

RSI

Renewable Solar Inverter for pump control
1.5-250 kW (2-350 hp)



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1. Product introduction

General description

The Grundfos Renewable Solar Inverter (RSI) is an off-grid solar inverter converting the DC power output from the solar panel to AC power supply for pump operation.

RSI can be used in both new and existing systems as long as the motor specifications are compatible and the motor is suitable for use with a variable frequency drive.

The list below contains the Grundfos pump types for use in applications with RSI:

- CR
- SP
- NB, NK
- MTR
- CM
- TP.

Features and benefits

Enclosure classes up to IP66

RSI is available in three enclosure classes: IP21, IP54 and IP66.

- IP21: RSI must be installed in a cabinet with sufficient ingress protection.
- IP54: RSI can be installed without a cabinet, but must not be installed outdoors without additional protection against water and sun.
- IP66: RSI can be installed without a cabinet. It can be installed outdoors, but should be shaded from direct sunlight.

Setup wizard with Grundfos product library

RSI has a built-in Grundfos product library which allows a plug-and-pump experience. The motor library contains all related parameters, which simplifies the setup process to just a few clicks and a setup time of a few minutes.

Detachable operating panel

The operating panel is mounted on RSI by using a magnet and a communication plug. The inverter can operate without the operating panel and operates with the last saved setup data.

AC/DC compatibility

RSI is AC and DC compatible. RSI can be connected to the grid or a generator as back-up power during solar panel disruptions.

The AC compatibility also allows the end user to connect the inverter to three-phase power in their workshop for off-site setup, which enables a fast and simple on-site installation.

Maximum power point tracking (MPPT)

The inverter has built-in electronics with four MPPT algorithms. The inverter continuously optimises the power output according to available solar irradiation as well as various environmental conditions.

Overvoltage and undervoltage protection

Overvoltage and undervoltage may occur in case of faulty installation. The inverter disconnects the power connection to the motor if the voltage falls outside the allowed voltage limits. The inverter stays in fault mode with the error code displayed until reset.

Overload protection

Overload may occur if the maximum allowed frequency is set too high or a wrong pump is used. The inverter disconnects the power connection to the motor if overload occurs. The inverter stays in fault mode with the error code displayed until reset.

Overcurrent protection

Overcurrent may occur if, for example, a wrong cable size is used. The inverter disconnects the power connection to the motor if the current falls outside the allowed current limits. The inverter stays in fault mode with the error code displayed until reset.

Note that for the overcurrent protection to function properly, the actual current value must be adjusted according to the maximum current attained at the maximum frequency shortly after the system started operation.

Overtemperature protection

The inverter may be overheated if appropriate ventilation is not available or the ambient temperature is too high. The inverter disconnects the power connection to the motor if overtemperature occurs in the inverter. The inverter stays in fault mode with the error code displayed until reset.

Note that the inverter does not detect motor temperature or protect the motor against overtemperature.

No-load protection

No-load situation of the inverter may occur if, for example, the cable to the motor is broken. The inverter disconnects the power connection to the motor if no-load occurs. The inverter stays in fault mode with the error code displayed until reset.

For the no-load protection to function properly, check the RSI installation and operating instructions carefully and follow them during operation.

Operating history

The inverter stores historical operating data. The data can be retrieved through the menu on the inverter.

Type key

Example: RSI 0100 3L 0003 4 X HMGR.

Code	Explanation
RSI	Renewable Solar Inverter
0100	Product type
3L	Three-phase power
0003 0072	Rated current [A]
Voltage	
2	208-240 V
4	380-440 V
5	380-500 V
Enclosure class	
X	IP66 / NEMA 4X
-	IP21 / NEMA 1
IP54	IP54 / NEMA 12
HMGR	Optional: Operating panel with graphical display
SBF4	Optional: IO board
SRBT	Optional: Real-time clock battery
BM4J	Grundfos internal reference
WT97	Grundfos standard warranty
DBIN	Optional: Brake resistor add-on

2. Applications

RSI is designed for continuous as well as intermittent operation. The system is suitable for various water supply systems, including irrigation.

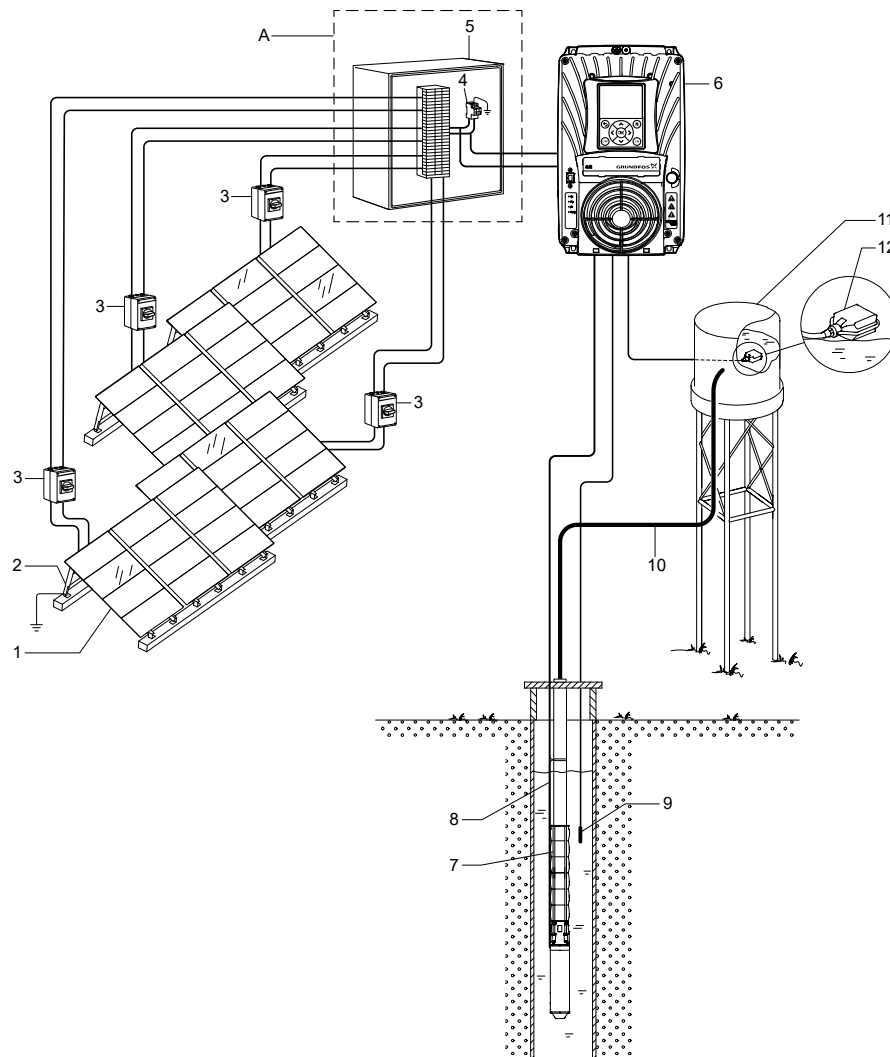
RSI can be used in existing systems with submersible pumps or dry-installed pumps, thus providing a very wide range of applications allowing you to leverage renewable energy sources with the ability to back up the system with grid or generator power.

