Реле давления
IS1000

Применяется для контроля давления сжатого воздуха

- Продолжительный срок службы
- Пригоден для модульного монтажа
- Различные варианты монтажа:
  - на выходе блока подготовки сжатого воздуха
  - между устройствами подготовки сжатого воздуха
  - самостоятельный монтаж

Технические характеристики

Рабочая среда		Сжатый воздух
Испытательное давление (МПа)		1.0
Макс. рабочее давление (МПа)		0.7
Давление срабатывания (МПа)		0.1 ~ 0.6
Гистерезис (МПа)		0.08
Воспроизводимость (МПа)		0.05
Тип коммутации		Нормально-разомкнутый *
Рабочее напряжение, ток		12 ~ 100 В (AC/DC), 50 мА
Максимальная нагрузка	постоянный ток (Вт)	2
	переменный ток (ВА)	2
Время переключения (мс)		1.2
Стойкость к ударным нагрузкам (G)		30
Соединительный кабель		двухпроводной, длина 3 м
Диапазон рабочих температур (°C)		-5 ~ 60
Присоединение		R 1/8
Степень защиты		IP40

* при отсутствии давления электрическая цепь размыкается

Реле давления IS1000M

Монтируется между двумя устройствами

Номер для заказа

Номер для заказа	A	B	C	D	Типоразмер для модульного монтажа
IS1000M-20-X215	11	76	66	28	AC20, AC20A
IS1000M-30-X215	13	86	72	30	AC30, AC30A
IS1000M-40-X215	15	95	77	36	AC40, AC40A
IS1000M-60-X215	22	92.5	68.5	53	AC50, AC60

Примечание: для монтажа требуются отдельные переходные детали.

Принадлежности
Манометр со встроенным реле давления

Серия GP46

Устройство объединяет манометр и реле давления
- Реле давления оборудовано индикатором срабатывания
- Манометр имеет ограничитель диапазона давления

Технические характеристики

Манометр	Рабочая среда		Сжатый воздух
	Диапазон индикации давления (МПа)		0 ~ 1.0
	Температура рабочей и окружающей среды (°C)		-5 ~ 60
	Присоединительная резьба		R(PT) 1/8, 1/4
Реле давления	Диапазон установки давления (МПа)		0.1 ~ 0.8
	Гистерезис (МПа)		0.07
	Точность установки* (МПа)		±0.05 (5 ~ 40 °C)
			±0.08 (-5 ~ 60 °C)
	Тип коммутации	Без индикатора	H.O. + H.3
		С индикатором	H.O..
	Рабочее напряжение, ток		24~250V, <500 мА
	Максимальная нагрузка (Вт)		<15 (постоянный ток)
	Максимальная нагрузка (ВА)		<30 (переменный ток)
	Соединительный кабель		трехпроводный, длина 0.3 м
	Индикатор	Постоянный ток	Светодиод
		Переменный ток	Неоновая лампочка
	Вес (кг)		0.12

* при низких температурах применять сухой воздух

Пример схемы

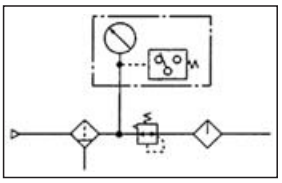
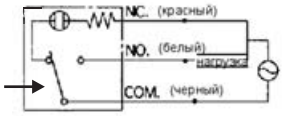


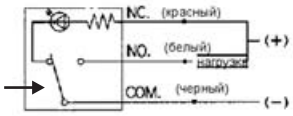
Схема подключения

С индикатором

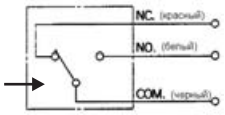
110V AC/220V AC



24V DC



Без индикатора



Стрелкой показано направление переключения контактов при увеличении давления. Индикатор (если есть) *выключается*, когда величина давления становится больше установленного значения, и *включается*, когда меньше.

Номер для заказа

GP46 — 10 — 01 L2 — C

Диапазон индикации давления
0 ~ 1.0 МПа / 0 ~ 10 кгс/см²

Присоединение

01	R(PT)1/8
02	R(PT)1/4

Индикатор

–	без индикатора
L2	неоновый (110/220 VAC)
L5	светодиод (24 VDC)

Разборная крышка
(для панельного монтажа)

–	без крышки
C	с крышкой

Указания

По монтажу

- Установите манометр так, чтобы деление "0" на шкале было направлено вниз, вертикально.
- Вибрация или прямые удары по устройству не допускаются
- Свяжитесь со специалистами SMC, если необходимо использовать манометр при пульсирующем давлении или при высоких частотах срабатывания реле

По окружающей среде

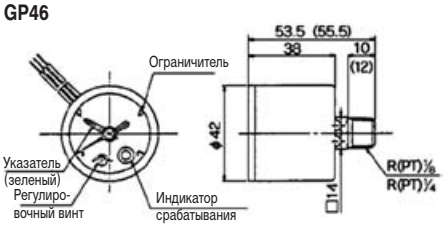
- Избегайте мест, где манометр может контактировать с коррозионными газами, химическими веществами, водой и т.д.
- Если манометр необходимо установить в местах, где возможно попадание воды , масла и т.д., необходимо использовать защитную крышку.

По настройке

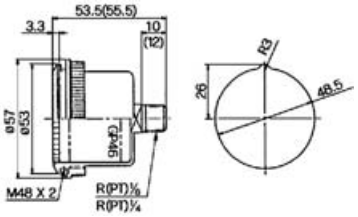
- Для настройки указателя (зелен.) или ограничителя удалите крышку, поворачивая против часовой стрелки до упора (примерно 6-7 мм).
- Используйте отвертку (2,9 мм) для настройки ограничителя. Будьте осторожны, чтобы не повредить стрелки и циферблат.
- Для настройки давления срабатывания поверните с помощью отвертки настроечный винт по часовой стрелке (в сторону минуса) для уменьшения давления или против часовой стрелки (в сторону плюса) для увеличения давления.
- После завершения настройки установите обратно крышку. Убедитесь, что она зафиксирована и плотно стоит на месте.

Размеры

GP46



GP46 с разборной крышкой
(для панельного монтажа)



Переносной манометр

PPA

- Возможность выбора единицы измерения (бар, кПа, МПа, ммHg, кгс/см^2, inHg, PSI)
- Жидкокристаллический дисплей с подсветкой
- Компактный дизайн. небольшой вес (около 100г с батарейками)
- Срок службы без смены батарей 12 месяцев (дисплей автоматически отключается после 5 минут неактивного состояния)
- Сохраняет значение максимального и минимального давления

Технические характеристики

Номер для заказа		PPA100	PPA101	PPA102
Среда		Сжатый воздух. некоррозионные газы		
Диапазон давлений		-0.1 ~ 1МПа	-101 ~ 10 кПа	-10 ~ 100 кПа
Испытательное давление		1.5МПа	200кПа	200кПа
Индикация		3 разряда ЖК индикатора с фоновой подсветкой		
Разрешающая способность дисплея		1/100		
Наименьшая единица отображения	кПа	-	1	1
	МПа	0.01	-	-
	ммHg	-	5	-
	кгс/см^2	0.1	0.01	0.01
	inHg	-	0.2	-
	PSI	1	0.1	0.1
	бар	0.1	0.01	0.01
Информация об ошибке		Избыточное давление, ошибка памяти, необходимость замены батареек		
Питание [1]		3 VDC (2 батарейки тип AA (R6 или LR6))		
Срок службы батареек		12 месяцев (без использования подсветки)		
Погрешность отображения		≤ ±2% (от диапазона измерения) при 25°C		
Воспроизводимость		≤ ±1% (от диапазона измерения) при 25°C		
Влияние температуры		≤ ±3% (от диапазона измерения) от 0 до 50°C. при стандарте 25°C		
Присоединительная резьба		M5x0.8		
Рабочая температура (°C) [2]		0 ~ 50		
Допустимая влажность рабочей среды		35 ~ 85% (без образования конденсата)		
Устойчивость к вибрации		100G		
Степень защиты		IP40		
Вес (г)		50		

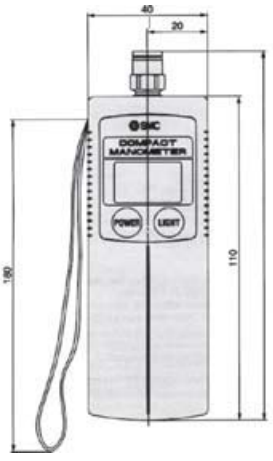
1) Батарейки в комплект не включены.

2) При низких температурах использовать сухой воздух

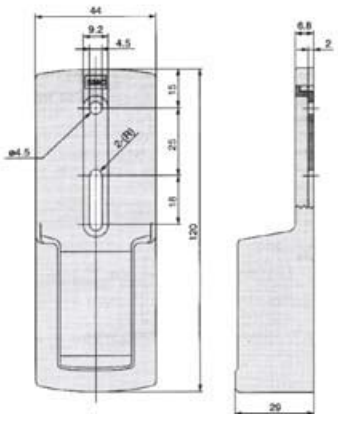
Принадлежности (заказываются отдельно)

Быстроразъемное соединение	∅4	KQ2H04-M5
	∅6	KQ2H06-M5
Держатель манометра		PPA-B

Размеры



Держатель



Пневмоэлектрическое реле

VR3200/VR3201

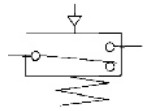
Предназначено для контроля наличия давления в пневмосистеме.
Используется в электропневматических системах управления.

Технические характеристики

Номер для заказа	VR3200-01	VR3201-01
Конструктивные особенности		Защитный корпус
Рабочее давление (МПа)	0.1 ~ 1.0	
Температура раб. и окружающей среды (°C)	-5 ~ 60	
Контакты	1 Н.З.+ Н.О.	
Присоединительная резьба	1/8	
Вес, (кг)	0.13	0.26

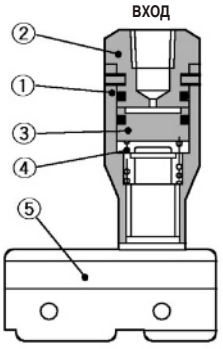
Электрические характеристики микровыключателя

Напряжение	Активная нагрузка (A)				Индуктивная нагрузка (A)			
	Резистивная нагрузка		Ламповая нагрузка		Индуктивная нагрузка		Электромотор	
	Н.З.	Н.О.	Н.З.	Н.О.	Н.З.	Н.О.	Н.З.	Н.О.
125VAC	15	15	4	2	10	10	4	2
250VAC	15	15	3	1.5	10	10	3	1.5
8VDC	15	15	3	1.5	15	15	5	2.5
14VDC	15	15	3	1.5	10	10	5	2.5
30VDC	6	6	3	1.5	5	5	5	2.5
125VDC	0.5	0.5	0.3	0.3	0.05	0.05	0.05	0.05
250VDC	0.25	0.25	0.2	0.2	0.03	0.03	0.03	0.03



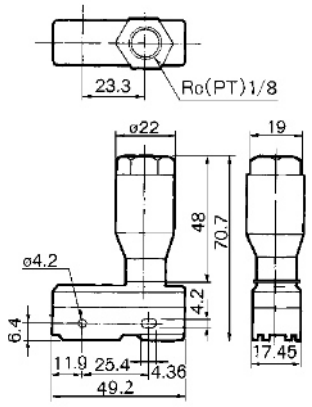
Спецификация

Поз.	Обозначение	Материал
1	Корпус	Латунь
2	Крышка	Латунь
3	Поршень	Полиацеталь
4	Пружина	Нерж. сталь
5	Микровыключатель	

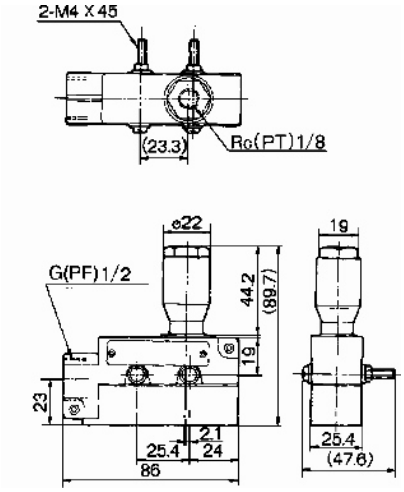


Размеры

VR3200-01



VR3201-01

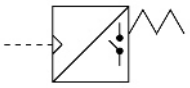


Реле давления

IS3000

Предназначено для контроля давления сжатого воздуха.

- Может использоваться для малых нагрузок 10 мА, с такими устройствами как реле, программируемые контроллеры и т.д.
- Может работать с высокой частотой - 1 цикл в сек
- Продолжительный срок службы (более 10 млн циклов) благодаря поршневой конструкции
- Простая установка давления, благодаря шкале давлений.
- Широкий диапазон установки давлений (0.1-0.7 МПа)



Технические характеристики

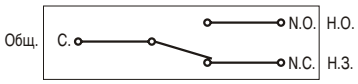
Номер для заказа*	IS3000-02 IS3010-02	
Среда	Сжатый воздух	
Испытательное давление (МПа)	1.0	
Макс. рабочее давление (МПа)	0.8	
Давление срабатывания (МПа)	0.1 ~ 0.7	
Диапазон рабочих температур (°C)	-5 ~ +60	
Гистерезис (МПа)	0.05	
Воспроизводимость (МПа)	±0.05	
Присоединение	1/4	
Мин. нагрузка	5VDC, 160 мА	5VDC, 1 мА
Тип микродатчика	стандарт	Для малых нагрузок
Индикатор	По запросу	
Вес (кг)	0.15	

* Индикатор по запросу

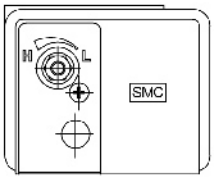
Характеристики реле

Модель	IS3000								IS3010	
Тип нагрузки	Активная нагрузка (A)				Индуктивная (A)				Активная нагрузка (A)	
	Резистивная нагрузка		Ламповая нагрузка		Индуктивная нагрузка		Электро-Резистивная мотор			
Напряжение/ схема	Н.З.	Н.О	Н.З	Н.О	Н.З.	Н.О	Н.З.	Н.О	Н.З.	Н.О
125VAC	5		1.5	0.7	3		2.5	1.3	0.1	
250VAC	3		1	0.5	2		1.5	0.8		
30VDC	4		2		3		3		0.1	
125VDC	0.4		0.05		0.4		0.05		-	

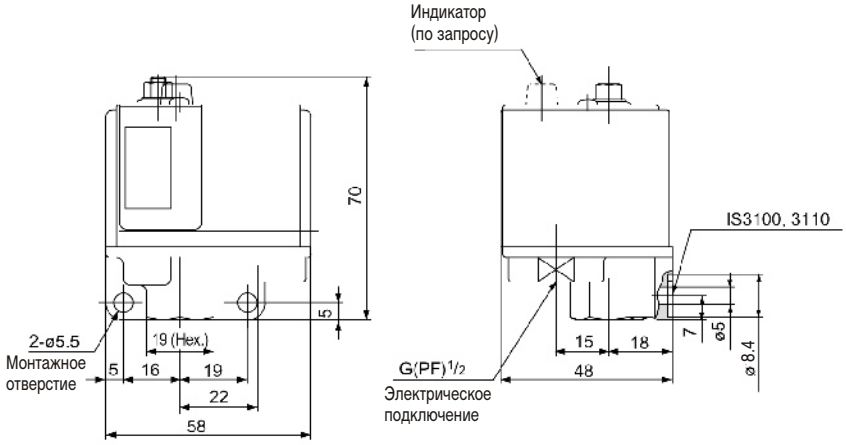
Схема подключения микровыключателя



Размеры



Для электрического подключения рекомендуется использовать кабельный ввод FGA21S-10G.



Реле давления общего назначения

ISG
R 3/8

Предназначено для контроля давления рабочей жидкости или сжатого воздуха.

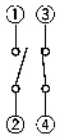
- Регулируемый гистерезис
- Высокая степень воспроизводимости рабочих характеристик
- Применимо с широкой номенклатурой рабочих сред сжатый воздух, вакуум, вода, пар до 150°C (исполнение из нерж. стали), инертные газы, минеральные масла, а также любые жидкости, не вызывающие коррозии нержавеющей стали.

Технические характеристики

Номер для заказа		Диапазон рабочих давлений (МПа)	Настраив. диапазон гистерезиса (МПа)	Испытательное давление (МПа)	Воспроизводимость (МПа)	Материалы, контактирующие со средой	Шкала гистерезиса
Стандартный тип	Брызго защищенное исполнение						
ISG110-030	ISG210-030	0.0~0.3	0.01 0.2	1.0	0.006	Латунь, бронза	Нет
ISG110-031	ISG210-031					Латунь, бронза	Есть
ISG111-030	ISG211-030					Нерж.сталь	Нет
ISG111-031	ISG211-031					Нерж.сталь	Есть
ISG120-030	ISG220-030	0.02~0.7	0.02~0.35	1.5	0.014	Латунь, бронза	Нет
ISG120-031	ISG220-031		0.02~0.45			Латунь, бронза	Есть
ISG121-030	ISG221-030		0.02~0.35			Нерж.сталь	Нет
ISG121-031	ISG221-031		0.02~0.45			Нерж.сталь	Есть
ISG130-030	ISG230-030	0.05~1.0	0.03~0.4	1.5	0.02	Латунь, бронза	Нет
ISG130-031	ISG230-031		0.03~0.6			Латунь, бронза	Есть
ISG131-030	ISG231-030		0.03~0.4			Нерж.сталь	Нет
ISG131-031	ISG231-031		0.03~0.6			Нерж.сталь	Есть
ISG190-030	ISG290-030	-7~ -100кПа	7~53кПа	0.5	2кПа	Латунь, бронза	Нет
ISG191-030	ISG291-030					Латунь, бронза	Есть
2751-203	2761-203	0.5 ~ 4.0	0.1 ~ 1.5	5.0		Латунь, бронза	Нет
2752-203	2762-203					Латунь, бронза	Есть
2751-1203	2761-1203					Нерж.сталь	Нет
2752-1203	2762-1203					Нерж.сталь	Есть

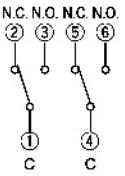
Электрические клеммы

Стандартное исполнение
1Н.З. + 1Н.0.



При срабатывании
1-2= замыкается
3-4= размыкается

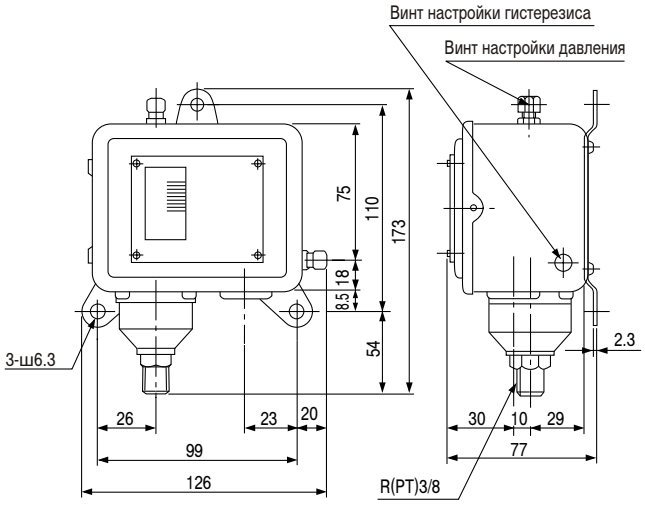
Две группы
Н.З. + Н.0. контактов
(по запросу)



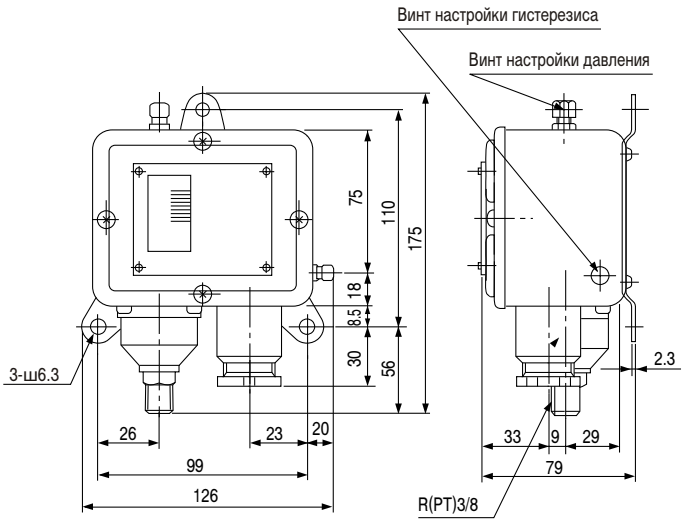
При срабатывании
1-3 4-6= замыкается
1-2 4-5= размыкается

Размеры

Открытый тип (без гистерезисной шкалы)



Брызгозащитное исполнение (без гистерезисной шкалы)



Реле перепада давления

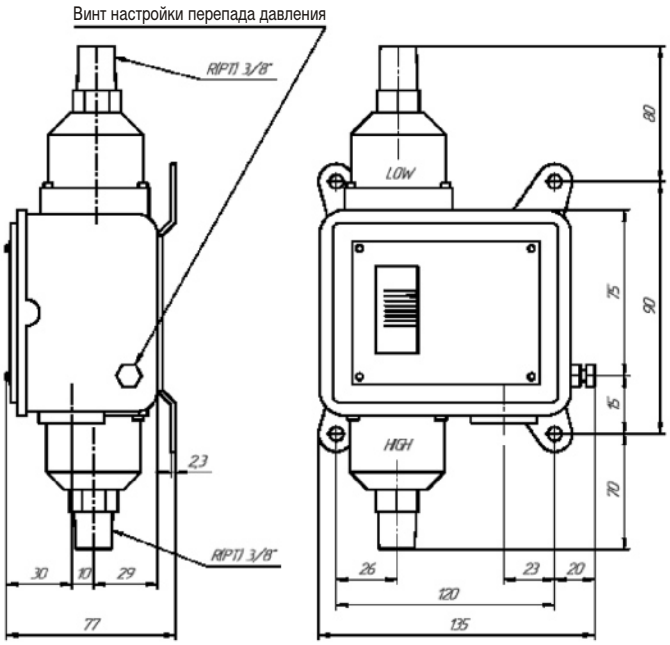
OPL-550

Предназначено для контроля перепада давления рабочей жидкости или сжатого воздуха.

Технические характеристики

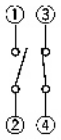
Номер для заказа	Диапазон рабочих давлений (МПа)	Настраиваемый диапазон давлений (МПа)	Испыт. давление (МПа)	Материалы, контактирующие со средой	Присоединение
OPL-550-1	0 ~ 0.3	0.03 ~ 0.2	1.5	Бронза	R 3/8
OPL-550-2	0.01 ~ 0.5	0.03 ~ 0.25			
OPL-550-3	0.02 ~ 0.5	0.04 ~ 0.3	3.0		
OPL-550-4	0.02 ~ 0.7	0.03 ~ 0.35	2.0		
OPL-550-1S	0 ~ 0.3	0.03 ~ 0.2	1.5	Нерж.сталь	
OPL-550-2S	0.01 ~ 0.5	0.03 ~ 0.25			
OPL-550-3S	0.02 ~ 0.5	0.04 ~ 0.3	3.0		
OPL-550-4S	0.02 ~ 0.7	0.03 ~ 0.35	2.0		

Размеры



Электрические клеммы

Стандартное
исполнение
1Н.О. + 1Н.З.



При срабатывании
①-②= замыкается
③-④= размыкается

Электронное реле давления/вакуума

PS1000/1100

Предназначено для контроля давления сжатого воздуха.

- Компактная конструкция, небольшой вес (5 грамм без кабеля).
- 2-х проводное исполнение (возможно как PNP, так и NPN подключение).
- Простой монтаж с помощью быстроразъемного соединения.
- Широкий диапазон установки давления от -0.1 до 0.45 МПа.
- Встроенный Индикатор.

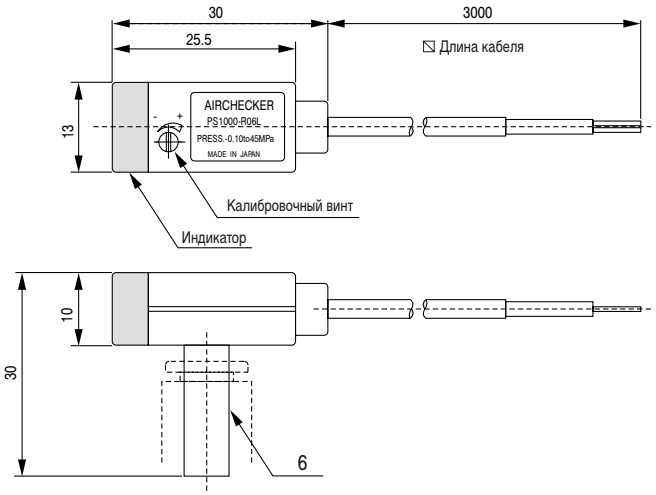
PS1000
для положительного давления

PS1100
для вакуума

Технические характеристики

Номер для заказа	PS1000-R06L	PS1100-R06L
Среда	Сжатый воздух	
Выход	ВКЛ, когда текущее давл. установленного уровня давления	ВКЛ, когда текущее давл. установленного уровня давления
Максимальное давление (МПа)	1.0	
Диапазон рабочих давлений (МПа)	- 0.1 ~ 0.45	- 0.1 ~ 0.4
Рабочая температура (С)	0 ~ 60	
Влияние температуры	± 3% (от полного диапазона)	
Воспроизводимость	± 1% (от полного диапазона)	
Гистерезис	4% (от полного диапазона)	
Напряжение питания	12 ~ 24V DC (колебания напряжения 10%)	
Ток нагрузки (мА)	5 ~ 50	
Ток утечки (мА)	1	
Внутр. падение напряжения (В)	5	
Напряжение пробоя изоляции	Между любым контактом и корпусом не хуже 1000V AC, 50/60 Гц в течение 1 мин.	
Сопротивление изоляции	Между любым контактом и корпусом 2 МОм (при 500V DC)	
Устойчивость к вибрации	10 ~ 500 Гц с амплитудой до 1.5 мм с ускорением 98 м/с^2 и с малыми амплитудами в трех измерениях длительностью до 2 часов	
Устойчивость к ударам	Допускается 980 м/с^2 в трех измерениях, не более 3 раз в каждом	
Присоединение	Переходник под быстроразъемное соединение 6	
Степень защиты	IP40	
Кабель	Маслостойкий 2-х проводной кабель 2.55, сечение жил 0.184мм^2, длина 3м	
Индикация	Зеленый светодиод загорается при активизации выхода	
Вес (г)	5 (без кабеля)	

Размеры

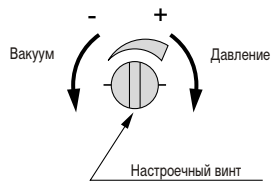


Электронное реле давления/вакуума
PS1000/1100

Настройка и подключение

Калибровка датчика

- Используйте калибровочный винт для установки давления
- Поверните по часовой стрелке для увеличения давления срабатывания



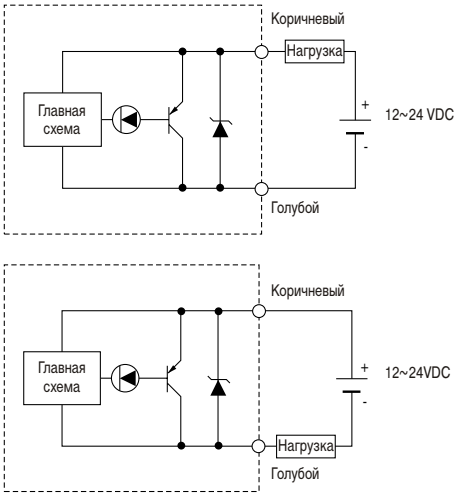
Настроечный винт (триммер)

Угол поворота триммера 220°
Специальный стопор препятствует повороту винта дальше установленного предела. Поворот дальше стопора может привести к повреждению винта.

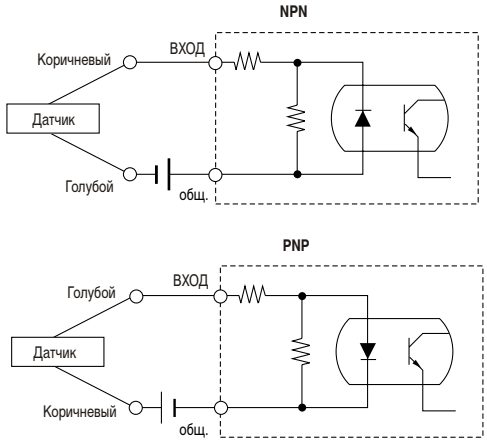
Характеристики датчика

Внутренняя схема/подключение

Схема подключения



Пример подключения к контроллеру



LED Readout

Digital Pressure Switch

Series ZSE4E

(For vacuum)

ISE4E

(For positive pressure)

For General Pneumatics

Push-button calibration with easy to read LED Readout.

Auto preset function

By pressing the set button, the sensor response to air fluctuations, calculates an average and the switch displays the calculated pressure.

Two independent outputs

Allows the calibration of 2 different setpoints. (e.g. Change of vacuum pad size requiring different setpoints or two different supply pressures requiring different pressure confirmation points.)

Choice of display units

Display units can be easily selected and changed, making these switches globaly acceptable.

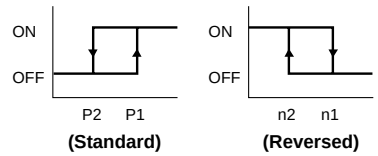
Vacuum	**kPa ⇔ mmHg ⇔ PSI ⇔ bar ⇔ InHg ⇔ kgf/cm²**
Positive press. (High)	**MPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**
Positive press. (Low)	**kPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**

Lock out mode

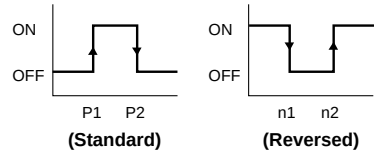
Prevents unauthorized changes to the calibration parameters.

Variety of switch output modes

Hysteresis mode



Window comparator mode



Exact detection of atmospheric pressure (For vacuum)

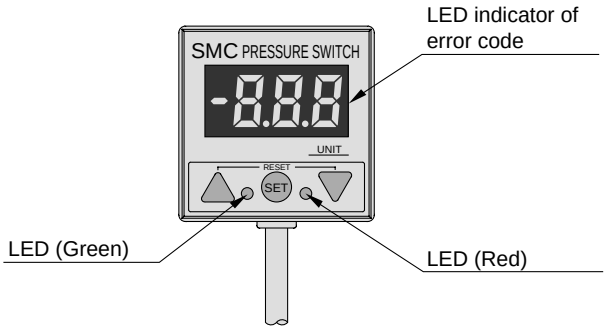
Atmospheric pressure can be immediately detected after vacuum release pressure is applied.

