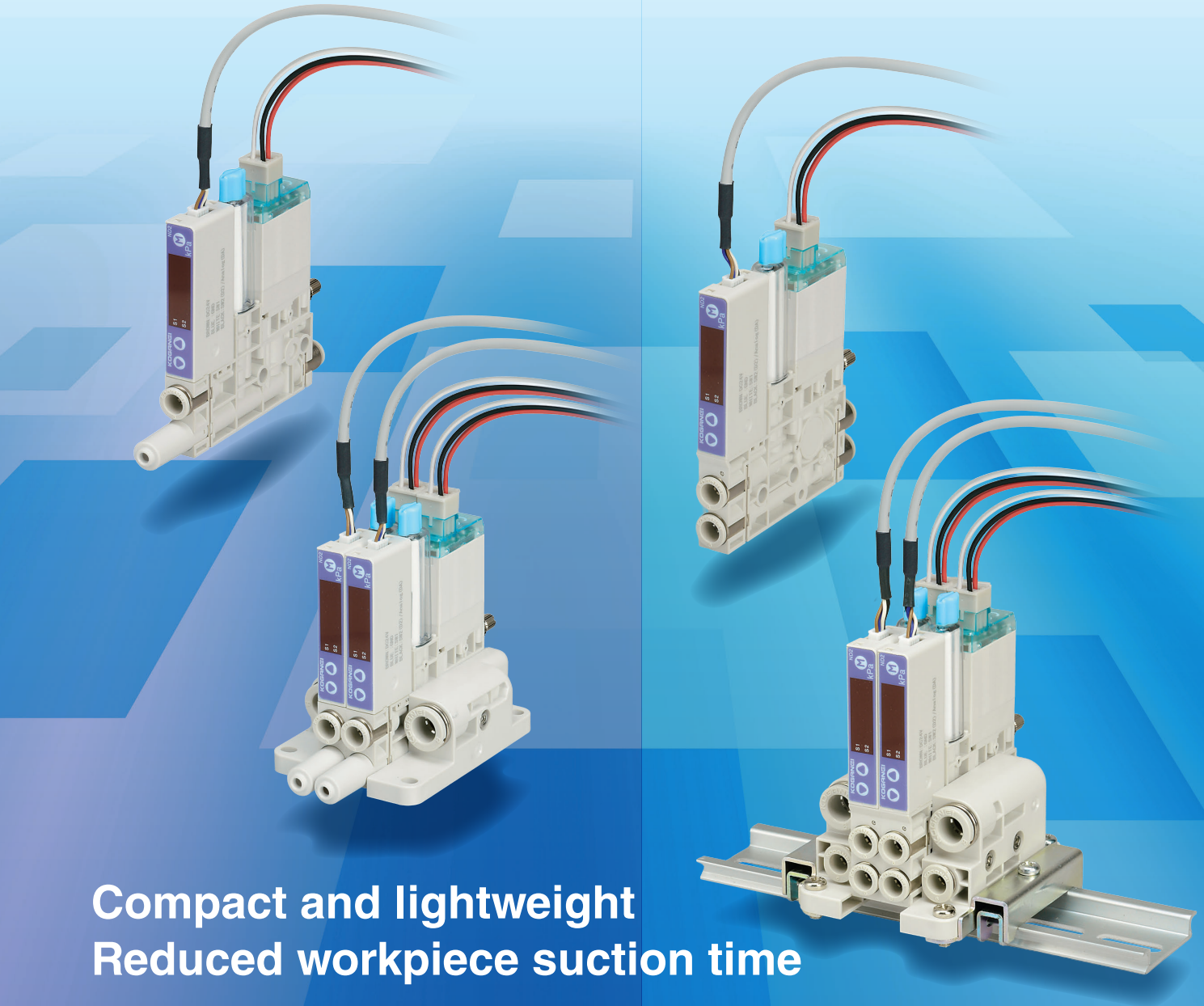
KOGANEI
https://www.koganei.co.jp

Catalog No.BK-S0007

NEW Products

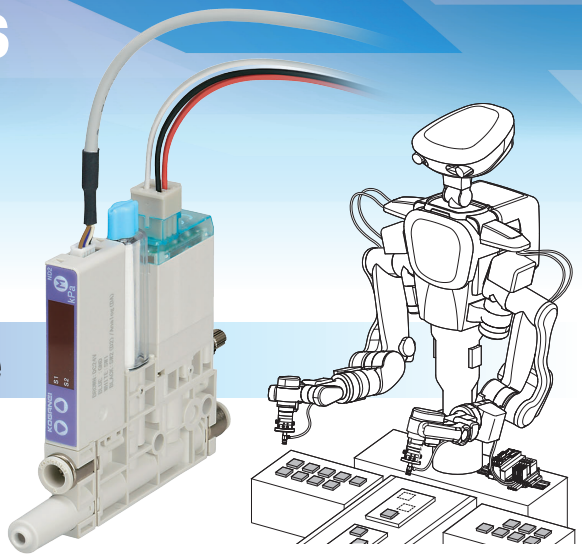
Micro Ejector LSME Series
Vacuum Valve Unit LSMV Series



Compact and lightweight
Reduced workpiece suction time

Achieves both improved productivity in vacuum transfer and energy savings

Micro Ejector LSME Series



Improved productivity Shorter tact time

Reduced workpiece suction time

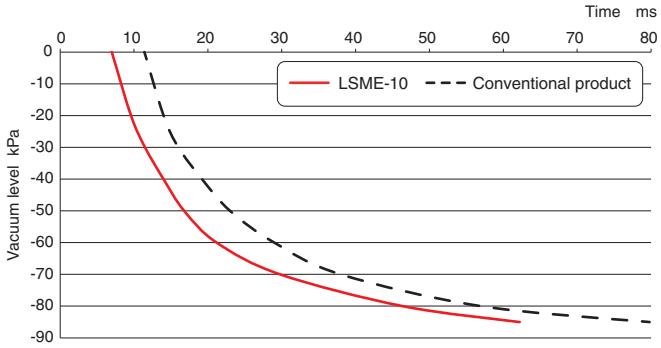
30% improvement in time to reach vacuum compared to our conventional products

Improved main valve response and reduced internal volume (filter, etc.)

When using a ϕ4 [0.157] tube with a length of 30 cm [11.811 in.] for the piping from the vacuum port to the workpiece, the time to reach -60 kPa [-17.724 inHg] is approximately 20 ms for the LSME, compared to approximately 30 ms for conventional products.

	Nozzle diameter	Main valve response	Product width	Vacuum level	Vacuum flow rate	Filter volume
Conventional product	ϕ1.0 [0.039]	Approx. 13 ms	21 mm [0.827 in.]	-88 kPa [-25.995 inHg]	18 L/min (ANR) [0.636 ft³/min (SCFM)]	Approx. 2.2 cm³ [0.134 in³]
LSME		Approx. 7 ms	10.5 mm [0.413 in.]			Approx. 1.3 cm³ [0.079 in³]

Values at supply pressure 0.4 MPa [58 psi] and standard atmospheric pressure



Energy savings

Equipped with low power consumption coil

Steady state: 0.1 W

Starting: 0.4 W (starting time: 70 ms)

Reduced air consumption * LSME-03 only

LSME-03 ϕ0.3 mm [0.012 in.] Small-diameter nozzle employed

Air consumption: 4 L/min (ANR) [0.141 ft³/min (SCFM)] (when 0.4 MPa [58 psi] is supplied) Vacuum level: -70 kPa [-20.678 inHg]

Vacuum flow rate: 3.5 L/min (ANR) [0.124 ft³/min(SCFM)]

Can be driven by our smart mini compressor.

Low noise

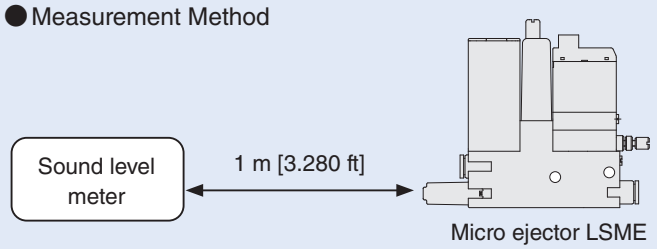
Achieves both performance and low noise through proprietary muffler structure.

* Compared to our products

- ϕ0.3 [0.012] nozzle ejector
  - LSME-03 → 42 dB[Note]
  - ME03 → 58 dB
- ϕ1.0 [0.039] nozzle ejector
  - LSME-10 → 60 dB[Note]
  - FME10-SH → 60 dB
  - (FME low-noise type muffler)

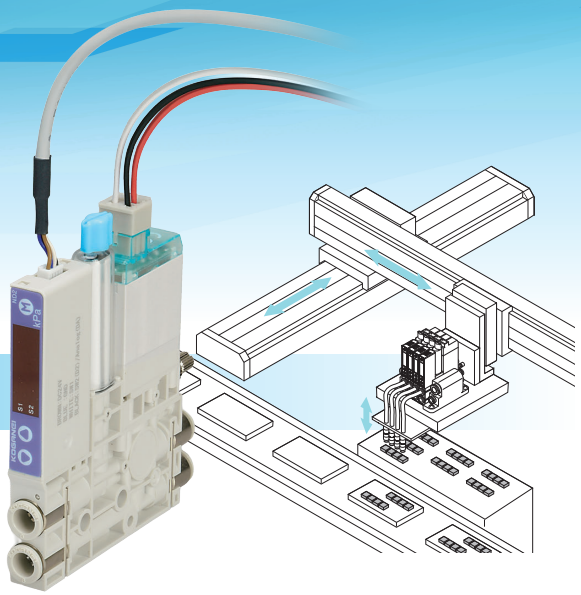
Note: 42 dB: Typical office environment
60 dB: Normal conversation level

● Measurement Method



(Measurement environment based on our measurement conditions)

Vacuum Valve Unit LSMV Series



Improved productivity Shorter tact time

Reduced workpiece suction time

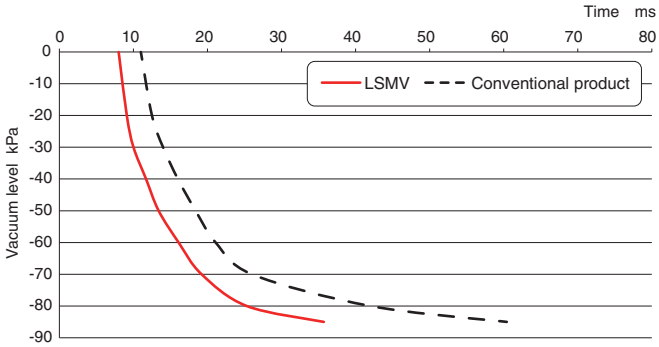
25% reduction in time to reach vacuum compared to our conventional products

Improved main valve response and reduced internal volume (filter, etc.)

When using a ϕ4 [0.157] tube with a length of 30 cm [11.811 in.] for the piping from the vacuum port to the workpiece, the time to reach -60 kPa [-17.724 inHg] is approximately 16 ms for the LSMV, compared to approximately 21 ms for conventional products.

	Main valve response	Product width	Vacuum flow rate	Filter volume
Conventional product	Approx. 13 ms	12.5 mm [0.492 in.]	35 L/min (ANR) [1.236 ft³/min (SCFM)]	Approx. 5.2 cm³ [0.317 in³]
LSMV	Approx. 7 ms	10.5 mm [0.413 in.]	20 L/min (ANR) [0.706 ft³/min (SCFM)]	Approx. 1.3 cm³ [0.079 in³]

Supply pressure: 0.4 MPa [58 psi] and -90 kPa [-26.586 inHg] Values at standard atmospheric pressure



Common

New vacuum pressure switch

Compact and lightweight 10 mm [0.394 in.] width, 10 g [0.35 oz] (without cable), cables available in 1.5 m [4.920 ft] and 3 m [9.840 ft]

Available in 4 types

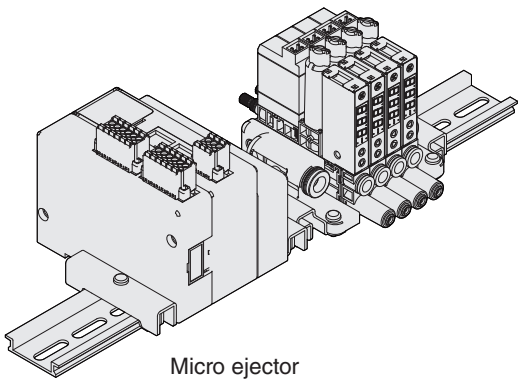
NDA	NPN, 1 switch output, 1 analog
ND2	NPN, 2 switch outputs
PDA	PNP, 1 switch output, 1 analog
PD2	PNP, 2 switch outputs

ECO setting mode Power consumption reduced from 0.2 W (normal mode) to 0.1 W in ECO setting mode

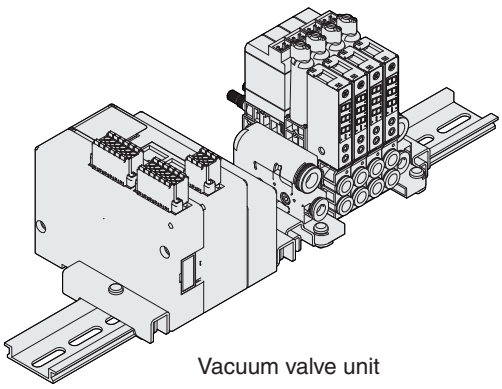
(At 24 VDC supply; other values based on our measurement conditions)

Communication support

I/O terminal mounted as a standard option (solenoid valve input and vacuum pressure switch output)



Micro ejector



Vacuum valve unit

General precautions

Mounting

1. The mounting orientation is unrestricted; however, do not subject the main body directly to strong impact or vibration.
2. Avoid use in locations and environments like those described below, which can result in damage to the valve. If use in such conditions is unavoidable, be sure to implement adequate protective measures, such as installing a cover.
   - Locations where water droplets, oil droplets, etc. may come into direct contact with the valve
   - Environments where condensation forms on the valve main body
   - Locations where chips, dust, or other particulate matter may come into direct contact with the valve
   - Locations exposed to salt, corrosive gasses, or electroconductive powders
3. Before installing piping to the micro ejector and the vacuum valve unit, thoroughly flush the inside of the pipes (with compressed air).
   Cuttings, sealing tape, or rust produced while doing piping work that gets inside the product could cause air leakage in the valve or a decrease in micro ejector performance.
4. Adjust the pressure of the air supplied to the micro ejector, using a regulator. If the piping to the micro ejector is long, set a higher pressure. When using an air supply valve, use a valve with an effective cross-sectional area at least three times the nozzle area of the micro ejector used.
5. Use one vacuum pad per micro ejector or vacuum valve unit. Using two or more pads may easily cause suction errors and will increase the time required to reach the set vacuum level.
6. Periodically replace the filter (order code: **LSMEZ-F**) provided as standard with the micro ejector or vacuum valve unit.
7. Do not use corrosive gases or liquids as the pressure medium.
8. Do not apply pressure exceeding the proof pressure to the vacuum switch or pressure sensor.
9. Do not subject the lead wires to excessive tensile force or extreme bending. When handling the product, always hold the body side and do not apply excessive force to the power cable.
10. When mounting the micro ejector or vacuum valve unit as a standalone component, a mounting bracket (**LSMEZ-21**) is available (tightening torque: 32 N·cm [2.832 in·lbf]).
    When mounting the main body directly, use M4 bolts (tightening torque: 50 to 60 N·cm [4.426 to 5.311 in·lbf]).
11. Ensure sufficient space around the exhaust port. Exhaust air resonance may increase noise and reduce micro ejector performance.
12. When increasing or decreasing the number of manifold units, or when replacing maintenance parts, tighten them to the specified tightening torque.

Air supply

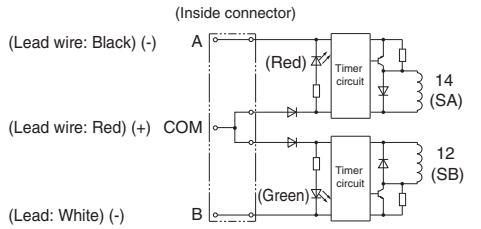
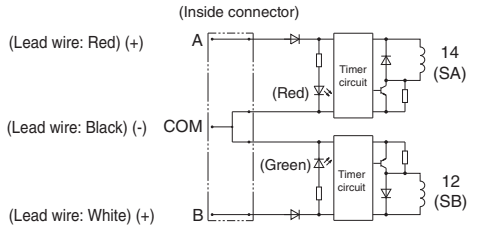
1. Use air as the medium. If any fluid other than air is to be used, consult us in advance.
2. Use clean air that does not contain deteriorated compressor oil or other contaminants. Install an air filter (filtration rating: 40 µm or less) near the micro ejector or vacuum valve unit to remove drain and foreign matter.Drain the air filter periodically.

Wiring

After finishing wiring, check that the connections are correct.

Solenoid

Internal circuit

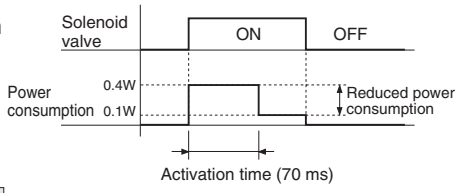
Voltage specifications	Internal circuit
Positive common (24 VDC)	
Negative common (24 VDC)	

NOTE
1. Do not perform a megger test between the pins.
2. If there is leakage current in the circuit, malfunction such as failure of the solenoid valve to return may occur. Be sure to use the product within the allowable circuit leakage current specified in the electrical specifications. If the leakage current exceeds the allowable value due to circuit conditions, etc., consult your nearest Koganei sales office.

Operating principle

By employing a timer circuit as described above, power consumption in the steady state after a certain period is reduced to approximately one-fourth of starting power, thereby achieving energy savings.

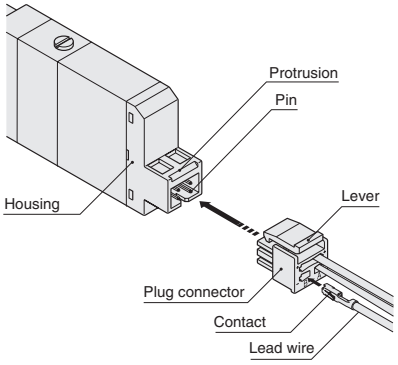
● **Power waveform**



Wiring procedure

1. Attaching and detaching the plug connector

To attach the connector, hold it with your fingers, insert it onto the pins, and push it in until the lever latch engages with the protrusion on the housing.
To detach the connector, hold the lever together with the connector, securely disengage the lever latch from the housing protrusion, and then pull it out.



NOTE When detaching the connector, ensure that the lever latch is completely disengaged from the protrusion before pulling it out. Pulling the connector out while it is still engaged with the protrusion may damage the housing.

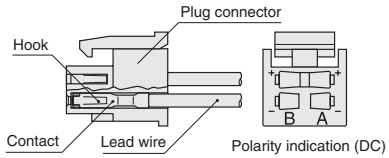
2. Attaching and detaching the plug connector and the contact

● Attaching

Push the lead wire with contact into the square □ opening of the plug connector. The hook of the contact will engage with the plug connector and lock in place. Gently pull the lead wire to confirm that it does not come out (see figure below).

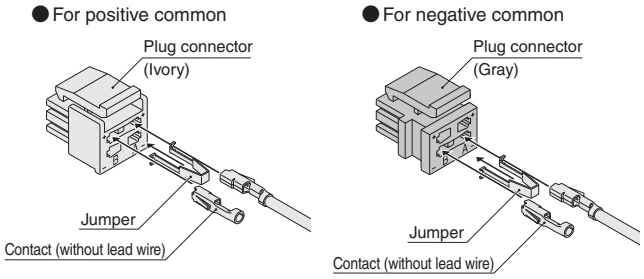
● Detaching

From the rectangular hole on the side of the plug connector, push in the contact hook, using a thin-tipped tool (such as a precision screwdriver), and while so doing, pulling out the lead wire to detach it. When reusing the contact, spread the hook outward as appropriate.



3. Common terminal and jumper

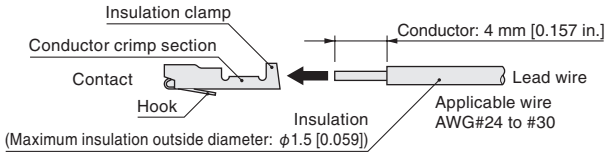
The plug connector is equipped with a jumper so that the wiring of solenoid A (SA) and solenoid B (SB) is configured as positive common. Do not remove the jumper.



The plug connector for positive common and the plug connector for negative common differ in shape.

4. Crimping the contact and the lead wire

To crimp the lead wire to the contact, strip approximately 4 mm [0.157 in.] of insulation from the end of the lead wire, insert it into the contact, and crimp it. At this time, ensure that the insulation does not enter the conductor crimp section.



NOTE

1. Do not pull the lead wire with excessive force.

2. Always use the dedicated tool to crimp the lead wire to the contact.

Contact: Model 706312-2MK
Manufactured by Minebea Connect Co., Ltd.

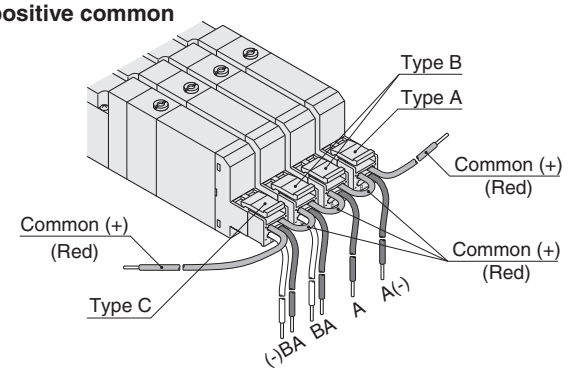
Manual tool: Model F1 (for 706312-2MK)
Manufactured by Minebea Connect Co., Ltd.

5. Common connector assembly

By using a common connector assembly for manifold solenoid valves, the common wires of each solenoid valve are consolidated into a single wire, thereby reducing wiring work.

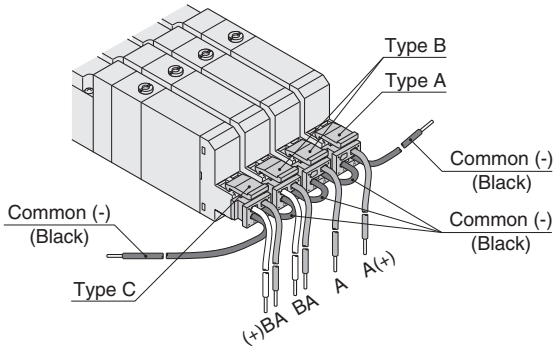
For the common connector assembly types, when viewed from the lead wire side, the right end is type A, the left end is type C, and all others are type B (see figure below).

● For positive common



● For negative common

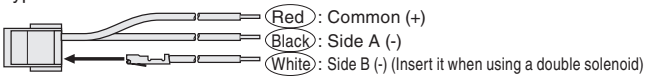
By ordering the optional negative common connector assembly, the assembly can be used with a negative common specification.



When ordering a common connector assembly, order the following:

● For positive common

Type A Model: **JAZ-PA**□*



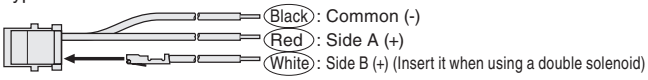
Type B Model: **JAZ-PB**□*

Type C Model: **JAZ-PC**□*

* Lead wire length **Blank** : 300 mm [11.811 in.]
3 : 3000 mm [118.1 in.]

● For negative common

Type A Model: **JAZ-MA**□*



Type B Model: **JAZ-MB**□*

Type C Model: **JAZ-MC**□*

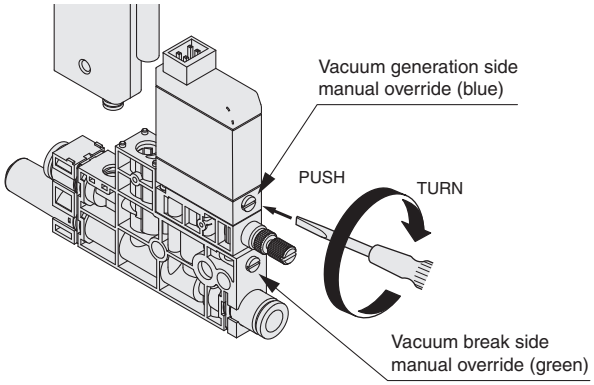
* Lead wire length **Blank** : 300 mm [11.811 in.]
3 : 3000 mm [118.1 in.]

Manual mechanism

Manual override button (lock/non-lock combination type)

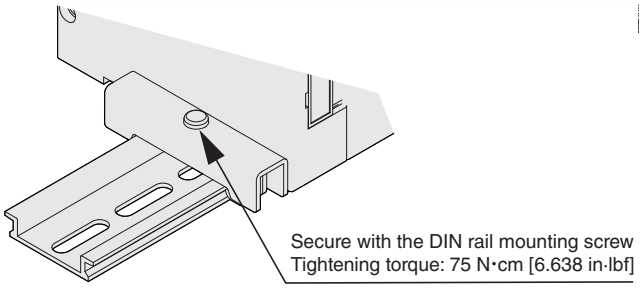
Using a precision screwdriver, press the manual override fully inward and turn it 90° clockwise to lock it.From the locked state, turn the manual override 90° counterclockwise. The button will return to its original position by spring force, and the lock will be released. If the manual override is not rotated, it can be operated in the same manner as the non-lock type.

NOTE
1. Be sure to release the lock of the manual override before starting normal operation.
2. Do not operate the manual override with an extremely sharp object such as a needle. Doing so may damage the button.
3. Do not over-rotate the manual override, as it may be damaged.
4. If the manual override of the solenoid valve has been operated during maintenance or similar work, confirm that the manual override has returned to its original position and that the main valve is in the required switching position before resuming operation.