Application example

The water production of an RSI system depends on the availability of solar power. The typical result is excess water production in the afternoon and insufficient water production in the morning and evening. A system equipped with a storage water tank enables a stable water supply throughout the day.

In a combiner box, all cables from the solar panels can be connected into one set of power input cables before connecting them to RSI.

Installation example, submersible pump



TM066677

Installation example showing solar panels, solar inverter, submersible pump and water tank

Pos.	Description
1	Solar panel
2	Support structure
3	Disconnect switch, DC
4	Surge protection DC ¹⁾
5	Combiner box
6	Renewable Solar Inverter
7	SP pump
8	Submersible drop cable
9	Dry-running switch
10	Outlet pipe
11	Water tank
12	Level switch
A	Optional

¹⁾ If the distance between the solar panel and the inverter is more than 10 m (32 ft), it is necessary to add extra surge protection closer to the solar panel.

3. System components

An RSI system consists of a three-phase Grundfos motor, an RSI solar inverter and various protection accessories.

The RSI system includes the following components:

- Grundfos motor
- RSI
- disconnect switch, AC (optional)
- disconnect switch, DC
- surge protection, DC
- solar panel
- dry-running switch
- level switch (optional)
- sine-wave filter (optional)
- combiner box.

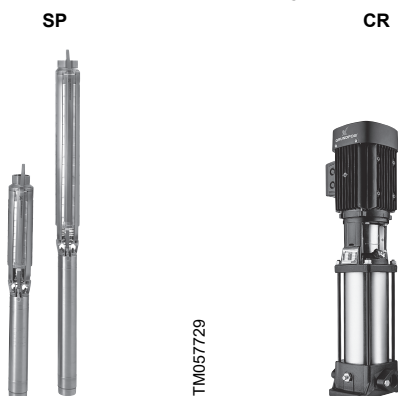
Pumps

Pump requirements for an RSI system:

- The rated frequency can be either 50 or 60 Hz.
- The pump must be able to operate with a voltage supply of $3 \times 380\text{--}440\text{ VAC}$ or $3 \times 208\text{--}220\text{ VAC}$.

As standard, Grundfos three-phase pumps can only be operated via an AC voltage supply. Therefore, the solar panels must not be connected directly to the pump but must be connected via an RSI.

Grundfos pumps suitable for RSI systems



Renewable Solar Inverter

For a general product description, see section Product Introduction.



RSI inverter

RSI combined with various sensors can offer the following functions:

- maximum power point tracking (MPPT)
- DC to three-phase AC conversion
- connection to dry-running switch
- connection to level switch
- operating history query.

Disconnect switch, AC (optional)

An AC disconnect switch is a standard disconnect switch used for normal three-phase power connection between the RSI output and the motor.

Sine-wave filter (optional)

A sine-wave filter is primarily used for protecting the motor against overvoltage and increased operating temperature. Output filters can also be used for reduction of motor acoustics.

Solar panel

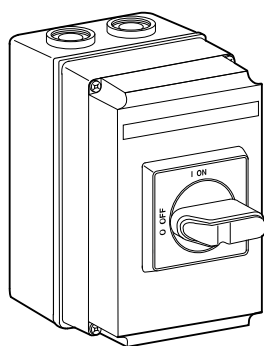
The solar panel offered by Grundfos is specially selected for Grundfos RSI.

All Grundfos solar panels are equipped with plugs and sockets enabling easy connection. The number of solar panels required depends on the water quantity and pressure required, and the installation location.

Dry-running switch

The dry-running switch is recommended for submersible pump operation. The switch can prevent the risk of the pump operating in a dry well, which could result in damage of the pump.

Disconnect switch, DC

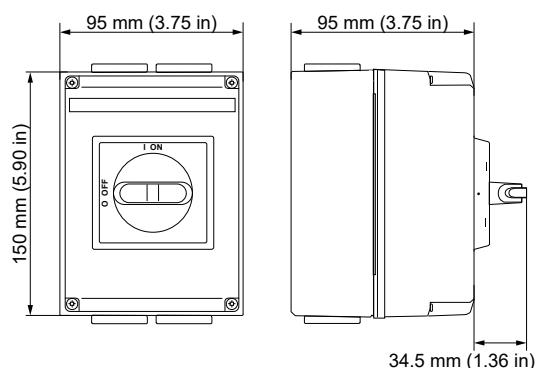


TM057581

Disconnect switch

The DC disconnect switch is suitable for the solar-powered RSI system.

