Dinel®

DISAI Automatic Systems
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Features

- **LCU-1232** - *2-state level regulation + ALARM function connection to 3 limit sensors (2 working - MIN, MAX, 1 alarm)*
- **LCU-1221** - *2-state level regulation connection to 2 limit sensors (MIN, MAX)*

- covers stabilized power supply for sensors energizing
- compatible with all types of Dinel level sensors (with outputs NPN, PNP, "S", NAMUR - here only for non-explosive area, or contact output)
- safety requirements according to EN 61010-1
- LED indication
- mounting on DIN rail 35 mm in distribution cabinet

Dimension drawing
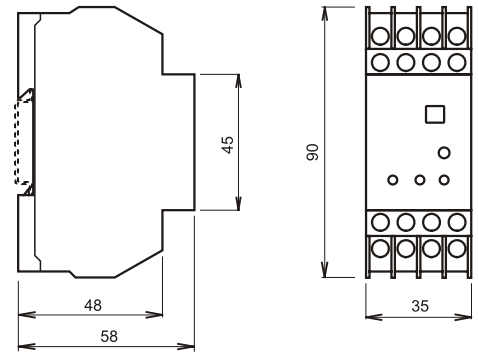
Technical data

Type	LCU-1232	LCU-1221
Nominal supply voltage	230V / 50Hz (±10 %)	
Nominal power demand	4 VA	
Output voltage for sensor supplying	12 VDC (±10%)	
Funkce ALARM	YES	NO
Maximum output current	50 mA	
Output short circuit current	typ. 300 mA	
Max. duration of output short-circuit	unlimited	
Max. input (short circuit) current	6 mA	
Input currents - to switch on - to switch off - threshold current	min. 2 mA max. 1 mA typ. 1,5 mA	
Contact rating - max. load current - max. switching voltage - max. switching power	3 A 250 V 500 VA	
Max. switching frequency at max. load	360 / h	
Contact life at max. load	min. 10^6 cycles	
Electric strength mains 230 V - output 12V	4 kV	
Ambient temperature	-20 to +50 °C	
Protection degree - enclosure, terminals	IP 20	
Housing material	polycarbonate	
Terminal material	CuBe	
Max. / recomm. connecting wires cross-section	4 mm² / 0,5 ÷ 1 mm²	
Weight	c. 0,2 kg	
Internal protection on mains 230 VAC	fuse T 50 mA	
Electrical safety requirements due to	EN 61010-1	
EMC	EN 55022, EN 61000-4-2, -3, -4, -5, -6, -8, -11	

Front panels and terminal numbering
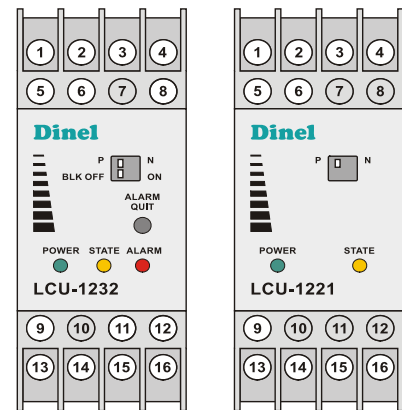
Function of signal LEDs

Green **"POWER"**
- shines - proper connection to 230 VAC, correct function
- doesn't shine - interruption of mains, failure

Orange **"STATE"**
- shines - contact of working relay (terminals 15, 16) is closed
- doesn't shine - contact 15, 14 is closed

Red **"ALARM"**
- shines - level failure - contact of alarm relay 11, 12 is open
- doesn't shine - normal state - contact 11, 12 is closed

Operating elements

Switch **"P / N"** - position P - LCU reacts to current flowing *to* the input terminals (No. 3, 4, 8)
- for sensors with PNP output

- position N - LCU reacts to current flowing *from* the input terminals (No. 3, 4, 8)
- for sensors with output type NPN, "S", NAMUR, or simple contact

Switch **"BLK OFF / ON"** - position OFF - no relation between alarm and working relay
- position ON - working relay is blocked by failure state of the level, contact 15, 16 becomes open

Button **"ALARM QUIT"** - when alarm event disappears, the alarm relay get back to active position - contact 11, 12 become closed

Function description

The LCU has two inputs for connection of two working level sensors (marked MIN, MAX) and one input for alarm level sensor (marked ALARM - only for LCU-1232). Working sensors provide operation of working relay (terminals 14, 15, 16). Alarm sensor activates alarm relay (terminals 11, 12).

Pump-up function (see application example of LCU-1232)

When the level drops under the MIN sensor, working relay is activated (contact between terminals 15, 16 is closed) and yellow LED STATE shines. The pump is switched-on and the level goes up. When the level reaches the MAX sensor, working relay is released (contact between terminals 15, 16 is open, contact 14, 15 is closed) and LED STATE dimes.

