Data sheet



Cold storage room controller

AK-RC 204B / AK-RC 205C / AK-RC 305W-SD

Food quality for walk-in coolers and freezers

Description

The new AK-RC family is a complete refrigeration controls range with great flexibility to adapt to cold storage rooms. The full AK-RC family controls are designed to save installation time, reduce energy consumption and provide the best food quality preservation for cold room application.

Features & benefits

- Ease of installation due to easy wiring and high environmental protection enclosure
- Fast commissioning with startup wizard
- Tiered platform with wide range of functionalities and logics
- Advanced defrost logic to improve energy saving and performance
- Magnetic thermal circuit protection included
- Wide display, clear and intuitive menu for at-a-glance information
- Integration into Danfoss ADAP-KOOL system over Modbus for a full store management
- Standard Modbus connectivity for 3rd party integration

Applications

- Easy and quick to mount
- Easy to wire
- Kitted with 2 NTC 10K sensors

Quick setup in few steps:

1. Wire controller
2. Apply power
3. Run the Wizard to select the correct application as per *Table: InI applications*
4. Configure the desired set-point

In the below table are listed all the available initial applications.

Table: InI applications

InI[1]	Type of installation			
	Cold regulation	**Pump Down**	**Defrost**	**Evaporator fans**
0	Demo mode: it displays the temperature but does not regulate the temperature or activate replays			
1	Solenoid	No	Electric	Yes
2	Solenoid + compressor	Yes	Electric	Yes
3	Solenoid + compressor	No	Electric	Yes
4	Solenoid	No	Air	Yes
5	Solenoid + compressor	Yes	Air	Yes
6	Solenoid + compressor	No	Air	Yes
7	Solenoid + compressor	Yes	Hot gas	Yes
8	Solenoid + compressor	No	Hot gas	Yes
9[2]	Solenoid + compressor	Yes	Reversed cycle	Yes
10[2]	Solenoid + compressor	No	Reversed cycle	Yes
11[2]	Solenoid	No	Static	No
12[2]	Solenoid + compressor	Yes	Static	No
13[2]	Solenoid + compressor	No	Static	No

(1) See Connection diagrams

(2) Not in 305W-SD

Ordering

Product code numbers

Type	Controller type	Communication type	Display - option	Code number
AK-RC 204B	Optyma Control. 1phase (2HP)	RS485 Modbus	Yes	080Z5001
AK-RC 205C	Optyma Control. 1phase (2HP)	RS485 Modbus	Yes	080Z5002
AK-RC 305W-SD	Optyma Control. 1phase (2HP)	RS485 Modbus	Yes	080Z5003

Accessories code numbers



084N3200

Temperature sensor, EKS 221, 1.5 m, NTC, 10000 Ohm

Measuring range [°C]: -50 - 110, Electrical connection: Cable, Cable type: Thermoplastic rubber

Related products

080Z5001 080Z5002 080Z5003



084N3208

Temperature sensor, EKS 221, 8.5 m, NTC, 10000 Ohm

Measuring range [°C]: -50 - 120, Electrical connection: Cable, Cable type: Thermoplastic rubber

Related products

080Z5001 080Z5002 080Z5003



084N3210

Temperature sensor, EKS 221, 3.5 m, NTC, 10000 Ohm

Measuring range [°C]: -50 - 120, Electrical connection: Cable, Cable type: Thermoplastic rubber

Related products

080Z5001 080Z5002 080Z5003



080Z3216

Temperature sensor, NTC

Packing format: Single pack, Quantity per packing format: 1

Related products

080Z5003

Note: 080Z3216 is only for AK-RC 305W-SD.

Overview

Product portfolio

Table: Portfolio overview

Technical characteristics	AK-RC 204B	AK-RC 205C	AK-RC 305W-SD
			
Danfoss P/N	080Z5001	080Z5002	080Z5003
Power Supply	230 V AC I	230 V AC I	100 – 240 V AC I
Dimmensions (W x H x D) mm	290 x 141 x 84, 4	290 x 141 x 84, 4	290 x 141 x 84, 4
Sealing	IP65	IP65	IP65
Electrical Protection	–	Yes (16A)	–
Digital outputs	–	1 SPDT 16A	1 SPDT 16A
	2 SPDT 20A	2 SPDT 20A	2 SPDT 20A
	2 SPST 16A	2 SPST 16A	2 SPST 16A
Analog inputs	2 NTC	2 NTC	2 NTC
Digital inputs	1	1	1
Wizard Menu	Yes	Yes	Yes
Temperature Control	Yes	Yes	Yes
Advanced defrost function	–	–	Yes
Modbus	Yes	Yes	Yes

Functions

Optyma Control controls completely the cold room system:

- Compressor
- Crankcase resistor
- Evaporator fans
- Defrost resistance (up to 2 evaporators)
- Solenoid valve
- Cold room light
- Door frame and drain heaters
- Door control (activity and alarms)
- Remote set-point change and defrost
- Alarms
  – Temperature
  – Open door

Figure: Autonomous system

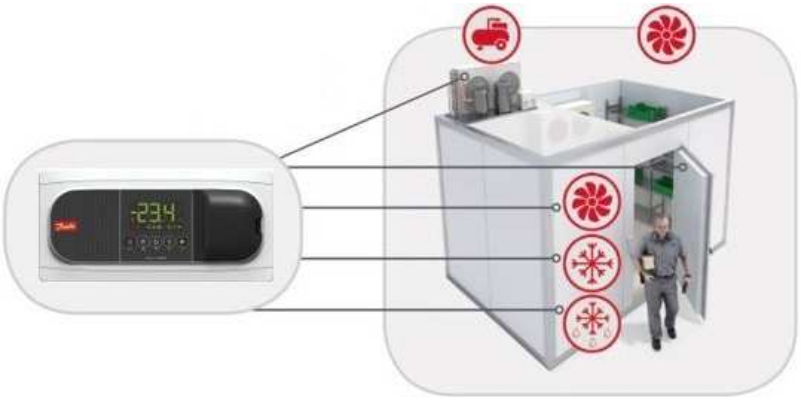
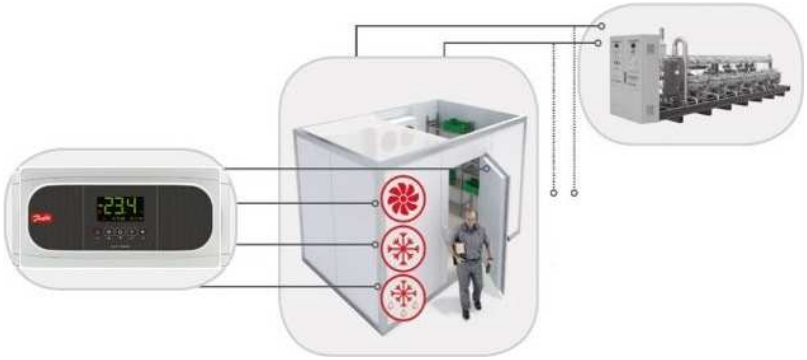


