

**PT. LUKES INDONESIA**  
Lindeteves Trade Center Lt UG, Blok B1 No. 6  
Jalan Hayam Wuruk, Jakarta - Indonesia  
Phone : 021 - 6231 7842, 628 5144  
Fax : 021 - 6231 0499  
email : lukes@cbn.net.id



## CR, CRI, CRN, CRE, CRIE, CRNE

Vertical multistage centrifugal pumps  
50 Hz



# Contents

## Product data

Introduction	3
Performance range of CR, CRI, CRN	4
Performance range of CRE, CRIE, CRNE	4
Applications	5
Product range	6
Pump	8
Motor	8
Terminal box positions	9
Ambient temperature	9
Viscosity	9

## Control of E-pumps

Examples of E-pump applications	10
Central management system	11
Remote control	11
Control panel	11
Control modes for E-pumps	12
CRE, CRIE, CRNE with integrated pressure sensor	12
CRE, CRIE and CRNE without sensor	12

## Construction

CR(E) 1s, 1, 3, 5, 10, 15 and 20	13
CRI(E), CRN(E) 1s, 1, 3, 5, 10, 15 and 20	13
CR(E) 32, 45, 64 and 90	14
CRN(E) 32, 45, 64 and 90	14
CR 120 and 150	15
CRN 120 and 150	15
Type keys	16

## Operating and inlet pressures

Maximum operating pressure and temperature range	17
Operating range of the shaft seal	17
Maximum inlet pressure	18

## Selection and sizing

Selection of pumps	19
WinCAPS and WebCAPS	20
How to read the curve charts	23
Guidelines to performance curves	23

## Performance curves/ technical data

CR 1s	24
CRI, CRN 1s	26
CR, CRE 1	28
CRI, CRN, CRIE, CRNE 1	30
CR, CRE 3	32
CRI, CRN, CRIE, CRNE 3	34
CR, CRE 5	36
CRI, CRN, CRIE, CRNE 5	38
CR, CRE 10	40
CRI, CRN, CRIE, CRNE 10	42
CR, CRE 15	44
CRI, CRN, CRIE, CRNE 15	46

CR, CRE 20	48
CRI, CRN, CRIE, CRNE 20	50
CR, CRE 32	52
CRN, CRNE 32	54
CR, CRE 45	56
CRN, CRNE 45	58
CR, CRE 64	60
CRN, CRNE 64	62
CR, CRE 90	64
CRN, CRNE 90	66
CR 120	68
CRN 120	70
CR 150	72
CRN 150	74

## Motor data

Standard motors for CR, CRI, CRN, 50 Hz	76
E-motors for CRE, CRIE, CRNE, 50 Hz	77

## Pumped liquids

Pumped liquids	78
List of pumped liquids	78

## Accessories

Pipework connection	80
Counter flanges for CR(E)	80
Counter flanges for CRN(E)	82
PJE couplings for CRN(E)	84
FlexiClamp base connections	84
Potentiometer for CRE, CRIE, CRNE	87
G10-LON interface for CRE, CRIE, CRNE	87
LiqTec for CR(E), CRI(E) and CRN(E)	87
Remote control, R100	87
EMC filter for CRE, CRIE, CRNE	87
Sensors for CRE, CRIE, CRNE	88

## Variants

Lists of variants - on request	89
--------------------------------	----

## Further product documentation

WebCAPS	90
WinCAPS	91

## 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, CRN

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 are available in various sizes and various numbers of stages to provide the flow and 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 CR pump motor 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



TMD2 7397 3403

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 CRE pump motor 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 identical to those of the CR, CRI and CRN pump range.

### Selecting a CRE pump

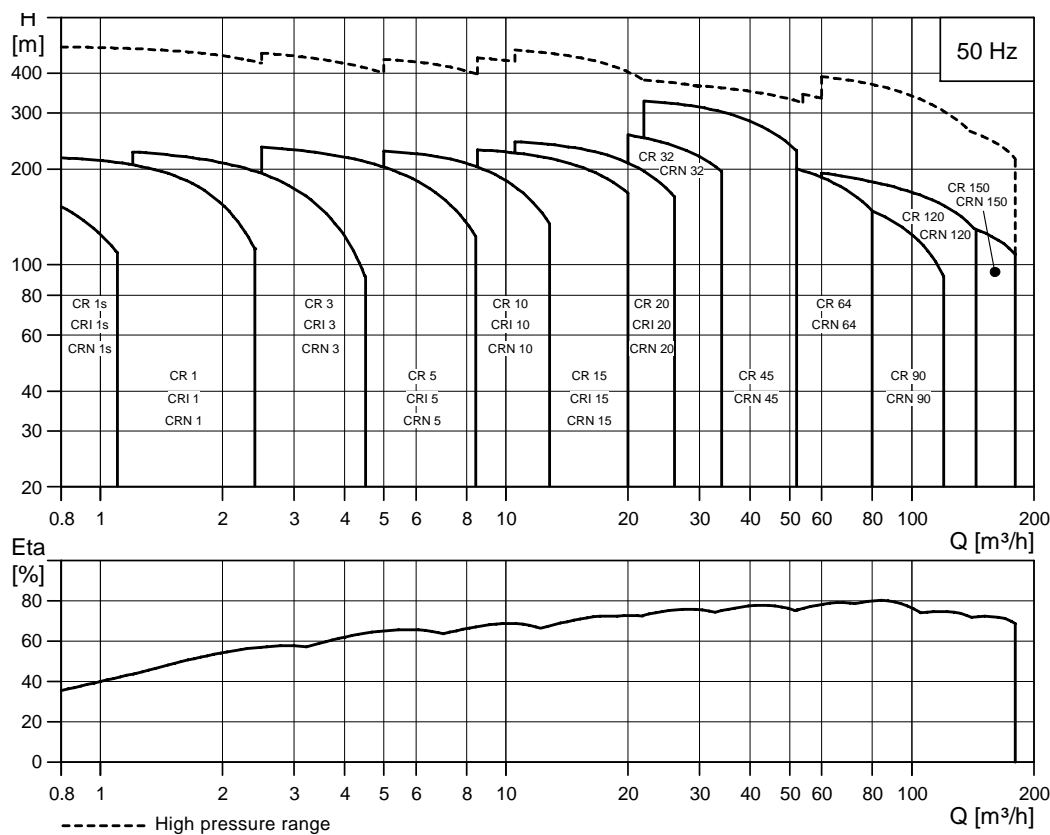
Select a CRE pump if the following features are required:

- 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:

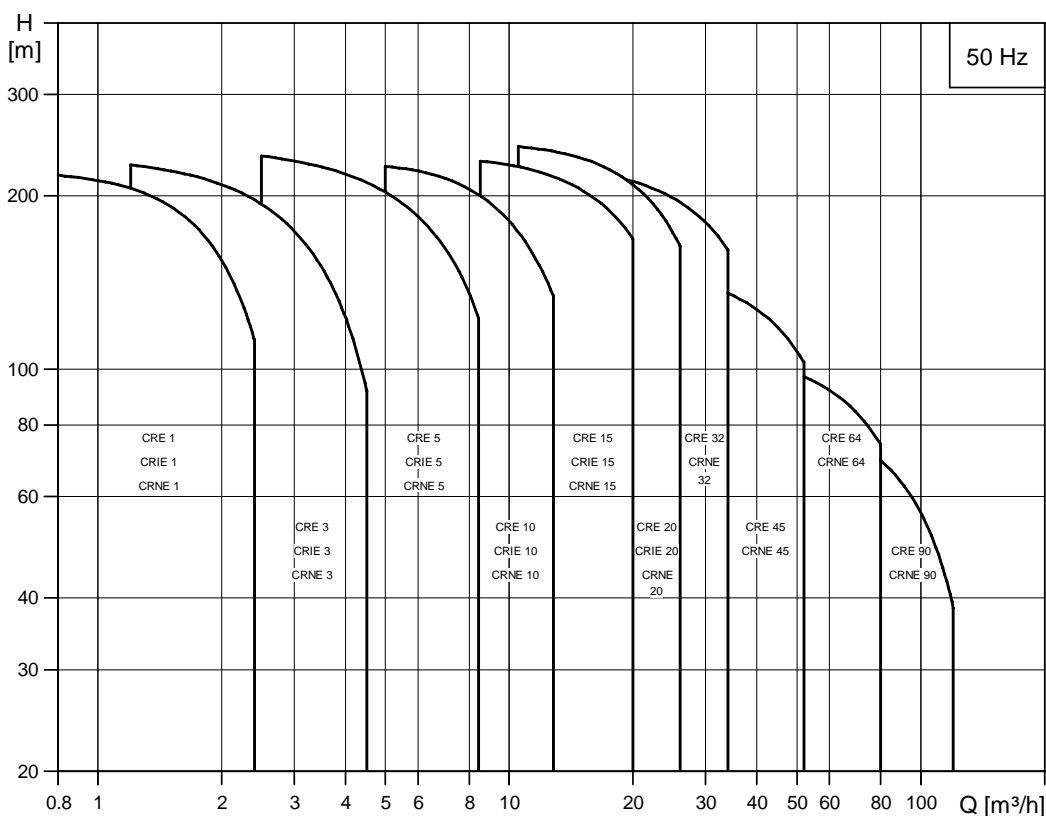
- energy savings
- increased comfort
- control and monitoring of the pump performance.

## Performance range of CR, CRI, CRN



TM02 1192 2507

## Performance range of CRE, CRIE, CRNE



TM02 7281 3605

## Applications

Application	CR, CRI	CRN	CRE, CRNE
<b>Water supply</b>			
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	●	○	●
<b>Industry</b>			
<b>Pressure boosting</b>			
Process-water systems	●	●	●
Washing and cleaning systems	●	●	○
Vehicle-washing tunnels	●	○	●
Fire-fighting systems	●		○
<b>Liquid transfer</b>			
Cooling and air-conditioning systems (refrigerants)	●	○	●
Boiler-feed and condensate systems	●	○	●
Machine tools (cooling lubricants)	●	●	●
Aquafarming★	●	○	
<b>Special transfer duties</b>			
Oils and alcohols	●	●	
Acids and alkalis★		●	
Glycol and coolants	●		
<b>Water treatment</b>			
Ultra-filtration systems		●	
Reverse-osmosis systems★		●	
Softening, ionising, demineralising systems		●	
Distillation systems		●	
Separators	●	●	●
Swimming baths★		●	
<b>Irrigation</b>			
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 <sup>3</sup> /h]	0.8	1	3	5	10	15	20
Temperature range [°C]	-20 to +120						
Temperature range [°C] – on request	-40 to +180						
Max. pump efficiency [%]	35	48	58	66	70	72	72
<b>CR pumps</b>							
Flow range [m <sup>3</sup> /h]	0.3-1.1	0.7-2.4	1.2-4.5	2.5-8.5	5-13	9-24	11-29
Max. pressure [bar]	21	22	24	24	22	23	25
High pressure [bar] – on request	-	47	41	47	44	47	48
Motor power [kW]	0.37-1.1	0.37-2.2	0.37-3	0.37-5.5	0.37-7.5	1.1-15	1.1-18.5
<b>CRE pumps</b>							
Flow range [m <sup>3</sup> /h]	-	0.7-2.4	1.2-4.5	2.5-8.5	5-13	8.5-23.5	10.5-29
Max. pressure [bar]	-	22	24	24	22	23	25
Motor power [kW]	-	0.37-2.2	0.37-3	0.37-5.5	0.37-7.5	1.1-15	1.1-18.5
<b>Version</b>							
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.						
<b>CR, CRE pipe connection</b>							
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	-	-
<b>CRI, CRIE pipe connection</b>							
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)	Ø48.3	Ø48.3	Ø48.3	Ø48.3	Ø60.3	Ø60.3	Ø60.3
Union (+GF+)	G 2	G2	G 2	G 2	G 2¼	G 2¼	G 2¼
<b>CRN(E) pipe connection</b>							
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)	Ø48.3	Ø48.3	Ø48.3	Ø48.3	Ø60.3	Ø60.3	Ø60.3
Union (+GF+)	G 2	G2	G 2	G 2	G 2¼	G 2¼	G 2¼

# Product data

CR, CRI, CRN,  
CRE, CRIE, CRNE

Range	CR, CRE 32	CR, CRE 45	CR, CRE 64	CR, CRE 90	CR 120	CR 150
Nominal flow rate [m <sup>3</sup> /h]	32	45	64	90	120	150
Temperature range [°C]	-30 to +120 <sup>1)</sup>					
Temperature range [°C] – on request	-40 to +180					
Max. pump efficiency [%]	78	79	80	81	75	72
<b>CR pumps</b>						
Flow range [m <sup>3</sup> /h]	15-40	22-58	30-85	45-120	60-160	75-180
Max. pressure [bar]	28	33	22	20	21	19
High pressure [bar] – on request	39	39	39	41	41	39
Motor power [kW]	1.5-30	3-45	4-45	5.5-45	11-75	11-75
<b>CRE pumps</b>						
Flow range [m <sup>3</sup> /h]	15-40	22-58	30-85	45-120	-	-
Max. pressure [bar]	28	26	20	20	-	-
Motor power [kW]	1.5-22	3-22	4-22	5.5-22	-	-
<b>Version</b>						
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.				-	-
<b>CR, CRE pipe connection</b>						
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
<b>CRI, CRIE pipe connection</b>						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP) on request	-	-	-	-	-	-
Flange	-	-	-	-	-	-
Flange on request	-	-	-	-	-	-
PJE coupling (Victaulic)	-	-	-	-	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-
<b>CRN(E) pipe connection</b>						
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" <sup>2)</sup>	4" <sup>2)</sup>	4" <sup>2)</sup>	4" <sup>2)</sup>	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-

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

<sup>2)</sup> On request. See the CR "Custom-built pumps" catalogue.

## Pump

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

The pumps are available with a Grundfos standard motor (CR pumps) or a 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.

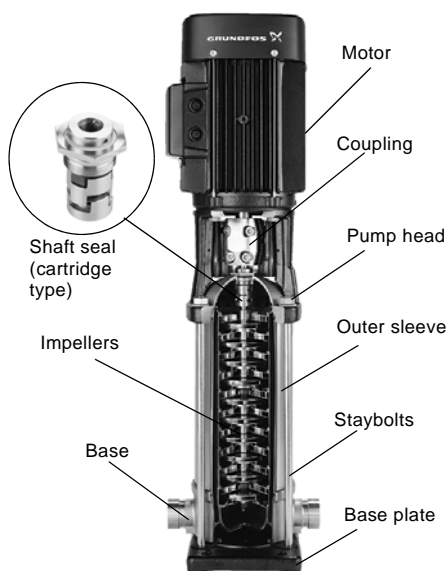


Fig. 3 CR pump

GR5357 - GR3395

## 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 to 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

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

Electrical tolerances comply with EN 60034.

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

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

	MG motor
<b>Mounting designation</b>	Up to 4 kW: V 18 From 5.5 kW: V 1
<b>Insulation class</b>	F
<b>Efficiency class</b>	EFF 1 (0.37-0.75 kW pumps are EFF 2)
<b>Enclosure class</b>	IP 55★
	P <sub>2</sub> : 0.37-1.5 kW: 3 x 220-240/380-415 V
<b>Supply voltage (Tolerance: ±10%)</b>	P <sub>2</sub> : 2.2-11 kW: 3 x 380-415 V
	P <sub>2</sub> : 15-75 kW: 3 x 380-415/660-690 V
<b>Supply frequency</b>	50 Hz

★ IP 44, IP 54 and IP 65 are available on request.

#### CRE, CRIE, CRNE

	MGE motor (P <sub>2</sub> ≤ 7.5 kW)	MMGE motor (P <sub>2</sub> ≥ 11-22 kW)
<b>Mounting designation</b>	Up to 4 kW: V 18 From 5.5 kW: V 1	
<b>Insulation class</b>	F	
<b>Efficiency class</b>	EFF 1★	EFF 2
<b>Enclosure class</b>	IP 54	
	P <sub>2</sub> : 0.37-1.1 kW: 1 x 200-240 V	P <sub>2</sub> : 11-22 kW: 3 x 380-415 V
<b>Supply voltage (Tolerance: ±10%)</b>	P <sub>2</sub> : 0.75-7.5 kW: 3 x 380-480 V	
<b>Supply frequency</b>	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 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.

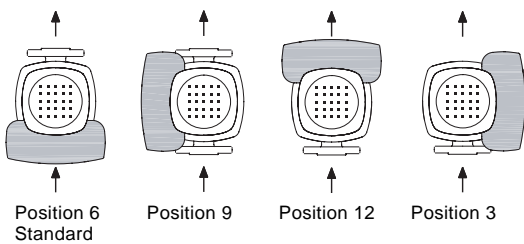


Fig. 4 Terminal box positions

TM03 3658 0606

## 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
1.1-11	Grundfos MG	EFF 1	+60	3500
15-75	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.

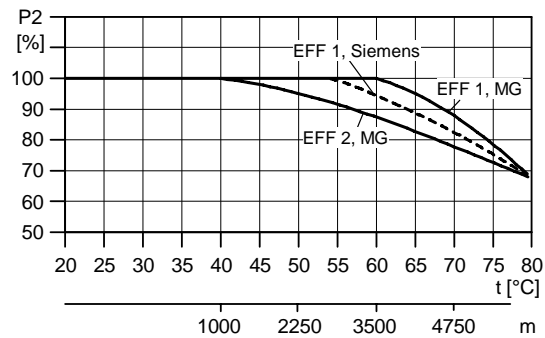


Fig. 5 Motor output depends on temperature/altitude

TM03 1868 3305

## 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 choice for a number of applications characterised by a need for variable flow at constant pressure. The pumps are suited for water supply systems and pressure boosting as well as for industrial applications.

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

### E-pumps in the service of industry

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 listed 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 such as office buildings and hotels.

**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, etc.
- building cooling systems, etc.

**Example:** E-pumps are an excellent choice for 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 outdoor temperature and various heat impacts inside the building.

## Control options of E-pumps

Communication with CRE, CRIE, CRNE pumps is possible by means of either of the following:

- a central management system
- remote control (Grundfos R100)
- 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 if the operator is not present near the E-pump. Communication is enabled by connecting the E-pump to a central management system. This allows the operator to monitor the pump and to change control modes and setpoint settings.

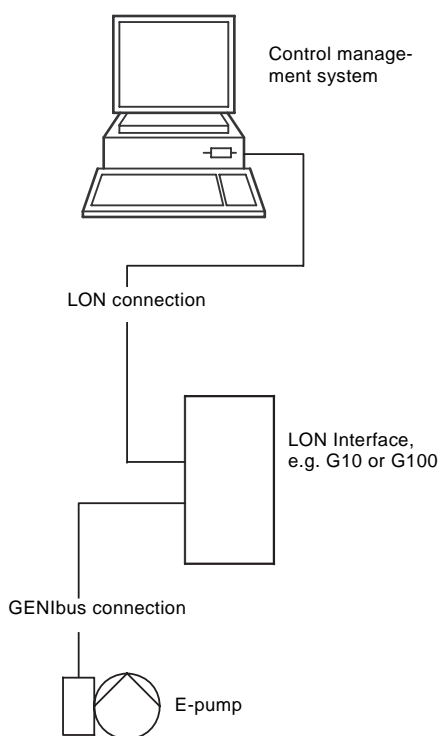


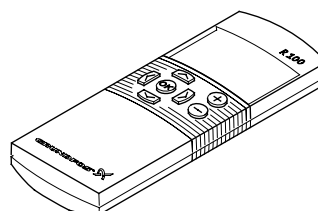
Fig. 6 Structure of a central management system

TM02 6592 1404

## 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.



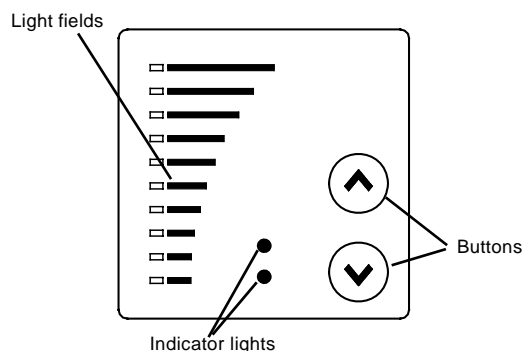
TM00 4498 2802

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

Use CRE, CRIE and CRNE pumps with integrated pressure sensor in 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, 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.



TM02 7398 3403

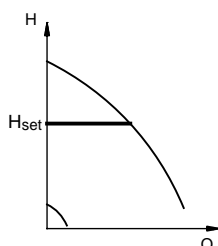
Fig. 9 CRE, CRIE and CRNE pumps

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 either of these modes:

- constant-pressure mode (factory setting)
- constant-curve mode.

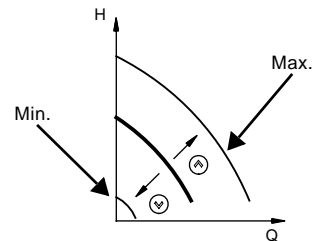
In **constant-pressure** mode, the pump maintains a preset pressure after the pump, irrespective of the flow, see figure below.



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.



TM00 9323 1204

Fig. 11 Constant curve mode

### CRE, CRIE and CRNE without sensor

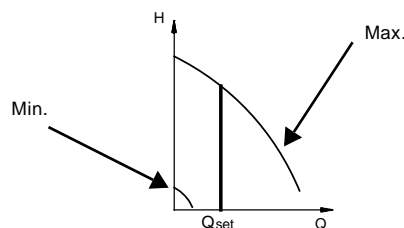
CRE, CRIE and CRNE pumps without sensor are suitable for applications

- where uncontrolled operation is required
- where 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 either of these modes:

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

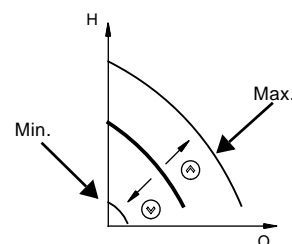
In **controlled**-operation mode, the pump adjusts its performance to the desired setpoint, see figure below.



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

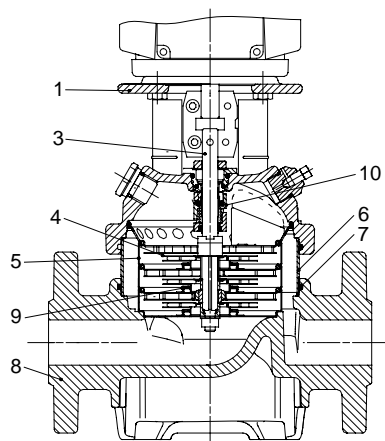
CRE, CRIE and CRNE pumps can be fitted with sensor types meeting the requirements mentioned in the data booklet titled "Grundfos E-pumps".

## 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 <sup>1)</sup> 1.4057 <sup>2)</sup>	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		

<sup>1)</sup> CR(E) 1S, 1, 3, 5

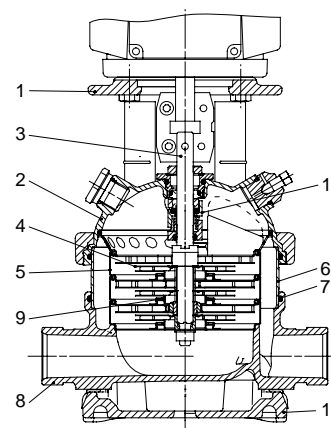
<sup>2)</sup> CR(E) 10, 15, 20

## 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) and CRN(E)

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJL-200 <sup>1)</sup>	EN-JL1030	ASTM 25B
2	Pump head cover	Stainless steel	1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	1.4401 <sup>2)</sup> 1.4460 <sup>3)</sup>	AISI 316 AISI 329
8	Base	Stainless steel	1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE		
10	Shaft seal	Cartridge type		
11	Base plate	Cast iron EN-GJL-200 <sup>1)</sup>	EN-JL1030	ASTM 25B
	Rubber parts	EPDM or FKM		
<b>CRI(E)</b>				
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		
<b>CRN(E)</b>				
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		

<sup>1)</sup> Stainless steel available on request.

<sup>2)</sup> CRI(E), CRN(E) 1S, 1, 3, 5

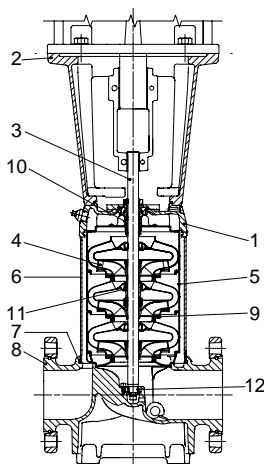
<sup>3)</sup> CRI(E), CRN(E) 10, 15, 20

## CR(E) 32, 45, 64 and 90



TM01 2150 1298 - GR5952

### Sectional drawing



TM01 1836 1403

### Materials, CR(E)

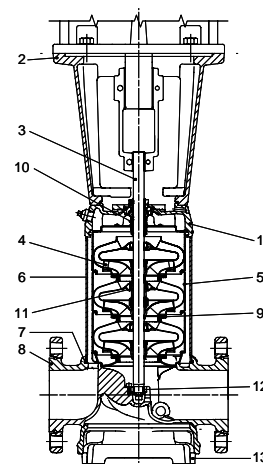
Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJS-500-7	EN-JS1050	ASTM 80-55-06
2	Motor stool	Cast iron EN-GJL-200	EN-JL1030	ASTM 25B
3	Shaft	Stainless steel	1.4057	AISI 431
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Outer sleeve	Stainless 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 equal 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 equal 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 <sup>1)</sup>	EN- JS1050	ASTM 88-55-06
	Rubber parts	EPDM or FKM		

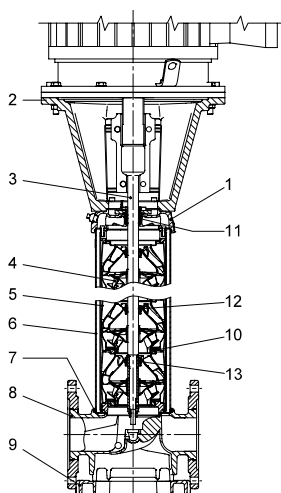
<sup>1)</sup> Stainless steel available on request.

## CR 120 and 150



GrA3731

### Sectional drawing



TM03 8835 2607

### Materials, CR

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 <sup>1)</sup>	SiC/SiC (Ø22) Carbon/SiC (Ø32)		
12	Support bearing	PTFE		
13	Bearing ring	SiC/SiC		
	Rubber parts	EPDM or FKM		

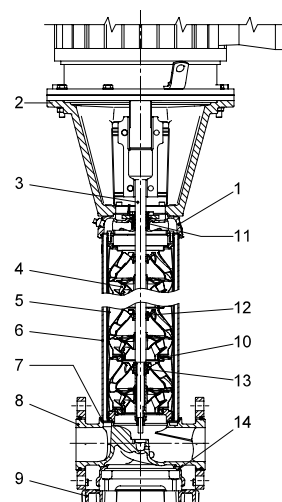
<sup>1)</sup> Ø22 mm shaft, 11-45 kW. Ø32 mm shaft, 55-75 kW.

## CRN 120 and 150



GrA3732 - GrA3735

### Sectional drawing



TM03 8836 2607

### Materials, CRN

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 <sup>1)</sup>	EN-JS1050	A 536 65-45-12
10	Neck ring	PTFE		
11	Shaft seal <sup>2)</sup>	SiC/SiC (Ø22) Carbon/SiC (Ø32)		
12	Support bearing	PTFE		
13	Bearing ring	SiC/SiC		
14	Base plate	Cast iron EN-GJS-500-7 <sup>1)</sup>	EN-JS1050	A 536 65-45-12
	Rubber parts	EPDM or FKM		

<sup>1)</sup> Stainless steel available on request.

<sup>2)</sup> Ø22 mm shaft, 11-45 kW. Ø32 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 <sup>3</sup> /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
<b>Pump version</b>							
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							
<b>Pipe connection</b>							
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							
<b>Materials</b>							
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							
<b>Code for rubber parts</b>							
E EPDM							
F FXM							
K FFKM							
V FKM							
<b>Shaft seal</b>							
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 → 10-16	16 bar	-20 °C to +120 °C	16 bar	-20 °C to +120 °C
CR(E), CRI(E) 10-17 → 10-22	-	-	25 bar	-20 °C to +120 °C
CRN(E) 10	-	-	25 bar	-20 °C to +120 °C
CR(E), CRI(E) 15-1 → 15-7	10 bar	-20 °C to +120 °C	-	-
CR(E), CRI(E) 15-1 → 15-10	-	-	16 bar	-20 °C to +120 °C
CR(E), CRI(E) 15-12 → 15-17	-	-	25 bar	-20 °C to +120 °C
CRN(E) 15	-	-	25 bar	-20 °C to +120 °C
CR(E), CRI(E) 20-1 → 20-7	10 bar	-20 °C to +120 °C	-	-
CR(E), CRI(E) 20-1 → 20-10	-	-	16 bar	-20 °C to +120 °C
CR(E), CRI(E) 20-12 → 20-17	-	-	25 bar	-20 °C to +120 °C
CRN(E) 20	-	-	25 bar	-20 °C to +120 °C
CR(E), CRN(E) 32-1-1 → 32-7	-	-	16 bar	-30 °C to +120 °C
CR(E), CRN(E) 32-8-2 → 32-14	-	-	30 bar	-30 °C to +120 °C
CR(E), CRN(E) 45-1-1 → 45-5	-	-	16 bar	-30 °C to +120 °C
CR(E), CRN(E) 45-6-2 → 45-11	-	-	30 bar	-30 °C to +120 °C
CR, CRN 45-12-2 → 45-13-2	-	-	33 bar	-30 °C to +120 °C
CR(E), CRN(E) 64-1-1 → 64-5	-	-	16 bar	-30 °C to +120 °C
CR, CRN 64-6-2 → 64-8-1	-	-	30 bar	-30 °C to +120 °C
CR(E), CRN(E) 90-1-1 → 90-4	-	-	16 bar	-30 °C to +120 °C
CR, CRN 90-5-2 → 90-6	-	-	30 bar	-30 °C to +120 °C
CR, CRN 120	-	-	30 bar	-30 °C to +120 °C
CR, CRN 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.

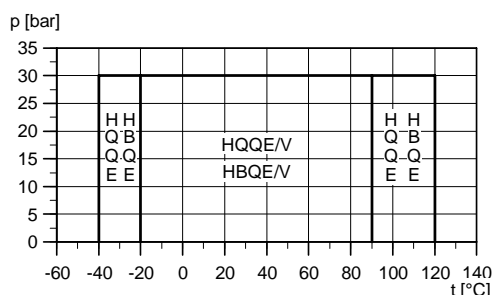


Fig. 14 Operating range of standard shaft seals

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	55-75	O-ring (cartridge) (balanced seal), Carbon/SiC, EPDM	-40 °C to +120 °C
HQQV	0.37-45	O-ring (cartridge) (balanced seal), SiC/SiC, FKM	-20 °C to +90 °C
HBQV	55-75	O-ring (cartridge) (balanced seal), Carbon/SiC, FKM	-20 °C to +90 °C

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.

<b>CR, CRI, CRN 1s</b>		
1s-2	› 1s-36	10 bar
<b>CR(E), CRI(E), CRN(E) 1</b>		
1-2	› 1-36	10 bar
<b>CR(E), CRI(E), CRN(E) 3</b>		
3-2	› 3-29	10 bar
3-31	› 3-36	15 bar
<b>CR(E), CRI(E), CRN(E) 5</b>		
5-2	› 5-16	10 bar
5-18	› 5-36	15 bar
<b>CR(E), CRI(E), CRN(E) 10</b>		
10-1	› 10-6	8 bar
10-7	› 10-22	10 bar
<b>CR(E), CRI(E), CRN(E) 15</b>		
15-1	› 15-3	8 bar
15-4	› 15-17	10 bar
<b>CR(E), CRI(E), CRN(E) 20</b>		
20-1	› 20-3	8 bar
20-4	› 20-17	10 bar
<b>CR(E), CRN(E) 32</b>		
32-1-1	› 32-4	4 bar
32-5-2	› 32-10	10 bar
32-11	› 32-14	15 bar
<b>CR(E), CRN(E) 45</b>		
45-1-1	› 45-2	4 bar
45-3-2	› 45-5	10 bar
45-6-2	› 45-13-2	15 bar
<b>CR(E), CRN(E) 64</b>		
64-1-1	› 64-2-2	4 bar
64-2-1	› 64-4-2	10 bar
64-4-1	› 64-8-1	15 bar
<b>CR(E), CRN(E) 90</b>		
90-1-1	› 90-1	4 bar
90-2-2	› 90-3-2	10 bar
90-3	› 90-6	15 bar
<b>CR, CRN 120</b>		
120-1	› 120-2-1	10 bar
120-2	› 120-5-1	15 bar
120-6-1	› 120-7	20 bar
<b>CR, CRN 150</b>		
150-1-1	› 150-1	10 bar
150-2-1	› 150-4-2	15 bar
150-5-2	› 150-6	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 5-16 A-A-A

Max. operating pressure: **16 bar**

Max. inlet pressure: **10 bar**

Discharge pressure against a closed valve: **10.6 bar**, see page 37.

