SCC-T1-Tp2 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 LCD display (OPC-S) or external display (OPU-S)
- Status LED

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

Temperature transmitter

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 once per second. It calculates an averaging signal over a preset number of seconds and generates an output signal based on lower and upper signal range values. Standard range is -40…400°C (-40…752°F) and 1 second's 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 on the –OP transmitter or by connecting OPU-S.

Minimum and maximum values

By using a display module (-OP or OPU-S), 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.

Types and Ordering

Part Name	Part No.	Measuring 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)	Includes display module OPC-S

Accessories

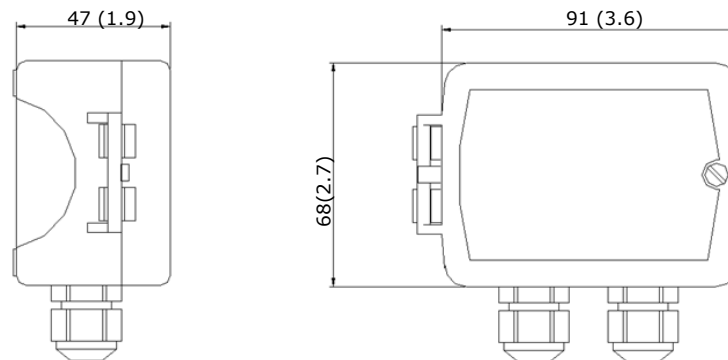| Part Name	Part No.	Description
S-Tp2-2	40-200012	Flying lead sensor, 2 m cable
SD-Tp2-12-2	40-200024	Flying lead duct sensor; Probe length 12 cm, 2 m cable
SD-Tp2-20-2	40-200027	Flying lead duct sensor; Probe length = 20 cm, 2 m cable
SDB-Tp2-12	40-200056	Duct sensor, Probe length 12 cm
SDB-Tp2-20	40-200034	Duct sensor, Probe length 20 cm
SRA-Tp2	40-200041	Indoor sensor
SOD-Tp2	40-200064	Outdoor sensor
OPU-S	40-500030	External display module
AMC-1	20-100035	Cable gland PG9 for cables ⌀ 4 – 8 mm (AWG 6 – 1)
AMC-2	20-100067	Conduit connector NPT 1/2

Technical Specification

Important notice and safety advice

This device is for use as a temperature transmitter. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent such a device failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

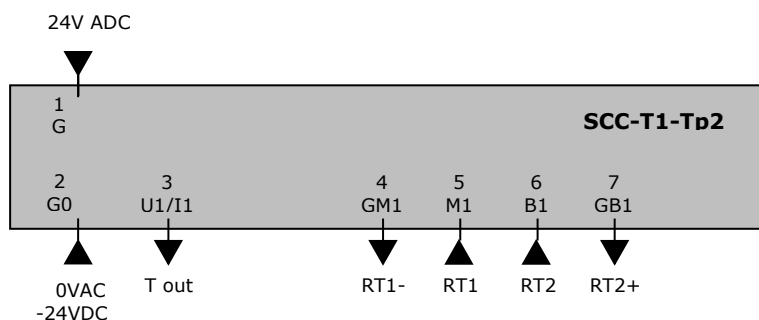|		
Power Supply	Operating Voltage	24 V AC 50/60 Hz ± 10%, 24VDC ± 10%
	Power Consumption	Max 2 VA
	Internal rectification: Signal ground = power ground	Half wave rectified Security transformer required
Connection	Terminal Connectors	For wire 0.34...2.5 mm² (AWG 24...12)
Signal Inputs	Sensing Element	PT1000 EN 60751
Signal Outputs	Output Signal Resolution Maximum Load	DC 0-10V or 0...20mA 10 Bit, 9.7 mV, 0.019.5 mA Voltage: ≥1kΩ Current: ≤250Ω
Environment	Operation Climatic Conditions Temperature Humidity	To IEC 721-3-3 class 3 K5 0...70°C (32...158°F), 0...50°C (32...122°F) for -OP type <95% R.H. non-condensing
	Transport & Storage Climatic Conditions Temperature Humidity Mechanical Conditions	To IEC 721-3-2 and IEC 721-3-1 class 3 K3 and class 1 K3 0...70°C (32...158°F), 0...50°C (32...122°F) for -OP type <95% R.H. non-condensing class 2M2
Standards	CE conformity EMC Directive Low Voltage Directive	 2004/108/EC 2006/95/EC
	Product standards Automatic electrical controls for household and similar use Special requirement on temperature dependent controls	 EN 60 730 –1 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
	Safety Class	III (IEC 60536)
General	Housing Materials	Fire proof PC+ABS (UL94 class V-0)
	Dimensions (H x W x D): Transmitter case	 68 x 91 x 47mm (2.7 x 3.7 x 1.9 in)
	Weight (including package)	SCC-T1-Tp2 : 185g (6.5 oz) SCC-T1-Tp2-OP : 215g (7.6 oz)

Dimension [mm](in)

Installation

The transmitter should be installed, probe facing down, directly on the wall, in weather protected area.

1. Turn the single screw on the cover counter clockwise and remove cover.
2. Mark the location for the mounting holes on the wall.
3. Depending on the wall material, drill two holes for plugs or use self-tapping screws.
4. Mount the transmitter flat on a wall in a weather protected area. The cable glands or conduit connectors must face downwards.
5. Connect the conductors to the terminals according to wiring diagram.
6. While in the open position, slide the two hooks of the cover into the latch at the left side of the back part.
7. Close the front part.
8. Tighten the single screw on the cover clockwise to secure the cover to the back part. There is no need to tighten the screw too much.

