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Made in Czech Republic
 02-15/2018 Rev:1



HRH-8

Level switch

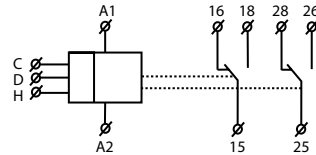


Characteristics

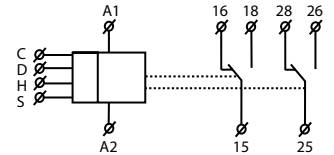
- Relay is designed to control the level of conductive liquids in wells, tanks, pools, tankers, reservoirs... (replacement HRH-1)
- Galvanically isolated supply and guard circuits
- Within one device, the following configurations can be selected:
 - 2x one-level monitoring (in separate tanks)
 - 1x two-level monitoring (in one tank)
 - Pumping from one tank to another
- DIP switch selection on the front panel (8 functions)
- Adjustable probe sensitivity (for each probe separately)
- Adjustable relay switching delay (for each probe separately)
- 10Hz watch frequency prevents polarization of the liquid and increases resistance to interference by network frequency
- 2x output relay (with changeover contact 16A / 250V AC1)
- 3-MODULE design, mounting onto DIN rail.

Symbol

(110 V, 230 V, 400 V)



(24 V AC/DC)



Notice

Leveling switches that use conductivity sensing must always be installed with respect to the requirements of electrical safety standards that are relevant to the application (e.g. normal, dangerous, particularly dangerous, swimming pools, fountains, accessible metal tanks, wells ...).

HRH-8 / 24V has basic insulation between supply terminals A1, A2 and D, H, C. This insulation is rated according to over-voltage category III.

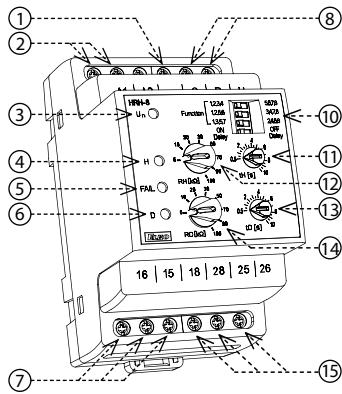
In installations where there is a risk of touching the conductive parts of the guard circuit, it is necessary to use an appropriate pre-rated low voltage safe source in accordance with the applicable regulations relating to this installation.

HRH-8 / 230V, HRH-8/400V and HRH-8 / 110V have reinforced insulation, which is rated according to over-voltage category III.

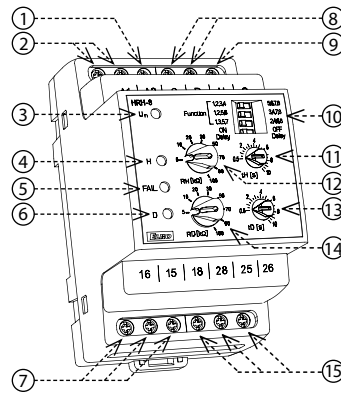
For these types it is not necessary to use front-end supply of safe low voltage.

Description

(110 V, 230 V, 400 V)

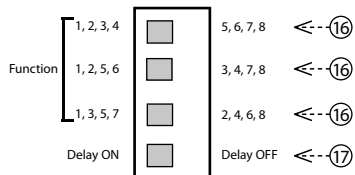


(24 V AC/DC)



- Terminal for connection of conductor common for both probes
- Supply voltage terminals
- Supply voltage indication
- Relay switching indication 1 / delay H
- Probe failure indication
- Relay switching indication 2 / delay D
- Relay 1 - Pump control 1
- Terminals for connecting probe
- Terminals for connecting shield
- DIP switch
- Setting the H probe delay
- Sensitivity Sensor H Adjustment
- Setting the D probe delay
- Sensitivity Sensor D Adjustment
- Relay 2 - Pump Control 2 (Function 1, 2, 3, 4) / Alarm (Function 5, 6, 7, 8)

Description and importance of DIP switches



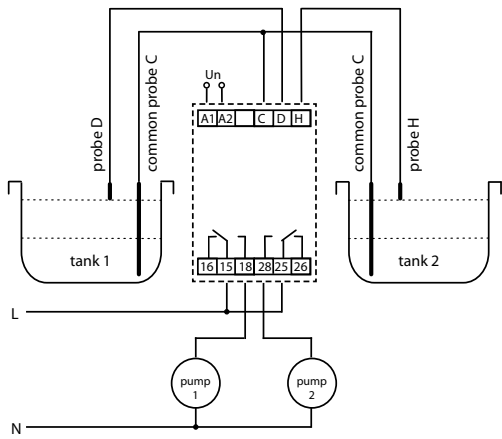
- Function selection
- Delayed relay on / off

