

For your safety, please read the following before using.

- Do not use corrosive or flammable gas or liquid with this product.
- Please use within the rating pressure range. Do not apply pressure beyond recommended maximum withstand pressure, permanent damage to the pressure sensor may occur.
- Do not drop, hit or allow excessive shock. Even if switch body appears undamaged, internal components may be broken and can cause malfunction.
- Turn power off before connecting wiring. Wrong wiring or short circuit will damage and / or cause malfunction.
- Do not use in environment containing steam or oil vapor.
- This product is not explosion-proof rated. Do not use in atmosphere containing flammable or explosive gases.
- Wiring for pressure sensor should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.
- With IO link function, the maximum extension for each individual connection is 20M between sensor and master.
- While switching ON, please start detection after 200ms.
- Sensors at end-of-life must be disposed of in accordance with E-Waste regulations of the country/region, NOT disposed of with regular garbage.

A. SPECIFICATIONS

MODEL	CODE 9000640L (Positive Pressure)
Rated Pressure Range	0.000-1.000MPa
Setting Pressure Range	-0.105~-1.050MPa
Withstand Pressure	1.5MPa
Fluid	Filtered air, Non-corrosive / Non-flammable gas
Set Pressure Resolution	kPa 1
	MPa 0.001
	kgf/cm ² 0.01
	bar 0.01
	psi 0.1
Power Supply Voltage	24V DC, Ripple (P-P) ≤10%
Current Consumption	≤35mA (no load)
Output Short Circuit Protection	Yes
Switch Output	NPN : open collector outputs Max. Load Current : 150 mA Max. Supply Voltage : 30 V DC Residual Voltage : ≤ 1 V (Load current 150 mA)
	PNP : open collector outputs Max. Load Current : 150 mA Max. Supply Voltage : 24 V DC Residual Voltage : ≤ 1 V (Load current 150 mA)
Repeatability	±0.2% F.S ±1 digit
Hysteresis	Single Point Mode
	Window Comparator Mode
Display	Main Display: 4 digital, 7 segment LCD display (Red/Green) Sub Display: 4 digital, 1st digit 11 segment, 7 segment for other (Orange)
Indicator Accuracy	±2% F.S. ±1 digit (Ambient temperature: 25±3°C)
Switch on Indicator	Red Indicator 1, 2 : OUT1 or OUT2 Green Indicator 1, 2 : OUT1 or OUT2
Analog Output (Voltage Output)	Output Voltage: 1-5V or 0-10V ±2.5% F.S (within rated pressure range) Linearity: ±1.5% F.S. Output Impedance: about 1kΩ
	Output Current: 4-20mA ±2.5% F.S (within rated pressure range) Linearity: ±1.5% F.S. Max. Load Impedance: 500Ω
Environment	Enclosure
	Ambient Temp. Range
	Ambient Humidity Range
	Withstand Voltage
	Insulation Resistance
Shock	Total amplitude 1.5m/s or 10G, 10Hz~55Hz~10Hz scan for 1 minute, 2 hours each direction of X, Y and Z
	100m/s ² (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	G1/8"(BSPP), M5
Lead Wire	Ø4 Oil-resistance cable (PVC) - 26 AWG (0.15 mm ²) - 5 cores
Weight	Approx. 80g (with 2 meter lead wire)

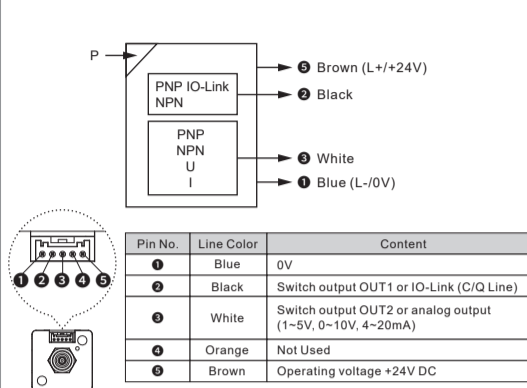
IO-Link Specifications

Type	Device
Version	V1.1
Communication Speed	COM2 (38.4kpbs)
Configuration File	IODD file ※1
Min. Cycle Time	3ms
Process Data Length	Input Data: 2 byte (2 bit BCD; 14 bit PDV), Output Data: 0 byte
On Request Data Communication	Available
Data Storage Function	Available
Event Function	Available
Vendor ID	1046 (0416)
Device ID	72 (0x00048)

NOTE

※1: The configuration file (IODD file) can be downloaded from the Metal Work website (<https://www.metalwork.it>).