The disconnect switch enables manual starting and stopping of the system. At least one DC disconnect switch is required for each set of solar panels connected in series to an RSI.



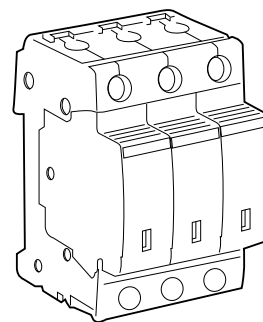
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Dimensions, disconnect switch

Combiner box (optional)

A combiner box combines the output of multiple solar panel arrays for connection to RSI, instead of having an array-to-array cable or exceeding the power range for the cable.

Surge protection, DC

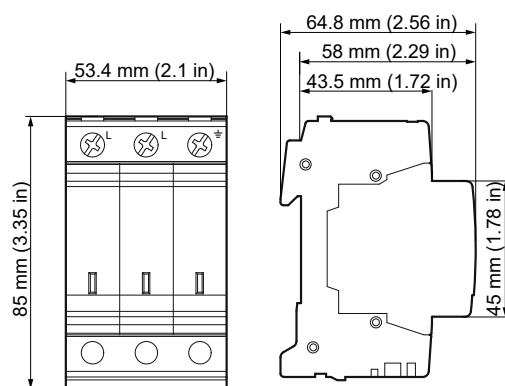


TM057582

Surge protection

The DC surge protection is suitable for the solar-powered RSI system.

The surge protection gives a very safe and reliable protection of the system by having a quick response. At least one DC surge protection is required for the DC input of RSI. We recommend also to have one DC surge protection for each solar array connected to RSI.



TM057586

Dimensions, surge protection

Level switch (optional)

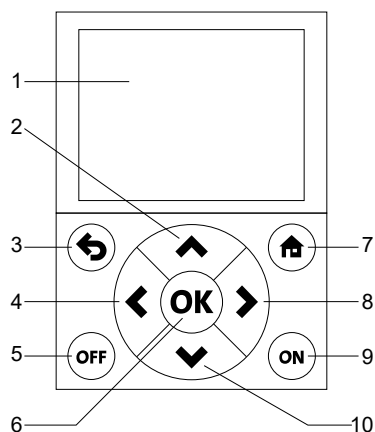
A level switch serves as a start/stop control that depends on the water level in the water tank.



TM022407

Level switch

4. Operating panel



TM076464

Operating panel

Pos.	Description
1	Display
2	Scroll menu up Increase value
3	Move backward in menu Exit edit mode Reset faults with long press
4	Move cursor left
5	Stop button
6	Enter active level/item Confirm selection
7	Change control place Access control page Change direction
8	Move cursor right
9	Start button
10	Scroll menu down Decrease value

Advanced password

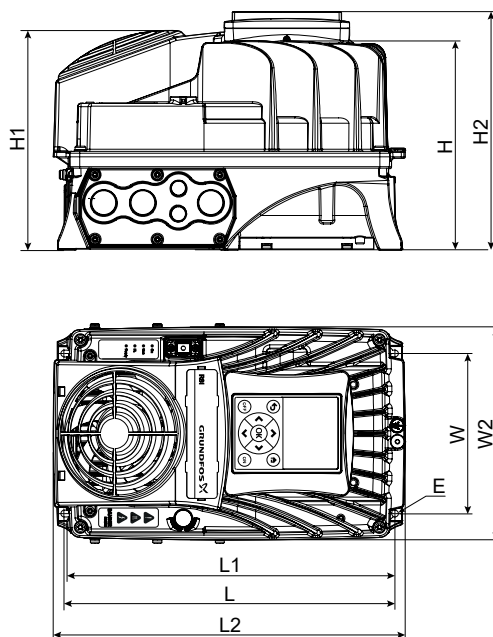
RSI is designed to fit into solar applications, and some parameters are hidden by a password (681400). Enter it in the quick setup under "Advanced password" to get full access to all the parameters.



Changing the parameters can influence the MPPT and may cause malfunction.

5. Technical data

Dimensions, frame A

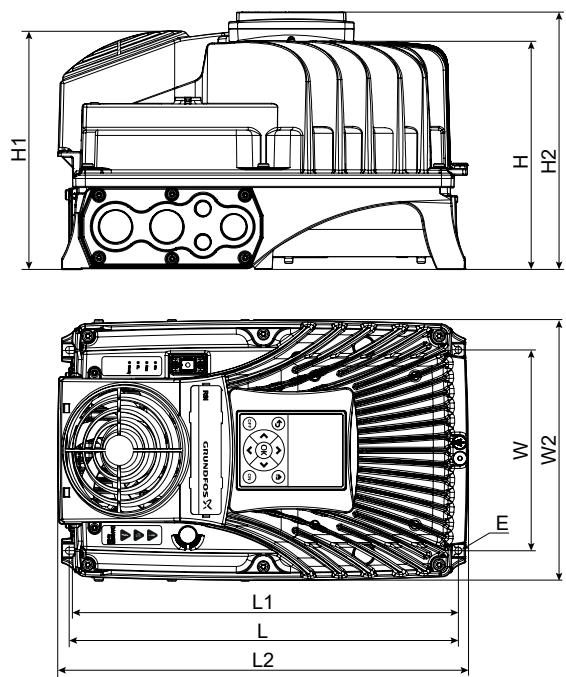


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Frame A, 1.5 - 5.5 kW (2 - 7.5 hp)

