

CR, CRI, CRN, CRE, CRIE, CRNE

Vertical multistage centrifugal pumps
60 Hz



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Introduction

This data booklet deals with CR, CRI and CRN as well as CRE, CRIE and CRNE pumps.



GR5381

Fig. 1 CR, CRI and CRN pumps

CR, CRI and CRN pumps are vertical multistage centrifugal pumps. The in-line design enables the pump to be installed in a horizontal one-pipe system where the suction and discharge ports are in the same horizontal plane and have the same pipe dimensions. This design provides a more compact pump design and pipework.

Grundfos CR pumps come with various pump sizes and various numbers of stages to provide the flow and the pressure required.

CR pumps are designed for a variety of applications from the pumping of potable water to the pumping of chemicals. The pumps are therefore suitable for a wide diversity of pumping systems where the performance and material of the pump meet specific demands.

The CR pumps consist of two main components: the motor and the pump unit. The motor of CR pumps is a Grundfos motor designed to EN standards.

The pump unit consists of optimised hydraulics, various types of connections, an outer sleeve, a pump head and various other parts.

CR pumps are available in various material versions according to the pumped liquid.

CRE, CRIE, CRNE pumps



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Fig. 2 CRE, CRIE and CRNE pumps

CRE, CRIE and CRNE pumps are built on the basis of CR, CRI, CRN pumps.

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

The difference between the CR and the CRE pump range is the motor. CRE, CRIE and CRNE pumps are fitted with an E-motor, i.e. a motor with built-in frequency control.

The motor of the CRE pump is a Grundfos MGE or MMGE motor designed to EN standards.

Frequency control enables continuously variable control of motor speed, which makes it possible to set the pump to operation at any duty point. The aim of continuously variable 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 control.

The pump materials are the same as those of the CR, CRI and CRN pump range.

Selecting a CRE pump

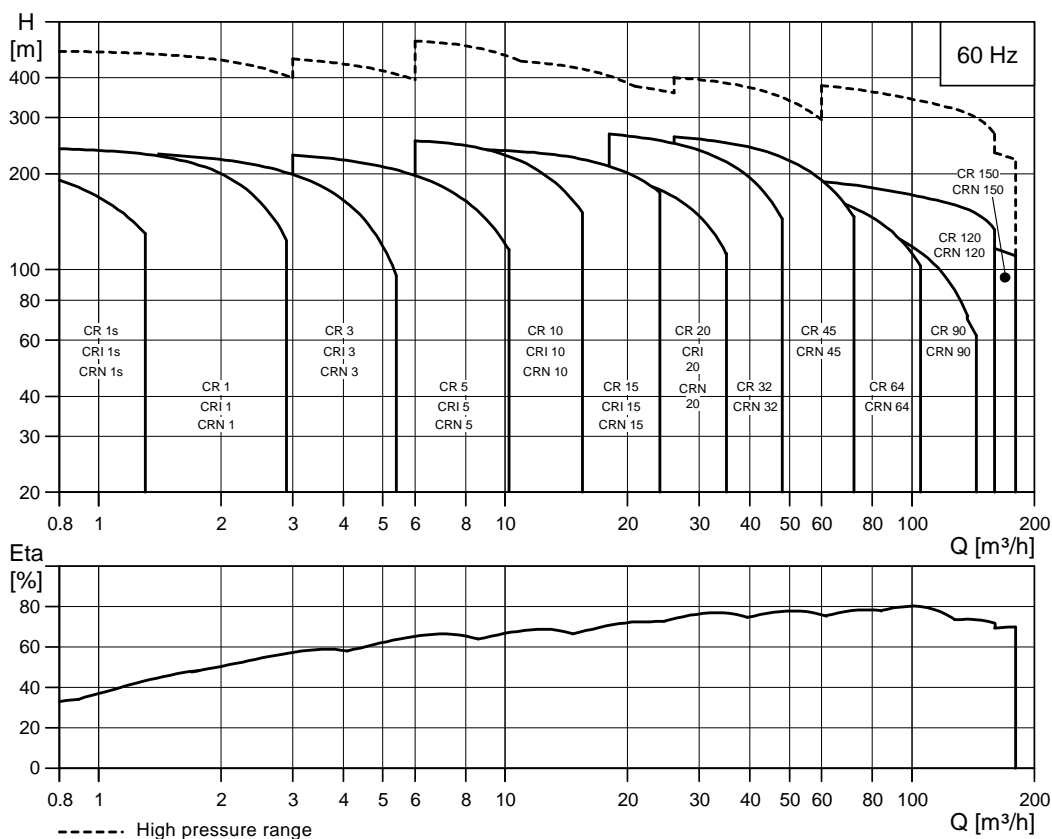
Select a CRE pump if the following features are required:

- controlled operation, i.e. consumption fluctuates
- constant pressure
- communication with the pump.

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

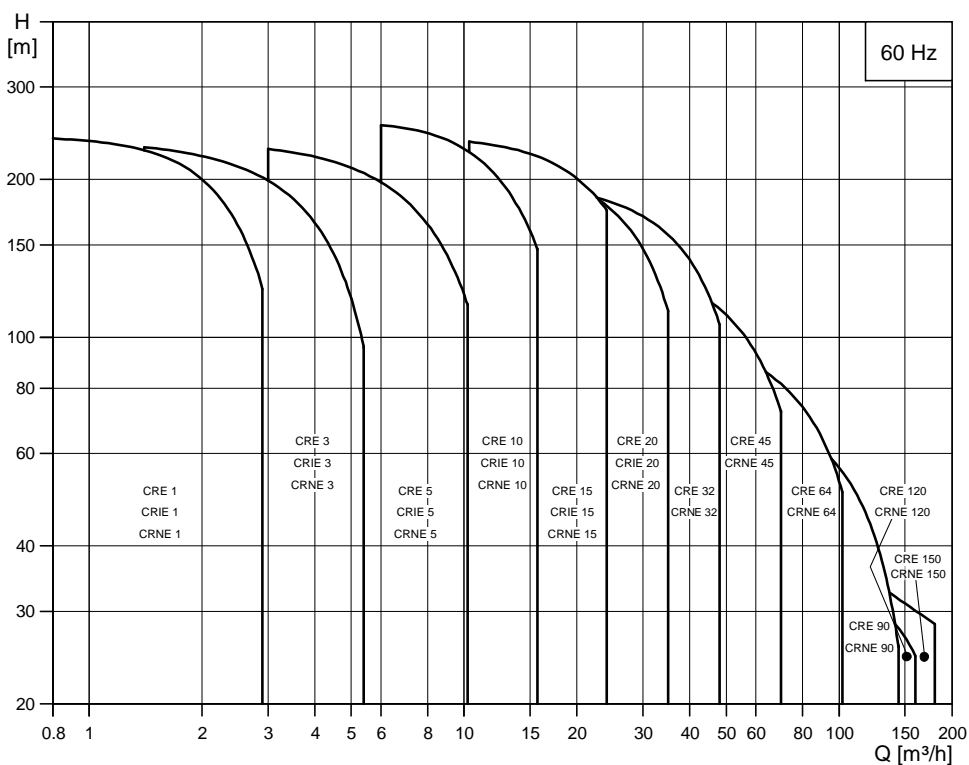
- energy savings
- increased comfort
- control and monitoring of the pump performance.

Performance range - CR, CRI, CRN



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Performance range - CRE, CRIE, CRNE



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Applications

Application	CR, CRI	CRN	CRE, CRNE
Water supply			
Filtration and transfer at waterworks	•	○	•
Distribution from waterworks	•	○	•
Pressure boosting in mains	•	○	•
Pressure boosting in high-rise buildings, hotels, etc.	•	○	•
Pressure boosting for industrial water supply	•	○	•
Industry			
Pressure boosting			
Process water systems	•	•	•
Washing and cleaning systems	•	•	○
Vehicle-washing tunnels	•	○	•
Fire-fighting 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			
Ultra-filtration systems		•	
Reverse-osmosis systems ★		•	
Softening, ionising, demineralizing systems		•	
Distillation systems		•	
Separators	•	•	•
Swimming baths ★		•	
Irrigation			
Field irrigation (flooding)	•	○	
Sprinkler irrigation	•	○	•
Drip-feed irrigation	•	○	

• Recommended version.

○ Alternative version.

★ CRT, CRTE version available.

For further information about CRT, CRTE pumps, see "Pumped liquids", page 78, or related CRT, CRTE data booklet.

Product range

Range	CR 1s	CR, CRE 1	CR, CRE 3	CR, CRE 5	CR, CRE 10	CR, CRE 15	CR, CRE 20
Nominal flow rate [m ³ /h]	1	1.2	3.6	6	12	18	24
Temperature range [°C]	-20 to +120						
Temperature range [°C] – on request	-40 to +180						
Max. pump efficiency [%]	35	49	59	67	70	72	72
CR pumps							
Flow range [m ³ /h]	0.4 - 1.3	0.8 - 2.9	1.4 - 5.4	3 - 10.2	6-16	10-29	13-35
Max. pressure [bar]	23	24	24	24	25	24	21
High pressure [bar] – on request	-	48	42	48	47	47	47
Motor power [kW]	0.37 - 1.1	0.37 - 3.0	0.37 - 4.0	0.55 - 7.5	0.75-11	1.5-18.5	2.2 - 18.5
CRE pumps							
Flow range [m ³ /h]	-	0.8 - 2.9	1.4 - 5.4	3 - 10.2	6-16	10-29	13-35
Max. 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							
CR, CRE: Cast iron and stainless steel EN 1.4301/AISI 304	•	•	•	•	•	•	•
CRI, CRIE: Stainless steel EN 1.4301/AISI 304	•	•	•	•	•	•	•
CRN, CRNE: Stainless steel EN 1.4401/AISI 316	•	•	•	•	•	•	•
CRT, CRTE: Titanium	See the CRT, CRTE data booklet.						
CR, CRE pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1	Rp 1¼	Rp 1½	Rp 2	Rp 2
Oval flange (BSP) on request	Rp 1¼	Rp 1¼	Rp 1¼	Rp 1	Rp 1¼ Rp 2	Rp 2½	Rp 2½
Flange	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 40	DN 50	DN 50
Flange on request	-	-	-	-	DN 50	-	-
CRI, CRIE pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1¼	Rp 1¼	Rp 1½	Rp 2	Rp 2
Oval flange (BSP) on request	Rp 1¼	Rp 1¼	Rp 1	Rp 1	Rp 2	-	-
Flange	DN 25/ DN 32	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 1¼ DN 32	R 1¼ DN 32	R 1¼ DN 32	R 1¼ DN 32	R 2 DN 50	R 2 DN 50	R 2 DN 50
Clamp coupling (L-coupling)	Ø 48.3	Ø 48.3	Ø 48.3	Ø 48.3	Ø 60.3	Ø 60.3	Ø 60.3
Union (+GF+)	G 2	G2	G 2	G 2	G 2¾	G 2¾	G 2¾
CRN(E) pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1¼	Rp 1¼	Rp 1½	Rp 2	Rp 2
Oval flange (BSP) on request	Rp 1¼	Rp 1¼	Rp 1	Rp 1	Rp 2	-	-
Flange	DN 25/ DN 32	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 1¼ DN 32	R 1¼ DN 32	R 1¼ DN 32	R 1¼ DN 32	R 2 DN 50	R 2 DN 50	R 2 DN 50
Clamp coupling (L-coupling)	Ø 48.3	Ø 48.3	Ø 48.3	Ø 48.3	Ø 60.3	Ø 60.3	Ø 60.3
Union (+GF+)	G 2	G2	G 2	G 2	G 2¾	G 2¾	G 2¾

- Standard
- Available

Range	CR, CRE 32	CR, CRE 45	CR, CRE 64	CR, CRE 90	CR, CRE 120	CR, CRE 150
Nominal flow rate [m ³ /h]	38	54	77	108	140	180
Temperature range [°C]	-30 to +120 ¹⁾			-30 to +120 ¹⁾ & ²⁾		
Temperature range [°C] – on request	-40 to +180			-		
Max. pump efficiency [%]	76	78	79	80	74	70
CR pumps						
Flow range [m ³ /h]	18-48	26-70	36-102	54-146	60-160	75-180
Max. pressure [bar]	27	26	18	16	19	16
High pressure [bar] – on request	40	40	36	33	37	31
Motor power [kW]	2.2 - 30	5.5 - 45	7.5 - 45	11-45	11-75	11-75
CRE pumps						
Flow range [m ³ /h]	18-48	26-70	36-102	54-146	60-160	75-180
Max. pressure [bar]	27	26	18.2	16.5	4	5
Motor power [kW]	2.2 - 22	5.5 - 22	7.5 - 22	11-22	18.5	22
Version						
CR, CRE: Cast iron and stainless steel EN 1.4301/AISI 304	•	•	•	•	•	•
CRI, CRIE: Stainless steel EN 1.4301/AISI 304	○	○	○	○	-	-
CRN, CRNE: Stainless steel EN 1.4401/AISI 316	•	•	•	•	•	•
CRT, CRTE: Titanium	See the CRT, CRTE data booklet				-	-
CR, CRE pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP) on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 125	DN 125
Flange on request	DN 80	DN 100	DN 125	DN 125	DN 150	DN 150
CRI, CRIE pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP) on request	-	-	-	-	-	-
Flange	-	-	-	-	-	-
Flange on request	-	-	-	-	-	-
PJE coupling (Victaulic)	-	-	-	-	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-
CRN(E) pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP) on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 125	DN 125
Flange on request	DN 80	DN 100	DN 125	DN 125	DN 150	DN 150
PJE coupling (Victaulic)	3" ³⁾	4" ³⁾	4" ³⁾	4" ³⁾	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-

• Standard

○ Available

¹⁾ CRN 32 to CRN 90 with HQQE shaft seal: -40 °C to 120 °C

²⁾ CR, CRN 120 and 150 with 55 or 75 kW motors with HBQE shaft seal: 0 °C to 120 °C

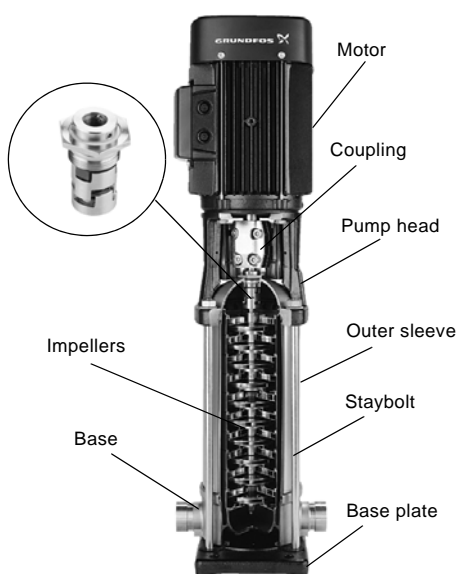
³⁾ On request. See the CR "Custom-built pumps" catalogue.

Pump

The CR and CRE pumps are a non-self-priming, vertical multistage centrifugal pumps. The pumps are available with a Grundfos standard motor (CR pumps) or a frequency-controlled motor (CRE pumps).

The pump consists of a base and a pump head. The chamber stack and the outer sleeve are secured between the pump head and the base by means of staybolts. The base has suction and discharge ports on the same level (in-line).

All pumps are equipped with a maintenance-free mechanical shaft seal of the cartridge type.



GR5357 - GR3395

Fig. 3 CR pump

Motor

Grundfos standard motors - MG and Siemens motors

CR, CRI and CRN pumps are fitted with a totally enclosed, fan-cooled, 2-pole Grundfos standard motor with principal dimensions in accordance with the EN standards.

Electrical tolerances according to EN 60034.

CR, CRI, CRN pumps are fitted with three-phase MG motors as standard.

CR, CRI, CRN pumps from 0.37 to 2.2 kW are also available with single-phase motors (1 x 220-230/240 V). See Win-/WebCAPS.

Frequency-controlled motors - MGE motors

CRE, CRIE and CRNE pumps are fitted with a totally enclosed, fan-cooled, 2-pole frequency-controlled motor with principal dimensions in accordance with the EN standards.

Electrical tolerances according to EN 60034.

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

CRE, CRIE, CRNE pumps from 0.75 to 1.1 kW are also available with three-phase MGE motors. See Win-/WebCAPS.

Electrical data

CR, CRI, CRN pumps

MG motor	
Mounting designation	Up to 4 kW: V 18 From 5.5 kW: V 1
Insulation class	F
Efficiency class	EFF 1 (0.37 - 0.75 kW are EFF 2)
Enclosure class	IP 55 ★
Supply voltage (Tolerance: +/-10%)	P ₂ : 0.37 - 1.1 kW: 3 x 220-255/380-440 V
	P ₂ : 1.5 kW: 3 x 220-277/380-480 V
	P ₂ : 2.2 - 5.5 kW: 3 x 380-480 V
Supply frequency	P ₂ : 7.5 - 75 kW: 3 x 380-480/660-690 V
	60 Hz

★ IP 44, IP 54 and IP 65 – on request.

CRE, CRIE, CRNE pumps

MGE motor	
Mounting designation	Up to 4 kW: V 18 From 5.5 kW: V 1
Insulation class	F
Efficiency class	EFF 1 ★
Enclosure class	IP 54
Supply voltage (Tolerance: +/-10%)	P ₂ : 0.37 - 1.1 kW: 1 x 200-240 V
	P ₂ : 0.75 - 22 kW: 3 x 380-480 V
Supply frequency	50/60 Hz

★ Single-phase MGE motors are EFF 2.

Optional motors

The Grundfos standard range of motors covers a wide variety of application demands. However, for special applications or operating conditions, custom-built motor solutions can be provided. For special applications or operating conditions, Grundfos offers custom-built motors such as:

- ATEX approved MG motors,
- MG motors with anti-condensation heating unit,
- motors with thermal protection.

Motor protection

MG and Siemens motors

Single-phase Grundfos motors have a built-in thermal overload switch (IEC 34-11: TP 211).

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

Three-phase Grundfos motors from 3 kW and upwards have a built-in thermistor (PTC) according to DIN 44 082 (IEC 34-11: TP 211).

MGE motors

CRE, CRIE, CRNE pumps require no external motor protection. The MGE motor incorporates thermal protection against slow overloading and blocking (IEC 34-11: TP 211).

Terminal box positions

As standard the terminal box is mounted on the suction side of the pump.

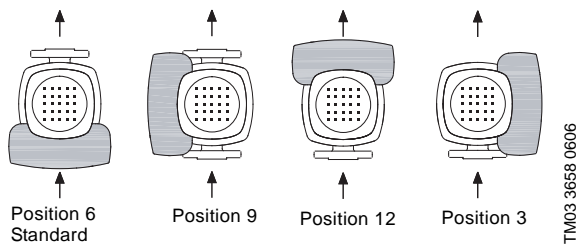


Fig. 4 Terminal box positions

Ambient temperature

Motor power [kW]	Motor make	Motor efficiency class	Maximum ambient temperature [°C]	Maximum altitude above sea level [m]
0.37 - 0.75	Grundfos MG	EFF 2	+40	1000
1.1 - 22	Grundfos MG	EFF 1	+60	3500
30-75	Siemens	EFF 1	+55	2750

If the ambient temperature exceeds the above temperature values or the pump is installed at an altitude exceeding the above altitude values, 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.

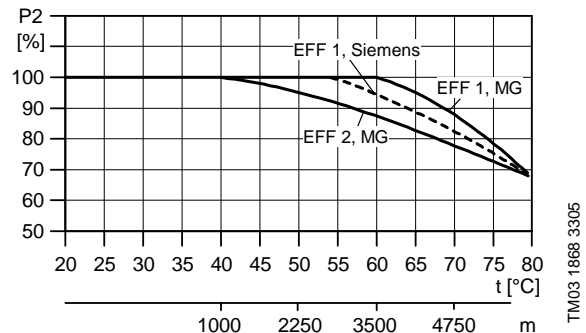


Fig. 5 Motor output depends on temperature/altitude

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 the power consumption.

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

Examples of E-pump applications

CRE, CRIE and CRNE pumps are the ideal solution in a number of applications characterized by a need for variable flow at constant pressure. The pumps are suited for water supply systems and pressure boosting, but also industrial applications.

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

E-pumps in the service of industry

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.

Below is mentioned some of the applications in which E-pumps are often used.

Constant pressure

- Water supply,
- Washing and cleaning systems,
- Distribution from waterworks,
- Humidifying systems,
- Water treatment systems,
- Process boosting systems, etc.

Example: Within industrial water supply, E-pumps with integrated pressure sensor are used to ensure a constant pressure in the piping network. 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 equalized. The constant pressure is stabilized 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, etc.

Example: In industrial freezing systems, E-pumps with 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 flow

- Steam boiler systems,
- Condensate systems,
- Sprinkler irrigation systems,
- Chemical industry, etc.

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 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 a stable steam production.

Dosing applications

- Chemical industry (i.e. control of pH-values),
- Petrochemical industry,
- Paint industry,
- Degreasing systems,
- Bleaching systems, etc.

Example: In the petrochemical industry, E-pumps with 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 i.e. office buildings, hotels, etc.

Example: E-pumps with 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 equalized.

Constant temperature

- Air-conditioning systems in hotels, schools,
- Building cooling systems, etc.

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

Control options of E-pumps

Communication with CRE, CRIE, CRNE pumps is possible by means of

- a central management system,
- remote control (Grundfos R100) or
- a control panel.

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

Central management system

Communication with the E-pump is possible even though the operator is not present near the E-pump. Communication is enabled by having connected the E-pump to a central management system allowing the operator to monitor and change control modes and setpoint settings of the E-pump.

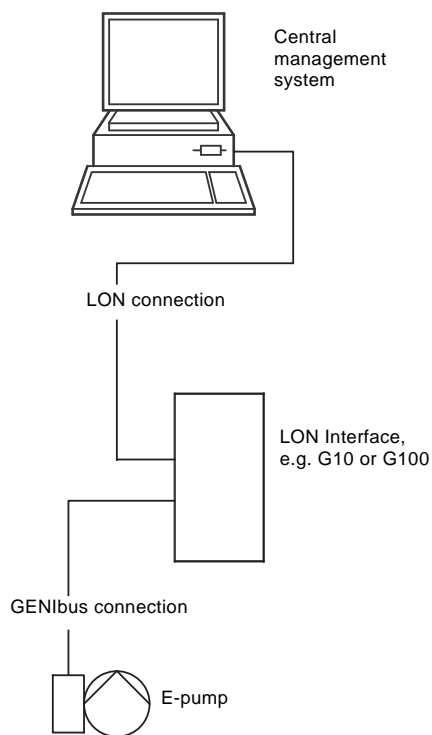


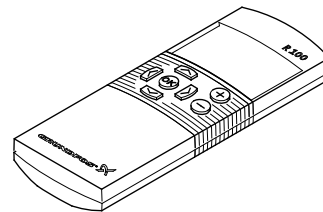
Fig. 6 Structure of a central management system

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Remote control

The R100 remote control produced by Grundfos is available as an accessory.

The operator communicates with the E-pump by pointing the IR-signal transmitter at the control panel of the E-pump terminal box.



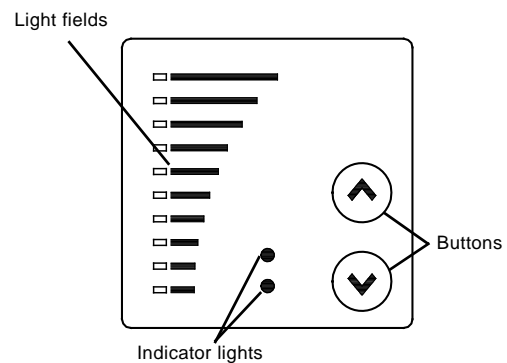
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Fig. 7 R100 remote control

On the R100 display it is possible to monitor and change control modes and settings of the E-pump.

Control panel

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



TM00 7600 0404

Fig. 8 Control panel on CRE pump

Control modes for E-pumps

Grundfos offers CRE, CRIE and CRNE pumps in two different variants:

- CRE, CRIE and CRNE with integrated pressure sensor
- CRE, CRIE and CRNE without sensor.

CRE, CRIE, CRNE with integrated pressure sensor

CRE, CRIE and CRNE pumps with integrated pressure sensor are suitable for applications where you want to control the pressure after the pump, irrespective of the flow. For further information, see the section "Examples of E-pump applications" on page 10.

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

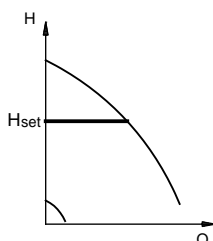


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Fig. 9 CRE, CRIE and CRNE pumps

A CRE, CRIE or CRNE pump with integrated pressure sensor facilitates installation and commissioning. CRE, CRIE and CRNE pumps with integrated pressure sensor can be set to:

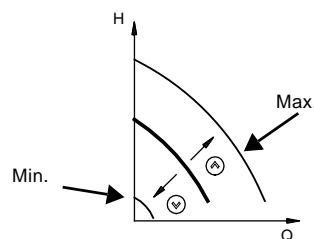
- constant-pressure mode (factory setting) or
- constant-curve mode.
- In **constant-pressure** mode, the pump maintains a preset pressure after the pump, irrespective of the flow, see figure below.



TM00 9322 4796

Fig. 10 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 figure below.



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Fig. 11 Constant curve mode

CRE, CRIE, CRNE without sensor

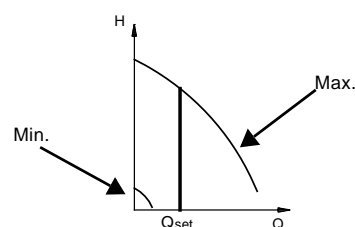
CRE, CRIE and CRNE pumps without sensor are suitable for applications where

- uncontrolled operation is required
- you want to fit another sensor later in order to control the flow, temperature, differential temperature, liquid level, pH value, etc at some arbitrary point in the system.

CRE, CRIE and CRNE pumps without sensor can be set to:

- controlled-operation mode or
- uncontrolled-operation mode (factory-setting).

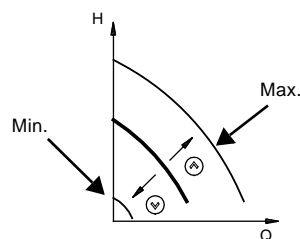
In **controlled**-operation mode, the pump adjusts its performance to the desired setpoint, see figure below.



TM02 7264 2803

Fig. 12 Constant flow mode

In **uncontrolled**-operation mode, the pump operates according to the constant curve set, see figure below.



TM00 9323 1204

Fig. 13 Constant curve mode

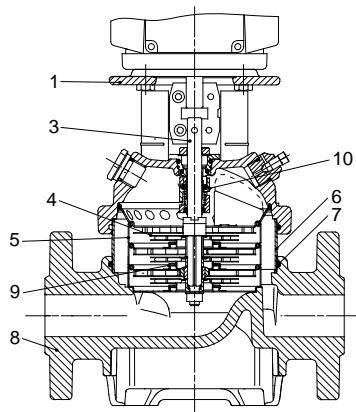
CRE, CRIE and CRNE pumps can be fitted with sensor types meeting the requirements mentioned in the data booklet titled "Grundfos E-pumps".

CR(E) 1s, 1, 3, 5, 10, 15 and 20



TM02 1198 0601 - GR7377 - GR7379

Sectional drawing



TM02 1194 1403

Materials: CR(E)

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJL-200	EN-JL1030	ASTM 25B
3	Shaft	Stainless steel	1.4401 ¹⁾ 1.4057 ²⁾	AISI 316 AISI 431
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Outer sleeve	Stainless steel	1.4301	AISI 304
7	O-ring for outer sleeve	EPDM or FKM		
8	Base	Cast iron EN-GJL-200	EN-JL1030	ASTM 25B
9	Neck ring	PTFE		
10	Shaft seal			
	Rubber parts	EPDM or FKM		

¹⁾ CR(E) 1S, 1, 3, 5

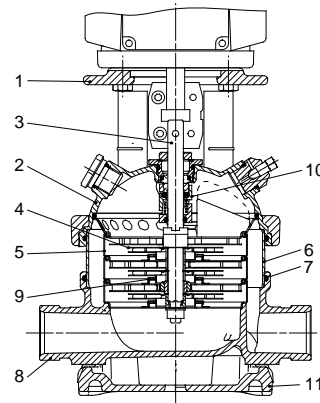
²⁾ CR(E) 10, 15, 20

CRI(E), CRN(E) 1s, 1, 3, 5, 10, 15 and 20



TM02 1808 2001 - GR7373 - GR7375

Sectional drawing



TM02 1195 1403

Materials: CRI(E), CRN(E)

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJL-200 ¹⁾	EN-JL1030	ASTM 25B
2	Pump head cover	Stainless steel	1.4408	CF 8M eq. to AISI 316
3	Shaft	Stainless steel	1.4401 ²⁾ 1.4460 ³⁾	AISI 316 AISI 329
8	Base	Stainless steel	1.4408	CF 8M eq. to AISI 316
9	Neck ring	PTFE		
10	Shaft seal	Cartridge type		
11	Base plate	Cast iron EN-GJL-200 ¹⁾	EN-JL1030	ASTM 25B
	Rubber parts	EPDM or FKM		
CRI(E)				
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Outer sleeve	Stainless steel	1.4301	AISI 304
7	O-ring for outer sleeve	EPDM or FKM		
CRN(E)				
4	Impeller	Stainless steel	1.4401	AISI 316
5	Chamber	Stainless steel	1.4401	AISI 316
6	Outer sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for outer sleeve	EPDM or FKM		

¹⁾ Stainless steel available on request.

²⁾ CRI(E), CRN(E) 1S, 1, 3, 5

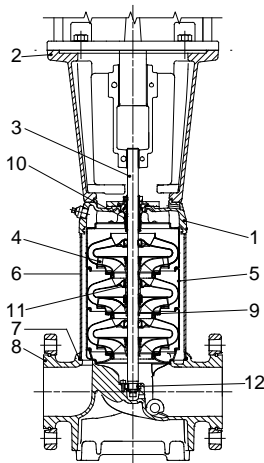
³⁾ CRI(E), CRN(E) 10, 15, 20

CR(E) 32, 45, 64 and 90



TM01 2150 1298 - GR5952

Sectional drawing



TM01 1836 1403

Materials: CR(E)

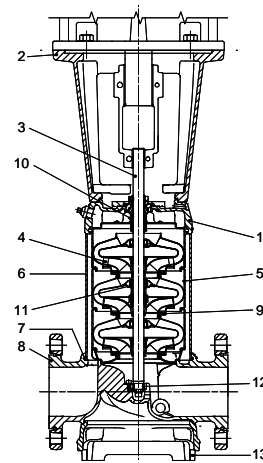
Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJS-500-7	EN-JS1050	ASTM 80-55-06
2	Motor stool	Cast iron EN-GJL-200	EN-JL1030	ASTM 25B
3	Shaft	Stainless steel	1.4057	AISI 431
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Outer sleeve	Stainless steel	1.4301	AISI 304
7	O-ring for outer sleeve	EPDM or FKM		
8	Base	Cast iron EN-GJS-500-7	EN-JS1050	ASTM 80-55-06
9	Neck ring	Carbon-graphite filled PTFE		
10	Shaft seal			
11	Bearing ring	Bronze		
12	Bottom bearing ring	Tungsten carbide/ tungsten carbide		
	Rubber parts	EPDM or FKM		

CRN(E) 32, 45, 64 and 90



TM02 7399 3403

Sectional drawing



TM01 1837 1403

Materials: CRN(E)

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Stainless steel	1.4408	CF 8M eq. to AISI 316
2	Motor stool	Cast iron EN-GJL-200 1)	EN-JL1030	ASTM 25B
3	Shaft	Stainless steel	1.4462	
4	Impeller	Stainless steel	1.4401	AISI 316
5	Chamber	Stainless steel	1.4401	AISI 316
6	Outer sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for outer sleeve	EPDM or FKM		
8	Base	Stainless steel	1.4408	CF 8M eq. to AISI 316
9	Neck ring	Carbon-graphite filled PTFE		
10	Shaft seal			
11	Bearing ring	Carbon-graphite filled PTFE		
12	Bottom bearing ring	Tungsten carbide/tungsten carbide		
13	Base plate	Cast iron EN-GJS-500-7 1)	EN-JS1050	ASTM 88-55-06
	Rubber parts	EPDM or FKM		

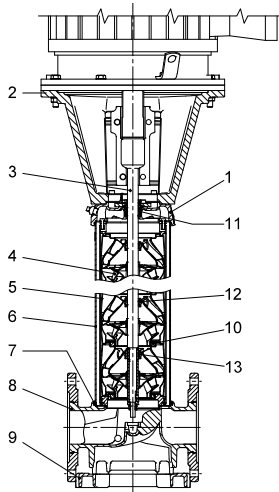
1) Stainless steel available on request.

CR(E) 120 and 150



GrA3731

Sectional drawing



TM03 8835 2607

Materials, CR(E)

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJS-500-7	EN-JS1050	A 536 65-45-12
2	Motor stool (11-45 kW)	Cast iron EN-GJL-200	EN-JL1030	A48-30 B
	Motor stool (55-75 kW)	Cast iron EN-GJS-500-7	EN-JS1050	A 536 65-45-12
3	Shaft	Stainless steel	1.4057	AISI 431
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Outer sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for outer sleeve	EPDM or FKM		
8	Base	Cast iron EN-GJS-500-7	EN-JS1050	A 536 65-45-12
9	Base plate	Cast iron EN-GJS-500-7	EN-JS1050	A 536 65-45-12
10	Neck ring	PTFE		
11	Shaft seal ¹⁾	SiC/SiC (∅ 22) Carbon/SiC (∅ 32)		
12	Support bearing	PTFE		
13	Bearing ring	SiC/SiC		
	Rubber parts	EPDM or FKM		

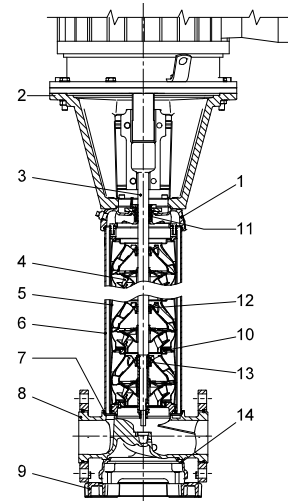
¹⁾ ∅ 22 mm shaft, 11-45 kW. ∅ 32 mm shaft, 55-75 kW.

CRN(E) 120 and 150



GrA3732 - GrA3735

Sectional drawing



TM03 8835 2607

Materials, CRN(E)

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Stainless steel	1.4408	A 351 CF 8M
2	Motor stool (11-45 kW)	Cast iron EN-GJL-200	EN-JL1030	A48-30 B
	Motor stool (55-75 kW)	Cast iron EN-GJS-500-7	EN-JS1050	A 536 65-45-12
3	Shaft	Stainless steel	1.4462	SAF 2205
4	Impeller	Stainless steel	1.4401	AISI 316
5	Chamber	Stainless steel	1.4401	AISI 316
6	Outer sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for outer sleeve	EPDM or FKM		
8	Base	Stainless steel	1.4408	A 351 CF 8M
9	Base plate	Cast iron EN-GJS-500-7 ¹⁾	EN-JS1050	A 536 65-45-12
10	Neck ring	PTFE		
11	Shaft seal ²⁾	SiC/SiC (∅ 22) Carbon/SiC (∅ 32)		
12	Support bearing	PTFE		
13	Bearing ring	SiC/SiC		
14	Base plate	Cast iron EN-GJS-500-7 ¹⁾	EN-JS1050	A 536 65-45-12
	Rubber parts	EPDM or FKM		

¹⁾ Stainless steel available on request.

²⁾ ∅ 22 mm shaft, 11-45 kW. ∅ 32 mm shaft, 55-75 kW.

