Installation guide/Quick start

Liquid Level Switch
Type LLS 4000 / LLS 4000U

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
LLS 4000 Weld connector G ¾"

LLS 4000U Weld connector NPT ¾"

Note: Horizontal installation Recommended

Weld connector
Clean for particles

uninterrupted hole size
no reduction

Torque (LLS 4000 only):
10 Nm/7.4 lb ft pre-tightening + 45 degrees clockwise rotation

Clean joining surfaces

45°

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

32 mm

max
45 mm
1.8 in

min
25 mm
1 in

LLS 4000
Alu-gasket

G ¾"

Teflon (PTFE) tape

LLS 4000U

NPT ¾"
Cable with M12 female connector

Relay: 30 V DC
200 mA
24 V DC +/- 25%

Color code M12 cable
Red
Green
White
Black
1
2
3
4

Danfoss M12 cables
034G7073, M12 cable female x 2 meter
034G7074, M12 cable female x 8 meter
Cables not included with LLS 4000/4000U

Note: Fasten the wire approx. 100 mm from the LLS

Fig. 7

Hand-tighten clockwise

Fig. 8
### Level Detection and Faults

<table>
<thead>
<tr>
<th>Level</th>
<th>Open at no Liquid (Normally Open)*</th>
<th>Closed at no Liquid (Normally Closed)*</th>
<th>Voltage Connected</th>
<th>Level Detection</th>
<th>LLS 4000/4000U Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Level sensor</td>
<td><img src="image1" alt="Diagram" /></td>
<td><img src="image2" alt="Diagram" /></td>
<td>Green LED</td>
<td>Yellow LED</td>
<td>Red LED</td>
</tr>
<tr>
<td>High Level sensor</td>
<td><img src="image3" alt="Diagram" /></td>
<td><img src="image4" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Level sensor</td>
<td><img src="image5" alt="Diagram" /></td>
<td><img src="image6" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Level sensor</td>
<td><img src="image7" alt="Diagram" /></td>
<td><img src="image8" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage supply outside spec.</td>
<td><img src="image9" alt="Diagram" /></td>
<td><img src="image10" alt="Diagram" /></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LLS 4000/4000U fault**</td>
<td><img src="image11" alt="Diagram" /></td>
<td><img src="image12" alt="Diagram" /></td>
<td></td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>

* 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, i.e. 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 (Separated Extra Low Voltage) with current limit of max. 8 A. |
|--------|-----------------------------------------------------------------------------------------------------------------------------------|
| 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.  
Max. cycles: 1.000.000 |

#### Mechanical Data

<table>
<thead>
<tr>
<th>Max. medium viscosity</th>
<th>5000 cps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. working pressure</td>
<td>65 bar (943 psi)</td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>-40 °C to +65 °C (-40 °F to +149 °F)</td>
</tr>
<tr>
<td>Medium temperature range</td>
<td>-50 °C to +120 °C (-58 °F to +248 °F)</td>
</tr>
<tr>
<td>Operating environment</td>
<td>Pollution degree 3, altitude 2000 max., outdoor use</td>
</tr>
<tr>
<td>Connection type</td>
<td>G ¾ in. or NPT ¾ in.</td>
</tr>
<tr>
<td>Weight</td>
<td>350 g (0.77 lbs.)</td>
</tr>
</tbody>
</table>

#### Approved media

**Refrigerants**

- R717/NH3 (Ammonia): -50 °C to +105 °C (-58 °F to +221 °F)
- R22: -50 °C to +86 °C (-58 °F to +187 °F)
- R404A: -50 °C to +63 °C (-58 °F to +145 °F)
- R410A: -50 °C to +61 °C (-58 °F to +142 °F)
- R134A: -50 °C to +91 °C (-58 °F to +196 °F)
Fig. 10

LLS 4000 (mm)

LLS 4000U (in)
LLS Bluetooth app download

1. Download from Google Play or App Store.

2. Search for LLS 4000.

3. Install app.

4. Open app and press "Scan" to view available devices.

Configuration

1. Press scan to view available devices.

2. Searching...

3. Select LLS 4000 from available devices.

4. Enter pin code: 0000.

5. Access device configuration and settings.

6. Configure device settings.

Pin code: 0000

Configurable

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Password: 12131400
In Service menu a unique password for Service menu can be entered.
- Go to menu upper right
- Go login
- Go to settings
- Go to Service Password
- Enter new Service Password

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: