

CHELIC PS-70 Series CCE

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.

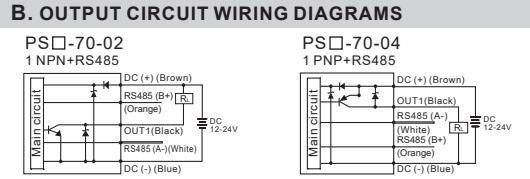
⑦ Wiring for pressure sensor should avoid power source line and high voltage line. If use in the same circuit, noise may cause malfunction.

⑧ Connect the ground wire with host controllers ground.

⑨ Wiring for RS485 MODBUS, please connect RS485 (B+) or (A-) before connecting power supply to avoid short circuit to damage to product.

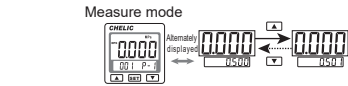
A. SPECIFICATIONS			
MODEL	PSN-70 (Positive)	PSV-70 (Vacuum)	PSC-70 (Compound)
Rated pressure range	0.000~1.000 MPa	-101.3~0.0 kPa	-100.0~100.0 kPa
Set pressure range	-0.100~1.000 MPa	-101.3~10.0 kPa	-101.0~101.0 kPa
Withstand pressure	1.5MPa	500kPa	
Fluid	Filtered air, Non-corrosive / Non-flammable gas		
Set pressure resolution	kPa	—	0.1
	MPa	0.001	—
	kgf/cm ²	0.01	0.001
	bar	0.01	0.001
	psi	0.1	0.01
	inHg	—	0.1
	mmHg	—	1
Power supply voltage	12 to 24V DC ±10%, Ripple (P-P) 10% or less		
Current consumption	≦ 40mA (With no load)		
Switch output	NPN: open collector 1 output Max. load current: 125mA Max. supply voltage: 30V DC Residual voltage: ≦ 1.5V		
	PNP: open collector 1 output Max. load current: 125mA Max. supply voltage: 24V DC Residual voltage: ≦ 1.5V		
Repeatability(Switch output)	≦ ±0.2% F.S. ±1 digit		
One point set mode	Adjustable(*1)		
Hysteresis mode			
Window comparator mode			
Response time	≦ 2.5ms(chattering-proof function: 25ms, 100ms, 250ms, 500ms, 1000ms, 1500ms, 2000ms and 5000ms selections)		
Output short circuit protection	Yes		
Display	4 digital, 7 segment LCD display (Red / Green / Orange) (Sampling rate : 0.2, 0.5, 1 seconds / time selectable)		
Indicator accuracy	±2% F.S. ±1 digit (ambient temperature: 25 ±3°C)		
Switch on Indicator	Orange Indicator 1 : OUT		
Enclosure	IP 40		
Ambient temp. Range	Operation : 0 ~ 50 °C, storage : -10 ~ 60 °C (No condensation or freezing)		
Ambient humidity range	Operation/Storage: 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/s ² (10G), 3 times each in direction of X, Y and Z		
Temperature characteristic	±2.5% F.S. of detected pressure (25°C) at temp. Range of 0~50°C		
Communication interface	RS-485		
Port size	R: R1/8", M5; NPT: NPT1/8", #10-32UNF; G: G1/8"(BSP), M5		
Lead wire	Ø4PVC - 26AWG (0.15 mm ²) - 5 cores		
Weight	Approx. 80g (with 2 meter lead wire)		

*1. Hysteresis value is adjustable within 1 ~ 8 digits for one point set mode and window comparator mode.

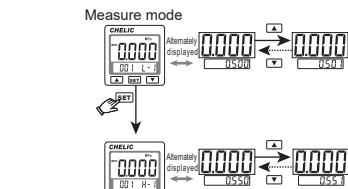


I. PRESSURE SETTING MODE

- ③ Setting Condition 1:
OUT 1 mode setting : " oP5 " (One point set mode)



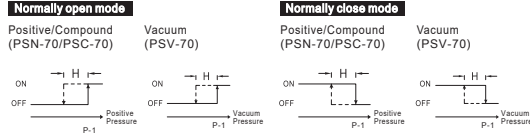
- ③ Setting Condition 2 :
OUT 1 mode setting : " H5 " (Hysteresis mode)
" U in " (Window comparator mode)



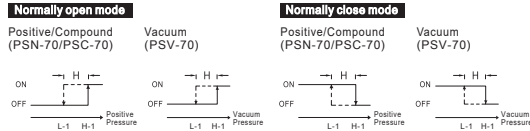
【NOTE :】
Do not disconnect power when the sub-display and setting value is flashing alternately; otherwise the system cannot store the values.

