

DT-TT920 Series Datasheet

Smart Programmable Temperature Transmitters

DAYTECH

Key Features

- Temperature measurement for gases and liquids
- Accuracy of $\pm 1^{\circ}\text{C}$. / Long Term Stability of $\pm 0.15\%$ F.S./10k
- Fast Response Speed: ~ 20 seconds
- Power supply: 12VDC – 30VDC
- Standard Range -50°C to 200°C , custom ranges available
- User Scalable output range, programmable from 100% to 25%, with a turn down of 4:1 F.S.
- 4-20mA, 0-5VDC, 0-10VDC output types
- 1 or 2 programmable PNP digital switching outputs, Time delay setting for PNP switching. MODBUS output available
- Automatic ambient temperature compensation and display
- 316SS Body and Wetted parts,
- Probe lengths from 20mm to 300mm
- Blue OLED Screen display with 3 pushbutton keys
- Display rotatable 180 degrees, Body rotatable 330 degrees
- CE Certification , IP65

Applications

- Gases and Liquids Pressure Measurement
- Tank Temperature Monitoring and Control
- Temperature control systems
- Pipeline temperature Monitoring and Control
- HVAC and Boiler Systems
- Hydraulic Systems
- Pneumatic Systems

Description

The DT-TT920 series of smart temperature transmitters are designed for industrial automation and process control. DT-TT920 is a smart temperature transmitter and switch combining temperature measurement, local display indication and digital ON/OFF control together in one highly engineered device. The housing and wetted parts are made of 316L stainless steel. It uses an advanced ARM industrial-grade MCU for processing power and a high quality pt100 sensing element. With 4:1 turndown user scalability, the DT-TT920 is flexible to meet your needs. DT-TT920 has a fast reaction speed and good electro-magnetic compatibility for highly accurate and robust temperature control. It can be used for a wide range of industrial temperature control applications such as tank or pipe temp, hydraulic and pneumatic equipment, boilers and batching systems. DT-TT920 provides visual process indication and localized process control via 1 or 2 PNP switch contact outputs. It has optional analog outputs of 0-5VDC, 0-10VDC or 4-20mA.

DT-TT920 has advanced functions such as PNP output time delay setting, output range changing setting (scaling from 25%~100%), as well settings: clear zero, base point and peak display. The device can be installed vertically, horizontally or rack mounted. The body can rotate 330 degrees and the display can rotate 180 degrees in order for viewer to face the display screen in a user friendly direction. The blue OLED display is very clear to read. With a specialized communication adaptor, DT-TT920 can be connected with a PC or PLC for acquiring data using the Modbus communication function.



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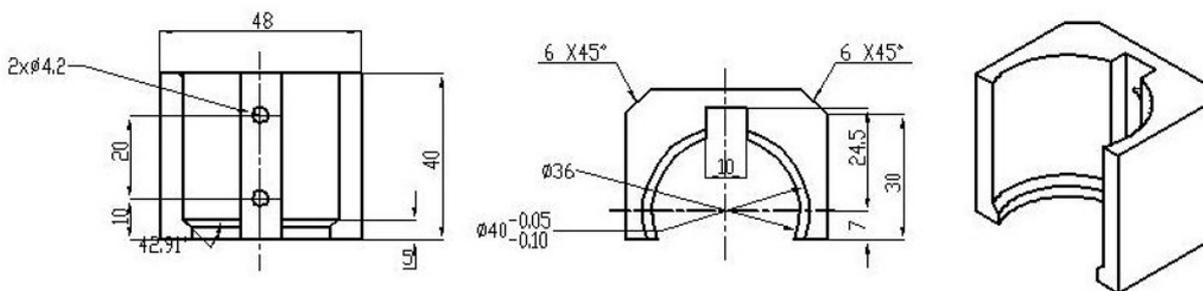
Dimensions

	Integrated Construction	Separated Construction	Forward up display
Unit: mm			
			Reversal display

Note: Standard product is integrated construction, separated construction is available upon request.

OPTIONAL MOUNTING BRACKET:

DT801 mounting bracket (optional components):



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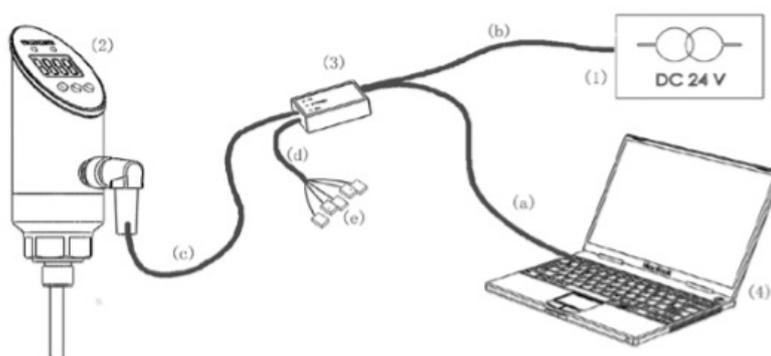


USER ROTATABLE DISPLAY AND BODY:

Forward up display	Reversal display	Forward up display
Rack Mounted installation	Pipe/tank horizontal installation	Pipe/tank vertical installation

With the advanced rotatable body and inverting display, you can install the device in various locations and rotate freely to see the display.

