

RSI, 1.5 - 37 kW (2-50 hp)

Installation and operating instructions



Advanced IO

<http://net.grundfos.com/Api/ccmsservices/public/literature/filedata/Grundfosliterature-5768592.pdf>

be
think
innovate

GRUNDFOS 

English (GB) Installation and operating instructions

Original installation and operating instructions

CONTENTS

	Page
1. General information	2
1.1 Symbols used in this document	2
2. Receiving the product	2
3. Technical data	3
3.1 Product range	3
3.2 Technical data	6
4. Installing the product	7
4.1 Installation example	7
4.2 Electrical connection	8
5. Operation	10
5.1 Control panel	11
5.2 Control panel operation	12
5.3 Quick setup parameter description	14
6. Fault finding the product	15
6.1 Fault codes and remedies	15
6.2 Resetting fault codes	21
6.3 Fault history	21
7. Servicing the product	21
7.1 Routine inspection	21
7.2 Inspection and replacement of wear parts	23
7.3 Storage and warranty	23
8. Disposing of the product	23



Warning
Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.



Advanced IO
<http://net.grundfos.com/AppI/ccmsservices/public/literature/filedata/Grundfosliterature-5768592.pdf>

1. General information

1.1 Symbols used in this document



Warning
If these safety instructions are not observed, it may result in personal injury.



Warning
If these instructions are not observed, it may lead to electric shock with consequent risk of serious personal injury or death.



Warning
The surface of the product may be so hot that it may cause burns or personal injury.



Caution
If these safety instructions are not observed, it may result in malfunction or damage to the equipment.



Note
Notes or instructions that make the job easier and ensure safe operation.

2. Receiving the product



Caution
Check the condition of the inverter before installation. Please do not install the inverter if the equipment appears to be damaged.

If any deviation from the order is found, please contact Grundfos. Once you get the product, please perform the following inspections before installation:

Inspection item	Inspection method
Consistency with ordered product	Inspect the product's nameplate
Damage or scratches	Inspect the product visually
Completeness of main inverter and accessories	Check carefully according to the product list
Are fastening parts, such as screws, tightened properly	Check with screwdriver, if necessary

3. Technical data

3.1 Product range

3.1.1 Dimensions

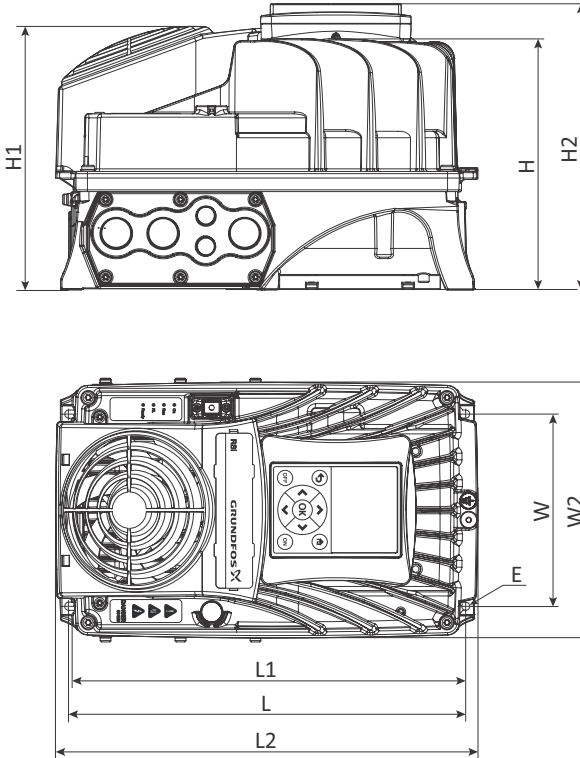


Fig. 1 Frame A 1.5 - 5.5 kW (2 - 7.5 hp)

		Product								
Frame size	Net weight [kg (lbs)]	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)]
Frame A	8.8 (19)	∅5.9 (0.23)	143.5 (5.7)	191 (7.5)	297 (11.7)	293 (11.5)	315 (12.4)	188 (7.4)	197 (7.8)	214 (8.4)

		Package		
Frame size	Gross weight [kg (lbs)]	Length [mm (in)]	Width [mm (in)]	Height [mm (in)]
Frame A	310 (683)	250 (9.8)	200 (7.9)	295 (11.6)

TM06 6526 1813

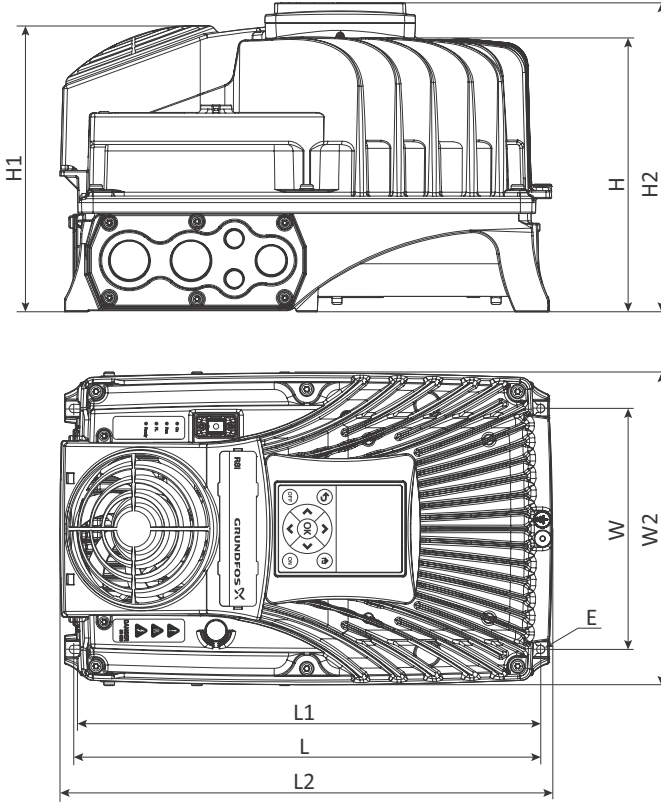


Fig. 2 Frame B 7.5 - 15 kW (10-20 hp)

