

Switches and sensors

	Page
● Pressure Switch, SG1/ST1-02	L 2
● Pressure Switch, SG-3	L 4
● Electronic Pressure Switch, ESP	L 6
● Pressure Sensor (Press. Transmitter), ETP	L 10
● Pressure Monitor, TXS	L 12

Архангельск (8182)63-90-72
 Астана (7172)727-132
 Астрахань (8512)99-46-04
 Барнаул (3852)73-04-60
 Белгород (4722)40-23-64
 Брянск (4832)59-03-52
 Владивосток (423)249-28-31
 Волгоград (844)278-03-48
 Вологда (8172)26-41-59
 Воронеж (473)204-51-73
 Екатеринбург (343)384-55-89
 Иваново (4932)77-34-06

Ижевск (3412)26-03-58
 Иркутск (395)279-98-46
 Казань (843)206-01-48
 Калининград (4012)72-03-81
 Калуга (4842)92-23-67
 Кемерово (3842)65-04-62
 Киров (8332)68-02-04
 Краснодар (861)203-40-90
 Красноярск (391)204-63-61
 Курск (4712)77-13-04
 Липецк (4742)52-20-81
 Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13
 Москва (495)268-04-70
 Мурманск (8152)59-64-93
 Набережные Челны (8552)20-53-41
 Нижний Новгород (831)429-08-12
 Новокузнецк (3843)20-46-81
 Новосибирск (383)227-86-73
 Омск (3812)21-46-40
 Орел (4862)44-53-42
 Оренбург (3532)37-68-04
 Пенза (8412)22-31-16
 Казахстан (772)734-952-31

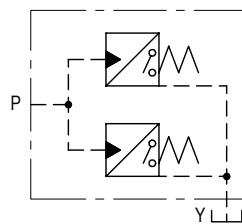
Пермь (342)205-81-47
 Ростов-на-Дону (863)308-18-15
 Рязань (4912)46-61-64
 Самара (846)206-03-16
 Санкт-Петербург (812)309-46-40
 Саратов (845)249-38-78
 Севастополь (8692)22-31-93
 Симферополь (3652)67-13-56
 Смоленск (4812)29-41-54
 Сочи (862)225-72-31
 Ставрополь (8652)20-65-13
 Таджикистан (992)427-82-92-69

Сургут (3462)77-98-35
 Тверь (4822)63-31-35
 Томск (3822)98-41-53
 Тула (4872)74-02-29
 Тюмень (3452)66-21-18
 Ульяновск (8422)24-23-59
 Уфа (347)229-48-12
 Хабаровск (4212)92-98-04
 Челябинск (351)202-03-61
 Череповец (8202)49-02-64
 Ярославль (4852)69-52-93

Pressure switch SG1/ST1-02



Functional Symbol



- The SG1/ST1-02 pressure switch senses circuit pressure to turn electrical circuits on and off.
- These products incorporate 2 micro-switches for high and low pressure settings.

Model Code

(F3) - ST1 - 02 - 10 - 11 -JA - S40 - J

1 2 3 4 5 6

- 1 Fluid
Omit for mineral oil, water glycol
F3:Phosphate ester
- 2 Pressure switch
ST1:Threaded type
SG1:Gasket mounting

- 3 Size
- 4 Sensing pressure adjustment range
See 'Specifications'
- 5 Design no.
- 6 ST1 only

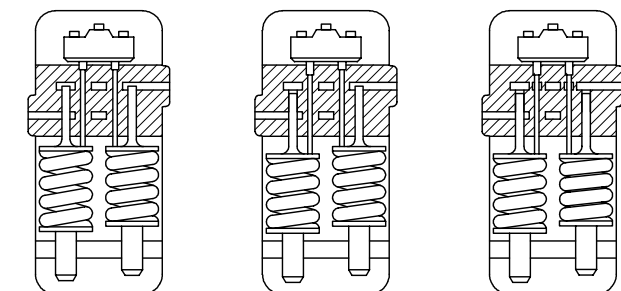
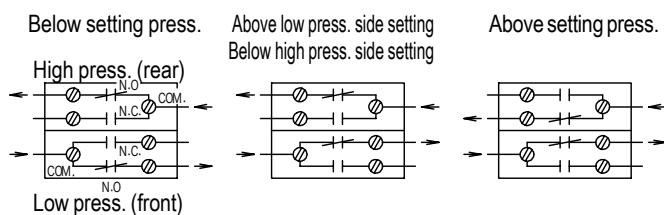
Specifications

Model	Max. Oper. Output MPa	Sensing Press. Adj. Range		Weight kg
		Code	MPa	
ST1-02	35	10	0.7~7	3.0
SG1-02		20	0.7~14	
		50	3.5~35	

● Micro-Switch Rating

Power Supply	DC		AC	
Voltage : V	125, 250, 480		125	250
Current A	15		0.5	0.25

● Micro-Switch Operation



Low press. High press.

Operating Considerations

- Remove cover, loosen locknut. Turn CW to increase sensing pressure, CCW to decrease sensing pressure.
- Connect drain port directly to tank.

Mounting Bolts (JIS B1176, Strength Class 12.9)