Connection terminals

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

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 must be placed in position 2-3. When connected with only 2 wires, then these 2 jumpers must be set to 1-2.
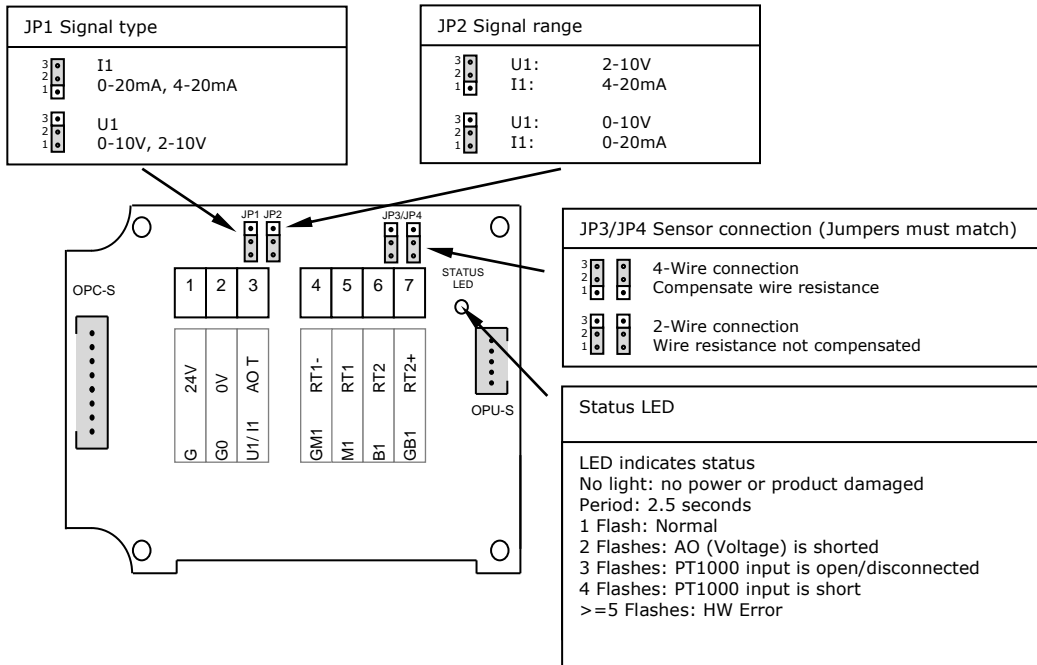
Output signal configuration

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

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

The signal range may be set with JP2 for both analog outputs. JP2 will only operate if the output range specified with OP01 and OP02 is left at the default position of 0…100%. With any other setting the position of JP2 has no influence and the range defined with the output parameters applies.

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

Jumper settings

JP1 Signal type	
3 2 1	I1 0-20mA, 4-20mA
3 2 1	U1 0-10V, 2-10V

JP2 Signal range		
3 2 1	U1: I1:	2-10V 4-20mA
3 2 1	U1: I1:	0-10V 0-20mA

JP1 JP2   JP3/JP4

OPC-S

1	2	3
24V	0V	AO T
G	G0	U1/I1

4	5	6	7
RT1-	RT1	RT2	RT2+
GM1	M1	B1	GB1

STATUS LED

OPU-S

JP3/JP4 Sensor connection (Jumpers must match)	
3 2 1	4-Wire connection Compensate wire resistance
3 2 1	2-Wire connection Wire resistance not compensated

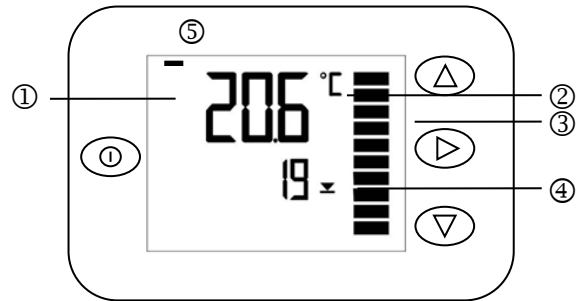| Status LED |
|---|
| LED indicates status
No light: no power or product damaged
Period: 2.5 seconds
1 Flash: Normal
2 Flashes: AO (Voltage) is shorted
3 Flashes: PT1000 input is open/disconnected
4 Flashes: PT1000 input is short
>=5 Flashes: HW Error |

Configuration of SCC-T1-Tp2-OP or SCC-T1-Tp2

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 OPU-S remote terminal need to be connected.

Display and operation

Legend:
1. 4-digit display of current value, Minimum, Maximum or control parameter
2. Unit of displayed value, °C, °F, % or none
3. Graphical display of output or input signal with a resolution of 10%
4. 4-digit display of current value or control parameter
5. Left bar = display of minimum value
   Right bar = display of maximum value

Ⓘ   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.

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

Indication and reset of minimum and maximum values

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.
6. After you are done, press RIGHT or LEFT key in order to return to the parameter selection level.
7. 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.

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%

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Vector Controls LLC
17, Francis J. Clark Circle
Bethel, CT 06801
USA

infous@vectorcontrols.com
www.vectorcontrols.com