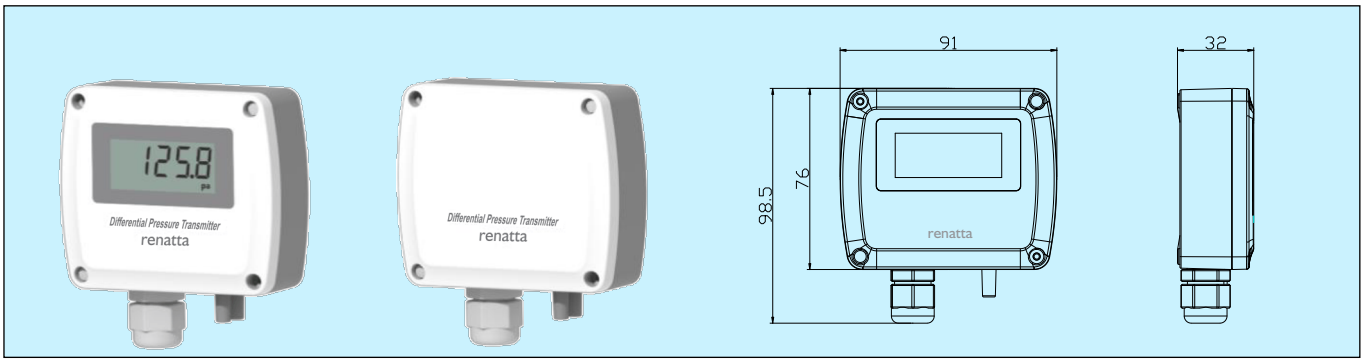
RNDTL Differential Pressure Transmitter

renatta



Applications & Features

Apply high accuracy MEMS sensor and digital technologies, can measure positive, negative or differential pressure. RNDTL for surface mount and RNDTL-F for flush mount

It can measure system pressure of fan, filter, etc., and can apply to various clean room, biological safety cabinet, clean bench, ducts collection, medical or pharmaceutical machine, etc.

Multiple ranges, engineering units, outputs and optional LCD

Over voltage and reverse polarity protection for power inputs and outputs, high reliability

Good performance with accuracy of 1.0% and range as low as 25Pa

Function keys: zero calibrate, unit select, response time set, etc.

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℃
Range: 25Pa(±12.5Pa) ~10kPa(±5kPa)
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: 0.5/1/2/5s, can be set by DIP switches
Zero set: easy to reset by external key
Process Connection: 5mm ID tubing
Display: 5 digits LCD, size 44x18mm, with unit indication
Units: 5 units, selected by DIP switches
Output: 0~5V/0~10V/4~20mA(2 or 3 wires), RS485/Modbus
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)
Housing: ABS+PC (housing) & PC(Cover), fire retardant UL94V-0
Protection: IP65
Weight: 180g
Approval: CE
Accessories: flush mount panel (model RNDTL-A), can be ordered separately

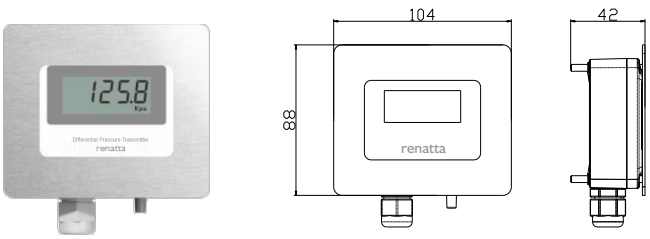
Models

Model	RNDTL RNDTL-F				DP transmitter Flush mount DP transmitter
Range		x			Range selection
Output			1 2 8		0~5V/0~10V/4~20mA (3 wires) 4~20mA (2 wires) RS485/Modbus
Display				0 1	N/A LCD

RNDTL-F Flush Mount DP Transmitter

It's the combination of RNDTL (with LCD) and flush mount panel (model RNDTL-A). The specifications are the same as RNDTL. And the model is RNDTL-Fxx1(with LCD).

It's for flush mount in various clean room or equipment. The 316 brushed stainless steel panel does not have any dust collection, easy and safe to clean. The size is W104×H88 ×T1.5(mm). The opening is W94×H78.5×D42(mm). The LCD size is 44x18(mm).