Product									
Net weight [kg (lb)]	E [mm (in)]	W [mm (in)]	W2 [mm (in)]	L [mm (in)]	L1 [mm (in)]	L2 [mm (in)]	H [mm (in)]	H1 [mm (in)]	H2 [mm (in)]
8.8 (19.40)	Ø5.9 (0.23)	143.5 (5.65)	191.0 (7.52)	297.0 (11.69)	293.0 (11.54)	315.0 (12.40)	188.0 (7.40)	197.0 (7.76)	214.0 (8.43)
Packaging									
Gross weight [kg (lb)]	Length [mm (in)]		Width [mm (in)]		Height [mm (in)]				
310 (683.43)	250 (9.84)		200 (7.87)		295 (11.61)				

Dimensions, frame B



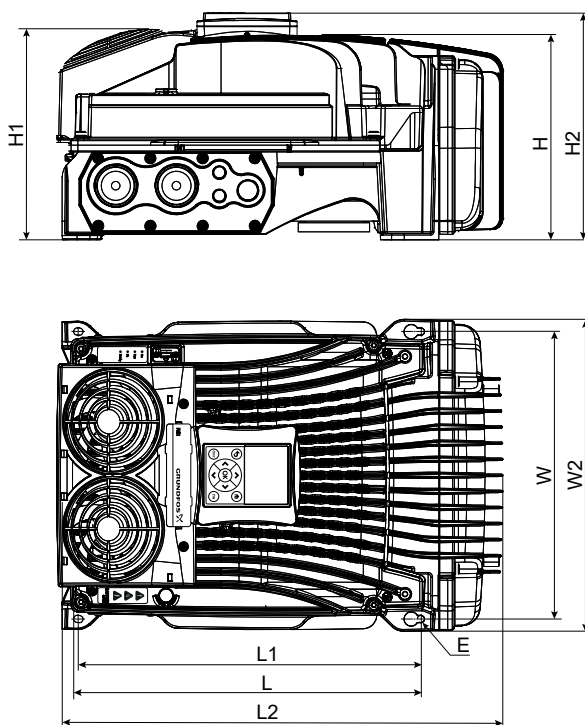
TM066527

Frame B, 7.5 - 15 kW (10 - 20 hp)

Product									
Net weight [kg (lb)]	E [mm (in)]	W [mm (in)]	W2 [mm (in)]	L [mm (in)]	L1 [mm (in)]	L2 [mm (in)]	H [mm (in)]	H1 [mm (in)]	H2 [mm (in)]
14.9 (32.85)	Ø6.1 (0.24)	180.0 (7.09)	233.0 (9.17)	349.0 (13.74)	345.2 (13.59)	368.0 (14.49)	204.0 (8.03)	214.0 (8.43)	231.0 (9.10)

Packaging			
Gross weight [kg (lb)]	Length [mm (in)]	Width [mm (in)]	Height [mm (in)]
310 (683.43)	250 (9.84)	200 (7.87)	295 (11.61)

Dimensions, frame C

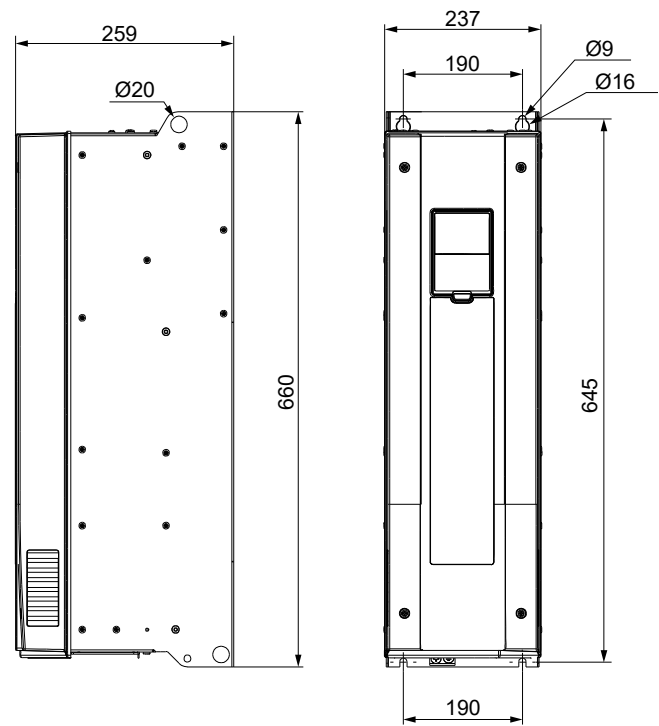


TM066528

Frame C, 18.5 - 37 kW (25 - 50 hp)

Product									
Net weight [kg (lb)]	E [mm (in)]	W [mm (in)]	W2 [mm (in)]	L [mm (in)]	L1 [mm (in)]	L2 [mm (in)]	H [mm (in)]	H1 [mm (in)]	H2 [mm (in)]
31.5 (69.45)	Ø8.2 (0.32)	322.0 (12.68)	350.0 (13.78)	385.0 (15.16)	382.5 (15.06)	500.0 (19.69)	230.0 (9.06)	236.0 (9.29)	254.0 (10)
Packaging									
Gross weight [kg]	Length [mm (in)]		Width [mm (in)]		Height [mm (in)]				
310 (683.43)	250 (9.84)		200 (7.87)		295 (11.61)				

