ENGINEERING
TOMORROW

Installation guide/Quick start

Liquid Level Switch

Type LLS 4000 / LLS 4000U

089

148R9650

Warning! This is a Class A device. This device may cause radio interference in residential areas. In case of interference, the operator may be required to take appropriate measures. This instrument has to be mounted on a metallic tank. The device is intended to be used in industrial areas.

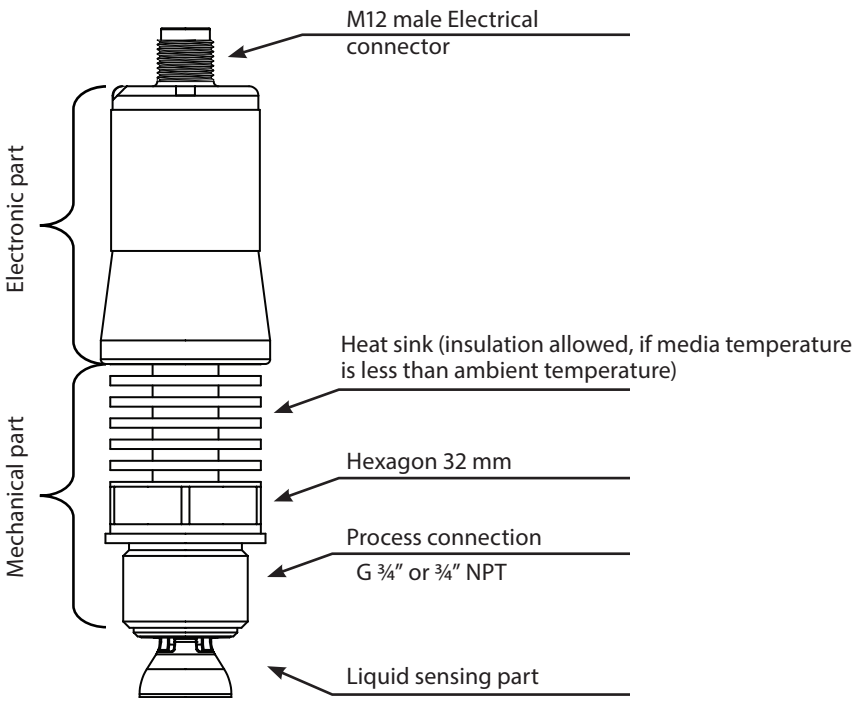


Fig. 1

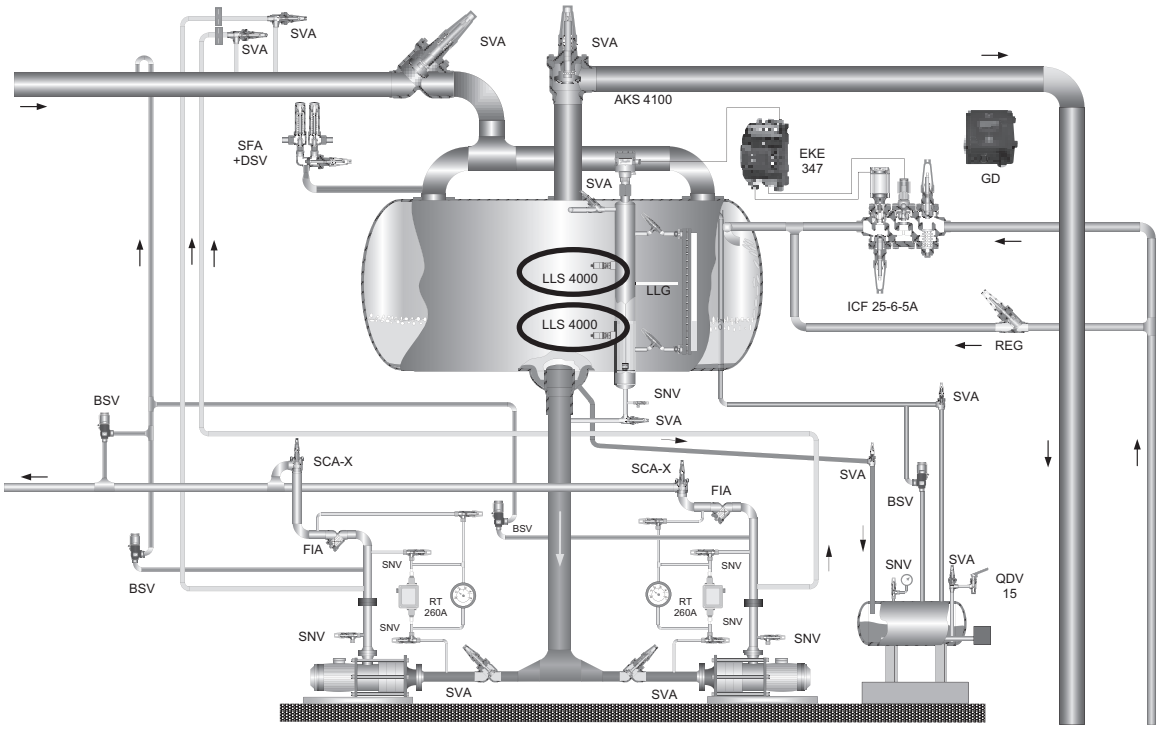


Fig. 2

148R9650

Импортер:ТОВ з ii "Данфосс ТОВ" 04080, Київ 80, п/с 168, Україна

Info for UK customers only:Danfoss Ltd., 22 Wycombe End, HP9 1NB, GB

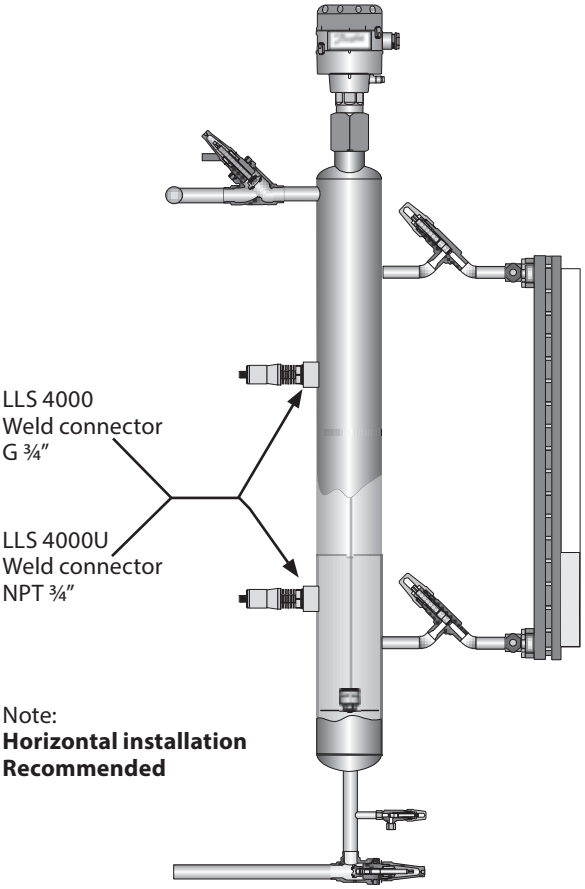
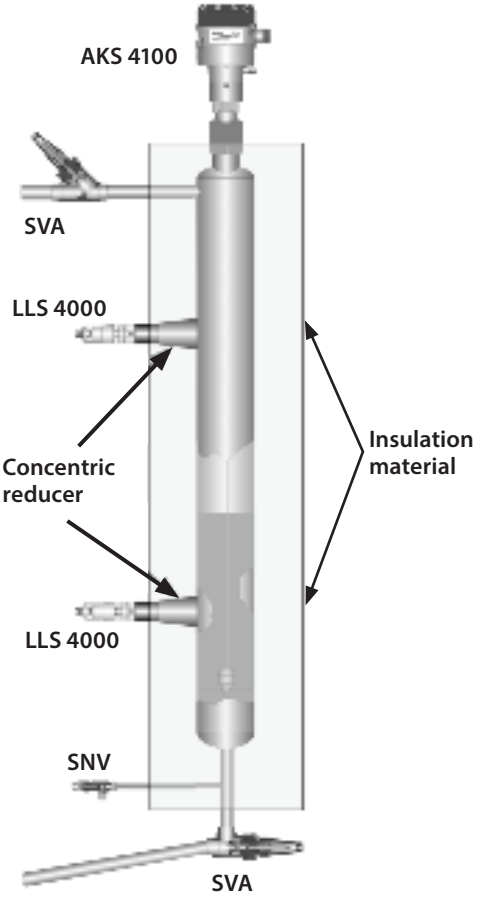
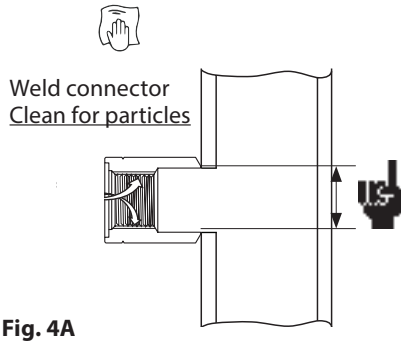


