

**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

Туре	Output signal active temperature	Probe length	Probe diameter
22DT-54H	420 mA	2" [50 mm]	0.24" [6 mm]
22DT-54L	420 mA	4" [100 mm]	0.24" [6 mm]
22DT-54N	420 mA	6" [150 mm]	0.24" [6 mm]
22DT-54P	420 mA	8" [200 mm]	0.24" [6 mm]
22DT-54R	420 mA	12" [300 mm]	0.24" [6 mm]
22DT-54T	420 mA	18" [450 mm]	0.24" [6 mm]

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Technical Data					
Electrical Data	Power supply DC	1524 V, ±10%, 0.5 W			
	Electrical connection	Removable spring loaded terminal block max. 2.5 mm <sup>2</sup>			
	Cable entry	-	and with strain		nm (1/2"
Functional Data	Multirange	8 measuring ranges selectable			
	Output signal active note	current output: max. 500 $\Omega$ load			
	Application	air water			
Measuring Data	Measuring values	temperat	ture		
	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	-5050°C	-30130°F	_
		S1	-10120°C	0250°F	
		S2	050°C	40140°F	
		S3	0250°C	30480°F	
		S4	-1535°C	0100°F	
		S5	0100°C	40240°F	
		S6	-2080°C	4090°F	
		S7	0160°C	0150°F	~
	Accuracy temperature active	±0.9°F @ 70°F [±0.5°C @ 21°C] typical 46 s @ 3 m/s typical 210 s @ 0 m/s			
	Time constant t (63%) in the air duct				
	Time constant t (63%) in water pipe	typical 7 s with thermowell brass typical 9 s with thermowell stainless steel			



Technical data sheet	22DT-54
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#### **Materials**

Cable glarid	PAO, DIACK
Housing	cover: lexan, orange
	base: lexan, orange
	seal: 0467 NBR70. black

#### Safety Data

	UV resistant	
Ambient humidity	max. 95% r.H., non-condensing	
Ambient temperature	-30120°F [-3550°C]	
Fluid temperature	-60320°F [-50160°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.



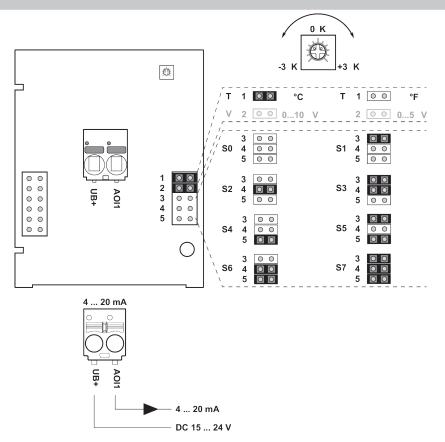
## Scope of delivery

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

Accessories		
Optional accessories	Description	Type
	Mounting plate S housing Cold barrier, Plastic, L 50 mm, for thermowell pocket A-22P-A Connection adapter, M20, for cable 1 x 6 mm, Multipack 10 pcs.	A-22D-A09 A-22P-A51 A-22G-A01.1
Optional accessories air	Description	Туре
	Mounting flange for sensor probe 6 mm, up to max. 80°C, Plastic Mounting flange for sensor probe 6 mm, up to max. 260°C, Brass	A-22D-A03 A-22D-A05
Recommended accessories water	Description	Туре
	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	A-22P-A27
	size 3/4" Syringe with thermal paste	A-22P-A44



## Wiring Diagram



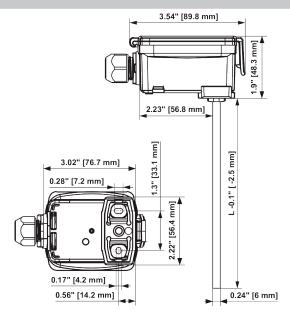
The adjustment of the measuring ranges is made by changing the bonding jumpers. The output value in the new measuring range is available after 2 seconds.

Setting	range [°C]	range [°F]	Factory setting
S0	-5050°C	-30130°F	
S1	-10120°C	0250°F	
S2	050°C	40140°F	
S3	0250°C	30480°F	
S4	-1535°C	0100°F	
S5	0100°C	40240°F	
S6	-2080°C	4090°F	
S7	0160°C	0150°F	~



### **Dimensions**

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L = Probe length

Туре	Probe length	Weight
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]