Pump-down function (see application example of LCU-1221)

When the level reaches up the MAX sensor, working relay is released (contact 14, 15 is closed) and LED STATE dimes. The pump (or the valve) is switched-on and the level goes down. When the level drops under the MIN sensor, working relay is activated (contact 14, 15 is open), the level can go up and LED STATE shines.

ALARM function (for type LCU-1232 only)

The ALARM input can be connected to level sensor with minimum failure or maximum failure state function. While the level reaches the failure state, the red ALARM LED shines and alarm contact 11, 12 opens. The ALARM lasts until the cause of alarm is removed and the ALARM QUIT button is pressed. Then ALARM LED dimes and contact 11, 12 become closed.
If it is need to affect the pumping process by means of alarm it is possible to either:
- connect the ALARM contacts (11, 12) serially to working contacts (14, 15, 16) or
- switch the BLK switch to ON position (see paragraph "Operating elements").

## Compatibility to various types of sensor output

- 3- wire performance - open collector output - type PNP (PO, PC)
- 3- wire performance - open collector output - type NPN (NO, NC)
- 2- wire performance - electronic current switch - type "S" (SO, SC)
- 2- wire performance - NAMUR output (RO, RC) - in safe (non-explosive) areas only
- 2- wire performance - any potential-free contact

The choice of sensor type is provided by means of switching the top-position switch onto P (PO or PC output sensors) or N position (for the other types of outputs). It is no possible to combine PO, PC type of sensor outputs with the others. The combination of NO, NC, SO, SC, RO, RC is possible.
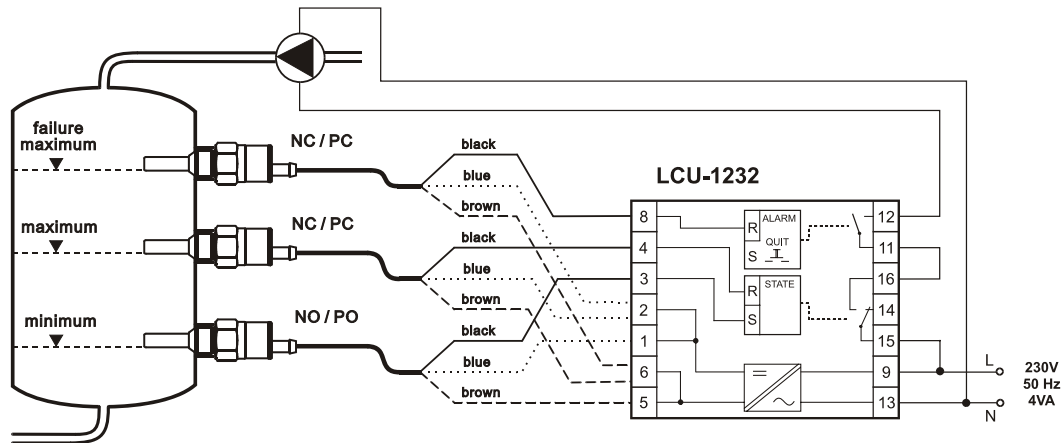
Important note:

For MIN (low) level sensing is necessary to use the sensor with normally (without media) open output (PO, NO, SO, RO). For MAX (high) level sensing is necessary to use the sensor with normally closed output (PC, NC, SC, RC).
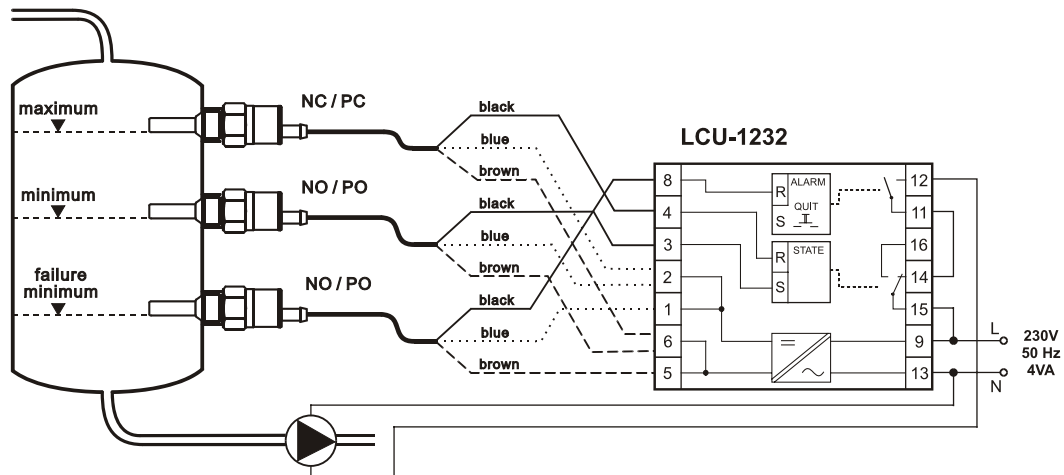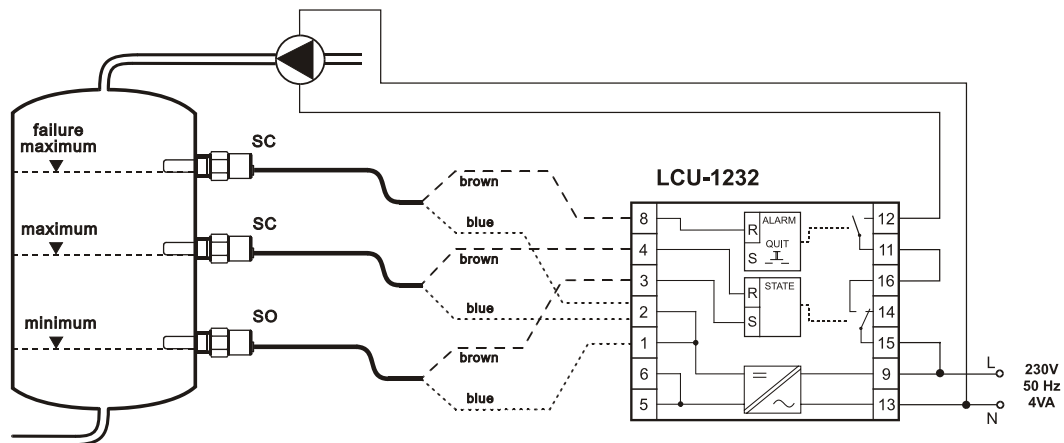
Inner block diagrams
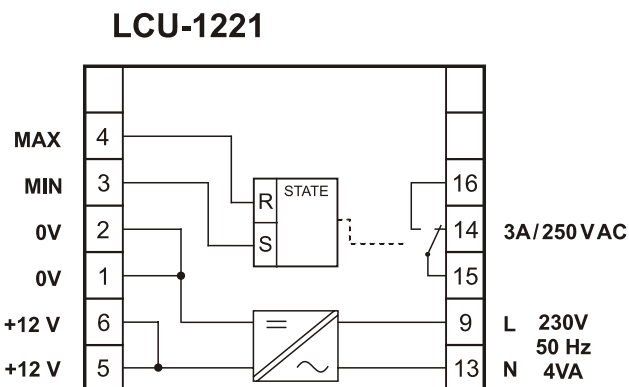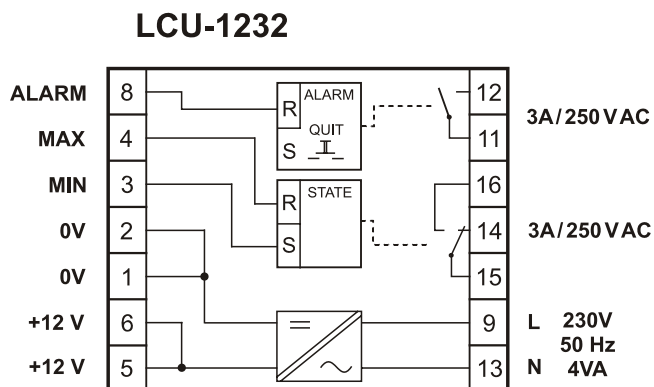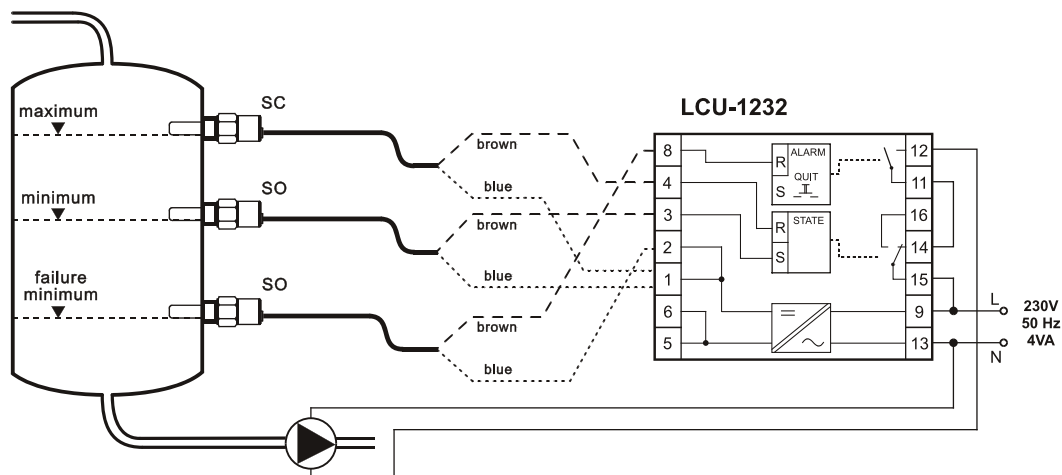
Wiring examples of LCU-1232