About the DIN rail mounting bracket

With the DIN rail mounting bracket attached to both sides of the manifold main body, hook both sides of the mounting bracket securely onto the DIN rail from above, and then fasten using the DIN rail mounting screw.



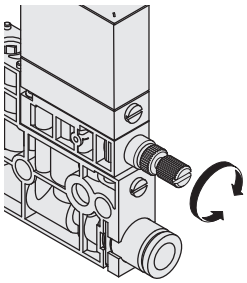
About the vacuum pressure switch

For handling instructions of the vacuum pressure switch, refer to the “instruction manual” available on our website.

Vacuum break

Adjustment of break flow rate

Turning the break flow rate adjustment needle clockwise decreases the break flow rate; turning it counterclockwise increases the break flow rate.
Tighten the lock nut by hand only. Do not use tools.



Piping

1. Connect the air supply to the compressed air supply port, and connect a vacuum pad or similar device to the vacuum generation port.
2. Use fittings and tubes whose internal diameters cannot be constricted. A small diameter means the flow and pressure become insufficient, which reduces the achievable vacuum and lengthens the time to achieve it, resulting in reduced performance.
   When using a common exhaust, increased exhaust resistance may reduce vacuum performance or cause exhaust air to flow back into other stations, preventing satisfactory performance. Refer to the following countermeasures:
   ・Avoid locations that may affect exhaust (such as walls).
   ・Increase the fitting size and piping diameter, and keep the piping length as short as possible.
   If performance does not improve after implementing the above measures, contact your nearest Koganei sales office.
3. Avoid spiral piping using coiled tubes or similar tubes. Between the micro ejector or vacuum valve unit and the vacuum pad, avoid using elbows whenever possible and use straight piping as much as possible.

Tube

1. Attaching and detaching the tube
For tube connection, insert a tube of the appropriate size until it contacts the tube stopper, then gently pull the tube to confirm proper connection.
To disconnect the tube, first push it in until it contacts the tube stopper. While pushing in the release ring evenly in that state, pull out the tube.

2. Either nylon or urethane tube may be used.
For tube outer diameter tolerance, use a nylon tube within ±0.1 mm [0.004 in.] of the nominal diameter, and urethane tube within ±0.15 mm [0.006 in.] of the nominal diameter. The ovality (difference between major and minor diameters) must be within 0.2 mm [0.008 in.]. (Use of Koganei tubes is recommended.)
If tubes other than Koganei's genuine or compatible (recommended) products is used, problems such as tube disconnection or air leakage may occur. Be sure to confirm suitability before assembling the pneumatic system.

NOTE
1. Do not use extremely soft tubes, as pull-out strength will be significantly reduced.
2. Always use tubes with no scratches on the outer surface. If scratches occur due to repeated use, cut off the damaged portion.
3. Do not bend or twist the tube excessively near the fitting. Doing so may cause air leakage. The recommended minimum bending radius for nylon and urethane tubes is shown in the table below.
4. Be sure to stop the air supply before attaching or detaching the tube. Also confirm that the air inside the manifold has been completely exhausted before performing the operation.

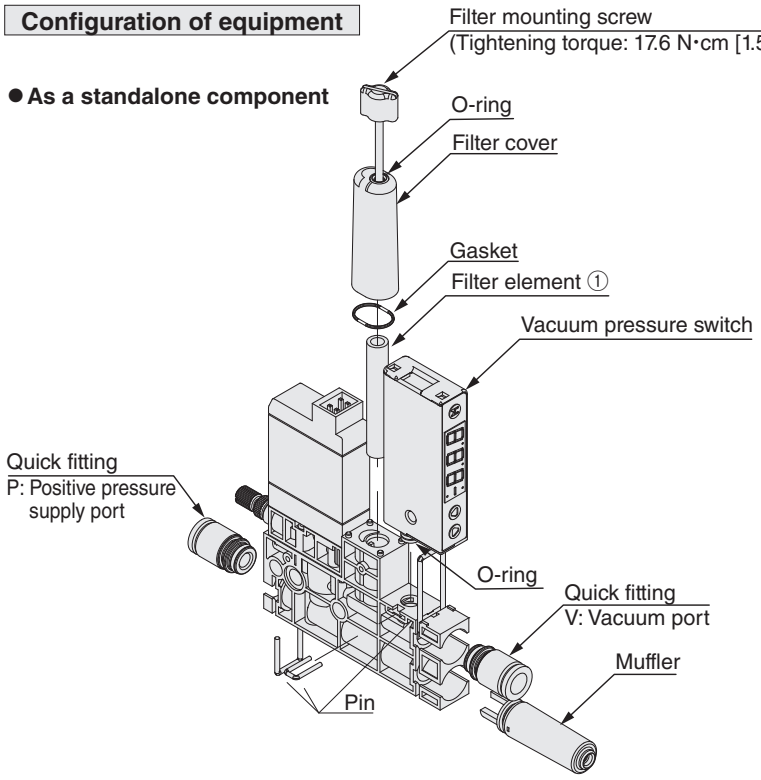
mm [in.]

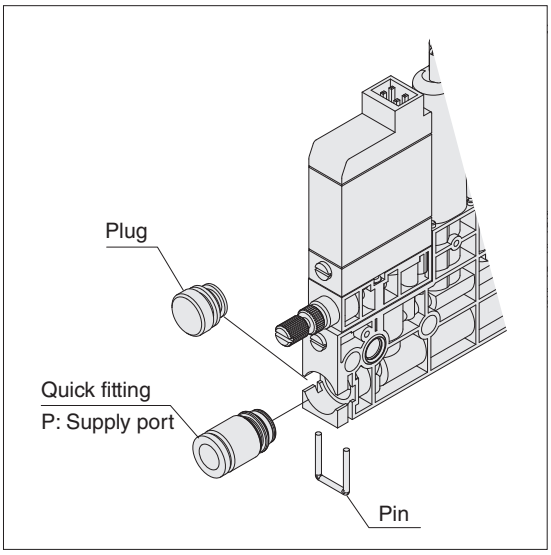
Tube size	Minimum bending radius	
	Nylon tube	Urethane tube
ϕ4 [0.157]	20 [0.787]	10 [0.394]
ϕ6 [0.236]	30 [1.181]	15 [0.591]
ϕ8 [0.315]	50 [1.969]	20 [0.787]

Micro ejector

Configuration of equipment

● **As a standalone component**

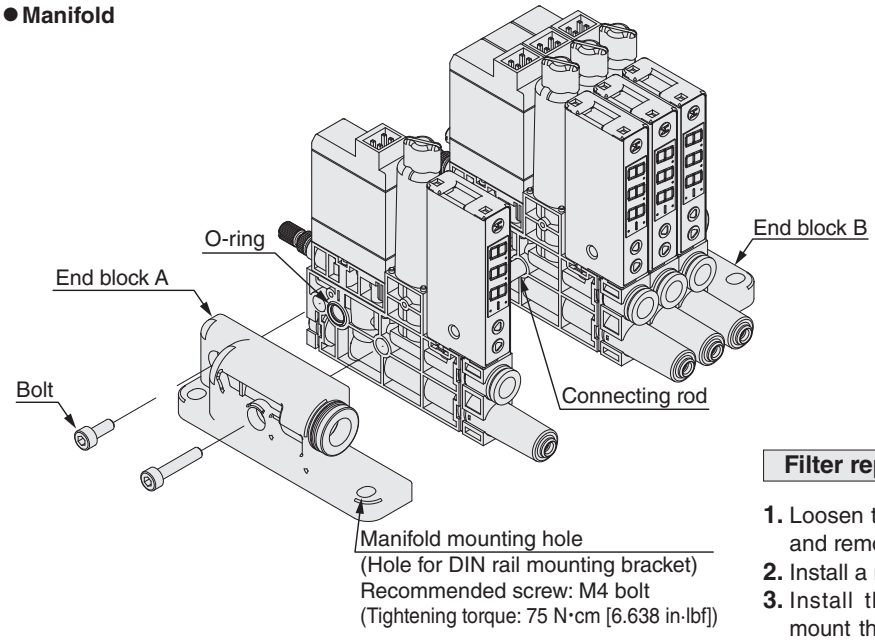




Caution: In a manifold, if multiple stations operate simultaneously, the compressed air supply may become insufficient. In such cases, pull out the pin and remove the plug as shown in the figure above, and install a fitting as an additional part[Note].

Note: Fitting model
LSMEZ-J4
LSMEZ-J6

● **Manifold**



Filter replacement method

1. Loosen the filter mounting screw, remove the filter cover, and remove the filter.
2. Install a new filter element to the filter cover.
3. Install the gasket and the O-ring to the filter cover, mount the filter cover, and tighten the cover with the filter mounting screw (tightening torque: 17.6 N·cm [1.558 in·lbf]).

Maintenance part

If a decrease in vacuum level or air leakage from the valve is observed, replacement of the maintenance part (filter) is recommended.

No.	Name	Order model
①	Filter element	**LSMEZ-F** (1 pack of 5 pieces)

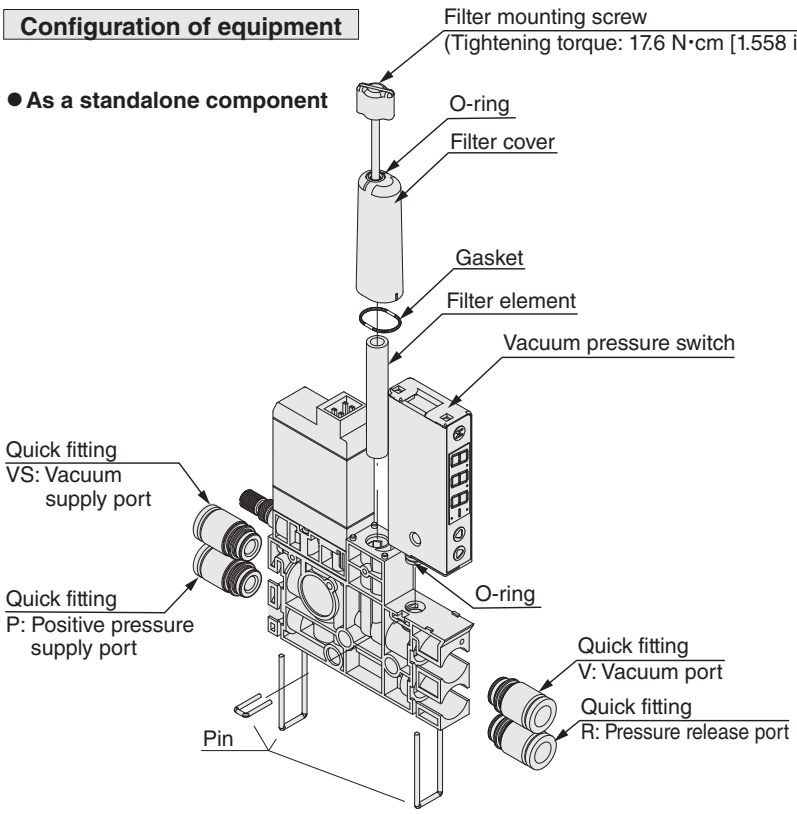
Assembling the manifold

Fully screw the two connecting rods into end block B. Next, insert the ejector main body onto the connecting rods in the desired order. Finally, insert end block A and secure it with hexagon socket head screws.
When tightening, place both end blocks on a flat surface and tighten to prevent twisting of the entire manifold (tightening torque: 63 N·cm [5.576 in·lbf]).

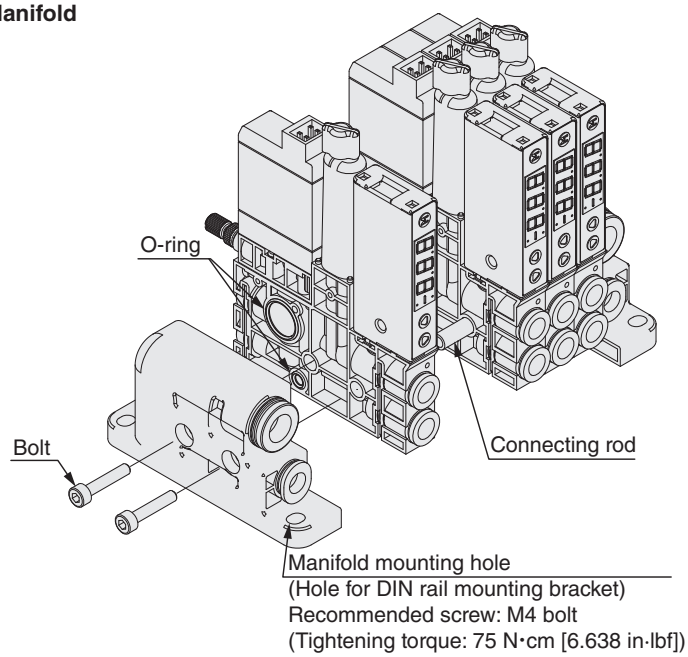
Vacuum valve unit

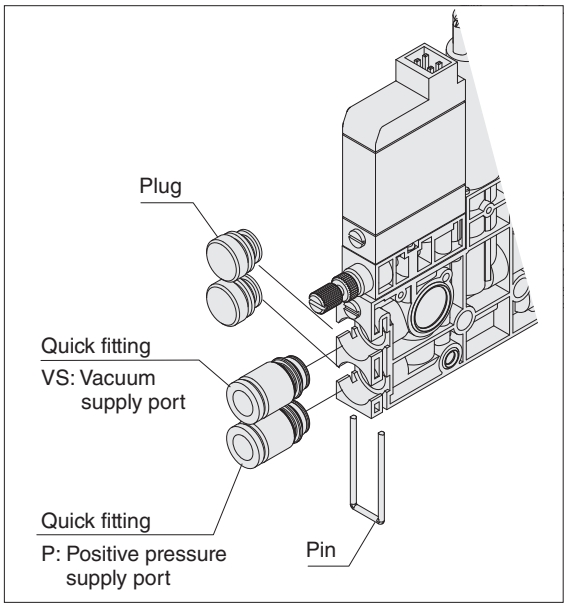
Configuration of equipment

● **As a standalone component**



● **Manifold**





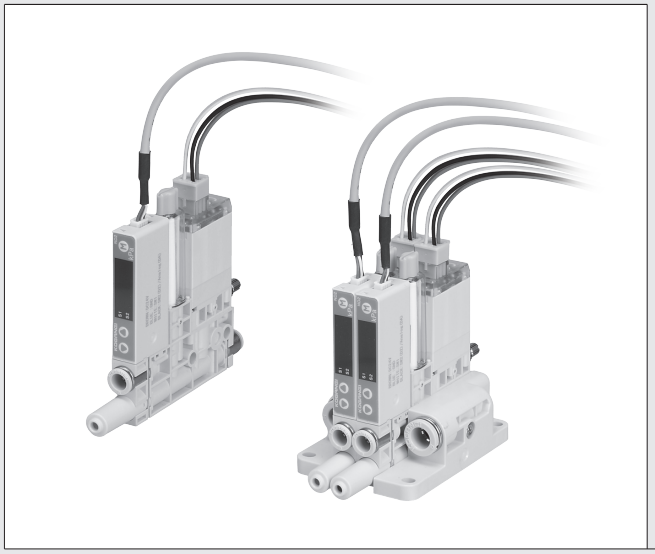
Caution: In a manifold, if multiple stations operate simultaneously, the compressed air supply and the supply vacuum pressure may become insufficient.
In such cases, pull out the pin and remove the plug as shown in the figure above, and install a fitting as an additional part[Note].
Note: Fitting model
LSMEZ-J4
LSMEZ-J6

Filter replacement method

1. Loosen the filter mounting screw, remove the filter cover, and remove the filter.
2. Install a new filter element to the filter cover.
3. Install the gasket and the O-ring to the filter cover, mount the filter cover, and tighten the cover with the filter mounting screw (tightening torque: 17.6 N·cm [1.558 in·lbf]).

Assembling the manifold

Fully screw the two connecting rods into end block B. Next, insert the ejector main body onto the connecting rods in the desired order Finally, insert end block A and secure it with hexagon socket head screws.
When tightening, place both end blocks on a flat surface and tighten to prevent twisting of the entire manifold (tightening torque: 63 N·cm [5.576 in·lbf]).



KOGANEI

Vacuum Equipment

Micro Ejector
LSME Series
INDEX

Products Compliant with RoHS Directive

⚠ **CAUTION** Before use, be sure to read the safety precautions on page 44.

Micro Ejector

LSME

Specifications

Item \ Basic model			LSME-03	LSME-10
Medium			Air[Note 1]	
Operating pressure range		MPa [psi]	0.3 to 0.6 [44 to 87]	
Operating temperature range (ambient and fluid)		°C[°F]	5 to 50 [41 to 122]	
Nozzle diameter		mm [in.]	0.3 [0.012]	1.0 [0.039]
Achievable vacuum[Note 2 Note 3]		kPa [inHg]	-87 [-25.700]	-88 [-25.995]
Vacuum side flow rate[Note 2]		L/min (ANR) [ft³/min (SCFM)]	3.5 [0.124]	18 [0.636]
Compressed air consumption[Note 2]		L/min (ANR) [ft³/min (SCFM)]	5.5 [0.194]	35 [1.236]
Lubrication			Not allowed	
Filter filtration rating		µm	30	
Connection port	Vacuum generation port		ϕ4 [0.157] or ϕ6 [0.236]	
	Compressed air supply port		As a standalone component: ϕ6 [0.236], for a manifold: ϕ8 [0.315]	
Mounting direction			Unrestricted	
Main valve specifications	Operating method		Internal pilot type	
	Valve function		Normally closed (NC) 2-port valve	
Shock resistance		m/s² [G]	294.2 [30] (in solenoid axial direction 150 [15])	

Note 1: Use clean air from which oil mist and dust have been removed.
2: For nozzle diameter 03, supply pressure: 0.6 MPa [87 psi]. For nozzle diameter 10, supply pressure: 0.4 MPa [58 psi].
3: At standard atmospheric pressure of 101.3 kPa [29.924 inHg] (abs).

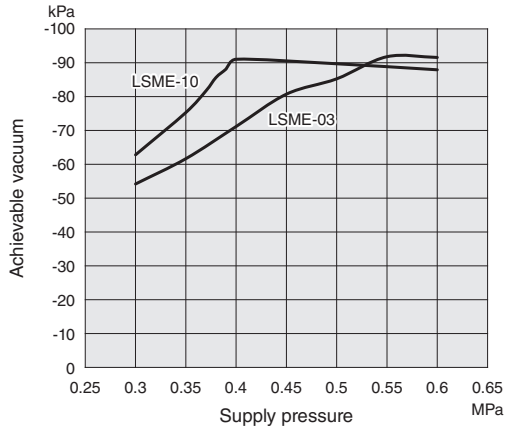
Electrical specifications

Item \ Rated voltage			DC24V
Operating voltage range		V	21.6 to 26.4 (24 ±10%)
Current value (at rated voltage)	Starting	mA	17
	Steady state	mA	4.2
Power consumption	Starting	W	0.4
	Steady state	W	0.1
Starting state duration (standard time)		ms	70
Allowable circuit leakage current		mA	1.0
Insulation resistance[Note]		MΩ	100 or more
LED indicator color			SA vacuum generation side: Red SB vacuum break side: Green
Surge protection (standard equipment)			Flywheel diode

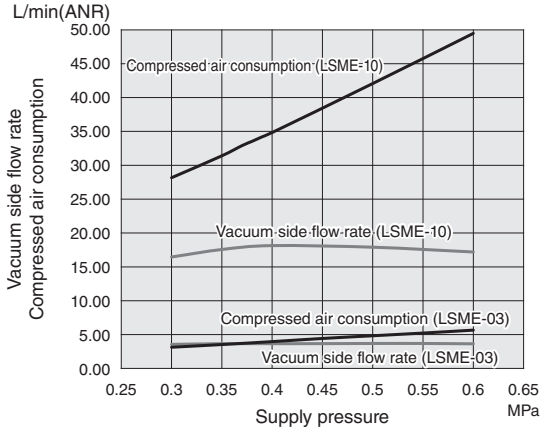
Note: Measured with a 500 VDC megger.

Air consumption, achievable vacuum, and vacuum side flow rate

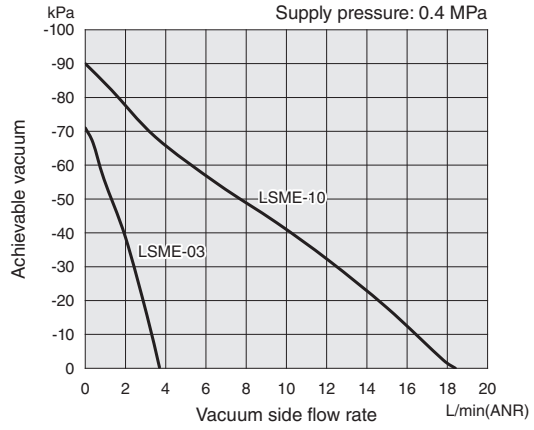
● Supply pressure - Achievable vacuum



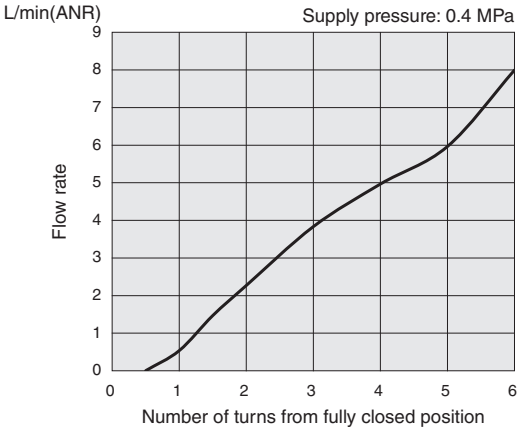
● Supply pressure - Flow rate



Flow characteristics

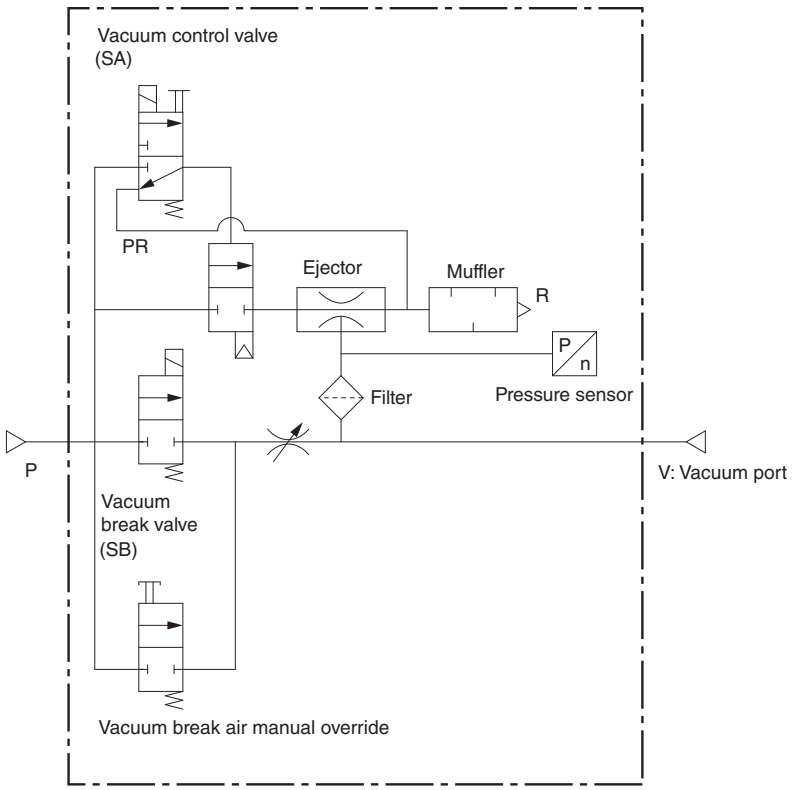


Vacuum break flow rate



Note: The indicated flow rate is the flow when the solenoid valve is energized.
With the manual override, the flow rate is lower.
Adjust the flow rate with the solenoid valve energized.

