

Pressure Sensor Indicators

PSM Series

INSTRUCTION MANUAL

TCD210226AF

Autonics

Thank you for choosing our Autonics product.

Read and understand the instruction manual and manual thoroughly before using the product.

For your safety, read and follow the below safety considerations before using.

For your safety, read and follow the considerations written in the instruction manual, other manuals and Autonics website.

Keep this instruction manual in a place where you can find easily.

The specifications, dimensions, etc. are subject to change without notice for product improvement. Some models may be discontinued without notice.

Follow Autonics website for the latest information.

Safety Considerations

- Observe all 'Safety Considerations' for safe and proper operation to avoid hazards.
- ▲ symbol indicates caution due to special circumstances in which hazards may occur.

▲ Warning Failure to follow instructions may result in serious injury or death.

01. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)
Failure to follow this instruction may result in personal injury, economic loss or fire.

02. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact or salinity may be present.
Failure to follow this instruction may result in explosion or fire.

03. Install on a device panel or to a pressure port directly to use.
Failure to follow this instruction may result in fire.

04. Do not connect, repair, or inspect the unit while connected to a power source.
Failure to follow this instruction may result in fire.

05. Check 'Connections' before wiring.
Failure to follow this instruction may result in fire.

06. Do not disassemble or modify the unit.
Failure to follow this instruction may result in fire or electric shock.

▲ Caution Failure to follow instructions may result in injury or product damage.

01. Use the unit within the rated specifications.
Failure to follow this instruction may result in fire or product damage.

02. Use a dry cloth to clean the unit, and do not use water or organic solvent.
Failure to follow this instruction may result in fire.

03. Keep the product away from metal chip, dust, and wire residue which flow into the unit.
Failure to follow this instruction may result in fire or product damage.

Cautions during Use

- Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.
- Power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- Use the product, 3 sec after supplying power.
- When using switching mode power supply, frame ground (F.G.) terminal of power supply should be grounded.
- Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive noise.
- Use twisted pair wire for communication line.
- This unit may be used in the following environments.
 - Indoors (in the environment condition rated in 'Specifications')
 - Altitude max. 2,000 m
 - Pollution degree 3
 - Installation category II

Ordering Information

This is only for reference, the actual product does not support all combinations. For selecting the specified model, follow the Autonics website.

P S M ① - ② ③ ④

- | | |
|--|---|
| ① No. of channels
4: 4 channels
8: 8 channels | ③ Control output
No mark: NPN open collector output
P: PNP open collector output |
| ② Sensor input
V: 1 - 5 VDC≐
A: DC 4 - 20 mA | ④ Option input / output
D: Digital input
R: RS485 communication |

Product Components

- Product
- Bracket
- Instruction manual

Sold Separately

- Sensor connector plug: CNE-P04-□
 - Pressure sensor: PSS Series
 - Connector socket⁰¹⁾: HIF3BA-20D-2.54R
 - Communication converter: SCM-US
 - I/O cable: CO20-HP□-□
- 01) Contact the manufacturer (Hirose Electric).

Manual

For proper use of the product, refer to the manuals and be sure to follow the safety considerations in the manuals.

Download the manuals from the Autonics website.

Software

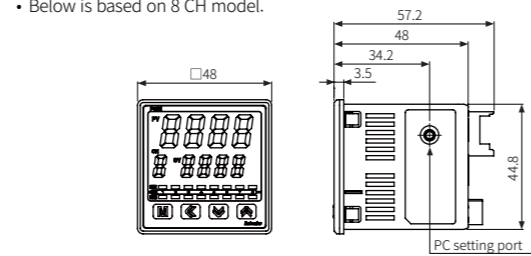
Download the installation file and the manuals from the Autonics website.

■ DAQMaster

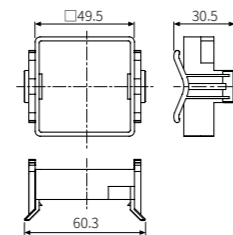
It is the comprehensive device management program for Autonics' products, providing parameter setting, monitoring and data management.

