

Grundfos packaged lift stations



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1. Introduction

Introduction

Grundfos packaged lift stations are pre-fabricated pumping stations made of PE-HD (polyethylene) and coming with discharge pipe and valves fitted. The pump(s) may be supplied separately.

The pipework is made of either PE polyethylene or stainless steel (AISI 304).

Unless another solution is selected, the 32" tanks, the 40" tanks and the 48" tanks have a PE-HD cover, locked with a special M10 bolt.

The 67" tanks have a fiber glass cover, with locking mechanism prepared for a padlock.

Applications

Grundfos packaged lift stations are used for collection and pumping of wastewater, such as rainwater, effluent or sewage. The pump type depends on the pumped liquid.

Wastewater is led into the collecting tank. When the liquid in the tank reaches the start level, the pump will start and pump the liquid into the sewer system

Main features

Get the complete packaged lift station from Grundfos. Thus, your lifting station can be Grundfos quality all the way. To complement our range of high-quality pumps and pumping equipment, we have developed a pumping station range that has everything you need: sturdy, well-designed polyethylene collecting tanks, all necessary accessories such as piping and valves, as well as reliable controllers. In this way you can get a complete packaged lift station ready to go into the ground. Getting everything from one supplier, you can be certain that every part meets the most stringent quality requirements and fits perfectly together.

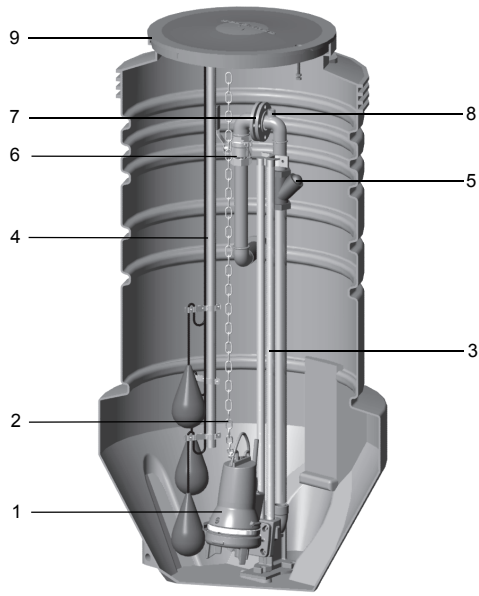
Once the lift station is installed, you will find that maintenance is reduced to an absolute minimum.

The combination of sturdy materials and convenient access to valves and pumps not only makes service easier – it also makes it much less frequent.

Powerful advantages

- **Corrosion-free materials**
Grundfos lift stations are made of corrosion-free materials throughout. This uncompromising choice of materials and the unique design make the units remarkably service-friendly and reliable.
- **Modular flexibility**
The prefabricated packaged lift stations consist of four main elements: one or two of our highly efficient and reliable pumps, a collecting tank in the size to suit your requirements, all piping and valves, and finally controllers and level sensors to ensure operational efficiency and safety.
- **Many sizes available**
The lift stations are available in various sizes, comprising four standard diameters and up to four standard lengths. The standard range is regularly updated with more variants.
- **Installation- and service-friendly**
The collecting tank has an extended, cone-shaped sump in order to secure the tank against buoyancy when installed in areas with high groundwater level. At the same time, this extended cone-shaped sump improves the self-cleaning effect and thereby limits sedimentation and odor problems. All components needed in the lift station can be reached from the top. In tank sizes 48" and less, the auto-coupling is secured in the bottom position without any use of screws. It is possible to remove the coupling together with the pipe work without entering the tank.

The components of the lift station are selected according to Grundfos' principles of high reliability, long life and great consideration for the environment during production, operation and disposal.



TM04 4617 1809

Fig. 1 Grundfos packaged lift station

Pos.	Description
1	Pump
2	Lifting chain
3	Guide rails
4	Level control system
5	Non-return valve
6	Isolating valve
7	Flange/coupling
8	Air release
9	Cover

2. Pumped liquids

Pumped liquids

- Drainage water
- rainwater (surface water)
- effluent
- sewage.

Liquid temperature

Maximum 104 °F (40 °C). For higher temperatures, contact your local Grundfos company.

The liquid temperature depends on the pump selected. See the installation and operating instructions of the individual pumps. For certain pump types, 140 °F (60 °C) is permissible for short periods. At 104 °F (40 °C), the tank begins to soften.

Acids and alkalis

The lift station is resistant to strong acids and alkalis as well as solvents.

The pumps are supplied with the lift station and normally stand pH values between 4 and 10. In case of doubt, contact your local Grundfos company.

Viscosity

Very thick wastewater must not be led into the collecting tank. See also the installation and operating instructions of the pump.

Density

Maximum 68.67 lb/ft³ (1100 kg/m³).

3. Identification

Type key

Type key, PLS.32 - PLS.48

Example	PLS	32	78	S	A	SS	SEG
Grundfos packaged lift station							
Sump diameter [inch]							
32:							
40:							
48:							
Length [inch]							
60:							
78:							
98:							
118:							
Installation of pump							
S:	Simplex pump installation						
D:	Duplex pump installation						
Installation of pump							
A:	Auto coupling on tank bottom						
S:	Free-standing						
Pipe material							
PE:	Polyethylene (1.5" or 2")						
SS:	Stainless steel, AISI 304 (1.5" or 2")						
Discharge piping is with NPSM thread							
Prepared for pump type							
SEG:	SEG						

Type key, PLS.67

Example	PLS	67	78	S	A	SS	DC	25
Grundfos packaged lift station								
Sump diameter [inch]								
67:	67							
Length [inch]								
78:								
98:								
118:								
138:								
157:								
177:								
197:								
217:								
236:								
Installation of pump								
S:	Simplex pump installation							
D:	Duplex pump installation							
Installation of pump								
A:	Auto coupling on tank bottom							
S:	Free-standing							
Pipe material								
PE:	Polyethylene							
SS:	Stainless steel							
Pipe design								
DC:	Direct outlet, common							
DS:	Direct outlet, separate							
GC:	Goose neck, common							
NV:	No valves							
Pipe diameter: code number from type key/ 10 [inches]								
Stainless steel:								
25:	2.5" (63mm)							
30:	3" (75mm)							
40:	4" (110mm)							
PE:								
25:	2.5" (63mm)							
30:	3" (75mm)							
40:	4" (110mm)							
Discharge piping is with ANSI flange connection								

Nameplate

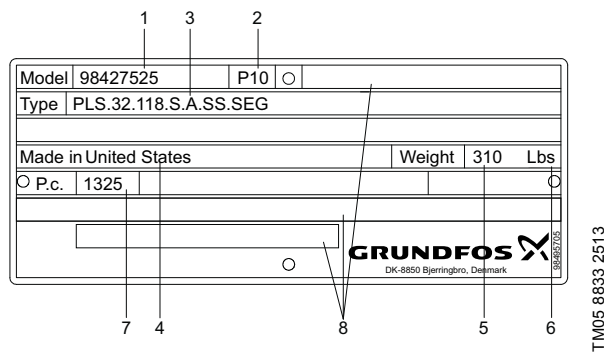


Fig. 2 Nameplate

Key to the nameplate

Pos.	Description
1	Product number
2	Product site code
3	Type designation
4	Country of origin
5	Weight
6	Weight unit
7	Production code - YYWW of production
8	Not filled in

4. Selection of products

Selection of products

When ordering a Grundfos lift station, you need to take the following six aspects into consideration:

1. pump
2. installation of pump and pipe material
3. diameter and length of collecting tank
4. level control system
5. pump controller
6. accessories.

1. Pump

See the data booklet for the specific pump or WebCAPS, and section *Type key* on page 6.

2. Installation of pump and pipe material

See section *Type key* on page 6.

The pump(s) can be installed in two ways:

- on an auto-coupling on the bottom of the tank
- free-standing.

3. Diameter and length of collecting tank

The collecting tank is available in various sizes. See section *Dimensions* on page 26 for dimensions and for calculation of needed volume.

For sizes PLS.32 - PLS.48 the only pump available is SEG.

Length [inch]	PLS.32	PLS.40	PLS.48, two pumps
	60	•	•
78	•	•	•
98	•	•	•
118	•	•	•

Length [inch]	PLS.67, two pumps		
	Pipe, SS	Pipe, PE	
	2.5" - 4"	2.5"	3" - 4"
78	•	•	•
98	•	•	•
118	•	•	•
138	•	•	•
157	•		•
177	•		•
197	•		•
217	•		•
236	•		•

4. Level control system

For level control system, see *Accessories*, section *Level system*, page 18 or WebCAPS.

5. Pump controller

For pump controller, see *Accessories*, section *Level controllers*, page 15 or WebCAPS.

6. Accessories

Depending on the installation type, accessories may be required. For selection of the correct accessories, see section *Accessories* from page 15.

5. Product range

Product range, PLS.32 - PLS.48

The table shows product numbers of lift stations without pump and controller.

Note: Remember to order the type of level control system to be delivered together with the collecting tank.

Type	Diameter	Length	Prepared for number of pumps	Installation of pump ¹	Pipe material ²	Prepared for pump type	Pipe diameter	Sump volume without pump	Weight without pump	Product number
	[Inch]	[Inch]						[ft ³]	[lb]	
PLS.32.60.S.A.SS.SEG	32	60	1	A	SS	SEGA15	1.5"	9.89	165	98427510
PLS.32.78.S.A.SS.SEG	32	78	1	A	SS	SEGA15	1.5"	9.89	185	98427517
PLS.32.98.S.A.SS.SEG	32	98	1	A	SS	SEGA15	1.5"	9.89	216	98427565
PLS.32.118.S.A.SS.SEG	32	118	1	A	SS	SEGA15	1.5"	9.89	311	98427525
PLS.32.60.S.A.SS.SEG	32	60	1	A	SS	SEGA20	2"	9.89	165	98427547
PLS.32.78.S.A.SS.SEG	32	78	1	A	SS	SEGA20	2"	9.89	185	98427548
PLS.32.98.S.A.SS.SEG	32	98	1	A	SS	SEGA20	2"	9.89	216	98427549
PLS.32.118.S.A.SS.SEG	32	118	1	A	SS	SEGA20	2"	9.89	311	98427550
PLS.40.60.S.A.SS.SEG	40	60	1	A	SS	SEGA15	1.5"	14.83	205	98427530
PLS.40.78.S.A.SS.SEG	40	78	1	A	SS	SEGA15	1.5"	14.83	249	98427531
PLS.40.98.S.A.SS.SEG	40	98	1	A	SS	SEGA15	1.5"	14.83	298	98427532
PLS.40.118.S.A.SS.SEG	40	118	1	A	SS	SEGA15	1.5"	14.83	373	98427533
PLS.40.60.S.A.SS.SEG	40	60	1	A	SS	SEGA20	2"	14.83	205	98427551
PLS.40.78.S.A.SS.SEG	40	78	1	A	SS	SEGA20	2"	14.83	220	98427552
PLS.40.98.S.A.SS.SEG	40	98	1	A	SS	SEGA20	2"	14.83	240	98427553
PLS.40.118.S.A.SS.SEG	40	118	1	A	SS	SEGA20	2"	14.83	337	98427554
PLS.48.60.D.A.SS.SEG	48	60	2	A	SS	SEGA15	1.5"	19.42	397	98427538
PLS.48.78.D.A.SS.SEG	48	78	2	A	SS	SEGA15	1.5"	19.42	397	98427539
PLS.48.98.D.A.SS.SEG	48	98	2	A	SS	SEGA15	1.5"	19.42	463	98427540
PLS.48.118.D.A.SS.SEG	48	118	2	A	SS	SEGA15	1.5"	19.42	529	98427541
PLS.48.60.D.A.SS.SEG	48	60	2	A	SS	SEGA15	2"	19.42	485	98427542
PLS.48.78.D.A.SS.SEG	48	78	2	A	SS	SEGA15	2"	19.42	489	98427543
PLS.48.98.D.A.SS.SEG	48	98	2	A	SS	SEGA15	2"	19.42	370	98427545
PLS.48.118.D.A.SS.SEG	48	118	2	A	SS	SEGA15	2"	19.42	569	98427546
PLS.48.60.D.A.SS.SEG	48	60	2	A	SS	SEGA20	2"	19.42	205	98427555
PLS.48.78.D.A.SS.SEG	48	78	2	A	SS	SEGA20	2"	19.42	249	98427556
PLS.48.98.D.A.SS.SEG	48	98	2	A	SS	SEGA20	2"	19.42	295	98427557
PLS.48.118.D.A.SS.SEG	48	118	2	A	SS	SEGA20	2"	19.42	373	98427558

1 A: Auto coupling
 2 SS: Stainless steel
 PE: Polyethylene (contact Grundfos)

Product range, PLS.67

PLS.67 pipe design	Stainless steel, AISI 304			Polyethylene, PE		
	2.5"	3"	4"	2.5"	3"	4"
GC: Goose neck, common	•	•	•	•	•	•
DC: Direct outlet, common	•	•	•	•	•	•
DS: Direct outlet, separate						
NV: No valves						

