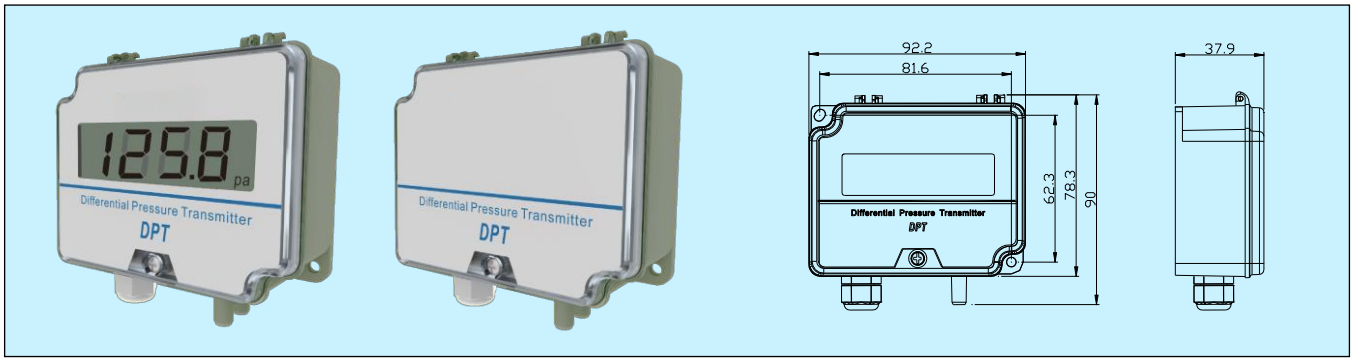
DPT(DPT-F Flush Mount)Differential Pressure Transmitter



Applications & Features

Apply high accuracy MEMS sensor and digital technologies, can measure positive, negative or differential pressure. DPT is suitable for wall mount, DPT-F is suitable for flush mount
It can measure system pressure of fan, blower, filter, furnace draft and orifice plate and can apply to various clean room, biological safety cabinet, clean bench, ducts collection, medical or pharmaceutical machine, etc.
Multiple ranges, engineering units and outputs
Good performance with accuracy of 1.0% and range as low as 25Pa
Function keys: zero calibrate, unit select, response time set, etc
Field upgradable LCD display module and multiple ranges selection

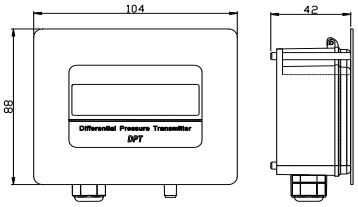
Specifications

Medium: non-combustible, non-corrosive air, insensitive to moisture, dust, condensation and oil
Working Temp.: -20~70℃
Medium Temp.:0~60℃
Temp. Compensation: 0~50℃
Working Pressure: overload 10xFS, burst 15xFS
Accuracy: ±1.0%FS (±2.0%FS@25Pa range)
Long term stability: ±0.5%FS/Year
Thermal effect: <0.05%FS/℃ (zero), <0.08%FS/℃ (FS)
Response Time: 0.5~30s, can be set by keys
Process Connection: 5mm ID tubing
Display: 4 digits LCD, size 65x18mm, with unit indication
Output: 0~10V, 4~20mA (2 wires), RS485 select able
Output Load: ≤500Ω (current), ≥2kΩ (voltage)
Power: Voltage: 16~28VAC/ 16~35VDC
Current: 18.5~35VDC (R_L=500Ω); 8.5~35VDC (R_L=0Ω)
Units: 5 units, selected by keys
Zero set: easy to reset by external key
Materials: ABS+PC(housing) & PC(Cover), fire retardant UL94V-0
Protection: IP54
Weight: 160g
Approval: CE
Accessories: LCD display module (model DPT-LCD), including 1 LCD module and 1 panel film, and flush mount panel (model DPT-A), can be ordered separately

Models

Model	DPT DPT-F				DP transmitter Flush Mount DP Transmitter
Range		X			Range selection
Output			1 E 2 8		0-10V 0-5V 4-20mA(2 wires) RS485/Modbus
Display				0 1	N/A LCD

DPT-F Flush Mount Differential Pressure Transmitter
It's the combination of DPT (with LCD) and flush mount panel (model DPT-A). The specifications are the same as DPT. And the model is DPT-Fxx1(with LCD). It's good for flush mount in clean room or equipment with no dust and easy to clean 316 brushed stainless steel panel, with the size W104×H88×T1. 5 and flush mount opening size W93 ×H79×D42(mm). The LCD size is 65x18(mm).

