

CRE, CRIE, CRNE

Vertical multistage centrifugal E-pumps

50/60 Hz



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1. Product introduction



Gr-1016581 - Gr-1023005 - Gr-1029297

Fig. 1 CRE, CRIE and CRNE pumps

The CRE, CRIE and CRNE pumps are based on the CR, CRI and CRN pumps.

CRE, CRIE and CRNE pumps belong to the so-called E-pump family and are referred to as E-pumps.

The difference between the CR and CRE pump ranges is the motor. CRE, CRIE and CRNE pumps are fitted with an E-motor, meaning a motor with a built-in frequency converter.

The E-pump motor is a Grundfos MGE motor designed to meet EN standards.

The built-in frequency converter enables continuous variable control of the motor speed. This means that the pump can be set to operation at any duty point.

The purpose of continuous variable speed control of the motor speed is to adjust the performance to a given requirement.

CRE, CRIE and CRNE pumps are available with an integrated pressure sensor connected to the frequency converter that functions as a feedback sensor for constant pressure control.

The pump materials are identical to those of the CR, CRI and CRN pump ranges.

When to select an E-pump

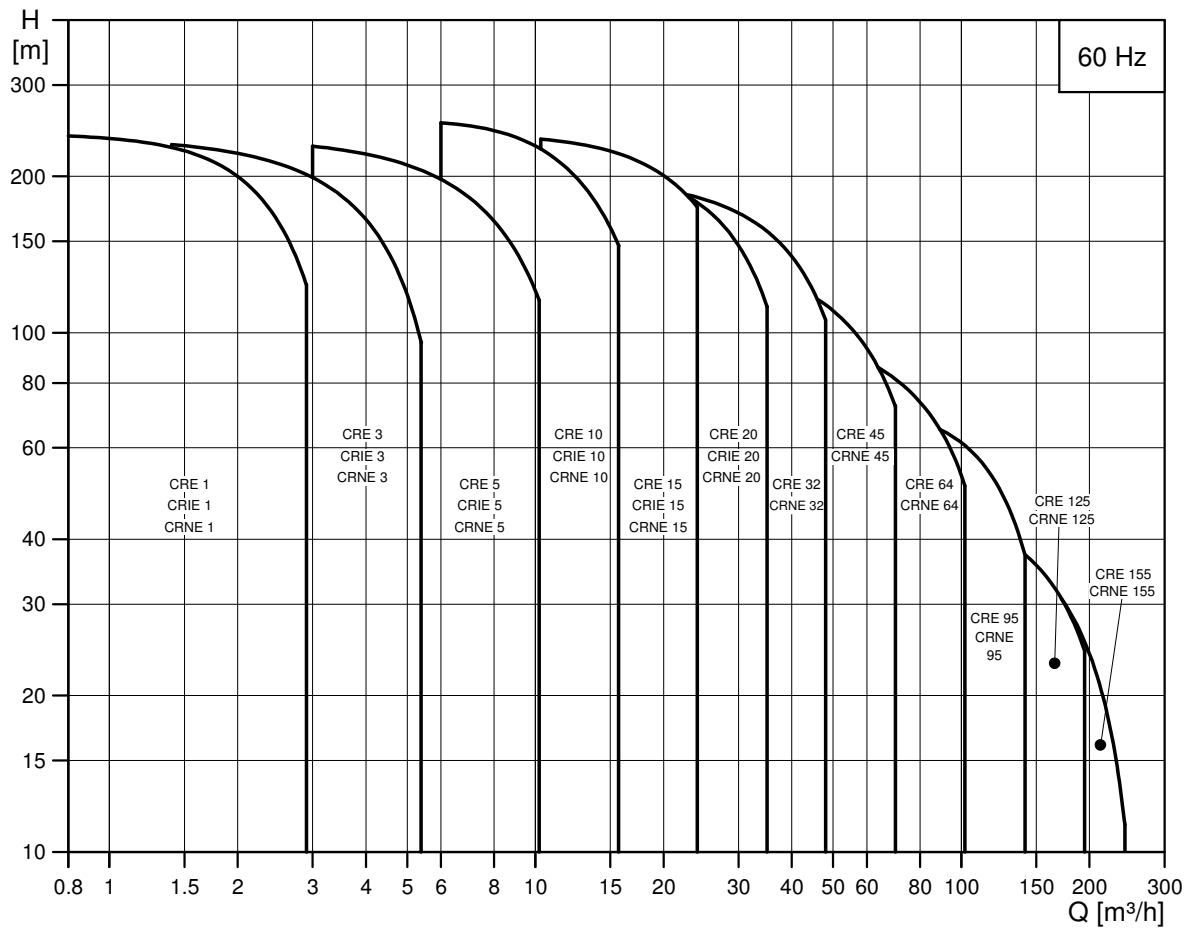
Select an E-pump if the following is required:

- controlled operation, meaning that the consumption fluctuates
- constant pressure
- communication with the pump.

Adaptation of performance through frequency-controlled speed control offers obvious benefits, such as:

- energy savings
- increased comfort
- control and monitoring of pump performance.

Performance range



TM02 7357 1519

Fig. 2 Performance range, CRE, CRIE and CRNE

EuP ready

The CRE, CRIE, CRNE pumps are energy-optimised and comply with the EuP Directive (Commission Regulation (EC) No 547/2012) which has been effective since 1 January 2013. As from this date, all pumps will be classified/graduated in a new energy minimum efficiency index (MEI).

Minimum efficiency index

Minimum efficiency index (MEI) means the dimensionless scale unit for hydraulic pump efficiency at best efficiency point (BEP), part load (PL) and overload (OL). The Commission Regulation (EU) sets efficiency requirements to $MEI \geq 0.10$ as from 1 January 2013 and $MEI \geq 0.40$ as from 1 January 2015. An indicative benchmark for best-performing water pump available on the market as from 1 January 2013 is determined in the Commission Regulation.

- The benchmark for most efficient water pumps is $MEI \geq 0.70$.
- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.
- The operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable-speed drive that matches the pump duty to the system.
- Information on benchmark efficiency is available at <http://europump.eu/efficiencycharts>.

Minimum efficiency index (MEI)

Pump type	MEI
CR 1-3	≥ 0.70
CR 3-3	≥ 0.70
CR 5-3	0.57
CR 10-3	≥ 0.70
CR 15-3	≥ 0.70
CR 20-3	≥ 0.70
CR 32-3	≥ 0.70
CR 45-3	≥ 0.70
CR 64-3	≥ 0.70
CR 95-3	≥ 0.70

Applications

Application

Water supply

Filtration and transfer at waterworks
 Distribution from waterworks
 Pressure boosting in mains
 Pressure boosting in high-rise buildings, for example hotels
 Pressure boosting for industrial water supply

Industry

Pressure boosting

Process water systems
 Washing and cleaning systems
 Vehicle-washing tunnels
 Firefighting systems

Liquid transfer

Cooling and air-conditioning systems (refrigerants)
 Boiler feed and condensate systems
 Machine tools (cooling lubricants)
 Aquafarming

Special transfer duties

Oils and alcohols
 Acids and alkalis
 Glycol and coolants

Water treatment

Ultrafiltration systems
 Reverse osmosis systems
 Softening, ionising, demineralising systems
 Distillation systems
 Separators
 Swimming baths

Irrigation

Field irrigation (flooding)
 Sprinkler irrigation
 Drip-feed irrigation

For further information about which pump version to choose for a specific application or liquid, see section [9. Pumped liquids](#), page 82.

Product range

Range	CRE 1	CRE 3	CRE 5	CRE 10	CRE 15	CRE 20
Rated flow rate [m ³ /h]	1.2	3.6	6	12	18	24
Liquid temperature [°C]	-20 - +120					
Liquid temperature [°C], on request	-40 - +180					
Maximum pump efficiency [%]	49	59	67	70	72	72
CRE pumps						
Flow rate [m ³ /h]	0.8 - 2.9	1.4 - 5.4	3 - 10.2	6-16	10-29	13-35
Maximum pressure [bar]	24	24	23	26	24	21
Motor power [kW]	0.37 - 3.0	0.37 - 4.0	0.55 - 7.5	0.75 - 11	1.5 - 18.5	2.2 - 18.5
Version						
CRE: Cast iron and stainless steel EN 1.4301 / AISI 304	•	•	•	•	•	•
CRIE: Stainless steel EN 1.4301 / AISI 304	•	•	•	•	•	•
CRNE: Stainless steel EN 1.4401 / AISI 316	•	•	•	•	•	•
CRT, CRTE: Titanium	See the CRT, CRTE data booklet available on Grundfos Product Center at www.grundfos.com .					
CRE pipe connection						
Oval flange (BSP)	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Oval flange (BSP), on request	Rp 1 1/4	Rp 1 1/4	Rp 1	Rp 1 1/4 Rp 2	Rp 2 1/2	Rp 2 1/2
Flange	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 40	DN 50	DN 50
Flange, on request	-	-	-	DN 50	-	-
CRIE pipe connection						
Oval flange (BSP)	Rp 1	Rp 1 1/4	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Oval flange (BSP), on request	Rp 1 1/4	Rp 1	Rp 1	Rp 2	-	-
Flange	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 40	DN 50	DN 50
Flange, on request	-	-	-	DN 50	-	-
PJE coupling (Victaulic)	R 1 1/4 DN 32	R 1 1/4 DN 32	R 1 1/4 DN 32	R 2 DN 50	R 2 DN 50	R 2 DN 50
Clamp coupling (L-coupling)	Ø48.3	Ø48.3	Ø48.3	Ø60.3	Ø60.3	Ø60.3
Union (+GF+)	G 2	G 2	G 2	G 2 3/4	G 2 3/4	G 2 3/4
CRNE pipe connection						
Oval flange (BSP)	Rp 1	Rp 1 1/4	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Oval flange (BSP), on request	Rp 1 1/4	Rp 1	Rp 1	Rp 2	-	-
Flange	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 40	DN 50	DN 50
Flange, on request	-	-	-	DN 50	-	-
PJE coupling (Victaulic)	R 1 1/4 DN 32	R 1 1/4 DN 32	R 1 1/4 DN 32	R 2 DN 50	R 2 DN 50	R 2 DN 50
Clamp coupling (L-coupling)	Ø42.5	Ø42.5	Ø42.5	Ø60.3	Ø60.3	Ø60.3
Union (+GF+)	G 2	G 2	G 2	G 2 3/4	G 2 3/4	G 2 3/4

- Standard.

Range	CRE 32	CRE 45	CRE 64	CRE 95	CRE 125	CRE 155
Rated flow rate [m ³ /h]	38	54	77	115	150	185
Liquid temperature [°C]	-30 - +120*					
Liquid temperature [°C], on request	-40 - +180					
Maximum pump efficiency [%]	76	78	79	81	78	78
CRE pumps						
Flow rate [m ³ /h]	18-48	26-70	36-102	58-150	75-195	90-240
Maximum pressure [bar]	27	26	18.2	8	8	4
Motor power [kW]	2.2 - 22	5.5 - 22	7.5 - 22	11-22	15-22	18.5
Version						
CRE: Cast iron and stainless steel EN 1.4301 / AISI 304	•	•	•	•	•	•
CRNE: Stainless steel EN 1.4401 / AISI 316	•	•	•	•	•	•
CRT, CRTE: Titanium	See the CRT, CRTE data booklet available on www.grundfos.com (Grundfos Product Center)				-	-
CRE pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 150	DN 150
Flange, on request	DN 80	DN 100	DN 125	DN 125		
CRIE pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	-	-	-	-	-	-
Flange, on request	-	-	-	-	-	-
PJE coupling (Victaulic)	-	-	-	-	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-
CRNE pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 150	DN 150
Flange, on request	DN 80	DN 100	DN 125	DN 125		
PJE coupling (Victaulic)	3"	4"	4"	5"	6"	6"
Clamp coupling (L-coupling)	88.9	114.3	114.3	141.3	168.3	168.3
Union (+GF+)	-	-	-	-	-	-

• Standard.

○ Available.

* CRNE 32 to 155 with HQQE shaft seal: -40 to +120 °C.

Pump

The CR and CRE pumps are non-self-priming, vertical multistage centrifugal pumps.

The pumps are available with a Grundfos standard motor (CR pumps) or a Grundfos frequency-controlled motor (CRE pumps).

The pump consists of a pump head and a base.

The chamber stack and the sleeve are secured between the pump head and the base with staybolts. The base has inlet and outlet ports on the same level (in line). All pumps are fitted with a maintenance-free mechanical shaft seal of the cartridge type.

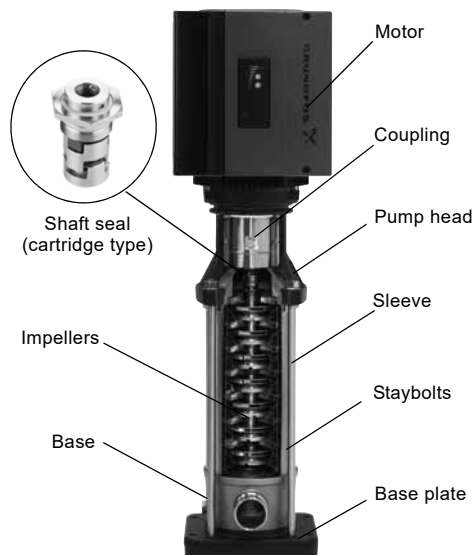


Fig. 3 CR pump

TM05 9471 3913 - TM3395

Motor

MGE motors

MGE motors incorporate thermal protection against slow overload and blocking (IEC 34-11: TP 211).

CRE, CRIE and CRNE pumps require no external motor protection.

Frequency-controlled MGE motors

CRE, CRIE and CRNE pumps are fitted with a totally enclosed, fan-cooled, frequency-controlled MGE motor with principal dimensions to EN standards.

Electrical tolerances comply with EN 60034.

CRE, CRIE, CRNE pumps from 0.37 to 1.1 kW are fitted with single-phase MGE motors as standard. The 1.5 kW single-phase MGE motors are available on request.

CRE, CRIE, CRNE pumps from 1.5 to 22 kW are fitted with three-phase MGE motors as standard. The 0.37 to 1.1 kW three-phase MGE motors are available on request.

See Grundfos Product Center or www.grundfos.com.

Electrical data

	MGE motor CRE, CRIE, CRNE
Mounting designation	Up to 4 kW: V18 5.5 kW and up: V1
Insulation class	F
Efficiency class	0.37 to 11 kW: IE5 level 15 to 22 kW: IE3
Enclosure class	0.37 to 11 kW: IP55 (IP66 optional) 15-22 kW: IP55
Supply voltage Tolerance: - 10 %/+ 10 %	P2: 0.37 - 1.5 kW: 1 x 200-240 V P2: 0.37 - 11 kW: 3 x 380-500 V P2: 15-22 kW: 3 x 380-480 V
Supply frequency	50/60 Hz

MGE 0.37 to 11 kW

Advanced functional module (FM 300)

The FM 300 is factory-fitted in all pumps from 0.37 to 11 kW.

The module has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required.

The FM 300 has these connections:

- three analog inputs
- one analog output
- two dedicated digital inputs
- two configurable digital inputs or open-collector outputs
- Grundfos Digital Sensor input and output
- two Pt100/1000 inputs
- two LiqTec sensor inputs
- two signal relay outputs
- GENIbus connection.

Connection terminals

All inputs and outputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits. All control terminals are supplied with protective extra-low voltage (PELV), thus ensuring protection against electric shock.

• Signal relay outputs

– Signal relay 1:

LIVE:

Mains supply voltages up to 250 VAC can be connected to this output.

PELV:

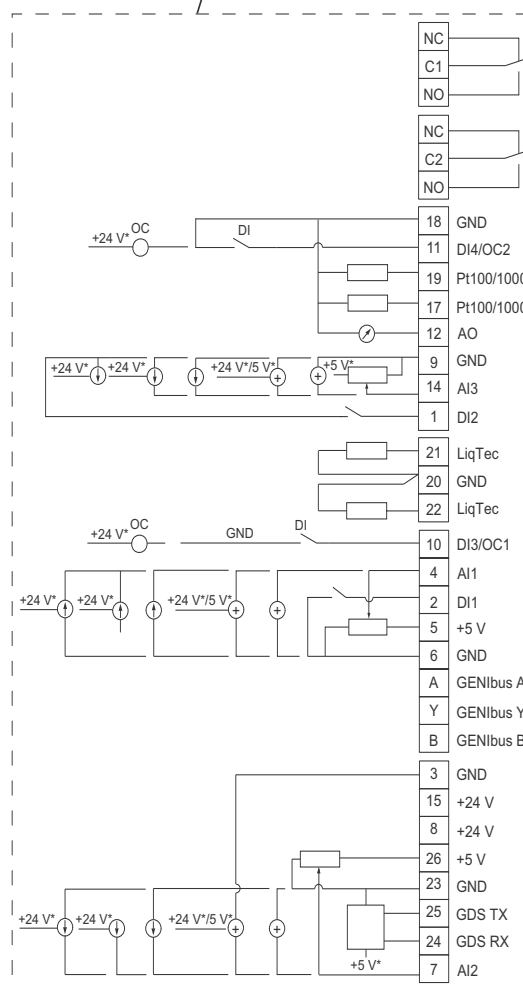
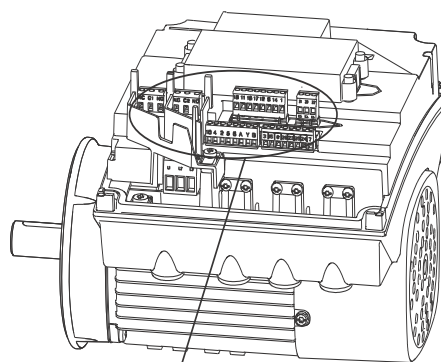
The output is galvanically separated from other circuits. Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.

– Signal relay 2:

PELV:

The output is galvanically separated from other circuits. Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.

- **Mains supply** (terminals N, PE, L or L1, L2, L3, PE)



* If an external supply source is used, there must be a connection to GND.

Fig. 4 Connection terminals, FM 300 functional module

TM05 3509 3512

MGE 15 to 22 kW

Advanced I/O module

The advanced I/O module is the standard functional module in all MGE motors from 15 to 22 kW.

The module has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required.

The Advanced I/O module has these connections:

- start/stop terminals
- three digital inputs
- one setpoint input
- one sensor input (feedback sensor)
- one sensor 2 input
- one analog output
- two Pt100 inputs
- two signal relay outputs
- GENIbus connection.

Connection terminals

As a precaution, the wires to be connected to the following connection groups must be separated from each other by reinforced insulation in their entire lengths.

Inputs

- Start/stop (terminals 2 and 3)
- digital inputs (terminals 1 and 9, 10 and 9, 11 and 9)
- sensor input 2 (terminals 14 and 15)
- Pt100 sensor inputs (terminals 17, 18, 19 and 20)
- setpoint input (terminals 4, 5 and 6)
- sensor input (terminals 7 and 8)
- GENIbus (terminals B, Y and A).

All inputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits.

All control terminals are supplied with protective extra-low voltage (PELV), thus ensuring protection against electric shock.

Output (relay signal, terminals NC, C, NO)

The output is galvanically separated from other circuits.

Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.

- analog output (terminal 12 and 13).

Mains supply (terminals L1, L2, L3)

A galvanic separation must fulfil the requirements for reinforced insulation including creepage distances and clearances specified in EN 61800-5-1.

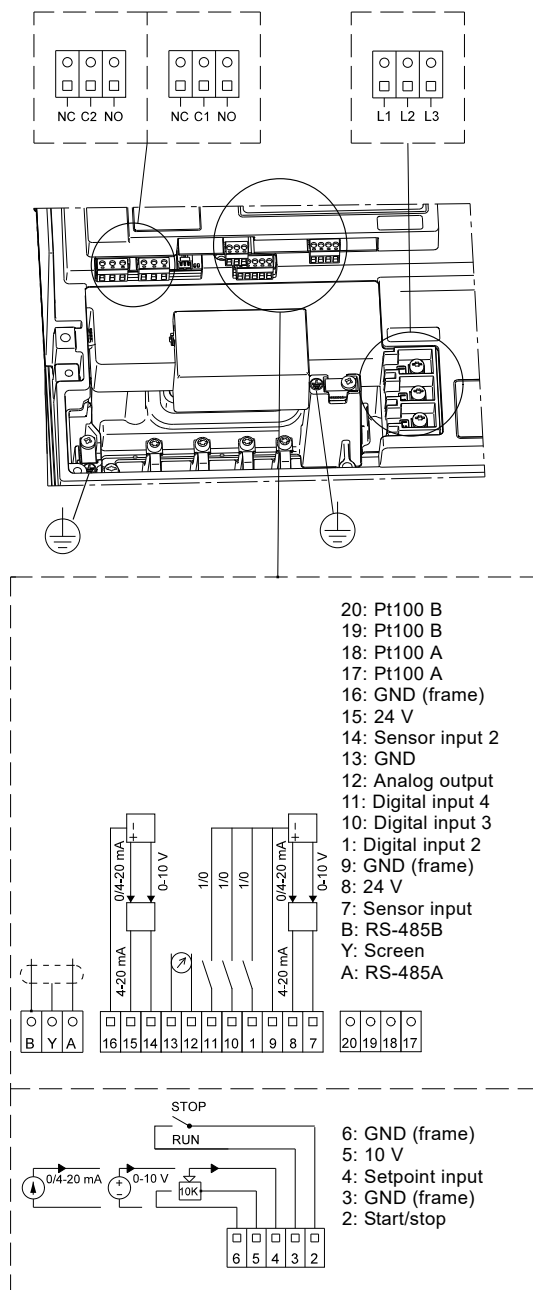


Fig. 5 Connection terminals, Advanced I/O module

Terminal box positions

As standard, the terminal box is fitted on the inlet side of the pump.

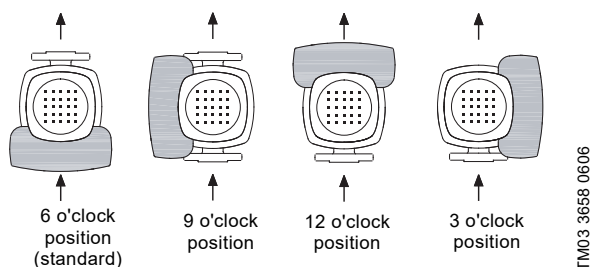


Fig. 6 Terminal box positions

Ambient temperature

Motor power [kW]	Motor make	Phase	Motor efficiency class	Maximum ambient temperature [°C]	Maximum altitude above sea level [m]
0.37 - 1.5	MGE	1	IE5	50	1000
0.37 - 11	MGE	3	IE5	50	
15-22	MGE	3	IE3	40	

If the ambient temperature exceeds the above maximum ambient temperatures or the pump is installed at an altitude exceeding 1000 metres, the motor must not be fully loaded due to the risk of overheating. Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air.

In such cases, it may be necessary to use a motor with a higher rated output.

Viscosity

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in power consumption.

In such situations, the pump must be fitted with a larger motor. If in doubt, contact Grundfos.

Installation altitude

Installation altitude is the height above sea level of the installation site. Motors installed up to 1000 metres above sea level can be loaded 100 %.

Motors installed more than 1000 metres above sea level must not be fully loaded due to the low density and consequently low cooling effect of the air.

MGE 0.37 to 11 kW

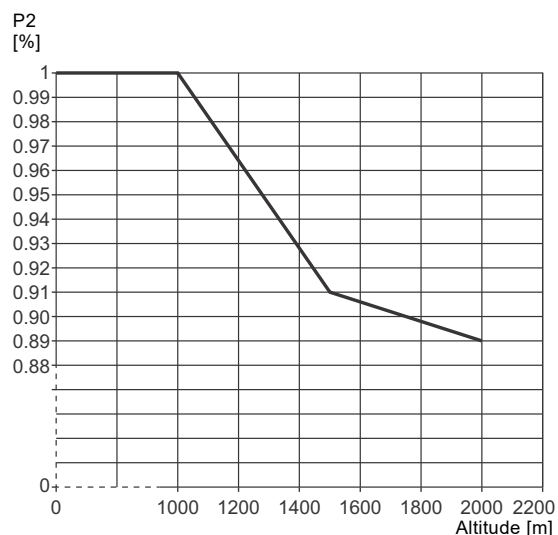


Fig. 7 Derating of motor output (P2) in relation to altitude above sea level

MGE 15 to 22 kW

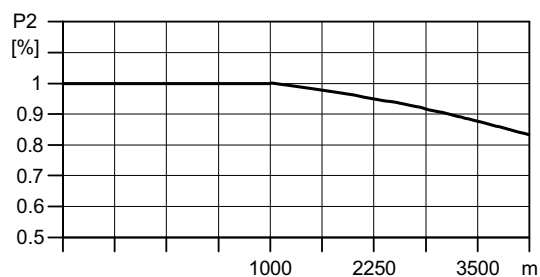


Fig. 8 Derating of motor output (P2) in relation to altitude above sea level

2. Control of E-pumps

Examples of E-pump applications

CRE, CRIE and CRNE pumps are the ideal choice for a number of applications characterised by a demand for variable flow at constant pressure. The pumps are suited for water supply systems and pressure boosting as well as for industrial applications.

Depending on the application, the pumps offer energy savings, increased comfort and improved processing.

E-pumps in the service of industry

The industry uses a large number of pumps in many different applications. Demands on pumps in terms of pump performance and mode of operation make speed control a must in many applications.

Some of the applications in which E-pumps are often used are listed below.

Constant pressure

- Water supply
- washing and cleaning systems
- distribution from waterworks
- humidifying systems
- water treatment systems
- process boosting systems.

Example: Within industrial water supply, E-pumps with integrated pressure sensor are used to ensure a constant pressure in the pipe system. From the sensor, the E-pump receives inputs about changes of pressure as a result of changes in the consumption. The E-pump responds to the input by adjusting the speed until the pressure is equalised. The constant pressure is stabilised once more on the basis of a preset setpoint.

Constant temperature

- Air-conditioning systems at industrial plants
- industrial cooling systems
- industrial freezing systems
- casting and moulding tools.

Example: In industrial freezing systems, E-pumps with a temperature sensor increase comfort and lower operating costs compared with pumps without a temperature sensor.

An E-pump continuously adapts its performance to the changing demands reflected in the differences in temperature of the liquid circulating in the freezing system. Thus, the lower the demand for cooling, the smaller the quantity of liquid circulated in the system and vice versa.

Constant level

- Boiler feed systems
- condensate systems
- sprinkler irrigation systems
- chemical industry.

Example: In a steam boiler, it is important to be able to monitor and control pump operation to maintain a constant level of water in the boiler.

By using an E-pump with a level sensor in the boiler, it is possible to maintain a constant water level.

A constant water level ensures optimum and cost-efficient operation as a result of stable steam production.

Dosing applications

- Chemical industry, meaning control of pH values
- petrochemical industry
- paint industry
- degreasing systems
- bleaching systems.

Example: In the petrochemical industry, E-pumps with a pressure sensor are used as dosing pumps.

The E-pumps help to ensure that the correct mixture ratio is achieved when more liquids are combined.

E-pumps functioning as dosing pumps improve processing and offer energy savings.

E-pumps in commercial building services

Commercial building services use E-pumps to maintain a constant pressure or a constant temperature based on a variable flow.

Constant pressure

Water supply in high-rise buildings, such as office buildings and hotels.

E-pumps with a pressure sensor are used for water supply in high-rise buildings to ensure a constant pressure even at the highest draw-off point. As the consumption pattern and thus the pressure changes during the day, the E-pump continuously adapts its performance until the pressure is equalised.

Constant temperature

- Air-conditioning systems in for example hotels and schools
- building cooling systems.

Example: E-pumps are an excellent choice for buildings where a constant temperature is essential. E-pumps keep the temperature constant in air-conditioned, high-rise glass buildings, irrespective of the seasonal fluctuations of the outdoor temperature and various heat impacts inside the building.

Control options

It is possible to communicate with CRE, CRIE, CRNE pumps via the following platforms:

- operating panel on the pump
- Grundfos GO Remote
- control systems, such as PLC, SCADA or BMS.

The purpose of controlling an E-pump is to monitor and control the pressure, temperature, flow and liquid level of the system.

Operating panel on pump

The operating panel on the E-pump terminal box makes it possible to change the setpoint settings manually.

MGE 0.37 to 11 kW

The operating condition of the pump is indicated by Grundfos Eye on the operating panel. See fig. 9, pos. A.

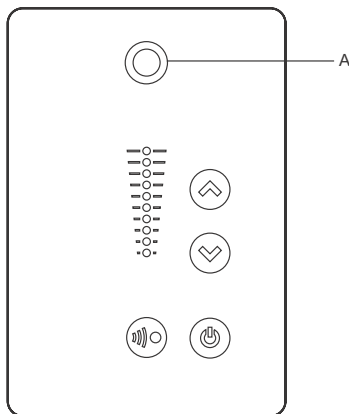


Fig. 9 Operating panel on CRE pump, 0.37 to 11 kW

MGE 15 to 22 kW

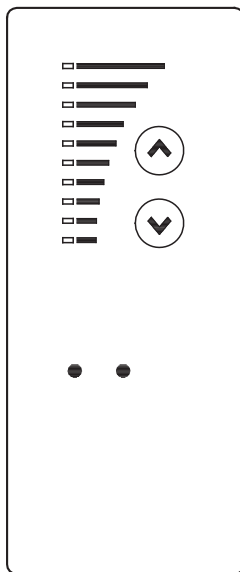


Fig. 10 Operating panel on CRE pump, 15 to 22 kW

Grundfos GO Remote

The pump is designed for wireless radio or infrared communication with Grundfos GO Remote.

Grundfos GO Remote enables setting of functions and gives access to status overviews, technical product information and actual operating parameters.

Grundfos GO Remote offers the following mobile interfaces (MI). See fig. 11.

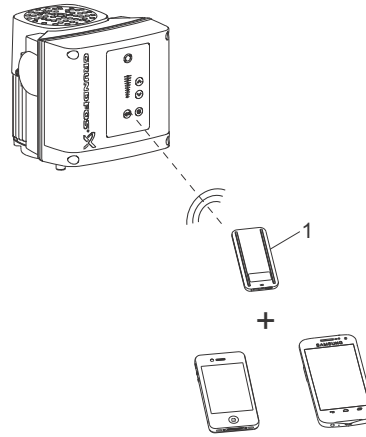


Fig. 11 Grundfos GO Remote communicating with the pump via radio or infrared connection (IR)

Pos.	Description
1	Grundfos MI 204: Add-on module enabling radio or infrared communication. You can use MI 204 in conjunction with an Apple iPhone or iPod with Lightning connector, for example a fifth generation or later iPhone or iPod. MI 204 is also available together with an Apple iPod touch and a cover.
2	Grundfos MI 301: Separate module enabling radio or infrared communication. You can use the module in conjunction with an Android or iOS-based smart device with Bluetooth connection.

TM05 5993 4312

TM02 8513 0304

TM06 6256 0916

Central management system

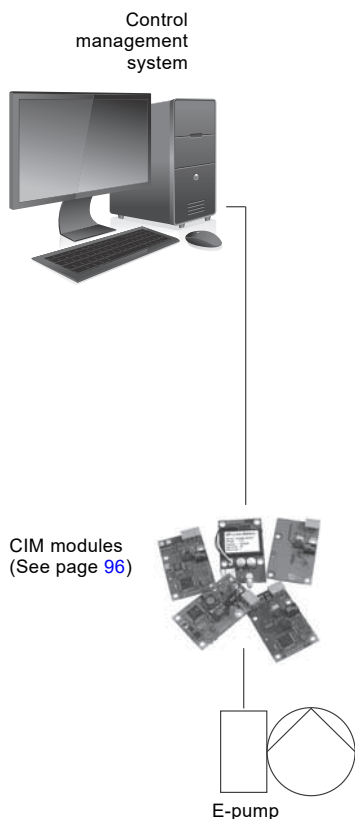


Fig. 12 Structure of a central management system

Control modes for E-pumps

CRE, CRIE and CRNE pumps are available in two variants:

- with integrated pressure sensor
- without sensor.

CRE, CRIE and CRNE with integrated pressure sensor

Use CRE, CRIE and CRNE pumps with integrated pressure sensor in applications where you want to control the pressure of the pump, irrespective of the flow. For further information, see [Examples of E-pump applications](#), page 13.

Signals of pressure changes in the pipe system are transmitted continuously from the sensor to the pump. The pump responds to the signals by adjusting its performance to compensate for the pressure difference between the actual and the required pressure. As this adjustment is a continuous process, a constant pressure is maintained in the pipes.

A CRE, CRIE or CRNE pump with integrated pressure sensor facilitates installation and commissioning.

The control mode can be set to either of these:

- constant pressure (factory setting)
- constant curve.

In constant-pressure mode, the pump maintains a preset pressure irrespective of the flow. See fig. 13.

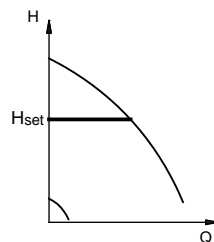


Fig. 13 Constant-pressure mode

In constant-curve mode, the pump is not controlled. It can be set to pump according to a preset pump characteristic within the range from min. curve to max. curve. See fig. 14.

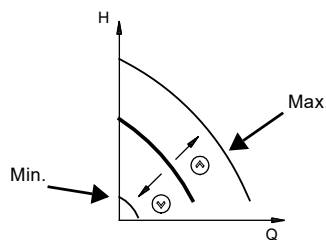


Fig. 14 Constant-curve mode

TM04 5022 1111

TM00 9322 4796

TM00 9323 1204

CRE, CRIE and CRNE without a sensor

CRE, CRIE and CRNE pumps without a sensor are suitable in these situations:

- Uncontrolled operation is required.
- You want to fit another sensor in order to control, for example, the flow, temperature, differential temperature, liquid level or pH value at some variable duty point in the system.

MGE 0.37 to 11 kW

These CRE, CRIE and CRNE pumps without a sensor can be set to either of these control modes:

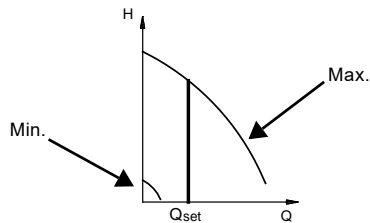
- constant pressure
- constant differential pressure
- constant temperature
- constant differential temperature
- constant flow rate
- constant level
- constant curve
- constant other value.

MGE 15 to 22 kW

These CRE, CRIE and CRNE pumps without a sensor can be set to either of these control modes:

- controlled operation
- uncontrolled operation (factory setting).

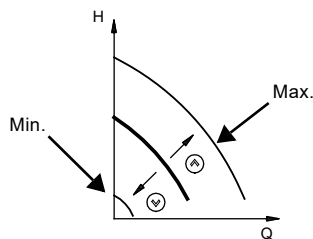
In controlled-operation mode, the pump adjusts its performance to the desired setpoint. See fig. 15.



TM02 7264 2803

Fig. 15 Constant-flow mode

In uncontrolled-operation mode, the pump operates according to the constant curve set. See fig. 16.



TM00 9323 1204

Fig. 16 Constant-curve mode

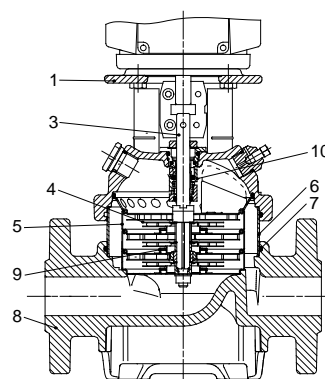
CRE, CRIE and CRNE pumps can be fitted with a sensor types meeting the requirements mentioned in the "Grundfos E-pumps" data booklet available on Grundfos Product Center at www.grundfos.com.

3. Construction

CRE 1, 3, 5, 10, 15 and 20



TM02 1198 0601 - GR7377 - GR7379



TM02 1194 1403

Materials, CRE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Grey cast iron	EN 1561 EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4401 ¹⁾ EN 10088 1.4057 ²⁾	AISI 316 AISI 431
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Grey cast iron	EN 1561 EN-GJL-250	ASTM 25B
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
	Staybolts	Bright steel	EN 10277-2 1.0533	-

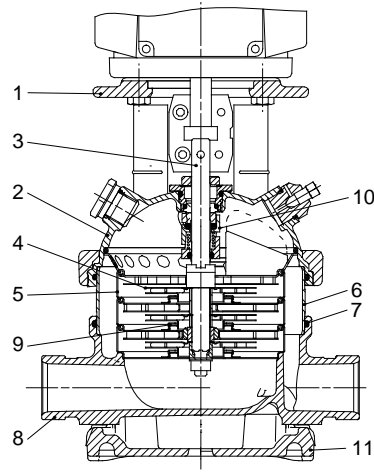
¹⁾ CRE 1, 3, 5.

²⁾ CRE 10, 15, 20.

CRIE 1, 3, 5, 10, 15 and 20



TM02 1808 2001 - GR7375



TM02 1195 1403

Materials, CRIE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Grey cast iron ¹⁾	EN 1563 EN-GJS-450-10	ASTM A536 65-45-12
2	Pump head	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	EN 10088 1.4401 ²⁾ EN 10088 1.4057 ³⁾	AISI 316 AISI 431
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
11	Base plate	Grey cast iron ¹⁾	EN 1561 EN-GJL-200 ³⁾ + 4) EN 1563 EN-GJS-500-7 ⁵⁾	ASTM 25B ³⁾ + 4) ASTM A536 70-50-05 ⁵⁾
	Staybolts	Bright steel	EN 10277-2 1.0533	-

¹⁾ Stainless steel available on request.

²⁾ CRIE 1, 3, 5.

³⁾ CRIE 10, 15, 20.

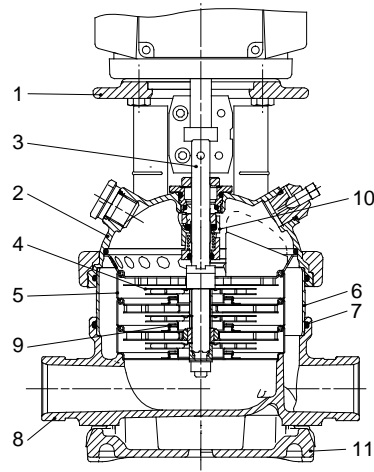
⁴⁾ CRIE 1, 3, 5 with FGJ flange connection.

⁵⁾ CRIE 1, 3, 5 with clamp connections (PJE, CA etc).

CRNE 1, 3, 5, 10, 15 and 20



TM02 1808 2001 - GR7373



TM02 1195 1403

Materials, CRNE

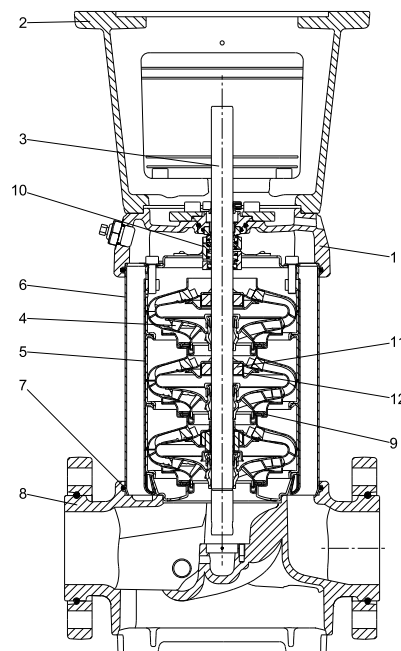
Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Grey cast iron ¹⁾	EN 1563 EN-GJS-450-10	ASTM A536 65-45-12
2	Pump head	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	EN 10088 1.4401 ²⁾ EN 10088 1.4460 ³⁾	AISI 316 AISI 329
4	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
5	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
6	Sleeve	Stainless steel	EN 10088 1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
11	Base plate	Grey cast iron ¹⁾	EN 1561 EN-GJL-200 ³⁾ + 4) EN 1563 EN-GJS-500-7 ⁵⁾	ASTM 25B ³⁾ + 4) ASTM A536 70-50-05 ⁵⁾
	Staybolts	Stainless steel	EN 10088 1.4401 ²⁾ EN 10088 1.4057 ³⁾	AISI 316 ²⁾ AISI 431 ³⁾

- 1) Stainless steel available on request.
- 2) CRNE 1, 3, 5.
- 3) CRNE 10, 15, 20.
- 4) CRNE 1, 3, 5 with FGJ flange connection.
- 5) CRNE 1, 3, 5 with clamp connections (PJE, CA etc).

CRE 32, 45 and 64



TM01 2150 1298



TM06 0711 0814

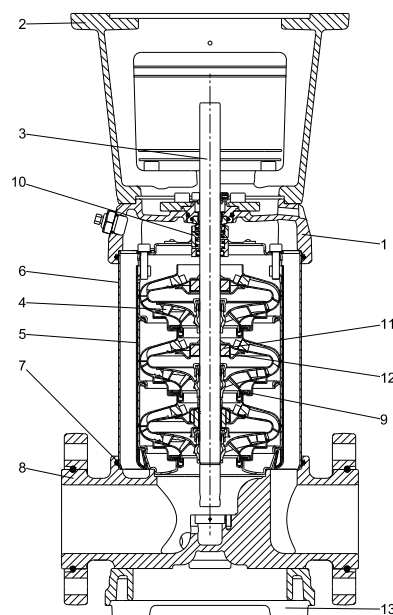
Materials, CRE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536 70-50-05
2	Motor stool	Grey cast iron	EN 1561 EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4057	AISI 431
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536 70-50-05
9	Neck ring	Carbon-graphite-filled PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
11	Bearing ring	Silicon carbide/Silicon carbide	-	-
12	Support bearing	Carbon-graphite-filled PTFE	-	-
13	Base plate	Ductile cast iron	EN-GJS-500-7	ASTM A536 70-50-05
	Staybolts	Bright steel	EN 10277-2 1.0533	-

CRNE 32, 45 and 64



TM06 9503 2417



TM06 0712 0814

Materials, CRNE

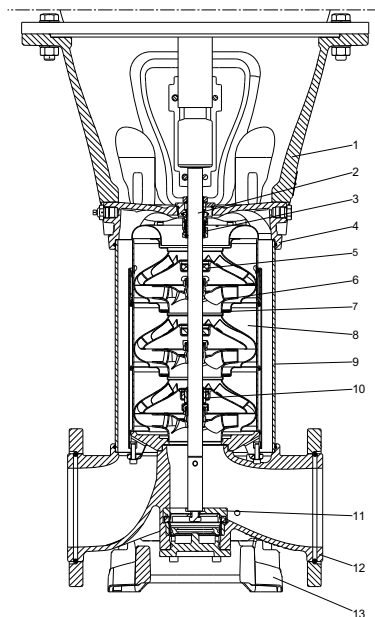
Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Stainless steel	EN10283 1.4408	CF 8M equal to AISI 316
2	Motor stool	Grey cast iron ¹⁾	EN 1561 EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4462	-
4	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
5	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
6	Sleeve	Stainless steel	EN 10088 1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM		-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	Carbon-graphite-filled PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
11	Bearing ring	Silicon carbide/Silicon carbide	-	-
12	Support bearing	Carbon-graphite-filled PTFE	-	-
13	Base plate	Ductile cast iron ¹⁾	EN 1563 EN-GJS-500-7	ASTM A536 70-50-05
	Staybolts	Stainless steel	EN 10088 1.4057	AISI 431

¹⁾ Stainless steel available on request.

CRE 95, 125, 155



DIN flange



TM06 9206 1917

TM06 5161 1917

Materials, CRE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
2	Shaft	Stainless steel	EN10088 1.4057 ¹⁾ EN10088 1.4462 ²⁾	EN10088 1.4057 = 431 EN10088 1.4462 = 318 LN
3	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
4	Pump head	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
5	Support bearing (bush)	Carbon-graphite-filled PTFE		
6	Impeller	Stainless steel	EN10088 1.4301	AISI 304
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN10088 1.4301	AISI 304
9	Sleeve	Stainless steel	EN10088 1.4301 ¹⁾ EN10088 1.4404 ²⁾	AISI 304 ¹⁾ AISI 316 L ²⁾
10	Bearing ring	Tungsten carbide/Tungsten carbide	-	-
11	Thrust handling device ³⁾	Stainless steel	EN10088 1.4401 EN10283 1.4408	AISI 316/CF 8M
		Silicon carbide/Tungsten carbide	-	-
12	Base	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
13	Base plate	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
	Staybolts	Stainless steel	EN 10088 1.4057	AISI 431

¹⁾ Applies to CRE 95.

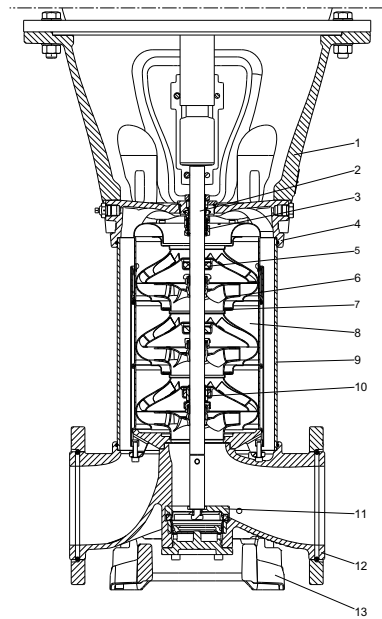
²⁾ Applies to CRE 125 to CRE 155.

³⁾ Only fitted on pumps with 75 kW motors or larger.

CRNE 95, 125, 155



TM06 9203 1917 - TM06 9208 1917 - TM06 9210 1917



TM06 5161 1917

Materials, CRNE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
2	Shaft	Stainless steel	EN 10088 1.4462	318 LN
3	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
4	Pump head	Stainless steel	EN 10283 1.4408	CF 8M
5	Support bearing (bush)	Carbon-graphite-filled PTFE	-	-
6	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
9	Sleeve	Stainless steel	EN 10088 1.4404	AISI 316 L
10	Bearing ring	Tungsten carbide/Tungsten carbide	-	-
11	Thrust handling device ¹⁾	Stainless steel	EN 10088 1.4401 EN 10283 1.4408	AISI 316/CF 8M
		Silicon carbide/Tungsten carbide	-	-
12	Base	Stainless steel	EN 10283 1.4408	CF 8M
13	Base plate	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
		Staybolts	Stainless steel	EN 10088 1.4057

¹⁾ Only fitted on pumps with 75 kW motors or larger.

4. Type key

Example	CR	E	32	s	-4	-2	-A	-F	-A	-E	-HQQE
Type range: CR, CRI, CRN, CRT											
Pump with integrated frequency converter											
Flow rate [m ³ /h]											
Undersize impeller (all impellers) CR 1s, CRI 1s, CRN 1s											
Number of impellers											
Number of reduced-diameter impellers CR, CRE, CRN, CRNE 32, 45, 64, 95, 125, 155											
Code for pump version											
Code for pipe connection											
Code for materials											
Code for rubber parts											
Code for shaft seal											

Key to codes

Code	Description
Pump version	
A	Basic version
B	Oversize motor
C	CR compact
D	Pump with pressure intensifier*
E	Pump with certificate
F	Pump for high temperatures (with air-cooled top)
G	E-pump without operating panel
H	Horizontal version
I	Different pressure rating
J	E-pump with a different maximum speed
K	Pump with low NPSH
L	Pump including Grundfos CUE and certificate
M	Magnetic drive
N	With sensor
O	Cleaned and dried
P	Undersize motor
Q	High-pressure pump with high-speed MGE motor*
R	Belt driven pump
S	High-pressure pump
T	Thrust handling device*
U	ATEX approved pump
V	Cascade function
W	Deep-well pump with ejector*
X	Special version
Y	Electropolished
Z	Pumps with bearing flange
Pipe connection	
A	Oval flange
B	NPT thread
CA	FlexiClamp
CX	Triclamp*
F	DIN flange
FC	DIN 11853-2 flange (collar flange)
FE	EN 1092-1, type E
G	ANSI flange
J	JIS flange
N	Changed diameter of ports
P	PJE coupling (Victaulic type)
X	Special version

Code	Description
Materials	
A	Basic version
B	Tungsten carbide/Tungsten carbide pump bearings
C	Carbon free pump
D	Carbon-graphite-filled PTFE (bearings)/Tungsten carbide
E	Pickled and passivated (Only Japan)
H	Flanges and base plate EN 1.4408
K	Bronze (bearings)/Tungsten carbide
L	Motor stool, base plate and flanges EN 1.4408
M	Motor stool, base plate, coupling and flanges EN 1.4408 and coupling guards in cobber. Bolts, nuts and spacing pipes EN 1.4401 or higher grade
N	Flanges EN 1.4408
P	PEEK neck ring
Q	Silicon carbide/Silicon carbide bearing in pump and Silicon carbide/Silicon carbide seal faces in thrust handling device
R	Silicon carbide/Silicon carbide bearing
S	PTFE neck rings
T	Base plate EN 1.4408
U	Silicon carbide/Silicon carbide bearing in pump and Silicon carbide/Tungsten carbide seal faces in thrust handling device
X	Special version

Code for rubber parts in pump	
E	EPDM
F	FXM (Fluoraz®)
K	FFKM (Kalrez®)
N	Neoprene
V	FKM (Viton®)

Shaft seal type designation	
A	O-ring seal with fixed driver*
H	Balanced cartridge seal with O-ring
O	Double seal, back-to-back*
P	Double seal, tandem*
X	Special version*

Seal face material	
B	Carbon, synthetic resin-impregnated
U	Cemented tungsten carbide
Q	Silicon carbide
X	Other ceramics*

Secondary seal material (rubber parts)	
E	EPDM
F	FXM (Fluoraz®)
K	FFKM (Kalrez®)
V	FKM (Viton®)

* Option. See the CR "Custom-built pumps" data booklet available on Grundfos Product Center. See QR code or link below.



<http://net.grundfos.com/qr/i/96486346>

Shaft seal

Example	-H	-Q	-Q	-E
Shaft seal type designation				
Material of rotating seal face				
Material of stationary seal face				
Material of secondary seal (rubber parts)				

5. Operating and inlet pressures

Maximum operating pressure and liquid temperature

Pump type	Oval flange		PJE, clamp, union, DIN	
	Maximum permissible operating pressure	Liquid temperature	Maximum permissible operating pressure	Liquid temperature
	[bar]	[°C]	[bar]	[°C]
CRE, CRIE, CRNE 1	16		25	
CRE, CRIE, CRNE 3	16		25	
CRE, CRIE, CRNE 5	16		25	
CRE, CRIE 10-1 → 10-10	16		16	
CRE, CRIE 10-12 → 10-17	-	-	25	
CRNE 10	16		25	
CRE, CRIE 15-1 → 15-5	10	-20 - +120	-	-
CRE, CRIE 15-1 → 15-8	-	-	16	
CRE, CRIE 15-9 → 15-12	-	-	25	-20 - +120
CRNE 15	10		25	
CRE, CRIE 20-1 → 20-5	10	-20 - +120	-	-
CRE, CRIE 20-1 → 20-7	-	-	16	
CRE, CRIE 20-8 → 20-10	-	-	25	-20 - +120
CRNE 20	10	-20 - +120	25	
CRE, CRNE 32-1-1 → 32-5	-	-	16	
CRE, CRNE 32-6-2 → 32-10-2	-	-	30	
CRE, CRNE 45-1-1 → 45-4	-	-	16	
CRE, CRNE 45-5-2 → 45-7	-	-	30	
CRE, CRNE 64-1-1 → 64-3	-	-	16	-30 - +120
CRE, CRNE 95-1-1 → -95-2-1	-	-	16	
CRE, CRNE 125-1-1 → 125-1	-	-	16	
CRE, CRNE 155-1-1	-	-	16	

NOTE: For pump sizes 32, 45, 64, the max. pressure for PJE version is 50 bar and only available in the CRNE version.

Operating range of the shaft seal

All pumps will be delivered with a HQQE/V cartridge shaft seal as standard.

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The range shown in figs 17 and 18 applies to clean water and water with antifreeze liquids. For selection of the right shaft seal, see section 9. *Pumped liquids*, page 82. If the operating range is exceeded, the life of the shaft seal may be reduced.

Note that if you pump demineralised water with a conductivity below 2 $\mu\text{S}/\text{cm}$ with a pump equipped with a silicon carbide/silicon carbide shaft seal, there is an increased risk of electro corrosion. We recommend that you use a silicon carbide/carbon or silicon carbide/tungsten carbide shaft seal instead.

Optional shaft seals

See section 11. *Variants*, page 97 for optional shaft seal solutions.

CRE, CRIE, CRNE 1-155

Ø12, Ø16 and Ø22 shafts seals (0.37 - 55 kW)

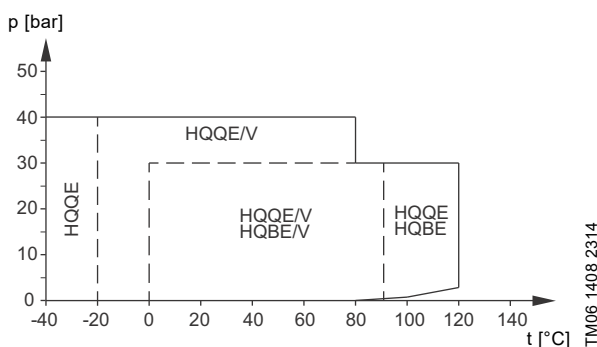


Fig. 17 Operating range of standard shaft seals for CRE, CRIE, CRNE 1-155

Standard shaft seal	Motor size [kW]	Description	Liquid temperature [°C]
HQQE	0.37 - 55	O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, EPDM	-40 - +120
HQQV		O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, FKM	-20 - +90
HQBE		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, EPDM	0 - +120
HQBV		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, FKM	0 - +90

Ø28 and Ø28 shaft seals (75-110 kW)

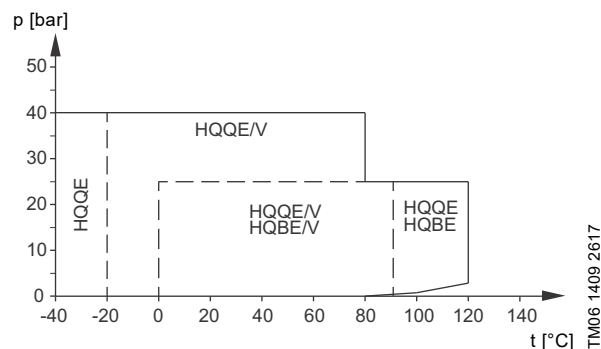


Fig. 18 Operating range of standard shaft seals for CR, CRN 125-155

Standard shaft seal	Motor size [kW]	Description	Liquid temperature [°C]
HQQE	75-110	O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, EPDM	-40 - +120
HQQV		O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, FKM	-20 - +90
HQBE		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, EPDM	0 - +120
HQBV		O-ring (cartridge) (balanced seal), Silicon carbide/carbon, FKM	0 - +90

Maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the outlet pressure, which is the actual inlet pressure plus the pressure delivered by the pump, must always be lower than the maximum permissible operating pressure.

If the maximum permissible operating pressure is exceeded, the conical bearing in the motor may be damaged and the life of the shaft seal reduced.

Pump type and stages	Maximum inlet pressure [bar]
CRE, CRIE, CRNE 1	
1-2 → 1-25	10
1-27	15
CRE, CRIE, CRNE 3	
3-2 → 3-17	10
3-19 → 3-25	15
CRE, CRIE, CRNE 5	
5-2 → 5-9	10
5-10 → 5-24	15
CRE, CRIE, CRNE 10	
10-1 → 10-5	8
10-6 → 10-17	10
CRE, CRIE, CRNE 15	
15-1 → 15-2	8
15-3 → 15-12	10
CRE, CRIE, CRNE 20	
20-1	8
20-2 → 20-10	10
CRE, CRNE 32	
32-1-1 → 32-2	4
32-3-2 → 32-6	10
32-7-2	15
CRE, CRNE 45	
45-1-1 → 45-1	4
45-2-2 → 45-3	10
45-4-2	15
CRE, CRNE 64	
64-1-1	4
64-1 → 64-2-1	10
64-2 → 64-3-2	15
CRE, CRNE 95	
95-1-1 → 95-2-1	10
CRE, CRNE 125	
125-1-1 → 125-1	10
CRE, CRNE 155	
155-1-1	10

Examples of operating and inlet pressures

The values for operating and inlet pressures must not be considered individually and must comply with the below statement.

The outlet pressure must be equal to or lower than the maximum operating pressure.

See the following definitions and examples.

Definitions

Pressure type	Definition
Maximum operating pressure	The maximum pressure is stated on the nameplate.
Pump differential pressure	The difference between the outlet pressure and inlet pressure.
Inlet pressure	The pressure measured at the pump inlet.
Outlet pressure	The inlet pressure added to the pump differential pressure.

Example 1

Pump, see page 37:	CRE 3-11 A-A-A
Max. operating pressure:	16 bar
Max. inlet pressure:	10 bar
Pump differential pressure:	10.3 bar*

* Flow rate = 0 m³/h

This pump is not allowed to start at an inlet pressure of 10 bar, but at an inlet pressure of 16.0 - 10.3 = 5.7 bar.

Example 2

Pump, see page 45:	CRE 10-2 A-A-A
Max. operating pressure:	16 bar
Max. inlet pressure:	8 bar
Pump differential pressure:	2.9 bar*

* Flow rate = 0 m³/h

This pump is allowed to start at an inlet pressure of 8 bar, as the outlet pressure is lower than the maximum operating pressure. This results in an operating pressure of 8.0 + 2.9 = 10.9 bar.

If the inlet or operating pressure exceeds the pressure permitted, see section 11. *Variants*, page 97.

6. Selection and sizing

Selection of pumps

Base the selection of pumps on these parameters:

- Duty point of the pump. See page 28.
- Sizing data such as pressure loss as a result of height differences, friction loss in the pipes, pump efficiency. See page 28.
- Pump materials. See page 30.
- Pump connections. See page 30.
- Shaft seal. See page 30.

Duty point of the pump

From a duty point, you can select a pump on the basis of the curve charts in section 7. *Performance curves and technical data*, starting on page 33.

Ideally, the duty point should match the best efficiency on the pump curve. See the example in fig. 20.

Sizing data

When sizing a pump, take these parameters into account:

- Required flow rate and pressure at the draw-off point
- Pressure loss as a result of height differences (H_{geo})
- Friction loss in the pipes (H_f)
It may be necessary to account for pressure loss in connection with long pipes, bends, valves or similar.
- Best efficiency at the estimated duty point.
- NPSH value.

For calculation of the NPSH value, see *Minimum inlet pressure, NPSH*, page 31.

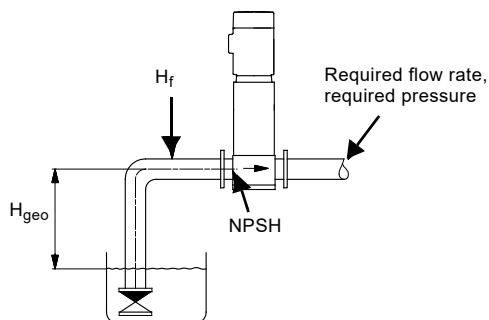


Fig. 19 Sizing data

Pump efficiency

Before determining the best efficiency point, identify the operation pattern of the pump. If you expect the pump to always operate at the same duty point, then select a CR pump which operates at a duty point corresponding to the best efficiency of the pump.

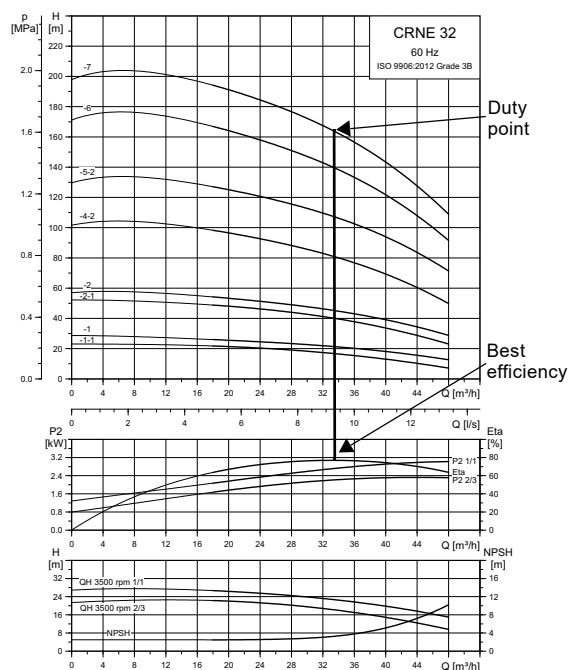


Fig. 20 Example of a CRE pump's duty point

As the pump is sized on the basis of the highest possible flow rate, it is important to always have the duty point to the right of the best efficiency point on the efficiency curve (eta). This must be considered in order to keep the efficiency high when the flow rate drops.

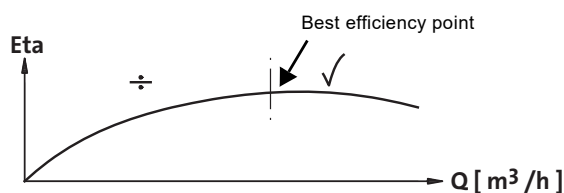


Fig. 21 Best efficiency

TM05 6846 2719

TM02 6711 1403

TM00 9190 1303

Normally, E-pumps are used in applications characterised by a variable flow. Consequently, it is not possible to select a pump that is constantly operating at optimum efficiency.

In order to achieve optimum operating economy, select the pump based on the following criteria:

- The maximum required duty point must be as close as possible to the QH curve of the pump.

The flow rate at the required duty point must be close to the optimum efficiency (eta) for most operating hours. Between the minimum and maximum performance curves, E-pumps have an infinite number of performance curves, each representing a specific speed. Therefore, it may not be possible to select a duty point close to the 100 % curve.

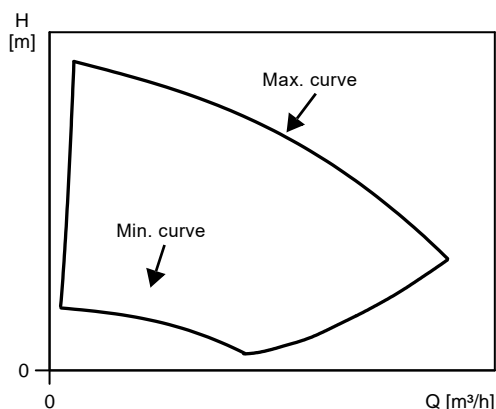


Fig. 22 Minimum and maximum performance curves

In situations where it is not possible to select a duty point close to the 100 % curve, the affinity equations can be used. The head (H), flow (Q) and input power (P) are all the appropriate variables for determining the motor speed (n). See fig. 23.

Note:

The approximated formulas apply on the condition that the system characteristic remains unchanged for n_n and n_x and that it is based on the formula $H = k \times Q^2$ where k is a constant.

The power equation implies that the pump efficiency is unchanged at the two speeds. In practice, this is not quite correct.

To obtain a precise calculation of the power savings resulting from a reduction of pump speed, take into account the efficiencies of the frequency converter and the motor.

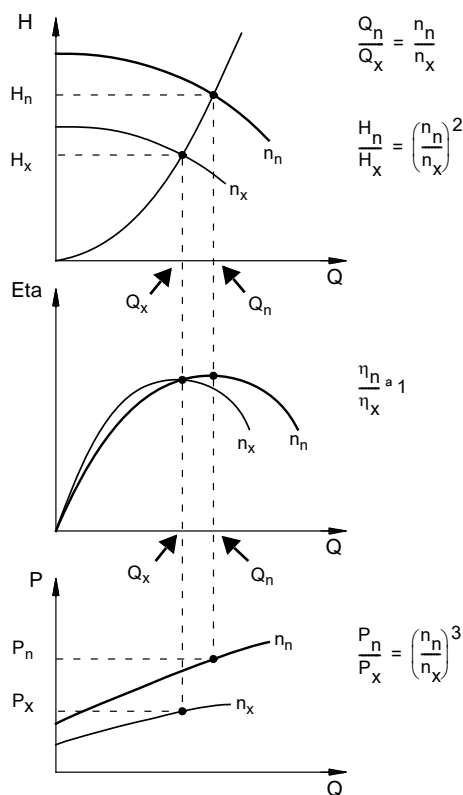


Fig. 23 Affinity equations

Legend

- H_n Rated head [m]
- H_x Actual head [m]
- Q_n Rated flow rate [m³/h]
- Q_x Actual flow rate [m³/h]
- n_n Rated motor speed [min⁻¹] ($n_n = 3500 \text{ min}^{-1}$)
- n_x Actual motor speed [min⁻¹]
- η_n Rated efficiency [%]
- η_x Actual efficiency [%]

Grundfos Product Center

We recommend that you size your pump in Grundfos Product Center, which is a selection program offered by Grundfos. For further information, see section 12. [Grundfos Product Center](#).

Grundfos Product Center features a user-friendly and easy-to-use virtual guide which leads you through the selection of the pump for the application in question.

TM01 4916 4803

TM00 8720 3496

Pump material

Select the material variant on the basis of the liquid to be pumped.

The product range covers the following basic types:

- CRE, CRIE
Use CRE, CRIE pumps for clean, non-aggressive liquids such as potable water and oils.
- CRNE
Use CRNE pumps for industrial liquids and acids.
See section 9. *Pumped liquids*, page 82, or contact Grundfos.

For saline- or chloride-containing liquids, such as sea water, CRTE pumps of titanium are available.

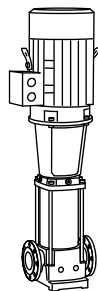


Fig. 24 CR pump

TM01 2100 1198

Pump connections

Selection of a pump connection depends on the rated pressure and pipes. To meet any requirement, the CRE, CRIE and CRNE pumps offer a wide range of flexible connections, such as:

- oval flange (BSP)
- DIN flange
- PJE coupling
- clamp coupling
- union (+GF+)
- other connections on request.

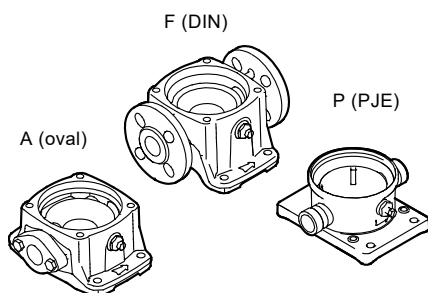


Fig. 25 Pump connections

TM02 1201 0601

Shaft seal

As standard, the CRE range is fitted with a Grundfos shaft seal (cartridge type) which is suitable for the most common applications.

The following key parameters must be taken into account when selecting the shaft seal:

- type of pumped liquid
- liquid temperature
- maximum pressure.

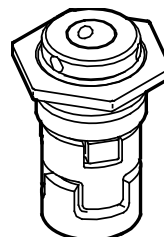


Fig. 26 Shaft seal (cartridge type)

TM02 0538 4800

Grundfos offers a wide range of shaft seal variants to meet specific demands. See section 9. *Pumped liquids*, page 82.

Operating pressure and inlet pressure

Do not exceed the limit values for these pressures:

- maximum operating pressure
- maximum inlet pressure.

Servicing shaft seals

Replacement shaft seals are available as complete service kits*.

Shaft seals fitted on CR, CRN 125-155 pumps with Ø28 mm or Ø36 mm shaft ends are serviceable. This means that the wear parts in these shaft seals are available as service kits* and can be replaced without having to renew the complete shaft seal.

* All service kits include detailed instructions on how to carry out the replacement.

Minimum inlet pressure, NPSH

We recommend calculating the inlet pressure "H" in these situations:

- 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 inlet side of the pump.

The maximum suction lift "H" in metres head can be calculated as follows:

$$H = p_b \times 10.2 - \text{NPSH} - H_f - H_v$$

p_b = Barometric pressure in bar.
 p_b can be set to 1 bar at sea level.
 In closed systems, p_b indicates the system pressure in bar.

NPSH = Net Positive Suction Head in metres head.
 To be read from the NPSH curve at the highest flow the pump will be delivering.

H_f = Friction loss in inlet pipe in metres head at the highest flow the pump will be delivering.

H_v = Vapour pressure in metres head
 To be read from the vapour pressure scale.
 H_v depends on the liquid temperature t_m .

If the calculated "H" is positive, the pump can operate at a suction lift of maximum "H" metres head.

If the calculated "H" is negative, an inlet pressure of minimum "H" metres head is required.

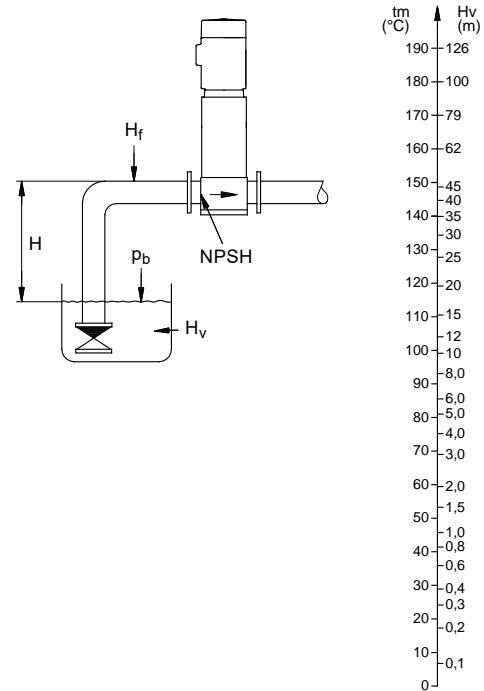


Fig. 27 Minimum inlet pressure, NPSH

To avoid cavitation, never select a pump with a duty point too far to the right on the NPSH curve.

Always check the NPSH value of the pump at the highest possible flow.

TM02 7439 3403

How to read the curve charts

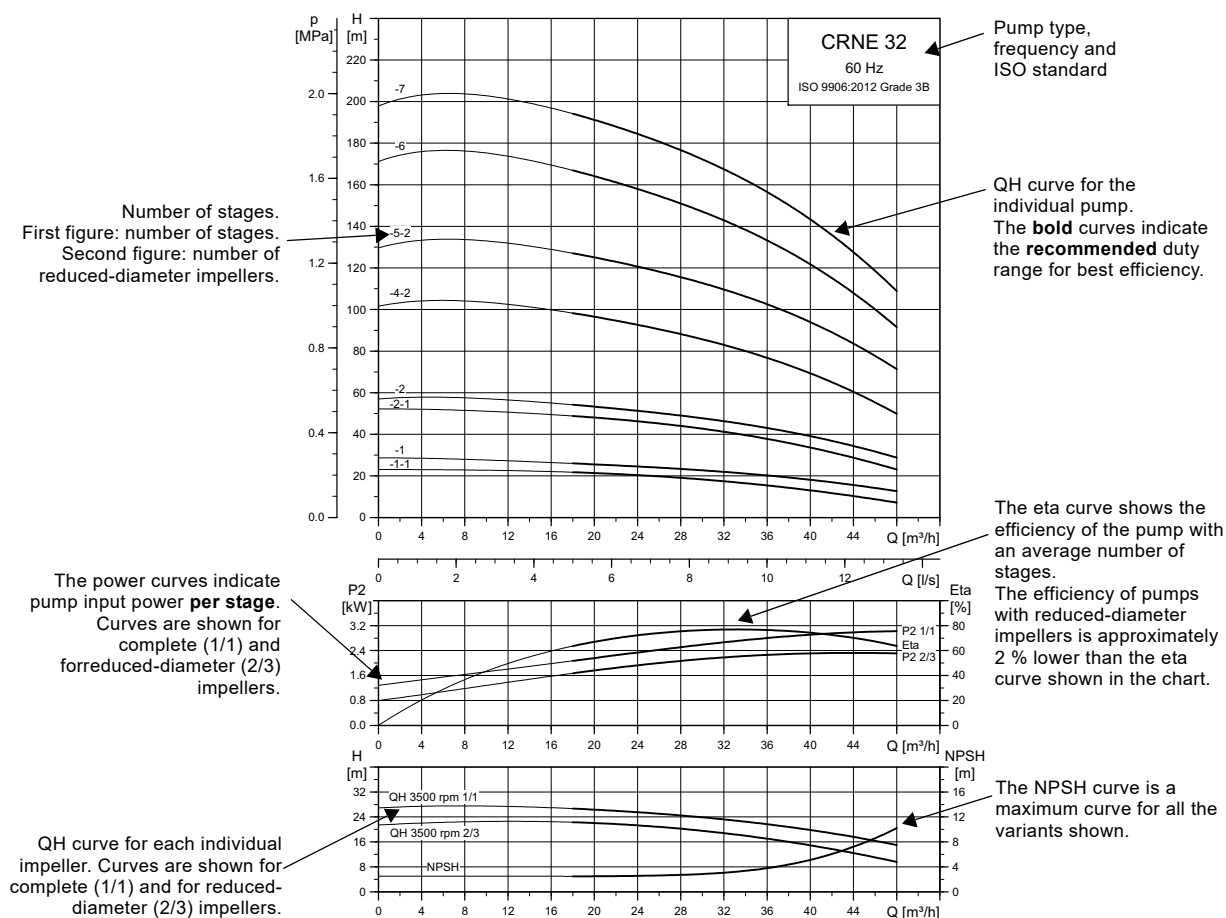


Fig. 28 How to read the curve charts

Guidelines to performance curves

The guidelines below apply to the curves shown on the following pages:

- Tolerances to ISO 9906:2012 Grade 3B, if indicated on the curve chart.
- The motors used for the measurements are standard Grundfos MG or MGE motors.
- Measurements have been made with airless water at a temperature of 20 °C.
- The curves apply to the following kinematic viscosity: $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt).
- Due to the risk of overheating, the pumps must not be used at a flow rate below the minimum flow rate.

The curve below shows the minimum flow rate as a percentage of the rated flow rate in relation to the liquid temperature. The dotted line shows a CR pump fitted with an air-cooled top assembly.

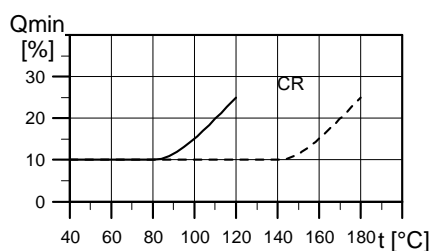


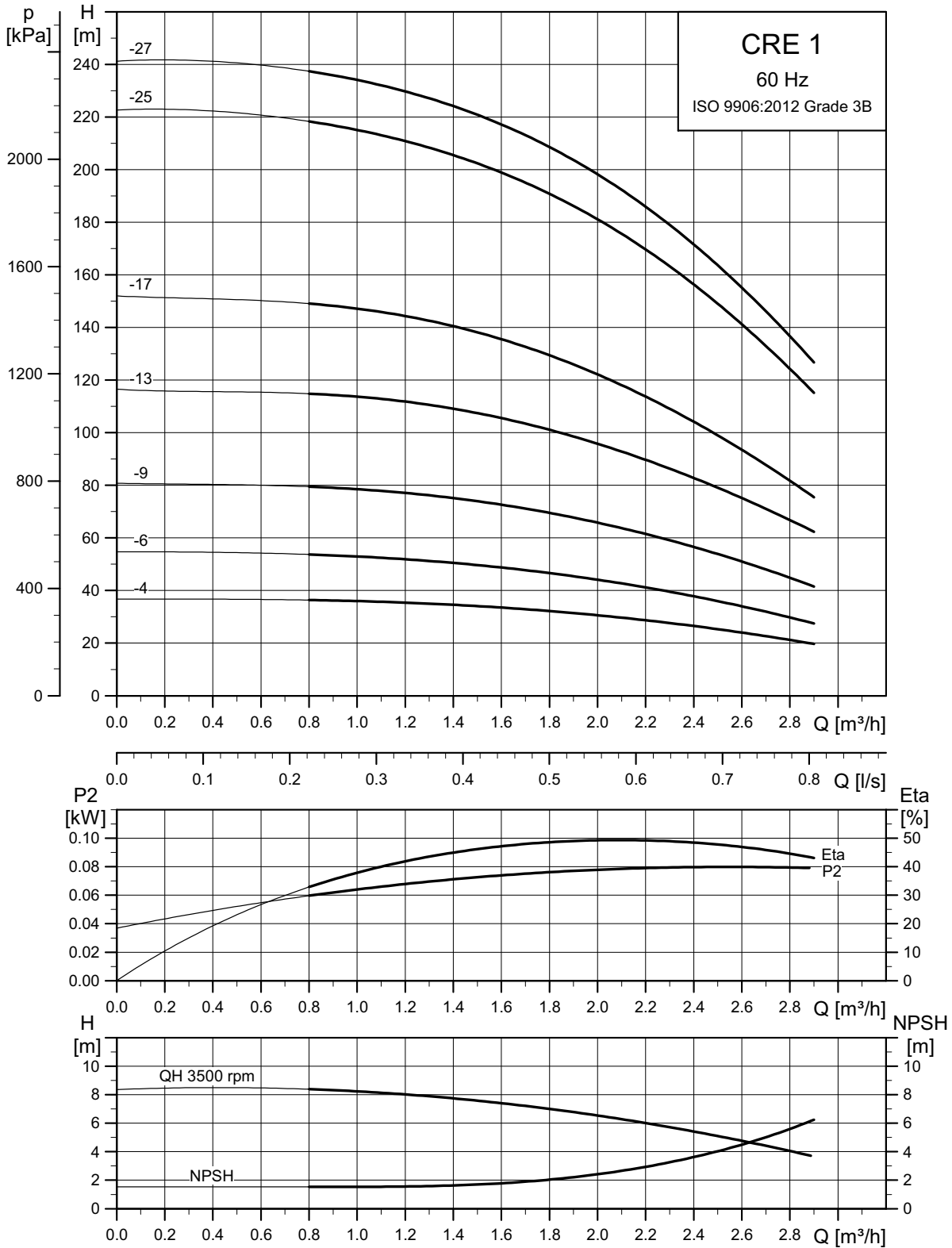
Fig. 29 Minimum flow rate

TM05 6846 0918

TM01 2816 0303

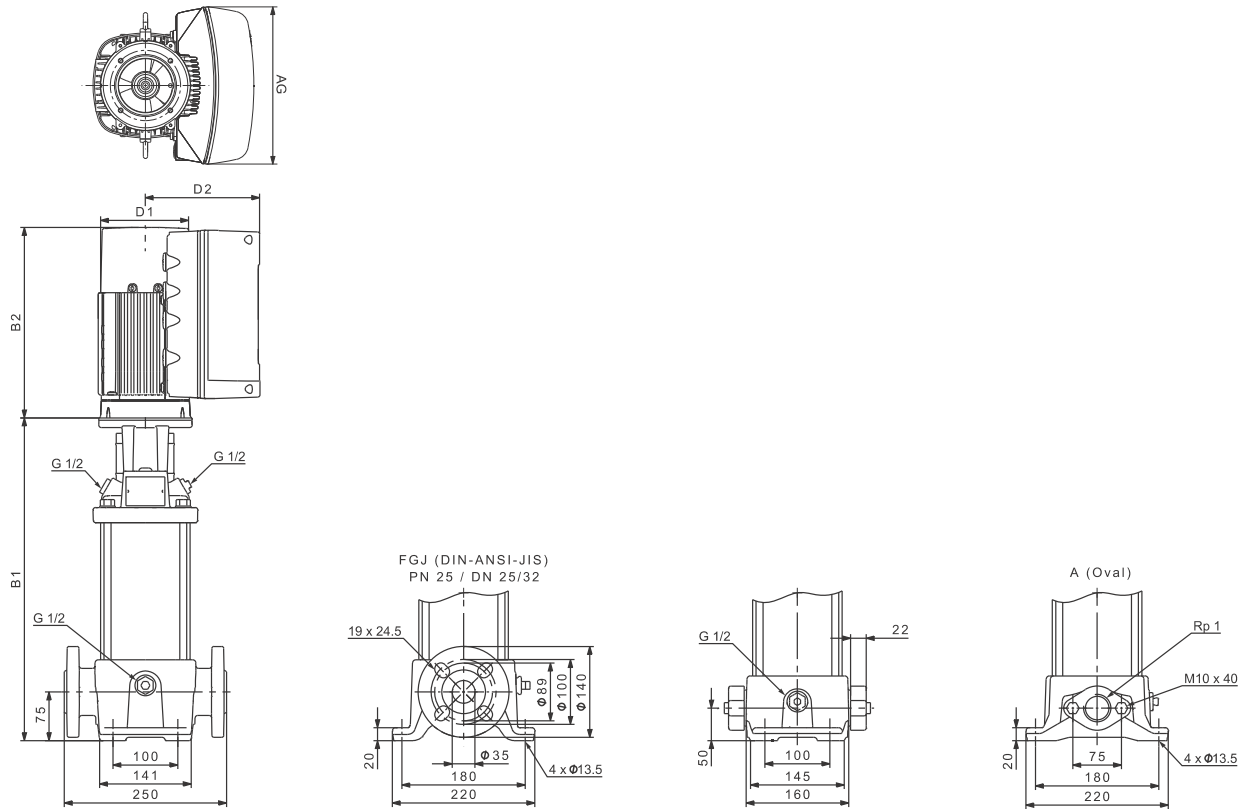
7. Performance curves and technical data

CRE 1



TM05 6833 2719

Dimensional sketches



TM05 9394 3713

Dimensions and weights

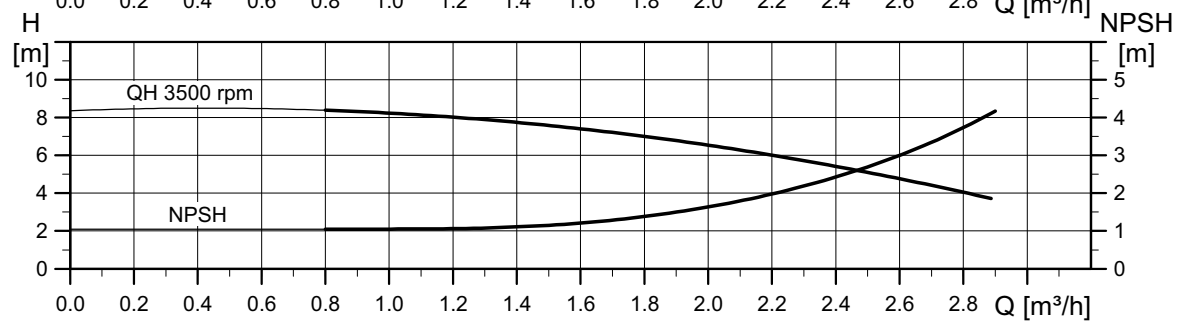
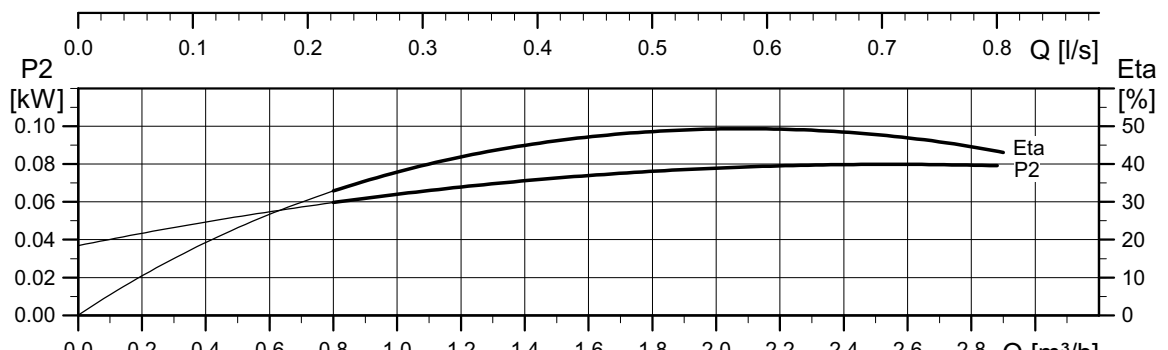
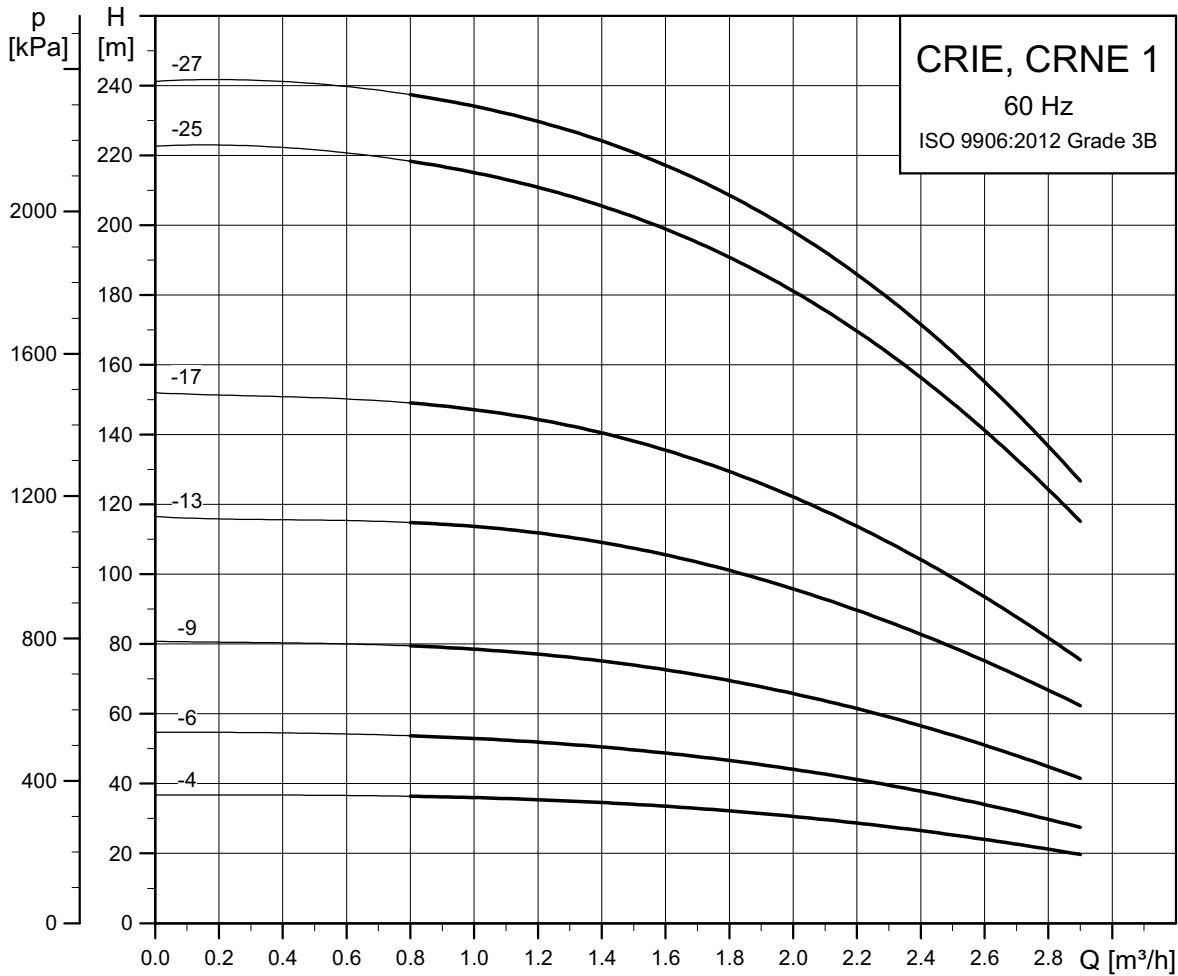
Pump type	P ₂ [kW]	CRE								
		Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	AG	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2					
CRE 1-4	0.37	272	486	297	511	122	158	212	22	26
CRE 1-6	0.55	308	522	333	547	122	158	212	22	27
CRE 1-9	0.75	368	582	393	607	122	158	212	24	29
CRE 1-13	1.1	440	654	465	679	122	158	212	27	31
CRE 1-17	1.5	528	802	553	827	122	158	268	33	38
CRE 1-25	2.2	-	-	697	971	178	167	268	-	42
CRE 1-27	3	-	-	737	1072	191	201	291	-	59

Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.

Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.

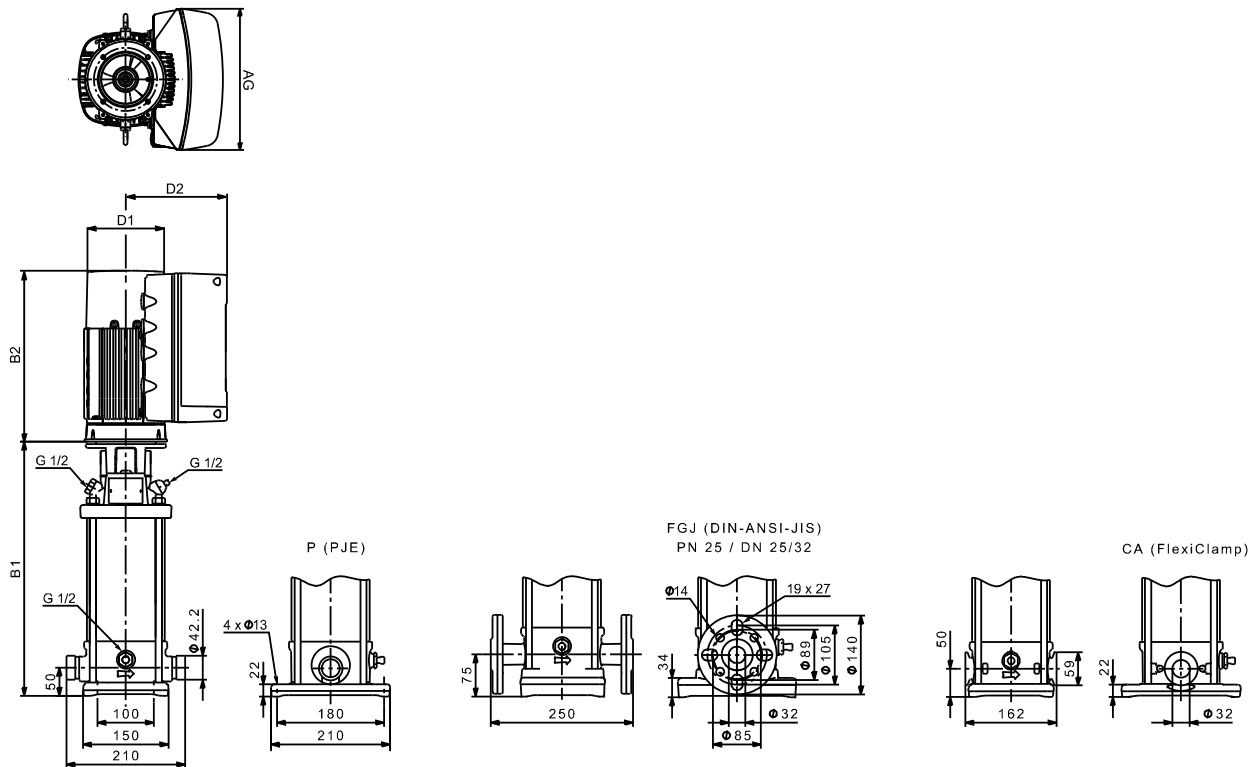
See Grundfos Product Center.

CRIE, CRNE 1



TM05 6834 2719

Dimensional sketches



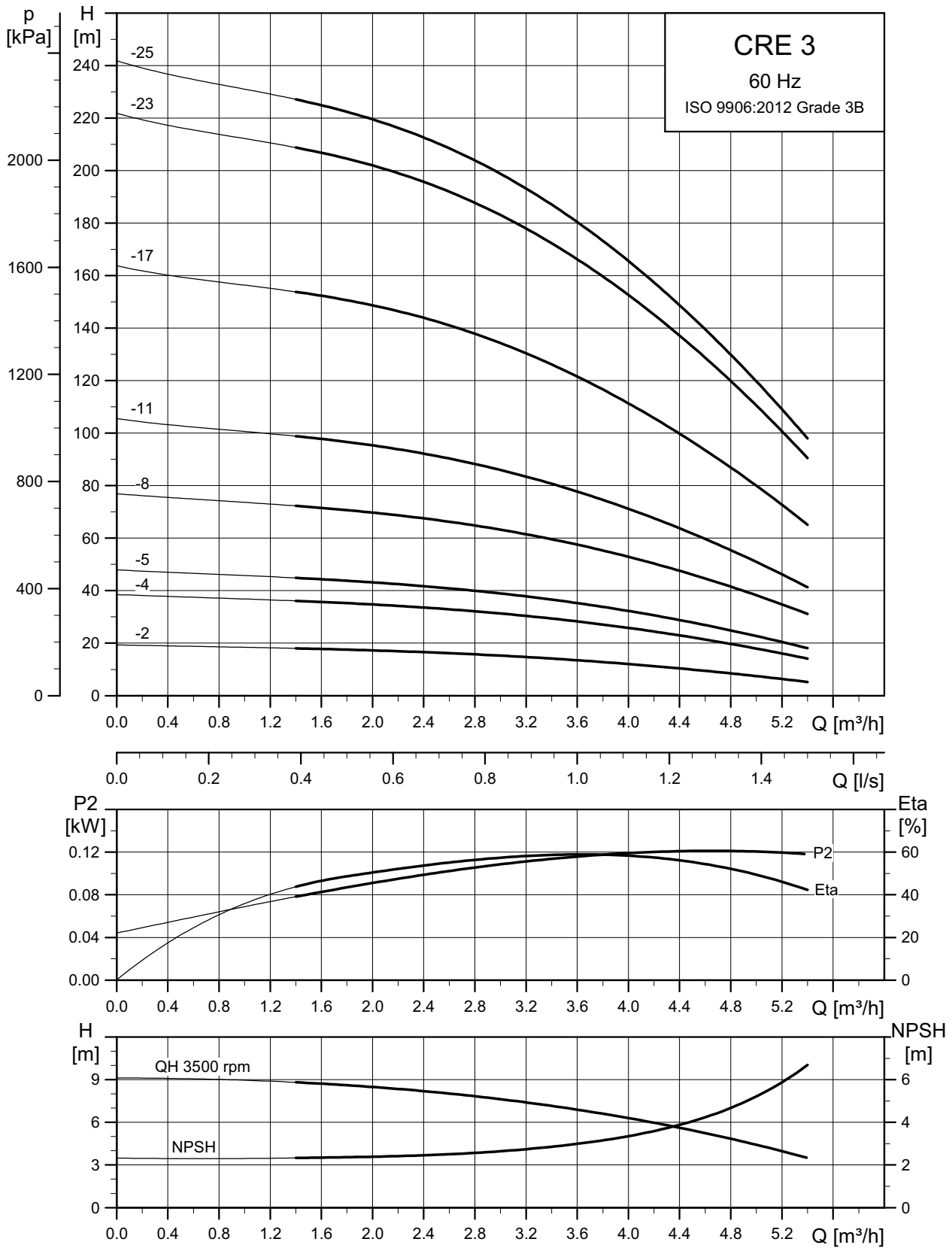
TM05 9395 0916

Dimensions and weights

Pump type	P ₂ [kW]	CRE								
		Dimension [mm]						Net weight [kg]		
		PJE/CA		DIN flange		D1	D2	AG	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2					
CRIE/CRNE 1-4	0.37	275	489	300	514	122	158	212	20	24
CRIE/CRNE 1-6	0.55	311	525	336	550	122	158	212	21	25
CRIE/CRNE 1-9	0.75	371	585	396	610	122	158	212	23	27
CRIE/CRNE 1-13	1.1	443	657	468	682	122	158	212	26	30
CRIE/CRNE 1-17	1.5	531	805	556	830	122	158	268	31	35
CRIE/CRNE 1-25	2.2	675	949	700	974	122	158	268	36	40
CRIE/CRNE 1-27	3	716	1050	741	1075	191	201	291	44	48

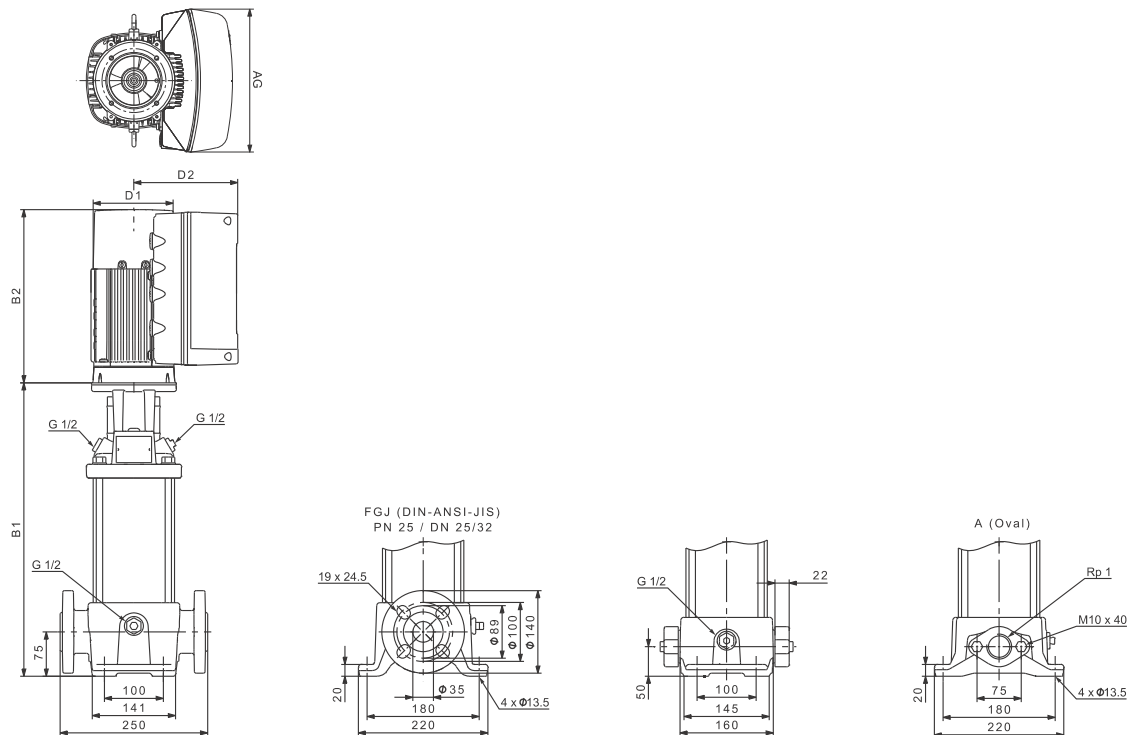
Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRE 3



TM05 6835 2719

Dimensional sketches



TM05 9394 3713

Dimensions and weights

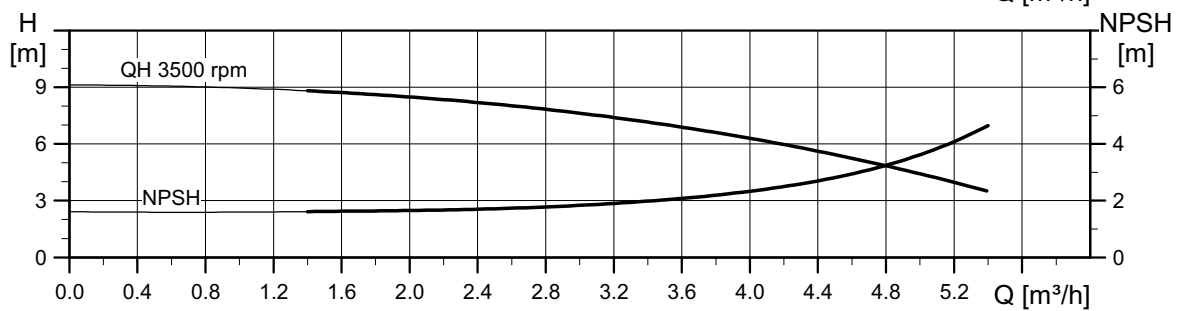
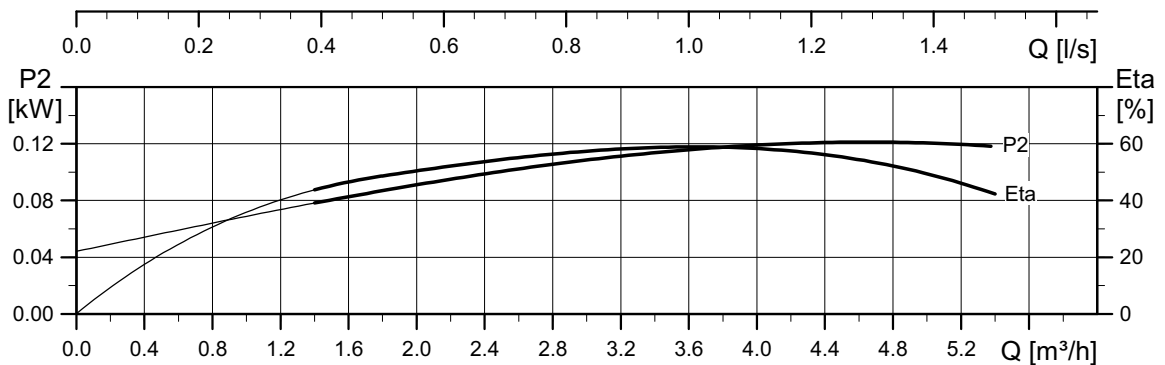
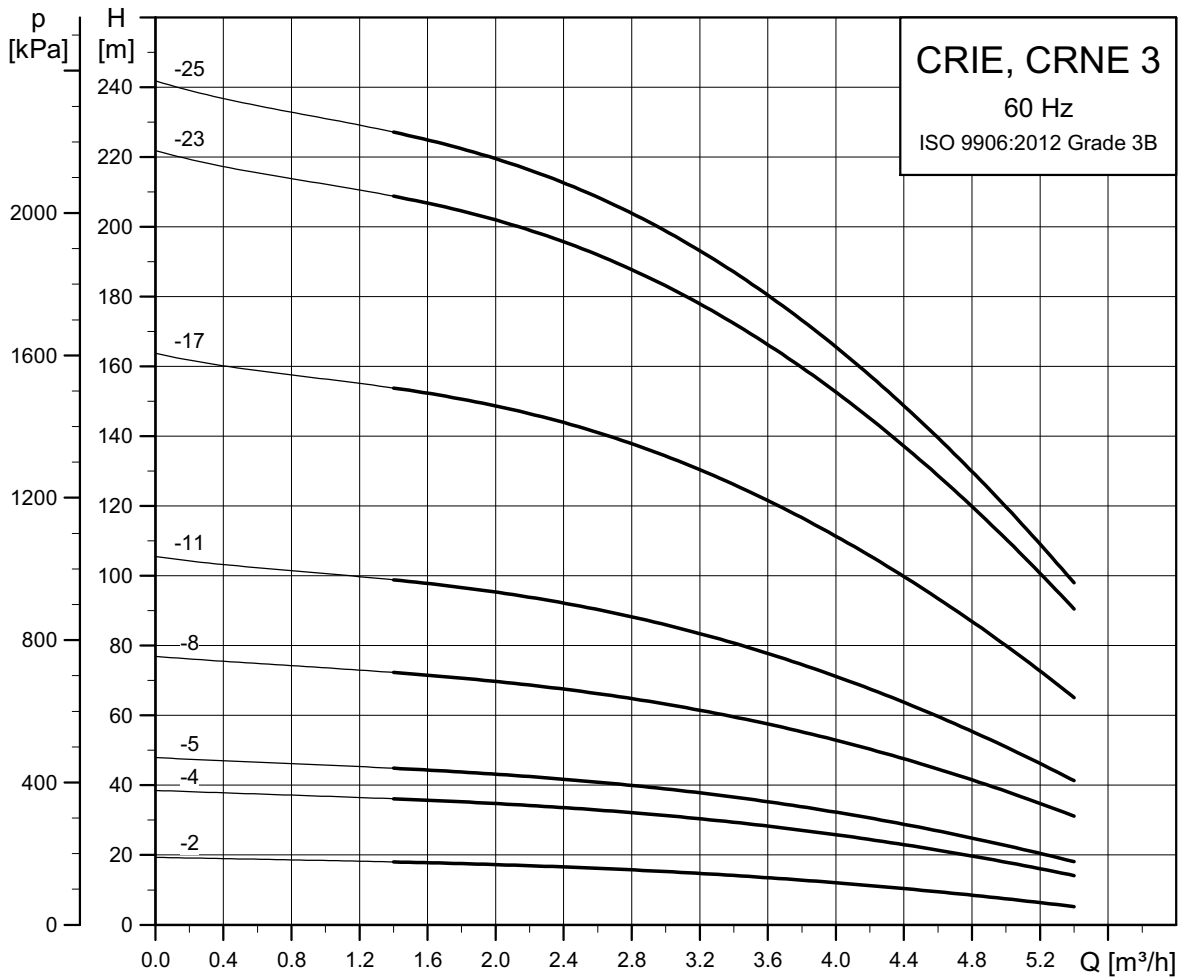
Pump type	P ₂ [kW]	CRE								
		Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	AG	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2					
CRE 3-2	0.37	254	468	279	493	122	158	212	21	26
CRE 3-4	0.55	272	486	297	511	122	158	212	22	26
CRE 3-5	0.75	296	510	321	535	122	158	212	23	27
CRE 3-8	1.1	350	564	375	589	122	158	212	25	29
CRE 3-11	1.5	420	694	445	719	122	158	268	31	35
CRE 3-17	2.2	528	849	553	827	122	158	268	46	39
CRE 3-23	3	-	-	665	999	191	201	291	-	48
CRE 3-25	4	-	-	701	1035	191	201	291	-	57

Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.

Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.

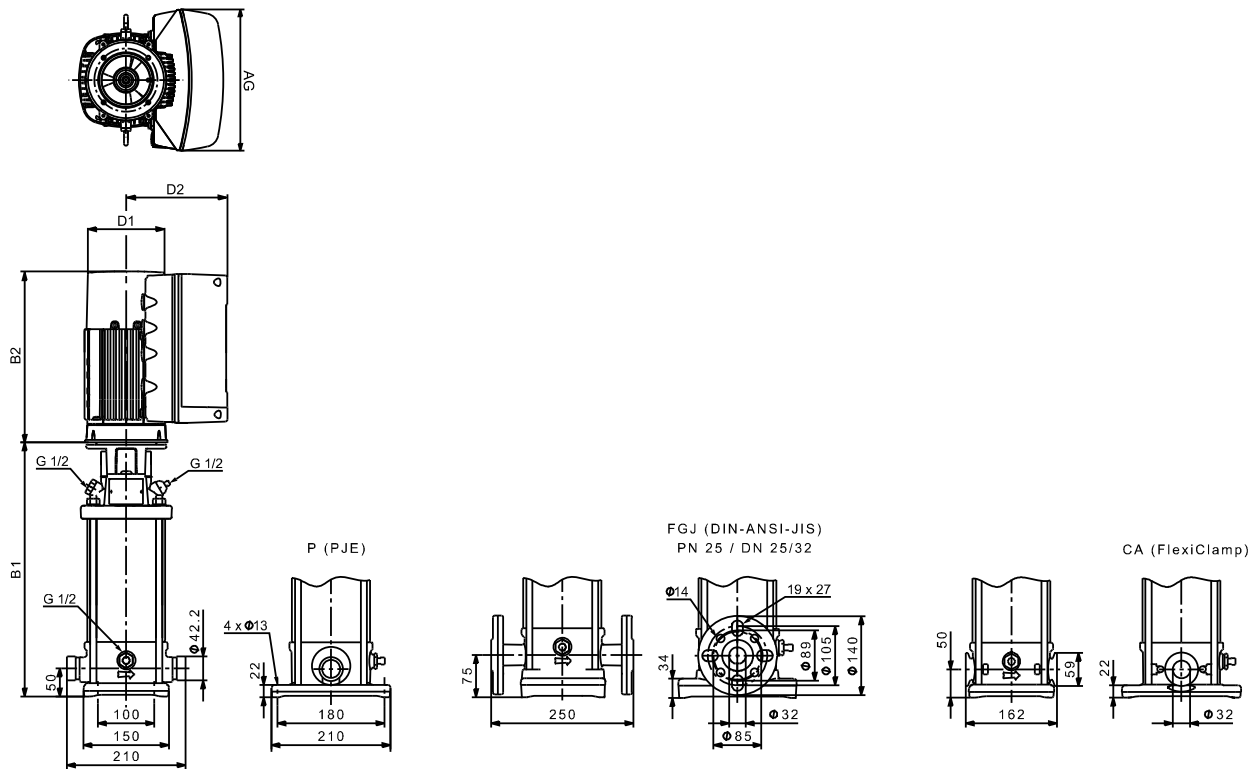
See Grundfos Product Center for dimensions.

CRIE, CRNE 3



TM05 6836 2719

Dimensional sketches



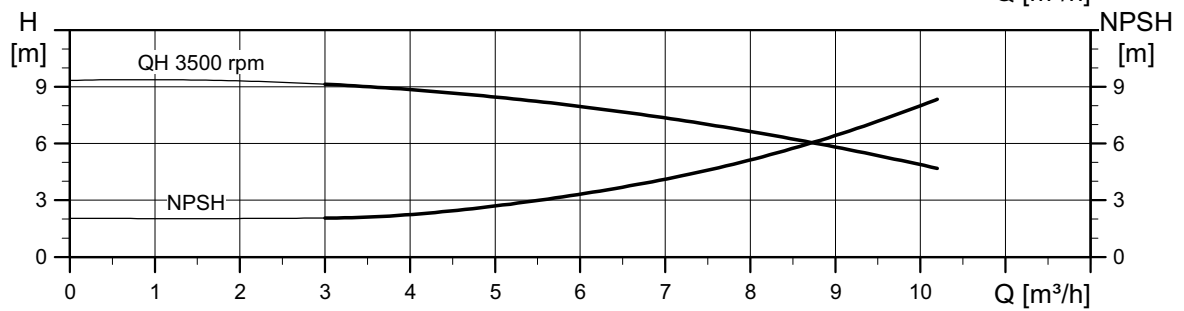
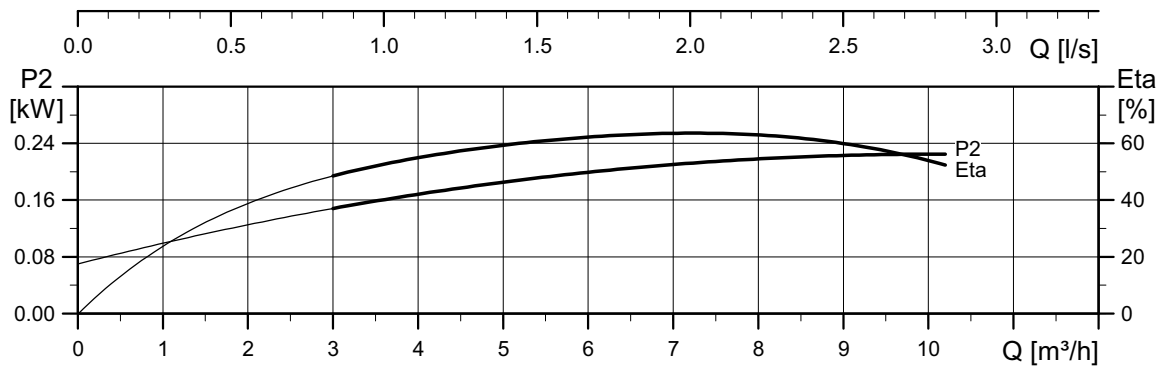
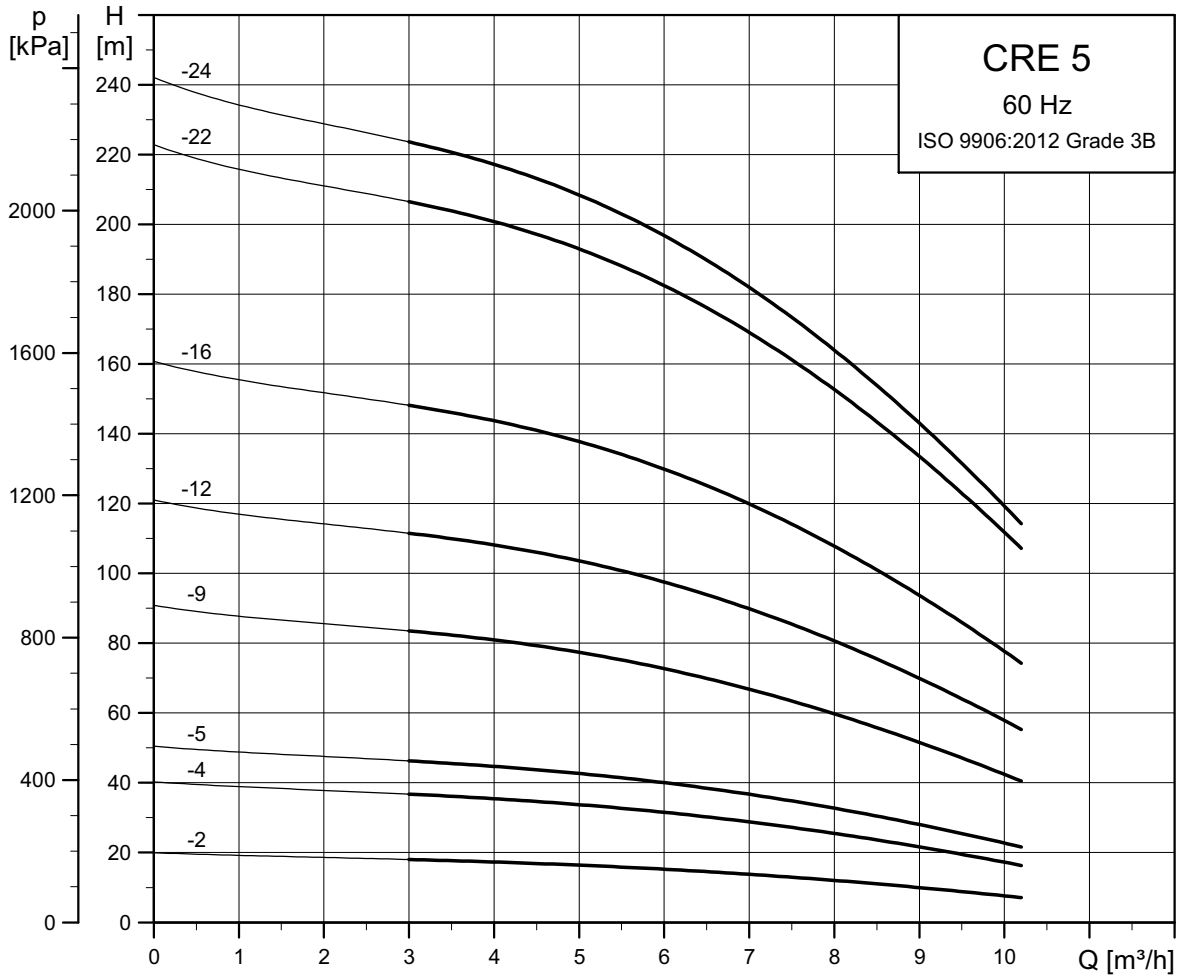
TM05 9395 3813

Dimensions and weights

Pump type	P ₂ [kW]	CRIE/CRNE								
		Dimension [mm]							Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	AG	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2					
CRIE/CRNE 3-2	0.37	257	471	282	496	122	158	212	19	23
CRIE/CRNE 3-4	0.55	275	489	300	514	122	158	212	20	24
CRIE/CRNE 3-5	0.75	299	513	324	538	122	158	212	22	26
CRIE/CRNE 3-8	1.1	353	567	378	592	122	158	212	24	28
CRIE/CRNE 3-11	1.5	423	657	448	682	122	158	268	27	31
CRIE/CRNE 3-17	2.2	531	805	556	830	122	158	268	33	37
CRIE/CRNE 3-23	3	644	978	669	1003	191	201	291	42	46
CRIE/CRNE 3-23	3	644	978	705	1039	191	201	291	42	55

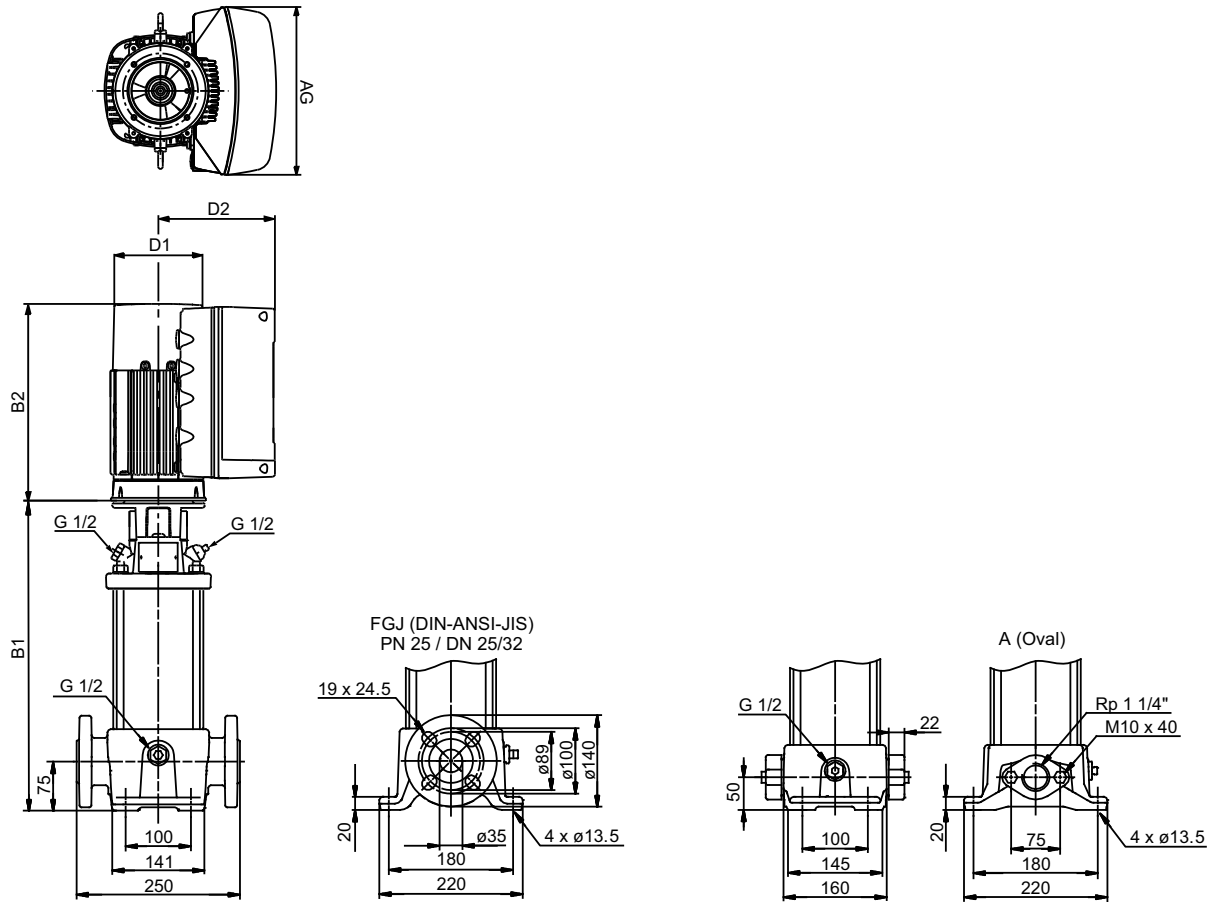
Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRE 5



TM05 6837 2719

Dimensional sketches



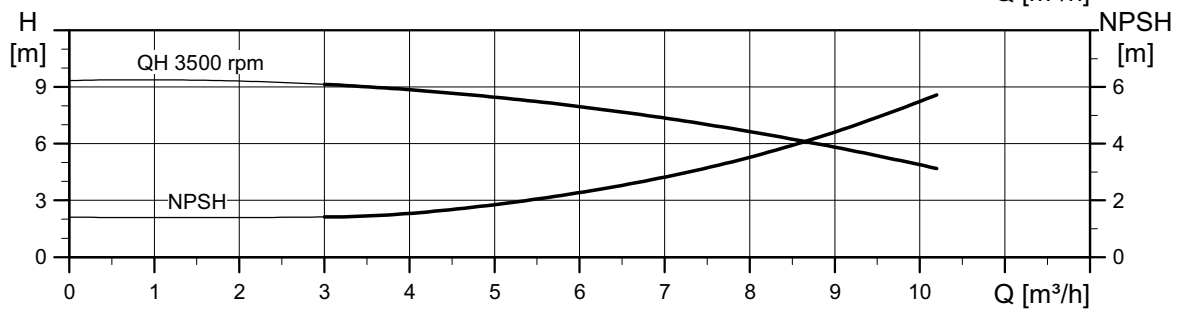
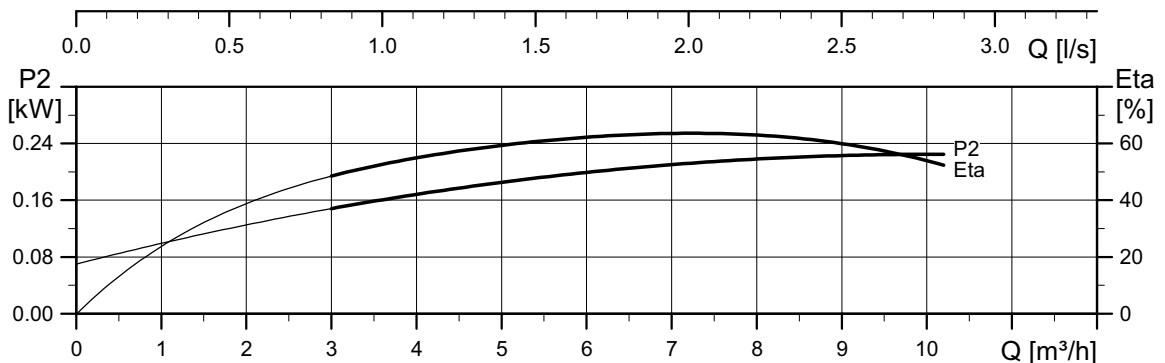
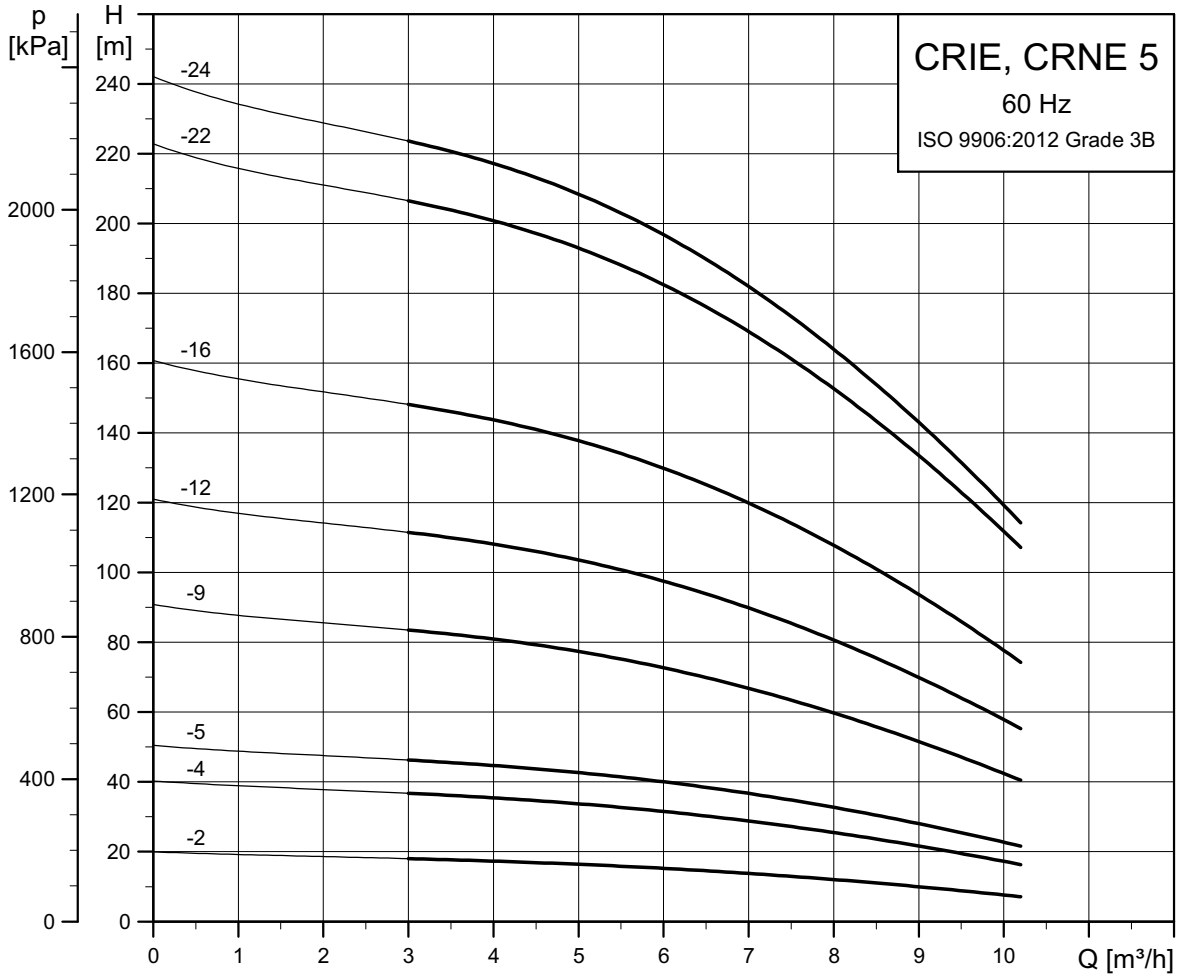
TM06 7709 0916

Dimensions and weights

Pump type	P ₂ [kW]	CRE									
		Dimension [mm]								Net weight [kg]	
		Oval flange		DIN flange		D1	D2	D3	AG	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2								
CRE 5-2	0.55	254	468	279	493	122	158	105	212	21	26
CRE 5-4	1.1	314	528	339	553	122	158	120	212	24	28
CRE 5-5	1.5	357	631	382	656	122	158	135	268	29	34
CRE 5-9	2.2	465	739	490	764	122	158	135	268	33	37
CRE 5-12	3	550	884	575	909	191.3	201	160	291	41	46
CRE 5-16	4	658	992	683	1017	191.3	201	160	291	51	56
CRE 5-22	5.5	-	-	875	1240	191.3	201	300	291	-	74
CRE 5-24	7.5	-	-	929	1318	255	237	300	346	-	81

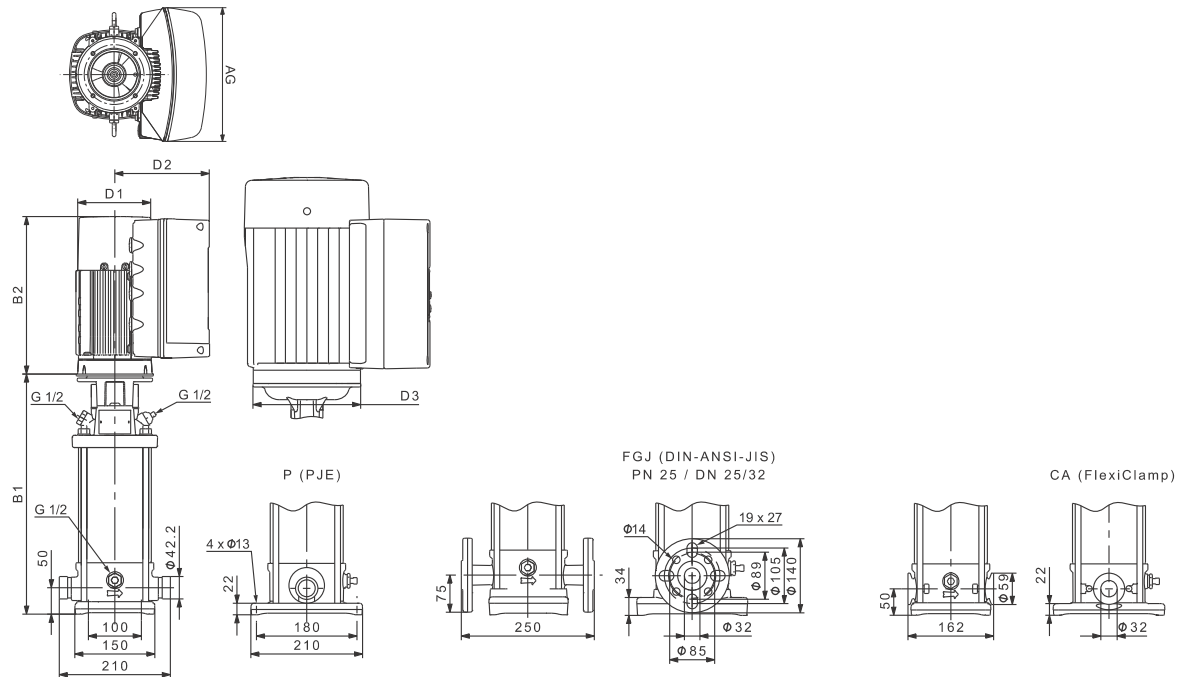
Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRIE, CRNE 5



TM05 6838 2719

Dimensional sketches



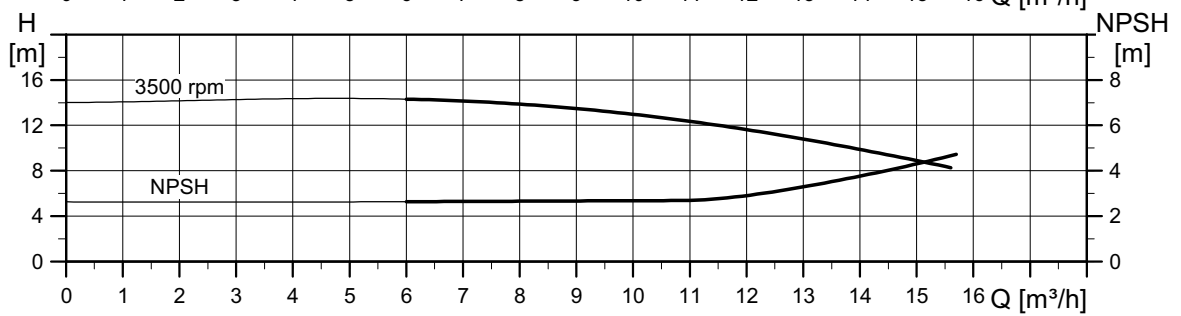
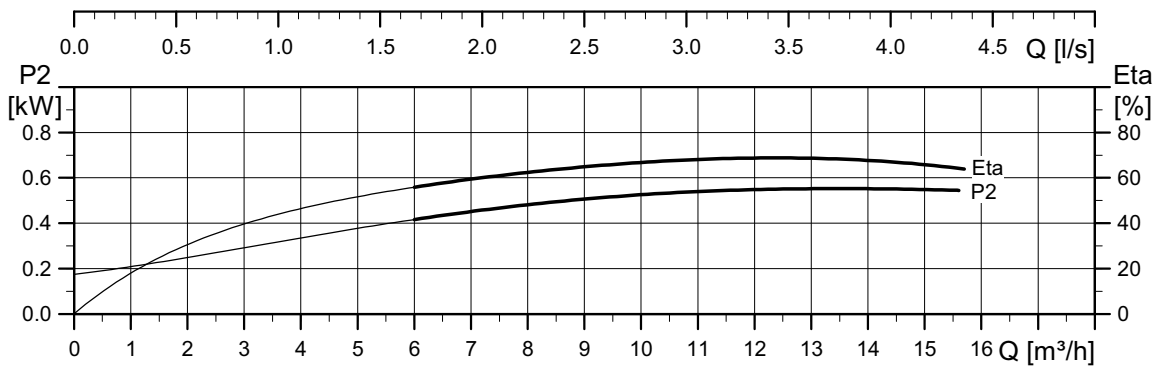
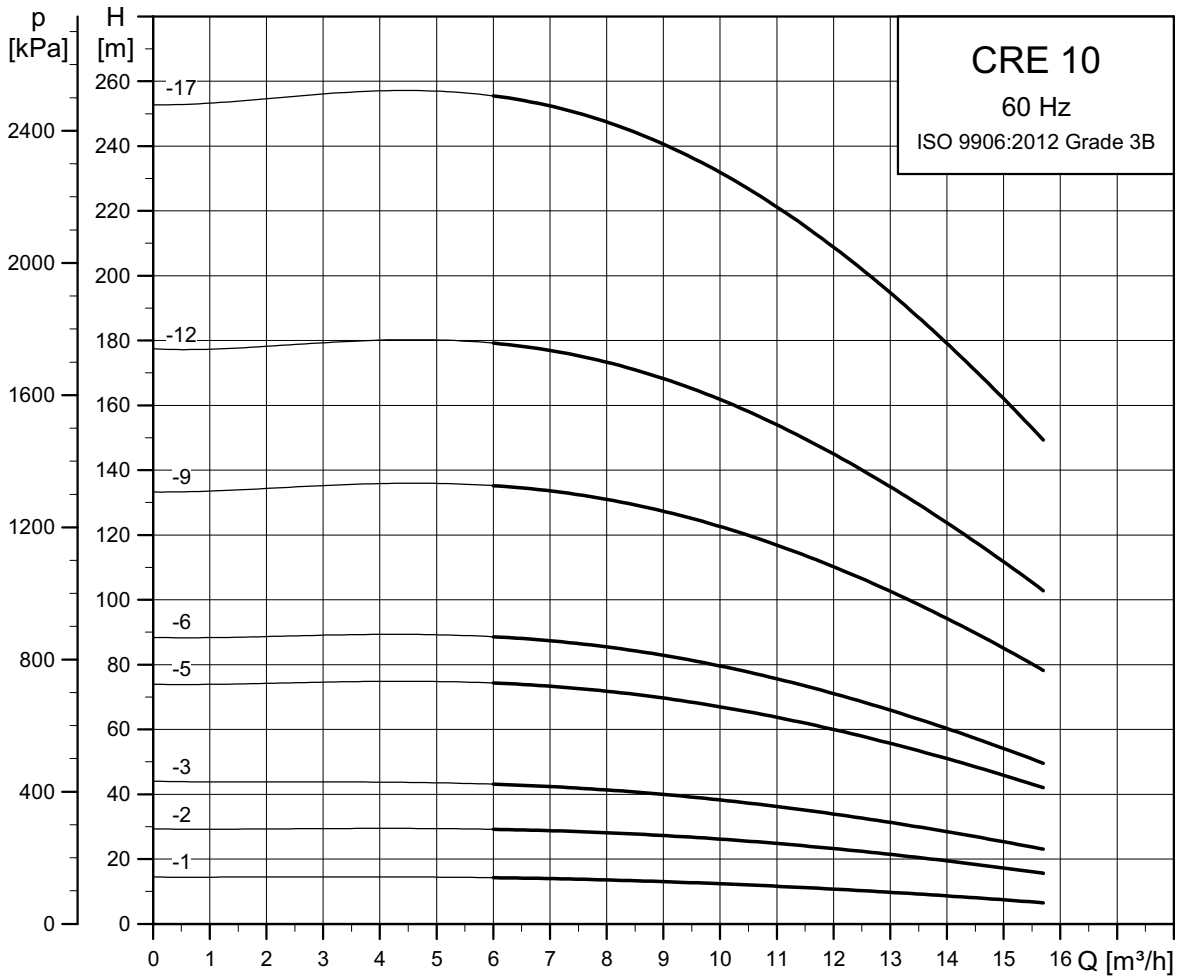
TM05 9397 3713

Dimensions and weights

Pump type	P ₂ [kW]	CRIE/CRNE									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2								
CRIE/CRNE 5-2	0.55	257	471	282	496	122	158	105	212	19	23
CRIE/CRNE 5-4	1.1	317	531	342	556	122	158	120	212	23	27
CRIE/CRNE 5-5	1.5	360	634	385	659	122	158	135	268	27	31
CRIE/CRNE 5-9	2.2	468	742	493	767	122	158	135	268	31	35
CRIE/CRNE 5-12	3	554	888	579	913	191	201	160	291	40	44
CRIE/CRNE 5-16	4	662	996	687	1021	191	201	160	291	50	54
CRIE/CRNE 5-22	5.5	853	1218	878	1243	191	201	300	291	67	71
CRIE/CRNE 5-24	7.5	907	1296	932	1321	255	237	300	346	74	78

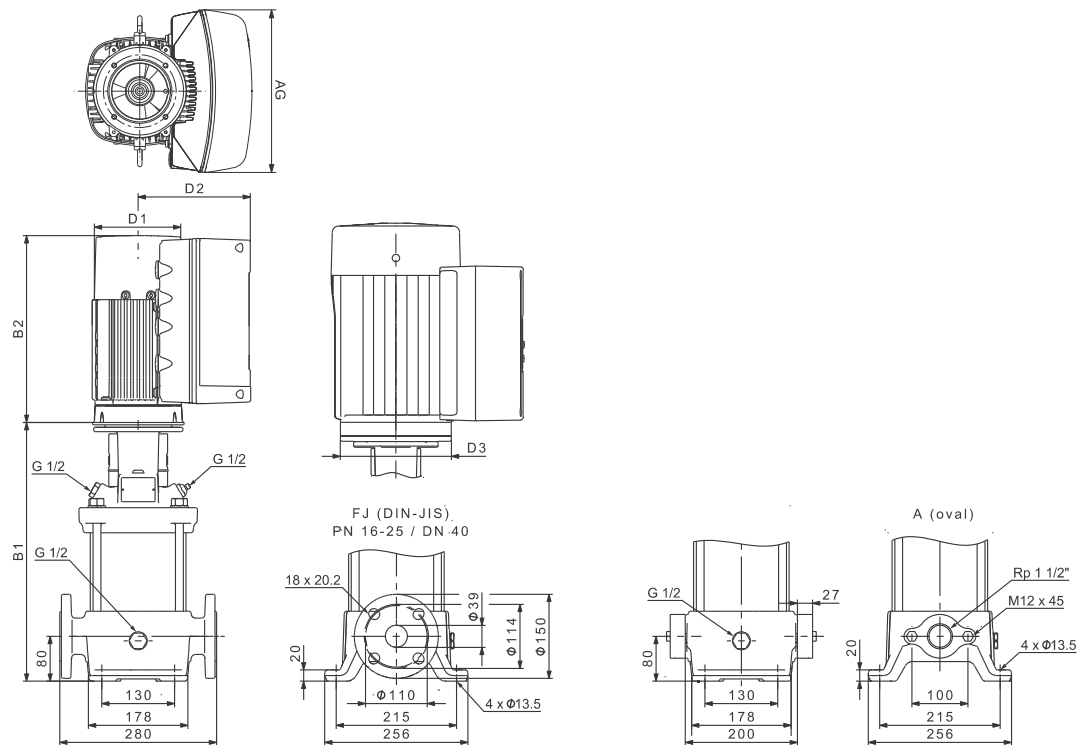
Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRE 10



TM05 6639 27 19

Dimensional sketches



TM05 9398 3713

Dimensions and weights

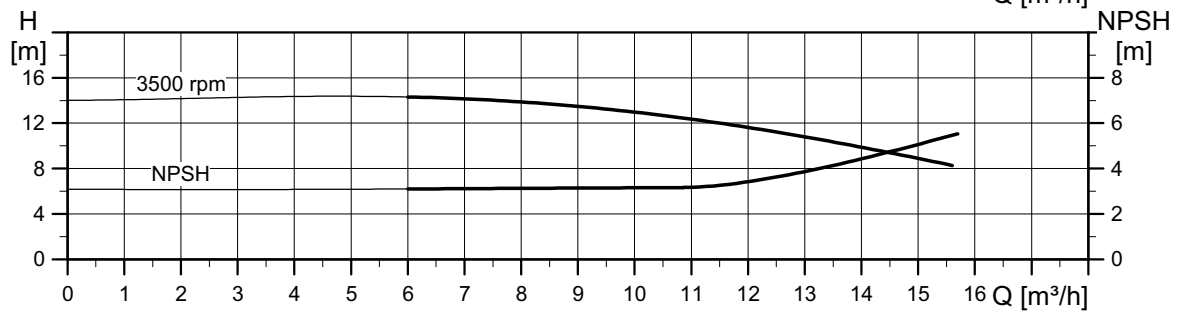
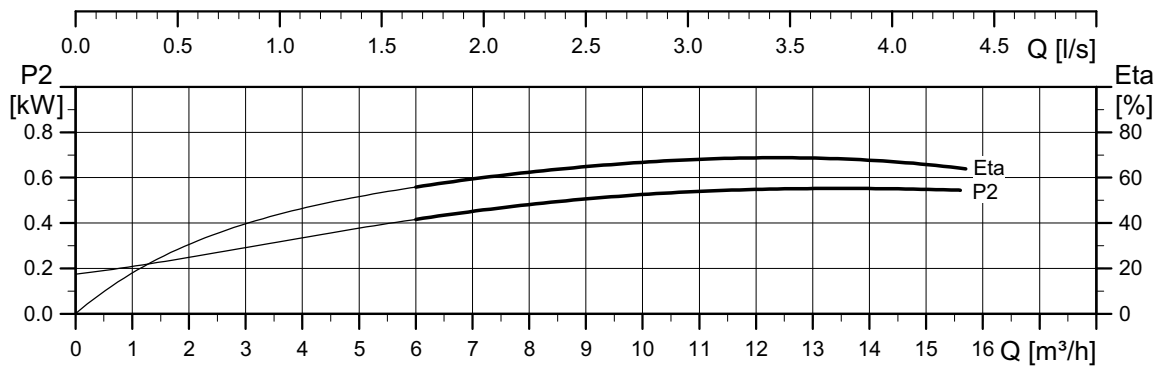
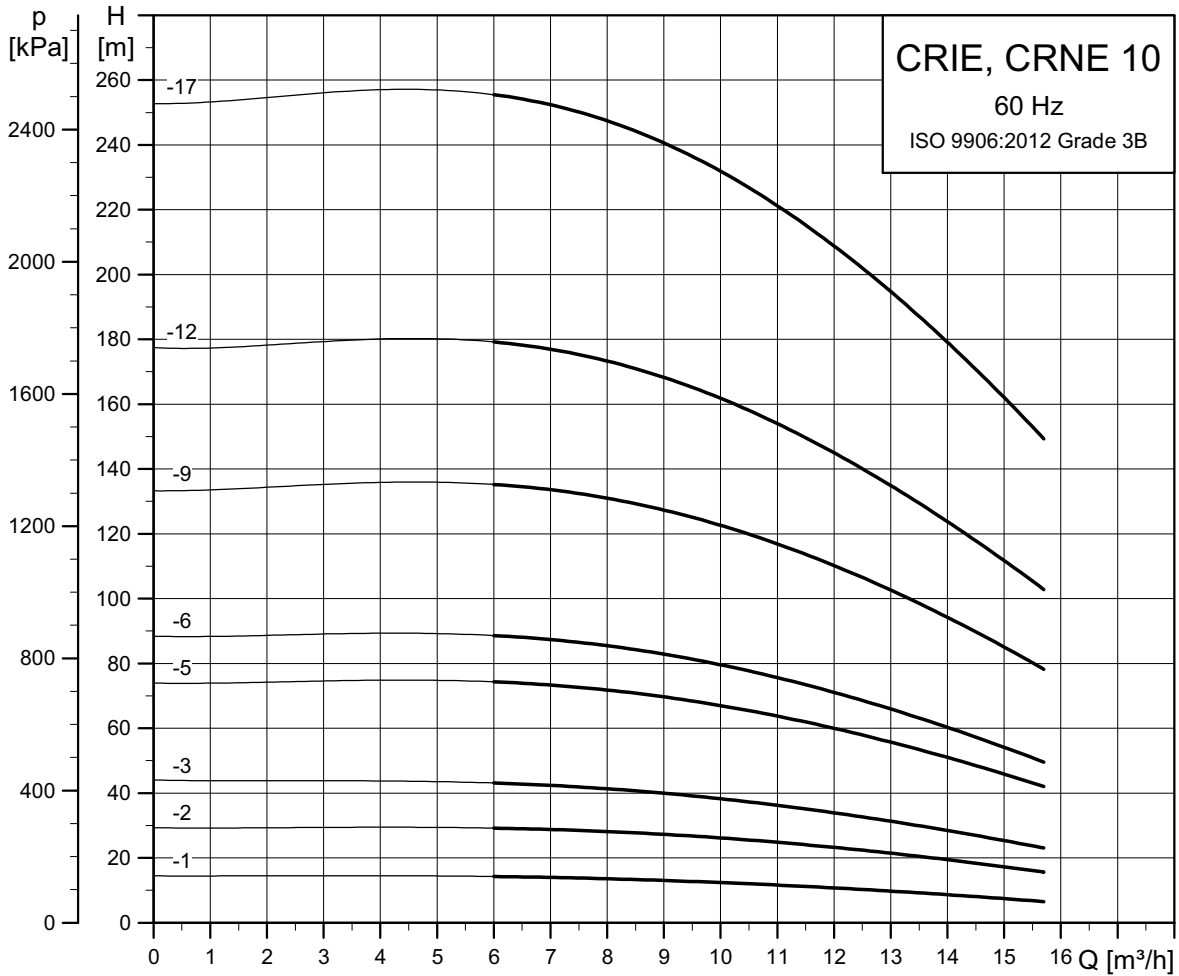
Pump type	P ₂ [kW]	CRE									Net weight [kg]	
		Dimension [mm]				D1	D2	D3	AG	Oval flange	DIN flange	
		Oval flange		DIN flange								
B1	B1+B2	B1	B1+B2									
CRE 10-1	0.75	347	561	347	561	122	158	120	212	35	37	
CRE 10-2	1.5	363	637	363	637	122	158	135	268	40	43	
CRE 10-3	2.2	393	667	393	667	122	158	135	268	43	45	
CRE 10-5	3	458	792	458	792	191	201	160	291	51	54	
CRE 10-6	4	488	822	488	822	191	201	160	291	60	63	
CRE 10-9	5.5	610	975	610	975	191	201	300	291	84	86	
CRE 10-12	7.5	-	-	700	1089	255	237	300	346	-	95	

Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.

Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.

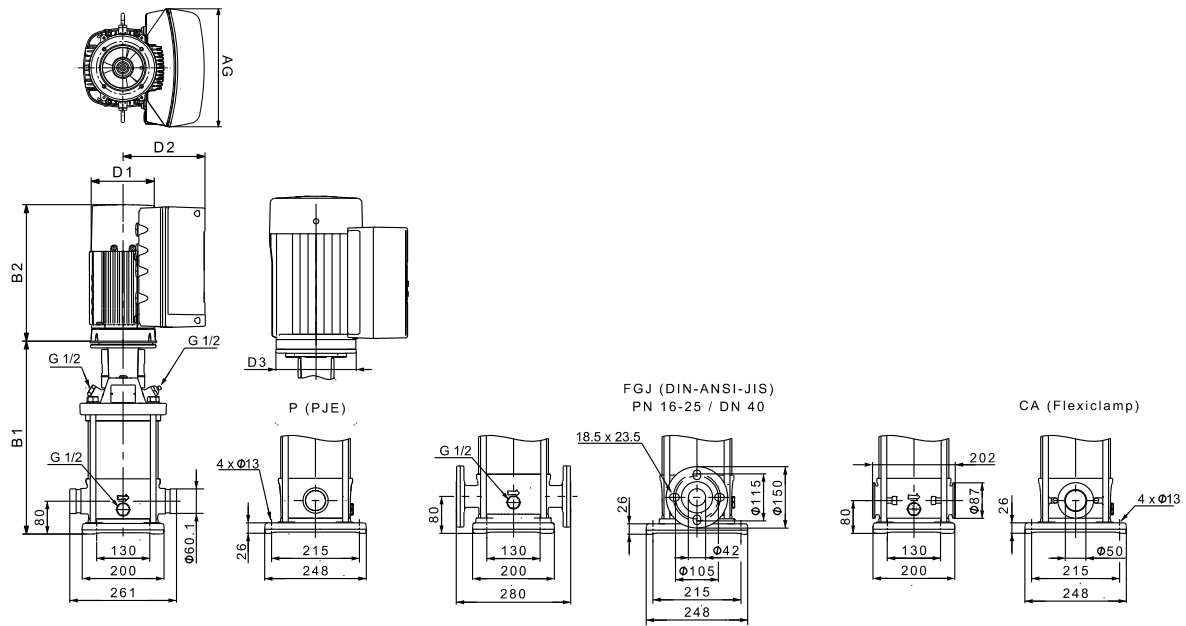
See Grundfos Product Center for dimensions.

CRIE, CRNE 10



TM05 6840 2719

Dimensional sketches



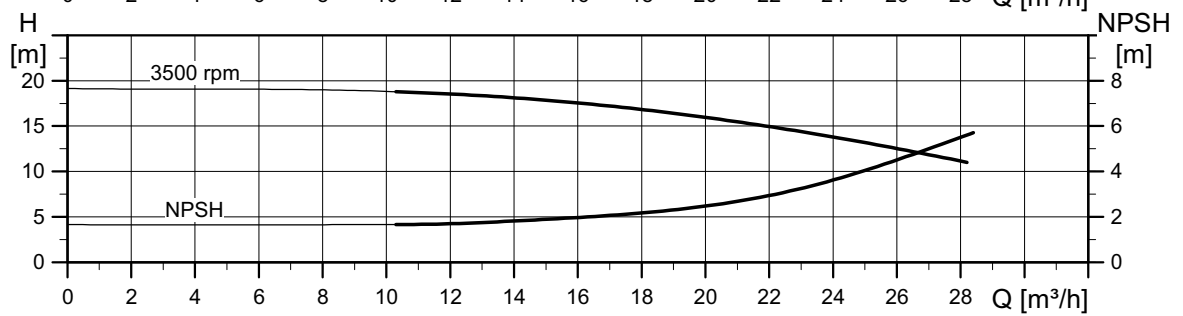
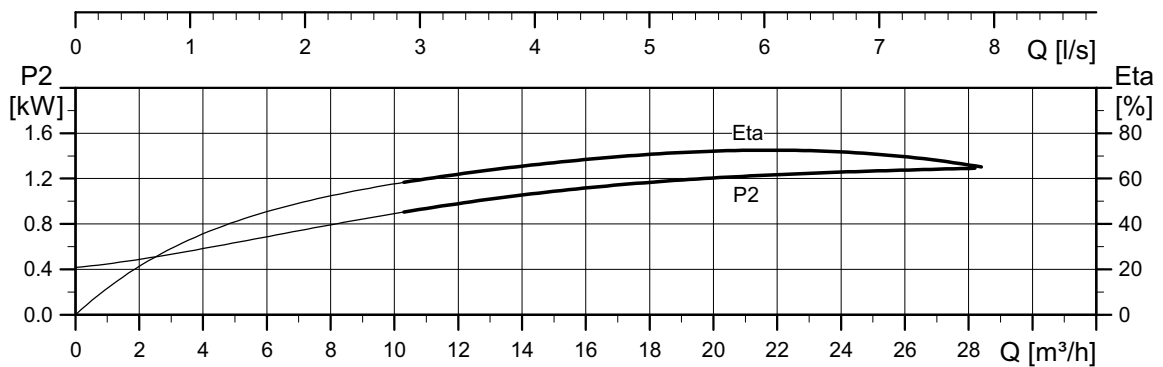
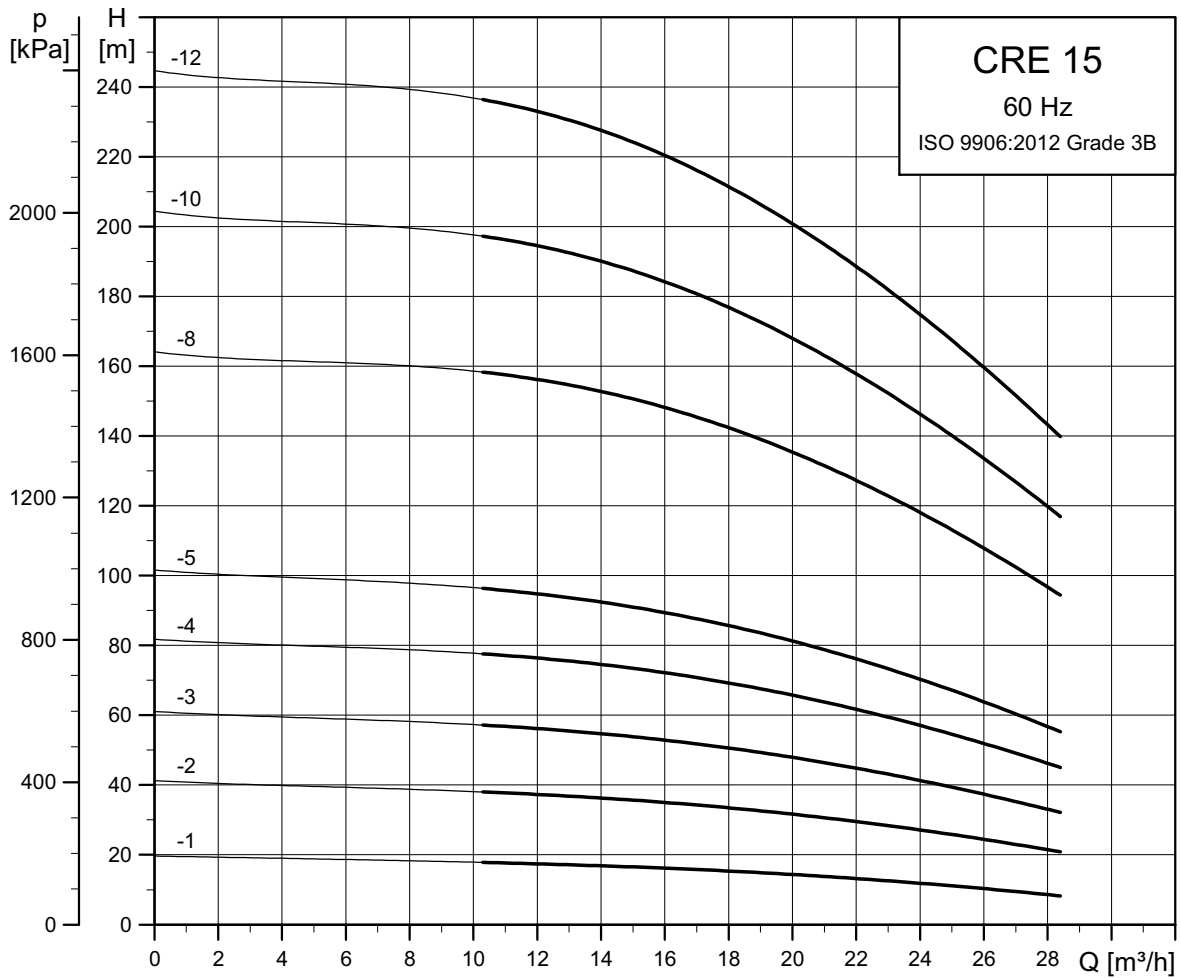
TM05 9401 3713

Dimensions and weights

Pump type	P ₂ [kW]	CRIE/CRNE									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						
CRIE/CRNE 10-1	0.75	357	571	357	571	122	158	120	212	32	35
CRIE/CRNE 10-2	1.5	373	647	373	647	122	158	135	268	38	41
CRIE/CRNE 10-3	2.2	403	677	403	677	122	158	135	268	40	44
CRIE/CRNE 10-5	3	468	802	468	802	191	201	160	291	49	53
CRIE/CRNE 10-6	4	498	832	498	832	191	201	160	291	58	62
CRIE/CRNE 10-9	5.5	620	985	620	985	191	201	300	291	81	85
CRIE/CRNE 10-12	7.5	710	1099	710	1099	255	237	300	346	91	94

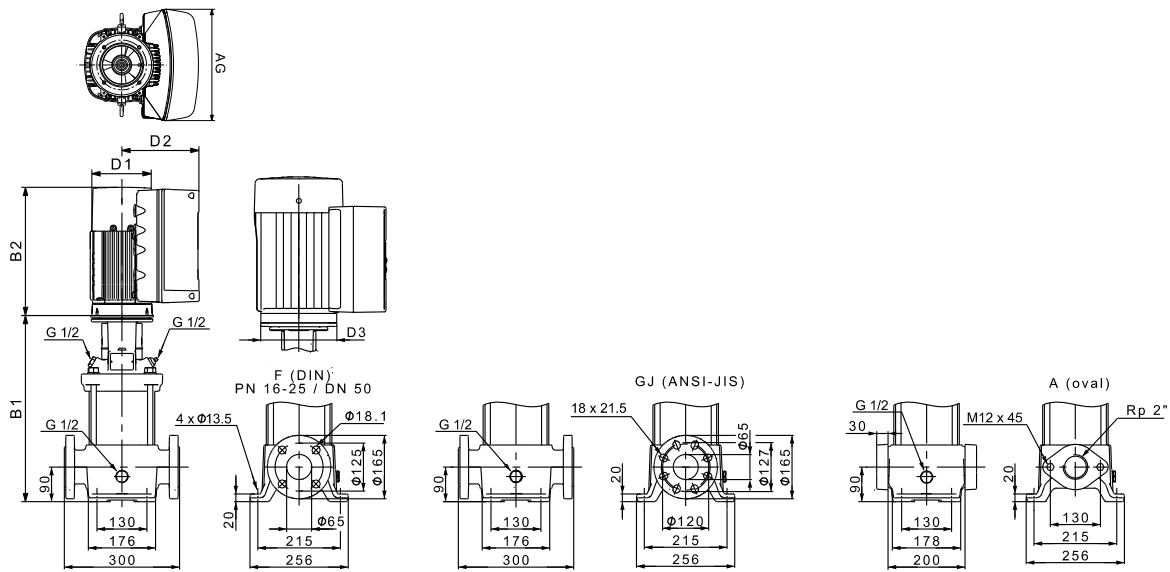
Pumps fitted with single-phase MGE motors (0.37, 0.55, 0.75 or 1.1 kW) can as an option be fitted with three-phase MGE motors.
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRE 15



TM05 6841 2719

Dimensional sketches



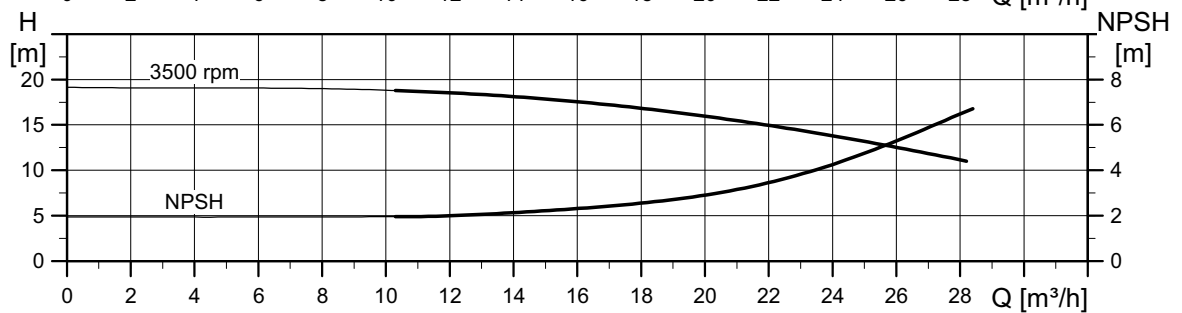
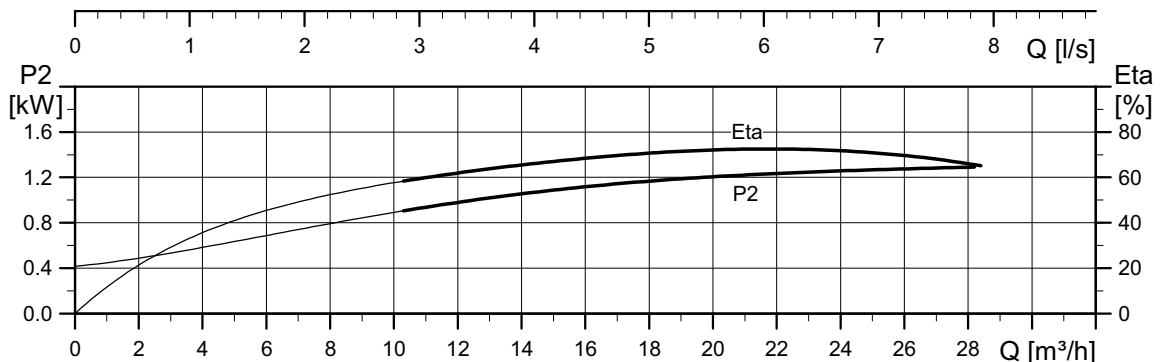
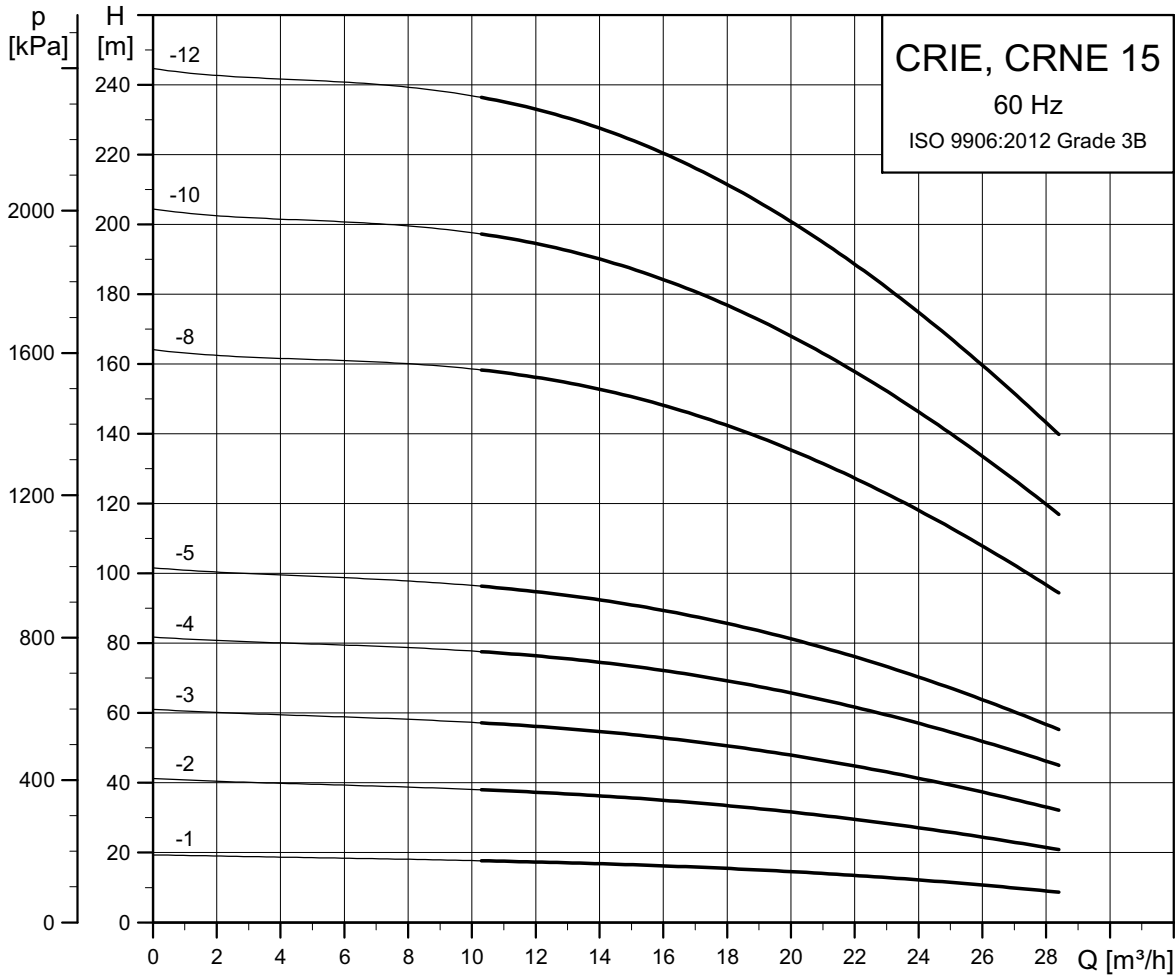
TM05 9399 3713

Dimensions and weights

Pump type	P ₂ [kW]	CRE									
		Dimension [mm]								Net weight [kg]	
		Oval flange		DIN flange		D1	D2	D3	AG	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2						
CRE 15-1	1.5	415	689	415	689	122	158	135	268	46	47
CRE 15-2	3	420	754	420	754	191	201	160	291	54	55
CRE 15-3	4	465	799	465	799	191	201	160	291	63	64
CRE 15-4	5.5	542	907	542	907	191	201	300	291	85	86
CRE 15-5	7.5	587	976	587	976	255	237	300	346	93	93
CRE 15-8	11	-	-	799	1205	255	237	350	346	-	122
CRE 15-10	15	-	-	904	1386	318	308	350	420	-	211
CRE 15-12	18.5	-	-	994	1520	318	308	350	420	-	226

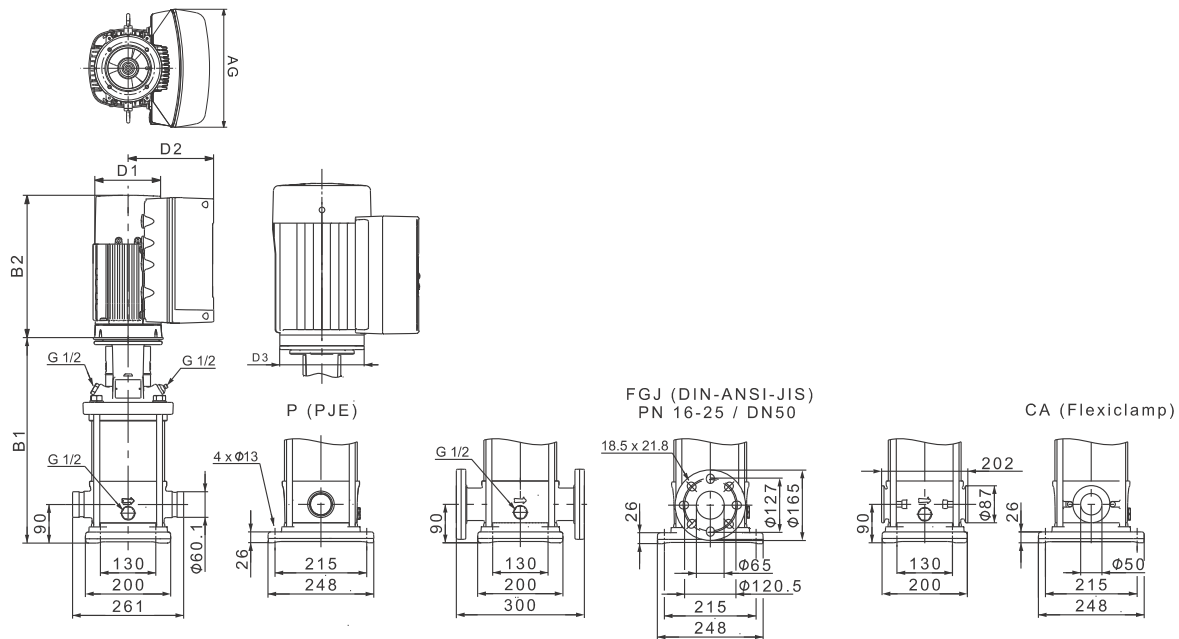
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRIE, CRNE 15



TM50 6842 2719

Dimensional sketches



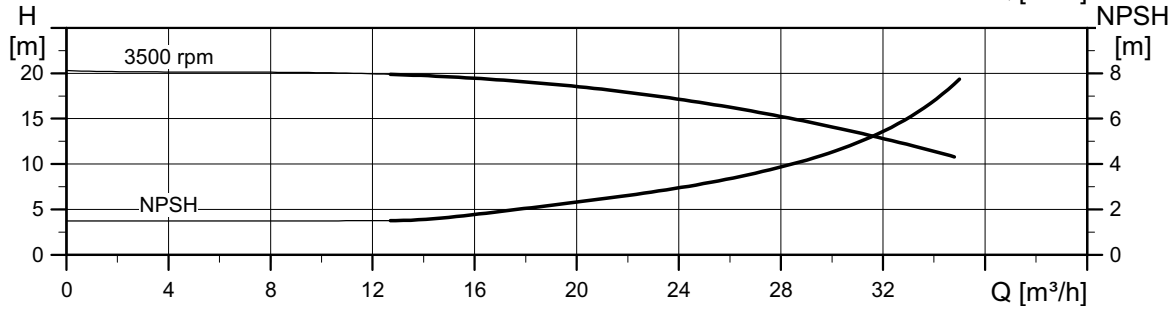
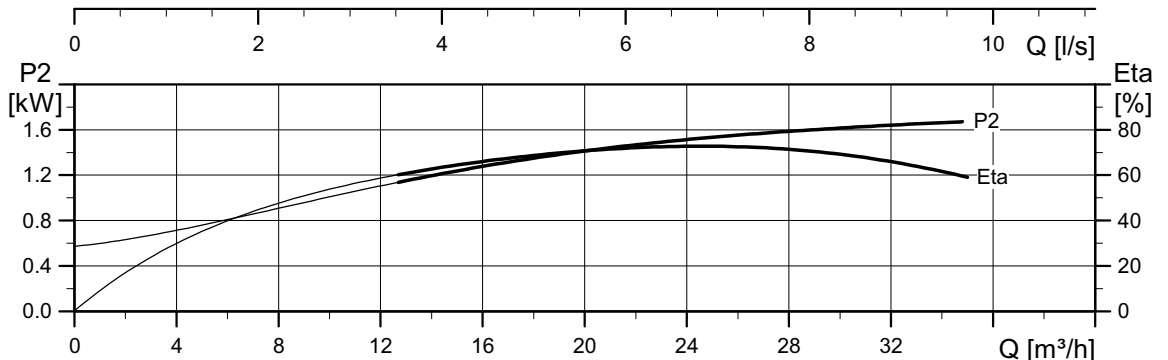
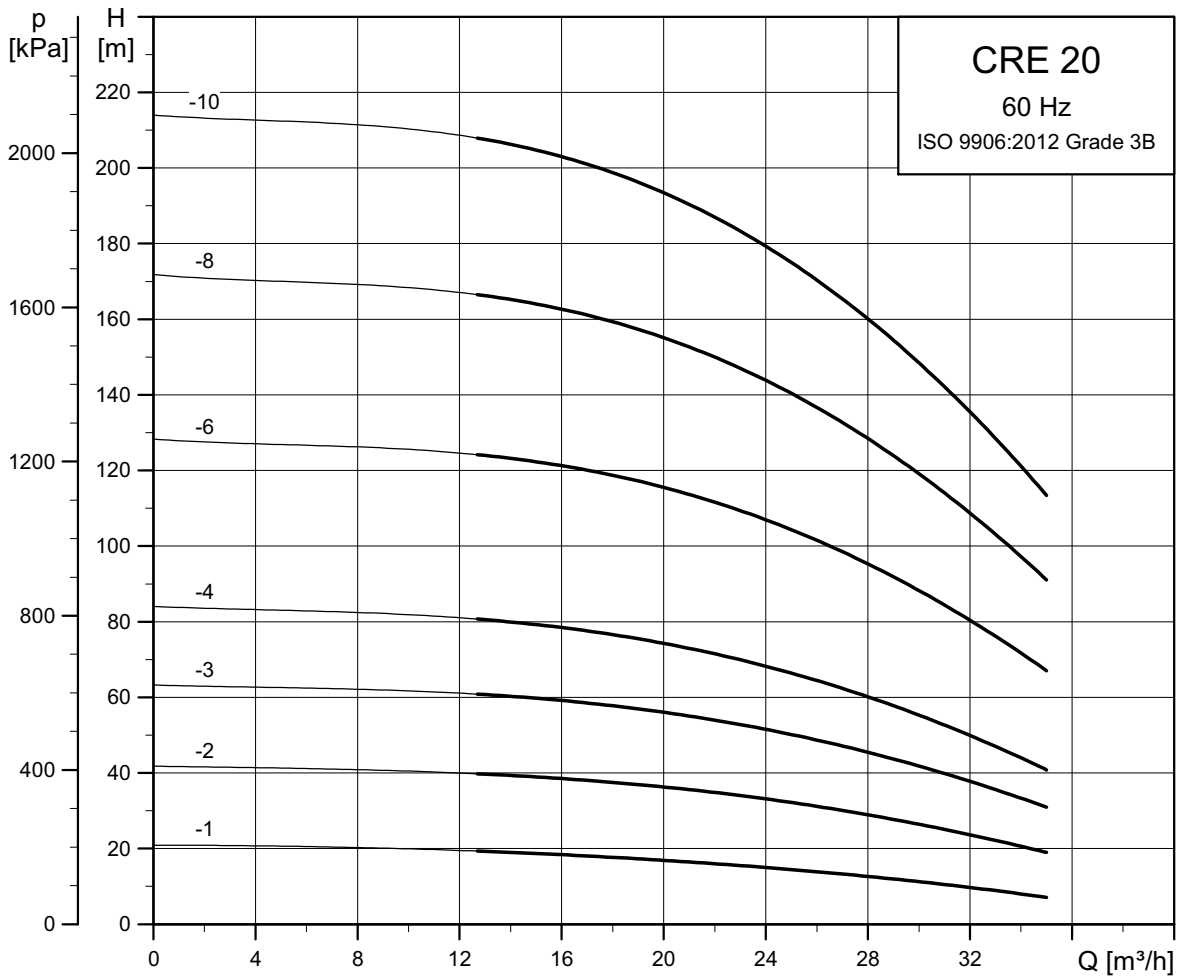
TM05 9400 3713

Dimensions and weights

Pump type	P ₂ [kW]	CRIE/CRNE									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2								
CRIE/CRNE 15-1	1.5	413	687	413	687	122	158	135	268	39	43
CRIE/CRNE 15-2	3	418	752	418	752	191	201	160	291	48	52
CRIE/CRNE 15-3	4	463	797	463	797	191	201	160	291	57	61
CRIE/CRNE 15-4	5.5	540	905	540	905	191	201	300	291	78	83
CRIE/CRNE 15-5	7.5	585	974	585	974	255	237	300	346	86	91
CRIE/CRNE 15-8	11	797	1203	797	1203	255	237	350	346	115	120
CRIE/CRNE 15-10	15	902	1384	902	1384	318	308	350	420	203	207
CRIE/CRNE 15-12	18.5	992	1518	992	1518	318	308	350	420	218	223

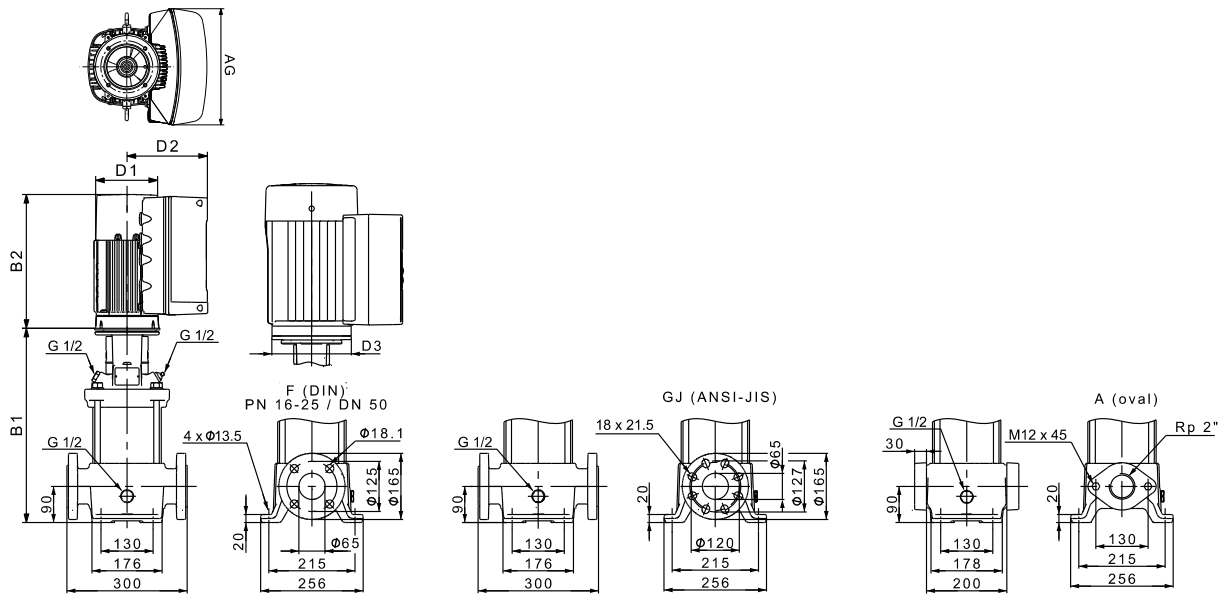
Pumps fitted with 1.5 kW three-phase MGE motors can as an option be fitted with single-phase MGE motors.
See Grundfos Product Center for dimensions.

CRE 20



TM506843 2719

Dimensional sketches

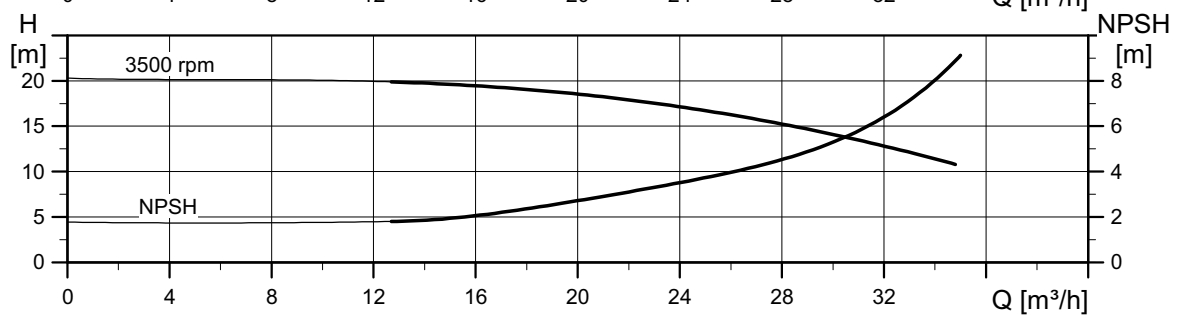
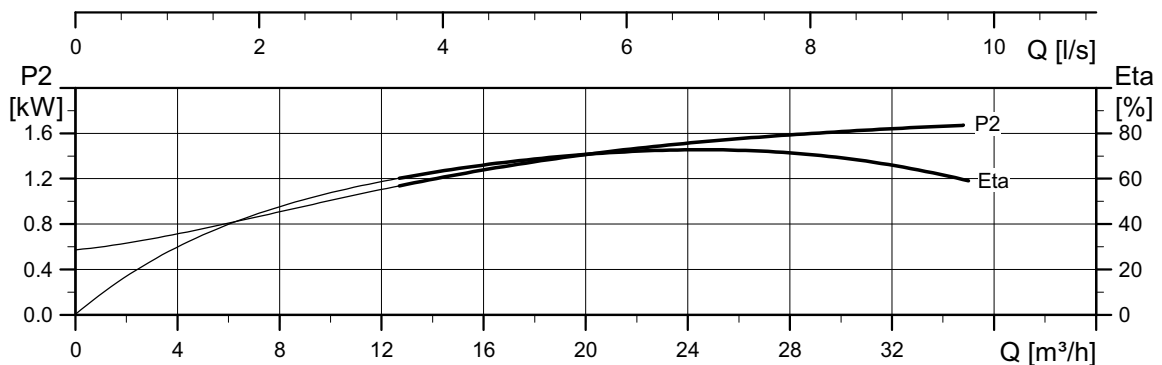
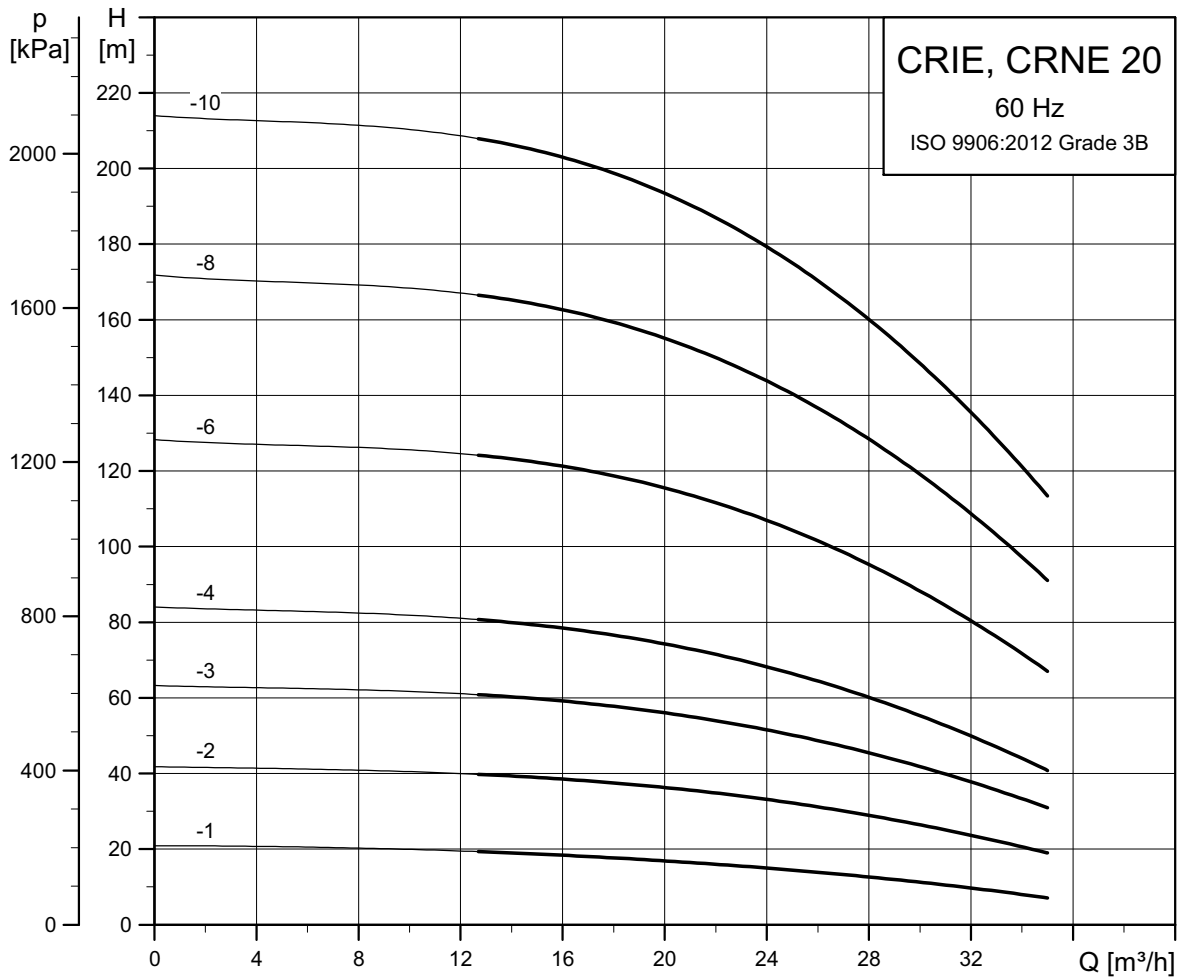


TM05 9399 3713

Dimensions and weights

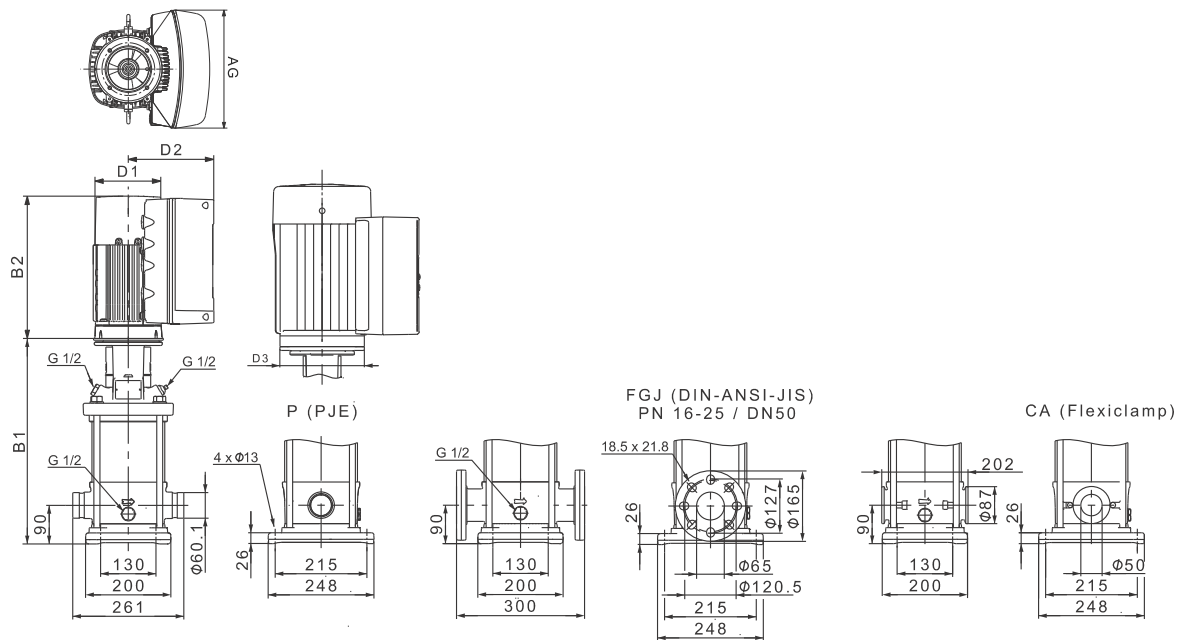
Pump type	P ₂ [kW]	CRE									
		Dimension [mm]								Net weight [kg]	
		Oval flange		DIN flange		D1	D2	D3	AG	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2						
CRE 20-1	2.2	415	689	415	689	122	158	135	268	47	48
CRE 20-2	4	420	754	420	754	191	201	160	291	62	63
CRE 20-3	5.5	497	862	497	862	191	201	300	291	84	84
CRE 20-4	7.5	542	931	542	931	255	237	300	346	91	92
CRE 20-6	11	-	-	724	1130	255	237	350	346	-	132
CRE 20-8	15	-	-	814	1296	318	308	350	420	-	207
CRE 20-10	18.5	-	-	904	1430	318	308	350	420	-	223

CRIE, CRNE 20



TM05 6844 2719

Dimensional sketches

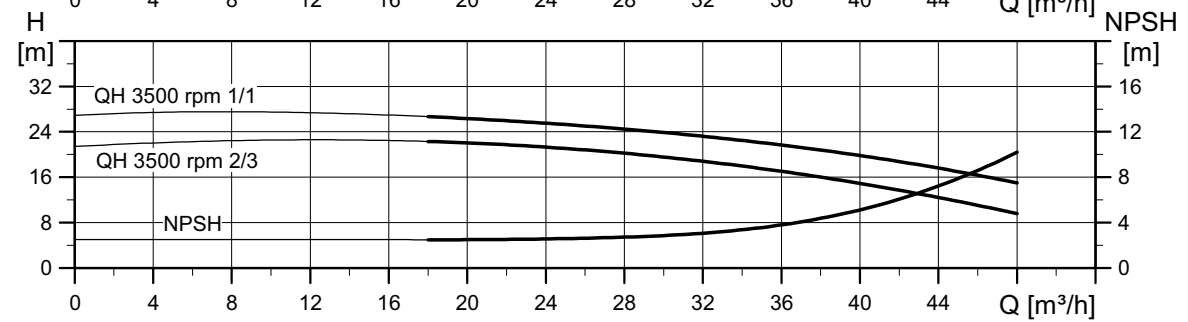
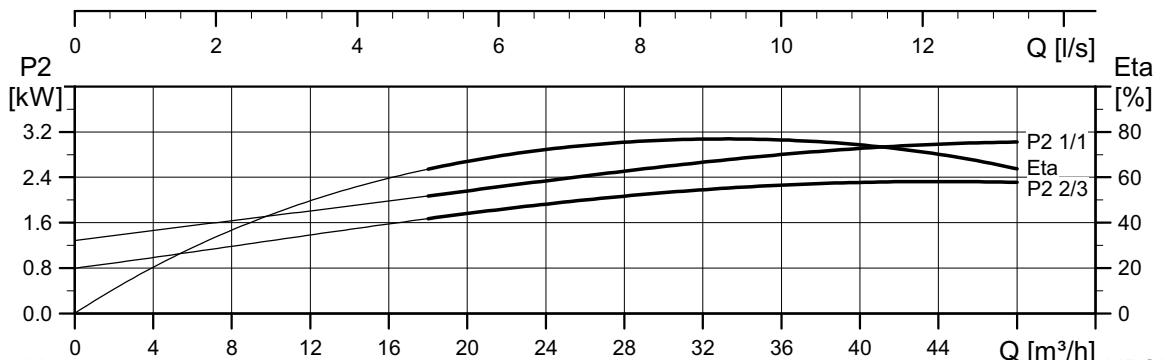
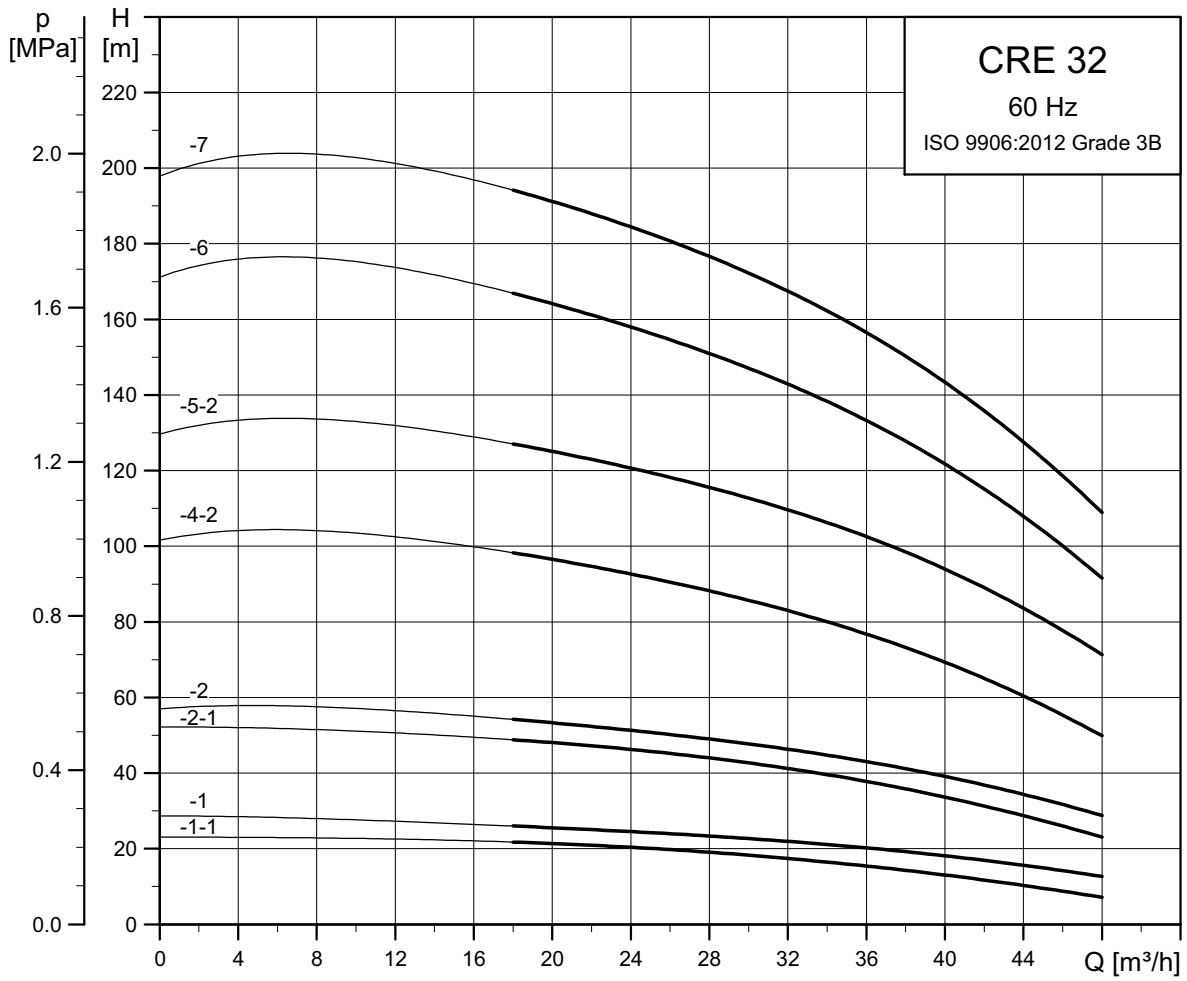


TM05 9400 3713

Dimensions and weights

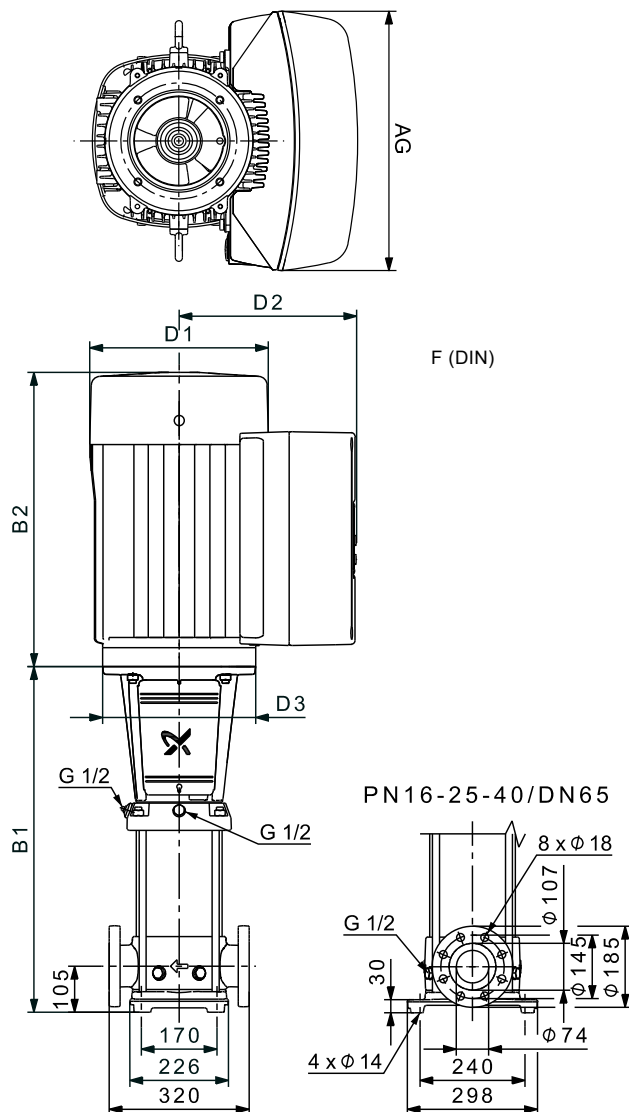
Pump type	P ₂ [kW]	CRIE/CRNE									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						
CRIE/CRNE 20-1	2.2	413	687	413	687	122	158	135	268	40	45
CRIE/CRNE 20-2	4	418	752	418	752	191	201	160	291	55	60
CRIE/CRNE 20-3	5.5	495	860	495	860	191	201	300	291	77	82
CRIE/CRNE 20-4	7.5	540	929	540	929	255	237	300	346	85	89
CRIE/CRNE 20-6	11	722	1128	722	1128	255	237	350	346	125	130
CRIE/CRNE 20-8	15	812	1294	812	1294	318	308	350	420	199	204
CRIE/CRNE 20-10	18.5	902	1428	902	1428	318	308	350	420	215	219

CRE 32



TM05 6845 2719

Dimensional sketches

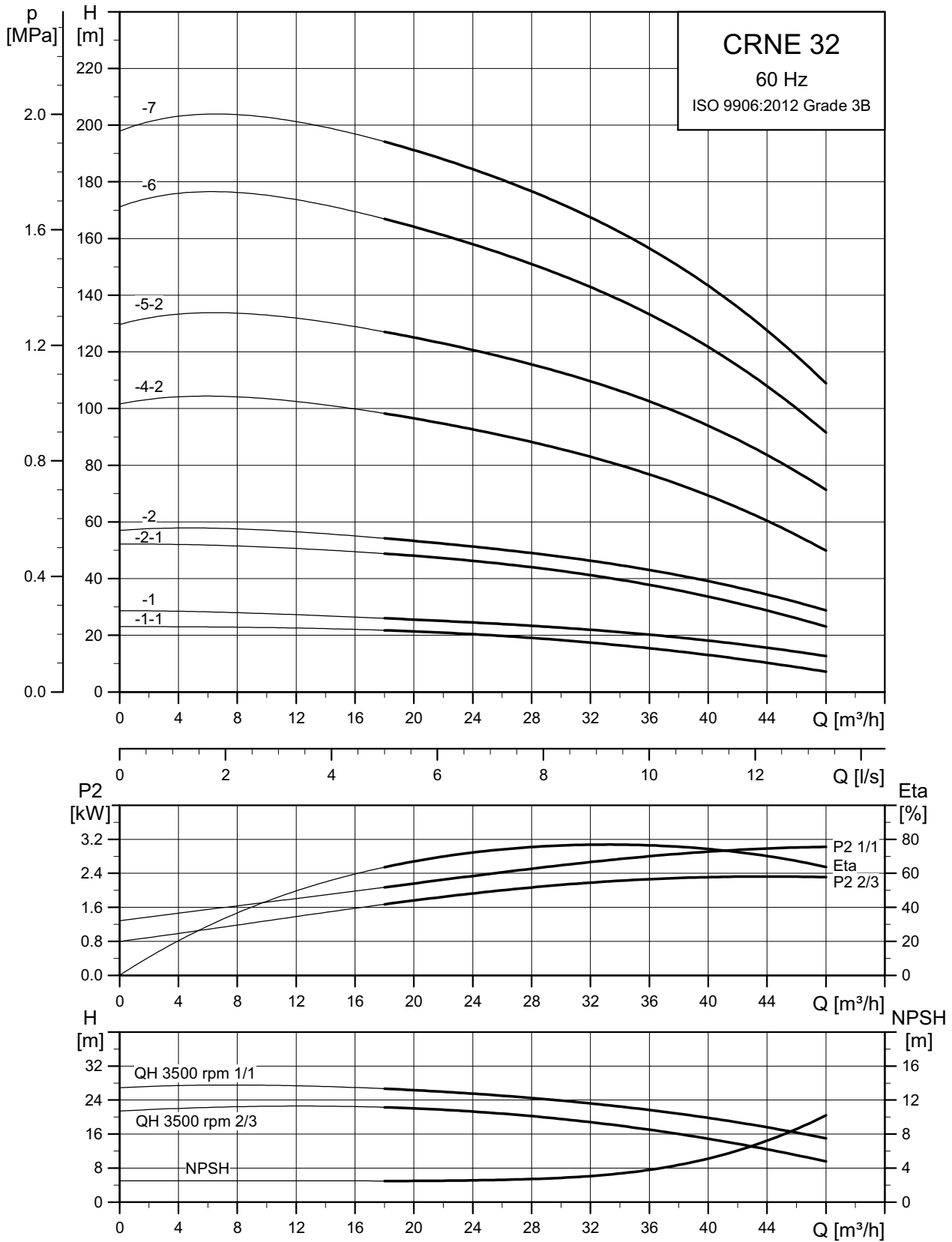


TM05 9384 3713

Dimensions and weights

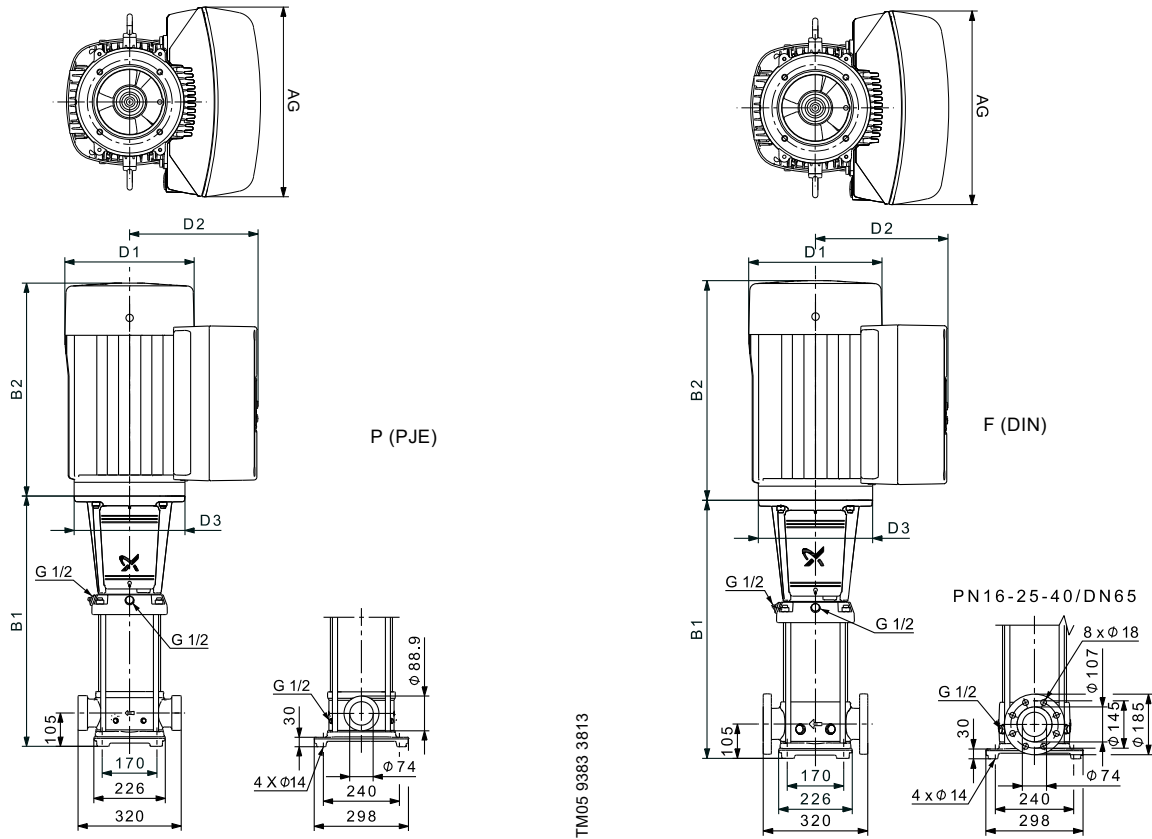
Pump type	P ₂ [kW]	CRE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRE 32-1-1	2.2	505	779	122	158	135	268	63
CRE 32-1	3	505	839	191	201	160	291	69
CRE 32-2-1	5.5	575	940	191	201	300	291	91
CRE 32-2	7.5	575	964	255	237	300	346	97
CRE 32-4-2	11	825	1231	255	237	350	346	129
CRE 32-5-2	15	895	1377	318	308	350	420	203
CRE 32-6	18.5	965	1491	318	308	350	420	218
CRE 32-7	22	1035	1587	318	308	350	420	234

CRNE 32



TM05 6846 27/19

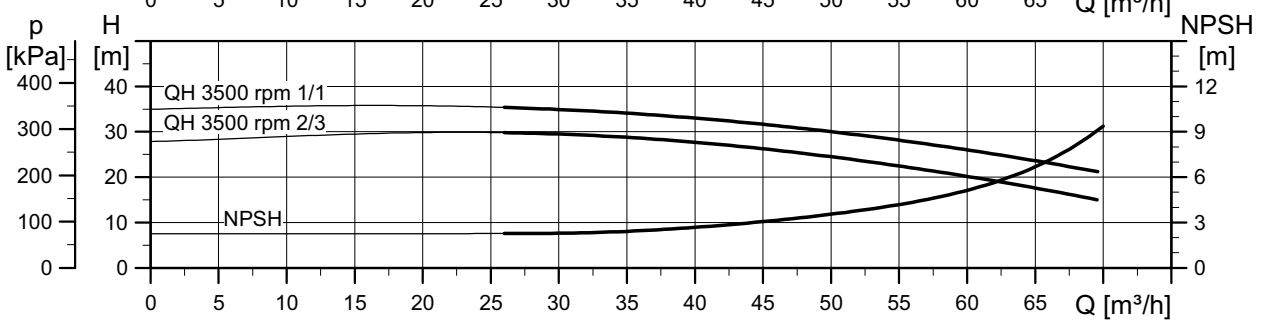
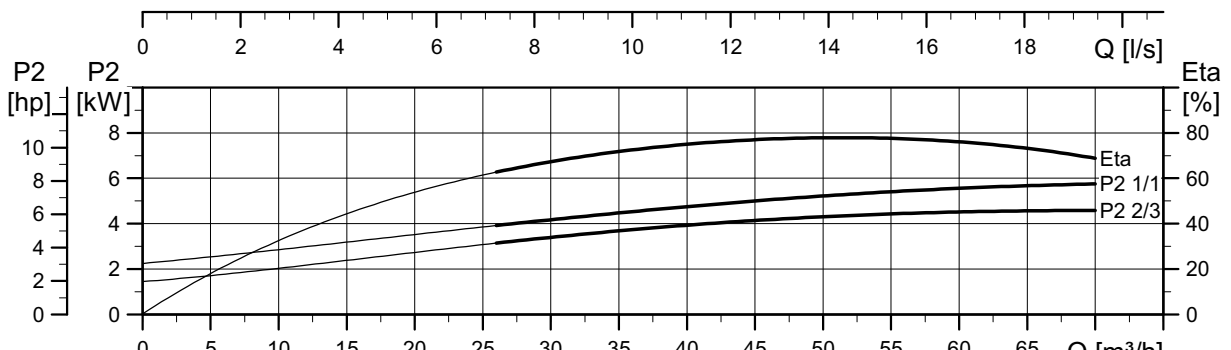
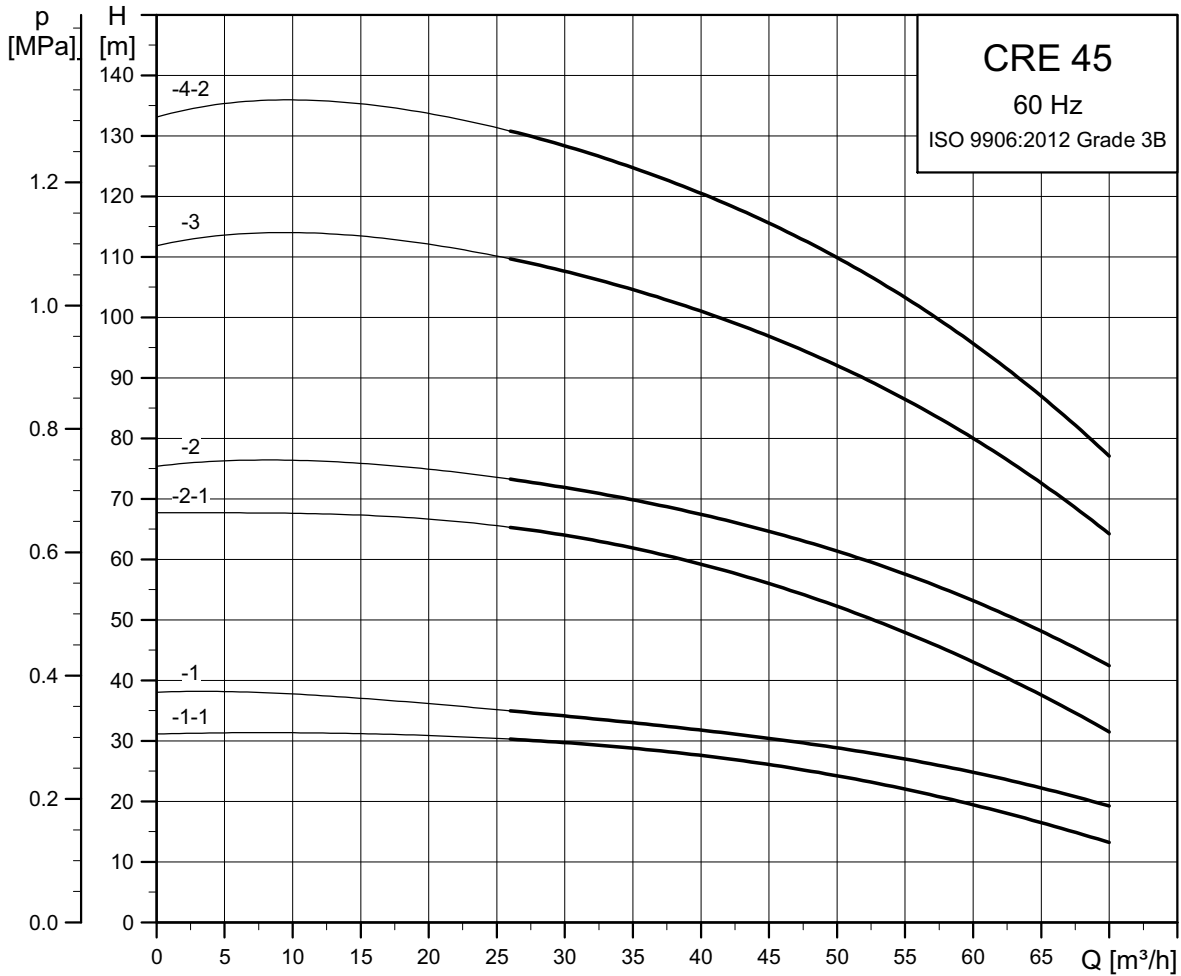
Dimensional sketches



Dimensions and weights

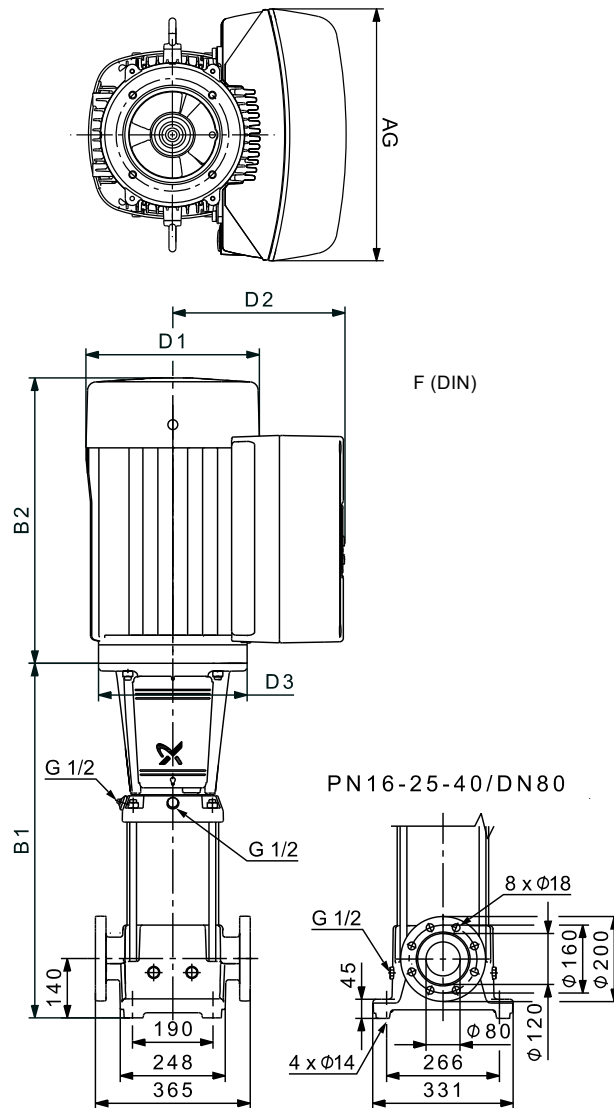
Pump type	P ₂ [kW]	CRNE									
		Dimension [mm]								Net weight [kg]	
		PJE		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2								
CRNE 32-1-1	2.2	505	779	505	779	122	158	135	268	65	65
CRNE 32-1	3	505	839	505	839	191	201	160	291	71	71
CRNE 32-2-1	5.5	575	940	575	940	191	201	300	291	93	93
CRNE 32-2	7.5	575	964	575	964	255	237	300	346	99	99
CRNE 32-4-2	11	825	1231	825	1231	255	237	350	346	132	132
CRNE 32-5-2	15	895	1377	895	1377	318	308	350	420	205	205
CRNE 32-6	18.5	965	1491	965	1491	318	308	350	420	220	220
CRNE 32-7	22	1035	1587	1035	1587	318	308	350	420	236	236

CRE 45



TM05 6847 27 19

Dimensional sketches

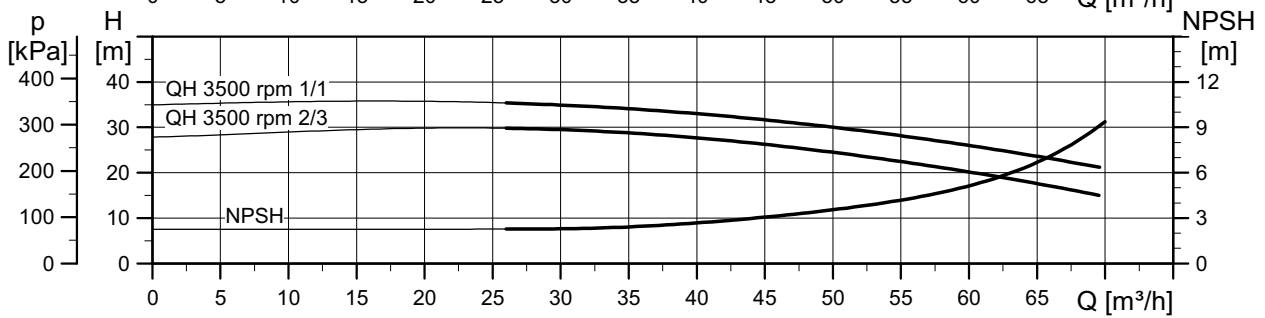
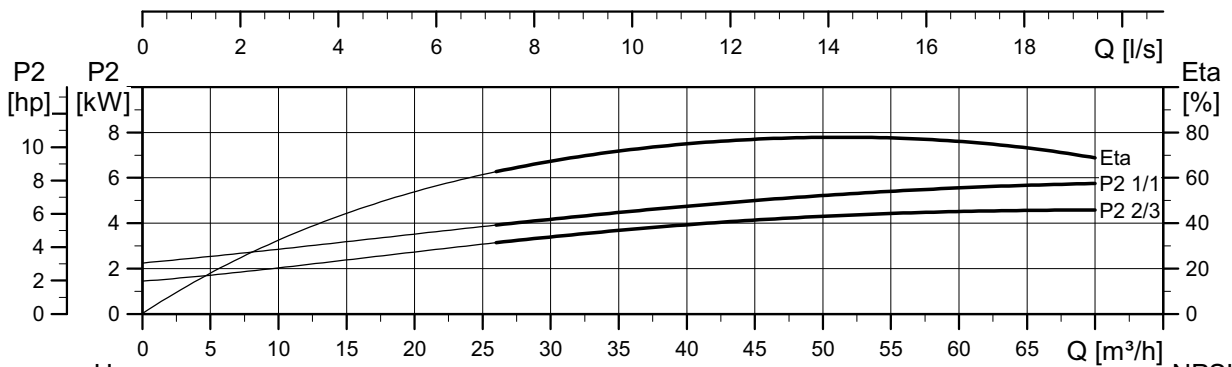
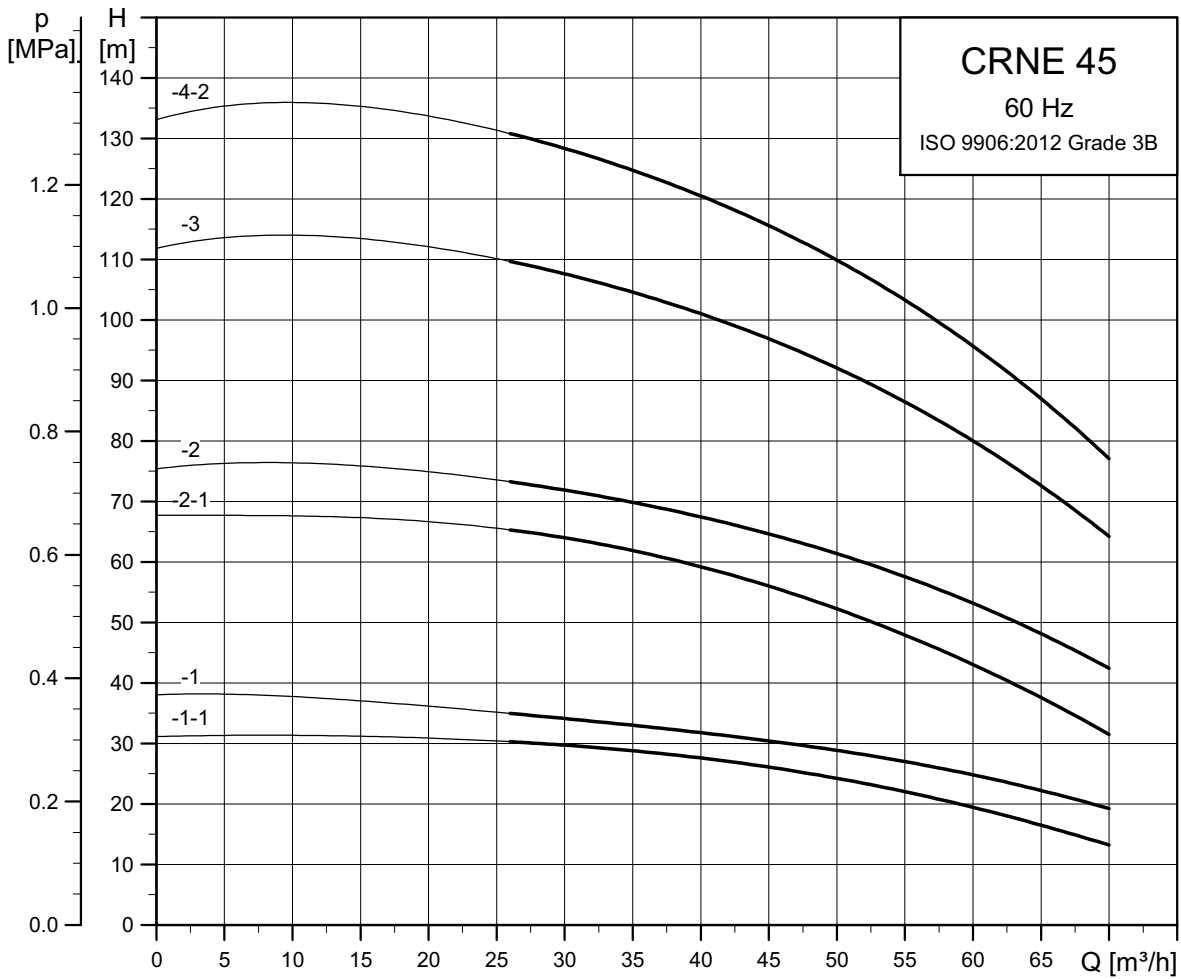


TM05 9385 3713

Dimensions and weights

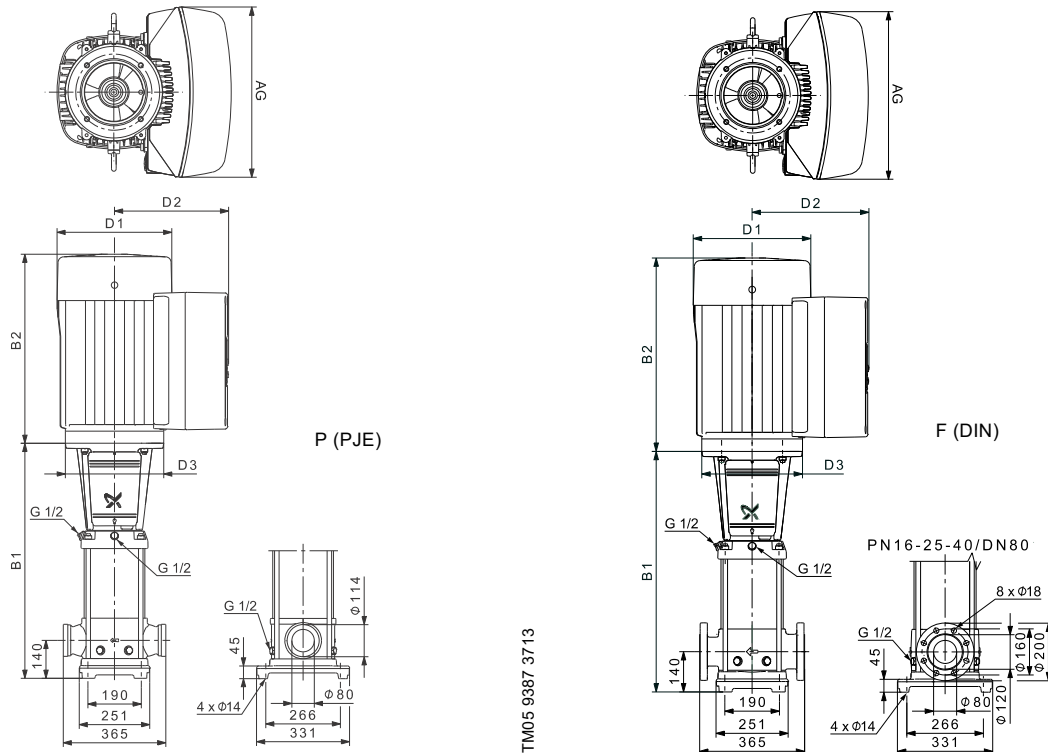
Pump type	P ₂ [kW]	CRE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRE 45-1-1	5.5	559	924	191	201	300	291	98
CRE 45-1	7.5	559	948	255	237	300	346	104
CRE 45-2-2	11	749	1155	255	237	350	346	134
CRE 45-2-1	11	749	1155	255	237	350	346	134
CRE 45-2	15	749	1231	318	308	350	420	204
CRE 45-3	18.5	829	1355	318	308	350	420	220
CRE 45-4-2	22	909	1461	318	308	350	420	237

CRNE 45



TM05 6848 2719

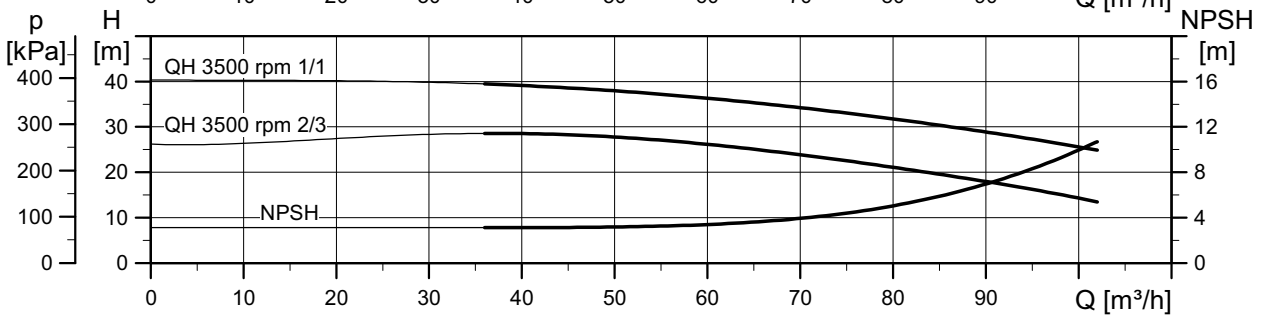
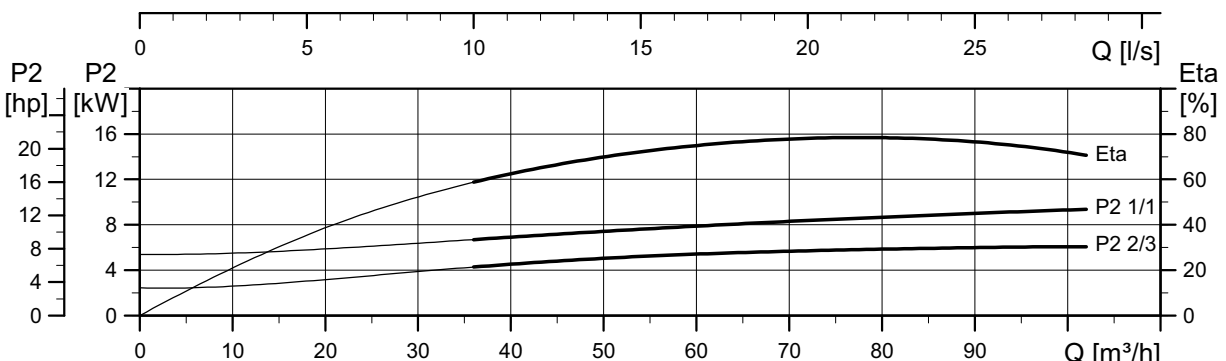
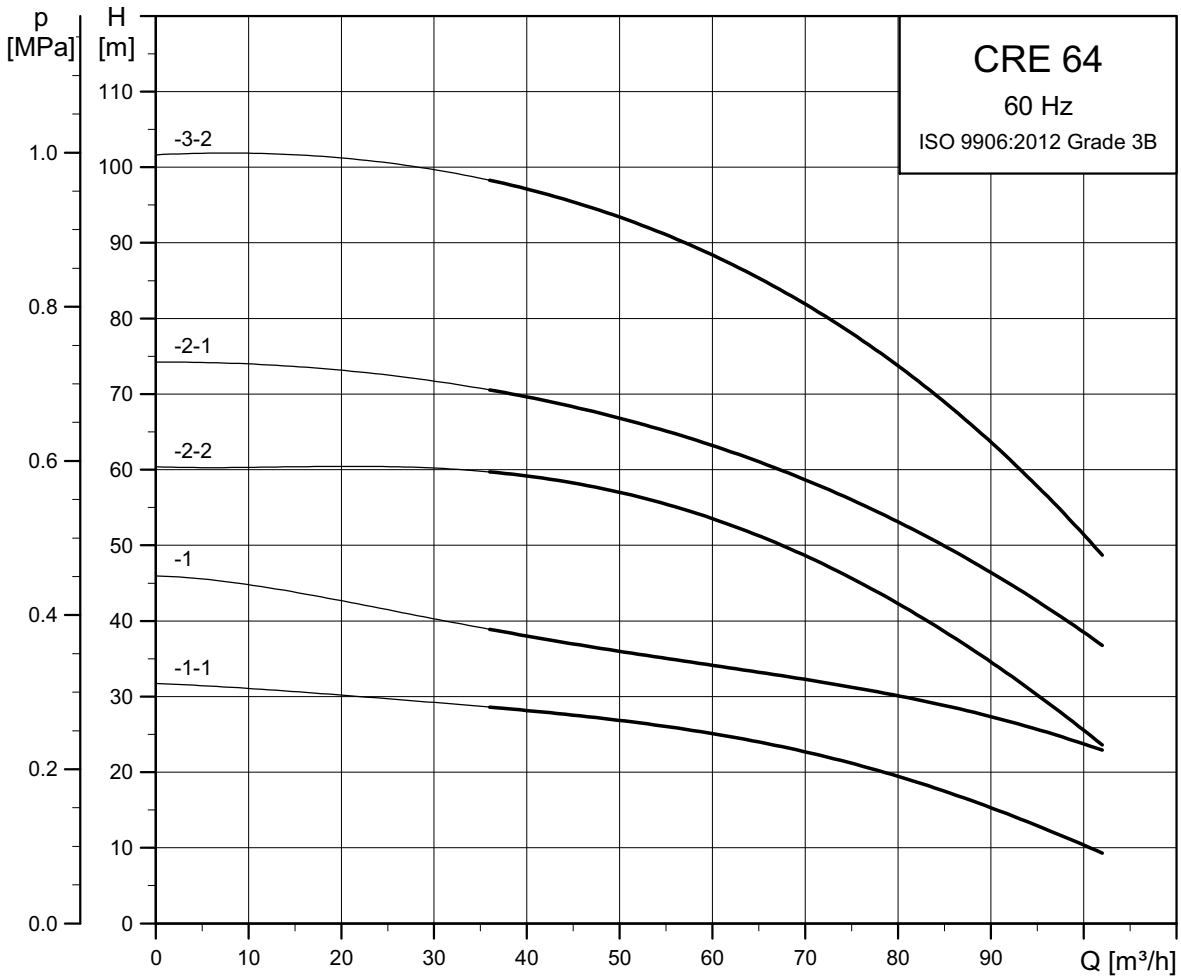
Dimensional sketches



Dimensions and weights

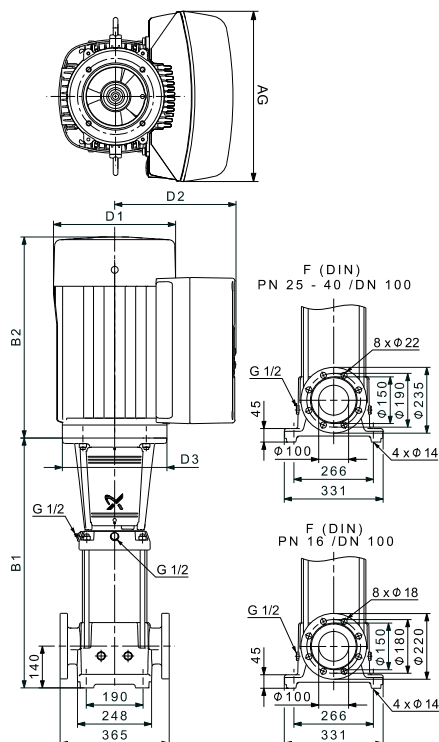
Pump type	P ₂ [kW]	CRNE									
		Dimension [mm]								Net weight [kg]	
		PJE		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						
CRNE 45-1-1	5.5	559	924	559	924	191	201	300	291	98	98
CRNE 45-1	7.5	559	948	559	948	255	237	300	346	104	104
CRNE 45-2-2	11	749	1155	749	1155	255	237	350	346	134	134
CRNE 45-2-1	11	749	1155	749	1155	255	237	350	346	134	134
CRNE 45-2	15	749	1231	749	1231	318	308	350	420	205	205
CRNE 45-3	18.5	829	1355	829	1355	318	308	350	420	221	221
CRNE 45-4-2	22	909	1461	909	1461	318	308	350	420	237	237

CRE 64



TM05 6849 2719

Dimensional sketches

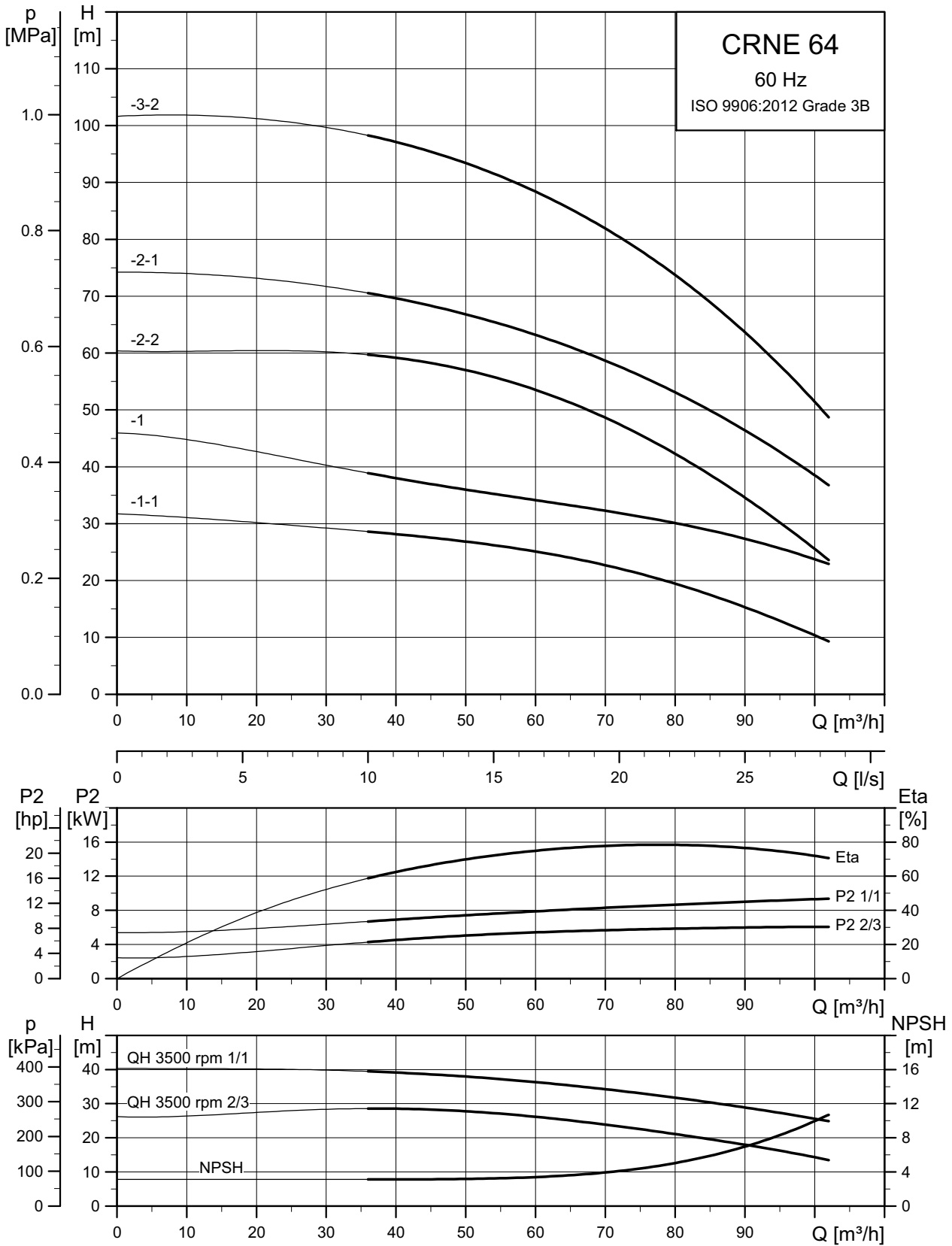


TM05 9388 3713

Dimensions and weights

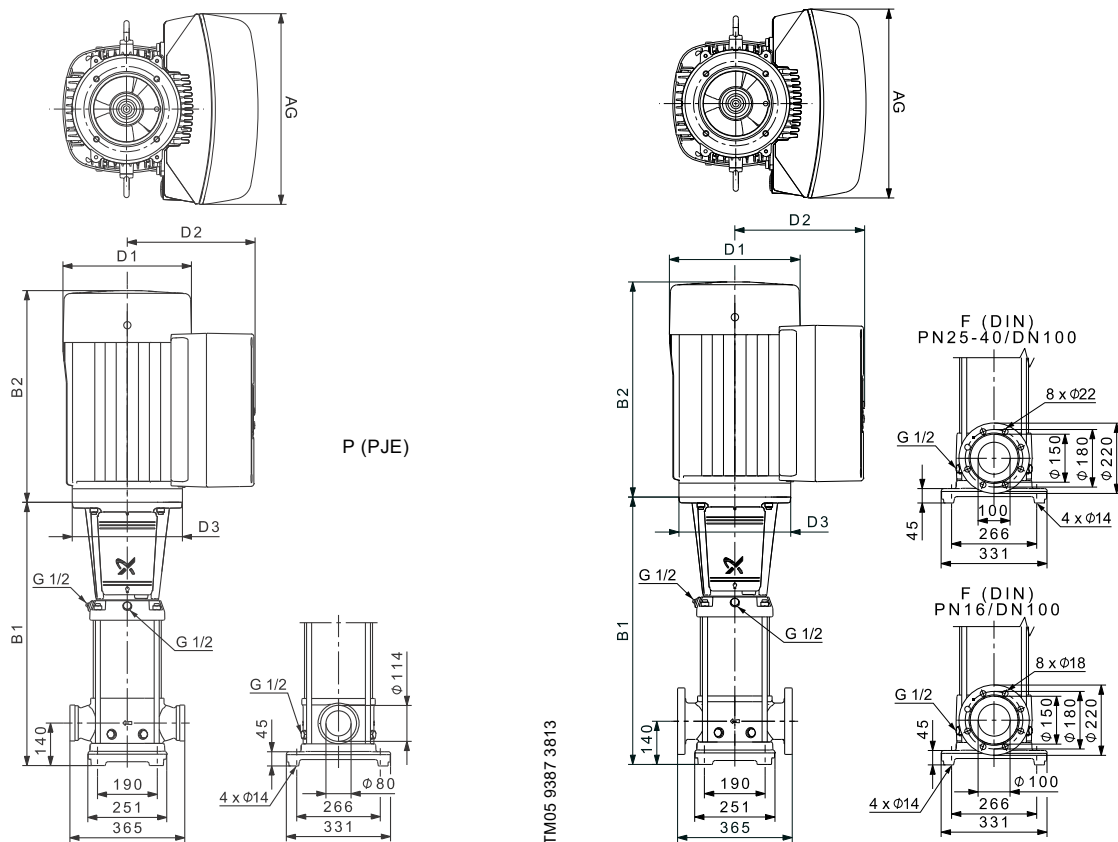
Pump type	P ₂ [kW]	CRE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRE 64-1-1	7.5	561	950	255	237	300	346	106
CRE 64-1	11	671	1077	255	237	350	346	132
CRE 64-2-2	15	754	1236	318	308	350	420	207
CRE 64-2-1	18.5	754	1280	318	308	350	420	219
CRE 64-3-2	22	836	1388	318	308	350	420	237

CRNE 64



TM05 6850 2719

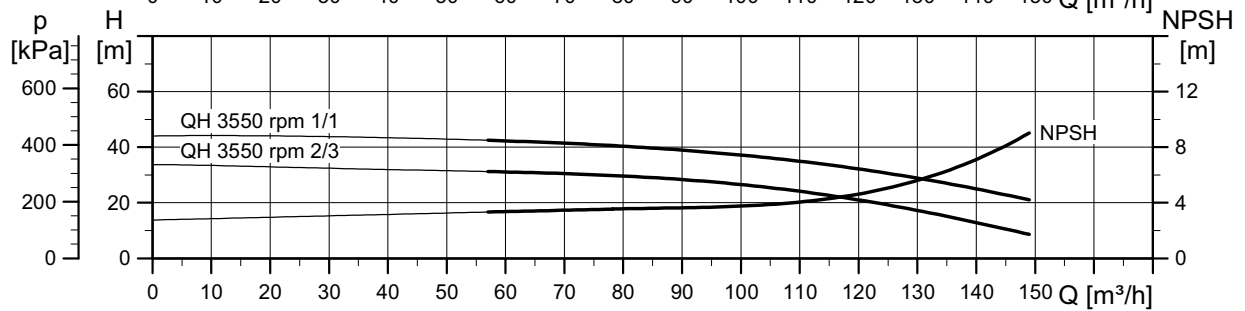
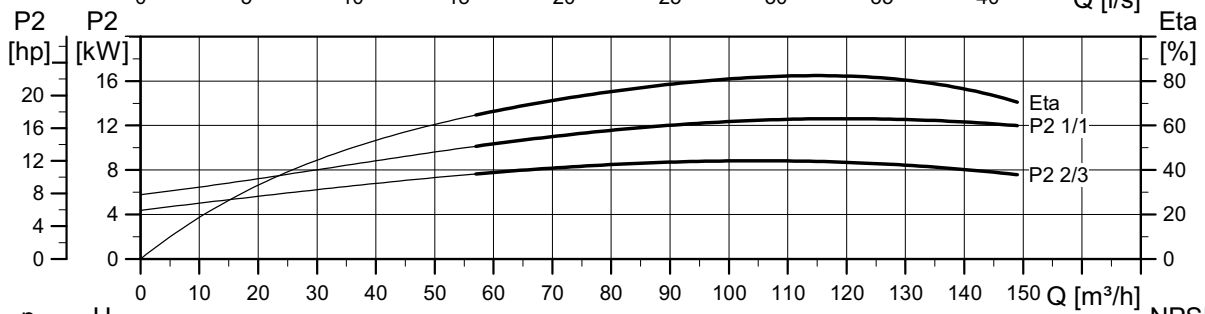
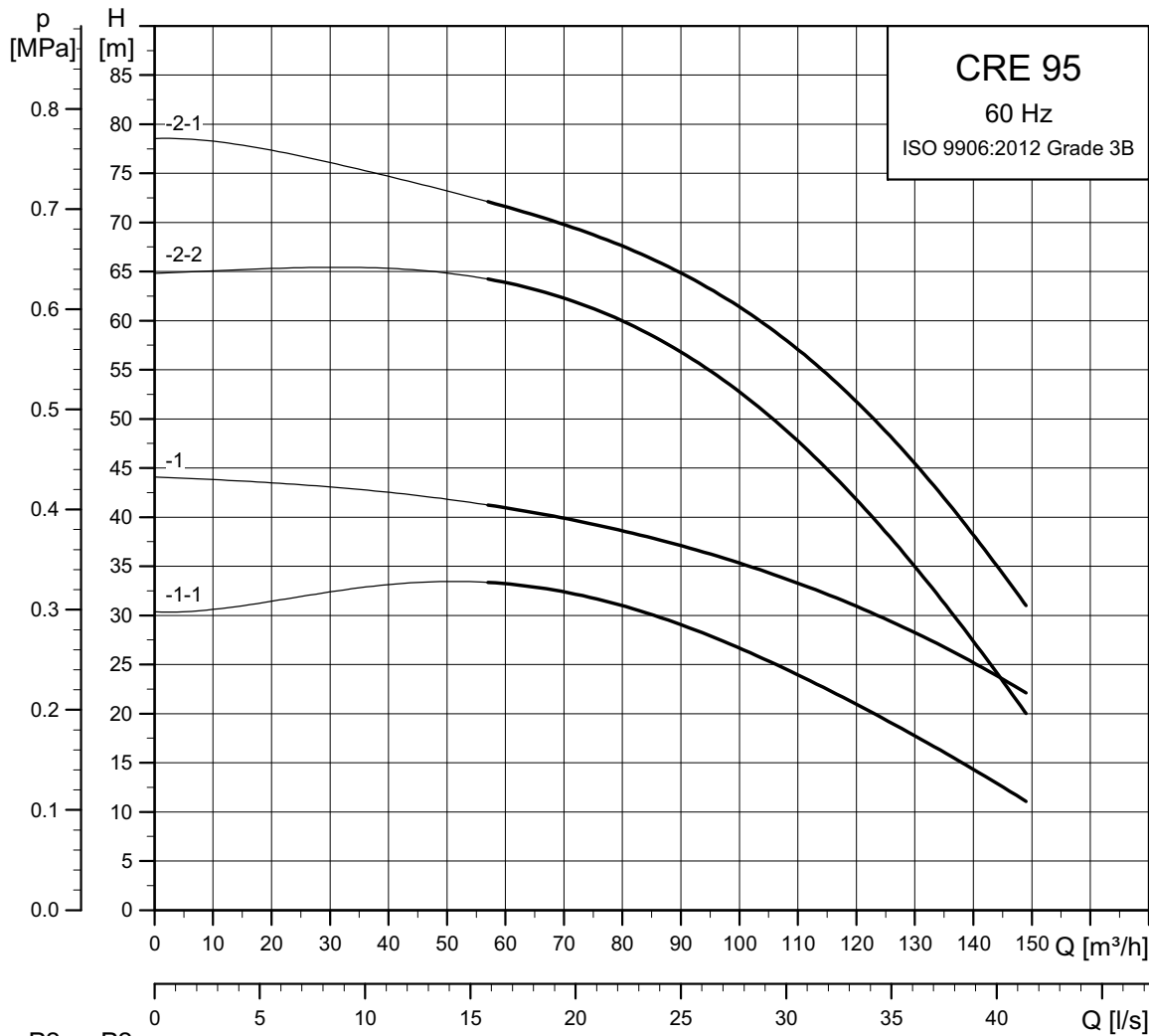
Dimensional sketches



Dimensions and weights

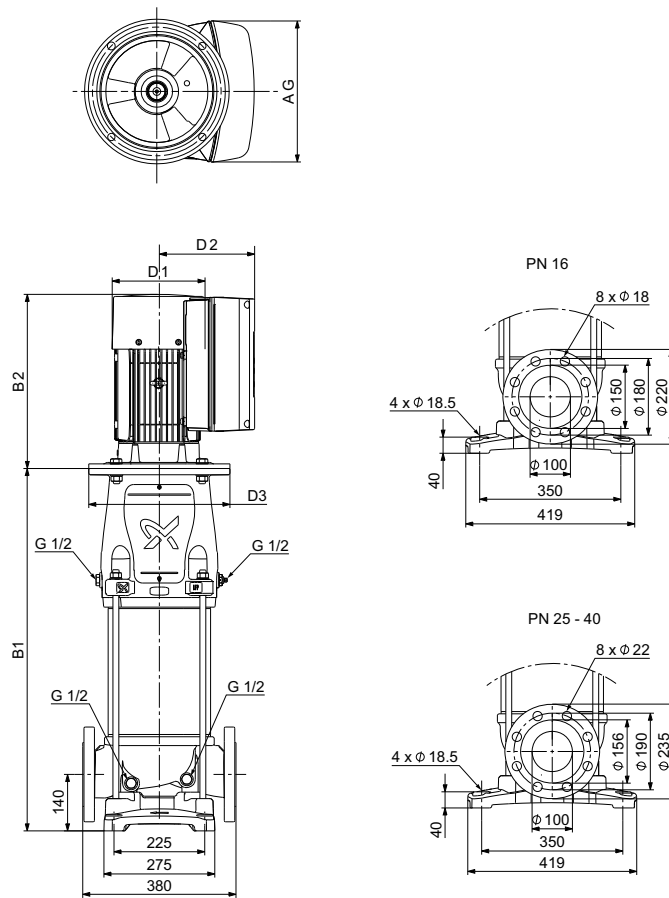
Pump type	P ₂ [kW]	CRNE									
		Dimension [mm]							Net weight [kg]		
		PJE		DIN flange		D1	D2	D3	AG	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						
CRNE 64-1-1	7.5	561	950	561	950	255	237	300	346	106	106
CRNE 64-1	11	671	1077	671	1077	255	237	350	346	132	132
CRNE 64-2-2	15	754	1236	754	1236	318	308	350	420	207	207
CRNE 64-2-1	18.5	754	1280	754	1280	318	308	350	420	219	219
CRNE 64-3-2	22	836	1388	836	1388	318	308	350	420	236	236

CRE 95



TM07 4489 2719

Dimensional sketches

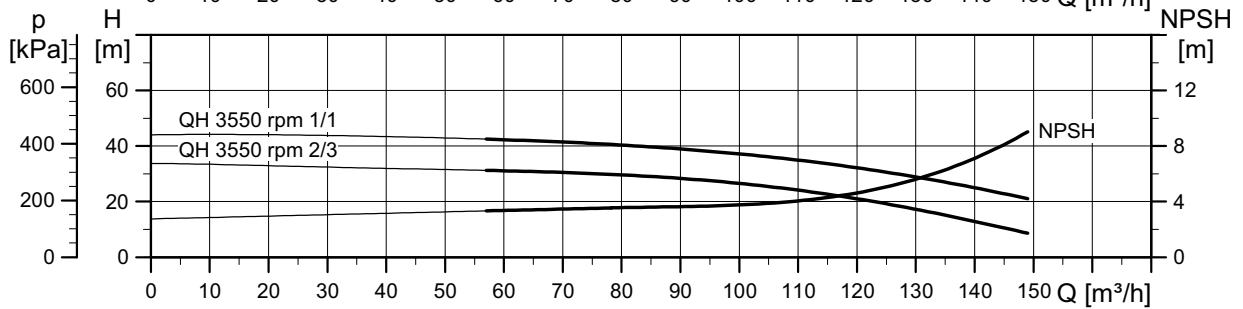
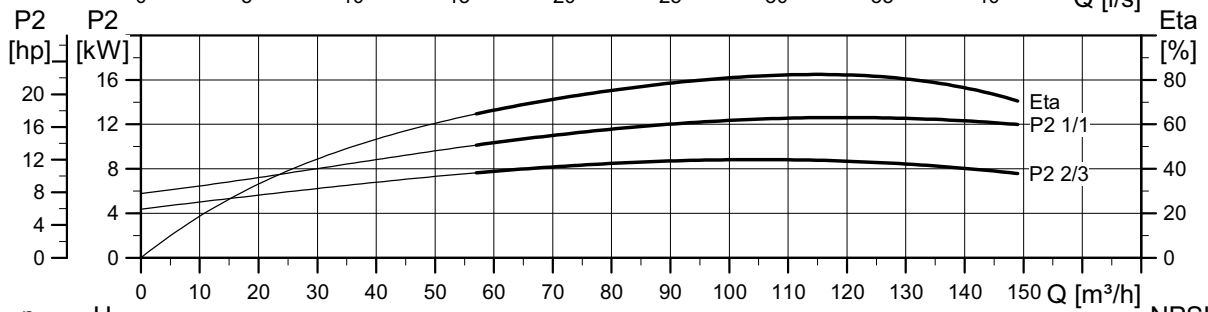
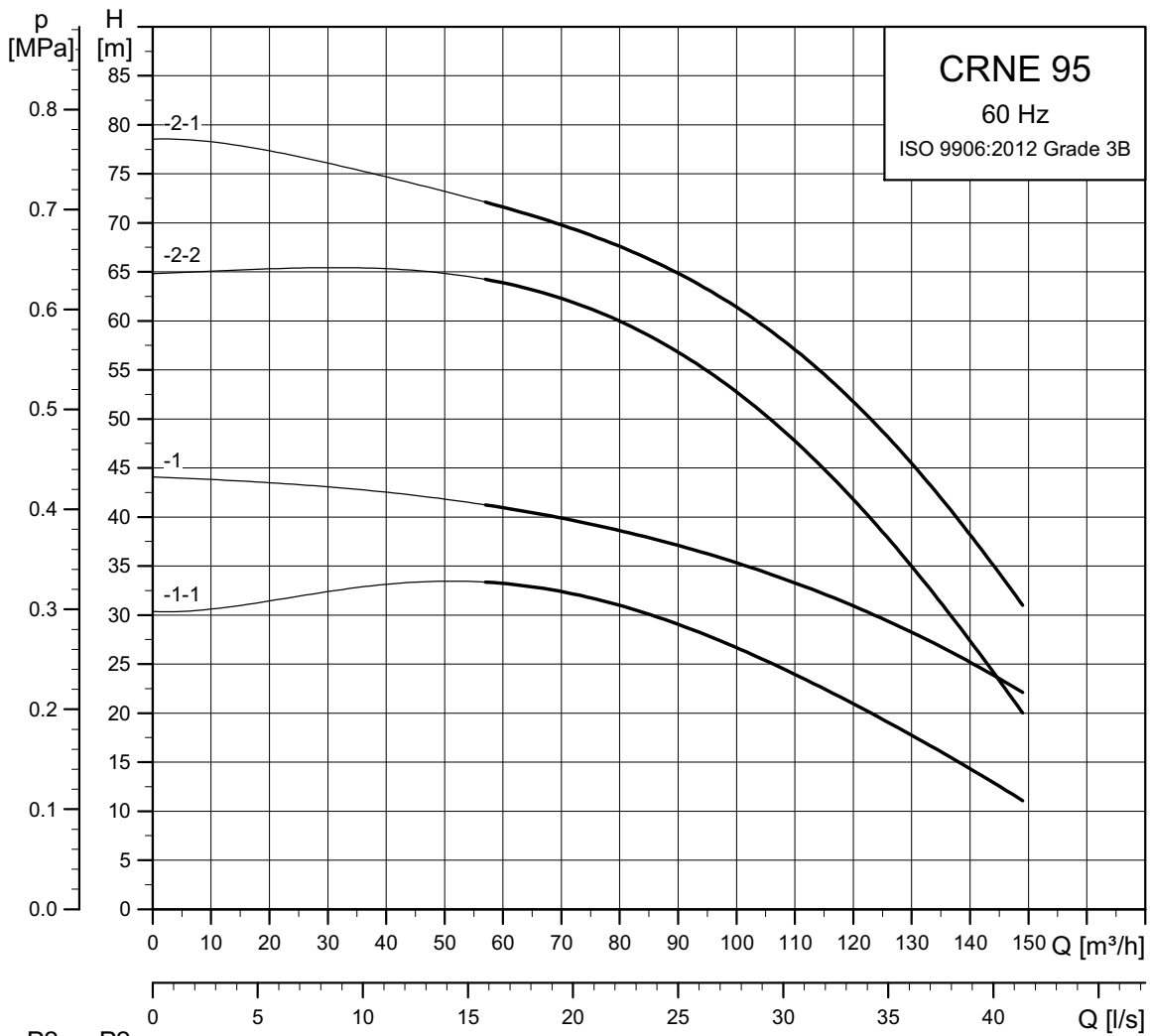


TM07 4392 1419

Dimensions and weights

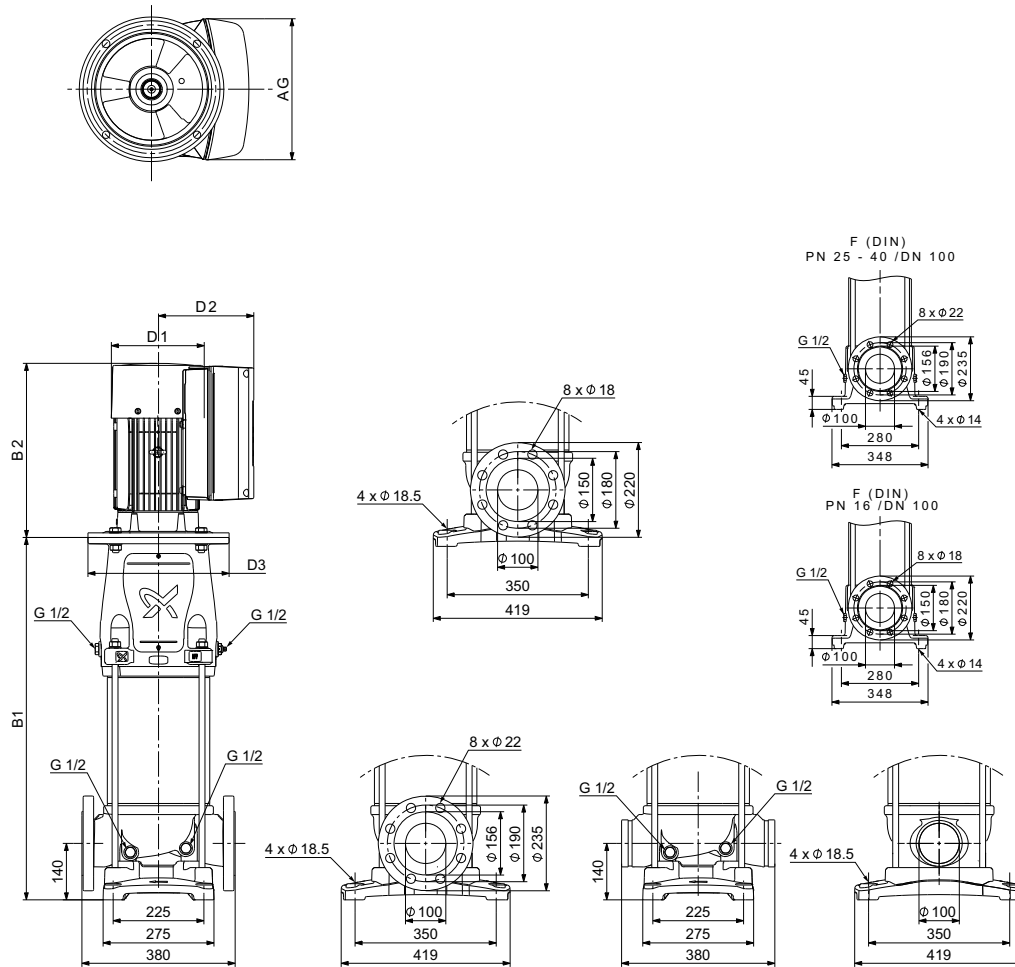
Pump type	P ₂ [kW]	CRE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRE 95-1-1	11	691	1097	255	237	350	346	165
CRE 95-1	15	691	1173	318	308	350	420	233
CRE 95-2-2	18.5	795	1321	318	308	350	420	251
CRE 95-2-1	22	795	1347	318	308	350	420	264

CRNE 95



TM07 4490 2719

Dimensional sketches

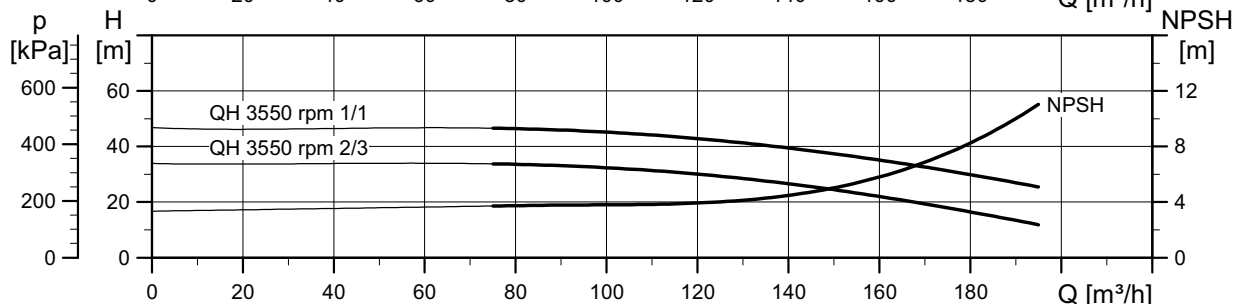
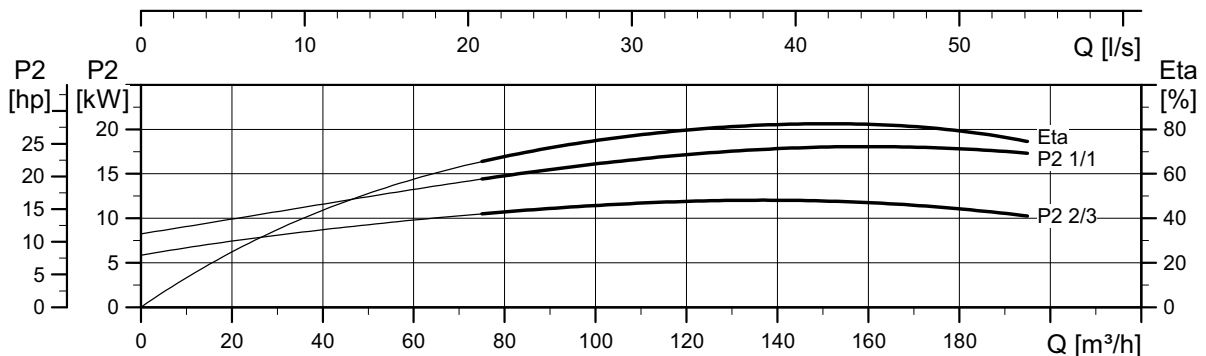
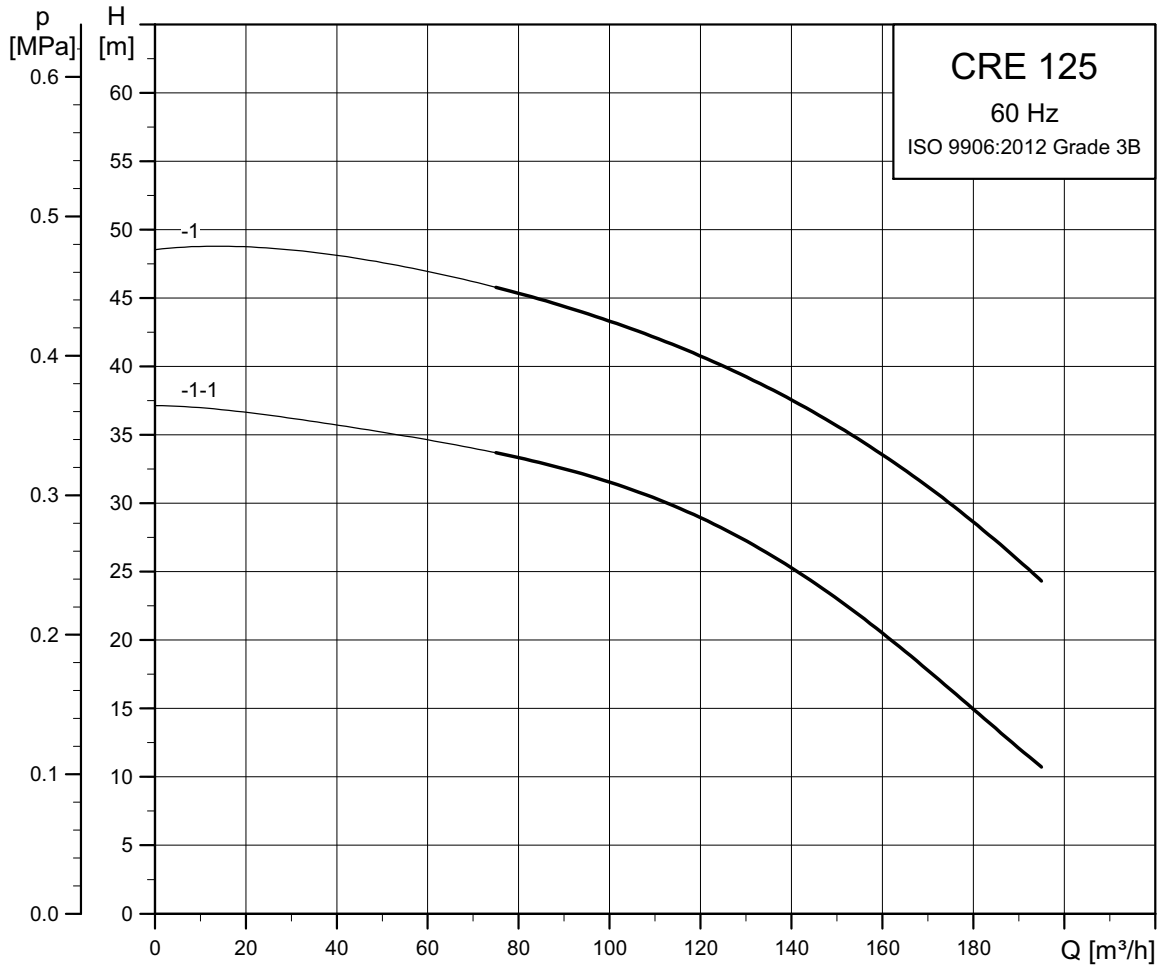


TM07 4390 14 19

Dimensions and weights

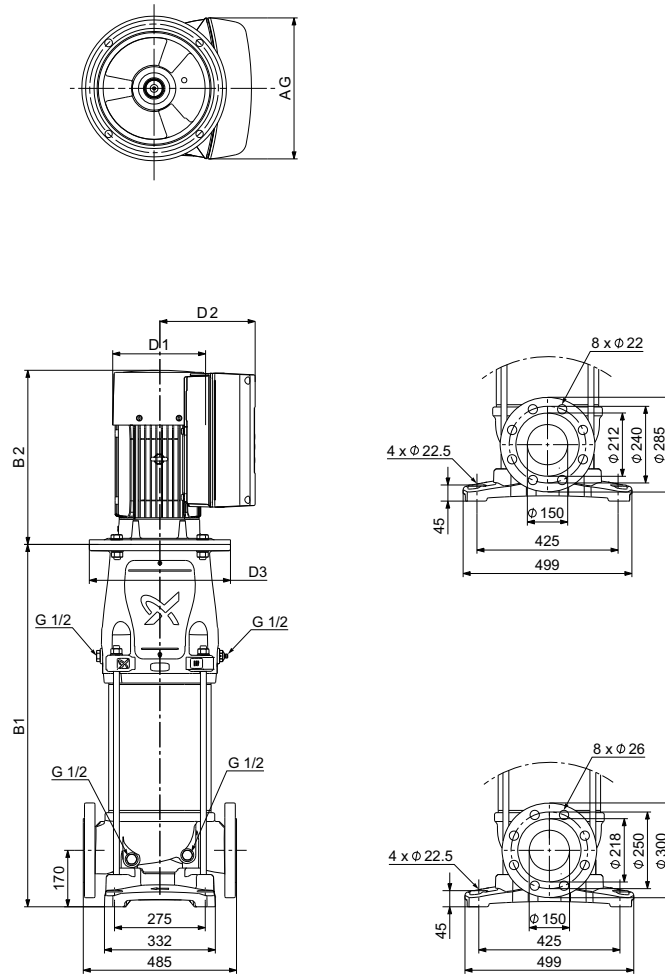
Pump type	P ₂ [kW]	CRNE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRNE 95-1-1	11	691	1097	255	237	350	346	165
CRNE 95-1	15	691	1173	318	308	350	420	233
CRNE 95-2-2	18.5	795	1321	318	308	350	420	251
CRNE 95-2-1	22	795	1347	318	308	350	420	264

CRE 125



TM07 4491 2719

Dimensional sketches

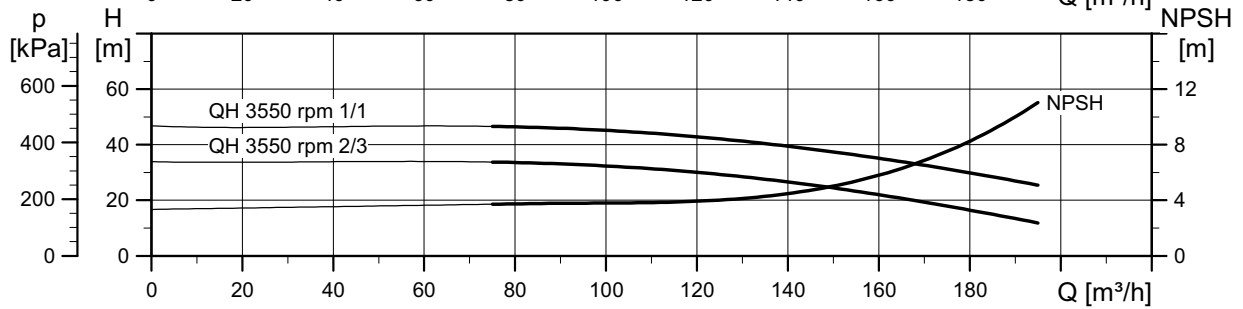
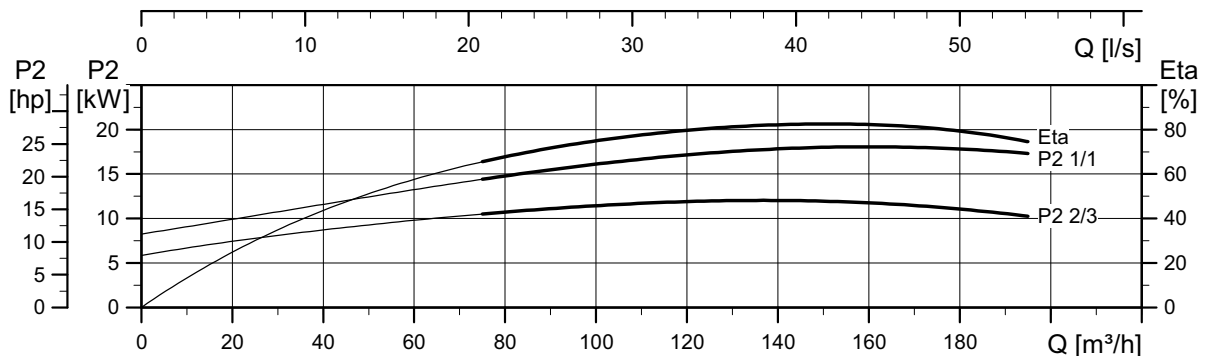
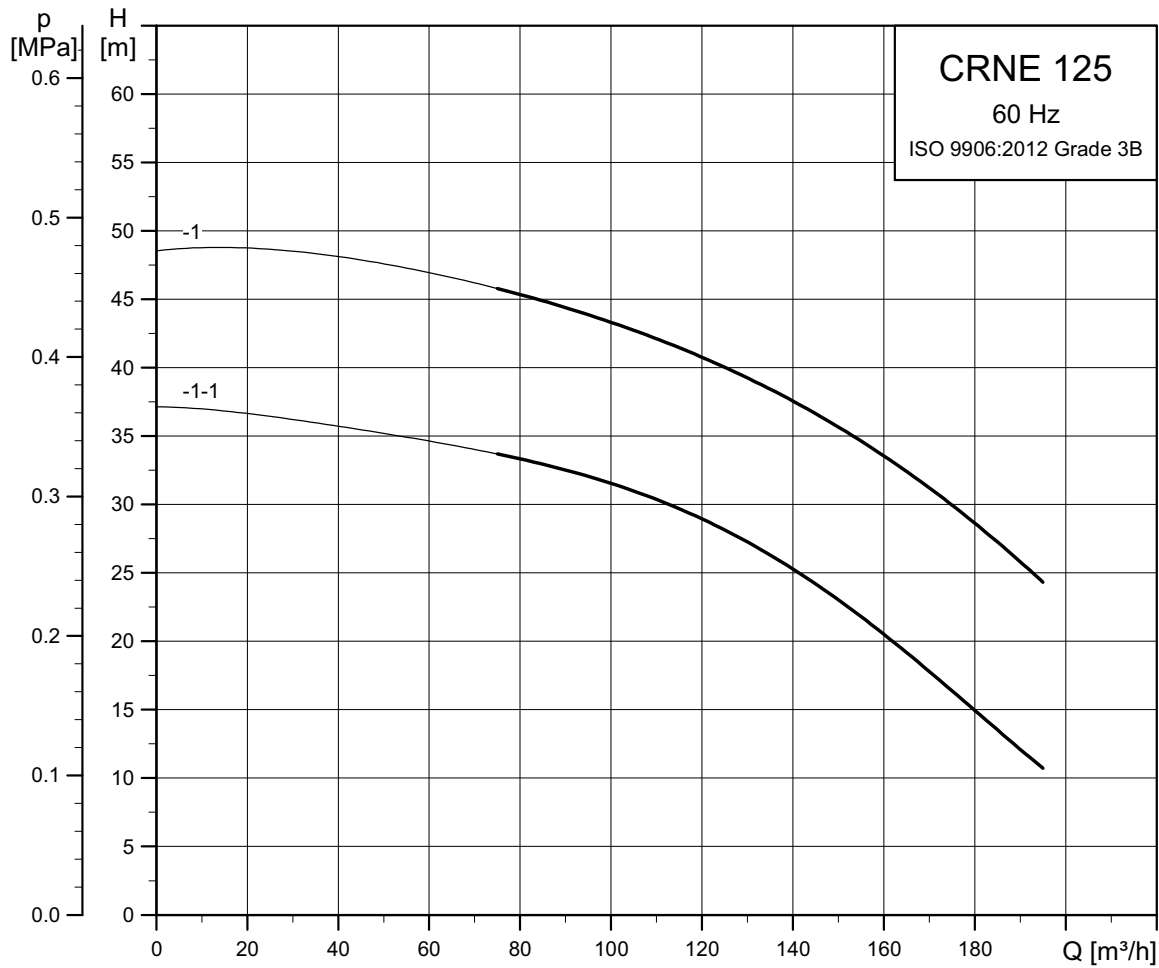


TM07 4393 1419

Dimensions and weights

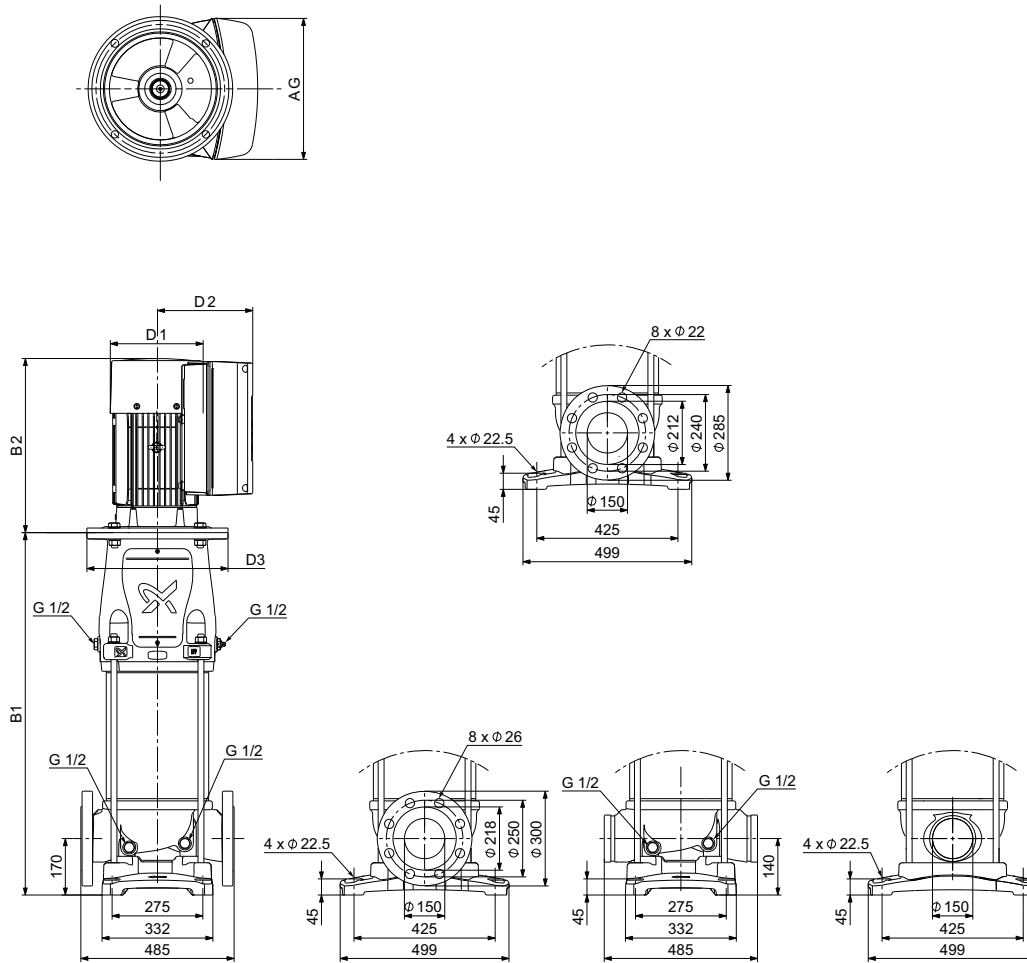
Pump type	P ₂ [kW]	CRE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRE 125-1-1	15	783	1265	318	308	350	420	278
CRE 125-1	18.5	783	1309	318	308	350	420	290

CRNE 125



TM07 4492 2719

Dimensional sketches

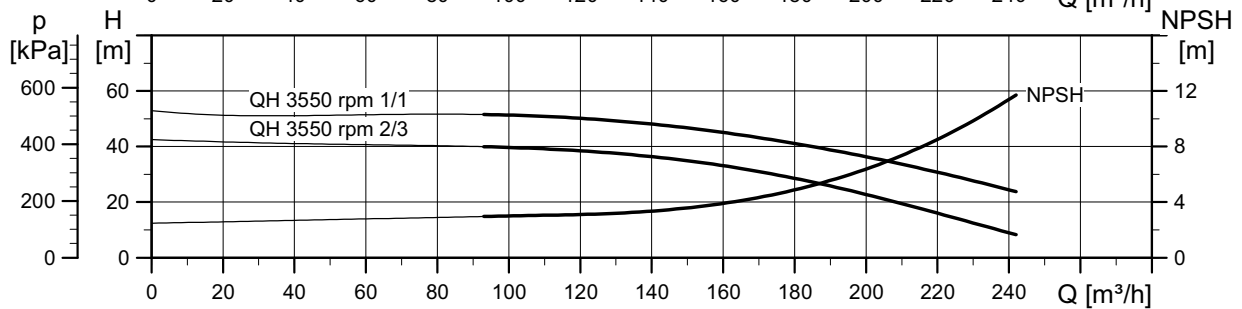
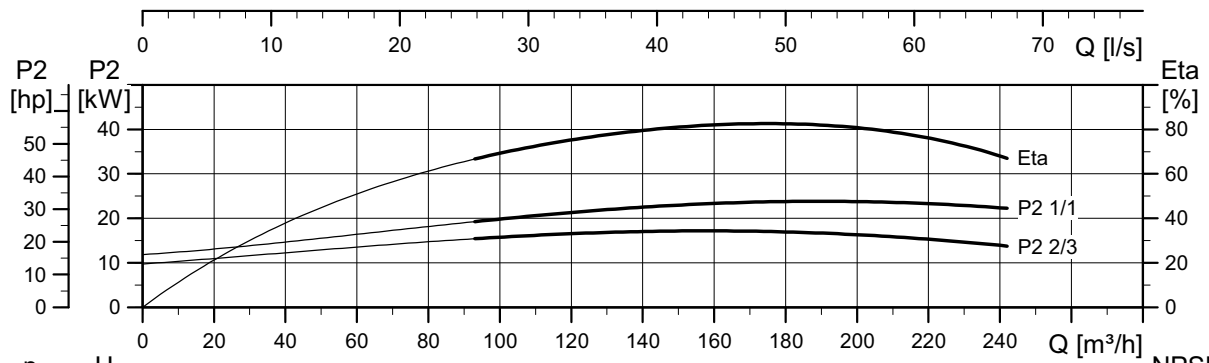
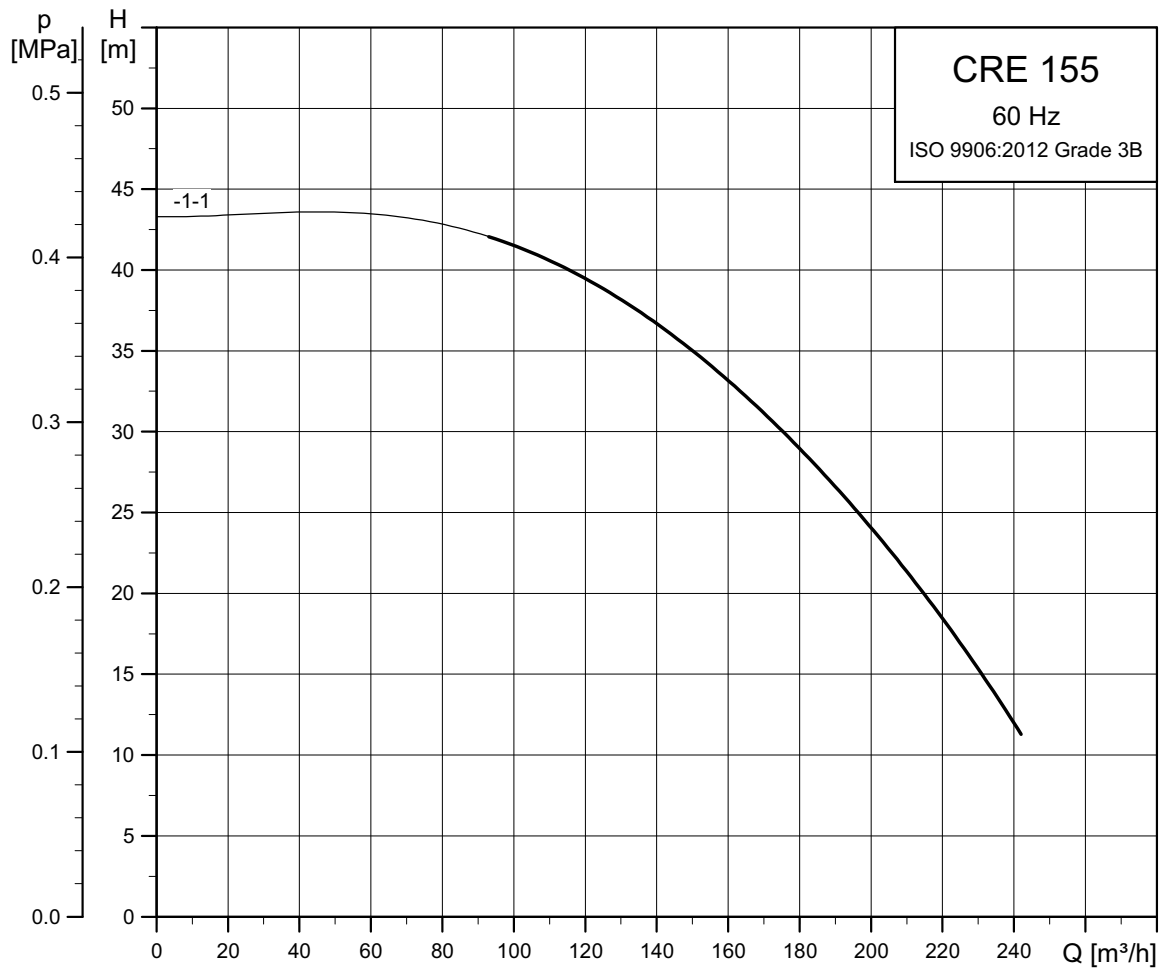


TM07 4391 1419

Dimensions and weights

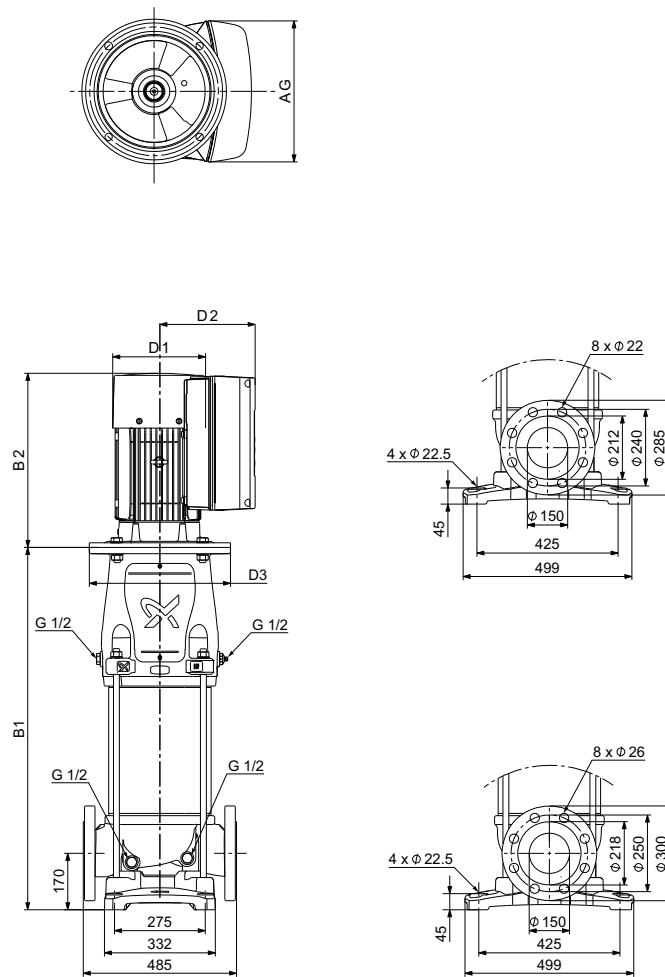
Pump type	P ₂ [kW]	CRNE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRNE 125-1-1	15	783	1265	318	308	350	420	278
CRNE 125-1	18.5	783	1309	318	308	350	420	290

CRE 155



TM07 4493 2719

Dimensional sketches

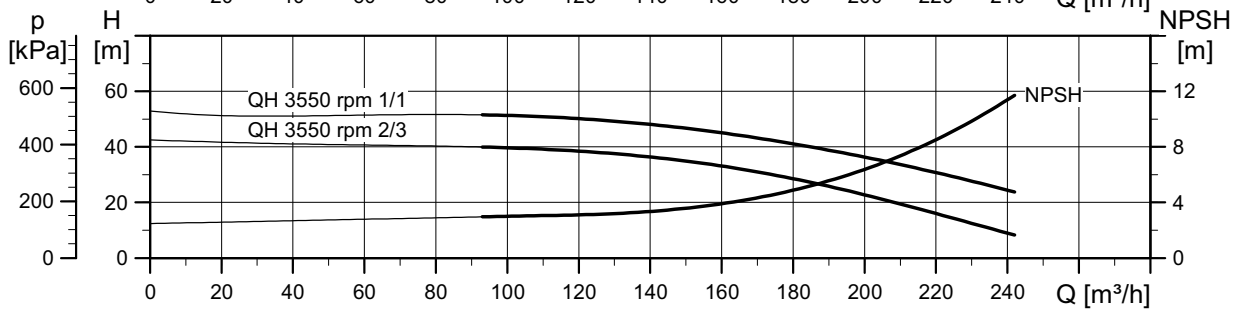
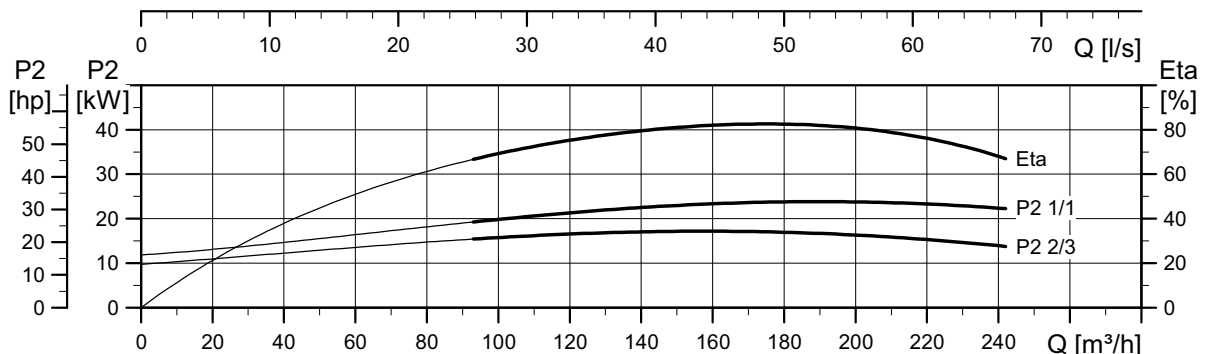
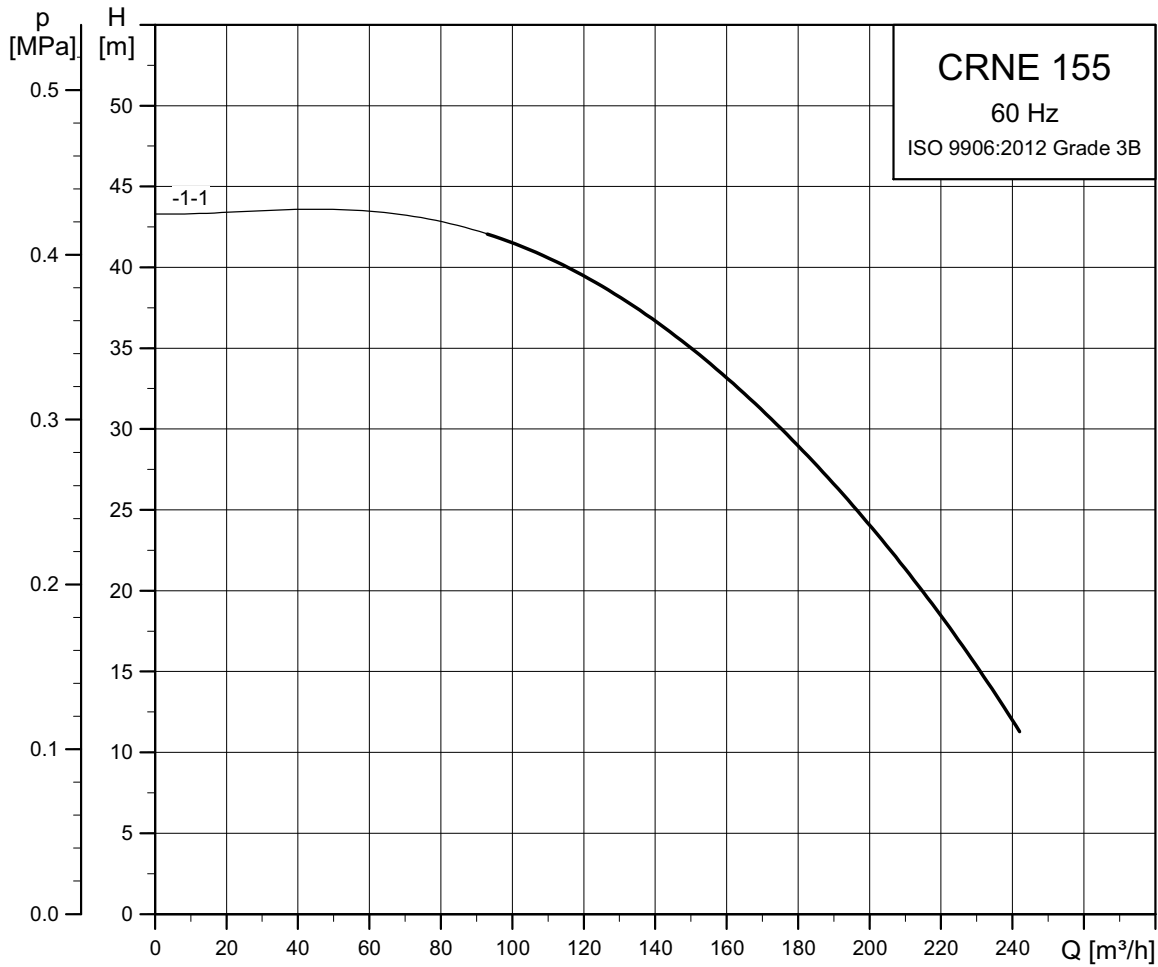


TM07 4393 1419

Dimensions and weights

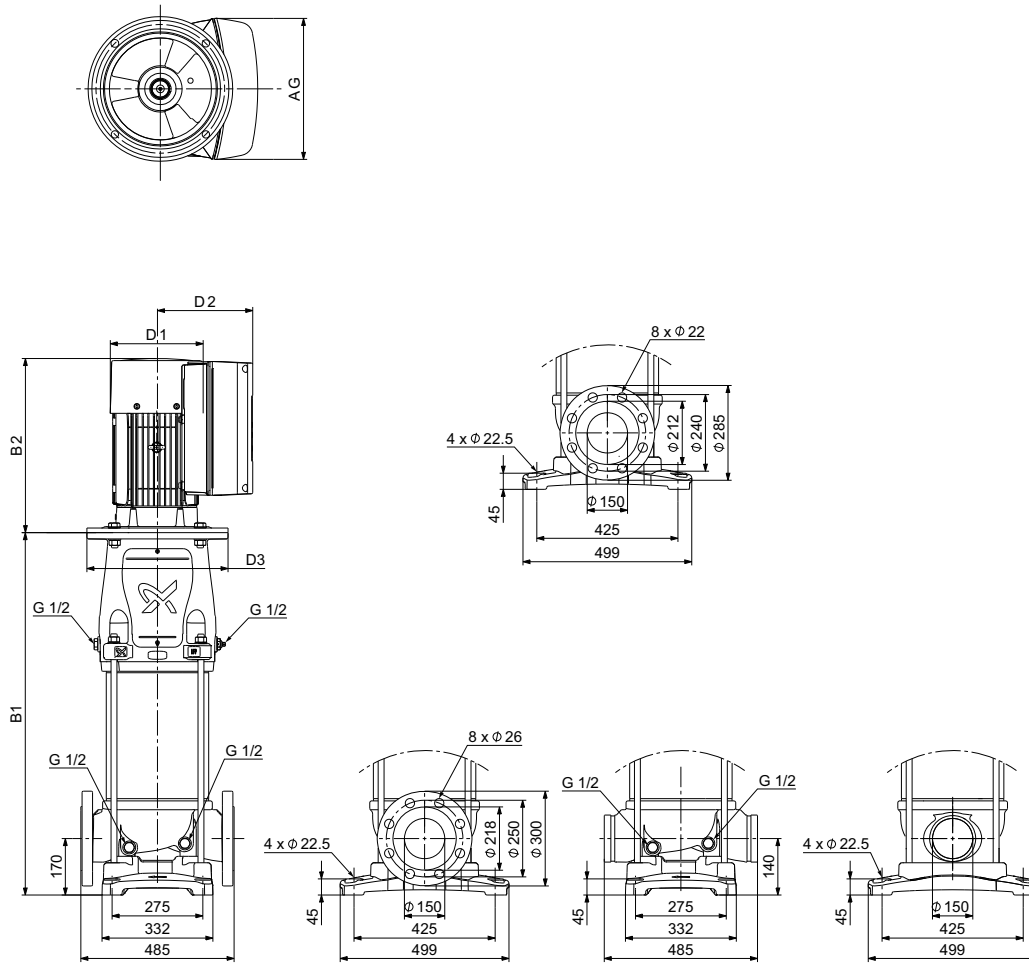
Pump type	P ₂ [kW]	CRE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRE 155-1-1	18.5	783	1309	318	308	350	420	291

CRNE 155



TM07 4494 2719

Dimensional sketches



TM07 4391 1419

Dimensions and weights

Pump type	P ₂ [kW]	CRNE						Net weight [kg]
		Dimension [mm]						
		B1	B1+B2	D1	D2	D3	AG	
CRNE 155-1-1	18.5	783	1309	318	308	350	420	291

8. Motor data

E-motors for CRE, CRIE, CRNE, 50/60 Hz

Motor make	P2 [kW]	Frame size	Phase	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	Motor efficiency class
Grundfos MGE	0.37*	71	1	200-240	2.4 - 2.1	0.96	84	IE5*
	0.55*	71	1	200-240	3.45 - 2.9	0.98	85.3	IE5*
	0.75*	80	1	200-240	4.7 - 3.9	0.99	85.2	IE5*
	1.1*	80	1	200-240	6.7 - 5.6	0.99	86.9	IE5*
	1.5*	90	1	200-240	9.1 - 7.6	0.99	87.4	IE5*
	0.37	71	3	380-500	1.05 - 1.0	0.68 - 0.54	84.5	IE5*
	0.55	71	3	380-500	1.35 - 1.3	0.77 - 0.61	85.9	IE5*
	0.75	80	3	380-500	1.7 - 1.6	0.83 - 0.67	85.9	IE5*
	1.1	80	3	380-500	2.2 - 1.9	0.89 - 0.79	89.1	IE5*
	1.5	90	3	380-500	2.9 - 2.4	0.92 - 0.85	88.9	IE5*
	2.2	90	3	380-500	4.15 - 3.4	0.93 - 0.87	90.1	IE5*
	3	100	3	380-500	5.8 - 4.8	0.91 - 0.86	90.7	IE5*
	4	112	3	380-500	7.6 - 6.2	0.92 - 0.87	92.2	IE5*
	5.5	132	3	380-500	10.3 - 8.2	0.92 - 0.88	92.7	IE5*
	7.5	132	3	380-500	14.1 - 11.2	0.93 - 0.89	92.5	IE5*
	11	160	3	380-500	20.3 - 16.0	0.93 - 0.90	93.1	IE5*
	15	160	3	380-480	30.0 - 26.0	0.91 - 0.86	91.9	IE3
	18.5	160	3	380-480	37.0 - 31.0	0.91 - 0.88	92.4	IE3
	22	180	3	380-480	43.5 - 35.0	0.91 - 0.90	92.7	IE3

* Pumps are normally fitted with three-phase MGE motors. Dimension tables in section 7. *Performance curves and technical data* on page 33 show pumps with three-phase MGE motors.

** The IE efficiency levels are defined in IEC 60034-30-2

E-motors, CRE, CRIE, CRNE, 50/60 Hz, 3 x 200-240 V

Motor make	P2 [kW]	Frame size	Phase	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	Motor efficiency class
Grundfos MGE	1.1	80	3	200-240	4.1 - 3.5	0.92 - 0.91	89.3	IE5
	1.5	90	3	200-240	5.4 - 4.6	0.92 - 0.92	88.9	IE5
	2.2	90	3	200-240	7.8 - 6.5	0.94 - 0.94	88.8	IE5
	4.0	112	3	200-240	10.5 - 8.8	0.94 - 0.94	90.3	IE5
	5.5	132	3	200-240	14.1 - 11.8	0.94 - 0.94	90.8	IE5

9. Pumped liquids

The pumps are suitable for thin, non-explosive liquids, not containing solid particles or fibres. The liquid must not chemically attack the pump materials.

When pumping liquids with a density and/or viscosity higher than that of water, use oversized motors, if required.

Whether a pump is suitable for a particular liquid depends on a number of factors of which the most important are the chloride content, pH value, temperature and content of chemicals and oils.

Please note that aggressive liquids, such as seawater and some acids, may attack or dissolve the protective oxide film of the stainless steel and thus cause corrosion.

CRE and CRIE

CRE and CRIE pumps are suitable for non-corrosive liquids.

Use CRE or CRIE pumps for liquid transfer, circulation and pressure boosting of cold or hot clean water.

CRNE

CRNE pumps are suitable for industrial liquids.

Use CRNE pumps in systems where all parts in contact with the liquid must be made of high-grade stainless steel.

CRTE

For saline or chloride-containing liquids such as seawater or for oxidising agents such as hypochlorites, we offer CRTE pumps made of titanium.

See the separate data booklet on CRTE available at www.grundfos.com (Grundfos Product Center).

List of pumped liquids

A number of typical liquids are listed on the next page.

Other pump versions may be applicable, but those stated in the list are considered to be the best choices.

The table is intended as a general guide only and cannot replace actual testing of the pumped liquids and pump materials under specific operating conditions.

Use the list with some caution, however. Factors such as those mentioned below may affect the chemical resistance of a specific pump version:

- concentration of the pumped liquid
- liquid temperature
- pressure.

Take safety precautions when pumping dangerous liquids.

Notes

D	Often with additives.
E	The density and/or viscosity differ from that/those of water. Take this factor into account when calculating motor output and pump performance.
F	Pump selection depends on many factors. Contact Grundfos.
H	Risk of crystallisation/precipitation in shaft seal.
1	Highly flammable liquid.
2	Combustible liquid.
3	Insoluble in water.
4	Low self-ignition point.

Pumped liquid	Chemical formula	Note	Liquid concentration, liquid temperature	CRE, CRIE	CRNE
Acetic acid	CH ₃ COOH	-	5 %, 20 °C	-	HQQE
Acetone	CH ₃ COCH ₃	1, F	100 %, 20 °C	-	HQQE
Alkaline degreasing agent		D, F	-	HQQE	-
Ammonium bicarbonate	NH ₄ HCO ₃	E	20 %, 30 °C	-	HQQE
Ammonium hydroxide	NH ₄ OH	-	20 %, 40 °C	HQQE	-
Aviation fuel		1, 3, 4, F	100 %, 20 °C	HQBV	-
Benzoic acid	C ₆ H ₅ COOH	H	0.5 %, 20 °C	-	HQQV
Boiler water		-	< 120 °C	HQQE	-
		F	120-180 °C	-	-
Calcareous water		-	< 90 °C	HQQE	-
Calcium acetate (as coolant with inhibitor)	Ca(CH ₃ COO) ₂	D, E	30 %, 50 °C	HQQE	-
Calcium hydroxide	Ca (OH) ₂	E	Saturated solution, 50 °C	HQQE	-
Chloride-containing water		F	< 30 °C, max. 500 ppm	-	HQQE
Chromic acid	H ₂ CrO ₄	H	1 %, 20 °C	-	HQQV
Citric acid	HOC(CH ₂ CO ₂ H) ₂ COOH	H	5 %, 40 °C	-	HQQE
Completely desalinated water (demineralised water)		-	120 °C	-	HQQE
Condensate		-	120 °C	HQQE	-
Copper sulphate	CuSO ₄	E	10 %, 50 °C	-	HQQE
Corn oil		D, E, 3	100 %, 80 °C	HQQV	-
Diesel oil		2, 3, 4, F	100 %, 20 °C	HQBV	-
Domestic hot water (potable water)		-	< 120 °C	HQQE	-
Ethanol (ethyl alcohol)	C ₂ H ₅ OH	1, F	100 %, 20 °C	HQQE	-
Ethylene glycol	HOCH ₂ CH ₂ OH	D, E	50 %, 50 °C	HQQE	-
Formic acid	HCOOH	-	5 %, 20 °C	-	HQQE
Glycerine (glycerol)	OHCH ₂ CH(OH)CH ₂ OH	D, E	50 %, 50 °C	HQQE	-
Hydraulic oil (mineral)		E, 2, 3	100 %, 100 °C	HQQV	-
Hydraulic oil (synthetic)		E, 2, 3	100 %, 100 °C	HQQV	-
Isopropyl alcohol	CH ₃ CHOHCH ₃	1, F	100 %, 20 °C	HQQE	-
Lactic acid	CH ₃ CH(OH)COOH	E, H	10 %, 20 °C	-	HQQV
Linoleic acid	C ₁₇ H ₃₁ COOH	E, 3	100 %, 20 °C	HQQV	-
Methanol (methyl alcohol)	CH ₃ OH	1, F	100 %, 20 °C	HQQE	-
Motor oil		E, 2, 3	100 %, 80 °C	HQQV	-
Naphthalene	C ₁₀ H ₈	E, H	100 %, 80 °C	HQQV	-
Nitric acid	HNO ₃	F	1 %, 20 °C	-	HQQE
Oil-containing water		-	< 100 °C	HQQV	-
Olive oil		D, E, 3	100 %, 80 °C	HQQV	-
Oxalic acid	(COOH) ₂	H	1 %, 20 °C	-	HQQE
Ozone-containing water	(O ₃)	-	< 100 °C	-	HQQE
Peanut oil		D, E, 3	100 %, 80 °C	HQQV	-
Petrol		1, 3, 4, F	100 %, 20 °C	HQBV	-
Phosphoric acid	H ₃ PO ₄	E	20 %, 20 °C	-	HQQE
Propanol	C ₃ H ₇ OH	1, F	100 %, 20 °C	HQQE	-
Propylene glycol	CH ₃ CH(OH)CH ₂ OH	D, E	50 %, 90 °C	HQQE	-
Potassium carbonate	K ₂ CO ₃	E	20 %, 50 °C	HQQE	-
Potassium formate (as coolant with inhibitor)	KOOCH	D, E	30 %, 50 °C	HQQE	-
Potassium hydroxide	KOH	E	20 %, 50 °C	-	HQQE
Potassium permanganate	KMnO ₄	-	5 %, 20 °C	-	HQQE
Rape seed oil		D, E, 3	100 %, 80 °C	HQQV	-
Salicylic acid	C ₆ H ₄ (OH)COOH	H	0.1 %, 20 °C	-	HQQE
Silicone oil		E, 3	100 %	HQQV	-
Sodium bicarbonate	NaHCO ₃	E	10 %, 60 °C	-	HQQE
Sodium chloride (as coolant)	NaCl	D, E	30 %, < 5 °C, pH > 8	HQQE	-
Sodium hydroxide	NaOH	E	20 %, +0 °C	-	HQQE
Sodium hypochlorite	NaOCl	F	0.1 %, 20 °C	-	HQQV
Sodium nitrate	NaNO ₃	E	10 %, 60 °C	-	HQQE
Sodium phosphate	Na ₃ PO ₄	E, H	10 %, 60 °C	-	HQQE
Sodium sulphate	Na ₂ SO ₄	E, H	10 %, 60 °C	-	HQQE
Softened water		-	< 120 °C	-	HQQE
Soya oil		D, E, 3	100 %, 80 °C	HQQV	-
Sulphuric acid	H ₂ SO ₄	F	1 %, 20 °C	-	HQQV
Sulphurous acid	H ₂ SO ₃	-	1 %, 20 °C	-	HQQE
Unsalted swimming-pool water		-	Approx. 2 ppm free chlorine (Cl ₂)	HQQE	-

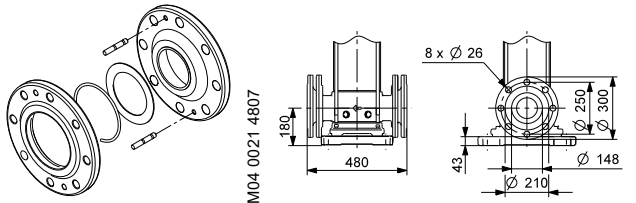
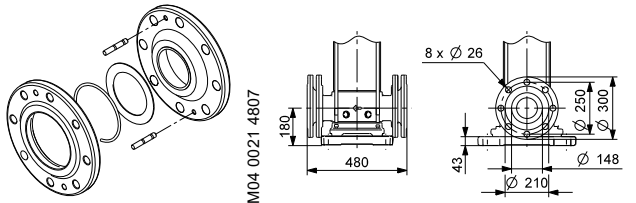
10. Accessories

Pipe connection

Various sets of counterflanges and couplings are available for pipe connection.

Adapter kit

DN 150 flanges are available for CRE, CRNE 125 and 155 pumps. To use DN 150 flanges, you must order two adapter kits per pump.

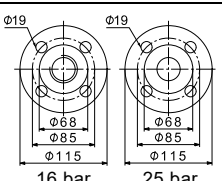
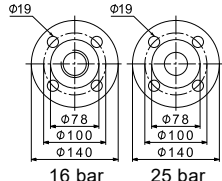
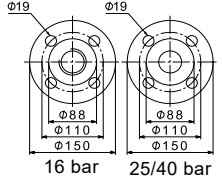
Adapter kit	Pump type	Pipe connection	Adapter kits required	Product number
	CRE 125 CRE 155	150 mm, nominal	2	96638169
	CRNE 125 CRNE 155	150 mm, nominal	2	96638180

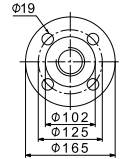
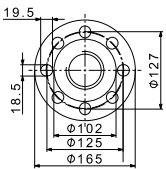
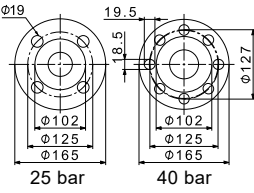
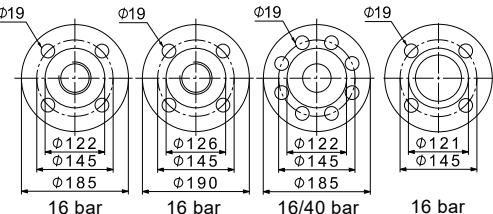
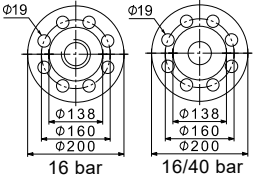
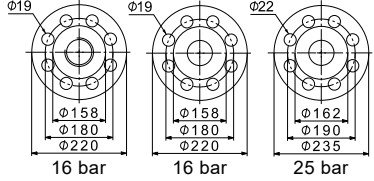
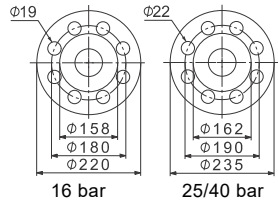
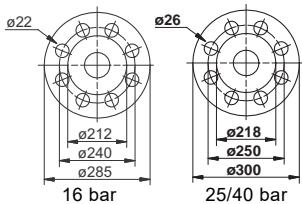
We offer an optional 6" pump base for the CRN 95, 125 and 155 pump ranges with DN 150 connections according to DIN, ANSI and JIS standards. This base eliminates the need for an adapter kit.

For more information, see CR "Custom-built pumps" data booklet in Grundfos Product Center at www.grundfos.com.

Counterflanges for CRE

A set consists of one counterflange, one gasket, bolts and nuts.

Counterflange	Pump type	Description	Rated pressure	Pipe connection	Product number
	CRE 1s CRE 1 CRE 3 CRE 5	Threaded	16 bar, EN 1092-2	Rp 1	409901
		For welding	25 bar, EN 1092-2	25 mm, nominal	409902
	CRE 1s CRE 1 CRE 3 CRE 5	Threaded	16 bar, EN 1092-2	Rp 1 1/4	419901
		For welding	25 bar, EN 1092-2	32 mm, nominal	419902
	CRE 10	Threaded	16 bar, EN 1092-2	Rp 1 1/2	429902
		Threaded	16 bar, EN 1092-2	Rp 2	429904
		For welding	25 bar, EN 1092-2	40 mm, nominal	429901
		For welding	40 bar, special flange	50 mm, nominal	429903

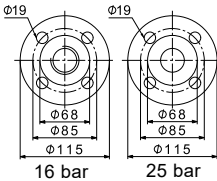
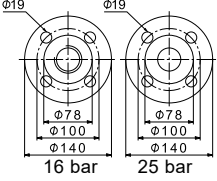
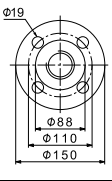
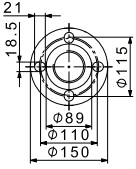
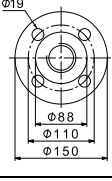
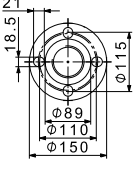
Counterflange	Pump type	Description	Rated pressure	Pipe connection	Product number
	TM05 0999 2011	Threaded	16 bar, EN 1092-2	Rp 2	339903
		Threaded	16 bar, special flange	Rp 2 1/2	339904
	TM05 1005 2011	CRE 15 CRE 20	16 bar, special flange	Rp 2 1/2*	96509578
	TM05 1000 2011		25 bar	40 bar	
			For welding	25 bar, EN 1092-2	50 mm, nominal
	TM05 0997 2011	CRE 32	16 bar, EN 1092-2	Rp 2 1/2	349902
			16 bar, special flange	Rp 3	349901
			16 bar, EN 1092-2	65 mm, nominal	349904
			40 bar, DIN 2635	65 mm, nominal	349905
	TM05 0996 2011	CRE 45	16 bar	Rp 3	350540
			16 bar	80 mm, nominal	350541
			40 bar	80 mm, nominal	350542
	TM05 0995 2011	CRE 64	16 bar, EN 1092-2	Rp 4	369901
			16 bar, EN 1092-2	100 mm, nominal	369902
			25 bar, EN 1092-2	100 mm, nominal	369905
	TM06 51.57 3915	CRE 95	16 bar, EN 1092-2	100 mm, nominal	369902
			25/40 bar, EN 1092-2	100 mm, nominal	-
	TM03 8891 2707 TM06 5171 4015	CRE 125 CRE 155	16 bar, EN 1092-2	150 mm, nominal	-
			25/40 bar, EN 1092-2	150 mm, nominal	-

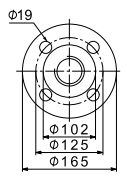
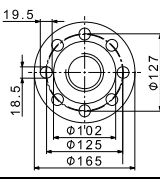
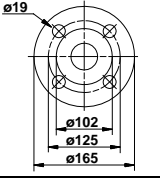
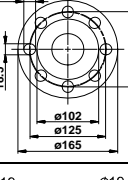
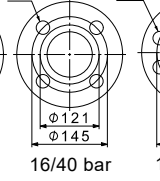

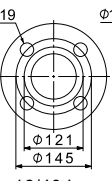
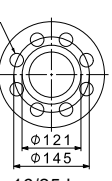
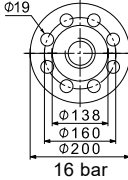
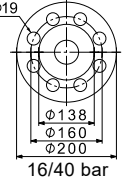
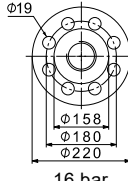
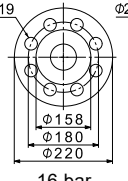
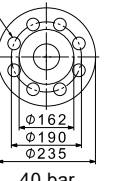
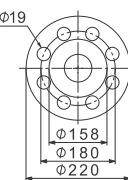
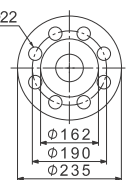
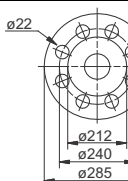
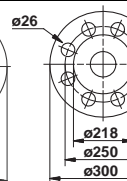
* Flange with 20 mm higher collar. With this collar, the installation dimensions of a CR 20 will be identical to those of a CR 32. If a CR 32 is replaced by a CR 20, the base must be raised by 15 mm.

Counterflanges for CRN

Counterflanges for CRN pumps are made of stainless steel EN 1.4401 (\approx AISI 316).

A set consists of one counterflange, one gasket, bolts and nuts.

Counterflange	Pump type	Description	Rated pressure	Pipe connection	Product number
 <p>16 bar 25 bar</p>	TM05 0998 2011 CRNE 1s, 1, 3, 5	Threaded	16 bar, EN 1092-1	Rp 1	405284
		For welding	25 bar, EN 1092-1	25 mm, nominal	405285
 <p>16 bar 25 bar</p>	TM05 1003 2011 CRNE 1s, 1, 3, 5	Threaded	16 bar, EN 1092-1	Rp 1 1/4	415304
		For welding	25 bar, EN 1092-1	32 mm, nominal	415305
	TM05 1001 2011	Threaded	16 bar, EN 1092-1	Rp 1 1/2	425245
	TM05 1006 2011 CRNE 10	Threaded	16 bar, EN 1092-1	Rp 2	96509570
	TM05 1001 2011	For welding	25 bar, EN 1092-1	40 mm, nominal	425246
	TM05 1006 2011	For welding	25 bar, special flange	50 mm, nominal	96509571

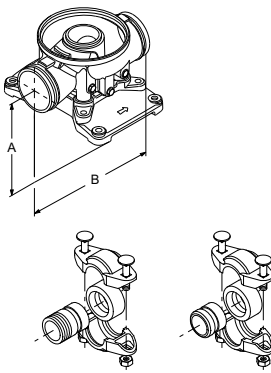
Counterflange	Pump type	Description	Rated pressure	Pipe connection	Product number
	TM05 0999 2011	Threaded	16 bar, EN 1092-1	Rp 2	335254
	TM05 1005 2011	Threaded	16 bar, special flange	Rp 2 1/2	96509575
	TM05 1005 2011	Threaded	16 bar, special flange	Rp 2 1/2*	96509579
	TM03 0402 2011	For welding	25 bar, EN 1092-1	50 mm, nominal	335255
	TM00 7203 2803	For welding	25 bar, special flange	65 mm, nominal	96509573
	TM05 0994 2011	Threaded	16 bar	Rp 2 1/2	349910
		Threaded	16 bar, special flange	Rp 3	349911
		For welding	16 bar	65 mm, nominal	349906
		For welding	40 bar	65 mm, nominal	349908
	TM05 0996 2011	Threaded	16 bar	Rp 3	350543
		For welding	16 bar	80 mm, nominal	350544
		For welding	40 bar	80 mm, nominal	350545
	TM05 0995 2011	Threaded	16 bar	Rp 4	369904
		For welding	16 bar	100 mm, nominal	369903
		For welding	40 bar	100 mm, nominal	369906
	TM06 5157 3915	For welding	16 bar, EN 1092-1	100 mm, nominal	360003
		For welding	25/40 bar, EN 1092-1	100 mm, nominal	369906
	TM03 8891 2707 TM06 5171 4015	For welding	16 bar, EN 1092-1	150 mm, nominal	98052936
		For welding	25/40 bar, EN 1092-1	150 mm, nominal	96750478

* Flange with 20 mm higher collar. With this collar, the installation dimensions of a CR 20 will be identical to those of a CR 32. If a CR 32 is replaced by a CR 20, the base must be raised by 15 mm.

PJE couplings for CRNE

Materials in contact with the pumped liquid are made of stainless steel EN 1.4401 (≈ AISI 316) and rubber.

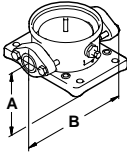
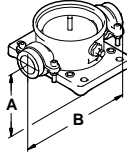
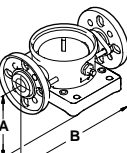
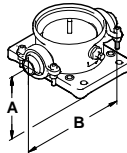
A set consists of two coupling halves (Victaulic type 77), one gasket, one pipe stub (for welding or threaded), bolts and nuts.

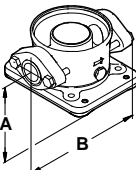
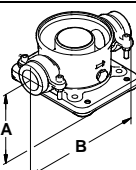
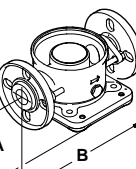
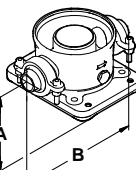
Coupling	Pump type	Pipe stub	Maximum pressure [bar]	A	B	Pipe connection	Rubber parts	Number of coupling sets required	Product number	
	CRNE 1s, 1, 3, 5	Threaded	69	50	320	R 1 1/4	EPDM	2	419911	
							FKM	2	419905	
		For welding	69	50	280	DN 32	EPDM	2	419912	
							FKM	2	419904	
		CRNE 10, 15, 20	Threaded	69	80	377	R 2	EPDM	2	339911
								FKM	2	339918
	For welding		69	80	371	DN 50	EPDM	2	339910	
							FKM	2	339917	
	CRNE 32	For welding	69	105	420	DN 80	EPDM	2	98144746	
							FKM	2	98144749	
CRNE 45, 64	For welding	69	140	465	DN 100	EPDM	2	98144752		
						FKM	2	98144755		
CRNE 95	For welding	69	140	465	DN 100	EPDM	2	98144752		
						FKM	2	98144755		
CRNE 125 CRNE 155	For welding	69	-	-	DN 150	EPDM	2	-		
						FKM	2	-		

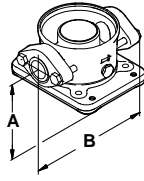
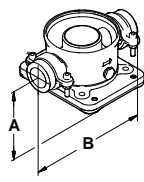
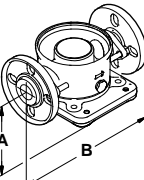
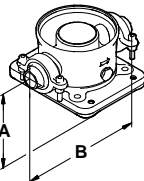
TM06 9172 1817 - TM00 3808 1094

FlexiClamp base connections

All sets comprise the necessary number of bolts and nuts as well as a gasket or O-ring.

Base connection	Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number
	CRIE CRNE 1s, 1, 3, 5 TM02 7368 3303	Oval (cast iron)	Rp 1	16	50	210	Klingersil	1	96449748
			Rp 1 1/4					1	96449749
		Oval (stainless steel)	Rp 1					2	96449746
			Rp 1 1/4					2	96449747
	CRIE CRNE 1s, 1, 3, 5 TM02 7369 3303	Union	G 2	25	50	228	EPDM	2	96449743
							FKM	2	96449744
	CRIE CRNE 1s, 1, 3, 5 TM02 7370 3303	DIN (stainless steel)	DN 25	16	75	250	EPDM	2	96449745
			DN 32				FKM	2	96449900
	CRIE CRNE 1s, 1, 3, 5 TM02 7371 3303	Clamp, threaded pipe stub	Rp 1	25	50	208	EPDM	2	405280
			FKM				2	405281	
			Rp 1 1/4				EPDM	2	415296
			1" NPT				FKM	2	415297
			1 1/4" NPT				EPDM	2	405291
							FKM	2	405292
							EPDM	2	415311
							FKM	2	415312
							EPDM	2	405282
							FKM	2	405283
	EPDM	2	415300						
	FKM	2	415301						
		Clamp, pipe stub for welding	28.5				EPDM	2	405282
			37.2				FKM	2	405283
							EPDM	2	415300
							FKM	2	415301

Base connection	Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number	
	CRIE 10 CRNE 10	Oval (cast iron)	Rp 1 1/4	16	80	260	Klingersil	2	96498775	
			Rp 1 1/2					2	96498727	
			Rp 2					2	96498836	
			Rp 1 1/4					2	96498776	
			Oval (stainless steel)					Rp 1 1/2	2	96498728
			Rp 2					2	96498835	
	CRIE 10 CRNE 10	Union	G 2 3/4	25	80	288	EPDM	2	96500275	
							FKM	2	96500276	
	CRIE 10 CRNE 10	FGJ (cast iron)	DN 40	16	80	316	EPDM	2	96498840	
							FKM	2	96500119	
							FGJ (stainless steel)	EPDM	2	96500263
								FKM	2	96500264
							FGJ (cast iron)	EPDM	2	96500265
								FKM	2	96500266
	CRIE 10 CRNE 10	Clamp, threaded pipe stub	Rp 1 1/2	25	80	346	EPDM	2	425238	
			Rp 2				FKM	2	425239	
			Rp 2 1/2				EPDM	2	335241	
							FKM	2	335242	
			Clamp, pipe stub for welding				EPDM	2	96508600	
							FKM	2	96508601	
EPDM	2	425242								
FKM	2	425243								
Clamp, pipe stub for welding	EPDM	2	335251							
	FKM	2	335252							

Base connection	Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number			
	CRIE 15, 20 CRNE 15, 20	Oval (cast iron)	Rp 1 1/4	10	90	260	Klingersil	2	96498775			
			Rp 1 1/2					2	96498727			
			Rp 2					2	96498836			
			Rp 1 1/4					2	96498776			
			Oval (stainless steel)					Rp 1 1/2	2	96498728		
			Rp 2					2	96498835			
	CRIE 15, 20 CRNE 15, 20	Union	G 2 3/4	25	90	288	EPDM	2	96500275			
							FKM	2	96500276			
	CRIE 15, 20 CRNE 15, 20	FGJ	DN 40	10	90	334	EPDM	2	96498840			
							(cast iron)	FKM	2	96500119		
							(stainless steel)	EPDM	2	96500263		
								FKM	2	96500264		
							FGJ (cast iron)	DN 50	EPDM	2	96500265	
									FKM	2	96500266	
									FGJ (stainless steel)	EPDM	2	96500267
										FKM	2	96500269
	CRIE 15, 20 CRNE 15, 20	Clamp, threaded pipe stub	Rp 1 1/2	25	90	346	EPDM	2	425238			
							FKM	2	425239			
							EPDM	2	335241			
							FKM	2	335242			
							EPDM	2	96508600			
							FKM	2	96508601			
			Clamp, pipe stub for welding				48.3 (DN 40)	EPDM	2	425242		
								FKM	2	425243		
							60.3 (DN 50)	EPDM	2	335251		
								FKM	2	335252		

Potentiometer

The potentiometer is suitable for setpoint setting and start/stop of the CRE, CRIE, CRNE pump.

Product	Product number
External potentiometer with cabinet for wall mounting	625468

EMC filter

The EMC filter is required when 11 to 22 kW E-pumps are installed in residential areas.

Product	Product number
EMC filter (11 kW)	96478309
EMC filter (15 kW)	
EMC filter (18.5 kW)	
EMC filter (22 kW)	

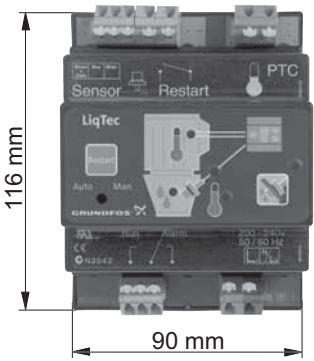
LiqTec

The LiqTec dry-running protection unit protects the pump and process against dry running and temperatures exceeding $130 \pm 5 \text{ }^\circ\text{C}$.

When connected to the motor PTC sensor, LiqTec also monitors the motor temperature.

LiqTec is prepared for DIN rail mounting in control cabinets.

Enclosure class: IPX0.

LiqTec unit	Pump type	Voltage [V]	LiqTec	Sensor 1/2"	Cable 5 m	Extension cable 15 m	Product number
	CRE CRIE CRNE	200-240	•	•	•	-	96556429
		80-130	•	•	•	-	96556430
		-	-	-	-	•	96443676
		-	-	•	•	-	96556427

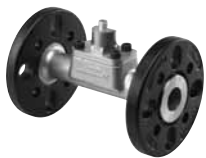
TM03 21108 3705

Kit, sensor cpl. MkII

This kit includes a sensor and cable only suitable for MGE motors.

Product	Product number
Sensor cpl. MkII with sensor and cable.	96556427

Sensors

Grundfos Vortex Flow sensor, VFI ¹⁾	Type	Flow range [m ³ /h]	Pipe connection	O-ring		Connection type		Product number	
				EPDM	FKM	Cast-iron flange	Stainless-steel flange		
	VFI 1.3-25 DN32 020 E	1.3 - 25	DN 32	•		•		97686141	
	VFI 1.3-25 DN32 020 F				•		•	97686142	
	VFI 1.3-25 DN32 020 E				•			•	97688297
	VFI 1.3-25 DN32 020 F				•			•	97688298
	VFI 2-40 DN40 020 E	2 - 40	DN 40	•		•		97686143	
	VFI 2-40 DN40 020 F				•		•	97686144	
	VFI 2-40 DN40 020 E				•			•	97688299
	VFI 2-40 DN40 020 F				•			•	97688300
	VFI 3.2-64 DN50 020 E	2 - 64	DN 50	•		•		97686145	
	VFI 3.2-64 DN50 020 F				•		•	97686146	
	VFI 3.2-64 DN50 020 E				•			•	97688301
	VFI 3.2-64 DN50 020 F				•			•	97688302
VFI 5.2-104 DN65 020 E	5.2 - 104	DN 65	•		•		97686147		
VFI 5.2-104 DN65 020 F				•		•	97686148		
VFI 5.2-104 DN65 020 E				•			•	97688303	
VFI 5.2-104 DN65 020 F				•			•	97688304	
VFI 8-160 DN80 020 E	8 - 160	DN 80	•		•		97686149		
VFI 8-160 DN80 020 F				•		•	97686150		
VFI 8-160 DN80 020 E				•			•	97688305	
VFI 8-160 DN80 020 F				•			•	97688306	
VFI 12-240 DN100 020 E	12 - 240	DN 100	•		•		97686151		
VFI 12-240 DN100 020 F				•		•	97686152		
VFI 12-240 DN100 020 E				•			•	97688308	
VFI 12-240 DN100 020 F				•			•	97688309	

¹⁾ For more information about the VFI sensor, see the Grundfos Direct Sensors™ data booklet, publication number 97790189 in Grundfos Product Center at www.grundfos.com.

Accessory	Type	Supplier	Measuring range	Product number
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	1-5 m ³ (DN 25)	ID8285
	SITRANS F M MAGFLO MAG 5100 W		3-10 m ³ (DN 40)	ID8286
	SITRANS F M MAGFLO MAG 5100 W		6-30 m ³ (DN 65)	ID8287
	SITRANS F M MAGFLO MAG 5100 W		20-75 m ³ (DN 100)	ID8288
Temperature sensor	TTA (0) 25	Carlo Gavazzi	0-25 °C	96432591
	TTA (-25) 25		-25 to +25 °C	96430194
	TTA (50) 100		50-100 °C	96432592
	TTA (0) 150		0-150 °C	96430195
Accessory for temperature sensor. All with 1/2 RG connection	Protecting tube ∅9 x 50 mm	Carlo Gavazzi		96430201
	Protecting tube ∅9 x 100 mm			96430202
	Cutting ring bush			96430203
Temperature sensor, ambient temperature	WR 52	tmg (DK: Plesner)	-50 to +50 °C	ID8295
Differential-temperature sensor	ETSD	Honsberg	0-20 °C	96409362
			0-50 °C	96409363

Note: All sensors have 4-20 mA signal output.

Danfoss pressure sensor kits

Content	Liquid temperature	Pressure [bar]	Product number
<ul style="list-style-type: none"> Danfoss pressure sensor, type MBS 3000, with 2 m screened cable. Connection: G 1/2 A (DIN 16288 - B6kt) 5 cable clips (black) Instructions PT (400212) 	-40 to +85 °C	0-4	96428014
		0-6	96428015
		0-10	96428016
		0-16	96428017
		0-25	96428018

DPI differential-pressure sensor kit

Content	Pressure [bar]	Product number
<ul style="list-style-type: none"> • 1 sensor incl. 0.9 m screened cable (7/16" connections) • 1 original DPI bracket for wall mounting • 1 Grundfos bracket for mounting on motor • 2 M4 screws for mounting of sensor on bracket • 1 M6 screw (self-cutting) for mounting on MGE 90/100 • 1 M8 screw (self-cutting) for mounting on MGE 112/132 • 3 capillary tubes (short/long) • 2 fittings (1/4" - 7/16") • 5 cable clips (black) • Installation and operating instructions (00480675) • Service kit instructions. 	0 - 0.6	96611522
	0 - 1.0	96611523
	0 - 1.6	96611524
	0 - 2.5	96611525
	0 - 4.0	96611526
	0 - 6.0	96611527
	0-10	96611550

Adjustable anti-vibration feet

TM04 3245 4016

The adjustable support foot reduces any vibrations from the system to the floor, allowing the system to be height-adjusted by ± 20 mm.

Description	Pump type	Product number
1 pcs. anti-vibration foot	CR(I)E 3 and 5	96412344
	CR(I)E 10 to 20	96412345
	CRE 32 to 95	96412347

Control MPC



TM05 3232 1012

Grundfos Control MPC is a complete control cabinet with a built-in CU 352 multipump control unit, main switch, contactors, IO 351 modules and cabling. Control MPC is designed for the control and monitoring of up to six identical pumps connected in parallel. Control MPC is supplied with all necessary components and contains application-optimised software.

For further information, please see the Control MPC Data Booklet at product-selection.grundfos.com.

Grundfos GO Remote

Grundfos GO Remote is used for wireless infrared or radio communication with the pumps.

Various Grundfos GO Remote variants are available. The variants are described in the following.

MI 202 and MI 204

MI 202 and MI 204 are add-on modules with built-in infrared and radio communication. MI 202 can be used in conjunction with an Apple iPhone or iPod with 30-pin connector and iOS 5.0 or later, for example a fourth generation iPhone or iPod.

MI 204 can be used in conjunction with an Apple iPhone or iPod with Lightning connector, for example a fifth generation iPhone or iPod.

(MI 204 is also available together with an Apple iPod touch and a cover.)

TM05 3887 1612
TM05 7704 1513

Fig. 30 MI 202 and MI 204

Supplied with the product:

- Grundfos MI 202 or 204
- sleeve
- quick guide
- charger cable.

MI 301

MI 301 is a module with built-in infrared and radio communication. MI 301 can be used in conjunction with Android or iOS-based smart devices with a Bluetooth connection. MI 301 has a rechargeable Li-ion battery and must be charged separately.

**Fig. 31** MI 301

Supplied with the product:

- Grundfos MI 301
- sleeve
- battery charger
- quick guide.

Product numbers

Grundfos GO Remote variant	Product number
Grundfos MI 202	98046376
Grundfos MI 204	98424092
Grundfos MI 204 including iPod touch	98612711
Grundfos MI 301	98046408

TM05 3890 1712

CIM communication interface modules

GRA 6121

Fig. 32 Grundfos CIM communication interface module

The CIM modules enable communication of operating data, such as measured values and setpoints, between CRE, CRIE or CRNE pumps of 11-22 kW and a building management system. The CIM modules are add-on communication modules which are fitted in the terminal box of CRE, CRIE, CRNE pumps of 11-22 kW.

Note: CIM modules must be fitted by authorised personnel.

We offer the following CIM modules:

CIM 100

For communication via LONWorks.

CIM 150

For communication via PROFIBUS DP.

CIM 200

For communication via Modbus RTU.

CIM 260

CIM 260 for 3G/4G cellular data connection to SCADA systems or for monitoring and control via SMS.

CIM 280

For connection to Grundfos iSOLUTIONS Cloud/GRM.

CIM 300

For communication via BACnet MS/TP.

CIM 500

Ethernet module for communication via PROFINET, Modbus TCP, BACnet IP, EtherNet/IP GRM IP, Grundfos iSOLUTIONS Cloud.

Available CIM modules

Description	Fieldbus protocol	Product number
CIM 100	LONWorks	96824797
CIM 150	PROFIBUS DP	96824793
CIM 200	Modbus RTU	96824796
CIM 260-EU*	3G/4G cellular	99439302
CIM 260-US*	3G/4G cellular	99439306
CIM 280-EU*	GiC/GRM 3G/4G	99439724
CIM 280-US*	GiC/GRM 3G/4G	99439725
CIM 300	BACnet MS/TP	96893770
CIM 500	Ethernet	98301408
Antenna (puc)	3G/4G	99518079

* Antenna not included.

For further information about data communication via CIM modules and fieldbus protocols, see the CIM documentation available in Grundfos Product Center at www.grundfos.com.

11. Variants

The variants are available on request.

Although the Grundfos CRE, CRIE, CRNE product range offers a number of pumps for different applications, customers require specific pump solutions to satisfy their needs. See the following documents:

- Grundfos "CR Custom-built pumps" data booklet
- Grundfos "CRN high pressure" data booklet.

Below please find the range of options available for customising the CRE pumps to meet the customers' demands.

Contact Grundfos for further information or for requests other than the ones mentioned below.

Motors

Variant	Description
Oversize motor	Ambient temperatures above 50 °C or installation at altitudes of more than 1000 metres above sea level require the use of an oversize motor, i.e. derating.
4-pole motor	We offer 4-pole standard motors.
IP66	The motor is completely dust-proof. The motor is protected against heavy seas or high-pressure water jets from any direction.
IT network (Earthing system)	This motor variant is designed for supply by an electric distribution system which has no connection to earth. This type of earthing system is called an IT network.
Advanced display	The pumps can be fitted with an advanced operating panel as an option.
Simple display	The pumps can be fitted with a simple operating panel as an option. Grundfos GO Remote is required to configure and set the pump.
Standard function module (FM200)	We offer FM 200 as an alternative to FM 300, fitted as standard. FM 200 offers fewer in- and output options compared to FM 300. The module has these connections: <ul style="list-style-type: none"> • two analog inputs • two digital inputs or one digital input and one • open-collector output • Grundfos Digital Sensor input and output • two signal relay outputs • GENIbus connection.

Shaft seals

Variant	Description
Shaft seal with FFKM O-ring	We recommend shaft seals with FFKM or FXM O-ring for applications where the pumped liquid may damage the standard O-ring material.
Seal with flush, quench seal	We recommend seals with flush/quench seals for applications involving crystallising, hardening or sticky liquids.
Air-cooled shaft seal system	We recommend air-cooled shaft seal systems for applications involving extremely high temperatures. No conventional mechanical shaft seal can withstand liquid temperatures of up to 180 °C for any length of time. In order to ensure a low liquid temperature around the standard shaft seal, the pump is fitted with a special air-cooled shaft seal chamber. No separate cooling is required.
Double seal with pressure chamber	We recommend double seals with pressure chamber for applications involving poisonous or explosive liquids. It protects the surrounding environment and the people working in the vicinity of the pump. It consists of two seals mounted in a "back-to-back" arrangement inside a separate pressure seal chamber. As the pressure in the chamber is higher than the pump pressure, leakage is prevented. A dosing pump or a special pressure intensifier generates the seal chamber pressure.
CR MAGdrive	Magnetically driven pumps for industrial applications. Key applications are industrial processes involving the handling of aggressive, environmentally dangerous or volatile liquids, for example organic compounds and solvents.

Pumps

Variant	Description
Horizontally mounted pump	For safety or height reasons, certain applications, for instance on ships, require the pump to be mounted in a horizontal position. For easy installation, the pump is fitted with brackets that support motor and pump.
Low-temperature pump	Exposed to temperatures down to -40 °C, coolant pumps may require neck rings with a different diameter in order to prevent impeller drag.
High-speed pump up to 47 bar	For high-pressure applications, we offer a unique pump capable of generating a pressure of up to 47 bar. The pump is fitted with a high-speed motor, type MGE. The direction of rotation is the opposite of that of standard pumps, and the chamber stack is turned upside-down, as a result of which the pumped liquid flows in the opposite direction.
High-pressure pump up to 47 bar	For high-pressure applications, we offer a unique double pump system capable of generating a pressure of up to 47 bar.
Low-NPSH pump (improved suction)	We recommend the Low-NPSH pump for boiler-feed applications where cavitation may occur due to poor inlet conditions.
Pump with bearing flange	The bearing flange is suitable for applications where the inlet pressure is higher than the maximum pressure recommended. The bearing flange increases the life of motor bearings. We recommend this pump for standard motors.
Belt-driven pump	Belt-driven pumps designed to operate in places with limited space or where no electrical power is available.
Pump for pharmaceutical and biotechnological applications	CRNE pumps designed for applications requiring the sterilisation and CIP capability of pipes, valves and pumps. (CIP = clean-in-place).

Connections and other variants

Variant	Description
Pipe connections	In addition to the wide range of standard flange connections, a 16 bar DIN standard clamping flange is available. Customised flanges are available according to specifications.
TriClamp connection	TriClamp connections are of a hygienic design with a sanitary coupling for use in the pharmaceutical and food industry.
Electropolished pump	To substantially reduce the risk of corrosion of the materials. For use in the pharmaceutical and food industry.

12. Grundfos Product Center

Online search and sizing tool to help you make the right choice.

<http://product-selection.grundfos.com>

All the information you need in one place

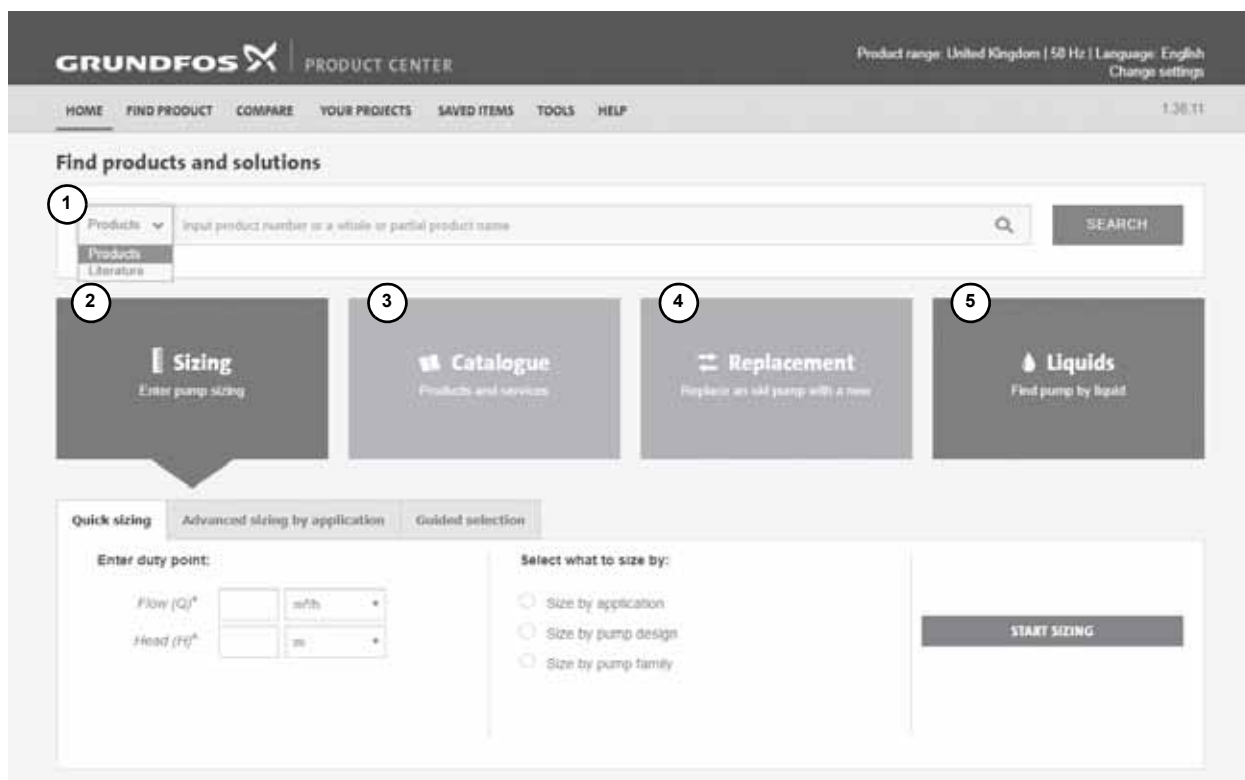
Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

Downloads

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc. in PDF format.



TM07 2384



TM07 2383

Pos. Description

- | | |
|---|---|
| 1 | This drop-down menu enables you to set the search function to "Products" or "Literature". |
| 2 | SIZING enables you to size a pump based on entered data and selection choices. |
| 3 | CATALOGUE gives you access to the Grundfos product catalogue.
REPLACEMENT enables you to find a replacement product.
Search results will include information on |
| 4 | the lowest purchase price
the lowest energy consumption
the lowest total life cycle cost. |
| 5 | LIQUIDS enables you to find pumps designed for aggressive, flammable or other special liquids. |

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GRUNDFOS A/S
DK-8850 Bjerringbro . Denmark
Telephone: +45 87 50 14 00
www.grundfos.com

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