Self-diagnostic function

■**Over-voltage**

■**Over-pressure**

■**Data error**



Calibration data

The calibration data is stored in an EEPROM. The EEPROM is rated to keep its memory for 100,000 hours (approx. 11 years) without having power supplied.

Panel mounting available

A special adaptor permits panel mounting.

Dust/Splash proof cover (Optional)

Refer to the p.3.2-21 to 3.2-24.

How to Order

Setting pressure range

—	–0.1 to 1MPa
L	–10 to 100kPa

Positive pressure **ISE4 □ E □ — □ — □ □**

Vacuum **ZSE4 E □ — □ — □ □**

Style

—	Standard
D*	Dust/Splash proof

*Refer to p.3.2-24 for the dust/splash proof specifications(IP66).

Lead wire length (Grommet)

—	0.6m
L	3m

Port size

01	R 1/8
T1	NPTF 1/8

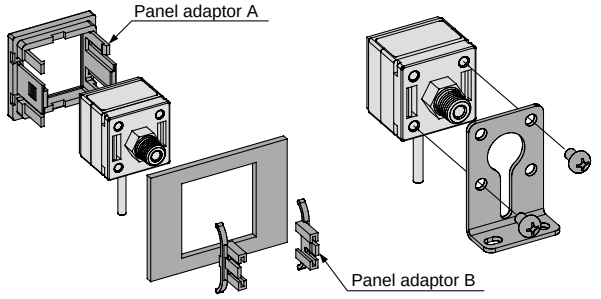
Note) Standard: M5 x 0.8 (Female)

Output specifications

26	Analog output (1 to 5V)
27	NPN Open collector/2 outputs
67	PNP Open collector/2 outputs

Panel mount adaptor No.
(Panel adaptor A + Panel adaptor B)
ZS-22-A
Panel adaptor A ·····ZS-22-01
Panel adaptor B ·····ZS-22-02

Bracket No.
(With two M4 mounting threads)
ZS-22-B



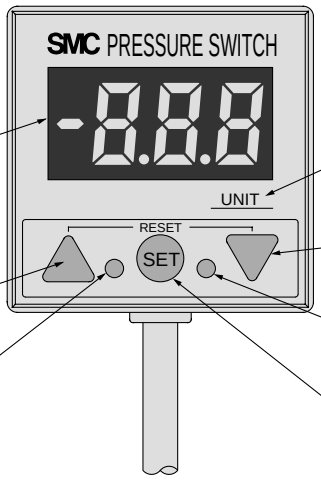
Specifications

Model		Vacuum ZSE4E	Positive pressure: 100kPa ISE4LE	Positive pressure: 1MPa ISE4E
Operating pressure		10 to –101kPa	–10 to 100kPa	–0.1 to 1MPa
Max. pressure		200kPa		1.0MPa
Min. display unit	kPa	1	1	–
	MPa	–	–	0.01
	mmHg	5	–	–
	kgf/cm²	0.01	0.01	0.1
	InHg	0.2	–	–
	PSI	0.1	0.1	1
	bar	0.01	0.01	0.1
Indicator light		ON: When Green (LED: OUT1 or Red: OUT2) turns on		
Frequency response		200Hz (5ms)		
Hysteresis	Hysteresis mode	Adjustable (Setting available from Hysteresis 0)		
	Window comparator mode (1)	Fixed (3 digits)		

Fluid	Air, Non corrosive gases
Temperature characteristics	±3% F.S. or less
Repeatability	±1% F.S. or less
Supply voltage	12 to 24V DC (Ripple ±10% or less)
Output specification	NPN open collector 30V, 80mA or less PNP open collector 80mA or less
Current consumption	–26, –27: 50mA or less, –67: 60mA or less
Error display	Green/Red light blinks. Display the error code on LED.
Pressure display	3 1/2 digits (8mm-size numerals)
Self diagnostic function	Over current(2), Over pressure, Data error, Pressure applied during zero out
Operating temperature range	0 to 50°C (No condensation)
Noise resistance	500Vp-p, Pulse width: 1μS, Standing: 1nS
Voltage resistance	Between external terminals and housing 1000V AC, 50/60Hz for 1 min.
Insulation resistance	Between external terminals and housing 2MΩ(500V DC by megameter)
Vibration resistance	10 to 500Hz Pulse width 1.5mm or acceleration 98 m/s^2 (smaller vibrations) to X, Y, Z directions (2 hrs)
Shock resistance	980 m/s^2 to X, Y, Z direction (3 times for each direction)
Lead wire	Grommet oil-resistant vinyl cabtire code -26 ø3.4 0.2 mm^2 3 core, -27, -67 ø35 0.14 mm^2 4 core
Weight(3)	Standard: 45g(including 0.6m-long lead wire), Dust/Splash proof: 110g
Port size	01: R(PT)1/8, M5 X 0.8 T1: NPTF1/8, M5 X 0.8
Protective construction(3)	Standard: IP40, Dust/Splash proof: IP66

Note 1) ●Window comparator mode:
The hysteresis is 3 digits, separate P1 from P2 by 7 digits or more and set them.
1 digit is the minimum pressure display unit. (See the table above.)
Note 2) ●Analog output has no overcurrent detection function.
Note 3) ●Refer to the p.3.2-21 to 3.2-24 for the details about the dust/splash proof specifications.

Description



RESET key

Press the UP and DOWN buttons simultaneously to reset the switch. Clears abnormalities. Display is "0".

LED

Displays mode.
Displays present pressure.
Displays error code.

UP key

Increases ON/OFF set point.
Switches to the peak holding mode.

LED (Green)

Displays switch operation condition at OUT1. Blinks on and off when an error occurs.

UNIT

After selecting a unit, place a unit sticker here.

DOWN key

Decreases ON/OFF set point.
Used for unit change and output mode change.

LED (Red)

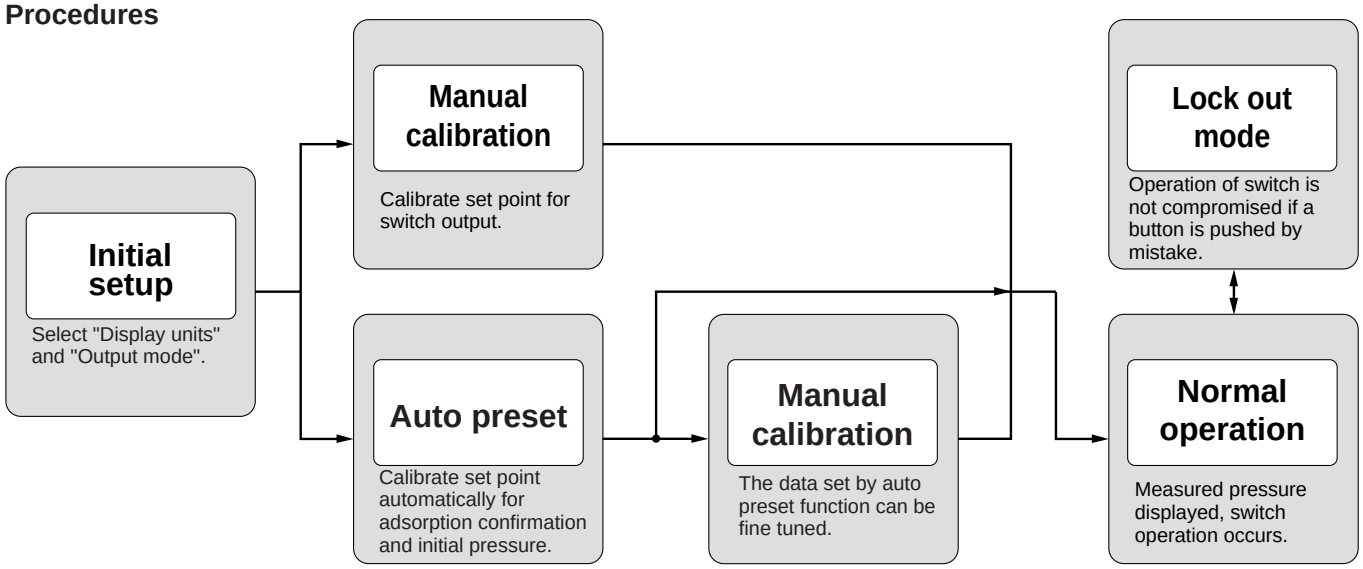
Displays switch operation condition at OUT2. Blinks on and off when an error occurs.

SET key

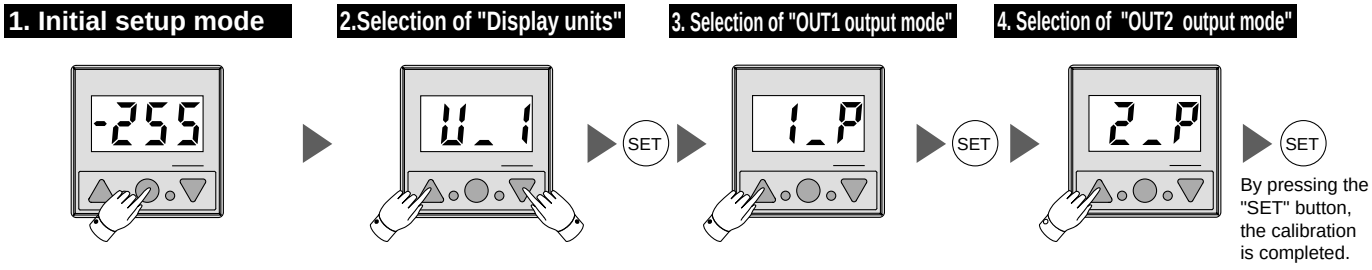
Changes the mode of operation.

Calibration Procedures

Procedures



Initial setup



Press the "SET" button for 1 to 2 seconds until "U_□"is displayed.

Select "Display units" by pressing the ▲ button or the ▼ button.

U_□ └ Units

(Refer to **Table1**.)

Select "OUT1 output mode" by pressing the ▲ button.

1_P: Normal mode

1_n: Reversed output mode

(Refer to **Table2**.)

Select "OUT2 output mode" by pressing the ▲ button.

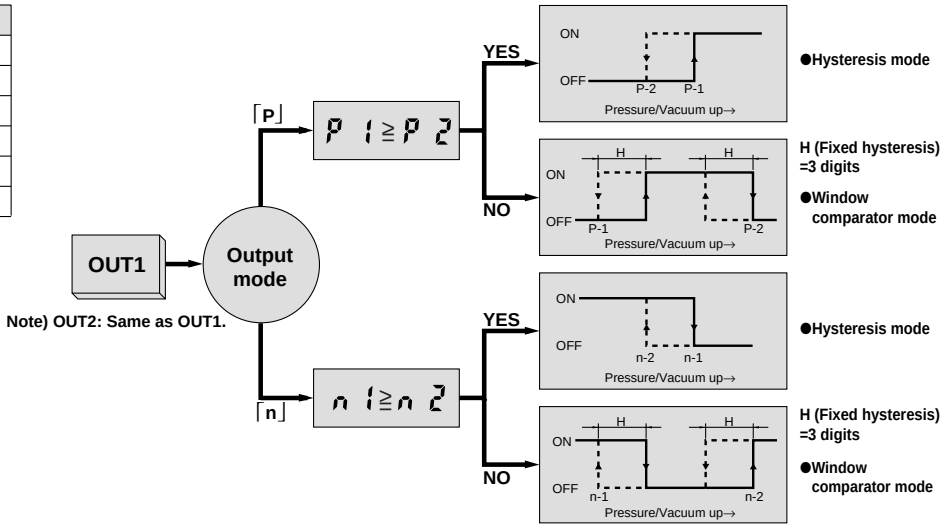
2_P: Normal mode

2_n: Reversed output mode

Table1

No.	ZSE4E	ISE4LE	ISE4E
1	kPa	kPa	MPa
2	kgf/cm^2	kgf/cm^2	kgf/cm^2
3	bar	bar	bar
4	PSI	PSI	PSI
5	InHg	——	——
6	mmHg	——	——

Table2 Output mode



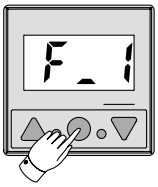
Calibration Procedures

Manual calibration

1. Calibration value input mode (Manual)

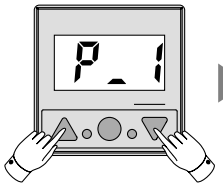
Press the "SET" button until "F_1" is displayed.

2.Preparation of manual setting



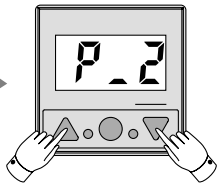
"F_1" is for manual setting, so press the "SET" button one more time.

3.Input set point value for OUT1(1)



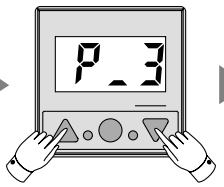
▲ button: Increase set point value
▼ button: Decrease set point value
"P_1" alternates with set point value.

4. Input set point value for OUT1(2)



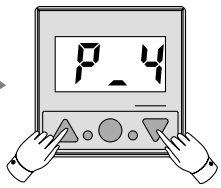
▲ button: Increase set point value
▼ button: Decrease set point value
"P_2" alternates with set point value.

5. Input set point value for OUT2(1)



▲ button: Increase set point value
▼ button: Decrease set point value
"P_3" alternates with set point value.

6. Input set point value for OUT2(2)

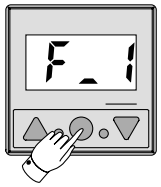


▲ button: Increase set point value
▼ button: Decrease set point value
"P_4" alternates with set point value.

By pressing the "SET" button, the calibration is completed.

Auto preset (In case of the adsorption confirmation)

1. Calibration value input mode



Press the "SET" button until "F_1" is displayed.

2. Auto preset mode

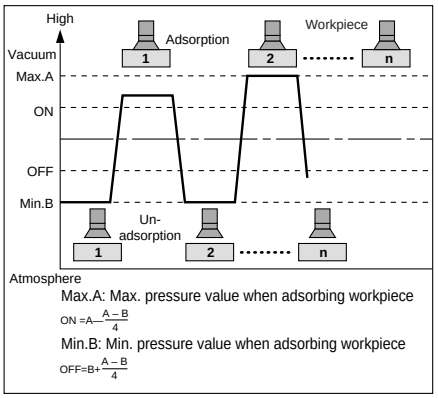
Select "F_2" by pressing the ▲ button.

3.Preparation for auto preset

When the initial condition for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT1.)

4. OUT1 auto preset

Repeat the steps of adsorption and no adsorption several times. This will set the best values automatically.



Max.A: Max. pressure value when adsorbing workpiece

$ON = A - \frac{A-B}{4}$

Min.B: Min. pressure value when adsorbing workpiece

$OFF = B + \frac{A-B}{4}$

5. Preparation for auto preset

After pressing, OUT1 auto preset is completed.

When the initial conditions for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT2.)

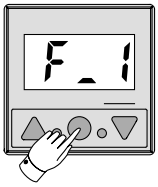
6. OUT2 auto preset

After pressing the "SET" button, OUT2 auto preset is completed.

Repeat the steps of adsorption and no adsorption several times. This will set the best values automatically.

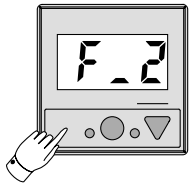
Auto preset (In case of the initial pressure confirmation)

1. Calibration value input mode



Press the "SET" button until "F_1" is displayed.

2. Auto preset mode



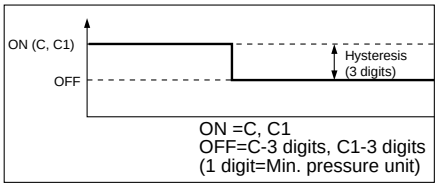
Select "F_2" by pressing the ▲button.

3. Preparation for auto preset

When the initial conditions for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT1.)

4. OUT1 auto preset

The best values can be set automatically.



5. Preparation for auto preset

OUT1 auto preset is complated.

When the initial conditions for adsorption confirmation are met, press the "SET" button.
(Press the ▲ button and ▼ button at once when it is not required to calibrate OUT2.)

6. OUT2 auto preset

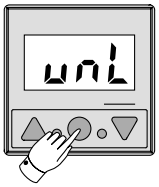
The best values can be set automatically.

After pressing the "SET" button, OUT2 auto preset is completed.

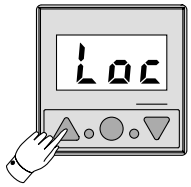
Other functions

●**Lock out mode** ---------- **Prevents the wrong operation.**

Lock out



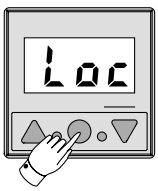
Press the "SET" button for more than 2 seconds until the display changes to "F_1 U_1" and then "unL".



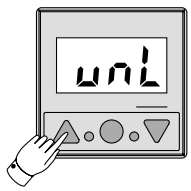
Select "Loc" by pressing the ▲ button.

Calibration is completed.

Lock out release



Press the "SET" button for more than 2 seconds until is displayed.



Select "unL" by pressing the ▲ button.

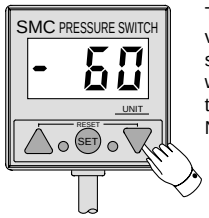
Calibration is completed.

Other Functions

●Peak Mode High

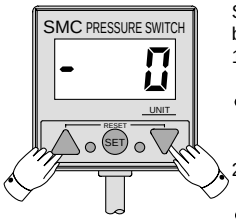
To display the high peak pressure (highest degree of vacuum), press the UP button for at least 1 second during normal operation. The LED indicator will blink. To return back to normal operation press the UP button for at least 1 second again.
Note) There is no "High" or "Low" indication on the display.

●Peak Mode Low



To display the low peak pressure (lowest degree of vacuum), press the DOWN button for at least 1 second during normal operation. The LED indicator will blink. To return back normal operation, press the DOWN button for at least 1 second again.
Note) There is no "High" or "Low" indication on the display.

●Reset Function



Simultaneously pressing the UP and DOWN button will reset the switch.
1) Reset will cause the following during normal operation:
- ●Peak high is cleared.
  Peak low is cleared.
  Zero is reset.

2) Reset will cause the following when error has occured:
- ●Switch will assume normal operation (all calibration data has retained).
- ●In case of data error, reset the setup mode and then switch will assume normal operation.

Note) In the setup mode, the reset function does not work.

Error Codes

Error codes

Display	Cause	Solution
Er 4	Calibration was changed by accident, reason unknown.	Push the Up and Down buttons to reset all the data.
Er 1 (1)	Output 1 output current is exceeding 80mA.	Turn off the power and verify the load connected output 1.
	Output 1 (Back wire) could be shorted out.	Verify that the output is not shorted out and then reset the switch.
Er 2 (1)	Output 2 output current is exceeding 80mA.	Turn off the power and verify the load connected output 2.
	Output 2 (white wire) Could be shorted out.	Verify that the output is not shorted out and then reset the switch.
Er 3	Max. operating pressure has been exceeded for more than 2 seconds. 1.5 X Max. operating prss. for pressure switch.0.5MPa (72psi) for vacuum switch.	Reduce the supply pressure to below the max. pressure rating and then reset the switch.
- - - -	When zeroing out the gauge, pressure differences ±0.07MPa for ISE4E and ±7kPa for ZSE4E have occured.	Apply atmospheric pressure and then reset the switch.

Note 1) Does not apply to Analog output.

⚠ Precautions

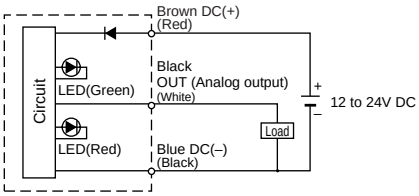
Be sure to read before handling. Refer to p.0-26 and 0-27 for Safety Instructions and common precautions on the products mentioned in this catalog, and refer to p.3.0-7 to 3.0-9 for precautoins on every series.

Internal Circuit and Wiring

Lead wire colors inside ( ) are those prior to conformity with IEC standards

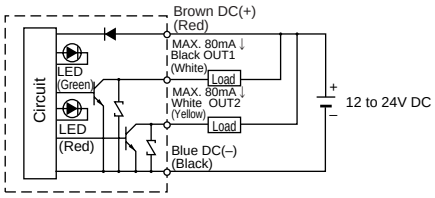
-26
Analog Output

1 to 5V (±5%F.S.)
Load impedance: 1kΩ



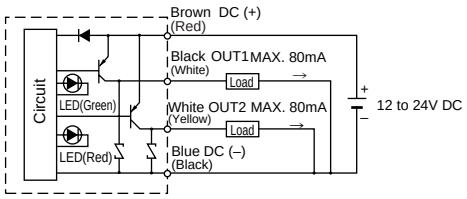
-27
NPN Open Collector

Max.30V, 80mA
Residual voltage:
1V or less



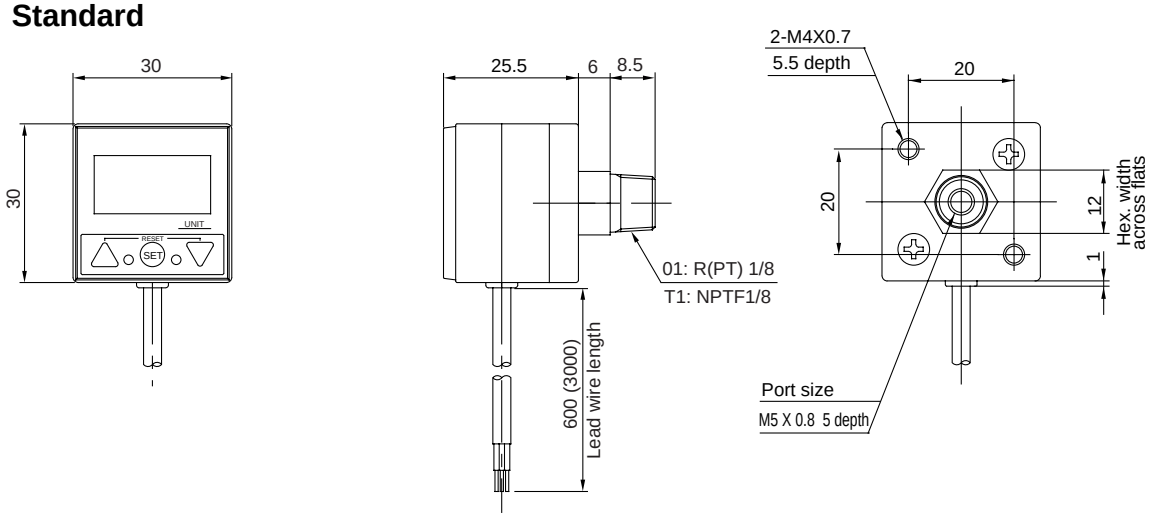
-67
PNP Open Collector

Max.80mA

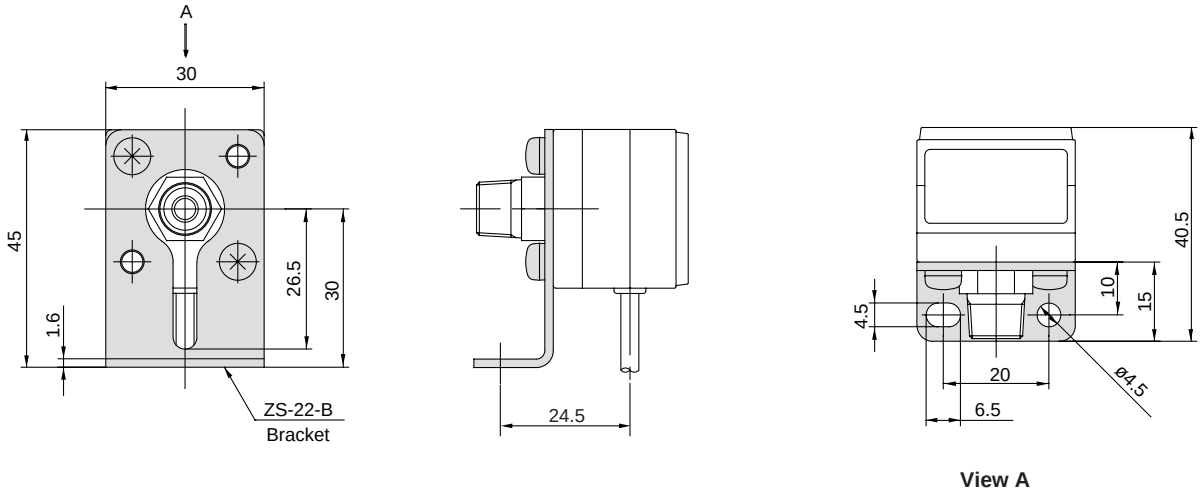


Dimensions

Standard

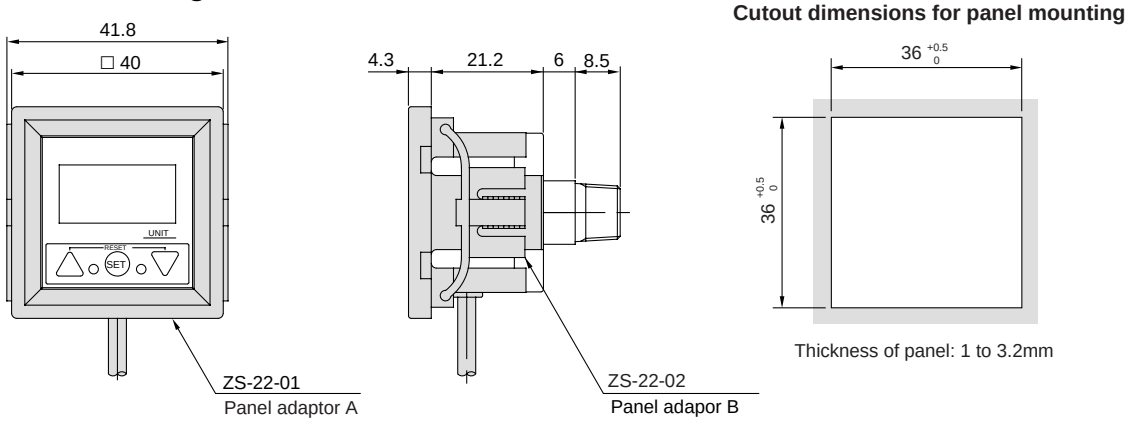


With bracket



View A

Panel mounting



Cutout dimensions for panel mounting

Thickness of panel: 1 to 3.2mm

With Backlight
Digital Pressure Switch
Series ZSE4B
(For vacuum)
ISE4B
(For positive pressure)

The backlight display is easy to read even in the dark.

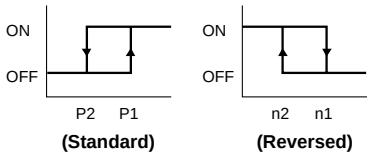
Choice of display units

Display units can be easily selected and changed, making these switches globaly acceptable.

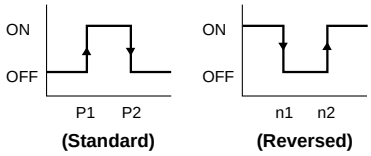
Vacuum	**kPa ⇔ mmHg ⇔ PSI ⇔ bar**
Positive press. (High)	**MPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**
Positive press. (Low)	**kPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**

Variety of switch output modes

Hysteresis mode



Window comparator mode

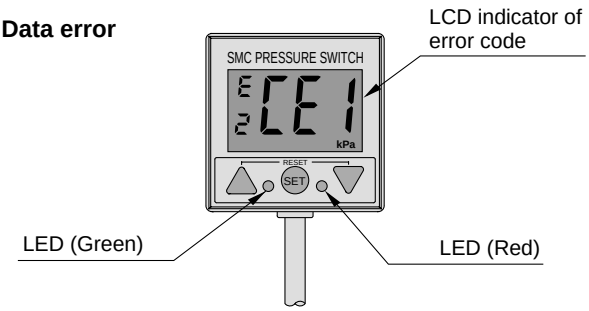


Exact detection of atmospheric pressure (For vacuum)

Atmospheric pressure can be immediately detected after vacuum release pressure is applied.

Self-diagnostic function

- **Over-voltage**
- **Over-pressure**
- **Data error**



Calibration data

The calibration data is stored in an EEPROM. The EEPROM is rated to keep its memory for 100,000 hours (approx. 11 years) without having power supplied.

Panel mounting available.

A special adaptor permits panel mounting.

Dust/Splash proof cover (Optional)

Refer to the p.3.2-21 to 3.2-24.

How to Order

Setting pressure range

—	–0.1 to 1MPa
L	–10 to 100kPa

Positive pressure	ISE4 □ B □ — □ — □ □
Vacuum	ZSE4 B □ — □ — □ □

Style

—	Standard
D*	Dust/Splash proof

*Refer to p.3.2-24 for the dust/splash proof specifications(IP66).

Lead wire length (Grommet)

—	0.6m
L	3m

Port size

01	Rc(PT) 1/8
T1	NPTF 1/8

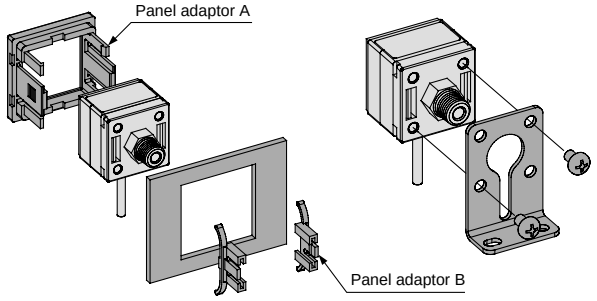
Note) Standard: M5 X 0.8 (Female)

Output specifications

25	NPN Open collector/1 output (Sinking)
26	Analog output (1 to 5V)
65	PNP Open collector/1 output (Sourcing)

Panel mount adaptor No.
(Panel adaptor A + Panel adaptor B)
ZS-22-A
Panel adaptor A ·····ZS-22-01
Panel adaptor B ·····ZS-22-02

Bracket No.
(With two M4 mounting threads)
ZS-22-B



⚠Caution

Be sure to read before handling. Refer to p.0-26 and 0-27 for Safety Instructions and common precautions on the products mentioned in this catalog and refer to p.3.0-7 to 3.0-9 for precautions on every series.