Dimensions

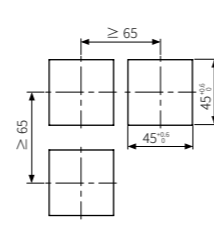
- Unit: mm, For the detailed drawings, follow the Autonics website.
- Below is based on 8 CH model.



■ Bracket

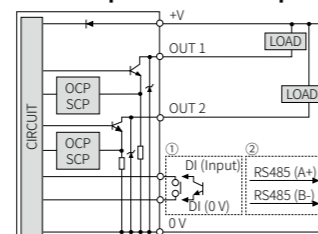


■ Panel cut-out

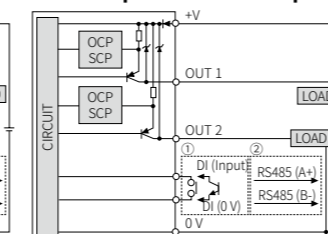


Inner Circuit

■ NPN open collector output

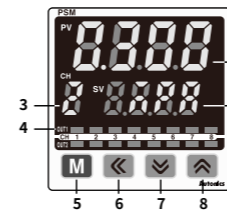


■ PNP open collector output



- Support OUT 1/2 per 1 channel
- ①: Digital input model, ②: RS485 Communication model
- OCP (over current protection circuit), SCP (short circuit protection circuit)
- The control output is abnormal when the control output circuit is shorted or over current is supplied.

Unit Descriptions

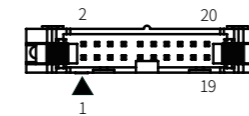


- PV display part (green, red)**
Run mode: Displays PV (present value)
Setting mode: Displays parameter
- SV display part (green)**
Run mode: Displays pressure unit
Setting mode: Displays parameter setting value
- Channel display part (red)**
Run mode: Displays channel
Setting mode: Displays parameter setting channel
- Output (OUT1: red, OUT2: green) indicator**
Turns ON when the corresponding control output is ON.
- [M] key**
Enters parameter group, selects item and returns run mode
- [←] key**
Run mode: Changes channels
Setting mode: Changes parameter setting channel or digit
- [▼], [▲] key**
Sets preset of output operation mode, runs the mode or changes parameter

Cautions during Wiring

- Contact the manufacture for the socket and cable.

	Model
Hirose connector	HIF3BA-20PA-2.54DS
Hirose connector socket	HIF3BA-20D-2.54R



Connections

■ Input (Sensor connector per channel)

Pin	Voltage input	Current input	
		2-wire	3-wire
4	INPUT	0 V	INPUT
3	0 V	N.C	0 V
2	TYPE ⁰¹⁾		
1	+V		

- Do not short +V and 0 V of sensor connector.
It may cause break inner circuit.

01) This pin is for automatically recognition of pressure sensor PSS model. Wire it only when connecting Autonics Pressure sensor PSS Series.

■ Output (HIF3FB-20PA-2.54DSA, 20-pin)

Support functions are different for each model.

Pin	2 ⁰¹⁾	4	6	8	10	12	14	16	18	20 ⁰²⁾
Func.	0 V	4 CH _{OUT2}	4 CH _{OUT1}	3 CH _{OUT2}	3 CH _{OUT1}	2 CH _{OUT2}	2 CH _{OUT1}	1 CH _{OUT2}	1 CH _{OUT1}	DI (0 V) / RS485 (B-)
Pin	1 ⁰¹⁾	3	5	7	9	11	13	15	17	19 ⁰²⁾
Func.	12-24 VDC≐	8 CH _{OUT2}	8 CH _{OUT1}	7 CH _{OUT2}	7 CH _{OUT1}	6 CH _{OUT2}	6 CH _{OUT1}	5 CH _{OUT2}	5 CH _{OUT1}	DI (Input) / RS485 (A+)

01) Pins 1 and 2 are power input terminals.

