

ALR 20/A Ex relay

50/60 Hz



ALR 20/A Ex relay 50/60 Hz

Installation and operating instructions

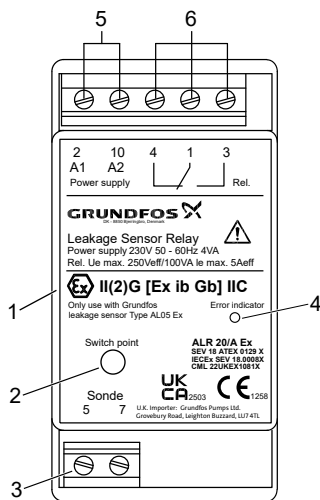
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2. Product introduction

2.1 Product description



TM083471

ALR 20/A Ex relay

Pos.	Designation
1	ALR 20/A Ex housing
2	Adjusting screw (Switch point)
3	Leakage sensor connections
4	Indicator light (Error indicator)
5	Power supply connections (L, N)
6	Relay connections

2.2 Applications

The leakage sensor relay ALR 20/A Ex functions together with the leakage sensor AL05 Ex as a leakage detection system for a submerged mixer, flowmaker or recirculation pump.

The ALR 20/A Ex is installed outside of the wet area, the leakage sensor AL05 Ex is installed in a submerged mixer, flowmaker or recirculation pump, and wired to the ALR 20/A Ex.

In case of defective sealing, the penetrating water is detected by the sensor, and further damages can be avoided.

2.3 Intended use

The ALR 20/A Ex is used together with the leakage sensor AL 05 Ex to monitor the sealing of a submerged mixer, flowmaker, or recirculation pump.

Specific conditions of use

The ambient temperature range of the ALR 20/A Ex is $-20\text{ °C} \leq T_{amb} \leq 40\text{ °C}$.

The ambient temperature range of the AL 05 Ex is $-20\text{ °C} \leq T_{amb} \leq 85\text{ °C}$.

2.4 Approvals

The product has been tested by Eurofins.

2.4.1 Ex approval standards

Leakage sensor relay ALR 20/A Ex marking

 II (2)G [Ex ib Gb] IIC

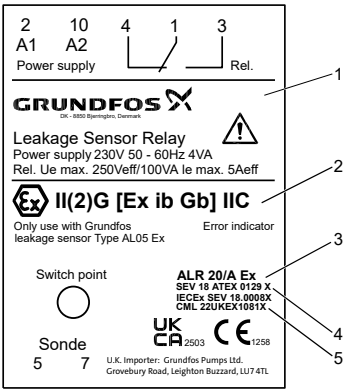
Leakage sensor AL05 Ex marking

 II 2G Ex db ib IIC T4 Gb

IECEX certificate No.: IECEX SEV 18.0008X

Directive/ standard	Code	Description
ATEX		The equipment conforms to the harmonised European standard.
	II	Equipment group according to the ATEX directive, defining the requirements applicable to the equipment in this group
	2	Equipment category according to the ATEX directive, defining the requirements applicable to the equipment in this category
	G	Explosive atmospheres caused by gases, vapours or mists
Harmonised European standard	Ex	Marking of explosion protection
	db	The leakage sensor can be part of flameproof enclosure according to EN 60079-1.
	ib	Intrinsic safety according to EN 60079-11
	IIC	Classification of gases, see EN 60079-0. Gas group C.
	T4	The maximum surface temperature is 135 °C.
	Gb	Equipment protection level. This product is suitable for zone 1 or zone 2.

2.5 Nameplate



Nameplate of the ALR 20/A Ex relay

Pos.	Description
1	Manufacturer
2	Ex description
3	Type identification
4	Certificate numbers (ATEX/IECEX)
5	Certificate number UKEX

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3. Receiving the product

When receiving the product, check the following points:

- The product corresponds to the order.
- The product is suitable for the actual supply voltage.
- The product does not have any transport damage. In case of any damage, contact the transporter immediately.

4. Installing the product



The ALR 20/A Ex must only be used together with leakage sensor type AL05 Ex.



Installation must be carried out by qualified persons only.

CAUTION

Electric shock

Minor or moderate personal injury



- Switch off the power supply before working on the product.
- Make sure that the power supply cannot be switched on unintentionally.

4.1 Mechanical installation



The ALR 20/A Ex relay itself is not explosion protected, and it is forbidden to install it in a potentially explosive environment.

The ALR 20/A Ex must be connected to the explosion-proof leakage sensor type AL 05 Ex so that they form a function unit where the ALR 20/A Ex is part of the explosion protection of the sensor.



The AR 20/A Ex must be installed in a way that the minimum protection class of IP54 is fulfilled according to EN 60529.



