

↗ DOMETIC

REFRIGERATION

COOLING UNIT

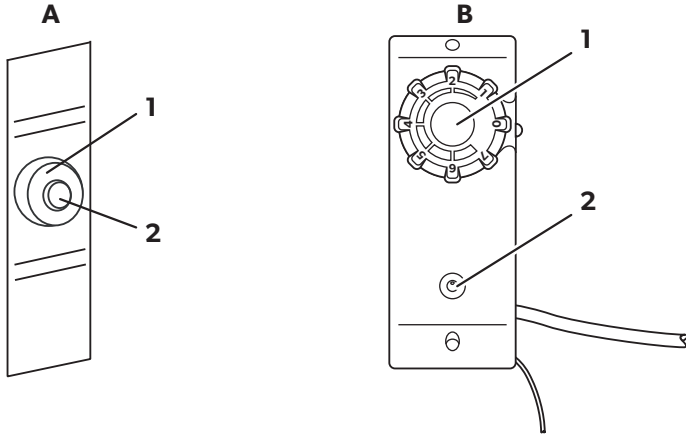


ColdMachine 50, 54, 55, 84, 85, 86, 94, 95, 96, CS-NC15
VD-01, VD-02, VD-03, VD-04, VD-05, VD-06, VD-07, VD-08,
VD-09, VD-14N, VD-15, VD-16, VD-18, VD-21

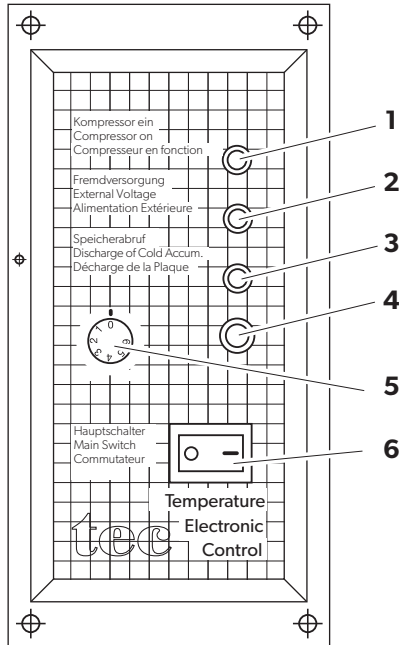
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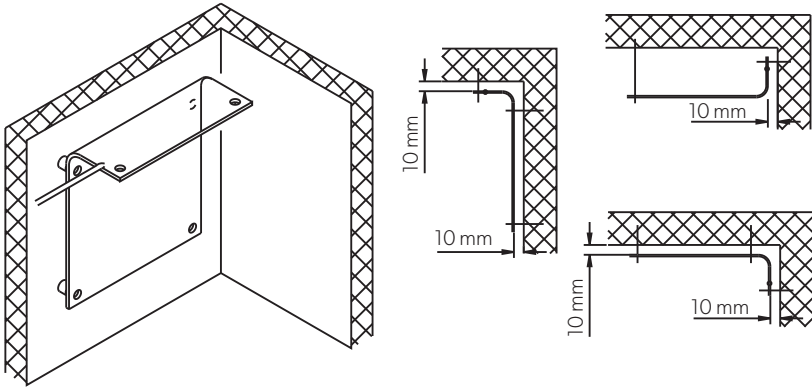
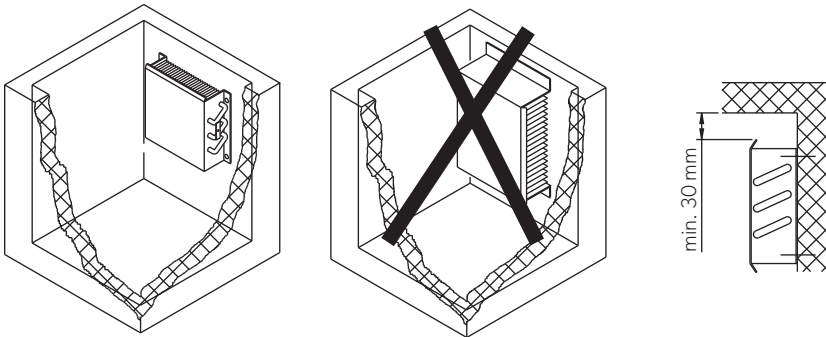
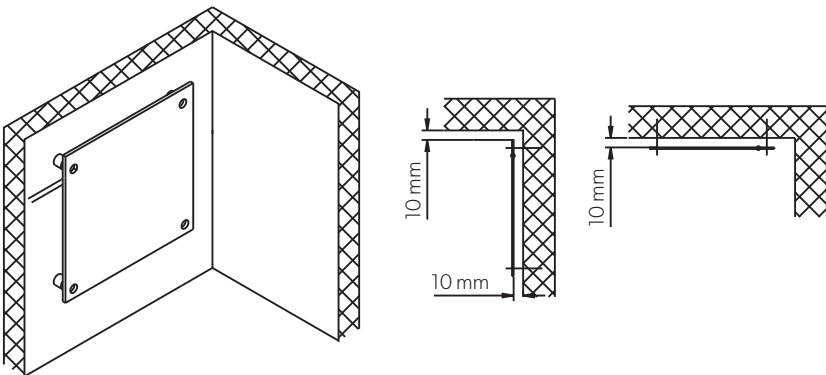
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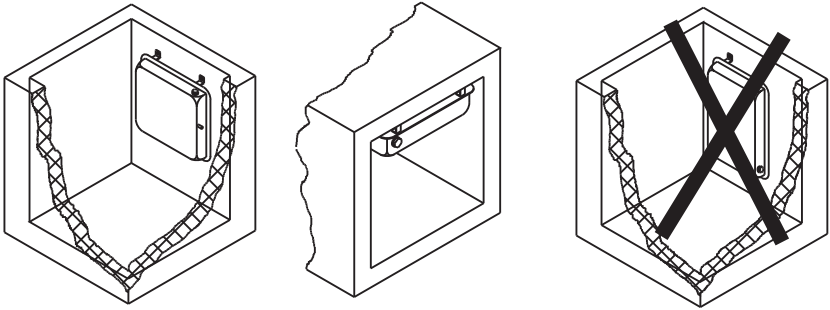


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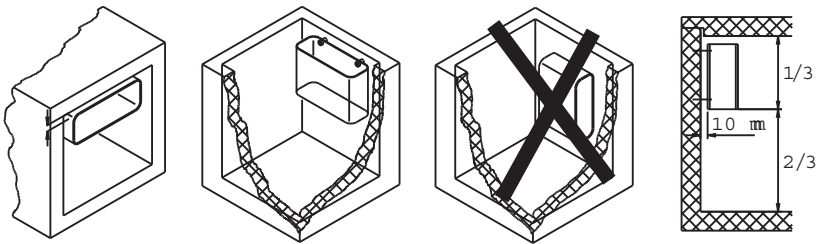