6. Construction

Construction

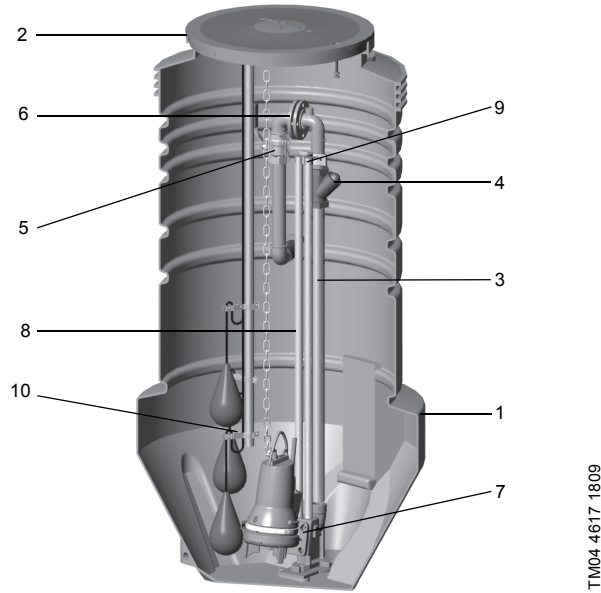


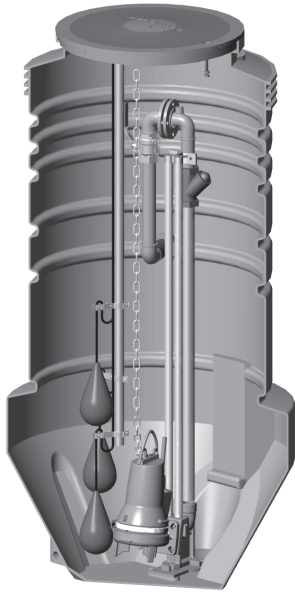
Fig. 3 Grundfos small lift station

Material specification

Pos.	Component	Material description	AISI/ASTM	DIN W.-Nr./EN standard	PLS.32 - PLS.48	PLS.67
1	Tank	PE HD	-	-	•	•
2	Cover	PE HD	-	-	•	-
		GRP	-	-	-	•
3	Piping	Aluminium	-	-	-	•
		Stainless steel	304	1.4301	•	•
4	Non-return ball valve	PE	-	-	•	•
		NBR rubber and stainless steel	304	1.4301	•	-
		Stainless steel	316	1.4401	•	•
5	Ball valve	Cast iron	-	GJS-400-15 (GGG-40)	-	•
		PP	-	-	•	•
6	Pipe coupling	Stainless steel	304	1.4301	•	•
		Cast iron	-	GJS-500-7 (GGG-50)	-	•
		PP, quick coupling	-	-	•	•
7	Auto coupling	Stainless steel, quick coupling	304	1.4301	•	-
		PE, flanged	-	-	-	•
		Stainless steel, flanged	304	1.4301	•	•
8	Guide rails	Cast iron	class 40B	EN-GJL-250	•	•
		Stainless steel	304	1.4301	•	-
9	Guide rail brackets	Stainless steel	304	1.4301	•	•
10	Holders for level sensors	Stainless steel	304	1.4301	•	•
		Screws	Stainless steel	304	1.4301	•

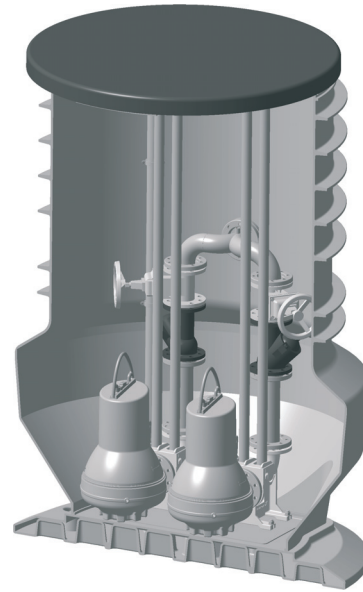
PE HD: Polyethylene, high density
 PP: Polypropylene
 GRP: Glass-reinforced plastic

Type of lift station



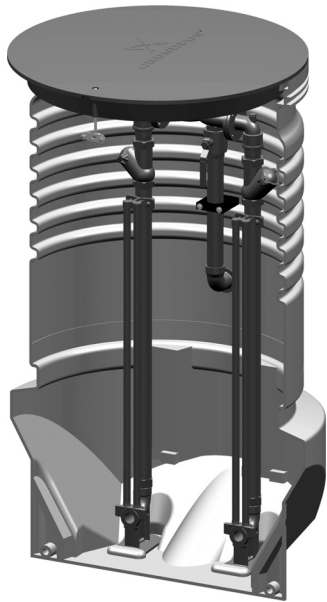
TM04 4617 1809

Lift station type PLS.32 and PLS 40 with one SEG pump on auto-coupling, goose neck outlet.



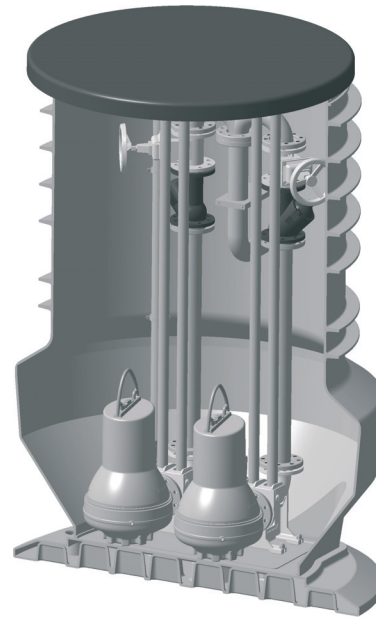
TM05 8451 2313

Lift station type PLS.67 with two SL solids handling pumps on auto-coupling, direct outlet



TM05 3707 1612

Lift station type PLS 48 for two SEG pumps on auto-coupling, goose neck outlet.



TM05 8452 2313

Lift station type PLS.67 with two SL solids handling pumps on auto-coupling, goose neck outlet

Grundfos packaged lift stations

Cover, PLS.32 - PLS.48

The cover is locked by means of a special bolt made of stainless steel A2. It can thus only be removed by persons with legitimate access to the tank.



Fig. 4 Cover

TM02 9499 0805

Cover, PLS.67

The cover is locked by means of a special bolt prepared for a padlock.



Fig. 6 Cover

TM05 3321 1112



Fig. 5 Locked cover

TM02 9498 0805

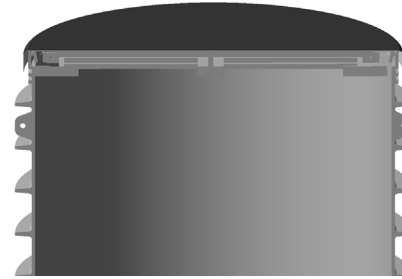


Fig. 7 Locked cover

TM05 3320 1112

7. Accessories

Level controllers

Grundfos offers a wide range of pump controllers to keep a watchful eye on liquid levels in the wastewater collecting tank, ensuring correct operation and protection of the pumps.

Controller ranges:

Dedicated Controls, DC control cabinets.

SLC and DLC level controllers.

CUG 100 control box.

The DC controller is designed for both one- and two-pump installations. The SLC and CUG 100 are designed for one-pump installations, and the DLC is for two-pump installations.