B. OUTPUT CIRCUIT WIRING DIAGRAMS

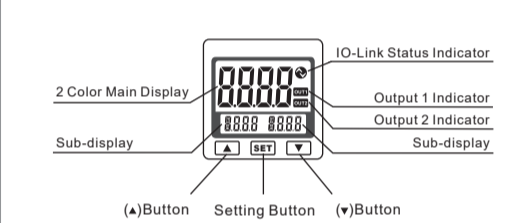


* NPN/PNP of switch output can be switched.

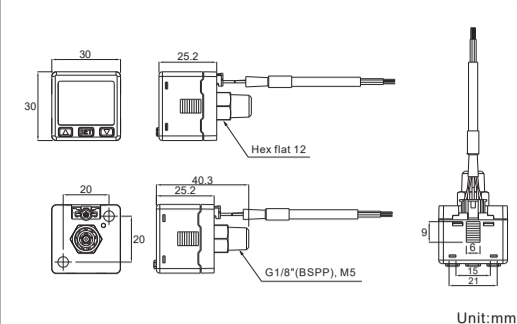
C. ORDERING INFORMATION

Digital pressure switch series 640	Code 9000640L
BT-12 Parallel mounting bracket	Code 9000641L
BT-13 Square mounting bracket	Code 9000644L
PA-C Panel adapter	Code 9000642L
PA-D Panel adapter + front protective lid	Code 9000643L

