

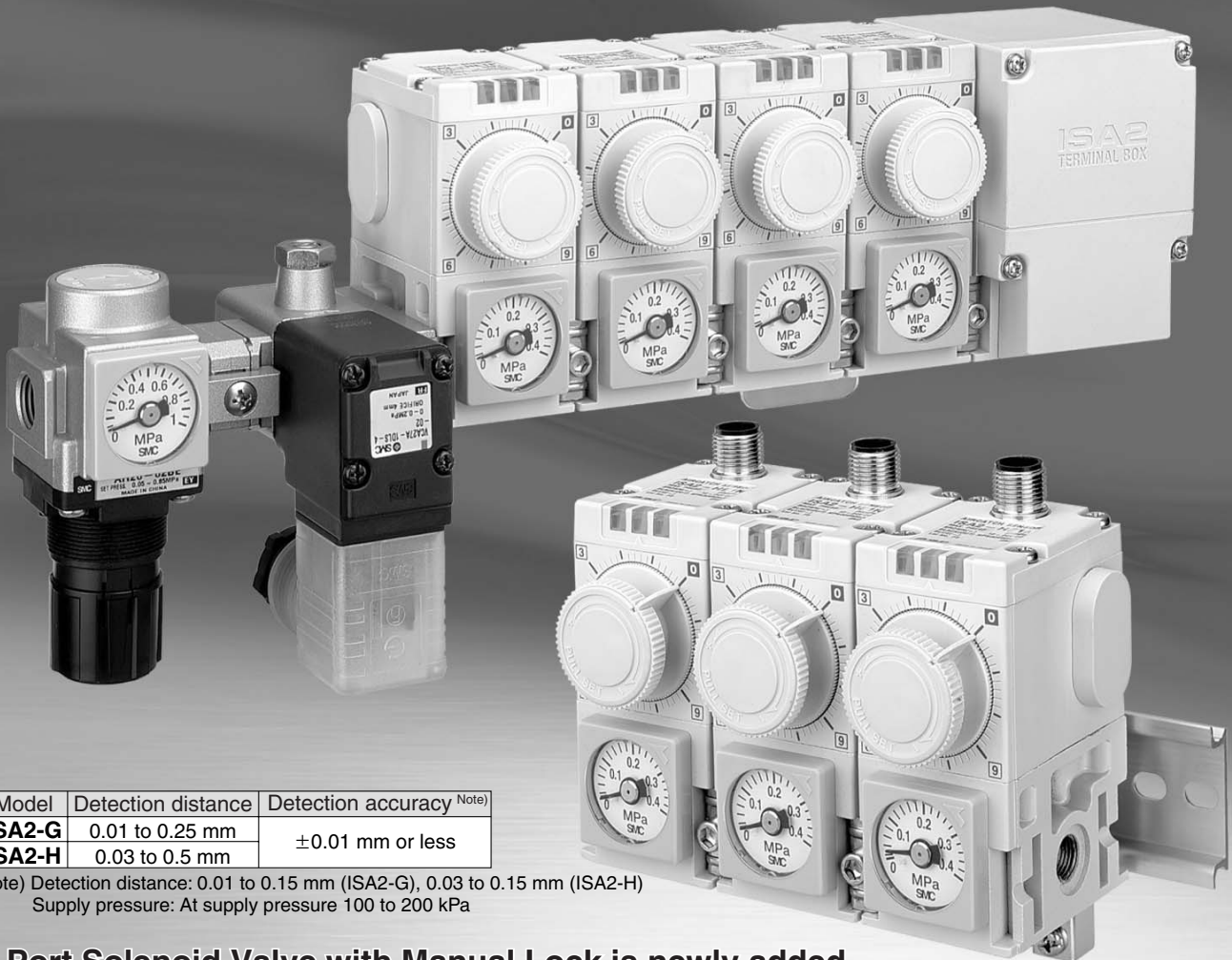
Air Catch Sensor Series ISA2

Detection distance

0.01 to 0.5 mm

Repetition accuracy

0.01 mm or less

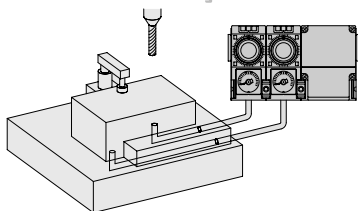


Model	Detection distance	Detection accuracy ^{Note)}
ISA2-G	0.01 to 0.25 mm	±0.01 mm or less
ISA2-H	0.03 to 0.5 mm	

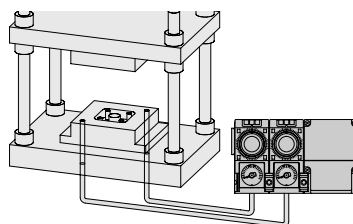
Note) Detection distance: 0.01 to 0.15 mm (ISA2-G), 0.03 to 0.15 mm (ISA2-H)
Supply pressure: At supply pressure 100 to 200 kPa

2 Port Solenoid Valve with Manual Lock is newly added.

To check the workpiece position
on the reference plane



Position check of metal mold



ZSE
ISE

PSE

ZSE3

PS

ZSE1

ZSP

ISA2

IS

ZSM

PF2

IF

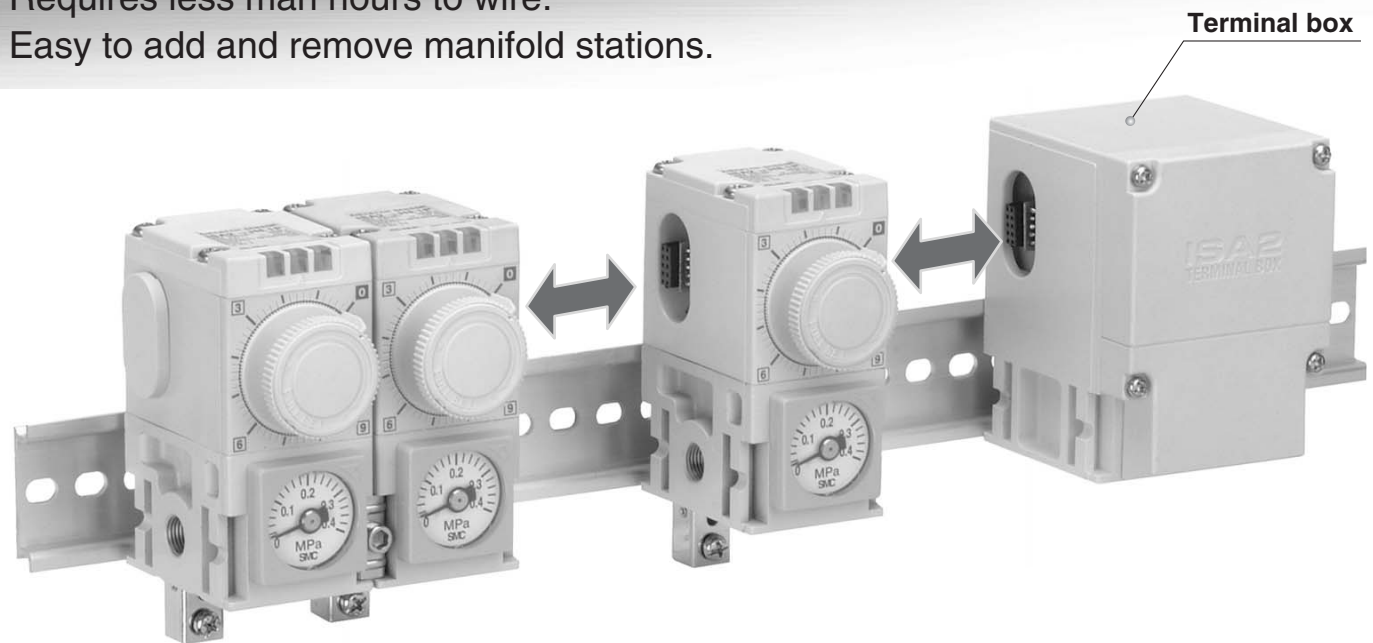
Data

Stable detection of 0.01 to 0.5 mm clearance

Due to the pneumatic bridge circuit and semiconductor pressure sensor, the non-contact type sensor is hardly affected by fluctuations in the supply pressure.

Plug connectors (Centralized wiring)

Requires less man hours to wire.
Easy to add and remove manifold stations.



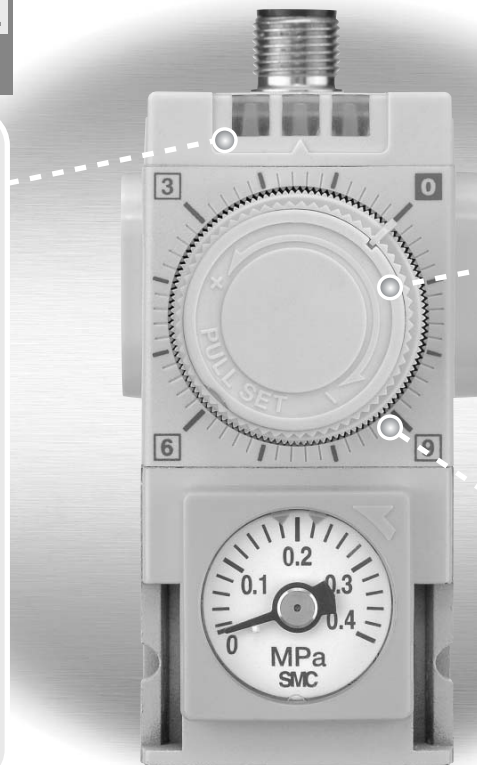
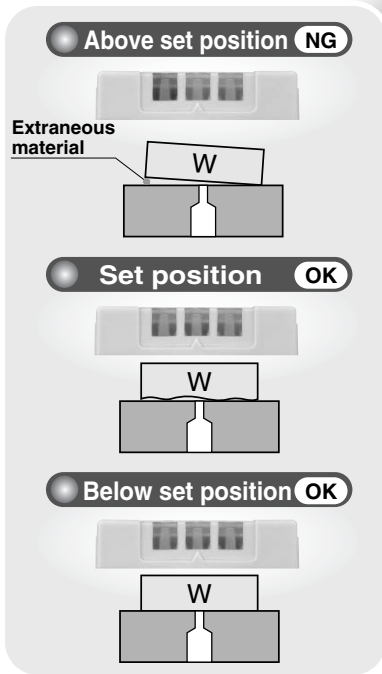
Modular construction

Requires less man hours to wire.



Air catch sensor *Series ISA2*

Optimum position is known at a glance.
LED level meter



Easy-to-operate large dial

Scale provides guidelines for set position.

ZSE□
ISE□

PSE

ZSE3

PS

ZSE1

ZSP

ISA2

IS□

ZSM

PF2□

IF□

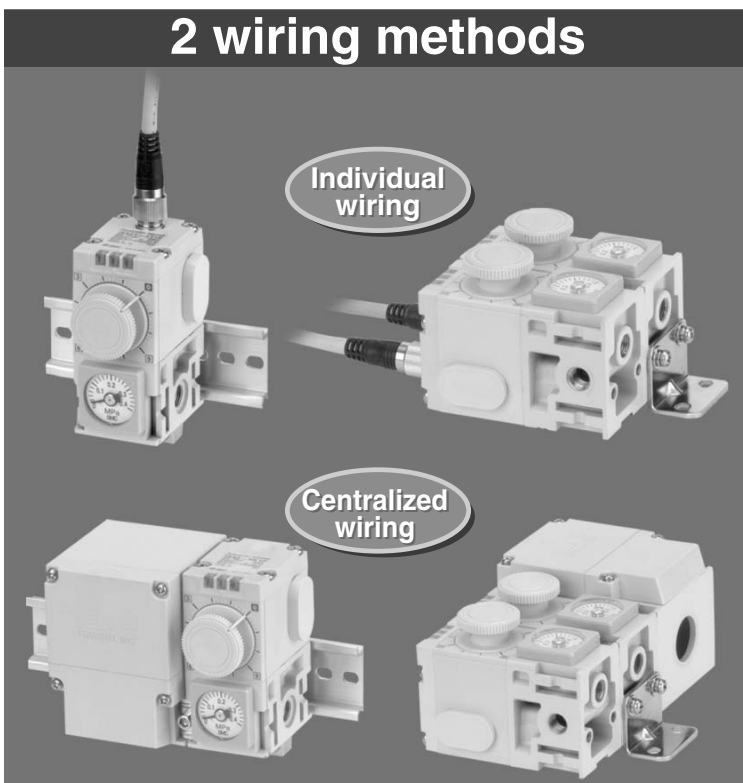
Data

Minimum operating pressure 30 kPa (ISA2-G)

Energy consumption can be reduced compared with the conventional models (Conventional models: 50 kPa)

Position of supply port: Either right side or left side is available.