Type of load	$\cos \varphi \geq 0.95$								
Mat. contacts AgNi, contact 16A	250V / 16A	250V / 5A	250V / 3A	230V / 3A (690VA)	x	800W	x	250V / 3A	250V / 10A
Type of load									
Mat. contacts AgNi, contact 16A	250V / 6A	250V / 6A	250V / 6A	24V / 16A	24V / 6A	24V / 4A	24V / 16A	24V / 2A	24V / 2A

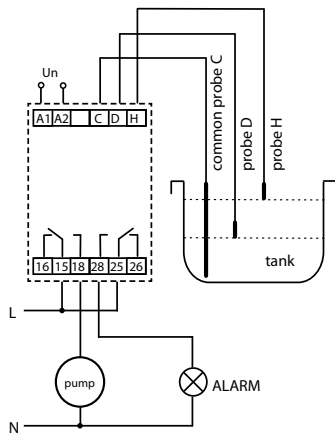
Connection

(110 V, 230 V, 400 V)

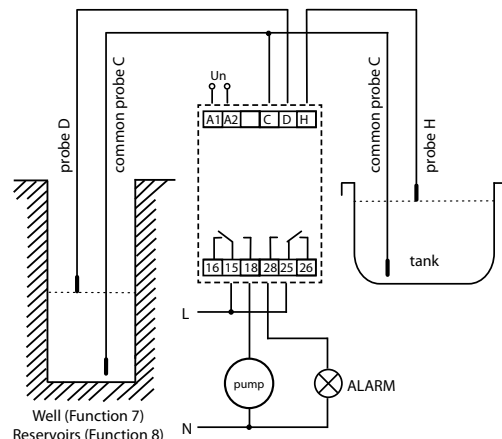
Wiring for functions 1, 2, 3, 4



Wiring for functions 5, 6

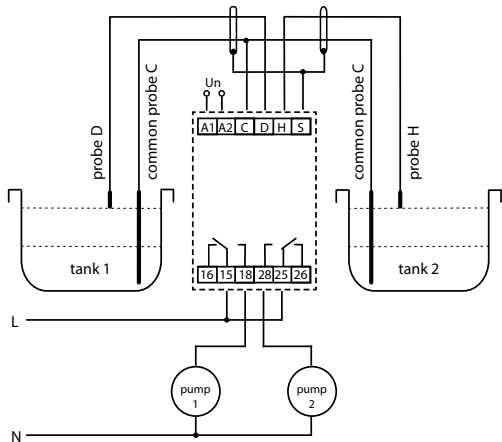


Wiring for functions 7, 8

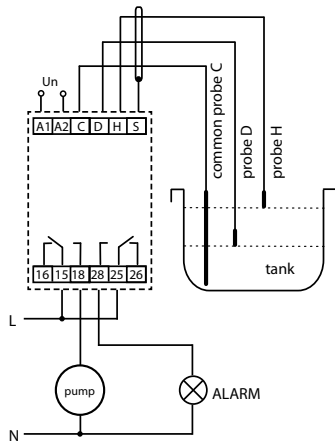


(24 V AC/DC)