Type keys

CR(E), CRI(E), CRN(E)

Example	CR E 32 (s) -4 -2 -A -F -G -E -HQQE
Type range: CR, CRI, CRN	
Pump with integrated frequency control	
Flow rate [m ³ /h]	
All impellers with reduced diameter (applies only to CR, CRI, CRN 1s)	
Number of impellers	
Number of reduced-diameter impellers (CR(E), CRN(E) 32, 45, 64, 90, 120 and 150)	
Code for pump version	
Code for pipe connection	
Code for materials	
Code for rubber parts	
Code for shaft seal	

Codes

Example	A	-F	-A	-E	-H	QQ	E
Pump version							
A	Basic version						
B	Oversize motor						
E	Pump with certificate/approval						
F	CR pump for high temperatures (air-cooled top assembly)						
H	Horizontal version						
HS	High-pressure pump with high speed MGE motor						
I	Different pressure rating						
J	Pump w/different max. speed						
K	Pump with low NPSH						
M	Magnetic drive						
N	Fitted with sensor						
P	Undersize motor						
R	Horizontal version with bearing bracket						
SF	High pressure pump						
X	Special version						
Pipe connection							
A	Oval flange						
B	NPT thread						
CA	FlexiClamp (CRI(E), CRN(E) 1, 3, 5, 10, 15, 20)						
F	DIN flange						
G	ANSI flange						
J	JIS flange						
N	Changed diameter of ports						
P	PJE coupling						
X	Special version						
Materials							
A	Basic version						
D	Carbon-graphite-filled PTFE (bearings)						
G	Wetted parts 1.4401/AISI 316						
GI	All parts stainless steel, wetted parts 1.4401/AISI 316						
I	Wetted parts 1.4301/AISI 304						
II	All parts stainless steel, wetted parts 1.4301/AISI 304						
K	Bronze (bearings)						
S	SiC bearings + PTFE neck rings						
X	Special version						
Code for rubber parts							
E	EPDM						
F	FXM						
K	FFKM						
V	FKM						
Shaft seal							
H	Balanced cartridge seal						
Q	Silicon carbide						
U	Tungsten carbide						
B	Carbon						
E	EPDM						
F	FXM						
K	FFKM						
V	FKM						

Maximum operating pressure and temperature range

	Oval flange		PJE, Clamp, UNION, DIN	
	Max. permissible operating pressure	Liquid temperature range	Max. permissible operating pressure	Liquid temperature range
CR, CRI, CRN 1s	16 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRI(E), CRN(E) 1	16 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRI(E), CRN(E) 3	16 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRI(E), CRN(E) 5	16 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRI(E) 10-1 → 10-10	16 [bar]	-20 °C to +120 °C	16 [bar]	-20 °C to +120 °C
CR(E), CRI(E) 10-12 → 10-17	-	-	25 [bar]	-20 °C to +120 °C
CRN(E) 10	16 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRI(E) 15-1 → 15-5	10 [bar]	-20 °C to +120 °C	-	-
CR(E), CRI(E) 15-1 → 15-8	-	-	16 [bar]	-20 °C to +120 °C
CR(E), CRI(E) 15-9 → 15-12	-	-	25 [bar]	-20 °C to +120 °C
CRN(E) 15	10 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRI(E) 20-1 → 20-5	10 [bar]	-20 °C to +120 °C	-	-
CR(E), CRI(E) 20-1 → 20-7	-	-	16 [bar]	-20 °C to +120 °C
CR(E), CRI(E) 20-8 → 20-10	-	-	25 [bar]	-20 °C to +120 °C
CRN(E) 20	10 [bar]	-20 °C to +120 °C	25 [bar]	-20 °C to +120 °C
CR(E), CRN(E) 32-1-1 → 32-5	-	-	16 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 32-6-2 → 32-10-2	-	-	30 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 45-1-1 → 45-4	-	-	16 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 45-5-2 → 45-7	-	-	30 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 64-1-1 → 64-3	-	-	16 [bar]	-30 °C to +120 °C
CR, CRN 64-4-2 → 64-5-2	-	-	30 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 90-1-1 → 90-3	-	-	16 [bar]	-30 °C to +120 °C
CR, CRN 90-4-2	-	-	30 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 120	-	-	30 [bar]	-30 °C to +120 °C
CR(E), CRN(E) 150	-	-	30 [bar]	-30 °C to +120 °C

Operating range of the shaft seal

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The following curves apply to clean water and water with anti-freeze liquids. For selecting the right shaft seal, see 'List of pumped liquids' page 78.

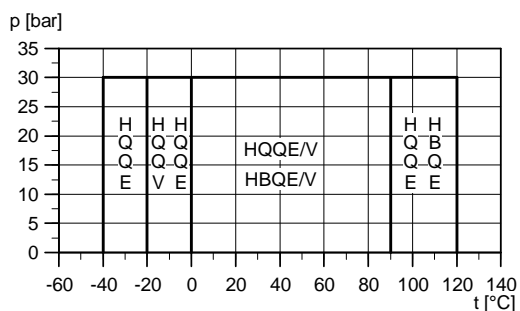


Fig. 14 Operating range of standard shaft seals

Standard shaft seal	Motor size [kW]	Description	Max. temperature range [°C]
HQQE	0.37 - 45	O-ring (cartridge) (balanced seal), SiC/SiC, EPDM	-40 °C to +120 °C
HBQE ¹⁾	55-75	O-ring (cartridge) (balanced seal), carbon/SiC, EPDM	0 °C to +120 °C
HQQV	0.37 - 45	O-ring (cartridge) (balanced seal), SiC/SiC, FKM	-20 °C to +90 °C
HBQV ¹⁾	55-75	O-ring (cartridge) (balanced seal), carbon/SiC, FKM	0 °C to +90 °C

¹⁾ Available as HQQE and HQQV on request

See "Variants on request", page 89, in case of extreme temperatures:

- low temperatures down to -40 °C or
- high temperatures up to +180 °C.

Maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the current inlet pressure + the pressure against a closed valve **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.

CR, CRI, CRN 1s		
1s-2	→ 1s-27	10 [bar]
CR(E), CRI(E), CRN(E) 1		
1-2	→ 1-25	10 [bar]
1-27		15 [bar]
CR(E), CRI(E), CRN(E) 3		
3-2	→ 3-15	10 [bar]
3-17	→ 3-25	15 [bar]
CR(E), CRI(E), CRN(E) 5		
5-2	→ 5-9	10 [bar]
5-10	→ 5-24	15 [bar]
CR(E), CRI(E), CRN(E) 10		
10-1	→ 10-5	8 [bar]
10-6	→ 10-17	10 [bar]
CR(E), CRI(E), CRN(E) 15		
15-1	→ 15-2	8 [bar]
15-3	→ 15-12	10 [bar]
CR(E), CRI(E), CRN(E) 20		
20-1		8 [bar]
20-2	→ 20-10	10 [bar]
CR(E), CRN(E) 32		
32-1-1	→ 32-2	4 [bar]
32-3-2	→ 32-6	10 [bar]
32-7-2	→ 32-10-2	15 [bar]
CR(E), CRN(E) 45		
45-1-1	→ 45-1	4 [bar]
45-2-2	→ 45-3	10 [bar]
45-4-2	→ 45-7	15 [bar]
CR(E), CRN(E) 64		
64-1-1		4 [bar]
64-1	→ 64-2-1	10 [bar]
64-2	→ 64-5-2	15 [bar]
CR(E), CRN(E) 90		
90-1-1	→ 90-2-2	10 [bar]
90-2-1	→ 90-4-2	15 [bar]
CR(E), CRN(E) 120		
120-1		10 bar
120-2-2	→ 120-3	15 bar
120-4-1	→ 120-5-2	20 bar
CR(E), CRN(E) 150		
150-1-1		10 bar
150-1	→ 150-2	15 bar
150-3-2	→ 150-4-2	20 bar

Examples of operating and inlet pressures

The values for operating and inlet pressures shown in the table should not be considered individually but should always be compared, see the following examples:

Example 1:

The following pump type has been selected:

CR 3-10 A-A-A

Max. operating pressure: **16 bar**

Max. inlet pressure: **10 bar**

Discharge pressure against a closed valve: **9.6 bar**, see page 32.

This pump is **not** allowed to start at an inlet pressure of 10 bar, but at an inlet pressure of $16.0 - 9.6 = 6.4$ bar.

Example 2:

The following pump type has been selected:

CR 10-2 A-A-A

Max. operating pressure: **16 bar**

Max. inlet pressure: **8.0 bar**

Discharge pressure against a closed valve: **2.9 bar**, see page 40.

This pump is allowed to start at an inlet pressure of 8.0 bar, as the discharge pressure against a closed valve is only 2.9 bar, which results in an operating pressure of $8.0 + 2.9 = 10.9$ bar. On the contrary, the max. operating pressure of this pump is limited to 16 bar, as a higher operating pressure will require an inlet pressure of more than 8.0 bar.

In case the inlet or operating pressure exceeds the pressure permitted, see "Lists of variants - on request" page 89.

Selection of pumps

Selection of pumps should be based on:

- The duty point of the pump (see section 1)
- Dimensional data such as pressure loss as a result of height differences, friction loss in the pipework, pump efficiency etc. (see section 2)
- Pump materials (see section 3)
- Pump connections (see section 4)
- Shaft seal (see section 5).

1. Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts shown in "Performance curves/Technical" data on page 24.

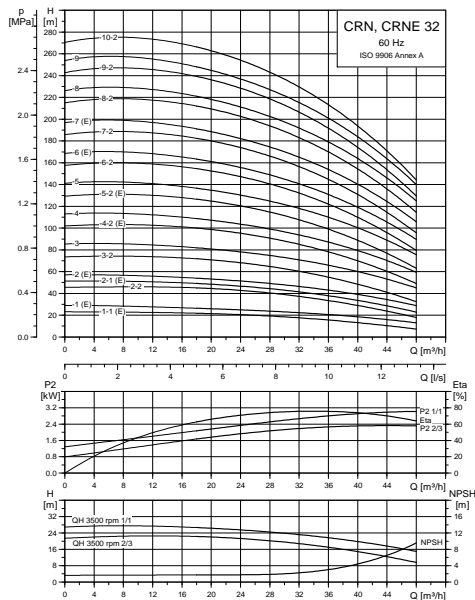


Fig. 15 Example of a curve chart

2. Dimensional data

When sizing a pump the following must be taken into account:

- Required flow and pressure at the draw-off point.
- Pressure loss as a result of height differences (H_{geo}).
- Friction loss in the pipework (H_f). It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- Best efficiency at the estimated duty point.
- NPSH value. For calculation of the NPSH value, see "Minimum inlet pressure - NPSH", page 22.

Pump efficiency

Before determining the best efficiency point, the operation pattern of the pump needs to be identified.

Is the pump expected to operate at the **same** duty point, then select a CR pump which is operating at a duty point corresponding with the best efficiency of the pump.

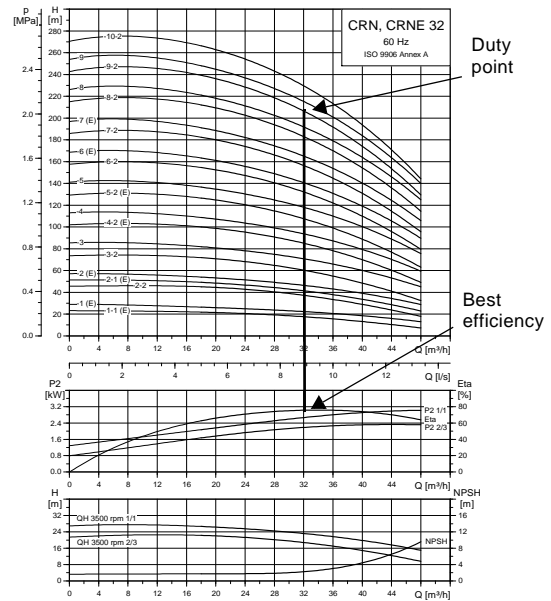


Fig. 16 Example of a CR pump's duty point

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

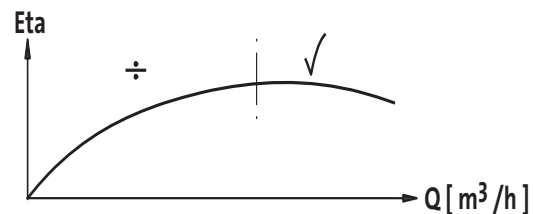


Fig. 17 Best efficiency

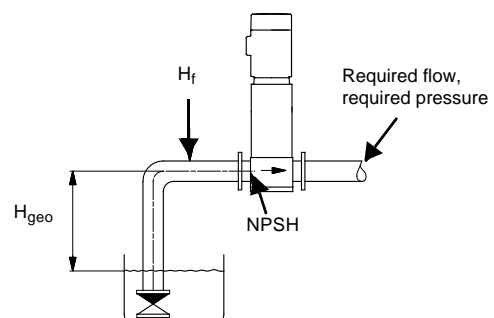


Fig. 18 Dimensional data

TM02 7323 3103

TM02 7323 3103

TM00 9190 1303

TM02 6711 1403

Normally, E-pumps are used in applications characterized 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, the pump should be selected on the basis of the following criteria:

- The max. duty point required should be as close as possible to the QH curve of the pump.
- The flow rate at the duty point required should be close to the optimum efficiency (eta) for most operating hours.

Between the min. and max. performance curve 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.

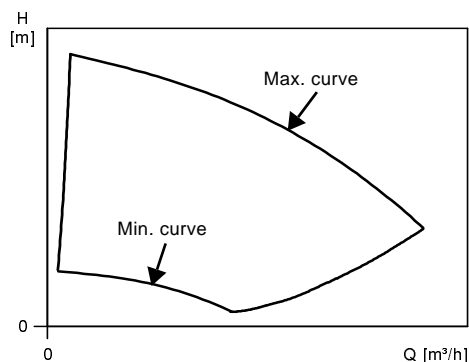


Fig. 19 Min. and max. performance curves

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

Note:

The approximated formulas apply on 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.

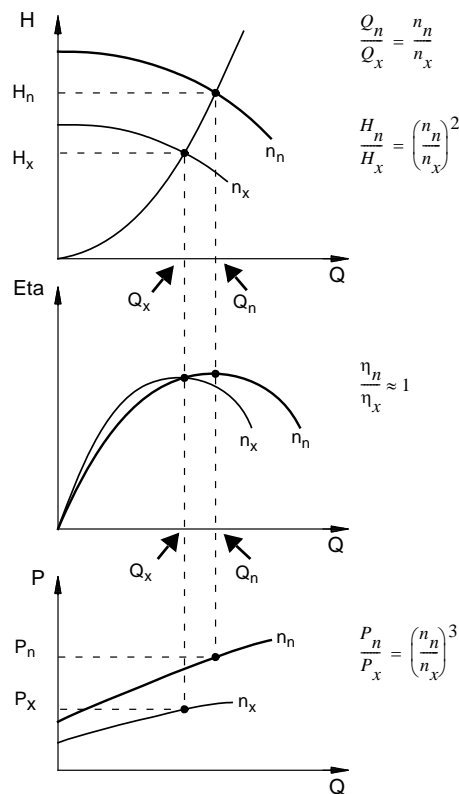


Fig. 20 Affinity equations

Legend

- H_n Rated head in metres
- H_x Current head in metres
- Q_n Rated flow in m^3/h
- Q_x Current flow in m^3/h
- n_n Rated motor speed in min^{-1} ($n_n = 3500 \text{ min}^{-1}$)
- n_x Current motor speed in min^{-1}
- η_n Rated efficiency in %
- η_x Current efficiency in %

WinCAPS and WebCAPS

WinCAPS and WebCAPS are both selection programmes offered by Grundfos.

The two programmes make it possible to calculate an E-pump's specific duty point and energy consumption.

By entering the dimensional data of the pump, WinCAPS and WebCAPS can calculate the exact duty point and energy consumption. For further information see page 90 and page 91.

TM01 4916 4803

TM00 8720 3496

Pump material

The material variant (CR(E), CRI(E), CRN(E)) should be selected based on the liquid to be pumped. The product range covers the following three basic types.

- CR(E), CRI(E)
Use CR(E), CRI(E) pumps for clean, non-aggressive liquids such as potable water and oils.
- CRN(E)
Use CRN(E) pumps for industrial liquids and acids. See "List of pumped liquids", page 78, or contact Grundfos.

For saline or chloride-containing liquids such as sea water, CRT(E) pumps of titanium are available.

Pump connections

Selection of pump connection depends on the rated pressure and pipework. To meet any requirement the CR(E), CRI(E) and CRN(E) 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.

Shaft seal

As standard, the CR(E) range is fitted with a Grundfos shaft seal (Cartridge type) 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 and
- maximum pressure.

Grundfos offers a wide range of shaft seal variants to meet specific demands see "List of pumped liquids" on page 78.

Inlet pressure and operating pressure

The limit values stated on page 17 and page 18 must **not** be exceeded as regards maximum inlet pressure and maximum operating pressure.

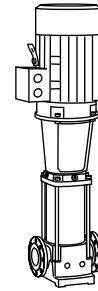


Fig. 21 CR pump

TM01 2100 1198

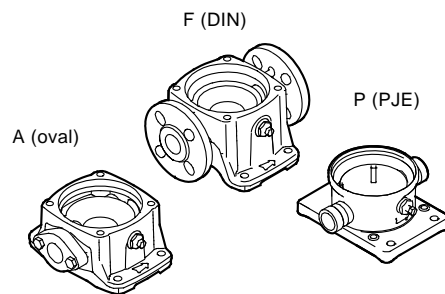


Fig. 22 Pump connections

TM02 1201 0601

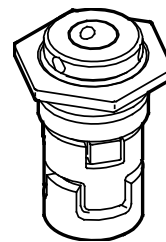


Fig. 23 Shaft seal (cartridge type)

TM02 0538 4800

Minimum inlet pressure, NPSH

Calculation of the inlet pressure "H" is recommended 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 suction side of the pump. The maximum suction lift "H" in metres head can be calculated as follows:

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

p_b = Barometric pressure in bar.
(Barometric pressure can be set to 1 bar).
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 suction 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 ".)

H_s = Safety margin = minimum 0.5 metres head.

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

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

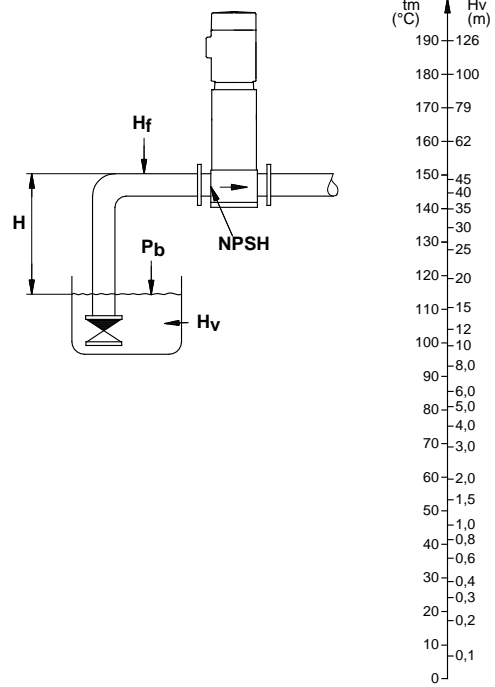


Fig. 24 Minimum inlet pressure - NPSH

Note: 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

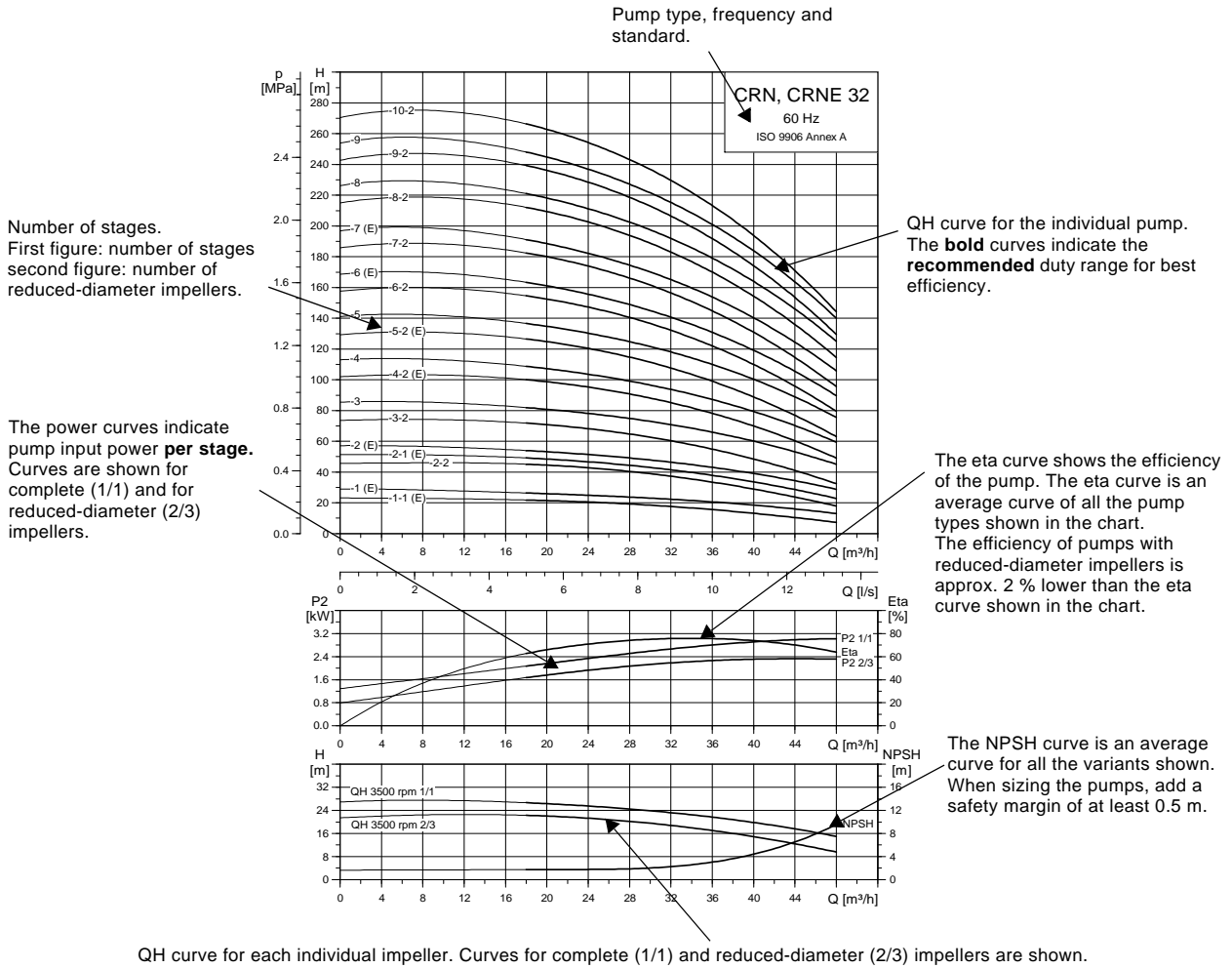


Fig. 25 How to read the curve charts

Guidelines to performance curves

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

1. Tolerances to ISO 9906, Annex A, if indicated.
2. The motors used for the measurements are standard Grundfos motors (MG or MGE).
3. Measurements have been made with airless water at a temperature of 20 °C.
4. The curves apply to a kinematic viscosity of $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt).
5. Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate.
6. The QH curves apply to a rated motor speed of 3500 min^{-1} . All curves are based on current motor speeds.

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

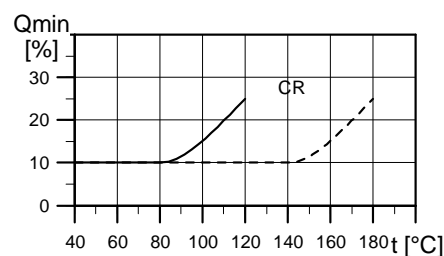


Fig. 26 Minimum flow rate

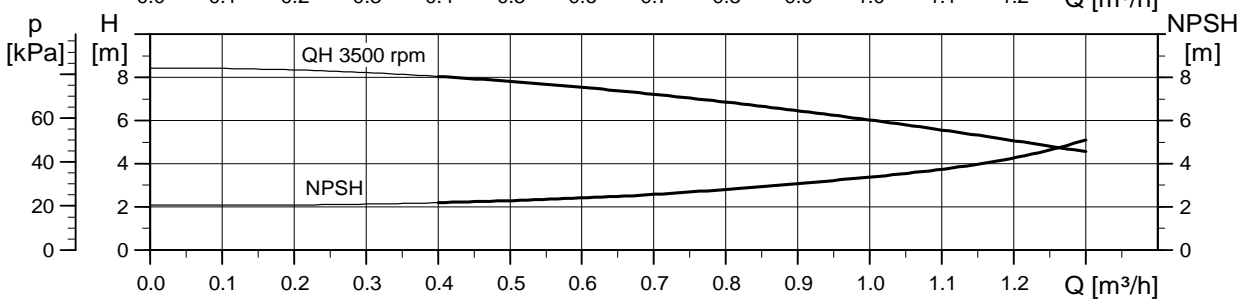
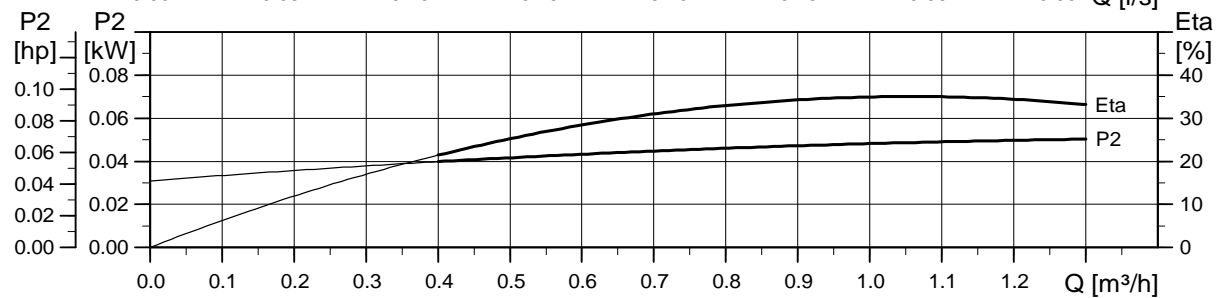
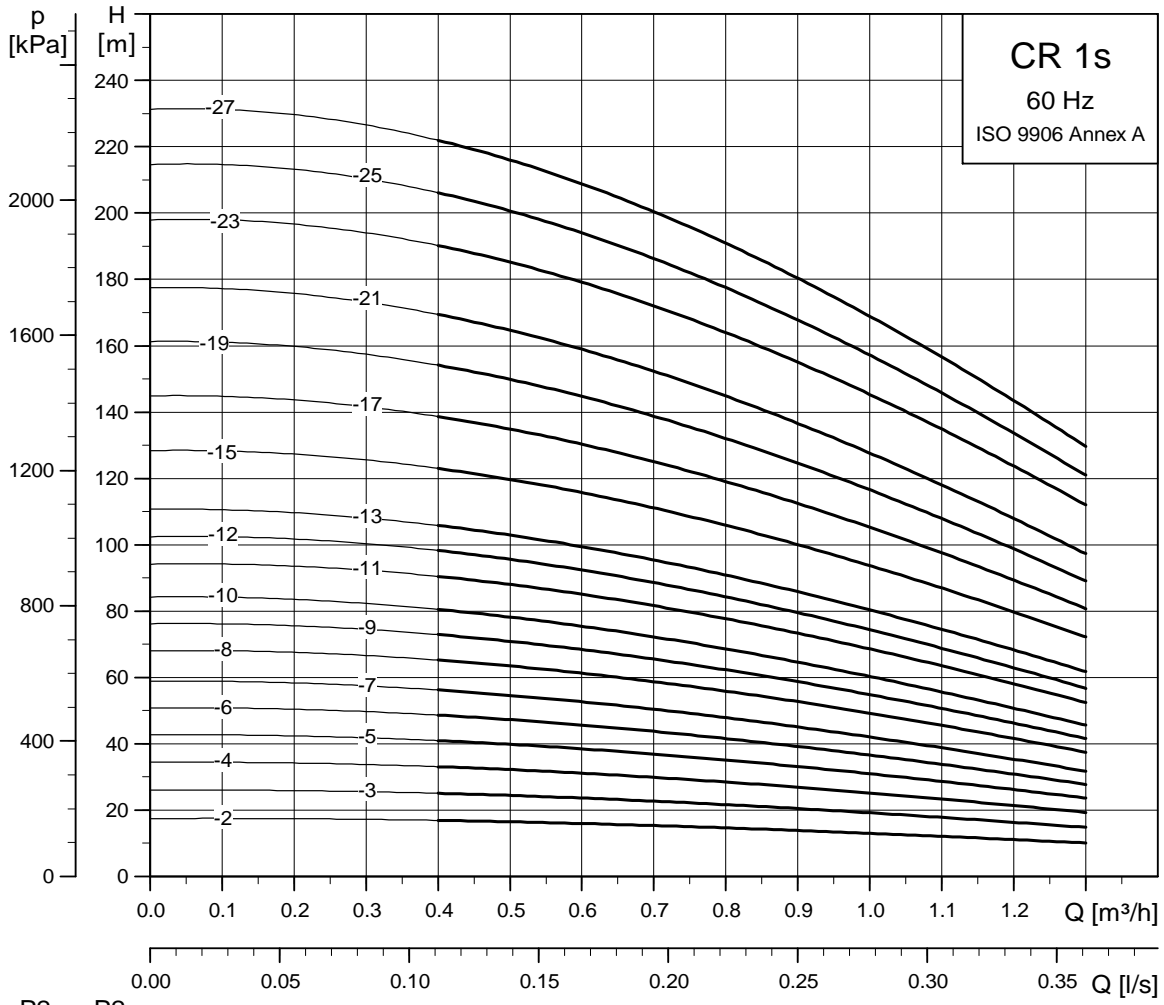
TM02 7323 3103

TM01 2816 3605

Performance curves Technical data

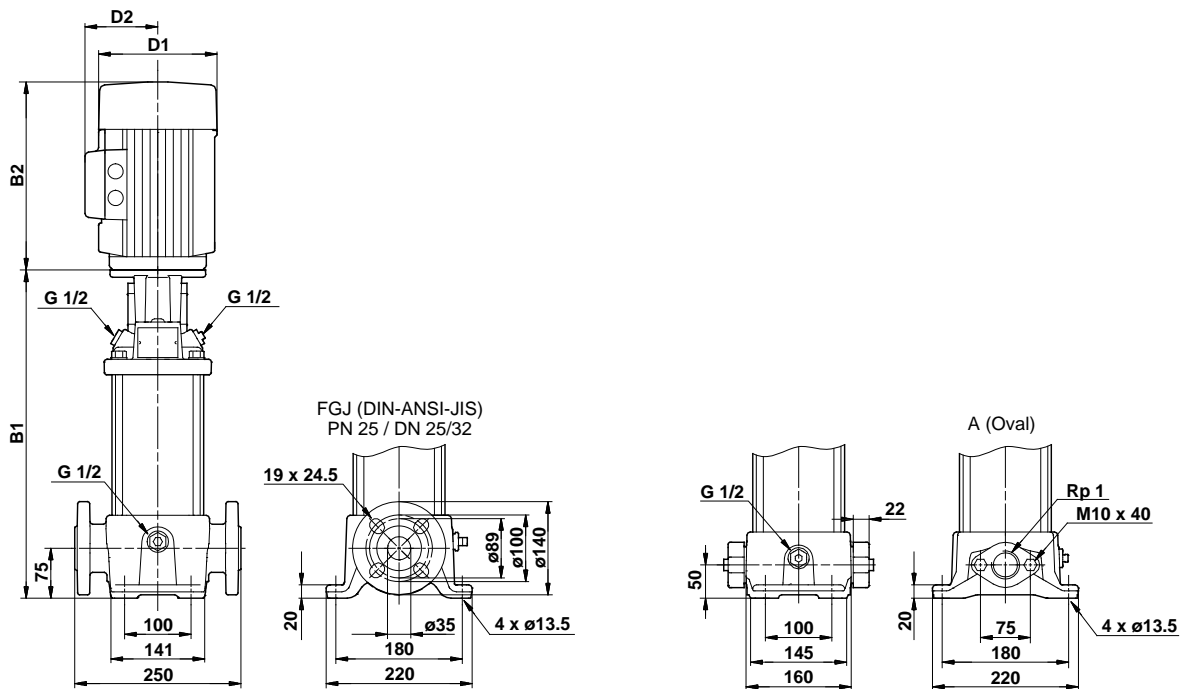
CR 1s

CR 1s



TM02 7422 3605

Dimensional sketch

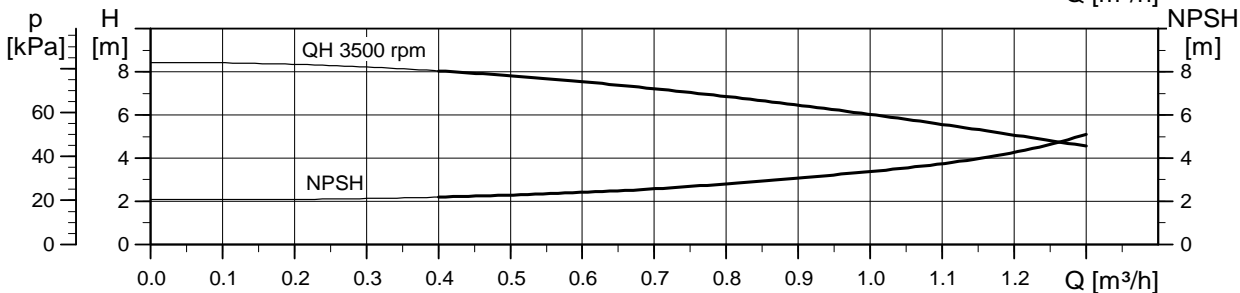
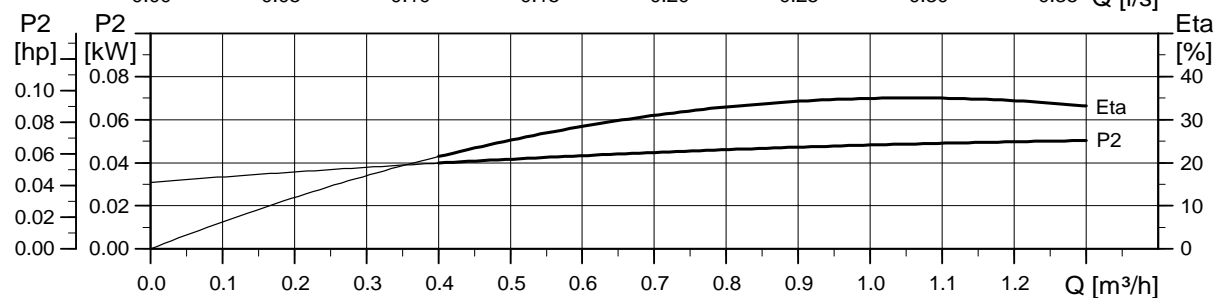
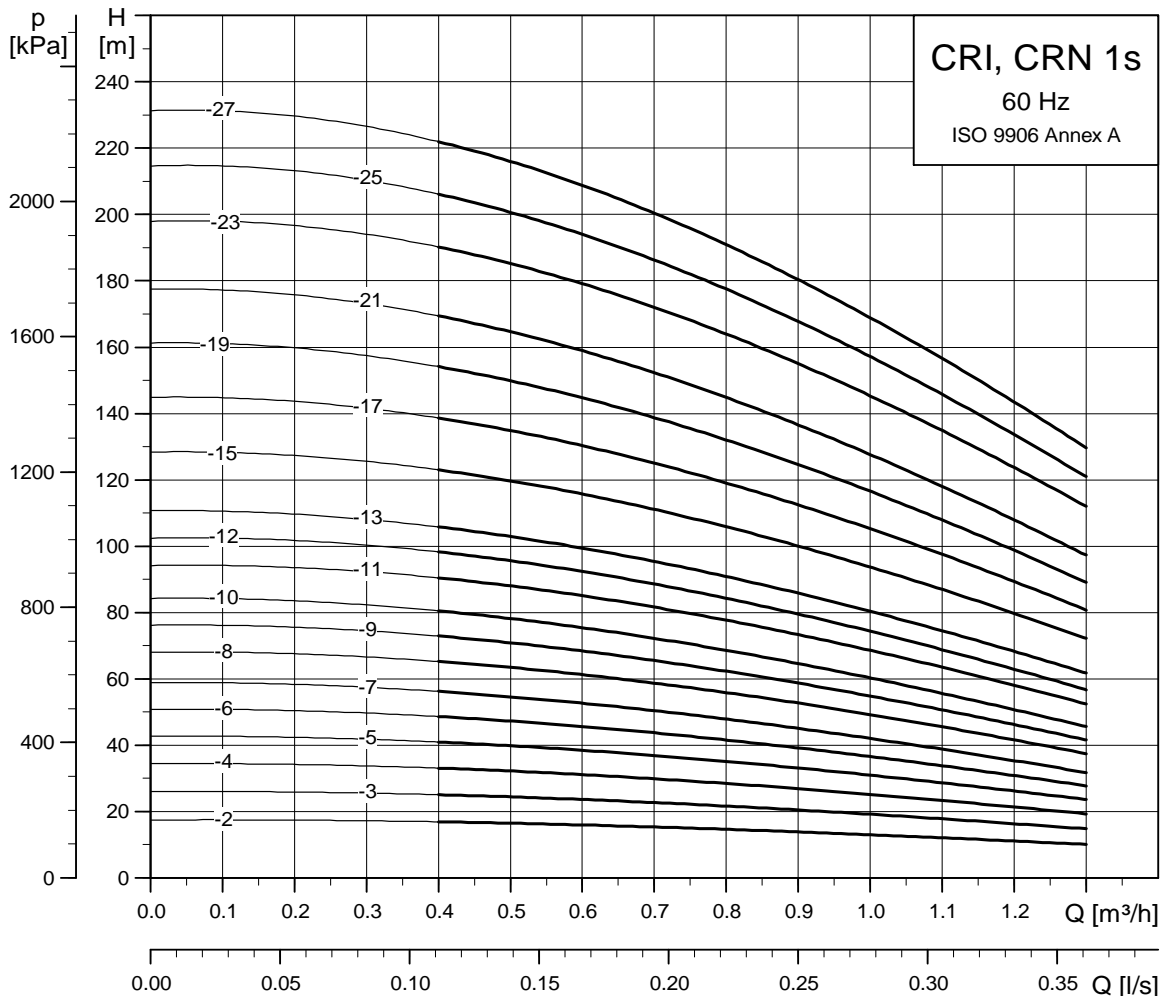


TM03 1721 2805

Dimensions and weights

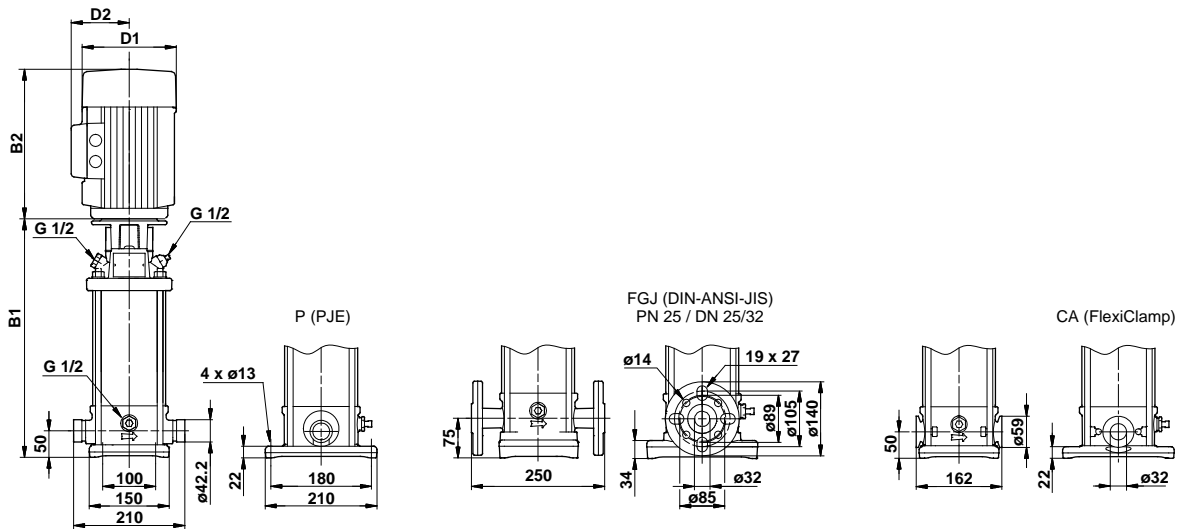
Pump type	Motor P ₂ [kW]	Dimension [mm]						Net weight [kg]	
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2				
CR 1s-2	0.37	254	445	279	470	141	109	18	23
CR 1s-3	0.37	254	445	279	470	141	109	18	23
CR 1s-4	0.37	272	463	297	488	141	109	19	23
CR 1s-5	0.37	290	481	315	506	141	109	19	24
CR 1s-6	0.37	308	499	333	524	141	109	19	24
CR 1s-7	0.37	326	517	351	542	141	109	20	24
CR 1s-8	0.55	344	535	369	560	141	109	21	25
CR 1s-9	0.55	362	553	387	578	141	109	21	26
CR 1s-10	0.55	380	571	405	596	141	109	22	26
CR 1s-11	0.75	404	635	429	660	141	109	24	28
CR 1s-12	0.75	422	653	447	678	141	109	24	29
CR 1s-13	0.75	440	671	465	696	141	109	25	29
CR 1s-15	1.1	476	707	501	732	141	109	27	32
CR 1s-17	1.1	537	768	537	768	141	109	28	33
CR 1s-19	1.1	-	-	573	804	141	109	-	34
CR 1s-21	1.1	-	-	609	840	141	109	-	35
CR 1s-23	1.5	-	-	661	942	178	110	-	42
CR 1s-25	1.5	-	-	697	978	178	110	-	43
CR 1s-27	1.5	-	-	733	1014	178	110	-	44

CRI, CRN 1s



TM02 7423 3605

Dimensional sketch

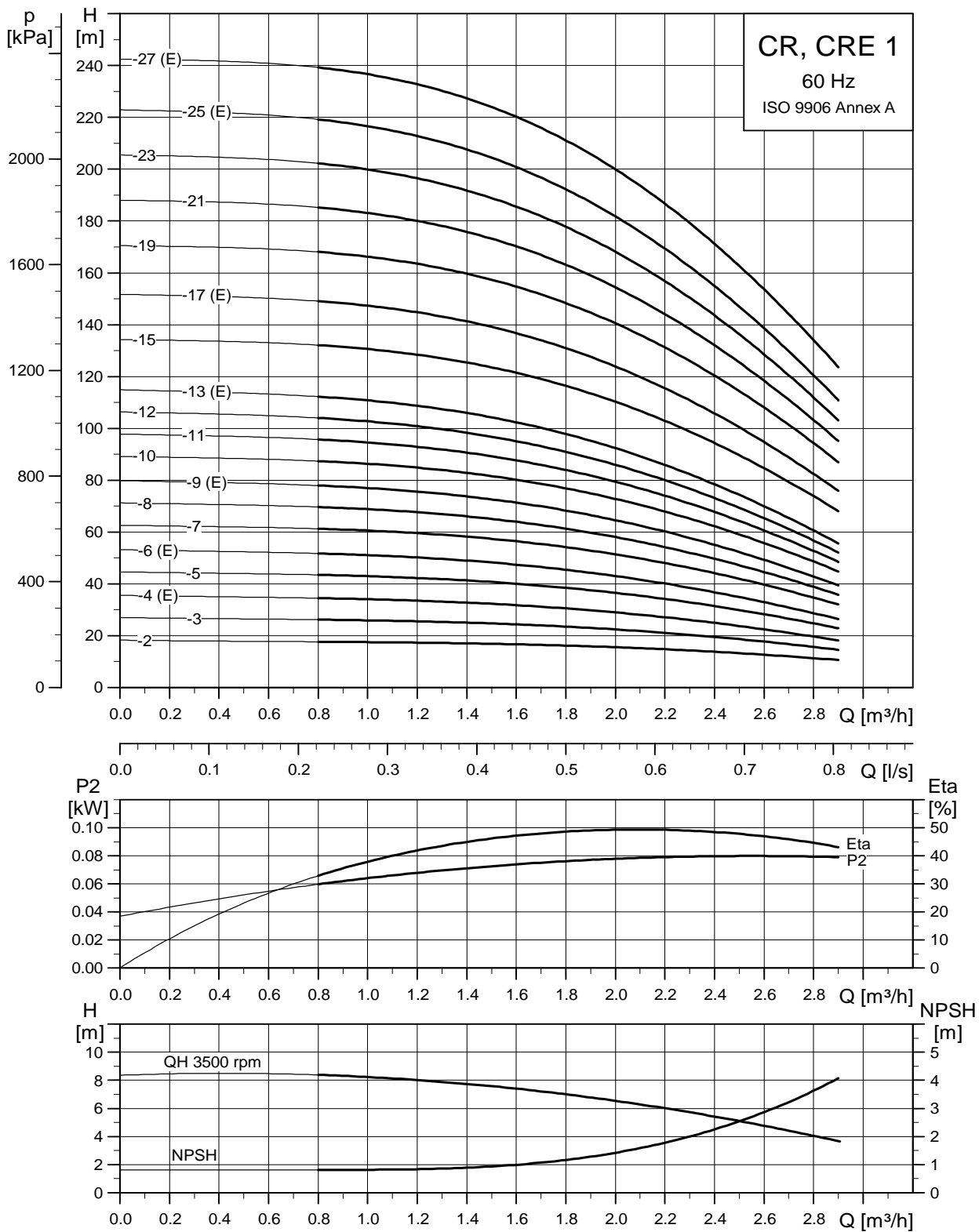


TM03 1722 2805

Dimensions and weights

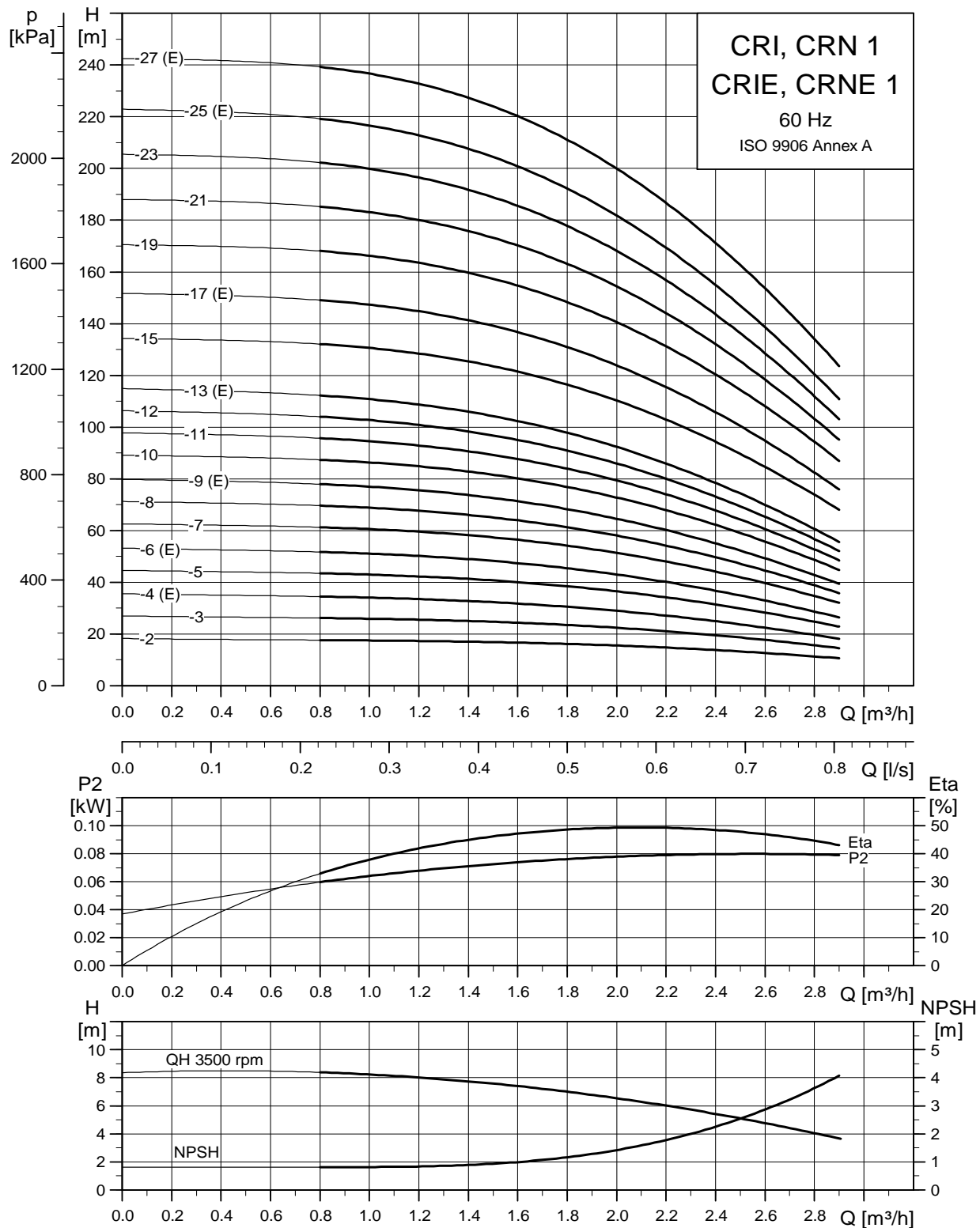
Pump type	Motor P ₂ [kW]	Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2				
CRI/CRN 1s-2	0.37	257	448	282	473	141	109	16	20
CRI/CRN 1s-3	0.37	257	448	282	473	141	109	16	21
CRI/CRN 1s-4	0.37	275	466	300	491	141	109	17	21
CRI/CRN 1s-5	0.37	293	484	318	509	141	109	17	21
CRI/CRN 1s-6	0.37	311	502	336	527	141	109	18	22
CRI/CRN 1s-7	0.37	329	520	354	545	141	109	18	22
CRI/CRN 1s-8	0.55	347	538	372	563	141	109	19	23
CRI/CRN 1s-9	0.55	365	556	390	581	141	109	19	24
CRI/CRN 1s-10	0.55	383	574	408	599	141	109	20	24
CRI/CRN 1s-11	0.75	407	638	432	663	141	109	22	27
CRI/CRN 1s-12	0.75	425	656	450	681	141	109	23	27
CRI/CRN 1s-13	0.75	443	674	468	699	141	109	23	27
CRI/CRN 1s-15	1.1	479	710	504	735	141	109	26	30
CRI/CRN 1s-17	1.1	515	746	540	771	141	109	27	31
CRI/CRN 1s-19	1.1	551	782	576	807	141	109	28	32
CRI/CRN 1s-21	1.1	587	818	612	843	141	109	29	33
CRI/CRN 1s-23	1.5	639	920	664	945	178	110	36	40
CRI/CRN 1s-25	1.5	675	956	700	981	178	110	37	41
CRI/CRN 1s-27	1.5	711	992	736	1017	178	110	37	42

CR, CRE 1



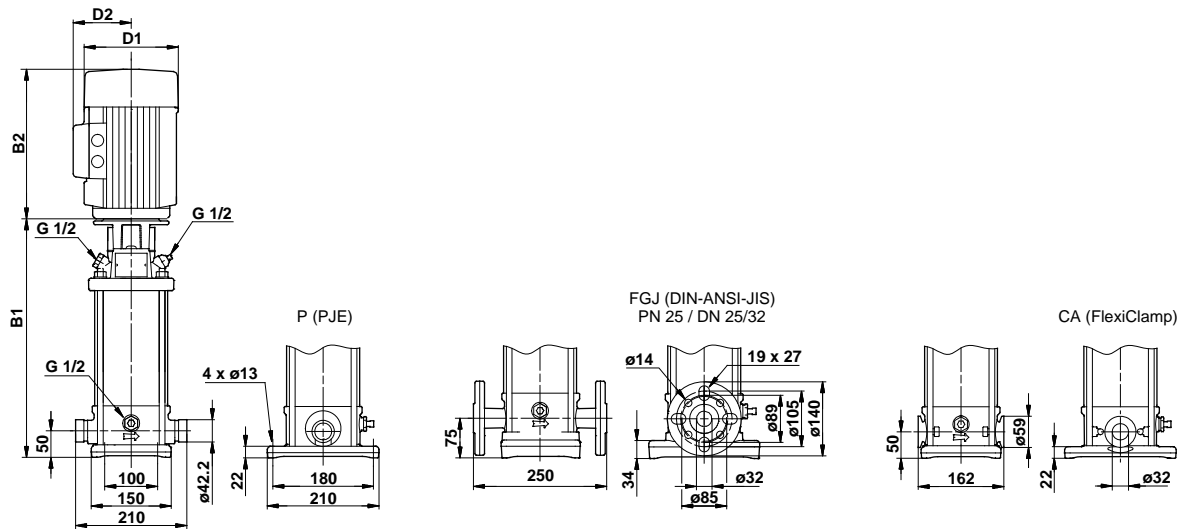
TM02 7310 3605

CRI, CRN, CRIE, CRNE 1



TM02 7311 3605

Dimensional sketch

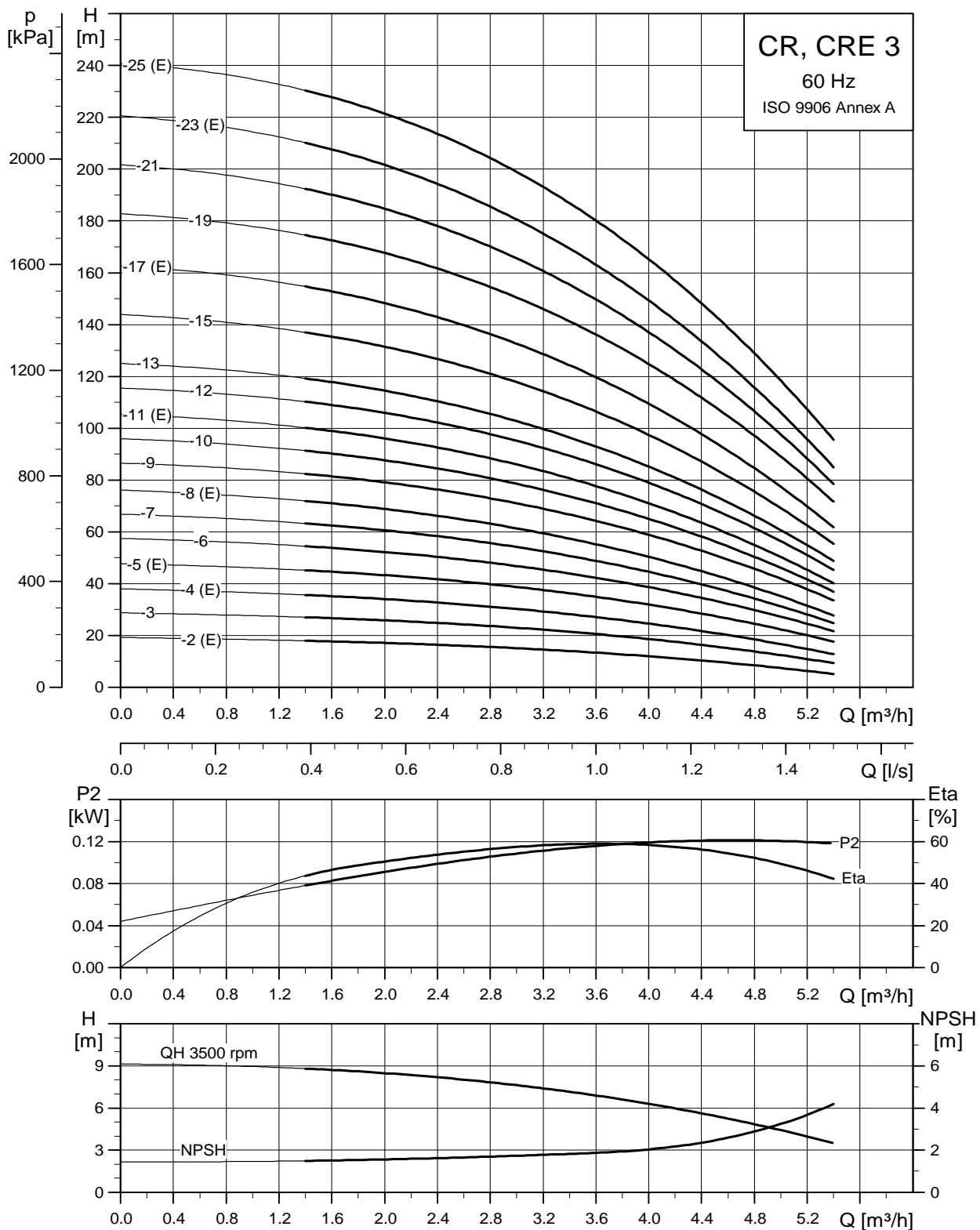


TM03 1722 2805

Dimensions and weights

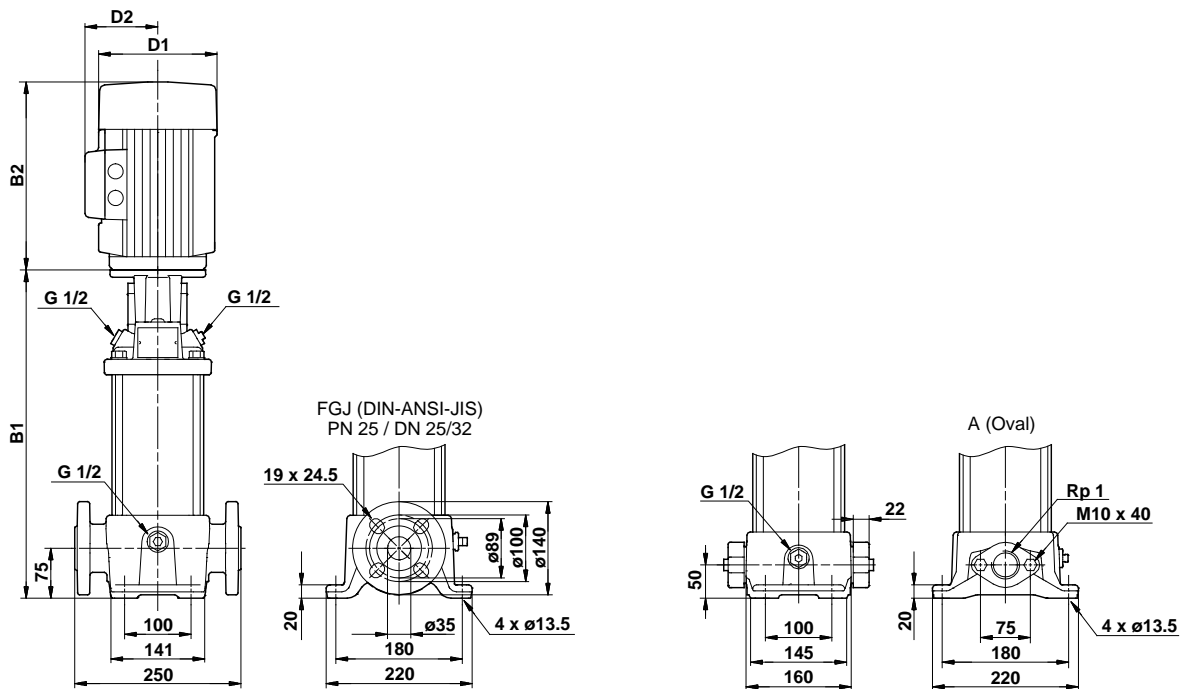
Pump type	Motor P ₂ [kW]	CRI/CRN						CRIE/CRNE									
		Dimension [mm]				Net weight [kg]		Dimension [mm]				Net weight [kg]					
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange	PJE/CA		DIN flange		PJE/CA	DIN flange		
B1	B1+B2	B1	B1+B2	B1	B1+B2					B1	B1+B2						
CRI/CRN 1-2	0.37	257	448	282	473	141	109	16	20	-	-	-	-	-	-		
CRI/CRN 1-3	0.37	257	448	282	473	141	109	16	21	-	-	-	-	-	-		
CRI(E)/CRN(E) 1-4	0.37	275	466	300	491	141	109	17	21	275	466	300	491	141	140	20	24
CRI/CRN 1-5	0.55	293	484	318	509	141	109	18	22	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 1-6	0.55	311	502	336	527	141	109	18	22	311	502	336	527	141	140	21	25
CRI/CRN 1-7	0.75	335	566	360	591	141	109	21	25	-	-	-	-	-	-	-	-
CRI/CRN 1-8	0.75	353	584	378	609	141	109	21	26	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 1-9	0.75	371	602	396	627	141	109	22	26	371	602	396	627	178	167	25	29
CRI/CRN 1-10	1.1	389	620	414	645	141	109	24	28	-	-	-	-	-	-	-	-
CRI/CRN 1-11	1.1	407	638	432	663	141	109	25	29	-	-	-	-	-	-	-	-
CRI/CRN 1-12	1.1	425	656	450	681	141	109	25	29	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 1-13	1.1	443	674	468	699	141	109	26	30	443	674	468	699	178	167	28	32
CRI/CRN 1-15	1.5	495	776	520	801	178	110	33	37	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 1-17	1.5	531	812	556	837	178	110	34	38	531	812	556	837	178	167	40	45
CRI/CRN 1-19	2.2	567	888	592	913	178	110	35	39	-	-	-	-	-	-	-	-
CRI/CRN 1-21	2.2	603	924	628	949	178	110	36	40	-	-	-	-	-	-	-	-
CRI/CRN 1-23	2.2	639	960	664	985	178	110	37	41	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 1-25	2.2	675	996	700	1021	178	110	37	42	675	996	700	1021	178	167	48	52
CRI(E)/CRN(E) 1-27	3	716	1051	741	1076	198	120	43	47	716	1051	741	1076	198	177	53	57

CR, CRE 3



TM02 7312 3605

Dimensional sketch

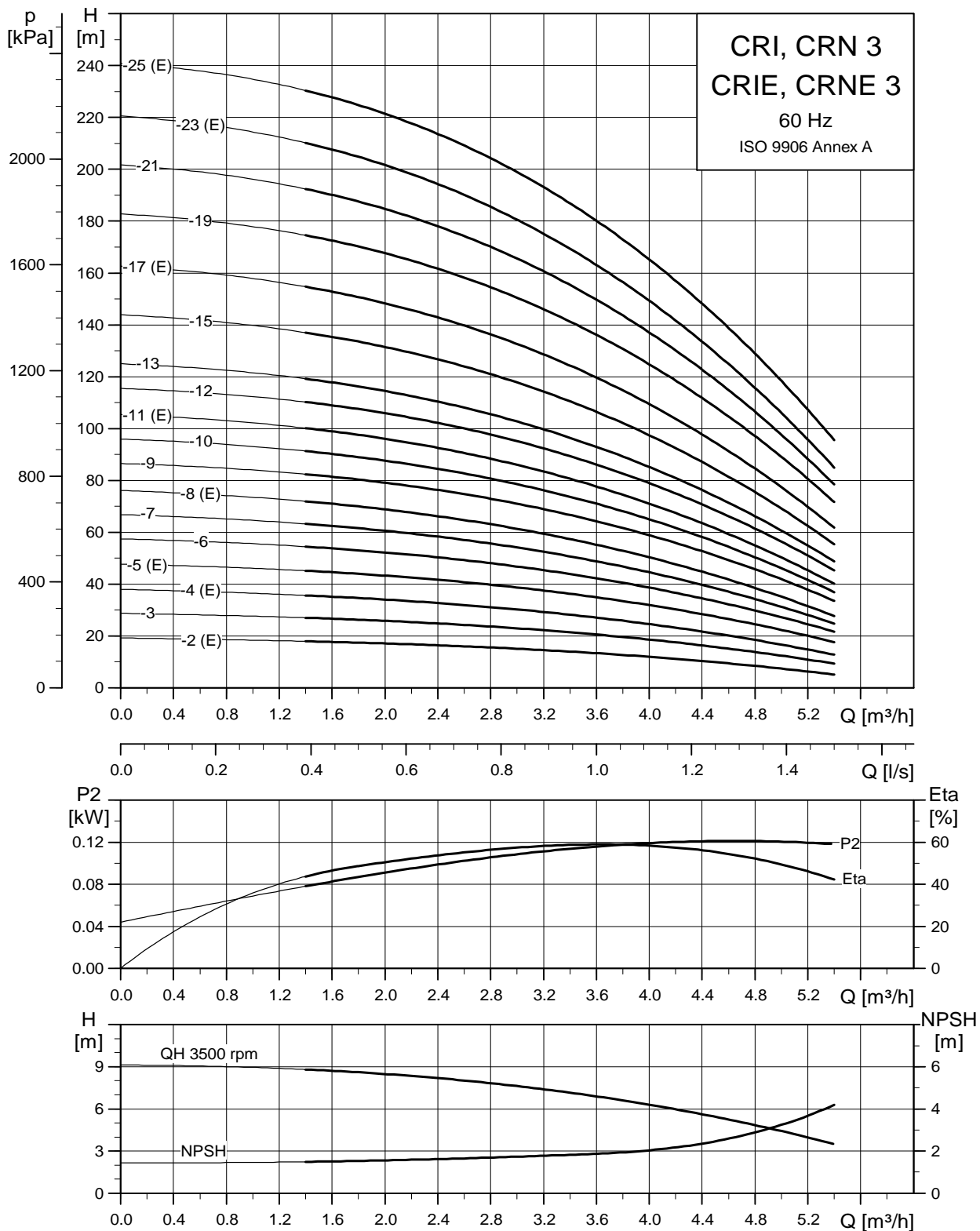


TM03 1721 2805

Dimensions and weights

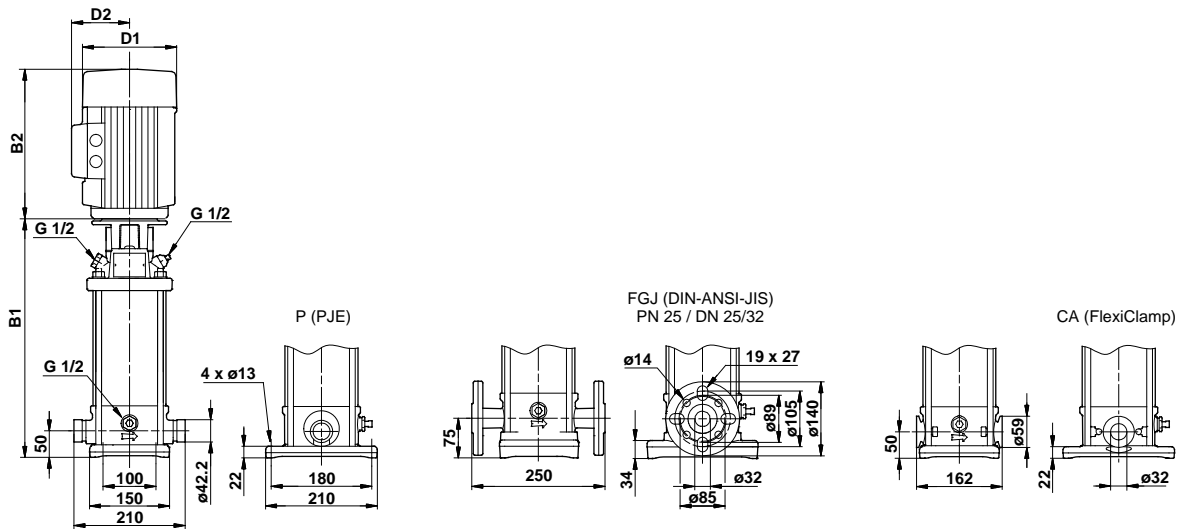
Pump type	Motor P ₂ [kW]	CR								CRE							
		Dimension [mm]				Net weight [kg]				Dimension [mm]				Net weight [kg]			
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2					B1	B1+B2	B1	B1+B2						
CR(E) 3-2	0.37	254	445	279	470	141	109	18	23	254	445	279	470	141	140	21	25
CR 3-3	0.55	254	445	279	470	141	109	19	24	-	-	-	-	-	-	-	-
CR(E) 3-4	0.55	272	463	297	488	141	109	19	24	272	463	297	488	141	140	22	27
CR(E) 3-5	0.75	296	527	321	552	141	109	22	26	296	527	321	552	178	167	25	29
CR 3-6	1.1	314	545	339	570	141	109	24	29	-	-	-	-	-	-	-	-
CR 3-7	1.1	332	563	357	588	141	109	24	29	-	-	-	-	-	-	-	-
CR(E) 3-8	1.1	350	581	375	606	141	109	25	29	350	581	375	606	178	167	27	32
CR 3-9	1.5	384	665	409	690	178	110	32	37	-	-	-	-	-	-	-	-
CR 3-10	1.5	402	683	427	708	178	110	33	37	-	-	-	-	-	-	-	-
CR(E) 3-11	1.5	420	701	445	726	178	110	33	38	420	701	445	726	178	167	40	44
CR 3-12	2.2	438	759	463	784	178	110	34	39	-	-	-	-	-	-	-	-
CR 3-13	2.2	492	813	517	838	178	110	35	40	-	-	-	-	-	-	-	-
CR 3-15	2.2	528	849	553	874	178	110	36	41	528	849	553	874	178	167	46	51
CR(E) 3-17	2.2	-	-	593	928	198	120	-	46	-	-	-	-	-	-	-	-
CR 3-19	3	-	-	629	964	198	120	-	47	-	-	-	-	-	-	-	-
CR 3-21	3	-	-	665	1000	198	120	-	47	-	-	665	1000	198	177	-	57
CR(E) 3-23	3	-	-	665	1000	198	120	-	47	-	-	665	1000	198	177	-	57
CR(E) 3-25	4	-	-	701	1073	220	134	-	59	-	-	701	1073	220	188	-	69