TM06 6527 1813

Product										
Frame size	Net weight [kg (lbs)]	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)]
Frame B	15 (33)	∅6.1 (0.24)	180 (7.1)	233 (9.2)	349 (13.7)	345.2 (13.6)	368 (14.5)	204 (8.0)	214 (8.4)	231 (9.1)

Package				
Frame size	Gross weight [kg (lbs)]	Length [mm (in)]	Width [mm (in)]	Height [mm (in)]
Frame B	310 (683)	250 (9.8)	200 (7.9)	295 (11.6)

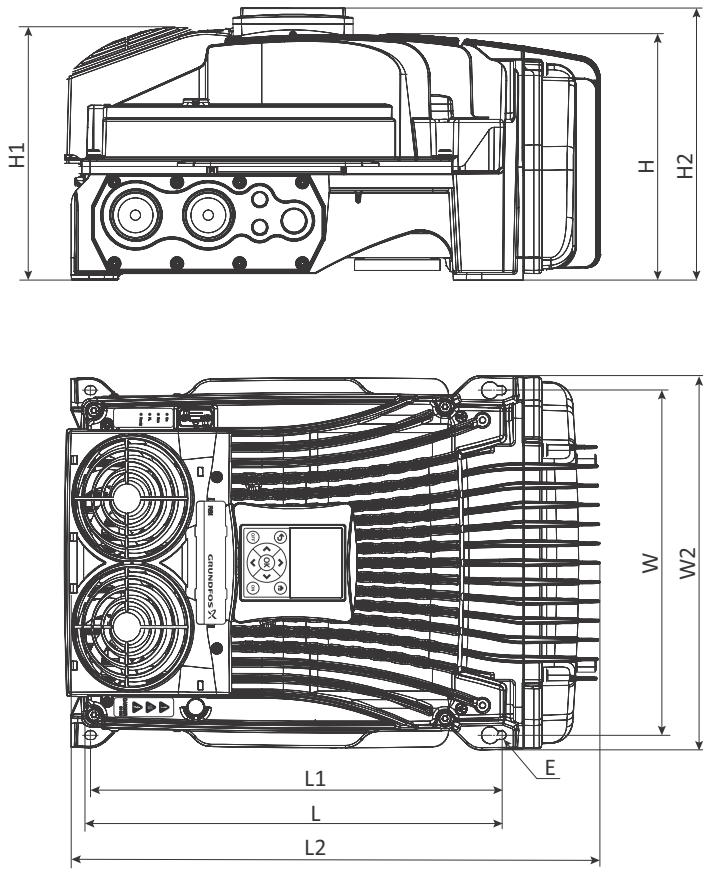


Fig. 3 Frame C 18.5 - 37 kW (25-50 hp)

TM06 6528 1914

Product										
Frame size	Net weight [kg (lbs)]	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)]
Frame C	32 (69)	Ø8.2 (0.32)	322 (12.7)	350 (13.8)	385 (15.2)	382.5 (15.1)	500 (19.7)	230 (9.1)	236 (9.3)	254 (10)

Package				
Frame size	Gross weight [kg (lbs)]	Length [mm (in)]	Width [mm (in)]	Height [mm (in)]
Frame C	310 (683)	250 (9.8)	200 (7.9)	295 (11.6)

3.2 Technical data

Voltage			3 x 208-240 V	3 x 380-440 V
Installation environment	Min. ambient temperature	[°C (°F)]	-10 (14)	-10 (14)
	Max. ambient temperature	[°C (°F)]	60 (140)	60 (140)
	Max. relative humidity	[%]	100	100
Electrical data	DC minimum MPP voltage	[VDC]	230	400
	DC recommended MPP voltage	[VDC]	290-336	530-615
	DC maximum input voltage	[VDC]	400	800
	AC input voltage	[VAC]	208-240	380-460
	AC rated output voltage	[VAC]	220	380-440
	Min. frequency	[Hz]	5	5
	Max. frequency	[Hz]	60	60
	Phases		3	3
	Enclosure class		IP66	IP66

3.2.1 Low voltage range (3 x 208-240 V)

Power [kW (hp)]	Product number	Electrical data		Frame size
		Max. P2 [kW (hp)]	Rated output current [A]	
1.5 (2)	99090622	1.5 (2)	8	A
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

3.2.2 High voltage range (3 x 380-440 V)

Power [kW]	Product number	Electrical data		Frame size
		Max. P2 [kW (hp)]	Rated output current [A]	
2.2 (3)	99044348	2.2 (3)	5.6	A
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

4. Installing the product



Warning
Installation must be carried out by qualified staff.



Caution
You must adjust the minimum frequency to a value that ensures water is discharged from the outlet of the pump.



Note
To adjust the minimum frequency, click the Home button on the control panel and select minimum frequency.

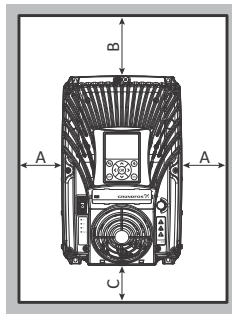
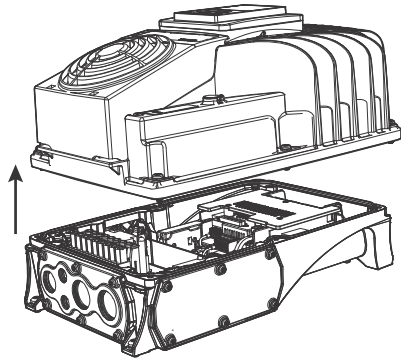


To ensure a good convective cooling effect, install the RSI according to fig. 4.
Caution
Do not install the equipment in direct sunlight.



Please ensure that the mounting wall can support the weight of the inverter. Find the weight in [3.2 Technical data](#).

4.1 Installation example



**Min. clearance
[mm (in)]**

Type	A	B	C
All types	80 (3.2)	160 (6.3)	60 (2.4)

A = Clearance left and right from the drive

B = Clearance above the drive

C = Clearance underneath the AC drive

Fig. 4 Installation example showing the required clearance when mounting the product

4.2 Electrical connection



DANGER

To avoid the risk of electric shock or fire, make sure that the power supply has been switched off before connecting the equipment, and make sure the earth terminal is reliably grounded.

To avoid arcing and fire, tighten all terminals with the specified torque.

Caution

For distances (pump to inverter) exceeding 15 m (50 ft), we recommend a sine wave filter with matching current ratings.

4.2.1 Output filters

Output filters are used for reducing the voltage stress on the motor windings and the stress on the motor insulation system as well as for decreasing acoustic noise from the frequency converter-driven motor.

One type of output filter is available as an accessory for the RSI:

- sine-wave filters.

Use of output filters

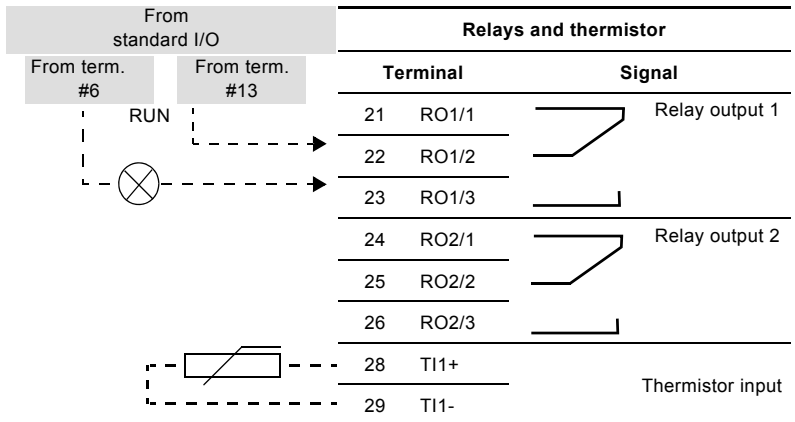
The table below shows when an output filter is required and the type to use. The selection depends on the following:

- pump type
- power cable length
- the required reduction of the acoustic noise from the motor.

Pump type	Shaft power, P2	Sine-wave filter
SP with motor voltage from 380 V and up	All	0-300 m*
Pumps with MG71 and MG80 up to and including 1.5 kW (2 hp)	Greater than 1.5 kW	0-300 m*
Reduction of noise emission, low reduction	All	-
Reduction of voltage peaks and noise emission, high reduction	All	0-300 m*

* The lengths stated apply to the power cable.

4.2.2 Relay and thermistor input terminals



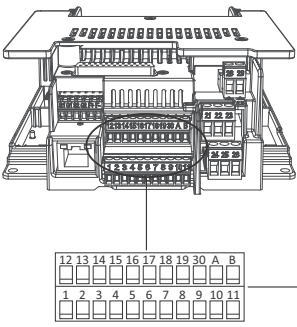
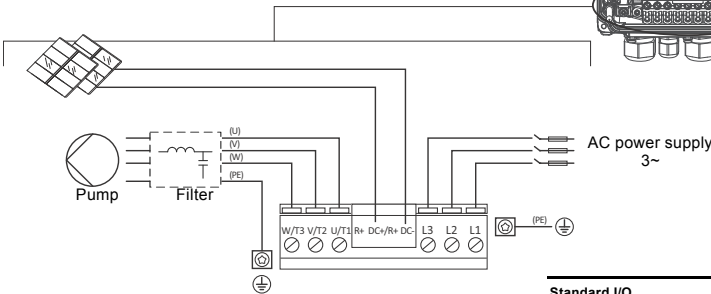
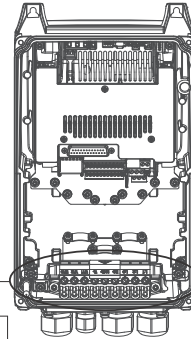
4.2.3 RSI input terminals

WARNING



Make sure that AC and DC power are never supplied to the RSI simultaneously. Grundfos recommends an interlocked change over switch.

Terminal	Description
L1 L2 L3	These terminals are the input connections for the power supply.
DC- DC+/R+ R-	DC bus terminal (DC- DC+) and break resistor terminals (R+ R-)
U/T1 V/T2 W/T3	These terminals are for motor connections.



Terminal	Signal/description
1	+10 Vref Reference output
2	AI1+ Analogue input, voltage or current
3	AI1- Analogue input, common
4	AI2+ Analogue input, voltage or current
5	AI2- Analogue input, common
6	24 Vout 24 V aux. voltage
7	GND I/O ground
8	DI1 Digital input 1, Start/stop
9	DI2 Digital input 2, Tank level switch
10	DI3 Digital input 3, Well level switch
11	CM Common for DI1-DI6
12	24 Vout 24 V aux. voltage
13	GND I/O ground
14	DI4 Digital input 4, Flow switch
15	DI5 Digital input 5, Flow meter
16	DI6 Digital input 6, AC operation
17	CM Common for DI1-DI6
18	AO1+ Analogue output, voltage or current
19	AO-/GND Analogue output ,common
30	+24 Vin 24 V auxiliary input voltage
A	RS485 Serial bus, negative
B	RS485 Serial bus, positive

Fig. 5 Position of terminals

TM06 6530 1914

5. Operation



WARNING

Check all electrical connections before powering up the system.



WARNING

The heat sink becomes hot during running and stays hot for a long time. Touching it while it is hot will cause burns.

Caution

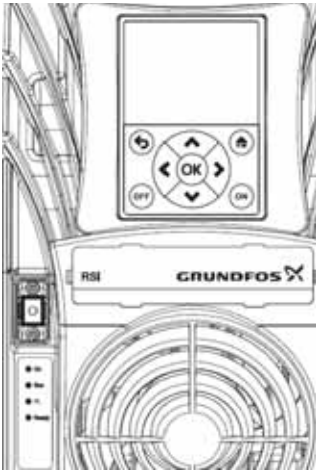
In case of altitudes over 1000 m (3280 ft), reduce the output current by 10 % for every 1500 m (4921 ft) increase in altitude.

Note

Adjust control parameters according to the steps indicated in this manual before the first start.

5.1 Control panel

The Renewable Solar Inverter control panel is shown in fig. 6 below. The control panel has four LEDs, a digital display and nine operating keys.



