

# DP100-AR

## User's manual

**DOTECH**  
SENSING & CONTROL

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INNOBIZ

### ⚠️ ※ Cautions

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 ② Pollution Degree 2 ③ At 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(0.50mm<sup>2</sup>).
  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 described 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 Aforementioned precautions must be observed, and if you fail to do so, it may cause a product's breakdown.  
※ The specifications, dimensions, and etc. are subject to change for enhancement without a prior notice.

## 1. Overview



### ※ Features

- Optimization of FAN Control by Differential Pressure
- Various Analog Control Outputs
- Current, voltage output selectable
- RS485 Modbus RTU
- Relay Alarm Output

### : Basic Specifications

Items	Description
Power	100 - 240 Vac, 50/60Hz
Power Consumption	MAX 5VA
Connection	Screw Terminal, wire range : 24~16AWG
Span Accuracy	± 3 %
Zero point Accuracy	± 0.2 Pa
Operation Condition	Temp. - 10~50°C, (Non condensation)
Storage Condition	Temp. - 20~60°C, Humidity below 90%RH
Size (W x H x D mm)	115 x 80 x 40
Weight	220g

### : Ordering Guide

Model	Description
DP100-AR-A1R4-500	Measuring range : -500 ~ 500Pa Analog output (4~20mA or 0~10V) RS485 model : MODBUS RTU MODE
DP100-AR-A1R4-125	Measuring range : -125 ~ 125Pa Analog output (4~20mA or 0~10V) RS485 model : MODBUS RTU MODE

### : Packing



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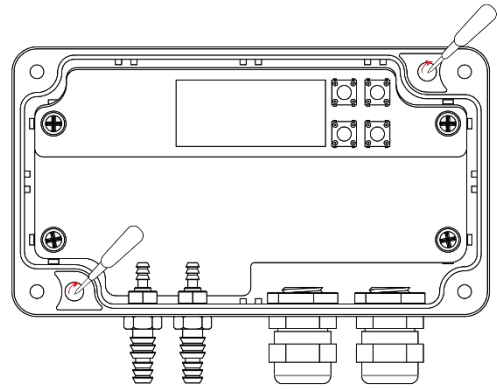
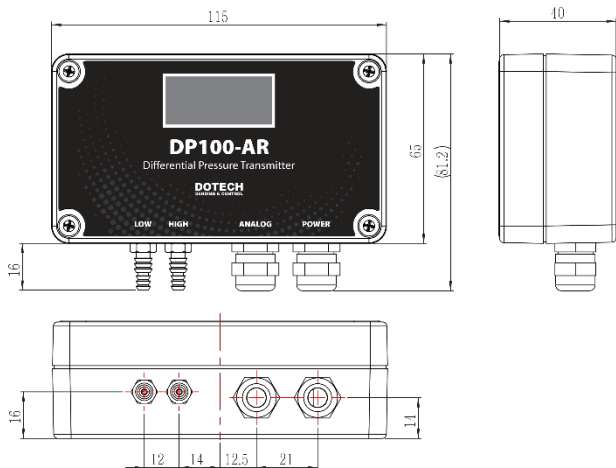
### : Display range for pressure

Unit	Measuring range	Display range of decimal point (Automatic Switching)
Pa	-500 ~ 500	-199.9 ~ 500.0 / -500 ~ -200
mmAq	-50 ~ 50	-19.99 ~ 50.00 / -50.0 ~ -20.0

※ Silicon Tube  $\phi 6.0 \times 3.0 \times 2M$  (※Standard scope of supply)

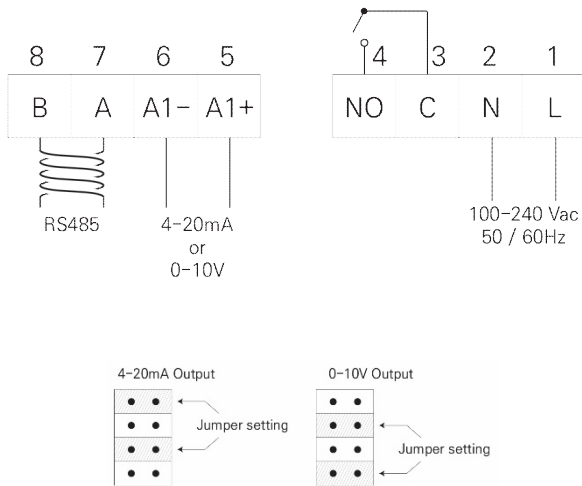
## 2. Installation

### : Dimension & Installation



- ※ Remove front case and fasten back plate of product using 2 screws.
- ※ Put a lid on back plate and tighten up the spring lock screw after finishing mount.

### : Wiring



### : DP100-AR

No.	Name	Description
1	L	100-240Vac, 50/60Hz Power Input
2	N	
3	COM	Alarm relay output 250Vac / 2A
4	N.O	
5	A1+	4-20mA or 0-10V analog output +
6	A1-	4-20mA or 0-10V analog output -
7	A	RS485 +
8	B	RS485 -

## 3. User Interface

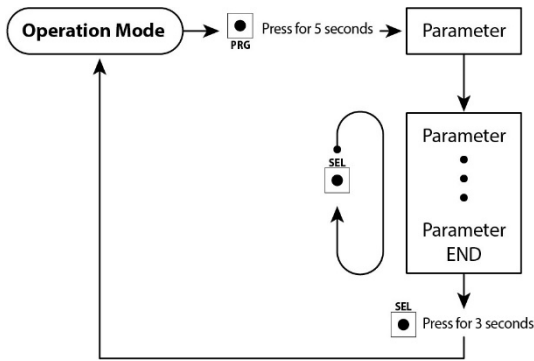
### : Lamp & Operation Button



Name	Description
PRG	Program setup and check unit of display
SEL	Press twice successively when clearing alarm
▲	Selection and storage
▼	Move menu and decrease set value
▲ + ▼	Identify peak value when pressing for 0.5 seconds.
▲ + ▼	Initialize peak value when pressing 5 seconds.
PRG + ▼	Initialization when pressing simultaneously for 10 seconds
▲ + ▼	Internal temperature of differential pressure sensor

## 4. Parameter

### : Parameter change



- Press PRG button for 5 seconds to change parameters.
- Press PRG button at parameter setup to move to next parameter.
- Movement to next menu and storage of set value during parameter setup are performed by SEL button.
- Set value will be flickering in every 0.5 seconds and change set value using ▲ key or ▼ key.
- Differential pressure will be displayed if pressing SEL button for 3 seconds after finishing parameter setup.

### : Setting (Press 3 seconds SEL button)

Address	Description	Code	Unit	Min.	Max.	Default	User
4 0003	Pressure setting (PID control)	<i>SP</i>	Pa	<i>USL</i>	<i>USH</i>	200.0	

### : Setting Group1 Table

Address	Description	Code	Unit	Min.	Max.	Default	User
4 0061	Control mode(※1)	<i>oFl</i>	-	<i>oFF(0) Pid(1) dP(2) FRn(3) nRL(4)</i>		<i>Pid(1)</i>	
4 0062	Auto tuning	<i>AtL</i>	-	<i>oFF(0) on(1)</i>		<i>oFF(0)</i>	
4 0063	Proportional	<i>Pd</i>	-	1	999.9	1.0	
4 0064	Integral	<i>I</i>	-	0	9999	200	
4 0065	Differential	<i>d</i>	-	0	9999	0	
4 0066	Set speed	<i>SSP</i>	rpm	0	9999	500	
4 0067	Set D.pressure	<i>SdP</i>	Pa	0	500	3.0	
4 0068	Unit D.pressure	<i>UdP</i>	Pa	1	500	2.0	
4 0069	Max. Speed	<i>HSP</i>	rpm	0	9999	1500	
4 0070	Min. Speed	<i>LSP</i>	rpm	0	9999	0	
4 0071	Manual Output Value	<i>RoO</i>	-	-1	100	-1	
4 0072	High limit output value	<i>RoH</i>	-	0	100	100	
4 0073	Low limit output value	<i>RoL</i>	-	0	100	0	
4 0074	Output method	<i>YIt</i>	-	<i>oFF(0) 420(1) 0(2) 0-1(3) 0-5(4) !-5(5) 204(6) ! 00(7) ! -0(8) 5-0(9) 5-1(10)</i>		<i>420(1)</i>	
4 0075	Output cycle	<i>oPt</i>	1/10 sec	1	999	5	

