

## Operating Instructions SU 600

4 ... 20 mA signal conditioning instrument



Document  
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Variable area flowmeters

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Vortex flowmeters

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Flow controllers

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Electromagnetic flowmeters

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Ultrasonic flowmeters

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Mass flowmeters

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**Level measuring instruments**

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Communications engineering

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Engineering systems & solutions

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Switches, counters, displays and recorders

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Heat metering

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Pressure and temperature

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# 1 About this document

## 1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

## 1.2 Target group

This operating instructions manual is directed to trained specialist personnel. The contents of this manual should be made available to these personnel and put into practice by them.

## 1.3 Symbols used



### Information, tip, note

This symbol indicates helpful additional information.



**Caution:** If this warning is ignored, faults or malfunctions can result.



**Warning:** If this warning is ignored, injury to persons and/or serious damage to the instrument can result.



**Danger:** If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.



### Ex applications

This symbol indicates special instructions for Ex applications.



### SIL applications

This symbol indicates instructions for functional safety which must be taken into account particularly for safety-relevant applications.



### List

The dot set in front indicates a list with no implied sequence.



### Action

This arrow indicates a single action.



### Sequence of actions

Numbers set in front indicate successive steps in a procedure.



### Battery disposal

This symbol indicates special information about the disposal of batteries and accumulators.

## 2 For your safety

### 2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protective equipment must always be worn.

### 2.2 Appropriate use

SU 600 is a universal signal conditioning instrument and power supply unit for connection of a 4 ... 20 mA/HART sensor.

You can find detailed information about the area of application in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

### 2.3 Warning about incorrect use

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

### 2.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and guidelines. The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for the trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed by the user.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

The safety approval markings and safety tips on the device must also be observed.

## 2.5 Safety label on the instrument

The safety approval markings and safety tips on the device must be observed.

## 2.6 CE conformity

The device fulfills the legal requirements of the applicable EC guidelines. By affixing the CE marking, we confirm successful testing of the product.

## 2.7 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfill this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

## 3 Product description

### 3.1 Configuration

#### Scope of delivery

The scope of delivery encompasses:

- Indicating and signal conditioning instrument SU 600
- Mounting set
- Identification label
- Documentation
  - this operating instructions manual

#### Overview

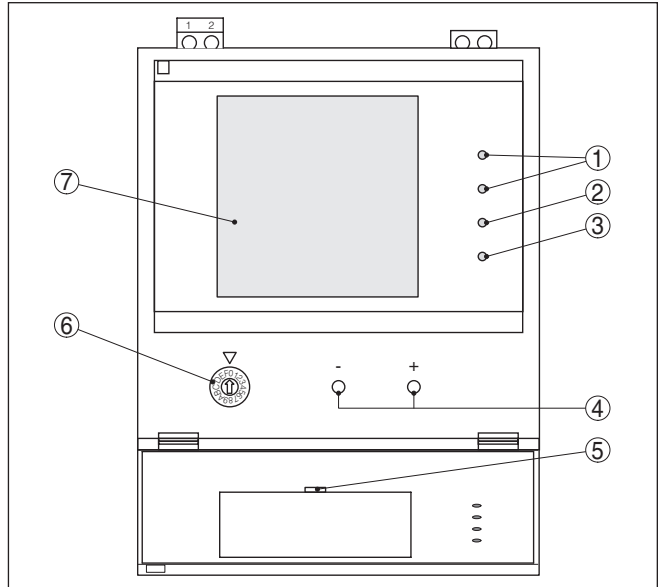


Fig. 1: SU 600

- 1 Status indication operating relay 1 and 2
- 2 Status indication fail safe relay
- 3 Status indication operation
- 4 [+/-] adjustment keys
- 5 Insertable tag for identification of the measurement loop
- 6 Function switch
- 7 LC display

#### Type label

The type label contains the most important data for identification and use of the instrument:

- Article number
- Serial number
- Technical data

## 3.2 Principle of operation

**Application area** SU 600 is a universal single signal conditioning instrument with integrated level switches and display for continuous sensors. At the same time, it can serve as power supply unit for the connected sensor. SU 600 is designed for connection of any 4 ... 20 mA sensor. The instrument is suitable for carrier rail, panel and surface mounting.

**Functional principle** The SU 600 signal conditioning instrument can power connected sensors and process their measurement signals. The requested measured variable is shown on the display and also outputted to the integrated current output for further processing. The measurement signal can thus be transferred to a remote indication or a superordinate control system. Two level relays for control of pumps or other devices are also integrated.

