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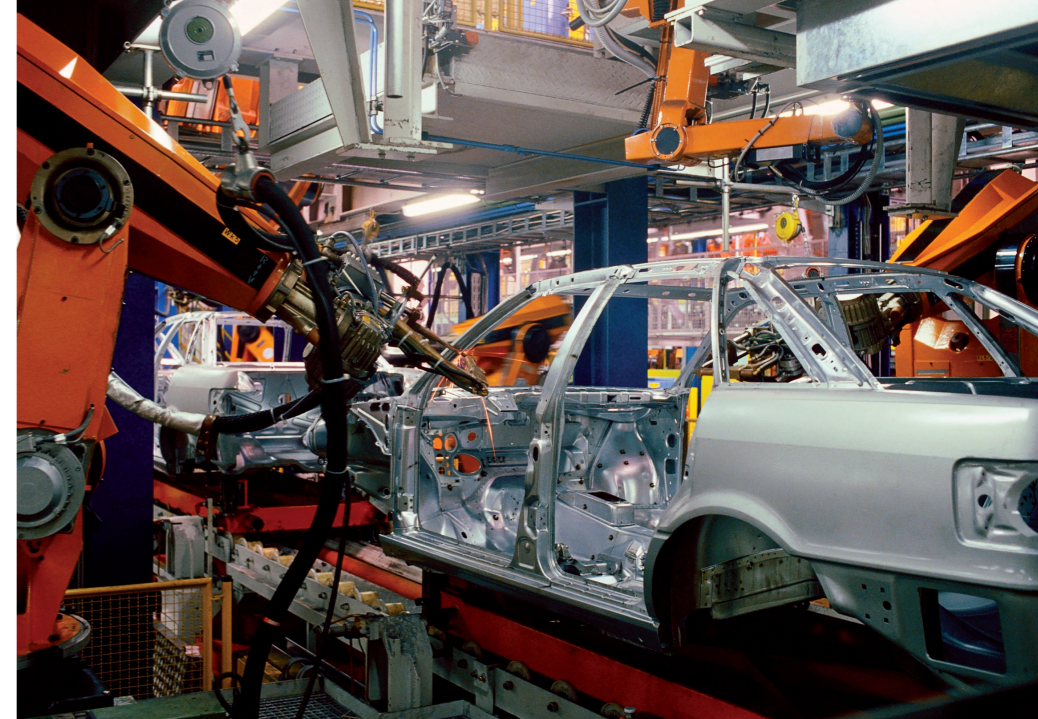
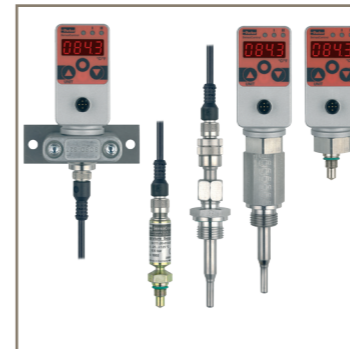
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Sensors and switches for Pressure, Temperature, Level and Flow



Sensors and switches for Pressure, Temperature, Level and Flow



EMEA Product Information Centre

Free phone: 00 800 27 27 5374

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US Product Information Centre

Toll-free number: 1-800-27 27 537

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ENGINEERING YOUR SUCCESS.



At Parker, we're guided by a relentless drive to help our customers become more productive and achieve higher levels of profitability by engineering the best systems for their requirements. It means looking at customer applications from many angles to find new ways to create value. Whatever the motion and control technology need, Parker has the experience, breadth of product and global reach to consistently deliver. No company knows more about motion and control technology than Parker. For further info call 00800 27 27 5374

Parker's Motion & Control Technologies



Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes



Climate Control

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO₂ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves



Electromechanical

Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydraulic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions



Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems



Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings



Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors



Pneumatics

Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors



Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves



Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

All the instruments meet the guidelines of the European Community (EU). It is confirmed that these products are approved acc. to following standards.



DIN/EN 61000-6-2
DIN/EN 61000-6-3

Note!

This document and other information from Parker Hannifin GmbH, provide product or system options for further investigation by users having technical expertise. Before you select or use any product or system it is important that you analyse all aspects of your application and review the information concerning the product or system in the current product catalogue. Due to the variety of operating conditions and applications for these products or systems, the user, through his own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance and safety requirements of the application are met. The products are subject to change by Parker Hannifin GmbH at any time without notice.

Technical subject to change. October 2019.

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Table of Contents

| | Page |
|---|----------------|
| Product overview | 4-5 |
| Selection guide pressure sensors | 6 |
| Selection guide pressure controller | 7 |
| Pressure and temperature sensors | 9-35 |
| SCP01 pressure sensor | 12-15 |
| SCP02 pressure sensor | 16-21 |
| SCP07 pressure sensor | 22-23 |
| SCP08 pressure sensor | 24-25 |
| SCPS01 pressure switch | 26-30 |
| SCT-150 temperature sensor | 31-32 |
| Volumetric flow rate sensors | 33-48 |
| SCQ flow meter | 35-38 |
| SCFT measurement turbine | 39-42 |
| SCVF volume counter | 43-48 |
| Digital display units | 49-52 |
| SCE-020 digital display unit | 49-52 |
| The Controller Family | 53-100 |
| SCPSDi PressureController | 55-60 |
| SCPSD PressureController | 61-66 |
| SCTSD TemperatureController | 67-78 |
| SCTSD-L combination switch | 79-82 |
| SCLSD LevelController | 83-88 |
| SCLTSD LevelTempController | 89-94 |
| SCOTC OilTankController | 95-100 |
| Accessories | 101-106 |
| SCK cable | 101-102 |
| SCA adapter | 103-104 |
| Software ControllerWIN | 105-106 |
| Installation and safety instructions | 107 |
| EMC | 107 |
| Compatibility with media (substances) | 107 |
| Pressure range selection | 107 |
| Appendix | 108-109 |
| Conversion charts | 108 |
| Index | 109 |
| Old and new references | 109 |

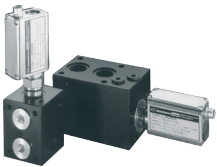

Product overview

Measurement

Pressure and temperature sensors

| SCP01 | SCP02 | SCP07 |
|---|---|---|
|  |  |  |
| Pressure sensor for standard applications | Pressure sensor for mobile hydraulics | Pressure sensor for safety requirements |
| Page 12-15 | Page 16-21 | Page 22-23 |
| SCP08 | SCPS01 | SCT-150 |
|  |  |  |
| Pressure sensor for press construction and die-casting | Pressure switch for series machines | Temperature sensor for high operating pressures |
| Page 24-25 | Page 26-30 | Page 31-32 |

Volumetric flow rate sensors

| SCQ | SCFT | SCVF |
|---|--|---|
|  |  |  |
| For quick flow changes | Low loss measuring of volume flow | Measures different substances |
| Measures in both directions | | Measures lower volume flows (leakage measurements) |
| Page 35-38 | Page 39-42 | Page 43-48 |

Displays





Digital display units




| SCE-020 |
|--|
|  |
| Displays a variety of measured values |
| Page 49-52 |

Product overview

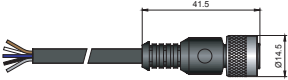
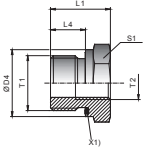
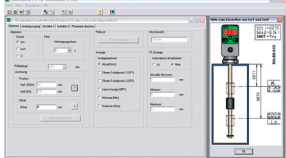
Measurement, display and switching

The Controller Family

| SCPSDi | SCPSD | SCTSD | SCTSD-L |
|---|---|---|---|
|  |  |  |  |
| Pressure display and monitoring | | Temperature display and monitoring | Temperature display and level monitoring |
| Page 55-60 | Page 61-66 | Page 67-78 | Page 79-82 |

| SCLSD | SCLTSD | SCOTC |
|---|--|---|
|  |  |  |
| Level display and monitoring | Level/temperature display and monitoring | |
| Page 83-88 | Page 89-94 | Page 95-100 |

Accessories

| SCK cable | SCA adapter | Software ControllerWIN |
|---|---|---|
|  |  |  |
| Page 101-102 | Page 103-104 | Page 105-106 |

Selection guide pressure sensors

| | | SCP01 | SCP02 | SCP07 | SCP08 | SCPS01 |
|------------------------|--|-----------------|-----------------------|------------------------|-------------------------|-----------------------------|
| Pressure-range | 0...(bar) relative -1...(bar) relative 0...(bar) absolut | 10...1000 | 10...1000 | 10...600 | 600/1000 | 25...800 |
| Accuracy | | 0,5 % | 0,5 % | 0,5 % | 0,5 % | 0,3...8 bar |
| Display | | | | | | |
| Output | Switching Output 0,5...4,5 V (ratiometric 5V) 0,5...4,5 V (nominal 24V) 0...5 V 1...6 V 0...10 V 0...20 mA 4...20 mA (3-wire) 4...20 mA (2-wire) | | • | | | • |
| Electrical Plug | M12 DIN EN 175301-803 Form A DIN Micro 9.4 AMP Superseal Deutsch DT04 4-pin Deutsch DT04 3-pin Cable 2m | • • • | • • • • | • • | • • • | • • • |
| Thread | G1/4 BSPP ED G 1/4 O-ring 1/4 NPT 7/16-20 UNF 9/16-20 UNF | • • • | • • • • • | • | • | • • • • • |
| Wetted parts | Stainless steel/ Soft sealing Stainless steel/ Metall sealing | FKM | FKM | FKM | FKM | FKM |
| Approvals | CE Marine Safety SIL / PL | • • | • | • • | • | • |

Selection guide pressure controller

| | | SCPSD | SCPSDi |
|------------------------|--|----------------------------|--------------------------------------|
| Pressure-range | 0...(bar) relative -1...(bar) relative 0...(bar) absolut | | |
| Accuracy | | | |
| Display | | • | • |
| Output | Switching Output 0,5...4,5 V (ratiometric 5V) 0,5...4,5 V (nominal 24V) 0...5 V 1...6 V 0...10 V 0...20 mA 4...20 mA (3-wire) 4...20 mA (2-wire) | • • | • • • • |
| Electrical Plug | M12 DIN EN 175301-803 Form A DIN Micro 9.4 AMP Superseal Deutsch DT04 4-pin Deutsch DT04 3-pin Cable 2m | • • | • |
| Thread | G1/4 BSPP ED G 1/4 O-Ring 1/4 NPT 7/16-20 UNF 9/16-20 UNF | | |
| Wetted parts | Stainless steel/ Soft sealing Stainless steel/ Metall sealing | NBR • | NBR • |
| Approvals | CE Marine Safety SIL / PL | • • | • • |

Certified sensors and switches for maritime applications



The products designed for maritime use meet the current international approvals:

- **ABS** American Bureau of Shipping
- **DNV** Det Norske Veritas
- **GL** Germanischer Lloyd

The portfolio extends from pressure sensors to electronic switches with display for pressure / level / temperature. Parker offers the chance to upgrade from mechanical to electronic measuring devices in the hydraulic system, with the following advantages:

- High accuracy
- Long lifetime
- Reliability
- Safety
- Comfortable functions
- High quality standards

These certified products will enhance the safety and reliability of maritime hydraulic systems:

SCP01/ SCPSD / SCPSDi / SCLTSD / SCTSD-L



Pressure and temperature sensors

Device features

- Long-term stability
- Immune to interference
- Rugged design
- Dependable



SensoControl[®] sensors feature long-term stability, interference immunity, a sturdy high-quality construction and a wide range of variants.

The sensors are designed and manufactured in our own production facilities under established standards for the industrial instrumentation and control systems. This allows us to easily adapt them to customer requirements or to critical applications.

We carefully consider the special requirements for automation and mobile hydraulics during the design phase. So our **SensoControl**[®] sensors are ideally suitable for the permanent series use in industrial and mobile applications.

Pressure sensors

The housing and all parts of the pressure sensors that touch the substances are manufactured from stainless steel. This provides a large range of media tolerability. A wide range of applications is possible due to the combination of high interference immunity and high resistance to external influences (shock, vibration and temperature).

The application areas are varied: from process engineering test rigs, conveying and lifting equipment, mobile hydraulics, general machine construction, pneumatic construction and hydraulic plant construction.

The SCP should be used when the pressure needs to be monitored reliably for long periods.

In this case the optimal sensor type can be selected from different product series according to the needs of the application. Different connecting plugs, output signals and connection threads are also available.




Temperature sensors

The SCT temperature sensor should be used when a temperature signal is required.

These are characterised by their pressure resistance up to 630 bar.

Pressure and temperature sensors

Overview

| | SCP01 | SCP02 | SCPS07 |
|----------------------|--|---|--|
| |  |  |  |
| Range of use | Pressure sensor for standard applications <ul style="list-style-type: none"> Stainless steel measuring cell Small design High burst pressure Resistant to pressure peaks Resistant to shock and vibration | Pressure sensor for mobile hydraulics <ul style="list-style-type: none"> Stainless steel measuring cell Small design Stainless steel housing High burst pressure ECE approval E1 High protection degree Resistant to shock and vibration | Pressure sensor for safety requirements <ul style="list-style-type: none"> PLd SIL 2 Two inverted 4-20 mA outputs Up to 600 bar G1/4 DIN 3852-11 (E) Compact design Long term stability Wide temperature range -40 to 85°C |
| Application | <ul style="list-style-type: none"> General machine construction Injection-mould machines Die-casting machines Press construction Test benches Machine tool | <ul style="list-style-type: none"> Mobile hydraulics Transport vehicles Conveyor vehicles Commercial vehicles Automotive technology Brake systems Oil pressure Test equipment and technology Gearbox control | <ul style="list-style-type: none"> Safety requirements Mobile hydraulic Cranes Suspended loads Tire presses |
| Order code | SCP01-xxxxP-xx-0x | SCP02-xxx-xx-0x | SCP07-xxx-24-05 |
| Refer to page | 12-15 | 16-21 | 22-23 |

Pressure and temperature sensors

SCP08



SCPS01



Range of use

Pressure sensor for press construction and die-casting

- 600 / 1000 bar
- G1/4"
- 0-10 V / 4...20 mA 2-wire
- M12x1 / DIN
- Reinforced internal design
- Persistence against shock & vibration
- Made for high pressure acceleration
- High dynamic signal

Pressure switch for series machines

- Stainless steel measuring cell
- Small design
- High burst pressure
- E1 road approval
- Resistant to pressure peaks
- Resistant to shock and vibration

Application

- Press construction
- Die-casting

- Construction machines
- Commercial vehicles
- Press construction
- Wind power facilities
- Injection-mould machines
- Tool-making machines
- Hydraulic power unit
- Special machine construction
- Replacement for mechanical pressure switches

Order code

SCP08-xxx-x4-0x

SCPS01-xxx-xx

Refer to page

24-25

26-30

SCT-150



Range of use

Measurement of pressure even under high operating pressures

- Resistance to pressures up to 630 bar
- Compact size
- Standard output signal
- Quick reaction time

Application

- Test benches
- Processing equipment
- Conveying and lifting equipment
- Machinery construction
- Pneumatic plant construction
- Hydraulic plant construction

Order code

SCT-150-41-07

Refer to page

31-32

SCP01 pressure sensor

Device features

- Small design
- Stainless steel measuring cell
- Stainless steel housing
- Shock and vibration proof
- Wide range of compatible substances
- High linearity
- Long-term stability
- Substance temperature -40...125 °C
- Pressure range up to 1000 bar
- High burst pressure
- Response time 1 ms
- Eroding milling
- Encapsulated electronics



The SCP01 pressure sensor was designed to meet industrial requirements and is used in control, regulating and monitoring systems.

The SCP01 is characterised by its compact design, high linearity and excellent interference immunity. It is suitable for quick control solutions because of its fast response speed. The compact stainless steel housing is good for harsh environmental conditions. All components which come into contact with the substance are made from stainless steel. This feature, combined with the welded, thin-layer measuring cell, ensure optimal compatibility with the substance.

In order to ensure an exact pressure measurement and to avoid disturbances, an EDM hole is integrated. This minimises the cavitation of air and dirt, thus preventing the measuring cell from being influenced by pressure surges and pressure peaks.

This product is ideal for permanent series usage in hydraulic applications because of its long lifespan, high accuracy, high reliability and sturdy stainless steel construction.

Typical application range

- General machine construction
- Injection-mould machines
- Die-casting machines
- Press construction
- Test benches
- Machine tool

SCP01 pressure sensor

Technical data

SCP01-xxx-x4-0x (bar; G1/4" BSPP)

| SCP01- | 010 | 016 | 025 | 040 | 060 | 100 | 160 | 250 | 400 | 600 | 1000 |
|---|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------|
| Pressure range P_n relative 0... (bar) | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 | 1000 |
| Overload pressure* P_{max} relative (bar) | $2 \times P_n$ | | | | | | | | | | $1.5 \times P_n$ |
| Burst pressure** P_{burst} relative (bar) | $4 \times P_n$ | | | | | | | | | | $2.5 \times P_n$ |

SCP01-xxxxP-x5-0x (psi; 1/4 NPT) & **SCP01-xxxxP-x7-0x** (psi; 7/16-20 UNF)

| SCP01- | 0150P | 0250P | 1000P | 3000P | 5000P | 9000P*** |
|---|----------------|-------|-------|-------|-------|----------|
| Pressure range P_n relative 0... (psi) | 150 | 250 | 1000 | 3000 | 5000 | 9000 |
| Overload pressure* P_{max} relative (psi) | $2 \times P_n$ | | | | | |
| Burst pressure** P_{burst} relative (psi) | $4 \times P_n$ | | | | | |

* DIN EN 60770-1 / ** DIN 16086 / *** only 1/4 NPT

| General | |
|---------------------------|---|
| Response time | ≤1 ms |
| Long-term stability | < 0.2 % FS / a |
| Load change | > 20 million |
| Weight | Approx. 80 g |
| MTTFd | > 100 years |
| Accuracy | |
| Non-linearity | BFSL acc. to IEC 61298-2 ≤± 0.25 %FS |
| Accuracy | Type ≤± 0.25 %FS Max. ≤± 0.5 %FS |
| Total error at 0 to 85 °C | ≤±1 %FS |
| Temperature coefficient | |
| Zero point | Max. ≤± 0.2 %FS/10 K |
| Output range | Max. ≤± 0.2 %FS/10 K |
| Material | |
| Housing | Stainless steel 1.4404 |

| Ambient conditions | |
|---|-----------------------|
| Ambient temperature range | -40...+85 °C |
| Fluid temperature range | -40...+125 °C |
| Compensated range | 0...+85 °C |
| Storage temperature | -40...+125 °C |
| Vibration resistance | IEC 60068-2-6: 20 g |
| Shock resistance | IEC 60068-2-27: 500 g |
| Electrical protection | |
| Short-circuit, signal to GND, reverse polarity protection | |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Process connection | |
| Eroding milling | 0.6 mm |
| Tightening torque | Max. 35 Nm |

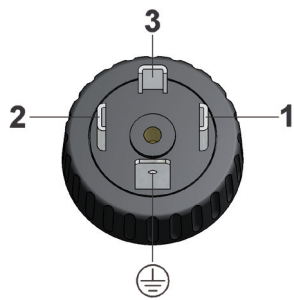
| Process connection | Seal | Parts in contact with substances |
|----------------------------------|------------------------------|---|
| G1/4A BSPP; DIN 3852 T11, Form E | Sealing ring DIN 3869-14-FKM | FKM Stainless steel 1.4404, Stainless steel 1.4548 |
| SAE 7/16 UNF Male O-ring | O-ring 8,12x1,83 FKM | FKM Stainless steel 1.4404, Stainless steel 1.4548 |
| 1/4 NPT | | Stainless steel 1.4404, Stainless steel 1.4548 |

| Output signal | 0...20 mA | 2-wire 4...20 mA | 4...20 mA | 0.5...4.5 V (nom); 0...5 V; 1...6 V; 0...10 V |
|-----------------------|---|---|---|---|
| Auxiliary power V_+ | +9...36 VDC | +9...36 VDC | +9...36 VDC | +14...36 VDC |
| Max. load | ≥50...≤500 Ω ($V_+ - 9 V$) / 20 mA | ≥50...≤500 Ω ($V_+ - 9 V$) / 20 mA | ≥50...≤500 Ω ($V_+ - 9 V$) / 20 mA | ≥10 kΩ |

SCP01 pressure sensor

Pin assignment

Device plug DIN EN 175301-803 Form A 4-pole (old 43650)



SCP01-...-06

SCP01-...-06-MA

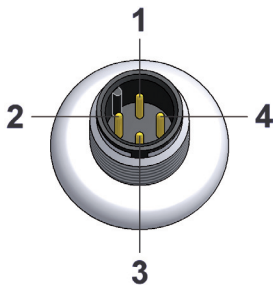
| PIN | 2-wire 4...20 mA | 3-wire 0/4...20 mA; 0.5...4.5 V (nom); 0...5 V; 0...10 V; 1...6 V | 2-wire 4...20 mA | 3-wire 0/4...20 mA; 0...10 V |
|-----|---------------------|---|---------------------|------------------------------------|
| 1 | P-signal | P-signal | V ₊ | V ₊ |
| 2 | n.c.* | 0 V / GND | n.c.* | 0 V / GND |
| 3 | V ₊ | V ₊ | P-signal | P-signal |
| ⊥ | n.c.* | | | |

Protection class

IP65

Circular connector M12x1 4-pole

SCP01-...-07



| PIN | 2-wire 4...20 mA | 3-wire 0/4...20 mA; 0.5...4.5 (nom); 0...5 V; 0...10 V; 1...6 V |
|-----|---------------------|---|
| 1 | V ₊ | V ₊ |
| 2 | P-signal | P-signal |
| 3 | n.c.* | 0 V / GND |
| 4 | n.c.** | |

Material

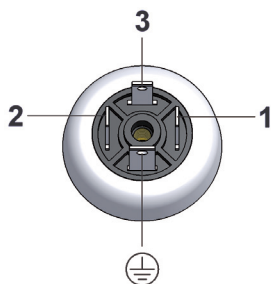
Metal plug

Protection class

IP67

Device plug (L-Industrial 9.4 mm)

SCP01-...-0C



| PIN | 2-wire 4...20 mA | 3-wire 0/4...20 mA; 0.5...4.5 (nom); 0...5 V; 0...10 V; 1...6 V |
|-----|---------------------|---|
| 1 | P-signal | P-signal |
| 2 | V ₊ | V ₊ |
| 3 | n.c.* | |
| ⊥ | n.c.* | 0 V / GND |

Protection class

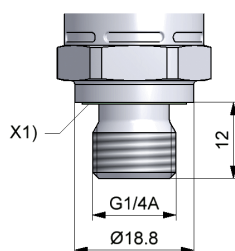
IP65

*n.c. = do not connect

**n.c. = do not connect / When flying leads are used on PIN 4, the PIN 4 has to be connected to GND.

SCP01-...-x4-0x

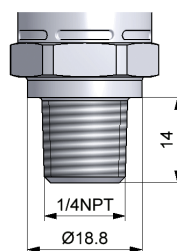
G1/4 BSPP ED



X1) = ED-seal

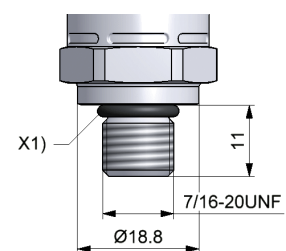
SCP01-...-x5-0x

1/4 NPT



SCP01-...-x7-0x

SAE 7/16-20UNF

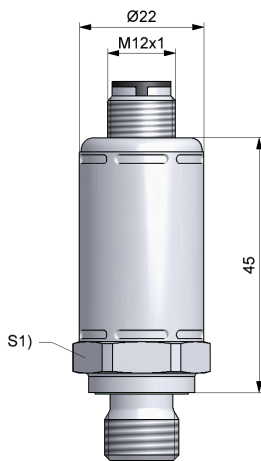


X1) = O ring 8.92 x 1.83



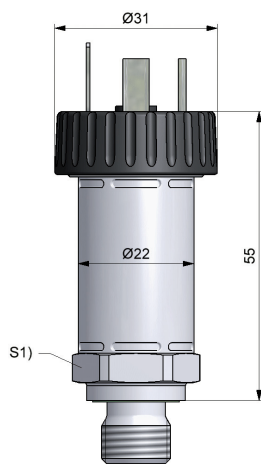
SCP01 pressure sensor

SCP01-xxx-xx-07



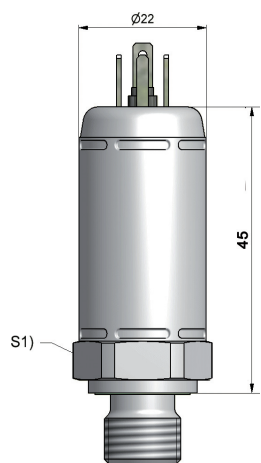
S1) = SW22

SCP01-xxx-xx-06



S1) = SW22

SCP01-xxx-xx-0C



S1) = SW22

Order code

Pressure sensor SCP01 (bar) SCP01-xxx-xx-0x
Pressure sensor SCP01 (bar) Marine SCP01-xxx-xx-0x-MA
 (approved by DNV/GL/ABS)

Pressure range (bar)

| | |
|--------------|------|
| 0...10 bar | 010 |
| 0...16 bar | 016 |
| 0...25 bar | 025 |
| 0...40 bar | 040 |
| 0...60 bar | 060 |
| 0...100 bar | 100 |
| 0...160 bar | 160 |
| 0...250 bar | 250 |
| 0...400 bar | 400 |
| 0...600 bar | 600 |
| 0...1000 bar | 1000 |

Output signal

| | |
|--------------------|---|
| 0...20 mA | 1 |
| 4...20 mA (3-wire) | 2 |
| 4...20 mA (2-wire) | 3 |
| 0...5 V* | A |
| 0,5...4,5 V (nom)* | S |
| 1...6 V* | B |
| 0...10 V | 4 |

*Not approved for marine applications

Process connection

| | |
|-------------|---|
| G 1/4" BSPP | 4 |
|-------------|---|

Connection plug

| | |
|--|---|
| Circular connector M12x1 4-pole | 7 |
| Device connector DIN EN 175301-803 Form A 4-pole | 6 |
| Device plug industrial micro DIN 9.4 mm | C |

Pressure sensor SCP01 (psi)

SCP01-xxxxP-xx-0x

Pressure range (psi)

| | |
|--------------|-------|
| 0...150 psi | 0150P |
| 0...250 psi | 0250P |
| 0...1000 psi | 1000P |
| 0...3000 psi | 3000P |
| 0...5000 psi | 5000P |
| 0...9000 psi | 9000P |

Output signal

| | |
|--------------------|---|
| 4...20 mA (3-wire) | 2 |
| 4...20 mA (2-wire) | 3 |
| 0...10 V | 4 |

Process connection

| | |
|--|---|
| SAE 7/16 UNF Male O ring (P _n max. = 400 bar) | 7 |
| 1/4 NPT (P _n max. = 600 bar) | 5 |

Connecting plug

| | |
|---------------------------------|---|
| Circular connector M12x1 4-pole | 7 |
|---------------------------------|---|

SCP02 pressure sensor

Device features

- Small design
- Stainless steel measuring cell
- Stainless steel housing
- Shock and vibration proof
- High protection degree
- E1 road approval
- Substance temperature -40 to 150 °C
- Up to 1000 bar
- 1 ms
- Up to 36-V wiring systems



The SCP02 was designed specifically for the use in mobile working machines. The SCP02 has e1-approval and is manufactured with state of the art production methods according to ISO/TS 16949.

The shock and vibration resistance, the EMC characteristics, the power supply as well as the extended temperature range all were designed for this application type.

The SCP02 is suitable for quick control solutions because of its fast response speed.

The compact stainless steel housing with the plastic connector allows for use in harsh environmental conditions such as those in mobile hydraulics.

The components which come into contact with the substance are made from stainless steel (1.4548). This feature, combined with the welded, thin-layer measuring cell, ensures optimal compatibility with the substance.

An EDM hole has been added so that you get a precise, interference-free pressure measurement. This minimises the cavitation of air and dirt, thus preventing the measuring cell from being influenced by pressure surges and pressure peaks.

Typical application range

- Mobile hydraulics
- Transport vehicles
- Conveyor vehicles
- Commercial vehicles
- Automotive technology
- Brake systems
- Oil pressure
- Test equipment and technology
- Gearbox control

SCP02 pressure sensor

Technical data

| SCP02- | 010 | 025 | 040 | 060 | 100 | 160 | 250 | 400 | 600 | 1000 |
|--|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-------------|
| Pressure range P_n relative 0... (bar) | 10 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 | 1000 |
| Overload pressure* P_{max} relative (bar) | 2 x P_n | | | | | | | | | 1.5 x P_n |
| Burst pressure** P_{burst} relative (bar) | 4 x P_n | | | | | | | | | 2.5 x P_n |

* DIN EN 60770-1

** DIN 16086

| General | |
|---|---|
| Response time | ≤1 ms |
| Long-term stability | < 0.2 % FS / a |
| Load change | > 100 million |
| Weight | Approx. 55 g |
| MTTFd | > 100 years |
| Accuracy | |
| Linearity, pressure hysteresis and reproducibility | ≤0.5 %FS |
| Complete accuracy | ≤1.0 %FS (0...+80 °C) ≤1.5 %FS (-25...+100 °C) ≤2.5 %FS (-40...+125 °C) |
| Temperature coefficient | |
| Zero point | Max. ≤± 0.2 %FS/10 K |
| Output range | Max. ≤± 0.2 %FS/10 K |
| Material | |
| Housing | EN/DIN 1.4301 |
| Electrical plug | Plastic PBT-GF30 Ultradur B4300 G6 black |

| Ambient conditions | |
|---|-----------------------|
| Ambient temperature range | -40...+125 °C |
| Fluid temperature range | -40...+150 °C |
| Storage temperature | -40...+125 °C |
| Vibration resistance | IEC 60068-2-6: 20 g |
| Shock resistance | IEC 60068-2-27: 500 g |
| Electrical protection | |
| Short circuit, signal against GND/0V and protection against polarity reversal (not with ratiometric output) | |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Process connection | |
| Eroding milling | 0.6 mm |
| Tightening torque | Max. 35 Nm |

| Process connection | Seal | Parts in contact with substances | Max. pressure range P_n |
|----------------------------------|------------------------------|----------------------------------|---------------------------|
| G1/4A BSPP; DIN 3852 T11, Form E | Sealing ring DIN 3869-14-FKM | EN/DIN 1.4548 / FKM | 1000 bar |
| SAE-4: 7/16-20 UNF O-ring | O-ring FKM | EN/DIN 1.4548 / FKM | 400 bar |
| SAE 6: 9/16-18 UNF O-ring | O-ring FKM | EN/DIN 1.4548 / FKM | 400 bar |
| G1/4 DIN ISO 228-1 O-ring | O-ring FKM | EN/DIN 1.4548 / FKM | 600 bar |
| 1/4 NPT | | EN/DIN 1.4548 | 600 bar |

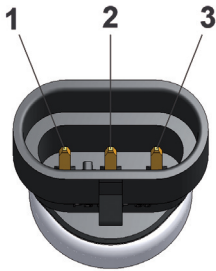
| Output signal P signal | 2-wire 4...20 mA | 0...5 V; 1...6 V 0.5...4.5 V nom. | 0...10 V | 0.5...4.5 V ratiometric |
|---------------------------|--|--------------------------------------|----------------|----------------------------|
| Auxiliary power V+ | +9...36 VDC | +9...36 VDC | +14...36 VDC | 5 V |
| Load Ω (Ohm) | ≥50...≤500 Ω ($V_+ - 9 V$) / 20 mA | ≥10 k Ω | ≥10 k Ω | ≥10 k Ω |

SCP02 pressure sensor

Pin assignment

AMP Superseal 1.5

SCP02-xxx-xx-0A

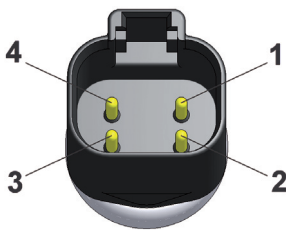


| PIN | 2-wire 4...20 mA | 0...5 V; 1...6 V; 0.5...4.5 V nom.; 0...10 V | 0.5...4.5 V ratiometric |
|-----|---------------------|---|----------------------------|
| 1 | P-signal | 0 V / GND | 0 V / GND |
| 2 | n.c.* | P-signal | P-signal |
| 3 | V ₊ | V ₊ | V ₊ |

Material Plastic PBT-GF30 Ultradur B4300 G6 black
Protection class IP67

DT04-4P

SCP02-xxx-xx-0D

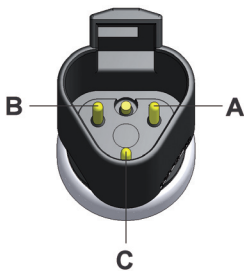


| PIN | 2-wire 4...20 mA | 0...5 V; 1...6 V; 0.5...4.5 V nom.; 0...10 V | 0.5...4.5 V ratiometric |
|-----|---------------------|---|----------------------------|
| 1 | V ₊ | V ₊ | V ₊ |
| 2 | P-signal | 0 V / GND | 0 V / GND |
| 3 | n.c.* | P-signal | P-signal |
| 4 | n.c.* | n.c.* | n.c.* |

Material Plastic PBT-GF30 Ultradur B4300 G6 black
Protection class IP67

DT04-3P

SCP02-xxx-xx-0E

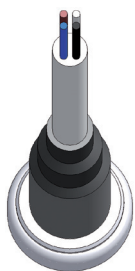


| PIN | 2-wire 4...20 mA | 0...5 V; 1...6 V; 0.5...4.5 V nom.; 0...10 V | 0.5...4.5 V ratiometric |
|-----|---------------------|---|----------------------------|
| A | V ₊ | V ₊ | V ₊ |
| B | n.c.* | P-signal | P-signal |
| C | P-signal | 0 V / GND | 0 V / GND |

Material Plastic PBT-GF30 Ultradur B4300 G6 black
Protection class IP67

2 m fixed cable

SCP02-xxx-xx-00



| | 2-wire 4...20 mA | 0...5 V; 1...6 V; 0.5...4.5 V nom.; 0...10 V | 0.5...4.5 V ratiometric |
|-------|---------------------|---|----------------------------|
| bn | V ₊ | V ₊ | V ₊ |
| black | n.c.* | P-signal | P-signal |
| blue | P signal | 0 V / GND | 0 V / GND |

Material Plastic PBT-GF30 Ultradur B4300 G6 black
Protection class IP69k

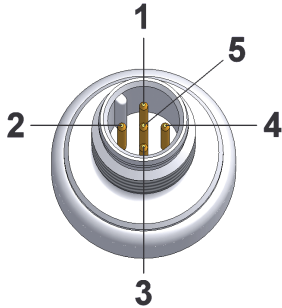
bn = brown-braun / bk = black-schwarz / bu = blue-blau
*n.c. = do not connect

SCP02 pressure sensor

Pin assignment

M12x1

SCP02-xxx-xx-x5



| PIN | 2-wire 4...20 mA | 0...5 V; 1...6 V 0.5...4.5 V nom.; 0...10 V | 0.5...4.5V ratiometric | CAN-Assignment |
|-----|---------------------|--|------------------------|---------------------------|
| 1 | V ₊ | V ₊ | V ₊ | CAN shield, PE |
| 2 | P-signal | P-signal | P-signal | +U _B , +24 VDC |
| 3 | n.c.* | 0 V / GND | 0 V / GND | GND, 0 V |
| 4 | n.c.* | n.c.* | n.c.* | CAN_H, CAN+ |
| 5 | n.c.* | n.c.* | n.c.* | CAN_L, CAN- |

Material

Plastic PBT-GF30 Ultradur B4300 G6 black

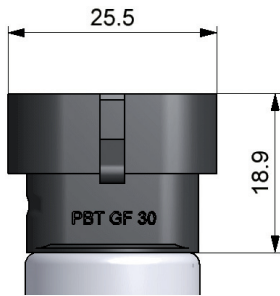
Protection class

IP67

*n.c. = do not connect

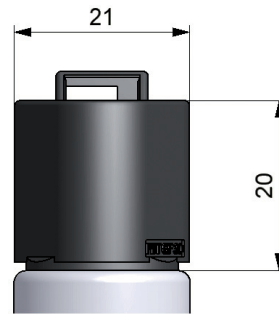
SCP02-xxx-xx-0A

AMP Superseal



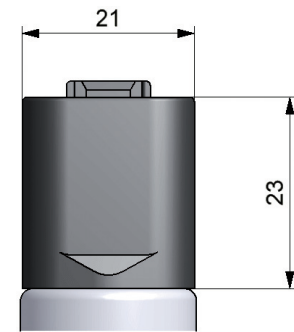
SCP02-xxx-xx-0D

DT04-4P



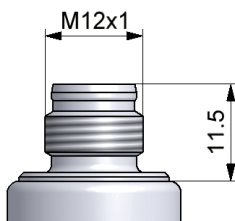
SCP02-xxx-xx-0E

DT04-3P



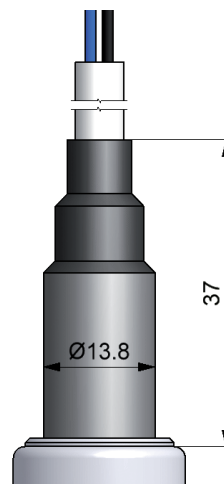
SCP02-xxx-xx-05

M12x1



SCP02-xxx-xx-00

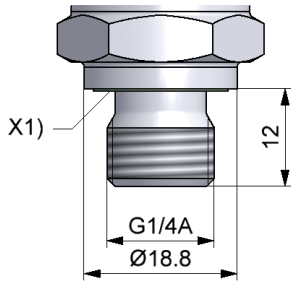
Stationary cable (2 m)



SCP02 pressure sensor

SCP02-xxx-x4-0x

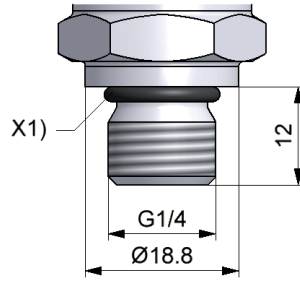
G 1/4, DIN 3852 T 11 (Form E)



X1) = ED-seal

SCP02-xxx-x8-0x

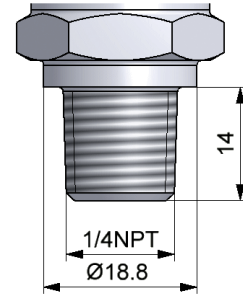
G1/4 O-ring



X1) = O-ring

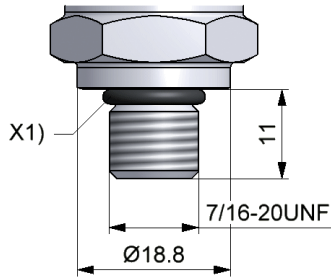
SCP02-xxx-x5-0x

1/4 NPT



SCP02-xxx-x7-0x

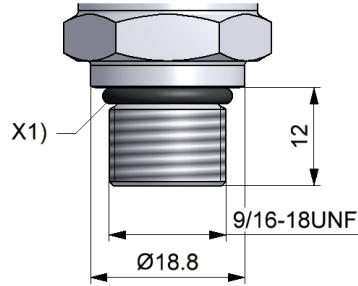
SAE 04 - O-ring



X1) = O-ring 8.92x1.83

SCP02-xxx-x6-0x

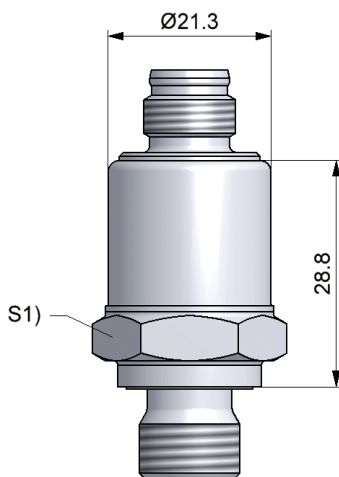
SAE 06 - O-ring



X1) = O-ring 11.89x1.98

SCP02-xxx-xx-0x

M12x1



S1) = SW22

SCP02 pressure sensor

Order code

Pressure sensor SCP02

Pressure range

| Pressure range | SCP02-xxxx-xx-0x |
|----------------|------------------|
| 0...10 bar | 010 |
| 0...25 bar | 025 |
| 0...40 bar | 040 |
| 0...60 bar | 060 |
| 0...100 bar | 100 |
| 0...160 bar | 160 |
| 0...250 bar | 250 |
| 0...400 bar | 400 |
| 0...600 bar | 600 |
| 0...1000 bar | 1000 |

Output signal

| | |
|---------------------------|---|
| 4...20 mA (2-wire) | 3 |
| 4...20 mA (3-wire) | 2 |
| 0...10 V | 4 |
| 0...5 V | A |
| 1...6 V | B |
| 0.5...4.5 V (ratiometric) | R |
| 0.5...4.5 V (nom.) | S |
| CAN | K |

Process connection

| | |
|---|---|
| G1/4 BSPP | 4 |
| 1/4 NPT (P _n max. = 600 bar) | 5 |
| 9/16-18 UNF, SAE 6 O-ring (P _n max. = 400 bar) | 6 |
| 7/16-20 UNF SAE-4 O-ring (P _n max. = 400 bar) | 7 |
| G1/4 O-ring (P _n max. = 600 bar) | 8 |

Connecting plug

| | |
|---------------------------------|---|
| Stationary cable 1 m | 0 |
| Circular connector M12x1 5-pole | 5 |
| Device plug AMP Superseal | A |
| Device plug DT04 4-pole | D |
| Device plug DT04 3 pole | E |

Connection cable and single plug

Connection cable, assembled

(open cable end)

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

| | |
|----------------------------|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

| | |
|----------------------------|---------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |

Order example

SCP02-400-34-05

Single sensor
 Pressure range 400 bar
 Output signal 4 to 20 mA (2-wire)
 G1/4 BSPP
 M12 connecting plug 5-pole

Pressure sensor SCP07

Device features

- For safety requirements
- PLd
- SIL 2
- Two inverted 4-20 mA outputs
- Up to 600 bar
- G1/4 DIN 3852-11 (E)
- Compact design
- Long term stability
- Wide temperature range -40 to 85°C



The SCP07 is a safety-related pressure transmitter and can be used in applications that require a Performance Level d according to EN ISO13849 or a SIL 2 according to IEC61508.

The SCP07 supervises the signals of its measurement cell and convert the pressure in two inverted 4-20 mA output signals. The control unit can monitor the safety-related functionality and the electrical connectivity of the SCP07.

Typical application range

- Mobile hydraulic
- Cranes
- Suspended loads
- Tire presses

Drucksensor SCP07

Technical data

| SCP07- | 010 | 025 | 060 | 100 | 250 | 400 | 600 |
|---|-----|-----|------|------|------|------|-------|
| Pressure range P_n 0... (bar) relative | 10 | 25 | 60 | 100 | 250 | 400 | 600 |
| Overload pressure P_{max} DIN EN 60770-1 (bar) relative | 50 | 50 | 200 | 200 | 500 | 800 | 1600 |
| Burst pressure P_{burst} 60770-1 (bar) relative | 250 | 250 | 1000 | 1000 | 2500 | 4000 | >4000 |

| General | |
|---------------------|----------------------------|
| Response time | ≤1 ms |
| Load change | >100 million |
| Material Housing | Stainless steel 1.4301 |
| Weight | Approx. 50 g |
| Process Connection | G1/4, DIN 3852 T11 (E) |
| Material | Stainless steel 1.4548 |
| Material diaphragm | Stainless steel 1.4548 |
| Wetted parts | FKM Stainless steel 1.4548 |
| Seal | ED Type: FKM |
| Installation torque | Max. 35 Nm |

| Ambient Conditions | |
|---------------------------------|----------------------|
| Media temperature | -40 to 125°C |
| Operation / Ambient temperature | -40 to 85°C |
| Storage temperature | -40 to 100°C |
| Vibration | IEC 60068-2-6 :20g |
| Shock | IEC 60068-2-27 :500g |

| Conformity | |
|------------|--|
| CE | EN 61326-1, EN 61326-3-1 |
| E1 | All vehicle types with +12/24 V and battery (-) at the chassis |

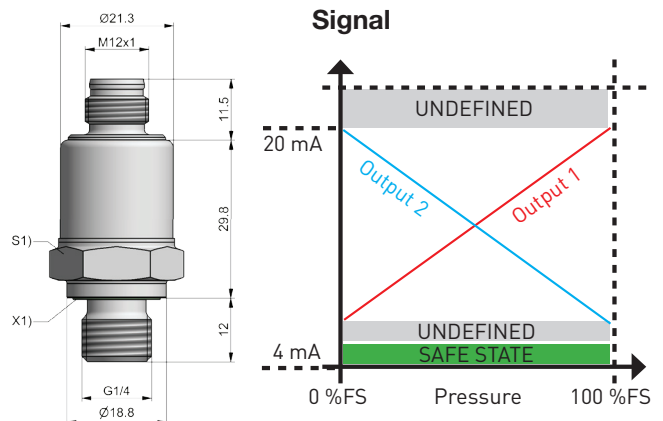
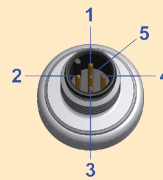
| Accuracy Parameter | |
|--|-----------------|
| Non-linearity + Hysteresis+Repeatability | ≤0,5 %FS |
| Long-term stability | ≤0,2 %FS / year |

| Overall Accuracy | |
|------------------|----------|
| @ -40°C...-25°C | ≤2,5 %FS |
| @ -25°C...0°C | ≤1,5 %FS |
| @ 0...85°C | ≤1 %FS |

| Safety classification | |
|--------------------------|-------------|
| IEC 61508:2010 | SIL 2 |
| Safety-related subsystem | Type B |
| Hardware architecture | 1oo1 |
| HFT | 0 |
| SFF (incl. control unit) | 95 % |
| PFH | 8,4 *10E-9 |
| EN ISO 13849-1:2010 | PLd |
| Category | 2 |
| DC (incl. control unit) | 93,8 % |
| CCF | 70 |
| MTTF _D | >100 years |
| MTBF (SN29500) | 420,7 years |

| Electrical Connection | | |
|-----------------------|-----------------------------------|-----|
| Output signal | 4...20 mA / 20...4 mA | |
| Supply voltage V_+ | 9...32 VDC ripple @50HZ 10 % | |
| Load _{max} | $(V_+ - 5.5 V) / 0,02 A [\Omega]$ | |
| Protection | Overvoltage | yes |
| | Short circuit | yes |
| | Reverse polarity | yes |
| | Signal on GND/ V_+ | yes |

| M12x1 | | |
|--|----------|-----------------|
| Protection class IEC 60529 (mounted connector) | IP67 | |
| Material | PBT-GF30 | |
| | Pin 1 | V_+ |
| | Pin 2 | 20...4 mA |
| | Pin 3 | GND |
| | Pin 4 | 4...20 mA |
| | Pin 5 | Do not connect! |



| | |
|------------------------------|------------------------|
| Order code | |
| Pressure sensor SCP07 | SCP07-xxx-24-05 |
| Pressure range | |
| 0...10 bar..... | 010 |
| 0...25 bar..... | 025 |
| 0...60 bar..... | 060 |
| 0...100 bar..... | 100 |
| 0...250 bar..... | 250 |
| 0...400 bar..... | 400 |
| 0...600 bar..... | 600 |

Pressure sensor SCP08

Device features

- 600 / 1000 bar
- G1/4"
- 0-10V / 4...20mA 2-wire
- M12x1 / DIN
- Reinforced internal design
- Persistence against shock & vibration
- Made for high pressure acceleration
- High dynamic signal



Particularly in die-casting applications the controlling for the piston requires a high dynamic pressure sensor. During this fast, high energetic process the components are stressed by shock, vibration and pressure acceleration.

The pressure sensor SCP08 measures the pressure via a special designed measurement cell and has a high adapted overload pressure to withstand the pressure peaks.

To avoid abrasion of the cell due to Diesel or similar effects, the process connection is protected by an adjusted drilling. The dimension of the drilling still guarantees an instantaneous pressure response.

To increase shock and vibration resistance, the relevant internal components are covered and reinforced. The speed of the sensor influences directly the quality of the production process.

The unique combination of accuracy, durability and high dynamic response makes the SCP08 ideal for the requirements of die-casting applications.

Typical applications

- Press construction
- Die-casting

Pressure sensor SCP08

Technical data

| SCP08- | 600 | 1000 |
|--|------|------|
| Pressure range P_n 0... (bar) relative | 600 | 1000 |
| Overload pressure P_{max} (bar) relative | 1200 | 1500 |
| Burst pressure P_{burst} (bar) relative | 1800 | 2000 |

| General | |
|------------------|---|
| Response time | 0...10 V $\leq 0,3$ ms 4...20 mA 2-Leiter $\leq 0,5$ ms* |
| Load change | >10 million. |
| Material Housing | Stainless steel 304 |
| Weight | Approx. 80 g |

| Ambient Conditions | |
|----------------------------------|-----------------|
| Media temperature | -40 to 125°C |
| Operation- / Ambient temperature | -40 to 105°C |
| Storage temperature | -40 to 125°C |
| Vibration | 20 g rms |
| Shock | 1 m on concrete |

| Conformity | |
|------------|-----|
| CE | yes |

| Overall Accuracy | |
|----------------------|-----------------------|
| @ RT *1 | $\leq 0,5$ %FS |
| @ -10°C...85°C *1 *2 | ≤ 2 %FS |
| @ -40...105°C *1 *2 | $\leq 2,5$ %FS |
| Long-term stability | $\leq 0,2$ %FS / year |

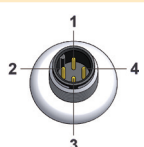
*1 incl. Non-linearity + Hysteresis + Offset + Gain
*2 incl. Repeatability + Temperature effects
RT = Room Temperature 20°C

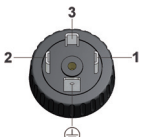
| Process Connection | |
|--------------------|-----------------------------|
| Thread | G1/4, DIN 3852 T11 (E) |
| Eroding milling | 0,6 mm |
| Volume measured | < 1 mm ³ |
| Seal | ED Type: FKM |
| Material | Stainless steel 17-4 PH |
| Material diaphragm | Stainless steel 17-4 PH |
| Wetted parts | FKM Stainless steel 17-4 PH |

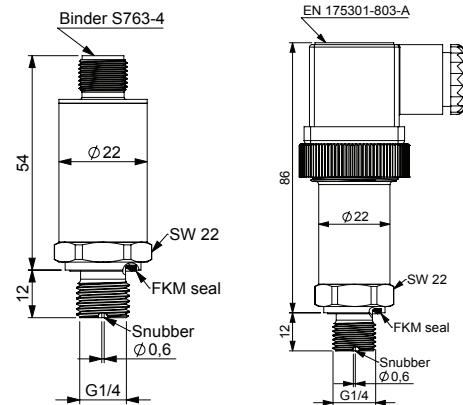
| Installation | |
|--|----------------|
| Installation torque | Max. 35 Nm |
| General | no restriction |
| Recommended preventive activities to avoid air inclusion: | |
| <ul style="list-style-type: none"> • Bleed air • Installation with Process connection on top | |

*with 2 m cable

| Output signal | | 0...10 V | 4...20 mA 2-wire |
|----------------------|----------------------|-------------------------|------------------------|
| Supply voltage V_+ | | 12...32 VDC | 10...32 VDC |
| Load _{max} | | 10 k Ω | $(V_+ - 10$ V) / 20 mA |
| Protection | Overvoltage | 36 signal on GND/ V_+ | |
| | Short circuit | yes | |
| | Reverse polarity | yes | |
| | Signal on GND/ V_+ | yes | |

| M12x1 | | | |
|---|-------|----------|------------------|
| Protection class (mounted connector) | IP67 | 0...10 V | 4...20 mA 2-wire |
|  | Pin 1 | V_+ | V_+ |
| | Pin 2 | P-signal | P-signal |
| | Pin 3 | V_- | |
| | Pin 4 | | |

| DIN EN 175301-803 Form A | | | |
|--|-------|----------|------------------|
| Protection class (mounted connector) | IP65 | 0...10 V | 4...20 mA 2-wire |
|  | Pin 1 | V_+ | V_+ |
| | Pin 2 | V_- | P-signal |
| | Pin 3 | P-signal | |
| | Pin 4 | | |



Order code

Pressure sensor SCP-08
4...20 mA; 2-wire

SCP08-xxxx-x4-0x

Pressure range (bar)

0...600 bar ————— 600
0...1000 bar ————— 1000

Output signal

4...20 mA (2-wire) ————— 3
0...10V ————— 4

Connecting plug

DIN EN 175301-803 Form A 4 pole ————— 6
M12x1 4 pole ————— 7



SCPS01 pressure switch

Device features

- Long service life
- No readjustment
- For harsh environments
- Accurate switching



The SCPS01 electronic pressure switches were designed to be used in mass-produced machines.

Installation and production

In order to reduce the complexity of installation for the customer, the pressure switch can be programmed with customer-specific values at the factory. There is then no longer any need to make time-consuming adjustments while the system is pressurized.

More safety for the equipment manufacturer

The pressure switch can be set-up by the equipment manufacturer using a software program. This prevents the switch from being manipulated by unauthorized end users.

Components

This pressure switch contains no moveable parts. All components which come into contact with the substance are made from stainless steel. This feature, combined with the welded, thin-layer pressure sensor, ensure optimal compatibility with the substance. A cushioning mechanism can be optionally integrated in the substance inlet. The stainless steel housing enables the switch to be used in extremely harsh environments.

Application area

The switches have been designed with EMC characteristics, shock resistance and vibration resistance so that they can be used in a wide variety of applications and with mobile machines.

They have e1 approval and the SCPS01 are therefore approved for use in public transportation vehicles.

Thanks to their sturdy, compact design, long-term stability, the SCPS01 are the alternative to mechanical pressure switches.

Application examples

- Construction machines
- Commercial vehicles
- Press construction
- Wind power facilities
- Injection-mould machines
- Tool-making machines
- Power packs
- Special machine construction
- Replacement for mechanical pressure switches

SCPS01 pressure switch

Technical data

| SCPS01- | 025 | 060 | 100 | 250 | 400 | 600 | 800 |
|--|------------|------------|-------------|-------------|-------------|-------------|-------------|
| Pressure range P_n , relative (bar) Adjusting range RSP...SP (Lowest reset switch point ... highest switch point) | 0...25 bar | 0...60 bar | 0...100 bar | 0...250 bar | 0...400 bar | 0...600 bar | 0...800 bar |
| Overload pressure* P_{max} , relative (bar) | 2 x P_n | | | | | | |
| Bursting pressure** P_{burst} , relative (bar) | 4 x P_n | | | | | | 3 x P_n |
| Smallest adjustable difference between SP and RSP (SP-RSP) | 0.3 bar | 0.6 bar | 1 bar | 3 bar | 4 bar | 6 bar | 8 bar |

Information about selecting the pressure range

The system pressure and pressure value used for switching are relevant for pressure switches:

Since a 400-bar pressure switch has a comparable resolution as that of a 600-bar pressure switch,

it is possible to use a pressure switch with a higher pressure range of P_n 600 bar – even when there is a smaller nominal pressure (for example, 315 bar).

This is a positive feature because it provides the same precision with improved safety (higher P_{max} over-pressure) and fewer product variants.

* DIN EN 60770-1

** DIN 160866

| General | |
|--|--|
| Response time | Typ. 10 ms, max. 20 ms |
| Long-term stability | < 0.2 % FS / a |
| Switching cycles | > 100 million |
| Weight | Approx. 100 g |
| MTTFd | > 100 years |
| Accuracy | |
| Linearity, pressure hysteresis and reproducibility | ≤0.5 %FS |
| Switching accuracy | ≤1.0 % FS (0...+80 °C) ≤1.5 % FS (-25...+100 °C) ≤2.5 % FS (-40...+125 °C) |
| Ambient conditions | |
| Ambient temperature range* | -40...+125 °C |
| Temperature of substance | -40...+150 °C |
| Storage temperature | -40...+125 °C |
| Vibration resistance | IEC 60068-2-6: 20 g |
| Shock resistance | IEC 60068-2-27: 500g |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |

* not for cable version

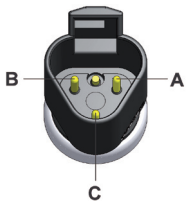
| Electrical connection | |
|----------------------------------|--|
| Plug | M12 plug; German DT04 Cable outlet 1 m |
| Supply voltage | 9...36 VDC 10 % allowed residual ripple at 50 Hz |
| Current consumption | 40 mA |
| Output signal | 1x PNP, 2x PNP 1x NPN, 2x NPN |
| Output current | Max. 500 mA per switch output |
| Electrical protection | Short circuit, signal against GND/0 V and protection against polarity reversal |
| Protection degree | IP67 and IP69k (dependent on the electrical connection used) |
| Material | |
| Housing | Stainless steel EN/DIN 1.4301 |
| Membrane | Stainless steel EN/DIN 1.4548 |
| Parts in contact with substances | Stainless steel EN/DIN 1.4548 / FKM (replaceable seal) * |
| Process connection | |
| Connection | ¼ BSP ; ¼ NPT** |
| Tightening torque | Max. 35 Nm |

SCPS01 pressure switch

Pin assignment

DT04-3P

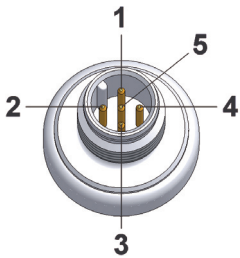
SCPS01-xxx-xx-0E



| PIN | Assignment |
|------------------|--|
| A | V ₊ |
| B | 0 V / GND |
| C | S1 out |
| Housing | GND |
| Material | Plastic PBT-GF30 Ultradur B4300 G6 black |
| Protection class | IP67 |

M12x1

SCPS01-xxx-xx-05



| PIN | Assignment |
|------------------|--|
| 1 | V ₊ |
| 2 | Out 2 |
| 3 | 0 V / GND |
| 4 | S1 out & Prog. |
| 5 | n.c.* |
| Housing | GND |
| Material | Plastic PBT-GF30 Ultradur B4300 G6 black |
| Protection class | IP67 |

* n.c. = do not connect

2 m fixed cable

SCPS01-xxx-xx-00



| Cable | Assignment |
|---------|----------------|
| bn | V ₊ |
| black | S1 out & Prog. |
| blue | 0 V / GND |
| white | Out 2 |
| Housing | GND |

Protection class IP69k

bn = brown-braun / bk = black-schwarz /
bu = blue-blau / wh = white-weiß

Software

Adjustable parameters

- Each output individually adjustable
- Switching point / reset point
- Switching delay / reset delay
- NO/NC contact
- Hysteresis window

Displayable parameters

- Pressure range
- Current pressure
- Serial number
- Firmware

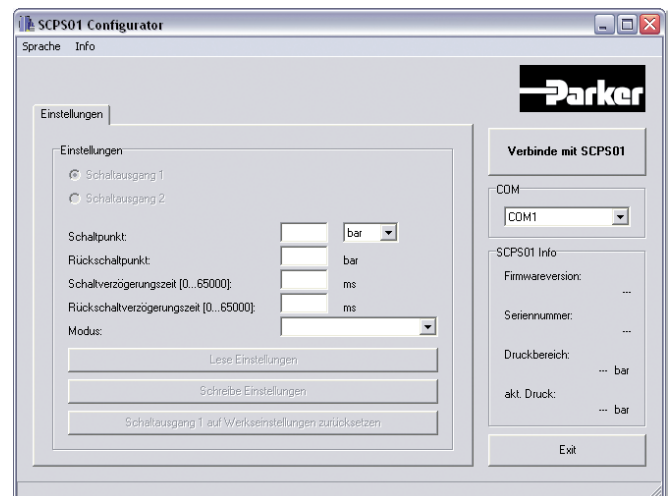
Standard setting

SP1 = 60 % FS rSP1 = 40 % FS

SP2 = 70 % FS rSP2 = 30 % FS

Connection

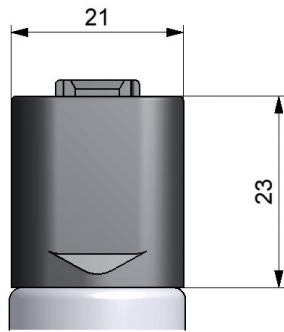
USB 2.0



SCPS01 pressure switch

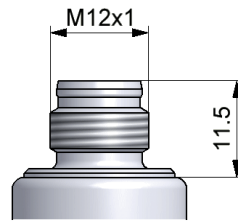
SCPS01-xxx-xx-0E

DT04-3P



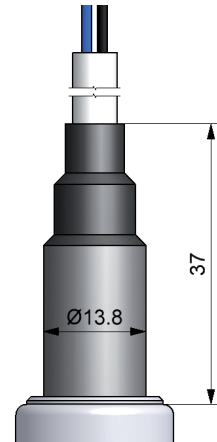
SCPS01-xxx-xx-05

M12x1



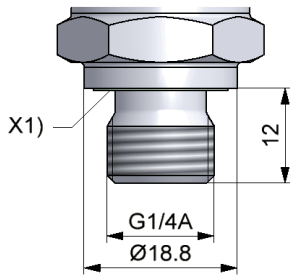
SCPS01-xxx-xx-00

Stationary cable (2 m)



SCPS01-xxx-x4-0x

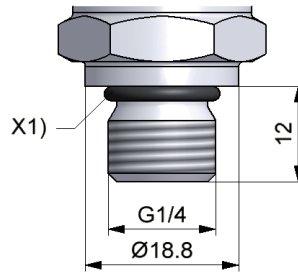
G 1/4, DIN 3852 T 11 (Form E)



X1) = ED-seal

SCPS01-xxx-x8-0x

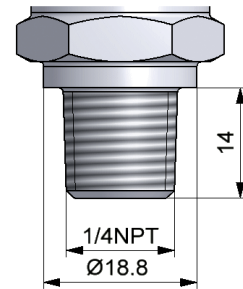
G1/4 O ring



X1) = O ring

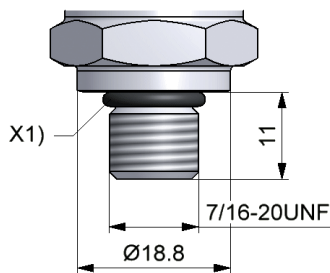
SCPS01-xxx-x5-0x

1/4 NPT



SCPS01-xxx-x7-0x

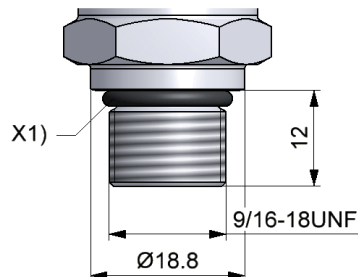
SAE 04 - O ring



X1) = O ring 8.92x1.83

SCPS01-xxx-x6-0x

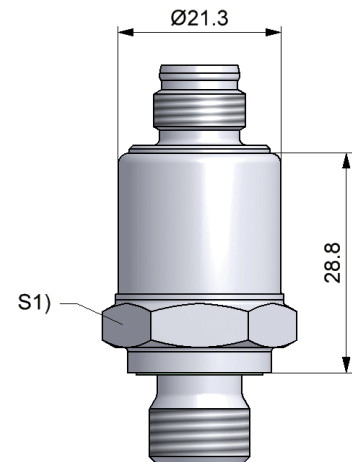
SAE 06 - O ring



X1) = O ring 11.89x1.98

SCPS01-xxx-xx-xx

M12x1



S1) = SW22

SCPS01 pressure switch

Order code

Pressure sensor SCPS01

SCPS01-xxx-xx-0x

Pressure range

| | |
|-------------|------------|
| 0...25 bar | 025 |
| 0...60 bar | 060 |
| 0...100 bar | 100 |
| 0...250 bar | 250 |
| 0...400 bar | 400 |
| 0...600 bar | 600 |
| 0...800 bar | 800 |

Output signal

| | |
|---------|----------|
| 1 x PNP | 1 |
| 2 x PNP | 2 |
| 1 x NPN | 3 |
| 2 x NPN | 4 |

Process connection

| | |
|---|----------|
| G1/4 BSPP | 4 |
| 1/4 NPT (P _n max. = 600 bar) | 5 |
| 9/16-18 UNF, SAE 6 O ring (P _n max. = 400 bar) | 6 |
| 7/16-20 UNF SAE-4 O ring (P _n max. = 400 bar) | 7 |
| G1/4 O ring (P _n max. = 600 bar) | 8 |

Connecting plug

| | |
|---------------------------------|----------|
| Stationary cable 2 m | 0 |
| Circular connector M12x1 5-pole | 5 |
| Device plug DT04 3-pole | E |

Accessories

Programming kit with circular connector M12x1 5-pole **SCPS01-PRG-Kit**

Connection cable and single plug

Connection cable, assembled

(open cable end)

SCK-400-xx-xx

Cable length (m)

| | |
|------|-----------|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

| | |
|----------------------------|-----------|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

| | |
|----------------------------|----------------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |

SCT-150 temperature sensor

Device features

- Withstands pressures up to 630 bar
- Compact design
- Heavy-duty steel housing
- Simple installation
- -25 °C to +100 °C



The SCT electronic temperature sensor features a compact design and high pressure resistance.

The SCT is used where temperatures have to be measured under high pressure and a compact housing is necessary.

With its pressure resistance up to 630 bar, the SCT temperature sensor is well suited for hydraulic applications.

It can be used for precise and quick temperature measurements.

The SCT series temperature sensors are compatible with the SCE panel meters. So both the hydraulic pressure and the substance temperature can be measured, checked and evaluated.

Application examples

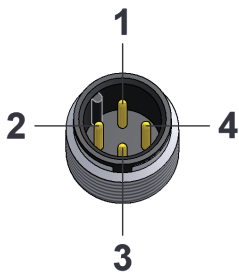
- Test benches
- Processing equipment
- Conveying and lifting equipment
- Machine construction
- Pneumatic plant construction
- Hydraulic plant construction

SCT-150 temperature sensor

Technical data

| Input | |
|---|---------------------------|
| Measuring range | -25...+100 °C |
| Accuracy | < ± 7 K |
| Response time | $\tau_{0,9} = 13.5$ |
| Output | |
| Output _T (scaling for output!) | 0...20 mA = -50...+125 °C |
| Load | ≤ 250 Ω |
| Process connection | |
| G1/4A ED or M10x1 | |
| Seal | FKM |
| Housing | Steel C15K/CF |
| Operating pressure P _n | 630 bar |
| Parts in contact with substances | Steel C15K/CF, FKM |
| Ambient conditions | |
| Power supply V ₊ | +11...+24 VDC |
| Current consumption | < 30 mA |
| Ambient temperature range | -20...+70 °C |
| Fluid temperature range | -25...+125 °C |
| Storage temperature | -25...+80 °C |
| Electrical connection | M12x1 |
| Protection degree | IP67 |

Pin assignment



| Cable | Assignment |
|-------|----------------|
| 1 | V ₊ |
| 2 | T-signal |
| 3 | 0 V / GND |
| 4 | n.c.* |

*n.c. = do not connect

Order code

Temperature sensor G1/4

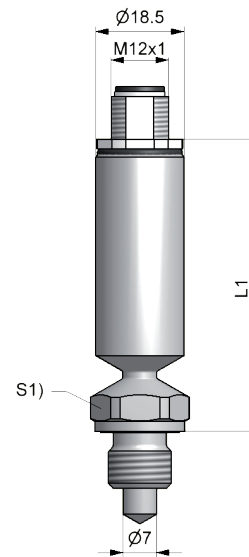
SCT-150-41-07

Temperature sensor M10x1

SCT-150-14-07

SCT-150-xx-07

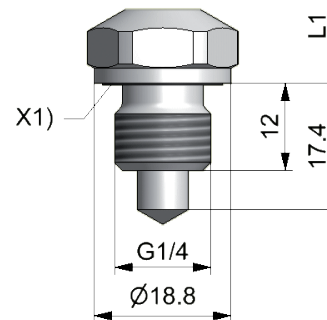
Circular connector M12x1; 4-pole



S1) = 19

SCT-150-41-07

G1/4A ED

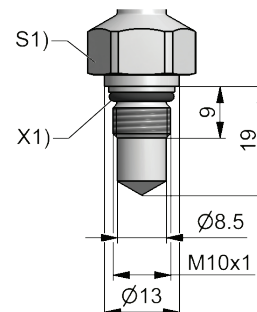


L1) = 61

X1) = ED seal

SCT-150-14-07

M10x1

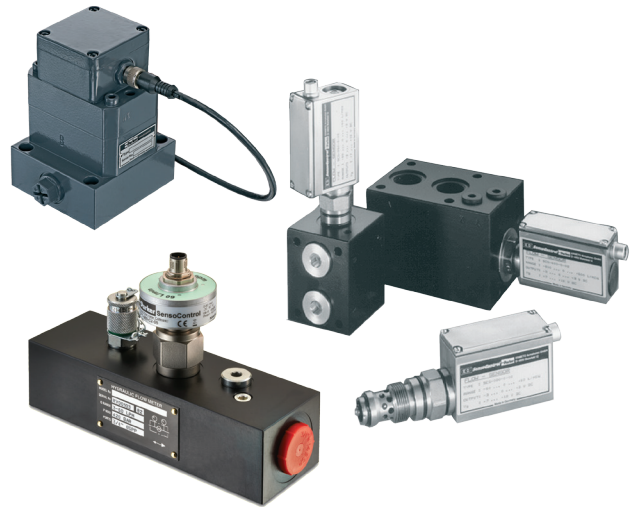


X1) = O-ring

Volumetric flow rate sensors

Device features

- Different measurement techniques
 - Quick
 - Not dependent on viscosity
 - Without loss
- Many measurement ranges
- Analogue output signal
- M12 connecting plug
- 24 VDC



The flow sensors used in **SensoControl**[®] provide accurate volume flow information in hydraulic systems (e.g. in testing equipment).

The sensors deliver a output signal that is proportional to the volumetric flow rate for further processing to an electronic system. They are compatible with conventional, well-known standards.

- M12 connecting plug
- 24 VDC
- 0/4 to 20 mA

The volumetric flow rate can be easily displayed when using the **SCE-020** panel meter.

In order to meet the many different application requirements, three different measuring principles are available:

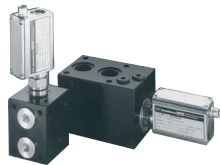
- **SCVF** geared counter
- **SCFT** turbine
- **SCQ** spring/piston

The volumetric flow rate sensors are used in control, regulation or monitoring systems where analogue signals are needed to capture the volume flow.

