



SM-
225617-A

INSTRUCTION MANUAL

REGULATOR

MNRB500

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

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

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 instruction manual carefully for proper operation.

INDEX

MNRB500
REGULATOR
Manual No. SM-225617-A

1. PRODUCT	
1.1 Specifications	1
1.2 External Dimensions	1
2. CAUTION	3
3. INSTALLATION	
3.1 Piping	4
3.2 Installation	4
4. OPERATION	
4.1 Pressure Setting	5
5. MAINTENANCE	
5.1 Troubleshooting	6
5.2 Replacement of Parts	7
5.3 Disassembling and Replacing the Regulator Block and the Supply Block ..	7
5.4 Disassembling Diagram and Expendable Parts List	9
6. MODEL NO. CLASSIFICATION	
6.1 Manifold Model Code	11
6.2 Manifold component block model	12
6.3 Preparing Mix Manifold Specifications	15

NOTE: Letters & figures enclosed within Gothic style brace
(examples such as [C2-4PP07] · [V2-503-B] etc.) are editing
symbols being unrelated with contents of the book.



1. PRODUCT

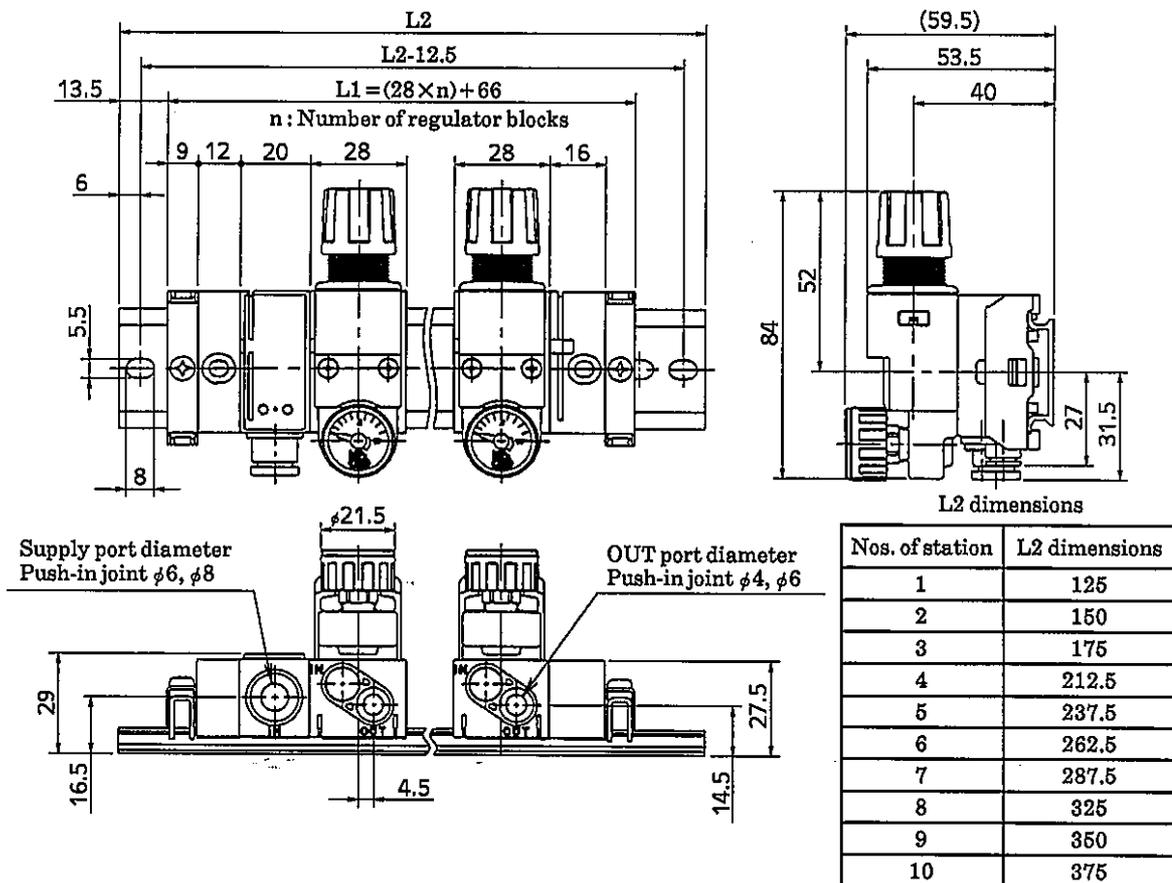
1.1 Specifications

Model No.		MNRB500A	MNRB500B
Item			
Media		Compressed air	
Maximum working pressure	MPa	0.8	
Withstanding pressure	MPa	1.2	
Working temperature range	°C	5~60	
Set pressure range	MPa	0.05~0.7 ※1	
Relief pressure	MPa	Set pressure plus 0.07	
Port size	IN	Push-in joint : φ6 · φ8	Push-in joint : φ4 · φ6
	OUT	Push-in joint : φ4 · φ6	
	GAUGE	Rc1/8	

※1 : The setting pressure range of the low-pressure type is 0.05 ~ 0.35.