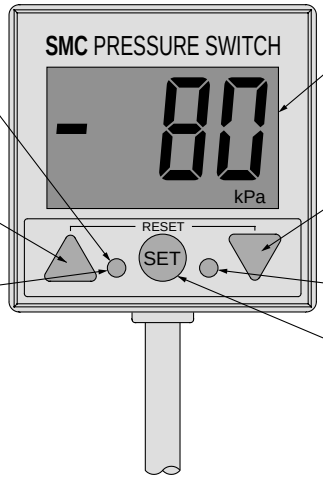
Specifications

Model		Vacuum ZSE4B	Positive pressure: 100kPa ISE4LB	Positive pressure: 1MPa ISE4B
Operating pressure range		10 to –101kPa	–10 to 100kPa	–0.1 to 1MPa
Max. pressure		200kPa		1MPa
Min. display unit	kPa	1	1	–
	MPa	–	–	0.01
	mmHg	5	–	–
	kgf/cm²	–	0.01	0.1
	PSI	0.1	0.1	1
	bar	0.01	0.01	0.1
Indicator light		ON: When Green LED turns on		
Frequency response		200Hz (5ms)		
Hysteresis(1)	Hysteresis mode	Adjustable (3 digits or more)		
	Window comparator mode	Fixed (3 digits)		

Fluid	Air, Non corrosive gases
Temperature characteristics	±3% F.S. or less
Repeatability	±1% F.S. or less
Supply voltage	12 to 24V DC (Ripple ± 10% or less)
Output Specification	NPN Open collector 30V, 80mA or less PNP open collector 80mA or less
Current consumption	45mA or less
Backlight	Yellow-green
Error display	Red light blinks. Display the error code on LCD
Pressure display	3 1/2 digits LCD (10mm-size numerals)
Self-diagnostic function	(Over current(2)), Over pressure, Data error, Pressure during zero out
Operating temperature range	0 to 50°C (No condensation)
Noise resistance	1,000Vp-p, Pulse width: 1μS, Standing: 1nS
Voltage resistance	Between external terminals and housing 1000V AC 50/60Hz for 1 min.
Insulation resistance	Between external terminals and housing 2MΩ (500V DC by megameter)
Vibration resistance	10 to 500Hz Pulse width 1.5mm or acceleration 98 m/s^2 (smaller vibrations) to X, Y, Z direction (2 hrs)
Shock resistance	980 m/s^2 to X, Y, Z direction (3 times for each direction)
Lead wire	Grommet oil-resistant vinyl cabtire code ø3.4 0.2 mm^2 3 core
Weight(3)	Standard: 45g (including 0.6m-long lead wire), Dust/Splash proof: 110g
Port size	01: R(PT) 1/8, M5 X 0.8 T1: NPTF1/8, M5 X 0.8
Protective construction(3)	Standard: IP40, Dust/Splash proof: IP66

Note 1) ●Hysteresis mode: When the values of P1 and P2 are the same or when P1 > P2 within 3 digits, the hysteresis will be automatically 3 digits for the set value of P1.
●Window comparator mode: The hysteresis is 3 digits, so separate P1 from P2 by 7 digits or more and set them. 1 digit is the minimum pressure display unit. (See the table above.)
Note 2) ●Analog output has no overcurrent detection function.
Note 3) ●Refer to p.3.2-21 to 3.2-24 for the details about the dust/splash proof specifications.

Description



RESET key
Press the UP and DOWN buttons simultaneously to reset the switch. Clears abnormalities. Displays "0".

UP key
Increases ON/OFF set point. Switches to the peak holding.

LED (Green)
Displays switch operation condition.

LCD
Displays present pressure. Displays ON/OFF setting value. Displays error code. Displays unit.

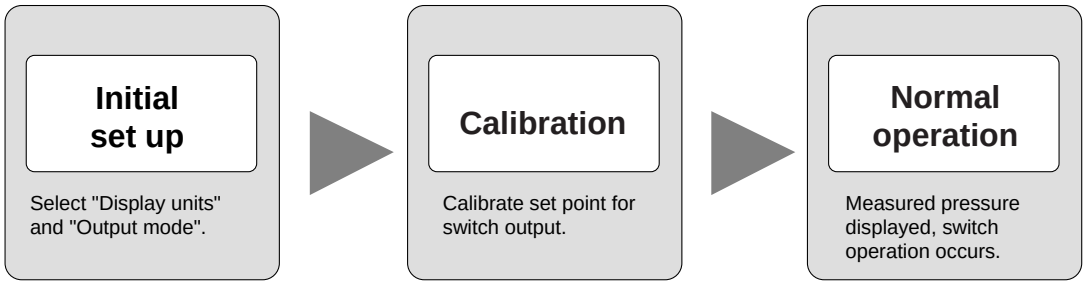
DOWN key
Decreases ON/OFF set point. Used for peak mode low change, unit change and output mode change.

LED (Red)
Blinks on and off when an error occurs.

SET key
Switches the mode. Used for unit change and output mode change by pressing the button for at least 1 second.

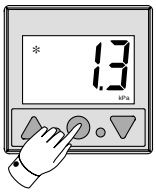
Calibration Procedures

Procedures



Initial setup

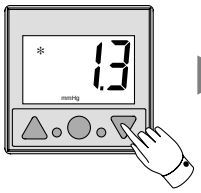
1. Initial setup mode



Press the "SET" button for at least 1 second. "1.3" is displayed and the display blinks.

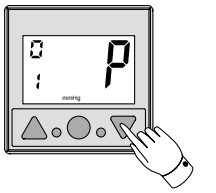
∗) "1.3" is a program version of a micro computer.

2. Selection of "Display units"



Select "Display unit" by pressing the ▼ button.
For
High prss. MPa → kgf/cm² → PSI → bar
Low prss. kPa → kgf/cm² → PSI → bar
For vacuum kPa → mmHg → PSI → bar

3. Selection of "Output mode"

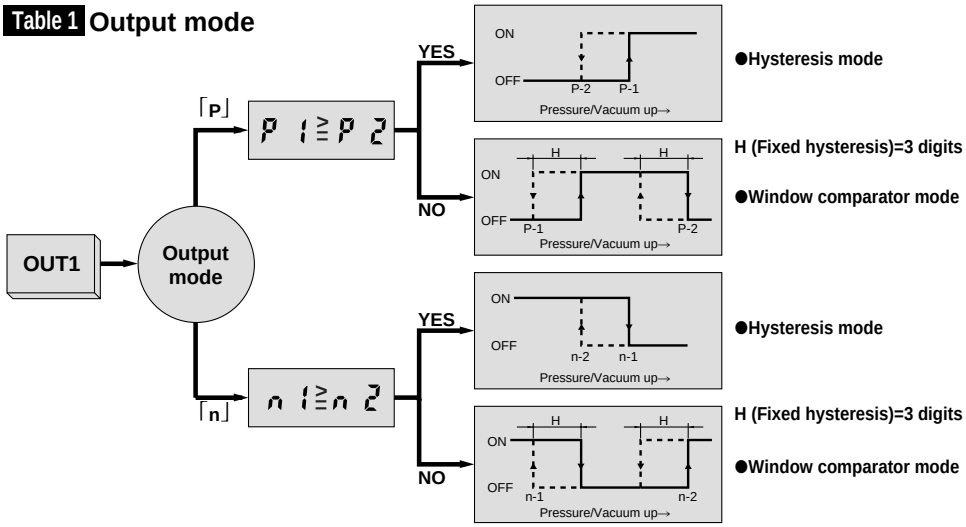


Select "Output mode" by pressing the ▼ button.

P: Normal mode
n: Reversed output mode
(Refer to **Table 1** .)

By pressing the "SET" button, the calibration is completed.

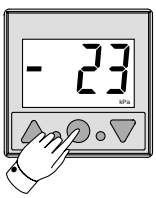
Table 1 Output mode



- ●Hysteresis mode
- H (Fixed hysteresis)=3 digits
- ●Window comparator mode
- ●Hysteresis mode
- H (Fixed hysteresis)=3 digits
- ●Window comparator mode

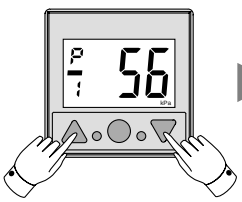
Calibration procedures

1. Set point input mode



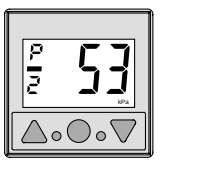
Press the "SET" button.

2. Input set point value (1)



▲ button: Increase set point value
▼ button: Decrease set point value

3. Input set point value (2)



By pressing the "SET" button, the calibration is completed.

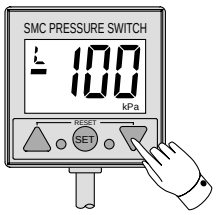
▲ button: Increase set point value
▼ button: Decrease set point value

Other Functions

●Peak Mode High

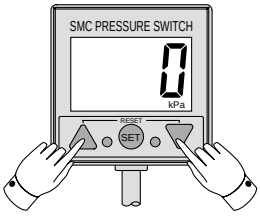
To display the high peak pressure (highest degree of vacuum), press the UP button during normal operation. The LCD displays "H". To return back to normal operation press the UP button again.

●Peak Mode Low



To display the low peak pressure (lowest degree of vacuum), press the DOWN button during normal operation. The LCD displays "L". To return back normal operation, press the DOWN button again.

●Reset Function



Simultaneously pressing the UP and DOWN button will reset the switch.

1) Reset will cause the following during normal operation:
- ●Peak high is cleared.
- Peak low is cleared.
- Zero is reset.

2) Reset will cause the following when error has occured:
- ●Switch will assume normal operation (all calibration data has retained).
- ●In case of data error, reset the setup mode and then switch will assume normal operation.

Note) In the setup mode, the reset function does not work.

Error Codes

Error codes

Display	Cause	Solution
E1 dE	Calibration was changed by accident, reason unknown.	Push the Up and Down buttons to reset all the data.
E2 CE1 (1)	Output 1 output current is exceeding 80mA.	Turn off the power and verify the load connected output 1.
	Output 1 (Back wire) could be shorted out.	Verify that the output is not shorted out and then reset the switch.
E3 PE	Max. operating pressure has been exceeded for more than 2 seconds. 1.5 X Max. operating prss. for pressure switch 0.5MPa (72psi) for vacuum switch	Reduce the supply pressure to below the max. pressure rating and then reset the switch.
E4 HP	When zeroing out the gauge, pressure differences ±0.07MPa for ISE4B and ±7kPa for ZSE4B have occured.	Apply atmospheric pressure and then reset the switch.

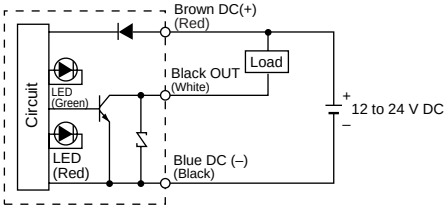
Note 1) Does not apply to Analog output.

Internal Circuit and Wiring

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

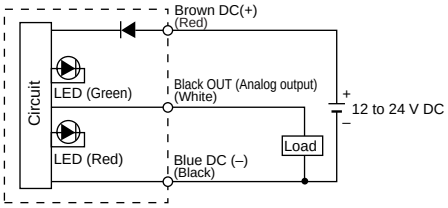
-25
NPN Open Collector

Max.30V, 80mA
Residual voltage:
1V or less



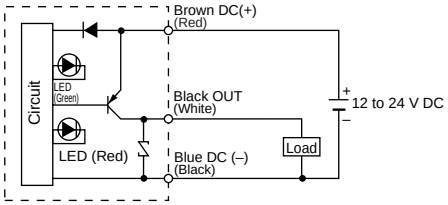
-26
Analog Output

1 to 5V (±5%F.S.)
Load impedance: 1kΩ



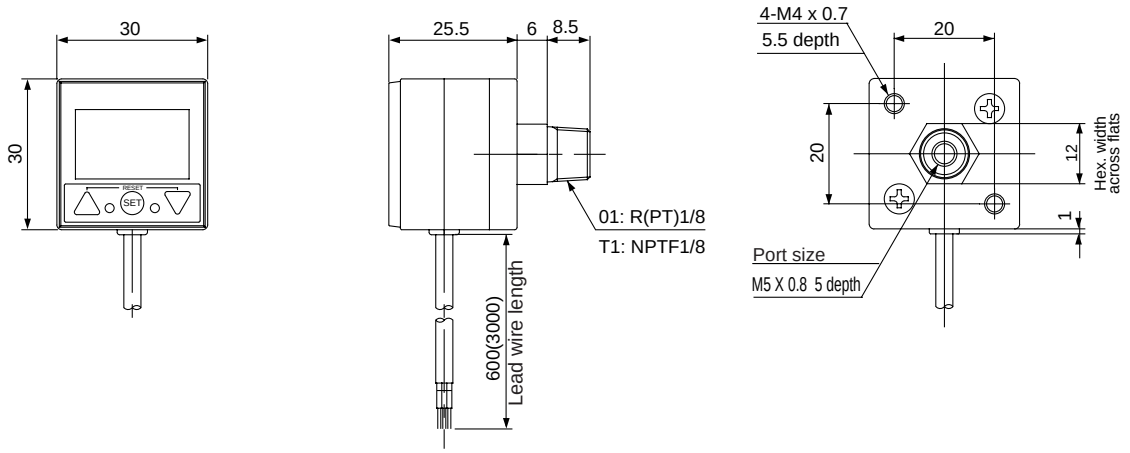
-65
PNP Open Collector

Max.80mA

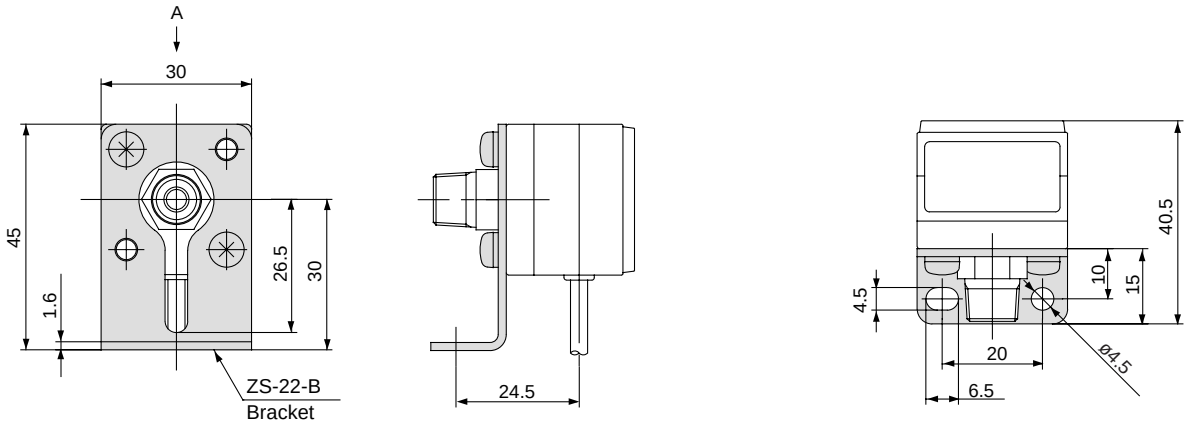


Dimensions

Standard

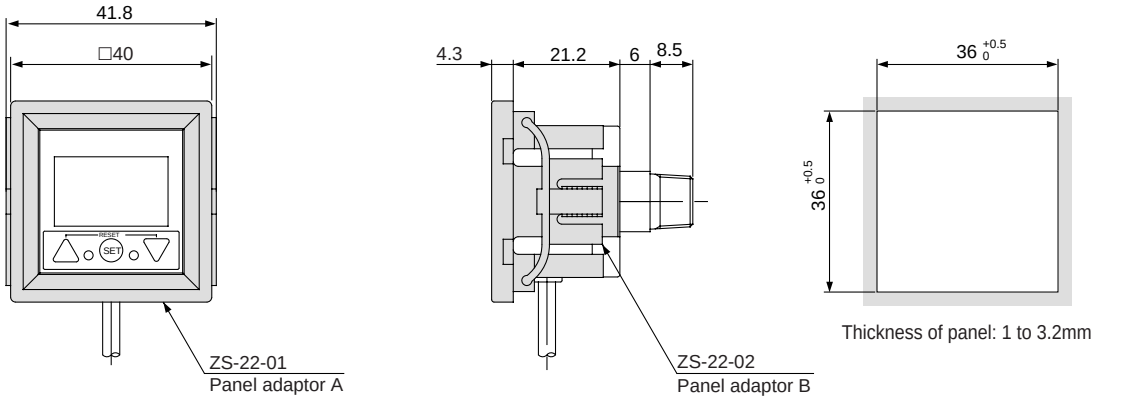


With bracket



View A

Panel mounting



Cutout dimensions for panel mounting

Thickness of panel: 1 to 3.2mm

For General Pneumatics

LCD Readout
Digital Pressure Switch
Series ZSE4
(For vacuum)
ISE4
(For positive pressure)

Digital Readout and
push-button calibration

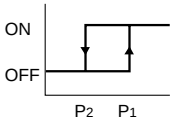
Choice of display units

Display units can be easily selected and changed, making these switches globaly acceptable.

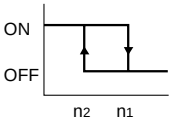
Vacuum	**kPa ⇔ mmHg ⇔ PSI ⇔ bar**
Positive press. (High)	**MPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**
Positive press. (Low)	**kPa ⇔ kgf/cm² ⇔ PSI ⇔ bar**

Variety of switch output modes

Hysteresis mode

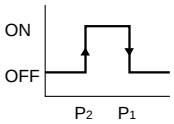


(Standard)

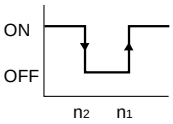


(Reversed)

Window comparator mode



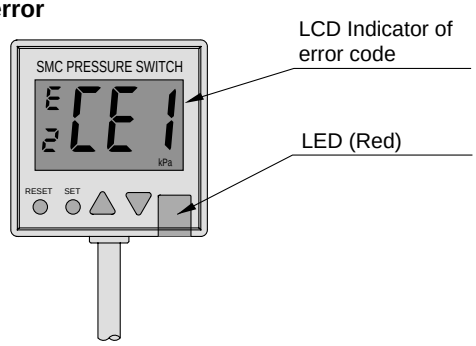
(Standard)



(Reversed)

Self-diagnostic function

- **Over-voltage**
- **Over-pressure**
- **Data error**



Panel mounting available.

A special adaptor permits panel mounting.

Dust/Splash proof cover (Optional)

Refer to the p.3.2-21 to 3.2-24.

Calibration data

The calibration data is stored in an EEPROM. The EEPROM is rated to keep its memory for 100,000 hours (approx. 11 years) without having power supplied.

How to Order

Setting pressure range

—	0 to 1MPa
L	0 to 100kPa

Positive pressure ISE4 □□ – □ – □ □

Vacuum ZSE4 □□ – □ – □ □

Style

—	Standard
D*	Dust/Splash proof

*Refer to p.3.2-22 for the dust/splash proof specifications(IP66).

Lead wire length (Grommet)

—	0.6m
L	3m

Port size

01	Rc(PT) 1/8
T1	NPTF 1/8

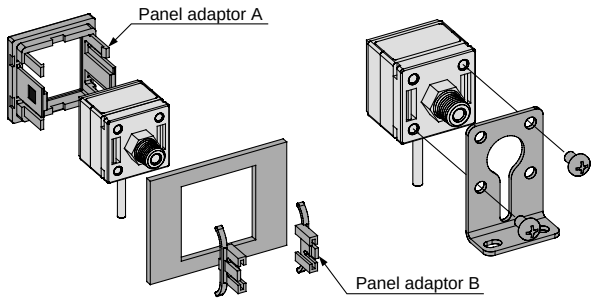
Note) Standard: M5 x 0.8 (Female)

Output specifications

25	NPN Open collector/1output (Sinking)
26	Analog output (1 to 5V)
65	PNP Open collector/1 output (Sourcing)

Panel mount adaptor No.
(Panel adaptor A + Panel adaptor B)
ZS-22-A
Panel adaptor A ·····ZS-22-01
Panel adaptor B ·····ZS-22-02

Bracket No.
(With two M4 mounting threads)
ZS-22-B



⚠Caution

Be sure to read before handling. Refer to p.0-26 and 0-27 for Safety Instructions and common precautions on the products mentioned in this catalog and refer to p.3.0-7 to 3.0-9 for precautions on every series.

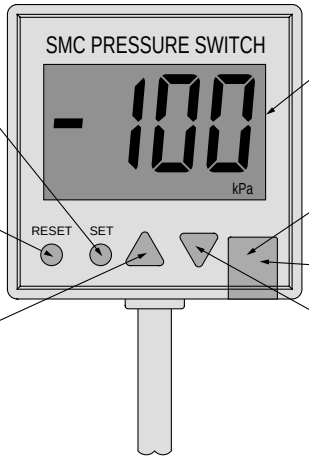
Specifications

Model		Vacuum ZSE4	Positive pressure: 100kPa ISE4L	Positive pressure: 1MPa ISE4
Operating pressure range		0 to –101kPa	0 to100kPa	0 to 1MPa
Max. pressure		200kPa		1MPa
Min.display unit	kPa	1	1	–
	MPa	–	–	0.01
	mmHg	5	–	–
	kgf/cm²	–	0.01	0.1
	PSI	0.1	0.1	1
	bar	0.01	0.01	0.1
Indicator light		ON: When Green LED turns on		
Frequency response		200Hz (5ms)		
Hysteresis(1)	Hysteresis mode	Adjustable (3 digits or more)		
	Window comparator mode	Fixed (3 digits)		

Fluid	Air, Non corrosive gases
Temperature characteristics	±3% F.S. or less
Repeatability	±1% F.S. or less
Supply voltage	12 to 24V DC (Ripple±10% or less)
Output specification	NPN open collector 30V, 80mA or less PNP open collector 80mA or less
Current consumption	25mA or less
Error display	Red light blinks. Display the error code on LCD
Pressure display	3 1/2 digits (10 mm-size numerals)
Self-diagnostic function	(Over current(2)), Over pressure, Data error, Pressure during zero out
Operating temperature range	0 to 50°C (No condensation)
Noise resistance	1000Vp-p, Pulse width: 1μ S·Standing: 1nS
Voltage resistance	Between external terminals and housing 1000V AC 50/60Hz for 1 min.
Insulation resistance	Between external terminals and housing 2MΩ (500V DC by megameter)
Vibration resistance	10 to 500 Hz Pulse width 1.5mm or acceleration 98 m/s^2 (smaller vibrations) to X, Y, Z direction (2 hrs)
Shock resistance	980 m/s^2 to X, Y, Z direction (3 times for each direction)
Lead wire	Grommet oil-resistant vinyl cabtire code ø3.4 0.2 mm^2 3 core
Weight	Standard: 40g (including 0.6m-long lead wire), Dust/Splash proof: 110g
Port size(2)	01: R(PT)1/8, M5 X 0.8 T1: NPTF1/8, M5 X 0.8
Protective construnction(3)	Standard: IP40, Dust/Splash proof: IP66

Note 1) ●Hysteresis mode: When the values of P1 and P2 are the same or when P1>P2 within 3 digits, the hysteresis will be automatically 3 digits for the set value of P1.
●Window comparator mode: The hysteresis is 3 digits, so separate P1 from P2 by 7 digits or more and set them. 1 digit is the minimum pressure display unit. (See the table above.)
Note 2) ●Analog output has no overcurrent detection function.
Note 3) ●Refer to p.3.2-21 to p.3.2-24 for the details about the dust/splash proof specifications.

Description



SET key
Switches the mode. Used for unit change and output mode change by pressing the button for at least 1 second.

RESET key
Clears abnormalities. Displays "0".

UP key
Increases ON/OFF set point. Switched to peak mode high by pressing the key during normal operation.

LCD
Displays present pressure.
Displays ON/OFF setting value.
Displays error code.
Displays unit.

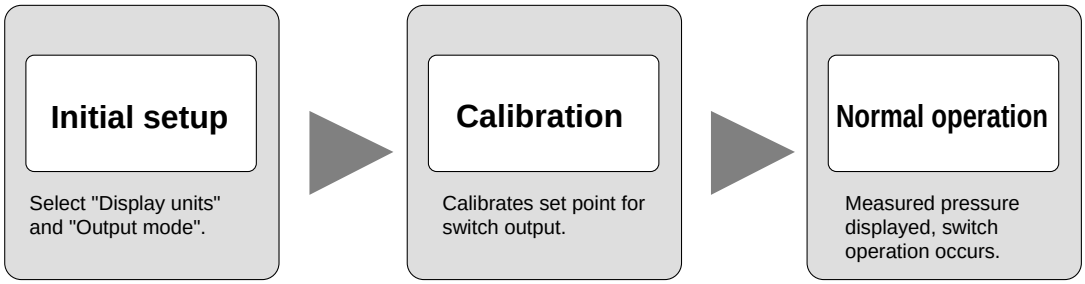
LED (Green)
Displays OUT1 operation condition.

LED (Red)
Blinks on and off when an error occurs.

DOWN key
Decreases ON/OFF set point. Switched to peak mode low by pressing the key during normal operation. Used for unit change and output mode change.

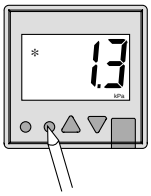
Calibration Procedures

Procedures



Initial setup

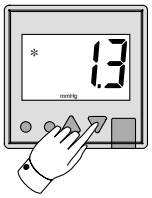
1. Initial setup mode



Press the "SET" button for at least 1 second. "1.3" is displayed and the display blinks.

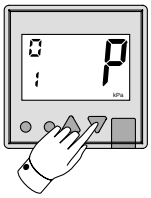
∗) "1.3 " is a program version of micro computer.

2. Selection of "Display unit"



Select "Display unit" by pressing the ▼ button.
For
High prss. MPa → kgf/cm² → PSI → bar
Low prss. kPa → kgf/cm² → PSI → bar
For vacuum kPa → mmHg → PSI → bar

3. Selection of "Output mode"

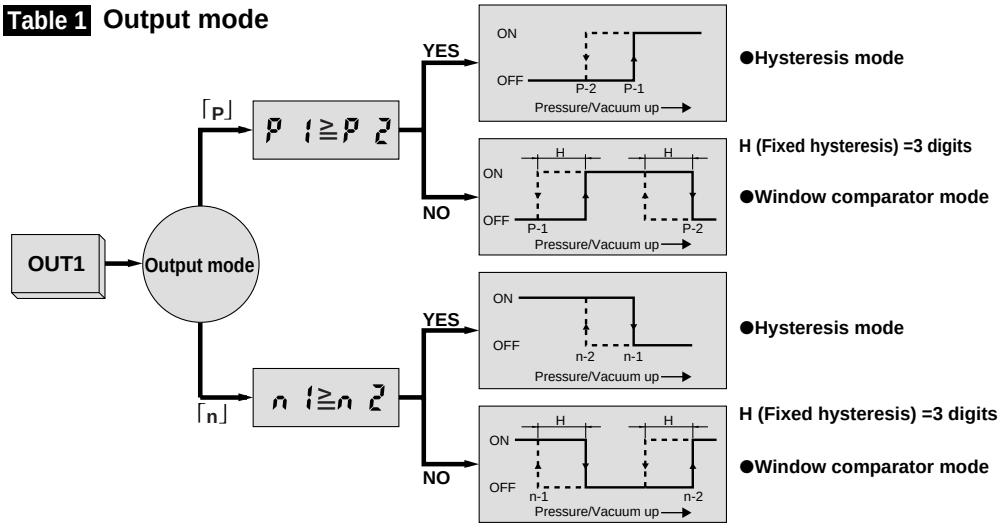


Select "Output mode" by pressing the ▼ button.

P: Normal mode
n: Reversed output mode
(Refer to **Table 1**.)

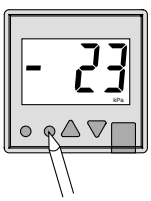
By pressing the "SET" button, the calibration is completed.

Table 1 Output mode



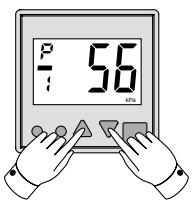
Calibration procedures

1. Set point value input mode



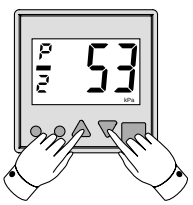
Press the "SET" button.

2. Input set point value (1)



▲ button: Increase set point value
▼ button: Decrease set point value

3. Input set point value (2)

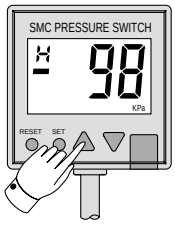


▲ button: Increase set point value
▼ button: Decrease set point value

By pressing the "SET" button, the calibration is completed.

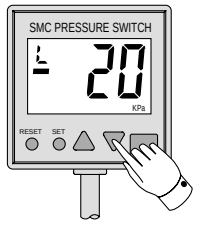
Other Functions

●Peak Mode High



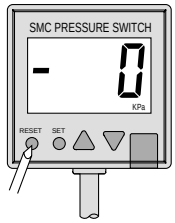
To display the high peak pressure (highest degree of vacuum), press the UP button during normal operation. The LCD displays "H". To return back to normal operation press the UP button again.

●Peak Mode Low



To display the low peak pressure (lowest degree of vacuum), press the DOWN button during normal operation. The LCD displays "L". To return back normal operation, press the DOWN button again.

●Reset Function



Simultaneously pressing the UP and DOWN button will reset the switch.

1) Reset will cause the following during normal operation:
- Peak high is cleared.
  Peak low is cleared.
  Zero is reset.

2) Reset will cause the following when error has occured:
- Switch will assume normal operation (all calibration data has retained).
- In case of data error, reset the setup mode and then switch will assume normal operation.

Note) In the setup mode, the reset function does not work.

Error Codes

Error codes

Display	Cause	Solution
dE	Calibration was changed by accident, reason unknown.	Push RESET to reset all the data.
CE1 (1)	Output 1 output current is exceeding 80mA.	Turn off the power and verify the load connected output 1.
	Output 1 (Black wire) could be shorted out.	Verify that the output is not shorted out and reset the switch.
PE	Max. operating pressure has been exceeded for more than 2 seconds.1.5 x Max.operating prss. For pressure switch 0.5MPa (72psi) for vacuum switch	Reduce the supply pressure to below the max. pressure rating and then reset the switch.
HP	When zeroing out the gauge, pressure differences ±0.07MPa for ISE4 and ±7kPa for ZSE4 have occured.	Apply atmospheric pressure and then reset the switch.

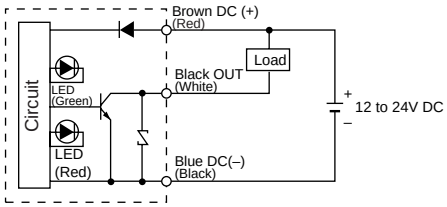
Note 1) Does not apply to Analog output.

