

SB./SP. - ST./TPC



Temperature Sensors

MODEL	RANGE [°C]	Sensing element	Application
SBA	T50	Balco	Room
SBA55	5T35	Balco+pot.	Room
SBC	-10T120	Balco	Immersion
SBD	-20T65	Balco	Air duct
SBE	-20T60	Balco	Outdoor
SBF	-10T120	Balco	Strap-on (pipe)
SBV	-20T65	Balco	Air duct
STA42	5T35	NTC+Pot.	Room
STA71	5T35	NTC	Room
STA75S	5T35	NTC+Pot.	Room
STA79S	5T35	NTC+Pot.+sel.	Room
STA80S	5T35	NTC+Pot.+sel.	Room
STD71	T35	NTC	Duct
STR71	T35	NTC	Return air (room)
SPC	-10T150	Platinum	Immersion
TPC	T500	Platinum	Immersion
SPT1000	-30T250	Platinum	Solar collectors



SBA/STA42/71



STA75S



STA79S/80S



SBA55



S.C



TPC



SBD/SBV



S.C



STR71



SPT1000

APPLICATION AND USE

Temperature sensors are employed in heating and air conditioning systems for both civil and industrial purposes. Connected to the relevant controllers or I/O modules, they allow detecting and controlling room, immersion, duct and outdoor temperature.

This series include sensors fitted with potentiometer for set point adjustment of the controller they are connected to, and sensors equipped with fan speed selector and on-off switch for specific fan-coil application.

OPERATION

The sensors detect temperature through the sensing element, that varies its ohm value according to the one detected. Each sensor is distinguished by the sensing element type, which determines its ohm/°C function, and by application. All sensors, except those with NTC thermistor, have direct variation sensing element (ohm value increases when the temperature increases).

Sensors with thermoresistance sensing element have reversed characteristics, i.e. their ohm value decreases when temperature increases. All sensors, except the TPC platinum sensors provided with 2 wires + 1 line compensation wire, must be connected to the controller by means of 2 suitable wires, in order to receive the Ohm signal generated by the corresponding sensing element.

COMPONIBILITA' SONDE-REGOLATORI iSMA CONTROLLI

SENSOR	ANALOGUE CONTROLLER	DIGITROLL CONTROLLER
SB.	200-500-KX436	4000
SP./TP.	TX500	-
STA42	RT200	-
STA71	RT700	7000

The performances stated in this sheet can be modified without any prior notice.

SENSOR	ANALOGUE CONTROLLER	DIGITROLL CONTROLLER
STA75S/80S	-	7000
STA79S	RT700	-
STD71	RT700	7000
STR71	700	7000

SENSOR	DIGITAL CONTROLLER
SPT1000	Multinet, Blue ID

MANUFACTURING CHARACTERISTICS

Product conforms to EMC 89/336 directive according to the below-mentioned standards: for emission EN 50081-1; for immunity EN 50082-1

Room sensors consist of an ABS base supporting the electronic card with the sensing element and terminals for electrical connections.

Air duct sensors consist of an ABS case with the terminal board; from its back part comes out the sheath, containing the sensing element at its end.

Only in the case of SBV sensor, the sheath, in its ending part, is provided with holes which make temperature detection faster. The case cover is fixed by screws and, in room sensors, is slotted for air circulation.

Pipe sensors, like air duct sensors, consist of an ABS case including, in the inner part, a card with the terminals for the electrical connections.

The sensing element is inserted into a steel conduit fitted with a male threaded connection for insertion on pipe connection. The TPC sensor is characterised by an aluminium DIN B connection head, which includes the electronic card with the terminals for the electrical connections located on the ceramic terminal strip.

Wire sensors consists of a silicone sheath inside which pass the 2 wires coming from the sensitive element that will be connected to the terminal board of the controller for the electrical connection.

INSTALLATION

Room sensors (S-A)

Mount the sensor on a wall at approximately 1.5 m from floor level, in an area representing the average room temperature. Avoid installation near doors, windows, heat sources and in air stagnation zones. Remove the lid and mount the sensor on the wall by screwing it using the two holes on the case bottom.

Pipe sensors

Immersion (S-C/T-C)

These sensors, except TPC sensors, are fitted with a sheath which allows the sensing element replacement, in case of malfunctioning, by extracting it from the well.

This overcomes the need to empty the pipe if the eventual sensor substitution is required.

Insert the sheath into the 1/2" female threaded fitting, having 15 mm max. length, welded on the pipe. The supplied sheath pipe is in AISI 304 steel while the threaded connection is made of brass: in case an AISI 304 sheath connection is required, the 421 accessory has to be ordered.

The sensor installation point must be preferably in a curve of the pipe and downstream the circulation pump, at least 1 m from the constant flow outlet of the control valve.

Insert the sensing element rod as much as possible into the sheath so as to obtain the max measurement accuracy, then tighten the fixing screw on the sheath connection.

TPC sensor is not equipped with sheath, the connection is mounted directly on the sensor into the 1/2" gas female connection, max. threaded length 15 mm, welded on the pipe.

In such case the eventual sensor replacement makes pipe emptying necessary. In order to provide the sensor with an auxiliary steel sheath, add accessory 421.

Strap-on sensors (S-F)

Remove the eventual isolation on the pipe and the painting before installing the sensor, then tighten the mounting strap around the pipe (max. pipe diameter 100 mm.).

Install the sensor preferably downstream the circulating pump and, anyway, at least 1 m from the control valve constant capa-

city outlet.

Air duct sensors (S-D/S-V)

Install the sensor in the duct by using the little flange and fix it on the duct wall by means of 2 screws. The sensor sheath must be totally immersed into the air duct, preferably in the middle, in vertical position.

Supply air sensor: install it downstream the supply fan and anyway at least 0,5 m far from the battery.

Sensor in return-air duct for room temperature detection: install it upstream the return air fan and anyway near the room return air duct.

Saturation point sensor: install it downstream the drop separator so that it cannot come into contact with water drops.

Outdoor sensors (S-E)

Install the sensor on the external wall of the building towards north or north-west.

However, avoid installation in a place directly exposed to sun beams. Moreover, avoid mounting near windows, louvered grilles, over doors, windows, stacks, or under balconies, protecting roofs, etc.

ELECTRICAL CONNECTIONS

For the cable type to be used and for terminal board connections to the controllers, make reference to the controller data sheets or to the diagrams and documents issued for the ordered control system execution.

It is fundamental to carry out the connections according to the existing standards, in particular CEI 64-8. It is, moreover, necessary to avoid positioning the sensor and the power cables into a single protection pipe or raceway.

Therefore, use separate and distant pipes or raceways.

In case of shielded cable, ground only one cable end.

ACCESSORIES

421 Stainless steel sheath AISI 304 with 1/2" gas male connection for SBC, SPC and SPT1000

BALCO sensors (SB.)

Model	Speed [m/s]	Response time (*) [s]		Con- nection	Max fluid pressure [Kpa]	Protection	Weight [Kg]
		$\Delta T = 0,1 \text{ } ^\circ\text{C}$	$\Delta T = 0,9 \text{ } ^\circ\text{C}$				
SBA	0,4	13	395	--	--	IP30	0,1
SBC	0,4	5,2	52,7	1/2" G(***)	4000	IP44	0,28
SBD	3	8,8	106	Flange	--	IP44	0,25
SBE	0,4	110	1060	--	--	IP44	0,2
SBF	--	61	475	Strap	--	IP44	0,2
SBV(**)	3	9,3	132	Flange	--	IP44	0,25

(*) Ref. Directive CEI 165-8/CENELEC HD 459 SD - standard IEC 751 (1983) mod. 1 (1986)

(**) not suitable for applications with possible condensation

(***) nichel-plated brass

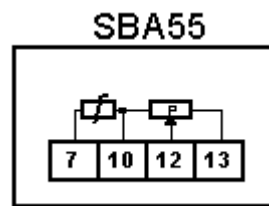
Note: SBC sensor is supplied together with 422 (brass) sheath.

