

Logic unit

SRL 6-50

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Important Notes

Usage for the intended purpose

The logic unit SRL 6-50 is used in conjunction with the level switches NRS 1-50, NRS 1-51 for monitoring the separate rinsing of the connecting lines leading to the level pots of externally installed water level limiters or high level alarms.

Function

If the level electrode (high / low level limiter) is installed in an isolatable level pot outside the boiler, make sure that the level pot is drained and the connecting lines are rinsed at regular intervals.

For this purpose the connecting lines must be shut off and opened at regular intervals and by opening and closing the drain valve the lines and the level pot will be rinsed.

During the rinsing process the water level cannot be measured in the level pot for 5 minutes. The level switch NRS 1-50, NRS 1-51 therefore bypasses the level electrode and monitors the rinsing and bypass time (standby input, controlled by the logic unit SRL 6-50).

Fig. 1 shows a water-level limiter system with a level electrode installed inside the boiler and a second electrode installed in an external level pot. The following combination is also possible: 2 external level electrodes NRG 1X-5X, 2 logic units SRL 6-50, 1 level switch NRS 1-50, NRS 1-51.

The logic unit monitors the following times and process sequences:

Interval time: This is the time interval at which, depending on the operating mode (24h / 72h boiler operation without constant supervision), the connecting lines have to be rinsed. The interval time starts when the logic unit is switched on.

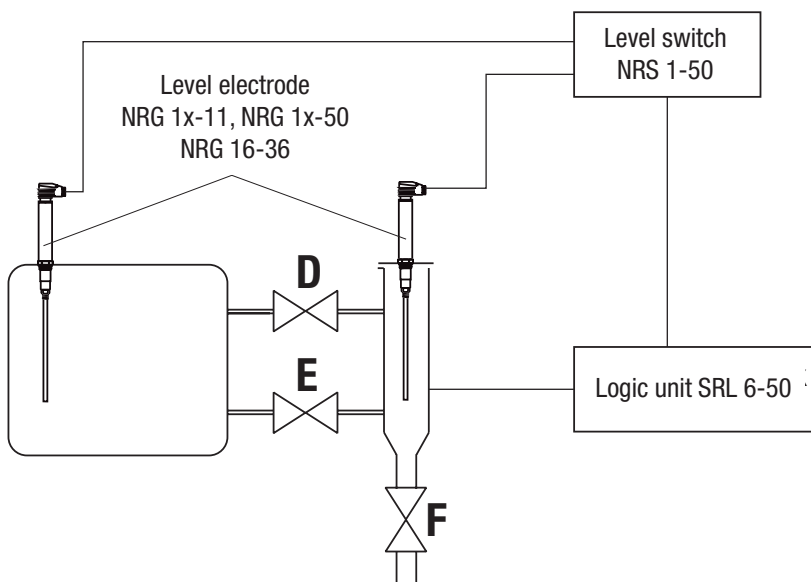


Fig. 1

Important Notes - continued -

Function - continued -

During operation the **standby time** is started after the interval time has elapsed and the interval time is reset to its initial value.

During the standby time the connecting lines must be rinsed.

Synchronizing: When valve D or E closes, the **purging time** starts and the interval time is reset to its initial value. The purging time can start any time. The purging time also starts when the logic unit is switched on and after the standby time has elapsed.

Once the purging time has started the stand-by input of the level switch NRS 1-50, NRS 1-51 will also be activated.

During the purging time all valves must be opened and closed in a fixed sequence. The logic unit polls the limit switches to obtain data on the valve positions and the level switch for information on the water level (low level if electrode is exposed).

If valves D and E are open after the rinsing process and valve F closed and the level electrode for low water (low level) is submerged again, the stand-by input of the level switch NRS 1-50, NRS 1-51 will be deactivated.

The stand-by time of the level switch is limited to a maximum of 5 minutes. If the stand-by input is not deactivated by the logic unit during this time, the level switch will open the safety circuit.

Safety note

The equipment fulfils a safety function and must only be installed and commissioned by qualified and competent staff.

Retrofitting and maintenance work must only be performed by qualified staff who – through adequate training – have achieved a recognised level of competence.

Important Notes - continued -

LV (Low Voltage) Directive and EMC (Electromagnetic Compatibility)

The equipment meets the requirements of the Low Voltage Directive 2014/35/EC and the EMC Directive 2014/30/EC.