2 wiring methods



Variations

Model	ISA2-G	ISA2-H
Operating pressure range	30 to 200 kPa	50 to 200 kPa
Detection distance	0.01 to 0.25 mm	0.03 to 0.5 mm
Output type	NPN open connector, PNP open collector	
Electrical entry	Lead wire with connector (Individual wiring) Terminal box (Centralized wiring)	
Mounting	DIN rail, Bracket	
Number of manifold stations	1 to 6 stations	
Port size	Rc, NPT, G 1/8	
Enclosure	IP66 (IP65 for solenoid valve. Regulator and pressure gauge are open type.)	

How to Order

For single and double notation type and additional stations

Air catch sensor

ISA2 - G [] E2 1 []

Detection distance

G	0.01 to 0.25 mm
H	0.03 to 0.5 mm

Piping specifications

Nil	Rc 1/8
N	NPT 1/8
F*	G 1/8

* Made to order

Pressure gauge Note 1)

A*	Without pressure gauge <small>Note 2)</small>		
E2	MPa single notation	0.2	Square embedded pressure gauge
Z2*	PSI single notation	MPa	
E4	MPa single notation	0.4	Round pressure gauge
Z4*	PSI single notation	MPa	
G2	MPa single notation	0.2	Round pressure gauge
P2*	MPa-PSI double notation	MPa	
G4	MPa single notation	0.4	
P4*	MPa-PSI double notation	MPa	

Note 1) Due to new Japanese weight and measurement legislation, PSI notation type cannot be sold or used in Japan.

Note 2) The pressure gauge port is Rc 1/8.

* Manufactured upon receipt of order.

Output specifications

1	NPN output
5	PNP output

Electrical entry

Individual wiring	Nil	Straight	
	L*	Right angle	
	N	Without lead wire	
Centralized wiring	P	Terminal block box	

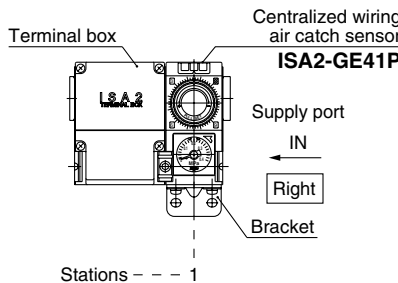
* Manufactured upon receipt of order.

- ZSE
- ISE
- PSE
- ZSE3
- PS
- ZSE1
- ZSP
- ISA2**
- IS
- ZSM
- PF2
- IF
- Data

Ordering Example

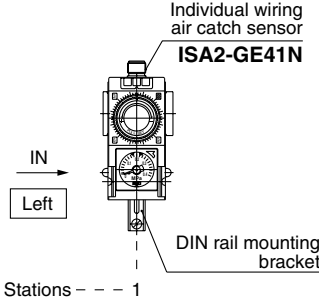
Without control unit

Centralized wiring



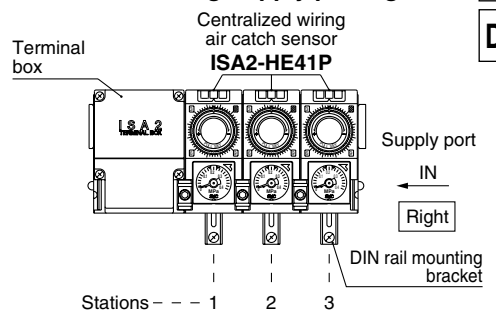
ISA2NSR-1B ... 1 set (1 station manifold part number)
***ISA2-GE41P** ... 1 set (Air catch sensor part number)
 ↳ Prefix the part number of the air catch sensor with an asterisk (*).

Individual wiring



ISA2NPL-1D ... 1 set (1 station manifold part number)
***ISA2-GE41N** ... 1 set (Air catch sensor part number)
 ↳ Prefix the part number of the air catch sensor with an asterisk (*).

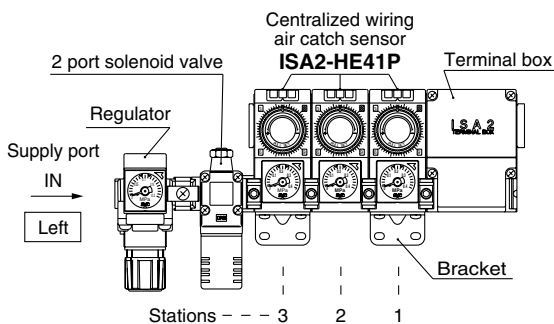
Centralized wiring/Supply port right



ISA2NSR-3D ... 1 set (3 stations manifold part number)
***ISA2-HE41P** ... 3 sets (Air catch sensor part number)
 ↳ Prefix the part number of the air catch sensor with an asterisk (*).

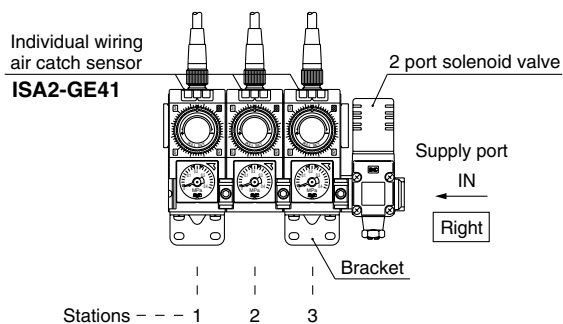
With control unit

Centralized wiring/Supply port left



IIA2CSL-3B5DLCE2 ... 1 set (3 stations manifold part number)
***ISA2-HE41P** ... 3 sets (Air catch sensor part number)
 ↳ Prefix the part number of the air catch sensor with an asterisk (*).

Individual wiring/Supply port right



IIA2VPR-3B5DLC ... 1 set (3 stations manifold part number)
***ISA2-GE41** ... 3 sets (Air catch sensor part number)
 ↳ Prefix the part number of the air catch sensor with an asterisk (*).

Series ISA2

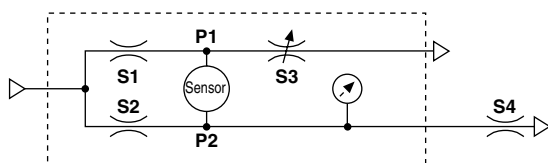
Specifications

Model		ISA2-G□□□1□	ISA2-G□□□5□	ISA2-H□□□1□	ISA2-H□□□5□	
Detection distance		0.01 to 0.25 mm		0.03 to 0.50 mm		
Fluid		Dry air (filtered to 5 μm)				
Operating pressure range		30 to 200 kPa		50 to 200 kPa		
Recommended detection nozzle		ø1.5		ø2.0		
Consumption flow rate ℓ/min (ANR)	Supply pressure	50 kPa	5 or less	10 or less		
		100 kPa	8 or less	15 or less		
		200 kPa	12 or less	22 or less		
Power supply voltage		12 to 24 VDC, Ripple (p-p) 10% or less (With power polarity protection)				
Current consumption		15 mA or less				
Switch Output		NPN	PNP	NPN	PNP	
		open collector: one output		open collector: one output		
		Maximum load current				80 mA
		Maximum load voltage				30 VDC (at NPN output)
		Residual voltage				1.5 V or less (at 80 mA)
Output protection		Yes				
Repeatability (Including temperature characteristics)		0.01 mm or less (Detection distance range 0.01 to 0.15 mm, supply pressure 100 to 200 kPa)		0.01 mm or less (Detection distance range 0.03 to 0.15 mm, supply pressure 100 to 200 kPa)		
Hysteresis ^{Note 1)}		0.01 mm or less (Detection distance range 0.01 to 0.15 mm)		0.01 mm or less (Detection distance range 0.03 to 0.15 mm)		
Indicator light		LED level meter ^{Note 2)} with 1 red, 2 green (Set value < detection distance: red, Set value = detection distance: green 1, Set value > detection distance: green 1 + green 2)				
Environmental Resistance	Enclosure		IP66			
	Operating temperature range		Operating: 0 to 60°C, Stored: -20 to 70°C (No condensation or no freezing)			
	Operating humidity range		Operating/stored: 35 to 85%RH (No condensation)			
	Withstand voltage		1000 VAC in 50/60 Hz for 1 minute between external terminal and case			
	Insulation voltage		2 MΩ or more between external terminal and case (measured with 500 VDC megaohm meter)			
	Vibration resistance		1.5 mm amplitude in 10 to 500Hz or acceleration of 98 m/s ² without control unit and bracket mounted, Others 30 m/s ² , whichever is smaller for 2 hours in X, Y, Z direction each (De-energized)			
Impact resistance		Without control unit and bracket mounted: 980 m/s ² , Others: 150 m/s ² in X, Y and Z direction, 3 times each (De-energized)				
Port size		Nil: Rc 1/8, N type: NPT 1/8, F type: G 1/8				
Lead wire (Individual wiring type)		4-core, oil resistant, cable (0.64 mm ²) with M12, 4-pin pre-wired connector				
Terminal block box (Centralized wiring type)		Front wiring (Electrical entry ø21)				
Weight		Individual wiring type (body only): 253 g, common wiring type (body only): 250 g, Terminal box: 205 g, lead wire: 278 g, connecting bracket with sealing for additional station: 4 g				

Note 1) Refer to "Relation between Nozzle Diameter and Detection Distance" (page 16-8-8) for hysteresis.

Note 2) Refer to "Setting Procedure" (page 16-8-11) for LED level meter.

Working Principle



S1, S2: Fix orifice

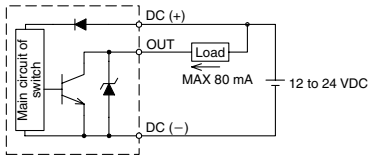
S3: Variable orifice (adjusted by setting dial)

S4: Detection nozzle

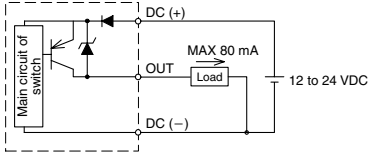
In a bridge circuit as in the left figure, a detection gap is applied to the detection nozzle (S4) while the setting dial S3 is adjusted to balance the pressure applied to the pressure sensor (P1 = P2). The pressure sensor detects the differential pressure generated when the detection nozzle (S4) is released. When the work piece comes close to the detection nozzle, the back pressure P2 increases until it is larger than P1 (P2 > P1). Then the switch output turns on to notify that the pressure is below the detection gap.