SLC

The SLC enables:

- control of **one** pump based on signals from float switches
- battery backup in case of mains supply failure (accessory)
- selection of automatic restarting
- selection of automatic/manual/off setting
- alarm indication of:
 - high water level
 - overload (via motor protection relay).

As standard, the SLC has an audio/visual high water-level alarm with auto reset.

- audio alarm, 120 VAC, with automatic reset
- visual alarm, with push to silence
- NEMA 4X enclosure.



Fig. 8 SLC controller

DLC

The DLC enables:

- control of **two** pumps based on signals from float switches
- automatic pump changeover (even distribution of operating hours on both pumps)
- battery backup in case of mains supply failure (accessory)

- selection of automatic restarting
- selection of automatic/manual/off setting
- alarm indication of:
 - high water level
 - overload (via motor protection relay).

As standard, the DLC has an audio/visual high water-level alarm with auto reset:

- audio alarm, 120 VAC, with automatic reset
- visual alarm, with push to silence
- NEMA 4X enclosure.



Fig. 9 DLC controller

Float switches

The Grundfos float switches are of the non-mercury type and are available for standard and explosion-proof pumps. The hermetically sealed polypropylene housing and polyurethane cable make the float switch resistant to, e.g., many chemicals, alcohol, uric acid, sewage, oils, petrol and fruit acid.

Location and position of float switches

The float switches are to be installed in the collecting tank floating on the pumped liquid.

The position of the float switches decides when the SLC or DLC will start and stop the pump:

- When the float switch is pointing upwards, the float switch contact will be closed and the pump will start.
- When the float switch is pointing downwards, the float switch contact will be opened and the pump will stop.

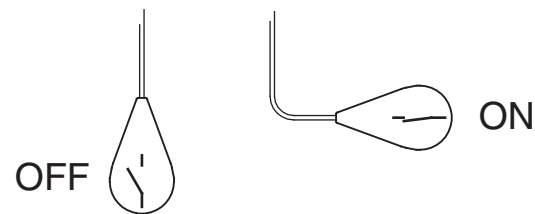


Fig. 10 Float switch positions

Dedicated Controls



Fig. 11 Dedicated Controls control unit.

Grundfos Dedicated Controls is a control system that can control and monitor one to six Grundfos wastewater pumps and a mixer.

Dedicated Controls are used in installations requiring advanced control and data communication.

The main components of the Dedicated Controls system are:

- CU 362 control unit
- IO 351B module (general I/O module).

Dedicated Controls is available as separate components.

The control system can be operated by

- float switches
- a level sensor (pressure transmitter)
- a level sensor and safety float switches.

The separate control unit and modules can be built for practically any size of system.

CU 362 control panel

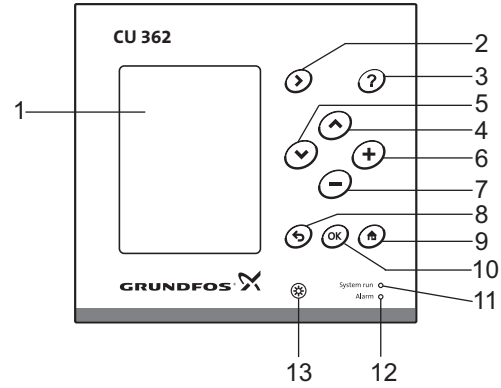


Fig. 12 CU 362 control panel

Pos.	Description
1	Display
2	Right
3	Help
4	Up
5	Down
6	Plus
7	Minus
8	Back
9	Home
10	OK (accept)
11	Indicator light, operation (green)
12	Indicator light, fault (red)
13	Contrast

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Status menu

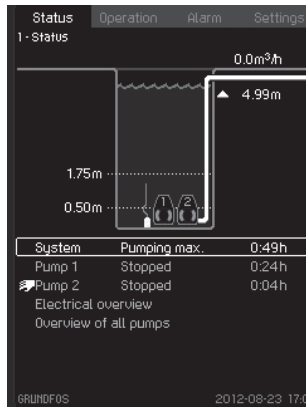


Fig. 13 Status menu

Description

- Graphical illustration of system (upper half of display).
- Clear text parameters.
- Indication of alarms that occur during operation (top and middle of display).
- Reading of system and individual pump performance (lower half of display).
- Button (?) for further information.
- Active buttons are illuminated.

Operation menu

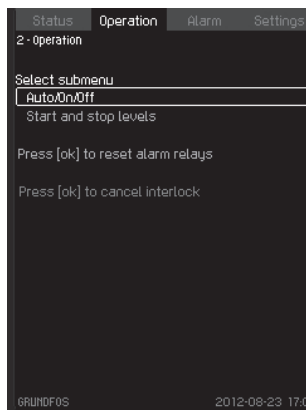


Fig. 14 Operation menu

Description

- Setting of basic parameters, for instance start/stop levels,
- Setting of auto/on/off of system or individual pumps.
- Resetting of alarm relays.
- Button (?) for further information.
- Active buttons are illuminated.

Alarm menu

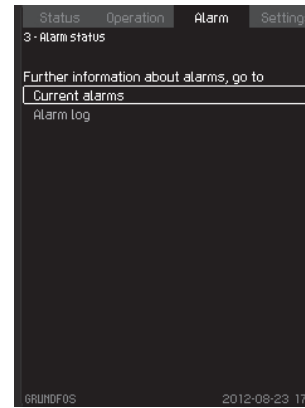


Fig. 15 Alarm menu

Description

- Current alarm and alarm log with detailed information:
 - What the cause of the fault is
 - Where the fault occurred (system, pump no. 1 etc.)
 - When the fault occurred (time and date)
 - When the fault disappeared (time and date).
- Alarm snapshot – reading of system and pump parameters at the time of alarm.
- Alarm log with up to 24 historical warnings and alarms.
- Button (?) for further information.
- Active buttons are illuminated.

Settings menu

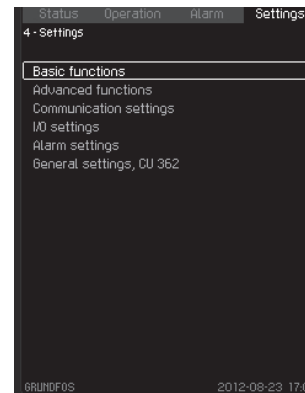


Fig. 16 Settings menu

Description

- Various settings:
 - Setting of analog/digital inputs and outputs.
 - Setting of application-optimized functions such as energy optimization, foam drainage and advanced alternation.
 - Display language.
 - Communication settings.
 - Ethernet etc.
- Button (?) for further information.
- Active buttons are illuminated.