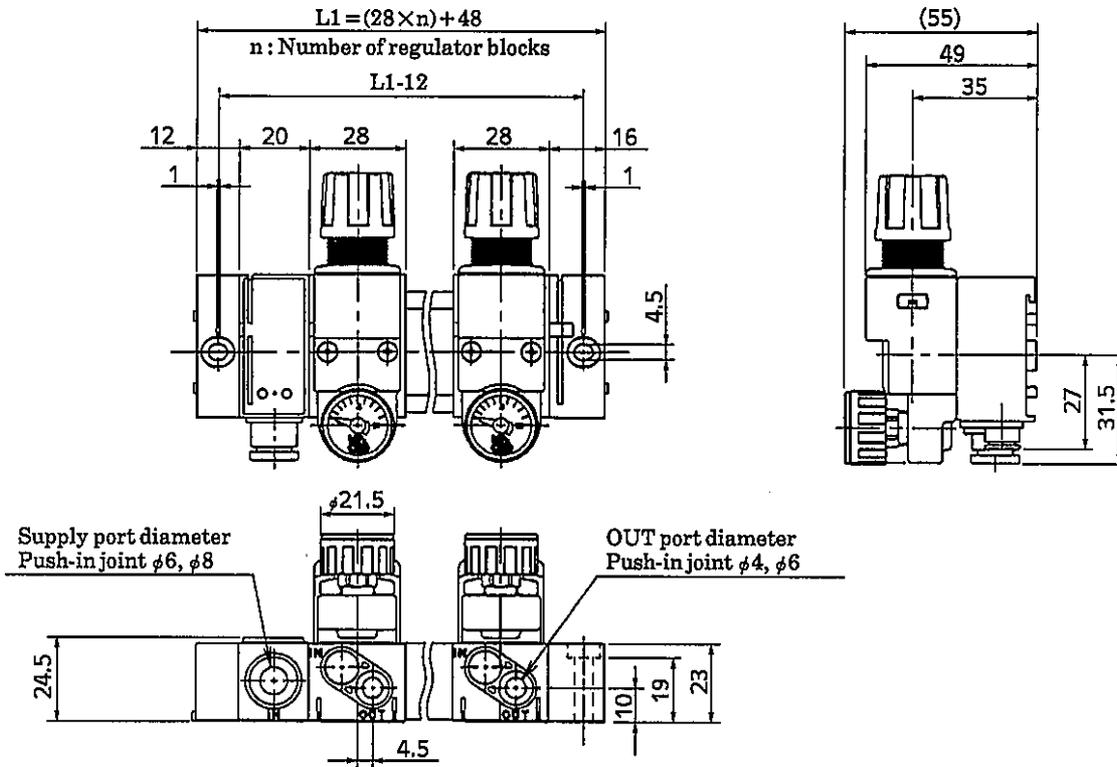
1.2 External Dimensions

- MNRB500A-※※C※※-※ (DIN rail-mounted type)

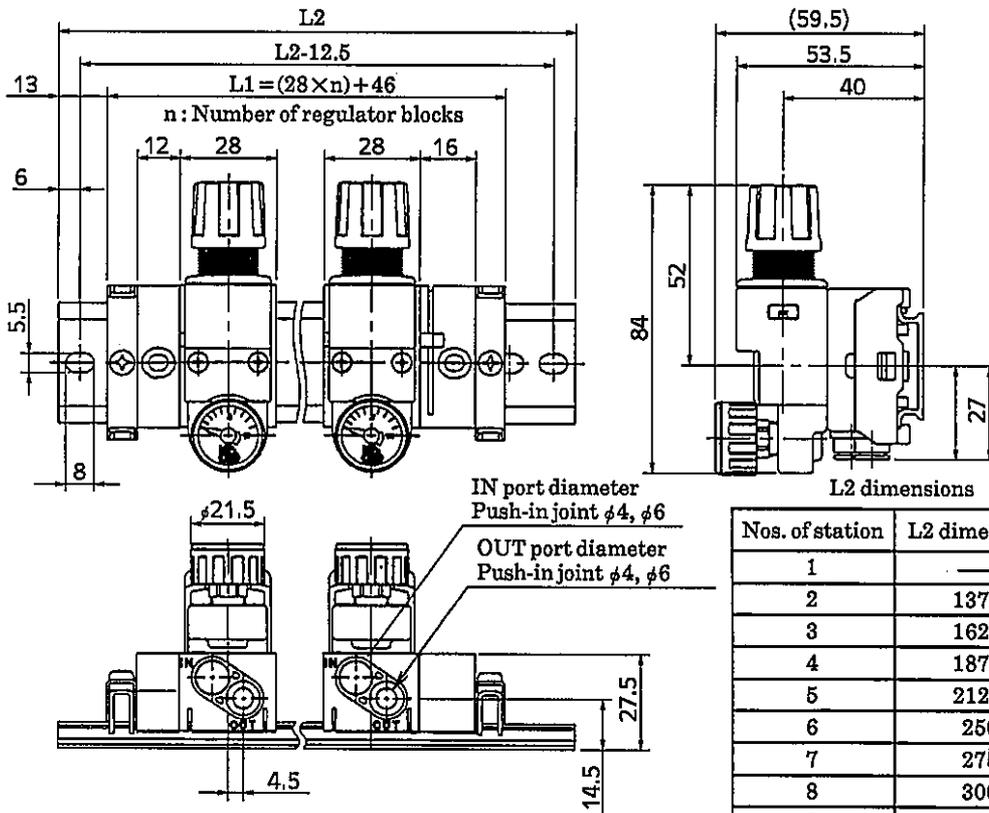




● MNRB500A-※※C※※-※-D (Direct mounted type)

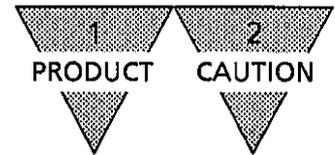


● MNRB500B-※※C※※-※ (DIN rail-mounted type)