**Voltage supply** Wide-range power supply unit with 20 ... 253 V AC/DC for worldwide use.  
Detailed information about the power supply can be found in chapter "*Technical data*".

## 3.3 Operation

The adjustment of SU 600 is carried out via the integrated keys and a 16-step function switch.

## 3.4 Packaging, transport and storage

**Packaging** Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test based on ISO 4180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

**Transport** Transport must be carried out in due consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

**Transport inspection** The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

**Storage** Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation

**Storage and transport temperature**

- Avoiding mechanical shock and vibration
- Storage and transport temperature see chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 ... 85 %



## 4 Mounting

### 4.1 General instructions

#### Installation possibilities

The instrument is designed for recessed installation in a front panel, housing front plate or a switching cabinet door. The required cut-out is 92 x 92 mm (3.63 x 3.63 in) according to EN 60529. When installed correctly, protection rating IP 40 is guaranteed. As an alternative, the instrument can be mounted into a switching cabinet or housing by means of three screws (fixed with screws on rear of housing). A mounting adapter for carrier rail mounting is optionally available in the scope of delivery (top hat rail 35 x 7.5 according to DIN EN 50022/60715).



#### Information:

If the instrument is mounted via the screws or carrier rail, it must always be inside a switching cabinet or protective case.

### 4.2 Mounting instructions

#### Front panel mounting

1. Make sure that the cutout required for installation has a size of 92 x 92 mm (3.63 x 3.63 in). The required installation depth is min. 90 mm (3.54 in).
2. Remove the pluggable terminal strips from the top and bottom.
3. Screw the threaded pin [3] into the rear of the instrument and tighten with a screwdriver.
4. Insert the instrument from the front into the front panel [1].
5. Place the clamping strap [2] from the back over the pin [3] and pull it with the knurled nut [4] against the panel [1].

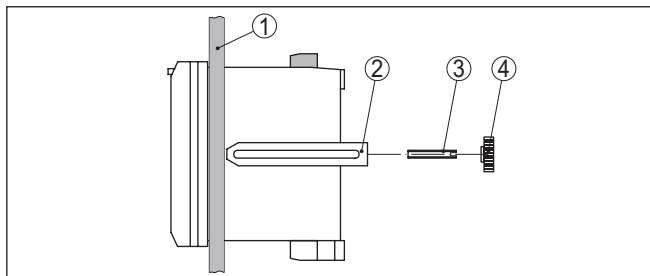


Fig. 2: Front panel mounting

- 1 Front panel
- 2 Clamping bracket
- 3 Pin
- 4 Knurled nut

#### Screw mounting

1. Insert the metal strap [1] from above into the housing cut-out.
2. Fasten the instrument directly to the wall with the three screws (max.  $\varnothing$  4 mm).

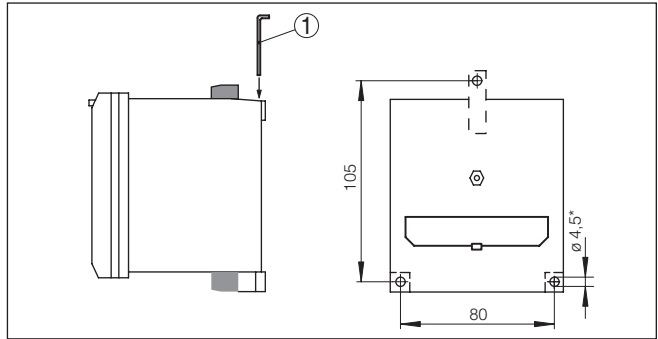


Fig. 3: Screw mounting

1 Metal strap

### Carrier rail mounting

1. Place the adapter plate [1] to the rear of SU 600 (spring of the adapter plate downward) and fasten the plate with screw [2] (M4 x 6).
2. Place SU 600 against the carrier rail [3] from below and push the instrument upward until it snaps in.

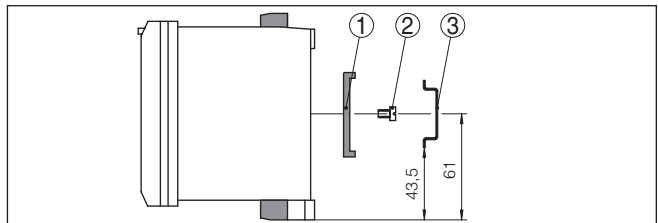


Fig. 4: Carrier rail mounting

- 1 Adapter plate
- 2 Screw (M4 x 6)
- 3 Carrier rail

## 5 Connecting to power supply

### 5.1 Preparing the connection

#### Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltage surges are expected, overvoltage arresters should be installed

#### Take note of safety instructions for Ex applications



In hazardous areas you must take note of the respective regulations, conformity and type approval certificates of the sensors and power supply units.

#### Select power supply

The power supply can be 20 ... 253 V AC, 50/60 Hz or 20 ... 253 V DC.

#### Select connection cable

The voltage supply of SU 600 is connected with standard cable according to the national installation standards.

The instrument is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

#### Cable screening and grounding

Connect the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal outside on the sensor housing must be connected to the potential equalisation.

If potential equalisation currents are expected, the screen connection on the side of SU 600 must be made via a ceramic capacitor (e. g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

#### Select connection cable for Ex applications



Take note of the corresponding installation regulations for Ex applications. In particular, make sure that no potential equalisation currents flow over the cable screen. In case of grounding on both sides this can be achieved by the use of a capacitor or a separate potential equalisation.

### 5.2 Input mode active/passive

With the function switch you can changeover between active and passive operation of the measuring data input.

- In active mode, SU 600 provides the power for the connected sensors. Power supply and measurement data are transmitted over the same two-wire cable. This mode is provided for connection of measuring transducers without separate voltage supply (sensors in two-wire version).
- In passive mode the sensors are not powered, only the measured value is transmitted. This input is for connection of transmitters with their own separate voltage supply (sensors in four-wire version). The SU 600 can be also looped into the existing circuit like a normal ammeter.

### 5.3 Connection procedure

Proceed as follows:

1. Mount SU 600
2. Connect sensor cable to terminal 1 and 2, and where applicable, connect the screen
3. Connect power supply (switched off) to terminal 5 and 6
4. If necessary, connect fail safe and operating relay as well as current output

The electrical connection is finished.

### 5.4 Wiring plan

#### Overview

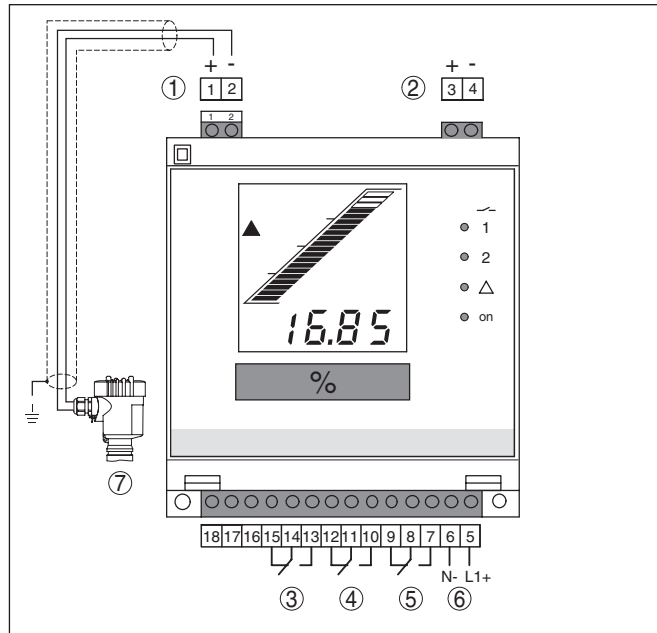


Fig. 5: Terminal assignment SU 600

- 1 Measurement data input, optionally available with sensor power supply
- 2 Current output
- 3 Fail safe relay
- 4 Relay 2
- 5 Relay 1
- 6 Voltage supply

## 6 Setup with the integrated display and adjustment unit

### 6.1 Adjustment system

The integrated display and adjustment unit is for measured value display, adjustment and diagnosis of SU 600. Indication and adjustment is carried out in the front via a clear LC-display and a function switch as well as two keys.

To open the cover, insert a screwdriver in the two slots on the top and turn it slightly.