Model	Hex Socket Bolt X 2	
	Metric	Unified
SG1-02	M6 × 50	1/4-20UNC × 50.8

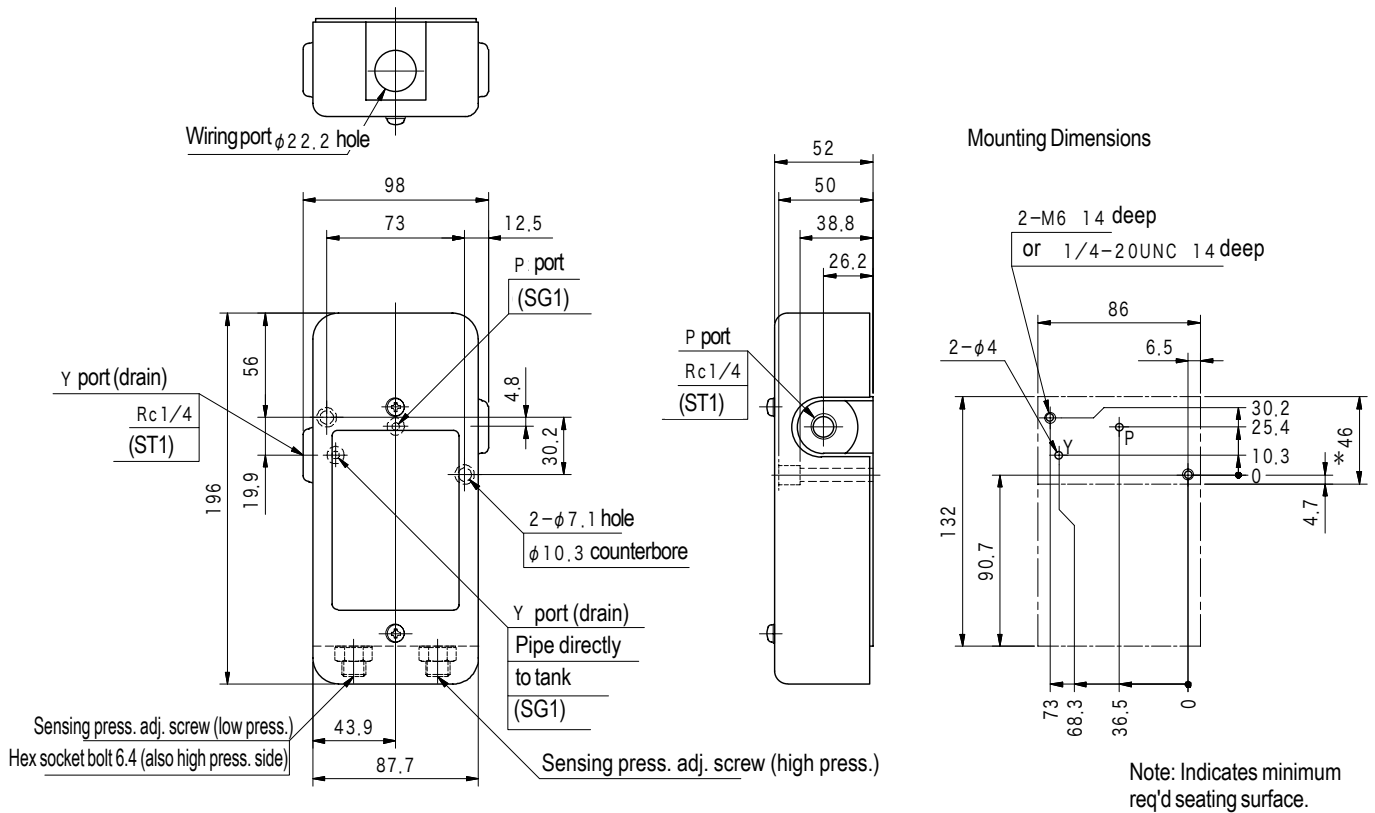
- Mounting bolts are not included with unit and must be ordered separately.
- Mounting bolt tightening torque: 12 ~ 15 Nm

Subplate

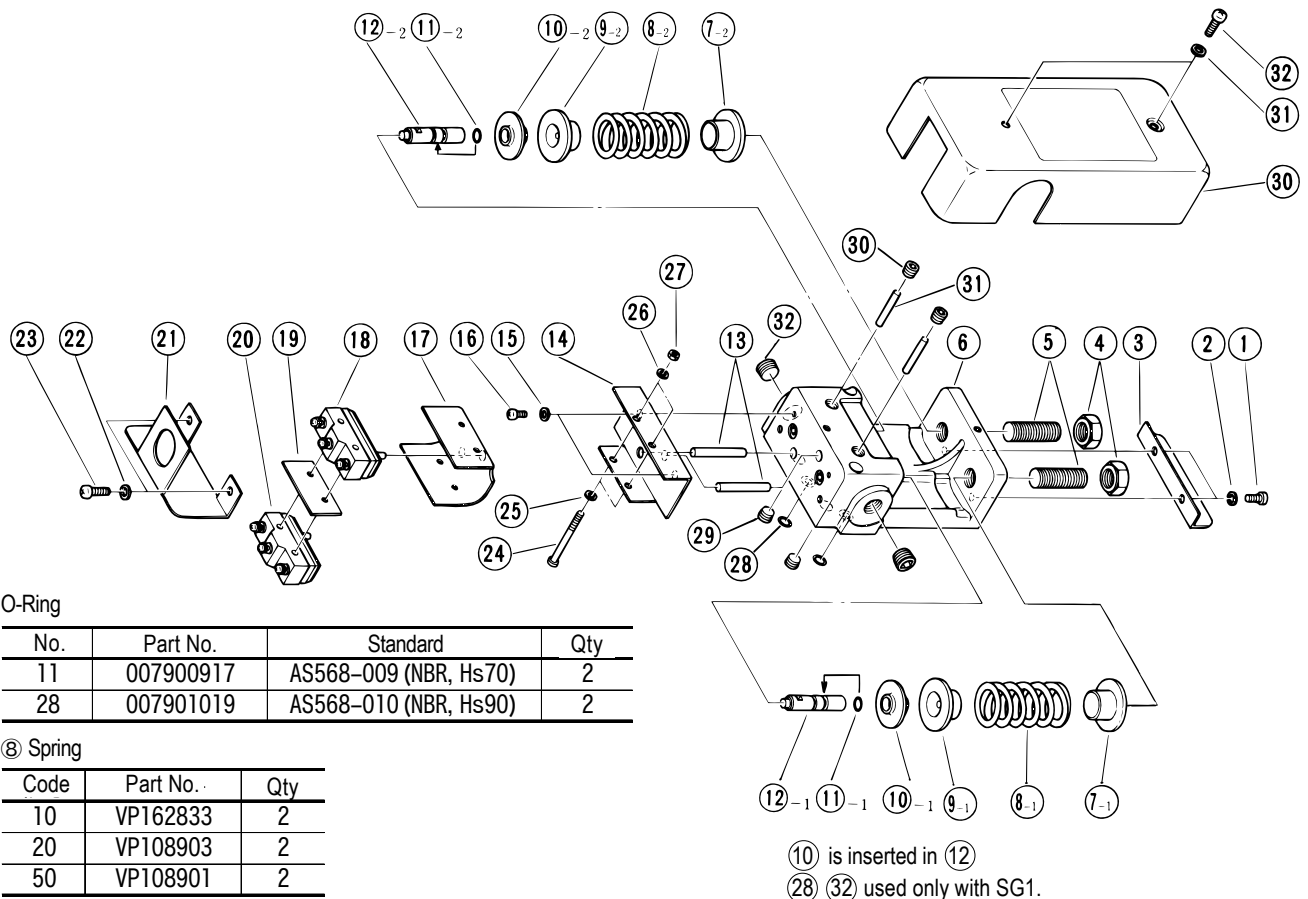
Model	Subplate	Connection Port Rc
SG1-02	SG1SM-02-10-JA-J	1/4

- Subplate is not included with unit and must be ordered separately.
- Subplate includes mounting bolts (unified thread).
- See page Q11 for dimensions.

