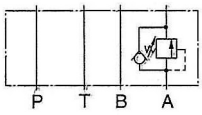
●The minimum adjustment pressure(MHP-01) equals the valve obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of this page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base side of the modular valve. To make pressure adjustment, loosen the lock nut and turn the pressure adjustment screw clockwise or anti-clockwise. For an increase of pressure, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.

The minimum adjustment pressure(MHA-01) equals the valve obtained from the minimum adjustment pressure characteristics plus the outlet-side back pressure of the valve on this page. The outlet-side back pressure should include the valves of the A-line and T-line pressure drop characteristics of the valves to be stacked due to the valve with internal drain.

Graphic Symbols



MHP-01



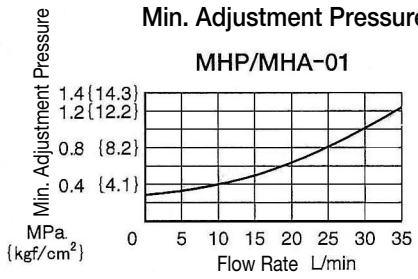
MHA-01

Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850

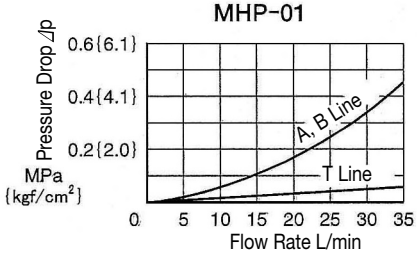
Min. Adjustment Pressure

MHP/MHA-01



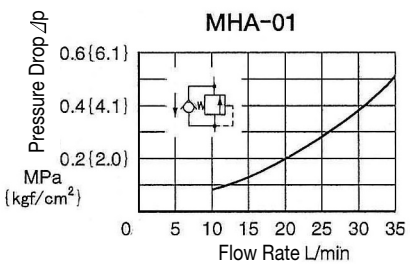
Pressure Drop

MHP-01



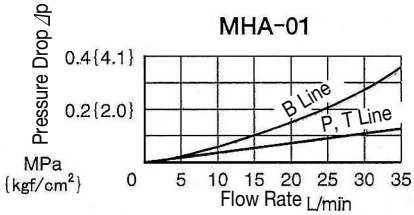
Pressure Drop for Free Flow

MHA-01

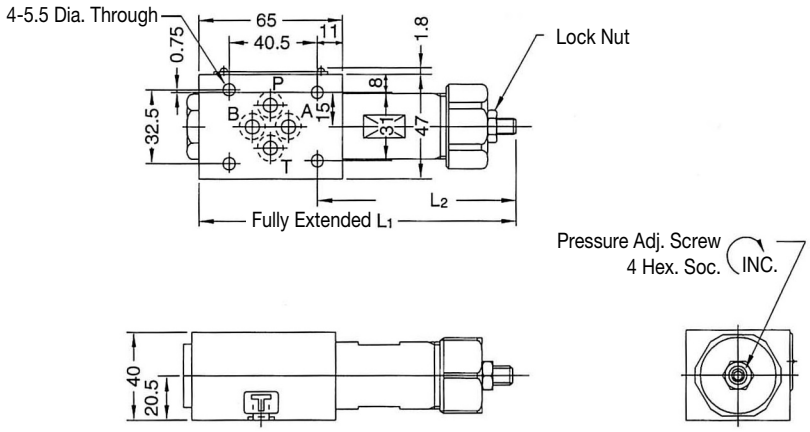


Pressure Drop

MHA-01



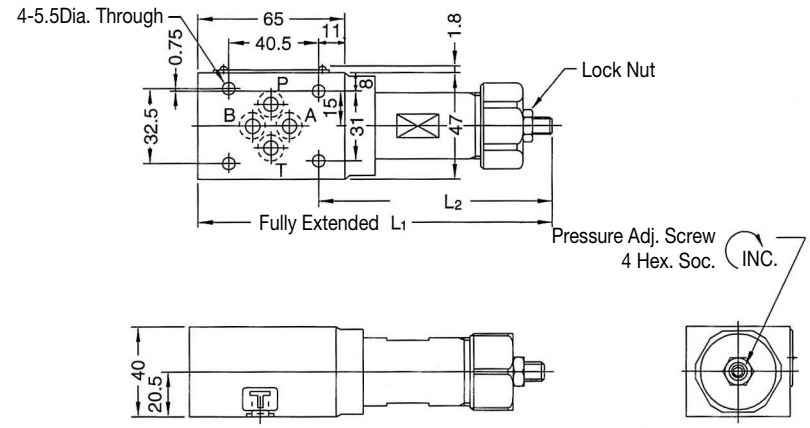
MHP-01



Model No.	L_1	L_2
MHP-01-C	151	92
MHP-01-H	166.5	107.5

Approx. Mass.....1.1kg

MHA-01



Model No.	L_1	L_2
MHA-01-C	171	112
MHA-01-H	186.5	127.5

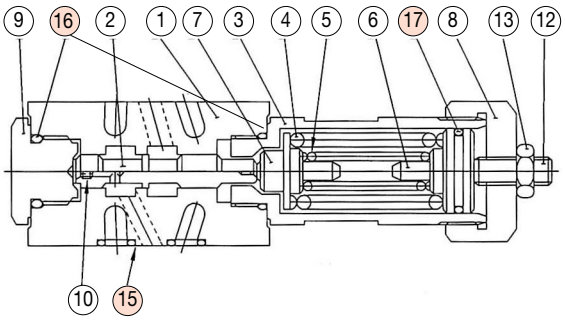
Approx. Mass.....1.1kg

CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

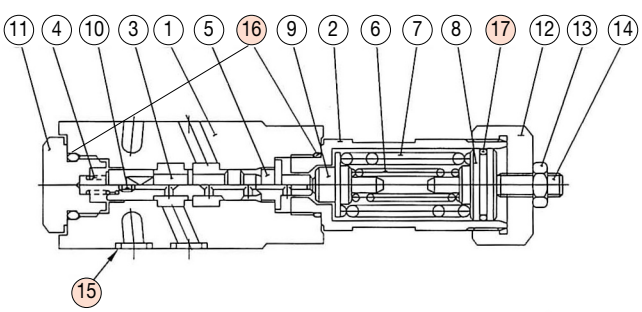
List of Seals

MHP-01



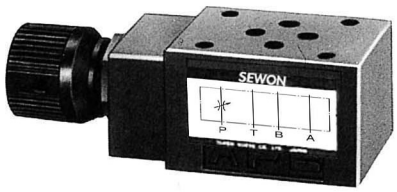
Item	Name of Parts	Part Number	Qty.
15	O-Ring	JIS B 2401-1B-P9	4
16	O-Ring	JIS B 2401-1B-P18	2
17	O-Ring	JIS B 2401-1A-P20	1

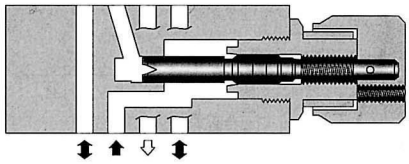
MHA-01



Item	Name of Parts	Part Number	Qty.
15	O-Ring	JIS B 2401-1B-P9	4
16	O-Ring	JIS B 2401-1B-P18	2
17	O-Ring	JIS B 2401-1B-P20	1

Throttle Modular Valves





Ratings

Model Numbers	Max. Operating Pressure MPa{kgf/cm²}	Max. Flow L/min
MSP-01-50	31.5{321}	60★

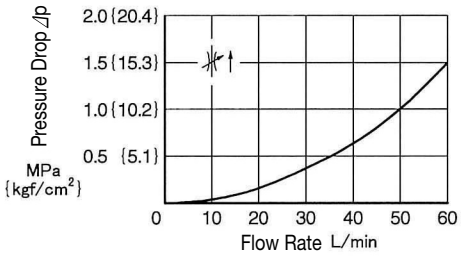
★At the low differential, maximum flow is limited. See "Pressure Drop at Throttle Fully Open".

Model Number Designation

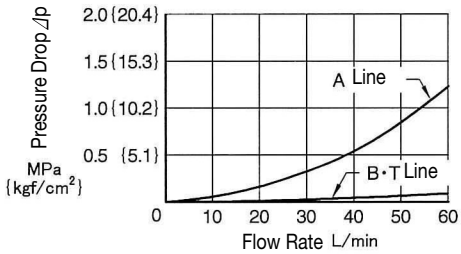
MSP	-01	-50
Series Number	Valve Size	Design Number
MSP: Check and Throttle Modular Valves for P-Line	01	50

Typical Performance Characteristics

Pressure Drop at Throttle Fully Open

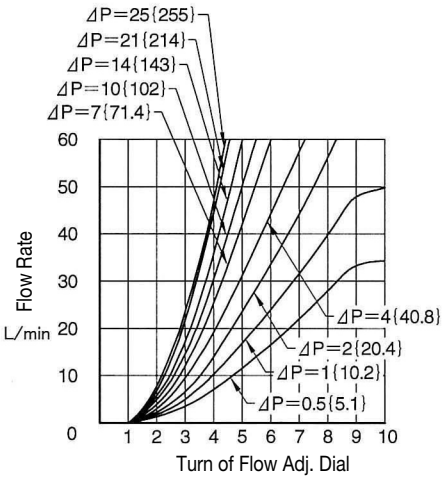


Pressure Drop

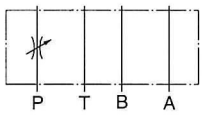


Metred Flow vs. Dial Position

⊿p=Differential Pressure MPa{kgf/cm²}



Graphic Symbols

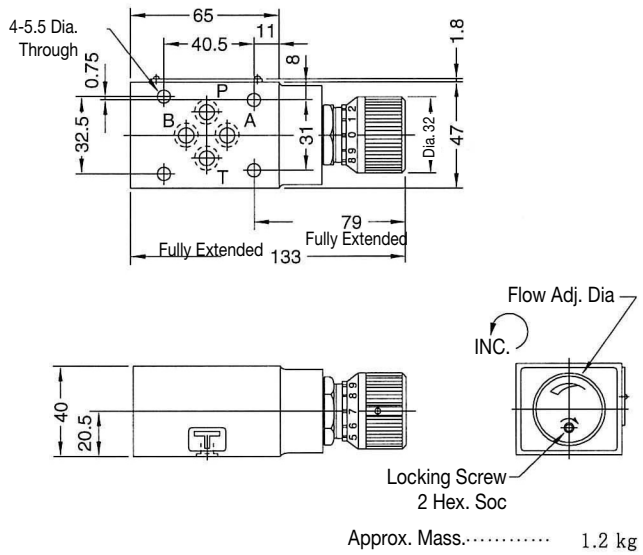


Instructions

●To make flow rate adjustment, loosen locking screw for the dial and turn the flow adjustment dial clockwise or anti-clockwise.
For a decrease of flow, turn the dial clockwise. Be sure to re-tighten the locking screw firmly after the adjustment of the flow rate.

Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850

MSP-01

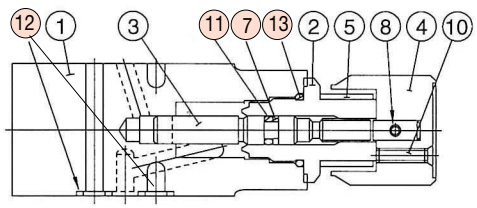


Approx. Mass..... 1.2 kg

List of Seals MSP-01

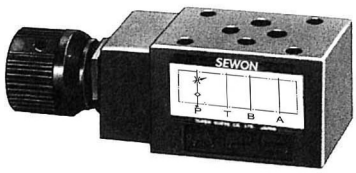
CAUTION

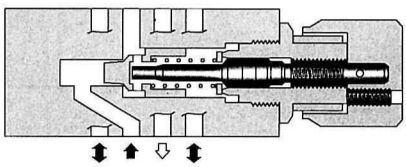
When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.