This pump is **not** allowed to start at an inlet pressure of 10 bar, but at an inlet pressure of  $16.0 - 10.6 = 5.4$  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: **2.0 bar**, see page 41.

This pump is allowed to start at an inlet pressure of 8.0 bar, as the discharge pressure against a closed valve is only 2.0 bar, which results in an operating pressure of  $8.0 + 2.0 = 10.0$  bar. On the contrary, the max. operating pressure of this pump is limited to 16.0 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 "Variants on request", page 89.

## Selection of pumps

Selection of pumps should be based on these elements:

- the duty point of the pump (see page 19)
- dimensional data such as pressure loss as a result of height differences, friction loss in the pipework, pump efficiency etc. (see page 19)
- pump materials (see page 21)
- pump connections (see page 21)
- shaft seal (see page 21).

### 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" from page 24.

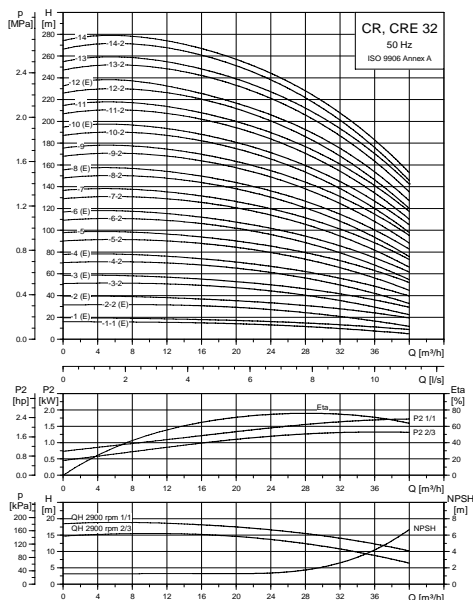


Fig. 15 Example of a curve chart

### Dimensional data

When sizing a pump, take the following factors 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.

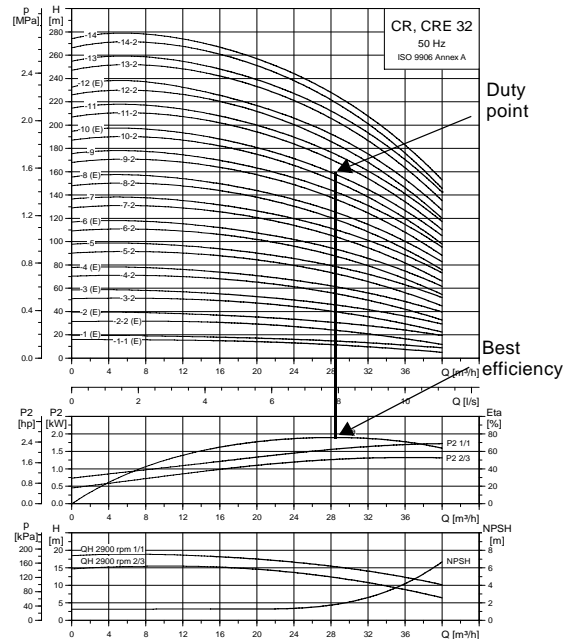


Fig. 16 Example of a CR pump's duty point

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.

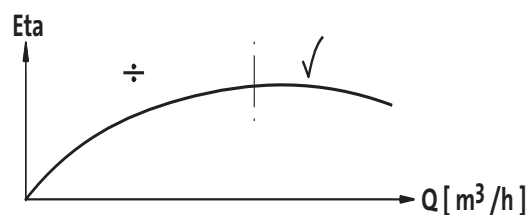


Fig. 17 Best efficiency

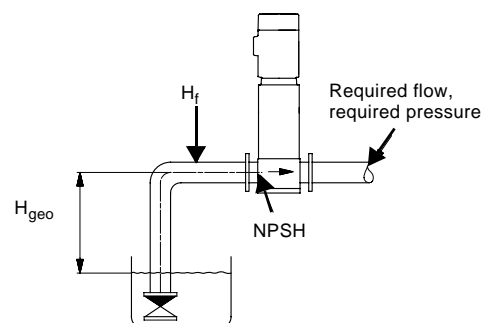


Fig. 18 Dimensional data

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 required duty point should be positioned so that  $P_2$  is close to the max. point of the QH curve.

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.

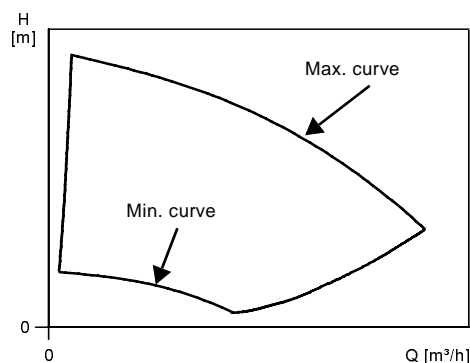


Fig. 19 Min. and max. performance curves

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.

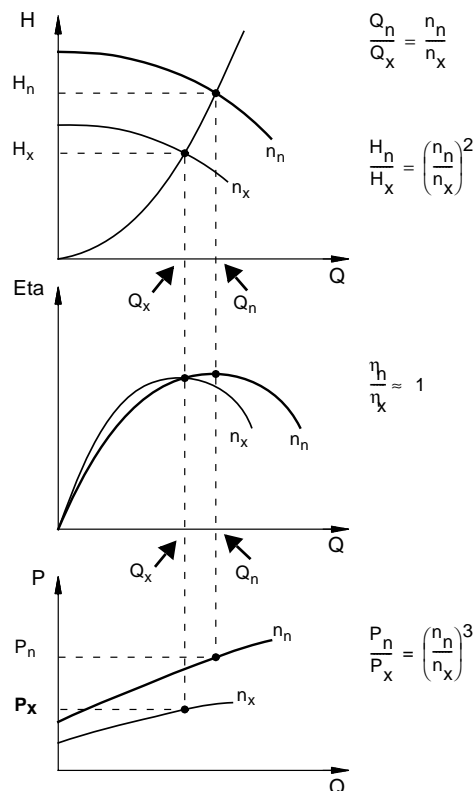


Fig. 20 Affinity equations

**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  $min^{-1}$  ( $n_n = 2900 min^{-1}$ )
- $n_x$  Current motor speed in  $min^{-1}$
- $\eta_h$  Rated efficiency in %
- $\eta_k$  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 pages 90 and 91.

TM01 4916 4803

TM00 8720 3496

## Pump material

Select the material variant (CR(E), CRI(E), CRN(E)) on the basis of 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.

These key parameters **must** be taken into account when selecting the shaft seal:

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

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

## Inlet pressure and operating pressure

Do **not** exceed the limit values stated on pages 17 and 18 as regards these pressures:

- maximum inlet pressure
- maximum operating pressure.

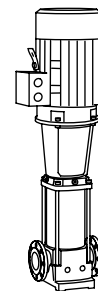


Fig. 21 CR pump

TM01 2100 1198

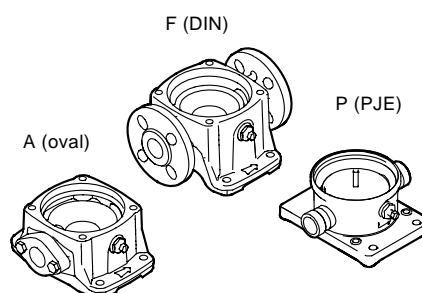


Fig. 22 Pump connections

TM02 1201 0601

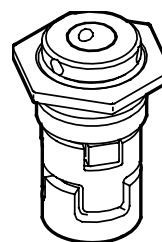


Fig. 23 Shaft seal (cartridge type)

TM02 0538 4800

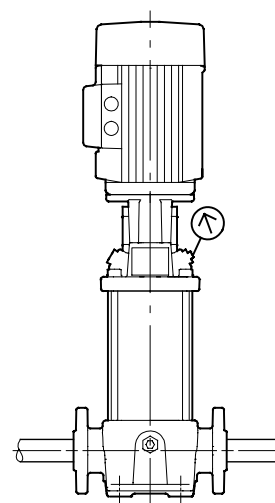


Fig. 24 Inlet and operating pressure

TM02 1204 060

## 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.

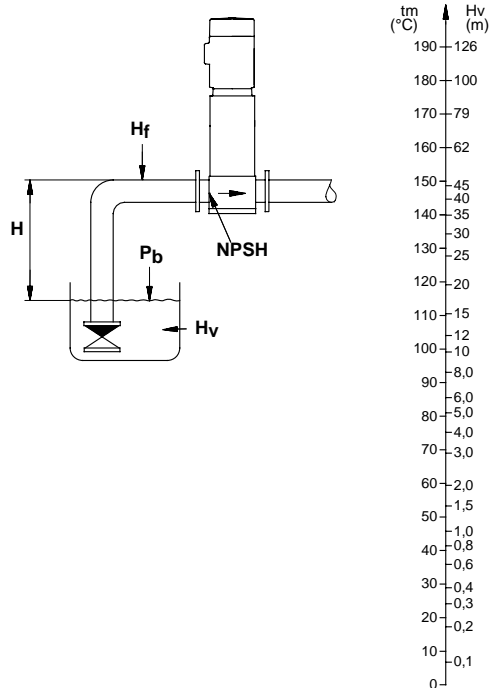


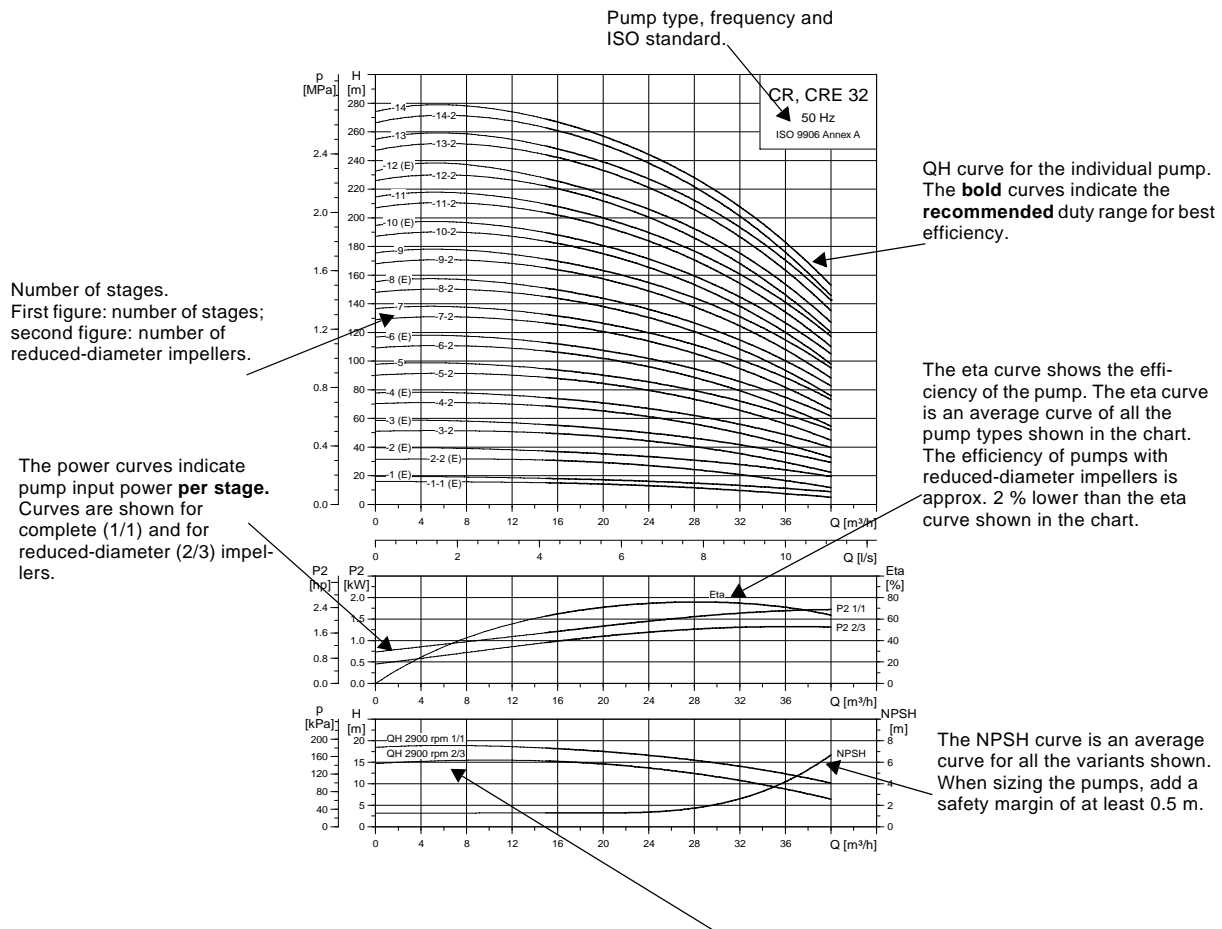
Fig. 25 Minimum inlet pressure - NPSH

**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



QH curve for each individual impeller. Curves for complete (1/1) and reduced-diameter (2/3) impellers are shown.

Fig. 26 How to read the curve charts

TM02 7302 3103

## Guidelines to performance curves

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

- Tolerances to ISO 9906, Annex A, if indicated.
- The motors used for the measurements are standard Grundfos motors (MG or MGE).
- Measurements have been made with airless water at a temperature of 20 °C.
- The curves apply to the following kinematic viscosity:  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt).
- Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate.
- The QH curves apply to a rated motor speed of  $2900 \text{ min}^{-1}$ . 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.

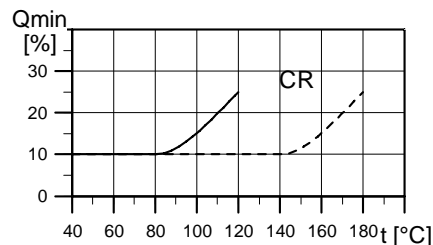
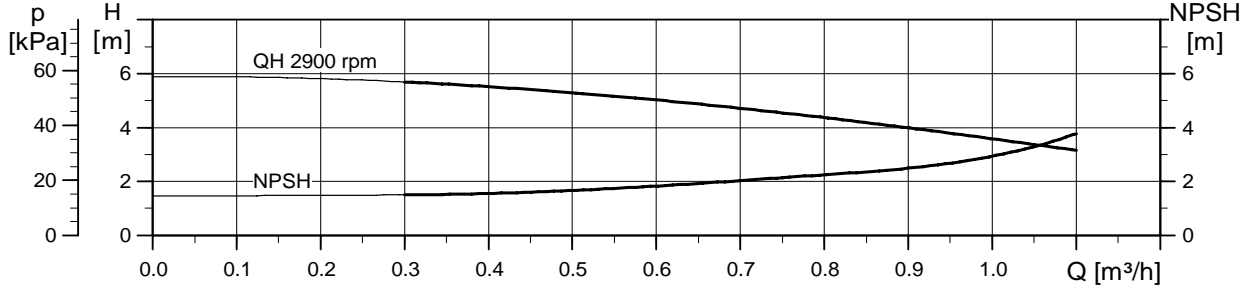
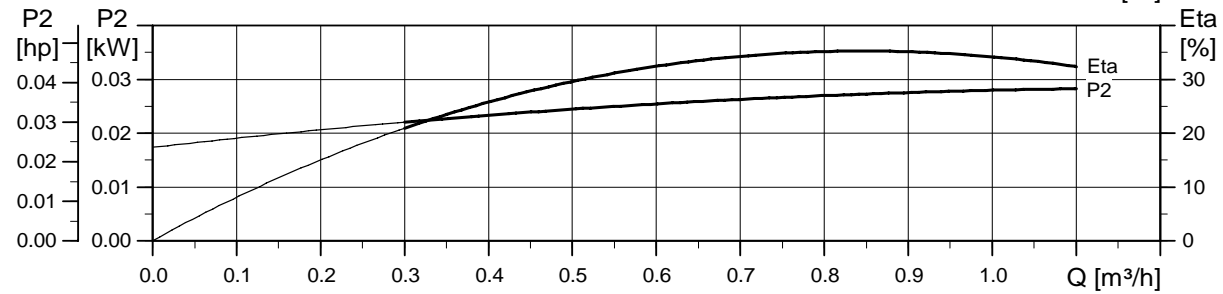
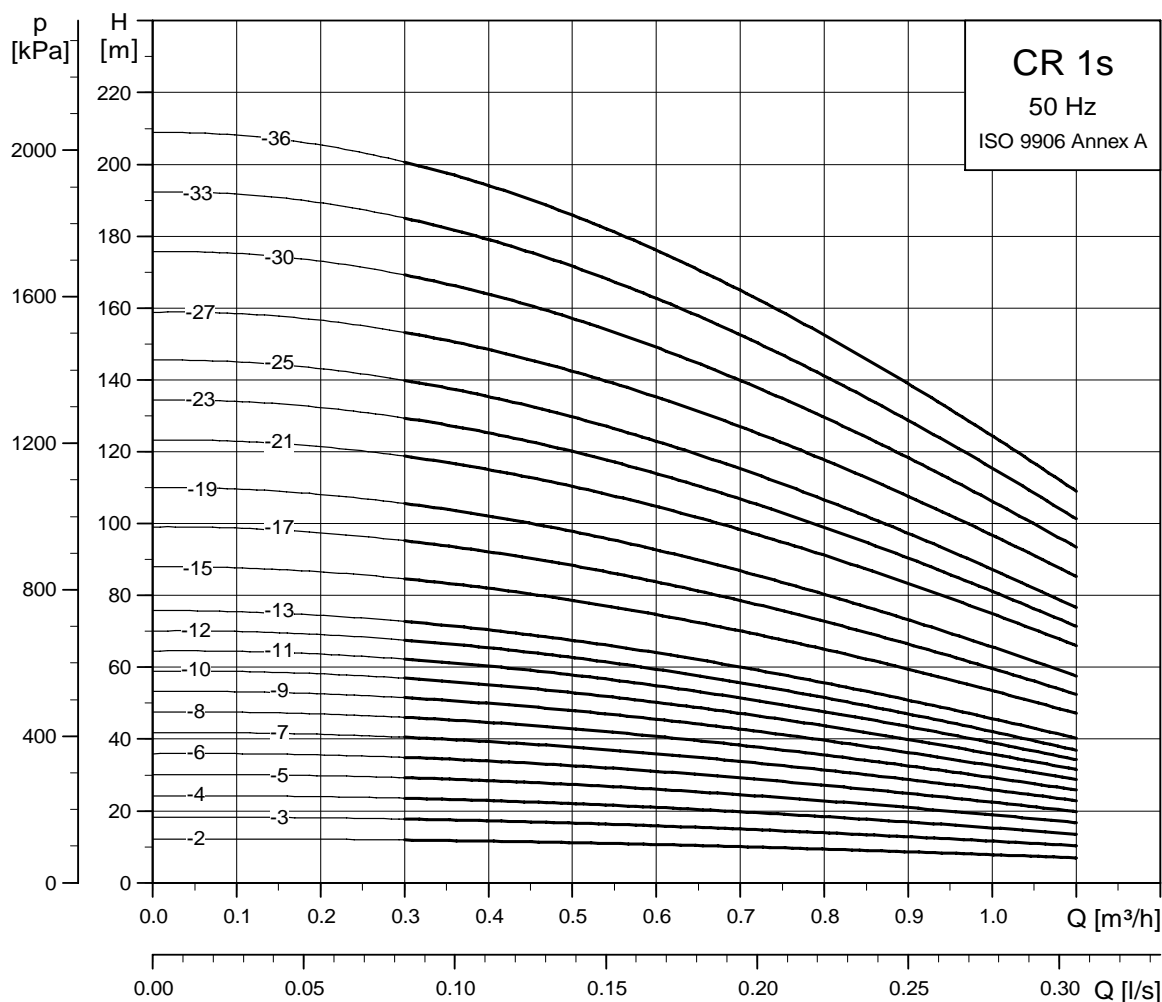


Fig. 27 Minimum flow rate

TM01 2816 0303

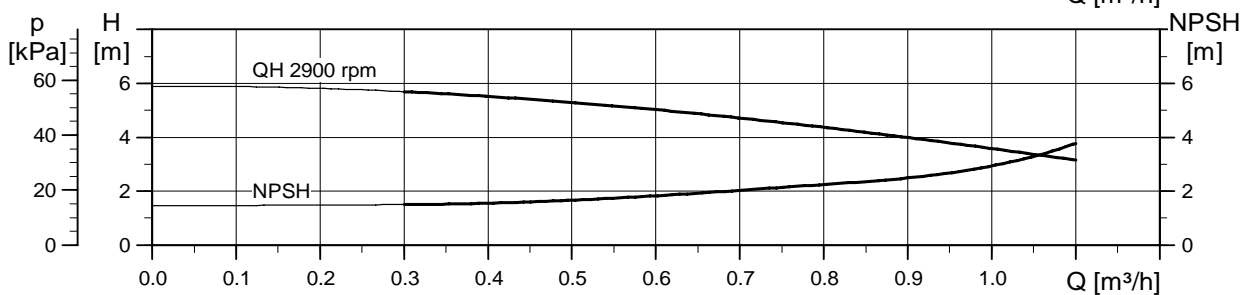
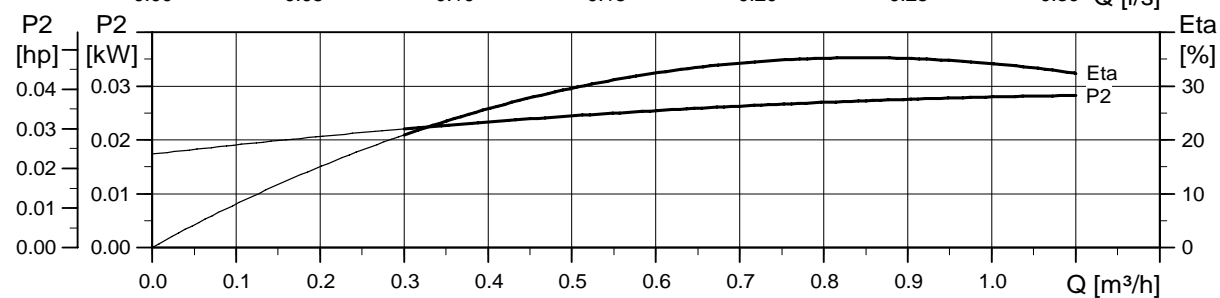
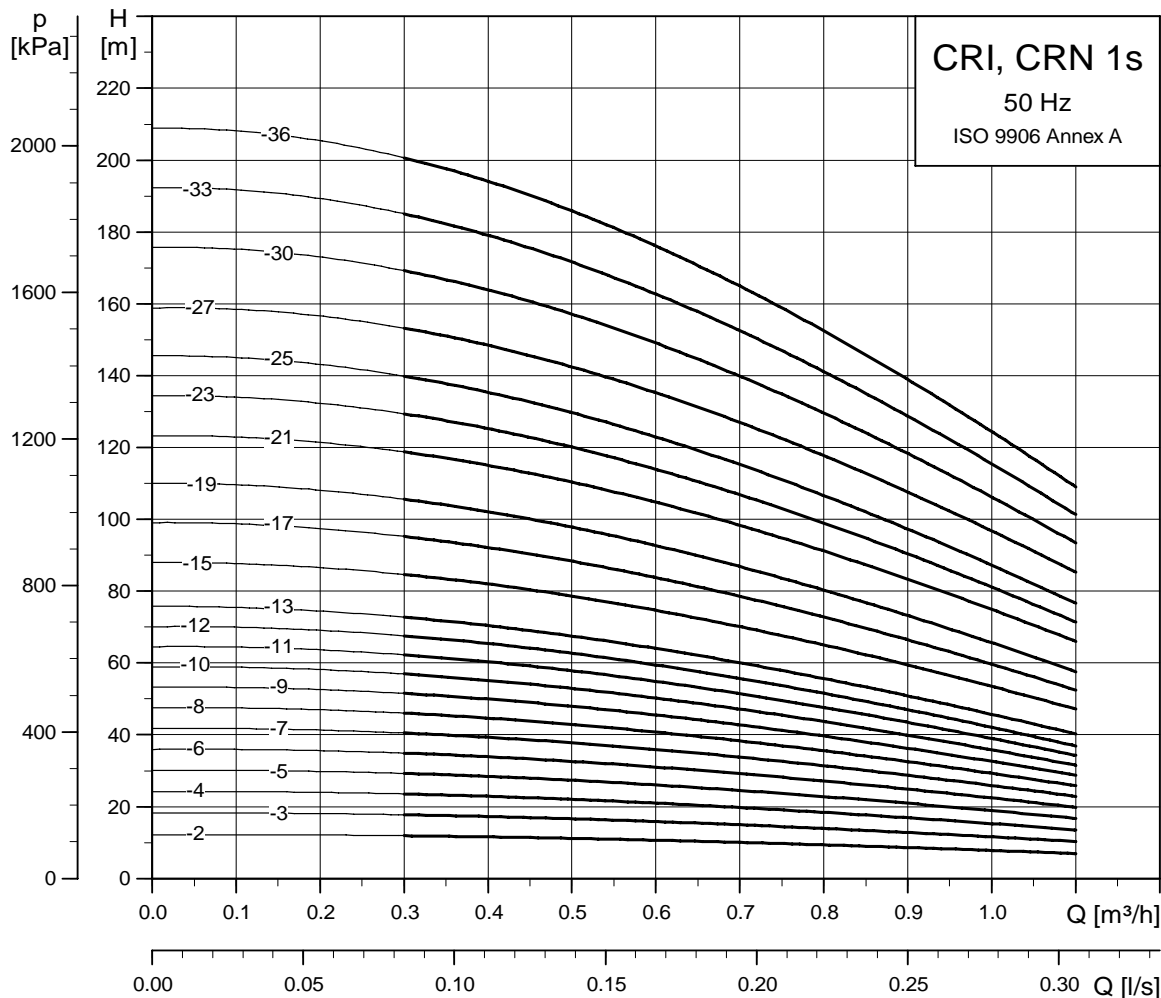
## CR 1s



TM02 7424 3605

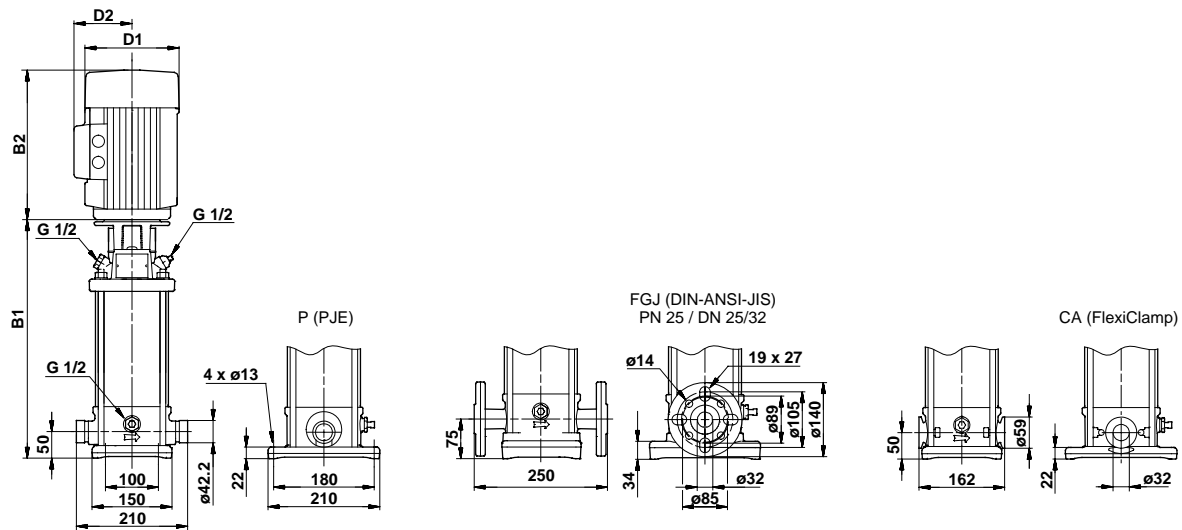


## CRI, CRN 1s



TM02 7425 3605

## Dimensional sketch

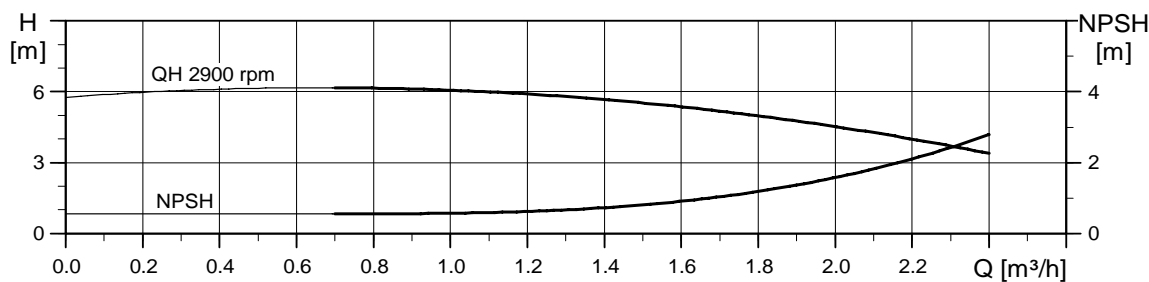
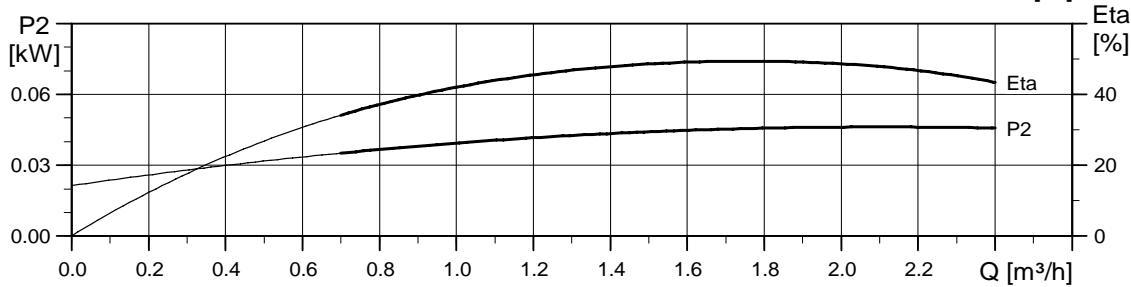
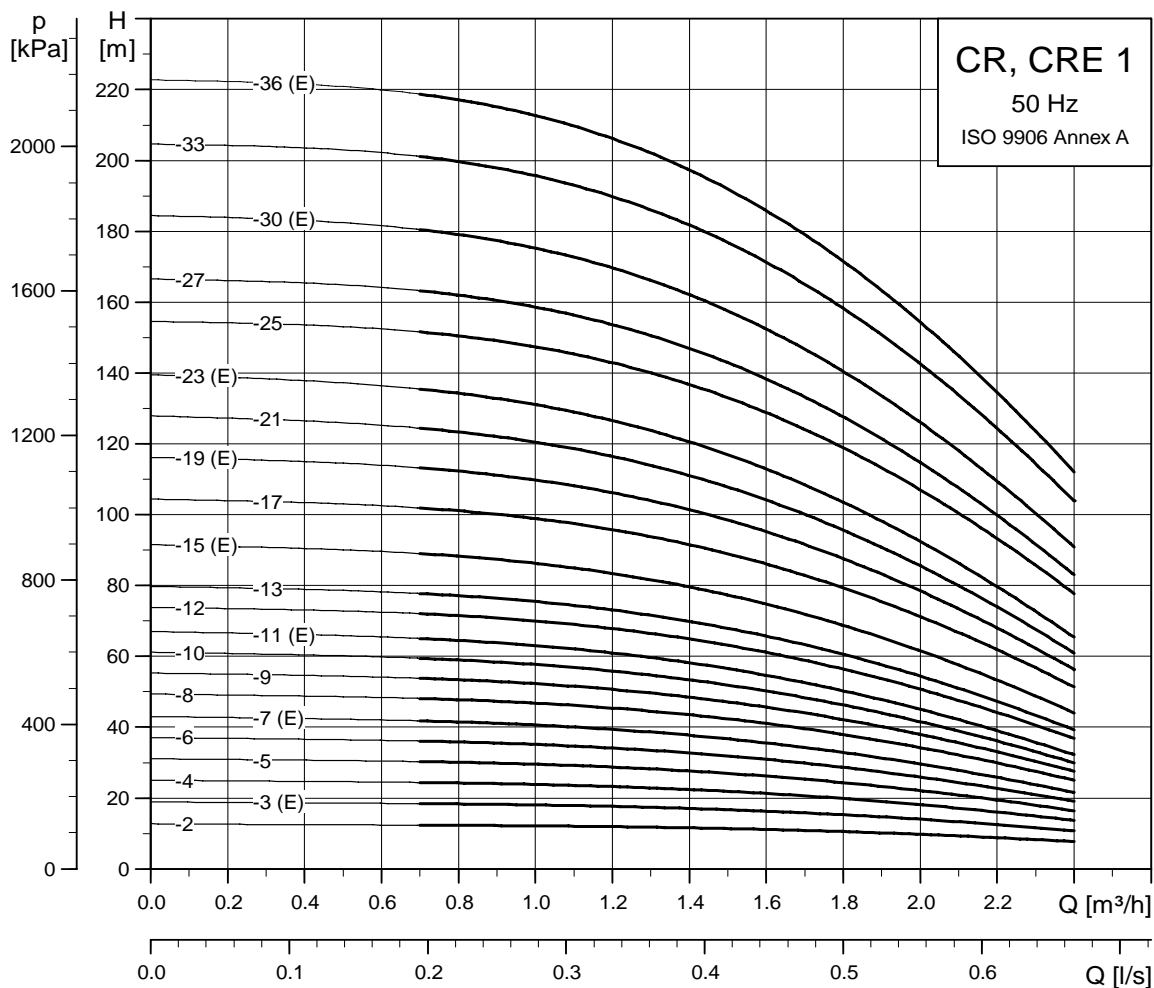