Internal Circuit and Wiring

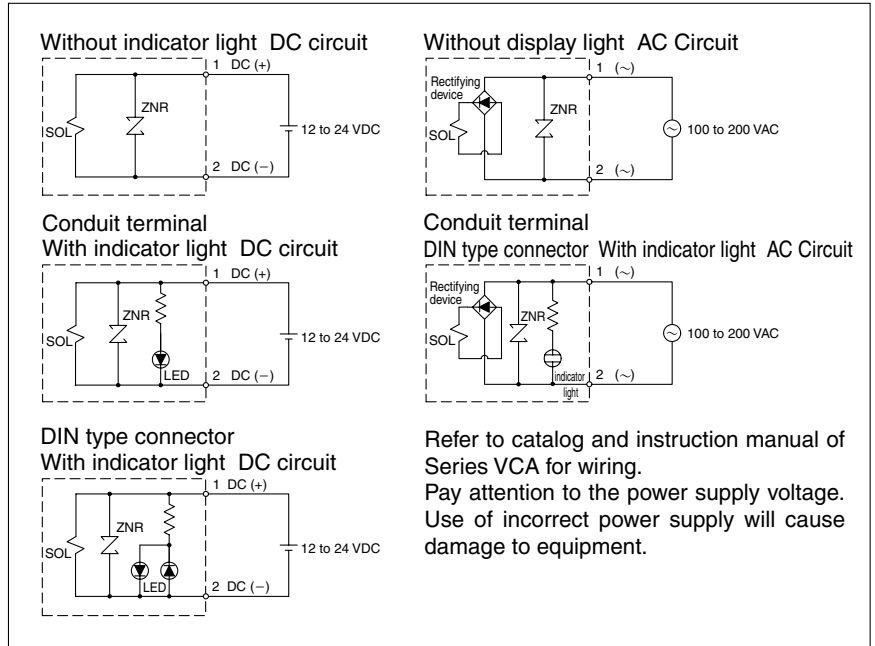
NPN open collector output



PNP open collector output

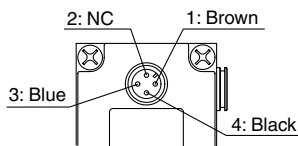


Circuit and Wiring for 2 Port Solenoid Valve



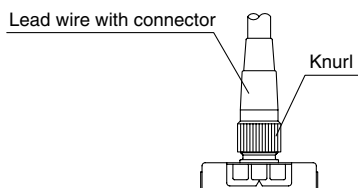
Wiring

Individual wiring



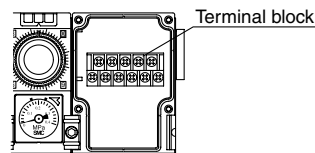
1	Brown	DC (+)
2	-	NC
3	Blue	DC (-)
4	Black	OUT

1. Insert the connector of the lead wire with its key groove at the proper position.
2. Hold the knurl with 2 fingers and rotate it clockwise until finger tight.

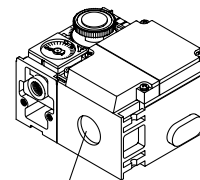


3. Connect the colored wires coming from the cable terminal. Refer to the circuit diagram and table above to avoid mistakes.

Centralized wiring



1. Mount the seal conduit on the terminal box. For mounting procedure, refer to the catalog and instruction manual provided by the manufacturer of the seal conduit.
2. Thread the cable through the seal conduit and arrange wiring according to the polarity of the terminal block illustrated above.
3. Fasten the seal conduit with a tightening torque not greater than 5 N·m. Do not hold the terminal box or the switch.



Seal conduit entry (ø21)

ZSE
ISE

PSE

ZSE3

PS

ZSE1
ISE2

ZSP

ISA2

IS

ZSM

PF2

IF

Data

Series ISA2

Relation between Nozzle Diameter and Detection Distance

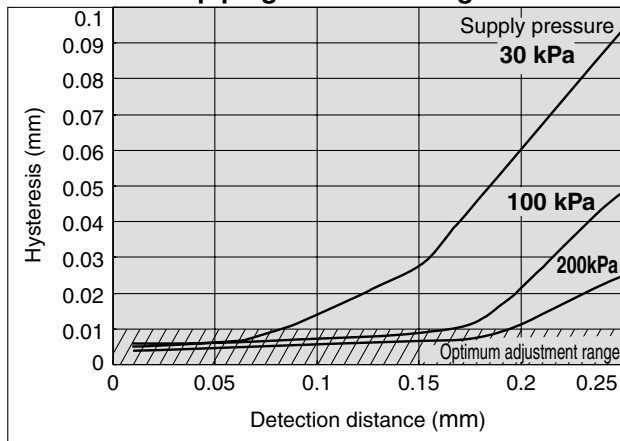
The data in the following charts are characteristics of hysteresis at the detection distance.

In case accuracy is required by the settings, the design should be made so that the hysteresis will stay within the optimum adjustment range not larger than 0.01 mm.

The smaller the hysteresis, the better the sensitivity. In cases where the hysteresis exceeds 0.01 mm, the air catch sensor should be used to check the presence of the work piece.

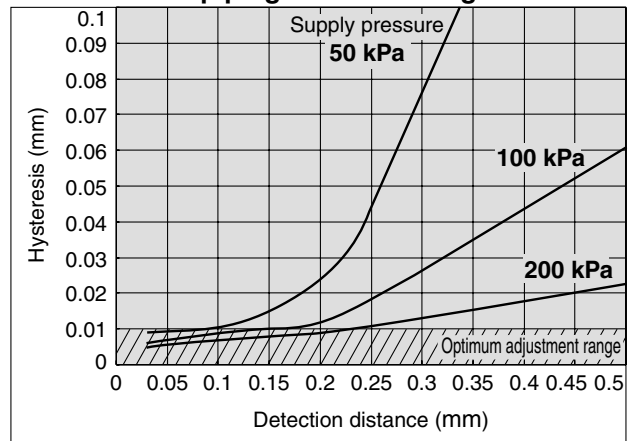
ISA2-G□□□□

Detection nozzle: $\phi 1.0$
Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m

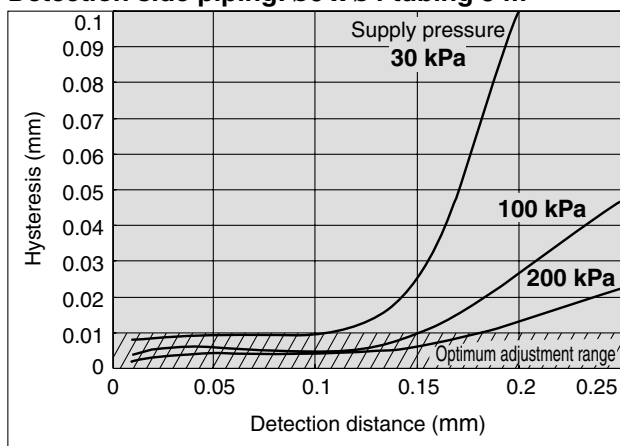


ISA2-H□□□□

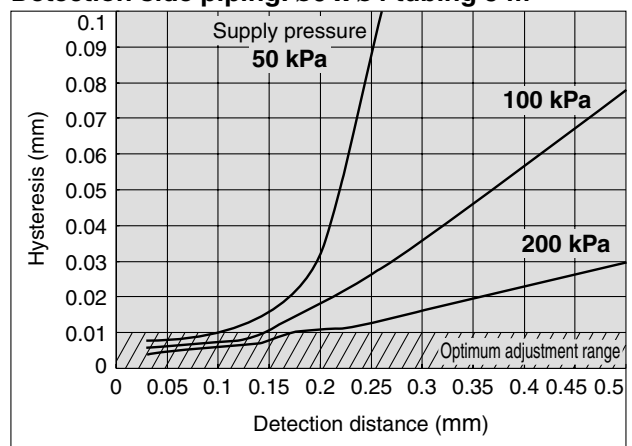
Detection nozzle: $\phi 1.0$
Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



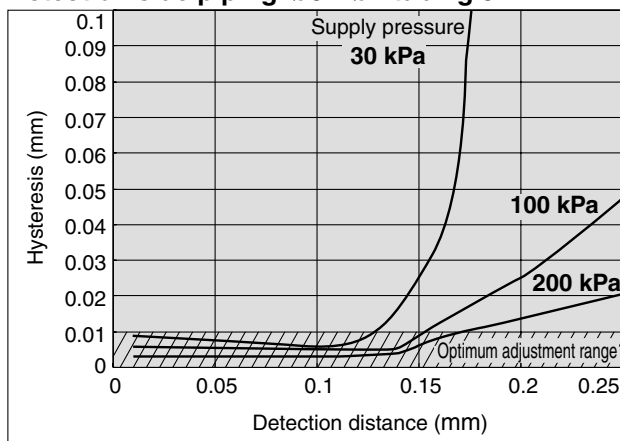
Detection nozzle: $\phi 1.5$
Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



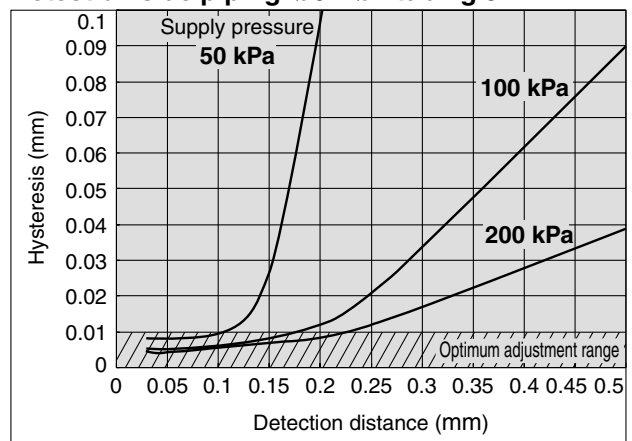
Detection nozzle: $\phi 1.5$
Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



Detection nozzle: $\phi 2.0$
Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



Detection nozzle: $\phi 2.0$
Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



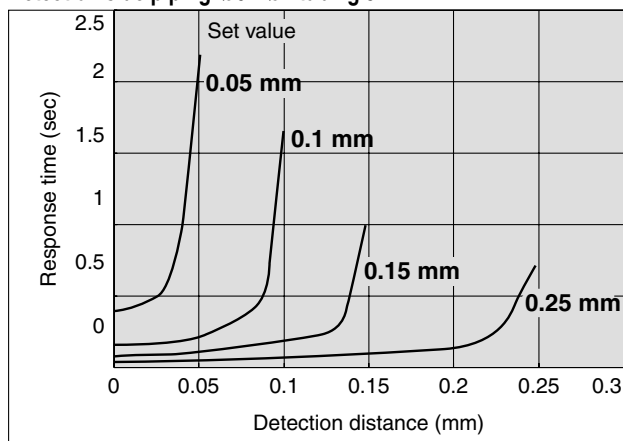
Response Time

Response time changes with detection distance and piping length. It is hardly influenced by the supply pressure and nozzle diameter ($\phi 1.0$ to $\phi 2.0$).

While all graphs assume a fixed set distance with changes in the detection distance, the upper charts show responses at various set values and the lower charts show responses at various piping lengths. If the set distance is equal to the set value, the response becomes quicker as the set value becomes smaller or the piping length becomes shorter.