TM05 4446 2412



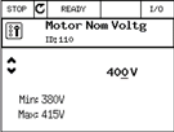
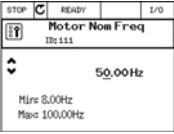
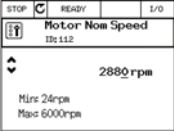
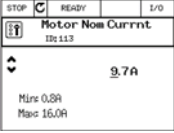
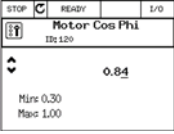
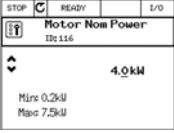
Fig. 6 Control panel layout

Digital display control panel
Operating keys (The function of the keys is shown in the table below.)
Mode indicator lights (LEDs): On RUN FLT (FAULT) Ready

Indicator lights and keys		Function description	
On	On indicator light	Yellow	On: Inverter is on.
Run	Run indicator light	Green	On: Inverter is running.
FLT	Fault indicator light	Red	On: System fault.
Ready	Ready indicator light	Yellow	On: System is ready to run.
	Return key		Returns to previous screen in the control panel and is used to reset faults.
	Home key		Returns to home screen in the control panel.
	Off key		Turns the inverter output OFF.
	On key		Turns the inverter output ON.
	Up key		Navigates the control panel and edits parameter values.
	Down key		Navigates the control panel and edits parameter values.
	Right key		Navigates the control panel and edits parameter values.
	Left key		Navigates the control panel and edits parameter values.
	OK key		Confirms selection and parameter values.

5.2 Control panel operation

5.2.1 Grundfos startup wizard

Display	Directions	Notes
	Select language	
	Select startup wizard	
	Verify or adjust the rated motor voltage	
	Verify or adjust the rated frequency	
	Verify or adjust the nominal speed	
	Verify or adjust the rated current	
	Verify or adjust the power factor	
	Verify or adjust the rated P2 power	

Display	Directions	Notes																																																																											
<table border="1"> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Pump Selection</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1968</td> </tr> <tr> <td colspan="5" style="text-align: center;">CH CR</td> </tr> <tr> <td colspan="5" style="text-align: center;">SP </td> </tr> </table>	STOP	<input checked="" type="checkbox"/>	READY		I/O	Pump Selection					ID:1968					CH CR					SP					<p>Select pump type or other and adjust parameters</p>	<table border="1"> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Min Freq Reference</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1963</td> </tr> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Acceleration time</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1963</td> </tr> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Deceleration time</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1964</td> </tr> <tr> <td colspan="5" style="text-align: center;"> 3.0s</td> </tr> </table>	STOP	<input checked="" type="checkbox"/>	READY		I/O	Min Freq Reference					ID:1963					STOP	<input checked="" type="checkbox"/>	READY		I/O	Acceleration time					ID:1963					STOP	<input checked="" type="checkbox"/>	READY		I/O	Deceleration time					ID:1964					3.0s				
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Pump Selection																																																																													
ID:1968																																																																													
CH CR																																																																													
SP																																																																													
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Min Freq Reference																																																																													
ID:1963																																																																													
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Acceleration time																																																																													
ID:1963																																																																													
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Deceleration time																																																																													
ID:1964																																																																													
3.0s																																																																													
<table border="1"> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">PV modules type</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1984</td> </tr> <tr> <td colspan="5" style="text-align: center;">Other GF100S SM260 </td> </tr> </table>	STOP	<input checked="" type="checkbox"/>	READY		I/O	PV modules type					ID:1984					Other GF100S SM260					<p>Select solar modules or other and adjust Vmp (maximum power voltage)</p>	<table border="1"> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Module MP Voltage</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1920</td> </tr> <tr> <td colspan="5" style="text-align: center;"> 31.4V</td> </tr> <tr> <td colspan="5" style="text-align: center;">Min: 10.0V Max: 100.0V</td> </tr> </table>	STOP	<input checked="" type="checkbox"/>	READY		I/O	Module MP Voltage					ID:1920					31.4V					Min: 10.0V Max: 100.0V																																		
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
PV modules type																																																																													
ID:1984																																																																													
Other GF100S SM260																																																																													
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Module MP Voltage																																																																													
ID:1920																																																																													
31.4V																																																																													
Min: 10.0V Max: 100.0V																																																																													
<table border="1"> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Series Modules Nr.</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1985</td> </tr> <tr> <td colspan="5" style="text-align: center;"> 18</td> </tr> <tr> <td colspan="5" style="text-align: center;">Min: 5 Max: 50</td> </tr> </table>	STOP	<input checked="" type="checkbox"/>	READY		I/O	Series Modules Nr.					ID:1985					18					Min: 5 Max: 50					<p>Select the number of solar modules</p>																																																			
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Series Modules Nr.																																																																													
ID:1985																																																																													
18																																																																													
Min: 5 Max: 50																																																																													
<table border="1"> <tr> <td>STOP</td> <td><input checked="" type="checkbox"/></td> <td>READY</td> <td></td> <td>I/O</td> </tr> <tr> <td colspan="5" style="text-align: center;">Output Sinus Filter</td> </tr> <tr> <td colspan="5" style="text-align: center;">ID:1986</td> </tr> <tr> <td colspan="5" style="text-align: center;">Yes No </td> </tr> </table>	STOP	<input checked="" type="checkbox"/>	READY		I/O	Output Sinus Filter					ID:1986					Yes No					<p>Select if a sine-wave filter is used or not</p>																																																								
STOP	<input checked="" type="checkbox"/>	READY		I/O																																																																									
Output Sinus Filter																																																																													
ID:1986																																																																													
Yes No																																																																													

5.3 Quick setup parameter description

Name	Description	Factory setting	User setting
Motor Nom Voltage	Motor rated voltage	380	
Motor Nom Freq	Motor rated frequency	50	
Motor Nom Current	Motor rated current	Size-dependent	
Current Limit	Maximum current from drive	Size-dependent	
Motor Cos Phi	Motor power factor	Size-dependent	
Motor Nom Power	Motor rated power	Size-dependent	
Pump Selection	Grundfos pump family	SP	
Min Freq Reference	Lower frequency	30	
Max Freq Reference	Target frequency	50	
Acceleration time	Initial ramp time	3	
Deceleration time	Final ramp time	3	
PV modules type	Solar panel type	SW260	
Module MP Voltage	Vmp maximum power point voltage	31, 4 V	
Series Modules No.	Number of solar panels in series	18	
Output Sinus Filter	Select if sine-wave filter is used or not	No	
Advanced Level PW	Password for advanced menu and service	0	

Digital inputs	Description
DI1	Start/stop
DI2	Tank level switch
DI3	Well level switch
DI4	Flow switch
DI5	Flow meter (pulsating)
DI6	AC operation

The User settings column is left blank to allow users to write down their own input settings.