TM03 1722 2805

## Dimensions and weights

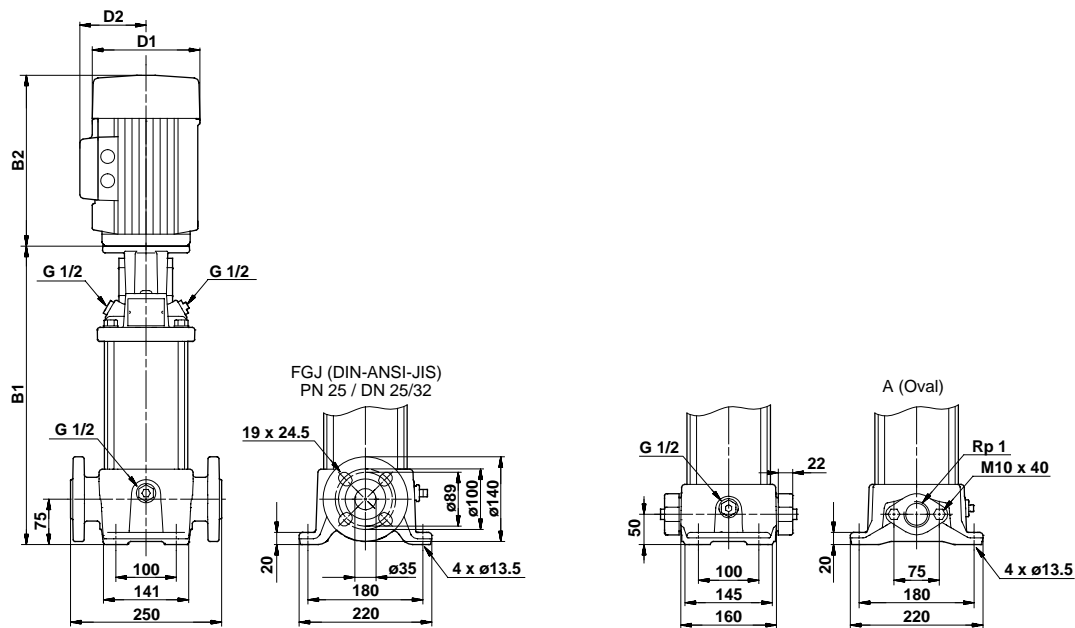
Pump type	Motor P <sub>2</sub> [kW]	Dimension [mm]					Net weight [kg]		
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2				
CRI/CRN 1s-2	0.37	257	448	282	473	141	109	16	20
CRI/CRN 1s-3	0.37	257	448	282	473	141	109	16	21
CRI/CRN 1s-4	0.37	275	466	300	491	141	109	17	21
CRI/CRN 1s-5	0.37	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	0.37	347	538	372	563	141	109	18	23
CRI/CRN 1s-9	0.37	365	556	390	581	141	109	19	23
CRI/CRN 1s-10	0.37	383	574	408	599	141	109	19	23
CRI/CRN 1s-11	0.37	401	592	426	617	141	109	19	24
CRI/CRN 1s-12	0.37	419	610	444	635	141	109	20	24
CRI/CRN 1s-13	0.37	437	628	462	653	141	109	20	25
CRI/CRN 1s-15	0.55	473	664	498	689	141	109	22	26
CRI/CRN 1s-17	0.55	509	700	534	725	141	109	23	27
CRI/CRN 1s-19	0.55	545	736	570	761	141	109	23	28
CRI/CRN 1s-21	0.75	587	818	612	843	141	109	26	31
CRI/CRN 1s-23	0.75	623	854	648	879	141	109	27	31
CRI/CRN 1s-25	0.75	659	890	684	915	141	109	28	32
CRI/CRN 1s-27	1.1	695	926	720	951	141	109	31	35
CRI/CRN 1s-30	1.1	749	980	774	1005	141	109	32	36
CRI/CRN 1s-33	1.1	803	1034	828	1059	141	109	33	37
CRI/CRN 1s-36	1.1	857	1088	882	1113	141	109	34	39

## CR, CRE 1



TM02 7290 3605

## Dimensional sketch

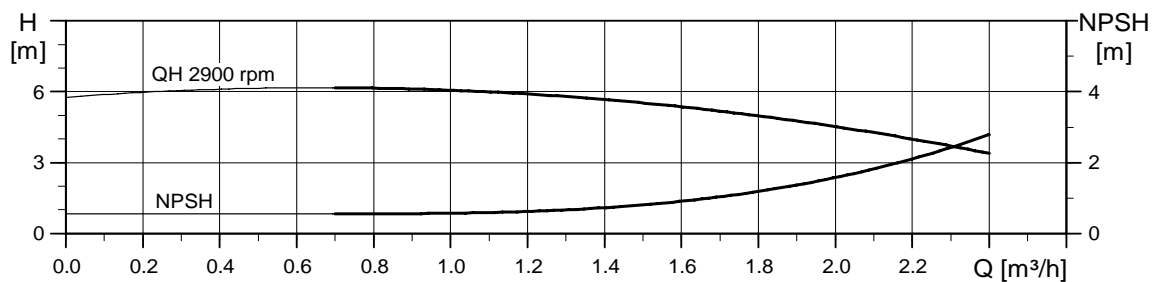
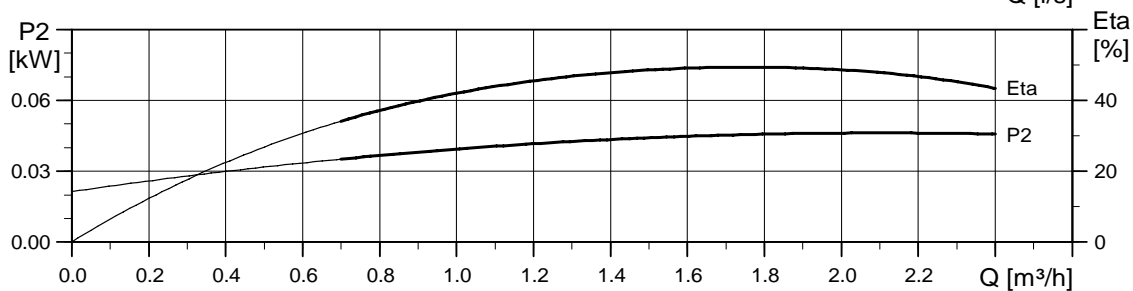
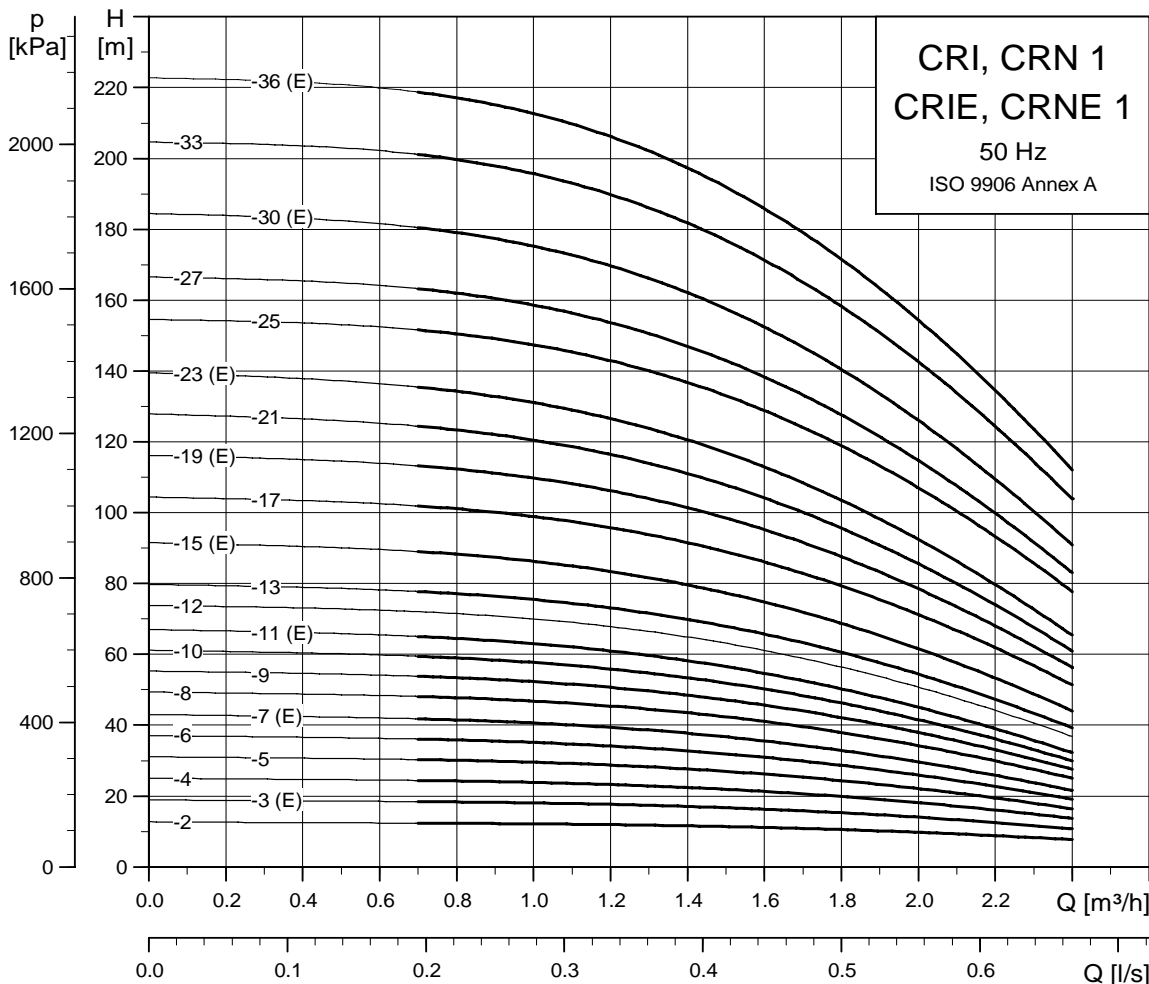


TM03 1721 2805

## Dimensions and weights

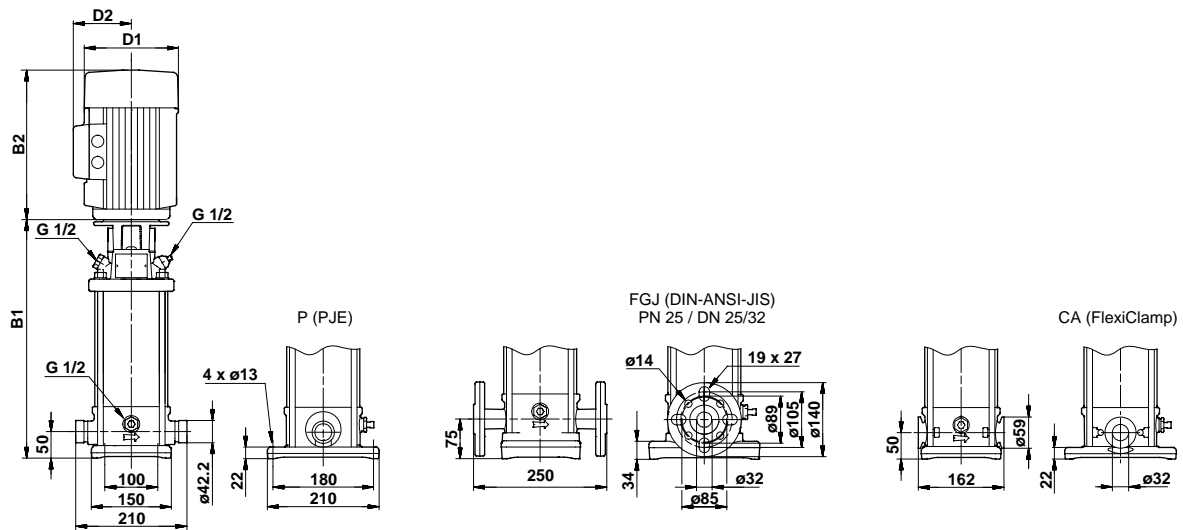
Pump type	Motor P <sub>2</sub> [kW]	CR								CRE							
		Dimension [mm]				Net weight [kg]				Dimension [mm]				Net weight [kg]			
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2	B1	B1+B2					B1	B1+B2						
CR 1-2	0.37	254	445	279	470	141	109	18	23	-	-	-	-	-	-	-	-
CR(E) 1-3	0.37	254	445	279	470	141	109	18	23	254	445	279	470	141	140	21	26
CR 1-4	0.37	272	463	297	488	141	109	19	23	-	-	-	-	-	-	-	-
CR 1-5	0.37	290	481	315	506	141	109	19	24	-	-	-	-	-	-	-	-
CR 1-6	0.37	308	499	333	524	141	109	20	24	-	-	-	-	-	-	-	-
CR(E) 1-7	0.37	326	517	351	542	141	109	20	25	326	517	351	542	141	140	23	27
CR 1-8	0.55	344	535	369	560	141	109	21	26	-	-	-	-	-	-	-	-
CR 1-9	0.55	362	553	387	578	141	109	21	26	-	-	-	-	-	-	-	-
CR 1-10	0.55	380	571	405	596	141	109	22	26	-	-	-	-	-	-	-	-
CR(E) 1-11	0.55	398	589	423	614	141	109	22	27	398	589	423	614	141	140	25	29
CR 1-12	0.75	422	653	447	678	141	109	24	29	-	-	-	-	-	-	-	-
CR 1-13	0.75	440	671	465	696	141	109	25	29	-	-	-	-	-	-	-	-
CR(E) 1-15	0.75	476	707	501	732	141	109	26	30	476	707	501	732	178	167	29	33
CR 1-17	1.1	512	743	537	768	141	109	29	33	-	-	-	-	-	-	-	-
CR(E) 1-19	1.1	548	779	573	804	141	109	29	34	548	779	573	804	178	167	32	36
CR 1-21	1.1	584	815	609	840	141	109	30	35	-	-	-	-	-	-	-	-
CR(E) 1-23	1.1	620	851	645	876	141	109	31	36	620	851	645	876	178	167	33	38
CR 1-25	1.5	-	-	697	978	178	110	-	44	-	-	-	-	-	-	-	-
CR 1-27	1.5	-	-	733	1014	178	110	-	44	-	-	-	-	-	-	-	-
CR(E) 1-30	1.5	-	-	787	1068	178	110	-	46	-	-	787	1068	178	167	-	52
CR 1-33	2.2	-	-	841	1162	178	110	-	47	-	-	-	-	-	-	-	-
CR(E) 1-36	2.2	-	-	895	1216	178	110	-	49	-	-	895	1216	178	167	-	59

## CRI, CRN, CRIE, CRNE 1



TM02 7291 3605

## Dimensional sketch

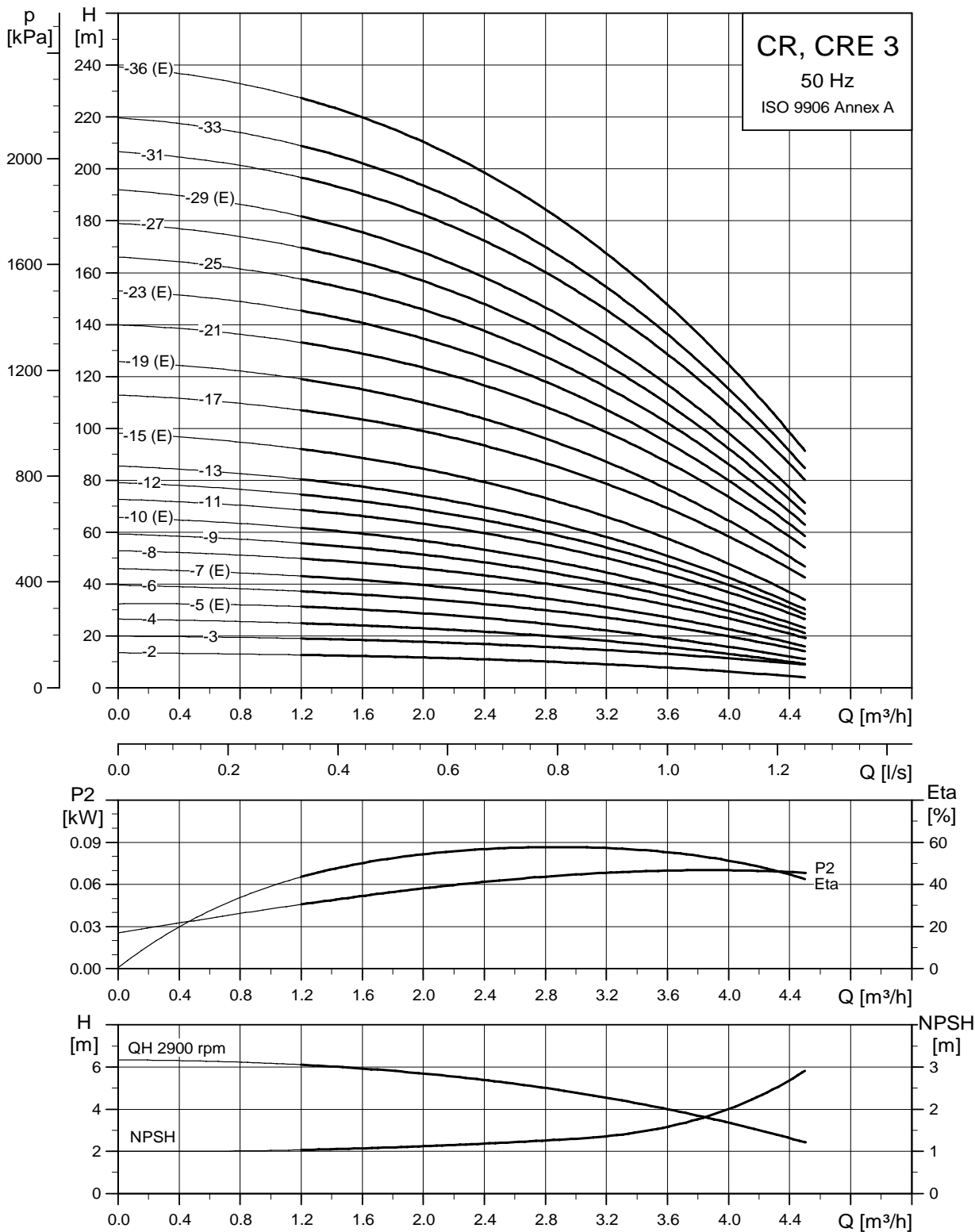


TM03 1722 2805

## Dimensions and weights

Pump type	Motor P <sub>2</sub> [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/CRN 1-2	0.37	257	448	282	473	141	109	16	20	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-3	0.37	257	448	282	473	141	109	16	21	257	448	282	473	141	140	19	23
CRI/CRN 1-4	0.37	275	466	300	491	141	109	17	21	-	-	-	-	-	-	-	
CRI/CRN 1-5	0.37	293	484	318	509	141	109	17	21	-	-	-	-	-	-	-	
CRI/CRN 1-6	0.37	311	502	336	527	141	109	18	22	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-7	0.37	329	520	354	545	141	109	18	22	329	520	354	545	141	140	21	25
CRI/CRN 1-8	0.55	347	538	372	563	141	109	19	23	-	-	-	-	-	-	-	
CRI/CRN 1-9	0.55	365	556	390	581	141	109	20	24	-	-	-	-	-	-	-	
CRI/CRN 1-10	0.55	383	574	408	599	141	109	20	24	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-11	0.55	401	592	426	617	141	109	20	24	401	592	426	617	141	140	23	27
CRI/CRN 1-12	0.75	425	656	450	681	141	109	23	27	-	-	-	-	-	-	-	
CRI/CRN 1-13	0.75	443	674	468	699	141	109	23	28	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-15	0.75	479	710	504	735	141	109	24	28	479	710	504	735	178	167	27	31
CRI/CRN 1-17	1.1	515	746	540	771	141	109	27	31	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-19	1.1	551	782	576	807	141	109	28	32	551	782	576	807	178	167	30	34
CRI/CRN 1-21	1.1	587	818	612	843	141	109	29	33	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-23	1.1	623	854	648	879	141	109	30	34	623	854	648	879	178	167	32	36
CRI/CRN 1-25	1.5	675	956	700	981	178	110	37	41	-	-	-	-	-	-	-	
CRI/CRN 1-27	1.5	711	992	736	1017	178	110	38	42	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-30	1.5	765	1046	790	1071	178	110	39	43	765	1046	790	1071	178	167	46	50
CRI/CRN 1-33	2.2	819	1140	844	1165	178	110	41	45	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 1-36	2.2	873	1194	898	1219	178	110	42	46	873	1194	898	1219	178	167	52	56

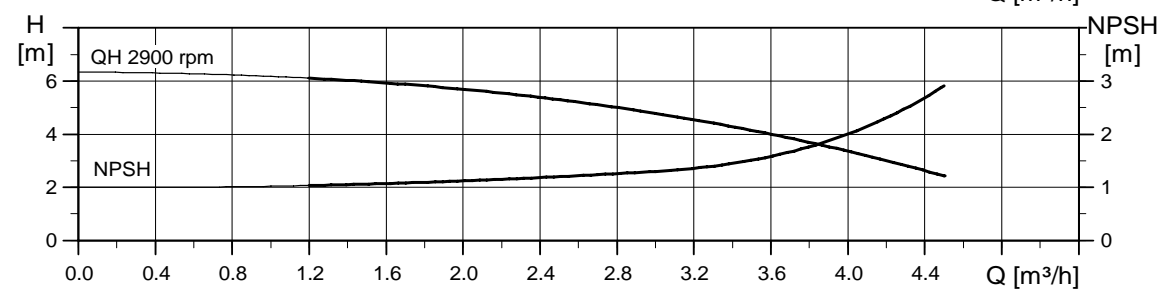
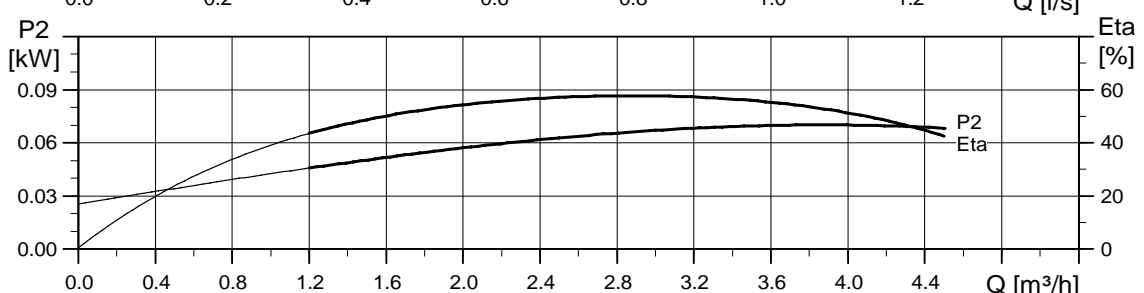
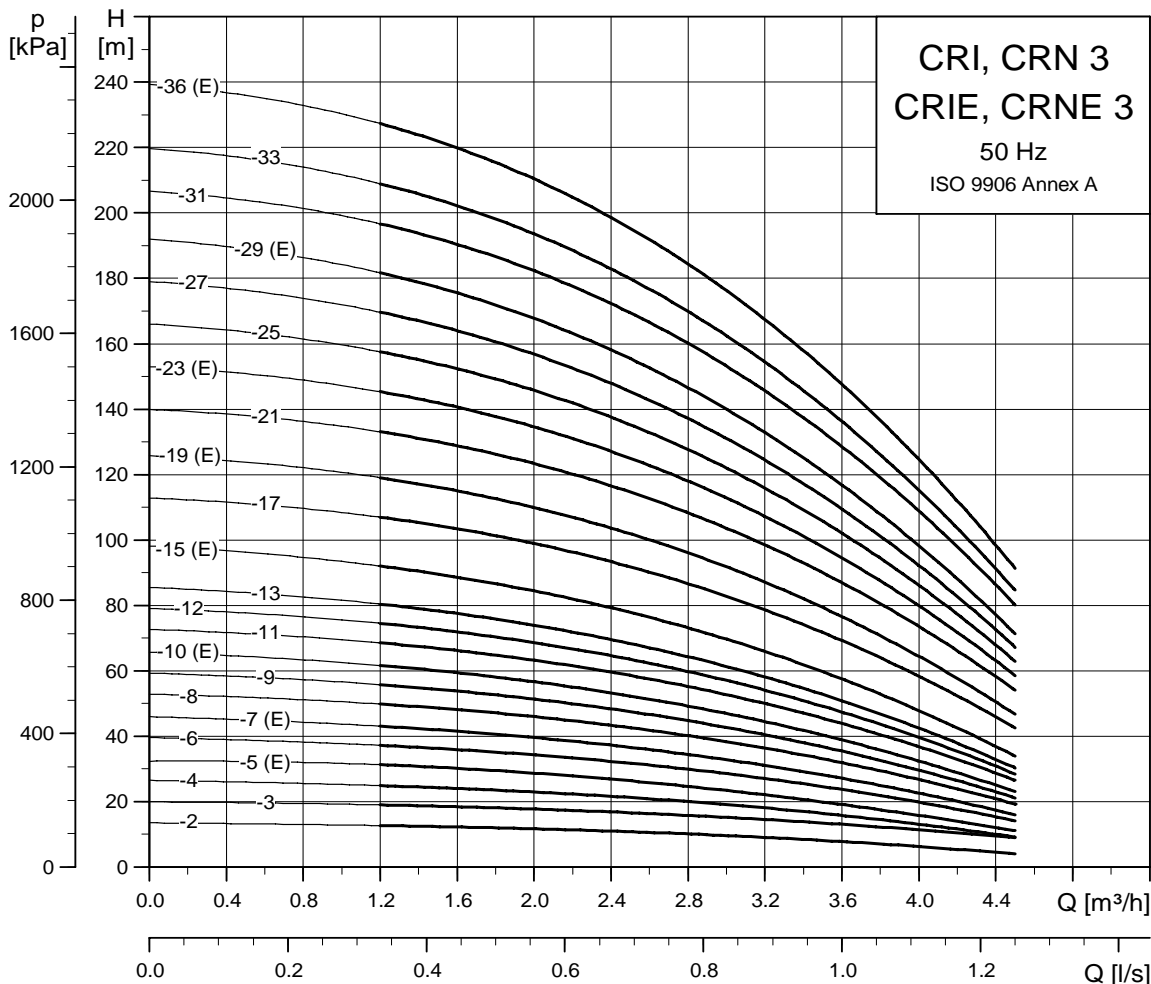
## CR, CRE 3



TM02 7292 3605

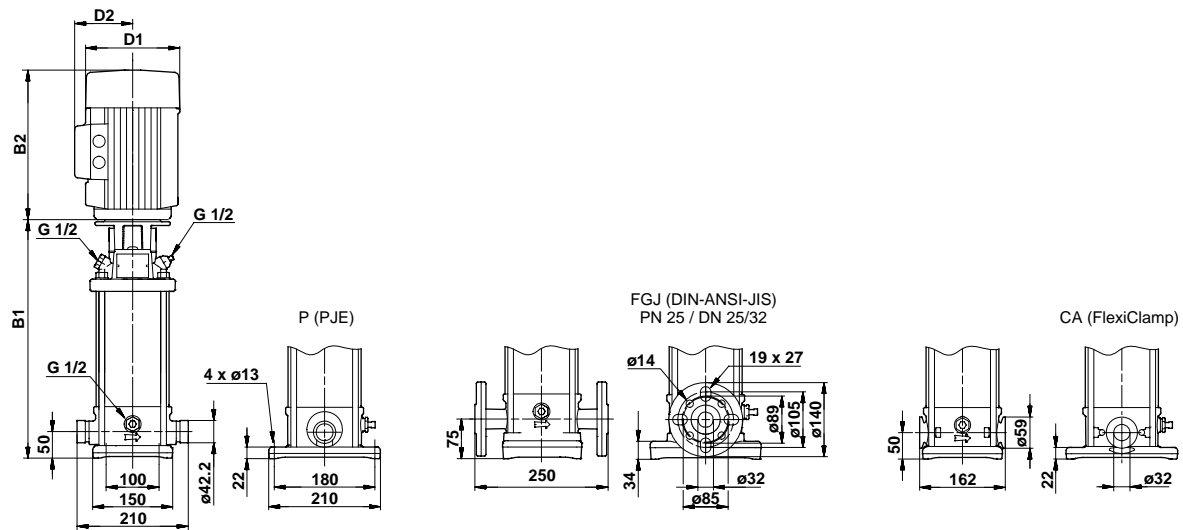


## CRI, CRN, CRIE, CRNE 3



TM02 7293 3605

## Dimensional sketch

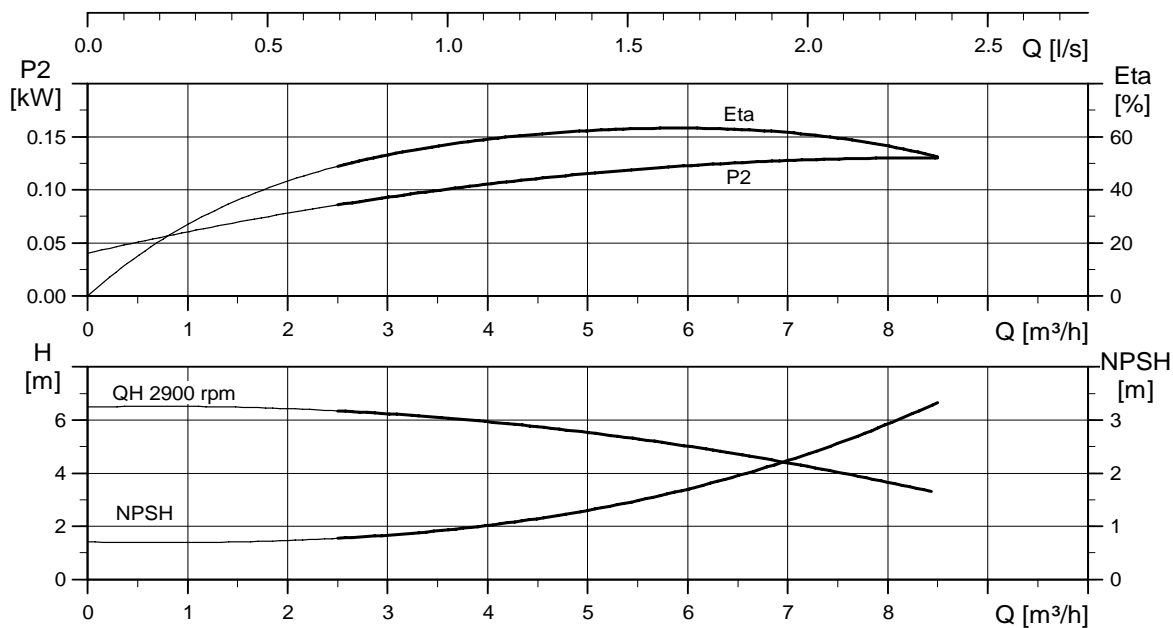
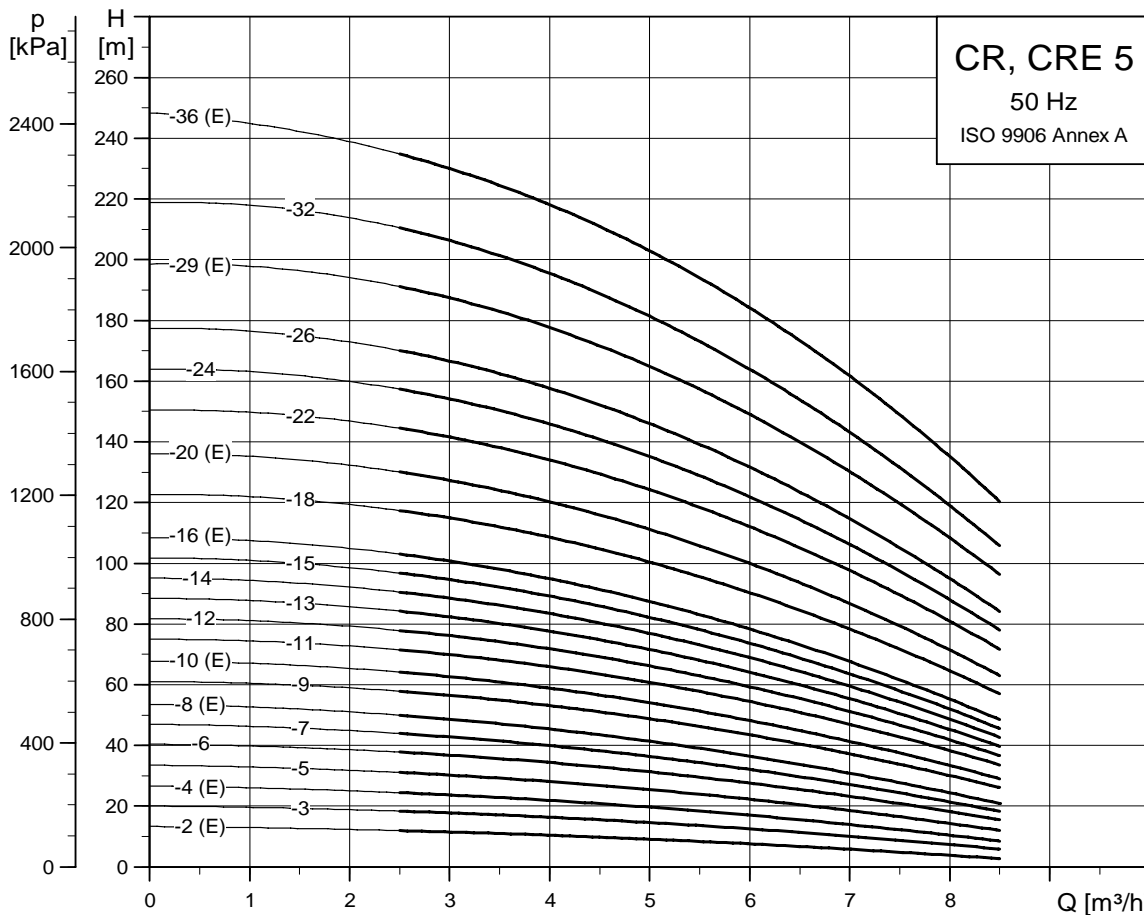