3 VD-01, VD-04, VD-08**4** VD-03**5** VD-02, VD-05, VD-18, VD-21

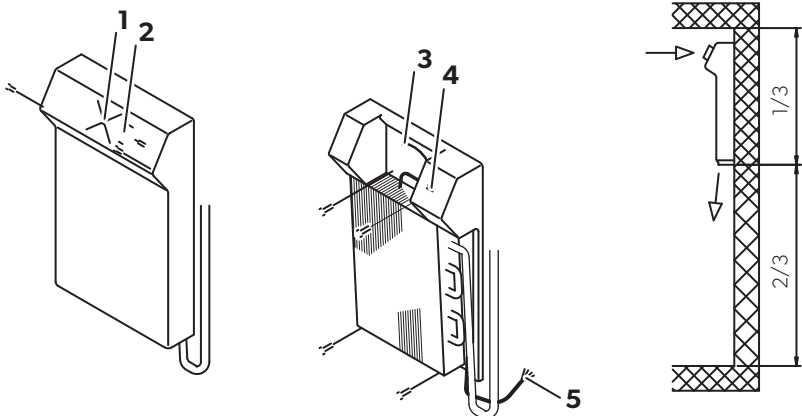
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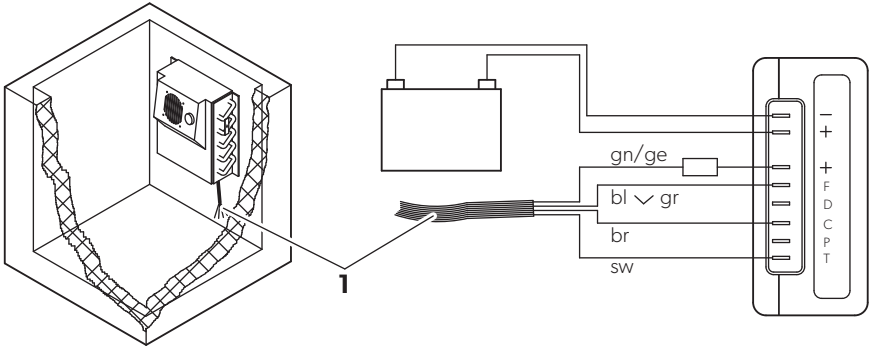
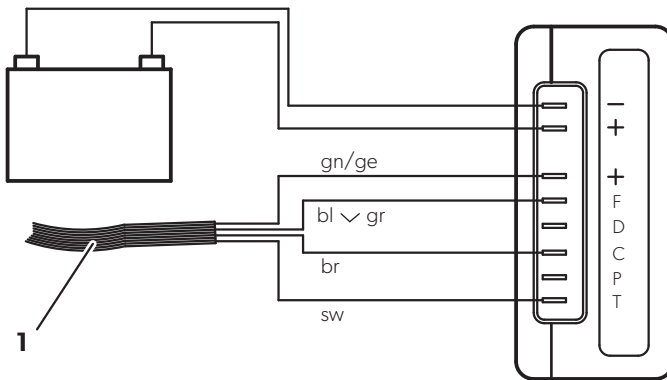
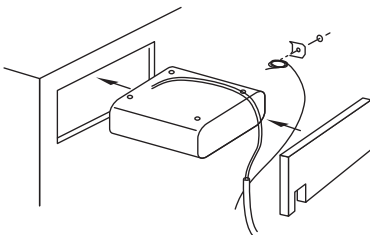
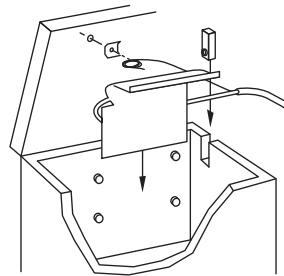


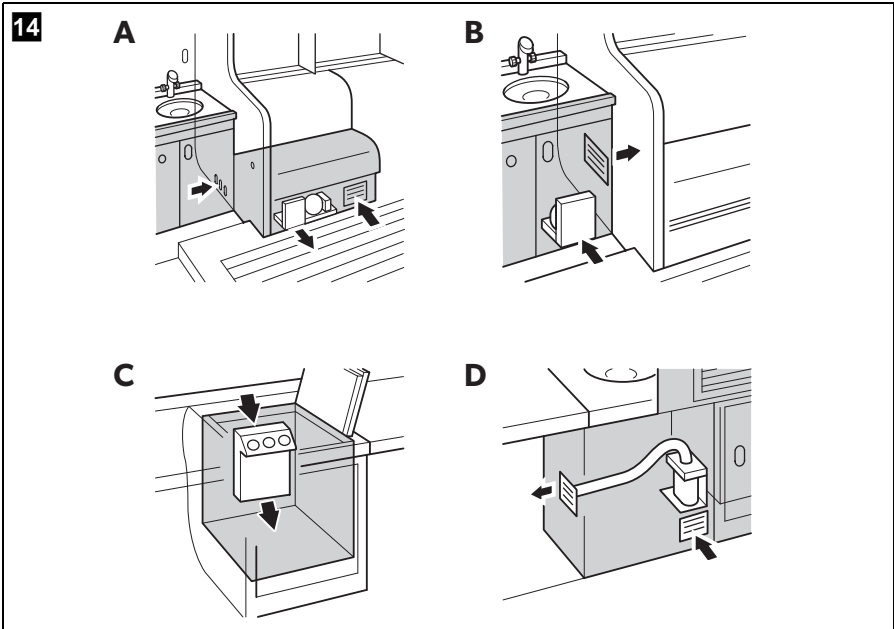
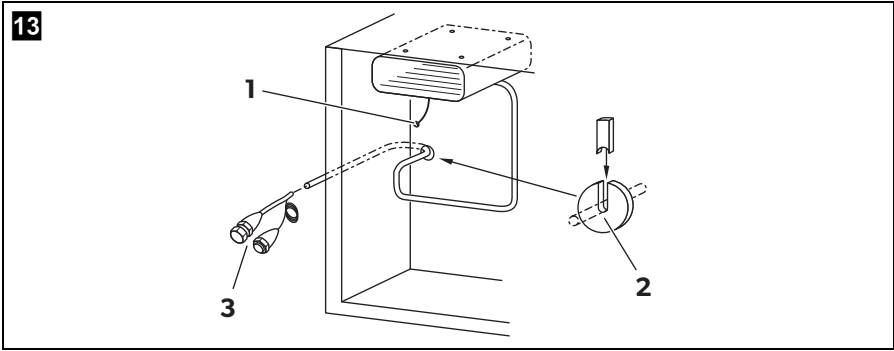
7 VD-07, VD-09

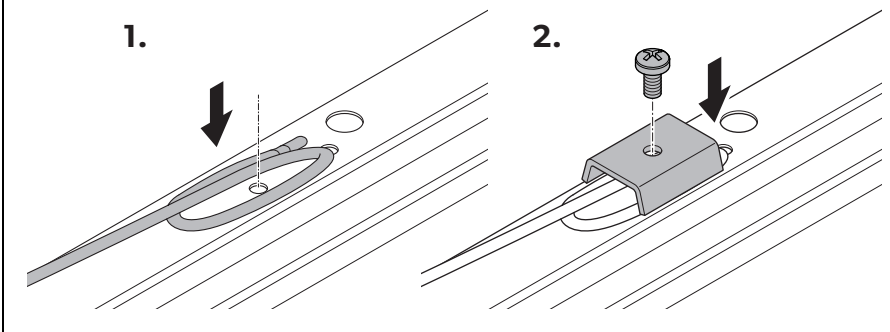
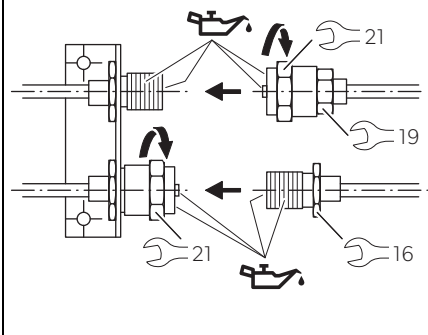
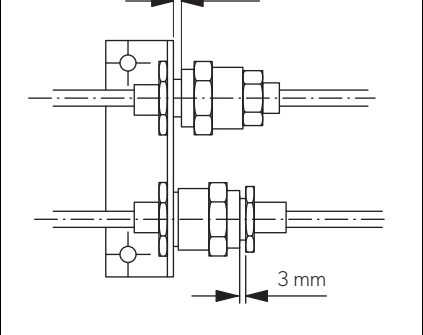
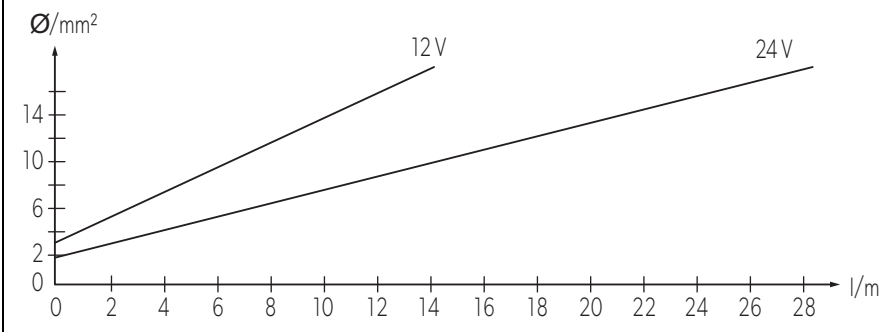


8 VD-14N, VD-15



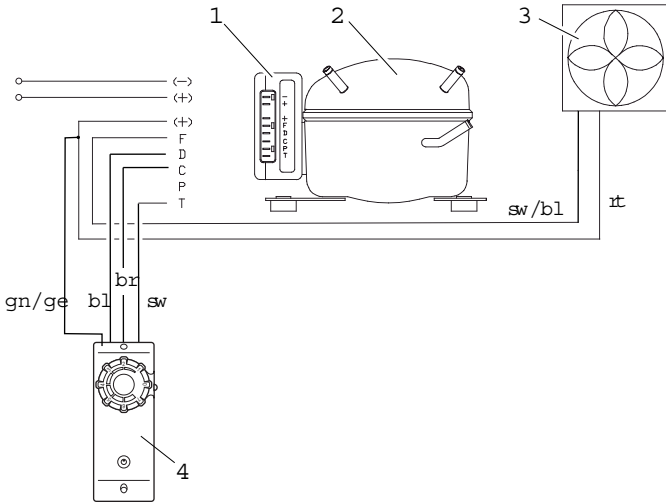
9 VD-16

10 VD-14N, VD-15

11

12




15**16****17****18**

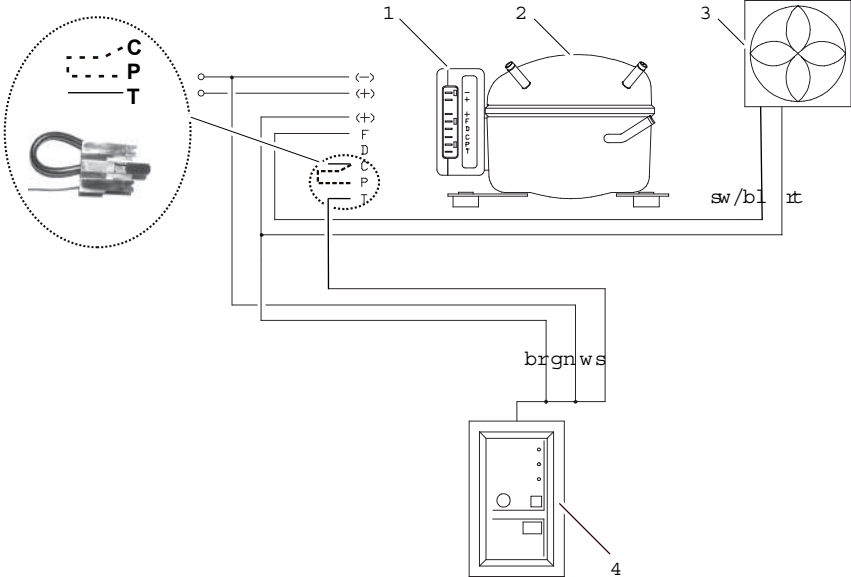
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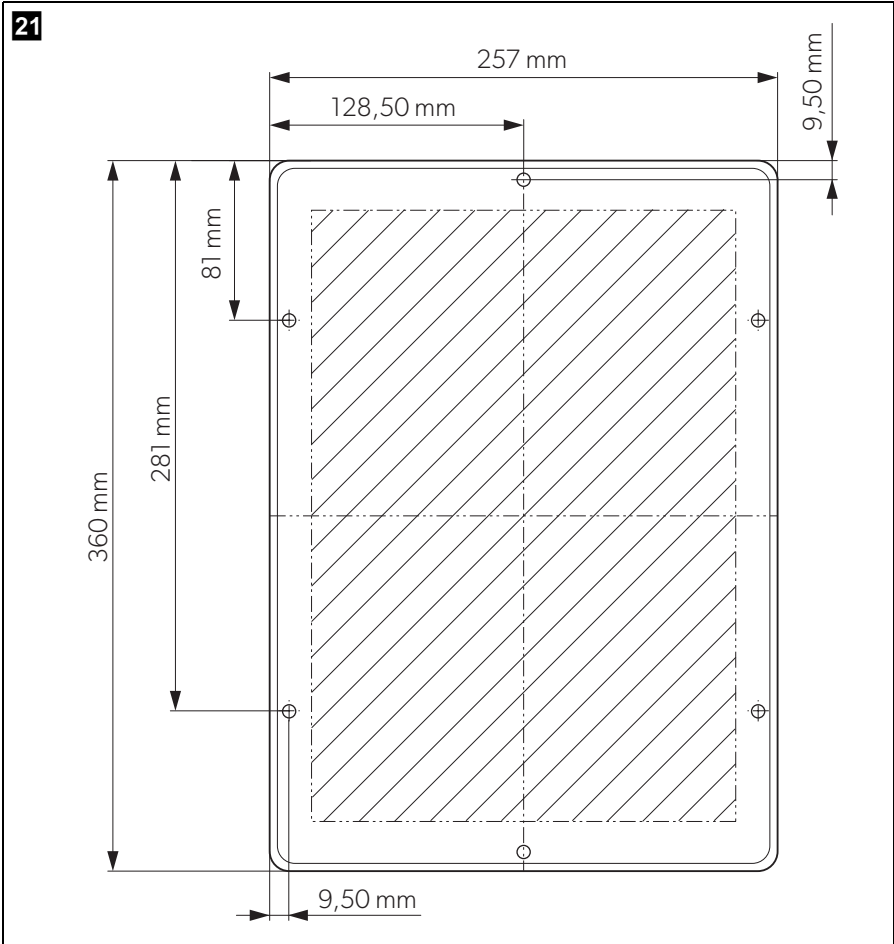


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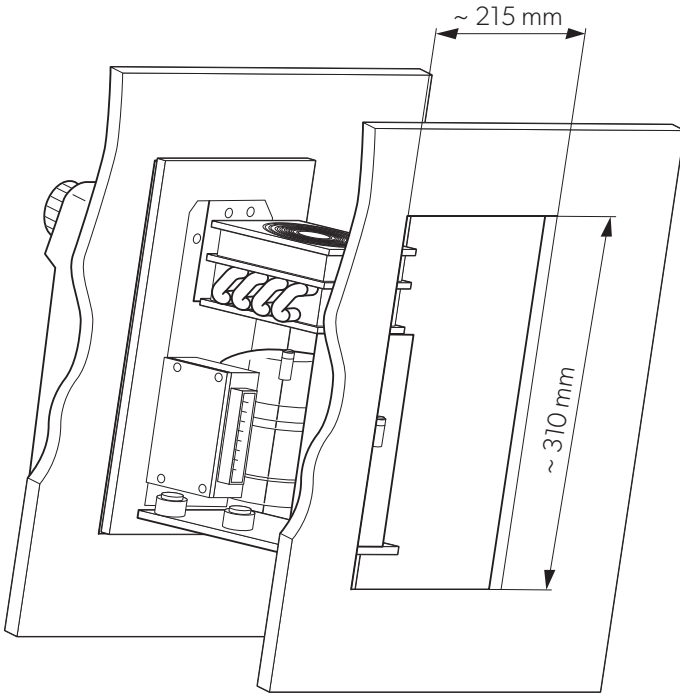
VD-06



	bl	br	ge	gn	gr	rt	sw	ws	v
EN	Blue	Brown	Yellow	Green	Grey	Red	Black	White	or
DE	Blau	Braun	Gelb	Grün	Grau	Rot	Schwarz	Weiss	oder
FR	Bleu	Marron	Jaune	Vert	Gris	Rouge	Noir	Blanc	ou
ES	Azul	Marrón	Amarillo	Verde	Gris	Rojo	Negro	Blanco	o bien
PT	Azul	Castanho	Amarelo	Verde	Cinzento	Vermelho	Preto	Branco	ou
IT	Blu	Marrone	Giallo	Verde	Grigio	Rosso	Nero	Bianco	oppure
NL	Blaauw	Bruin	Geel	Groen	Grijs	Rood	Zwart	Wit	of
DA	Blå	Brun	Gul	Grøn	Grå	Rød	Sort	Hvid	eller
SV	Blå	Brun	Gul	Grön	Grå	Röd	Svart	Vit	eller
NO	Blå	Brun	Gul	Grønn	Grå	Rød	Svart	Hvit	eller
FI	Sininen	Ruskea	Keltainen	Vihreä	Harmaa	Punainen	Musta	Valkoinen	tai
RU	Синий	Коричневый	Желтый	Зеленый	Серый	Красный	Черный	Белый	или
PL	Niebieski	Brazowy	Żółty	Zielony	Szary	Czerwony	Czarny	Biały	lub
SK	Modrá	Hnedá	Žltá	Zelená	Sivá	Červená	Čierna	Biela	alebo
CS	Modrá	Hnědá	Žlutá	Zelená	Šedá	Červená	Černá	Bílá	nebo
HU	Kék	Barna	Sárga	Zöld	Szürke	Piros	Fekete	Fehér	vagy



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Please read these instructions carefully and follow all instructions, guidelines, and warnings included in this product manual in order to ensure that you install, use, and maintain the product properly at all times. These instructions **MUST** stay with this product.

By using the product, you hereby confirm that you have read all instructions, guidelines, and warnings carefully and that you understand and agree to abide by the terms and conditions as set forth herein. You agree to use this product only for the intended purpose and application and in accordance with the instructions, guidelines, and warnings as set forth in this product manual as well as in accordance with all applicable laws and regulations. A failure to read and follow the instructions and warnings set forth herein may result in an injury to yourself and others, damage to your product or damage to other property in the vicinity. This product manual, including the instructions, guidelines, and warnings, and related documentation, may be subject to changes and updates. For up-to-date product information, please visit dometic.com.

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1 Explanation of symbols



DANGER!

Safety instruction: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



WARNING!

Safety instruction: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

**CAUTION!**

Safety instruction: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

**NOTICE!**

Indicates a situation that, if not avoided, can result in property damage.

**NOTE**

Supplementary information for operating the product.

2 Safety instructions

2.1 General safety

**DANGER!**

- **Danger of fatal injuries!**

When using the device on boats: if the device is powered by the mains, ensure that the power supply has a residual current circuit breaker!

**WARNING!**

- This device may only be installed and repaired by a qualified technician. Inadequate repairs can lead to considerable hazards. Should your device need to be repaired, please contact customer services.
- Do not operate the device if it is visibly damaged.
- Do not open the refrigerant circuit under any circumstances. An exception to this is when the device has to be disconnected for return shipping (chapter "Installing the external temperature regulator" on page 21).
- Set up the device in a dry location where it is protected against splashing water.
- Do not place the device near naked flames or other heat sources (heaters, direct sunlight, gas ovens etc.).
- Make sure that the compressor is sufficiently ventilated.
- **Electronic devices are not toys!**
Always keep and use the device out of the reach of children.

- People (including children) whose physical, sensory or mental capacities or whose lack of experience or knowledge prevent them from using this product safely should not use it without the supervision or instruction of a responsible person.
- Before you start up the device for the first time, check that the operating voltage matches the battery voltage (see type plate).
- If the connection cable is damaged, it must be replaced to prevent possible electrical hazards. Only replace a damaged connection cable with a connection cable of the same type and specifications.
- Do not store any explosive substances, such as spray cans with propellants in the device.

2.2 Operating the device safely



DANGER! Danger of fatal injuries!

- Do not touch exposed cables with your bare hands. This especially applies when operating the device from the AC mains.



NOTICE!

- Never use cleaners that contain sand, acids or solvents to clean the evaporator.
- Protect the device against rain and moisture.
- Disconnect the cooling device and other consumer units from the battery before you connect the quick charging device.



NOTE

- Disconnect the device if you are not going to use it for a prolonged period.

2.3 Safety precautions when handling batteries



CAUTION! Danger of injury!

- Batteries contain aggressive and caustic acids. Avoid battery fluid coming into contact with your body. If your skin does come into contact with battery fluid, wash the part of your body in question thoroughly with water.
- If you connect the device to a battery, make sure that no food comes into contact with the battery acid.

3 Scope of delivery

Quantity	Description
1	Cooling unit or evaporator
1	Operating manual

4 Accessories

If you wish to operate the cooling unit from the 230 V AC mains, please use one of the following rectifiers.

Available as accessory (not included in scope of delivery):

Description	Item number
CoolPower EPS100 rectifier For devices with BD35F compressor (50/80/CS/CS series)	9600000440
CoolPower MPS35 rectifier For devices with BD35F compressor (50/80/CS/CS series)	9600000445
CoolPower MPS50 rectifier For devices with BD50F compressor (90 series)	9600000441

5 Intended use

The cooling unit is suited for building your own refrigerator or cooler.

The cooler unit is suitable for cooling and freezing food. The device is also suitable for use on boats.

This product is only suitable for the intended purpose and application in accordance with these instructions.

This manual provides information that is necessary for proper installation and/or operation of the product. Poor installation and/or improper operating or maintenance will result in unsatisfactory performance and a possible failure.

The manufacturer accepts no liability for any injury or damage to the product resulting from:

- Incorrect assembly or connection, including excess voltage
- Incorrect maintenance or use of spare parts other than original spare parts provided by the manufacturer

- Alterations to the product without express permission from the manufacturer
- Use for purposes other than those described in this manual

Dometic reserves the right to change product appearance and product specifications.

6 Technical description

The cooling units are suitable for use with 12 V or 24 V DC voltage and can therefore be used for camping or on boats. Furthermore, you can connect them to a 230 V mains supply via the rectifiers (see chapter “Accessories” on page 16).

When used on boats, the cooling unit can withstand a constant heeling of 30°.

The cooling unit must be used together with an evaporator. In addition, you can use an accumulator with or without TEC control. The **CS-NC15** comprises a cooling unit and an evaporator.

Use the continuously variable thermostat on the evaporator to set the desired temperature.

The accumulator and TEC program control ensure a high cooling capacity and improve the unit’s efficiency. The accumulator is charged when there is a sufficient supply of power (for example when powered by a mains adapter). In the event of accumulator usage or under-voltage, the coolant is drawn from the accumulator until it is empty. Thus, no power is taken from the battery during this time.

The TEC program control always ensures that

- Cold energy is stored if there is excess electrical energy (external supply of power by a generator).
- The coolant accumulator can be used at any time to ensure that the complete battery power is used for other consumers.
- Stored cold energy is automatically retrieved to preserve the interior cooling temperature of the cooling area, once the battery capacity is exhausted.



NOTE

Further information on the coolant accumulator can be found in chapter “Use coolant accumulator” on page 27.

6.1 Battery monitor

The cooling device is equipped with an electronic device to protect against reversing the polarity when connecting to a battery. To protect the battery, the cooling device switches off automatically if the voltage is insufficient (see following table).

Devices without TEC control

Connection voltage	Switch-off voltage	Restart voltage
12 V	10.4 V	11.7 V
24 V	22.8 V	24.2 V

Devices with TEC control

Connection voltage	Switch-off voltage	Restart voltage
12 V	10.7 V	13.0 V
24 V	22.0 V	26.0 V

7 Installing the cooling unit



WARNING!

The installation may only be performed by a qualified technician.

7.1 Tools required

For **installation and assembly**, you will need the following tools:

- Drill
- Screwdriver
- Open-ended spanner: 16 mm, 19 mm and 21 mm
- Sealant and PUR foam
- Cable, cable lugs and cable clips
- Ester oil

7.2 Notes on the cooling container

Permitted cooling area contents

Make sure that maximum cooling area contents specified are not exceeded for the respective evaporator type (see chapter “Technical data” on page 31).

Minimum insulation

The maximum cooling area contents are based on a minimum insulation thickness of 35 mm of foam polyurethane with a density of 40 kg/m³. If other insulating materials are used such as styrofoam, double the wall thickness to attain the same level of heat insulation.

Installing the evaporator

The evaporator must be installed in the cooling container (except **CS-NC15**, the evaporator is premounted).

Observe the following in the process:

- Correct installation position (fig. **3**, page 4 up to fig. **9**, page 6)
- Arrangement in the cooling container as far to the top as possible
- Install a least 10 mm from the wall (**not VD-14N and VD-15**).



NOTICE!

For cooling units without valve couplings (ready-to install units): Do not open the refrigerant circuit during installation. You may have to make the wall openings larger to be able to slide the evaporator through them (fig. **11**, page 6). Or alternatively, you create an opening that allows you to install the cooling lines at the top (fig. **12**, page 6).

Connecting the evaporator

- Connect the evaporators **VD-14N and VD-15** in accordance with fig. **10**, page 6.
- Connect evaporator **VD-16** according to fig. **9**, page 6.
- Connect other evaporators according to fig. **19**, page 9.

Keys for the illustrations

No. in fig. 8 , page 5	Explanation
1	DC fan
2	Thermostat button
3	Connection plug for DC fan
4	Thermostat
5	Connection cable

No. in fig. 9 , page 6	Explanation
1	Connection cable

No. in fig. 10 , page 6	Explanation
1	Connection cable

No. in fig. 19 , page 9 and fig. 20 , page 9	Explanation
1	Connection block
2	Compressor
3	Fan
4	Switch fig. 19 or TEC controller fig. 20

**NOTICE!**

Carefully insulate and seal off the wall openings after installation to prevent moisture penetration.

For cooling units with valve couplings

- ▶ Cut out a hole with a diameter of at least 30 mm (fig. **13**, page 7) for the cooling lines. To do this, use a circular cutter.

**NOTICE!**

Never bend the connecting line between the evaporator and the unit. The minimum bending radius is 25 mm.

7.3 Installing the cooling unit

It is important to select the proper location for setting up the unit. To ensure trouble-free operation, please note the following points:

- Set up the cooling unit in a dry, sheltered place. Avoid placing it near heat sources such as radiators, gas ovens or hot water pipes. Do not place in direct sunlight.
- On a boat, install the cooling unit, if possible, below the waterline.
- The refrigeration unit functions at a tilt angle of up to 30°. Install the unit on a flat base so that it will still operate, even at the strongest possible inclination.
- The heated air must dissipate unhindered (fig. 14, page 7).
- When installing the cooling unit in a closed room such as a wardrobe, pantry or aft compartment, openings must have a cross section of at least 200 cm² (25 cm x 8 cm) for cooling and exhaust air.
- Make sure that the air flow on the condenser (fig. 14 C, page 7) is not restricted.
- Maintain a minimum distance between the condenser and adjoining wall of 50 mm.
- **CS-NC15:** Observe the drilling template (fig. 21, page 11) and the installation drawing (fig. 22, page 12).

7.4 Installing the external temperature regulator

Mechanical thermostat

The temperature regulator can be mounted either on the outside or inside of the cooling container. The interior temperature is regulated depending on the surface temperature of the evaporator, or **for VD-14N and VD-15**, depending on the room temperature.

- ▶ Connect the coiled end of the sensor cable to the evaporator (fig. 15, page 8, **not VD-14N, VD-15**) using the clamping plate. This is premounted on **VD-14N, VD-15**.
- ▶ Make sure that the sensor line does not make contact anywhere else with the evaporator or with the suction line.

TEC control

The TEC control must be attached outside of the cooling container. The internal temperature is regulated according to the evaporator surface temperature.

The temperature sensor has been factory-mounted to the accumulator.

- ▶ Connect the temperature sensor with the TEC control via the plug-in coupling.

Mount the one-way couplings (not CS-NC15)



NOTICE!

Only persons who are skilled and knowledgeable in the field of refrigeration technology may connect one-way couplings. The general regulations for handling refrigerants must be observed!

The one-way couplings are only suitable for connecting the refrigeration units once. Re-opening or improper connection of the couplings will result in a complete loss of the refrigerant and in the failure of the refrigeration unit!

In such cases, the two previously connected parts of the cooling unit must be disassembled and sent in. At the factory, the one-way couplings are renewed and the product is refilled with refrigerant.

The two components of the refrigeration unit – the evaporator and the compressor-condenser unit – are supplied separately. The components are connected with one-way couplings. The refrigerant quantity required to operate the entire refrigeration unit is already contained in the two components. A subsequent filling with refrigerant is, therefore, not necessary.

- ▶ Assemble the compressor-condenser unit and the evaporator unit.
- ▶ Remove the protective caps and plugs from the unconnected halves of the one-way coupling of the compressor-condenser unit and the evaporator unit.
- ▶ Carefully clean the coupling seat and the threaded surface to prevent dirt or foreign material from entering the system.



NOTICE! Risk of coolant leakage

- Always use two wrenches when tightening the one-way couplings to prevent the pipes from twisting!
- Reusing the one-way couplings is not permitted!
- Determine which of the two one-way clutch connections is more difficult to access with the wrench and connect it first.
- Always connect only one one-way coupling connection and then the second.

**NOTE**

The O-ring is only an interim seal during the initial connection of the one-way couplings. This O-ring is only used for the initial sealing between the piercing of the diaphragm and the final metallic sealing. A leak-free seal is only achieved by a metallic connection between the two coupling halves.

- ▶ Apply refrigerant oil to the internal and external threads and to the internal mandrels (fig. **16**, page 8).
- ▶ Connect the two halves of the coupling and screw them together by hand at first (fig. **17**, page 8). Do not use a wrench!

One-way coupling with union nut:

- ▶ Screw on the coupling half with the union nut using a wrench size 21 mm and a wrench size 19 mm up to the end of the thread or until a noticeable resistance is felt. Do not tighten the screw connection yet.

The wrench size 19 mm serves as a guide when screwing on the union nut.

Connection of the one-way coupling with external thread:

- ▶ Screw on the coupling half with the union nut using a wrench size 21 mm and a wrench size 16 mm up to the end of the thread or until a noticeable resistance is felt. Do not tighten the screw connection yet.

The wrench size 16 mm is used for counterholding when screwing on the union nut.

- ▶ Use a pencil to draw a line lengthwise from the union nut to the bracket of the opposite coupling half.
- ▶ Now tighten the union nut firmly with a torque of 30 Nm or another 1/4 turn. The offset of the line shows how strongly the one-way coupling was tightened. This last turn is necessary to ensure a leak-free connection between the coupling halves.

**NOTE**

The distance between the beginning of the union nut and the hexagon of the external thread must not exceed 3 mm (fig. **17**, page 8).

- ▶ Perform a leak test on the coupling connections. This ensures that the one-way couplings are correctly connected and the sealing is functional.

7.5 Connecting the cooling unit

Connecting to a battery

The cooling unit can be operated from a 12 V or a 24 V DC voltage supply.



NOTICE!

To avoid voltage loss and therefore a drop in performance, the cable should be kept as short as possible and should not be interrupted. For this reason avoid additional switches, plugs or power strips.

- ▶ Determine the required cross section of the cable in relation to the cable length according to fig. **18**, page 8.

Key for fig. **18**, page 8

Co-ordinate axis	Meaning	Unit
l	Cable length	m
∅	Cable cross section	mm ²



NOTICE!

Make sure that the polarity is correct.

- ▶ Before you start up the unit for the first time, check that the operating voltage matches the battery voltage (see type plate).
- ▶ Connect your cooling unit
 - as directly as possible to the pole of the battery or
 - to a plug socket which is fuse protected with at least 15 A (at 12 V) or 7.5 A (at 24 V).



NOTICE!

Disconnect the cooling device and other power consuming devices from the battery before you connect the battery to a quick charging device. Overvoltage can damage the electronics of the device.