ISA2-G

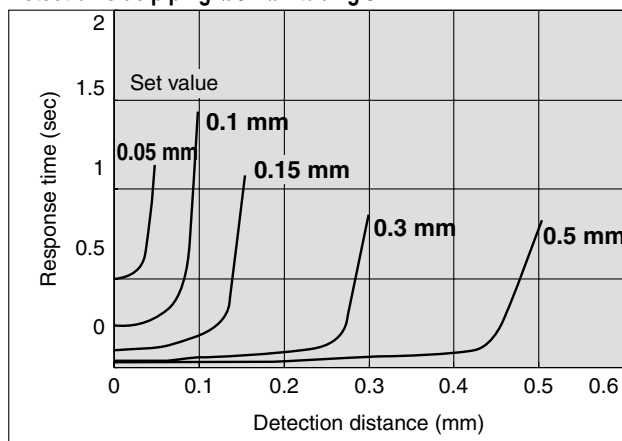
Detection nozzle: $\phi 1.5$ Supply pressure: 100 kPa
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



Detection distance–Response time characteristics

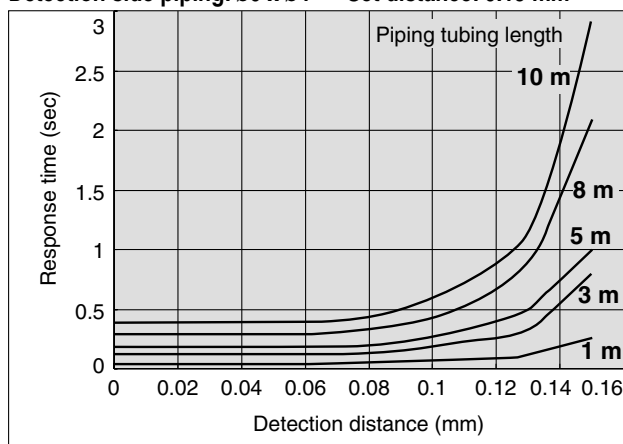
ISA2-H

Detection nozzle: $\phi 2.0$ Supply pressure: 100 kPa
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



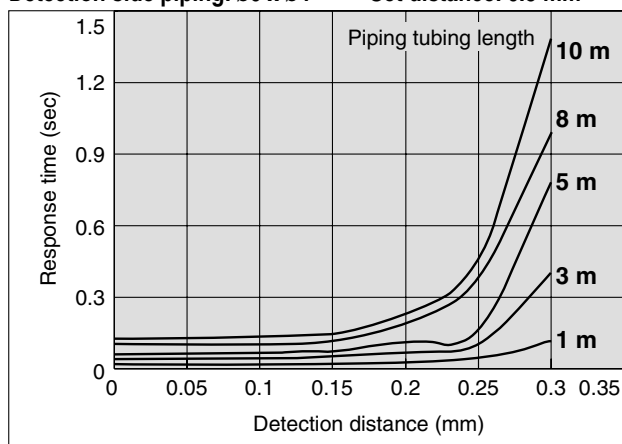
Detection distance–Response time characteristics

Detection nozzle: $\phi 1.5$ Supply pressure: 100 kPa
 Detection side piping: $\phi 6 \times \phi 4$ Set distance: 0.15 mm



Piping tubing length–Response time

Detection nozzle: $\phi 2.0$ Supply pressure: 100 kPa
 Detection side piping: $\phi 6 \times \phi 4$ Set distance: 0.3 mm



Piping tubing length–Response time

Nozzle Shape

Please keep the nozzle shape as illustrated below.
 Take every caution against chamfer on the detection surface and/or nozzle hole, which could affect the characteristics as illustrated in Figure (1).

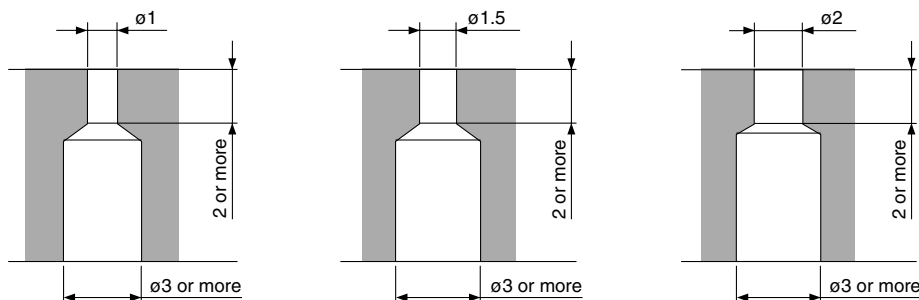
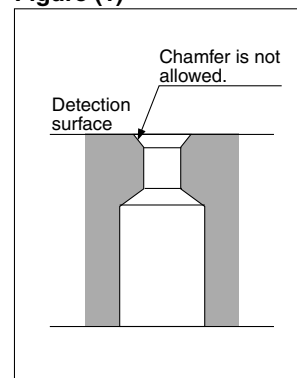


Figure (1)



- ZSE
- ISE
- PSE
- ZSE3
- PS
- ZSE1
- ZSE2
- ZSP
- ISA2
- IS
- ZSM
- PF2
- IF
- Data

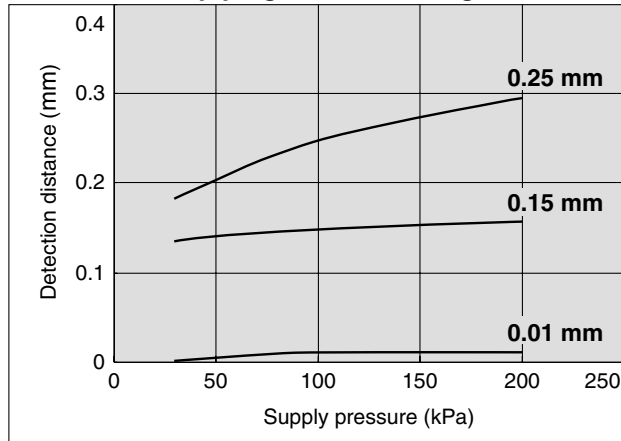
Series ISA2

Supply Pressure Dependence

The charts illustrate changes in the detection distance with fluctuations in the supply pressure.

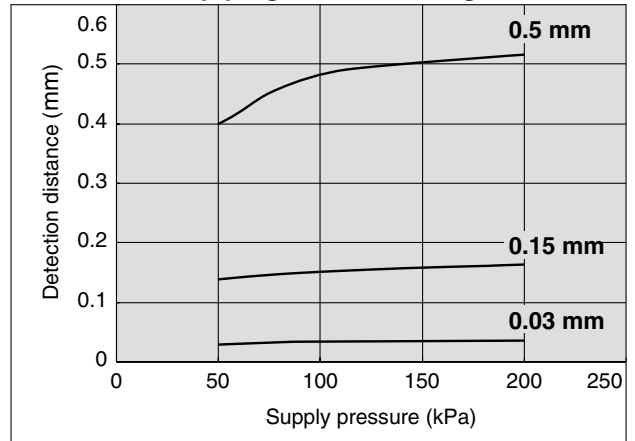
ISA2-G□□□□

Detection nozzle: $\phi 1.0$
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m

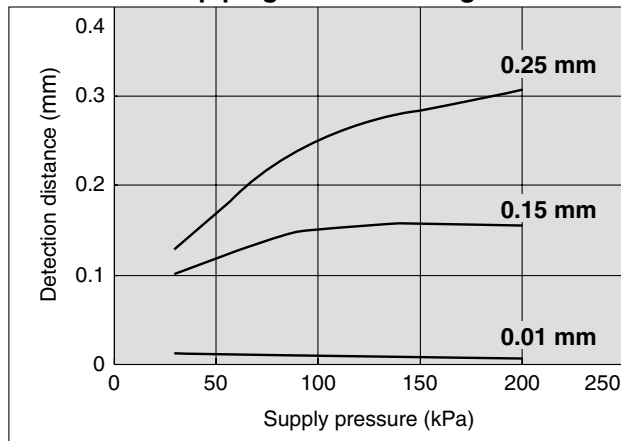


ISA2-H□□□□

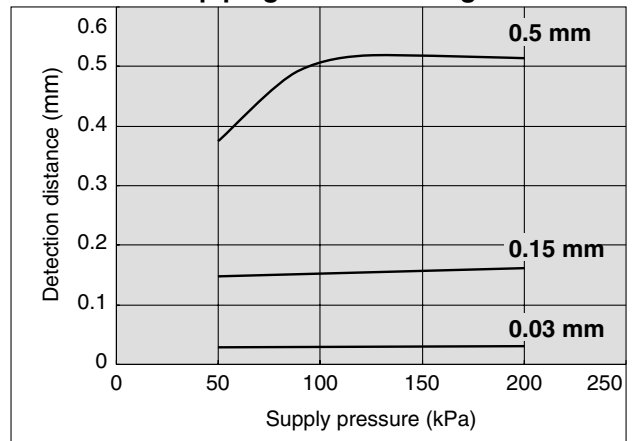
Detection nozzle: $\phi 1.0$
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



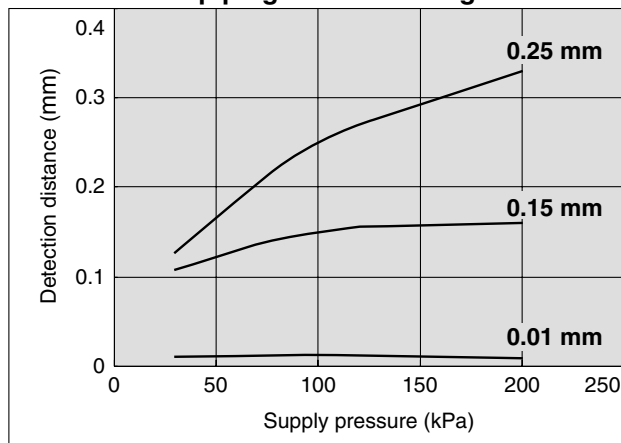
Detection nozzle: $\phi 1.5$
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



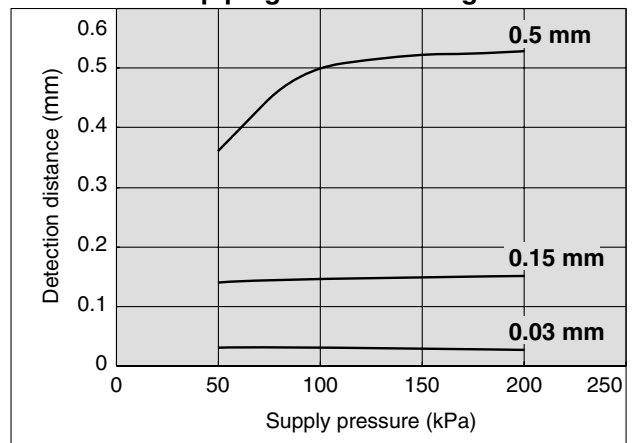
Detection nozzle: $\phi 1.5$
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



Detection nozzle: $\phi 2.0$
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m



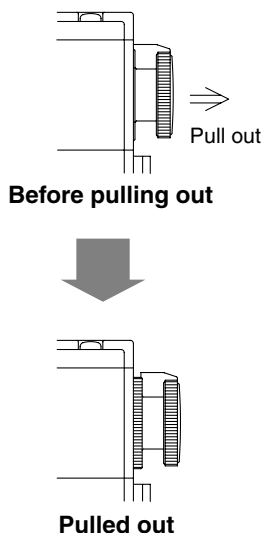
Detection nozzle: $\phi 2.0$
 Detection side piping: $\phi 6 \times \phi 4$ tubing 5 m




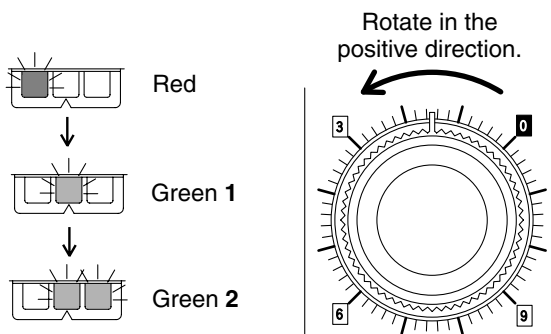
Setting Procedure



The detection distance is set with the LED level meter and setting dial.

Keep the setting dial pulled out while in use. If released, it will return to its original position and become unable to rotate.



1. For accuracy in setting, apply a clearance gauge to the detection nozzle to replicate the set condition in advance.
2. Confirm that the set pressure is applied. If the setting dial is fully open, the LED level meter appears as .
3. Pull the setting dial and rotate it in the positive direction. The lights will turn on in the order shown below.



4. The sensor output comes on when the lights on the LED level meter turn on as . Complete the setting when this condition is observed.
5. Apply the clearance gauge again to confirm that the lights turn on as .