TM03 1722 2805

## Dimensions and weights

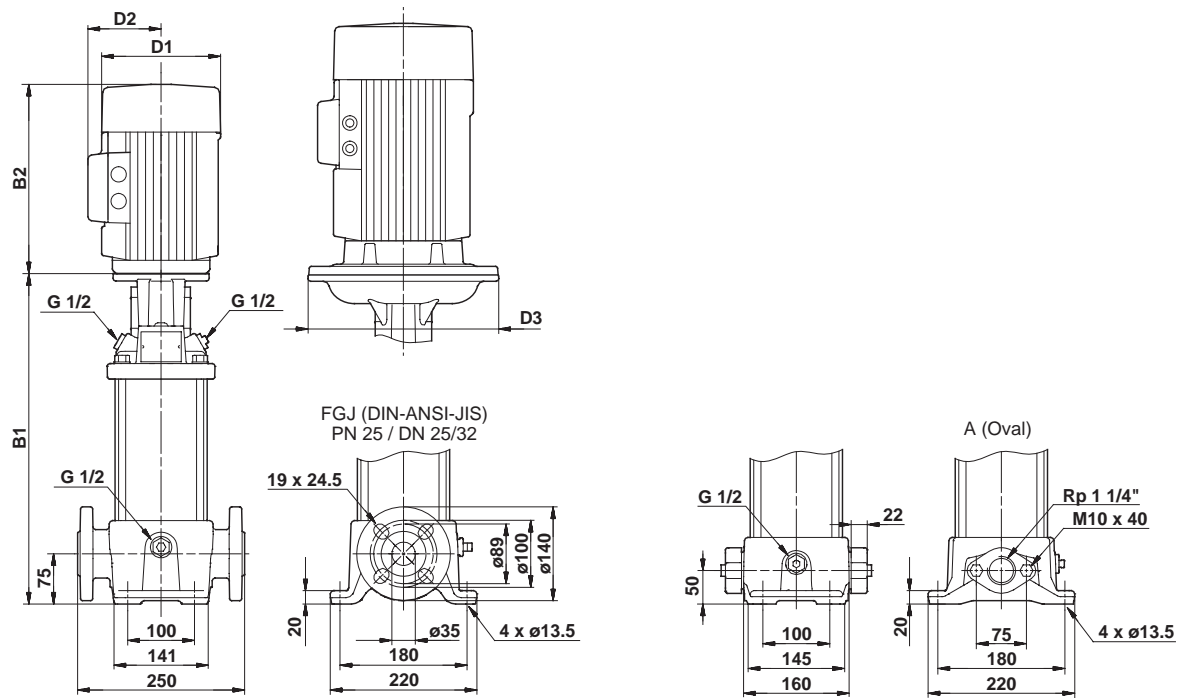
Pump type	Motor P <sub>2</sub> [kW]	CRI/CRN								CRIE/CRNE							
		Dimension [mm]				Net weight [kg]				Dimension [mm]				Net weight [kg]			
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2	B1	B1+B2					B1	B1+B2						
CRI/CRN 3-2	0.37	257	448	282	473	141	109	16	20	-	-	-	-	-	-	-	-
CRI/CRN 3-3	0.37	257	448	282	473	141	109	16	21	-	-	-	-	-	-	-	-
CRI/CRN 3-4	0.37	275	466	300	491	141	109	17	21	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-5	0.37	293	484	318	509	141	109	17	21	293	484	318	509	141	140	20	24
CRI/CRN 3-6	0.55	311	502	336	527	141	109	18	23	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-7	0.55	329	520	354	545	141	109	19	23	329	520	354	545	141	140	21	26
CRI/CRN 3-8	0.75	353	584	378	609	141	109	21	26	-	-	-	-	-	-	-	-
CRI/CRN 3-9	0.75	371	602	396	627	141	109	22	26	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-10	0.75	389	620	414	645	141	109	22	26	389	620	414	645	178	167	25	29
CRI/CRN 3-11	1.1	407	638	432	663	141	109	25	29	-	-	-	-	-	-	-	-
CRI/CRN 3-12	1.1	425	656	450	681	141	109	25	29	-	-	-	-	-	-	-	-
CRI/CRN 3-13	1.1	443	674	468	699	141	109	26	30	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-15	1.1	479	710	504	735	141	109	26	31	479	710	504	735	178	167	29	33
CRI/CRN 3-17	1.5	531	812	556	837	178	110	34	38	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-19	1.5	567	848	592	873	178	110	34	39	567	848	592	873	178	167	41	45
CRI/CRN 3-21	2.2	603	924	628	949	178	110	36	40	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-23	2.2	639	960	664	985	178	110	37	41	639	960	664	985	178	167	47	51
CRI/CRN 3-25	2.2	675	996	700	1021	178	110	37	42	-	-	-	-	-	-	-	-
CRI/CRN 3-27	2.2	711	1032	736	1057	178	110	38	42	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-29	2.2	747	1068	772	1093	178	110	39	43	747	1068	772	1093	178	167	49	54
CRI/CRN 3-31	3	788	1123	813	1148	198	120	44	48	-	-	-	-	-	-	-	-
CRI/CRN 3-33	3	824	1159	849	1184	198	120	45	49	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 3-36	3	878	1213	903	1238	198	120	46	50	878	1213	903	1238	198	177	56	60

## CR, CRE 5



TM02 7294 3605

## Dimensional sketch

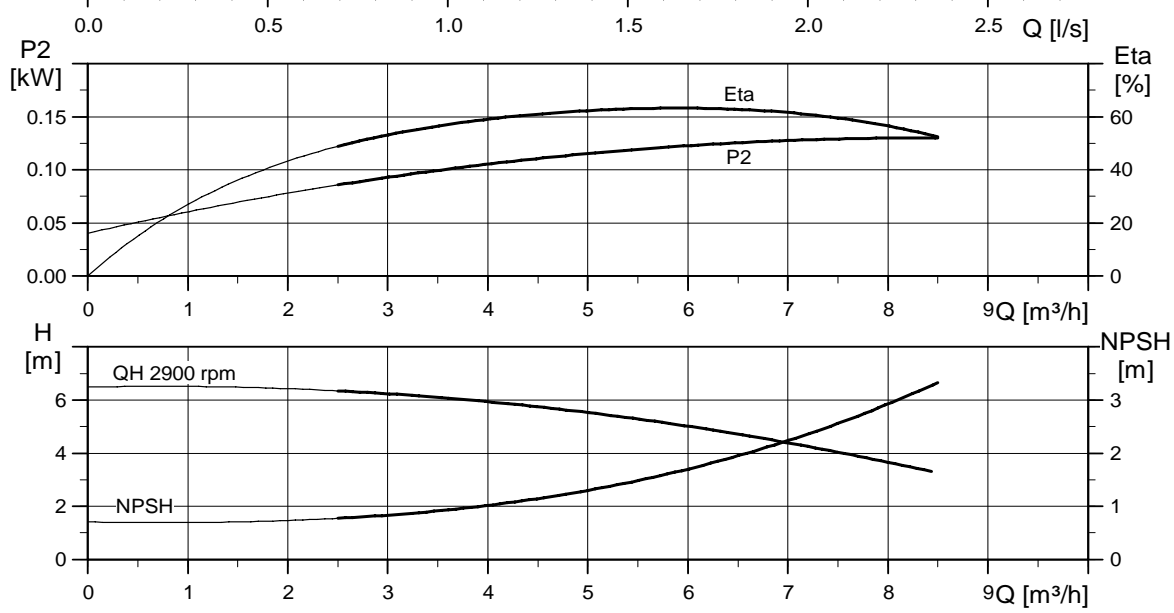
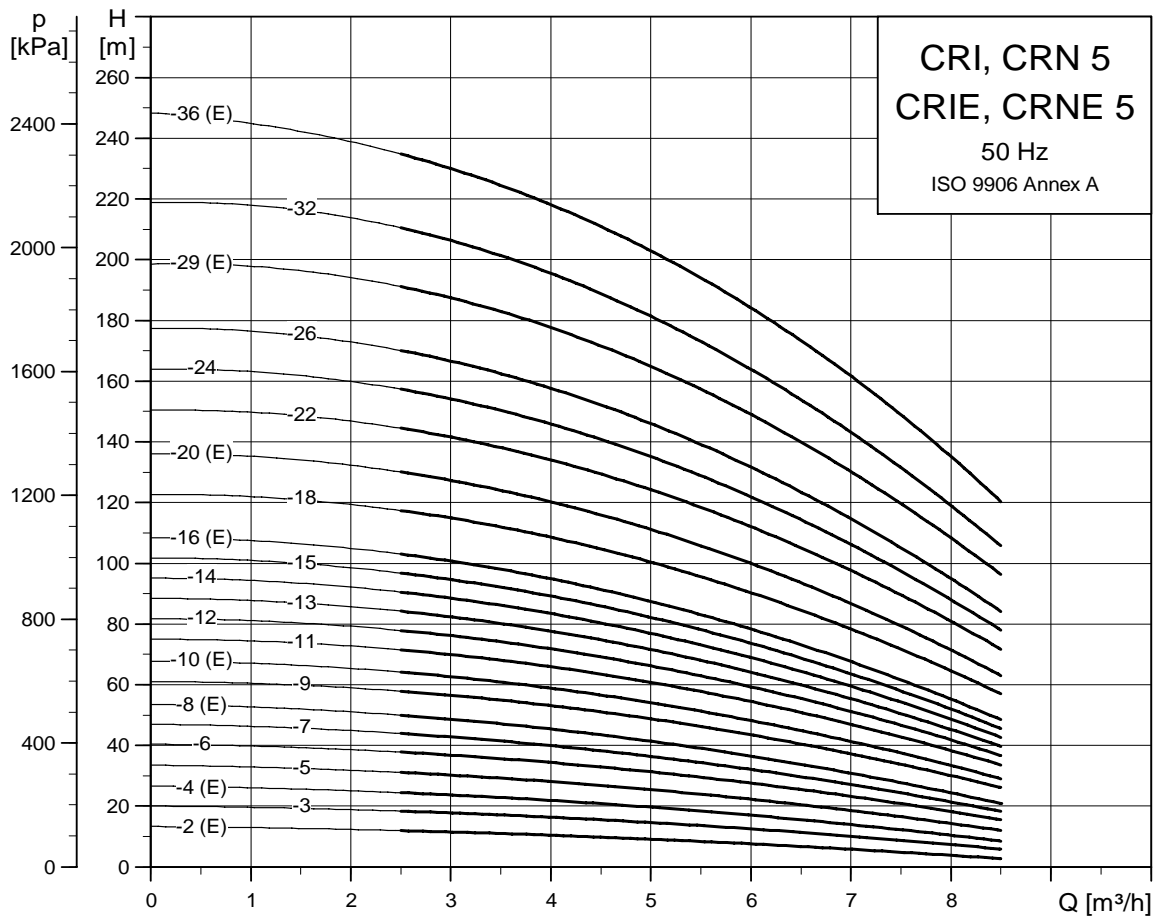


TM03 1723 2805

## Dimensions and weights

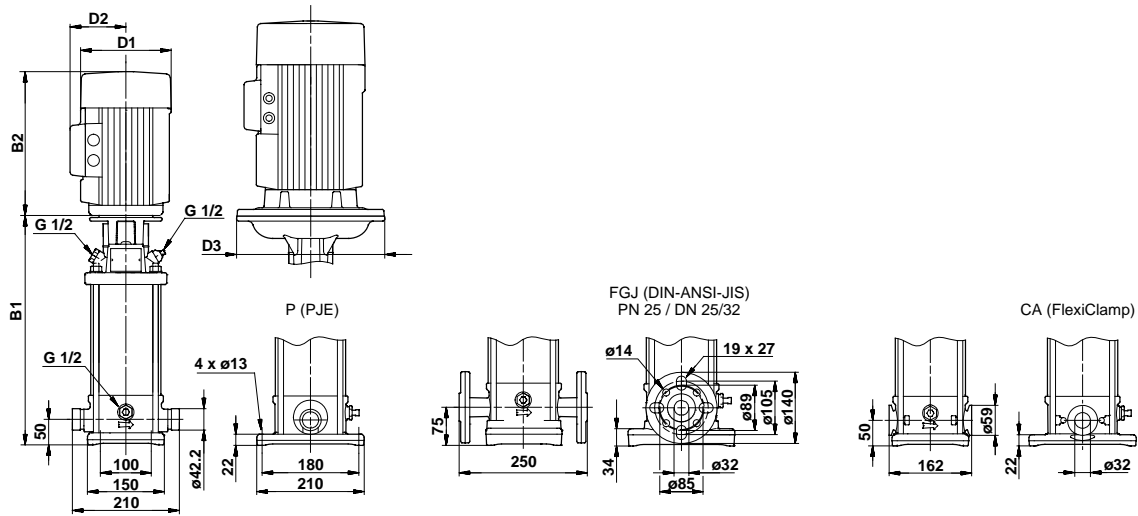
Pump type	Motor P <sub>2</sub> [kW]	CR									CRE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange		Oval flange		DIN flange		D1	D2	D3	Oval flange
B1	B1+B2	B1	B1+B2								B1	B1+B2	B1	B1+B2					
CR(E) 5-2	0.37	254	445	279	470	141	109	-	18	23	254	445	279	470	141	140	-	21	26
CR 5-3	0.55	281	472	306	497	141	109	-	20	24	-	-	-	-	-	-	-	-	-
CR(E) 5-4	0.55	308	499	333	524	141	109	-	20	25	308	499	333	524	141	140	-	23	27
CR(E) 5-5	0.75	341	572	366	597	141	109	-	22	27	341	572	366	597	178	167	-	25	30
CR 5-6	1.1	368	599	393	624	141	109	-	25	30	-	-	-	-	-	-	-	-	-
CR 5-7	1.1	395	626	420	651	141	109	-	26	30	-	-	-	-	-	-	-	-	-
CR(E) 5-8	1.1	422	653	447	678	141	109	-	26	31	422	653	447	678	178	167	-	28	33
CR 5-9	1.5	465	746	490	771	178	110	-	34	38	-	-	-	-	-	-	-	-	-
CR(E) 5-10	1.5	492	773	517	798	178	110	-	34	39	492	773	517	798	178	167	-	41	46
CR 5-11	2.2	519	840	544	865	178	110	-	36	40	-	-	-	-	-	-	-	-	-
CR 5-12	2.2	546	867	571	892	178	110	-	36	41	-	-	-	-	-	-	-	-	-
CR 5-13	2.2	573	894	598	919	178	110	-	37	41	-	-	-	-	-	-	-	-	-
CR 5-14	2.2	600	921	625	946	178	110	-	37	42	-	-	-	-	-	-	-	-	-
CR 5-15	2.2	627	948	652	973	178	110	-	38	43	-	-	-	-	-	-	-	-	-
CR(E) 5-16	2.2	654	975	679	1000	178	110	-	38	43	654	975	679	1000	178	167	-	49	53
CR 5-18	3	712	1047	737	1072	198	120	-	44	48	-	-	-	-	-	-	-	-	-
CR(E) 5-20	3	766	1101	791	1126	198	120	-	45	50	766	1101	791	1126	198	177	-	55	60
CR 5-22	4	820	1192	845	1217	220	134	-	57	62	-	-	-	-	-	-	-	-	-
CR 5-24	4	-	-	899	1271	220	134	-	-	63	-	-	-	-	-	-	-	-	-
CR 5-26	4	-	-	953	1325	220	134	-	-	64	-	-	-	-	-	-	-	-	-
CR(E) 5-29	4	-	-	1034	1406	220	134	-	-	66	-	-	1034	1406	220	188	-	-	76
CR 5-32	5.5	-	-	1145	1536	220	134	300	-	82	-	-	-	-	-	-	-	-	-
CR(E) 5-36	5.5	-	-	1253	1644	220	134	300	-	84	-	-	1253	1644	220	188	-	-	91

## CRI, CRN, CRIE, CRNE 5



TM02 7295 3605

## Dimensional sketch

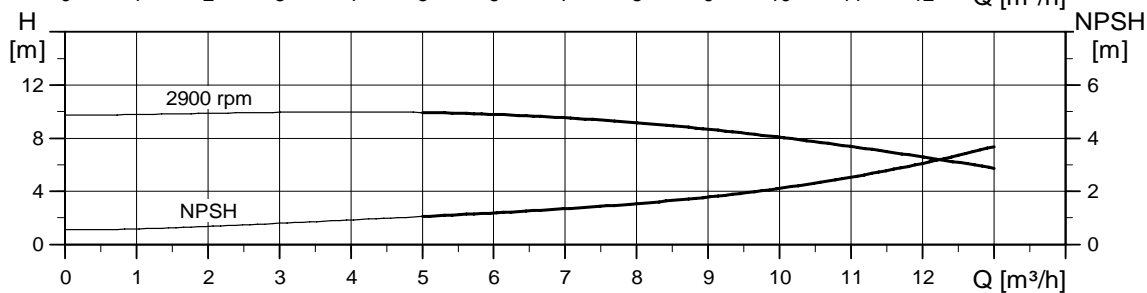
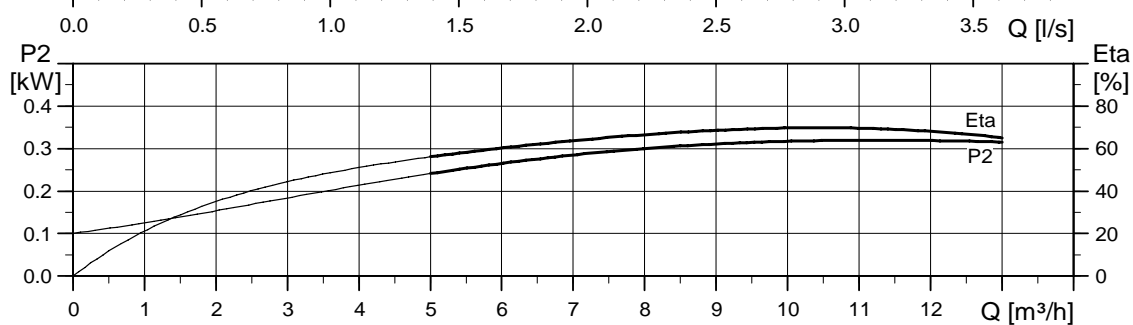
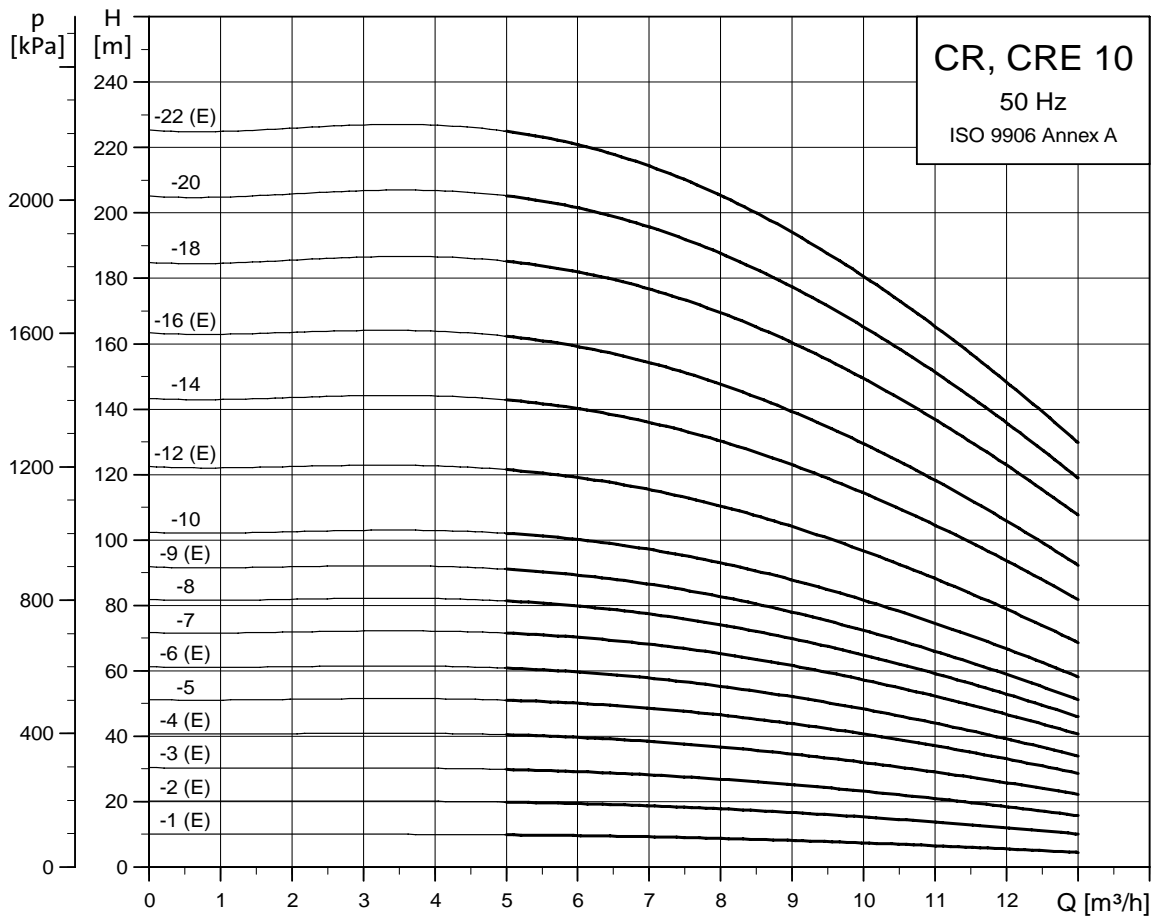


TM03 1724 2805

## Dimensions and weights

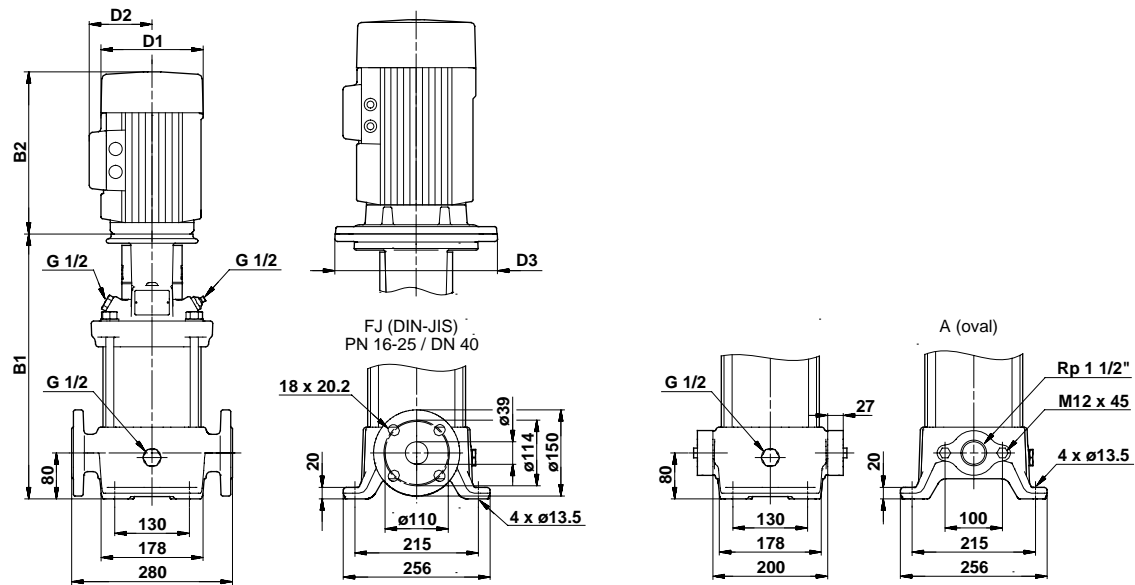
Pump type	Motor P <sub>2</sub> [kW]	CRI/CRN										CRIE/CRNE									
		Dimension [mm]								Net weight [kg]		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange		
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2							
CRI(E)/CRN(E) 5-2	0.37	257	448	282	473	141	109	-	16	21	257	448	282	473	141	140	-	19	23		
CRI/CRN 5-3	0.55	284	475	309	500	141	109	-	18	22	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-4	0.55	311	502	336	527	141	109	-	18	22	311	502	336	527	141	140	-	21	25		
CRI/CRN(E) 5-5	0.75	344	575	369	600	141	109	-	21	25	344	575	369	600	178	167	-	23	27		
CRI/CRN 5-6	1.1	371	602	396	627	141	109	-	24	28	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-7	1.1	398	629	423	654	141	109	-	24	28	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-8	1.1	425	656	450	681	141	109	-	25	29	425	656	450	681	178	167	-	27	31		
CRI/CRN 5-9	1.5	468	749	493	774	178	110	-	32	36	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-10	1.5	495	776	520	801	178	110	-	32	37	495	776	520	801	178	167	-	39	43		
CRI/CRN 5-11	2.2	522	843	547	868	178	110	-	34	38	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-12	2.2	549	870	574	895	178	110	-	34	38	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-13	2.2	576	897	601	922	178	110	-	35	39	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-14	2.2	603	924	628	949	178	110	-	35	40	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-15	2.2	630	951	655	976	178	110	-	36	40	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-16	2.2	657	978	682	1003	178	110	-	36	41	657	978	682	1003	178	167	-	47	51		
CRI/CRN 5-18	3	716	1051	741	1076	198	120	-	42	46	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-20	3	770	1105	795	1130	198	120	-	43	47	770	1105	795	1130	198	177	-	53	57		
CRI/CRN 5-22	4	824	1196	849	1221	220	134	-	55	59	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-24	4	878	1250	903	1275	220	134	-	56	61	-	-	-	-	-	-	-	-	-		
CRI/CRN 5-26	4	932	1304	957	1329	220	134	-	58	62	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-29	4	1013	1385	1038	1410	220	134	-	59	64	1013	1385	1038	1410	220	188	-	70	74		
CRI/CRN 5-32	5.5	1123	1514	1148	1539	220	134	300	75	79	-	-	-	-	-	-	-	-	-		
CRI(E)/CRN(E) 5-36	5.5	1231	1622	1256	1647	220	134	300	77	81	1231	1622	1256	1647	220	188	-	84	88		