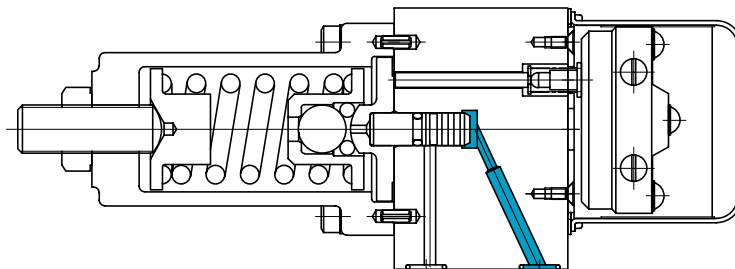
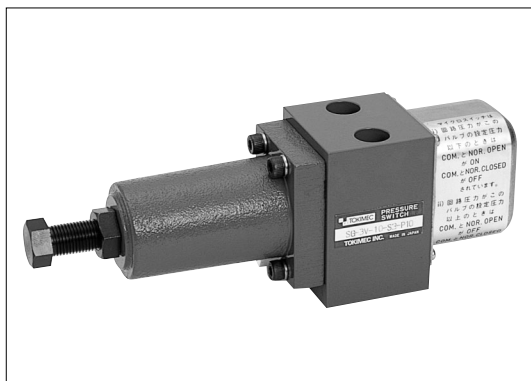
Dimensions



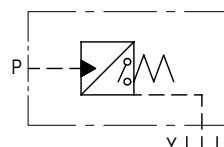
Construction



Pressure switch SG-3



Functional Symbol



- This pressure switch is used to sense pressure in hydraulic circuits to turn electrical circuits ON and OFF.

Model Code

(F3) - SG - 3 F -12 - (LA)

1 2 3 4 5

- 1 Fluid
Omit for mineral oil, water glycol
F3:phosphate ester
- 2 Pressure switch (gasket mounting)
- 3 Sensing pressure adjustment range
See 'Specifications'
- 4 Design no.
- 5 Indicator lamp (option)
Omit for no indicator lamp (st'd)
LA:Indicator lamp

Specifications

Model	Max. Oper. Output MPa	Sensing Press. Adj. Range		Weight kg
		Code	MPa	
SG-3	21	F	0.7~14	1.9
		V	3.5~21	

● Micro-Switch Rating

Power Supply		AC		DC	
Voltage	V	125, 250, 480		125	250
Voltage	A	15		0.5	0.25

● Micro-Switch and Circuit Pressure Relationship

1. Circuit pressure lower than setting pressure

COMMON —●— NORMALLY OPEN
 ○— NORMALLY CLOSED

2. Circuit pressure higher than setting pressure

COMMON —○— NORMALLY OPEN
 ●— NORMALLY CLOSED

Operating Considerations

- Loosen locknut, turn adjustment screw clockwise to raise sensing pressure setting, counterclockwise to lower sensing pressure setting.
- Drain port should be connected directly to tank.
- Indicator lamp flashes when circuit pressure exceeds setting pressure, activating micro-switch (option).

Mounting Bolts (JIS B1176,Strength Class 12.9)

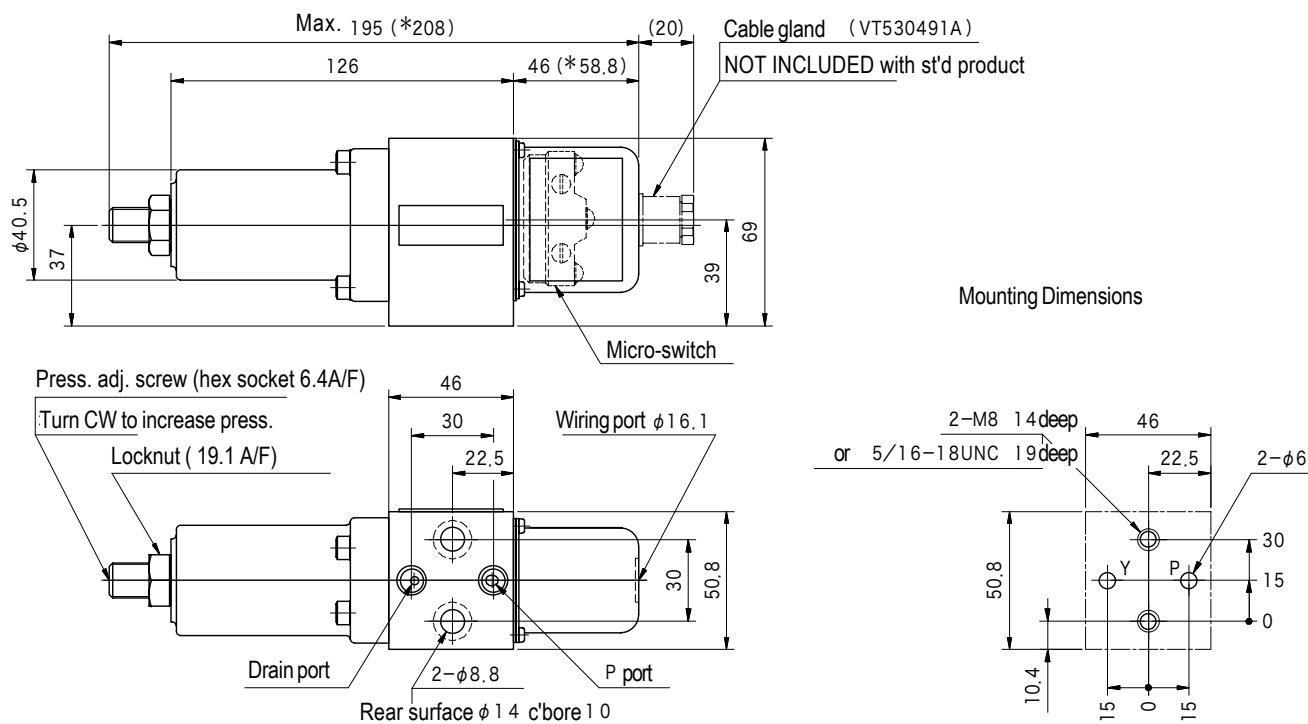
Model	Hex Socket Bolts X 2	
	Metric	Unified
SG-3	M8 × 70	5/16-18UNC × 76.2

- Pressure switch mounting bolts are not included and must be ordered separately.
- Mounting bolt tightening torque: 27 - 33Nm