Grundfos packaged lift stations

The Dedicated Controls can be fitted with various units:

- The CU 362 control unit, which is the 'brain' of the Dedicated Controls system, is fitted in the cabinet front. The CU 362 can be fitted with one of the Grundfos CIM communication modules mentioned below, depending on the monitoring needs or the SCADA system:
 - The CIM 200 is a Grundfos communication module used for the Modbus RTU fieldbus protocol.
 - The CIM 250 is a communication module used for GSM/GPRS communication. The CIM 250 establishes communication between the CU 362 and a SCADA system, thereby allowing the application to be monitored and controlled remotely. This module also offers SMS messaging, for example status and alarm messages.
 - The CIM 270 is a communication module for the Grundfos Remote Management system (GRM). The CIM 270 establishes communication between the CU 362 and the GRM, thereby allowing the application to be monitored and controlled remotely.
- The IO 351B module, which is a general I/O module. The IO 351B communicates with the CU 362 via GENIbus.
- The MP 204 motor protector (optional), which provides many electrical status values, for example voltage, current, power, insulation resistance and energy. The MP 204 offers better protection of the pumps than a conventional motor protection device.
- The CUE/VFD (optional), which is either a Grundfos variable-frequency converter or a general variable-frequency converter, also offers better pump protection and a more steady flow through the pit pipes, so the pumps are treated well and the energy consumption is kept at a minimum.

For further information, see the data booklet or installation and operating instructions for Dedicated Controls on www.grundfos.us (WebCAPS).





Name	Dedicated Controls
Application	
One pump	•
Two pumps (up to six pumps)	•
Mixer	•
Battery backup	•
Level sensor	
Float switch	•
Electrodes	
Air bell	
Pressure sensor	•
Ultrasonic sensor	•
Analog level sensor with safety float switches	•
Starting method	
Direct-on-line starting (DOL)	•
Star-delta starting	•
Soft starter	•
Basic functions	
Start and stop of pump(s)	•
Pump alternation	•
High-level alarm	•
Dry-running-level alarm	•
Flow measurement (calculated or via flow sensor)	•
Pump statistics	•
Conflicting-levels alarm	•
Advanced functions	
Start and stop delays (prevent water hammering)	•
Motor temperature sensor	•
Test run/anti-seizing	•
Daily emptying (emptying the pit once a day)	•
Water-in-oil sensor input	•
Communication	
SMS messaging	• ¹⁾
SCADA communication (GSM/GPRS)	• ²⁾
User interface	
Level indication	•
Graphical display	•
PC Tool WW Controls	•

¹⁾ If an SMS module is fitted.

²⁾ If a CIM 250 GSM/GPRS module is fitted in the CU 362.


Level control system

SLC and DLC





Picture	Description	Dimensions			Product number	
		Motor shaft power	Overload range [A]	Min amp. required to disconnect [A]		
	Simplex Level Controller SLC panel, 208/230 VAC, 1-phase	2.0 hp				
		1.5 hp	2.0-6.3	15	98376348	
		1.8 hp				
	2.0 hp	5.7-18.9	15	98411557		
	3.0 hp					
	2.0 hp					
	Simplex Level Controller SLC panel, 208/230 VAC, 3-phase	3.0 hp	9.0-30	30	98376349	
		4.0 hp				
		5.5 hp				
		7.5 hp	15-45	40	98376350	
		8.0 hp				
		10.0 hp				
	12.5 hp	15-45	60	98376371		
	15.0 hp					
		Simplex Level Controller SLC panel, 460 VAC, 3-phase	1.5 hp	2.0-6.3	15	98376372
1.8 hp						
2.0 hp						
3.0 hp		5.7-18.9	20	98376373		
4.0 hp						
5.5 hp						
7.5 hp		5.7- 8.9	25	98376374		
8.0 hp						
10.0 hp						
12.5 hp						
15.0 hp						
		Duplex Level Controller SLC panel, 208/230 VAC, 1-phase	2.0 hp			
			1.5 hp	2.0-6.3	20	98376375
			1.8 hp			
		2.0 hp	5.7-18.9	20	98411558	
	3.0 hp					
	2.0 hp					
	Duplex Level Controller SLC panel, 208/230 VAC, 3-phase	3.0 hp	9.0-30	50	98376376	
		4.0 hp				
		5.5 hp				
		7.5 hp	15-45	75	98376377	
		8.0 hp				
		10.0 hp				
	12.5 hp	15-45	120	98376378		
	15.0 hp					
		Duplex Level Controller SLC panel, 460 VAC, 3-phase	1.5 hp	2.0-6.3	20	98376379
1.8 hp						
2.0 hp						
3.0 hp		5.7- 8.9	40	98376380		
4.0 hp						
5.5 hp						
7.5 hp		5.7- 8.9	50	98376381		
8.0 hp						
10.0 hp						
12.5 hp						
15.0 hp						

Grundfos packaged lift stations

Float switches

Type	Pipe diameter [mm]	Description	Product number
	TM05 6793 5112	Grundfos float switch MS1 UL with 33 ft cable	98365984
		Grundfos float switch MS1 UL with 40 ft cable	98365985
		Grundfos float switch MS1 UL with 60 ft cable	98365986
		Cable support in stainless steel	98365987
		Grundfos float switch MS1 Ex IECex with 33 ft cable	98372085
		Grundfos float switch MS1 Ex IECex with 40 ft cable	98372086
		Grundfos float switch MS1 Ex IECex with 60 ft cable	98372087
		Cable support in stainless steel	98365987

Accessories

Type	Pipe diameter [mm]	Description	Product number
	1.5" (40mm)	Sleeve	96230763
	2" (50)	Sleeve	96230753
	2.5" (63)	Sleeve	96571523
	3" (75)	Sleeve	96571527
	3.5" (90)	Sleeve	96571528
	4" (110)	Sleeve (in-situ)	91716040
	5" (160)	Sleeve (in-situ)	91713754
	8" (200)	Sleeve (in-situ)	91712032
		Center drill	91712026
	1.5" (40mm)	Hole saw, 2" (51 mm)	96571532
	2" (50mm)	Hole saw, 2.4" (60 mm)	96571533
	2.5" (63mm)	Hole saw, 3" (75 mm)	96571534
	3" (75mm)	Hole saw, 3.5" (86 mm)	96571535
	3.5" (90mm)	Hole saw, 4" (102 mm)	96571536
	4" (110mm)	Hole saw, 5" (127 mm)	91713756
5" (160mm)	Hole saw, 7" (177 mm)	91713755	
	Single-pump installation	For frost protection, the insulation jacket is fitted directly over pipes and valves. Up to 2.5"	96571529
	Double-pump installation	For frost protection, the insulation jacket is fitted directly over pipes and valves. Up to 2.5"	96653751
		Ventilation kit 2" (50 mm)	96571531
		Ventilation kit 3.5" (90 mm)	98171612

8. Installation

Installation

Local regulations and legal requirements must always be met. For further information, see the installation and operating instructions of the pumping station.

Installation of pump

The lift stations come without pumps installed, but prepared for easy installation of pumps. For installation and start-up, see the installation and operating instructions of the pump.

Note: The pump must be lowered carefully into the tank in order to avoid damage to pump and tank.

Pipe work with flange connections

If a tank is to be installed at temperatures below 32 °F (0 °C), it is advisable to loosen all bolts of the flange and retighten them when the tank has been installed. In this way, stress in the pipes is prevented.

Fitting the chain

In the case of pumps on auto coupling, it is advisable to fit the chain in the foremost lifting eye of the lifting bracket. When lifting the pump make sure to use a lifting device that is approved for the weight of the pump. Make sure to keep body parts away from a lifted pump.

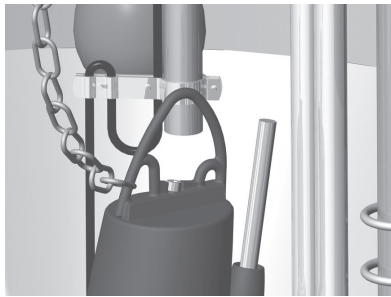


Fig. 17 Chain fitted to pump

TM04 4593 1709

Installation of level controller

See the installation and operating instructions of the controller.

Location of inlet

When locating the tank inlet, take the following aspects into consideration:

- The inlet must be located higher than the highest "start level" of the pump, in order to prevent back flow.
- The tank inlet must not be located within the area shown in fig. 18, as it will disturb the function of the float switches.

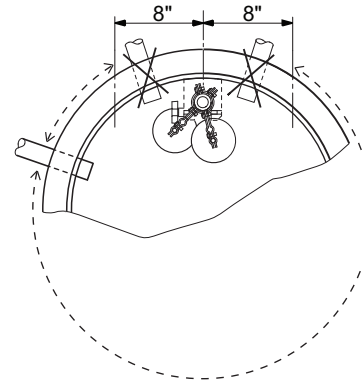


Fig. 18 Location of inlet, PLS.32 - PLS.48

TM05 8342 2313

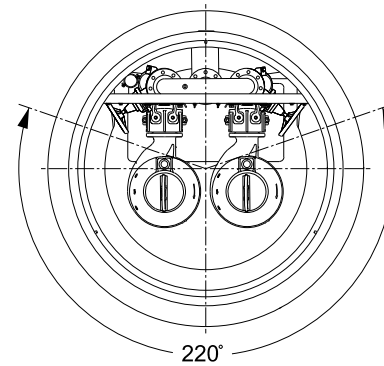


Fig. 19 Location of inlet, PLS.67

TM05 3261 1012

Start-up

See the installation and operating instructions of the pump and the controller, respectively.

Note: The controller must not be installed in the tank.

Maintenance

See the installation and operating instructions of the pump and the controller, respectively.

It is important that the tank cover is properly secured so that unauthorized persons cannot remove it.

9. Approvals

Approvals

The standard versions of SEG 60 Hz pumps have been approved by CSA, and the explosion-proof version hold an FM type examination certificate no.: 3035318.

Approval standards

These pumps are CSA approved according to UL778 and C22.2 no 108 and FM approved according to FM 3600, FM 3615 and FM 3615.80.

Explanation to FM approval

The SEG 60 Hz pumps have the following explosion protection classification: Class I, Division 1, Groups C and D, T4, T3, IP68.

Standards	Code	Description
FM3600 FM3615 FM3615.80	Class I	= Explosive atmosphere is caused by gas or vapours.
	Division 1	= Area classification
	Groups C and D	= Classification of gases
	T4/T3	= maximum surface temperature is 275 °F (135 °C) and 392 °F (200 °C)
	IP68	= Enclosure class according to IEC 60529.

10. Tank volume and starting frequency

In a pumping station, the water volume comprises the volume below the lowest pump stop level and the pumpable volume above this level, fluctuating with pump operation and incoming flow rate. The starting frequency of the pumps depends on the pumpable volume and the incoming flow rate.

The starting frequency Z is a function of the ratio between Q_{in}/Q and V_h , where

Q_{in} = incoming flow rate [gpm]

Q = pump capacity [gpm]

V_h = accumulated (pump able) volume between start and stop [ft^3].

Note that when the maximum inflow is equal to the pump capacity, the pump will be running continuously. When the actual pump capacity, for single-pump operation, is equal to the maximum peak inflow, Z_{max} will always appear when the inflow is half the pump capacity.

$$Z_{max} = \frac{Q \times 8.021}{4 \times V_h}$$

Z_{max} = maximum number of starts per hour.

By isolating V_h we get:

$$V_h = \frac{Q \times 8.021}{4 \times Z_{max}}$$

V_h = necessary minimum accumulated volume between start and stop.

In installations where the expected maximum incoming flow Q_{in} is less than 60 % of the pump capacity, the accumulated sump volume must be chosen in such a way that there will be at least two pump starts a day in order to prevent sedimentation in the sump.

The following drawings show values of empty tanks without pump, pipes, etc.

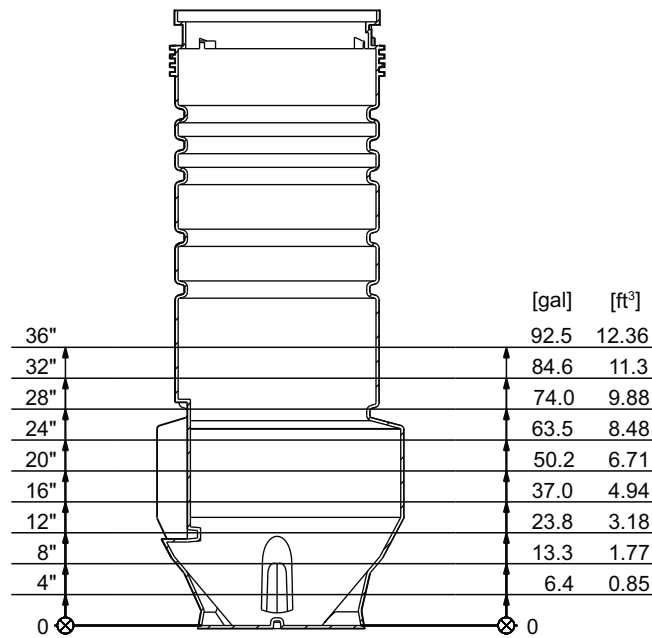


Fig. 20 Effective volume in relation to liquid level, PLS.32

TM05 8635 2213

Grundfos packaged lift stations

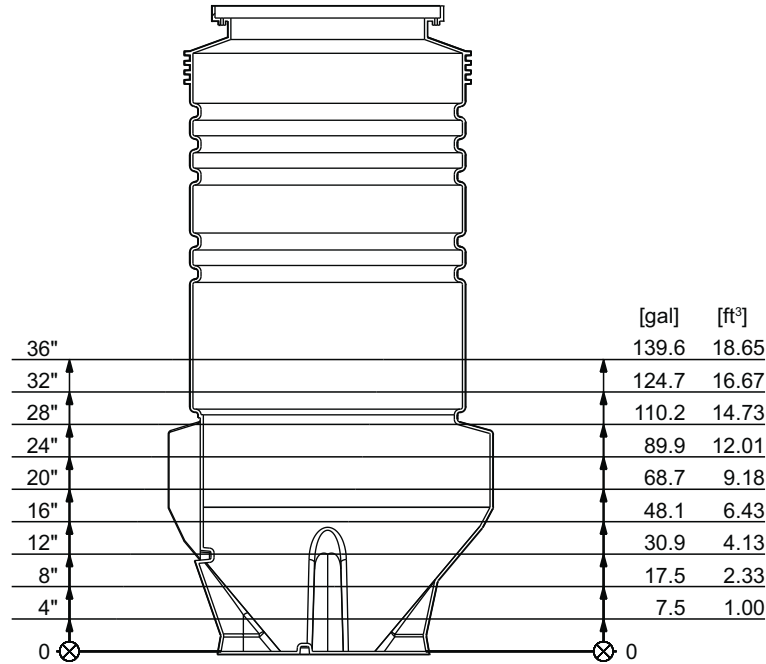


Fig. 21 Effective volume in relation to liquid level, PLS.40

TM05 8836 2213

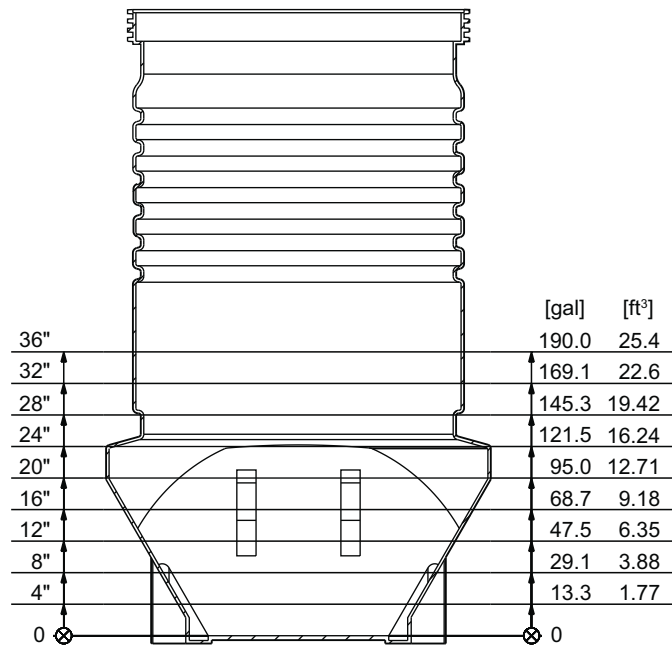


Fig. 22 Effective volume in relation to liquid level, PLS.48 (two pumps)

TM05 8837 2213

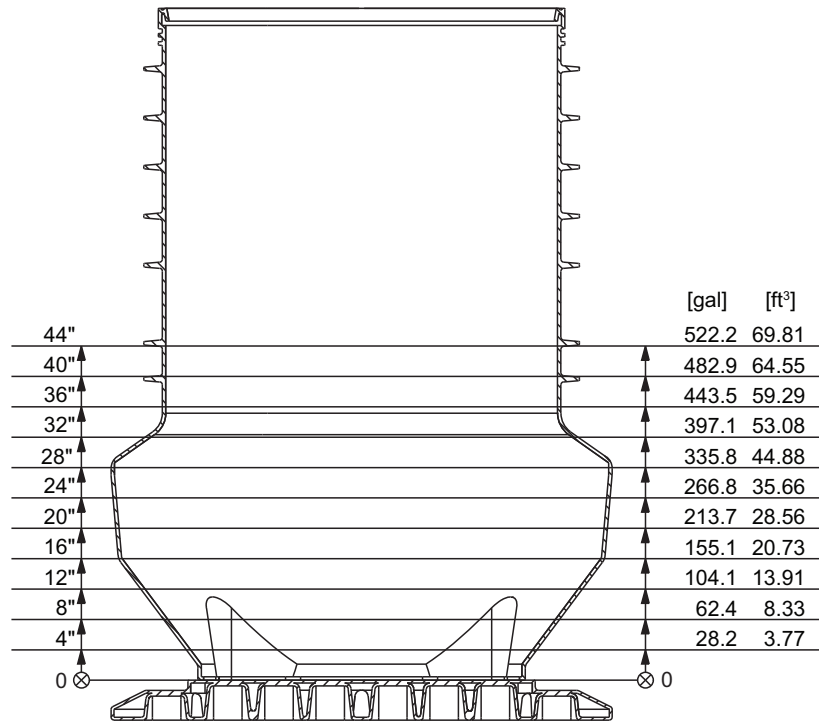
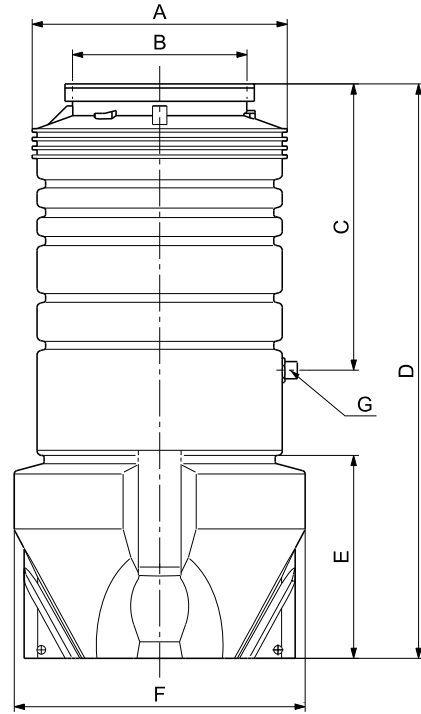


Fig. 23 Effective volume in relation to liquid level, PLS.67

TM05 8838 2213

Dimensions



TMO2 9586 4908

Fig. 24 Dimensional sketch

Lift station	A [Inch (mm)]	B [Inch (mm)]	C [Inch (mm)]
PLS.32	27.32 (694)	23.23 (590)	39.37 (1000)
PLS.40	35.20 (894)	23.23 (590)	39.37 (1000)
PLS.48	43.07 (1094)	38.58 (980)	39.37 (1000)
PLS.67	56.30 (1430)	53.35 (1355)	31.50 (800) 39.37 (1000) 47.24 (1200)

Lift station	D [Inch (mm)]	E [Inch (mm)]	F [Inch (mm)]	G [Inch (mm)]
PLS.32	60 (1500)* 78 (2000) 98 (2500) 118 (3000)	27.17 (690)	32.28 (820)	1.5"- 2" (DN40 - DN50)
PLS.40	60 (1500)* 78 (2000) 98 (2500) 118 (3000)	27.17 (690)	40.16 (1020)	1.5"- 2" (DN40 - DN50)
PLS.48	60 (1500)* 78 (2000) 98 (2500) 118 (3000)	27.17 (690)	48.03 (1220)	1.5" - 2" (DN40- DN50)
PLS.67	78 - 236 (2000-6000)	42.32 (1075)	69.29 (1760)	2.5", 3", 4" (DN65 - DN100)

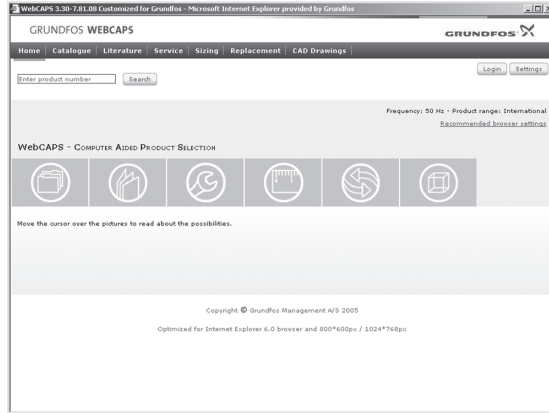
Tolerances for PE material are ± 3 %.

* For 60" tanks, dimension E can vary from 29" to 39".

Weight, see section *Product range, PLS.32 - PLS.48.*

11. Further product information

WebCAPS

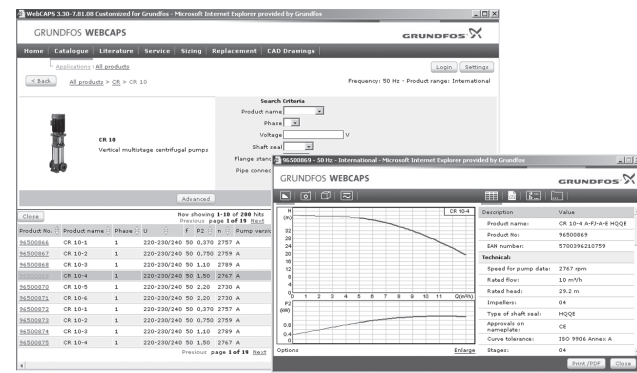


WebCAPS is a **Web-based Computer Aided Product Selection** program available on www.grundfos.us.

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

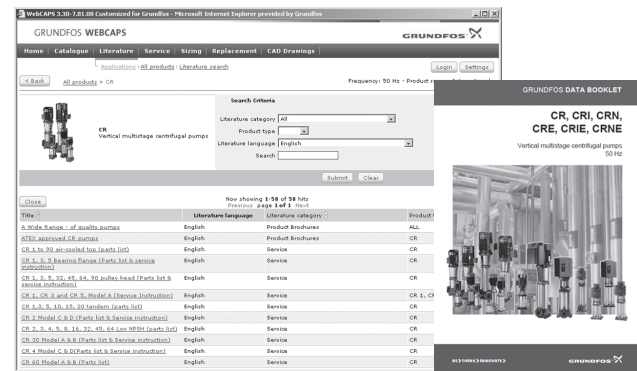
- catalog
- literature
- service
- sizing
- replacement
- cad drawings.



Catalog

Based on fields of application and pump types, this section contains the following:

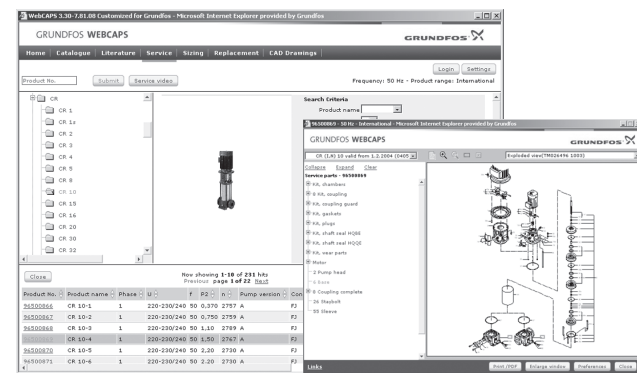
- technical data
- curves (QH, Eff, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

This section contains all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as service kit catalog and service kit instructions
- quick guides
- product brochures.



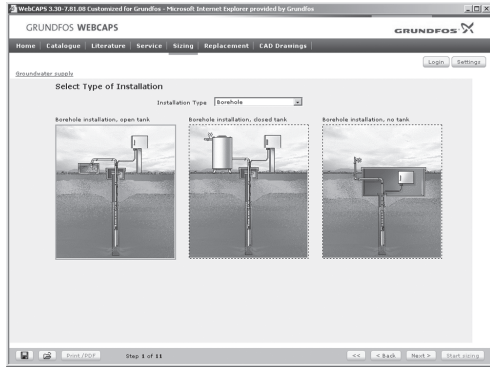
Service

This section contains an easy-to-use interactive service catalog. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.

Furthermore, the section contains service videos showing you how to replace service parts.

Grundfos packaged lift stations

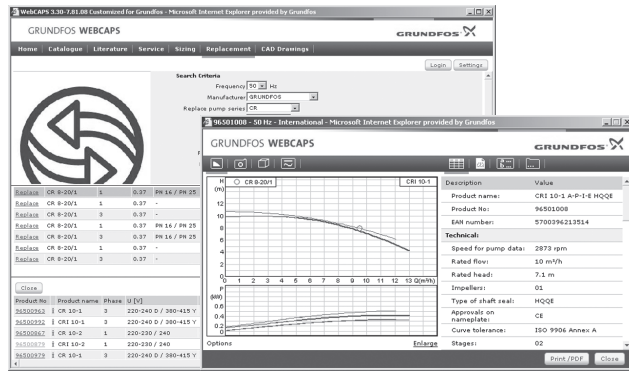
Further product information



Sizing

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

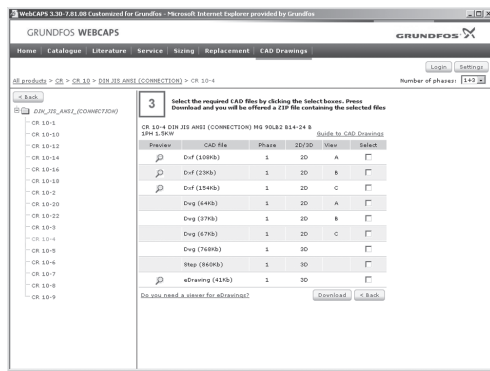
- Select the most suitable and efficient pump for your installation.
- Carry out advanced calculations based on energy, consumption, payback periods, load profiles, life cycle costs, etc.
- Analyze your selected pump via the built-in life cycle cost tool.
- Determine the flow velocity in wastewater applications, etc.



Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump. The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



CAD drawings

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

- 2-dimensional drawings:
- .dxf, wireframe drawings
 - .dwg, wireframe drawings.
- 3-dimensional drawings:
- .dwg, wireframe drawings (without surfaces)
 - .stp, solid drawings (with surfaces)
 - .eprt, E-drawings.

WinCAPS



Fig. 25 WinCAPS DVD

WinCAPS is a Windows-based Computer Aided Product Selection program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on DVD and updated once a year.

GO CAPS

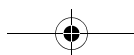
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GRUNDFOS 

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