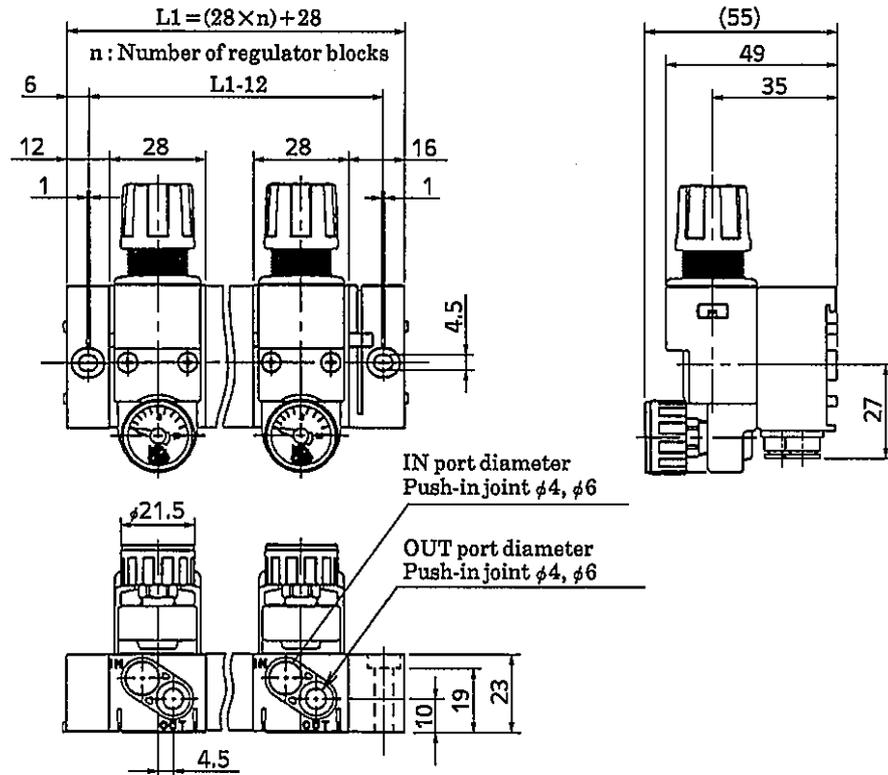


L2 dimensions

Nos. of station	L2 dimensions
1	—
2	137.5
3	162.5
4	187.5
5	212.5
6	250
7	275
8	300
9	325
10	362.5



● MNRB500B-※※C※-※-D (Direct mounted type)



2. CAUTION

Do not use the regulator under the following conditions. If the regulator must be used for some unavoidable reason, protect it with a cover, case, etc.

- 1) A place where the ambient temperature is not between 5°C and 60°C.
- 2) A place where the regulator will be exposed to waterdrops or cutting oil.
- 3) A place where dew forms because of high humidity and/or temperature changes.
- 4) A place subject to a corrosive gas, fluid or chemical atmosphere.
- 5) A place where the regulator will be exposed to a sea breeze or splashes of saltwater.
- 6) A place where the regulator will be exposed to direct sunlight.

3. INSTALLATION

3.1 Piping

- 1) Connect the piping so that air flows from IN to OUT marked on the sub base.
- 2) Install a 5 μ m air filter in the IN port of the regulator.
- 3) Install a pressure gauge in the gauge port. If a pressure gauge is not used, install a pipe plug instead. Tighten the pressure gauge and the pipe plug to 3.5 N·m or less.
- 4) Flush the pneumatic piping completely before connection.
- 5) Applicable tubes

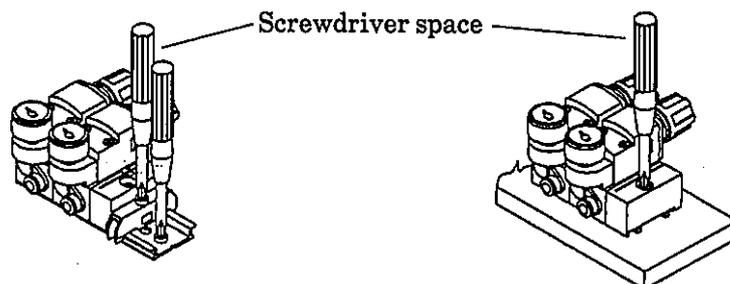
The piping is designed to be connected with a push-in joint. Piping tubes of an improper outer diameter, wall thickness or hardness may become disconnected or cause leakage. Use our specified tube.

Tube	Outer diameter	Outer diameter tolerance	Inner diameter	Minimum bending radius
Soft nylon F-1500 series	$\phi 4$	± 0.1	$\phi 2.5$	10
	$\phi 6$		$\phi 4$	20
	$\phi 8$		$\phi 5.7$	30
Urethane F-1500 series	$\phi 4$	+0.1	$\phi 2$	10
	$\phi 6$	-0.15	$\phi 4$	20
	$\phi 8$	+0.1 -0.2	$\phi 5$	30
New urethane NU series	$\phi 4$	± 0.1	$\phi 2.5$	10
	$\phi 6$		$\phi 4.5$	15
	$\phi 8$		$\phi 6$	28

- 6) Insert the piping tube in the push-in joint, and confirm that the tube is connected completely.

3.2 Installation

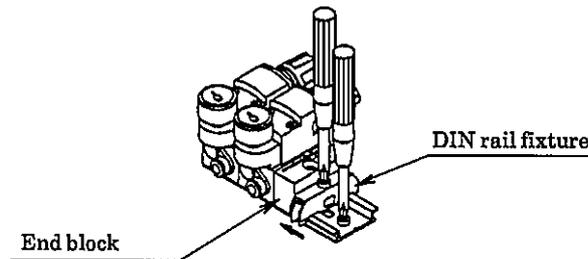
- 1) Do not move or swing the regulator by holding the pressure adjustment knob.
- 2) Install the regulator as close to the intended pneumatic unit as possible.
- 3) When disassembling the regulator, secure enough space for disassembly.



- 4) When installing the block manifold DIN rail-mounted type, fix the DIN rail, and secure the DIN rail fixtures on the outer side of the right and left end blocks that are attached to both end faces of the manifold.

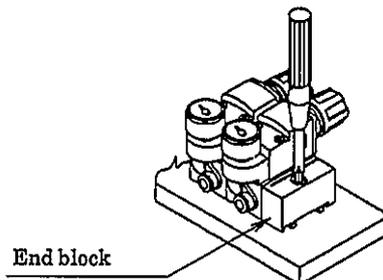
Tighten the DIN rail fixture set screws to 1.4~2.0N·m.

Fix the DIN rail fixtures by holding them close to the end blocks. Follow this rule during addition of a regulator block, maintenance or disassembly.



- 5) To directly mount the regulator without using the DIN rail, fasten both end blocks with M4 screws. Tighten the screws to 1.4~2.0N·m.

Mount the regulator on a flat bearing face. If external force is applied from the top to the regulator on a face that is not mounted on a bearing face, this will damage the coupled portions of the manifold. If no bearing face is available, use a rail-mounted type DIN.



- 6) Do not install the regulator in a location affected by vibration or impact.

4. OPERATION

4.1 Pressure Setting

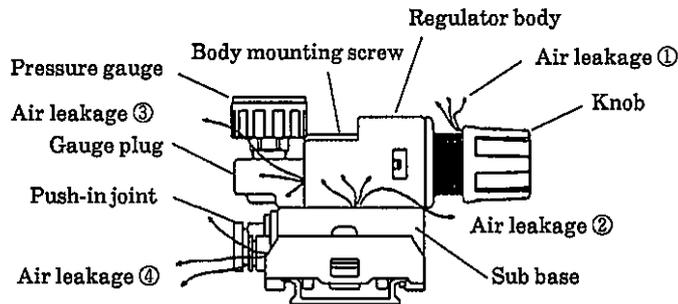
- 1) Before setting the pressure, pull up the knob to confirm that it is un-locked, and turn the knob.
- 2) The pressure increases by turning the pressure adjustment knob in the H direction, or decreases by turning the knob in the L direction. When setting the pressure, increase it from a low level to a high level.
- 3) By pushing the knob, it is locked and cannot turn.
- ※ Adjust the pressure within the set pressure range. However, it cannot be set at a value higher than the primary pressure.
- 4) Do not rotate the knob further in the L direction (decompression direction) from the set pressure of 0 MPa. The knob lock will no longer function.



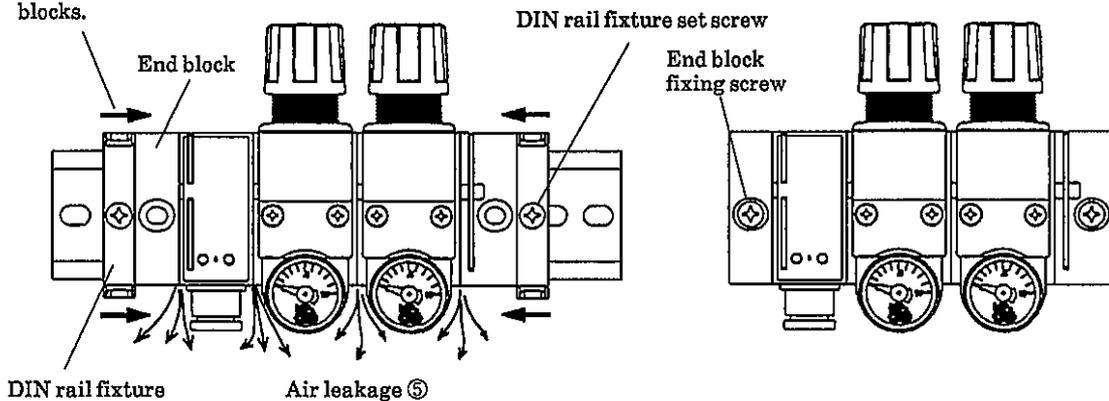
5. MAINTENANCE

5.1 Troubleshooting

Problem	Main cause	Measure
<ul style="list-style-type: none"> • The pressure cannot be adjusted. • Air leaks from the bottom of the knob ①. 	<ul style="list-style-type: none"> • There is a foreign substance on the rubber face of the valve element. 	<ul style="list-style-type: none"> • Remove the foreign substances from the rubber face of the valve element.
	<ul style="list-style-type: none"> • The compressed air flows from the OUT port to the IN port. 	<ul style="list-style-type: none"> • Cut off the compressed air, and connect the piping to the IN and OUT ports correctly.
	<ul style="list-style-type: none"> • The rubber face of the valve element is damaged. • The piston packing is damaged. • An O-ring is damaged. 	<ul style="list-style-type: none"> • Shut off the compressed air, disassemble the regulator, and replace the damaged part with a new one.
<ul style="list-style-type: none"> • Air leaks ② from a clearance between the regulator and the sub base. 	<ul style="list-style-type: none"> • The body packing is shrunken or damaged. • The body mounting screw is loose. 	<ul style="list-style-type: none"> • Shut off the compressed air, and tighten the screw.
<ul style="list-style-type: none"> • The pressure does not increase. • Air leaks from the gauge plug ③. 	<ul style="list-style-type: none"> • The primary pressure is insufficient. 	<ul style="list-style-type: none"> • Check the primary pressure.
	<ul style="list-style-type: none"> • The primary piping is long, or its diameter is small. 	<ul style="list-style-type: none"> • Reduce the primary piping length, or increase the piping diameter.
	<ul style="list-style-type: none"> • The indicator of the pressure gauge does not function at all. • The gauge plug packing is shrunken or damaged. 	<ul style="list-style-type: none"> • Replace the pressure gauge with a new one. • Replace the gauge plug packing.
<ul style="list-style-type: none"> • Air leaks from the push-in joint ④. 	<ul style="list-style-type: none"> • The tube is not inserted completely. 	<ul style="list-style-type: none"> • Confirm whether the tube is inserted completely.
	<ul style="list-style-type: none"> • The seal material of the push-in joint is expanded, shrunken or damaged. 	<ul style="list-style-type: none"> • Replace the push-in joint with a new one.
<ul style="list-style-type: none"> • Air leaks ⑤ from a clearance between the coupled blocks. 	<ul style="list-style-type: none"> • An O-ring is damaged. 	<ul style="list-style-type: none"> • Shut off the compressed air, disassemble the regulator, and replace the damaged part with a new one.
	<ul style="list-style-type: none"> • The clearance between the coupled blocks has become wider. 	<ul style="list-style-type: none"> • Check the DIN rail fixture set screws and the end block fixing screws for looseness.