Subplate

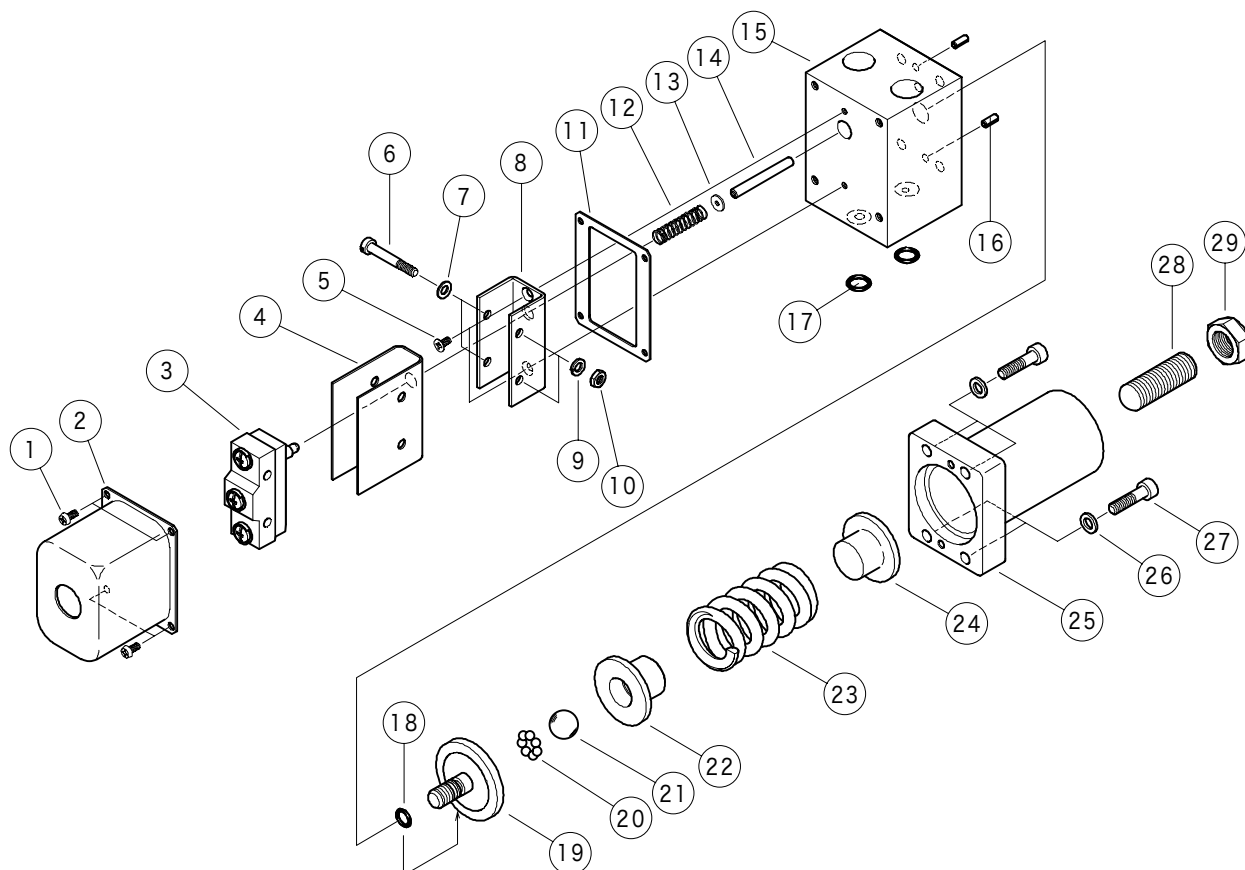
No subplate is available. Mount on manifold block.

Dimensions



Note: Marked dimensions indicates model LA (with indicator lamp).

Construction



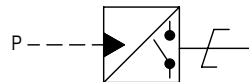
O-Rings

No.	Part No.	Standard	Qty
17	007901117	AS568-011 (NBR, Hs70)	2
18	VA19495		1

Electronic pressure switch ESP



Functional Symbol



- The ESP electronic pressure switch incorporates a vapor deposition type semiconductor strain gauge pressure sensor module and hybrid electronic circuit.
- There are no moving parts to cause mechanical friction and wear. The ESP is compact and offers reliability and life superior to conventional Bourdon Tube and piston type pressure switches.

Model Code

ESP P -H (2)- H (20) - 10

1 2 3 4 5 6 7

- 1 Electronic pressure switch
- 2 Mounting thread
P:R1/4
F:G1/4 O-ring seal
- 3 Sensing pressure setting range
L1:0.02 1 MPa
L :0.2 10 MPa
H :0.7 35 MPa
H1:1 50 MPa
- 4 No. of contacts, deadband adjustment
Omitted:1contact, variable deadband
2:2contacts, fixed deadband
3:1contact, fixed deadband
- 5 Power supply, output rating
H: Power supply DC24V(10~28V)
Output NPN open collector output DC30V, 80mA MAX.

- (*1)HN:Power supply DC24V (10~28V)
Output PNP open collector output DC30V, 80mA MAX.
- 6 Construction, accuracy (see 'Specifications')
Omitted: Drip proof
- (*2)20:Water proof
- 7 Design no.

Note:

- *1. HN type not applicable with 4 'Omitted: 1 contact, variable deadband'
- *2. 6 '20: Water proof type is applicable with 4 '3: 1 contact, fixed deadband'

Specifications

● Sensing, Output

Allowable max. pressure	Code	L1	L	H	H1
	MPa	2	20	52.5	75

Sensing pressure setting method: rotary variable resistor (3 turns). Contact method: upper limit contact (transistor ON when pressure rises to setting pressure.)

Deadband:	Variable	2~10 %F. S.
	Fixed	1 %F. S. (TYP.)

Indicator: LED

Power supply and output rating: see 'Model Code'

Cable: 3 core (4 core) cable 2000mm

Repeatability: less than ± 0.2 %F. S. 以内

Temperature drift:	Drip proof	Less than ± 0.05 %F. S.
	Water proof	Less than ± 0.1 %F. S.

Response: less than 1ms

Fluctuating voltage effect: less than

● Environment, Construction

Oper. temperature: $-20 \sim +70^{\circ}\text{C}$

Allowable humidity :5~90%RH

Insul. resistance: Above:100M Ω (at DC500 megaV)

Resis. voltage: AC350 V 1 min. (measured current above 5mA)

Vibration resis.: JIS D 1601 steps 70 X, Y, Z direction

Shock resis.: JIS C 0912-1984 196 m/s² X, Y, Z direction

Cycle durability: above:10⁷

Specifications

Water Resistance:	JIS D 0203-D2 and IEC-IP66	Water Proof
	JIS D 0203-M2	Drip Proof

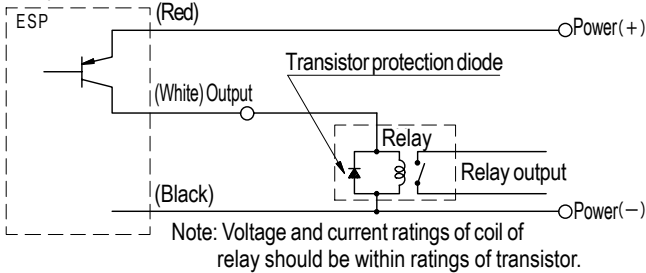
Wetted surface mat'l :SUS630 or SUS316
Mounting thread:R1/4 or G1/4

Weight:	440 g	Water Proof
	200 g	Drip Proof

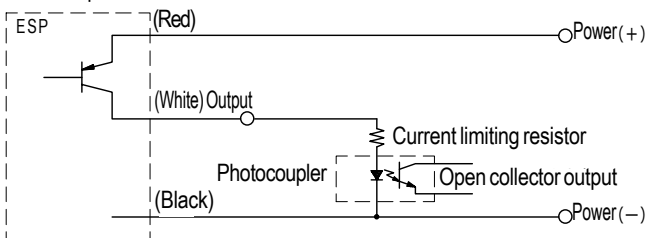
● Open Collector Output Application Example

HN(PNP-VDE Specification)

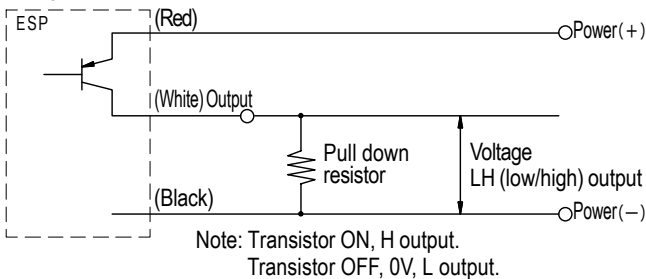
Relay Connection



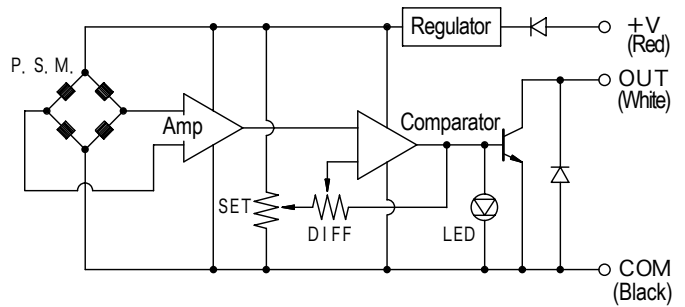
Photocoupler Connection



Voltage Output

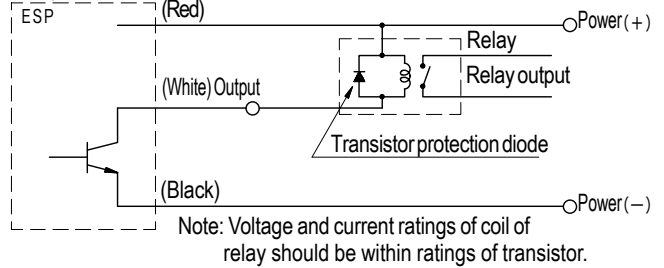


● Circuit

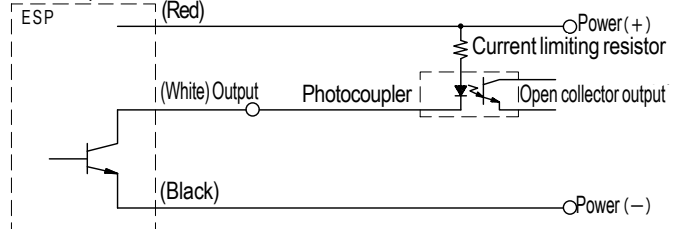


H (NPN)

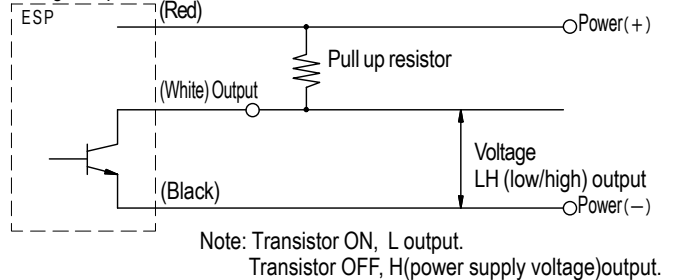
Relay Connection



Photocoupler Connection



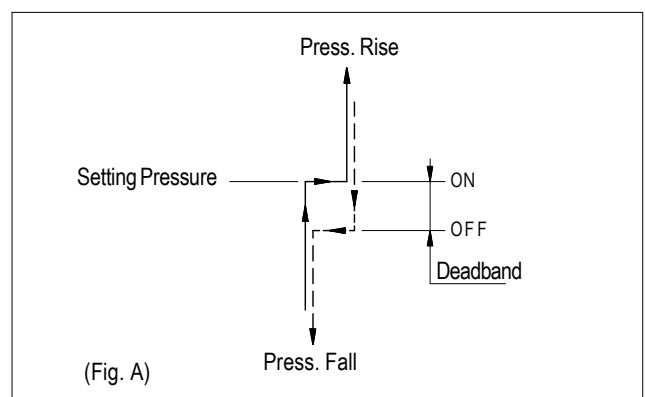
Voltage Output



Operating Considerations

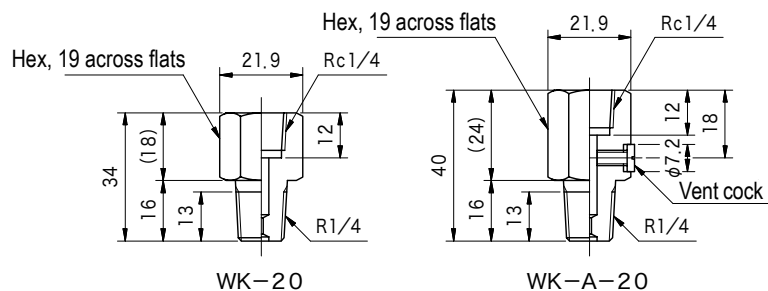
- Surge pressure may vary depending on the design of the circuit but surges 2 to 5 times greater than circuit pressure may be generated. Use restrictors to protect equipment under such conditions.
- Adjust trimmer for pressure setting while observing pressure gauge. After setting, confirm contact points using the LED display. Make sure to tighten trimmer drip proof cap after adjustment.
- Setting hints
 - First turn pressure setting trimmer (SET) in UP direction to set pressure at maximum then turn deadband adjustment trimmer (DIFF) in the direction opposite of INC to set minimum deadband.
 - Pressurize until unit switches ON, and obtain constant pressure.
 - Gradually turn SET in direction opposite UP, and stop at point when output switches ON (LED lights).
 - Turn DIFF in the direction of INC and maximize deadband.
 - Reduce pressure to the unit to the desired OFF point and fix (value of OFF point is ON point reduced by the deadband).