Fig. 3A



To prevent the LLS4000 from being covered by insulation material (e.g., in low-temperature applications), we recommend using a concentric reducer (e.g., DN32-DN50) between the standpipe and the LLS4000 weld nipple, as shown in the sketch.

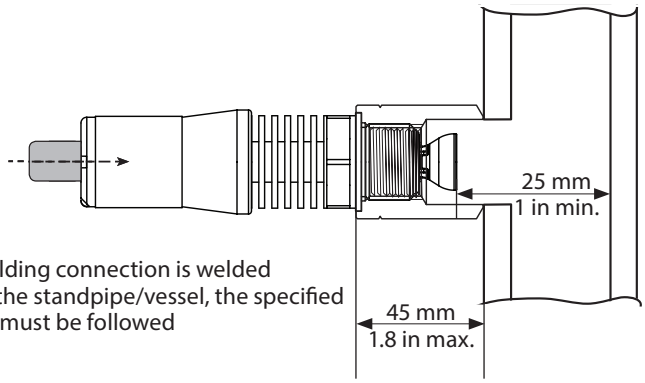
Fig. 3B



Min. Ø30mm uniform hole, with no size reduction

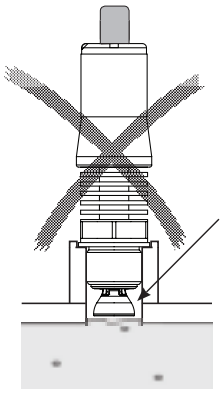
Observe:
Important to ensure the free flow of liquid to LLS 4000/4000U

Fig. 4A



When a welding connection is welded directly to the standpipe/vessel, the specified dimension must be followed

Fig. 4B



Note:
Vertical or inclined installation is not recommended.
Risk of Gas Pockets

Fig. 5

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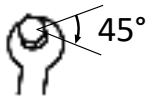
Keep the sensor assembled during both electrical and mechanical installation. Disassemble electronic and mechanical parts only if necessary during service.

Torque (LLS 4000 with G ¾" and alu gasket)
10 Nm/7.4 lb ft pre-tightening + 45 degrees clockwise rotation



