

SE60 cable Ex

60 Hz, ANSI

Installation and operating instructions



SE60 cable Ex

<http://net.grundfos.com/qr/i/99952997>



English (US) Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe Grundfos SE60 explosion-proof (Ex) cables for 60 Hz ANSI.

CONTENTS

	Page
1. LIMITED WARRANTY	2
2. General information	3
2.1 Hazard statements	3
2.2 Notes	3
3. Product introduction	3
3.1 Product description	3
3.2 Intended use	3
3.3 Identification	4
3.4 Approvals	5
4. Installation requirements	5
5. Mechanical connection	5
5.1 Cable connection	5
6. Cable types	7
7. Electrical connection	8
8. Service	8
8.1 Maintenance and repair	8
8.2 Spare parts	8
9. Technical data	8
10. Disposal	9



Read this document and the online version of the installation and operating instructions before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.

1. LIMITED WARRANTY

New equipment manufactured by seller or service supplied by seller is warranted to be free from defects in material and workmanship under normal use and service for a minimum of twelve (12) months from date of installation, eighteen (18) months from date of shipment, unless otherwise stated in product warranty guide (available upon request). In the case of spare or replacement parts manufactured by seller, the warranty period shall be for a period of twelve months from shipment. Seller's obligation under this warranty is limited to repairing or replacing, at its option, any part found to its satisfaction to be so defective, provided that such part is, upon request, returned to seller's factory from which it was shipped, transportation prepaid. Parts replaced under warranty shall be warranted for twelve months from the date of the repair, not to exceed the original warranty period. This warranty does not cover parts damaged by decomposition from chemical action or wear caused by abrasive materials, nor does it cover damage resulting from misuse, accident, neglect, or from improper operation, maintenance, installation, modification or adjustment. This warranty does not cover parts repaired outside seller's factory without prior written approval. Seller makes no warranty as to starting equipment, electrical apparatus or other material not of its manufacture. If purchaser or others repair, replace, or adjust equipment or parts without seller's prior written approval, seller is relieved of any further obligation to purchaser under this paragraph with respect to such equipment or parts, unless such repair, replacement, or adjustment was made after seller failed to satisfy within a reasonable time seller's obligations under this paragraph. Seller's liability for breach of these warranties (or for breach of any other warranties found by a court of competent jurisdiction to have been given by seller) shall be limited to: (a) accepting return of such equipment exw plant of manufacture, and (b) refunding any amount paid thereon by purchaser (less depreciation at the rate of 15 % per year if purchaser has used equipment for more than thirty [30] days), and cancelling any balance still owing on the equipment, or (c) in the case of service, at seller's option, redoing the service, or refunding the purchase order amount of the service or portion thereof upon which such liability is based. These warranties are expressly in lieu of any other warranties, express or implied, and seller specifically disclaims any implied warranty of merchantability or fitness for a particular purpose, and in lieu of any other obligation or liability on the part of the seller whether a claim is based upon negligence, breach of warranty, or any other theory or cause of action. In no event shall seller be liable for any consequential, incidental, indirect, special or punitive damages of any kind. For purposes of this paragraph, the equipment warranted shall not include equipment, parts, and work not manufactured or performed by seller. With respect to such equipment, parts, or work, seller's only obligation shall be to assign to purchaser the warranties provided to seller by the manufacturer or supplier providing such equipment, parts or work. No equipment furnished by seller shall be deemed to be defective by reason of normal wear and tear, failure to resist erosive or corrosive action of any fluid or gas, purchaser's failure to properly store, install, operate, or maintain the equipment in accordance with good industry practices or specific recommendations of seller, including, but not limited to seller's installation and operation manuals, or purchaser's failure to provide complete and accurate information to seller concerning the operational application of the equipment.

2. General information

2.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.



WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.



CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:



SIGNAL WORD

Description of hazard

Consequence of ignoring the warning.
- Action to avoid the hazard.

2.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



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



Tips and advice that make the work easier.

3. Product introduction

Note: Product images are for illustrative purposes only.

3.1 Product description

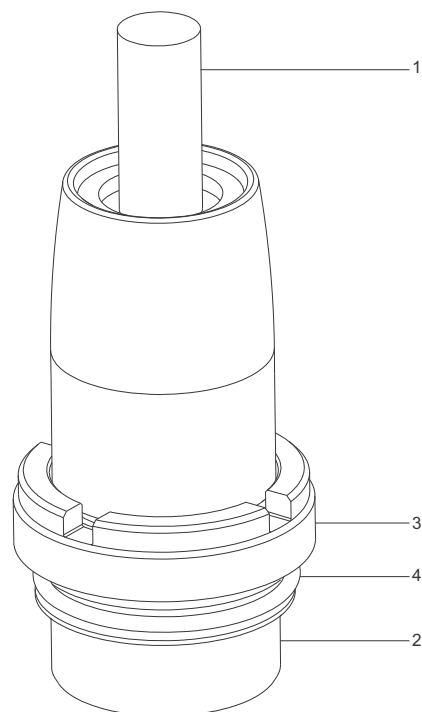


Fig. 1

Pos.	Designation
1	Cable
2	Plug
3	Union nut
4	O-ring

3.2 Intended use

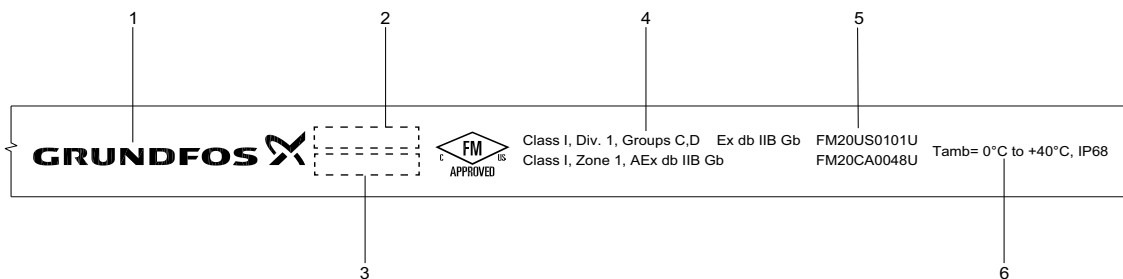
The SE60 cable Ex is intended for use with the following 60 Hz ANSI-standard Grundfos products:

- small (SEG) and
- medium (SL) size explosion-proof submersible wastewater pumps
- explosion-proof agitators (SMD).

TM-07 6573 2120

3.3 Identification

3.3.1 Identification print



TM07 6595 2220

Pos.	Description	Pos.	Description
1	Manufacturer	4	Ex marking
2	Product number	5	Approval number
3	Batchcode number	6	Ambient temperature

3.3.2 Type key

Example: SE60 cable.ws.C/D.EX.4G AWG14+3×AWG16.Y.49

Code	Description	Explanation
SE60 cable	Assembled cable	Cable type
[]	Without screening	Cable screening
ws	With screening	
B	Plug type	Pump frame size
C/D		
Ex	Explosion-proof cable	Cable version
7G AWG16	7-pole cable	Number of poles × size of cores
4G AWG14+3×AWG16		
7G AWG14+3×AWG16		
Y	Y-connected	Type of connection
D	Δ-connected	
33	Length	Cable length [ft]
49		
66		
82		
98		
131		
164		

3.4 Approvals

The SE60 cable Ex is tested and certified by FM approvals in projects 3053414 and 3059579.

The cable's certificate for US market is FM20US0101U.

Division marking Class I, Division 1, Groups C and D.

Zone marking Class I, Zone I, AEx db IIB Gb.

Standard	Code	Description
FM 3600, FM 3615, FM 3650, ANSI/IEC 60529, ANSI/UL 60079-0, ANSI/UL 60079-1	Class I	Explosive atmosphere is caused by gas or vapours.
	Division 1	Area classification. Flammable material present intermittently.
	Groups C and D	Gas groups, ethylene and propane.
	Zone 1	Area classification, Flammable material present intermittently
	AEx	Explosion protected based on American National Standard.
	db	Type of protection, Flameproof.
	IIB	Gas groups, Ethylene and Propane
	Gb	Equipment protection level, Gas atmosphere, "high" level of protection.

The cable's certificate for CA market is FM20CA0048U.

Division marking: Class I, Division 1, Groups C and D.

Zone marking: Ex db IIB Gb.