- Gradually turn DIFF in the direction opposite of INC, and stop at the output OFF point (LED extinguished).
- Raise and lower pressure and confirm ON, OFF function.



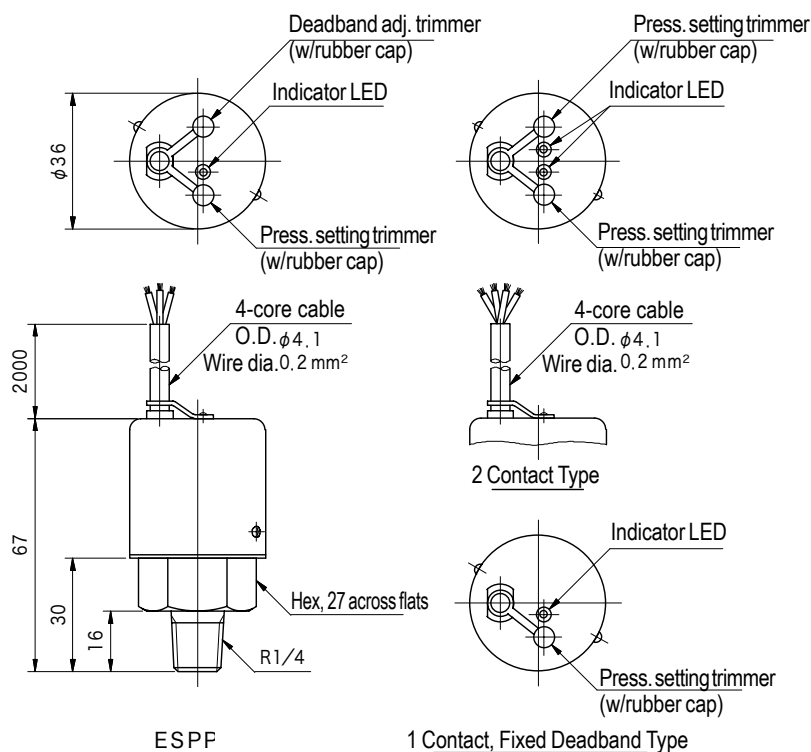
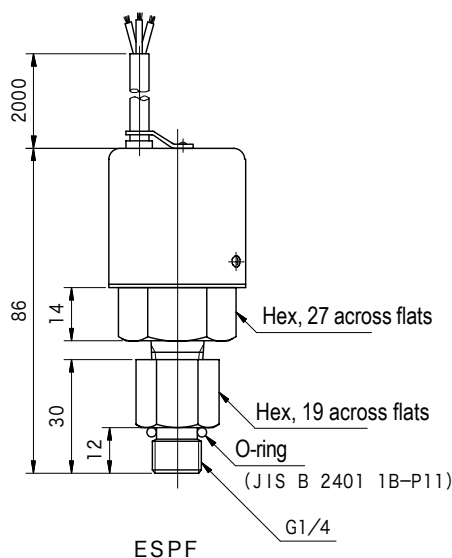
Power Supply, Fittings

- Special Power Supply (DC24V output)
TSP-100:AC100 V Power supply
TSP-101:AC200 V Power supply
- Restrictor Fitting
WK-20
WK-A-20



Dimensions

E S P * - * (*) - * (*) - 10 (Drip Proof Type)

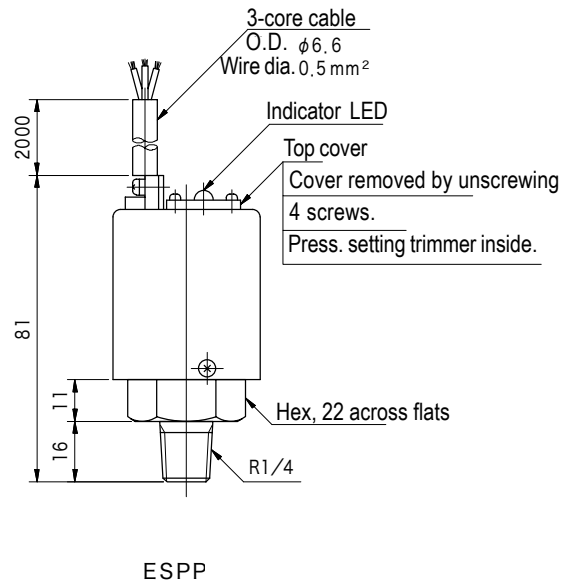
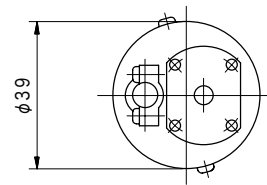
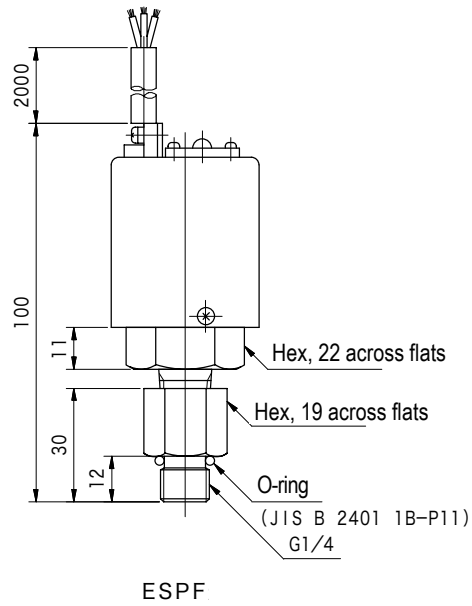


Cable Wire Color

(1 Contact)	(2 Contact)
Red Power Supply (+)	Red Power Supply (+)
White Output (1)	White Output (1)
Black Power Supply (-) COMMON	Green Output (2)
	Black Power Supply (-) COMMON

Dimensions

E S P * - H3 - H20 - 10 (Water Proof Type)



Pressure sensor (Pressure transmitter) ETP



- This pressure sensor incorporates a vapor deposition type semiconductor strain gauge pressure sensing module and amplifier circuit.