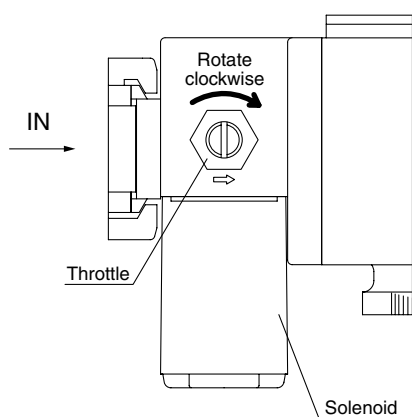
Handling and setting of 2 port solenoid valve

Throttle setting for blowing to prevent water and cutting oil from entering the nozzle.

(Clockwise: Close throttle; Counterclockwise: Open throttle)

* The setting is not applicable to valves without throttle.

1. Power off the valve.
2. Rotate the throttle clockwise for adjustment so that the detection nozzle will not suck up water or cutting oil.

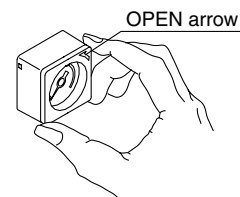


3. Power on the valve, then off again.
Confirm that the detection nozzle does not suck up water or cutting oil.
Note) Do not rotate the throttle more than 4 turns or it will fall out.

Handling and setting of limit gauge indicator

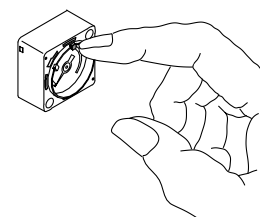
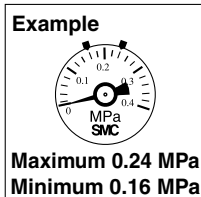
1. Removal of cover

Hook the finger on the front cover ridge and rotate it in the direction of the OPEN arrow until it stops (15°). Then pull out and remove the cover.



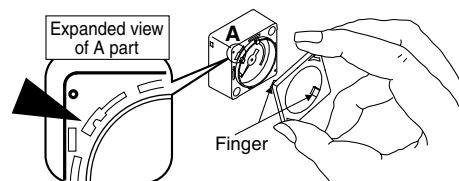
2. Setting the installation needle

The installation needle should be moved by the fingertip. Set the 2 green installation needles at the maximum and minimum limits of pressure.



3. Installation of cover

After setting the installation needles, locate the OPEN arrow at the top right position and insert the claws on the cover into the grooves on the case (indicated by ▼ in the expanded view of A part). Rotate the cover clockwise until it stops. Confirm that the cover is firmly secured.



ZSE
ISE

PSE

ZSE3

PS

ZSE1

ZSE2

ZSP

ISA2

IS

ZSM

PF2

IF

Data

Series ISA2

Relation between Dial Scale and Detection Distance

Test procedure and conditions

Dial scales when the detection nozzle is under the following conditions;

Supplied pressure: 100 kPa

Piping: $\phi 6 \times \phi 4$ tubing, 5 m in length.

Results of measurement ^{Note 1)}

● Relation between the detection distance and set dial scales ^{Note 2)} (Scale numbers)

ISA2-G□

Detection distance	Detection nozzle diameter		
	$\phi 1.0$	$\phi 1.5$	$\phi 2.0$
0.05 mm	0.3 to 0.7	0.9 to 1.4	0.3 to 0.7
0.10 mm	1.1 to 1.5	2.3 to 2.8	2.0 to 2.5
0.15 mm	1.9 to 2.3	3.4 to 4.1	3.7 to 4.6
0.20 mm	2.5 to 3.0	4.4 to 5.5	5.3 to 7.0
0.25 mm	3.0 to 3.5	5.2 to 7.0	6.6 to 10.7

ISA2-H□

Detection distance	Detection nozzle diameter		
	$\phi 1.0$	$\phi 1.5$	$\phi 2.0$
0.1 mm	1.1 to 1.5	2.4 to 2.8	2.6 to 3.4
0.2 mm	2.4 to 2.9	4.5 to 5.1	5.4 to 6.4
0.3 mm	3.0 to 3.5	5.5 to 6.3	7.0 to 8.3
0.4 mm	3.3 to 3.8	6.0 to 7.0	7.9 to 9.6
0.5 mm	3.5 to 4.0	6.5 to 7.5	8.6 to 10.7

● Average variation per scale (Detection distance [mm])

ISA2-G□

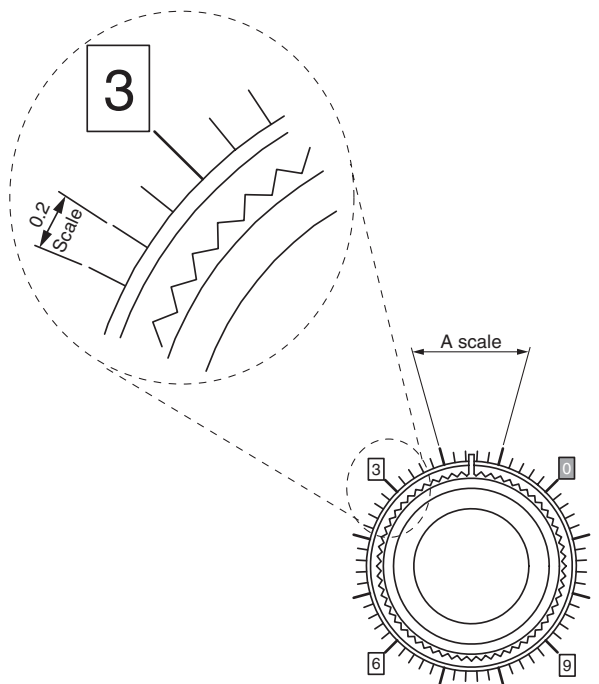
Detection distance	Detection nozzle diameter		
	$\phi 1.0$	$\phi 1.5$	$\phi 2.0$
0.05 mm	0.010	0.005	0.006
0.10 mm	0.007	0.004	0.003
0.15 mm	0.010	0.005	0.004
0.20 mm	0.010	0.005	0.003
0.25 mm	0.010	0.007	0.003

ISA2-H□

Detection distance	Detection nozzle diameter		
	$\phi 1.0$	$\phi 1.5$	$\phi 2.0$
0.1 mm	0.008	0.004	0.003
0.2 mm	0.008	0.005	0.004
0.3 mm	0.025	0.011	0.007
0.4 mm	0.046	0.019	0.011
0.5 mm	0.050	0.021	0.012

Note 1) This data provides reference values as a guide only, this should not be viewed as a guarantee of our products performance.

Note 2) Set dial scales are as follows;

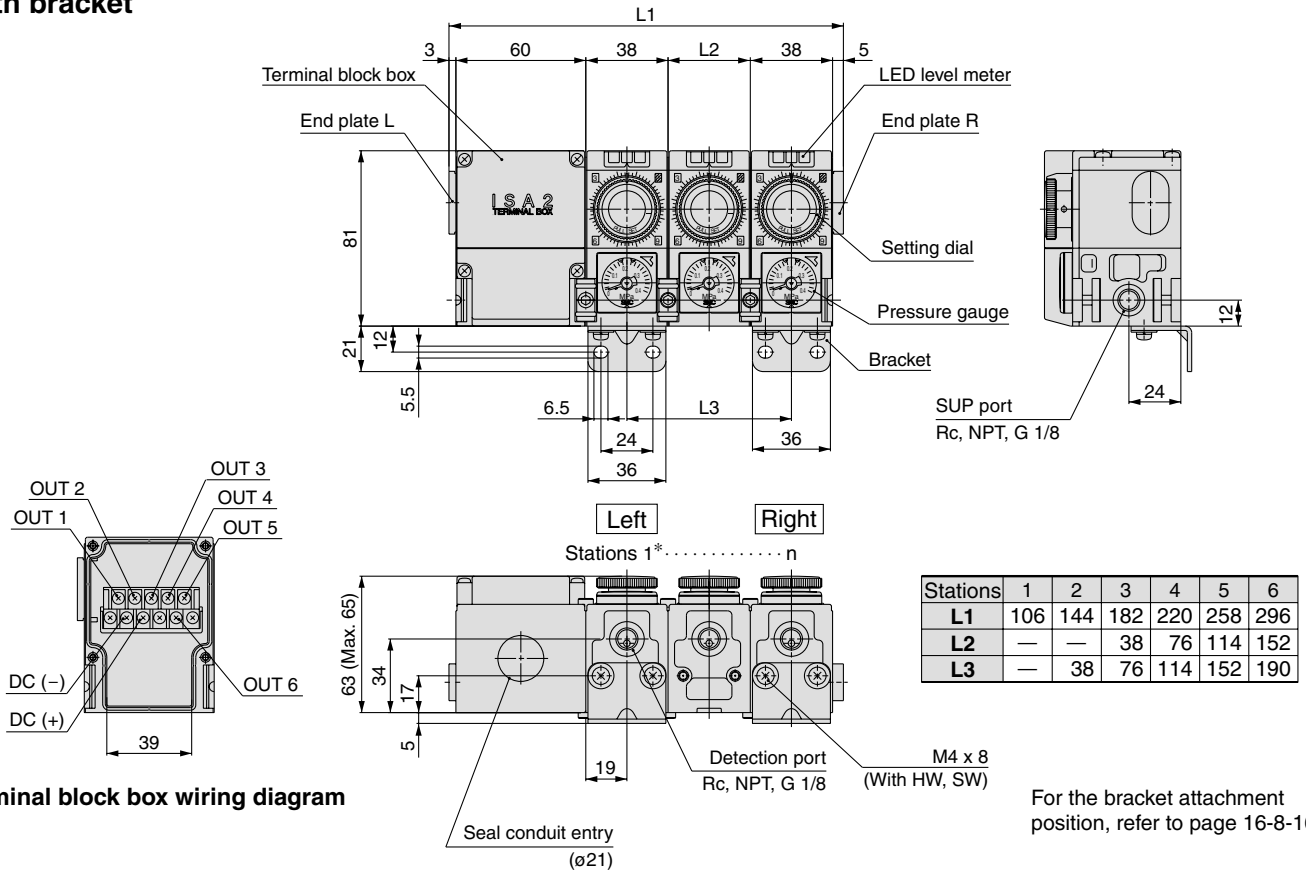


Between each major scales, it is sub divided into ten smaller settings (for example, between 2.0 to 3.0—2.1, 2.2, 2.3 etc.), settings are possible at each increment.