Dimensions, frame MR7

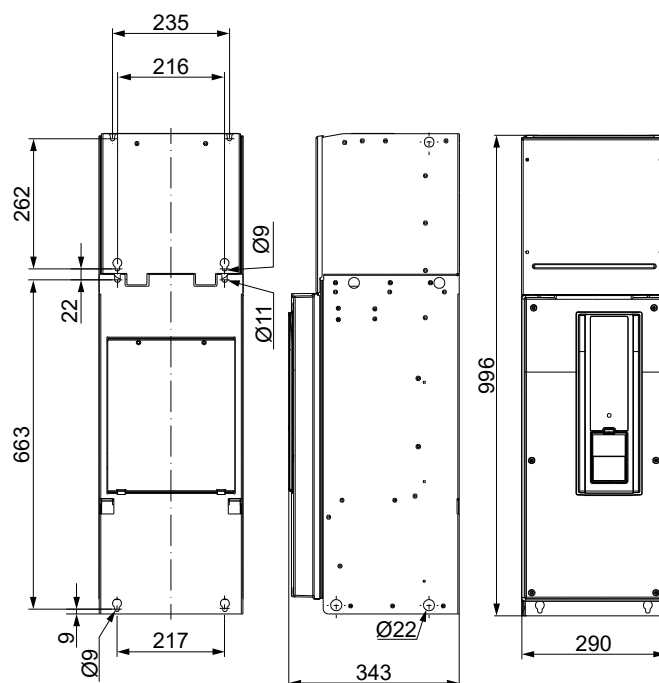


TM075444

Frame MR7, 45 - 55 kW (60 - 74 hp)

Product								
Net weight [kg (lb)]	E [mm (in)]	E1 [mm (in)]	E2 [mm (in)]	W [mm (in)]	W2 [mm (in)]	L [mm (in)]	L2 [mm (in)]	H2 [mm (in)]
37.5 (82.67)	Ø9 (0.35)	Ø16 (0.63)	Ø20 (0.79)	190 (7.48)	237 (9.33)	645 (25.39)	660 (25.98)	259 (10.20)
Packaging								
Gross weight [kg (lb)]	Length [mm (in)]			Width [mm (in)]		Height [mm (in)]		
40.5 (89.29)	320 (12.60)			330 (12.99)		750 (29.53)		

Dimensions, frame MR8

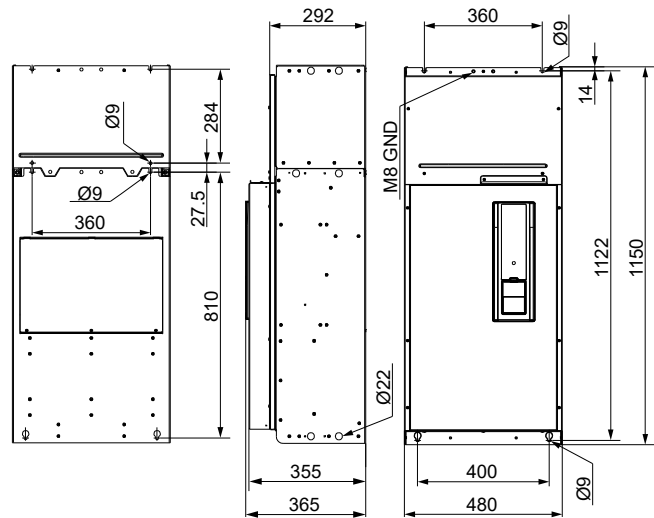


TM075445

Frame MR8, 110 kW (148 hp)

Product											
Net weight [kg (lb)]	E [mm (in)]	E1 [mm (in)]	E2 [mm (in)]	W [mm (in)]	W1 [mm (in)]	W2 [mm (in)]	W3 [mm (in)]	L [mm (in)]	L2 [mm (in)]	L3 [mm (in)]	H2 [mm (in)]
66 (145.50)	Ø9 (0.35)	Ø11 (0.43)	Ø22 (0.87)	217 (8.54)	216 (8.50)	290 (11.42)	235 (9.25)	663 (26.10)	996 (39.21)	262 (10.31)	343 (13.50)
Packaging											
Gross weight [kg (lb)]		Length [mm (in)]		Width [mm (in)]		Height [mm (in)]					
80.5 (177.47)		540 (21.26)		430 (16.93)		1140 (44.88)					

Dimensions, frame MR9



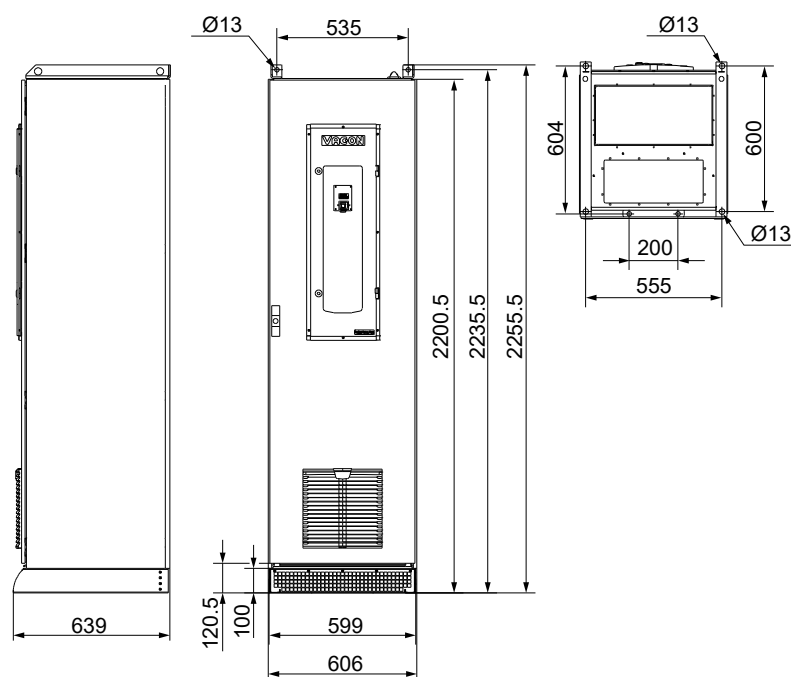
TM075446

Frame MR9, 132 - 160 kW (177 - 215 hp)

Product												
Net weight	E	E1	W	W1	W2	L	L1	L2	L3	H	H1	H2
[kg (lb)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]	[mm (in)]
119.50	Ø9	Ø22	400	360	480	1122	810	1150	284	355	292	365
(263.45)	(0.35)	(0.87)	(15.75)	(14.17)	(18.90)	(44.17)	(31.89)	(45.28)	(11.18)	(13.98)	(11.50)	(14.37)

