METAL WORK PNEUMATIC — Digital pressure switch series 640 CE
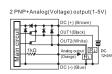
For your safety, please read the following before using.

① Do not use corrosive or flammable gas or liquid with this product.
② Please use within the rating pressure range. Do not apply pressure beyond recommended maximum withstand pressure, permanent damage to the pressure sensor may occur.
③ Do not drop, hit or allow excessive shock. Even if switch body appears undamaged, internal components may be broken and can cause malfunction.
④ Turn power off before connecting wiring. Wrong wiring or short circuit will damage and / or cause malfunction.
⑤ Do not use in environment containing steam or oil vapor.
⑥ This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
⑦ Wiring for pressure sensor should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.
⑧ For Use on a Flat Surface of a Type 1 Enclosure.

A. SPECIFICATIONS — CODE 9000640

Rated pressure range		0.000~1,000 MPa
Setting pressure range		-0.100~1,000 MPa
Withstand pressure		1.5 MPa
Fluid		Filtered air, Non-corrosive / Non-flammable gas
Set pressure resolution	kPa	—
	MPa	0,001
	kgf/cm²	0,01
	bar	0,01
	psi	0,1
	inHg	—
Power supply voltage		12 to 24V DC ±10%, Ripple (P-P) 10% or less
Current consumption		≤ 40mA (With no load)
Switch output	Output type	2 PNP open collector
	Max. load current	125 mA
	Max. supply voltage	24V DC
	Residual voltage	≤ 1.5V
	Response time	≤ 2.5 ms (chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms and 1500ms selections)
	Output short circuit protection	Yes
Analog output	Voltage output — Voltage	1~5V (±2.5%)
	Voltage output — Impedance	About 1kΩ
	Linearity	±1% F.S.
Display	LCD display	3½ digit, 7segment (red/ green)
	Switch ON Indicator	Orange (1 & 2 Indicator) OUT1 OUT2
	Updates time	About 0.2s
	Indicator accuracy	±2% F.S. ±1 digit (ambient temperature: 25 ±3°C)
Repeatability(Switch output)		±0.2% F.S. ±1 digit
Environment	Enclosure	IP65
	Operation ambient temp. range	0 ~ 50°C
	Storage ambient temp. range	-10 ~ 60°C (No condensation or freezing)
	Ambient humidity range	35 ~ 85% RH (No condensation)
	Withstand voltage	1000V AC in 1-min (between case and lead wire)
	Insulation resistance	50MΩ (at 500V DC, between case and lead wire)
	Vibration	Total amplitude 1.5mm or 10G,10Hz-55Hz-10Hz scan for 1 minute, two hours each direction of X, Y and Z
	Shock	100m/s² (10G), 3 times each in direction of X, Y and Z
Temperature characteristic		± 2% F.S. of detected pressure (25°C) at temp. Range of 0~50°C
Port size		R1/8", M5
Lead wire		Oil-resistance cable (0.15mm²)
Weight		Approx. 86g (with 2 meter lead wire)

B. OUTPUT CIRCUIT WIRING DIAGRAMS

2 PNP+Analog(Voltage) output(1-5V)

DC (+)(Brown), OUT1(Black), OUT2(White), Analog output (Orange), DC (-)(Blue), DC 12-24V

C. ORDERING INFORMATION

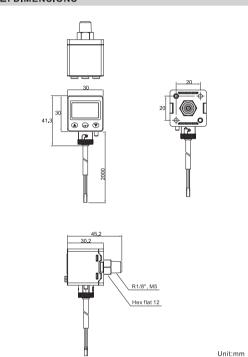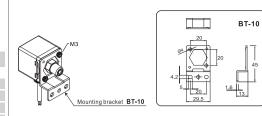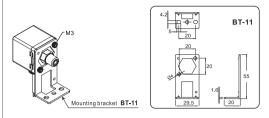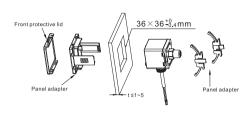|	
Digital pressure switch series 640	Code 9000640
BT-10 Parallel mounting bracket	Code 9000641
BT-11 Square mounting bracket	Code 9000644
PA-E Panel adapter	Code 9000642
PA-F Panel adapter + front protective lid	Code 9000643

D. PANEL DESCRIPTION

Pressure Unit Display Section
Output 1 Indicator
Output 2 Indicator
2 Color Main Display
(▲)Button Setting Button (SET) (▼)Button

E. DIMENSIONS

R1/8", M5
Hex flat 12
Unit:mm

F. OPTIONAL PARTS DIMENSIONS

① Mounting bracket

Mounting bracket BT-10
Mounting bracket BT-11

② Panel Adapter

Front protective lid
Panel adapter
36 × 36 mm
≤1~5
Front protective lid / Panel adapter
Unit:mm

③ Dustproof protector
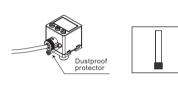

Dustproof protector

⚠ **Caution:**
This device must be installed to maintain IP65 (Dust and splash proof) enclosure rating.

G. INITIAL SETTING MODE

Measure mode → Press SET button for more than 3 seconds.

OUT1 Operating mode setting (oU1): (oPS)One point set mode → Hysteresis → Window comparator mode. Use the ▲ or ▼ button to set OUT1 operating mode.

OUT1 type setting (oU1): NO mode / NC mode

OUT2 Operating mode setting (oU2): oFF mode → One point set mode → Hysteresis → Window comparator mode. Use the ▲ or ▼ button to set OUT2 operating mode.

OUT2 type setting (oU2): NO mode / NC mode. Use the ▲ or ▼ button to set OUT2 type. (*1)

Response time setting (rES): 2.5ms → 25ms → 100ms → 250ms → 1500ms → 1000ms → 500ms. Use the ▲ or ▼ button to select response time.

Display color setting (CoL): ON:Green OFF:Red / ON:Red OFF:Green / Green ON/OFF / ON/OFF: Red. Use the ▲ or ▼ button to set display color.

Unit setting (Un): PA (MPa) → GF (kgf/cm²) → bAr (bar) → PS (psi). Use the ▲ or ▼ button to set desired pressure unit.

Measure mode

【 NOTE : 】
*1. This setting mode will not display when output 2 is set to oFF.

H. ADVANCE SETTING MODE

Measure mode → Press SET button for more than 5 seconds.

Fixed hysteresis value selection (HYS): 3 4 5 6 7 8. Use the ▲ or ▼ button to adjust fixed hysteresis value.
*Applicable for one point set mode and window comparator mode.
*Hysteresis mode does not have this setting selection.

Display color selection (dSP): oU1 / oU2. Use the ▲ or ▼ button to select LCD display color relation OUT 1 or OUT2.

Power-Save Mode (SLP): oFF / on. Use the ▲ or ▼ button to turn Power-Save mode on or off. (*1)

Restore factory setting (rSt): oFF / on. Use the ▲ or ▼ button to select to restore to default factory settings.

Display fine adjustment mode (Fin): oFF / on. Use the ▲ ▼ (*2)

Measure mode

【 NOTE : 】
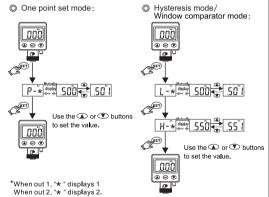*1. When setting is "on", the power-save mode would be started. Please refer the item 【 I 】 in detailed.
*2. When setting is "on", the display fine adjustment mode would be started. Please refer the item 【 S 】 in detailed.

I. POWER-SAVE MODE

◎ During Power-Save mode, the main display will turned off if no buttons is pressed after 30 seconds.
◎ During Power-Save mode, the output LCD may not be synchronize with the output. It is normal and will not affect output operation.
◎ Press any button to turn-on main display temporarily.

Measure mode ← No button operation for 30 seconds / Press any button → Power-Save mode (Main display will flash "SLP")

J. PRESSURE SETTING MODE

◎ One point set mode：
P-* → 500 → 50 1. Use the ▲ or ▼ buttons to set the value.
When out 1, "" displays 1. When out 2, "*" displays 2.

◎ Hysteresis mode/ Window comparator mode：
L-* → 500 → 50 1
H-* → 550 → 55 1. Use the ▲ or ▼ buttons to set the value.

K. OUTPUT TYPE

(1) One point set mode:
Normal open mode / Normal close mode — Positive/Compound (P/C) / Vacuum (V)

(2) Hysteresis mode:
Normal open mode / Normal close mode — Positive/Compound (P/C) / Vacuum (V)

(3) Window comparator mode:
Normal open mode / Normal close mode — Positive/Compound (P/C) / Vacuum (V)

【 NOTE : 】
*1. In case hysteresis is set at less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.
*2. When using window comparator mode, the difference between two set points must be greater than the fixed hysteresis, otherwise will cause the switch output to malfunction.