Standard	Code	Description
CSA C22.2 No.1, CSA C22.2 No.0.4, CSA C22.2 No.100, CSA C22.2 No.145, CSA C22.2 No. 60079-0, CSA C22.2 No. 60079-1, CSA C22.2 No. 60529.	Class I	Explosive atmosphere is caused by gas or vapours.
	Division 1	Area classification. Flammable material present intermittently.
	Groups C and D	Gas groups, ethylene and propane.
	Zone 1	Area classification. Flammable material present intermittently
	Ex	Explosion protected.
	db	Type of protection, flameproof.
	IIB	Gas groups, ethylene and propane
	Gb	Equipment protection level. Gas atmosphere, "high" level of protection.

4. Installation requirements



Before installation, make sure that the environment is not potentially explosive.



Ex assembled cable installation must be carried out by Grundfos or a Grundfos-authorized service workshop.



Before installation, inspect the assembled cable for damages. Only undamaged cable can be installed.



After removing the protective cap, inspect the external insulation of rubber cable and cable plug part.



Check the O-ring and the connection surface (see fig. 1 pos. 2 and 4). If visible damage is detected, replace the cable.



The cable plug must be fixed with the lock nut from the service kit.

5. Mechanical connection

5.1 Cable connection

Proceed as follows:



Use Rocol 22 (Sapphire Agua Sil) lubricant, or equivalent type.

- Clean the cable plug, the locking ring, the rubber cable and the cable entry hole in the product house.
- Lubricate the groove on the cable plug for the O-ring.
- Fit the O-ring on the plug into the groove and lubricate it.
- Connect the cable plug to the cable entry hole of product housing. The guide pin on the cable plug has to fit into the socket. See fig. 2.
- Screw the union nut into the product and tighten it with the spanner (PN 95043464). Torques to apply:
 - 50+/-5 Nm - type B
 - 75+/-5 Nm - types C/D



To avoid damaging the wires in the pin housing, make sure the cable plug cannot rotate when tightening the union nut.