Packaging			
Gross weight	Length	Width	Height
[kg (lb)]	[mm (in)]	[mm (in)]	[mm (in)]
148.00	570	730	1300
(326.28)	(22.44)	(28.74)	(51.18)

Dimensions, frame ED



TM075727

Frame ED, 200 - 250 kW (268 - 335 hp)

Product										
Net weight [kg (lb)]	E [mm (in)]	W [mm (in)]	W1 [mm (in)]	W2 [mm (in)]	L [mm (in)]	L1 [mm (in)]	L2 [mm (in)]	H [mm (in)]	H1 [mm (in)]	H2 [mm (in)]
200 kW: 280 (617.29)	Ø13	535	599	606	2235.5	2200.5	2255.5	600	604	639
250 kW: 420 (925.94)	(0.51)	(21.06)	(23.58)	(23.86)	(88.01)	(86.63)	(88.80)	(23.62)	(23.78)	(25.16)

Packaging			
Gross weight [kg (lb)]	Length [mm (in)]	Width [mm (in)]	Height [mm (in)]
200 kW: 351 (773.82)	880	800	200 kW: 1300 (51.18)
250 kW: 491 (1082.47)	(34.65)	(31.50)	250 kW: 2450 (96.46)

Electrical and enclosure data

Voltage			3 x 208-240 V	3 x 380-440 V
Installation environment	Minimum ambient temperature	[°C (°F)]	-10 (14)	-10 (14)
	Maximum ambient temperature	[°C (°F)]	60 (140)	60 (140)
	Maximum relative humidity	[%]	100	100
Electrical data	Minimum MPP voltage	[VDC]	230	450
	Recommended MPP voltage	[VDC]	290-336	530-615
	Maximum input voltage	[VDC]	400	800
	Input voltage	[VAC]	208-240	380-480
	Rated output voltage	[VAC]	208-240	380-440
	Minimum frequency	[Hz]	5	5
	Maximum frequency	[Hz]	160	160
	Phases		3	3
	Enclosure class		IP66	IP54, IP66

Technical data for disconnect switch, DC

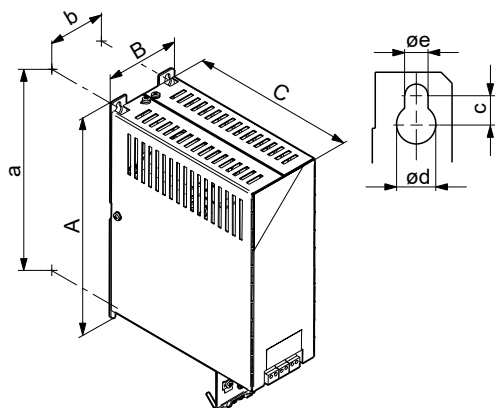
Voltage, DC [V]	1000
Current [A]	16
Weight [kg (lb)]	1.05 (2.315)
Marking	IEC 60047

Technical data for surge protection, DC

Voltage, DC [V]	1000
Current [kA]	40
Weight [kg (lb)]	0.375 (0.827)
Marking	CE

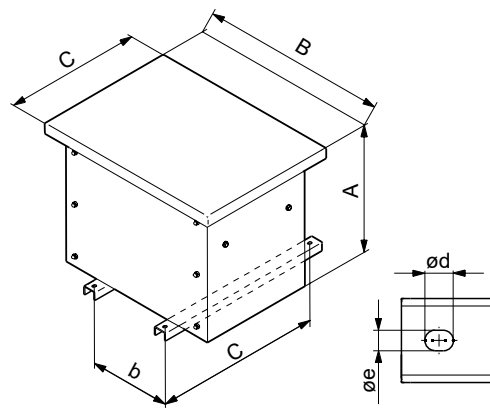
Dimensions and weights of output filters

Wall mounting



TM040625

Floor mounting



TM040624

Product number	Mounting	Height [mm (in)]		Width [mm (in)]		Depth [mm (in)]		Screw holes [mm (in)]			Weight [kg (lb)]
		A	a	B	b	C	c	Ød	Øe	f	
Sine-wave filters											
96754973	Wall	268 (10.55)	257 (10.12)	90 (3.54)	70 (2.76)	205 (8.07)	-	11 (0.43)	6.5 (0.26)	8 (0.31)	7.1 (15.65)
96754974	Wall	268 (10.55)	257 (10.12)	130 (5.12)	90 (3.54)	205 (8.07)	-	11 (0.43)	6.5 (0.26)	8 (0.31)	9.1 (20.06)
96754976	Wall	330 (12.99)	312 (12.28)	150 (5.90)	120 (4.72)	260 (10.24)	-	19 (0.75)	9 (0.35)	12 (0.47)	16.9 (37.26)
96754977	Wall	430 (16.93)	412 (16.22)	150 (5.90)	120 (4.72)	260 (10.24)	-	19 (0.75)	9 (0.35)	12 (0.47)	19.9 (43.87)
96754978	Wall	530 (20.86)	500 (19.69)	170 (6.69)	125 (4.92)	260 (10.24)	-	19 (0.75)	9 (0.35)	12 (0.47)	39 (85.98)
96755019	Wall	610 (24.02)	580 (22.83)	170 (6.69)	125 (4.92)	260 (10.24)	-	19 (0.75)	9 (0.35)	12 (0.47)	41 (90.39)
96755021	Wall	200 (7.87)	190 (7.48)	75 (2.95)	60 (2.36)	205 (8.07)	-	8 (0.31)	4.5 (0.18)	7 (0.28)	3.3 (7.28)
96755032	Wall	610 (24.02)	580 (22.83)	170 (6.69)	135 (5.31)	260 (10.24)	-	19 (0.75)	9 (0.35)	12 (0.47)	54 (119.05)
97774436	Floor	918 (36.14)	-	940 (37.00)	779 (30.67)	792 (31.18)	660 (25.98)	11 (0.43)	22 (0.87)	-	205.0 (451.95)
97775142	Floor	918 (36.14)	-	940 (37.00)	779 (30.67)	792 (31.18)	660 (25.98)	11 (0.43)	22 (0.87)	-	237.0 (522.50)
97775146	Floor	918 (36.14)	-	940 (37.00)	779 (30.67)	792 (31.18)	660 (25.98)	11 (0.43)	22 (0.87)	-	307.0 (678.82)
97775148	Floor	918 (36.14)	-	940 (37.00)	779 (30.67)	792 (31.18)	660 (25.98)	11 (0.43)	22 (0.87)	-	370.0 (815.71)
97775149	Floor	1161 (45.71)	-	1260 (49.61)	1099 (43.27)	991 (39.02)	860 (33.86)	11 (0.43)	22 (0.87)	-	425.0 (936.96)

6. Product numbers

Renewable Solar Inverter

Low voltage range (3 × 208-240 V)

Power [kW (hp)]	Product number	Electrical data		Frame size	IP class
		Max. P2 [kW (hp)]	Rated output current [A]		
1.5 (2)	99090622	1.5 (2)	8	A	IP66
2.2 (3)	99090633	2.2 (3)	11	A	
3.0 (4)	99090634	3.0 (4)	12.5	A	
4.0 (5)	99090635	4.0 (5)	18	B	
5.5 (7.5)	99090636	5.5 (7.5)	24.2	B	
7.5 (10)	99090637	7.5 (10)	31	B	
11 (15)	99090638	11 (15)	48	C	
15 (20)	99090639	15 (20)	62	C	

High voltage range (3 × 380-440 V)

Power [kW (hp)]	Product number	Electrical data		Frame size	IP class
		Max. P2 [kW (hp)]	Rated output current [A]		
2.2 (3)	99044348	2.2 (3)	5.6	A	IP66
3.0 (4)	99044349	3.0 (4)	8	A	
4.0 (5)	99044350	4.0 (5)	9.6	A	
5.5 (7.5)	99044351	5.5 (7.5)	12	A	
7.5 (10)	99044352	7.5 (10)	16	B	
11 (15)	99044363	11 (15)	23	B	
15 (20)	99044364	15 (20)	31	B	
18.5 (25)	99044365	18.5 (25)	38	C	
22 (30)	99044366	22 (30)	46	C	
30 (40)	99044367	30 (40)	61	C	
37 (50)	99044368	37 (50)	72	C	IP54
45 (60)	99648886	45 (60)	87	MR7	
55 (75)	99648887	55 (75)	105	MR7	
110 (150)	99648888	110 (150)	205	MR8	
132 (200)	99648889	132 (200)	261	MR9	
160 (250)	99648890	160 (250)	310	MR9	
200 (300)	99648891	200 (300)	385	ED	
250 (350)	99648892	250 (350)	460	ED	

Sine-wave filter (IP21)

Voltage	Max. P2 to motor [kW (hp)]	Product number
3 × 380-440 VAC	2.2 (3)	96754973
	3 (4)	
	4 (5)	96754974
	5.5 (7.5)	96754976
	7.5 (10)	
	11 (15)	96754977
	15 (20)	96754978
	18.5 (25)	
	22 (30)	96755019
	30 (40)	96755021
	37 (50)	96755032
	55 (75)	97774436
	90 (120)	97775142
	132 (200)	97775146
3 × 208-240 VAC	200 (300)	97775148
	250 (350)	97775149
	1.5 (2)	96754973
	2.2 (3)	96754976
	3 (4)	
	4 (5)	96754977
	5.5 (7.5)	96754978
	7.5 (10)	
	11 (15)	96755021
	15 (20)	96755032

Real-time clock (RTC)

Description	Product number
Battery pack	99240261

Cable glands

Description	Product number
Cable gland kit, RSI frame A	99240259
Cable gland kit, RSI frame B	99297480
Cable gland kit, RSI frame C	99297483

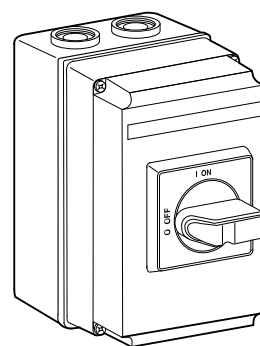
Option boards

Description	Product number
Digital	99295565
Analog	99295551
Pt100	99295525

PC Tool (RS-485)

Description	Product number
Grundfos PC Tool	99240260

Disconnect switch, DC

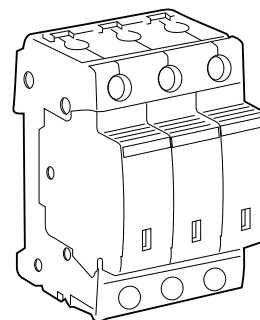


TM057581

Disconnect switch

Description	Product number
Disconnect switch, DC	98341686

Surge protection, DC

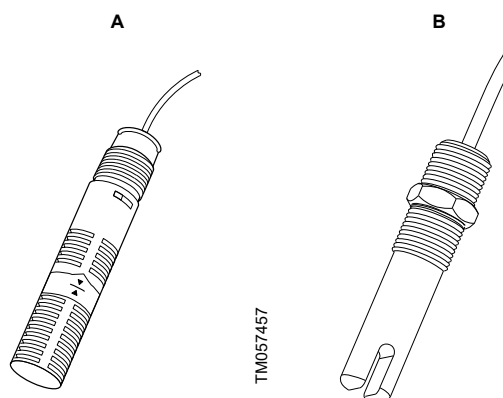


TM057582

Surge protection

Description	Product number
Surge protection, DC	98341687

Dry-running switch



TM057457

TM061270

Description	Product number
Dry-running switch for submersible pumps (A)	98347579
Dry-running switch for dry-installed pumps (B)	97911215

Level switch (optional)



TM022407

Description	Product number
Level switch	010748

High water level: Contact is closed.