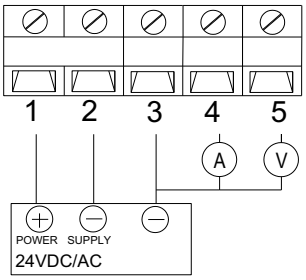
Ranges

Code	UNIT & Range & Display Resolution					
	Pa	**Pa**	**kPa**	**in wc**	**mm wc**	**mbar**
0	**0-25**	25.0	0.025	0.100	2.50	0.250
1	**0-60**	60.0	0.060	0.250	6.00	0.600
2	**0-125**	125.0	0.125	0.500	12.00	1.250
3	**0-250**	250.0	0.250	1.000	25.00	2.500
4	**0-500**	500.0	0.500	2.000	50.00	5.000
5	**0-1000**	1000	1.000	4.000	100.0	10.00
6	**0-2500**	2500	2.500	10.00	250.0	25.00
7	**0-5000**	5000	5.000	20.00	500.0	50.00
8	**0-10000**	10000	10.000	40.00	1000.0	100.00

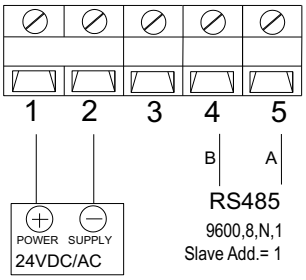
1. Set the 5 engineering units by DIP switches and the related LCD indicator will be on.
2. For zero center models, add **"Z"** at the end of the model. For example, RNDTL1xxZ means the range is -30-0-30Pa

Connection

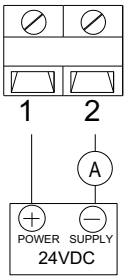
0~5V/0~10V/4~20mA(3 wires)



RS485/Modbus

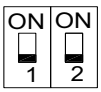


4~20mA(2 wires)

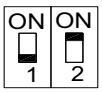


Settings and Operations

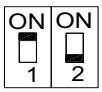
1. Respond time set: switch SW2 to different position for 0.5s, 1s, 2s and 5s according to the diagram below.



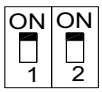
0.5S (default)



1S

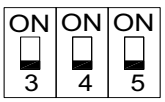


2S

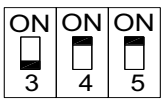


5S

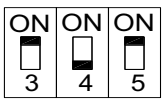
2. Unit set: Set the unit switch as below.



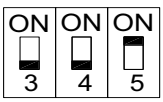
Pa (default)



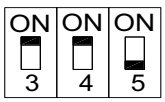
kPa



mbar



mm w.c.



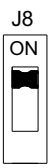
in w.c.

3. 0~5V/0~10V select:

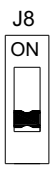
0~10V

0~5V

4. Terminal resistance



Terminal resistance : 120Ω



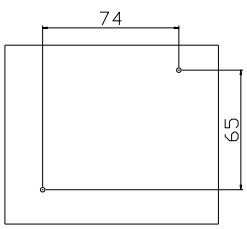
Terminal resistance: None (default)

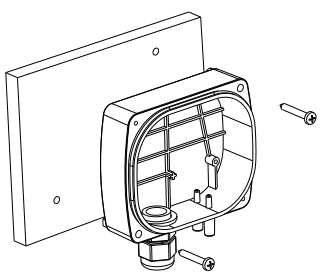
5. Reset button

Installation

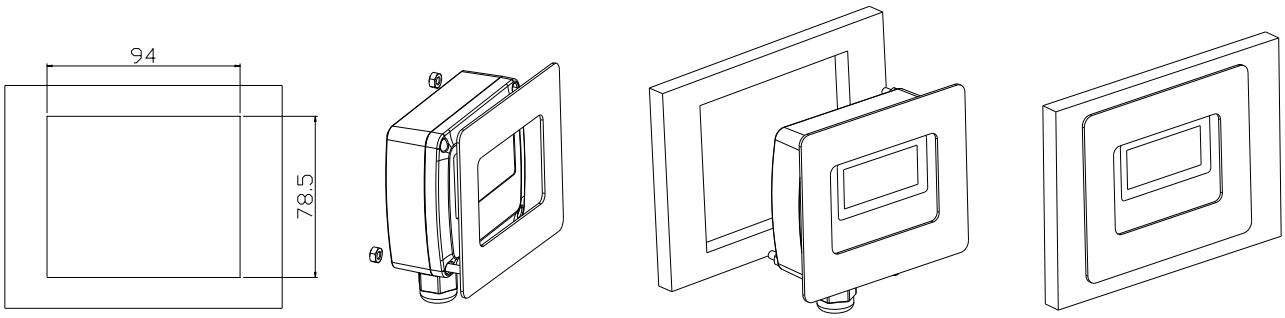
1、Surface Mounting for RNDTLT :

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





2、Flush Mounting for RNDTTL-F:



(1) Cut a 94(W)×78.5(H)mm rectangular 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 induce serious damages.