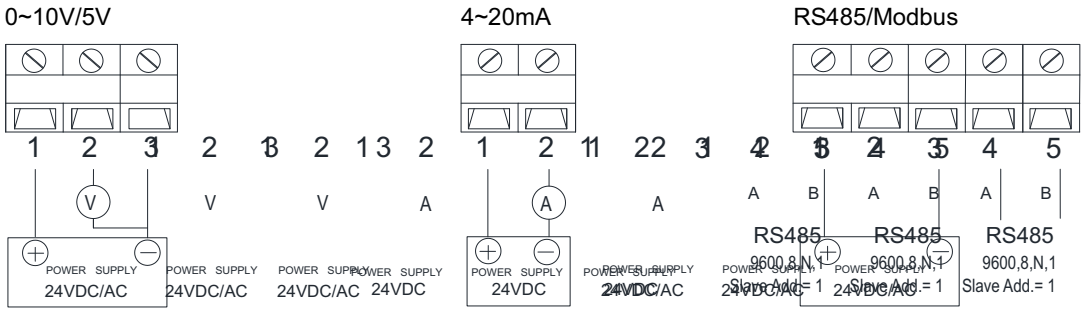


Measuring Ranges

Code	Unit & Range & Display Resolution					
	Pa	Pa	kPa	in w.c.	mm w.c.	mbar
1	0-25/60/125	25.0	0.025	0.100	2.50	0.250
		60.0	0.060	0.250	6.00	0.600
		125.0	0.125	0.500	12.00	1.250
3	0-250/500/1000	250.0	0.250	1.000	25.00	2.500
		500.0	0.500	2.000	50.00	5.000
		1000	1.000	4.000	100.0	10.00
6	0-2500/5000/10000	2500	2.500	10.00	250.0	25.00
		5000	5.000	20.00	500.0	50.00
		10000	10.00	40.00	1000	100.0

1. Code 1 and 3 have multiple ranges which could be jumper selected.
2. Set the 5 engineering units by button keys and the related LCD indicator will be on.
3. For zero center models, add "Z" at the end of the model. For example, DPT1xxZ, means the range is -30-0-30/-62.5-0-62.5pa.25Pa does not have this function. DPT3xxZ, means the range is -125-0-125/-250-0-250/-500-0-500Pa. Code 6 does not have this function.
4. If the measured value is -0.xxx, the LCD will display -.xxx. When the measured value is -1XXX, the LCD will display "⊣ xxx" .

Connection

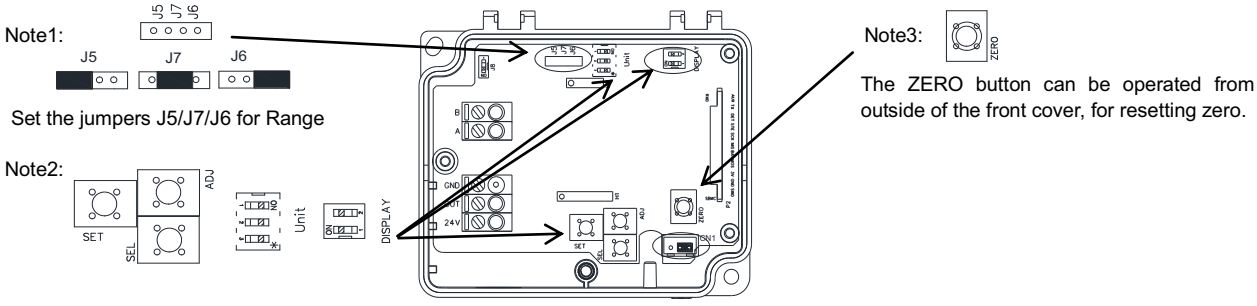


DPT1XX and DPT3XX Range Jumpers Setting(J5, J6, J7)：

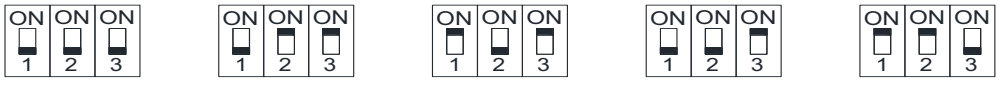
Models	Jumpers				Remark
	Range	J5	J6	J7(default)	
DPT1XX	0～25Pa			√	√：ON (Connected)
	0～60Pa	√			
	0～125Pa		√		
DPT3XX	0～250Pa			√	
	0～500Pa	√			
	0～1000Pa		√		
DPT6XX	0～2500Pa			√	
	0～5000Pa	√			
	0～10000Pa		√		

Models	Jumpers				Remark
	Range	J5	J6	J7(default)	
DPT1XXZ	0～25Pa			√	√：ON (Connected)
	-30～30Pa	√			
	-62.5～62.5Pa		√		
DPT3XXZ	-125～125Pa			√	
	-250～250Pa	√			
	-500～500Pa		√		

Settings and Operations



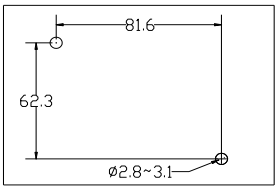
1. Unit setting: Set the unit switch as below.

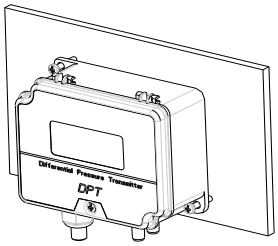


2. Respond time setting: Set the switch as below.

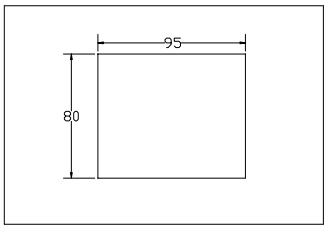
Surface Mounting for DPT:

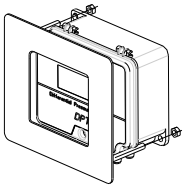
It can be installed by surface mount and connected high(+) and low(-) pressures with accessories.

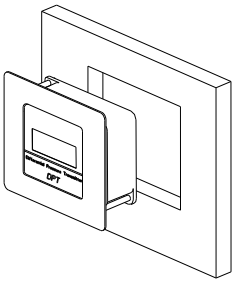


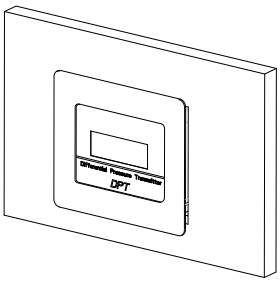


Flush Mounting for DPT-F:









(1) Cut a 95(W)×80(H)mm rect angular hole on the wall.
(2) Assemble the panel with the transmitter as shown above. Connect the tubes (be careful of the high(+)/low(-) ports) and the electrical terminals, then give some glue on the back of the stainless steel installation panel, insert the transmitter into the hole and paste the panel with the wall properly.

Zero reset & Calibration:

According to different environment and sensor's characteristics, for long term of using, the sensor's accuracy maybe drift. The transmitter should be zero reset after initial installed to meet the specified accuracy, and be zero reset periodically in every 6-12 months' using. It is recommended to be "zero reset" after the initial 7 days continuous working.
Zero reset: keep the high（+）/low（-）pressure ports unconnected in stable air, or directly connect them, press the button "ZERO" for 5s to perform "zero reset". It means "remove the zero drift of the transmitter in order to improve the accuracy". It is recommended that this operation could be done periodically.
Initial zero reset: when initial power on, it should be zero reset after fully warm-up and stable, to meet the specified accuracy.
Long term zero drift & reset: It may have long term zero drift after continuous working; customers can reset it periodically.
Re-calibration & zero reset: when re-calibration needed, zero reset should be done first. A qualified standard manometer is needed for re-calibration operation. Please follow the operation procedures below.

Attention

It should be power OFF during installing and wiring. When using 24VAC, it is strongly recommended to power the unit with independent transformer. If sharing a 24VAC transformer with other equipments such as controllers, transmitters or actuators, please make sure the terminals 24V and GND are connected correctly. Otherwise, it may reduce serious damages.

Warranty

- It has limited warranty for eighteen (18) months after the production date.
- It does not extend to any unit that has been subjected to misuse or accident.
- It is, in any event, strictly limited to the replacement or repair of the product itself.

DPT Differential Pressure Transmitter - Operation Instruction

Button definition:

"SET": Set/Confirm/Save; "SEL": Bit Select/Decrease; "ADJ": Adjust/Increase; "Zero":Zero Reset
Zero reset: keep the high（+）/low（-）pressure ports unconnected in stable air, or directly connect the two, press the button "Zero" 5s to reset the actual "zero point". It means "remove the zero drift of the transmitter in order to improve the accuracy". It is recommended that this operation could be done periodically.

Operation instruction:

1."P485": Set RS485 address(Default set: 1, available ranges 1~255, but recommend 1~30)
SET→SEL/ADJ→P485→SET→SEL/ADJ→XXX→SET (XXX means RS485 address)
Note: Refer to the communication data table

2."P483": Set RS485 Baud Rate (Default set: 9600, available 9600 or 4800)
SET→SEL/ADJ→P483→SET→SEL/ADJ→XXX→SET (XXX means Baud Rate index)
Index: 1: 9600; 2: 4800.

3."P482": Set RS485 Parity Bit (Default set: 0, available 0,1 or 2)
SET→SEL/ADJ→P482→SET→SEL/ADJ→XXX→SET (XXX means Parity Bit index)
Index: 0: none; 1: odd; 2: Even.

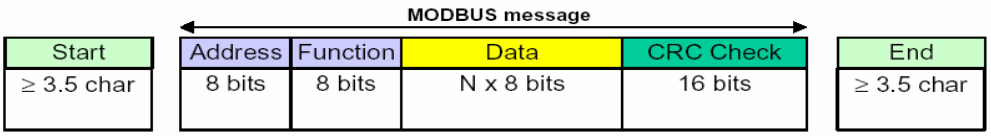
System Error signal:

Err 1 Keys input operation code is wrong
Err 2 Input data is not available
Err 3 Modbusattempt to write read only register error
Err 4 Modbus CRC check error
Err 6 Password Key input error

RS485 Communication- - -Modbus RTU
For DPT series

1 Communication setting

1.1 Baud rate：9600
1.2 Data：8Bit
1.3 Stop：1
1.4 Parity：None
1.5 Protocol：Modbus RTU/RS485



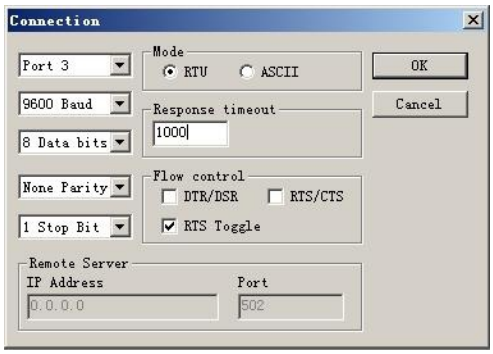
A typical Modbus RTU mode message frame is shown as above. In the Modbus RTU mode, the messages between frames are separated by at least 3.5 characters time's silent interval. If the silent interval between two characters is more than 3.5 characters time, the former character was transferred successfully, and the current character's transmission starts.

2 Modbus Address

The message's first frame field is the device's address. Modbus could locate up to 256 different addresses, including valid addresses from 1~247. Address 0 is for broadcast and address 248~255 are reserved for special addresses.
Slave address can be set with compatible Modbus RTU software. Default address is 1. It is suggested each single loop is less than 32 devices.

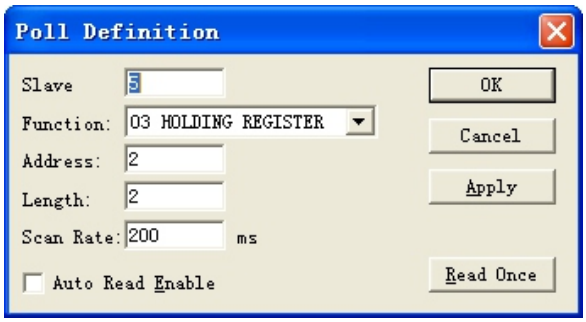
3 Modbus function

The function code is the second data in the frame. Valid function codes are from 0~127 (01H~7FH). See the relevant Modbus standard. It supports 03H/06H function codes, shown as the following Modbus Poll software. The detail register addresses are in: **6 General registers table**.



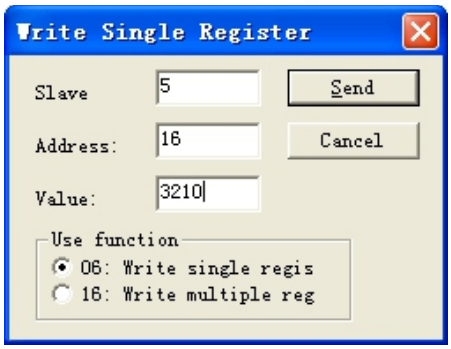
03H Read Holding Registers

Example: Read the current pressure value.
Shown as right
Slave address：5
Function: 03
Register started address: 40002
Register reading length:2
Scan rate: 200 ms
Communication codes：
Master / PC to SLAVE： 05 03 00 01 00 02 94 4F
SLAVE to Master / PC： 05 03 00 05 00 01 F4 95 8F