Symbols



Vacuum pressure switch

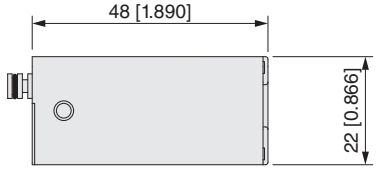
Specifications

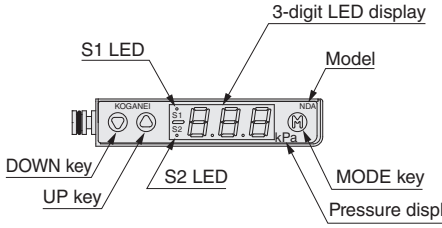
Option symbol/(Additional part model)		**ND2 (LSMEZ-ND2)**	**NDA (LSMEZ-NDA)**	**PD2 (LSMEZ-PD2)**	**PDA (LSMEZ-PDA)**
Product type		NPN, 2 outputs	NPN, 1 output/analog output	PNP, 2 outputs	PNP, 1 output/analog output
Indication method		Gauge pressure			
Rated pressure range		Selectable by pressure range setting from: -99.9 to 99.9 kPa [-29.510 to 29.510 inHg]; -100 to 300 kPa [-29.540 to 88.620 inHg]; and -100 to 700 kPa [-29.540 to 206.8 inHg]. * When -100 to 700 kPa [-29.540 to 206.8 inHg] is selected, the proof pressure is limited to 600 kPa [177.2 inHg]. * Factory setting: -100 to 300 kPa [-29.540 to 88.620 inHg]			
Proof pressure		600 kPa [177.2 inHg]			
Applicable fluid		Non-corrosive gas			
Power supply voltage		12 to 24 VDC ±10%, ripple P-P 10% or less			
Current consumption		30 mA or less			
Switch output	Number of outputs	2 points	1 points	2 points	1 points
	Output type	NPN open collector output		PNP open collector output	
	Pressure setting range	-100 to 700 kPa [-29.540 to 206.8 inHg] * Depending on pressure range setting			
	Repeatability	±0.2%F.S.±1digit			
	Load current	100mA MAX.			
	Applied voltage	30 V MAX. (between switch output and 0 V)		–	
	Residual voltage	1.5 V or less (at load current 100 mA)		2 V or less (at load current 100 mA)	
	Response time	4 ms or less * When filter setting is disabled			
	Short-circuit protection	Provided			
Pressure display	Number of digits	Sign and 3-digit, 7-segment LED display			
	Display accuracy	±2% F.S.± 1 digit (0 to 50°C [32 to 122°F])			
Operation indicator		Output 1 (S1), output 2 (S2) Lights when switch output is ON Flashes during output setting; lights/flashes during error			
Analog voltage output		–	1 to 5 V ±2% F.S. (0 to 50°C [32 to 122°F]) Output impedance: 1 kΩ	–	1 to 5 V ±2% F.S. (0 to 50°C [32 to 122°F]) Output impedance: 1 kΩ
Environmental resistance	Operating temperature range	0 to 50°C [32 to 122°F]			
	Operating humidity range	35 to 85% RH (no condensation)			
	Withstand voltage	1 minute at 500 VAC			
	Insulation resistance	At 500 VDC megger, then 100 MΩ or higher			
	Vibration resistance	Amplitude 1.5 mm [0.059 in.], 10 to 55 Hz, 2 hours each in X, Y, and Z directions			
	Shock resistance	490 m/s^2 [50 G], 3 times each in 3 directions			
	EMC	EMI: EN55011, EMS: EN61000-6-2			
Mass		Approx. 10 g [0.35 oz] (excluding cable)			
Cable*		Connector cable LSMEZ-K15 (1500 mm [59.055 in.])/-K30(3000 mm [118.1 in.])			

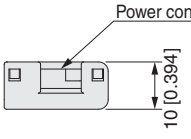
* If you select a vacuum pressure switch when purchasing a micro ejector, the connector cable LSMEZ-K15 (1500 mm [59.055 in.]) is included. If you purchase the vacuum pressure switch as a single unit, the connector cable is not included. Please select a model separately to purchase the cable.

Dimensional drawings and part names (mm [in.])

● Dimensional drawings and part names



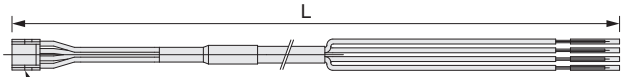




Caution: When connecting or disconnecting the connector cable, ensure that no load is applied to the connection between the vacuum pressure switch and the micro ejector main body. Failure to do so may result in leakage or damage.

● Additional parts (sold separately)

Model	Dimension L
LSMEZ-K15	1500 [59.055]
LSMEZ-K30	3000 [118.1]



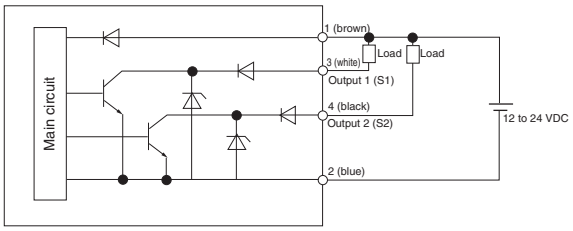
Contact: JST GH Series SSHL-002T-P0.2
Connector: JST GH Series GHR-04V-S

Wiring table and circuit diagrams

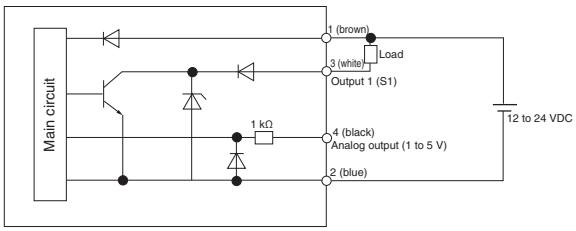
● Wiring table

Connector pin No.	Terminal name	Cable color
1	DC24V	Brown
2	GND	Blue
3	Output 1 (S1)	White
4	2-output type: Output 2 (S2) Analog output type: Analog output	Black

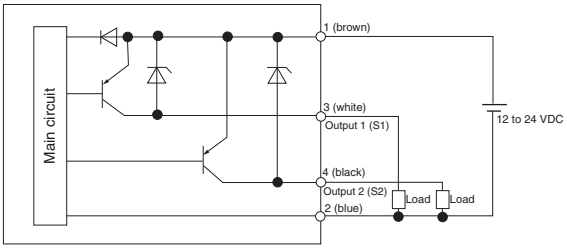
● Circuit diagrams



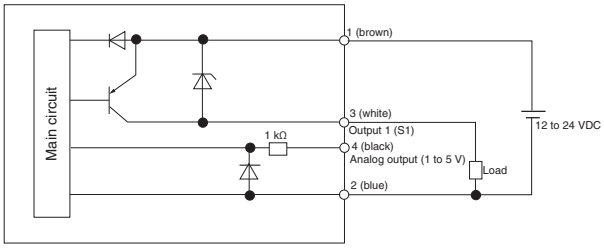
LSMEZ-ND2 (NPN, 2-output type)



LSMEZ-NDA (NPN, 1-output/analog output type)



LSMEZ-PD2 (PNP, 2-output type)



LSMEZ-PDA (PNP, 1-output/analog output type)

Functions

■ Switch output

<Output mode setting>

HYS: Hysteresis mode (factory setting)

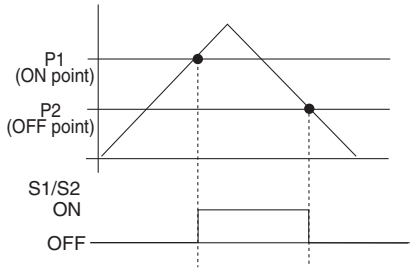
CO: Window comparator mode

OFF: OFF mode

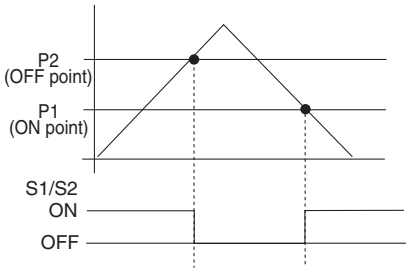
● Hysteresis mode

Mode for setting P1 (ON point) and P2 (OFF point).

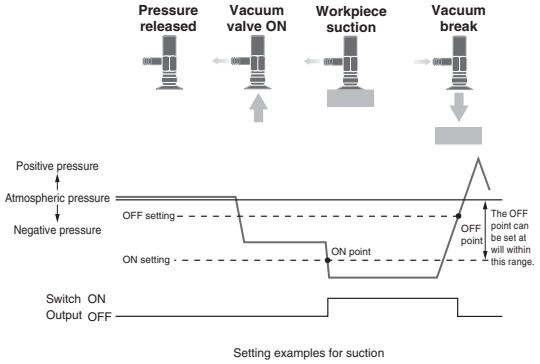
Output is provided according to the threshold values (P1 and P2) and the non-inverted/inverted setting.



If P1 > P2

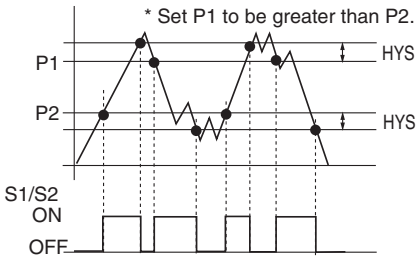


If P2 > P1



Setting examples for suction

● Window comparator mode
Mode in which the output turns ON when the value is within the setting value range between P1 and P2.
The OFF point depends on the hysteresis (HYS) setting.
Output is provided according to the threshold values (P1 and P2), hysteresis (HYS), and the non-inverted/inverted setting.



● OFF mode
Mode in which the output remains OFF at all times.
If the inverted setting is selected in OFF mode, the output remains ON.

● **Non-inverted/inverted setting (N.O./N.C.)**
Used to set the output to non-inverted or inverted.
N.O.: Non-inverted (factory setting)
N.C.: Inverted

■ Analog output (Analog types [-NDA/-PDA] only)

An analog voltage of 1 to 5 V linked to the pressure value is output.
The pressures when the voltage is 1 V and 5 V depend on the range setting.
If the filter setting is enabled, the response of the analog output will also become slower according to the filter setting.

■ Filter setting

Used to apply low-pass filter processing to the pressure detection value to reduce noise and pressure fluctuation.

F-0: Low-pass filter disabled (factory setting)
F-1 to F-7: Low-pass filter enabled

* The larger the number, the stronger the filter and the slower the response. The filter setting affects the response of the display value, switch output, and analog output.

■ ECO setting

Setting for reducing power consumption by turning off the LED display.
When ECO setting is enabled, pressing any button will activate the LED display for 5 seconds, after which the LED will automatically turn off.

OFF: Disabled (factory setting)
ON: Enabled

■ Key lock setting

Setting for disabling button operations to prevent settings from being changed accidentally due to unintended button operations.
When the key lock setting is enabled and a button is pressed, "LOC" is displayed for 0.5 seconds and the product returns to the measurement mode.

OFF: Disabled (factory setting)
ON: Enabled

■ Pressure range setting

Used to set the pressure measurement range.
You can select from the following three types:

99.9: -99.9 to 99.9 kPa [-29.510 to 29.510 inHg]

300: -100 to 300 kPa [-29.540 to 88.620 inHg] (factory setting)

700: -100 to 700 kPa [-29.540 to 206.8 inHg] (* The proof pressure is limited to 600 kPa [177.2 inHg].)

Range setting	-99.9 to 99.9 kPa [-29.510 to 29.510 inHg]	-100 to 300 kPa [-29.540 to 88.620 inHg]	-100 to 700 kPa [-29.540 to 206.8 inHg]
Upper limit pressure kPa [inHg]	99.9 [29.510]	300 [88.620]	700 [206.8]
Lower limit pressure kPa [inHg]	-99.9 [-29.510]	-100 [-29.540]	-100 [-29.540]
Display resolution kPa [inHg]	0.1 [0.030]	1 [0.295]	1 [0.295]
Analog output*	1 to 5 V		
Pressure at 1 V kPa [inHg]*	-99.9 [-29.510]	-100 [-29.540]	-100 [-29.540]
Pressure at 5 V kPa [inHg]*	99.9 [29.510]	300 [88.620]	700 [206.8]
Zero-point voltage V*	3.0	2.0	1.5

* Analog output is available only for analog output types.

As a standalone component

Basic model	Main body mass	Additional mass
		Vacuum pressure switch
(A)LSME-**-J*	59 g [2.08 oz]	10 g [0.35 oz] (lead wire mass: 58 g [2.05 oz])

The valve connector is not included in the mass.
Calculation example
LSME-03-J6-PN 59 g
ALSME-10-J6-ND2-PN 59 + 10 = 69 g

Manifold

Non-plug-in type

Basic model	End block mass	-DR (with DIN mounting bracket and DIN rail)
LSMEM1N	35.5 [1.25]	83 [2.93]
LSMEM2N	37.5 [1.32]	87.5 [3.09]
LSMEM3N	39.5 [1.39]	87.5 [3.09]
LSMEM4N	41.5 [1.46]	91.5 [3.23]
LSMEM5N	43.5 [1.53]	91.5 [3.23]
LSMEM6N	46 [1.62]	95.5 [3.37]
LSMEM7N	48 [1.69]	95.5 [3.37]
LSMEM8N	50 [1.76]	95.5 [3.37]
LSMEM9N	52 [1.83]	99.5 [3.51]
LSMEM10N	54 [1.90]	99.5 [3.51]
LSMEM11N	56.5 [1.99]	99.5 [3.51]
LSMEM12N	58.5 [2.06]	104 [3.67]
LSMEM13N	60.5 [2.13]	104 [3.67]
LSMEM14N	62.5 [2.20]	108 [3.81]
LSMEM15N	64.5 [2.28]	108 [3.81]
LSMEM16N	67 [2.36]	112 [3.95]

Calculation example
LSMEM16N -DR 1104 + 67 + 112 = 1283
stn1 to stn16 ALSME-10-J6-ND2-PN 69 × 16 = 1104
The valve connector is not included in the mass.

Manifold serial transmission type

Without I/O module

Basic model	End block mass	Blank: Without I/O module
LSMEM1S	135 [4.76]	145.5 [5.13]
LSMEM2S	141 [4.97]	145.5 [5.13]
LSMEM3S	143 [5.04]	145.5 [5.13]
LSMEM4S	149.5 [5.27]	145.5 [5.13]
LSMEM5S	151.5 [5.34]	145.5 [5.13]
LSMEM6S	153.5 [5.41]	145.5 [5.13]
LSMEM7S	160 [5.64]	145.5 [5.13]
LSMEM8S	162 [5.71]	145.5 [5.13]
LSMEM9S	168 [5.93]	145.5 [5.13]
LSMEM10S	174.5 [6.16]	145.5 [5.13]
LSMEM11S	176.5 [6.23]	145.5 [5.13]
LSMEM12S	162 [5.71]	145.5 [5.13]
LSMEM13S	185 [6.53]	145.5 [5.13]
LSMEM14S	191 [6.74]	145.5 [5.13]
LSMEM15S	193 [6.81]	145.5 [5.13]
LSMEM16S	195.5 [6.90]	145.5 [5.13]

Calculation example
LSMEM16S-K3-DR 1104 + 199.5 + 145.5 = 1449
stn1 to stn16 ALSME-10-J6-NDA-PN 69 × 16 = 1104
The valve connector and the connector cable are not included in the mass.

N1 (digital input module) P1 (digital input module)

Basic model	End block mass	N1,P1
LSMEM1S	135 [4.76]	264 [9.31]
LSMEM2S	141 [4.97]	264 [9.31]
LSMEM3S	143 [5.04]	264 [9.31]
LSMEM4S	149.5 [5.27]	264 [9.31]
LSMEM5S	151.5 [5.34]	264 [9.31]
LSMEM6S	153.5 [5.41]	264 [9.31]
LSMEM7S	160 [5.64]	264 [9.31]
LSMEM8S	162 [5.71]	264 [9.31]
LSMEM9S	168 [5.93]	354 [12.49]
LSMEM10S	174.5 [6.16]	354 [12.49]
LSMEM11S	176.5 [6.23]	354 [12.49]
LSMEM12S	162 [5.71]	354 [12.49]
LSMEM13S	185 [6.53]	354 [12.49]
LSMEM14S	191 [6.74]	354 [12.49]
LSMEM15S	193 [6.81]	354 [12.49]
LSMEM16S	195.5 [6.90]	354 [12.49]

Calculation example
LSMEM16S-K3-N1-DR 1104 + 199.5 + 354 = 1657.5
stn1 to stn16 ALSME-10-J6-NDA-PN 69 × 16 = 1104
The valve connector and the connector cable are not included in the mass.

N2 (digital input module) P2 (digital input module) A1 (analog input module)

Basic model	End block mass	N2,P2,A1
LSMEM1S	135 [4.76]	264 [9.31]
LSMEM2S	141 [4.97]	264 [9.31]
LSMEM3S	143 [5.04]	264 [9.31]
LSMEM4S	149.5 [5.27]	264 [9.31]
LSMEM5S	155.5 [5.49]	354 [12.49]
LSMEM6S	157.5 [5.56]	354 [12.49]
LSMEM7S	164 [5.78]	354 [12.49]
LSMEM8S	166 [5.86]	354 [12.49]
LSMEM9S	172.5 [6.08]	444 [15.66]
LSMEM10S	178.5 [6.30]	444 [15.66]
LSMEM11S	180.5 [6.37]	444 [15.66]
LSMEM12S	162 [5.71]	444 [15.66]
LSMEM13S	193 [6.81]	534 [18.84]
LSMEM14S	195.5 [6.90]	534 [18.84]
LSMEM15S	201.5 [7.11]	534 [18.84]
LSMEM16S	203.5 [7.18]	534 [18.84]

Calculation example
LSMEM16S-K3-N2-DR 1104 + 203.5 + 534 = 1841.5
stn1 to stn16 ALSME-10-J6-ND2-PN 69 × 16 = 1104
The valve connector and the connector cable are not included in the mass.

NA (digital input module) PA (digital input module)

Basic model	End block mass	NA,PA
LSMEM1S	135 [4.76]	354 [12.49]
LSMEM2S	141 [4.97]	354 [12.49]
LSMEM3S	143 [5.04]	354 [12.49]
LSMEM4S	149.5 [5.27]	354 [12.49]
LSMEM5S	155.5 [5.49]	444 [15.66]
LSMEM6S	157.5 [5.56]	444 [15.66]
LSMEM7S	164 [5.78]	444 [15.66]
LSMEM8S	166 [5.86]	444 [15.66]
LSMEM9S	172.5 [6.08]	534 [18.84]
LSMEM10S	178.5 [6.30]	534 [18.84]
LSMEM11S	180.5 [6.37]	534 [18.84]
LSMEM12S	162 [5.71]	534 [18.84]
LSMEM13S	193 [6.81]	624 [22.01]
LSMEM14S	195.5 [6.90]	624 [22.01]
LSMEM15S	201.5 [7.11]	624 [22.01]
LSMEM16S	203.5 [7.18]	624 [22.01]

Calculation example
LSMEM16S-K3-N2-DR 1104 + 203.5 + 624 = 1931.5
stn1 to stn16 ALSME-10-J6-ND2-PN 69 × 16 = 1104
The valve connector and the connector cable are not included in the mass.

Micro ejector (single unit) order code

□ **LSME** – □ – □ – □ – □ **DC24V**

Lead wire specifications
PN — Without connector, without lead wire
PS — Connector, lead wire 300 mm [11.811 in.] positive common
PS3 — Connector, lead wire 3000 mm [118.1 in.] positive common
MS — Connector, lead wire 300 mm [11.811 in.] negative common
MS3 — Connector, lead wire 3000 mm [118.1 in.] negative common

CPS — Prewired connector with terminals, lead wire 300 mm [11.811 in.] positive common*
CPS3 — Prewired connector with terminals, lead wire 3000 mm [118.1 in.] positive common*
CMS — Prewired connector with terminals, lead wire 300 mm [11.811 in.] negative common*
CMS3 — Prewired connector with terminals, lead wire 3000 mm [118.1 in.] negative common*

* CPS, CPS3, CMS, and CMS3 are available only when ALSME (for manifold mounting) is selected.

Vacuum pressure switch (1.5 m [4.920 ft] cable supplied)
Blank — Without vacuum pressure switch
NDA — Vacuum pressure switch (NPN, 1 switch output, 1 analog)
ND2 — Vacuum pressure switch (NPN, 2 switch outputs)
PDA — Vacuum pressure switch (PNP, 1 switch output, 1 analog)
PD2 — Vacuum pressure switch (PNP, 2 switch outputs)

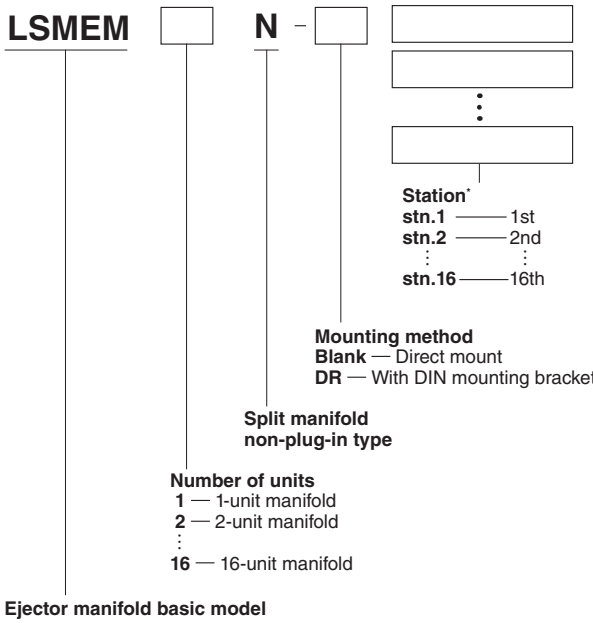
Vacuum port fitting
J4 — ϕ4QJ
J6 — ϕ6QJ

Nozzle diameter
03 — ϕ0.3 mm [0.012 in.]
10 — ϕ1.0 mm [0.039 in.]

LSME: Ejector
ALSME: Ejector for manifold mounting

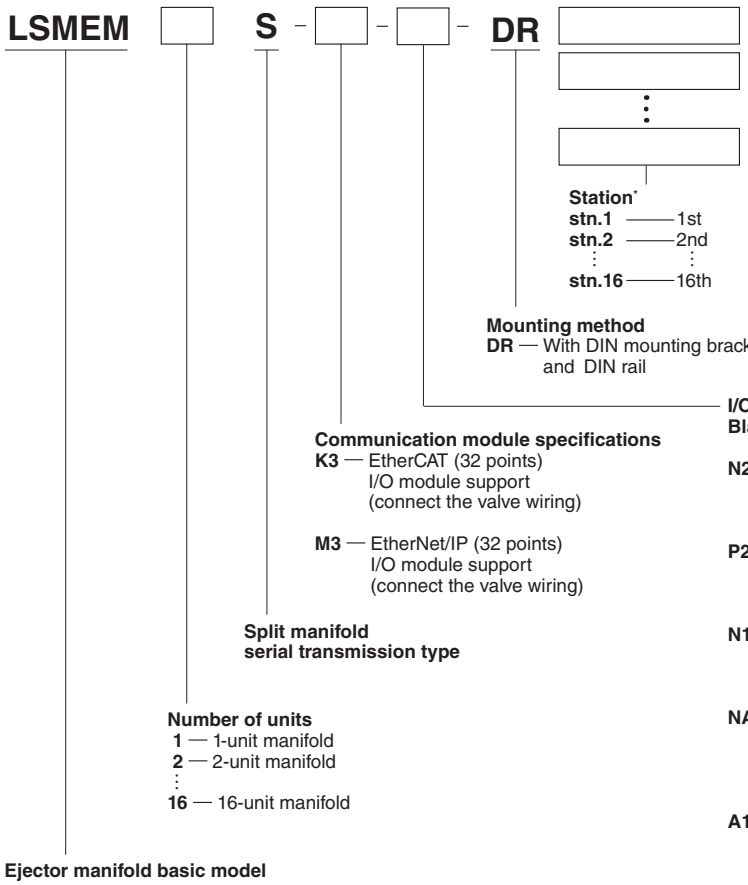
Micro ejector manifold order code

● Ejector manifold Non-plug-in type



* Selectable only for ALSME (for manifold mounting).
stn.1 to **stn.16** can be mounted only with the same model.

● Ejector manifold Serial transmission type



* Selectable only for ALSME (for manifold mounting).
stn.1 to **stn.16** can be mounted only with the same model.

● For the manifold serial transmission type, adding additional units is not supported.

I/O module specifications

Blank — Without I/O module (communication module only)

N2 — Digital input module (NPN, 8 points)
Connect 2 switch outputs.
stn.-mounted ejector's option “pressure switch: ND2” is required.

P2 — Digital input module (PNP, 8 points)
Connect 2 switch outputs.
stn.-mounted ejector's option “pressure switch: PD2” is required.

N1 — Digital input module (NPN, 8 points)
Connect 1 switch output (do not wire the analog output).
stn.-mounted ejector's option “pressure switch: NDA” is required.

NA — Digital input module (NPN, 8 points)
Analog input module (8 points)
Connect 1 switch output and 1 analog output, respectively.
stn.-mounted ejector's option “pressure switch: NDA” is required.

A1 — Analog input module (8 points)
Connect 1 analog output (do not wire the switch output).
stn.-mounted ejector's option “pressure switch: NDA or PDA” is required.

P1 — Digital input module (PNP, 8 points)
Connect 1 switch output (do not wire the analog output).
stn.-mounted ejector's option “pressure switch: PDA” is required.

PA — Digital input module (PNP, 8 points)
Analog input module (8 points)
Connect 1 switch output and 1 analog output, respectively.
stn.-mounted ejector's option “pressure switch: PDA” is required.

Micro ejector additional parts order code

LSMEZ – □

Ejector and vacuum valve unit additional part basic model

Additional part type

F — Filter element (pack of 5)

21 — Bracket for mounting as a standalone component (2 bolts and 2 nuts included)

J4 — Embedded quick fitting ϕ4 [0.157]

J6 — Embedded quick fitting ϕ6 [0.236]

NDA — Vacuum pressure switch (NPN, 1 output switch, 1 analog)

ND2 — Vacuum pressure switch (NPN, 2 output switches)

PDA — Vacuum pressure switch (PNP, 1 output switch, 1 analog)

PD2 — Vacuum pressure switch (PNP, 2 output switches)

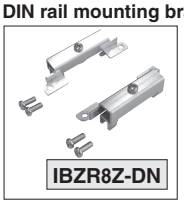
K15 — Connector cable (1.5 m [4.920 ft])

K30 — Connector cable (3 m [9.840 ft])

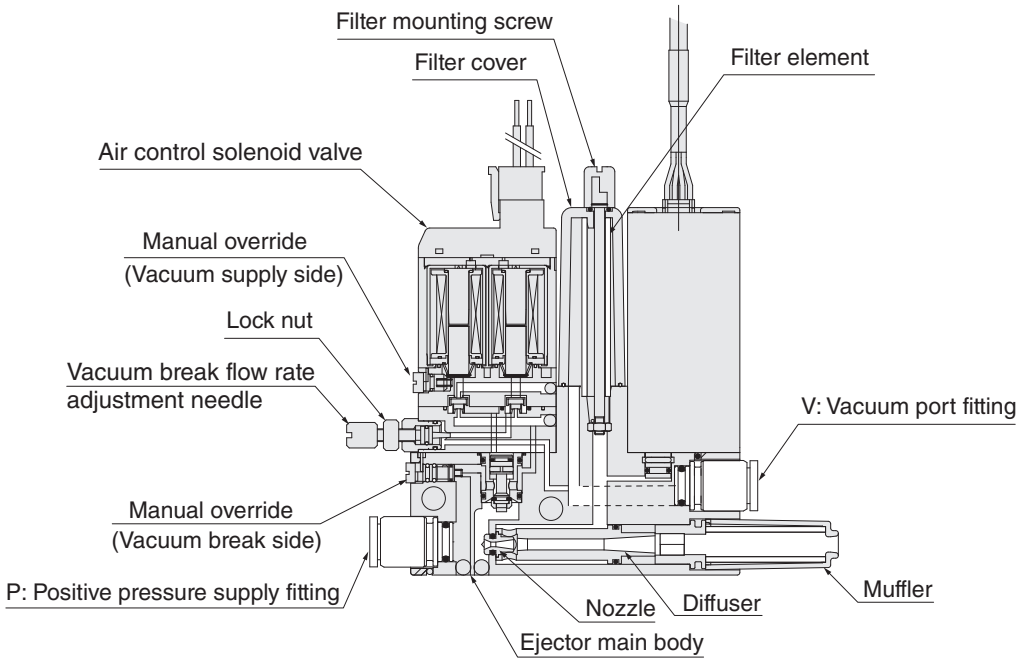
KM — Ejector muffler (ejector-dedicated part)

RV — Connecting rod for adding 1 unit (set of 2)

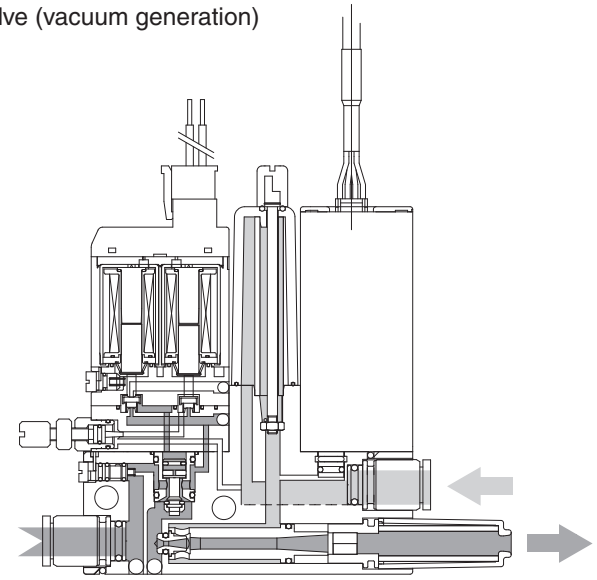
DIN rail mounting bracket



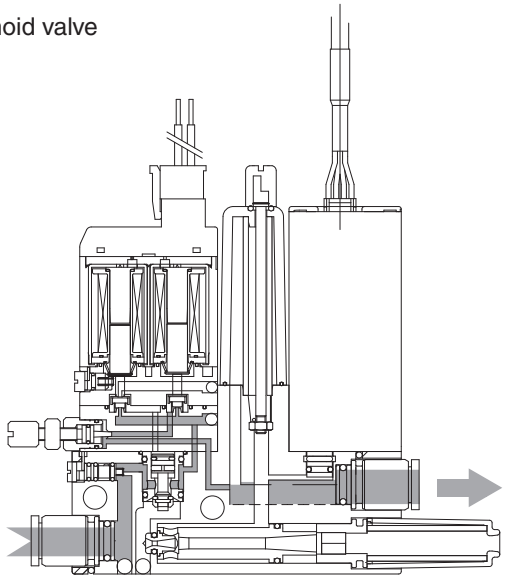
(4 main body mounting screws included)



● When the supply air control solenoid valve (vacuum generation) (SA) is ON

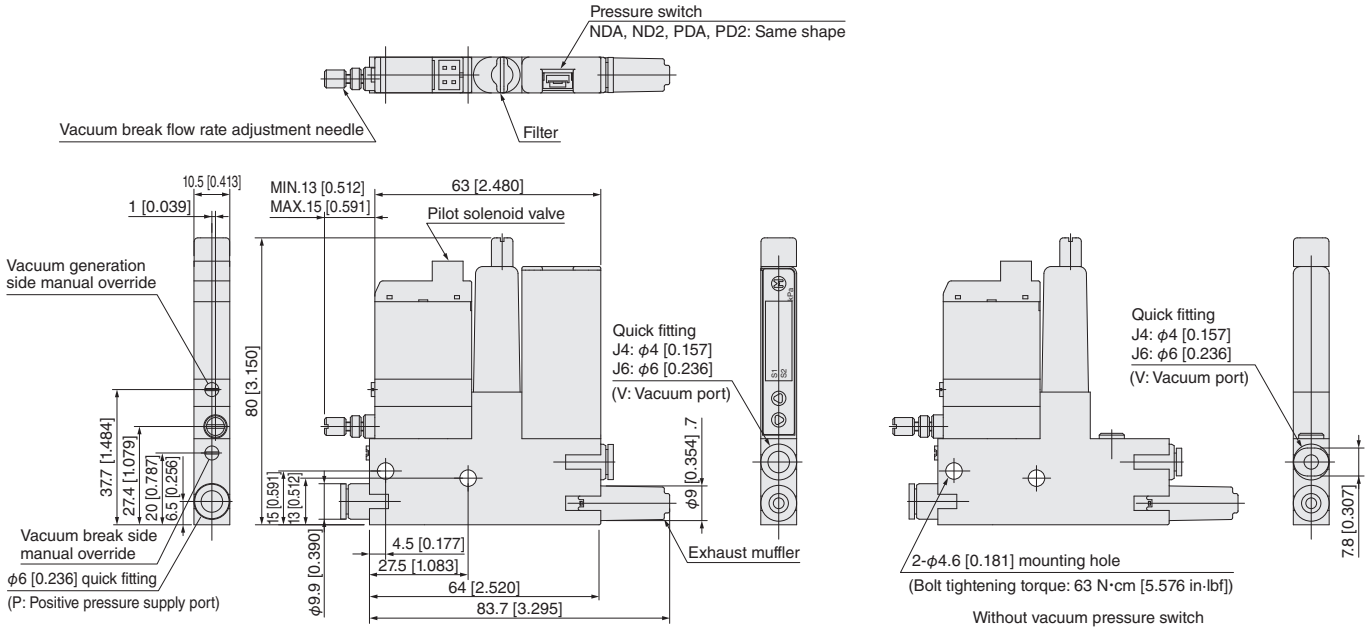


● When the vacuum break air control solenoid valve (SB) is ON

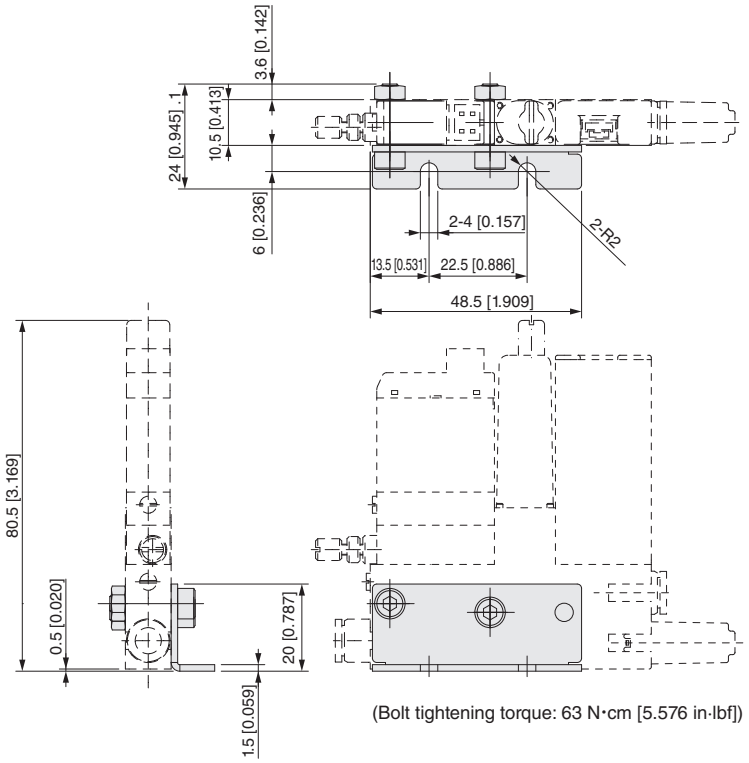


● LSME- □ -J □ - □ -PN

(The main body dimensional drawing is the same for nozzle diameters **03** and **10**.)

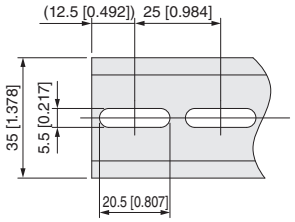


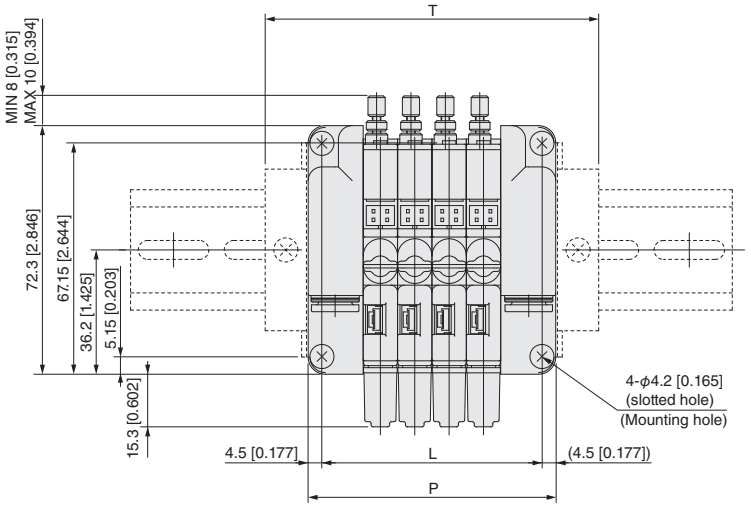
● LSMEZ-21 (additional part)

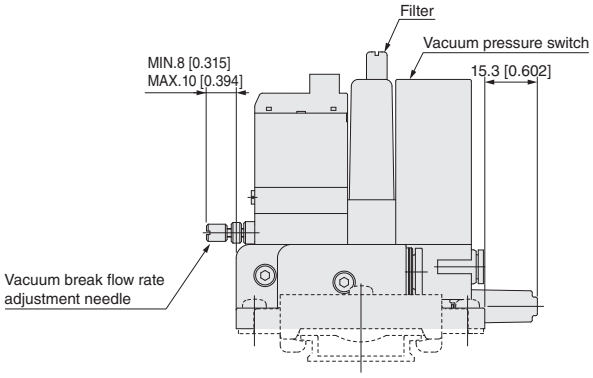


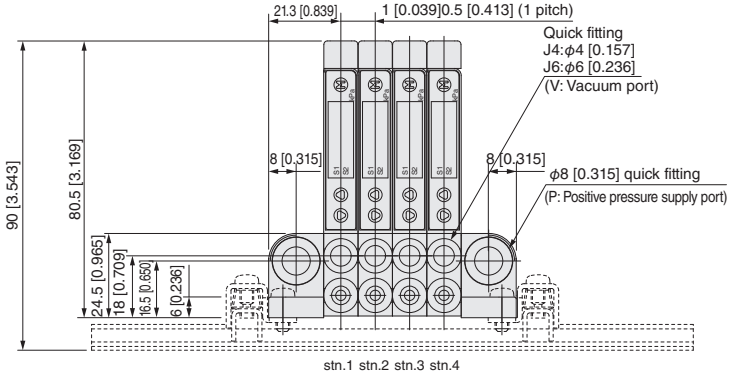
● LSMEM □ N - □

- Number of units
- Split manifold non-plug-in type
- DIN mounting bracket and DIN rail
  Blank: None
  DR: Included









Number of manifold units	L	P	T	Total length of DIN rail
1	33.5 [1.319]	42.5 [1.673]	67.5 [2.657]	150 [5.906]±2 [0.079]
2	44 [1.732]	53 [2.087]	78 [3.071]	175 [6.890]±2 [0.079]
3	54.5 [2.146]	63.5 [2.500]	88.5 [3.484]	175 [6.890]±2 [0.079]
4	65 [2.559]	74 [2.913]	99 [3.898]	200 [7.874]±2 [0.079]
5	75.5 [2.972]	84.5 [3.327]	109.5 [4.311]	200 [7.874]±2 [0.079]
6	86 [3.386]	95 [3.740]	120 [4.724]	225 [8.858]±2 [0.079]
7	96.5 [3.799]	105.5 [4.154]	130.5 [5.138]	225 [8.858]±2 [0.079]
8	107 [4.213]	116 [4.567]	141 [5.551]	225 [8.858]±2 [0.079]
9	117.5 [4.626]	126.5 [4.980]	151.5 [5.965]	250 [9.843]±2 [0.079]
10	128 [5.039]	137 [5.394]	162 [6.378]	250 [9.843]±2 [0.079]
11	138.5 [5.453]	147.5 [5.807]	172.5 [6.791]	250 [9.843]±2 [0.079]
12	149 [5.866]	158 [6.220]	183 [7.205]	275 [10.827]±2 [0.079]
13	159.5 [6.280]	168.5 [6.634]	193.5 [7.618]	275 [10.827]±2 [0.079]
14	170 [6.693]	179 [7.047]	204 [8.031]	300 [11.811]±2 [0.079]
15	180.5 [7.106]	189.5 [7.461]	214.5 [8.445]	300 [11.811]±2 [0.079]
16	191 [7.520]	200 [7.874]	225 [8.858]	325 [12.795]±2 [0.079]

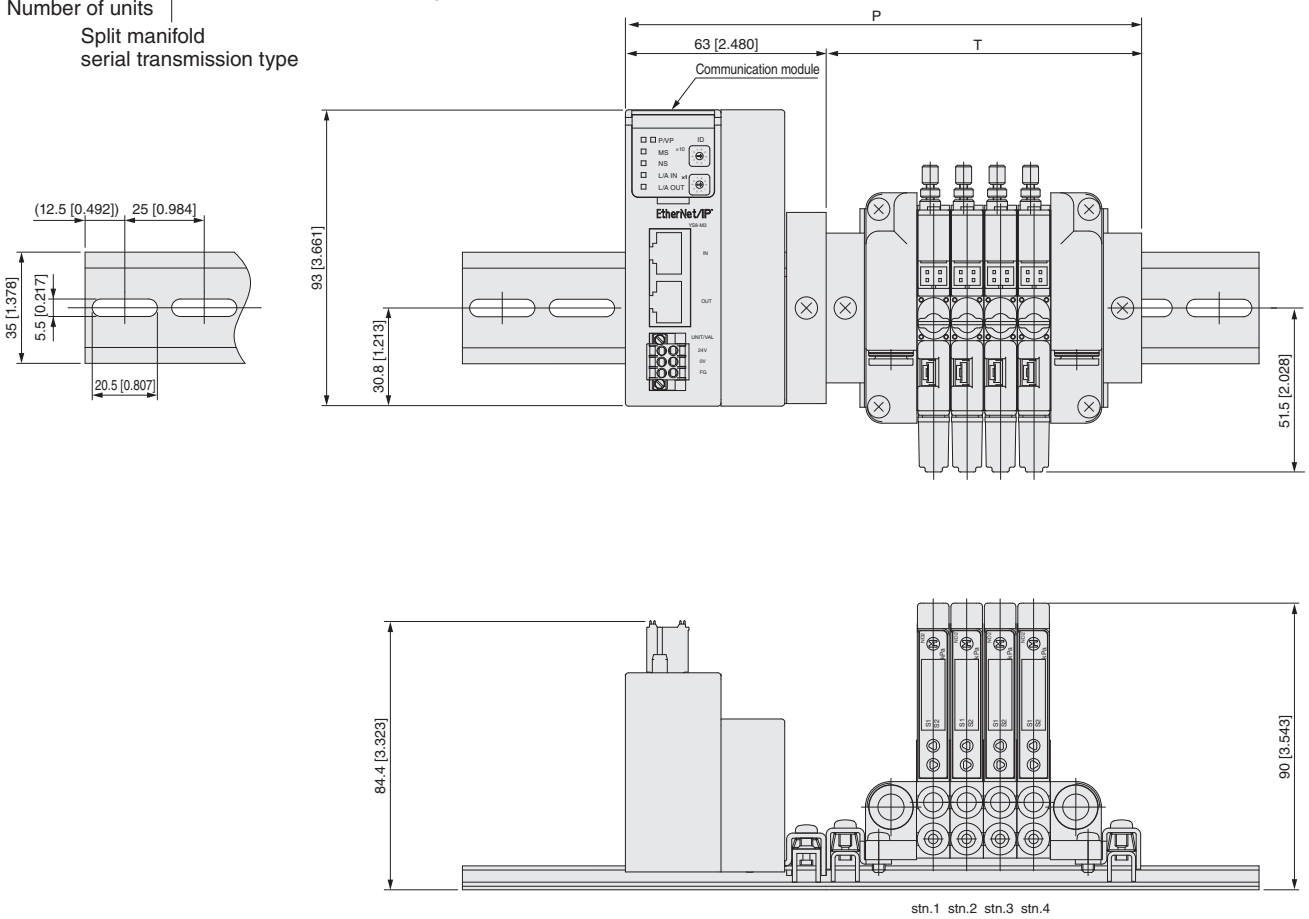
● LSMEM □ S - □ -DR

With DIN mounting bracket and DIN rail

Communication module specifications

Number of units

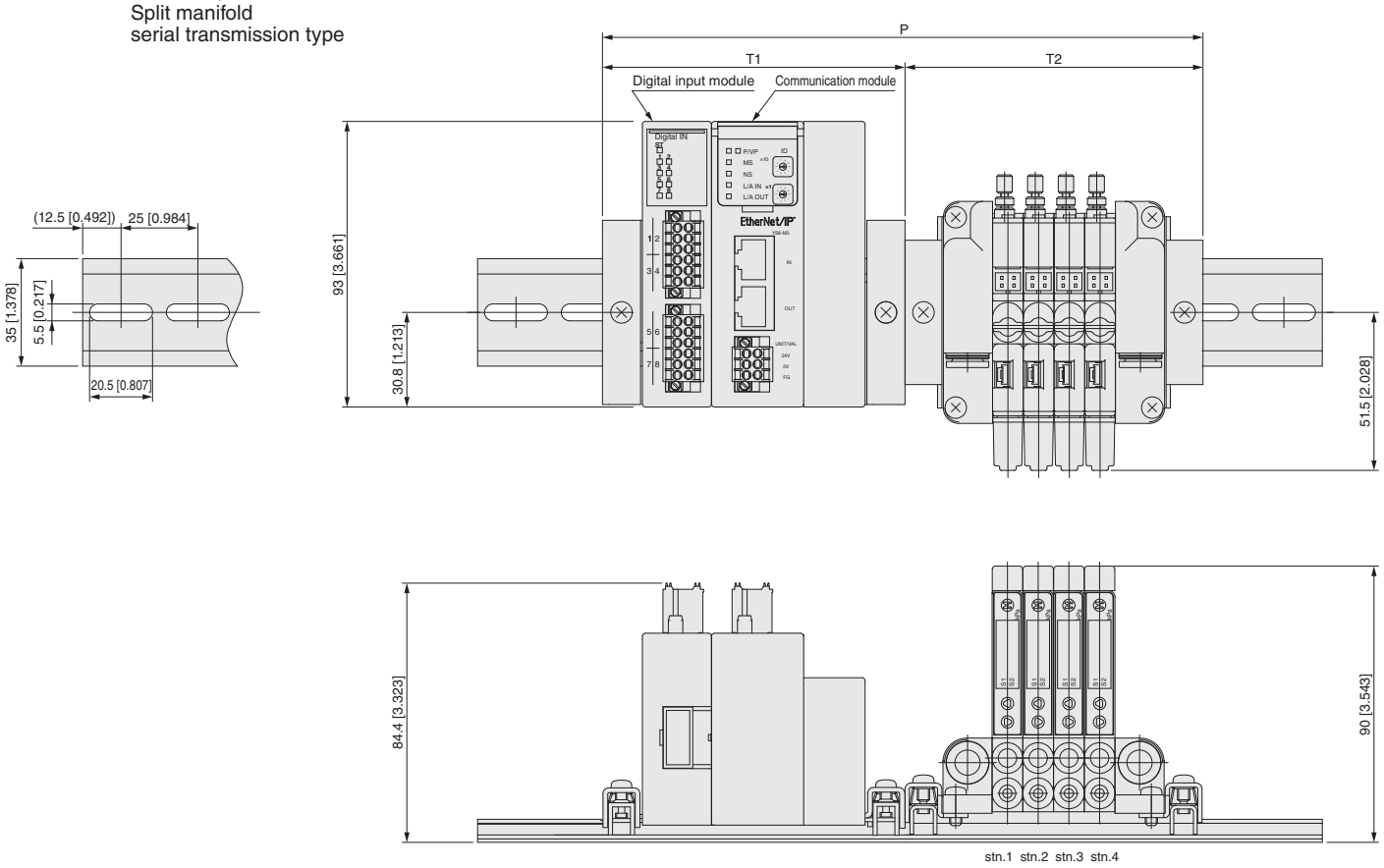
Split manifold serial transmission type



Number of manifold units	T	P	Total length of DIN rail
1	67.5 [2.657]	130.5 [5.138]	225 [8.858]±2 [0.079]
2	78 [3.071]	141 [5.551]	250 [9.843]±2 [0.079]
3	88.5 [3.484]	151.5 [5.965]	250 [9.843]±2 [0.079]
4	99 [3.898]	162 [6.378]	250 [9.843]±2 [0.079]
5	109.5 [4.311]	172.5 [6.791]	275 [10.827]±2 [0.079]
6	120 [4.724]	183 [7.205]	275 [10.827]±2 [0.079]
7	130.5 [5.138]	193.5 [7.618]	300 [11.811]±2 [0.079]
8	141 [5.551]	204 [8.031]	300 [11.811]±2 [0.079]
9	151.5 [5.965]	214.5 [8.445]	300 [11.811]±2 [0.079]
10	162 [6.378]	225 [8.858]	325 [12.795]±2 [0.079]
11	172.5 [6.791]	235.5 [9.272]	325 [12.795]±2 [0.079]
12	183 [7.205]	246 [9.685]	325 [12.795]±2 [0.079]
13	193.5 [7.618]	256.5 [10.098]	350 [13.780]±2 [0.079]
14	204 [8.031]	267 [10.512]	350 [13.780]±2 [0.079]
15	214.5 [8.445]	277.5 [10.925]	375 [14.764]±2 [0.079]
16	225 [8.858]	288 [11.339]	375 [14.764]±2 [0.079]

● LSMEM □ S - □ - □ -DR

With DIN mounting bracket and DIN rail
I/O module specifications
Communication module specifications
Number of units
Split manifold serial transmission type



Dimension table for N2 and P2

Number of manifold units	Number of digital input modules	T1	T2	P	Total length of DIN rail
1	1	98.5 [3.878]	67 [2.638]	165.5 [6.516]	250 [9.843]± 2 [0.079]
2			77 [3.031]	175.5 [6.909]	275 [10.827]± 2 [0.079]
3			87 [3.425]	185.5 [7.303]	275 [10.827]± 2 [0.079]
4			97 [3.819]	195.5 [7.697]	300 [11.811]± 2 [0.079]
5	2	121 [4.764]	107 [4.213]	228 [8.976]	325 [12.795]± 2 [0.079]
6			117 [4.606]	238 [9.370]	325 [12.795]± 2 [0.079]
7			127 [5.000]	248 [9.764]	350 [13.780]± 2 [0.079]
8			137 [5.394]	258 [10.157]	350 [13.780]± 2 [0.079]
9	3	143.5 [5.650]	147 [5.787]	290.5 [11.437]	375 [14.764]± 2 [0.079]
10			157 [6.181]	300.5 [11.831]	400 [15.748]± 2 [0.079]
11			167 [6.575]	310.5 [12.224]	400 [15.748]± 2 [0.079]
12			177 [6.969]	320.5 [12.618]	425 [16.732]± 2 [0.079]
13	4	166 [6.535]	187 [7.362]	353 [13.898]	450 [17.717]± 2 [0.079]
14			197 [7.756]	363 [14.291]	450 [17.717]± 2 [0.079]
15			207 [8.150]	373 [14.685]	475 [18.701]± 2 [0.079]
16			217 [8.543]	383 [15.079]	475 [18.701]± 2 [0.079]

* The number of communication modules is fixed at 1.