Note

After modifying the parameters in the table above, the inverter needs to be stopped and started again to update the parameters.

Note

No record is made of undervoltage fault caused by insufficient power due to low sunlight intensity.

6. Fault finding the product

6.1 Fault codes and remedies

Fault code	Fault ID	Fault name	Possible cause	Remedy
1	1	Overcurrent (hardware fault)	AC drive has detected too high a current ($> 4 \cdot I_H$) in the power cable: <ul style="list-style-type: none"> • sudden heavy load increase 	Check load. Check motor.
	2	Overcurrent (software fault)	<ul style="list-style-type: none"> • short circuit in power cables • unsuitable motor 	Check cables and connections. Run identification. Check ramp times.
2	10	Overvoltage (hardware fault)	The DC-link voltage has exceeded the limits defined. <ul style="list-style-type: none"> • too short a deceleration time 	Make deceleration time longer. Use brake chopper or brake resistor (available as options).
	11	Overvoltage (software fault)	<ul style="list-style-type: none"> • brake chopper is disabled • high overvoltage spikes in supply • start/stop sequence too fast 	Activate overvoltage controller. Check input voltage.
3	20	Earth fault (hardware fault)	Current measurement has detected that the motor phase current sum is not zero.	Check power cables and motor.
	21	Earth fault (software fault)	<ul style="list-style-type: none"> • insulation failure in cables or motor 	
5	40	Charging switch	The CHARGING switch is open, when the START command has been given. <ul style="list-style-type: none"> • faulty operation • component failure 	Reset the fault and restart. Contact the nearest distributor if the fault reoccurs.
7	60	Saturation	Various causes: <ul style="list-style-type: none"> • defective component • brake resistor short circuit or overload 	Cannot be reset from keypad. Switch off power. Do not switch the power back on! Contact factory. If this fault appears simultaneously with F1, check power cables and motor.

Fault code	Fault ID	Fault name	Possible cause	Remedy
	600		Communication between control circuit and power unit has failed.	
	601		Communication interference between control circuit and power unit, but it is still working.	
	602		Watchdog has reset the CPU.	Reset the fault and restart.
	603		Auxiliary power voltage in power unit is too low.	Contact the nearest distributor if the fault reoccurs.
	604		Phase fault: Voltage of an output phase does not follow the reference.	
	605		CPLD has faulted, but there is no detailed information about the fault.	
	606		Control panel and power unit software are incompatible.	Update software. Contact the nearest distributor if the fault reoccurs.
	607		Software version cannot be read. There is no software in the power unit.	Update power unit software. Contact the nearest distributor if the fault reoccurs.
8		System fault		
	608		CPU overload. A part of the software (for example application) has caused an overload situation. The source of fault has been suspended.	
	609		Memory access has failed. For example, retain variables could not be restored.	Reset the fault and restart. Contact the nearest distributor if the fault reoccurs.
	610		Necessary device properties cannot be read.	
	614		Configuration error.	
	647		Software error.	
	648		Invalid function block used in application. System software and application are not compatible.	Update software. Contact the nearest distributor if the fault reoccurs.
	649		Resource overload. Error when loading parameter initial values. Error when restoring parameters. Error when saving parameters.	
	80	Undervoltage (fault)	DC-link voltage is under the voltage limits defined.	
9	81	Undervoltage (alarm)	<ul style="list-style-type: none"> • most probable cause: too low a supply voltage • AC drive internal fault • defect input fuse • external charge switch not closed Note! This fault occurs only if the drive is in Run state.	In case of temporary supply voltage failure, reset the fault and restart the AC drive. Check the supply voltage. If it is adequate, an internal fault has occurred. Contact the nearest distributor.
10	91	Input phase	Input line phase is missing.	Check supply voltage, fuses and cable.
11	100	Output phase supervision	Current measurement has detected that there is no current in one of the motor phases.	Check power cable and motor.

Fault code	Fault ID	Fault name	Possible cause	Remedy
12	110	Brake chopper supervision (hardware fault)	No brake resistor installed. Brake resistor is broken.	Check brake resistor and cabling. If these are OK, the chopper is faulty. Contact the nearest distributor.
	111	Brake chopper saturation alarm	Brake chopper failure.	
13	120	AC drive undertemperature (fault)	Too low temperature measured in power unit's heat sink or board. Heat sink temperature is under -10 °C (14 °F).	Check the ambient temperature.
14	130	AC drive overtemperature (fault, heat sink)	Too high temperature measured in power unit's heat sink or board. Heat sink temperature is over 100 °C (212 °F).	Check the correct amount and flow of cooling air. Check the heat sink for dust. Check the ambient temperature. Make sure that the switching frequency is not too high in relation to the ambient temperature and motor load.
	131	AC drive overtemperature (alarm, heat sink)		
	132	AC drive overtemperature (fault, board)		
	133	AC drive overtemperature (alarm, board)		
15	140	Motor stalled	Motor is stalled.	Check motor and load.
16	150	Motor overtemperature	Motor is overloaded.	Decrease motor load. If no motor overload exists, check the temperature model parameters.
17	160	Motor underload	Motor is underloaded.	Check load.
19	180	Power overload (short-time supervision)	Drive power is too high.	Decrease load.
	181	Power overload (long-time supervision)		
25	240	Motor control fault	Start angle identification has failed.	Reset the fault and restart. Contact the nearest distributor if the fault reoccurs.
	241		Generic motor control fault.	
26	250	Startup prevented	Startup of the drive has failed. Run request is ON when new software (firmware or application), a parameter setting or any other file, which affects the operation of the drive, has been loaded to the drive.	Reset the fault and stop the AC drive. Load the software and start the AC drive.
30	530	STO fault	Emergency stop button or some other STO operation has been activated.	When the STO function is activated, the drive is in safe state.
32	312	Fan cooling	Fan life time is up.	Change fan and reset fan life time counter.
33	320	Fire mode enabled	Fire mode of the drive is enabled. The drive's protections are not in use.	Check the parameter settings