Internal Circuit and Wiring

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

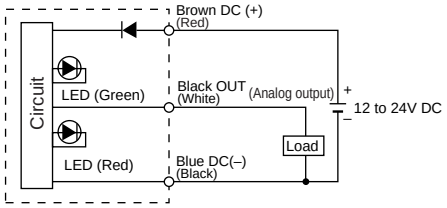
-25
NPN Open Collector

Max.30V, 80mA
Residual voltage:
1V or less



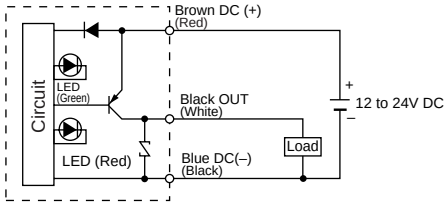
-26
Analog Output

1 to 5V (±5%F.S.)
Load impedance: 1kΩ



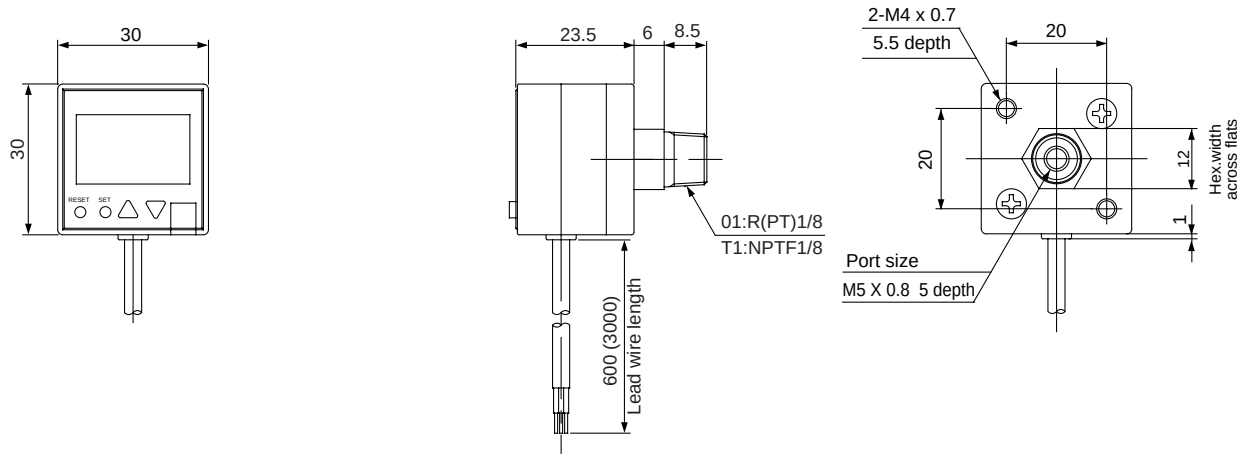
-65
PNP Open Collector

Max.80mA

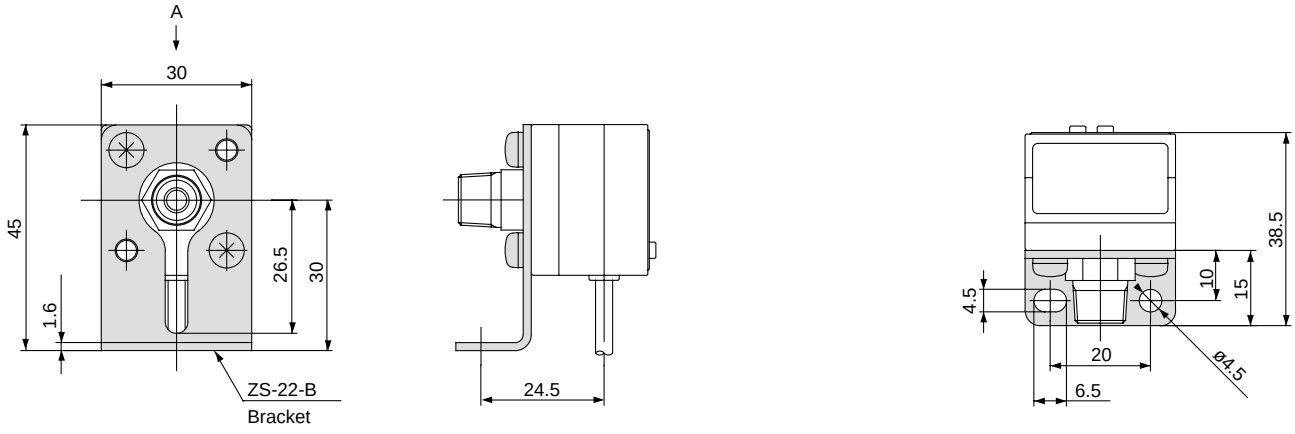


Dimensions

Standard

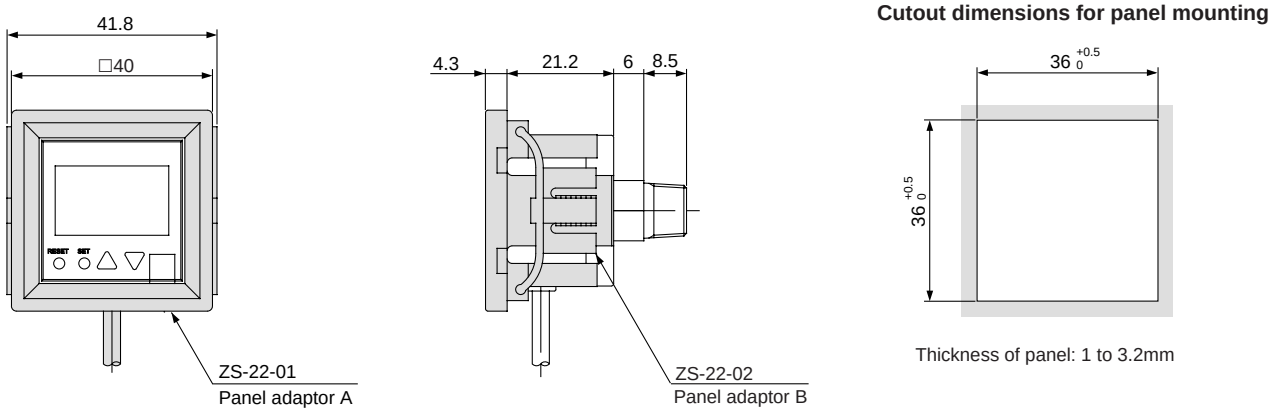


With bracket



View A

Panel mounting



Cutout dimensions for panel mounting

Thickness of panel: 1 to 3.2mm

Dust/Splash Proof (IP66)
Digital Pressure Switch
Series ZSE4□D
(For vacuum)
ISE4□□D
(For positive pressure)

For applications in adverse environments where water/dust are present.

ZSE4E/ISE4E
ZSE4B/ISE4B
ZSE4/ISE4

Dust/Splash proof specification is available on all the standard models.

(Refer to pages of every series for detailed functions.)

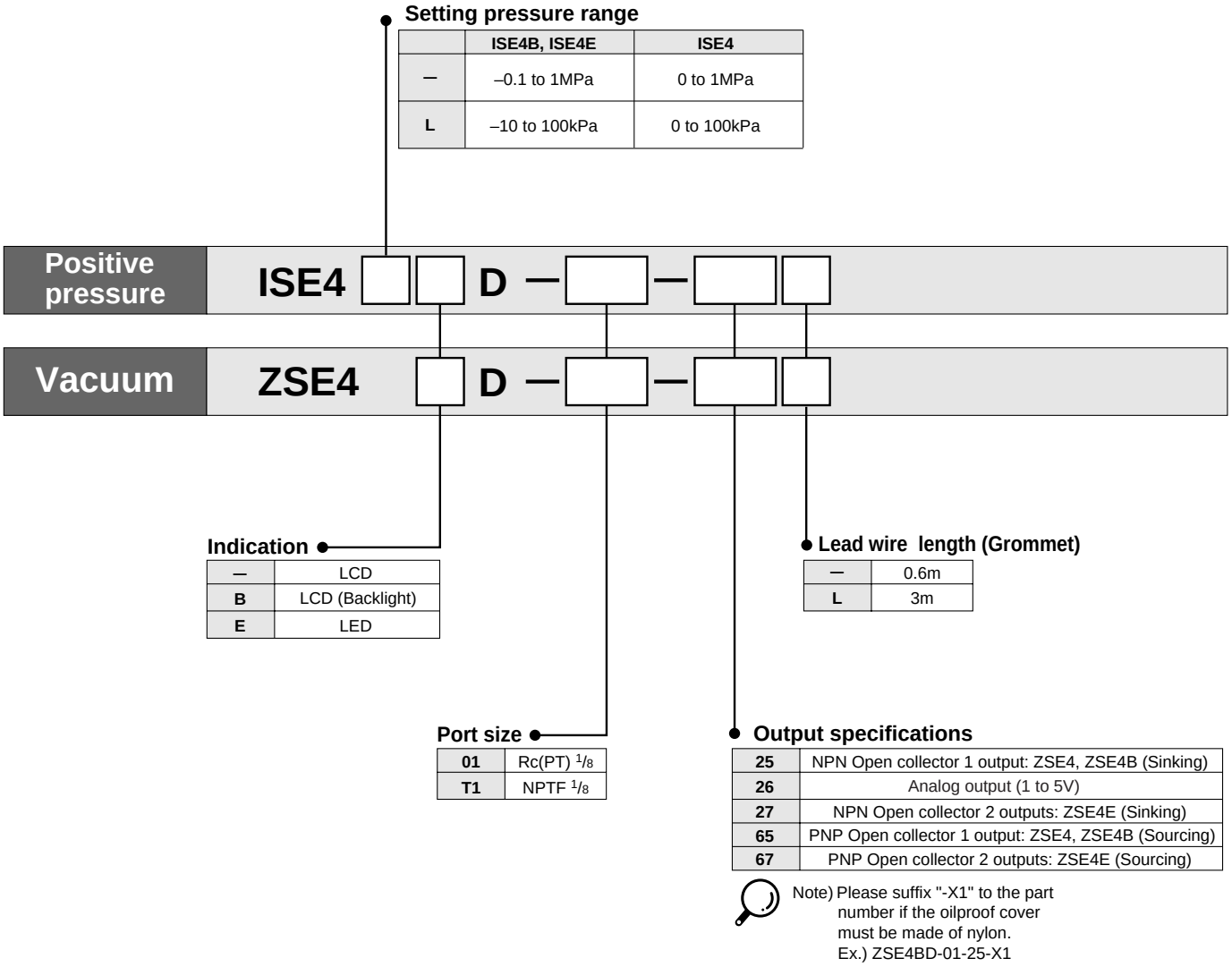
Lightweight: 110g

Resin construction

DIN rail mounting

Easy mounting and removal

How to Order

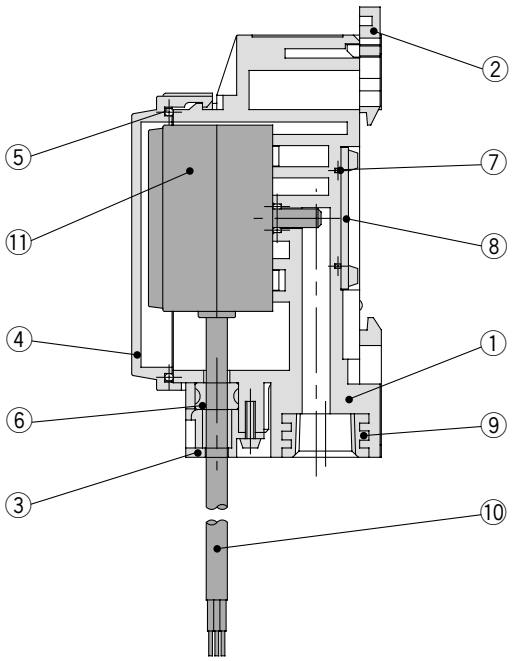


Specifications (Mechanical specifications of optional cover)

Model	ZSE4□D/ISE4□□D
Operating temperature range	0 to 50°C (No condensation)
Vibration resistance	10 to 500Hz Pulse width 1.5mm or acceleration 98 m/s² (smaller vibrations) to X, Y, Z direction (2 hrs)
Shock resistance	980 m/s² to X, Y, Z direction (3 times for each direction)
Lead wire	Gromment oil-resistant vinyl cabtire code: –25, –26, –65 ø3.4 0.2mm² 3core; –27, –67 ø3.5 0.14mm² 4core
Weight	110g (Including 0.6m-long lead wire)
Port size	01: Rc(PT) 1/8 T1: NPTF 1/8
Protective construction	IP66

Refer to the following pages for the details of each series.
- ZSE4/ISE4 Series → P.3.2-17
- ZSE4B/ISE4B Series → P.3.2-11
- ZSE4E/ISE4E Series → P.3.2-3

Construction



Parts List

No.	Description	Material
①	**Body**	PBT
②	**DIN rail stopper**	PBT
③	**Bush stopper**	PBT
④	**Cover A**	PC
⑤	**Gasket A**	NBR
⑥	**Reed bush**	NBR
⑦	**Gasket B**	NBR
⑧	**Cover B**	SECC
⑨	**Insert nut**	A2011
⑩	**Lead wire**	PVC(Vinyl sheath)
⑪	**Digital pressure switch (4□type)**	—

⚠ Precautions

Be sure to read before handling. Refer to p.0-26 and 0-27 for Safety Instructions and common precautions on the products mentioned in this catalog and refer to p.3.0-7 to 3.0-9 for precautions on every series.

Selection

⚠Caution

① If the unit is to be used in an area where it will be exposed to oil based liquids, please order the "X1" option. (Made to Order)

Piping

⚠Caution

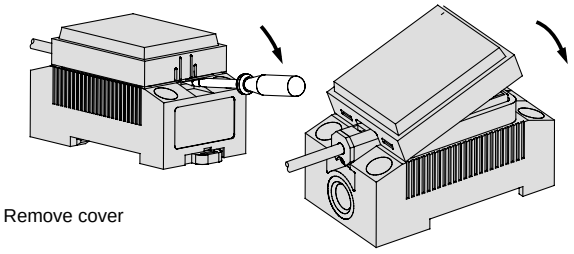
① If this product is to be applied in an area where water and dust might enter the atmospheric pressure port, please attach a section of ø4 mm tubing to the port nipple and route the other end to an area where water and dust can not enter the tubing.

Installation

⚠ Caution

①Apply cover.

Hook the cover on the projection parts of the body and push down as shown below. Be careful not to twist the gasket at that time.
To remove the cover, lift the hook of the cover with a screw driver.

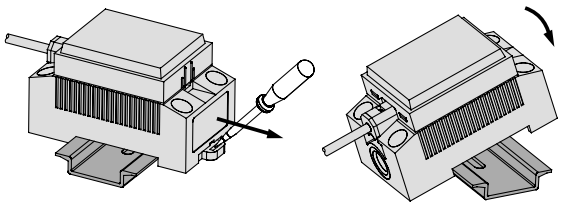


Remove cover

Apply cover

②Mounting on DIN rail

As illustrated below, hook the nail located on the bottom of the body on the DIN rail and press down in the direction of the arrow. To remove from the DIN rail lift the switch up with a bladed screw driver etc. in the direction of arrow.



Removing from DIN rail

Mounting on DIN rail

Recommended DIN rail: OMRON, PFP-(50)N

Protective Construction (IP Equivalent)

Definition: The first digit defines the amount of protection against penetration of solid objects into the housing. The second digit defines the amount of protection against liquids penetrating the housing.

IP 6 6

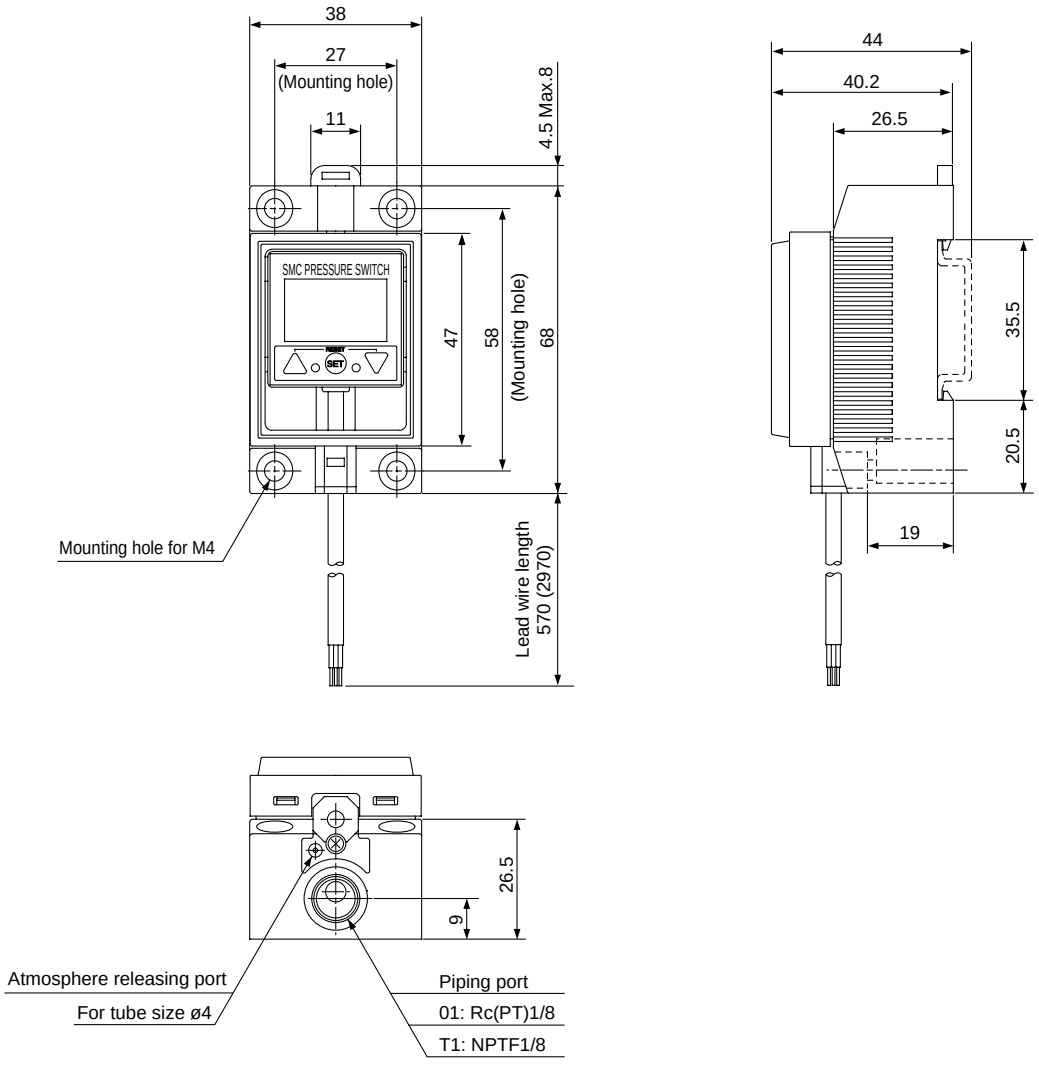
Degree of Protection against Contact and Entrance of Solid Foreign Bodies

0	No protection
1	Protection against foreign objects > 50mm.
2	Protection against foreign objects > 12mm.
3	Protection against foreign objects > 2.5mm.
4	Protection against foreign objects > 1.0mm.
5	Protection against harmful deposits of dust.
6	Protection against penetration of dust.

Degree of Protection against Ingress of Liquid

0	No protection	—
1	Protection against drops of condensed water.	Drip proof 1
2	Protection against drops of liquid when housing is tilted to 15° from vertical.	Drip proof 2
3	Protection against rain < 60° from vertical.	Splash proof
4	Protection against splashing.	Spray proof
5	Protection against water jets.	Jet proof
6	Protection against conditions on ships' decks. Water from heavy seas will not enter.	Water proof
7	Protection against immersion in water. Water will not enter under stated conditions of pressure and time.	Water tight
8	Protection against indefinite immersion in water under a specified pressure.	Under water

Dimensions



Датчик давления для различных сред

PSE560

Предназначен для контроля давления различных сред

- Четыре диапазона рабочих давлений
- Применение для различных сред, контактирующий материал нержавеющая сталь (SUS316L)
- Выходной сигнал 1~5VDC или 4~20мА
- Высокая точность и линейность характеристик
- Компактная конструкция
- Может использоваться совместно с контроллером PSE200 или PSE300 (только с выходом 1-5V)
- Степень защиты IP65

Технические характеристики

Тип датчика		PSE560	PSE561	PSE563	PSE564
Диапазон рабочих давлений		0 ~ 1.0 МПа	0 ~ -101 кПа	-100 ~ 100 кПа	0 ~ 500 кПа
Испытательное давление		1.5 МПа	500 кПа	500 кПа	750 кПа
Рабочая среда		Среды, не вызывающие коррозию нерж. стали (SUS316L)			
Диапазон температур (°C)	Рабочих	-10 ~ 60			
	Хранения	-20 ~ 70			
Напряжение питания		12 ~ 24V DC (колебания напряжения 10%)			
Аналоговый выход	Напряжение	1~5 V, сопротивление нагрузки 1 кОм, потребление тока 10 мА			
	Ток	4~20 мА Макс. сопротивление нагрузки: 100 Ом (при 12 VDC) и 500 Ом (при 24 VDC)			
Погрешность измерений		J ± 1% (от полного диапазона при температуре +25° ± 3°C)			
Линейность		J ± 0.5% (от полного диапазона)			
Воспроизводимость		J ± 0.2% (от полного диапазона)			
Чувствительность к колебаниям напряжения питания		J ± 0.3% (от полного диапазона)			
Чувствительность к измененим температуры окружающей среды в диапазонах	0 ~ 50°C	J ± 2% (от полного диапазона)			
	-10 ~ 60°C	J ± 3% (от полного диапазона)			
Степень защиты		IP65			
Напряжение пробоя изоляции		Не менее 250VAC между внешним контактом и корпусом в течение 1 мин.			
Сопротивление изоляции		50 МОм при 50VAC			
Устойчивость к вибрации		10 ~ 150Гц с амплитудой 1.5мм или при ускорении 20м²/с в 3-х взаимноперпендикулярных направлениях в течение 2-х часов			
Устойчивость к ударам		Допускается 500м²/с в 3-х взаимноперпендикулярных направлениях не более 3-х раз в каждом			
Вес (кг)		0.2			

Номер для заказа

PSE56 **0** — **01** — **28**

Диапазон рабочих давлений

0	0 ~ 1 MPa
1	0 ~ -0.101 Mpa
3	-0.1 ~ 0.1 Mpa
4	0 ~ 0.5 Mpa

Выходной сигнал

-	аналоговый выход (1~5V)
28	аналоговый выход (4~20мА)

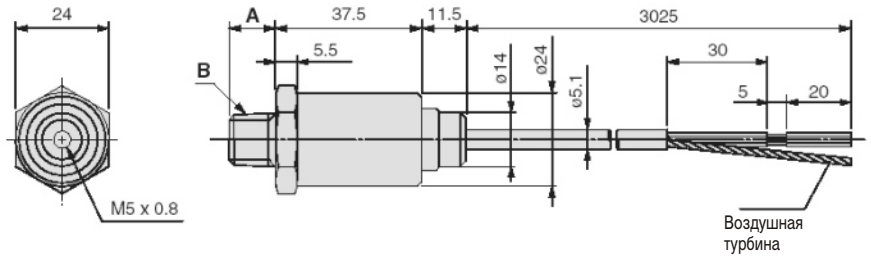
Присоединительный порт

01	Наружн. R1/8
02	Наружн. R1/4
C01	Внутр. Rc1/8

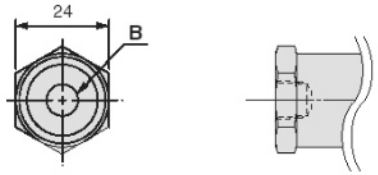
Датчик давления для различных сред
PSE560

Размеры

PSE56t-01/02



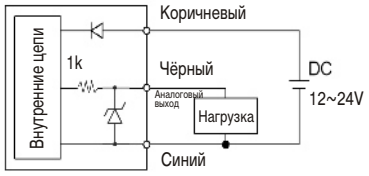
PSE56t-C01



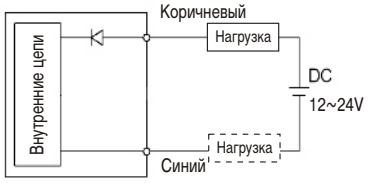
	A	B
PSE56i-01	8.2	R1/8
PSE56i-01	12	R1/4
PSE56i-01	-	Rc1/8

Электрическая схема и схема подключений

Выход 1~5 В



Выход 4~20 мА



Нагрузку можно подключать как к “+” так и к “-”

Контроллер для датчиков давления

PSE300

Предназначен для визуального отображения, а также для контроля уровня давления.

- Работа в одном из 5 режимов измерения давления в зависимости от диапазона
- Высокое быстродействие (время срабатывания по дискретному выходу менее 1мс)
- Аналоговый выходной сигнал (1~5VDC или 4~20мА) в дополнение к 2 дискретным (NPN или PNP)
- Совместимость с любым датчиком давления PSE, имеющим выходной сигнал 1~5VDC
- Возможность измерения перепада давления (совместно с датчиком PSE550)
- Высокая точность измерений и стабильность характеристик
- Степень защиты IP40

Технические характеристики

Контроллер		**PSE30**					
Тип совместимого датчика		PSE533 PSE563	PSE531 PSE561	PSE532	PSE564	PSE530 **PSE560**	PSE550
Настраиваемый диапазон давлений		-101~101кПа	10~-101кПа	-10~100кПа	- 0.1~1МПа	- 50~500кПа	- 0.2~2.0кПа *
Наименьшая единица отображения		0.2 кПа	0.1 кПа	0.1 кПа	0.001 МПа	1 кПа	0.01 кПа
Напряжение питания		12 ~ 24 VDC (колебания напряжения =±10%)					
Потребление тока (мА)		J50 (без учета потребления датчиком)					
Входной сигнал		1~5 VDC, входное сопротивление 1МОм, 1 вход					
Гистерезис	Режим гистерезиса	Регулируемый					
	Режим окна						
Дискретный выход	Тип	2 выхода NPN или PNP, защита от к.з.					
	Макс. ток нагрузки (мА)	80					
	Макс. напряжение (V)	30					
	Падение напряжения (V)	1					
	Время срабатывания	J1мс (При использовании функции защиты от скачков давления					
		время реакции может быть установлено по выбору 20, 160, 640 либо 1280 мс)					
Воспроизводимость		J± 0.1% (от полного диапазона)					
Аналоговый выход	По напряжению	1~5VDC, линейность ±0.2% (от полн. диап.) без учета погрешности датчика, время срабатывания J150мс, выходное сопротивление 1кОм					
	Точность (при 25°C) (от полного диапазона)	J±0.6%				J±1%	J±1.5%
	По току	4~20мА, линейность +/-0.2% (от полн. диап.) без учета погрешности датчика, время срабатывания 150мс Макс. сопротивление нагрузки: 300 Ом (при 12 VDC) и 600 Ом (при 24 VDC) Мин. сопротивление нагрузки: 50 Ом					
	Точность (при 25°C) (от полного диапазона)	J±1.0%				J±1.5%	J±2%
Точность индикации (при 25°C) (от полн. диапазона)		J±0.5% ±2 ед.мл.разряда		J±0.5% ±1 ед. мл. разряда			
Индикация давления		3+1/2 разряда, 2-х цветовой (красный и зеленый) 7-ми сегментный дисплей , частота обновления 5Гц					
Степень защиты		IP40					
Диапазон температур (°C)	Рабочих	0~50					
	Хранения	-10~60					
Напряжение пробоя изоляции		Между любым контактом и корпусом не хуже 1000V AC, 50/60 Гц в течение 1 мин.					
Сопротивление изоляции		Между любым контактом и корпусом 50 МОм (при 500V DC)					
Устойчивость к вибрации		10~150Гц с амплитудой 1.5мм или при 20м/с² в 3-х взаимноперпендикулярных направлениях в течение 2-х часов					
Устойчивость к ударам		Допускается 100м/с² в 3-х взаимноперпендикулярных направлениях не более 3-х раз в каждом					
Влияние температуры 1)		J±0.5% (от полного диапазона)					
Вес (г)		30 (без кабеля)					

[1] В рабочем диапазоне температур по сравнению с измерением при 25°C

Принадлежности (заказываются отдельно)

Наименование	Номер для заказа
Ответная часть разъема для подключения датчика серии PSE	**ZS-28-C**
Крепежный угольник	**ZS-28-B**
Комплект для панельного монтажа	**ZS-27-C**
Комплект для панельного монтажа с защитным стеклом	**ZS-27-D**

Контроллер для датчиков давления
PSE300

Номер для заказа

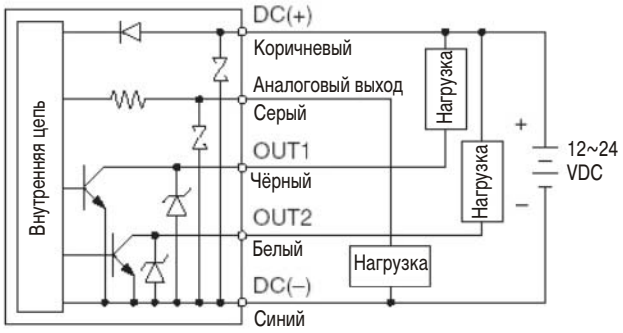
PSE30 **0** — L

Входной сигнал

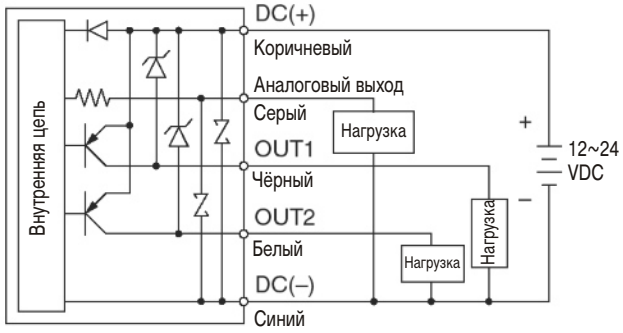
0	2 вых. NPN и 1 аналог. вых. 1- 5 VDC
1	2 вых. NPN и 1 аналог. вых. 4- 20 мА
2	2 вых. NPN и функция автосдвига
3	2 вых. PNP и 1 аналог. вых. 1- 5 VDC
4	2 вых. PNP и 1 аналог. вых. 4- 20 мА
5	2 вых. PNP и функция автосдвига

Электрическая схема и схема подключений

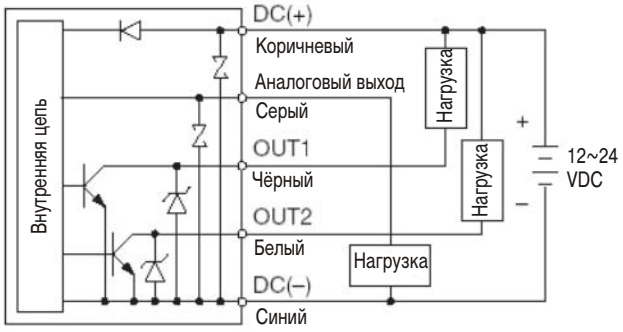
PSE300
2 выхода NPN + Аналоговый выход 1~5V



