

## SCC-T1-Tp2 (-OP) Temperature Transmitter for PT1000 probes

### Features

- Precision temperature measurement for different ranges and accuracies
- Minimum and maximum value memory
- 0...10V, 0...20mA or 2...10V, 4...20mA measuring signals, selectable with jumpers
- Optional alternative signal ranges programmable
- Selectable averaging signal
- Optional external display device (OPA-S)

### Applications

- For indoor, outdoor, duct, immersion temperature measurement for heating, ventilation and air conditioning applications.
- Recording of minimum and maximum values for critical environments
- Supervision of critical temperatures

### Functions

The transmitter measures the temperature for a PT1000 platinum film element. The transmitter does not include the PT1000 sensor. An external PT1000 according to EN 60751 has to be connected for the transmitter to operate. The microprocessor samples the temperature constantly. It calculates an averaging signal over a preset number of measurements and generates an output signal based on lower and upper signal range values. Standard range is -40...400°C (-40...752°F) and 1 seconds average.

The output signal range and type may be customized by jumpers and if required by a programming tool. Standard signal ranges are 0-10VDC, 2-10VDC, 4-20mA and 0-20mA. These ranges can be set by jumpers. Other ranges can be set by using a programming tool. (OPA-S or OPC-S)

### Minimum and Maximum Values:

Using the programming tool, the user has the option to read out and reset minimum and maximum values. The minimum and maximum values may as well be used as output signals. The minimum and maximum values are saved into a non-volatile memory and are therefore available after a power interruption.

### Ordering

Item Name	Item Code	Temperature Range	Options
SCC-T1-Tp2	40-300075	-40...400°C (-40...752°F)	
SCC-T1-Tp2-OP	40-300076	-40...400°C (-40...752°F)	with display module
(*) For measuring accuracy add to accuracy of sensing element			

### Connect these sensors to the SCC

Item name	Item Code	Description	Sensing element
S-Tp2-2	40-20 0012	Flying lead sensor, 2 m cable	PT1000 EN 60751
SD-Tp2-12-2	40-20 0024	Flying lead duct sensor; Probe length 12 cm, 2 m cable	
SD-Tp2-20-2	40-20 0027	Flying lead duct sensor; Probe length = 20 cm, 2 m cable	
SDB-Tp2-12	40-20 0056	Duct sensor, Probe length 12 cm	
SDB-Tp2-20	40-20 0034	Duct sensor, Probe length 20 cm	
SRA-Tp2	40-20 0041	Indoor sensor	
SOD-Tp2	40-20 0064	Outdoor sensor	
OPA-S	40-50 0006	External display module	
AMC-1	20-10 0035	Cable gland PG9 for cables Ø 4 – 8 mm (AWG 6 – 1)	
AMC-2	20-10 0067	Conduit connector NPT 1/2	

### Technical Specification

Power Supply	Operating Voltage	24 V AC 50/60 Hz ± 10%, 24VDC ± 10%
	Power Consumption	Max 2 VA
	Internal rectification:	Half wave rectified
Connection	Signal ground = power ground	Security transformer required
	Terminal Connectors	For wire 0.34...2.5 mm <sup>2</sup> (AWG 24...12)
Sensing Probe	Sensing Element	PT1000 EN 60751
Signal Outputs	Output Signal	DC 0-10V or 0...20mA
	Resolution	10 Bit, 9.7 mV, 0.019.5 mA
	Accuracy	± 0.5%
	Maximum Load	20 mA, 500 $\Omega$ (current output mode)
Environment	Operation	To IEC 721-3-3
	Climatic Conditions	class 3 K5
	Temperature	0...70°C (32...158°F)
	Humidity	<95% R.H. non-condensing
	Transport & Storage	To IEC 721-3-2 and IEC 721-3-1
Standards	Climatic Conditions	class 3 K3 and class 1 K3
	Temperature	-20...80°C (-4...176°F)
	Humidity	<95% R.H. non-condensing
Standards	Mechanical Conditions	class 2M2
	CE conformity	2004/108/EC
Standards	EMC Directive	2006/95/EC
	Low Voltage Directive	2006/95/EC
Standards	Product standards	
	Automatic electrical controls for household and similar use	EN 60 730 – 1
	Special requirement on temperature dependent controls	EN 60 730 – 2 – 9
	Electromagnetic compatibility for industrial and domestic sector	Emissions: EN 60 730-1 Immunity: EN 60 730-1
	Degree of Protection	IP64 to EN 60 529
General	Safety Class	III (IEC 60536)
	Housing Materials	PC+ABS (UL94 class V-0)
General	Dimensions (H x W x D)	68 x 91 x 47mm (2.7 x 3.7 x 1.9in)
	Weight (including package)	SCC-T1-Tp2 : 185g (6.5 oz) SCC-T1-Tp2-OP : 215g (7.6 oz)

### Installation

The SCC should be installed on a flat vertical surface protected from direct sunlight and rain.