Fault code	Fault ID	Fault name	Possible cause	Remedy
37	360	Device changed (same type)	Option board changed for one previously inserted in the same slot. The board's parameter settings are saved.	Device is ready for use. Old parameter settings will be used.
38	370	Device changed (same type)	Option board added. The option board was previously inserted in the same slot. The board's parameter settings are saved.	Device is ready for use. Old parameter settings will be used.
39	380	Device removed	Option board removed from slot.	Device no longer available.
40	390	Device unknown	Unknown device connected (power unit/option board)	Device no longer available.
41	400	IGBT temperature	IGBT temperature (unit temperature + I ₂ T) is too high.	Check load. Check motor size. Run identification.
44	430	Device changed (different type)	Option board or power unit changed. No parameter settings are saved.	Set the option board parameters again if option board was changed. Set the converter parameters again if power unit was changed.
45	440	Device changed (different type)	Option board added. The option board was not previously present in the same slot. No parameter settings are saved.	Set the option board parameters again.
46	662	Real Time Clock	RTC battery voltage level is low.	Replace the battery.
47	663	Software updated	Software of the drive has been updated (either the whole software package or application).	No actions needed.
50	1050	AI low fault	At least one of the available analogue input signals has gone below 50 % of the defined minimum signal range. Control cable is broken or loose. Signal source has failed.	Change the faulty parts. Check the analogue input circuit. Check that parameter AI1 signal range is set correctly.
51	1051	External fault	Fault activated by digital input.	Check the digital input or the device connected to it. Check the parameter settings.
52	1052 1352	Keypad communication fault	The connection between the control keypad and frequency converter is broken.	Check keypad connection and possibly the keypad cable.
53	1053	Fieldbus communication fault	The data connection between the fieldbus master and fieldbus board is broken.	Check installation and fieldbus master.
54	1654 1754	Slot D fault Slot E fault	Defective option board or slot.	Check board and slot.
57	1057	Identification	Identification run has failed.	Check that the motor is connected to the drive. Ensure that there is no load on the motor shaft. Ensure that the start command will not be removed before completion of identification run.

Fault code	Fault ID	Fault name	Possible cause	Remedy
58	1058	Mechanical brake	Actual status of mechanical brake remains different from the control signal for longer than what is defined.	Check the status and connections of the mechanical brake.
63	1063	Low water level	The minimum water level is not ok.	Check settings and water level status.
64	1064	Max. water level	The maximum water level is not ok.	Check settings and water level status.
65	1065	PC communication fault	The data connection between the PC and frequency converter is broken.	
66	1066	Thermistor fault	The thermistor input has detected an increase of motor temperature.	Check motor cooling and load. Check thermistor connection. (If thermistor input is not in use, it has to be short circuited)
68	1301	Maintenance counter 1 alarm	Maintenance counter has reached the alarm limit.	Carry out the required maintenance and reset counter.
	1302	Maintenance counter 2 alarm	Maintenance counter has reached the alarm limit.	Carry out the required maintenance and reset counter.
	1303	Maintenance counter 3 alarm	Maintenance counter has reached the alarm limit.	Carry out the required maintenance and reset counter.
	1304	Maintenance counter 4 alarm	Maintenance counter has reached the alarm limit.	Carry out the required maintenance and reset counter.
	1310		Non-existing ID number is used for mapping values to Fieldbus Process Data Out.	Check parameters in Fieldbus Data Mapping menu.
69	1311	Fieldbus mapping error	Not possible to convert one or more values for Fieldbus Process Data Out.	The value being mapped may be of an undefined type. Check parameters in Fieldbus Data Mapping menu.
	1312		Overflow when mapping and converting values for Fieldbus Process Data Out (16-bit).	
76	1076	Start failed	Start command is active and was blocked in order to prevent unintentional rotation of the motor during the first startup.	Reset drive to restore normal operation. Whether restart is needed depends on the parameter settings.
77	1077	> 5 connections	Maximum number of 5 simultaneous active fieldbus or PC tool connections supported by the application exceeded.	Remove excessive active connections.
100	1100	Soft fill time-out	The Soft fill function in the PID controller has timed out. The wanted process value was not achieved within the time set.	Check for any pipe bursts.
101	1101	Process supervision fault (PID1)	PID controller: Feedback value outside of supervision limits (and the delay if set).	Check settings.
105	1105	Process supervision fault (PID2)	PID controller: Feedback value outside of supervision limits (and the delay if set).	Check settings.

Fault code	Fault ID	Fault name	Possible cause	Remedy
109	1109	Input pressure supervision	Input pressure supervision signal has gone below the alarm limit.	Check the process. Check the parameters.
	1409		Input pressure supervision signal has gone below the fault limit.	Check the input pressure sensor and connections.
111	1315	Temperature fault 1	At least one of the selected temperature input signals has reached the alarm limit.	Find the cause of the temperature raise.
	1316		At least one of the selected temperature input signals has reached the fault limit.	Check the temperature sensor and connections.
112	1317	Temperature fault 2	At least one of the selected temperature input signals has reached the fault limit.	Check that the temperature input is hard-wired if no sensor is connected.
	1318		At least one of the selected temperature input signals has reached the fault limit.	See option board manual for further information.

6.2 Resetting fault codes

When a fault occurs and the RSI stops, examine the cause of the fault, perform the actions described in section 6.1 and reset the fault in one of the ways below:

1. With a long (1 s) press on the Reset button on the keypad.
2. By entering the Diagnostics menu (M4), entering Reset faults (M4.2) and selecting Reset faults parameter.
3. For keypads with LCD display only: By selecting the value Yes for the parameter and clicking OK.

6.3 Fault history

The inverter will record the 40 most recent fault codes. Searching this information will help you investigate the cause of the fault. Fault information is stored together with additional information in the Fault history menu.

Check the cause of the fault thoroughly and remedy the fault before resetting. If it cannot be reset or persists after resetting, check the cause again as continuous resetting will damage the inverter.

Caution

Caution

In case of overload and overheat protection, delay the resetting for 5 minutes.

7. Servicing the product

Warning

- Maintenance and inspection must be performed by a qualified electrician.
- Do not dismantle the inverter when it is running. The inverter must be powered off for at least 5 minutes before conducting maintenance and inspection.



