ENGINEERING
TOMORROW

Danfoss

Data Sheet

Monitoring unit
Type **PR-OCTO**

IoT Enabler for remote control and tracking of refrigeration equipment

The PR-OCTO device is an IoT Enabler specifically designed for cooling applications like bottle coolers, ice cream cabinets and other refrigeration type of equipment. This Enabler allows connectivity and access to the Alsense™ Cloud solutions from Danfoss.

The OCTO operates connected to existing electronic controllers, gathering the data from the controller using a communication port. Using the embedded modem, the Bluetooth link and the WiFi capabilities of the device, it can provide multiple options of communications with the cloud and very accurate positioning.

Product specification

Layout

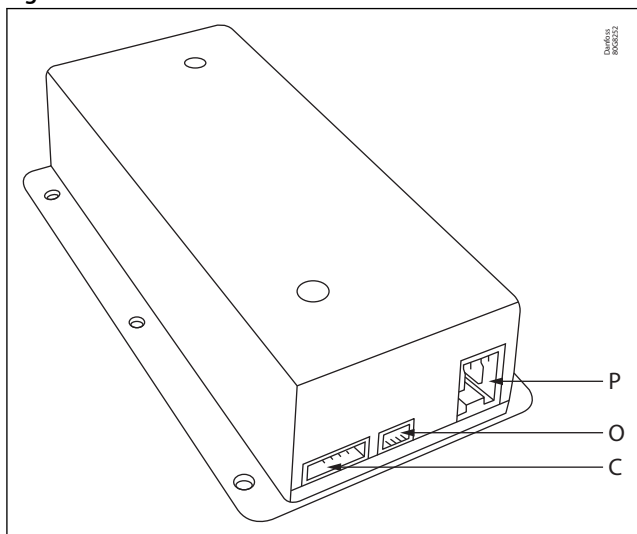Figure 1 and Figure 2 illustrate the layout of the PR-OCTO device.

Figure 1: Side A
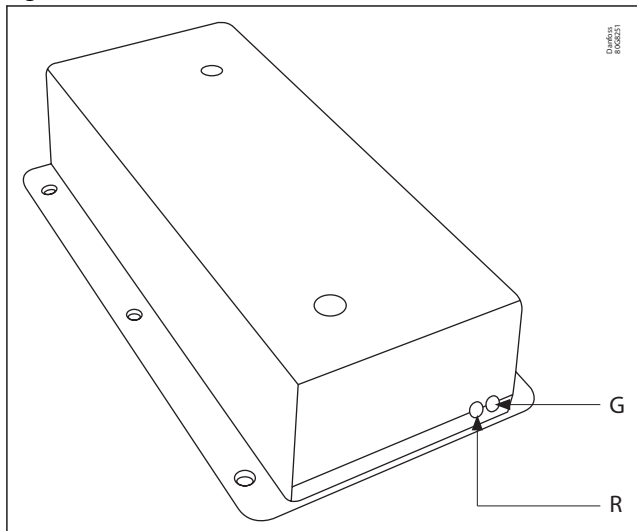
G	**Green LED:** Status of the mobile connection and the connection with the Alsense Platform.
R	**Red LED:** Status of the power supply and the communication with the electronic thermostat.

See Table 1 for details on the operation.

Figure 2: Side B

P	**Power supply connector:** 100 – 240 V ~
O	**Optional connector:** the RS485/RS232 communication port for suitable thermostat.
C	**COMM connector:** The TTL communication port with the electronic thermostat.

See Connections with an electronic controller for details on the connectors.

Table 1: LED operation details

RED LED OFF	The device is not correctly powered.
RED LED blinking	The device is powered and the communication with the electronic thermostat is not established yet.
RED LED ON	The device is powered and the communication with the electronic thermostat is correctly established.
RED LED fast blinking	The device is powered while the communication with the electronic thermostat has been interrupted.
GREEN LED OFF	The modem is not running
GREEN LED fast blinking	The modem is not registered to the network
GREEN LED blinking	The modem is registered to the network

Compatibility

The PR-OCTO device gives the possibility to execute the lock command and to collect the diagnostic information only in conjunction with an electronic thermostat.

The current version of the PR-OCTO includes the compatibility with the thermostats listed in Table 2.

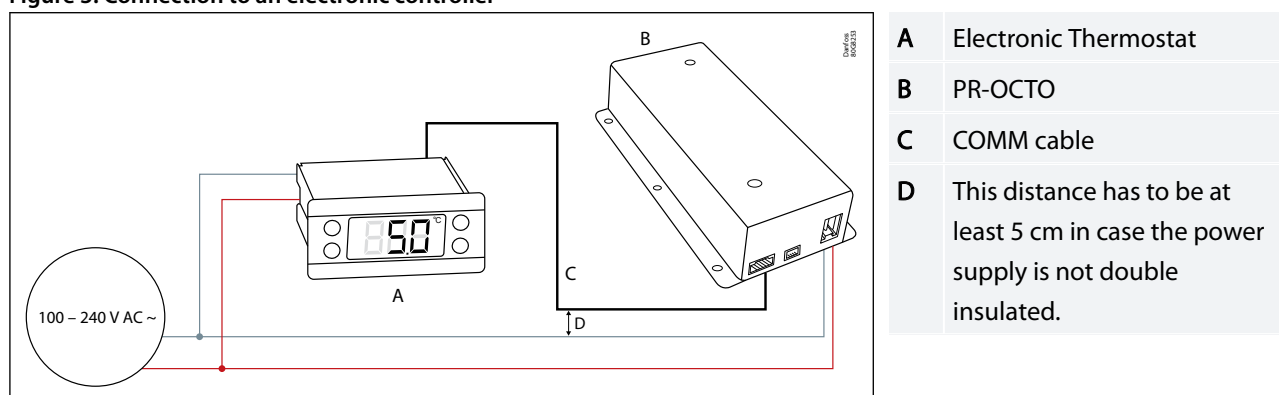**Table 2: Compatible electronic thermostats**

Manufacturer	Models
Danfoss	ERC111, ERC112, EETa
Eliwell	EWPLUS400, EWPLUS961, EWPLUS974, EWPLUS974 Smart, EWPLUS978

List of compatible controllers is updated frequently, please consult your Danfoss representative for controllers not included.

Connections with an electronic controller

Figure 3: Connection to an electronic controller

A	Electronic Thermostat
B	PR-OCTO
C	COMM cable
D	This distance has to be at least 5 cm in case the power supply is not double insulated.

The PR-OCTO requires two connections, one for the power supply, the other with the electronic thermostat.

The power supply must be shared with the electronic thermostat: the PR-OCTO must be powered on only when the thermostat is also powered on. If the PR-OCTO is powered on when the thermostat is off, a "Controller communication failure" alarm is raised after 60 minutes.

ℹ **NOTE:**
Neither the cables nor the connectors are included in the PR-OCTO package.

For the POWER SUPPLY connector of the PR-OCTO, either two standard fast-on connectors or one connector with screw terminal can be used. In Table 3, illustrates the Lumberg 3611 02 K1, an easy plug connector with lift clamp and protection against misplacing and fast assembling. Neither the easy plug connector nor the standard fast-on connectors are included in the PR-OCTO package.

ℹ **NOTE:**
If the power supply cable is not double insulated, it must be physically separated from the COMM cable.

Table 3: Two possible PR-OCTO terminations for the power supply cable.

Standard fast-on	Easy plug double fast-on (for indirect mating)
	Lumberg 3611 02 K1

Concerning the COMM Cable (the communication cable between the PR-OCTO and the electronic thermostat) a specified cable must be used depending on the specified thermostat.

The COMM Cable could be either assembled by the cooler manufacturer or could be purchased from Danfoss.

The PR-OCTO is compatible with the following Danfoss controllers: ERC11X (models **ERC112** and **ERC111**), and EETa (models **EETa 2W**, and **EETa 3W**). Table 7 shows ordering codes for the communication cable between Danfoss controllers and PR-OCTO.

Connector pinout

The pinout of the COMM connector (see Figure 4) is the following:
- Pin 1: +5V out (max 150 mA)
- Pin 2: TTL port 2 Rx (input to PR-OCTO, Tx output from Controller), CAN H on 300B5074 model
- Pin 3: TTL port 2 Tx (output from PR-OCTO, Rx input to Controller), CAN L on 300B5074 model
- Pin 4: TTL port 1 Tx (output from PR-OCTO, Rx input to Controller)
- Pin 5: TTL port 1 Rx (input to PR-OCTO, Tx out from Controller)
- Pin 6: Ground

Figure 4: COMM connector (JST PHR-6)
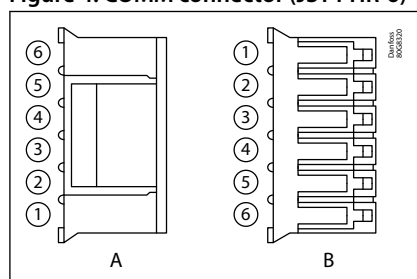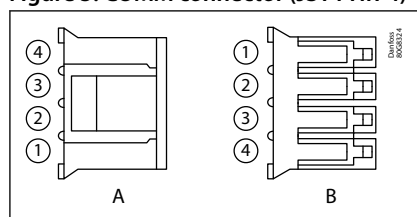

A	Side A
B	Side B

Installation with a RS485 or RS232 electronic controller

In case the controller has an RS485 or an RS232 communication, the Optional connector can be used.