Warranty

During warranty period, if failed, the product can be returned for repairing or replacing after confirmed normal operation.

RS485 Communication- - -Modbus RTU For RNDTL 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

MODBUS message

Start	Address	Function	Data	CRC Check	End
≥ 3.5 char	8 bits	8 bits	N x 8 bits	16 bits	≥ 3.5 char

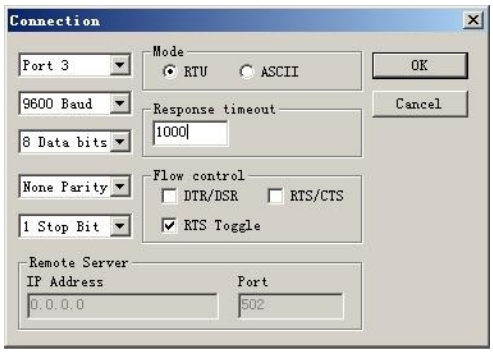
A typical Modbus RTU mode message frame is shown as above. In the Modbus RTU mode, the messages between frames are separated by at least 3.5 characters time's silent interval. If the silent interval between two characters is more than 3.5 characters time, the former character was transferred successfully,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

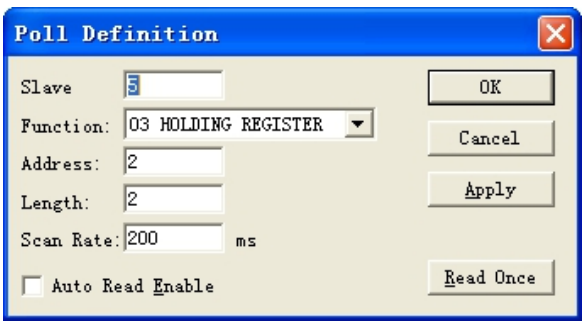
3. Modbus function

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**.



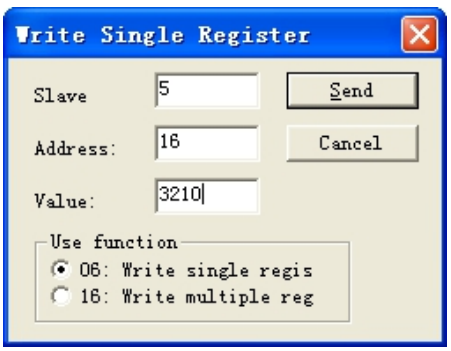
03H Read Holding Registers

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



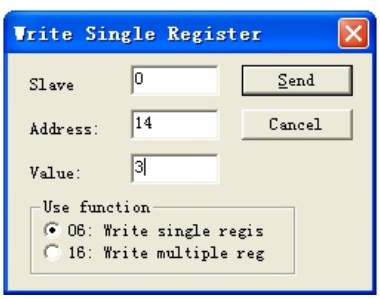
4. Broadcast mode to write data to slave

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.

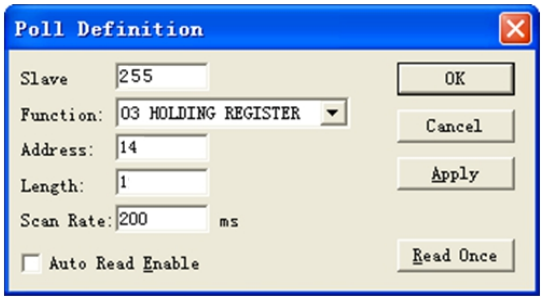
Shown as the right, the slave address is changed to 3 by using broadcast mode.

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	
40002, 00001	R	Signed	Pressure original value	Actual pressure value=Pressure original value / Pressure index
40003, 00002	R	Signed	Pressure index	
40004, 00003	R	Signed	Pressure unit	1:Pa; 2:KPa; 3:mBar; 4:mmWC; 5:inWC
……				
40007, 00006	R	Signed	Low limit original value	Low limit=Low limit original value/Pressure index
40008, 00007	R	Signed	High limit original value	High limit=Low limit original value/Pressure index
……				
40014, 00013	R/W	Signed	RS485-Modbus RTU slave address	Default slave address =1, Range: 1~247
40015, 00014	R/W	Signed	pressure zero calibration	write “1234” to clear pressure to zero
40016, 00015	R/W	Signed	Function register(RESET)	Write “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.

Contact Detail

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