Digital Pressure Switch

DPX300

User Manual

DOTECH
SENSING & CONTROL

DOTECH INC.
6F, JOONGANG-ILBO B/D, 30, Dongsan-ro, Danwon-gu,
Ansan-si, Gyeonggi-do, KOREA
TEL: +82-31-495-3767 FAX: +82-31-495-3917
www.dotech21.com

INNOBIZ

⚠ CAUTIONS

1. This product may cause an electric shock in handling. Please do not attempt to open it with power turned on.
2. This product should be installed in a place fixed secured by a rack or panel.
3. This product can be used under the following environmental condition.
   ① Indoor ②Pollution Degree 2 ③At an altitude of 2000m or below
4. Power input must be within the designated ranges.
5. To turn on or turn off power supply for this product, please the circuit breaker or switch of a standard product of IEC 60947-1 or IEC 60947-3 product and install it within a close distance allowing convenient operation by user.
6. Please be understood that if this product is dismantled or modified discretionary, after sales service will not be able to be provided.
7. An output wire to be used for this product should be inflammable grade FV1 (V-1 grade or above), the thickness of the wire should be AWG No. 20 or above(0.50mm²).
8. In order to prevent it from an inductive noise, please maintain the high-voltage wire and power wire separated.
9. Please avoid installing the product in a place where a strong magnetism, noise, severe vibration and impact exist.
10. When extending the sensor wire, use a shield wire and do not extend it unnecessary long.
11. The sensor wire and signal wire should be away from the power and load wires using conduits separately installed.
12. Please avoid using the product near a device generating strong high frequency noise (high-frequency welding machine, high-frequency sewing machine, high-frequency radiotelegraph, high capacity SCR controller)
13. Product's damages other than those decribed in the guarantee conditions provided by the manufacturer shall not be responsible by us.
14. If this unit is used to control machineries (Medical equipment, vehicle, train, airplane, combustion apparatus, entertainment, processing and transportation equipment, elevator and various safety device etc.) enabling to effect on human or property, it is required to install fail-safe device.

※ The Abservationed precautions must be observed, and Your failure to do so, it may cause product's breakdown.
※ The specifications, dimensions, and etc. are subject to change for improvement without a prior notice.

1. OVERVIEW

※ FEATURES

- High pressure protection, Low pressure protection, Oil pressure protection, an integrated high pressure fan control
- Automatic / Manual reset, Selection of various refrigerants
- Precise pressure control, Sensor offset, Sensor error detection

: SPECIFICATIONS(STANDARD MODEL)

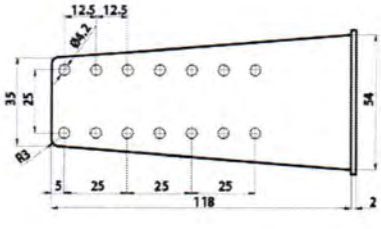
		Description
Power		100 ~ 240 Vac, 50/60 Hz
Power Consumption		MAX 10 VA
Output		4P Relay Outputs / 250Vac, 30Vdc, 5 A
Pressure Sensors	Measurement Range	-0.10 ~ 5.00 MPa
	Accuracy	±1.0 %FS
	Overpressure	150 %FS
	Stability	±0.5 %FS/year
	Shock	20 g sinusoidal, 11 msec
	Vibration	x-y-z directions of 5 -2000Hz / 10g
	Working Temp.	-40 ~ 100 ℃
	Connection	7/16UNF" / MALE
	Pressure Type	Gauge
Dimensions		159(W)mm X 128(H)mm X 58(D)mm
Operation		Temperature -10~50 ℃ / Humidity 90%RH or less
Storage		Temperature -20~60 ℃ / Humidity 90%RH or less

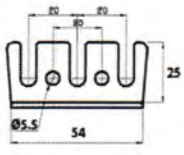
: SELECTION GUIDE

Model	Description
DPX300-HLO-00-MPA	Digital Pressure Switch Standard(Pressure Unit: MPa)
DPX300-HLO-R4-MPA	Digital Pressure Switch for Communication(RS485 Modbus)
DPX300-HLO-00-KGF	Digital Pressure Switch Standard(Pressure Unit: kgf/cm2)
DPX300-HLO-R4-KGF	Digital Pressure Switch for Communication(RS485 Modbus)
DPX300-HLO-00-BAR	Digital Pressure Switch Standard(Pressure Unit: bar)
DPX300-HLO-R4-BAR	Digital Pressure Switch for Communication(RS485 Modbus)
DPX300-HLO-00-PSI	Digital Pressure Switch Standard(Pressure Unit: psi)
DPX300-HLO-R4-PSI	Digital Pressure Switch for Communication(RS485 Modbus)

※ Communication is not supported in standard models.
※ Specify the pressure unit when ordering.

: Supplied Contents





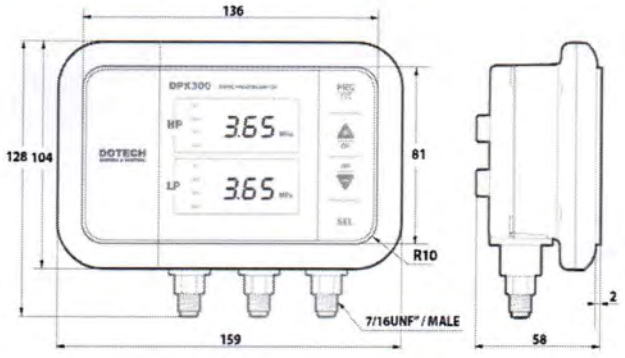
Bracket 1ea

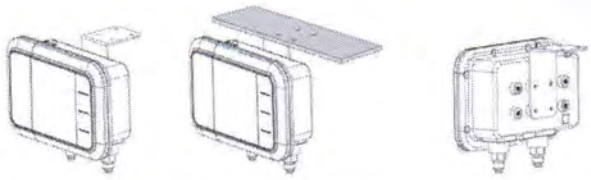
User Manual

※ This item is provided for securing the bracket tightening all bolts please.

2. INSTALLATION

: DIMENSIONS AND MOUNTING(unit: mm)



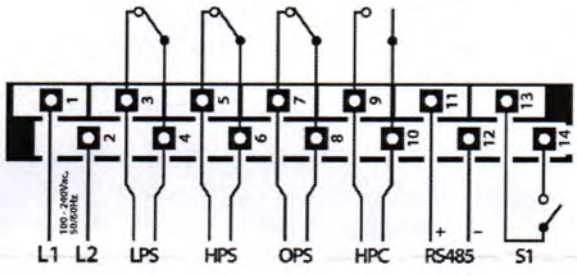


※ Please install a siphon tube to protect from pulsating pressure and high temperature contact.

LP : Low Pressure | OP : Oil Pressure | HP : High Pressure (unit : mm)

: WIRING DIAGRAM

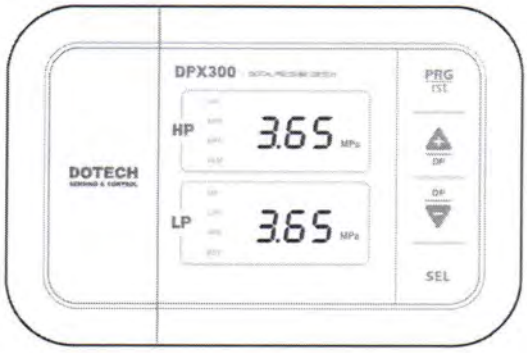
릴레이접점용량 : 250Vac, 30Vdc, 5A * 4ea



No	Connection	Description
1	L1	100~240Vac, 50/60Hz Power Input
2	L2	
3	LPS	Open when the low pressure is below lower limit
4		Common signal
5	HPS	Open when the high pressure is above the upper limit
6		Common signal
7	OPS	Open when the oil pressure is below lower limit
8		Common signal
9	HPC	Closed when the high pressure is above the upper limit
10		Common signal
11	RS485	TRX + signal
12		TRX - signal
13	S1	Compressor operation status input switch Operation: Close contact, stops: Open contacts
14		

