Danfoss PR-SOLO Monitoring Unit Installation Guide

Contents

Danfoss PR-SOLO Monitoring Unit

This document illustrates the PR-SOLO installation and association activities into an equippment. This document only describes the installation made in the final location of the device.
The installation made during the production of the equipment (that will be moved after in a new location) is not covered by this manual.

How the SOLO works

PR-SOLO device is an IoT Enabler. The main features of PR-SOLO are temperature recording and position tracking of the equipment in which it is installed without any wiring operation. PR-SOLO has been realized as a battery operated device with possible to replace them when exhausted.

Before the installation on the equipment, the operator needs to perform the activation procedure. At the end of the activation phase the device starts sending data to the Alsense system with the configured frequency.
Failure to perform correctly the pairing procedure will render the data gathered by the PR-SOLO irrelevant for the purpose of the tracking, hence, following the steps indicated in this document is critical.

To maximize the capability of the device to send the data, two transmission technologies are used by the device: Mobile communication and Wi-Fi communication. The mobile communication is provided with an embedded modem andan international SIM, while the Wi-Fi communication must be provided and configured by the customer. Thus, it is important to provide a Wi-Fi hotspot and configure it.

Identification

The following products are available:

Type	Description	Code no.
PR-SOLO	PR-SOLO H Global 1N	300B5035
PR-SOLO	PR-SOLO H GPS Global 1N	300B5040

Warnings

- The installation of the PR-SOLO has to be performed only and exclusively by qualified and skilled technicians.
- Inside the device there is an antenna. For this reason, while the PR-SOLO is working it must be at the minimum distance of 9.5 cm (4”) from people. The installation must be done to ensure this distance.
- Any document related to the conformity declaration of the PR-SOLO can be downloaded from **www.danfoss.com**
- This equipment is not suitable for use in locations where children are likely to be present.
- The device must be installed at a height of less than 2 m.
- Risk of explosion if the battery is replaced by an incorrect type.
- Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery, that can result in an explosion.
- Leaving a battery in an extremely high temperature surrounding environment that can result in an explosion or the leakage of flammable liquid or gas.
- A battery subjected to extremely low air pressure that may result in an explosion or a leakage of flammable liquid or gas.

Installation

The PR-SOLO can be installed in a very simple way because it does not require any electrical connection to the equipment.
Find suitable position to install the PR-SOLO.
Firstly, it is necessary to find the best position where to fix the device. There are 2 main options:

1. Outside the equipment: this is the best option to have reliable communication and position fixing by GNSS (GPS/GLONASS/Galileo). If the PR-SOLO is installed outside, the internal temperature cannot be monitored.
2. Inside the equipment: this will allow to monitor the internal temperature, but it requires to configure the Wi-Fi connectivity and/or check the mobile network availability.

Outside the equipment
The best position to install the PR-SOLO is above the cabinet in the top position. The top position allows the PR-SOLO to have the best chances to fix the position and to be able to transmit (with both Wi-Fi and Mobile). If the roof of the equipment is flat, then the PR-SOLO can be installed in any position on the roof. Otherwise, if some metallic obstacle(s) can shield the mobile signal, then the PR-SOLO must be placed in the farthermost position respect to the metallic obstacles. The PR-SOLO must be placed with the label facing up.

Before positioning the PR-SOLO, activate it and check the mobile signal. In case of transmission problems, it is strongly suggested to configure the Wi-Fi.

Inside the equipment
The most important thing is to check if the equipment shields the PR-SOLO communication. The chosen position should also allow the opening of the device’s battery compartment for future replacements. Hence, the following

procedure is suggested to find the right position on the equipment/fridge.

Fig. 1: The suggested fixing positions to be verified in a vertical fridge.

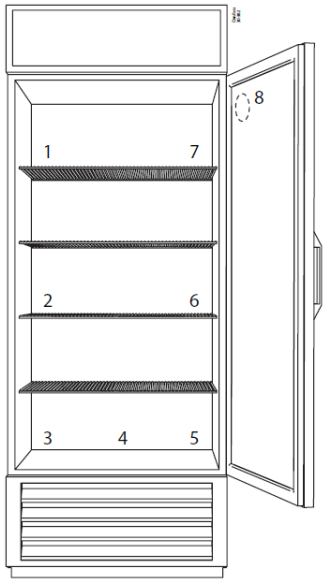
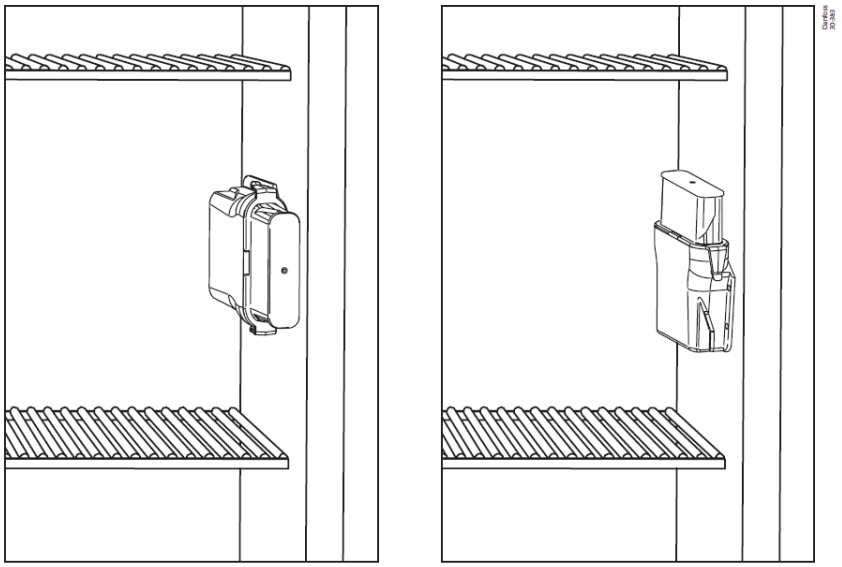