## CR, CRE 10



TM02 7296 3605

## Dimensional sketch

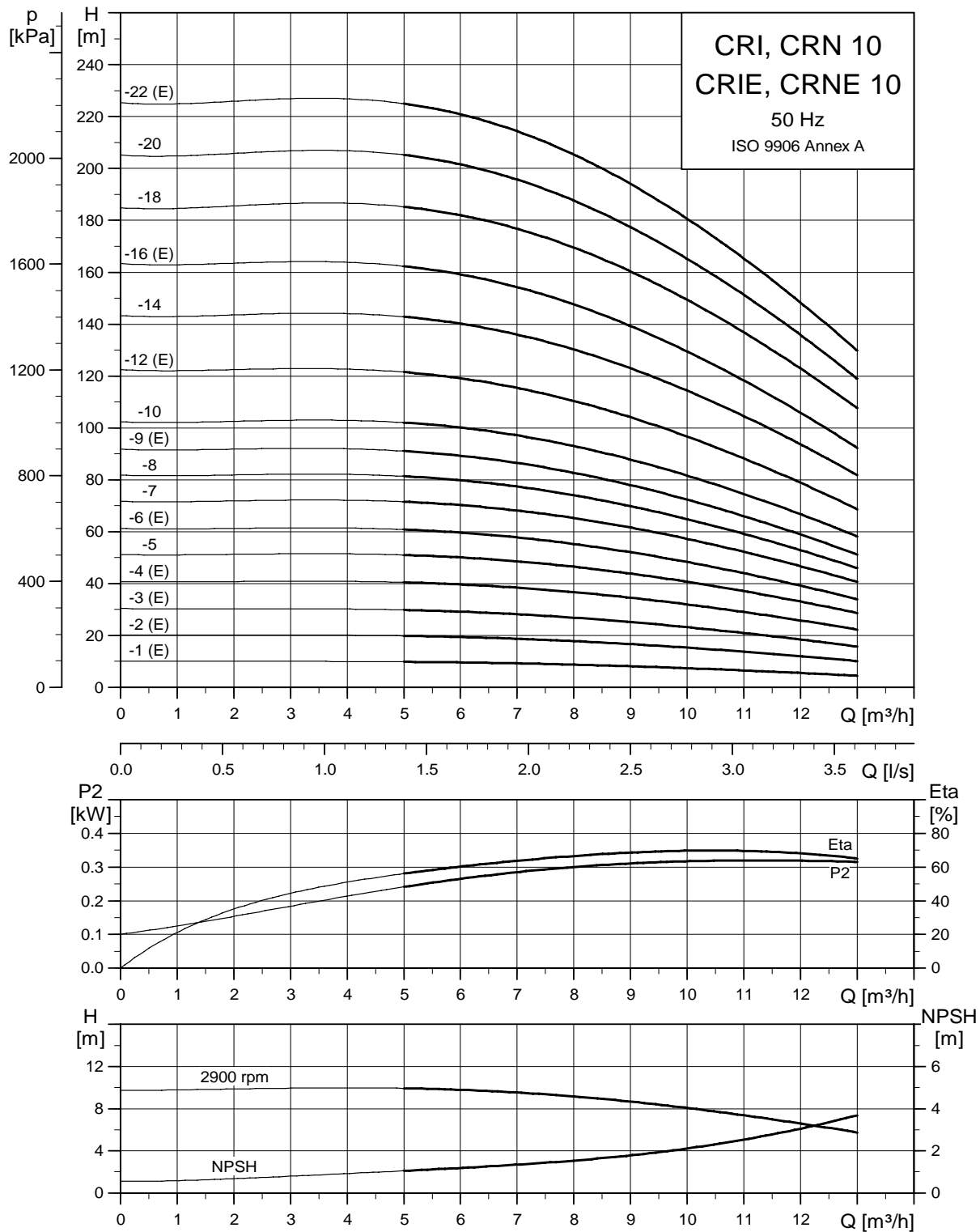


TM03 1725 2805

## Dimensions and weights

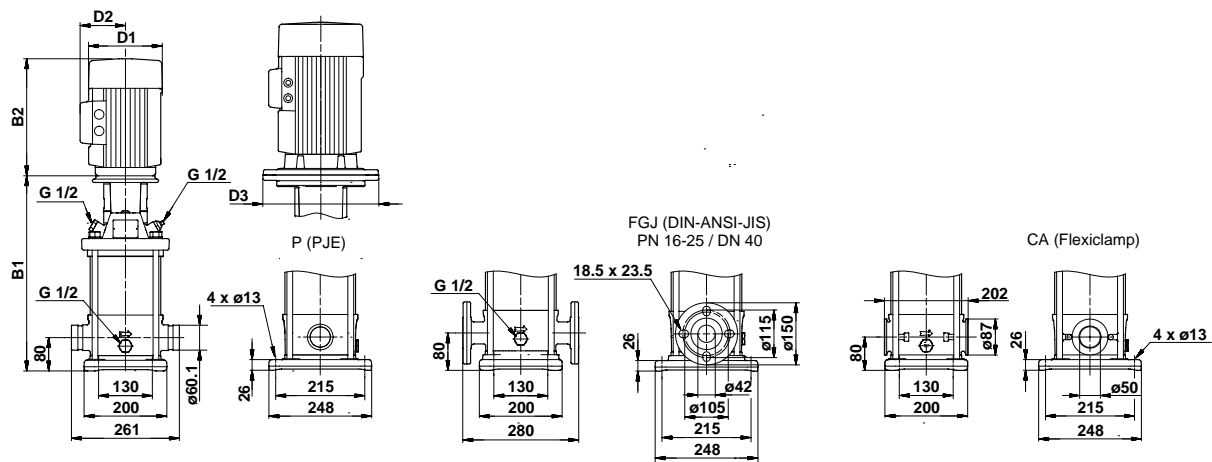
Pump type	Motor P <sub>2</sub> [kW]	CR										CRE									
		Dimension [mm]								Net weight [kg]		Dimension [mm]								Net weight [kg]	
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange		
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2							
CR(E) 10-1	0.37	343	534	343	534	141	109	-	31	34	343	534	343	534	141	140	-	34	37		
CR(E) 10-2	0.75	347	578	347	578	141	109	-	34	36	347	578	347	578	178	167	-	36	39		
CR(E) 10-3	1.1	377	608	377	608	141	109	-	37	39	377	608	377	608	178	167	-	39	42		
CR(E) 10-4	1.5	423	704	423	704	178	110	-	45	47	423	704	423	704	178	167	-	52	54		
CR 10-5	2.2	453	774	453	774	178	110	-	46	49	-	-	-	-	-	-	-	-	-		
CR(E) 10-6	2.2	483	804	483	804	178	110	-	47	50	483	804	483	804	178	167	-	58	60		
CR 10-7	3	518	853	518	853	198	120	-	52	55	-	-	-	-	-	-	-	-	-		
CR 10-8	3	548	883	548	883	198	120	-	53	56	-	-	-	-	-	-	-	-	-		
CR(E) 10-9	3	578	913	578	913	198	120	-	54	57	578	913	578	913	198	177	-	64	67		
CR 10-10	4	608	980	608	980	220	134	-	66	69	-	-	-	-	-	-	-	-	-		
CR(E) 10-12	4	668	1040	668	1040	220	134	-	69	71	668	1040	668	1040	220	188	-	79	81		
CR 10-14	5.5	760	1151	760	1151	220	134	300	91	94	-	-	-	-	-	-	-	-	-		
CR(E) 10-16	5.5	820	1211	820	1211	220	134	300	93	96	820	1211	820	1211	220	188	298	100	102		
CR 10-18	7.5	-	-	880	1271	220	134	300	-	101	-	-	-	-	-	-	-	-	-		
CR 10-20	7.5	-	-	940	1331	220	134	300	-	103	-	-	-	-	-	-	-	-	-		
CR(E) 10-22	7.5	-	-	1000	1391	220	134	300	-	105	-	-	1000	1391	220	188	298	-	113		

## CRI, CRN, CRIE, CRNE 10



TM02 7297 3605

## Dimensional sketch

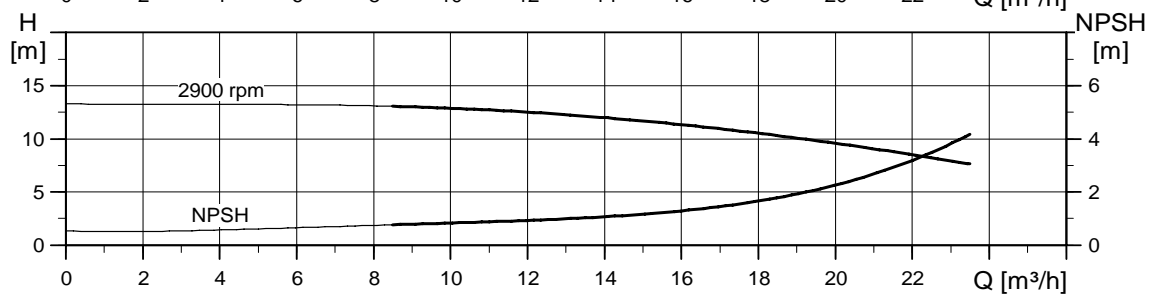
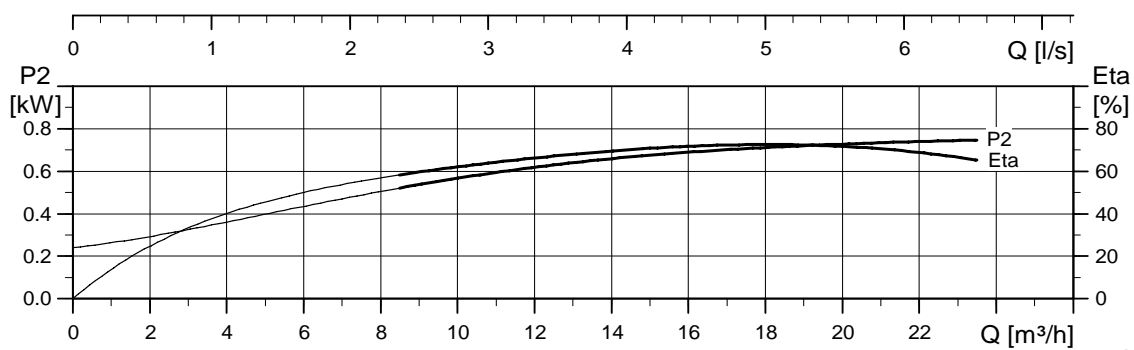
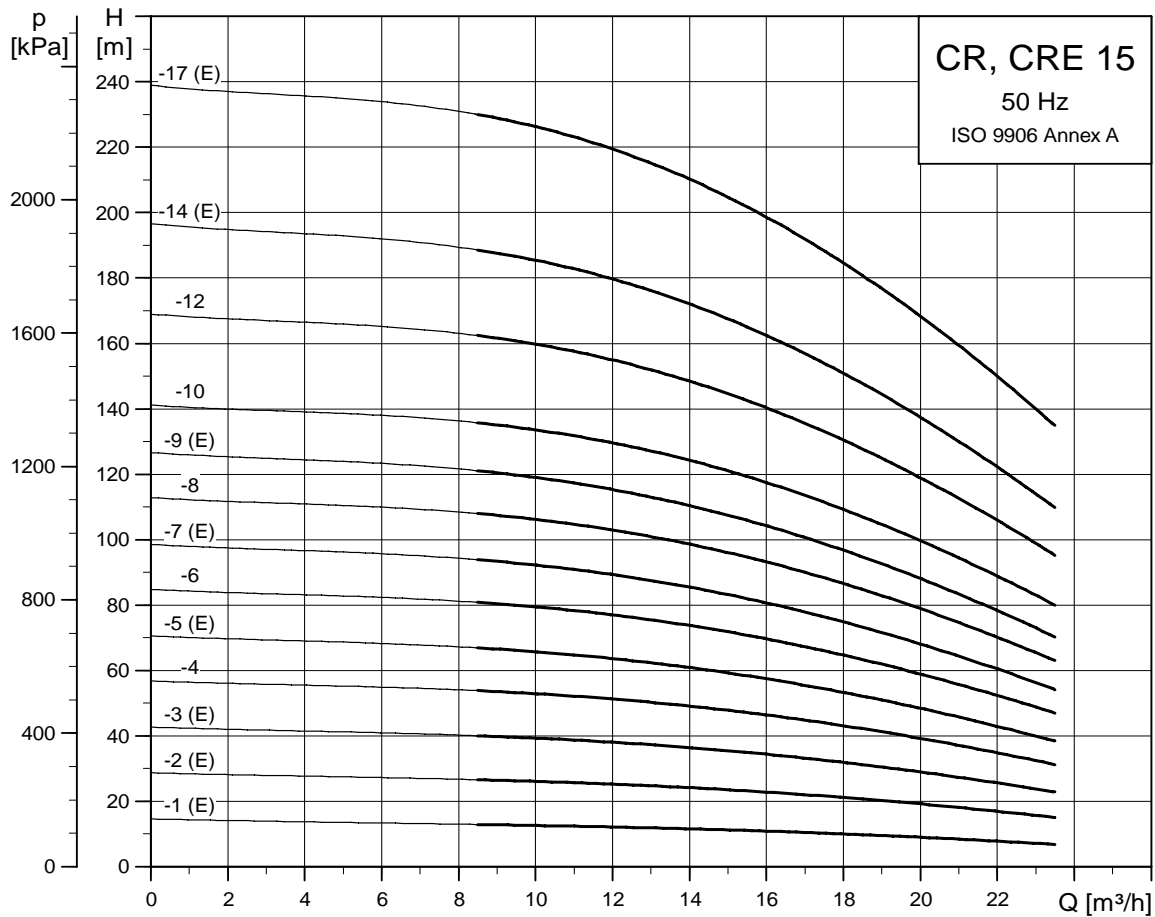


TM03 2498 4405

## Dimensions and weights

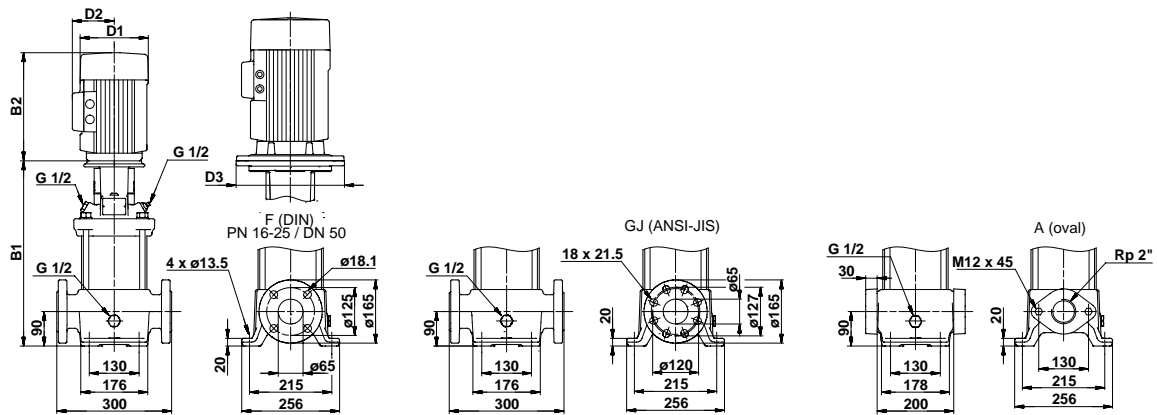
Pump type	Motor P <sub>2</sub> [kW]	CRI/CRN										CRIE/CRNE								
		Dimension [mm]									Net weight [kg]		Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2						
CRI(E)/CRN(E) 10-1	0.37	353	544	353	544	141	109	-	28	32	353	544	353	544	141	140	-	31	35	
CRI(E)/CRN(E) 10-2	0.75	357	588	357	588	141	109	-	31	34	357	588	357	588	178	167	-	33	37	
CRI(E)/CRN(E) 10-3	1.1	387	618	387	618	141	109	-	34	38	387	618	387	618	178	167	-	37	40	
CRI(E)/CRN(E) 10-4	1.5	433	714	433	714	178	110	-	42	46	433	714	433	714	178	167	-	49	53	
CRI/CRN 10-5	2.2	463	784	463	784	178	110	-	44	48	-	-	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 10-6	2.2	493	814	493	814	178	110	-	45	49	493	814	493	814	178	167	-	55	59	
CRI/CRN 10-7	3	528	863	528	863	198	120	-	50	54	-	-	-	-	-	-	-	-	-	
CRI/CRN 10-8	3	558	893	558	893	198	120	-	52	55	-	-	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 10-9	3	588	923	588	923	198	120	-	53	56	588	923	588	923	198	177	-	63	66	
CRI/CRN 10-10	4	618	990	618	990	220	134	-	65	68	-	-	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 10-12	4	678	1050	678	1050	220	134	-	67	70	678	1050	678	1050	220	188	-	77	81	
CRI/CRN 10-14	5.5	770	1161	770	1161	220	134	300	89	93	-	-	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 10-16	5.5	830	1221	830	1221	220	134	300	91	95	830	1221	830	1221	220	188	298	98	102	
CRI/CRN 10-18	7.5	890	1281	890	1281	220	134	300	96	99	-	-	-	-	-	-	-	-	-	
CRI/CRN 10-20	7.5	950	1341	950	1341	220	134	300	98	101	-	-	-	-	-	-	-	-	-	
CRI(E)/CRN(E) 10-22	7.5	1010	1401	1010	1401	220	134	300	100	104	1010	1401	1010	1401	220	188	298	108	111	

## CR, CRE 15



TM02 7298 3605

## Dimensional sketch

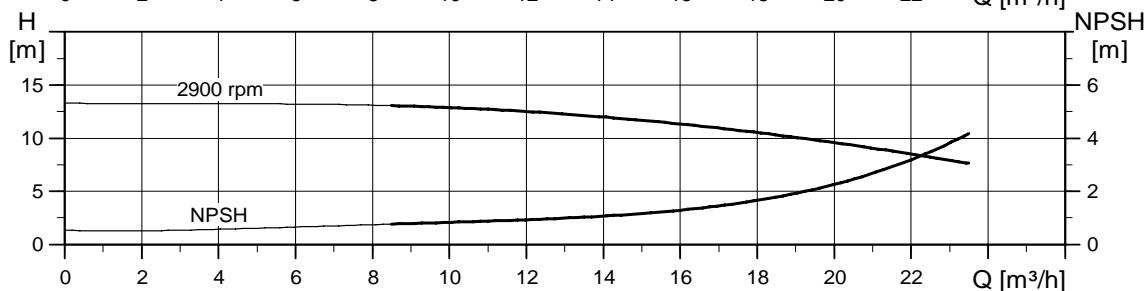
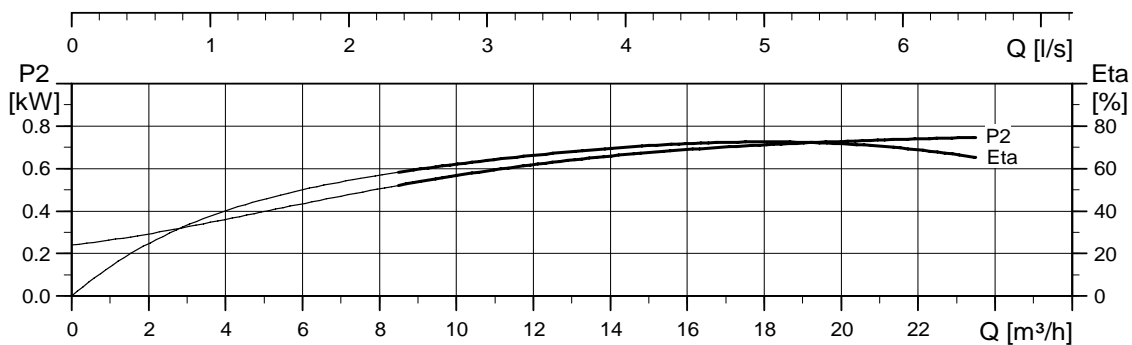
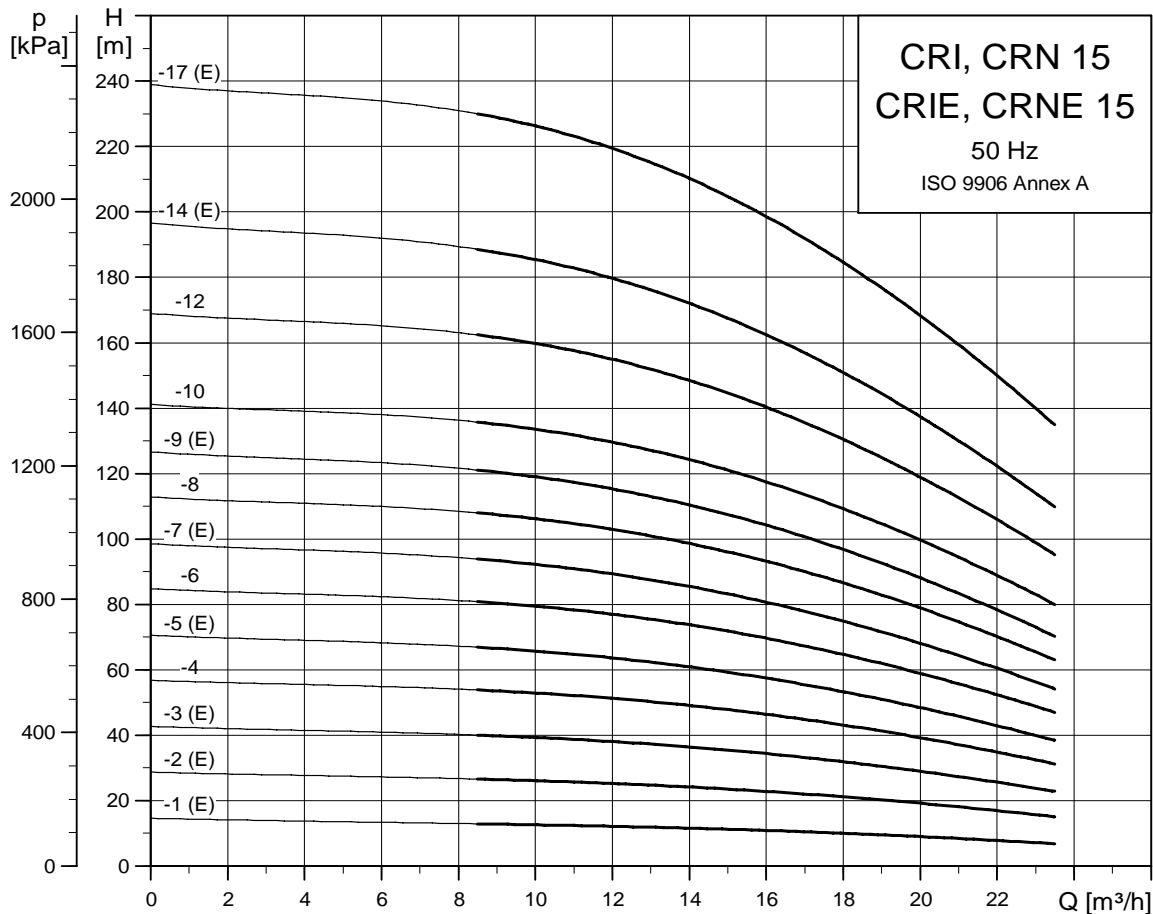


TM03 1727 2805

## Dimensions and weights

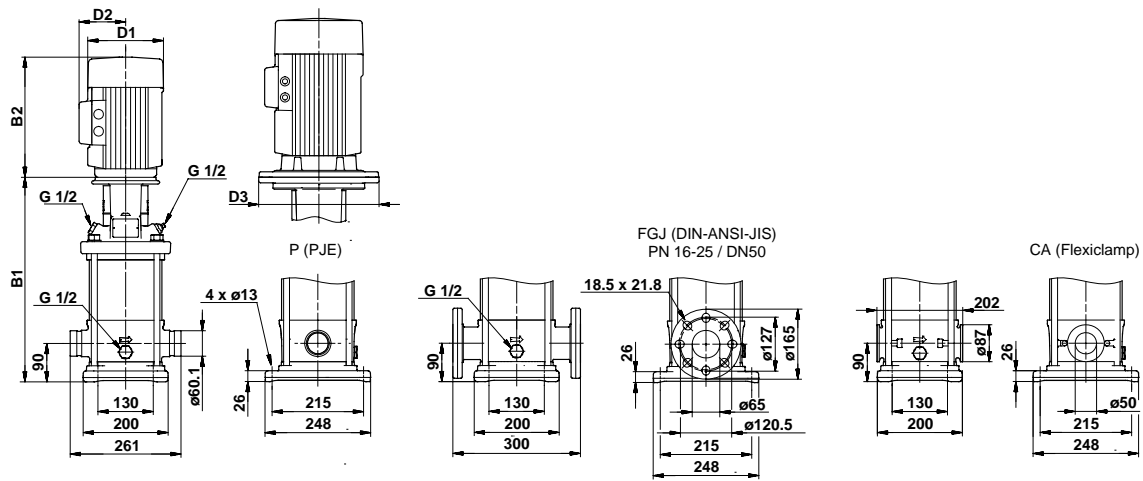
Pump type	Motor P <sub>2</sub> [kW]	CR										CRE									
		Dimension [mm]						Net weight [kg]				Dimension [mm]						Net weight [kg]			
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange		
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2							
CR(E) 15-1	1.1	400	631	400	631	141	109	-	41	42	400	631	400	631	178	167	-	44	45		
CR(E) 15-2	2.2	415	736	415	736	178	110	-	49	50	415	736	415	736	178	167	270	59	60		
CR(E) 15-3	3	465	800	465	800	198	120	-	54	55	465	800	465	800	198	177	270	64	65		
CR 15-4	4	510	882	510	882	220	134	-	67	68	-	-	-	-	-	-	-	-	-		
CR(E) 15-5	4	555	927	555	927	220	134	-	68	69	555	927	555	927	220	188	270	78	79		
CR 15-6	5.5	632	1023	632	1023	220	134	300	90	91	-	-	-	-	-	-	-	-	-		
CR(E) 15-7	5.5	677	1068	677	1068	220	134	300	92	93	677	1068	677	1068	220	188	298	99	100		
CR 15-8	7.5	-	-	722	1113	220	134	300	-	97	-	-	-	-	-	-	-	-	-		
CR(E) 15-9	7.5	-	-	767	1158	220	134	300	-	98	-	-	767	1158	220	188	298	-	106		
CR 15-10	11	-	-	889	1388	260	172	350	-	130	-	-	-	-	-	-	-	-	-		
CR 15-12	11	-	-	979	1478	260	172	350	-	134	-	-	-	-	-	-	-	-	-		
CR(E) 15-14	11	-	-	1069	1568	260	172	350	-	138	-	-	1084	1533	258	359	350	-	205		
CR(E) 15-17	15	-	-	1204	1682	320	197	350	-	157	-	-	1219	1680	313	377	350	-	227		

## CRI, CRN, CRIE, CRNE 15



TM02 7299 3605

## Dimensional sketch

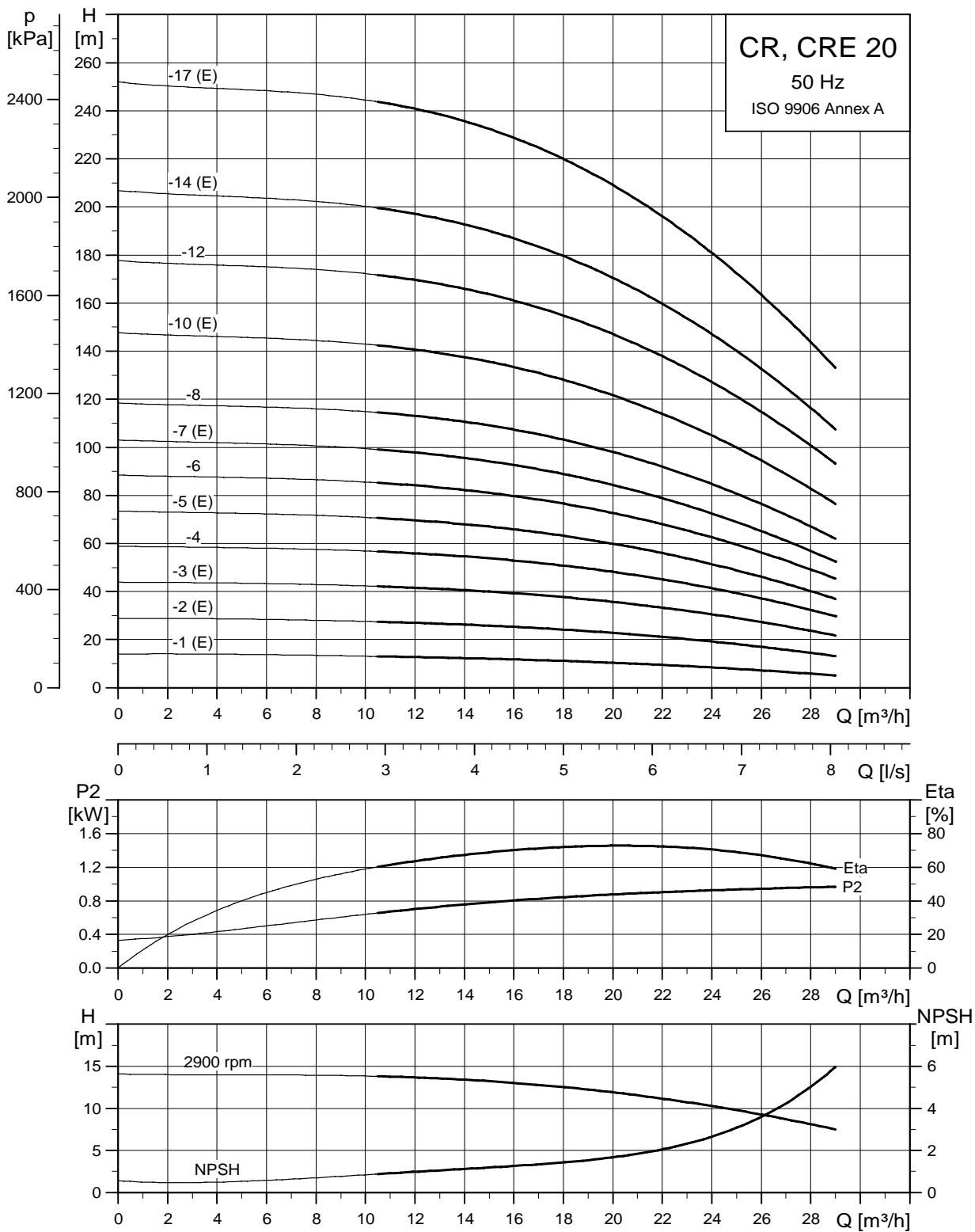


TM03 1728 2805

## Dimensions and weights

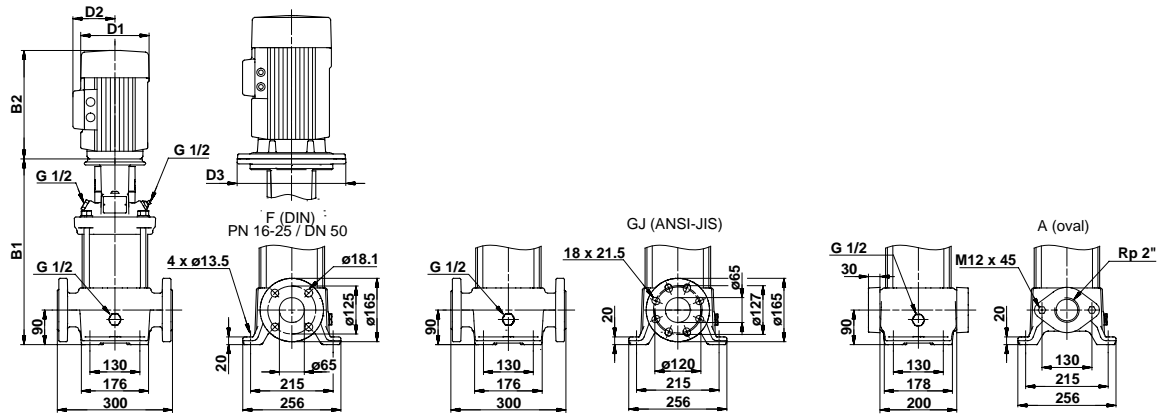
Pump type	Motor P <sub>2</sub> [kW]	CR/CRN									CRIE/CRNE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CRI(E)/CRN(E) 15-1	1.1	397	628	397	628	141	109	-	34	39	397	628	397	628	178	167	-	37	42
CRI(E)/CRN(E) 15-2	2.2	413	734	413	734	178	110	-	42	47	413	734	413	734	178	167	270	53	57
CRI(E)/CRN(E) 15-3	3	463	798	463	798	198	120	-	48	53	463	798	463	798	198	177	270	58	63
CR/CRN 15-4	4	508	880	508	880	220	134	-	61	65	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 15-5	4	553	925	553	925	220	134	-	62	67	553	925	553	925	220	188	270	72	77
CR/CRN 15-6	5.5	630	1021	630	1021	220	134	300	84	89	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 15-7	5.5	675	1066	675	1066	220	134	300	86	90	675	1066	675	1066	220	188	298	92	97
CR/CRN 15-8	7.5	720	1111	720	1111	220	134	300	89	94	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 15-9	7.5	765	1156	765	1156	220	134	300	91	96	765	1156	765	1156	220	188	298	99	104
CR/CRN 15-10	11	887	1386	887	1386	260	172	350	123	128	-	-	-	-	-	-	-	-	-
CR/CRN 15-12	11	977	1476	977	1476	260	172	350	126	131	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 15-14	11	1067	1566	1067	1566	260	172	350	130	134	1082	1531	1082	1531	258	359	350	197	202
CRI(E)/CRN(E) 15-17	15	1202	1680	1202	1680	320	197	350	149	153	1217	1678	1217	1678	313	377	350	219	224

