



INSTRUCTION MANUAL

LCD Digital Display Gas Pressure Sensor XP Series

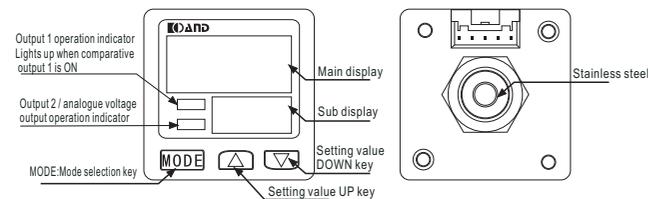
Thank you very much for purchasing AND products.
First of all, please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this product.
Kindly keep this manual in a convenient place for quick reference.

1. This product is designed for use with non-corrosive gas. It cannot be used for corrosive gas, flammable and explosive gas or liquid ;
2. Please use within the rated voltage range;
3. Please pay attention to the pressure range of this product. If the pressure is exceeded, dangerous situations may occur;
4. Executive standard: Q / AND01-2014 "Digital display gas pressure sensor"

⚠ WARNINGS

- Never use this product as a sensing device for personnel protection.
- In case of using sensing devices for personnel protection, use products which meet laws and standards, such as OSHA, ANSI or IEC etc., for personnel protection applicable in each region or country.

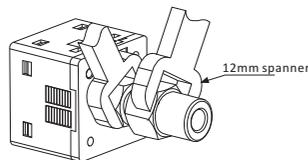
1 PART DESCRIPTION



Note 1: When the pressure unit is set to a unit other than "MPa" or "KPa", Please attach the unit switch plate corresponds to the set pressure unit.

2 PIPING

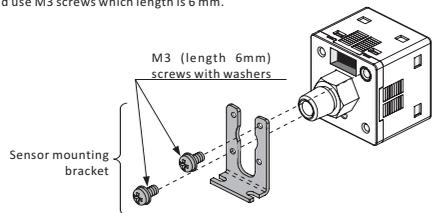
When connecting a commercial coupler to the pressure port, attach a 12mm spanner to the pressure port's hexagon section to fix the port and then tighten with a tightening torque of 5.1N.m or less (M5 female: 1N.m or less). The commercial coupler or pressure port section will be damaged if the tightening torque is excessive. Wrap sealing tape around the coupler when connecting to prevent leaks.



3 MOUNTING

Installation diagram with bracket

When mounting the sensor onto the sensor mounting bracket, the tightening torque should be 12 N.m or less, and use M3 screws which length is 6 mm.

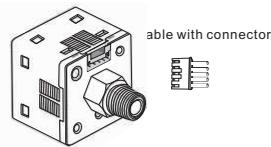


Note: The bracket is optional and needs to be selected separately when ordering.

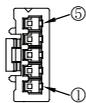
4 WIRING

Connection method

Please use the cable with connector we provided.
Note: Pressing the release lever of the cable with connector, pull out the connector, otherwise it can cause cable break or connector break.



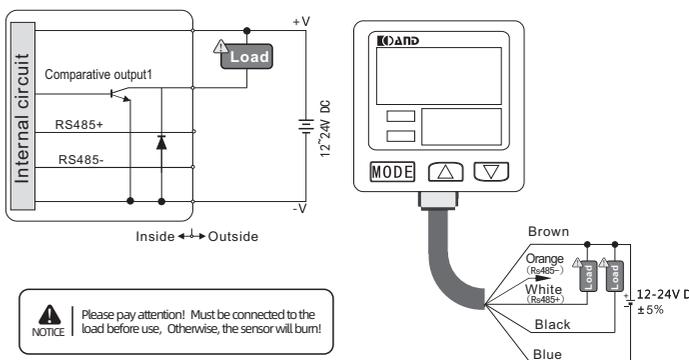
Connection connector pin arrangement



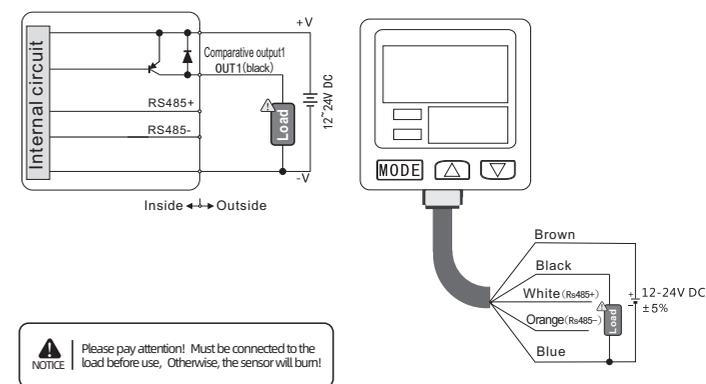
Connector pin No.	Terminal name
① Brown	+V
② Black	Comparative output 1
③ White	Comparative output 2
④ Orange	Analogue voltage
⑤ Blue	0V