Item	Name of Parts	Part Numbers	Qty.
7	Backup Ring	JIS 2407-T2-P6	1
11	O-Ring	JIS 2401-1A-P6	1
12	O-Ring	JIS 2401-1B-P9	4
13	O-Ring	JIS 2401-1B-P18	1

Check and Throttle Modular Valves





Ratings

Model Numbers	Max. Operating Pressure MPa{kgf/cm²}	Max. Flow L/min
MSCP-01-60	31.5{321}	35★

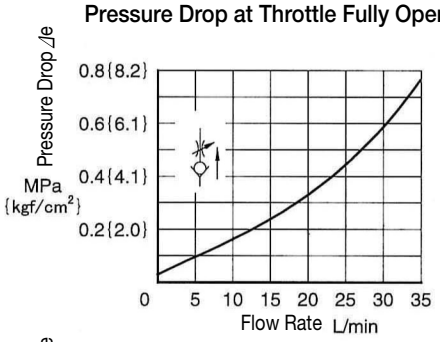
★At the low differential, maximum flow is limited. See "Pressure Drop at Throttle Fully Open".

Model Number Designation

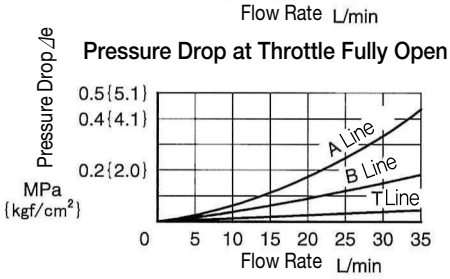
MSCP	-01	-30
Series Number	Valve Size	Design Number
MSCP : Check and Throttle Modular Valves for P-Line	01	30

Typical Performance Characteristics

Pressure Drop at Throttle Fully Open

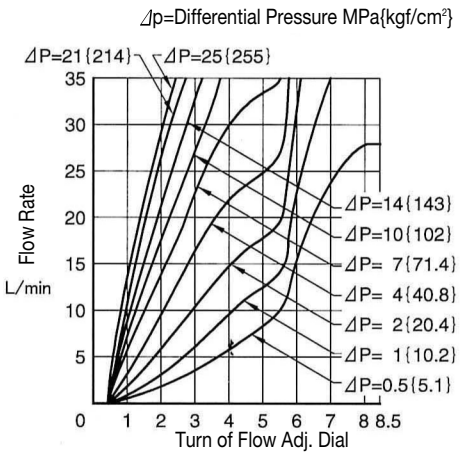


Pressure Drop at Throttle Fully Open

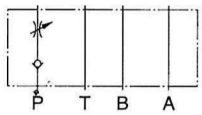


Hydraulic Fluid:
Viscosity 35mm²/s, Specific Gravity 0.850

Metred Flow vs. Dial Position



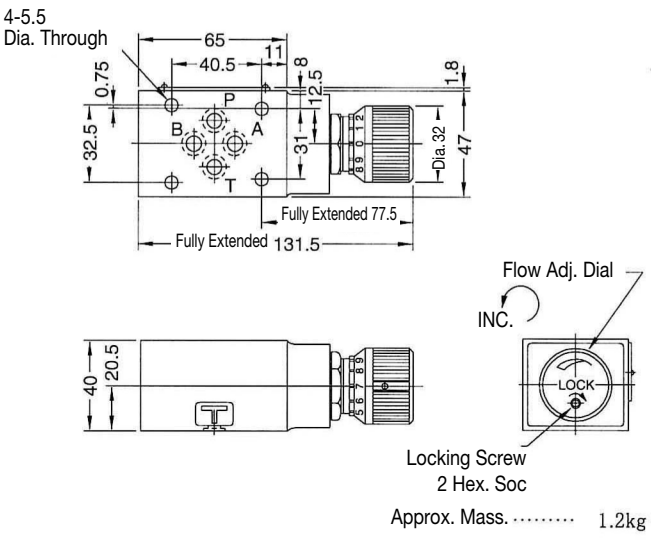
KS Graphic Symbols



Instructions

- To make flow rate adjustment, loosen locking screw for the dial and turn the flow adjustment dial clockwise or anti-clockwise. For a decrease of flow, turn the dial clockwise. Be sure to re-tighten the locking screw firmly after the adjustment of the flow rate.

MSCP-01

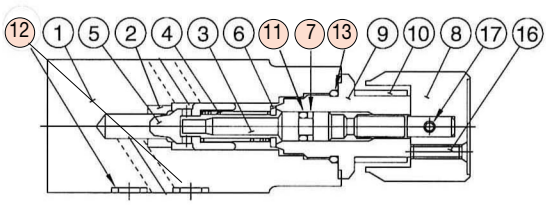


Approx. Mass. ····· 1.2kg

List of Seals MSCP-01

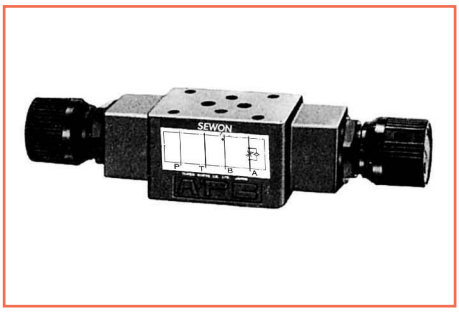
CAUTION

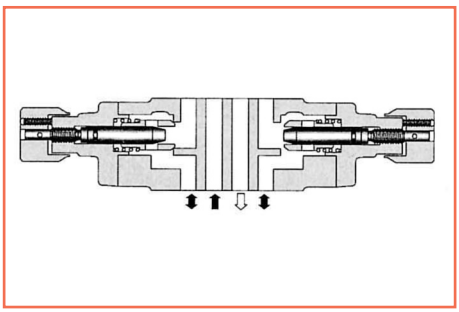
When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.