Secure the DIN rail fixture close to the end blocks.



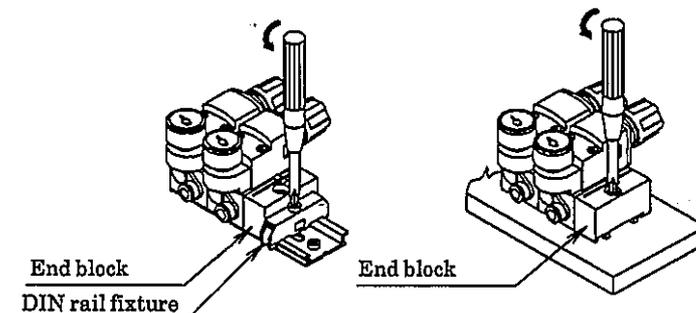
5.2 Replacement of Parts

Before disassembling the regulator, shut off the primary pressure, and release any residual pressure to confirm that the regulator is depressurized completely. Disassemble the regulator according to the disassembling diagram.

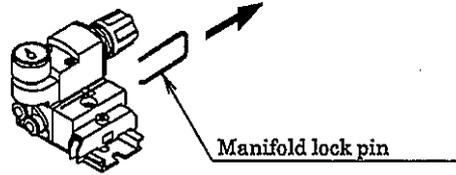
5.3 Disassembling and Replacing the Regulator Block and the Supply Block

- 1) When replacing the rail-mounted type DIN, first unfasten the DIN rail fixture set screws.

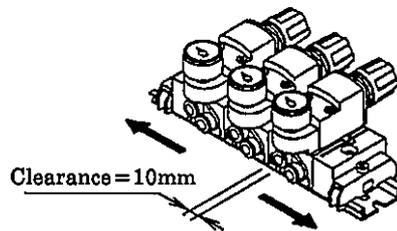
In the case of the direct mounted type that does not use the DIN rail, remove the end block fixing screws.



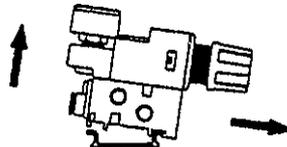
- 2) Using a thin screwdriver, draw out the manifold lock pin coupling the regulator block or supply block that is to be replaced.



- 3) Slide the blocks to the end blocks, and allow a clearance of about 10 mm on both sides of the block for replacement. Or, draw out both of the direct mounted type end blocks.



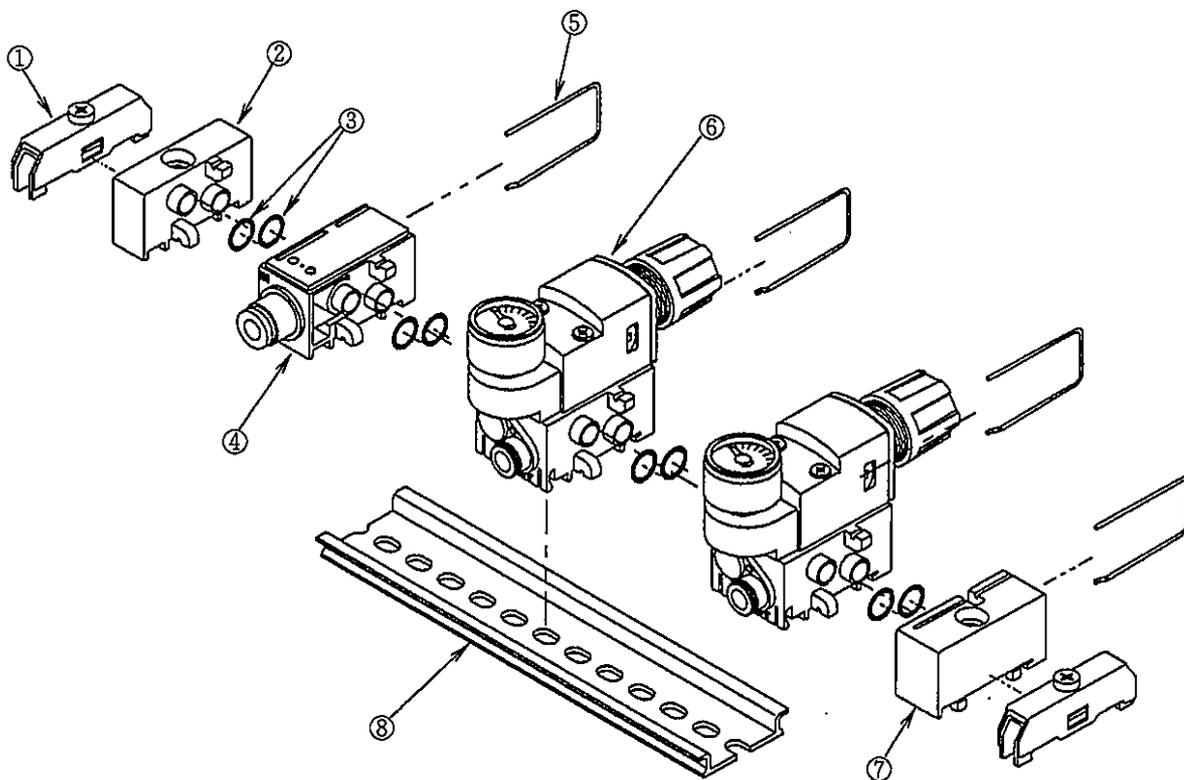
- 4) Raise the pressure gauge side, and draw the block toward the pressure adjustment knob. The block can be removed. By sliding both DIN rail fixtures more than 2 mm away from the end blocks, the entire manifold block can be removed.