Dimensions: Centralized Wiring Type

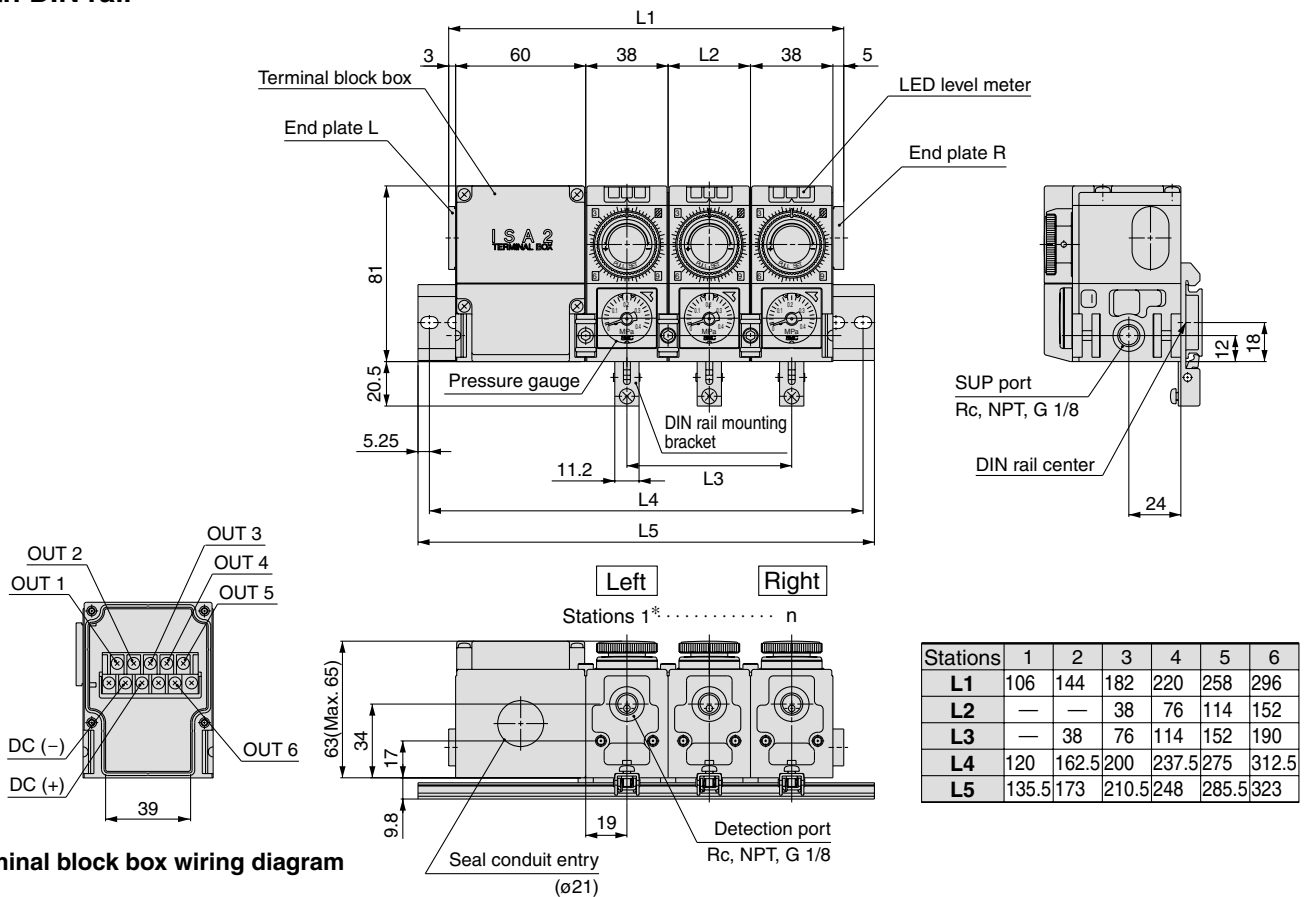
* When the SUP port is on the left, the stations are sequentially numbered from the side of the terminal block box.

With bracket



Terminal block box wiring diagram

With DIN rail



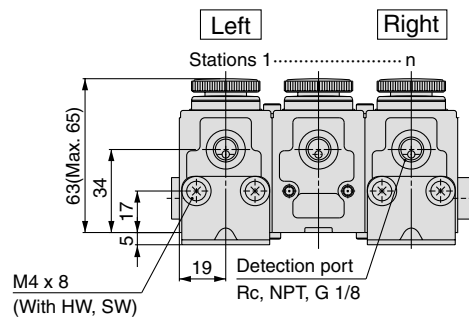
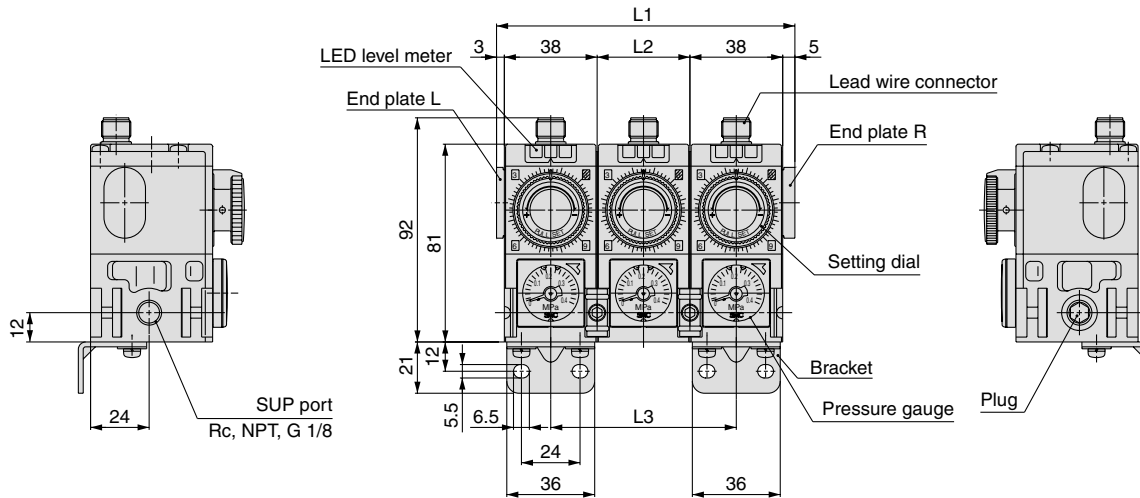
Terminal block box wiring diagram

- ZSE
- ISE
- PSE
- ZSE3
- PS
- ZSE1
- ZSE2
- ZSP
- ISA2
- IS
- ZSM
- PF2
- IF
- Data

Series ISA2

Dimensions: Individual Wiring Type

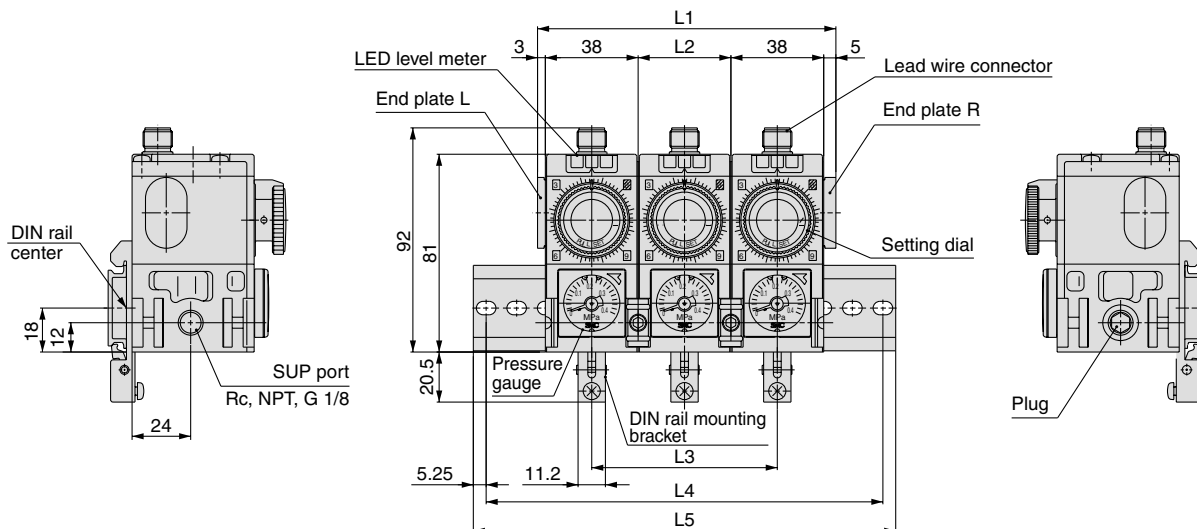
With bracket



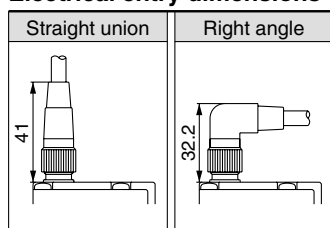
Stations	1	2	3	4	5	6
L1	46	84	122	160	198	236
L2	—	—	38	76	114	152
L3	—	38	76	114	152	190

For the bracket attachment position, refer to page 16-8-16.

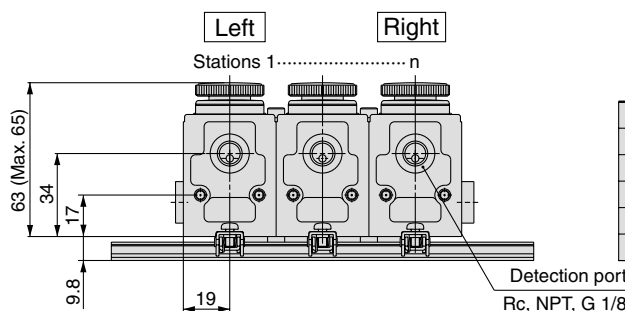
With DIN rail



Electrical entry dimensions



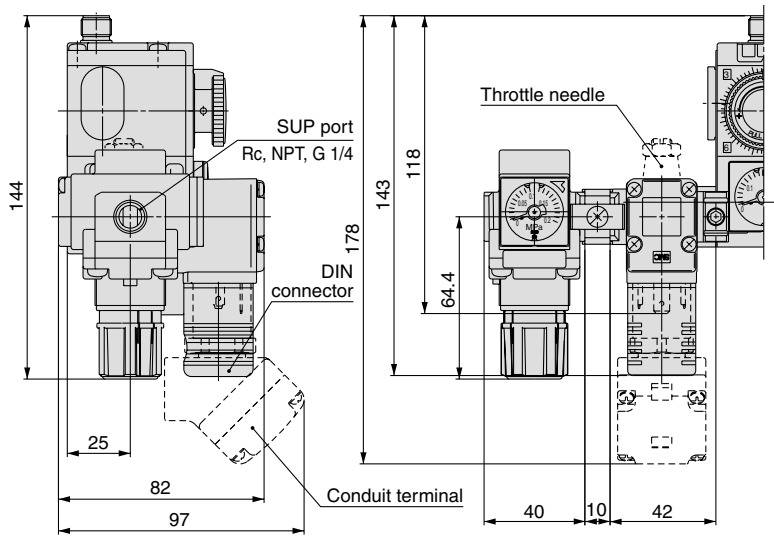
The direction of a right angle connector cannot be changed.



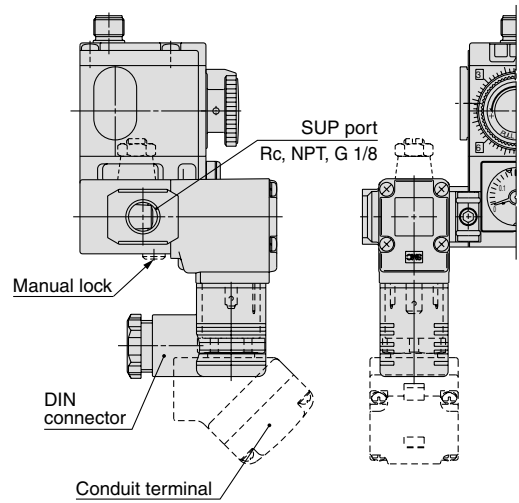
Stations	1	2	3	4	5	6
L1	46	84	122	160	198	236
L2	—	—	38	76	114	152
L3	—	38	76	114	152	190
L4	62.5	120	162.5	200	237.5	275
L5	73	135.5	173	210.5	248	285.5

Dimensions: With Control Unit

SUP port on the left

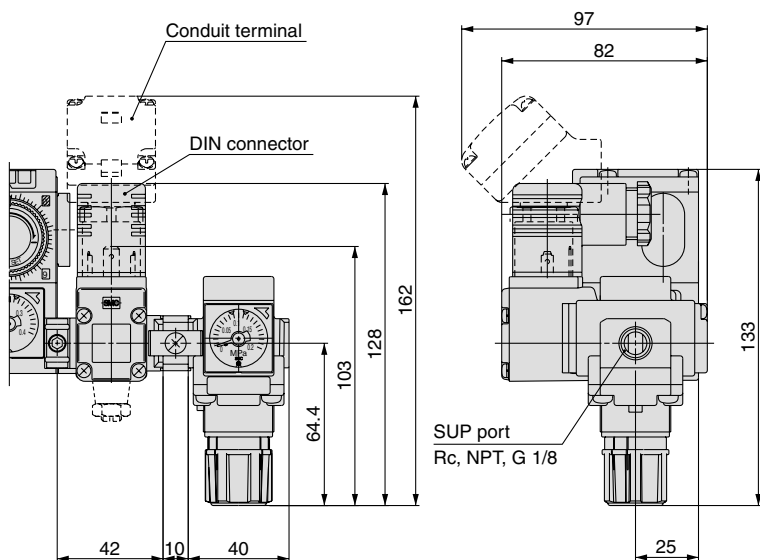


With regulator + 2 port solenoid valve

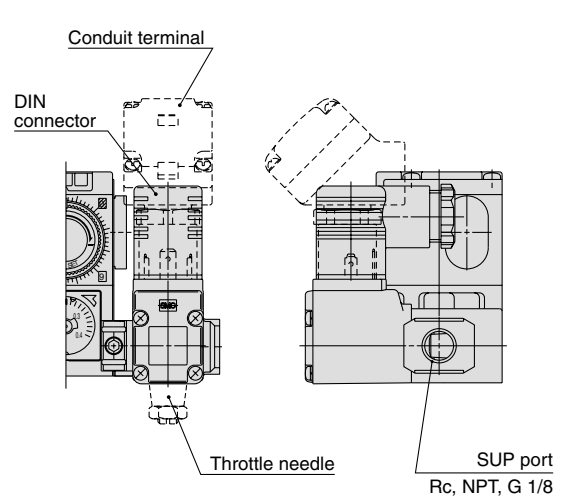


With 2 port solenoid valve

SUP port on the right



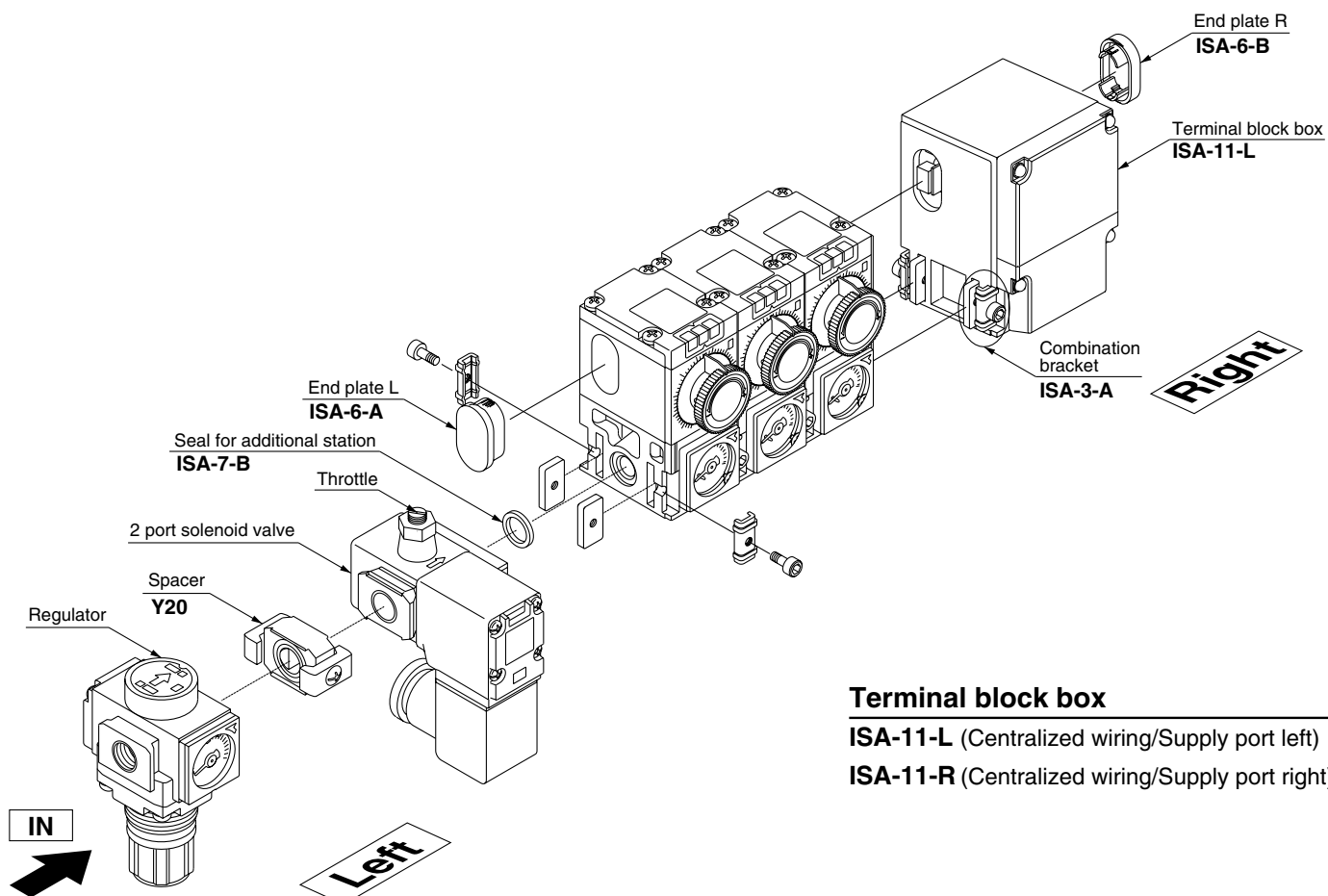
With regulator + 2 port solenoid valve



With 2 port solenoid valve

- ZSE
- ISE
- PSE
- ZSE3
- PS
- ZSE1
- ZSE2
- ZSP
- ISA2**
- IS
- ZSM
- PF2
- IF
- Data

Parts List



ZSE
ISE

PSE

ZSE3

PS

ZSE1

ZSP

ISA2

IS

ZSM

PF2

IF

Data

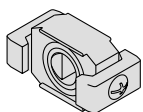
Terminal block box

ISA-11-L (Centralized wiring/Supply port left)

ISA-11-R (Centralized wiring/Supply port right)

Spacer

Y20



Seal for additional station

ISA-7-B

When 2 air catch sensors are connected or when a 2 port solenoid valve is connected to the left:



ISA-7-A

When a 2 port solenoid valve is connected to the right:



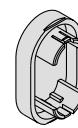
End plate L

ISA-6-A



End plate R

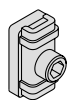
ISA-6-B



Joint bracket

ISA-3-A

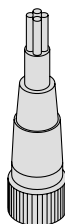
A pair consists 1 set.



Lead wire with connector (Individual wiring type)

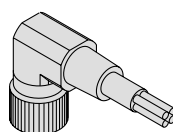
ISA-8-A

Straight, 5 m



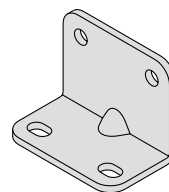
ISA-8-B

Right angle, 5 m



Bracket

ISA-4-A



With mounting screw 2 pcs.

DIN rail mounting bracket

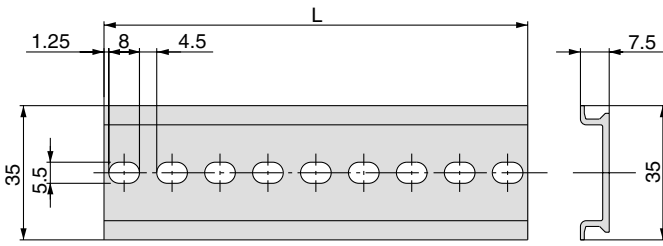
ISA-9-A



Series ISA2

DIN Rail

ISA-5-□



Part no.	L	Applicable models	
		Individual wiring type	Centralized wiring type
ISA-5-1	73.0	IISA2□P□-1	—
ISA-5-2	135.5	IISA2□P□-2	IISA2□S□-1
ISA-5-3	173.0	IISA2□P□-3	IISA2□S□-2
ISA-5-4	210.5	IISA2□P□-4	IISA2□S□-3
ISA-5-5	248.0	IISA2□P□-5	IISA2□S□-4
ISA-5-6	285.5	IISA2□P□-6	IISA2□S□-5
ISA-5-7	323.0	—	IISA2□S□-6

Pressure Gauge for Air Catch Sensor

Square embedded pressure gauge

GC3-□4AS

Notation specifications

Nil	MPa single notation
P	PSI single notation

Maximum pressure indication

2	0.2 MPa
4	0.4 MPa

Round pressure gauge

G36-□4□01

Notation specifications

Nil	MPa single notation
P ^{Note}	MPa-PSI double notation

Maximum pressure indication

2	0.2 MPa
4	0.4 MPa

Note) For double notation of MPa and PSI, add "-X30" at the end of part number.
Example) G36-P4-01-X30

Connection thread

Nil	Rc 1/8
P	NPT 1/8

Regulator

AR 20-□02E-1□

Thread type

Nil	Rc
N	NPT
F	G

Option (The shape of pressure gauge) ^{Note 2)}

Nil	None
E	Square embedded pressure gauge (With limit indicator)
G ^{Note 1)}	Round pressure gauge (With limit indicator)

Note 1) The pressure gauge port is Rc 1/8. The pressure gauge is included in the package (not assembled).

Note 2) Order individually when 0.4 MPa gauge is required.

Option specification

Nil	None
N	Non-relieving
R	Flow direction: Right to left
Z ^{Note 1)}	Unit representations on the label and pressure gauge are PSI and °F

When specifying more than one option, enter symbols first in numerical, then in alphabetical orders.

Note 1) Compatible with thread type NPT. Under the New Measurement Law, this type is only sold outside Japan. (The SI unit is used inside Japan.) In all cases, with the exception of NPT, add "-X2025" at the end of the order number. Example) AR20-02E-1-X2025

Standard Specifications

Model	AR20
Port size	1/4
Fluid	Air
Proof pressure	1.5 MPa
Maximum operating pressure	1.0 MPa
Set pressure range	0.02 to 0.2 MPa
Gauge port size ^{Note 1)}	1/8
Relief pressure	Set pressure + 0.05 MPa (at relief flow of 0.1 l/min(ANR))
Ambient and fluid temperature	-5 to 60°C (No condensation)
Construction	Relieving type
Weight (kg)	0.29
Pressure gauge	0.2 MPa
	Round ^{Note 2)}
	Square embedded ^{Note 3)}
	G36-2-□01
	GC3-2AS

Note 1) The type with square embedded pressure gauge does not have connection.

Note 2) The "□" in the part number of the round pressure gauge indicates the type of connection threads, no symbol for R and N for NPT. Contact SMC for supply of the connection thread type NPT and the pressure gauge of PSI unit representation.

Note 3) With an O-ring (1 pc.) and mounting screws (2 pcs.).

2 Port Solenoid Valve

VCA27A-5DL S-4-02-Q

Voltage

1	100 VAC
2	200 VAC
3	110 VAC
4	220 VAC
5	24 VDC
6	12 VDC
36	230 VAC

Port size

02	Rc 1/4
02N	NPT 1/4
02F	G 1/4

CE marked

Throttle

Nil	Without throttle and manual lock
S	With throttle
B	With manual lock
K	With manual lock and throttle

Electrical entry

D	DIN connector
DL	DIN connector (With light)
DO	DIN connector (Without connector)
T	Conduit terminal
TL	Conduit terminal (With light)

Standard Specifications

	Valve type	Direct operation poppet
Valve specifications	Fluid	Air, Inert gas
	Withstand pressure MPa	2.0
	Body material	Al
	Seal material	HNBR
	Ambient temperature °C	-20 to 60
	Fluid temperature °C	-10 to 60 (No freezing)
	Enclosure	Dustproof and jetproof (Equivalent to IP65)
	Atmosphere	Environment with no corrosive or explosive gas
	Valve leakage cm ³ /min (ANR)	0.2 or less
	Mounting orientation	Free
Coil specifications	Vibration resistance/Impact resistance m/s ² ^{Note 2)}	30/150 or less
	Rated voltage	24/12 VDC, 100/110/200/220 VAC (50/60 Hz)
	Allowable voltage fluctuation	±10% rated voltage
	Type of coil insulation	B type
	Power consumption	DC VCA2: 6.5 W
Apparent power	^{Note 1)} AC 50 Hz	VCA2: 7.5 VA
	60 Hz	

Note 1) Since the AC specifications include a rectifying device, there is no difference between the apparent power required for starting and holding.