Item	Name of Parts	Part Numbers	Qty.
7	Backup Ring	JIS B 2407-T2-P6	1
11	O-Ring	JIS B 2401-1A-P6	1
12	O-Ring	JIS B 2401-1B-P9	4
13	O-Ring	JIS B 2401-1B-P18	1

Throttle and Check Modular Valves





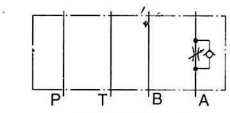
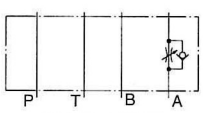
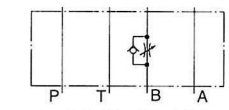
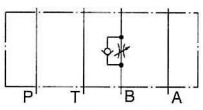
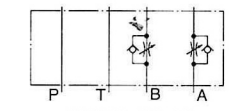
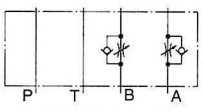
Ratings

Model Numbers	Max. Operating Pressure MPa {kgf/cm²}	Max. Flow L/min
MS※-01-※※-60	31.5{321}	60

Model Number Designation

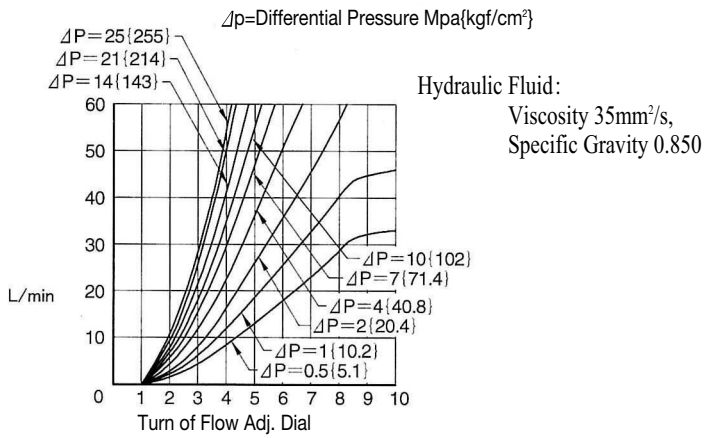
MSW	-01	-X	Y	-60
Series Number	Valve Size	Direction of Flow ("A" Line)	Direction of Flow ("B" Line)	Design Number
MSA : Throttle and Check Valve for A-Line	**01**	**X** : Metre-out **Y** : Metre-in	——	**60**
MSB : Throttle and Check Valve for B-Line			**X** : Metre-out **Y** : Metre-in	
MSW : Throttle and Check Valve for A&B-Line		**X** : Metre-out **Y** : Metre-in		

KS Graphic Symbols

Metre-out	Metre-in
 MSA-01-X	 MSA-01-Y
 MSB-01-X	 MSB-01-Y
 MSW-01-X	 MSW-01-Y

Typical Performance Characteristics

Metred Flow vs. Dial Position

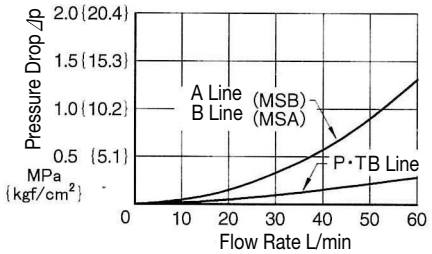


Hydraulic Fluid:
Viscosity 35mm²/s,
Specific Gravity 0.850

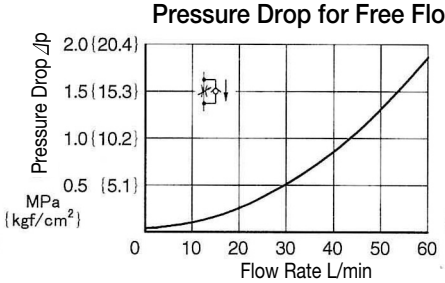
Instructions

- To make flow rate adjustment, loosen locking screw for the dial and turn the flow adjustment dial clockwise or anti-clockwise. For a decrease of flow, turn the dial clockwise. Be sure to re-tighten the locking screw firmly after the adjustment of the flow rate.

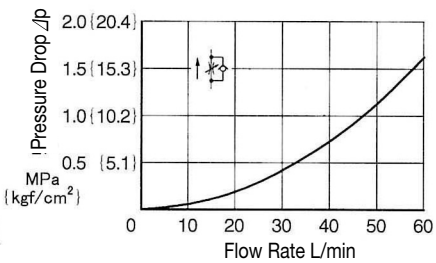
Pressure Drop



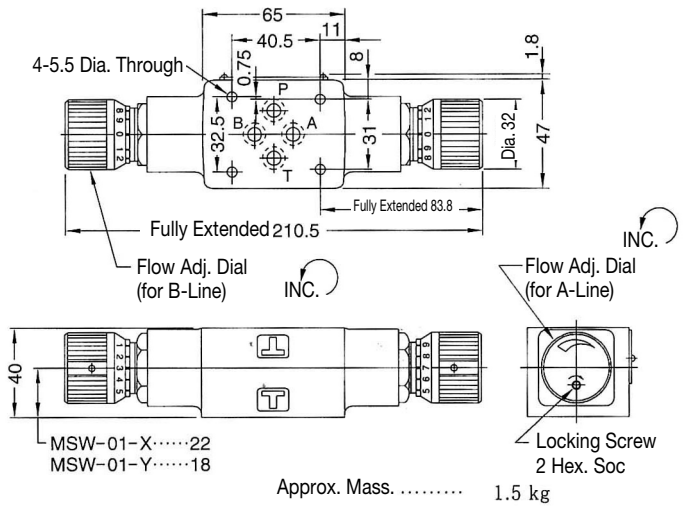
Pressure Drop for Free Flow



Pressure Drop at Throttle Fully Open

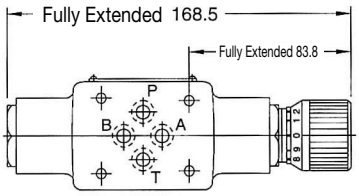


MSW-01-$\frac{X}{Y}$



Approx. Mass. ····· 1.5 kg

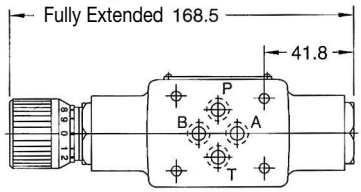
MSA-01-$\frac{X}{Y}$



Approx. Mass. ····· 1.3 kg

For other dimensions, refer to "MSW-01-$\frac{X}{Y}$" drawing above.

