

**ADVANCE FEATURES**





- built-in pressure sensor
- 2 safe switching contacts
- parameter LCD display
- protected by password for unauthorized adjustments
- analogue output 4...20 mA or 0...10 V
- SIL 2 value



**GENERAL**

The components of the QPS1 and the complete device are subject to quality controls. Each QPS1 is individually calibrated and subjected to a final test. In this way we can guarantee that the device is free on defects upon delivery and complies with the specified specifications. However, if there is cause for complaint, please return the pressure switch to us outlining the fault. If you have any queries regarding technical details or the suitability of the pressure switch for your application, please contact our sales/technical department. The QPS1 pressure switch are maintenance-free and should operate perfectly when used according to the specifications (see Technical Data). However, if despite all this, faults arise, please contact UniteQ Service. Interference by anybody other than UniteQ personnel will invalidate all warranty claims.

**SAFETY & WARNINGS**

 GENERAL	<p>This device is designed for connection to hazardous electric voltages and pressurized fluid lines. Ignoring this warning can result in severe personal injury or mechanical damage. To avoid the risk of electric shock and fire, the safety instructions of this guide must be observed, and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the guideline. Prior to the Commissioning of the device, this installation guide must be examined carefully. Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired</p>
 HAZARDOUS	<p>Until the device is fixed, do not connect hazardous voltages to the device and pressure on the measured fluid line. The following operations should only be carried out on a disconnected device and under ESD.</p> <p>Safe conditions:            General mounting, connection and disconnection of wires.            Troubleshooting the device.</p>
 INSTALLATION	<p>Follow the installation instructions under chapter "ASSEMBLY" of the guideline. Do not open the top cover by loosening the bolts as this will damage the seal. By doing this, the IP class is no longer guaranteed.</p>
 CAUTION	<p>Repair of the device and replacement of components must be done by UniteQ only.</p>

## **SYAFETY INSTRUCTIONS**

### Definitions

Hazardous voltages have been defined as the ranges: 75 to 1500 Volt DC, and 50 to 1000 Volt AC. Technicians are qualified persons educated or trained to mount, operate, and also trouble-shoot technically correct and in accordance with safety regulations. Operators, being familiar with the contents of this manual, adjust and operate the knobs or potentiometers during normal operation.

### Receipt and unpacking

Unpack the device without damaging it and check whether the device type corresponds to the one ordered. The packing should always follow the device until this has been permanently mounted.

### Environment

Avoid direct sun light, dust, high temperatures, mechanical vibrations and shock, and rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation. The device must be installed in pollution degree 2 or better. The device is designed to be safe at least under an altitude up to 2000 m. The device is designed for indoor use.

### Mounting

Only technicians who are familiar with the technical terms, warnings, and instructions in the manual and who are able to follow these, should connect the device. Should there be any doubt as to the correct handling of the device, please contact UniteQ.

Mounting of electrical connection of the device should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location.

Stranded wire should be installed with an insulation stripping length of 5 mm or via a suitable insulated terminal such as a bootlace ferrule.

Descriptions of input/output and supply connections are shown in the circuit diagram and dimension drawing. Connection of the measured line is shown in the dimension drawing.

### Calibration and adjustment

During calibration and adjustment, the measuring and connection of external voltages must be carried out according to the specifications of this manual. The technician must use tools and instruments that are safe to use.

### Normal operation

Operators are only allowed to adjust and operate devices that are safely fixed in panels, etc., thus avoiding the danger of personal injury and damage. This means there is no electrical shock hazard, and the device is easily accessible.

### Liability

To the extent the instructions in this manual are not strictly observed, the custom-er cannot advance a demand against UniteQ that would otherwise exist according to the concluded sales agreement.