TECHNICAL CHARACTERISTICS

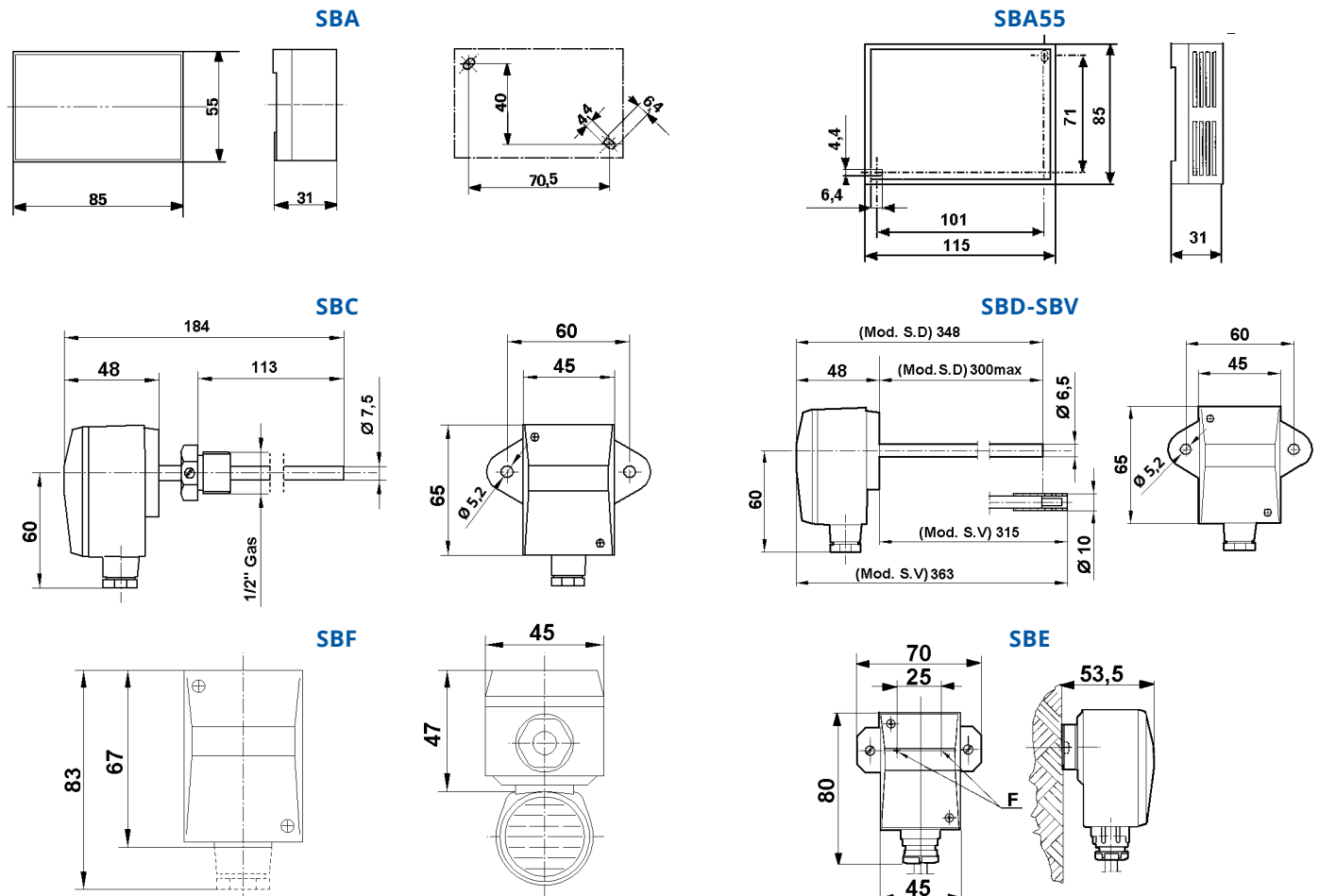
CHARACTERISTIC	DESCRIPTION
Sensing element	BALCO 1000 Ohm 21,1°C
Average variation	6,2 Ohm/°C
Accuracy	$\pm 0,8 \text{ K}$
Terminal board	Screw terminals for 1,5 mm ² max wires
Conduit opening	PG9 (SBA) except room version
Operating temp. (tested)	-10°C to 60°C
Storage temp.	-20°C to 65°C

ELECTRICAL CONNECTIONS

SBA/C/D/E/F/V 2 non polarised terminals



DIMENSIONS [mm]



NTC sensors (ST.)