MSB-01-$\frac{X}{Y}$

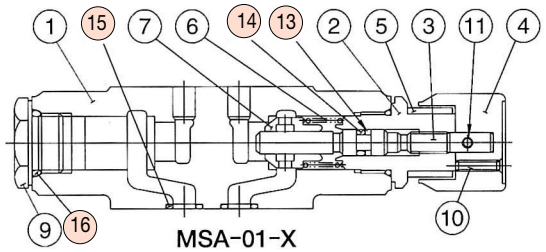


Approx. Mass. ····· 1.3 kg

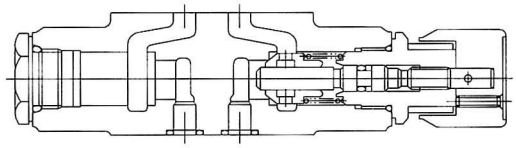
For other dimensions, refer to "MSW-01-$\frac{X}{Y}$" drawing above.

List of Seals

MSA-01, MSB-01, MSW-01



MSA-01-X



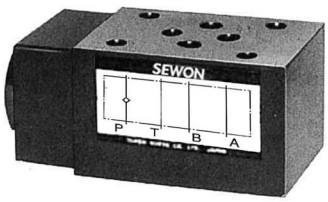
MSA-01-Y

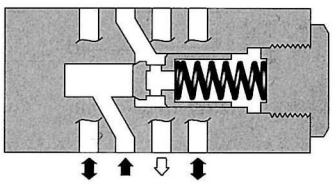
Item	Name of Parts	Part Numbers	Qty.	
			MSA,MSB	MSW
13	Backup Ring	JIS B 2407-T2-P6	1	2
14	O-Ring	JIS B 2401-1A-P6	1	2
15	O-Ring	JIS B 2401-1B-P9	4	4
16	O-Ring	JIS B 2401-1B-P18	2	2

⚠ CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

Check Modular Valves





Ratings

Model Numbers	Max. Operating Pressure MPa {kgf/cm²}	Max. Flow L/min
MC※-01-※-30	31.5{321}	35

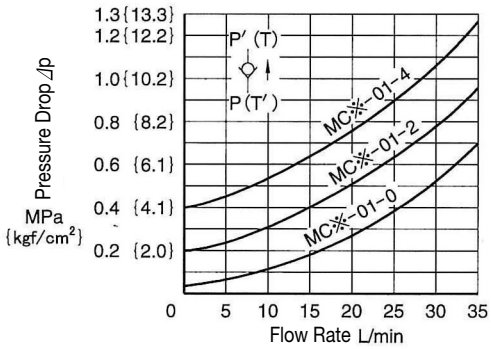
Model Number Designation

MCP	-01	-0	-30
Series Number	Valve Size	Cracking Pressure MPa{kgf/cm²}	Design Number
MCP : P Check Valves for P-Line **MCT** : T Check Valves for P-Line	**01**	**0** : 0.035{0.36} **2**: 0.2{2.0} **4** : 0.4{4.1}	**30**

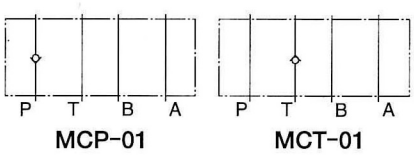
Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850

Typical Performance Characteristics

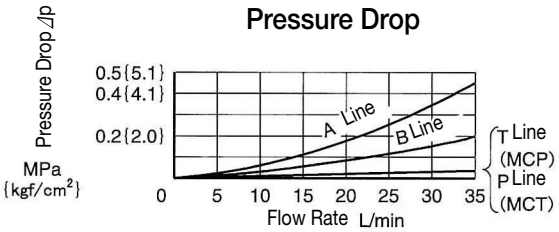
Pressure Drop for Free Flow



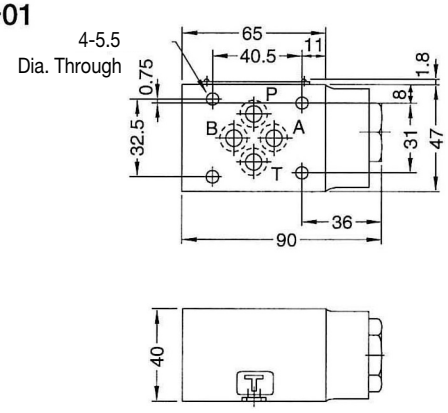
Graphic Symbols



Pressure Drop



MCP-01 MCT-01



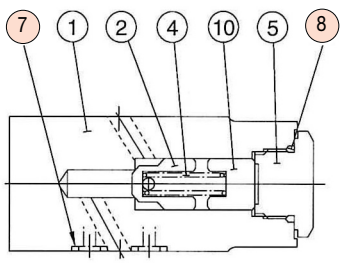
Approx. Mass..... 1.1kg

List of Seals

CAUTION

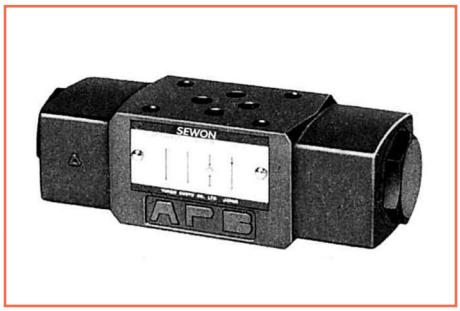
When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

MCP-01
MCT-01



Item	Name of Parts	Numbers	Qty.
7	O-Ring	JIS B 2401-1B-P9	4
8	O-Ring	JIS B 2401-1B-P18	1