06H Preset Single Register

Example: restore factory settings.
Shown as right
Slave address：5
Function：06
Register address：40016
Set value：3210
Communication codes：
Master / PC to SLAVE：05 06 00 0F 0C 8A 3C 1A
SLAVE to Master / PC：05 06 00 0F 0C 8A 3C 1A

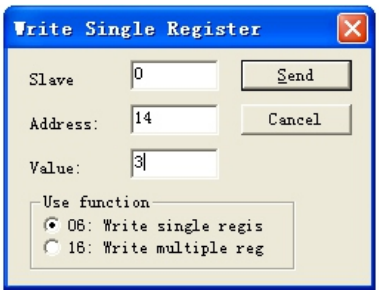


4 Broadcast mode to write data to slave

Using broadcast mode, customer can write data to all slavers connected to the network. Address of broadcast mode to write data is 0.

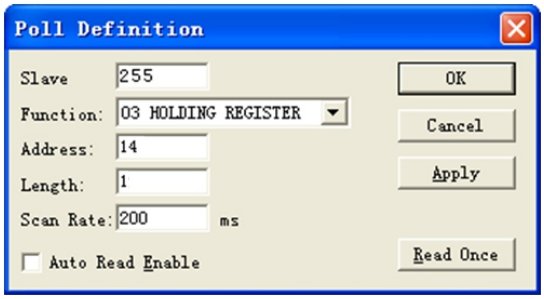
For example: change slave address with broadcast mode, customer can set a new slave address. Note: since this operation will modify all the addresses of the slavers to the same address, it is NOT applicable for network of more than one slaver.

Shown as the right, the slave address is changed to 3 by using broadcast mode.
Slave address：0
Function：06
Register address：40014
Set value：3
Communication codes：
Master / PC to SLAVE：00 06 00 0D 00 03 59 D9
SLAVE to Master / PC：none



5 Special mode to read data from slave

With the special mode, customer can read the register data under the circumstance of NOT knowing the slave address.
Address of special mode read data: 255(0xFF)
Note: this operation is applicable for ONLY ONE slave in the network.
Example: As shown on the right, a special mode to read slave address
Slave address: 255(0xFF)
Function: 03
Started register：40014
Register reading length：1
Communication codes：
Master / PC to SLAVE：FF 03 00 0D 00 01 00 17
SLAVE to Master / PC：FF 03 00 0D 00 01 00 17



6 General register table

Register address	R/W	Type	Definition	Remarks
40001, 00000	R	Signed	Product code	DPT series product code: 8001
40002, 00001	R	Signed	Pressure original value	Pressure value= Pressure original value / Pressure index
40003, 00002	R	Signed	Pressure index	
40004, 00003	R	Signed	Pressure unit	1:Pa(default), 2:KPa, 3:mbar, 4:mmWC, 5:inWC
……				
40007, 00006	R	Signed	Low range limit	For example: 0 means the low range limit is 0
40008, 00007	R	Signed	High range limit	For example: 60 means the high range limit is 60
40009, 00008	R/W	Signed	Pressure unit setting	1:Pa(default), 2:KPa, 3:mbar, 4:mmWC, 5:inWC
40010, 00009	R/W	Signed	Display update interval	Range:（ 5/10/50/100）, default : 10 (1s)
……				
40014, 00013	R/W	signed	RS485-Modbus RTU slave address	Default slave address =1, Range: 1~255
40015, 00014	R/W	signed	Pressure zero calibration	Write (06 function) “1234” to calibrate zero
40016, 00015	R/W	Signed	Function register	Write (06 function) “3210” to reset default setting
……				
40029, 00028	R/W	signed	RS485 baud rate	9600（ default ）or 4800
40030, 00029	R/W	signed	RS485 Parity	0:NONE（ default）,1:ODD,2=EVEN

Note: 1. 40001 is PLC mode ADDRESS (BASE 1); 00000 is PROTOCOL ADDRESS (BASE 0).

2. Function register 40016: Use the 06 function code to write password (3210) to the register 40016 to return to the factory set.

3. For pressure unit settings as Pa, KPa, mbar, the range low and high limits data unit is Pa, for pressure unit setting as mmWC, the range low and high limits = data *10, for pressure unit setting as inWC, the range low and high limits = data *100.