ATEX (Atmosphère Explosible)

According to the European Directive 2014/34/EC the equipment must **not** be used in explosion risk areas.

Note on the Declaration of Conformity / Declaration by the Manufacturer C€

For details on the conformity of our equipment according to the European Directives see our Declaration of Conformity or our Declaration of Manufacturer.

The current Declaration of Conformity / Declaration of Manufacturer are available in the Internet under www.gestra.com or can be requested from us.

Technical data

SRL 6-50

Supply:

Supply voltage

24 VDC $\pm$ 20 %, 0.1 A

Fuse

External 0.5 A (semi-delay), without external wiring (indicators)

Power consumption

4 VA

Inputs:

Wiring of limit switches, level switches NRS 1-50, NRS 1-51

5 volt-free contacts of the limit switches of the valves

1 volt-free contact of the level switch NRS 1-50, NRS 1-51

1 signal input for switching between water level limiter / high level alarm

1 signal input for switching between steam boiler / hot-water installation

Outputs:

4 change-over contacts, 8 A, 30 V DC, $\cos \varphi = 1$ (IEC 61810)

for messages:

Standby on/off (at level switches NRS 1-50, NRS 1-51)

Standby time (Start) running,

Purging time (Standby) running

Deactivated (Stop)

Times:

Interval time

1 - 9999 hours, adjustable

Standby time

1 - 99 hours, adjustable

Purging time

5:10 minutes, factory set

Other time settings on request

Equipment design:

Indicators and adjustors

1 indicating & operating display,

1 green LED indicating standby time (Start),

1 amber LED indicating purging time (Standby)

1 red LED indicating deactivation (Stop)

Housing

Case for wall mounting with see-through lid, hinge and latch.

Casing material: ABS, polycarbonate

Cable entry / electrical connection

1 14pole spring-loaded terminal strip, conductor size 2.5 mm²

Cable gland with integrated cable clamp 1 x M20 x 1.5

1 Female connector M12 of sensor, with 8 poles

SRL 6-50

Protection class

2 (completely insulated)

Protection

IP 65 to EN 60529

Weight

approx. 1.3 kg

Further conditions:**Ambient temperature**

when system is switched on: 0 °C ... 55 °C,
during operation: -10 °C ... 55 °C

Transport temperature

-20 °C ... +80 °C (< 100 hours),
defrosting time of the de-energized equipment before it can be put into operation: 24 hours.

Storage temperature

-20 °C ... +70 °C,
defrosting time of the de-energized equipment before it can be put into operation: 24 hours.

Relative humidity

max. 95 %, no moisture condensation

Scope of supply

SRL 6-50

- 1 Logic unit with enclosure for wall mounting
- 1 Connecting cable, length 5 m, one end fitted with female M12 connector, with 8 poles
- 1 Installation & operating manual

