

# 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 ( $\geq 5$  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

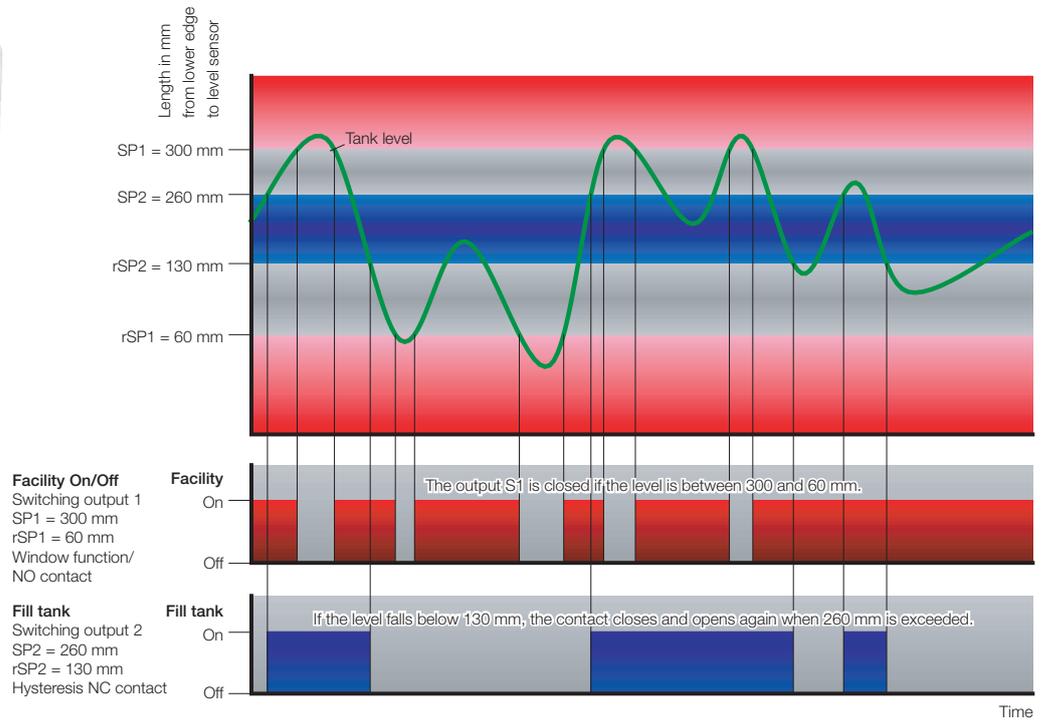
# SCLTSD LevelTempController

## Application examples

### SCLSD



Application example  
Refer to page 61



# 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

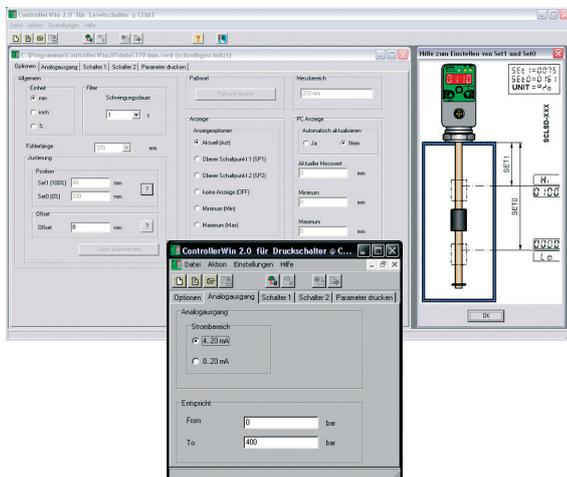
- Metal housing
- Waterproof
- Excellent interference immunity
- Vibration proof
- Shock proof

### 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 / (-4...185°F)
Temperature range of substance	≤ 80 °C / (≤ 176°F)
Storage temperature range	-40...+100 °C / (-40...212°F)
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 $RL \leq (V_+ - 8 V) / 20 \text{ mA} (\leq 500 \Omega)$

## Level

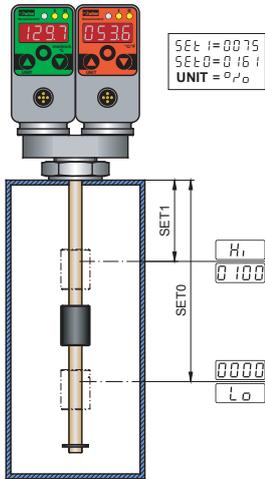
Input parameters	
Measuring component	Resistance reed chain with float
Connector thread	G3/4 BSPP; nickel-plated brass; ED soft seal NBR*
Parts in contact with substances	Brass; nickel-plated brass; NBR*
Temperature range of substance	≤ 80 °C / (≤ 176°F)
Output values	
Switching point accuracy	± 1 % FS at 25 °C / (77°F)
Display accuracy	± 1 % FS ± 1 Digit at 25 °C / (77°F)
Response speed	≤ 700 ms
Resolution	7.5 mm
Float	
Material	NBR
Dimensions	For 250, 370 and 520: Ø 17.8 mm, Length 32 mm; 800 and 1000: Ø 21 mm, Length 35 mm
Viscosity	Max. 250 cSt at 25 °C / (77°F)
Density	at least 0.750 g/cm <sup>3</sup>
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 / (77°F)
Display accuracy	± 0.35 % FS ± 1 Digit at 25 °C / (77°F)
Response speed	≤ 300 ms
Analogue output	0/4...20 mA; programmable; freely scalable; 4...20 mA = -40...125 °C / (-40...257°F)

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

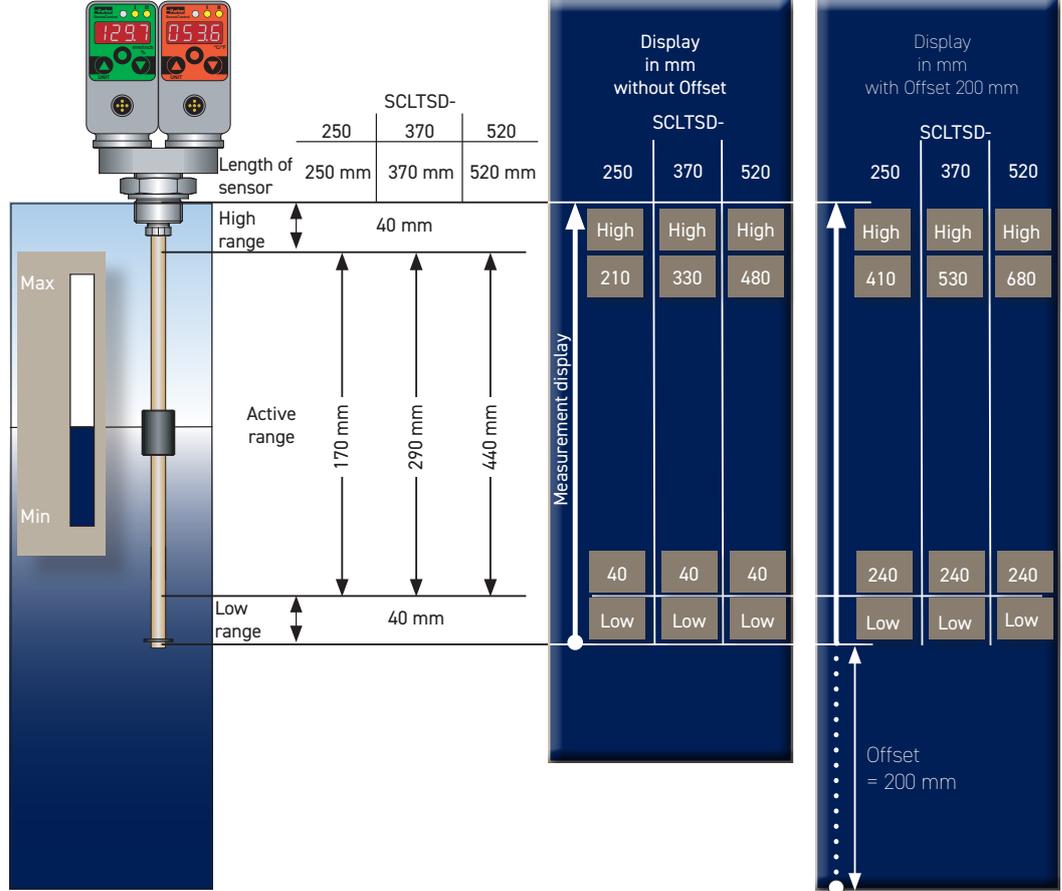
# SCLTSD LevelTempController

## Display possibilities

Example of a percent display



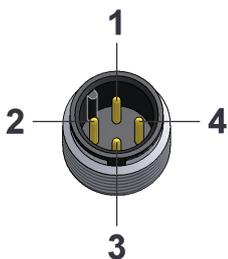
Example of a mm display



L1 Sensor length Measurement range	L2 active range	Display resolution Increment size	Increment size	Lowest reset switch point RSP	Largest switching 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

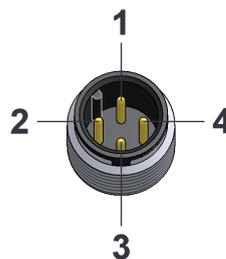
## Pin assignment

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



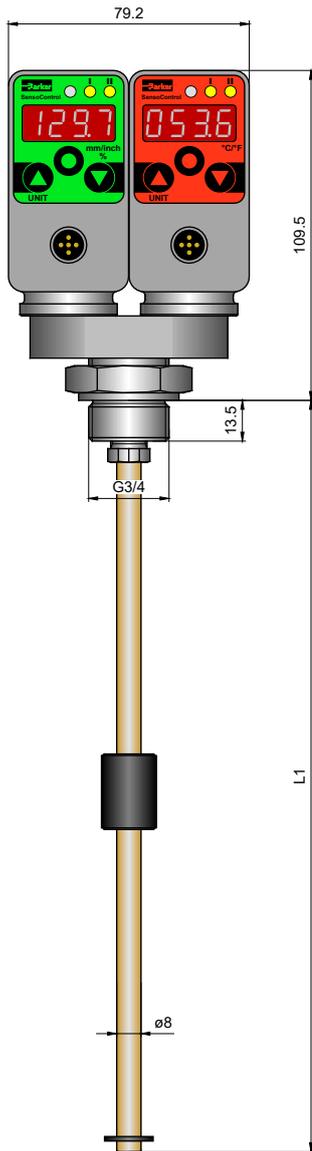
PIN	Assignment
1	V <sub>+</sub>
2	S2 out
3	0 V / GND
4	S1 out

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



PIN	Assignment
1	V <sub>+</sub>
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** (open cable end) SCK-400-xx-xx

Cable length (m)	
2 m	02
5 m	05
10 m	10

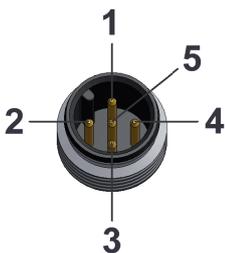
Connecting plug	
M12 cable jack; straight	45
M12 cable jack; 90° angled	55

**Single connector** SCK-145

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



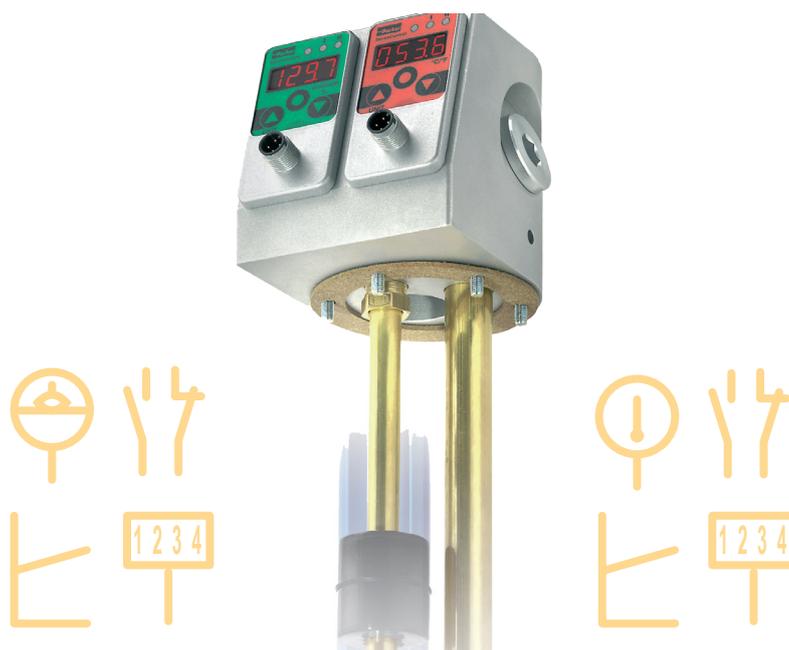
PIN	Assignment
1	V <sub>+</sub>
2	S2 out
3	0 V / GND
4	S1 out
5	Analogue out



# 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 ( $\geq 5$  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

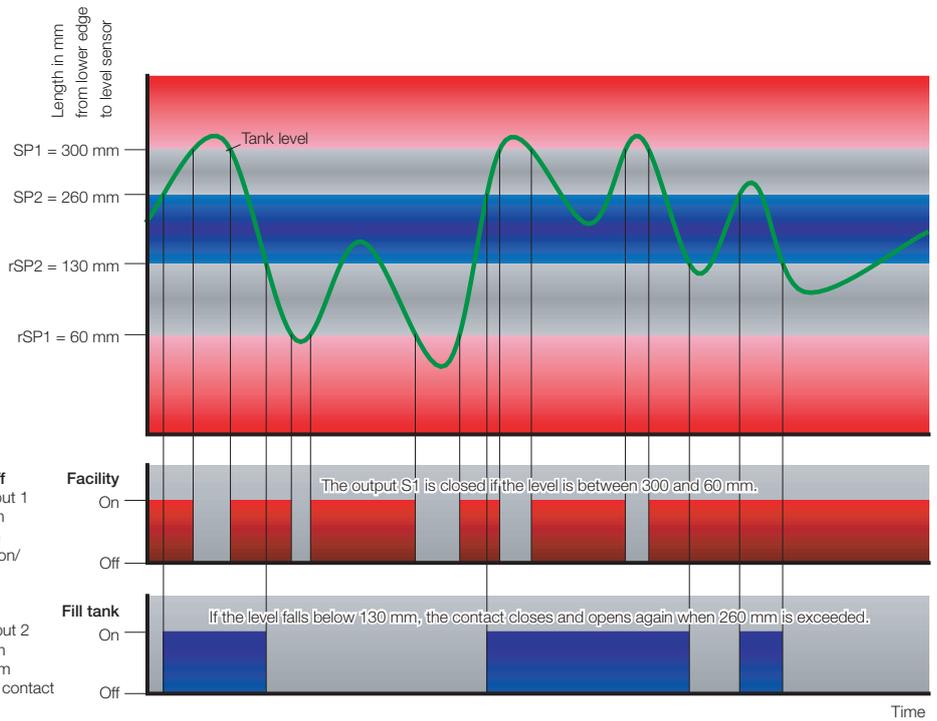
# SCOTC OilTankController

## Application examples

### SCLSD



Application example  
Refer to page 61



# 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)

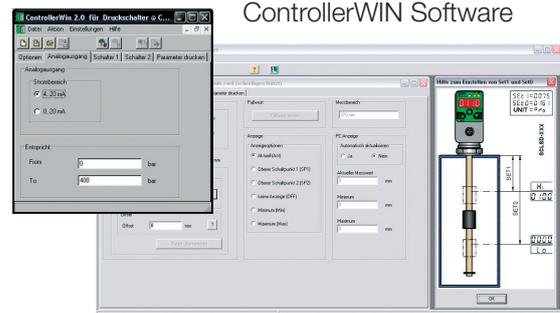
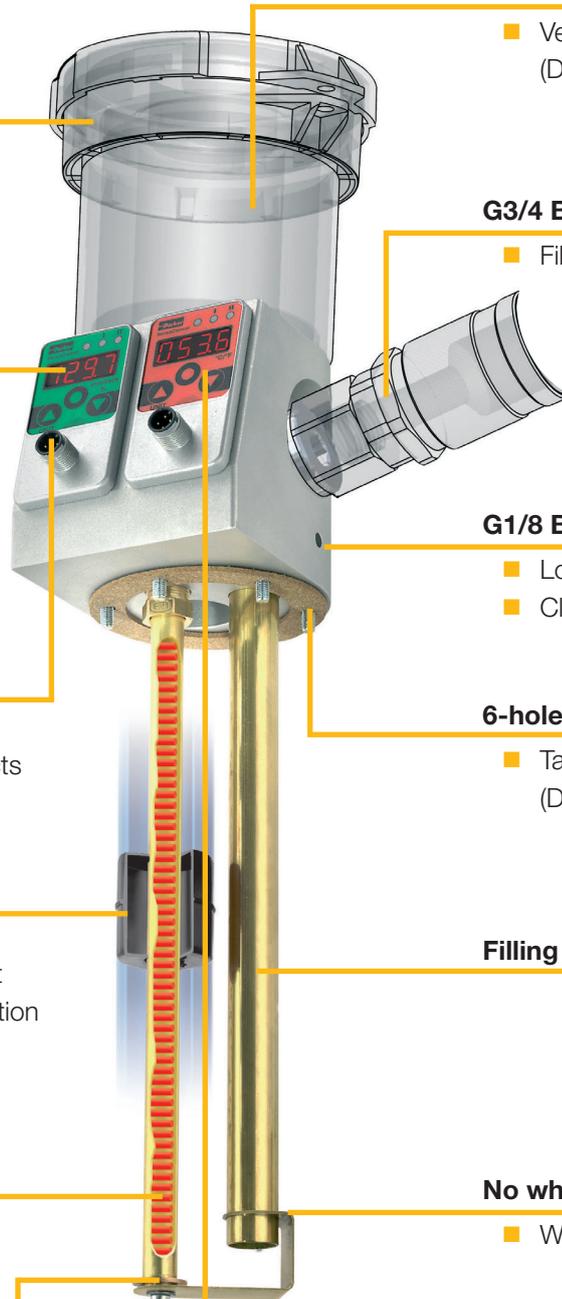
### Filling tube

### 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 / (-4...176°F)
Temperature range of substance	≤ 80 °C / (≤ 176°F)
Storage temperature range	-40...+100 °C / (-40...212°F)
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 / (77°F)
Display accuracy	± 1 % FS ± 1 Digit at 25 °C / (77°F)
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 / (77°F)
Display accuracy	± 0.5 % FS ± 1 Digit at 25 °C / (77°F)
Response speed	≤ 300 ms
Analogue output	0/4...20 mA; programmable; freely scalable; 4...20 mA = -40...125 °C / (-40...257°F)
Optional temperature switch (S3 out)	
Alarm contact with > 65 °C	Open contact
Maximum charging current	0.7 A

# SCOTC OilTankController

## Pin assignment

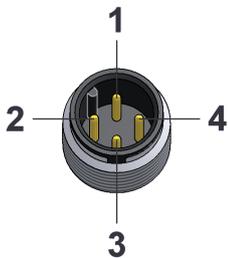
### Without safety-control-output

#### SCOTC-xxxx-00-07

for temperature and level

2 switching outputs

M12x1; 4-pole



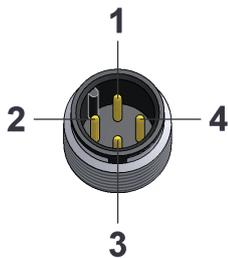
PIN	Assignment
1	V <sub>+</sub>
2	S2 out
3	0 V / GND
4	S1 out

#### SCOTC-xxxx-10-07

for temperature and level

1 switching outputs, 1 analogue output

M12x1; 5-pole



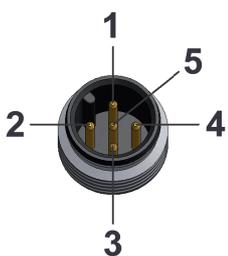
PIN	Assignment
1	V <sub>+</sub>
2	Analogue out
3	0 V / GND
4	S1 out

#### SCOTC-xxxx-10-05

for temperature and level

2 switching outputs, 1 analogue output

M12x1; 5-pole



PIN	Assignment
1	V <sub>+</sub>
2	S2 out
3	0 V / GND
4	S1 out
5	Analogue out

### With safety-control-output

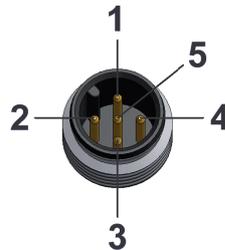
#### SCOTC-xxxx-00-05

Level:

Two variable switching outputs,

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

M12x1; 5-pole



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

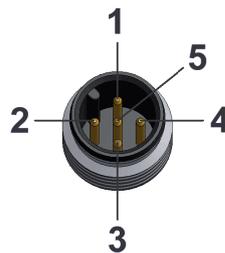
#### SCOTC-xxxx-00-05

Temperature:

Two variable switching outputs,

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

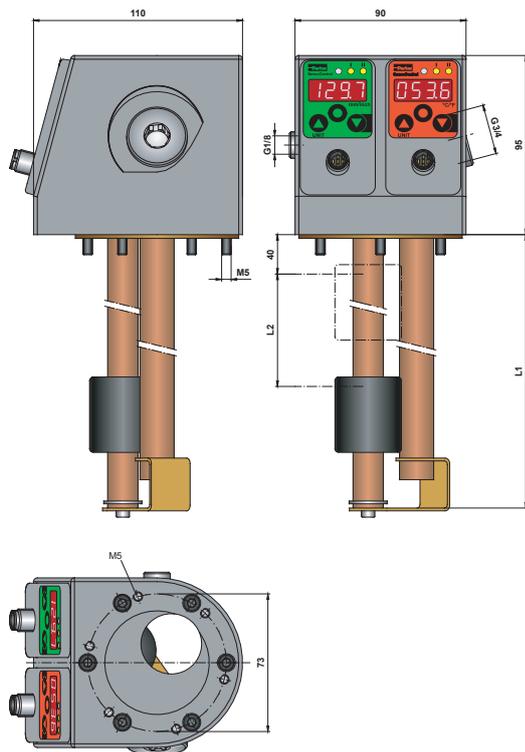
M12x1; 5-pole



PIN	Assignment
1	V <sub>+</sub>
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	<b>250</b>
370 mm	<b>370</b>
520 mm	<b>520</b>
800 mm	<b>800</b>
1000 mm	<b>1000</b>

## 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	<b>02</b>
5 m	<b>05</b>
10 m	<b>10</b>

**Connecting plug**

M12 cable jack; straight	<b>45</b>
M12 cable jack; 90° angled	<b>55</b>

**Single connector**

M12 cable jack; straight	<b>SCK-145</b>
M12 cable jack; 90° angled	<b>SCK-155</b>

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