



VarioTrane TR1

Series 2800



TR1-PRC002-E4





Contents

Motor coils	6
EMC filter for long motor cables	11
Ordering numbers for TR1 2800 200-240 V	12
Ordering numbers for TR1 2800 380-480V	14
Order form	20
PC software	21
PC Software tools	21
Mechanical dimensions	22
Electrical installation	26
Electrical installation, control terminals	28
General technical data	30
Technical data, mains supply 1 x 220 - 240 V/3 x 200-240V	36
Technical data, mains supply 3 x 380 - 480 V	37



Data sheet

This section makes it easier for you to specify and order a TR1 Series VFD.

Choice of frequency converter

The frequency converter must be chosen on the basis of the present motor current at maximum loading of the unit. The frequency converters rated output current I_{INV} , must be equal to or greater than the required motor current.

Mains voltage

TR1 Series VFD is available for two mains voltage ranges: 200-240 V and 380-480 V.

- 1 x 220 - 240 V single-phase AC voltage
- 3 x 200 - 240 V three-phase AC voltage
- 3 x 380 - 480 V three-phase AC voltage

Select whether the frequency converter is connected to a mains voltage of:

1 x 220 - 240 Volt mains voltage

Type	Typical shaft output P_{INV}		Max. constant output current I_{INV}	Max. constant output power at 230 V S_{INV}
	[kW]	[HP]		
2803	0.37	0.5	2.2	0.9
2805	0.55	0.75	3.2	1.3
2807	0.75	1.0	4.2	1.7
2811	1.1	1.5	6.0	2.4
2815	1.5	2.0	6.8	2.7

3 x 200 - 240 Volt mains voltage

Type	Typical shaft output P_{INV}		Max. constant output current I_{INV}	Max. constant output power at 230 V S_{INV}
	[kW]	[HP]		
2803	0.37	0.5	2.2	0.9
2805	0.55	0.75	3.2	1.3
2807	0.75	1.0	4.2	1.7
2811	1.1	1.5	6.0	2.4
2815	1.5	2.0	6.8	2.7
2822	2.2	3.0	9.6	3.8
2840	3.7	5.0	16.0	6.4

3 x 380 - 480 Volt mains voltage

Type	Typical shaft output $P_{INV.}$		Max. constant output current $I_{INV.}$	Max. constant output power at 400 V $S_{INV.}$
	[kW]	[HP]	[A]	[kVA]
2805	0.55	0.75	1.7	1.1
2807	0.75	1.0	2.1	1.7
2811	1.1	1.5	3.0	2.0
2815	1.5	2.0	3.7	2.6
2822	2.2	3.0	5.2	3.6
2830	3.0	4.0	7.0	4.8
2840	4.0	5.0	9.1	6.3
2855	5.5	7.5	12.0	8.3
2875	7.5	10.0	16.0	11.1
2880	11	15	24	16.6
2881	15	20	32	22.2
2882	18.5	25	37.5	26.0

Enclosure

All TR1 Series VFD units are supplied with IP 20 enclosure as standard. This enclosure level is ideal for panel mounting in areas where a high degree of protection is required; at the same time IP 20 enclosures allow side-by-side installation without any need for extra cooling equipment. IP 20 units can be upgraded to NEMA 1 by fitting a terminal cover.

In addition, TR1 2880-82 units are supplied with Nema 1 enclosure as standard.

Brake

TR1 Series VFD is available with or without an integral brake module. See also the section entitled *Brake resistors* for ordering a Brake resistor.

RFI filter

TR1 Series VFD is available with or without an integral 1A RFI-filter. The integral 1A RFI filter complies with EMC standards EN 55011-1A.

With an integral RFI filter there is compliance with EN 55011-1B with a max. 15-metre

screened/armoured motor cable on TR1 2803-2815 1 x 220-240 Volt. TR1 2880-82 with integral 1B filter comply with EMC standard EN 50011 - 1B

Harmonic filter

The harmonic currents do not affect power consumption directly, but they increase the heat losses in the installation (transformer, cables). That is why, in a system with a relatively high percentage of rectifier load, it is important to keep the harmonic currents at a low level so as to avoid a transformer overload and high cable temperature. For the purpose of ensuring low harmonic currents, TR1 2822 3 x 200-240 V and TR1 2805-2882 380-480 V are fitted with coils in their intermediate circuit as standard. This reduces the input current I_{RMS} by typically 40 %. Please note that 1 x 220-240 V units are not supplied with coils in their intermediate circuit.

FC protocol

TR1 Series VFD frequency converters are able to fulfill many different functions in a monitoring system. The frequency converter can be integrated directly in an overall surveillance

system, which will allow detailed process data to be transferred via serial communication.

The protocol standard is based on an RS 485 bus system with a maximum transmission speed of 9600 baud. The following Drive profiles are supported as standard:

- FC Drive, which is a profile adapted to TR1.
- Profidrive, which supports the profidrive profile.

See *Serial communication* for further details of telegram structure and Drive profile.

TR1 Software Dialog can be used on the Sub D plug.

Fieldbus option

The increasing information requirements in industry make it necessary to collect or visualize many different process data. Important process data help the system technician with the daily monitoring of the system. The large amounts of data involved in major systems make a higher transmission speed than 9600 baud desirable.

Profibus

Profibus is a fieldbus system, which can be used for linking automation devices such as sensors and actuators with the controls by means of a two-conductor cable. Profibus DP is a very fast communication protocol, made specially for communication between the automation system and various types of equipment. Profibus is a registered trade mark.

DeviceNet

DeviceNet fieldbus systems can be used for linking automation devices such as sensors and actuators with the controls by means of a fourwire conductor cable.

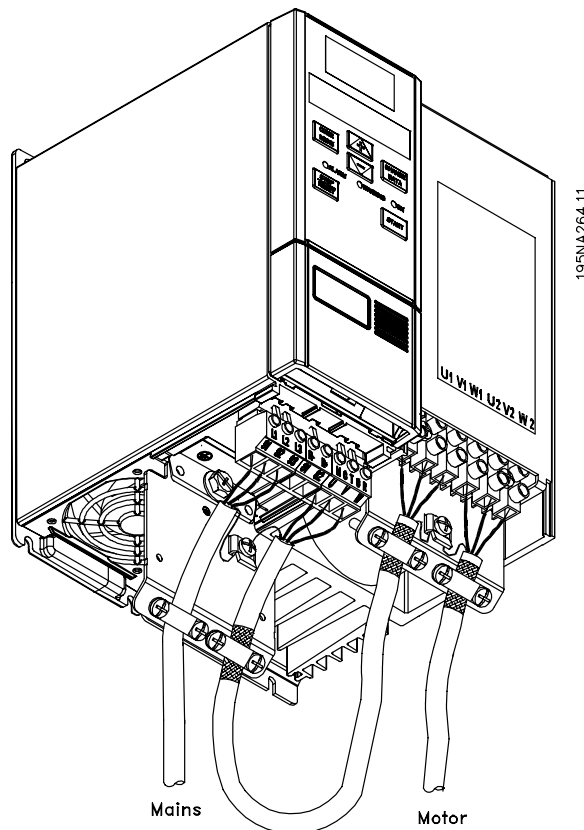
DeviceNet is a medium speed communication protocol, made specially for communication between the automation system and various types of equipment.

Units with DeviceNet protocol cannot be controlled by FC protocol and Profidrive protocol.

Motor coils

By fitting the motor coil module between the frequency and the motor it is possible to use up

to 200 metres of unscreened/unarmoured motor cable or 100 metres of screened/armoured motor cable. The motor coil module has an enclosure of IP 20 and can be installed side-by-side.



Technical data for TR1 28032875 Motor coils	
Max. cable length (unscreened/unarmoured) ¹⁾	200 m
Max. cable length (screened/armoured) ¹⁾	100 m
Enclosure	IP 20
Max. rated current ¹⁾	16 A
Max. voltage ¹⁾	480 V AC
Min. distance between TR1 and motor coil	Side-by-side
Min. distance above and below motor coil	100 mm
Dimensions H x W x D (mm) ²⁾	200 x 90 x 152
Weight	3.8 kg

¹⁾ Parameter 411 *Switching frequency* = 4500 Hz.

²⁾ For mechanical dimensions see under *Mechanical dimensions*.

RFI 1B filter

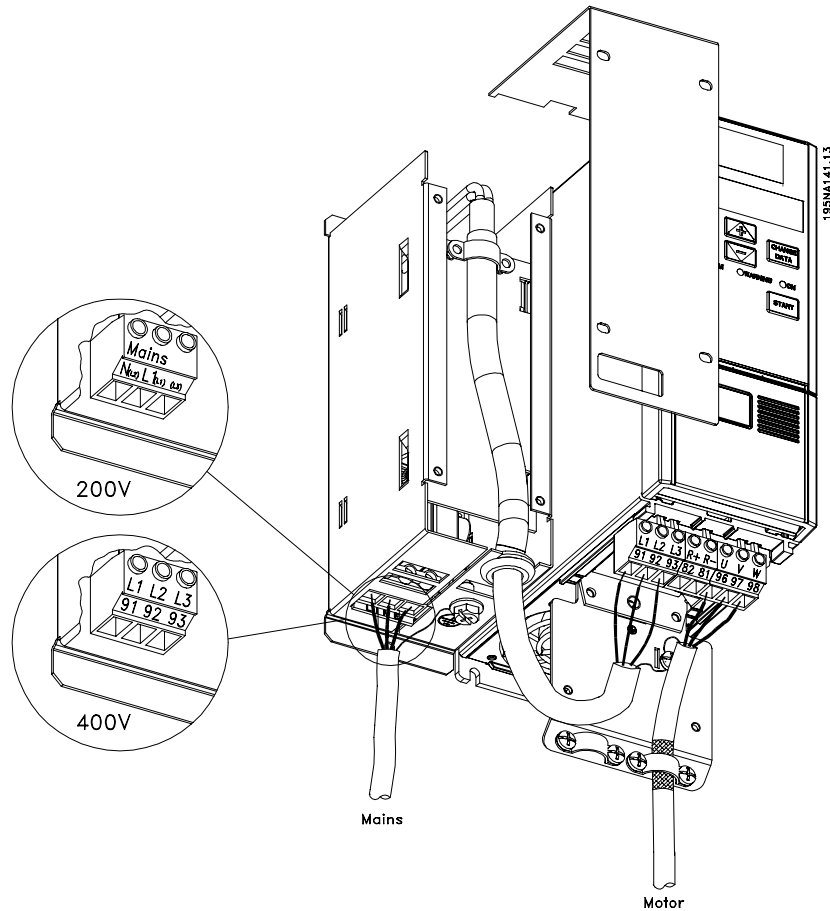
All frequency converters will cause electromagnetic noise in the mains supply when they are operating. An RFI (Radio

Frequency Interference) filter will reduce the electromagnetic noise in the mains supply. Without an RFI filter there is a risk that a frequency converter will disrupt other electrical

components that are connected to the mains and might thus cause operating disruption. By fitting an RFI 1B filter module between the mains supply and the TR1 Series VFD, the TR1 Series VFD complies with the EMC norm EN 55011-1B.