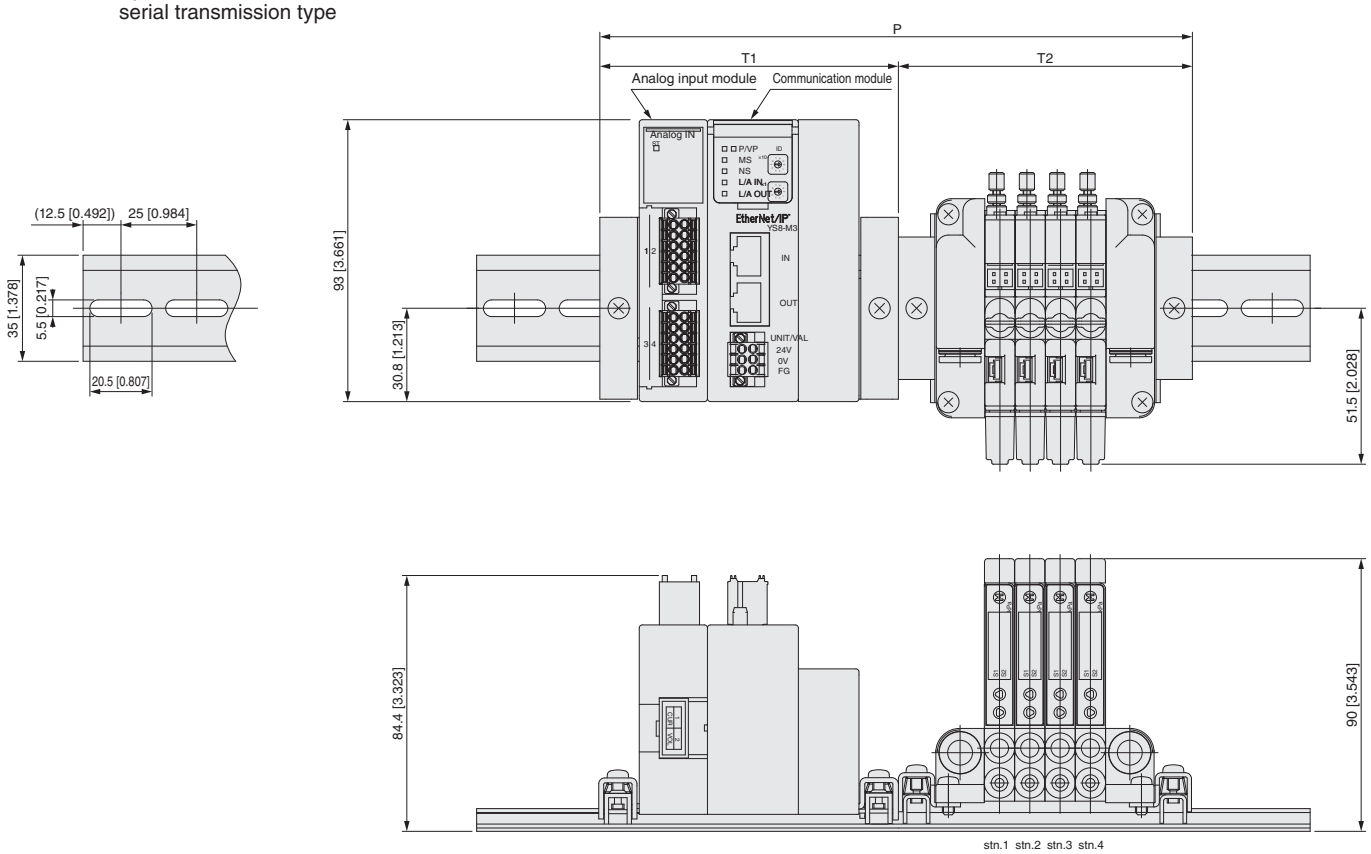
Dimension table for N1 and P1

Number of manifold units	Number of digital input modules	T1	T2	P	Total length of DIN rail
1	1	98.5 [3.878]	67 [2.638]	165.5 [6.516]	250 [9.843]± 2 [0.079]
2			77 [3.031]	175.5 [6.909]	275 [10.827]± 2 [0.079]
3			87 [3.425]	185.5 [7.303]	275 [10.827]± 2 [0.079]
4			97 [3.819]	195.5 [7.697]	300 [11.811]± 2 [0.079]
5			107 [4.213]	205.5 [8.091]	300 [11.811]± 2 [0.079]
6			117 [4.606]	215.5 [8.484]	300 [11.811]± 2 [0.079]
7			127 [5.000]	225.5 [8.878]	325 [12.795]± 2 [0.079]
8			137 [5.394]	235.5 [9.272]	325 [12.795]± 2 [0.079]
9	2	121 [4.764]	147 [5.787]	268 [10.551]	350 [13.780]± 2 [0.079]
10			157 [6.181]	278 [10.945]	375 [14.764]± 2 [0.079]
11			167 [6.575]	288 [11.339]	375 [14.764]± 2 [0.079]
12			177 [6.969]	298 [11.732]	400 [15.748]± 2 [0.079]
13			187 [7.362]	308 [12.126]	400 [15.748]± 2 [0.079]
14			197 [7.756]	318 [12.520]	425 [16.732]± 2 [0.079]
15			207 [8.150]	328 [12.913]	425 [16.732]± 2 [0.079]
16			217 [8.543]	338 [13.307]	425 [16.732]± 2 [0.079]

* The number of communication modules is fixed at 1.

● LSMEM □ S - □ - □ -DR

With DIN mounting bracket and DIN rail
I/O module specifications
Communication module specifications
Number of units
Split manifold serial transmission type



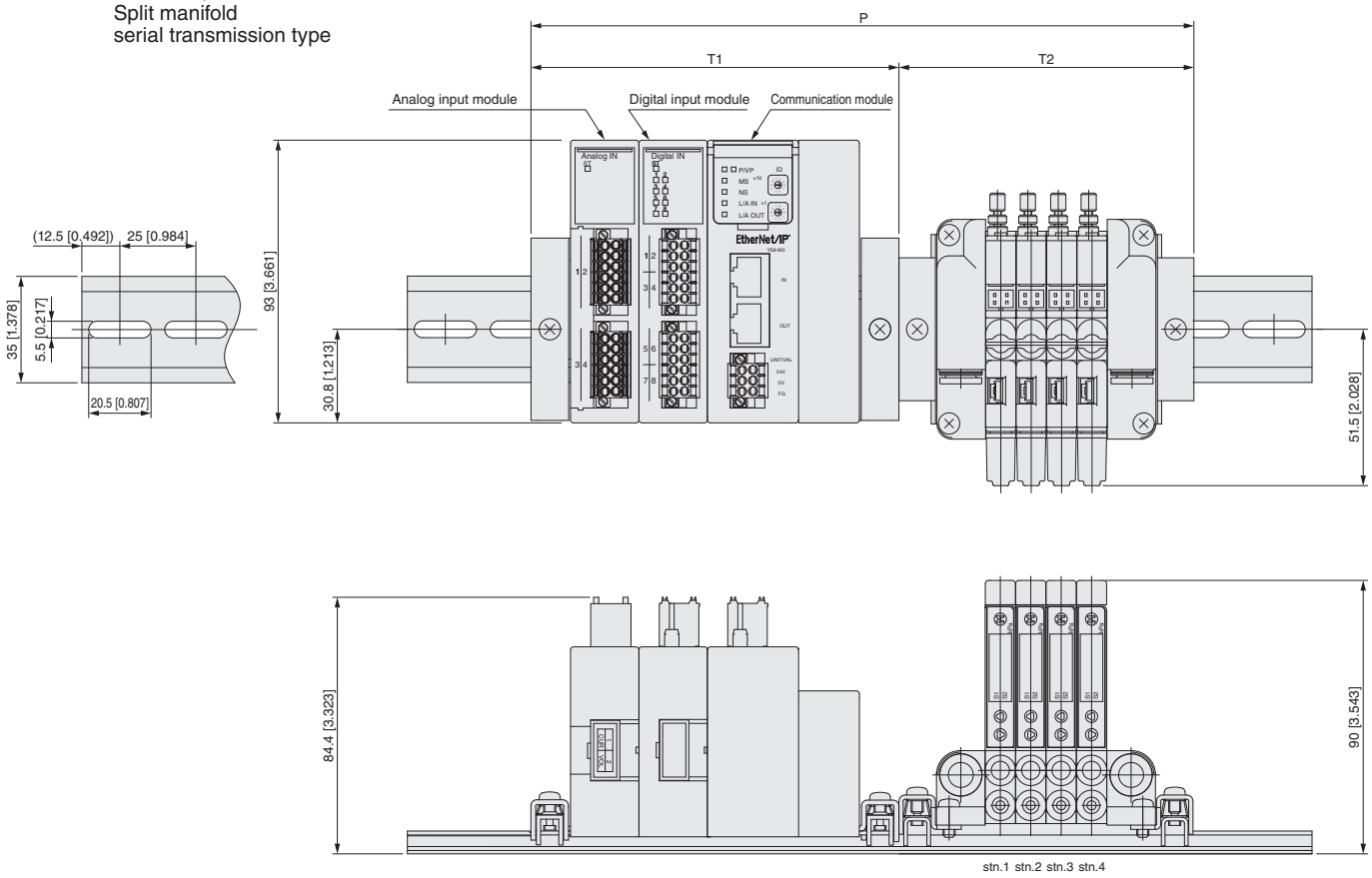
Dimension table for A1

Number of manifold units	Number of analog input modules	T1	T2	P	Total length of DIN rail
1	1	98.5 [3.878]	67.5 [2.657]	166 [6.535]	250 [9.843]±2 [0.079]
2			78 [3.071]	176.5 [6.949]	275 [10.827]±2 [0.079]
3			88.5 [3.484]	187 [7.362]	275 [10.827]±2 [0.079]
4			99 [3.898]	197.5 [7.776]	300 [11.811]±2 [0.079]
5	2	121 [4.764]	109.5 [4.311]	230.5 [9.075]	325 [12.795]±2 [0.079]
6			120 [4.724]	241 [9.488]	325 [12.795]±2 [0.079]
7			130.5 [5.138]	251.5 [9.902]	350 [13.780]±2 [0.079]
8			141 [5.551]	262 [10.315]	350 [13.780]±2 [0.079]
9	3	143.5 [5.650]	151.5 [5.965]	295 [11.614]	375 [14.764]±2 [0.079]
10			162 [6.378]	305.5 [12.028]	400 [15.748]±2 [0.079]
11			172.5 [6.791]	316 [12.441]	400 [15.748]±2 [0.079]
12			183 [7.205]	326.5 [12.854]	425 [16.732]±2 [0.079]
13	4	166 [6.535]	193.5 [7.618]	359.5 [14.154]	450 [17.717]±2 [0.079]
14			204 [8.031]	370 [14.567]	450 [17.717]±2 [0.079]
15			214.5 [8.445]	380.5 [14.980]	475 [18.701]±2 [0.079]
16			225 [8.858]	391 [15.394]	475 [18.701]±2 [0.079]

* The number of communication modules is fixed at 1.

● LSMEM □ S - □ - □ -DR

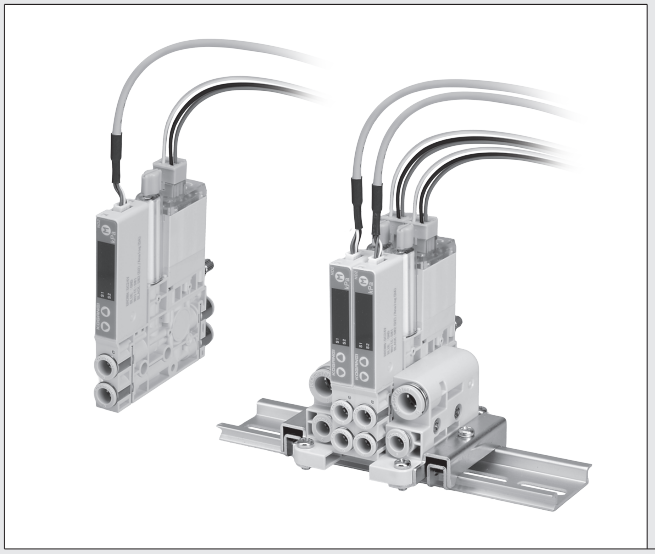
With DIN mounting bracket and DIN rail
I/O module specifications
Communication module specifications
Number of units
Split manifold serial transmission type



Dimension table for NA and PA

Number of manifold units	Number of digital input modules	Number of analog input modules	T1	T2	P	Total length of DIN rail
1	1	1	121 [4.764]	67.5 [2.657]	188.5 [7.421]	275 [10.827]±2 [0.079]
2				78 [3.071]	199 [7.835]	300 [11.811]±2 [0.079]
3				88.5 [3.484]	209.5 [8.248]	300 [11.811]±2 [0.079]
4				99 [3.898]	220 [8.661]	325 [12.795]±2 [0.079]
5		2	143.5 [5.650]	109.5 [4.311]	253 [9.961]	350 [13.780]±2 [0.079]
6				120 [4.724]	263.5 [10.374]	350 [13.780]±2 [0.079]
7				130.5 [5.138]	274 [10.787]	375 [14.764]±2 [0.079]
8				141 [5.551]	284.5 [11.201]	375 [14.764]±2 [0.079]
9	2	3	188.5 [7.421]	151.5 [5.965]	340 [13.386]	425 [16.732]±2 [0.079]
10				162 [6.378]	350.5 [13.799]	450 [17.717]±2 [0.079]
11				172.5 [6.791]	361 [14.213]	450 [17.717]±2 [0.079]
12				183 [7.205]	371.5 [14.626]	450 [17.717]±2 [0.079]
13		4	211 [8.307]	193.5 [7.618]	404.5 [15.925]	500 [19.685]±2 [0.079]
14				204 [8.031]	415 [16.339]	500 [19.685]±2 [0.079]
15				214.5 [8.445]	425.5 [16.752]	525 [20.669]±2 [0.079]
16				225 [8.858]	436 [17.165]	525 [20.669]±2 [0.079]

* The number of communication modules is fixed at 1.



KOGANEI

Vacuum Equipment

Vacuum Valve Unit LSMV Series

INDEX

Products Compliant with RoHS Directive

⚠ **CAUTION** Before use, be sure to read the safety precautions on page 44.

Vacuum Valve Unit

LSMV

Specifications

Item \ Basic model			LSMV-TA	LSMV-T2
Medium			Air[Note]	
Operating pressure range			-100 to 0 kPA [-29.54 to 0 inHg], 0.3 to 0.6 MPa [44 to 87 psi]	
Operating temperature range (ambient and fluid)		°C [°F]	5 to 50 [41 to 122]	
Vacuum side flow rate		L/min (ANR) [ft3/min (SCFM)]	20 [0.706]	
Filter filtration rating		μm	30	
Connection port	Vacuum generation port		ϕ4 [0.157] or ϕ6 [0.236]	
	Compressed air supply port		ϕ6 [0.236]	
	Vacuum supply port		As a standalone component: ϕ6 [0.236], for a manifold: ϕ8 [0.315]	
Main valve specifications	Operating method		Internal pilot type	
	Valve function		Normally closed (NC) 3-port valve	Self-holding
Lubrication			Not allowed	
Mounting direction			Unrestricted	
Shock resistance		m/s^2 [G]	294.2 [30] (in solenoid axial direction 150 [15])	

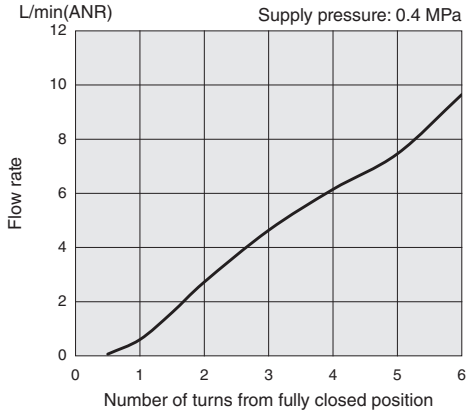
Note: Use clean air from which oil mist and dust have been removed.

Electrical specifications

Item \ Rated voltage			DC24V
Operating voltage range		V	21.6 to 26.4 (24 ±10%)
Current value (at rated voltage)	Starting	mA	17
	Steady state	mA	4.2
Power consumption	Starting	W	0.4
	Steady state	W	0.1
Starting state duration (standard time)		ms	70
Allowable circuit leakage current		mA	1.0
Insulation resistance[Note]		MΩ	100 or more
LED indicator color			SA vacuum generation side: Red SB vacuum break side: Green
Surge protection (standard equipment)			Flywheel diode

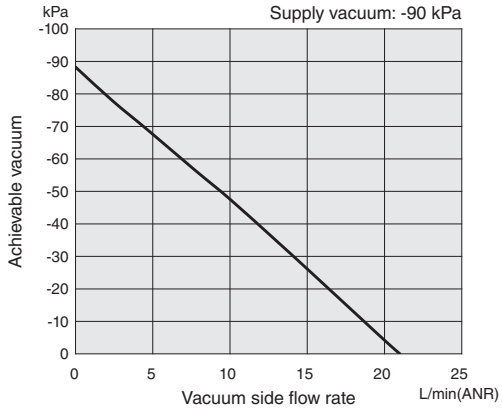
Note: Measured with a 500 VDC megger.

Vacuum break flow rate



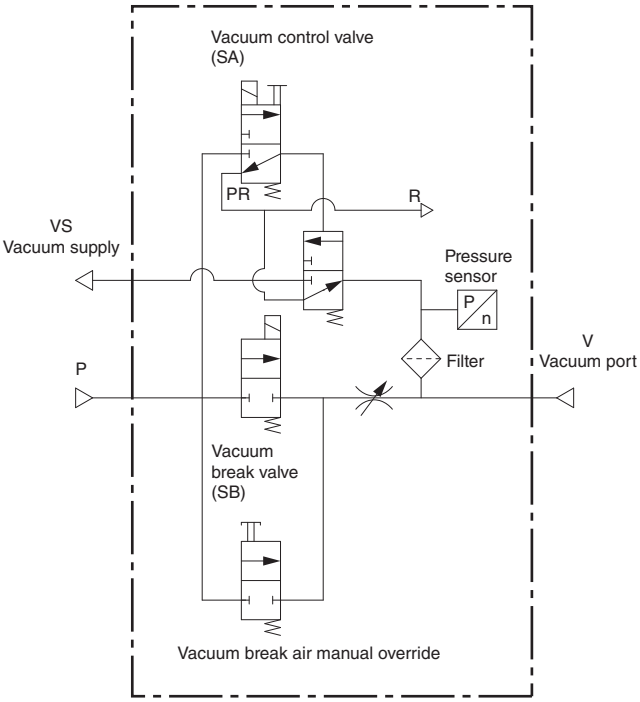
Note: The indicated flow rate is the flow when the solenoid valve is energized.
With the manual override, the flow rate is lower.
Adjust the flow rate with the solenoid valve energized.

Flow characteristics

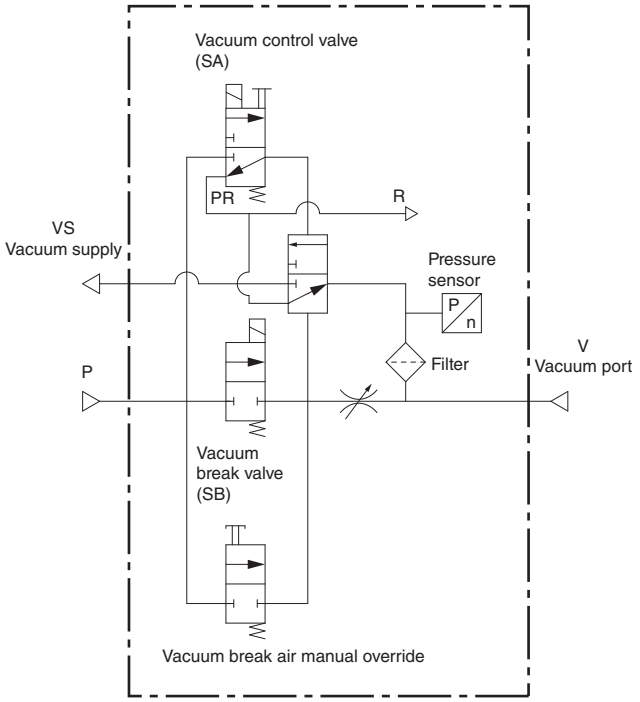


Symbols

● -TA 3-port valve



● -T2 Self-holding



Vacuum pressure switch

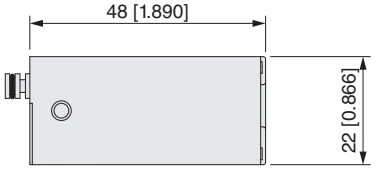
Specifications

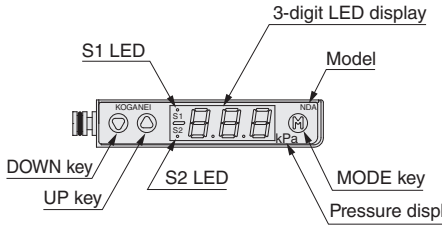
Option symbol/(Additional part model)		**ND2 (LSMEZ-ND2)**	**NDA (LSMEZ-NDA)**	**PD2 (LSMEZ-PD2)**	**PDA (LSMEZ-PDA)**
Product type		NPN, 2 outputs	NPN, 1 output/analog output	PNP, 2 outputs	PNP, 1 output/analog output
Indication method		Gauge pressure			
Rated pressure range		Selectable by pressure range setting from: -99.9 to 99.9 kPa [-29.510 to 29.510 inHg]; -100 to 300 kPa [-29.540 to 88.620 inHg]; and -100 to 700 kPa [-29.540 to 206.8 inHg]. * When -100 to 700 kPa [-29.540 to 206.8 inHg] is selected, the proof pressure is limited to 600 kPa [177.2 inHg]. * Factory setting: -100 to 300 kPa [-29.540 to 88.620 inHg]			
Proof pressure		600 kPa [177.2 inHg]			
Applicable fluid		Non-corrosive gas			
Power supply voltage		12 to 24 VDC ±10%, ripple P-P 10% or less			
Current consumption		30 mA or less			
Switch output	Number of outputs	2 points	1 points	2 points	1 points
	Output type	NPN open collector output		PNP open collector output	
	Pressure setting range	-100 to 700 kPa [-29.540 to 206.8 inHg] * Depending on pressure range setting			
	Repeatability	±0.2%F.S.±1digit			
	Load current	100mA MAX.			
	Applied voltage	30 V MAX. (between switch output and 0 V)		–	
	Residual voltage	1.5 V or less (at load current 100 mA)		2 V or less (at load current 100 mA)	
	Response time	4 ms or less * When filter setting is disabled			
	Short-circuit protection	Provided			
Pressure display	Number of digits	Sign and 3-digit, 7-segment LED display			
	Display accuracy	±2% F.S. ±1 digit (0 to 50°C [32 to 122°F])			
Operation indicator		Output 1 (S1), output 2 (S2) Lights when switch output is ON Flashes during output setting; lights/flashes during error			
Analog voltage output		–	1 to 5 V ±2% F.S. (0 to 50°C [32 to 122°F]) Output impedance: 1 kΩ	–	1 to 5 V ±2% F.S. (0 to 50°C [32 to 122°F]) Output impedance: 1 kΩ
Environmental resistance	Operating temperature range	0 to 50 °C [32 to 122°F]			
	Operating humidity range	35 to 85% RH (no condensation)			
	Withstand voltage	1 minute at 500 VAC			
	Insulation resistance	At 500 VDC megger, then 100 MΩ or higher			
	Vibration resistance	Amplitude 1.5 mm [0.059 in.], 10 to 55 Hz, 2 hours each in X, Y, and Z directions			
	Shock resistance	490 m/s² [50 G], 3 times each in 3 directions			
	EMC	EMI: EN55011, EMS: EN61000-6-2			
Mass		Approx. 10 g [0.35 oz] (excluding cable)			
Cable*		Connector cable LSMEZ-K15 (1500 mm [59.055 in.])/-K30(3000 mm [118.1 in.])			

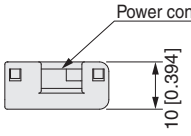
* If you select a vacuum pressure switch when purchasing a vacuum valve unit, the connector cable LSMEZ-K15 (1500 mm [59.055 in.]) is included. If you purchase the vacuum pressure switch as a single unit, the connector cable is not included. Please select a model separately to purchase the cable.

Dimensional drawings and part names (mm [in.])

● Dimensional drawings and part names



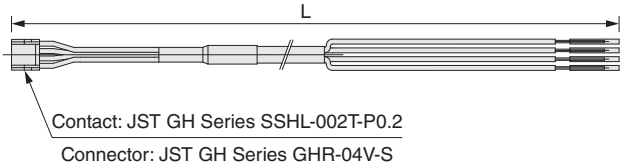




Caution: When connecting or disconnecting the connector cable, ensure that no load is applied to the connection between the vacuum pressure switch and the micro ejector main body. Failure to do so may result in leakage or damage.