Figure 2: Distributed system



AK-RC 305W using Adaptive Defrost logic optimize the time that drain, and tray resistors are working, significantly reducing the electrical consumption fan regulation to take advantage of thermal inertia (frost) of the evaporator, achieving:

- Less number of compressor activations
- Less energy consumption
- Less mechanical stress as a result of less compressor activations

Minimize number and duration of defrost:

- Reduce thermal stress
- Increase time in set-point
- Reduce energy consumption
- Reduce risk of gas leakage

Product details

General data

Table: Technical data

Features		Specifications
Power supply	AK-RC 204B	230 V~ ±10%, 50 Hz ±5%
	AK-RC 205C	230 V~ ±10%, 50 Hz ±5%
	AK-RC 305W	100 – 240 V~ 50/60 Hz
Maximum input power in the operation		6.3 VA
Maximum nominal current		15 A
Relay SSV / DEFROST - SPDT - 20 A	NO	EN60730-1: 15 (15) A 250 V~
	NC	EN60730-1: 15 (13) A 250 V~
Relay FAN - SPST - 16 A		EN60730-1: 12 (9) A 250 V~
Relay COOL - SPST - 16 A		EN60730-1: 12 (9) A 250 V~
Relay AUX 1 - SPDT - 20 A	NO	EN60730-1: 15 (15) A 250 V~
	NC	EN60730-1: 15 (13) A 250 V~
Relay AUX 2 - SPDT - 16 A	NO	EN60730-1: 12 (9) A 250 V~
	NC	EN60730-1: 10 (8) A 250 V~
No. of relay operations		EN60730-1: 100,000 operations
Probe temperature range		-50.0 – +99.9 °C
Resolution, setting and differential		0.1 °C
Thermometric precision		±1 °C
Loading tolerance of the NTC probe at 25 °C		±0.4 °C
Working ambient temperature	AK-RC 204B	-10 – +50 °C
	AK-RC 205C	-10 – +45 °C
	AK-RC 305W	-10 – +50 °C
Storage ambient temperature		-30 – +60 °C
Protection degree		IP65
Pollution degree		II s/ EN 60730-1
Control device classification		Built-in assembly, with type 1.B automatic operation action feature, for use in clean situations, logical support (software) class A and continuous operation.
		Degree of contamination 2 acc. to UNE-EN 60730-1.
		Double isolation between power supply, secondary circuit and relay output.
Temperature during ball-pressure test		Accessible parts: 75 °C
		Parts which position active elements: 125 °C
Current of radio jamming suppression tests		270 mA
Voltage and current as per EMC tests		207 V, 17 mA
Type of assembly		Fixed internal
Internal buzzer		Present

Dimensions

Figure: AK-RC 204B



Figure: AK-RC 205C



Figure: AK-RC 305W



Connections

Connection diagrams

	Compressor		4-way inverter valve
	Crankcase resistor	AUX1	Auxiliary relay 1
	Fan	AUX2	Auxiliary relay 2
	Defrost resistor		High-low pressure controller
	Solenoid		High pressure controller
HG	Hot gas-valve		Low pressure controller
COND	Condenser solenoid for hot gas		

AK-RC 204B

Figure: InI = 1, 4, 11

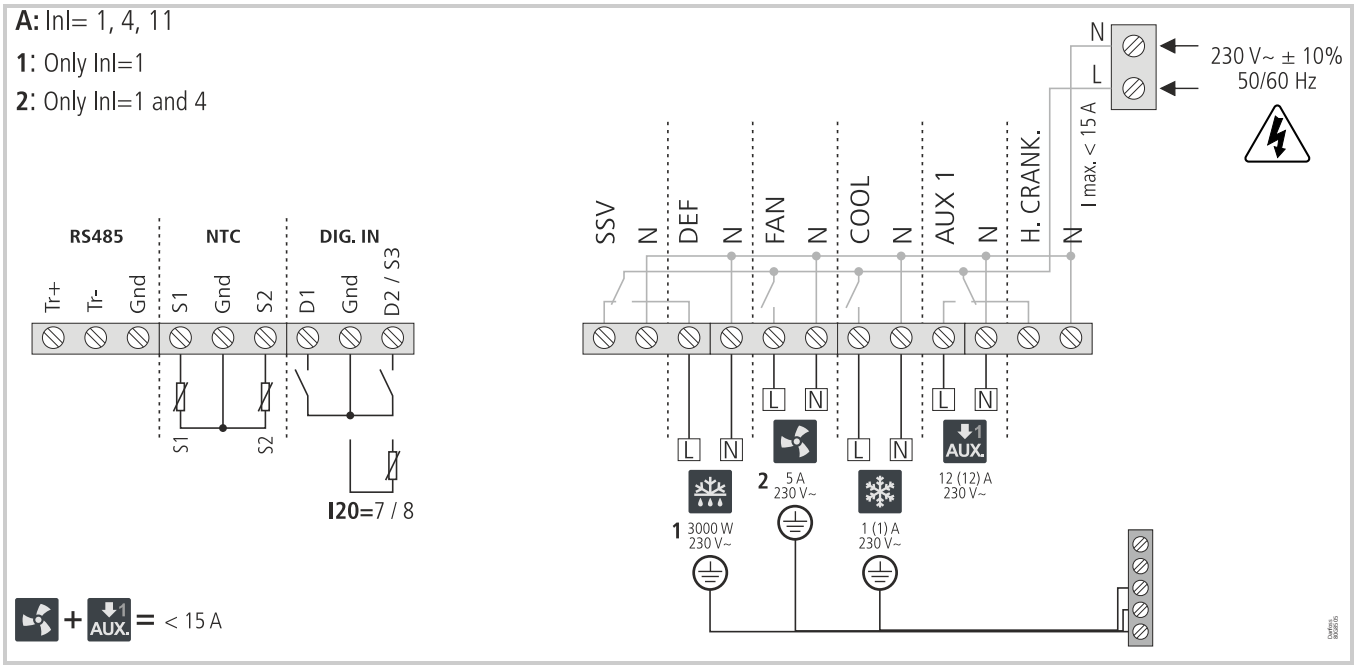


Figure: InI = 2, 3, 5, 6, 12, 13

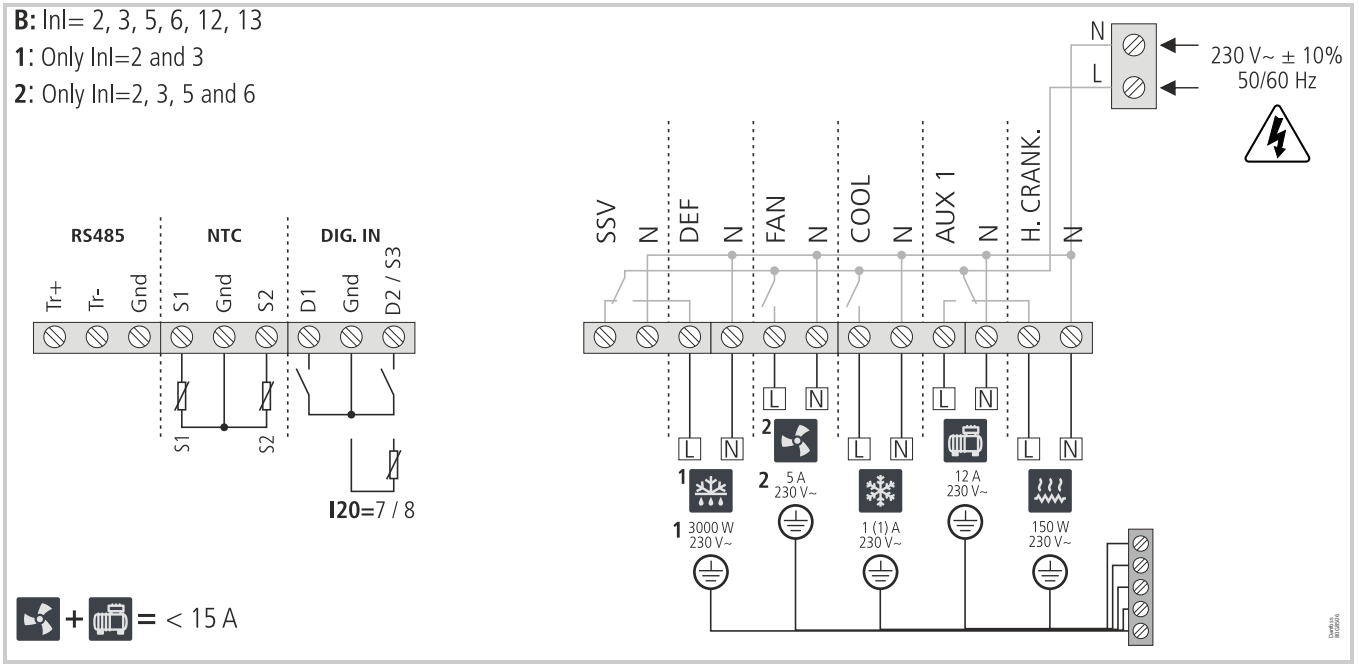


Figure: InI = 7, 8

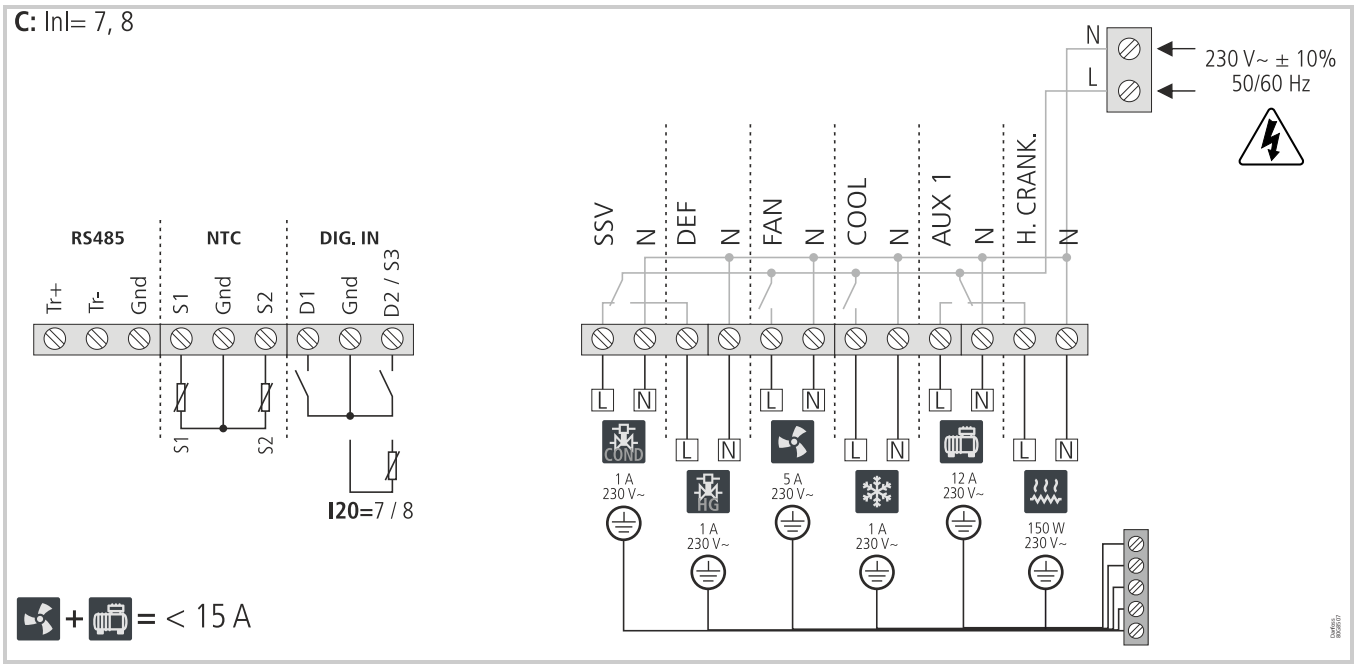
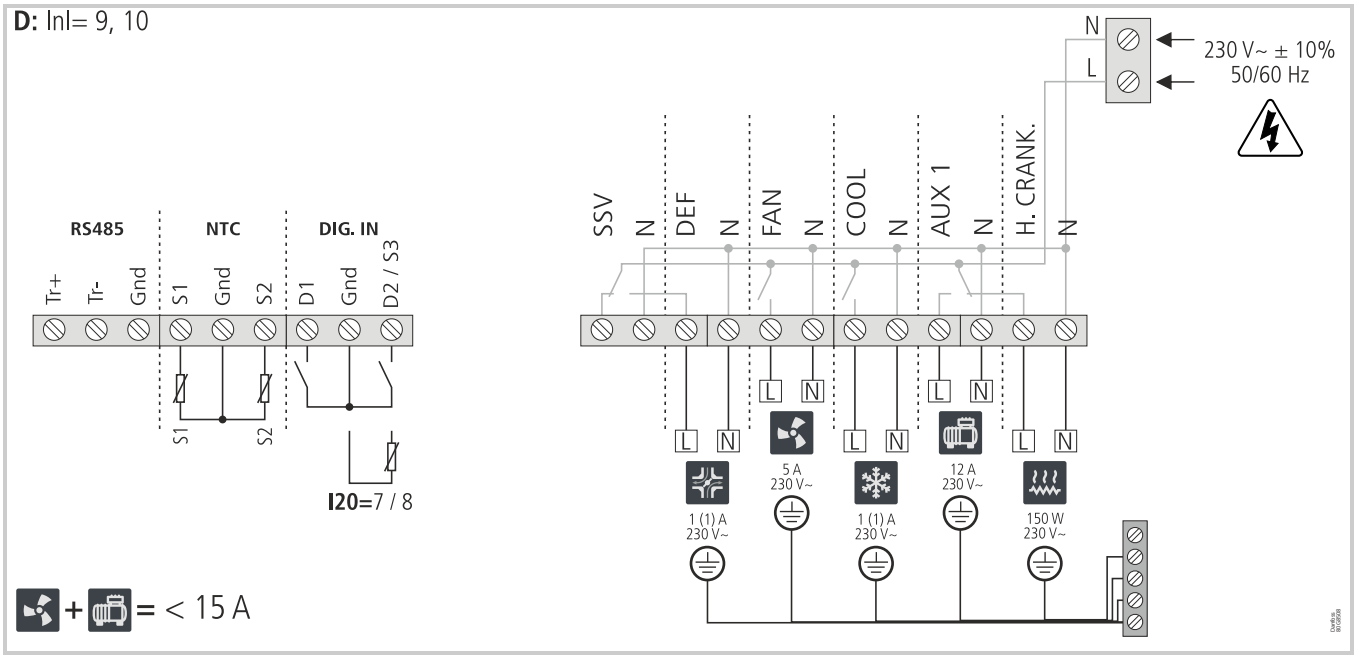