## **ASSEMBLY**

The QPS1 should always be mounted on a flat surface to prevent deformation of the device. The hydraulic connection must be mounted tension-free with a rigid pipe or with a hose. It is not permitted to mount the QPS1 under tension. Sealing can be by means of an O-ring or a metallic soft seal to DIN 3852. The tightening torque should be approx. 20...30 Nm. The electrical connection should be carried out by a qualified electrician according to the relevant regulations of the country concerned. The electronic pressure switches QPS1 carry the CE mark. A declaration of conformity is available on request.

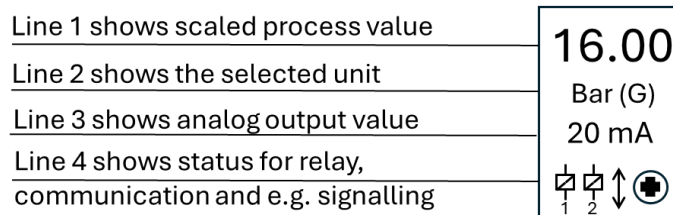
Additional assembly instructions that experience has shown to reduce the effect of electromagnetic interference:

- Make line connections as short as possible.
- Use screened lines.
- The cable screening must be fitted by qualified personnel subject to the ambient conditions and with the aim of suppressing interference.
- Direct proximity to connecting lines of user units or electrical or electronic units causing interference must be avoided as far as possible.

If inductive loads are to be switched using the relays, varistors should be used on the load to prevent high switch-off surges.

## **OPERATION**

### Display layout



### Display indication

During normal operation the QPS1 displays the current pressure value (*line 1 on the display*) with the selected unit (*line 2 on the display*) in bar G or in bar absolute and the analog output (*line 3 on the display*).

### Adjustment of switching points

To adjust the switching points, the protective window must be removed by loosening the 4 screws. Adjusting the switching point may only be carried out by an authorized person. To gain access to the controls, the seal must be broken and a password must be entered.

For adjustment of the configuration the authorized person will be guided through all parameters and can choose the settings which fit the application. For each menu there is a scrolling help text which is automatically shown in line 3 of the display.




Configuration is carried out by use of the 3 function keys:

- ▲ will increase the numerical value or choose the next parameter,
- ▼ will decrease the numerical value or choose the previous parameter,
- Ⓞ will save the chosen value and proceed to the next menu.

When configuration is completed, the display will return to the default state. Pressing and holding Ⓞ will return to the previous menu or return to the default state without saving the changed values or parameters.

If no key is activated for 1 minute, the display will return to the default state without saving the changed values or parameters.

Display icons explained for adjustments


Relay status (Relay energized). Icon with 1 or 2 blinking indicates delayed relay action (programmable on/off delay.	
Arrow up/down indicates value is trending higher/lower	
Circular indicator confirms display to host communication	


Password protection


Access for setpoint adjustments is blocked by assigned password. The password is saved in the device in order to ensure a high degree of protection against unauthorized modifications to the default manufacture setpoints. If the configured password is not known, please contact UniteQ to support you.


Setpoint adjustment


These menus allow you to make a quick setpoint change and relay test when the FastSet menu is activated. This function can only be activated when the relays are set for setpoint function and are controlled by a setpoint. (The default setpoints are set by UniteQ manufacture.)

Pressing  and  simultaneously will activate a relay test and change the state of the relay.

Pressing  will increase the setpoint in line 1.

Pressing  will decrease the setpoint in line 1.

Pressing  will save the setpoint change.

Holding down  for more than 1 second will return the unit to the default state without saving the setpoint change.

Error of signal and sensor indication

When an error displayed on the display, please contact UniteQ to help you resolve the error. The error type is displayed in line 3 as text and at the same time the backlight flashes. In line 4 of the display, the status of relay 1 and relay 2 is displayed.

The following error messages may appear and have the following meaning:

SE.BR sensor break

SE.SH sensor short

IN.LO low input signal (signal outside the selected range)

IN.NI high input signal (signal outside the selected range)

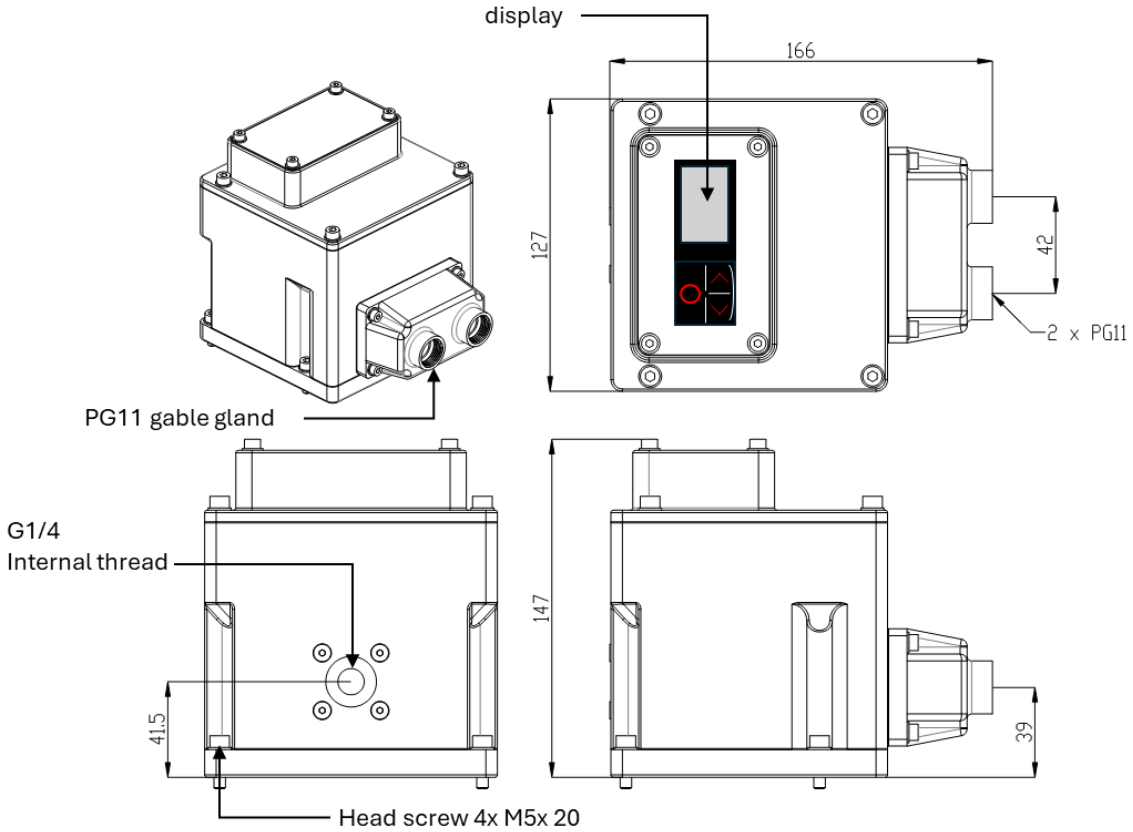
The follow status is displayed

COM indicating correct functioning of the device (flashing bullet)

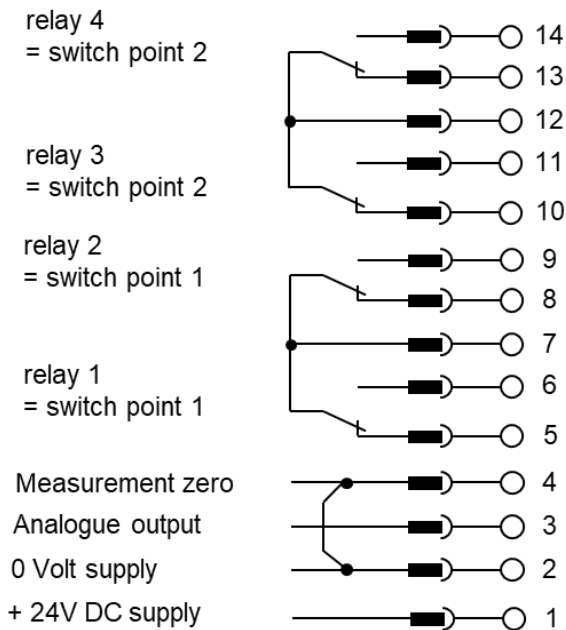
arrow up/down indicates tendency readout of the input signal.