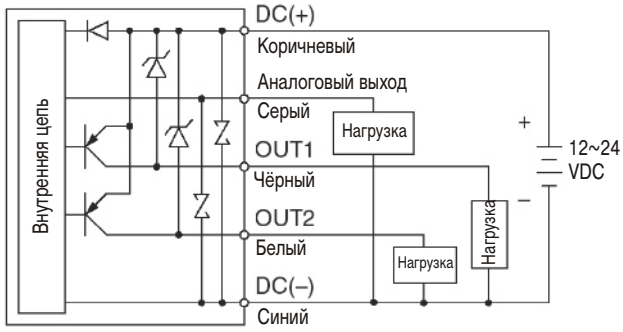
PSE303
2 выхода NPN + Аналоговый выход 1~5V



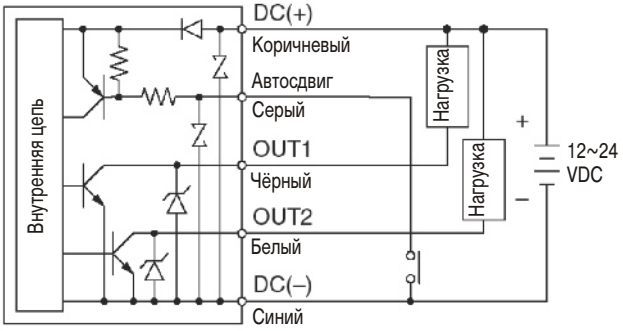
PSE301
2 выхода NPN + Аналоговый выход 4~20мА



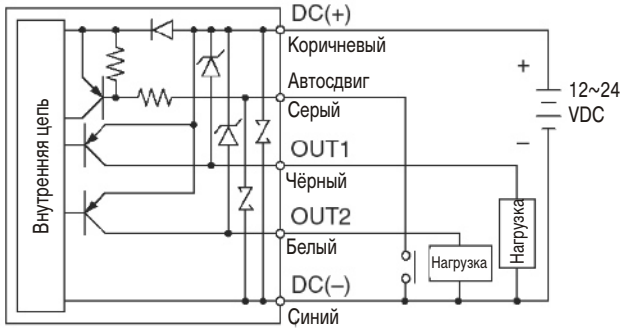
PSE304
2 выхода NPN + Аналоговый выход 4~20мА



PSE302
2 выхода NPN + Функция автосдвига

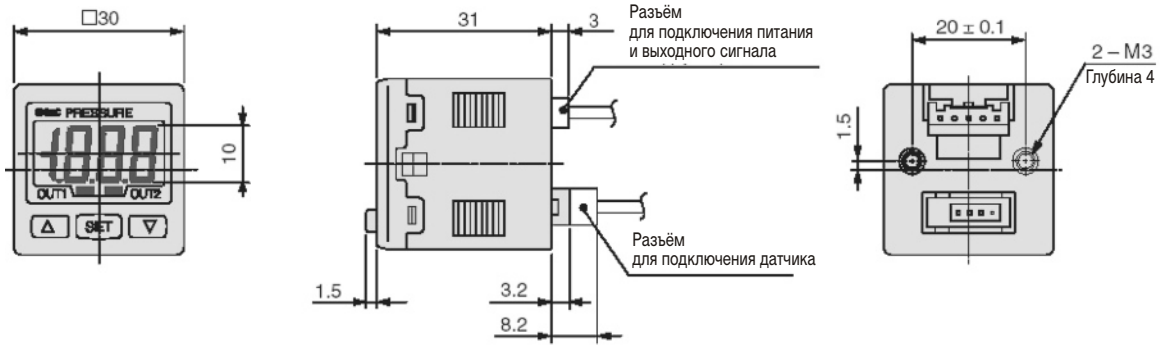


PSE305
2 выхода NPN + Функция автосдвига

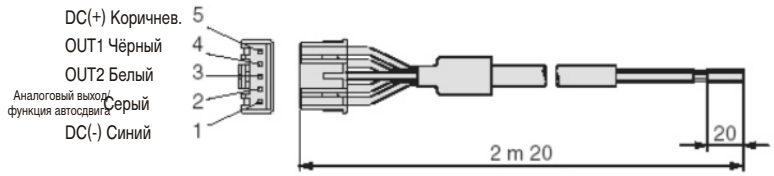


Размеры

С крепёжным угольником



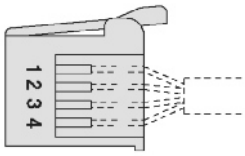
Ответная часть разъема с кабелем для подключения питания и выходного сигнала ZS-28-A



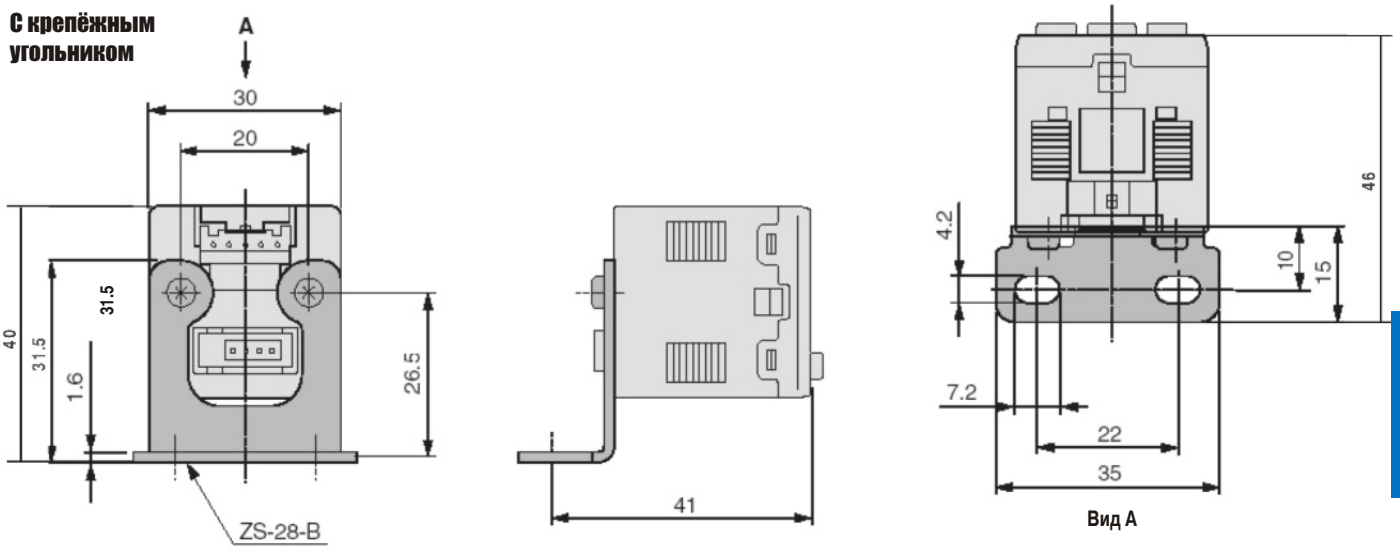
Поставляется с контроллером

Ответная часть разъема для подключения датчика

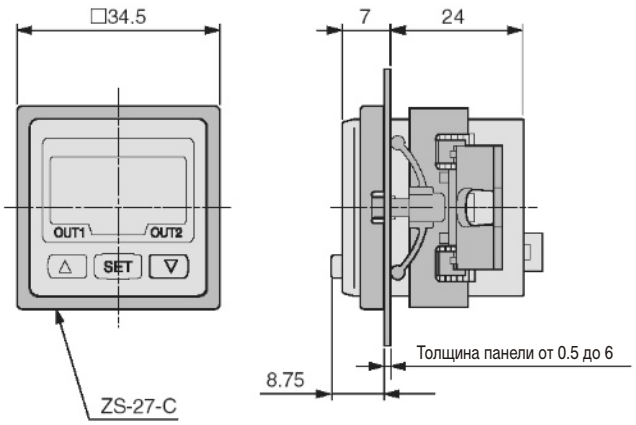
№ контакта	
1	DC (+)
2	Не используется
3	DC (-)
4	1~5VDC



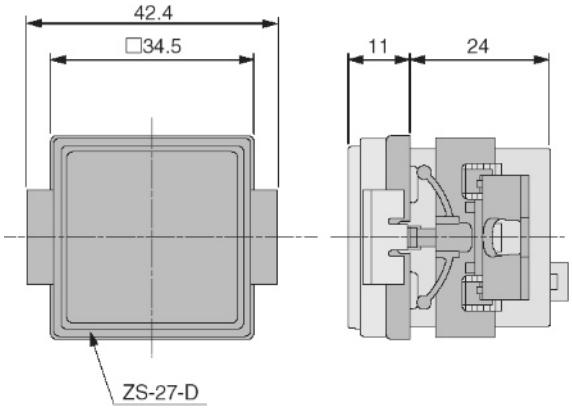
С крепёжным угольником



Панельный монтаж



Панельный монтаж с защитным стеклом



ZSE40/ISE40

Предназначен для контроля уровня давления или вакуума в пневмосистеме

- Удобен в использовании и настройке имеет встроенный светодиодный индикатор (красный)
- Перенастраиваемые режимы включения-выключения выходного сигнала (окно либо гистерезис)
- Высокое разрешение - 0.001 МПа
- Высокое быстродействие - время реакции менее 2.5 мс
- 2 дискретных (PNP/NPN) выхода плюс аналоговый (1 ~ 5 V) выход
- Защита от скачков давления
- Автоподстройка под изменяющийся уровень первичного давления
- Данные калибровки хранятся в памяти датчика длительное время без подачи на него электрического питания
- Различные варианты крепления и подключения сжатого воздуха
- Степень защиты Ip65

Технические характеристики

Модель		ZSE40F	ZSE40	ISE40
Диапазон давлений		-100~100 кПа	0~-101.3 кПа	0~1.0 МПа
Испытательное давление		500 кПа		1.5 МПа
Наименьшая единица отображения	кПа	0.1		-
	МПа	-		0.001
	мм рт.ст.	1		-
	кгс/см^2	0.001		0.01
	psi	0.02	0.01	0.1
	бар	0.001		0.01
Рабочая среда		Сжатый воздух, нейтральные газы		
Время реакции (мс)		2.5[1] (400 Гц)		
Индикация		Зеленый светодиод загорается при активизации выхода 1 (OUT1)		
		Красный светодиод загорается при активизации выхода 2 (OUT2)		
Гистерезис	Режим гистерезиса	Регулируемый		
	Режим окна	Фиксированный (3 цифры младшего разряда)		
Воспроизводимость		±0.2% (от полного диапазона)		
Влияние температуры		В диапазоне 0~50°C ±2% (от полного диапазона)		
Напряжение питания		12~24V DC (колебания напряжения ±10%)		
Потребление тока (мА)		55		
Выход	Дискретный	2 выхода NPN или PNP, открытый коллектор, макс. 30V, 80мА, защита от к.з.		
	Аналоговый	1~5V ±5%(от полного диапазона), линейность ±1%, сопротивление нагрузки 1 кОм	1~5V ±2.5%(от полного диапазона), линейность ±1%, сопротивление нагрузки 1кОм	
Индикация давления		3+½ разряда на светодиодном дисплее (частота обновления 5 Гц)		
Точность индикации		±2% (от полного диапазона); ±1 единица младшего разряда(при 25°C)		
Диапазон температур (°C)	Рабочих	0~50		
	Хранения	-10~60		
Влияние температуры		В диапазоне 0~50°C ±2% (от полного диапазона)		
Вход автосдвига		Соединение с контактом DC (-)		
Напряжение пробоя изоляции		Между любым контактом и корпусом не хуже 1000V AC, 50/60 Гц в течение 1 мин.		
Сопротивление изоляции		Между любым контактом и корпусом 50 МОм (при 500V DC)		
Устойчивость к вибрации		10 ~ 500 Гц с амплитудой до 1.5 мм или с ускорением 98 м/с^2 и с малыми амплитудами в трех измерениях длительностью до 2 часов		
Устойчивость к ударам		Допускается 980 м/с^2 в трех измерениях, не более 3 раз в каждом		
Присоединительная резьба		R1/8 (внутренняя M5)		
Степень защиты[2]		IP65		
Вес (г)		60 (стандартное исполнение)		

[1] При использовании функции защиты от скачков давления может время реакции быть установлено по выбору 24, 192 либо 768 мс.
[2] При эксплуатации датчика в местах, где возможно попадание инородных частиц или воды в порт выпуска воздуха рекомендуется использовать трубку с внутренним диаметром 2.5 мм, например TU0425, для соединения порта с безопасной зоной. При этом необходимо избегать засорения или пережатия трубки, так как это приведет к погрешности в измерениях.

Принадлежности (заказываются отдельно)

Наименование	Номер для заказа
Крепежный угольник *	**ZS-24-B**
Комплект для крепления на панели *	**ZS-22-A**
Комплект для крепления на панели с защитным стеклом*	**ZS-24-C**

* Размеры см. в серии ZSE4/ISE4

Прецизионный датчик давления с цифровой индикацией
ZSE40/ISE40

Номер для заказа

Диапазон давлений

–	-0.100 ~ 1.000 MPa	Позитивное давление

Позитивное давление	ISE40	□	01	22	L
Вакуум /низкое давление	ZSE40	□	01	22	L

Диапазон давлений

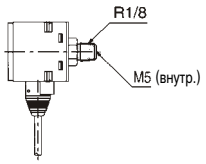
–	10 ~ -101.3 kPa	Вакуум
F	-100 ~ 100.0 kPa	Низкое давление

Выход

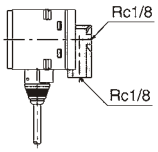
22	NPN (2 выхода)+ аналоговый выход (1-5V)
30	NPN (2 выхода)+ вход автосдвига
62	PNP (2 выхода)+ аналоговый выход (1-5V)
70	PNP (2 выхода)+ вход автосдвига

Исполнение

01: R1/8(M5 внутр.)

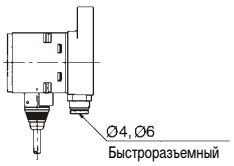


***W1:** R1/8(M5 внутр.)



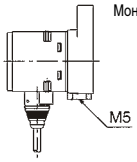
***C4:** 4
***C6:** 6

Монтаж на стене



***M5:** M5 0.8

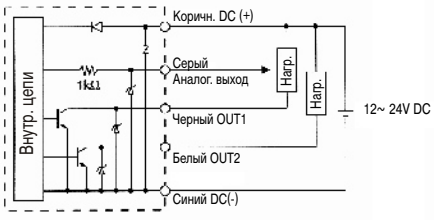
Монтаж на стене



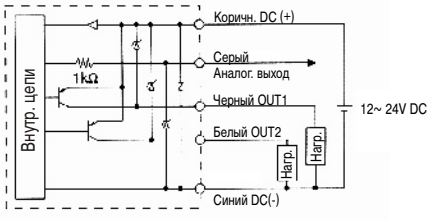
* Опция

Электрическая схема и схема подключений

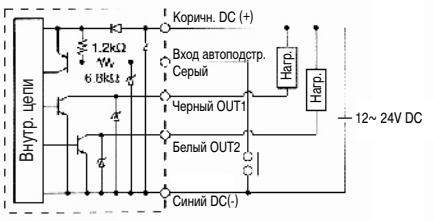
ZSE40 (F)
ISE40-□-22 (L)
Аналоговый выход



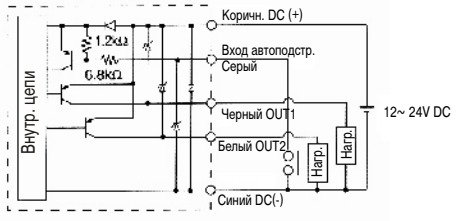
ZSE40 (F)
ISE40-□-62 (L)
Аналоговый выход



ZSE40 (F)
ISE40-□-30 (L)
Вход автосдвига

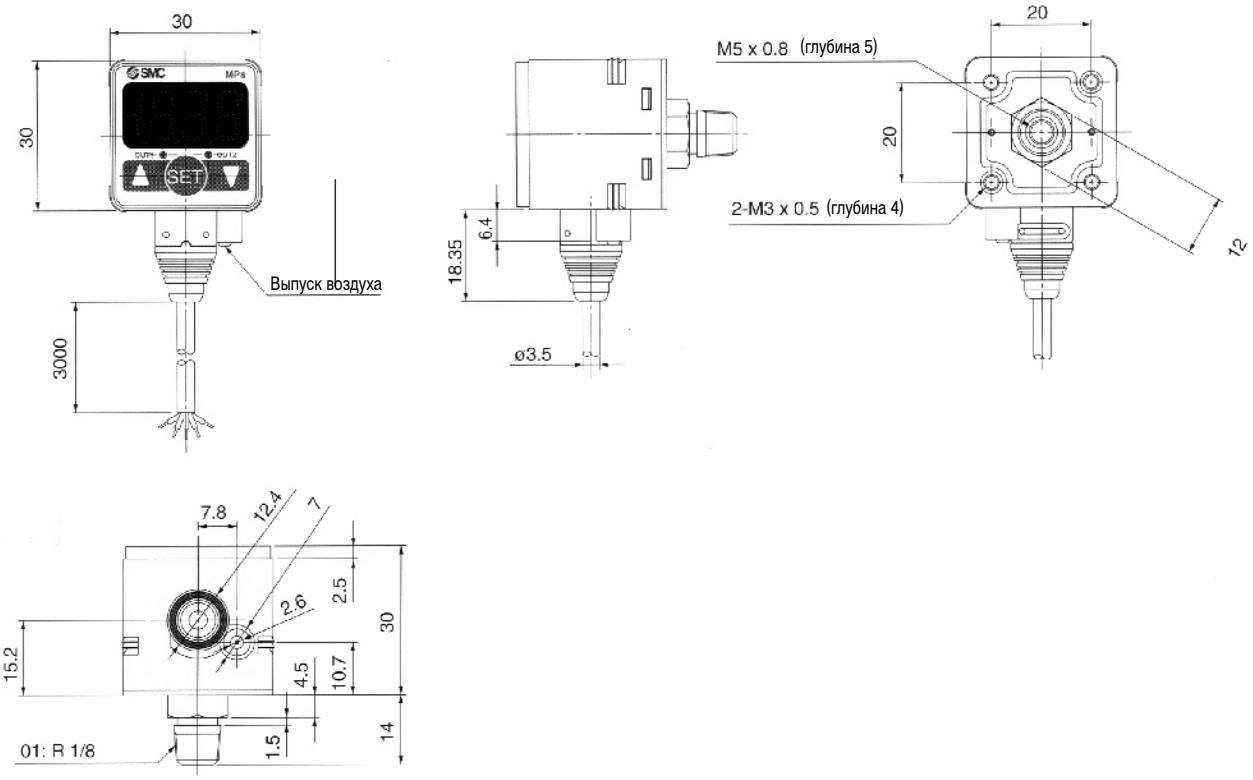


ZSE40 (F)
ISE40-□-70 (L)
Вход автосдвига

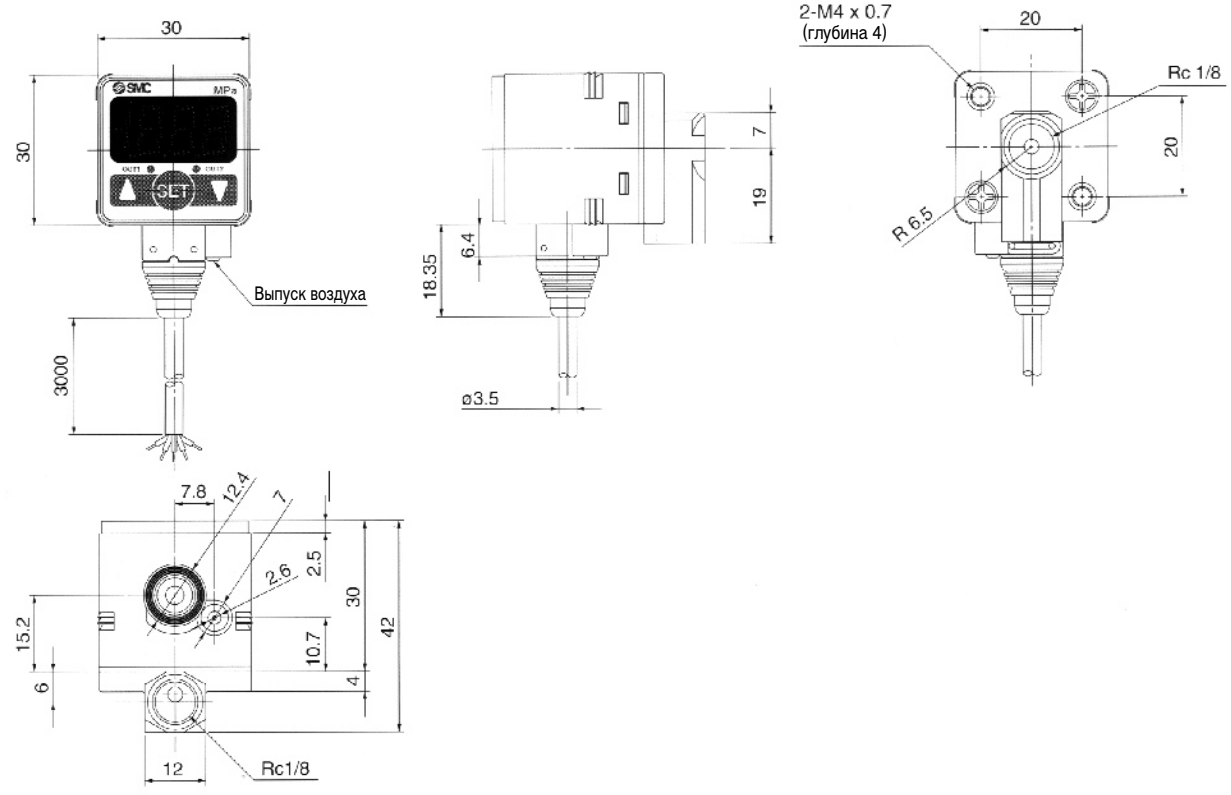


Размеры

ZSE40(F)/ISE40-01



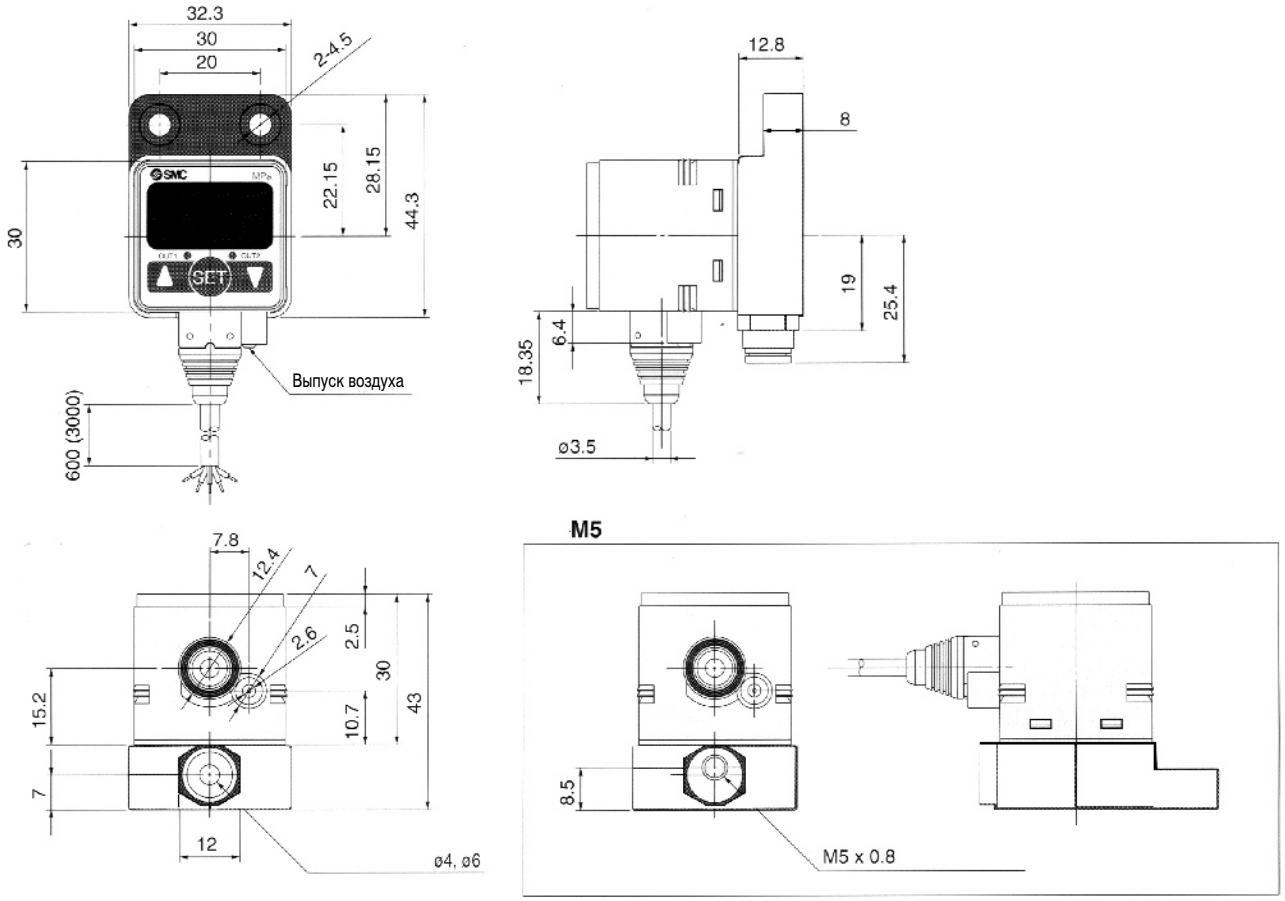
ZSE40(F)/ISE40- 1



Прецизионный датчик давления с цифровой индикацией
ZSE40/ISE40

Размеры

ZSE40(F)/ISE40 - C4 C6 5



Датчики давления PSE

Серия	Тип	Рабочая среда	Рабочее давление	Испытательное давление	Диапазон рабочих температур	Воспроиз-водимость*	Линейность*	Точность*	Степень защиты	Напряжение питания	Аналоговый выходной сигнал	
											1~5VDC	4~20мА
PSE510	PSE510	Воздух, неагрессивные газы	0 ~ 1 МПа	1МПа	0 ~ 50ºC	±0.3%			IP 40	12 ~ 24 VDC ± 10%	●	○
	PSE511		-101 ~ 0 кПа	200кПа		±0.3%					●	○
	PSE512		0 ~ 100 кПа	200кПа		±0.3%					●	○
PSE530	PSE530		0 ~ 1 МПа	1.5МПа		±1%	±1%	±2%			●	○
	PSE531		-100 ~ 0 кПа	500кПа		±1%	±1%	±2%			●	○
	PSE532		0 ~ 101 кПа	500кПа		±1%	±1%	±2%			●	○
	PSE533		-101 ~ 101кПа	500кПа		±1%	±1%	±2%			●	○
PSE540	PSE541		-101 ~ 0 кПа	500кПа		±0.2%	±0.4%	±2%			●	○
	PSE543		-101 ~ 101кПа	500кПа		±0.2%	±0.4%	±2%			●	○
PSE550**			0 ~ 2 кПа	50 кПа		±0.3%	±0.5%	±1%			●	●
PSE520		Среды, химически неактивные при контакте с нержавеющей сталью	0 ~ 1 МПа	2МПа	-10 ~ 70ºC	±0.3%			IP 65		●	○
PSE560	PSE560		0 ~ 1 МПа	1.5МПа	-10 ~ 60ºC	±0.2%	±0.5%	±1%			●	●
	PSE561		-100 ~ 0 кПа	500кПа		±0.2%	±0.5%	±1%			●	●
	PSE563		-100 ~ 100кПа	500кПа		±0.2%	±0.5%	±1%			●	●
	PSE564		0 ~ 500кПа	750кПа		±0.2%	±0.5%	±1%			●	●

Контроллеры датчиков давления PSE

Серия	Тип	Совместимые датчики давления	Число подклю-чаемых датчиков	Тип сигнала подклю-чаемых датчиков		Число выходных каналов				Быстродействие, мс		Диапазон рабочих температур	Напряжение питания	Воспроизводимость*	Влияние температуры*	Степень защиты
				1~5VDC	4~20мА	Дискретные		Аналоговые		Дискр. выходы	Аналог. выходы					
						NPN	PNP	1~5VDC	4~20мА							
PSE100	PSE100	PSE51[], PSE520, PSE530/31/32, PSE541, PSE560/61	1	●	●	2	—	—	—	10	—	0 ~ 50ºC	12 ~ 24 VDC ± 10%	±0.2%	±0.5%	IP40, IP66 при панельном монтаже
	PSE101			●	●	—	2	—	—							
PSE200	PSE200	PSE51[], PSE541/43, PSE520, PSE560/61/63	1 ~ 4	●	○	5	—	—	—	5	—			±0.1%		IP40, IP65 при панельном монтаже
	PSE201			●	○	—	5	—	—							
PSE300	PSE300	PSE510/11, PSE530/31/33, PSE54[], PSE520, PSE550	1	●	○	2	—	1	—	1	150					IP 40
	PSE301			●	○	2	—	—	1							
	PSE302			●	○	2	—	—	—							
	PSE303			●	○	—	2	1	—							
	PSE304			●	○	—	2	—	1							
	PSE305			●	○	—	2	—	—							

Примечания:

1) * - в процентных долях от полного диапазона

2) ** - для измерения дифференциального давления

ISE70/75/75H

Предназначено для контроля давления в пневмо- и гидросистемах

- Рабочее давление до 15 МПа
- Возможность использования для различных сред
- Высокое быстродействие - время реакции менее 2.5 мс
- Возможность одновременного использования NPN и PNP выходов
- Дисплей может изменять цвет индикации при срабатывании выхода
- Компактная конструкция
- Корпус выполнен из алюминия
- Степень защиты IP67