For safety reasons the cooling unit is equipped with an electronic system to prevent polarity reversal. This protects the cooling unit when it is connected to a battery.

Connecting to a 230 V mains supply



WARNING!

- Never handle plugs and switches with wet hands or if you are standing on a wet surface.
- If you are operating your cooling device on board a boat with a mains connection of 230 V from the land, you must install a residual current circuit breaker between the 230 V mains supply and the cooling device.
Seek advice from a trained technician.

- ▶ To operate the cooling unit from the 230 V mains, use the rectifier
 - CoolPower EPS100 for devices with BD35F compressor (50/80/CS/CS series),
 - CoolPower MPS35 for devices with BD35F compressor (50/80/CS/CS series),
 - CoolPower MPS50 for devices with BD50F compressor (90 series).



NOTE

The output voltage of the described rectifier is 24 V. Please remember this when connecting other consumers at a later time.

8 Using the cooling unit

8.1 Energy saving tips

- Choose a well ventilated installation location which is protected from direct sunlight.
- Allow hot food to cool down first before placing it in the device.
- Do not open the refrigerated container more often than necessary.
- Do not leave the door open for longer than necessary.
- Defrost the refrigerated container once a layer of ice forms.
- Avoid unnecessary low temperatures.
- Clean the condenser of dust and dirt at regular intervals.
- Clean the lid seal regularly.

8.2 Start the cooling unit

Devices without TEC control

- ▶ Switch in the cooling unit by turning the control button clockwise (fig. **1** A1 or B1, page 3).

If you turn the control button further, you can regulate the temperature. Devices with energy storage function offer a storage activation button (fig. **1** A2, page 3).



NOTE

If the red LED flashed or glows, a fault has occurred and the system cannot be operated (see error table in Chapter chapter "LED on the thermal element (fig. **1** 2, page 3)" on page 29).

Devices with TEC control

Devices with TEC control are started by actuating the main switch (fig. **2** 6, page 3). You can then regulate the temperature (fig. **2** 5, page 3) with the temperature selector.

8.3 Shutting down the cooling unit

If you do not intend to use the cooling device for a prolonged period, proceed as follows:

- ▶ **Devices without TEC control:** Turn the control to 0.
- ▶ **Devices with TEC control:** Switch off the device with the main switch (fig. **2** 6, page 3).
- ▶ Disconnect the power cable from the battery or pull the DC cable plug out of the rectifier.
- ▶ Clean the cooling device.
- ▶ Leave the door slightly open over the cover.
This prevents odour build-up.

9 Use coolant accumulator

9.1 Display and control elements of devices with TEC program control

No. in fig. 2 , page 3	Explanation
1	Green LED: Indicates that the compressor is working.
2	Yellow LED: indicates that the external power supply is present (voltage is higher than 13.5 V or 27.0 V). The LED flashes if the external power supply is too low (voltage ≤ 10.7 V or 21.7 V. Version E: ≤ 10.7 V or 22.0 V).
3	Red LED: indicates that the accumulator is being discharged because <ul style="list-style-type: none"> • the discharge button has been pressed • Low voltage shutdown (voltage ≤ 10.7 V or 21.4 V. Version E: ≤ 10.7 V or 22.0 V).
4	Accumulator discharge button: interrupts compressor operation until <ul style="list-style-type: none"> • the stored cold energy is exhausted • The external supply voltage level is restored after low voltage.
5	Temperature selector: allows the temperature in the cooling area to be set as required Min. (left limit) = warmest setting Max. (right limit) = coldest setting
6	Main switch: for switching the cooling device on and off. Position 0 = OFF Position – = ON

9.2 Accumulator function

The accumulator function ensures that cold energy is stored automatically (up to 8 hours) if enough electrical power is available, for example when supplied by a mains adapter.

Stored cooling power is discharged

- automatically when the switch-off voltage is reached (see the table on page 18)
- or manually by pressing the discharge button (fig. **1** A2 or fig. **2** 4, page 3).

**NOTE**

The cold accumulator can only be discharged manually if it was fully charged beforehand.

The accumulator is automatically charged if,

- the restart voltage is exceeded
- or the accumulator is empty and you switch the device off and on again using the control button (fig. **2** 6, page 3, does only function on VD-06).

**NOTICE!**

When you are discharging the accumulator, although there is an external supply of power – for example to avoid operating noise from the compressor – use the main switch to switch the unit off (fig. **1** B1 or fig. **2** 6, page 3).

**NOTE**

Please remember: Low internal temperature = high current consumption!

10 Warranty

The statutory warranty period applies. If the product is defective, please contact the manufacturer's branch in your country (see dometic.com/dealer) or your retailer.

For repair and warranty processing, please include the following documents when you send in the device:

- A copy of the receipt with purchasing date
- A reason for the claim or description of the fault

11 Disposal

- ▶ Place the packaging material in the appropriate recycling waste bins, wherever possible.



If you wish to finally dispose of the product, ask your local recycling center or specialist dealer for details about how to do this in accordance with the applicable disposal regulations.

12 Troubleshooting

LED on the thermal element (fig. 1 2, page 3)

Number of flashes	Error type	Remedy
1	Battery protection shutdown	Check battery voltage, fuse and cable cross section
2	Fan overvoltage shutdown	Check condenser and evaporator fan current: total target value < 0.5 A
3	Compressor start-up fault	Reduce load on cooling system: <ul style="list-style-type: none"> • Ensure good ventilation around the cooling unit • Store pre-cooled goods
4	Compressor overload shutdown	Reduce load on cooling system: <ul style="list-style-type: none"> • Ensure good ventilation around the cooling unit • Store pre-cooled goods
5	Electronic fuse shutdown	Reduce load on cooling system: <ul style="list-style-type: none"> • Ensure good ventilation around the cooling unit

Compressor does not run

Fault	Possible cause	Remedy
$U_T = 0V$	The connection between the battery and the – electronics is interrupted	Establish a connection
	Main switch defective (if installed)	Replace the main switch
	Additional supply line fuse has blown (if installed)	Replace the fuse
$U_T \leq U_{ON}$	Battery voltage is too low	Charge the battery
Start attempt with $U_T \leq U_{OFF}$	Loose cables	Establish a connection
	Poor contact (corrosion)	Establish a connection
	Battery capacity too low	Replace the battery
	Cable cross section too low	Replace the cable (fig. 18, page 8)

Fault	Possible cause	Remedy
Start attempt with $U_T \geq U_{ON}$	Ambient temperature too high	–
	Insufficient ventilation and/or cooling	Provide improved ventilation for the cooling unit
	Condenser is dirty	Clean the condenser
	Fan defective (if installed)	Replace the fan

U_T Voltage between the positive and negative electronic terminals

U_{ON} Switch-on voltage of the electronics

U_{OFF} Switch-off voltage of the electronics

Interior temperature too low in control setting 1

Fault	Possible cause	Remedy
Compressor runs constantly	Thermostat sensor has no contact on the evaporator	Secure the sensor
	Thermostat defective	Change the thermostat
Compressor runs for a long time	Large quantities have been frozen in the freezer compartment	–

Cooling capacity drops, interior temperature rises

Fault	Possible cause	Remedy
Compressor runs for a long time/continuously	Evaporator is iced over	Defrost the evaporator
	Ambient temperature too high	–
	Insufficient ventilation and/or cooling	Provide improved ventilation for the cooling unit
	Condenser is dirty	Clean the condenser
Compressor runs infrequently	Fan defective (if installed)	Replace the fan
	Battery capacity exhausted	Charge the battery

Unusual noises

Fault	Possible cause	Remedy
Loud humming	A component of the refrigerant circuit cannot move freely (lies against the wall)	Bend the component carefully away from the obstruction
	Foreign body jammed between the cooling device and the wall	Remove the foreign body
	Fan noise (if installed)	Clean the fan blades

13 Technical data

	50	54	55
Max. cooling area contents:	80 litres	130 litres	
Connection voltage:	12 V $\overline{=}$ or 24 V $\overline{=}$		
Power consumption:	35 – 40 W, depending on the evaporator type		
Coolant quantity:	28 g	35 g	
CO ₂ equivalent:	0.040 t	0.050 t	
Global warming potential (GWP):	1430		
Dimensions (W x H x D) in mm:	315 x 140 x 170	386x155x130	220x160x220
Weight:	3.74 kg	6.0 kg	6.5 kg

	84	85	86
Max. cooling area contents:	250 litres		
Connection voltage:	12 V $\overline{=}$ or 24 V $\overline{=}$		
Coolant quantity:	45 g		
CO ₂ equivalent:	0.064 t		
Global warming potential (GWP):	1430		
Dimensions (W x H x D) in mm:	386x155x130	220x155x220	220x230x177
Weight:	6.0 kg	6.0 kg	6.5 kg

	94	95	96
Max. cooling area contents:	400 litres		
Connection voltage:	12 V ⁼⁼⁼ or 24 V ⁼⁼⁼		
Coolant quantity:	60 g		
CO2 equivalent:	0.086 t		
Global warming potential (GWP):	1430		
Dimensions (W x H x D) in mm:	386x155x130	220x155x220	220x230x177
Weight:	6.0 kg	6.0 kg	6.5 kg

	CS-NC15
Max. cooling area contents:	250 litres
Connection voltage:	12 V ⁼⁼⁼ or 24 V ⁼⁼⁼
Coolant quantity:	60 g
CO2 equivalent:	0.086 t
Global warming potential (GWP):	1430
Dimensions (W x H x D) in mm:	360x255x275
Weight:	8.5 kg

	VD-01	VD-02	VD-03	VD-04
Max. cooling area content at 35 mm PU insulation:	80 litres	30 litres	170 litres	130 litres
Max. cooling area content at 50 mm PU insulation:	100 litres	50 litres	200 litres	170 litres
Power consumption:	35 W	35 W	50 W	45 W
Voltage	12 V ⁼⁼⁼ or 24 V ⁼⁼⁼			
Coolant quantity:	17 g		20 g	30 g
CO2 equivalent:	0.024 t		0.029 t	0.043 t

	VD-01	VD-02	VD-03	VD-04
Global warming potential (GWP):	1430			
Dimensions (W x H x D) in mm:	300x245x110	275x215x25	380x230x82	375x255x100
Weight:	1.5 kg	1.0 kg	2.0 kg	1.5 kg
	CU-50 + VD-01	CU-50 + VD-02	CU-50 + VD-07	
Max. cooling area content at 35 mm PU insulation:	50 litres	30 litres	60 litres	
Max. cooling area content at 50 mm PU insulation:	75 litres	50 litres	80 litres	
Power consumption:	30 W			
Temperature:	ambient: 32 °C, internal: 5 °C			
	VD-05	VD-07	VD-08	VD-09
Max. cooling area content at 35 mm PU insulation:	130 litres	100 litres	160 litres	160 litres
Max. cooling area content at 50 mm PU insulation:	170 litres	130 litres	180 litres	180 litres
Power consumption:	45 W	35 W	60 W	60 W
Voltage	12 V ⁼⁼⁼ or 24 V ⁼⁼⁼			
Coolant quantity:	30 g	45 g	15 g	65 g
CO2 equivalent:	0.043 t	0.064 t	0.021 t	0.093 t
Global warming potential (GWP):	1430			
Dimensions (W x H x D) in mm:	375x350x25	255x210x90	450x270x340	365x140x270
Weight:	1.5 kg	1.5 kg	2.0 kg	2.0 kg

	VD-14N	VD-15	VD-18
Max. cooling area content at 35 mm PU insulation:	300 litres	200 litres	100 litres
Max. cooling area content at 50 mm PU insulation:	400 litres	250 litres	150 litres
Power consumption:	80 W	60 W	45 W
Voltage	12 V ⁼⁼⁼ or 24 V ⁼⁼⁼		
Coolant quantity:	15 g		
CO2 equivalent:	0.021 t		
Global warming potential (GWP):	1430		
Dimensions (W x H x D) in mm:	220x275x65	220x275x65	350x250x25
Weight:	2.5 kg	1.5 kg	1.5 kg

	VD-16	VD-21
Max. cooling area content at 60 mm PU insulation:	130 litres	250 litres
Max. cooling area content at 100 mm PU insulation:	200 litres	300 litres
Power consumption:	60 W	60 W
Voltage	12 V ⁼⁼⁼ or 24 V ⁼⁼⁼	
Coolant quantity:	40 g	10 g
CO2 equivalent:	0.057 t	0.014 t
Global warming potential (GWP):	1430	
Dimensions (W x H x D) in mm:	330x260x130	1370x305x10
Weight:	2.5 kg	4.0 kg

	VD-16 for series 80	VD-16 for series 90
Max. cooling area content at 35 mm PU insulation:	120 litres	200 litres
Max. cooling area content at 50 mm PU insulation:	200 litres	250 litres
Power consumption:	65 W	80 W
Voltage	12 V $\overline{=}$ or 24 V $\overline{=}$	
Coolant quantity:	40 g	
CO ₂ equivalent:	0.057 t	
Global warming potential (GWP):	1430	
Dimensions (W x H x D) in mm:	380x300x62	
Weight:	5.0 kg	

Test/certificates:

The coolant circuit contains R-134a.

Contains fluorinated greenhouse gases