J. OUTPUT TYPE

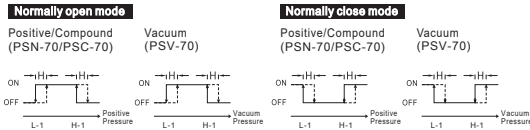
- (1) One point set mode:



- (2) Hysteresis mode:

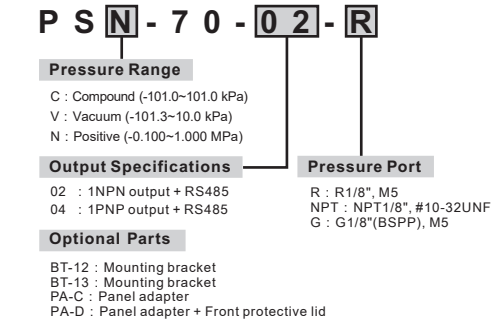


- (3) Window comparator mode:

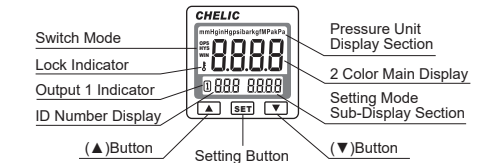


【NOTE :】
*1. In case hysteresis is set at less than or equal to 2 digits, switch output may chatter if input pressure fluctuates near the set point.
*2. When using window comparator mode, the difference between two set points must be greater than the fixed hysteresis, otherwise will cause the switch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