- **The cable openings must face downwards.**
- To install the transmitter, secure the base plate with two screws on a flat weather protected surface.
- Connect the wires according to the wiring diagram to the measuring circuit in the cover.
- Seal the wire with the cable gland provided.
- Assemble the cover with the base plate. Make sure the seal in the seal groove of the cover is not damaged and in place.
- Tighten the four screws of the cover with equal moderate torque to complete the installation.

### Analog Output Configuration

The analog output signal type may be configured with a jumper for 0-10 VDC or 0-20 mA control signals. The jumper is located next to the terminal connector of the analog output. See table below for jumper placement. The factory default-setting is set to 0-10 VDC.

Signal Range	JP2 Jumper selection
0 – 10 V, 0 – 20 mA	(1-2)
2 – 10 V, 4 – 20 mA	(2-3)

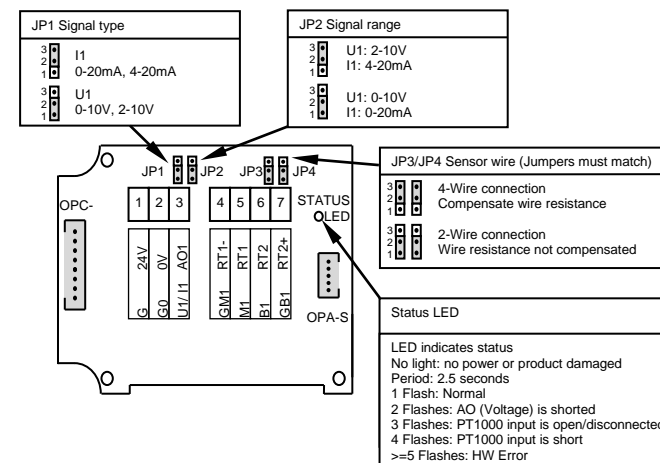
Signal Type	JP1 Jumper selection
0 – 10 V	(1-2)
0 – 20 mA	(2-3)

output range specified with the default position of other setting the position of the range defined with the

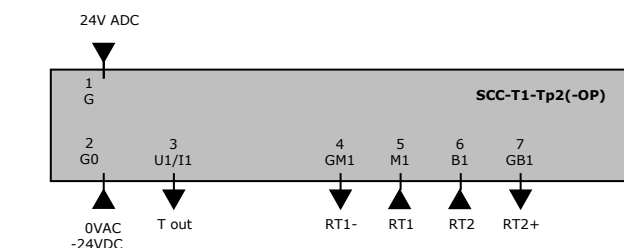
### 4-wire vs. 2-wire sensor

PT1000 measurement allows precise temperature measurement through a temperature dependent resistor. Any connection wire, especially if they have a certain length, will add (and thus falsify) the measured resistance. It is therefore suggested, in order to keep accuracy, to connect a 4-wire sensor to the transmitter when cables are longer than a very few meters. In case of a 4 wire sensor, JP3 & JP4 should be placed on position 2-3 or removed. When connected with only 2 wires, then these 2 jumpers must be set to position 1-2.

### Wiring Diagram

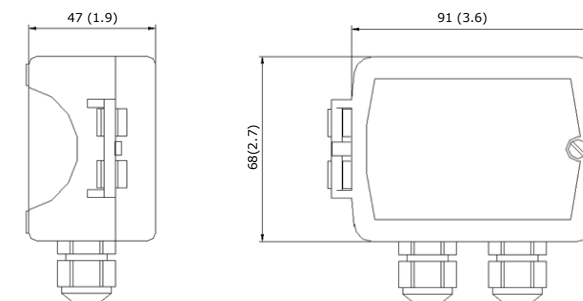


### Terminal Connections



- 1: G Power supply 24VAC, +24VDC
- 2: G0 Power supply 0VAC, -24VDC
- 3: U1 JP1 = 1-2, voltage output of temperature transmitter 0...10V or 2...10V (JP2)
- 3: I1 JP1 = 2-3, current output of temperature transmitter 0...20mA or 4...20mA (JP2)
- 4: GM1 Negative power supply for external sensing element
- 5: M1 Negative measuring input for external sensing element
- 6: B1 Positive measuring input for external sensing element
- 7: GB1 Positive power supply for external sensing element

### Dimensions [mm](inch)



### Configuration of SCC-T1-Tp2-OP or SCC-T1-Tp2 with OPA-S

In order to configure the SCC transmitter or access minimum and maximum settings either the SCC-T1-Tp2-OP has to be used or an OPA-S remote terminal need to be connected.  
Standard display:  
The current, minimum or maximum value is shown in the large digits. The small digits indicate the active input. (IN 1). The vertical bar on the right side indicates the actual output voltage or current in 10% steps.

#### Indication and reset of minimum and maximum values

Activate the desired transmitter for dual transmitter by pressing the RIGHT key. Press UP to display Maximum values, press DOWN key to display minimum values.  
Resetting minimum or maximum values: Pressing either UP or DOWN keys for longer than 3 seconds while the minimum or maximum values are displayed.

### Configuration parameters

The SCC *intelligent* sensors can be adapted to fit perfect into your application. The preparation of the sensing signal is defined by parameters.

The parameters are password protected. The parameters can be changed as follows:

1. Press UP and DOWN key simultaneously for three seconds. The display will indicate CODE.
2. Select a password using UP or DOWN keys. Dial **09** in order to get access to the configuration parameters. Press the RIGHT key after selecting the correct password.
3. Once logged in, choose IP for input configuration or OP for output configuration using UP or DOWN. Press the RIGHT key after selection.
4. The parameters are now displayed. The small digits show the parameter number, the large one its value.
5. Select the parameters with the UP/DOWN keys. Change a parameter by pressing the RIGHT key. The MIN and MAX symbols show up and indicate that the parameter may be modified now. Use UP and DOWN key to adjust the value. After you are done, press RIGHT or LEFT key in order to return to the parameter selection level.
6. Press the LEFT key again so as to leave the menu. The unit will return to normal operation if no key is pressed for more than 5 minutes.
7. The parameters and its values depend on the transmitter. Please use the respective datasheet for the list of parameters

#### Input configuration

Parameter	Description	Range	Default
IP 00	TI1: Celsius or Fahrenheit, C = OFF, F = ON	ON, OFF	OFF
IP 01	TI1: Samples taken for averaging control signal	1...255	1
IP 02	TI1: Calibration	-10...10	0.0
IP 03	TI1: Minimum temperature	-40...400°C (752°F)	-40 °C
IP 04	TI1: Maximum temperature	-40...400°C (752°F)	400°C

#### Output configuration

Parameter	Description	Range	Default
OP 00	AO1: Configuration of output signal: 0 = Feedback temperature input 1 = Feedback temperature minimum value 2 = Feedback temperature maximum value	0 - 2	0
OP 01	AO1: Minimum limitation of output signal	0 - Max %	0%
OP 02	AO1: Maximum limitation of output signal	Min - 100%	100%

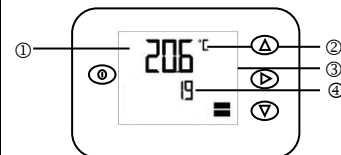
#### Error messages

Following error condition may be displayed:

**Err1:** Communication time out between terminal unit and transmitter. Terminal unit will reset after 10 seconds.

**Err2:** Temperature sensor faulty. The connection to the temperature sensor may be interrupted or the temperature sensor is damaged.

#### Display and Keys SCC-T1-Tp2-OP



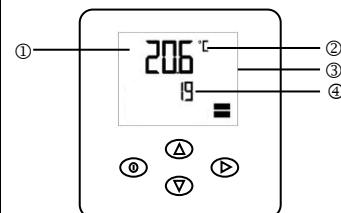
Legend:

1. 4-digit display of current value, Minimum, Maximum or control parameter
2. Unit of displayed value, °C, °F, % or none
3. Vertical display of output or input signal with a resolution of 10%
4. 4-digit display of current value or control parameter

#### Operation Keys:

- ① LEFT key: Exit from parameter menu
- △ UP key: Display Maximum values, Press for more than 2 seconds resets Maximum value
- ▽ DOWN key: Display Minimum values, Press for more than 2 seconds resets Minimum value
- ▷ RIGHT key: Select transmitter, For transmitters with more than one input.

#### Display and Keys for OPA-S



Legend:

1. 4-digit display of current value, Minimum, Maximum or control parameter
2. Unit of displayed value, °C, °F, % or none
3. Vertical display of output or input signal with a resolution of 10%
4. 4-digit display of current value or control parameter

#### Operation Keys:

- ① LEFT key: Exit from parameter menu
- △ UP key: Display Maximum values, Press for more than 2 seconds resets Maximum value
- ▽ DOWN key: Display Minimum values, Press for more than 2 seconds resets Minimum value
- ▷ RIGHT key: Select transmitter, For transmitters with more than one input.