It is absolutely forbidden for unauthorised persons to repair the inverter as this can cause personal injury or equipment damage

Note

Any service performed on the inverter by unqualified staff will void the warranty.

7.1 Routine inspection

To ensure the inverter runs stably, carry out an annual inspection.

7.1.1 Inspection and maintenance requirements

Warning



- The inspection must be performed by trained and qualified technical staff. Disconnect the power supply to the inverter before starting inspection

1. If it is necessary to conduct an insulation test on the inverter, all input and output terminals must have a proper short circuit. Insulation tests must not be performed on a single terminal. Use a 500 V mega ohm meter to conduct the test.

Caution

Do not use the mega ohm meter to test the control circuit.

2. When conducting an insulation test on the motor, between motor and inverter.

7.1.2 Main inspection and maintenance points

Inspection frequency		Inspection issue	Inspection item	Criteria or requirements
Routine ¹⁾	Regular ²⁾			
√		Running environment	1. Temperature 2. Humidity 3. Gas 4. Dust	1. Temperature < 50 °C (122 °F). 2. Humidity < 90 %, no condensation. 3. No flammable, explosive gas. 4. Non-corrosive environment.
	√	Cooling system	1. Installation environment 2. Radiator 3. Fan	1. Good ventilation in installation environment. 2. Radiator air duct not blocked. 3. Fan should be running smoothly, if equipped.
√		Inverter cabinet	1. Vibration 2. Temperature rise 3. Noise 4. Conductors, terminals	1. Vibration that appears steady and normal 2. Normal temperature. 3. No abnormal noise. 4. Conductors and terminals fastened properly.
√		Motor	1. Vibration 2. Temperature rise 3. Noise	1. Steady running. 2. Normal temperature. 3. No abnormal noise.
√		Input and output parameters	1. Input voltage 2. Output current	1. Input voltage within limit. 2. Output current under the rated value.

1) Every 1000 running hours.

2) Every month.

7.2 Inspection and replacement of wear parts

7.2.1 Cooling fan

Inverters are equipped with cooling fans. The cooling fan's service life is about 15000 hours. If the fan generates abnormal noise or produces vibrations, replace it immediately. The cooling fan will start automatically when the internal temperature of the inverter exceeds 55 °C (131 °F) and stop when the internal temperature of the inverter falls below than 45 °C (113 °F).

7.3 Storage and warranty

7.3.1 Storage

If the product is stored for a long time after purchasing, comply with the following requirements:

1. Avoid placing the inverter in high-temperature or humid areas or areas with vibration and metal dust. Ensure proper ventilation.
2. The performance of the capacitor inside the inverter can be reduced if the equipment is not used for a long period of time. It is thus necessary to start up the equipment every two years to restore the performance of the capacitor and inspect the inverter function at the same time. The voltage must be increased gradually through a DC power supply with power-on time being no less than 5 hours.

7.3.2 Warranty

The following situations are not covered by the warranty:

- Faults caused by failure to comply with this manual or standard specifications.
- Faults caused by self-repairing and unauthorised modification.
- Faults caused by poor storage and maintenance.
- Faults caused by abnormal use of the inverter.
- Damage caused by fire, salt corrosion, gas corrosion, earthquake, storm, flooding, lightning, abnormal voltage or other force majeure situations.

8. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

Subject to alterations.

Argentina

Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Centro
Industrial Garin
1619 Garin Pcia. de B.A.
Phone: +54-3327 414 444
Telefax: +54-3327 45 3190

Australia

GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Phone: +61-8-8461-4611
Telefax: +61-8-8340 0155

Austria

GRUNDFOS Pumpen Vertrieb
Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Telefax: +43-6246-883-30

Belgium

N.V. GRUNDFOS Bellux S.A.
Boomsesteenweg 81-83
B-2630 Aartselaar
Tél.: +32-3-870 7300
Télécopie: +32-3-870 7301

Belarus

Представительство ГРУНДФОС в
Минске
220125, Минск
ул. Шафарнянская, 11, оф. 56, БЦ
«Порт»
Тел.: +7 (375 17) 286 39 72/73
Факс: +7 (375 17) 286 39 71
E-mail: minsk@grundfos.com

Bosnia and Herzegovina

GRUNDFOS Sarajevo
Zmaja od Bosne 7-7A,
BH-71000 Sarajevo
Phone: +387 33 592 480
Telefax: +387 33 590 465
www.ba.grundfos.com
e-mail: grundfos@bih.net.ba

Brazil

BOMBAS GRUNDFOS DO BRASIL
Av. Humberto de Alencar Castelo
Branco, 630
CEP 09850 - 300
São Bernardo do Campo - SP
Phone: +55-11 4393 5533
Telefax: +55-11 4343 5015

Bulgaria

Grundfos Bulgaria EOOD
Slatina District
Iztochna Tangenta street no. 100
BG - 1592 Sofia
Tel. +359 2 49 22 200
Fax. +359 2 49 22 201
email: bulgaria@grundfos.bg

Canada

GRUNDFOS Canada Inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

China

GRUNDFOS Pumps (Shanghai) Co. Ltd.
10F The Hub, No. 33 Suhong Road
Minhang District
Shanghai 201106
PRC
Phone: +86 21 612 252 22
Telefax: +86 21 612 253 33

COLOMBIA

GRUNDFOS Colombia S.A.S.
Km 1.5 vía Siberia-Cota Conj. Potrero
Chico,
Parque Empresarial Arcos de Cota Bod.
1A.
Cota, Cundinamarca
Phone: +57(1)-2913444
Telefax: +57(1)-8764586

Croatia

GRUNDFOS CROATIA d.o.o.
Buzinski prilaz 38, Buzin
HR-10010 Zagreb
Phone: +385 1 6595 400
Telefax: +385 1 6595 499
www.hr.grundfos.com

GRUNDFOS Sales Czechia and Slovakia s.r.o.