Технические характеристики

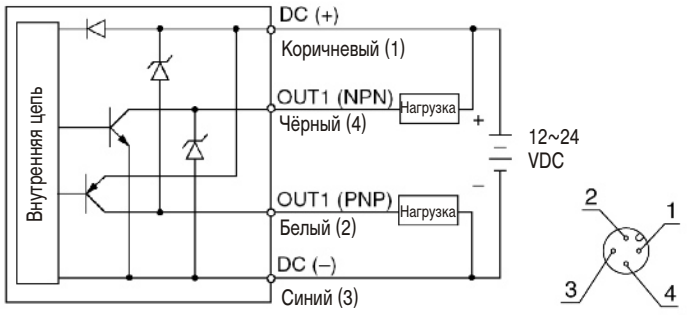
Номер для заказа		ISE70-F02-43	ISE75-F02-43	ISE75H-F02-43
Диапазон рабочих давлений (МПа)		0 ~ 1.0	0 ~ 10	0 ~ 15
Испытательное давление (МПа)		1.5	30	45
Настраиваемый диапазон давлений (МПа)		-0.1 ~ 1.0	0.4 ~ 10	0.5 ~ 15
Наименьшая единица отображения (МПа)		0.01	0.1	
Рабочая среда		Воздух, инертный газ	Среды, не вызывающие коррозию нерж. стали (SUS430 и SUS630)	
Напряжение питания		12 ~ 24VDC (колебания напряжения ±10%)		
Потребление тока (мА)		55		
Выход	Тип	NPN и PNP открытый коллектор, защита от к.з.		
	Макс. ток нагрузки (мА)	80		
	Макс. напряжение (V)	30		
	Падение напряжения (V)	1		
	Время реакции (мс)	2.5 [1] (400 Гц)		
Воспроизводимость		±0.5% (от полного диапазона)		
Гистерезис	Режим гистерезиса	Регулируемый (может быть установлен с нуля)		
	Режим окна			
Индикация давления		3-разрядный 7-сегментный индикатор на 2-х цветном (красный/зеленый) ЖК-индикаторе, частота обновления 5 Гц		
Точность индикации		±2% (от полного диапазона), ±1 единица младшего разряда (при 25°C)		
Температура рабочей среды (°C)		0 ~ 50	-5 ~ 80	
Температура окружающей среды (°C)		0 ~ 50	-5 ~ 500	
Температура хранения (°C)		-10 ~ 60°		
Относительная влажность		35 ~ 85 %		
Напряжение пробоя изоляции [2]		1000VAC 50/60 Гц	250VAC, 50/60 Гц	
Сопротивление изоляции		Между любым контактом и корпусом 50 МОм (при 500V DC)		
Устойчивость к вибрации		10 500 Гц с амплитудой до 1.5 мм или с ускорением 98 м/с^2 и с малыми амплитудами в трех измерениях длительностью до 2 часов		
Устойчивость к ударам		Допускается 980 м/с^2 в трех измерениях, не более 3 раз в каждом		
Влияние температуры [3]		±2% (от полного диапазона)	±3% (от полного диапазона)	
Присоединительная резьба		G1/4 (Rc 1/4, NPT 1/4 - по запросу)		
Кабель		4-х контактный разъем M12		
Степень защиты		IP67		
Вес (кг)		0.19 (без кабеля)	0.21 (без кабеля)	

[1] При использовании функции защиты от скачков давления время реакции может быть установлено по выбору:
2.5 мс, 20 мс, 160 мс, 640 мс, 1000 мс либо 2000 мс

[2] Между любым контактом и корпусом в течение 1 мин

[3] В рабочем диапазоне температур по сравнению с измерением при 25°C

Электрическая схема и схема подключений

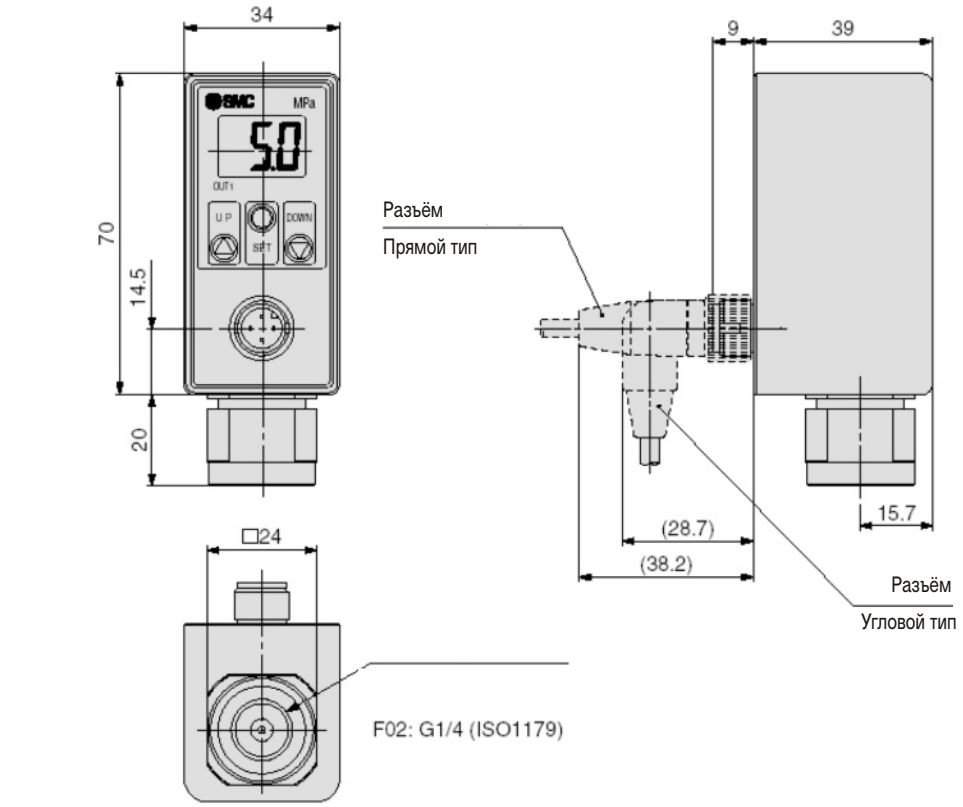


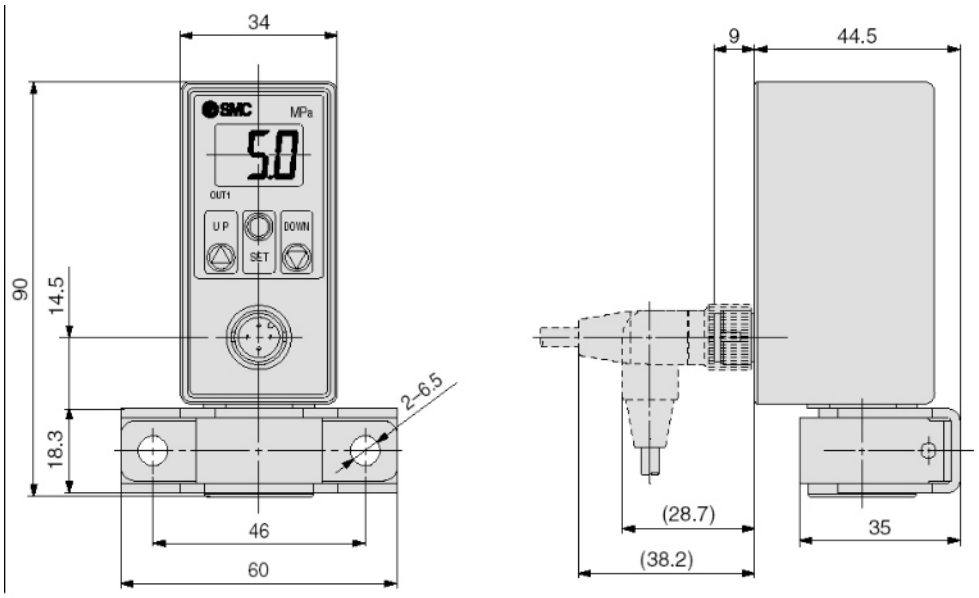
Принадлежности (заказываются отдельно)

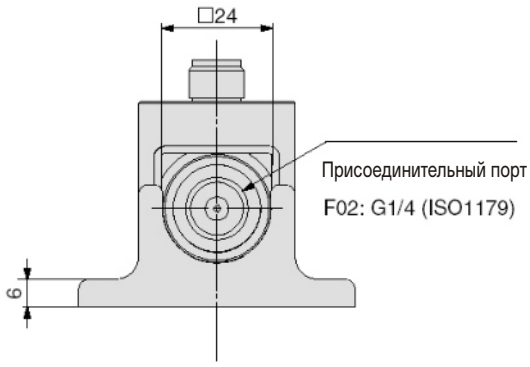
Наименование		Номер для заказа
Крепежный угольник		ZS-31-A
Ответная часть разъема M12, с кабелем 5 м	Прямой тип	ZS-31-B
	Угловой тип	ZS-31-C

Реле давления с цифровой индикацией
ISE 0/ 5/ 5

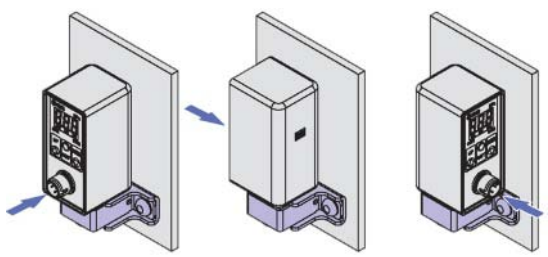
Размеры







Возможно изменение монтажного положения в пространстве



CAT.ES100-45 Ⓑ-UK

SMC

CE

Air Catch Sensor for Work Piece Detection

Air Catch Sensor

Detection distance
0.01 to 0.5mm

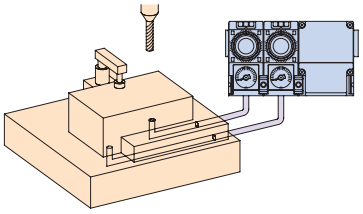
Repetition accuracy
0.01mm or less

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

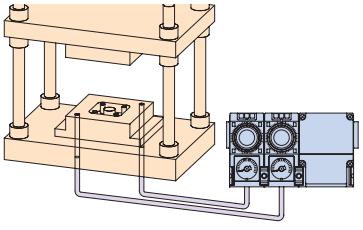
Note) Detection distance: 0.01 to 0.15mm (ISA2-G), 0.03 to 0.15mm (ISA2-H)
Supply pressure : At supply pressure 100 to 200kPa

2 Port Solenoid Valve with Manual Lock is newly added.

To check the work piece position on the reference plane



Position check of metal mold



Series ISA2

Stable detection of 0.01 to 0.5 mm clearance

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

Plug connectors (Centralised wiring)

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

Modular construction

Requires less man hours to wire.

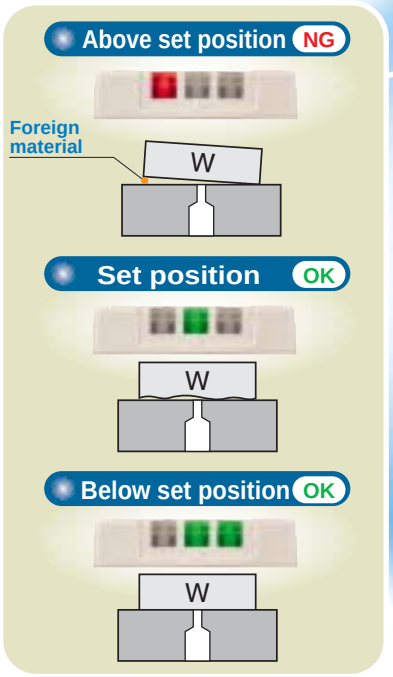
With regulator + 2 port solenoid valve

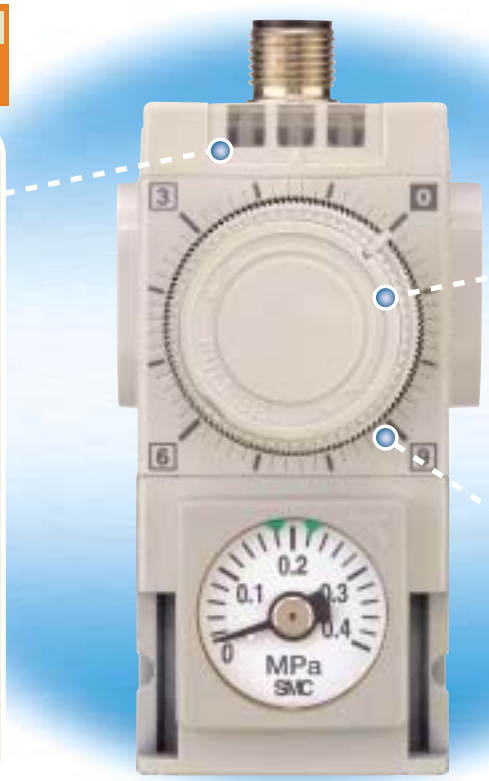
With 2 port solenoid valve

Air catch sensor Series ISA2

Optimum position is known at a glance.

LED level meter





Easy-to-operate **large dial**

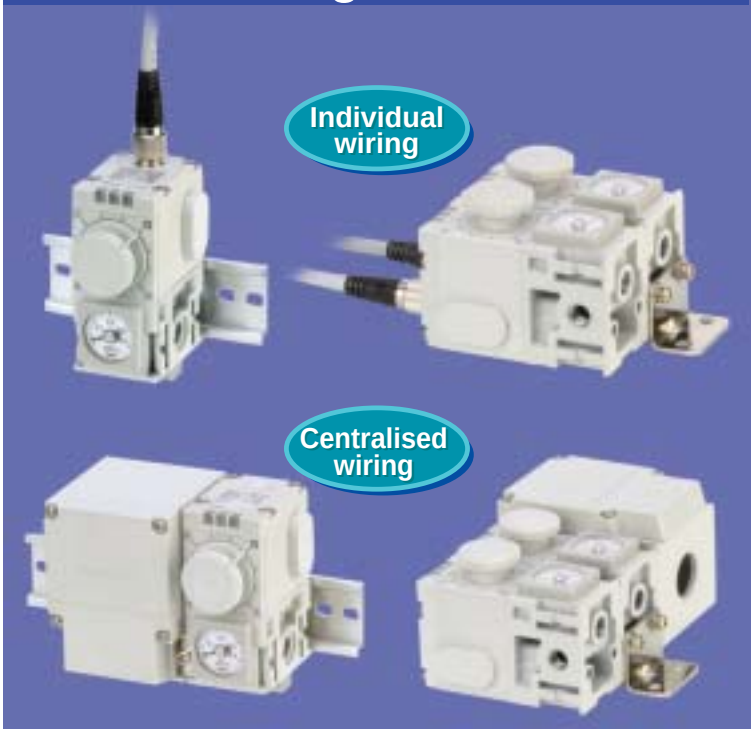
Scale provides guidelines for set position.

Minimum operating pressure 30kPa (ISA2-G)

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

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 200kPa	50 to 200kPa
Detection distance	0.01 to 0.25mm	0.03 to 0.5mm
Output type	NPN open connector, PNP open collector	
Electrical entry	Lead wire with connector (Individual wiring) Terminal box (Centralised 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.)	

Air Catch Sensor
Series ISA2

How to Order

Manifold

Without control unit IISA2 N **PL** – **3** **B**

With control unit IISA2 **C** **SL** – **3** **B** **1** **D** **E2**

Control unit

C	With regulator + 2 port solenoid valve
V	With 2 port solenoid valve

Electrical entry and supply port position

SR	Centralised wiring with supply port on the right
SL	Centralised wiring with supply port on the left
PR	Individual wiring with supply port on the right
PL	Individual wiring with supply port on the left

Note) The supply port position is the one when the switch is viewed from the front.

Stations

1	1 station
2	2 stations
3	3 stations
4	4 stations
5	5 stations
6	6 stations

Option

-	Without bracket
B	With bracket
D	With mounting bracket for DIN rail

Note) DIN-rail must be ordered separately. (Refer to the page 15.)

Voltage of 2 port solenoid valve

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

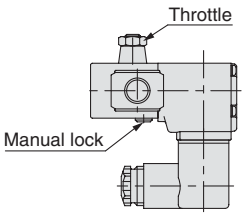
Pressure gauge of regulator Note 1)

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

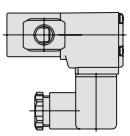
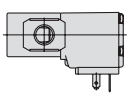
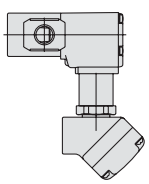
Note 1) Due to new Japanese weight and measurement legislation, PSI notation type cannot be sold or used in Japan.
Note 2) The pressure gauge port is Rc 1/8.
* Manufactured upon receipt of order.

Throttle/Manual lock of 2 port solenoid valve

-	Without throttle, without manual lock
C	With throttle, without manual lock
W	Without throttle, with manual lock
M	With throttle, with manual lock



Electrical entry of 2 port solenoid valve

D : DIN connector **DL:** DIN connector (With indicator light)	**D0:** DIN connector (Without connector)	**T** : Conduit terminal **TL:** Conduit terminal (With indicator light)
		

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 0.25mm
H	0.03 to 0.5mm

Piping specifications

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

* Made to order

Output specifications

1	NPN Output
5	PNP Output

Pressure gauge Note 1)

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

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.

Electrical entry

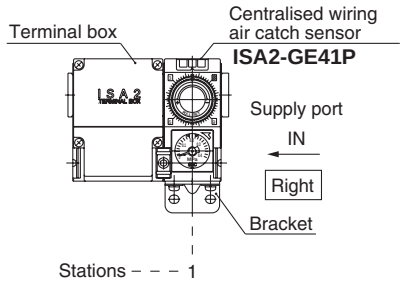
Individual wiring	-	Straight
	L*	Right angle
	N	Without lead wire
Centralised wiring	P	Terminal block box

* Manufactured upon receipt of order.

Example

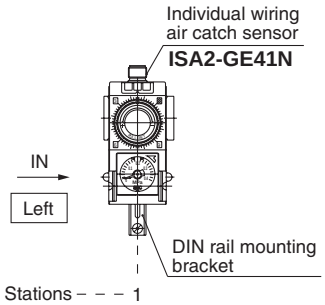
Without control unit

Centralised wiring



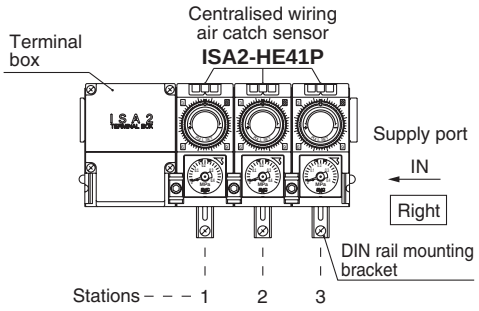
IISA2NSR-1B · · · 1 set (1 station manifold part number)
***ISA2-GE41P** · · · 1 set (Air catch sensor part number)
Prefix the part number of the air catch sensor with an asterisk (*).

Individual wiring



IISA2NPL-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 (*).

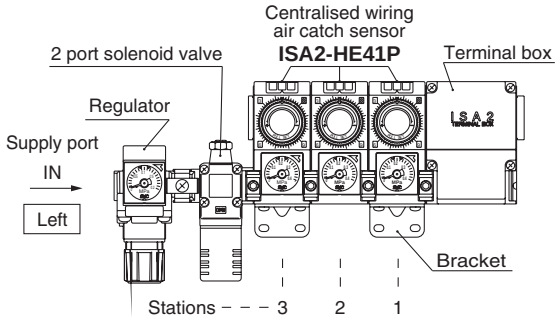
Centralised wiring/Supply port right



IISA2NSR-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 (*).

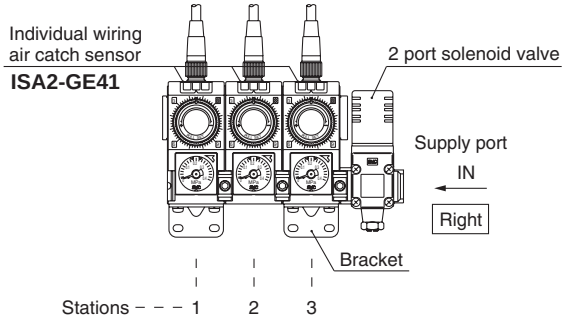
With control unit

Centralised wiring/Supply port left



IISA2CSL-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



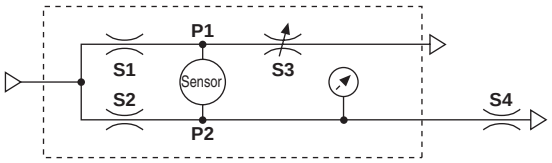
IISA2VPR-3B5DLC · · · 1 set (3 stations manifold part number)
***ISA2-GE41** · · · · · · · · · 3 sets (Air catch sensor part number)
Prefix the part number of the air catch sensor with an asterisk (*).

Specifications

Model			ISA2-G□□□1□	ISA2-G□□□5□	ISA2-H□□□1□	ISA2-H□□□5□
Detection distance			0.01 to 0.25mm		0.03 to 0.50mm	
Fluid			Dry air (filtered to 5μm)			
Operating pressure range			30 to 200kPa		50 to 200kPa	
Recommended detection nozzle			ø1.5		ø2.0	
Consumption flow rate ℓ/min (ANR)	Supply pressure	50kPa	5 or less		10 or less	
		100kPa	8 or less		15 or less	
		200kPa	12 or less		22 or less	
Power supply voltage			12 to 24VDC, Ripple (p-p) 10% or less (with power polarity protection)			
Current consumption			15mA or less			
Switch Output			NPN open collector: one output	PNP open collector: one output	NPN open collector: one output	PNP open collector: one output
	Maximum load current		80mA			
	Maximum load voltage		30VDC (at NPN output)			
	Residual voltage		1.5V or less (at 80mA)			
	Output protection		With short circuit protection			
Repeatability (Including temperature characteristics)			0.01mm or less (Detection distance range 0.01 to 0.15mm, supply pressure 100 to 200kPa)		0.01mm or less (Detection distance range 0.03 to 0.15mm, supply pressure 100 to 200kPa)	
Hysteresis Note 1)			0.01mm or less (Detection distance range 0.01 to 0.15mm)		0.01mm or less (Detection distance range 0.03 to 0.15mm)	
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 (with no condensation and no freezing)			
	Operating humidity range		Operating/stored: 35 to 85%RH (with no condensation)			
	Withstand voltage		1000 VAC in 50/60Hz 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/s² without control unit and bracket mounted, Others 30m/s², whichever is smaller for 2 hours in X, Y, Z direction each (de-energised)			
	Impact resistance		Without control unit and bracket mounted: 980m/s², Others: 150m/s² in X, Y and Z direction, 3 times each (de-energised)			
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 (0.64mm²) with M12, 4 pin pre-wired connector			
Terminal block box (centralised wiring type)			Front wiring (Electrical entry ø21)			
Weight			Individual wiring type (body only): 253g, common wiring type (body only): 250g, Terminal box: 205g, lead wire: 278g, connecting bracket with sealing for additional station: 4g			

Note 1) Refer to “Relation between the nozzle diameter and detection distance” (page 5) for hysteresis.
Note 2) Refer to “Setting procedure” (page 8) for LED level meter.

Working principle

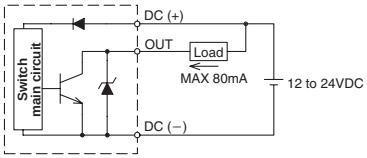


S1, S2: Fix orifice
S3: Variable orifice (adjusted by setting dial)
S4: Detection nozzle

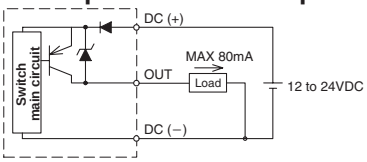
In a bridge circuit as in the left figure, a detection gap is applied to the detection nozzle (S4) while the setting dial S3 is adjusted to balance the pressure applied to the pressure sensor (P1=P2). The pressure sensor detects the differential pressure generated when the detection nozzle (S4) is released. 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

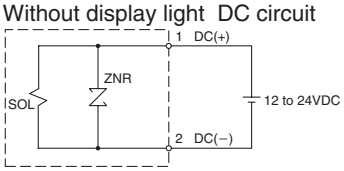


PNP open collector output

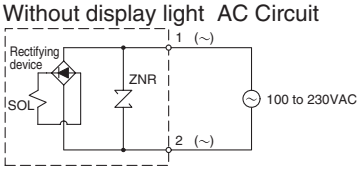


Circuit and wiring for 2 port solenoid valve

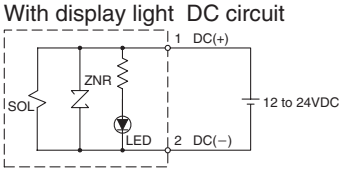
Without display light DC circuit



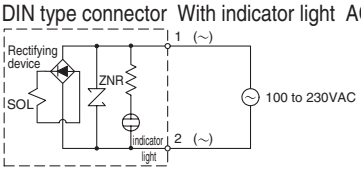
Without display light AC Circuit



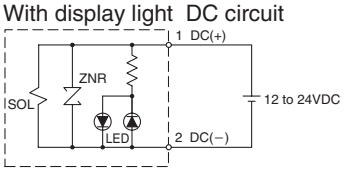
Conduit terminal
With display light DC circuit



Conduit terminal
DIN type connector With indicator light AC Circuit



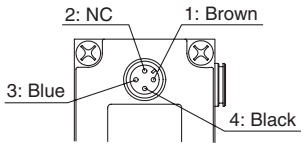
DIN type connector
With display light DC circuit



Refer to catalogue and instruction manual of Series VCA for wiring.
Pay attention to the power supply voltage. Use of incorrect power supply will cause damage to equipment.

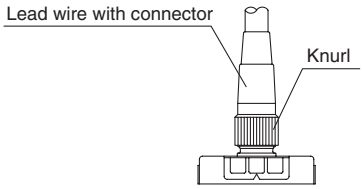
Wiring

Individual wiring



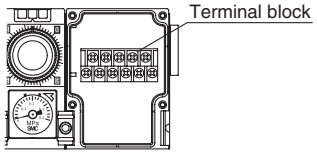
1	Brown	DC (+)
2	–	NC
3	Blue	DC (−)
4	Black	OUT

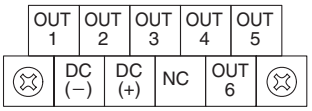
1. Insert the connector of the lead wire with its key groove at the proper position.
2. Hold the knurl with 2 fingers and rotate it clockwise until finger tight.



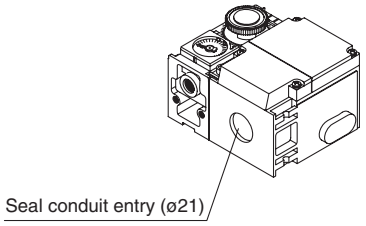
3. Connect the coloured wires coming from the cable terminal. Refer to the circuit diagram and table above to avoid mistakes.

Centralised wiring





1. Mount the seal conduit on the terminal box. For mounting procedure, refer to the catalogue 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.

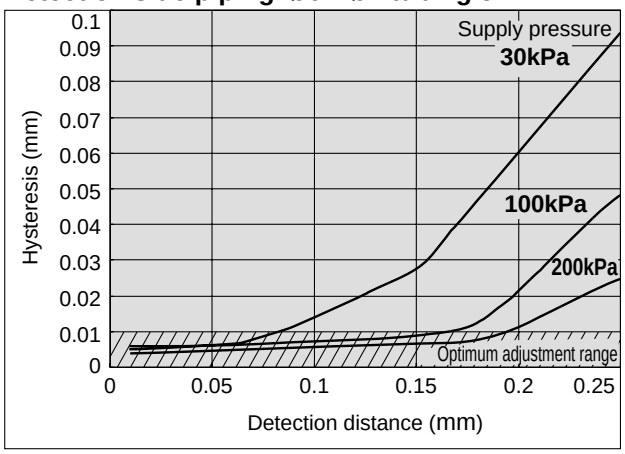


Relation between Nozzle Diameter and Detection Distance

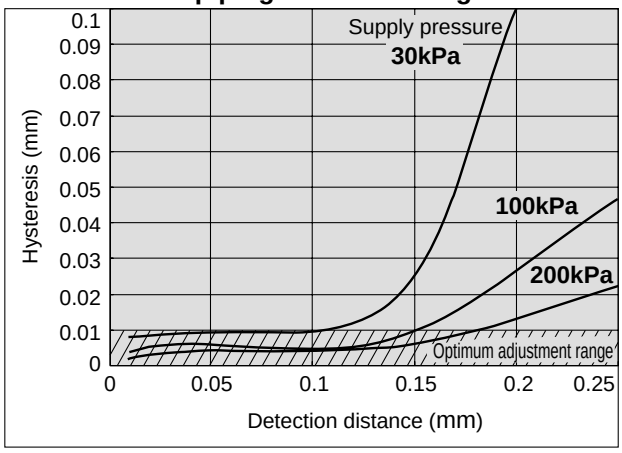
The data in the following charts are characteristics of hysteresis at the detection distance.
In case accuracy is required by the settings, the design should be made so that the hysteresis will stay within the optimum adjustment range not larger than 0.01 mm.
The smaller the hysteresis, the better the 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□□□□□

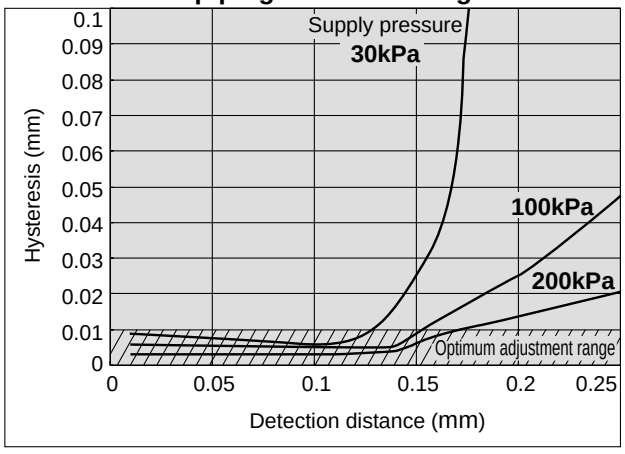
Detection nozzle: ø1.0
Detection side piping: ø6 x ø4 tubing 5m



Detection nozzle: ø1.5
Detection side piping: ø6 x ø4 tubing 5m

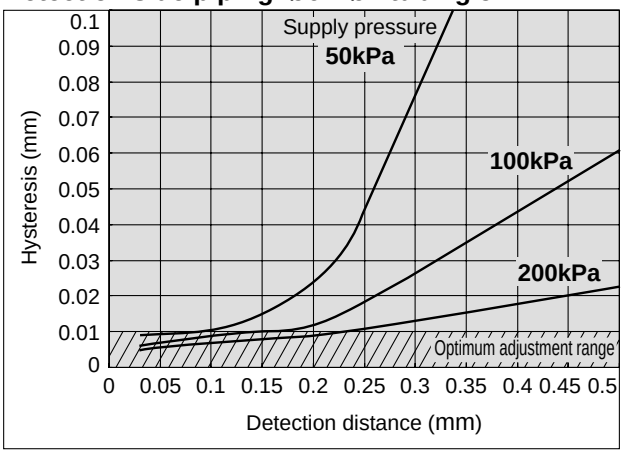


Detection nozzle: ø2.0
Detection side piping: ø6 x ø4 tubing 5m

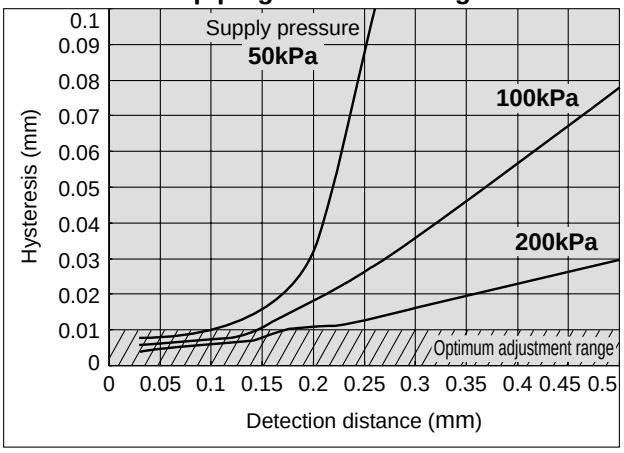


ISA2-H□□□□□

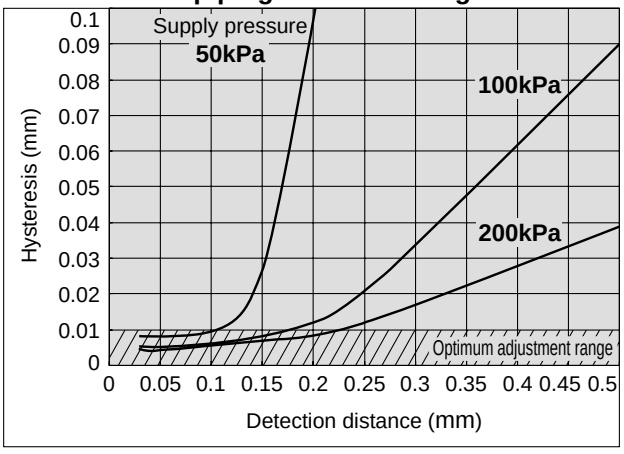
Detection nozzle: ø1.0
Detection side piping: ø6 x ø4 tubing 5m



Detection nozzle: ø1.5
Detection side piping: ø6 x ø4 tubing 5m



Detection nozzle: ø2.0
Detection side piping: ø6 x ø4 tubing 5m

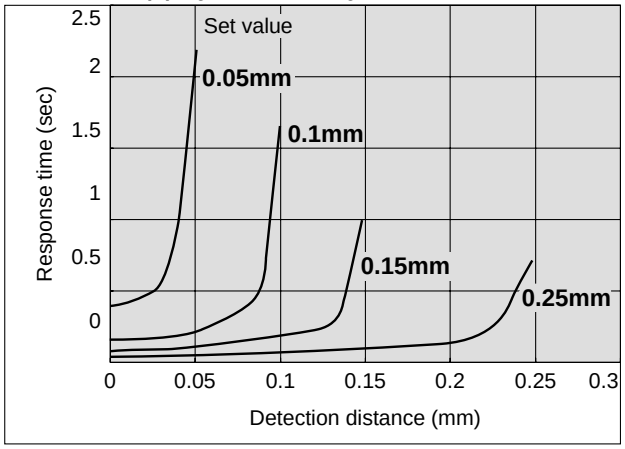


Response Time

Response time changes with detection distance and piping length. It is hardly influenced by the supply pressure and nozzle diameter (ø1.0 to ø2.0).
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.