● Additional parts (sold separately)

Model	Dimension L
LSMEZ-K15	1500 [59.055]
LSMEZ-K30	3000 [118.1]

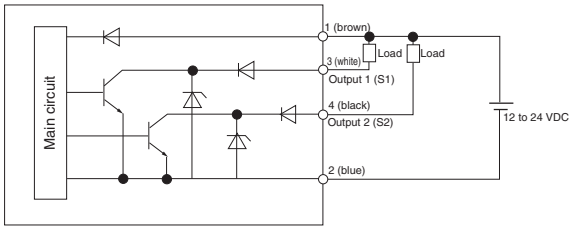


Wiring table and circuit diagrams

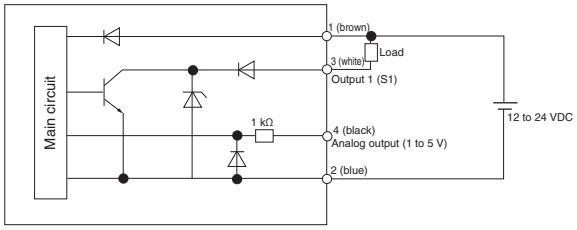
● Wiring table

Connector pin No.	Terminal name	Cable color
1	DC24V	Brown
2	GND	Blue
3	Output 1 (S1)	White
4	2-output type: Output 2 (S2) Analog output type: Analog output	Black

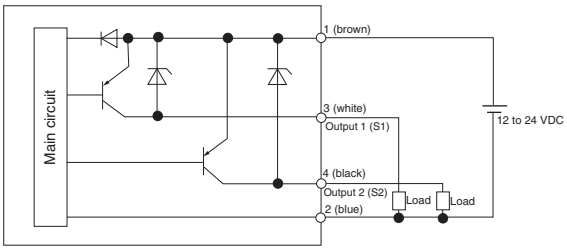
● Circuit diagrams



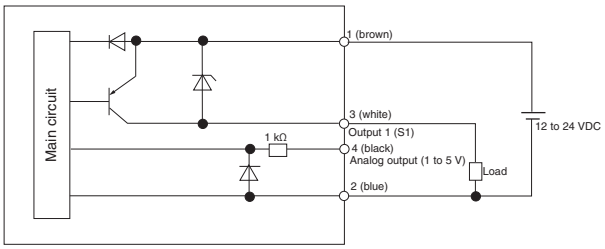
LSMEZ-ND2 (NPN, 2-output type)



LSMEZ-NDA (NPN, 1-output/analog output type)



LSMEZ-PD2 (PNP, 2-output type)



LSMEZ-PDA (PNP, 1-output/analog output type)

Functions

■ Switch output

<Output mode setting>

HYS: Hysteresis mode (factory setting)

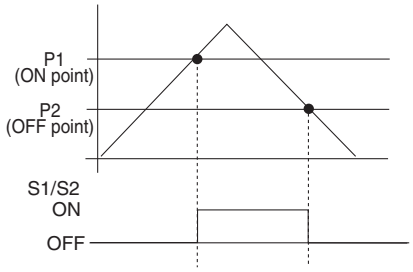
CO: Window comparator mode

OFF: OFF mode

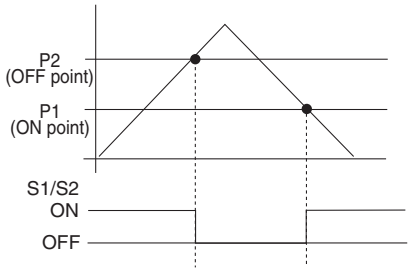
● Hysteresis mode

Mode for setting P1 (ON point) and P2 (OFF point).

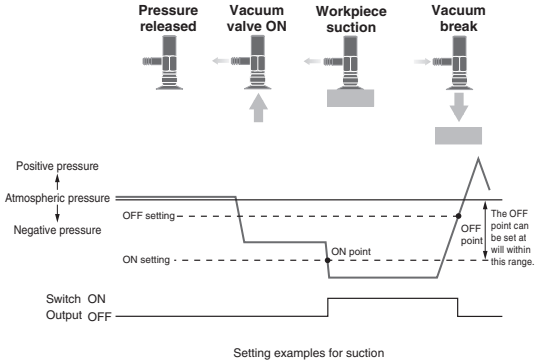
Output is provided according to the threshold values (P1 and P2) and the non-inverted/inverted setting.



If P1 > P2

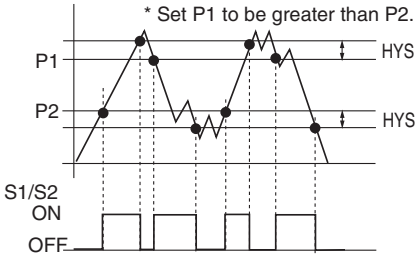


If P2 > P1



Setting examples for suction

● Window comparator mode
Mode in which the output turns ON when the value is within the setting value range between P1 and P2.
The OFF point depends on the hysteresis (HYS) setting.
Output is provided according to the threshold values (P1 and P2), hysteresis (HYS), and the non-inverted/inverted setting.



● OFF mode
Mode in which the output remains OFF at all times.
If the inverted setting is selected in OFF mode, the output remains ON.

● **Non-inverted/inverted setting (N.O./N.C.)**
Used to set the output to non-inverted or inverted.
N.O.: Non-inverted (factory setting)
N.C.: Inverted

■ Analog output (Analog types [-NDA/-PDA] only)

An analog voltage of 1 to 5 V linked to the pressure value is output.
The pressures when the voltage is 1 V and 5 V depend on the range setting.
If the filter setting is enabled, the response of the analog output will also become slower according to the filter setting.

■ Filter setting

Used to apply low-pass filter processing to the pressure detection value to reduce noise and pressure fluctuation.

F-0: Low-pass filter disabled (factory setting)
F-1 to F-7: Low-pass filter enabled

* The larger the number, the stronger the filter and the slower the response. The filter setting affects the response of the display value, switch output, and analog output.

■ ECO setting

Setting for reducing power consumption by turning off the LED display.
When ECO setting is enabled, pressing any button will activate the LED display for 5 seconds, after which the LED will automatically turn off.

OFF: Disabled (factory setting)
ON: Enabled

■ Key lock setting

Setting for disabling button operations to prevent settings from being changed accidentally due to unintended button operations.
When the key lock setting is enabled and a button is pressed, "LOC" is displayed for 0.5 seconds and the product returns to the measurement mode.

OFF: Disabled (factory setting)
ON: Enabled

■ Pressure range setting

Used to set the pressure measurement range.
You can select from the following three types:

99.9: -99.9 to 99.9 kPa [-29.510 to 29.510 inHg]

300: -100 to 300 kPa [-29.540 to 88.620 inHg] (factory setting)

700: -100 to 700 kPa [-29.540 to 206.8 inHg] (* The proof pressure is limited to 600 kPa [177.2 inHg].)

Range setting	-99.9 to 99.9 kPa [-29.510 to 29.510 inHg]	-100 to 300 kPa [-29.540 to 88.620 inHg]	-100 to 700 kPa [-29.540 to 206.8 inHg]
Upper limit pressure kPa [inHg]	99.9 [29.510]	300 [88.620]	700 [206.8]
Lower limit pressure kPa [inHg]	-99.9 [-29.510]	-100 [-29.540]	-100 [-29.540]
Display resolution kPa [inHg]	0.1 [0.030]	1 [0.295]	1 [0.295]
Analog output*	1 to 5 V		
Pressure at 1 V kPa [inHg]*	-99.9 [-29.510]	-100 [-29.540]	-100 [-29.540]
Pressure at 5 V kPa [inHg]*	99.9 [29.510]	300 [88.620]	700 [206.8]
Zero-point voltage V*	3.0	2.0	1.5

* Analog output is available only for analog output types.

As a standalone component

Basic model	Main body mass	Additional mass
		Vacuum pressure switch
(A)LSMV-**-J*	66 g [2.33 oz]	10 g [0.35 oz] (lead wire mass: 58 g [2.05 oz])

The valve connector is not included in the mass.
Calculation example
LSMV-TA-J6-PN 66 g
ALSMV-T2-J6-PDA-PN 66 + 10 = 76 g

Manifold

Non-plug-in type

Basic model	End block mass	-DR (with DIN mounting bracket and DIN rail)
LSMVM1N	49.5 [1.75]	83 [2.93]
LSMVM2N	51.5 [1.82]	87.5 [3.09]
LSMVM3N	53.5 [1.89]	87.5 [3.09]
LSMVM4N	55.5 [1.96]	91.5 [3.23]
LSMVM5N	57.5 [2.03]	91.5 [3.23]
LSMVM6N	60 [2.12]	95.5 [3.37]
LSMVM7N	62 [2.19]	95.5 [3.37]
LSMVM8N	64 [2.26]	95.5 [3.37]
LSMVM9N	66 [2.33]	99.5 [3.51]
LSMVM10N	68 [2.40]	99.5 [3.51]
LSMVM11N	70.5 [2.49]	99.5 [3.51]
LSMVM12N	72.5 [2.56]	104 [3.67]
LSMVM13N	74.5 [2.63]	104 [3.67]
LSMVM14N	76.5 [2.70]	108 [3.81]
LSMVM15N	78.5 [2.77]	108 [3.81]
LSMVM16N	81 [2.86]	112 [3.95]

Calculation example
LSMVM4N 304 + 55.5 = 359.5
stn1 to stn4 ALSMV-T2-J6-PDA-PN 76 × 4 = 304
The valve connector is not included in the mass.

Manifold serial transmission type

Without I/O module

Basic model	End block mass	Blank: Without I/O module
LSMVM1S	149 [5.26]	145.5 [5.13]
LSMVM2S	155 [5.47]	145.5 [5.13]
LSMVM3S	157 [5.54]	145.5 [5.13]
LSMVM4S	163.5 [5.77]	145.5 [5.13]
LSMVM5S	165.5 [5.84]	145.5 [5.13]
LSMVM6S	167.5 [5.91]	145.5 [5.13]
LSMVM7S	174 [6.14]	145.5 [5.13]
LSMVM8S	176 [6.21]	145.5 [5.13]
LSMVM9S	182 [6.42]	145.5 [5.13]
LSMVM10S	188.5 [6.65]	145.5 [5.13]
LSMVM11S	190.5 [6.72]	145.5 [5.13]
LSMVM12S	176 [6.21]	145.5 [5.13]
LSMVM13S	199 [7.02]	145.5 [5.13]
LSMVM14S	205 [7.23]	145.5 [5.13]
LSMVM15S	207 [7.30]	145.5 [5.13]
LSMVM16S	209.5 [7.39]	145.5 [5.13]

Calculation example
LSMVM4S-M3-DR 304 + 163.5 + 145.5 = 613
stn1 to stn4 ALSMV-T2-J6-PDA-PN 76 × 4 = 304
The valve connector and the connector cable are not included in the mass.

N1 (digital input module) P1 (digital input module)

Basic model	End block mass	N1,P1
LSMVM1S	149 [5.26]	264 [9.31]
LSMVM2S	155 [5.47]	264 [9.31]
LSMVM3S	157 [5.54]	264 [9.31]
LSMVM4S	163.5 [5.77]	264 [9.31]
LSMVM5S	165.5 [5.84]	264 [9.31]
LSMVM6S	167.5 [5.91]	264 [9.31]
LSMVM7S	174 [6.14]	264 [9.31]
LSMVM8S	176 [6.21]	264 [9.31]
LSMVM9S	182 [6.42]	354 [12.49]
LSMVM10S	188.5 [6.65]	354 [12.49]
LSMVM11S	190.5 [6.72]	354 [12.49]
LSMVM12S	176 [6.21]	354 [12.49]
LSMVM13S	199 [7.02]	354 [12.49]
LSMVM14S	205 [7.23]	354 [12.49]
LSMVM15S	207 [7.30]	354 [12.49]
LSMVM16S	209.5 [7.39]	354 [12.49]

Calculation example
LSMVM4S-M3-P1-DR 304 + 163.5 + 264 = 731.5
stn1 to stn4 ALSMV-T2-J6-PDA-PN 76 × 4 = 304
The valve connector and the connector cable are not included in the mass.

N2 (digital input module) P2 (digital input module) A1 (analog input module)

Basic model	End block mass	N2,P2,A1
LSMVM1S	149 [5.26]	264 [9.31]
LSMVM2S	155 [5.47]	264 [9.31]
LSMVM3S	157 [5.54]	264 [9.31]
LSMVM4S	163.5 [5.77]	264 [9.31]
LSMVM5S	169.5 [5.98]	354 [12.49]
LSMVM6S	171.5 [6.05]	354 [12.49]
LSMVM7S	178 [6.28]	354 [12.49]
LSMVM8S	180 [6.35]	354 [12.49]
LSMVM9S	186.5 [6.58]	444 [15.66]
LSMVM10S	192.5 [6.79]	444 [15.66]
LSMVM11S	194.5 [6.86]	444 [15.66]
LSMVM12S	176 [6.21]	444 [15.66]
LSMVM13S	207 [7.30]	534 [18.84]
LSMVM14S	209.5 [7.39]	534 [18.84]
LSMVM15S	215.5 [7.60]	534 [18.84]
LSMVM16S	217.5 [7.67]	534 [18.84]

Calculation example
LSMVM4S-M3-P2-DR 304 + 163.5 + 264 = 731.5
stn1 to stn4 ALSMV-T2-J6-PD2-PN 76 × 4 = 304
The valve connector and the connector cable are not included in the mass.

NA (digital input module) PA (digital input module)

Basic model	End block mass	NA,PA
LSMVM1S	149 [5.26]	354 [12.49]
LSMVM2S	155 [5.47]	354 [12.49]
LSMVM3S	157 [5.54]	354 [12.49]
LSMVM4S	163.5 [5.77]	354 [12.49]
LSMVM5S	169.5 [5.98]	444 [15.66]
LSMVM6S	171.5 [6.05]	444 [15.66]
LSMVM7S	178 [6.28]	444 [15.66]
LSMVM8S	180 [6.35]	444 [15.66]
LSMVM9S	186.5 [6.58]	534 [18.84]
LSMVM10S	192.5 [6.79]	534 [18.84]
LSMVM11S	194.5 [6.86]	534 [18.84]
LSMVM12S	176 [6.21]	534 [18.84]
LSMVM13S	207 [7.30]	624 [22.01]
LSMVM14S	209.5 [7.39]	624 [22.01]
LSMVM15S	215.5 [7.60]	624 [22.01]
LSMVM16S	217.5 [7.67]	624 [22.01]

Calculation example
LSMVM4S-M3-P2-DR 304 + 163.5 + 354 = 821.5
stn1 to stn4 ALSMV-T2-J6-PD2-PN 76 × 4 = 304
The valve connector and the connector cable are not included in the mass.

Vacuum valve unit (single unit) order code

□ **LSMV** – □ – □ – □ – □ **DC24V**

Lead wire specifications
PN — Without connector, without lead wire
PS — Connector, lead wire 300 mm [11.811 in.] positive common
PS3 — Connector, lead wire 3000 mm [118.1 in.] positive common
MS — Connector, lead wire 300 mm [11.811 in.] negative common
MS3 — Connector, lead wire 3000 mm [118.1 in.] negative common

CPS — Prewired connector with terminals, lead wire 300 mm [11.811 in.] positive common*
CPS3 — Prewired connector with terminals, lead wire 3000 mm [118.1 in.] positive common*
CMS — Prewired connector with terminals, lead wire 300 mm [11.811 in.] negative common*
CMS3 — Prewired connector with terminals, lead wire 3000 mm [118.1 in.] negative common*

* CPS, CPS3, CMS, and CMS3 are available only when ALSMV (for manifold mounting) is selected.

Vacuum pressure switch (1.5 m [4.920 ft] cable supplied)
Blank — Without vacuum pressure switch
NDA — Vacuum pressure switch (NPN, 1 switch output, 1 analog)
ND2 — Vacuum pressure switch (NPN, 2 switch outputs)
PDA — Vacuum pressure switch (PNP, 1 switch output, 1 analog)
PD2 — Vacuum pressure switch (PNP, 2 switch outputs)

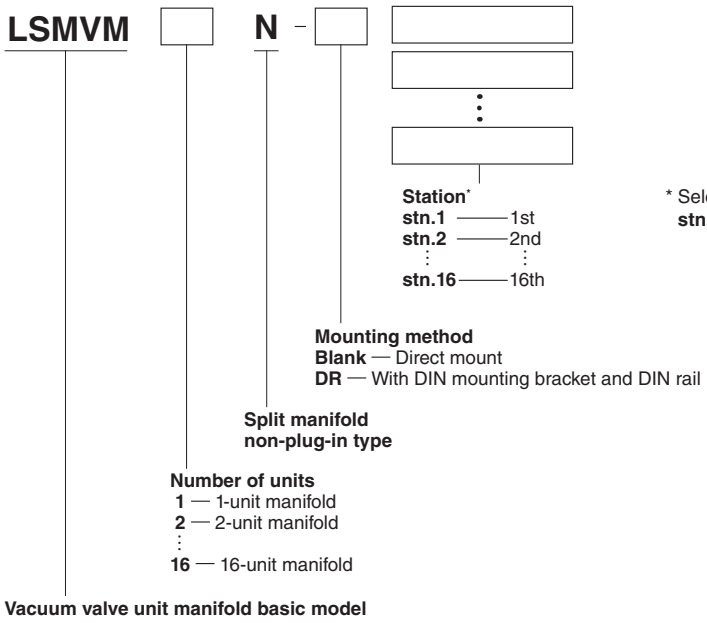
Vacuum port fitting
J4 — ϕ4QJ
J6 — ϕ6QJ

Valve specifications
TA — 3-port
T2 — Self-holding

LSMV: Vacuum valve unit
ALSMV: Vacuum valve unit for manifold mounting

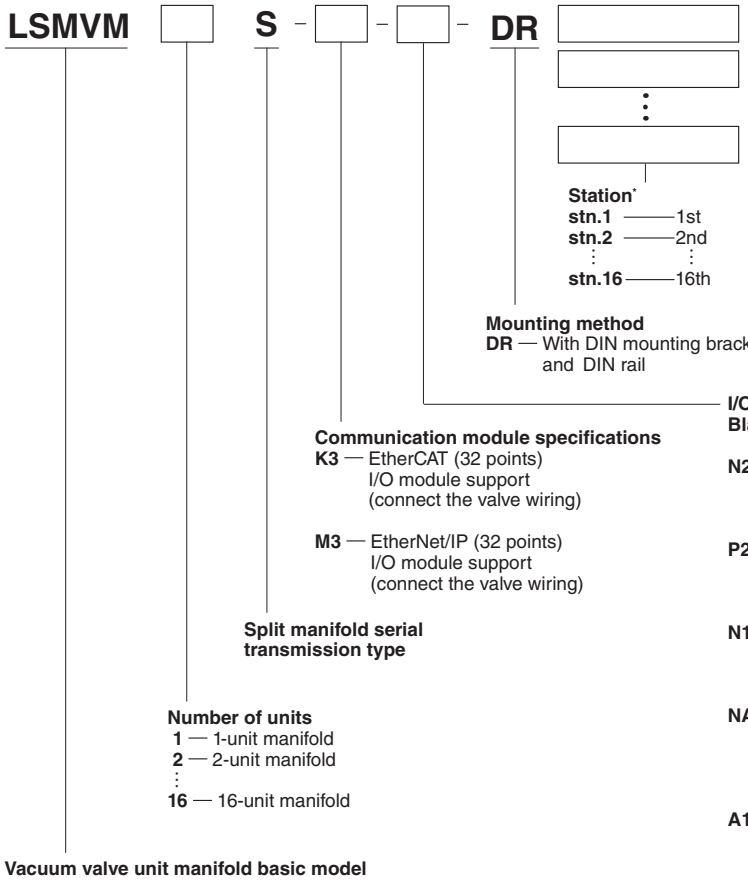
Vacuum valve unit manifold order code

● Vacuum valve unit manifold Non-plug-in type



* Selectable only for ALSMV (for manifold mounting).
stn.1 to **stn.16** can be mounted only with the same model.

● Vacuum valve unit manifold Serial transmission type



* Selectable only for ALSMV (for manifold mounting).
stn.1 to **stn.16** can be mounted only with the same model.

● For the manifold serial transmission type, adding additional units is not supported.

N2 — Digital input module (NPN, 8 points)
Connect 2 switch outputs.
stn.-mounted ejector's option “pressure switch: ND2” is required.

P2 — Digital input module (PNP, 8 points)
Connect 2 switch outputs.
stn.-mounted ejector's option “pressure switch: PD2” is required.

N1 — Digital input module (NPN, 8 points)
Connect 1 switch output (do not wire the analog output).
stn.-mounted ejector's option “pressure switch: NDA” is required.

NA — Digital input module (NPN, 8 points)
Analog input module (8 points)
Connect 1 switch output and 1 analog output, respectively.
stn.-mounted ejector's option “pressure switch: NDA” is required.

A1 — Analog input module (8 points)
Connect 1 analog output (do not wire the switch output).
stn.-mounted ejector's option “pressure switch: NDA or PDA” is required.

P1 — Digital input module (PNP, 8 points)
Connect 1 switch output (do not wire the analog output).
stn.-mounted ejector's option “pressure switch: PDA” is required.

PA — Digital input module (PNP, 8 points)
Analog input module (8 points)
Connect 1 switch output and 1 analog output, respectively.
stn.-mounted ejector's option “pressure switch: PDA” is required.

Vacuum valve unit additional part order code

LSMEZ – □

Ejector and vacuum valve unit additional part basic model

Additional part type

F — Filter element (pack of 5)

21 — Bracket for mounting as a standalone component (2 bolts and 2 nuts included)

J4 — Embedded quick fitting ϕ4 [0.157]

J6 — Embedded quick fitting ϕ6 [0.236]

NDA — Vacuum pressure switch (NPN, 1 output switch, 1 analog)

ND2 — Vacuum pressure switch (NPN, 2 output switches)

PDA — Vacuum pressure switch (PNP, 1 output switch, 1 analog)

PD2 — Vacuum pressure switch (PNP, 2 output switches)

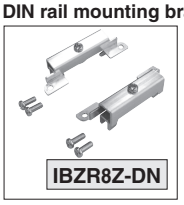
K15 — Connector cable (1.5 m [4.920 ft])

K30 — Connector cable (3 m [9.840 ft])

KM — Ejector muffler (ejector-dedicated part)

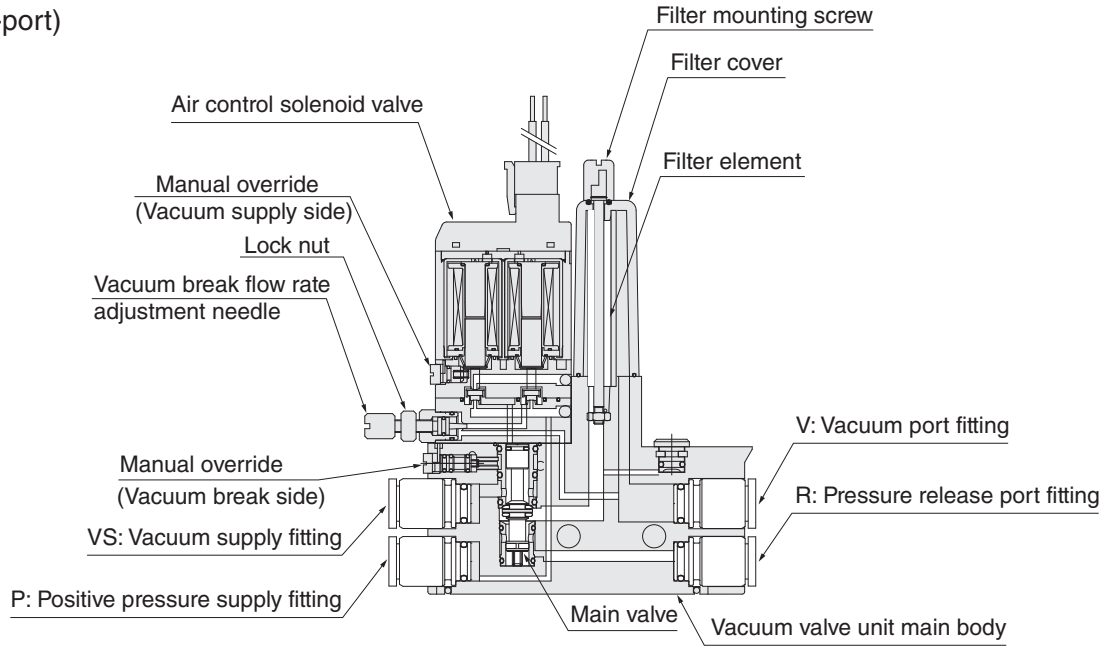
RV — Connecting rod for adding 1 unit (set of 2)

DIN rail mounting bracket

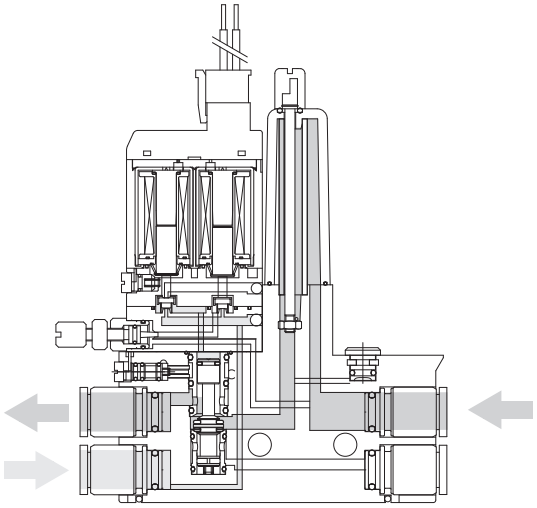


(4 main body mounting screws included)

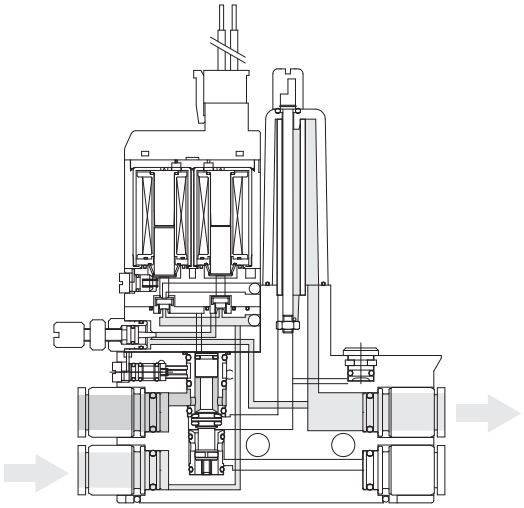
■-TA (3-port)