MODBUS COMMUNICATION CONNECTION:



(a)	USB connection cable	(1)	24VDC Power Supply(user purchase)
(b)	5.5mm DC Power Supply Plug	(2)	DT-TT920 Intelligent temperature switch
(c)	M12×1, 8-pin cable	(3)	DT 701Communication adaptor
(d)	5-pin RVVP shielded cable	(4)	PC
(e)	cable fastener: Red—VCC Green—OUTPUT	Yellow—K1	Black—GND Blue—K2

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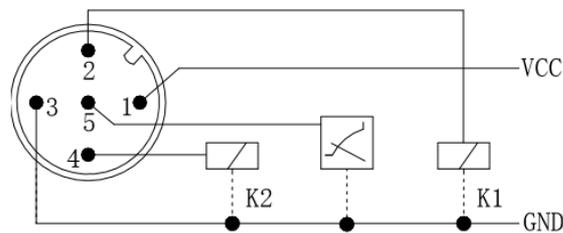
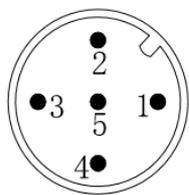
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5-PIN PLUG ANALOG AND DIGITAL CONNECTION:

(1) 5-pin plug pin definition and wire connection:

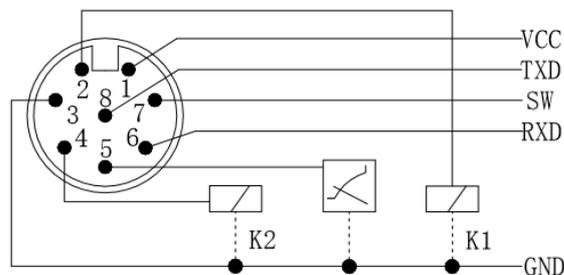
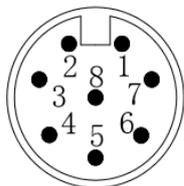
Wire	Color	1×PNP	2×PNP	1×PNP+ Voltage	2×PNP+ Voltage	1×PNP+ Current	2×PNP+ Current
1	Red	VCC					
2	Yellow	K1- Output					
3	Black	GND					
4	Blue	-	K2-Output	-	K2-Output	-	K2-Output
5	Green	-	-	0V~5/10V		0/4mA~20mA	



8-PIN PLUG ANALOG, DIGITAL AND MODBUS CONNECTION:

(2) 8-pin plug pin definition and wire connection:

Code	Wire color	1×PNP	2×PNP	1×PNP+ Voltage	2×PNP+ Voltage	1×PNP+ Current	2×PNP+ Current
1	Red	VCC					
2	Yellow	K1- Output					
3	Black	GND					
4	Blue	-	K2-Output	-	K2-Output	-	K2-Output
5	Yellow	-	-	0V~5/10V		0/4mA~20mA	
6	-	RXD					
7	-	SW					
8	-	TXD					



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Operating Modes – User Scalability

Range	Range Drift percent	New range	New range scale	
-50°C~200°C ①	25%FS ②	62.5°C ②	-50°C~12.5°C 12.5°C~75°C ③ 75.5°C~138°C 137.5°C~200°C	
	50%FS	125°C	-50°C~75°C 15°C~140°C 75°C~200°C	
	75%FS	187.5°C	-50°C~137.5°C 12.5°C~200°C	
	100%FS	250°C	-50°C~200°C	
-50°C~200°C ①	25%FS ②	62.5°C ② reversal output	12.5°C~75°C ④	

The DT-TT920 has flexible and advanced scalability options built in to the sensor, using the on board control of the MCU.

- Scalable turndown ratio of 4:1 (25% to 100% F.S.).
- User can select the URL (Upper Range Limit) and LRL (Lower Range Limit) so that the output is scaled to the window of pressure range that is required.
- User can reverse the operation of the analog output.
- Note – the accuracy remains the original sensor accuracy as %F.S.