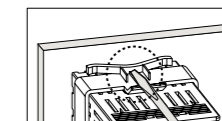
02) It varies depending on the option input / output specifications for each model.

Rated Pressure and Max. Pressure Display Range

Unit	Negative		Static		Compound	
	Decimal point	Rated range (max. range)	Decimal point	Rated range (max. range)	Decimal point	Rated range (max. range)
MPa	-	-	0.001	0.000 to 1.000 (-0.050 to 1.100)	-	-
kPa	0.1	0.0 to -101.3 (5.0 to -101.3)	0.1	0.0 to 100.0 (-5.0 to 110.0)	0.1	-101.3 to 100.0 (-101.3 to 110.0)
kgf/cm ²	0.001	0.000 to -1.033 (0.051 to -1.033)	0.001	0.000 to 1.020 (-0.051 to 1.122)	0.001	-1.034 to 1.020 (-1.034 to 1.122)
bar	0.001	0.000 to -1.013 (0.050 to -1.013)	0.001	0.000 to 1.000 (-0.050 to 1.100)	0.001	-1.013 to 1.000 (-1.013 to 1.100)
psi	0.01	0.00 to -14.70 (0.74 to -14.70)	0.01	0.00 to 14.50 (-0.72 to 15.96)	0.02	-14.70 to 14.50 (-14.70 to 15.96)
mmHg	1	0 to -760 (38.0 to -760.0)	-	-	1	-760 to 750 (-760.0 to 824.0)
inHg	0.1	0.0 to -29.9 (1.50 to -29.90)	-	-	0.1	-29.9 to 29.5 (-29.88 to 32.58)
mmH ₂ O ⁰¹⁾	0.1	0.0 to -103.3 (5.1 to -103.3)	-	-	0.1	-103.4 to 102.0 (-103.4 to 112.2)

01) Display value × 100

Installation



Insert this unit into a panel, fasten bracket by pushing with tools.

Specifications

Model	PSM4-□□□	PSM8-□□□
Display pressure range	Refer to 'Rated Pressure and Max. Pressure Display Range'.	
Max. inputs	4	8
Sensor input	<ul style="list-style-type: none"> 1 - 5 VDC≐ (Input impedance: ≈ 300 kΩ) DC 4 - 20 mA model (Input impedance: ≈ 100 Ω) 	
Sensor supply power	12 - 24 VDC≐, 40 mA per channel (1 - 4 ch max. current: ≤ 100 mA, 5 - 8 ch max. current: ≤ 100 mA)	
Display type	7 Segment LED 4 digit	
Display accuracy	±0.1% F.S. ±2 digit (at 23 ±5 °C)	
Control output and display temp. characteristic	-10 to 0 °C: ±0.3% F.S. ± 2 digit 0 to 50 °C: ±0.2% F.S. ± 2 digit (at 25 °C)	
Option input	Digital input 1	
Contact input	[L]: ≤ 0.2 V	
Solid state input	Residual voltage ≤ 1.0 V, Leakage current ≤ 0.1 mA	
Protection structure	Front: IP65, the others: IP30 (IEC standard)	
Certification	CE ENEC	
Unit weight (packaged)	≈ 65 g (≈ 108 g)	

Power supply	12 - 24 VDC≐ (ripple P-P: ≤ 10%)
Permissible voltage range	90 to 110 % of rated voltage
Power consumption	≤ 3 W
Current consumption	≤ 100 mA ⁰¹⁾
Control output	NPN open collector output / PNP open collector output model
Load voltage	≤ 30 VDC≐
Load current	≤ 100 mA
Residual voltage	NPN: ≤ 1 VDC≐, PNP: ≤ 2 VDC≐
Hysteresis	Different by output operation mode ⁰²⁾
Repeat error	±0.1% F.S. ±Min display interval
Response time	• 4 CH model: 2.5, 100, 500, 1000 ms • 8 CH model: 5, 100, 500, 1000 ms
RS485 comm.	Modbus RTU
Protection circuit	Output short over-current protection circuit, power supply reverse connection protection circuit
Insulation resistance	≥ 100 MΩ (500 VDC≐ megger)
Dielectric strength	Between the charging part and the case: 1,000 VAC~ 50 / 60 Hz for 1 min
Vibration	1.5 mm amplitude at frequency of 10 to 55 Hz in each X, Y, Z direction for 2 hours
Ambient temperature	-10 to 50 °C, storage: -20 to 60 °C (rated at no freezing or condensation)
Ambient humidity	30 to 85%RH, storage: 30 to 85%RH (rated at no freezing or condensation)

01) Except sensor consumption current.
All output indicators ON: ≤ 120 mA / RS485 communication connection: 120 mA

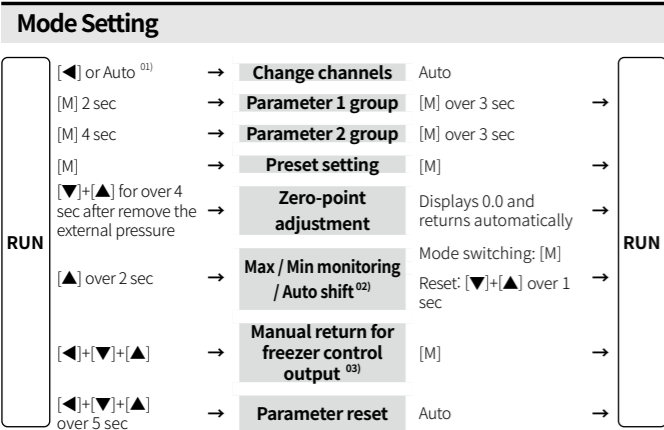
02) Refer to output operation mode.

Communication Interface

■ RS485

Comm. protocol	Modbus RTU
Application standard	Compliance with EIA RS485
Max. connection	31-unit (address: 1 to 127)
Comm. synchronous method	Asynchronous
Comm. method	2-wire half duplex
Comm. distance	< 800 m
Comm. speed	2,400 / 4,800 / 9,600 (default) / 19,200 / 38,400 bps
Comm. response time	5 to 99 ms (default: 20 ms)
Start bit	1-bit (fixed)
Data bit	8-bit (fixed)
Parity bit	None (default), Even, Odd
Stop bit	1-bit, 2-bit (default)

- Do not change parameter by front keys of the product during communication connection. It may cause malfunction.
- Do not set duplicated address on the same communication line.
- When setting the parameter using SCM-US, match the communication speed to the PSM. Settable communication speed: 2400 ~ 19200 bps (recommendation: 9600 bps)
- SCM-US is for setting parameter, unsuitable for monitoring.
- The communication via RS485 and the SCM-US can not be used simultaneously because when the SCM-US is connected, communication through the power / communication connection terminal is blocked.



01) Depends on P2-7 Channel auto change cycle setting.
 02) Digital option input model, Auto shift judgment level checking /setting is available when P2-3 Digital input terminal function is set as SHFT. (no input displays 0)
 03) Available when P1-8 OUT operation mode is set freezer pressure control at over 1 channel and P2-3 Digital input terminal function is set manual return for freezer control output.

Parameter Setting

- Some parameter are activated / deactivated depending on other parameters. Refer to the description.
- The setting item name and setting value are cross-displayed on the display part.
- It returns to RUN mode when there is no additional key input for 30 sec in each parameter group.
- [M] key: Saves setting value and moves to next parameter
- [▲], [▼] key: Selects setting value

Parameter 1 group

- Setting for each channel is possible. During setting, press the [◀] key to change the channel.