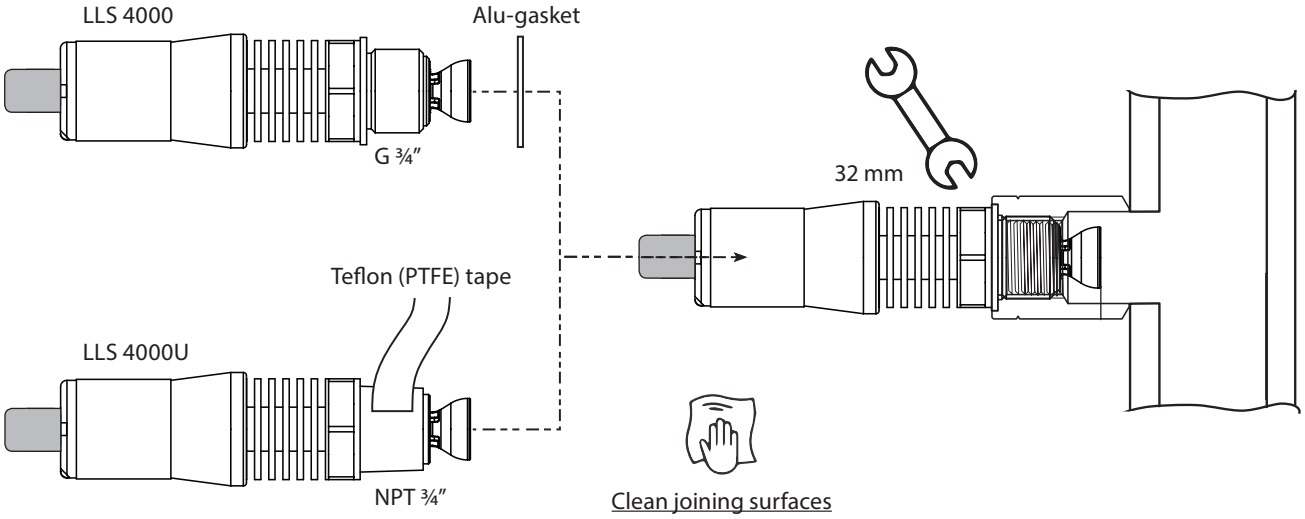
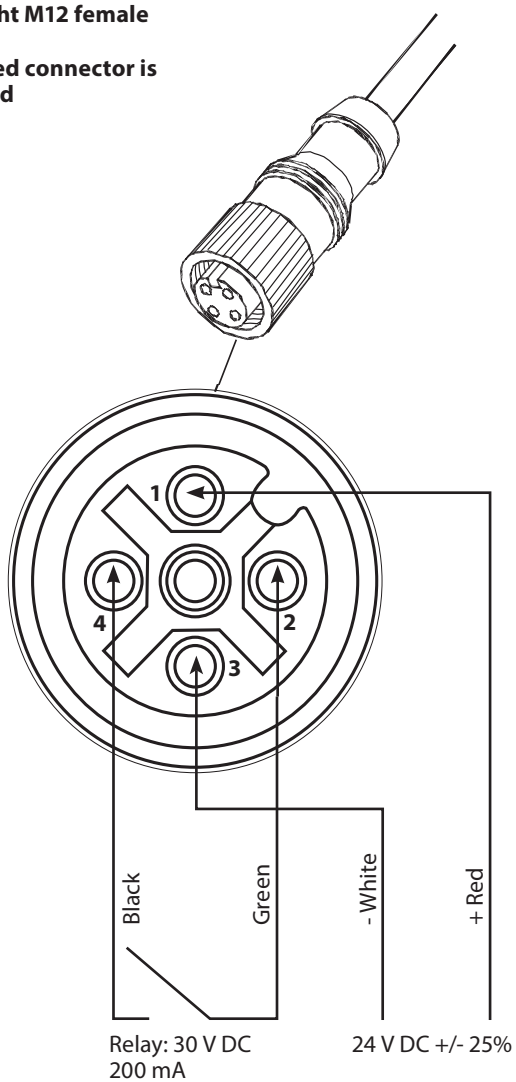
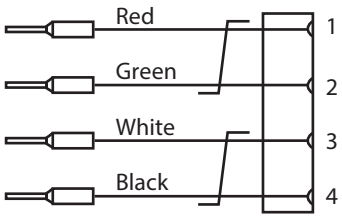


Fig. 6

Cable with straight M12 female connector.
Cables with angled connector is not recommended