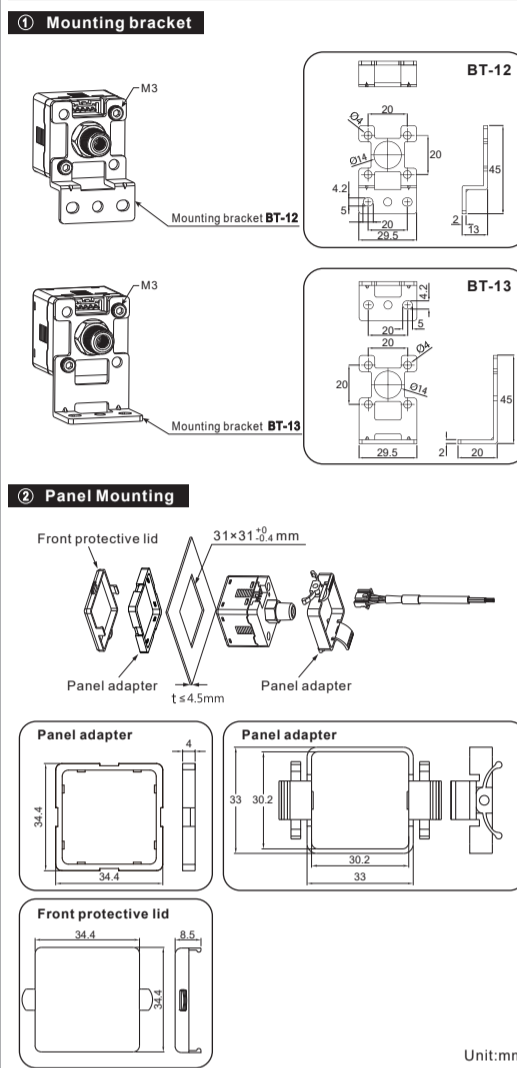
D. PANEL DESCRIPTION



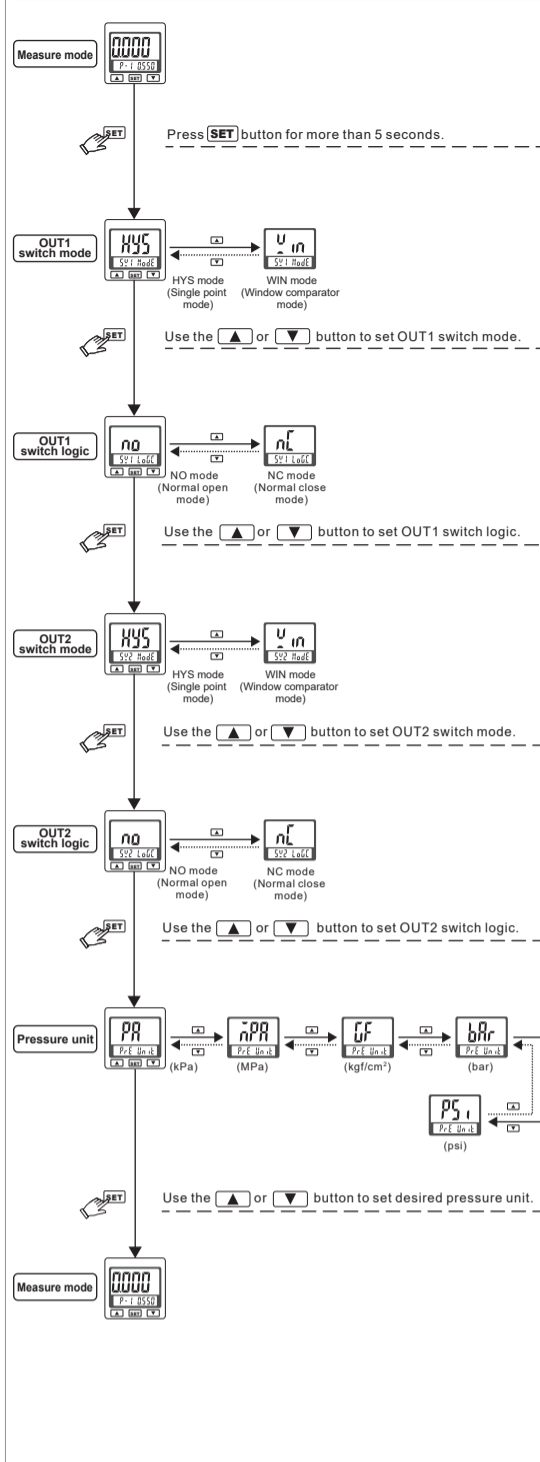
E. DIMENSIONS



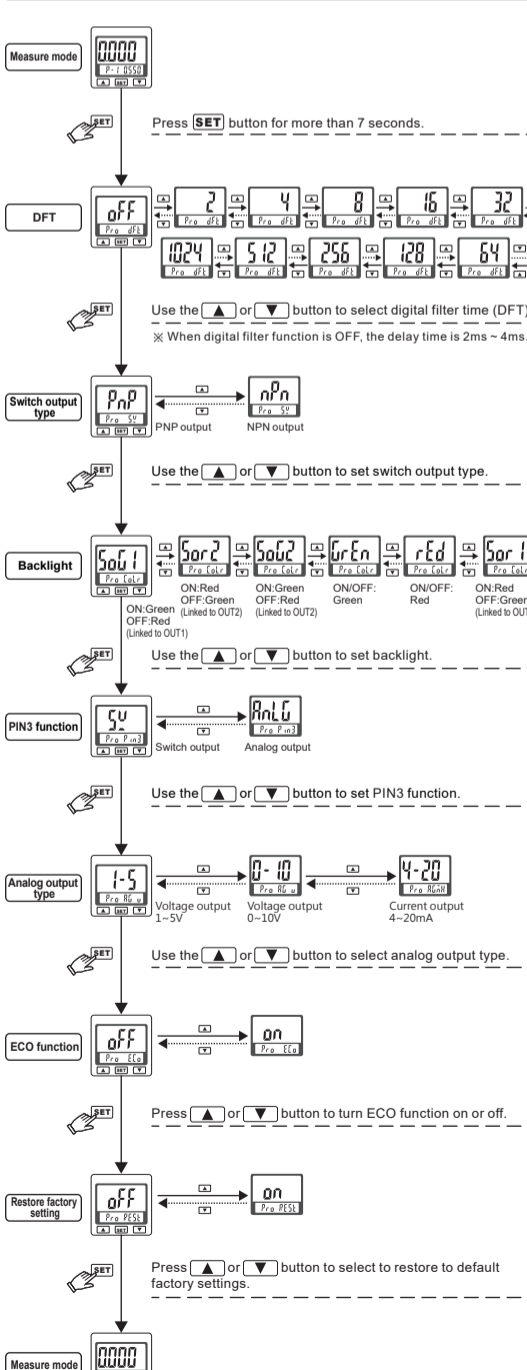
F. OPTIONAL PARTS DIMENSIONS



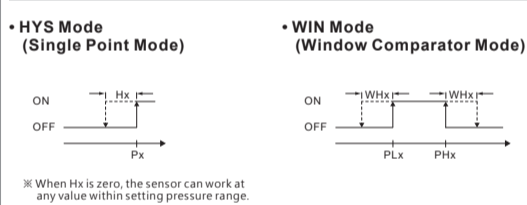
G. INITIAL SETTING MODE



H. ADVANCE SETTING MODE



I. SWITCH MODE



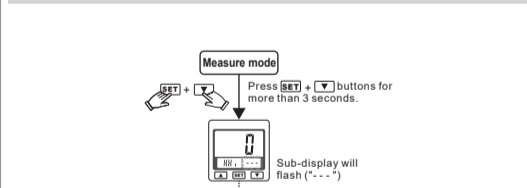
J. ZERO CLEAR

Press the (▲) and (▼) buttons at the same time until the "----" is shown. Release the buttons to end zero clear.