## CR, CRE 20



TM02 7300 3605

## Dimensional sketch

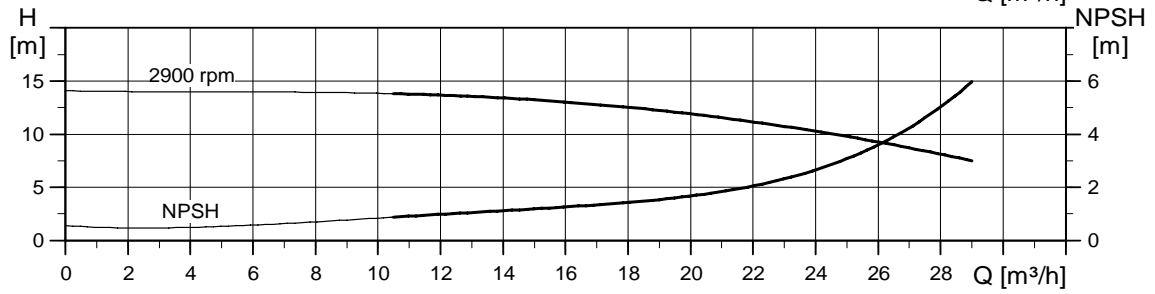
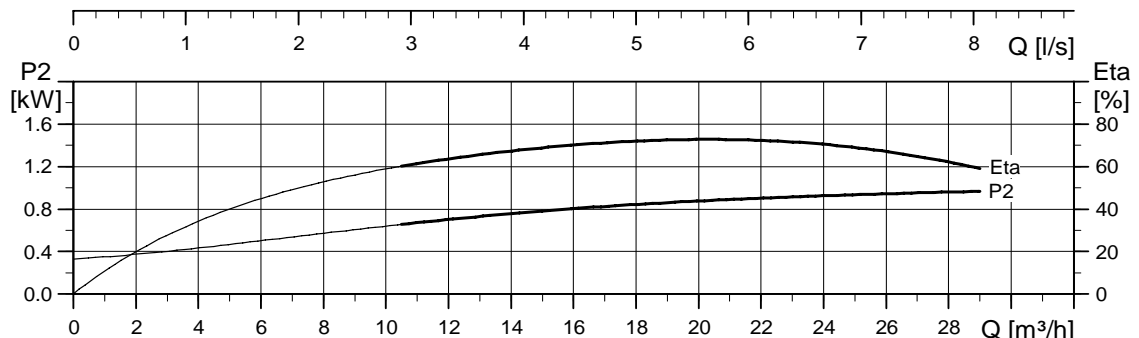
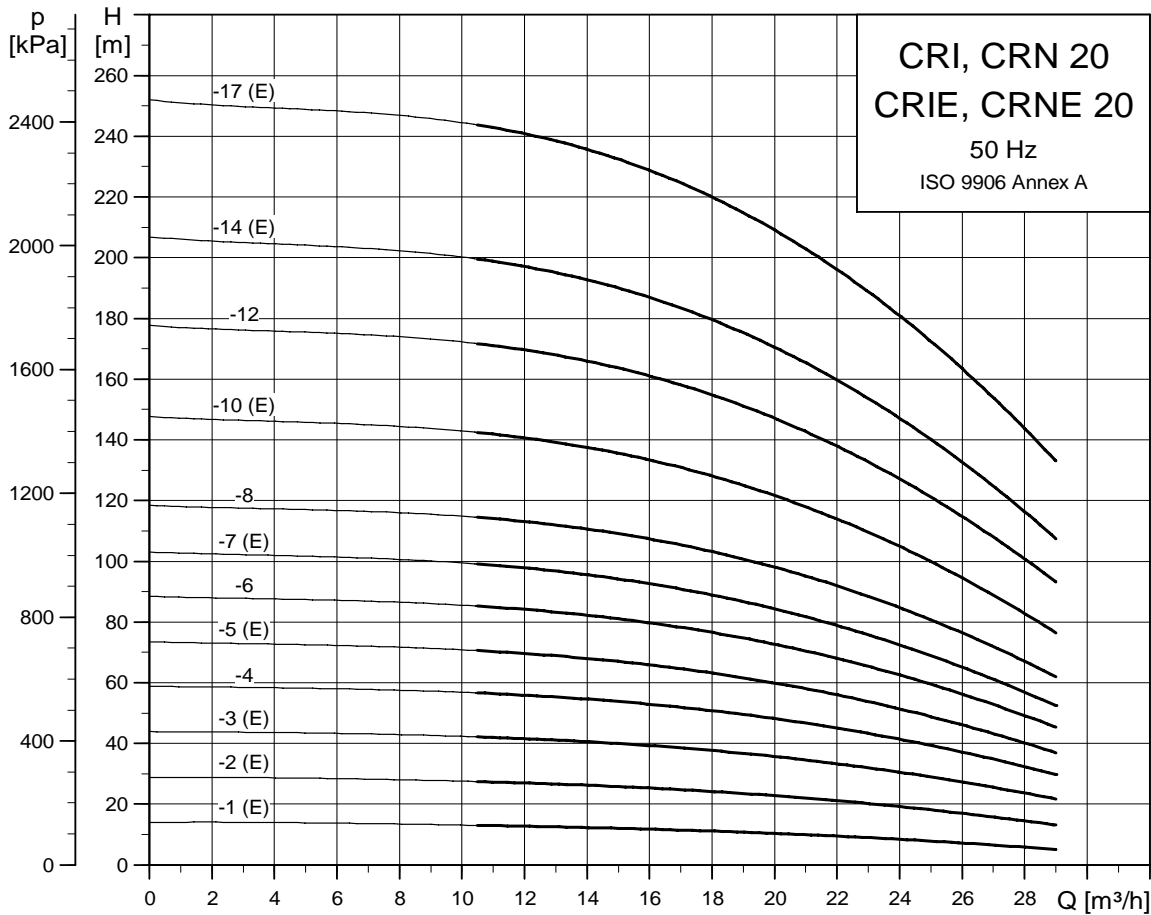


TM03 1727 2805

## Dimensions and weights

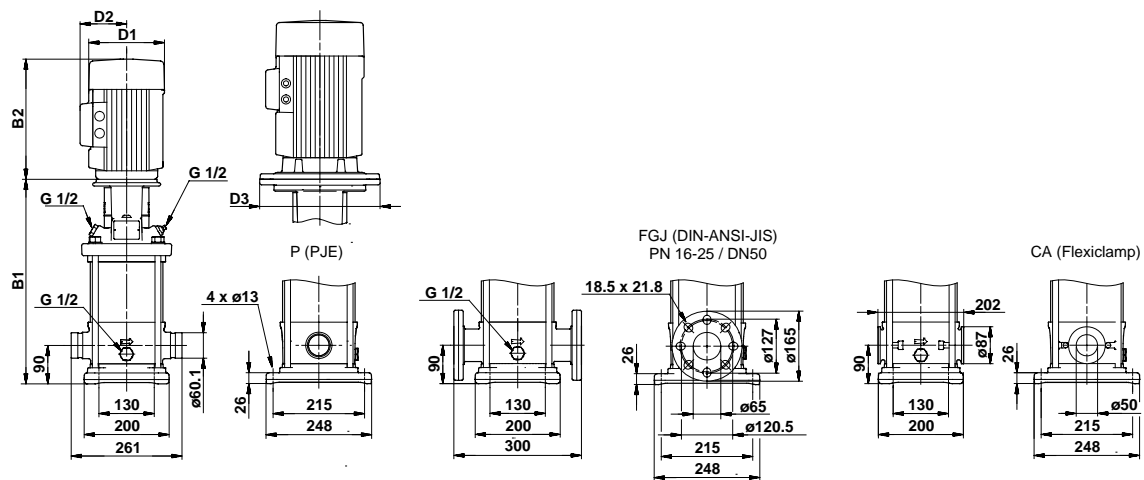
Pump type	Motor P <sub>2</sub> [kW]	CR									CRE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange	Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CR(E) 20-1	1.1	400	631	400	631	141	109	-	41	42	400	631	400	631	178	167	-	44	45
CR(E) 20-2	2.2	415	736	415	736	178	110	-	49	50	415	736	415	736	178	167	-	59	60
CR(E) 20-3	4	465	837	465	837	220	134	-	65	66	465	837	465	837	220	188	-	75	76
CR 20-4	5.5	542	933	542	933	220	134	300	87	88	-	-	-	-	-	-	-	-	-
CR(E) 20-5	5.5	587	978	587	978	220	134	300	89	90	587	978	587	978	220	188	298	95	96
CR 20-6	7.5	632	1023	632	1023	220	134	300	92	93	-	-	-	-	-	-	-	-	-
CR(E) 20-7	7.5	677	1068	677	1068	220	134	300	94	95	677	1068	677	1068	220	188	298	102	103
CR 20-8	11	-	-	799	1298	260	172	350	-	127	-	-	-	-	-	-	-	-	-
CR(E) 20-10	11	-	-	889	1388	260	172	350	-	130	-	-	904	1353	258	359	350	-	198
CR 20-12	15	-	-	979	1457	320	197	350	-	148	-	-	-	-	-	-	-	-	-
CR(E) 20-14	15	-	-	1069	1547	320	197	350	-	152	-	-	1084	1545	313	377	350	-	222
CR(E) 20-17	18.5	-	-	1204	1722	320	197	350	-	187	-	-	1219	1718	313	377	350	-	262

## CRI, CRN, CRIE, CRNE 20



TM02 7301 3605

## Dimensional sketch

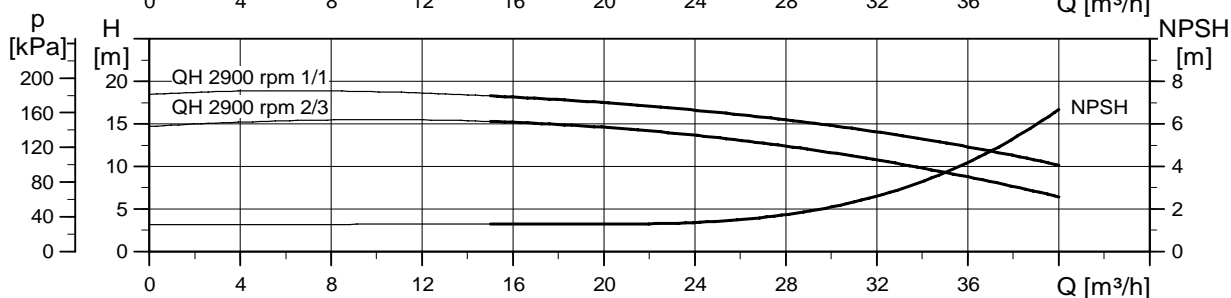
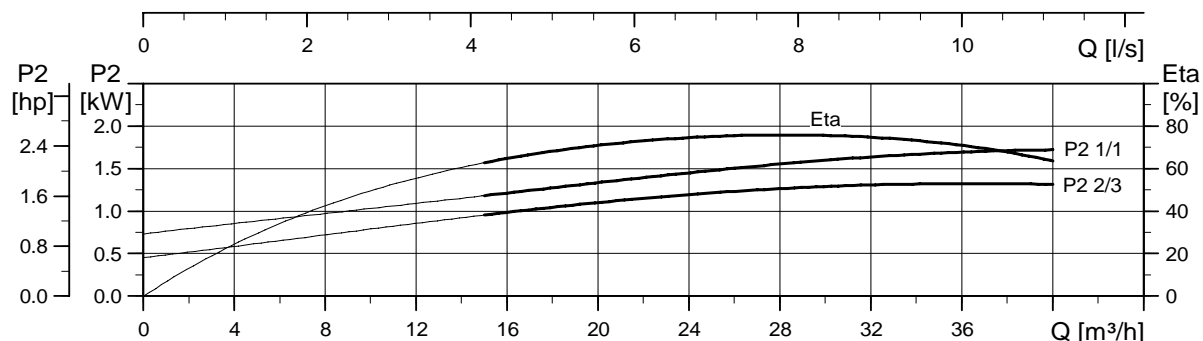
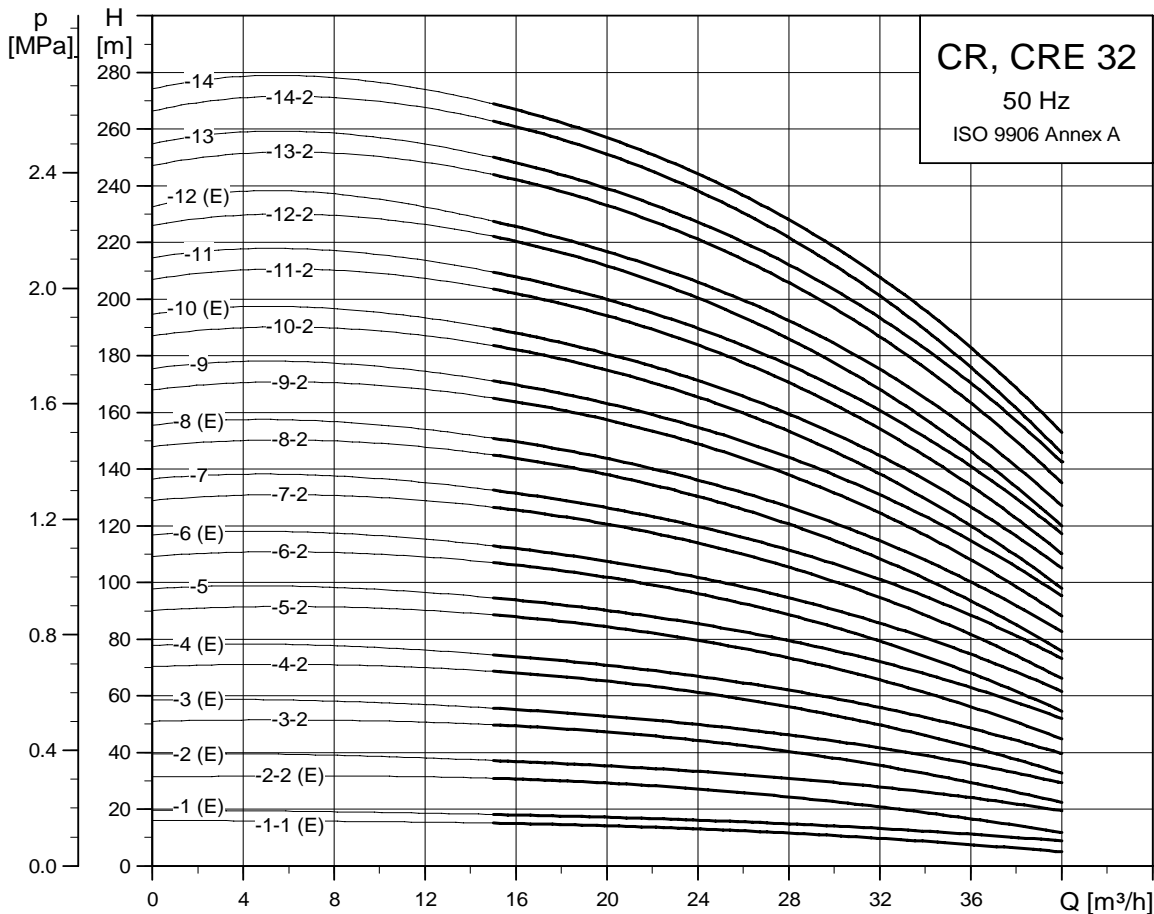


TM03 1728 2805

## Dimensions and weights

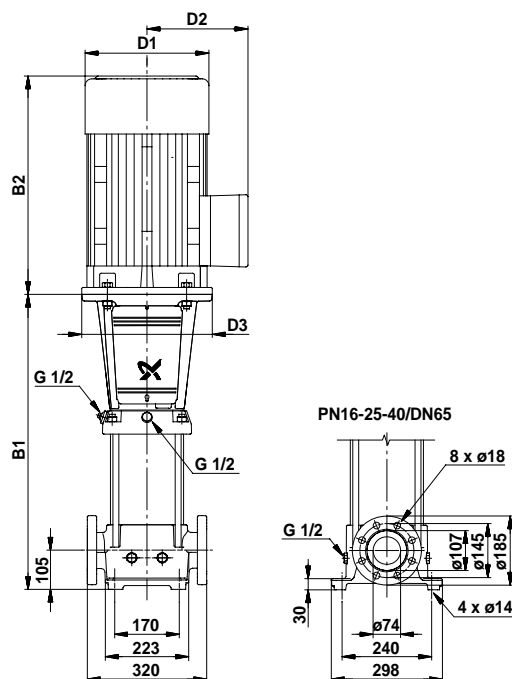
Pump type	Motor P <sub>2</sub> [kW]	CRI/CRN									CRIE/CRNE								
		Dimension [mm]						Net weight [kg]			Dimension [mm]						Net weight [kg]		
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2						B1	B1+B2	B1	B1+B2					
CRI(E)/CRN(E) 20-1	1.1	397	628	397	628	141	109	-	34	39	397	628	397	628	178	167	-	37	42
CRI(E)/CRN(E) 20-2	2.2	413	734	413	734	178	110	-	42	47	413	734	413	734	178	167	-	53	57
CRI(E)/CRN(E) 20-3	4	463	835	463	835	220	134	-	59	64	463	835	463	835	220	188	-	69	74
CRI/CRN 20-4	5.5	540	931	540	931	220	134	300	81	86	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 20-5	5.5	585	976	585	976	220	134	300	82	87	585	976	585	976	220	188	298	89	94
CRI/CRN 20-6	7.5	630	1021	630	1021	220	134	300	86	91	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 20-7	7.5	675	1066	675	1066	220	134	300	88	92	675	1066	675	1066	220	188	298	96	100
CRI/CRN 20-8	11	797	1296	797	1296	260	172	350	119	124	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 20-10	11	887	1386	887	1386	260	172	350	123	128	902	1351	902	1351	258	359	350	191	195
CRI/CRN 20-12	15	977	1455	977	1455	320	197	350	140	145	-	-	-	-	-	-	-	-	-
CRI(E)/CRN(E) 20-14	15	1067	1545	1067	1545	320	197	350	144	148	1082	1543	1082	1543	313	377	350	214	219
CRI(E)/CRN(E) 20-17	18.5	1202	1720	1202	1720	320	197	350	179	183	1217	1716	1217	1716	313	377	350	254	259

## CR, CRE 32



TM02 7302 3605

## Dimensional sketch

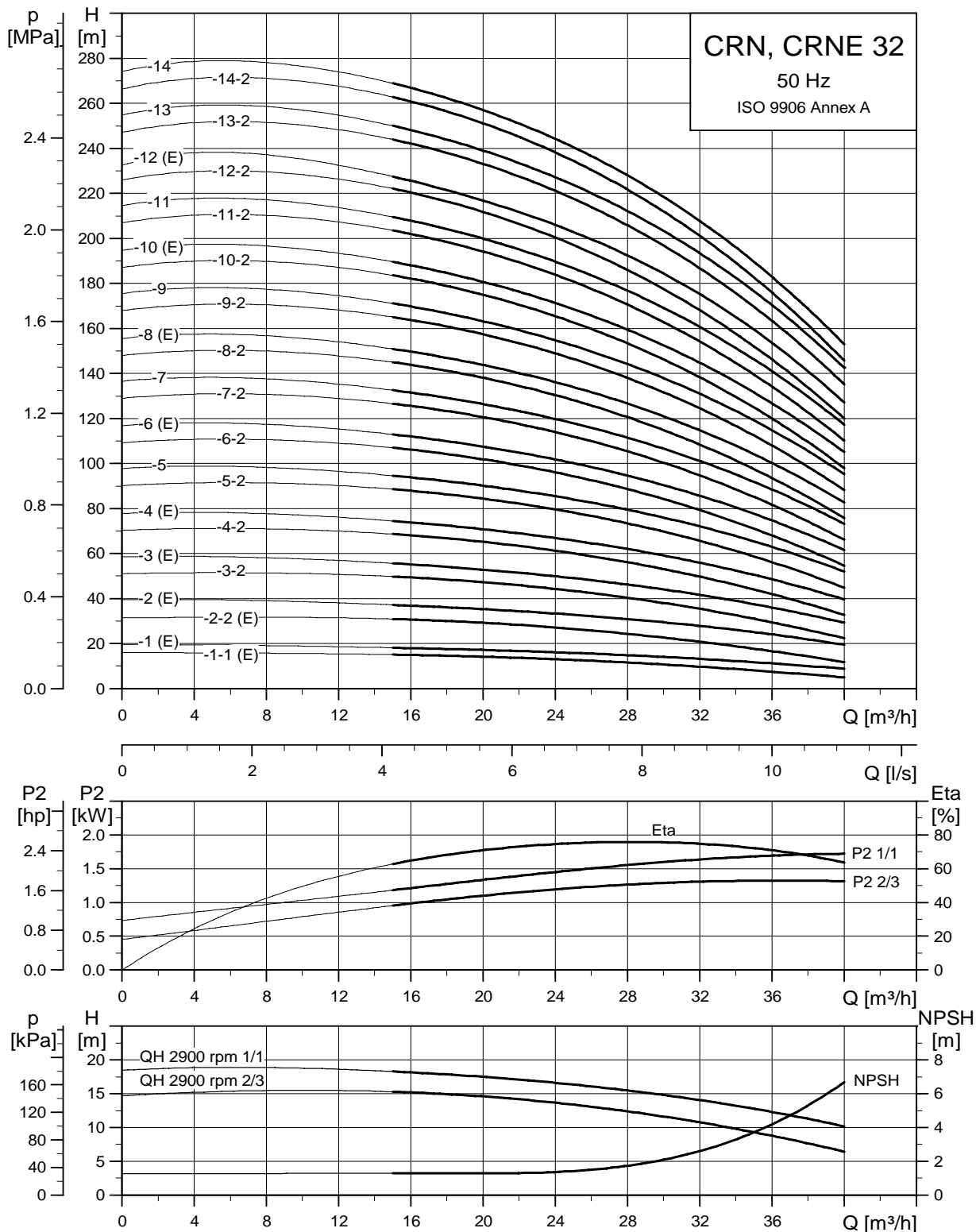


## Dimensions and weights

Pump type	Motor P <sub>2</sub> [kW]	CR					Net weight [kg]	CRE					Net weight [kg]
		Dimension [mm]						Dimension [mm]					
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 32-1-1	1.5	505	786	178	110	270	64	505	786	178	167	270	70
CR(E) 32-1	2.2	505	826	178	110	270	64	505	826	178	167	270	74
CR(E) 32-2-2	3	575	910	198	120	270	71	575	910	198	177	270	81
CR(E) 32-2	4	575	947	220	134	270	82	575	947	220	188	270	92
CR 32-3-2	5.5	645	1036	220	134	300	96	-	-	-	-	-	-
CR(E) 32-3	5.5	645	1036	220	134	300	96	645	1036	220	188	298	103
CR 32-4-2	7.5	715	1106	220	134	300	101	-	-	-	-	-	-
CR(E) 32-4	7.5	715	1106	220	134	300	101	715	1106	220	188	298	109
CR 32-5-2	11	895	1394	260	172	350	139	-	-	-	-	-	-
CR 32-5	11	895	1394	260	172	350	139	-	-	-	-	-	-
CR 32-6-2	11	965	1464	260	172	350	142	-	-	-	-	-	-
CR(E) 32-6	11	965	1464	260	172	350	142	965	1414	258	359	350	194
CR 32-7-2	15	1035	1513	320	197	350	163	-	-	-	-	-	-
CR 32-7	15	1035	1513	320	197	350	163	-	-	-	-	-	-
CR 32-8-2	15	1105	1583	320	197	350	169	-	-	-	-	-	-
CR(E) 32-8	15	1105	1583	320	197	350	169	1105	1566	313	377	350	220
CR 32-9-2	18.5	1175	1693	320	197	350	180	-	-	-	-	-	-
CR 32-9	18.5	1175	1693	320	197	350	180	-	-	-	-	-	-
CR 32-10-2	18.5	1245	1763	320	197	350	183	-	-	-	-	-	-
CR(E) 32-10	18.5	1245	1763	320	197	350	183	1245	1744	313	377	350	262
CR 32-11-2	22	1315	1925	363	262	350	272	-	-	-	-	-	-
CR 32-11	22	1315	1925	363	262	350	272	-	-	-	-	-	-
CR 32-12-2	22	1385	1995	363	262	350	276	-	-	-	-	-	-
CR(E) 32-12	22	1385	1995	363	262	350	276	1385	1910	351	399	350	308
CR 32-13-2	30	1455	2101	415	300	400	329	-	-	-	-	-	-
CR 32-13	30	1455	2101	415	300	400	329	-	-	-	-	-	-
CR 32-14-2	30	1525	2171	415	300	400	332	-	-	-	-	-	-
CR 32-14	30	1525	2171	415	300	400	332	-	-	-	-	-	-

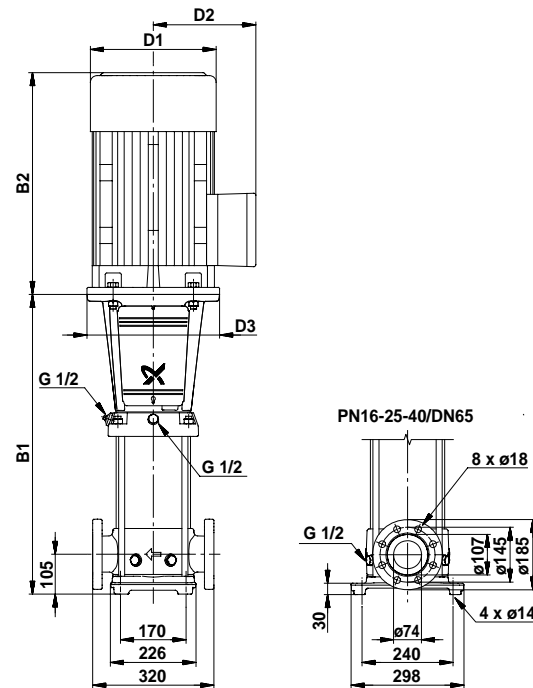
TM01 1749 3298

## CRN, CRNE 32



TM02 7303 3605

## Dimensional sketch

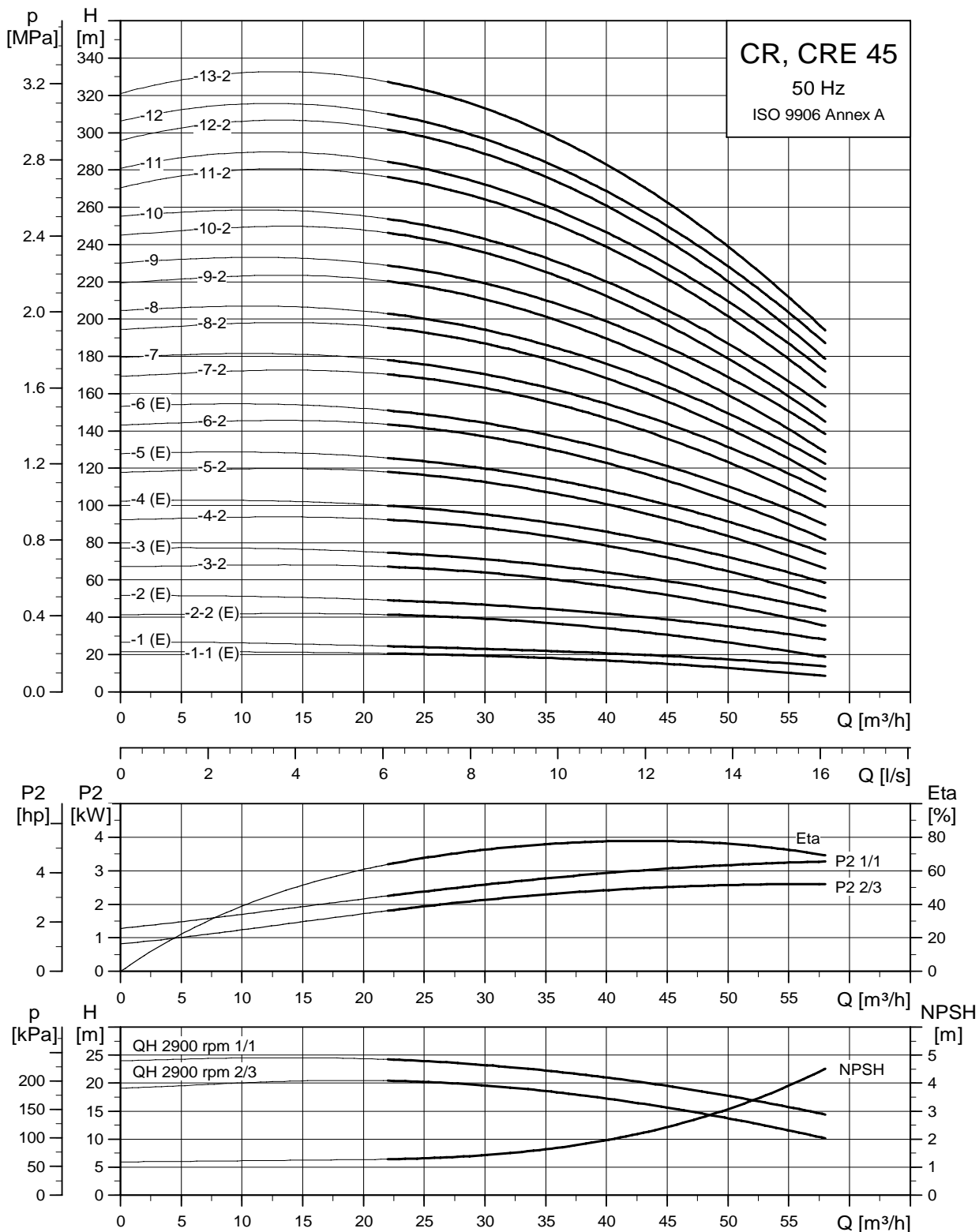


TM01 1750 2203

## Dimensions and weights

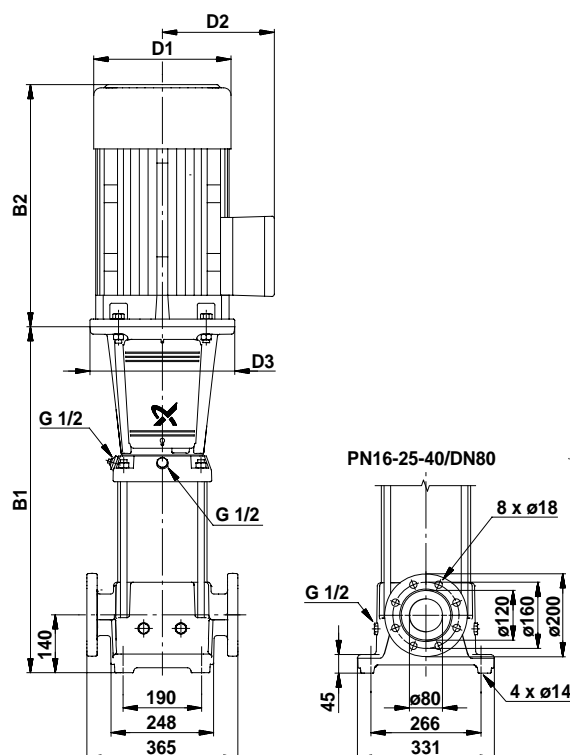
Pump type	Motor P <sub>2</sub> [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 32-1-1	1.5	505	786	178	110	270	66	505	786	178	167	270	73
CRN(E) 32-1	2.2	505	826	178	110	270	66	505	826	178	167	270	77
CRN(E) 32-2-2	3	575	910	198	120	270	73	575	910	198	177	270	83
CRN(E) 32-2	4	575	947	220	134	270	84	575	947	220	188	270	94
CRN 32-3-2	5.5	645	1036	220	134	300	99	-	-	-	-	-	-
CRN(E) 32-3	5.5	645	1036	220	134	300	99	645	1036	220	188	298	105
CRN 32-4-2	7.5	715	1106	220	134	300	104	-	-	-	-	-	-
CRN(E) 32-4	7.5	715	1106	220	134	300	104	715	1106	220	188	298	111
CRN 32-5-2	11	895	1394	260	172	350	141	-	-	-	-	-	-
CRN 32-5	11	895	1394	260	172	350	141	-	-	-	-	-	-
CRN 32-6-2	11	965	1464	260	172	350	144	-	-	-	-	-	-
CRN(E) 32-6	11	965	1464	260	172	350	144	965	1414	258	359	350	196
CRN 32-7-2	15	1035	1513	320	197	350	165	-	-	-	-	-	-
CRN 32-7	15	1035	1513	320	197	350	165	-	-	-	-	-	-
CRN 32-8-2	15	1105	1583	320	197	350	171	-	-	-	-	-	-
CRN(E) 32-8	15	1105	1583	320	197	350	171	1105	1566	313	377	350	222
CRN 32-9-2	18.5	1175	1693	320	197	350	182	-	-	-	-	-	-
CRN 32-9	18.5	1175	1693	320	197	350	182	-	-	-	-	-	-
CRN 32-10-2	18.5	1245	1763	320	197	350	185	-	-	-	-	-	-
CRN(E) 32-10	18.5	1245	1763	320	197	350	185	1245	1744	313	377	350	264
CRN 32-11-2	22	1315	1925	363	262	350	274	-	-	-	-	-	-
CRN 32-11	22	1315	1925	363	262	350	274	-	-	-	-	-	-
CRN 32-12-2	22	1385	1995	363	262	350	278	-	-	-	-	-	-
CRN(E) 32-12	22	1385	1995	363	262	350	278	1385	1910	351	399	350	310
CRN 32-13-2	30	1455	2101	415	300	400	331	-	-	-	-	-	-
CRN 32-13	30	1455	2101	415	300	400	331	-	-	-	-	-	-
CRN 32-14-2	30	1525	2171	415	300	400	335	-	-	-	-	-	-
CRN 32-14	30	1525	2171	415	300	400	335	-	-	-	-	-	-

## CR, CRE 45



TM02 7304 3605

## Dimensional sketch

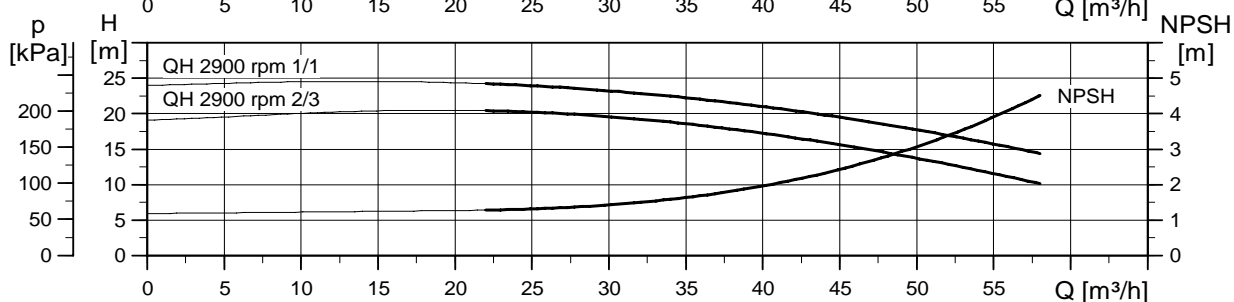
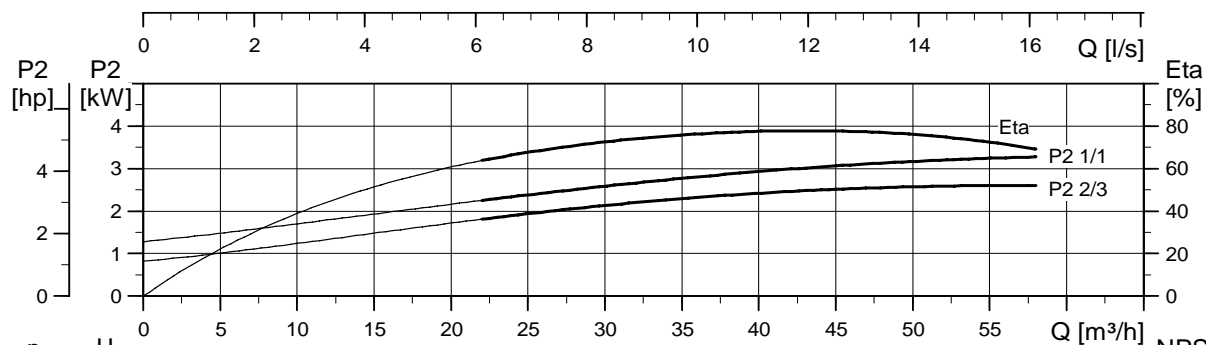
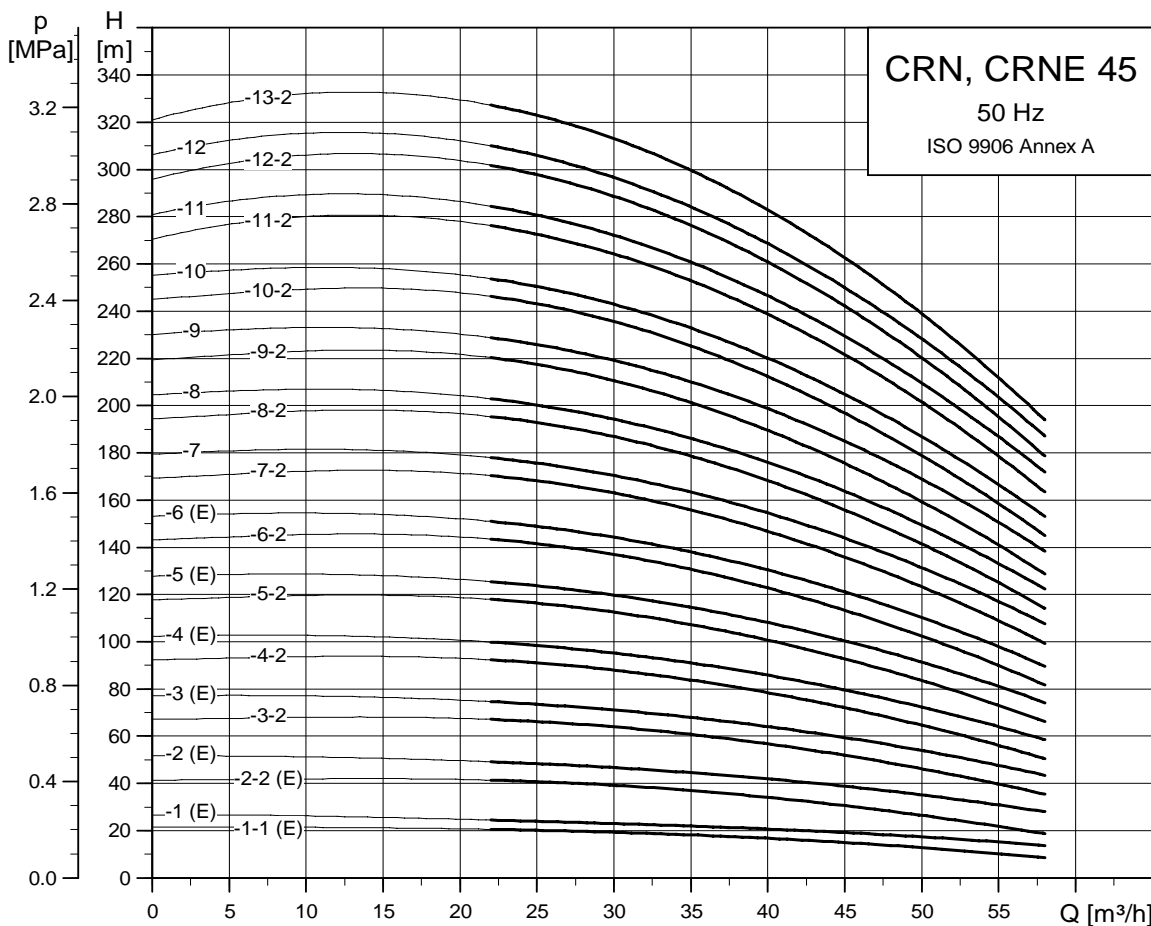


TM01 1751 3203

## Dimensions and weights

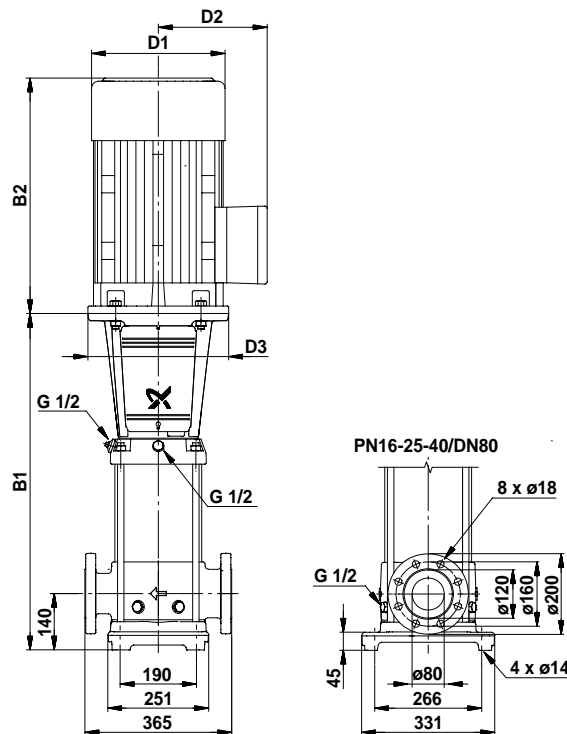
Pump type	Motor P <sub>2</sub> [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 45-1-1	3	559	894	198	120	270	78	559	894	198	177	270	88
CR(E) 45-1	4	559	931	220	134	270	89	559	931	220	188	270	99
CR(E) 45-2-2	5.5	639	1030	220	134	300	104	639	1030	220	188	298	110
CR(E) 45-2	7.5	639	1030	220	134	300	106	639	1030	220	188	298	114
CR 45-3-2	11	829	1328	260	172	350	144	-	-	-	-	-	-
CR(E) 45-3	11	829	1328	260	172	350	144	829	1278	258	359	350	196
CR 45-4-2	15	909	1387	320	197	350	166	-	-	-	-	-	-
CR(E) 45-4	15	909	1387	320	197	350	166	909	1370	313	377	350	217
CR 45-5-2	18.5	989	1507	320	197	350	177	-	-	-	-	-	-
CR(E) 45-5	18.5	989	1507	320	197	350	177	989	1488	313	377	350	256
CR 45-6-2	22	1069	1679	363	262	350	269	-	-	-	-	-	-
CR(E) 45-6	22	1069	1679	363	262	350	269	1069	1594	351	399	350	301
CR 45-7-2	30	1149	1795	415	300	400	324	-	-	-	-	-	-
CR 45-7	30	1149	1795	415	300	400	324	-	-	-	-	-	-
CR 45-8-2	30	1229	1875	415	300	400	328	-	-	-	-	-	-
CR 45-8	30	1229	1875	415	300	400	328	-	-	-	-	-	-
CR 45-9-2	30	1309	1955	415	300	400	332	-	-	-	-	-	-
CR 45-9	37	1309	2012	415	300	400	362	-	-	-	-	-	-
CR 45-10-2	37	1389	2092	415	300	400	367	-	-	-	-	-	-
CR 45-10	37	1389	2092	415	300	400	367	-	-	-	-	-	-
CR 45-11-2	45	1469	2178	442	325	450	450	-	-	-	-	-	-
CR 45-11	45	1469	2178	442	325	450	450	-	-	-	-	-	-
CR 45-12-2	45	1549	2258	442	325	450	455	-	-	-	-	-	-
CR 45-12	45	1549	2258	442	325	450	455	-	-	-	-	-	-
CR 45-13-2	45	1629	2338	442	325	450	459	-	-	-	-	-	-

## CRN, CRNE 45



TM02 7305 3605

## Dimensional sketch

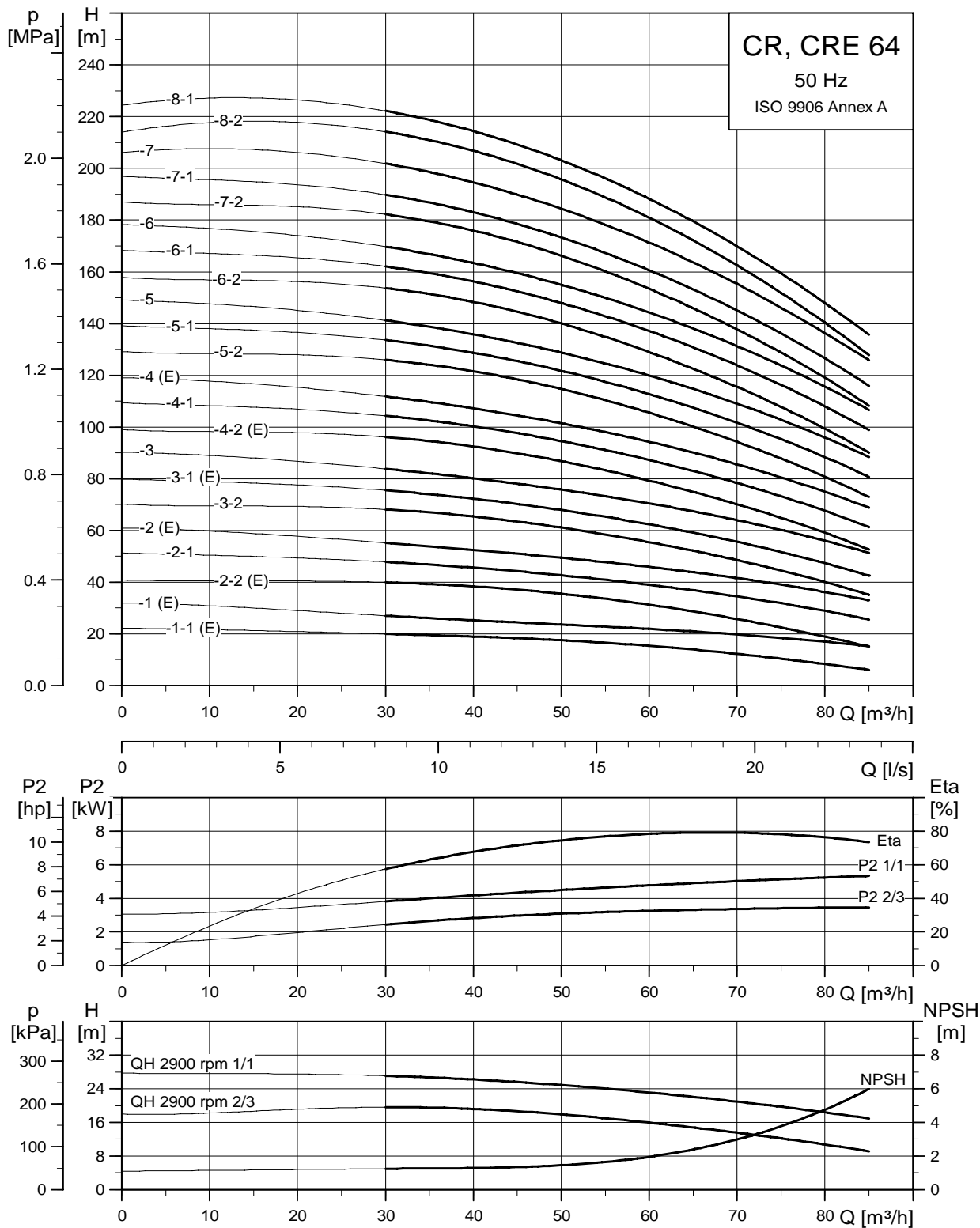


TM01 1752 3203

## Dimensions and weights

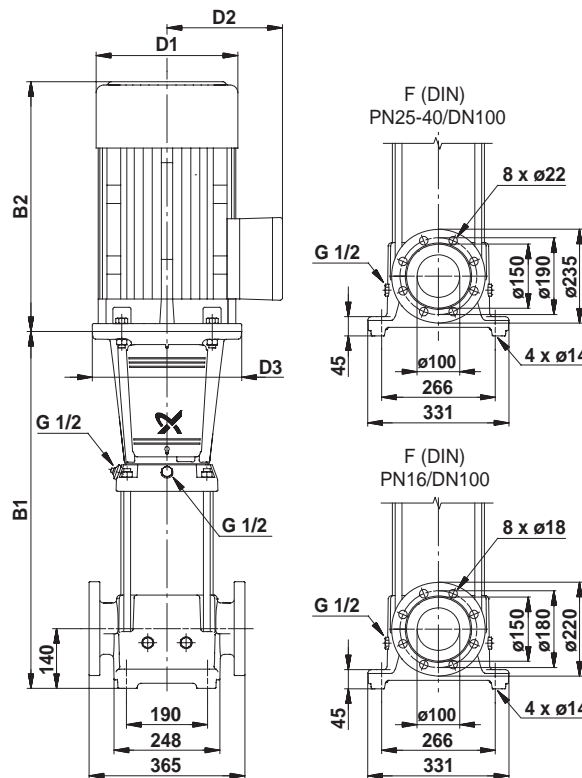
Pump type	Motor P <sub>2</sub> [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 45-1-1	3	559	894	198	120	270	78	559	894	198	177	270	88
CRN(E) 45-1	4	559	931	220	134	270	89	559	931	220	188	270	99
CRN(E) 45-2-2	5.5	639	1030	220	134	300	104	639	1030	220	188	298	111
CRN(E) 45-2	7.5	639	1030	220	134	300	106	639	1030	220	188	298	114
CRN 45-3-2	11	829	1328	260	172	350	145	-	-	-	-	-	-
CRN(E) 45-3	11	829	1328	260	172	350	145	829	1278	258	359	350	197
CRN 45-4-2	15	909	1387	320	197	350	166	-	-	-	-	-	-
CRN(E) 45-4	15	909	1387	320	197	350	166	909	1370	313	377	350	217
CRN 45-5-2	18.5	989	1507	320	197	350	177	-	-	-	-	-	-
CRN(E) 45-5	18.5	989	1507	320	197	350	177	989	1488	313	377	350	256
CRN 45-6-2	22	1069	1679	363	262	350	270	-	-	-	-	-	-
CRN(E) 45-6	22	1069	1679	363	262	350	270	1069	1594	351	399	350	302
CRN 45-7-2	30	1149	1795	415	300	400	324	-	-	-	-	-	-
CRN 45-7	30	1149	1795	415	300	400	324	-	-	-	-	-	-
CRN 45-8-2	30	1229	1875	415	300	400	328	-	-	-	-	-	-
CRN 45-8	30	1229	1875	415	300	400	328	-	-	-	-	-	-
CRN 45-9-2	30	1309	1955	415	300	400	333	-	-	-	-	-	-
CRN 45-9	37	1309	2012	415	300	400	363	-	-	-	-	-	-
CRN 45-10-2	37	1389	2092	415	300	400	367	-	-	-	-	-	-
CRN 45-10	37	1389	2092	415	300	400	367	-	-	-	-	-	-
CRN 45-11-2	45	1469	2178	442	325	450	450	-	-	-	-	-	-
CRN 45-11	45	1469	2178	442	325	450	450	-	-	-	-	-	-
CRN 45-12-2	45	1549	2258	442	325	450	455	-	-	-	-	-	-
CRN 45-12	45	1549	2258	442	325	450	455	-	-	-	-	-	-
CRN 45-13-2	45	1629	2338	442	325	450	459	-	-	-	-	-	-

## CR, CRE 64



TM02 7306 3605

## Dimensional sketch

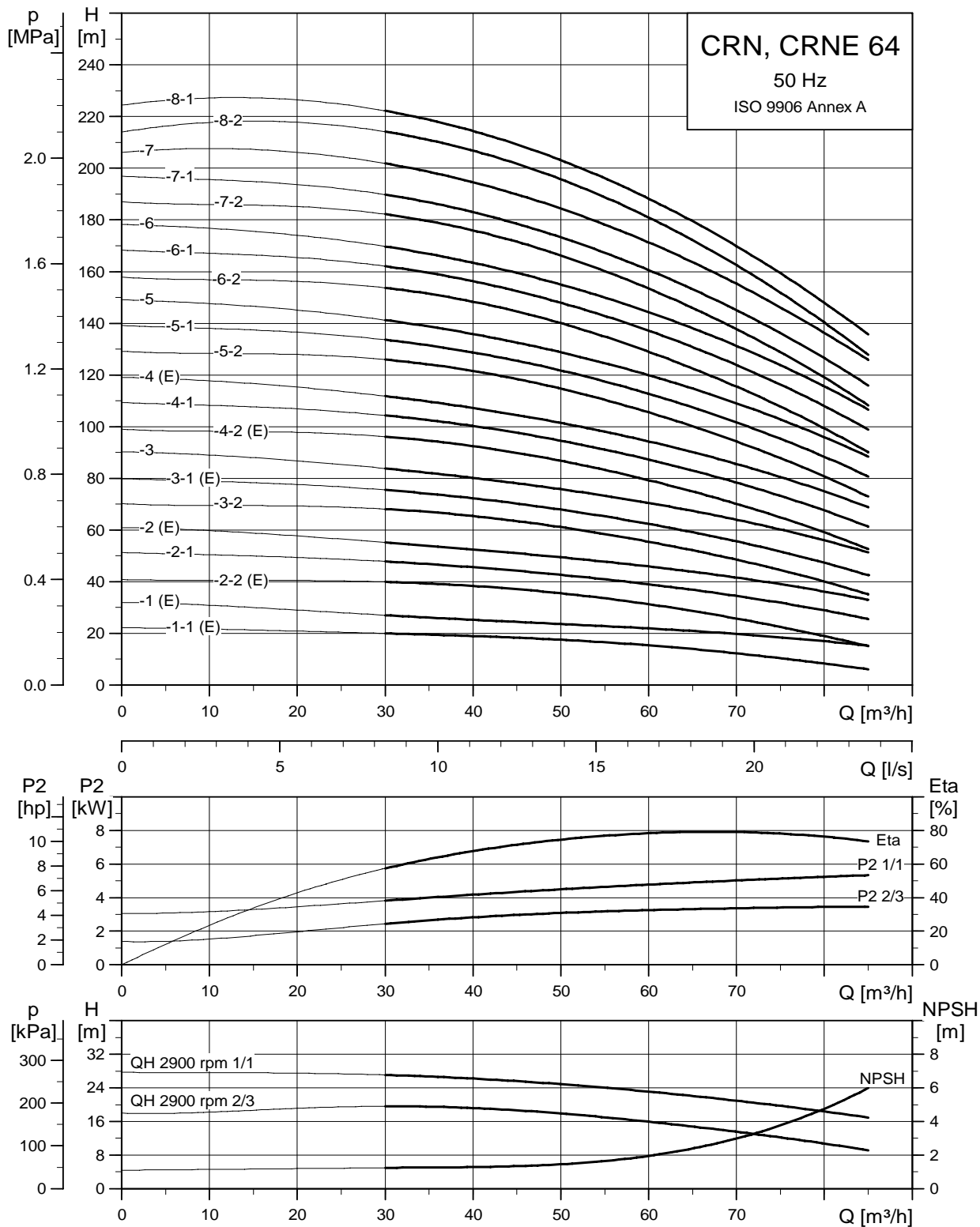


TM01 1753 5197

## Dimensions and weights

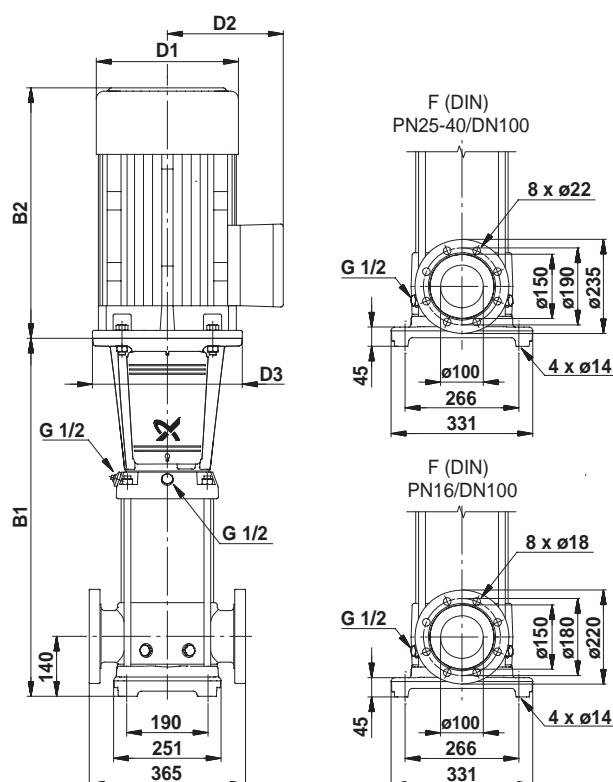
Pump type	Motor P <sub>2</sub> [kW]	CR						CRE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 64-1-1	4	561	933	220	134	270	91	561	933	220	188	270	101
CR(E) 64-1	5.5	561	952	220	134	300	102	561	952	220	188	298	109
CR(E) 64-2-2	7.5	644	1035	220	134	300	109	644	1035	220	188	298	117
CR 64-2-1	11	754	1253	260	172	350	143	-	-	-	-	-	-
CR(E) 64-2	11	754	1253	260	172	350	143	754	1203	258	359	350	195
CR 64-3-2	15	836	1314	320	197	350	166	-	-	-	-	-	-
CR(E) 64-3-1	15	836	1314	320	197	350	166	836	1297	313	377	350	217
CR 64-3	18.5	836	1354	320	197	350	173	-	-	-	-	-	-
CR(E) 64-4-2	18.5	919	1437	320	197	350	177	919	1418	313	377	350	256
CR 64-4-1	22	919	1529	363	262	350	263	-	-	-	-	-	-
CR(E) 64-4	22	919	1529	363	262	350	263	919	1444	351	399	350	295
CR 64-5-2	30	1001	1647	415	300	400	318	-	-	-	-	-	-
CR 64-5-1	30	1001	1647	415	300	400	318	-	-	-	-	-	-
CR 64-5	30	1001	1647	415	300	400	318	-	-	-	-	-	-
CR 64-6-2	30	1084	1730	415	300	400	324	-	-	-	-	-	-
CR 64-6-1	37	1084	1787	415	300	400	354	-	-	-	-	-	-
CR 64-6	37	1084	1787	415	300	400	354	-	-	-	-	-	-
CR 64-7-2	37	1166	1869	415	300	400	359	-	-	-	-	-	-
CR 64-7-1	37	1166	1869	415	300	400	359	-	-	-	-	-	-
CR 64-7	45	1166	1875	442	325	450	438	-	-	-	-	-	-
CR 64-8-2	45	1249	1958	442	325	450	443	-	-	-	-	-	-
CR 64-8-1	45	1249	1958	442	325	450	443	-	-	-	-	-	-

## CRN, CRNE 64



TM02 7307 3605

## Dimensional sketch

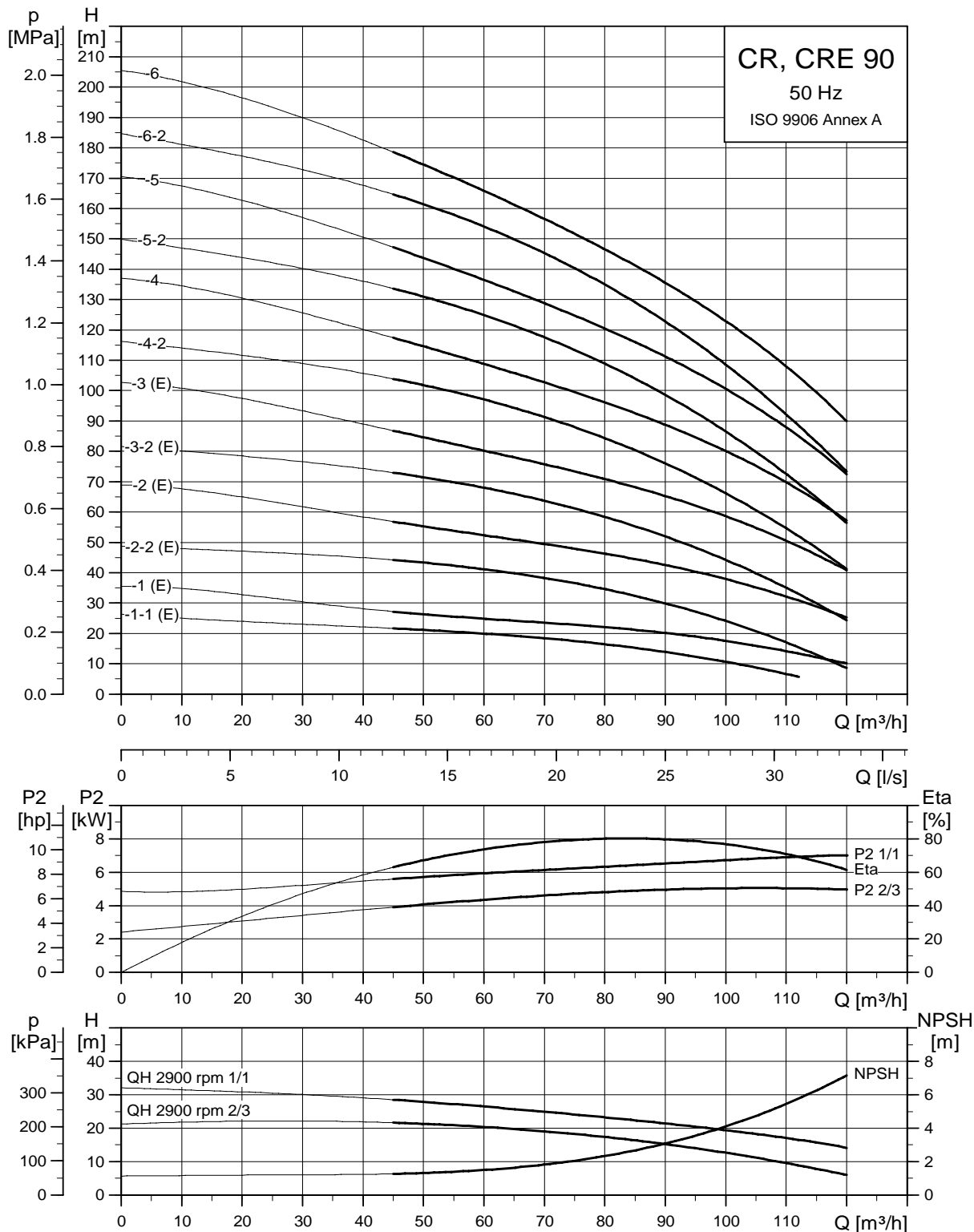


TM01 1754 0904

## Dimensions and weights

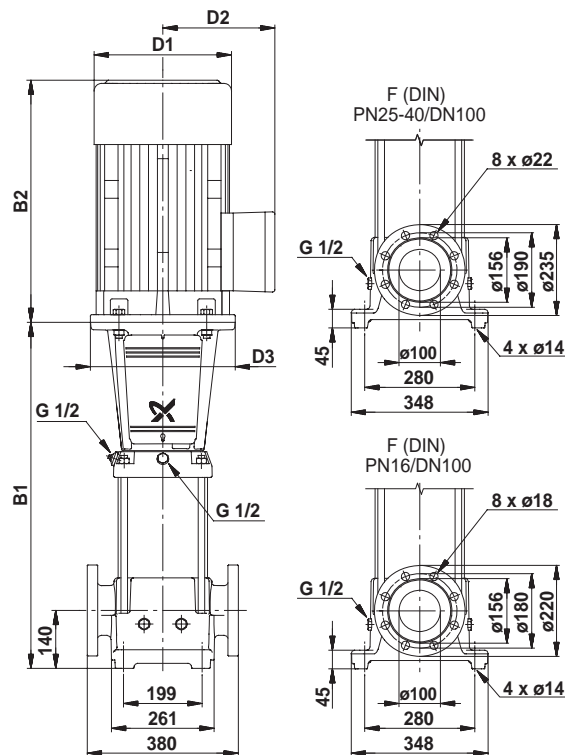
Pump type	Motor P <sub>2</sub> [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 64-1-1	4	561	933	220	134	270	91	561	933	220	188	270	101
CRN(E) 64-1	5.5	561	952	220	134	300	102	561	952	220	188	298	109
CRN(E) 64-2-2	7.5	644	1035	220	134	300	109	644	1035	220	188	298	116
CRN 64-2-1	11	754	1253	260	172	350	143	-	-	-	-	-	-
CRN(E) 64-2	11	754	1253	260	172	350	143	754	1203	258	359	350	195
CRN 64-3-2	15	836	1314	320	197	350	166	-	-	-	-	-	-
CRN(E) 64-3-1	15	836	1314	320	197	350	166	836	1297	313	377	350	217
CRN 64-3	18.5	836	1354	320	197	350	173	-	-	-	-	-	-
CRN(E) 64-4-2	18.5	919	1437	320	197	350	177	919	1418	313	377	350	256
CRN 64-4-1	22	919	1529	363	262	350	263	-	-	-	-	-	-
CRN(E) 64-4	22	919	1529	363	262	350	263	919	1444	351	399	350	295
CRN 64-5-2	30	1001	1647	415	300	400	318	-	-	-	-	-	-
CRN 64-5-1	30	1001	1647	415	300	400	318	-	-	-	-	-	-
CRN 64-5	30	1001	1647	415	300	400	318	-	-	-	-	-	-
CRN 64-6-2	30	1084	1730	415	300	400	325	-	-	-	-	-	-
CRN 64-6-1	37	1084	1787	415	300	400	355	-	-	-	-	-	-
CRN 64-6	37	1084	1787	415	300	400	355	-	-	-	-	-	-
CRN 64-7-2	37	1166	1869	415	300	400	359	-	-	-	-	-	-
CRN 64-7-1	37	1166	1869	415	300	400	359	-	-	-	-	-	-
CRN 64-7	45	1166	1875	442	325	450	439	-	-	-	-	-	-
CRN 64-8-2	45	1249	1958	442	325	450	443	-	-	-	-	-	-
CRN 64-8-1	45	1249	1958	442	325	450	443	-	-	-	-	-	-