The mating connector is JST PHR-4 (see Figure 5) and the following wiring must be followed:
- Pin 1: 5 V power out (max. 150 mA) do not connect
- Pin 2: RS485+ or RS232 Tx (output from PR-OCTO, Rx input to controller)
- Pin 3: RS485- or RS232 Rx (input to PR-OCTO, Tx output from controller)
- Pin 4: Ground

Figure 5: COMM connector (JST PHR-4)

A	Side A
B	Side B

Technical specification

Table 4: Technical specification

Features	Description
Weight	126 g
Case Material	Polycarbonate Makrolon: RW2407
Storage Temperature	-20 – 85 °C
Operating Temperature	-20 – 55 °C

Features	Description
Humidity	95% non condensing
Voltage	100 – 240 V AC, 50/60 Hz

Connectivity	• Modem GSM/GPRS 4-bands 850/900/1800/1900 MHz (only 300B5101), maximum output power 33 dBm ±2 dB
	• Modem LTE Cat M1/NB2/EGPRS bands:
	  ○ 1/2/3/4/5/8/12/13/18/19/20/25/26(2)/27(2)/28/31/66/71(3)/85(2) Cat M1 band only (3) Cat NB2 band only (not on 300B5072), maximum output power 21 dBm +1.7/-3 dB
	• WiFi
	  ○ Protocols 802.11 b/g/n (802.11n up to 150 Mbps)
	  ○ Frequency range 2.4 ~ 2.5 GHz
	  ○ Maximum output power 7 dBm
	• Bluetooth Protocols V4.2 BR/EDR and BLE specification
	  ○ NZIF receiver with –97 dBm sensitivity
	  ○ Class1, class2 and class3 transmitter
	  ○ AFH, Audio CVSD and SBC
	  ○ Maximum output power 0 dBm
	• SIM on Chip
	• 4FF SIM Holder for additional Plastic Nano SIM (not on 300B5072)
	• Internal PCB Antenna
	• 8 MB Flash memory
	• 25F supercapacitor

Table 5: Models

Model	Modem (Coverage)	TTL	SIM holder	Additional communications
PR-OCTO RS485 4G Y3 SH 4T	4G/2G (300B5071)	2	Yes	RS485

Dimensions

All units are in mm.
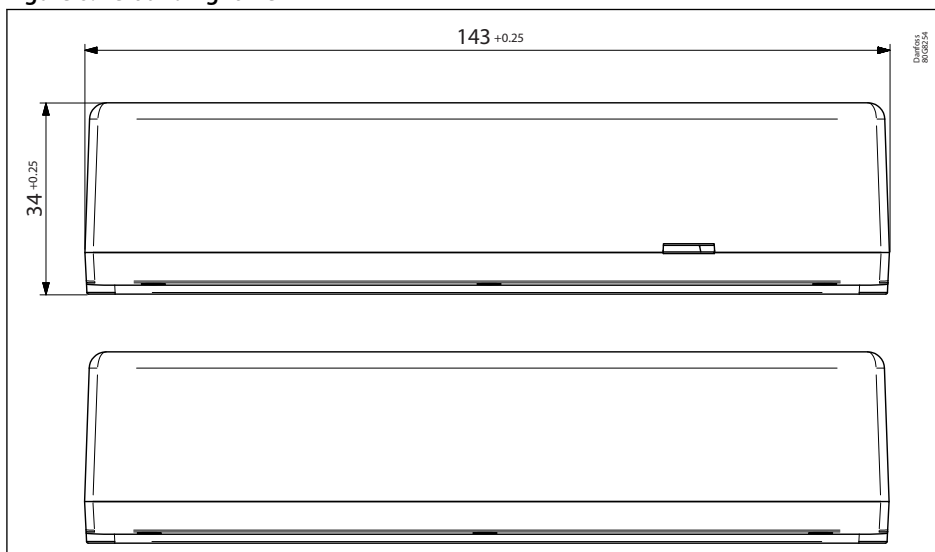
Figure 6: Left and right view
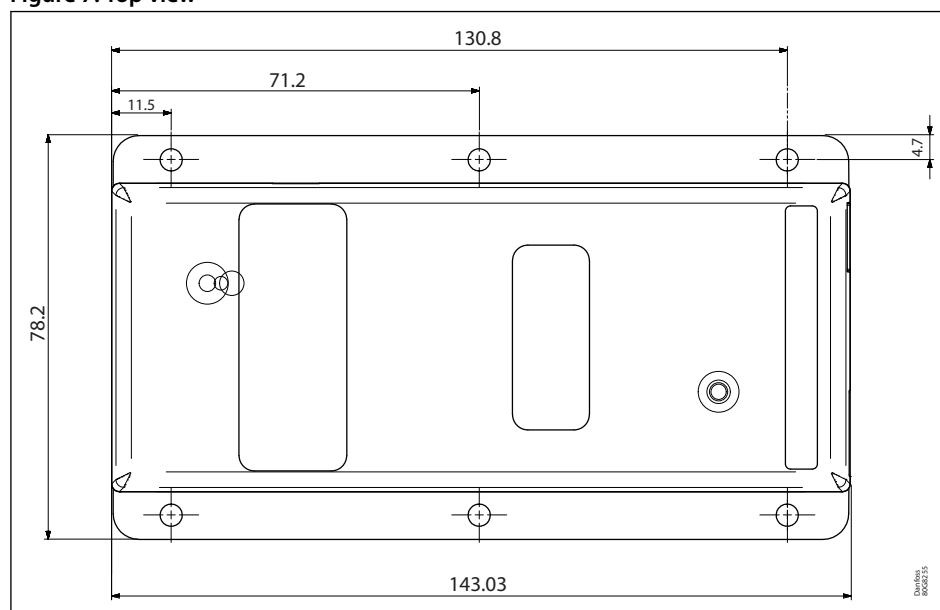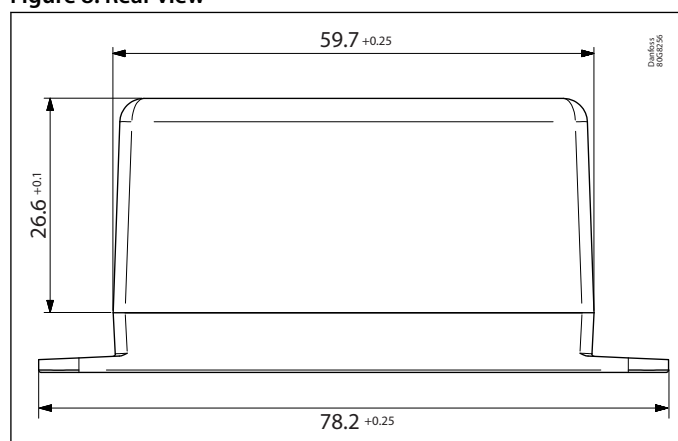
Figure 7: Top view