Figure: InI = 9, 10



AK-RC 205C

Figure: Inl = 1, 4, 11

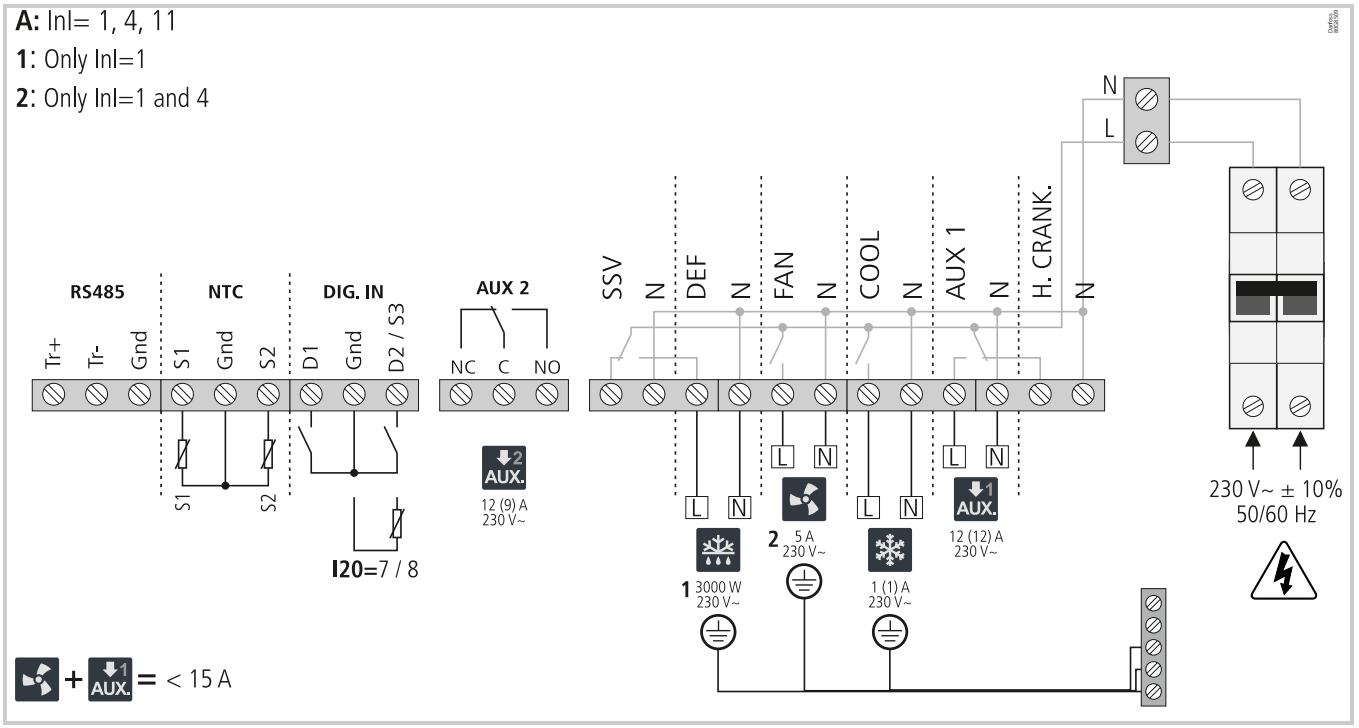


Figure: Inl = 2, 3, 5, 6, 12, 13