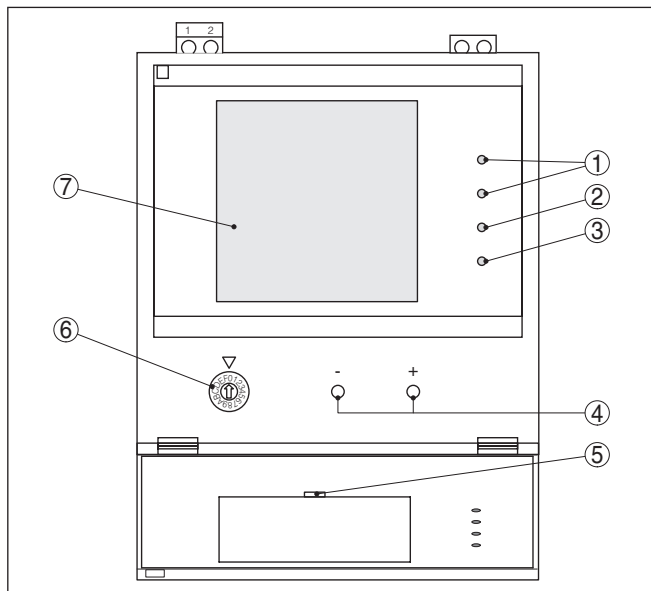


Fig. 6: Display and adjustment elements

- 1 Status indication operating relay 1 and 2
- 2 Status indication fail safe relay
- 3 Status indication operation
- 4 Adjustment keys +/-
- 5 Insertable tag for identification of the measurement loop
- 6 Function switch
- 7 LC display

#### Key functions

- **[Function switch]** for selection of:
  - Adjustment
  - Relay switching points
  - Indication scaling
  - Current output
  - Integration time
  - Offset correction
  - Current input active/passive
- **[+/-] key:**

- Change value of the parameters

By pushing the [+/-] key, you change the individual parameters of the selected function. In this phase, the processed parameter is flashing. By briefly pushing the two keys simultaneously, you save your settings. "Save" is briefly displayed.

## 6.2 Setup steps

### Setup

Setup comprises mainly the adjustment of the measurement loop. A scaling of the measured value for the LC display and the adaptation of the relay switching points are further settings. Additional setup steps would be, if necessary, setting an integration time (damping) to steady the measured value or modifying the current output characteristics.

To clearly denote the measuring unit, the supplied labels can be inserted in the cover. In case several SU 600 are used, each measurement loop should be clearly labelled.

### Switch-on phase

After being switched on, SU 600 first of all carries out a short self-check. The following steps are carried out:

- Internal check of the electronics
- Indication of the firmware version
- The output signal jumps briefly to the set fault value

Then the actual measured value is displayed and the corresponding current is transmitted to the current output.

### Measured value indication

The measured value indication shows the digital indication value and also an analogue bargraph. Here, it is absolutely necessary that the function switch is set to position [ 0 ] ("OPERATE").

### Function switch

The following functions can be selected via the rotary switch:

- **0**: Measured value display and simulation
- **1**: Relay 1 switching point ON
- **2**: Relay 1 switching point OFF
- **3**: Relay 2 switching point ON
- **2**: Relay 2 switching point OFF
- **5**: Decimal point position of the scaling
- **6**: Scaling for 100 %
- **7**: Scaling for 0 %
- **8**: Switch over current output 0/4 ... 20 mA
- **9**: Damping of the measured value (integration time)
- **A**: Offset correction
- **B**: Min. adjustment in percent through change of the level
- **C**: Max. adjustment in percent through change of the level
- **D**: Min. adjustment in mA without changing the level
- **E**: Max. adjustment in mA without changing the level
- **F**: Changeover current input active/passive

### Current input active/passive

- In active mode, SU 600 provides the power for the connected sensor. Power supply and measurement data are transmitted over the same two-wire cable. This mode is provided for connection of

measuring transducers without separate operating voltage (sensor in two-wire version).

- In passive mode, the sensors are not powered, only the measurement value is transmitted. This mode is provided for connection of transmitters with their own separate operating voltage (sensors in four-wire version).
- Set the function switch to position **[F]** and select the suitable mode with the **[+/-]** keys. Save your settings by pushing both keys simultaneously.

### Offset correction

When a pressure transmitter is used, an offset correction should be carried out first. These instruments are factory-set in a certain position. If the pressure transmitter is now mounted in a different position, its measuring range is shifted slightly. The zero point is readjusted by carrying out the offset correction in uncovered (unpressurised) condition. The complete measuring range will be shifted by the deviating amount.

1. Make sure that the pressure transmitter is completely unpressurised, uncovered (unimmersed) and mounted in its final position.
2. Set the function switch to position **[A]**. The display indicates now the actual sensor current in mA. Save the current status by pushing the **[+/-]** keys simultaneously.