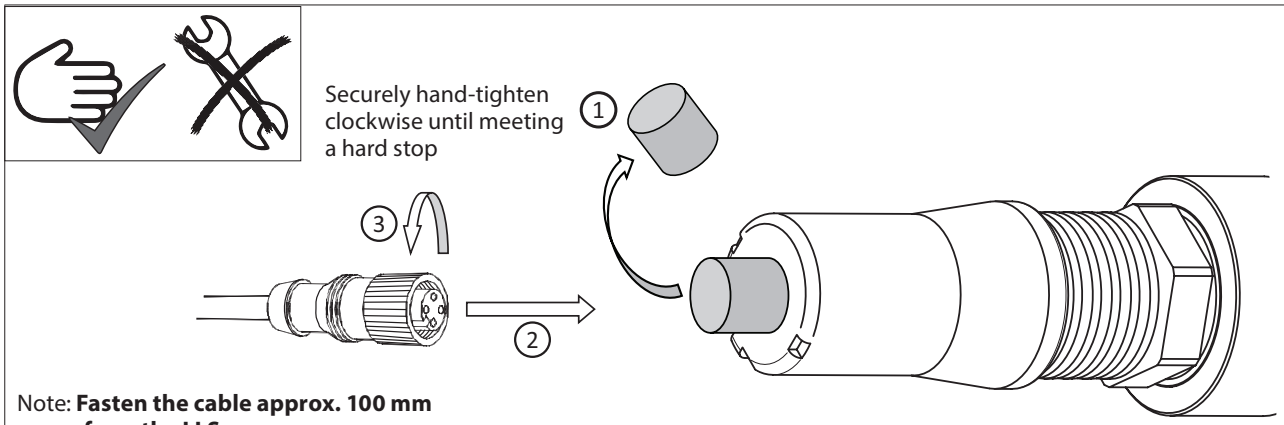


Color code M12 cable



Danfoss M12 cables
034G2201, straight M12 cable female x 2 meter
034G2200, straight M12 cable female x 8 meter
Cables not included with LLS 4000/4000U

Fig. 7



Note: **Fasten the cable approx. 100 mm from the LLS**

Fig. 8

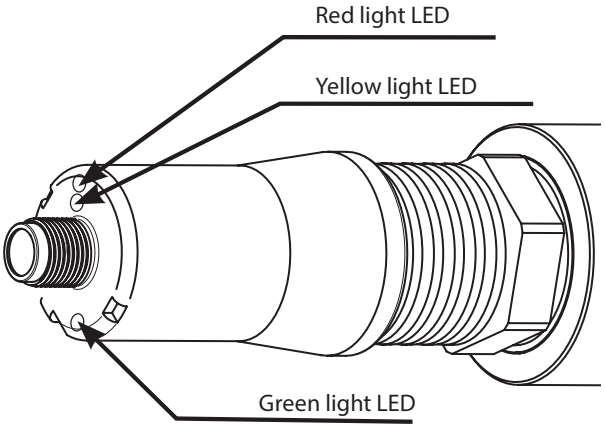


Fig. 9

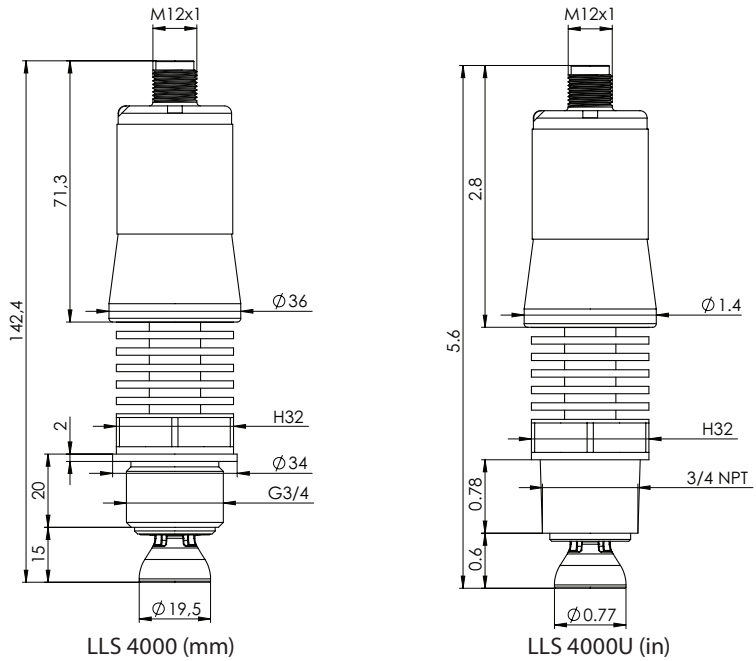


Fig. 10

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	Level	Open at no Liquid (Normally Open)*	Closed at no Liquid (Normally Closed)*	Voltage connected	Level detection	LLS 4000/4000U Fault
				Green LED	Yellow LED	Red LED
High Level sensor			SIL2 fixed configuration	●		
High Level sensor		1)		●	●	
Low Level sensor				●	●	
Low Level sensor			2)	●		
Voltage supply outside spec.	–					
LLS 4000/4000U fault**	–			●	●***	●

●	Green LED ON	●	Yellow LED ON	●	Red LED ON	✳	Green LED Flashing. LLS 4000/4000U connected to Bluetooth device

* Configuration dependent. Non-SIL2 fully configurable. SIL2 fixed configuration and only applicable for High Level sensor
** For failure types please connect the device to the Bluetooth App, enter fault state mode, and read the failure type
*** Fault can be detected at any detected level, ie. 2 or all 3 lights on

Not recommended in these applications because
1) A High Level Alarm may not be registered at a power failure
2) A Low Level Alarm may not be registered at a power failure

General specifications

Electrical data		
Supply	24 V DC +/-25%, 80 mA Standard power supply of type: SELV (Safety Extra Low Voltage) with current limit of max. 8A.	
Relay (Solid state)	Max 30 V DC, 200 mA. Same power supply as to supply can be used. Observe: In applications with request for SIL2, another separate SELV power supply may be needed.	
	Min. cycles: 1.000.000 Default delay between detection and relay switching: PV (Product Version) All SIL devices, regardless of PV: 1 second All non-SIL, PV02: 1 second All non-SIL, PV03 or greater: 2 seconds Product Version number can be found on product label. Actual delay highly influenced by media viscosity and shall be validated before commissioning.	
Mechanical Data		
Max. medium viscosity	5000 cP (Un-detection is delayed up to 20 seconds)	
Max. working pressure	140 bar (2030 psi)	
Ambient temperature range	-40 °C to +65 °C (-40 °F to +149 °F)	
Medium temperature range	-50 °C to +120 °C (-58 °F to +248 °F). Observe restrictions on saturation temperature for approved medias	
Operating environment	Pollution degree 3, altitude 2000 max., outdoor use Relative humidity RH4 to RH99 % (IEC 60721-3-4: 1995 Class 4K4)	
Connection type	G ¾ in. or NPT ¾ in.	
Weight	350 g (0.77 lbs.)	
Approved media		
Detection of specific refrigerants and oils • Ammonia • Listed H(C)FCs and HFOs • Oils • Detection of oil in ammonia plants, in e.g. oil collector/pot. Can detect change of state between Ammonia Liquid and Oil [3] **NOTE:** For other medias and mixed medias, please contact Danfoss	**Media**	**Saturation temperature range**
	R717 (Ammonia)	-50 °C – +105 °C (-58 °F – +221 °F)
	R717 (Ammonia Liquid)/Oil [3]	-50 °C – +105 °C (-58 °F – +221 °F)
	R22 (HCFC)	-50 °C – +86 °C (-58 °F – +187 °F)
	R507A (HCFC)	-50 °C – +60 °C (-58 °F – +140 °F)
	R134a (HFC)	-50 °C – +91 °C (-58 °F – +196 °F)
	R404A (HFC)	-50 °C – +63 °C (-58 °F – +145 °F)
	R407A (HFC)	-50 °C – +72 °C (-58 °F – +162 °F)
	R410A (HFC)	-50 °C – +61 °C (-58 °F – +142 °F)
	R513A (HFC)	-50 °C – +83 °C (-58 °F – +181 °F)
	R1234ze(E) (HFO)*	-50 °C – +85 °C (-58 °F – +185 °F)
	PAO (Oil)**	Max 5000 cP and +120 °C (Max 5000 cP and +248 °F)
	POE (Oil)**	Max 5000 cP and +120 °C (Max 5000 cP and +248 °F)
	Mineral (Oil)**	Max 5000 cP and +120 °C (Max 5000 cP and +248 °F)
Approvals	CE: PED, EMC, RED, RoHS, LVD CRN SIL2 FCC IC UA CMIIT ANATEL [1] NBTC [2]	

* R1234ze(E) with POE oils (miscible)

** When detecting oils in Ammonia, H(C)FC and HFO systems, the refrigerant gas temperature above the oil must be lower than 80 °C

[1] Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados. Para maiores informações, consulte o site da ANATEL – www.anatel.gov.br.