Fig. 2: The suggested orientations to be verified in any of the positions shown in Fig. 1.



Installation procedure

The following procedure is suggested for the installation. Please refer also to the Alsense application user manual for further details on the app (link when available):

1. Wake-up the PR-SOLO with the magnet (see Fig. 3).
2. Start the “IoT enabler installation” procedure in smartphone application.
3. Connect to the PR-SOLO (in case use device barcode option in the application.)
4. Check signal: with the smartphone application if there is a sufficient mobile signal in the location (green or orange). If the signal is not enough (red) then go directly to the Wi-Fi configuration step (push “next” button))
5. Try position: Temporary fix the PR-SOLO in the position to be checked, and with the smartphone application read the signal pressing the “refresh” button.
6. Found position: The position with a good power signal for the mobile network (green or orange) can be chosen for the definitive installation.
7. Retry: Otherwise check another position if available.
8. Not Found: If all the positions are not suitable (red mobile signal), then the Wi-Fi configuration is mandatory.
9. Wi-Fi Configuration: with the smartphone application configure the Wi-Fi to use a reliable hotspot that will be used to communicate.
10. Select or create the Site where the equipment is installed
11. Select or create the equipment where the IoT enabler is installed
12. Configurate: the alarm threshold and timing (see smartphone application documentation)
13. Exit the process

Click here for the association and configuration with Alsense™ ProsaLink

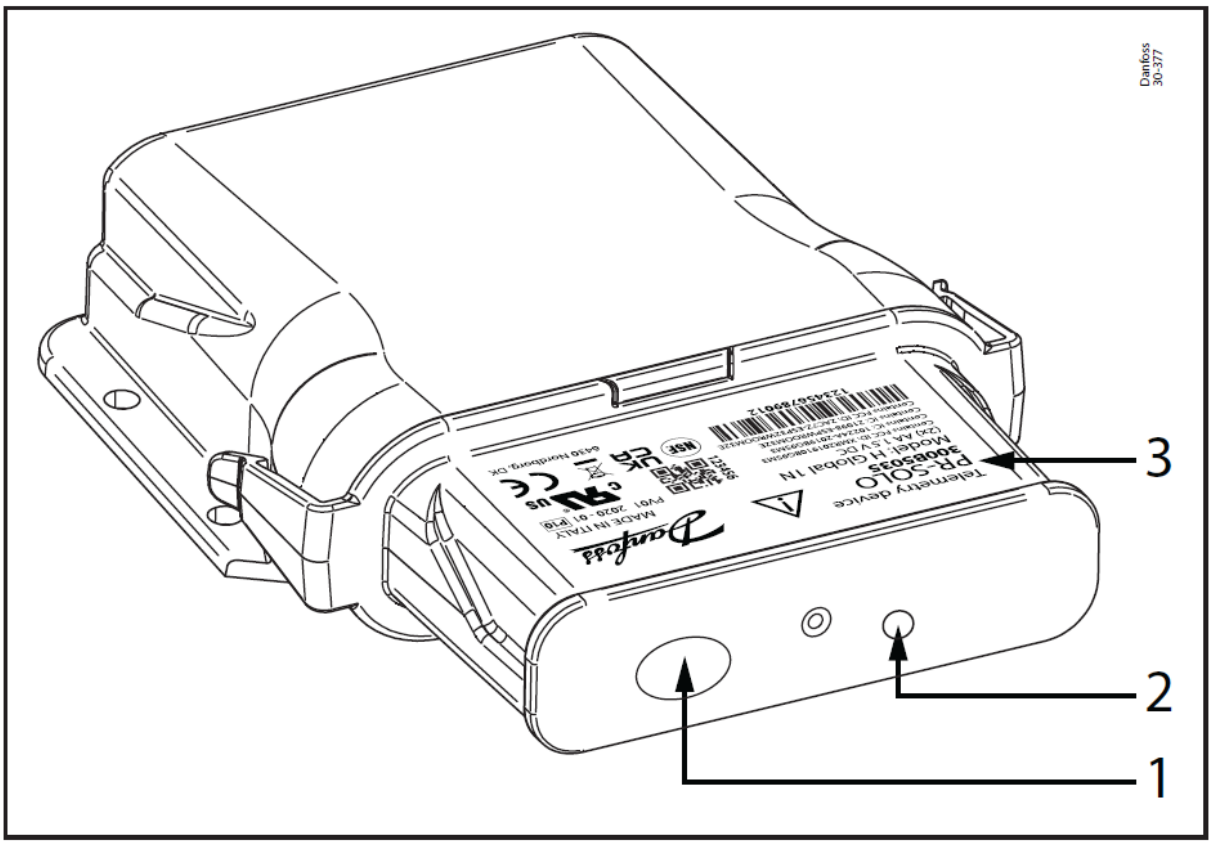
How to wake up the device

The fig. 3 shows the position of the magnetic sensor. To wake up the device and connect the smartphone