Parameter	Display	Default	Setting range	Condition															
P1-1 PSS model auto recognition	RE.SC	OFF	OFF, ON • This function is available when connecting Autonics Pressure sensor PSS Series to recognize pressure type and range automatically. • Auto recognition method: P1-1 PSS model auto recognition ON → PSM power OFF ⁰¹⁾ → PSS connection → PSM power ON	-															
P1-2 Input display	dI SP	5 t n d	STND: standard, SCAL: Scale	-															
P1-3 Pressure type ⁰²⁾	i n - t	P o S H	POS.H: Static (standard) POS.L: Static (Rated Pressure and Max. Pressure Display Range: use low decimal point) VACU: Negative COMP: Compound	P1-2 Input display: STND															
P1-4 Display unit	U n i t	ε P P A	Pressure Unit Static: KPA: kPa, KGF: kgf/cm ² , BAR: bar, PSI: psi, MPA: MPa Negative: KPA: kPa, KGF: kgf/cm ² , BAR: bar, PSI: psi, MMHG: mmHg, INHG: inHg, H2O: mmH ₂ O Compound	* 1-3 Pressure type: POS.H															
P1-5 Scale decimal point	d o t	0 0 0 0	0000, 000.0, 00.00, 0.000	P1-2 Input display: SCAL															
P1-6 Low limit input scale	L - S C	0 0 0 0	-1999 to 9999 • Varies according to P1-5 Scale decimal point	P1-2 Input display: SCAL															
P1-7 High limit input scale	H - S C	1 0 0 0	-1999 to 9999 H-SC ≥ L-SC ± (3 × Min. display unit) • Varies according to P1-5 Scale decimal point	P1-2 Input display: SCAL															
P1-8 OUT operation mode	o U t ε n	H Y S n	HYS.M: Hysteresis WIN: Window comparison output HY-W: Hysteresis - Window comparison output AUTO: Auto sensitivity setting FRZE: Freezer pressure control F.OUT: Forced output control	-															
P1-9 Output type	n o n C	i a ε o	<table border="1"> <thead> <tr> <th></th> <th>OUT1</th> <th>OUT2</th> </tr> </thead> <tbody> <tr> <td>10.20</td> <td>Normally open</td> <td>Normally open</td> </tr> <tr> <td>10.2C</td> <td>Normally open</td> <td>Normally closed</td> </tr> <tr> <td>1C.20</td> <td>Normally closed</td> <td>Normally open</td> </tr> <tr> <td>1C.2C</td> <td>Normally closed</td> <td>Normally closed</td> </tr> </tbody> </table>		OUT1	OUT2	10.20	Normally open	Normally open	10.2C	Normally open	Normally closed	1C.20	Normally closed	Normally open	1C.2C	Normally closed	Normally closed	-
	OUT1	OUT2																	
10.20	Normally open	Normally open																	
10.2C	Normally open	Normally closed																	
1C.20	Normally closed	Normally open																	
1C.2C	Normally closed	Normally closed																	
P1-10 Auto shift range	S H o t	o U t i	OUT1: OUT 1 of corresponding CH OUT2: OUT 2 of corresponding CH OUTA: OUT 1+2 of corresponding CH ALL: OUT1+2 of all channels	P2-3 Digital input terminal function: SHFT															

01) Must turn OFF the unit and connect PSS. Otherwise it may cause malfunction.
 02) Below parameters are initialized when the setting value is changed.
 P1-4 Display unit, P1-5 Scale decimal point, P1-6 Low limit input scale, P1-7 High limit input scale, Preset value, Auto shift judgment level

Parameter 2 group

• For all channels.