Pilot Operated Check Modular Valves

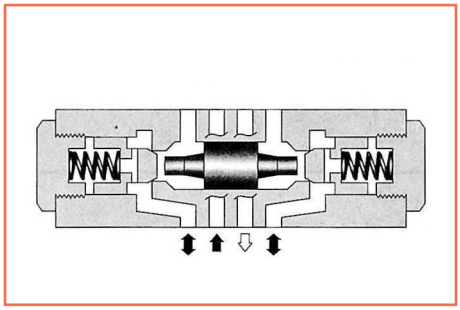


Ratings

Model Numbers	Max. Operating Pressure MPa {kgf/cm²}	Max. Flow L/min
MP※-01-※-40	31.5{321}	35

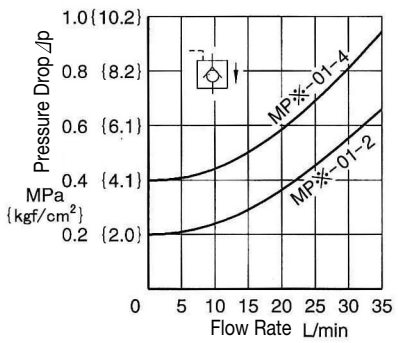
Model Number Designation

MPA	-01	-2	-40
Series Number	Valve Size	Cracking Pressure Mpa{kgf/cm²}	Design Number
MPA : Pilot Operated Check Valves for A-Line **MPB** : Pilot Operated Check Valves for B-Line	**01**	**2** : 0.2{2.0} **4** : 0.4{4.1}	**40(Standard)** **4001(Low Pilot Pressure Control Type)**

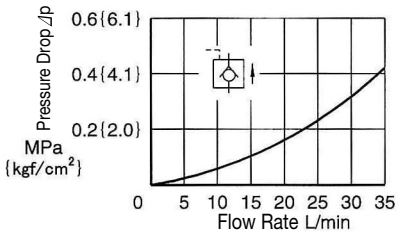


Typical Performance Characteristics

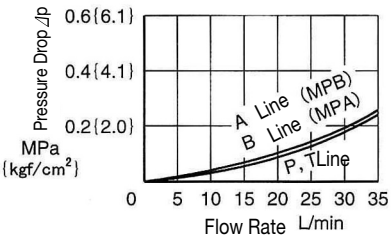
Pressure Drop for Free Flow



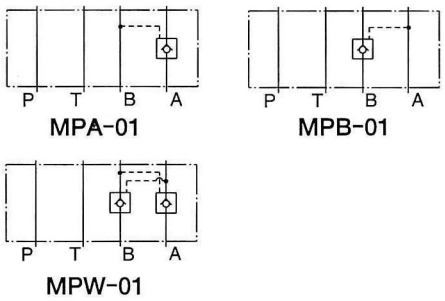
Pressure Drop for Reversed Controlled Flow



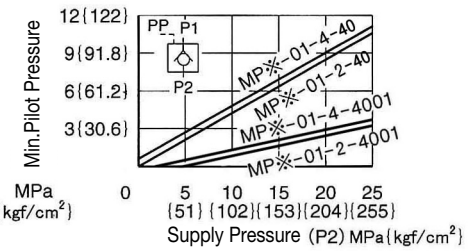
Pressure Drop



Graphic Symbols

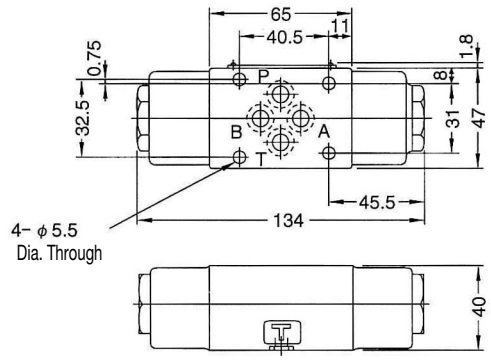


Min.Pilot Pressure



Hydraulic Fluid:
Viscosity 35mm²/s, Specific Gravity 0.850

MPA-01
MPB-01
MPW-01



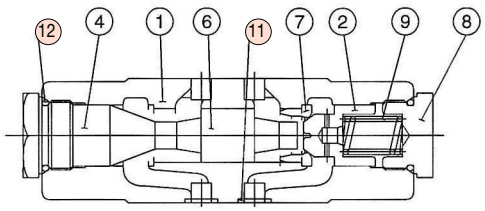
Approx. Mass.....1.2kg

Spare Parts List

MPA-01
MPB-01
MPW-01

CAUTION

When making replacement of seals, please do it carefully after reading through the relevant instructions in the Operator's Manual.

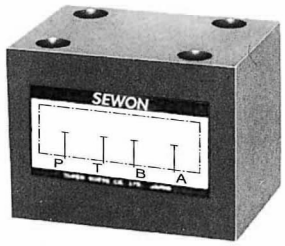


MPA-01

Item	Name of Parts	Part Numbers	Qty.
11	O-Ring	JIS B 2401-1B-P9	4
12	O-Ring	JIS B 2401-1B-P18	2

End Plates

Blocking Plates are used for auxiliary mounting surface or for closing unnecessary circuits. Bypass plates are used for unidirectional circuits that require no solenoid operated directional valves.

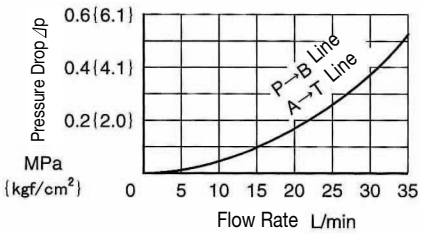


Model Number Designation

MDC	-01	-A	-30
Series Number	Valve Size	Type of Plate MPa{kgf/cm²}	Design Number
MDC :End Plate	**01**	**A** : Blocking Plate **B** : Bypass Plate	**30**

End Plate

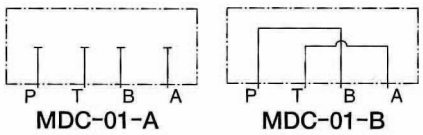
Hydraulic Fluid : Viscosity 35mm²/s,
Specific Gravity 0.850



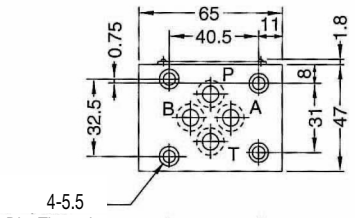
Ratings

Model Numbers	Max. Operating Pressure MPa{kgf/cm²}	Max. Flow L/min
MDC-01-※-30	31.5{321}	35

Graphic Symbols

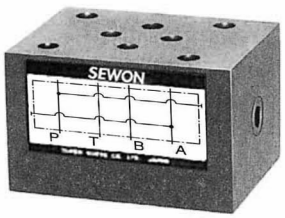


MDC-01



Connecting Plates

These plates are used for detecting pressure of each line.



