Screw-in thermocouple temperature sensor MSTS-TS

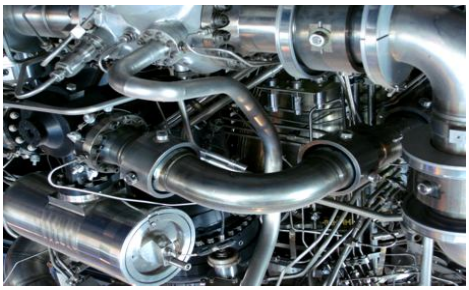
- Input:	thermocouple type K (-50...+200 °C)
- Output:	4...20 mA current loop HART (2-wire)
- Voltage supply:	out of current loop (12...40 VDC)
- Accuracy:	see technical details
- Process connection:	several options
- Electrical connection:	several plugs
- Temperature range:	-40...+85 °C (ambient)
- Limit value contacts:	2 electronically (NPN / PNP)
- Adjustment:	keys / software
- Material:	stainless steel 1.5471 (medium contact)
- Protection:	at least IP65

Technical data

Input		
Thermocouple:	type K, NiCr-Ni (-50...200 °C, minimum range: 50°C)	
Output		
Current signal:	4...20 mA with superimposed communication signal (HART), 2-wire current loop	
Current range:	3,8...20,8 mA	
Signal on error:	3,8 mA (sensor break, sensor open circuit)	
Performance		
Sensor:	Type K:	±1,5°C (according DIN EN 60584-2 class 1)
Measuring amplifier:	Accuracy:	0,5K or 0,08% of range
	Resolution:	16 Bit / 0,3 µA
	Long term stability:	0,05% / year
	Filter setting:	yes
	Transmission behaviour:	temperature linear
	Turn-on delay time:	<5 s
	Response time:	1 s
Indicator / limit values:	Resolution:	-9999...9999 digit
	Error of measurement:	±0,2% of range, ±1 digit
	Temperature drift:	100 ppm/K
	Features:	according VDMA 24574-1 up to 24574-4
	Operation:	according VDMA 24574-1 up to 24574-4
Programmable features		
Measuring amplifier:	measuring range start / measuring range end /	
Display:	range of indication / time of indication / decimal point / units / stabilisation of zero point / locking of programming / calibration points / TAG number	
Limit value contacts:	limit value 1 and 2 / hysteresis 1 and 2 / delay times 1 and 2	

Applications

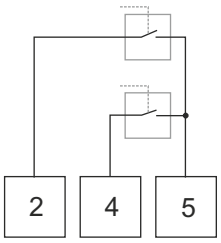
For use in climating, ventilating and heating installations and the whole range of industrial application. With it's two configurable limit value contacts, the integrated display and the numerous electrical connections, the temperature sensor is also suitable for applications with higher requirements.



Technical data (continued)

Indication	
Display:	7 segment, 8,5 mm, red, 4 digits, representation mirror-inverted 180° possible
Head of display:	rotatable approx. 330°
Memory:	minimum / maximum values
Indication:	- measuring value - unit of measurement - control menu
Decimal point:	automatically or manually, dependent on measuring range / unit Representation: xxxx / xxx.x / xx.xx / x.xxx
Limit contacts	
Electronically:	2x PNP or NPN (30 VDC, 200 mA) Option: 2x PNP or NPN (30 VDC, 1000 mA)
Indication:	1 LED red for each limit value
Voltage across:	<1 V
Settings:	with 3 keys (TouchM-Technology)
Setting range:	switch point and hysteresis: any value within measuring range
Switching delay:	0,0...999,9 s
Failsafe function:	adjustable
Galvanical insulation:	switching outputs are separated from measuring amplifier
Supply	
Voltage:	HART current loop: 12...40 VDC VDC
Load:	R = (U_B-12 V) / 22 mA
Reverse battery protection:	available (no function, no damage)
Ambient conditions	
Temperature:	Operating range: -40...+85 °C Medium: -50...+200 °C Storing: -40...+100 °C
Condensation:	uncritical
Mechanics	
Dimensions:	see page 3
Process connection:	1/4" /3/8" / 1/2" / 3/4" / 1" / 1/4NPT / 3/8NPT / 1/2NPT
Extension:	100 mm (Option)
Electrical connection:	see page 3
Material:	Protecting tube: stainless steel 1.4571 (standard 6x0,5 mm) Extension: stainless steel 1.4571 Process connection: stainless steel 1.4571 Body: PBT GF30 Head of display: polycarbonate (makrolon)
Weight:	approx.150 g (70 mm, 1/2", M12)
Fitting position:	any
System pressure:	PN 25
Protection of device:	Ingress protection: at least IP 65 (electronics) PCB: potted

Connection M12-plug (example)

Assignement plug M12x1, 8-pole				
Current loop 4...20 mA HART + - 1 3	Electronical limit value contacts  2 4 5	Shield ⏚ 8		

Electrical connection

M12x1	Super Seal	Deutsch	Deutsch	Bayonet	Valve	MIL	
							
4-, 5-, 8-pole	3-pole	3-pole	4-pole	4-pole	4-pole	6-pole	

Connection Limit value (LV)	M12 4-pole	M12 5-pole	M12 8-pole	Bayonet 4-pole	Deutsch 4-pole	Deutsch 3-pole	Super Seal 3-pole	Valve 4-pole	MIL 6-pole	
1 electronical LV	X	X	X	X	X			X	X	
2 electronical LV		X	X						X	

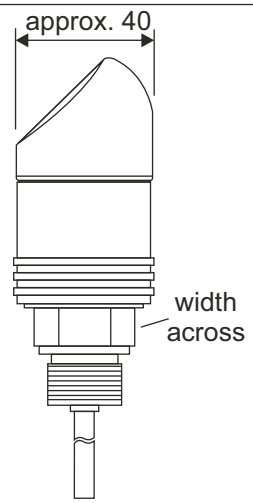
HART Communication and configuration

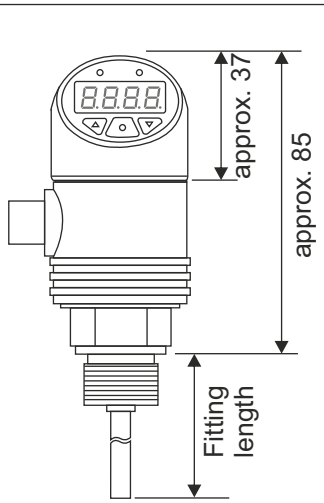
The HART-Tool is a graphical user interface for the ME series with menu-driven progam for configuration. It can be used for putting into operation, configuration, analysis of signals, data backup and documentation of the device.
Operating systems: Windows 2000, Windows XP
Connection via HART interface (modem) with USB interface of a PC or hand-held HART communicator

Settings:
- Adjustment of output current
- Limits of measuring range
- HART TAG number
- 6-point calibration (linearization)
- Simulation of output current
- Linear output signal
- 2-point calibration
- Filter function
- HART address

Please note: When using communication via a HART modem, a comunication resistance of 250 Ω has to be taken into account.

Dimensions (in mm)





Ordering code

O	S	X	X	X	X	X	X	-	X	X	X

Input:	Thermocouple type K	0
Sensor type:	±1,5°C (according DIN EN 60584-2 class 1)	0
Protecting tube:	Ø6x0,5 mm	0
	Other protecting tube (to specify)	1
	Ø6x0,5 mm with extension 100 mm	2
	Other protecting tube with extension 100 mm (to specify)	3
Fitting length:	50 mm	0
	100 mm	1
	200 mm	2
	250 mm	3
	400 mm	4
	600 mm	5
	1000 mm	6
	Other length (to specify)	7
Process connection:	1/4”	0
	3/8”	1
	1/2”	2
	3/4”	3
	1”	4
	1/4NPT	5
	3/8” NPT	6
	1/2” NPT	7
Limit value contacts:	2x PNP, 30 VDC, 200 mA (standard)	0
	1x PNP, 30 VDC, 200 mA	1
	Without	2
	2x NPN, 30 VDC, 200 mA	3
	1x NPN, 30 VDC, 200 mA	4
	2x PNP, 30 VDC, 1000 mA	5
	1x PNP, 30 VDC, 1000 mA	6
	2x NPN, 30 VDC, 1000 mA	7
	1x NPN, 30 VDC, 1000 mA	8
Electrical connection:	M12, 4-pole	0
	M12, 5-pole	1
	M12, 8-pole	2
	Deutsch DT04, 3-pole	3
	Deutsch DT04, 4-poe	4
	Super Seal 1.5, 3-pole	5
	Bayonet (DIN), 4-pole	6
	Valve plug, 4-pole	7
	MIL, 6-pole	9
Configuration:	Factory setting[1)]	0
	Customized (to specify)[2)]	1
Other:	Special model	0

1) Measuring range: / Indicating range

2) All settings, which are possible according the technical data, can be selected. For not given values the details of factory-set are used..

Accessories:

Interface HART, USB, software Order No.: