



Design Guide

VLT[®] Brake Resistor MCE 101

VLT[®] Frequency Converters • FC 51 • FC 102 • FC 202 • FC 301
FC 302 • FC 360 • FCD 302 • VLT[®] 2800



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1 Introduction

1.1 How to Read this Design Guide

Danfoss VLT® Brake Resistors MCE 101 are optimised for:

- VLT® Micro Drive FC 51
- VLT® HVAC Drive FC 102
- VLT® AQUA Drive FC 202
- VLT® AutomationDrive FC 300
- VLT® AutomationDrive FC 360
- VLT® Decentral Drive FCD 302
- VLT® 2800

General versions for horizontal and vertical applications are available.

The Design Guide provides the information required to select and plan installation of the right brake resistor for an application:

- Selection of the correct brake resistor
- Pre-installation considerations
- Programming.

As an alternative to using a brake resistor, other braking methods can be applied depending on the braking profile of the application, see *chapter 7 Special Conditions*.

Additional technical literature is also available online at www.danfoss.com/BusinessAreas/DrivesSolutions/Documentations/Technical+Documentation.

1.2 Conformity



Table 1.1 Approval

1) See Table 9.2 and Table 9.4 for UL conformity.

What is CE Conformity and Labelling

The purpose of CE labelling is to avoid technical trade obstacles within EFTA and the EU. The EU has introduced the CE label as a simple way of showing whether a product complies with the relevant EU directives. The CE label says nothing about the specifications or quality of the product. Brake resistors are regulated by the following EU directive:

The low-voltage directive (2006/95/EC)

Brake resistors must be CE labelled in accordance with the low-voltage directive of December 12, 2006. The directive applies to all electrical equipment and appliances used in the 50-1000 V AC and the 75-1500 V DC voltage ranges. Danfoss CE-labels in accordance with the directive and issues a declaration of conformity upon request.

1.3 Safety Precautions

WARNING

When in use, the brake resistor surface temperature rises. DO NOT touch the brake resistor during operation.

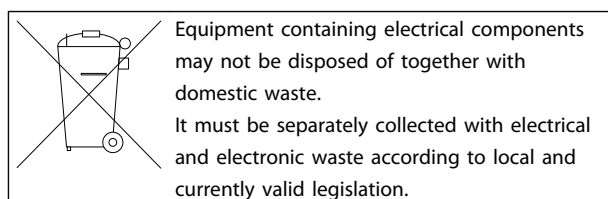
WARNING

Never work on a brake resistor in operation.

NOTICE

Never attempt to repair a defective brake resistor.

1.4 Disposal



2 Product Overview

2.1 Description of the Brake System

When the speed reference of a frequency converter is reduced, the motor acts as a generator and the frequency converter brakes. When a motor acts as a generator, it supplies energy to the frequency converter which is collected in the DC link. The function of the brake resistor is to provide a load on the DC link during braking, thereby ensuring that the braking power is absorbed by the brake resistor.

If a brake resistor is not used, the DC-link voltage of the frequency converter continues to increase, until disconnecting for protection. The advantage of using a brake resistor is that it enables braking of a heavy load quickly, e.g. on a conveyor belt.

The brake resistors in this series are all external components. Therefore, the brake resistor does not form an integral part of the frequency converter. The external brake resistor provides the following advantages:

- The resistor time cycle can be selected as required.
- The heat developed during braking can be conveyed beyond the panel cabinet to allow the energy to be used.
- The electronic components do not overheat, even when the brake resistor is overloaded.

The brake resistor series is suitable for Danfoss frequency converters

- VLT® Micro Drive FC 51
- VLT® HVAC Drive FC 102
- VLT® AQUA Drive FC 202
- VLT® AutomationDrive FC 300
- VLT® AutomationDrive FC 360
- VLT® Decentral Drive FCD 302
- VLT® 2800

2.2 Horizontal or Vertical Load

2.2.1 How to Select

The Danfoss brake resistor range consists of 2 groups:

- Brake resistors for horizontal loads (conveyors, trolleys, gantry cranes, etc.), see *Illustration 2.1*;
- Brake resistors for vertical loads (cranes, hoists, elevators), see *Illustration 2.2*.

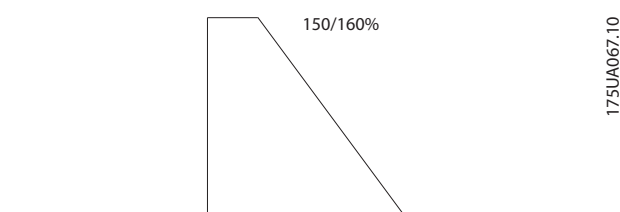


Illustration 2.1 Horizontal Loads

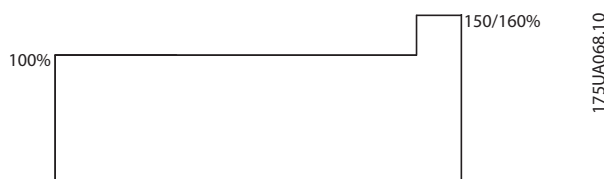


Illustration 2.2 Vertical Loads

The brake resistor range is intended to cover the general braking requirements for horizontal and vertical brake applications.

To select the best brake resistor for an application, refer to *chapter 8.1 Selection Flow Chart*. The flow chart links to further information, either selection tables or calculations of inertia or duty cycle.

To cater for both the horizontal and vertical ranges, 3 types of brake resistors are available:

- Aluminium-housed flat-pack brake resistors
- Aluminium-housed compact brake resistors
- Steel grid brake resistors

2.3 Aluminium-housed Brake Resistors

2.3.1 Aluminium-housed Flat-pack Brake Resistors

The flat-pack brake resistor is an anodized aluminium-housed resistor suitable for wall mounting or on a footprint or an L-profile bracket. The L-profile bracket is used for rear mounting. The brake resistor is designed for high pulse loads of up to 40 times the nominal load and is therefore suitable for both vertical and horizontal applications. The enclosure protection is IP54 or IP65.

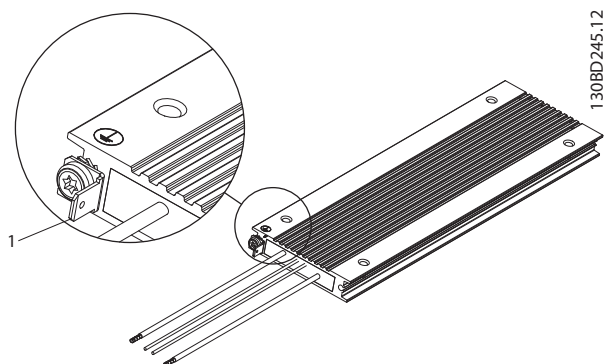


Illustration 2.3 Flat-pack IP54

2.3.2 Aluminium-housed Compact Brake Resistor

The compact brake resistor is housed in aluminium profiles with pre-mounted brackets for wall mounting. It is designed for high pulse loads of up to 60 times the nominal load and is therefore used for both horizontal and vertical loads. The enclosure protection class is either IP21, IP54 or IP65. The brake resistor IP classes IP21 and IP65 are equipped with a connection box containing cable glands and cable connection to the resistor and the temperature switch. IP54 versions have fixed unscreened cables.

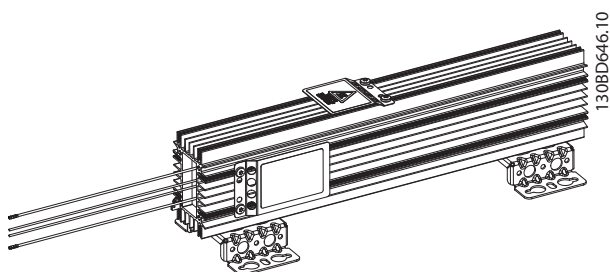


Illustration 2.4 CBR-V-CT IP54

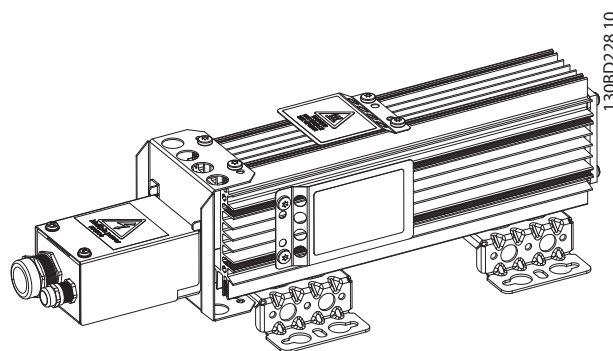


Illustration 2.5 CBR-V-DT IP21

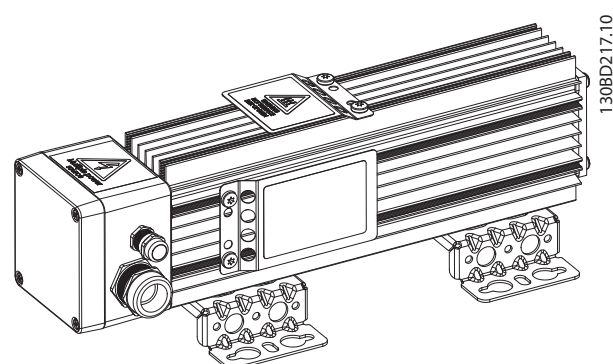


Illustration 2.6 CBR-V-BT IP65

2.4 Steel Grid Brake Resistors

The steel grid brake resistor is steel grid housed and consists of multiple elements. This brake resistor is suitable for pulse loads between 10 and 20 times the nominal load, suitable for frequent braking applications such as cranes, hoists and elevators. It is supplied in an IP20 enclosure with cable glands and has a built-in temperature switch.

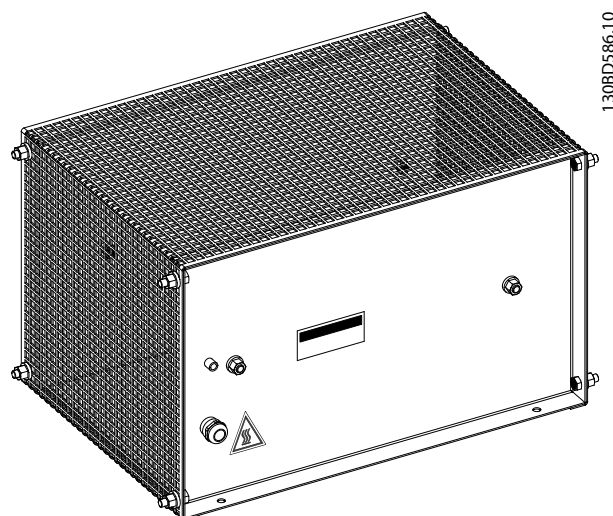


Illustration 2.7 Steel Grid House IP20

3 Installation

3.1 Mechanical Installation

The brake resistors are cooled by natural convection, and the specified minimum clearances must be observed to ensure efficient ventilation. The ventilation must be efficient enough to dispatch the regenerative power in the brake resistor.

NOTICE

When installing the brake resistor, ensure all precautions are in place to avoid the risk of overloading. Overloading can lead to a fire hazard due to the heat generated in the brake resistor.

The brake resistor is very hot during or after braking. The brake resistor must be located in a secure environment to avoid fire risk.

- Mount the brake resistor free of any combustible materials at a well ventilated location.
- The MCE 101 brake resistors product type 9xx contain a built-in temperature switch (for overtemperature protection purposes. See chapter 3.3 Protective Functions).

3.1.1 Aluminium-housed Compact Brake Resistors and Flat-pack Brake Resistors

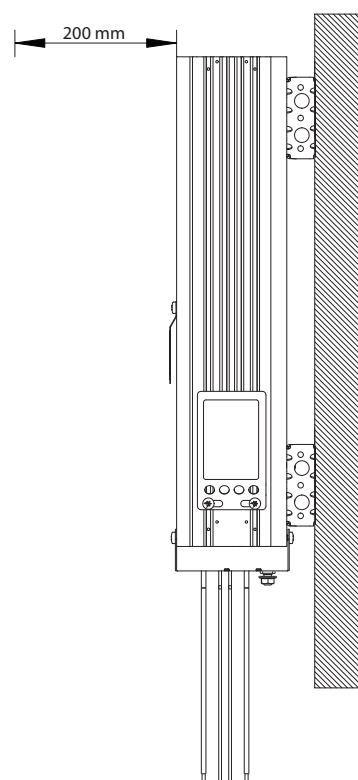
The aluminium-housed compact and flat-pack brake resistors are designed for vertical mounting for optimum cooling performance. However, horizontal mounting is possible for both flat-pack and compact brake resistors. Derating with 20% is required when mounting the compact brake resistors horizontally. No derating for flat-packs are required. The enclosure protection of the IP21 types is reduced to IP20 when mounted horizontally.

NOTICE

All resistors are cooled by natural convection. To ensure sufficient airflow and cooling, follow minimum clearance in *Illustration 3.1* to *Illustration 3.8*.

Vertical Mounting, IP54

For minimum clearances for vertical mounting for all aluminium-housed compact and flat-pack brake resistors, see *Illustration 3.1* and *Illustration 3.2*.



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Illustration 3.1 Vertical Mounting, IP54
Versions with Fixed Cables

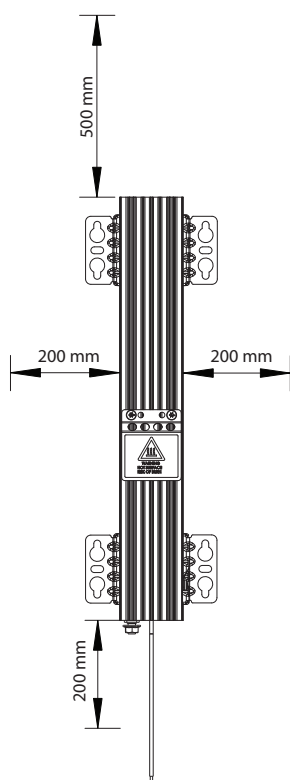


Illustration 3.2 Vertical Mounting, IP54
Versions with Fixed Cables

Horizontal mounting, IP54

For minimum clearances for horizontal mounting for all aluminium-housed compact and flat-pack brake resistors, see *Illustration 3.3* (top view).

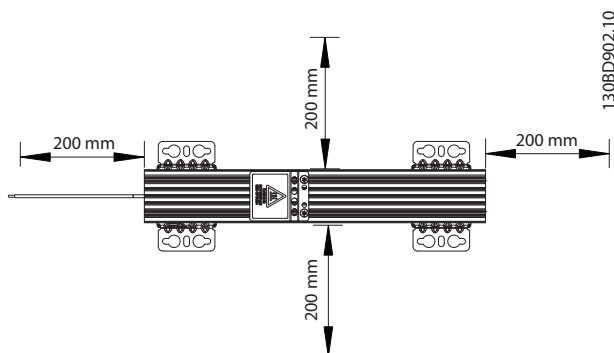


Illustration 3.3 Horizontal mounting, IP54
Versions with Fixed Cables

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For minimum clearances for horizontal mounting for all aluminium-housed compact and flat-pack brake resistors, IP54 versions (versions with fixed cables), see *Illustration 3.4* (side view).

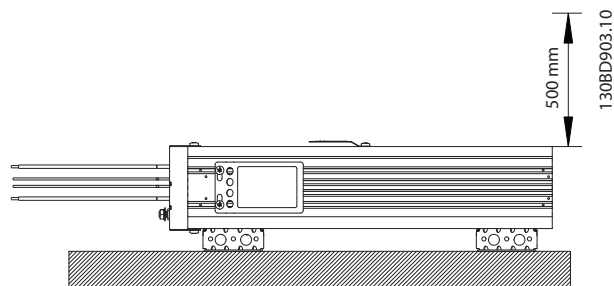


Illustration 3.4 Horizontal mounting, IP54
Versions with Fixed Cables

Vertical mounting, IP21 and IP65

For minimum clearances for vertical mounting for all aluminium-housed compact brake resistors, see *Illustration 3.5* and *Illustration 3.6*.

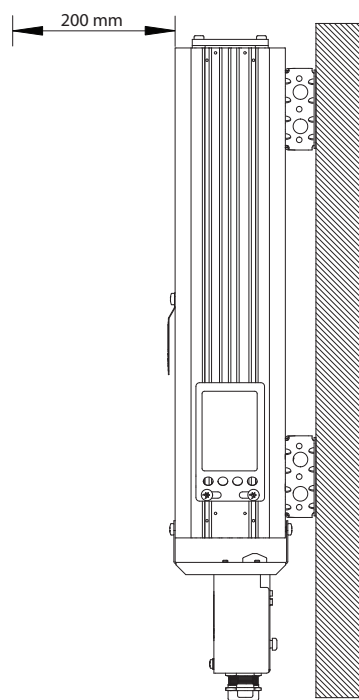


Illustration 3.5 Vertical Mounting, IP21 and IP65
Versions with Connection Box

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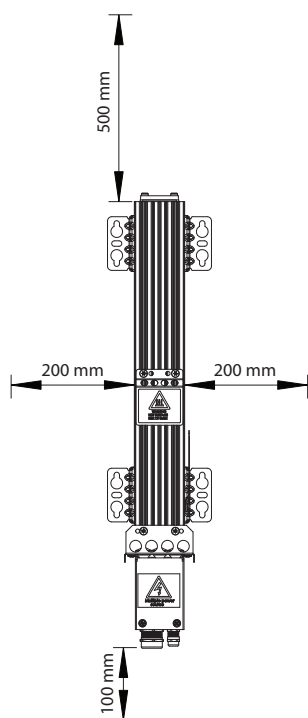


Illustration 3.6 Vertical Mounting, IP21 and IP65
Versions with Connection Box

Horizontal mounting, IP21 and IP65

For minimum clearances for horizontal mounting for all aluminium-housed compact brake resistors, see *Illustration 3.7* (top view).

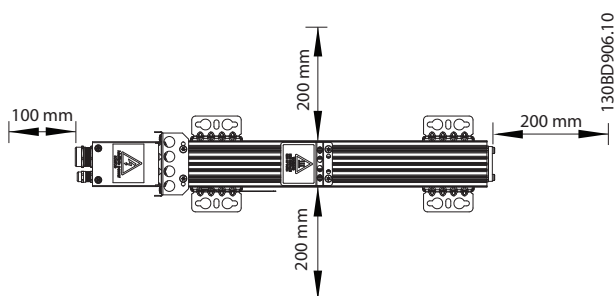


Illustration 3.7 Horizontal Mounting, IP21 and IP65
Versions with Connection Box

130BD905.10

Horizontal mounting, IP21 and IP65

For minimum clearances for horizontal mounting for all aluminium housed compact brake resistors, see *Illustration 3.8* (side view).

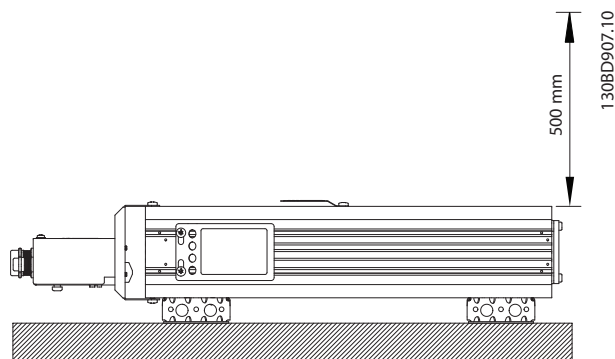


Illustration 3.8 Horizontal Mounting, IP21 and IP65
Versions with Connection Box

Orientation, compact and flat-pack brake resistors

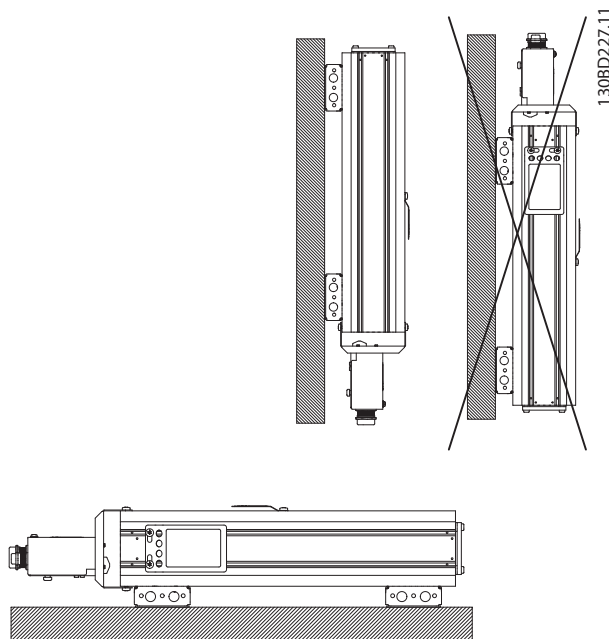


Illustration 3.9 Orientation of Compact and Flat-pack Brake
Resistors

Derating with 20% is required when mounting the compact brake resistors horizontally. The enclosure protection of the IP21 types is reduced to IP20 when mounted horizontally.

3.1.2 Steel Grid Brake Resistors

The steel grid brake resistors are designed for horizontal mounting only.

3

NOTICE

All resistors are cooled by natural convection. To ensure sufficient airflow and cooling, follow minimum clearances in *Illustration 3.10* and *Table 3.3*.

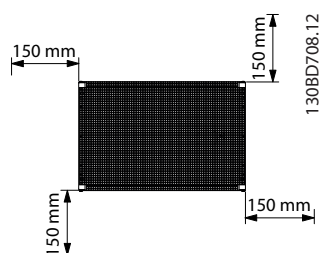


Illustration 3.10 Minimum Clearances of all Steel Grid Brake Resistors - Top View

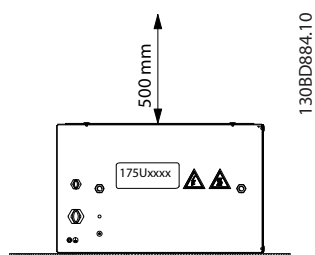


Illustration 3.11 Minimum Clearances of all Steel Grid Brake Resistors - Side View

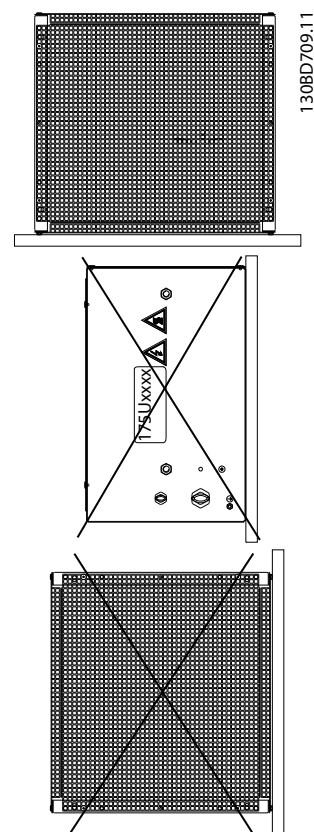


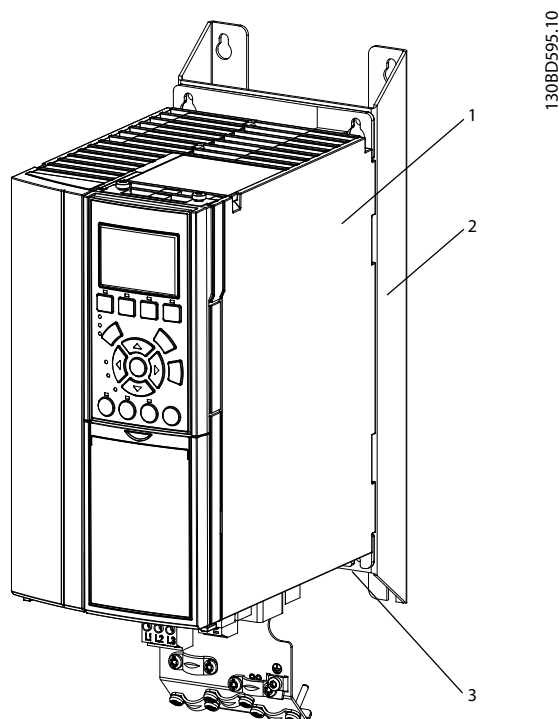
Illustration 3.12 Orientation of Steel Grid Brake Resistors

3.1.3 Accessories

Footprint brackets

The footprint bracket is an accessory used for mounting flat-pack brake resistors.

Use the footprint bracket to mount the brake resistor at the rear of the frequency converter. Once mounted, the combined brake resistor and frequency converter occupy the same space in the cabinet as the frequency converter alone.



1	Frequency converter
2	Footprint mounting bracket
3	Flat-pack brake resistor

Illustration 3.13 Flat-pack Brake Resistor mounted at Rear of Frequency Converter

Part number	Compatible brake resistor	Compatible frequency converter enclosure size
175U0085	1x100 W flat-pack 1x200 W flat-pack	A2
175U0087	2x100 W flat-pack 2x200 W flat-pack	A2
175U0086	2x100 W flat-pack 2x200 W flat-pack	A3
175U0088	1x100 W flat-pack 1x200 W flat-pack	A3

Table 3.1 Selection Table

For mechanical dimensions for footprint brackets, see chapter 9.8.2 Mounting Brackets: Footprint.

L profile brackets

The L profile bracket is an accessory used for mounting flat-pack brake resistors. The L profile brackets support both horizontally and vertically mounting on a fixed surface optimising the required footprint.

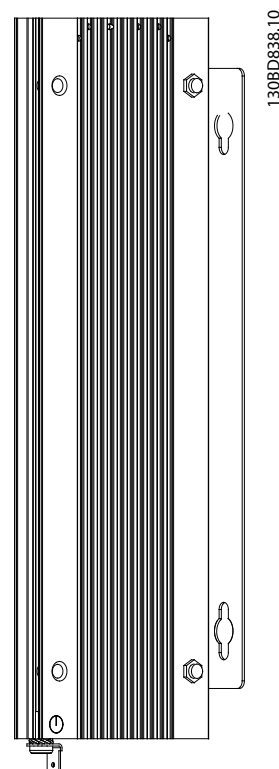


Illustration 3.14 L Profile Bracket

Part number	Compatible brake resistor
175U0009	1x200 W flat-pack
175U0011 ¹⁾	1x100 W flat-pack 1x300 W flat-pack

Table 3.2

1) Order 2x175U0011 for 300 W flat-pack brake resistors.

For mechanical dimensions for L profile brackets, see chapter 9.8.1 Mounting Brackets: L Profile

3.2 Electrical Installation

3.2.1 EMC Precautions

The following EMC precautions are recommended to achieve interference-free operation of fieldbus cable(s) and digital and analog inputs and outputs.

Observe relevant national and local regulations, for example regarding protective earth connection. Keep the fieldbus cable(s) away from motor and brake resistor cables to avoid coupling of high frequency noise from one cable to another. Normally, a distance of 200 mm (8 inches) is sufficient, but keeping the greatest possible distance between the cables is recommended, especially where cables run in parallel over long distances. When crossing is unavoidable, the fieldbus cable(s) must cross motor and brake resistor cables at an angle of 90°, see *Illustration 3.15*.

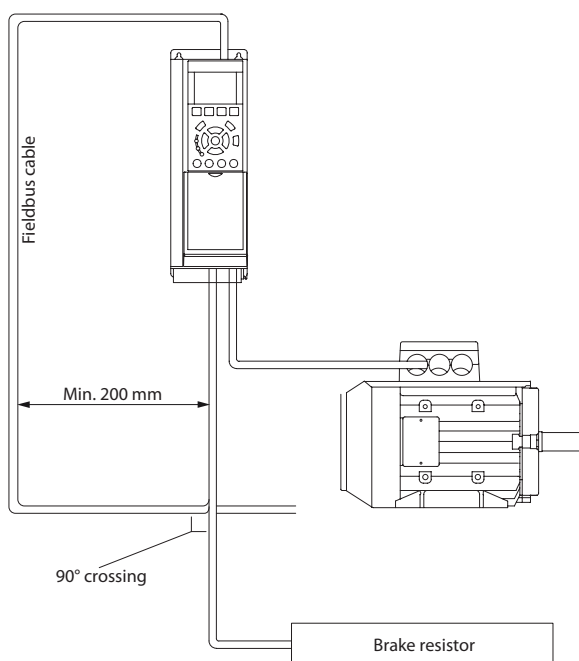


Illustration 3.15 Cable Routing

3.2.2 Cable Connection

NOTICE

To comply with EMC emission specifications, screened/armoured cables are recommended.

NOTICE

Cables General: All cabling must comply with national and local regulations on cable cross-sections and ambient temperature.

See *Table 3.3* for recommended temperature ratings for all cables and conductors connected to the brake resistor as ground connection, thermal switch and brake power.

IP class	Recommended cables
IP20	$\geq 80^\circ\text{C}$
IP21	$\geq 80^\circ\text{C}$
IP54	$\geq 90^\circ\text{C}^{1)}$
IP65	$\geq 90^\circ\text{C}$

Table 3.3 Cable Temperature Ratings

1) For ground connection

How to connect more than one resistor

Star parallel connection to ensure load is shared evenly between 2 or more resistors.

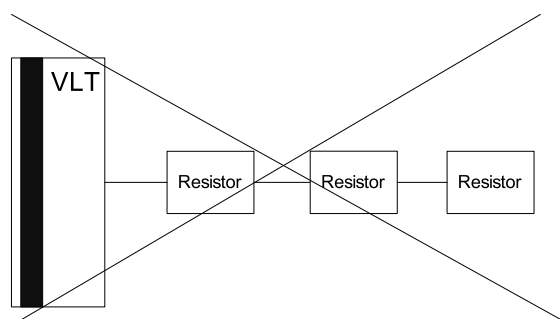
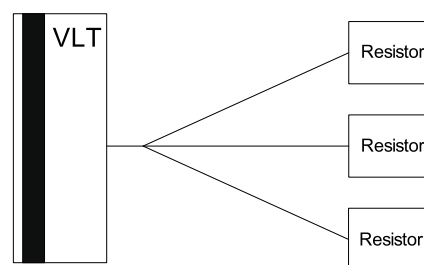


Illustration 3.16 Connection of Several Brake Resistors

Brake resistors with fixed cables

To reduce the electrical noise from the wires between the brake resistor and the frequency converter, twist the wires. For enhanced EMC performance a metal screen can be used.

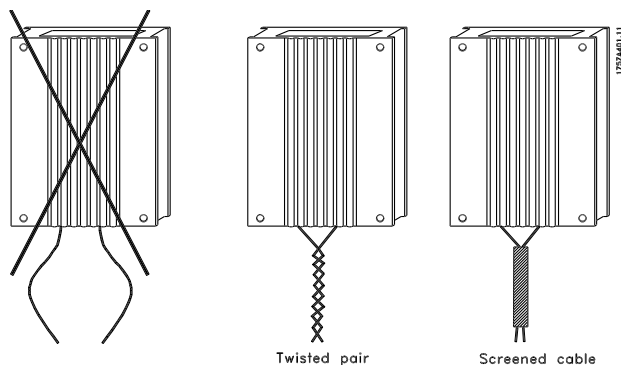


Illustration 3.17 Twisted Cables

3.2.3 Brake Cable

Max. length: 20 m shielded cable.

Ensure the connection cable to the brake resistor is shielded. Connect the shielding to the conductive back plate of the frequency converter and to the brake resistor metal cabinet, using cable clamps.

3.3 Protective Functions

3.3.1 Overtemperature Protection

The Danfoss brake resistor MCE 101 is equipped with a galvanic isolated temperature switch (PELV) that is closed under normal operating conditions and open if the brake resistor is overheated.

NOTICE

Use the temperature switch as overtemperature protection feature to prevent damage of the brake resistor caused by overtemperature. To prevent damage to the brake resistor, perform an immediate stop or a ramp down.

There are several ways the temperature switch can be used:

The temperature switch as digital input to frequency converter

Example 1

1. Connect terminal T1 of the brake resistor to the frequency converter terminal 12 or 13.
2. Connect terminal T2 of the brake resistor to a digital input e.g. terminal 18.

Automatic restart after enabling of the temperature switch:

Select *coast inverse* for the selected digital input.

Prevent automatic restart:

Select *latched start* for the selected digital input.

NOTICE

Coast does not terminate the brake function.

Example 1

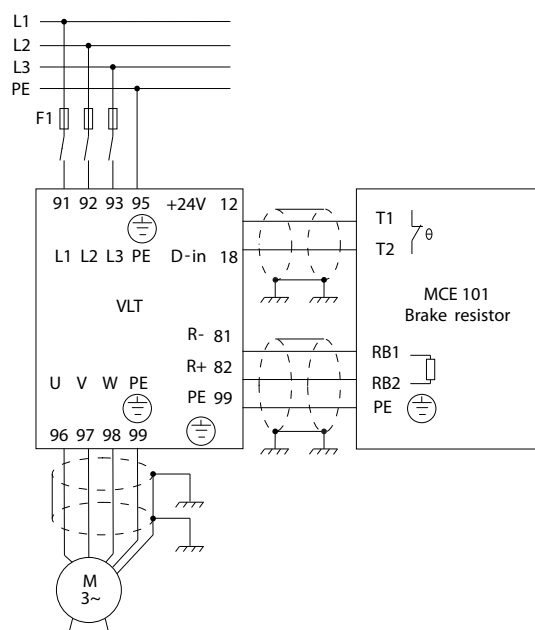


Illustration 3.18 Temperature Switch in Brake Resistor

NOTICE

The temperature switch as input to the frequency converter cannot be considered a primary safety function.

In case of a malfunction in the brake IGBT, the frequency converter and brake resistor are only protected by disconnecting the mains supply to the frequency converter. The temperature switch must be connected disabling the mains supply to the frequency converter by a contactor preventing dangerous overtemperatures.

1308D553.11

The temperature switch disabling the mains supply to VLT by a contactor

Example 2

1. Connect the brake resistor built-in thermal switch as controlling an input contactor. In this example, the thermal switch within the brake resistor is connected in series with the thermal switch within the motor.
2. Connect start and stop push buttons in series with the thermal switches.
3. Connect to a contactor in the mains supply in front of the frequency converter.

Thermal overheating in brake resistor or motor disables the mains supply to the frequency converter.

Example 2

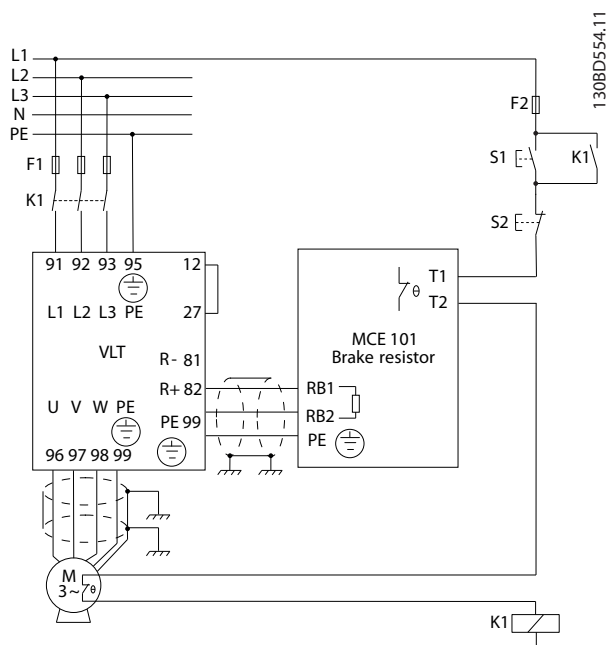


Illustration 3.19 Temperature Switch in both Motor and Brake Resistor disabling Mains Supply by an Input Contactor

Thermo relay disabling the brake resistor

Example 3

Calculate the brake current ($I_{\text{thermo relay}}$) setting of the temperature switch as follows:

$$I_{\text{thermo relay}} = \sqrt{\frac{P_{\text{brake resistor max}}}{R_{\text{br}}}}$$

R_{br} is the current brake resistor value calculated in chapter 4.1.2 Calculation of Brake Resistor Resistance.

Look up the brake current setting of the thermo relay for Danfoss brake resistors in chapter 8 Selection Guide.

3.3.2 Brake Resistor and Brake IGBT

Brake resistor power monitor

In addition, the brake power monitor function makes it possible to read out the momentary power and the mean power for a selected time period. The brake can also monitor the power energising and make sure it does not exceed a limit selected in *parameter 2-12 Brake Power Limit (kW)*. In *2-13 Brake Power Monitoring*, select the function to carry out when the power transmitted to the brake resistor exceeds the limit set in *parameter 2-12 Brake Power Limit (kW)*.

NOTICE

Monitoring the brake power does not fulfil a safety function. The brake resistor circuit is not ground leakage protected.

The brake is protected against short-circuiting of the brake resistor, and the brake transistor is monitored to ensure that short-circuiting of the transistor is detected. Use a relay or digital output to protect the brake resistor against overloading in the event of a fault in the frequency converter, see chapter 3.3.1 Overtemperature Protection.

Overvoltage control (OVC) can be selected as an alternative brake function in *parameter 2-17 Over-voltage Control*. If the DC-link voltage increases, this function is active for all units. The function ensures that a trip can be avoided. This is done by increasing the output frequency to limit the voltage from the DC link. It is a useful function, e.g. if the ramp-down time is too short since tripping of the frequency converter is avoided. In this situation the ramp-down time is extended.

4 System Integration

4.1 Brake Resistor Calculation

To ensure the optimal selection of brake resistor for a given application, its inertia and braking profile calculations are required.

This chapter explains the calculations required to obtain values for optimal selection of brake resistor for a given application.

4.1.1 Brake Set-up

The following sections use expressions and abbreviations related to the brake set-up in *Illustration 4.1*.

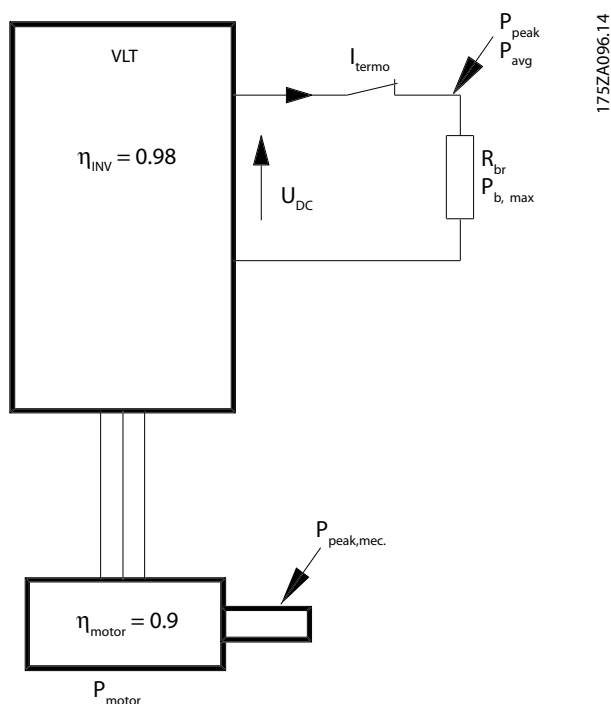


Illustration 4.1 Brake Set-up

4.1.2 Calculation of Brake Resistor Resistance

To prevent the frequency converter from cutting out for protection when the motor brakes, select resistor values on the basis of the peak braking power and the intermediate circuit voltage:

$$R_{br} = \frac{U_{dc}^2}{P_{peak}} [\Omega]$$

The brake resistor performance depends on the DC-link voltage (U_{dc}).

U_{dc} is the voltage, where the brake is activated. The FC-series brake function is settled depending on the mains supply.

DC-link Voltage (U_{dc}), FC 51

Size [V]	Brake active [V]	Warning before cut out [V]	Cut out (trip) [V]
FC 51 1x200-240	390	410	410
FC 51 3x200-240	390	410	410
FC 51 3x380-480, 1.5-4.0 kW	770	800	800
FC 51 3x380-480, 5.5-15 kW	705-770 ¹⁾	800	800
FC 51 3x380-480, 18.5-22 kW	770	800	800

Table 4.1 DC-link Voltage (U_{dc}), FC 51

1) Adjustable with 2-14 Brake Voltage Reduce

DC-link Voltage (U_{dc}), FC 102

Size [V]	Brake active [V DC]	High voltage warning [V DC]	Over voltage alarm [V DC]
FC 102 3x200-240	390	405	410
FC 102 3x380-480	778	810	820
FC 102 3x525-600 ¹⁾	943	965	975
FC 102 3x525-600 ²⁾	1099	1109	1130
FC 102 3x525-690	1099	1109	1130

Table 4.2 DC-link Voltage (U_{dc}), FC 102

1) Enclosure types A, B, C

2) Enclosure types D, E, F

DC-link Voltage (U_{dc}), FC 202

Size [V]	Brake active [V DC]	High voltage warning [V DC]	Over voltage alarm [V DC]
FC 202 3x200-240	390	405	410
FC 202 3x380-480	778	810	820
FC 202 3x525-600 ¹⁾	943	965	975
FC 202 3x525-600 ²⁾	1099	1109	1130
FC 202 3x525-690	1099	1109	1130

Table 4.3 DC-link Voltage (U_{dc}), FC 202

1) Enclosure types A, B, C

2) Enclosure types D, E, F

DC-link Voltage (U_{dc}), FC 301/FC 302

Size [V]	Brake active [V DC]	High voltage warning [V DC]	Over voltage alarm [V DC]
FC 301 3x200-240 ¹⁾	365	405	410
FC 301 3x200-240 ²⁾	390	405	410
FC 302 3x200-240	390	405	410
FC 301 3x380-480 ¹⁾	728	810	820
FC 301 3x380-480 ²⁾	778	810	820
FC 302 3x380-500 ³⁾	810	840	855
FC 302 3x380-500 ⁴⁾	810	828	855
FC 302 3x525-600 ³⁾	943	965	975
FC 302 3x525-600 ⁴⁾	1099	1109	1130
FC 302 3x525-690	1099	1109	1130

Table 4.4 DC-link Voltage (U_{dc}), FC 301/FC 302

1) Enclosure type A

2) Enclosure types B, C

3) Enclosure types A, B, C

4) Enclosure types D, E, F

DC-link Voltage (U_{dc}), FC 360

Size [V]	Brake active [V DC]	High voltage warning [V DC]	Over voltage alarm [V DC]
FC 360 3x380-480, 0.37-22 kW	700-770 ¹⁾	800	800
FC 360 3x380-480, 30-75 kW	N/A ²⁾	800	800

Table 4.5 DC-link Voltage (U_{dc}), FC 360

1) Adjustable with 2-14 Brake voltage reduce

2) No built-in brake option

DC-link Voltage (U_{dc}), FCD 302

Size [V]	Brake active [V DC]	High voltage warning [V DC]	Over voltage alarm [V DC]
FCD 302 3x380-480	778	810	820

Table 4.6 DC-link Voltage (U_{dc}), FCD 302

DC-link Voltage (U_{dc}), VLT 2800

Size [V]	Brake active [V DC]	High voltage warning [V DC]	Over voltage alarm [V DC]
VLT 2800 3x200-240	385	400	410
VLT 2800 3x380-480	770	800	820

Table 4.7 DC-link Voltage (U_{dc}), VLT 2800

Use the brake resistance R_{rec} to ensure that the frequency converter is able to brake at the highest braking torque ($M_{br}(\%)$) (e.g. 160%). The formula is written as:

$$R_{rec} [\Omega] = \frac{U_{dc}^2 \times 100}{P_{motor} \times M_{br}(\%) \times \eta_{VLT} \times \eta_{motor}}$$

η_{motor} is typically at 0.90

η_{VLT} is typically at 0.98

When a higher brake resistor resistance is selected, 160%/150%/110% braking torque cannot be obtained, and there is a risk that the frequency converter cuts out of DC-Link overvoltage for protection.

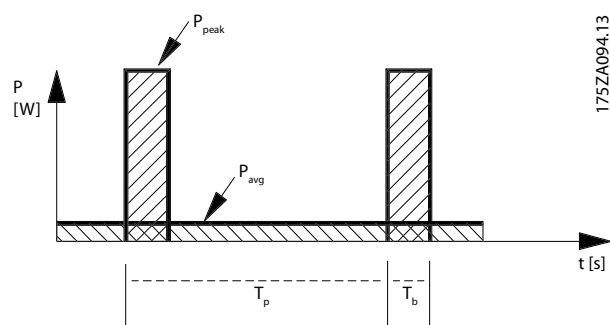
For braking at lower torque, for example 80% torque, it is possible to install a brake resistor with lower power rating. Calculate size using the formula for calculating R_{rec} .

4.1.3 Calculation of Braking Power

When calculating the braking power, ensure that the brake resistor is scaled for the average power as well as the peak power.

- The average power is determined by the process period time, i.e. the length of the braking time in relation to the process period time.
- The peak power is determined by the braking torque, which means that as braking progresses, the brake resistor must be able to dissipate the energy input.

Illustration 4.2 shows the relation between the average power and the peak power.



T_p	Process period time in s
T_b	Braking time in s

Illustration 4.2 Relation between Average Power and Peak Power

4.1.4 Calculation of the Brake Resistor Peak Power

$P_{\text{peak, mec}}$ is the peak power by which the motor brakes on the motor shaft. Calculate $P_{\text{peak, mec}}$ as follows:

$$P_{\text{peak, mec}} = P_{\text{motor}} \times M_{\text{BR}(\%)} \quad [W]$$

P_{peak} is the braking power dissipated to the brake resistor when the motor brakes.

P_{peak} is lower than $P_{\text{peak, mec}}$ since the power is reduced by the efficiencies of the motor and the frequency converter.

Calculate P_{peak} as follows:

$$P_{\text{peak}} = P_{\text{motor}} \times M_{\text{BR}(\%)} \times \eta_{\text{motor}} \times \eta_{\text{VLT}} \quad [W]$$

When the brake resistor recommended by Danfoss is selected (R_{rec}) on the basis of the tables in *chapter 8 Selection Guide*, the brake resistor is certain to provide a braking torque of 160%/150%/110% on the motor shaft.

4.1.5 Calculation of the Brake Resistor Average Power

The average power is determined by the length of the braking time in relation to the process period time.

When the kinetic energy (E_b) transferred to the resistor in each braking sequence is known (see *chapter 6.1 Conveyor Belt* and *chapter 6.2 Centrifuge*), calculate the average power of the brake resistor as follows:

$$P_{\text{avg}} = \frac{E_b}{T_p} \quad [W]$$

T_p = period time in s, see *Illustration 4.2*.

When the kinetic energy transferred to the resistor in each braking sequence is not known, calculate the average power on the basis of the process period time and the braking time.

Calculate the duty-cycle for the braking sequence as follows:

$$\text{Duty cycle} = \frac{T_b \times 100}{T_p} \quad [\%]$$

where

T_p = process period time in s

T_b = braking time in s

Danfoss offers brake resistors with a duty-cycle of max. 10% and 40%. If a 10% duty-cycle is applied, the brake resistors are able to absorb P_{peak} for 10% of the period time. The remaining 90% of the period time is used on deflecting excess heat.

Calculate the average power with 10% duty-cycle as follows:

$$P_{\text{avg}} = P_{\text{peak}} \times 10\% \quad [W]$$

Calculate the average power with 40% duty-cycle as follows:

$$P_{\text{avg}} = P_{\text{peak}} \times 40\% \quad [W]$$

The calculations apply to intermittent braking using a period time of 30 s.

NOTICE

Exceeding the specified intermittent braking period time may result in overheating the resistor.

4.1.6 Braking of Inertia

When braking high inertia values on the motor shaft, base the brake resistor values on the inertia, $\Delta\omega$, Δt , see *Illustration 4.3*.

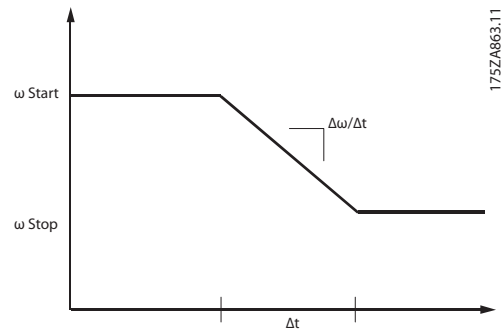


Illustration 4.3 Braking of High Inertia

Δt is determined by the ramp-down time.

NOTICE

The ramp-down time goes from the rated motor frequency to 0 Hz.

P_{peak} can be calculated as:

$$P_{\text{peak}} = \eta_{\text{motor}} \times \eta_{\text{VLT}} \times \omega_{\text{start}} \times j \times \frac{\Delta\omega}{\Delta t}$$

$$P_{\text{peak}} = \eta_{\text{motor}} \times \eta_{\text{VLT}} \times n_{\text{start}} \times j \times \left(\frac{2 \times \pi}{60}\right)^2 \times \frac{\Delta n}{\Delta t}$$

j is the motor shaft inertia.

5 Programming

For descriptions of all available parameters, see the product specific *Programming Guide*, www.danfoss.com/BusinessAreas/DrivesSolutions/Documentations/VLT+Technical+Documentation.htm.

5.1 Parameters for VLT® Micro Drive FC 51

2-10 Brake Function

Option: Function:

		NOTICE Resistor brake is only functional in frequency converters with integrated dynamic brake. An external resistor must be connected. Resistor Brake The resistor brake limits voltage in the intermediate circuit when the motor acts as generator. Without brake resistor, the frequency converter eventually trips. The resistor brake consumes surplus energy resulting from motor braking. A frequency converter with brake, stops a motor faster than without a brake, which is used in many applications. Requires connection of external brake resistor. An alternative to the resistor brake is the AC brake. AC Brake The AC brake consumes surplus energy by creating power loss in the motor. It is important to keep in mind that an increase in power loss causes motor temperature to rise.
[0] *	Off	No brake function.
[1]	Resistor Brake	Resistor brake is active.
[2]	AC Brake	AC brake is active.

2-11 Brake Resistor (Ohm)

Range: Function:

5 Ω*	[5-5000 Ω]	Set brake resistor value.
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2-14 Brake Voltage Reduce

Range: Function:

0 V*	[0 - 0 V]	
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5.2 Parameters for VLT® HVAC Drive FC 102 and VLT® AQUA Drive FC 202

2-02 DC Braking Time

Range: Function:

10 s*	[0 - 60 s]	Set the duration of the DC braking current set in 2-01 DC Brake Current, once activated.
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2-03 DC Brake Cut In Speed [RPM]

Range: Function:

Size related*	[0 - 0 RPM]	Set the DC brake cut-in speed to activate the DC braking current set in 2-01 DC Brake Current, upon a stop command. When 1-10 Motor Construction is set to [1] PM non-salient SPM this value is limited to 0 RPM (OFF)
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NOTICE

Parameter 2-03 DC Brake Cut In Speed [RPM] does not have effect when 1-10 Motor Construction=[1] PM, non-salient SPM.

2-04 DC Brake Cut In Speed [Hz]

Range: Function:

Size related*	[0 - 1000.0 Hz]	Set the DC brake cut-in speed for activation of the DC braking current set in 2-01 DC Brake Current, upon a stop command.
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NOTICE

Parameter 2-04 DC Brake Cut In Speed [Hz] has no effect when 1-10 Motor Construction[1] PM, non-salient SPM.

2-10 Brake Function		
Option:	Function:	
		Available selections depend on 1-10 Motor Construction: [0] Asynchron: [0] Off [1] Resistor brake [2] AC brake [1] PM non-salient: [0] Off [1] Resistor brake
[0]	Off	No brake resistor installed.
[1]	Resistor brake	Brake resistor incorporated in the system, for dissipation of surplus brake energy as heat. Connecting a brake resistor allows a higher DC-link voltage during braking (generating operation). The resistor brake function is only active in frequency converters with an integral dynamic brake.
[2]	AC brake	AC Brake only works in Compressor Torque mode in 1-03 Torque Characteristics.

2-11 Brake Resistor (ohm)		
Range:	Function:	
Size related* [5.00 - 65535.00 Ohm]		Set the brake resistor value in Ω. This value is used for monitoring the power to the brake resistor in 2-13 Brake Power Monitoring. This parameter is only active in frequency converters with an integral dynamic brake. Use this parameter for values without decimals. For a selection with 2 decimals, use parameter 30-81 Brake Resistor (ohm).

2-12 Brake Power Limit (kW)		
Range:	Function:	
Size related* [0.001 - 2000.000 kW]		Parameter 2-12 Brake Power Limit (kW) is the expected average power dissipated in the brake resistor over the time period selected within 2-13 Brake Power Monitoring. It is used as the monitoring limit for 16-33 Brake Energy /2 min and thereby specifies when a warning/alarm is to be given. To calculate parameter 2-12 Brake Power Limit (kW), the following formula can be used. $P_{br,avg}[W] = \frac{U_{br}^2[V] \times t_{br}[s]}{R_{br}[\Omega] \times T_{br}[s]}$ $P_{br,avg}$ is the average power dissipated in the brake resistor, R_{br} is the resistance of the brake resistor. t_{br} is the active breaking time within the 120 s period, T_{br}.

2-12 Brake Power Limit (kW)		
Range:	Function:	
		U_{br} is the DC voltage where the brake resistor is active. NOTICE If values are unknown, or if T_{br} is different from 120 s, the practical approach is to run the brake application, readout 16-33 Brake Energy /2 min and then enter this +20% in 2-12 Brake Power Limit (kW).

2-13 Brake Power Monitoring		
Option:	Function:	
		This parameter is only active in frequency converters with an integral dynamic brake. This parameter enables monitoring of the power to the brake resistor. The power is calculated on the basis of the resistance (parameter 2-11 Brake Resistor (ohm)), the DC-link voltage, and the resistor duty time. The time period can be selected in this parameter. The functions are as follows: Off: Brake power monitoring disabled. Default setting. Warning (time period): Activates a warning on the display when the power transmitted over the selected time period exceeds 100% of the monitoring limit (parameter 2-12 Brake Power Limit (kW)). The warning disappears when the transmitted power falls below 80% of the monitoring limit. Trip (time period): Trips frequency converter and displays an alarm when the calculated power exceeds 100% of the monitoring limit. Warning & trip (time period): Activates both of the above, including warning, trip and alarm.
[0] *	Disabled	Brake power monitoring disabled.
[1]	Warning 120s	Warning based on 120 s time periode.
[2]	Trip 120s	Trip based on 120 s time periode.
[3]	Warning & trip 120s	Warning and trip based on 120 s time periode.
[4]	Warning 30s	Warning based on 30 s time periode.
[5]	Trip 30s	Trip based on 30s time periode

2-13 Brake Power Monitoring

Option:	Function:	
[6]	Warning & trip 30s	Warning and trip based on 30 s time periode.
[7]	Warning 60s	Warning based on 60 s time periode.
[8]	Trip 60s	Trip based on 60 s time periode.
[9]	Warning & trip 60s	Warning and trip based on 60 s time periode.
[10]	Warning 300s	Warning based on 300 s time periode.
[11]	Trip 300s	Trip based on 300 s time periode.
[12]	Warning & trip 300s	Warning and trip based on 300 s time periode.
[13]	Warning 600s	Warning based on 600s time periode.
[14]	Trip 600s	Trip based on 600 s time periode.
[15]	Warning & trip 600s	Warning and trip based on 600 s time periode.

If power monitoring is disabled or Warning is selected, the brake function remains active, even if the monitoring limit is exceeded. This may lead to thermal overload of the resistor. It is also possible to generate a warning via a relay/digital outputs. The measuring accuracy of the power monitoring depends on the accuracy of the resistance of the resistor (better than $\pm 20\%$).

2-15 Brake Check

Option:	Function:	
		Select type of test and monitoring function to check the connection to the brake resistor, or whether a brake resistor is present, and then display a warning or an alarm in the event of a fault. The brake resistor disconnection function is tested during power-up. However, the brake IGBT test is performed when there is no braking. A warning or trip disconnects the brake function. The testing sequence is as follows: 1. The DC-link ripple amplitude is measured for 300 ms without braking. 2. The DC-link ripple amplitude is measured for 300 ms with the brake turned on. 3. If the DC-link ripple amplitude while braking is lower than the DC-link ripple amplitude before braking +1%. Brake check failed, return a warning or alarm. 4. If the DC-link ripple amplitude while braking is higher than the DC-link ripple amplitude before braking +1%. Brake check OK.
[0]	Off	Monitors brake resistor and brake IGBT for a short-circuit during operation. If a short-circuit occurs, a warning appears.
[1]	Warning	Monitors brake resistor and brake IGBT for a short-circuit, and runs a test for brake resistor disconnection during power-up.

2-15 Brake Check

Option:	Function:	
[2]	Trip	Monitors for a short-circuit or disconnection of the brake resistor, or a short-circuit of the brake IGBT. If a fault occurs, the frequency converter cuts out while displaying an alarm (trip locked).
[3]	Stop and trip	Monitors for a short-circuit or disconnection of the brake resistor, or a short-circuit of the brake IGBT. If a fault occurs, the frequency converter ramps down to coast and then trips. A trip lock alarm is displayed.
[4]	AC brake	Monitors for a short-circuit or disconnection of the brake resistor, or a short-circuit of the brake IGBT. If a fault occurs, the frequency converter performs a controlled ramp-down.

NOTICE

Remove a warning arising in connection with [0] Off or [1] Warning by cycling the mains supply. The fault must be corrected first. For [0] Off or [1] Warning, the frequency converter keeps running even if a fault is located.

2-16 AC brake Max. Current

Range:	Function:	
100 %*	[0 - 1000.0 %]	Enter the maximum permissible current when using AC brake to avoid overheating of motor windings. The AC brake function is available in Flux mode only.

NOTICE

Parameter 2-16 AC brake Max. Current has no effect when 1-10 Motor Construction=[1] PM, non-salient SPM.

2-17 Over-voltage Control

Option:	Function:	
[0]	Disabled	No OVC required.
[2] *	Enabled	Activates OVC.

NOTICE

Parameter 2-17 Over-voltage Control has no effect when 1-10 Motor Construction[1] PM, non-salient SPM.

NOTICE

The ramp time is automatically adjusted to avoid tripping of the frequency converter.

16-32 Brake Energy /s		
Range:		Function:
0 kW*	[0 - 10000 kW]	View the brake power transmitted to an external brake resistor, stated as an instantaneous value.

16-33 Brake Energy /2 min		
Range:		Function:
0 kW*	[0 - 10000 kW]	View the brake power transmitted to an external brake resistor. The mean power is calculated on an average level based on the selected time period within 2-13 Brake Power Monitoring.

30-81 Brake Resistor (ohm)		
Range:		Function:
Size related*	[0.01 - 65535.00 Ohm]	Set the brake resistor value in Ω with 2 decimals. This value is used for monitoring the power to the brake resistor in 2-13 Brake Power Monitoring.

5.3 Parameters for VLT[®] AutomationDrive FC 301/FC 302 and [®] Decentral Drive FCD 302

2-02 DC Braking Time		
Range:		Function:
10 s*	[0 - 60 s]	Set the duration of the DC braking current set in 2-01 DC Brake Current, once activated.

2-03 DC Brake Cut In Speed [RPM]		
Range:		Function:
Size related*	[0 - 60000 RPM]	Set the DC brake cut-in speed for activation of the DC braking current set in 2-01 DC Brake Current, upon a stop command.

2-04 DC Brake Cut In Speed [Hz]		
Range:		Function:
Size related*	[0 - 1000.0 Hz]	Set the DC brake cut-in speed for activation of the DC braking current set in 2-01 DC Brake Current, upon a stop command.

NOTICE

Parameter 2-04 DC Brake Cut In Speed [Hz] has no effect when 1-10 Motor Construction[1] PM, non-salient SPM.

2-10 Brake Function		
Option:		Function:
[0]	Off	No brake resistor is installed.
[1]	Resistor brake	A brake resistor is incorporated in the system, for dissipation of surplus brake energy as heat. Connecting a brake resistor allows a higher DC-link voltage during braking (generating operation). The resistor brake function is only active in frequency converters with an integral dynamic brake.
[2]	AC brake	Is selected to improve braking without using a brake resistor. This parameter controls an overmagnetisation of the motor when running with a generative load. This function can improve the OVC-function. Increasing the electrical losses in the motor allows the OVC function to increase the braking torque without exceeding the over voltage limit.

NOTICE

The AC brake is not as efficient as dynamic braking with resistor.
AC brake is for VVC⁺ mode in both open and closed loop.

2-11 Brake Resistor (ohm)		
Range:		Function:
Size related*	[5.00 - 65535.00 Ohm]	Set the brake resistor value in Ω. This value is used for monitoring the power to the brake resistor in 2-13 Brake Power Monitoring. This parameter is only active in frequency converters with an integral dynamic brake. Use this parameter for values without decimals. For a selection with 2 decimals, use parameter 30-81 Brake Resistor (ohm).

2-12 Brake Power Limit (kW)		
Range:		Function:
Size related*	[0.001 - 2000.000 kW]	Parameter 2-12 Brake Power Limit (kW) is the expected average power dissipated in the brake resistor over the time period selected within 2-13 Brake Power Monitoring. It is used as the monitoring limit for 16-33 Brake Energy /2 min and thereby specifies when a warning/alarm is to be given. To calculate parameter 2-12 Brake Power Limit (kW), the following formula can be used. $P_{br,avg}[W] = \frac{U_{br}^2[V] \times t_{br}[s]}{R_{br}[\Omega] \times T_{br}[s]}$ $P_{br,avg}$ is the average power dissipated in the brake resistor, R_{br} is the resistance of the brake resistor. t_{br} is the active breaking time within the 120 s period, T_{br}. U_{br} is the DC voltage where the brake resistor is active. NOTICE If values are unknown, or if T_{br} is different from 120 s, the practical approach is to run the brake application, readout 16-33 Brake Energy /2 min and then enter this +20% in 2-12 Brake Power Limit (kW).

2-13 Brake Power Monitoring		
Option:	Function:	
	This parameter is only active in frequency converters with an integral dynamic brake. This parameter enables monitoring of the power to the brake resistor. The power is calculated on the basis of the resistance (parameter 2-11 Brake Resistor (ohm)), the DC-link voltage, and the resistor duty time. The time period can be selected in this parameter. The functions are as follows:	

2-13 Brake Power Monitoring		
Option:	Function:	
	Off: Brake power monitoring disabled. Default setting. Warning (time period): Activates a warning on the display when the power transmitted over the selected time period exceeds 100% of the monitoring limit (parameter 2-12 Brake Power Limit (kW)). The warning disappears when the transmitted power falls below 80% of the monitoring limit. Trip (time period): Trips frequency converter and displays an alarm when the calculated power exceeds 100% of the monitoring limit. Warning & trip (time period): Activates both of the above, including warning, trip and alarm.	
[0] *	Disabled	Brake power monitoring disabled.
[1]	Warning 120s	Warning based on 120 s time periode.
[2]	Trip 120s	Trip based on 120 s time periode.
[3]	Warning & trip 120s	Warning and trip based on 120 s time periode.
[4]	Warning 30s	Warning based on 30 s time periode.
[5]	Trip 30s	Trip based on 30s time periode
[6]	Warning & trip 30s	Warning and trip based on 30 s time periode.
[7]	Warning 60s	Warning based on 60 s time periode.
[8]	Trip 60s	Trip based on 60 s time periode.
[9]	Warning & trip 60s	Warning and trip based on 60 s time periode.
[10]	Warning 300s	Warning based on 300 s time periode.
[11]	Trip 300s	Trip based on 300 s time periode.
[12]	Warning & trip 300s	Warning and trip based on 300 s time periode.
[13]	Warning 600s	Warning based on 600s time periode.
[14]	Trip 600s	Trip based on 600 s time periode.
[15]	Warning & trip 600s	Warning and trip based on 600 s time periode.

If power monitoring is disabled or Warning is selected, the brake function remains active, even if the monitoring limit is exceeded. This may lead to thermal overload of the resistor. It is also possible to generate a warning via a relay/digital outputs. The measuring accuracy of the power monitoring depends on the accuracy of the resistance of the resistor (better than ±20%).

2-15 Brake Check		
Option:	Function:	
	Parameter 2-15 Brake Check is only active in frequency converters with an integral dynamic brake. Select type of test and monitoring function to check the connection to the brake resistor, or whether a brake resistor is present, and then display a warning or an alarm in the event of a fault. NOTICE The brake resistor disconnection function is tested during power-up. However, the brake IGBT test is performed when there is no braking. A warning or trip disconnects the brake function. The testing sequence is as follows: 1. The DC-link ripple amplitude is measured for 300 ms without braking. 2. The DC-link ripple amplitude is measured for 300 ms with the brake turned on. 3. If the DC-link ripple amplitude while braking is lower than the DC-link ripple amplitude before braking + 1%: <i>Brake check has failed by returning a warning or alarm.</i> 4. If the DC-link ripple amplitude while braking is higher than the DC-link ripple amplitude before braking + 1%: <i>Brake check is OK.</i>	
[0]	Off	Monitors brake resistor and brake IGBT for a short-circuit during operation. If a short-circuit occurs, warning 25 appears.
[1]	Warning	Monitors brake resistor and brake IGBT for a short-circuit, and runs a test for brake resistor disconnection during power-up.
[2]	Trip	Monitors for a short-circuit or disconnection of the brake resistor, or a short-circuit of the brake IGBT. If a fault occurs, the frequency converter cuts out while displaying an alarm (trip locked).
[3]	Stop and trip	Monitors for a short-circuit or disconnection of the brake resistor, or a short-circuit of the brake IGBT. If a fault occurs, the frequency converter ramps down to coast and then trips. A trip lock alarm is displayed (e.g. warning 25, 27 or 28).
[4]	AC brake	Monitors for a short-circuit or disconnection of the brake resistor, or a short-circuit of the brake IGBT. If a fault occurs, the frequency converter performs a controlled ramp-down. This option is available for FC 302 only.

2-15 Brake Check		
Option:	Function:	
[5]	Trip Lock	

NOTICE

Remove a warning arising in connection with [0] Off or [1] Warning by cycling the mains supply. The fault must be corrected first. For [0] Off or [1] Warning, the frequency converter keeps running even if a fault is located.

2-16 AC brake Max. Current		
Range:	Function:	
100 %*	[0 - 1000.0 %]	Enter the maximum permissible current when using AC brake to avoid overheating of motor windings.

NOTICE

Parameter 2-16 AC brake Max. Current has no effect when 1-10 Motor Construction[1] PM, non salient SPM.

2-17 Over-voltage Control		
Option:	Function:	
		Overvoltage control (OVC) reduces the risk of the frequency converter tripping due to an overvoltage on the DC-link caused by generative power from the load.
[0] *	Disabled	No OVC required.
[1]	Enabled (not at stop)	Activates OVC except when using a stop signal to stop the frequency converter.
[2]	Enabled	Activates OVC.

NOTICE

Do not enable OVC in hoisting applications.

2-18 Brake Check Condition		
Range:	Function:	
[0] *	At Power Up	Brake check is performed at power up.
[1]	After Coast Situations	Brake check is performed after coast situations.

16-32 Brake Energy /s		
Range:	Function:	
0 kW*	[0 - 10000 kW]	View the brake power transmitted to an external brake resistor, stated as an instantaneous value.

16-33 Brake Energy /2 min		
Range:		Function:
0 kW*	[0 - 10000 kW]	View the brake power transmitted to an external brake resistor. The mean power is calculated on an average level based on the selected time period within 2-13 Brake Power Monitoring.

30-81 Brake Resistor (ohm)		
Range:		Function:
Size related*	[0.01 - 65535.00 Ohm]	Set the brake resistor value in Ω. This value is used for monitoring the power to the brake resistor in 2-13 Brake Power Monitoring. This parameter is only active in frequency converters with an integral dynamic brake.

5.4 Parameters for VLT® AutomationDrive FC 360

2-10 Brake Function		
Option:		Function:
[0]	Off	No brake resistor is installed.
*		
[1]	Resistor brake	A brake resistor is incorporated in the system for dissipation of surplus brake energy as heat. Connecting a brake resistor allows a higher DC-link voltage during braking (generating operation). The brake resistor function is only active in frequency converters with an integral dynamic brake.
[2]	AC brake	Improves braking without using a brake resistor. This parameter controls an overmagnetisation of the motor when running with a generative load. This function can improve the OVC-function. Increasing the electrical losses in the motor allows the OVC-function to increase braking torque without exceeding the voltage limit. NOTICE The AC brake is not as efficient as dynamic braking with resistor. AC brake is for VVC ⁺ mode in both open and closed loop.

2-11 Brake Resistor (ohm)		
Range:		Function:
Size related*	[0 - 65535 Ohm]	Set the brake resistor value in Ω. This value is used for monitoring the power to the brake resistor. <i>Parameter 2-11 Brake Resistor (ohm)</i> is only active in frequency converters with an integral dynamic brake. Use this parameter for values without decimals.

2-12 Brake Power Limit (kW)		
Range:		Function:
Size related*	[0.001 - 2000 kW]	<i>Parameter 2-12 Brake Power Limit (kW)</i> is the expected average power dissipated in the brake resistor over a period of 120 s. It is used as the monitoring limit for 16-33 Brake Energy /2 min and thereby specifies when a warning/alarm is to be given. To calculate <i>parameter 2-12 Brake Power Limit (kW)</i> , the following formula can be used. $P_{br,avg}[W] = \frac{U_{br}^2[V] \times t_{br}[s]}{R_{br}[\Omega] \times T_{br}[s]}$ $P_{br,avg}$ is the average power dissipated in the brake resistor, R_{br} is the resistance of the

2-12 Brake Power Limit (kW)		
Range:	Function:	
	brake resistor. t_{br} is the active breaking time within the 120 s period, T_{br} . U_{br} is the DC voltage where the brake resistor is active. This depends on the unit as follows: T4 units: 778 V NOTICE If R_{br} is not known or if T_{br} is different from 120 s, the practical approach is to run the brake application, readout 16-33 Brake Energy /2 min and then enter this + 20% in 2-12 Brake Power Limit (kW).	

2-16 AC Brake, Max current		
Range:	Function:	
100 %* [0 - 160 %]	Enter the maximum permissible current when using AC brake to avoid overheating of motor windings. NOTICE Parameter 2-16 AC Brake, Max current has no effect when 1-10 Motor Construction is set to [1] PM, non-salient SPM.	

2-17 Over-voltage Control		
Option:	Function:	
	Overvoltage control (OVC) reduces the risk of the frequency converter tripping due to an overvoltage on the DC-link caused by generative power from the load.	
[0] *	Disabled	No OVC required.
[1]	Enabled (not at stop)	Activates OVC except when using a stop signal to stop the frequency converter.
[2]	Enabled	Activates OVC WARNING Do NOT enable OVC in hoisting applications.

5.5 Parameters for VLT® 2800

126 DC brake time		
Range:	Function:	
10 sec*	[0 - 60 sec.]	The DC brake time is set at which parameter 132 DC brake voltage is to be active.

127 DC brake cut-in frequency		
Range:	Function:	
0.00 OFF*	[0.0 (OFF) - par. 202]	Set the DC brake cut-in frequency at which the DC brake is to be activated in connection with a stop command.

132 DC brake voltage		
Range:	Function:	
0%*	[0 - 100% of max. DC brake voltage]	Set the DC brake voltage to be activated at stop when the DC brake frequency set in parameter 127 DC brake cut-in frequency is reached, or if DC braking inverse is active via a digital input or via serial communication. Subsequently, the DC brake voltage is active for the time set in parameter 126 DC brake time.

400 Brake function		
Option:	Function:	
[0]	Off	
[1]	Resistor brake	Select [1] Resistor brake if the frequency converter has an integral brake transistor, and a brake resistor is connected to terminals 81, 82. A higher DC-link voltage is permitted during braking (generated operation) when a brake resistor is connected.
[4]	AC brake	Select [4] AC brake to improve braking without using brake resistors. Note that [4] AC brake is not as effective as [1] Resistor brake.
[5]	Load sharing	

NOTICE

Disconnected and reconnect mains voltage to activate a change of selection.

456 Brake Voltage Reduce

Range:

Function:

0*	[0-25 V if 200 V device]	Set the voltage by which the level for resistor braking is reduced. It is only active when [1] Resistor is selected in parameter 400 Brake function.
0*	[0-50 V if 400 V device]	

NOTICE

The greater the reduction value, the faster the reaction to a generator overload. Should only be used if there are problems with overvoltage in the DC-link voltage.

6 Application Examples

6.1 Conveyor Belt

Illustration 6.1 shows the relation between the braking power and the acceleration/braking of a conveyor belt.

Note:

- The motor power during braking is negative, since the torque on the motor shaft is negative.
- The motor power is time-dependent.

The braking power (the power to be dissipated to the brake resistor) corresponds almost exactly to the negative motor power plus losses in the motor and the frequency converter.

Kinetic energy (E) in conveyor belt + motor:

$$E = 0.5 \times m \times v^2 + 0.5 \times j \times \omega^2 [Ws]$$

where

m = mass with linear movement [kg]

v = speed of mass with linear movement [m/s]

j = inertia of motor and gear box [kgm²]

ω = motor speed [rad/s]

$$\omega = \text{motor speed} = \frac{n \times 2\pi}{60} [\text{rad} / \text{s}]$$

This formula is also expressed as follows:

$$E = 0.50 \times m \times v^2 + 0.0055 \times j \times n^2 [Ws]$$

However, not all of the energy is dissipated in the brake resistor. The friction of the conveyor belt and the power loss of the motor also contribute to the braking function. So, the formula for energy dissipation (E_b) to the brake resistor is as follows:

$$Eb = \left(0.5 \times m \times v^2 + 0.5 j \omega^2 - 0.5 \times M_f \omega \right) \times \eta_M [Ws]$$

where

M_f = Friction torque [Nm]

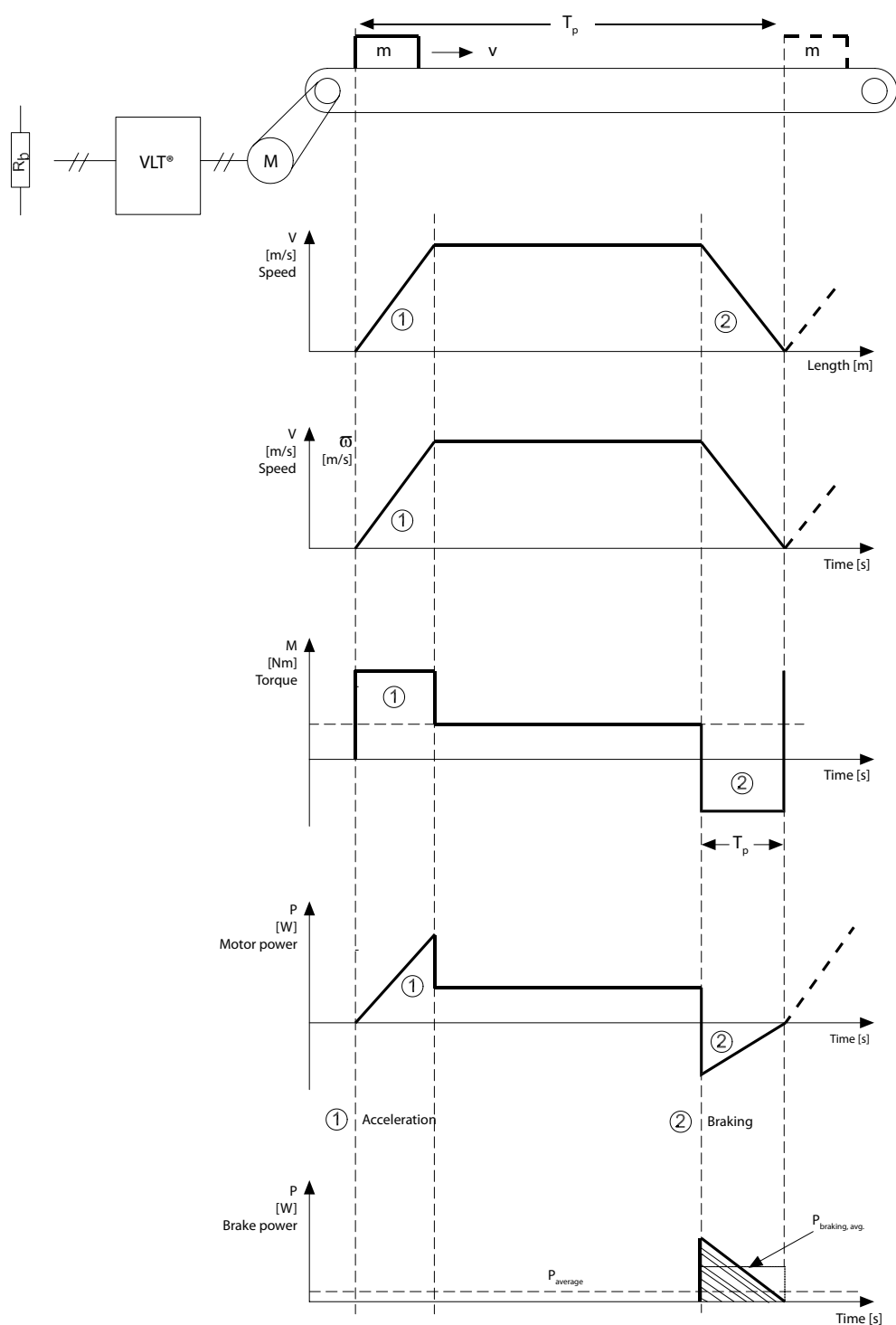
η_M = Motor efficiency

Insert:

$$\omega = \frac{n \times 2\pi}{60}$$

The result is:

$$Eb = \left(0.5 \times m \times v^2 + 0.0055 \times j \times n^2 - 0.052 \times n \times M_f \right) \times \eta_M [Ws]$$



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Illustration 6.1 Conveyor Belt: Relation between Braking Power and Acceleration/Deceleration

6.2 Centrifuge

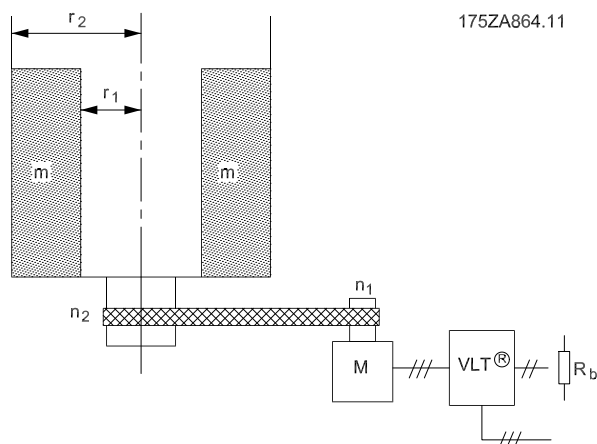


Illustration 6.2 Centrifuge with Brake Resistor

Braking of a centrifuge is a typical application of brake resistors, shown in *Illustration 6.2*.

The formula for energy dissipation (E_b) to the brake resistor is:

$$E_b = (0.0055 \times J_C \times n_2^2 + 0.0055 \times J_M \times n_1^2) \times \eta_M [Ws]$$

where

m = weight of the centrifuge content [kg]

J_C = centrifuge inertia [kgm^2] = $0.5 \times m \times (r_1^2 + r_2^2)$

J_M = gear motor inertia [kgm^2]

η_M = gear motor efficiency

n_1 = max. motor speed [rpm]

n_2 = max. centrifuge speed [rpm]

R_b = brake resistor

6.3 Continuous Braking

To achieve continuous braking, select a brake resistor in which the constant braking power does not exceed the average power P_{avg} of the brake resistor.

NOTICE

Contact the Danfoss distributor for further information.

7 Special Conditions

7.1 Alternative Braking Methods

7.1.1 DC Injection Braking

If the 3-phase winding of the stator is fed with direct current, a stationary magnetic field Φ is set up in the stator bore causing a voltage to be induced in the bars of the cage rotor as long as the rotor is in motion. Since the electrical resistance of the rotor cage is very low, even small induced voltages can create a high rotor current. This current produces a strong braking effect on the bars and hence on the rotor. As the speed decreases, the frequency of the induced voltage decreases and with it the inductive impedance. The ohmic resistance of the rotor gradually becomes dominant and so increases the braking effect as the speed comes down. The braking torque generated decreases steeply just before standstill and finally ceases when there is no further movement. Direct current injection braking is therefore not suitable for holding a load at rest.

FC 102, 202, 301 and 302-Series

An over-modulated DC current added to the AC current works as an eddy current brake (*parameter 2-02 DC Braking Time* $\neq 0$ s).

7.1.2 AC-braking

When the motor acts as a brake, the DC-link voltage increases because energy is fed back to the DC-link. The principle in AC-brake is to increase the magnetisation during the braking and thereby increase the thermal losses of the motor.

FC 102, 202, 301 and 302-Series

The brake energy is distributed in the motor by changing the loss conditions in the motor. The AC brake function cannot be used in applications with high cycling frequency since this overheats the motor (*parameter 2-10 Brake Function*=[2] AC Brake). By using factory settings it is possible to brake with about 50% of rated torque below 2/3 of rated speed and with about 25% at rated speed. The function is not working at low speed (below 1/3 of nominal motor speed).

VLT 2800

By using parameter 144 in VLT 2800, it is possible to adjust the size of the generator torque that can be applied to the motor without the intermediate circuit voltage exceeding the warning level.

The braking torque depends on the speed. With the AC-brake function enabled and parameter 144=1.3 (factory setting) it is possible to brake with about 50% of rated torque below 2/3 of rated speed and with about 25 % at rated speed. The function is not working at low speed (below 1/3 of nominal motor speed). It is only possible to run for about 30 s with parameter 144 greater than 1.2.

NOTICE

If the value in parameter 144 is increased, the motor current simultaneously increases significantly when generator loads are applied. The parameter should therefore only be changed if it is guaranteed during measurement that the motor current in all operating situations never exceeds the maximum permitted current in the motor. Note: The current cannot be read out from the display.

7.1.3 Mechanical Holding Brake

A mechanical holding brake mounted directly on the motor shaft normally performs static braking. In some applications, the static holding torque is working as static holding of the motor shaft (usually synchronous permanent motors). A holding brake is either controlled by a PLC or directly by a digital output from the frequency converter (relay or solid state).

NOTICE

When the holding brake is included in a safety chain: A frequency converter cannot provide a safe control of a mechanical brake. A redundancy circuitry for the brake control must be included in the total installation.

7.1.4 DC Braking

Resistor brake is useful from max. speed down to a certain frequency. Below this frequency DC braking is to be applied as required. The most efficient way of doing this is to use a combination of dynamic and DC braking. See *Illustration 7.1*. The parameters can be found in *chapter 5 Programming*.

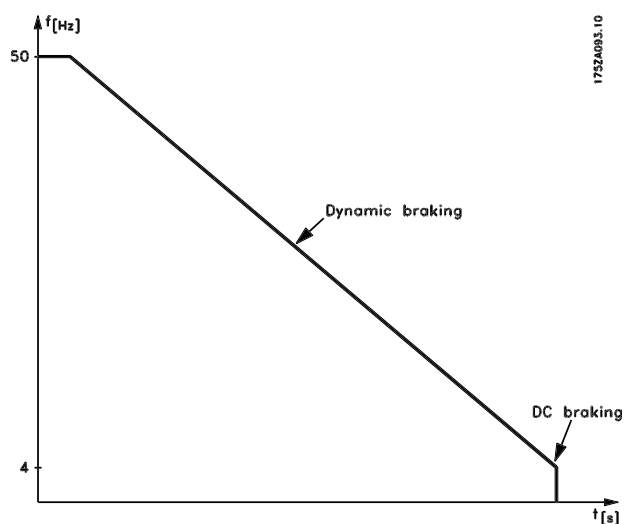


Illustration 7.1 Optimum Braking

How to calculate optimum DC-brake cut in frequency:

$$\text{Slip } s = \frac{n_0 - n_n}{n_0} \times 100 [\%]$$

$$\text{Synchronous speed } n_0 = \frac{f \times 60}{p} [1/\text{min}]$$

f = frequency supplied to motor

p = no. of pole pairs

n_n = speed of the rotor

$$\text{DC-brake cut in frequency} = 2 \times \frac{s \times f}{100} [\text{Hz}]$$

8 Selection Guide

8.1 Selection Flow Chart

To select the correct size of brake resistor for an application, refer to the flow chart in *Illustration 8.1*.

1. Select an answer to each question from the top down.
2. Follow the answer to reach the next question, or to obtain guidance in calculating inertia or duty cycle.
3. The final box indicates the correct selection table, or whether to call hotline for additional guidance.

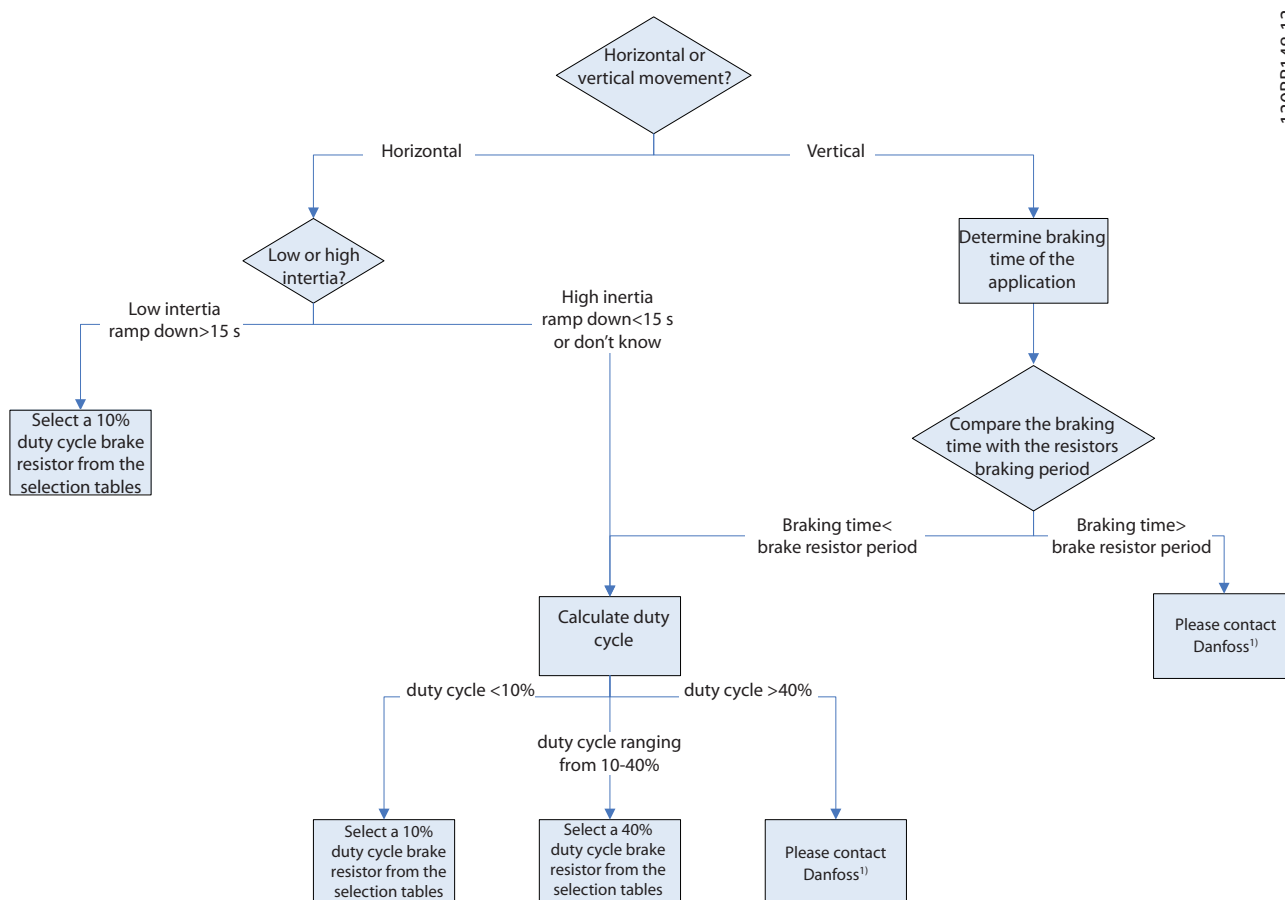


Illustration 8.1 Brake Resistor Selection Flow Chart

1) When contacting Danfoss, provide the following data:

- Nominal power 100%
- Maximum power during brake cycle
- Braking time/duty cycle
- Supply voltage (max. DC)
- Resistance (Ω)
- With or without temperature switch
- IP enclosure rating
- Type of reference drive

8.2 Selection Tables for Recommended Brake Resistors

8.2.1 Abbreviations used in the Brake Resistor Tables

Mains	Voltage class
P _m	Rated motor size for frequency converter
R _{min}	Minimum permissible brake resistor - by frequency converter
R _{rec}	Recommended brake resistor resistance of Danfoss brake resistors
Thermo relay	Brake current setting of external thermo relay
Danfoss part number	Danfoss brake resistor order numbers
Cable cross-section	Recommended minimum value based upon PVC insulated copper cable. 30 °C ambient temperature with normal heat dissipation
P _{br,cont.}	Brake resistor average rated power. The temperature switch enables at approximate 90% of continuous rated power at brake resistors with IP54, IP21 and IP65 enclosure protection
R _{br,nom}	The nominal (calculated) resistor value to ensure a brake power on motor shaft of 150/160/110% for 1 minute

8.2.2 VLT[®] Micro Drive FC 51

10% duty cycle, horizontal braking, S2, T2, T4

FC 51				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
S2	1.5	60.0	70.9	70	0.200	175u3026	-	-	-	1.5	1.6
S2	2.2	40.0	47.6	48	0.200	175u3031	-	-	-	1.5	1.9
T2	1.5	60.0	70.9	70	0.200	175u3026	-	-	-	1.5	1.6
T2	2.2	40.0	47.6	48	0.200	175u3031	-	-	-	1.5	1.9
T2	3.7	23.0	27.7	27	0.360	175u3326	175u3477	175u3478	-	1.5	3.5
T4	1.5	234	274.8	270	0.200	175u3007	-	-	-	1.5	0.8
T4	2.2	157	184.4	200	0.200	175u3008	-	-	-	1.5	0.9
T4	3	113	133.7	145	0.300	175u3300	-	-	-	1.5	1.3
T4	4	83.0	98.9	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
T4	5.5	60.0	71.2	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
T4	7.5	44.0	51.8	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
T4	11	29.0	34.8	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
T4	15	21.0	25.3	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
T4	18.5	17.0	20.4	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3
T4	22	14.0	17.1	19	2.200	175u3357	175u3049	175u3050	-	1.5	10.1

Table 8.1 S2, T2, T4, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, S2, T2, T4

FC 51				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
S2	1.5	60.0	70.9	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
S2	2.2	40.0	47.6	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
T2	1.5	60.0	70.9	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
T2	2.2	40.0	47.6	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
T2	3.7	23.0	27.7	27	1.400	175u3305	175u3410	175u3409	-	1.5	6.8
T4	1.5	234	274.8	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T4	2.2	157	184.4	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T4	3	113	133.7	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
T4	4	83.0	98.9	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
T4	5.5	60.0	71.2	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
T4	7.5	44.0	51.8	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
T4	11	29.0	34.8	38	5.000	-	-	-	175u3236	1.5	11.5
T4	15	21.0	25.3	28	6.000	-	-	-	175u3237	2.5	14.7
T4	18.5	17.0	20.4	22	8.000	-	-	-	175u3238	4	19
T4	22	14.0	17.1	19	10.000	-	-	-	175u3203	4	23

Table 8.2 S2, T2, T4, Vertical Braking 40% Duty Cycle

8.2.3 VLT® HVAC Drive FC 102

10% duty cycle, horizontal braking, T2

FC 102				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	1.1	130	152.9	145	0.100	175u3016	-	-	-	1.5	0.8
T2	1.5	81.0	110.5	100	0.100	175u3021	-	-	-	1.5	0.9
T2	2.2	58.5	74.1	70	0.200	175u3026	-	-	-	1.5	1.6
T2	3	45.0	53.7	48	0.200	175u3031	-	-	-	1.5	1.9
T2	3.7	31.5	39.9	35	0.300	175u3325	-	-	-	1.5	2.7
T2	5.5	22.5	28.7	27	0.360	175u3326	175u3477	175u3478	-	1.5	3.5
T2	7.5	17.7	20.8	18	0.570	175u3327	175u3442	175u3441	-	1.5	5.3
T2	11	12.6	14.0	13	0.680	175u3328	175u3059	175u3060	-	1.5	6.8
T2	15	8.7	10.2	9.0	1.130	175u3329	175u3068	175u3069	-	2.5	10.5
T2	18.5	5.3	8.2	5.7	1.400	175u3330	175u3073	175u3074	-	4	14.7
T2	22	5.1	6.9	5.7	1.700	175u3331	175u3483	175u3484	-	4	16
T2	30	3.2	5.0	3.5	2.200	175u3332	175u3080	175u3081	-	6	24
T2	37	3.0	4.1	3.5	2.800	175u3333	175u3448	175u3447	-	10	27
T2	45	2.4	3.3	2.8	3.200	175u3334	175u3086	175u3087	-	16	32

Table 8.3 T2, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T2

FC 102				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	1.1	130	152.9	145	0.300	175u3300	-	-	-	1.5	1.3
T2	1.5	81.0	110.5	100	0.450	175u3301	175u3402	175u3401	-	1.5	2
T2	2.2	58.5	74.1	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
T2	3	45.0	53.7	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
T2	3.7	31.5	39.9	35	1.130	175u3304	175u3408	175u3407	-	1.5	5.4
T2	5.5	22.5	28.7	27	1.400	175u3305	175u3410	175u3409	-	1.5	6.8
T2	7.5	17.7	20.8	18	2.200	175u3306	175u3412	175u3411	-	1.5	10.4
T2	11	12.6	14.0	13	3.200	175u3307	175u3414	175u3413	-	2.5	14.7
T2	15	8.7	10.2	9.0	5.500	-	175u3176	175u3177	-	4	23
T2	18.5	5.3	8.2	5.7	6.000	-	-	-	175u3233	10	33
T2	22	5.1	6.9	5.7	8.000	-	-	-	175u3234	10	38
T2	30	3.2	5.0	3.5	9.000	-	-	-	175u3235	16	51
T2	37	3.0	4.1	3.5	14.000	-	-	-	175u3224	25	63
T2	45	2.4	3.3	2.8	17.000	-	-	-	175u3227	35	78

Table 8.4 T2, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T4

FC 102				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	1.1	546	607.3	630	0.100	175u3002	-	-	-	1.5	0.4
T4	1.5	382	437.3	410	0.100	175u3004	-	-	-	1.5	0.5
T4	2.2	260	293.3	270	0.200	175u3007	-	-	-	1.5	0.8
T4	3	189	212.7	200	0.200	175u3008	-	-	-	1.5	0.9
T4	4	135	157.3	145	0.300	175u3300	-	-	-	1.5	1.3
T4	5.5	99.0	113.3	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
T4	7.5	72.0	82.4	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
T4	11	50.0	55.3	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
T4	15	36.0	40.3	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
T4	18.5	27.0	32.5	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
T4	22	20.3	27.2	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3
T4	30	18.0	19.8	19	2.200	175u3357	175u3049	175u3050	-	1.5	10.1
T4	37	13.4	16.0	14	2.800	175u3341	175u3055	175u3056	-	2.5	13.3
T4	45	10.8	13.1	12	3.200	175u3359	175u3061	175u3062	-	2.5	15.3
T4	55	8.8	10.7	9.5	4.200	-	175u3065	175u3066	-	4	20
T4	75	6.5	7.8	7.0	5.500	-	175u3070	175u3071	-	6	26
T4	90	4.2	6.5	5.5	7.000	-	-	-	175u3231	10	36
T4	110	3.6	5.3	4.7	9.000	-	-	-	175u3079	16	44
T4	132	3.0	4.4	3.7	11.000	-	-	-	175u3083	25	55
T4	160	2.5	3.6	3.3	13.000	-	-	-	175u3084	35	63
T4	200	2.0	2.9	2.7	16.000	-	-	-	175u3088	50	77
T4	250	1.6	2.3	2.1	20.000	-	-	-	175u3091	70	98
T4	315	1.2	1.8	1.7	26.000	-	-	-	175u3093	2x35	124
T4	355	1.2	1.6	1.3	32.000	-	-	-	175u3097	2x35	157
T4	400	1.2	1.4	1.2	36.000	-	-	-	175u3098	2x50	173
T4	450	1.1	1.3	1.1	42.000	-	-	-	175u3099	2x50	196
T4	500	0.9	1.1	2x1.9	-	-	-	-	-	-	-
T4	560	0.9	1.0	2x1.7	-	-	-	-	-	-	-
T4	630	0.8	0.9	2x1.5	-	-	-	-	-	-	-
T4	710	0.7	0.8	2x1.3	-	-	-	-	-	-	-
T4	800	0.6	0.7	3x1.8	-	-	-	-	-	-	-
T4	1000	0.5	0.6	3x1.6	-	-	-	-	-	-	-

Table 8.5 T4, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T4

FC 102				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]	R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
						Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	1.1	546	607.3	630	0.300	175u3309	-	-	-	1.5	0.7
T4	1.5	382	437.3	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
T4	2.2	260	293.3	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T4	3	189	212.7	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T4	4	135	157.3	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
T4	5.5	99.0	113.3	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
T4	7.5	72.0	82.4	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
T4	11	50.0	55.3	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
T4	15	36.0	40.3	38	5.000	-	-	-	175u3236	1.5	11.5
T4	18.5	27.0	32.5	28	6.000	-	-	-	175u3237	2.5	14.7
T4	22	20.3	27.2	22	8.000	-	-	-	175u3238	4	19
T4	30	18.0	19.8	19	10.000	-	-	-	175u3203	4	23
T4	37	13.4	16.0	14	14.000	-	-	-	175u3206	10	32
T4	45	10.8	13.1	12	17.000	-	-	-	175u3210	10	38
T4	55	8.8	10.7	9.5	21.000	-	-	-	175u3213	16	47
T4	75	6.5	7.8	7.0	26.000	-	-	-	175u3216	25	61
T4	90	4.2	6.5	5.5	36.000	-	-	-	175u3219	35	81
T4	110	3.6	5.3	4.7	42.000	-	-	-	175u3221	50	95
T4	132	3.0	4.4	3.7	52.000	-	-	-	175u3223	70	119
T4	160	2.5	3.6	3.3	60.000	-	-	-	175u3225	2x35	135
T4	200	2.0	2.9	2.7	78.000	-	-	-	175u3228	2x50	170
T4	250	1.6	2.3	2.1	90.000	-	-	-	175u3230	2x70	207
T4	315	1.2	1.8	1.7	-	-	-	-	-	-	-
T4	355	1.2	1.6	1.3	-	-	-	-	-	-	-
T4	400	1.2	1.4	1.2	-	-	-	-	-	-	-
T4	450	1.1	1.3	1.1	-	-	-	-	-	-	-
T4	500	0.9	1.1	2x1.9	-	-	-	-	-	-	-
T4	560	0.9	1.0	2x1.7	-	-	-	-	-	-	-
T4	630	0.8	0.9	2x1.5	-	-	-	-	-	-	-
T4	710	0.7	0.8	2x1.3	-	-	-	-	-	-	-
T4	800	0.6	0.7	3x1.8	-	-	-	-	-	-	-
T4	1000	0.5	0.6	3x1.6	-	-	-	-	-	-	-

Table 8.6 T4, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T6

FC 102				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T6	1.1	620	889.1	850	0.100	175u3001	-	-	-	1.5	0.4
T6	1.5	550	642.7	570	0.100	175u3003	-	-	-	1.5	0.4
T6	2.2	380	431.1	415	0.200	175u3005	-	-	-	1.5	0.7
T6	3	260	312.5	270	0.200	175u3007	-	-	-	1.5	0.8
T6	4	189	231.6	200	0.300	175u3342	-	-	-	1.5	1.1
T6	5.5	135	166.6	145	0.450	175u3343	175u3012	175u3013	-	1.5	1.7
T6	7.5	99.0	121.1	100	0.570	175u3344	175u3136	175u3137	-	1.5	2.3
T6	11	69.0	81.6	72	0.680	175u3345	175u3456	175u3455	-	1.5	2.9
T6	15	48.6	59.4	52	1.130	175u3346	175u3458	175u3457	-	1.5	4.4
T6	18.5	35.1	47.9	38	1.400	175u3347	175u3460	175u3459	-	1.5	5.7
T6	22	27.0	40.1	31	1.700	175u3348	175u3037	175u3038	-	1.5	7
T6	30	22.5	29.2	27	2.200	175u3349	175u3043	175u3044	-	1.5	8.5
T6	37	17.1	23.6	19	2.800	175u3350	175u3462	175u3461	-	2.5	11.4
T6	45	13.5	19.4	14	3.200	175u3358	175u3464	175u3463	-	2.5	14.2
T6	55	11.7	15.8	13.5	4.200	-	175u3057	175u3058	-	4	17
T6	75	9.9	11.5	11	5.500	-	175u3063	175u3064	-	6	21
T6	90	8.6	9.6	7.0	7.000	-	-	-	175u3245	10	32

Table 8.7 T6, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T6

FC 102				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T6	1.1	620	889.1	850	0.280	175u3317	175u3104	175u3105	-	1.5	0.6
T6	1.5	550	642.7	570	0.450	175u3318	175u3430	175u3429	-	1.5	0.9
T6	2.2	380	431.1	415	0.570	175u3319	175u3432	175u3431	-	1.5	1.1
T6	3	260	312.5	270	0.960	175u3320	175u3434	175u3433	-	1.5	1.8
T6	4	189	231.6	200	1.130	175u3321	175u3436	175u3435	-	1.5	2.3
T6	5.5	135	166.6	145	1.700	175u3322	175u3126	175u3127	-	1.5	3.3
T6	7.5	99.0	121.1	100	2.200	175u3323	175u3438	175u3437	-	1.5	4.4
T6	11	69.0	81.6	72	3.200	175u3324	175u3440	175u3439	-	1.5	6.3
T6	15	48.6	59.4	52	5.500	-	175u3148	175u3149	-	1.5	9.7
T6	18.5	35.1	47.9	38	6.000	-	-	-	175u3239	2.5	12.6
T6	22	27.0	40.1	31	8.000	-	-	-	175u3240	4	16
T6	30	22.5	29.2	27	10.000	-	-	-	175u3200	4	19
T6	37	17.1	23.6	19	14.000	-	-	-	175u3204	10	27
T6	45	13.5	19.4	14	17.000	-	-	-	175u3207	10	35
T6	55	11.7	15.8	13.5	21.000	-	-	-	175u3208	16	40
T6	75	9.9	11.5	11	26.000	-	-	-	175u3211	25	49
T6	90	8.6	9.6	7.0	30.000	-	-	-	175u3241	35	66

Table 8.8 T6, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T7

FC 102				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T7	1.1	620	830	630	0.100	175u3002	-	-	-	1.5	0.4
T7	1.5	513	600	570	0.100	175u3003	-	-	-	1.5	0.4
T7	2.2	340	403	415	0.200	175u3005	-	-	-	1.5	0.7
T7	3	243	292	270	0.300	175u3361	-	-	-	1.5	1
T7	4	180	216	200	0.360	-	175u3009	175u3010	-	1.5	1.3
T7	5.5	130	156	145	0.450	-	175u3012	175u3013	-	1.5	1.7
T7	7.5	94	113	105	0.790	-	175u3481	175u3482	-	1.5	2.6
T7	11	94.5	110.9	105	0.790	175u3360	175u3481	175u3482	-	1.5	2.7
T7	15	69.7	80.7	72	1.130	175u3351	175u3466	175u3465	-	1.5	3.8
T7	18.5	46.8	65.1	52	1.400	175u3352	175u3468	175u3467	-	1.5	4.9
T7	22	36.0	54.5	42	1.700	175u3353	175u3032	175u3033	-	1.5	6
T7	30	29.0	39.7	31	2.200	175u3354	175u3470	175u3469	-	1.5	7.9
T7	37	22.5	32.1	27	2.800	175u3355	175u3472	175u3471	-	2.5	9.6
T7	45	18.0	26.3	22	3.200	175u3356	175u3479	175u3480	-	2.5	11.3
T7	55	13.5	21.4	15.5	4.200	-	175u3474	175u3473	-	4	15.4
T7	75	13.5	15.6	13.5	5.500	-	175u3476	175u3475	-	6	19
T7	90	8.8	13.0	11	7.000	-	-	-	175u3232	10	25
T7	110	8.8	10.6	9.1	9.000	-	-	-	175u3067	16	32
T7	132	6.6	8.8	7.4	11.000	-	-	-	175u3072	16	39
T7	160	4.2	7.2	6.1	13.000	-	-	-	175u3075	16	46
T7	200	4.2	5.8	5.0	16.000	-	-	-	175u3078	25	57
T7	250	3.4	4.6	4.0	20.000	-	-	-	175u3082	35	71
T7	315	2.3	3.7	3.2	26.000	-	-	-	175u3085	50	90
T7	400	2.3	2.9	2.5	32.000	-	-	-	175u3089	70	113
T7	450	2.0	2.6	2.3	36.000	-	-	-	175u3090	2x35	125
T7	500	1.9	2.3	2.0	42.000	-	-	-	175u3092	2x35	145
T7	560	1.5	2.1	1.6	52.000	-	-	-	175u3094	2x50	180
T7	630	1.4	1.8	1.4	60.000	-	-	-	175u3095	2x50	207
T7	710	1.2	1.6	2x2.6	-	-	-	-	-	-	-
T7	800	1.1	1.4	2x2.2	-	-	-	-	-	-	-
T7	900	1.0	1.3	2x2.0	-	-	-	-	-	-	-
T7	1000	0.9	1.1	3x2.6	-	-	-	-	-	-	-
T7	1200	0.8	1.0	3x2.4	-	-	-	-	-	-	-
T7	1400	0.6	0.8	3x2.0	-	-	-	-	-	-	-

Table 8.9 T7, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T7

FC 102				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T7	1.1	620	830	630	0.360	-	175u3108	175u3109	-	1.5	0.8
T7	1.5	513	600	570	0.570	-	175u3110	175u3111	-	1.5	1
T7	2.2	340	403	415	0.790	-	175u3112	175u3113	-	1.5	1.3
T7	3	243	292	270	1.130	-	175u3118	175u3119	-	1.5	2
T7	4	180	216	200	1.700	-	175u3122	175u3123	-	1.5	2.8
T7	5.5	130	156	145	2.200	-	175u3106	175u3107	-	1.5	3.7
T7	7.5	94	113	105	3.200	-	175u3132	175u3133	-	1.5	5.2
T7	11	94.5	110.9	105	4.200	-	175u3134	175u3135	-	1.5	6
T7	15	69.7	80.7	72	4.200	-	175u3142	175u3143	-	1.5	7.2
T7	18.5	46.8	65.1	52	6.000	-	-	-	175u3242	2.5	10.8
T7	22	36.0	54.5	42	8.000	-	-	-	175u3243	2.5	13.9
T7	30	29.0	39.7	31	10.000	-	-	-	175u3244	4	18
T7	37	22.5	32.1	27	14.000	-	-	-	175u3201	10	23
T7	45	18.0	26.3	22	17.000	-	-	-	175u3202	10	28
T7	55	13.5	21.4	15.5	21.000	-	-	-	175u3205	16	37
T7	75	13.5	15.6	13.5	26.000	-	-	-	175u3209	16	44
T7	90	8.8	13.0	11	36.000	-	-	-	175u3212	25	57
T7	110	8.8	10.6	9.1	42.000	-	-	-	175u3214	35	68
T7	132	6.6	8.8	7.4	52.000	-	-	-	175u3215	50	84
T7	160	4.2	7.2	6.1	60.000	-	-	-	175u3218	70	99
T7	200	4.2	5.8	5.0	78.000	-	-	-	175u3220	2x35	125
T7	250	3.4	4.6	4.0	90.000	-	-	-	175u3222	2x35	150
T7	315	2.3	3.7	3.2	-	-	-	-	-	-	-
T7	400	2.3	2.9	2.5	-	-	-	-	-	-	-
T7	450	2.0	2.6	2.3	-	-	-	-	-	-	-
T7	500	1.9	2.3	2.0	-	-	-	-	-	-	-
T7	560	1.5	2.1	1.6	-	-	-	-	-	-	-
T7	630	1.4	1.8	1.4	-	-	-	-	-	-	-
T7	710	1.2	1.6	2x2.6	-	-	-	-	-	-	-
T7	800	1.1	1.4	2x2.2	-	-	-	-	-	-	-
T7	900	1.0	1.3	2x2.0	-	-	-	-	-	-	-
T7	1000	0.9	1.1	3x2.6	-	-	-	-	-	-	-
T7	1200	0.8	1.0	3x2.4	-	-	-	-	-	-	-
T7	1400	0.6	0.8	3x2.0	-	-	-	-	-	-	-

Table 8.10 T7, Vertical Braking 40% Duty Cycle

8.2.4 VLT® AQUA Drive FC 202

10% duty cycle, horizontal braking, T2

FC 202				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	0.25	380	691.3	630	0.100	175u3002	-	-	-	1.5	0.4
T2	0.37	380	466.7	410	0.100	175u3004	-	-	-	1.5	0.5
T2	0.55	275	313.7	300	0.100	175u3006	-	-	-	1.5	0.6
T2	0.75	188	230.0	200	0.100	175u3011	-	-	-	1.5	0.7
T2	1.1	130	152.9	145	0.100	175u3016	-	-	-	1.5	0.8
T2	1.5	81.0	110.5	100	0.100	175u3021	-	-	-	1.5	0.9
T2	2.2	58.5	74.1	70	0.200	175u3026	-	-	-	1.5	1.6
T2	3	45.0	53.7	48	0.200	175u3031	-	-	-	1.5	1.9
T2	3.7	31.5	39.9	35	0.300	175u3325	-	-	-	1.5	2.7
T2	5.5	22.5	28.7	27	0.360	175u3326	175u3477	175u3478	-	1.5	3.5
T2	7.5	17.7	20.8	18	0.570	175u3327	175u3442	175u3441	-	1.5	5.3
T2	11	12.6	14.0	13	0.680	175u3328	175u3059	175u3060	-	1.5	6.8
T2	15	8.7	10.2	9.0	1.130	175u3329	175u3068	175u3069	-	2.5	10.5
T2	18.5	5.3	8.2	5.7	1.400	175u3330	175u3073	175u3074	-	4	15
T2	22	5.1	6.9	5.7	1.700	175u3331	175u3483	175u3484	-	4	16
T2	30	3.2	5.0	3.5	2.200	175u3332	175u3080	175u3081	-	6	24
T2	37	3.0	4.1	3.5	2.800	175u3333	175u3448	175u3447	-	10	27
T2	45	2.4	3.3	2.8	3.200	175u3334	175u3086	175u3087	-	16	32

Table 8.11 T2, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T2

FC 202				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	0.25	380	691.3	630	0.100	175u3002	-	-	-	1.5	0.4
T2	0.37	380	466.7	410	0.100	175u3004	-	-	-	1.5	0.5
T2	0.55	275	313.7	300	0.200	175u3096	-	-	-	1.5	0.8
T2	0.75	188	230.0	200	0.200	175u3008	-	-	-	1.5	0.9
T2	1.1	130	152.9	145	0.300	175u3300	-	-	-	1.5	1.3
T2	1.5	81.0	110.5	100	0.450	175u3301	175u3402	175u3401	-	1.5	2
T2	2.2	58.5	74.1	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
T2	3	45.0	53.7	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
T2	3.7	31.5	39.9	35	1.130	175u3304	175u3408	175u3407	-	1.5	5.4
T2	5.5	22.5	28.7	27	1.400	175u3305	175u3410	175u3409	-	1.5	6.8
T2	7.5	17.7	20.8	18	2.200	175u3306	175u3412	175u3411	-	1.5	10.4
T2	11	12.6	14.0	13	3.200	175u3307	175u3414	175u3413	-	2.5	14.7
T2	15	8.7	10.2	9.0	5.500	-	175u3176	175u3177	-	4	23
T2	18.5	5.3	8.2	5.7	6.000	-	-	-	175u3233	10	33
T2	22	5.1	6.9	5.7	8.000	-	-	-	175u3234	10	38
T2	30	3.2	5.0	3.5	9.000	-	-	-	175u3235	16	51
T2	37	3.0	4.1	3.5	14.000	-	-	-	175u3224	25	63
T2	45	2.4	3.3	2.8	17.000	-	-	-	175u3227	35	78

Table 8.12 T2, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T4

FC 202				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	1000	1864.2	1200	0.100	175u3000	-	-	-	1.5	0.3
T4	0.55	1000	1246.3	1200	0.100	175u3000	-	-	-	1.5	0.3
T4	0.75	620	910.2	850	0.100	175u3001	-	-	-	1.5	0.4
T4	1.1	546	607.3	630	0.100	175u3002	-	-	-	1.5	0.4
T4	1.5	382	437.3	410	0.100	175u3004	-	-	-	1.5	0.5
T4	2.2	260	293.3	270	0.200	175u3007	-	-	-	1.5	0.8
T4	3	189	212.7	200	0.200	175u3008	-	-	-	1.5	0.9
T4	4	135	157.3	145	0.300	175u3300	-	-	-	1.5	1.3
T4	5.5	99.0	113.3	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
T4	7.5	72.0	82.4	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
T4	11	50.0	55.3	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
T4	15	36.0	40.3	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
T4	18.5	27.0	32.5	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
T4	22	20.3	27.2	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3
T4	30	18.0	19.8	19	2.200	175u3357	175u3049	175u3050	-	1.5	10.1
T4	37	13.4	16.0	14	2.800	175u3341	175u3055	175u3056	-	2.5	13.3
T4	45	10.8	13.1	12	3.200	175u3359	175u3061	175u3062	-	2.5	15.3
T4	55	8.8	10.7	9.5	4.200	-	175u3065	175u3066	-	4	20
T4	75	6.5	7.8	7.0	5.500	-	175u3070	175u3071	-	6	26
T4	90	4.2	6.5	5.5	7.000	-	-	-	175u3231	10	36
T4	110	3.6	5.3	4.7	9.000	-	-	-	175u3079	16	44
T4	132	3.0	4.4	3.7	11.000	-	-	-	175u3083	25	55
T4	160	2.5	3.6	3.3	13.000	-	-	-	175u3084	35	63
T4	200	2.0	2.9	2.7	16.000	-	-	-	175u3088	50	77
T4	250	1.6	2.3	2.1	20.000	-	-	-	175u3091	70	98
T4	315	1.2	1.8	1.7	26.000	-	-	-	175u3093	2x35	124
T4	355	1.2	1.6	1.3	32.000	-	-	-	175u3097	2x35	157
T4	400	1.2	1.4	1.2	36.000	-	-	-	175u3098	2x50	173
T4	450	1.1	1.3	1.1	42.000	-	-	-	175u3099	2x50	196
T4	500	0.9	1.1	2x1.9	-	-	-	-	-	-	-
T4	560	0.9	1.0	2x1.7	-	-	-	-	-	-	-
T4	630	0.8	0.9	2x1.5	-	-	-	-	-	-	-
T4	710	0.7	0.8	2x1.3	-	-	-	-	-	-	-
T4	800	0.6	0.7	3x1.8	-	-	-	-	-	-	-
T4	1000	0.5	0.6	3x1.6	-	-	-	-	-	-	-

Table 8.13 T4, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T4

FC 202				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	1000	1864.2	1200	0.200	175u3101	-	-	-	1.5	0.4
T4	0.55	1000	1246.3	1200	0.200	175u3101	-	-	-	1.5	0.4
T4	0.75	620	910.2	850	0.200	175u3308	-	-	-	1.5	0.5
T4	1.1	546	607.3	630	0.300	175u3309	-	-	-	1.5	0.7
T4	1.5	382	437.3	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
T4	2.2	260	293.3	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T4	3	189	212.7	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T4	4	135	157.3	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
T4	5.5	99.0	113.3	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
T4	7.5	72.0	82.4	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
T4	11	50.0	55.3	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
T4	15	36.0	40.3	38	5.000	-	-	-	175u3236	1.5	11.5
T4	18.5	27.0	32.5	28	6.000	-	-	-	175u3237	2.5	14.7
T4	22	20.3	27.2	22	8.000	-	-	-	175u3238	4	19
T4	30	18.0	19.8	19	10.000	-	-	-	175u3203	4	23
T4	37	13.4	16.0	14	14.000	-	-	-	175u3206	10	32
T4	45	10.8	13.1	12	17.000	-	-	-	175u3210	10	38
T4	55	8.8	10.7	9.5	21.000	-	-	-	175u3213	16	47
T4	75	6.5	7.8	7.0	26.000	-	-	-	175u3216	25	61
T4	90	4.2	6.5	5.5	36.000	-	-	-	175u3219	35	81
T4	110	3.6	5.3	4.7	42.000	-	-	-	175u3221	50	95
T4	132	3.0	4.4	3.7	52.000	-	-	-	175u3223	70	119
T4	160	2.5	3.6	3.3	60.000	-	-	-	175u3225	2x35	135
T4	200	2.0	2.9	2.7	78.000	-	-	-	175u3228	2x50	170
T4	250	1.6	2.3	2.1	90.000	-	-	-	175u3230	2x70	207
T4	315	1.2	1.8	1.7	-	-	-	-	-	-	-
T4	355	1.2	1.6	1.3	-	-	-	-	-	-	-
T4	400	1.2	1.4	1.2	-	-	-	-	-	-	-
T4	450	1.1	1.3	1.1	-	-	-	-	-	-	-
T4	500	0.9	1.1	2x1.9	-	-	-	-	-	-	-
T4	560	0.9	1.0	2x1.7	-	-	-	-	-	-	-
T4	630	0.8	0.9	2x1.5	-	-	-	-	-	-	-
T4	710	0.7	0.8	2x1.3	-	-	-	-	-	-	-
T4	800	0.6	0.7	3x1.8	-	-	-	-	-	-	-
T4	1000	0.5	0.6	3x1.6	-	-	-	-	-	-	-

Table 8.14 T4, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T6

FC 202				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T6	0.75	620	1329.7	1200	0.100	175u3000	-	-	-	1.5	0.3
T6	1.1	620	889.1	850	0.100	175u3001	-	-	-	1.5	0.4
T6	1.5	550	642.7	570	0.100	175u3003	-	-	-	1.5	0.4
T6	2.2	380	431.1	415	0.200	175u3005	-	-	-	1.5	0.7
T6	3	260	312.5	270	0.200	175u3007	-	-	-	1.5	0.8
T6	4	189	231.6	200	0.300	175u3342	-	-	-	1.5	1.1
T6	5.5	135	166.6	145	0.450	175u3343	175u3012	175u3013	-	1.5	1.7
T6	7.5	99.0	121.1	100	0.570	175u3344	175u3136	175u3137	-	1.5	2.3
T6	11	69.0	81.6	72	0.680	175u3345	175u3456	175u3455	-	1.5	2.9
T6	15	48.6	59.4	52	1.130	175u3346	175u3458	175u3457	-	1.5	4.4
T6	18.5	35.1	47.9	38	1.400	175u3347	175u3460	175u3459	-	1.5	5.7
T6	22	27.0	40.1	31	1.700	175u3348	175u3037	175u3038	-	1.5	7
T6	30	22.5	29.2	27	2.200	175u3349	175u3043	175u3044	-	1.5	8.5
T6	37	17.1	23.6	19	2.800	175u3350	175u3462	175u3461	-	2.5	11.4
T6	45	13.5	19.4	14	3.200	175u3358	175u3464	175u3463	-	2.5	14.2
T6	55	11.7	15.8	13.5	4.200	-	175u3057	175u3058	-	4	17
T6	75	9.9	11.5	11	5.500	-	175u3063	175u3064	-	6	21
T6	90	8.6	9.6	7.0	7.000	-	-	-	175u3245	10	32

Table 8.15 T6, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T6

FC 202				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T6	0.75	620	1329.7	1200	0.360	-	175u3102	175u3103	-	1.5	0.6
T6	1.1	620	889.1	850	0.280	175u3317	175u3104	175u3105	-	1.5	0.6
T6	1.5	550	642.7	570	0.450	175u3318	175u3430	175u3429	-	1.5	0.9
T6	2.2	380	431.1	415	0.570	175u3319	175u3432	175u3431	-	1.5	1.1
T6	3	260	312.5	270	0.960	175u3320	175u3434	175u3433	-	1.5	1.8
T6	4	189	231.6	200	1.130	175u3321	175u3436	175u3435	-	1.5	2.3
T6	5.5	135	166.6	145	1.700	175u3322	175u3126	175u3127	-	1.5	3.3
T6	7.5	99.0	121.1	100	2.200	175u3323	175u3438	175u3437	-	1.5	4.4
T6	11	69.0	81.6	72	3.200	175u3324	175u3440	175u3439	-	1.5	6.3
T6	15	48.6	59.4	52	5.500	-	175u3148	175u3149	-	1.5	9.7
T6	18.5	35.1	47.9	38	6.000	-	-	-	175u3239	2.5	12.6
T6	22	27.0	40.1	31	8.000	-	-	-	175u3240	4	16
T6	30	22.5	29.2	27	10.000	-	-	-	175u3200	4	19
T6	37	17.1	23.6	19	14.000	-	-	-	175u3204	10	27
T6	45	13.5	19.4	14	17.000	-	-	-	175u3207	10	35
T6	55	11.7	15.8	13.5	21.000	-	-	-	175u3208	16	40
T6	75	9.9	11.5	11	26.000	-	-	-	175u3211	25	49
T6	90	8.6	9.6	7.0	30.000	-	-	-	175u3241	35	66

Table 8.16 T6, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T7

FC 202				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]	R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
						Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T7	1.1	620	830	630	0.100	175u3002	-	-	-	1.5	0.4
T7	1.5	513	600	570	0.100	175u3003	-	-	-	1.5	0.4
T7	2.2	340	403	415	0.200	175u3005	-	-	-	1.5	0.7
T7	3	243	292	270	0.300	175u3361	-	-	-	1.5	1
T7	4	180	216	200	0.360	-	175u3009	175u3010	-	1.5	1.3
T7	5.5	130	156	145	0.450	-	175u3012	175u3013	-	1.5	1.7
T7	7.5	94	113	105	0.790	-	175u3481	175u3482	-	1.5	2.6
T7	11	94.5	110.9	105	0.790	175u3360	175u3481	175u3482	-	1.5	2.7
T7	15	69.7	80.7	72	1.130	175u3351	175u3466	175u3465	-	1.5	3.8
T7	18.5	46.8	65.1	52	1.400	175u3352	175u3468	175u3467	-	1.5	4.9
T7	22	36.0	54.5	42	1.700	175u3353	175u3032	175u3033	-	1.5	6
T7	30	29.0	39.7	31	2.200	175u3354	175u3470	175u3469	-	1.5	7.9
T7	37	22.5	32.1	27	2.800	175u3355	175u3472	175u3471	-	2.5	9.6
T7	45	18.0	26.3	22	3.200	175u3356	175u3479	175u3480	-	2.5	11.3
T7	55	13.5	21.4	15.5	4.200	-	175u3474	175u3473	-	4	15
T7	75	13.5	15.6	13.5	5.500	-	175u3476	175u3475	-	6	19
T7	90	8.8	13.0	11	7.000	-	-	-	175u3232	10	25
T7	110	8.8	10.6	9.1	9.000	-	-	-	175u3067	16	32
T7	132	6.6	8.8	7.4	11.000	-	-	-	175u3072	16	39
T7	160	4.2	7.2	6.1	13.000	-	-	-	175u3075	16	46
T7	200	4.2	5.8	5.0	16.000	-	-	-	175u3078	25	57
T7	250	3.4	4.6	4.0	20.000	-	-	-	175u3082	35	71
T7	315	2.3	3.7	3.2	26.000	-	-	-	175u3085	50	90
T7	400	2.3	2.9	2.5	32.000	-	-	-	175u3089	70	113
T7	450	2.0	2.6	2.3	36.000	-	-	-	175u3090	2x35	125
T7	500	1.9	2.3	2.0	42.000	-	-	-	175u3092	2x35	145
T7	560	1.5	2.1	1.6	52.000	-	-	-	175u3094	2x50	180
T7	630	1.4	1.8	1.4	60.000	-	-	-	175u3095	2x50	207
T7	710	1.2	1.6	2x2.6	-	-	-	-	-	-	-
T7	800	1.1	1.4	2x2.2	-	-	-	-	-	-	-
T7	900	1.0	1.3	2x2.0	-	-	-	-	-	-	-
T7	1000	0.9	1.1	3x2.6	-	-	-	-	-	-	-
T7	1200	0.8	1.0	3x2.4	-	-	-	-	-	-	-
T7	1400	0.6	0.8	3x2.0	-	-	-	-	-	-	-

Table 8.17 T7, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T7

FC 202				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T7	1.1	620	830	630	0.360	-	175u3108	175u3109	-	1.5	0.8
T7	1.5	513	600	570	0.570	-	175u3110	175u3111	-	1.5	1
T7	2.2	340	403	415	0.790	-	175u3112	175u3113	-	1.5	1.3
T7	3	243	292	270	1.130	-	175u3118	175u3119	-	1.5	2
T7	4	180	216	200	1.700	-	175u3122	175u3123	-	1.5	2.8
T7	5.5	130	156	145	2.200	-	175u3106	175u3107	-	1.5	3.7
T7	7.5	94	113	105	3.200	-	175u3132	175u3133	-	1.5	5.2
T7	11	94.5	110.9	105	4.200	-	175u3134	175u3135	-	1.5	6
T7	15	69.7	80.7	72	4.200	-	175u3142	175u3143	-	1.5	7.2
T7	18.5	46.8	65.1	52	6.000	-	-	-	175u3242	2.5	10.8
T7	22	36.0	54.5	42	8.000	-	-	-	175u3243	2.5	13.9
T7	30	29.0	39.7	31	10.000	-	-	-	175u3244	4	18
T7	37	22.5	32.1	27	14.000	-	-	-	175u3201	10	23
T7	45	18.0	26.3	22	17.000	-	-	-	175u3202	10	28
T7	55	13.5	21.4	15.5	21.000	-	-	-	175u3205	16	37
T7	75	13.5	15.6	13.5	26.000	-	-	-	175u3209	16	44
T7	90	8.8	13.0	11	36.000	-	-	-	175u3212	25	57
T7	110	8.8	10.6	9.1	42.000	-	-	-	175u3214	35	68
T7	132	6.6	8.8	7.4	52.000	-	-	-	175u3215	50	84
T7	160	4.2	7.2	6.1	60.000	-	-	-	175u3218	70	99
T7	200	4.2	5.8	5.0	78.000	-	-	-	175u3220	2x35	125
T7	250	3.4	4.6	4.0	90.000	-	-	-	175u3222	2x35	150
T7	315	2.3	3.7	3.2	-	-	-	-	-	-	-
T7	400	2.3	2.9	2.5	-	-	-	-	-	-	-
T7	450	2.0	2.6	2.3	-	-	-	-	-	-	-
T7	500	1.9	2.3	2.0	-	-	-	-	-	-	-
T7	560	1.5	2.1	1.6	-	-	-	-	-	-	-
T7	630	1.4	1.8	1.4	-	-	-	-	-	-	-
T7	710	1.2	1.6	2x2.6	-	-	-	-	-	-	-
T7	800	1.1	1.4	2x2.2	-	-	-	-	-	-	-
T7	900	1.0	1.3	2x2.0	-	-	-	-	-	-	-
T7	1000	0.9	1.1	3x2.6	-	-	-	-	-	-	-
T7	1200	0.8	1.0	3x2.4	-	-	-	-	-	-	-
T7	1400	0.6	0.8	3x2.0	-	-	-	-	-	-	-

Table 8.18 T7, Vertical Braking 40% Duty Cycle

8.2.5 VLT® AutomationDrive FC 301

10% duty cycle, horizontal braking, T2

FC 301				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	0.25	368	415.9	410	0.100	175u3004	-	-	-	1.5	0.5
T2	0.37	248	280.7	300	0.100	175u3006	-	-	-	1.5	0.6
T2	0.55	166	188.7	200	0.100	175u3011	-	-	-	1.5	0.7
T2	0.75	121	138.4	145	0.100	175u3016	-	-	-	1.5	0.8
T2	1.1	81.0	92.0	100	0.100	175u3021	-	-	-	1.5	0.9
T2	1.5	58.5	66.5	70	0.200	175u3026	-	-	-	1.5	1.6
T2	2.2	40.2	44.6	48	0.200	175u3031	-	-	-	1.5	1.9
T2	3	29.1	32.3	35	0.300	175u3325	-	-	-	1.5	2.7
T2	3.7	22.5	25.9	27	0.360	175u3326	175u3477	175u3478	-	1.5	3.5
T2	5.5	17.7	19.7	18	0.570	175u3327	175u3442	175u3441	-	1.5	5.3
T2	7.5	12.6	14.3	13	0.680	175u3328	175u3059	175u3060	-	1.5	6.8
T2	11	8.7	9.7	9	1.130	175u3329	175u3068	175u3069	-	2.5	10.5
T2	15	5.3	7.5	5.7	1.400	175u3330	175u3073	175u3074	-	4	15
T2	18.5	5.1	6.0	5.7	1.700	175u3331	175u3483	175u3484	-	4	16
T2	22	3.2	5.0	3.5	2.200	175u3332	175u3080	175u3081	-	6	24
T2	30	3.0	3.7	3.5	2.800	175u3333	175u3448	175u3447	-	10	27
T2	37	2.4	3.0	2.8	3.200	175u3334	175u3086	175u3087	-	16	32

Table 8.19 T2, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T2

FC 301				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	0.25	368	415.9	410	0.100	175u3004	-	-	-	1.5	0.5
T2	0.37	248	280.7	300	0.200	175u3096	-	-	-	1.5	0.8
T2	0.55	166	188.7	200	0.200	175u3008	-	-	-	1.5	0.9
T2	0.75	121	138.4	145	0.300	175u3300	-	-	-	1.5	1.3
T2	1.1	81.0	92.0	100	0.450	175u3301	175u3402	175u3401	-	1.5	2
T2	1.5	58.5	66.5	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
T2	2.2	40.2	44.6	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
T2	3	29.1	32.3	35	1.130	175u3304	175u3408	175u3407	-	1.5	5.4
T2	3.7	22.5	25.9	27	1.400	175u3305	175u3410	175u3409	-	1.5	6.8
T2	5.5	17.7	19.7	18	2.200	175u3306	175u3412	175u3411	-	1.5	10.4
T2	7.5	12.6	14.3	13	3.200	175u3307	175u3414	175u3413	-	2.5	14.7
T2	11	8.7	9.7	9	5.500	-	175u3176	175u3177	-	4	23
T2	15	5.3	7.5	5.7	6.000	-	-	-	175u3233	10	33
T2	18.5	5.1	6.0	5.7	8.000	-	-	-	175u3234	10	38
T2	22	3.2	5.0	3.5	9.000	-	-	-	175u3235	16	51
T2	30	3.0	3.7	3.5	14.000	-	-	-	175u3224	25	63
T2	37	2.4	3.0	2.8	17.000	-	-	-	175u3227	35	78

Table 8.20 T2, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T4

FC 301				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	1000	1121.4	1200	0.100	175u3000	-	-	-	1.5	0.3
T4	0.55	620	749.8	850	0.100	175u3001	-	-	-	1.5	0.4
T4	0.75	485	547.6	630	0.100	175u3002	-	-	-	1.5	0.4
T4	1.1	329	365.3	410	0.100	175u3004	-	-	-	1.5	0.5
T4	1.5	240	263.0	270	0.200	175u3007	-	-	-	1.5	0.8
T4	2.2	161	176.5	200	0.200	175u3008	-	-	-	1.5	0.9
T4	3	117	127.9	145	0.300	175u3300	-	-	-	1.5	1.3
T4	4	86.9	94.6	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
T4	5.5	62.5	68.2	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
T4	7.5	45.3	49.6	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
T4	11	34.9	38.0	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
T4	15	25.3	27.7	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
T4	18.5	20.3	22.3	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3
T4	22	16.9	18.7	19	2.200	175u3357	175u3049	175u3050	-	1.5	10.1
T4	30	13.2	14.5	14	2.800	175u3341	175u3055	175u3056	-	2.5	13.3
T4	37	10.6	11.7	12	3.200	175u3359	175u3061	175u3062	-	2.5	15.3
T4	45	8.7	9.6	9.5	4.200	-	175u3065	175u3066	-	4	20
T4	55	6.6	7.8	7.0	5.500	-	175u3070	175u3071	-	6	26
T4	75	4.2	5.7	5.5	7.000	-	-	-	175u3231	10	36

Table 8.21 T4, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T4

FC 301				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	1000	1121.4	1200	0.200	175u3101	-	-	-	1.5	0.4
T4	0.55	620	749.8	850	0.200	175u3308	-	-	-	1.5	0.5
T4	0.75	485	547.6	630	0.300	175u3309	-	-	-	1.5	0.7
T4	1.1	329	365.3	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
T4	1.5	240	263.0	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T4	2.2	161	176.5	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T4	3	117	127.9	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
T4	4	86.9	94.6	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
T4	5.5	62.5	68.2	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
T4	7.5	45.3	49.6	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
T4	11	34.9	38.0	38	5.000	-	-	-	175u3236	1.5	11.5
T4	15	25.3	27.7	28	6.000	-	-	-	175u3237	2.5	14.7
T4	18.5	20.3	22.3	22	8.000	-	-	-	175u3238	4	19
T4	22	16.9	18.7	19	10.000	-	-	-	175u3203	4	23
T4	30	13.2	14.5	14	14.000	-	-	-	175u3206	10	32
T4	37	10.6	11.7	12	17.000	-	-	-	175u3210	10	38
T4	45	8.7	9.6	9.5	21.000	-	-	-	175u3213	16	47
T4	55	6.6	7.8	7.0	26.000	-	-	-	175u3216	25	61
T4	75	4.2	5.7	5.5	36.000	-	-	-	175u3219	35	81

Table 8.22 T4, Vertical Braking 40% Duty Cycle

8.2.6 VLT® AutomationDrive FC 302

10% duty cycle, horizontal braking, T2

FC 302				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	0.25	380	475.3	410	0.100	175u3004	-	-	-	1.5	0.5
T2	0.37	275	320.8	300	0.100	175u3006	-	-	-	1.5	0.6
T2	0.55	188	215.7	200	0.100	175u3011	-	-	-	1.5	0.7
T2	0.75	130	158.1	145	0.100	175u3016	-	-	-	1.5	0.8
T2	1.1	81.0	105.1	100	0.100	175u3021	-	-	-	1.5	0.9
T2	1.5	58.5	76.0	70	0.200	175u3026	-	-	-	1.5	1.6
T2	2.2	45.0	51.0	48	0.200	175u3031	-	-	-	1.5	1.9
T2	3	31.5	37.0	35	0.300	175u3325	-	-	-	1.5	2.7
T2	3.7	22.5	29.7	27	0.360	175u3326	175u3477	175u3478	-	1.5	3.5
T2	5.5	17.7	19.7	18	0.570	175u3327	175u3442	175u3441	-	1.5	5.3
T2	7.5	12.6	14.3	13.0	0.680	175u3328	175u3059	175u3060	-	1.5	6.8
T2	11	8.7	9.7	9.0	1.130	175u3329	175u3068	175u3069	-	2.5	10.5
T2	15	5.3	7.5	5.7	1.400	175u3330	175u3073	175u3074	-	4	14.7
T2	18.5	5.1	6.0	5.7	1.700	175u3331	175u3483	175u3484	-	4	16
T2	22	3.2	5.0	3.5	2.200	175u3332	175u3080	175u3081	-	6	24
T2	30	3.0	3.7	3.5	2.800	175u3333	175u3448	175u3447	-	10	27
T2	37	2.4	3.0	2.8	3.200	175u3334	175u3086	175u3087	-	16	32

Table 8.23 T2, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T2

FC 302				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T2	0.25	380	475.3	410	0.100	175u3004	-	-	-	1.5	0.5
T2	0.37	275	320.8	300	0.200	175u3096	-	-	-	1.5	0.8
T2	0.55	188	215.7	200	0.200	175u3008	-	-	-	1.5	0.9
T2	0.75	130	158.1	145	0.300	175u3300	-	-	-	1.5	1.3
T2	1.1	81.0	105.1	100	0.450	175u3301	175u3402	175u3401	-	1.5	2
T2	1.5	58.5	76.0	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
T2	2.2	45.0	51.0	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
T2	3	31.5	37.0	35	1.130	175u3304	175u3408	175u3407	-	1.5	5.4
T2	3.7	22.5	29.7	27	1.400	175u3305	175u3410	175u3409	-	1.5	6.8
T2	5.5	17.7	19.7	18	2.200	175u3306	175u3412	175u3411	-	1.5	10.4
T2	7.5	12.6	14.3	13.0	3.200	175u3307	175u3414	175u3413	-	2.5	14.7
T2	11	8.7	9.7	9.0	5.500	-	175u3176	175u3177	-	4	23
T2	15	5.3	7.5	5.7	6.000	-	-	-	175u3233	10	33
T2	18.5	5.1	6.0	5.7	8.000	-	-	-	175u3234	10	38
T2	22	3.2	5.0	3.5	9.000	-	-	-	175u3235	16	51
T2	30	3.0	3.7	3.5	14.000	-	-	-	175u3224	25	63
T2	37	2.4	3.0	2.8	17.000	-	-	-	175u3227	35	78

Table 8.24 T2, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T5

FC 302				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T5	0.37	1000	1389.2	1200	0.100	175u3000	-	-	-	1.5	0.3
T5	0.55	620	928.8	850	0.100	175u3001	-	-	-	1.5	0.4
T5	0.75	558	678.3	630	0.100	175u3002	-	-	-	1.5	0.4
T5	1.1	382	452.5	410	0.100	175u3004	-	-	-	1.5	0.5
T5	1.5	260	325.9	270	0.200	175u3007	-	-	-	1.5	0.8
T5	2.2	189	218.6	200	0.200	175u3008	-	-	-	1.5	0.9
T5	3	135	158.5	145	0.300	175u3300	-	-	-	1.5	1.3
T5	4	99.0	117.2	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
T5	5.5	72.0	84.4	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
T5	7.5	50.0	61.4	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
T5	11	36.0	41.2	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
T5	15	27.0	30.0	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
T5	18.5	20.3	24.2	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3
T5	22	18.0	20.3	19	2.200	175u3357	175u3049	175u3050	-	1.5	10.1
T5	30	13.4	15.8	14	2.800	175u3341	175u3055	175u3056	-	2.5	13.3
T5	37	10.8	12.7	12	3.200	175u3359	175u3061	175u3062	-	2.5	15.3
T5	45	8.8	10.4	9.5	4.200	-	175u3065	175u3066	-	4	20
T5	55	6.5	8.5	7.0	5.500	-	175u3070	175u3071	-	6	26
T5	75	4.2	6.2	5.5	7.000	-	-	-	175u3231	10	36
T5	90	3.6	5.1	4.7	9.000	-	-	-	175u3079	16	44
T5	110	3.0	4.2	3.7	11.000	-	-	-	175u3083	25	55
T5	132	2.5	3.5	3.3	13.000	-	-	-	175u3084	35	63
T5	160	2.0	2.9	2.7	16.000	-	-	-	175u3088	50	77
T5	200	1.6	2.3	2.1	20.000	-	-	-	175u3091	70	98
T5	250	1.2	1.8	1.7	26.000	-	-	-	175u3093	2x35	124
T5	315	1.2	1.5	1.3	32.000	-	-	-	175u3097	2x35	157
T5	355	1.2	1.3	1.2	36.000	-	-	-	175u3098	2x50	173
T5	400	1.1	1.1	1.1	42.000	-	-	-	175u3099	2x50	196
T5	450	0.9	1.0	2x1.9	-	-	-	-	-	-	-
T5	500	0.9	0.9	2x1.7	-	-	-	-	-	-	-
T5	560	0.8	0.8	2x1.5	-	-	-	-	-	-	-
T5	630	0.7	0.7	2x1.3	-	-	-	-	-	-	-
T5	710	0.6	0.6	3x1.8	-	-	-	-	-	-	-
T5	800	0.5	0.6	3x1.6	-	-	-	-	-	-	-

Table 8.25 T5, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T5

FC 302				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T5	0.37	1000	1389.2	1200	0.200	175u3101	-	-	-	1.5	0.4
T5	0.55	620	928.8	850	0.200	175u3308	-	-	-	1.5	0.5
T5	0.75	558	678.3	630	0.300	175u3309	-	-	-	1.5	0.7
T5	1.1	382	452.5	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
T5	1.5	260	325.9	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T5	2.2	189	218.6	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T5	3	135	158.5	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
T5	4	99.0	117.2	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
T5	5.5	72.0	84.4	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
T5	7.5	50.0	61.4	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
T5	11	36.0	41.2	38	5.000	-	-	-	175u3236	1.5	11.5
T5	15	27.0	30.0	28	6.000	-	-	-	175u3237	2.5	14.7
T5	18.5	20.3	24.2	22	8.000	-	-	-	175u3238	4	19
T5	22	18.0	20.3	19	10.000	-	-	-	175u3203	4	23
T5	30	13.4	15.8	14	14.000	-	-	-	175u3206	10	32
T5	37	10.8	12.7	12	17.000	-	-	-	175u3210	10	38
T5	45	8.8	10.4	9.5	21.000	-	-	-	175u3213	16	47
T5	55	6.5	8.5	7.0	26.000	-	-	-	175u3216	25	61
T5	75	4.2	6.2	5.5	36.000	-	-	-	175u3219	35	81
T5	90	3.6	5.1	4.7	42.000	-	-	-	175u3221	50	95
T5	110	3.0	4.2	3.7	52.000	-	-	-	175u3223	70	119
T5	132	2.5	3.5	3.3	60.000	-	-	-	175u3225	2x35	135
T5	160	2.0	2.9	2.7	78.000	-	-	-	175u3228	2x50	170
T5	200	1.6	2.3	2.1	90.000	-	-	-	175u3230	2x70	207
T5	250	1.2	1.8	1.7	-	-	-	-	-	-	-
T5	315	1.2	1.5	1.3	-	-	-	-	-	-	-
T5	355	1.2	1.3	1.2	-	-	-	-	-	-	-
T5	400	1.1	1.1	1.1	-	-	-	-	-	-	-
T5	450	0.9	1.0	2x1.9	-	-	-	-	-	-	-
T5	500	0.9	0.9	2x1.7	-	-	-	-	-	-	-
T5	560	0.8	0.8	2x1.5	-	-	-	-	-	-	-
T5	630	0.7	0.7	2x1.3	-	-	-	-	-	-	-
T5	710	0.6	0.6	3x1.8	-	-	-	-	-	-	-
T5	800	0.5	0.6	3x1.6	-	-	-	-	-	-	-

Table 8.26 T5, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T6

FC 302				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T6	0.75	620	914.2	850	0.100	175u3001	-	-	-	1.5	0.4
T6	1.1	550	611.3	570	0.100	175u3003	-	-	-	1.5	0.4
T6	1.5	380	441.9	415	0.200	175u3005	-	-	-	1.5	0.7
T6	2.2	260	296.4	270	0.200	175u3007	-	-	-	1.5	0.8
T6	3	189	214.8	200	0.300	175u3342	-	-	-	1.5	1.1
T6	4	135	159.2	145	0.450	175u3343	175u3012	175u3013	-	1.5	1.7
T6	5.5	99.0	114.5	100	0.570	175u3344	175u3136	175u3137	-	1.5	2.3
T6	7.5	69.0	83.2	72	0.680	175u3345	175u3456	175u3455	-	1.5	2.9
T6	11	48.6	56.1	52	1.130	175u3346	175u3458	175u3457	-	1.5	4.4
T6	15	35.1	40.8	38	1.400	175u3347	175u3460	175u3459	-	1.5	5.7
T6	18.5	27.0	32.9	31	1.700	175u3348	175u3037	175u3038	-	1.5	7
T6	22	22.5	27.6	27	2.200	175u3349	175u3043	175u3044	-	1.5	8.5
T6	30	17.1	21.4	19	2.800	175u3350	175u3462	175u3461	-	2.5	11.4
T6	37	13.5	17.3	14	3.200	175u3358	175u3464	175u3463	-	2.5	14.2
T6	45	10.8	14.2	13.5	4.200	-	175u3057	175u3058	-	4	17
T6	55	8.8	11.6	11	5.500	-	175u3063	175u3064	-	6	21
T6	75	6.6	8.4	7.0	7.000	-	-	-	175u3245	10	32

Table 8.27 T6, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T6

FC 302				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T6	0.75	620	914.2	850	0.280	175u3317	175u3104	175u3105	-	1.5	0.6
T6	1.1	550	611.3	570	0.450	175u3318	175u3430	175u3429	-	1.5	0.9
T6	1.5	380	441.9	415	0.570	175u3319	175u3432	175u3431	-	1.5	1.1
T6	2.2	260	296.4	270	0.960	175u3320	175u3434	175u3433	-	1.5	1.8
T6	3	189	214.8	200	1.130	175u3321	175u3436	175u3435	-	1.5	2.3
T6	4	135	159.2	145	1.700	175u3322	175u3126	175u3127	-	1.5	3.3
T6	5.5	99.0	114.5	100	2.200	175u3323	175u3438	175u3437	-	1.5	4.4
T6	7.5	69.0	83.2	72	3.200	175u3324	175u3440	175u3439	-	1.5	6.3
T6	11	48.6	56.1	52	5.500	-	175u3148	175u3149	-	1.5	9.7
T6	15	35.1	40.8	38	6.000	-	-	-	175u3239	2.5	12.6
T6	18.5	27.0	32.9	31	8.000	-	-	-	175u3240	4	16
T6	22	22.5	27.6	27	10.000	-	-	-	175u3200	4	19
T6	30	17.1	21.4	19	14.000	-	-	-	175u3204	10	27
T6	37	13.5	17.3	14	17.000	-	-	-	175u3207	10	35
T6	45	10.8	14.2	13.5	21.000	-	-	-	175u3208	16	40
T6	55	8.8	11.6	11	26.000	-	-	-	175u3211	25	49
T6	75	6.6	8.4	7.0	30.000	-	-	-	175u3241	35	66

Table 8.28 T6, Vertical Braking 40% Duty Cycle

10% duty cycle, horizontal braking, T7

FC 302				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T7	1.1	620	830	630	0.100	175u3002	-	-	-	1.5	0.4
T7	1.5	513	600	570	0.100	175u3003	-	-	-	1.5	0.4
T7	2.2	340	403	415	0.200	175u3005	-	-	-	1.5	0.7
T7	3	243	292	270	0.300	175u3361	-	-	-	1.5	1
T7	4	180	216	200	0.360	-	175u3009	175u3010	-	1.5	1.3
T7	5.5	130	156	145	0.450	-	175u3012	175u3013	-	1.5	1.7
T7	7.5	94	113	105	0.790	-	175u3481	175u3482	-	1.5	2.6
T7	11	69.7	76.2	72	1.130	175u3351	175u3466	175u3465	-	1.5	3.8
T7	15	46.8	55.5	52	1.400	175u3352	175u3468	175u3467	-	1.5	4.9
T7	18.5	36.0	44.7	42	1.700	175u3353	175u3032	175u3033	-	1.5	6
T7	22	29.0	37.5	31	2.200	175u3354	175u3470	175u3469	-	1.5	7.9
T7	30	22.5	29.1	27	2.800	175u3355	175u3472	175u3471	-	2.5	9.6
T7	37	18.0	23.5	22	3.200	175u3356	175u3479	175u3480	-	2.5	11.3
T7	45	13.5	19.3	15.5	4.200	-	175u3474	175u3473	-	4	15.4
T7	55	13.5	15.7	13.5	5.500	-	175u3476	175u3475	-	6	19
T7	75	8.8	11.5	11	7.000	-	-	-	175u3232	10	25
T7	90	8.8	9.5	9.1	9.000	-	-	-	175u3067	16	32
T7	110	6.6	7.8	7.4	11.000	-	-	-	175u3072	16	39
T7	132	4.2	6.4	6.1	13.000	-	-	-	175u3075	16	46
T7	160	4.2	5.3	5.0	16.000	-	-	-	175u3078	25	57
T7	200	3.4	4.2	4.0	20.000	-	-	-	175u3082	35	71
T7	250	2.3	3.4	3.2	26.000	-	-	-	175u3085	50	90
T7	315	2.3	2.7	2.5	32.000	-	-	-	175u3089	70	113
T7	355	2.0	2.4	2.3	36.000	-	-	-	175u3090	2x35	125
T7	400	1.9	2.1	2.0	42.000	-	-	-	175u3092	2x35	145
T7	500	1.5	1.7	1.6	52.000	-	-	-	175u3094	2x50	180
T7	560	1.4	1.5	1.4	60.000	-	-	-	175u3095	2x50	207
T7	630	1.2	1.3	2x2.6	-	-	-	-	-	-	-
T7	710	1.1	1.2	2x2.2	-	-	-	-	-	-	-
T7	800	1.0	1.1	2x2.0	-	-	-	-	-	-	-
T7	900	0.9	0.9	3x2.6	-	-	-	-	-	-	-
T7	1000	0.8	0.8	3x2.4	-	-	-	-	-	-	-
T7	1200	0.7	0.7	3x2.0	-	-	-	-	-	-	-

Table 8.29 T7, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T7

FC 302				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T7	1.1	620	830	630	0.360	-	175u3108	175u3109	-	1.5	0.8
T7	1.5	513	600	570	0.570	-	175u3110	175u3111	-	1.5	1
T7	2.2	340	403	415	0.790	-	175u3112	175u3113	-	1.5	1.3
T7	3	243	292	270	1.130	-	175u3118	175u3119	-	1.5	2
T7	4	180	216	200	1.700	-	175u3122	175u3123	-	1.5	2.8
T7	5.5	130	156	145	2.200	-	175u3106	175u3107	-	1.5	3.7
T7	7.5	94	113	105	3.200	-	175u3132	175u3133	-	1.5	5.2
T7	11	69.7	76.2	72	4.200	-	175u3142	175u3143	-	1.5	7.2
T7	15	46.8	55.5	52	6.000	-	-	-	175u3242	2.5	10.8
T7	18.5	36.0	44.7	42	8.000	-	-	-	175u3243	2.5	13.9
T7	22	29.0	37.5	31	10.000	-	-	-	175u3244	4	18
T7	30	22.5	29.1	27	14.000	-	-	-	175u3201	10	23
T7	37	18.0	23.5	22	17.000	-	-	-	175u3202	10	28
T7	45	13.5	19.3	15.5	21.000	-	-	-	175u3205	16	37
T7	55	13.5	15.7	13.5	26.000	-	-	-	175u3209	16	44
T7	75	8.8	11.5	11	36.000	-	-	-	175u3212	25	57
T7	90	8.8	9.5	9.1	42.000	-	-	-	175u3214	35	68
T7	110	6.6	7.8	7.4	52.000	-	-	-	175u3215	50	84
T7	132	4.2	6.4	6.1	60.000	-	-	-	175u3218	70	99
T7	160	4.2	5.3	5.0	78.000	-	-	-	175u3220	2x35	125
T7	200	3.4	4.2	4.0	90.000	-	-	-	175u3222	2x35	150
T7	250	2.3	3.4	3.2	-	-	-	-	-	-	-
T7	315	2.3	2.7	2.5	-	-	-	-	-	-	-
T7	355	2.0	2.4	2.3	-	-	-	-	-	-	-
T7	400	1.9	2.1	2.0	-	-	-	-	-	-	-
T7	500	1.5	1.7	1.6	-	-	-	-	-	-	-
T7	560	1.4	1.5	1.4	-	-	-	-	-	-	-
T7	630	1.2	1.3	2x2.6	-	-	-	-	-	-	-
T7	710	1.1	1.2	2x2.2	-	-	-	-	-	-	-
T7	800	1.0	1.1	2x2.0	-	-	-	-	-	-	-
T7	900	0.9	0.9	3x2.6	-	-	-	-	-	-	-
T7	1000	0.8	0.8	3x2.4	-	-	-	-	-	-	-
T7	1200	0.7	0.7	3x2.0	-	-	-	-	-	-	-

Table 8.30 T7, Vertical Braking 40% Duty Cycle

8.2.7 VLT® AutomationDrive FC 360

10% duty cycle, horizontal braking, T4

FC 360				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	890	1042	1200	0.100	175u3000	-	-	-	1.5	0.3
T4	0.55	593	694	850	0.100	175u3001	-	-	-	1.5	0.4
T4	0.75	434	509	630	0.100	175u3002	-	-	-	1.5	0.4
T4	1.1	288	338	410	0.100	175u3004	-	-	-	1.5	0.5
T4	1.5	208	244	270	0.200	175u3007	-	-	-	1.5	0.8
T4	2.2	139	164	200	0.200	175u3008	-	-	-	1.5	0.9
T4	3	100	119	145	0.300	175u3300	-	-	-	1.5	1.3
T4	4	74.0	87.9	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
T4	5.5	54.0	63.3	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
T4	7.5	38.0	46.1	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
T4	11	27.0	33.0	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
T4	15	19.0	24.0	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
T4	18.5	16.0	19.4	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3
T4	22	16.0	18.0	19	2.200	175u3357	175u3049	175u3050	-	1.5	10.1
T4	30	11.0	13.8	14	2.800	175u3341	175u3055	175u3056	-	2.5	13.3
T4	37	9.0	11.1	12	3.200	175u3359	175u3061	175u3062	-	2.5	15.3
T4	45	8.0	9.1	9.5	4.200	-	175u3065	175u3066	-	4	20
T4	55	6.0	7.4	7.0	5.500	-	175u3070	175u3071	-	6	26
T4	75	4.0	5.4	5.5	7.000	-	-	-	175u3231	10	36

Table 8.31 T4, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T4

FC 360				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	890	1042	1200	0.200	175u3101	-	-	-	1.5	0.4
T4	0.55	593	694	850	0.200	175u3308	-	-	-	1.5	0.5
T4	0.75	434	509	630	0.300	175u3309	-	-	-	1.5	0.7
T4	1.1	288	338	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
T4	1.5	208	244	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T4	2.2	139	164	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T4	3	100	119	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
T4	4	74.0	87.9	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
T4	5.5	54.0	63.3	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
T4	7.5	38.0	46.1	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
T4	11	27.0	33.0	38	5.000	-	-	-	175u3236	1.5	11.5
T4	15	19.0	24.0	28	6.000	-	-	-	175u3237	2.5	14.7
T4	18.5	16.0	19.4	22	8.000	-	-	-	175u3238	4	19
T4	22	16.0	18.0	19	10.000	-	-	-	175u3203	4	23
T4	30	11.0	13.8	14	14.000	-	-	-	175u3206	10	32
T4	37	9.0	11.1	12	17.000	-	-	-	175u3210	10	38
T4	45	8.0	9.1	9.5	21.000	-	-	-	175u3213	16	47
T4	55	6.0	7.4	7.0	26.000	-	-	-	175u3216	25	61
T4	75	4.0	5.4	5.5	36.000	-	-	-	175u3219	35	81

Table 8.32 T4, Vertical Braking 40% Duty Cycle

8.2.8 VLT® Decentral Drive FCD 302

10% duty cycle, horizontal braking, T4

FCD 302				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	1000	1281.6	1200	0.100	175u3000	-	-	-	1.5	0.3
T4	0.55	620	856.9	850	0.100	175u3001	-	-	-	1.5	0.4
T4	0.75	558	625.8	630	0.100	175u3002	-	-	-	1.5	0.4
T4	1.1	382	417.5	410	0.100	175u3004	-	-	-	1.5	0.5
T4	1.5	260	300.6	270	0.200	175u3007	-	-	-	1.5	0.8
T4	2.2	189	201.7	200	0.200	175u3008	-	-	-	1.5	0.9
T4	3	135	146.2	145	0.300	175u3300	-	-	-	1.5	1.3

Table 8.33 T4, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, T4

FCD 302				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
T4	0.37	1000	1281.6	1200	0.200	175u3101	-	-	-	1.5	0.4
T4	0.55	620	856.9	850	0.200	175u3308	-	-	-	1.5	0.5
T4	0.75	558	625.8	630	0.300	175u3309	-	-	-	1.5	0.7
T4	1.1	382	417.5	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
T4	1.5	260	300.6	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
T4	2.2	189	201.7	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
T4	3	135	146.2	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7

Table 8.34 T4, Vertical Braking 40% Duty Cycle

8.2.9 VLT® 2800

10% duty cycle, horizontal braking, 200-400 V

VLT 2800				Horizontal braking 10% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross-section [mm²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
2803 (200V)	0.37	275	313	300	0.100	175u3006	-	-	-	1.5	0.6
2805 (200V)	0.55	185	210	200	0.100	175u3011	-	-	-	1.5	0.7
2807 (200V)	0.75	135	154	145	0.100	175u3016	-	-	-	1.5	0.8
2811 (200V)	1.1	91	102	100	0.100	175u3021	-	-	-	1.5	0.9
2815 (200V)	1.5	66	74	70	0.200	175u3026	-	-	-	1.5	1.6
2822 (200V)	2.2	44	50	48	0.200	175u3031	-	-	-	1.5	1.9
2840 (200V)	3.7	22	29	27	0.360	175u3326	175u3477	175u3478	-	1.5	3.5
2805 (400V)	0.55	747	839	850	0.100	175u3001	-	-	-	1.5	0.4
2807 (400V)	0.75	558	613	630	0.100	175u3002	-	-	-	1.5	0.4
2811 (400V)	1.1	370	409	410	0.100	175u3004	-	-	-	1.5	0.5
2815 (400V)	1.5	260	294	270	0.200	175u3007	-	-	-	1.5	0.8
2822 (400V)	2.2	185	198	200	0.200	175u3008	-	-	-	1.5	0.9
2830 (400V)	3	135	143	145	0.300	175u3300	-	-	-	1.5	1.3
2840 (400V)	4	99	106	110	0.450	175u3335	175u3450	175u3449	-	1.5	1.9
2855 (400V)	5.5	74	76	80	0.570	175u3336	175u3452	175u3451	-	1.5	2.5
2875 (400V)	7.5	52	55	56	0.680	175u3337	175u3027	175u3028	-	1.5	3.3
2880 (400V)	11	35	37	38	1.130	175u3338	175u3034	175u3035	-	1.5	5.2
2881 (400V)	15	26	27	28	1.400	175u3339	175u3039	175u3040	-	1.5	6.7
2882 (400V)	18.5	21	22	22	1.700	175u3340	175u3047	175u3048	-	1.5	8.3

Table 8.35 200-400 V, Horizontal Braking 10% Duty Cycle

40% duty cycle, vertical braking, 200-400 V

VLT 2800				Vertical braking 40% duty cycle							
Frequency converter data				Brake resistor data						Installation	
				R _{rec} [Ω]	P _{br,cont.} [kW]	Danfoss part number				Cable cross- section [mm ²]	Thermo relay [A]
Mains type	P _m [kW]	R _{min} [Ω]	R _{br,nom} [Ω]			Wire IP54	Screw terminal IP21	Screw terminal IP65	Bolt connection IP20		
2803 (200V)	0.37	275	313	300	0.200	175u3096	-	-	-	1.5	0.8
2805 (200V)	0.55	185	210	200	0.200	175u3008	-	-	-	1.5	0.9
2807 (200V)	0.75	135	154	145	0.300	175u3300	-	-	-	1.5	1.3
2811 (200V)	1.1	91	102	100	0.450	175u3301	175u3402	175u3401	-	1.5	2
2815 (200V)	1.5	66	74	70	0.570	175u3302	175u3404	175u3403	-	1.5	2.7
2822 (200V)	2.2	44	50	48	0.960	175u3303	175u3406	175u3405	-	1.5	4.2
2840 (200V)	3.7	22	29	27	1.400	175u3305	175u3410	175u3409	-	1.5	6.8
2805 (400V)	0.55	747	839	850	0.200	175u3308	-	-	-	1.5	0.5
2807 (400V)	0.75	558	613	630	0.300	175u3309	-	-	-	1.5	0.7
2811 (400V)	1.1	370	409	410	0.450	175u3310	175u3416	175u3415	-	1.5	1
2815 (400V)	1.5	260	294	270	0.570	175u3311	175u3418	175u3417	-	1.5	1.4
2822 (400V)	2.2	185	198	200	0.960	175u3312	175u3420	175u3419	-	1.5	2.1
2830 (400V)	3	135	143	145	1.130	175u3313	175u3422	175u3421	-	1.5	2.7
2840 (400V)	4	99	106	110	1.700	175u3314	175u3424	175u3423	-	1.5	3.7
2855 (400V)	5.5	74	76	80	2.200	175u3315	175u3138	175u3139	-	1.5	5
2875 (400V)	7.5	52	55	56	3.200	175u3316	175u3428	175u3427	-	1.5	7.1
2880 (400V)	11	35	37	38	5.000	-	-	-	175u3236	1.5	11.5
2881 (400V)	15	26	27	28	6.000	-	-	-	175u3237	2.5	14.7
2882 (400V)	18.5	21	22	22	8.000	-	-	-	175u3238	4	19

Table 8.36 200-400 V, Vertical Braking 40% Duty Cycle

8.3 Selection Tables for Alternative Brake Resistors

8.3.1 Abbreviations used in the Brake Resistor Tables

Mains	Voltage class
P_m	Rated motor size for frequency converter
R_{min}	Minimum permissible brake resistor - by frequency converter
R_{rec}	Recommended brake resistor resistance of Danfoss brake resistors
Duty cycle	$P_{br,cont} \times 100 / P_m$
Danfoss part number	Danfoss brake resistor order numbers
$P_{br,cont}$	Brake resistor average rated power
$R_{br,nom}$	The nominal (calculated) resistor value to ensure a brake power on motor shaft of 150/160/110% for 1 minute

8.3.2 VLT[®] HVAC Drive FC 102, T2

Mains: 200-240 V, T2

FC 102	P_m	R_{min}	$R_{br,nom}$	Flat-pack IP65		
				R_{rec} per item/ $P_{br,cont}$	Duty cycle	Danfoss part number
T2	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
P1K1	1.1	130	152.9	150/100	9	1005
P1K1	1.1	130	152.9	150/200	18	0989
P1K5	1.5	81.0	110.5	100/100	7	1006
P1K5	1.5	81.0	110.5	100/200	14	0991
P2K2	2.2	58.5	74.1	72/200	9	0992
P3K0	3	45.0	53.7	50/200	7	0993
P3K7	3.7	31.5	39.9	35/200	6	0994
P3K7	3.7	31.5	39.9	72/200	11	2x0992

Table 8.37 Mains: 200-240 V (T2)

8.3.3 VLT[®] HVAC Drive FC 102, T4

Mains: 380-480 V, T4

FC 102	P_m	R_{min}	$R_{br,nom}$	Flat-pack IP65		
				R_{rec} per item/ $P_{br,cont}$	Duty cycle	Danfoss part number
T4	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
P1K1	1.1	546	607.3	620/100	9	1001
P1K1	1.1	546	607.3	620/200	18	0982
P1K5	1.5	382	437.3	430/100	7	1002
P1K5	1.5	382	437.3	430/200	14	0983
P2K2	2.2	260	293.3	310/200	9	0984
P3K0	3	189	212.7	210/200	7	0987
P4K0	4	135	157.3	150/200	5	0989
P4K0	4	135	157.3	300/200	20	2x0985
P5K5	5.5	99.0	113.3	130/200	7	2x0990

Table 8.38 Mains: 380-480 V (T4)

8.3.4 VLT® AQUA Drive FC 202, T2

Mains: 200-240 V, T2

FC 202	P _m	R _{min}	R _{br,nom}	Flat-pack IP65		
				R _{rec} per item/P _{br,cont.}	Duty cycle	Danfoss part number
T2	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
PK25	0.25	380	691.3	430/100	40	1002
PK37	0.37	380	466.7	430/100	27	1002
PK55	0.55	275	313.7	330/100	18	1003
PK55	0.55	275	313.7	310/200	36	0984
PK75	0.75	188	230.0	220/100	13	1004
PK75	0.75	188	230.0	210/200	26	0987
P1K1	1.1	130	152.9	150/100	9	1005
P1K1	1.1	130	152.9	150/200	18	0989
P1K5	1.5	81.0	110.5	100/100	7	1006
P1K5	1.5	81.0	110.5	100/200	14	0991
P2K2	2.2	58.5	74.1	72/200	9	0992
P3K0	3	45.0	53.7	50/200	7	0993
P3K7	3.7	31.5	39.9	35/200	6	0994
P3K7	3.7	31.5	39.9	72/200	11	2x0992
P5K5	5.5	22.5	28.7	40/200	7	2x0996

Table 8.39 Mains: 200-240 V (T2)

8.3.5 VLT® AQUA Drive FC 202, T4

Mains: 380-480 V, T4

FC 202	P _m	R _{min}	R _{br,nom}	Flat-pack IP65		
				R _{rec} per item/P _{br,cont.}	Duty cycle	Danfoss part number
T4	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
PK75	0.75	620	910.2	830/100	13	1000
P1K1	1.1	546	607.3	620/100	9	1001
P1K1	1.1	546	607.3	620/200	18	0982
P1K5	1.5	382	437.3	430/100	7	1002
P1K5	1.5	382	437.3	430/200	14	0983
P2K2	2.2	260	293.3	310/200	9	0984
P3K0	3	189	212.7	210/200	7	0987
P4K0	4	135	157.3	150/200	5	0989
P4K0	4	135	157.3	300/200	10	2x0985
P5K5	5.5	99.0	113.3	130/200	7	2x0990
P7K5	7.5	72.0	82.4	80/240	6	2x0090

Table 8.40 Mains: 380-480 V (T4)

8.3.6 VLT® AutomationDrive FC 301, T2

Mains: 200-240 V, T2

FC 301	P _m	R _{min}	R _{br,nom}	Flat-pack IP65		
				R _{rec} per item/P _{br,cont.}	Duty cycle	Danfoss part number
T2	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
PK25	0.25	368	415.9	430/100	40	1002
PK37	0.37	248	280.7	330/100	27	1003
PK37	0.37	248	280.7	310/200	55	0984
PK55	0.55	166	188.7	220/100	20	1004
PK55	0.55	166	188.7	210/200	37	0987
PK75	0.75	121	138.4	150/100	14	1005
PK75	0.75	121	138.4	150/200	27	0989
P1K1	1.1	81.0	92.0	100/100	10	1006
P1K1	1.1	81.0	92.0	100/200	19	0991
P1K5	1.5	58.5	66.5	72/200	14	0992
P2K2	2.2	40.2	44.6	50/200	10	0993
P3K0	3	29.1	32.3	35/200	7	0994
P3K0	3	29.1	32.3	72/200	14	2x0992
P3K7	3.7	22.5	25.9	40/200	11	2x0996

Table 8.41 Mains: 200-240 V (T2)

8.3.7 VLT® AutomationDrive FC 302, T2

Mains: 200-240 V, T2

FC 302	P _m	R _{min}	R _{br,nom}	Flat-pack IP65		
				R _{rec} per item/P _{br,cont.}	Duty cycle	Danfoss part number
T2	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
PK25	0.25	380	475.3	430/100	40	1002
PK37	0.37	275	320.8	330/100	27	1003
PK37	0.37	275	320.8	310/200	54	0984
PK55	0.55	188	215.7	220/100	18	1004
PK55	0.55	188	215.7	210/200	36	0987
PK75	0.75	130	158.1	150/100	13	1005
PK75	0.75	130	158.1	150/200	27	0989
P1K1	1.1	81.0	105.1	100/100	9	1006
P1K1	1.1	81.0	105.1	100/200	18	0991
P1K5	1.5	58.5	76.0	72/200	13	0992
P2K2	2.2	45.0	51.0	50/200	9	0993
P3K0	3	31.5	37.0	35/200	7	0994
P3K0	3	31.5	37.0	72/200	14	2x0992
P3K7	3.7	22.5	29.7	40/200	10	2x0996

Table 8.42 Mains: 200-240 V (T2)

8.3.8 VLT® AutomationDrive FC 301, T4

Mains: 380-480 V, T4

FC 301	P _m	R _{min}	R _{br,nom}	Flat-pack IP65		
				R _{rec} per item/P _{br,cont.}	Duty cycle	Danfoss part number
T4	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
PK37	0.37	620	1121.4	830/100	27	1000
PK55	0.55	620	749.8	830/100	18	1000
PK75	0.75	485	547.6	620/100	13	1001
PK75	0.75	485	547.6	620/200	27	0982
P1K1	1.1	329	365.3	430/100	9	1002
P1K1	1.1	329	365.3	430/200	18	0983
P1K5	1.5	240	263.0	310/200	13	0984
P2K2	2.2	161	176.5	210/200	9	0987
P3K0	3	117.0	127.9	150/200	7	0989
P3K0	3	117.0	127.9	300/200	14	2x0985
P4K0	4	87	94.6	240/200	10	2x0986
P5K5	5.5	63	68.2	160/200	7	2x0988
P7K5	7.5	45	49.6	130/200	5	2x0990
P11K	11	34.9	38.0	80/240	4	2x0090
P15K	15	25.3	27.7	72/240	3	2x0091

Table 8.43 Mains: 380-480 V (T4)

8.3.9 VLT® AutomationDrive FC 302, T5

Mains: 380-500 V, T5

FC 302	P _m	R _{min}	R _{br,nom}	Flat-pack IP65		
				R _{rec} per item/P _{br,cont.}	Duty cycle	Danfoss part number
T5	[kW]	[Ω]	[Ω]	[Ω/W]	%	175Uxxxx
PK37	0.37	620	1389.2	830/100	27	1000
PK55	0.55	620	928.8	830/100	18	1000
PK75	0.75	558	678.3	620/100	13	1001
PK75	0.75	558	678.3	620/200	27	0982
P1K1	1.1	382	452.5	430/100	9	1002
P1K1	1.1	382	452.5	430/200	18	0983
P1K5	1.5	260	325.9	310/200	13	0984
P2K2	2.2	189	218.6	210/200	9	0987
P3K0	3	135	158.5	150/200	7	0989
P3K0	3	135	158.5	300/200	14	2x0985
P4K0	4	99	117.2	240/200	10	2x0986
P5K5	5.5	72	84.4	160/200	7	2x0988
P7K5	7.5	50	61.4	130/200	5	2x0990
P11K	11	36.0	41.2	80/240	4	2x0090
P15K	15	27.0	30.0	72/240	3	2x0091

Table 8.44 Mains: 380-500 V (T5)

9 Specifications

9.1 Ambient Conditions

Environment

Ambient temperature range	-40 to 70 °C
Temperature range during storage/transport	-40 to 70 °C
Maximum temperature at housing	300 °C
Maximum relative humidity	5-85%, non-condensation during operation

Power derating as a function of ambient temperature. (100% power rating and pulse-load):

- Steel grid brake resistors, IP20	Continuous power 100% @ 40 °C to 70% @ 70 °C, linear
- Aluminum-housed compact brake resistors, IP21	Continuous power 100% @ 40 °C to 75% @ 70 °C, linear
- Aluminum-housed brake resistors - compact and flat-pack, IP54	Continuous power 100% @ 40 °C to 75% @ 70 °C, linear
- Aluminum compact brake resistors, IP65	Continuous power 100% @ 40 °C to 50% @ 70 °C, linear

Power derating at vertical mounted resistor (wall-mounted) when mounted horizontal (100% power rating and pulse-load):

- Aluminum-housed flat-pack brake resistors, IP54	No derating
- Aluminum-housed compact brake resistors, IP21, IP54, IP65	-20%

Cooling requirements:

The brake resistors are cooled by free natural convection. The power ratings of the resistors refers to cooling conditions with free natural cooling. The requirements for minimum clearances must be observed during installation.

Derating at high altitudes	100% @ 1000 m above sea level
Derating at high altitudes	94% @ 1500 m above sea level
Derating at high altitudes	82% @ 3000 m above sea level

9

9.2 General Electrical Specifications

Electrical specifications

Resistance tolerances	±10%
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Insulation	> 20 MΩ @ 1000 V
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Dielectric strength	2500 V AC for 1 min.
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Operating voltage:

- Aluminum-housed compact brake resistors, IP54	UL: 600 V AC/600 V DC
- Aluminum-housed compact brake resistors, IP54	IEC: 690 V AC/1100 V DC
- Aluminum-housed flat-pack brake resistors, IP54	UL: 1000 V AC/1400 V DC
- Aluminum-housed flat-pack brake resistors, IP54	IEC: 1000 V AC/1400 V DC
- Aluminum-housed compact brake resistors, IP21, IP65	UL: 600 V AC/600 V DC
- Aluminum-housed compact brake resistors, IP21, IP65	IEC: 690 V AC/1100 V DC
- Steel grid brake resistors, IP20	IEC: 690 V AC/1100 V DC

Power rating (continuous load 100%) with and without temperature switch

- Without temperature switch	100% of continuous power rating @ 40 °C
- With temperature switch, steel grid brake resistors, IP20	100% of continuous power rating @ 40 °C
- With temperature switch, aluminum-housed brake resistors, IP21, IP54, IP65	Minimum 80% of continuous power rating @ 40 °C
- With temperature switch, aluminum-housed brake resistors, IP21, IP54, IP65	Temperature switch enables at ≥80% of the continuous power rating @ 40 °C

Electrical data temperature switch:

- Steel grid brake resistors, IP20	10 A, 250 V AC, normally closed (NC). Enables at 260 °C
- Aluminum-housed brake resistors, IP21, IP54, IP65	2 A, 250 V AC, normally closed (NC). Enables at 180 °C

9.3 Electrical Data: MCE 101 Product Types 9xx

P/N	Resi- stance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch ^{2) 3)}	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3000	1200	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3001	850	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3002	630	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3003	570	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3004	410	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3005	415	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3006	300	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3007	270	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3008	200	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3009	200	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3010	200	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3011	200	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3012	145	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3013	145	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3014	145	280	2.8	0.7	1	4.0	12	16	6	-	-	-	-
175U3015	145	280	2.8	0.7	1	4.0	12	16	6	-	-	-	-
175U3016	145	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3017	110	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3018	110	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3019	105	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3020	105	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3021	100	100	1.65	0.405	1	-	-	-	-	0.5	20	1.5	16
175U3022	80	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3023	80	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3024	72	960	10.8	2.6	1	4.0	12	16	6	-	-	-	-
175U3025	72	960	13	3.3	1	4.0	12	16	6	-	-	-	-
175U3026	70	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3027	56	680	9.4	2.2	1	4.0	12	16	6	-	-	-	-
175U3028	56	680	9.4	2.2	1	4.0	12	16	6	-	-	-	-
175U3029	52	1290	17.8	3.8	1	4.0	12	16	6	-	-	-	-
175U3030	52	1290	17.8	3.8	1	4.0	12	16	6	-	-	-	-
175U3031	48	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3032	42	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3033	42	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3034	38	1130	15.6	3.3	1	4.0	12	16	6	-	-	-	-
175U3035	38	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3036	35	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3037	31	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3038	31	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3039	28	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3040	28	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3041	27	280	2.8	0.7	1	4.0	12	16	6	-	-	-	-
175U3042	27	280	2.8	0.7	1	4.0	12	16	6	-	-	-	-
175U3043	27	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3044	27	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3047	22	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3048	22	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3049	19	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3050	19	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3051	15.5	3500	43.4	10.8	1	4.0	12	55	1/0	-	-	-	-
175U3052	15.5	3500	43.4	10.8	1	4.0	12	55	1/0	-	-	-	-
175U3053	18	450	6.2	1.45	1	4.0	12	16	6	-	-	-	-
175U3054	18	450	6.2	1.45	1	4.0	12	16	6	-	-	-	-
175U3055	14	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3056	14	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3057	13.5	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-

P/N	Resistance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch 2) 3)	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3058	13.5	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3059	13	680	9.4	2.2	1	4.0	12	16	6	-	-	-	-
175U3060	13	680	9.4	2.2	1	4.0	12	16	6	-	-	-	-
175U3061	12	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3062	12	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3063	11	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3064	11	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3065	9.5	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3066	9.5	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3067	9.1	9000	121	29	2	2.5	14	2xM8		-	-	-	-
175U3068	9.0	1130	14.5	3.1	1	4.0	12	16	6	-	-	-	-
175U3069	9.0	1130	14.5	3.1	1	4.0	12	16	6	-	-	-	-
175U3070	7.0	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3071	7.0	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3072	7.4	11000	148	36	2	2.5	14	2xM8		-	-	-	-
175U3073	5.7	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3074	5.7	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3075	6.1	13000	174	42	2	2.5	14	2xM8		-	-	-	-
175U3076	5.5	6300	87.0	20.5	1	6.0	10	55	1/0	-	-	-	-
175U3077	5.5	6300	87.0	20.5	1	6.0	10	55	1/0	-	-	-	-
175U3078	5.0	16000	215	52	2	2.5	14	2xM8		-	-	-	-
175U3079	4.7	9000	121	29	2	2.5	14	2xM8		-	-	-	-
175U3080	3.5	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3081	3.5	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3082	4.0	20000	268	65	2	2.5	14	2xM8		-	-	-	-
175U3083	3.7	11000	148	36	2	2.5	14	2xM8		-	-	-	-
175U3084	3.3	13000	174	42	2	2.5	14	2xM8		-	-	-	-
175U3085	3.3	26000	349	85	2	2.5	14	2xM8		-	-	-	-
175U3086	2.8	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3087	2.8	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3088	2.7	16000	215	52	2	2.5	14	2xM8		-	-	-	-
175U3089	2.5	32000	429	104	2	2.5	14	2xM8		-	-	-	-
175U3090	2.3	36000	483	117	2	2.5	14	2xM8		-	-	-	-
175U3091	2.1	20000	268	65	2	2.5	14	2xM8		-	-	-	-
175U3092	2.0	42000	563	137	2	2.5	14	2xM8		-	-	-	-
175U3093	1.7	26000	349	85	2	2.5	14	2xM8		-	-	-	-
175U3094	1.6	52000	697	169	2	2.5	14	2xM8		-	-	-	-
175U3095	1.4	60000	805	195	2	2.5	14	2xM8		-	-	-	-
175U3096	300	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3097	1.3	32000	429	104	2	2.5	14	2xM8		-	-	-	-
175U3098	1.2	36000	483	117	2	2.5	14	2xM8		-	-	-	-
175U3099	1.1	42000	563	137	2	2.5	14	2xM8		-	-	-	-
175U3101	1200	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3102	1200	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3103	1200	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3104	850	280	2.8	0.7	1	4.0	12	16	6	-	-	-	-
175U3105	850	280	2.8	0.7	1	4.0	12	16	6	-	-	-	-
175U3106	145	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3107	145	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3108	630	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3109	630	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3110	570	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3111	570	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3112	415	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3113	415	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3114	410	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3115	410	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3116	270	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3117	270	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-

P/N	Resistance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch 2) 3)	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3118	270	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3119	270	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3120	200	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3121	200	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3122	200	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3123	200	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3124	145	450	5.0	1.25	1	4.0	12	16	6	-	-	-	-
175U3125	145	450	5.0	1.25	1	4.0	12	16	6	-	-	-	-
175U3126	145	1700	21.1	5.7	1	4.0	12	16	6	-	-	-	-
175U3127	145	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3130	110	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3131	110	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3132	105	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3133	105	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3134	105	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3135	105	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3136	100	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3137	100	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3138	80	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3139	80	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3140	72	2800	35.0	8.7	1	4.0	12	16	6	-	-	-	-
175U3141	72	2800	35.0	8.7	1	4.0	12	16	6	-	-	-	-
175U3142	72	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3143	72	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3144	70	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3145	70	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3146	56	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3147	56	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3148	52	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3149	52	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3152	48	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3153	48	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3154	42	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3155	42	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3156	38	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3157	38	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3160	35	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3161	35	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3162	31	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3163	31	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3166	28	6300	78.7	19.5	1	6.0	10	55	1/0	-	-	-	-
175U3167	28	6300	78.7	19.5	1	6.0	10	55	1/0	-	-	-	-
175U3168	27	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3169	27	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3170	22	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3171	22	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3172	18	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3173	18	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3174	13	3500	43.4	10.8	1	4.0	12	55	1/0	-	-	-	-
175U3175	13	3500	43.4	10.8	1	4.0	12	55	1/0	-	-	-	-
175U3176	9.0	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3177	9.0	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3178	5.7	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3179	5.7	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3180	5.7	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3181	5.7	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3182	3.5	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3183	3.5	8200	102.2	25.3	1	6.0	10	55	1/0	-	-	-	-
175U3200	27.0	10000	134	33	2	2.5	14	2xM8		-	-	-	-

P/N	Resistance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch 2) 3)	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3201	27.0	14000	188	46	2	2.5	14	2xM8		-	-	-	-
175U3202	22.0	17000	228	55	2	2.5	14	2xM8		-	-	-	-
175U3203	19.0	10000	134	33	2	2.5	14	2xM8		-	-	-	-
175U3204	19	14000	188	46	2	2.5	14	2xM8		-	-	-	-
175U3205	15.5	21000	282	68	2	2.5	14	2xM8		-	-	-	-
175U3206	14.0	14000	188	46	2	2.5	14	2xM8		-	-	-	-
175U3207	14.0	17000	228	55	2	2.5	14	2xM8		-	-	-	-
175U3208	13.5	21000	282	68	2	2.5	14	2xM8		-	-	-	-
175U3209	13.5	26000	349	85	2	2.5	14	2xM8		-	-	-	-
175U3210	12.0	17000	228	55	2	2.5	14	2xM8		-	-	-	-
175U3211	11.0	26000	349	85	2	2.5	14	2xM8		-	-	-	-
175U3212	11.0	36000	483	117	2	2.5	14	2xM8		-	-	-	-
175U3213	9.5	21000	282	68	2	2.5	14	2xM8		-	-	-	-
175U3214	9.1	42000	563	137	2	2.5	14	2xM8		-	-	-	-
175U3215	7.4	52000	697	169	2	2.5	14	2xM8		-	-	-	-
175U3216	7.0	26000	349	85	2	2.5	14	2xM8		-	-	-	-
175U3217	7.0	36000	483	117	2	2.5	14	2xM8		-	-	-	-
175U3218	6.1	60000	805	195	2	2.5	14	2xM8		-	-	-	-
175U3219	5.5	36000	483	117	2	2.5	14	2xM8		-	-	-	-
175U3220	5.0	78000	105	254	2	2.5	14	2xM8		-	-	-	-
175U3221	4.7	42000	563	137	2	2.5	14	2xM8		-	-	-	-
175U3222	4.0	90000	121	293	2	2.5	14	2xM8		-	-	-	-
175U3223	3.7	52000	69	169	2	2.5	14	2xM8		-	-	-	-
175U3224	3.5	14000	188	46	2	2.5	14	2xM8		-	-	-	-
175U3225	3.3	60000	805	195	2	2.5	14	2xM8		-	-	-	-
175U3227	2.8	17000	228	55	2	2.5	14	2xM8		-	-	-	-
175U3228	2.7	78000	105	254	2	2.5	14	2xM8		-	-	-	-
175U3230	2.1	90000	121	293	2	2.5	14	2xM8		-	-	-	-
175U3231	5.5	7000	94	23	2	2.5	14	2xM8		-	-	-	-
175U3232	11	7000	94	23	2	2.5	14	2xM8		-	-	-	-
175U3233	5.7	6000	80	20	2	2.5	14	2xM8		-	-	-	-
175U3234	5.7	8000	107	26	2	2.5	14	2xM8		-	-	-	-
175U3235	3.5	9000	121	29	2	2.5	14	2xM8		-	-	-	-
175U3236	38	5000	67	16	2	2.5	14	2xM8		-	-	-	-
175U3237	28	6000	80	20	2	2.5	14	2xM8		-	-	-	-
175U3238	22	8000	107	26	2	2.5	14	2xM8		-	-	-	-
175U3239	38	6000	80	20	2	2.5	14	2xM8		-	-	-	-
175U3240	31	8000	107	26	2	2.5	14	2xM8		-	-	-	-
175U3241	7.0	30000	402	98	2	2.5	14	2xM8		-	-	-	-
175U3242	52	6000	80	20	2	2.5	14	2xM8		-	-	-	-
175U3243	42	8000	107	26	2	2.5	14	2xM8		-	-	-	-
175U3244	31	10000	134	33	2	2.5	14	2xM8		-	-	-	-
175U3245	7	7000	94	23	2	2.5	14	2xM8		-	-	-	-
175U3300	145	300	5	1	1	-	-	-	-	0.5	20	1.5	16
175U3301	100	450	5	1.25	1	-	-	-	-	0.5	20	1.5	16
175U3302	70	570	6.6	1.65	1	-	-	-	-	0.5	20	1.5	16
175U3303	48	960	11.5	2.88	1	-	-	-	-	0.5	20	1.5	16
175U3304	35	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3305	27	1400	17.5	4.38	1	-	-	-	-	0.5	20	6.0	10
175U3306	18	2200	27.3	6.8	1	-	-	-	-	0.5	20	6.0	10
175U3307	13	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3308	850	200	3.05	0.75	1	-	-	-	-	0.5	20	1.5	16
175U3309	630	300	5	1	1	-	-	-	-	0.5	20	1.5	16
175U3310	410	450	5	1.25	1	-	-	-	-	0.5	20	1.5	16
175U3311	270	570	6.6	1.65	1	-	-	-	-	0.5	20	1.5	16
175U3312	200	960	10.8	2.6	1	-	-	-	-	0.5	20	1.5	16
175U3313	145	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3314	110	1700	21.1	5.27	1	-	-	-	-	0.5	20	6.0	10
175U3315	80	2200	27.3	6.8	1	-	-	-	-	0.5	20	6.0	10

P/N	Resistance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch 2) 3)	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3316	56	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3317	850	280	2.8	0.7	1	-	-	-	-	0.5	20	1.5	16
175U3318	570	450	5	1.25	1	-	-	-	-	0.5	20	1.5	16
175U3319	415	570	6.6	1.65	1	-	-	-	-	0.5	20	1.5	16
175U3320	270	960	10.8	2.6	1	-	-	-	-	0.5	20	1.5	16
175U3321	200	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3322	145	1700	21.1	5.27	1	-	-	-	-	0.5	20	6.0	14
175U3323	100	2200	27.3	6.8	1	-	-	-	-	0.5	20	6.0	10
175U3324	72	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3325	35	300	5	1	1	-	-	-	-	0.5	20	1.5	16
175U3326	27	360	4.2	1.05	1	-	-	-	-	0.5	20	1.5	16
175U3327	18	570	6.6	1.65	1	-	-	-	-	0.5	20	1.5	16
175U3328	13	680	9.4	2.2	1	-	-	-	-	0.5	20	1.5	16
175U3329	9.0	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3330	5.7	1400	17.5	4.38	1	-	-	-	-	0.5	20	6.0	10
175U3331	5.7	1700	21.1	5.27	1	-	-	-	-	0.5	20	6.0	10
175U3332	3.5	2200	27.3	6.8	1	-	-	-	-	0.5	20	6.0	10
175U3333	3.5	2800	35.0	8.7	1	-	-	-	-	0.5	20	6.0	10
175U3334	2.8	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3335	110	450	6.6	1.65	1	-	-	-	-	0.5	20	1.5	16
175U3336	80	570	5.0	1.25	1	-	-	-	-	0.5	20	1.5	16
175U3337	56	680	9.4	2.2	1	-	-	-	-	0.5	20	1.5	16
175U3338	38	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3339	28	1400	17.5	4.38	1	-	-	-	-	0.5	20	6.0	10
175U3340	22	1700	21.1	5.27	1	-	-	-	-	0.5	20	6.0	10
175U3341	14	2800	35	8.7	1	-	-	-	-	0.5	20	6.0	10
175U3342	200	300	5	1	1	-	-	-	-	0.5	20	1.5	16
175U3343	145	450	5	1.25	1	-	-	-	-	0.5	20	1.5	16
175U3344	100	570	6.6	1.65	1	-	-	-	-	0.5	20	1.5	16
175U3345	72	680	9.4	2.2	1	-	-	-	-	0.5	20	1.5	16
175U3346	52	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3347	38	1400	17.5	4.38	1	-	-	-	-	0.5	20	6.0	10
175U3348	31	1700	21.1	5.27	1	-	-	-	-	0.5	20	6.0	10
175U3349	27	2200	27.3	6	1	-	-	-	-	0.5	20	6.0	10
175U3350	19	2800	35	8.7	1	-	-	-	-	0.5	20	6.0	10
175U3351	72	1130	14.5	3.6	1	-	-	-	-	0.5	20	1.5	16
175U3352	52	1400	17.5	4.38	1	-	-	-	-	0.5	20	6.0	10
175U3353	42	1700	21.1	5.27	1	-	-	-	-	0.5	20	6.0	10
175U3354	31	2200	27.3	6.8	1	-	-	-	-	0.5	20	6.0	10
175U3355	27	2800	35	8.7	1	-	-	-	-	0.5	20	6.0	10
175U3356	22	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3357	19	2200	27.3	6.8	1	-	-	-	-	0.5	20	6.0	10
175U3358	14	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3359	12	3200	39.9	9.9	1	-	-	-	-	0.5	20	6.0	10
175U3360	105	790	9.5	2.37	1	-	-	-	-	0.5	20	1.5	16
175U3361	270	300	5	1	1	-	-	-	-	0.5	20	1.5	16
175U3401	100	450	5	1.2	1	4.0	12	16	6	-	-	-	-
175U3402	100	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3403	70	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3404	70	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3405	48	960	11.5	2.88	1	4.0	12	16	6	-	-	-	-
175U3406	48	960	11.5	2.88	1	4.0	12	16	6	-	-	-	-
175U3407	35	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3408	35	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3409	27	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3410	27	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3411	18	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3412	18	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3413	13	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-

P/N	Resistance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch 2) 3)	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3414	13	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3415	410	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3416	410	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3417	270	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3418	270	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3419	200	960	10.8	2.6	1	4.0	12	16	6	-	-	-	-
175U3420	200	960	10.8	2.6	1	4.0	12	16	6	-	-	-	-
175U3421	145	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3422	145	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3423	110	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3424	110	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3427	56	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3428	56	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3429	570	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3430	570	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3431	415	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3432	415	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3433	270	960	10.8	2.6	1	4.0	12	16	6	-	-	-	-
175U3434	270	960	10.8	2.6	1	4.0	12	16	6	-	-	-	-
175U3435	200	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3436	200	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3437	100	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3438	100	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3439	72	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3440	72	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3441	18	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3442	18	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3445	5.7	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3446	5.7	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3447	3.5	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3448	3.5	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3449	110	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3450	110	450	5	1.25	1	4.0	12	16	6	-	-	-	-
175U3451	80	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3452	80	570	6.6	1.65	1	4.0	12	16	6	-	-	-	-
175U3455	72	680	9.4	2.2	1	4.0	12	16	6	-	-	-	-
175U3456	72	680	9.4	2.2	1	4.0	12	16	6	-	-	-	-
175U3457	52	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3458	52	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3459	38	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3460	38	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3461	19	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3462	19	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3463	14	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3464	14	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3465	72	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3466	72	1130	14.5	3.6	1	4.0	12	16	6	-	-	-	-
175U3467	52	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3468	52	1400	17.5	4.38	1	4.0	12	16	6	-	-	-	-
175U3469	31	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3470	31	2200	27.3	6.8	1	4.0	12	16	6	-	-	-	-
175U3471	27	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3472	27	2800	35	8.7	1	4.0	12	16	6	-	-	-	-
175U3473	15.5	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3474	15.5	4200	52.5	14.8	1	4.0	12	55	1/0	-	-	-	-
175U3475	13.5	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3476	13.5	5500	68.6	17	1	4.0	12	55	1/0	-	-	-	-
175U3477	27	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-
175U3478	27	360	4.2	1.05	1	4.0	12	16	6	-	-	-	-

P/N	Resi- stance	Continuous power 100% load	Pulse load power 10% duty cycle ¹⁾	Pulse load power 40% duty cycle ¹⁾	Temp. switch ^{2) 3)}	Terminal max wire cross-section				Wire cross-section ⁴⁾			
						Temp. switch		Power cables		Temp. switch		Power cables	
	[Ω]	[W]	[kW]	[kW]	Type	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]	[mm ²]	[AWG]
175U3479	22	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3480	22	3200	39.9	9.9	1	4.0	12	16	6	-	-	-	-
175U3481	105	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3482	105	790	9.5	2.37	1	4.0	12	16	6	-	-	-	-
175U3483	5.7	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-
175U3484	5.7	1700	21.1	5.27	1	4.0	12	16	6	-	-	-	-

Table 9.1 Electrical Data: Product Types 9xx

1) Based on reference profiles with 30 s repetition rates

2) Temperature switch type 1: 2 A, 250 V AC. Normally closed (NC). Enables at 180 °C

3) Temperature switch type 2: 10 A, 250 V AC. Normally closed (NC). Enables at 260 °C

4) Only for versions with fixed cables. All cables are 1000 mm unscreened cables.

9.4 Mechanical Data: MCE 101 Product Types 9xx

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3000	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3001	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3002	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3003	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3004	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3005	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3006	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3007	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3008	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3009	1.8	21	Y	914CBR-V210DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3010	1.8	65	Y	914CBR-V210BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3011	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3012	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3013	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3014	1.3	21	Y	914CBR-V160DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3015	1.3	65	Y	914CBR-V160BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3016	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3017	1.8	21	Y	914CBR-V210DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3018	1.8	65	Y	914CBR-V210BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3019	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3020	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3021	0.27	54	Y	914CCH145CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3022	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3023	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3024	4.6	21	Y	914CBR-V560DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3025	4.6	65	Y	914CBR-V560BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3026	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3027	3.5	21	Y	914CBR-V400DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3028	3.5	65	Y	914CBR-V400BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3029	6.1	21	Y	914CBR-V760DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3030	6.1	65	Y	914CBR-V760BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3031	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3032	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3033	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3034	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3035	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3036	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3037	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3038	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3039	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3040	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3041	1.3	21	Y	914CBR-V160DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3042	1.3	65	Y	914CBR-V160BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3043	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3044	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3047	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3048	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3049	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3050	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3051	25.5	21	N	929CBT-V560GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3052	26.5	65	N	929CBT-V560BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3053	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3054	1.3	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3055	12.8	21	N	914CBT-H660DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3056	12.8	65	N	914CBT-H660BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3057	29	21	N	929CBT-V660GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3058	30	65	N	929CBT-V660BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3059	3.5	21	Y	914CBR-V400DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3060	3.5	65	Y	914CBR-V400BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3061	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3062	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3063	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3064	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3065	29	21	N	929CBT-V660GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3066	30	65	N	929CBT-V660BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3067	21	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3068	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3069	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3070	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3071	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3072	24	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3073	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3074	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3075	25	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3076	39	21	N	930CBT-V660GHT	930CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3077	39	65	N	930CBT-V660BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3078	35	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3079	21	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3080	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3081	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3082	37	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3083	24	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3084	25	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3085	45	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3086	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3087	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3088	35	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3089	48	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3090	74	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3091	37	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3092	78	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3093	45	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3094	90	20	N	917CMD27	917CMD27	chapter 9.7.14 Figure 14 - 917CMD27
175U3095	90	20	N	917CMD27	917CMD27	chapter 9.7.14 Figure 14 - 917CMD27
175U3096	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3097	48	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3098	74	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3099	78	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3101	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3102	1.8	21	Y	914CBR-V210DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3103	1.8	65	Y	914CBR-V210BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3104	1.3	21	Y	914CBR-V160DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3105	1.3	65	Y	914CBR-V160BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3106	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3107	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3108	1.8	21	Y	914CBR-V210DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3109	1.8	65	Y	914CBR-V210BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3110	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3111	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3112	3.9	21	Y	914CBR-V460DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3113	3.9	65	Y	914CBR-V460BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3114	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3115	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3116	3.9	21	Y	914CBR-V460DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3117	3.9	65	Y	914CBR-V460BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3118	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3119	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3120	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3121	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3122	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3123	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3124	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3125	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3126	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3127	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3130	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3131	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3132	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3133	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3134	29	21	N	929CBT-V660GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3135	30	65	N	929CBT-V660BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3136	3.0	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3137	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3138	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3139	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3140	12.8	21	N	914CBT-H660DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3141	12.8	65	N	914CBT-H660BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3142	29	21	N	929CBT-V660GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3143	30	65	N	929CBT-V660BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3144	3.9	21	Y	914CBR-V460DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3145	3.9	65	Y	914CBR-V460BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3146	12.8	21	N	914CBT-H660DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3147	12.8	65	N	914CBT-H660BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3148	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3149	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3152	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3153	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3154	44.5	21	N	930CBT-V760GHT	930CBT-VxxxGHT	chapter 9.7.18 Figure 18 - 930CBT-VxxxGHT
175U3155	44.5	65	N	930CBT-V760BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3156	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3157	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3160	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3161	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3162	44.5	21	N	930CBT-V760GHT	930CBT-VxxxGHT	chapter 9.7.18 Figure 18 - 930CBT-VxxxGHT
175U3163	44.5	65	N	930CBT-V760BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3166	39	21	N	930CBT-V660GHT	930CBT-VxxxGHT	chapter 9.7.18 Figure 18 - 930CBT-VxxxGHT
175U3167	39	65	N	930CBT-V660BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3168	11.0	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3169	11.0	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3170	44.5	21	N	930CBT-V760GHT	930CBT-VxxxGHT	chapter 9.7.18 Figure 18 - 930CBT-VxxxGHT
175U3171	44.5	65	N	930CBT-V760BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3172	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3173	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3174	25.5	21	N	929CBT-V560GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3175	26.5	65	N	929CBT-V560BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3176	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3177	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3178	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3179	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3180	44.5	21	N	930CBT-V760GHT	930CBT-VxxxGHT	chapter 9.7.18 Figure 18 - 930CBT-VxxxGHT
175U3181	44.5	65	N	930CBT-V760BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3182	44.5	21	N	930CBT-V760GHT	930CBT-VxxxGHT	chapter 9.7.18 Figure 18 - 930CBT-VxxxGHT
175U3183	44.5	65	N	930CBT-V760BGHT	930CBT-VxxxBGHT	chapter 9.7.19 Figure 19 - 930CBT-VxxxBGHT
175U3200	22	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3201	25	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3202	35	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3203	20	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3204	25	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3205	41	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3206	25	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3207	35	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3208	41	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3209	45	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3210	35	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3211	45	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3212	74	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3213	41	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3214	78	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3215	90	20	N	917CMD27	917CMD27	chapter 9.7.14 Figure 14 - 917CMD27
175U3216	45	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3217	74	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3218	90	20	N	917CMD27	917CMD27	chapter 9.7.14 Figure 14 - 917CMD27
175U3219	74	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3220	182	20	N	917CMD37	917CMD37	chapter 9.7.15 Figure 15 - 917CMD37
175U3221	78	20	N	917CM37	917CM37	chapter 9.7.13 Figure 13 - 917CM37
175U3222	190	20	N	917CMD37	917CMD37	chapter 9.7.15 Figure 15 - 917CMD37
175U3223	90	20	N	917CMD27	917CMD27	chapter 9.7.14 Figure 14 - 917CMD27
175U3224	25	20	N	917CM17	917CM17	chapter 9.7.10 Figure 10 - 917CM17
175U3225	90	20	N	917CMD27	917CMD27	chapter 9.7.14 Figure 14 - 917CMD27
175U3227	35	20	N	917CM25	917CM25	chapter 9.7.11 Figure 11 - 917CM25
175U3228	182	20	N	917CMD37	917CMD37	chapter 9.7.15 Figure 15 - 917CMD37
175U3230	190	20	N	917CMD37	917CMD37	chapter 9.7.15 Figure 15 - 917CMD37

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3231	19	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3232	19	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3233	19	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3234	20	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3235	21	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3236	15	20	N	917CM13	917CM13	chapter 9.7.8 Figure 8 - 917CM13
175U3237	19	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3238	20	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3239	19	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3240	20	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3241	52	20	N	917CM27	917CM27	chapter 9.7.12 Figure 12 - 917CM27
175U3242	19	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3243	20	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3244	22	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3245	20	20	N	917CM15	917CM15	chapter 9.7.9 Figure 9 - 917CM15
175U3300	1.58	54	Y	914CCH355CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3301	2.4	54	Y	914CBR-V260CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3302	3	54	Y	914CBR-V330CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3303	4.6	54	Y	914CBR-V560CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3304	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3305	8.2	54	Y	914CBT-H400CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3306	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3307	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3308	0.54	54	Y	914CCH251CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3309	1.58	54	Y	914CCH355CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3310	2.4	54	Y	914CBR-V260CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3311	3	54	Y	914CBR-V330CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3312	4.6	54	Y	914CBR-V560CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3313	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3314	9.2	54	Y	914CBT-H460CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3315	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3316	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3317	1.3	54	Y	914CBR-V160CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3318	2.4	54	Y	914CBR-V260CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3319	3	54	Y	914CBR-V330CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3320	4.6	54	Y	914CBR-V560CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3321	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3322	9.2	54	N	914CBT-H460CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3323	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3324	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3325	1.58	54	Y	914CCH355CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3326	1.8	54	Y	914CBR-V210CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3327	3	54	Y	914CBR-V330CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3328	3.5	54	Y	914CBR-V400CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3329	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3330	8.2	54	Y	914CBT-H400CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3331	9.2	54	Y	914CBT-H460CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3332	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3333	12.8	54	Y	914CBT-H660CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3334	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3335	2.4	54	Y	914CBR-V260CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3336	3	54	Y	914CBR-V330CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3337	3.5	54	Y	914CBR-V400CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3338	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3339	8.2	54	Y	914CBT-H400CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3340	9.2	54	Y	914CBT-H460CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3341	12.8	54	Y	914CBT-H660CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3342	1.58	54	Y	914CCH355CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3343	2.4	54	Y	914CBR-V260CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3344	3	54	Y	914CBR-V330CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3345	3.5	54	Y	914CBR-V400CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3346	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3347	8.2	54	Y	914CBT-H400CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3348	9.2	54	Y	914CBT-H460CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3349	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3350	12.8	54	Y	914CBT-H660CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3351	5.4	54	Y	914CBR-V660CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3352	8.2	54	Y	914CBT-H400CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3353	9.2	54	Y	914CBT-H460CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3354	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3355	12.8	54	Y	914CBT-H660CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3356	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3357	11	54	Y	914CBT-H560CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3358	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3359	14.6	54	Y	914CBT-H760CHT	914CBT-HxxxCHT	chapter 9.7.2 Figure 2 - 914CBT-HxxxCHT
175U3360	3.9	54	Y	914CBR-V460CT	914CBR-VxxxCT	chapter 9.7.5 Figure 5 - 914CBR-VxxxCT
175U3361	1.58	54	Y	914CCH355CT	914CCHxxxCT	chapter 9.7.7 Figure 7 - 914CCHxxxCT
175U3401	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3402	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3403	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3404	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3405	4.6	65	Y	914CBR-V560BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3406	4.6	21	Y	914CBR-V560DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3407	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3408	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3409	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3410	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3411	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3412	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3413	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3414	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3415	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3416	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3417	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3418	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3419	4.6	65	Y	914CBR-V560BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3420	4.6	21	Y	914CBR-V560DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3421	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3422	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3423	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3424	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3427	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3428	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3429	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3430	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3431	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3432	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3433	4.6	65	Y	914CBR-V560BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3434	4.6	21	Y	914CBR-V560DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3435	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3436	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3437	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3438	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3439	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3440	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3441	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3442	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3445	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3446	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3447	12.8	65	N	914CBT-H660BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3448	12.8	21	N	914CBT-H660DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3449	2.4	65	Y	914CBR-V260BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3450	2.4	21	Y	914CBR-V260DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3451	3	65	Y	914CBR-V330BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3452	3	21	Y	914CBR-V330DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3455	3.5	65	Y	914CBR-V400BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3456	3.9	21	Y	914CBR-V400DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3457	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3458	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3459	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3460	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3461	12.8	65	N	914CBT-H660BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3462	12.6	21	N	914CBT-H660DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3463	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3464	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3465	5.4	65	Y	914CBR-V660BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3466	5.4	21	Y	914CBR-V660DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3467	8.2	65	N	914CBT-H400BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3468	8.2	21	N	914CBT-H400DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3469	11	65	N	914CBT-H560BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3470	11	21	N	914CBT-H560DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3471	12.8	65	N	914CBT-H660BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3472	12.8	21	N	914CBT-H660DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3473	30	65	N	929CBT-V660BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3474	29	21	N	929CBT-V660GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3475	33.5	65	N	929CBT-V760BGHT	929CBT-VxxxBGHT	chapter 9.7.17 Figure 17 - 929CBT-VxxxBGHT
175U3476	32.5	21	N	929CBT-V760GHT	929CBT-VxxxGHT	chapter 9.7.16 Figure 16 - 929CBT-VxxxGHT
175U3477	1.8	21	Y	914CBR-V210DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3478	1.8	65	Y	914CBR-V210BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT
175U3479	14.6	21	N	914CBT-H760DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3480	14.6	65	N	914CBT-H760BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT
175U3481	3.9	21	Y	914CBR-V460DT	914CBR-VxxxDT	chapter 9.7.4 Figure 4 - 914CBR-VxxxDT
175U3482	3.9	65	Y	914CBR-V460BT	914CBR-VxxxBT	chapter 9.7.6 Figure 6 - 914CBR-VxxxBT

P/N	Weight [kg]	Enclosure rating [IP class]	UL	Product type	Drawing type	Drawing reference
175U3483	9.2	21	N	914CBT-H460DHT	914CBT-HxxxDHT	chapter 9.7.1 Figure 1 - 914CBT-HxxxDHT
175U3484	9.2	65	N	914CBT-H460BHT	914CBT-HxxxBHT	chapter 9.7.3 Figure 3 - 914CBT-HxxxBHT

Table 9.2 Mechanical Data: Product Types 9xx

9.5 Electrical Data: Product Types BWD and BWG

P/N	Resistance	Continuous power	Temperature switch	Wire cross-section		Fixed cable see footnotes
		100% load		Power cables		
		[W]		[mm ²]	[AWG]	
175U0089	60	200	No	1.5	16	1)
175U0090	80	240	No	2.5	14	1)
175U0091	72	240	No	2.5	14	1)
175U0982	620	200	No	1.5	16	1)
175U0983	430	200	No	1.5	16	1)
175U0984	310	200	No	1.5	16	1)
175U0985	300	200	No	1.5	16	1)
175U0986	240	200	No	1.5	16	1)
175U0987	210	200	No	1.5	16	1)
175U0988	160	200	No	1.5	16	1)
175U0989	150	200	No	1.5	16	1)
175U0990	130	200	No	1.5	16	1)
175U0991	100	200	No	1.5	16	1)
175U0992	72	200	No	1.5	16	1)
175U0993	50	200	No	1.5	16	1)
175U0994	35	200	No	1.5	16	1)
175U0995	27	200	No	1.5	16	1)
175U0996	40	200	No	1.5	16	1)
175U1000	830	100	No	1.5	16	1)
175U1001	620	100	No	1.5	16	1)
175U1002	430	100	No	1.5	16	1)
175U1003	330	100	No	1.5	16	1)
175U1004	220	100	No	1.5	16	1)
175U1005	150	100	No	1.5	16	1)
175U1006	100	100	No	1.5	16	1)
175N2395	430	100	No	1.5	16	2)
175N2396	620	100	No	1.5	16	2)
175N2397	830	100	No	1.5	16	2)
175N2398	150	200	No	1.5	16	2)
175N2399	210	200	No	1.5	16	2)
175N2400	310	200	No	1.5	16	2)

Table 9.3 Electrical Data: Product Types BWD and BWG

1) 510 mm unscreened cables

2) 800 mm Ø8 screened cable

9.6 Mechanical Data: Product Types BWD and BWG

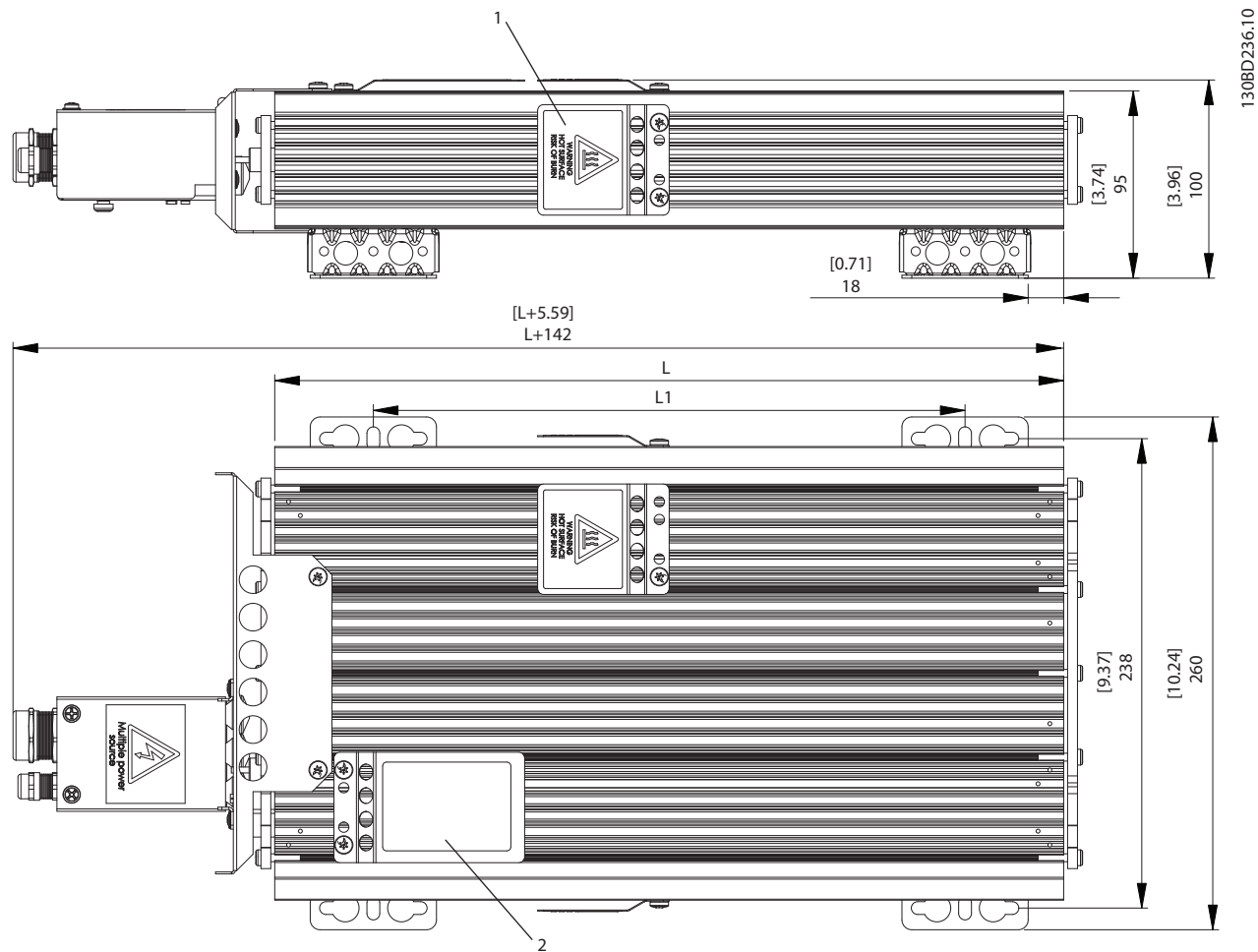
P/N	Weight	Enclosure rating	UL ¹⁾	Product type	Drawing type	Drawing reference
	[kg]	[IP class]				
175U0089	0.55	65	Y	BWD500060	BWD500xxx	chapter 9.7.21 Figure 21 - BWD500xxx
175U0090	1.05	65	Y	BWD600080	BWD600xxx	chapter 9.7.22 Figure 22 - BWD600xxx
175U0091	1.05	65	Y	BWD600072	BWD600xxx	
175U0982	0.55	65	Y	BWD500620	BWD500xxx	chapter 9.7.21 Figure 21 - BWD500xxx
175U0983	0.55	65	Y	BWD500430	BWD500xxx	
175U0984	0.55	65	Y	BWD500310	BWD500xxx	
175U0985	0.55	65	Y	BWD500300	BWD500xxx	
175U0986	0.55	65	Y	BWD500240	BWD500xxx	
175U0987	0.55	65	Y	BWD500210	BWD500xxx	
175U0988	0.55	65	Y	BWD500160	BWD500xxx	
175U0989	0.55	65	Y	BWD500150	BWD500xxx	
175U0990	0.55	65	Y	BWD500130	BWD500xxx	
175U0991	0.55	65	Y	BWD500100	BWD500xxx	
175U0992	0.55	65	Y	BWD500072	BWD500xxx	
175U0993	0.55	65	Y	BWD500050	BWD500xxx	
175U0994	0.55	65	Y	BWD500035	BWD500xxx	
175U0995	0.55	65	Y	BWD500027	BWD500xxx	
175U0996	0.55	65	Y	BWD500040	BWD500xxx	
175U1000	0.28	65	Y	BWD250830	BWD250xxx	chapter 9.7.20 Figure 20 - BWD250xxx
175U1001	0.28	65	Y	BWD250620	BWD250xxx	
175U1002	0.28	65	Y	BWD250430	BWD250xxx	
175U1003	0.28	65	Y	BWD250330	BWD250xxx	
175U1004	0.28	65	Y	BWD250220	BWD250xxx	
175U1005	0.28	65	Y	BWD250150	BWD250xxx	
175U1006	0.28	65	Y	BWD250100	BWD250xxx	
175N2395	0.41	65	Y	BWG250430	BWG250xxx	chapter 9.7.23 Figure 23 - BWG250xxx
175N2396	0.41	65	Y	BWG250620	BWG250xxx	
175N2397	0.41	65	Y	BWG250830	BWG250xxx	
175N2398	0.68	65	Y	BWG500150	BWG500xxx	chapter 9.7.24 Figure 24 - BWG500xxx
175N2399	0.68	65	Y	BWG500210	BWG500xxx	
175N2400	0.68	65	Y	BWG500310	BWG500xxx	

Table 9.4 Mechanical Data: Product Types BWD and BWG

1) Y=yes, N=no

9.7 Mechanical Drawings

9.7.1 Figure 1 - 914CBT-HxxxDHT



1	Hot surface warning x3
2	Name plate

Illustration 9.1 IP21, Side View and Top View

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.04 in	Weight [kg]
175U3032	MCE101A42R0P1K70E21TAW	42	460	18.11	360	14.17	9.2
175U3037	MCE101A31R0P1K70E21TAW	31	460	18.11	360	14.17	9.2
175U3039	MCE101A28R0P1K40E21TAW	28	400	15.75	300	11.81	8.2
175U3043	MCE101A27R0P2K20E21TAW	27	560	22.05	460	18.11	11
175U3047	MCE101A22R0P1K70E21TAW	22	460	18.11	360	14.17	9.2
175U3049	MCE101A19R0P2K20E21TAW	19	560	22.05	460	11.81	11
175U3055	MCE101A14R0P2K80E21TAW	14	660	25.98	560	22.05	12.8
175U3061	MCE101A12R0P3K20E21TAW	12	760	29.92	660	25.98	14.6
175U3073	MCE101A5R70P1K40E21TAW	5.7	400	15.75	300	11.81	8.2
175U3080	MCE101A3R50P2K20E21TAW	3.5	560	22.05	460	11.81	11
175U3086	MCE101A2R80P3K20E21TAW	2.8	760	29.92	660	25.98	14.6
175U3106	MCE101A145R2K20E21TAW	145	560	22.05	460	11.81	11
175U3122	MCE101A200R1K70E21TAW	200	460	18.11	360	14.17	9.2
175U3126	MCE101A145R1K70E21TAW	145	460	18.11	360	14.17	9.2
175U3130	MCE101A110R2K20E21TAW	110	560	22.05	460	18.11	11
175U3132	MCE101A105R3K20E21TAW	105	760	29.92	660	25.98	14.6
175U3138	MCE101A80R0P2K20E21TAW	80	560	22.05	460	18.11	11
175U3140	MCE101A72R0P2K80E21TAW	72	660	25.98	560	22.05	12.8
175U3146	MCE101A56R0P2K80E21TAW	56	660	25.98	560	22.05	12.8
175U3152	MCE101A48R0P1K40E21TAW	48	400	15.75	300	11.81	8.2
175U3160	MCE101A35R0P1K70E21TAW	35	460	18.11	360	14.17	9.2
175U3168	MCE101A27R0P2K20E21TAW	27	560	22.05	460	18.11	11
175U3172	MCE101A18R0P3K20E21TAW	18	760	29.92	660	25.98	14.6
175U3410	MCE101A27R0P1K40E21TAW	27	400	15.75	300	11.81	8.2
175U3412	MCE101A18R0P2K20E21TAW	18	560	22.05	460	18.11	11
175U3414	MCE101A13R0P3K20E21TAW	13	760	29.92	660	25.98	14.6
175U3424	MCE101A110R1K70E21TAW	110	460	18.11	360	14.17	9.2
175U3428	MCE101A56R0P3K20E21TAW	56	760	29.92	660	25.98	14.6
175U3438	MCE101A100R2K20E21TAW	100	560	22.05	460	18.11	11
175U3440	MCE101A72R0P3K20E21TAW	72	760	29.92	660	25.98	14.6
175U3446	MCE101A5R70P1K40E21TAW	5.7	400	15.75	300	11.81	8.2
175U3448	MCE101A3R50P2K80E21TAW	3.5	660	25.98	560	22.05	12.8
175U3460	MCE101A38R0P1K40E21TAW	38	400	15.75	300	11.81	8.2
175U3462	MCE101A19R0P2K80E21TAW	19	660	25.98	560	22.05	12.8
175U3464	MCE101A14R0P3K20E21TAW	14	760	29.92	660	25.98	14.6
175U3468	MCE101A52R0P1K40E21TAW	52	400	15.75	300	11.81	8.2
175U3470	MCE101A31R0P2K20E21TAW	31	560	22.05	460	18.11	11
175U3472	MCE101A27R0P2K80E21TAW	27	660	25.98	560	22.05	12.8
175U3479	MCE101A22R0P3K20E21TAW	22	760	29.92	660	25.98	14.6
175U3483	MCE101A5R70P1K70E21TAW	5.7	460	18.11	360	14.17	9.2

Table 9.5 Mechanical Dimensions

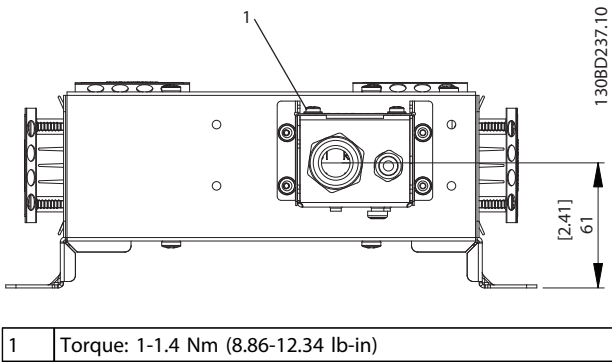


Illustration 9.2 IP21, End View, Connection Box

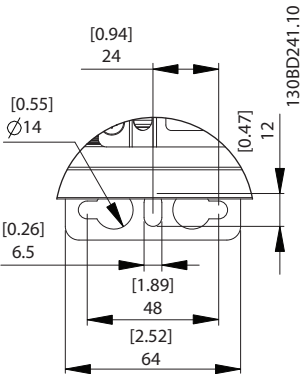
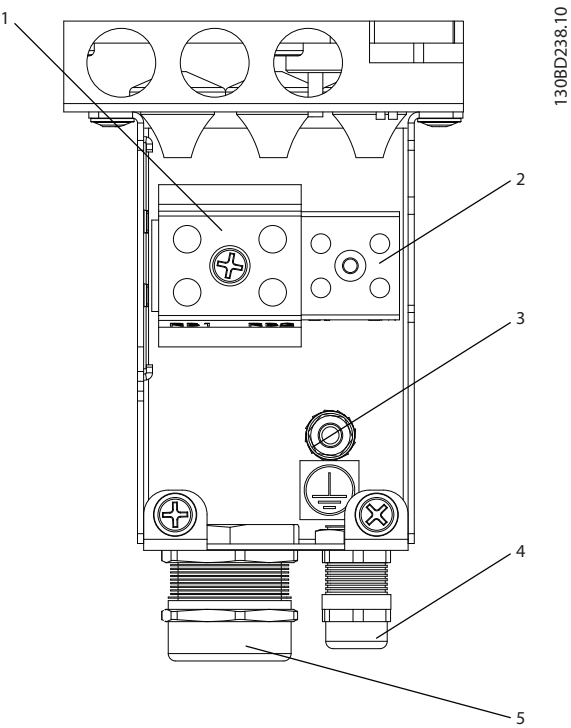


Illustration 9.3 Mounting Hole



1	Resistor connection: Marked RB1/RB2 Type: Phoenix G10/2 IEC: 0.5-10 mm ² /800 V UL: AWG 20-6/600 V Wire Stripping: 12 mm (0.47 in) Torque: 1.5-1.8 Nm (13.28-15.94 lb-in)
2	Temperature switch connection Marked: T1/T2 Type: Phoenix G5/2 with screw connection IEC: 0.2-4 mm ² /500 V UL: AWG 24-12 /300 V Wire Stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
3	PE: M5 Torque 2-2.7 Nm (17.71-23.91 lb-in)
4	For temperature switch cable: Clamping Range: 3.5-7.0 mm (0.14-0.28 lb-in)
5	For resistor cable: Cable gland with internal connection for braid Clamping Range: 9.0-16.5 mm (0.35-0.65 lb-in)

Illustration 9.4 Connection Box

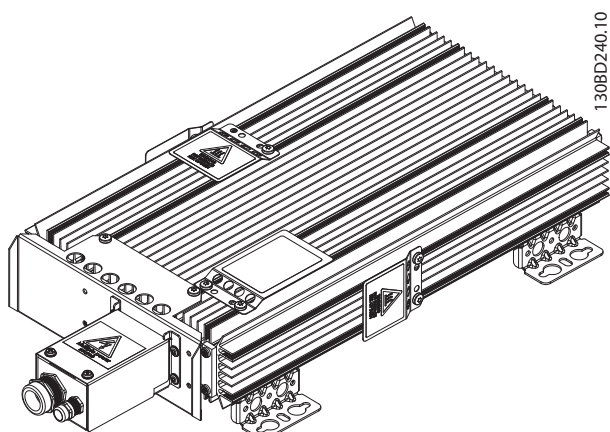


Illustration 9.5 IP21, 3D View

Mechanical mounting (see *Illustration 9.6*):

- Vertical with connection box down (IP21), or
- Horizontal (IP20)

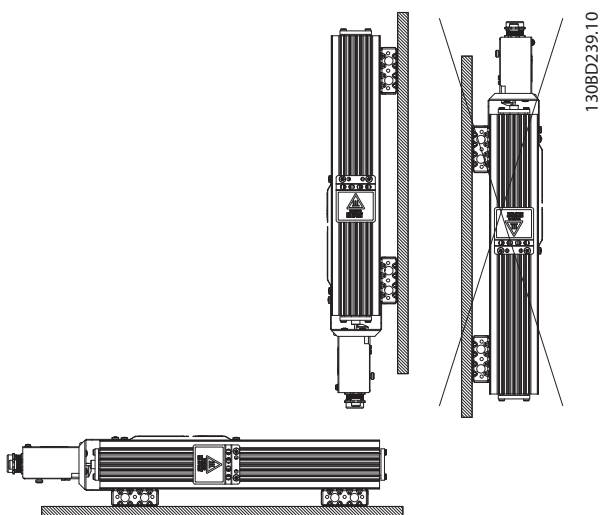
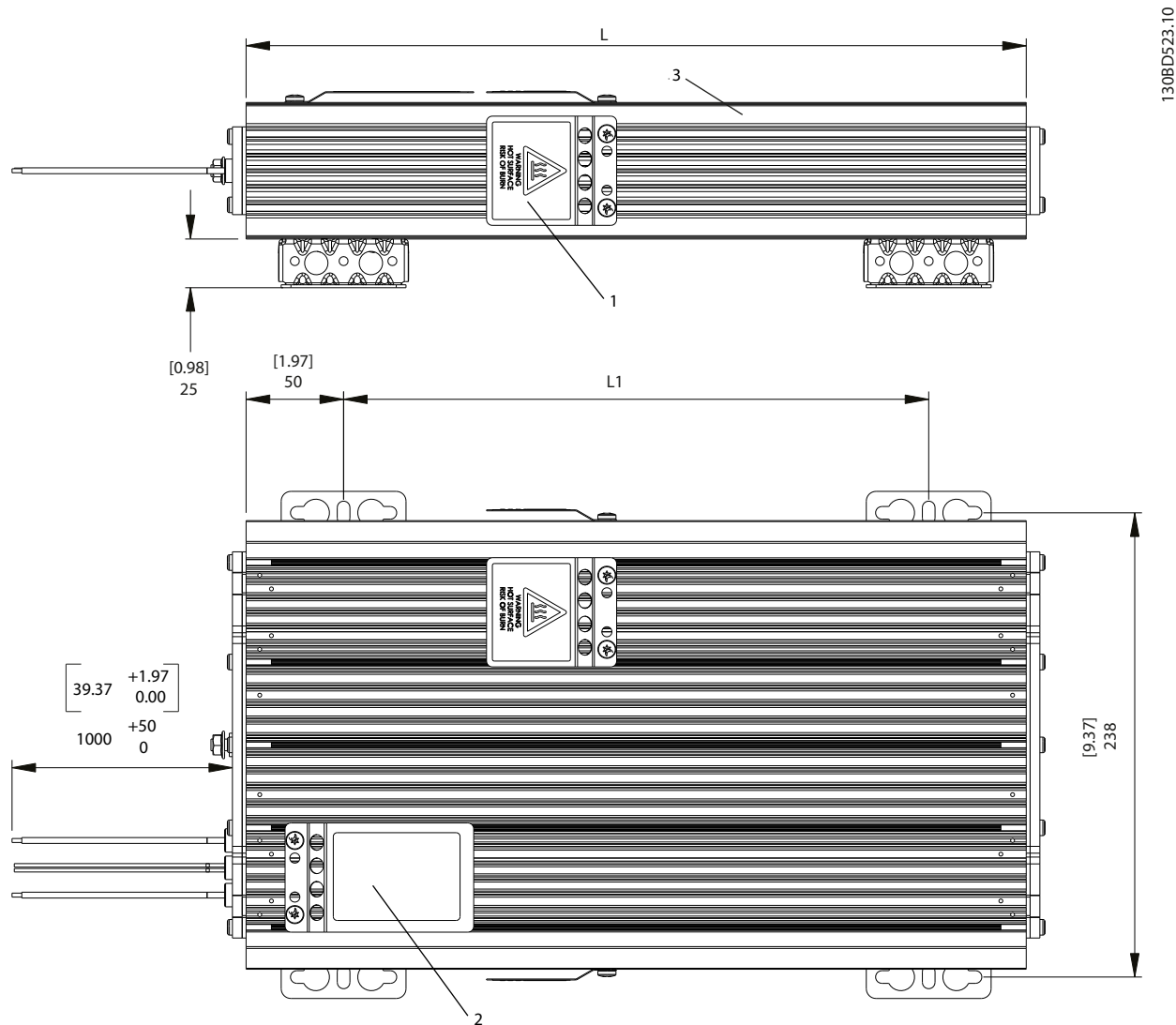


Illustration 9.6 Mechanical Mounting

9.7.2 Figure 2 - 914CBT-HxxxCHT



1	Hot surface warning x3
2	Name plate

Illustration 9.7 IP54, Side View and Top View

Resistor cable	AWG, see Table 9.7, UL, 1000 V
Temperature switch	180° C NC, AWG 20, orange

Table 9.6 Cable Details

Danfoss code	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.04 in	Weight [kg]	[AWG]
175U3305	MCE101A27R0P1k40E54CAW	27	400	15.75	300	11.81	8.2	10
175U3306	MCE101A18R0P2K20E54CAW	18	560	22.05	460	18.11	11	10
175U3307	MCE101A13R0P3K20E54CAW	13	760	29.92	660	25.98	14.6	10
175U3314	MCE101A110R0P1K70E54CAW	110	460	18.11	360	14.17	9.2	10
175U3315	MCE101A80R0P2K20E54CAW	80	560	22.05	460	18.11	11	10
175U3316	MCE101A56R0P3K20E54CAW	56	760	29.92	660	25.98	14.6	10
175U3322	MCE101A145R0P1K70E54CAW	145	460	18.11	360	14.17	9.2	14
175U3323	MCE101A100R0P2K20E54CAW	100	560	22.05	460	18.11	11	10
175U3324	MCE101A72R0P3K20E54CAW	72	760	29.92	660	25.98	14.6	10
175U3330	MCE101A5R0P1K40E54CAW	5.7	400	15.75	300	11.81	8.2	10
175U3331	MCE101A5R0P1K70E54CAW	5.7	460	18.11	360	14.17	9.2	10
175U3332	MCE101A3R50P2K20E54CAW	3.5	560	22.05	460	18.11	11	10
175U3333	MCE101A3R50P2K80E54CAW	3.5	660	25.98	560	22.05	12.8	10
175U3334	MCE101A2R80P3K20E54CAW	2.8	760	29.92	660	25.98	14.6	10
175U3339	MCE101A28R0P1K40E54CAW	28	400	15.75	300	11.81	8.2	10
175U3340	MCE101A22R0P1K70E54CAW	22	460	18.11	360	14.17	9.2	10
175U3341	MCE101A14R0P2K80E54CAW	14	660	25.98	560	22.05	12.8	10
175U3347	MCE101A38R0P1K40E54CAW	38	400	15.75	300	11.81	8.2	10
175U3348	MCE101A31R0P1K70E54CAW	31	460	18.11	360	14.17	9.2	10
175U3349	MCE101A27R0P2K20E54CAW	27	560	22.05	460	18.11	11	10
175U3350	MCE101A19R0P2K80E54CAW	19	660	25.98	560	22.05	12.8	10
175U3352	MCE101A52R0P1K40E54CAW	52	400	15.75	300	11.81	8.2	10
175U3353	MCE101A42R0P1K70E54CAW	42	460	18.11	360	14.17	9.2	10
175U3354	MCE101A31R0P2K20E54CAW	31	560	22.05	460	18.11	11	10
175U3355	MCE101A27R0P2K80E54CAW	27	660	25.98	560	22.05	12.8	10
175U3356	MCE101A22R0P3K20E54CAW	22	760	29.92	660	25.98	14.6	10
175U3357	MCE101A19R0P2K20E54CAW	19	560	22.05	460	18.11	11	10
175U3358	MCE101A14R0P3K20E54CAW	14	760	29.92	660	25.98	14.6	10
175U3359	MCE101A12R0P3K20E54CAW	12	760	29.92	660	25.98	14.6	10

Table 9.7 Mechanical Dimensions

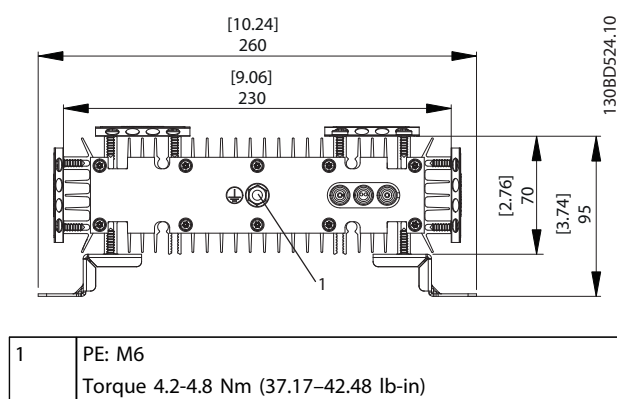


Illustration 9.8 IP54, End View, Cable End

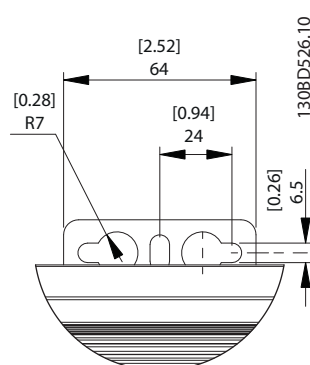


Illustration 9.9 Mounting Hole

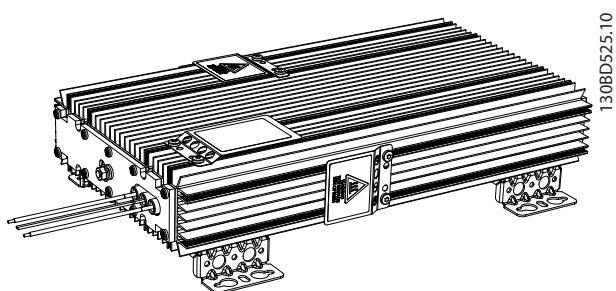


Illustration 9.10 IP54, 3D View

Mechanical mounting (see *Illustration 9.11*):

- Vertical with cables down, or
- Horizontal

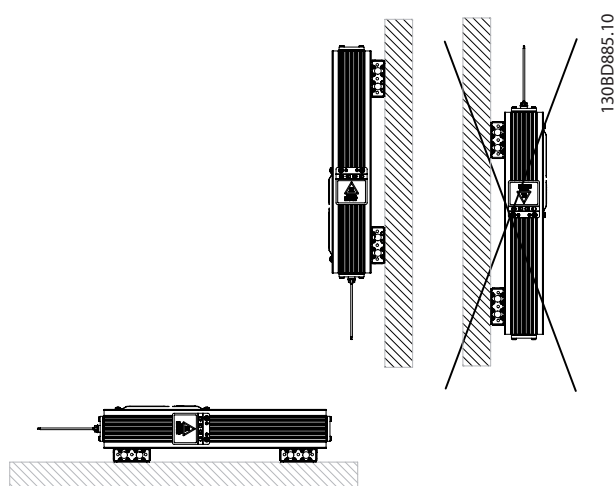
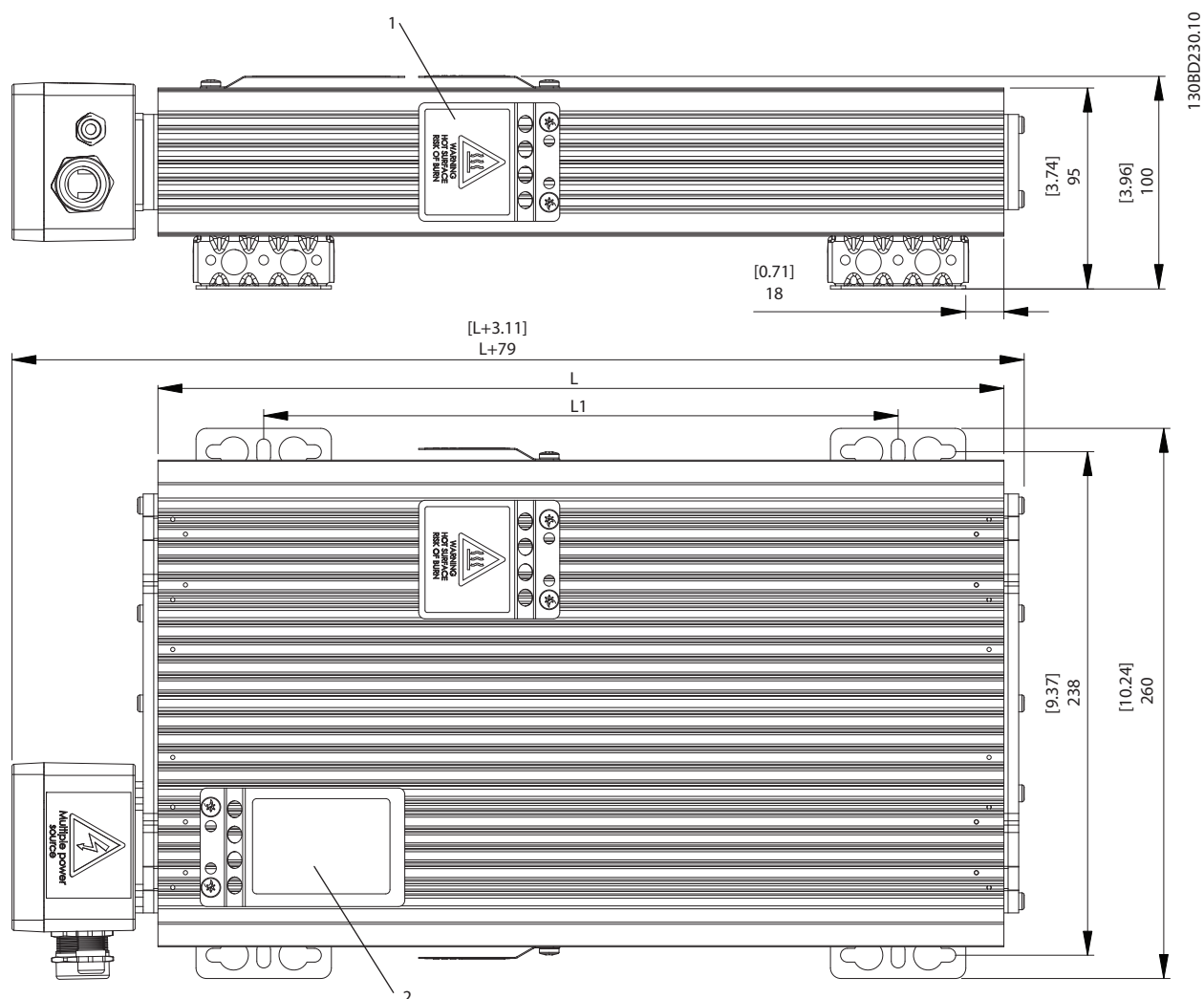


Illustration 9.11 Mechanical Mounting

9.7.3 Figure 3 - 914CBT-HxxxBHT



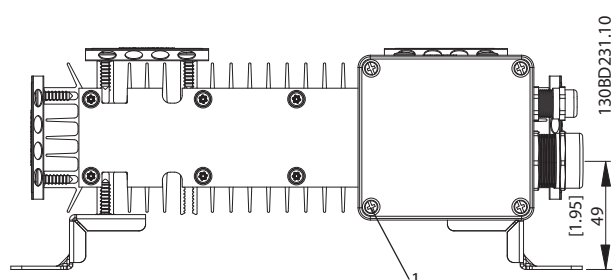
1	Hot surface warning x3
2	Name plate

Illustration 9.12 IP65, Side View and Top View

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.04 in	Weight [kg]
175U3033	MCE101A42R0P1K70E65TAW	42	460	18.11	360	14.17	9.2
175U3038	MCE101A31R0P1K70E65TAW	31	460	18.11	360	14.17	9.2
175U3040	MCE101A28R0P1K40E65TAW	28	400	15.75	300	11.81	8.2
175U3044	MCE101A27R0P2K20E65TAW	27	560	22.05	460	18.11	11
175U3048	MCE101A22R0P1K70E65TAW	22	460	18.11	360	14.17	9.2
175U3050	MCE101A19R0P2K20E65TAW	19	560	22.05	460	18.11	11
175U3056	MCE101A14R0P2K80E65TAW	14	660	25.98	560	22.05	12.8
175U3062	MCE101A12R0P3K20E65TAW	12	760	29.92	660	25.98	14.6
175U3074	MCE101A5R70P1K40E65TAW	5,7	400	15.75	300	11.81	8.2
175U3081	MCE101A3R50P2K20E65TAW	3,5	560	22.05	460	18.11	11
175U3087	MCE101A2R80P3K20E65TAW	2,8	760	29.92	660	25.98	14.6

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.04 in	Weight [kg]
175U3107	MCE101A145RP2K20E65TAW	145	560	22.05	460	18.11	11
175U3123	MCE101A200RP1K70E65TAW	200	460	18.11	360	14.17	9.2
175U3127	MCE101A145RP1K70E65TAW	145	460	18.11	360	14.17	9.2
175U3131	MCE101A110RP2K20E65TAW	110	560	22.05	460	18.11	11
175U3133	MCE101A105RP3K20E65TAW	105	760	29.92	660	25.98	14.6
175U3139	MCE101A80R0P2K20E65TAW	80	560	22.05	460	18.11	11
175U3141	MCE101A72R0P2K80E65TAW	72	660	25.98	560	22.05	12.8
175U3147	MCE101A56R0P2K80E65TAW	56	660	25.98	560	22.05	12.8
175U3153	MCE101A48R0P1K40E65TAW	48	400	15.75	300	11.81	8.2
175U3161	MCE101A35R0P1K70E65TAW	35	460	18.11	360	14.17	9.2
175U3169	MCE101A27R0P2K20E65TAW	27	560	22.05	460	18.11	11
175U3173	MCE101A18R0P3K20E65TAW	18	760	29.92	660	25.98	14.6
175U3409	MCE101A27R0P1K40E65TAW	27	400	15.75	300	11.81	8.2
175U3411	MCE101A18R0P2K20E65TAW	18	560	22.05	460	18.11	11
175U3413	MCE101A13R0P3K20E65TAW	13	760	29.92	660	25.98	14.6
175U3423	MCE101A110RP1K70E65TAW	110	460	18.11	360	14.17	9.2
175U3427	MCE101A56R0P3K20E65TAW	56	760	29.92	660	25.98	14.6
175U3437	MCE101A100RP2K20E65TAW	100	560	22.05	460	18.11	11
175U3439	MCE101A72R0P3K20E65TAW	72	760	29.92	660	25.98	14.6
175U3445	MCE101A5R70P1K40E65TAW	5,7	400	15.75	300	11.81	8.2
175U3447	MCE101A3R50P2K80E65TAW	3,5	660	25.98	560	22.05	12.8
175U3459	MCE101A38R0P1K40E65TAW	38	400	15.75	300	11.81	8.2
175U3461	MCE101A19R0P2K80E65TAW	19	660	25.98	560	22.05	12.8
175U3463	MCE101A14R0P3K20E54TAW	14	760	29.92	660	25.98	14.6
175U3467	MCE101A52R0P1K40E65TAW	52	400	15.75	300	11.81	8.2
175U3469	MCE101A31R0P2K20E65TAW	31	560	22.05	460	18.11	11
175U3471	MCE101A27R0P2K80E65TAW	27	660	25.98	560	22.05	12.8
175U3480	MCE101A22R0P3K20E65TAW	22	760	29.92	660	25.98	14.6
175U3484	MCE101A5R70P1K70E65TAW	5,7	460	18.11	360	14.17	9.2

Table 9.8 Mechanical Dimensions



1	Torque 2–3 Nm (17.71–26.57 lb-in)
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Illustration 9.13 IP65, End View, Connection Box

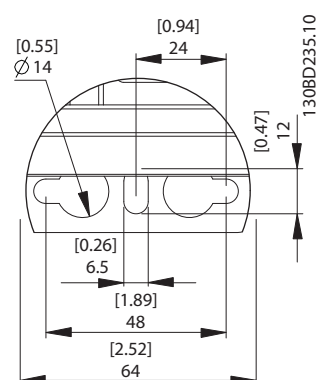
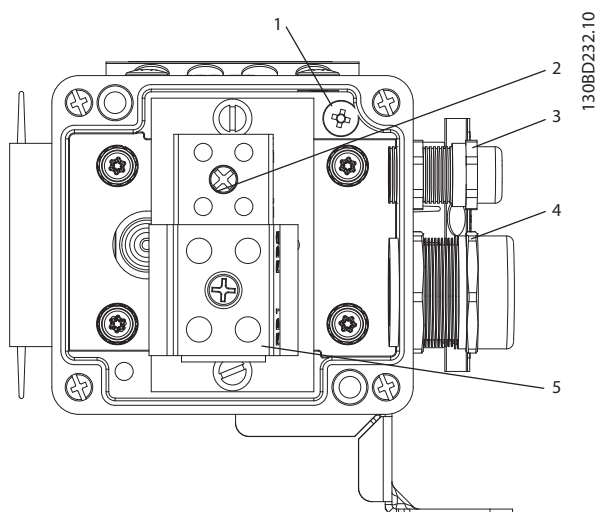


Illustration 9.14 Mounting Hole



1	PE: M4 Torque 2–3 Nm (17.71-26.57 lb-in)
2	Temperature switch connection: Marked: T1/T2. Type: PHOENIX G5/2 with Screw Connection IEC: 0.2-4 mm ² /500 V UL: AWG 24-12/300 V Wire Stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
3	For temperature Switch Cable: Clamping Range: 3.5-7.0 mm (0.14–0.28 in)
4	For resistor cable: Cable gland with internal connection for braid Clamping Range: 9.0-16.5 mm (0.35–0.65 in)
5	Resistor connection: Marked RB1/RB2 Type: PHOENIX G10/2 IEC: 0.5-10 mm ² /800 V UL: AWG 20-6 /600 V Wire Stripping: 12 mm (0.47 in) Torque: 1.5-1.8 Nm (13.28-15.94 lb-in)

Illustration 9.15 Connection Box

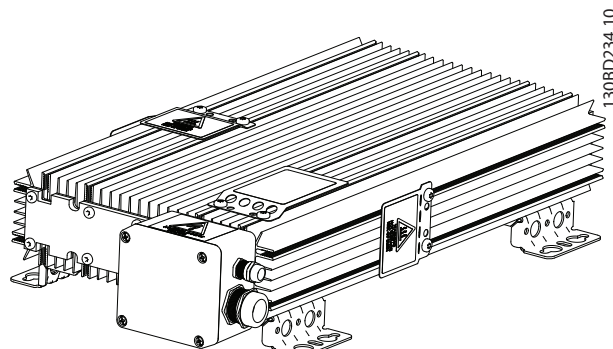


Illustration 9.16 IP65, 3D View

Mechanical mounting (see *Illustration 9.11*):

- Vertical with connection box down, or
- Horizontal

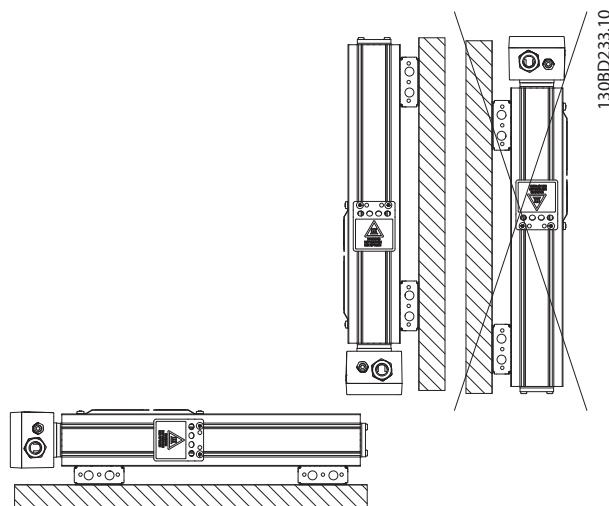
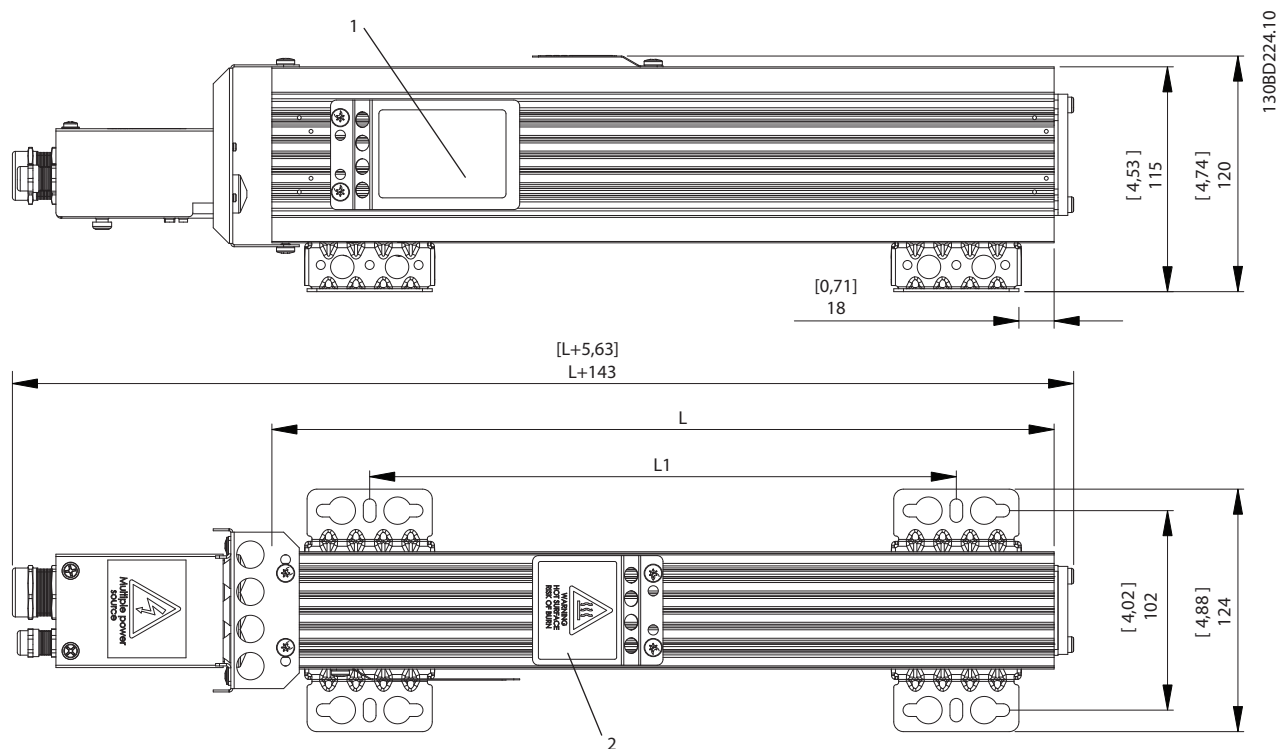


Illustration 9.17 Mechanical Mounting

9.7.4 Figure 4 - 914CBR-VxxxDT



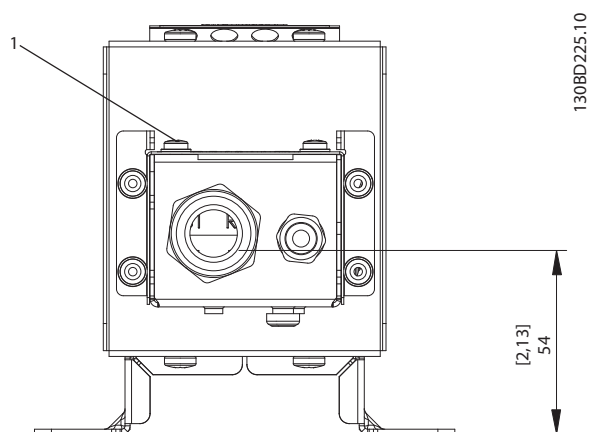
1	Name plate
2	Hot surface warning x2

Illustration 9.18 IP21, Side View and Top View

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.04 in	Weight [kg]
175U3009	MCE101A200RP360RE21TAW	200	210	8.27	110	4.33	1.8
175U3012	MCE101A145RP450RE21TAW	145	260	10.24	160	6.30	2.4
175U3014	MCE101A145RP280RE21TAW	145	160	6.30	70	2.76	1.3
175U3017	MCE101A110RP360RE21TAW	110	210	8.27	110	4.33	1.8
175U3019	MCE101A105RP570RE21TAW	105	330	12.99	230	9.06	3
175U3022	MCE101A80RP450RE21TAW	80	260	10.24	160	6.30	2.4
175U3024	MCE101A72R0P960RE21TAW	72	560	22.05	460	18.11	4.6
175U3027	MCE101A56R0P680RE21TAW	56	400	15.75	300	11.81	3.5
175U3029	MCE101A52R0P1K29E21TAW	52	760	29.92	660	25.98	6.1
175U3034	MCE101A38R0P1K13E21TAW	38	660	25.98	560	22.05	5.4
175U3041	MCE101A27R0P280RE21TAW	27	160	6.30	70	2.76	1.3
175U3053	MCE101A18R0P450RE21TAW	18	260	10.24	160	6.30	2.4
175U3059	MCE101A13R0P680RE21TAW	13	400	15.75	300	11.81	3.5
175U3068	MCE101A9R00P1K13E21TAW	9	660	25.98	560	22.05	5.4
175U3102	MCE101A1K20P360RE21TAW	1200	210	8.27	110	4.33	1.8
175U3104	MCE101A850RP280RE21TAW	850	160	6.30	70	2.76	1.3
175U3108	MCE101A630RP360RE21TAW	630	210	8.27	110	4.33	1.8
175U3110	MCE101A570RP570RE21TAW	570	330	12.99	230	9.06	3
175U3112	MCE101A415RP790RE21TAW	415	460	18.11	360	14.17	3.9
175U3114	MCE101A410RP570RE21TAW	410	330	12.99	230	9.06	3
175U3116	MCE101A270RP790RE21TAW	270	460	18.11	360	14.17	3.9

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.04 in	Weight [kg]
175U3118	MCE101A270RP1K13E21TAW	270	660	25.98	560	22.05	5.4
175U3120	MCE101A200RP1K13E21TAW	200	660	25.98	560	22.05	5.4
175U3124	MCE101A145RP450RE21TAW	145	260	10.24	160	6.30	2.4
175U3136	MCE101A100RP570RE21TAW	100	330	12.99	230	9.06	3
175U3144	MCE101A70R0P790RE21TAW	70	460	18.11	360	14.17	3.9
175U3402	MCE101A100RP450RE21TAW	100	260	10.24	160	6.30	2.4
175U3404	MCE101A70R0P570RE21TAW	70	330	12.99	230	9.06	3
175U3406	MCE101A48R0P960RE21TAW	48	560	22.05	460	18.11	4.6
175U3408	MCE101A35R0P1K13E21TAW	35	660	25.98	560	22.05	5.4
175U3416	MCE101A410RP450RE21TAW	410	260	10.24	160	6.30	2.4
175U3418	MCE101A270RP570RE21TAW	270	330	12.99	230	9.06	3
175U3420	MCE101A200RP960RE21TAW	200	560	22.05	460	18.11	4.6
175U3422	MCE101A145RP1K13E21TAW	145	660	25.98	560	22.05	5.4
175U3430	MCE101A570RP450RE21TAW	570	260	10.24	160	6.30	2.4
175U3432	MCE101A470RP570RE21TAW	415	330	12.99	230	9.06	3
175U3434	MCE101A270RP960RE21TAW	270	560	22.05	460	18.11	4.6
175U3436	MCE101A200RP1K13E21TAW	200	660	25.98	560	22.05	5.4
175U3442	MCE101A18R0P570RE21TAW	18	330	12.99	230	9.06	3
175U3450	MCE101A110RP450RE21TAW	110	260	10.24	160	6.30	2.4
175U3452	MCE101A80R0P570RE21TAW	80	330	12.99	230	9.06	3
175U3456	MCE101A72R0P680RE21TAW	72	400	15.75	300	11.81	3.5
175U3458	MCE101A52R0P1K13E21TAW	52	660	25.98	560	22.05	5.4
175U3466	MCE101A72R0P1K13E21TAW	72	660	25.98	560	22.05	5.4
175U3477	MCE101A27R0P360RE21TAW	27	210	8.27	110	4.33	1.8
175U3481	MCE101A105RP790RE21TAW	105	460	18.11	360	14.17	3.9

Table 9.9 Mechanical Dimensions



1	Torque 1–1.4 Nm (8.86–12.34 lb-in)
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Illustration 9.19 IP21, End View, Connection Box

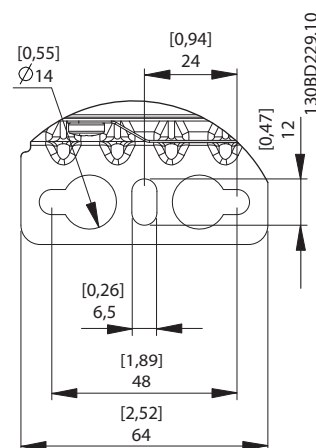
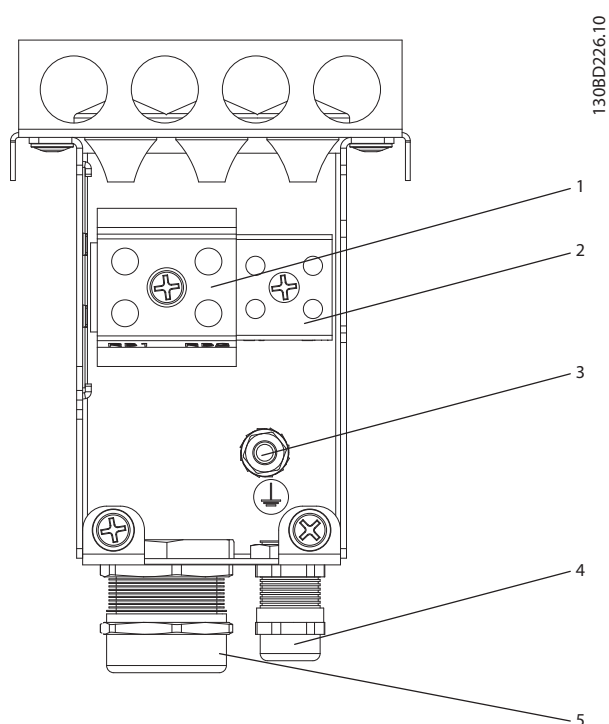


Illustration 9.20 Mounting Hole



1	Resistor connection: Marked RB1/RB2 Type: Phoenix G10/2 IEC: 0.5-10 mm ² /800 V UL: AWG 20-6/600 V Wire Stripping: 12 mm (0.47 in) Torque: 1.5-1.8 Nm (13.28-15.94 lb-in)
2	Temperature switch connection Marked: T1/T2 Type: Phoenix G5/2 with screw connection IEC: 0.2-4 mm ² /500 V UL: AWG 24-12/300 V Wire Stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
3	PE: M5 Torque 2-2.7 Nm (17.71-23.91 lb-in)
4	For temperature Switch Cable: Clamping Range: 3.5-7.0 mm (0.14-0.28 lb-in)
5	For resistor cable: Cable gland with internal connection for braid Clamping Range: 9.0-16.5 mm (0.35-0.65 lb-in)

Illustration 9.21 Connection Box

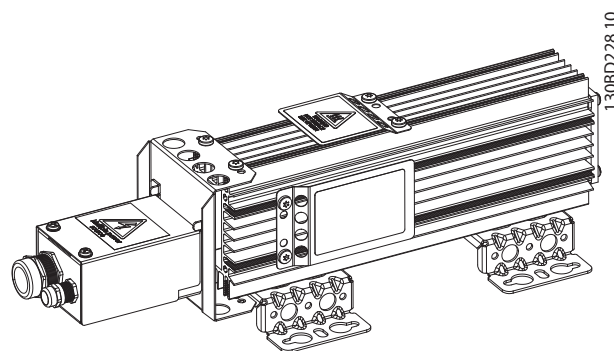


Illustration 9.22 IP21, 3D View

Mechanical mounting (see *Illustration 9.23*):

- Vertical with connection box down (IP21), or
- Horizontal (IP20)

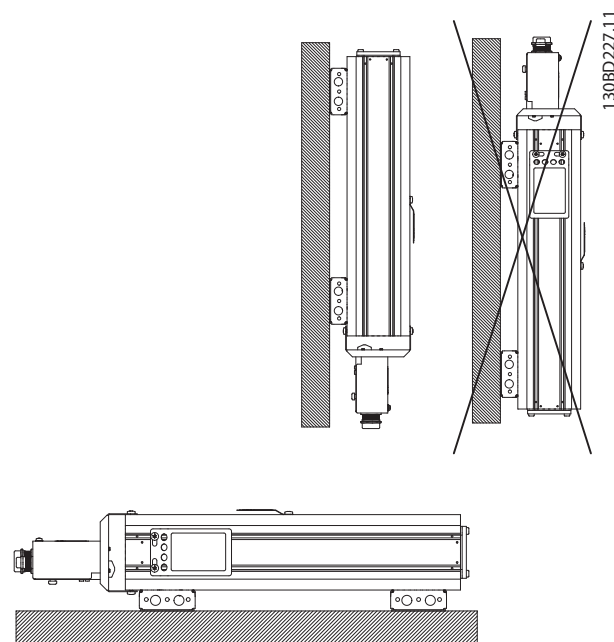
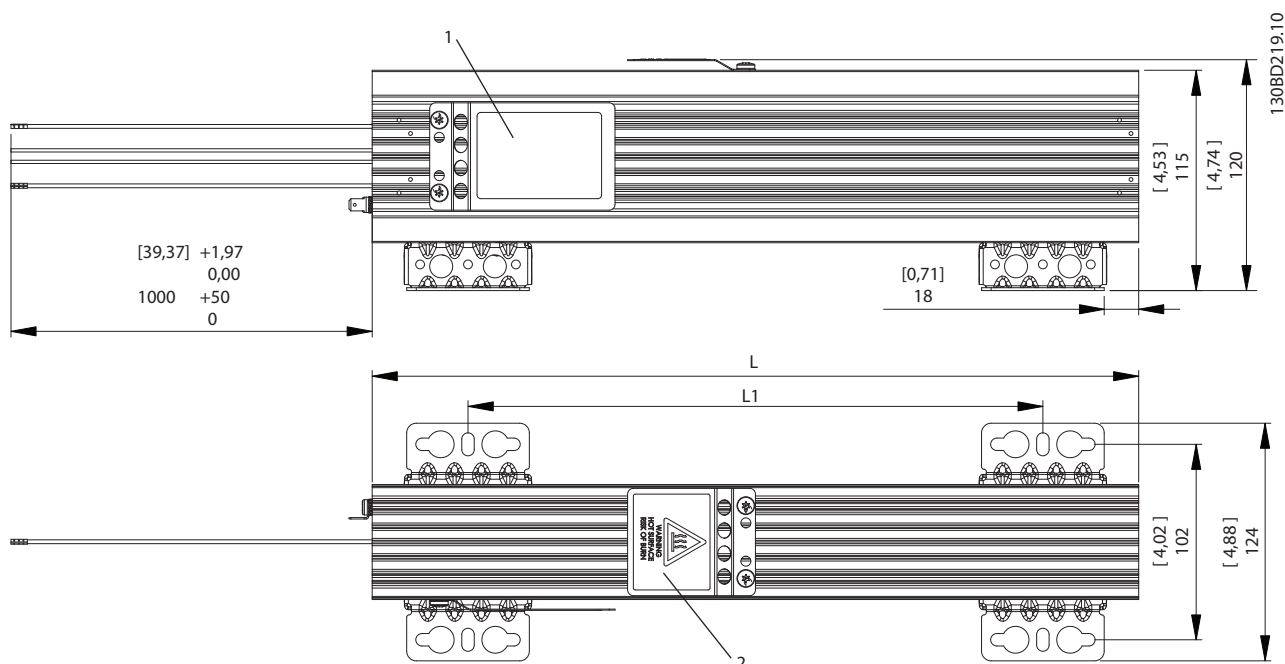


Illustration 9.23 Mechanical Mounting

9.7.5 Figure 5 - 914CBR-VxxxCT



1	Name plate
2	Hot surface warning x2

Illustration 9.24 IP54, Side View and Top View

Resistor cable	AWG 16, UL Style 1659, 600 V, 250 °C
Temperature switch	180 °C NC, AWG 20, orange

Table 9.10 Cable Details

Danfoss P/N	Typcode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.08 in	Weight [kg]
175U3301	MCE101A100RP450RE54CAW	100	260	10.24	160	6.3	2.4
175U3302	MCE101A70R0P570RE54CAW	70	330	12.99	230	9.06	3
175U3303	MCE101A48R0P960RE54CAW	48	560	22.05	460	18.11	4.6
175U3304	MCE101A35R0P1K13E54CAW	35	660	25.98	560	22.05	5.4
175U3310	MCE101A410RP450RE54CAW	410	260	10.24	160	6.30	2.4
175U3311	MCE101A270RP570RE54CAW	270	330	12.99	230	9.06	3
175U3312	MCE101A200RP960RE54CAW	200	560	22.05	460	18.11	4.6
175U3313	MCE101A145RP1K13E54CAW	145	660	25.98	560	22.05	5.4
175U3317	MCE101A850RP280RE54CAW	850	160	6.30	70	2.76	1.3
175U3318	MCE101A570RP450RE54CAW	570	260	10.24	160	6.30	2.4
175U3319	MCE101A415RP570RE54CAW	415	330	12.99	230	9.06	3
175U3320	MCE101A270RP960RE54CAW	270	560	22.05	460	18.11	4.6
175U3321	MCE101A200RP1K13E54CAW	200	660	25.98	560	22.05	5.4
175U3326	MCE101A27R0P360RE54CAW	27	210	8.27	110	4.33	1.8
175U3327	MCE101A18R0P570RE54CAW	18	330	12.99	230	9.06	3
175U3328	MCE101A13R0P680RE54CAW	13	400	15.75	300	11.81	3.5
175U3329	MCE101A9R00P1K13E54CAW	9	660	25.98	560	22.05	5.4
175U3335	MCE101A110RP450RE54CAW	110	260	10.24	160	6.30	2.4

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L1 ±0.08 in	Weight [kg]
175U3336	MCE101A80R0P570RE54CAW	80	330	12.99	230	9.06	3
175U3337	MCE101A56R0P680RE54CAW	56	400	15.75	300	11.81	3.5
175U3338	MCE101A38R0P1K13E54CAW	38	660	25.98	560	22.05	5.4
175U3343	MCE101A145RP450RE54CAW	145	260	10.24	160	6.30	2.4
175U3344	MCE101A100RP570RE54CAW	100	330	12.99	230	9.06	3
175U3345	MCE101A72R0P680RE54CAW	72	400	15.75	300	11.81	3.5
175U3346	MCE101A52R0P1K13E54CAW	52	660	25.98	560	22.05	5.4
175U3351	MCE101A72R0P1K13E54CAW	72	660	25.98	560	22.05	5.4
175U3360	MCE101A105RP790RE54CAW	105	460	18.11	360	14.17	3.9

Table 9.11 Mechanical Dimensions

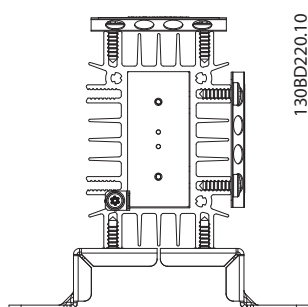


Illustration 9.25 IP54, End View, Connection Box

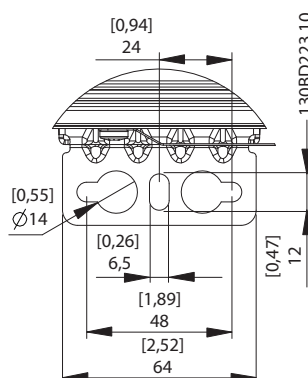
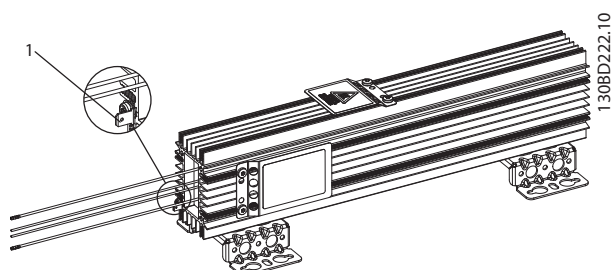


Illustration 9.26 Mounting Hole



1	PE Male Fast-On tab 6.3x0.8
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Illustration 9.27 IP54, 3D View

Mechanical mounting (see *Illustration 9.28*):

- Vertical with connection box down, or
- Horizontal

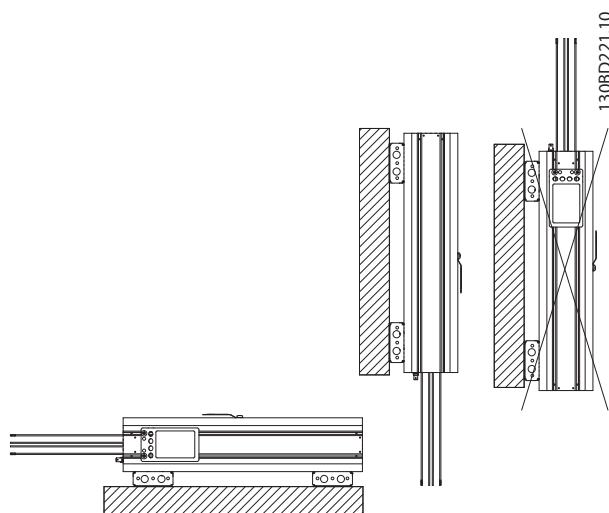
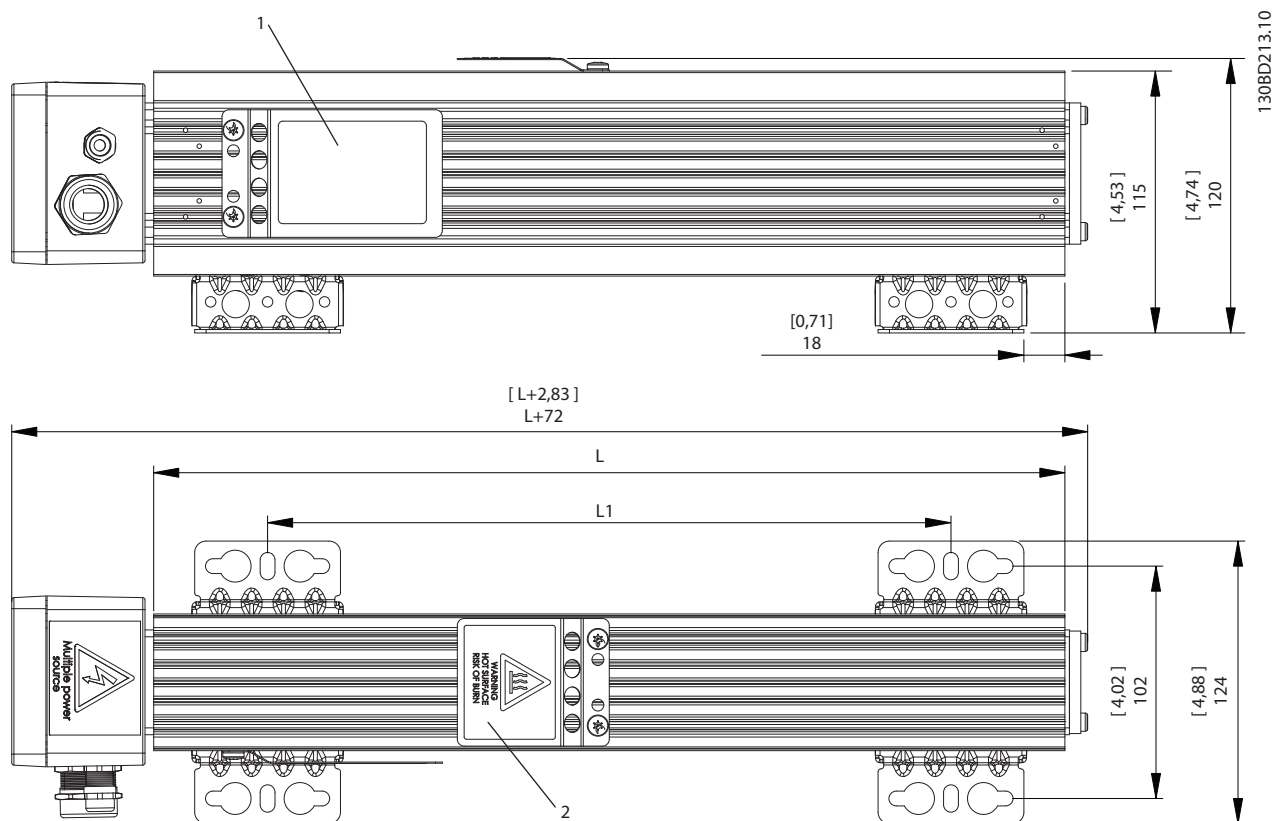


Illustration 9.28 Mechanical Mounting

9.7.6 Figure 6 - 914CBR-VxxxBT



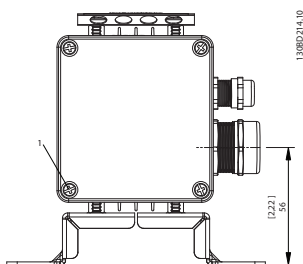
1	Name plate
2	Hot surface warning x2

Illustration 9.29 IP65, Side View and Top View

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L ±0.08 in	Weight [kg]
175U3010	MCE101A200RP360RE65TAW	200	210	8.27	110	4.33	1.8
175U3013	MCE101A145RP450RE65TAW	145	260	10.24	160	6.3	2.4
175U3015	MCE101A145RP280RE65TAW	145	160	6.3	70	2.76	1.3
175U3018	MCE101A110RP360RE65TAW	110	210	8.27	110	4.33	1.8
175U3020	MCE101A105RP570RE65TAW	105	330	12.99	230	9.06	3
175U3023	MCE101A80RP450RE65TAW	80	260	10.4	160	6.3	2.4
175U3025	MCE101A72R0P960RE65TAW	72	560	22.05	460	18.11	4.6
175U3028	MCE101A56R0P680RE65TAW	56	400	15.75	300	11.81	3.5
175U3030	MCE101A52R0P1K29E65TAW	52	760	29.92	660	25.98	6.1
175U3035	MCE101A38R0P1K13E65TAW	38	660	25.98	560	22.05	5.4
175U3042	MCE101A27R0P280RE65TAW	27	160	6.3	70	2.76	1.3
175U3054	MCE101A18R0P450RE65TAW	18	260	10.24	160	6.3	2.4
175U3060	MCE101A13R0P680RE65TAW	13	400	15.75	300	11.81	3.5
175U3069	MCE101A9R00P1K13E65TAW	9	660	25.98	560	22.05	5.4
175U3103	MCE101A1K20P360RE65TAW	1200	210	8.27	110	4.3	1.8
175U3105	MCE101A850RP280RE65TAW	850	160	6.3	70	2.76	1.3
175U3109	MCE101A630RP360RE65TAW	630	210	8.27	110	4.33	1.8
175U3111	MCE101A570RP570RE65TAW	570	330	12.99	230	9.06	3
175U3113	MCE101A415RP790RE65TAW	415	460	18.11	360	14.17	3.9

Danfoss P/N	Typecode	[Q]	L ±2 mm	L ±0.08 in	L1 ±2 mm	L ±0.08 in	Weight [kg]
175U3115	MCE101A410RP570RE65TAW	410	330	12.99	230	9.06	3
175U3117	MCE101A270RP790RE65TAW	270	460	18.11	360	14.17	3.9
175U3119	MCE101A270RP1K13E65TAW	270	660	25.98	560	22.05	5.4
175U3121	MCE101A200RP1K13E65TAW	200	660	25.98	560	22.05	5.4
175U3125	MCE101A145RP450RE65TAW	145	260	10.24	160	6.3	2.4
175U3137	MCE101A100RP570RE65TAW	100	330	12.99	230	9.06	3
175U3145	MCE101A70R0P790RE65TAW	70	460	18.11	360	14.17	3.9
175U3401	MCE101A100RP450RE65TAW	100	260	10.24	160	6.3	2.4
175U3403	MCE101A70R0P570RE65TAW	70	330	12.99	230	9.06	3
175U3405	MCE101A48R0P960RE65TAW	48	560	22.05	460	18.11	4.6
175U3407	MCE101A35R0P1K13E65TAW	35	660	25.98	560	22.05	5.4
175U3415	MCE101A410RP450RE65TAW	410	260	10.24	160	6.3	2.4
175U3417	MCE101A270RP570RE65TAW	270	330	12.99	230	9.06	3
175U3419	MCE101A200RP960RE65TAW	200	560	22.05	460	18.11	4.6
175U3421	MCE101A145RP1K13E65TAW	145	660	25.98	560	22.05	5.4
175U3429	MCE101A570RP450RE65TAW	570	260	10.24	160	6.3	2.4
175U3431	MCE101A415RP570RE65TAW	415	330	12.99	230	6.09	3
175U3433	MCE101A270RP960RE65TAW	270	560	22.05	460	18.11	4.6
175U3435	MCE101A200RP1K13E65TAW	200	660	25.98	560	22.05	5.4
175U3441	MCE101A18R0P570RE65TAW	18	330	12.99	230	9.06	3
175U3449	MCE101A110RP450RE65TAW	110	260	10.24	160	6.3	2.4
175U3451	MCE101A80R0P570RE65TAW	80	330	12.99	230	9.06	3
175U3455	MCE101A72R0P680RE65TAW	72	400	15.75	300	11.81	3.5
175U3457	MCE101A52R0P1K13E65TAW	52	660	25.98	560	22.05	5.4
175U3465	MCE101A72R0P1K13E65TAW	72	660	25.98	560	22.05	5.4
175U3478	MCE101A27R0P360RE65TAW	27	210	8.27	110	4.33	1.8
175U3482	MCE101A105RP790RE65TAW	105	460	18.11	360	14.17	3.9

Table 9.12 Mechanical Dimensions



1	Torque 2–3 Nm (17.71–26.57 lb-in)
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Illustration 9.30 IP65, End View, Connection Box

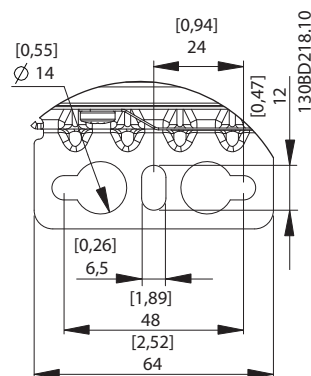
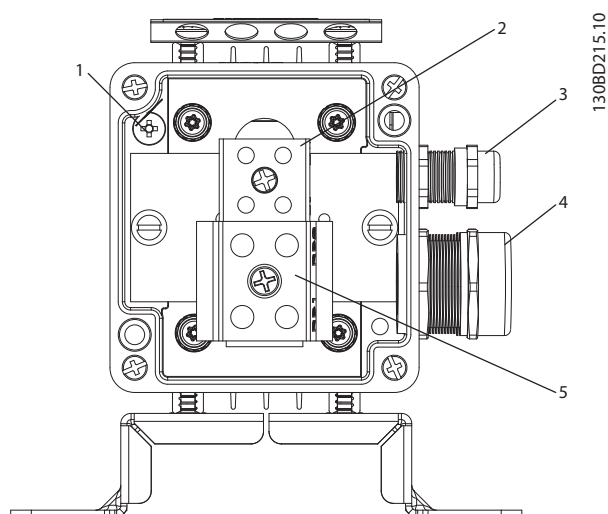


Illustration 9.31 Mounting Hole



1	PE M4 Torque 2–3 Nm (17.71-26.57 lb-in)
2	Temperature switch connection: Marked T1/T2 Type: Phoenix G5/2 with screw connection IEC: 0.2-4 mm ² /500 V UL: AWG 24-12/300 V Wire Stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
3	For temperature switch cable: Clamping Range: 3.5–7.0 mm (0.14–0.28 lb-in)
4	For resistor cable: Cable gland with internal connection for braid Clamping Range: 9.0–16.5 mm (0.35–0.65 in)
5	Resistor connection: Marked RB1/RB2 Type: PHOENIX G10/2 IEC: 0.5-10 mm ² /800 V UL: AWG 20–6/600 V Wire Stripping: 12 mm (0.47 in) Torque: 1.5–1.8 Nm (13.28-15.94 lb-in)

Illustration 9.32 Connection Box

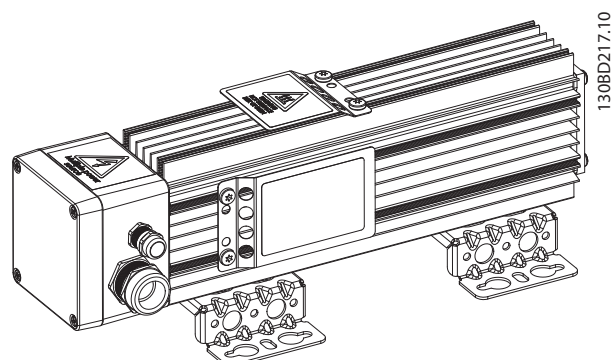


Illustration 9.33 IP65, 3D View

Mechanical mounting (see *Illustration 9.34*):

- Vertical with connection box down, or
- Horizontal

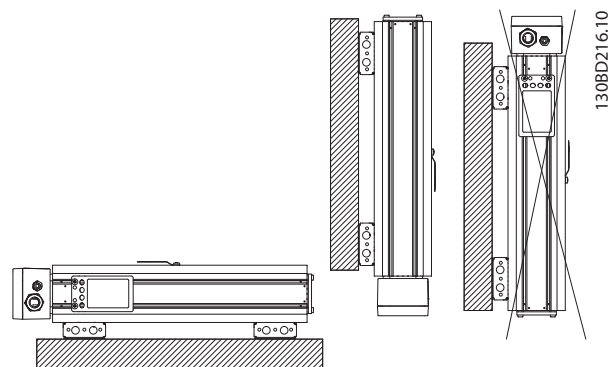
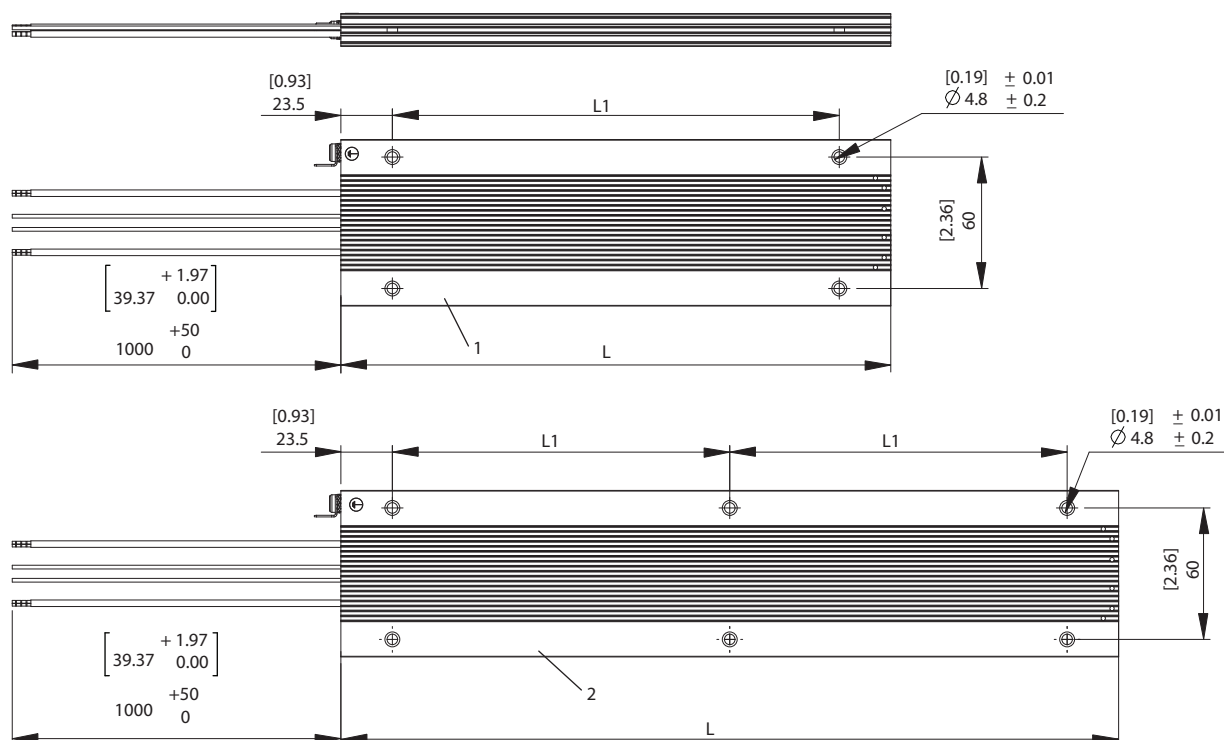


Illustration 9.34 Mechanical Mounting

9.7.7 Figure 7 - 914CCHxxxCT



130BD242.10

1	Supplier Marking
2	Supplier Marking

Illustration 9.35 IP54, Side View and Top View

Resistor cable	AWG 16, UL Style 1659, 600 V, 250 °C
Temperature switch	180 °C NC, AWG 20, orange

Table 9.13 Cable Details

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±0.5 mm	L1 ±0.02 in	Weight [kg]
175U3000	MCE101A1K20P100RE54CAW	1200	145	5.71	98	3.86	0.27
175U3001	MCE101A850RP100RE54CAW	850	145	5.71	98	3.86	0.27
175U3002	MCE101A630RP100RE54CAW	630	145	5.71	98	3.86	0.27
175U3003	MCE101A570RP100RE54CAW	570	145	5.71	98	3.86	0.27
175U3004	MCE101A410RP100RE54CAW	410	145	5.71	98	3.86	0.27
175U3005	MCE101A415RP200RE54CAW	415	251	9.8	204	8.03	0.54
175U3006	MCE101A300RP100RE54CAW	300	145	5.71	98	3.86	0.27
175U3007	MCE101A270RP200RE54CAW	270	251	9.8	204	8.03	0.54
175U3008	MCE101A200RP200RE54CAW	200	251	9.8	204	8.03	0.54
175U3011	MCE101A200RP100RE54CAW	200	145	5.71	98	3.86	0.27
175U3016	MCE101A145RP100RE54CAW	145	145	5.71	98	3.86	0.27
175U3021	MCE101A100RP100RE54CAW	100	145	5.71	98	3.86	0.27
175U3026	MCE101A70R0P200RE54CAW	70	251	9.8	204	8.03	0.54
175U3031	MCE101A48R0P200RE54CAW	48	251	9.8	204	8.03	0.54
175U3036	MCE101A35R0P200RE54CAW	35	251	9.8	204	8.03	0.54
175U3096	MCE101A300RP200RE54CAW	300	251	9.8	204	8.03	0.54

Danfoss P/N	Typecode	[Ω]	L ±2 mm	L ±0.08 in	L1 ±0.5 mm	L1 ±0.02 in	Weight [kg]
175U3101	MCE101A1K20P200RE54CAW	1200	251	9.8	204	8.03	0.54
175U3300	MCE101A145RP300RE54CAW	145	355	13.98	154 (x2)	6.06 (x2)	1.58
175U3308	MCE101A850RP200RE54CAW	850	251	9.8	204	8.03	0.54
175U3309	MCE101A630RP300RE54CAW	630	355	13.98	154 (x2)	6.06 (x2)	1.58
175U3325	MCE101A35R0P300RE54CAW	35	355	13.98	154 (x2)	6.06 (x2)	1.58
175U3342	MCE101A200RP300RE54CAW	200	355	13.98	154 (x2)	6.06 (x2)	1.58
175U3361	MCE101A270RP300RE54CAW	270	355	13.98	154 (x2)	6.06 (x2)	1.58

Table 9.14 Mechanical Dimensions

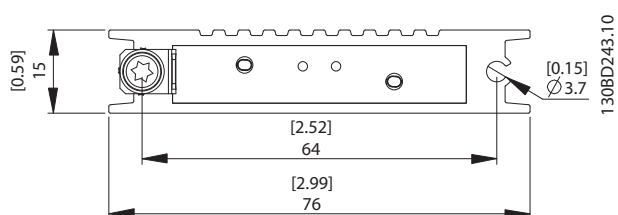
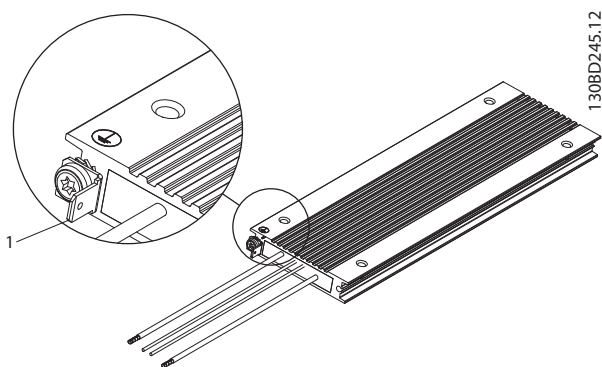


Illustration 9.36 IP54, End View Cable End



1	PE Male fast-on tab 6.3x0.8
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Illustration 9.37 IP54, 3D View

Mechanical mounting (see *Illustration 9.38*):

- Vertical with cables down, or
- Horizontal

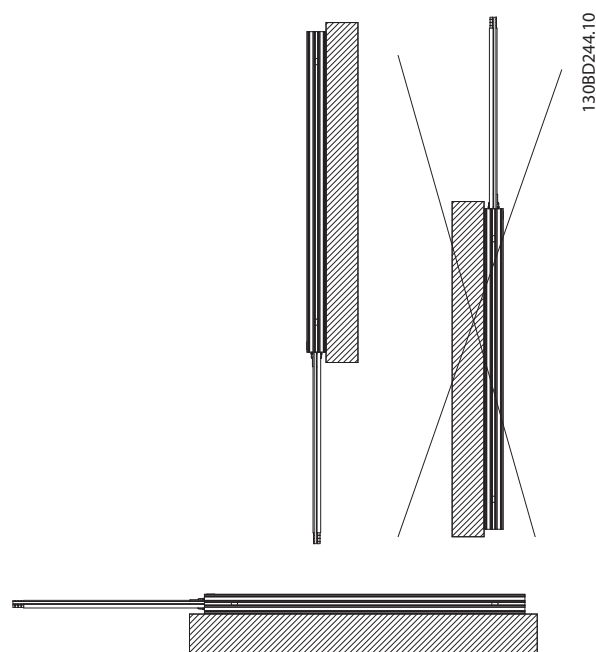


Illustration 9.38 Mechanical Mounting

9.7.8 Figure 8 - 917CM13

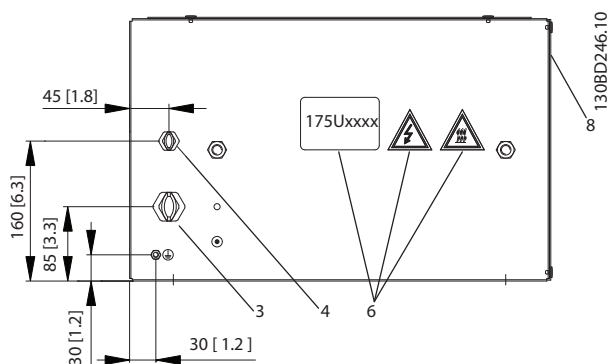


Illustration 9.39 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.42</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M6
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	4x fixing hole Ø 9 mm

Table 9.15 Legend to *Illustration 9.39* to *Illustration 9.43*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3236	MCE101C38R0P5K00E20BAW	38	M25	15

Table 9.16 Mechanical Dimensions

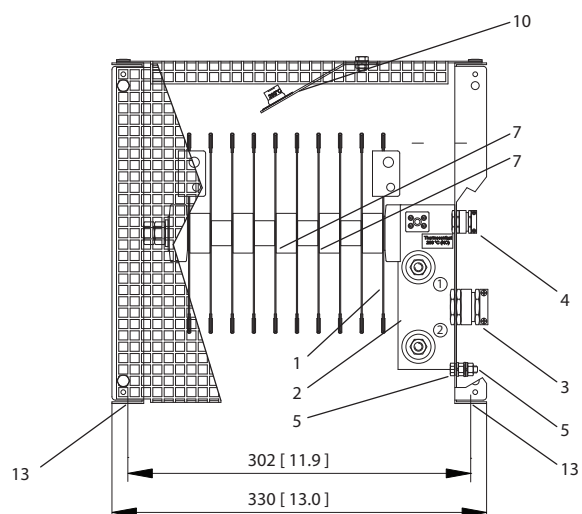


Illustration 9.40 IP20, Front View

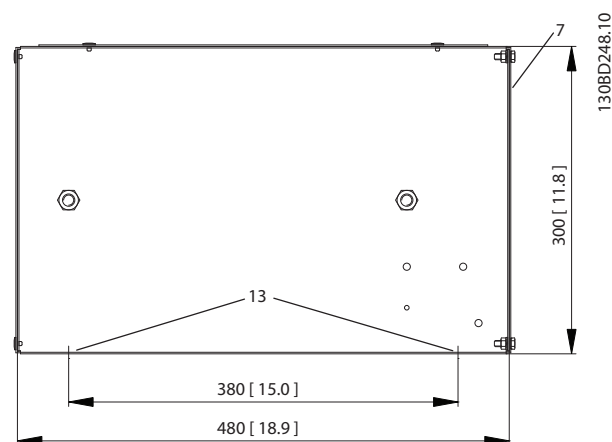


Illustration 9.41 IP20, Side View, Left

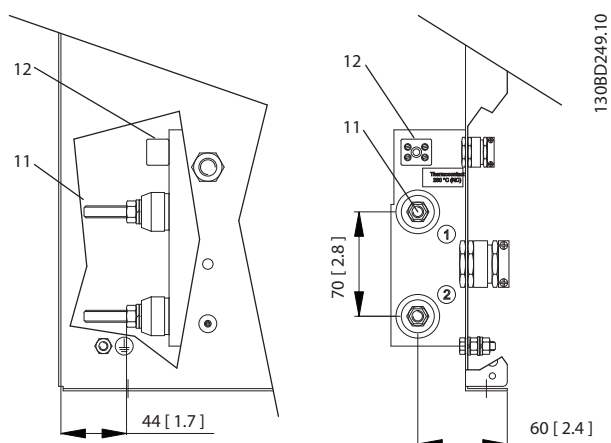


Illustration 9.42 Connections

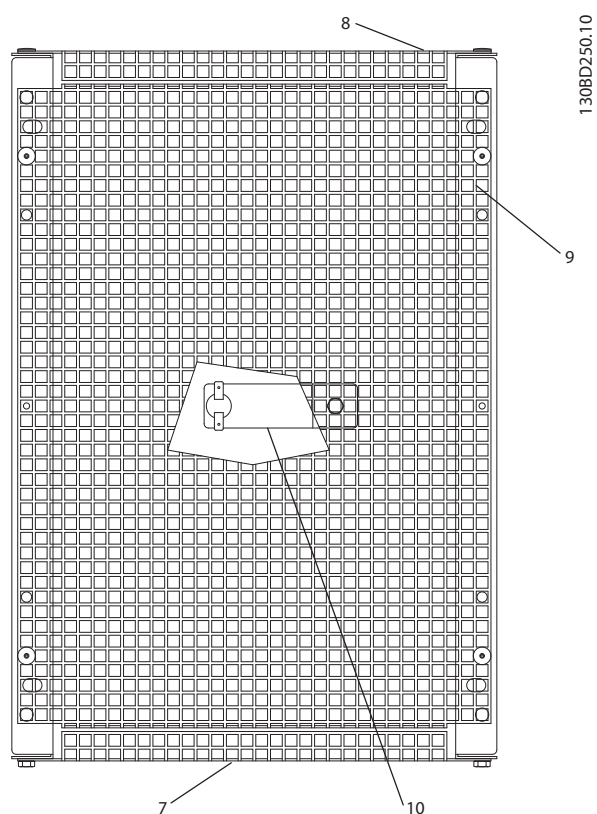


Illustration 9.43 IP20, Top View

9.7.9 Figure 9 - 917CM15

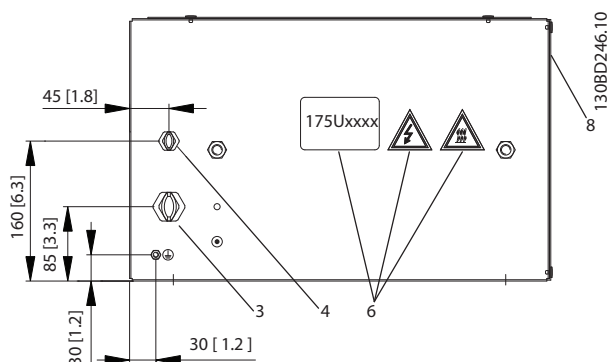


Illustration 9.44 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.47</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M6
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm²
13	4x fixing hole Ø 9 mm

Table 9.17 Legend to *Illustration 9.44* to *Illustration 9.47*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3067	MCE101C9R10P9K00E20BAW	9.1	M40	21
175u3079	MCE101C4R70P9K00E20BAW	4.7	M40	21
175u3200	MCE101C27R0P10K0E20BAW	27.0	M25	22
175u3203	MCE101C19R0P10K0E20BAW	19.0	M25	20
175u3231	MCE101C5R50P7K00E20BAW	5.5	M32	19
175u3232	MCE101C11R0P7K00E20BAW	11	M25	19
175u3233	MCE101C5R70P6K00E20BAW	5.7	M25	19
175u3234	MCE101C5R70P8K00E20BAW	5.7	M25	20
175u3235	MCE101C3R50P9K00E20BAW	3.5	M25	21
175u3237	MCE101C28R0P6K00E20BAW	28	M25	19
175u3238	MCE101C22R0P8K00E20BAW	22	M25	20
175u3239	MCE101C38R0P6K00E20BAW	38	M25	19
175u3240	MCE101C31R0P8K00E20BAW	31	M25	20
175u3242	MCE101C52R0P6K00E20BAW	52	M25	19
175u3243	MCE101C42R0P8K00E20BAW	42	M25	20
175u3244	MCE101C31R0P10K0E20BAW	31	M25	22
175u3245	MCE101C7R00P7K00E20BAW	7	M32	20

Table 9.18 Mechanical Dimensions

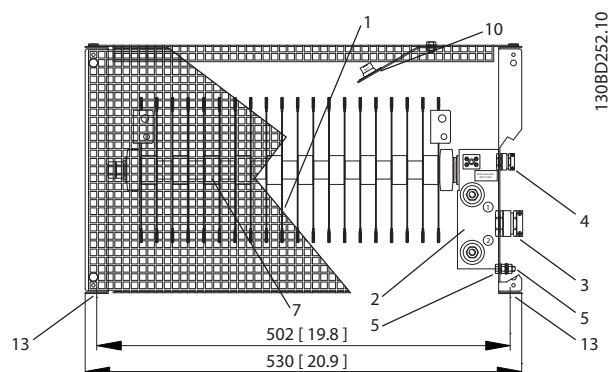


Illustration 9.45 IP20, Front View

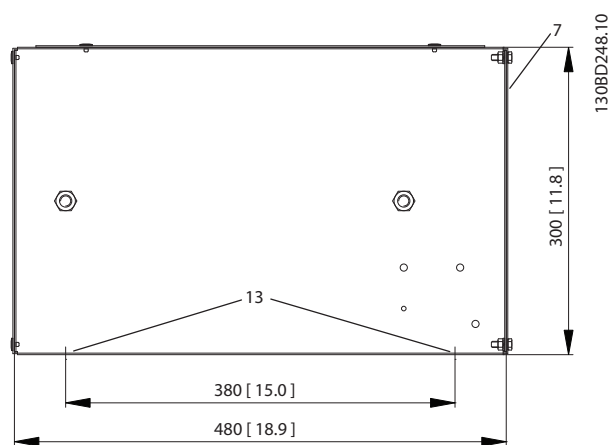


Illustration 9.46 IP20, Side View, Left

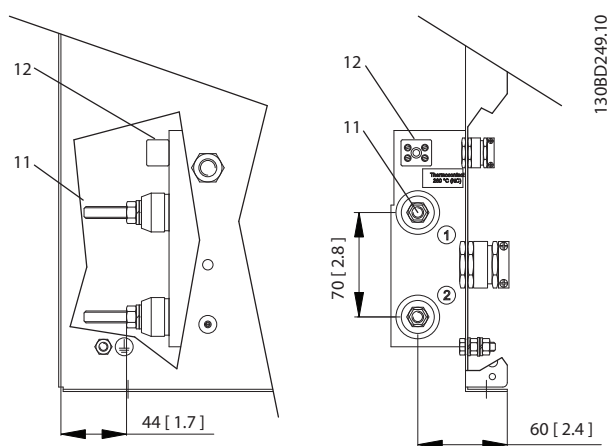


Illustration 9.47 Connections

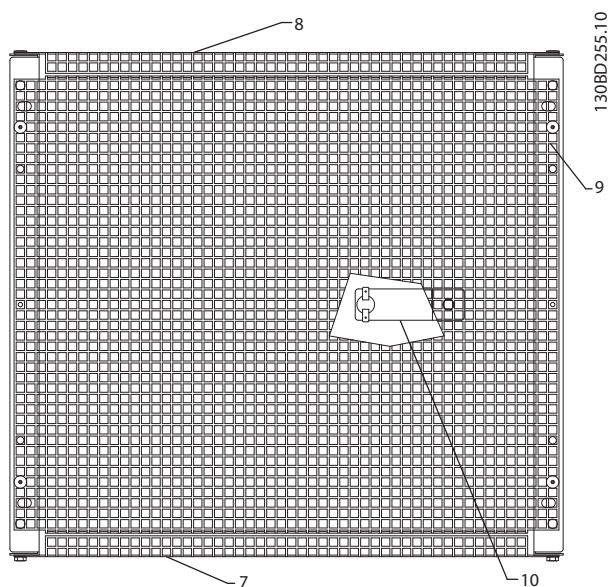


Illustration 9.48 IP20, Top View

9.7.10 Figure 10 - 917CM17

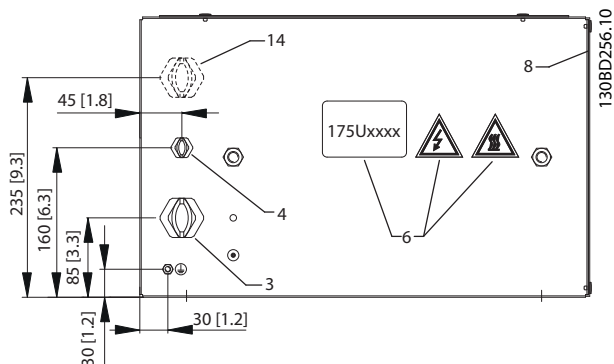


Illustration 9.49 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.52</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M6
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	4x fixing hole Ø 9 mm
14	Second cable gland. Not in use.

Table 9.19 Legend to *Illustration 9.49* to *Illustration 9.53*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3072	MCE101C7R40P11K0E20BAW	7.4	M40	24
175u3075	MCE101C6R10P13K0E20BAW	6.1	M50	25
175u3083	MCE101C3R70P11K0E20BAW	3.7	M50	24
175u3084	MCE101C3R30P13K0E20BAW	3.3	2xM25	25
175u3201	MCE101C27R0P14K0E20BAW	27.0	M25	25
175u3204	MCE101C19R0P14K0E20BAW	19	M25	25
175u3206	MCE101C14R0P14K0E20BAW	14.0	M32	25
175u3224	MCE101C3R50P14K0E20BAW	3.5	M40	25

Table 9.20 Mechanical Dimensions

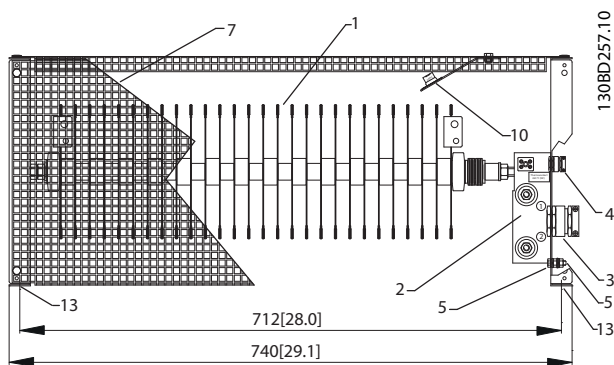


Illustration 9.50 IP20, Front View

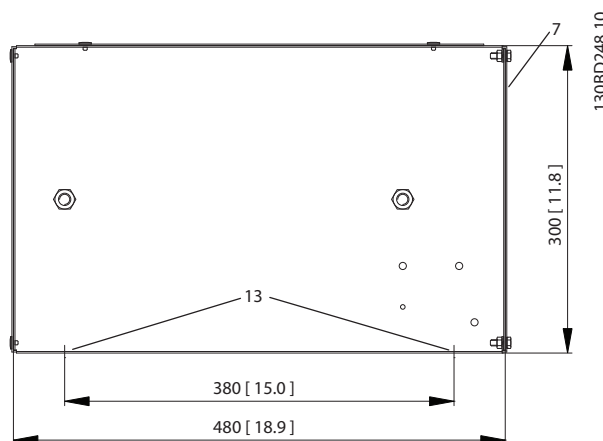


Illustration 9.51 IP20, Side View, Left

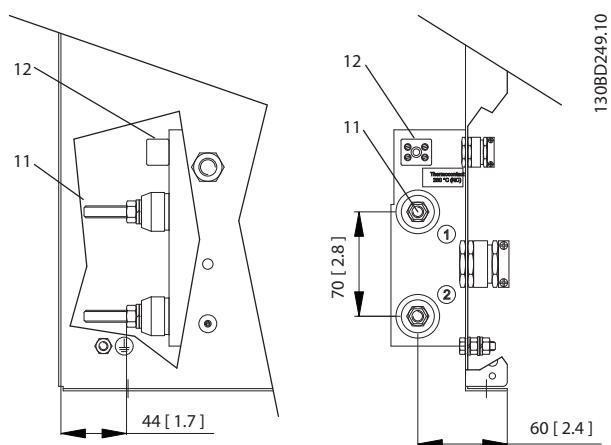


Illustration 9.52 Connections

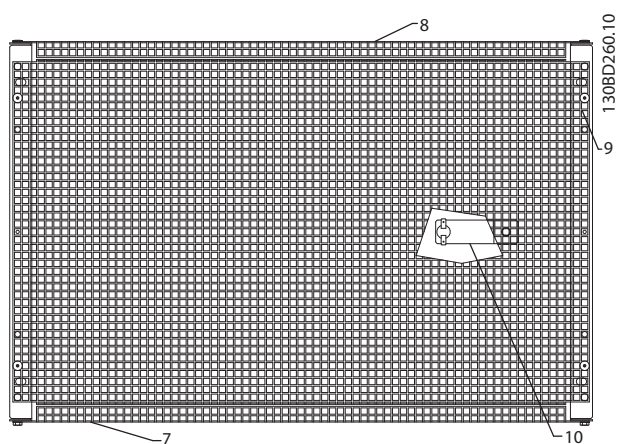


Illustration 9.53 IP20, Top View

9.7.11 Figure 11 - 917CM25

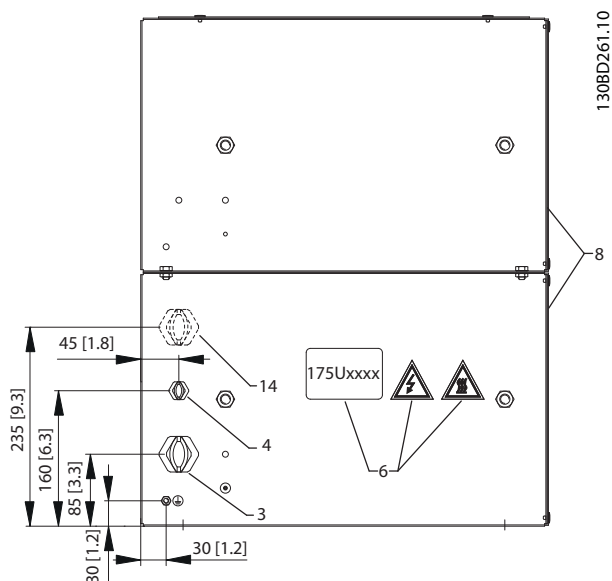


Illustration 9.54 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.57</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M6
6	Name plate/warnings signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	4x fixing hole Ø 9 mm
14	Second cable gland. Not in use

Table 9.21 Legend to *Illustration 9.54* to *Illustration 9.58*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3078	MCE101C5R00P16K0E20BAW	5.0	2xM25	35
175u3082	MCE101C4R00P20K0E20BAW	4.0	2xM32	37
175u3088	MCE101C2R70P16K0E20BAW	2.7	2xM32	35
175u3091	MCE101C2R10P20K0E20BAW	2.1	2xM40	37
175u3202	MCE101C22K0P17K0E20BAW	22.0	M25	35
175u3207	MCE101C14R0P17K0E20BAW	14.0	M32	35
175u3210	MCE101C12R0P17K0E20BAW	12.0	M32	35
175u3227	MCE101C2R80P17K0E20BAW	2.8	M40	35

Table 9.22 Mechanical Dimensions

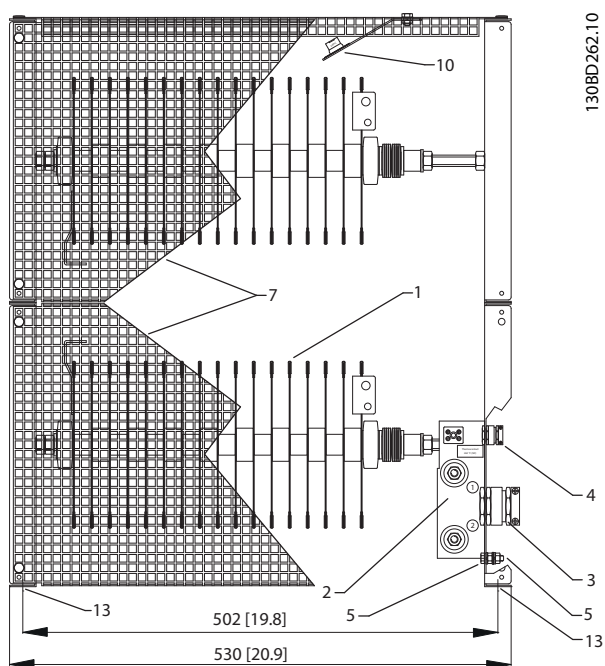


Illustration 9.55 IP20, Front View

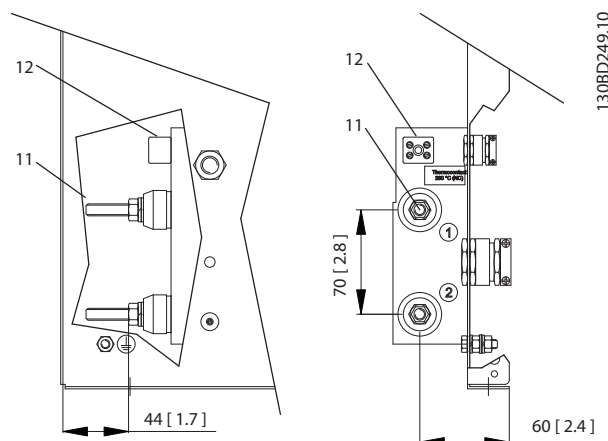


Illustration 9.57 Connections

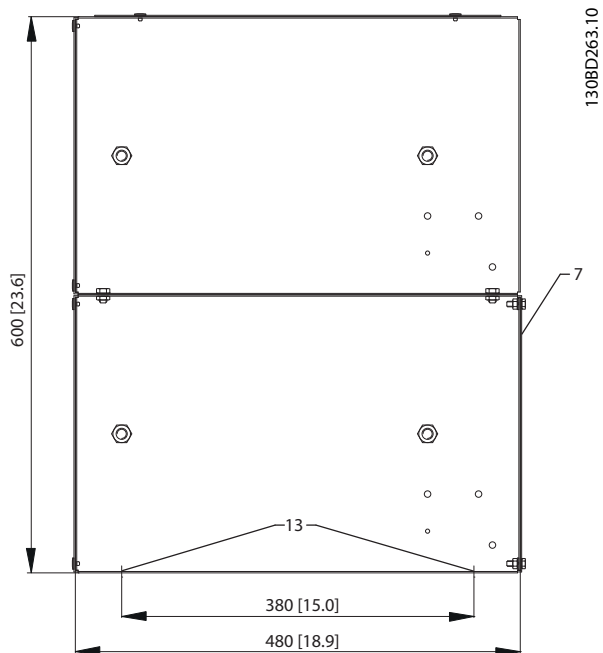


Illustration 9.56 IP20, Side View, Left

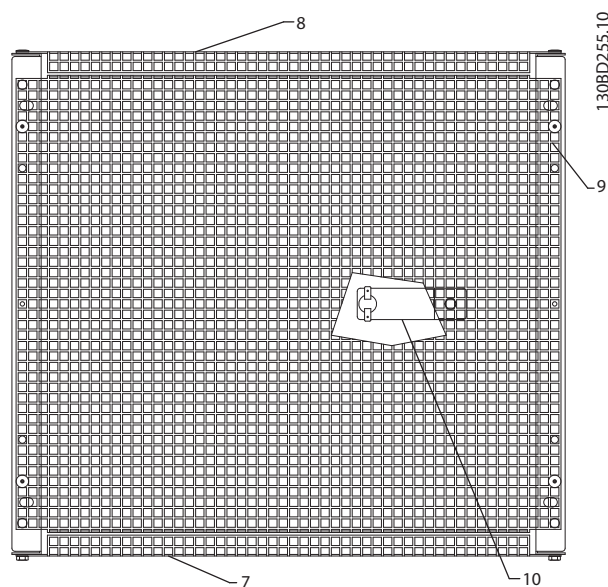
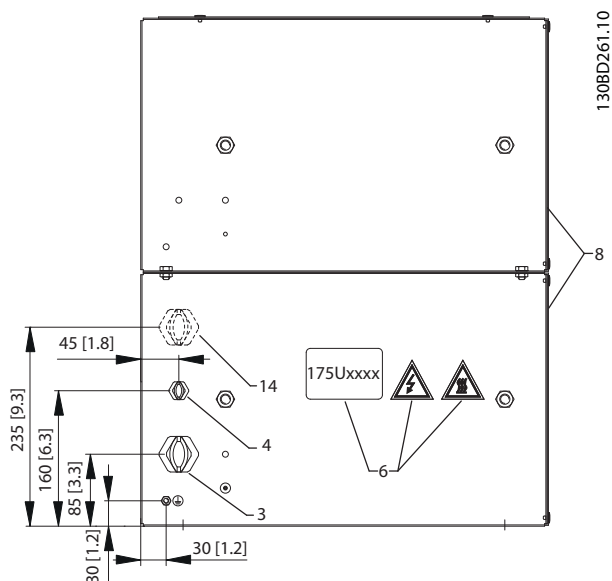


Illustration 9.58 IP20, Top View

9.7.12 Figure 12 - 917CM27



1	Resistor
2	Terminal board, see <i>Illustration 9.62</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M6
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	4x fixing hole Ø 9 mm
14	Second cable gland. Not in use.

Table 9.23 Legend to *Illustration 9.59* to *Illustration 9.63*

Illustration 9.59 IP20, Side View, Right

Danfoss P/N	Typecode	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3085	MCE101C3R30P26K0E20BAW	3.3	2xM32	45
175u3089	MCE101C2R50P32K0E20BAW	2.5	2xM50	48
175u3093	MCE101C1R70P26K0E20BAW	1.7	2xM50	45
175u3097	MCE101C1R30P32K0E20BAW	1.3	2xM50	48
175u3205	MCE101C15R5P21K0E20BAW	15.5	M32	41
175u3208	MCE101C13R5P21K0E20BAW	13.5	M32	41
175u3209	MCE101C13R5P26K0E20BAW	13.5	M32	45
175u3211	MCE101C11R0P26K0E20BAW	11.0	M32	45
175u3213	MCE101C9R50P21K0E20BAW	9.5	M32	41
175u3216	MCE101C7R00P26K0E20BAW	7.0	M40	45
175u3241	MCE101C7R00P30K0E20BAW	7.0	M40	52

Table 9.24 Mechanical Dimensions

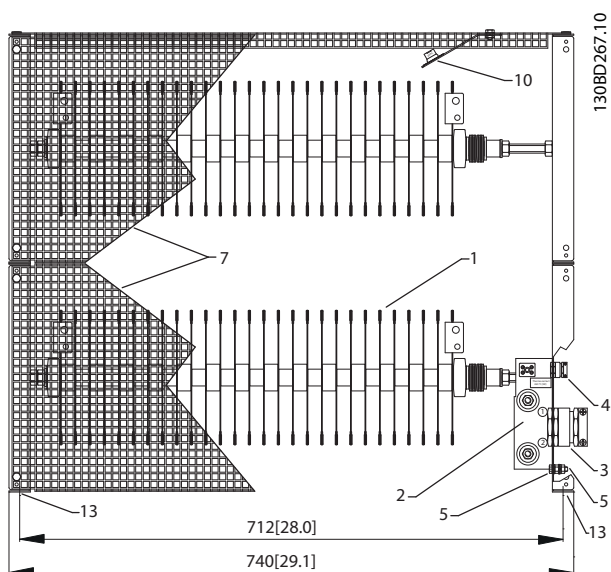


Illustration 9.60 IP20, Front View

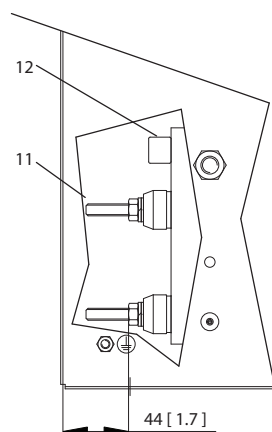
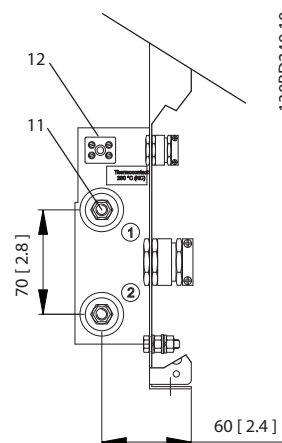


Illustration 9.62 Connections



1308D249.10

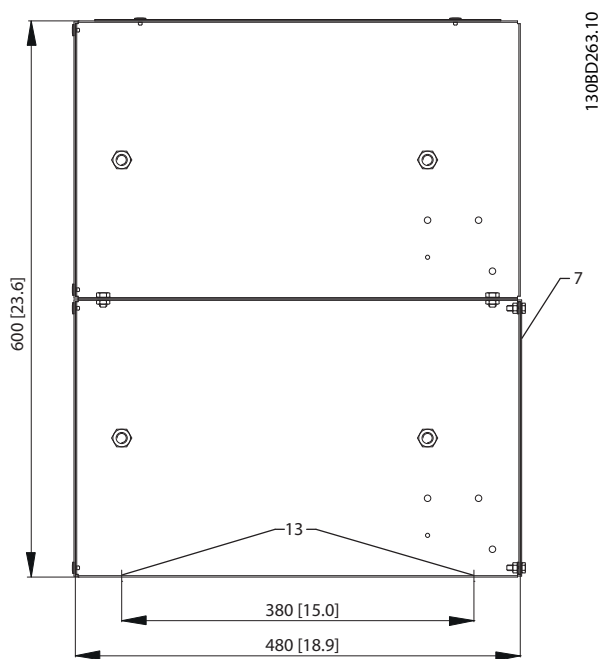


Illustration 9.61 IP20, Side View, Left

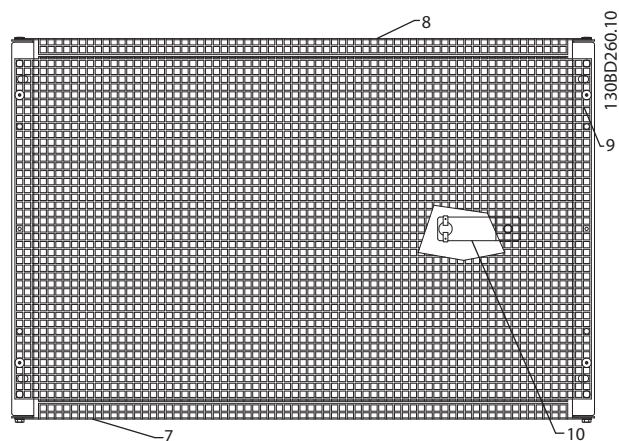


Illustration 9.63 IP20, Top View

9.7.13 Figure 13 - 917CM37

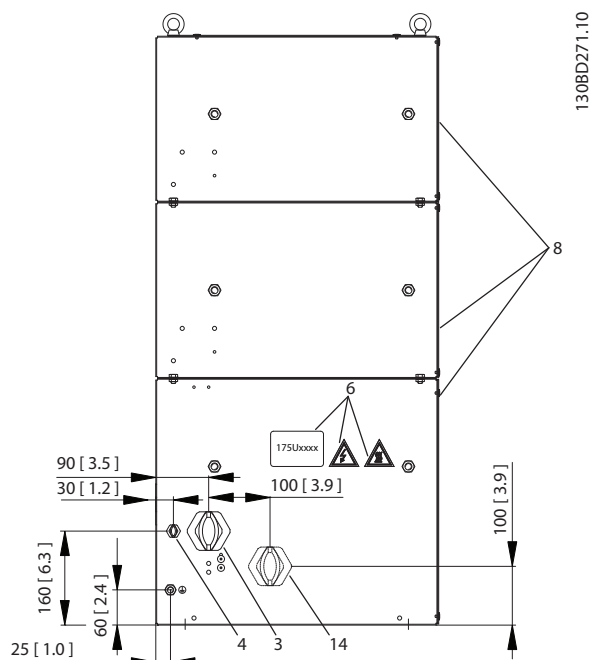


Illustration 9.64 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.67</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M10
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	4x fixing hole Ø 9 mm
14	Second cable gland. Not in use.

Table 9.25 Legend to *Illustration 9.64* to *Illustration 9.68*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3090	MCE101C2R30P36K0E20BAW	2.3	2xM50	74
175u3092	MCE101C2R00P42K0E20BAW	2.0	2xM50	78
175u3098	MCE101C1R20P36K0E20BAW	1.2	2xM50	74
175u3099	MCE101C1R10P42K0E20BAW	1.1	2xM50	78
175u3212	MCE101C11R0P36K0E20BAW	11.0	M32	74
175u3214	MCE101C9R10P42K0E20BAW	9.1	M40	78
175u3217	MCE101C7R00P36K0E20BAW	7.0	M50	74
175u3219	MCE101C5R50P36K0E20BAW	5.5	M40	74
175u3221	MCE101C4R70P42K0E20BAW	4.7	M40	78

Table 9.26 Mechanical Dimensions

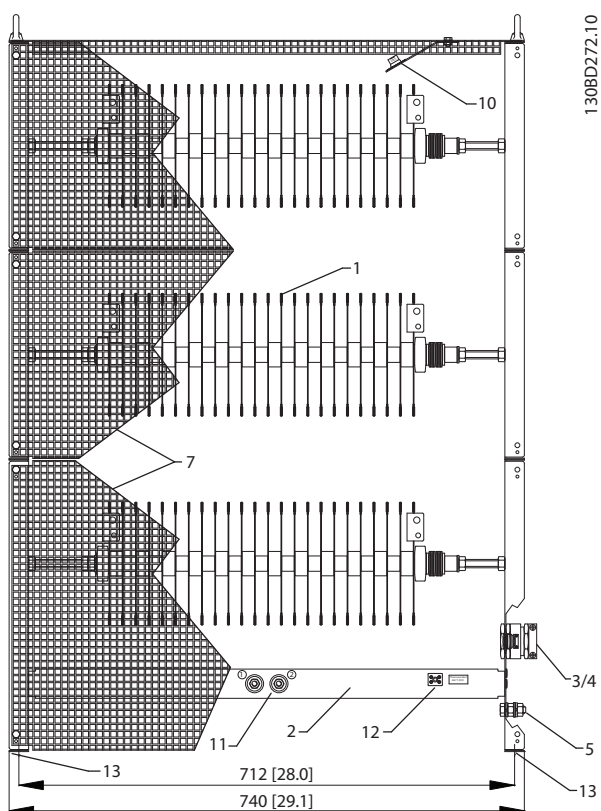


Illustration 9.65 IP20, Front View

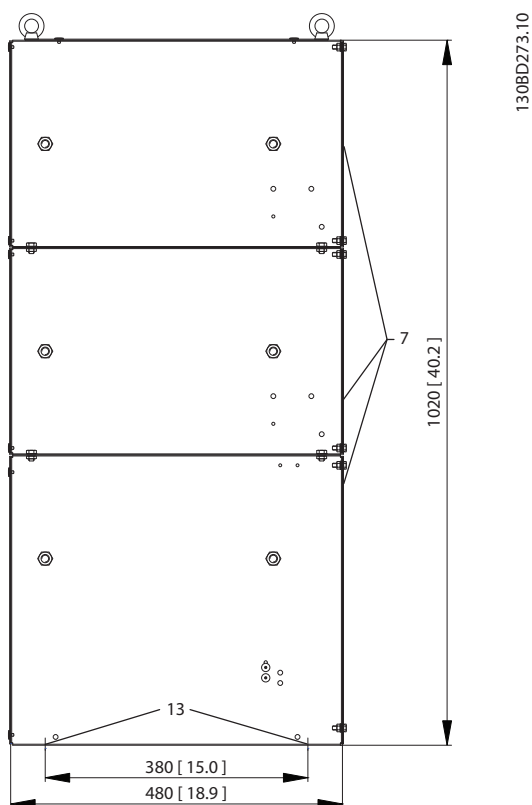


Illustration 9.66 IP20, Side View, Left

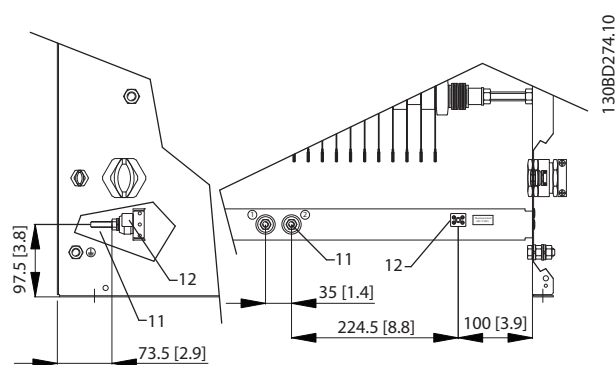


Illustration 9.67 Connections

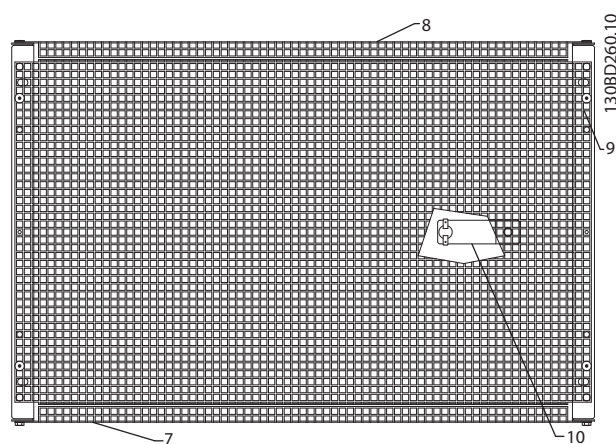


Illustration 9.68 IP20, Top View

9.7.14 Figure 14 - 917CMD27

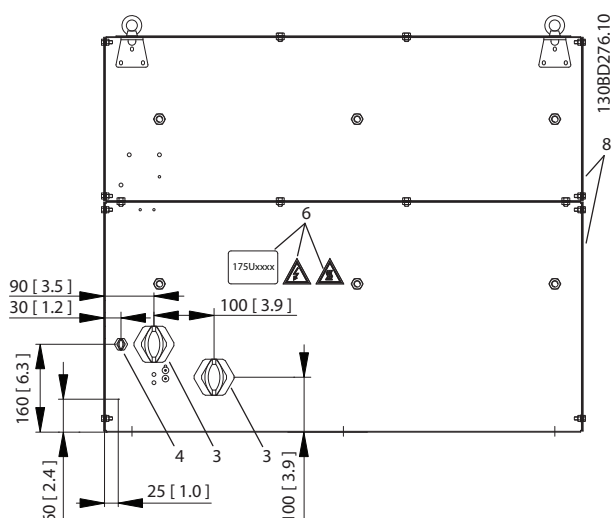


Illustration 9.69 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.72</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M10
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2xbolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	6xfixing hole Ø 9 mm

Table 9.27 Legend to *Illustration 9.69* to *Illustration 9.73*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3094	MCE101C1R60P52K0E20BAW	1.6	2xM50	90
175u3095	MCE101C1R40P60K0E20BAW	1.4	2xM50	90
175u3215	MCE101C7R40P52K0E20BAW	7.4	M40	90
175u3218	MCE101C6R10P60K0E20BAW	6.1	M50	90
175u3223	MCE101C3R70P52K0E20BAW	3.7	M50	90
175u3225	MCE101C3R30P60K0E20BAW	3.3	2xM25	90

Table 9.28 Mechanical Dimensions

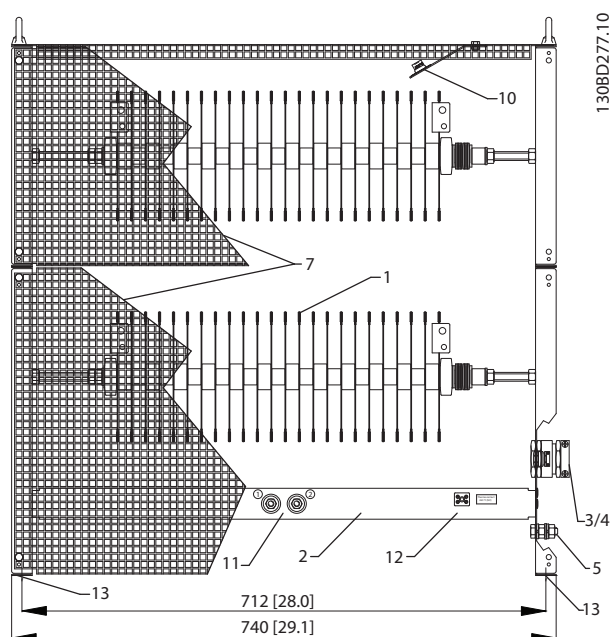


Illustration 9.70 IP20, Front View

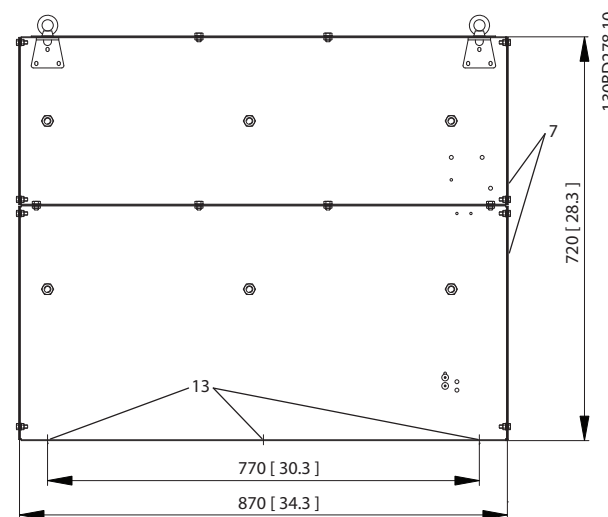


Illustration 9.71 IP20, Side View, Left

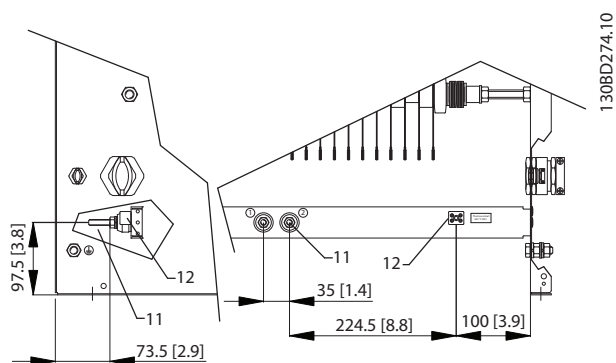


Illustration 9.72 Connections

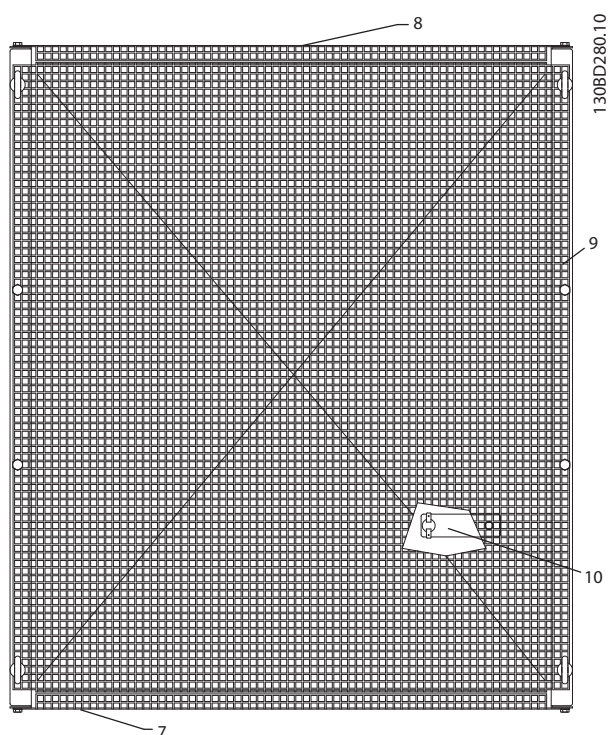


Illustration 9.73 IP20, Top View

9.7.15 Figure 15 - 917CMD37

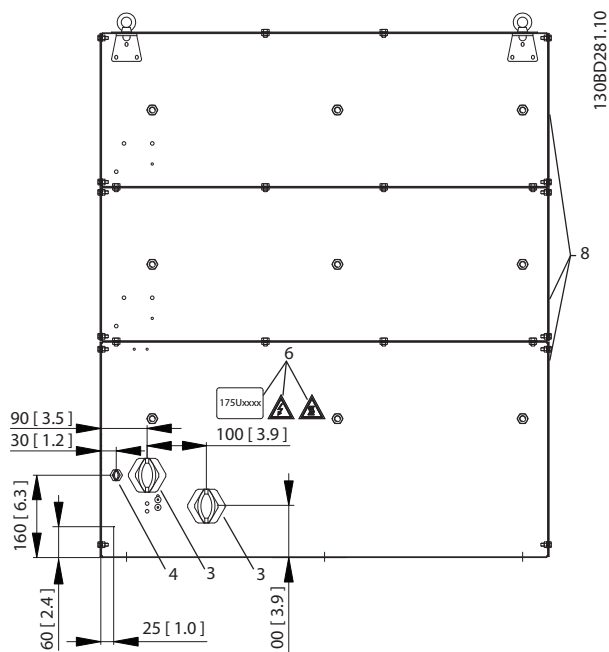


Illustration 9.74 IP20, Side View, Right

1	Resistor
2	Terminal board, see <i>Illustration 9.77</i>
3	Cable gland for load cables
4	Cable gland M16 temperature switch cable
5	Grounding bolt M10
6	Name plate/warning signs
7	Front cover IP20
8	Rear cover IP20
9	Top cover IP20
10	Temperature switch 260 °C (NC)
11	Load connection, 2x bolt M8
12	Auxiliary connection for temperature switch, porcelain clamp 2.5 mm ²
13	6x fixing hole Ø 9 mm

Table 9.29 Legend to *Illustration 9.74* to *Illustration 9.78*

Danfoss P/N	Type code	Resistance [Ω]	Cable gland type for load terminals	Weight [kg]
175u3220	MCE101C5R00P78K0E20BAW	5.0	2xM25	182
175u3222	MCE101C4R00P90K0E20BAW	4.0	2xM32	190
175u3228	MCE101C2R70P78K0E20BAW	2.7	2xM32	182
175u3230	MCE101C2R10P90K0E20BAW	2.1	2xM40	190

Table 9.30 Mechanical Dimensions

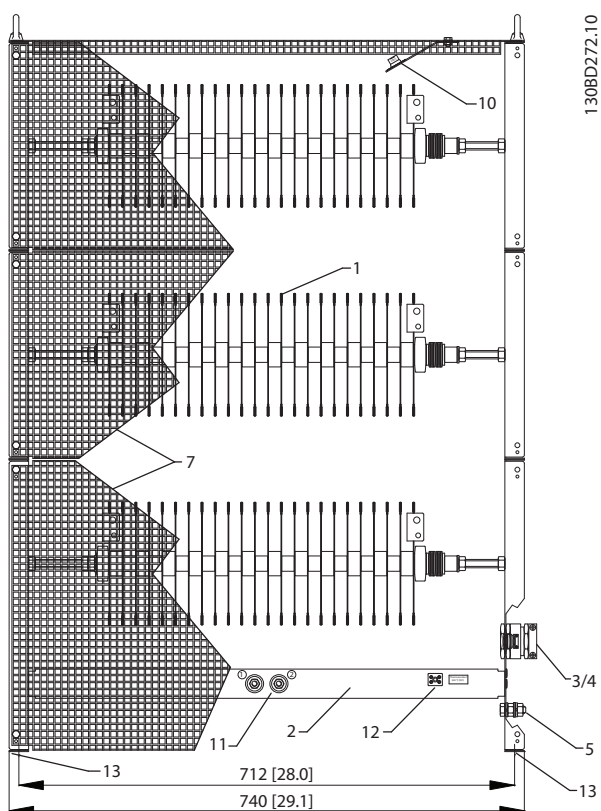


Illustration 9.75 IP20, Front View

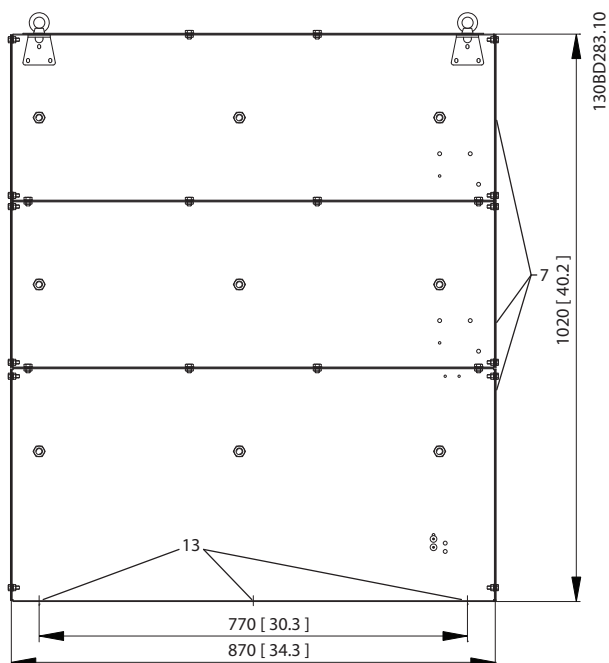


Illustration 9.76 IP20, Side View, Left

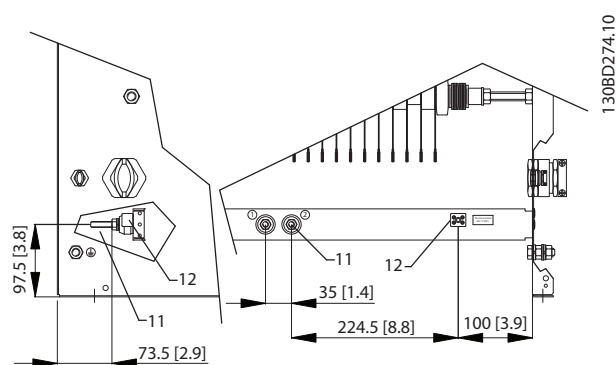


Illustration 9.77 Connections

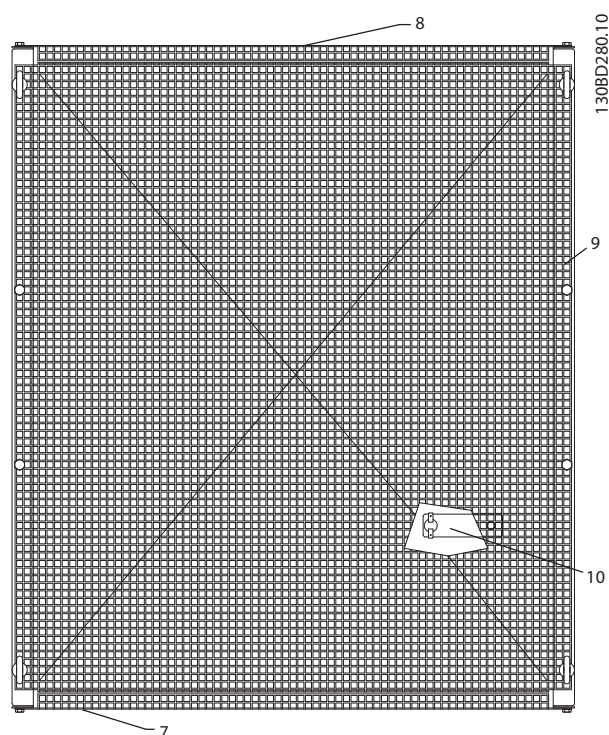
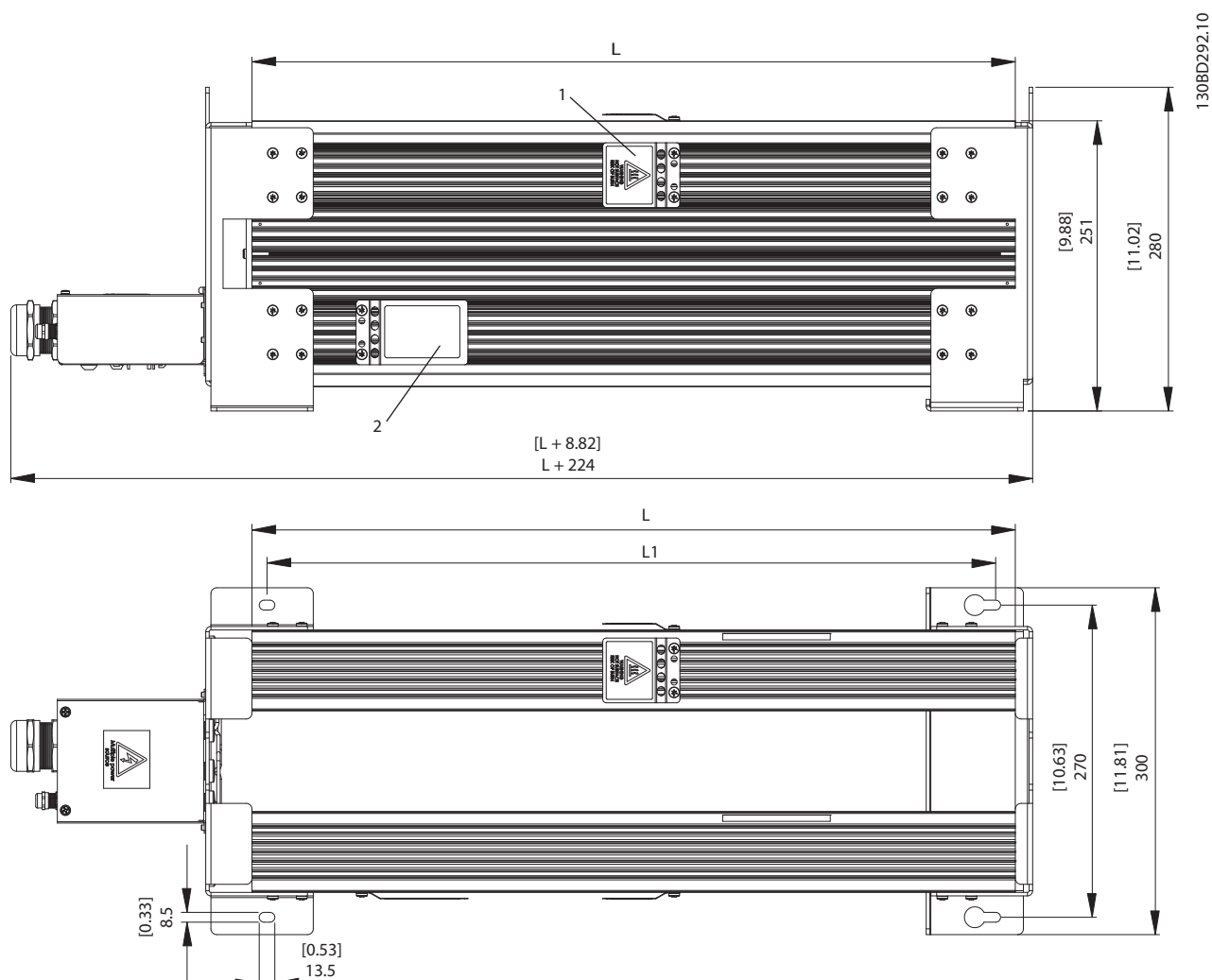


Illustration 9.78 IP20, Top View

9.7.16 Figure 16 - 929CBT-VxxxGHT



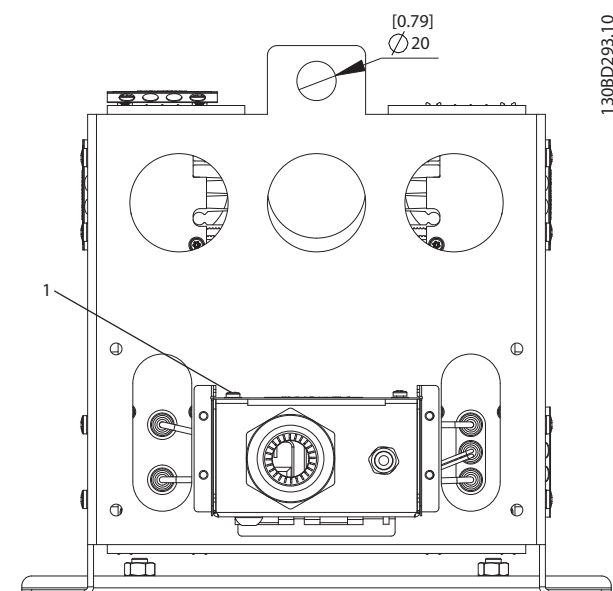
1	Hot surface warning x3
2	Name plate

Illustration 9.79 IP21, Side View and Top View

Danfoss P/N	Typecode	Ω	$L \pm 2$ mm	$L \pm 0.08$ in	$L1 \pm 2$ mm	$L1 \pm 0.04$ in	Weight [kg]
175U3051	MCE101A15R5P3K50E21TAW	15.5	560	22.05	530	20.87	25.5
175U3057	MCE101A13R5P4K20E21TAW	13.5	660	25.98	630	24.80	29
175U3063	MCE101A11R0P5K50E21TAW	11	760	29.92	730	28.74	32.5
175U3065	MCE101A9R50P4K20E21TAW	9.5	660	25.98	630	24.80	29
175U3070	MCE101A7R00P5K50E21TAW	7	760	29.92	730	28.74	32.5
175U3134	MCE101A105RP4K20E21TAW	105	660	25.98	630	24.80	29
175U3142	MCE101A72R0P4K20E21TAW	72	660	25.98	630	24.80	29
175U3148	MCE101A52R0P5K50E21TAW	52	760	29.92	730	28.74	32.5
175U3156	MCE101A38R0P5K50E21TAW	38	760	29.92	730	28.74	32.5
175U3174	MCE101A13R0P3K50E21TAW	13	560	22.05	530	20.87	25.5
175U3176	MCE101A9R00P5K50E21TAW	9	760	29.92	730	28.74	32.5
175U3178	MCE101A5R70P5K50E21TAW	5.7	760	29.92	730	28.74	32.5

Danfoss P/N	Typecode	Ω	L $\pm$ 2 mm	L $\pm$ 0.08 in	L1 $\pm$ 2 mm	L1 $\pm$ 0.04 in	Weight [kg]
175U3474	MCE101A15R5P4K20E21TAW	15.5	660	25.98	630	24.80	29
175U3476	MCE101A13R5P5K50E21TAW	13.5	760	29.92	730	28.74	32.5

Table 9.31 Mechanical Dimensions



1	Torque 1–1.4 Nm (8.85–12.39 lb-in)
---	------------------------------------

Illustration 9.80 IP21, End View, Connection Box

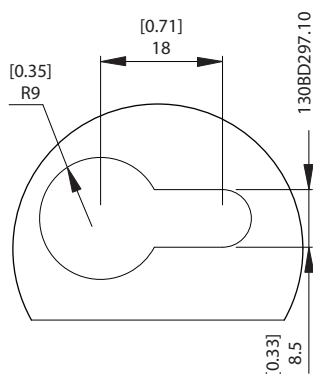
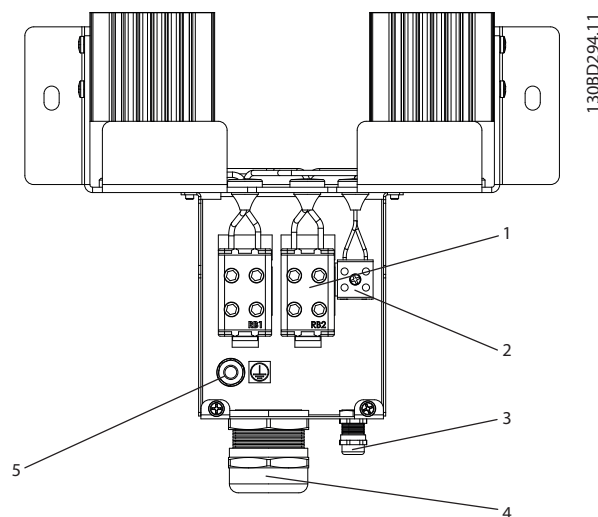


Illustration 9.81 Mounting Hole



1	Resistor connection: Marked RB1/RB2 Type: ENSTO KE 66 IEC: Cu 2.5-50 mm², Al: 6-50 mm²/750 V UL: AWG 6-1/0/600 V Wire stripping: 23 mm (0.9 in) Torque: 10 Nm (88.51 lb-in)
2	Temperature switch connection: Marked: T1/T2 Type: PHOENIX G5/2 with screw connection IEC: 0.2-4 mm² 500 V UL: AWG 24-12/300 V Wire stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
3	For temperature switch cable: Clamping range: 3.5–7.0 mm (0.14–0.28 in) Size Wrench (SW): 16 mm (0.63 in)
4	For resistor cable: Cable gland with internal connection for braid Clamping range: 19-28 mm Size Wrench (SW): 45 mm (1.78 in)
5	PE: M8 Torque: 4.5–5.5 Nm (39.83–48.68 lb-in)

Illustration 9.82 Connection Box

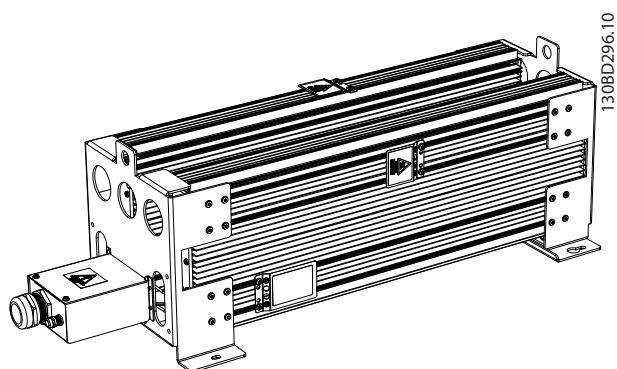


Illustration 9.83 IP21, 3D View

Mechanical mounting (see *Illustration 9.84*):

- Vertical with connection box down (IP21), or
- Horizontal (IP20)

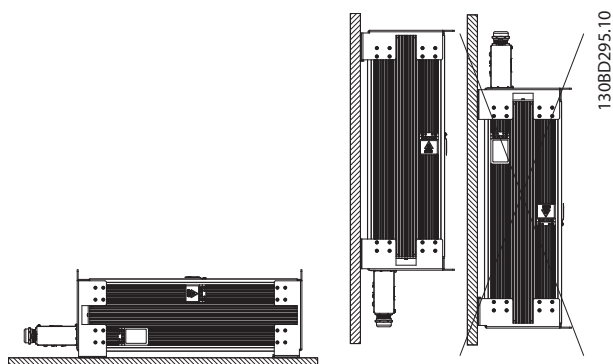
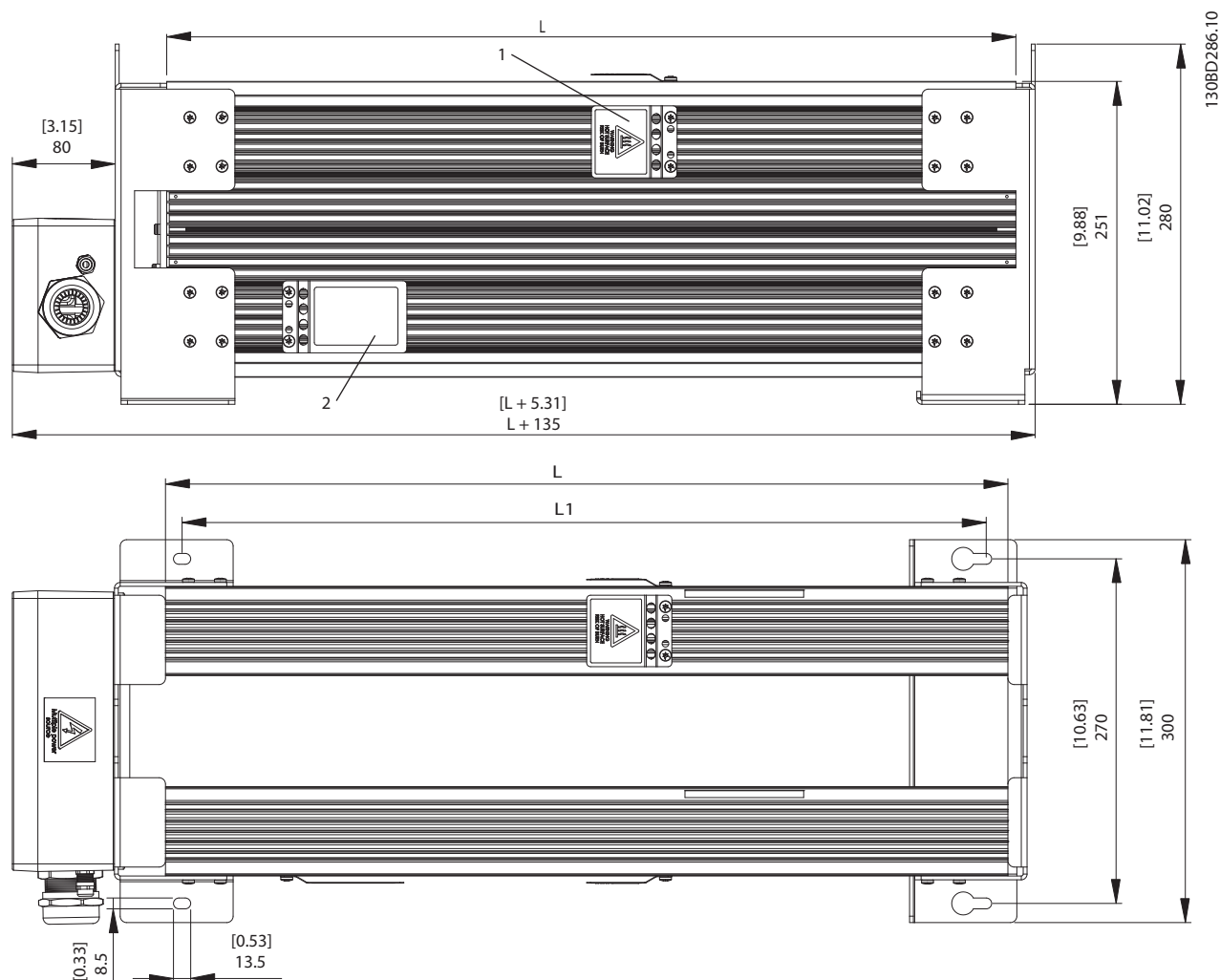


Illustration 9.84 Mechanical Mounting

9.7.17 Figure 17 - 929CBT-VxxxBGHT



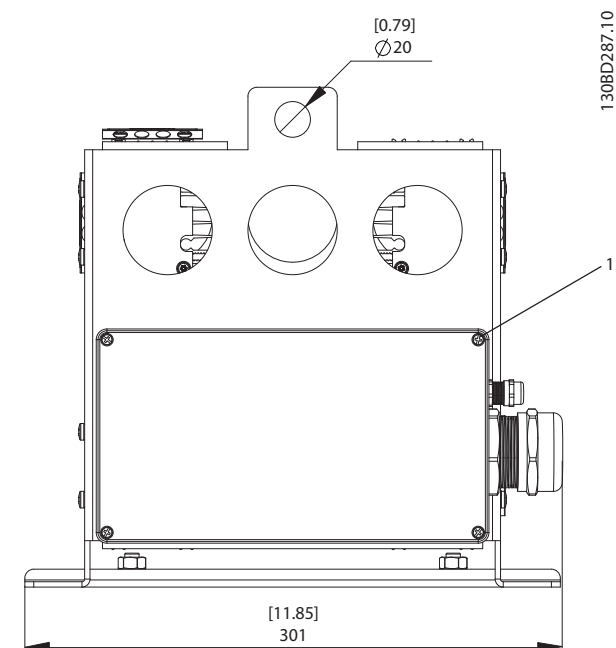
1	Hot surface warning x3
2	Name plate

Illustration 9.85 IP65, Side View and Top View

Danfoss code	Typecode	Ω	L±2 mm	L±0.08 in	L1±2 mm	L1±0.04 in	Weight [kg]
175U3052	MCE101A15R5P3K50E65TAW	15,5	560	22.05	530	20.87	26.5
175U3058	MCE101A13R5P4K20E65TAW	13,5	660	25.95	630	24.8	30
175U3064	MCE101A11R0P5K50E65TAW	11	760	29.92	730	28.74	33.5
175U3066	MCE101A9R50P4K20E65TAW	9,5	660	25.95	630	24.8	30
175U3071	MCE101A7R00P5K50E65TAW	7	760	29.92	730	28.74	33.5
175U3135	MCE101A105RP4K20E65TAW	105	660	25.95	630	24.8	30
175U3143	MCE101A72R0P4K20E65TAW	72	660	25.95	630	24.8	30
175U3149	MCE101A52R0P5K50E65TAW	52	760	29.92	730	28.74	33.5
175U3157	MCE101A38R0P5K50E65TAW	38	760	29.92	730	28.74	33.5
175U3175	MCE101A13R0P3K50E65TAW	13	560	22.05	530	20.87	26.5
175U3177	MCE101A9R00P5K50E65TAW	9	760	29.92	730	28.74	33.5

Danfoss code	Typecode	Ω	$L \pm 2$ mm	$L \pm 0.08$ in	$L1 \pm 2$ mm	$L1 \pm 0.04$ in	Weight [kg]
175U3179	MCE101A5R70P5K50E65TAW	5,7	760	29.92	730	28.74	33.5
175U3473	MCE101A15R5P4K20E65TAW	15,5	660	25.95	630	24.8	30
175U3475	MCE101A13R5P5K50E65TAW	13,5	760	29.92	730	28.74	33.5

Table 9.32 Mechanical Dimension



1	Torque 1–1.4 Nm (8.86–12.34 lb-in)
---	------------------------------------

Illustration 9.86 IP65, End View, Connection Box

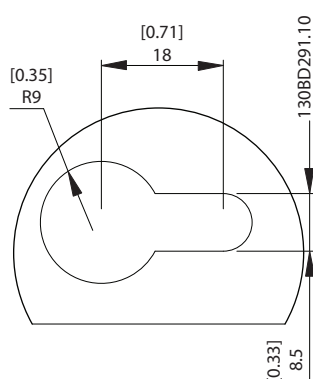
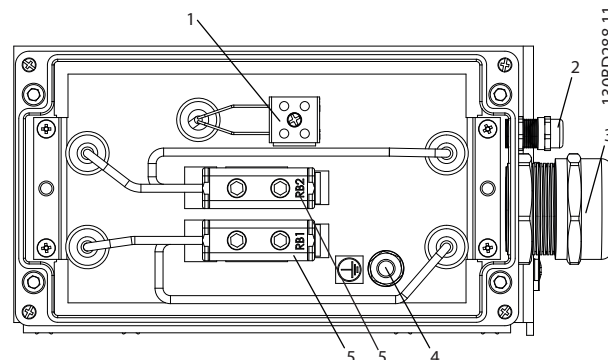


Illustration 9.87 Mounting Hole



1	Temperature switch connection: Marked: T1 /T2 IEC: 0.2–4 mm ² /500 V UL: AWG 24–12/300 V Wire stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
2	For temperature switch cable: Clamping range: 3.5–7.0 mm (0.14–0.28 in) Size Wrench (SW): 16 mm (0.63 in)
3	For resistor cable: Cable gland with internal connection for braid Clamping range: 19–28 mm (0.74–1.1 in) Size Wrench (SW): 45 mm (1.78)
4	PE: M8 Torque 4.5–5 Nm (39.83–48.68 lb-in)
5	Resistor connection: Marked RB1/RB2 IEC: Cu 2.5–50 mm ² , Al: 6–50 mm ² /750 V UL: AWG 6–1/0/600 V Wire stripping: 23 mm (0.9 in) Torque: 10 Nm (88.51 lb-in)

Illustration 9.88 Connection Box

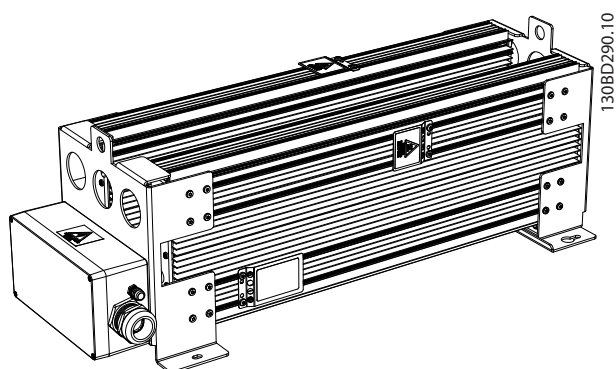


Illustration 9.89 IP65, 3D View

Mechanical mounting (see *Illustration 9.90*):

- Vertical with connection box down, or
- Horizontal

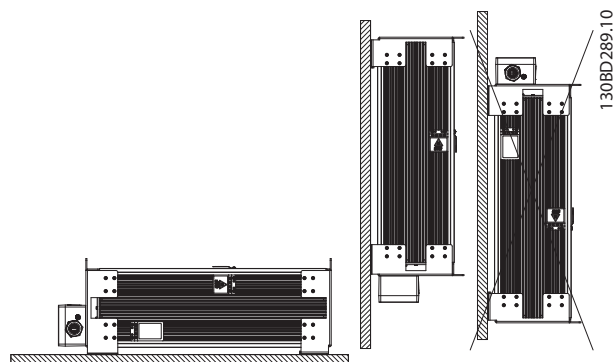
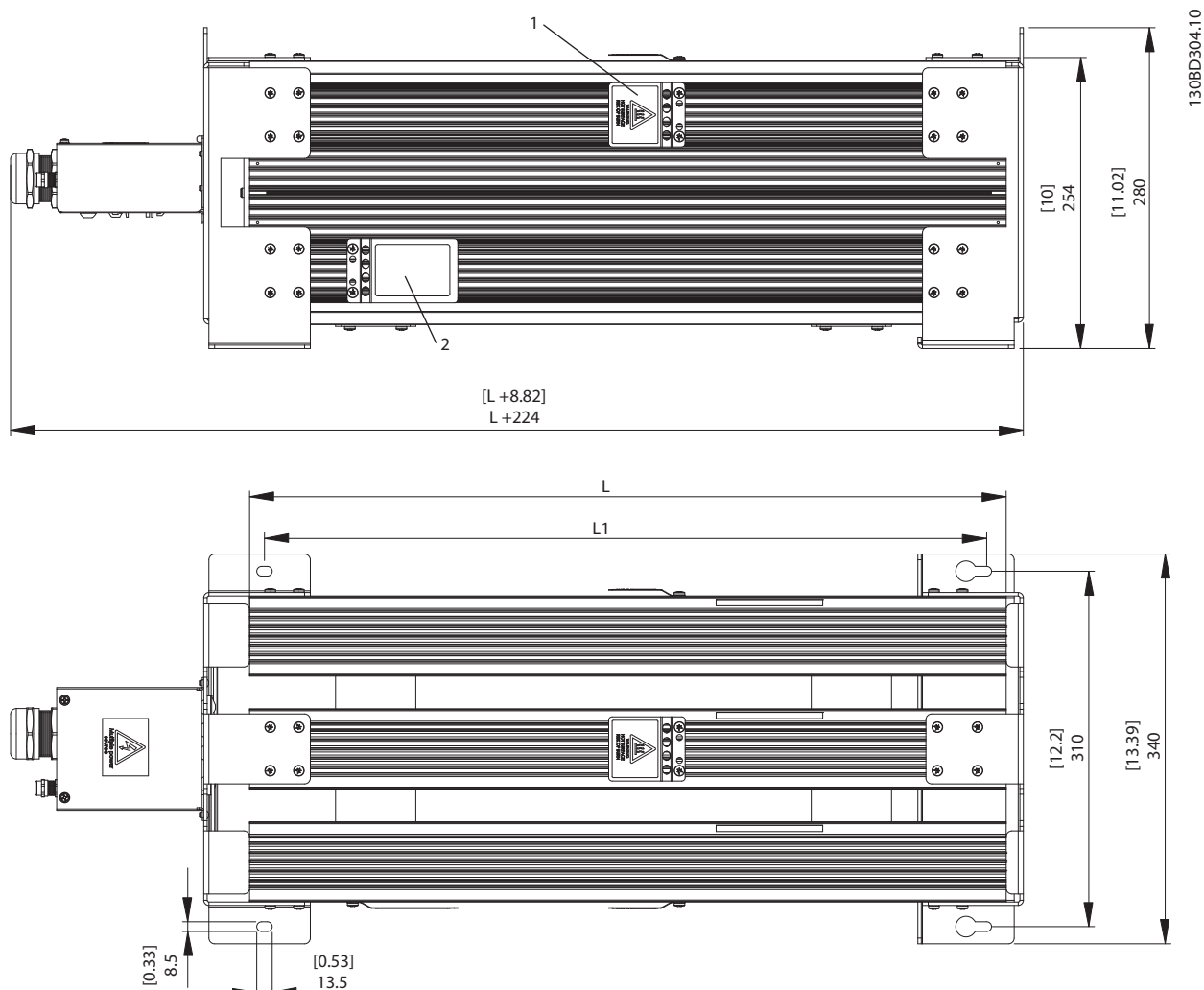


Illustration 9.90 Mechanical Mounting

9.7.18 Figure 18 - 930CBT-VxxxGHT

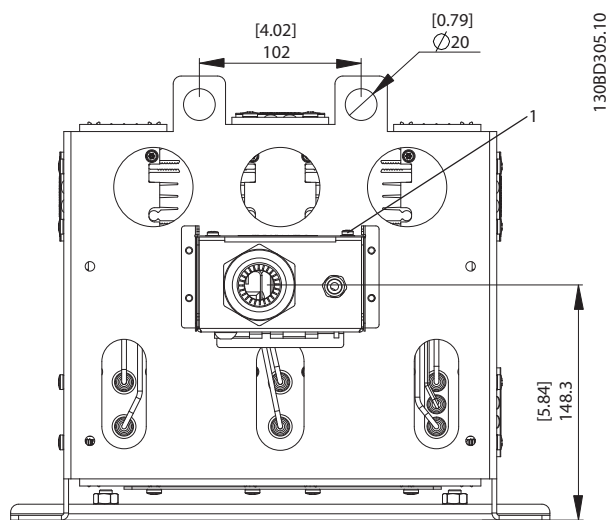


1	Hot Surface Warning x3
2	Name plate

Illustration 9.91 IP21, Side View and Top View

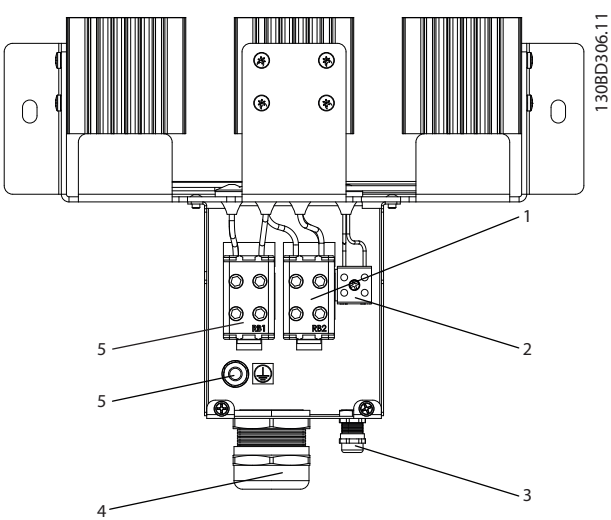
Danfoss P/N	Type code	Ω	$L \pm 2$ mm	$L \pm 0.08$ in	$L1 \pm 2$ mm	$L1 \pm 0.04$ in	Weight [kg]
175U3076	MCE101A5R50P6K30E21TAW	5.5	660	25.98	630	24.8	39
175U3154	MCE101A42R0P8K20E21TAW	42	760	29.92	730	28.74	44.5
175U3162	MCE101A31R0P8K20E21TAW	31	760	29.92	730	28.74	44.5
175U3166	MCE101A28R0P6K30E21TAW	28	660	25.98	630	24.8	39
175U3170	MCE101A22R0P8K20E21TAW	22	760	29.92	730	28.74	44.5
175U3180	MCE101A5R70P8K20E21TAW	5.7	760	29.92	730	28.74	44.5
175U3182	MCE101A3R50P8K20E21TAW	3.5	760	29.92	730	28.74	44.5

Table 9.33 Mechanical Dimensions



1	Torque 1–1.4 Nm (8.86–12.34 in)
---	---------------------------------

Illustration 9.92 IP21, End View, Connection Box



1	Resistor connection: Marked RB1/RB2 ENSTO KE66 EIC: Cu 2.5-50 mm ² , Al 6-50 mm ² /750 V UL: AWG 6-1/0 / 600 V Wire stripping: 23 mm (0.9 in) Torque: 10 Nm (90 lb-in)
2	Temperature switch connection: Marked: T1/T2 PHOENIX G5/2 IEC: 0.2-4 mm ² /500 V UL: AWG 28-10/300 V Wire stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
3	For temperature switch cable: Clamping Range: 3.5-7.0 mm (0.14–0.28 in) Size Wrench (SW): 16 mm (0.63 in)
4	For resistor cable: Cable gland with internal connection for braid Clamping Range: 19-28 mm (0.74–1.1 in) Size Wrench (SW): 45 mm (1.78 in)
5	PE: M8 Torque: 5–5.5 Nm (44.28–48.71 lb-in)

Illustration 9.94 Connection Box

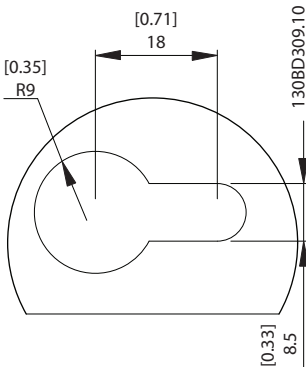


Illustration 9.93 Mounting Hole

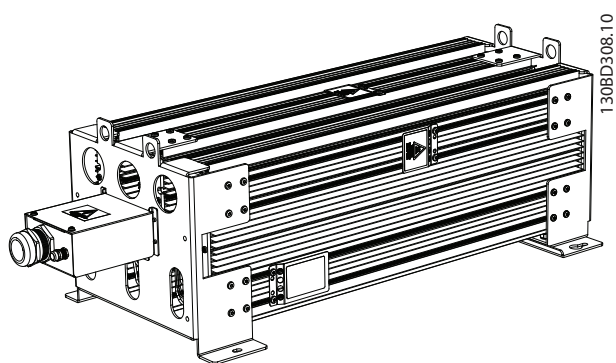


Illustration 9.95 IP21, 3D View

Mechanical mounting (see *Illustration 9.96*):

- Vertical with connection box down (IP21), or
- Horizontal (IP20)

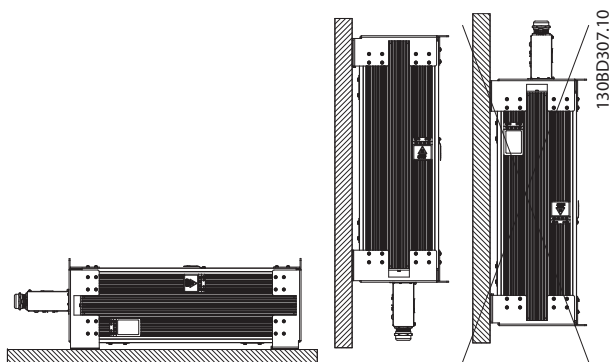
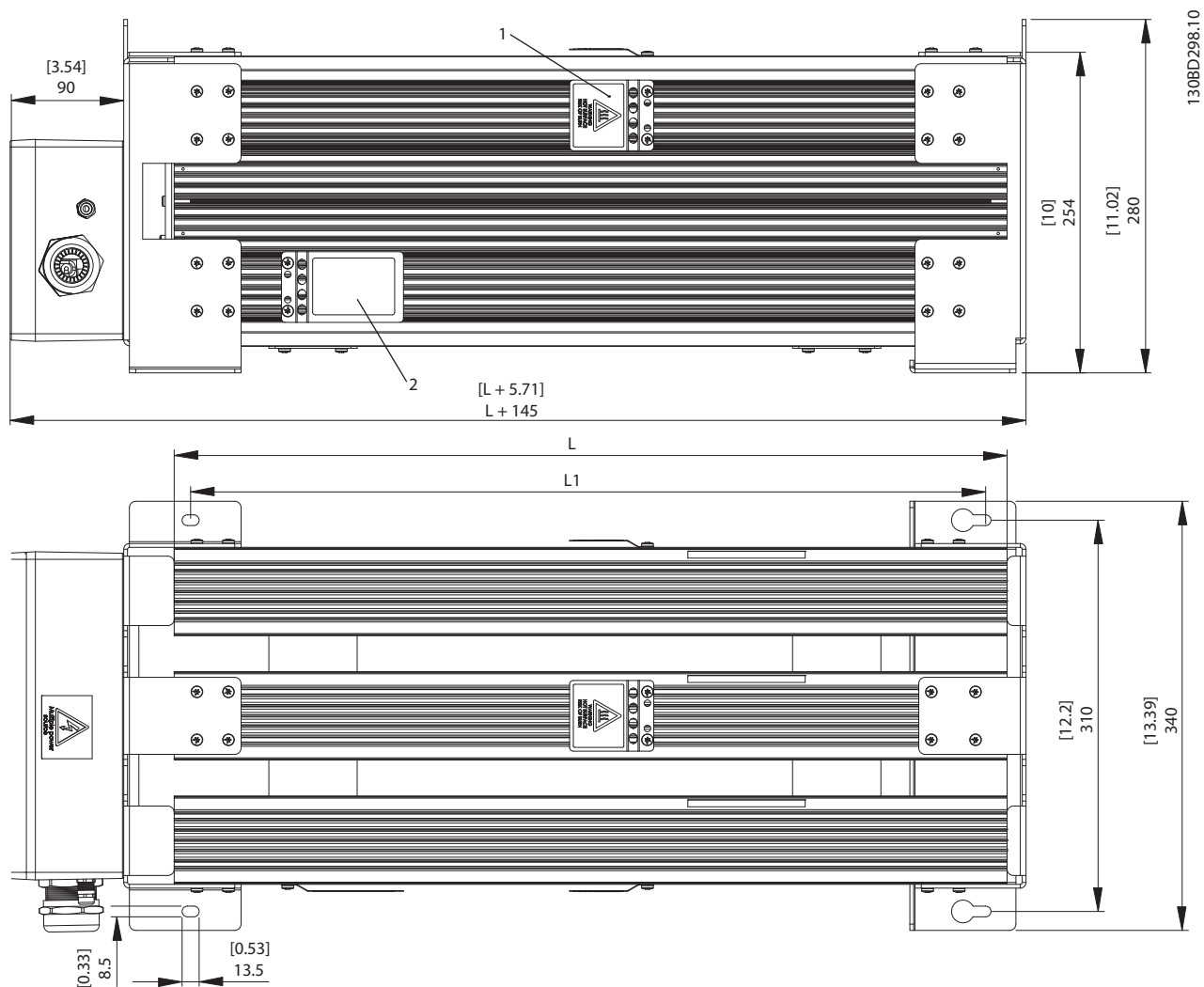


Illustration 9.96 Mechanical Mounting

9.7.19 Figure 19 - 930CBT- VxxxBGHT

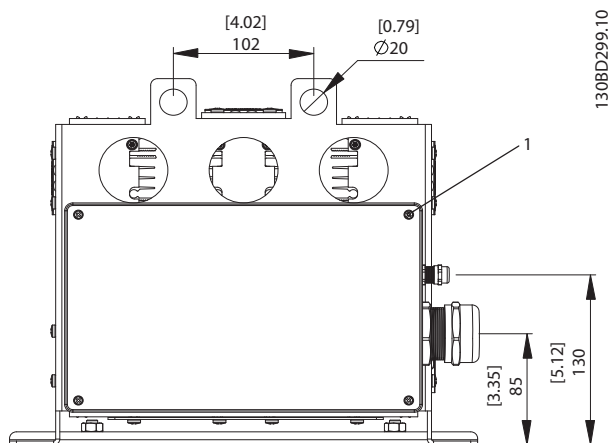


1	Hot Surface Warning
2	Name plate

Illustration 9.97 IP65, Side View and Top View

Danfoss P/N	Type code	Ω	L±2 mm	L±0.08 in	L1±2 mm	L1±0.04 in	Weight [kg]
175U3077	MCE101A5R50P6K30E65TAW	5.5	660	25.98	630	24.8	39
175U3155	MCE101A42R0P8K20E65TAW	42	760	29.92	730	28.74	44.5
175U3163	MCE101A31R0P8K20E65TAW	31	760	29.92	730	28.74	44.5
175U3167	MCE101A28R0P6K30E65TAW	28	660	25.98	630	24.8	39
175U3171	MCE101A22R0P8K20E65TAW	22	760	29.92	730	28.74	44.5
175U3181	MCE101A5R70P8K20E65TAW	5.7	760	29.92	730	28.74	44.5
175U3183	MCE101A3R50P8K20E65TAW	3.5	760	29.92	730	28.74	44.5

Table 9.34 Mechanical Dimensions



1	Torque 1–1.4 Nm (8.86–12.34 in)
---	---------------------------------

Illustration 9.98 IP65, End View, Connection Box

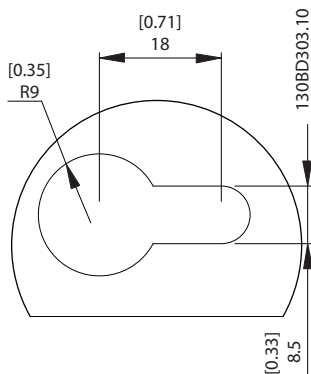
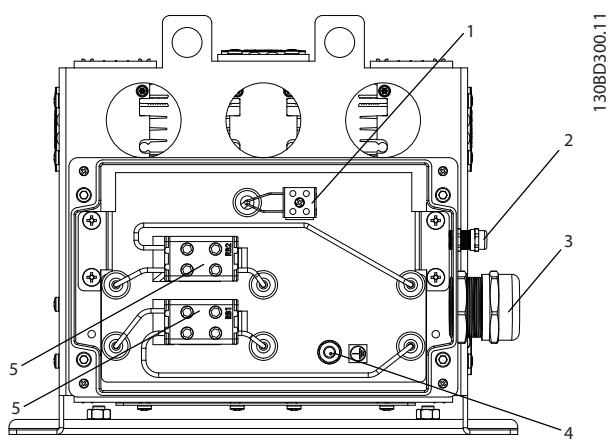


Illustration 9.99 Mounting Hole



1	Temperature switch connection: Marked: T1/T2, PHOENIX G5/2 IEC: 0.2-4 mm ² /500 V UL: AWG 28-10/300 V Wire stripping: 8 mm (0.31 in) Torque: 0.7 Nm (6.2 lb-in)
2	For temperature switch cable: Clamping range: 3.5–7.0 mm (0.14–0.28 in) Size Wrench (SW): 16 mm (0.63 in)
3	For resistor cable: Cable gland with internal connection for braid Clamping Range: 19-28 mm (0.74–1.1 in) Size Wrench (SW): 45 mm (1.78 in)
4	PE: M8 Torque 5–5.5 Nm (44.28–48.71 lb-in)
5	Resistor connection: Marked RB /RB2, ENSTO K66 IEC: Cu 2.5-50 mm ² , Al 6-50 mm ² /750 V UL: AWG 6-1/0/600 V Wire stripping: 23 mm (0.9 in) Torque: 10 Nm (90 lb-in)

Illustration 9.100 Connection Box

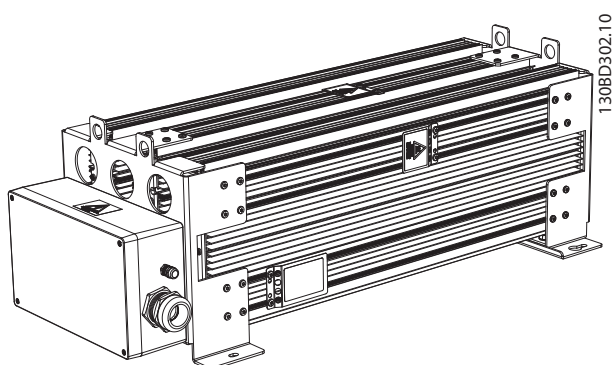


Illustration 9.101 IP65, 3D View

Mechanical mounting (see *Illustration 9.102*):

- Vertical with connection box down, or
- Horizontal

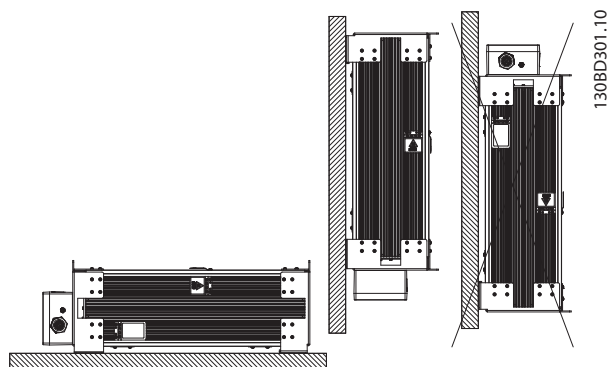
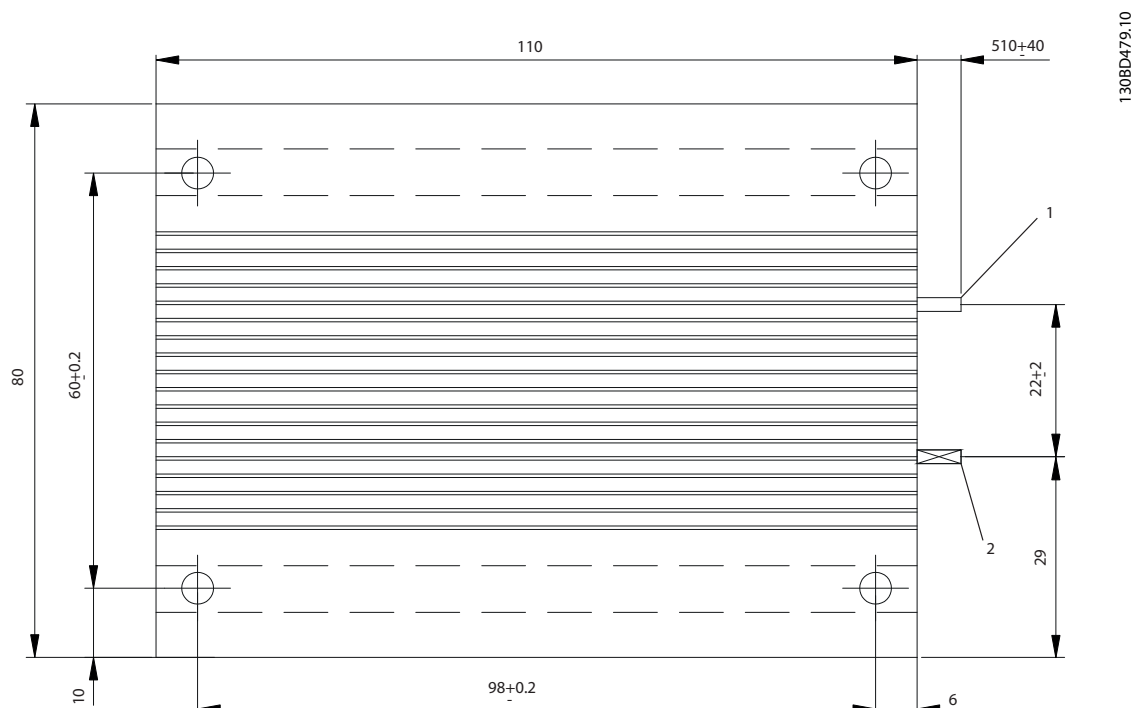


Illustration 9.102 Mechanical Mounting

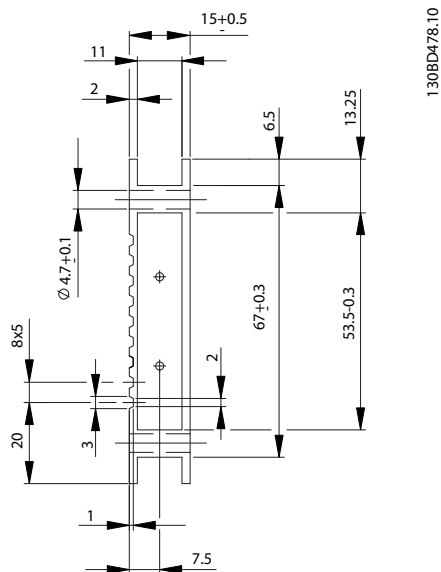
9.7.20 Figure 20 - BWD250xxx



1	PTFE wire, AWG 16, white
2	PTFE wire, AWG 16, brown

Table 9.35

Illustration 9.103 BWD250xxx



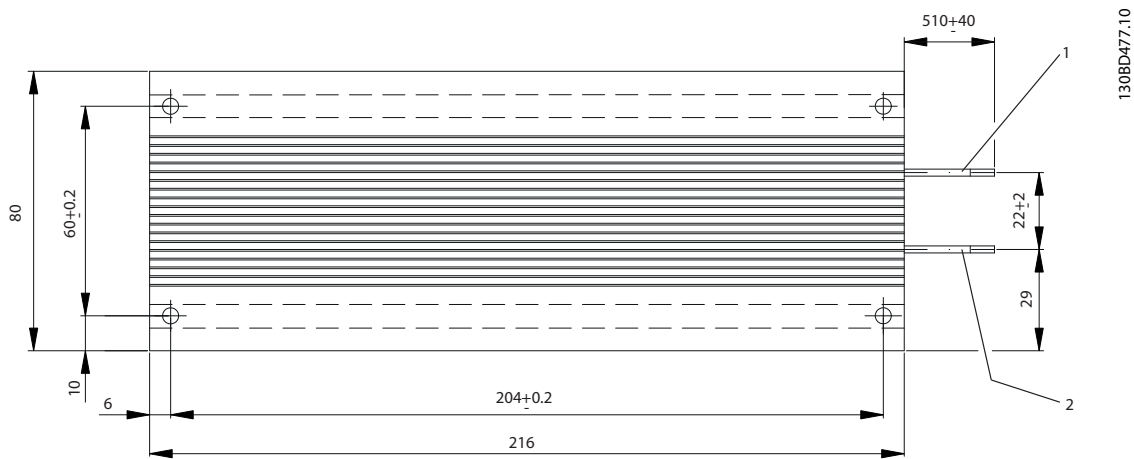
1	PTFE wire, AWG 16, white
2	PTFE wire, AWG 16, brown

Table 9.36

Illustration 9.104 BWD250xxx

9

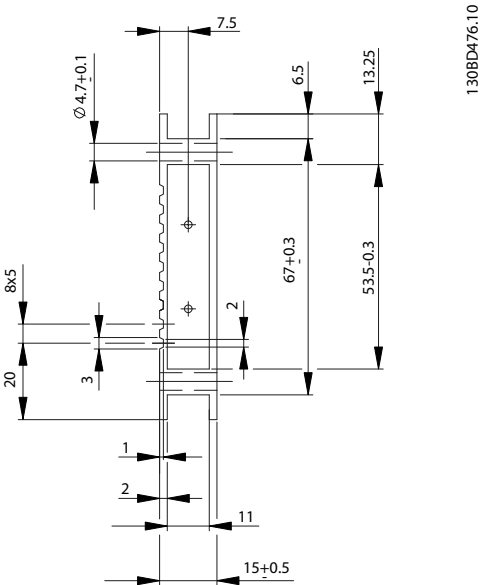
9.7.21 Figure 21 - BWD500xxx



1	PTFE wire, AWG 16, white
2	PTFE wire, AWG 16, brown

Table 9.37

Illustration 9.105 BWD500xxx

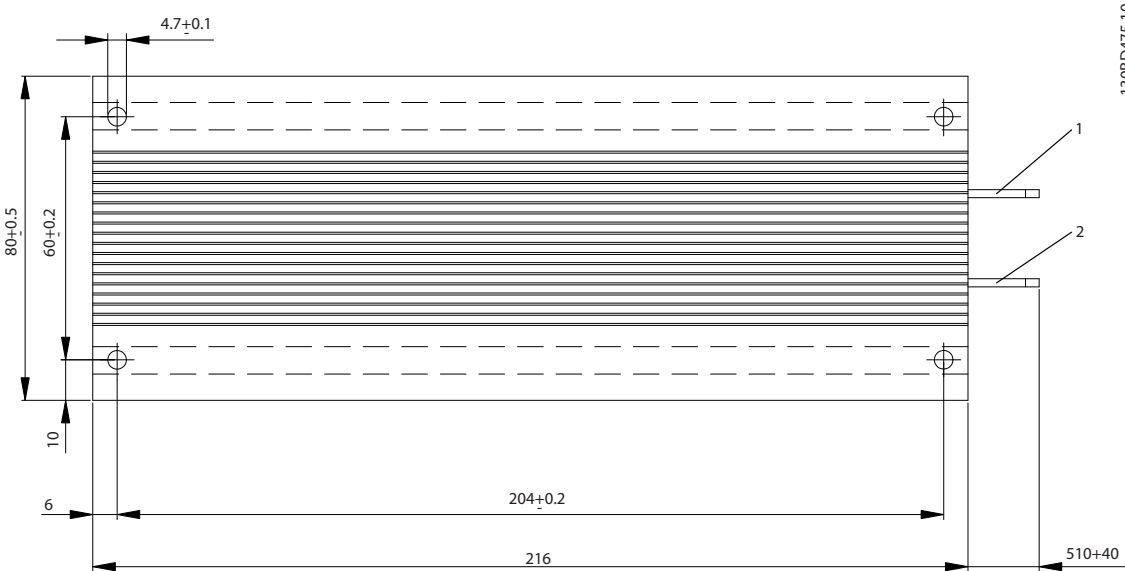


1	PTFE wire, AWG 16, white
2	PTFE wire, AWG 16, brown

Table 9.38

Illustration 9.106 BWD500xxx

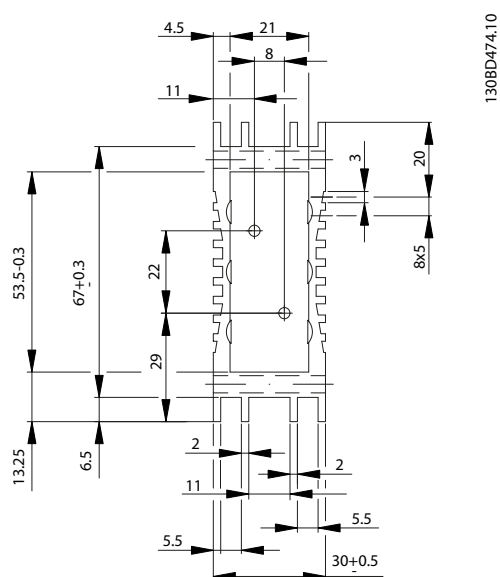
9.7.22 Figure 22 - BWD600xxx



1	PTFE wire, AWG 14, white
2	PTFE wire, AWG 14, brown

Table 9.39

Illustration 9.107 BWD600xxx

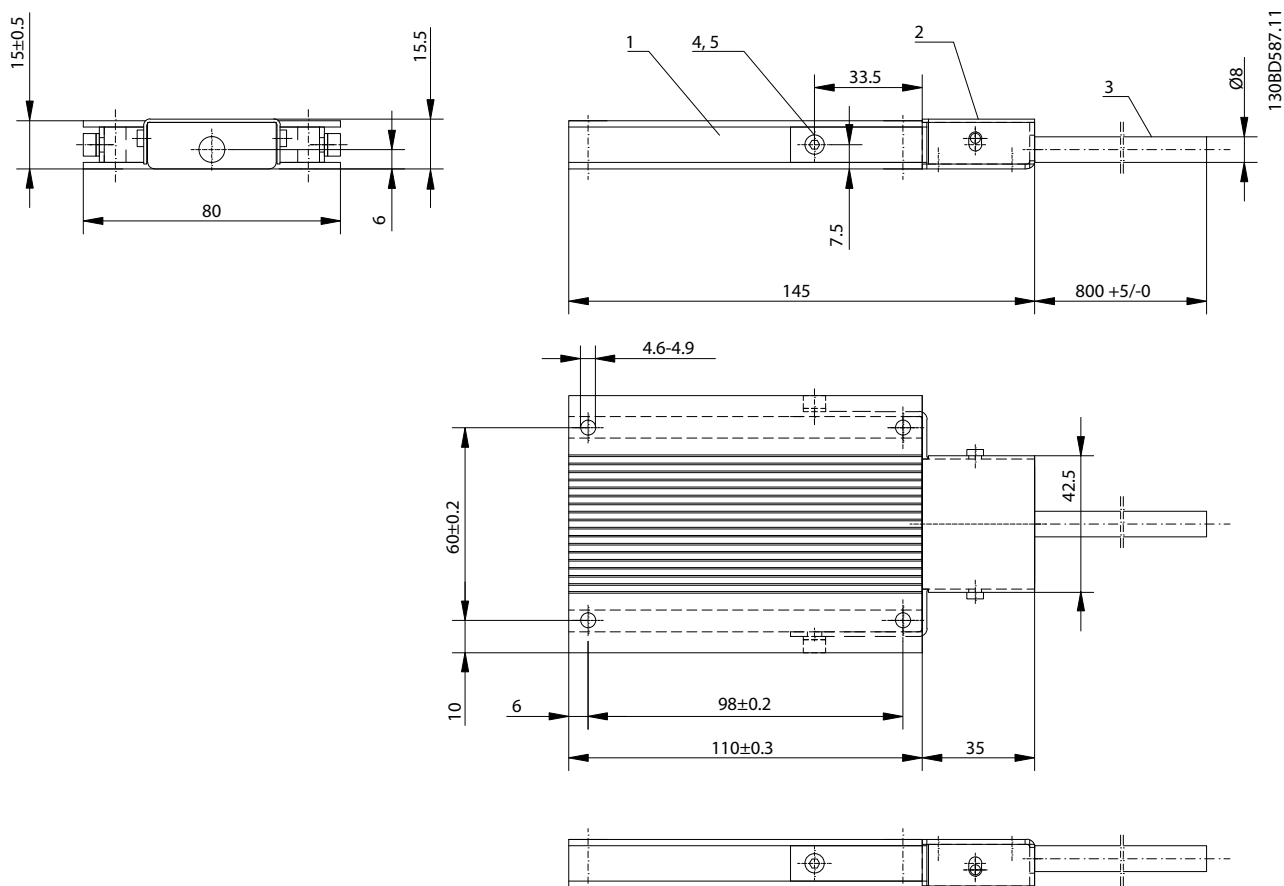


1	PTFE wire, AWG 14, white
2	PTFE wire, AWG 14, brown

Table 9.40

Illustration 9.108 BWD600xxx

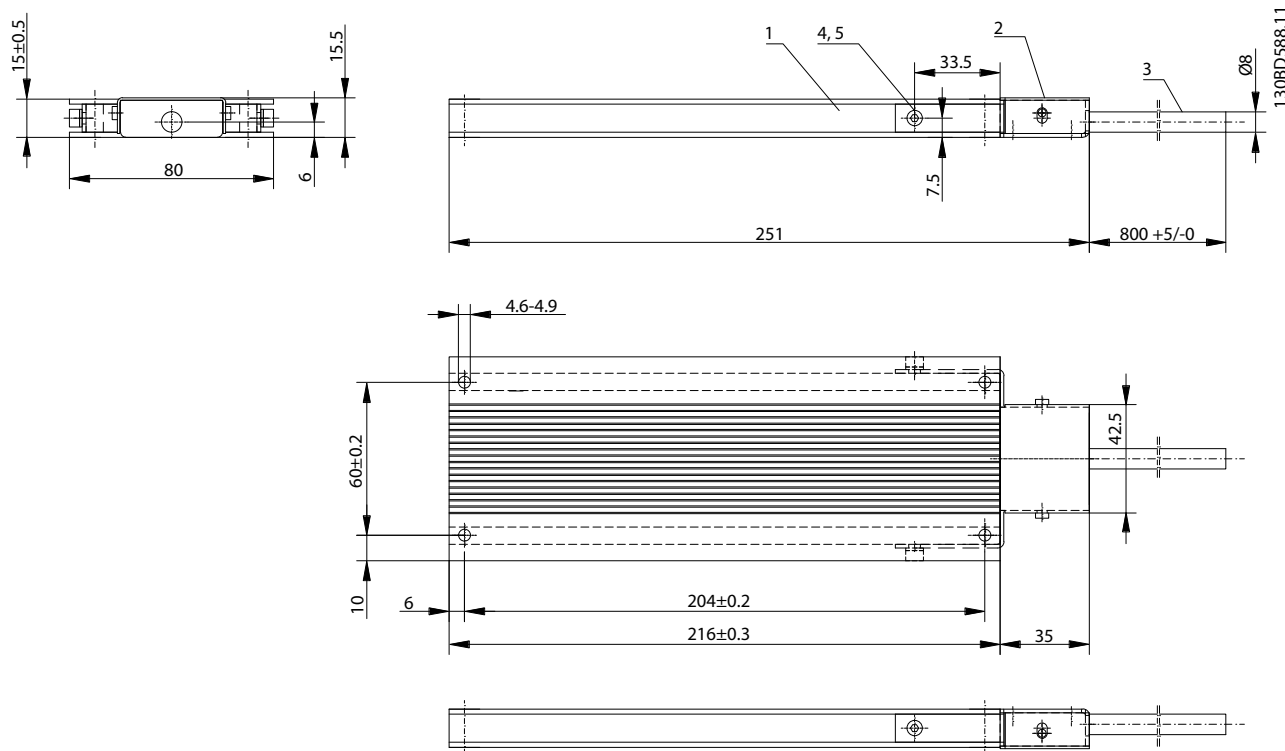
9.7.23 Figure 23 - BWG250xxx



1	Brake resistor
2	Enclosure
3	Screened cable
4	Screw
5	Fan-shaped washer

Illustration 9.109 BWG250xxx

9.7.24 Figure 24 - BWG500xxx



1	Brake resistor
2	Enclosure
3	Screened cable
4	Screw
5	Fan-shaped washer

Illustration 9.110 BWG500xxx

9.8 Mechanical Drawings: Accessories

9.8.1 Mounting Brackets: L Profile

L profile mounting brackets are compatible with the brake resistor types:

- Flat-pack

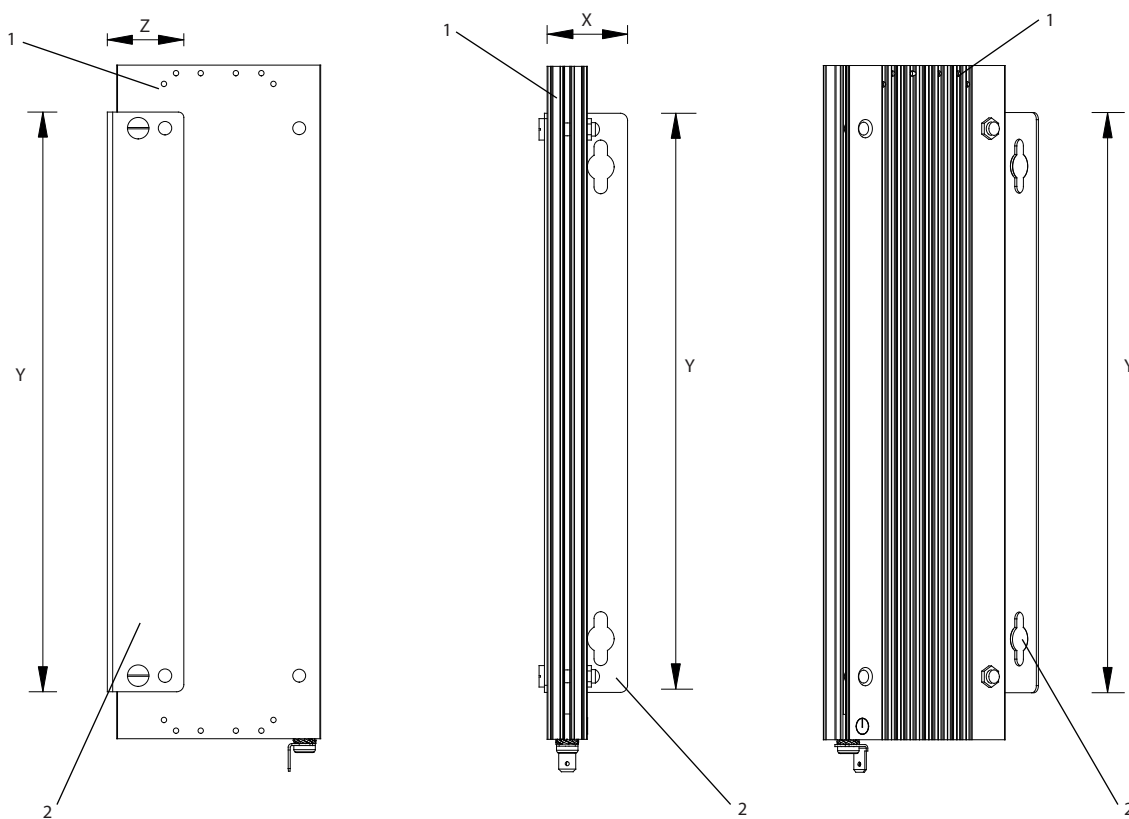
Part number	Compatible brake resistor type	L profile drawing reference
175U0009	1x200 W flat-pack	<i>Illustration 9.112</i>
175U0011 ¹⁾	1x100 W flat-pack 1x300 W flat-pack	<i>Illustration 9.113</i>

Table 9.41 L Profile Mounting Brackets

1) Order 2x175U011 for 300 W flat-pack brake resistors.

Part number	L-profile bracket		Screw		Locking washer		Cap nut	
	quantity supplied	size [mm]	quantity supplied	size	quantity supplied	size	quantity supplied	size
175U0011	1	See <i>Table 9.44</i>	2	M4x20	2	S4	2	M4
175U0009	1	See <i>Table 9.44</i>	2	M4x20	2	S4	2	M4

Table 9.42 Items Supplied



130BD570.10

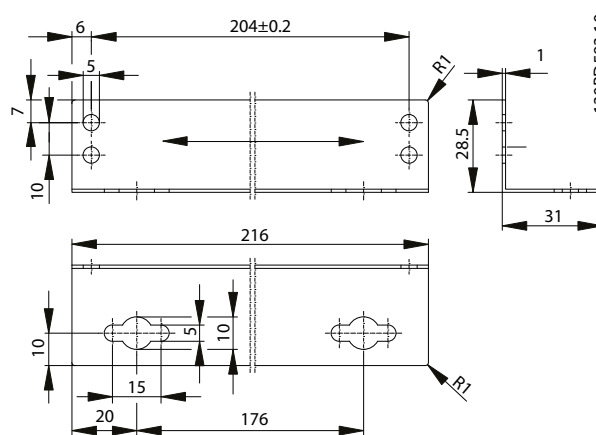
Illustration 9.111 Dimensions L Profile Mounting Bracket

1	Brake resistor
2	L profile mounting bracket

Table 9.43 Legend to Illustration 9.111

Dimension	Size	
	175U0009	175U0011
	[mm]	[mm]
X	31	31
Y	216	110
Z	28.5	28.5

Table 9.44 Dimensions L Profile Mounting Bracket



130BD593.10

Illustration 9.112 L Profile Bracket 175U0009

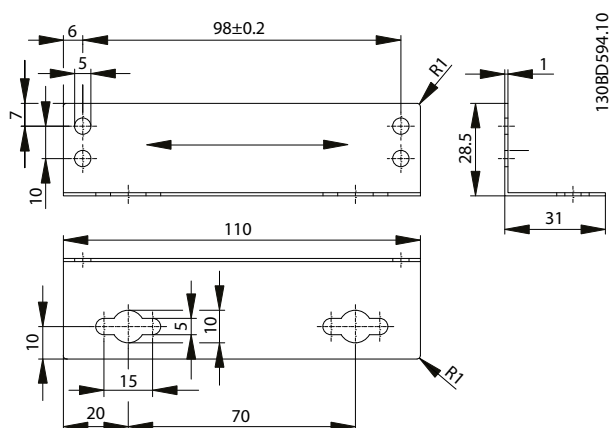


Illustration 9.113 L Profile Bracket 175U0011

9.8.2 Mounting Brackets: Footprint

Footprint mounting brackets are compatible with the brake resistor types:

- Flat-pack only

P/N	Compatible brake resistor	Compatible frequency converter enclosure size	Footprint drawing reference
175U0085	1x100 W flat-pack 1x200 W flat-pack	A2	Illustration 9.115
175U0087	2x100 W flat-pack 2x200 W flat-pack	A2	Illustration 9.116
175U0086	2x100 W flat-pack 2x200 W flat-pack	A3	Illustration 9.117
175U0088	1x100 W flat-pack 1x200 W flat-pack	A3	Illustration 9.118

Table 9.45 Footprint Mounting Bracket Compatibility

Mounting bracket	P/N		175U0085	175U0086	175U0087	175U0088
Screw set	Distance bolt	number supplied	-	4	4	-
		size	-	M4x32	M4x32	-
	Screw	number supplied	4	4	4	4
		size	M4x20	M4x20	M4x20	M4x20
	Locking washer	number supplied	4	4	4	4
		size	S4	S4	S4	S4

Table 9.46 Accessories Supplied

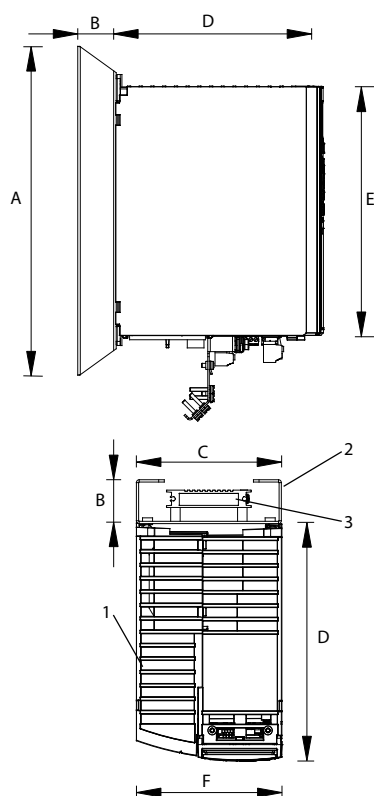


Illustration 9.114 Dimensions: Footprint Mounting Bracket

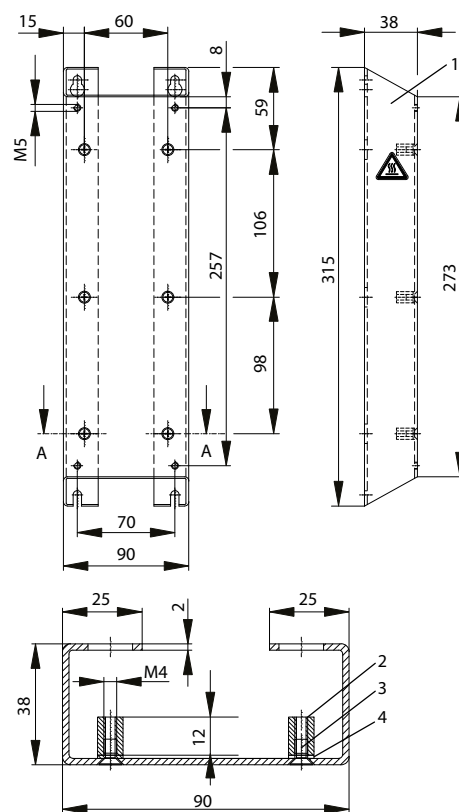


Illustration 9.115 Footprint Bracket 175U0085

1	Frequency converter
2	Footprint mounting bracket
3	Flat-pack brake resistor

Table 9.47 Legend to Illustration 9.114

	A	B	C	D	E	F
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
Frequency converter						
Footprint bracket 175U0085	315	38	90	207	273	90
Footprint bracket 175U0086	315	65	130	207	273	130
Footprint bracket 175U0087	315	65	90	207	273	90
Footprint bracket 175U0088	315	38	130	207	273	130

Table 9.48 Dimensions: Footprint Mounting Bracket

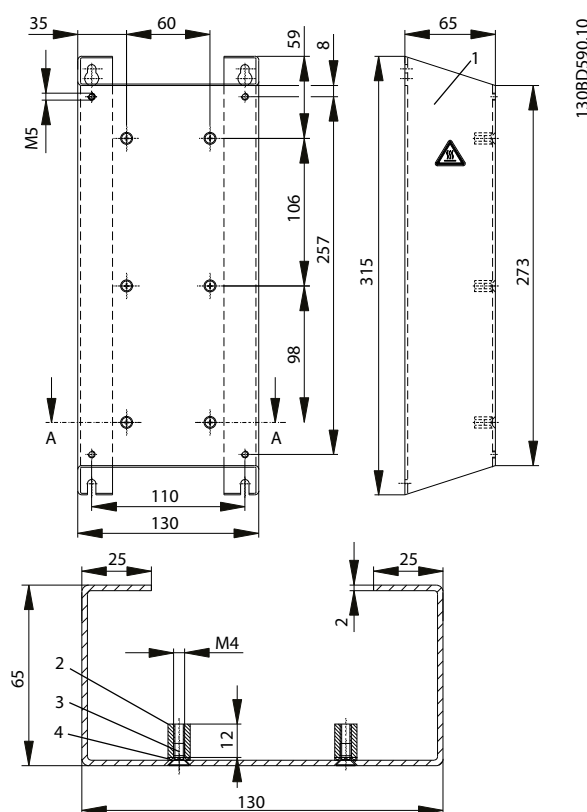


Illustration 9.116 Footprint Bracket 175U0086

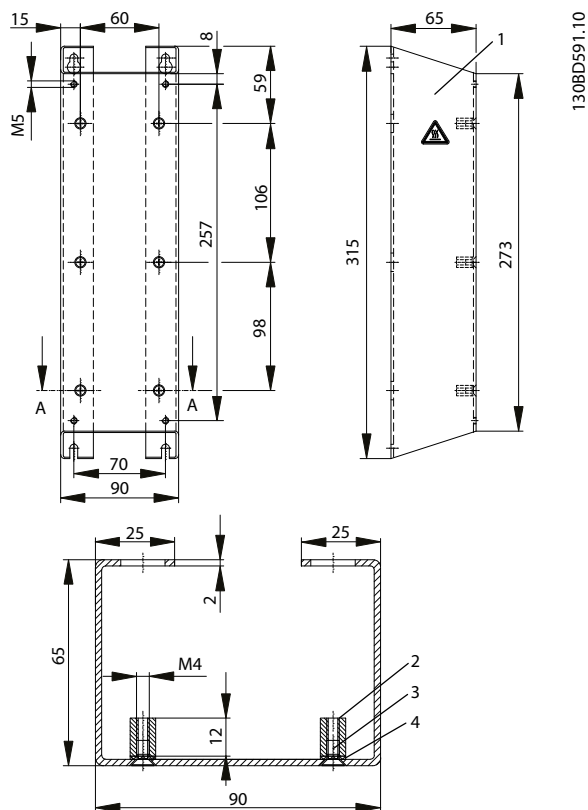


Illustration 9.117 Footprint Bracket 175U0087

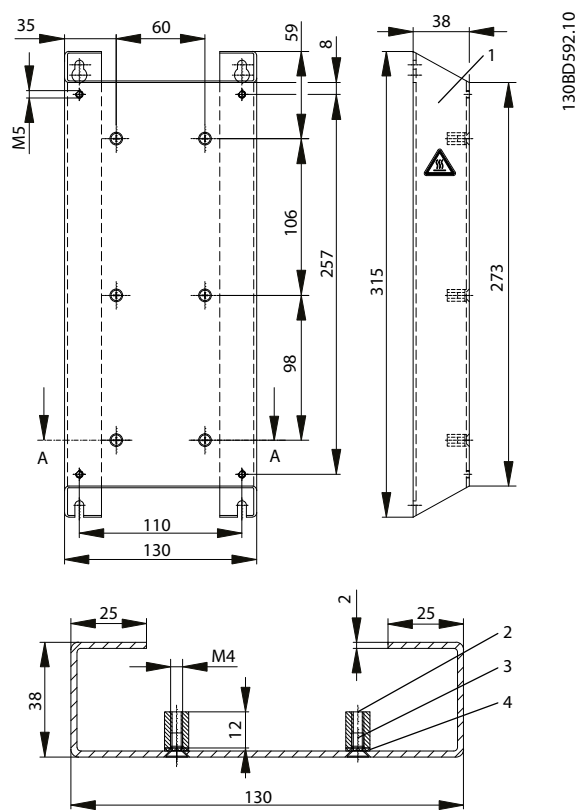


Illustration 9.118 Footprint Bracket 175U0088

1	Frame
2	Distance bolt
3	Screw
4	Fan-shaped washer

Table 9.49 Legend for all Footprint Brackets

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A

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