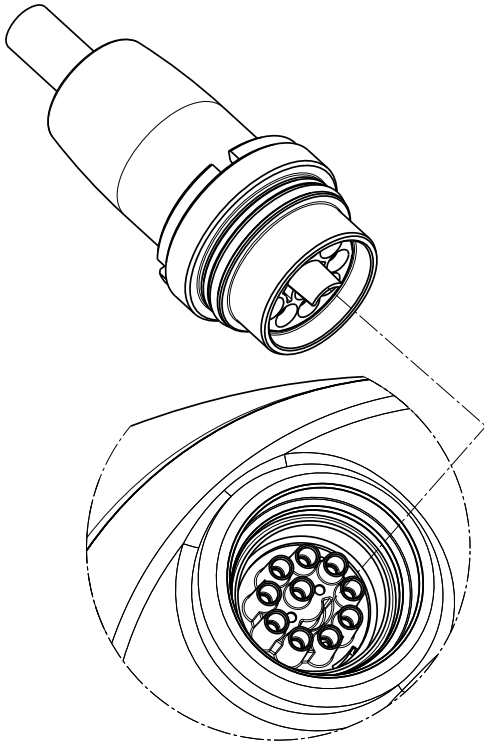


Fig. 2 Plug with the pin

TM-07 6487 1920

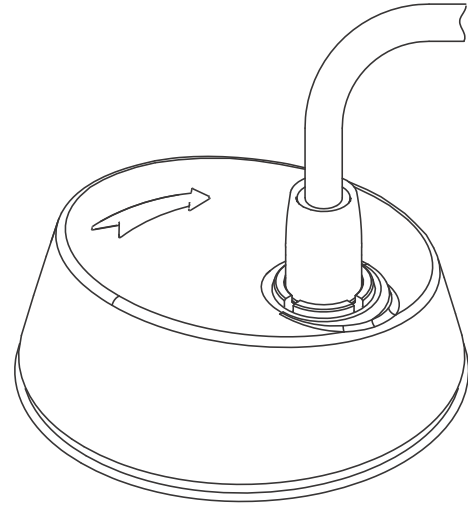


Fig. 4 Connected cable

TM-07 6425 1920

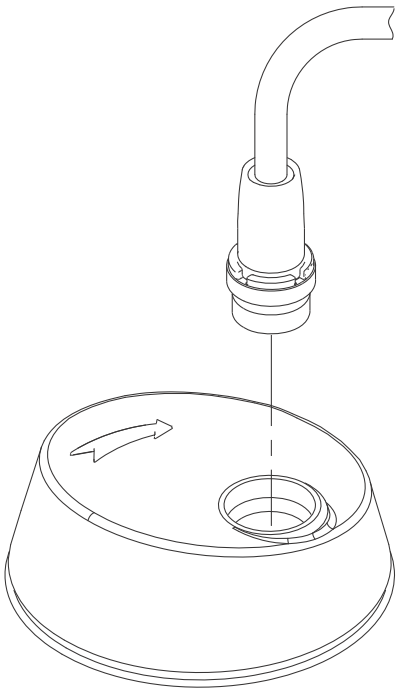


Fig. 3 Pump with cable plug

TM-07 6424 1920

6. Cable types

Plug type	Pole	Screen	Connection	Steel grade	Cable length [ft]							Steel grade		
					33	49	66	82	98	131	164	Plug housing	Union nut	Top nut
B	7	-	-	Normal	√	√	√	√	√	√	√	EN 1.4408	EN 1.4408	-
			-	Duplex	√	√	√	√	√	√	√	EN 1.4517	EN 1.4517	-
		√	-	Normal	√	√	√	√	√	√	-	EN 1.4404	EN 1.4408	EN 1.4404
			-	Duplex	√	√	√	√	√	√	√	EN 1.4517	EN 1.4517	EN 1.4462
C/D	7	-	Y	Normal	√	√	√	√	√	√	-	EN 1.4408	EN 1.4408	-
				Duplex	√	√	√	√	√	√	√	EN 1.4517	EN 1.4517	-
			D	Normal	√	√	√	√	√	√	-	EN 1.4408	EN 1.4408	-
				Duplex	√	√	√	√	√	√	√	EN 1.4517	EN 1.4517	-
		√	Y	Normal	√	√	√	√	√	√	-	EN 1.4404	EN 1.4408	EN 1.4404
				Duplex	√	√	√	√	√	√	√	EN 1.4462	EN 1.4517	EN 1.4462
			D	Normal	√	√	√	√	√	√	-	EN 1.4404	EN 1.4408	EN 1.4404
				Duplex	√	√	√	√	√	√	√	EN 1.4462	EN 1.4517	EN 1.4462
10	-	-	Normal	√	√	√	√	√	√	-	EN 1.4408	EN 1.4408	-	
			Duplex	√	√	√	√	√	√	√	EN 1.4517	EN 1.4517	-	

Plug type B

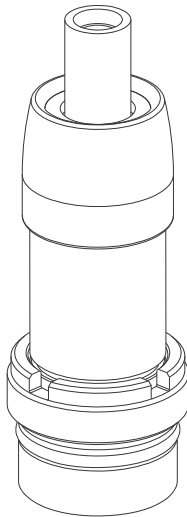


Fig. 5 Plug type B with 7-pole screened cable

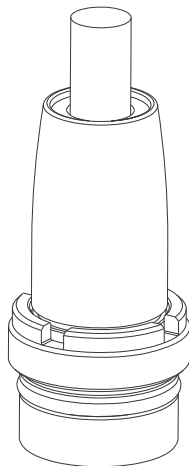


Fig. 6 Plug type B with 7-pole unscreened cable

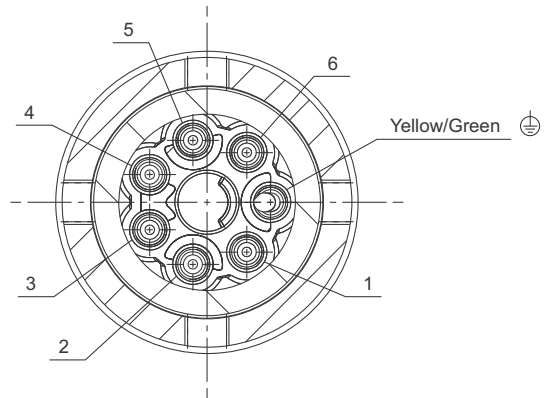


Fig. 7 7-pole cable end for plug type B

Plug type C and D with 7-pole cable

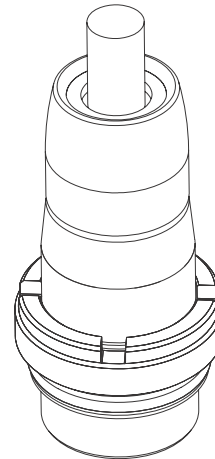


Fig. 8 Plug type C and D with 7-pole screened cable

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TM07 6567 3520

TM-07 6570 1920

TM07 7242 3520

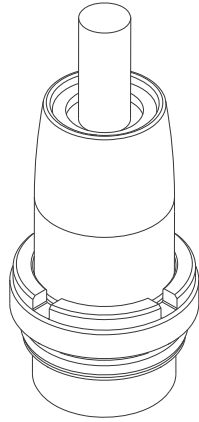


Fig. 9 Plug type C and D with unscreened cable

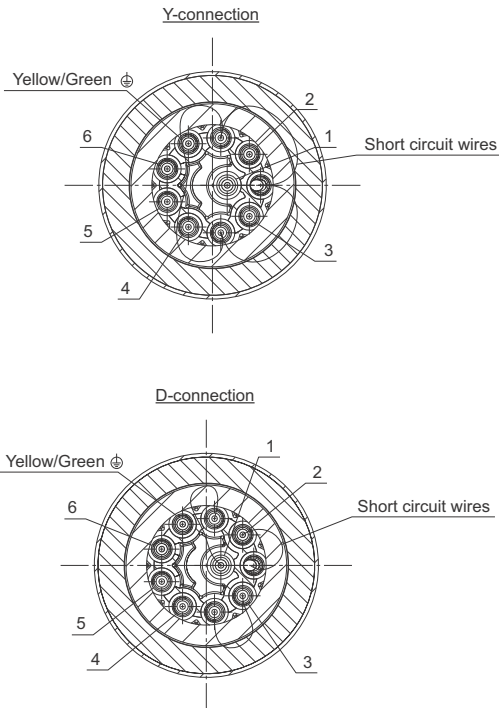


Fig. 10 7-pole cable end for plug type C and D

Plug type C and D with 10-pole cable

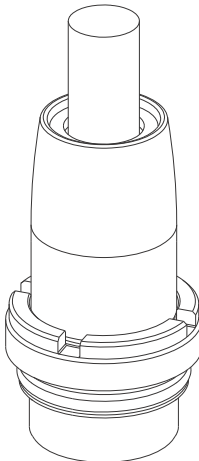


Fig. 11 Plug type C and D with 10-pole unscreened cable

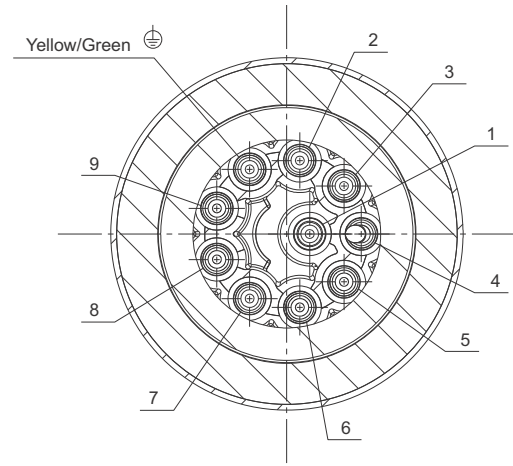


Fig. 12 10-pole unscreened cable end for plug type C and D

7. Electrical connection



After cable installation, an earthing-continuity check must be done.

Connect the free end of the cable to the mains or to the control panel according to the Installation and operating instructions of the selected product.

All the Installation and operating instructions of Grundfos products are available on www.product-selection.grundfos.com



Ensure proper earthing connection between the screen of the cable and the control cabinet.

8. Service

8.1 Maintenance and repair

The assembled cable is maintenance-free and must not be repaired. Cable condition must be checked regularly. Damaged cable must be replaced.

If the cable is disconnected, the re-connection of the cable must follow the instructions in section 5.1 *Cable connection*.



Ex assembled cable installation must be carried out by Grundfos or a Grundfos-authorized service workshop.

8.2 Spare parts

The O-ring and the union nut are the only parts that can be replaced.



Ex assembled cable installation must be carried out by Grundfos or a Grundfos-authorized service workshop.

9. Technical data

Operating temperature range: 32 to 104°F

Enclosure class: IP68

Maximum installation depth: 66 ft.

Voltage range: 200-575 VAC

Power range: 1.6-17 hp (1.2-12.7 kW)

10. Disposal

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.

See also end-of-life information at www.grundfos.com/product-recycling.

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