Parameter	Display	Default	Setting range	Condition									
P2-1 Channel copy	C o P Y	i - - R	<table border="1"> <thead> <tr> <th></th> <th>Original CH</th> <th>Target CH</th> </tr> </thead> <tbody> <tr> <td>4 CH</td> <td>1 to 4</td> <td>1 to 4, A: ALL</td> </tr> <tr> <td>8 CH</td> <td>1 to 8</td> <td>1 to 8, A: ALL</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Copy item⁰¹⁾: Preset value, Parameter 1 group (except P1-10 Auto shift range) 		Original CH	Target CH	4 CH	1 to 4	1 to 4, A: ALL	8 CH	1 to 8	1 to 8, A: ALL	-
	Original CH	Target CH											
4 CH	1 to 4	1 to 4, A: ALL											
8 CH	1 to 8	1 to 8, A: ALL											
P2-2 Response time	S P d	2.5	[4 channel model] 2.5, 100, 500, 1000 ms [8 channel model] 5, 100, 500, 1000 ms	-									
P2-3 Digital input terminal function	d - i n	S H F t	[Digital option input model] SHFT: Auto shift, HOLD, REST: Manual return for freezer control output	-									
P2-4 Digital input channel	d - C H	d i . C H	[Digital option input model] DI.CH: Corresponding channel DI.AL: All channels	-									
P2-5 Zero-point adjustment channel	ε E r S	r S C H	RS.CH: Corresponding channel RS.AL: All channels	-									
P2-6 Peak reset channel	P E r S	r S C H	RS.CH: Corresponding channel RS.AL: All channels	-									
P2-7 Channel auto change cycle	R t . C H	o F F	OFF, 2, 5 sec	-									
P2-8 Power save	S P o E	o F F	OFF, ON • No operation for over 1 min in RUN mode: Turn OFF front part (except output indicator)	-									
P2-9 Present value display part color	C L o r	r - - G	R-G: Red / Green, R-R: Red / Red, G-R: Green / Red, G-G: Green / Green • Display: Standard / Output	-									
P2-10 Comm. address	R d r S	0 0 1	[RS485 option output model] 001 to 127	-									
P2-11 Baud rate	b P S	9 6	[RS485 option output model] 24, 48, 96, 192, 384 (×100 bps)	-									
P2-12 Parity bit	P r t Y	n o n E	[RS485 option output model] NONE, EVEN, ODD	-									
P2-13 Stop bit	S t P	2	[RS485 option output model] 1, 2 bit	-									
P2-14 Response time	r S Y t	2 0	[RS485 option output model] 5 to 99 ms	-									
P2-15 Comm. write	C o n Y	E n R	[RS485 option output model] ENA: Enable, DISA: Disable	-									
P2-16 Parameter reset	i n i t	n o	NO, YES	-									
P2-17 Lock	L o C k	o F F	OFF LOC1: All setting lock LOC2: Parameter setting lock / Preset, Zero-point adjustment setting and monitoring reset are available	-									

01) Resets auto shift judgment level and zero-point adjustment.

Auto shift Preset Setting

Setting method

[Parameter setting]

- Select P2-3 Digital input terminal function as SHFT.
- Press the [▲] key for over 2 sec. in RUN mode to enter Max / Min monitoring / Auto shift menu.
- Press the [M] key to entering Auto shift setting and press the [▼] or [▲] key to change preset.
- When reset the set correcting value, press the [▼] + [▲] keys for over 1 sec.

[External input setting]

- The measured pressure when auto shift input is applied to the digital input terminal is set as the reference pressure. The measured values are stored in SH.IN.

Operation mode	Preset	Default	Setting range			
Auto-shift	Auto-shift correction	S H i N	0			
				Pressure	Setting range (after correction)	Setting range (preset range)
				Negative	-101.3 to 5.0 kPa	-101.3 to 101.3 kPa
				Static	-5.0 to 110.0 kPa	-110.0 to 110.0 kPa
Compound	-50.0 to 1100 kPa	-1100 to 1100 kPa				
Compound	-101.3 to 110.0 kPa	-101.3 to 110.0 kPa				

Precaution

- Auto shift correction is reset as 0 when changing P1-8 OUT operation mode and preset value or zero-point adjustment.
- Preset setting range is wider than the rated pressure with the source pressure fluctuations.
- In case of forced output control mode or PV HHHH/LLLL, Auto shift function does not operate.
- When the auto shift digital input is applied for over 5 sec., the source pressure of OUT1 and OUT2 of all channels is changed at once regardless of the setting range.