### Adjustment in mA without changing the level

For this adjustment procedure, two sensor current values (4 ... 20 mA) must be entered corresponding to the levels 0 % and 100 %.

When using a pressure transmitter, an offset correction should be carried out to reach maximum accuracy. Carry out this offset correction before adjustment and with the sensor uncovered (unimmersed).

- Now select the position **[D]** or **[E]** on the function switch, enter the current values in mA for min. or max. adjustment and save your settings.

### Adjustment in % by changing the level

During this adjustment procedure, the current level is assigned to a certain percentage value. For this reason, percentage values that correspond to the actual filling levels must be entered for the min. and max. adjustment. The ideal calibration is at 0 % and 100 %. Because it is not always possible to empty or fill a vessel completely, any value can of course be entered. The greater the difference between the two adjustment points, the more precise the measurement. It does not matter which value is entered first.

- Select position **[B]** or **[C]** on the function switch, enter the percentage values for the min. and max. adjustment and save your settings.

### Relay outputs

Two operating relays are integrated in SU 600 for level detection. First of all, determine at which switching points the relays should switch on and off again. Furthermore you have to distinguish between the relay modes overflow and dry run protection. You switch over by exchanging the ON/OFF values of the relay.

- **Overflow protection:** Relay is switched off when the max. level is exceeded (safe currentless state), relay is switched on again when the level falls below the min. level (switch-on point < switch-off point)
  - **Dry run protection:** Relay is switched off when the level falls below the min. level (safe currentless state), relay is switched on again when the max. level is exceeded (switch-on point > switch-off point)
- To adjust the on and off switching points of relay 1, set the function switch to position [1] or [2], enter the switching points for ON or OFF and save your settings. If necessary, proceed in the same way with relay 2 (position [3] or [4]).

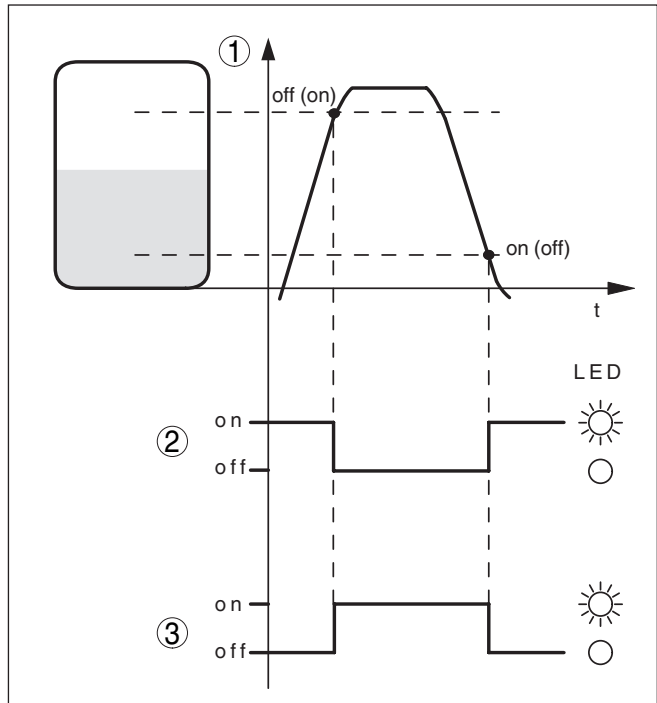


Fig. 7: Relay modes

- 1 Filling height
- 2 Mode overflow protection
- 3 Mode dry run protection

## Scaling

Scaling means converting the measured value into a certain parameter and unit. The indication can then show the volume in litres e.g., instead of the percentage value. Indication values from -9999 to +9999 are possible.

1. First of all, determine the max. indicating range and the number of decimal places after the decimal point -- max. four decimal places



can be displayed. Select position [ 5 ] of the function switch, place the decimal point in the required position and save your settings.

2. Now select position [6] or [7] on the function switch, enter the requested values for 100 % or 0 % and save your settings.

### Damping

To suppress fluctuations in the measured value display, e.g. caused by an agitated product surface, an integration time can be set. This time can be between 0 and 250 seconds. Remember that the reaction time of the entire measurement will then be longer and the sensor will react to measured value changes with a delay. In general, a period of a few seconds is sufficient to smooth the measured value display.

→ Now select position [9] on the function switch, enter the requested value and save your settings

### Current output 0/4 ... 20 mA

The characteristics of the current output can be switched over from 4 ... 20 mA to 0 ... 20 mA.