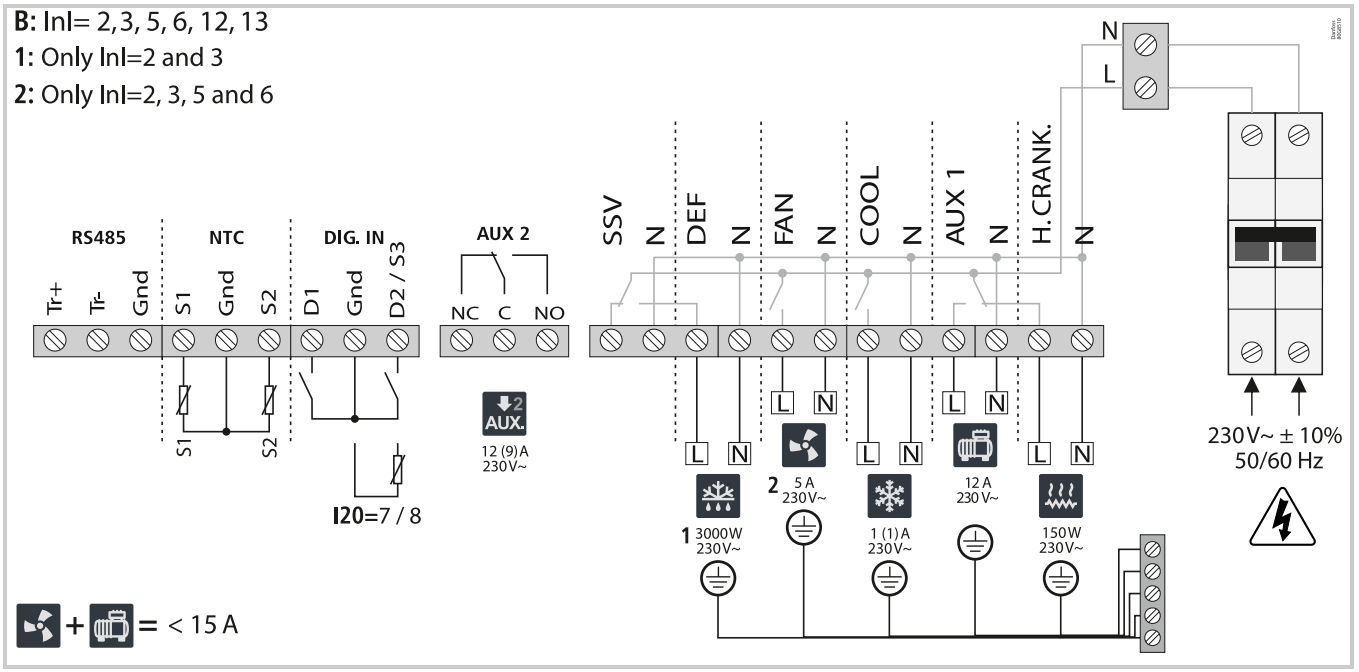


Figure: InI = 7, 8

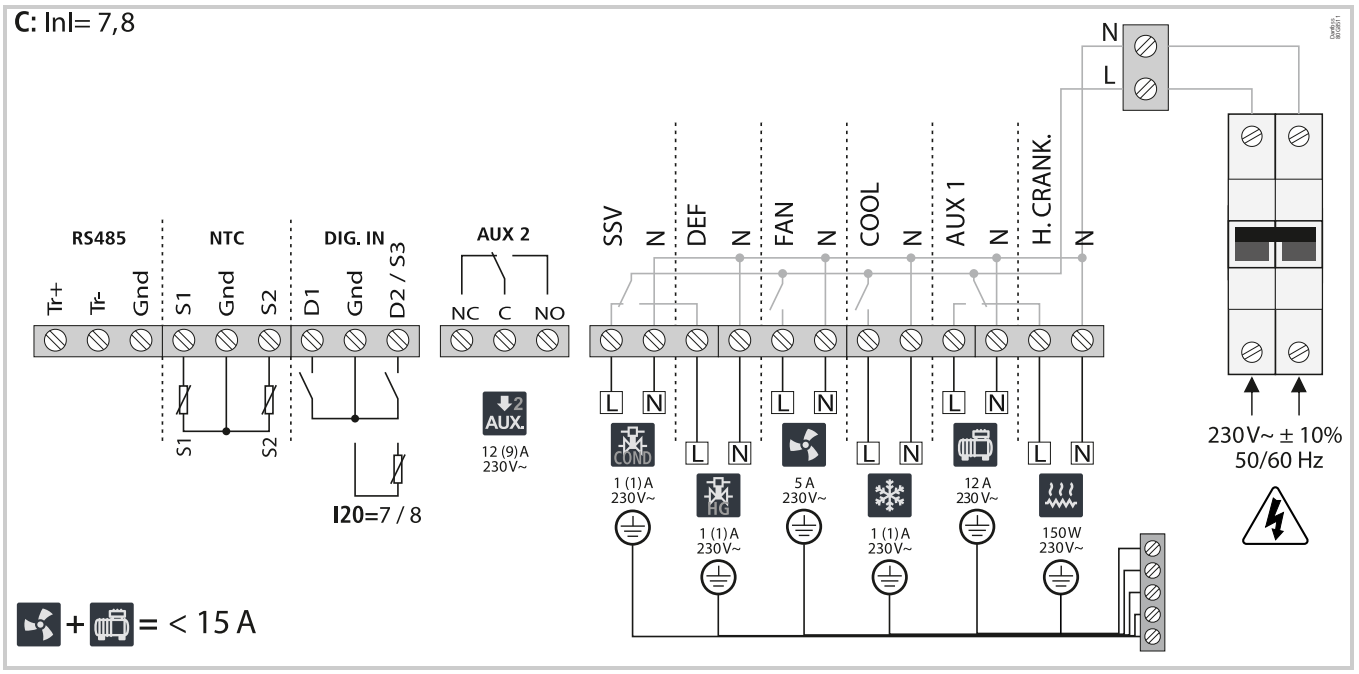
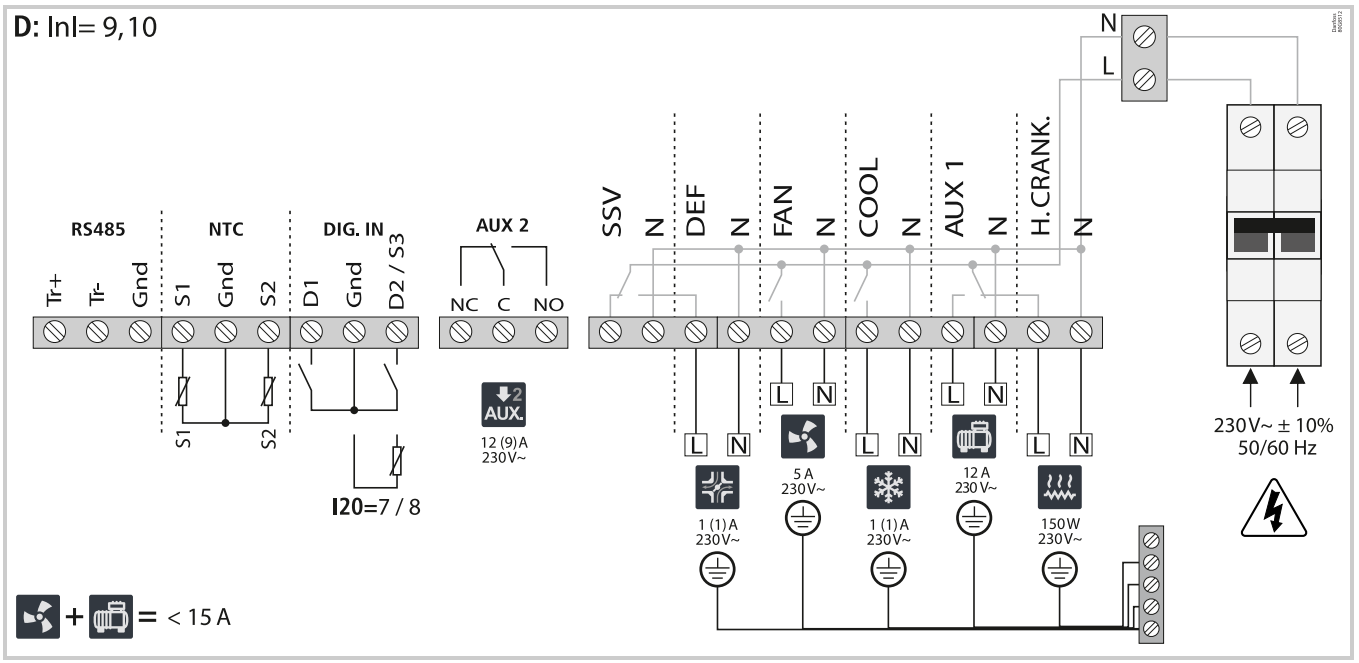