K. KEY LOCK FUNCTION

Use key lock function to prevent unauthorized or accidental tampering with the switch setting.

L. CLEAR PEAK/BOTTOM VALUE FUNCTION



M. IO-LINK STATUS INDICATOR DESCRIPTION

Indicator Light	Display	Status
Off	Off	SIO Mode
Flashing	Flashing	When communication starts up / Offline
On	On	IO-Link Mode

N. ERROR CODE INSTRUCTION

Error Name	Error Code	Error Condition	Troubleshooting
Excess load current error	Errr 1	Output 1 load current is more than 150mA.	Turn power off and check the cause of overload current or lower the current load under 150mA, then restart.
Residual pressure error	Errr 2	Output 2 load current is more than 150mA.	Turn power off and check the cause of overload current or lower the current load under 150mA, then restart.
System error	Errr 3	During zero reset, ambient pressure is over ±3% F.S.	Change input pressure to ambient pressure and perform zero reset again.
System error	Errr 4	Device Hardware Fault (EEPROM)	Turn power off, and then restart. If error condition remains, please return to factory for inspection.
Internal temperature overrun	Errr 5	IO-Link Fault-Device	Turn power off, remove load and restart, if sensor is still not in normal state, please return it to factory for analysis.
Applied pressure error	HHHH	Supply pressure exceeds the upper limit of pressure setting.	Adjust the pressure within operating pressure range.
Applied pressure error	LLLL	Supply pressure exceeds the lower limit of pressure setting.	Adjust the pressure within operating pressure range.

O. PROCESS DATA

Bit Offset	Item	Note
0	OUT1 output	OFF = 0; ON = 1
1	OUT2 output	OFF = 0; ON = 1
2-15	Measurement value	Unsigned 14 bit ※1

NOTE

※1: Refer to the table (Unit specification and measurement value)(PDV)

PDI Data Structure

Bit Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
Item	Measurement value (PDV)															OUT2	OUT1

Unit Specification and Measurement Value (PDV)

Series	Unit	Set Pressure Range	Gradient	Intercept	Display Dot
900064L	kPa	-105 ~ 1050	0.070499908442	-105	0
	MPa	-0.105 ~ 1.050	0.00070499908	-0.105	3
	kgf/cm ²	-1.07 ~ 10.71	0.000719038027	-1.07	2
	bar	-1.05 ~ 10.50	0.000704999084	-1.05	2
	psi	-15.2 ~ 152.3	0.010224012696	-15.2	1

Conversion formula of the process data and pressure measurement value.
Pressure measurement value = Gradient × PDV + Intercept
Pressure set value = Gradient × PDV + Intercept

P. IO-LINK PARAMETER SETTING

Direct Parameters Page 1

Address	Access	Parameter Name	Initial Value (dec)	Contents
0x07	R/W	OUT1 set point 1 WIN mode (P1L)		
0x08	R	Vendor ID	0x0416 (1046)	Metal Work SpA
0x09	R	Product ID	9000640L	
0x0A	R	Device ID	0x00048 (72)	9000640L
0x0B	R	Product text	Pressure sensor	

ISDU Parameters

Index (dec)	Subindex	Access	Parameters	Initial Value	Remarks
0x002 (2)	0	W	System command		Refer to the table 1
0x00C (12)	0	R/W	Device access lock	0x0000	Refer to the table 2
0x010 (16)	0	R	Vendor name	Metal Work SpA	
0x011 (17)	0	R	Vendor text	http://www.metalwork.it	
0x012 (18)	0	R	Product name	9000640L	
0x013 (19)	0	R	Product ID	9000640L	
0x014 (20)	0	R	Product text	Pressure sensor	
0x015 (21)	0	R	Serial number	xxxxxxxxxxxxxx	
0x016 (22)	0	R	Hardware version	Vx.y	
0x017 (23)	0	R	Software version	Vx.y	
0x018 (24)	0	R/W	Application specific tag	xxx	
0x019 (25)	0	R/W	Function tag	xxx	
0x001A (26)	0	R/W	Location tag	xxx	
0x0024 (36)	0	R	Device status parameter		Refer to the table 3
0x0025 (37)	0	R	Device detailed state parameter		Refer to the table 4
0x0028 (40)	0	R	Process data input		The latest value of process data can be read.