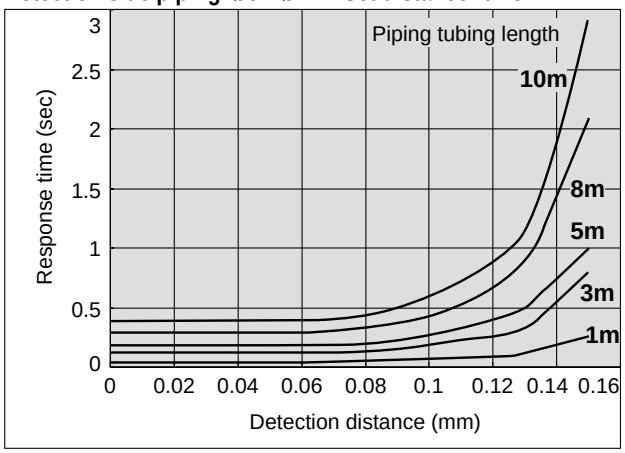
ISA2-G□□□□

Detection nozzle: ø1.5 **Supply pressure: 100kPa**
Detection side piping: ø6 x ø4 tubing 5m



Detection distance−Response time characteristics

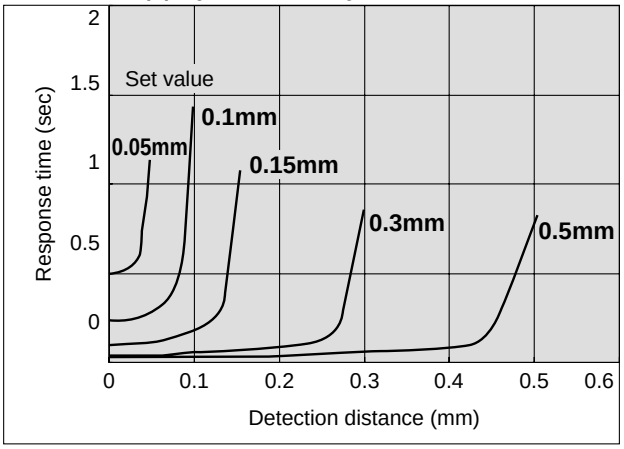
Detection nozzle: ø1.5 **Supply pressure: 100kPa**
Detection side piping: ø6 x ø4 **Set distance: 0.15mm**



Piping tubing length−Response time

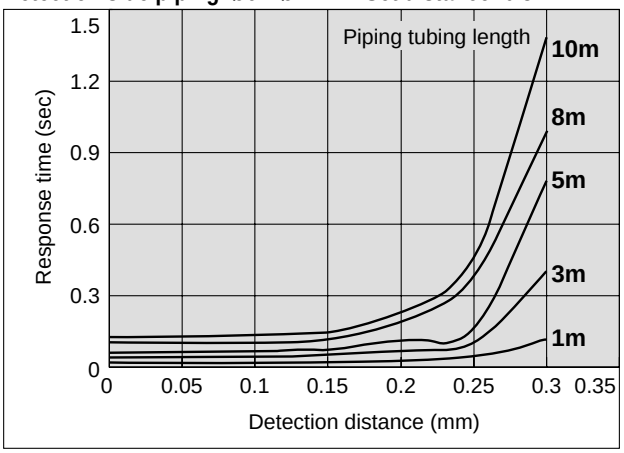
ISA2-H□□□□

Detection nozzle: ø2.0 **Supply pressure: 100kPa**
Detection side piping: ø6 x ø4 tubing 5m



Detection distance−Response time characteristics

Detection nozzle: ø2.0 **Supply pressure: 100kPa**
Detection side piping: ø6 x ø4 **Set distance: 0.3mm**



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.

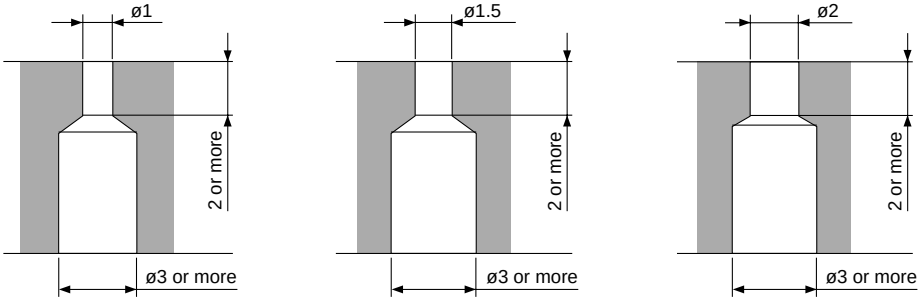
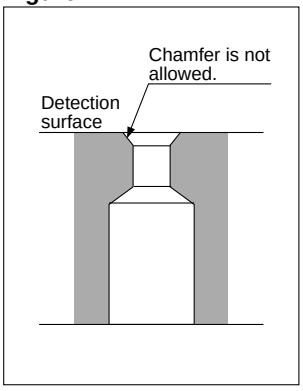


Figure 1

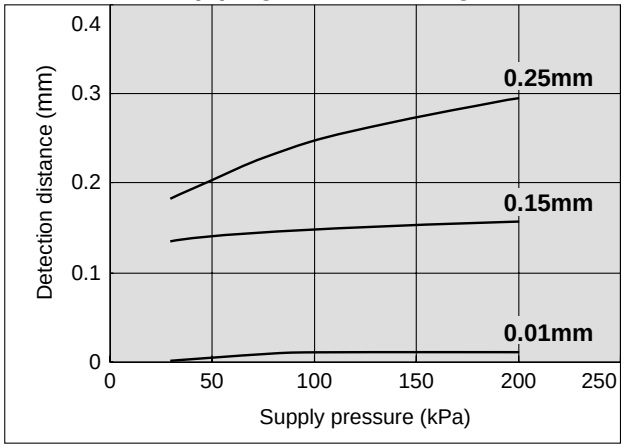


Supply Pressure Dependence

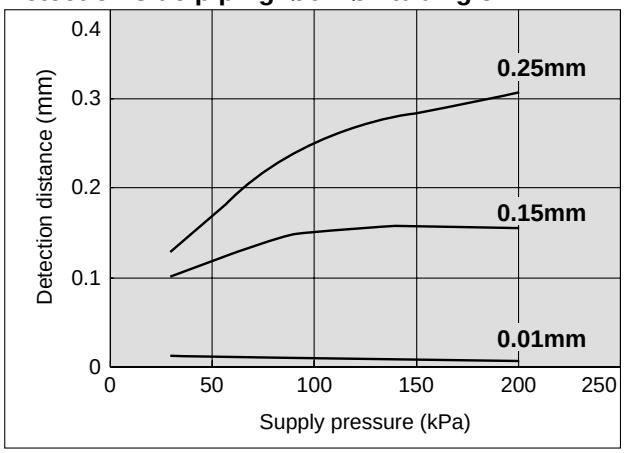
The charts illustrate changes in the detection distance with fluctuations in the supply pressure.

ISA2-G□□□□□

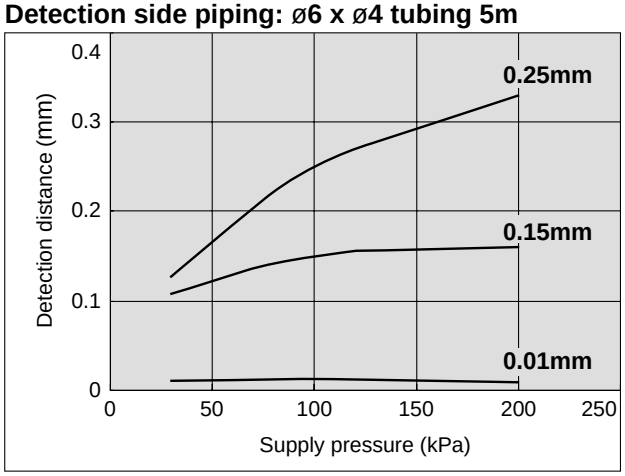
Detection nozzle: ø1.0
Detection side piping: ø6 x ø4 tubing 5m



Detection nozzle: ø1.5
Detection side piping: ø6 x ø4 tubing 5m

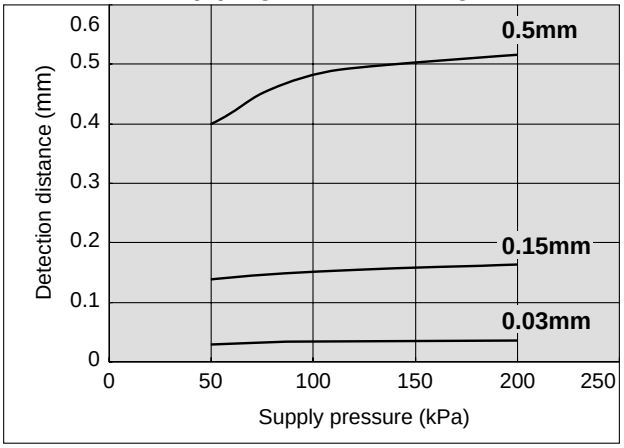


Detection nozzle: ø2.0
Detection side piping: ø6 x ø4 tubing 5m

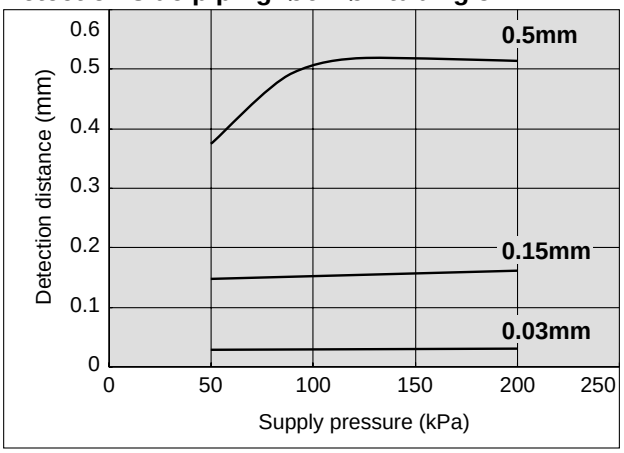


ISA2-H□□□□□

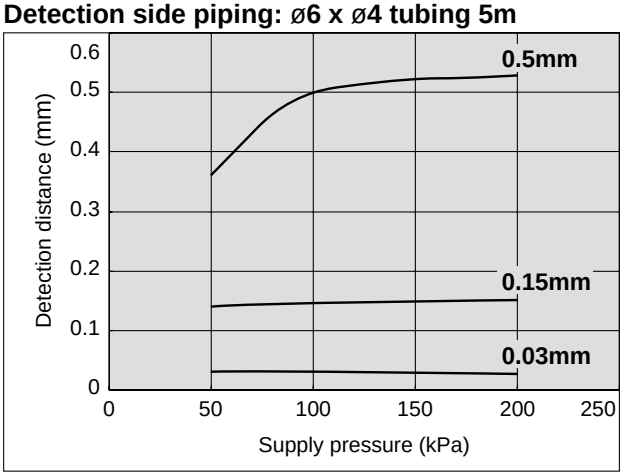
Detection nozzle: ø1.0
Detection side piping: ø6 x ø4 tubing 5m



Detection nozzle: ø1.5
Detection side piping: ø6 x ø4 tubing 5m

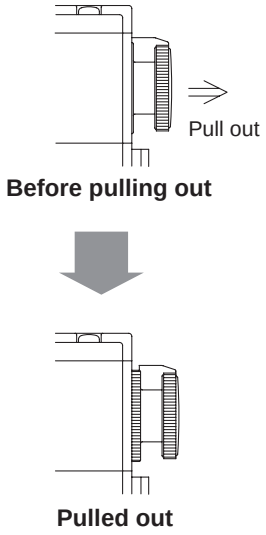


Detection nozzle: ø2.0
Detection side piping: ø6 x ø4 tubing 5m

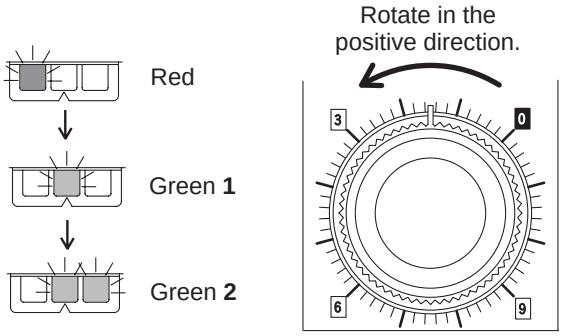


Setting Procedure

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.



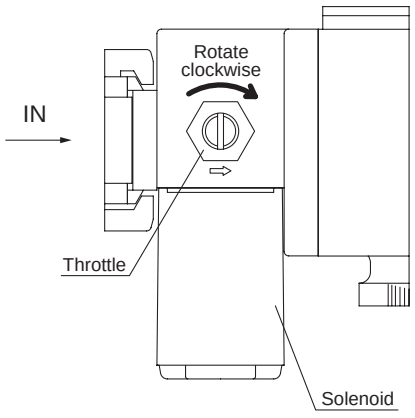
4. The sensor output comes on when the lights on the LED level meter turn on as □□□. Complete the setting when this condition is observed.
5. Apply the clearance gauge again to confirm that the lights turn on as □□□.

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, Counter-clockwise: 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.

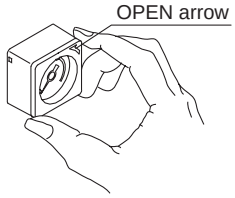


3. Power on the valve, then off again.
Confirm that the detection nozzle does not suck up water or cutting oil.
Note) Do not rotate the throttle more than 4 turns or it will fall out.

Handling and setting of limit gauge indicator

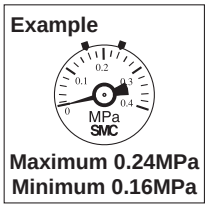
1. Removal of cover

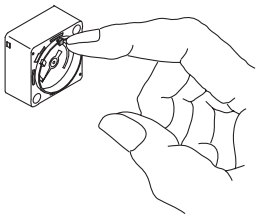
Grip fingers on the front cover ridge and rotate it in the direction of the OPEN arrow until it stops (15°).
Then pull out and remove the cover.



2. Setting the installation needle

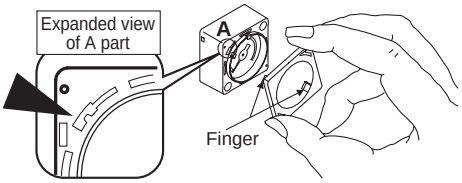
The installation needle should be moved by the fingertip.
Set the 2 green installation needles at the maximum and minimum limits of pressure.





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.



Relation between Dial Scale and Detection Distance

Test procedure and conditions

Dial scales when the detection nozzle is under the following conditions;
Supplied pressure: 100kPa
Piping: ø6xø4 tubing, 5m 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		
	ø1.0	ø1.5	ø2.0
0.05mm	0.3 to 0.7	0.9 to 1.4	0.3 to 0.7
0.10mm	1.1 to 1.5	2.3 to 2.8	2.0 to 2.5
0.15mm	1.9 to 2.3	3.4 to 4.1	3.7 to 4.6
0.20mm	2.5 to 3.0	4.4 to 5.5	5.3 to 7.0
0.25mm	3.0 to 3.5	5.2 to 7.0	6.6 to 10.7

ISA2-H□

Detection distance	Detection nozzle diameter		
	ø1.0	ø1.5	ø2.0
0.1mm	1.1 to 1.5	2.4 to 2.8	2.6 to 3.4
0.2mm	2.4 to 2.9	4.5 to 5.1	5.4 to 6.4
0.3mm	3.0 to 3.5	5.5 to 6.3	7.0 to 8.3
0.4mm	3.3 to 3.8	6.0 to 7.0	7.9 to 9.6
0.5mm	3.5 to 4.0	6.5 to 7.5	8.6 to 10.7

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

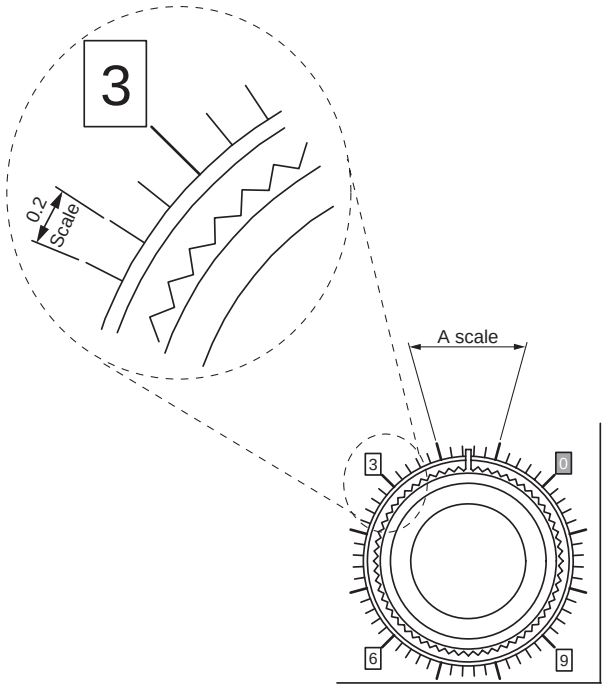
ISA2-G□

Detection distance	Detection nozzle diameter		
	ø1.0	ø1.5	ø2.0
0.05mm	0.010	0.005	0.006
0.10mm	0.007	0.004	0.003
0.15mm	0.010	0.005	0.004
0.20mm	0.010	0.005	0.003
0.25mm	0.010	0.007	0.003

ISA2-H□

Detection distance	Detection nozzle diameter		
	ø1.0	ø1.5	ø2.0
0.1mm	0.008	0.004	0.003
0.2mm	0.008	0.005	0.004
0.3mm	0.025	0.011	0.007
0.4mm	0.046	0.019	0.011
0.5mm	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;

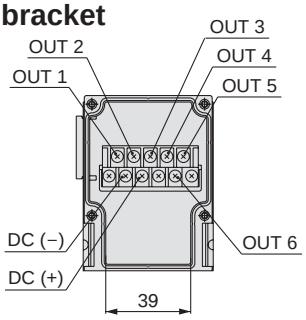


Between each major scales, it is sub divided into ten smaller settings (for example, between 2.0 to 3.0 – 2.1, 2.2, 2.3 etc), settings are possible at each increment.

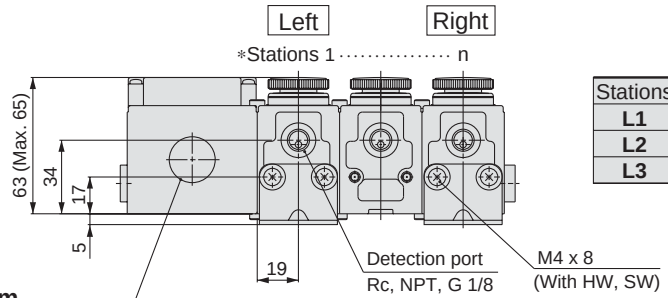
Dimensions/Centralised Wiring Type

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

With bracket

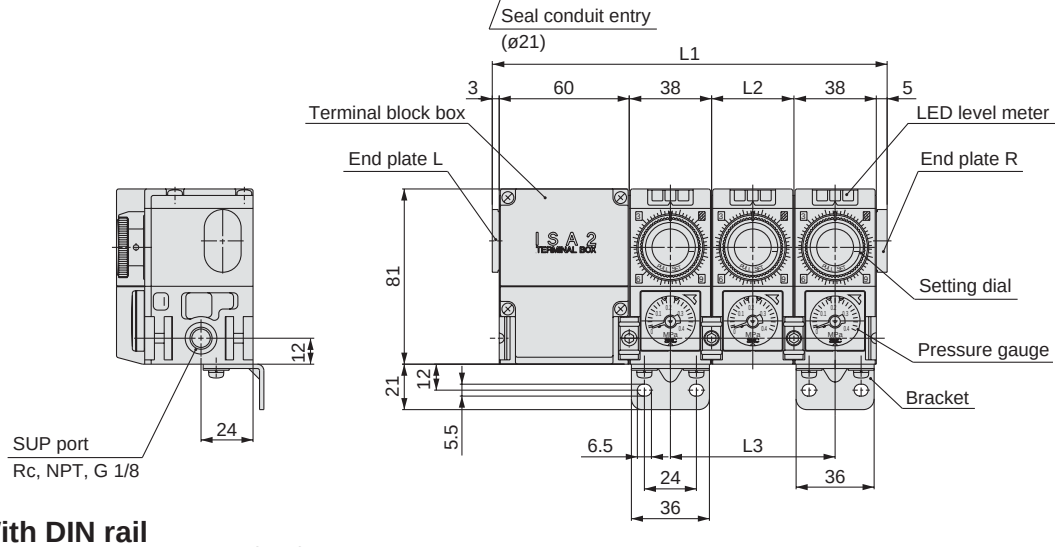


Terminal block box wiring diagram

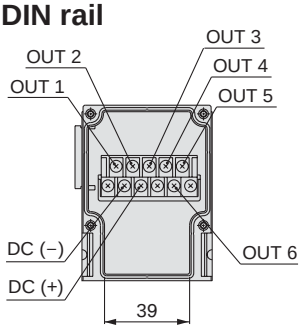


Stations	1	2	3	4	5	6
L1	106	144	182	220	258	296
L2	—	—	38	76	114	152
L3	—	38	76	114	152	190

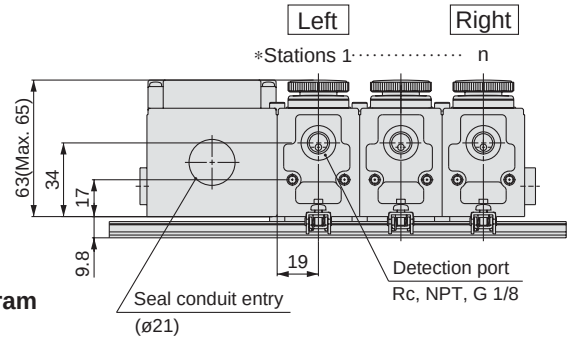
For the bracket attachment position, refer to page 13.



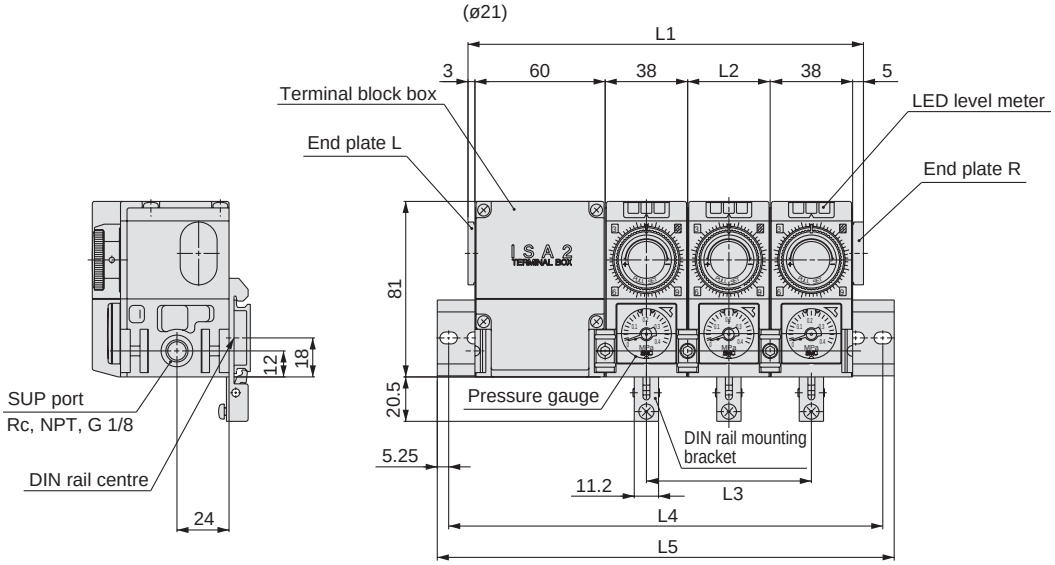
With DIN rail



Terminal block box wiring diagram

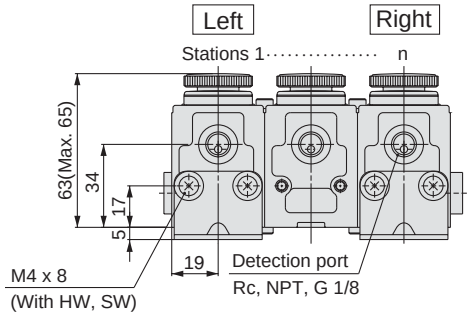


Stations	1	2	3	4	5	6
L1	106	144	182	220	258	296
L2	—	—	38	76	114	152
L3	—	38	76	114	152	190
L4	120	162.5	200	237.5	275	312.5
L5	135.5	173	210.5	248	285.5	323



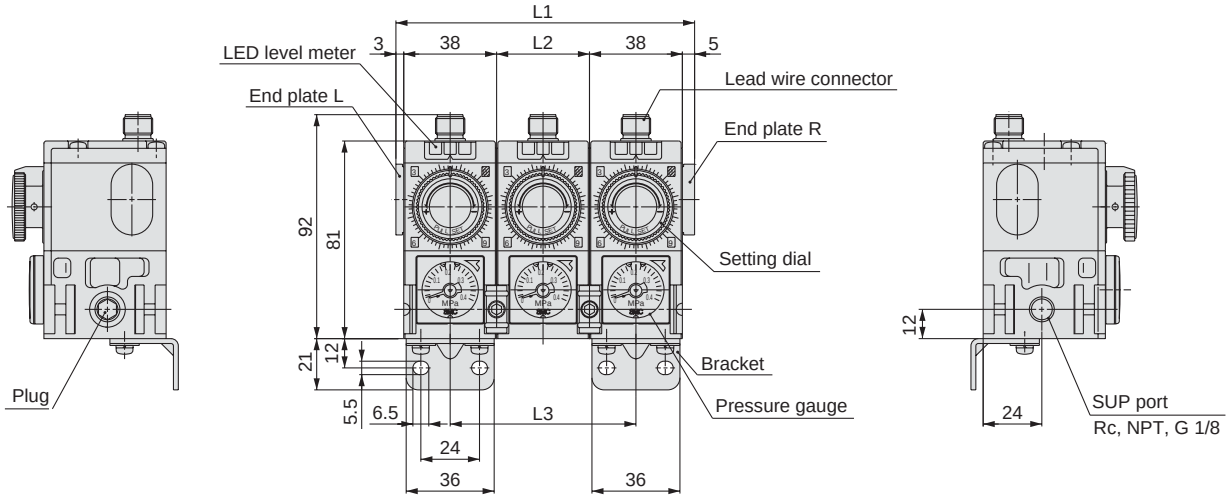
Dimensions/Individual Wiring Type

With bracket



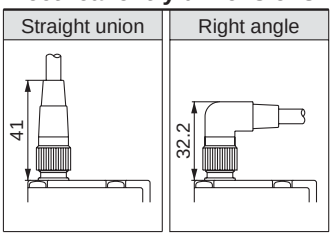
Stations	1	2	3	4	5	6
L1	46	84	122	160	198	236
L2	—	—	38	76	114	152
L3	—	38	76	114	152	190

For the bracket attachment position, refer to page 13.

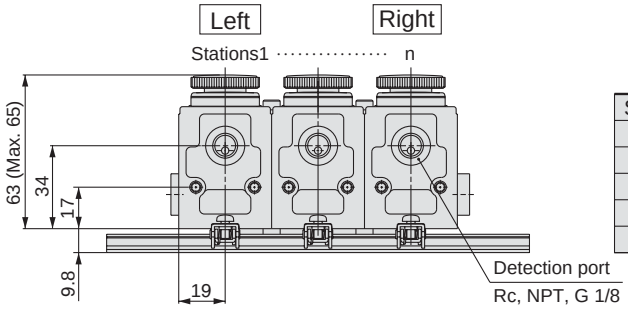


With DIN rail

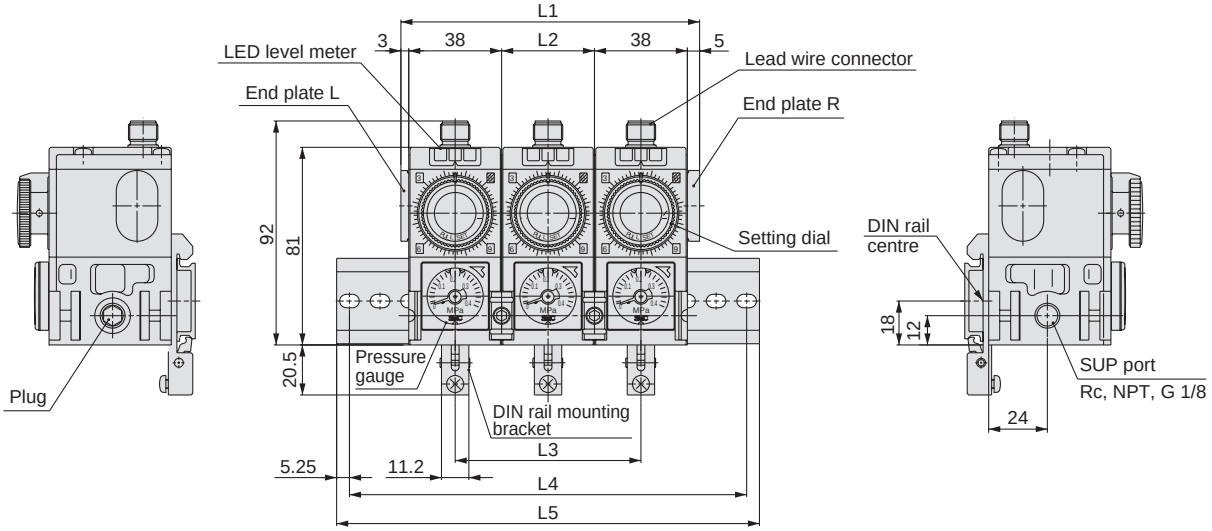
Electrical entry dimensions



The direction of a right angle connector cannot be changed.

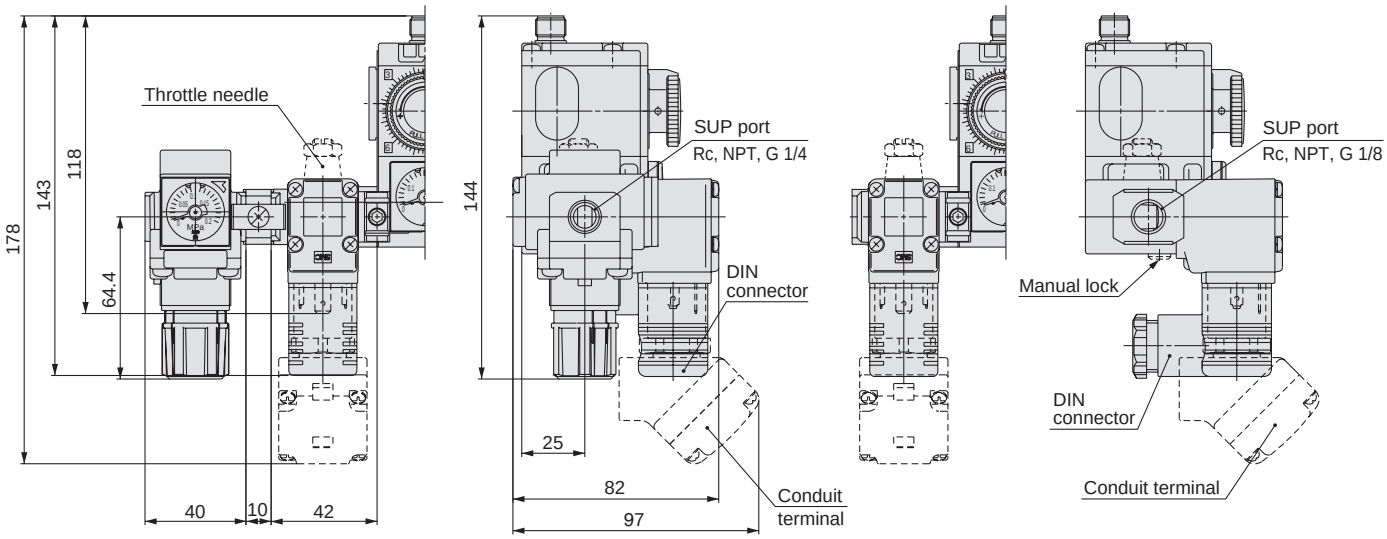


Stations	1	2	3	4	5	6
L1	46	84	122	160	198	236
L2	—	—	38	76	114	152
L3	—	38	76	114	152	190
L4	62.5	120	162.5	200	237.5	275
L5	73	135.5	173	210.5	248	285.5



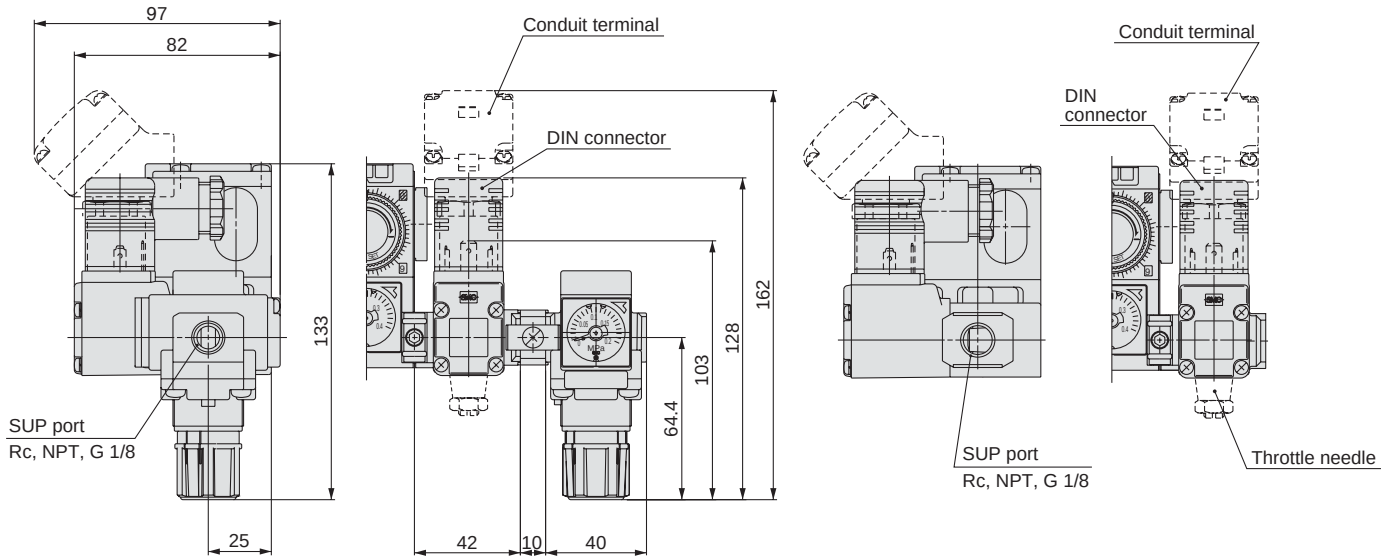
Dimensions/With control unit

SUP port on the left



With regulator + 2 port solenoid valve **With 2 port solenoid valve**

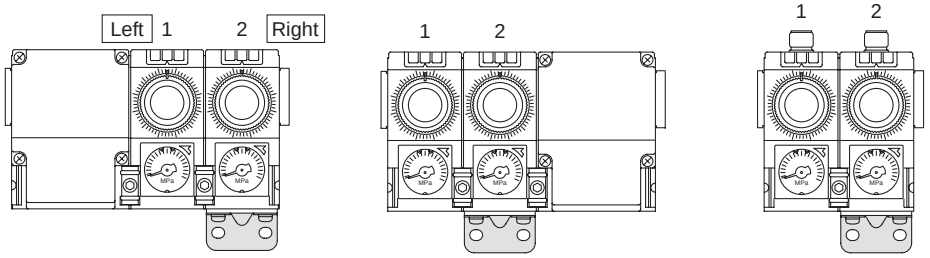
SUP port on the right



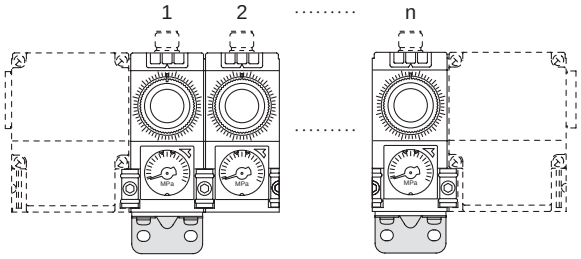
With regulator + 2 port solenoid valve **With 2 port solenoid valve**

Bracket Mounting Position

With 2 stations, the bracket is mounted on the second sensor from the left.

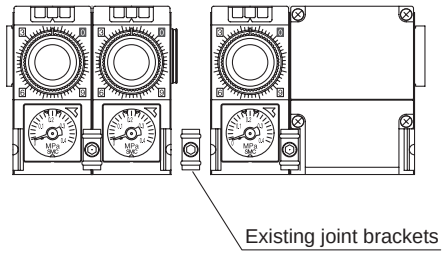


With n stations, the bracket is mounted on the first and "n" th sensor from the left.



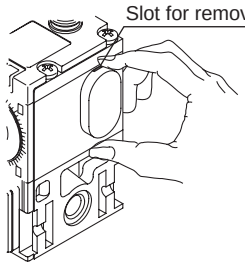
Addition of Manifold Stations

1. Disassembly



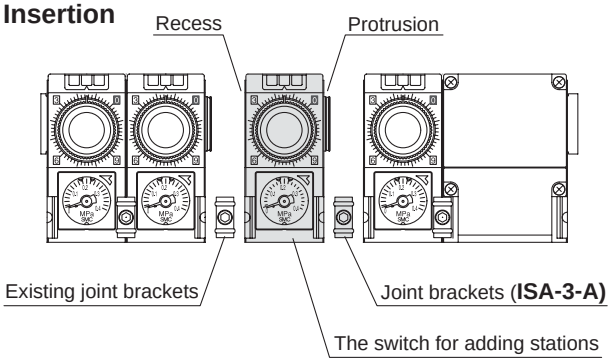
1. Loosen the screws and remove the 2 mounting brackets on the front and back side.
2. Disassemble the switch carefully so that the O-ring on the SUP port will not be detached.

End plate removal



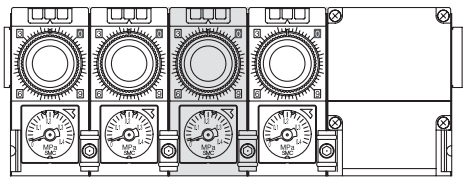
Grip the fingers on the top and bottom removal grooves to pull out the plate.
It can be removed by pulling horizontally.

2. Insertion



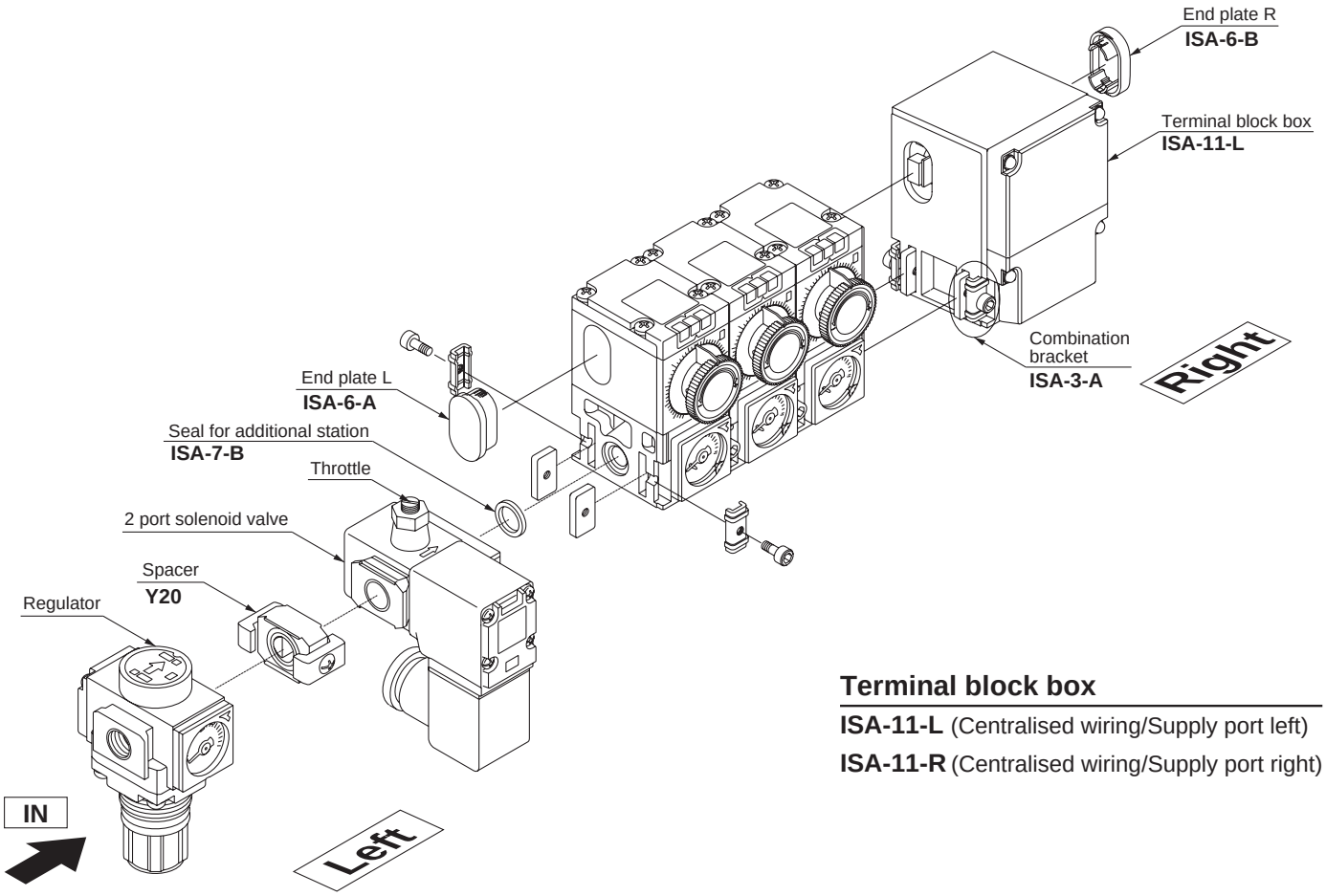
1. Fit seal for additional station (**ISA-7-B**) to the recess of the SUP port of the additional switch.
2. Fit the protrusion of the additional switch into the existing switch.
3. Mount joint brackets (**ISA-3-A**) at 2 positions.
   Note) Perform temporary tightening of screws.
4. Confirm that the recess of the SUP port of the existing switch has seal for additional station attached.
5. Fit the protrusion of the existing switch into the recess of the additional switch.
6. Mount the existing joint bracket.
   Note) Perform temporary tightening of screws.

3. Assembly



1. Tighten the joint brackets with the prescribed tightening torque of 1.2N·m.
2. Arrange pneumatic piping and confirm that there is no air leakage from new joints.

Parts List



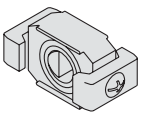
Terminal block box

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

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

Spacer

Y20



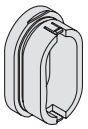
Seal for additional station

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:

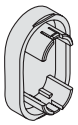
End plate L

ISA-6-A



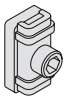
End plate R

ISA-6-B



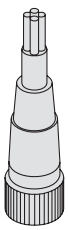
Joint bracket

ISA-3-A
A pair consists 1 set.

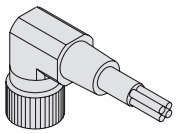


Lead wire with connector (Individual wiring type)

ISA-8-A
Straight, 5m

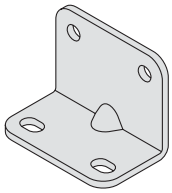


ISA-8-B
Right angle, 5m



Bracket

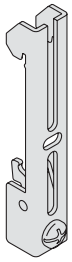
ISA-4-A



With mounting screw 2 pcs.

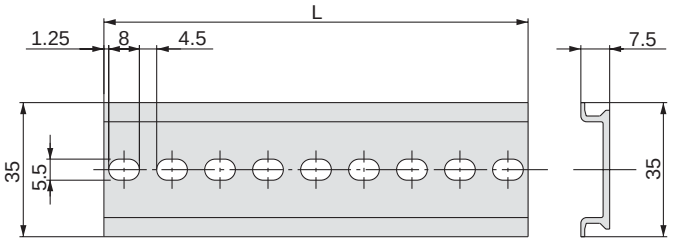
DIN rail mounting bracket

ISA-9-A



DIN Rail

ISA-5-□



Part no.	L	Applicable models	
		Individual wiring type	Centralised 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

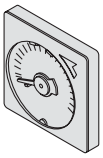
GC3 – □ 4 AS

Notation specification

-	MPa single notation
P	PSI single notation

Maximum pressure indication

2	0.2MPa
4	0.4MPa



Round pressure gauge

G36 – □ 4 – □ 01

Notation specification

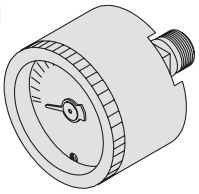
-	MPa single notation
P Note)	MPa-PSI double notation

Maximum pressure indication

2	0.2MPa
4	0.4MPa

Connection thread

-	R 1/8
N	NPT 1/8



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

Regulator

AR 20 – □ 02 E – 1 □

Thread type

-	Rc
N	NPT
F	G

Option (The shape of pressure gauge) Note 2)

-	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

-	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			1.5MPa
Maximum operating pressure			1.0MPa
Set pressure range			0.02 to 0.2MPa
Gauge port size Note 1)			1/8
Relief pressure			Set pressure + 0.05MPa {at relief flow of 0.1ℓ/min(ANR)}
Ambient and fluid temperature			−5 to 60°C (with no condensation)
Construction			Relieving type
Weight (kg)			0.29
Pressure gauge	0.2MPa	Round Note 2)	G36-2-□01
		Square embedded Note 3)	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 – 5 DL S – 4 – 02 – Q

Voltage

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

Port size

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

CE marked

Throttle

-	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)
D0	DIN connector (without connector)
T	Conduit terminal
TL	Conduit terminal (with light)

Standard specifications

Valve specifications	Valve type			Direct operation poppet
	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 (with no freezing)
	Enclosure			Dustproof and jetproof (Equivalent to IP65)
	Atmosphere			Environment with no corrosive or explosive gas
	Valve leakage cm³/min (ANR)			0.2 or less
	Mounting orientation			Free
	Vibration resistance/Impact resistance m/s² Note 2)			30/150 or less
Coil specifications	Rated voltage			24/12VDC, 100/110/200/220/230VAC (50/60Hz)
	Allowable voltage fluctuation			±10% rated voltage
	Type of coil insulation			B type
	Power consumption	DC		VCA2: 6.5W
	Apparent power	AC Note 1)	50Hz	VCA2: 7.5VA
			60Hz	

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 300Hz range in the axial and right angle directions of the main valve and armature, for both energised and de-energised 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 energised and de-energised states.

Series *ISA2*
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of **"Caution", "Warning" or "Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.

⚠ Warning : Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified. Refering to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven object have been confirmed.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuit in press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

Series ISA2
Common Precautions 1
Be sure to read before handling.

Design and Selection

⚠ Warning

1. Operate the switch only within the specified voltage.

Use of the switch outside the range of the specified voltage can cause not only malfunction and damage to the switch but also electric shocks and fire.

2. Never apply a load above the maximum load capacity.

It can damage the air catch sensor or shorten the life time.

3. Do not use a load that generates surge voltage.

Although the output circuit of the air catch sensor is equipped for surge protection, repeated application of surges can damage the air catch sensor.

When a load, such as a relay or solenoid, which generates surge is directly driven, use a type of switch having a built-in surge absorbing element.

4. Be sure to observe the set pressure range and maximum operating pressure.

Use of the air catch sensor outside the range of the specified pressure can cause failure. Use at a pressure exceeding the maximum operating pressure may damage the air catch sensor.

5. Be aware of internal voltage drops of the air catch sensor.

When the air catch sensor is used below the specified voltage, even if the air catch sensor operates normally, the load may fail to operate. Confirm the operating voltage of the load and adjust it to satisfy the formula below.

Power supply voltage − Internal voltage drop of air catch sensor > Load operating voltage

6. Quality of operating air

1. Use clean air.

Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

2. Install air filters.

Install air filters at the upstream side of valves, The filtration degree should be 5μm or finer.

3. Install an after cooler, air dryer or water separator, etc.

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after cooler, air dryer or water separator, etc.

Mounting

⚠ Warning

1. Do not use the switch unless it operates normally.

After installation, repair or reform, connect air and electricity and conduct appropriate function and leakage tests to confirm proper installation.

2. Observe the prescribed tightening torque in installation.

If screws are tightened with a force beyond the tightening torque range, it can cause damage to the mounting screws, mounting brackets and switches. If the force is below the tightening torque range, the fixing screws can come loose during operation.

connection thread :1/8, 1/4

Nominal size	Proper tightening torque N·m
M5	1/6 rotation after manual tightening
1/8	7 to 9
1/4	12 to 14

3. Detection port

Do not insert wire, etc. into pressure port. It will damage the pressure sensor and cause malfunction.

Maintenance

⚠ Warning

1. Removal of the product

1. Shut off the fluid supply and release the fluid pressure inside the system.
2. Shut off the power supply.
3. Remove the product.

2. Perform periodic inspections to confirm proper operation.

Unexpected malfunctions or incorrect operation can cause possible danger.

3. Be careful when using the air catch sensor in an interlocking circuit.

When using the air catch sensor in an interlocking circuit, build a multiple interlocking system to prevent trouble or malfunction. At the same time, perform periodic inspections to confirm proper operation.

⚠ Caution

1. When the body becomes dirty.

Wipe off dirt with soft cloth. In case of heavy dirt, soak the cloth in neutral detergent diluted with water, wring the water out, wipe off the dirt with the cloth and finish with dry cloth.

Series ISA2
Common Precautions 2
Be sure to read before handling.

Wiring

⚠ Warning

1. Confirm the colours and terminal numbers of the wires when connecting.
Incorrect wiring can lead to damage, failure and malfunction. Confirm colours and terminal numbers in the operation manual when wiring.

2. Avoid repeatedly bending or stretching lead wires.
Broken wires will result from applying repeated bending stress or stretching force to the lead wires. Replace any lead wire that is damaged and can possibly cause malfunction.

3. Confirm proper insulation of wiring.
Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.) Damage may occur due to excess current flow into an air catch sensor.

4. Do not run wiring near power lines or high voltage lines.
Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

5. Do not allow short circuit of loads.
Take special care to avoid reverse wiring with the power supply line (brown) and the output line (black).

Operating Environment

⚠ Warning

1. Never use in an atmosphere of explosive gases.
The construction of air catch sensor is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an atmosphere of corrosive gases, chemicals, sea water, water, or vapor or in an environment where such a substance adheres.

3. Do not use in environment where vibration or impact occurs.

4. Do not operate in a location near a heat source or where radiated heat will be received.

5. Take proper protection measures in an environment where water splashes, oil or spatters from welding may adhere to the product.

6. Do not use in locations where surge is generated.
If there is equipment generating a large surge (such as a solenoid lifter, high frequency induction furnace or motor) around the air catch sensor, it can deteriorate or damage the circuit elements inside the air catch sensor. Apply surge protection measures to the source of the surge and keep the lines apart from each other.

Pressure Source

⚠ Warning

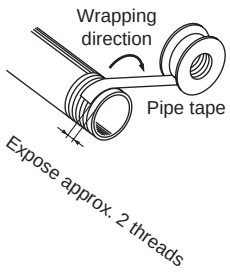
1. Use the air catch sensor within the specified fluid and ambient temperature range.
The fluid and ambient temperature are 0 to 60°C. Take measures to prevent freezing, since moisture in circuits may be frozen at or below 5°C, which can cause damage the O-ring and lead to malfunction. Installation of an air dryer is recommended to remove drain and moisture. Do not use the air catch sensor in an environment with sudden temperature changes even if the ambient temperature range is compliant with the specifications.

Piping

⚠ Caution

1. Preparation before piping
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.
Do not allow tensile, contracting or bending forces by piping to be applied to the valve body.

2. Wrapping of pipe tape
When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping. Also, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



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/s^2.**
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 5μm 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

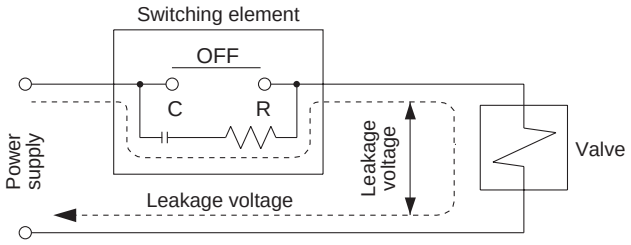
⚠ Warning

1. **Energised continuously**
   Consult SMC if the product is to be energised 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.

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

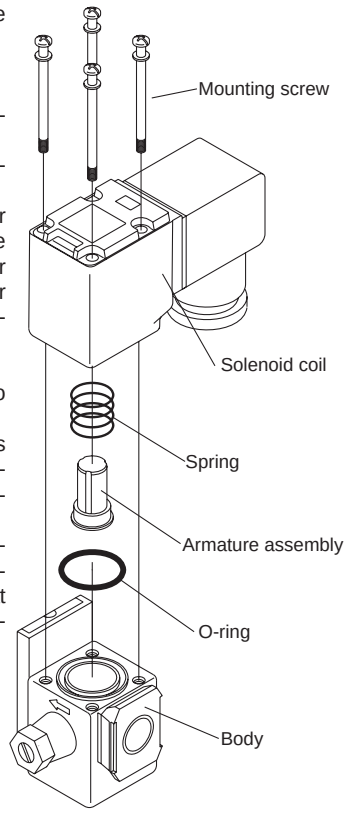
1. Remove the top mounting screws.
2. Remove the solenoid coil, spring and armature assembly.
3. If there is any foreign matter adhering on the surface, take appropriate measures to clear it off such as an air blow or washing with neutral detergent.

·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·m

VCA27	0.4 to 0.5

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.

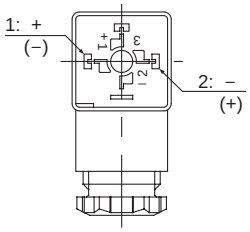
3. The voltage variation must stay within the -10% to +10% range of the rated voltage. In case importance is attached to response characteristics due to use of a DC power source, keep the variation within the -5% to +5% range. The voltage drop is the value at the lead wire to which the coil is connected.

Wiring

⚠Caution

DIN connector (B type only)

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

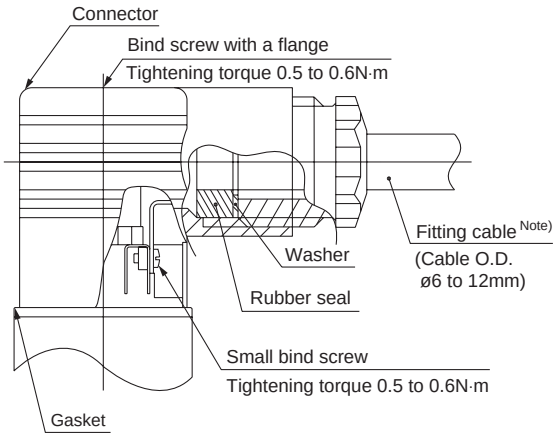


Terminal No.	1	2
DIN terminal	+ (−)	− (+)

∗No polarity.

·A compatible heavy duty cable with an O.D. ø6 to 12 mm is applicable.

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



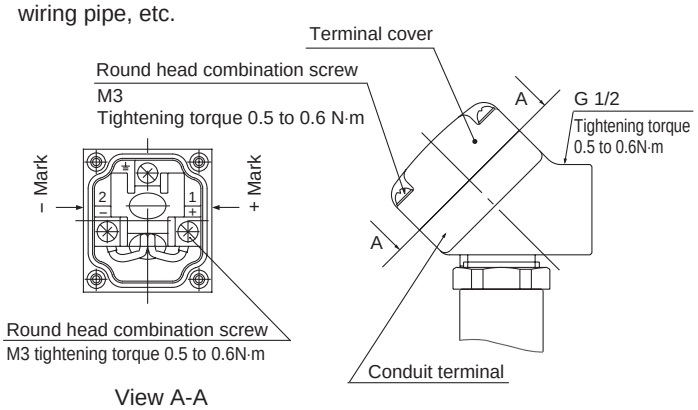
Note) With a cable O.D. ø9 to 12 mm, hollow the rubber sealing before use.

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.



View A-A
(Internal connection diagram)

Series ISA2
Specific Product Precautions 3

Be sure to read before handling.

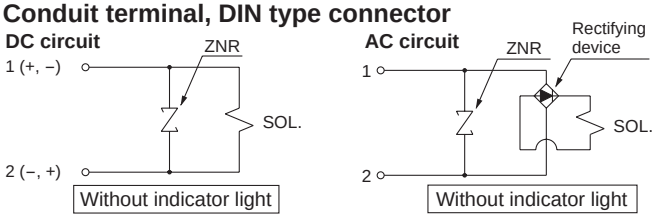
2 Port Solenoid Valve Series VCA

Electric Circuit

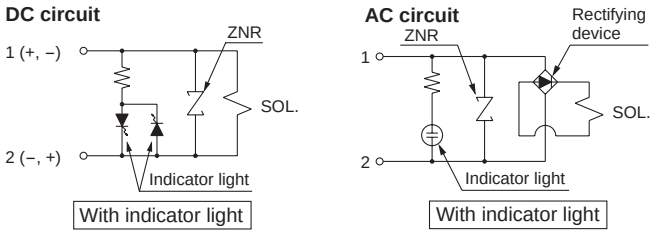
⚠ Caution

In case of series VC (B type coil)

Conduit terminal, DIN type connector



Conduit terminal, DIN type connector



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

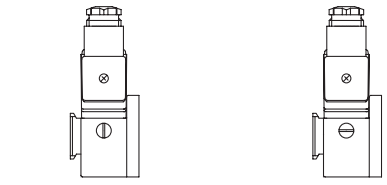
How to operate manually

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 coloured 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 coloured 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.

SMC Corporation

1-16-4 Shimbashi, Minato-ku, Tokyo 105-0004, JAPAN
Tel: 03-3502-2740 Fax: 03-3508-2480
URL http://www.smcworld.com

European Marketing Centre (EMC)
Zuazobidea 14, 01015 Vitoria
Tel: +34 945-184 100 Fax: +34 945-184 124
URL http://www.smceu.com

1st printing **DO** printing **DO 30 UK** **Printed in Spain**