[2] เครื่องโทรคมนาคมและอุปกรณ์นี้มีความสอดคล้องตามมาตรฐานหรือข้อกำหนดทางเทคนิคของ กสทช.
This telecommunication equipment conforms to the technical standards or requirements of NBTC.

[3] Observe: This application can only be used on non-SIL2 sensors. I.e. code numbers 084H6001 / 084H6003.
Select: Hybrid media detection\Ammonia Liquid/Oil (Mineral/Synthetic) in CoolConfig App.

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LLS Bluetooth app download

Download "**CoolConfig Mobile**" via Google Play and App store

1

2

Search for **CoolConfig**

3

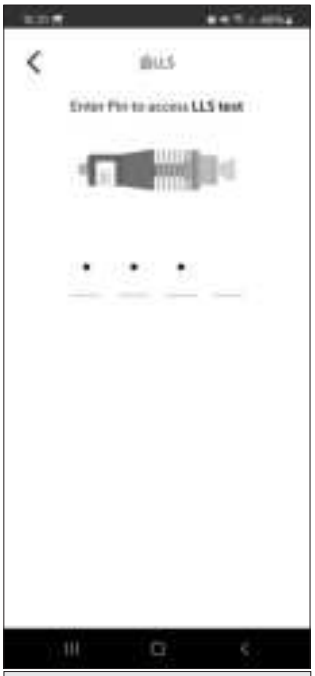
Download

Observe!
Always download or update to latest App version

Configuration

Press the "Start scanning"

Choose LLS



Enter the password: 0000

Window "Status"

Window "Alarm"

Window "Service"
Login password: 12131400

Advanced setup

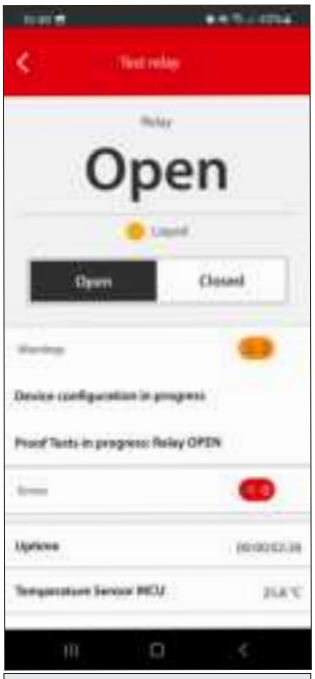
Media type

Configuration continued

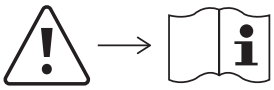
Switch state

Manually Test Relay

Relay Closed



Relay Open



Read and apply safety instructions contained in product documentation.

Direct current.

General warnings/precautions

- Every use that is not described in this guide is considered incorrect and is not authorized by the manufacturer.
- The LLS device should only be used with approved media listed under **General specifications**. Use with other medias must be validated by Danfoss before installation.
- Verify that the installation and operating conditions of the device respects those specified in this guide, especially concerning the supply voltage and environmental conditions.
- All service and maintenance operations must be performed by qualified personnel.
- Installation must comply with local standards and legislation.
- Before carrying out any maintenance operations on the device, disconnect the device from the main power supply.
- Before unscrewing the LLS device from the pipe or tank ensure that pipe or tank is empty and not under pressure.
- Liability for injury or damage caused by incorrect use of the device lies solely with the user.
- Depending on the application, the metallic part of the instrument may be hot or cold.
- If media detection or non-detection by the level switch could generate a hazard the SIL version and specific instructions described in the safety manual (periodic proof test) should be used. The SIL safety manual can be downloaded from Danfoss web site or by scanning the QR code below.

For further documents (Data sheet, SIL2 safety manual etc.) scan this QR code:

Danfoss A/S, 6430 Nordborg, Denmark
www.danfoss.com

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