Figure: InI = 9, 10



AK-RC 305W

Figure: InI = 1, 4

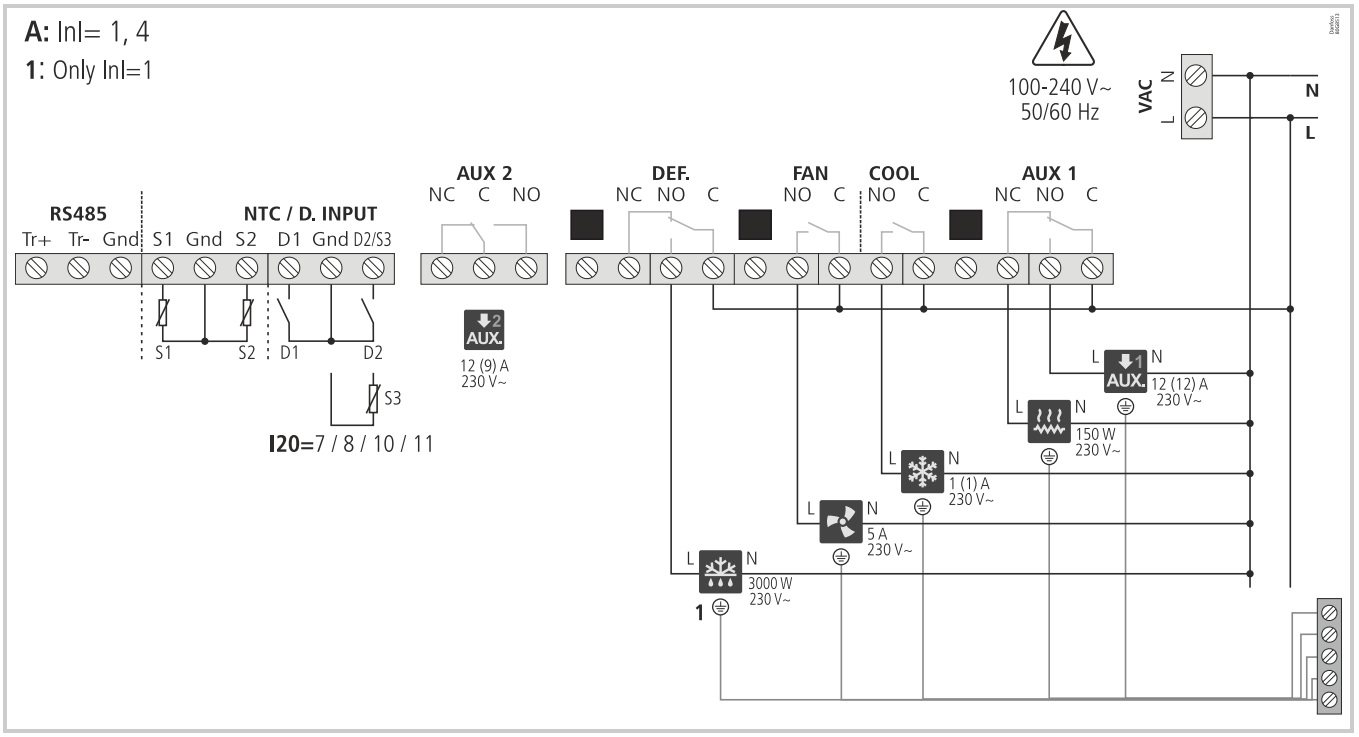


Figure: InI = 2, 3, 5, 6

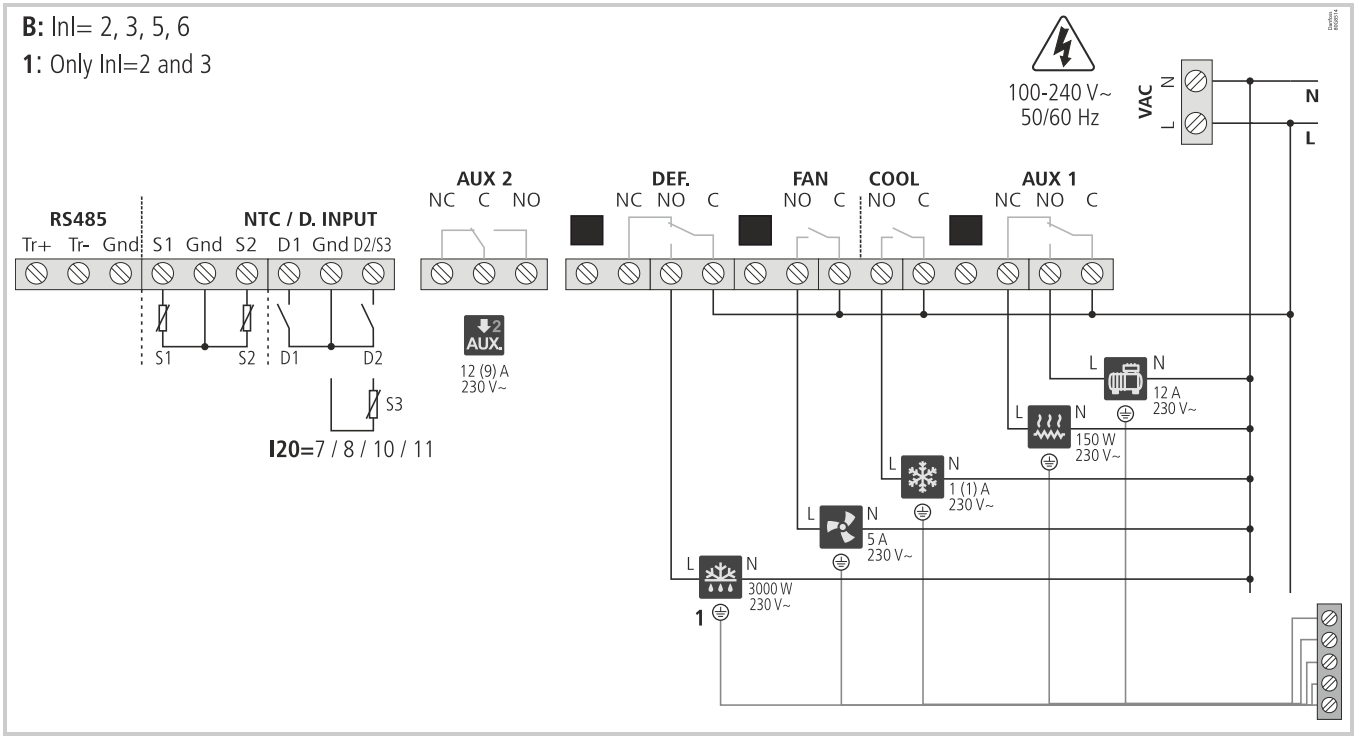


Figure: InI = 7, 8

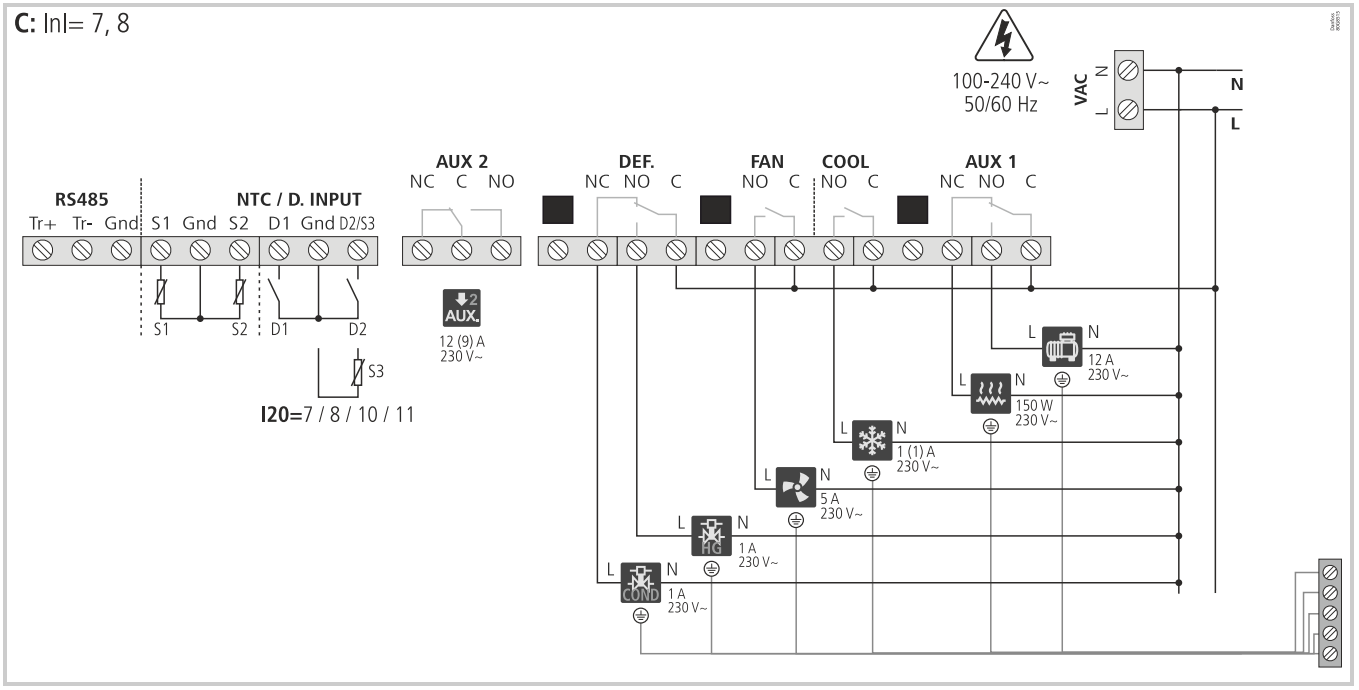
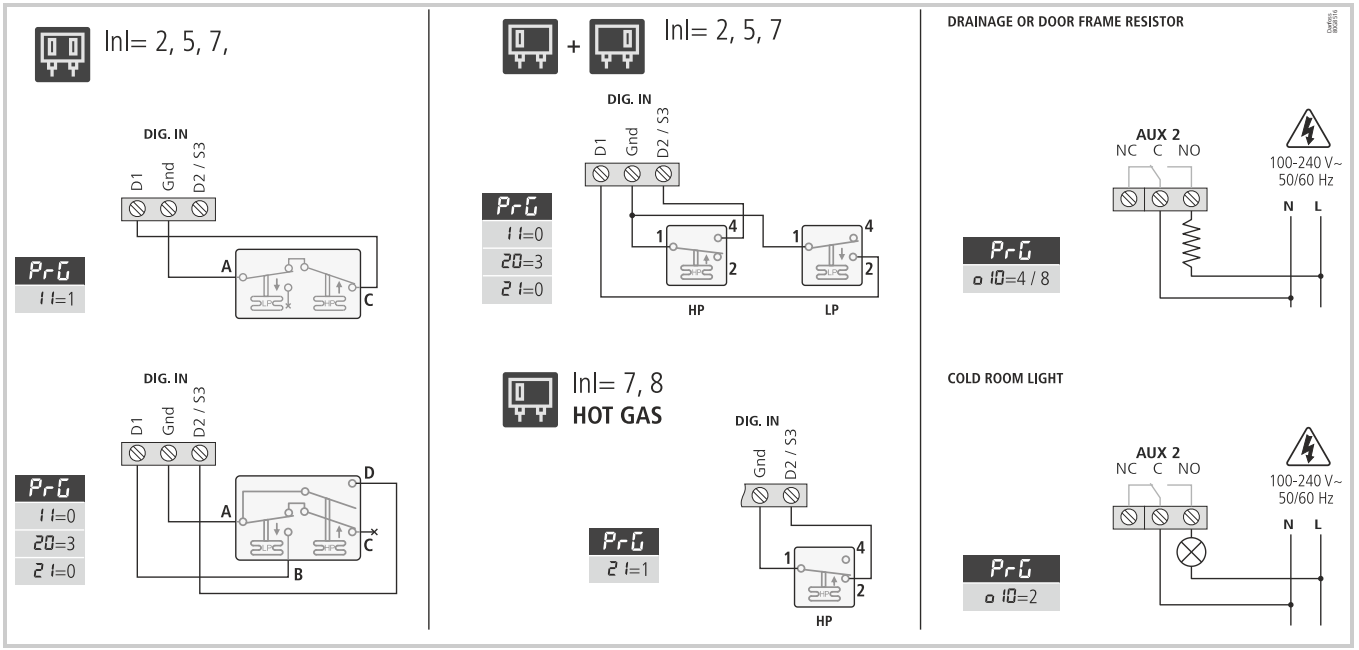
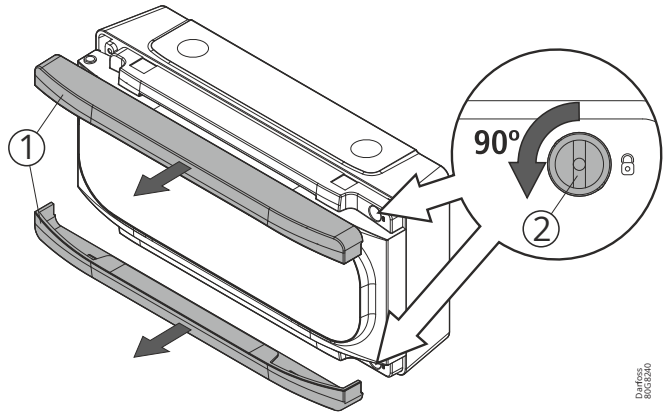