L. ANALOG OUTPUT DESCRIPTION

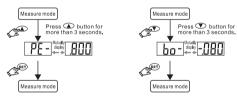Analog output range 1 to 5V, proportional to the pressure range.

(Positive) Analog output(V) — 0.000 (Low) / 1,000 (MPa) (High)

M. ZERO POINT SETTING

Use the ▲ + ▼ button at the same time until the "00" is shown, Release the button to end zero setting.

N. THE MAX. & MIN. DISPLAY MODE
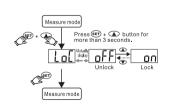
◎ The Max. value display mode:
Measure mode → Press ▲ button for more than 3 seconds. (PE- 800) → Measure mode

◎ The Min. value display mode:
Measure mode → Press ▼ button for more than 3 seconds. (bo- -080) → Measure mode

O. KEY LOCK/UNLOCK MODE

Measure mode → Press SET + ▲ button for more than 3 seconds. (LoC) oFF Unlock / on Lock → Measure mode

◎ Key lock mode, it displays as picture when pressing any key. After some time, it would be returned to measure mode. (LoC)

P. Wire Installation Instruction

Please install the wire as the following step.
● Turn upward the salient point by terminal.(See figure ①)
● Install to the terminal to the groove by pressure sensor.(See figure ②)
● Terminal cover install to the products.(See figure ③)
● Turn the terminal cover to lock.(See figure ④)

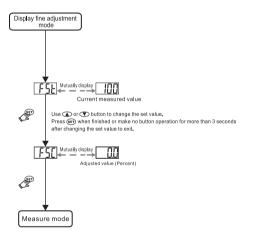【 NOTE : 】 Recommend not insert-extract over 20 times.

Q. PRESSURE UNIT CONVERSION TABLE

From \ To	Pa	kPa	MPa	kgf/cm²	psi	bar	inHg
1 Pa	1	0.001	0.000001	0.0000101972	0.000145038	0.00001	0.0002953
1 kPa	1000.000	1	0.001000	0.010197	0.145038	0.010000	0.2953
1 MPa	1000000	1000	1	10.197	145.038	10	295.2998
1 kgf/cm²	98066.5	98.0665	0.0980665	1	14.2233	0.980665	28.95979
1 psi	6895	6.895	0.006895	0.07031	1	0.06895	2.036074
1 bar	100000.0	100.000	1.01972	14.5038	1	29.52998
1 inHg	3386.388	3.386388	0.003386	0.034530	0.491141	0.033863	1

R. FINE ADJUSTMENT MODE

Display fine adjustment mode (FSE): Current measured value → 100. Use the ▲ or ▼ button to change the set value. Press SET when finished or make no button operation for more than 3 seconds after changing the set value to exit.

FSC: Adjusted value (Percent) → 00

Measure mode

This function eliminates slight differences in the output values and allows uniformity in the numbers displayed. Displayed values of the pressure sensor can be calibrated to within ±2.5% R.D.

±2.5% R.D. — Displayed pressure value / Applied pressure

— :Factory setting display value set prior to shipment
▓ :Display calibration range

R.D. (Real Detect)
【 NOTE : 】
1. Setting resolution is ±0.1% R.D.
2. The signal would be changed with analog output after adjusting.

S. ERROR CODE INSTRUCTION

Error Type	Error code	Error Condition	Troubleshooting
Excess load current error	Er1	Output 1 load current is more than 125 mA	Turn output off and check the cause of overload current or lower the current load under 125 mA, then restart.
	Er2	Output 2 load current is more than 125 mA	
Residual pressure error	Er3	During zero reset, ambient pressure is over ±3% F.S.	Change input pressure to ambient pressure and perform zero reset again.
Applied pressure error	HHH	Supply pressure exceeds the upper limit of pressure setting.	Adjust the pressure within operating pressure range.
	LLL	Supply pressure exceeds the lower limit of pressure setting.	
System error	Er4	Internal system error	Turn power off, and then restart. If error condition remains, please return to factory for inspection.
	Er5	Internal system error	
	Er6	Internal data error	
	Er7	Internal data error	