Čajkovského 21
779 00 Olomouc
Phone: +420-585-716 111

Denmark

GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Estonia

GRUNDFOS Pumps Eesti OÜ
Peterburi tee 92G
11415 Tallinn
Tel: + 372 606 1690
Fax: + 372 606 1691

Finland

OY GRUNDFOS Pumput AB
Trukkikuja 1
FI-01360 Vantaa
Phone: +358-(0) 207 889 500

France

Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tél.: +33-4 74 82 15 15
Télécopie: +33-4 74 94 10 51

Germany

GRUNDFOS GMBH
Schlüterstr. 33
40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Telefax: +49-(0) 211 929 69-3799
e-mail: infoservice@grundfos.de
Service in Deutschland:
e-mail: kundendienst@grundfos.de

Greece

GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +0030-210-66 46 273

Hong Kong

GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor
Siu Wai Industrial Centre
29-33 Wing Hong Street &
68 King Lam Street, Cheung Sha Wan
Kowloon
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

Hungary

GRUNDFOS Hungária Kft.
Park u. 8
H-2045 Törökbálint,
Phone: +36-23 511 110
Telefax: +36-23 511 111

India

GRUNDFOS Pumps India Private
Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia

PT. GRUNDFOS POMPA
Graha Intirub Lt. 2 & 3
Jln. Cililitan Besar No.454. Makasar,
Jakarta Timur
ID-Jakarta 13650
Phone: +62 21-469-51900
Telefax: +62 21-460 6910 / 460 6901

Ireland

GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Phone: +353-1-4089 800
Telefax: +353-1-4089 830

Italy

GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Telefax: +39-02-95309290 / 95838461

Japan

GRUNDFOS Pumps K.K.
1-2-3, Shin-Miyakoda, Kita-ku,
Hamamatsu
431-2103 Japan
Phone: +81 53 428 4760
Telefax: +81 53 428 5005

Korea

GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Phone: +82-2-5317 600
Telefax: +82-2-5633 725

Latvia

SIA GRUNDFOS Pumps Latvia
Deglava biznesa centrs
Augusta Deglava iela 60, LV-1035, Rīga,
Tālr.: + 371 714 9640, 7 149 641
Faks: + 371 914 9646

Lithuania

GRUNDFOS Pumps UAB
Smolensko g. 6
LT-03201 Vilnius
Tel: + 370 52 395 430
Fax: + 370 52 395 431

Malaysia

GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie Industrial Park
40150 Shah Alam
Selangor
Phone: +60-3-5569 2922
Telefax: +60-3-5569 2866

Mexico

Bombas GRUNDFOS de México S.A. de
C.V.
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
Apodaca, N.L. 66600
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

Netherlands

GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Telefax: +31-88-478 6332
E-mail: info_gnl@grundfos.com

New Zealand

GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway

GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +47-22 32 21 50

Poland

GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Tel: (+48-61) 650 13 00
Fax: (+48-61) 650 13 50

Portugal

Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Telefax: +351-21-440 76 90

Romania

GRUNDFOS Pompe România SRL
Bd. Biruintei, nr 103
Pantelimon county Ilfov
Phone: +40 21 200 4100
Telefax: +40 21 200 4101
E-mail: romania@grundfos.ro

Russia

ООО Грундфос Россия
109544, г. Москва, ул. Школьная, 39-
41, стр. 1
Тел. (+7) 495 564-88-00 (495) 737-30-
00
Факс (+7) 495 564 88 11
E-mail grundfos.moscow@grundfos.com

Serbia

Grundfos Srbija d.o.o.
Omladinskih brigada 90b
11070 Novi Beograd
Phone: +381 11 2258 740
Telefax: +381 11 2281 769
www.rs.grundfos.com

Singapore

GRUNDFOS (Singapore) Pte. Ltd.
25 Jalan Tukang
Singapore 619264
Phone: +65-6681 9688
Telefax: +65-6681 9689

Slovakia

GRUNDFOS s.r.o.
Prievozská 4D
821 09 BRATISLAVA
Phona: +421 2 5020 1426
sk.grundfos.com

Slovenia

GRUNDFOS LJUBLJANA, d.o.o.
Leskovoška 9e, 1122 Ljubljana
Phone: +386 (0) 1 568 06 10
Telefax: +386 (0) 1 568 06 19
E-mail: tehnika-si@grundfos.com

South Africa

GRUNDFOS (PTY) LTD
Corner Mountjoy and George Allen
Roads
Wilbart Ext. 2
Bedfordview 2008
Phone: (+27) 11 579 4800
Fax: (+27) 11 455 6066
E-mail: lsmart@grundfos.com

Spain

Bombas GRUNDFOS España S.A.
Camino de la Fuentequilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Telefax: +34-91-628 0465

Sweden

GRUNDFOS AB
Box 333 (Lunnagårdsgatan 6)
431 24 Mölndal
Tel.: +46 31 332 23 000
Telefax: +46 31 331 94 60

Switzerland

GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-44-806 8111
Telefax: +41-44-806 8115

Taiwan

GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Phone: +886-4-2305 0868
Telefax: +886-4-2305 0878

Thailand

GRUNDFOS (Thailand) Ltd.
92 Chaloev Phrakiat Rama 9 Road,
Dokmai, Pravej, Bangkok 10250
Phone: +66-2-725 8999
Telefax: +66-2-725 8998

Turkey

GRUNDFOS POMPA San. ve Tic. Ltd.
Sti.
Gebze Organize Sanayi Bölgesi
İhsan dede Caddesi,
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

Ukraine

Бізнес Центр Європа
Столичне шосе, 103
м. Київ, 03131, Україна
Телефон: (+38 044) 237 04 00
Факс.: (+38 044) 237 04 01
E-mail: ukraine@grundfos.com

United Arab Emirates

GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone
Dubai
Phone: +971 4 8815 166
Telefax: +971 4 8815 136

United Kingdom

GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 4TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.

GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Uzbekistan

Grundfos Tashkent, Uzbekistan The
Representative Office of Grundfos
Kazakhstan in Uzbekistan
38a, Oybek street, Tashkent
Телефон: (+998) 71 150 3290 / 71 150
3291
Факс: (+998) 71 150 3292

Addresses Revised 05.12.2016

be think innovate

98464145 0417

ECM: 1207397

The name Grundfos, the Grundfos logo, and **be think innovate** are registered trademarks owned by Grundfos Holding A/S or Grundfos A/S, Denmark. All rights reserved worldwide.
© Copyright Grundfos Holding A/S

www.grundfos.com

GRUNDFOS 