- 5) Replace the block with a new one.
- 6) Keeping the blocks in close contact with each other, insert the manifold lock pin until it touches the bottom of the groove.
- 7) Fasten the blocks to the manifold by following steps 4) and 5) of 3.2 Installation.

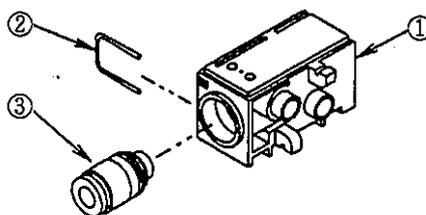
5.4 Disassembling Diagram and Expendable Parts List

1) Block manifold disassembling diagram



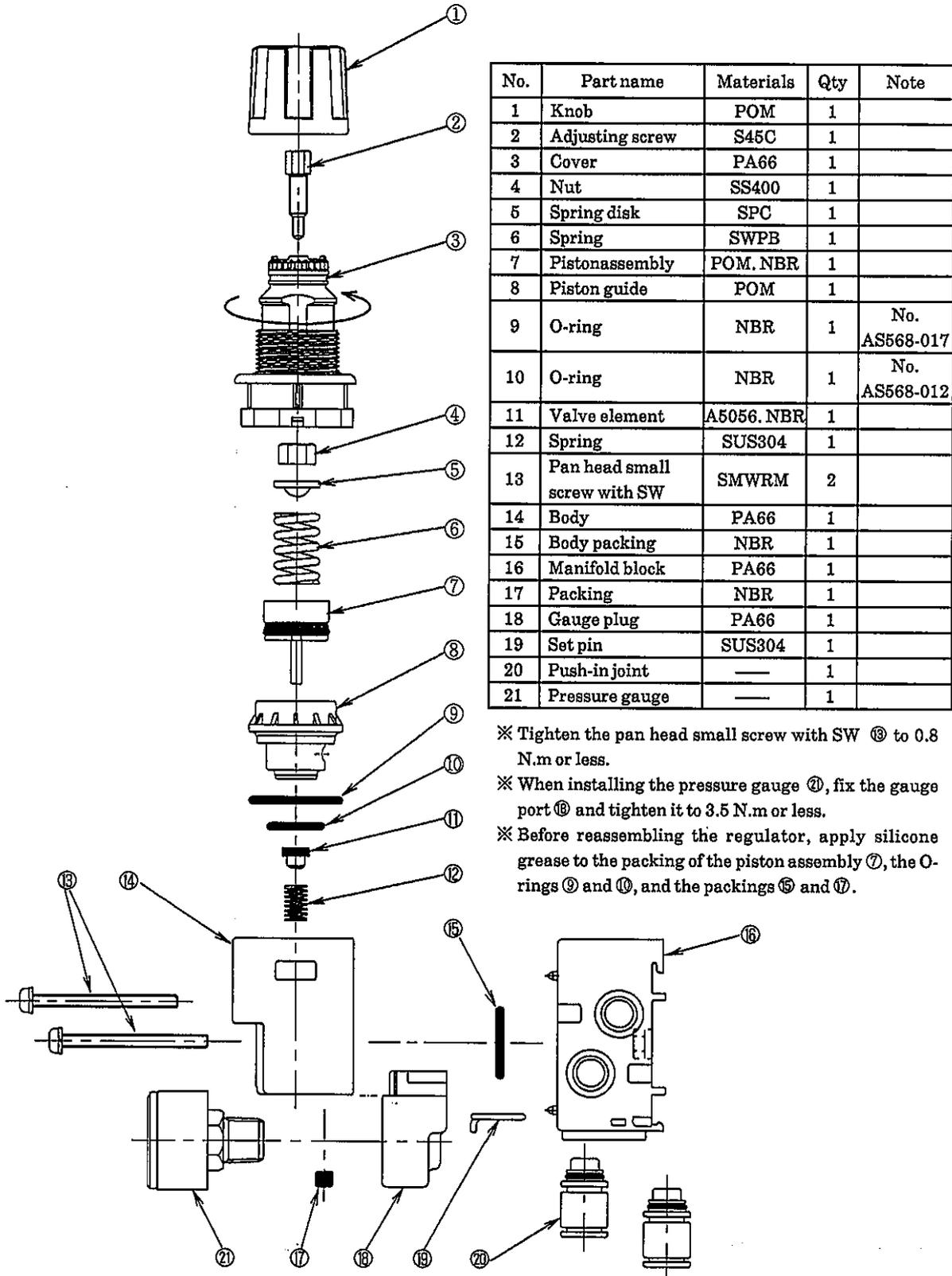
No.	Part name	Materials	Qty	Note
1	DIN rail fixture	SPCC	2	Rail-mounted type DIN only
2	End block L	PA66	1	
3	O-ring	NBR	$(n+m+1) \times 2$	Standard No. AS568-011
4	Common supply block		m	Common supply type only
5	Manifold lock pin	SUS304	$(n+m+1)$	
6	Regulator block		n	
7	End block R	PA66	1	
8	DIN rail	Aluminum	1	Rail-mounted type DIN only

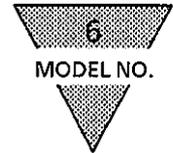
2) Supply block disassembling diagram (common supply type only)



No.	Part name	Materials	Qty	Note
1	IN port block	PA66	1	
2	Lock pin	SUS304	1	
3	Push-in joint	—	1	

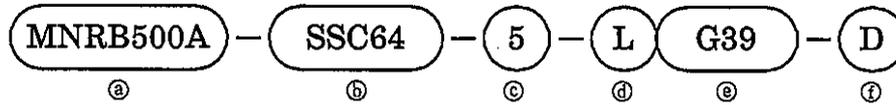
3) Regulator block disassembling diagram





6. MODEL NO. CLASSIFICATION

6.1 Manifold Model Code



Ⓐ Model No.		Ⓑ Connection				Ⓒ No. of stations ※3		
MNRB500A	Common supply type	Direction		Port size		1	1 station	
		IN	OUT	IN-OUT		2	2 stations	
MNRB500B	Individual supply type	S	S	Straight	C64 ※1	IN φ6, OUT φ4	3	3 stations
		L	L	Elbow	C66 ※1	IN φ6, OUT φ6	4	4 stations
					C84 ※1	IN φ8, OUT φ4	5	5 stations
					C86 ※1	IN φ8, OUT φ6		
					C4 ※2	IN, OUT φ4		
			C6 ※2	IN, OUT φ6				

Ⓓ Option ※4		Ⓔ Pressure gauge ※4		Ⓕ How to mounting	
L	For low pressure	No code	φ21 Standard product	No code	Rail-mounted DIN
N	Non-relief		φ27 For low pressure	D ※3	Direct mounted
T	Without pressure gauge	G39	φ27		
X1	Inverse IN position				

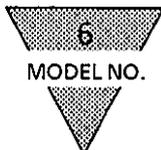
Note 1 : There is one supply block. When using three or more manifolds at the same time, add a supply block for every three manifolds. In such a case, specify in the mix manifold specifications.

※1 : The port size represents only the common supply type.

※2 : The port size represents only the individual supply type.

※3 : Do not use more than five direct mounted type manifolds.

※4 : The regulator block options and the pressure gauge are common.



6.2 Manifold component block model

1) Regulator block

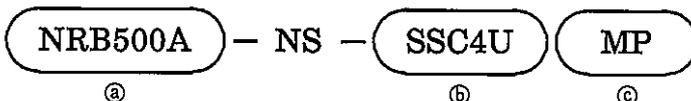


㉑ Model No.		㉒ Connection						
NRB500A	Common supply type	Direction ※1			Port size		Position	
		IN	OUT		IN-OUT		OUT position	
NRB500B	Individual supply type	S	S	Straight	C4	φ4	No code	Pressure gauge side
		L	L	Elbow	C6	φ6	U	Knob side

㉓ Option		㉔ Pressure gauge	
L	For low pressure	No code	φ21 Standard product
N	Non-relief		φ27 For low pressure
T	Without pressure gauge	G39	φ27

※1: The indication of the IN direction is not necessary with the regulator block for common supply.

2) Sub base

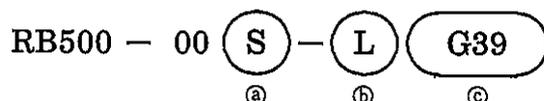


㉑ Model No.		㉒ Connection						
NRB500A	Common supply type	Direction ※1			Position		口径	
		IN	OUT		OUT position		IN-OUT	
NRB500B	Individual supply type	S	S	Straight	No code	Pressure gauge side	C4	φ4
		L	L	Elbow	U	Knob side	C6	φ6

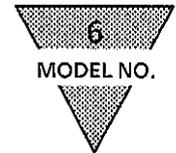
㉓ Option	
No code	Without masking plate
MP	For masking plate

※1: The indication of the IN direction is not necessary with the regulator block for common supply.

3) Regulator



Model No.	㉑ Type		㉒ Option		㉓ Pressure gauge	
NRB500	S	For single unit (RB500)	L	For low pressure	No code	φ21 Standard product
			N	Non-relief		φ27 For low pressure
	M	For manifold (MNRB500A, B)	T	Without pressure gauge	G39	φ27
			P	Panel mount		



4) Common supply block

NRB500 – NP – (S)
 ③

Model No.	③ Connection			
	Direction		Port size	
NRB500	S	Straight	C6	φ6
	L	Elbow	C8	φ8

5) End block

NRB500 – NE (D)
 ③

Model No.	③ Type	
	NRB500	No code
L		End block L for DIN rail
D		End block R
DL		End block L

6) Common supply block equipped with pressure switch

NRB500 – APS – (S) – (3)
 ③ ④

Model No.	③ Connection				④ Lead wire length	
	Direction		Port size		No code	1m
NRB500	S	Straight	C6	φ6	3	3m
	L	Elbow	C8	φ8	5	5m

7) Pressure switch

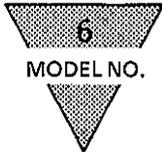
NRB500 – APS – (3)
 ④

Model No.	④ Lead wire length	
	NRB500	No code
3		3m
5		5m

8) DIN rail

NRB500 – BAA – (150)
 ③

Model No.	③ DIN rail dimension	
	NRB500	125
150		150m
⋮		⋮



9) Cartridge joint (for regulator block)

NRB500 — joint — **CL4**
 Ⓐ

Model No.	Ⓐ Type	
NRB500	C4	Straight φ4
	C6	Straight φ6
	CL4	Elbow φ4 (for single unit)
	CL6	Elbow φ6 (for single unit)
	CLL4	Long elbow φ4 (for manifold)
	CLL6	Long elbow φ6 (for manifold)