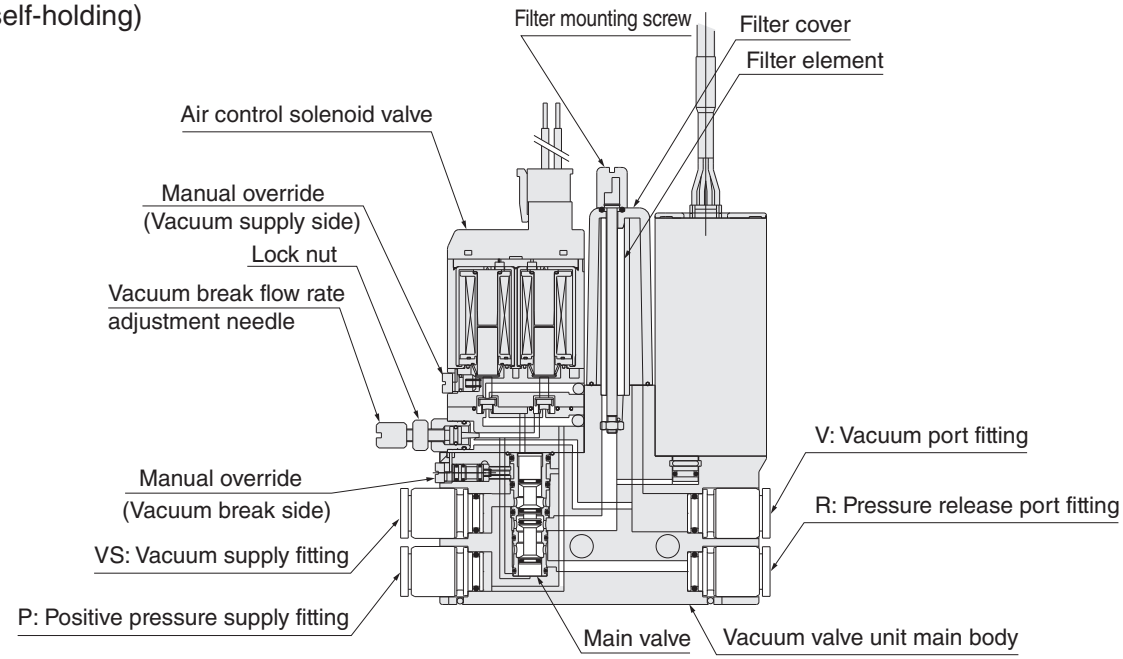
● When the vacuum side control solenoid valve (SA) is ON



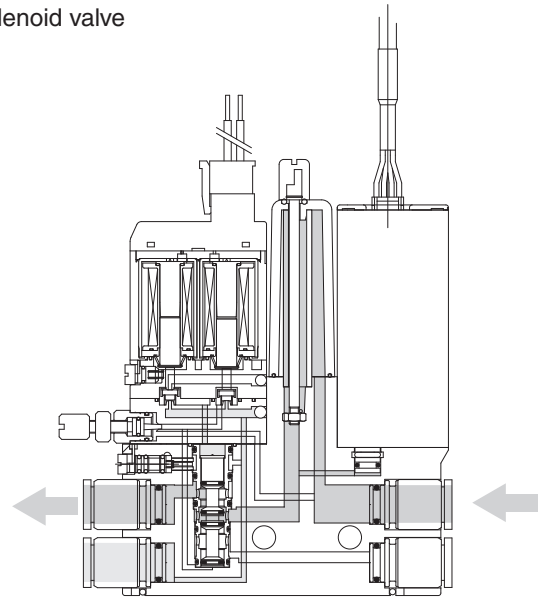
● When the vacuum break air control solenoid valve (SB) is ON



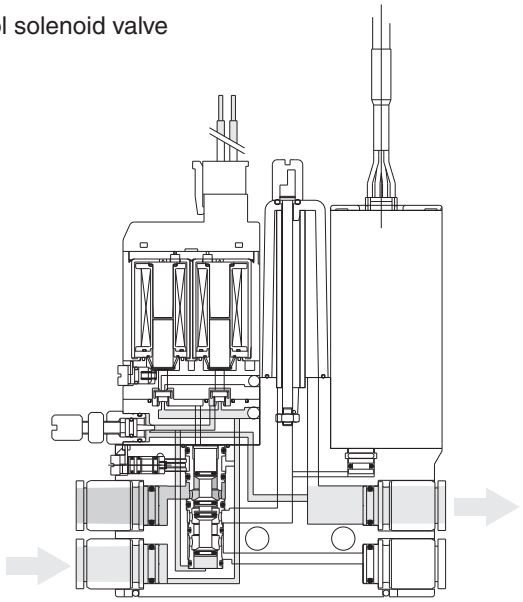
■-T2 (self-holding)



● When the vacuum side control solenoid valve (SA) is ON

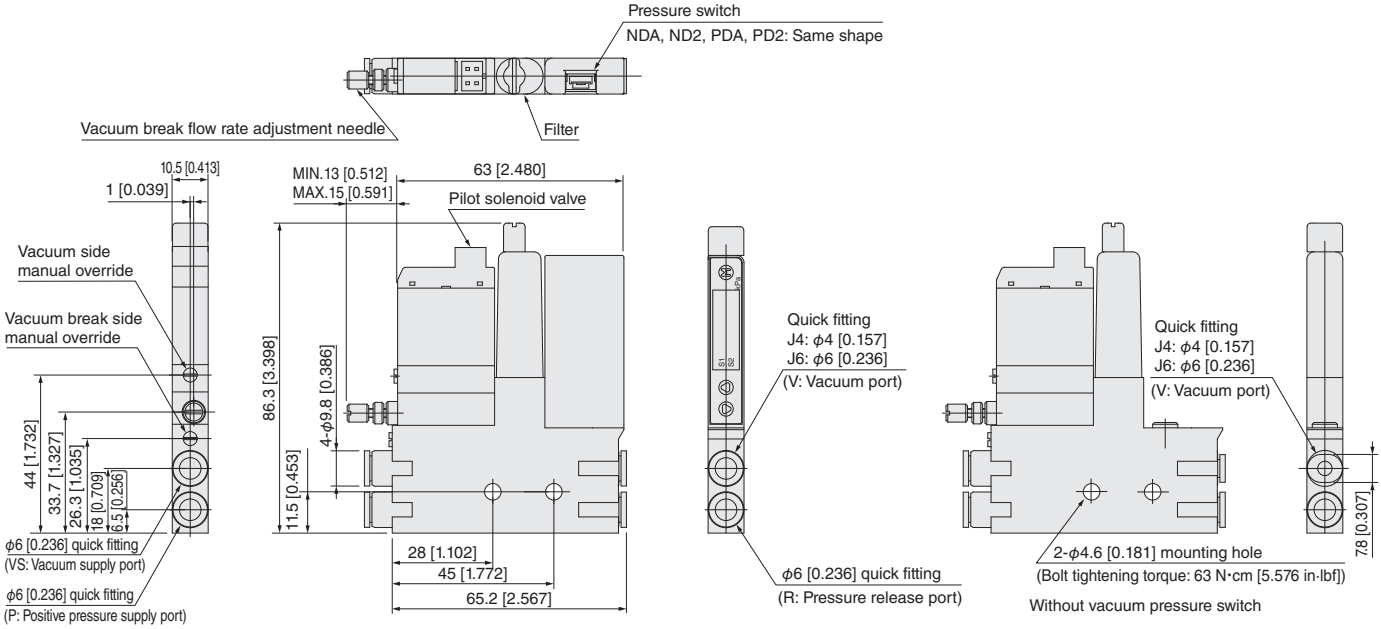


● When the vacuum break air control solenoid valve (SB) is ON

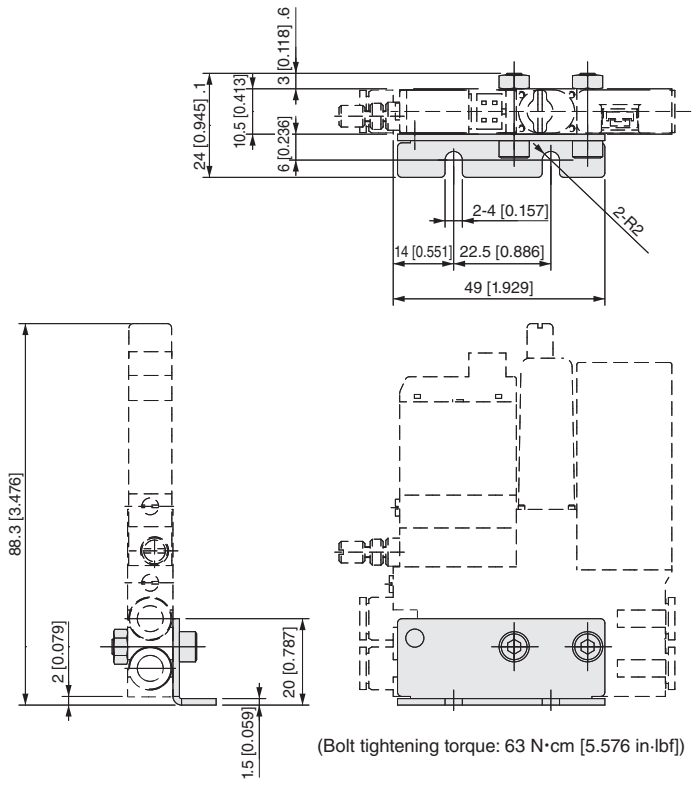


● LSMV-T □ -J □ - □ -PN

(The main body dimensional drawing is the same for valve specifications **TA** and **T2**.)

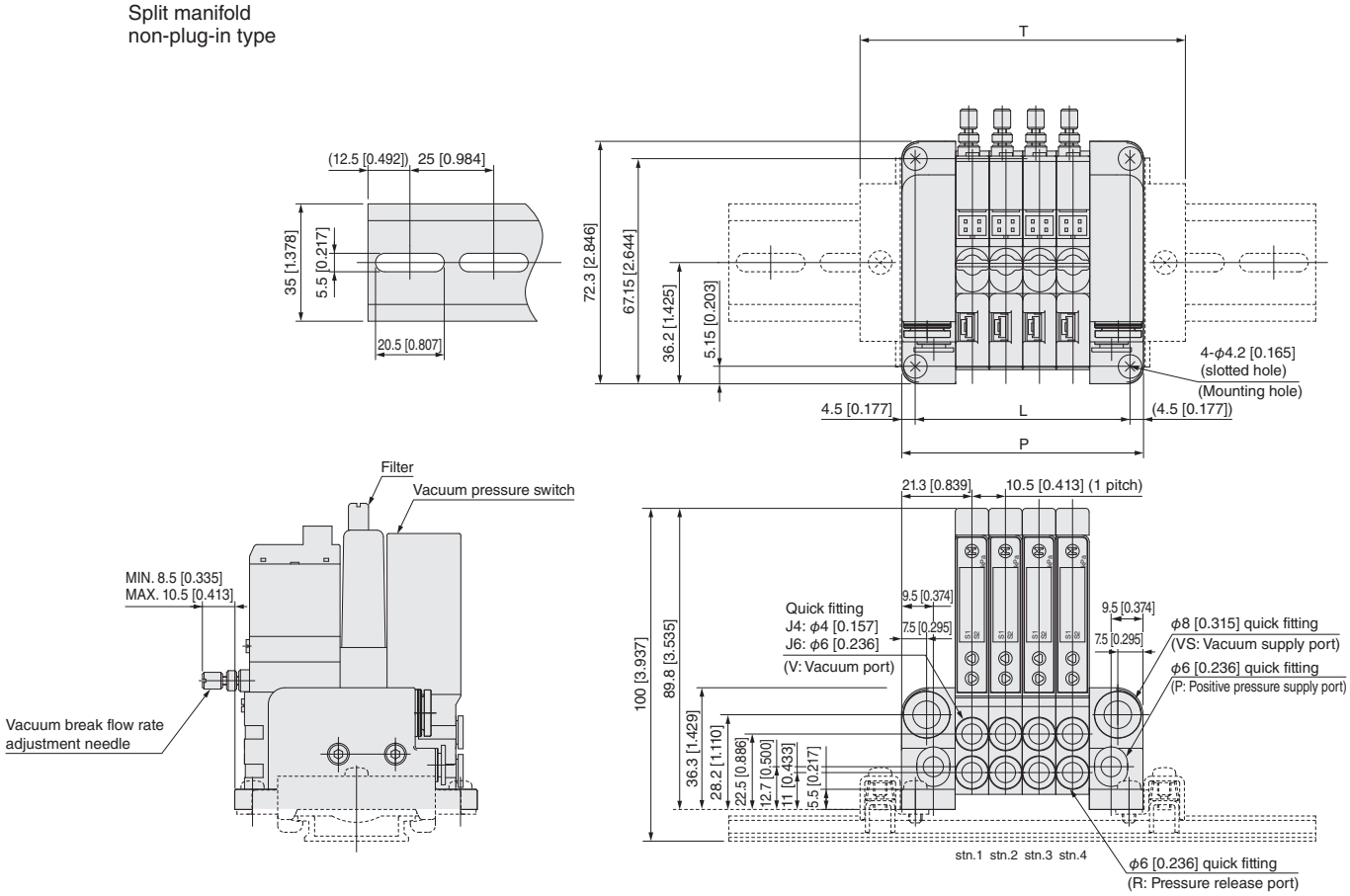


● LSMEZ-21 (additional part)



● LSMVM □ N - □

- Number of units
- Split manifold non-plug-in type
- DIN mounting bracket and DIN rail
  Blank: None
  DR: Included



Number of manifold units	L	P	T	Total length of DIN rail
1	33.5 [1.319]	42.5 [1.673]	67.5 [2.657]	150 [5.906]±2 [0.079]
2	44 [1.732]	53 [2.087]	78 [3.071]	175 [6.890]±2 [0.079]
3	54.5 [2.146]	63.5 [2.500]	88.5 [3.484]	175 [6.890]±2 [0.079]
4	65 [2.559]	74 [2.913]	99 [3.898]	200 [7.874]±2 [0.079]
5	75.5 [2.972]	84.5 [3.327]	109.5 [4.311]	200 [7.874]±2 [0.079]
6	86 [3.386]	95 [3.740]	120 [4.724]	225 [8.858]±2 [0.079]
7	96.5 [3.799]	105.5 [4.154]	130.5 [5.138]	225 [8.858]±2 [0.079]
8	107 [4.213]	116 [4.567]	141 [5.551]	225 [8.858]±2 [0.079]
9	117.5 [4.626]	126.5 [4.980]	151.5 [5.965]	250 [9.843]±2 [0.079]
10	128 [5.039]	137 [5.394]	162 [6.378]	250 [9.843]±2 [0.079]
11	138.5 [5.453]	147.5 [5.807]	172.5 [6.791]	250 [9.843]±2 [0.079]
12	149 [5.866]	158 [6.220]	183 [7.205]	275 [10.827]±2 [0.079]
13	159.5 [6.280]	168.5 [6.634]	193.5 [7.618]	275 [10.827]±2 [0.079]
14	170 [6.693]	179 [7.047]	204 [8.031]	300 [11.811]±2 [0.079]
15	180.5 [7.106]	189.5 [7.461]	214.5 [8.445]	300 [11.811]±2 [0.079]
16	191 [7.520]	200 [7.874]	225 [8.858]	325 [12.795]±2 [0.079]

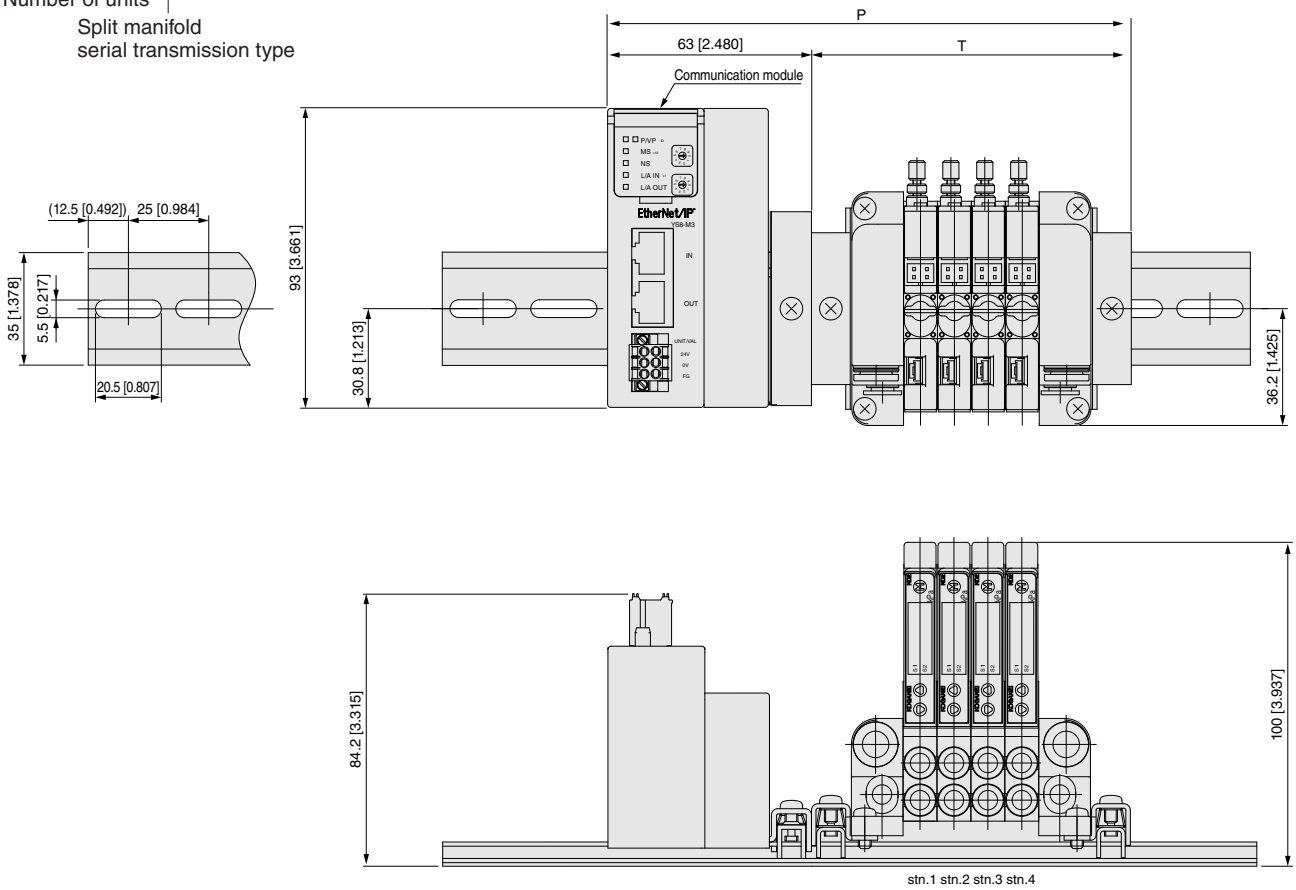
● LSMVM □ S - □ -DR

With DIN mounting bracket and DIN rail

Communication module specifications

Number of units

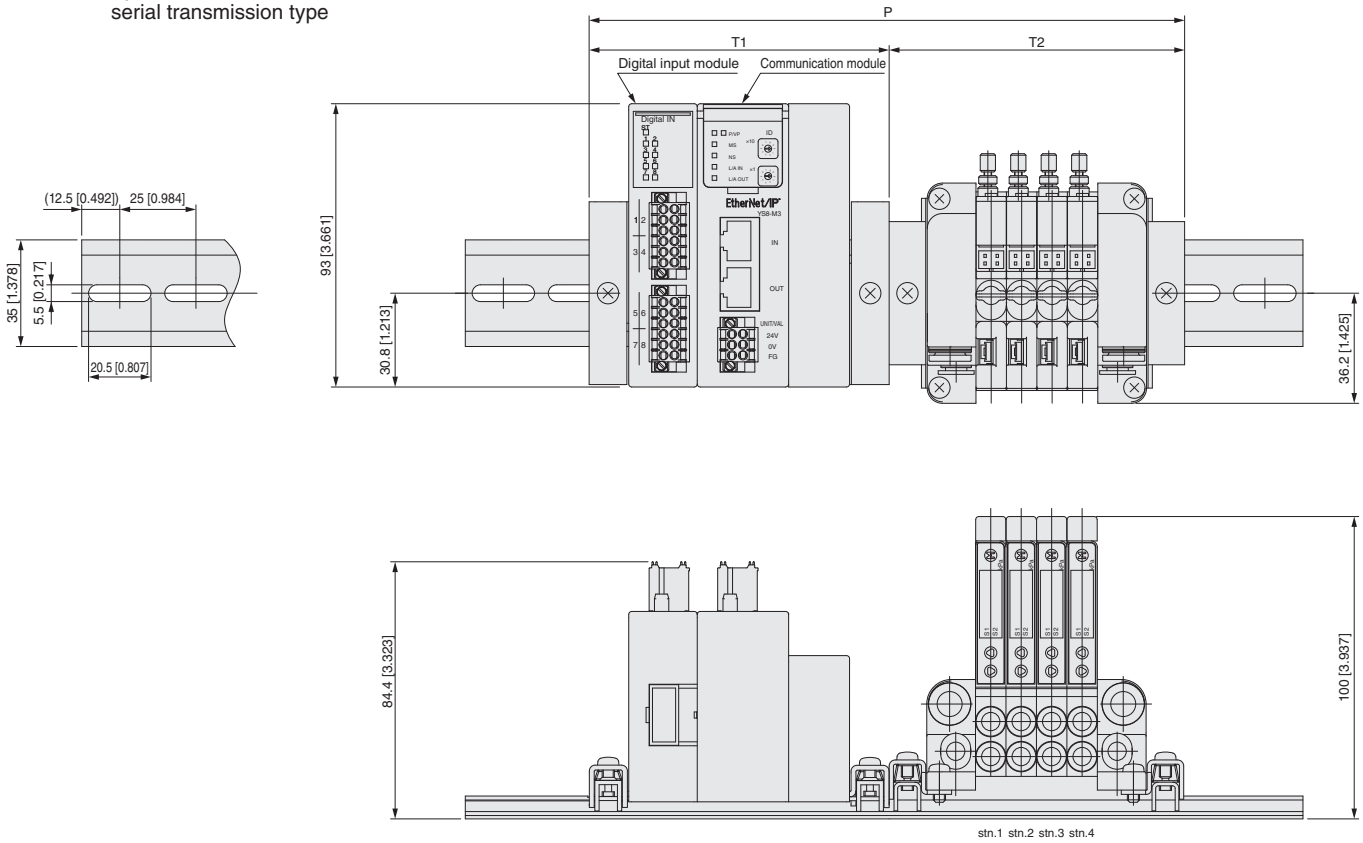
Split manifold serial transmission type



Number of manifold units	T	P	Total length of DIN rail
1	67.5 [2.657]	130.5 [5.138]	225 [8.858]±2 [0.079]
2	78 [3.071]	141 [5.551]	250 [9.843]±2 [0.079]
3	88.5 [3.484]	151.5 [5.965]	250 [9.843]±2 [0.079]
4	99 [3.898]	162 [6.378]	250 [9.843]±2 [0.079]
5	109.5 [4.311]	172.5 [6.791]	275 [10.827]±2 [0.079]
6	120 [4.724]	183 [7.205]	275 [10.827]±2 [0.079]
7	130.5 [5.138]	193.5 [7.618]	300 [11.811]±2 [0.079]
8	141 [5.551]	204 [8.031]	300 [11.811]±2 [0.079]
9	151.5 [5.965]	214.5 [8.445]	300 [11.811]±2 [0.079]
10	162 [6.378]	225 [8.858]	325 [12.795]±2 [0.079]
11	172.5 [6.791]	235.5 [9.272]	325 [12.795]±2 [0.079]
12	183 [7.205]	246 [9.685]	325 [12.795]±2 [0.079]
13	193.5 [7.618]	256.5 [10.098]	350 [13.780]±2 [0.079]
14	204 [8.031]	267 [10.512]	350 [13.780]±2 [0.079]
15	214.5 [8.445]	277.5 [10.925]	375 [14.764]±2 [0.079]
16	225 [8.858]	288 [11.339]	375 [14.764]±2 [0.079]

● LSMVM □ S - □ - □ -DR

With DIN mounting bracket and DIN rail
I/O module specifications
Communication module specifications
Number of units
Split manifold serial transmission type



Dimension table for N2 and P2

Number of manifold units	Number of digital input modules	T1	T2	P	Total length of DIN rail
1	1	98.5 [3.878]	67.5 [2.657]	166 [6.535]	250 [9.843]± 2 [0.079]
2			78 [3.071]	176.5 [6.949]	275 [10.827]± 2 [0.079]
3			88.5 [3.484]	187 [7.362]	275 [10.827]± 2 [0.079]
4			99 [3.898]	197.5 [7.776]	300 [11.811]± 2 [0.079]
5	2	121 [4.764]	109.5 [4.311]	230.5 [9.075]	325 [12.795]± 2 [0.079]
6			120 [4.724]	241 [9.488]	325 [12.795]± 2 [0.079]
7			130.5 [5.138]	251.5 [9.902]	350 [13.780]± 2 [0.079]
8			141 [5.551]	262 [10.315]	350 [13.780]± 2 [0.079]
9	3	143.5 [5.650]	151.5 [5.965]	295 [11.614]	375 [14.764]± 2 [0.079]
10			162 [6.378]	305.5 [12.028]	400 [15.748]± 2 [0.079]
11			172.5 [6.791]	316 [12.441]	400 [15.748]± 2 [0.079]
12			183 [7.205]	326.5 [12.854]	425 [16.732]± 2 [0.079]
13	4	166 [6.535]	193.5 [7.618]	359.5 [14.154]	450 [17.717]± 2 [0.079]
14			204 [8.031]	370 [14.567]	450 [17.717]± 2 [0.079]
15			214.5 [8.445]	380.5 [14.980]	475 [18.701]± 2 [0.079]
16			225 [8.858]	391 [15.394]	475 [18.701]± 2 [0.079]

* The number of communication modules is fixed at 1.