Preset Setting

Setting method

- The setting item name and setting value are cross-displayed on the display part.
- Set the operation mode in P1-8 OUT operation mode.
- Enter the preset setting mode by pressing [M] key from RUN mode.
- Select the setting item by [M] key and change the preset by [▼] or [▲] key. (except forced output control mode)

Preset setting by operation mode

Operation mode	Preset	Setting range	
Hysteresis	Pressure detection level 1	S t 1 Min. display pressure < ST1 ≤ Max. display pressure	
	Hysteresis level 1	H Y S 1 Min. display pressure ≤ HYS1 < ST1	
	Pressure detection level 2	S t 2 Min. display pressure < ST2 ≤ Max. display pressure	
	Hysteresis level 2	H Y S 2 Min. display pressure ≤ HYS2 < ST2	
Window comparison output ⁰¹⁾	Pressure detection low limit 1	L o - 1 Min. display pressure ≤ LO-1 ≤ Max. display pressure - (3 × Min. display interval)	
	Pressure detection high limit 1	H i - 1 LO-1 + (3 × Min. display interval) ≤ HI-1 ≤ Max. display pressure	
	Pressure detection low limit 2	L o - 2 Min. display pressure ≤ LO-2 ≤ Max. display pressure - (3 × Min display interval)	
	Pressure detection high limit 2	H i - 2 LO-2 + (3 × Min display interval) ≤ HI-2 ≤ Max. display pressure	
Hysteresis-Window comparison output ⁰¹⁾	Pressure detection level 1	S t 1 Min. display pressure < ST1 ≤ Max. display pressure	
	Hysteresis level 1	H Y S 1 Min. display pressure ≤ HYS1 < ST1	
	Pressure detection low limit	L o 1 Min. display pressure ≤ LOW ≤ Max. display pressure - (3 × Min display interval)	
	Pressure detection high limit	H i G H Low + (3 × Min display interval) ≤ HIGH ≤ Max. display pressure	
Auto sensitivity setting	Pressure level 1	S t 1 Min. display pressure ≤ ST1 ≤ Max. display pressure-1% of rated pressure	
	Pressure level 2 ⁰²⁾	S t 2 ST1+1% of rated pressure ≤ ST2 ≤ Max. display pressure	
	Pressure detection level	S E t Auto setting SET = $\frac{ST1+ST2}{2}$ • Manual setting is possible by [▼] or [▲] key.	
Freezer Pressure control	Pressure detection level 1	S t 1 Min. display pressure < ST1 ≤ Max. display pressure	
	Hysteresis level 1	H Y S 1 0 to 10% of display pressure range (F.S.) digit	
	Output OFF delay time	t i n E 0 to 3,600 sec	
	Pressure detection level 2	S t 2 Min. display pressure < ST2 ≤ Max. display pressure	
	Hysteresis level 2	H Y S 2 10% of 0 to Display Pressure range (F.S.) digit	
Manual/Auto reset	r , R - n	AUTO: Auto return, MAN: Manual return	
Forced output control ⁰³⁾	F o U t	-	• Manual ON/OFF for OUT1/2 is possible by [▼] or [▲] key.

01) Hysteresis: 1 (Min display interval, fixed)
 02) When error appears, check setting conditions and set proper setting values.
 03) Hold / Auto shift function does not operate..

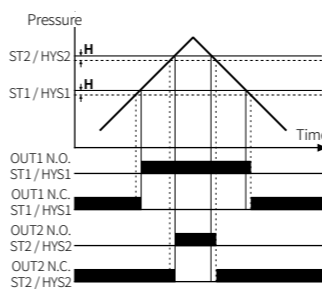
Output Operation Mode

Change the output operation mode to change pressure detection method.