application via BLE, place the magnetic object in the highlight position. The red LED should start blinking and then steady on. Then on the smartphone application should start the communication with the PR-SOLO.

The following commonly used items may be able to activate the magnetic sensor: magnetic whiteboard button memo holders, loudspeakers, headphones and headphone case, iPhone 12 or later (back side has a magnetic zone), screwdriver magnets, DC electric motors.

Fig. 3: The position of the magnetic sensor.

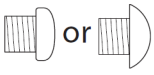


1. Magnetic sensor
2. Red LED: Provides information about the device status (sleeping, waking up, or ready for BLE connection).
3. Label with barcode

How to check the mobile signal
The smartphone application has an special widget that shows the signal power of the last communication. To verify if in the present position the signal is good, the “refresh” button can be pressed. This will force a new communication with the Alsense cloud and then the signal power is updated. Because the communication if checked with an actual transmission, the signal power is updated after several seconds (from 30 – 60 sec typically, max. 6 min).

Mounting

How to fix the device onto the equipment
The device can be fixed to the equipment in several ways. The suggested ones are:

- By 4 pan or round head 4 mm screws; 
- With a bi-adhesive tape to be applied on the bottom face (opposite to the label face). Other fixing methods can

reduce the transmission power of the device.

How to register the installation
When the PR-SOLO has been physically attached to the equipment, it is necessary to proceed to notify the new installation to the Alsense system. This activity must be performed using the smartphone application. In the following sections, the required information for the matching is described.

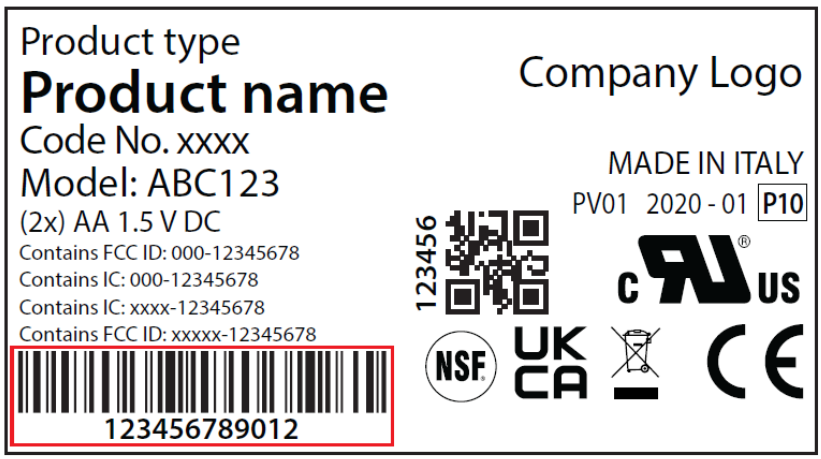
Mandatory association data

Equipment owns a lot of properties and, among all, the most important one for the pairing purpose is the Barcode. The Barcode can be assigned either during the equipment's assembly by the manufacturer (OEM) or when the equipment is delivered. It uniquely identifies the equipment among all the others owned.
This information, combined with the PR-SOLO device code, is the basic pairing that allows the telemetry system working.

Table 1: Mandatory pairing information

Name	Description
PR-SOLO device code	You can find this code (in form of barcode too) on the label applied on the PR-SOLO box, as illustrated in Fig. 3. This code is unique among all the PR-SOLO devices produced.
Equipment barcode	This alphanumeric code is usually placed in a label attached outside the equipment (see the highlighted barcode in Fig. 4). This code is unique among all the equipment owned by the equipment's owner.

Fig. 4: Example of an asset's label which contains the equipment model, and the barcode.



Optional association data
There is other information that allows us to increase the completeness of the association, but they are not strictly necessary, and they can be deduced later using the fundamental pairing data.

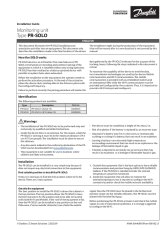
Table 2: Optional pairing information

Name	Description
Equipment serial number	Every equipment owns a manufacturer code called serial number applied by the OEMs. This code is unique among all the equipment produced by the equipment's manufacturer. Use the same as the equipment barcode.
Equipment model	The equipment model along with the customization.

Maintenance
Please refer to the datasheet for batteries replacement and gasket maintenance.

For more detailed information, please see the respective Data Sheet.

Documents / Resources

	Danfoss PR-SOLO Monitoring Unit [pdf] Installation Guide PR-SOLO Monitoring Unit, PR-SOLO, Monitoring Unit, Unit

References

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