CRI, CRN, CRIE, CRNE 3



TM02 7313 3605

Dimensional sketch

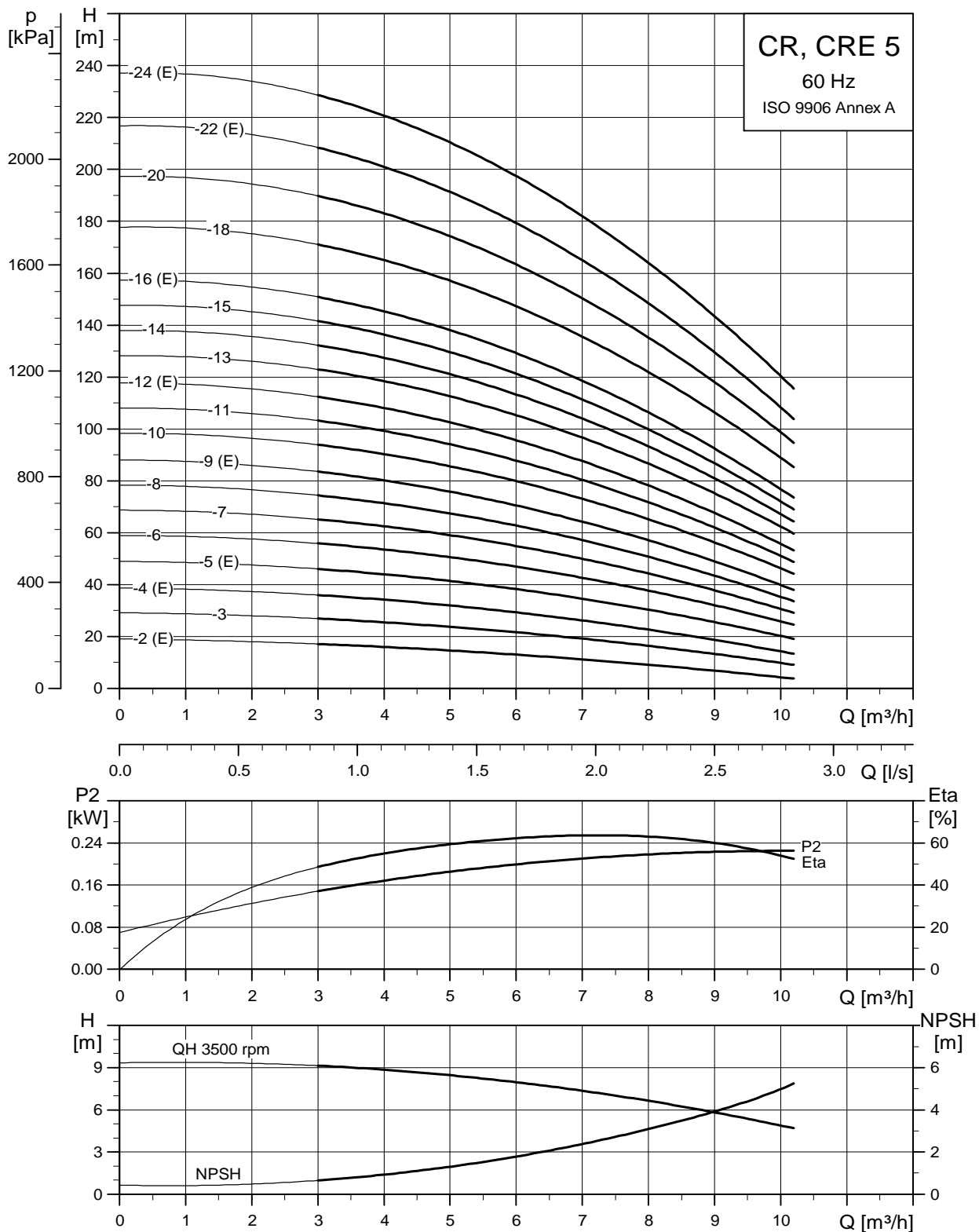


TM03 1722 2805

Dimensions and weights

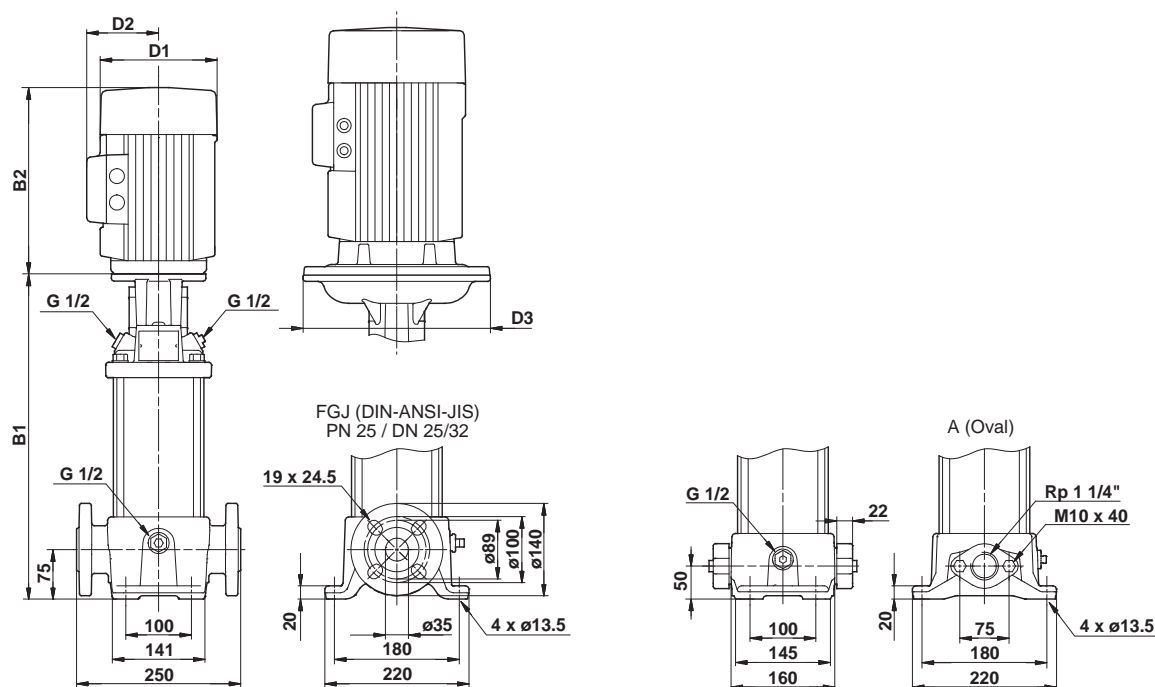
Pump type	Motor P ₂ [kW]	CRI/CRN								CRIE/CRNE							
		Dimension [mm]				Net weight [kg]				Dimension [mm]				Net weight [kg]			
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2	B1	B1+B2					B1	B1+B2						
CRI(E)/CRN(E) 3-2	0.37	257	448	282	473	141	109	16	20	257	448	282	473	141	140	19	23
CRI/CRN 3-3	0.55	257	448	282	473	141	109	17	21	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-4	0.55	275	466	300	491	141	109	17	22	275	466	300	491	141	140	20	24
CRI(E)/CRN(E) 3-5	0.75	299	530	324	555	141	109	20	24	299	530	324	555	178	167	23	27
CRI/CRN 3-6	1.1	317	548	342	573	141	109	23	27	-	-	-	-	-	-	-	-
CRI/CRN 3-7	1.1	335	566	360	591	141	109	23	27	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-8	1.1	353	584	378	609	141	109	24	28	353	584	378	609	178	167	26	30
CRI/CRN 3-9	1.5	387	668	412	693	178	110	30	35	-	-	-	-	-	-	-	-
CRI/CRN 3-10	1.5	405	686	430	711	178	110	31	35	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-11	1.5	423	704	448	729	178	110	31	35	423	704	448	729	178	167	38	42
CRI/CRN 3-12	2.2	441	762	466	787	178	110	32	36	-	-	-	-	-	-	-	-
CRI/CRN 3-13	2.2	459	780	484	805	178	110	33	37	-	-	-	-	-	-	-	-
CRI/CRN 3-15	2.2	495	816	520	841	178	110	33	38	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-17	2.2	531	852	556	877	178	110	34	38	531	852	556	877	178	167	44	49
CRI/CRN 3-19	3	572	907	597	932	198	120	39	44	-	-	-	-	-	-	-	-
CRI/CRN 3-21	3	608	943	633	968	198	120	40	44	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-23	3	644	979	669	1004	198	120	41	45	644	979	669	1004	198	177	51	55
CRI(E)/CRN(E) 3-25	4	680	1052	705	1077	220	134	53	57	680	1052	705	1077	220	188	63	67

CR, CRE 5



TM02 7314 9605

Dimensional sketch

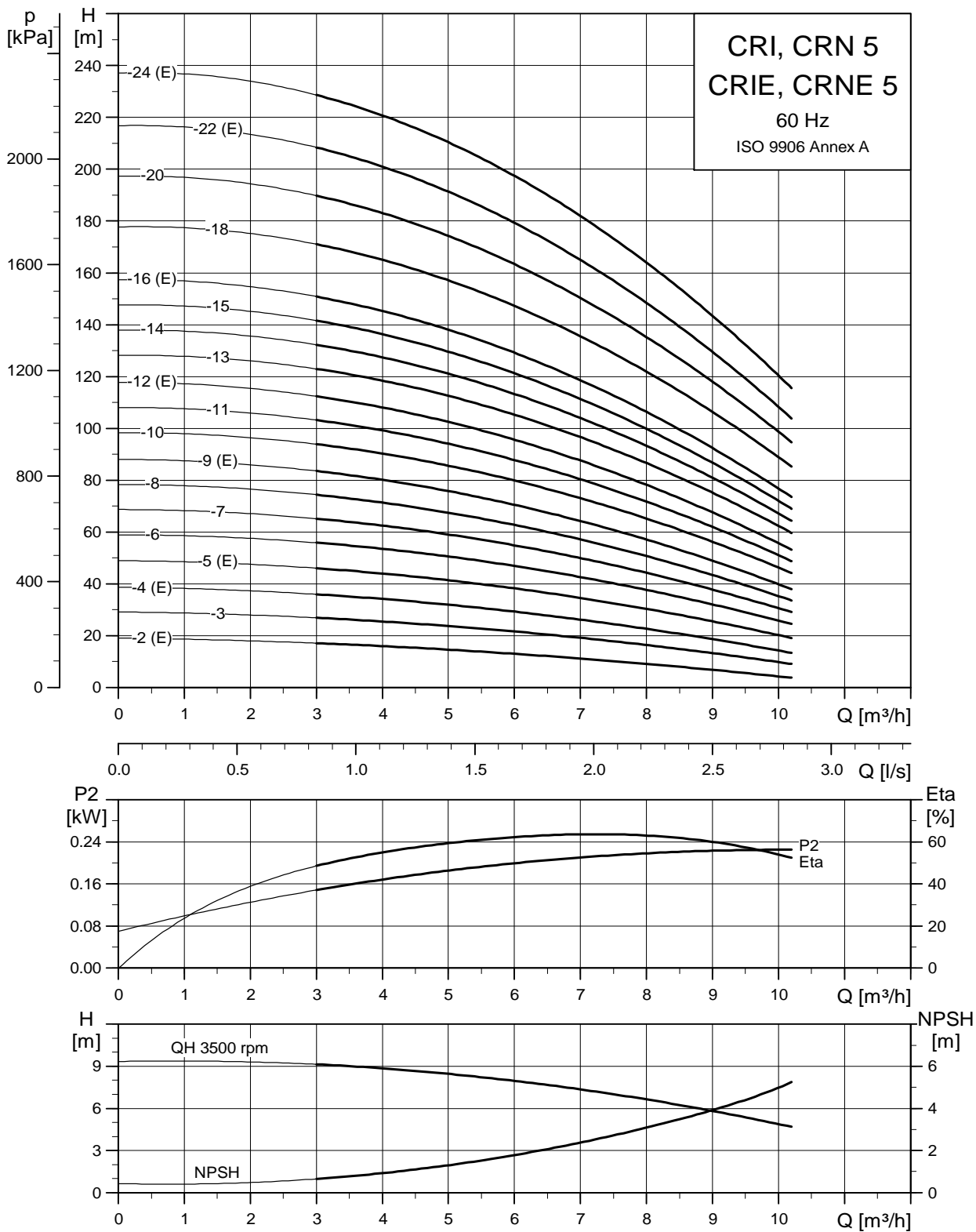


TM03 1723 2805

Dimensions and weights

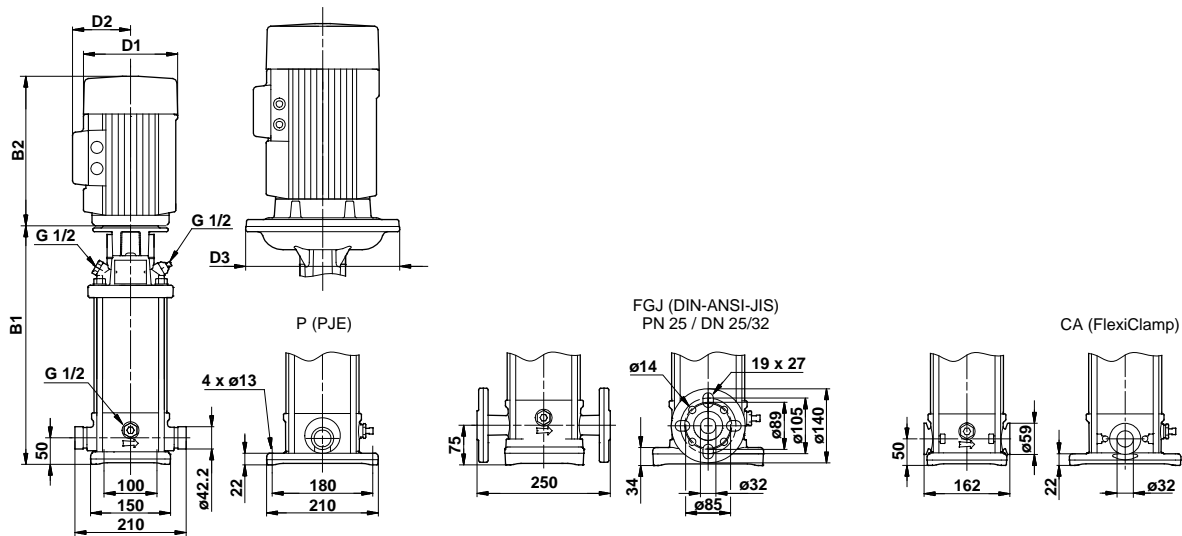
Pump type	Motor P ₂ [kW]	CR									CRE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CR(E) 5-2	0.55	254	445	279	470	141	109	-	19	23	254	445	279	470	141	140	-	22	26
CR 5-3	1.1	287	518	312	543	141	109	-	23	28	-	-	-	-	-	-	-	-	-
CR(E) 5-4	1.1	314	545	339	570	141	109	-	24	28	314	545	339	570	178	167	-	26	31
CR(E) 5-5	1.5	357	638	382	663	178	110	-	32	36	357	638	382	663	178	167	-	38	43
CR 5-6	2.2	384	705	409	730	178	110	-	33	37	-	-	-	-	-	-	-	-	-
CR 5-7	2.2	411	732	436	757	178	110	-	33	38	-	-	-	-	-	-	-	-	-
CR 5-8	2.2	438	759	463	784	178	110	-	34	38	-	-	-	-	-	-	-	-	-
CR(E) 5-9	2.2	465	786	490	811	178	110	-	34	39	465	786	490	811	178	167	-	45	49
CR 5-10	3	496	831	521	856	198	120	-	39	44	-	-	-	-	-	-	-	-	-
CR 5-11	3	523	858	548	883	198	120	-	40	44	-	-	-	-	-	-	-	-	-
CR(E) 5-12	3	550	885	575	910	198	120	-	40	45	550	885	575	910	198	177	-	50	55
CR 5-13	4	577	949	602	974	220	134	-	52	56	-	-	-	-	-	-	-	-	-
CR 5-14	4	604	976	629	1001	220	134	-	53	57	-	-	-	-	-	-	-	-	-
CR 5-15	4	631	1003	656	1028	220	134	-	53	58	-	-	-	-	-	-	-	-	-
CR(E) 5-16	4	658	1030	683	1055	220	134	-	54	58	658	1030	683	1055	220	188	-	64	68
CR 5-18	5.5	-	-	767	1158	220	134	300	-	74	-	-	-	-	-	-	-	-	-
CR 5-20	5.5	-	-	821	1212	220	134	300	-	75	-	-	-	-	-	-	-	-	-
CR(E) 5-22	5.5	-	-	875	1266	220	134	300	-	76	-	-	875	1266	220	188	300	-	83
CR(E) 5-24	7.5	-	-	929	1308	260	159	300	-	79	-	-	929	1308	260	213	300	-	87

CRI, CRN, CRIE, CRNE 5



TM02 7315 3605

Dimensional sketch

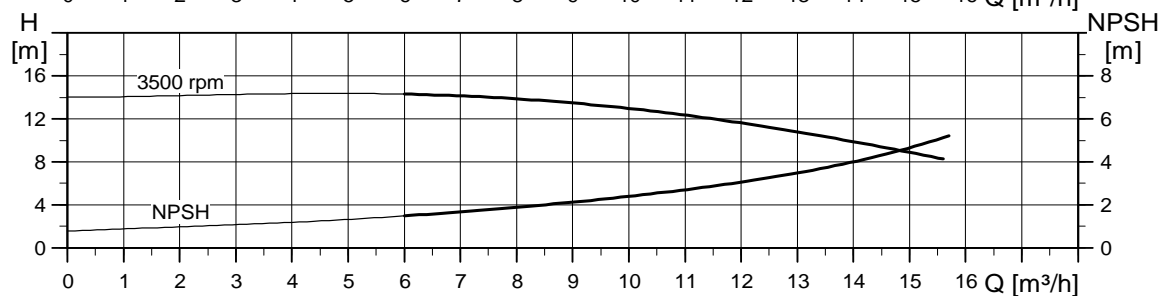
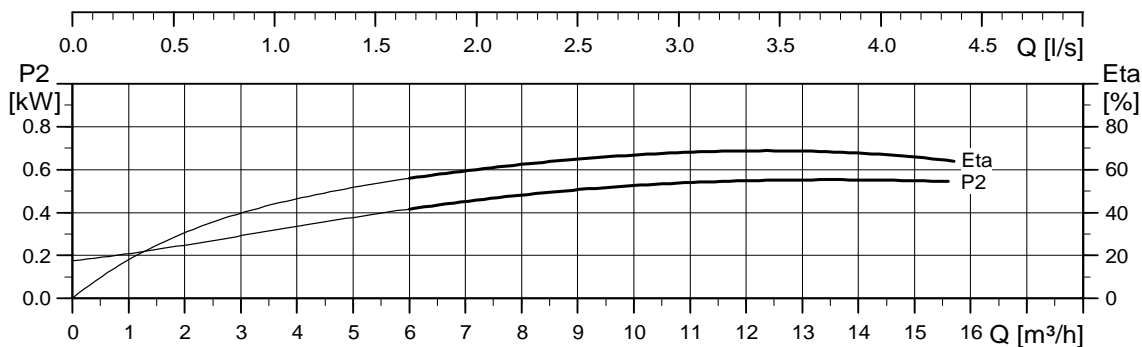
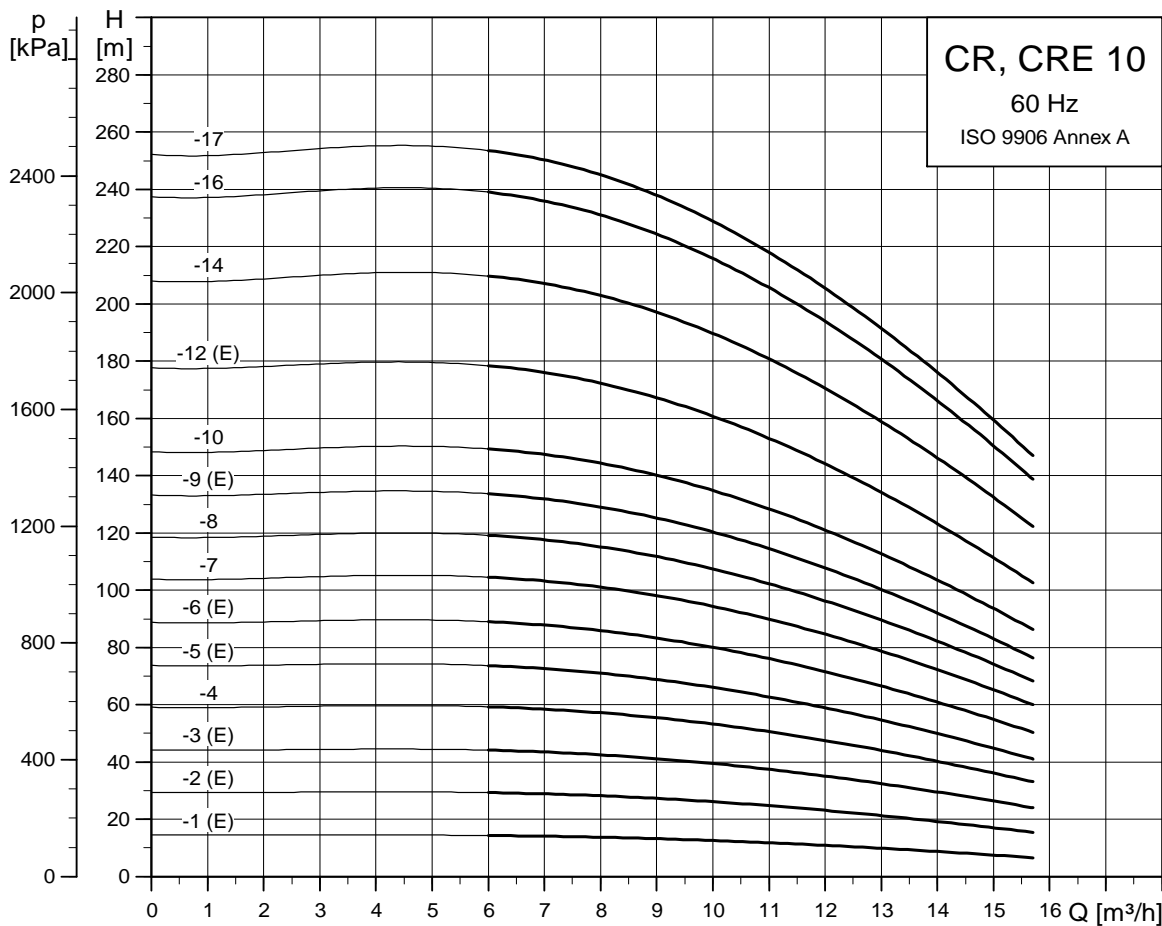


TM03 1724 2805

Dimensions and weights

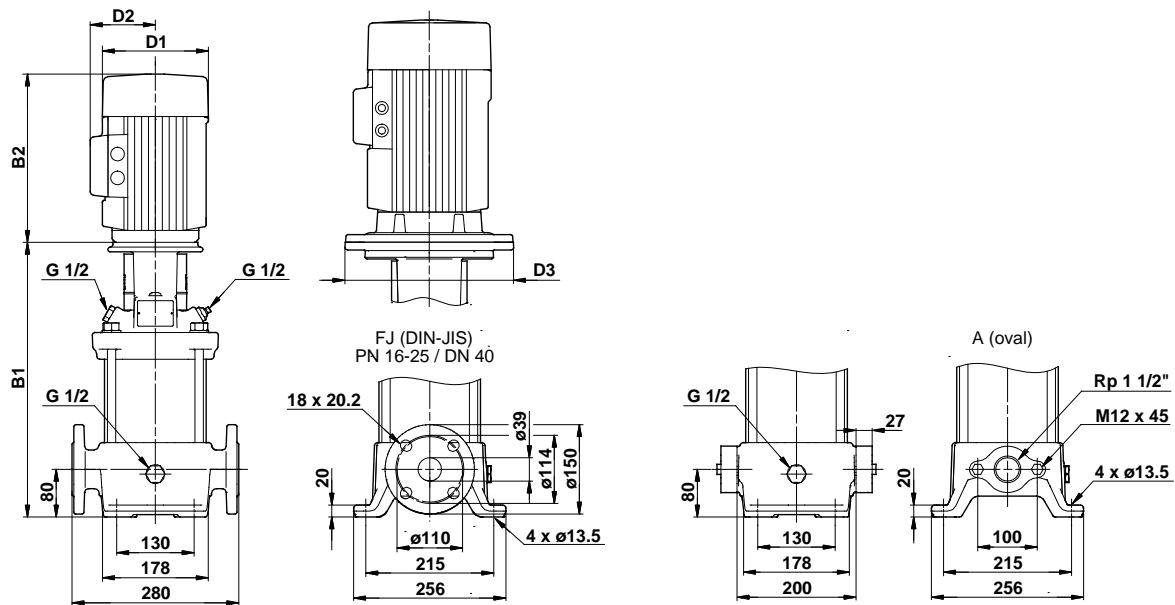
Pump type	Motor P ₂ [kW]	CRI/CRN										CRIE/CRNE							
		Dimension [mm]								Net weight [kg]		Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CRI(E)/CRN(E) 5-2	0.55	257	448	282	473	141	109	-	17	21	257	448	282	473	141	140	-	20	24
CRI/CRN 5-3	1.1	290	521	315	546	141	109	-	22	26	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 5-4	1.1	317	548	342	573	141	109	-	23	27	317	548	342	573	178	167	-	25	29
CRI(E)/CRN(E) 5-5	1.5	360	641	385	666	178	110	-	30	34	360	641	385	666	178	167	-	36	41
CRI/CRN 5-6	2.2	387	708	412	733	178	110	-	31	35	-	-	-	-	-	-	-	-	-
CRI/CRN 5-7	2.2	414	735	439	760	178	110	-	31	35	-	-	-	-	-	-	-	-	-
CRI/CRN 5-8	2.2	441	762	466	787	178	110	-	32	36	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 5-9	2.2	468	789	493	814	178	110	-	32	37	468	789	493	814	178	167	-	43	47
CRI/CRN 5-10	3	500	835	525	860	198	120	-	37	42	-	-	-	-	-	-	-	-	-
CRI/CRN 5-11	3	527	862	552	887	198	120	-	38	42	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 5-12	3	554	889	579	914	198	120	-	39	43	554	889	579	914	198	177	-	49	53
CRI/CRN 5-13	4	581	953	606	978	220	134	-	50	54	-	-	-	-	-	-	-	-	-
CRI/CRN 5-14	4	608	980	633	1005	220	134	-	51	55	-	-	-	-	-	-	-	-	-
CRI/CRN 5-15	4	635	1007	660	1032	220	134	-	51	55	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 5-16	4	662	1034	687	1059	220	134	-	52	56	662	1034	687	1059	220	188	-	62	66
CRI/CRN 5-18	5.5	745	1136	770	1161	220	134	300	67	71	-	-	-	-	-	-	-	-	-
CRI/CRN 5-20	5.5	799	1190	824	1215	220	134	300	68	72	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 5-22	5.5	853	1244	878	1269	220	134	300	69	73	853	1244	878	1269	220	188	300	76	80
CRI(E)/CRN(E) 5-24	7.5	907	1286	932	1311	260	159	300	72	76	907	1286	932	1311	260	213	300	80	84

CR, CRE 10



TM02 7316 3605

Dimensional sketch

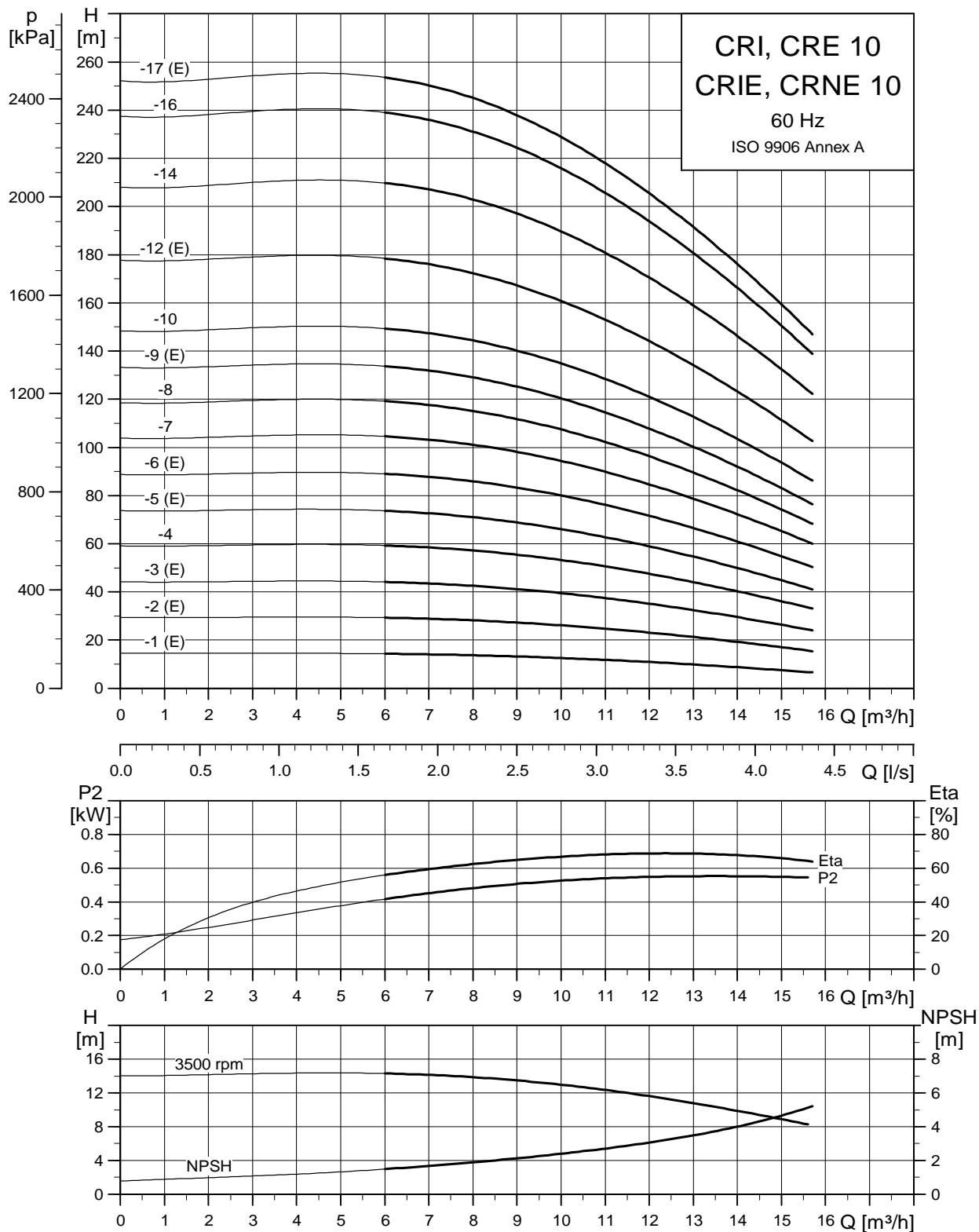


TM03 1725 2805

Dimensions and weights

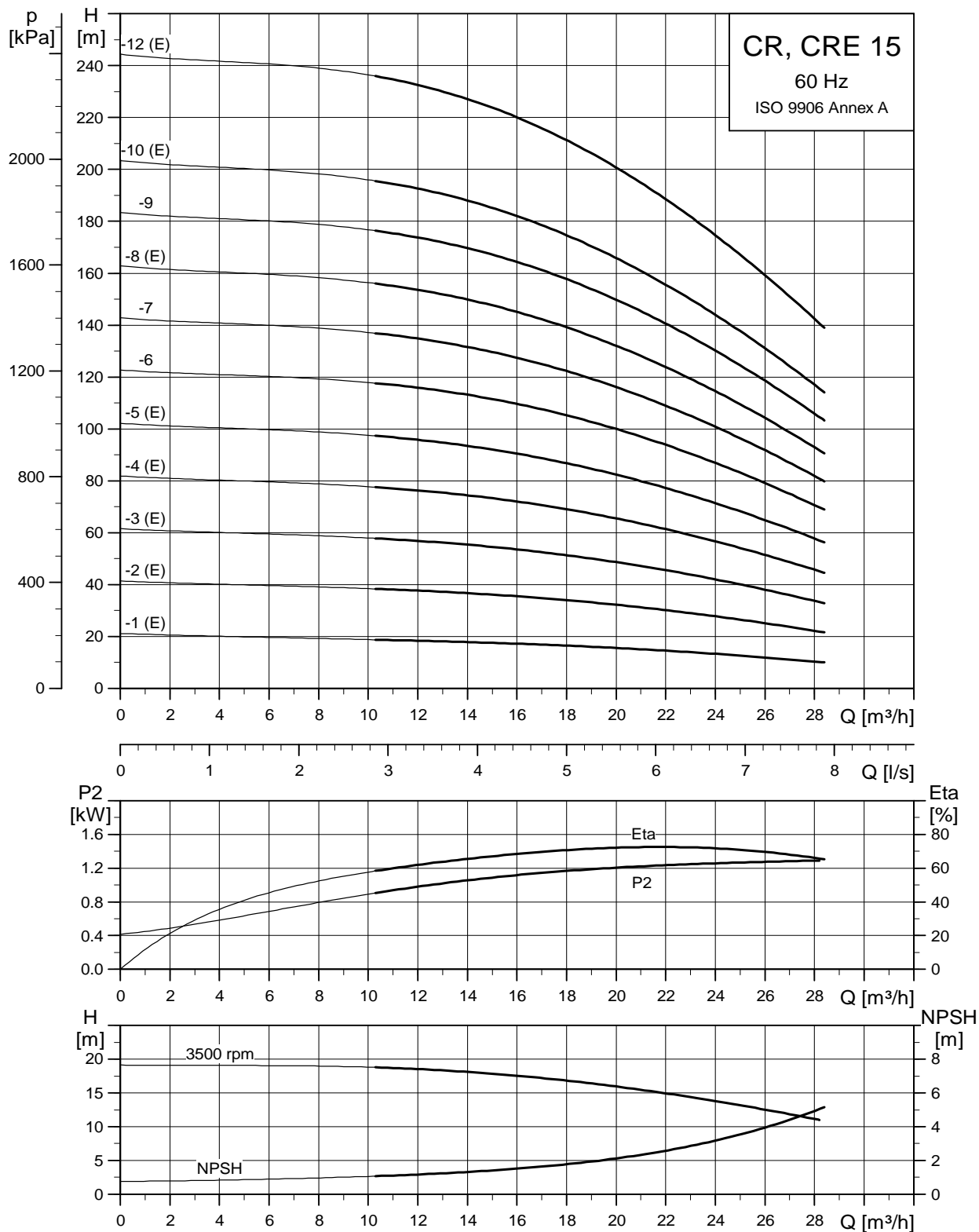
Pump type	Motor P ₂ [kW]	CR									CRE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CR(E) 10-1	0.75	347	578	347	578	141	109	-	33	36	347	578	347	578	178	167	-	36	39
CR(E) 10-2	1.5	363	644	363	644	178	110	-	43	45	363	644	363	644	178	167	-	50	52
CR(E) 10-3	2.2	393	714	393	714	178	110	-	44	47	393	714	393	714	178	167	-	55	57
CR 10-4	3	428	763	428	763	198	120	-	49	52	-	-	-	-	-	-	-	-	-
CR(E) 10-5	3	458	793	458	793	198	120	-	50	53	458	793	458	793	198	177	-	60	63
CR(E) 10-6	4	488	860	488	860	220	134	-	62	65	488	860	488	860	220	188	-	72	75
CR 10-7	5.5	550	941	550	941	220	134	300	84	87	-	-	-	-	-	-	-	-	-
CR 10-8	5.5	580	971	580	971	220	134	300	85	88	-	-	-	-	-	-	-	-	-
CR(E) 10-9	5.5	610	1001	610	1001	220	134	300	86	89	610	1001	610	1001	220	188	300	93	95
CR 10-10	7.5	640	1019	640	1019	260	159	300	89	92	-	-	-	-	-	-	-	-	-
CR(E) 10-12	7.5	-	-	700	1079	260	159	300	-	94	-	-	700	1079	260	213	300	-	102
CR 10-14	11	-	-	837	1308	314	204	350	-	147	-	-	-	-	-	-	-	-	-
CR 10-16	11	-	-	897	1368	314	204	350	-	149	-	-	-	-	-	-	-	-	-
CR(E) 10-17	11	-	-	957	1428	314	204	350	-	151	-	-	972	1443	314	308	350	-	196

CRI, CRE, CRIE, CRNE 10



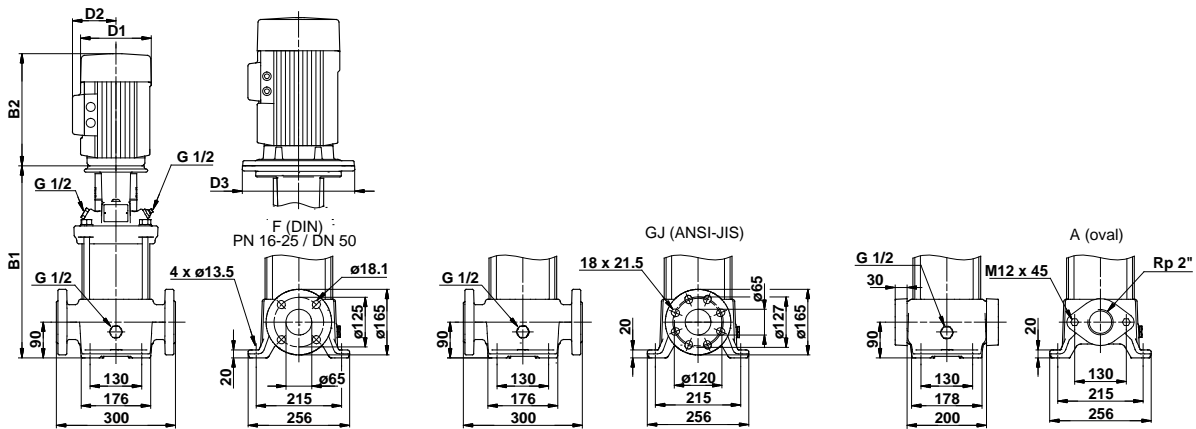
TM02 7317 3605

CR, CRE 15



TM02 7318 3605

Dimensional sketch

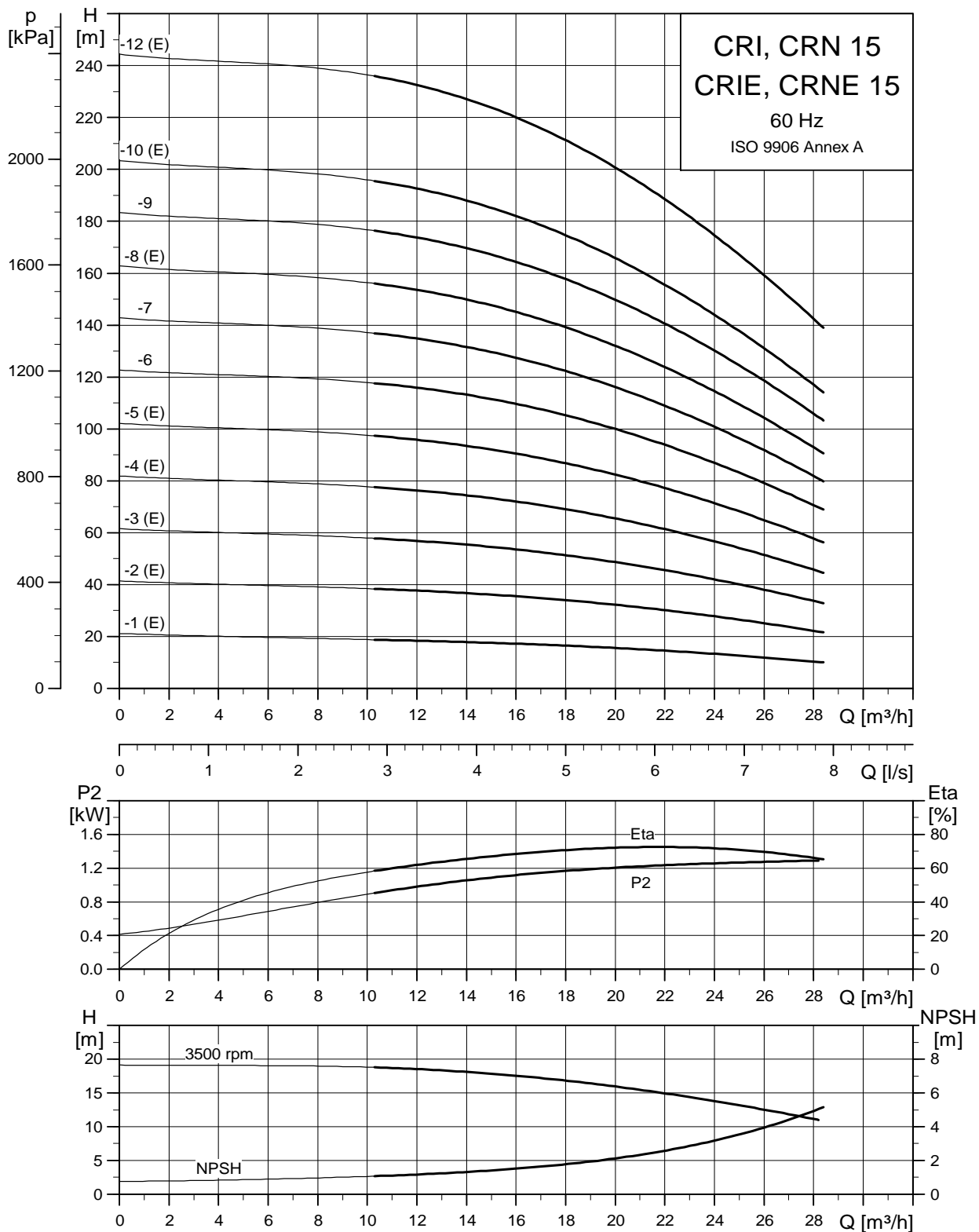


TM03 1727 2805

Dimensions and weights

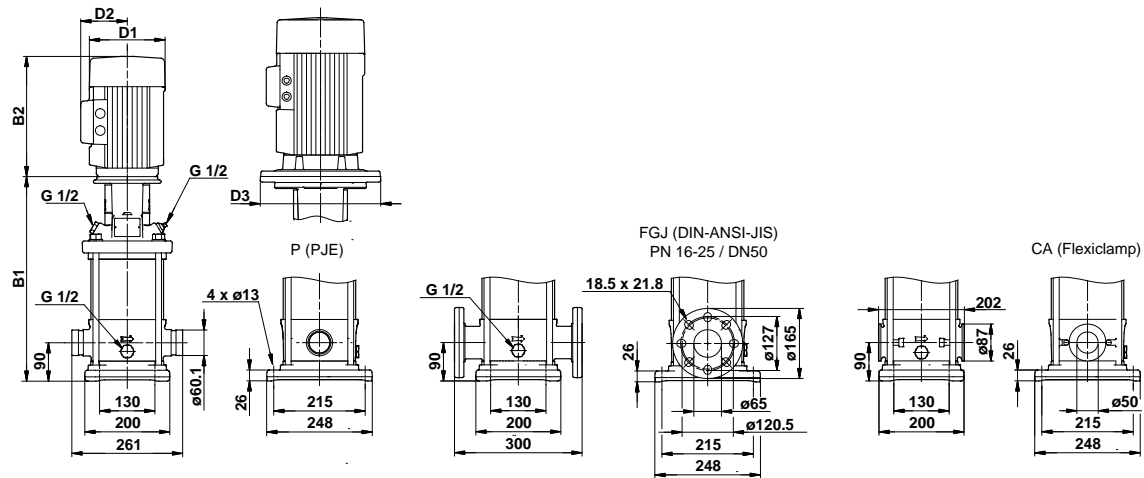
Pump type	Motor P ₂ [kW]	CR									CRE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]					Net weight [kg]			
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CR(E) 15-1	1.5	415	696	415	696	178	110	-	48	49	415	696	415	696	178	167	-	55	56
CR(E) 15-2	3	420	755	420	755	198	120	-	53	54	420	755	420	755	198	177	-	63	64
CR(E) 15-3	4	465	837	465	837	220	134	-	65	66	465	837	465	837	220	188	-	75	76
CR(E) 15-4	5.5	542	933	542	933	220	134	300	87	88	542	933	542	933	220	188	300	94	95
CR(E) 15-5	7.5	587	966	587	966	260	159	300	91	92	587	966	587	966	260	213	300	99	100
CR 15-6	11	-	-	709	1180	314	204	350	-	144	-	-	-	-	-	-	-	-	-
CR 15-7	11	-	-	754	1225	314	204	350	-	145	-	-	-	-	-	-	-	-	-
CR(E) 15-8	11	-	-	799	1270	314	204	350	-	147	-	-	814	1285	314	308	350	-	191
CR 15-9	15	-	-	844	1315	314	204	350	-	161	-	-	-	-	-	-	-	-	-
CR(E) 15-10	15	-	-	889	1360	314	204	350	-	163	-	-	904	1375	314	308	350	-	211
CR(E) 15-12	18.5	-	-	979	1494	314	204	350	-	179	-	-	994	1509	314	308	350	-	226

CRI, CRN, CRIE, CRNE 15



TM02 7319 3605

Dimensional sketch

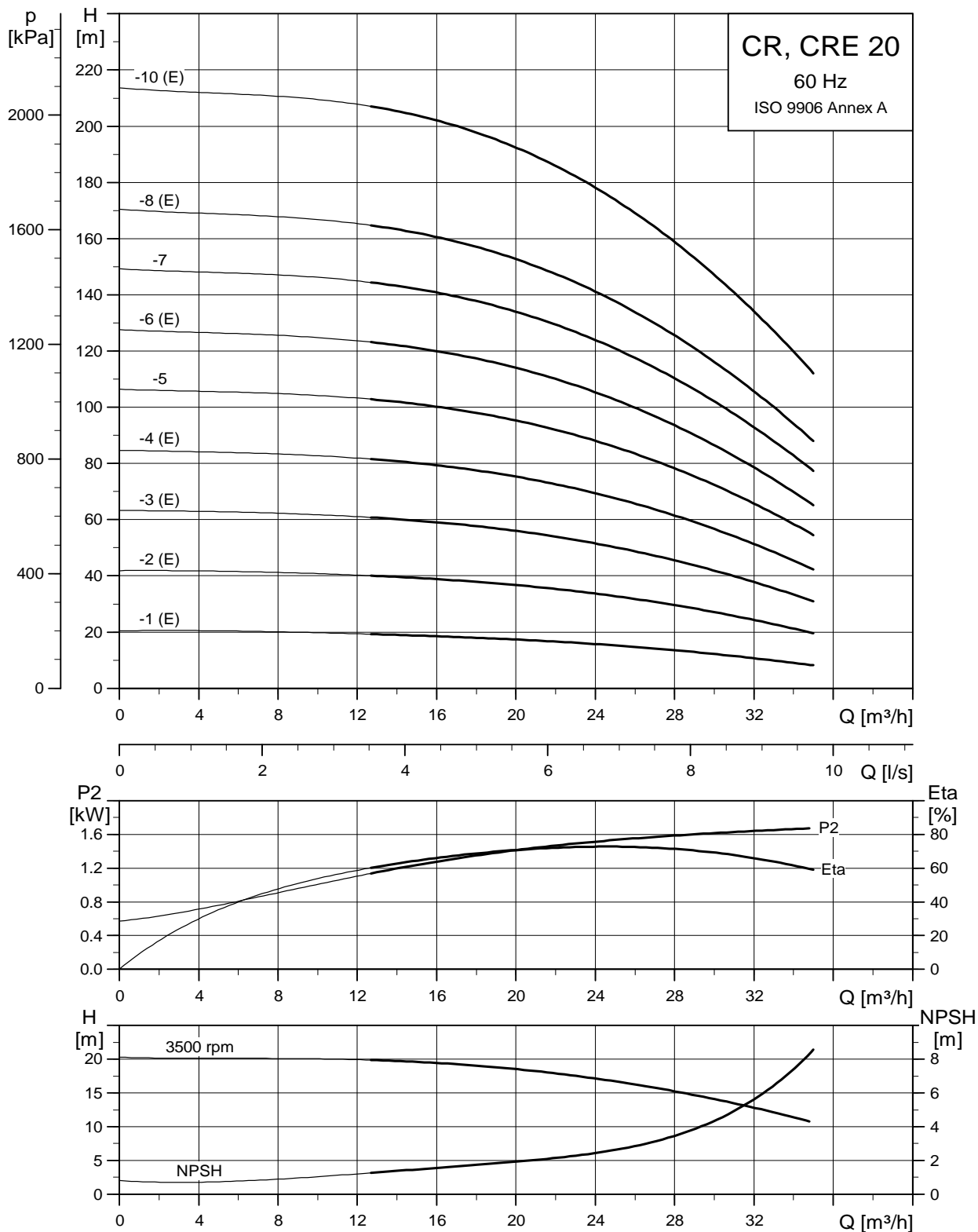


TM03 1728 2805

Dimensions and weights

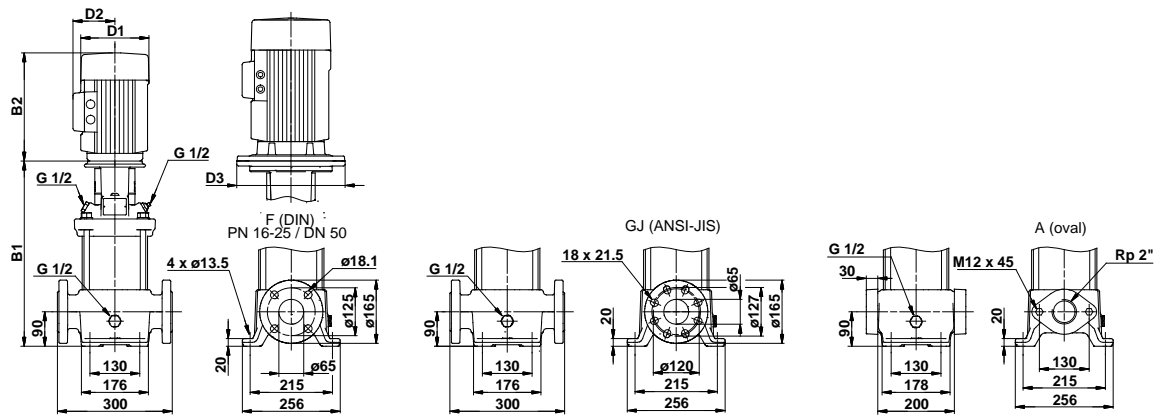
Pump type	Motor P ₂ [kW]	CRI/CRN										CRIE/CRNE							
		Dimension [mm]								Net weight [kg]		Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CRI(E)/CRN(E) 15-1	1.5	413	694	413	694	178	110	-	41	46	413	694	413	694	178	167	-	48	53
CRI(E)/CRN(E) 15-2	3	418	753	418	753	198	120	-	47	51	418	753	418	753	198	177	-	57	61
CRI(E)/CRN(E) 15-3	4	463	835	463	835	220	134	-	59	64	463	835	463	835	220	188	-	69	74
CRI(E)/CRN(E) 15-4	5.5	540	931	540	931	220	134	300	81	86	540	931	540	931	220	188	300	87	92
CRI(E)/CRN(E) 15-5	7.5	585	964	585	964	260	159	300	84	89	585	964	585	964	260	213	300	92	97
CRI/CRN 15-6	11	707	1178	707	1178	314	204	350	136	141	-	-	-	-	-	-	-	-	-
CRI/CRN 15-7	11	752	1223	752	1223	314	204	350	138	143	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 15-8	11	797	1268	797	1268	314	204	350	139	144	812	1283	812	1283	314	308	350	184	189
CRI/CRN 15-9	15	842	1313	842	1313	314	204	350	153	158	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 15-10	15	887	1358	887	1358	314	204	350	155	160	902	1373	902	1373	314	308	350	203	207
CRI(E)/CRN(E) 15-12	18.5	977	1492	977	1492	314	204	350	171	176	992	1507	992	1507	314	308	350	218	223

CR, CRE 20



TM02 7320 3605

Dimensional sketch

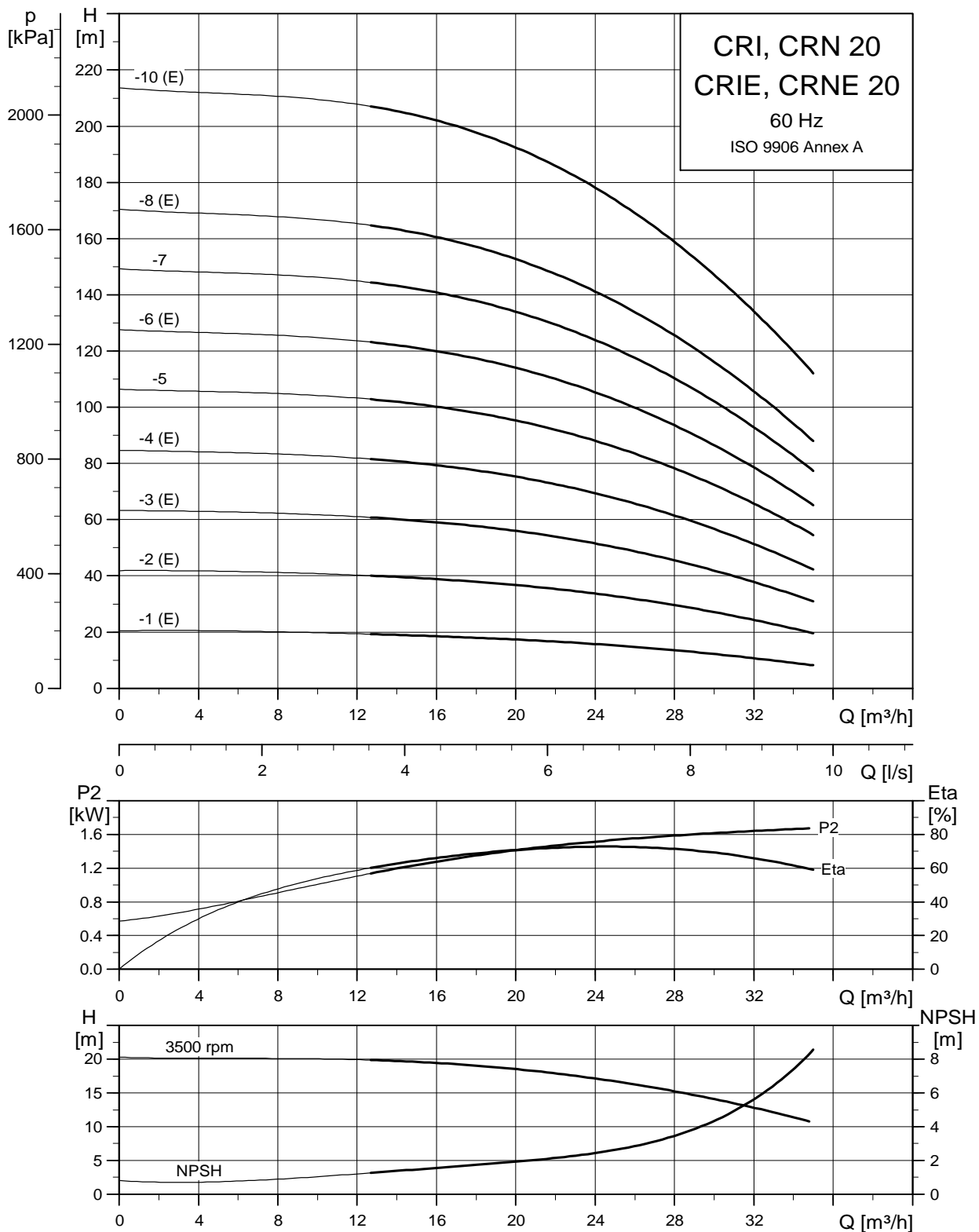


TM03 1727 2805

Dimensions and weights

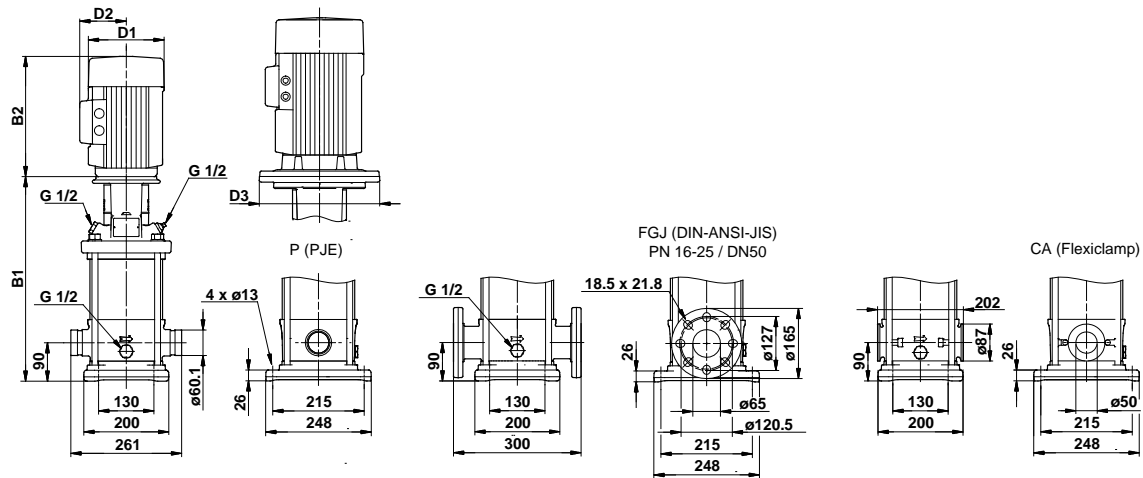
Pump type	Motor P ₂ [kW]	CR									CRE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange				Oval flange	DIN flange	Oval flange	DIN flange		D1	D2	D3	Oval flange	DIN flange		
		B1	B1+B2	B1	B1+B2	B1	B1+B2												
CR(E) 20-1	2.2	415	736	415	736	178	110	-	49	50	415	736	415	736	178	167	-	59	60
CR(E) 20-2	4	420	792	420	792	220	134	-	64	65	420	792	420	792	220	188	-	74	75
CR(E) 20-3	5.5	497	888	497	888	220	134	300	86	87	497	888	497	888	220	188	300	93	93
CR(E) 20-4	7.5	542	921	542	921	260	159	300	89	90	542	921	542	921	260	213	300	97	98
CR 20-5	11	664	1135	664	1135	314	204	350	141	142	-	-	-	-	-	-	-	-	-
CR(E) 20-6	11	-	-	709	1180	314	204	350	-	144	-	-	724	1195	314	308	350	-	188
CR 20-7	15	-	-	754	1225	314	204	350	-	157	-	-	-	-	-	-	-	-	-
CR(E) 20-8	15	-	-	799	1270	314	204	350	-	159	-	-	814	1285	314	308	350	-	207
CR(E) 20-10	18.5	-	-	889	1404	314	204	350	-	176	-	-	904	1419	314	308	350	-	223

CRI, CRN, CRIE, CRNE 20



TM02 7321 3605

Dimensional sketch

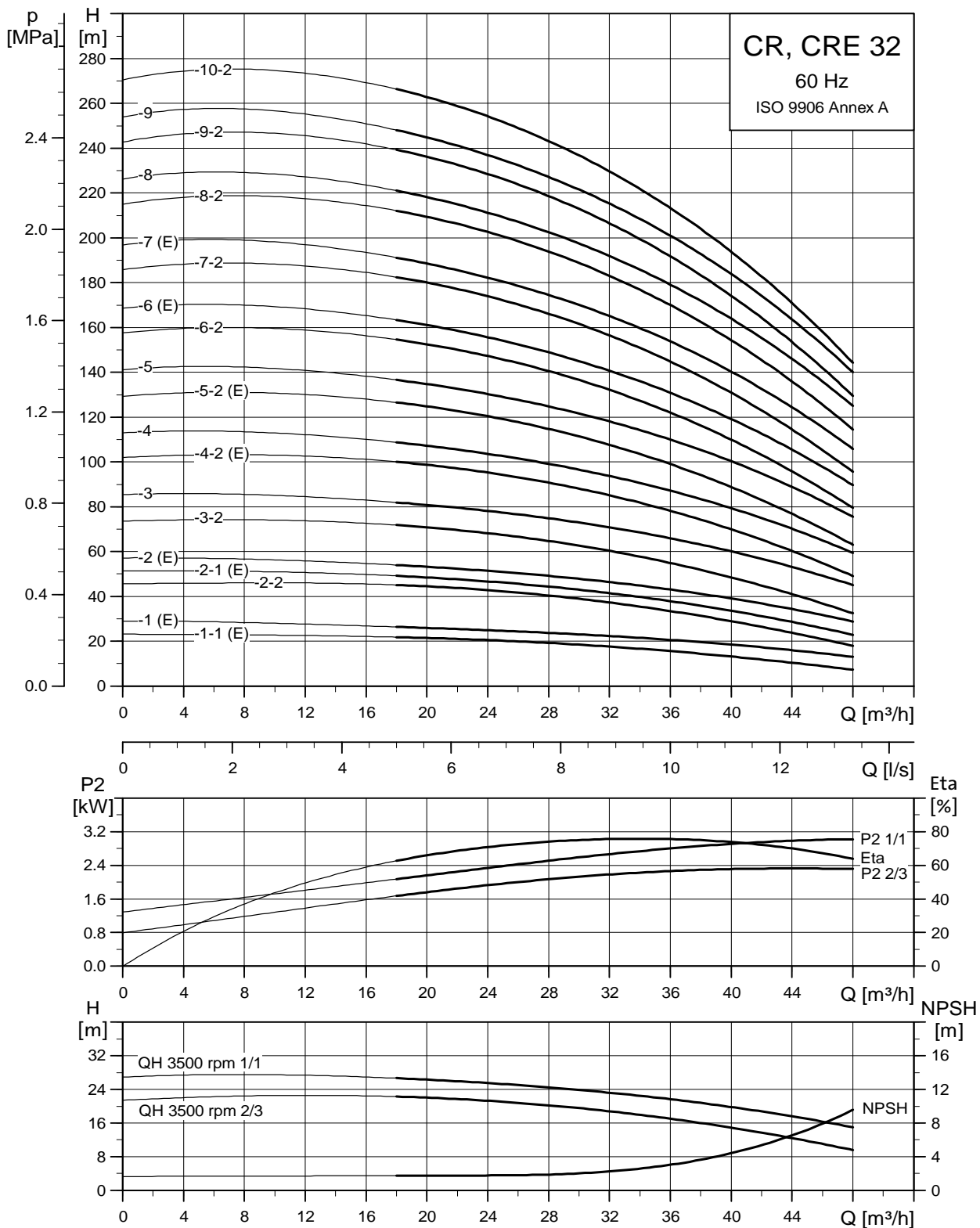


TM03 1728 2805

Dimensions and weights

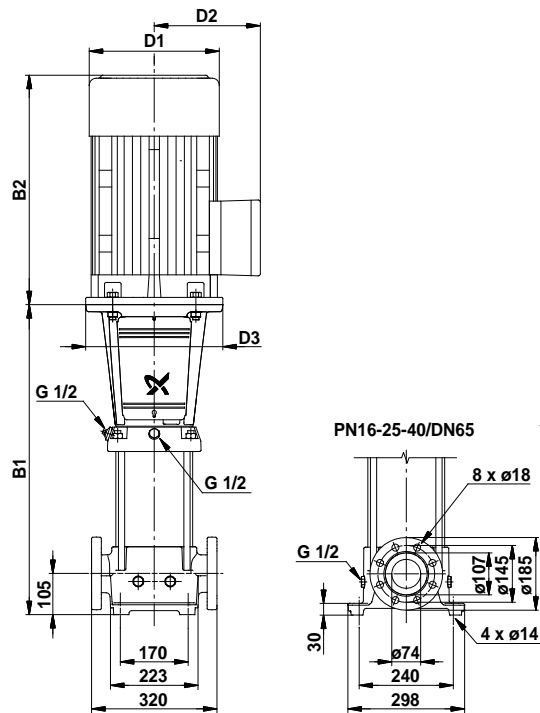
Pump type	Motor P ₂ [kW]	CRI/CRN										CRIE/CRNE							
		Dimension [mm]								Net weight [kg]		Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CRI(E)/CRN(E) 20-1	2.2	413	734	413	734	178	110	-	42	47	413	734	413	734	178	167	-	52	57
CRI(E)/CRN(E) 20-2	4	418	790	418	790	220	134	-	58	62	418	790	418	790	220	188	-	68	72
CRI(E)/CRN(E) 20-3	5.5	495	886	495	886	220	134	300	79	84	495	886	495	886	220	188	300	86	91
CRI(E)/CRN(E) 20-4	7.5	540	919	540	919	260	159	300	83	88	540	919	540	919	260	213	300	91	95
CRI/CRN 20-5	11	662	1133	662	1133	314	204	350	134	139	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 20-6	11	707	1178	707	1178	314	204	350	136	141	722	1193	722	1193	314	308	350	181	185
CRI/CRN 20-7	15	752	1223	752	1223	314	204	350	150	155	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 20-8	15	797	1268	797	1268	314	204	350	151	156	812	1283	812	1283	314	308	350	199	204
CRI(E)/CRN(E) 20-10	18.5	887	1402	887	1402	314	204	350	168	173	902	1417	902	1417	314	308	350	215	219

CR, CRE 32



TM02 7322 3605

Dimensional sketch

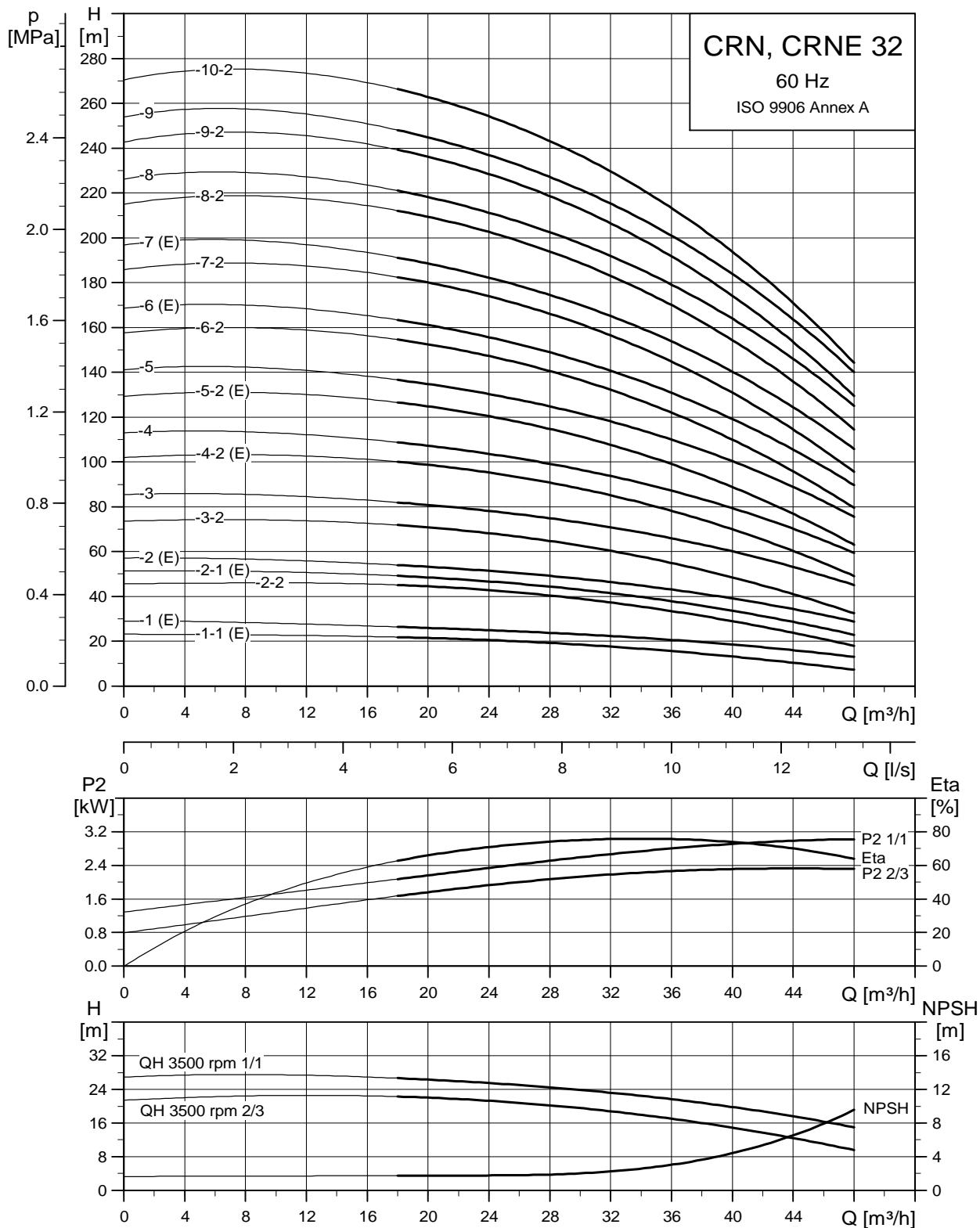


TM01 1749 3298

Dimensions and weights

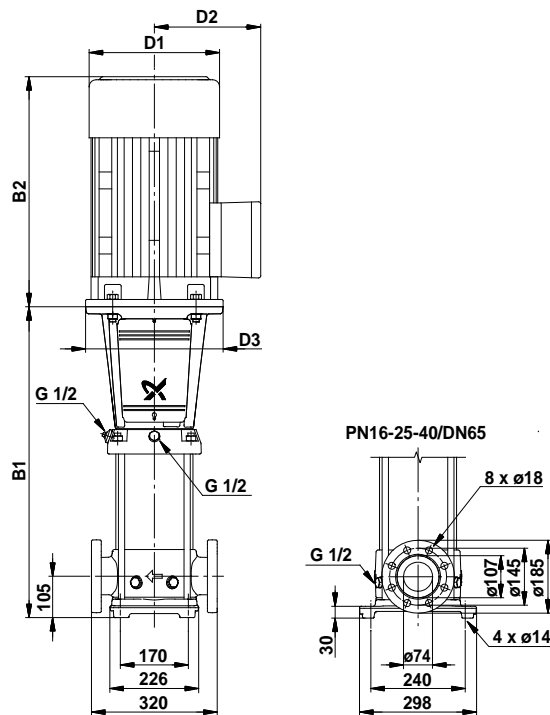
Pump type	Motor P ₂ [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 32-1-1	2.2	505	826	178	110	270	64	505	826	178	167	270	74
CR(E) 32-1	3	505	840	198	120	270	68	505	840	198	177	270	78
CR 32-2-2	5.5	575	966	220	134	300	93	-	-	-	-	-	-
CR(E) 32-2-1	5.5	575	966	220	134	300	93	575	966	220	188	300	100
CR(E) 32-2	7.5	575	954	260	159	300	95	575	954	260	213	300	103
CR 32-3-2	11	755	1226	314	204	350	153	-	-	-	-	-	-
CR 32-3	11	755	1226	314	204	350	153	-	-	-	-	-	-
CR(E) 32-4-2	11	825	1296	314	204	350	156	825	1296	314	308	350	185
CR 32-4	15	825	1296	314	204	350	168	-	-	-	-	-	-
CR(E) 32-5-2	15	895	1366	314	204	350	171	895	1366	314	308	350	203
CR 32-5	18.5	895	1410	314	204	350	184	-	-	-	-	-	-
CR 32-6-2	18.5	965	1480	314	204	350	187	-	-	-	-	-	-
CR(E) 32-6	18.5	965	1480	314	204	350	187	965	1480	314	308	350	218
CR 32-7-2	22	1035	1576	314	204	350	204	-	-	-	-	-	-
CR(E) 32-7	22	1035	1576	314	204	350	204	1035	1576	314	308	350	234
CR 32-8-2	30	1105	1715	402	300	400	312	-	-	-	-	-	-
CR 32-8	30	1105	1715	402	300	400	312	-	-	-	-	-	-
CR 32-9-2	30	1175	1785	402	300	400	315	-	-	-	-	-	-
CR 32-9	30	1175	1785	402	300	400	315	-	-	-	-	-	-
CR 32-10-2	30	1245	1855	402	300	400	319	-	-	-	-	-	-

CRN, CRNE 32



TM02 7323 3605

Dimensional sketch

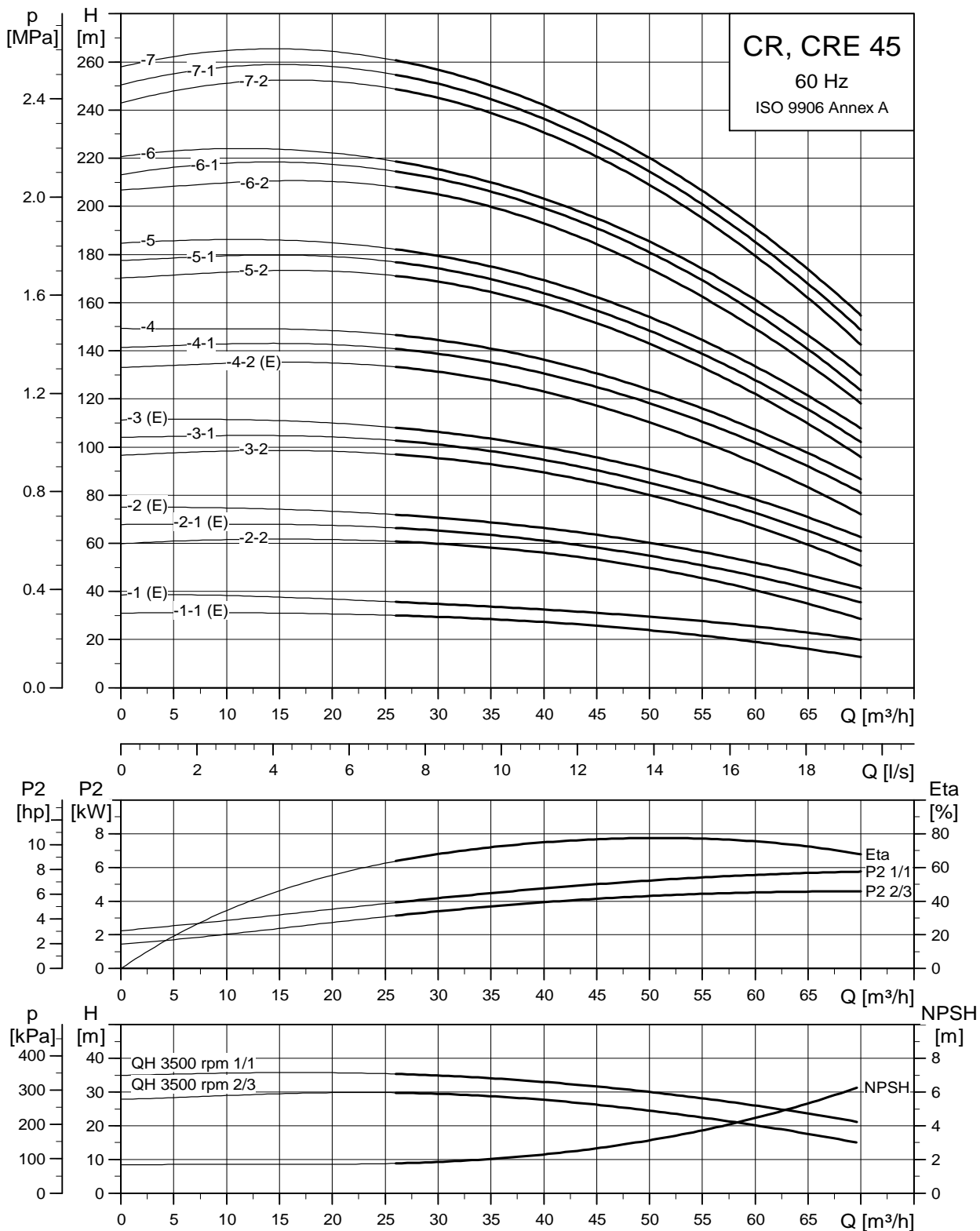


TM01 1750 2203

Dimensions and weights

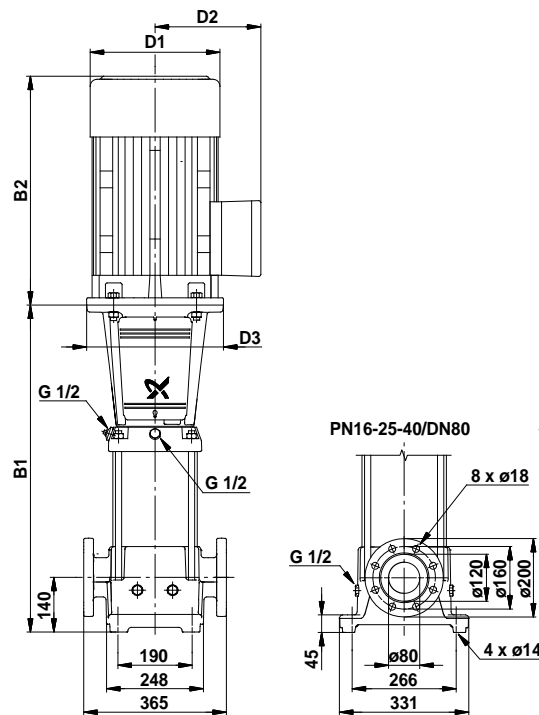
Pump type	Motor P ₂ [kW]	CRN						CRNE					
		Dimension [mm]			Net weight [kg]			Dimension [mm]			Net weight [kg]		
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 32-1-1	2.2	505	826	178	110	270	66	505	826	178	167	270	77
CRN(E) 32-1	3	505	840	198	120	270	70	505	840	198	177	270	80
CRN 32-2-2	5.5	575	966	220	134	300	95	-	-	-	-	-	-
CRN(E) 32-2-1	5.5	575	966	220	134	300	95	575	966	220	188	300	102
CRN(E) 32-2	7.5	575	954	260	159	300	97	575	954	260	213	300	105
CRN 32-3-2	11	755	1226	314	204	350	155	-	-	-	-	-	-
CRN 32-3	11	755	1226	314	204	350	155	-	-	-	-	-	-
CRN(E) 32-4-2	11	825	1296	314	204	350	158	825	1296	314	308	350	187
CRN 32-4	15	825	1296	314	204	350	170	-	-	-	-	-	-
CRN(E) 32-5-2	15	895	1366	314	204	350	173	895	1366	314	308	350	205
CRN 32-5	18.5	895	1410	314	204	350	186	-	-	-	-	-	-
CRN 32-6-2	18.5	965	1480	314	204	350	189	-	-	-	-	-	-
CRN(E) 32-6	18.5	965	1480	314	204	350	189	965	1480	314	308	350	220
CRN 32-7-2	22	1035	1576	314	204	350	206	-	-	-	-	-	-
CRN(E) 32-7	22	1035	1576	314	204	350	206	1035	1576	314	308	350	236
CRN 32-8-2	30	1105	1715	402	300	400	314	-	-	-	-	-	-
CRN 32-8	30	1105	1715	402	300	400	314	-	-	-	-	-	-
CRN 32-9-2	30	1175	1785	402	300	400	318	-	-	-	-	-	-
CRN 32-9	30	1175	1785	402	300	400	318	-	-	-	-	-	-
CRN 32-10-2	30	1245	1855	402	300	400	321	-	-	-	-	-	-

CR, CRE 45



TM02 7324-3103

Dimensional sketch

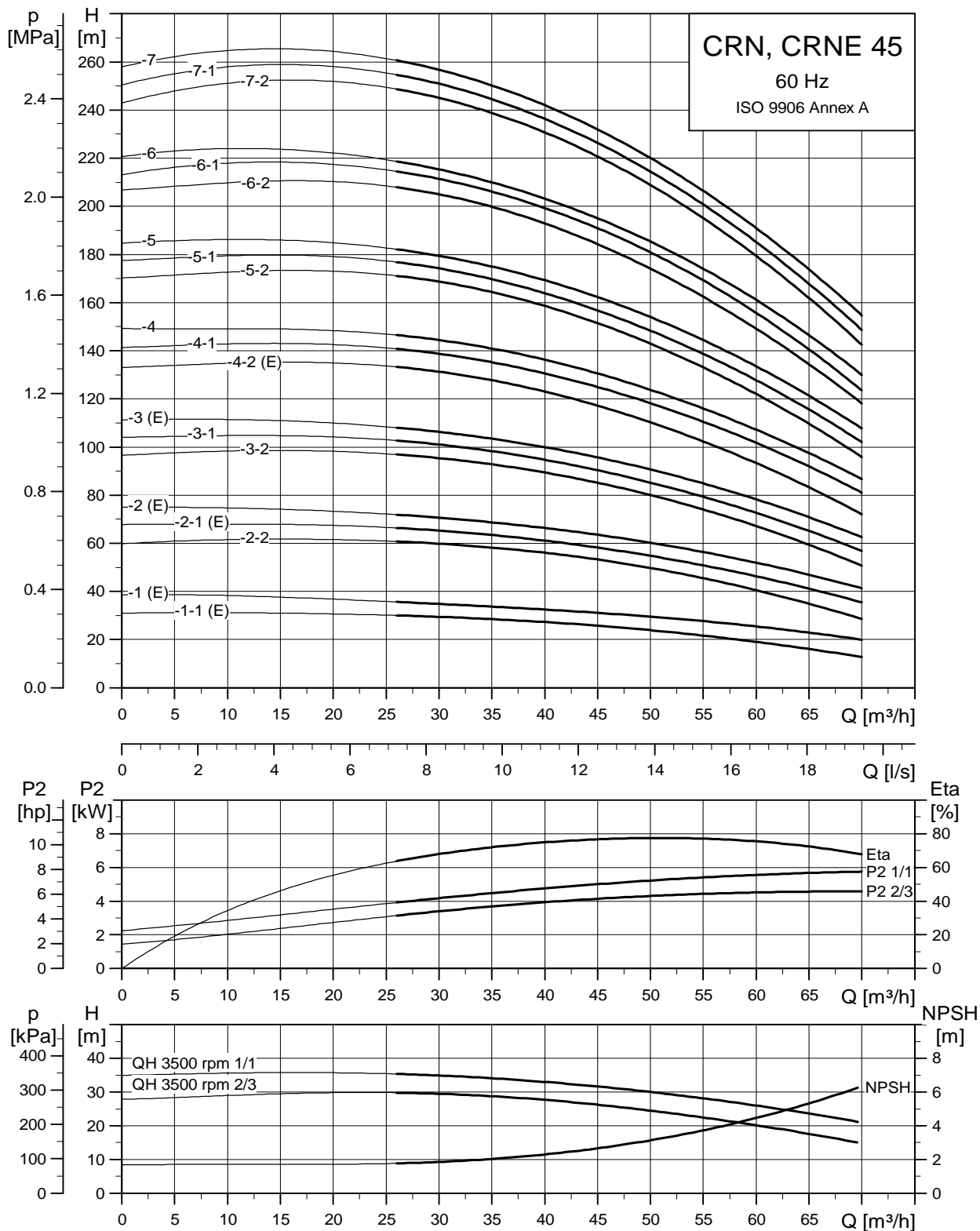


TM01 1751 3202

Dimensions and weights

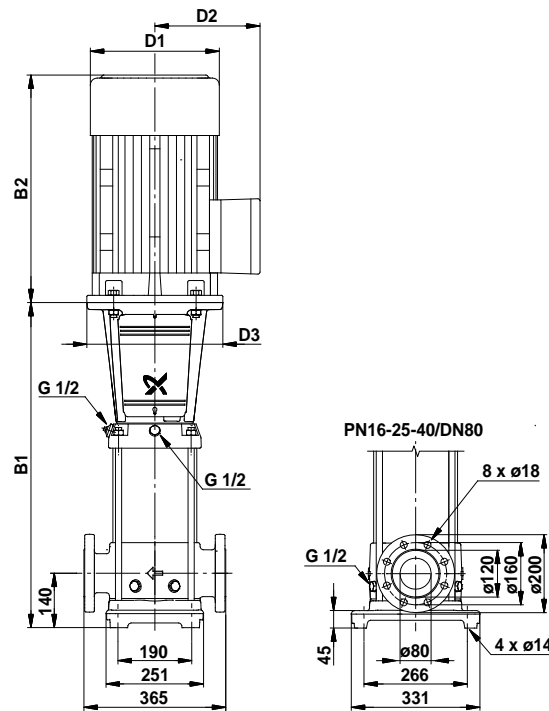
Pump type	Motor P ₂ [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 45-1-1	5.5	559	950	220	134	300	100	559	950	220	188	300	107
CR(E) 45-1	7.5	559	938	260	159	300	102	559	938	260	213	300	110
CR(E) 45-2-2	11	749	1220	314	204	350	160	749	1220	314	308	350	189
CR(E) 45-2-1	11	749	1220	314	204	350	160	749	1220	314	308	350	189
CR(E) 45-2	15	749	1220	314	204	350	172	749	1220	314	308	350	204
CR 45-3-2	18.5	829	1344	314	204	350	189	-	-	-	-	-	-
CR 45-3-1	18.5	829	1344	314	204	350	189	-	-	-	-	-	-
CR(E) 45-3	18.5	829	1344	314	204	350	189	829	1344	314	308	350	220
CR(E) 45-4-2	22	909	1450	314	204	350	207	909	1450	314	308	350	237
CR 45-4-1	30	909	1519	402	300	400	309	-	-	-	-	-	-
CR 45-4	30	909	1519	402	300	400	309	-	-	-	-	-	-
CR 45-5-2	30	989	1599	402	300	400	313	-	-	-	-	-	-
CR 45-5-1	30	989	1599	402	300	400	313	-	-	-	-	-	-
CR 45-5	30	989	1599	402	300	400	313	-	-	-	-	-	-
CR 45-6-2	37	1069	1736	402	300	400	349	-	-	-	-	-	-
CR 45-6-1	37	1069	1736	402	300	400	349	-	-	-	-	-	-
CR 45-6	37	1069	1736	402	300	400	349	-	-	-	-	-	-
CR 45-7-2	45	1149	1858	442	325	450	433	-	-	-	-	-	-
CR 45-7-1	45	1149	1858	442	325	450	433	-	-	-	-	-	-
CR 45-7	45	1149	1858	442	325	450	433	-	-	-	-	-	-

CRN, CRNE 45



TM02 7325-3605

Dimensional sketch

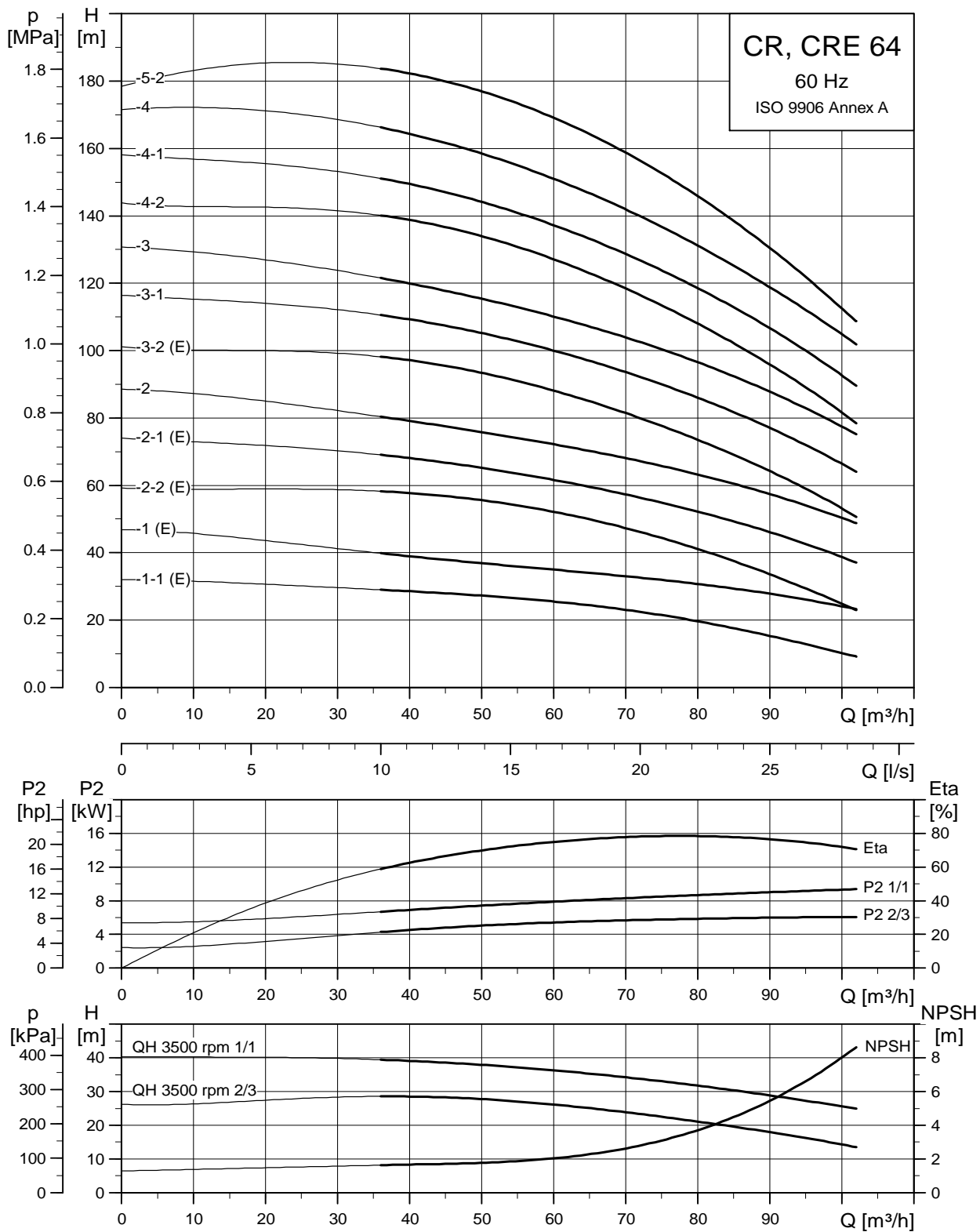


TM01 1752 3203

Dimensions and weights

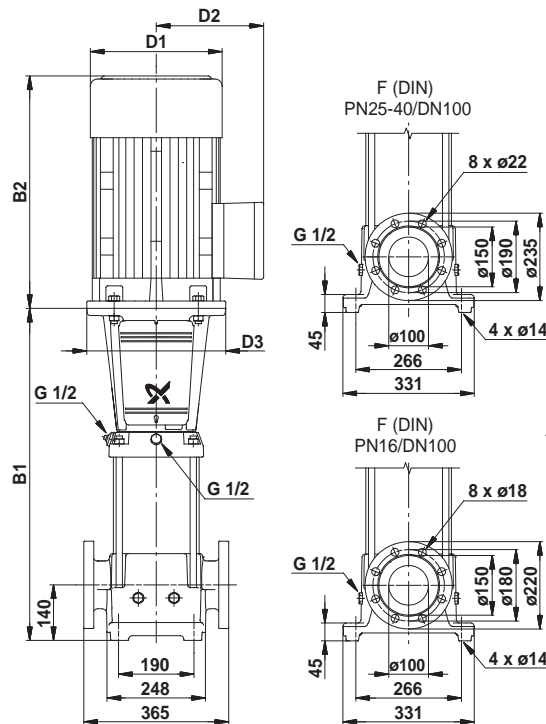
Pump type	Motor P ₂ [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 45-1-1	5.5	559	950	220	134	300	100	559	950	220	188	300	107
CRN(E) 45-1	7.5	559	938	260	159	300	102	559	938	260	213	300	110
CRN(E) 45-2-2	11	749	1220	314	204	350	161	749	1220	314	308	350	190
CRN(E) 45-2-1	11	749	1220	314	204	350	161	749	1220	314	308	350	190
CRN(E) 45-2	15	749	1220	314	204	350	173	749	1220	314	308	350	205
CRN 45-3-2	18.5	829	1344	314	204	350	190	-	-	-	-	-	-
CRN 45-3-1	18.5	829	1344	314	204	350	190	-	-	-	-	-	-
CRN(E) 45-3	18.5	829	1344	314	204	350	190	829	1344	314	308	350	221
CRN(E) 45-4-2	22	909	1450	314	204	350	207	909	1450	314	308	350	237
CRN 45-4-1	30	909	1519	402	300	400	309	-	-	-	-	-	-
CRN 45-4	30	909	1519	402	300	400	309	-	-	-	-	-	-
CRN 45-5-2	30	989	1599	402	300	400	313	-	-	-	-	-	-
CRN 45-5-1	30	989	1599	402	300	400	313	-	-	-	-	-	-
CRN 45-5	30	989	1599	402	300	400	313	-	-	-	-	-	-
CRN 45-6-2	37	1069	1736	402	300	400	350	-	-	-	-	-	-
CRN 45-6-1	37	1069	1736	402	300	400	350	-	-	-	-	-	-
CRN 45-6	37	1069	1736	402	300	400	350	-	-	-	-	-	-
CRN 45-7-2	45	1149	1858	442	325	450	433	-	-	-	-	-	-
CRN 45-7-1	45	1149	1858	442	325	450	433	-	-	-	-	-	-
CRN 45-7	45	1149	1858	442	325	450	433	-	-	-	-	-	-

CR, CRE 64



TM02 7326 3605

Dimensional sketch

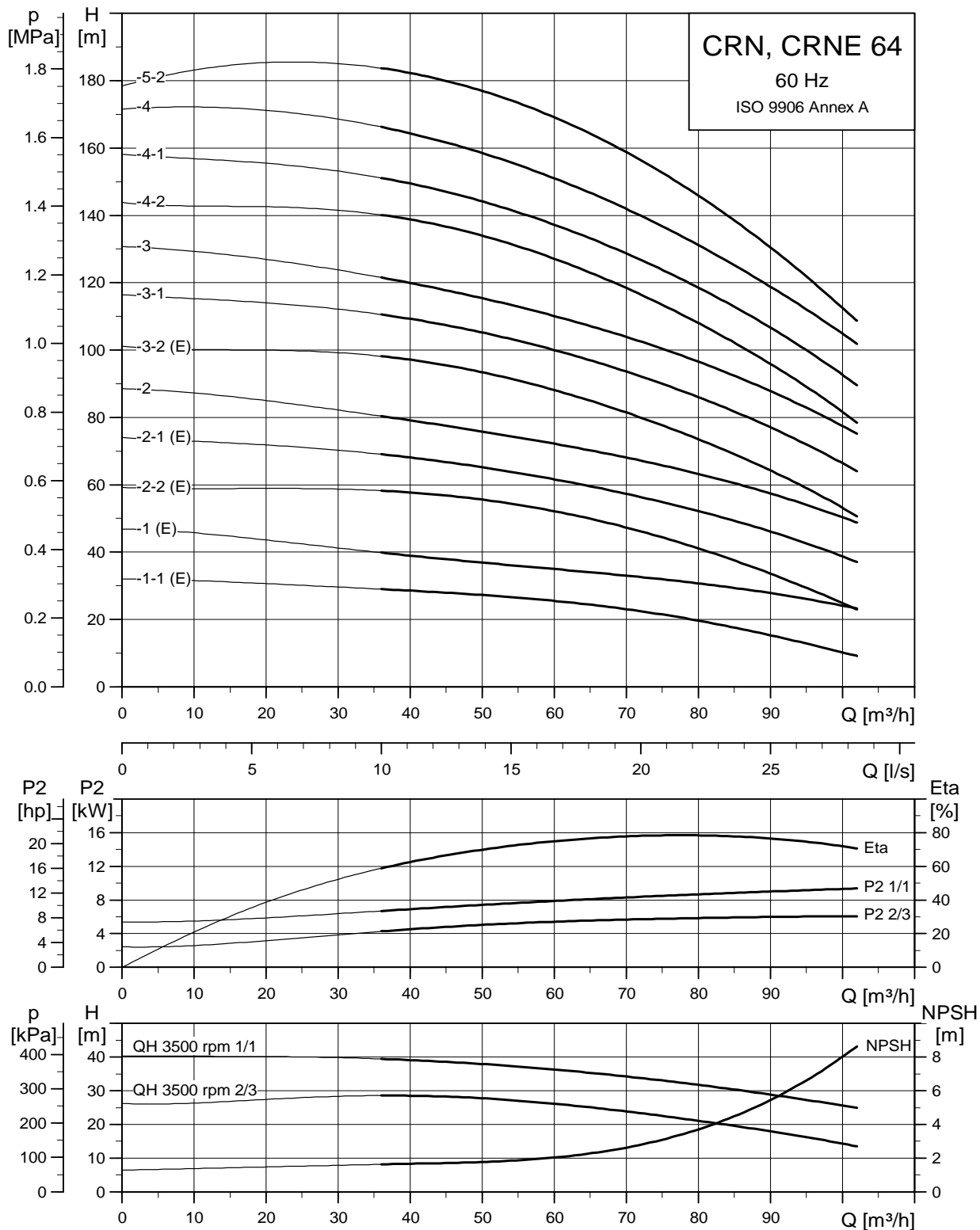


TM01 1763.5197

Dimensions and weights

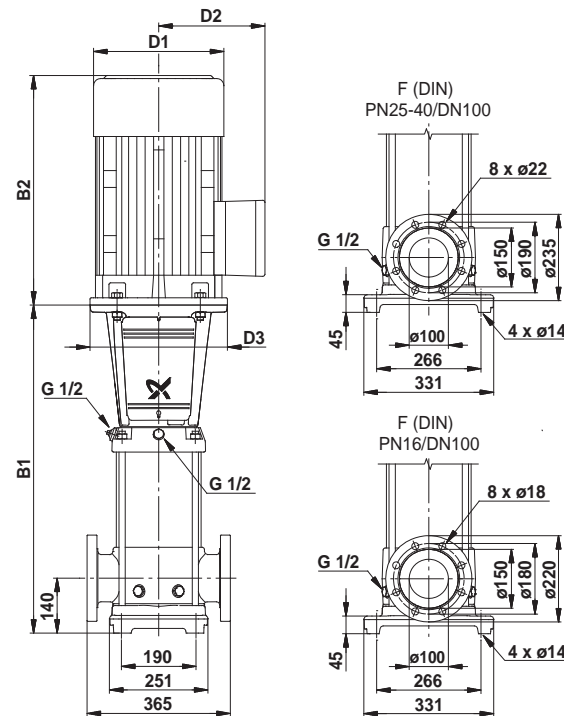
Pump type	Motor P ₂ [kW]	CR						CRE					
		Dimension [mm]			Net weight [kg]			Dimension [mm]			Net weight [kg]		
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 64-1-1	7.5	561	940	260	159	300	104	561	940	260	213	300	112
CR(E) 64-1	11	671	1142	314	204	350	159	671	1142	314	308	350	188
CR(E) 64-2-2	15	754	1225	314	204	350	175	754	1225	314	308	350	207
CR(E) 64-2-1	18.5	754	1269	314	204	350	188	754	1269	314	308	350	219
CR 64-2	22	754	1295	314	204	350	202	-	-	-	-	-	-
CR(E) 64-3-2	22	836	1377	314	204	350	207	836	1377	314	308	350	237
CR 64-3-1	30	836	1446	402	300	400	309	-	-	-	-	-	-
CR 64-3	30	836	1446	402	300	400	309	-	-	-	-	-	-
CR 64-4-2	37	919	1586	402	300	400	345	-	-	-	-	-	-
CR 64-4-1	37	919	1586	402	300	400	345	-	-	-	-	-	-
CR 64-4	45	919	1628	442	325	450	424	-	-	-	-	-	-
CR 64-5-2	45	1001	1710	442	325	450	429	-	-	-	-	-	-

CRN, CRNE 64



TM02 7327 3605

Dimensional sketch

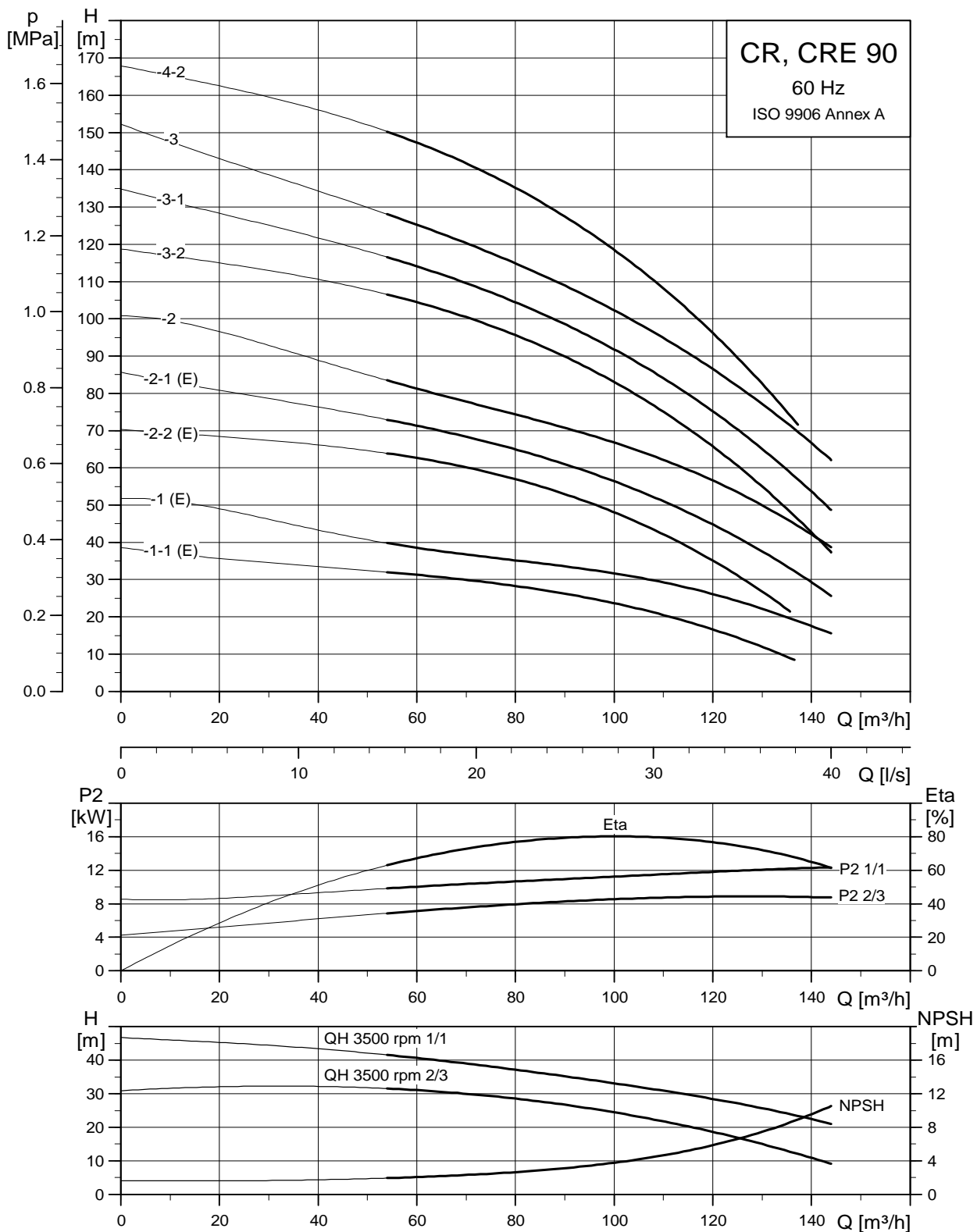


TM01 1754-0904

Dimensions and weights

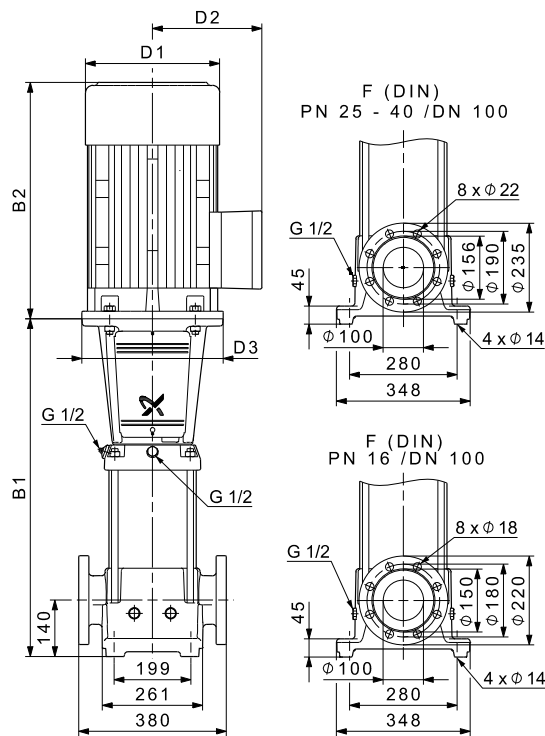
Pump type	Motor P ₂ [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 64-1-1	7.5	561	940	260	159	300	104	561	940	260	213	300	112
CRN(E) 64-1	11	671	1142	314	204	350	159	671	1142	314	308	350	188
CRN(E) 64-2-2	15	754	1225	314	204	350	175	754	1225	314	308	350	207
CRN(E) 64-2-1	18.5	754	1269	314	204	350	188	754	1269	314	308	350	219
CRN 64-2	22	754	1295	314	204	350	202	-	-	-	-	-	-
CRN(E) 64-3-2	22	836	1377	314	204	350	206	836	1377	314	308	350	236
CRN 64-3-1	30	836	1446	402	300	400	309	-	-	-	-	-	-
CRN 64-3	30	836	1446	402	300	400	309	-	-	-	-	-	-
CRN 64-4-2	37	919	1586	402	300	400	346	-	-	-	-	-	-
CRN 64-4-1	37	919	1586	402	300	400	346	-	-	-	-	-	-
CRN 64-4	45	919	1628	442	325	450	425	-	-	-	-	-	-
CRN 64-5-2	45	1001	1710	442	325	450	430	-	-	-	-	-	-

CR, CRE 90



TM02 7328 3605

Dimensional sketch

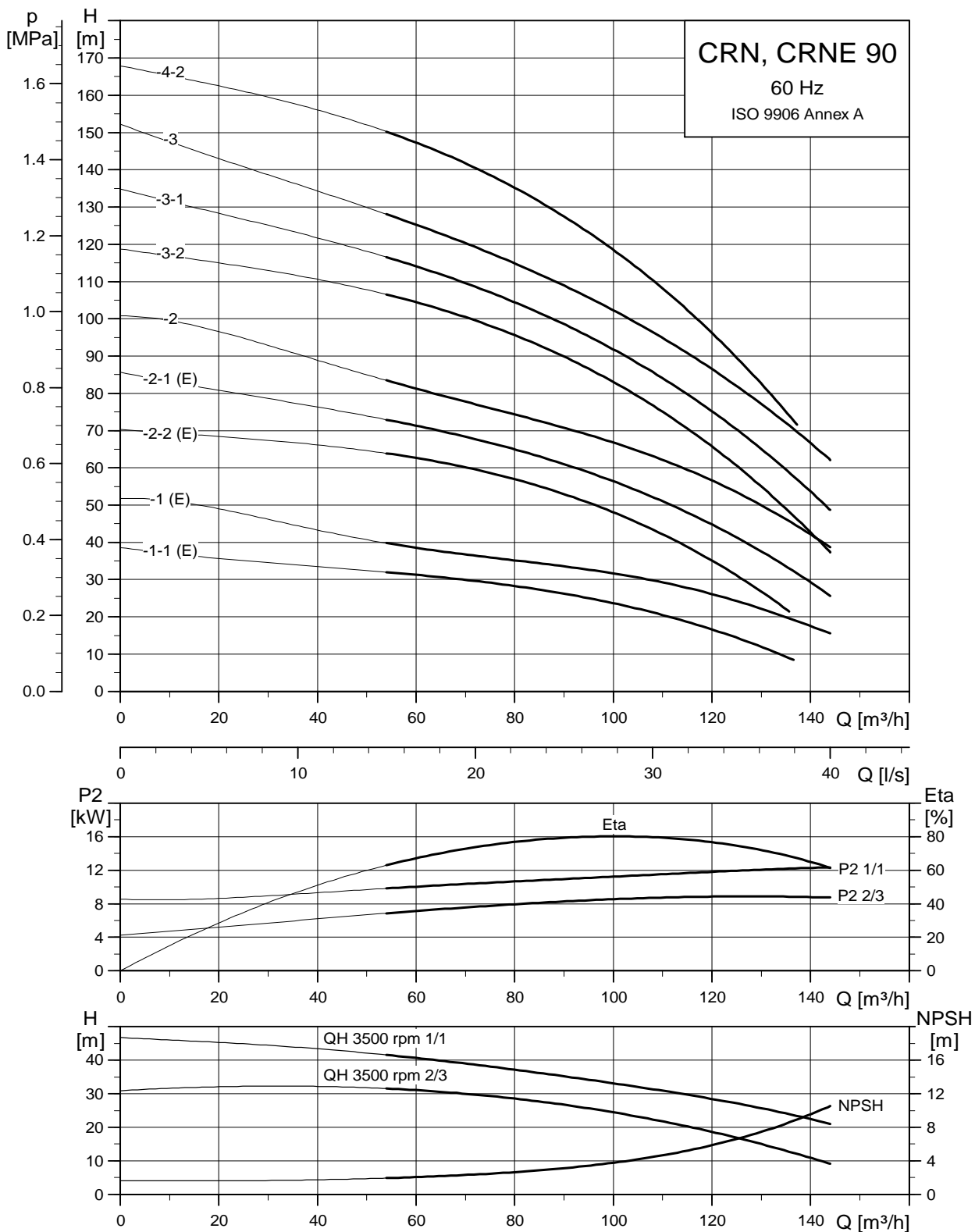


TM01 1755 4809

Dimensions and weights

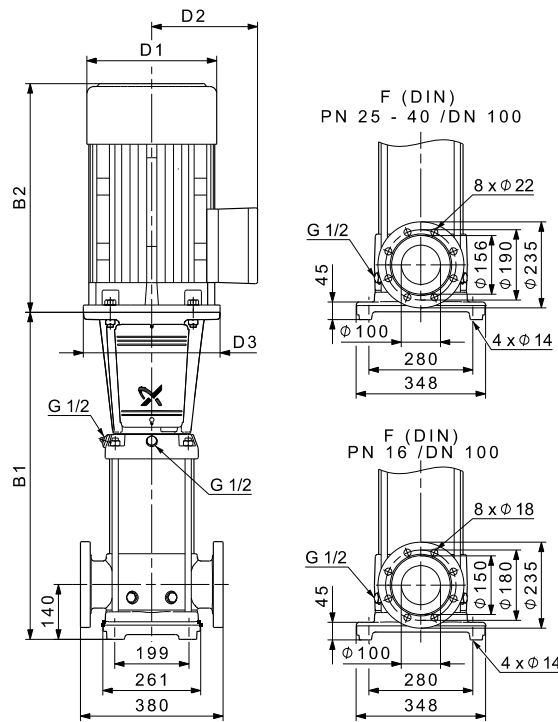
Pump type	Motor P ₂ [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 90-1-1	11	681	1152	314	204	350	164	681	1152	314	308	350	193
CR(E) 90-1	15	681	1152	314	204	350	176	681	1152	314	308	350	208
CR(E) 90-2-2	18.5	773	1288	314	204	350	194	773	1288	314	308	350	225
CR(E) 90-2-1	22	773	1314	314	204	350	207	773	1314	314	308	350	237
CR 90-2	30	773	1383	402	300	400	309	-	-	-	-	-	-
CR 90-3-2	37	865	1532	402	300	400	345	-	-	-	-	-	-
CR 90-3-1	37	865	1532	402	300	400	345	-	-	-	-	-	-
CR 90-3	45	865	1574	442	325	450	424	-	-	-	-	-	-
CR 90-4-2	45	957	1666	442	325	450	431	-	-	-	-	-	-

CRN, CRNE 90



TM02 7329 3605

Dimensional sketch

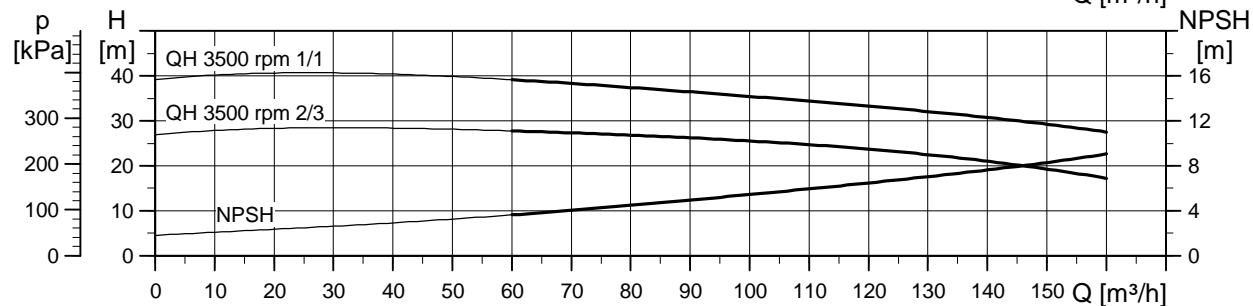
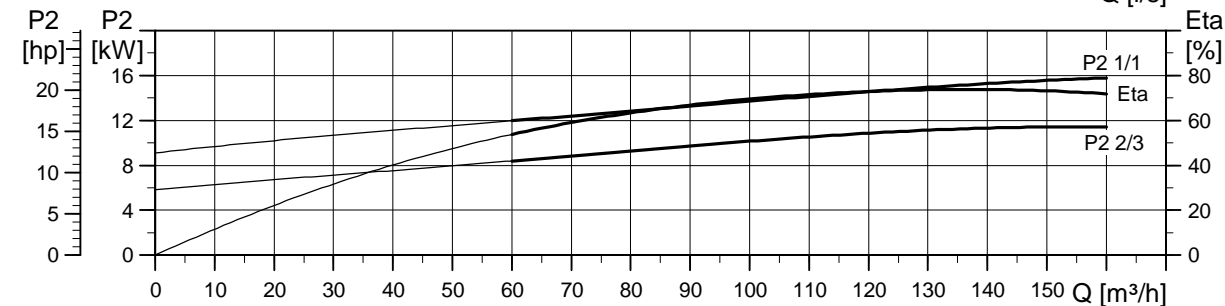
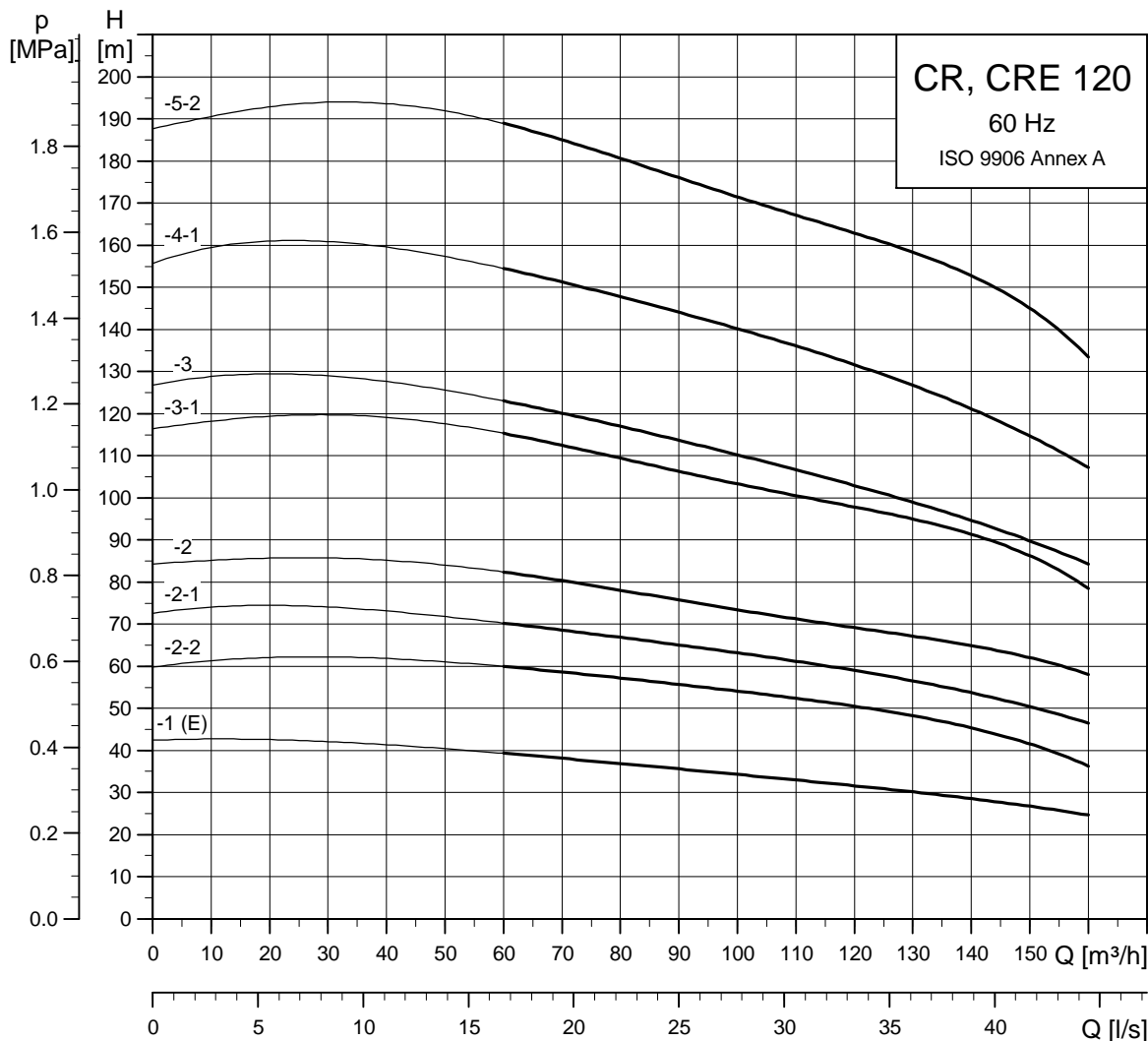


TM02 1570 4809

Dimensions and weights

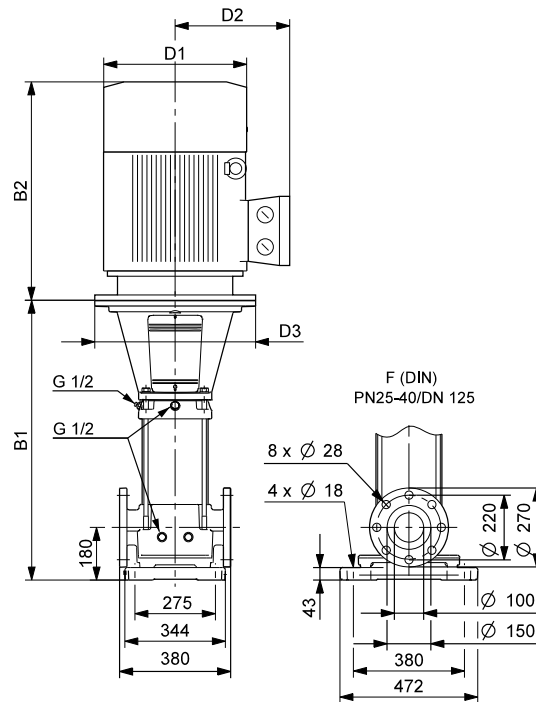
Pump type	Motor P ₂ [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 90-1-1	11	681	1152	314	204	350	165	681	1152	314	308	350	194
CRN(E) 90-1	15	681	1152	314	204	350	177	681	1152	314	308	350	209
CRN(E) 90-2-2	18.5	773	1288	314	204	350	195	773	1288	314	308	350	226
CRN(E) 90-2-1	22	773	1314	314	204	350	209	773	1314	314	308	350	241
CRN 90-2	30	773	1383	402	300	400	311	-	-	-	-	-	-
CRN 90-3-2	37	865	1532	402	300	400	346	-	-	-	-	-	-
CRN 90-3-1	37	865	1532	402	300	400	349	-	-	-	-	-	-
CRN 90-3	45	865	1574	442	325	450	426	-	-	-	-	-	-
CRN 90-4-2	45	957	1666	442	325	450	433	-	-	-	-	-	-

CR, CRE 120



TM03 8748 4408

Dimensional sketch

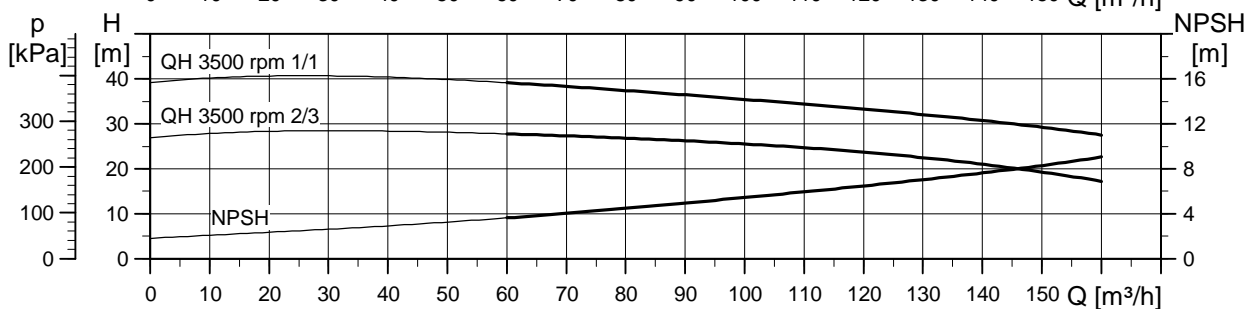
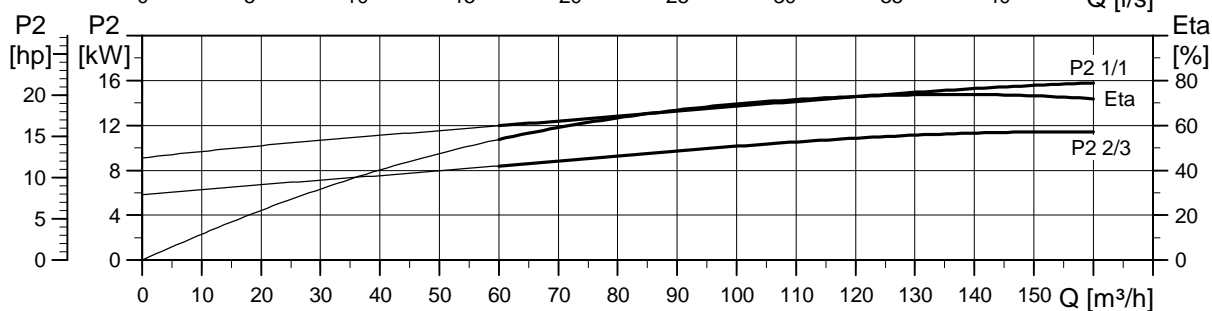
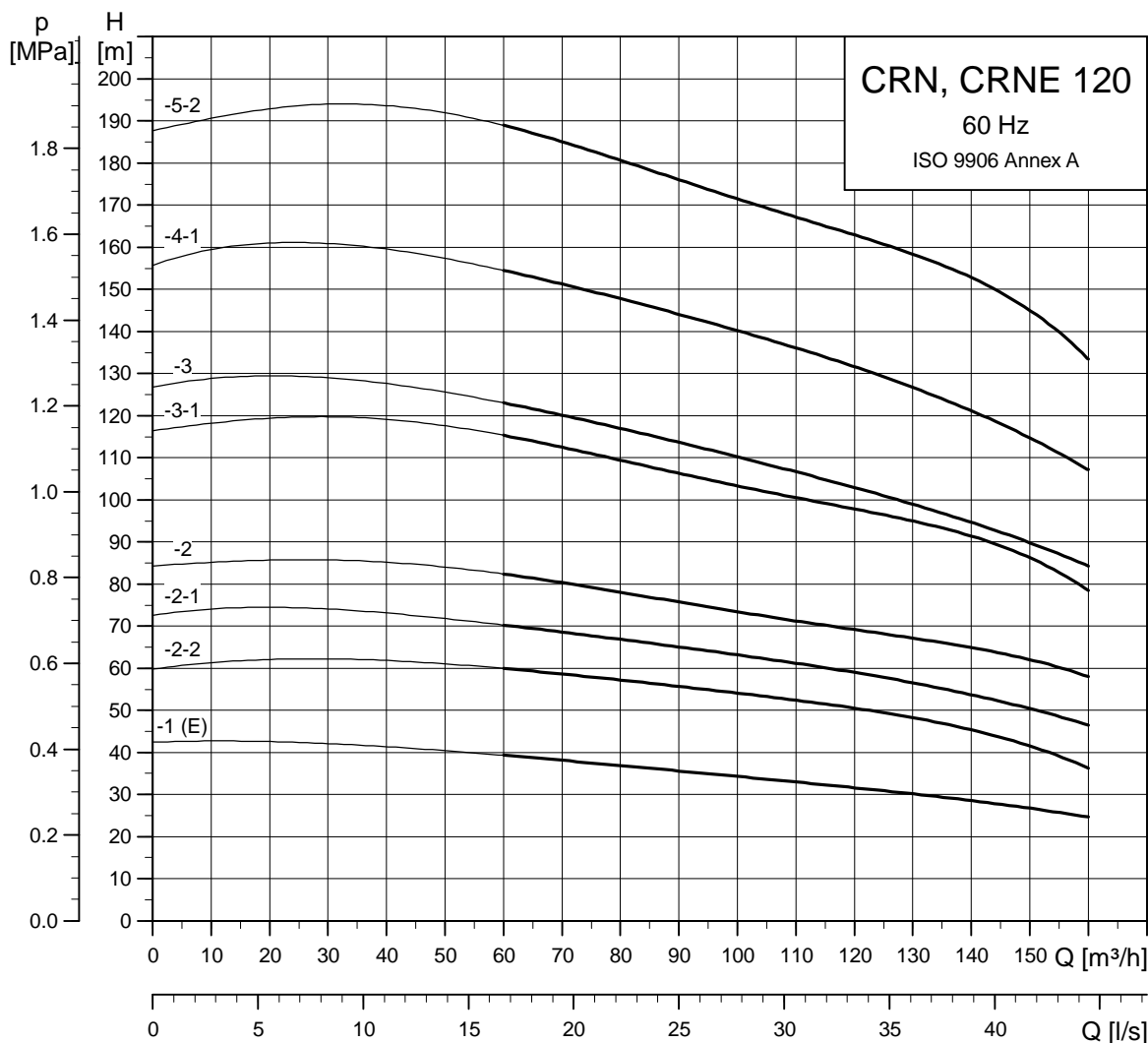


TM03 9704 2108

Dimensions and weights

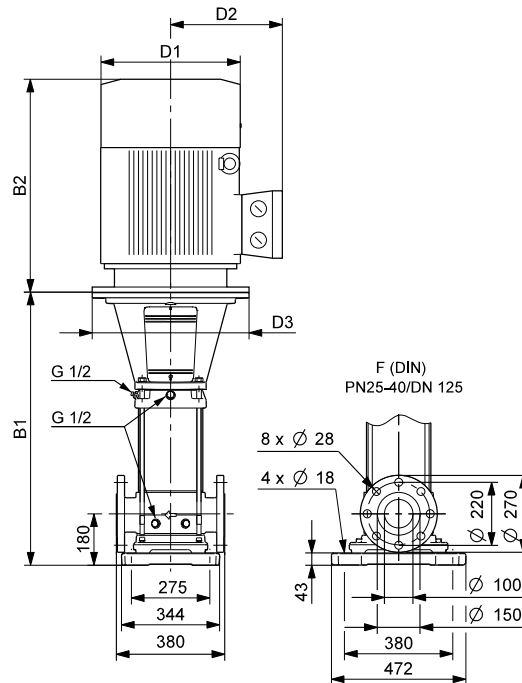
Pump type	Motor P ₂ [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 120-1	18.5	834	1349	314	204	350	217	834	1349	314	308	350	248
CR 120-2-2	30	990	1600	402	300	400	343	-	-	-	-	-	-
CR 120-2-1	30	990	1600	402	300	400	343	-	-	-	-	-	-
CR 120-2	37	990	1657	402	300	400	373	-	-	-	-	-	-
CR 120-3-1	45	1145	1854	442	325	450	462	-	-	-	-	-	-
CR 120-3	55	1175	1922	495	392	550	597	-	-	-	-	-	-
CR 120-4-1	75	1331	2151	555	432	550	742	-	-	-	-	-	-
CR 120-5-2	75	1486	2306	555	432	550	752	-	-	-	-	-	-

CRN, CRNE 120



TM03 8749 4408

Dimensional sketch

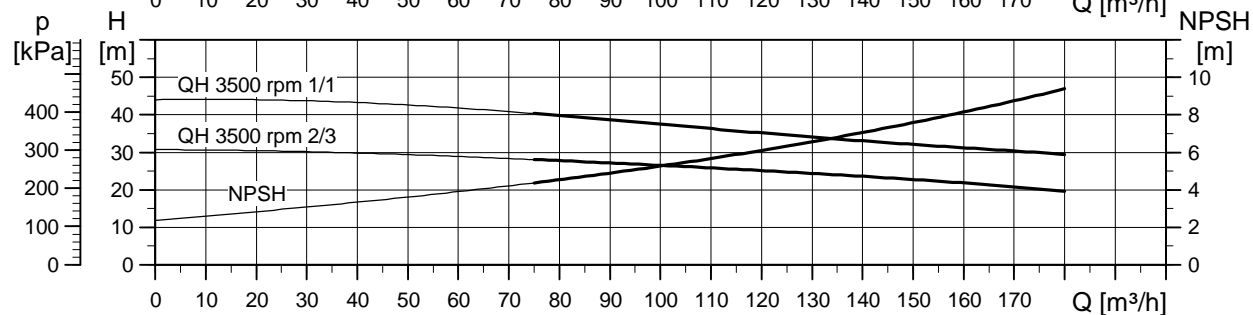
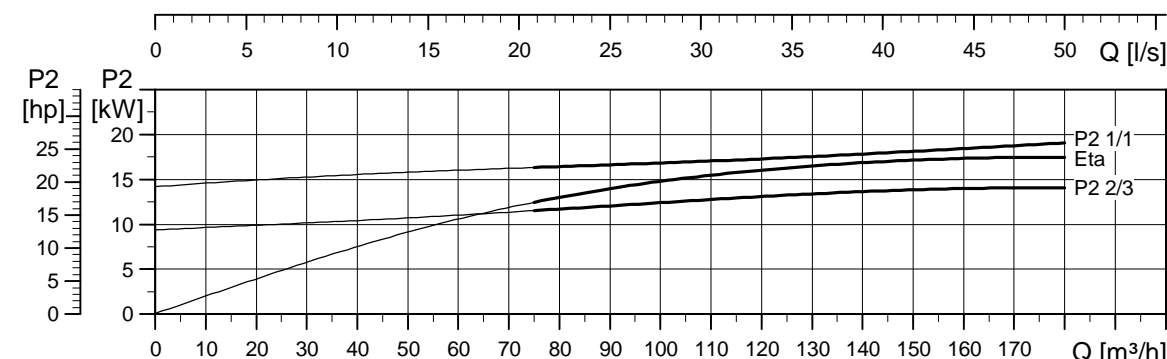
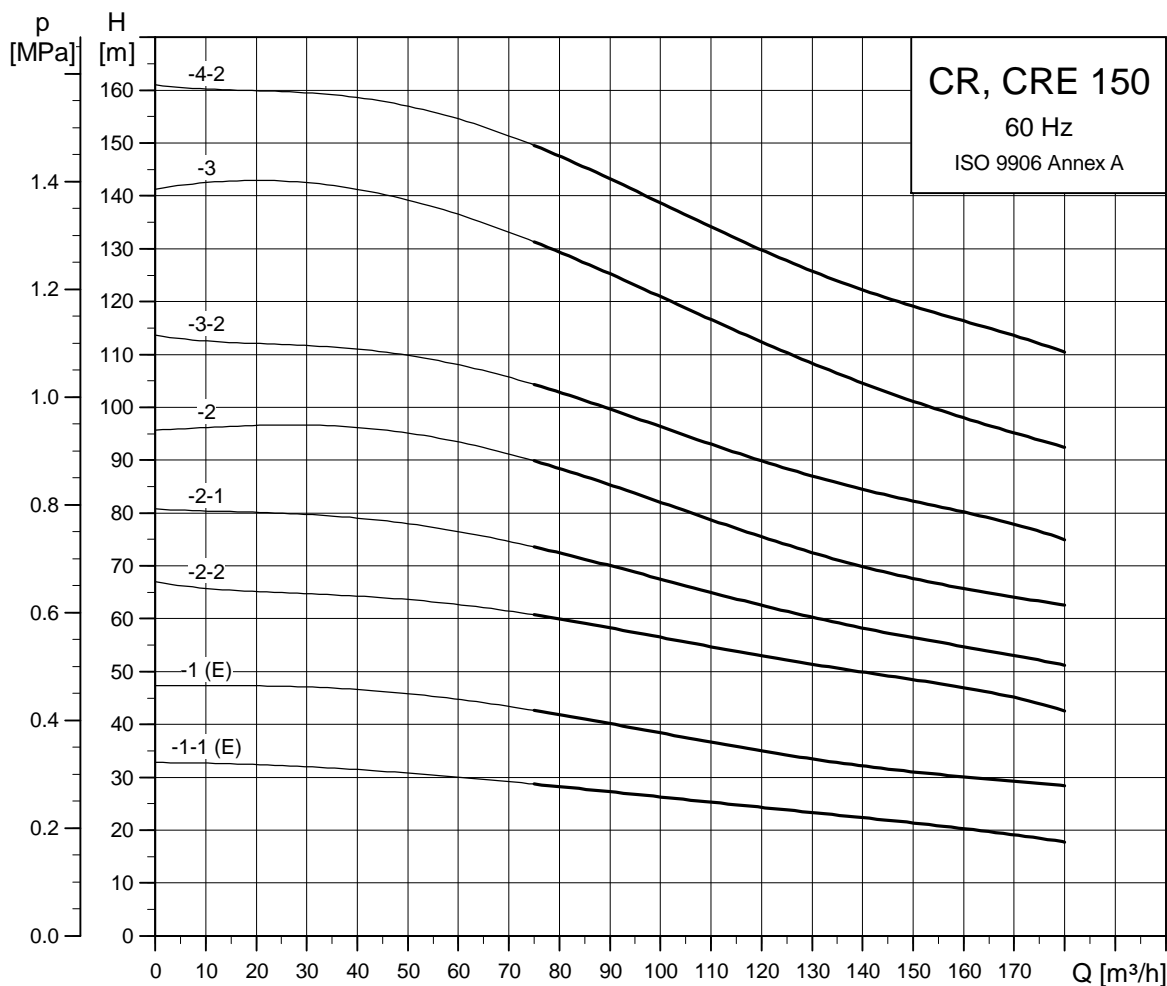


TM03 9705 2108

Dimensions and weights

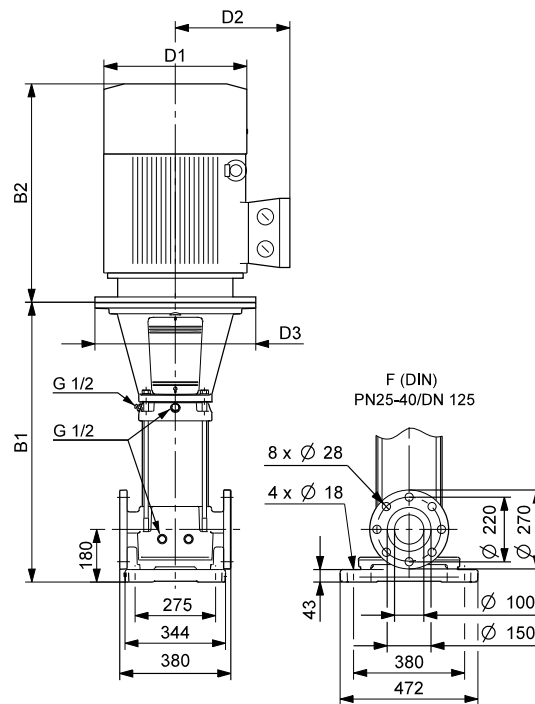
Pump type	Motor P ₂ [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 120-1	18.5	834	1349	314	204	350	221	834	1349	314	308	350	252
CRN 120-2-2	30	990	1600	402	300	400	346	-	-	-	-	-	-
CRN 120-2-1	30	990	1600	402	300	400	346	-	-	-	-	-	-
CRN 120-2	37	990	1657	402	300	400	376	-	-	-	-	-	-
CRN 120-3-1	45	1145	1854	442	325	450	465	-	-	-	-	-	-
CRN 120-3	55	1175	1922	495	392	550	600	-	-	-	-	-	-
CRN 120-4-1	75	1331	2151	555	432	550	745	-	-	-	-	-	-
CRN 120-5-2	75	1486	2306	555	432	550	755	-	-	-	-	-	-

CR, CRE 150



TM03 8750 4408

Dimensional sketch

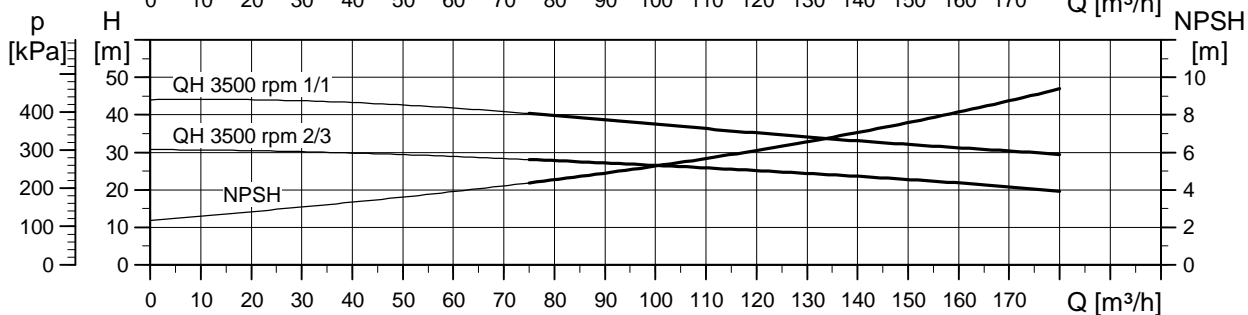
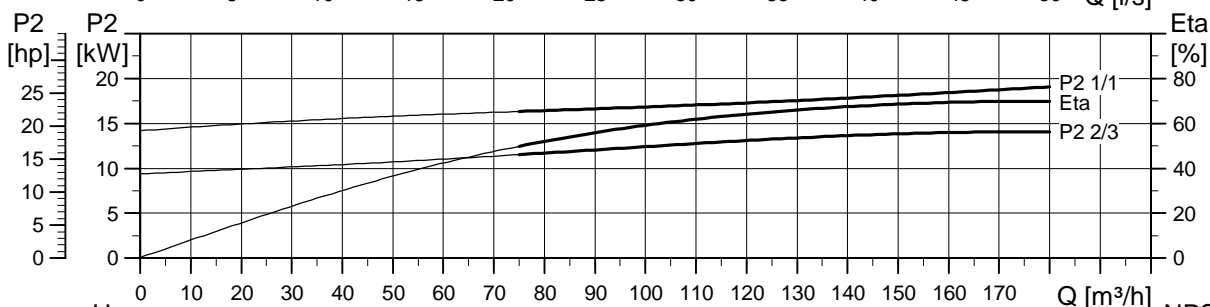
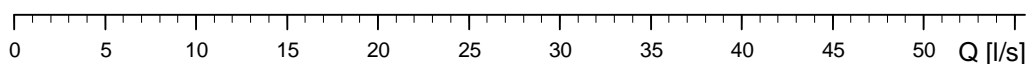
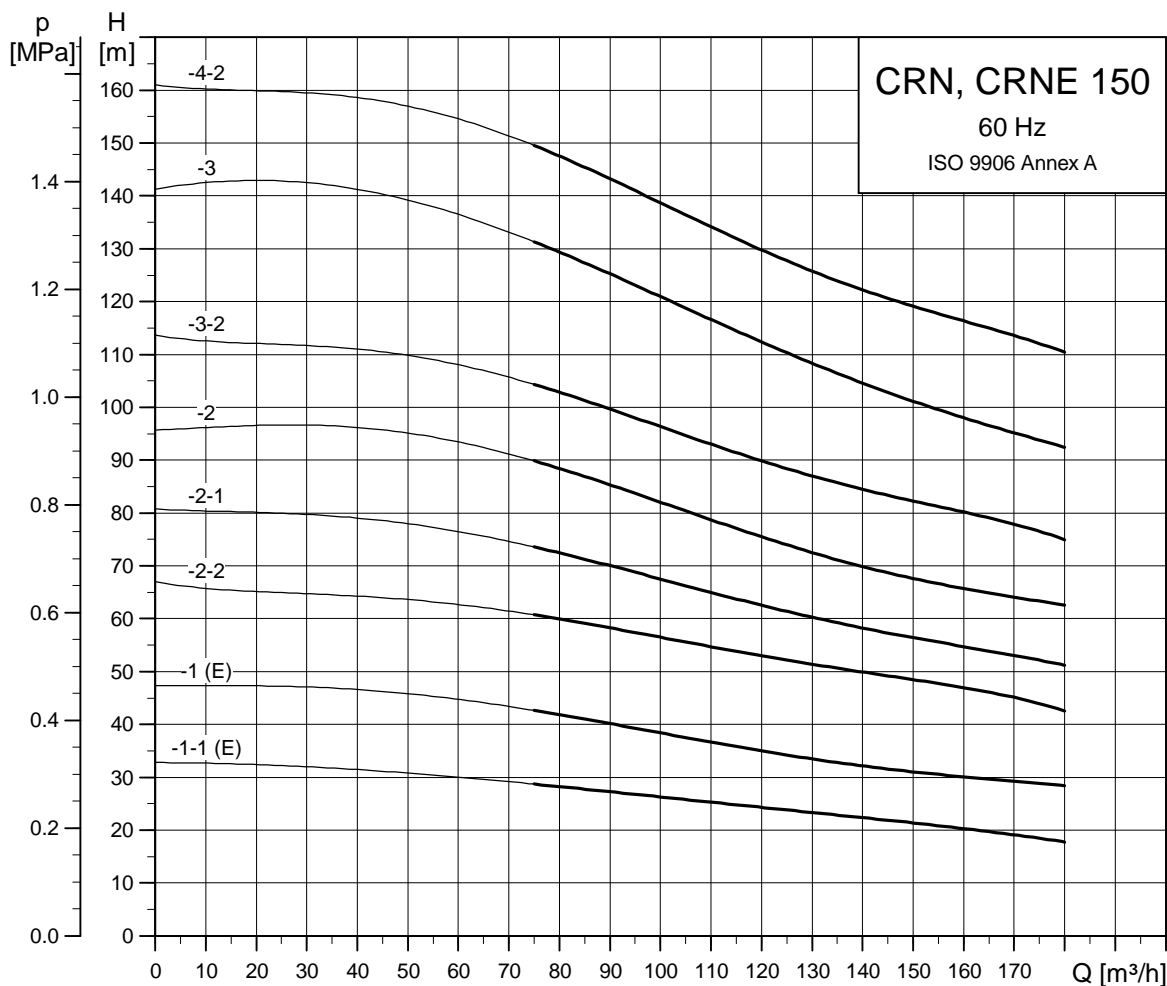


TM039704 2108

Dimensions and weights

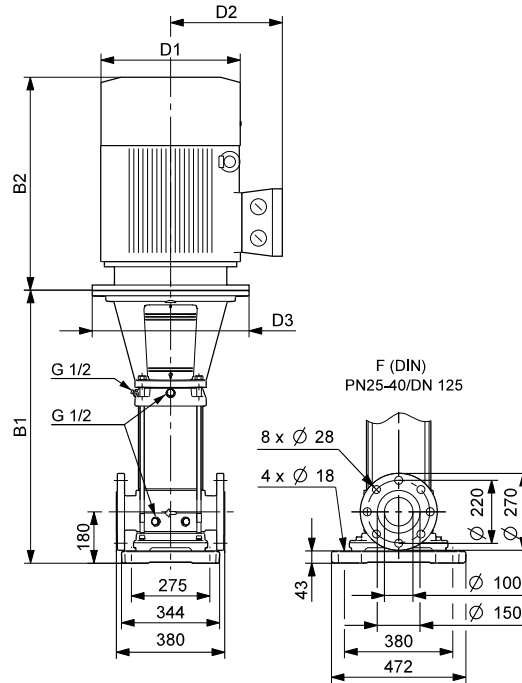
Pump type	Motor P ₂ [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 150-1-1	18.5	834	1349	314	204	350	217	834	1349	314	308	350	248
CR(E) 150-1	22	834	1375	314	204	350	231	834	1375	314	308	350	261
CR 150-2-2	30	990	1600	402	300	400	343	-	-	-	-	-	-
CR 150-2-1	37	990	1657	402	300	400	373	-	-	-	-	-	-
CR 150-2	45	990	1699	442	325	450	452	-	-	-	-	-	-
CR 150-3-2	55	1175	1922	495	392	550	598	-	-	-	-	-	-
CR 150-3	75	1175	1995	555	432	550	732	-	-	-	-	-	-
CR 150-4-2	75	1331	2151	555	432	550	742	-	-	-	-	-	-

CRN, CRNE 150



TM03 8751 4408

Dimensional sketch




TM03 9705 2108


Dimensions and weights

Pump type	Motor P ₂ [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 150-1-1	18.5	834	1349	314	204	350	221	834	1349	314	308	350	252
CRN(E) 150-1	22	834	1375	314	204	350	235	834	1375	314	308	350	265
CRN 150-2-2	30	990	1600	402	300	400	346	-	-	-	-	-	-
CRN 150-2-1	37	990	1657	402	300	400	376	-	-	-	-	-	-
CRN 150-2	45	990	1699	442	325	450	456	-	-	-	-	-	-
CRN 150-3-2	55	1175	1922	495	392	550	601	-	-	-	-	-	-
CRN 150-3	75	1175	1995	555	432	550	735	-	-	-	-	-	-
CRN 150-4-2	75	1331	2151	555	432	550	745	-	-	-	-	-	-

Standard motors for CR, CRI, CRN - 60 Hz

Motor P ₂ [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	I _{start}	Speed [rpm]	
0.37	71	220-255Δ/380-440Y	1.5-1.4/0.9-0.8	0.85-0.76	79.0-80.0	8.3-9.4/4.8-4.9	3410-3470	<p>MG</p>  <p>TM03 1711 2805</p>
0.55	71	220-255Δ/380-440Y	2.2-2.1/1.3-1.2	0.85-0.76	81.5-83.0	10.8-12.3/6.3-7.2	3390-3460	
0.75	80	220-255Δ/380-440Y	2.9-2.7/1.7-1.6	0.86-0.78	83.0-85.0	17.1-20.0/9.9-11.5	3400-3470	
1.1	80	220-255Δ/380-440Y	4.2-3.9/2.5-2.2	0.88-0.82	82.0-84.5	25.6-30.4/14.9-17.5	3390-3460	
1.5	90	220-277Δ/380-480Y	5.4-4.7/3.1-2.7	0.90-0.81	84.0-85.0	41.7-49.4/24.2-28.4	3470-3530	
2.2	90	380-480Δ	4.5-3.7	0.91-0.85	84.0-87.0	34.7-40.7	3470-3530	
3.0	100	380-480Δ	6.2-5.7	0.89-0.84	84.0-87.5	49.6-62.2	3430-3530	
4.0	112	380-480Δ	7.8-6.8	0.90-0.82	88.0-89.5	79.6-102	3510-3540	
5.5	132	380-480Δ	10.8-9.5	0.90-0.82	89.0-89.0	108-138	3510-3540	
7.5	132	380-480Δ/660-690Y	14.4-12.0/8.3-8.1	0.91-0.85	90.0-91.5	97.9-126/56.4-85.1	3480-3510	
11	160	380-480Δ/660-690Y	21.2-17.2/12.2-11.6	0.91-0.87	90.0-92.5	123-153/70.8-103	3500-3550	
15	160	380-480Δ/660-690Y	29.0-22.8/16.6-15.8	0.92-0.89	90.0-92.5	168-203/96.3-141	3500-3550	
18.5	160	380-480Δ/660-690Y	35.0-28.0/20.2-19.2	0.92-0.89	90.5-93.0	214-272/123-186	3500-3550	
22	180	380-480Δ/660-690Y	42.0-33.5/24.2-22.8	0.92-0.89	90.0-92.5	273-348/157-237	3500-3550	
30	200	380-480Δ/660-690Y	55.0-45.0/31.5-30.0	0.90-0.86	92.5-93.5	358-360/252-240	3540-3565	
37	200	380-480Δ/660-690Y	67.0-54.0/38.5-37.0	0.90-0.87	93.0-94.0	442-448/254-307	3540-3565	
45	225	380-480Δ/660-690Y	81.0-65.0/46.5-44.0	0.90-0.87	94.5-95.0	543-559/312-378	3545-3570	
55	250	380-480Δ/660-690Y	97.0-79.0/56.0-53.0	0.91-0.88	94.5-95.0	621-632/358-424	3565-3580	
75	280	380-480Δ/660-690Y	134-108/77.0-73.0	0.90-0.87	95.0-95.5	871-864/501-584	3565-3580	

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

Motor P ₂ [kW]	Frame size	Phase	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	MGE
0.37	71	1	200-240	2.7 - 2.5	0.96	68.0	 <p>TM03 1712 2805</p>
0.55	71	1	200-240	3.9 - 3.6	0.96	70.0	
0.75	80	1	200-240	5.1 - 4.7	0.97	72.0	
1.1	80	1	200-240	7.4 - 6.8	0.97	73.0	
0.75*	90	3	380-480	2.1 - 1.8	0.80 - 0.70	77.0	
1.1*	90	3	380-480	2.6 - 2.3	0.88 - 0.77	78.0	
1.5	90	3	380-480	3.3 - 2.7	0.91 - 0.87	81.0	
2.2	90	3	380-480	4.6 - 3.8	0.92 - 0.90	83.0	
3.0	100	3	380-480	6.2 - 5.0	0.94 - 0.92	83.0	
4.0	112	3	380-480	8.1 - 6.6	0.94 - 0.92	85.0	
5.5	132	3	380-480	11.0 - 8.8	0.94 - 0.93	85.5	
7.5	132	3	380-480	14.8 - 11.6	0.94 - 0.95	86.0	
11	132	3	380-480	22.5 - 18.8	0.90 - 0.90	86.5	
15	160	3	380-480	30.0 - 26.0	0.91 - 0.86	87.5	
18.5	160	3	380-480	37.0 - 31 - 0	0.91 - 0.88	88.0	
22	180	3	380-480	43.0 - 35.0	0.91 - 0.90	87.5	

* Pumps are normally fitted with single-phase MGE motors. Previous dimensions tables show pumps with single-phase MGE motors

Pumped liquids

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, oils, etc.

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

The CR(E), CRI(E), CRN(E) pump types are suitable for the following liquids:

CR(E), CRI(E)

CR(E), CRI(E) pumps are suitable for non-corrosive liquids.

Use CR(E), CRI(E) pumps for liquid transfer, circulation and pressure boosting of cold or hot clean water.

CRN(E)

CRN(E) pumps are suitable for industrial liquids.

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

CRT(E)

CRT(E) pumps are suitable for these liquids:

- saline liquids
- hypochlorites
- acids.

For saline or chloride-containing liquids such as sea water or oxidizing agents such as hypochlorites, Grundfos offers CRT(E) pumps made of titanium. See separate data booklet on CRT(E), accessible in WebCAPS.

List of pumped liquids

A number of typical liquids are listed below.

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 working conditions.

However, use the list with some caution. 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	Density and/or viscosity differ from that of water. Allow for this when calculating motor output and pump performance.
F	Pump selection depends on many factors. Contact Grundfos.
H	Risk of chrySTALLIZATION/precipitation in shaft seal.
1	The pumped liquid highly inflammable.
2	The pumped liquid is combustible.
3	Insoluble in water.
4	Low self-ignition point.

Pumped liquid	Note	Liquid concentration, liquid temperature	CR(E), CRI(E)	CRN(E)
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	-
Calcareous water	F	+120 °C - +180 °C	-	-
Calcium acetate (as coolant with inhibitor) Ca (CH ₃ COO) ₂	-	<+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 (demineralized water)	-	<+120 °C	-	HQQE
Condensate	-	<+120 °C	HQQE	-
Copper sulfate, CuSO ₄	E	10 %, +50 °C	-	HQQE

Pumped liquids

CR, CRI, CRN, CRE, CRIE, CRNE

Pumped liquid	Note	Liquid concentration, liquid temperature	CR(E), CRI(E)	CRN(E)
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 %, +50 °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 sulfate, Na ₂ SO ₄	E, H	10 %, +60 °C	-	HQQE
Softened water	-	<+120 °C	-	HQQE
Soya oil	D, E, 3	100 %, +80 °C	HQQV	-
Sulfuric acid, H ₂ SO ₄	F	1 %, +20 °C	-	HQQV
Sulfurous acid, H ₂ SO ₃	-	1 %, +20 °C	-	HQQE
Unsalted swimming pool water	-	Approx. 2 ppm free chlorine (Cl ₂)	HQQE	-

Pipework connection

For pipework connection, various sets of counter flanges and couplings are available.

Adapter kit

DN 150 flanges are available for CR, CRN 120 and 150 pumps. To use DN 150 flanges, two adapter kit must be ordered per pump.

Adapter kit	Pump type	Pipe connection	Number of flange kits needed	Product number
	CR 120 CR 150	150 mm, nominal	2	96638169
	CRN 120 CRN 150	150 mm, nominal	2	96638180

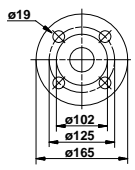
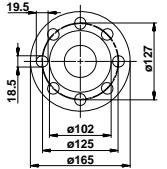
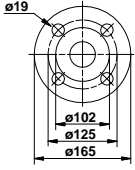
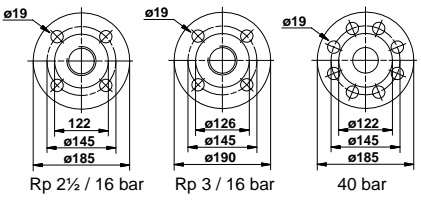
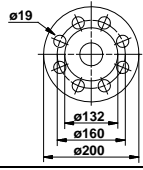
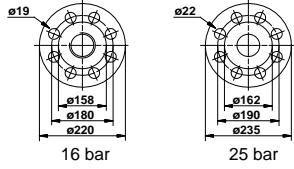
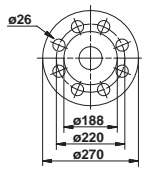
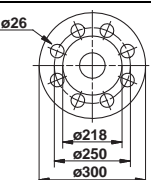
Counter flanges for CR(E)

A set consists of one counter flange, one gasket, bolts and nuts.

Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number
	CR 1s CR(E) 1 CR(E) 3 CR(E) 5	Threaded	16 bar, EN 1092-2	Rp 1	409901
		For welding	25 bar, EN 1092-2	25 mm, nominal	409902
	CR 1s CR(E) 1 CR(E) 3 CR(E) 5	Threaded	16 bar, EN 1092-2	Rp 1¼	419901
		For welding	25 bar, EN 1092-2	32 mm, nominal	419902
	CR(E) 10	Threaded	16 bar, EN 1092-2	Rp 1½	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

Accessories

CR, CRI, CRN, CRE, CRIE, CRNE

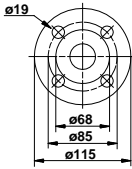
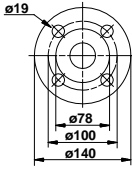
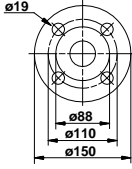
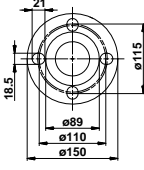
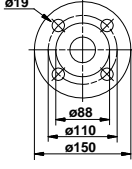
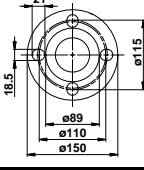
Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number	
	TM03 0402 3705	Threaded	16 bar, EN 1092-2	Rp 2	339903	
		Threaded	16 bar, special flange	RP 2½	339904	
	TM02 7203 2803	CR(E) 15 CR(E) 20	Threaded	16 bar, special flange	RP 2½ ★	96509578
	TM03 0402 3705	For welding	25 bar, EN 1092-2	50 mm, nominal	339901	
		For welding	40 bar, special flange	65 mm, nominal	339902	
 <p>Rp 2½ / 16 bar Rp 3 / 16 bar 40 bar</p>	TM03 2116 3705	CR(E) 32	Threaded	16 bar, EN 1092-2	RP 2½	349902
			Threaded	16 bar, special flange	RP 3	349901
			For welding	16 bar, EN 1092-2	65 mm, nominal	349904
			For welding	40 bar, DIN 2635	65 mm, nominal	349905
			For welding	16 bar, special flange	80 mm, nominal	349903
	TM03 2117 3705	CR(E) 45	Threaded	16 bar	RP 3	350540
			For welding	16 bar	80 mm, nominal	350541
			For welding	40 bar	80 mm, nominal	350542
 <p>16 bar 25 bar</p>	TM03 2118 3705	CR(E) 64 CR(E) 90	Threaded	16 bar, EN 1092-2	RP 4	369901
			For welding	16 bar, EN 1092-2	100 mm, nominal	369902
			For welding	25 bar, EN 1092-2	100 mm, nominal	369905
	TM03 8892 2707	CR(E) 120	For welding	40 bar, EN 1092-2	125 mm, nominal	96750475
	TM03 8891 2707	CR(E) 150	For welding	40 bar, EN 1092-2	150 mm, nominal	96750476

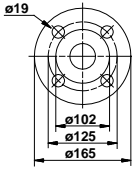
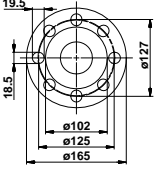
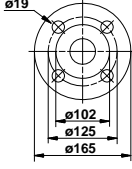
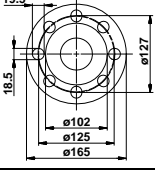
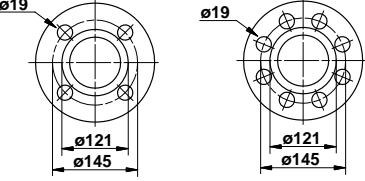
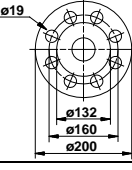
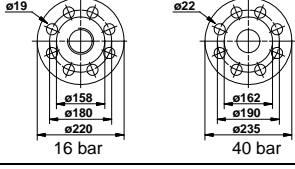
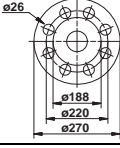
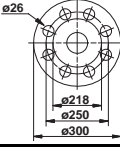
★ Flange with 20 mm higher collar. With this collar, the installation dimensions of a CR 20 will be identical to those of a CR 32.
If a CR 32 is replaced with a CR 20, the base must be raised by 15 mm.

Counter flanges for CRN(E)

Counterflanges for CRN(E) pumps are made of stainless steel according to EN 1.4401 (AISI 316).

A set consists of one counter flange, one gasket, bolts and nuts.

Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number	
	TM03 2115 3705	CRI(E), CRN(E) 1s, 1, 3 and 5	Threaded	16 bar, EN 1092-2	Rp 1	405284
			For welding	25 bar, EN 1092-2	25 mm, nominal	405285
	TM03 0400 3705	CRI(E), CRN(E) 1s, 1, 3 and 5	Threaded	16 bar, EN 1092-2	Rp 1½	415304
			For welding	25 bar, EN 1092-2	32 mm, nominal	415305
	TM03 0401 3705		Threaded	16 bar, EN 1092-2	Rp 1½	425245
	TM02 7202 2803	CRI(E) 10 CRN(E) 10	Threaded	16 bar, EN 1092-2	Rp 2	96509570
	TM03 0401 3705		For welding	25 bar, EN 1092-2	40 mm, nominal	425246
	TM02 7202 2803		For welding	25 bar, special flange	50 mm, nominal	96509571

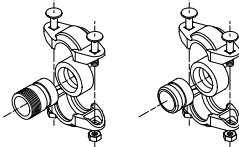
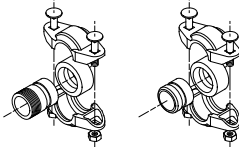
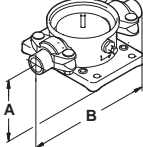
Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number	
	TM03 0402 3705		16 bar, EN 1092-2	Rp 2	335254	
	TM02 7203 2803		16 bar, special flange	Rp 2½	96509575	
			16 bar, special flange	Rp 2½ ★	96509579	
	TM03 0402 3705		25 bar, EN 1092-2	50 mm, nominal	335255	
	TM00 7203 2803		25 bar, special flange	65 mm, nominal	96509573	
	TM03 2119 3705		16 bar	Rp 2½	349910	
			25 bar/40 bar	16 bar, Special flange	Rp 3	349911
				16 bar	65 mm, nominal	349906
				40 bar	65 mm, nominal	349908
				16 bar, Special flange	80 mm, nominal	349907
				25 bar, Special flange	80 mm, nominal	349909
	TM03 2117 3705		16 bar	Rp 3	350543	
			16 bar	80 mm, nominal	350544	
			40 bar	80 mm, nominal	350545	
	TM03 2118 3705		16 bar	Rp 4	369904	
			40 bar	100 mm, nominal	369903	
			40 bar	100 mm, nominal	369906	
	TM03 8892 2707		40 bar, EN 1092-2	125 mm, nominal	96750477	
	TM03 8891 2707		40 bar, EN 1092-2	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 with a CR 20, the base must be raised by 15 mm.

PJE couplings for CRN(E)

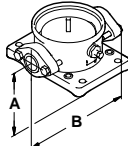
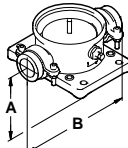
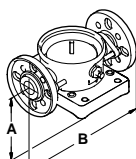
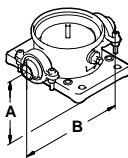
Materials in contact with the pumped liquid are made of stainless steel EN 1.4401 (AISI 316) and rubber.

A PJE coupling 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	PN	A	B	Pipework connection	Rubber parts	Number of coupling sets needed	Product number	
	CRI(E) CRN(E) 1, 3, 5	Threaded	80 bar	50	320	R 1½	EPDM	2	419911	
								FKM	2	419905
	CRI(E) CRN(E) 1, 3, 5	For welding	80 bar	50	280	DN 32	EPDM	2	419912	
								FKM	2	419904
	CRI(E) CRN(E) 10, 15, 20	Threaded	70 bar	80	377	R 2	EPDM	2	339911	
								FKM	2	339918
		For welding	70 bar	80	371	DN 50		EPDM	2	339910
								FKM	2	339917

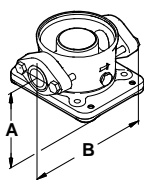
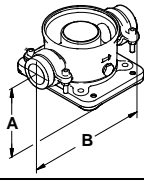
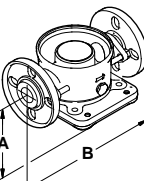
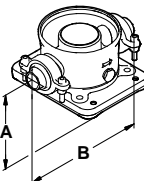
FlexiClamp base connections

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

Base connection	Pump type	Connection	Pipework connection	PN	A	B	Rubber parts	Number of coupling sets needed	Product number
	CRI(E) CRN(E) 1, 3, 5	Oval (cast iron)	Rp 1	16	50	210	Klingersil	1	96449748
			Rp 1½				Klingersil	1	96449749
		Oval (stainless steel)	Rp 1				Klingersil	2	96449746
			Rp 1½				Klingersil	2	96449747
	CRI(E) CRN(E) 1, 3, 5	Union	G 2	25	50	228	EPDM	2	96449743
							FKM	2	96449744
	CRI(E) CRN(E) 1, 3, 5	DIN (stainless steel)	DN 25	16	75	250	EPDM	2	96449745
			DN 32				FKM	2	96449900
	CRI(E) CRN(E) 1, 3, 5	Clamp, threaded pipe stub	-	25	50	208	EPDM	2	405280
							FKM	2	405281
							EPDM	2	415296
							FKM	2	415297
							EPDM	2	405291
							FKM	2	405292
							EPDM	2	415311
							FKM	2	415312
							EPDM	2	405282
							FKM	2	405283
Clamp, pipe stub for welding	28.5	-	EPDM	2	415300				
	37.2	-	FKM	2	415301				

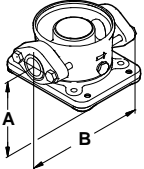
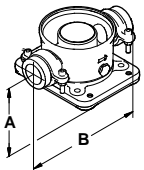
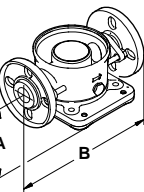
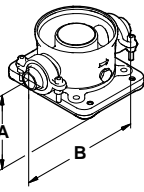
Accessories

CR, CRI, CRN, CRE, CRIE, CRNE

Base connection	Pump type	Connection	Pipework connection	PN	A	B	Rubber parts	Number of coupling sets needed	Product number	
	CRI(E) 10 CRN(E) 10	Oval (cast iron)	Rp 1¼	16	80	260	Klingersil	2	96498775	
			Rp 1½				Klingersil	2	96498727	
			Rp 2				Klingersil	2	96498836	
		Oval (stainless steel)	Rp 1¼				Klingersil	2	96498776	
			Rp 1½				Klingersil	2	96498728	
			Rp 2				Klingersil	2	96498835	
	CRI(E) 10 CRN(E) 10	Union	G 2¾	25	80	288	EPDM	2	96500275	
							FKM	2	96500276	
	CRI(E) 10 CRN(E) 10	FGJ (cast iron)	DN 40	16	80	316	EPDM	2	96498840	
							FKM	2	96500119	
							EPDM	2	96500263	
		FGJ (stainless steel)					FKM	2	96500264	
							FGJ (cast iron)	EPDM	2	96500265
								FKM	2	96500266
FGJ (stainless steel)	EPDM	2	96500267							
	FKM	2	96500269							
	CRI(E) 10 CRN(E) 10	Clamp, threaded pipe stub	Rp 2	25	80	346	EPDM	2	425238	
							FKM	2	425239	
							-	EPDM	2	335241
								FKM	2	335242
							-	EPDM	2	96508600
								FKM	2	96508601
							Clamp, pipe stub for welding	EPDM	2	425242
								FKM	2	425243
								EPDM	2	335251
								FKM	2	335252

Accessories

CR, CRI, CRN, CRE, CRIE, CRNE

Base connection	Pump type	Connection	Pipework connection	PN	A	B	Rubber parts	Number of coupling sets needed	Product number	
	TM02 7372 3303 CRI(E) 15, 20 CRN(E) 15, 20	Oval (cast iron)	Rp 1½	10	90	260	Klingersil	2	96498775	
			Rp 1½				Klingersil	2	96498727	
			Rp 2				Klingersil	2	96498836	
		Oval (stainless steel)	Rp 1½				Klingersil	2	96498776	
			Rp 1½				Klingersil	2	96498728	
			Rp 2				Klingersil	2	96498835	
	TM02 7374 3303 CRI(E) 15, 20 CRN(E) 15, 20	Union	G 2¾	25	90	288	EPDM	2	96500275	
							FKM	2	96500276	
	TM02 7373 3303 CRI(E) 15, 20 CRN(E) 15, 20	FGJ (cast iron)	DN 40	10	90	334	EPDM	2	96498840	
							FKM	2	96500119	
		FGJ (stainless steel)	EPDM				2	96500263		
			FKM				2	96500264		
		FGJ (cast iron)	EPDM				2	96500265		
			FKM				2	96500266		
FGJ (stainless steel)	DN 50	EPDM	2	96500267						
	FKM	2	96500269							
	TM02 7375 3303 CRI(E) 15, 20 CRN(E) 15, 20	Clamp, threaded pipe stub	Rp 1½	25	90	346	EPDM	2	425238	
			FKM				2	425239		
			Rp 2				EPDM	2	335241	
							FKM	2	335242	
			Rp 2½				EPDM	2	96508600	
							FKM	2	96508601	
			48.3 (DN 40)				EPDM	2	425242	
							FKM	2	425243	
			Clamp, pipe stub for welding				60.3 (DN 50)	EPDM	2	335251
							FKM	2	335252	

Potentiometer for CRE, CRIE, CRNE

Potentiometer for setpoint setting and start/stop of the CRE, CRIE, CRNE pump.

Product	Product number
External potentiometer with cabinet for wall mounting	625468

G10-LON interface for CRE, CRIE, CRNE

The G10-LON interface is used in connection with data transmission between a Locally Operating Network (LON) and electronically controlled Grundfos pumps applying the Grundfos bus-protocol GENIbus.

Product	Product number
G10-LON interface	00605726

LiqTec for CR(E), CRI(E) and CRN(E)

A dry-running protection device, the LiqTec protects pump and process against dry running and temperatures exceeding 130 °C ±5 °C. Connected to the motor PTC sensor, LiqTec also monitors motor temperature.

LiqTec is prepared for DIN rail mounting in control cabinet.

Enclosure class: IP X0.

Remote control, R100

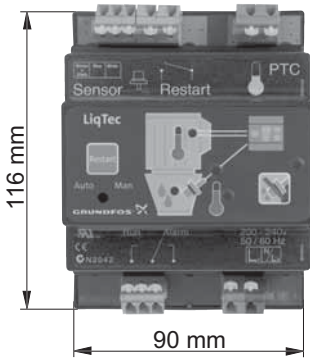
R100 is used for wireless communication with the CRE, CRIE, CRNE pump. The communication takes place by means of infrared light.

Product	Product number
R100	625333

EMC-filter for CRE, CRIE, CRNE

EMC-filter required for installation of 11-22 kW E-pumps in residential areas.

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

Dry-running protection	Pump type	Voltage [V]	LiqTec	Sensor ½"	Cable 5 m	Extension cable 15 m	Product number
	CR(E) CRI(E) CRN(E)	200-240	•	•	•	-	96556429
		80-130	•	•	•	-	96556430
		-	-	-	-	•	96443676

TM03 2108 3705

Sensors for CRE, CRIE, CRNE

Accessory	Type	Supplier	Measuring range	Product number
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	1-5 m ³ (DN 25)	ID8285
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	3-10 m ³ (DN 40)	ID8286
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	6-30 m ³ (DN 65)	ID8287
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	20-75 m ³ (DN 100)	ID8288
Temperature sensor	TTA (0) 25	Carlo Gavazzi	0 °C to +25 °C	96432591
Temperature sensor	TTA (-25) 25	Carlo Gavazzi	-25 °C to +25 °C	96430194
Temperature sensor	TTA (50) 100	Carlo Gavazzi	+50 °C to +100 °C	96432592
Temperature sensor	TTA (0) 150	Carlo Gavazzi	0 °C to +150 °C	96430195
Accessory for temperature sensor. All with ½ RG connection	Protecting tube Ø 9 x 50 mm	Carlo Gavazzi		96430201
	Protecting tube Ø 9 x 100 mm	Carlo Gavazzi		96430202
	Cutting ring bush	Carlo Gavazzi		96430203
Temperature sensor, ambient temperature	WR 52	tmg (DK: Plesner)	-50 °C to +50 °C	ID8295
Differential temperature sensor	ETSD	Honsberg	0 °C to +20 °C	96409362
Differential temperature sensor	ETSD	Honsberg	0 °C to +50 °C	96409363

Note: All sensors have 4-20 mA signal out-put.

Danfoss pressure sensor kits for CRE, CRIE, CRNE 1, 3, 5, 10, 15, 20, 32, 45, 64, 90, 120 and 150

Kit consisting of..	Pressure range	Temperature range	Product number
<ul style="list-style-type: none"> Danfoss pressure transmitter, type MBS 3000, with 2 m screened cable Connection: G ½ A (DIN 16288 - B6kt) 5 cable clips (black) Instruction manual PT (00 40 02 12) 	0-4 bar	-40 °C to +85 °C	96428014
	0-6 bar		96428015
	0-10 bar		96428016
	0-16 bar		96428017
	0-25 bar		96428018

DPI differential pressure sensor kit

The kit comprises:	Pressure range	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 bar	96611522
	0 - 1.0 bar	96611523
	0 - 1.6 bar	96611524
	0 - 2.5 bar	96611525
	0 - 4.0 bar	96611526
	0 - 6.0 bar	96611527
	0 - 10 bar	96611550

Lists of variants - on request

Although the Grundfos CR(E), CRI(E), CRN(E) product range offers a number of pumps for different applications, customers require specific pump solutions to satisfy their needs. See following documents:

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

Below please find the range of options available for customizing the CR(E) pumps to meet the customers' demands.

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

Motors

Variant	Description
ATEX motor	For operation in hazardous atmospheres, explosion-proof or dust-ignition-proof motors may be required.
Motor with anti-condensation heating unit	For operation in humid environments motors with built-in anti-condensation heating unit may be required.
Motor with thermal protection	Grundfos offers motors with built-in bimetallic thermal switches or temperature-controlled PTC sensors (thermistors) incorporated in the motor windings.
Oversized motor	Ambient temperatures above 40 °C or installation at altitudes of more than 1000 metres above sea level require the use of an oversized motor (i.e. derating).
4-pole motor	Grundfos offers standard motors fitted with 4-poles.

Shaft seals

Variant	Description
Shaft seal with FFKM O-ring material	Shaft seals with FFKM or FXM O-ring material are recommended for applications where the pumped liquid may damage the standard O-ring material.
Seal with flush, quench seal	Recommended for applications involving crystallizing, hardening or sticky liquids.
Air-cooled shaft seal system	Recommended 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. For such applications, Grundfos' unique air-cooled shaft seal system is recommended. 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	Recommended for applications involving poisonous or explosive liquids. Protects the surrounding environment and the people working in the vicinity of the pump. 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, environmental, dangerous or volatile liquids, e.g. organic compounds, solvents, etc.

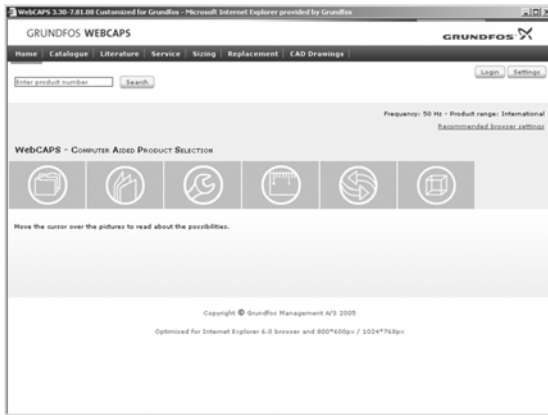
Pumps

Variant	Description
Horizontally mounted pump	For safety or height reasons, certain applications, for instance on ships, require the pump to be mounted in the horizontal position. For easy installation the pump is equipped with brackets that support motor and pump.
Low-temperature pump down to -40 °C	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, Grundfos offers a unique pump capable of generating up to 47 bar. The pump is equipped 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, Grundfos offers a unique double pump system capable of generating a pressure of up to 47 bar.
Low-NPSH pump (improved suction)	Recommended 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. (Recommended 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	CRN(E) pumps designed for applications requiring the sterilization and CIP capability of pipes, valves and pumps. (CIP = Cleaning-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. Customized 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/food industry.

WebCAPS

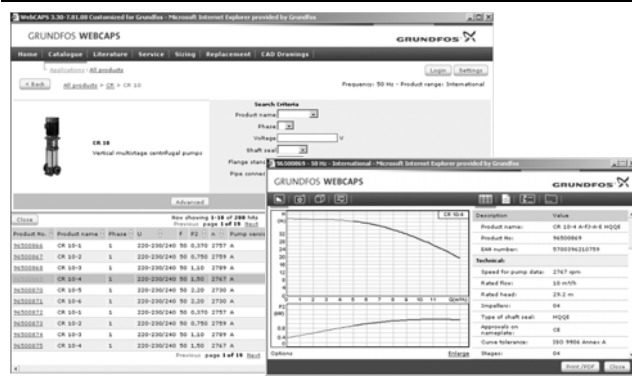


WebCAPS is a **Web**-based **Computer Aided Product Selection** program available on www.grundfos.com.

WebCAPS contains detailed information on more than 185,000 Grundfos products in more than 20 languages.

In WebCAPS, all information is divided into 6 sections:

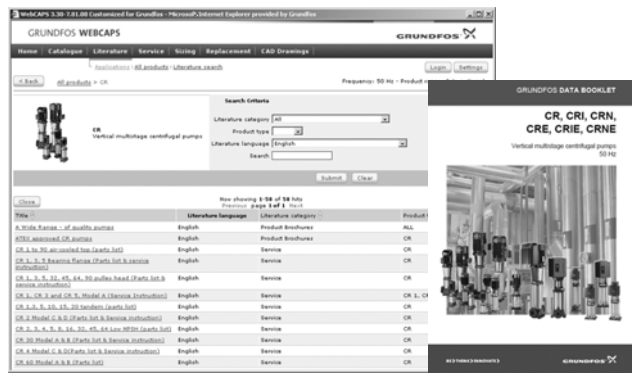
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

This section is based on fields of application and pump types, and contains

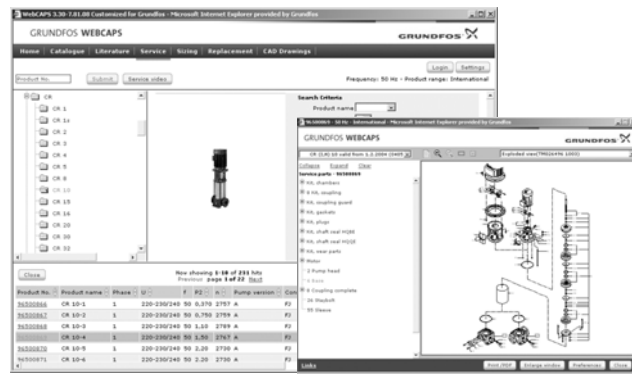
- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

In this section you can access all the latest documents of a given pump, such as

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



Service

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

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



Sizing

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

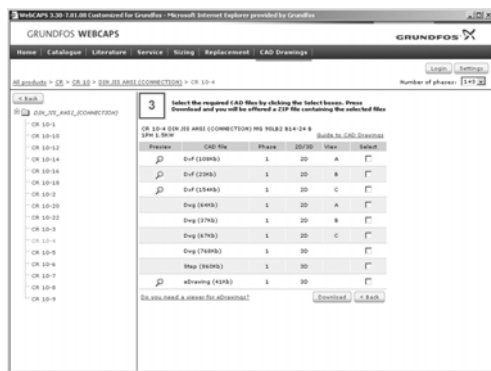
- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- analyse your selected pump via the built-in life cycle cost tool
- determine the flow velocity in wastewater applications,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



Replacement

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

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



CAD drawings

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

These formats are available in WebCAPS:

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

WinCAPS



Fig. 27 WinCAPS CD-ROM

WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 185,000 Grundfos products in more than 20 languages.

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

WinCAPS is available on CD-ROM and updated once a year.

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