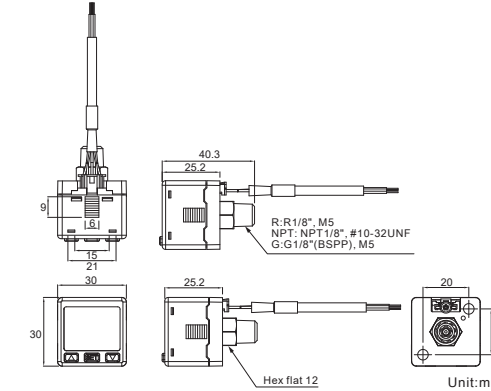
C. ORDERING INFORMATION



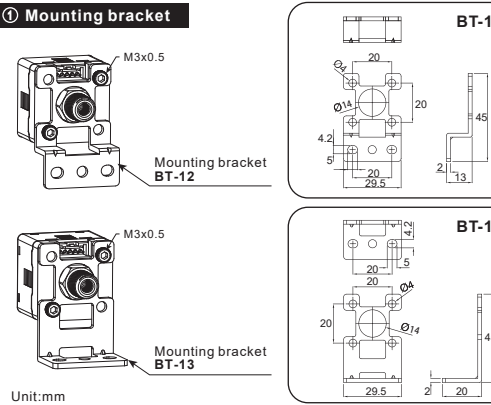
D. PANEL DESCRIPTION



E. DIMENSIONS



F. OPTIONAL PARTS DIMENSIONS

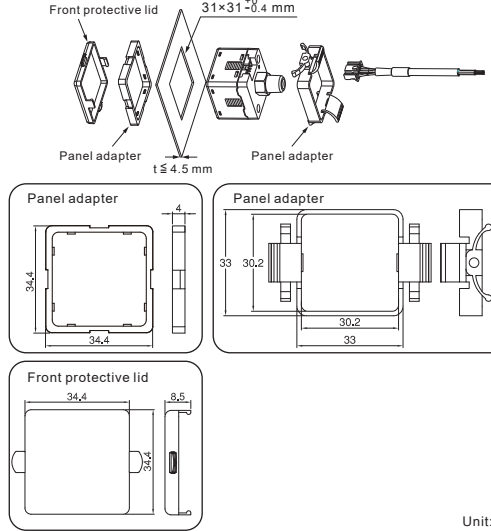


K. COMMUNICATION PROTOCOL (Modbus RTU)

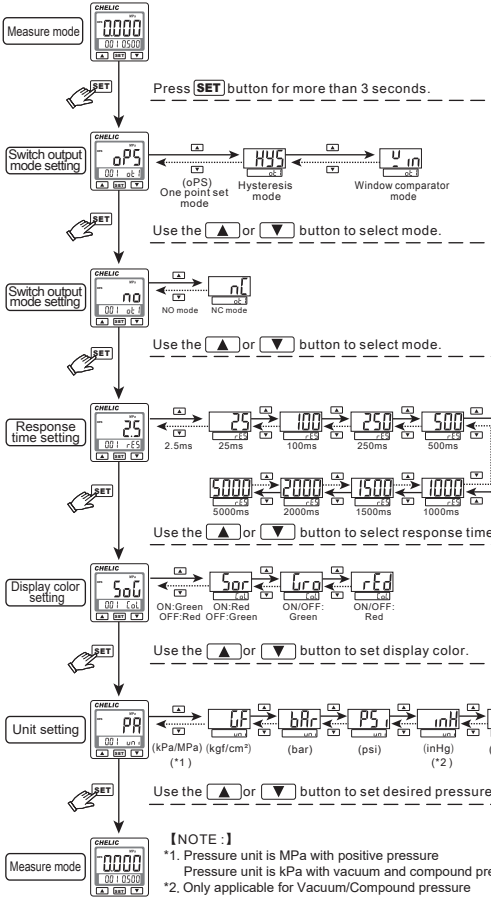
(1) Computer /PLC transmit data format (Master)					
ID Number 1 Byte	Read 1 Byte	Function Code 2 Byte	Data Number 2 Byte	CRC CheckSum 2 Byte	
(2) Pressure sensor response data format (Slave <PS-70>)					
ID Number 1 Byte	Read 1 Byte	Data Number 1 Byte	Data 2N Byte(*)	CRC CheckSum 2 Byte	
* N is the number of data					
(3) Computer /PLC transmit data format (Master)					
ID Number 1 Byte	Write 1 Byte	Function Code 2 Byte	Data 2 Byte	CRC CheckSum 2 Byte	
(4) Pressure sensor response data format (Slave <PS-70>)					
ID Number 1 Byte	Write 1 Byte	Function Code 2 Byte	Data 2 Byte	CRC CheckSum 2 Byte	
(5) Pressure sensor response data format (Error)					
ID Number 1 Byte	Write 1 Byte	Error Code 1 Byte	CRC CheckSum 2 Byte		
(6) Read / Write Code					
Read / Write Code		Description			
03H		Read pressure sensor data Range 1 ~ 4 data Number, 2 ~ 8 Bytes			
06H		Write pressure sensor data			
(7) Example : Read pressure sensor value Computer /PLC transmit data format (Master)					
ID Number (01H)	Read (03H)	Function Code (0002H)	Data Number (0001H)	CRC CheckSum (25CAH)	
Pressure sensor data format					
ID Number (01H)	Read (03H)	Data Number (02H)	Data (0001H)	CRC CheckSum (7984H)	
(8) Example : ID Number setting response Computer /PLC transmit data format (Master)					
ID Number (01H)	Write (06H)	Function Code (0000H)	Data (0001H)	CRC CheckSum (480AH)	
Pressure sensor response data					
ID Number (01H)	Write (06H)	Function Code (0000H)	Data (0001H)	CRC CheckSum (480AH)	
Example : ID Number setting response error					
ID Number (01H)	Write (06H)	Function Code (0000H)	Data (01FFH)	CRC CheckSum (C81AH)	
Pressure sensor response error (Example : setting data is over)					
ID Number (01H)	Write (86H)	Error Code (03H)	Data (0261H)	CRC CheckSum (0261H)	
(When the pressure sensor is abnormal, MSB will be set to 1, so the command code is 86H)					
(9)Function Code :					
Function Code	Item	Description		Operation	
0000H	ID Number	Range : 0 ~ 255		Read / Write	
0001H	Pressure type	0 : Vacuum , 1 : Compound , 3 : Positive		Read	
0002H	Pressure value	Range : -32768 ~ 32767		Read	
0003H	Unit setting	0 : kPa , 1 : kgf , 2 : bar , 3 : psi , 4 : inHg , 5 : mmHg , 6 : MPa		Read / Write	
0004H	Decimal place	Range : 0 ~ 3		Read	
0005H	Switch output mode	0 : OPS , 1 : HYS , 2 : WIN		Read / Write	
0006H	Switch output mode	0 : NO , 1 : NC		Read / Write	
0007H	Response time	0 : 2.5ms, 1 : 25ms, 2 : 100ms, 3 : 250ms, 4 : 500ms, 5 : 1000ms, 6 : 1500ms, 7 : 2000ms, 8 : 5000ms		Read / Write	
0008H	Display color selection	0 : SOG , 1 : SOR , 2 : GRN , 3 : RED		Read / Write	
0009H	Hysteresis value	Range : 1 ~ 8		Read / Write	
000AH	Power-save mode	0 : OFF , 1 : ON		Read / Write	
000BH	Fine adjustment	Range : -25 (-2.5%) ~ 25 (2.5%)		Read / Write	
000CH	Baud rate	0 : 9600 , 1 : 19200 , 2 : 38400 , 3 : 115200		Read / Write	
000DH	Transmission format	0 : N81 , 1 : E81 , 2 : O81		Read / Write	
000EH	Communications protocol	0 : RTU , 1 : ASC		Read / Write	
000FH	Restore factory setting	0 or 1 : ON		Write	
0010H	Switch set point (P-1 or L-1)	Range : According to pressure type and unit		Read / Write	
0011H	Switch set point (H-1)	Range : According to pressure type and unit		Read / Write	
0012H	Switch output state	0 : OFF , 1 : ON		Read	
0013H	Key lock mode	0 : OFF , 1 : ON		Read / Write	
0014H	Switch output type	0 : NPN , 1 : PNP		Read	
0015H	Display refresh time	0 : 200ms , 1 : 500ms , 2 : 1000ms		Read / Write	
0016H	Zero point setting	0 or 1 : ON (If ambient pressure is over ±3% F.S., error code shows 03H)		Write	

