PROCESS SENSORS
CORPORATION
a KPM brand

User Manual

PSC-T42L / PSC-T42G
PSC-S42N / PSC-G42N

Process Sensors Corporation
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CHAPTER 1

General information

We are pleased that you purchased a high quality pyrometer from our pyrometer series PSC-T42L / PSC-T42G / PSC-S42N / PSC-G42N for non-contact temperature measurement.

Please read this manual carefully before beginning any operation with the pyrometer and keep it in a save place. It contains all the necessary information for set up and long-term operation of the pyrometer.

If you have any questions, we would ask you to read this manual first.

Should you still have any open questions, notice any errors in this manual or wish to pass on any tips and suggestions for improvement, please inform your supplier or contact us directly:

Process Sensors Corporation
113 Cedar Street, S-1
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Tel.: 508 473 9901
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Email: IRtemp@processsensors.com
www: www.processsensorsIR.com

This way, you help us to provide you with the best possible product and correct documentation.

CHAPTER 2

General advice and safety regulations

In this chapter

Intended usage

This device has to be used only for non-contact temperature measurement. If you use the pyrometer not compliant to the description in this user manual it may cause loss of all warranty claims against the manufacturer.

Use and maintenance of the pyrometer

Use of the pyrometer is restricted to qualified personnel which has got instructions before initial operation and handling. Instructions should be given by a supervisor or optionally by Process Sensors Corporation customer service.

The pyrometer must be operated only with an isolated safety extra-low voltage (SELV) that poses no danger to health and life of the user. Please refer to chapter Technical data and accessories, on page 12.

Modifications of the device

It is strongly prohibited to do technical modifications of the device without permission of the manufacturer. Contraventions absolve the manufacturer from liability for any damages. It automatically causes loss of all warranty claims against the manufacturer. Please note that the damage of the warranty seal on the back of the device also causes the loss of warranty claims.

Environmental protection

The lens or its coating may contain harmful materials, which are without danger following the intended usage. The unit may not be disposed of with normal waste, for disposal send the device to Process Sensors Corporation, 113 Cedar Street S-1, Milford, MA 01757

Disposal (in accordance with RL2002/96/EC)

Laser operation

Fully mounted units including integrated laser-aiming light or optional laser aiming light adaptor meet the safety requirements of Class 2 and are identified accordingly:

Do not look directly into the beam when the laser is switched on!

Laser class 2:
Safe to the human eye for short time duration due to the eyelid closing reflex (looking into the beam for up to 0.25 s).

CHAPTER 3

MAINTENANCE AND WARRANTY

In this chapter

Maintenance

The device does not need any maintenance.

ATTENTION: Do not clean the lens with acidic or solvent-based fluids. A slight pollution of the lens can be cleaned by using dry and oil free compressed air. For heavy pollution, please use a soft and dry tissue.

Packing and storage

If the original packaging is not available, please use a shock-proof package for shipment of the pyrometer. For overseas shipment or long term storage in rooms with high humidity the pyrometer should be heat sealed to protect it against humidity. Please also protect the optics with a protection cover (as delivered) or a plastic film.

Warranty

PSC will replace or repair defective parts, which result from design errors or manufacturing faults, within a period of one year from the date of shipment. Special terms can be arranged, in writing, at the time of purchase of the equipment. Devices, for which the return under warranty has been approved, should be sent to Process Sensors Corporation.

The warranty is void if the device is opened, disassembled, modified, or otherwise destroyed, without obtaining prior written approval from PSC. The warranty is also void if the device is improperly used, or if it is operated or stored under conditions which do not correspond to those defined in the technical specification.

Process Sensors Corporation does not accept liability for any damage or losses which might occur, including financial losses and consequential damages, as a result of use of the equipment, or which occurs as a result of defects in the design or manufacture of the device.

The seller does not give any warranty or assurances, that the equipment can be utilized for any special applications for which the customer did not inform PSC.

Declaration

Changes in the interests of technical progress or changes that go back to amended statutory provisions stay reserved during delivery time if the delivery item is not substantially changed and therefore the serviceability is not touched, the value is preserved or increased and the changes are reasonable for the purchaser.

CHAPTER 4

Introduction

In this chapter

Scope of delivery

- PSC-T42L / PSC-T42G / PSC-S42N / PSC-G42N
- two mounting screw nuts M40 × 1.5
- connection cable 5 m (5 pin)
- lock screw M16 × 1.5
- manual
- inspection sheet

Please note: For further cable lengths (available separately) please refer chapter Accessories, on page 16.

Application range

The compact and digital PSC pyrometer PSC-T42L / PSC-T42G / PSC-S42N / PSC-G42N is especially designed for industrial purposes. This device is suitable for non-contact temperature measurement between –20 °C and 2500 °C and got three different spectral ranges, depending on the application.

The PSC-T42L (8 µm to 14 µm) is usable for many applications in fields of non-metallic or coated metallic surfaces.

The PSC-T42G (5.14 µm) is ideal for measuring glass surface.

The devices PSC-S42N (0.8 µm to 1.1 µm) and PSC-G42N (1.5 µm to 1.8 µm) are suitable for measurements of metals, graphite, ceramics, Induction and flame heat treating applications.

The robust solid stainless steel housing allows usage in rough environmental conditions. Measuring spot sizes from 4.2 mm (PSC-T42L / PSC-T42G) and from 1.2 mm (PSC-S42N / PSC-G42N) can be easily realized. With a minimal response time (t_{95}) of only 100ms (PSC-T42L / PSC-T42G) and 10ms (PSC-S42N / PSC-G42N) the devices are usable for fast measuring tasks.

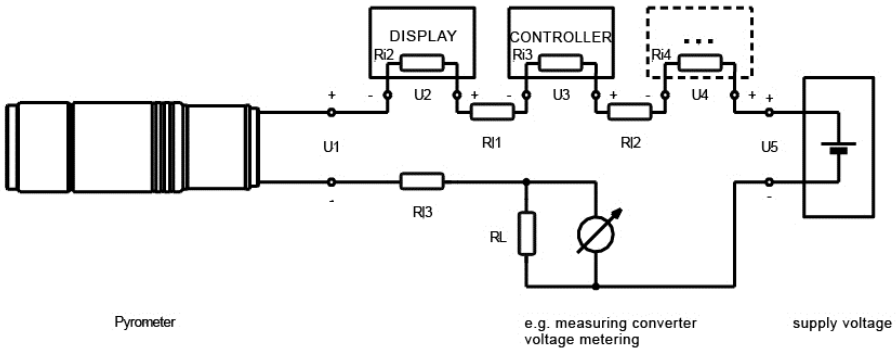
Emissivity can be adjusted directly at the device. The temperature linear standard output signal of 4 to 20 mA allows easy implementation in existing measuring and controlling systems.

The integrated laser aiming light or optional laser aiming light adaptor allow exact alignment to the measuring object.

Functional principle

The PSC-T42L / PSC-T42G / PSC-S42N / PSC-G42N work in two-wire technology. Both wires of a two-wire device will be used simultaneously for power supply and transmitting of the measuring signal. The infrared radiation of the measured object will be displayed on a detector and transferred in an electrical signal. This signal will be digitally processed and transferred in the standard temperature linear signal of 4 mA to 20 mA.

The power transmission of the measuring signal is specifically suitable for bridging great distances. In current operation the influence of electromagnetic interferences on the measuring signal is minimized (low resistance receiver input) Accessory devices like a digital display or a controller, that convert the output signal of 4 mA to 20 mA, can be integrated in the current loop.



Block diagram current loop

Voltage U1 must be 12 V minimum:
$U1_{min} = 12\,V = U - R_{Burden} \times 20\,mA$
$R_{Burden} = Ri2 + Ri3 + Ri4 + Rl1 + Rl2 + Rl3$

R_i	internal resistance of connected devices
R_l	lead resistance $R_l = \frac{\rho * l}{A}$
RL	load resistance
ρ	resistivityCu 0.0178 $\Omega * \frac{mm^2}{m}$
l	pipeline length ($cable\ length * 2$)
A	conductor cross section

Example: Rl at 100 m cable length and $A = 0.25\ mm^2$ approx. 15 Ω

If supply voltage $U = 24\,V$ → $R_{Burden} = 600\ \Omega$(maximum)
If supply voltage $U = 18\,V$ → $R_{Burden} = 300\ \Omega$ (maximum)
If supply voltage $U = 30\,V$ → $R_{Burden} = 900\ \Omega$ (maximum)

Basics

Find detailed information concerning basics of non-contact temperature measurement technology in references /1/-/3/.

Every real body emits according to its surface temperature and infrared radiation which intensity is less than that of an ideal radiating blackbody radiator of the same temperature. The ratio of the radiations is characterized by emissivity ε. Emissivity charts can be found on our website at www.processsensorsIR.com

/1/ Touloukian, Y.S..: Thermophysical Properties of Matter: The TPRC Data Series, Purdue University, Thermophysical Properties Research Center Staff, R. Browker, 1975, 1991:
Vol. 7. Thermal Radiative Properties: Metallic Elements & Alloys.
Vol. 8. Thermal Radiative Properties: Nonmetallic Solids.
Vol. 9. Thermal Radiative Properties: Coatings.

/2/ Walther, L.; Gerber, D.: Infrarotmesstechnik. Verlag Technik, Berlin 1981

/3/ Stahl, K.; Miosga, G.: Infrarottechnik. HüthigVerlag Heidelberg, 1986

/4/ Lieneweg, F.: Handbuch der technischen Temperaturmessung. Verlag Vieweg, Braunschweig, 1976

CHAPTER 5

Technical data and accessories

In this chapter

Device data

Device type	PSC-T42L		PSC-T42G		PSC-S42N				PSC-G42N			
Temperature range	–20 … 300 °C 0 … 700 °C		100 … 1300 °C 500 … 2500 °C		600 … 1800 °C 800 … 2500 °C				250 … 1300 °C 350 … 1800 °C			
Spectral range	8 … 14 µm		5 µm		0.8 … 1.1 µm				1.5 … 1.8 µm			
Fixed optics (see table)	300	2000	300	800	210	290	650	4000	210	290	650	4000
Emissivity ε	0.20 to 1.00, adjustable (factory setting when delivered: 1.00)				0.05 to 1.00, adjustable (factory setting when delivered: 1.00)							
Sub temperature range	optional factory set: adjustable within temperature range, minimum span 50 °C											
Response time t95	100 ms, optional factory set up to 100 s				10 ms, optional factory set up to 100 s							
Measurement uncertainty[1)]	1 % of measured value in °C or 1 K [2)]				0.5 % of measured value in °C							
Reproducibility[1)]	0.5 % of measured value in °C or 0.5 K [2)]				0.1 % of measured value in °C							
NETD [3)]	< 0.1 K [4)]				< 0.1 K [1)]							
Ambient temperature dependence, static[1)]	< 0.05 K/K(T_U)[4)]				<0.1 K/K(T_U)[5)]							
Output	4 to 20 mA temperature linear, burden max. 500 Ω at 24 V											
Aiming	Laser aiming light (optional accessory)				Laser aiming light (built-in)							
Power supply	24 V DC ± 25 %, residual ripple 500 mV and for laser aiming light 7 to 30 V DC, < 200 mW											

Device type	PSC-T42L	PSC-T42G	PSC-S42N	PSC-G42N
Power consumption	max. 0.6 W (without laser aiming)			
Operating temperature	0 to 70 °C			
Storage temperature	–20 to 70 °C			
Safety class	IP 65 according to DIN EN 60529 and DIN 40050			
Weight	approx. 450 g			
Housing/dimensions	thread M40 × 1.5; length 125 mm			
Test regulations	EN 55 011: 1998, class A			
CE symbol	According to EU regulations			
Scope of delivery	PSC-T42L/PSC-T42G/PSC-S42N/PSC-G42N, manual, inspection sheet, two mounting screw nuts, connecting cable 5 m, 5 pin (other cable lengths on request)			

[1)]Specifications for black body radiator, $T_{ambience}$ = 23 °C, t95 = 1 s.

[2)]Whichever is higher value.

[3)]Noise equivalent temperature difference.

[4)]At$T_{ambience}$= 23 °C, $T_{Object\ DT\ 42L}$ = 100 °C, $T_{Object\ DT\ 42G}$ = 250 °C/700 °C

[5)]At $T_{ambience}$= 23 °C, T_{Object} = 1000 °C

Fixed Focus Optics

Depending on customer requirements, the device is equipped with a fixed optics which has to be decided when ordering. The optics can be changed at PSC later. A recalibration is required then.

Optical data (Focus point - bold)		**Optics 300**									
Meas. distance a [mm] / Meas. field Ø M [mm]		0	100	200	260	**295**	300	400	500	600	800
PSC-T42L	–20 … 700 °C	15.0	11.8	8.6	6.6	**5.5**	6.0	13	20	27	41
PSC-T42G	100 … 2500 °C	15.0	10.8	6.7	4.2	**5.5**	6.0	15	22	29	44
Optical data (Focus point - bold)		**Optics 800**									
Meas. distance a [mm] / Meas. field Ø M [mm]		0	300	500	600	780	**800**	1000	1200	1500	2000
PSC-T42G	100 … 2500 °C	15.0	14.6	14.4	14.3	14.1	**14**	18	24	32	48
Optical data (Focus point - bold)		**Optics 2000**									
Meas. distance a [mm] / Meas. field Ø M [mm]		0	800	1200	1800	**2000**	2500	3000	3500	4000	5000
PSC-T42L	–20 … 700 °C	15.0	24	28	34	**36**	46	57	68	80	110

Optical data (Focus point - bold)		**Optics 210**											
Meas. Distance a [mm]		0	100	**210**	300	400	500	600	800	1000	1500	2000	4000
Meas. field ∅ M [mm] PSC-S42N	600 ... 1800 °C	12.5	7.5	**2.0**	8.2	15.1	22.0	28.9	42.7	56.5	91	126	264
	800 ... 2500 °C	12.5	7.1	**1.2**	7.1	13.6	20.1	26.6	39.7	52.7	85	118	248
Meas. field ∅ M [mm] PSC-G42N	250 ... 1300 °C	12.5	7.5	**2.0**	8.2	15.1	22.0	28.9	42.7	56.5	91	126	264
	350 ... 1800 °C	12.5	7.1	**1.2**	7.1	13.6	20.1	26.6	39.7	52.7	85	118	248
Optical data (Focus point - bold)		**Optics 290**											
Meas. Distance a [mm]		0	100	200	**290**	400	500	600	800	1000	1500	2000	4000
Meas. field ∅ M [mm] PSC-S42N	600 ... 1800 °C	11.8	8.8	5.7	**3.0**	8.6	13.7	18.8	29.0	39.2	65	90	192
	800 ... 2500 °C	11.8	8.2	4.7	**1.5**	6.5	11.1	15.7	24.9	34.1	57	80	172
Meas. field ∅ M [mm] PSC-G42N	250 ... 1300 °C	11.8	8.8	5.7	**3.0**	8.6	13.7	18.8	29.0	39.2	65	90	192
	350 ... 1800 °C	11.8	8.2	4.7	**1.5**	6.5	11.1	15.7	24.9	34.1	57	80	172

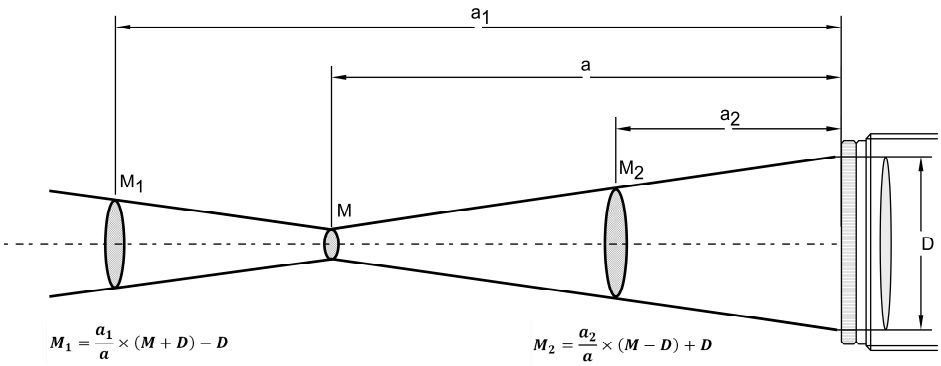
Optical data (Focus point - bold)		**Optics 650**											
Meas. Distance a [mm]		0	100	200	300	400	500	**650**	800	1000	1500	2000	4000
Meas. field ∅ M [mm] PSC-S42N	600 ... 1800 °C	10.8	10.1	9.5	8.8	8.2	7.5	**6.5**	10.5	15.8	29.1	42	96
	800 ... 2500 °C	10.8	9.7	8.6	7.4	6.3	5.2	**3.5**	6.8	11.2	22.2	33	77
Meas. field ∅ M [mm] PSC-G42N	250 ... 1300 °C	10.8	10.1	9.5	8.8	8.2	7.5	**6.5**	10.5	15.8	29.1	42	96
	350 ... 1800 °C	10.8	9.7	8.6	7.4	6.3	5.2	**3.5**	6.8	11.2	22.2	33	77
Optical data (Focus point - bold)		**Optics 4000**											
Meas. Distance a [mm]		0	100	200	300	400	500	650	800	1000	1500	2000	**4000**
Meas. field ∅ M [mm] PSC-S42N	600 ... 1800 °C	10.4	11.1	11.9	12.6	13.4	14.1	15.2	16.3	17.8	21.5	25.2	**40**
	800 ... 2500 °C	10.4	10.6	10.9	11.1	11.4	11.6	12.0	12.3	12.8	14.0	15.2	**20**
Meas. field ∅ M [mm] PSC-G42N	250 ... 1300 °C	10.4	11.1	11.9	12.6	13.4	14.1	15.2	16.3	17.8	21.5	25.2	**40**
	350 ... 1800 °C	10.4	10.6	10.9	11.1	11.4	11.6	12.0	12.3	12.8	14.0	15.2	**20**

*) The measuring field diameter M90 defines a generally circular flat surface of a measuring object of which the radiation sensor receives 90 % of the blackbody irradiance of the measuring object. The increase of the measuring signal caused by dihedral angle is characterized by the environmental factor SSE (size of source effect). It specifies how much the received blackbody irradiance increases when the measuring field diameter is doubled. The value is typical 9 % for above-named devices.

Special note

Please note: The measuring object must be at least as large as the measuring field at current measurement distance.

The measuring field diameter M changes according to the measuring distance a. The respective values are to find in the charts above (minimum measuring field diameter and respective measuring distance are marked in bold).
Interim values can be calculated approximately with the following formulas:



Calculation of measuring field diameter M

Accessories

Depending on the application in different areas and industrial facilities the PSC Infrared GmbH offers a wide range of accessories. Accessories can be ordered at any time and installed on site, e.g.

Mounting angle fixed	Order number: PSC-3310A21010
Mounting angle adjustable	Order number: PSC-3310A21011
Cooling jacket with air purge unit	Order number: PSC-3310A23010
Air purge	Order number: PSC-3310A22010
Vacuum flange KF 16 with Zn Se window	Order number: PSC-3310A34041
Window slide (without window)	Order number: PSC-3310A21210

Connecting cable 2 m	Order number: PSC-3310A11511
Connecting cable 5 m	Order number: PSC-3310A11512
Connecting cable 10 m	Order number: PSC-3310A11513
Connecting cable 15 m	Order number: PSC-3310A11514
Connecting cable 20 m	Order number: PSC-3310A11515
Connecting cable 25 m	Order number: PSC-3310A11516
Connecting cable 30 m	Order number: PSC-3310A11517
Laser aiming light	Order number: PSC-3310A33010
Digital display	Consult PSC
Power supply 24VDC	Order number: 950-004

CHAPTER 6

Installation and initial operation

In this chapter

Preparation

The pyrometer position and the respectively adjustable parameters are determined from the application. Concerning the pyrometer position, please take care of ambient temperature, atmospheric conditions and potential occurrence of electromagnetic interferences.

Ambient temperature

The ambient temperatures must not exceed the allowed operation temperature for the pyrometer: 0°C to 70°C. Otherwise wrong measuring results may occur or even a damage the pyrometer. If the ambient temperature is too high the pyrometer must be used in combination with appropriate accessories (e.g. cooling jacket, please refer chapter Accessories, on page 16). A water connection (water pressure max. 10 bar) is needed for the cooling jacket.

Atmospheric conditions

Smoke, dust, steam or other air contamination as well as contaminated optics are a problem for non-contact temperature measurement. As the Pyrometer cannot receive the full infrared energy for an exact measurement, measuring errors will be the result. An air purge unit (see chapter Accessories, on page 16) can be helpful to avoid contamination of the lens. An air purge unit requires a respective air supply (air pressure < 0.5 bar, oil free).

Electromagnetic interferences

Any interferences beyond may affect proper functionality of the pyrometer!

To protect the device from electromagnetic interferences the following methods are recommended:

- The device should be mounted as far as possible from potential sources of interferences, e.g. machine parts with electrical motors, which may produce interference peaks.

- Use shielded cables for all connections. Please select a cable from our accessories list, chapter Accessories, on page 16.
- Make sure that the Pyrometer is grounded properly.
- To avoid ground loops please connect only the cable shield or the ground of the pyrometer.

(Please refer chapter Connecting the pyrometer , on page 21)

Installation of the pyrometer

Location requirements

It is recommended to use the available fixed or adjustable mounting angles for mounting of the device. Please refer chapter Accessories, on page 16.

Operating personal requirements

Qualified operating personnel should do the installation. Please follow the instruction in this manual when installing the pyrometer.

Advice: We only recommend qualified personnel to operate the pyrometer. The PSC Infrared GmbH will not cover damages caused by improper installation of non-qualified operating personnel.

Mechanical installation

Install the optional right angle mounting bracket at the required position. Then use the nut to lock the bracket into position. IR sensor mounting threads are M40 × 1.5.

PSC-42 series Pyrometer with mounting angle (optional)

For installing the pyrometer, please do the following steps:

1. Remove front mounting nuts
2. Place back mounting nut at required position
3. Insert pyrometer in mounting bracket
4. Tighten mounting nuts

Connecting cable

Please only use our PUR connecting cables which have been made up in advance. The cables are available in different lengths (please refer chapter Accessories, on page 16). This ensures that the standards concerning EC Declaration of Conformity and safety class are

adhered. The usage of coat material PUR increases the chemical, thermal and mechanical resistance compared with standard cables (PVC).

Alignment of the pyrometer

Please align the pyrometer at the measuring object before starting the measurement. A correct alignment of the pyrometer can be done by using the built-in laser aiming light or the optional laser aiming light adaptor (please refer chapter Accessories, on page 16).

Laser aiming light:

In the focus point of the optics the aiming light is focused. The laser light spot has approximately the measuring spot size of the pyrometer but not absolutely exactly the same size. The pyrometer must be fixed in the correct measuring distance to avoid measuring errors caused by a too big spot size. The laser will switch off automatically after 120 seconds in use to protect the laser and the device from overheating. It has to be switched on again by switching on the power supply for aiming light. The laser will also switch off automatically if ambient temperature reaches more than 50°C.

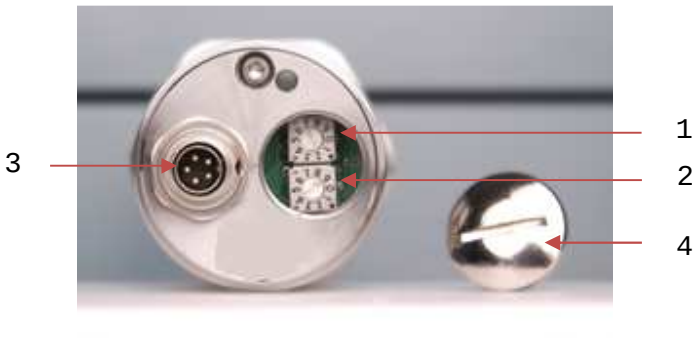
Laser aiming light adaptor:

The optional battery operated laser aiming light needs to be screwed on the front of the pyrometer. During this time temperature measurement is not possible.

The LASER light spot is not the same size as the measuring spot size of the pyrometer. It marks the center of the measuring field.

Connections

All connections are located at the rear side of the device as shown in figures. The plug-in construction of the connections allows a fast and save connection and change of the devices.



Pyrometer connections

1) Emissivity adjustment (decade based 100 %)
BCD switch, 0 to 9

2) Emissivity adjustment (unit position based 100 %)
BCD switch, 0 to 9

3) Connector for power supply and laser aiming light if applicable
The 5 pin connector is used for the power supply and signal output (4 mA to 20 mA) of the pyrometer and for power supply of the laser aiming light (only PSC-G42N, PSC-S42N).

4) Lock screw

The lock screw must be loosened for adjusting the emissivity with the BCD switches.

Please note: Protection class IP65 is only guaranteed for tighten lock screw.

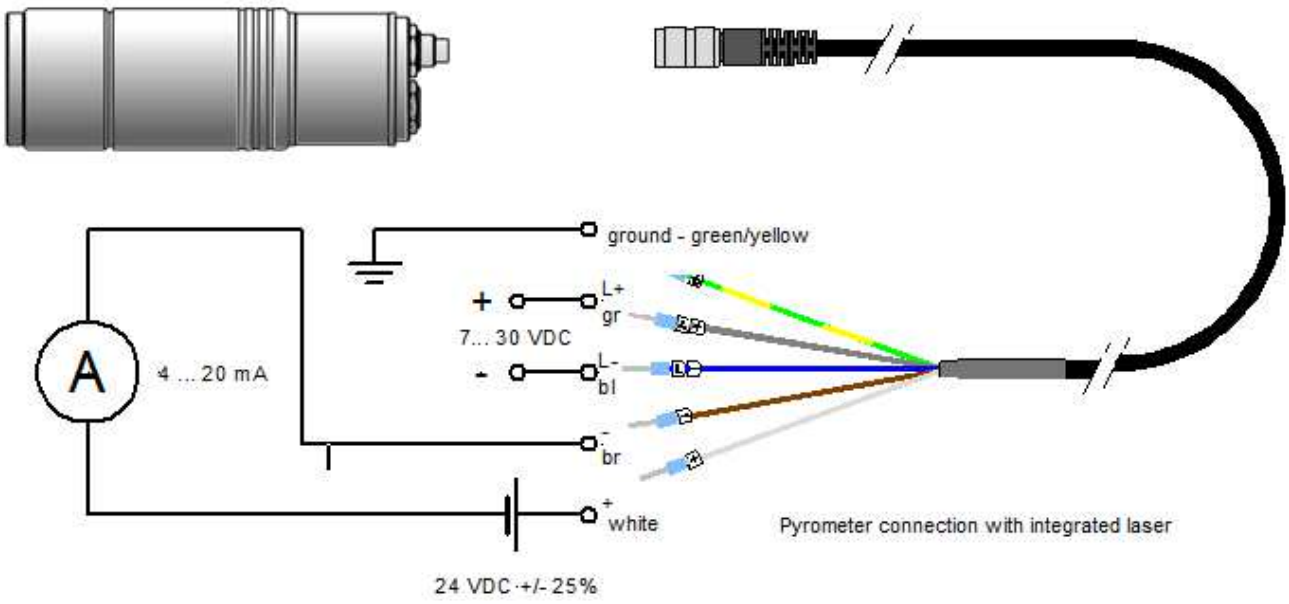
Initial operation of the pyrometer

Connecting the pyrometer

The PSC-T42L / PSC-T42G / PSC-S42N / PSC-G42 requires a power supply of 24 VDC ±25 % to operate. Connect one side of the sensor interconnecting cable to 5-pin connector at the rear side of the pyrometer and connect the other end of the cable to a 24 VDC power supply. **Note:** The pyrometer is equipped with reverse-polarity protection.

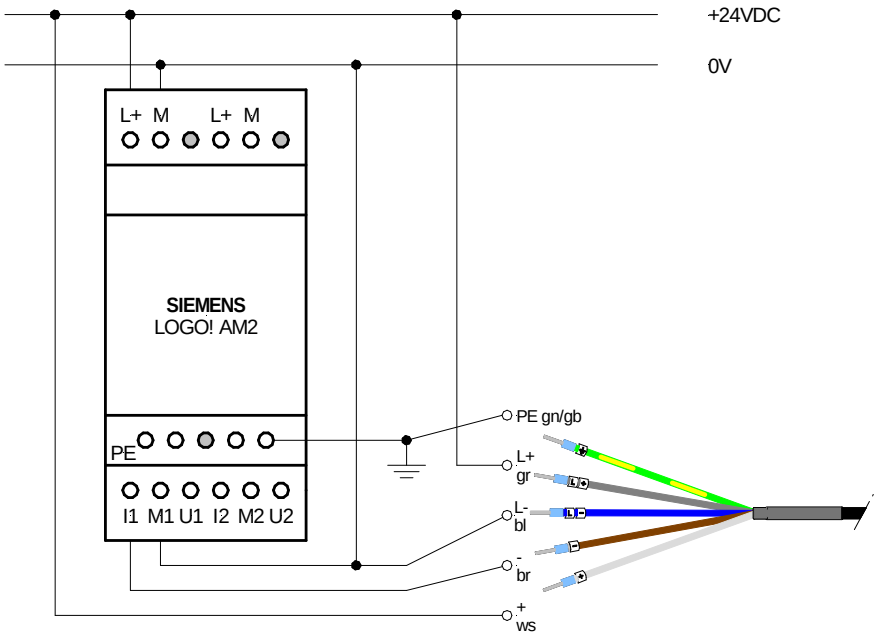
Polarity is important when connecting the pyrometer with power supply (see Figure below).

The power consumption is 35mA max. You may also use a common power supply for the pyrometer and the targeting light.



The connector pins L+ (gray) and L- (blue) are not used for devices without integrated laser aiming light.

Additional devices like a digital display or a controller that process the output signal 4 to 20 mA can be integrated in the current loop.



Connection of the pyrometer using the example Siemens LOGO! (PLC analog input)

To meet the requirements of the electromagnetic compatibility all connecting cables should be shielded.

The shield of a five wire connecting cable is connected at pyrometer side only. At cable extensions the shield has to be extended as well. The electrical grounding is done at only one position to avoid ground loops. If the housing of the pyrometer is connected to earth (PE) already through the mounting, the shield of the cable (green/yellow) should not be connected.

The device needs no warm time, as it is ready for use. To avoid measurement errors, please wait for ambient temperature stabilization. Generally, it takes about 10 to 15 minutes.

Parameters

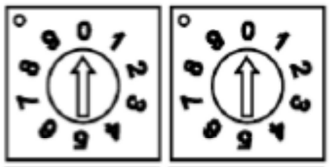
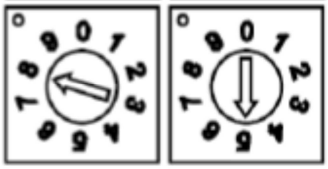
Emissivity ε

You can only adjust the emissivity at the device by loosen the lock screw.

The emissivity is adjustable from 0.05/0.20 to 1.00 (depending on device type) in steps of 0.01.

Adjustment at the device

Adjust the emissivity via the two BCD switches:

Emissivity	Switch setting
ε = 1,00	
ε = 0,85	

Please note: Forbidden adjustment values of the emissivity (e.g. ε< 0.05) will be set internally as ε = 0.05 for PSC-S42N / PSC-G42N and PSC-T42 devices as ε = 0.20.

Switch setting 00 is equivalent to ε = 1.00.

Annotation regarding emissivity

The emissivity of a measuring object specifies how much radiation it emits compared to an ideal heat radiator, a blackbody radiator, at the same temperature. According to Kirchhoff's radiation law, absorption and emission capacity are equal. The black body radiator has an emissivity of 1. In contrast, real measuring objects always have an emissivity of < 1. This value should be known and should be adjusted at the pyrometer.

Pre-set parameters at the factory

Ambient compensation

All measuring objects with an emissivity of < 1.00 (100%), reflect external radiation from their ambient surroundings. This is either subtracted or added to the resulting pyrometer's output signal reading. Because of this, the measurement reading becomes inaccurate. Generally ambient room temperature background surroundings will not influence or has minimal influence on the IR sensor's temperature reading. Caution should be taken when the background temperature is higher than that the object temperature being measured.

The pyrometer series PSC-T42L / PSC-T42G / PSC-S42N / PSC-G42N has automatic compensation. In this case the inside temperature of the device stabilizes to the IR sensor's surrounding ambient temperature within the limits of the sensor's ambient temperature specification.

Please note: If the measuring object has the same temperature as its ambient, the emissivity has a value 1. So a parameter change of the emissivity has no influence of the measuring value.

Response time t95

The pyrometers response time characterizes the time span in which the measured temperature during erratic variation has to coincide with the measuring field so the pyrometer is able to reach 95% of the initial value of the measured temperature. The minimal response time within this series of devices is 100ms (PSC-T42L, PSC-T42G) or 10 ms (PSC-S42N, PSC-G42N) and is set by the value “min”. The speed of response can be adjusted up to 100 seconds.

Sub temperature range

You can set a sub temperature range for the pyrometer. The sub temperature range can only limit the temperature range and must have a minimum span of 50°C between lower and upper limit. This range limits only the scaling of the current output. The lower value refers to 4 mA and the upper value to 20 mA.