ON: ■■■■■ OFF: _____ H: Hysteresis A: Min display interval

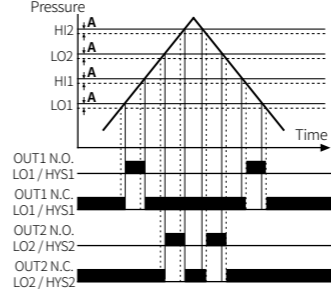
Hysteresis

- Set the hysteresis for pressure detection directly.
- Setting: Pressure detection level (ST1, ST2), Hysteresis (HYS1, HYS2)



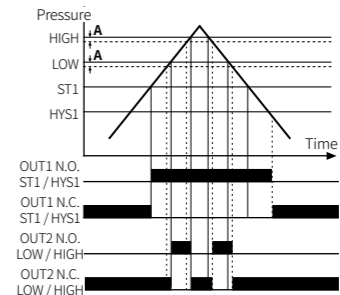
Window comparison output

- It detects pressure at the desired range.
- Hysteresis is fixed as min. display interval.
- Setting: High limit (HI1, HI2), Low limit (LO1, LO2)



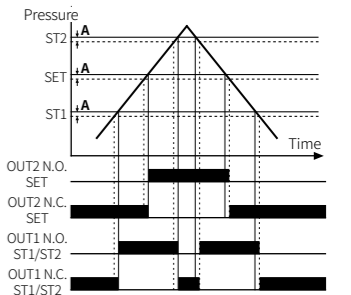
Hysteresis - Window comparison output

- It is available both hysteresis mode and window comparison output mode operations.
- Setting: Pressure detection level (ST1), Hysteresis (HYS1), High limit (HIGH), Low limit (LOW)



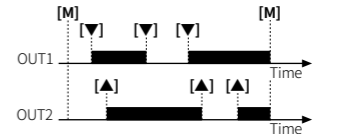
Auto sensitivity setting

- This function is to set the proper position (SET) automatically by applied pressure from two positions (ST1, ST2).
 $SET = \frac{ST1+ST2}{2}$
- Hysteresis is fixed as min. display interval.



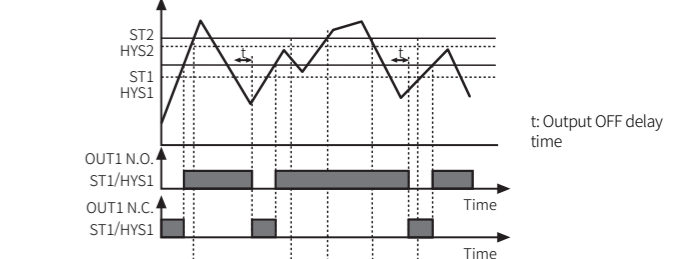
Forced output control Mode

- It displays the present pressure with forcibly holding comparing output OFF regardless of setting value.
- Manual ON/OFF for OUT1/2 is possible by [M], [▼] or [▲] key during forced output control operation.



Freezer pressure control

- Pressure control for freezer system.
- OUT1 is for main output control. Output OFF delay time prevent from repeat ON/OFF.
- OUT2 is for alarm of abnormal high pressure.
- OUT1 setting: Pressure detection level (ST1), Hysteresis (HYS1), Output OFF delay time (TIME)
- OUT2 setting: Pressure detection level (ST2), Hysteresis (HYS2), Manual / Auto reset (R,A-M)



Manual reset		ⓐ after hysteresis 2: Maintains ON until reset signal (digital input or [◀]+[▼]+[▲] key)
Auto reset		Output OFF after Hysteresis 2

Error

Display	Cause	Troubleshooting
E r r 1	When external pressure (≥ ±5% of rated pressure) is input while adjusting zero point.	Try again after removing external pressure.
E r r 2	When over-current is applied on control output.	Remove the over current conditions such as adjusting load resistance.
L L L L	When applied pressure exceeds low-limit of display pressure range.	Apply pressure within display pressure range.
H H H H	When applied pressure exceeds high-limit of display pressure range.	Apply pressure within display pressure range.
- H H - - L L - - H L -	Auto shift correction error.	Set the corrected setting value within setting pressure range.