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Operating Modes – PNP Output Programming

Hys. Mode	Win. Mode
<p>① Action Value ② Release Value ③ Difference between ① and ②/hysteresis ④ Output status of NO ⑤ Output status of NC</p>	<p>① Upper action value ② Lower action value ④ Output status of NO ⑤ Output status of NC</p>
<p>Setting range for switch points: Action Value: -46.25°C~200°C Release Value: -47.5°C~198.75°C Action Value-Release Value ≥ 1.25°C</p>	<p>Switch point setting ranges: Upper Action Value: -46.25°C~200°C Lower Action Value: -47.5°C~198.75°C Upper Action Value-Lower Action Value ≥ 1.25°C</p>
<p>Switch action time delay can be set: 0.0s~750.0s</p>	

The DT-TT920 has flexible and advanced PNP switched digital output options built in to the sensor, using the on board control of the MCU.

- Hysteresis Mode – Rising and Falling, Action and Release.
- Window Mode – ON/OFF within a window of the 0-100% scaled output.
- Delay timer for increased process control usability.
- User can reverse the operation of the analog output.
- Note – the accuracy remains the original sensor accuracy as %F.S.

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Technical Specifications

Parameter	Value	Note
Measurement Range	Standard: -50°C ~ 200°C (-58°F ~ 392°F) Custom ranges are available upon request	
Resolution	0.1°C	
Range Scalability	100% to 25% of F.S. / 4:1	
Accuracy	±0.5%F.S / ±1.0°C(±2.0°F)	
Thermal Drift	±0.15%F.S/10k	
Power Supply	12-30VDC	
Operating Temperature (media)	- 50°C~+200°C	
Environmental Temperature	- 25°C~+70°C	
Storage Temperature	- 40°C~+80°C	
Operating Humidity	0%RH to 85%RH	
Sensing element type	PT100 RTD	
Media Compatibility	Corrosive medium compatible with 316SS Body and 316SS diaphragm PTFE Gasket seal	
Screen Display	Blue OLED 128 x 64 resolution	
Switch Display	2 x Red LEDs	
Display Units	°C or °F - shows process and environmental temperature	
Key Push Buttons	3 Rubber Keys	
Digital and Analog Output Configurations	1 switch: 1×PNP 2 switches: 2×PNP 1 switch + voltage output: 1×PNP + 0V~ 5VDC/10VDC 2 switches + voltage output: 2×PNP + 0V~ 5VDC/10VDC 1 switch + current output : 1×PNP + 0mA/4mA~ 20mADC 2 switches + current output : 2×PNP + 0mA/4mA~ 20mADC Switch current: Max.1.2A Switch reaction: <10ms Switch time delay: 0.00s~750.00s Switch action pattern: Hys. Mode / Win. Mod	
Communication Signal	RS485 Modbus	
Sealing	PTFE gasket	
Gross Weight	300 grams (integrated) 580 grams (separated)	
Electrical connector	M12x1, 5 PIN Connector OR M12x1, 8 PIN Connector.	
Pressure Connection	M20×1.5, ½”BSP (G1/2), ¼”BSP (G1/4), NPT1/4	
Response Time	20 seconds	
Temperature Units	°C or °F	
Compliance Certification	RoHS, CE	
EMC	GB/T 17626.2/3/4-2006	
Shock	≤10g/10Hz...500Hz (IEC60068-2-6-2007)	
Impact	≤50g/11ms (IEC60068-2-27-2008)	

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Selection Guide

DT-TT920	Intelligent Temperature Switch (-50°C ~ 200°C)					
	Code	Construction				
	Null	Integrated construction				
	F	Separated construction				
		Code	Output			
		1K	1 × PNP			
		2K	2 × PNP			
		1KV	1 × PNP+0V~5/10VDC			
		2KV	2 × PNP+0V~5/10VDC			
		1KA	1 × PNP+0/4mA~20mADC			
		2KA	2 × PNP+0/4mA~20mADC			
			Code	Thread		
			C1	M20x1.5 male		
			C3	G1/2 male		
				Code	Probe length	
				L	L: 20mm~300mm	
					Code	Others
					R5	5-pin M12X1 plug (cable)
					R8	8-pin M12X1 plug for Modbus communication (cable)
DT-TT920	F	1KA	C1	20	R5	←the whole spec.

Optional Components

- DT-TT900 Communication adaptor DT701 (USB connector included, 2m RVVP cable with 8-pin M12*1 straight plug.
- DT801 Mounting Bracket
- DT901 2m RVVP cable with 5-pin M12X1 female right angle plug
- DT902 2m RVVP cable with 8-pin M12X1 female right angle plug
- The 5 PIN option does not come with MODBUS.
- If you require different types of process connections or functions, please talk to our sales engineers, we can accommodate many different requests.

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