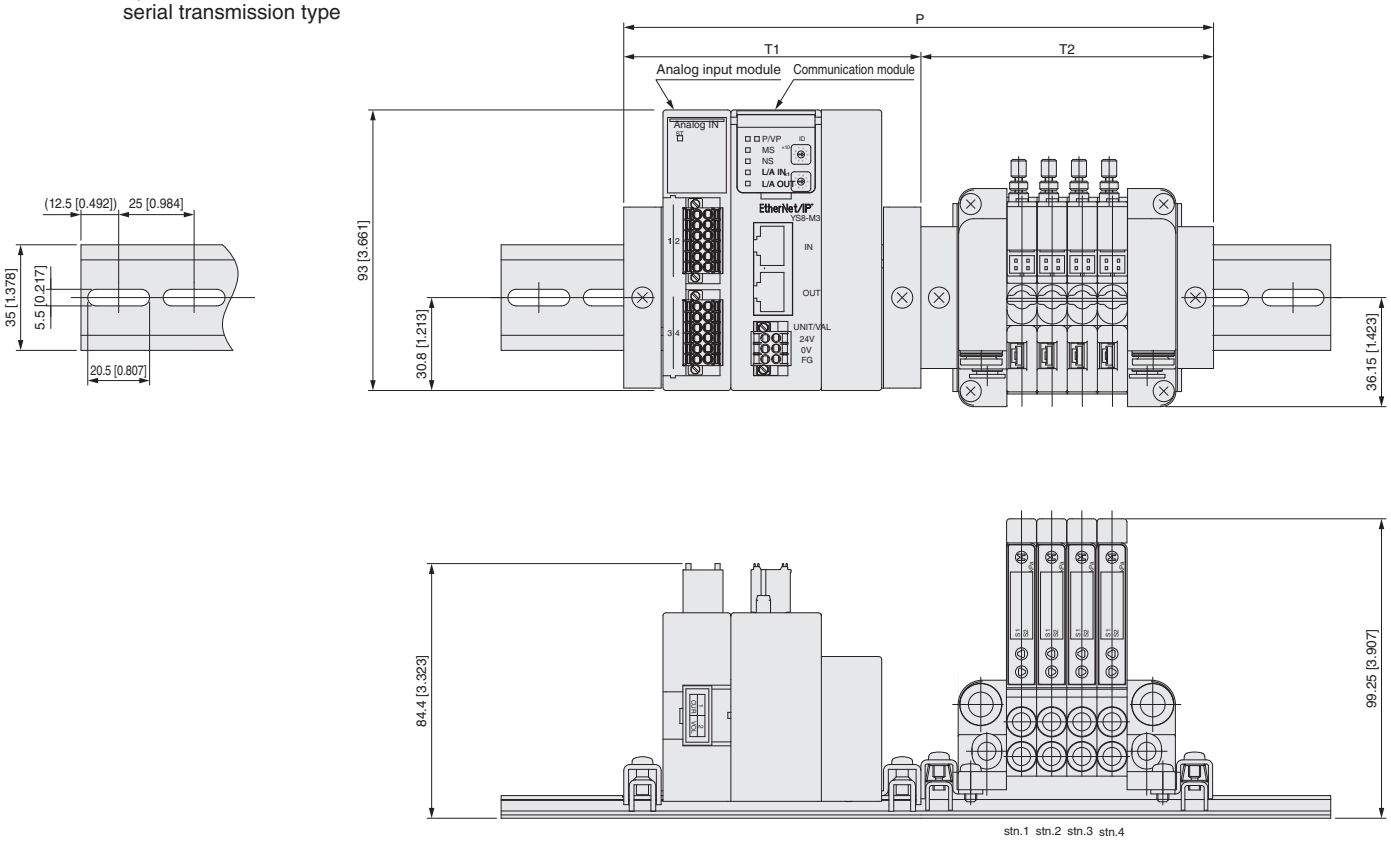
Dimension table for N1 and P1

Number of manifold units	Number of digital input modules	T1	T2	P	Total length of DIN rail
1	1	98.5 [3.878]	67.5 [2.657]	166 [6.535]	250 [9.843]± 2 [0.079]
2			78 [3.071]	176.5 [6.949]	275 [10.827]± 2 [0.079]
3			88.5 [3.484]	187 [7.362]	275 [10.827]± 2 [0.079]
4			99 [3.898]	197.5 [7.776]	300 [11.811]± 2 [0.079]
5			109.5 [4.311]	208 [8.189]	300 [11.811]± 2 [0.079]
6			120 [4.724]	218.5 [8.602]	300 [11.811]± 2 [0.079]
7			130.5 [5.138]	229 [9.016]	325 [12.795]± 2 [0.079]
8			141 [5.551]	239.5 [9.429]	325 [12.795]± 2 [0.079]
9	2	121 [4.764]	151.5 [5.965]	272 [10.709]	350 [13.780]± 2 [0.079]
10			162 [6.378]	283 [11.142]	375 [14.764]± 2 [0.079]
11			172.5 [6.791]	293.5 [11.555]	375 [14.764]± 2 [0.079]
12			183 [7.205]	304 [11.969]	400 [15.748]± 2 [0.079]
13			193.5 [7.618]	314.5 [12.382]	400 [15.748]± 2 [0.079]
14			204 [8.031]	325 [12.795]	425 [16.732]± 2 [0.079]
15			214.5 [8.445]	335.5 [13.209]	425 [16.732]± 2 [0.079]
16			225 [8.858]	346 [13.622]	425 [16.732]± 2 [0.079]

* The number of communication modules is fixed at 1.

● **LSMVM □ S - □ - □ -DR**

- With DIN mounting bracket and DIN rail
- I/O module specifications
- Communication module specifications
- Number of units
- Split manifold serial transmission type



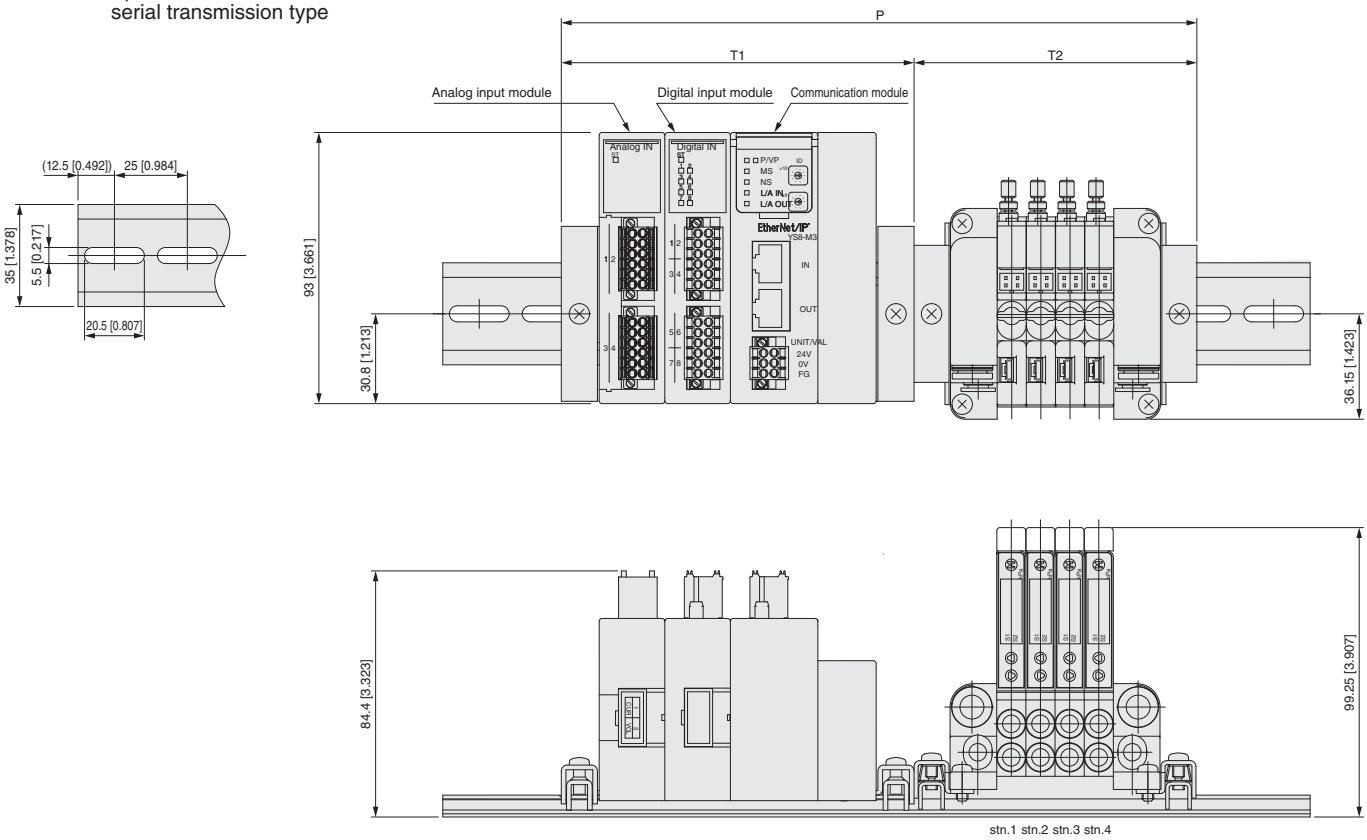
Dimension table for A1

Number of manifold units	Number of analog input modules	T1	T2	P	Total length of DIN rail
1	1	98.5 [3.878]	67.5 [2.657]	166 [6.535]	250 [9.843]±2 [0.079]
2			78 [3.071]	176.5 [6.949]	275 [10.827]±2 [0.079]
3			88.5 [3.484]	187 [7.362]	275 [10.827]±2 [0.079]
4			99 [3.898]	197.5 [7.776]	300 [11.811]±2 [0.079]
5	2	121 [4.764]	109.5 [4.311]	230.5 [9.075]	325 [12.795]±2 [0.079]
6			120 [4.724]	241 [9.488]	325 [12.795]±2 [0.079]
7			130.5 [5.138]	251.5 [9.902]	350 [13.780]±2 [0.079]
8			141 [5.551]	262 [10.315]	350 [13.780]±2 [0.079]
9	3	143.5 [5.650]	151.5 [5.965]	295 [11.614]	375 [14.764]±2 [0.079]
10			162 [6.378]	305.5 [12.028]	400 [15.748]±2 [0.079]
11			172.5 [6.791]	316 [12.441]	400 [15.748]±2 [0.079]
12			183 [7.205]	326.5 [12.854]	425 [16.732]±2 [0.079]
13	4	166 [6.535]	193.5 [7.618]	359.5 [14.154]	450 [17.717]±2 [0.079]
14			204 [8.031]	370 [14.567]	450 [17.717]±2 [0.079]
15			214.5 [8.445]	380.5 [14.980]	475 [18.701]±2 [0.079]
16			225 [8.858]	391 [15.394]	475 [18.701]±2 [0.079]

* The number of communication modules is fixed at 1.

● LSMVM □ S - □ - □ -DR

With DIN mounting bracket and DIN rail
I/O module specifications
Communication module specifications
Number of units
Split manifold serial transmission type



Dimension table for NA and PA

Number of manifold units	Number of digital input modules	Number of analog input modules	T1	T2	P	Total length of DIN rail
1	1	1	121 [4.764]	67.5 [2.657]	188.5 [7.421]	275 [10.827]±2 [0.079]
2				78 [3.071]	199 [7.835]	300 [11.811]±2 [0.079]
3				88.5 [3.484]	209.5 [8.248]	300 [11.811]±2 [0.079]
4				99 [3.898]	220 [8.661]	325 [12.795]±2 [0.079]
5		2	143.5 [5.650]	109.5 [4.311]	253 [9.961]	350 [13.780]±2 [0.079]
6				120 [4.724]	263.5 [10.374]	350 [13.780]±2 [0.079]
7				130.5 [5.138]	274 [10.787]	375 [14.764]±2 [0.079]
8				141 [5.551]	284.5 [11.201]	375 [14.764]±2 [0.079]
9	2	3	188.5 [7.421]	151.5 [5.965]	340 [13.386]	425 [16.732]±2 [0.079]
10				162 [6.378]	350.5 [13.799]	450 [17.717]±2 [0.079]
11				172.5 [6.791]	361 [14.213]	450 [17.717]±2 [0.079]
12				183 [7.205]	371.5 [14.626]	450 [17.717]±2 [0.079]
13		4	211 [8.307]	193.5 [7.618]	404.5 [15.925]	500 [19.685]±2 [0.079]
14				204 [8.031]	415 [16.339]	500 [19.685]±2 [0.079]
15				214.5 [8.445]	425.5 [16.752]	525 [20.669]±2 [0.079]
16				225 [8.858]	436 [17.165]	525 [20.669]±2 [0.079]

* The number of communication modules is fixed at 1.

Before selecting and using an appropriate product, please read all the safety precautions carefully to ensure proper product use.
The safety precautions described below are intended to help you use the product safely and correctly and to prevent injury to you or other people and damage to property.
Always adhere to ISO 4414 (Pneumatic fluid power - General rules and safety requirements for systems and their components), JIS B 8370 (Pneumatic fluid power - General rules and safety requirements for systems and their components), and other safety regulations.

"DANGER", "WARNING", "CAUTION", and "ATTENTION"

⚠ DANGER	Indicates situations that can be clearly predicted as dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
⚠ WARNING	Indicates situations that, while not immediately dangerous, could become dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
⚠ CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. Minor or semi-serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
⚠ ATTENTION	Indicates no risk of injury, but gives points that should be observed for proper use of the product.

■This product was designed and manufactured as a part for use in general industrial machinery.

- Before selecting or handling equipment, a system designer or other person with sufficient knowledge and experience should first read the "Safety Precautions", "Catalog", "Owner's Manual" and other documentation.Handling errors create dangerous situations.
- After reading the "Owner's Manual", catalog, and other documentation, store them in a location where they are easily available for reference by users of this product.
- Whenever transferring or lending the product to another person, always attach the instruction manual, and other information to the product where they are easily visible in order to ensure that the new user can use the product safely and properly.
- The danger, warning and caution items listed in these safety precautions do not cover all possible contingencies. Read the catalog and instruction manual carefully, and always keep safety first.

⚠ DANGER

- The product is not designed or manufactured for the following applications.
  If you are considering such applications, be sure to consult us.
  1. Medical devices related to the maintenance or management of human life and health
  2. Machines or equipment designed for the purpose of moving or transporting people
  3. Critical safety components in mechanical devices
  4. Applications requiring particularly high levels of safety (Nuclear energy, space equipment, railway, aviation, marine vessels, vehicles, military equipment, medical devices, food and beverage production equipment, combustion equipment, amusement equipment, functional safety equipment, etc.)
- Do not use the product in locations with dangerous substances such as flammable or ignitable substances. This product is not explosion-proof. There is a risk of ignition and fire.
- When mounting the product, always make sure it is firmly supported and secured (including the workpiece). If the product tips over, drops, or malfunctions, there is a risk of personal injury.
- Users of pacemakers or other similar medical devices should maintain a distance of at least 1 m [3.280 ft] from the product. Some products contain strong magnets internally, and the magnetic field may cause malfunction of pacemakers.
- Never modify the product. Doing so can cause malfunctions and create the risk of personal injury, electric shock, fire, etc.
- Never inappropriately disassemble/assemble or repair the basic structure, performance, or functions of the product. Doing so may cause injury, electric shock, fire, etc.
- Do not splash water on the product. Splashing water on the product, washing the product, or using the product under water may cause abnormal operation leading to injury, electric shock, fire, etc.
- While the product is operating, avoid touching it with your hands or otherwise approaching too close except for the specified operations. Also while the product is operating, do not attempt to adjust internal or attached mechanisms (such as attaching/detaching connectors for wires, adjusting pressure switches, disconnecting tubes or sealed plugs, or adjusting the installation position of the product).
  If the product drops or malfunctions, there is a risk of personal injury.

⚠ WARNING

- Koganei products can be used under a variety of conditions. Therefore, the person responsible for system design must fully evaluate the products to determine compatibility with the system.
  The designer who determines the suitability of the system is responsible for guarantying the desired performance and safety of the system. Study and evaluate the latest catalogs, technical documents, and specifications sufficiently to configure a system that assures safety and reliability, such as by using fail-safes that anticipate possible device malfunctions.
- Do not use the product in excess of its specification range. Using the product outside of its specified range could result in product breakdowns, stop of functions, or damage. It could also drastically reduce the operating life.
- Before supplying air or electricity to the product and before starting operation, always conduct a safety check of the area where the equipment is operating. Unintentional supply of air or electricity creates the risk of injury due to contact with moving parts.
- Do not touch terminals, various switches, and other components with the power on. Doing so creates the risk of electric shock and abnormal operation.
- Do not allow the product to be thrown into fire. Doing so creates the risk of the product exploding or the release of toxic gases.
- Do not sit, stand, or place objects on the product. Doing so creates the risk of injury due to tripping or the product tipping over or falling, resulting in product damage and abnormal, erratic, or runaway operation.
- When performing maintenance, inspection, servicing, or replacement work related to the product, be sure to completely shut off the air or vacuum pressure supply and confirm that the pressure inside the product and the connected piping has returned to atmospheric pressure before proceeding. In particular, note that pressure may remain in compressors, vacuum pumps, or air tanks.
  If pressure remains in the piping, actuators may move unexpectedly, which could result in injury.
- Design equipment, as well as safety circuits, so that people are not injured and equipment is not damaged if there is an emergency stop, power outage, or other system abnormality that stops the machinery.

- Be sure to release the lock of the locking-type manual override on products equipped with a solenoid valve before starting normal operation. Failure to do so may cause malfunction.
- Before performing any kind of wiring work, be sure to turn off the electric power. Failure to do so creates the risk of electric shock.
- Correctly apply the rated voltage to the product. Applying the wrong voltage will make it impossible to obtain the rated function, and create the risk of damage to and burnout of the product.
- Do not allow lead wires and other cords to become damaged. Allowing a cord to become damaged, bent excessively, pulled, rolled up, placed under heavy objects, or squeezed between two objects creates the risk of current leaks or defective continuity that can lead to fire, electric shock, or abnormal operation.
- Do not connect or disconnect connectors while the power is turned on. Also, never apply unnecessary force to connectors. Doing so creates the risk of personal injury, device damage, and electric shock due to abnormal machine operation.
- Always check the catalog and other reference materials for correct product wiring and piping. Improper wiring or piping creates the risk of the abnormal operation of the actuator and other components.
- After completing wiring work, check to make sure that all connections are correct before turning on the power.
- After completing piping, check if there are no errors in the circuit before supplying air.
- When installing the product inside a control panel or attaching a cover to the product, provide adequate heat dissipation measures, so that the ambient temperature remains within the specified range even during continuous operation or continuous energization. If continuous energization is required for an extended period, contact us.
- Products equipped with solenoid valves (solenoids), sensors (reed switches), etc., may generate surge voltage and electromagnetic noise when the power is turned OFF, which may affect the operation of peripheral devices. Select anti-surge product or implement appropriate surge suppression and electromagnetic noise countermeasures in the electrical circuit.
- Do not use media other than the ones listed in the specification table. Using a medium not listed in the specification table could lead to a short-term stoppage of functions, sudden degradation in performance, or reduced operating life.
- When the product has been idle for over 48 hours or has been in storage, the sliding parts may have become stuck, leading to operating delays or sudden movements at initial operation. Before initial operation, always run a test to check that operations are normal.
- Do not use the product in locations subject to direct sunlight (ultraviolet radiation); in locations subjected to high temperature or humidity; in locations where dust, salt, or iron particles are present; or in locations with media and/or an ambient atmosphere that includes organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, fluorocarbon gas, ozone, acids, alkalis or other corrosive substances. Doing so could lead to stoppage of functions within a short period, a sudden degradation in performance, or reduced operating life. For information about materials, see materials of major parts.
- If the product is not used for long periods (over 30 days), it is possible that the sliding parts may have become stuck leading to slow operation or sudden movements, possibly resulting in injury. Check for proper operation a minimum of once every 30 days.
- Do not use products or the wiring for controlling them near power lines through which large electric currents flow or that are subject to strong magnetic fields or surges.Doing so could result in unintended operation.
- Do not use the product near the ocean, in direct sunlight, near mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions, or stop functions. (except for ozone-resistant products)
- Do not use the product in locations where it is exposed to radiant heat from nearby heat sources.

⚠ CAUTION

- When mounting the product, leave room for adequate working space around it. Failure to do so will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- When transporting or installing heavy products, ensure personal safety by securely supporting them with a lift or support fixture, or by having multiple personnel perform the work.
- Do not scratch, dent, or deform the product main body by climbing on it, using it as a step, or placing objects on top of it. Doing so could result in operations stopping or performance falling due to the product being damaged or broken.
- When doing installation or adjustment work, clearly display work-in-progress sign so that the air or electric power supply is not turn on unintentionally. Unintentional supply of air or electricity creates the risk of injury due to sudden operation or electric shock.
- Do not subject the product to excessive impact such as striking, dropping, or bumping during handling. Even if there is no visible external damage, internal components may be damaged and cause malfunction.
- Do not short-circuit the load of the pressure switch.
  If the comparison output is turned ON while the load is short-circuited, the pressure switch may be damaged due to overcurrent.
  Example of load short circuit: Directly connecting the comparison output lead wire to the power supply.
- Do not bring any magnetic media or magnetic data within 1 m [3.280 ft] of the product. The magnetic field generated by the motor or coil built into the product may destroy data stored on magnetic media.
- If leakage current occurs in the control circuit, the product may operate unintentionally. Implement countermeasures against leakage current in the control circuit so that it does not exceed the allowable leakage current specified for the product.
- Use the specified lubricant for lubricating sliding parts. Using other lubricants may cause deterioration, reduced functionality, or changes in the properties of the material used.
- Do not block the breather hole of the product. Pressure fluctuations occur due to volume changes during operation. Blocking the breather hole may disturb the pressure balance, resulting in unintended operation, equipment damage, or injury.
- Do not apply positive pressure to the vacuum (supply or generation) port of vacuum equipment. Applying positive pressure may damage vacuum equipment (vacuum gauge, ejector, vacuum regulator, vacuum pump, etc.).
- When using dry air with a dew point exceeding 20°C [-4°F], the properties of the lubricating oil may change. This may cause reduced performance or functional failure.

⚠ ATTENTION

- When considering using the product for applications that demand extreme safety, such as aviation facilities, combustion equipment, leisure equipment, safety devices, or in other ways predicted to greatly affect assets or human lives, or in situations or environments not described in the “Catalog” or “Owner’s Manual”, etc., take sufficient safety precautions, such as by allowing ample rating and performance margins for the application and by implementing adequate safety measures, such as fail-safes.Also, be sure to consult us about such applications.

- Isolate the operating components of machinery, such as with protective covers, so there is no direct contact with people.
- When considering using the product for applications that demand extreme safety, such as aviation facilities, combustion equipment, leisure equipment, safety devices, or in other ways predicted to greatly affect assets or human lives, or in situations or environments not described in the “Catalog” or “Owner’s Manual”, etc., take sufficient safety precautions, such as by allowing ample rating and performance margins for the application and by implementing adequate safety measures, such as fail-safes.Also, be sure to consult us about such applications.
- Isolate the operating components of machinery, such as with protective covers, so there is no direct contact with people.
- Do not configure controls so that workpieces fall if there is a power outage.
  Configure measures to prevent workpieces from falling in case the equipment has a power outage or emergency stop.
- Install a silencer (muffler, etc.) on the exhaust port.
  This will help reduce exhaust noise.
- After adjusting the pressure, lock the pressure adjustment handle.
- Wear protective gloves, safety glasses, protective mask, safety shoes, and other protective clothing as necessary to be safe when handling the product.
- When the product can no longer be used or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and functions over its operating life. Always conduct daily inspections on pneumatic equipment and confirm that all requisite system functions are satisfied to prevent accidents from happening.
- This product is not completely air-leak-free. For applications such as maintaining pressure (including vacuum) inside a pressure vessel, designs should take into consideration the required volume and holding time.
- For inquiries about the product, consult your nearest Koganei sales office or the Overseas Department. The addresses and telephone numbers are shown on the back cover of this catalog.

⚠ Other precautions

- Always observe the following items.
  1. When using this product in a pneumatic system, use only genuine Koganei parts or compatible parts (recommended parts).
  Use only genuine Koganei parts or compatible parts (recommended parts) to do maintenance or repairs.
  Use only specified procedures and methods.
  2. Never inappropriately disassemble or assemble the product in relation to its basic construction, performance, or functions.

Koganei bears no responsibility if these safety precautions are not fully observed.

Warranty and disclaimer

1. Warranty period
   The warranty period of Koganei products is one year from the date of delivery.
   * Some products have a two-year warranty period. For details, contact the nearest Koganei sales office or Overseas Department.
2. Warranty scope and disclaimer

(1) If a failure attributable to Koganei is found in a product purchased from Koganei or an authorized retailer/dealer during the warranty period, Koganei will repair or replace it free of charge. For some products, a service life, such as the number of operations, may be specified in their warranty periods. For details, contact the nearest Koganei sales office or the Overseas Department.

(2) The Koganei product warranty covers that product alone. Consequently, Koganei is not responsible for any incidental damage (including costs incurred for the repair and replacement of the product) attributable to any failure of the Koganei product, decrease in function, or decrease in performance.

(3) Koganei is not responsible for any losses or for any damages to other machinery caused by breakdown, loss of function, or loss of performance of Koganei products.

(4) Koganei is not responsible for any losses due to use or storage of the product in a way that is outside of the product specifications prescribed in Koganei catalogs and instruction manuals, and/or due to actions that violate the mounting, installation, adjustment, maintenance or other safety precautions.

(5) Koganei is not responsible for any losses caused by breakdown of the product due to factors outside the responsibility of Koganei, including but not limited to fire, natural disaster, the actions of third parties, and intentional actions or errors by the purchaser.

Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.
- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.
- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.
- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.
- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

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