Volumetric flow rate sensors

Overview

SCQ



SCFT



SCVF



Range of use

For quick flow changes
Measures in both directions

- Response speed ≤ 2 ms
- Reverse operation
- Wide viscosity range
- Compact size
- Up to 420 bar

Low loss measuring of volume flow

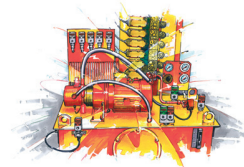
- Response speed ≤ 50 ms
- Many measurement ranges
- Low flow resistance
- Up to 800 l/min
- Up to 420 bar

Measures different substances
Measures lower volume flows (leakage measurements)

- Very wide measurement range
- Not dependent on viscosity
- Up to 400 bar

Applications

- Test rigs
- General machine construction
- Hydraulic plant construction



Order code

SCQ-xxx-10-07

SCFT-xxx-22-07

SCVF-xxx-10-07

Refer to page

35-38

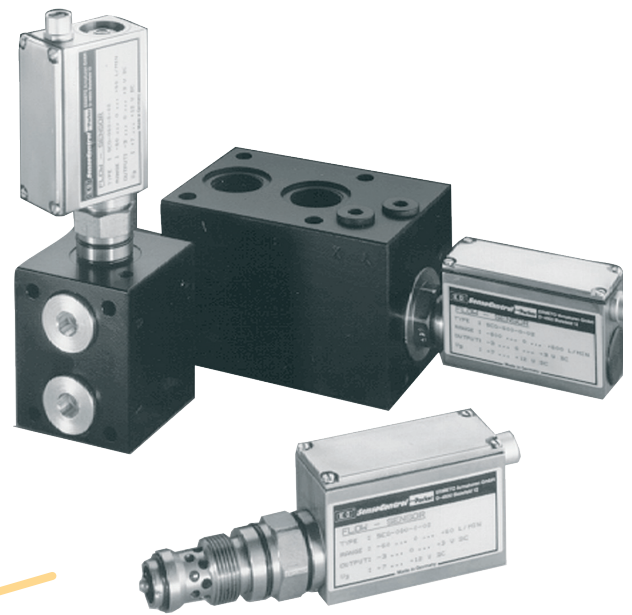
39-42

43-48

SCQ flow meter

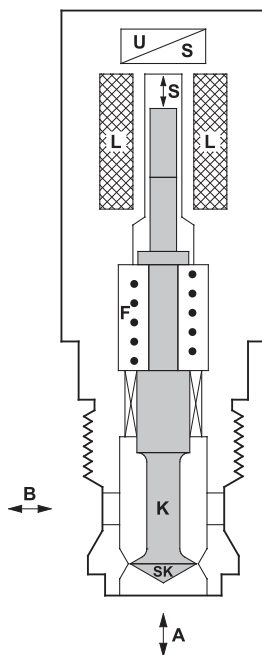
Device features

- Measurement principle Spring/piston principle
- Response time ≤ 2 ms
- Measurement in both directions
- Wide viscosity range
- Compact design
- Withstands pressures up to 420 bar



Function

The piston (K) is moved due to a flow from A to B or from B to A. In the idle state, the spring (F) and the piston (K) are in equilibrium. The delta (S) is proportional to the flow and is converted to a value through the built-in electronics. Through the change in direction of the piston (B to A), the flow direction can be indicated. (e.g. -45.8 l/min) The reaction time of the piston movement is less than 2 ms.



SCQ measurement principle

Application

When working with high-pressure hydraulics, it is very important to be able to quickly detect the flow rate.

Installation with a connection block permits the combined measurement of p, T and Q. Rapid assembly of the **SCQs** is achieved with an in-line adaptor for tube or hose installation. Use under extreme conditions (such as high load changes or rapid pressure increases) is possible because of the sturdy construction.

The **SCQ** is the perfect solution when recording highly dynamic volume flow changes. Rapid load changes, which can cause damage for example in valves and pumps, can be safely detected. Due to its unique measurement process, the **SCQ** can capture volume flow in both directions.

SCQ flow meter

Technical data

| SCQ- | 150 |
|----------------------|-------------------|
| Measuring range QN | -150...+150 l/min |
| Qmax | -165...+165 l/min |
| Substance connection | M42 (NG16) |
| Weight (g) | 1050 |

Accuracy

| | |
|-------------------------------------|------------------|
| Deviation from characteristic curve | ±2 % FS @ 46cSt. |
| Response time | 2 ms |
| Thermal drift | ±0.05 % FS/°C |
| Repeat accuracy | ± 0.5 % FS |

Resistance to pressure

| | |
|------------------------------------|------------------|
| Pressure range | 3...420 bar |
| Operating pressure P _n | 315 bar |
| Overload pressure P _{max} | 420 bar |
| Pressure drop ΔP (bar) @ (FS) | Refer to diagram |

Material

| | |
|----------------------------------|------------|
| Housing | Steel |
| Seal | NBR |
| Parts in contact with substances | Steel, NBR |

Ambient conditions

| | |
|-----------------------|-------------------|
| Operating temperature | +10...+60 °C |
| Storage temperature | -20...80 °C |
| Tmax Fluid | +80 °C |
| Filtration | 25 μm |
| Viscosity range | 15...100 cSt. |
| Protection degree | IP67 DIN EN 60529 |

Electrical connection

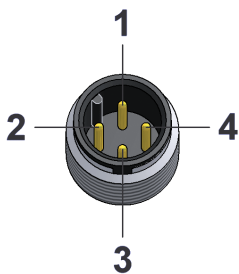
| | |
|---------------------|--|
| Plug | M12x1; 4-pole |
| Supply voltage | +18...+30 VDC |
| Current consumption | 40 mA |
| Output | 0...20 mA = -FS...+FS (10 mA = 0 l/min) |
| Load | ≤ 150 Ω |
| Signal noise | < 5 mV |

EM compatibility

| | |
|----------------------------|--------------|
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |

Pin assignment

M12x1; 4-pole

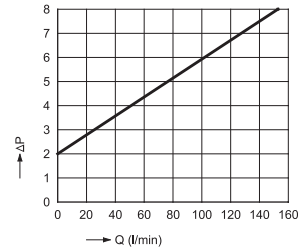
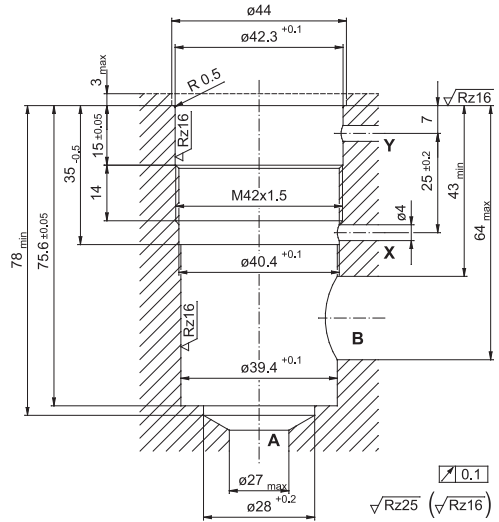
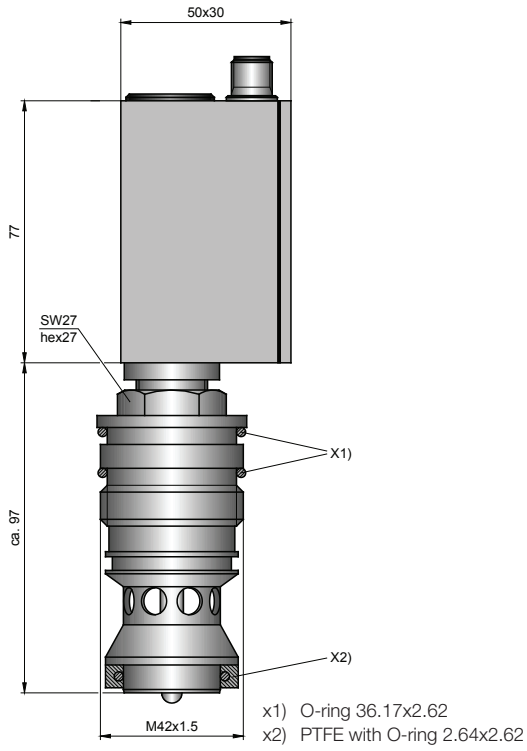


| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Q signal |
| 3 | 0 V / GND |
| 4 | - |

SCQ flow meter

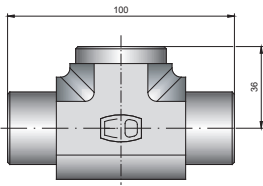
Screw plug hole and pressure-drop curve **SCQ-150**

30 Nm torque

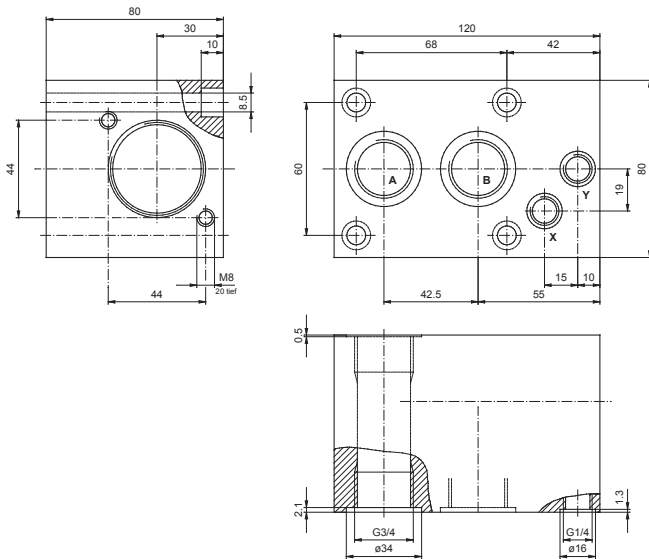


SCQ flow meter

SCAQ-GI-R1/2



SCAQ-150



Order code

SCQ-150 (-150 to +150 l/min)

M12x1, 4-pole; connecting plug; IP67
0 to 20 mA; -150...+150 l/min

SCQ-150-10-07

Accessories SCQ-150

Connector block
G3/4 BSPP inner (A-B) and M42 inner
With screw plug:
M42 outer and
G3/4 BSPP outer (A-B)

SCAQ-150

Spare parts

Spacer ring for SCQ-060
Seal kit for SCQ-060
Seal kit for SCQ-150

SC-910

SC-911

SC-912

Connection cable and single plug

Connection cable, assembled

(open cable end)

SCK-400-xx-xx

Cable length (m)

2 m

5 m

10 m

02

05

10

Connecting plug

M12 cable jack; straight

M12 cable jack; 90° angled

45

55

Single connector

M12 cable jack; straight

M12 cable jack; 90° angled

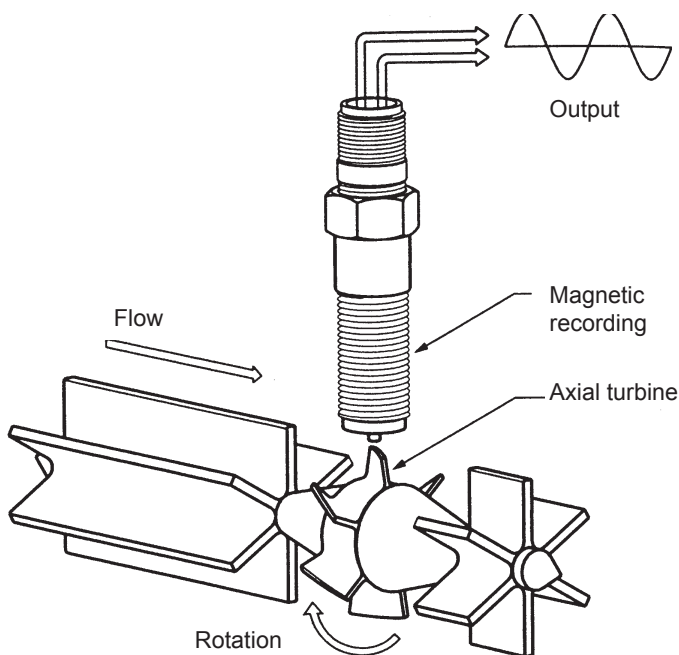
SCK-145

SCK-155

SCFT measurement turbine

Device features

- Measurement principle: Turbine
- Response speed ≤ 50 ms
- Measurement range from 1 to 800 l/min
- Low flow resistance
- Suitable for reverse operation
- Built-in pressure and temperature ports



Function

The turbine wheel is driven by the oil flow. The generated frequencies are processed through the digital electronics and influences from the disturbing flow effects are compensated for. Because of the low flow resistance Q_R , the hydraulic circuit operates with very low losses.

Reverse operation is also possible because of the special vane (winged) design - so the turbine can be operated in both directions.

The turbine is fitted with an EMA-3 screw coupling for measuring pressure. Oil temperature can be measured directly in the oil flow of the turbine by connecting the temperature sensor (**SCT-150**). This provides all important measurements at the installation location.

Application

The **SCFT** is the ideal solution if the volumetric flow rate needs to be recorded loss-free across a wide flow range (up to 800 l/min.).

SCFT measurement turbine

Technical data

| SCFT- | 015 | 060 | 150 | 300 | 600 | 800 |
|--|-----------|-----------|-----------|----------|-------------|------------|
| Flow measuring range Q _n (l/min) | 1...15 | 3...60 | 5...150 | 8...300 | 15...600 | 20...800 |
| Accuracy (± %) FS/IR @ 21cSt. | ± 1 % FS | ± 1 % IR | ± 1 % IR | ± 1 % IR | ± 1 % IR | ± 1 % IR |
| Operating pressure P _n (bar) | 350 | 350 | 350 | 350 | 290 | 400 |
| Ports (A - B) | G1/2 BSPP | G3/4 BSPP | G3/4 BSPP | G1 BSPP | G1 1/4 BSPP | G1 7/8 UNF |
| Pressure drop ΔP (bar) @ (FS) | 1.5 | 1.5 | 1.5 | 4 | 4 | 5 |
| Weight (g) | 700 | 1600 | 1600 | 1700 | 2700 | 5000 |

FS = Full Scale
IR = Indicated Reading

Accuracy

| | |
|-----------------|---------------|
| Response time | 50 ms |
| Thermal drift | ±0.05 % FS/°C |
| Repeat accuracy | ± 0.5 % FS |

Resistance to pressure

| | |
|------------------------------------|----------------------|
| Q _{max} (l/min) | Q _N x 1.1 |
| Overload pressure P _{max} | P _N x 1.2 |

Material

| | |
|---------------------------------------|-----------------------|
| Housing | Aluminium |
| Seal | FKM |
| Parts in contact with sub- stances | Aluminium, steel, FKM |

Ambient conditions

| | |
|------------------------|----------------------------|
| Ambient temperature | -10...+50 °C |
| Storage temperature | -20...+80 °C |
| T _{max} Fluid | -20...+80 °C |
| Filtration | 25 μm (10 μm for SCFT-015) |
| Viscosity range | 15...100 cSt. |
| Protection class | IP66 EN60529 |

Ports

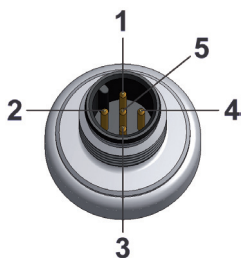
| | |
|--|-----------|
| Temperature measurement (SCT-150-14-07) | M10x1 OR |
| Pressure connection | EMA3 |
| Pressure (VSTI) | G1/4 BSPP |

Electrical connection

| | |
|----------------------------------|--------------------------|
| Plug | M12x1; 5-pole |
| Power supply V ₊ | 18...30 V |
| Output signal | 4...20 mA ± 0...FS l/min |
| Complete output current range | 0...21 mA |
| Current consumption | < 30 mA |
| Protection degree | IP66 EN60529 |

Pin assignment

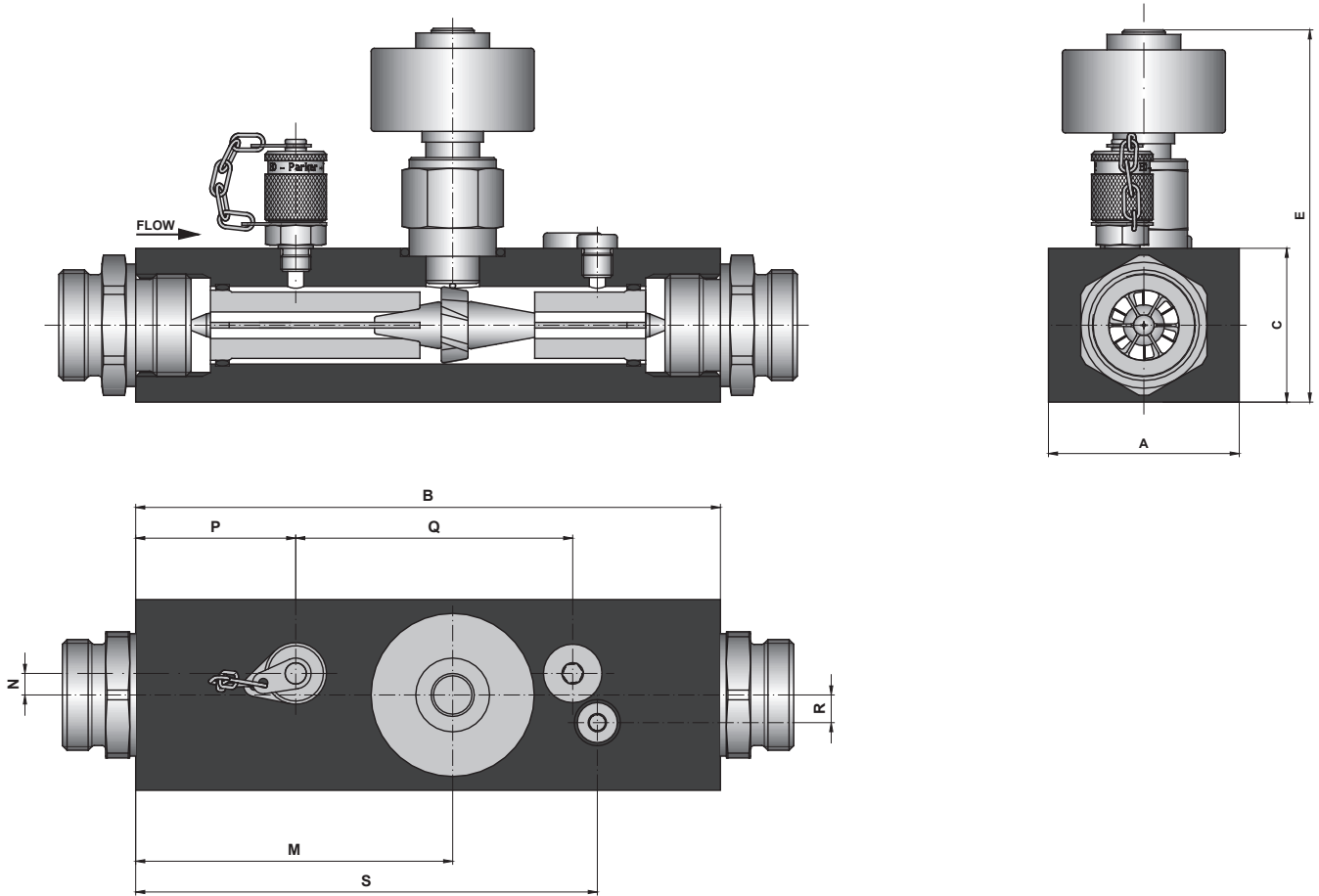
M12x1; 5-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | n.c. |
| 3 | Q signal |
| 4 | n.c.* |
| 5 | 0 V / GND |

*n.c. = do not connect

SCFT measurement turbine



Volumetric flow rate sensors

| # | SCFT-015 | SCFT-060 | SCFT-150 | SCFT-300 | SCFT-600 | SCFT-800 |
|---|----------|----------|----------|----------|----------|----------|
| A | 37 | 62 | 62 | 62 | 62 | 100 |
| B | 136 | 190 | 190 | 190 | 212 | 212 |
| C | 37 | 50 | 50 | 50 | 75 | 75 |
| E | 115 | 130 | 130 | 134 | 149 | 152 |
| M | 70 | 103 | 103 | 103 | 127 | 126 |
| N | 0 | 5 | 5 | 7 | 9 | 10 |
| P | 25 | 50 | 50 | 52 | 62 | 60 |
| Q | N/A | 92 | 92 | 90 | 106 | 104 |
| R | 0 | 5 | 5 | 9 | 11 | 10 |
| S | 115 | 157 | 157 | 150 | 168 | 181 |

SCFT measurement turbine

Order code

SCFT

M12x1, 5-pole; connecting plug; IP66

4...20 mA (3-wire)

1...15 l/min

SCFT-015-22-07

3...60 l/min

SCFT-060-22-07

5...150 l/min

SCFT-150-22-07

8...300 l/min

SCFT-300-22-07

15...600 l/min

SCFT-600-22-07

20...800 l/min

SCFT-800-22-07

Connection cable and single plug

Connection cable, assembled

SCK-400-xx-xx

(open cable end)

Cable length (m)

2 m

02

5 m

05

10 m

10

Connecting plug

M12 cable jack; straight

45

M12 cable jack; 90° angled

55

Single connector

M12 cable jack; straight

SCK-145

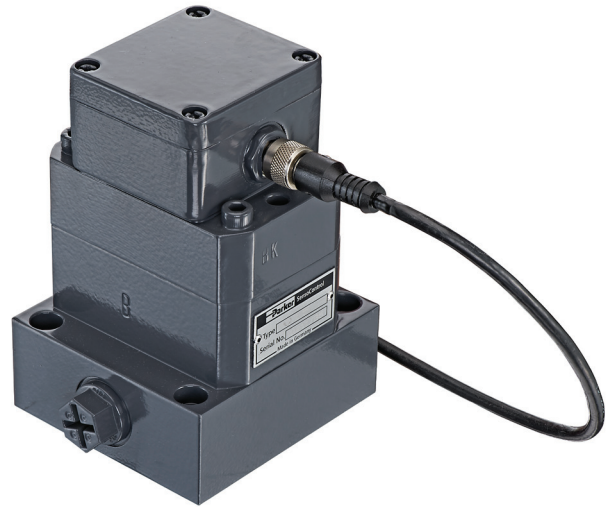
M12 cable jack; 90° angled

SCK-155

SCVF volume counter

Device features

- Measurement principle: Volume/geared counter
- Eight measurement ranges from 0.01 - 2 to 1 - 300 l/min
- Accuracy $\pm 0.5\%$ FS
- Withstands pressures up to 400 bar
- High viscosity range
- Low noise
- Exact flow rate measurement over a wide viscosity range
- Versatile usage for different substances



Gear counter for highly accurate flow rate measurements in hydraulic systems

Function

The SCVF geared counter functions as a volume flow meter. A very precisely crafted pair of geared wheels is driven by the fluid flow.

The SCVF works over a wide viscosity range. Different seals permit usage in many different applications.

Applications

Due to the wide viscosity range, any liquid can be measured that can be pumped and has a certain degree of lubricating capability.

- Brake fluid (EPDM seal)
- Skydrol
- Mineral oils
- Hydraulic oil and
- Grease

The SCVF is the ideal solution when carrying out precise flow rate measurements over a wide viscosity range.

SCVF volume counter

Technical data

| SCVF- | 002 | 004 | 015 | 040 | 060 | 080 | 150 | 300 |
|--|------------|------------|-----------|-----------|-----------|-----------|-----------|-----------|
| Flow measuring range (l/min) | 0.01...2.0 | 0.02...4.0 | 0.2...15 | 0.4...40 | 0.4...60 | 0.4...80 | 0.6...150 | 1.0...300 |
| Pressure range P _N (bar) | 400 | 315 | 400 | 400 | 400 | 400 | 315 | 315 |
| Overload pressure P _O (bar) | 480 | 400 | 480 | 480 | 480 | 480 | 350 | 350 |
| Connection | G3/8 BSPP | G3/8 BSPP | G3/8 BSPP | G1/2 BSPP | G1/2 BSPP | G1/2 BSPP | G1 BSPP | G1 BSPP |
| Sound level dB (A) | < 60 | < 60 | < 60 | < 70 | < 70 | < 70 | < 70 | < 72 |
| Resolution (pulses / litre) | 40,000 | 25,000 | 4082 | 965 | 965 | 965 | 333.33 | 191 |

Accuracy

| | |
|-------------------------------------|--|
| Deviation from characteristic curve | ± 0.3 % FS ≥ 20 cSt. ± 0.5 % FS ≥ 20 cSt. |
| Response time | < 10 ms |
| Repeat accuracy | 0.01 % FS |
| Substance *) | Hydraulic oil (25 micron filter) |

Material

| | |
|---------|--|
| | Material 1.7139 Contains no non-ferrous metal or silicone |
| Housing | Steel |
| Seal | FKM EPDM on request |

Ambient conditions

| | |
|---------------------|------------------------|
| Ambient temperature | 0...+55 °C |
| Storage temperature | -25...+85 °C |
| Fluid temperature | -30...120 °C |
| Viscosity range | Refer to diagram p. 48 |
| Protection degree | IP65 DIN EN 60529 |

FS = Full scale value

*) When using other substances, please state the viscosity range and the type of seals. (Attach the data sheet of the substance if possible)

Electrical connection

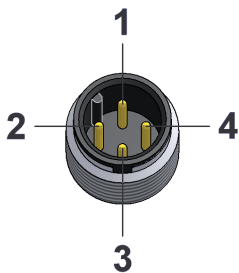
| | |
|-----------------------------|--------------------------|
| Plug | M12x1; 4-pole |
| Power supply V ₊ | +18...+30 VDC |
| Current consumption | < 28 mA |
| Output signal | 0...20 mA ± 0...FS l/min |
| Load | ≤ 150 Ω |

EM compatibility

| | |
|----------------------------|--------------|
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |

Pin assignment

M12x1; 4-pole

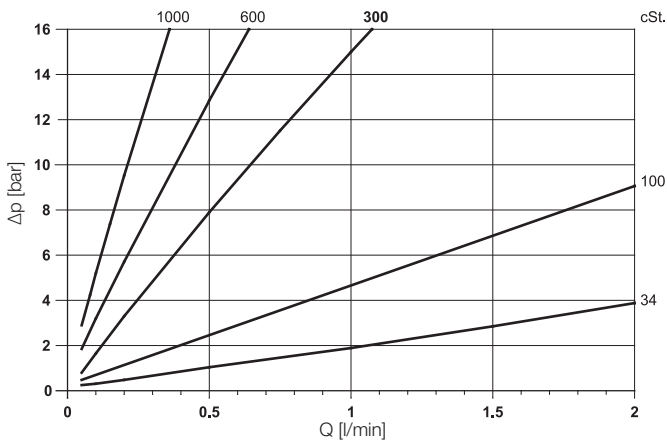


| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Q-signal |
| 3 | 0 V / GND |
| 4 | - |

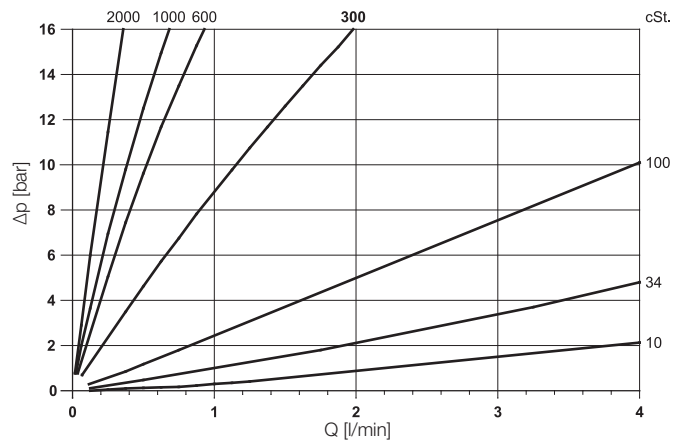
SCVF volume counter

Technical data

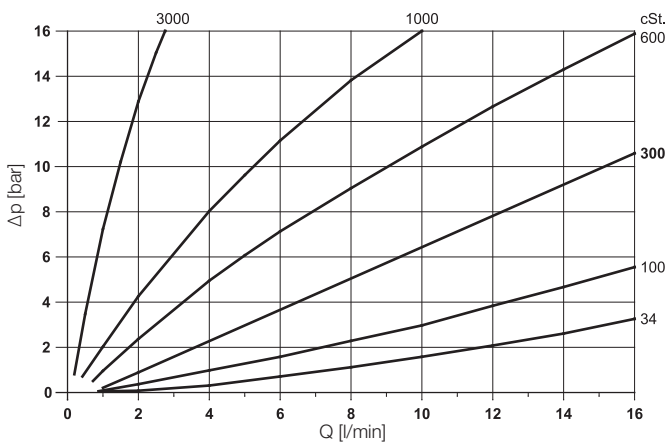
SCVF-002 Δp - Viscosity



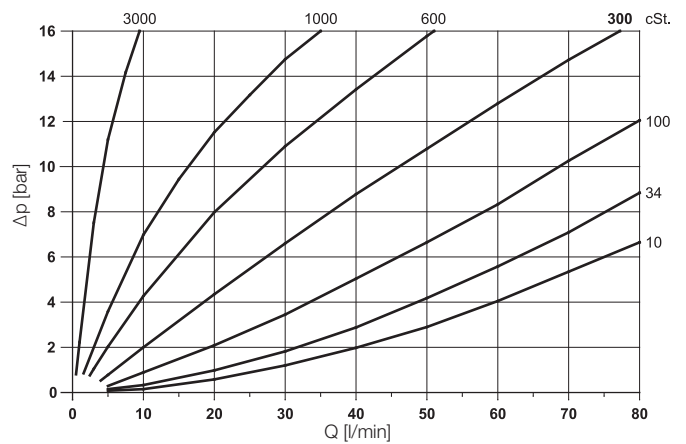
SCVF-004 Δp - Viscosity



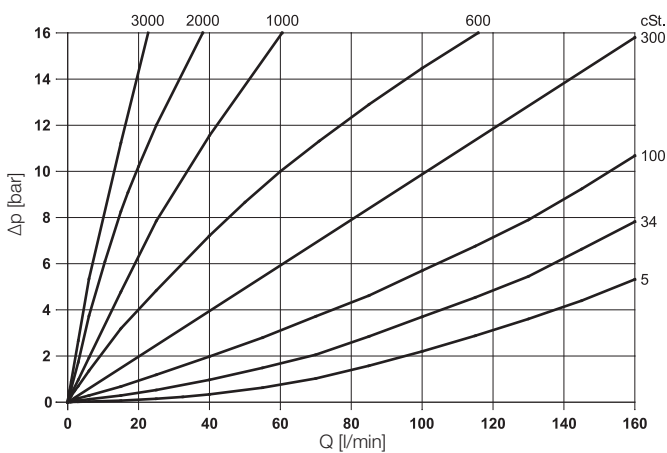
SCVF-015 Δp - Viscosity



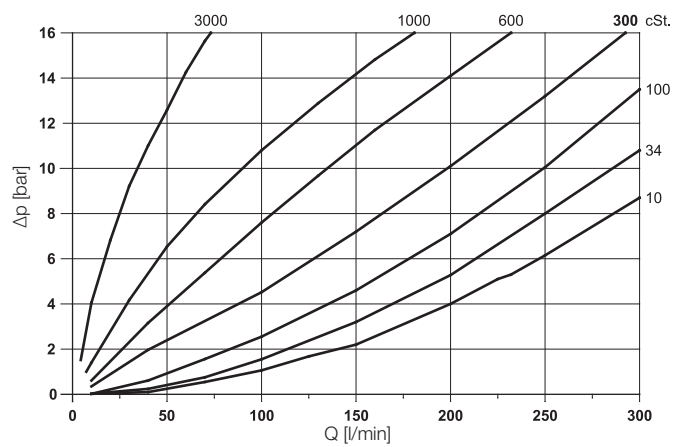
SCVF-040/060/080 Δp - Viscosity



SCVF-150 Δp - Viscosity



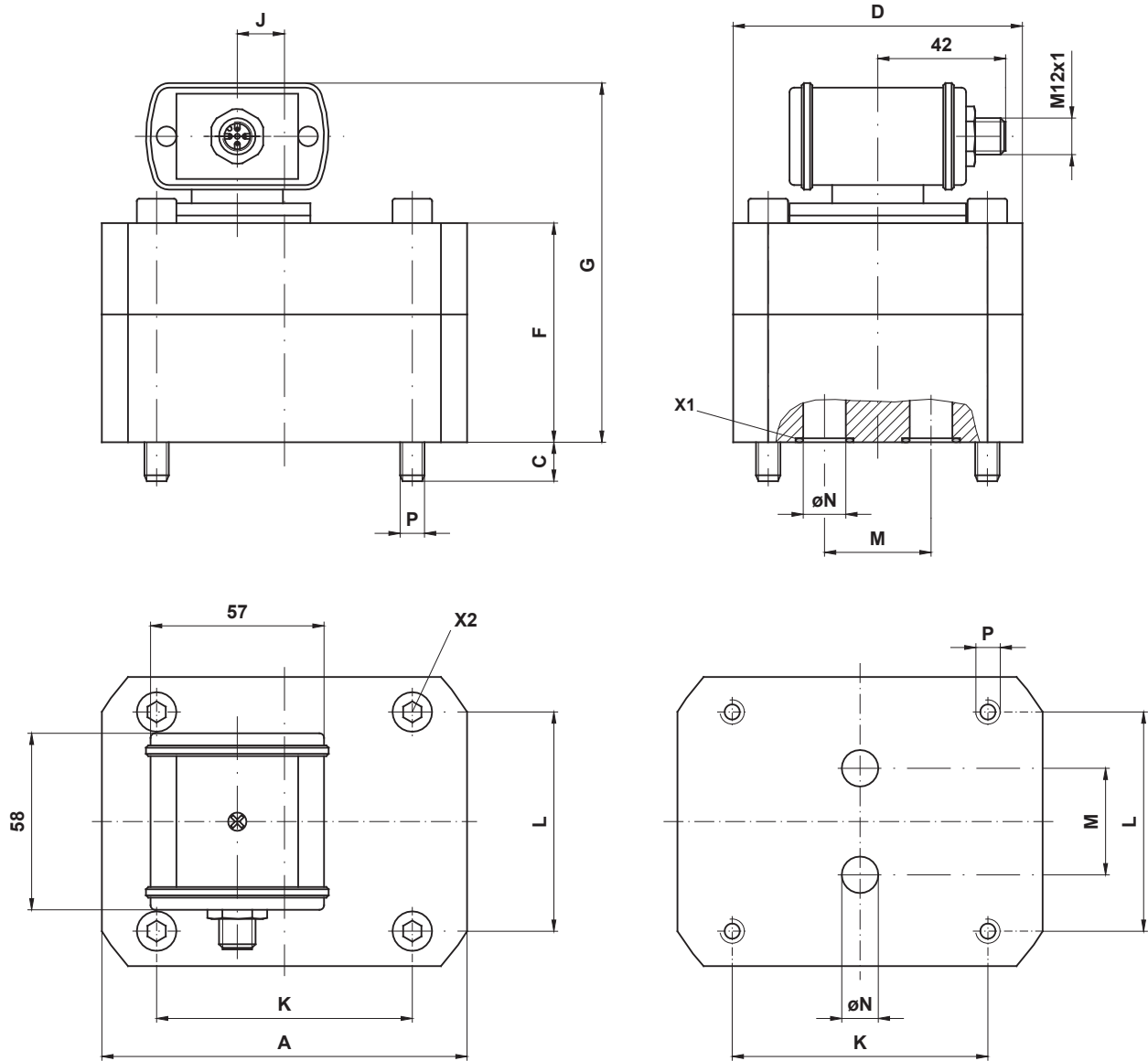
SCVF-300 Δp - Viscosity



Δp = pressure loss



SCVF volume counter

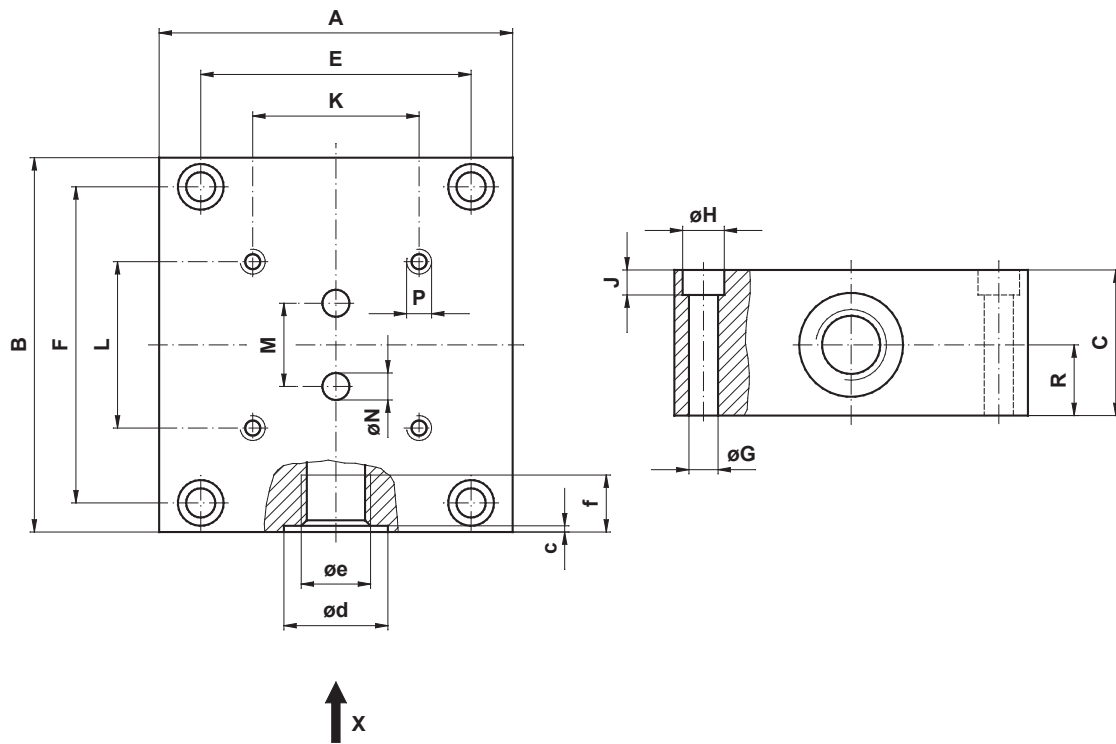


| Type | Weight [kg] | Torque [Nm] | A | C | D | F | G | J | K | L | M | øN | P |
|----------|-------------|-------------|-----|----|-----|-----|-----|------|----|----|----|-----|-----|
| SCVF-002 | 1.8 | 14 | 85 | 10 | 60 | 50 | 87 | - | 70 | 40 | 20 | 6.5 | M6 |
| SCVF-004 | 2 | 14 | 85 | 9 | 60 | 56 | | - | 70 | 40 | 20 | 6.5 | M6 |
| SCVF-015 | 2 | 14 | 85 | 13 | 60 | 57 | 94 | - | 70 | 40 | 20 | 9 | M6 |
| SCVF-040 | 5.2 | 35 | 120 | 13 | 95 | 72 | 109 | 10.5 | 84 | 72 | 35 | 16 | M8 |
| SCVF-060 | | | | | | | | | | | | | |
| SCVF-080 | | | | | | | | | | | | | |
| SCVF-150 | 9 | 120 | 170 | 18 | 120 | 89 | 140 | 46.5 | 46 | 95 | 50 | 25 | M12 |
| SCVF-300 | 13 | 120 | 170 | 22 | 120 | 105 | 142 | 40 | 46 | 95 | 50 | 25 | M12 |

All measurements in mm

SCVF volume counter

Dimensioned drawings connection plate



| Type | kg | A | B | C | E | F | øG | øH | J | K | L | M | øN | P | R | c | ød | øe BSPP | f |
|----------------------------------|-----|-----|-----|----|-----|-----|----|----|---|----|----|----|-----|------------|------|-----|----|------------|----|
| SCVF-002 SCVF-004 SCVF-015 | 1.8 | 85 | 90 | 35 | 65 | 76 | 7 | 11 | 7 | 70 | 40 | 20 | 6.5 | M6/t = 14 | 17 | 0.7 | 25 | G3/8 | 13 |
| SCVF-040 SCVF-060 SCVF-080 | 2.9 | 100 | 120 | 37 | 80 | 106 | 7 | 11 | 7 | 84 | 72 | 35 | 12 | M8/t = 18 | 17.5 | 0.7 | 29 | G 1/2 | 15 |
| SCVF-150 SCVF-300 | 14 | 160 | 165 | 80 | 140 | 145 | 9 | 15 | 9 | 46 | 95 | 50 | 25 | M12/t = 24 | 28 | 1 | 42 | G1 | 19 |

All measurements in mm

SCVF volume counter

Order code

SCVF

M12x1, 4-pole; connecting plug; IP65; incl. connection plate

0...20 mA

0.01...2 l/min

SCVF-002-10-07

0.02...4 l/min

SCVF-004-10-07

0.2...15 l/min

SCVF-015-10-07

0.4...40 l/min

SCVF-040-10-07

0.4...60 l/min

SCVF-060-10-07

0.4...80 l/min

SCVF-080-10-07

0.6...150 l/min

SCVF-150-10-07

1...300 l/min

SCVF-300-10-07

Connection cable and single plug

Connection cable, assembled

SCK-400-xx-xx

(open cable end)

Cable length (m)

2 m

02

5 m

05

10 m

10

Connecting plug

M12 cable jack; straight

45

M12 cable jack; 90° angled

55

Single connector

M12 cable jack; straight

SCK-145

M12 cable jack; 90° angled

SCK-155

SCE-020 digital display unit

Device features

- Easily readable digital display:
 - Large
 - Bright
- Programmable
- Unit of measure can be selected
- Adjustable display range
- Input:

| | |
|---------|--------------|
| Current | 0/4 to 20 mA |
| Voltage | 0 to 10 V |
- Switching output
- Loop-through function:
 - Analogue output
 - Serial interface
- Standard housing 96 x 48 mm



Diverse connections, a flexible display and many outputs are the features of the digital display SCE.

The SCE-020 converts standard analogue signals (in the range 0 to 10 V up to 0/4 to 20 mA) into clearly readable measurement values or units.

The **SCE-020** can be used to easily display every desired sensor. (pressure, temperature, torque, length, etc.)

Functions

The display can be read from a long distance. The measurement range and the decimal point can be adjusted to fit user requirements so that different measurement values can be displayed.

The accompanying units are mounted on a separate illumination area.

The power supply varies from 11 to 30 VDC.

An adjustable limit value be monitored using the floating switching output.

Loop-through function

The analogue output or the RS232 serial interface can forward the signal to the appropriate peripheral.

The SCE-020 display unit can be used when different measurement values need to be displayed in a simple and flexible manner.

SCE-020 digital display unit

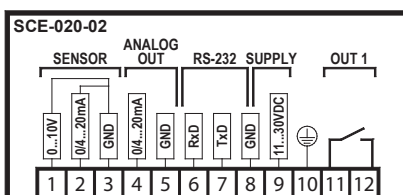
Technical data

| | SCE-020-2 |
|----------------------|--|
| Input | 0...20 mA, 4...20 mA or 0...10 V |
| Input resistance | 0...20 mA = 150 Ω, 4...20 mA = 150 Ω, 0...10 V = 67 KΩ |
| Analogue output | 0...20 mA, 4...20 mA |
| Analogue output load | ≤ 500 Ω |
| Interface | RS-232C |
| Limit value | Floating CO contact 250 V/5 A max. |

| Input | |
|-----------------------------|--|
| Measurement error | ± 0.2 % of the display °± 1 digit |
| Measurement rate | 5 ms |
| | Threshold query every 5 ms |
| Measuring range | Freely selectable (programmable) |
| Display | |
| Display | 4-digit 7-segment LED |
| Display range | -999 to 9999 |
| Digit height | 13 mm |
| Decimal point | Freely programmable |
| Dimension display | Selectable, by attaching a dimensioning label to the appropriate illumination area |
| Ambient conditions | |
| Operating temperature range | 0...+60 °C |
| Storage temperature range | -25...+80 °C |
| Relative humidity | < 80 % |
| Protection degree | IP44 |

| Power supply | |
|---------------------|---|
| Auxiliary Power | 11...30 VDC |
| Current consumption | Approx. 100 mA |
| Housing | |
| Material | PC ABS black Self-extinguishing according to UL94V0, For table and console installation |
| Front dimensions | 96 x 48 mm |
| Installation depth | 131 mm |
| Connection | 12 -pole terminal block with wire protection, max. 1.5 mm ² |
| Mounting position | As required |
| Weight | Approx. 200 g |

Pin assignment

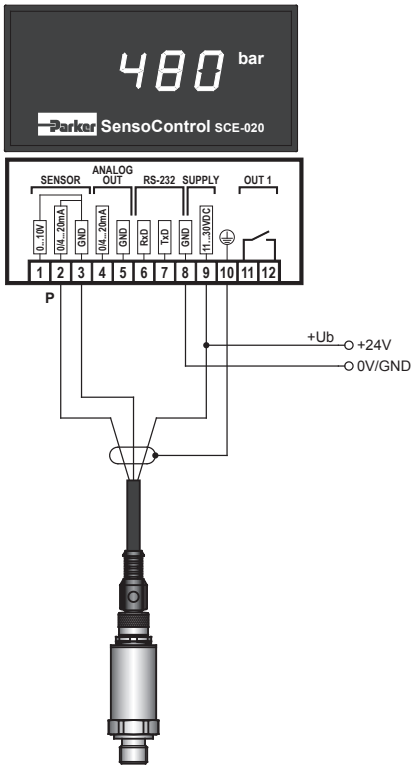


SCE-020 digital display unit

Connection examples (0/4 to 20 mA)

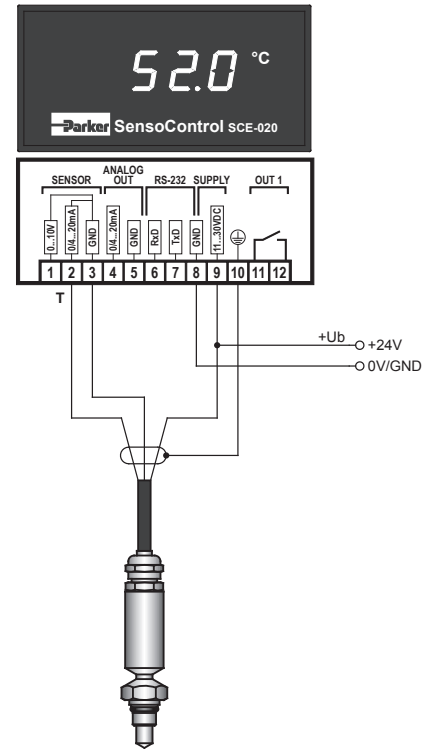
SCE-020-02

Pressure sensor SCP



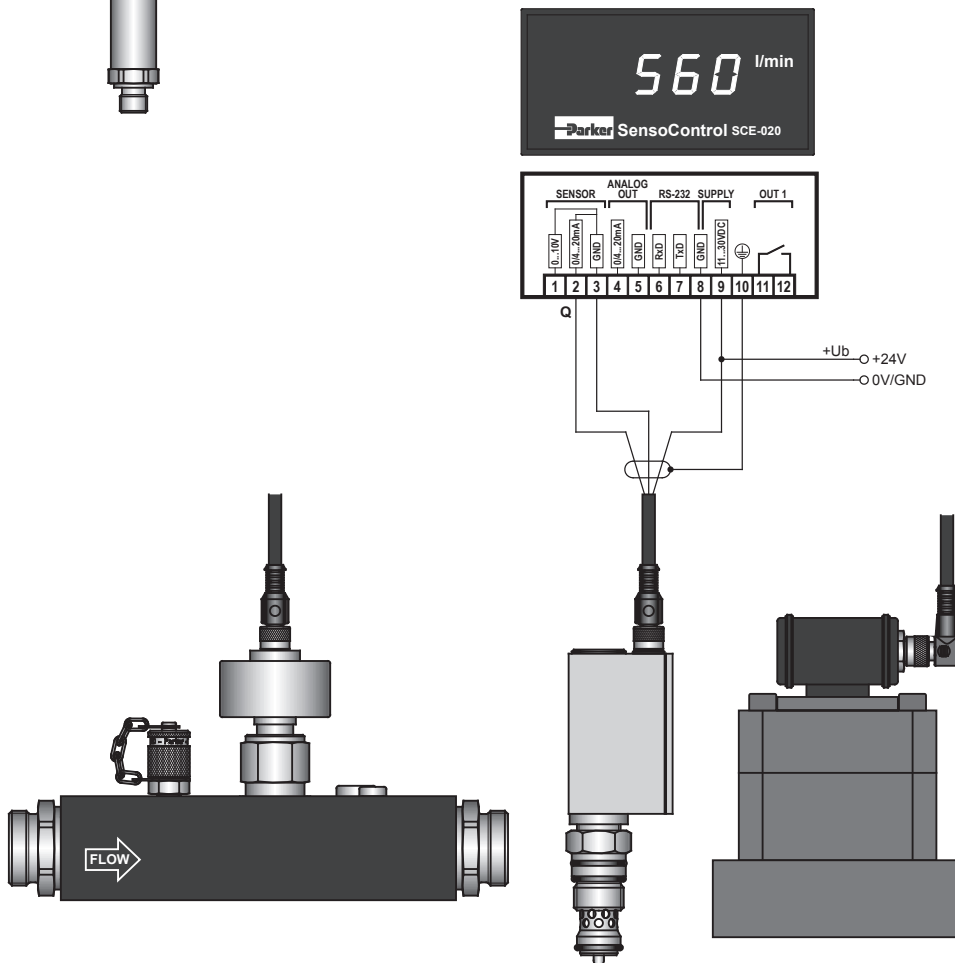
SCE-020-02

Temperature sensor SCT

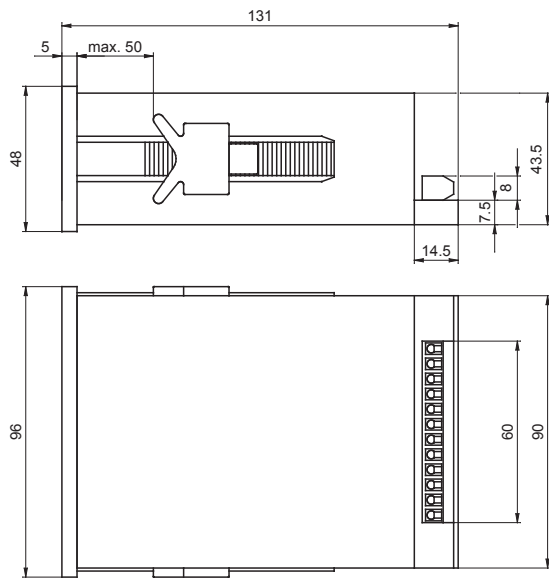
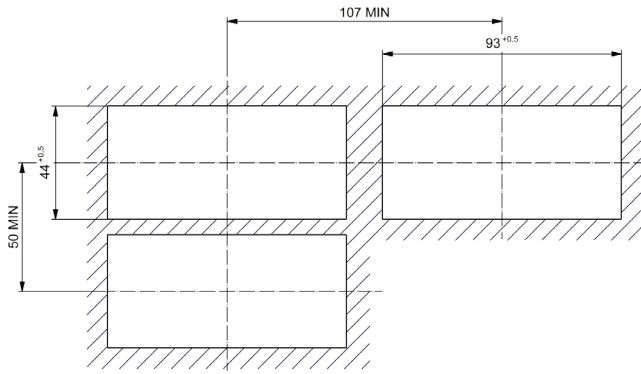


SCE-020-02

Flow sensor



SCE-020 digital display unit



Order code

SCE-020 Input 0/4 to 20 mA/0 to 10 V
+ 1 switching output
+ RS232C serial interface

SCE-020-02

Accessories:

Data cable SCE – PC

SCK-300-02-31

The Controller Family

Device features

- Large display
- Freely adjustable
- Rugged metal construction
- Compact size
- Long-term stability
- Dependable
- Immune to interference



This controller is used in control, regulation or monitoring systems where switching signals or analogue signals are used or a display is required.

The controller can replace the following:

- Mechanical switches
- Mechanical displays
(pressure gauges, thermometers, inspection glass)
- Sensors

All the above mentioned functions can be combined in one device.

All control devices have a compact and pivoting metal housing so that they can be mounted optimally under adverse installation conditions. The large display can always be perfectly positioned so that it is easy to read even at longer distances.

Both of the switching outputs can be set individually either as NO or NC. They also both have hysteresis and the window functions. Therefore the on and off switching values as well as delay times (attenuation) for each of the switching points can be chosen freely.





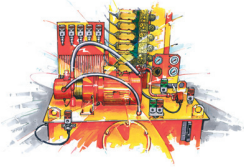
Thanks to these easy switching functions, intelligent adjustments can be set which are normally not possible using a mechanical switch. Therefore, many switches can be replaced with one controller.




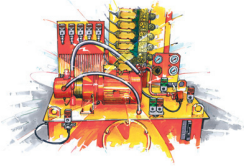
The controllers offer good practical characteristics combined with diverse mounting and setting options.

Because of its compact design, long lifespan and high functionality, this controller is ideal for the permanent series use in hydraulic and pneumatic applications.

The Controller Family

Overview

| | SCPSDi | SCPSD | SCTSD | SCTSD-L |
|----------------------|---|---|--|---|
| |  |  |  |  |
| Range of use | Pressure display and monitoring | | Temperature display and monitoring | Temperature display and level monitoring |
| | <ul style="list-style-type: none"> ■ Compact size ■ Resistant to pressure peaks ■ Resistant to shock and vibration ■ IO link | <ul style="list-style-type: none"> ■ Compact size ■ Resistant to pressure peaks ■ Resistant to shock and vibration | <ul style="list-style-type: none"> ■ Temperature display ■ Modular design ■ Suitable for control panel and tank construction ■ High pressure version | <ul style="list-style-type: none"> ■ Temperature display ■ Fixed level contacts |
| Applications | <ul style="list-style-type: none"> ■ Test benches ■ Processing equipment ■ Conveying and lifting equipment ■ General machine construction ■ Pneumatic plant construction ■ Hydraulic plant construction | | |  |
| Order code | SCPSDi-xxx-x4-x7 | SCPSD-xxx-x4-xx | SCTSD-150-xx-xx | SCTSD-L-xxxxx-xxxxx |
| Refer to page | 55-60 | 61-66 | 67-78 | 79-82 |

| | SCLSD | SCLTSD | SCOTC | |
|----------------------|---|---|---|---|
| |  |  |  | |
| Range of use | Level indication and monitoring | Level/temperature display and monitoring | | |
| | <ul style="list-style-type: none"> ■ Level display ■ Practical monitoring with window function ■ Continuous level measurement | <ul style="list-style-type: none"> ■ Level display ■ Temperature display ■ Continuous level measurement ■ One bore hole | <ul style="list-style-type: none"> ■ Level display ■ Temperature display ■ Continuous level measurement ■ One bore hole ■ Connection to the filling coupling ■ Connection to the air filter | |
| Applications | <ul style="list-style-type: none"> ■ Test benches ■ Processing equipment ■ Conveying and lifting equipment ■ General machine construction ■ Pneumatic plant construction ■ Hydraulic plant construction | | |  |
| Order code | SCLSD-xxx-x0-07 | SCLTSD-xxx-x0-07 | SCOTC-xxx-x0-07 | |
| Refer to page | 83-88 | 89-94 | 95-100 | |

SCPSDi PressureController

Device features

- IO LINK
- VDMA menu
- ECO mode
- > 360° pivot function
- 180° reversible display
- Analogue output V/mA
- Operator safety improved with LOCK
- Compact size
- Rugged
- MPa, bar, PSI
- Metal housing
- Installation width 35 mm
- Installation height 78 mm



The SCPSDi is an electronic pressure switch with:

- Pressure display
- Two programmable switching outputs
- Optional analogue output signal
- IO-Link interface
- VDMA menu navigation

The key features of the SCPSDi are the innovative design and the resulting installation options combined with the diverse connection possibilities.

These unique functions make the SCPSDi ideal for permanent series use in industrial applications.

Innovative construction design

The external-thread pressure port is stop-free and can be turned independently of the housing. So you can install the pressure connection without turning the housing. The small size means that it can easily be installed in cramped quarters. After the installation, the housing can be fully rotated over 360° with no stop. It also locks into position while under pressure.

For the internal-thread pressure port, all components that come into contact with the pressurized substance are made from stainless steel. It does not have any seals so it can be used with a wide range of substances including corrosive and aggressive media.

The display is readable from large distances and can be rotated through 180° for overhead installation. A horizontally-mounted display is optionally available.

Reliable / safe / sturdy

The pressure is recorded with a long-term stable and maintenance-free measuring cell. A functional error is signalled and can be processed further according to DESI-NA. The metal housing is void of moving seals and is resistant to moisture, shock and vibrations.

Easy to use

The terminology and symbols used, as well as the menu structure used for setting parameters can be easily browsed using the buttons in accordance with the VDMA standard journal (VDMA 24574-1) or automatically using IO Link.

Universal

Each switching output can be adjusted individually:

- NO/NC contact
- On/off switching pressures
- Delay times
- Hysteresis / window function

The optional analogue output is switchable between 0/4 to 20 mA and 0 to 10 V. An unintentional parameter change is prevented with use of the LOCK function (button lock).

Numerous versions are available for the many different applications.

- Diverse pressures ranges up to 600 bar
- Diverse inner and outer threads
- With or without analogue output

SCPSDi PressureController

Device features

Display

- Active-lit LED display
- Pressure display
- Units are displayed
- Bar / PSI / MPa
- Switch status is shown
- 180° rotation for top mount
- ECO mode*

Design

- No moveable seals
- Few housing elements
- No mixing of materials
- Ergonomic
- Minimal surface area for dirt
- Compact size
- Plug in the front
- Compact installation dimensions
- Sloped display

Measuring component

- Hermetically sealed and welded stainless steel membrane
- Zero-point stability
- Long-term stability
- No wear and tear
- Excellent pressure resistance
- Up to a nominal pressure of 600 bar

Innovative construction of external threads

- The external-thread pressure port is stop-free and can be turned independently of the housing. So you can install the pressure connection without turning the housing.
- The housing can be set in any direction for optimal cable routing and locks under pressure.
- Self-contained housing
- No force is exerted on the measuring component during installation
- Stainless steel
- BSPP/UNF/NPT
- NBR sealing

Housing

- Metal housing
- No movable elements, therefore wear-free
- Not sensitive to external environment
- Waterproof IP67
- Rugged

Adjustments and settings

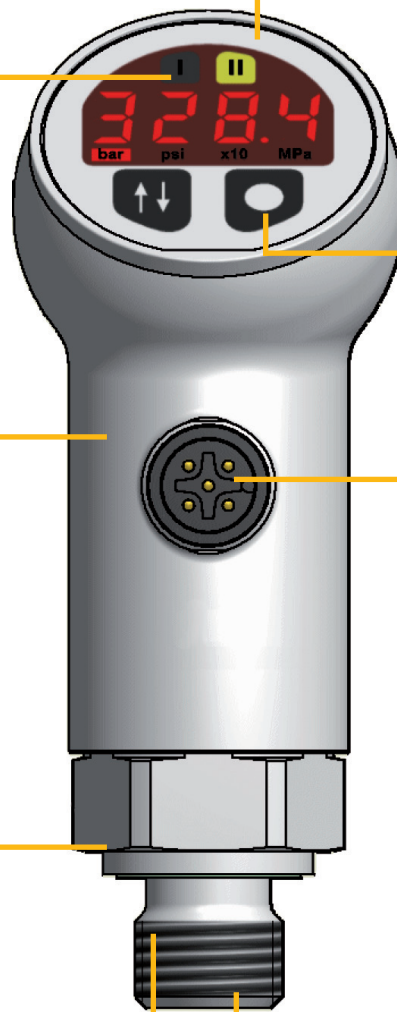
- VDMA menu navigation
- Two large buttons
- LOCK function**

M12

- Threaded metal connection
- The plug cannot be over-rotated or broken off
- VDMA-compliant assignment of pins
- IO link
- DESINA
- 2 switching outputs
- Switchable analogue output
 - 0...20 mA
 - 4...20 mA
 - 0...10 V
- Excellent interference immunity

Inner thread

- All components that come into contact with the substance being measured are made from stainless steel
- No internal sealing components
- Wide range of compatible substances
- Resistant against corrosive and aggressive substances



* ECO mode (activated via menu): pressure switch is run with minimum power in this mode

** LOCK function (button lock): Prevents accidental changing of the pressure switch parameters

SCPSDi PressureController

Technical data

| SCPSDi- | 010 | 016 | 025 | 060 | 100 | 250 | 400 | 600 |
|---|----------------|---------|---------|--------|---------|---------|---------|---------|
| Pressure range P_n , relative (bar) Adjusting range RSP...SP (Lowest reset switch point ... highest switch point) | -1...10 | -1...16 | -1...25 | 0...60 | 0...100 | 0...250 | 0...400 | 0...600 |
| Overload pressure * P_{max} relative (bar) | $2 \times P_n$ | | | | | | | |
| Burst pressure ** P_{burst} relative (bar) | $3 \times P_n$ | | | | | | | |
| Display resolution Increment size (bar) | 0.01 | 0.01 | 0.01 | 0.1 | 0.1 | 1 | 1 | 1 |
| Smallest adjustable difference between SP and RSP (SP-RSP) | 0.01 | 0.01 | 0.01 | 0.1 | 0.1 | 1 | 1 | 1 |

* DIN EN 60770-1

** DIN 16086

| Input values | |
|--|---|
| Switching cycles | ≥ 100 million |
| Scanning rate | ≤ 10 ms |
| Process connection Inner/outer thread | G1/4 BSPP, 7/16 UNF, NPT |
| Tightening torque | 35 Nm |
| Parts in contact with substances | Inner thread Stainless steel 1.4301; 1.4404 |
| | Outer thread Stainless steel 1.4301; 1.4404; 1.0718 CF; NBR |
| Temperature range of substance | -20...+105 °C |
| MTTFd | > 100 years |
| Output values | |
| Accuracy* | ± 0.5% FS typ.; +/- 1% FS max. |
| Temperature drift | ± 0.03% FS/K |
| Long-term stability | ± 0.2% FS/a |
| Repeat accuracy | ± 0.25% FS |
| Switch point accuracy | ± 0.5% FS typ.; +/- 1% FS max. |
| Display accuracy | ± 0.5% FS +/- 1 digit typ. ± 1% FS +/- 1 digit max. |
| Max. display value | 110% P_n |
| Analogue output | +/- 0.5% FS typ.; +/- 1% FS max. |
| * Including non-linearity, hysteresis, zero-point and full-scale deviations (corresponds to measurement deviations according to IEC 61298-2) | |
| Response speed | |
| Switching output | ≤ 10 ms |
| Analogue output | ≤ 10 ms |

| Electrical connection | |
|-----------------------------|---|
| Supply voltage V_+ | Nominal 24 VDC; 12...30 VDC |
| Electrical connection | M12x1; 4-pole according to DIN EN 61076-2-101 |
| Short circuit protection | Yes |
| Reverse polarity protection | Yes |
| Overload protection | Yes |
| Current consumption | < 50 mA; in ECO mode < 40 mA |
| Switch-on current | < 100 mA |
| Outputs | |
| Switching output 1 | High-side/low-side switch (PNP/NPN) |
| | Switching current: max. 200 mA |
| | Short-circuit current: 400 mA (short-term), Short-circuit resistance |
| Switching output 2 | Switching voltage: Supply voltage – 1.5 VDC |
| | High-side (PNP)* Optional |
| | Switching current: max. 500 mA |
| IO Link | Short-circuit current: 800 mA (momentary), short-circuit-proof |
| | Switching voltage: $V_+ - 1.5$ VDC |
| Analogue output | 4...20 mA, 0...20 mA, 0...10 V |

*see ECN15003

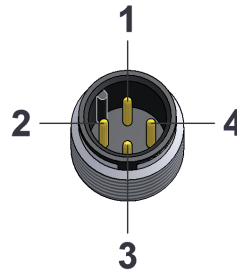
SCPSDi PressureController

Technical data

| Housing | |
|----------------------------|---|
| Rotating | > 360° |
| Readability of the display | viewing angle can be rotated 180° Configurable (programming) |
| Display | 4-digit 7-segment LED with additional symbols for units and switching status display; Digit height: ~6 mm, Height of units: ~2 mm |
| Material | Die-cast nickel-plated zinc |
| Protection degree | IP67 |
| Weight | 148 g |
| Ambient conditions | |
| Ambient temperature range | -25...+85 °C |
| Storage temperature range | -40...+85 °C |
| Vibration resistance | 20 g; 10...500 Hz; IEC60068-2-6 |
| Shock resistance | 50 g; 11 ms; IEC60068-2-29 |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Interference immunity | EN 61000-6-2 |
| General | |
| MTTFd | > 100 years |
| RoHS-compliant | Yes |

Pin assignment

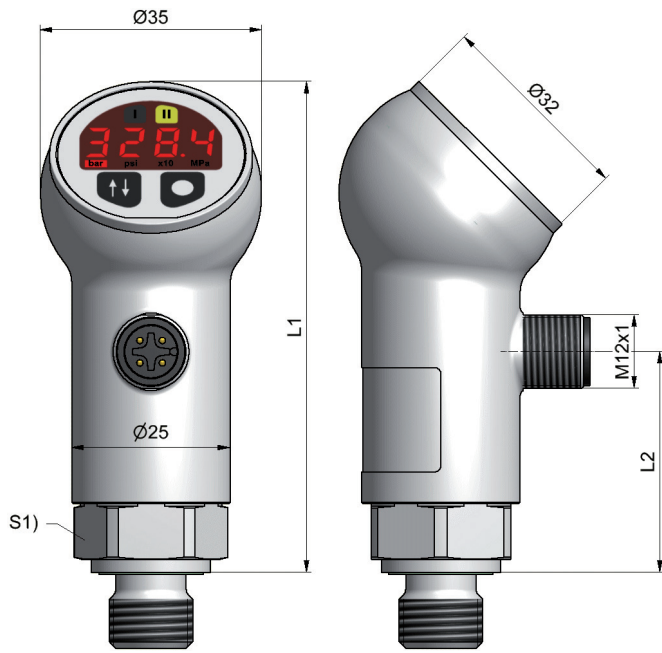
M12x1; 4-pole



| PIN | Assignment |
|-----|-------------------|
| 1 | V ₊ |
| 2 | S2 out / analogue |
| 3 | 0 V / GND |
| 4 | S1 out / IO Link |

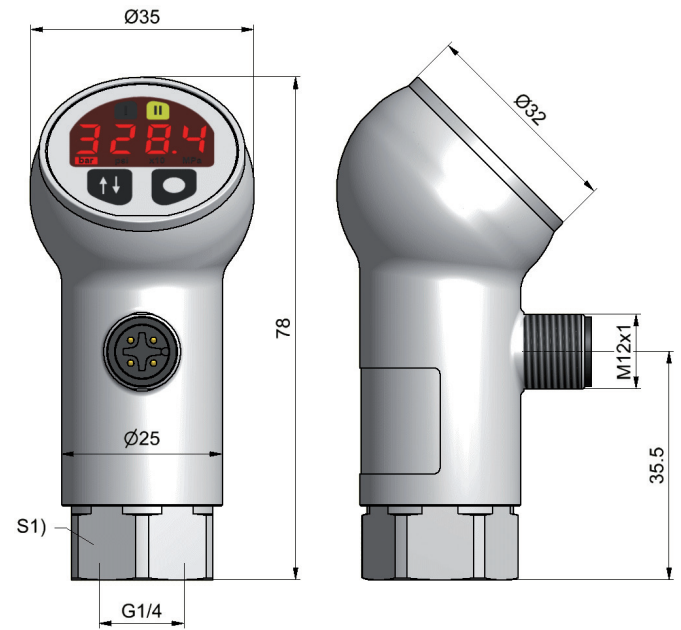
SCPSDi PressureController

SCPSDi-xxx-xx-17

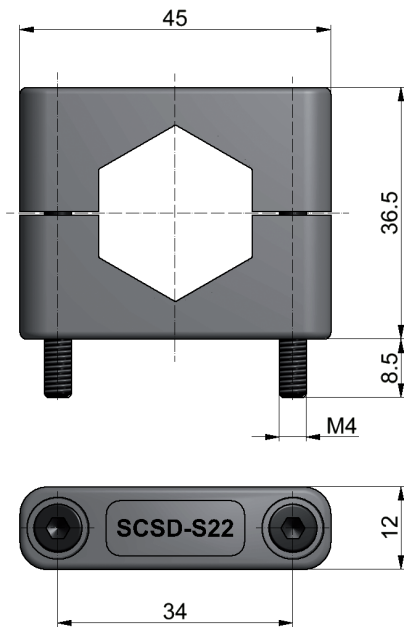


S1) SW22

SCPSDi-xxx-xx-27



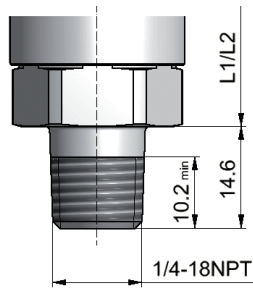
SCSD-S22



SCPSDi PressureController

SCPSDi-xxx-x5-17

1/4 NPT
L1) 75.5
L2) 33



Order code

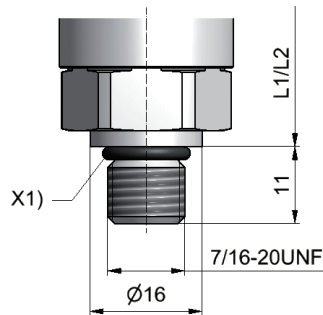
SCPSDi 2 switching outputs; SCPSDi-xxx-04-x7-
SCPSDi 2 switching outputs Marine; SCPSDi-xxx-04-x7-MA
(approved by DNV/GL/ABS)
without analogue output,
G 1/4, M12x1; 4-pole

1 switching output;
1 switching output Marine;
(approved by DNV/GL/ABS)
switchable analogue output,
G 1/4, M12x1; 4-pole

SCPSDi-xxx-14-x7
SCPSDi-xxx-14-x7-MA

SCPSDi-xxx-x7-17

7/16UNF
L1) 78
L2) 35.5
X1) OR 8.92x1.83



Pressure range

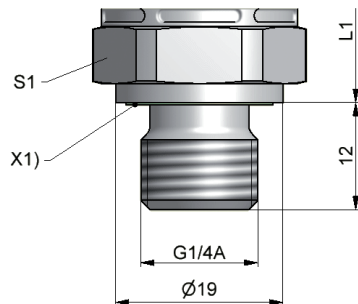
| | |
|-----|-----|
| 010 | 010 |
| 016 | 016 |
| 025 | 025 |
| 060 | 060 |
| 100 | 100 |
| 250 | 250 |
| 400 | 400 |
| 600 | 600 |

Version

| | |
|--------------|---|
| Outer thread | 1 |
| Inner thread | 2 |

SCPSDi-xxx-x4-17

G1/4ED
L1) 77.5
L2) 35
X1) ED seal



Connection cable and single plug

Connection cable, assembled SCK-400-xx-xx
(open cable end)

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

| | |
|----------------------------|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

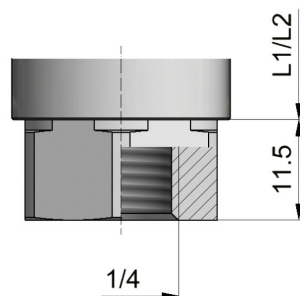
| | |
|----------------------------|---------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |

Accessories:

| | |
|----------------|----------|
| Securing clamp | SCSD-S27 |
|----------------|----------|

SCPSDi-xxx-x4-27

G1/4



SCPSD PressureController

Device features

- Compact size
- Rugged
- Dependable
- Easily operable
- Long-term stability
- Excellent interference immunity
- Metal housing
- High protection class
- Many variants
- Pivoting
- Analogue output
- Password
- MPa, bar, PSI



The PressureController combines the functions of a pressure switch, a pressure sensor and a display device.

- Pressure gauge (manometer)
- Switching outputs
- Analogue signal

The PressureController is easy to operate, has a compact design and is very reliable. The PressureController features excellent technical specifications, optimal pressure management and a wide variety of installation options. This makes it perfect for permanent series use in industrial applications.

Easy to use

The parameters are set using the keys or over a programming module.

High functionality

Each switching output can be adjusted individually:

- NO/NC contact
- On/off switching pressures
- Delay times
- Hysteresis / window function
- Attenuation

Thanks to these easy switching functions, intelligent adjustments can be set which are normally not possible using a mechanical switch. Therefore, many switches can be replaced with one controller.

The analogue output is individually adjustable

- 0/4...20 mA switchable
- Starting pressure selectable
- End pressure selectable

Reliable and safe

The pressure is recorded with a long term stable measuring cell. A functional error is signalled and can be processed further according to DESINA. Parameters can be password protected to avoid unauthorised changes.

Rugged

The housing is made of metal and is resistant to moisture, shock and vibrations. The electronics are protected against reverse polarity, over-voltage and short-circuits.

Everything at a glance

The large illuminated display can be read from long distances. The pressures can be displayed in MPa, bar or PSI.

Optimal installation possibilities

The SCPSD is ideal for installation under critical conditions because of its compact design and excellent interference immunity. The display is always easy to read because the housing can be positioned as needed.

Universal

Diverse versions are available for the many different applications.

SCPSD PressureController

Device features

Everything at a glance

- Sloped display
- Digital display
 - Large
 - Illuminated
- Display
 - PSI/bar/Mpa
 - Current pressure
 - Minimum pressure
 - Maximum pressure
 - Switching points

Variable installation

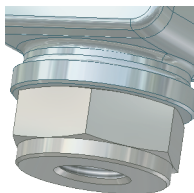
- Compact size
- 290° pivotable

Pressure port

- Stainless steel
- Long term stable measuring cell
- Wide range of compatible substances

Thread

- Inner thread



- Outer thread



Optical interface

- Switch status is shown

Easy to use

- 3 large buttons
- Display of the unit

Rugged

- Metal housing
- Waterproof
- Excellent interference immunity
- Vibration proof
- Shock proof

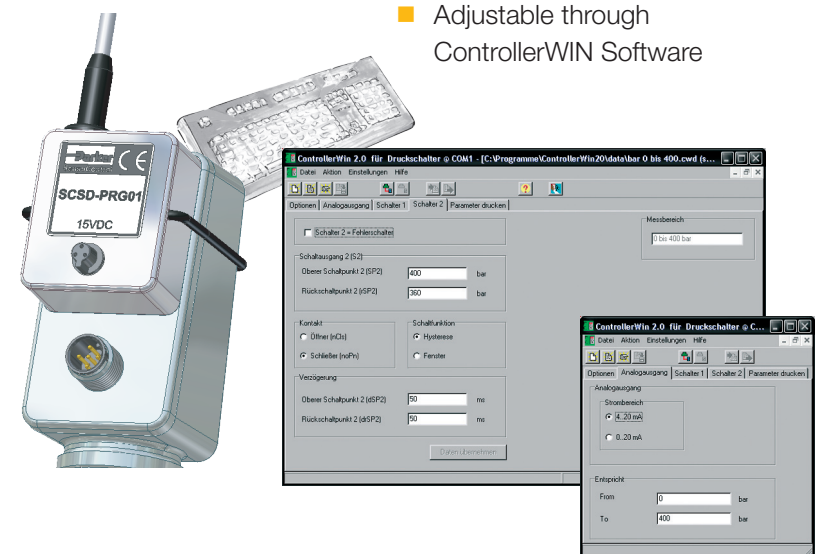
Tube clamp

- Safe installation with the sturdy SCSD-S27 clamp



Programming module

- Adjustable through ControllerWIN Software



SCPSD PressureController

Technical data

| SCPSD- | 004 | 010 | 016 | 060 | 100 | 250 | 400 | 600 |
|---|---|---------|---------|--------------------------------|---------|---------|---------|---------|
| Pressure range P_n relative (bar) Adjusting range RSP...SP | -1...4 | -1...10 | -1...16 | 0...60 | 0...100 | 0...250 | 0...400 | 0...600 |
| Overload pressure P_n (bar) | 10 | 20 | 40 | 120 | 200 | 500 | 800 | 1200 |
| Burst pressure P_n (bar) | 12 | 25 | 50 | 550 | 800 | 1200 | 1700 | 2200 |
| Display resolution (bar) | 0.01 | 0.01 | 0.01 | 0.1 | 0.1 | 1 | 1 | 1 |
| Smallest adjustable difference between SP and RSP (SP-RSP) | 0.03 | 0.06 | 0.09 | 0.3 | 0.6 | 2 | 3 | 3 |
| Measuring component | Ceramic | | | Thin film DMS | | | | |
| Parts in contact with substances | Stainless steel 1.4404; Ceramic AL2O3; NBR | | | Stainless steel 1.4404; 1.4542 | | | | |

| Input parameters | |
|--------------------------------|---|
| Switching cycles | ≥ 100 million |
| Polling rate | ≥ 5 ms |
| Connector thread | G1/4 BSPP; ED soft seal NBR* (DIN 3852 T2, Form X); ED (DIN3852 T11, Form E) |
| Tightening torque | 35 Nm |
| Temperature range of substance | -20...+85 °C |
| Weight | Approx. 300 g |
| MTTFd | > 100 years |
| Output values | |
| Accuracy | ± 0.5 % FS typ.; ± 1 % FS max. |
| Temperature drift | ± 0.02 % FS/°K type (at -20...+85 °C) ± 0.03 % FS/°K max. |
| Long-term stability | ± 0.2 % FS/a |
| Repeat accuracy | ± 0.25 % FS |
| Switching point accuracy | ± 0.5 % FS typ.; ± 1 % FS max. |
| Display accuracy | ± 0.5 % FS type ± 1 Digit ± 1 % FS max. ± 1 Digit |
| Response speed | |
| Switching output | ≤ 10 ms |
| Analogue output | ≤ 10 ms |

| Electrical connection | |
|------------------------------------|---|
| Supply voltage V_+ | 15 to 30 VDC nominal 24 VDC; Protection class 3 |
| Electrical connection | M12x1; 4-pole; 5-pole; with gold-plated contacts device connector |
| Short-circuit protection | Yes |
| Protection against wrong insertion | Yes |
| Overload protection | Yes |
| Current consumption | < 100 mA |
| Housing | |
| | Adjustable direction to 290°C |
| Material | Painted zinc die cast Z 410 |
| Foil material | Polyester |
| Display | 4-digit 7-segment LED; red; digit height 9 mm |
| Protection degree | IP67 DIN EN 60529; |

SCPSD PressureController

Technical data

| Ambient conditions | |
|----------------------------|---|
| Ambient temperature range | -20...+85 °C |
| Storage temperature range | -40...+100 °C |
| Vibration resistance | 20 g; 10...500 Hz IEC60068-2-6** |
| Shock resistance | 50 g; 11 ms IEC60068-2-29** |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Outputs | |
| Switching outputs | Two MOSFET high-side switches (PNP) |
| Contact functions | NO / NC contact; window / hysteresis; function freely adjustable |
| Switching voltage | V_+ -1.5 VDC |
| Switching current max. | 0.5 A per switch |
| Short-circuit current | 2.4 A per switch |
| Analogue output | 0/4...20 mA; programmable; freely scalable; $RL \leq (\text{Supply voltage} - 8 \text{ V}) / 20 \text{ mA} (\leq 500 \Omega)$ |

* different sealing material (FKM, EPDM etc.) upon request

** does not apply for version DIN EN 175301-803 Form A (old DIN43650)

Information about selecting the pressure range

The following parameters are relevant when working with pressure switches:

- System pressure
- Switching point pressure

Since a 400-bar pressure switch has a comparable resolution (of 1 bar) as that of a 600-bar pressure switch (also 1 bar), it is possible to use a 600-bar pressure switch even when there is a smaller nominal pressure (for example, 315 bar).

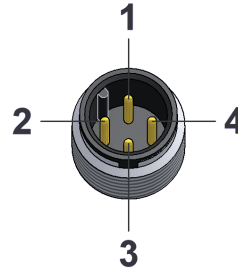
This is a positive feature because it provides the same precision with improved safety and fewer product variants.

Pin assignment

SCPSD-xxx-14-x7

1 switching and 1 analogue output

M12x1; 4-pole

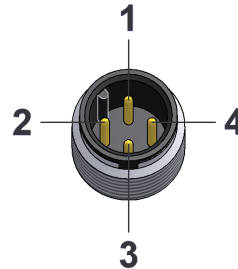


| PIN | Assignment |
|-----|--------------|
| 1 | V_+ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCPSD-xxx-04-x7

2 switching outputs;

M12x1; 4-pole



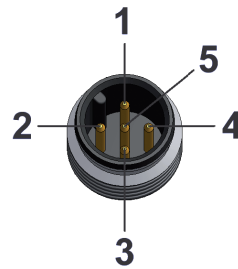
| PIN | Assignment |
|-----|------------|
| 1 | V_+ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |



SCPSD-xxx-14-x5

2 switching outputs; 1 analogue output;

M12x1; 5-pole



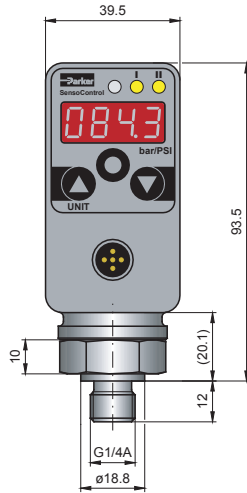
| PIN | Assignment |
|-----|--------------|
| 1 | V_+ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |



SCPSD PressureController

Outer thread

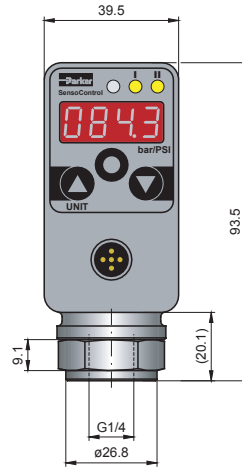
SCPSD-xxx-x4-1x



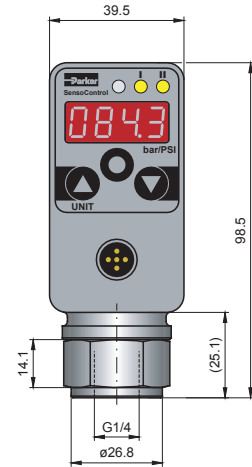
Inner thread

SCPSD-xxx-x4-2x

Up to 10 bar



From 16 bar

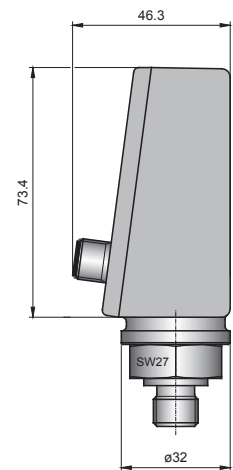
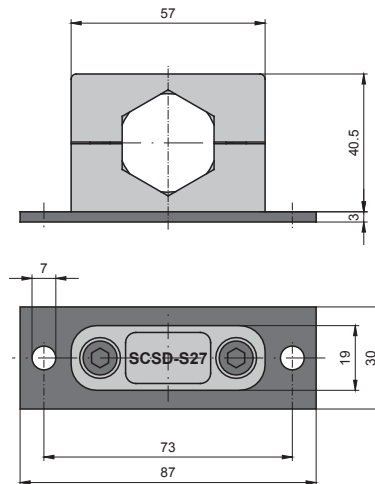


M12 connecting plug

SCPSD-xxx-x4-x5

Clamp (accessory)

SCSD-S27



SCPSD PressureController

Order code

SCPSD digital pressure switch

2 switching outputs; no analogue output: SCPSD-xxx-04-x7

M12x1 connecting plug; 4-pole

1 switching output; with analogue output: SCPSD-xxx-14-x7

M12x1 connecting plug; 4-pole

2 switching outputs; with analogue output SCPSD-xxx-14-x5

M12x1 connecting plug; 5-pole

Pressure range

| | |
|-----|-----|
| 004 | 004 |
| 010 | 010 |
| 016 | 016 |
| 060 | 060 |
| 100 | 100 |
| 250 | 250 |
| 400 | 400 |
| 600 | 600 |

Version

| | |
|------------------------|---|
| G1/4 BSPP outer thread | 1 |
| G1/4 BSPP inner thread | 2 |

Accessories:

- PC Programming KIT
- Securing clamp
- Reducing adapter M22x1.5
- Reducing adapter G1/2 BSPP
- Attenuation adapter
- Attenuation adapter
- Flange adapter
- for mechanical pressure switch

SCSD-PRG-KIT

SCSD-S27

SCA-1/4-M22x1.5-ED

SCA-1/4-ED-1/2-ED

SCA-1/4EDX1/4-D

SCA-1/2EDX1/2-D

SCAF-1/4-40

Connection cable and single plug

Connection cable, assembled

(open cable end)

SCK-400-xx-xx

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

| | |
|----------------------------|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

| | |
|----------------------------|----------------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |

Order example

SCPSD-100-04-27

- Pressure range 100 bar
- 2 switching outputs
- G1/4 BSPP inner thread
- M12 connecting plug



SCPSD-004-14-17

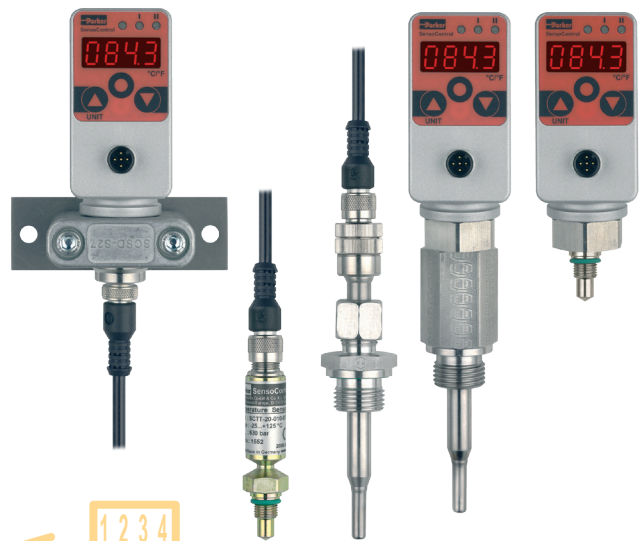
- Pressure range 4 bar
- 1 switching output
- 1 analogue output
- G1/4 BSPP outer thread
- M12 connecting plug



SCTSD TemperatureController

Device features

- Compact size
- Rugged
- Dependable
- Easily operable
- Metal housing
- High protection class
- Modular construction
- Many variants
- Analogue output
- Pivoting
- Password
- °C, °F



The TemperatureController combines the functions of a temperature switch, a temperature sensor and a display device.

- Temperature display (Thermometer)
- Switching outputs
- Analogue signal

Simple operation, extensive functionality and a modular design are the most important characteristics of the TemperatureController.

The TemperatureController offers excellent technical specifications, optimum temperature management, combined with a variety of installation options. It is perfect for applications when the temperature needs to be reliably monitored and easily viewed.

Easy to use

The normal temperature monitoring limit values adjustments (e.g. cooling and alarm) are made either with the keys or the programming module.

High functionality

Each switching output can be adjusted individually:

- NO/NC contact
- On/off switching pressures
- Delay times
- Hysteresis / window function
- time delay

Thanks to these easy switching functions, intelligent adjustments can be set which are normally not possible using a mechanical switch. Therefore, many switches can be replaced with one controller.

The analogue output is individually adjustable

- 0/4...20 mA switchable
- Adjustable start temperature
- Adjustable end temperature

Reliable and safe

A functional error is signalled and can be processed further according to DESINA. Parameters can be password protected to avoid unauthorised changes.

Rugged

The housing is made of metal and is resistant to moisture, shock and vibrations. The electronics are protected against reverse polarity, over-voltage and short-circuits.

Everything at a glance

The large illuminated display can be read from long distances. The temperature can be selected to °C or °F. The temperature is always optimally readable due to the modular construction and the pivoting housing.

Optimal installation possibilities

Sensors in various lengths are available for different tank sizes. These can be directly connected to the TemperatureController via a cable. Additionally the temperature sensor is available up to 630 bar for high pressure applications.

Universal

Diverse versions are available for the many different applications.

SCTSD TemperatureController

Application example Tank temperature monitoring

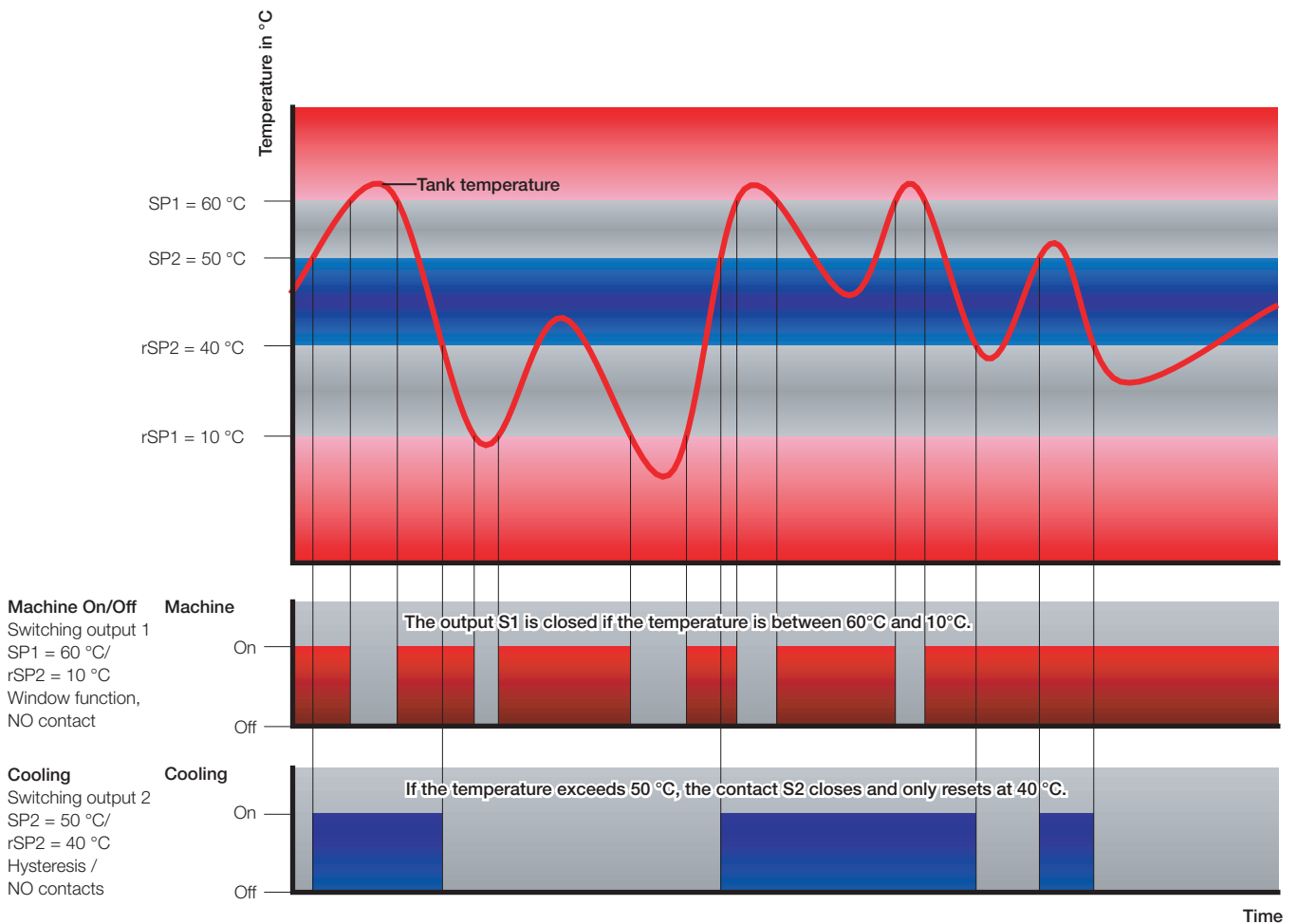
Machine On / Off

The facility should shut down when the tank temperature falls below 10°C or climbs above 60°C.

A protective wire-break mechanism should be considered to improve safety.

Cooling

If the temperature climbs above 50°C, the tank temperature should be cooled with a refrigerating unit down to 40°C.



SCTSD Modular TemperatureController

Device features

Everything at a glance

- Sloped display
- Digital display
 - Large
 - Illuminated
- Display
 - °C, °F
 - Current temperature
 - Minimum temperature
 - Maximum temperature
 - Switching points

Variable installation

- Compact size
- 290° pivotable

Connect as required

- 2 switching outputs
- Analogue output
- 0...20 or 4...20 mA
- Freely programmable
- Scalable
- Plug
 - M12
 - DIN EN 175301-803 Form A (old DIN43650)



Optical interface

- Switch status is shown

Easy to use

- 3 large buttons
- Display of the unit

Rugged

- Metal housing
- Waterproof
- Excellent interference immunity
- Vibration proof
- Shock proof

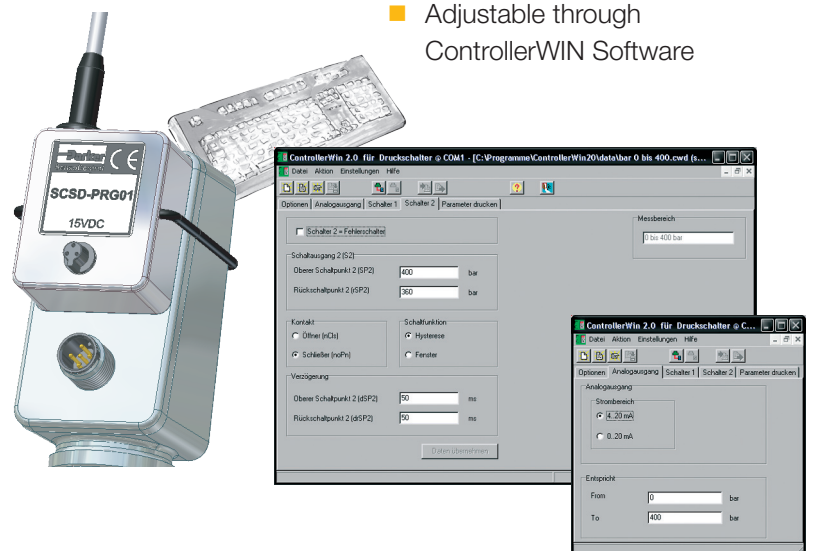
Tube clamp

- Safe installation with the sturdy SCSD-S27 clamp



Programming module

- Adjustable through ControllerWIN Software



SCTSD Modular Temperature Controller

Device features

Adjustable height

Through clamping thread

- SCA-TT-10-1/2



Cable

- SCK-410-03-45-45



Temperature sensor

- Stainless steel
- Wide range of compatible substances
- Diverse lengths
- SCTT-10-xxx-07

High pressure temperature sensor

- 630 bar
- SCTT-20-010-07



Connection adapter

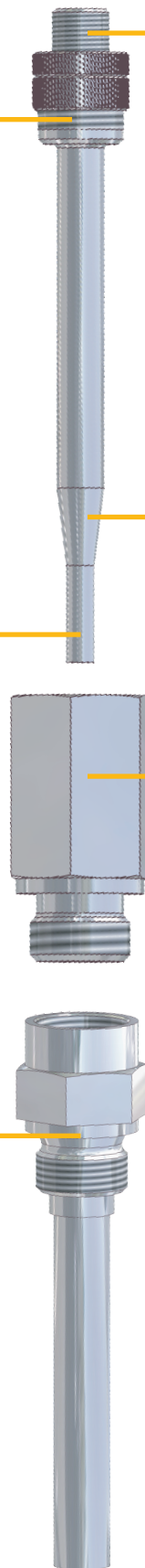
- SCA-TT-10-SD



Immersion tube

Additional with

- High pressures
- Aggressive substance
- Immersion tube SCA-TT-10-xxx



SCTSD Modular Temperature Controller

Technical data

| Input parameters SCT-150 | |
|-------------------------------|---|
| Display range | -50...+150 °C |
| Sensor input | PT1000 |
| Sensor connection | M12x1; 4-pole |
| Output values | |
| Switching accuracy at 25 °C | ± 0.35 % FS |
| Display accuracy at 25 °C | ± 0.35 % FS ± 1 Digit |
| Electrical connection | |
| Supply voltage V ₊ | 15...30 VDC nominal 24 VDC; Protection class 3 |
| Electrical connection | M12x1; 4-pole; 5-pole; Device plug DIN EN 175301-803 Form A (old DIN43650) |
| Short-circuit protection | Yes |
| Overload protection | Yes |
| Current consumption | < 100 mA |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |

* does not apply for version DIN EN 175301-803 Form A (old DIN43650)

| Temperature sensor SCTT-10-xxx-07 | |
|-----------------------------------|--|
| Measuring component | PT1000/DIN EN 60751, Class B |
| Measuring range | -40...+125 °C |
| Response time | $\tau_{0.5} = 6 \text{ s} / \tau_{0.9} = 25 \text{ s}$ |
| Accuracy | ± 0.3 K + 0.005* t |
| Material | Stainless Steel 1.4571 |
| Nominal pressure (max) | 10 bar |
| Temperature of substance | -40...+125 °C |
| Ambient temperature | -25...+80 °C (for the connector area) |
| Storage temperature | -25...+85 °C |

| Housing | |
|-------------------|--|
| | Orientation adjustable to 290° |
| Material | Die-cast zinc Z 410; painted |
| Foil material | Polyester |
| Display | 4-digit 7-segment LED; red; digit height 9 mm |
| Protection degree | IP67 EN 60529 IP65 with device plug DIN EN 175301-803 Form A (old DIN43650) |

| Ambient conditions | |
|---------------------------|------------------------------------|
| Ambient temperature range | -20...+85 °C |
| Storage temperature range | -40...+100 °C |
| Vibration resistance | 20 g; 10...500 Hz IEC60068-2-6* |
| Shock resistance | 50 g; 11 ms IEC60068-2-29* |

| Outputs | |
|-------------------|--|
| Switching outputs | 2 x PNP high-side switch, 0.7 A/switch |
| Contact functions | NO / NC contact; window / hysteresis |
| Response speed | 300 ms |
| Accuracy | ± 1 % FS |
| Analogue output | 0/4...20 mA; programmable; freely scalable; 4...20 mA = -40...125 °C |

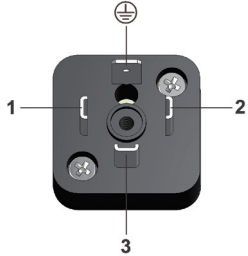
| High pressure sensor SCTT-20-010-07 | |
|-------------------------------------|--|
| Measuring component | PT1000/DIN EN 60751, Class B |
| Measuring range | -40...+125 °C |
| Response time | $\tau_{0.5} = 3 \text{ s} / \tau_{0.9} = 15 \text{ s}$ |
| Accuracy | ± 0.3 K + 0.005*t |
| Material | Stainless Steel 1.4404 |
| Threaded stud | M10x1 |
| Seal | O ring 7.65x1.78 mm; FKM |
| Measuring pipe diameter | 7 mm |
| Installation length | 18.5 mm |
| Nominal pressure P _n | 630 bar |
| Overload pressure P _{max} | 800 bar |
| Burst pressure P _{burst} | 1200 bar |
| Temperature of substance | -40...+125 °C |
| Ambient temperature | -25...+80 °C (for the connector area) |
| Storage temperature | -25...+85 °C |

SCTSD Modular Temperature Controller

Pin assignment

SCTSD-150-00-06

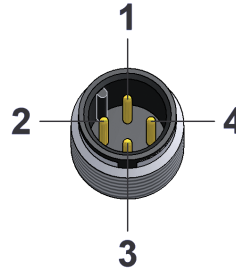
1 switching output
DIN EN 175301-803 Form A 4-pole (old 43650)



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | 0 V / GND |
| 3 | S1 out |
| | - |

SCTSD-150-00-07

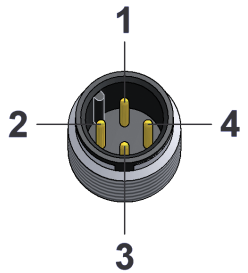
2 switching outputs
M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCTSD-150-10-07

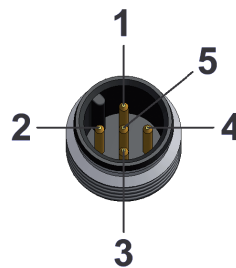
1 switching output, 1 analogue output
M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

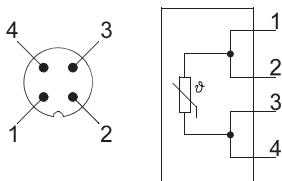
SCTSD-150-10-05

2 switching outputs, 1 analogue output
M12x1; 5-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |

SCTT-x0-xxx-07

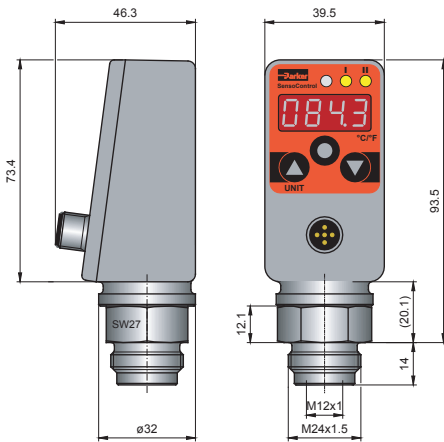


| Measuring range | Display resolution Increment size | Lowest reset switch point RSP | Largest switching value SP | Smallest adjustable difference between SP and RSP (SP-RSP) |
|-----------------|--------------------------------------|-------------------------------------|----------------------------------|--|
| -50...150 °C | 0.1 °C | -50 °C | 150 °C | 0.8 |

SCTSD Modular Temperature Controller

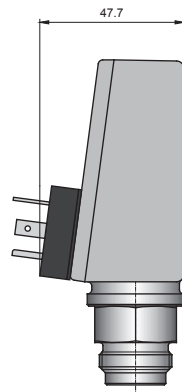
M12 connecting plug

SCTSD-150-x4-05



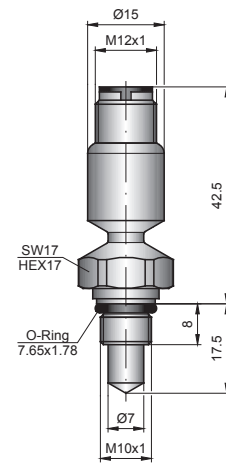
DIN 43650

SCTSD-xxx-00-06



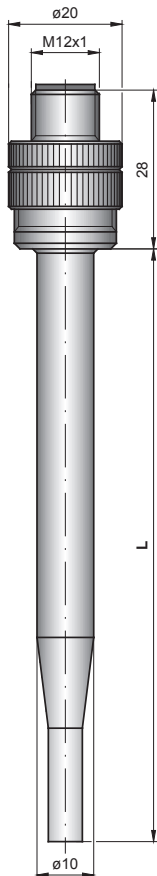
High pressure temperature sensor

SCTT-20-010-07



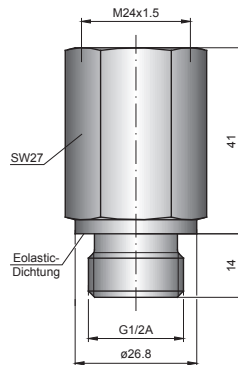
Temperature sensor

SCTT-10-xxx-07



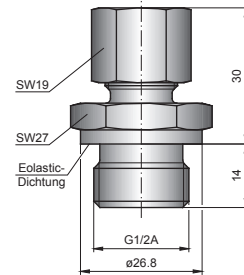
Connection adapter (accessory)

SCA-TT-10-SD



Clamping thread (accessory)

SCA-TT-10-1/2



Material:

Stainless Steel 1.4404

Male stud:

G1/2A BSPP DIN3852-E

Seal type:

ED (Eolastic seal type)

Screw plug hole

G1/2A BSPP DIN3852-E

Replacement seals:

ED1/2VITX (FKM)

GE10LR1/2EDOMD71:

(with 10 mm bore hole)

Stainless Steel 1.4571

EO-2-functional nut:

FM10L71

Male stud:

G1/2A BSPP DIN3852-E

Seal type:

ED (Eolastic seal type)

Replacement seal:

ED1/2VITX (FKM)

SCTSD Modular Temperature Controller

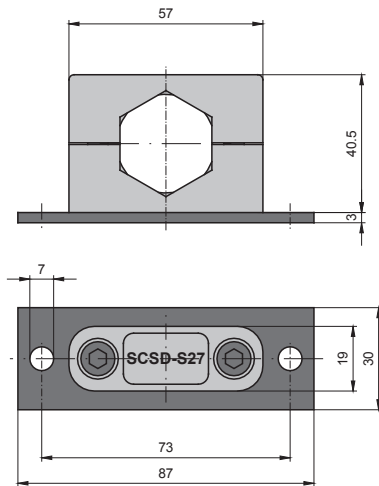
Sensor cable 3 m (accessory)

SCK-410-03-45-45



Clamp (accessory)

SCSD-S27



Order example

Components for the control panel - high pressure version

Securing clamp **SCSD-S27**
 Sensor cable 3 m (SCTSD-SCTT) **SCK-410-03-45-45**
 High pressure temperature sensor **SCTT-20-10-07**

Components for the control panel

Securing clamp **SCSD-S27**
 Sensor cable 3 m (SCTSD-SCTT) **SCK-410-03-45-45**
 Clamping thread G1/2 BSPP **SCA-TT-10-1/2**
 Temperature sensor 150 mm **SCTT-10-150-07**
 Optional: Immersion tube G1/2 BSPP 100 mm **SCA-TT-10-100**

Direct mounting components

Connection adapter (SCTSD-SCTT) **SCA-TT-10-SD**
 Temperature sensor 100 mm **SCTT-10-100-07**
 Optional: Immersion tube G1/2 BSPP 200 mm **SCA-TT-10-200**

Order code

SCTSD module

1 switch output; no analogue output **SCTSD-150-00-06**
 DIN EN 175301-803 Form A
 (old DIN 43650) connecting plug

2 switch outputs; no analogue output **SCTSD-150-00-07**
 M12x1 connecting plug; 4-pole

1 switch output; with analogue output **SCTSD-150-10-07**
 M12x1 connecting plug; 4-pole

2 switch outputs; with analogue output **SCTSD-150-10-07**
 M12x1 connecting plug; 5-pole

Accessories:

Securing clamp
 Sensor cable 3 m (SCTSD-SCTT)
 Clamping thread G1/2 BSPP
 Connection adapter (SCTSD-SCTT)
 High pressure temperature sensor
 Immersion tube G1/2 BSPP

SCSD-S27
SCK-410-03-45-45
SCA-TT-10-1/2
SCA-TT-10-SD
SCTT-20-10-07
SCA-TT-10-xxx

Length mm

100 mm **100**
 150 mm **150**
 250 mm **250**

Temperature sensor

SCTT-10-xxx-07

Length mm

100 mm **100**
 150 mm **150**
 250 mm **250**

Connection cable and single plug

Connection cable, assembled

SCK-400-xx-xx

(open cable end)

Cable length (m)

2 m **02**
 5 m **05**
 10 m **10**

Connecting plug

M12 cable jack; straight **45**
 M12 cable jack; 90° angled **55**

Single connector

M12 cable jack; straight **SCK-145**
 M12 cable jack; 90° angled **SCK-155**

SCTSD high pressure TemperatureController

Device features

Everything at a glance

- Sloped display
- Digital display
 - Large
 - Illuminated
- Display
 - °C, °F
 - Current temperature
 - Minimum temperature
 - Maximum temperature
 - Switching points

Rugged

- Metal housing
- Waterproof
- Excellent interference immunity
- Vibration proof
- Shock proof

Variable installation

- Compact size
- 290° pivotable

Programming module

- Adjustable through ControllerWIN Software

Optical interface

- Switch status is shown

Easy to use

- 3 large buttons
- Display of the unit

Connect as required

- 2 switching outputs
- Analogue output
- 0...20 or 4...20 mA
- Freely programmable
- Scalable
- M12 connecting plug

High pressure resistance

- Up to 630 bar



SCTSD high pressure Temperature Controller

Technical data

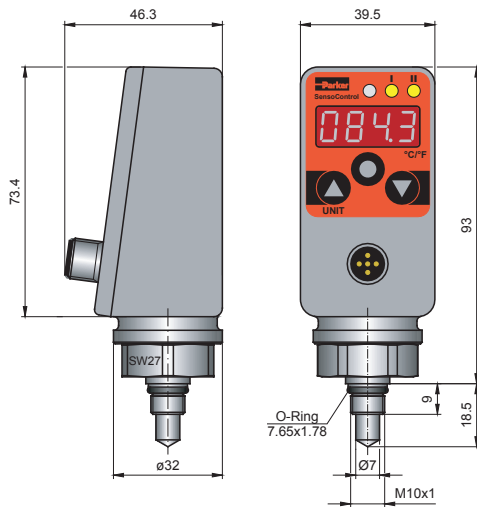
| Input values SCTSD-150-x2-0x | |
|------------------------------|--|
| Measuring range | -40...+100 °C |
| Input for measuring element | PT1000/DIN EN 60751; Class B |
| Range of use | Liquid media, air |
| Output values | |
| Switching accuracy at 25 °C | ± 0.35 % FS |
| Display accuracy at 25 °C | ± 0.35 % FS ± 1 Digit |
| Temperature margin of error | ± 0.01 % FS/°C typ. (for -20...+85 °C) |
| Long-term stability | ± 0.2 % FS/a |
| Electrical connection | |
| Supply voltage V_+ | 15 to 30 VDC (with protection against polarity reversal) |
| Electrical connection | M12x1; 4-pole; 5-pole; with gold-plated contacts |
| Short-circuit protection | Yes |
| Overload protection | Yes |
| Current consumption | < 100 mA |
| Mechanical connection | |
| Threaded male stud | M10x1 |
| Seal | O-ring 7.65x1.78 mm; FKM |
| Measuring pipe diameter | 7 mm |
| Installation length | 18.5 mm |
| Material | Stainless Steel 1.4404 |
| P_N pressure | 630 bar |
| P_{max} | 800 bar |
| Burst pressure | 1200 bar |
| Housing | |
| | Adjustable direction to 290°C |
| Material | Die-cast zinc Z 410; painted |
| Foil material | Polyester |
| Display | 4-digit 7-segment LED; red; digit height 9 mm |
| Protection degree | IP67 EN 60529 |

| Ambient conditions | |
|----------------------------|--|
| Ambient temperature range | -25...+80 °C |
| Storage temperature range | -25...+85 °C |
| Media temperature range | -40...+100 °C |
| Vibration resistance | 20 g; 10...500 Hz IEC60068-2-6* |
| Shock resistance | 50 g; 11 ms IEC60068-2-29 |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Outputs | |
| Switching outputs | 2 x PNP high-side switch |
| Contact functions | NO / NC contact; window / hysteresis |
| Switching current: | 0.5 A / switch to 85 °C; 0,7 A / switch to 70 °C |
| Response speed | ≤ 0.7 s maximum load current |
| Optional analogue output | |
| Measuring range | 0/4...20 mA |
| Response speed (0-95 %) | ≤ 300 ms |
| Analogue output error | ± 1 % FS |
| Load | ≤ 500 Ω from V_+ > 18 VDC |

SCTSD high pressure Temperature Controller

M12 connecting plug

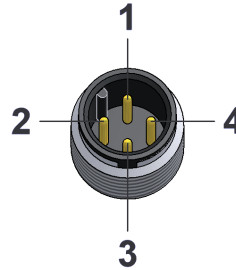
SCTSD-150-x4-05



Pin assignment

SCTSD-150-02-07

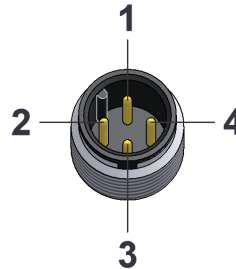
2 switching outputs
M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCTSD-150-12-07

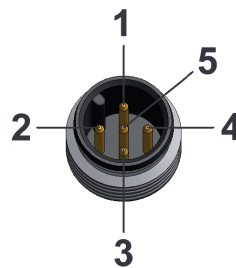
1 switching output, 1 analogue output
M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCTSD-150-12-05

2 switching outputs, 1 analogue output
M12x1; 5-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |

| Measuring range | Display resolution Increment size | Lowest reset switch point RSP | Largest switching value SP | Smallest adjustable difference between SP and RSP (SP-RSP) |
|-----------------|--------------------------------------|-------------------------------------|----------------------------------|--|
| -40...100 °C | 0.1 °C | -40 °C | 100 °C | 0.8 |

SCTSD high pressure Temperature Controller

Order code

SCTSD high pressure

2 switch outputs; no analogue output **SCTSD-150-02-07**

M12x1 connecting plug; 4-pole

1 switch output; with analogue output **SCTSD-150-12-07**

M12x1 connecting plug; 4-pole

2 switch outputs; with analogue output **SCTSD-150-12-05**

M12x1 connecting plug; 5-pole

Accessories

PC Programming Kit **SCSD-PRG-KIT**

Connection cable and single plug

Connection cable, assembled **SCK-400-xx-xx**

(open cable end)

Cable length (m)

2 m **02**

5 m **05**

10 m **10**

Connecting plug

M12 cable jack; straight **45**

M12 cable jack; 90° angled **55**

Single connector

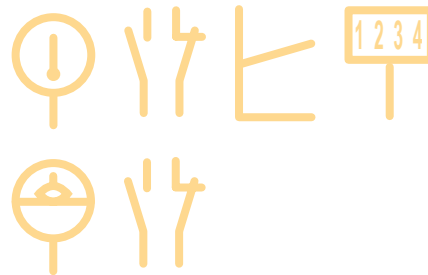
M12 cable jack; straight **SCK-145**

M12 cable jack; 90° angled **SCK-155**

SCTSD-L combination switch

Device features

- Compact design
- Temperature display
- Individually adjustable temperature switching outputs
- Small switching hysteresis
- Preset
 - For standard oils
 - For cooling
 - For switching off (T_{max})
- Fixed level contacts
- Only one float
- Preset level
 - Warning and shutdown min.
 - Shut-down min./max.
- Up to one meter probe length



The SCTSD-L combination switch was designed to meet the requirements of hydraulic facility construction. It combines the functions of a fixed mechanical level switch with an adjustable temperature switch with display.

Level

The tank level is measured using a highly dynamic, fully encapsulated magnetic float which switches the bi-stable reed contacts. The M12 pin assignments are compatible with conventional existing systems. The level contacts are pre-determined according to the normal tank sizes. There are two standard switch output versions available:

- Warning minimum level and shutdown minimum level
- Shutdown maximum and minimum levels

The switching positions were chosen according to the proven experiences of plant constructors and the DIN. For safety reasons (fail-safe / closed circuit), the switching behaviour of the standard switch is an NC contact.

Optionally the contacts can be changed at the factory and pre-set in line with the customer's requirements.

Temperature

The temperature is detected using a sensor; it is then evaluated and constantly displayed using the SCTSD TemperatureController (as described in the SCTSD section). Thanks to the easy switching functions (e.g. switching windows), intelligent switching settings can be achieved that are not possible using a mechanical temperature switch.

Normally the outputs for the normal temperature functions cooling on/off and shutdown are pre-installed as standard. The temperature thresholds were designed for standard oils (HLP).

It is possible to adjust the temperature monitoring temperature limits (e.g. cooling and shutdown) for each output individually using the keys:

- On/off switching temperature limits
- NO/NC contact
- Hysteresis / window function
- Time delay and attenuation

Optional (see: SCTSD-L-....-KIT5) 3 different versions of temperature switching outputs are available:

- 2 switching outputs
- 1 switching and 1 analogue output
- 2 switching outputs and one analogue output

SCTSD-L combination switch

Technical data

| General | |
|--------------------------|--------------------------------------|
| Measurement principle | Magnetic float reed switches |
| Float | NBR, Ø 18 mm, length 25 mm, magnetic |
| Viscosity | Max. 250 cSt at 25 °C |
| Density | at least 0.750 g/cm ³ |
| Connector thread | G3/4 outer thread |
| Protection tube | Ø 8 mm |
| Probe length Lmax | Lowest switching point + 35 mm |
| Operating pressure | 1 bar max. |
| Accuracy | ±2 mm |
| Material | |
| Protection tube | Brass |
| Connector thread | Brass |
| Ambient conditions | |
| Temperature of substance | -20...+85 °C |
| Storage temperature | -40...+100 °C |

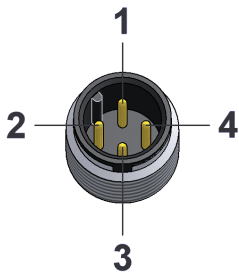
| Preset temperatures | |
|---------------------------------------|-----------------------------------|
| Switching output 1* | 50 °C contact closed (cooling on) |
| | 45 °C contact open (cooling off) |
| Switching output 2* | 63 °C contact open (shutdown) |
| | 60 °C contact closed |
| Level switching outputs | |
| Switching current: | 0.5 A max. |
| Switching voltage | 100 V max. |
| Switching power | 10 W max. |
| Switching function | NO or NC (bi-stable) |
| Contact material | Rhodium |
| Plug | M12x1; 4 pin |
| Smallest difference between L1 and L2 | 30 mm |
| Smallest switching position L1 | 30 mm from the tank lid |

*) Each temperature switching output can be individually re-programmed or adjusted:

- NO/NC contact
- On/off switching temperature
- Hysteresis / window function
- Time delay and attenuation

Fill level pin assignments

M12x1; 4-pole



| PIN | Assignment |
|-----|------------|
| 1 | IN |
| 2 | OUT S2 |
| 3 | n.c.* |
| 4 | OUT S1 |

*n.c. = do not connect

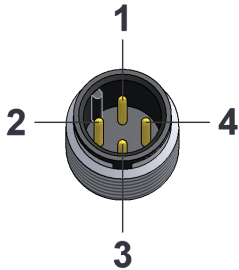
SCTSD-L combination switch

Temperature pin assignment

SCTSD-150-0X-0X
(Refer chapter SCTSD)

SCTSD-L-xxxxO-xxFO
SCTSD-L-xxxxx-xxxxx-KIT5

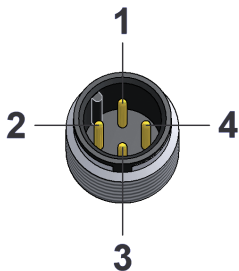
2 switching outputs
M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCTSD-L-xxxxx-xxxxx-17-KIT5

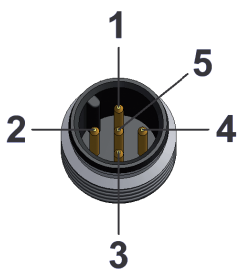
1 switching output, 1 analogue output
M12x1; 4-pole



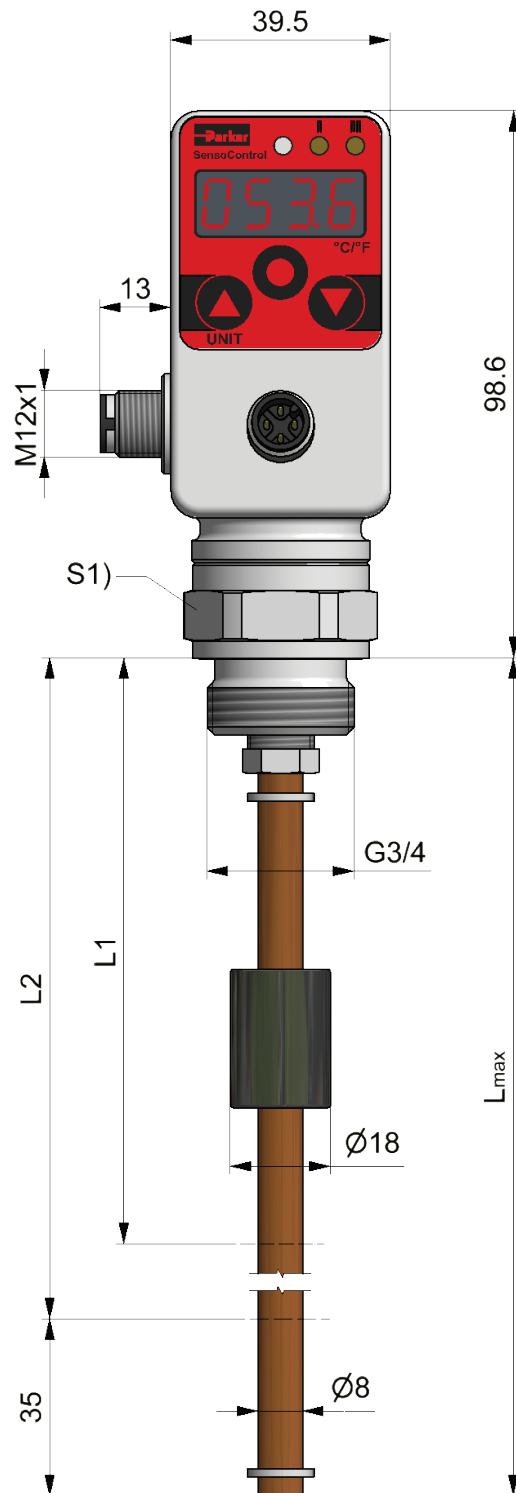
| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCTSD-L-xxxxO-xxFO
SCTSD-L-xxxxx-xxxxx-15-KIT5

2 switching outputs, 1 analogue output
M12x1; 5-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |



SCTSD-L combination switch

Order code

Standard version

2 level outputs, temperature display
2 temperature switching outputs

Advanced warning & shut-off

Warning = S1 out; falling open (L1)
Cut-out = S2 out; falling open (L2)

Length (L1 / L2 mm)

| | | |
|--------------|-----|-----|
| 60 / 90 mm | 060 | 090 |
| 75 / 105 mm | 075 | 105 |
| 90 / 120 mm | 090 | 120 |
| 95 / 135 mm | 095 | 135 |
| 110 / 150 mm | 110 | 150 |
| 125 / 165 mm | 125 | 165 |
| 135 / 165 mm | 135 | 165 |
| 130 / 180 mm | 130 | 180 |
| 145 / 195 mm | 145 | 195 |
| 160 / 210 mm | 160 | 210 |
| 140 / 220 mm | 140 | 220 |
| 165 / 225 mm | 165 | 225 |
| 180 / 240 mm | 180 | 240 |
| 195 / 255 mm | 195 | 255 |
| 210 / 270 mm | 210 | 270 |
| 160 / 280 mm | 160 | 280 |
| 225 / 285 mm | 225 | 285 |
| 240 / 300 mm | 240 | 300 |
| 245 / 315 mm | 245 | 315 |
| 260 / 330 mm | 260 | 330 |
| 275 / 345 mm | 275 | 345 |
| 290 / 360 mm | 290 | 360 |
| 315 / 385 mm | 315 | 385 |
| 340 / 410 mm | 340 | 410 |
| 355 / 435 mm | 355 | 435 |
| 380 / 460 mm | 380 | 460 |
| 420 / 500 mm | 420 | 500 |
| 460 / 550 mm | 460 | 550 |
| 510 / 600 mm | 510 | 600 |
| 560 / 650 mm | 560 | 650 |
| 600 / 700 mm | 600 | 700 |
| 650 / 750 mm | 650 | 750 |
| 700 / 800 mm | 700 | 800 |
| 750 / 850 mm | 750 | 850 |
| 800 / 900 mm | 800 | 900 |
| 850 / 950 mm | 850 | 950 |

Shutdown min. / max.

Cut-out max = S1 out; rising open (L1)
Cut-out min = S2 out; falling open (L2)

Length (L1 / L2 mm)

| | | |
|-------------|-----|-----|
| 40 / 90 mm | 040 | 090 |
| 50 / 120 mm | 050 | 120 |
| 60 / 135 mm | 060 | 135 |
| 90 / 165 mm | 090 | 165 |
| 40 / 170 mm | 040 | 170 |
| 60 / 250 mm | 060 | 250 |
| 40 / 320 mm | 040 | 320 |
| 60 / 370 mm | 060 | 370 |
| 40 / 400 mm | 040 | 400 |

Combination switch

SCTSD-L-xxxxx-xxxxx

Combination switch Marine

(approved by DNV/GL/ABS)
2 level outputs, temperature display
2 temperature switching outputs

Length (L1 mm)

min. 40 mm / max. 950 mm

Version

Falling closed — FC
Falling open — FO
Rising closed — RC
Rising open — RO

Length (L2 in mm)

min. 40 mm / max. 950 mm

Version

Falling closed — FC
Falling open — FO
Rising closed — RC
Rising open — RO

Combination switch

SCTSD-L-xxxxx-xxxxx-1x

Combination switch Marine

(approved by DNV/GL/ABS)
2 level outputs, temperature display
1 temperature-analogue output
(0/4..20 mA)

Length (L1 mm)*

min. 40 mm / max. 950 mm

Version

Falling closing — FC
Falling open — FO
Rising closing — RC
Rising open — RO

Length (L2 in mm)*

min. 40 mm / max. 950 mm

Version

Falling closing — FC
Falling open — FO
Rising closing — RC
Rising open — RO

Plug-in connection

M12; 4-pole (1 temperature switching output) — 7
M12; 5-pole (2 temperature switching outputs) — 5

*Switching output 1 (L1) can be above or below switching output 2 (L2)

L1 and L2 are multiples of 10 mm

Smallest difference between L1 and L2 = 30 mm

SCLSD LevelController

Device features

- Proven measuring system
- Level display
- mm / inch / % display
- High and low display
- Analogue output
- Switching outputs
- No surge pipe necessary
- Replacement for several mechanical switches
- Pivoting



The LevelController combines the functions of a level switch, a level sensor and a level display.

- Level display (inspection glass)
- Switching outputs
- Analogue signal

The LevelController is ideal for the monitoring tank contents.

Easy to use

The parameters are set using the keys or over a programming module.

High functionality

Each switching output can be adjusted individually:

- NO/NC contact
- Upper and lower level switching point
- Delay times
- Hysteresis / window function
- Attenuation

The analogue output is individually adjustable:

- 0/4...20 mA switchable
- Upper level adjustable
- Lower level adjustable

Reliable and safe

The position of the float is finely (≥ 5 mm) and continuously recorded and shown in the display in mm or inch. Through this continuous recording, the danger of individual mechanical contacts "sticking" no longer exists. Therefore the operational reliability of the monitored plant is increased. Parameters can be password protected to avoid unauthorised changes.

Everything at a glance

The display can be read from long distances. Using the selectable percent display the full level is uniformly displayed independent of the tank shape. An offset can also be entered (difference from the sensor to the tank bottom) to give a realistic indication of the level from the tank bottom.

Different uses can easily be implemented or corrected at a later date using the menu-driven level switching points. As the switching point no longer needs to be specified at the time of order, the versions of mechanical level switches required is reduced.

Universal

Thanks to these easy switching functions (hysteresis and window functions, NC or NO functions), intelligent adjustments can be set which are normally not possible using a mechanical level switch. Therefore, many switches can be replaced with one controller. With the optional analogue output, the level and temperature can be monitored easily with a controller (e.g. for leakage monitoring).

SCLSD LevelController

Application example: Tank temperature monitoring

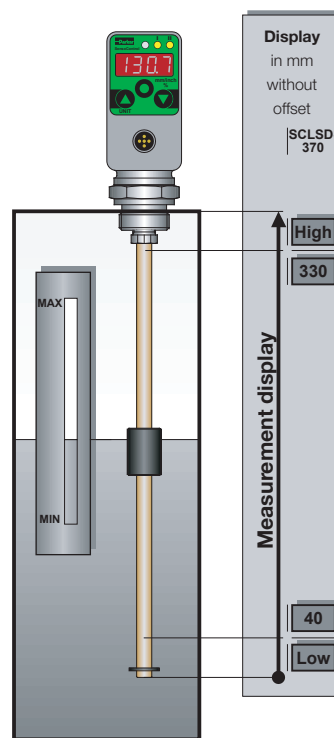
Since the conventional specifications for mechanical level switches (the mm data from the tank lid) are often used during project planning, these data are selected here for a practical example.

Facility off

If the tank level falls below 310 mm (measured from the tank top / dry run) or climbs above 70 mm (measured from the tank top / overflow), switch off should occur. A protective wire-break mechanism should be considered to improve safety.

Automatic tank filling

If the tank level falls below 240 mm (measured from the tank top), the tank should be automatically filled to 110 mm (measured from the tank top) with a pump.



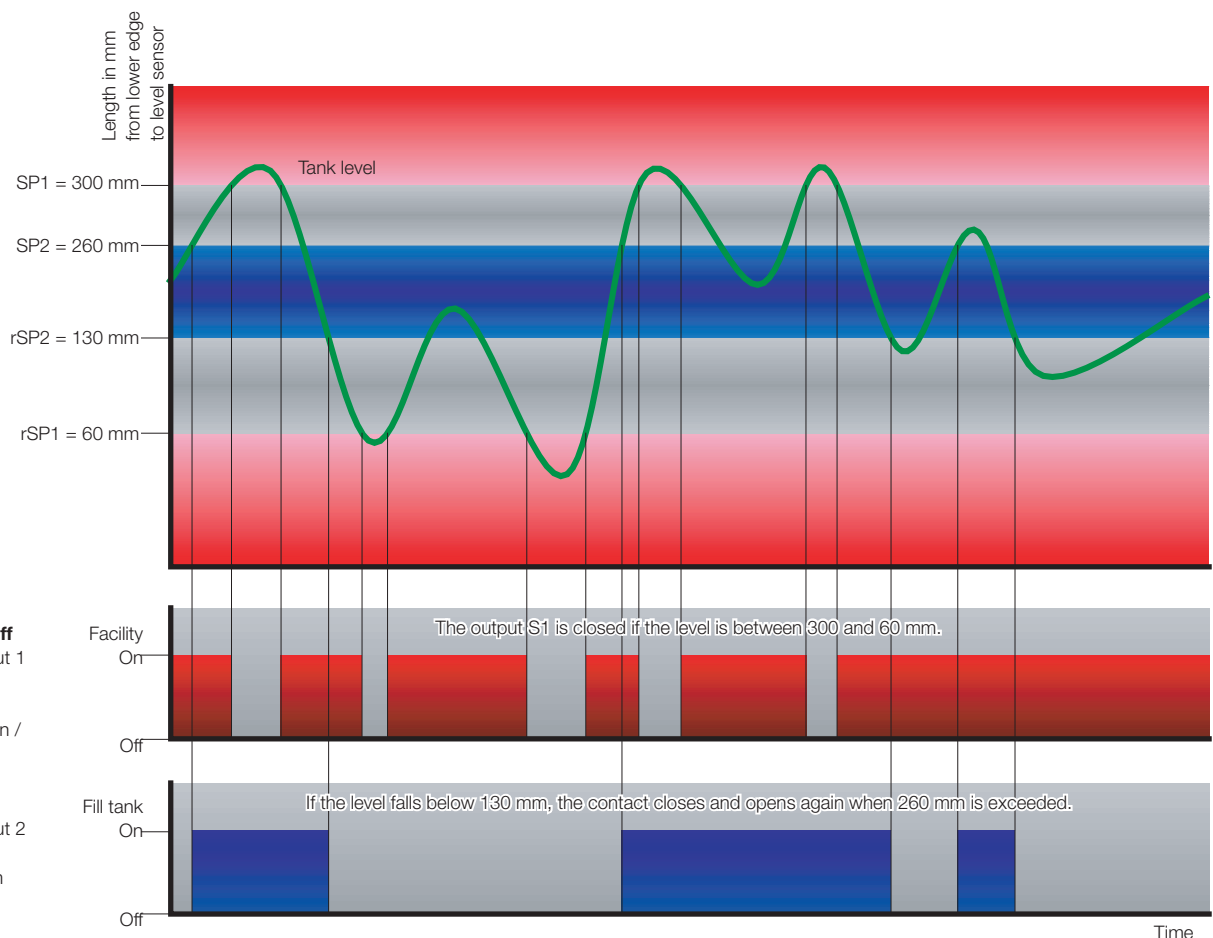
Resulting switch value for a SCLSD-370 mm

Stop above:
 $370 \text{ mm} - 70 \text{ mm} = 300 \text{ mm}$
 Stop below:
 $370 \text{ mm} - 310 \text{ mm} = 60 \text{ mm}$
 Window function, NO contact

The output S1 is closed, if the level is between 300 and 60 mm.

Load stop:
 $370 \text{ mm} - 110 \text{ mm} = 260 \text{ mm}$
 Load on:
 $370 \text{ mm} - 240 \text{ mm} = 130 \text{ mm}$
 Hysteresis function, NC contact

If the level falls below 130 mm, the contact closes and opens again when 260 mm is exceeded.



SCLSD LevelController

Device features

Everything at a glance

- Sloped display
- Digital display
 - Large
 - Illuminated
- Display
 - mm, inch, or %
 - Actual level
 - High and low display
 - Switching points

Rugged

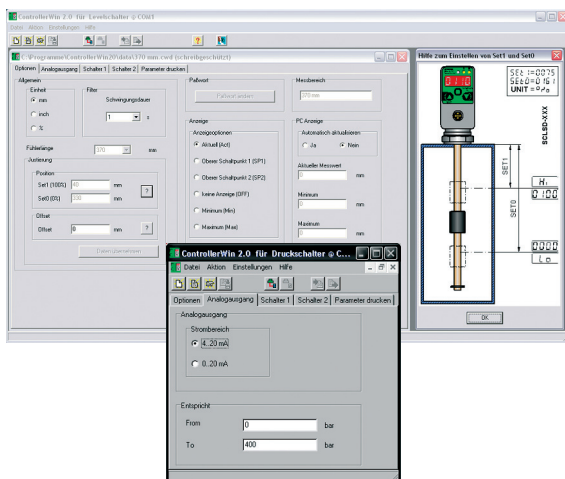
- Metal housing
- Waterproof
- Excellent interference immunity
- Vibration proof
- Shock proof

Variable installation

- Compact size
- 290° pivotable
- G3/4 BSP
- Flange for DIN

Programming module

- Adjustable with ControllerWIN Software



Optical interface

- Switch status is shown

Easy to use

- 3 large buttons
- Display of the unit

Connect as required

- 2 switching outputs
- Analogue output
- 0...20 or 4...20 mA
- Freely programmable
- Scalable
- M12 connecting plugs

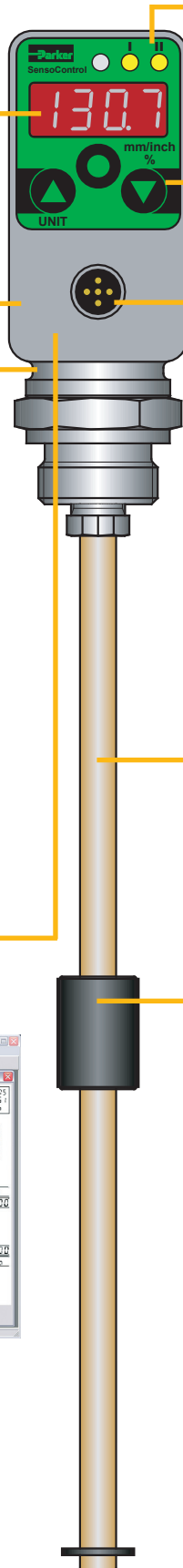


No surge pipe necessary

- Electronic attenuation adjustable attenuation

Proven measuring system

- High float dynamics
- Small design
- Universal usage



SCLSD LevelController

Technical data

| Input parameters | |
|------------------------------------|---|
| Measuring component | Resistance reed chain with float |
| Connector thread | G3/4 BSPP; nickel-plated brass; ED soft seal NBR* |
| Parts in contact with substances | Brass; nickel-plated brass; NBR* |
| Temperature range of substance | -20...+85 °C |
| Output values | |
| Switching point accuracy | ± 1 % FS at 25 °C |
| Display accuracy | ± 1 % FS ± 1 Digit at 25 °C |
| Response speed | ≤ 700 ms |
| Resolution | 7.5 mm |
| Float | |
| Material | NBR |
| Dimensions | Ø 18 mm, Length 35 mm |
| Viscosity | Max. 250 cSt at 25 °C |
| Density | at least 0.750 g/cm ³ |
| Level rod | |
| Material | Stainless steel |
| Dimensions | Ø 8 mm |
| Operating pressure | 1 bar |
| Electrical connection | |
| Supply voltage V ₊ | 15...30 VDC nominal 24 VDC; Protection class 3 |
| Electrical connection | M12x1; 4-pole; 5-pole; with gold-plated contacts |
| Short-circuit protection | Yes |
| Protection against wrong insertion | Yes |
| Overload protection | Yes |
| Current consumption | < 100 mA |

| Housing | |
|----------------------------|---|
| | Adjustable direction to 290°C |
| Material | Die-cast zinc Z 410; painted |
| Foil material | Polyester |
| Display | 4-digit 7-segment LED; red; digit height 9 mm |
| Protection degree | IP67 DIN EN 60529 |
| Ambient conditions | |
| Ambient temperature range | -20...+85 °C |
| Storage temperature range | -40...+100 °C |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Outputs | |
| Switching outputs | Two MOSFET high-side switches (PNP) |
| Contact functions | NO / NC contact; window / hysteresis function freely adjustable |
| Switching voltage | V ₊ - 1.5 VDC |
| Switching current max. | 0.5 A per switch |
| Short-circuit current | 2.4 A per switch |
| Analogue output | 0/4...20 mA; programmable; freely scalable RL ≤ (power supply - 8 V) / 20 mA (≤ 500 Ω) |

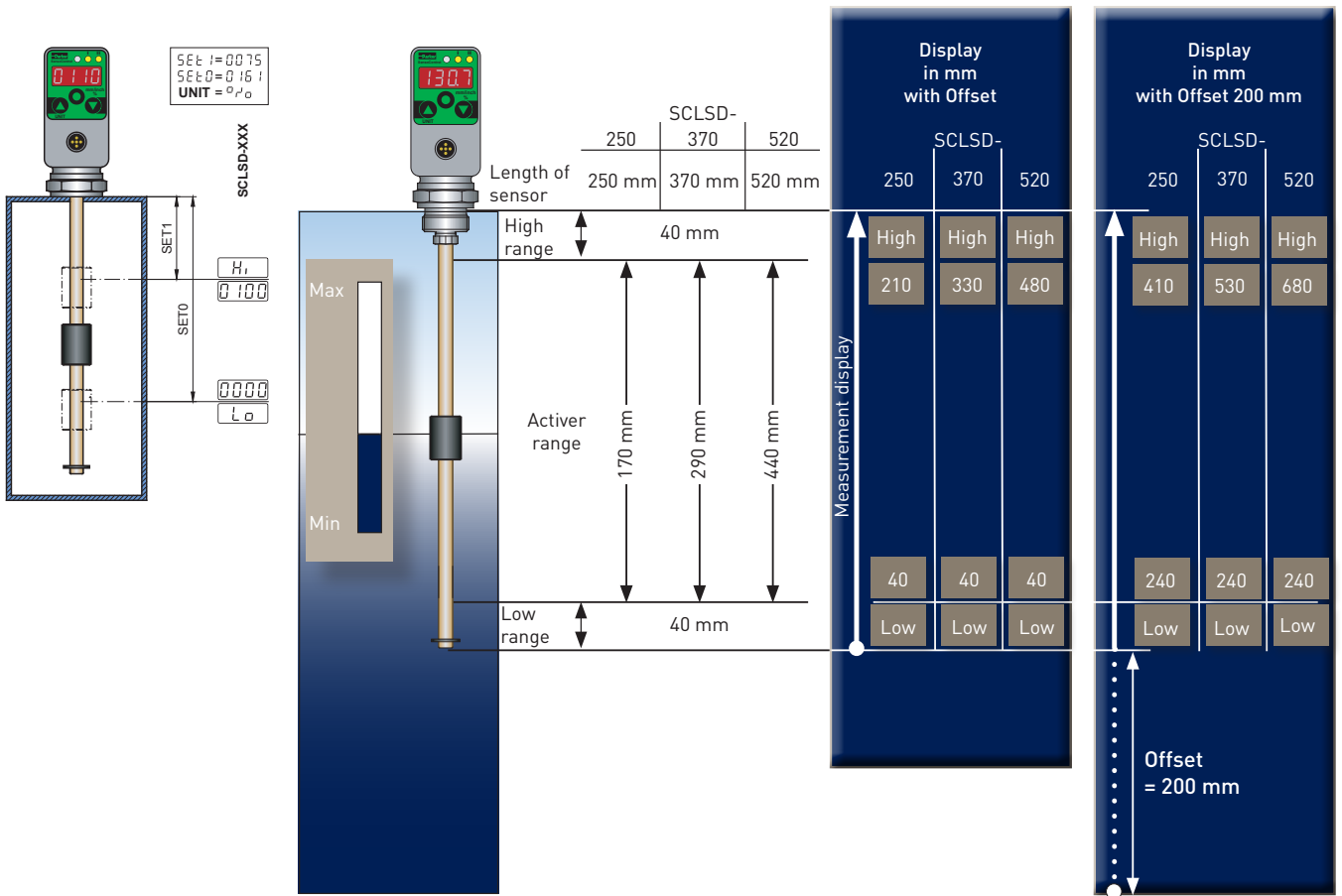
* different sealing material (FKM, EPDM etc.) upon request

SCLSD LevelController

Display possibilities

Example of a percent display

Example of a mm display

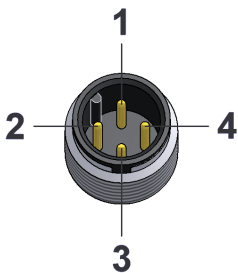


| L1 Sensor length Measurement range | L2 active range | Display resolution Increment size | Incre- ment size | Lowest reset switch point RSP | Largest switch- ing value SP | Smallest adjustable difference between SP and RSP (SP-RSP) |
|--|--------------------|---|------------------------|-------------------------------------|------------------------------------|--|
| 250 mm | 40...210 mm | 1 mm | 5 mm | 40 mm | 210 mm | 5 mm |
| 370 mm | 40...330 mm | 1 mm | 5 mm | 40 mm | 330 mm | 5 mm |
| 520 mm | 40...480 mm | 1 mm | 5 mm | 40 mm | 480 mm | 5 mm |
| 800 mm | 40...760 mm | 1 mm | 10 mm | 40 mm | 760 mm | 10 mm |
| 1000 mm | 40...960 mm | 1 mm | 10 mm | 40 mm | 960 mm | 10 mm |

Pin assignment

SCLSD-xxx-00-07

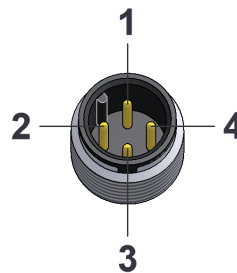
2 switching outputs; M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |

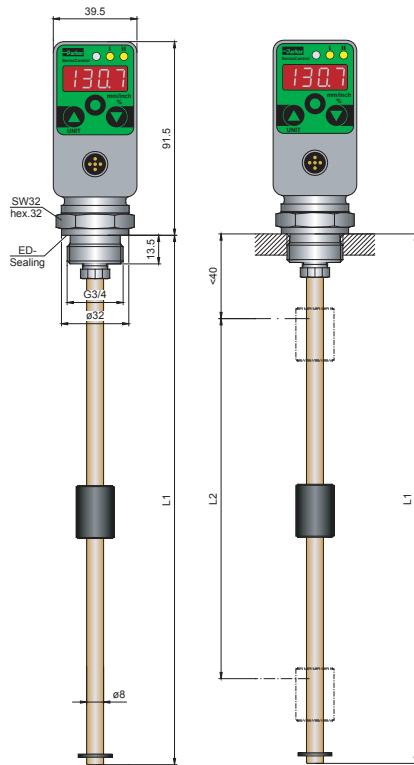
SCLSD-xxx-10-07

1 switching output, 1 analogue output, M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCLSD LevelController



L1 = length of the sensor (mm)
L2 = active range (mm)

Order code

SCLSD LevelController

2 switching outputs;
2 switching outputs Marine;
(approved by DNV/GL/ABS)
no analogue output
M12x1 connecting plug; 4-pole

SCLSD-xxx-00-07
SCLSD-xxx-00-07-MA

1 switching output;
1 switching output Marine;
(approved by DNV/GL/ABS)
with analogue output
M12x1 connecting plug; 4-pole

SCLSD-xxx-10-07
SCLSD-xxx-00-07-MA

2 switching outputs;
2 switching outputs Marine;
(approved by DNV/GL/ABS)
with analogue output
M12x1 connecting plug; 5-pole

SCLSD-xxx-10-05
SCLSD-xxx-10-05-MA

Length (Installation length L1 mm)

| | |
|---------|------|
| 250 mm | 250 |
| 370 mm | 370 |
| 520 mm | 520 |
| 800 mm | 800 |
| 1000 mm | 1000 |

Accessories

PC Programming Kit

SCSD-PRG-KIT

Flange adapter

SCAF-3/4-90

6-hole connection DIN 24557, part 2

Connection cable and single plug

Connection cable, assembled

SCK-400-xx-xx

(open cable end)

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

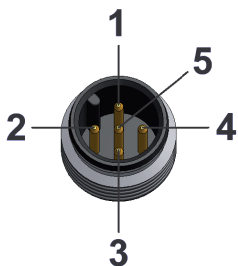
| | |
|----------------------------|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

| | |
|----------------------------|---------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |

SCLSD-xxx-10-05

2 switching outputs, 1 analogue output
M12x1; 5-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |

SCLTSD LevelTempController

Device features

- Proven measuring system
- Pivoting
- Level display
- mm / inch / % display
- High and low display
- Analogue output
- Switching outputs
- Only one hole
- No surge pipe necessary
- Replacement for several mechanical switches



With the **LevelTempController**, you can set up and display the temperature and the level individually using a common platform. When monitoring the tank, this integration of level and temperature functionality opens up many possibilities.