The ambient temperature of the installation site must not exceed 40 °C.

During installation, the sensitivity of the seal monitoring is defined by the setting of the switch point. This setting eliminates disturbing effects such as cable length to the sensor, type of gear oil, ambient temperature and others.

The ALR 20/A Ex can be fitted on a DIN EN-mounting rail TS 35 on side-by-side with 10 mm clearance.

The ALR 20/A Ex must be installed in the control cabinet:

1. Slide the ALR 20/A Ex onto a rail to the correct position.



The ALR 20/A Ex is equipped with a mounting bracket that fits only to a 35 mm width mounting rail.

2. Connect the wires according to the instructions in Electrical connection.
3. Carry out the electrical connection. See also Technical data.

4.2 Electrical connection

CAUTION

Electric shock

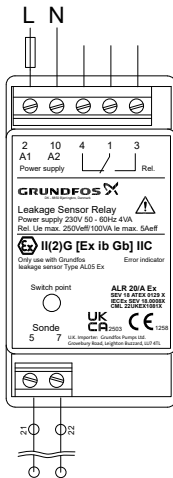
Minor or moderate personal injury



- Switch off the power supply before working on the product.
- Make sure that the power supply cannot be switched on unintentionally.
- A fuse has to be integrated into the power supply circuit. Use a 250 VAC, 0.032 A fine-wire fuse (slow-acting) according to IEC 60127.
- The whole cabinet, which the ALR 20/A Ex and its fuse are parts of, must be equipped with a circuit breaker according to IEC 60947-2 or an equipment switch according to IEC 60947-3.

Carry out the electrical connections according to local regulations.

For all electrical connections, see fig. Electrical connections.



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Electrical connections

Terminal	Function
2 (A1)	Power supply (L - phase)
10 (A2)	Power supply (N - neutral)
1-3; 1-4	Relay outputs
5-7 (clamp light blue)	Sensor

4.2.1 Connection of main power supply

The power supply must be connected with terminal 2 and 10 according to the label on the cover. Use adequate wires for the main power supply.

4.2.2 Connection of relay contacts

The change-over switch acts as the output signal. According to the marking of the maximum switching current is 5 A.

Relay outputs

Operation	Relay function
No leakage detected	Relay contact 1-4 closed Relay contact 1-3 open
Leakage detected	Relay contact 1-4 open Relay contact 1-3 closed

4.2.3 Leakage sensor connections

If the feed cable is extended, follow the ATEX-directives, standards EN 60079-11 and EN 60079-14 to maintain the intrinsic safe circuit.



For intrinsically safe and non-intrinsically safe circuits the clamp connections must be separated and marked clearly. The operator must make sure that all installation works are according to the relevant standards.

The sensor cable leads 21 and 22 must be connected to the light blue terminal 5 and 7. For additional extension, a screened cable should be used. The maximum length of the cable from the ALR 20/A Ex to the leakage sensor is 50 m.

As an alternative to forward the signal over longer distances (> 50 m), use the potential-free outputs (terminal 1 and 4).

4.2.4 Setting the switch point

CAUTION

Electric shock

Minor or moderate personal injury



- When the power supply is on, the settings of the switch point must only be conducted with a suitable and isolated tool.

The switch point must be set after every connection or re-connection of the leakage sensor to the ALR 20/A Ex.

Proceed as follows, see fig. ARL 20/A Ex Relay:

1. Turn the adjusting screw (2) on top of the ALR 20/A Ex housing counter clockwise until the indicator light (4) is on (indicator light signalling a fault).
2. Turn the adjusting screw (2) slowly in the opposite direction until the indicator light (4) is off.
3. Continue turning the adjusting screw (2) approximately a quarter (from 60° to 90°) in the same direction as under step 2.

4.2.5 Testing the leakage sensor

Two wires lead from ALR 20/A Ex to the sensor. They supply the sensor and also lead a variable current signal, depending on the amount of water in the gear oil. This current, measured by the ALR 20/A Ex, decreases as the amount of water in the oil increases and is compared with a manually adjustable switch point. If the limit of this switch point is exceeded, the relay switches to "error" mode.

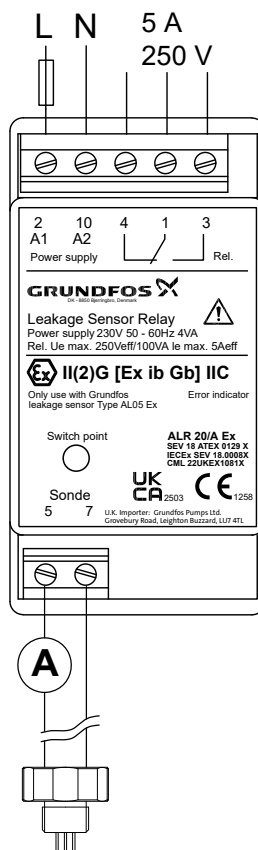
In case of a short circuit or a cable break, the relay automatically switches to "error" mode.