5 I/O CIRCUIT DIAGRAMS

NPN Output



PNP Output

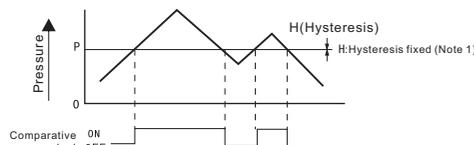


6 OUTPUT MODE AND OUTPUT OPERATION

The EASY mode, hysteresis mode or window comparator mode can be selected as the output mode for comparative output 1 and comparative output 2.

EASY mode

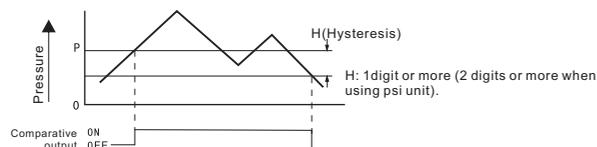
ON / OFF of the comparative output is controlled in this mode.



Notes: (1) Hysteresis can be fixed in 8 steps.
(2) "P-1" is displayed for comparative output 1 and "P-2" for comparative output 2 on the sub-display.

Hysteresis Mode

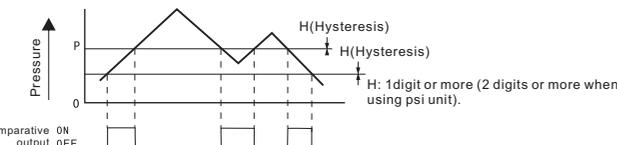
The comparative output ON / OFF state can be controlled with randomly set hysteresis in this mode.



Note 1: "H-1" or "Lo-1" is displayed for comparative output 1 and "Hi-2" or "Lo-2" for comparative output 2 on the sub-display.

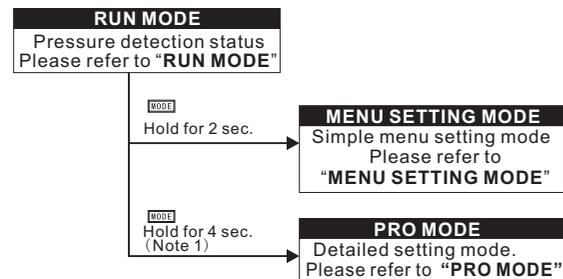
Window Comparator Mode

In this mode, the ON or OFF state of the comparative output is controlled with a pressure in the set range.



Notes: (1) Hysteresis can be fixed in 8 steps.
(2) "Hi-1", "Lo-1" is displayed for comparative output 1 and "Hi-2", "Lo-2" for comparative output 2 on the sub-display.

7 Setting Setting steps

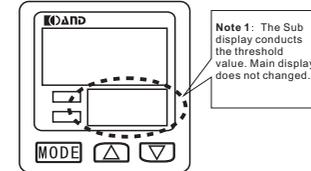


Note 1: Press and hold the mode switch button for 2 seconds to switch to the menu setting mode. To switch to the PRO mode, please press the button continuously.

8 PRO MODE

Setting the threshold value

Refer to "MENU SETTING MODE" for setting conditions.



If the set pressure range is exceeded, "UP" (exceeds the upper limit) or "DOWN" (exceeds the lower limit) will appear on the sub display. "DOWN" will also appear if the Hi side threshold value exceeds the Lo side threshold value when setting the "hysteresis mode / window comparator mode" threshold value.

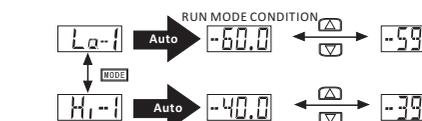
Setting condition 1

Comparative output 1 output mode: "EASY"("EASY" MODE)
Comparative output 2 output mode: "OFF"("OFF" MODE)



Setting condition 2

Comparative output 1 output mode: "HYS"("Hysteresis Mode") or "WVMP"(Window Comparator Mode)



Zero-adjustment function

The zero-adjustment function forcibly sets the pressure value to "zero" when the pressure port is opened.