The **LevelTempController** combines the functions of a level and temperature switch, a level and temperature sensor and a level and temperature indicator:

- Level and temperature display (thermometer / inspection glass)
- Switching outputs
- Analogue signal

Level

The position of the float is finely (≥ 5 mm) and continuously recorded and shown in the display in mm or inch. Because the level is continuously recorded, the danger of individual mechanical contacts "sticking" no longer exists. Therefore the operational reliability of the monitored plant is greatly increased.

Using the selectable percent display, the full level is uniformly displayed for the users, independent of the tank shape. An offset can also be entered (difference from the sensor to the tank bottom) to give a realistic indication of the level from the tank bottom.

Different uses can easily be implemented or corrected at a later date using the menu-driven level switching points.

As the switching point no longer needs to be specified at the time of order, the versions of mechanical level switches required is reduced.

Temperature

The temperature in the substance is continuously recorded and displayed. The switching outputs can be individually set up just like the LevelController. Naturally all the convenient switching functions are available: window, hysteresis function and open / close as well as an analogue output for temperature.

Reliable and safe

Parameters can be password protected to avoid unauthorised changes.

Universal

Thanks to these easy switching functions (hysteresis and window functions, NC or NO functions), intelligent adjustments can be set on the LevelTempController which are normally not possible using a mechanical level switch. Therefore, many switches can be replaced with one controller. With the optional analogue outputs, the level and temperature can be monitored easily with a controller.

Level: e.g. for leakage monitoring

Temperature: e.g. coolers, heating, alarm, shutdown

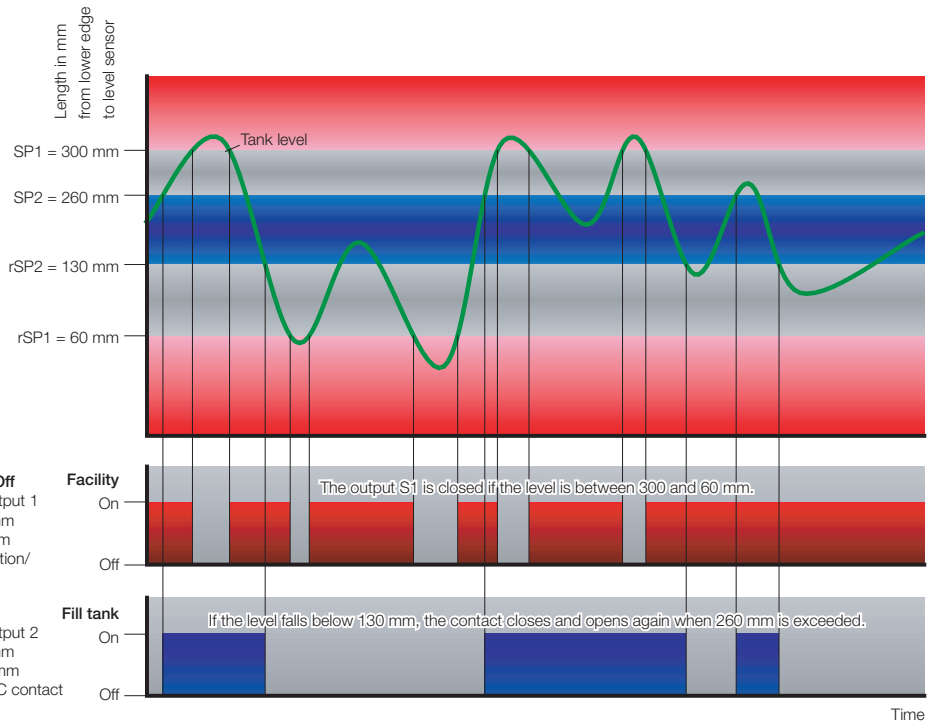
SCLTSD LevelTempController

Application examples

SCLSD



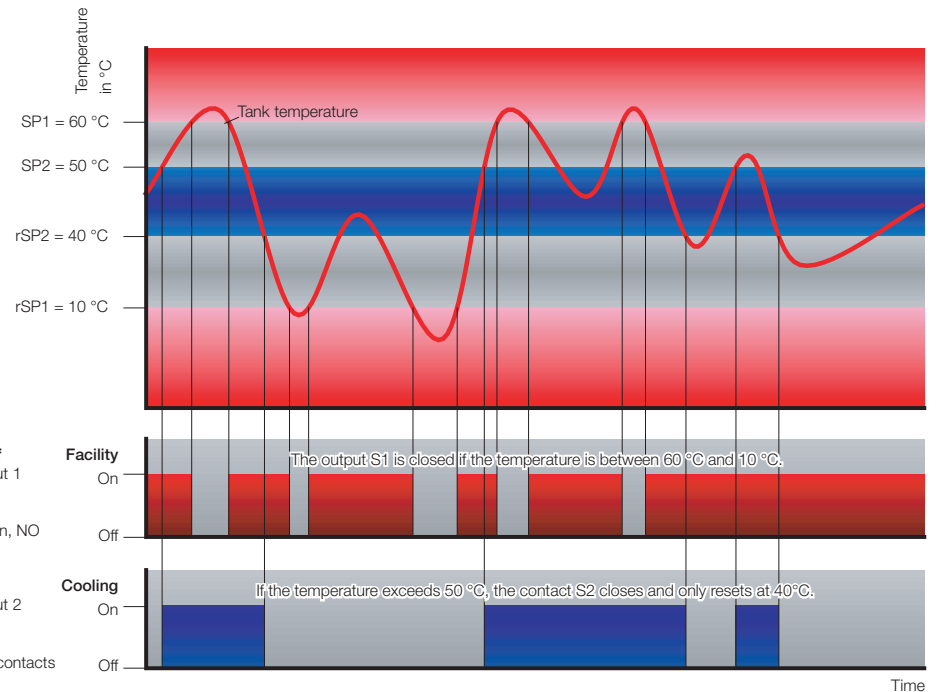
Application example
Refer to page 84



SCTSD



Application example
Refer to page 68



SCLTSD LevelTempController

Device features

Everything at a glance

- Sloped display
- Digital display
 - Large
 - Illuminated
 - Switching points
- Display level
 - mm, inch, or %
 - Actual level
 - High and low display
- Temperature display
 - °C, °F
 - Current temperature

Rugged

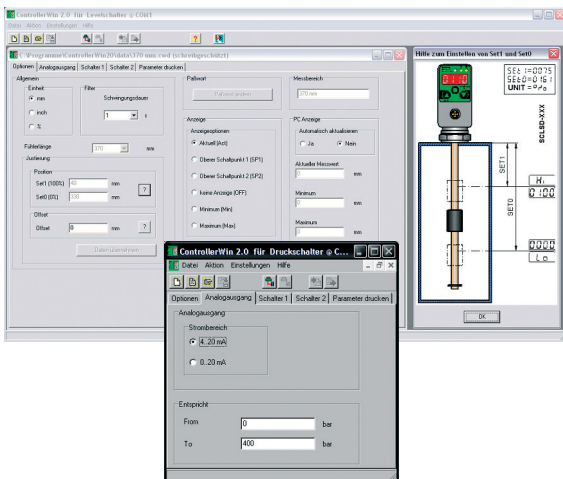
- Metal housing
- Waterproof
- Excellent interference immunity
- Vibration proof
- Shock proof

Variable installation

- A coupling hole
- Compact size
- 290° pivotable
- G3/4 BSPP
- DIN flange

Programming module

- Adjustable with ControllerWIN Software



Optical interface

- Switch status is shown

Easy to use

- 3 large buttons
- Display of the unit

Connect as required

- 2 switching outputs
- Analogue output
- 0...20 or 4...20 mA
- Freely programmable
- Scalable
- M12 connecting plugs

Twin concept

- 2 in 1

No surge pipe necessary

- Electronic attenuation
- adjustable attenuation

Level

- Proven measuring system
- High float dynamics
- Small design
- Universal usage

Temperature sensor

- Integrated in the rod end



SCLTSD LevelTempController

Technical data

| Electrical connection | |
|------------------------------------|---|
| Supply voltage V_+ | 15...30 VDC nominal 24 VDC; Protection class 3 |
| Electrical connection | M12x1; 4-pole; 5-pole; with gold-plated contacts |
| Short-circuit protection | Yes |
| Protection against wrong insertion | Yes |
| Overload protection | Yes |
| Current consumption | < 100 mA |
| Housing | |
| | Adjustable direction to 290°C |
| Material | Die-cast zinc Z 410; painted |
| Foil material | Polyester |
| Display | 4-digit 7-segment LED; red; digit height 9 mm |
| Protection degree | IP67 DIN EN 60529 |
| Ambient conditions | |
| Ambient temperature range | -20...+85 °C |
| Temperature range of substance | ≤ 80 °C |
| Storage temperature range | -40...+100 °C |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Outputs | |
| Switching outputs | Two MOSFET high-side switches (PNP) |
| Contact functions | NO / NC contact; window / hysteresis function freely adjustable |
| Switching voltage | $V_+ - 1.5$ VDC |
| Switching current max. | 0.5 A per switch |
| Short-circuit current | 2.4 A per switch |
| Analogue output | 0/4 to 20 mA; programmable; freely scalable $RL \leq (V_+ - 8 \text{ V}) / 20 \text{ mA} (\leq 500 \Omega)$ |

Level

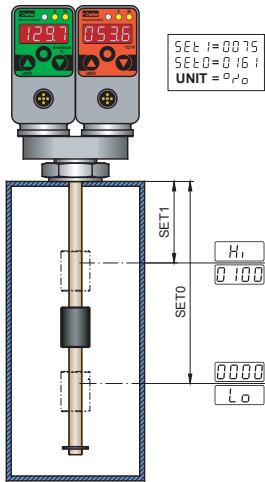
| Input parameters | |
|----------------------------------|--|
| Measuring component | Resistance reed chain with float |
| Connector thread | G3/4 BSPP; nickel-plated brass; ED soft seal NBR* |
| Parts in contact with substances | Brass; nickel-plated brass; NBR* |
| Temperature range of substance | ≤ 80 °C |
| Output values | |
| Switching point accuracy | ± 1 % FS at 25 °C |
| Display accuracy | ± 1 % FS ± 1 Digit at 25 °C |
| Response speed | ≤ 700 ms |
| Resolution | 7.5 mm |
| Float | |
| Material | NBR |
| Dimensions | Ø 18 mm, Length 35 mm |
| Viscosity | Max. 250 cSt at 25 °C |
| Density | at least 0.750 g/cm ³ |
| Level rod | |
| Material | Stainless steel |
| Dimensions | Ø 8 mm |
| Operating pressure | 1 bar |
| Temperature | |
| Output values | |
| Switching point accuracy | ± 0.35 % FS at 25 °C |
| Display accuracy | ± 0.35 % FS ± 1 Digit at 25 °C |
| Response speed | ≤ 300 ms |
| Analogue output | 0/4...20 mA; programmable; freely scalable; 4...20 mA = -40...125 °C |

* different sealing material (FKM, EPDM etc.) upon request

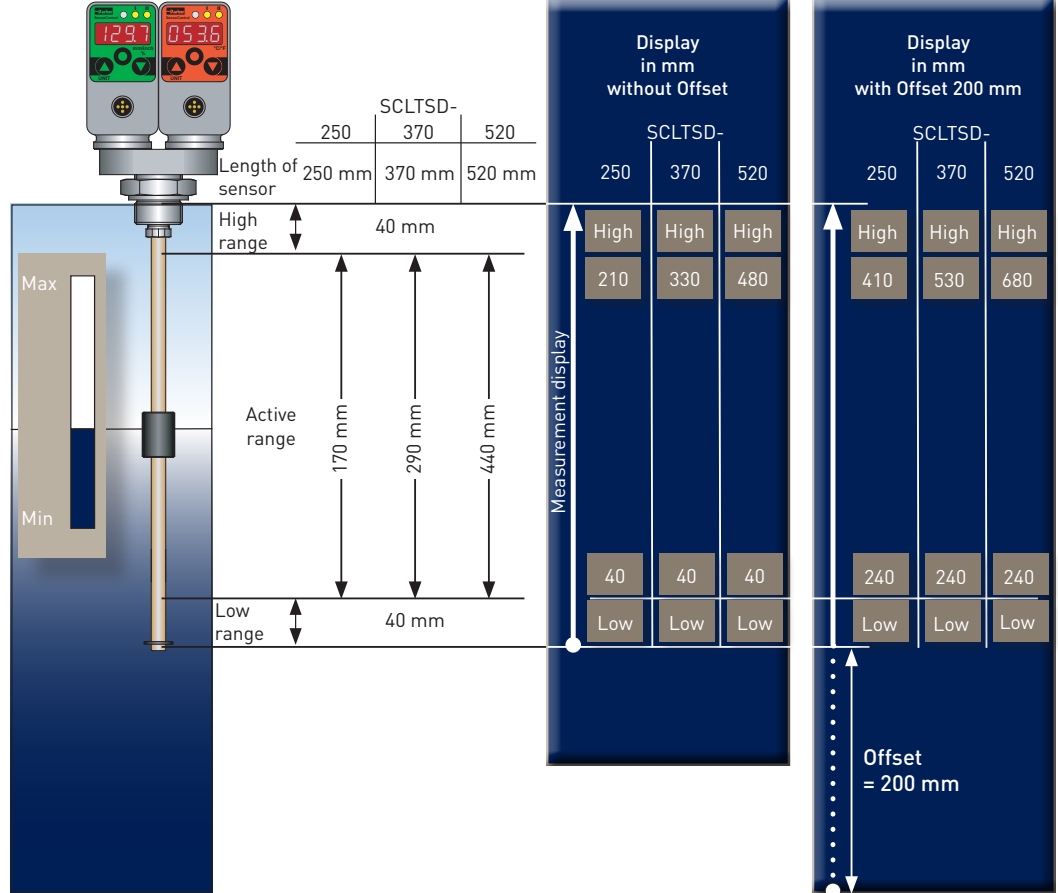
SCLTSD LevelTempController

Display possibilities

Example of a percent display



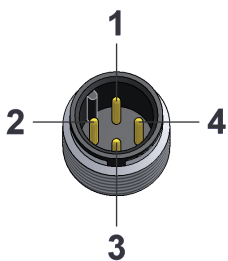
Example of a mm display



| L1 Sensor length Measurement range | L2 active range | Display reso- lution Increment size | Increment size | Lowest reset switch point RSP | Largest switch- ing value SP | Smallest adjustable difference between SP and RSP (SP-RSP) |
|--|--------------------|---|-------------------|-------------------------------------|------------------------------------|--|
| 250 mm | 40...210 mm | 1 mm | 5 mm | 40 mm | 210 mm | 5 mm |
| 370 mm | 40...330 mm | 1 mm | 5 mm | 40 mm | 330 mm | 5 mm |
| 520 mm | 40...480 mm | 1 mm | 5 mm | 40 mm | 480 mm | 5 mm |
| 800 mm | 40...760 mm | 1 mm | 10 mm | 40 mm | 760 mm | 10 mm |
| 1000 mm | 40...960 mm | 1 mm | 10 mm | 40 mm | 960 mm | 10 mm |

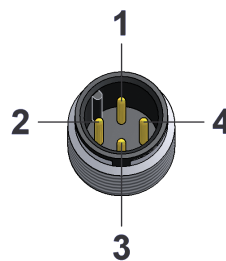
Pin assignment

SCLTSD-xxx-00-07 for temperature and level
2 switching outputs; M12x1; 4-pole



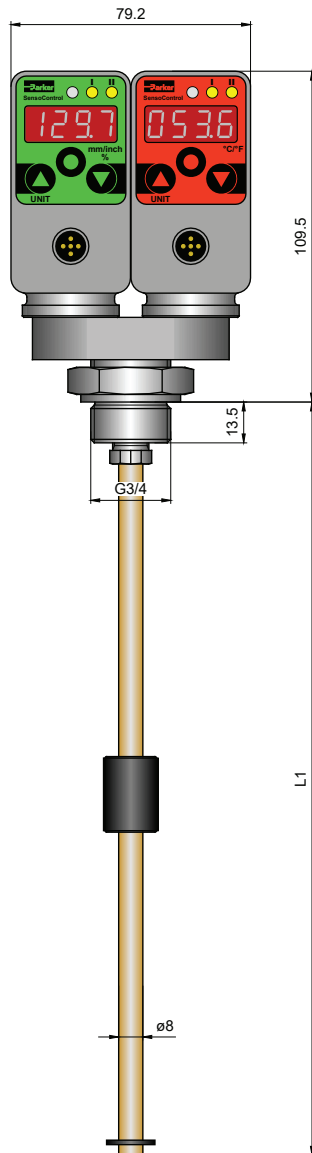
| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCLTSD-xxx-10-07 for temperature and level
1 switching output, 1 analogue output, M12x1; 4-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCLTSD LevelTempController



L1 = length of the sensor (mm)
L2 = active range (mm)

Order code

SCLTSD LevelTempController

2 switching outputs;
2 switching outputs Marine;
(approved by DNV/GL/ABS)
no analogue output
M12x1 connecting plug; 4-pole

SCLTSD-xxx-00-07
SCLTSD-xxx-00-07-MA

1 switching output;
1 switching output Marine;
(approved by DNV/GL/ABS)
with analogue output
M12x1 connecting plug; 4-pole

SCLTSD-xxx-10-07
SCLTSD-xxx-10-07-MA

2 switching output;
2 switching output Marine
(approved by DNV/GL/ABS)
with analogue output
M12x1 connecting plug; 5-pole

SCLTSD-xxx-10-05
SCLTSD-xxx-10-05-MA

Installation length (L1 mm)

| | |
|---------|------|
| 250 mm | 250 |
| 370 mm | 370 |
| 520 mm | 520 |
| 800 mm | 800 |
| 1000 mm | 1000 |

Accessories

PC Programming Kit

SCSD-PRG-KIT

Flange adapter

SCAF-3/4-90

6-hole connection DIN 24557, part 2

Connection cable and single plug

Connection cable, assembled

SCK-400-xx-xx

(open cable end)

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

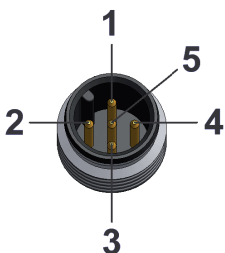
Connecting plug

| | |
|----------------------------|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

| | |
|----------------------------|---------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |

SCLTSD-xxx-10-05 for temperature and level
2 switching outputs, 1 analogue output; M12x1; 5-pole



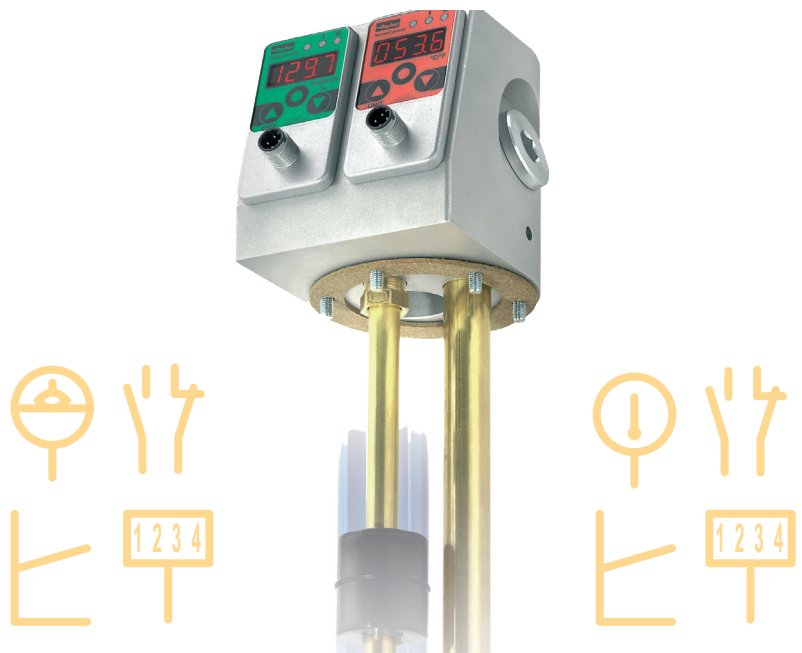
| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |



SCOTC OilTankController

Device features

- Proven measuring system
- Level and temperature display
- mm / inch / % display
- High and low display
- Only one hole
- Continuous level measurement
- Connection
 - Filling coupling
 - Air filter
 - Low pressure
- No surge pipe necessary



In addition to the **LevelTempController**, the **OilTankController** also offers standardised connections for an air filter and a fill coupling.

When monitoring the tank for series use, this integration of level and temperature functionality together with air filter and fill adapter port opens up many possibilities. An additional connecting hole is required for the four functions.

The OilTankController combines the functions of a level and temperature switch, a level and temperature sensor and a level and temperature display:

- Level and temperature display (thermometer / inspection glass)
- Switching outputs
- Analogue signal

Level

The position of the float is finely (≥ 5 mm) and continuously recorded and shown in the display in mm or inch. Because the level is continuously recorded, the danger of individual mechanical contacts "sticking" no longer exists. Therefore the operational reliability of the monitored plant is greatly increased.

Using the selectable percent display, the full level is uniformly displayed for the users, independent of the tank shape. An offset can also be entered (difference from the sensor to the tank bottom) to give a realistic indication of the level from the tank bottom.

Different uses can easily be implemented or corrected at a later date using the menu-driven level switching points.

As the switching point no longer needs to be specified at the time of order, the versions of mechanical level switches required is reduced.

Temperature

The temperature in the substance is continuously recorded and displayed. The switching outputs can be individually set up just like the LevelController. Naturally all the convenient switching functions are available: window, hysteresis function and open/close as well as an analogue output for temperature.

Reliable and safe

Parameters can be password protected to avoid unauthorised changes.

Universal

In combination with the comfortable switch functions like hysteresis and window function, open/close contact functions **LevelTempController** intelligent settings can be made which are not possible with a mechanical level/temperature switch. Therefore, many switches can be replaced with one controller. With the optional analogue outputs, the level and temperature can be monitored easily with a controller.

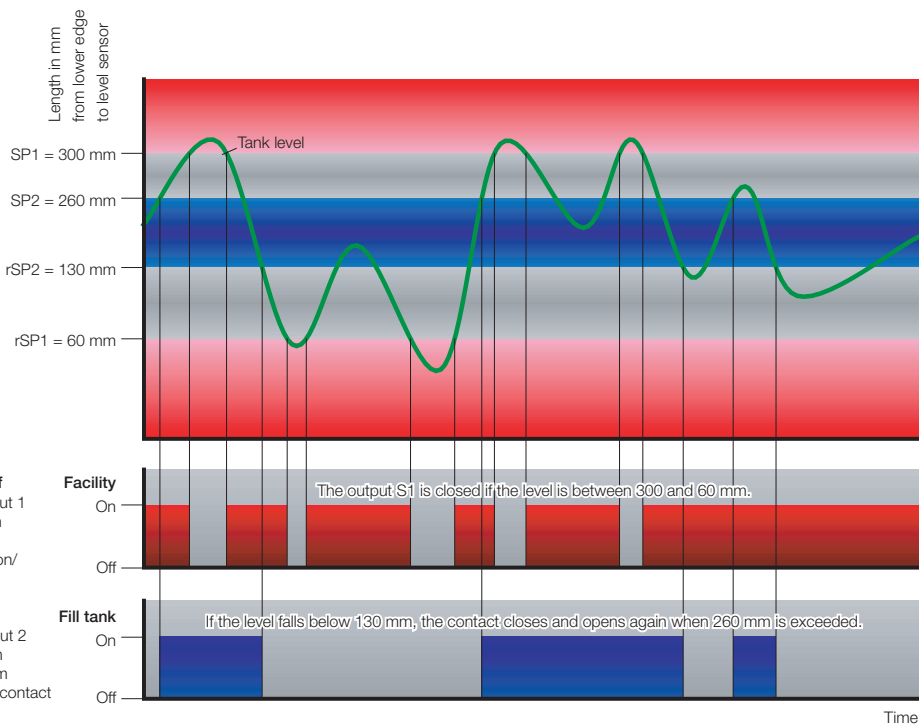
Level: e.g. for leakage monitoring

Temperature: e.g. coolers, heating, alarm, shutdown

SCOTC OilTankController

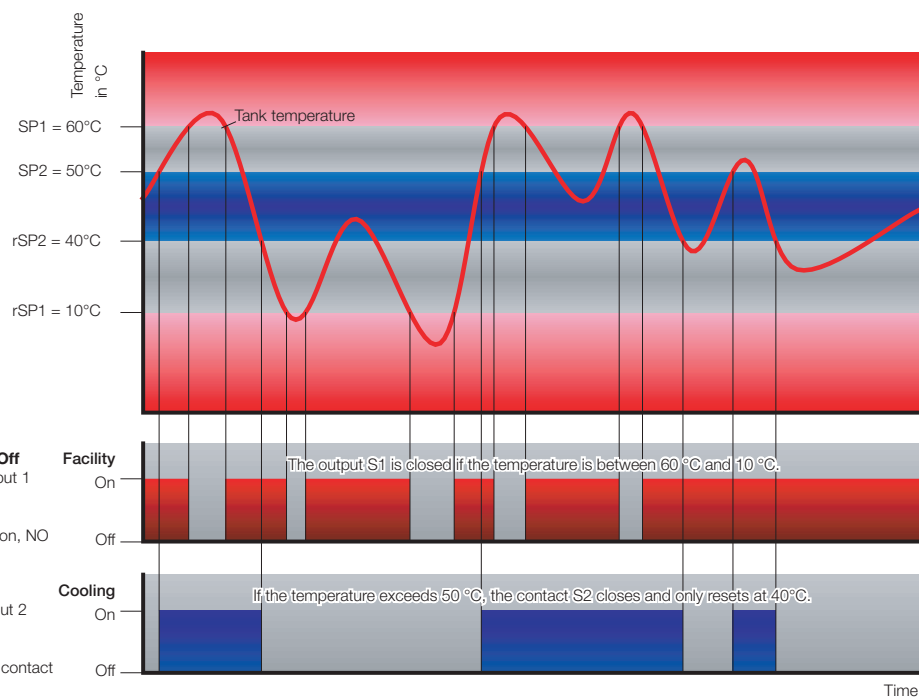
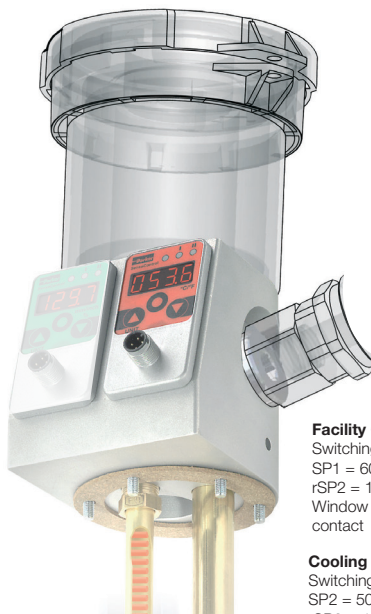
Application examples

SCLSD



Application example
Refer to page 84

SCTSD



Application example
Refer to page 68

SCOTC OilTankController

Device features

Getting to the point

- Compact construction (4 in 1)
- Easy adjustment of the switching points using the menu
- Analogue output
- Safety control
- Cost savings in the logistics, assembly and maintenance

Level and temperature

- Display
- Adjustable switching output
- Analogue output

The extended version

with safety control

- Additional fixed switching contacts
- Level min/max
- Temperature too high

Real fill level

- The level controller continuously measures the position of the float and continuously shows the position in the display.
- Up to 1000 mm

No surge pipe necessary

- Electronic attenuation adjustable attenuation

Temperature sensor

- Integrated in the rod end

6-hole standard for

- Ventilation filter* (DIN 24557, part 2)

G3/4 BSPP for

- Filling coupling*

G1/8 BSPP for

- Low pressure switch*
- Clogging indicator*

6-hole standard for

- Tank connection (DIN 24557, part 2)

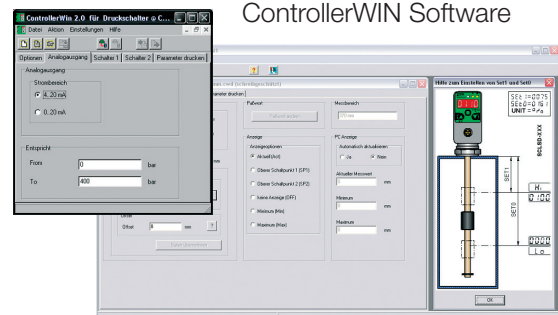
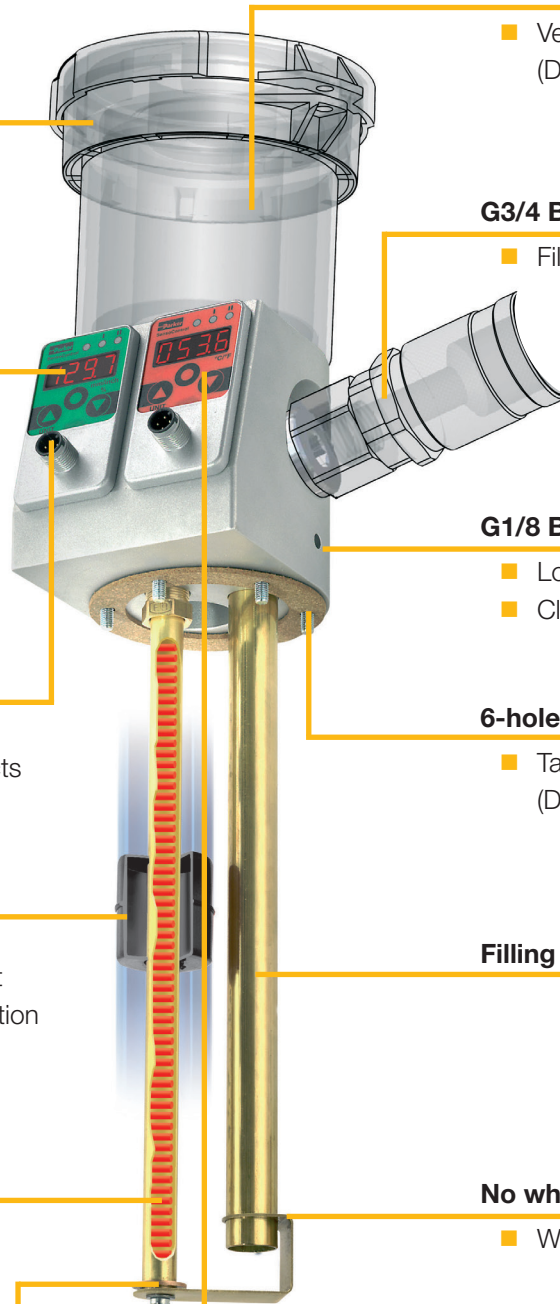
Filling tube

No whirl-up

- Whirl-up protection

Programming module

- Adjustable with ControllerWIN Software



* Venting filter, filling coupling, low pressure switch and clogging indicator are not included in the delivery.

SCOTC OilTankController

Technical data

| SCOTC | 250 | 370 | 520 | 800 | 1000 |
|--------------------------|-------------|-------------|-------------|-------------|-------------|
| Tank installation length | 250 mm | 370 mm | 520 mm | 800 mm | 1000 mm |
| Adjustment range | 40...210 mm | 40...330 mm | 40...480 mm | 40...760 mm | 40...960 mm |

| Electrical connection | |
|------------------------------------|---|
| Supply voltage V_+ | 15 to 30 VDC nominal 24 VDC; Protection class 3 |
| Electrical connection | M12x1; 4-pole; 5-pole; with gold-plated contacts |
| Short-circuit protection | Yes |
| Protection against wrong insertion | Yes |
| Overload protection | Yes |
| Current consumption | < 100 mA |
| Housing | |
| Material | Die-cast zinc Z 410; painted Aluminium |
| Foil material | Polyester |
| Display | 4-digit 7-segment LED; red; digit height 9 mm |
| Protection degree | IP67 DIN EN 60529 |
| Ambient conditions | |
| Ambient temperature range | -20...+80 °C |
| Temperature range of substance | ≤ 80 °C |
| Storage temperature range | -40...+100 °C |
| Sampling period | 300 ms |
| Display refresh | 1 s |
| EM compatibility | |
| Disturbance emissions | EN 61000-6-3 |
| Resistance to interference | EN 61000-6-2 |
| Outputs | |
| Switching outputs | Two MOSFET high-side switches (PNP) |
| Contact functions | NO / NC contact; window / hysteresis function freely adjustable |
| Switching voltage | V_+ -1.5 VDC |
| Switching current max. | 0.5 A per switch |
| Short-circuit current | 2.4 A per switch |
| Optional analogue output | |
| Measuring range | 0/4...20 mA; programmable |
| Response speed (0 to 95%) | ≤ 300 ms |
| Error | ± 1 % FS |
| Load | ≤ 500 Ω from $V_b > 18$ VDC |

Level

| Input variables | |
|--------------------------------------|--|
| Measuring component | Reed chain resistance |
| Connector thread | 6 hole standard- DIN 24557, part 2 |
| Output variables | |
| Switching point accuracy | ± 1 % FS at 25 °C |
| Display accuracy | ± 1 % FS ± 1 Digit at 25 °C |
| Response speed | ≤ 700 ms |
| Resolution | 5 mm...520 mm; 10 mm > 520 mm |
| Float | |
| Material | Polypropylene |
| Dimensions | Ø 35 mm, Length 40 mm |
| Level rod | |
| Material | Brass |
| Dimensions | Ø 12 mm |
| Operating pressure | 1 bar max. |
| Optional Lo-Hi contact (S3 out) | |
| Alarm contact | In series switched Lo and Hi NC contact |
| Maximum load current | 0.7 A |
| Temperature | |
| Input variables | |
| Sensor element | PT1000 |
| Filling tube | Ø 18x1 mm |
| Response time | $\tau_{0.9} = 60$ s |
| Output variables | |
| Switching point accuracy | ± 0.5 % FS at 25 °C |
| Display accuracy | ± 0.5 % FS ± 1 Digit at 25 °C |
| Response speed | ≤ 300 ms |
| Analogue output | 0/4...20 mA; programmable; freely scalable; 4...20 mA = -40...125 °C |
| Optional temperature switch (S3 out) | |
| Alarm contact with > 65 °C | Open contact |
| Maximum charging current | 0.7 A |

SCOTC OilTankController

Pin assignment

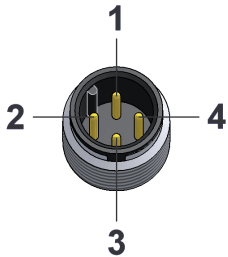
Without safety-control-output

SCOTC-xxxx-00-07

for temperature and level

2 switching outputs

M12x1; 4-pole



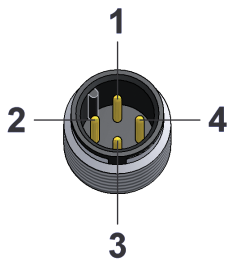
| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCOTC-xxxx-10-07

for temperature and level

1 switching outputs, 1 analogue output

M12x1; 5-pole



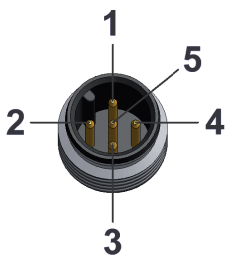
| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | Analogue out |
| 3 | 0 V / GND |
| 4 | S1 out |

SCOTC-xxxx-10-05

for temperature and level

2 switching outputs, 1 analogue output

M12x1; 5-pole



| PIN | Assignment |
|-----|----------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | Analogue out |

With safety-control-output

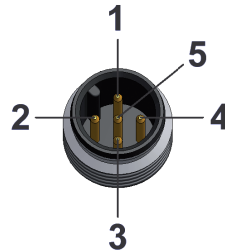
SCOTC-xxxx-00-05

Level:

Two variable switching outputs,

One fixed safety-control-output level min/max;

M12x1; 5-pole



| PIN | Assignment |
|-----|----------------------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | S3 out (L-Low / L-High) |

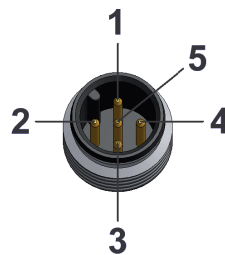
SCOTC-xxxx-00-05

Temperature:

Two variable switching outputs,

One fixed safety-control-output temperature max. 65 °C

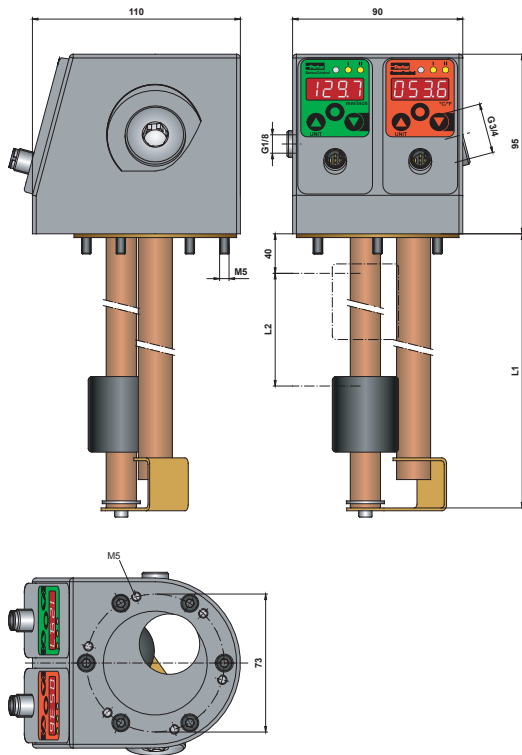
M12x1; 5-pole



| PIN | Assignment |
|-----|--------------------|
| 1 | V ₊ |
| 2 | S2 out |
| 3 | 0 V / GND |
| 4 | S1 out |
| 5 | S3 out (T-High) |

| L1 Sensor length Measurement range | L2 active range | Display resolu- tion increment size | Increment size | Lowest reset switch point RSP | Largest switch- ing value SP | Smallest adjustable difference between SP and RSP (SP-RSP) |
|--|-----------------------|--|-------------------|-------------------------------------|------------------------------------|--|
| 250 mm | 170 mm | 1 mm | 5 mm | 40 | 210 | 5 mm |
| 370 mm | 290 mm | 1 mm | 5 mm | 40 | 330 | 5 mm |
| 520 mm | 440 mm | 1 mm | 5 mm | 40 | 480 | 5 mm |
| 800 mm | 720 mm | 1 mm | 10 mm | 40 | 760 | 10 mm |
| 1000 mm | 920 mm | 1 mm | 10 mm | 40 | 960 | 10 mm |

SCOTC OilTankController



L1 = length of the sensor (mm)
L2 = active range (mm)

Order code

SCOTC OilTankController *

2 switching outputs; no analogue output SCOTC-xxxx-00-07
M12x1 connecting plug; 4-pole

2 switching outputs; with analogue output SCOTC-xxxx-10-07
M12x1 connecting plug; 4-pole

1 switching output; with analogue output SCOTC-xxxx-10-05
M12x1 connecting plug; 5-pole

3 switching outputs; no analogue output SCOTC-xxxx-00-05
M12x1 connecting plug; 5-pole
with safety control

Length (Installation length L1 mm)

| | |
|---------|------|
| 250 mm | 250 |
| 370 mm | 370 |
| 520 mm | 520 |
| 800 mm | 800 |
| 1000 mm | 1000 |

Accessories

PC Programming Kit

SCSD-PRG-KIT

Connection cable and single plug

Connection cable, assembled

SCK-400-xx-xx

(open cable end)

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

| | |
|----------------------------|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |

Single connector

M12 cable jack; straight

SCK-145

M12 cable jack; 90° angled

SCK-155

* Venting filter, filling coupling, low pressure switch and clogging indicator are not included in the delivery.

SCK cable

Device features

- One cable for all
- Compact size
- Interference-free
- Compatible to:
 - Sensors
 - Controllers
- M12 plug
- DIN EN 175301 (Device plug)
- Available in a variety of lengths



The **SensoControl**[®] cable was designed for use with the industrial sensors and switches.

Thus the M12 cable and M12 plug are

- Compact
- Shielded
- Five-pole

5-pole version

The 5-pole cable is suitable for both 4-pole and 5-pole connections. The sensor variants with a 4-pole connector are fully compatible with the 5-pole cable.

So despite different pin counts on the pressures switch (Controller Family SCxSD and SCOTC) and sensors, it is always possible to use just one cable version (5-pole) regardless of the plug version.

The SCK-400-xxx-x5 cables fit to all components in this catalogue using M12 connectors.

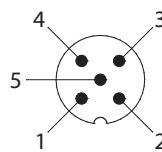
Shielding

Shielding protects against interference and ensures improved operational safety.

- Higher EMC protection

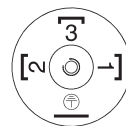
Pin assignment

SCK-400-xx-x5



| PIN | | | |
|-----|----|-------|---------|
| 1 | bn | brown | braun |
| 2 | wh | white | weiß |
| 3 | bu | blue | blau |
| 4 | bk | black | schwarz |
| 5 | gy | grey | grau |

SCK-400-xx-56

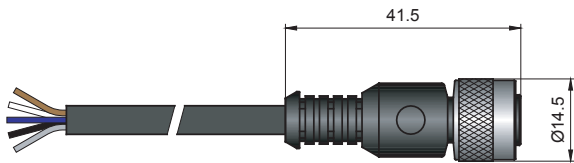


| PIN | | | |
|-----|----|--------|-------|
| 1 | ye | yellow | gelb |
| 2 | gn | green | grün |
| 3 | bn | brown | braun |
| | | | |

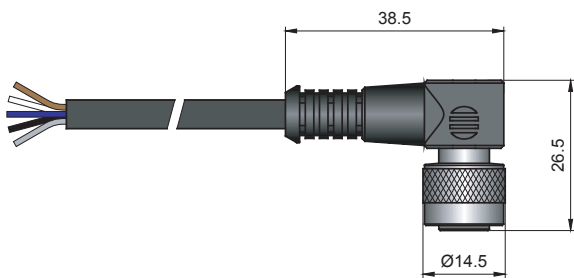
SCK cable

Connection cable

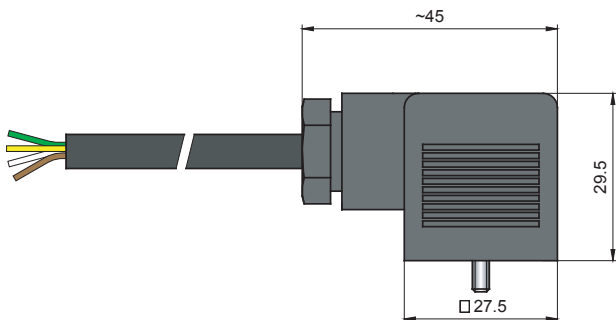
SCK-400-xx-45



SCK-400-xx-55

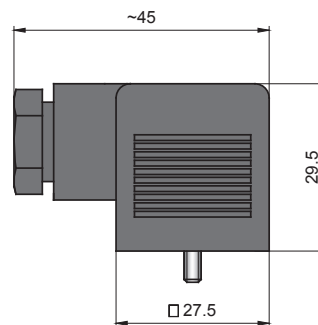


SCK-400-xx-56



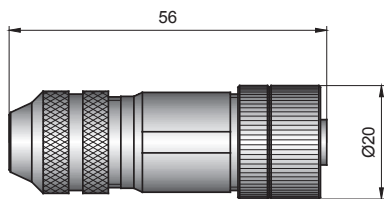
Single connector

SCK-006 (Device plug)

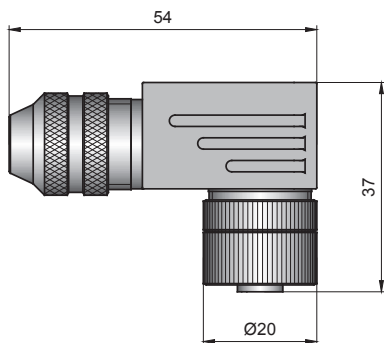


Single connector

SCK-145



SCK-155



Connection cable and single plug

Connection cable, assembled

(open cable end)

Cable length (m)

| | |
|------|----|
| 2 m | 02 |
| 5 m | 05 |
| 10 m | 10 |

Connecting plug

| | |
|---|----|
| M12 cable jack; straight | 45 |
| M12 cable jack; 90° angled | 55 |
| Cable socket DIN EN 175301-803 Form A (old DIN 43650) | 56 |

Single connector

| | |
|---|---------|
| M12 cable jack; straight | SCK-145 |
| M12 cable jack; 90° angled | SCK-155 |
| Cable socket DIN EN 175301-803 Form A (old DIN 43650) | SCK-006 |

SCA adapter

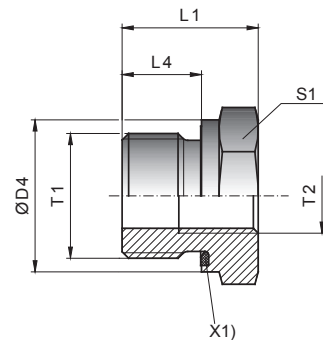
SCA-1/4 reduction adapter

The SCA-1/4 provides compatibility for earlier sensor versions with the hydraulic connection M22x1.5 or G1/2 BSPP.

- When replacing earlier versions

This allows facilities to be updated without major planning overhead.

SCA-1/4-M22x1.5-ED
SCA-1/4-ED-1/2-ED



X1) EOLASTIC-seal

| | T1 | T2 | ØD4 | L1 | L4 | S1 | Weight (g/1 St) | PN (bar) ¹⁾ | DF ** |
|---------------------------|-----------|-----------|-----|----|----|----|-----------------|------------------------|-------|
| SCA-1/4-M22x1.5-ED | M22x1.5 | G1/4 BSPP | 27 | 24 | 14 | 27 | 56 | 400 | 4 |
| SCA-1/4ED1/2-ED | G1/2 BSPP | G1/4 BSPP | 27 | 24 | 14 | 27 | 56 | 400 | 4 |

SCA-1/4 attenuation adapter

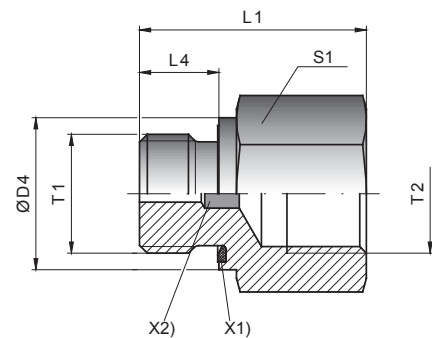
System-related pressure spikes are reduced with the SCA-1/4-EDX-1/4-D.

- Attenuation for pressure peaks

The G1/2 BSPP version ensures compatibility for earlier sensor versions to the G1/2 BSPP hydraulic connection.

- When replacing earlier versions

SCA-1/4-EDX-1/4-D



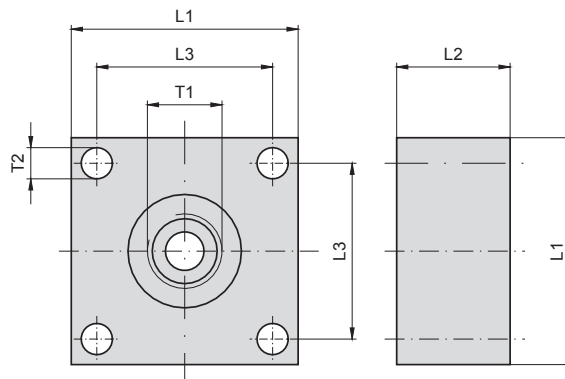
X1) EOLASTIC-seal

| | T1 | T2 | ØD4 | L1 | L4 | S1 | Weight (g/1 St) | PN (bar) ¹⁾ | DF ** |
|------------------------|------------|-----------|-----|----|----|----|-----------------|------------------------|-------|
| SCA-1/4EDX1/4-D | G1/4A BSPP | G1/4 BSPP | 19 | 34 | 12 | 22 | 61 | 630 | 3.5 |

SCA adapter

SCPSD flange adapter SCAF-1/4-40 for mechanical pressure switch

When replacing existing mechanical pressures switches SCAF-1/4-40 with 40x40mm flange connections



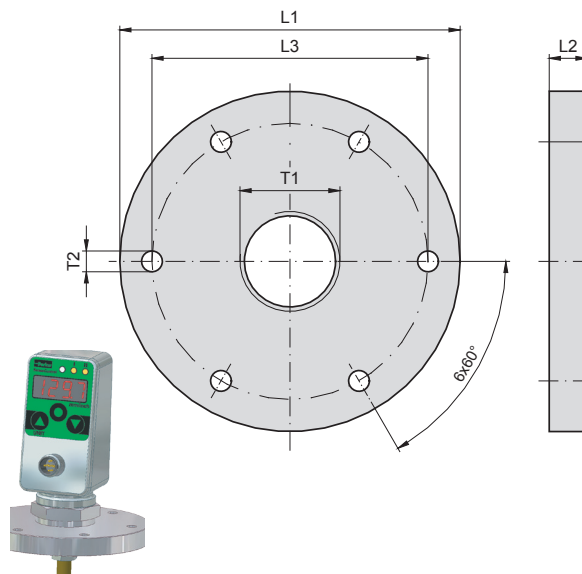
SCAF-1/4-40
for mechanical pressure switch

SCAF-1/4-40

| T1 | T2 | L1 | L2 | L3 | Weight (g/1 St) | PN (bar) ¹⁾ Alu | DF ** |
|-----------|-----|----|----|----|-----------------|----------------------------|-------|
| G1/4 BSPP | 5.5 | 40 | 20 | 31 | 15 | 400 | 4 |

SCLSD/SCLTSD flange adapter SCAF-3/4-90 6-hole connection DIN 24557, part 2

For LevelController and LevelTemp Controller (SCLSD and SCLTSD), a compatibility to the tank connections 6-hole DIN 24557, part 2, is ensured.



SCAF-3/4-90
6-hole connection DIN 24557, part 2

SCAF-3/4-90

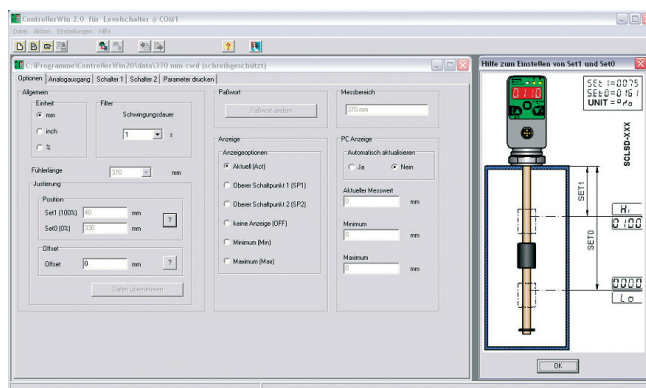
| T1 | T2 | L1 | L2 | L3 | Weight (g/1 St) | Material |
|-----------|-----|----|----|----|-----------------|---------------------|
| G3/4 BSPP | 5.5 | 90 | 10 | 73 | 520 | Nickel-plated brass |

** DF = Design Factor (safety factor)

ControllerWIN software

Device features

- Suitable for the Controller Family
- Simple adjustment of all parameters
- Saving of the parameters
- Adjustment with PC/laptop
 - at the workbench
 - at the desk
 - in the plant



The ControllerWIN software allows the adjustment and saving of all parameters, including:

- Switching points
- NO / NC contact function
- Window / hysteresis
- Scaling of the analogue output
- Passwords

From the Controller Family product series:

- SCPSD
- SCTSD
- SCLSD
- SCLTSD
- SCOTC

Function

A no-contact infra-red interface is used to compare the data with the corresponding functional controller. This can take place directly in the facility or externally using a power supply unit (not included in the delivery).

- It is not necessary to disconnect the power supply or pull the cable out (operations are not interrupted).

A programming adapter is connected to the corresponding controller and the data is transmitted to a PC.

The SCSD-PRG_KIT programming kit includes all components (adapter, software and power supply) required for adjusting the controller with the PC or laptop:

- At the workbench
- At the desk
- In the plant

Application

- Saving and logging the adjusted values
- Programming multiple controllers
- Easy exchange of existing controllers

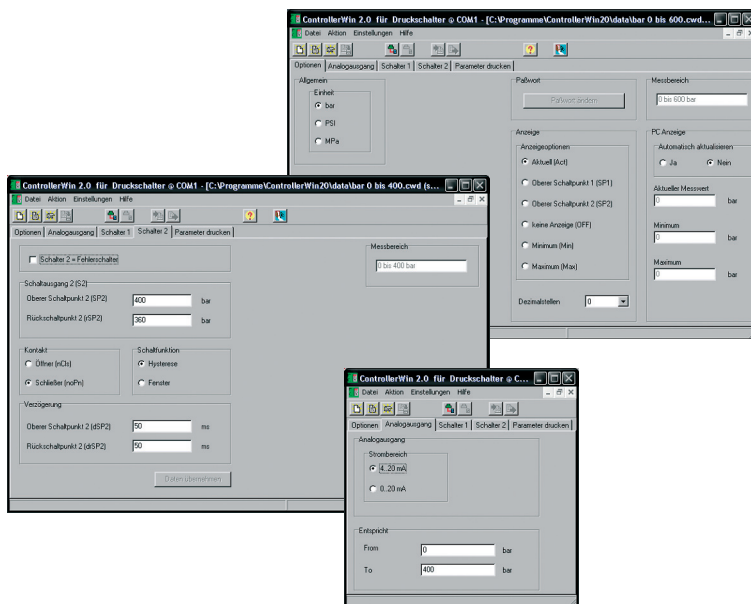
The programming kit is the ideal solution in each of these cases.

ControllerWIN software

Technical data

System requirements

| Operating system | PC / laptop connection | Controller connection |
|----------------------|---|---|
| WIN 98/2000/ME/NT/XP | RS232 (USB using conventional adapter) | Parker infra-red interface SCxSD/SCOTC |



Accessories for:

| PressureController | TemperatureController | LevelController | LevelTempController | OilTankController |
|---------------------------------|------------------------------------|---------------------------------|--|-------------------|
| | | | | |
| Pressure display and monitoring | Temperature display and monitoring | Level indication and monitoring | Level and temperature display and monitoring | |

Order code

PC Programming KIT

SCSD-PRG-KIT



Installation and safety instructions



The CE mark indicates a high-quality device that complies with the European directive 89/336/EWG and EMVG.

We confirm that these products comply with the following standards:

EMC

- Electromagnetic emission: EN 61000-6-3
- Electromagnetic immunity: EN 61000-6-2

Important

- Electromagnetic disturbances can affect the desired signal.
- Apply all general EMC strategies when planning facilities and machines.
- We recommend using shielded cables (SCK-400-xx-x5) in order to achieve better EMC immunity.
- Make sure you route analogue and data cables so that there is a sufficient gap between them.
- An effective earthing strategy will help you to avoid measuring errors.

Always connect metal housings with the reference ground. The PE protective earth should have a low-ohm connection. According to VDE 0701, the PE resistance must be measured.

Power feed voltage



Each sensor series specifies the recommended feed voltage to be used when operating the standard sensor. We recommend using a low-noise, high-quality, constant voltage source. Certain specifications (such as sensitivity and thermal sensitivity shift) may change when other power feeds are used. Each sensor is trimmed to its peak performance. The sensor's performance may change when other power feed types are used. Make sure you comply with the polarity and earthing regulations.

Improperly connected feed wires can damage sensors and amplifiers!

If one pole of the sensor feed is automatically earthed via the sensor's processing system, then you should avoid an additional earth on the sensor signal wire. This would cause the sensor to short circuit and damage the sensor.

Do not apply feed-in voltage to the output wires. This will permanently damage the sensors!



The sensor will be damaged if the data sheet specifications and maximum recommended feed voltage levels are exceeded!

Compatibility with media (substances)

SensoControl® products which come into contact with the substance are not produced in an oil-free or fat-free environment.

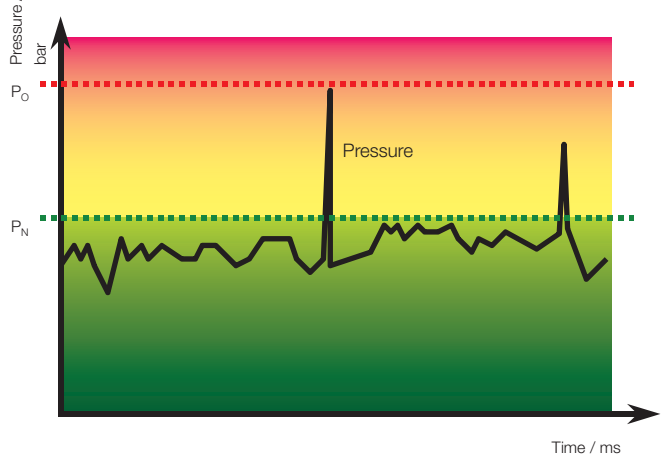
Therefore these products are **not** suitable for use in applications which use explosive mixtures of oil and gas (e.g. oxygen or compression). This could lead to a danger of explosion!

Danger of explosion!

Only use substances which are compatible with the components that come into contact with the substance. (Refer to the data sheets)

Please consult with the plant manufacturer or the manufacturer of the substance if you have any questions. (Refer to catalogue 4100 chapter C).

Pressure range selection



When selecting pressure components, ensure that the overload pressure P_{max} will not be exceeded.

It is possible that the pressure cell can be deformed when the overload pressure P_{max} is exceeded (depending on the duration, frequency and level of the pressure spike).

Note: The "diesel effect" caused by entrapped air can result in pressure spikes that far exceed the maximum pressure.

The nominal pressure P_N of the pressure component (sensor/switch) should be higher than the nominal pressure of the system to be measured.

Appendix

Temperature conversion table

Celsius to Fahrenheit

| °C | °F |
|-----|-----|
| 150 | 302 |
| 145 | 293 |
| 140 | 284 |
| 135 | 275 |
| 130 | 266 |
| 125 | 257 |
| 120 | 248 |
| 115 | 239 |
| 110 | 230 |
| 105 | 221 |
| 100 | 212 |
| 95 | 203 |
| 90 | 194 |
| 85 | 185 |
| 80 | 176 |
| 75 | 167 |
| 70 | 158 |
| 65 | 149 |
| 60 | 140 |
| 55 | 131 |
| 50 | 122 |
| 45 | 113 |
| 40 | 104 |
| 35 | 95 |
| 30 | 86 |
| 25 | 77 |
| 20 | 68 |
| 15 | 59 |
| 10 | 50 |
| 5 | 41 |
| 0 | 32 |
| -5 | 23 |
| -10 | 14 |
| -15 | 5 |
| -20 | -4 |
| -25 | -13 |
| -30 | -22 |
| -35 | -31 |
| -40 | -40 |
| -45 | -49 |
| -50 | -58 |

Fahrenheit to celsius

| °F | °C |
|-----|-----|
| 340 | 171 |
| 330 | 166 |
| 320 | 160 |
| 310 | 154 |
| 300 | 149 |
| 290 | 143 |
| 280 | 138 |
| 270 | 132 |
| 260 | 127 |
| 250 | 121 |
| 240 | 116 |
| 230 | 110 |
| 220 | 104 |
| 210 | 99 |
| 200 | 93 |
| 190 | 88 |
| 180 | 82 |
| 170 | 77 |
| 160 | 71 |
| 150 | 66 |
| 140 | 60 |
| 130 | 54 |
| 120 | 49 |
| 110 | 43 |
| 100 | 38 |
| 90 | 32 |
| 80 | 27 |
| 70 | 21 |
| 60 | 16 |
| 50 | 10 |
| 40 | 4 |
| 30 | -1 |
| 20 | -7 |
| 10 | -12 |
| 0 | -18 |
| -10 | -23 |
| -20 | -29 |
| -30 | -34 |
| -40 | -40 |
| -50 | -46 |
| -60 | -51 |

Pressure conversion table

bar to psi

| bar | psi |
|------|-------|
| 1000 | 14505 |
| 800 | 11604 |
| 600 | 8703 |
| 500 | 7253 |
| 400 | 5802 |
| 250 | 3626 |
| 160 | 2321 |
| 100 | 1451 |
| 60 | 870 |
| 40 | 580 |
| 35 | 508 |
| 25 | 363 |
| 16 | 232 |
| 10 | 145 |
| 6 | 87 |
| 4 | 58 |
| 2.5 | 36 |
| 1.6 | 23 |
| 1 | 15 |

psi to bar

| psi | bar |
|-------|------|
| 10000 | 689 |
| 9000 | 620 |
| 7000 | 483 |
| 6000 | 414 |
| 4000 | 276 |
| 3000 | 207 |
| 2500 | 172 |
| 1000 | 69 |
| 900 | 62 |
| 600 | 41 |
| 500 | 34 |
| 400 | 28 |
| 250 | 17 |
| 150 | 10.3 |
| 100 | 6.9 |
| 90 | 6.2 |
| 60 | 4.1 |
| 40 | 2.8 |
| 25 | 1.7 |
| 10 | 0.7 |

Examples

Temperature conversion

Initial value: 100

°C in °F: 212 °F

°F in °C: 37.78 °C

Pressure conversion

Initial value: 35

bar in psi: 507.675 psi

psi in bar: 2.41296 bar

Appendix

Index

| | | | |
|--------------------|---------|----------------|--------|
| SCxSD | 53-54 | SCOTC-... | 95-100 |
| SC-910 | 38 | SCP01-... | 12-15 |
| SC-911 | 38 | SCP02-... | 16-21 |
| SC-912 | 38 | SCP07 | 22-23 |
| SCA-1/4EDX1/2-ED | 103 | SCP08 | 24-25 |
| SCA-1/4EDX1/4-D | 103 | SCPS01-... | 26-30 |
| SCA-1/4-M22x1.5-ED | 103 | SCPSD-... | 61-66 |
| SCAF-1/4-40 | 104 | SCPSDi-... | 55-60 |
| SCAF-3/4-90 | 104 | SCQ-150-10-07 | 35-38 |
| SCA-SMA3-... | 101 | SCSD-PRG-KIT | 106 |
| SCAQ-060 | 35-38 | SCSD-S27 | 66 |
| SCAQ-150 | 35-38 | SCT-150-... | 31-32 |
| SCAQ-GI-R1/2 | 35-38 | SCTSD-150-... | 67-78 |
| SCA-TT-10-1/2 | 74 | SCTSD-L-... | 79-82 |
| SCA-TT-10-xxx | 74 | SCTT-10-xxx-07 | 74 |
| SCE-020-02 | 49-52 | SCTT-20-10-07 | 74 |
| SCFT-... | 39-42 | SCVF-... | 43-48 |
| SCK-006 | 101-102 | | |
| SCK-145 | 101-102 | | |
| SCK-155 | 101-102 | | |
| SCK-300-02-31 | 52 | | |
| SCK-400-... | 101-102 | | |
| SCK-410-03-45-45 | 74 | | |
| SCLSD-... | 83-88 | | |
| SCLTSD-... | 79-94 | | |

Old and new references

| Old order number | New order number | Old order number | New order number |
|------------------|------------------|------------------|--------------------------------------|
| SCK-007 | SCK-145 | SCP-xxx-x4-0x-MO | SCP02-xxx-x4-0x |
| SCK-045 | SCK-145 | SCP-xxx-x4-0x | SCP01-xxx-x4-0x |
| SCK-047 | SCK-145 | SCP-xxx-10-06 | SCP01-xxx-14-06 + SCA-1/4-M22x1.5-ED |
| SCK-055 | SCK-155 | SCP-xxx-10-07 | SCP01-xxx-14-07 + SCA-1/4-M22x1.5-ED |
| SCK-057 | SCK-155 | SCP-xxx-12-06 | SCP01-xxx-14-06 + SCA-1/4-ED-1/2-ED |
| SCK-147 | SCK-145 | SCP-xxx-12-07 | SCP01-xxx-14-07 + SCA-1/4-ED-1/2-ED |
| SCK-157 | SCK-155 | SCP-xxx-20-06 | SCP01-xxx-24-06 + SCA-1/4-M22x1.5-ED |
| SCK-200-xxx-45 | SCK-400-xxx-45 | SCP-xxx-20-07 | SCP01-xxx-24-07 + SCA-1/4-M22x1.5-ED |
| SCK-200-xxx-47 | SCK-400-xxx-45 | SCP-xxx-22-06 | SCP01-xxx-24-06 + SCA-1/4-ED-1/2-ED |
| SCK-200-xxx-55 | SCK-400-..55 | SCP-xxx-22-07 | SCP01-xxx-24-07 + SCA-1/4-ED-1/2-ED |
| SCK-200-xxx-56 | SCK400-xxx-56 | SCP-xxx-30-06 | SCP01-xxx-34-06 + SCA-1/4-M22x1.5-ED |
| SCK-200-xxx-57 | SCK-400-..55 | SCP-xxx-30-07 | SCP01-xxx-24-07 + SCA-1/4-M22x1.5-ED |
| SCK-400-xxx-06 | SCK-400-xxx-56 | SCP-xxx-32-06 | SCP01-xxx-34-06 + SCA-1/4-ED-1/2-ED |
| SCK-400-xxx-07 | SCK-400-xxx-45 | SCP-xxx-32-07 | SCP01-xxx-24-07 + SCA-1/4-ED-1/2-ED |
| SCK-400-xxx-47 | SCK-400-xxx-45 | SCP-xxx-40-06 | SCP01-xxx-44-06 + SCA-1/4-M22x1.5-ED |
| SCK-400-xxx-57 | SCK-400-..55 | SCP-xxx-40-07 | SCP01-xxx-44-07 + SCA-1/4-M22x1.5-ED |
| SCPSD-xxx-04-05 | SCPSD-xxx-04-17 | SCP-xxx-42-06 | SCP01-xxx-44-06 + SCA-1/4-ED-1/2-ED |
| SCPSD-xxx-04-06 | SCPSD-xxx-04-16 | SCP-xxx-42-07 | SCP01-xxx-44-07 + SCA-1/4-ED-1/2-ED |
| SCPSD-xxx-04-07 | SCPSD-xxx-04-17 | SCT-150-14-00 | SCT-150-14-07+SCK-400-05-45 |
| SCPSD-xxx-14-05 | SCPSD-xxx-14-15 | | |

Please ask about compatible products for non-listed items.