Formula for calculation of the temperature out of the current value

$$T_{Object} = \left(\frac{Iist - Imin}{Imax - Imin} * MBU\right) + MBA$$

$Iist$	read current value in mA
$Imin$	lower current value 4 mA
$Imax$	upper current value 20 mA
MBA	start of (sub) temperature range in °C
MBE	end of (sub) temperature range in °C
MBU	(sub)temperature range in °C $MBU = MBE - MBA$

CHAPTER 7

EG Declaration of conformity

For the product identified as follows:
Infrared Pyrometer **PSC**

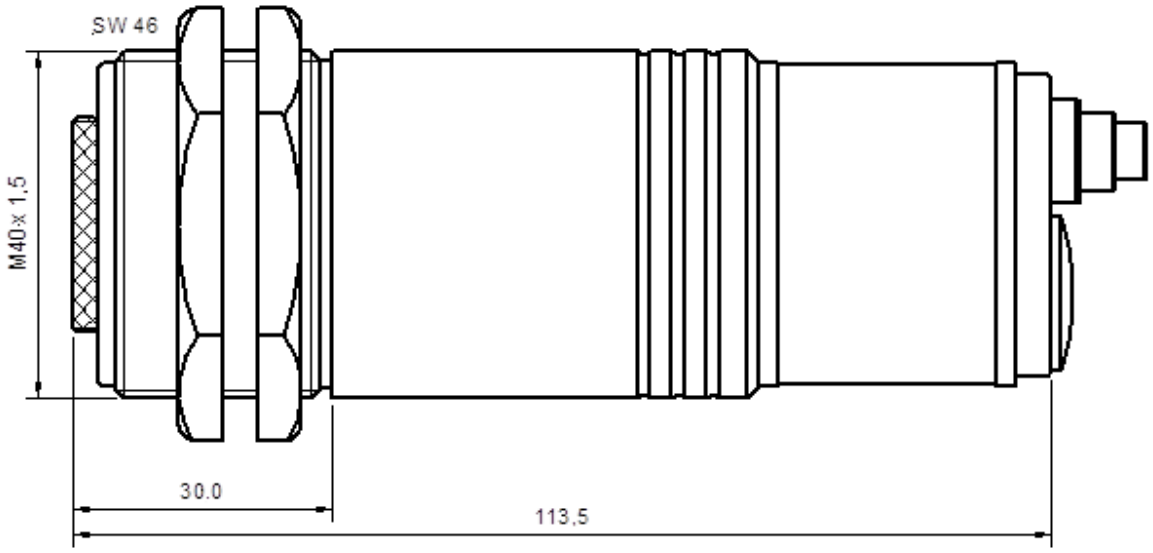
It is hereby confirmed that this product meets the basic protection requirements, as defined in the Guidelines of the Committee for Harmonization of Legal Specifications of the Member States:
2004/108/EC (electromagnetic compatibility)
and
2006/95/EC (electrical equipment designed for use within certain voltage limits)

For the assessment of the product following standards have been considered:
EN 61326-1
EN 61010-1

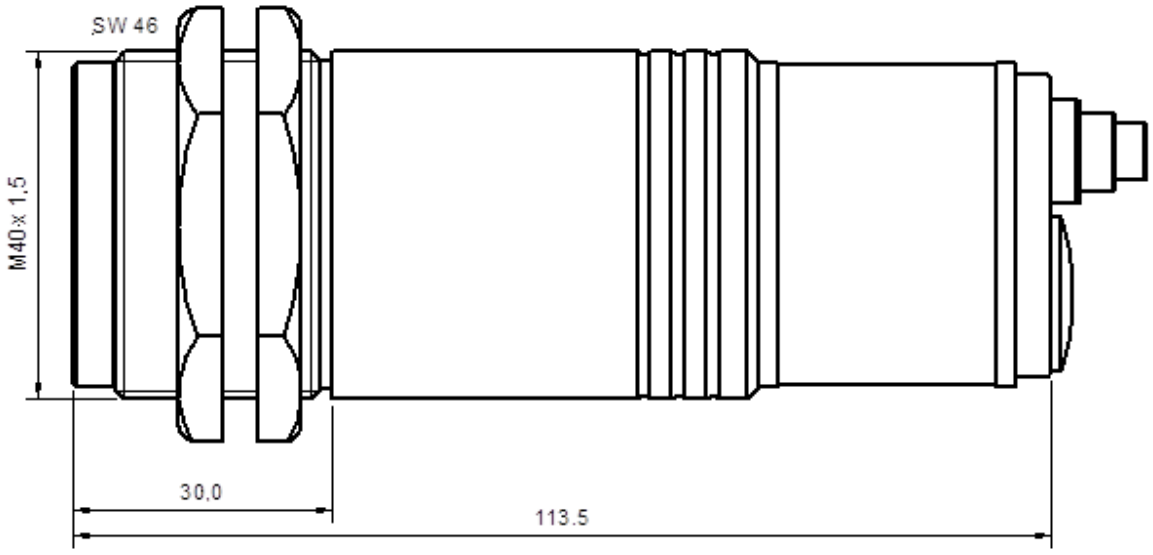
The manufacturer or importer is responsible for this declaration
Process Sensors Corporation
113 Cedar Street, S-1
Milford, MA 01757

CHAPTER 8

Dimensional drawings in mm



Dimensional drawing for models PSC-S42N and PSC-G42N



Dimensional drawing for models PSC-T42L and PSC-T42G