Screw-in Infrared Temperature Sensor HART MSTS-IR

Characteristics

- Input:	Infrared radiation
- Maximum range	-40...+1000 °C
- Output:	4...20 mA HART
- Voltage supply:	24 VDC ±10%
- Accuracy:	see technical details
- Process connection:	several options
- Electrical connection:	M12 male, 8-pole
- Temperature range:	-20...+80 °C (ambient)
- Limit value contacts:	2 electronically (NPN / PNP)
- Adjustment:	keys / software
- Material:	stainless steel 1.5471 (medium contact)

Technical data

Input		
Infrared radiation:	-40...1000 °C	
Output		
Current signal:	4...20 mA with superimposed communication signal (HART)	
Current range:	3,6...21 mA	
Signal on error:	21 mA (sensor break, sensor open circuit, Sensor short circuit, underflow)	
Performance		
Infrared sensor:	Range:	-40...1000 °C (minimum range: 100 °C)
	Spectral region:	8...14 µm
	Optical resolution:	15:1
	Accuracy*:	±1,5 °C, ±1,5%
	Repeatability*:	±0,75 °C, 0,75%
	Temperature coefficient:	±0,05 K/K, ±0,05% (ambient temperature: <18 °C, >28 °C)
	Resolution:	0,1 °C
	Response time:	30 ms (t90)
	Warm-up time:	10 min
	Emissivity, amplification:	0,100...1,100
	Transmittance:	0,100...1,000
* Temperature: ambient = 23±5 °C, test object = >0 °C / whichever is greater / ε = 1 / response time = 1 s		
Measuring amplifier:	Accuracy:	0,3% of range
	Resolution:	16 Bit
	Filter setting:	0...99 s
	Transmission behaviour:	temperature linear
	Measuring rate:	10 measurements / s
	Adjustment:	keys on display / via software (HART communication)
	Turn-on delay time:	<5 s
Indicator / limit values:	Resolution:	-9999...9999 digit
	Error of measurement:	±0,2% of range, ±1 digit
	Temperature drift:	100 ppm/K

Applications

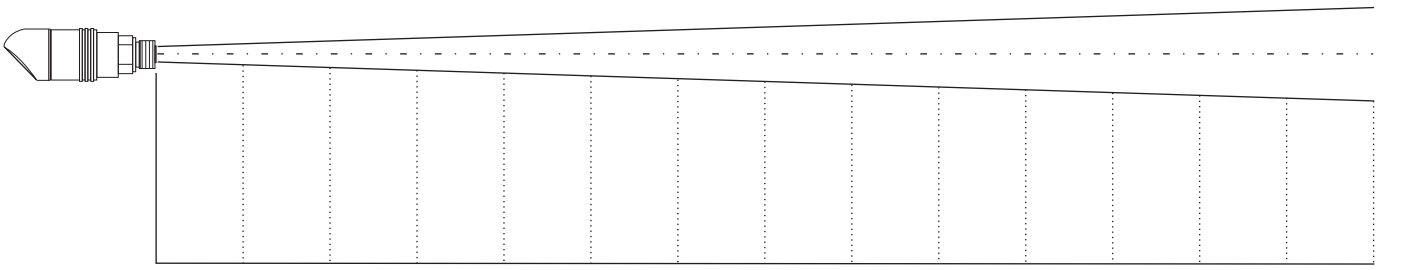
The MSTS-IR is designed for process monitoring with a non-contact measurement of temperature. With it's two configurable limit value contacts, the integrated display and the numerous electrical connections, the temperature sensor is also suitable for applications with higher requirements.




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
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:	24 VDC ±10%
Reverse battery protection:	available (no function, no damage)
Ambient conditions	
Temperature:	Operating range: -20...+80 °C Sensing head: -20...120 °C Storing: -40...+85 °C
Air humidity:	10...95% rH (no condensation)
Mechanics	
Dimensions:	see page 3
Process connection:	1/2" / 3/4" / 1" / 1/2NPT
Electrical connection:	M12 male, 8-pole
Material:	Process connection: stainless steel 1.4571 Sensing head: stainless steel Body: PBT GF30 Head of display: polycarbonate (makrolon)
Weight:	approx.240 g
Fitting position:	any (avoid deposition on optics)
System pressure:	0 bar (barometric pressure)
Protection of device:	Ingress protection: at least IP 65 (electronics) PCB: potted
Vibration:	IEC 68-2-6: 3G, 11 – 200 Hz, any axis
Shock:	IEC 68-2-27: 50G, 11 ms, any axis
Programmable features	
Measuring amplifier:	Measuring range start (LRV) / Measuring range end (URV) / Adjustment, simulation of output current / Filter function / Linear output signal / HART address / 2-point calibration
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
Features, Operation:	according VDMA 24574-1 up to 24574-4

Optical charts



S (mm)	6,5	8,3	10	15	20	25	30	35	40	45	50	55	60	65	70
D (mm)	0	75	150	225	300	375	450	525	600	675	750	825	900	975	1050

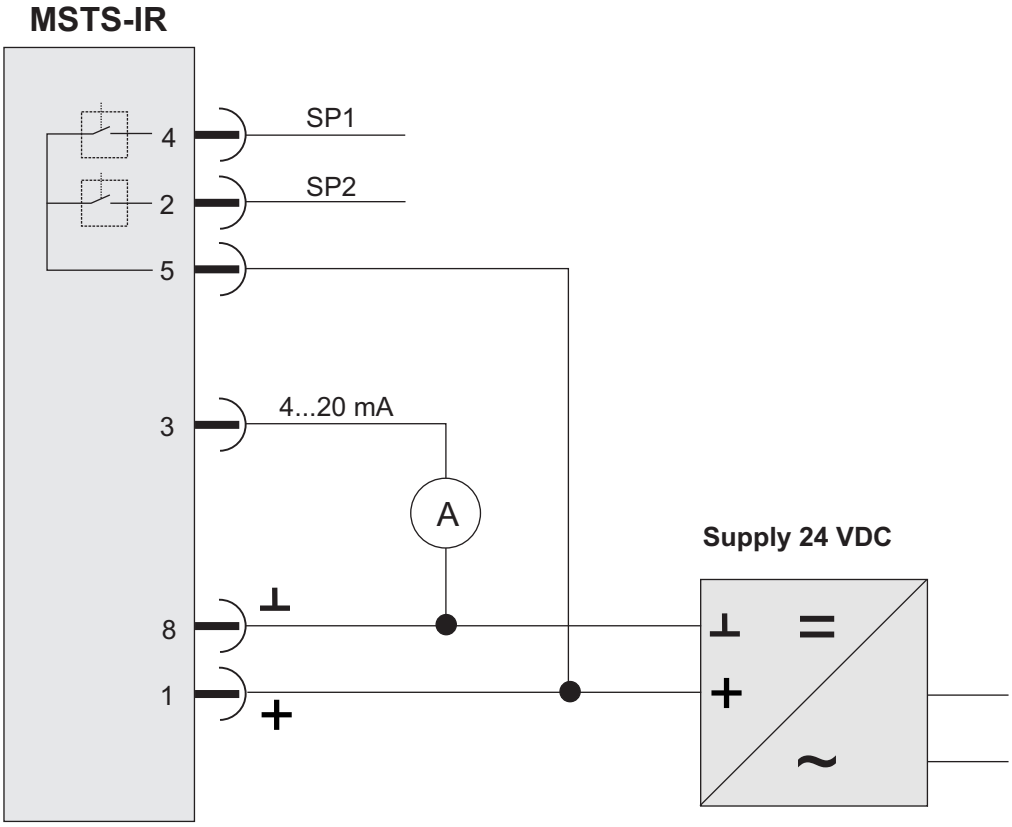
S = Spot size D = Distance from front of the sensing head to the object

For valid measurement the spot size should be as large as the object or smaller.

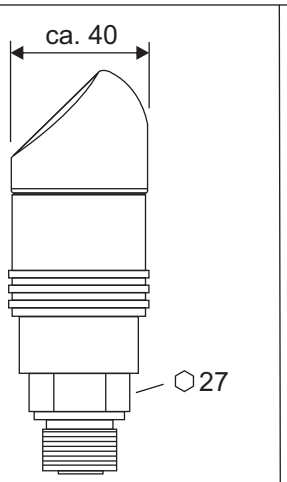
Electrical connection

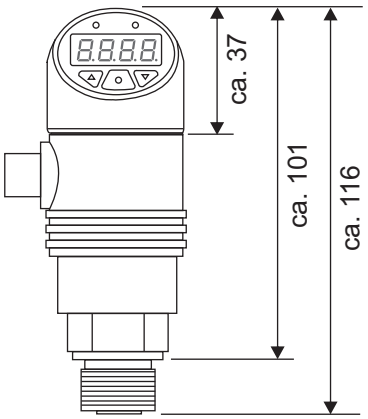
Assignment plug M12x1, 8-pole				
4...20 mA HART + 1 - 3	Electronical limit value contacts 2 4 5	Supply + 1 ⊥ 8		

Example of electrical connection



Dimensions (in mm)





Order code

O	C	X	X	X	X	X	X	-	X	X	X

Input:	Infrared radiation	0
Sensor type:	MIELT15	0
Process connection:	1/2”	3
	3/4”	4
	1”	5
	1/2” NPT	9
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, 8-pole	2
Configuration:	Factory setting[1)]	1
	Customized (to specify)[2)]	2
Special model:	No	0
	Yes (to specify)	1

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.:

HART Communication

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, XP, Windows 7 und 8.1
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
- 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.