Hydro Solo-S

Complete pressure boosting system
50 Hz



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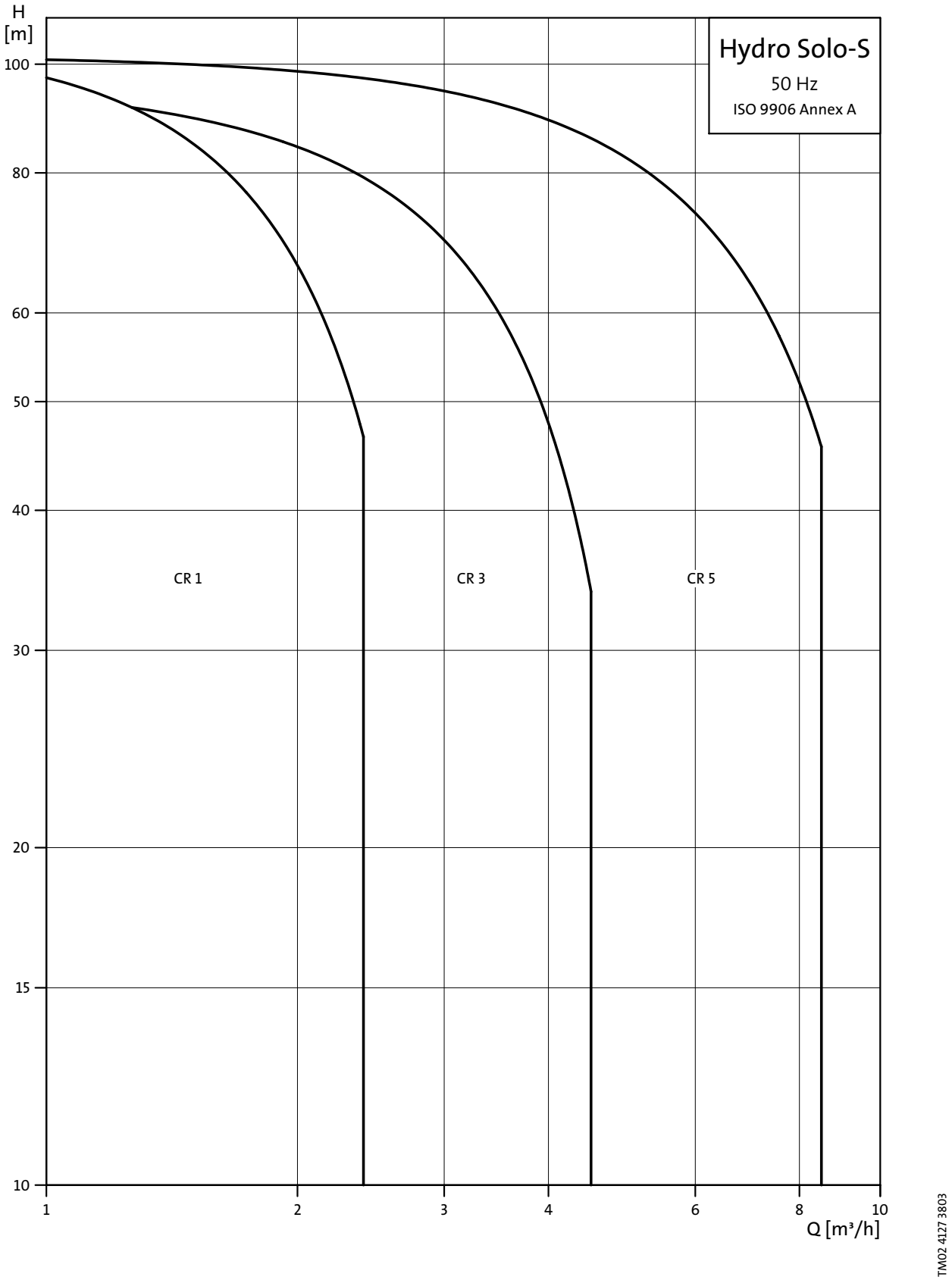
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Performance range



Hydro Solo-S

Grundfos Hydro Solo-S booster sets are designed for the transfer and pressure boosting of clean water in single-family houses, cottages, farms or as pressure boosting in other systems e.g. process water systems and irrigation.

Hydro Solo-S is compact, maintenance-free and easy to install. The booster set is ready for operation when the piping system and the electricity supply have been connected.

Grundfos Hydro Solo-S booster set with one pump is a combined unit consisting of one pump (CR) fitted with isolating valve, discharge pipe, pressure switch, pressure gauge and diaphragm tank.

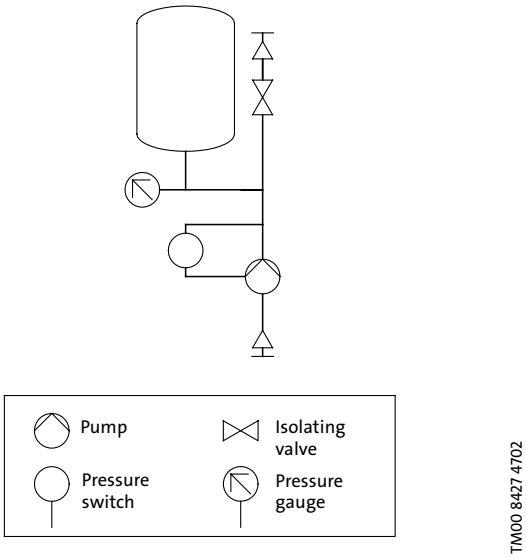


Fig. 1 Principal sketch of Hydro Solo-S

Operating conditions

Capacity:	0.7 - 8.5 m^3/h
Liquid temperature:	0 °C to +70 °C
Ambient temperature:	0 °C to +40 °C
System pressure:	The maximum system pressure is 10 bar.

The total of inlet pressure and head must not exceed the maximum system pressure.

Inlet pressure

Minimum inlet pressure - NPSH:

Calculation of the inlet pressure "H" is recommended when ....

- the liquid temperature is high
- the flow is significantly higher than the rated flow
- water is drawn from depths
- water is drawn through long pipes
- inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift "H" in metres head can be calculated as follows:

$H = p_b \times 10.2 - NPSH - H_f - H_v - H_s$

p_b = Barometric pressure in bar.
Barometric pressure can be set to 1, if required.

NPSH = **N**et **P**ositive **S**uction **H**ead in metres head.
NPSH can be read from the NPSH curve at the maximum capacity at which the pump will run.

H_f = Friction loss in suction pipe in metres head.

H_v = Vapour pressure in metres head.

H_s = Safety margin of min. 0.5 metres head.

Maximum inlet pressure

Pump type	Phases		Max. inlet pressure
	1~	3~	
CR 1-4	●	●	7 [bar]
CR 1-7	●	●	7 [bar]
CR 1-10	●	●	7 [bar]
CR 1-13	-	●	10 [bar]
CR 1-17	-	●	10 [bar]
CR 3-4	●	●	7 [bar]
CR 3-7	●	●	7 [bar]
CR 3-10	●	●	7 [bar]
CR 3-12	-	●	10 [bar]
CR 3-15	-	●	10 [bar]
CR 5-3	-	●	7 [bar]
CR 5-4	●	-	7 [bar]
CR 5-5	-	●	7 [bar]
CR 5-8	-	●	7 [bar]
CR 5-10	-	●	10 [bar]
CR 5-15	-	●	10 [bar]

Example of operating and inlet pressures

The values for operating and inlet pressures must not be considered individually but must always be compared, see the following example:

Example:

The following pump type has been selected:
CR 5-3 A-A-A

Max. operating pressure: **10 bar**
Max. inlet pressure: **7 bar**
Discharge pressure against a closed valve: **1.4 bar**.

The system is allowed to start at an inlet pressure of 7 bar as the discharge pressure is only 1.4 bar which results in an operating pressure of 7 + 1.4 = **8.4 bar**.

Type key

Single-phase:

Example	Hydro	Solo-S	CR 5-4	1 x 200 - 240 V, 50 Hz
Type range				
Subgroup				
Pump type				
Supply voltage, frequency				

Three-phase:

Example	Hydro	Solo-S	CR 3-12	3 x 380 - 415 V, 50 Hz
Type range				
Subgroup				
Pump type				
Supply voltage, frequency				

Product range

Pump type	Motor [kW]	Pressure switch [bar]	Product numbers	
			1 x 200 - 240 V 50 Hz, PE	3 x 380 - 415 V 50 Hz, N, PE
CR 1-4	0.37	0 - 6	96471823	96471831
CR 1-7	0.37	0 - 6	96471824	96471832
CR 1-10	0.55	0 - 6	96471825	96471833
CR 1-13	0.75	0 - 10	-	96471834
CR 1-17	1.1	0 - 10	-	96471835
CR 3-4	0.37	0 - 6	96471826	96471836
CR 3-7	0.55	0 - 6	96471827	96471837
CR 3-10	0.75	0 - 6	96471828	96471838
CR 3-12	1.1	0 - 10	-	96471839
CR 3-15	1.1	0 - 10	-	96471840
CR 5-3	0.55	0 - 6	-	96471841
CR 5-4	0.55	0 - 6	96471829	-
CR 5-5	0.75	0 - 6	-	96471842
CR 5-8	1.1	0 - 6	-	96471843
CR 5-10	1.5	0 - 10	-	96471844
CR 5-15	2.2	0 - 10	-	96471845

Construction

Pos.	Designation	Qty.
1	CR pump	1
2	Diaphragm tank	1
3	Pressure switch	1
4	Pressure gauge	1
5	Discharge pipe (brass)	1
6	Isolating valve	1

On the discharge side of the pump is fitted a discharge pipe made of brass.

On the discharge pipe are fitted a pressure switch.

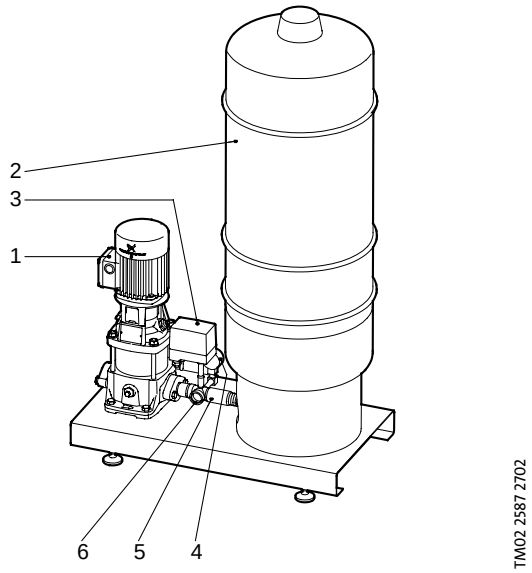


Fig. 2 Construction of Hydro Solo-S

Installation

A Hydro Solo-S booster set **must** be installed in a well ventilated room to ensure sufficient cooling for the pump. Hydro Solo-S is **not** suitable for outdoor installation.

The booster set should be placed with sufficient clearance around it.

Mechanical installation

The pipes connected to the booster set must be of adequate size. To avoid resonance, expansion joints should be fitted both in the discharge and suction pipes.

The pipes are to be connected to the discharge pipe and the pump suction port.

The booster set should be tightened up prior to start-up.

It is always advisable to fit pipe hangers both on the suction and discharge side.

The system should be positioned on an even and solid surface, e.g. a concrete floor or foundation.

Curve conditions

The following curves are subject to the following guidelines:

Performance measurement is made at a water temperature of +20°C. Test liquid: Pure water.

The curves describe the pump mean values.

The curves should not be used as guarantee curves.

Curve tolerance: ISO 9906, Annex A.

The conversion between head H(m) and pressure p (kPa) has been made for water with a density of ρ = 1000 kg/m^3.

The curves apply to a kinematic viscosity of 1 mm^2/s (1 cSt).

Motor

The motor is a totally enclosed, fan-cooled, 2-pole Grundfos standard motor with principal dimensions in accordance with the EN standards.

Electrical tolerances according to EN 60034.

Electrical data

Mounting designation	Up to 4 kW: V 18
Insulation class	F
Efficiency class	Eff.2 Eff.1 – on request
Enclosure class	IP 55 IP 44 and IP 54 – on request
50 Hz Standard voltages	3 x 200-220/346-380V, –10%/+10% 3 x 220-240/380-415V 3 x 380-415Δ V 1 x 220-230/240 V

Motor protection

Single-phase motors have a built-in thermal overload switch.

Three-phase motors must be connected to a motor starter in accordance with local regulations.

To protect the motor against overload, it **must** be connected to an external thermal-magnetic motor circuit breaker GV2-ME.

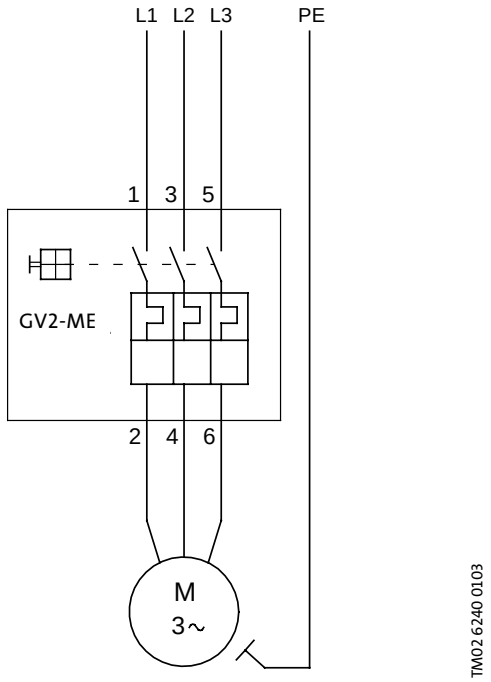
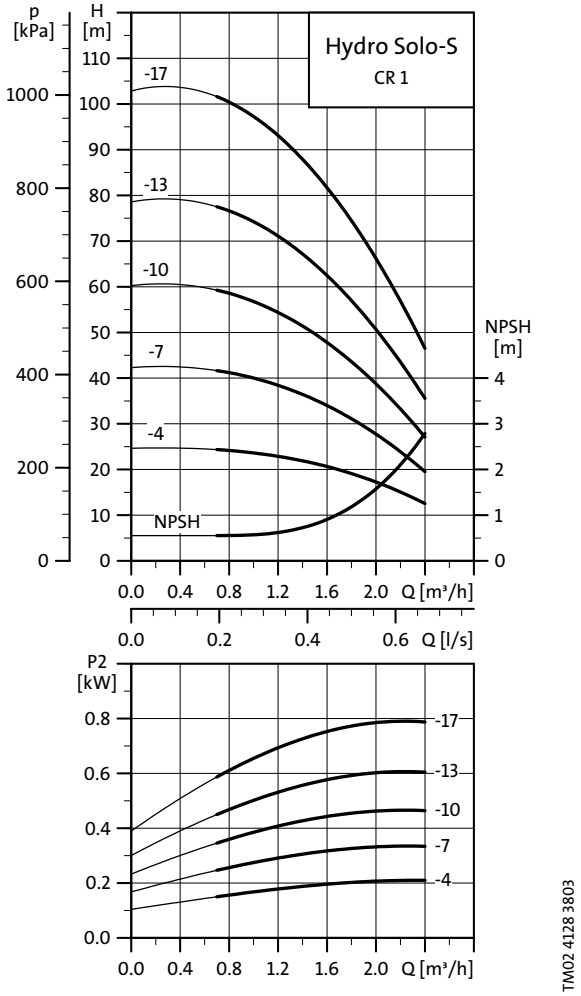
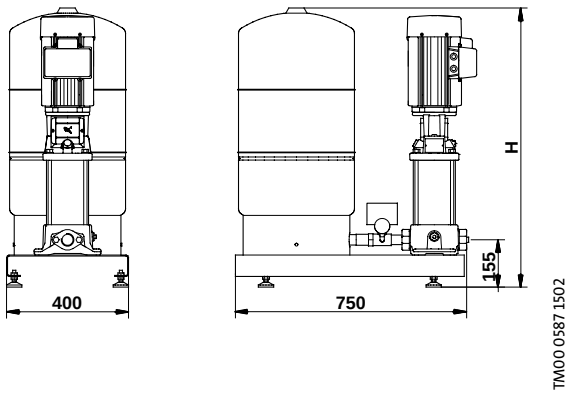


Fig. 3 Motor protection

Description	Mounting	Product number
Motor: 0.37 - 0.55 kW	On the pump	96 49 11 18
Motor: 0.75 kW	On the pump	96 49 11 19
Motor: 1.1 - 1.5 kW	On the pump	96 48 27 17
Motor: 2.2 kW	On the pump	96 48 49 69

Technical data

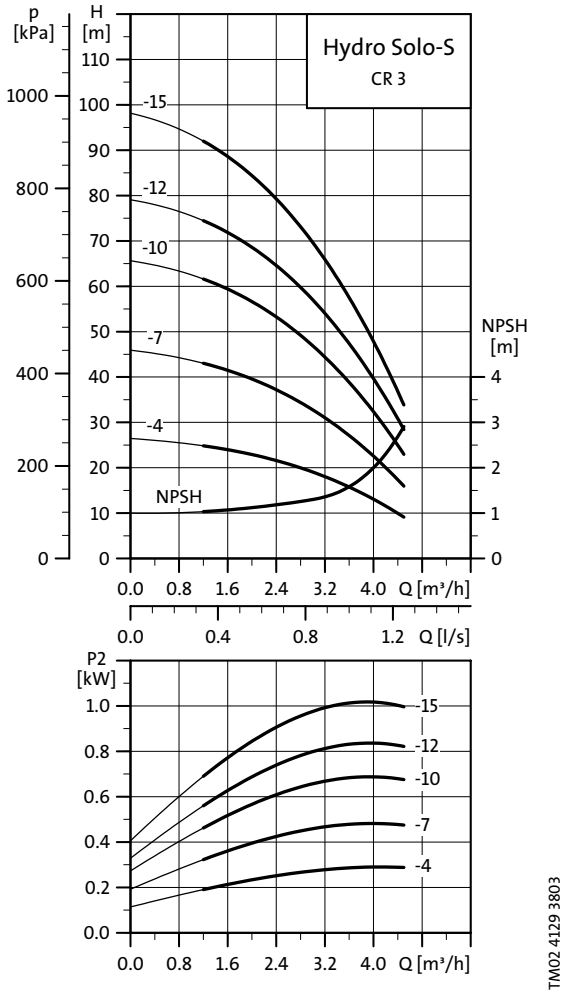


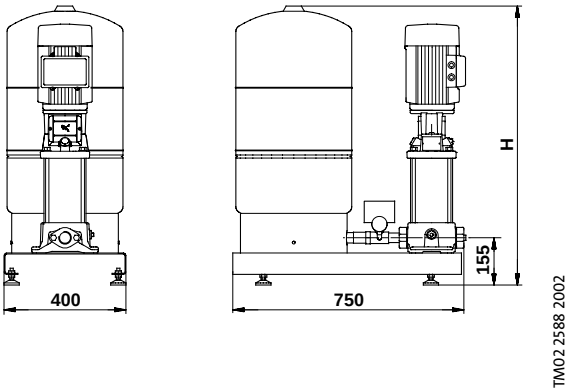


Electrical data, dimensions and weights

Pump type	Motor [kW]	Full load current 1/1 [A]		Supply voltage		Diaphragm tank [litres]	Connection		H [mm]	Weights [kg]		Packing [m³]
		1~	3~	1 x 220-240 V, PE	3 x 380-415 V, PE		Inlet	Outlet		Net	Gross	
CR 1-4	0.37	3.0-2.7	1.0	●	●	80	Rp 1	Rp 1	924	50.0	53.0	0.30
CR 1-7	0.37	3.0-2.7	1.0	●	●	80	Rp 1	Rp 1	924	51.0	54.0	0.30
CR 1-10	0.55	4.0-3.7	1.44	●	●	80	Rp 1	Rp 1	924	53.0	56.0	0.30
CR 1-13	0.75	-	1.9	-	●	80	Rp 1	Rp 1	924	72.0	75.0	0.30
CR 1-17	1.1	-	2.65	-	●	80	Rp 1	Rp 1	924	74.0	77.0	0.30

Technical data

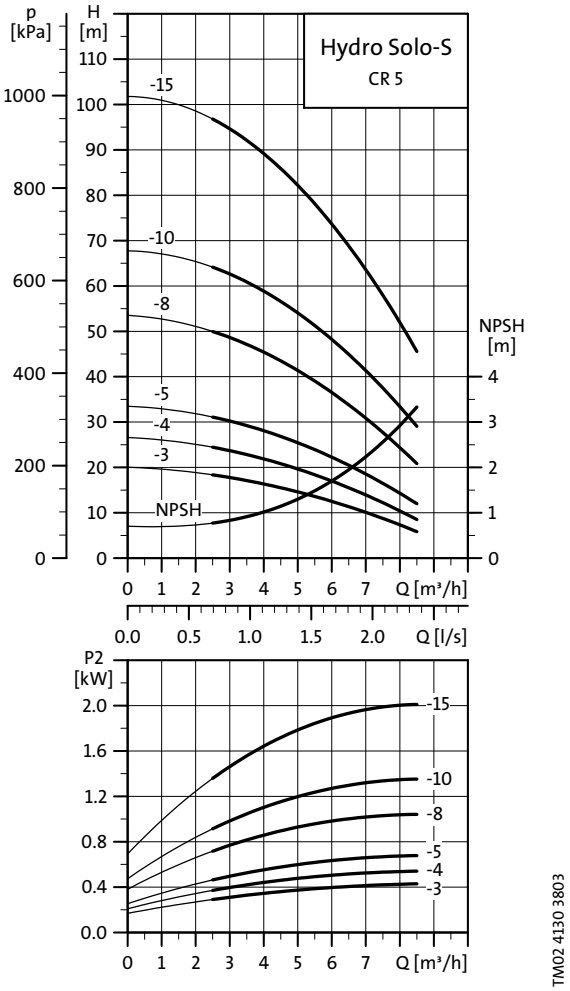


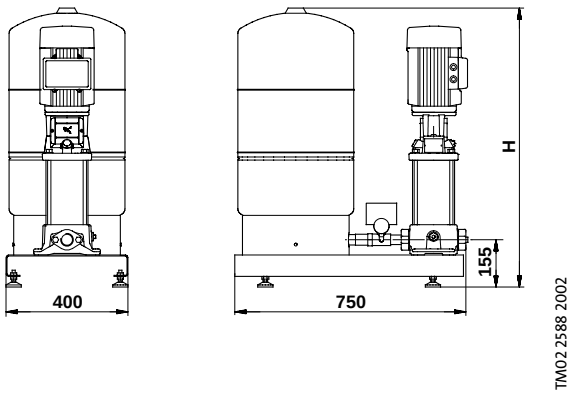


Electrical data, dimensions and weights

Pump type	Motor [kW]	Full load current 1/1 [A]		Supply voltage		Diaphragm tank [litres]	Connection		H [mm]	Weights [kg]		Packing [m³]
		1~	3~	1 x 220-240 V, PE	3 x 380-415 V, PE		Inlet	Outlet		Net	Gross	
CR 3-4	0.37	3.0-2.7	1.0	●	●	120	Rp 1	Rp 1	1269	56.0	59.0	0.42
CR 3-7	0.55	4.0-3.7	1.44	●	●	120	Rp 1	Rp 1	1269	58.0	61.0	0.42
CR 3-10	0.75	5.1-4.8	1.9	●	●	120	Rp 1	Rp 1	1269	61.0	64.0	0.42
CR 3-12	1.1	-	2.65	-	●	120	Rp 1	Rp 1	1269	85.0	88.0	0.42
CR 3-15	1.1	-	2.65	-	●	120	Rp 1	Rp 1	1269	86.0	89.0	0.42

Technical data





Electrical data, dimensions and weights

Pump type	Motor [kW]	Full load current 1/1 [A]		Supply voltage		Diaphragm tank [litres]	Connection		H [mm]	Weights [kg]		Packing [m³]
		1~	3~	1 x 220-240 V, PE	3 x 380-415 V, PE		Inlet	Outlet		Net	Gross	
CR 5-3	0.55	-	1.44	-	●	120	Rp 1¼	Rp 1	1269	56.0	59.0	0.42
CR 5-4	0.55	4.0-3.7	-	●	-	120	Rp 1¼	Rp 1	1269	60.0	63.0	0.42
CR 5-5	0.75	-	1.9	-	●	120	Rp 1¼	Rp 1	1269	60.0	63.0	0.42
CR 5-8	1.1	-	2.65	-	●	120	Rp 1¼	Rp 1	1269	63.0	66.0	0.42
CR 5-10	1.5	-	3.4	-	●	120	Rp 1¼	Rp 1	1269	92.0	95.0	0.42
CR 5-15	2.2	-	4.75	-	●	120	Rp 1¼	Rp 1	1269	96.0	99.0	0.42

Further product documentation

In addition to the printed data booklet, Grundfos offers the following sources of product documentation.

- WinCAPS
- WebCAPS.

WinCAPS

WinCAPS is a **Win**dows-based **C**omputer-**A**ided **P**roduct **S**election program containing information on more than 90,000 Grundfos products.

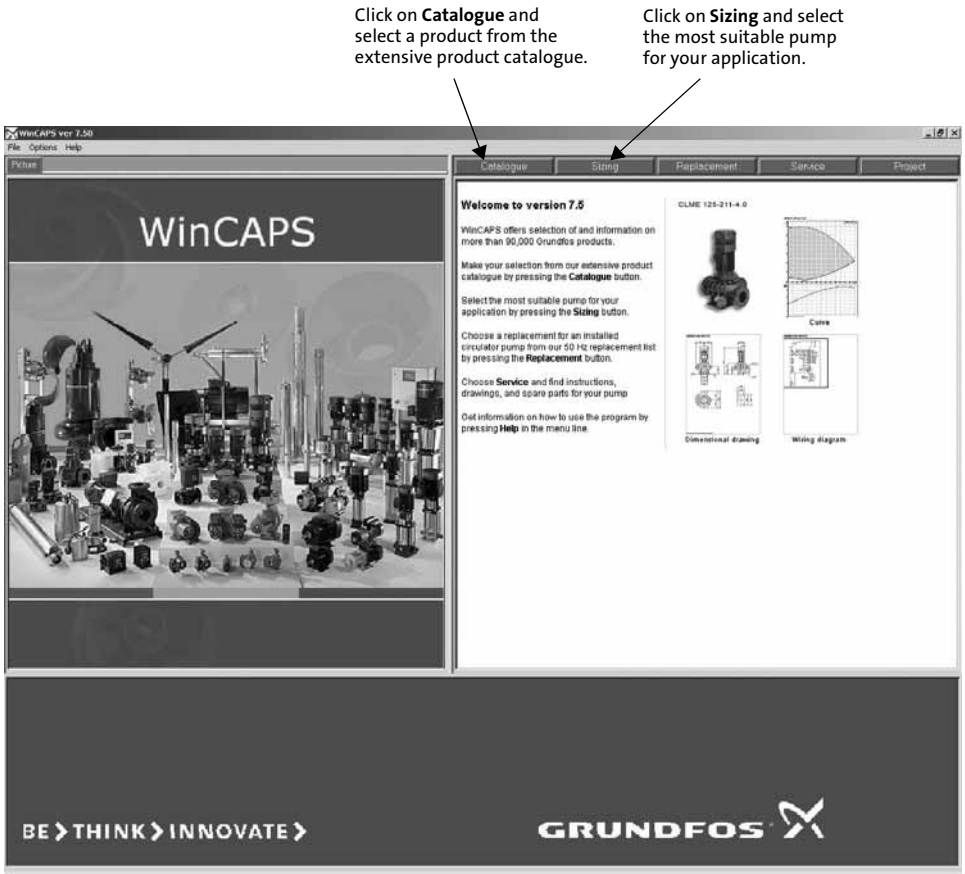
Available on CD-ROM in more than 15 languages, WinCAPS offers

- detailed technical information
- selection of the optimum pump solution
- dimensional drawings of each pump
- detailed service documentation
- installation and operating instructions
- wiring diagrams of each pump.



cd-wincaps

Fig. 4 WinCAPS CD-ROM



WinCAPS

Fig. 5 WinCAPS

Further product documentation

WebCAPS

WebCAPS is a **Web**-based **C**omputer **A**ided-**P**roduct **S**election program and a web-version of WinCAPS.

Available on Grundfos' homepage, **www.grundfos.com**, WebCAPS offers

- detailed technical information
- dimensional drawings of each pump
- wiring diagrams of each pump.

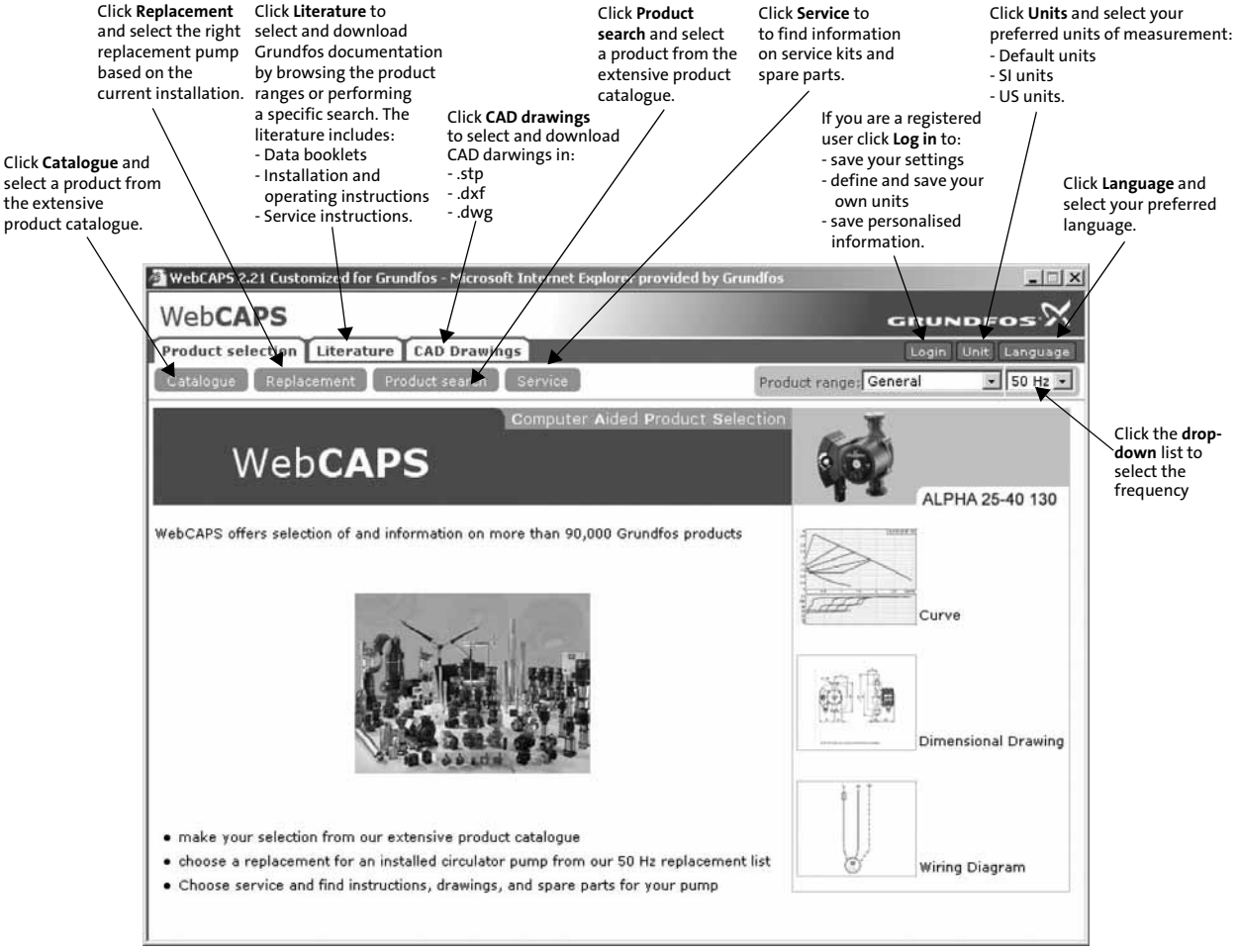


Fig. 6 WebCAPS

BE > THINK > INNOVATE >

Being responsible is our foundation
Thinking ahead makes it possible
Innovation is the essence

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Subject to alterations.

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