Error Code	Description
01H	Read / Write error
02H	Function Code error
03H	Illegal data or over setting value

② Panel Mounting



G. INITIAL SETTING MODE



L. COMMUNICATION PROTOCOL (Modbus ASCII)

(1) Computer /PLC transmit data format (Master)							
Head	ID Number	Read	Function Code	Data Number	LRC CheckSum	Trailer CR+LF	
1 Byte	2 Byte	2 Byte	4 Byte	4 Byte	2 Byte	2 Byte	
(2) Pressure sensor response data format (Slave <PS-70>)							
Head	ID Number	Write	Function Code	Data	LRC CheckSum	Trailer CR+LF	
1 Byte	2 Byte	2 Byte	2 Byte	4N Byte(*)	2 Byte	2 Byte	
* N is the number of data							
(3) Computer /PLC transmit data format (Master)							
Head	ID Number	Write	Function Code	Data	LRC CheckSum	Trailer CR+LF	
1 Byte	2 Byte	2 Byte	4 Byte	4 Byte	2 Byte	2 Byte	
(4) Pressure sensor response data format (Slave <PS-70>)							
Head	ID Number	Write	Function Code	Data	LRC CheckSum	Trailer CR+LF	
1 Byte	2 Byte	2 Byte	4 Byte	4 Byte	2 Byte	2 Byte	
(5) Pressure sensor response data format (Error)							
Head	ID Number	Write	Error Code	LRC CheckSum	Trailer CR+LF		
1 Byte	2 Byte	2 Byte	2 Byte	2 Byte	2 Byte		
(6) Read / Write Code							
Read / Write Code		Description					
30H33H		Read pressure sensor data Range 1 ~ 4 data Number, 4 ~ 16 Bytes					
30H36H		Write pressure sensor data					
(7) Example : Read pressure sensor value Computer /PLC transmit data format (Master)							
Head (3AH)	ID Number (30H31H)	Read (30H33H)	Function Code (30H30H30H30H)	Data Number (30H30H30H30H)	LRC CheckSum (46H39H)	Trailer (0DH0AH)	
Pressure sensor response data format							
Head (3AH)	ID Number (30H31H)	Read (30H33H)	Data Number (30H30H30H30H)	Data (30H30H30H30H)	LRC CheckSum (46H39H)	Trailer (0DH0AH)	
(8) Example : ID Number setting response Computer /PLC transmit data format (Master)							
Head (3AH)	ID Number (30H31H)	Write (30H36H)	Function Code (30H30H30H30H)	Data (30H30H30H30H)	LRC CheckSum (46H38H)	Trailer (0DH0AH)	
Pressure sensor response data							
Head (3AH)	ID Number (30H31H)	Write (30H36H)	Function Code (30H30H30H30H)	Data (30H30H30H30H)	LRC CheckSum (46H38H)	Trailer (0DH0AH)	
Example : ID Number setting response error							
Head (3AH)	ID Number (30H31H)	Write (30H36H)	Function Code (30H30H30H30H)	Data (30H31H46H46H)	LRC CheckSum (46H39H)	Trailer (0DH0AH)	
Pressure sensor response error (Example : setting data is over)							
Head (3AH)	ID Number (30H31H)	Write (30H36H)	Error Code (30H33H)	LRC CheckSum (37H36H)	Trailer (0DH0AH)		
(When the pressure sensor is abnormal, MSB will be set to 1, so the command code is 38H36H)							
(9)Function Code :							
Function Code	Item	Description				Operation	
30H30H30H30H	ID Number	Range : 0 ~ 255				Read / Write	
30H30H30H31H	Pressure type	0 : Vacuum , 1 : Compound , 3 : Positive				Read	
30H30H30H32H	Pressure value	Range : -32768 ~ 32767				Read	
30H30H30H33H	Unit setting	0 : kPa , 1 : kgf , 2 : bar , 3 : psi , 4 : inHg , 5 : mmHg , 6 : MPa				Read / Write	
30H30H30H34H	Decimal place	Range : 0 ~ 3				Read	
30H30H30H35H	Switch output mode	0 : OPS , 1 : HYS , 2 : WIN				Read / Write	
30H30H30H36H	Switch output mode	0 : NO , 1 : NC				Read / Write	
30H30H30H37H	Response time	0 : 2.5ms , 1 : 25ms , 2 : 100ms , 3 : 250ms , 4 : 500ms , 5 : 1000ms , 6 : 1500ms , 7 : 2000ms , 8 : 5000ms				Read / Write	
30H30H30H38H	Display color selection	0 : SOG , 1 : SOR , 2 : GRN , 3 : RED				Read / Write	
30H30H30H39H	Hysteresis value	Range : 1 ~ 8				Read / Write	
30H30H30H41H	Power-save mode	0 : OFF , 1 : ON				Read / Write	
30H30H30H42H	Fine adjustment	Range : -25 (-2.5%) ~ 25 (2.5%)				Read / Write	
30H30H30H43H	Baud rate	0 : 9600 , 1 : 19200 , 2 : 38400 , 3 : 115200				Read / Write	
30H30H30H44H	Transmission format	0 : N81 , 1 : E81 , 2 : O81				Read / Write	
30H30H30H45H	Communications protocol	0 : RTU , 1 : ASC				Read / Write	
30H30H30H46H	Restore factory setting	0 or 1 : ON				Write	
30H30H31H30H	Switch set point (P-1 or L-1)	Range : According to pressure type and unit				Read / Write	
30H30H31H31H	Switch set point (H-1)	Range : According to pressure type and unit				Read / Write	
30H30H31H32H	Switch output state	0 : OFF , 1 : ON				Read	
30H30H31H33H	Key lock mode	0 : OFF , 1 : ON				Read / Write	
30H30H31H34H	Switch output type	0 : NPN , 1 : PNP				Read	
30H30H31H35H	Display refresh time	0 : 200ms , 1 : 500ms , 2 : 1000ms				Read / Write	
30H30H31H36H	Zero point setting	0 or 1 : ON (If ambient pressure is over ±3% F.S., error code shows 03H36H)				Write	

Error Code	Description
30H31H	Read / Write error
30H32H	Function Code error
30H33H	Illegal data or over setting value

H. ADVANCE SETTING MODE