→ Now select position [8] on the function switch, adjust the requested characteristics curve and save your settings

### Simulation

To check if the settings of SU 600 are correct, the simulation mode can be used. Any individual measured value can be simulated and e.g. the correct behaviour of the relays and the connected instruments can be checked.

Switching over between the functions "OPERATE" and "Simulation" is done by pushing the [+/-] keys for at least 3 seconds. In the simulation mode, the set value flashes on the display. The simulation can be switched off by pushing both keys again for approx. 3 seconds. If no key is pushed, the display switches automatically over to "OPERATE" after approx. 60 minutes and the simulation is terminated.

→ To start simulation, push the [+/-] keys simultaneously until the displayed value starts flashing (approx. 3 seconds). By pushing either of the [+/-] keys, you can set the requested simulation value and carry out your check.

### Reset

With a reset, all values set by the user will be lost and are reset to factory settings.

→ Interrupt the power supply of SU 600. Push the [+/-] keys simultaneously and hold them while you switch on the power supply. The display shows "RES" and the default settings will be restored. These are the following:

- Relay switch on points: 10 %
- Relay switch off points: 100 %
- Decimal point: 888.8
- Display min.: 0
- Display max.: 100.0
- Integration time: 0 s
- Offset correction: 0
- Current output: 4 ... 20 mA
- Min. adjustment: 0 % or 4 mA
- Max. adjustment: 100 % or 20 mA

### 6.3 Application example

- An upright cylindrical (linear) tank has a volume of 2700 l
- The max. filling volume is 2650 l, the min. filling volume 50 l
- The level sensor in the vessel is a pressure transmitter (passive), outputting a standardised 4 ... 20 mA signal
- For further processing, an additional 4 ... 20 mA output signal is required
- The full and empty adjustment was carried out directly in the sensor. The following values are outputted:
  - Max. volume (display max.) 20 mA = 2650 l
  - Min. volume (display min.) 4 mA = 50 l
- Relay 1 should switch on an emptying pump at a level of 90 % and switch off the pump at a level of 10 %

#### General procedure

1. Select the following functions with the rotary switch.
2. Push one of the two [+/-] adjustment keys, the digital indication flashes (if the rotary switch is set to "OPERATE", the [+/-] keys are inoperable)
3. Adjust the requested value with the [+/-] keys. If you hold the key pushed, the digital indication changes the value more quickly.
4. Save your settings by pushing the [+/-] keys simultaneously

#### Current output

1. Set the function switch to position [8]. Select with the [+/-] keys the measured value output 4 ... 20 mA or 0 ... 20 mA. For this example, choose 4 - 20.

The displayed numbers have the following meanings:

- 0 - 20 = 0 ... 20 mA
- 4 - 20 = 4 ... 20 mA

2. Save the value by pushing [+/-] simultaneously

SU 600 requires for scaling of the indication, the adjustment of the filling quantities for 0 % and 100 %. The vessel must neither be filled nor emptied.

#### Scaled indication at 0 %

1. Set the function switch to position [7] (display min.)
2. Set the value to 50 via the [+/-] keys
3. Save the value by pushing both keys simultaneously

#### Scaled indication at 100 %

1. Set the function switch to position [6] (display max.)
2. Set the value to 2650 via the [+/-] keys
3. Save the value by pushing both keys simultaneously

#### Decimal point

Since the range of the example tank is between 50 l and 2650 l, you need all 4 decimal places for the digital indication.

1. Set the function switch to position [5] (Decimal Point)
2. By pushing the [+/-] keys, you move the decimal point
3. Save the value by pushing both keys simultaneously

#### Relay

- Set the function switch to position [1] (relay 1 on). For the given example, select the value 90.0 (90.0 %) with the [+/-] keys. The internal relay 1 then switches on when this value is reached. Save the value by pushing the two keys simultaneously.

- Set the function switch to position [ 2 ] (relay 1 off). Select the value 10.0 (10.0 %) with the [ +/- ] keys. The internal relay 1 then switches off when the value falls below this value. The respective relay control lamp lights when the relay is energized. If the switching points are too close together (< 0.1 %), the appropriate LED flashes. The relay takes on the safe condition. In mode "OPERATE" an error message is outputted on the display.
- If you want to control additional relays, proceed in the same way, as with relay 1. The switch positions for setting the respective relays are stated in the list of the function switch under "Setup procedure".

**Note:**

If you want to change the mode (i.e. the switching function of the relays), you have to exchange the On and Off values.

## 7 Maintenance and fault rectification

### 7.1 Maintenance

If the instrument is used properly, no special maintenance is required in normal operation.

### 7.2 Rectify faults

#### Reaction when malfunctions occur

The operator of the system is responsible for taking suitable measures to rectify faults.

#### Causes of malfunction

Maximum reliability is ensured. Nevertheless, faults can occur during operation. These may be caused by the following, e.g.:

- Measured value from sensor not correct
- Voltage supply
- Interference in the cables

#### Fault rectification

The first measures to be taken are to check the input/output signals as well as to evaluate the error messages via the display. The procedure is described below. In many cases, the causes can be determined in this way and faults can be rectified.

#### Fault message

The signal conditioning instrument and the connected sensors are permanently monitored during operation and the values entered during parameter adjustment are checked for plausibility. If irregularities occur or in case of incorrect parameter adjustment, a fault signal is triggered. In case of an instrument defect or line break/shortcircuit, a fault signal is also triggered.

The fail safe relay deenergises in case of failure, the failure indication lights and the current output jumps to 22 mA. In addition, one of the following fault messages is outputted on the display.

Error code	Cause	Rectification
E003	CRC error (error with self-check)	<ul style="list-style-type: none"> <li>- Carry out a reset</li> <li>- Send instrument for repair</li> </ul>
E014	Sensor current > 21 mA or short-circuit	<ul style="list-style-type: none"> <li>- Check sensor, e.g. on failure</li> <li>- Remove short-circuit</li> </ul>
E015	Sensor in boot phase Sensor current < 3.6 mA or line break	<ul style="list-style-type: none"> <li>- Check sensor, e.g. on failure</li> <li>- Remove line break</li> <li>- Check connection of the sensor</li> </ul>
E016	Empty/full adjustment reversed	<ul style="list-style-type: none"> <li>- Carry out a fresh adjustment</li> </ul>
E017	Adjustment span too small	<ul style="list-style-type: none"> <li>- Carry out a fresh adjustment and increase the distance between min. and max. adjustment</li> </ul>
E021	Scaling span too small	<ul style="list-style-type: none"> <li>- Carry out a fresh scaling, increase the distance between min. and max. scaling.</li> </ul>

Error code	Cause	Rectification
E110	Relay switching points too close together	– Increase the difference between the two relay switching points

### Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "Set up" may have to be carried out again.

## 7.3 Instrument repair

If a repair is necessary, please proceed as follows:

On our homepage in the Internet under

<http://www.krohne-mar.com/fileadmin/>

[media-lounge/PDF-Download/Specimen\\_e.pdf](http://www.krohne-mar.com/fileadmin/media-lounge/PDF-Download/Specimen_e.pdf)

you can download a return form.

By doing this you help us carry out the repair quickly and without having to call back for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and possibly also a safety data sheet to the instrument

## 8 Dismount

### 8.1 Dismounting steps

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

### 8.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the parts to be easily separable.

#### **WEEE directive 2002/96/EG**

This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

## 9 Supplement

### 9.1 Technical data

#### General data

Series	Instrument for mounting into front panel, switching cabinet or housing
Weight	400 g (0.882 lbs)
Housing material	plastic ABS/POM
Connection terminals	
– Type of terminal	Screw terminal
– Max. wire cross-section	1.5 mm <sup>2</sup> (AWG 16)

#### Voltage supply

Operating voltage	20 ... 253 V AC, 50/60 Hz, 20 ... 253 V DC
Max. power consumption	12 VA, 4 W

#### Sensor input

Number of sensors	1 x 4 ... 20 mA
Type of input (switchable)	
– mode active	Sensor supply through SU 600
– mode passive	Sensor has an own power supply
Measured value transmission	4 ... 20 mA
Deviation	
– Accuracy	±20 µA (0.1 % of 20 mA)
Terminal voltage mode active	30 ... 22 V at 4 ... 20 mA
Current limitation mode active	30 mA
Internal resistance mode passive	< 250 Ω
Detection line break	≤ 3.6 mA
Detection shortcircuit	≥ 21 mA
Adjustment range	
– Empty adjustment	3.8 ... 20.2 mA
– Full adjustment	4.1 ... 20.5 mA
– min. adjustment delta	300 µA
Connection cable to the sensor	two-wire standard cable (screening recommended)