Figure 8: Rear view

Warnings

⚠ **WARNING:**
- The installation of the PR-OCTO has to be performed only and exclusively by qualified and skilled technicians.
- The installation of the PR-OCTO should be performed while the cooler is switched-off.
- Inside the device there is a GPRS antenna. For this reason, while the PR-OCTO is working it must be at the minimum distance of 9.5 cm (4") from the people. The installation must be done to ensure this distance.
- The PR-OCTO has to be installed in a protected position. The PR-OCTO has to be embedded in the cooler and not accessible. In case of installation on the back side of the cooler, the PR-OCTO has to be protected with an additional box to protect people from electric shock.
- If the power supply cable of the PR-OCTO is not double insulated, it has to be physically separated from the COMM cable (the communication cable with the thermostat).
- The PR-OCTO input power supply is protected by over-currents by the F002 device, with this characteristics: delayed fuse 250 V 400 mA.
- Any document related to the conformity declaration of the PR-OCTO can be downloaded from www.danfoss.com.
- This equipment is not suitable for use in locations where children are likely to be present.

Ordering

Table 6: Ordering

Type	Description	Code No.
PR-OCTO	PR-OCTO RS485 4G Y3 SH 4T	300B5071

Table 7: COMM cables for Danfoss controllers

Controller	Length	Code No.
ERC11X	0.6 m	080G3396
ERC11X	2 m	080G3388
ERC11X	4 m	080G3389
EETa	2 m	080N0330
EETa	4 m	080N0331

Certificates, declarations, and approvals

The list contains all certificates, declarations, and approvals for this product type. Individual code number may have some or all of these approvals, and certain local approvals may not appear on the list.

Some approvals may change over time. You can check the most current status at danfoss.com or contact your local Danfoss representative if you have any questions.

Table 8: Certificates, declarations, and approvals

File name	Document type	Document topic	Approval authority
-	EU Declaration of conformity	**RED – Radio Equipment Directive (2014/53/EU)** The full text of the EU declaration of conformity is available at the following internet address: Certificates, declarations, and approvals **RoHS – Restriction of the use of certain hazardous substances directive (2011/65/EU)** • EN 50581: 2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substance	Danfoss
E488917-A2-UL E500508-A6001-UL	Electrical - Safety Certificate	-	UL

Operation of this equipment is subject to the following two conditions:
• This equipment or device may not cause harmful interference.
• This equipment or device must accept any interference, including interference that may cause undesired operation.

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