

Duct / Immersion Temperature Sensor

Active sensor (4...20 mA) for measuring temperature in duct applications. In combination with a stainless steel or brass thermowell can also be used for pipe applications. IP65 / NEMA 4X rated enclosure.


Type Overview

Type	Output signal active temperature	Probe length	Probe diameter
22DT-54H	4...20 mA	2" [50 mm]	0.24" [6 mm]
22DT-54L	4...20 mA	4" [100 mm]	0.24" [6 mm]
22DT-54N	4...20 mA	6" [150 mm]	0.24" [6 mm]
22DT-54P	4...20 mA	8" [200 mm]	0.24" [6 mm]
22DT-54R	4...20 mA	12" [300 mm]	0.24" [6 mm]
22DT-54T	4...20 mA	18" [450 mm]	0.24" [6 mm]

Technical Data

Electrical Data	Power supply DC	15...24 V, $\pm 10\%$, 0.5 W		
	Electrical connection	Removable spring loaded terminal block max. 2.5 mm ²		
	Cable entry	Cable gland with strain relief $\varnothing 6..8$ mm (1/2" NPT conduit adapter included)		
Functional Data	Multirange	8 measuring ranges selectable		
	Output signal active note	current output: max. 500 Ω load		
	Application	air water		
Measuring Data	Measuring values	temperature		
	Measuring range temperature	Active sensor: range selectable Attention: max. measuring temperature is restricted by max. fluid temperature (see Safety data)		
	Setting	range [°C]	range [°F]	Factory setting
	S0	-50...50°C	-30...130°F	
	S1	-10...120°C	0...250°F	
	S2	0...50°C	40...140°F	
	S3	0...250°C	30...480°F	
	S4	-15...35°C	0...100°F	
	S5	0...100°C	40...240°F	
	S6	-20...80°C	40...90°F	
	S7	0...160°C	0...150°F	✓
	Accuracy temperature active	$\pm 0.9^\circ\text{F}$ @ 70°F [$\pm 0.5^\circ\text{C}$ @ 21°C]		
	Time constant t (63%) in the air duct	typical 46 s @ 3 m/s typical 210 s @ 0 m/s		
	Time constant t (63%) in water pipe	typical 7 s with thermowell brass typical 9 s with thermowell stainless steel		

Materials	Cable gland	PA6, black
	Housing	cover: lexan, orange base: lexan, orange seal: 0467 NBR70, black UV resistant
Safety Data	Ambient humidity	max. 95% r.H., non-condensing
	Ambient temperature	-30...120°F [-35...50°C]
	Fluid temperature	-60...320°F [-50...160°C]
	Housing surface temperature	max. 160°F [70°C]
	Protection class IEC/EN	III protective extra-low voltage (pelv)
	Protection class UL	UL Class 2 Supply
	EU Conformity	CE Marking
	Certification IEC/EN	IEC/EN 60730-1
	Certification UL	cULus acc. to UL60730-1A/-2-9, CAN/CSA E60730-1:02/-2-9
	Degree of protection IEC/EN	IP65
	Quality Standard	ISO 9001

Safety Notes


This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application. Unauthorised modifications are prohibited. The product must not be used in relation with any equipment that in case of a failure may threaten humans, animals or assets.

Ensure all power is disconnected before installing. Do not connect to live/operating equipment.

Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.

The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Remarks
General Remarks Concerning Sensors

When using lengthy connection wires (depending on the cross section used) the measuring result might be falsified due to a voltage drop at the common GND-wire (caused by the voltage current and the line resistance). In this case, 2 GND-wires must be wired to the sensor - one for supply voltage and one for the measuring current.

Sensing devices with a transducer should always be operated in the middle of the measuring range to avoid deviations at the measuring end points. The ambient temperature of the transducer electronics should be kept constant. The transducers must be operated at a constant supply voltage (± 0.2 V). When switching the supply voltage on/off, onsite power surges must be avoided.