a) Pump-up regulation with ALARM function for failure maximum detection
   NPN or PNP output sensors are connected (e.g. DLS-27N, CPS-24N)

b) Pump-down regulation with ALARM function for failure minimum detection
   NPN or PNP output sensors are connected (e.g. DLS-27N, CPS-24N)
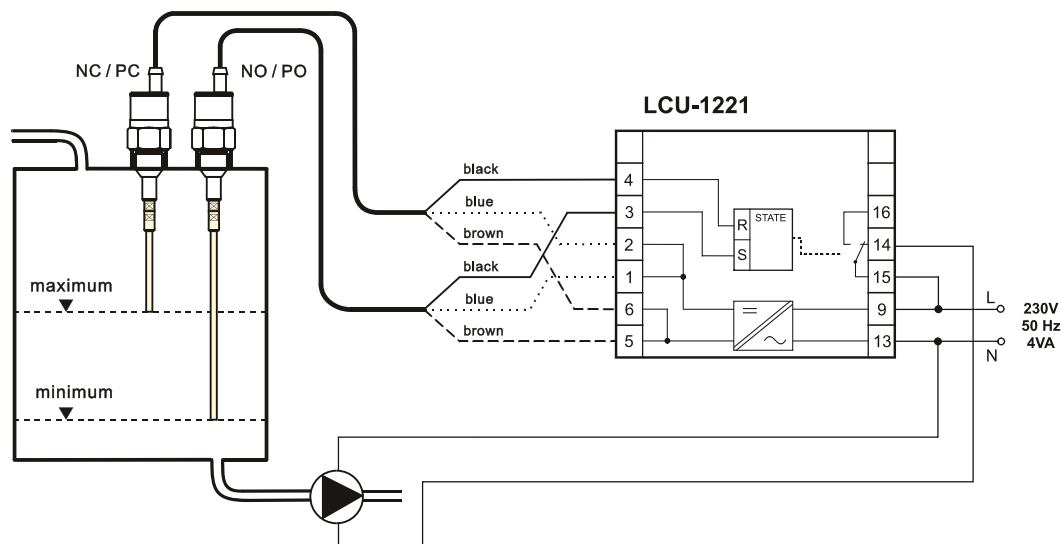

c) Pump-up regulation with ALARM function for failure maximum detection
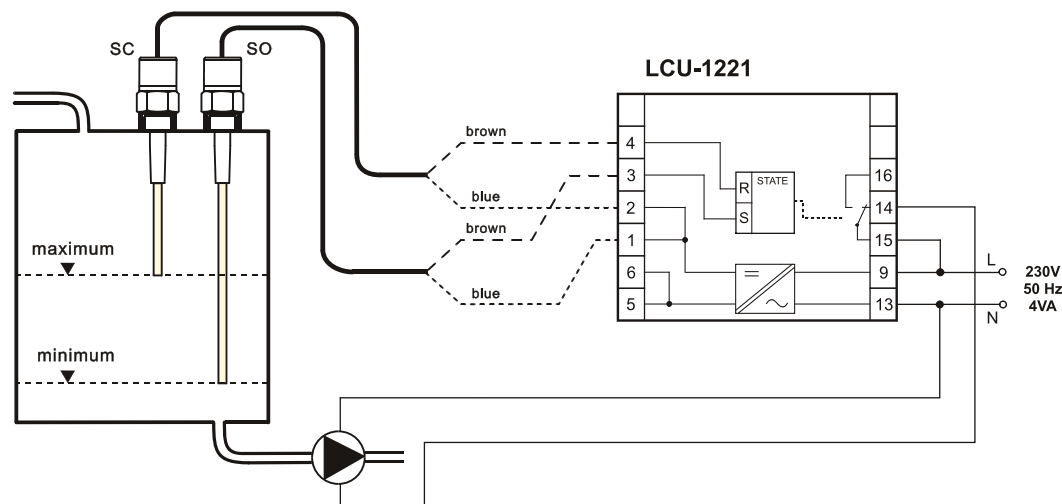   SO or SC output sensors are connected (e.g. GPLS-25N, CLS-18)

d) Pump-down regulation with ALARM function for failure minimum detection
   SO or SC output sensors are connected (e.g. GPLS-25N, CLS-18)

Wiring examples of LCU-1221

a) Pump-down regulation
   NPN or PNP output sensors are connected (e.g. DLS-27N, CPS-24N)

b) Pump-down regulation
   SO or SC output sensors are connected (e.g. GPLS-25N, CLS-18)