Testing with connected ALR 20/A Ex

To test the status and functionality of the leakage sensor and the ALR 20/A Ex, the current flowing through the sensor must be measured. See fig. ALR 20/A Ex wiring for testing.

The table below helps to make a conclusion depending on the current measured:

Current [mA]	Meaning	Cause	Relay status
< 0.5	No floating current	Break of power cable	Error
0.5 - 5	Low current	Sensor detects water in oil	Error
5-11	Normal current	Sensor detects few water or no water in oil	Depends on the switch point setting.
> 11	Too high current	Short circuit in power cable	Error



ALR 20/A Ex wiring for testing

4.2.6 Radio frequency radiation exposure information (for Canada and US only)

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

5. Starting up the product



Startup must be carried out by authorised persons only.

Switch on the power supply, and check that the signal is as expected (5 mA for 0 % water). If the signal is ok, the system is ready for operation.

6. Operating the product

For operation, supply the indicated voltage to the ALR 20/A Ex relay. To integrate the ALR 20/A Ex relay into the motor control, use the switching contacts (1, 3, 4). During normal operation, the intern relay turns on and off, and controls the pins 1, 3 and 4.

In case of a fault (water is detected in the oil, cable break of the switch, short circuit of the cable or power failure) the relay is activated and controls the pins 1, 3 and 4.

A device fault is indicated by an illuminating diode on the front panel of the ALR 20/A Ex, see fig. ARL 20/A Ex Relay, pos. 4. It is possible to draw an external fault signal over pins 1 and 3 (closed in case of fault).

When the fault is eliminated, the product restarts automatically and returns to normal operation. Non-automatic restart of the motor must be made by settings in the control.

7. Storing the product



Moisture inside the packaging can damage the electrical connections.

Store the product in the original packaging to protect it against moisture and heat.

Storage temperature: -20 to +40 °C.

After long periods of storage, carry out a visual inspection of the product to make sure that there is no moisture inside the packaging.

8. Servicing the product

The ALR 20/A Ex requires no maintenance. It may only be cleaned with a dustless cloth.

8.1 Replacing the product

Replace the ALR 20/A Ex in case of a fault.

WARNING

Electric shock

Death or serious personal injury



- Switch off the power supply before working on the product.
- Make sure that the power supply cannot be switched on unintentionally.

9. Technical data

9.1 Operating conditions of ALR 20/A Ex

Ambient temperature	-20 to +40 °C
Relative humidity	Maximum 95 % (no condensation)
Installation altitude	Maximum 2000 m above sea level

9.2 Electrical data of ALR 20/A Ex

Nominal operating voltage	230 VAC
Permitted voltage tolerance	-15 to +10 %
Frequency	50/60 Hz
Power input	Approximately 4 VA
Power transformer	According to EN 61558-1/EN 61558-2-6, it must be short-circuit proof: VDE, SEV mark of conformity
On time	100 %
Air gaps and leakage distance	Mains/relay output, according to EN 60664-1 Leakage distance: 12 mm
Overvoltage category	Category II
Rating surge voltage	4 kV
Interference emission	According to EN 61000-6-4
Immunity to interference	According to EN 61000-6-2
Relay output	1 change-over switch, potential-free
Insulation test voltage	Inductor contact 5 kV AC Surge 10 kV ($1.2 \times 50 \mu\text{s}$)
Maximum switching voltage	250 VAC / 24 VDC
Maximum switching current	5 A
Maximum switching capacity	100 VA / 100 W
Electrical life cycle	100 000 switching cycles at maximum load
Mechanical life cycle	20 000 000 switching cycles

Connections	Conductor cross-section stranded wire 2.5 mm ² , single-wired 4 mm ²
Enclosure class	IP20 according to EN 60529. In order to meet the requirements of Pollution Degree 2, install ALR 20/A Ex in a protected environment with enclosure class IP54 or better, according to IEC 60529. The cabinet must be of a flame-retardant material.
Leakage sensor circuit	Intrinsically safe according to EN 60079-11. [ib Gb] IIC U _o = 15.8 V I _o = 125 mA C _o = 0.478 µF L _o = 12 µH

9.3 Dimensions and weights

Dimensions

Dimensions include the mounting bracket.

Height	Width	Depth
96 mm	49 mm	50 mm

Weight

Product weight: 0.175 kg.

10. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way.

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.



The crossed-out wheeled bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

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