In the system: Installing the logic unit

Dimensions of SRL 6-50

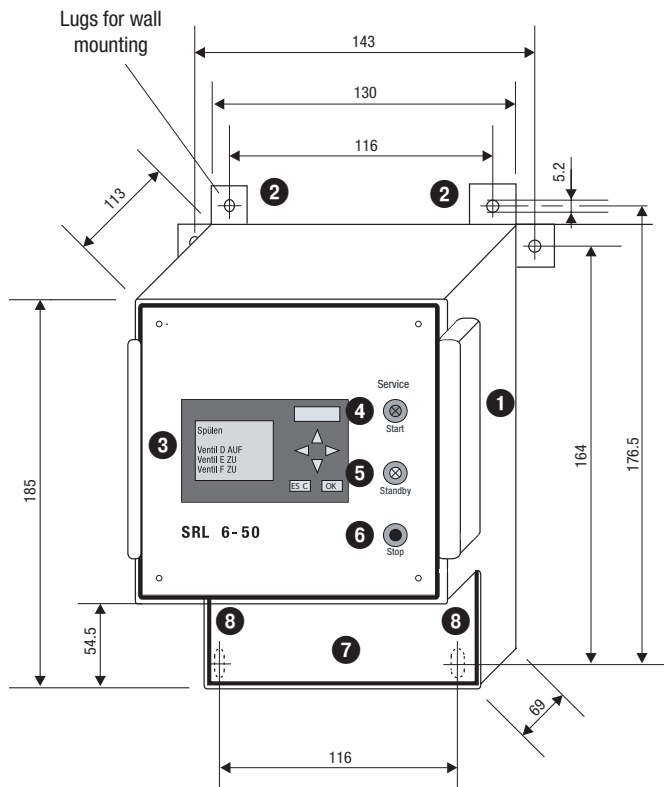


Fig. 2

Key

- | | |
|------------------------------------|--------------------------------------|
| ① Latch | ⑤ Standby LED, yellow (purging time) |
| ② Lugs for wall mounting | ⑥ Stop LED, red (deactivation) |
| ③ Indicator and adjustor pad | ⑦ Lid for terminal block |
| ④ Start LED, green (stand-by time) | ⑧ Cover screws |

Installing logic unit SRL 6-50

The enclosure of the logic unit is designed for wall mounting and should be installed close to the external level pot.

Name plate / marking

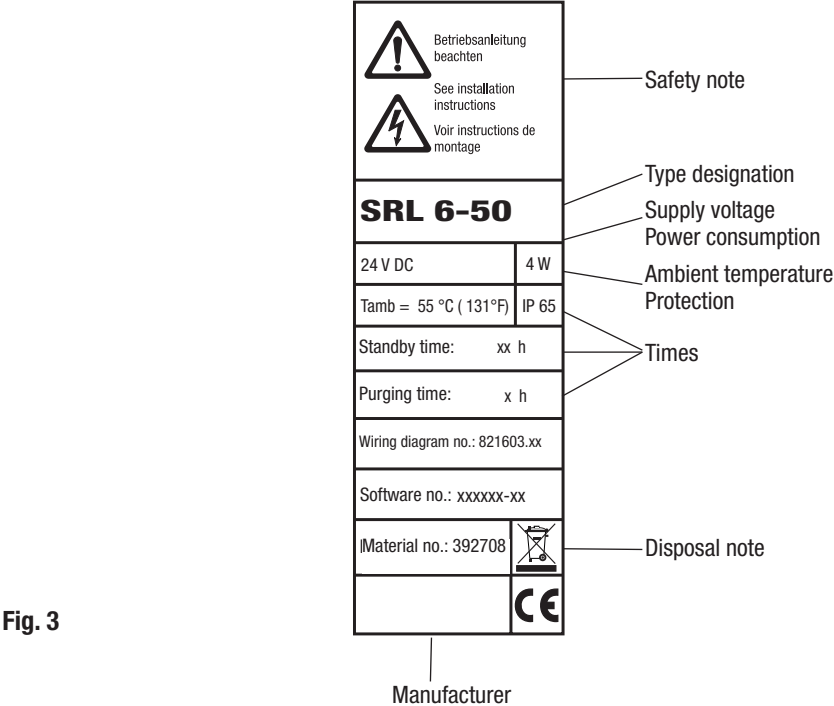


Fig. 3



Attention

The name plate specifies the technical features of the equipment. Note that any piece of equipment without its specific name plate must neither be commissioned nor operated.

