

Electronic pressure switch ESP



Function Symbol



- Discriminates output signals which use strain gauges from the pressure-sensing area by a electronic circuit for Open-Collector Output of transistor.

Model Code

ESPP-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 to 1 MPa

L2: 0.2 to 10 MPa

H: 0.7 to 35 MPa

H1: 1 to 50 MPa

4 No. of contacts, deadband adjustment

Omit: 1 contact, variable deadband

2: 2 contacts, fixed deadband

3: 1 contact, fixed deadband

5 Power supply, output rating

H: Power supply DC24V(10 to 28V)

Output NPN open collector output DC30V, 80mA MAX.

HN: Power supply DC24V(10 to 28V) (*1)

Output PNP open collector output DC30V, 80mA MAX.

6 Construction, accuracy (see "Specifications")

Omit: drip proof

20: water proof (*2)

7 Design no.

Note:

*1. HN type not applicable with 4. *Omitted for 1 contact, variable deadband'.

*2. 20: Water proof type is applicable with 4. *3: 1 contact, fixed deadband'.

Specifications

● Sensing, Output

Rated pressure:

Code	L1	L	H	H1
MPa	1	10	35	50

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 2000 mm

Repeatability: less than $\pm 0.2\%$ F.S.

Temperature characteristic:

Drip proof	Less than $\pm 0.05\%$ F.S.
Water proof	Less than $\pm 0.1\%$ F.S.

Response: less than 1ms

Fluctuating voltage effect: less than $\pm 0.1\%$ F.S.

● Environment, Construction

Working temperature range: -20 to $+70^{\circ}\text{C}$

Allowable humidity range: 5 to 90%RH

Insulation resistance: Above 100 M Ω (at DC50V)

Voltage resistance: AC350 V 1 min.

(measured current above 5 mA)

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

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

Cycle durability: above 10⁷ times

Note: When measuring the insulation resistance, do not apply a voltage of DC 50V or higher.

Specifications

Water Resistance:

JIS C 0920 IP67	Water proof
JIS D 0203-M2	Drip proof

Wetted surface material: SUS630 or SUS316

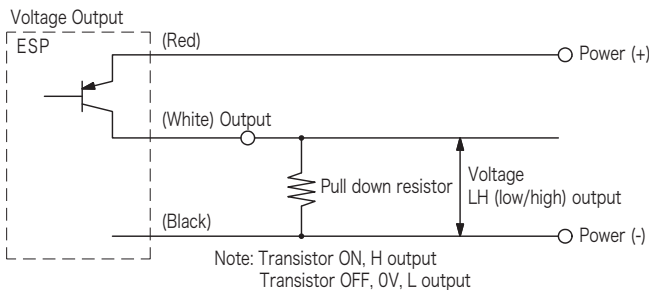
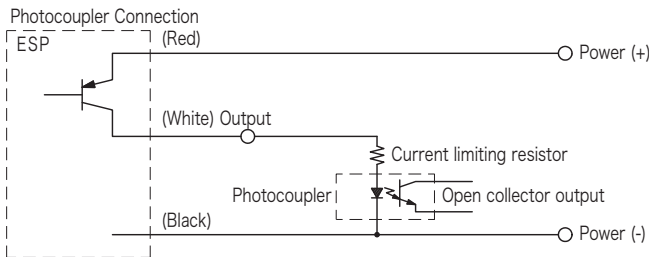
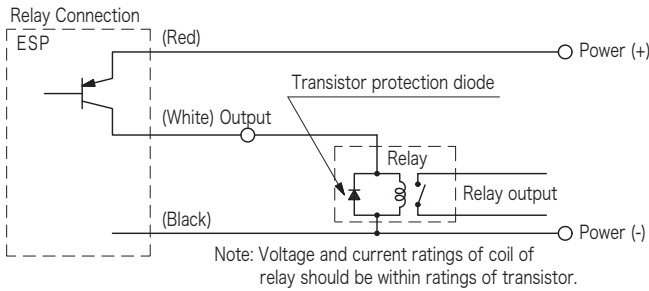
Mounting thread: R1/4 or G1/4

Weight:

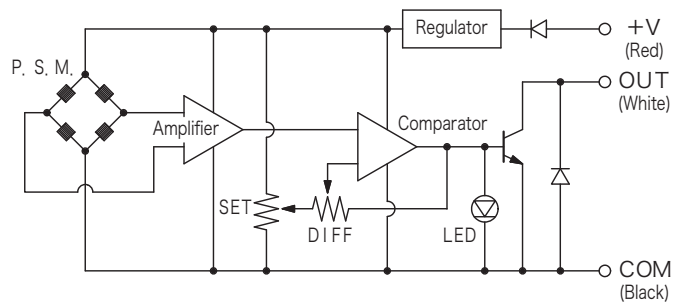
440 g	Water proof
200 g	Drip proof

Open Collector Output Application Example

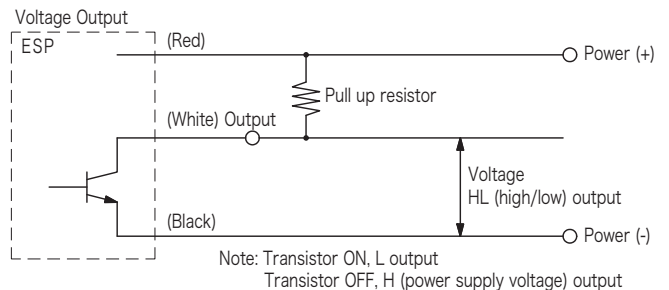
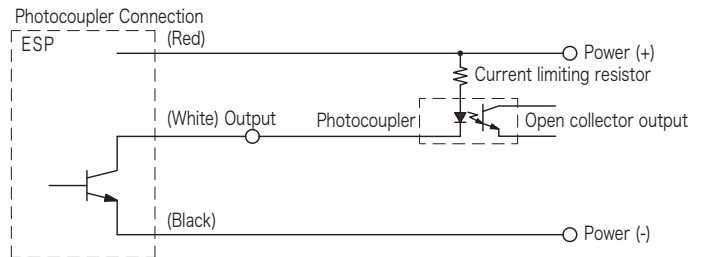
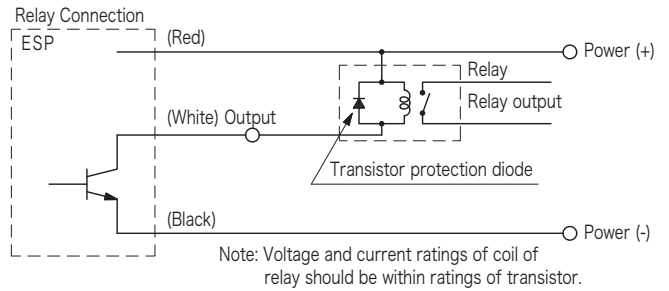
HN (PNP-VDE standard)



Internal circuit



H (NPN)



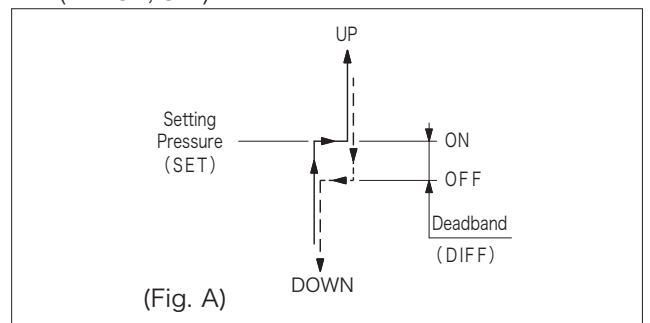
Notes on Operation

- 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 restrictor fittings 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 with drip proof cap after adjustment.
- Setting procedure (refer to Fig. A)
These pressure switches establish a difference in the pressure at which they turn ON and OFF in order to safeguard against chattering near the set pressure. This pressure difference is referred to as the deadband. The adjustment trimmer used to set the deadband is marked "DIFF." The adjustment trimmer used to set the pressure at which the switch is turned ON is marked "SET." DIFF is used to set the difference from SET.

Setting procedures

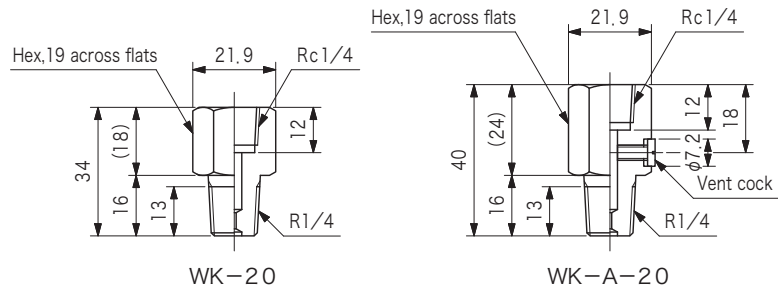
- (1) First turn pressure setting trimmer (SET) in UP direction to set pressure at maximum then turn deadband adjustment trimmer (DIFF) in the direction opposite of INC to set minimum deadband.
- (2) Pressurize until unit switches ON, and obtain constant pressure.

- (3) Gradually turn SET in direction opposite of UP, and stop at point when output switches ON (LED lights). This completes "ON pressure" setting.
- (4) Turn DIFF in the direction of INC and maximize deadband.
- (5) Reduce pressure to the unit to the desired OFF point and fix (value of OFF point is ON point reduced by the deadband).
- (6) Gradually turn DIFF in the direction opposite of INC, and stop at point when output switched OFF (LED extinguished). This fixes "OFF pressure," and the pressure switch setting is completed.
- (7) Raise and lower pressure and confirm ON, OFF function (LED ON, OFF).



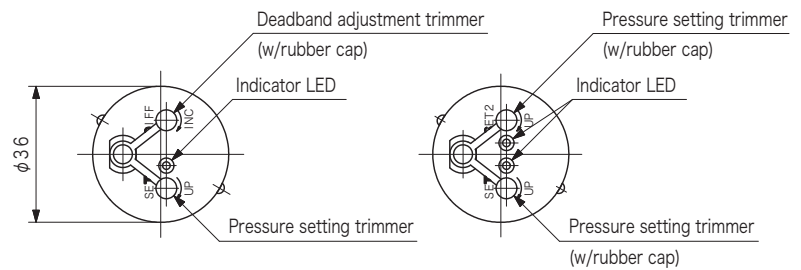
Power Supply, Couplings

- Restrictor coupling
WK-20
WK-A-20



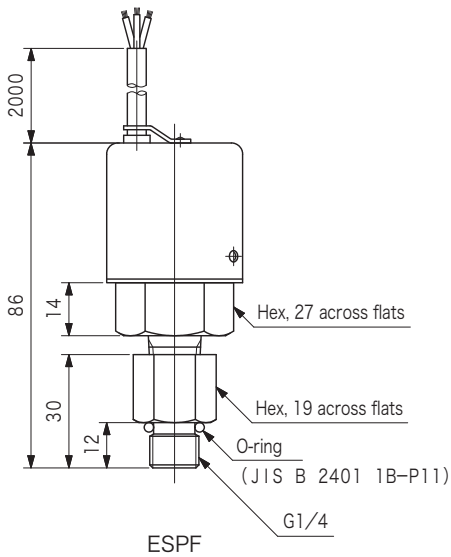
Dimensions

ESP*-*(*)-*(*)-10 (Drip proof)

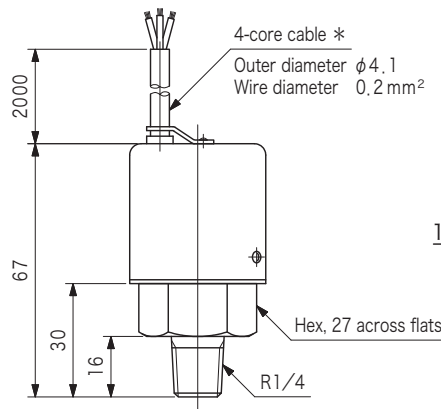


1-contact, Variable Deadband Type

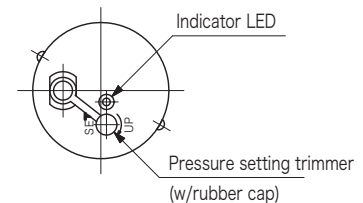
2-contact, Fixed Deadband Type



ESPF



ESPP



1-contact, Fixed Deadband Type

Cable Wire Color

1-contact Type *		2-contact Type	
Red	Power Supply (+)	Red	Power Supply (+)
White	Output (1)	White	Output (1)
Black	Power Supply (-) COMMON	Green	Output (2)
		Black	Power Supply (-) COMMON

* With the 1 contact type, the green wire in the 4 core cable has been disconnected inside the covering.

Dimensions

ESP*-H3-H20-10 (Water proof)