10) Pressure gauge

G **29** D — 6 — **P10**
 Ⓐ Ⓑ

Ⓐ Model No.	Ⓑ Pressure indication	
G29D	P04	0~0.4MPa (G29D only)
G39D	P10	0~1.0MPa

11) Cartridge joint (for common supply block)

NRB500 — Qjoint — **L6**
 Ⓐ

Model No.	Ⓐ Type	
NRB500	6	Straight φ6
	8	Straight φ8
	L6	Elbow φ6
	L8	Elbow φ8

12) Blank plug

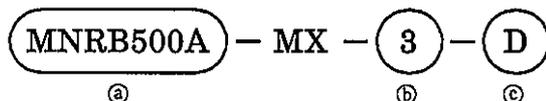
GSP **4** — B
 Ⓐ

Model No.	Ⓐ Type	
GSP	4	φ4
	6	φ6
	8	φ8

6.3 Preparing Mix Manifold Specifications

Specify the selected combination of regulator block connecting direction, port size and options, as well as the pressure gauge with the mix manifold model code in the mix manifold specifications.

1) Mix manifold model code



a Model No.		b Number of regulator blocks		c Installation	
MNRB500A	Common supply type	1	1	No code	DIN rail-mounted
		2	2	D ※1	Direct mounted
MNRB500B	Individual supply type	3	3		
		⋮	⋮		

※1: The number of regulator and supply blocks available for the direct mounted type must be six or less.
However, up to five regulator blocks can be used.

2) Preparing mix manifold specifications

Specify the model number, installation position number and quantity of component blocks. For component blocks, see pages 12 ~ 14.

Component block name	Installation position No.										Qty	
	Model No.	1	2	3	4	5	6	7	8	9		10
End block L	NRB500 - NE <input type="checkbox"/> L	○										1
Common supply block	NRB500 - NP - <input type="checkbox"/> SC6		○						○			2
Common supply block equipped with APS	NRB500 - APS - <input type="checkbox"/> - <input type="checkbox"/>											
Regulator block	NRB500 <input type="checkbox"/> A - <input type="checkbox"/> SC4 <input type="checkbox"/> L <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>			○				○				2
	NRB500 <input type="checkbox"/> A - <input type="checkbox"/> SC6 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> G39						○					1
	NRB500 <input type="checkbox"/> A - <input type="checkbox"/> LC4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>				○							1
	NRB500 <input type="checkbox"/> A - <input type="checkbox"/> SC4 <input type="checkbox"/> L <input type="checkbox"/> N <input type="checkbox"/> T <input type="checkbox"/>					○						1
	NRB500 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>											
	NRB500 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>											
	NRB500 <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>											
Sub base equipped with masking plate	NRB500 <input type="checkbox"/> - NS - <input type="checkbox"/> - MP											
End block R	NRB500 - NE <input type="checkbox"/>									○		1
DIN rail	L ₂ = <input type="checkbox"/> 262.5 mm	Attachment		GSP4-B		2 piece		GSP8-B		piece		
		Blank plug		GSP6-B		piece						

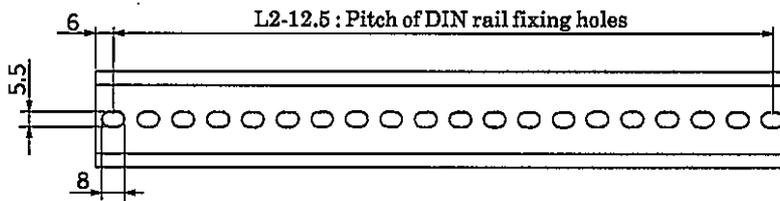
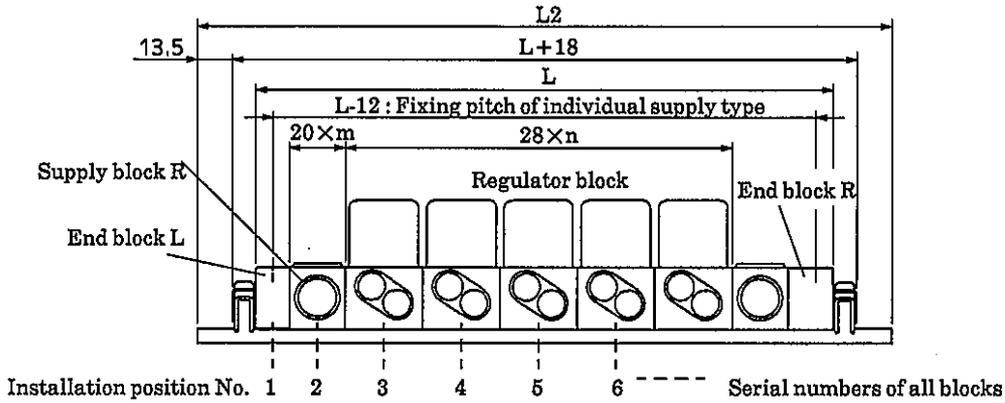


3) DIN rail length and manifold dimensions

Manifold length L2 : See the below table.

$$L = (28 \times n) + (20 \times m) + 28$$

n : Number of regulator blocks
 m : Number of supply blocks



Length L2 of common supply type manifold

Number of blocks	Dimension m = 1	Dimension m = 2	Dimension m = 3
1	125		
2	150		
3	175	200	
4	212.5	225	
5	237.5	262.5	275
6	262.5	287.5	300
7	287.5	312.5	337.5
8	325	337.5	362.5
9	350	375	387.5
10	375	400	412.5

Length L2 of individual supply type manifold

Number of blocks	Dimension m = 1
1	—
2	137.5
3	162.5
4	187.5
5	212.5
6	250
7	275
8	300
9	325
10	362.5