If the value in line 1 or unit in line 2 flashes, the unit has detected that the setpoint has been exceeded and that the relay is in "delay" mode. When the delay time has passed and the relay makes/breaks, the relay sign either displays or disappears.

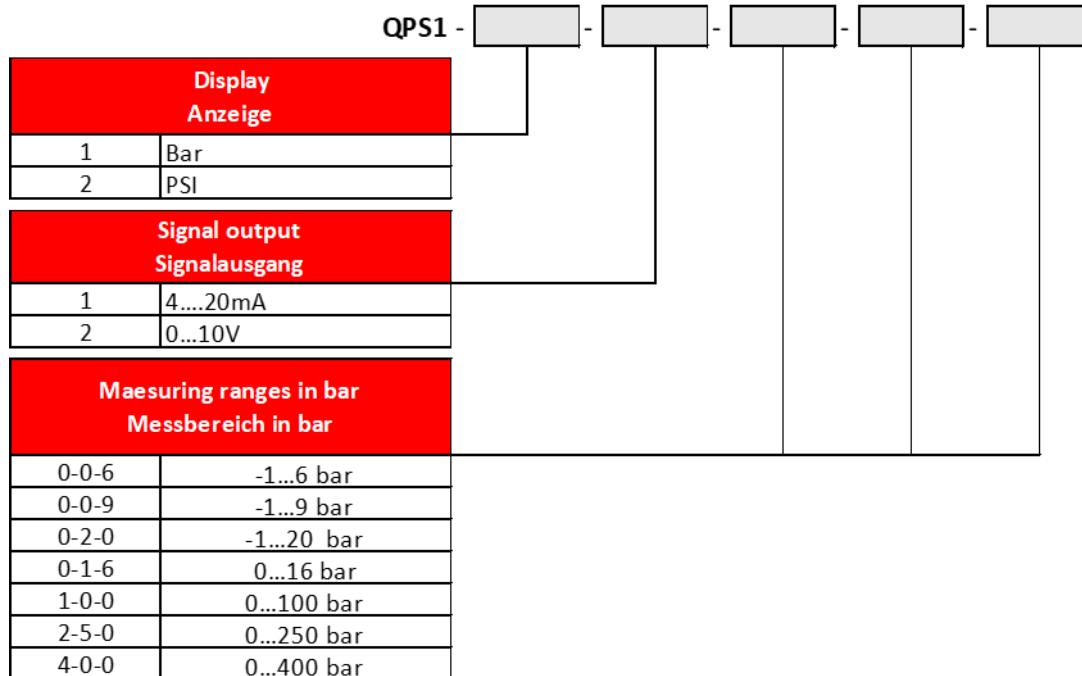
**DIMENSION**



**CIRCUIT DIAGRAM**



**PRODUCT SELECTION**



**DATA SHEET**

TECHNICAL DATA	
<b>GENERAL DATA</b>	
Measuring ranges	-1...6,-1.9,0...16, <sup>1</sup> -1...20,0...100,0...250,0...400 bar
Accuracy class	< ± 0.5 % full scale (FS)
Housing material	Plastic (PA12)
Weight	1.2kg
Safety type	IP65/IP67 (EN60529)
CE conformity	According to Directive 2014/30/EU
Ambient temperature range	-20...+60° C
Storage temperature range	-20...+85° C
Mechanical shock	100g/11msec according to IEC 60068-2-27
Vibration (operation)	20g max at 10...2000 Hz according to IEC 60068-2-6
Pressure Media	Fluids compatible with Stainless Steel AISI 430F and 17-4 PH
Achievable safety integrity	suitable up to category 1, PL c (EN ISO 13849-1), SIL 2 (IEC 61508)
Life time	20 years
<b>MECHANICAL DATA</b>	
Type of connection	G 1/4" internal thread
Torque	20...30 Nm
Media compatibility	Materials compatible with steel, stainless steel 1.4301/1.4435 and Viton/Teflon
Media temperature	-20...+70° C
<b>ELECTRICAL CONNECTIONS</b>	
Connection	14-pole terminal strip
Maximum wire connection	1.5 mm <sup>2</sup>
Cable gland connection	2 x PG 11

## DATA SHEET

TECHNICAL DATA	
<b>CONTROL INPUT</b>	
Rated supply voltage	24 V DC -10 % / +20 %
Rated control circuit supply voltage US	21.6 V DC ... 28.8 V DC
Rated control supply current IS	30 mA
Inrush current	typ. 100 mA ( $\Delta t = 10$ ms at Us)
Power consumption	650 mW (to US)
Protective circuit	Serial protection against polarity reversal, Suppressor diode, 38.6 V/600 W
<b>SENSOR DATA</b>	
Overload capacity	> 200 % FS
Burst pressure	> 300 % FS
Compensation temperature range	-20...+85° C
Non Linearity (BFSL)	$\pm 0.15\%$ FS (typ) $\pm 0.25\%$ FS (max)
Hysteresis	+ 0.1% FS (typ) + 0.15% FS (max)
Repeatability	$\pm 0.025\%$ FS (typ) $\pm 0.05\%$ FS (max)
Zero offset tolerance	$\pm 0.15\%$ FS (typ) $\pm 0.25\%$ FS (max)
Span offset tolerance	$\pm 0.15\%$ FS (typ) $\pm 0.25\%$ FS (max)
Temp. effects over compensated zero point	$\pm 0.01\%$ FS/°C typ. ( $\pm 0.02\%$ FS/°C max.)
Temp. effects over compensated range (span)	$\pm 0.01\%$ FS/°C typ. ( $\pm 0.02\%$ FS/°C max.)
Log term stability	< 0.2% FS/per year
Response time (10...90%FSO)	< 1 msec.
<b>SIGNAL OUTPUT</b>	
Current output	4...20 mA, max current absorption 35mA
Voltage output	0...10 V, max current absorption 15mA
Zero output signal	4mA; 0 Vdc
Full scale output signal	20mA; 10Vdc
<b>RELAY OUTPUT</b>	
Switching voltage range	15V DC ...250 V AC/DC
Limiting continuous current	6 A (N/O contact, high demand); 4 A (N/O contact, low demand); 4 A (N/C contact, high-demand); 2.4 A (N/C contact, low-demand)
Inrush current, minimum	min. 10 mA (N/O contact / N/C contact)
Inrush current	max. 6 A (N/O contact); max. 4 A (N/C contact)
Sq. Total current $I_{TH}^2 = I_1^2 + I_2^2 + \dots + I_N^2$	37 A <sup>2</sup> (N/O contact, high-demand, observe derating) 16 A <sup>2</sup> (N/C contact, high-demand, observe derating)
Switching capacity	min. 150 mW (N/O contact / N/C contact)
Switching frequency	max. 1 Hz
Switching capacity in accordance with IEC 609	6 A (AC1, 230 V); 3 A (AC15, 230 V); 6 A (DC1, 24 V, N/O contact) 4 A (DC1, 24 V, N/C contact); 3 A (DC13, 24 V, N/O contact)
Output fuse	6 A gL/gG; 4 A gL/gG (for low-demand applications)
Mechanical service life	10 <sup>7</sup> cycles
<b>ACCESSORIES</b>	
Accessories included	4 pieces mounting screws M5 x 20 mm 2 pieces PG 11 cable gland