Model	Speed [m/s]	Response time (*) [s]		Connection	Protection	Weight [Kg]
		$\Delta T = 0,1 \text{ }^\circ\text{C}$	$\Delta T = 0,9 \text{ }^\circ\text{C}$			
STA71	0,4	6	260	-	IP30	0,1
STA42/75S	0,4	6	260	-	IP30	0,1
STA79S/80S	0,4	6	260	-	IP30	0,152
STD71	3	3	45	Flange	IP30	0,2
STR71	3	1	16	Threaded	IP30	0,05

(*) Ref. CEI165-8/CENELEC HD459S2 directive - standard IEC751 (1983) mod. 1 (1986)

TECHNICAL CHARACTERISTICS

CHARACTERISTIC	DESCRIPTION
Sensing element	NTC Thermistor 5000 Ohm 25°C
Aver. variation (negative)	290 Ohm/°C
Terminal board	screw terminal for 1,5 mm ² wires, except STR bipolar flexible 1 m cable
Conduit opening	PG9 (only for STD)
Operating temp.	-10°C to 60°C
Storage temp.	-25°C to 65°C

Room sensors with potentiometer for set-point variation

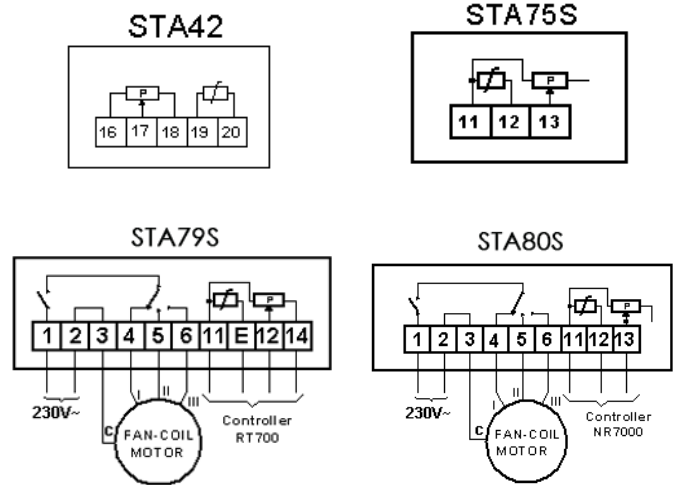
STA42 external knob
 STA75S external knob without degree scale

Room sensors with potentiometer for set-point variation and 3 fan-coil speed selector (230 V~) or on-off switch

STA79S external knob without degree scale
 STA80S external knob without degree scale

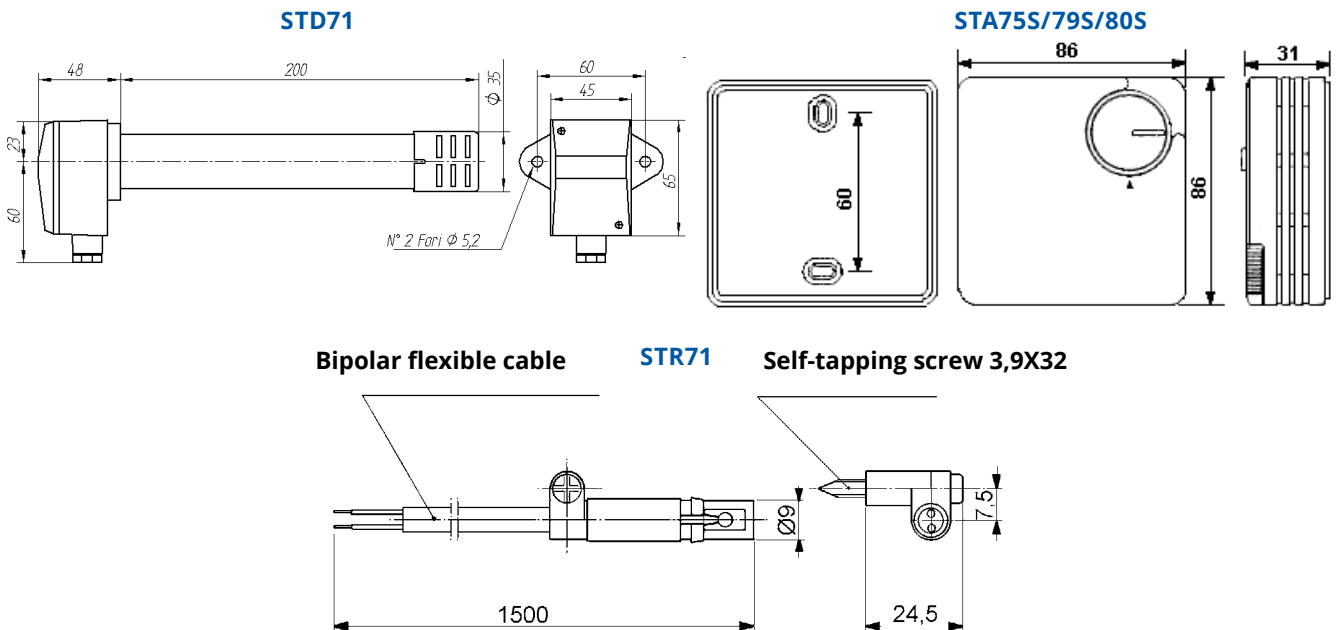
ELECTRICAL CONNECTIONS

STA71/STD71 2 non polarised terminals
 STR71 cable with 2 non polarised wires



DIMENSIONS [mm]

For STA71/42 see SBA dimensions



PLATINUM sensors (SPC/TPC)

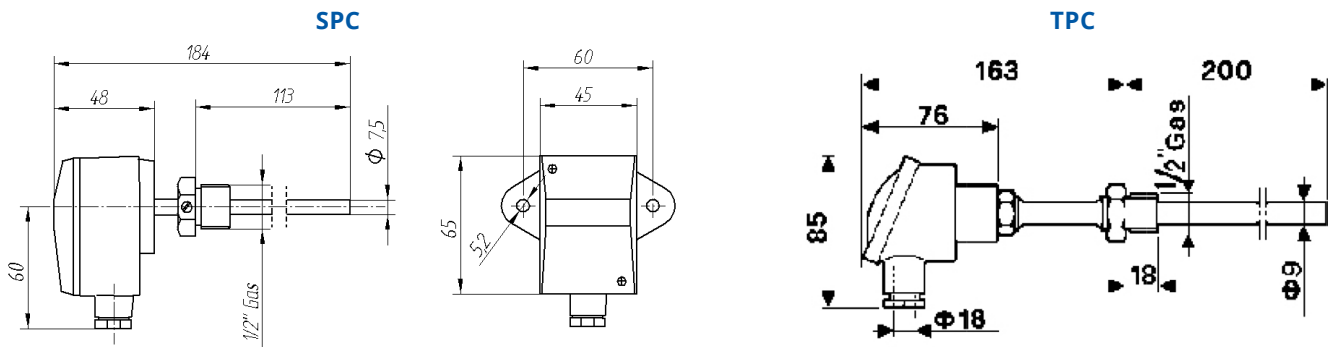
Model	Speed [m/s]	Response time (*) [s]		Length [mm]	Ø [mm]	Connection	Max fluid pressure (Kpa)	IP	Weight [Kg]
		ΔT = 0,1 °C	ΔT = 0,9 °C						
SPC	0,4	3,6	35	113	7,5	1/2" Gas brass	4000	IP44	0,28
TPC	0,4	3,6	35	200	9	1/2 AISI 304	5000	IP45	0,4

(*) Ref. CEI165-8/CENELEC HD459S2 directive - standard IEC751 (1983) mod. 1 (1986)

TECHNICAL CHARACTERISTICS

CHARACTERISTIC	DESCRIPTION
Sensing element	Platinum 100 Ohm 0°C
Accuracy	± 0,1%
Average variation	0,366 Ohm/°C
Operating temp.	-10°C to 60°C
Storage temp.	-20°C to 65°C
Terminal board	SPC, 2 terminals 2,5 mm ² max TPC, 3 terminals (2 wires + 1 line compensation wire) 2,5 mm ² max

DIMENSIONS [mm]



COLLEGAMENTI ELETTRICI

SPC 2 non polarised terminals

TPC 1 WHITE terminal and 1 RED terminal signal output to controller;
1 WHITE terminal for line compensation (if present)

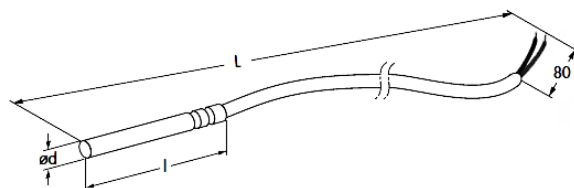
WIRE sensor (SPT1000)

TECHNICAL CHARACTERISTICS

CHARACTERISTIC	DESCRIPTION
Sensing element	Platinum 1000 Ohm 0°C
Average variation	at 0 °C 1000 Ohm ± 0,12%
Operating temperature	-30°C to 250°C
Protection	IP67

DIMENSIONS [mm]

L: 1500 mm
Ød: 6 mm
l: 50 mm



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