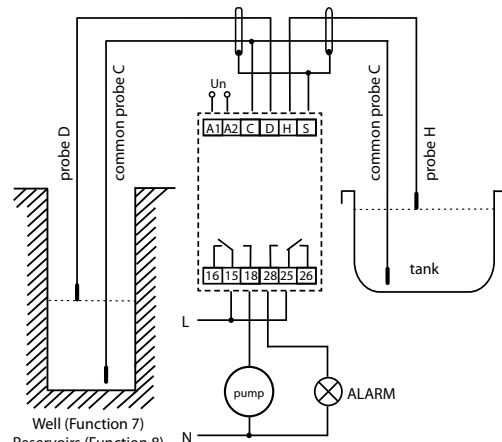
Wiring for functions 1, 2, 3, 4



Wiring for functions 5, 6

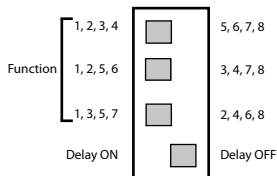


Wiring for functions 7, 8

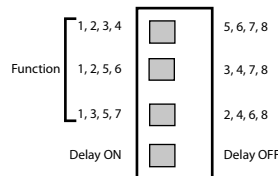


Setting

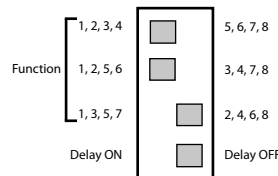
Function 1 OFF Delay



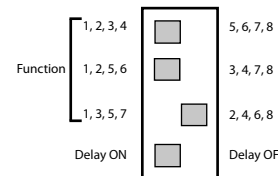
Function 1 ON Delay



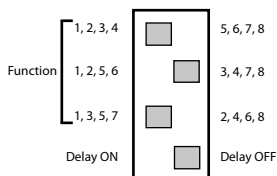
Function 2 OFF Delay



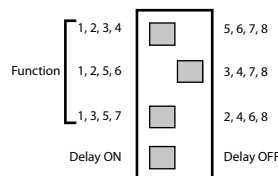
Function 2 ON Delay



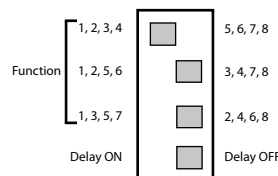
Function 3 OFF Delay



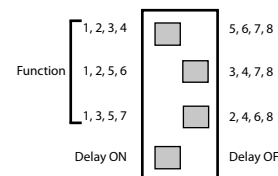
Function 3 ON Delay



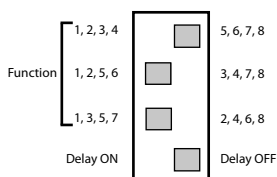
Function 4 OFF Delay



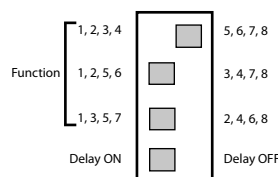
Function 4 ON Delay



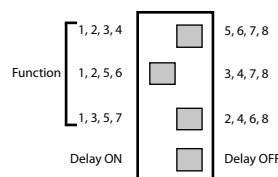
Function 5 OFF Delay



Function 5 ON Delay



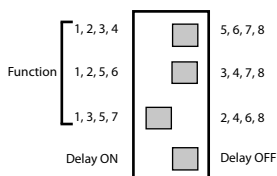
Function 6 OFF Delay



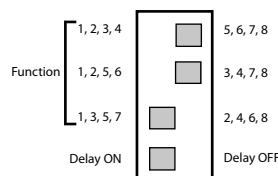
Function 6 ON Delay



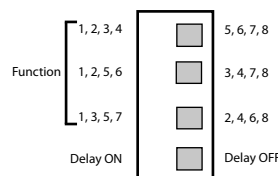
Function 7 OFF Delay



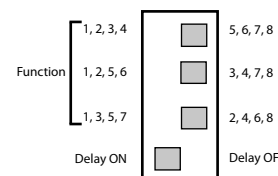
Function 7 ON Delay



Function 8 OFF Delay

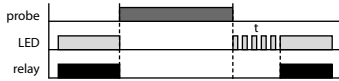


Function 8 ON Delay

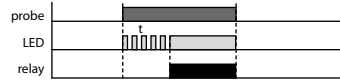


Function

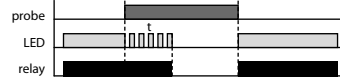
PUMP UP, ON DELAY
(Function 1,3,4)



PUMP DOWN, ON DELAY
(Function 2,3,4)



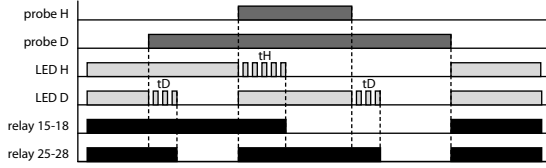
PUMP UP, OFF DELAY
(Function 1,3,4)



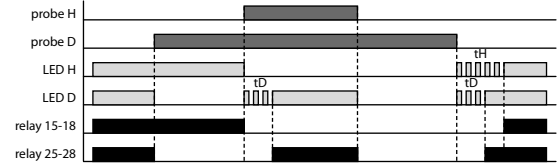
PUMP DOWN, OFF DELAY
(Function 2,3,4)



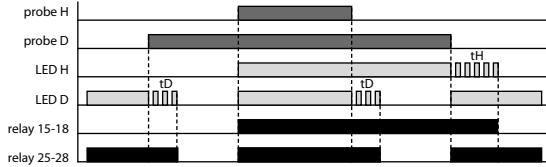
PUMP UP, OFF DELAY (Function 5)



PUMP UP, ON DELAY (Function 5)



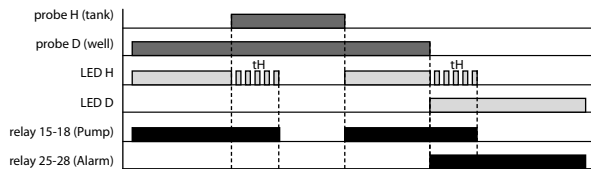
PUMP DOWN, OFF DELAY (Function 6)



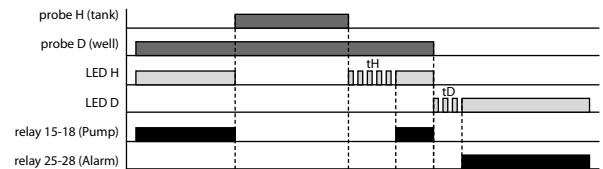
PUMP DOWN, ON DELAY (Function 6)



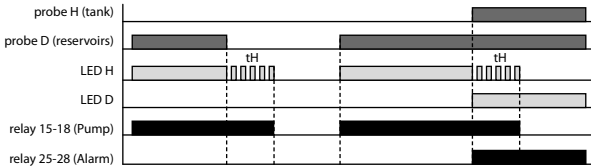
WELL - TANK, OFF DELAY (Function 7)



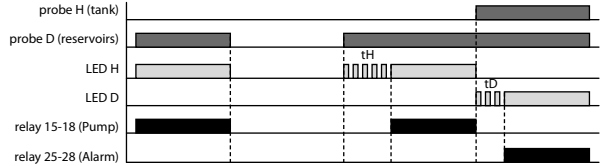
WELL - TANK, ON DELAY (Function 7)



RESERVOIRS - TANK, OFF DELAY (Function 8)



RESERVOIRS - TANK, ON DELAY (Function 8)



The relay is designed to monitor the level of conductive liquids with a choice of 8 functions:

- 1) - 2 separate tanks (each with 1 probe) - both PUMP UP (filling)
- 2) - 2 separate tanks (each with 1 probe) - both PUMP DOWN (emptying)
- 3) - 2 separate tanks (each with 1 probe) - H PUMP DOWN probe, D PUMP UP probe
- 4) - 2 separate tanks (each with 1 probe) - H PUMP UP probe, probe D PUMP DOWN
- 5) - both probes in one tank - PUMP UP - maintain level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (level is not between probes H and D)
- 6) - Both probes in one tank - PUMP DOWN - maintaining the level between probes H and D (as HRH-5), relay 1 switches on the pump, relay 2 alarm (the level is not between probes H and D)
- 7) - Pumping from the well to the tank - probe D in the well, probe H in the tank. The pump only runs if the probe D is flooded (enough water in the well) and the tank is not full (probe H). The alarm reports a lack of water in the well (probe D is not flooded).
- 8) - Pumping from the sump to the tank - probe D in the sump, probe H in the tank. The pump only runs if the probe D is flooded (full tank) and the tank is not full (probe H). The alarm reports the status of full tank and sump (both probes are flooded).

LED indication:

The red LED lights up - the corresponding relay is switched on

Red LED flashes - delay timing

The yellow LED indicates probe failure - Functions 5, 6 probe H is flooded and probe D is not.

To prevent polarization and electrolysis of the liquid and undesirable oxidation of the monitoring probes, an AC current of 10 Hz is used for monitoring. The low frequency has a positive effect on suppression of interference by 50 (60) Hz. Three probes are used to monitor the level: H - upper level, D - lower level and C - common probe. In the case of the use of a conductive material tank, it is possible to use the tank itself as a C probe. Probe C can also be connected to the protective conductor of the power supply system (PE). To prevent undesired switching by various influences (soiling of dips, moisture ...), the sensitivity of the device can be set according to the conductivity of the liquid being monitored (corresponding to the "resistance" of the liquid) in the range of 5 to 100 kΩ. To limit the effect of undesired switching of output contacts by raising the liquid level in the tank, it is possible to set the output response delay 0.5 - 10 s.