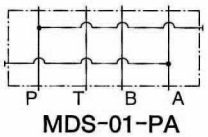
Model Number Designation

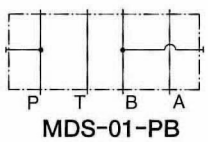
MDS	-01	-PA	-30
Series Number	Valve Size	Type of Plate MPa{kgf/cm²}	Design Number
MDS : Connecting Plate	**01**	**PA** : P & A-Lines **PB** : P & B-Lines **AT** : A & T-Lines	**30**

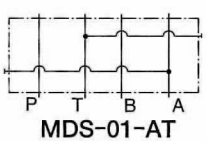
Ratings

Model Numbers	Max. Operating Pressure Mpa{kgf/cm²}	Max. Flow L/min
MDS-01-※-30	31.5{321}	35

Graphic Symbols

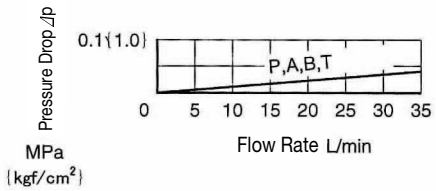




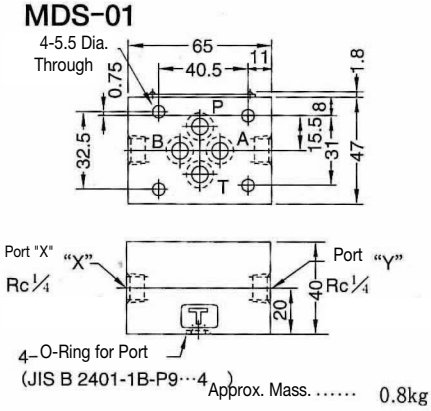


Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850



MDS-01



Model Number	Pressure Detecting Line	
	Port "X"	Port "Y"
MDS-01-PA	P-Line	A-Line
MDS-01-PB	B-Line	P-Line
MDS-01-AT	T-Line	A-Line

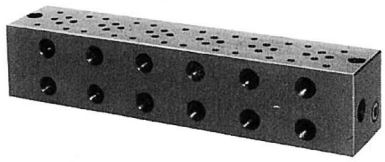
Base Plates, For Modular Valves

Ratings

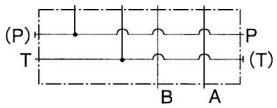
Max. Operating Pressure ····· 25MPa {255kgf/cm²}

Model Number Designation

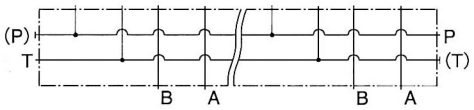
MMC	-01	-6	-40
Series Number	Valve Size	Number of Stations	Design Number
MMC : Base Plates	**01**	**1** : 1Stations **6** : 6Stations **2** : 2Stations **7** : 7Stations **3** : 3Stations **8** : 8Stations **4** : 4Stations **9** : 9Stations **5** : 5Stations **10**:10Stations	**40**