NB!:

To comply with EN 55011-1B the RFI 1B filter module must be fitted together with a TR1 Series VFD with integral 1A RFI filter.



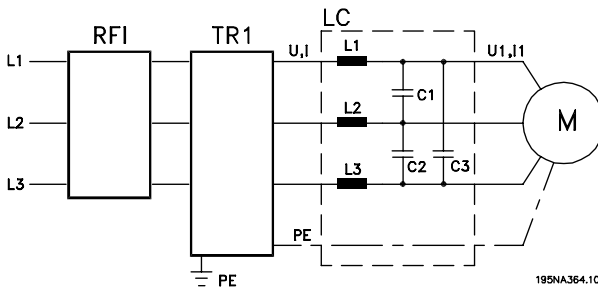
Technical data for TR1 2803-2875 RFI 1B filter	
Max. cable length (screened/armoured) 200-240 V	100 m (At 1A: 100 m)
Max. cable length (screened/armoured) 380-480 V	25 m (At 1A: 50 m)
Enclosure	IP 20
Max. rated current	16 A
Max. Voltage	480 V AC
Max. voltage to earth	300 V AC
Min. distance between TR1 and RFI 1B filter	Side-by-Side
Min. distance above and below RFI 1B filter	100 mm
Dimensions H x W x D (mm) ¹⁾	200 x 60 x 87
Weight	0.9 kg

¹⁾ For mechanical dimensions see under *Mechanical dimensions*.

RFI 1B/LC filter

The RFI 1B/LC filter contains both an RFI module that complies with EN 55011-1B and an LC filter that reduces the acoustic noise.

LC filter



When a motor is controlled by a frequency converter, at times you will be able to hear the acoustic noise from the motor. The noise, which is caused by the design of the motor, is generated every time one of the inverter contacts in the frequency converter is activated. The frequency of the acoustic noise therefore corresponds to the frequency converters connection frequency.

The filter reduces the voltages du/dt , the peak voltage U_{peak} and ripple current ΔI to the motor, so that the current and voltage are almost sine-shaped. The acoustic motor noise is thus reduced to a minimum.

Because of the ripple current in the coils some noise will be emitted by the coils. This problem can be solved completely by fitting the filter inside a cabinet or equivalent.

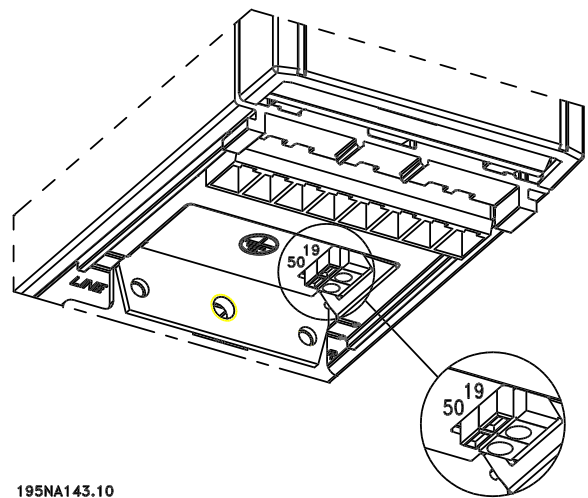
An LC filter for the frequency converter, which muffles the acoustic motor noise, can be supplied. Before the filters are put into use you must ensure that:

- rated current is observed
- mains voltage is 200-480 V
- parameter 412 *Variable switching frequency* is set to *LC filter attached* [3]
- output frequency is max. 120 Hz

See drawing on the next page.

Installation of thermistor (PTC)

The RFI 1B/LC filter has an integral thermistor (PTC), which is activated if an overtemperature arises. The frequency converter can be programmed to stop the motor and activate an alarm via a relay output or a digital output if the thermistor is activated.

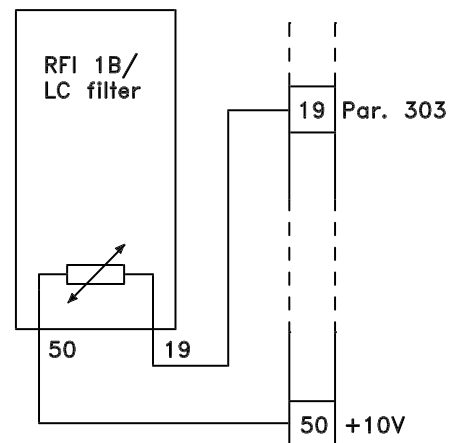


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The thermistor must be connected between terminal 50 (+10V) and one of the digital inputs 18, 19, 27 and 29.


In parameter 128 *Motor thermal protection Thermistor warning* [1] or *Thermistor trip* [2] are selected.


The thermistor is connected as follows:

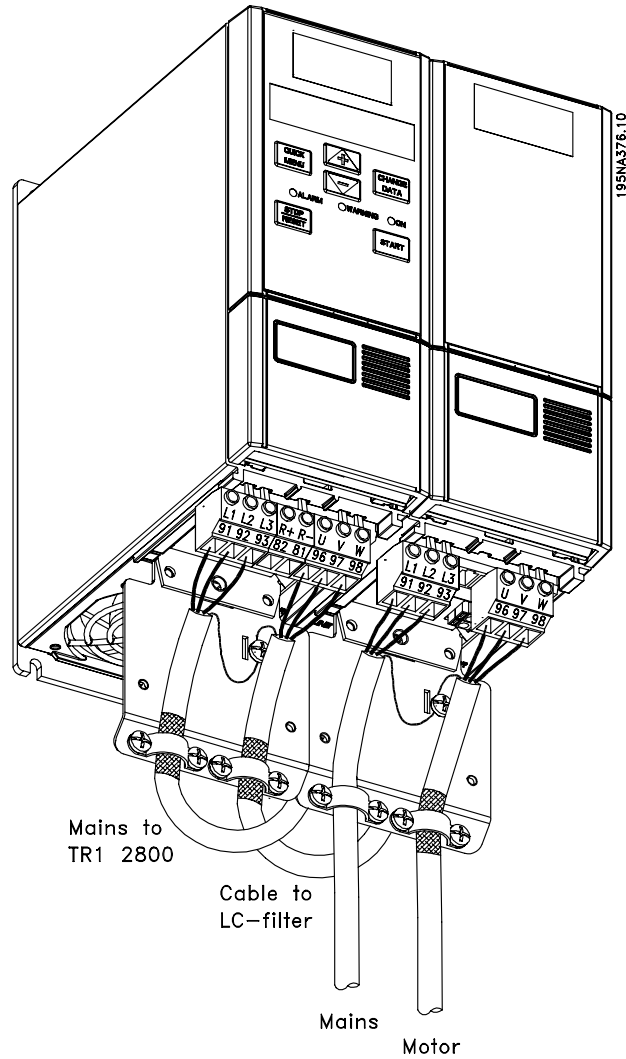


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RFI 1B/LC filter

NBI:
 To comply with EN 55011-1B the RFI 1B filter module must be fitted to a TR1 Series VFD with integral 1A RFI filter.

NBI:
 The 1B/LC filter is not suitable for 200 V devices due to the high I_Ø input current.



Technical data for TR1 2803-2840 RFI 1B/LC filter	
Max. cable length (screened/armoured)	380-480 25 m (At 1A: 50 m)
V	
Enclosure	IP 20
Max. rated current	4.0 (Order no.: 195N3100); 9.1 (Order no.: 195N3101)
Max. voltage	480 V AC
Max. voltage to earth	300 V AC
Min. distance between TR1 and RFI 1B/LC filter	Side-by-Side
Min. distance above and below RFI 1B/LC filter	100 mm
Dimensions 195N3100 4.0 A H x W x D (mm)	200 x 75 x 168
Dimensions 195N3101 9.1 A H x W x D (mm)	267.5 x 90 x 168
Weight 195N3100 4.0 A	2.4 kg
Weight 195N3101 9.1 A	4.0 kg

EMC filter for long motor cables


NBI:

To comply with EN55011-1A the EMC filter must be fitted to a TR1 Series VFD with integral 1A RFI filter.


NBI:

Set switching frequency, parameter 411, to 4500 Hz


NBI:

Fitting position of frequency converter: Vertical only.

Technical data for TR1 2805-2875 380-480 V EMC filter for long motor cables	
Max. cable length (screened/armoured)	TR1 2805-2815 380-480 V: 100 m TR1 2822-2840 380-480 V: 100 m TR1 2855-2875 380-480 V: 150 m
Enclosure	IP 20
Max. rated current	192H4719: 3.2 A, 192H4720: 9.0 A, 192H4893: 16 A
Input voltage range	3 x 380-480 V ± 10%
Mains frequency	50-60 Hz
Input	Terminals 2,5 mm ² (192H4893 4 mm ²)
Output	Flexible cords with sleeves
Design	Metal housing (suited for foot print and side mounting to TR1 Series VFD)
Min. distance above and below filter	100 mm
Ambient temperature	Ta= 50 °C
Dimensions 192H4719 H x W x D (mm) ¹	244 x 75 x 45
Dimensions 192H4720 H x W x D (mm) ¹	313 x 90 x 50
Dimensions 192H4893 H x W x D (mm) ¹	313 x 140 x 50

¹For drawing and more detailed dimensions, see in *Mechanical dimensions*

Control unit

The frequency converter is always supplied with an integral control unit.

All displays are in the form of a six-digit LED display capable of showing one item of operating data continuously during normal operation. As a supplement to the display, there are three indicator lamps for voltage (ON), warning (WARNING) and alarm (ALARM). Most of the frequency converters parameter Setups can be changed immediately via the integral control panel.

An LCP 2 control panel to be connected via a plug to the front of the frequency converter is available as an option. The LCP 2 control panel can be installed up to 3 metres away from the

frequency converter, e.g. on a front panel, by means of the accompanying mounting kit. All displays of data are via a 4-line alpha-numerical display, which in normal operation is able to show 4 operating data items and 3 operation modes continuously. During programming, all the information required for quick, efficient parameter Setup of the frequency converter is displayed. As a supplement to the display, there are three indicator lamps for voltage (ON), warning (WARNING) and alarm (ALARM). Most of the frequency converters parameter Setups can be changed immediately via the LCP 2 control panel.

Ordering numbers for TR1 2800 200-240 V

0,37 kW 1 x 220-240 V / 3 x 200-240 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N0001
-	SB	-	-	195N0002
R1	ST	-	-	195N0003
R1	SB	-	-	195N0004
-	ST	✓	-	195N0005
-	SB	✓	-	195N0006
R1	ST	✓	-	195N0007
R1	SB	✓	-	195N0008
-	ST	-	✓	195N0009
-	SB	-	✓	195N0010
R1	ST	-	✓	195N0011
R1	SB	-	✓	195N0012

0,55 kW 1 x 220-240 V / 3 x 200-240 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N0013
-	SB	-	-	195N0014
R1	ST	-	-	195N0015
R1	SB	-	-	195N0016
-	ST	✓	-	195N0017
-	SB	✓	-	195N0018
R1	ST	✓	-	195N0019
R1	SB	✓	-	195N0020
-	ST	-	✓	195N0021
-	SB	-	✓	195N0022
R1	ST	-	✓	195N0023
R1	SB	-	✓	195N0024

0,75 kW 1 x 220-240 V / 3 x 200-240 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N0025
-	SB	-	-	195N0026
R1	ST	-	-	195N0027
R1	SB	-	-	195N0028
-	ST	✓	-	195N0029
-	SB	✓	-	195N0030
R1	ST	✓	-	195N0031
R1	SB	✓	-	195N0032
-	ST	-	✓	195N0033
-	SB	-	✓	195N0034
R1	ST	-	✓	195N0035
R1	SB	-	✓	195N0036

1,1 kW 1 x 220-240 V / 3 x 200-240 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N0037
-	SB	-	-	195N0038
R1	ST	-	-	195N0039
R1	SB	-	-	195N0040
-	ST	✓	-	195N0041
-	SB	✓	-	195N0042
R1	ST	✓	-	195N0043
R1	SB	✓	-	195N0044
-	ST	-	✓	195N0045
-	SB	-	✓	195N0046
R1	ST	-	✓	195N0047
R1	SB	-	✓	195N0048

1,5 kW 1 x 220-240 V / 3 x 200-240 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N0049
-	SB	-	-	195N0050
R1	ST	-	-	195N0051
R1	SB	-	-	195N0052
-	ST	✓	-	195N0053
-	SB	✓	-	195N0054
R1	ST	✓	-	195N0055
R1	SB	✓	-	195N0056
-	ST	-	✓	195N0057
-	SB	-	✓	195N0058
R1	ST	-	✓	195N0059
R1	SB	-	✓	195N0060

2,2 kW 3 x 200-240 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N0061
-	SB	-	-	195N0062
R1	ST	-	-	195N0063
R1	SB	-	-	195N0064
-	ST	✓	-	195N0065
-	SB	✓	-	195N0066
R1	ST	✓	-	195N0067
R1	SB	✓	-	195N0068
-	ST	-	✓	195N0069
-	SB	-	✓	195N0070
R1	ST	-	✓	195N0071
R1	SB	-	✓	195N0072

3,7 kW		3 x 200-240 V		
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N0073
-	SB	-	-	195N0074
R1	ST	-	-	195N0075
R1	SB	-	-	195N0076
-	ST	✓	-	195N0077
-	SB	✓	-	195N0078
R1	ST	✓	-	195N0079
R1	SB	✓	-	195N0080
-	ST	-	✓	195N0081
-	SB	-	✓	195N0082
R1	ST	-	✓	195N0083
R1	SB	-	✓	195N0084

ST: Standard unit.

SB: Standard unit with integral brake.

R1: With RFI filter that complies with EN 55011-1A.



NBI:

For TR1 2803-2815 with an R1 filter it is only possible to connect single-phase mains voltage 1 x 220 - 240 Volt.

Ordering numbers for TR1 2800 380-480V

0,55 kW TR1 2805 3 x 380-480 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N1001
-	SB	-	-	195N1002
R1	ST	-	-	195N1003
R1	SB	-	-	195N1004
-	ST	✓	-	195N1005
-	SB	✓	-	195N1006
R1	ST	✓	-	195N1007
R1	SB	✓	-	195N1008
-	ST	-	✓	195N1009
-	SB	-	✓	195N1010
R1	ST	-	✓	195N1011
R1	SB	-	✓	195N1012

0,75 kW TR1 2807 3 x 380-480 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N1013
-	SB	-	-	195N1014
R1	ST	-	-	195N1015
R1	SB	-	-	195N1016
-	ST	✓	-	195N1017
-	SB	✓	-	195N1018
R1	ST	✓	-	195N1019
R1	SB	✓	-	195N1020
-	ST	-	✓	195N1021
-	SB	-	✓	195N1022
R1	ST	-	✓	195N1023
R1	SB	-	✓	195N1024

1,1 kW TR1 2811 3 x 380-480 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N1025
-	SB	-	-	195N1026
R1	ST	-	-	195N1027
R1	SB	-	-	195N1028
-	ST	✓	-	195N1029
-	SB	✓	-	195N1030
R1	ST	✓	-	195N1031
R1	SB	✓	-	195N1032
-	ST	-	✓	195N1033
-	SB	-	✓	195N1034
R1	ST	-	✓	195N1035
R1	SB	-	✓	195N1036

1,5 kW TR1 2815 3 x 380-480 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N1037
-	SB	-	-	195N1038
R1	ST	-	-	195N1039
R1	SB	-	-	195N1040
-	ST	✓	-	195N1041
-	SB	✓	-	195N1042
R1	ST	✓	-	195N1043
R1	SB	✓	-	195N1044
-	ST	-	✓	195N1045
-	SB	-	✓	195N1046
R1	ST	-	✓	195N1047
R1	SB	-	✓	195N1048

2,2 kW TR1 2822 3 x 380-480 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N1049
-	SB	-	-	195N1050
R1	ST	-	-	195N1051
R1	SB	-	-	195N1052
-	ST	✓	-	195N1053
-	SB	✓	-	195N1054
R1	ST	✓	-	195N1055
R1	SB	✓	-	195N1056
-	ST	-	✓	195N1057
-	SB	-	✓	195N1058
R1	ST	-	✓	195N1059
R1	SB	-	✓	195N1060

3,0 kW TR1 2830 3 x 380-480 V				
RFI	Unit	Profibus	DeviceNet	Ordering no.
DP				
-	ST	-	-	195N1061
-	SB	-	-	195N1062
R1	ST	-	-	195N1063
R1	SB	-	-	195N1064
-	ST	✓	-	195N1065
-	SB	✓	-	195N1066
R1	ST	✓	-	195N1067
R1	SB	✓	-	195N1068
-	ST	-	✓	195N1069
-	SB	-	✓	195N1070
R1	ST	-	✓	195N1071
R1	SB	-	✓	195N1072

4,0 kW TR1 2840 3 x 380-480 V				
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N1073
-	SB	-	-	195N1074
R1	ST	-	-	195N1075
R1	SB	-	-	195N1076
-	ST	✓	-	195N1077
-	SB	✓	-	195N1078
R1	ST	✓	-	195N1079
R1	SB	✓	-	195N1080
-	ST	-	✓	195N1081
-	SB	-	✓	195N1082
R1	ST	-	✓	195N1083
R1	SB	-	✓	195N1084

5,5 kW TR1 2855 3 x 380-480 V				
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N1085
-	SB	-	-	195N1086
R1	ST	-	-	195N1087
R1	SB	-	-	195N1088
-	ST	✓	-	195N1089
-	SB	✓	-	195N1090
R1	ST	✓	-	195N1091
R1	SB	✓	-	195N1092
-	ST	-	✓	195N1093
-	SB	-	✓	195N1094
R1	ST	-	✓	195N1095
R1	SB	-	✓	195N1096

7,5 kW TR1 2875 3 x 380-480 V				
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N1097
-	SB	-	-	195N1098
R1	ST	-	-	195N1099
R1	SB	-	-	195N1100
-	ST	✓	-	195N1101
-	SB	✓	-	195N1102
R1	ST	✓	-	195N1103
R1	SB	✓	-	195N1104
-	ST	-	✓	195N1105
-	SB	-	✓	195N1106
R1	ST	-	✓	195N1107
R1	SB	-	✓	195N1108

11 kW TR1 2880 3 x 380-480 V				
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N1109
-	SB	-	-	195N1110
R3	ST	-	-	195N1111
R3	SB	-	-	195N1112
-	ST	✓	-	195N1113
-	SB	✓	-	195N1114
R3	ST	✓	-	195N1115
R3	SB	✓	-	195N1116
-	ST	-	✓	195N1117
-	SB	-	✓	195N1118
R3	ST	-	✓	195N1119
R3	SB	-	✓	195N1120

15 kW TR1 2881 3 x 380-480 V				
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N1121
-	SB	-	-	195N1122
R3	ST	-	-	195N1123
R3	SB	-	-	195N1124
-	ST	✓	-	195N1125
-	SB	✓	-	195N1126
R3	ST	✓	-	195N1127
R3	SB	✓	-	195N1128
-	ST	-	✓	195N1129
-	SB	-	✓	195N1130
R3	ST	-	✓	195N1131
R3	SB	-	✓	195N1132

18.5 kW TR1 2882 3 x 380-480 V				
RFI	Unit	Profibus DP	DeviceNet	Ordering no.
-	ST	-	-	195N1133
-	SB	-	-	195N1134
R3	ST	-	-	195N1135
R3	SB	-	-	195N1136
-	ST	✓	-	195N1137
-	SB	✓	-	195N1138
R3	ST	✓	-	195N1139
R3	SB	✓	-	195N1140
-	ST	-	✓	195N1141
-	SB	-	✓	195N1142
R3	ST	-	✓	195N1143
R3	SB	-	✓	195N1144



Data sheet

ST: Standard unit.

SB: Standard unit with integral brake.

R1: With RFI filter that complies with EN 55011-1A.

R3: With RFI filter that complies with EN 55011-1B.

Brake resistors

Flatpack brake resistors IP 54

Type	P _{motor} [kW]	R _{MIN} [Ω]	Size [Ω] / [W] per item	Duty cycle %	Order no. 175Uxxxx
2803 (200 V)	0.37	297	330 Ω / 100 W	30	1003
2805 (200 V)	0.55	198	220 Ω / 100 W	20	1004
2807 (200 V)	0.75	135	150 Ω / 100 W	14	1005
2811 (200 V)	1.10	99	100 Ω / 100 W	8	1006
2815 (200 V)	1.50	69	72 Ω / 200 W	16	0092
2822 (200 V)	2.20	43	50 Ω / 200 W	9	0993
2840 (200 V)	3.70	21	50 Ω / 200 W	11	2x0993 ¹
2805 (400 V)	0.55	747	830 Ω / 100 W	20	1000
2807 (400 V)	0.75	558	620 Ω / 100 W	14	1001
2811 (400 V)	1.10	387	430 Ω / 100 W	8	1002
2815 (400 V)	1.50	297	310 Ω / 200 W	16	0984
2822 (400 V)	2.20	198	210 Ω / 200 W	9	0987
2830 (400 V)	3.00	135	150 Ω / 200 W	5.5	0989
2840 (400 V)	4.00	99	240 Ω / 200 W	11	2x0986 ¹

¹These two resistors must be connected in parallel.
See dimensions of Flatpack brake resistors on the next page.

Brake resistor for TR1 2803-2882 duty-cycle 40% data and codenumber

TR1 type	Intermittent braking period time [seconds]	P _{motor} [kW]	R _{min} [Ω]	R _{rec} [Ω]	P _{b, max} [kW]	Therm.relay [Amp]	Code number 175Uxxxx	Cable cross section [mm ²]
2803 (200 V)	120	0,37	297	330	0,16	0,7	1900*	1,5**
2805 (200 V)	120	0,55	198	220	0,25	1,1	1901*	1,5**
2807 (200 V)	120	0,75	135	150	0,32	1,5	1902*	1,5**
2811 (200 V)	120	1,1	99	110	0,45	2,0	1975*	1,5**
2815 (200 V)	120	1,5	74	82	0,85	3,2	1903*	1,5**
2822 (200 V)	120	2,2	50	56	1,00	4,2	1904*	1,5**
2840 (200 V)	120	3,7	22	25	3,00	11,0	1925	1,5**
2805 (400 V)	120	0,55	747	830	0,45	0,7	1976*	1,5**
2807 (400 V)	120	0,75	558	620	0,32	0,7	1910*	1,5**
2811 (400 V)	120	1,1	387	430	0,85	1,4	1911*	1,5**
2815 (400 V)	120	1,5	297	330	0,85	1,6	1912*	1,5**
2822 (400 V)	120	2,2	198	220	1,00	2,1	1913*	1,5**
2830 (400 V)	120	3,0	135	150	1,35	3,0	1914*	1,5**
2840 (400 V)	120	4,0	99	110	1,60	3,8	1979*	1,5**
2855 (400 V)	120	5,5	80	80	2,00	5,0	1977*	1,5**
2875 (400 V)	120	7,5	56	56	3,00	6,8	1978*	1,5**
2880 (400 V)	120	11	40	40	5,00	11,2	1997*	1,5**
2881 (400 V)	120	15	30	30	10,0	18,3	1998	2,5**
2882 (400 V)	120	18,5	25	25	13,0	22,8	1999	4**

*With KLIXON switch

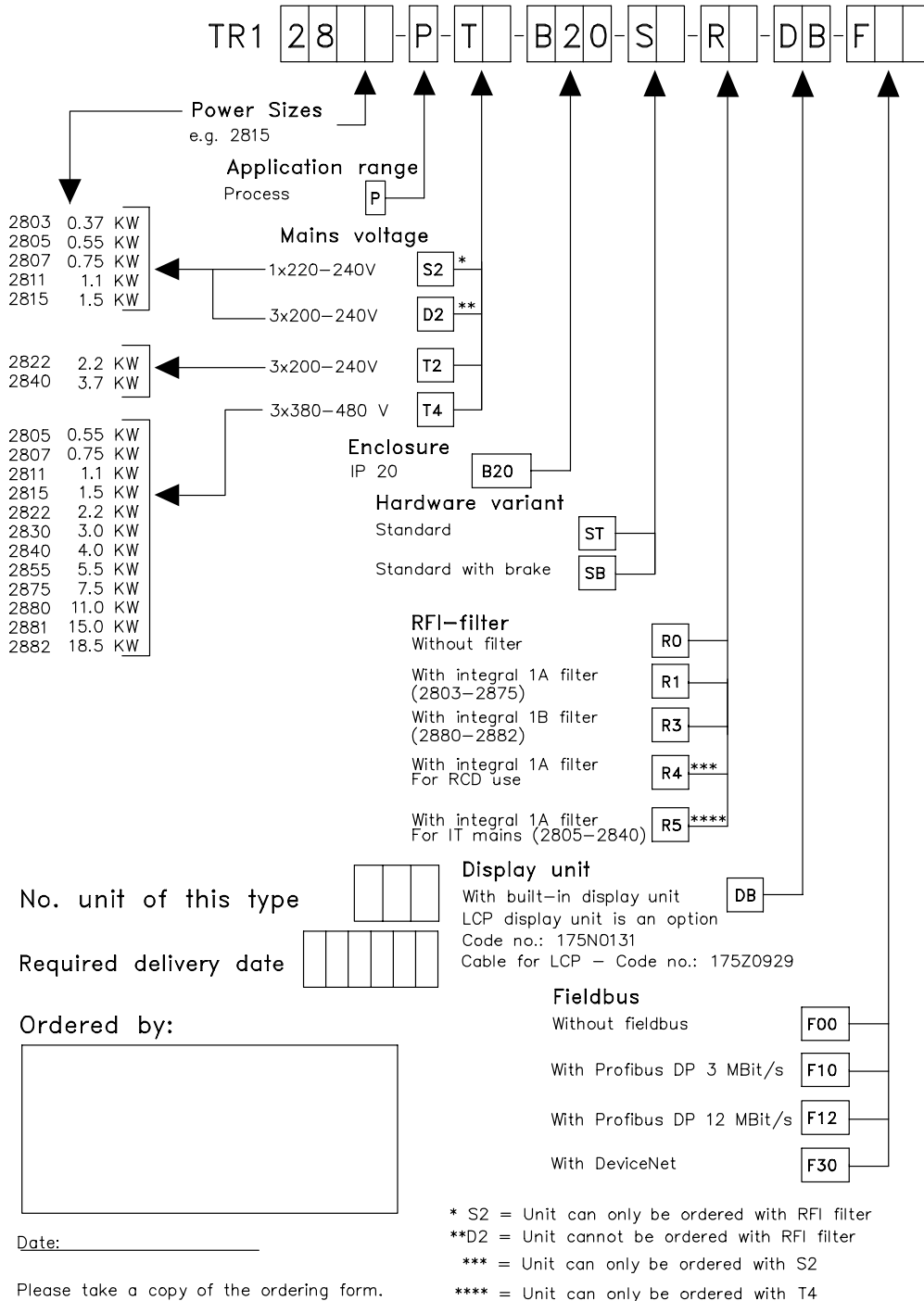
**Always observe national and local regulations



Data sheet

P_{motor}	: Rated motor size for TR1 type
R_{min}	: Minimum permissible brake resistor
R_{rec}	: Recommended brake resistor
$P_{\text{b, max}}$: Brake resistor rated power as stated by supplier
Therm. relay	: Brake current setting of thermal relay
Code number	: Order numbers for brake resistors
Cable cross section	: Recommended <u>minimum</u> value based upon PVC insulated cober cable, 30 degree Celsius ambient temperature with normal heat dissipation

See dimensions of brake resistor for TR1 2803-2882 dutycycle 40% in instruction MI.90.FX.YY.



Please take a copy of the ordering form.
Fill it in and send or fax your order
to the nearest Danfoss rep. office.

195NA363.10

PC Software tools**PC Software - MCT 10**

All drives are equipped with a serial communication port. We provide a PC tool for communication between PC and frequency converter, TR1 Motion Control Tool MCT 10 Set-up Software.

MCT 10 Set-up Software

MCT 10 has been designed as an easy to use interactive tool for setting parameters in our frequency converters.

The MCT 10 Set-up Software will be useful for:

- Planning a communication network off-line. MCT 10 contains a complete frequency converter database
- Commissioning frequency converters on line
- Saving settings for all frequency converters
- Replacing a drive in a network
- Expanding an existing network
- Future developed drives will be supported

MCT 10 Set-up Software support Profibus DP-V1 via a Master class 2 connection. It makes it possible to on line read/write parameters in a frequency converter via the Profibus network. This will eliminate the need for an extra communication network.

The MCT 10 Set-up Software Modules

The following modules are included in the software package:

**MCT 10 Set-up Software**

- Setting parameters
- Copy to and from frequency converters
- Documentation and print out of parameter settings incl. diagrams

SyncPos

- Creating SyncPos programme

Ordering number:

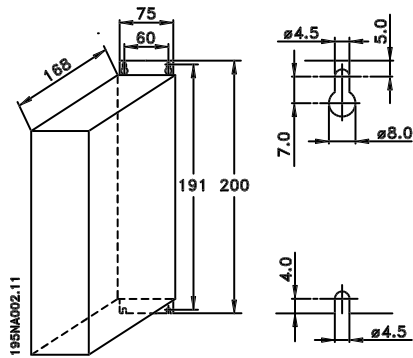
Please order your CD containing MCT 10 Set-up Software using code number 130B1000.

Mechanical dimensions

The drawings below give the mechanical dimensions. All dimensions are in mm.

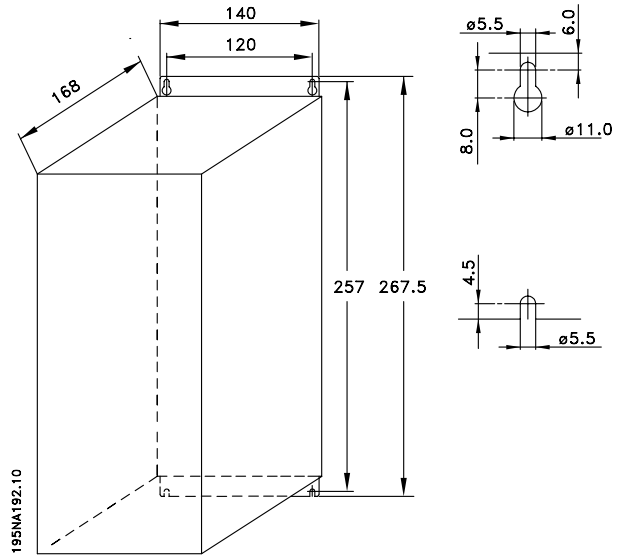
TR1 2803-2815 200-240 Volt

TR1 2805-2815 380-480 Volt



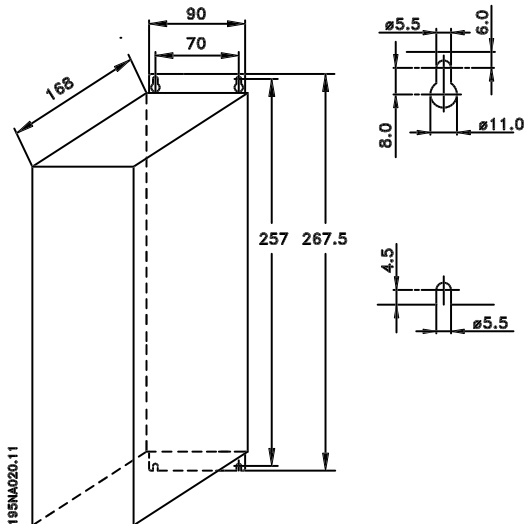
TR1 2840 200-240 Volt

TR1 2855-2875 380-480 Volt

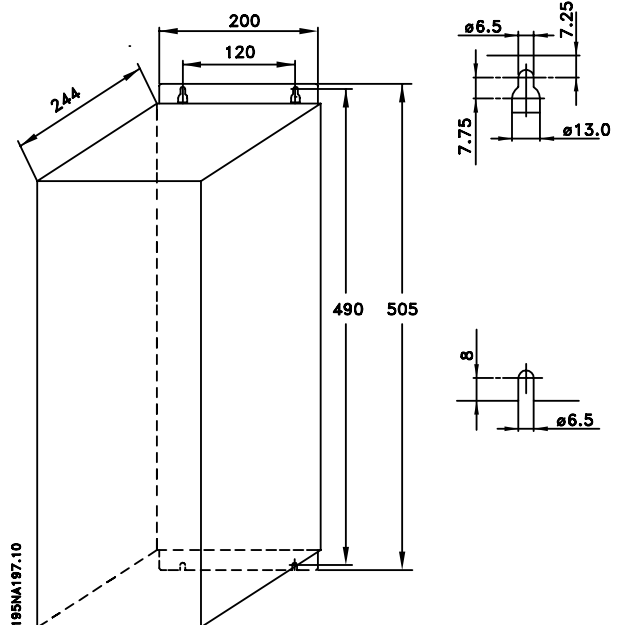


TR1 2822 200-240 Volt

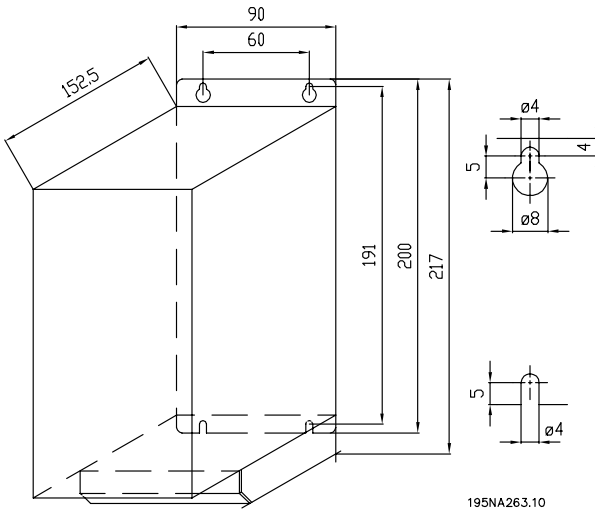
TR1 2822-2840 380-480 Volt



TR1 2880-82 380-480V

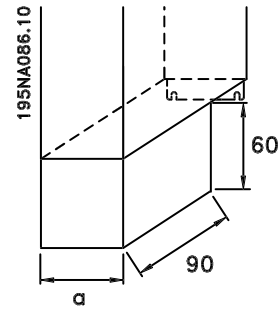


Motor coils (195N3110)

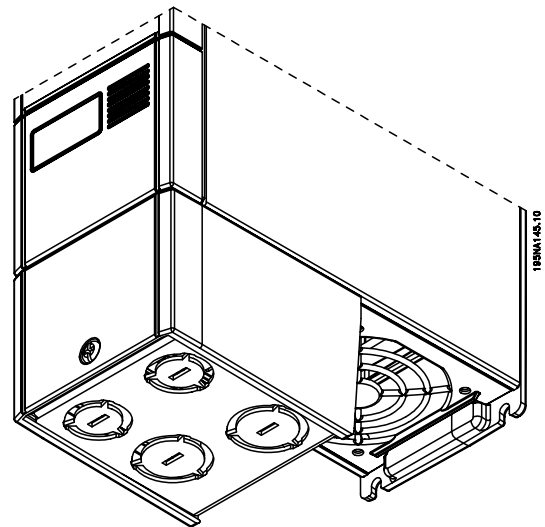
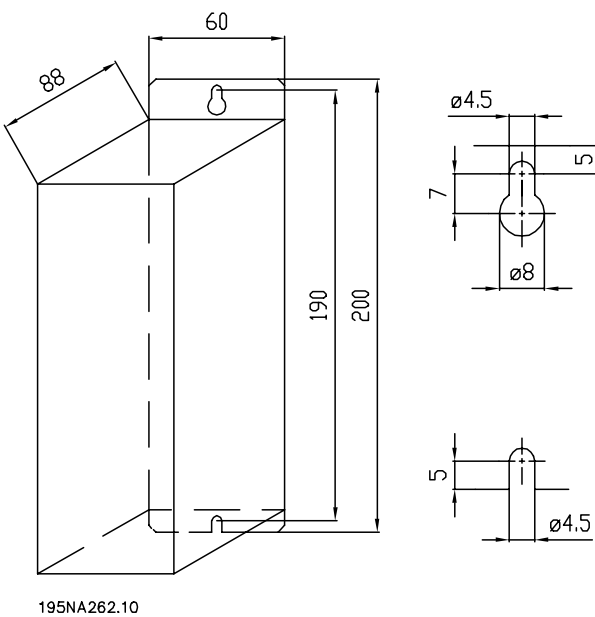


Terminal cover

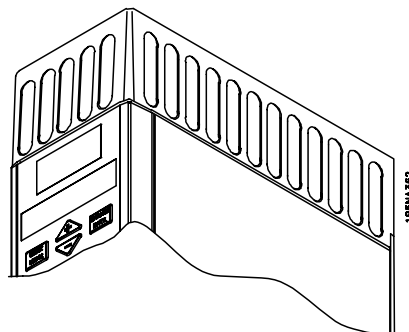
The drawing below gives the dimensions for NEMA 1 terminal covers for TR1 2803-2875. Dimension a depends on the unit type.

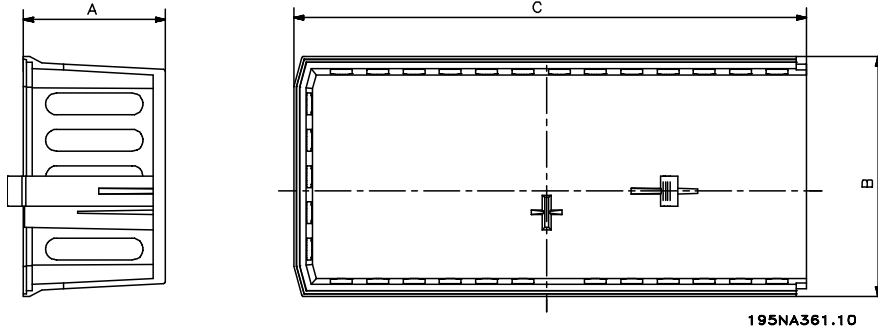


RFI 1B filter (195N3103)



IP 21 solution

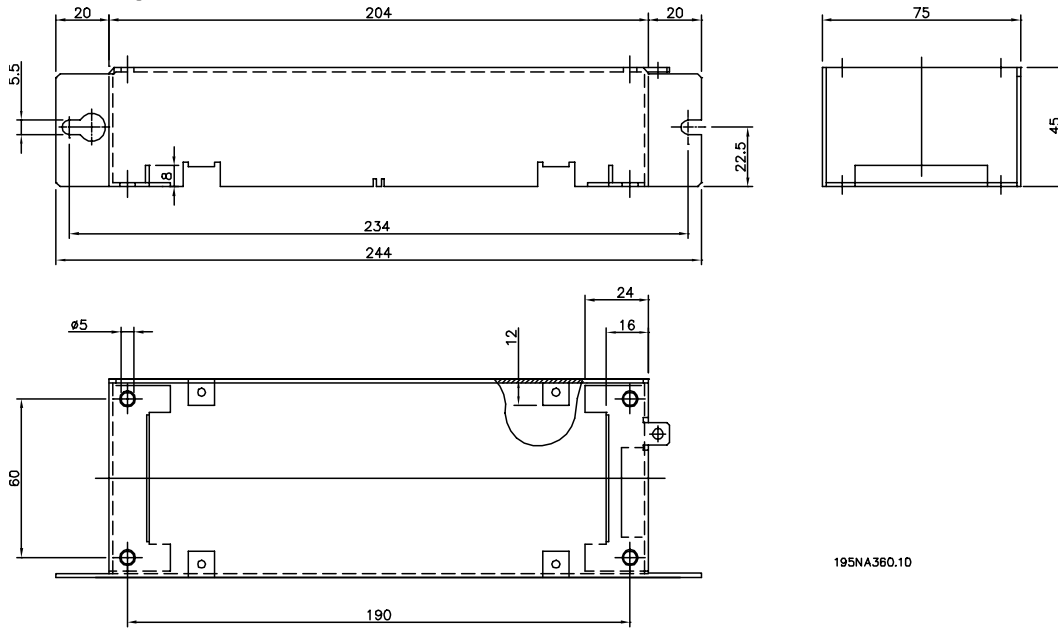




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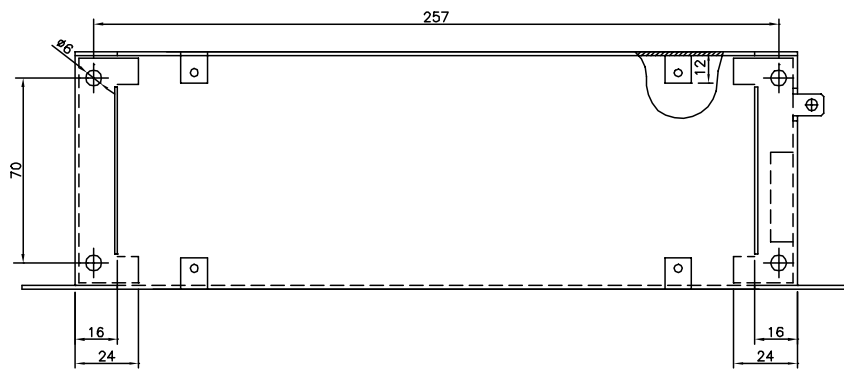
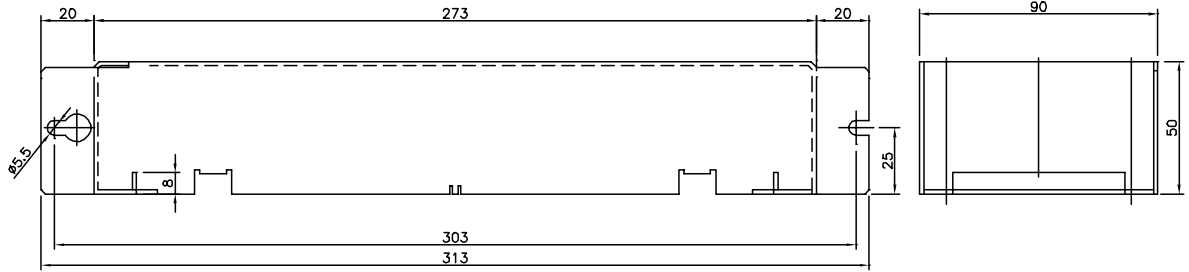
Dimensions

Type	Code number	A	B	C
TR1 2803-2815 200-240 V, TR1 2805-2815 380-480 V	195N2118	47	80	170
TR1 2822 200-240 V, TR1 2822-2840 380-480 V	195N2119	47	95	170
TR1 2840 200-240 V, TR1 2855-2875 380-480 V	195N2120	47	145	170
TR1 2880-2882 380-480 V	195N2126	47	205	245

EMC filter for long motor cables


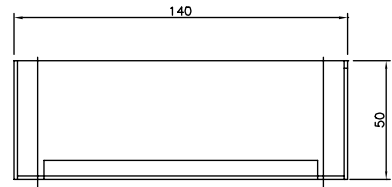
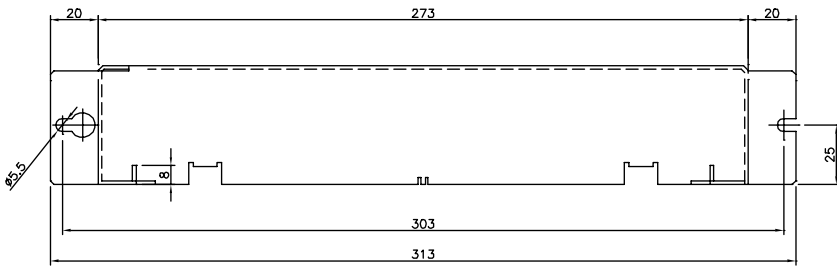
195NA360.10

192H4719

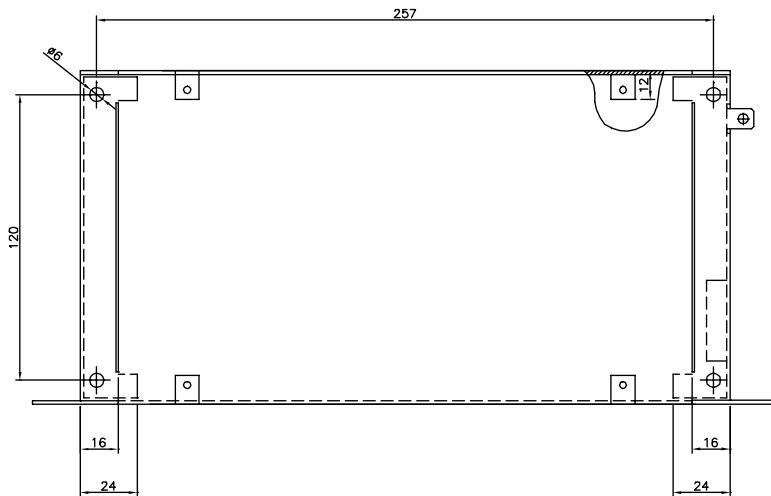


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192H4720

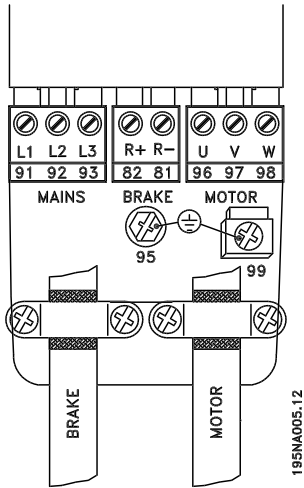


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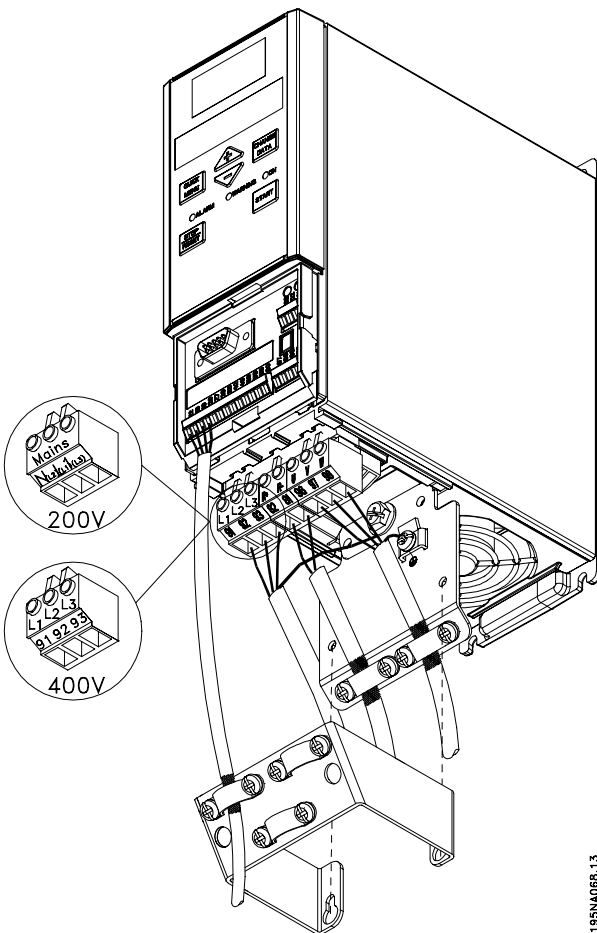


192H4893

Electrical installation

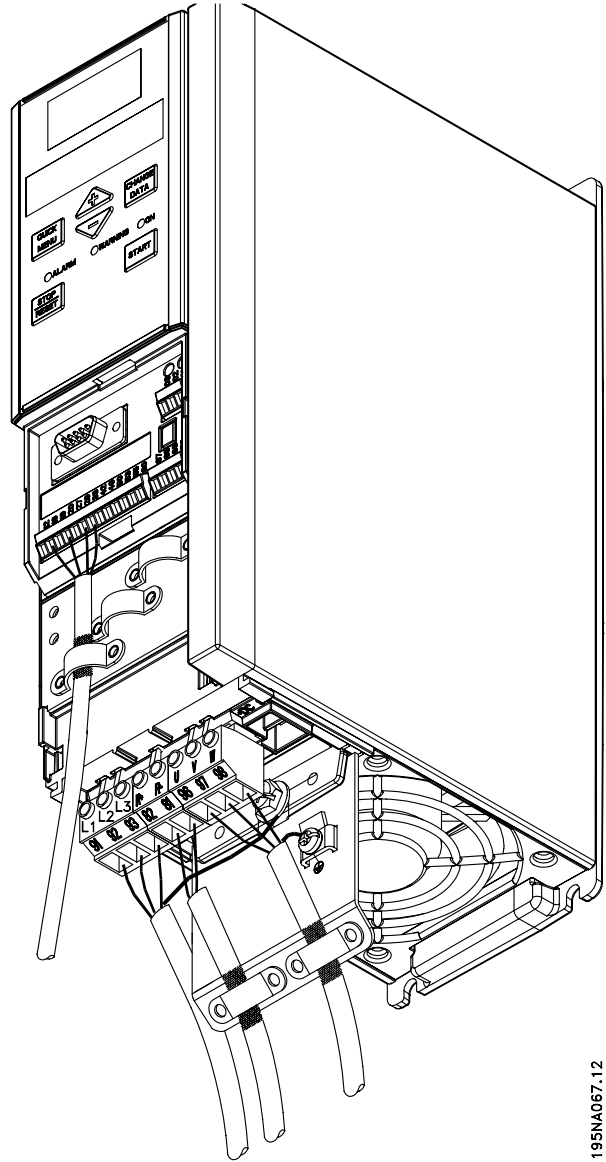


195NA005.12



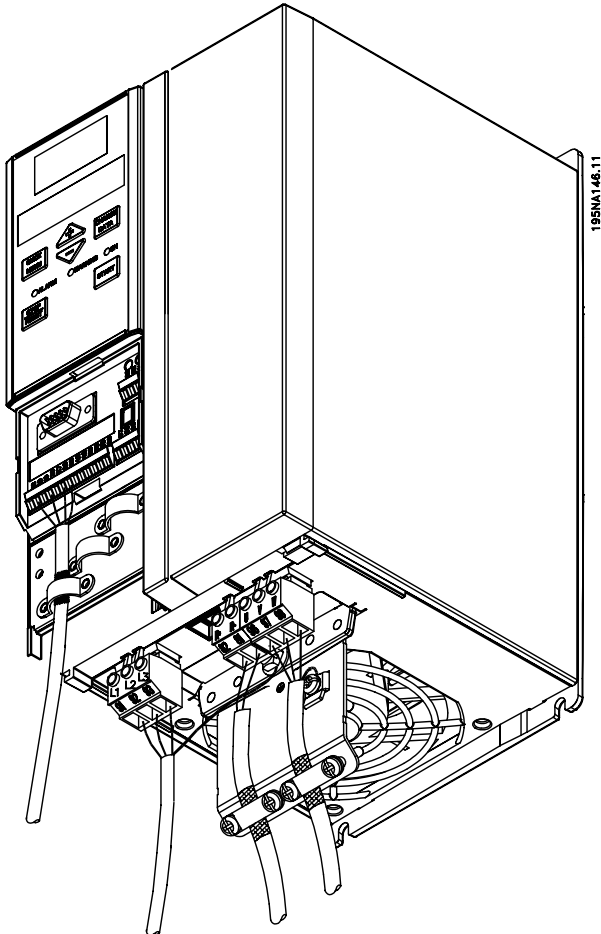
195NA065.13

TR1 2803-2815 200-240 V, 2805-2815 380-480 V

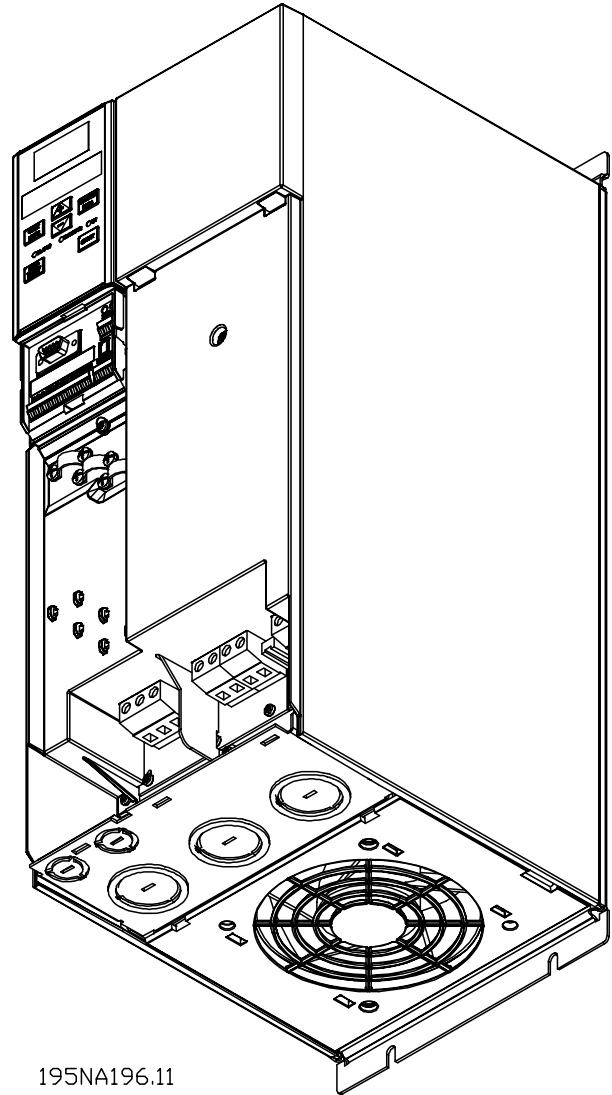


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TR1 2822 200-240 V, 2822-2840 380-480 V

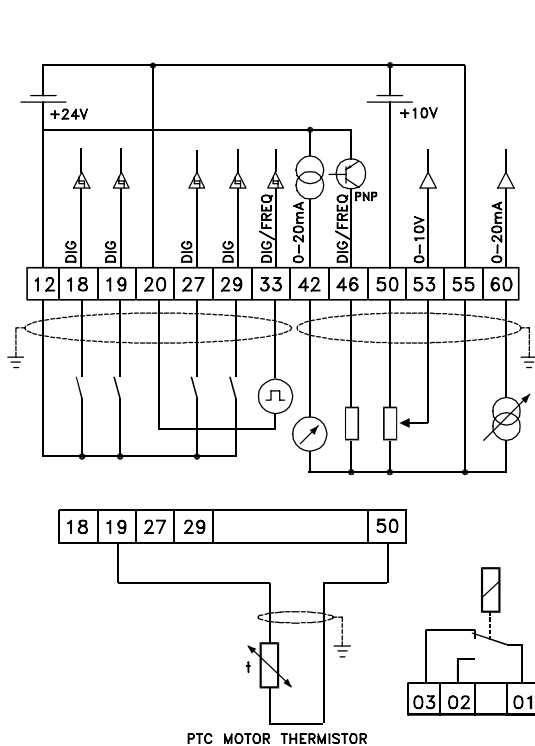


TR1 2840 200-240 V, 2855-2875 380-480 V



TR1 2880-2882 380-480V

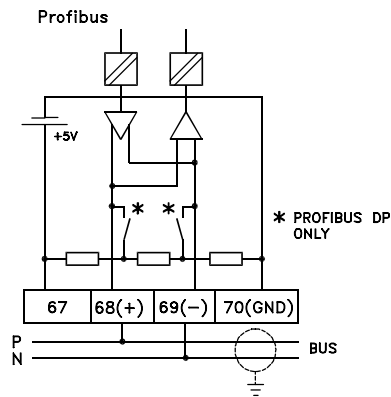
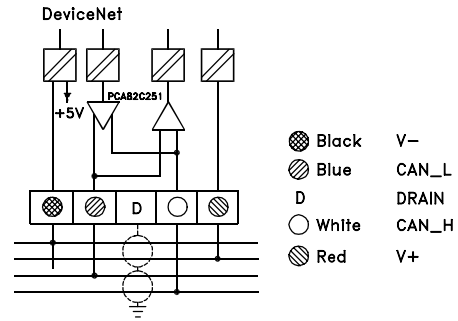
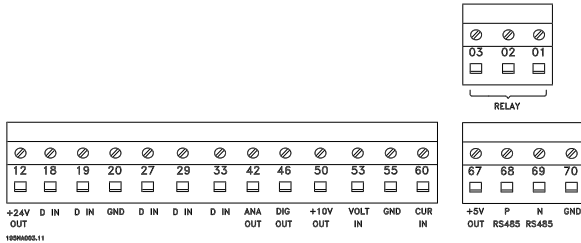
Please note, that the units will be supplied with two bottom plates; one for metric glands and one for conduits.



195NA028.14

PTC MOTOR THERMISTOR

Electrical installation, control terminals



No.	Function
01-03	Relay outputs 01-03 can be used for indicating status and alarms/warnings.
12	24 V DC voltage supply.
18-33	Digital inputs.
20, 55	Common frame for input and output terminals.
42	Analog output for displaying frequency, reference, current or torque.
46 ¹	Digital output for displaying status, warnings or alarms, as well as frequency output.
50	+10 V DC supply voltage for potentiometer or thermistor.
53	Analogue voltage input 0 - 10 V DC.
60	Analogue current input 0/4 - 20 mA.
67 ¹	+ 5 V DC supply voltage to Profibus.
68, 69 ¹	RS 485, Serial communication.
70 ¹	Frame for terminals 67, 68 and 69. Normally this terminal is not to be used.



Data sheet

1. The terminals are not valid for DeviceNet.
See the DeviceNet manual, MG.90.BX.YY
for further details.

General technical data

Mains supply (L1, L2, L3):

Supply voltage TR1 2803-2815 220-240 V (N, L1)	1 x 220/230/240 V ±10%
Supply voltage TR1 2803-2840 200-240 V	3 x 200/208/220/230/240 V ±10%
Supply voltage TR1 2805-2882 380-480 V	3 x 380/400/415/440/480 V ±10%
Supply frequency	50/60 Hz ± 3 Hz
Max. imbalance on supply voltage	± 2.0% of rated supply voltage
True Power Factor (λ)	0.90 nominal at rated load
Displacement Power Factor ($\cos \varphi$)	near unity (> 0.98)
Number of connections at supply input L1, L2, L3	2 times/min.
Max. short-circuit value	100,000 A

Output data (U, V, W):

Output voltage	0 - 100% of supply voltage
Output frequency	0.2 - 132 Hz, 1 - 1000 Hz
Rated motor voltage, 200-240 V units	200/208/220/230/240 V
Rated motor voltage, 380-480 V units	380/400/415/440/460/480 V
Rated motor frequency	50/60 Hz
Switching on output	Unlimited
Ramp times	0.02 - 3600 sec.

Torque characteristics:

Starting torque (parameter 101 Torque characteristic = Constant torque)	160% in 1 min.*
Starting torque (parameter 101 Torque characteristics = Variable torque)	160% in 1 min.*
Starting torque (parameter 119 <i>High starting torque</i>)	180% for 0.5 sec.*
Overload torque (parameter 101 Torque characteristic = Constant torque)	160%*
Overload torque (parameter 101 Torque characteristic = Variable torque)	160%*

**Percentage relates to frequency converters nominal current.*

Control card, digital inputs:

Number of programmable digital inputs	5
Terminal number	18, 19, 27, 29, 33
Voltage level	0 - 24 V DC (PNP positive logic)
Voltage level, logic 0	< 5 V DC
Voltage level, logic 1	> 10 V DC
Maximum voltage on input	28 V DC
Input resistance, R_i (terminals 18, 19, 27, 29)	approx. 4 k Ω
Input resistance, R_i (terminal 33)	approx. 2 k Ω

All digital inputs are galvanically isolated from the supply voltage (PELV) and other high-voltage terminals. See section entitled Galvanic Isolation.

Control card, analog inputs:

Number of analog voltage inputs	1 pcs.
Terminal number	53
Voltage level	0 - 10 V DC (scaleable)
Input resistance, R_i	approx. 10 k Ω
Max. voltage	20 V
Number of analog current inputs	1 pcs.
Terminal number	60
Current level	0/4 - 20 mA (scaleable)
Input resistance, R_i	approx. 300 Ω
Max. current	30 mA
Resolution for analog inputs	10 bit
Accuracy of analog inputs	Max. error 1% of full scale
Scan interval	13.3 msec

The analog inputs are galvanically isolated from the supply voltage (PELV) and other high-voltage terminals. See section entitled Galvanic Isolation.

Control card, pulse inputs:

Number of programmable pulse inputs	1
Terminal number	33
Max. frequency at terminal 33	67.6 kHz (Push-pull)
Max. frequency at terminal 33	5 kHz (open collector)
Min. frequency at terminal 33	4 Hz
Voltage level	0 - 24 V DC (PNP positive logic)
Voltage level, logic 0	< 5 V DC
Voltage level, logic 1	> 10 V DC
Maximum voltage on input	28 V DC
Input resistance, R_i	approx. 2 k Ω
Scan interval	13.3 msec
Resolution	10 bit
Accuracy (100 Hz- 1 kHz) terminal 33	Max. error: 0.5% of full scale
Accuracy (1 kHz - 67.6 kHz) terminal 33	Max. error: 0.1% of full scale

The pulse input (terminal 33) is galvanically isolated from the supply voltage (PELV) and other high-voltage terminals. See section entitled Galvanic Isolation.

Control card, digital/frequency output:

Number of programmable digital/pulse outputs	1 pcs.
Terminal number	46
Voltage level at digital/frequency output	0 - 24 V DC (O.C PNP)
Max. output current at digital/frequency output	25 mA.
Max. load at digital/frequency output	1 k Ω
Max. capacity at frequency output	10 nF
Minimum output frequency at frequency output	16 Hz
Maximum output frequency at frequency output	10 kHz
Accuracy on frequency output	Max. error: 0.2 % of full scale
Resolution on frequency output	10 bit



Data sheet

The digital output is galvanically isolated from the supply voltage (PELV) and other high-voltage terminals. See section entitled Galvanic Isolation.

Control card, analog output:

Number of programmable analog outputs	1
Terminal number	42
Current range at analog output	0/4 - 20 mA
Max. load to common at analog output	500 Ω
Accuracy on analog output	Max. error: 1.5 % of full scale
Resolution on analog output	10 bit

The analog output is galvanically isolated from the supply voltage (PELV) and other high-voltage terminals. See section entitled Galvanic Isolation.

Control card, 24 V DC output:

Terminal number	12
Max. load	130 mA

The 24 V DC supply is galvanically isolated from the supply voltage (PELV) , but has the same potential as the analogue and digital inputs and outputs. See section entitled Galvanic Isolation.

Control card, 10 V DC output:

Terminal number	50
Output voltage	10.5 V ±0.5 V
Max. load	15 mA

The 10 V DC supply is galvanically isolated from the supply voltage (PELV) and other high-voltage terminals. See section entitled Galvanic Isolation.

Control card, RS 485 serial communication:

Terminal number	68 (TX+, RX+), 69 (TX-, RX-)
Terminal number 67	+ 5 V
Terminal number 70	Common for terminals 67, 68 and 69

Full galvanic isolation. See section entitled Galvanic Isolation.