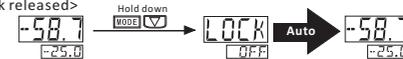


Key lock function

The key lock function prevents key operations so that the conditions set in each setting mode are not inadvertently changed.

<Key lock set> Refer to **10 PRO MODE** "<Key lock set>"

<Key lock released>

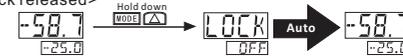


Menu lock function

The menu lock function means that when the menu item is locked, the reference value can still be set.

<Menu lock> Refer to **10 PRO MODE** "<Key lock set>"

<Key lock released>

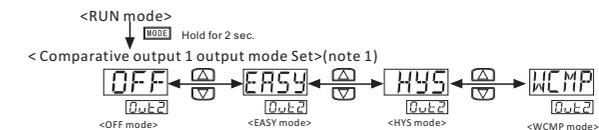


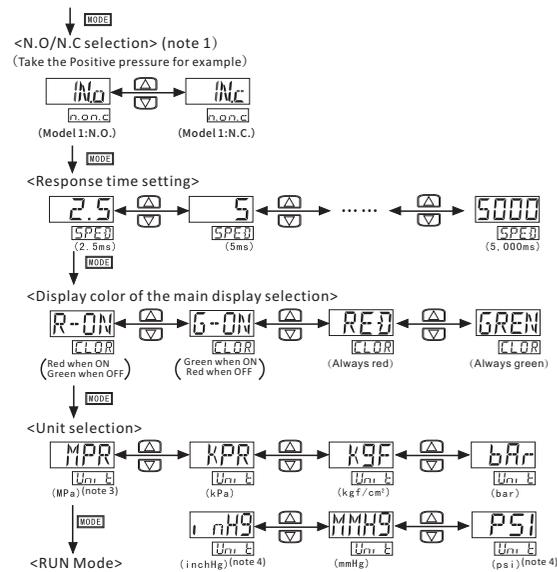
9 MENU SETTING MODE

In RUN mode, press and hold the mode switch button for 2 seconds to switch to the menu setting mode.

The mode will change to RUN mode when the mode selection key is held down during this setting process. In doing so, changed items before holding down the mode selection key have been set.

The left display is in the initial state (factory state).





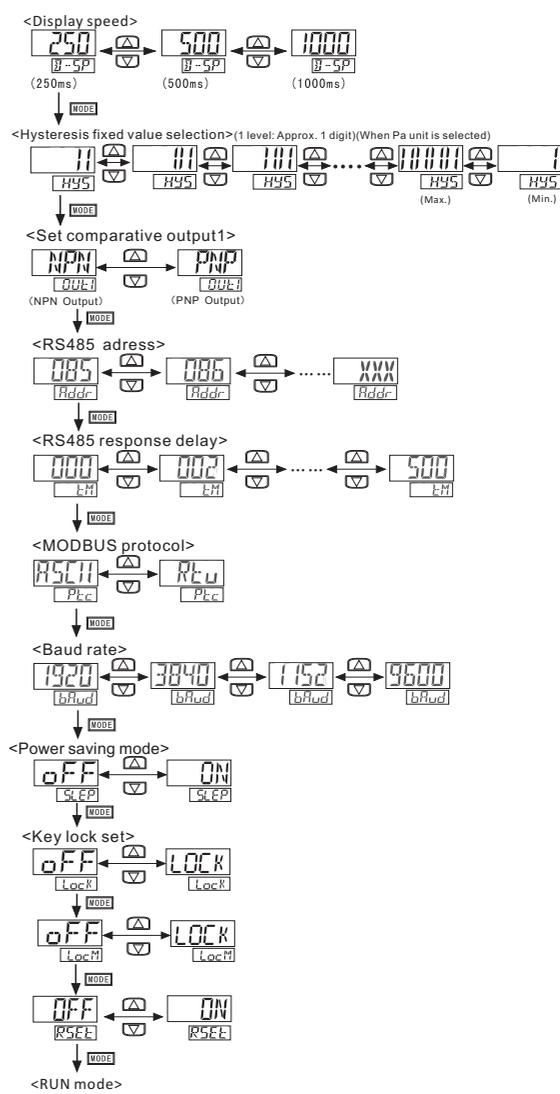
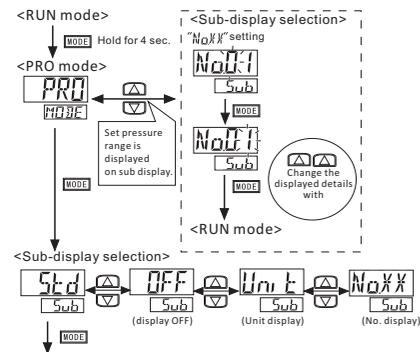
Note 1: If the comparative output 2 output mode setting is set to "Off", the display of N.O. / N.C. selection is same in positive pressure type and continuous pressure type.
Note 2: Positive pressure type, and continuous pressure type, the initial state of comparative output is "N.O."
Note 3: The initial state of continuous pressure type is "Kpa", and "Mpa" is not displayed.
Note 4: This not displayed on the positive pressure type.