(※1) Control mode *FRn(3)*

ex) Set D.pressure (*SdP*) : 3Pa, Unit D.pressure (*UdP*) : 2Pa, Set speed (*SSP*) : 500rpm, Measuring D.pressure: 8Pa

Speed Change:  $SSP + (\text{Measuring D.pressure} - SdP) / UdP \times 100$

Output value :  $500 + (8 - 3) / 2 \times 100 = 750$  [rpm]

: Setting Group2 Table

Address	Description	Code	Unit	Min.	Max.	Default	User
4 0077	Select Pressure Unit	<i>Unit</i>	-	<i>PA</i> (0) = Pa	<i>mmA</i> (1) = mmAg	<i>mmA</i> (0)	
4 0078	User Set Max.(※1)	<i>USH</i>	Pa	<i>USL</i>	999	500	
4 0079	User Set Min.(※1)	<i>USL</i>	Pa	-199	<i>USH</i>	0	
4 0080	Set 0	<i>oFS</i>	-	-19.9	99.9	0.0	
4 0081	Decimal point (※2)	<i>dP</i>	-	<i>0.!</i> (0) :Display Below decimal point	<i>!</i> (1) :No display Below decimal point	<i>0.!</i> (0)	
4 0082	D.Pressure sensor offset(※3)	<i>SPn</i>	K	0.0	99.9	10.0	
4 0083	Sensor filter set(※4)	<i>SFlt</i>	초	0.1	5.0	5.0	
4 0084	Sensor value display cycle	<i>Sdt</i>	초	0.0	5.0	0.5	
4 0085	Display Mode Set	<i>dIS</i>	-	<i>dPB</i> : D.Pressure, <i>SPd</i> : Set speed			<i>dPB</i> (0)
4 0086	Comm. ID set	<i>id</i>	-	1	128	1	
4 0087	BPS set	<i>bPS</i>	-	<i>4B</i> (0) = 4800	<i>9E</i> (1) = 9600 <i>192</i> (2) = 19200 <i>3B4</i> (3) = 38400	<i>9E</i> (1)	
	Max. Trans output range	<i>rth</i>	Pa	-199	999	500	
	Min. Trans output range	<i>rLl</i>	Pa	-199	999	0	

(※1) Max. | Min. User set value : Enter the range of desired settings that you can set.

(※2) Decimal point : When set the '1', display current D.pressure value but the value is not include below decimal point.

(※3) D.pressure Sensor offset : Correct deviation of differential pressure

(※4) Sensor Input filter set : In case of frequent hunting of the present differential pressure value, it is corrected by increasing filter value.

: TRIP / ALARM MESSAGE

No.	Description	Code	Setting Details	Operating at detection	Way to clear
1	System fault	<i>SY5</i>	Reset default value and power again.	Immediately stop	Manual
2	Input sensor open / disconnection	<i>oPn</i>	This message will occur if differential pressure has some problem. ※ Request A/S	Immediately stop	Manual
3	Sensor input lower limit	<i>LLL</i>	This message will occur if input of sensor is lower than lower limit (-500Pa).	Immediately stop	Manual
4	Sensor input upper limit	<i>HHH</i>	This message will occur if input of sensor is higher than upper limit (500Pa).	Immediately stop	Manual

※ In case of the above mentioned errors, it will be normally operated once cause of error is solved.

5. Communication Protocol

: Specifications of Communication (-R4 model)

Item	Description
Transmission line connection	Multiple line
Communications method	RS-485 (2-wire, half-duplex)
Baud-rate	4800, 9600, 19200, 38400 BPS default 9600 BPS
Parity, Data, Stop bit	None, 8 Data, 1 Stop
Protocol Type	Modicon Mod-Bus RTU MODE
Function Code	Read HOLD REGISTERS (0x03) / Preset Single Register (0x06)
Maximum Read Word	32 Word
Media Type	BELDEN 9841 / 9842, LG LIREV-AMESB
Poll interval	100msec

: Communication Table for Status

Address	Description	Unit	Type	Size(Word)	Data	Inside Data	Scale
4 0106	Product state Code	-	Analog	INT16	Note below Bit Status		4 0106
Bit 14	Fault of sensor measurement	-	Digital	Bit	0 = Normal	1 = Abnormal	
4 0107	Displayed differential pressure		Analog	INT16			