Table 1

Value (dec)	Function Definition	Description
0x80 (128)	Device reset	Restarts the device
0x81 (129)	Application reset	Clear peak/bottom value
0x82 (130)	Restore factory settings	Restores factory default values
0x83 (131)	Back-to-box	The parameter of the device are set to factory default values and communication will be inhibited until the next power cycle.
0xA0 (160)	Zero clear	Executes zero clear

Table 2

Value (dec)	Contents
0x0000 (0)	Key unlock (initial value)
0x0008 (8)	Key lock

Table 3

Value (dec)	State Definition
0x00 (0)	Normal operation
0x01 (1)	Maintenance inspection required
0x02 (2)	Out of specification
0x03 (3)	Function check
0x04 (4)	Failure

Table 4

Array	Event Content	Event Classification	Value	Event Code
1	Internal Failure	Error	0xF4	0x1801
2	OUT2(PIN3) overload/short circuit	Error	0xF4	0x8D01
3	Pressure overrun	Warning	0xE4	0x8CA1

Product Individual Parameters

Index (dec)	Subindex	Access	Parameter	Data Storage	Data Type	Initial value (dec)	Remarks
0x003C (60)	1	R/W	OUT1 set point 1 WIN mode (P1L)	Y	Unit 16	P1L = 500	
	2	R/W	OUT1 set point 2 WIN mode (P1H)	Y	Unit 16	P-1 = P1H = 550	
	3	R/W	OUT1 set point 3 WIN mode (P1H)	Y	Unit 16	P-1 = P1H = 550	
0x003D (61)	1	R/W	OUT1 switch logic	Y	Unit 8	N.O.	0x00 = N.O. 0x01 = N.C.
	2	R/W	OUT1 HYS mode	Y	Unit 8	HYS mode	0x01 = HYS mode 0x02 = WIN mode
	3	R/W	OUT1 switch hysteresis WIN mode (H-1) WIN mode (WH1)	Y	Unit 16	H1 = WH1 = 50	
0x003E (62)	1	R/W	OUT2 set point 1 WIN mode (P2L)	Y	Unit 16	P2L = 500	
	2	R/W	OUT2 set point 2 WIN mode (P2H)	Y	Unit 16	P-2 = P2H = 550	
	3	R/W	OUT2 set point 3 WIN mode (P2H)	Y	Unit 16	P-2 = P2H = 550	
0x003F (63)	1	R/W	OUT2 switch logic	Y	Unit 8	N.O.	0x00 = N.O. 0x01 = N.C.
	2	R/W	OUT2 HYS mode	Y	Unit 8	HYS mode	0x01 = HYS mode 0x02 = WIN mode
	3	R/W	OUT2 switch hysteresis HYS mode (H-2) WIN mode (WH2)	Y	Unit 16	H2 = WH2 = 50	
0x0118 (280)	0	R/W	Backlight	Y	Unit 16	SOG1	0 : SOG1 1 : SOG2 2 : SOG3 3 : SOG4 4 : GREEN 5 : RED
0x016C (364)	0	R/W	Analog output type	Y	Unit 16	1-5V	0 : 0-10V 1 : 1-5V 2 : 4-20mA
0x017F (383)	0	R/W	Pressure unit	Y	Unit 16	kPa	0 : kPa 1 : MPa 2 : kgf/cm ² 3 : bar 4 : psi
0x0182 (386)	0	R/W	DFT (Digital Filter Time)	Y	Unit 16	OFF	0 : OFF 1 : 2ms 2 : 4ms 3 : 8ms 4 : 16ms 5 : 32ms 6 : 64ms 7 : 128ms 8 : 256ms 9 : 512ms 10 : 1024ms
0x01E2 (482)	0	R/W	PIN3 function	Y	Unit 16	Switch output	0 : Switch output 1 : Analog output
0x01E8 (488)	0	R/W	ECO function	Y	Unit 16	OFF	0 : OFF 1 : ON
0x01EA (490)	0	R/W	Key lock function	Y	Unit 16	Unlock	0 : Unlock 1 : Lock
0x2005 (8197)	0	R	Bottom value	N	Unit 16		
0x2008 (8198)	0	R	Peak value	N	Unit 16		