3. USER INTERFACES

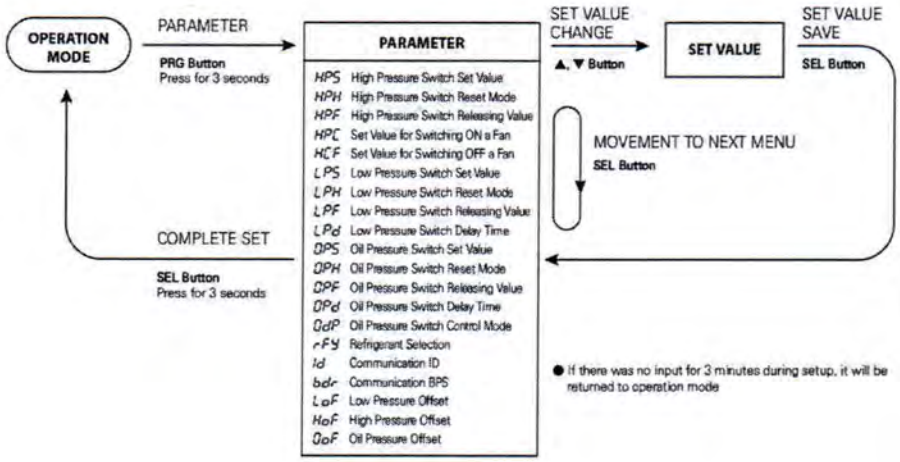
: DISPLAY AND CONTROLS



		Description
	DP	On when displaying differential pressure
LED	HPS	ON/OFF of Output / ON when Overpressure
	HPC	ON/OFF of Output / ON when Fan is Running
	ALM	On when alarm occurs
	OP	On when displaying oil pressure
	LPS	ON/OFF of Output / ON when Underpressure
	OPS	On/Off of output / On when oil pressure
	RST	ON when Manual Reset
Button	PRG rst	Parameter Settings / Manual Reset(if pressed twice quickly)
	▲	Increase or Move Up
	▼	Decrease or Move Down
	SEL	Select & Save / Display of Saturated Temperature
	▲ ▼	Display differential pressure value, oil pressure value
	PRG rst ▼	Setup values will be initialized if pushing PRG button and ▼button for 10 seconds.

4. PARAMETER

: PARAMETER CHANGE



: PARAMETER TABLE

Address	Menu	Code	Unit	Step	Min	Max	Default	CustomSetup
40031	High Pressure Switch Set Value	HPS	MPa	0.01	-0.10	5.00	2.60	
40032	High Pressure Switch Reset Mode (※1) (Manual / Automatic Reset)	HPH	A(0)= Automatic Reset		H(1)= Manual Reset		H(1)	
40033	High Pressure Switch Releasing Value	HPF	MPa	0.01	-0.10	HPS-0.01	2.50	
40041	Set Value for Switching ON a Fan	HPC	MPa	0.01	-0.10	5.00	1.50	
40043	Set Value for Switching OFF a Fan	HCF	MPa	0.01	-0.10	HPC-0.01	1.40	
40051	Low Pressure Switch Set Value	LPS	MPa	0.01	-0.10	5.00	0.25	
40052	Low Pressure Switch Reset Mode (※1) (Manual / Automatic Reset)	LPH	A(0)= Automatic Reset		H(1)= Manual Reset		A(0)	
40053	Low Pressure Switch Releasing Value	LPF	MPa	0.01	LPS+0.01	5.00	0.35	
40055	Low Pressure Switch Delay Time (※2)	LPd	sec	1	0	999	0	
40065	Oil Pressure Switch Set Value (※3)	OPS	MPa	0.01	-0.00	5.00	0.10	
40066	Oil Pressure Switch Reset Mode (※1) (Manual / Automatic Reset)	OPH	A(0)= Automatic Reset		H(1)= Manual Reset		A(0)	
40067	Oil Pressure Switch Releasing Value (※3)	OPF	MPa	0.01	oPS+0.01	5.10	0.20	
40068	Oil Pressure Switch Delay Time (※4)	OPd	sec	1	0	999	0	
40069	Oil Pressure Switch Control Mode (※5)	OdP	O-L (0)=OP-LP		H-O(1)=HP-OP		O-L(0)	
40061	Refrigerant Selection (※6)	rFY	r22(0)=R22 r23(1)=R23 123(2)=R-123		124(3)=R-124 134(4)=R-134a 404(5)=R-404a	407(6)=R-407c 410(7)=R-410a 507(8)=R-507	r22(0)	
40063	Communication ID	Id	-	1	1	255	1	
40064	Communication BPS	bdr	48(0)=4800	96(1)=9600	192(2)=19200	384(3)=38400	96(1)	
40071	Low Pressure Offset (※7)	LoF	MPa	0.01	-1.99	1.99	0.00	
40072	High Pressure Offset (※7)	HoF	MPa	0.01	-1.99	1.99	0.00	
40073	Oil Pressure Offset (※7)	OoF	MPa	0.01	-1.99	1.99	0.00	

(※1) Reset mode: Automatic Reset (A): It will be reset automatically when reaching releasing pressure value.
Manual reset (H): It will not be reset when reaching release pressure value unless users press RST button twice consecutively.

(※2) Low pressure switch delay time: If output is activated, it maintenances ON status during minimum ON time even under the OFF condition.

(※3) Oil Pressure Switch Set Value: Differential pressure = Oil pressure – Low pressure
When input switch for compressor operation status (S1) is closed (Normally closed contact (N.C)), it becomes an ON condition for oPS (Oil Pressure Switch Set Value) output it dP (Differential pressure value)is less than oPS (Oil Pressure Switch Set Value). Output is de-activated if dP (Differential pressure valve) is higher than oPF (Oil Pressure Switch Releasing Value) after output is activated.

(※4) Oil Pressure Switch Delay Time: Output will be activated after maintaining delay time which is set even though it is under the ON condition.
LED lamp will be turned on a light simultaneously with output after flickering during delay time.

(※5) Oil Pressure Switch Control Mode: Control mode for oil pressure switch: In case of using control mode for oil pressure switch as O-L (OP – LP), it can be come to a output state of OPS due to pressure equalizing at the status of compressor stop.

(※6) Refrigerant selection: Display saturation temperature in accordance with selected refrigerant.

(※7) Offset: Offset the differential for pressure sensor.
e.g) If displayed pressure value: 0.20MPa and actual pressure value: 0.22MPa It is offset by inputting +0.02MPa.

: TRIP / ALARM MESSAGE

No	Menu	Code	Description / Instructions	Response at Detection	Reset Type
1	Internal Parameter Error	SYS	Change any parameters and turn off. Then restart.	Immediate Stop	Automatic Reset
2	High Pressure Sensor Open	HoP	Please check a high pressure sensor because it is open.	Immediate Stop	Automatic Reset
3	High Pressure Sensor Short	HSH	Please check a high pressure sensor because it is short.	Immediate Stop	Automatic Reset
4	Low Pressure Sensor Open	LoP	Please check a low pressure sensor because it is open.	Immediate Stop	Automatic Reset
5	Low Pressure Sensor Short	LSH	Please check a low pressure sensor because it is short.	Immediate Stop	Automatic Reset
6	Oil Pressure Sensor Open	OoP	Please check a oil pressure sensor because it is open.	Immediate Stop	Automatic Reset
7	Oil Pressure Sensor Short	OSH	Please check a oil pressure sensor because it is short.	Immediate Stop	Automatic Reset

※ When it alarms, it beeps and all the outputs are cut off. To stop the beep, press the reset.

5. COMMUNICATIONS SPECIFICATIONS

: Communication Model (-R4)

	Description
Transmission line connection	Multiple line
Communications method	RS485 (2-wire, half-duplex)
BPS	BPS default 9600 BPS
Parity, Data, Stop bit	None, 8 Data, 1 Stop
Protocol Type	Modbus RTU MODE
Function Code	Read HOLD REGISTERS (0x03) , Preset Single Register (0x06)
Maximum Read Word	16 Word
Media Type	BELDEN 9841 / 9842, LG LIREV-AMESB
Poll interval	100msec

: HOLD STATES REGISTERS

Address	Menu	Unit	Type	Size (Word)	DPX200	MMI	Scale
4 0011	Output status code	-	Digital	INT 16	Refer to bit status below		-
Bit0	High Pressure Switch Set Value	-	Digital	Bit	0 : OFF	1 : ON	-
Bit1	Set Value for Switching ON a Fan	-	Digital	Bit	0 : OFF	1 : ON	-
Bit2	Low Pressure Switch Set Value		Digital	Bit	0 : OFF	1 : ON	-
Bit3	Oil Pressure Switch Set Value		Digital	Bit	0 : OFF	1 : ON	-
4 0013	Alarm status code	-	Digital	INT 16	Refer to bit status below		-
Bit0	Internal control variables error (Internal control factor error)	-	Digital	Bit	0 : Normal	1 : Alarm	-
Bit1	High pressure sensor faulty	-	Digital	Bit	0 : Normal	1 : Alarm	-
Bit2	Low pressure sensor faulty		Digital	Bit	0 : Normal	1 : Alarm	-
Bit3	Oil pressure sensor faulty		Digital	Bit	0 : Normal	1 : Alarm	-
4 0023	Display of high pressure value	MPa	Analog	INT 16	-0.10 ~ 5.00	-10 ~ 500	1/100
4 0024	Display of low pressure value	MPa	Analog	INT 16	-0.10 ~ 5.00	-10 ~ 500	1/100
4 0025	Display of oil pressure value	MPa	Analog	INT 16	0.00 ~ 5.00	0 ~ 500	1/100
4 0026	Display of saturation temperature for low pressure	℃	Analog	INT 16	-150.0 ~ 200.0	-1500 ~ 2000	1/10
4 0027	Display of saturation temperature for high pressure	℃	Analog	INT 16	-150.0 ~ 200.0	-1500 ~ 2000	1/10
4 0030	Display of differential pressure value (Oil pressure – Low pressure)	℃	Analog	INT 16	0.0 ~ 5.10	0 ~ 510	1/100

※ Pressure Unit Conversion Table

	MPa	bar	kgf/cm^2	psi
1MPa	1	1×10	1.0197162×10	1.450382×10^2
1bar	1×10^{-1}	1	1.019716	1.4503824×10
$1kgf/cm^2$	9.80665×10^{-2}	9.80665×10^{-1}	1	1.4223393×10
1psi	6.895×10^{-3}	6.8947×10^{-2}	7.0307×10^{-2}	1