Note 2) Vibration resistance: No malfunction resulted in a one-sweep test in a 10 to 300 Hz range in the axial and right angle directions of the main valve and armature, for both energized and de-energized states.

Shock resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed in the axial and right angle directions of the main valve and armature, for both energized and de-energized states.



Series ISA2

Specific Product Precautions 1

Be sure to read before handling.

Air Catch Sensor Series ISA2

Operating Environment

Warning

1. Do not use in an environment where vibration or impact occurs. Use a bracket in an environment with vibration exceeding 30 m/s².
2. The enclosure of the switch conforms to IP66 and that for the solenoid valve to IP65. The pressure gauge and the regulator have open constructions. Take proper protection measures in an environment where water splashes, oil or spatters from welding may adhere to the product.
3. Since steel piping lacking flexibility is easily affected by moment loads or propagation of vibration, employ flexible tubing, etc., to prevent interactions of such factors.
4. Although CE accredited, this air catch sensor is not equipped with surge protection against lightning. Necessary counter-measures for possible lightning surge should be fitted to system components as required.
5. Do not operate in locations having an atmosphere of flammable, explosive or corrosive gases, which can result in fire, explosion or corrosion. The air catch sensor does not have an explosion proof rating.

Caution

1. When an air catch sensor is contained in a box, provide an air outlet to constantly keep the atmospheric pressure inside the box.
Internal pressure rises will hinder normal air discharge and may lead to possible malfunction.
2. The air outlet is provided on the setting dial section of the air catch sensor. Do not turn off air supply to the switch if water or cutting oil splashes around the setting dial.

Mounting

Caution

1. If the detection nozzle is exposed to splashes of water or cutting oil, do not allow backflow from the detection nozzle to the switch body. Install the switch body at a position higher than the detection nozzle wherever possible.

Piping

Caution

1. Piping equipment

In the piping between the switch body and the detection nozzle, do not use equipment or fittings that can possibly cause leakage or serve as resistance.
Do not use One-touch fittings in an environment where the air catch sensor is exposed to water or other liquid.

Pressure Source

Caution

1. Supply air

Since the orifice of the air catch sensor is small, prevent foreign matter from entering the equipment. For this purpose, use supply air that is dry and filtered 5 mm or better.

2. Operating pressure

Since the product adopts a semiconductor pressure sensor, keep the operating pressure not larger than 0.2 MPa.

2 Port Solenoid Valve Series VCA

Precautions on Design

Warning

1. Energized continuously

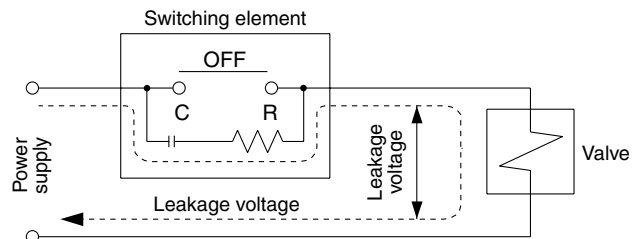
Please consult with SMC if the product is to be energized continuously for long periods of time.

Selection

Caution

1. Leakage voltage

Take special precautions if a resistor is used in parallel with the switching element or a C-R element (for surge voltage protection) is used for protection of the switching element. The valve may fail to turn off due to leakage current flowing through the resistor or C-R element.



AC coil

10% or less rated voltage

DC coil

2% or less rated voltage

Mounting

Warning

1. Do not use the air catch sensor if the leakage amount increases or the equipment does not operate properly.

After installation, connect compressed air and electricity and conduct an appropriate functionality inspection to confirm that the air catch sensor is installed properly.

2. Do not apply external force to the coil.

Apply a wrench to the exterior surface of the piping joint at the time of tightening.

3. Do not use heat insulators, etc. to keep the temperature at the coil assembly.

Do not use a tape heater for freeze prevention except on the piping and body. If may cause the coil to burn.

ZSE
ISE

PSE

ZSE3

PS

ZSE1

ZSE2

ZSP

ISA2

IS

ZSM

PF2

IF

Data



Series ISA2

Specific Product Precautions 2

Be sure to read before handling.

2 Port Solenoid Valve Series VCA

Disassembly and Assembly

⚠ Caution

• Before the product is disassembled, shut off the power and pressure supply and exhaust the residual pressure.

• Disassembly procedure

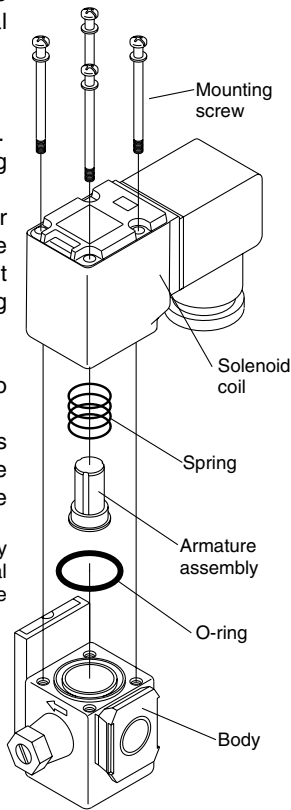
1. Remove the top mounting screws.
2. Remove the solenoid coil, spring and armature assembly.
3. If there is any foreign matter adhering on the surface, take appropriate measures to clear it off such as an air blow or washing with neutral detergent.

• Assembly procedure

Reverse the above procedure to assemble the product.

In case the electrical entry is changed, also change the mounting orientation of the solenoid coil before assembly.

Note 1) Tighten the 4 mounting screws by each pair of corners on a diagonal line at the proper tightening torque shown below.



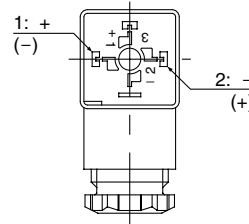
Proper Tightening Torque $N \cdot m$	
VCA27	0.4 to 0.5

Wiring

⚠ Caution

DIN connector (B type only)

The internal wiring of the DIN connector is illustrated below. Connect each terminal to the power supply.

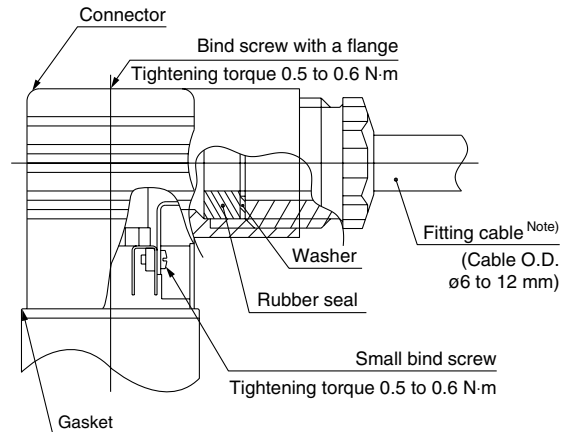


Terminal no.	1	2
DIN terminal	+ (-)	- (+)

* No polarity.

• A cable with an O.D. $\phi 6$ to 12 mm is applicable.

• Tighten each part with an appropriate tightening torque shown below.



Note) With a cable O.D. $\phi 9$ to 12 mm, hollow the rubber sealing before use.

Wiring

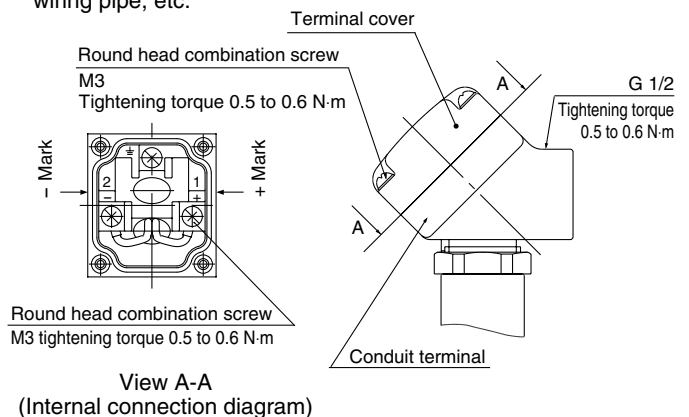
⚠ Caution

1. Use electrical wires with a conductive sectional area of 0.5 to 1.25 mm². Make sure that no excessive force is applied to the wires.
2. Adopt an electrical circuit which will not cause chattering at the contact.
3. The voltage variation must stay within the -10% to +10% range of the rated voltage. In case importance is attached to response characteristics due to use of a DC power source, keep the variation within the -5% to +5% range. The voltage drop is the value at the lead wire to which the coil is connected.

Conduit terminal

In case of a conduit terminal, refer to the marks below for wiring.

- Tighten each part with an appropriate tightening torque shown below.
- Seal the piping part (G 1/2) securely with a dedicated electric wiring pipe, etc.





Series ISA2

Specific Product Precautions 3

Be sure to read before handling.

2 Port Solenoid Valve Series VCA

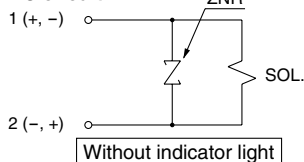
Electric Circuit

⚠ Caution

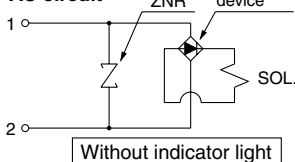
In case of series VC (B type coil)

Conduit terminal, DIN type connector

DC circuit

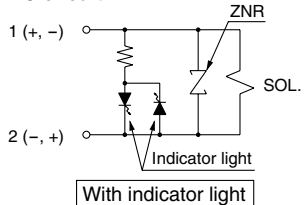


AC circuit

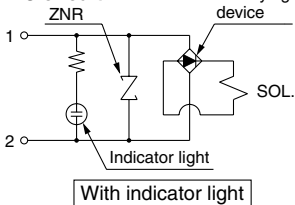


Conduit terminal, DIN type connector

DC circuit



AC circuit



Maintenance

⚠ Warning

1. Low-frequency operation

Perform valve switching at least every 30 days to prevent malfunction. Also, conduct a periodic inspection at intervals of approximately 6 months to use the product in its best condition.

Manual Operation

⚠ Warning

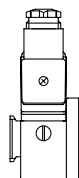
How to operate manually

Locking type (tool required)

To open valve: Rotate to the right by 90° using a flat head screwdriver. It will still hold open even when the driver removed.

To close valve: Rotate to the left by 90° to achieve the former closed position.

Electrical operations should be undertaken when the valve is closed.



Valve closed (vertical slit)



Valve open (horizontal slit)

Regulator Series AR

Mounting and Adjustment

⚠ Warning

1. The adjustment knob must be handled manually. Use of tools may cause damage to the product.
2. Check the inlet and outlet pressure indications on the pressure gauge while setting. If the knob is turned to excess, it may cause internal parts to fracture.
3. Since products for 0.02 to 0.2 MPa settings come with a pressure gauge for 0.2 MPa, do not apply pressure exceeding 0.2 MPa. It may cause damage to the pressure gauge.

⚠ Caution

1. Unlock the knob before pressure adjustment and lock it again when the adjustment is over. Incorrect procedure may cause damage to the knob or lead to the outlet pressure fluctuation.
 - Pull the adjustment knob to release the lock. An orange colored line is provided at the bottom of the adjustment handle for visual checking.
 - Push the pressure regulation knob to engage the lock. If it does not lock easily, turn the knob slightly clockwise or counterclockwise until the orange colored line goes out of sight.
2. When the product is installed, leave a space of 60 mm on the side of the valve guide (opposite to the knob) for maintenance and inspection.

ZSE□
ISE□

PSE

ZSE3

PS

ZSE1

ZSE2

ZSP

ISA2

IS□

ZSM

PF2□

IF□

Data