In the system: Wiring the logic unit

Wiring diagram for logic unit SRL 6-50

SRL 6-50

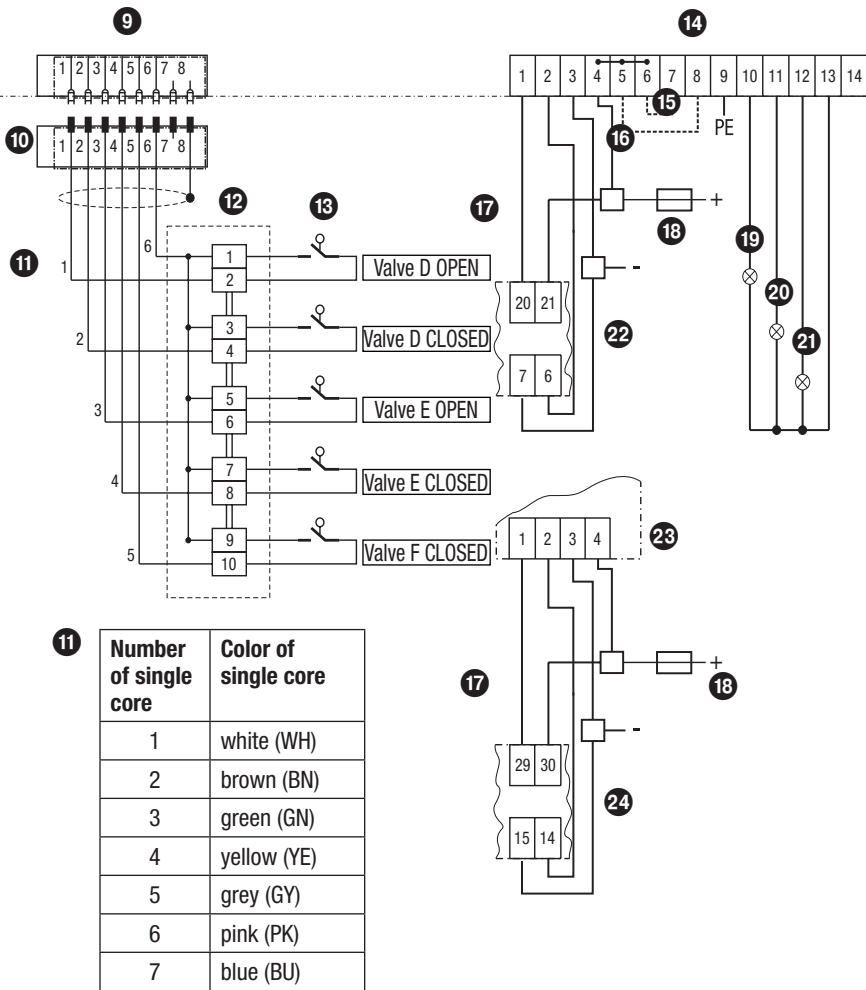


Fig. 4

Key

- ⑨ Female connector of sensor M12, with 8 poles
- ⑩ Male connector of sensor M12, with connecting cable
- ⑪ Conductor marking at one end of the connecting line
- ⑫ Terminal box (provided on site), installed close to level pot
- ⑬ Limit switch of valve
- ⑭ Spring-loaded terminal strip with 14 poles, conductor size 2.5 mm²
- ⑮ External bridge on terminals 6 / 7 for high level alarm (level electrode NRG 1X-51)
- ⑯ External bridge on terminals 5 / 8 for water level limiter (level electrode NRG 1X-50) in hot-water plants
- ⑰ Terminals in control cabinets for providing the supply voltage and for connecting the logic unit and the level switch
- ⑱ Connection for supply voltage **24 V DC** with 0.5 A semi-delay fuse provided on site (see "Technical Data")
- ⑲ External indication of deactivation (Stop), 24 DC 1A
- ⑳ External indication of purging time (Standby), 24 DC 1A
- ㉑ External indication of standby time (Start), 24 DC 1A
- ㉒ Level switch NRS 1-50, NRS 1-51, connection: first standby input and first signal output
- ㉓ Second logic unit SRL 6-50
- ㉔ Level switch NRS 1-50, connection: second standby input and second signal output



Danger

- For the supply of the logic unit SRL 6-50 with 24 V DC use a safety extra-low voltage (SELV) power supply unit that must be electrically isolated from dangerous contact voltages and must meet at least the requirements on double or reinforced isolation acc. to DIN EN 50178 or DIN EN 61010-1 or DIN EN 60730-1 or DIN EN 60950 (safe electrical isolation).
- Any item of equipment that you want to connect to terminals 6, 7, 14, 15 (standby input 1 / 2) of level switch NRS 1-50, NRS 1-51 must be certified to have at least double or reinforced isolation according to DIN EN 50178 or DIN EN 61010-1 or DIN EN 60730-1 or DIN EN 60950 (safe isolation) between the standby inputs, the signal outputs and the live parts of the installation that are not supplied with safety extra-low voltage.



Note

We recommend to use the same safety power supply unit in order to supply the logic unit SRL 6-50 and the level switches NRS 1-50, NRS 1-51 with 24 V DC.



Attention

- Fuse the logic unit with an external 0.5 A semi-delay fuse (see “Technical Data”).
- To connect the level electrode NRG 1X-51 / level switch NRS 1-51 (high level alarm) bridge terminals 6 and 7 with a wire link.
- To connect the level electrode NRG 1X-50 / level switch NRS 1-50 (water level limiter, application in hot-water installation) bridge terminals 5 and 8 with a wire link.
- If external indicator lights are connected the logic unit must supply them with 24 V DC.
- Install connecting lines to the logic unit and to the limit switches separated from power cables.
- Do not use unused terminals as support point terminals.

Tools

- Screwdriver, size 2.5, completely insulated according to VDE 0680-1
- Screwdriver, size 2

In the system: Wiring the logic unit - continued -

Wiring terminal strip

Wire the terminal strips according to the wiring diagram **Fig. 4**.

To connect the limit switches please provide a terminal box (protection IP 65) close to the level pot **Fig. 4**.

The level pot is provided with three shut-off valves. Both valves D and E are fitted with two limit switches for "OPEN" position (D 1 / E 1) and "CLOSED" position (D 2 / E 2).

The drain valve F is fitted with only one limit switch for the "CLOSED" position.

To connect the terminal box and the logic unit please use the supplied connecting cable and wire the terminals in accordance with the wiring diagram **Fig. 4**.

It is possible to connect external indicator lights to terminals 10 to 12. For this purpose screw an additional cable gland M20 x 1.5 into the housing. The bore for the second cable gland is pre-punched and must be knocked out.

Insert the male connector of the connecting cable into the female connector of the logic unit and fix it in place by turning the knurled nut.

Basic Settings

Factory settings

Logic unit SRL 6-50

The logic unit features the following factory set default values:

- Interval time: 24 hours
- Standby time: 1 hour
- Purging time (SRL 6-50): 5:10 minutes

Start, Operation, Alarm and Test

SRL 6-50

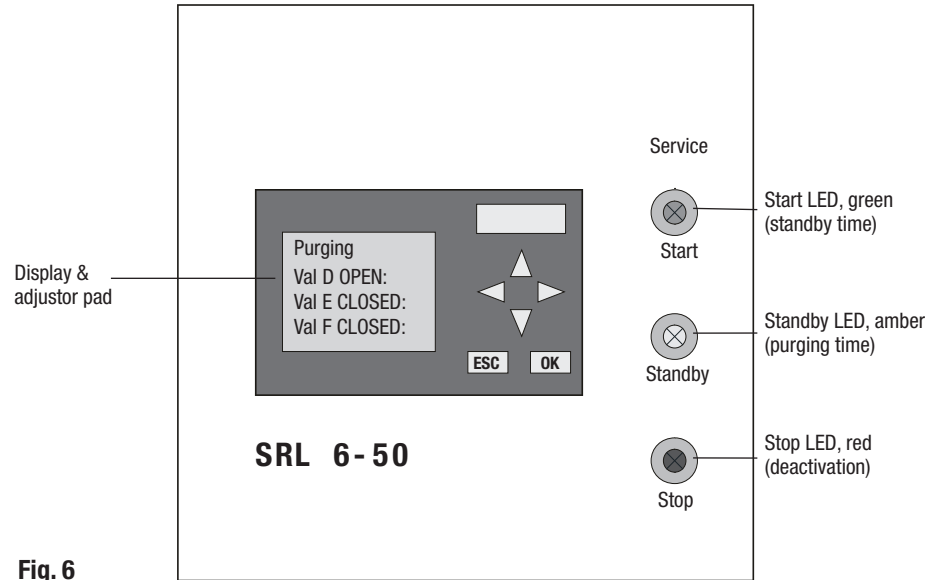


Fig. 6

Start			
Activity	Indicator & adjustor pad	LED indication	Function
Switch on supply voltage.	Please wait until limiter is ready	All LEDs are illuminated for 3 sec., then only the Start LED remains illuminated.	Initialising, takes approx. 40 sec.
After applying the supply voltage initiate the first purging process. To continue see indication of sequence schedule for purging.	Purging Valve D OPEN (CLOSED) Valve E CLOSED Valve F CLOSED	Standby LED illuminated	Purging time running, standby input activated (NRS 1-5X)

Operation			
Activity	Indicator & adjustor pad	LED indication	Function
Interval time elapsed and re-started	Purging Valve D OPEN (CLOSED) Valve E CLOSED Valve F CLOSED	Start LED illuminated	Standby time running
Initiate purging process, see sequence schedule for purging.		Start LED not illuminated Standby LED illuminated	Purging time running, standby input activated (NRS 1-5X)



Note

When operating the valves **Fig. 7** follow the sequence schedule indicated in the display & adjustor pad. The individual steps are listed in chronological order.

Sequence schedule for purging		
	Steam boiler	Hot-water plant
Fig. 7 Awaiting low level message (only with level electrode NRG 1X-50, low-level limiter) Remaining purging time First close valve F. Then slowly open valve D.	Purging Valve D OPEN Valve E CLOSED Valve F CLOSED 04:13m Valve D OPEN Valve E CLOSED Valve F OPEN 03:56m Awaiting low level message 37 sec. 03:21m Valve D CLOSED Valve E CLOSED Valve F OPEN 03:02m Valve D CLOSED Valve E OPEN Valve F OPEN 02:46m Valve D OPEN Valve E OPEN Valve F CLOSED 02:36m Awaiting normal level	Purging Valve D CLOSED Valve E CLOSED Valve F CLOSED 04:13m Valve D CLOSED Valve E CLOSED Valve F OPEN 03:56m Awaiting low level message 37 sec. 03:21m Valve D CLOSED Valve E CLOSED Valve F CLOSED 03:02m Valve D OPEN Valve E CLOSED Valve F CLOSED 02:46m Valve D OPEN Valve E OPEN Valve F CLOSED 02:36m Awaiting normal level

Purging finished			
Action	Indicator & adjustor pad	LED indication	Function
Purging finished. Indication of interval time & remaining time	Interval: 24h Remaining: 23h 59m	All LEDs are not illuminated.	Standby input deactivated (NRS 1-5X)

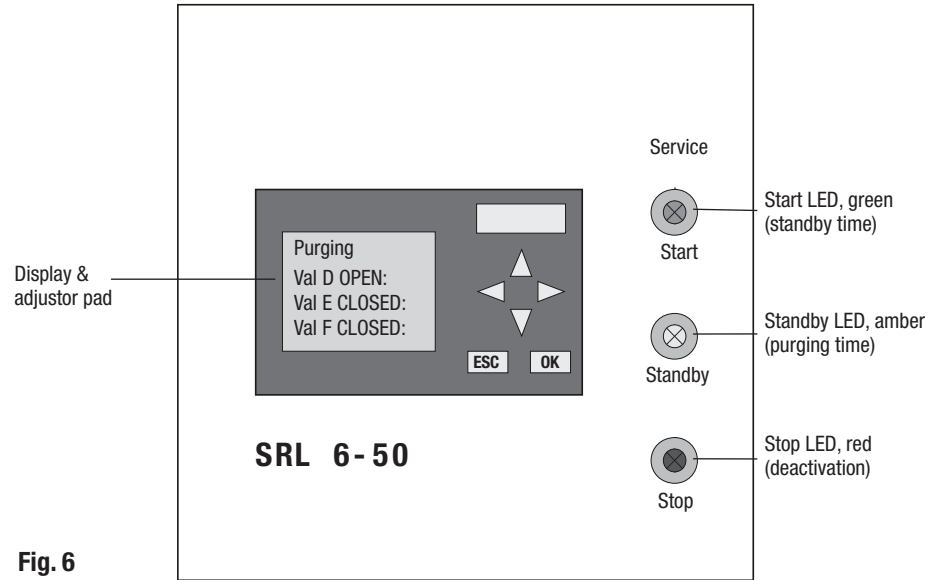


Fig. 6

Changing standby and interval time		
Action	Indicator & ajdustor pad	Function
Press button ESC and ▲ simultaneously.	PW input 0 Press ESC > 1 sec. and OK to confirm	The password input box opens.
To enter the password press and hold down ESC until the input line is activated and highlighted.		
Briefly press OK . The input mask appears.	PW input 000000 Press ESC > 1 sec. and OK to confirm	The input mask appears and you can enter the password 003503.
Use buttons ▲ ▼ to enter the password 003503. To jump back and forth between the digits use buttons ◀ ▶ .		
To confirm the password press button OK and then ESC . The next mask appears.		The password is confirmed.
If the entered password is incorrect the system displays a flashing message: Password incorrect . You have to enter the password within 60 seconds otherwise your entry will not be applied and you have to repeat the procedure.		

Start, Operation and Alarm - continued -

SRL 6-50 - continued -

Changing the standby time		
Action	Indicator & ajdustor pad	Function
To enter the standby time press and hold button ESC until the input line is highlighted.	Standby time 01:00 h To change the setting press ESC > 1 sec. and confirm with OK	The input mask appears and you can enter the new standby time.
Briefly press button OK . The input mask appears.		
Use buttons ▲ ▼ to enter the digits. To jump back and forth between the digits use buttons ◀ ▶ .		
Press button OK .		The entry is confirmed.

Changing the interval time		
Action	Indicator & ajdustor pad	Function
To change the interval time press buttons ESC and ▶ simultaneously.	Interval time 01:00 h To change the setting press ESC > 1 sec. and confirm with OK	The input mask appears and you can enter the new interval time.
To enter the interval time press and hold button ESC until the input line is highlighted.		
Briefly press button OK . The input mask appears.		
Use buttons ▲ ▼ to enter the digits. To jump back and forth between the digits use buttons ◀ ▶ .		
Press button OK .		The entry is confirmed.



Attention

To determine the interval and standby time please consult the expert for the plant system.

Start, Operation and Alarm - continued -

SRL 6-50 - continued -



Attention

It is not permitted to purge two measuring pots (including the connecting lines) at the same time.

If standby inputs 1 and 2 of the level switch are activated at the same time, the level switch will open the safety circuit.



Danger

Please check positions of valves after each purging process. The valves must be in **operating position**, which means that valves D and E must be open and valve F closed.

Troubleshooting

Indication, diagnosis & remedy

Possible operating errors				
Error	Position of valves	Indicator & adjustor pad	LED indication*	Remedy
Purging time elapsed without purging	Operating position Valve D OPEN Valve E OPEN Valve F CLOSED	Purging must be repeated.	Standby LED not illuminated, Stop LED illuminated for approx. 40 sec., then Start LED lights up (standby time)	Initiate purging during standby time
Purging not finished successfully during the preset purging time (5 min)	Operating position	appears alternately for approx. 40 sec. End of purging time Waiting for NRS 1-50/51 then the following appears: Purging Valve D OPEN (CLOSED) Valve E CLOSED Valve F CLOSED	Standby LED not illuminated, Stop LED illuminated for approx. 40 sec., then Start LED lights up (standby time)	Initiate purging during standby time
Purging not finished successfully during the preset purging time (5 min)	Not in operating position	Purging Valve D OPEN (CLOSED) Valve E CLOSED Valve F CLOSED	Standby LED not illuminated, Stop LED illuminated for approx. 40 sec., then Standby LED lights up again (purging time)	Initiate purging during purging time
For installations with two measuring pots				
Purging time for measuring pot 1 running, purging for measuring pot is started in parallel	Operating position	Indicated sequence as specified above	Standby LED not illuminated, Stop LED illuminated for approx. 40 sec., then Start LED lights up (standby time)	Move all valves to operating position. Both logic units re-start with standby time. Now purge both measuring pots one after the other.
Purging time for measuring pot 1 running, purging for measuring pot is started in parallel	Not in operating position		Standby LED not illuminated, Stop LED illuminated for approx. 40 sec., then Standby LED lights up again (purging time)	
*after SRL internal purging time (5 minutes 10 seconds) has elapsed				

Troubleshooting - continued -

Indication, diagnosis & remedy - continued -

Fault in program sequence, safety circuit in level switch interrupted	
Error	Remedy
Display & adjustor pad signals "Limit switch defective".	Replace defective limit switch.
Failure of voltage supply during purging time, standby input deactivated and safety circuit interrupted (NRS 1-5X).	Apply supply voltage, continue purging process.

Replacing and disposing of the logic unit

Replacing the logic unit

1. Switch off supply voltage.
2. Undo cover screws **8** and remove cover for terminal block **7**. (Fig. 2)
3. Unplug control cables from terminal strip **14** and pull cables out of the cable gland.
4. Detach connecting cables for limit switches.
5. Remove the logic unit.
6. Install and connect new logic unit.
7. Attach connecting cables for limit switches.
8. Switch on supply voltage
9. Initiate first purging process.

Disposal

For the disposal of the equipment observe the pertinent legal regulations concerning waste disposal.

If faults occur that are not listed above or cannot be corrected, please contact our service centre or authorized agency in your country.



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