Setting item	Description
Comparative output 1 output mode setting	Sets the output operation of comparative output 1.
Comparative output 2 output mode setting	Sets the output operation of comparative output 2.
N.O. / N.C. selection	Normal open (N.O.) or normal close (N.C.) can be selected.
Response time setting	Sets the response time. The response time can be selected from 2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1,000ms or 5,000ms.
Displayed color of the main indicator can be changed.	Displayed color of the main indicator can be changed.
Unit selection	Pressure unit can be changed.

10 PRO MODE

In RUN mode, press and hold the mode switch button for 4 seconds to switch to PRO mode. The mode will change to RUN mode when the mode selection key is held down during this setting process. However, changed items before holding down the mode selection key have been set.

The left display is in the initial state (factory state).

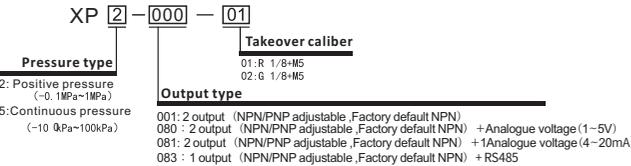


Setting item	Description
Sub-display selection	Changes the indication of the sub-display. "OFF": Displays nothing. "Unit": Presently selected pressure unit is displayed. "No.": Desired No. can be shown.
Display speed selection	Changes the speed of the displayed pressure value on the main display.
HYS fixed value selection	Sets hysteresis of the EASY mode and the window comparator mode.(8 steps)
Displayed color relation selection	The setting contents set at the displayed color setting in Menu setting mode can be related with either comparative output 1 or comparative output 2.
Reset setting	Returns to default settings (factory settings).

11 Error display

Error display	Approach	Content
Err1	Short circuit caused by excessive current	Turn off the power and check the load.
Err2	Increase gas pressure during zero calibration	The applied pressure of the pressure hole should be atmospheric pressure, please re-zero.
Err3	External input beyond rated pressure range.	Applied pressure should be within the rated pressure range.
XXX	Applied gas pressure exceeds the upper limit of the displayable pressure range	Applied pressure should be within the rated pressure range.
-XXX	Applied gas pressure is below the lower limit of the displayable pressure range(back pressure)	Applied pressure should be within the rated pressure range.

12 SPECIFICATIONS



S.N.	Product	Description
Options 1	Type of connection cable	A0: without cable (user-supplied) B2: Cable(2 meters, 5-core) B3: Cable(3 meters, 5-core)
Options 2	Mounting brackets	C1: Metal mounting bracket (type 04) C2: Metal mounting bracket (type 05) D1: Panel mounting bracket 01/02, with protective cover 03 E0: without mounting bracket (user-supplied)
Options 3	Packing	110: Carton A + Cardboard A 121: Carton A + Inner Box A 133: Carton A + Neutral Inner Box A

Items	Positive pressure	Continuous pressure
Pressure type	Standard pressure	
Rated pressure range	-0.1MPa~1.0MPa	-100kPa~100kPa
Set pressure range	-0.1MPa~1.0MPa	-100kPa~100kPa
Withstand pressure	1.5MPa	500kPa
Applicable fluid	Non-corrosive gas	
Supply voltage	12~24V DC±5%	
Power consumption	24V 30mA Max	12V 60mA Max
Comparative output	NPN O.C output:80mA/24VDC Max PNP O.C output : 80mA/24VDC	
Repeatability	±0.2% F.S.	±0.5% F.S.
Response time	2.5ms, 5ms, 10ms, 25ms, 50ms, 100ms, 250ms, 500ms, 1,000ms or 5,000ms selectable with key operations	

Analogue output	Voltage outputgas	0.6V~5V (or less)	1V~5V (or less)
	Current outputgas	Linearity: ±1%F.S 2.4mA~20mA (or less)	Output impedance : 1 KΩ 4mA~20mA (or less)
Ambient temperature range	Operating temperature: 0~50°C Storage temperature: -10~60°C (No dew condensation or icing allowed)		
Ambient humidity range	35~85%RH		
temperature characteristic	±0.5%F.S. (25°C)		
Protection class	IP40		
Material	Enclosure: Nylon + Fiberglass Stainless steel: Hex copper nickel plate Key part: Silicon rubber	LCD display: Acrylic Sealing ring:H-NBR	
Size	30X30X25.2mm (Plastic part) / 30X30X42.2mm (including connectors)		
Weight	about 80g(Digital pressure sensor body + user interface connector)		

13 MODBUS communication protocol

Data Format	Address	Funtion	Data	CRC
	8bit	8bit	n*8bit	16bit

Single frame test: 1 start bit, 8 data bit, 1 stop bit, no parity bit.
 The baud rate is adjustable. The default is 19200
 Function codes support 03, 04, 06, and 10, read hold values of a single register, read input values of a single register, write values of a single register, and write values of multiple registers

Serial Number	Parameter	Register Name	Parameter Range	Default	Read/write	Explain
1	Barometric value	1	-1000~1000		R	XP2: -100~1000对应-100kPa~1000kPa XP5: -1000~1000对应-100.0kPa~100.0kPa
2	Initialization	2	0-1	0	W	1:Initialize
3	Baud Rate	7	0-3	1	R/W	0:9600 1:19200 2:38400 3:115200 Sudo Reboot
4	Zero Setting	8	0-1	0	W	1:Zero setting
5	Address	9	1-247	85	R/W	485 Address
6	Comparative Output1 Target Value	10	-100~1000 *	500	R/W	* Parameter ranges follow units XP2: MPa/kPa/bar:-100~1000, kgf:-101~1019, psi:-145~1451, mmHg:-750~7500, inHg:-295~2953
7	Comparative Output1 Upper Limit	11	-100~1000 *	600	R/W	
8	Comparative Output1 Lower Limit	12	-100~1000 *	400	R/W	XP5: kPa/bar:-100~100, kgf:-101~101, psi:-145~145, mmHg:-750~750, inHg:-295~295
9	Comparative Output1 Model	13	0-3	0	R/W	0~3 Correspond to OFF,EASY,HYS,WCOMP
10	Displays color setting values	14	0-3	0	R/W	0: R_ON, 1: G_ON, 2: RED, 3: GREEN
11	Unit Setting Value	15	0-6	0	R/W	0~6 Correspond toMPa, kPa, kgf, bar, psi, mmHg, inHg
12	N.O./N.C. Setting	16	0-3	0	R/W	0: 1No., 1: 1Nc
13	Output Type Set Value	17	0-1	0	R/W	0: NPN, 1: PNP

Remark

- The parameter range of the pressure value in different units is as follows:
 Positive pressure: MPa/kPa lbar: -100~1000, kgf:-101~1019, psi:-145~1451, mmHg:-750~7500, inHg:-295~2953
 Continuous pressure: kPa/bar: -1000~1000, kgf: -1010~1010, psi:-1450~1450, mmHg:-7500~7500, inHg:-2950~2950
- The parameter ranges of the target value, upper limit value and lower limit value in different units are as follows:
 Positive pressure: MPa/kPa/bar: -100~1000, kgf:-101~1019, psi:-145~1451, mmHg:-750~7500, inHg:-295~2953
 Continuous pressure: kPa/bar: -100~1000, kgf:-101~101, psi:-145~145, mmHg:-750~7500, inHg:-295~295

14 CAUTIONS



- This product has been developed / produced for industrial use only.
- Be sure to perform wiring with the power off. Take care that wrong wiring will damage the sensor.
- When the product is initially installed, powered off and then turned on again, or when a small pressure is detected, please warm up for 10 to 15 minutes to maintain the best operating state of the product.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this sensor, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not use during the initial transient time (0.5 sec.) after the power supply is switched on.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- The specification may not be satisfied in a strong magnetic field.
- Avoid dust, dirt, and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Do not insert wires, etc. into the pressure port. The diaphragm will get damaged and correct operation shall not be maintained.
- Do not operate the keys with pointed or sharp objects.
- Make sure that stress by forcible bend or pulling is not applied directly to the sensor cable joint.
- Do not use it for long periods of time in shock pressure situations (please also consider buffer measures).



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