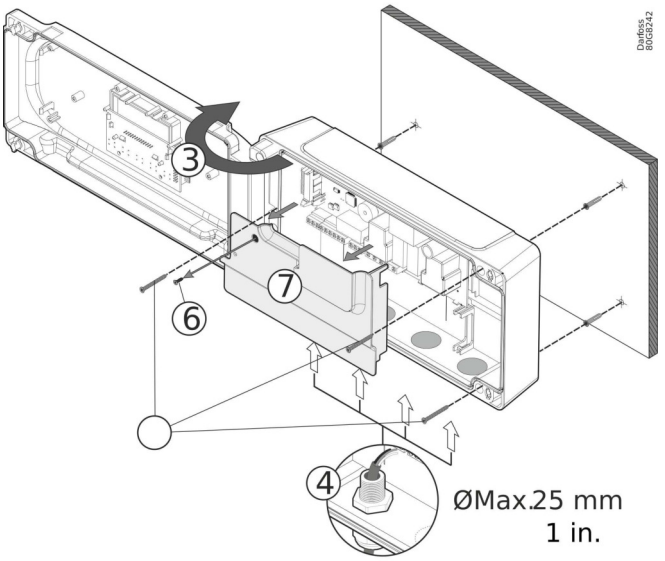
Figure: InI = 2, 5, 7

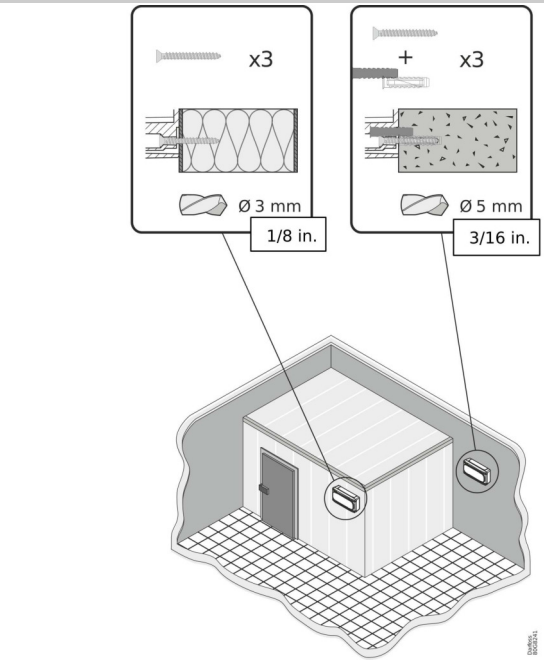


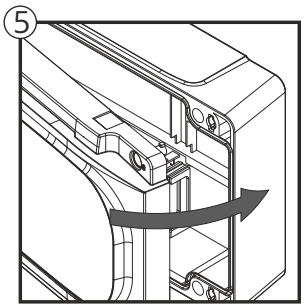
Installation

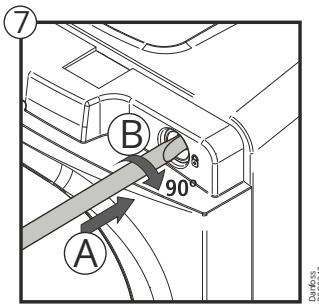
Mounting













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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.

When you click on the link you will be directed to the latest version of the 'Declaration of Conformity'. Products developed and sold before this date of issue conform to the directives/standards in force at the time of their sale.

Approval type	Title	Certification body	Approval topic
Export Control Declaration	Cold room controllers	Danfoss	
EU-UK Declaration	Danfoss EU-UK 080R1239.00	Danfoss	EU RoHS

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