#### Relay outputs

Quantity	2 x operating relay, 1 x fail safe relay
Contact	Floating spdt
Contact material	AG NI 0.15 hard gold-plated
Switching voltage	min. 10 mV DC, max. 250 V AC/DC
Switching current	min. 10 µA DC, max. 3 A AC, 1 A DC

Breaking capacity <sup>1)</sup>	min. 50 mW, max. 500 VA, max. 54 W DC
Min. switching hysteresis	0.5 %

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### Current output

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Quantity	1 x output
Range	0/4 ... 20 mA
Resolution	0.1 %/20 $\mu$ A
Max. load	500 $\Omega$
Fault message	22 mA
Accuracy	$\pm$ 25 $\mu$ A (0.125 % of 20 mA)
Temperature error (relating to 20 mA)	0.01 %/K

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### Indicators

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Measured value indication	
– LC display (45 x 45 mm)	digital and quasianalogue indication
– Max. indicating range	-9999 ... 9999
LED displays	
– Status, operating voltage	1 x LED green
– Status, fault signal	1 x LED red
– Status operating relay 1/2	2 x LED yellow

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### Operation

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Adjustment elements	2 x key, 1 x function selection switch
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### Ambient conditions

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Ambient temperature	-20 ... +60 °C (-4 ... +140 °F)
Storage and transport temperature	-40 ... +80 °C (-40 ... +176 °F)

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### Electrical protective measures

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Protection rating	
– Wall, rail mounting	IP 20
– Front panel mounting	IP 40
Overvoltage category	II
Protection class	II

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### Electrical separating measures

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Reliable separation according to VDE 0106 part 1 between power supply, sensor input and digital component

– Reference voltage	250 V
– Voltage resistance of the isolation	3.75 kV

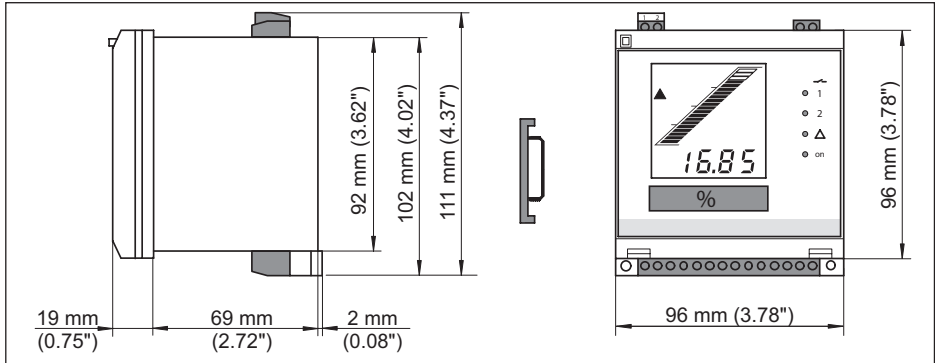
<sup>1)</sup> If inductive loads or stronger currents are switched through, the gold plating on the relay contact surface will be permanently damaged. The contact is then no longer suitable for switching low-level signal circuits.



Galvanic separation between relay output and digital part

- Reference voltage 250 V
- Voltage resistance of the isolation 4 kV

## 9.2 Dimensions



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## **9.3 Certificate**

### **9.3 CE declarations of conformity**



## Konformitätserklärung

Declaration of conformity  
Déclaration de conformité

**KROHNE**

**Krohne S.A.S.**  
Les Ors BP 98  
F-26103 Romans Cedex

erklärt in alleiniger Verantwortung, daß das Produkt / declare under  
our sole responsibility that our product / déclare sous sa seule  
responsabilité que le produit

**SU600**

auf das sich diese Erklärung bezieht, mit den folgenden Normen  
übereinstimmt / to which this declaration relates is in conformity  
with the following standards / auquel se réfère cette déclaration  
est conforme aux normes

Emission / Emission / Emission → EN 61326 : 1997 (Klasse B) / A1 : 1998 (Klasse A)  
Immission / Susceptibility / Immission → EN 61326 : 1997 / A1 : 1998  
EN 61010 – 1 : 2001

gemäß den Bestimmungen der Richtlinien / following the provision  
of Directives / conformément aux dispositions des Directives

73/23 EWG  
89/336 EWG

29.04.2005

  
i.V./p.p./P.O. Florian Stengele

## **9.4 Trademark**

All the brands as well as trade and company names used are property of their lawful proprietor/originator.

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Subject to change without notice

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