Relay outputs:

Number of programmable relay outputs	1
Terminal number, control card	1-3 (break), 1-2 (make)
Max. terminal load (AC) on 1-3, 1-2, control card	240 V AC, 2 A
Min. terminal load on 1-3, 1-2, control card	24 V DC 10 mA, 24 V AC 100 mA

The relay contact is separated from the rest of the circuit by strengthened isolation. See section entitled Galvanic Isolation.

Cable lengths and cross sections:

Max. motor cable length, screened/armoured cable	40 m
Max. motor cable length, unscreened/unarmoured cable	75 m
Max. motor cable length, screened/armoured cable and motor coil	100 m
Max. motor cable length, unscreened/unarmoured cable and motor coil	200 m
Max. motor cable length, screened/armoured cable and RFI/1B filter	200 V, 100 m
Max. motor cable length, screened/armoured cable and RFI/1B filter	400 V, 25 m
Max. motor cable length, screened/armoured cable and RFI 1B/LC filter	400 V, 25 m

Max. cross section to motor, see next section.



Data sheet

Max. cross section to control wires, rigid wire 1.5 mm²/16 AWG (2 x 0.75 mm²)
Max. cross section to control cables, flexible cable 1 mm²/18 AWG
Max. cross section to control cables, cable with enclosed core 0.5 mm²/20 AWG

When complying with EN 55011 1A and EN 55011 1B the motor cable must in certain instances be reduced. See EMC emission.

Control characteristics:

Frequency range	0.2 - 132 Hz, 1 - 1000 Hz
Resolution of output frequency	0.013 Hz, 0.2 - 1000 Hz
Repeat accuracy of <i>Precise start/stop</i> (terminals 18, 19)	≤ ± 0.5 msec
System response time (terminals 18, 19, 27, 29, 33)	≤ 26.6 msec
Speed control range (open loop)	1:15 of synchronous speed
Speed control range (closed loop)	1:120 of synchronous speed
Speed accuracy (open loop)	90 - 3600 rpm: Max. error of ±23 rpm
Speed accuracy (closed loop)	30 - 3600 rpm: Max. error of ±7.5 rpm

All control characteristics are based on a 4-pole asynchronous motor

Surroundings:

Enclosure	IP 20
Enclosure with options	NEMA 1
Vibration test	0.7 g
Max. relative humidity	5% - 93% during operation
Ambient temperature	Max. 45 °C (24-hour average max. 40 °C)
Min. ambient temperature during full-scale operation	0 °C
Min. ambient temperature at reduced performance	- 10 °C
Temperature during storage/transport	-25 - +65/70 °C
Max. altitude above sea level	1000 m
EMC standards, Emission	EN 50081-2, EN 61800-3, EN 55011
EMC standards, Immunity	EN 50082-1/2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61800-3

Safeguards:

Electronic thermal motor protection against overload.

Temperature monitoring of the power module ensures that the frequency converter cuts out if the temperature reaches 100 °C. An overload temperature cannot be reset until the temperature of the power module is below 70 °C.

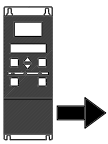

The frequency converter is protected against short-circuits on motor terminals U, V, W.

If a mains phase is missing, the frequency converter will cut out.

Monitoring of the intermediate circuit voltage ensures that the frequency converter cuts out if the intermediate circuit voltage is too low or too high.





The frequency converter is protected against earth fault on motor terminals U, V, W.

Technical data, mains supply 1 x 220 - 240 V/3 x 200-240V

According to . international standards		Type	2803	2805	2807	2811	2815	2822	2840
	Output current (3 x 200-240V)	I_{INV} [A]	2.2	3.2	4.2	6.0	6.8	9.6	16
		I_{MAX} (60s) [A]	3.5	5.1	6.7	9.6	10.8	15.3	25.6
	Output power (230 V)	S_{INV} [KVA]	0.9	1.3	1.7	2.4	2.7	3.8	6.4
	Typical shaft output	$P_{M,N}$ [kW]	0.37	0.55	0.75	1.1	1.5	2.2	3.7
	Typical shaft output	$P_{M,N}$ [HP]	0.5	0.75	1.0	1.5	2.0	3.0	5.0
	Max. cable cross section, motor	[mm ² /AWG] ¹⁾	4/10	4/10	4/10	4/10	4/10	4/10	4/10
	Input current (1 x 220-240 V)	$I_{L,N}$ [A]	5.9	8.3	10.6	14.5	15.2	-	-
		$I_{L,MAX}$ (60s) [A]	9.4	13.3	16.7	23.2	24.3	-	-
	Input current (3 x 200-240 V)	$I_{L,N}$ [A]	2.9	4.0	5.1	7.0	7.6	8.8	14.7
		$I_{L,MAX}$ (60s) [A]	4.6	6.4	8.2	11.2	12.2	14.1	23.5
	Max. cable cross section, power	[mm ² /AWG] ¹⁾	4/10	4/10	4/10	4/10	4/10	4/10	4/10
	Max. pre-fuses	IEC/UL ²⁾ [A]	20/20	20/20	20/20	20/20	20/20	20/20	25/25
	Efficiency ³⁾	[%]	95	95	95	95	95	95	95
	Power loss at 100% load	[W]	24	35	48	69	94	125	231
	Weight	[kg]	2.0	2.0	2.0	2.0	2.0	3,7	6.0
	Enclosure ⁴⁾	type	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20

1. American Wire Gauge. Max. cable cross section is the largest cable cross section that can be attached to the terminals. Always observe national and local regulations.
2. Type gG pre-fuses must be used for installation according to IEC rules. If you want to maintain UL/cUL you must use pre-fuses of the type Bussmann KTN-R 200 V, KTS-R 500 V or Ferraz Shawmut, type ATMR (max. 30A). The fuses must be placed for protection in a circuit that is capable of supplying a maximum of 100,000 amps RMS (symmetrical), 500 V maximum.
3. Measured using a 25 m screened/armoured motor cable with a rated load and rated frequency.
4. IP20 is standard for TR1 2805-2875, whereas NEMA 1 is an option.

Technical data, mains supply 3 x 380 - 480 V

According to international standards		Type	2805	2807	2811	2815	2822	2830
	Output current (3 x 380-480V)	I_{INV} [A]	1.7	2.1	3.0	3.7	5.2	7.0
		I_{MAX} (60s) [A]	2.7	3.3	4.8	5.9	8.3	11.2
	Output power (400 V)	S_{INV} [KVA]	1.1	1.7	2.0	2.6	3.6	4.8
	Typical shaft output	$P_{M,N}$ [kW]	0.55	0.75	1.1	1.5	2.2	3.0
	Typical shaft output	$P_{M,N}$ [HP]	0.75	1.0	1.5	2.0	3.0	4.0
	Max. cable cross section, motor	[mm ² /AWG] ¹⁾	4/10	4/10	4/10	4/10	4/10	4/10
	<hr/>							
	Input current (3 x 380-480 V)	$I_{L,N}$ [A]	1.6	1.9	2.6	3.2	4.7	6.1
		$I_{L,MAX}$ (60s)[A]	2.6	3.0	4.2	5.1	7.5	9.8
	Max. cable cross section, power	[mm ² /AWG] ¹⁾	4/10	4/10	4/10	4/10	4/10	4/10
	Max. pre-fuses	IEC/UL ²⁾ [A]	20/20	20/20	20/20	20/20	20/20	20/20
	Efficiency ³⁾	[%]	96	96	96	96	96	96
	Power loss at 100% load	[W]	28	38	55	75	110	150
	Weight	[kg]	2.1	2.1	2.1	2.1	3.7	3.7
	Enclosure ⁴⁾	type	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
<hr/>								
According to international standards		Type	2840	2855	2875	2880	2881	2882
	Output current (3 x 380-480V)	I_{INV} [A]	9.1	12	16	24	32.0	37.5
		I_{MAX} (60s) [A]	14.5	19.2	25.6	38.4	51.2	60.0
	Output power (400 V)	S_{INV} [KVA]	6.3	8.3	11.1	16.6	22.2	26.0
	Typical shaft output	$P_{M,N}$ [kW]	4.0	5.5	7.5	11.0	15.0	18.5
	Typical shaft output	$P_{M,N}$ [HP]	5.0	7.5	10.0	15.0	20.0	25.0
	Max. cable cross section, motor	[mm ² /AWG] ¹⁾	4/10	4/10	4/10	16/6	16/6	16/6
	<hr/>							
	Input current (3 x 380-480 V)	$I_{L,N}$ [A]	8.1	10.6	14.9	24.0	32.0	37.5
		$I_{L,MAX}$ (60s)[A]	13.0	17.0	23.8	38.4	51.2	60
	Max. cable cross section, power	[mm ² /AWG] ¹⁾	4/10	4/10	4/10	16/6	16/6	16/6
	Max. pre-fuses	IEC/UL ²⁾ [A]	20/20	25/25	25/25	50/50	50/50	50/50
	Efficiency ³⁾	[%]	96	96	96	97	97	97
	Power loss at 100% load	[W]	200	275	372	412	562	693
	Weight	[kg]	3.7	6.0	6.0	18.5	18.5	18.5
	Enclosure ⁴⁾	type	IP20	IP20	IP20	IP20/ NEMA 1	IP20/ NEMA 1	IP20/ NEMA 1

1. American Wire Gauge. Max. cable cross section is the largest cable cross section that can be attached to the terminals. Always observe national and local regulations.

2. Type gG pre-fuses must be used for installation according to IEC rules. If you want to maintain UL/cUL you must use pre-fuses of the type Bussmann KTN-R 200



Data sheet

V, KTS-R 500 V or Ferraz Shawmut, type ATMR (max. 30A). The fuses must be placed for protection in a circuit that is capable of supplying a maximum of 100,000 amps RMS (symmetrical), 500 V maximum.

3. Measured using a 25 m screened/armoured motor cable with a rated load and rated frequency.

4. IP20 is standard for TR1 2805-2875, whereas NEMA 1 is an option.



B	
Brake resistor.....	4
Brake resistors	17

C	
Control terminals	28
Control unit	11

D	
DeviceNet	5
Dimensions.....	22

E	
Electrical installation.....	26
EMC filter for long motor cables	11

F	
Fieldbus option	5

I	
IP 21 solution	23

L	
LC filter	8

M	
Mains supply	36
Mains voltage	3
MCT 10.....	21
Motor coils	6 , 23

O	
Order form	20
Ordering numbers for TR1 2800 200-240 V	12
Ordering numbers for TR1 2800 380-480V	14

P	
Profibus DP-V1	21
PC Software tools.....	21
Profibus.....	5

R	
RFI 1B filter.....	6 , 23
RFI 1B/LC filter	8

T	
Terminal cover	23
Thermistor.....	8



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