Model Code

ETP P- H1 -H L D-W- (C) -11

1 2 3 4 5 6 7 8 9

- | | | |
|--|--|---|
| <p>1 Electronic pressure sensor</p> <p>2 Mounting thread
P:R1/4</p> <p>3 Pressure sensing range
L1:0~1MPa
L:0~10MPa
M:0~20MPa
H:0~35MPa
H1:0~50MPa</p> | <p>4 Power supply
H:DC24V
G:DC+15V
E:DC15V</p> <p>5 Output ratings
See 'Specifications'</p> <p>6 Accuracy
See 'Specifications'</p> <p>7 Cap
W:With water proof cap</p> | <p>8 Calibration switch
Omitted for momentary switch
C:Toggle switch, self-holding type</p> <p>9 Design no.</p> |
|--|--|---|

Specifications

● Sensing, Output

Press. Sensing Range		Allow. Max. Press.
Code	MPa	MPa
L1	0~1	2
L	0~10	20
M	0~20	40
H	0~35	52.5
H1	0~50	75

Power Supply		Consump. Current
Code		(at no load)
H	DC24 V ±15 %	35 mA
G	DC±15 V ±5 %	30 mA
E	DC15 V ±5 %	35 mA

Output Ratings		Calibration Signal Output
Code		
H	0~10 V DC (Min. load resis. 10 kΩ)	10 V
L	0~5 V DC (Min. load resis. 10 kΩ)	5 V
A	4~20 mA DC (Max. load resis. 350 Ω)	20 mA

Accuracy (※1)		Temperature Drift
Code		
C (※2)	±0.25 % F.S.	±0.025 % F.S. / °C
D	±0.5 % F.S.	±0.05 % F.S. / °C

Note ※1 : Accuracy includes linearity, repeatability, and hysteresis.

※2 : Accuracy code 'C' applicable for pressure sensing range codes L1, L, and M only.

Response: less than 1ms

Voltage fluctuations effect: less than: +0.1%F.S. of rated voltage.

● Environment, Construction

Operating temp.: -20~+70°C (Accuracy guaranteed range 0~+70°C)

Allowable humidity: 5~95%RH

Insul. resistance: above 100 MΩ (at DC 500 megaV)

Resis. voltage: AC 350 V 1 min.

Vibration resis.: JIS D 1601 steps 70 X, Y, Z direc. 4H

Shock resis.: JIS C 0912-1984 196 m/s² X, Y, Z direction

Cycle durability: above 10⁷

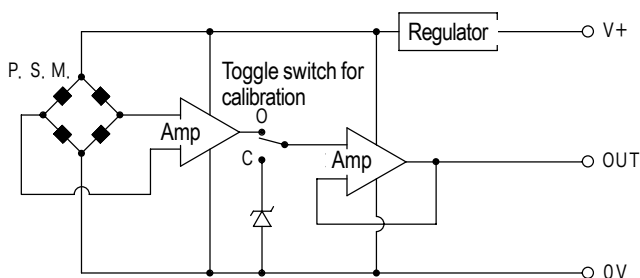
Water resis.: splash proof (JIS C 0920)

Wetted surface mat'l: SUS630 or SUS316

Weight: 320 g

● Circuit

Power supply : H type



Operating Considerations

- Pressure is adjusted prior to shipment from factory. As such do not touch trimmer and electronic parts inside of cover.
- 4~20mA output circuit (floating constant load current type) is shown at right. Output remains constant regardless of fluctuation in load resistance.
- Special cord with connector (5 core cable, outer dia. $\phi 6.2$, wire dia. 0.18mm^2)

CAY- 2-10: cord length 2m

CAY- 3-10: cord length 3m

CAY- 6-10: cord length 6m

CAY- 10-10: cord length 10m

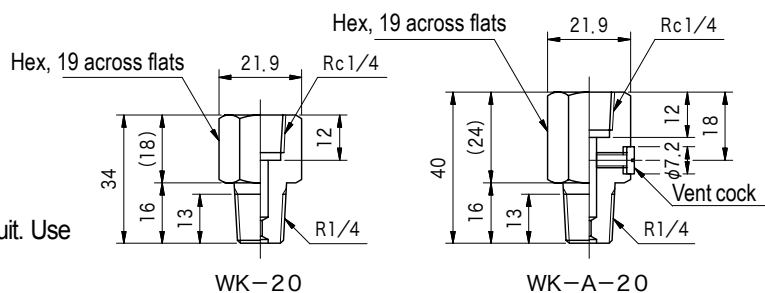
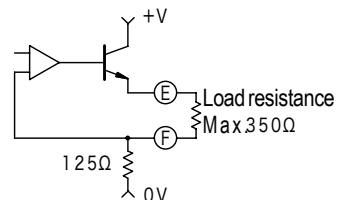
CAY- 20-10: cord length 20m

- Special power supply (DC24V output)

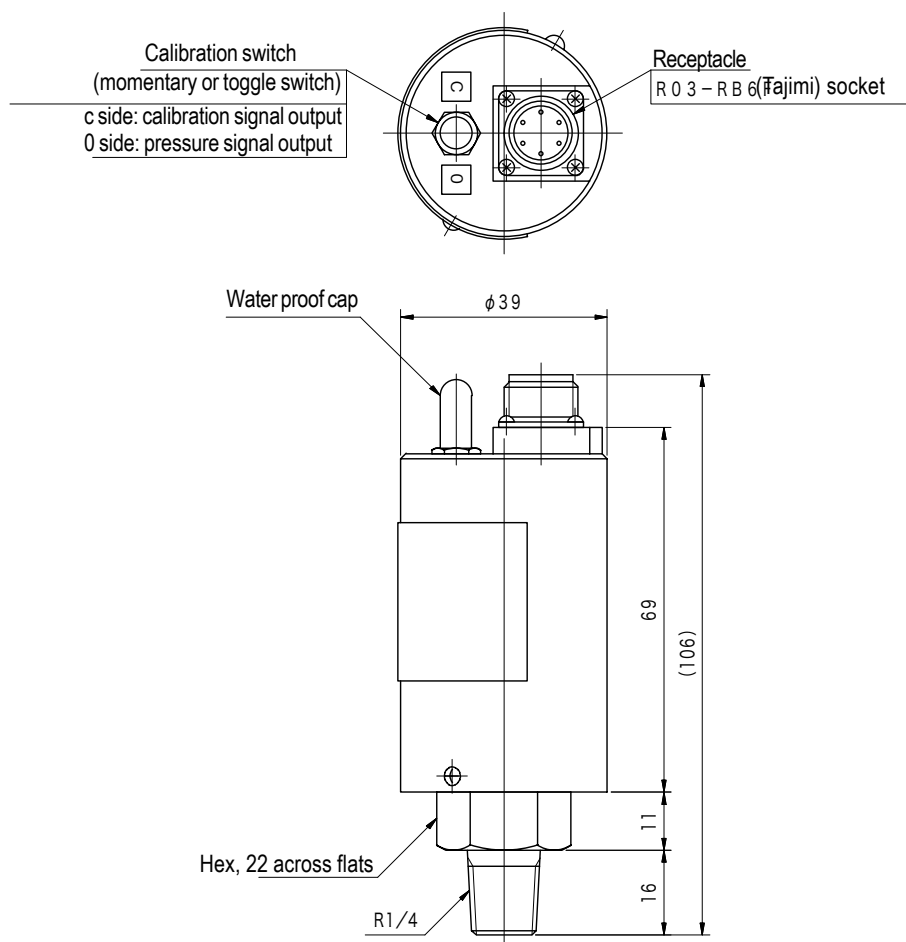
TSP-100: AC100V

TSP-101: AC200V

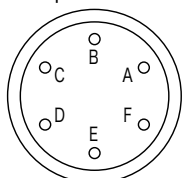
- Sudden surge pressure may be generated in hydraulic circuit. Use fitting with restrictor to protect pressure sensor.



Dimensions



Receptacle Interface



Note: Connection plug, R04-P6M (Tajimi) Water proof type

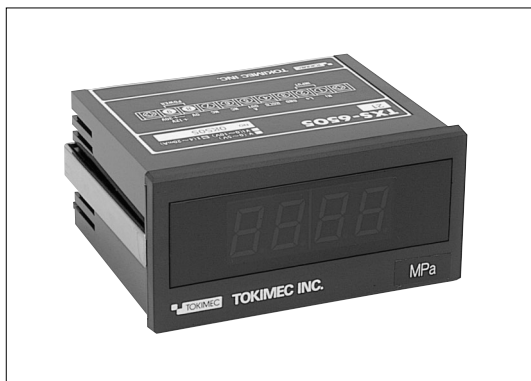
0~5. 0~10V Output

Pin Code	Cable Col.	DC24 V	DC15 V
A	Red	+24V (power)	+15V (power)
B	Blue		-15V (power)
C	White	0 V	0 V
D			
E	Green	Output	Output
F			

4~20 mA Output

Pin Code	Cable Col.	DC24 V	DC15 V
A	Red	+24V (power)	+15V (power)
B	Blue		-15V (power)
C	White	0 V	0 V
D			
E	Green	Output (+)	Output (+)
F	Yellow	Output (-)	Output (-)

Pressure monitors TXS



- The TXS digital scaling meter incorporates a scaling function which allows input signals to be displayed as physical and stoichiometric values in 3-1/2 digit readouts.
- Unit can be used as a pressure monitor when used together with our ETP pressure sensor.
- Analog output of monitor values, hold function is standard.

Model Code

TXS - 6505 - I - 30

1 2 3

- 1 Pressure monitor
TXS-6505:Digital panel meter
- 2 Input signal
I:4~20mA
V:0~5V V1:0~10V

3 Design no.

Specifications

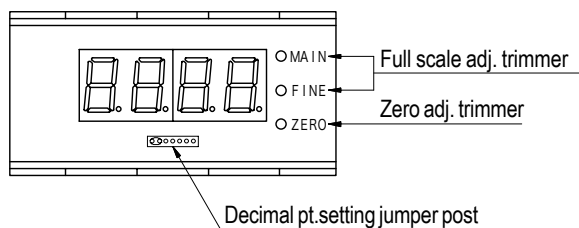
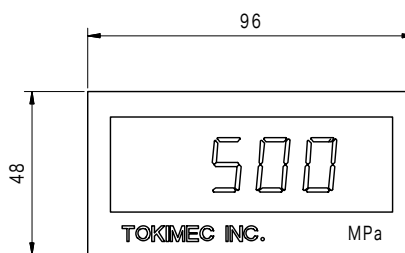
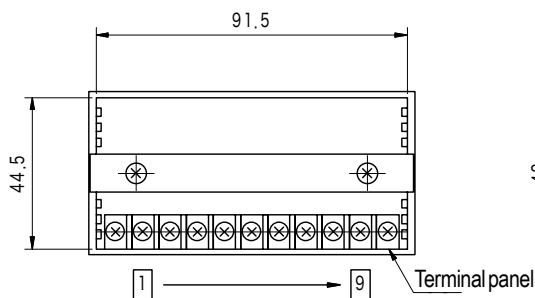
Description	Condition	TXS-6505
Input power		DC12 V~DC30 V
Current consumption	DC12 V	Less than 90 mA
	DC15 V	70 mA standard
	DC24 V	55 mA standard
Input method		Floating input method
Input signal		I : 4~20 mA, V : 0~5 V, V1 : 0~10 V
A-D conversion		Double integral method
NMRR	Sampling rate 2.5 times/sec.	40dB st'd 50/60 Hz
Measurement accuracy	Ta=+23 °C±1 °C 20~85%RH, 1 year	± (0.15 % of Irdgl+1 digit)
Temperature drift	Ta=0~+50 °C	Less than ± (100 ppm of Irdgl+0.1 digit) /°C
Sampling rate	Ta=+23 °C±1 °C 20~85%RH	Approx. 2.5 times/sec.
Warm up time		5 min.
HOLD input		Negative logic, 5 V-CMOS · LSTTL compatible
Analog output	Output voltage	Display value unit, (mV) (except hold time)
	Output current	Less than DC1 mA
Display		7 segment red LED
Display character size		14.2 mm
Polarity display		r _ _ displayed only when minus
Overflow display	Display value > +1999	r 1 displayed
Decimal point display		DP1~DP3 setting possible (jumper post setting)

Specifications

Operating temperature		0~55 °C
Operating humidity		20~85 %RH
Storage temperature		-20~+70 °C
Storage humidity	Ta ≤ 40 °C	20~95 %RH
CMV	OV-INPUT Lo (GND)	All less than ±1000 V
Withstand voltage	Panel -DPM OV Panel -DPM GND Panel -DPM LO	AC2000 V 1 min.
Insulation resistance	Panel -DPM OV Panel -DPM GND Panel -DPM LO	Above 500 MΩ (at DC500 megaV)

Dimensions

TXS-6505



With front panel removed

Terminal Panel Arrangement

SIGNAL INPUT			(Analog output)			POWER INPUT		
HI	LO	GND	HOLD	A. OUT	NC	NC	0V	24V (+12~+30V)
1	2	3	4	5	6	7	8	9

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06

Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Казахстан (772)734-952-31

Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Таджикистан (992)427-82-92-69

Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93