Graphic Symbols

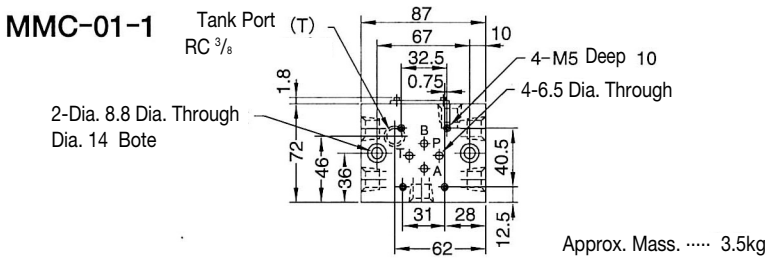


MMC-01-1

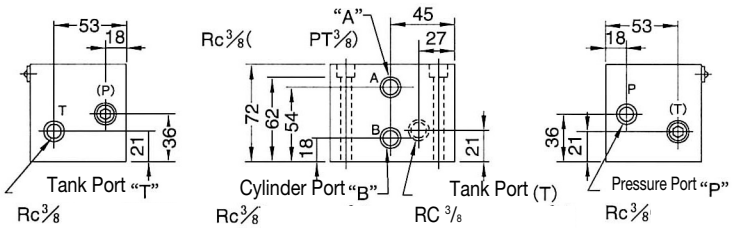


MMC-01-2~10

MMC-01-1

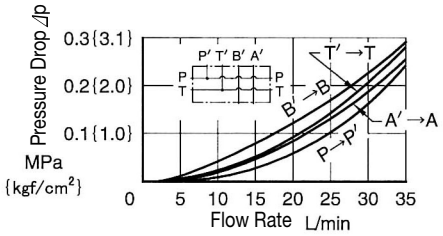


Approx. Mass. ····· 3.5kg

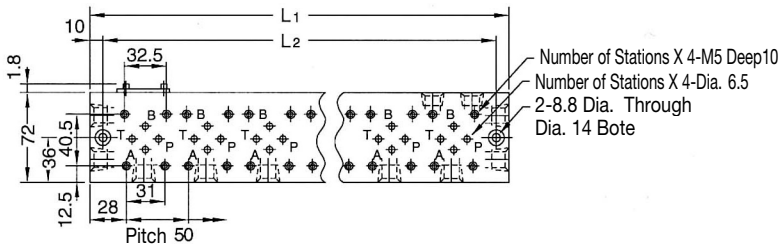


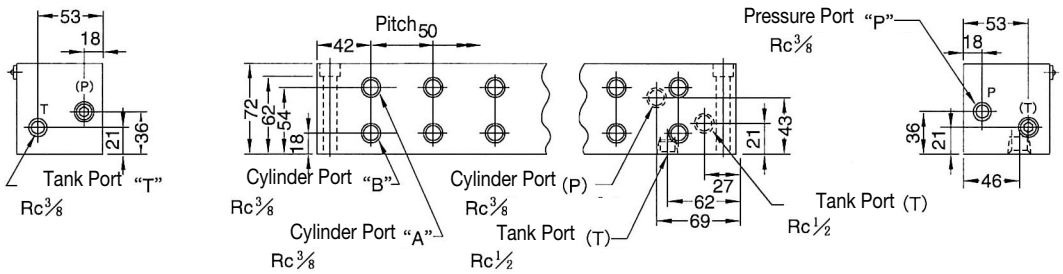
Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35mm²/s, Specific Gravity 0.850



MMC-01-2~10





Model Numbers	L1	L2	Approx. Mass. kg
MMC-01-2	137	117	5.5
MMC-01-3	187	167	7.0
MMC-01-4	237	217	8.5
MMC-01-5	287	267	10.0
MMC-01-6	337	317	11.5

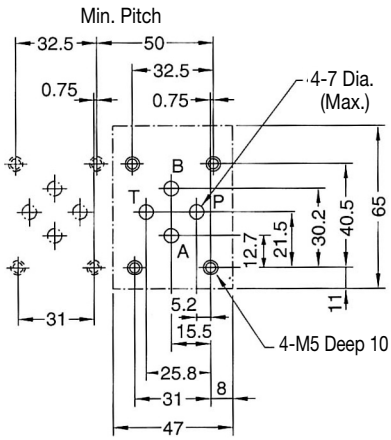
Model Numbers	L1	L2	Approx. Mass. kg
MMC-01-7	387	367	13.0
MMC-01-8	437	417	14.5
MMC-01-9	487	467	16.0
MMC-01-10	537	517	17.5

Instructions

Port Used : Base plate has three (two, in case of I station type) pressure port "P"s and four tank port "T"s. Any one of these ports or two or more ports may be used. However, please note that the ports marked with (P) or (T) in the drawing are normally plugged. Remove the plugs when using such ports. Make sure that ports that are nor currently used are properly plugged.

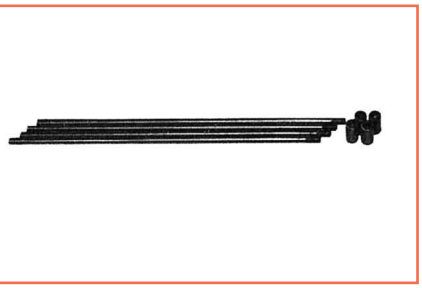
Interface Mounting Surface Dimensions for 1/8 Modular Valves.

When standard base plates (MMC-01) are not used. the mounting surface described on right must be prepared. The mounting surface should have a good machined finish.



Mounting Bolt Kits

Valves are mounted with four stud bolts. Valve combination varies according to the circuit type. Hence, the mounting bolt kits are available on a combination type basis. When ordering the bolt kit, be sure to give the bolt kit model number from the table below.



Model Number Designation

MBK	-01	-02	-30
Series Number	Size of Modular Valve	Bolt Number	Design Number
MBK: Bolt Kits for Modular Valves	**01**	**01,02,03,04,05** (Refer to the following chart)	**30**

Bolt Kit Composition

Stud Bolt ····· 4Pcs.
Nut ····· 4Pcs. } 1 Set.

Note: In case of bolt kit model number having "05", four hexagon socket head cap screws only.

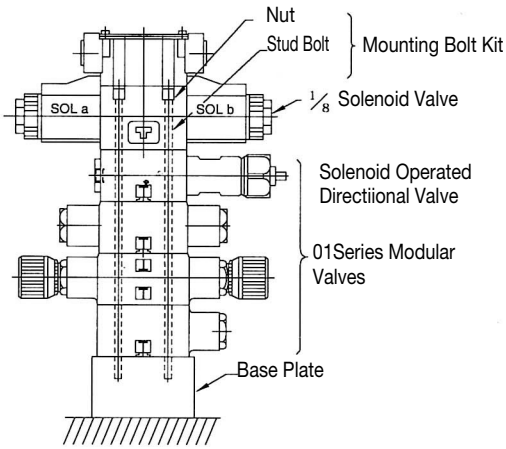
Tightening Torque

Operation Pressure MPa{kgf/cm²}	Tightening Torque Nm{kgf · m}
25{255} or less	5~6{0.5~0.6}
25{255} More than	6~7{0.6~0.7}

Bolt Kits Selection Chart

Model Numbers	Solenoid Operated Directional Valve			Approx. Mass 1Set.
	Quantity of valves to be stacked (※-DSG-01)	End Plate (MDC-01)	Modular Valve & Connecting Plate (M※※-01)	
MBK-01-01-30	1	0	1	60
	0	1		
MBK-01-02-30	1	0	2	100
	0	1		
MBK-01-03-30	1	0	3	130
	0	1		
MBK-01-04-30 ★1	1	0	4	160
	0	1		
MBK-01-05-30	1 ★2	0	0	40
	0	1		

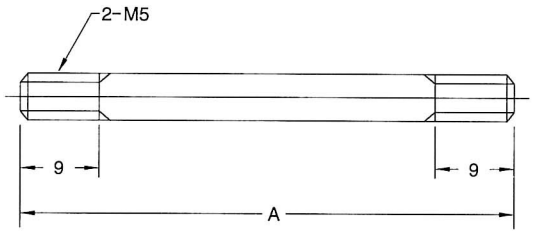
★1. In case of MBK-01-04-30, operating pressure is restricted at 25MPa{255kgf/cm²} or less.
★2. The solenoid operated directional valve comes with mounting bolts.



Stacking Example

MBK-01

●Stud Bolt



Model Numbers	Amm
01	94
02	134
03	174
04	214
05	Hexagon Socket head screw M5×45L

●Nut