HRH-8

Function:	8
Supply terminals:	A1 - A2
Voltage range:	AC 110 V, AC 230 V, AC 400 V or AC/DC 24V galvanically separated (AC 50-60Hz)
Burden max.:	2.5 W / 5 VA (AC 230 V, AC 110V, AC 400 V), 1.4 W / 2 VA (AC/DC 24 V)
Max. dissipated power (Un + terminals):	4 W (110 V, 230 V, 400 V); 3 W (24 V)
Supply voltage tolerance:	-15 %; +10 %

Measuring circuit

Hysteresis (input - opening):	in an adjustable range 5 kΩ - 100 kΩ
Voltage on electrode:	max. AC 3.5 V
Current in probes:	AC < 1 mA
Time reaction:	max. 400 ms
Max. cable capacity:	800 nF (sensitivity 5kΩ), 100 nF (sensitivity 100 kΩ)
Time delay t:	adjustable 0.5 -10 sec

Accuracy

Setting accuracy (mech.):	± 5 %
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Output

Number of contacts:	2x changeover / SPDT (AgNi / Silver Alloy)
Current rating:	16 A / AC1
Breaking capacity:	4000 VA / AC1, 384 W / DC
Inrush current:	30 A / < 3 s
Switching voltage:	250 V AC / 24 V DC
Output indication:	red LED
Mechanical life:	3x10 ⁷
Electrical life (AC1):	0.7x10 ⁵

Other information

Operating temperature:	-20 °C to 55 °C (-4 °F to 131 °F)
Storage temperature:	-30 °C to 70 °C (-22 °F to 158 °F)
Electrical strength:	4 kV (supply - output)
Operating position:	any
Mounting:	DIN rail EN 60715
Protection degree:	IP40 from front panel / IP20 terminals
Overvoltage category:	III.
Pollution degree:	2
Max. cable size (mm ²):	solid wire max. 1x 2.5 or 2x1.5 / with cavern max. 1x 1.5 (AWG 12)
Dimensions:	90 x 52 x 65 mm (3.5" x 2" x 2.6")
Weight:	8.7 oz (247 g) (110V, 230V, 400V); 5.1 oz (145 g) (24 V)

Any measuring probe suffices. Due to constant contact with fluid we recommend:
Measuring probes:

- Level probe SHR-1-M - brass probe, Level probe SHR-1-N - stainless steel probe
- probes designed for monitoring flooding
- Level probe SHR-2
- stainless steel probe certified for drinking water, which in combination with an adequate assessment device used for detecting levels e.g. in wells, boreholes, tanks
- in plastic case sealed with bushing P67
- Level probe SHR-3
- stainless steel designed for use in harsh and industrial environments, designed to be secured to the wall or tank lid with screws.
- Three-wire cable D03VV-F 3x0.75/3.2
- cable for probes SHR-1 and SHR-2, 3x 0.75 mm² certified for drinking water, 1 m
- Wire D05V-K 0.75/3.2
- wire for probes SHR-1 and SHR-2, 1x 0.75 mm² certified for drinking water, 1 m

Warning

Device is constructed for connection for 1-phase main or DC circuits (according to types, it is necessary to observe voltage ranges) and must be installed in accordance with regulations and standards applicable in a country of use. Installation, connection and setting can be done only by a person with an adequate electro-technical qualification which has read and understood this instruction manual and product functions. The device contains protections against over-voltage peaks and disturbing elements in the supply main. To ensure correct function of these protection elements it is necessary to front-end other protective elements of higher degree (A, B, C) and screening of disturbances of switched devices (contactors, motors, inductive load etc.) as it is stated in a standard. Before you start with installation, make sure that the device is not energized and that the main switch is OFF. Do not install the device to the sources of excessive electromagnetic disturbances. By correct installation, ensure good air circulation so the maximal allowed operational temperature is not exceeded in case of permanent operation and higher ambient temperature. While installing the device use screwdriver width approx. 2 mm. Keep in mind that this device is fully electronic while installing. Correct function of the device is also depended on transportation, storing and handling. In case you notice any signs of damage, deformation, malfunction or missing piece, do not install this device and claim it at the seller. After operational life treat the product as electronic waste.