Low water level: Contact is open.

Solar cables

Description	Product number
Array to controller (MC4) 10	98257868
Array to array (MC4) 0.5	98257892

Service kits, wear parts

Description	Product number
Fan (A/B)	99297481
Fan (C)	99396484
Protective ventilation GORE-tex (A/B/C)	99297482
Fan internal (A/B)	99297484
Fan internal (C)	99297485
Keypad including cable (A/B/C)	99297486
HMI cable (A/B/C)	99297487
Control board (A/B/C)	99297488
HMI cap (ABC)	99297489

7. Appendix

The tables below show the recommended cable size to be used between solar panel and RSI in order to keep the power loss lower than 2 % at 20 °C (68 °F).

High voltage range (3 × 380-440 VAC)

Current in cable [A]	Distance between solar panel and RSI												
	[m (ft)]												
	30 (98)	60 (197)	90 (295)	120 (394)	150 (492)	180 (591)	210 (689)	240 (787)	270 (886)	300 (984)	330 (1083)	360 (1181)	390 (1280)
Recommended cable size													
[mm ² (AWG)]													
3	1.5 (16)	1.5 (16)	1.5 (16)	1.5 (16)	1.5 (16)	1.5 (16)	2.5 (14)	2.5 (14)	2.5 (14)	2.5 (14)	4 (12)	4 (12)	6 (10)
6	1.5 (16)	1.5 (16)	1.5 (16)	2.5 (14)	2.5 (14)	4 (12)	4 (12)	4 (12)	6 (10)	6 (10)	6 (10)	6 (10)	10 (8)
9	1.5 (16)	1.5 (16)	2.5 (14)	4 (12)	4 (12)	6 (10)	6 (10)	6 (10)	10 (8)	10 (8)	10 (8)	10 (8)	16 (6)
12	1.5 (16)	2.5 (14)	4 (12)	4 (12)	6 (10)	6 (10)	10 (8)	10 (8)	10 (8)	10 (8)	16 (6)	16 (6)	16 (6)
15	1.5 (16)	2.5 (14)	4 (12)	6 (10)	6 (10)	10 (8)	10 (8)	10 (8)	16 (6)	16 (6)	16 (6)	16 (6)	16 (6)

Low voltage range (3 × 208-240 VAC)

Current in cable [A]	Distance between solar panel and RSI												
	[m (ft)]												
	30 (98)	60 (197)	90 (295)	120 (394)	150 (492)	180 (591)	210 (689)	240 (787)	270 (886)	300 (984)	330 (1083)	360 (1181)	390 (1280)
Recommended cable size													
[mm ²]													
3	1.5 (16)	1.5 (16)	1.5 (16)	2.5 (14)	2.5 (14)	2.5 (14)	4 (12)	4 (12)	4 (12)	4 (12)	6 (10)	6 (10)	6 (10)
6	1.5 (16)	2.5 (14)	2.5 (14)	4 (12)	4 (12)	6 (10)	6 (10)	6 (10)	10 (8)	10 (8)	10 (8)	10 (8)	16 (6)
9	1.5 (16)	2.5 (14)	4 (12)	6 (10)	6 (10)	10 (8)	10 (8)	10 (8)	16 (6)	16 (6)	16 (6)	16 (6)	16 (6)
12	2.5 (14)	4 (12)	6 (10)	6 (10)	10 (8)	10 (8)	16 (6)	16 (6)	16 (6)	16 (6)	25 (4)	25 (4)	25 (4)
15	2.5 (14)	4 (12)	6 (10)	10 (8)	10 (8)	16 (6)	16 (6)	16 (6)	25 (4)	25 (4)	25 (4)	25 (4)	25 (4)

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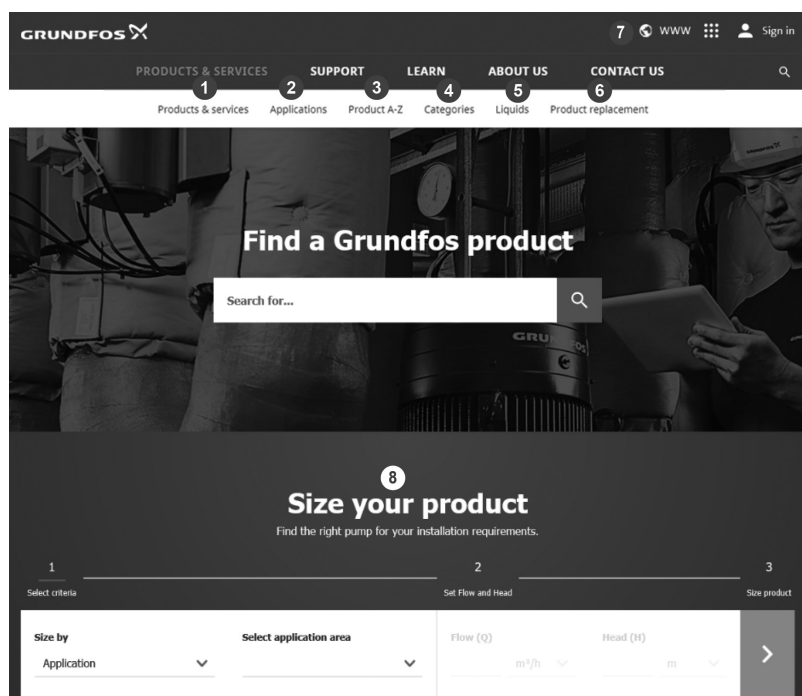
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