Build-up of Self-Heating by Electrical Dissipative Power

Temperature sensors with electronic components always have a dissipative power which affects the temperature measurement of the ambient air. The dissipation in active temperature sensors shows a linear increase with rising operating voltage. This dissipative power should be taken into account when measuring temperature. As Belimo transducers work with a variable operating voltage, only one operating voltage can be taken into consideration, for reasons of production engineering. Transducers 0...10 V / 4...20 mA have a standard setting at an operating voltage of DC 24 V. That means, that at this voltage, the expected measuring error of the output signal will be the least. For other operating voltages, the offset error will be increased by a changing power loss of the sensor electronics. If a recalibration should become necessary later directly on the sensor, this can be done by means of a trimming potentiometer on the sensor board.

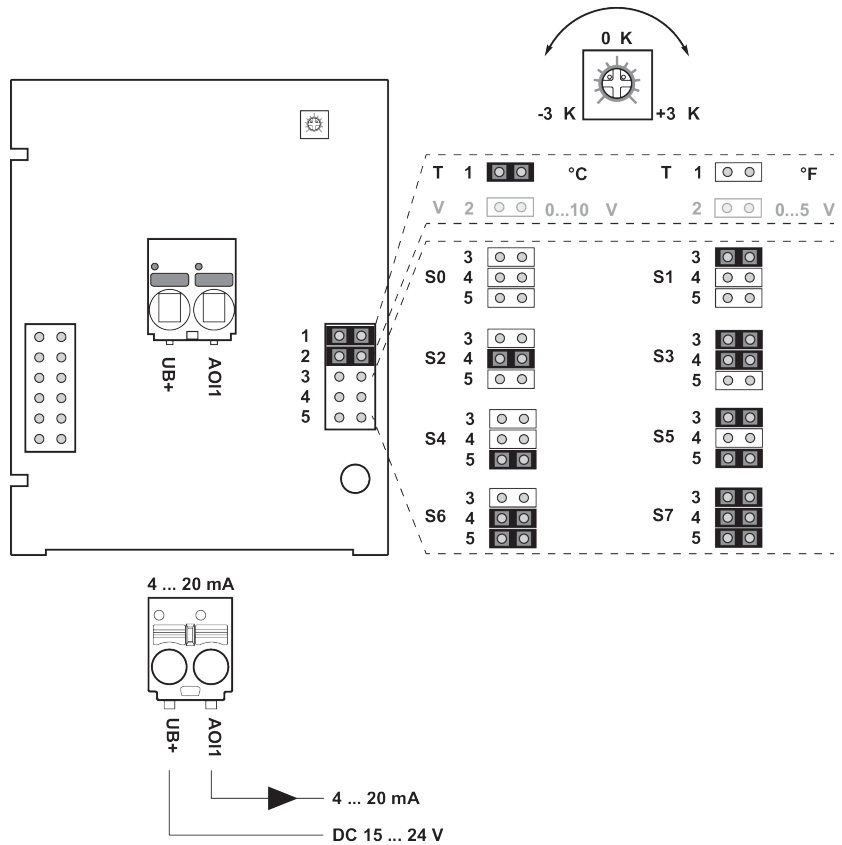
Scope of delivery

Scope of delivery	Description	Type
	Mounting clip, with screws and adhesive foil	A-22D-A11
	1/2" NPT conduit adapter	

Accessories

Optional accessories	Description	Type
	Mounting plate S housing	A-22D-A09
	Cold barrier, Plastic, L 50 mm, for thermowell pocket A-22P-A..	A-22P-A51
	Connection adapter, M20, for cable 1 x 6 mm, Multipack 10 pcs.	A-22G-A01.1
Optional accessories air	Description	Type
	Mounting flange for sensor probe 6 mm, up to max. 80°C, Plastic	A-22D-A03
	Mounting flange for sensor probe 6 mm, up to max. 260°C, Brass	A-22D-A05
Recommended accessories water	Description	Type
	Thermowell pocket (fabricated) Stainless steel, 2" [50 mm], 1/2" NPT, wrench size 3/4"	A-22P-A05
	Thermowell pocket (fabricated) Brass, 2" [50 mm], 1/2" NPT, wrench size 3/4"	A-22P-A17
	Thermowell pocket (machined) Stainless steel, 2" [50 mm], 1/2" NPT, wrench size 3/4"	A-22P-A36
	Thermowell pocket (fabricated) Stainless steel, 4" [100 mm], 1/2" NPT, wrench size 3/4"	A-22P-A07
	Thermowell pocket (fabricated) Brass, 4" [100 mm], 1/2" NPT, wrench size 3/4"	A-22P-A19
	Thermowell pocket (machined) Stainless steel, 4" [100 mm], 1/2" NPT, wrench size 3/4"	A-22P-A37
	Thermowell pocket (fabricated) Stainless steel, 6" [150 mm], 1/2" NPT, wrench size 3/4"	A-22P-A09
	Thermowell pocket (fabricated) Brass, 6" [150 mm], 1/2" NPT, wrench size 3/4"	A-22P-A21
	Thermowell pocket (machined) Stainless steel, 6" [150 mm], 1/2" NPT, wrench size 3/4"	A-22P-A38
	Thermowell pocket (fabricated) Stainless steel, 8" [200 mm], 1/2" NPT, wrench size 3/4"	A-22P-A11
	Thermowell pocket (fabricated) Brass, 8" [200 mm], 1/2" NPT, wrench size 3/4"	A-22P-A23
	Thermowell pocket (machined) Stainless steel, 8" [200 mm], 1/2" NPT, wrench size 3/4"	A-22P-A39
	Thermowell pocket (fabricated) Stainless steel, 12" [300 mm], 1/2" NPT, wrench size 3/4"	A-22P-A13
	Thermowell pocket (fabricated) Brass, 12" [300 mm], 1/2" NPT, wrench size 3/4"	A-22P-A25
	Thermowell pocket (fabricated) Stainless steel, 18" [450 mm], 1/2" NPT, wrench size 3/4"	A-22P-A15
	Thermowell pocket (fabricated) Brass, 18" [450 mm], 1/2" NPT, wrench size 3/4"	A-22P-A27
	Syringe with thermal paste	A-22P-A44

Wiring Diagram

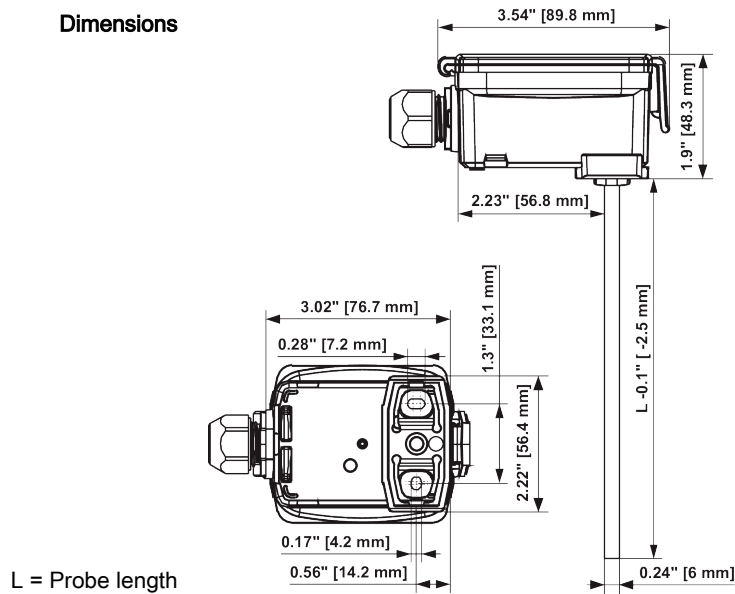


The adjustment of the measuring ranges is made by changing the bonding jumpers. The output value in the new measuring range is available after 2 seconds.

Setting	range [°C]	range [°F]	Factory setting
S0	-50...50°C	-30...130°F	
S1	-10...120°C	0...250°F	
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S3	0...250°C	30...480°F	
S4	-15...35°C	0...100°F	
S5	0...100°C	40...240°F	
S6	-20...80°C	40...90°F	
S7	0...160°C	0...150°F	✓

Dimensions

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22DT-54H	2" [50 mm]	0.26 lb [0.12 kg]
22DT-54L	4" [100 mm]	0.29 lb [0.13 kg]
22DT-54N	6" [150 mm]	0.29 lb [0.13 kg]
22DT-54P	8" [200 mm]	0.31 lb [0.14 kg]
22DT-54R	12" [300 mm]	0.33 lb [0.15 kg]
22DT-54T	18" [450 mm]	0.35 lb [0.16 kg]