








# INSTRUMENTATION

## INSTRUMENTATION

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# INSTRUMENTATION

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# PRESSURE SWITCH: IS3000

## PNEUMATIC PRESSURE SWITCH: IS3000

- ✓ High Frequency Operation
- ✓ Long Life
- ✓ Simple Pressure Setting
- ✓ Compact and Lightweight
- ✓ Optional Neon Lamp Available



### TECHNICAL SPECIFICATIONS

Item	Model	IS3000-02	IS3100	IS3010-02	IS3110
Fluid		Air			
Proof Pressure		1000kPa			
Max Operating Pressure		800kPa			
Pressure Regulating Range		100 - 700 kPa			
Ambient & Fluid Temperatures		-5 -60°C			
Sensitivity		Within 50kPa (@ Set Pressure 100 - 500 kPa) Within 60kPa (@ Set Pressure 500 - 700 kPa)			
Repeatability		±20 kPa			
Weight		0.15kg			
Port/Connection		Rc(PT)1/4	Flange	Rc(PT)1/4	Flange
Micro Switch Type		Standard		Microload	
Minimum Applicable Load		DC 5V 160mA		DC 5V 1mA	

1kPa = 0.145PSI

### MICRO SWITCH RATINGS

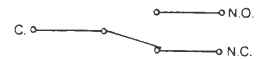
Model	IS3000								IS3010	
	Non Inductive Load (A)				Inductive Load (A)				Non Inductive Load	
	Resistance Load		Lighting Load*		Inductive Load		Motor Load*		Resistance Load	
Circuit (V)	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.
AC125	5		1.5	0.7	3		2.5	1.3	0.1	
AC250	3		1	0.5	2		1.5	0.8		
DC30	4		2		3		3		0.1	
DC125	0.4		0.05		0.4		0.05		-	

Insulation Resistance 100 MΩ @ 500V (DC)

\*High Inrush Circuits

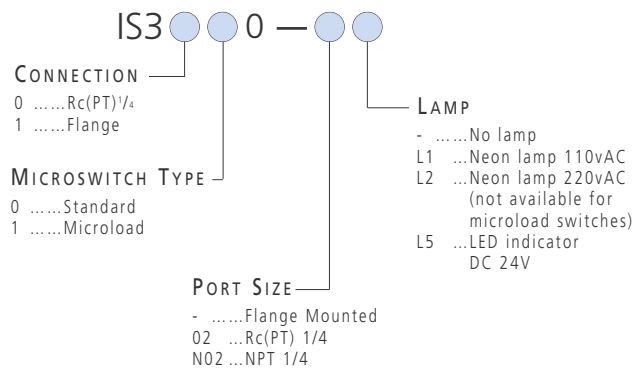
### WIRING

Please wire micro-switch in accordance with the molded symbols that appear beside the terminal screws.



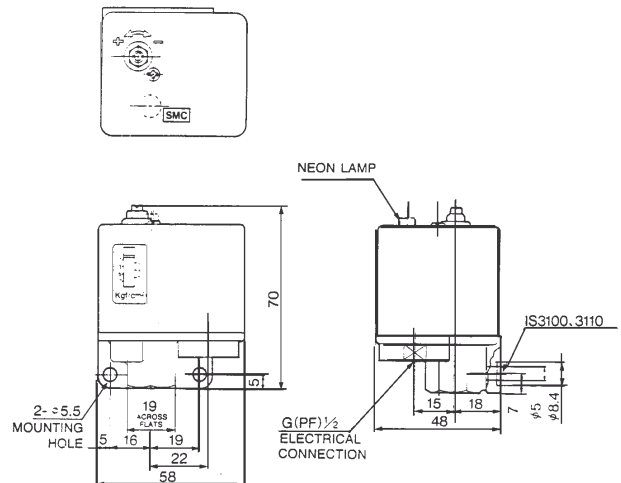
### HOW TO ORDER

#### PNEUMATIC PRESSURE SWITCH: SERIES IS3000



### DIMENSIONS

#### PNEUMATIC PRESSURE SWITCH: SERIES IS3000



# INSTRUMENTATION PRESSURE SWITCHES

## PNEUMATIC PRESSURE SWITCH: SERIES ISG

- ✓ ISG Pressure Switches are widely used in industrial machines and power plant applications to give automatic pressure control
- ✓ Easy Adjustment by external wrench is provided. Pressure setting is clearly seen with the use of a scale
- ✓ High Reliability and Long Life
- ✓ Adjustable Differential



### TECHNICAL SPECIFICATIONS

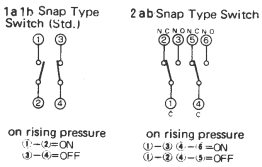
Fluid	Air, Non corrosive water, oil gases*
Pressure Setting Range	0.05~1MPa / 7~145PSI
Adjustable Differential	0.03~0.6MPa / 5~90PSI
Max Operating Pressure	1.5MPa / 220PSI
Electrical Contacts	1a, 1b Dual Contact
Electrical Entry	Grommet
Inlet Port Size	R 3/8 (male)
Ambient and Fluid Temp	Max 60°C / 140°F
Weight	1.3 kg

\*Materials in contact with fluid, phosphor bronze/brass

### SYMBOLS



### CONTACTS



### ELECTRICAL CAPACITY

Voltage	AC amps		DC amps	
	Instantaneous Peak Current	Switch Cut-off Current	Instantaneous Peak Current	Switch Cut-off Current
24	—	—	8	3
48	—	—	6	1.5
110	30	12	4	0.5
220	20	10	2	0.25
440	15	6	—	—
550	10	5	—	—

Insulation resistance 100 m.Ohm min at 500V DC  
Test voltage AC 2000V for 1 minute

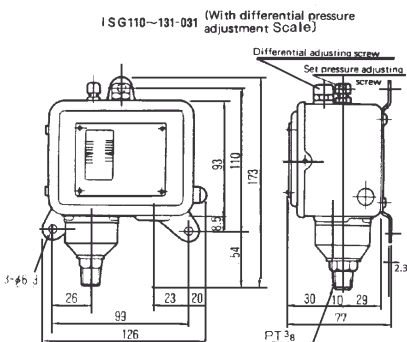
### HOW TO ORDER

PNEUMATIC PRESSURE SWITCH: SERIES ISG

ISG130-031

### DIMENSIONS

#### PNEUMATIC PRESSURE SWITCH: SERIES ISG



- Do not set differential below the minimum specified.
  - The scale is for reference use only. Use gauge for accurate setting.
- Installation:
- The switch can be installed vertically or horizontally.
  - Surge Absorber should be used in liquid lines to avoid pulsating pressure.
  - Ensure wiring is clear of mechanism movement.
  - When wiring industrial type non water proof units ensure earth wire is fitted.

## COMPACT PRESSURE SWITCH: SINGLE CONTACT SERIES IS1000

- ✓ Compact and Light Weight (50mm x 23mm x 15mm)
- ✓ Operational Pressure set made easy by Scale Plate
- ✓ Shield Plate attached to prevent external magnetic interference
- ✓ Long Life



### TECHNICAL SPECIFICATIONS

Model	IS1000-01
Proof Pressure	1.0 MPa (145PSI)
Max Operating Pressure	0.7 MPa (100PSI)
Pressure Range: -X201	0.1~0.4 MPa (14.5~60PSI)
Pressure Range: -X215	0.15~0.6 MPa (22~90PSI)
Differential	0.08 MPA (12PSI) or less
Contact	1a single contact (low pressure, no contact)
Electrical Entry	Grommet • Lead wire length 3metre
Fluid	Air
Ambient and Fluid Temperature	5~60°C / 40~140°F
Port Size	R 1/8 (Male)

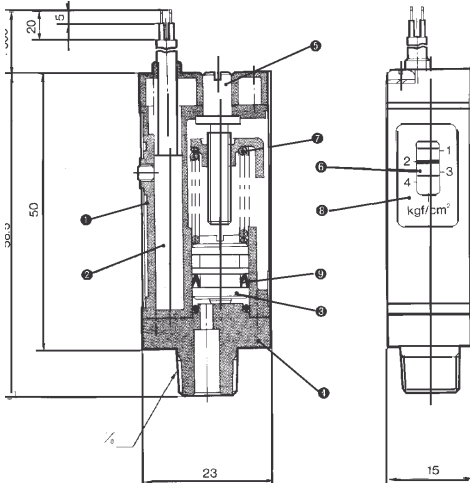
### SWITCH CHARACTERISTICS

Max Contact Capacity	2V (AC), 2W (DC)		
Voltage	24V AC, DC or less	48V AC, DC	100V AC, DC
Max Operating Current	50mA	40mA	20mA
Shock Resistance	30G		
Response Time	1.2ms		

\*Note. Not suitable for 240V AC

### DIMENSIONS

#### COMPACT PRESSURE SWITCH: SERIES IS1000



### ELECTRICAL CIRCUIT

Up to 100V AC/DC



### SYMBOLS



### HOW TO ORDER

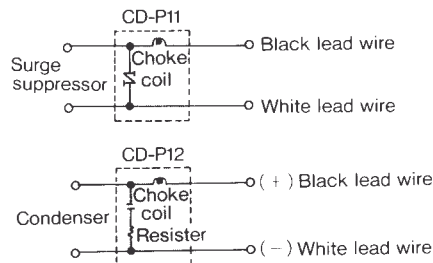
#### COMPACT PRESSURE SWITCH: SERIES IS1000

IS1000 — 01 —

PORT THREAD  
01 ... 1/8 PT  
N01 ... NPT1/8

	Set Pressure Range	Lead Wire Length
-X201	1~4 bar	3m
-X215	1.5~6 bar	3m

### CONTACTS



- When detecting ON-pressure signal, note that set pressure on scale plate plus ON-OFF differential will be ON-pressure signal.
- Don't use with corrosive fluids.
- When piping switch by hand, hold body not wires.
- Electrical wire must not be subjected to excessive force.

### ACCESSORIES

#### COMPACT PRESSURE SWITCH: SERIES IS1000 FOR USE IF WIRING LENGTH > 5M

CD-P11	.....	Contact protection box (100V AC)
CD-P12	.....	Contact protection box (24V DC)

# INSTRUMENTATION PRESSURE SWITCHES

## PRESSURE SWITCH WITH LCD DIGITAL DISPLAY SERIES GS40

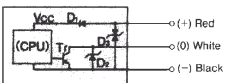
- ✓ Digital Pressure Gauge Function added to Pressure Switch
- ✓ Semi-Conductor Sensor
- ✓ High Reliability
- ✓ Easy Operation
- ✓ Low Power Consumption
- ✓ Digital Display of Low Limit during setting
- ✓ 5 Options of Displayed Pressure Unit
- ✓ Preliminary Alarm Display gives warning that pressure is within 10% of set point



### TECHNICAL SPECIFICATIONS

Fluid	Air and Inert Gas				
Differential	3% F.S (Full Span) or less				
Accuracy	±3% F.S (5~40°C) ±5% F.S (0~60°C)				
Operating Voltage	12 to 24 VDC (Ripple: +10% or less)				
Output	Open collector (NPN) 30V 80mA				
Action Indicator Light	Lighting under ON condition (ON at preset) (pressure or less)				
Current Consumption	15mA (24VDC under ON condition) or less				
Maximum Operating Pressure	145PSI (0.98 MPa)				
Operating Temperature Range	0~60°C / 32~140°F				
Sampling Frequency	4Hz				
Pressure Unit	psi	kPa	kgf/cm <sup>2</sup>	MPa	bar
Preset Pressure Range	0~142	0~975	0~9.9	0~0.98	0~9.8

### CIRCUIT AND ELECTRICAL CONNECTION



#### RED LEAD WIRE -

Connect with blue (+) side of the direct current to actuate the switch.

#### WHITE LEAD WIRE -

Connect with the inout terminal of the sequence controller or the DC relay or other load since this is the switch output.

#### BLACK LEAD WIRE -

Connects with minus (-) side of the direct current to actuate the switch.

D1 - Reverse-connection preventing diode

D2 - Surge killer (Surge absorbing diode)

D3 - Surge killer (Surge absorbing diode)

TR - Output transistor

### HOW TO ORDER

PRESSURE SWITCH GS40

GS40-01

### SETTING INSTRUCTIONS

#### HOW TO PRESET PRESSURE SWITCH:

Keep pressing the push button (1) SET and turn the pressure set trimmer (3) P.SET and figures are shown on the pressure display board (4) LCD. (The preset pressure increases when the pressure switch is turned clockwise and it decreases when turned counterclockwise.) After presetting, return the push button (1) SET to the original place, and the pressure on the line side is shown on the pressure display board (4) LCD.

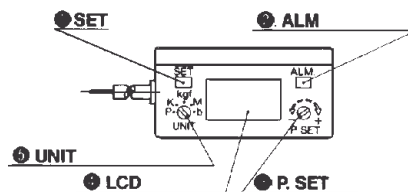
#### HOW TO CHANGE PRESSURE UNIT:

When the unit change switch (5) UNIT is adjusted to each position, the unit and figures of the pressure display change. P:psi, K:kPa, kgf:kgf/cm<sup>2</sup>, M:MPa, b:bar

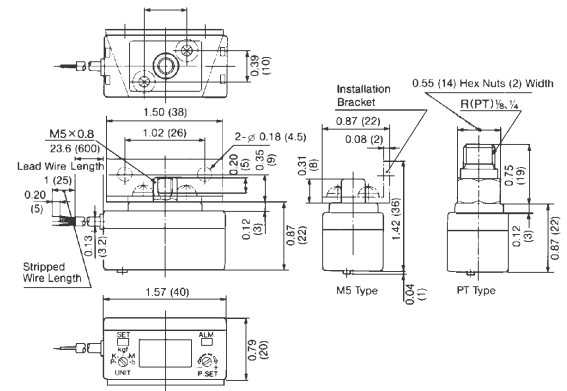
#### ALARM DISPLAY

When the pressure reaches within +10% of the value preset by a pressure switch value, the LCD lights to show that the pressure is approaching the preset value.

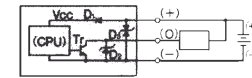
When the line pressure becomes lower than the preset pressure, the LED (red) of (2) ALM lights and the switch turns on.



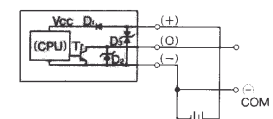
### DIMENSIONS PRESSURE SWITCH GS40



### WIRING EXAMPLES



WIRING EXAMPLES OF RELAY AND RESISTANCE LOAD



WIRING EXAMPLES USED WITH A SEQUENCE CONTROLLER (COM TERMINAL IS -VE)

## AIR AND LIQUID PRESSURE SWITCHES WITH SEPARATE SENSOR AND INDICATOR SERIES PSE

- ✓ Compact Remote Sensors can be mounted in inaccessible areas
- ✓ Separate Indicator with Digital Readout
- ✓ Backlit Seven Segment LED Display
- ✓ Two Input Channels on Indicator – remotely selected
- ✓ Air/Gas and Liquid Sensors available
- ✓ Pre-set and Alarm Functions incorporated into Indicator
- ✓ Remote Reset Function
- ✓ Indicator Settings can be key-locked
- ✓ Vacuum Sensor Available
- ✓ Din Rail and Panel Mount Indicator Options
- ✓ Choice of Sensor Fitting Threads



### TECHNICAL SPECIFICATIONS SERIES PSE

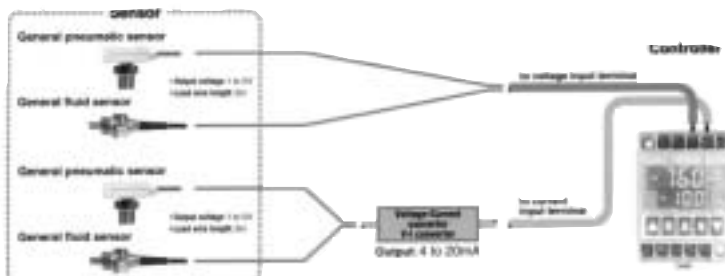
Model No	PSE100	PSE101
Output	NPN Open Collector Max 30V 80mA	PNP Open Collector Max 80mA
Output Point	2CH x 2 output	
Source Voltage	12~24VDC (ripple 10% or less)	
Current Consumption	250mA or less	
Pressure Range Display	-99.9~10kPa (vacuum), -10~100kPa (low pressure), -0.1~1MPa (high pressure)	
Display Resolution	0.1kPa (vacuum and low pressure) 1kPa (high pressure)	
Display Unit:	Vacuum and Low Pressure: kPa, mmHg, kgf/cm <sup>2</sup> , bar, 1nHg High Pressure: kPa, MPa, kgf/cm <sup>2</sup> , bar	
Display Specification	4 digit x 2 7 segments LED	
Sampling Frequency	4Hz	
Display Light	Green when switch output 1 Red when switch output 2	
Emergency Display	"Error" display on 7 segment LED	
Self Diagnosis Function	Excess pressure, excess current, sensor end connection, data error (All these display functions are provided)	
Additional Function	Auto preset: Single touch button setting possible with each adsorption. Auto shift: Input terminal possible with zero clearance.	
Response Frequency	100Hz (10ms)	
Operating Temperature Range	0~50°C (air should not be frozen) / 32~120°F	
Temperature	25±10°C	
Characteristic*	0~50°C / 32~120°F ±0.3% F.S. or less ±0.5% F.S. or less	
Repetition Accuracy	±0.2% F.S. or less	
Noise Resistance	500Vp-p pulse width 1μs standing 1ns	
Withstand Voltage	Between whole wires and case 1000VAC 50/60Hz for one minute	
Insulation Resistance	Between whole wires and case 2MΩ (500VDC by megameter)	
Protection Class	Panel mount type: IP66, wall mount, DIN rail type: IP40	
Mounting	A: Panel mount. B: Wall mount, DIN rail	
Mass	A: Approx 90g. B: Approx 110g	
Sensor	Supply Voltage	Same as Source Voltage
Connection	Voltage Input	1~5V (Input Impedance: 100kΩ)
	Current Input	4~20mA (Input Impedance: 250Ω)

\* Based on 25°C (77°F)

1MPa = 145PSI

### TECHNICAL SPECIFICATIONS

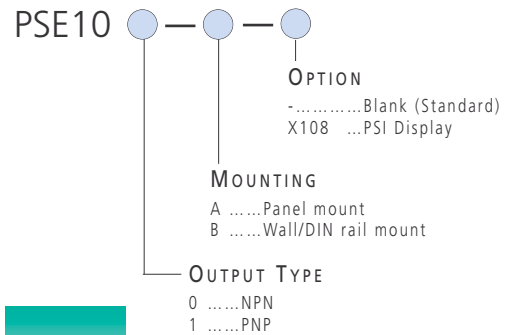
#### DIGITAL PRESSURE SWITCH WITH REMOTE SENSOR DIAGRAM



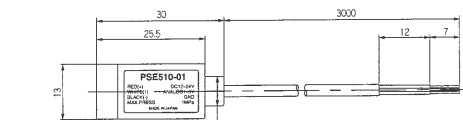
When installing indicators next to each other, allow 20mm between units.  
Minimum separation 65mm between centres.

### HOW TO ORDER

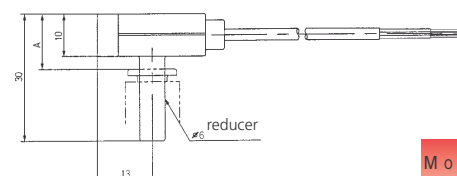
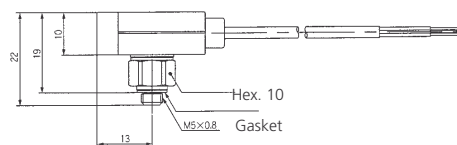
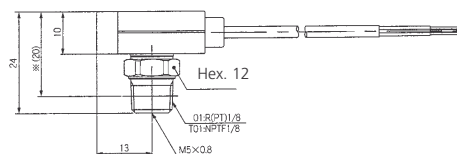
#### REMOTE SENSOR PRESSURE SWITCH SYSTEM



### DIMENSIONS PSE 51\*



\*Dimensions refer to ones measured after R(PT) has been screwed in.



MORE HOW TO ORDER SEE NEXT PAGE

# REMOTE SENSOR PRESSURE SWITCH SYSTEM SERIES PSE

## TECHNICAL SPECIFICATIONS

### PRESSURE SENSOR (FOR AIR)

Model No	PSE510	PSE511	PSE512
Operating Pressure Range	0~1MPa (0~145PSI)	-101~0kPa (-14.5~0PSI)	0~100kPa (0~14.5PSI)
Max Operating Pressure	1MPa		200kPa
Fluid	Air • Non-corrosive gas		
Output	Analogue output (1~5V load impedance: 10kΩ or more)		
Source Voltage	12~24VDC (ripple 10% or less)		
Current Consumption	10mA or less		
Operating Temperature Range	0~50°C (air should not be frozen) / 32~120°F		
Temperature	25±10°C	+1% F.S. or less	
Characteristic*	0~50°C (32~120°F)	+1.5% F.S. or less	
Repetition Accuracy		+0.3% F.S. or less	
Withstand Voltage	Between whole wires and case 1000VAC 50/60Hz for one minute		
Insulation Resistance	Between whole wires and case 2MΩ (500VDC by megameter)		
Vibration Resistance	10~500Hz width = 1.5mm or acceleration 10G (Choose the smaller vibration) to X, Y, Z direction (two hours)		
Shock Resistance	100G X, Y, Z directions (three times for each direction)		
Protection Structure	IP40		

\* Based on 25°C (80°F)

## TECHNICAL SPECIFICATIONS

### PRESSURE SENSOR (NON-CORROSIVE GAS AND LIQUID)

Model No	PSE520-01	PSE520-02
Operating Pressure Range	0~1MPa (0~145PSI)	
Max Operating Pressure	2MPa (30PSI)	
Fluid	Fluid which does not corrode SUS304 and 630	
Output	Analogue output (1~5V. Load impedance: 10kΩ or more)	
Source Voltage	12~24VDC (ripple 10% or less)	
Current Consumption	15mA or less	
Operating Temperature Range	-10~70°C (air should not be frozen) / 14~160°F	
Temperature	25±10°C	+1% F.S. or less
Characteristic*	-10~70°C (14~160°F)	+3% F.S. or less
Repetition Accuracy		+0.3% F.S. or less
Withstand Voltage	Between GND terminal and case 250VAC for one minute	
Insulation Resistance	Between external terminal and case 100MΩ (50VDC by megameter)	
Vibration Resistance	10~55Hz duplex width = 1.5mm to X, Y, Z direction (two hours)	
Shock Resistance	30G (11ms or less) X, Y, Z directions (three times for each direction)	
Protection Structure	IP65	
Material:	Case	Case: SUS304. Fitting SUS304
	Pressure detection portion	Diaphragm: SUS630
Lead Wire	Special flexible polyvinyl chloride Ø6 three-core (red, black, white) 3000m	
Port Size	1/8	1/4
	M5x0.8	M5x0.8
Mass	Approx 220g	

\* Based on 25°C (80°F)

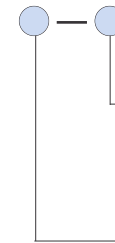
## TECHNICAL SPECIFICATIONS CONNECTION

Part No	R06	M5	01
Material	Case Resin case:PBT	Resin case:PBT Fitting:SUS303	Resin case:PBT Fitting C3604BD (Electroless nickel plating)
	Pressure Detecting Portion	Pressure Sensor: Silicon, O-Ring: BBR	
Lead Wire	Oil-proof captive cord Ø2.55 three core (red, black, white) 3000mm		
Port Size	Ø6 reducer	M5x0.8	1/8 / M5x0.8
Mass	Approx 7g (excl. wire)	Approx 10g (excl. wire)	Approx. 12g (excl. wire)

## HOW TO ORDER

### AIR/INERT GAS SENSOR

PSE51



#### CONNECTION TYPE

- R06 ...6mm male stem
- M5 ...M5x0.8
- 01 ...Rc(PT)1/8 and M5x0.8
- T01 ...NPTF 1/8 and M5x0.8

#### PRESSURE RANGE

- 0 .....High pressure (0~1MPa)
- 1 .....Vacuum (-101~0kPa)
- 2 .....Low pressure (0~100kPa)

## HOW TO ORDER

### GAS AND LIQUID SENSOR

PSE520



#### PORT SIZE

- 01 ...Rc(PT)1/8 and M5x0.8
- 02 ...Rc(PT)1/4 and M5x0.8
- T01 ...NPTF 1/8 and M5x0.8
- T02 ...NPTF 1/4 and M5x0.8

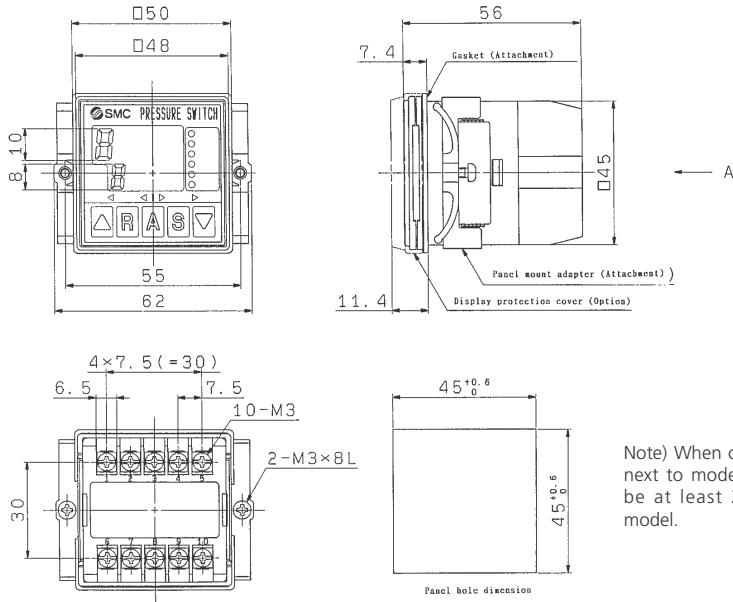
## ACCESSORIES

PSE-V	Voltage to current converter (to convert a 1~5V input signal to a 4~20mA current output)
PSE-C	Protection cover for indicator
PSE-P	Panel mount adaptor plate
PSE-G	Panel mount gasket



## DIMENSIONS

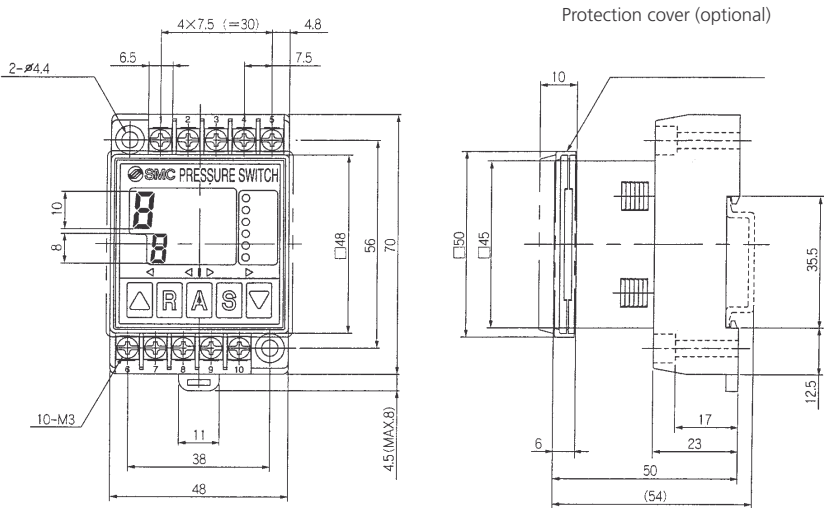
### A: PANEL MOUNTED TYPE / PSE100



Note) When controller is installed next to model, controller should be at least 20mm away from model.

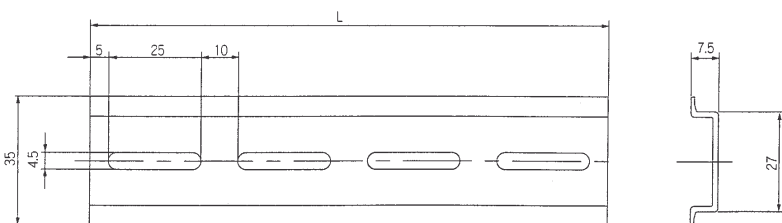
## DIMENSIONS

### B: TYPE DIN RAIL MOUNT / PSE100



## DIMENSIONS

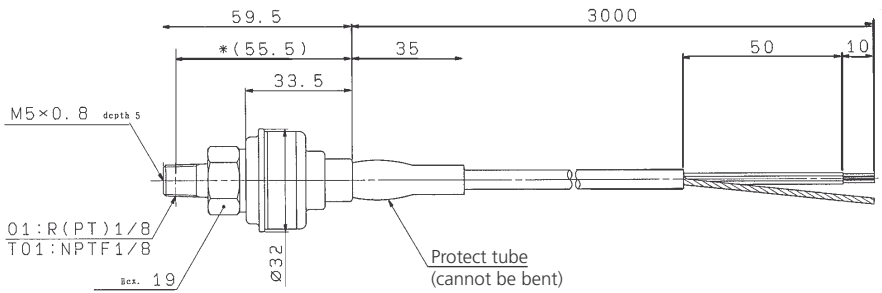
### B: SUITABLE DIN RAIL



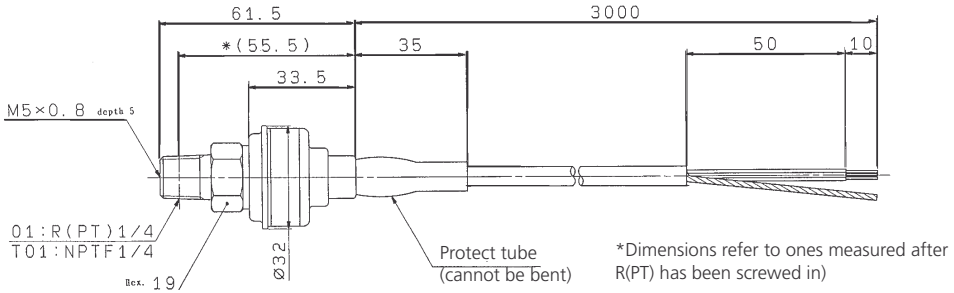
# REMOTE SENSOR PRESSURE SWITCH SYSTEM SERIES PSE



## DIMENSIONS PSE520 - 01, T01



## PSE520 - 02, T02



PRESSURE SENSOR  
SERIES PS1000/1100

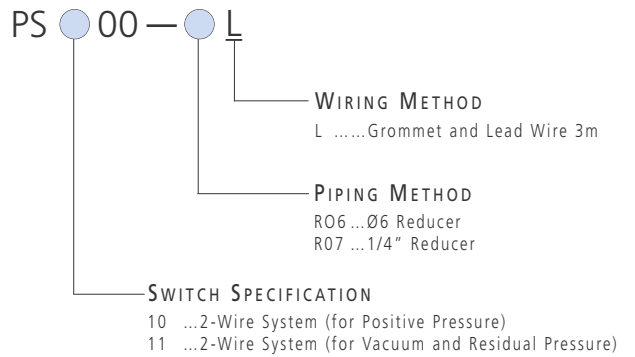
- ✓ Very compact
- ✓ Lightweight and robust
- ✓ Vacuum or pressure
- ✓ Adjustable

TECHNICAL  
SPECIFICATIONS  
SERIES PS1000/1100

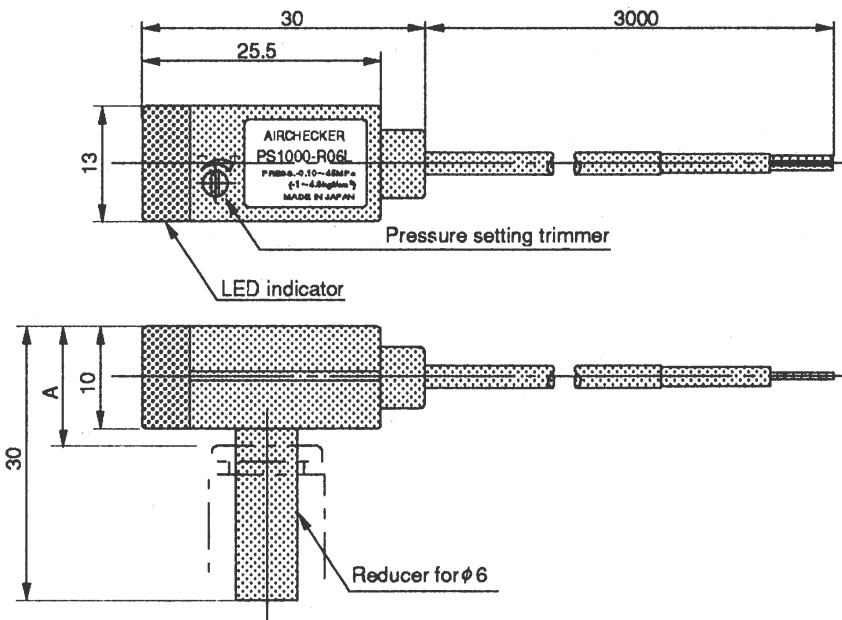
Model No	PS1000-R06L	PS1100-R06L
Fluid	Air	
Operating Pressure Range	-0.1~1.0MPa (-14.5~145PSI)	
Setting Pressure Range	-0.1~0.45MPa (-14.5~65PSI)	-0.1~0.4MPa (-14.5~60PSI)
Hysteresis	≤4% F.S.	
Temperature Characteristics	≤3% F.S.	
Repetition Accuracy	≤±1% F.S.	
Load Voltage	DC12~24V (Ripple ≤±10%)	
Load Current	5~40mA	
Leak Current	≤1mA	
Inner Drop Voltage	≤5V	
Switch Output (see Diagram)	Present Pressure ≥ Set Pressure: ON	Present Pressure ≤ Set Pressure: ON
Indication Lamp	ON: Red LED turns on	
Operating Temperature	0~60°C / 32~140°F	
Piping Method	Ø6 reducer	
Lead Wire	Grommet Type Oil-proof Captyre-cord two Wires Ø2.55, 0.18mm <sup>2</sup> , 3m	



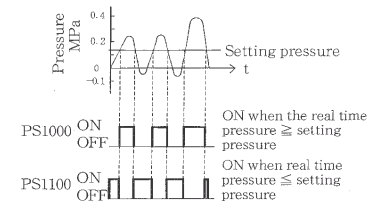
How To  
ORDER  
SERIES  
PS1000/1100



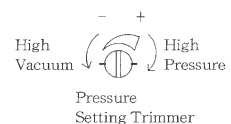
DIMENSIONS  
PS1000/1100



SWITCH OUTPUT FUNCTION



- Setting of Pressure Switch
- By setting the pressure trimmer, pressure is set.
- Pressure becomes bigger at the clockwise direction, and for the high vacuum rate, turn the trimmer to the counter-clockwise direction.
- Please use the ⊖ driver which has the adequate size for the trimmer, and turn it easy with fingertips.



### VACUUM/PRESSURE SWITCH OR TRANSMITTER WITH OPTIONAL BACKLIT LCD PRESSURE INDICATION SERIES ZSE4/ISE4

- ✓ Large LCD Display shows actual pressure and permits easy setting of ON/OFF
- ✓ Series allows choice of applicable pressure range and output type
- ✓ A variety of switch output modes can be selected by push button settings
- ✓ Display can be set to show peak or minimum pressures during normal operation
- ✓ Complete Self Diagnosis with Error Indication
- ✓ Panel Mountable



#### TECHNICAL SPECIFICATIONS

10 Bar = 1 MPa

	Vacuum Models	Pressure Models 1 Bar (14.5PSI)	Pressure Models 10 Bar (145PSI)
NPN Output	ZSE4-01-25L	ISE4L-01-25L	ISE4-01-25L
PNP Output	ZSE4-01-65L	ISE4L-01-65L	ISE4-01-65L
Analog Output	ZSE4-01-26L	ISE4L-01-26L	ISE4-01-26L
Operating Pressure Range	+10 to -101kPa (1.5~15PSI)	-0.1~1 Bar (-1.5~15PSI)	-1~10 Bar (-1.5~145PSI)
Minimum Displayed Unit	mmHG: 5 PSI: 0.1 Bar: 0.01 kPa: 1	kgf/cm <sup>2</sup> = 0.01 PSI: 0.1 Bar: 0.01 kPa: 1	kgf/cm <sup>2</sup> = 0.1 PSI: 1 Bar: 0.1 MPa: 0.01
Switch Indicator	ON (green light)	ON (green light)	ON (green light)
Response Frequency	200Hz (5ms) (not analog output model)	200Hz (5ms) (not analog output model)	200Hz (5ms) (not analog output model)
Differential (NOTE 1)	min 3 units of display (not analog output model)	min 3 units of display (not analog output model)	min 3 units of display (not analog output model)
Fluid	Air, inert gas	Air, inert gas	Air, inert gas
Temperature Characteristics	+3% F.S	+3% F.S	+3% F.S
Repeatable Accuracy	+1%	+1%	+1%
Power Supply	DC12-24V (less than or equal to ripple 10%)		
Current	45mA		
Error display	Red LED + displayed error code on LCD		
Operation Temp Range	0~50°C / 32~120°F		
Noise Resistance	1000Vp-p pulse width 1 micro standing 1rs		
Insulation Strength	AC1000V 50/60Hz (1mj)		
Insulation Resistance	2MΩ (DC500V by megger)		
Vibration Resistance	10-500Hz width = 1.5mm or acceleration 10G to X, Y, Z direction (2 hours)		
Shock Resistance	100G, X, Y, Z		
Weight	45g		
Port Size	1/8, M5 x Male and M5 x 0.8 Female		

## NOTE 1:

Minimum Differential

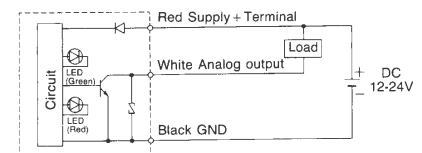
- Hysteresis mode: When P1=P2>P2 by less than three units, differential is automatically set at three units of P1 display
- Window mode: Differential is fixed at three units of the display

#### OUTPUT SPECIFICATIONS

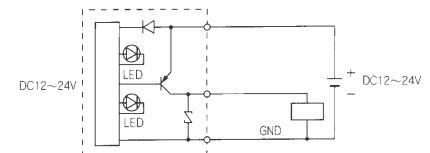
Model	Item	Output Method	Output Specifications
ZSE4-01-25	Vacuum	NPN output	NPN open collector 30V, 80mA, residual voltage: 1V or less
ZSE4-01-26		Analog output	1~5V (± 5%F.S.), load impedance : 1kΩ
ZSE4-01-65		PNP output	PNP open collector 80mA
ISE4L-01-25	Positive Pressure 100kPa	NPN output	NPN open collector 30V, 80mA, residual voltage: 1V or less
ISE4L-01-26		Analog output	1~5V (± 5%F.S.), load impedance: 1kΩ
ISE4L-01-65	Positive Pressure (14.5PSI) Type	PNP output	PNP open collector 80mA
ISE4-01-25		NPN output	NPN open collector 30V, 80mA, residual voltage : 1V or less
ISE4-01-26	Positive Pressure 1MPa	Analog output	1~5V (± 5%F.S.), load impedance: 1kΩ
ISE4-01-65		PNP output	PNP open collector 80mA

#### OUTPUT CIRCUIT AND WIRING

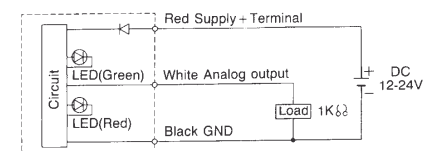
##### Switch Output Type (-25)



-65 PNP



##### Analog Output Type (-26)



## PRECAUTIONS:

- 1 When handling the switch, hold the body, not the wire. Electrical cable must not be subjected to excessive force.
- 2 When connecting the switch, use a spanner on the hexagon fitting. NEVER use tools on the switch body.
- 3 Do not use switch near corrosive materials.
- 4 The switch is not liquid sealed. Protect from rain, dew, spray or use enclosed type ZSE4BD/ISE4BD as shown on page 7.11

## INSTRUCTIONS

- LCD .....Displays present Pressure  
 Displays ON/OFF Setting  
 Displays Error Code  
 Displays Unit
- LED (Green) ....Displays Switch Operation Conditions
- LED (Red) .....Blinks on and off when an error occurs
- SET key .....Switches to the Setting Mode  
 When the button is pressed for one second or more, the mode changes to the output mode.
- UP key .....Increases ON/OFF Setting Value.  
 When the button is pressed during Pressure Display the mode changes to the peak display mode\*
- DOWN key .....Decreases ON/OFF setting value  
 When the button is pressed during Pressure Display, the mode changes to the bottom display mode. \* Used for unit change and output mode change.
- RESET .....Clears anomaly  
 Displays "0" (Press up and down key together)

\* Peak and bottom display allows the LCD to show the highest and lowest pressures encountered by the switch but normal switch or analog operation is unaffected.

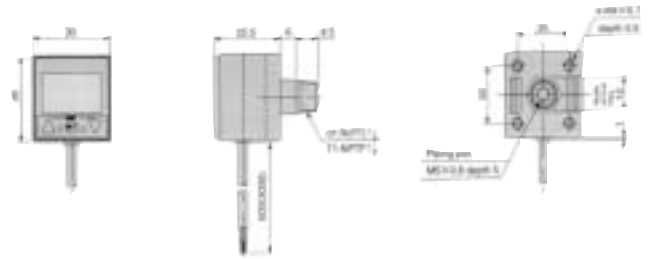
## ERROR INDICATION AND INSTRUCTIONS

When an error occurs, take the following steps.

Display	Situation	Solution
	Set data is corrupted by some external influence	Push "Reset" and re-insert settings
	Over current is evident in (Output 1) switch	Switch off power supply. Remove cause of the excess load.
	>500 kPa pressure applied to vacuum switch. 150% of rated pressure applied to pressure switch	Setting pressure must be less than maximum rated pressures

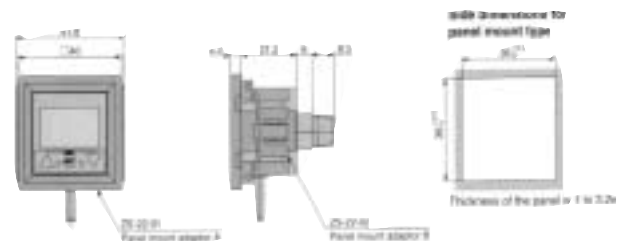
## DIMENSIONS

### SERIES ZSE4/ISE4 STANDARD TYPE

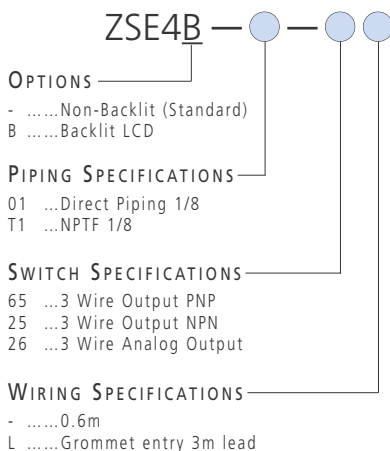


## DIMENSIONS

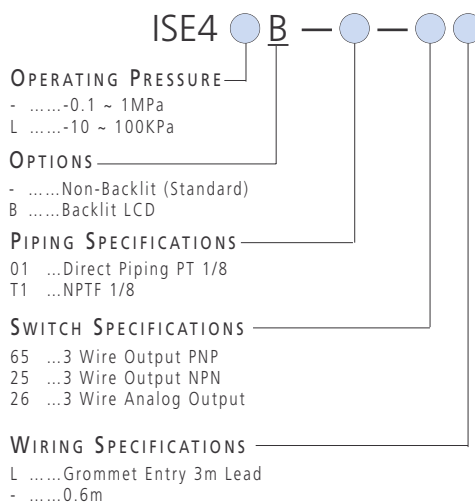
### SERIES ZSE4/ISE4 PANEL MOUNTING TYPE



## HOW TO ORDER VACUUM PRESSURE SWITCH SERIES ZSE4



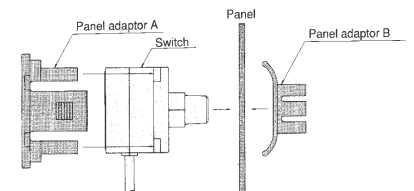
## HOW TO ORDER POSITIVE PRESSURE SWITCH SERIES ISE4



## ACCESSORIES ZSE4/ISE4

Panel Mount Adaptor ..... ZS-22-A

## PANEL MOUNTING KIT ZS-22-A



## WATER DROP RESISTANT TYPE DIGITAL INDICATION PRESSURE SWITCH SERIES ZSE4D/ISE4D



- ✓ IP66 Environment Protection. This Pressure Switch is constructed to resist water spray and fine particles for use in adverse environmental conditions
- ✓ DIN Rail Mountable
- ✓ Direct Wall Mountable

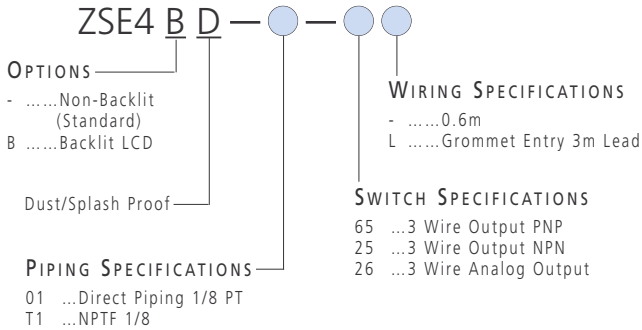
### TECHNICAL SPECIFICATIONS

As for ZSE4B/ISE4B except:  
 Weight.....110g  
 Port Size .....1/8 (Taper Female)  
 Enclosure .....IP66 According to IEC 529

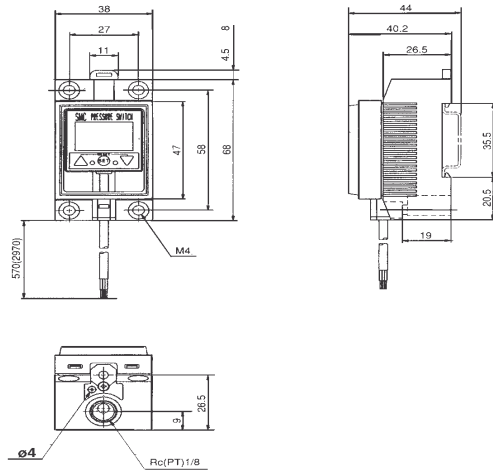
### BREATHER PIPING METHOD

If there is the possibility that the switch will be used in an atmosphere where there is excessive water, oil or dust around the body, and these substances may enter in through the atmospheric port, insert a Ø4mm tube into this port and pipe away to a cleaner area.

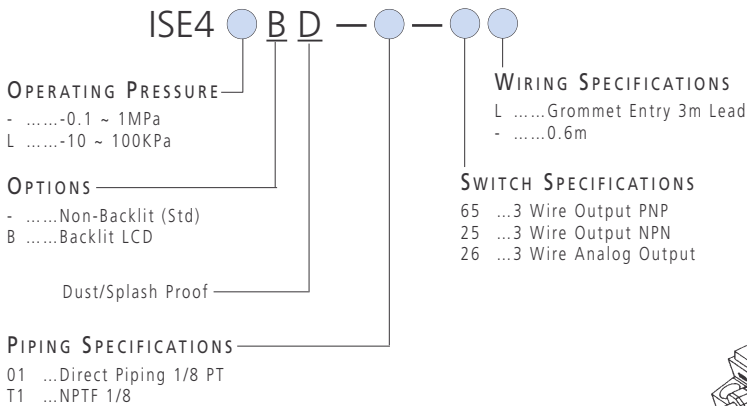
### How To ORDER VACUUM PRESSURE SWITCH SERIES ZSE4D



### DIMENSIONS ZSE4D/ISE4D

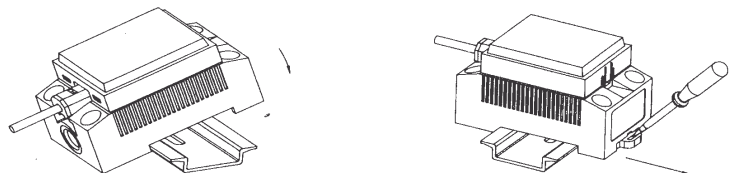


### How To ORDER POSITIVE PRESSURE SWITCH SERIES ISE4



### DIN RAIL MOUNTING

To mount, hook on to bottom rail and hand push in direction of arrow.  
 To remove, use a screwdriver in the direction shown by the arrow.



## DIGITAL PRESSURE SWITCH FOR GENERAL PURPOSE FLUID SERIES ZSE5/ISE5

- ✓ Multi-Fluid Applications
- ✓ Variety of Switch Output Modes
- ✓ Peak/Bottom Hold Function
- ✓ Complete Self-Diagnosis
- ✓ Exact Detection of Atmospheric Pressure



### TECHNICAL SPECIFICATIONS SERIES ZSE5/ISE5

Item	ZSE5-02-26L	ZSE5-02-27L	ZSE5-02-67L	ISE5-02-26L	ISE5-02-27L	ISE5-02-67L
Pressure Setting	-100kPa~100kPa {14.5PSI}			-0.1MPa~1MPa {145PSI}		
Unit Setting	mmHg, kPa, PSI, kgf/cm <sup>2</sup> / bar			MPa, PSI, kgf/cm <sup>2</sup> , bar		
Min Setting Range	mmHg:10, kPa:2, PSI: 0.2 kgf/cm <sup>2</sup> : 0.02, bar: 0.02			MPa: 0.01, PSI: 1 kgf/cm <sup>2</sup> : 0.1, bar: 0.1		
Hysteresis <sup>*</sup> : Hysteresis Mode	-	Adjustable (2 digit or more)		-	Adjustable (3 digit or more)	
Window Comparator Mode	-	Fixed (2 digit)		-	Fixed (3-digit)	
Display Light	-	ON: turn on light Output 1: Green, 2: Red		-	ON: turn on light Output 1: Green, 2: Red	
Response Frequency	-	200Hz		-	200Hz	
Max Operating Pressure	200kPa (30PSI)			1.5MPa (220PSI)		

DIMENSIONS  
SEE NEXT PAGE

### TECHNICAL SPECIFICATIONS SWITCH

Model	Switch Specification	Output Specification
ZSE5-02-26L	None (Analog Output)	1~5V(5%F.S.)
ZSE5-02-27L	Two Output	NPN Open Collector 30V, 80mA
ZSE5-02-67L	Two Output	PNP Open Collector 80mA
ISE5-02-26L	None (Analog Output)	1~5V(5%F.S.)
ISE5-02-27L	Two Output	NPN Open Collector 30V, 80mA
ISE5-02-67L	Two Output	PNP Open Collector 80mA

### TECHNICAL SPECIFICATIONS COMMON SPECIFICATIONS

Fluid	Fluid that will not corrode SUS304 and SUS630
Temperature Characteristics	+~3%F.S. max.
Repetition Accuracy	+~1% max.
Power Supply	12~24vDC (Ripple 10% max.)
Consumption Current	45mA max.
Emergency Display	Red/display the error code on LCD
Pressure Display	3 1/2 digit LCD
Self-Diagnosis Function	Excess pressure/Data error <sup>*</sup>
Operating Temp Range	0~50°C /32~120°F
Noise Resistance	500Vp-p pulse width 1μs, standing 1nS
Insulation Resistance	Between whole wires and case 2MΩ (50vDC by megameter)
Vibration Resistance	10~500Hz width=1.5mm or acceleration 10G (Choose the smaller vibration) to X, Y, Z direction (two hours)
Shock Resistance	100G to X, Y, Z direction (three times for each direction)
Weight	126g (Including 3m-long lead wire)

#### Notes:

##### • Hysteresis mode

ZSE: .....When the values of P1 and P2 are the same or when P1>P2 within two digits, the hysteresis will be automatically two digits for the set value of P1.

ISE: .....When the values of P1 and P2 are the same or when P1>P2 within three digits, the hysteresis will be automatically three digits for the set value of P1.

##### • Window comparator mode:

ZSE: .....The hysteresis is two digits, so separate P1 from P2 by five digits or more and set them.

ISE: .....The hysteresis is three digits, so separate P1 from P2 by seven digits or more and set them.

\* (One digit is the minimum pressure display unit)

<sup>\*</sup> Analogue output has no overcurrent detection unit

### HOW TO ORDER VACUUM PRESSURE SWITCH

ZSE5B-02- L

#### OPTIONS

- .....Non-Backlit (Std)
- B .....Backlit LCD

#### WIRING SPECIFICATIONS

L .....3m

#### PIPING SPECIFICATIONS

- 02 ...PT 1/4
- T2 ...NPTF 1/4

#### SWITCH SPECIFICATIONS

- 26 ...Analog 3-Wire
- 27 ...2 Output (NPN) 4-Wire
- 67 ...2 Output (PNP) 4-Wire

### HOW TO ORDER POSITIVE PRESSURE SWITCH

ISE5B-02- L

#### OPTIONS

- .....Non-Backlit (Std)
- B .....Backlit LCD

#### WIRING SPECIFICATIONS

L .....3m

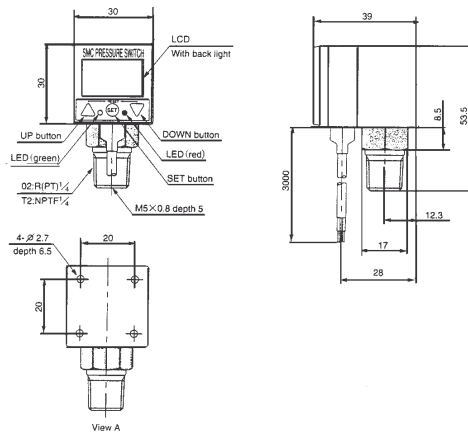
#### PIPING SPECIFICATIONS

- 02 ...PT 1/4
- T2 ...NPTF 1/4

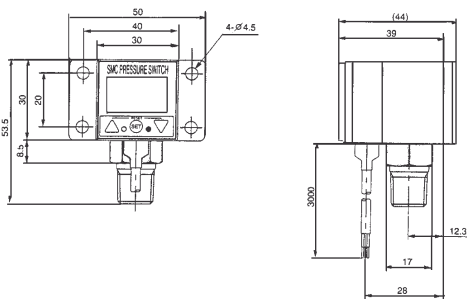
#### SWITCH SPECIFICATIONS

- 26 ...Analog 3-Wire
- 27 ...2 Output (NPN) 4-Wire
- 67 ...2 Output (PNP) 4-Wire

## DIMENSIONS SERIES ZSE5/ISE5



## WITH BRACKET



## FLUID OPTIONS

- Dry Air
- Drain-Containing Air
- Hydraulic Fluid (JIS-K2213)
- Silicon Oil (JIS-K2213)
- Lubricating Oil (JIS-K6301)
- Freon
- Carbon Dioxide
- Ammonia
- Argon
- Nitrogen Gas
- Chlorine Gas

## ACCESSORIES BRACKET

Bracket ZS-22-D With Four M3 Tappings



## AIR CATCH SENSOR SERIES ISA

- ✓ Detects the presence of an object by the use of Back Pressure
- ✓ Colored Indicator Lights ensure quick and accurate setting
- ✓ Water Splash and Dust Particle resistant to IP66
- ✓ Free Mount or Manifold Types Available
- ✓ Switch is movable without disturbing manifold

APPLICATIONS  
SEE NEXT PAGE 

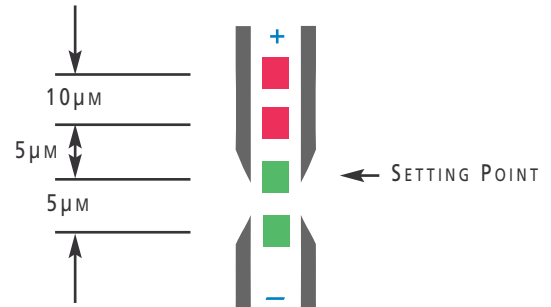
### TECHNICAL SPECIFICATIONS

Fluid ..... Dry air filtered to 5µm  
 Operating Pressure ..... 0.05MPa~0.2MPa (7~30PSI)  
 Pressure Range ..... 0.1MPa~0.2MPa (14.5~30PSI)  
 Detection Distance Range ..... 0.01~0.3mm  
 Repeatability ..... ±0.01mm (@25°C / 180°F)  
 Hysteresis ..... ≤ 0.01mm (Detection distance (0.01~0.15mm))  
 Detection Nozzel Bore Size ..... Ø1 standard  
 Indication ..... Operation lamp: Green when on + deviation indicator  
 Power Supply Voltage ..... DC12~24V  
 Current Consumption ..... ≤ 30mA  
 Output Type: ISA11 ..... NPN open collector 30V ≤ 80mA  
                           ISA15 ..... PNP open collector 30V ≤ 80mA  
 Operating Temp Range ..... 0~60°C / 32~140°F (no dew formation)  
 Vibration Resistance ..... 10G  
 Proof Pressure ..... 0.5MPa / 73PSI  
 Proof Noise ..... Direct input 1000Vp-p  
   Pulse duration 1µs pulse rise 1ns  
 Weight ..... 250g (incl. guage & 5m lead wire)  
 Port Size ..... Rc 1/8  
 Air consumption ..... 16 l/min (@0.10MPa Supply Pressure)  
   21 l/min (@0.15MPa Supply Pressure)  
   25 l/min (@0.20MPa Supply Pressure)

1MPa = 145PSI

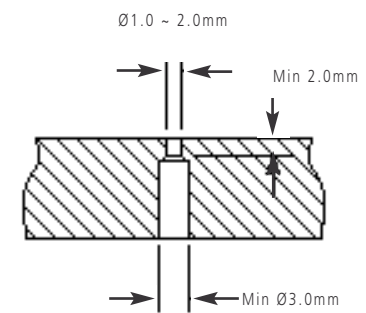


**SETTING INDICATOR**  
 Red LED = Output is OFF  
 Green LED = Output is ON

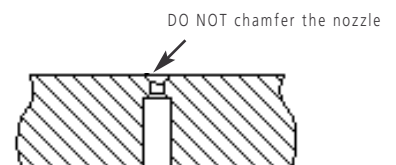


### NOZZLE TYPE

The detection nozzle should have an I.D. of between 1.0~2.0mm and 2mm in depth. Avoid chamfering the edge of the nozzle. Chamfering causes a narrower detection distance range.

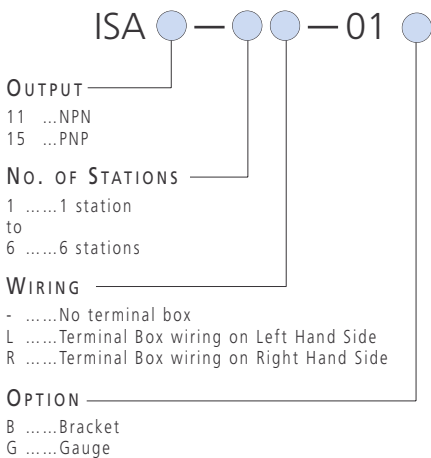


Correct ✓



Incorrect ✗

### HOW TO ORDER AIR CATCH SENSOR SERIES ISA

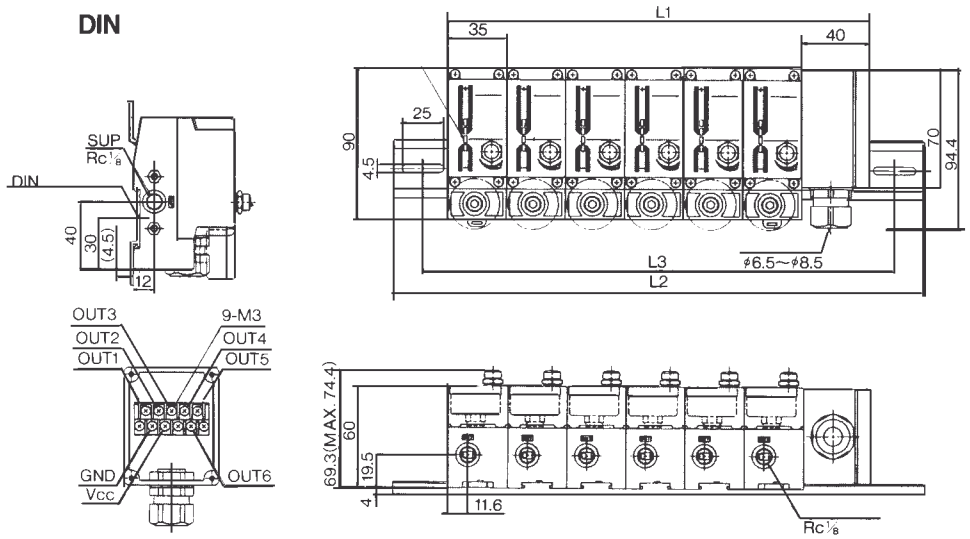


### ACCESSORIES AIR CATCH SENSOR SERIES ISA

Bracket .....ISA-1-A  
 Gauge .....G33-3-01

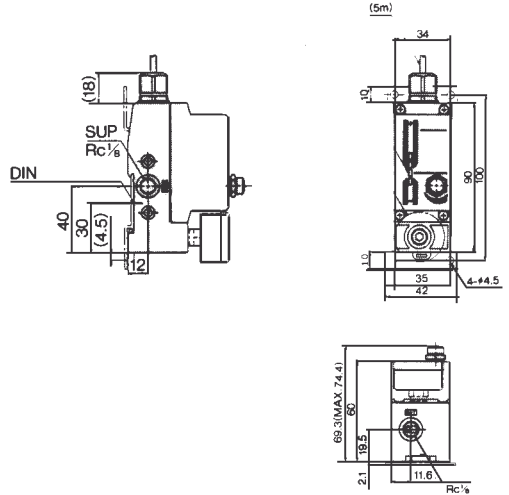
# AIR CATCH SENSOR SERIES ISA

## DIMENSIONS TERMINAL BOX TYPE



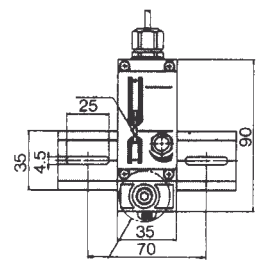
No. of Sensors	2	3	4	5	6
L1	110	145	180	215	250
L2	140	175	210	245	280
L3	175	210	245	280	315

## DIMENSIONS SINGLE UNIT TYPE



No. of Sensors	2	3	4	5	6
L1	70	105	140	175	210
L2	-	36	71	106	141

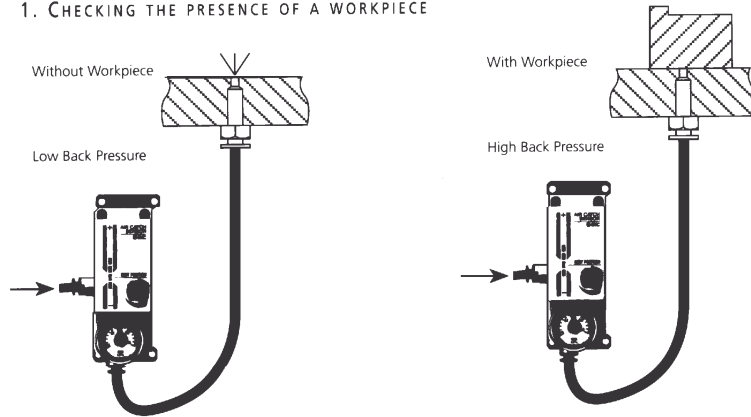
## DIMENSIONS SINGLE UNIT: DIN RAIL MOUNT



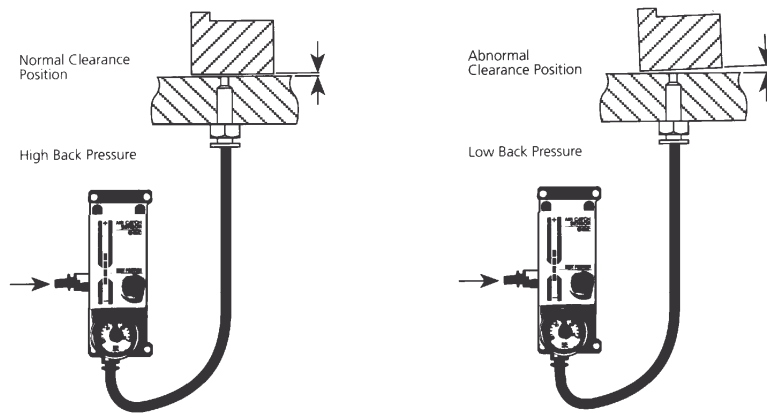
No. of Sensors	2	3	4	5	6
L1	70	105	140	175	210
L2	105	140	175	210	245
L3	140	175	210	245	280



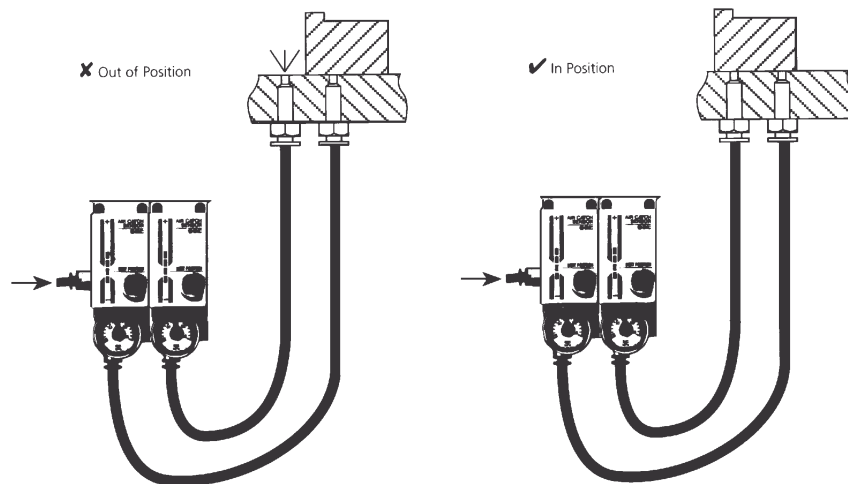
1. CHECKING THE PRESENCE OF A WORKPIECE



2. CHECKING THE NORMAL CLEARANCE POSITION OF A WORKPIECE



3. CHECKING THE POSITION OF A WORKPIECE



# PRECISION REGULATOR SERIES IR1/2/3000

## PRECISION REGULATOR SERIES IR1/2/3000

- ✓ Compact and Lightweight
- ✓ Easy Setting
- ✓ Excellent Flow Characteristics
- ✓ Can be combined with (N)AF Air Filter and/or (N)AM (Mist Separator) due to the adaptation of the Modular Style Body



**TECHNICAL SPECIFICATIONS**  
BASIC TYPE

Model	IR1000/2000	IR1010/2010	IR1020/2020
Port Size	Series 10□0: 1/8" / Series IR20□0: 1/4"		
Max Supply Pressure	1MPa (145PSI)		
Min Supply Pressure	Set Pressure +0.05MPa / 8PSI Note 1)		
Regulating Pressure	0.005~0.2MPa	0.005~0.4MPa	0.005~0.8MPa
Range	(0.7~30PSI)	(0.7~50PSI)	(0.7~120PSI)
Sensitivity	0.2% FS Max		
Repeatability	±0.5% FS Max		
Air Consumption	Series 10□0: 5l/min Max at Supply Pressure of 1MPa IR20□0: 4l/min Max at Supply Pressure of 1MPa Note 2) IR20□0: 3l/min (ANR) Max at Supply Pressure of 0.7MPa		
Gauge Port Size	1/8" (2 Ports - Front/Back)		
Ambient & Fluid Temperature	-5 ~ 60°C / 23~140°F (with no freezing)		

Note 1) Always keep a Minimum Differential of 0.05MPa from Set Pressure

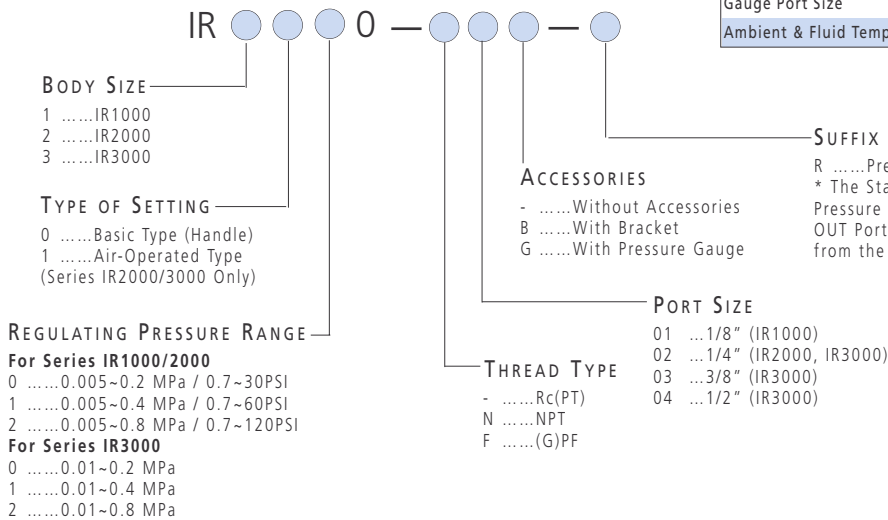
Note 2) Air is always bleeding to atmosphere

**TECHNICAL SPECIFICATIONS**  
BASIC AND AIR-OPERATED TYPES

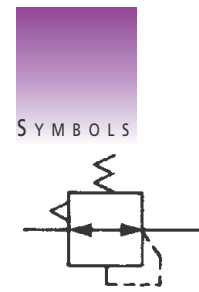
Type	Basic	Air-Operated	Air-Operated
Model	IR30□0	IR2120	IR3120
Port Size	1/4", 3/8", 1/2"	1/4"	1/4", 3/8", 1/2"
Max Supply Pressure	1MPa (145PSI)		
Min Supply Pressure (Set P)	+0.1MPa	+0.05MPa	+0.1MPa
Regulating Pressure	3000: 0.01~0.2MPa	0.005~0.8MPa	0.01~0.8MPa
Range	3010: 0.01~0.4MPa		
	3020: 0.01~0.8MPa		
Sensitivity	0.2% FS Max		
Repeatability	±0.5% FS Max		
Air Consumption at 1MPa Supply Pressure	≤9.5l/min (Bleed P)	≤4l/min	≤9.5l/min
at 0.7MPa	≤2l/min (EXH)	≤3l/min	≤2l/min at Max
Gauge Port Size	1/8" (2 Ports - Front/Back)		
Ambient & Fluid Temperature	-5 ~ 60°C / 23~140°F (with no freezing)		

**HOW TO ORDER**

PRECISION REGULATOR SERIES IR1/2/3000



**DIMENSIONS**  
SEE NEXT PAGE



**ACCESSORIES**  
SERIES IR1000/2000/3000

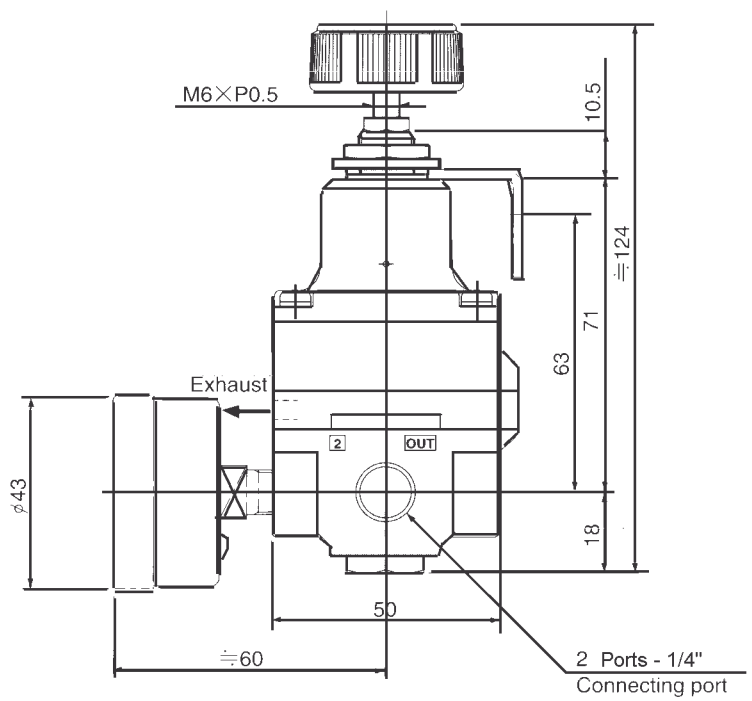
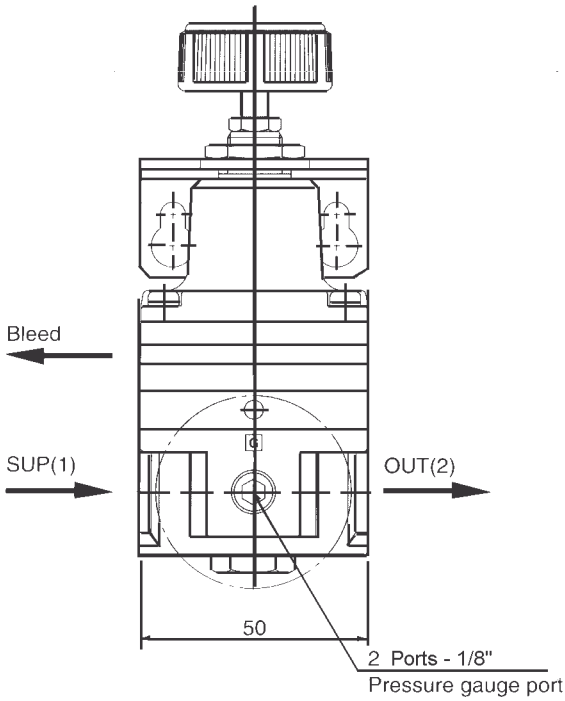
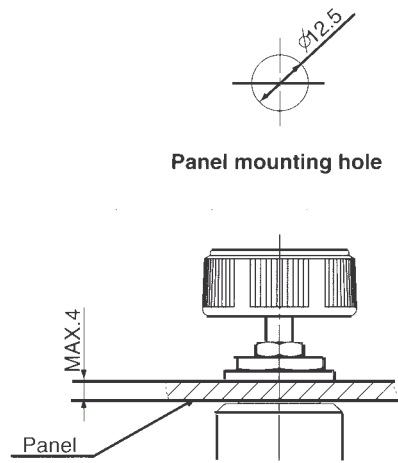
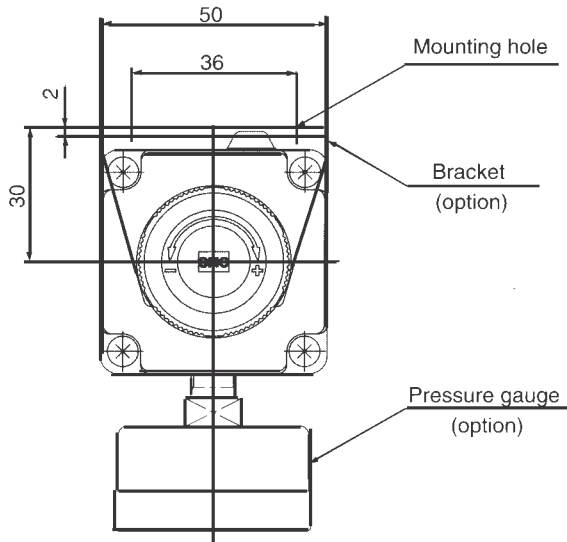
Model	IR1000	IR1010	IR1020	IR2000	IR2010	IR2020/2120	IR3000	IR3010	IR3020/3120
Bracket	P36201023			P36202028			P36203018		
Pressure Gauge	G33-2-01	G33-4-01	G33-10-01	G43-2-01	G43-4-01	G43-10-01	G43-10-01	G43-4-01	G43-10-01

Accuracy ± 3% (full span)

# PRECISION REGULATOR SERIES IR1/2/3000

DIMENSIONS

PRECISION REGULATOR SERIES IR2000



# INSTRUMENTATION REGULATOR SERIES ITV

## ELECTRO-PNEUMATIC REGULATOR SERIES ITV2000, 3000

- ✓ Air Consumption is near zero l/min (ANR) at desired set pressure (Balanced Condition)
- ✓ Zero and Span Adjustment is possible with No Air Pressure
- ✓ Easy to read with LED with choice of 5 units of measurement
- ✓ 4 Input Current/Voltage Range Options
- ✓ 2 Monitor Options - Analog or Switch (NPN or PNP)
- ✓ Plug-in Wiring with Removable Cable (Straight or Right-Angle Plug)
- ✓ IP65 Protection Standard
- ✓ Same Mounting Dimensions as IT Series (Same Bracket) for Stand-alone use with Threaded Ports



### TECHNICAL SPECIFICATIONS

1MPa = 145PSI

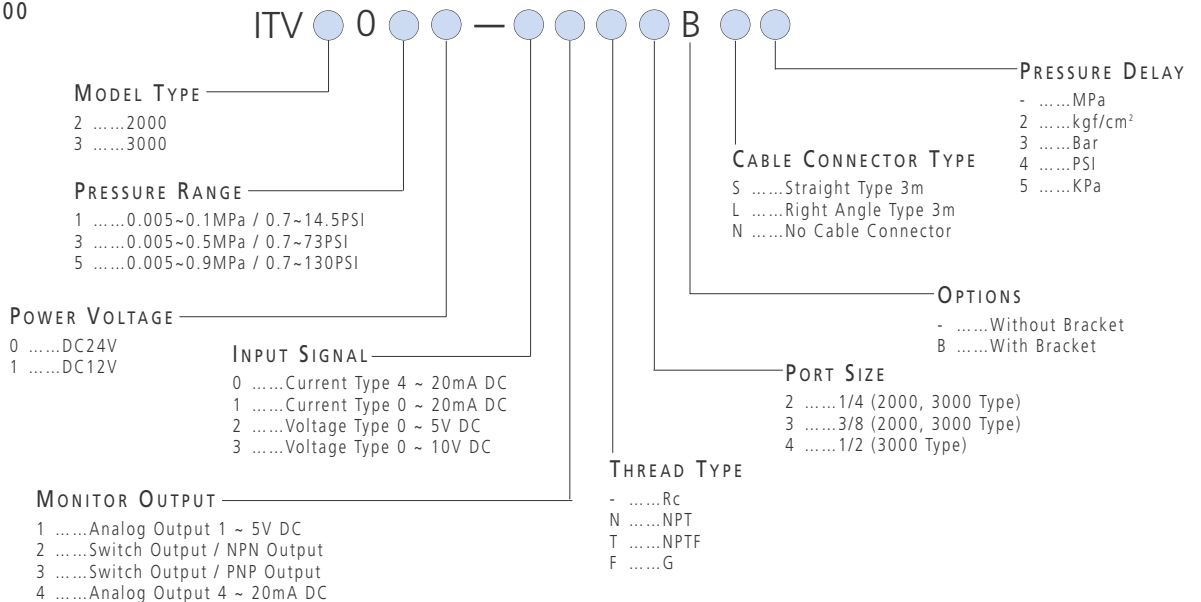
Model	ITV201□	ITV203□	ITV205□
	ITV301□	ITV303□	ITV305□
Max Supply Pressure	0.2MPa	1.0MPa	1.0MPa
Min Supply Pressure	Setting Pressure 0.1MPa / 14.5PSI		
Setting Pressure Range	0.005~0.1MPa	0.005~0.5MPa	0.005~0.9MPa
Power Voltage	DC24V±10%, DC12~15V		
Input Signal	Current Type <sup>Note1)</sup>	4~20mA, 0~20mA DC	
	Voltage Type	0~5VDC, 0~10VDC	
Input Impedance	Current Type	250Ω or less	
	Voltage Type	Approx 6.5Ω	
Output Signal <sup>Note2)</sup>	Analog Output	1 ~ 5 VDC / 4 ~ 20mA DC	
	Switch Output	NPN Open Collector Output: 30V, 30mA PNP Open Collector Output: 30V, 30mA	
Linearity	±1% or less (Full Span)		
Hysteresis	±0.5% or less (Full Span)		
Repeatability	±0.5% or less (Full Span)		
Output Pressure	Accuracy	±3% or less (Full Span)	
Indication (3 Digit)	Minimum Unit	MPa: 0.01, Kg/cm <sup>2</sup> : 0.01, Bar: 0.01, PSI: 0.1 <sup>Note3)</sup> , KPa: 1	
Ambient Fluid Temperature	5 ~ 50°C / 40 ~ 122°F (No Dew Condensation)		

Note 1) 2 Wire 4~20mA DC and 2 Wire mA DC are not possible. Power Voltage (24VDC or 12 VDC) is necessary.

Note 2) Either Analog Output or Switch Output can be selected. For Switch Output Selection, either NPN Output or PNP Output can be selected.

Note 3) For ITV205□, ITV305□, 1PSI is the minimum Unit.

### HOW TO ORDER SERIES ITV2000, 3000



# ELECTRO-PNEUMATIC REGULATOR

## ELECTRO-PNEUMATIC HYBRID REGULATOR SERIES VY

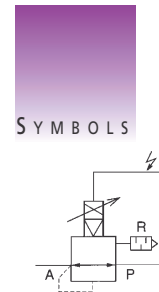
- ✓ Simple Construction
- ✓ Easy to Connect
- ✓ Choice of Signal Voltage Ranges
- ✓ Wide Range of Body Sizes with Common Control Unit
- ✓ Internal and External Pilot Versions Available
- ✓ Integral Pressure Sensor and Amplifier
- ✓ High Relief Capacity to Exhaust



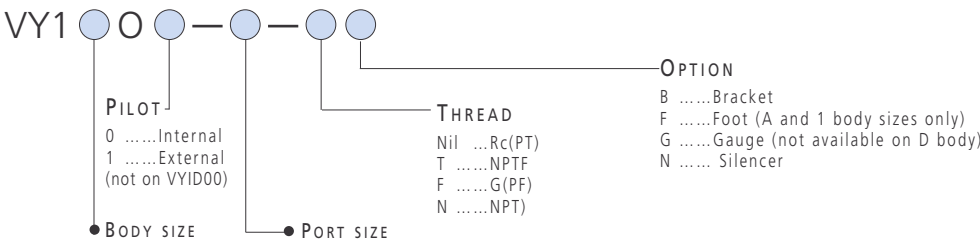
An applicable solution for applications where the precision and response of the IT range is not required. The VY-HyReg Range is constructed by utilizing a standard control unit either alone (VY1D00-M5) or as a Pilot Valve controlling one of the Range of VEX1 Power Valves.

### TECHNICAL SPECIFICATIONS CONTROL UNIT

Applicable Fluid	Dry Air, Inert Gas
Required Filtration Level for Supply and Pilot Air	5(m)
Lubrication	Unnecessary (see note 7)
Ambient and Fluid Temperature	0 - 50 °C / 32~120°F
Maximum Operating Pressure	7PSI ≤ (128PSI / 0.88 MPa)
Set Pressure	0.5 Kg/cm <sup>2</sup> ~ Supply Pressure
External Pilot Supply Pressure (For VY1*01 Type)	Set Pressure ~ 130PSI / 9 Kg/cm <sup>2</sup>
Control Signal Voltage	1 ~ 5 V DC Standard 0 ~ 10 V DC Available as an Option
Control Signal Power Requirement	Less than 1mW
Power Supply Voltage	24 V DC ± 10%
Power Consumption	1.8 W maximum
Electrical Connection	DIN Plug
Cable Gland Size	Suits 4 ~ 6.5 mm Cable
Bleed Air Consumption (at 9 Kg/cm <sup>2</sup> Supply Pressure)	Maximum 10 nl/min
Mounting	Any Orientation



### HOW TO ORDER SERIES VY



DIMENSIONS SEE NEXT PAGE

Mounting Type	Symbol	Symbol	P,A port	R port	Cv	Hysteris	Sensitivity	Repeatability	
Base Mounted Type	D	00	Without subplate		0.007	1%	0.5%	±0.5%	
		M5	M5						
	B	00	Without subplate		0.28	2.5%	1%	±1%	
		M5	M5		0.41				
	2	01	1/4		0.9				
		02	1/4		1.4				
	4	00	Without subplate		2.0	3%	1.5%	±1%	
		02	1/4		3.3				
		03	1/4		3.9				
		04	1/2		3.9				
	body Ported Type	A	M5	M5		0.28	2.5%	1%	±1%
			01	1/4		0.9			
1		02	1/4		1.4				
		02	1/4		2.0				
3		03	1/4		3.3				
		04	1/2		3.9				
5		04	1/2		7.2				
		06	1/2		8.9				
7		10	1		10	5%	2%	±2%	
		12	1 1/4	1 1/4	17				
9		14	1 1/2		18				
		20	2	2	33				
								37	

Notes:

- Avoid mounting the valve in a position where it will be subject to vibration.
- Ensure that pipework is thoroughly clean and free of water and debris during installation.
- Use a three-core screened cable for signal and power. Conductor diameter minimum 0.5mm<sup>2</sup> each core
- Wiring - terminal designations are molded onto the valve body.
- The valve bleeds air to exhaust when energized so operation without a silencer is not recommended.
- If the valve is used with lubricated air, the factory pre-lubrication will be washed out so lubrication must be continued.
- If lubricated air must be used, the external pilot type (VY1?01) and oil-free air supplied to the pilot port.
- Manifold mounted versions of the VY-Hyreg are available.

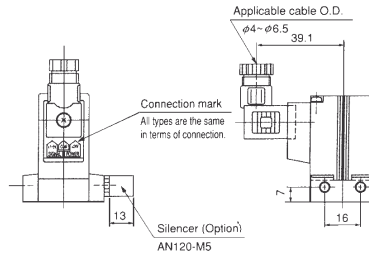
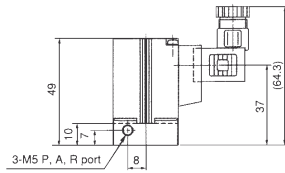
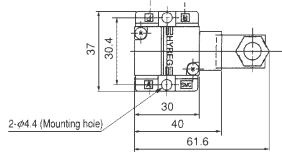
Wiring: The use of three-core screened cable is strongly recommended with the screen earthed at the end away from the VY Valve.

Terminal Designations are as follows:

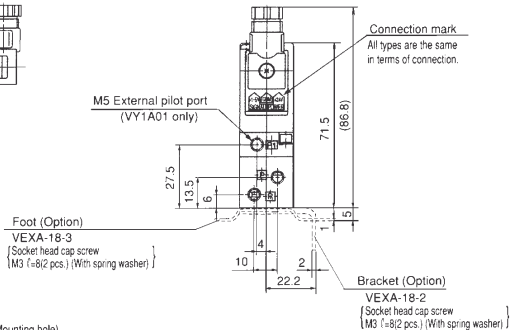
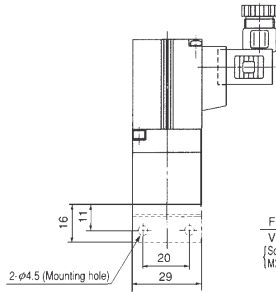
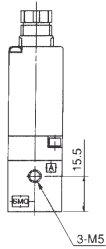
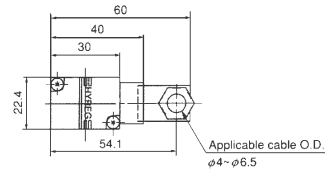
- 1 = 24v Power Supply
- 2 = Control Signal
- 3 = Common Negative for both power and signal.

# 7.22 INSTRUMENTATION ELECTRO-PNEUMATIC REGULATOR

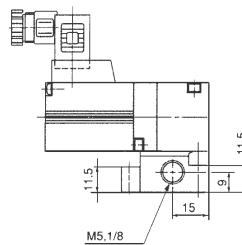
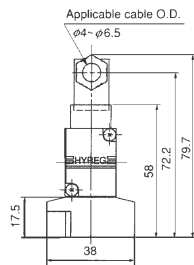
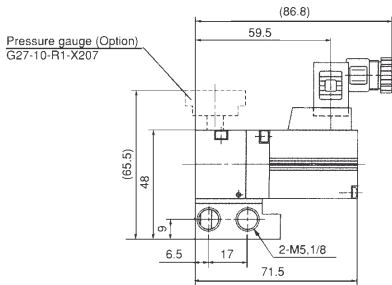
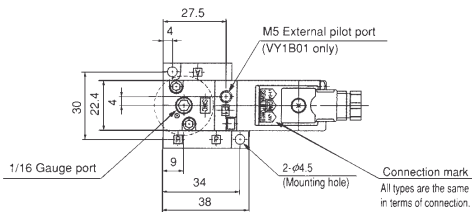
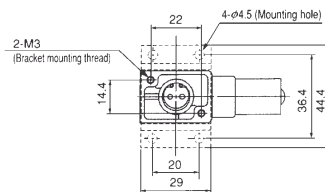
## DIMENSIONS SERIES VY1D00-M5



## DIMENSIONS SERIES VY1A0<sup>0</sup>-M5



## DIMENSIONS SERIES VY1B0<sup>0</sup>-M5

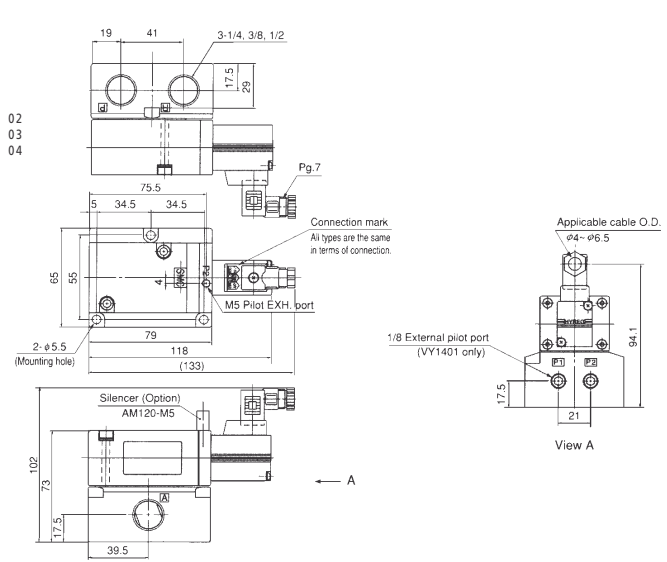




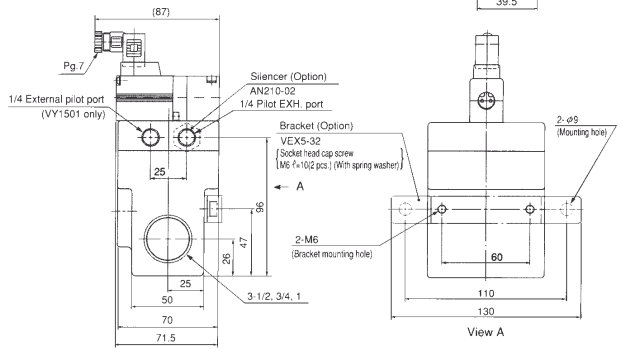
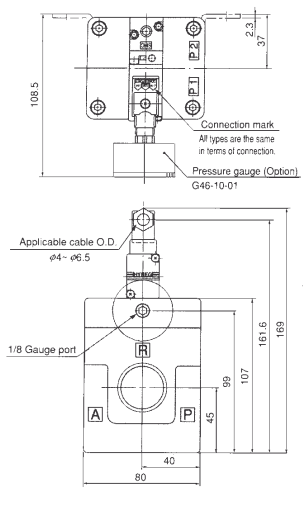


# INSTRUMENTATION ELECTRO-PNEUMATIC REGULATOR

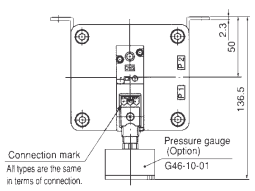
## DIMENSIONS SERIES VY140<sup>0</sup>-



## DIMENSIONS SERIES VY150<sup>0</sup>-



## DIMENSIONS SERIES VY170<sup>0</sup>-



## DIMENSIONS SERIES VY190<sup>0</sup>-