## CR, CRE 90



TM02 7308 3605

## Dimensional sketch

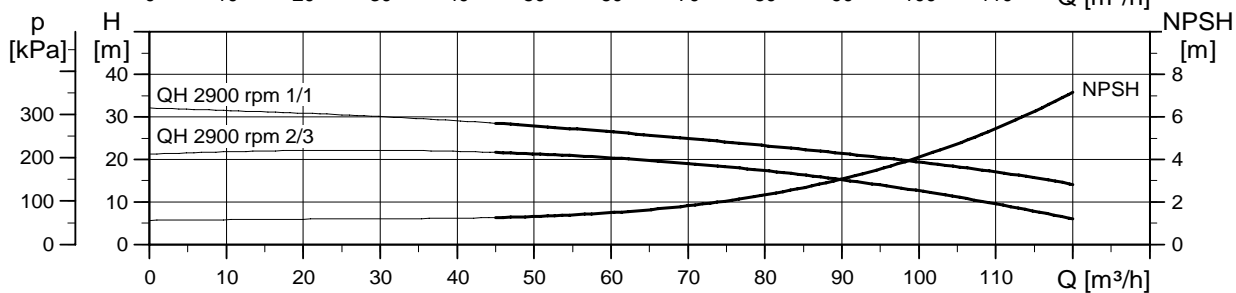
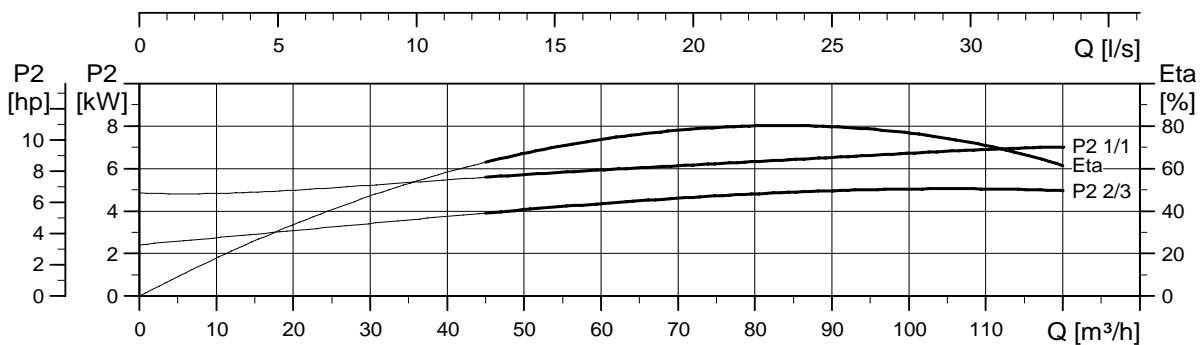
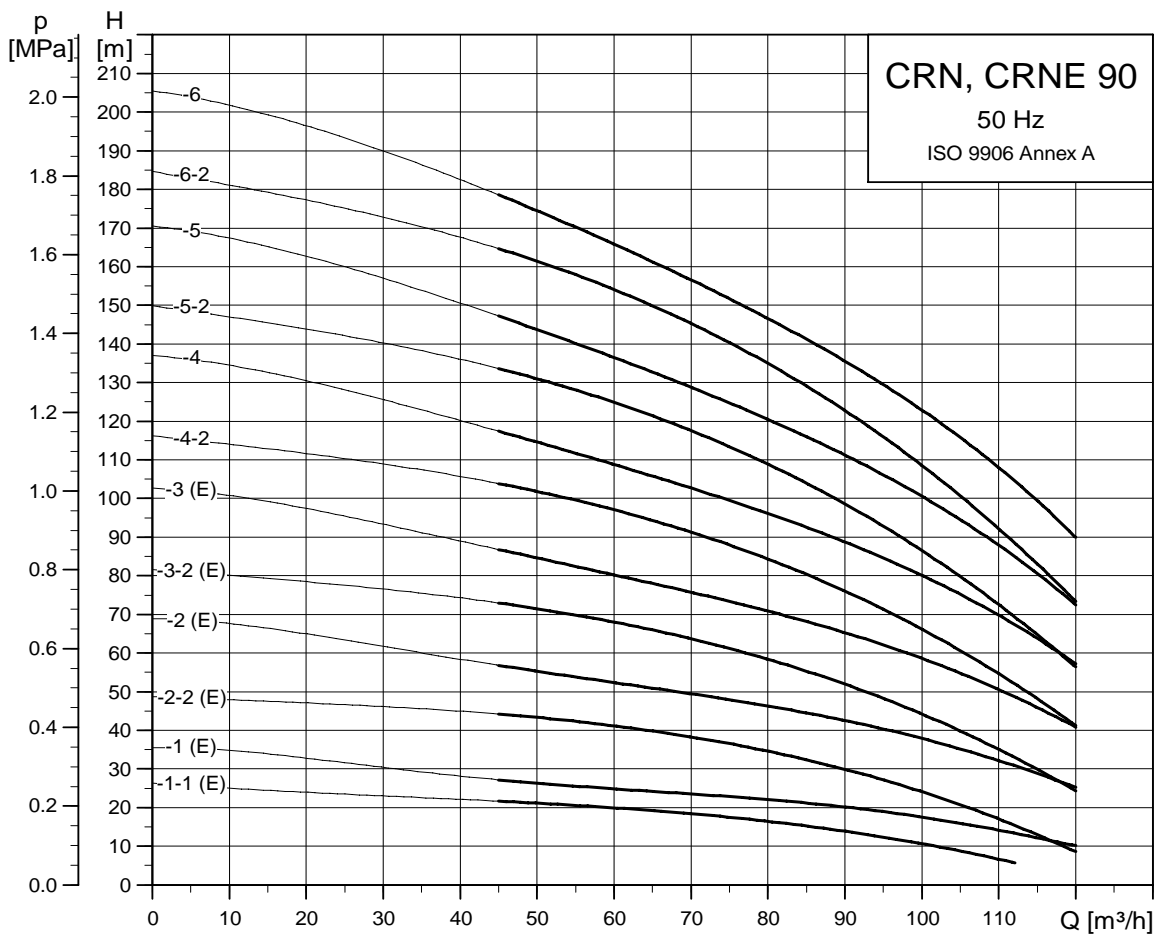


TM01 1755 2203

## Dimensions and weights

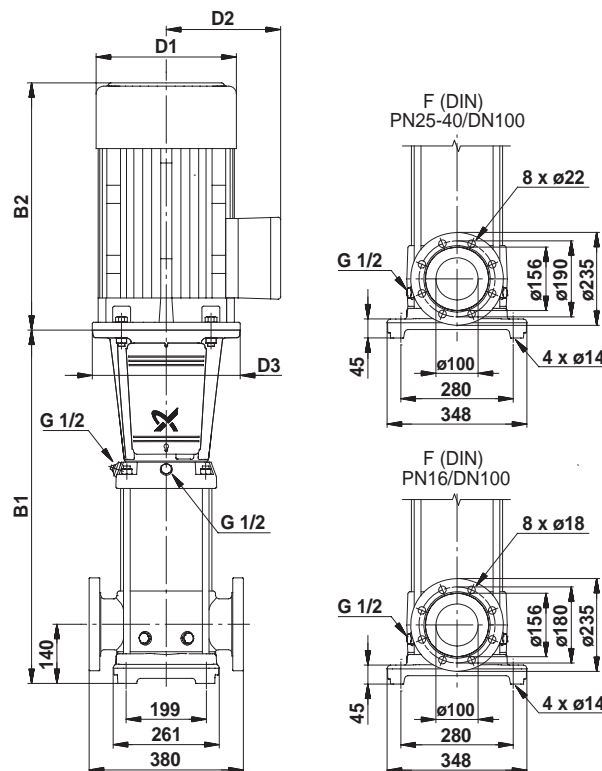
Pump type	Motor P <sub>2</sub> [kW]	CR					Net weight [kg]	CRE					Net weight [kg]
		Dimension [mm]						Dimension [mm]					
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CR(E) 90-1-1	5.5	571	962	220	134	300	107	571	962	220	188	298	114
CR(E) 90-1	7.5	571	962	220	134	300	109	571	962	220	188	298	117
CR(E) 90-2-2	11	773	1272	260	172	350	149	773	1222	258	359	350	201
CR(E) 90-2	15	773	1251	320	197	350	167	773	1234	313	377	350	218
CR(E) 90-3-2	18.5	865	1383	320	197	350	179	865	1364	313	377	350	258
CR(E) 90-3	22	865	1475	363	262	350	264	865	1390	351	399	350	296
CR 90-4-2	30	957	1603	415	300	400	320	-	-	-	-	-	-
CR 90-4	30	957	1603	415	300	400	320	-	-	-	-	-	-
CR 90-5-2	37	1049	1752	415	300	400	356	-	-	-	-	-	-
CR 90-5	37	1049	1752	415	300	400	356	-	-	-	-	-	-
CR 90-6-2	45	1141	1850	442	325	450	441	-	-	-	-	-	-
CR 90-6	45	1141	1850	442	325	450	441	-	-	-	-	-	-

## CRN, CRNE 90



TM02 7305 3605

## Dimensional sketch

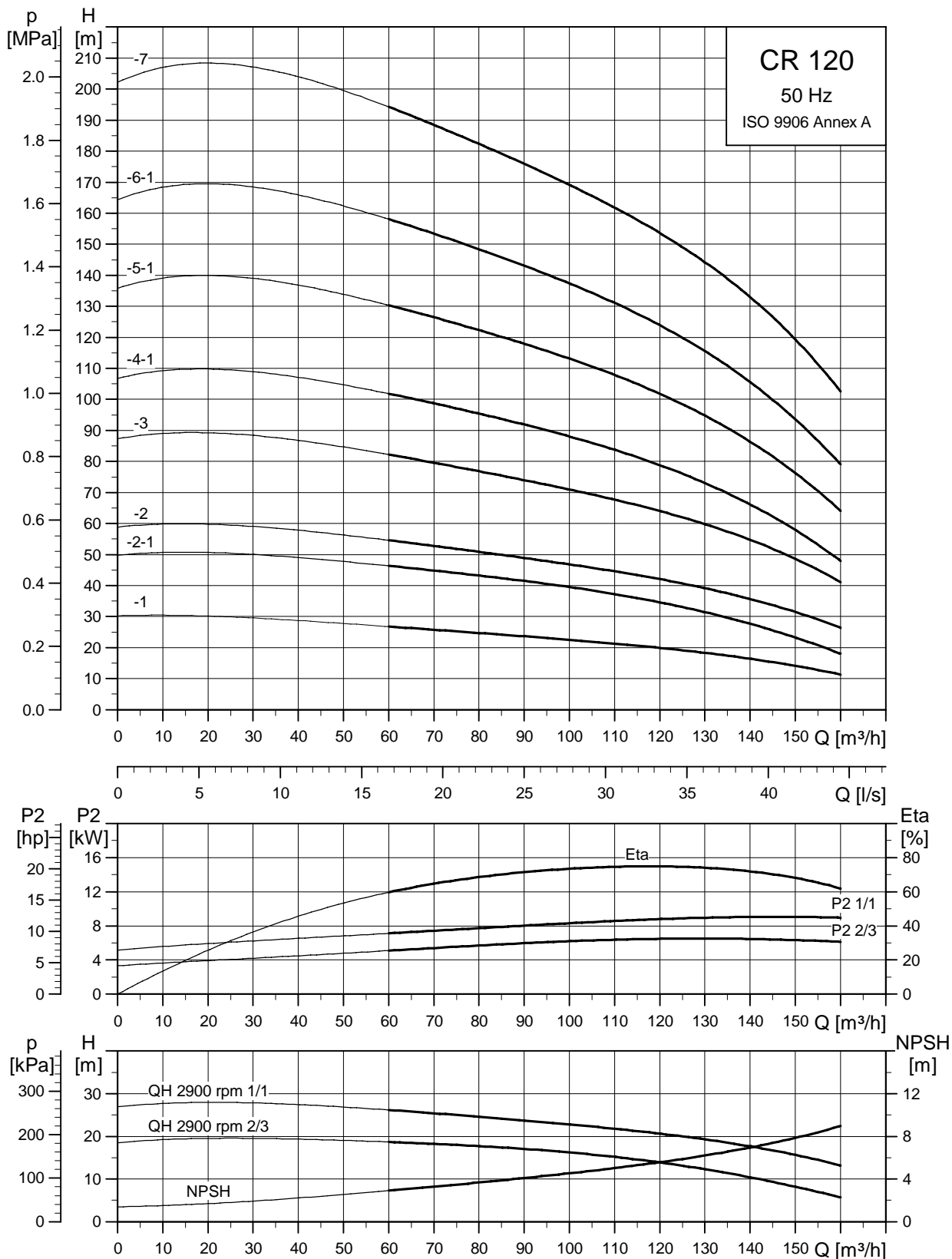


TM02 1570 2203

## Dimensions and weights

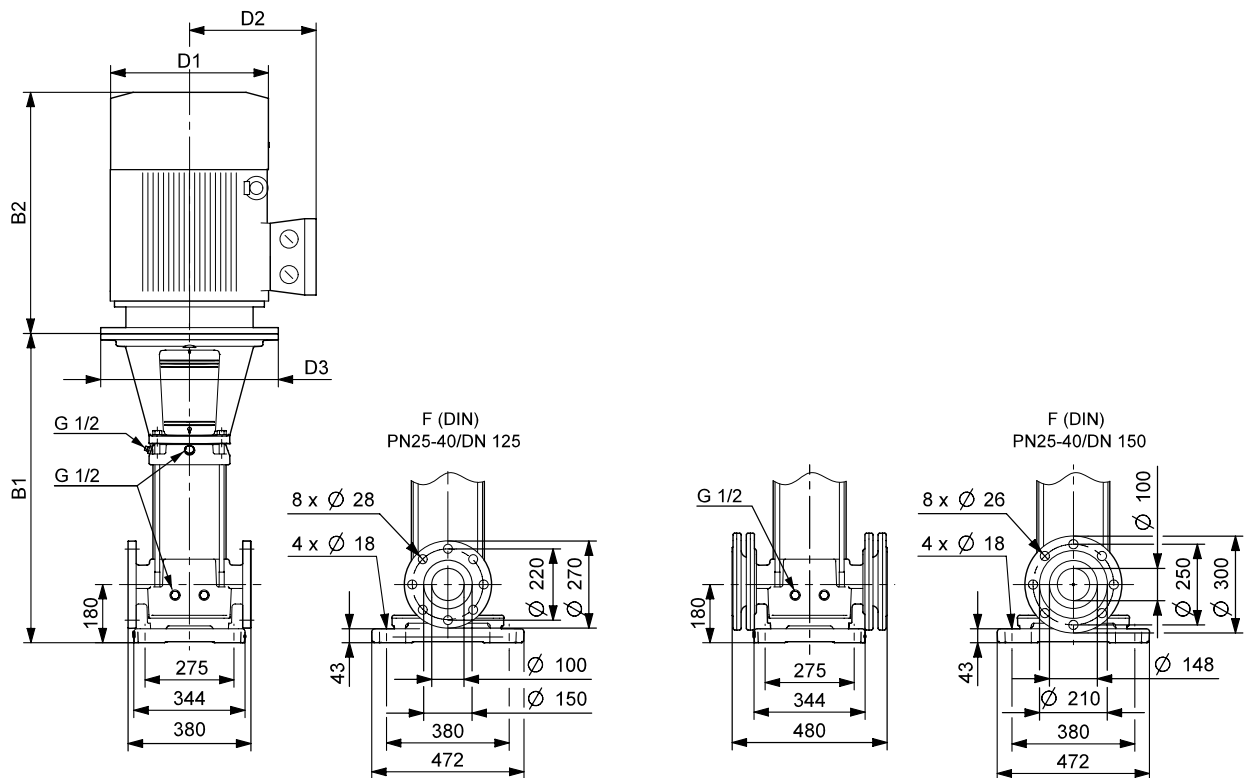
Pump type	Motor P <sub>2</sub> [kW]	CRN						CRNE					
		Dimension [mm]					Net weight [kg]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3		B1	B1+B2	D1	D2	D3	
CRN(E) 90-1-1	5.5	571	962	220	134	300	109	571	962	220	188	298	115
CRN(E) 90-1	7.5	571	962	220	134	300	111	571	962	220	188	298	118
CRN(E) 90-2-2	11	773	1272	260	172	350	150	773	1222	258	359	350	202
CRN(E) 90-2	15	773	1251	320	197	350	168	773	1234	313	377	350	219
CRN(E) 90-3-2	18.5	865	1383	320	197	350	180	865	1364	313	377	350	259
CRN(E) 90-3	22	865	1475	363	262	350	266	865	1390	351	399	350	298
CRN 90-4-2	30	957	1603	415	300	400	321	-	-	-	-	-	-
CRN 90-4	30	957	1603	415	300	400	321	-	-	-	-	-	-
CRN 90-5-2	37	1049	1752	415	300	400	359	-	-	-	-	-	-
CRN 90-5	37	1049	1752	415	300	400	359	-	-	-	-	-	-
CRN 90-6-2	45	1141	1850	442	325	450	443	-	-	-	-	-	-
CRN 90-6	45	1141	1850	442	325	450	443	-	-	-	-	-	-

## CR 120



TM03 8743 2407

## Dimensional sketch

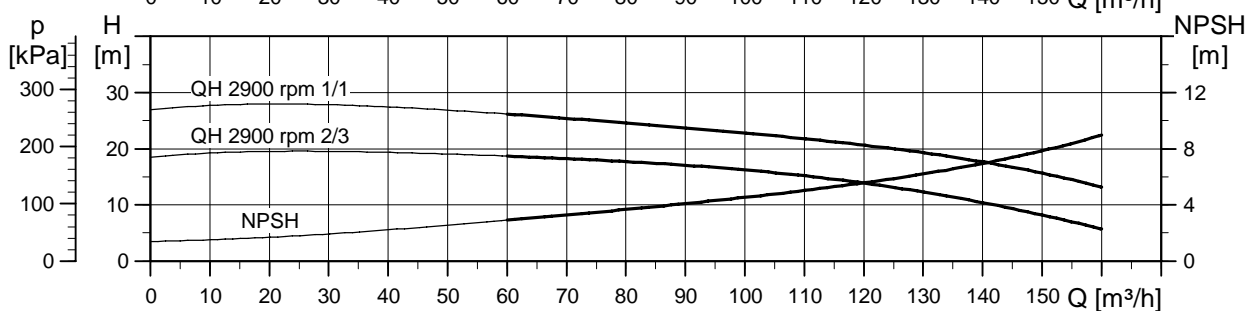
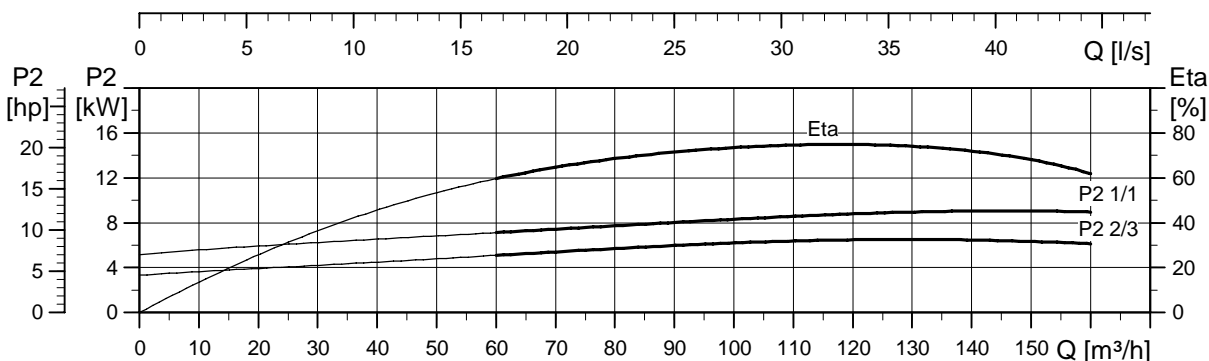
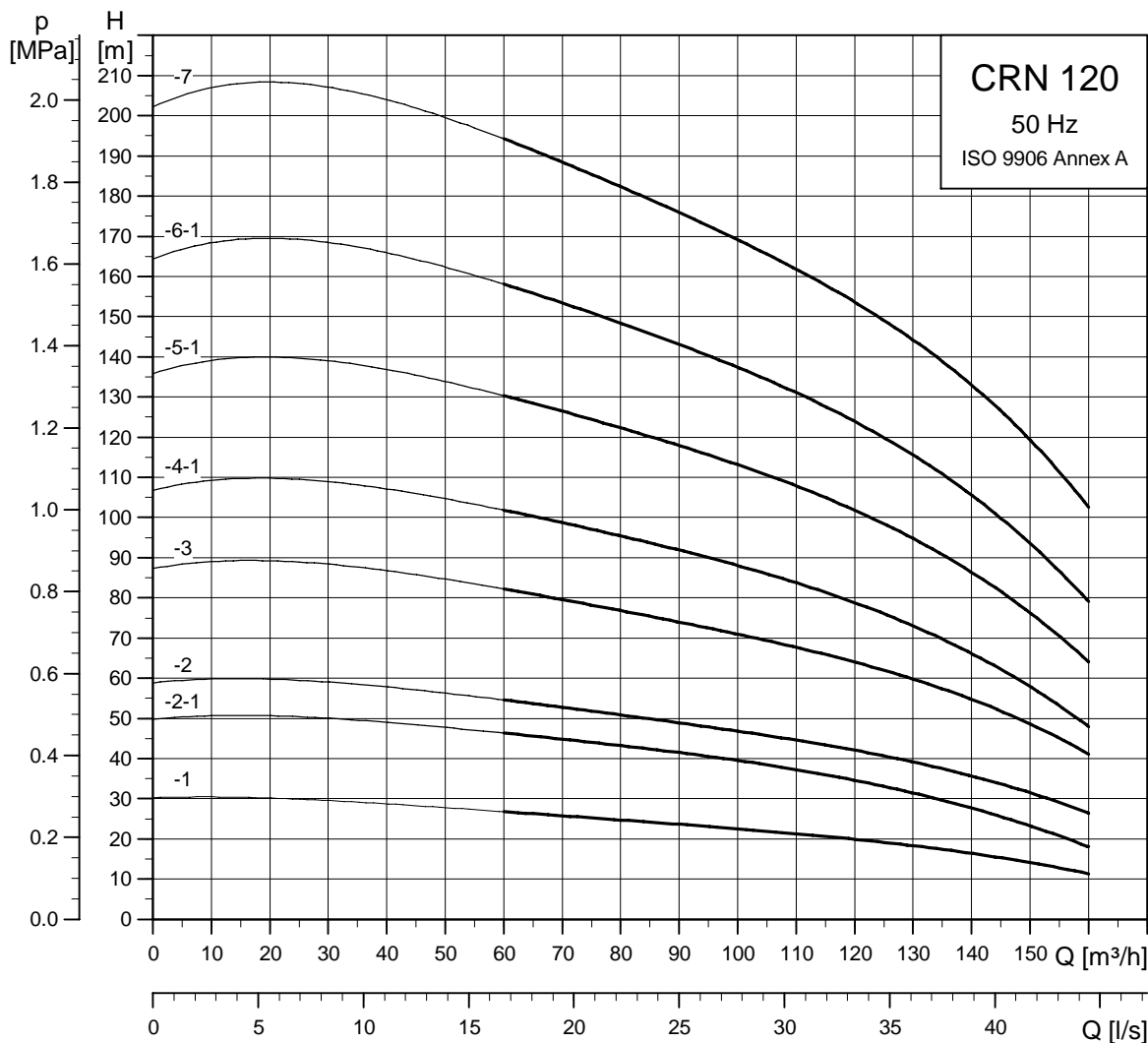


TM03 5999 4106

## Dimensions and weights

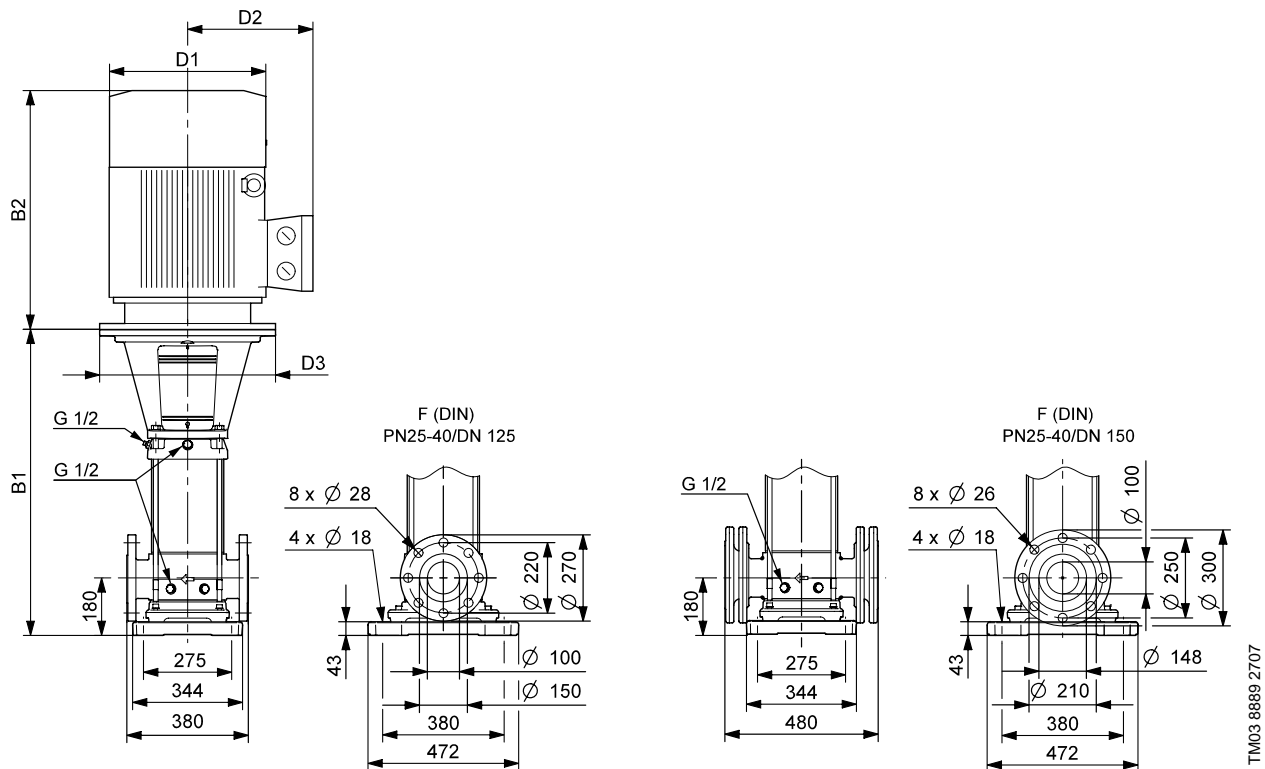
Pump type	Motor P <sub>2</sub> [kW]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 120-1	11	835	1334	260	172	350	193
CR 120-2-1	18.5	990	1508	320	197	350	211
CR 120-2	22	990	1600	363	262	350	297
CR 120-3	30	1146	1756	402	300	400	357
CR 120-4-1	37	1301	1968	402	300	400	397
CR 120-5-1	45	1457	2166	442	325	449	486
CR 120-6-1	55	1642	2389	495	392	550	631
CR 120-7	75	1798	2618	555	432	550	775

## CRN 120



TM03 8744 2407

## Dimensional sketch

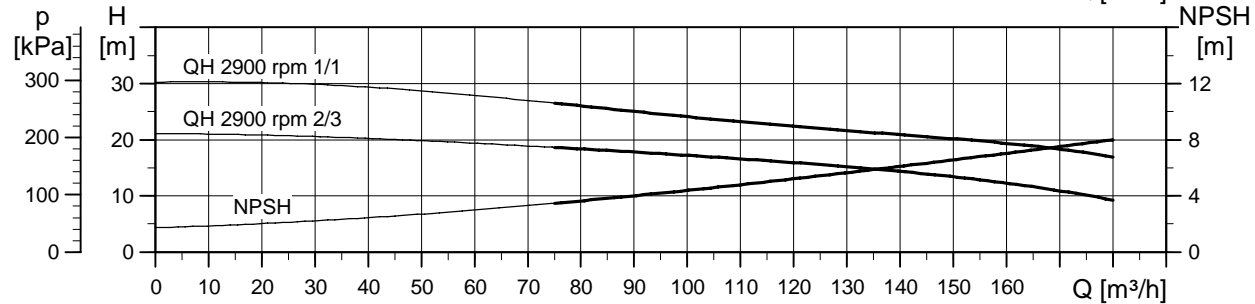
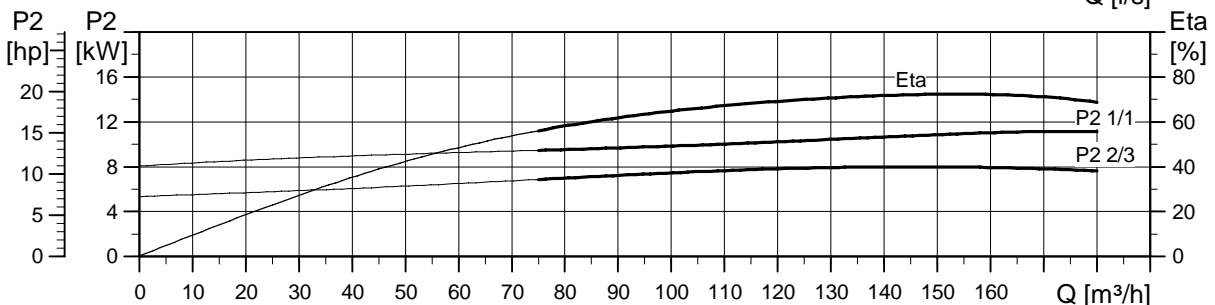
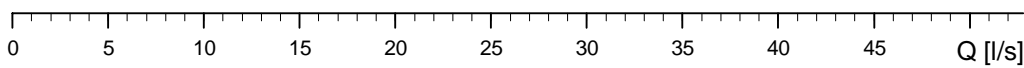
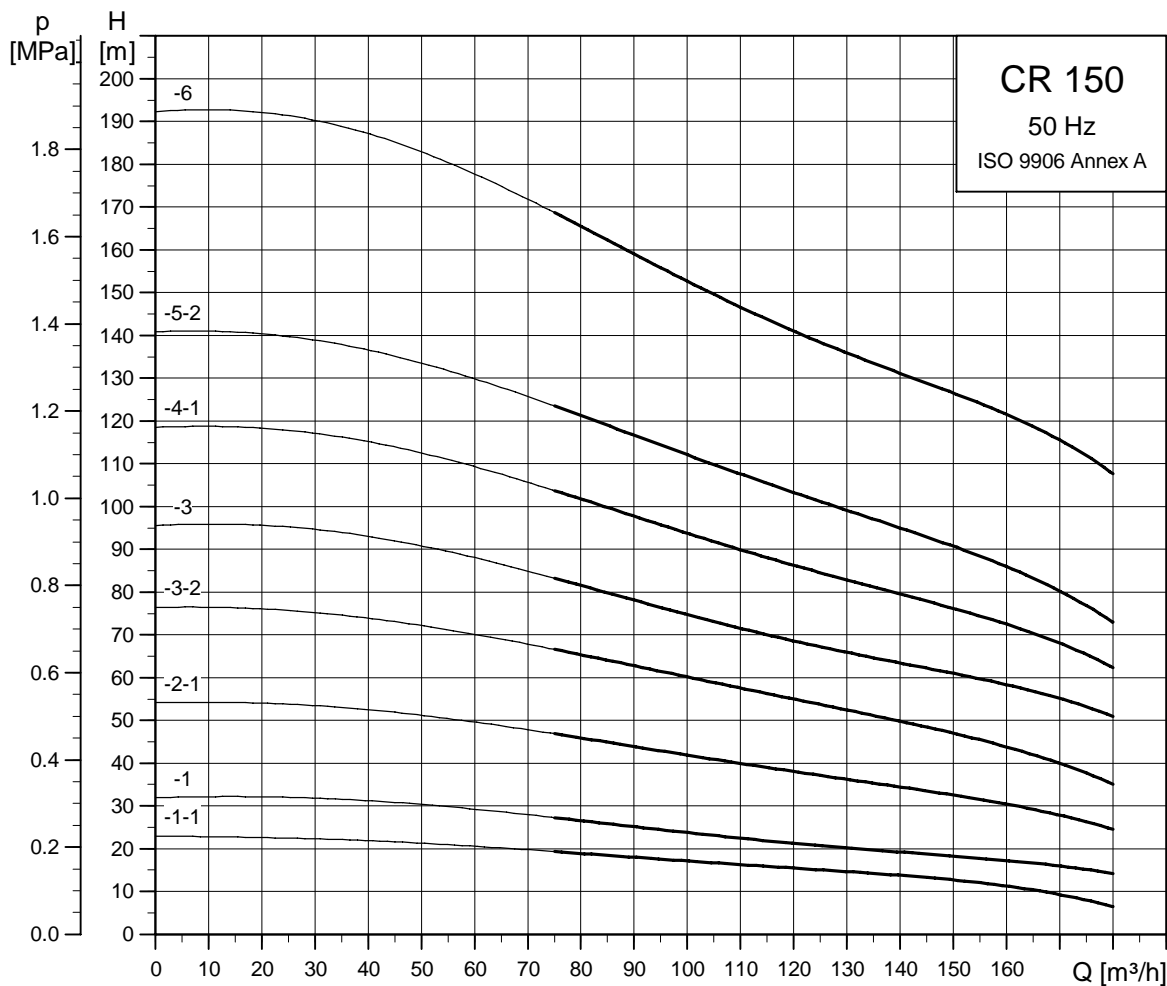


TM03 8889 2707

## Dimensions and weights

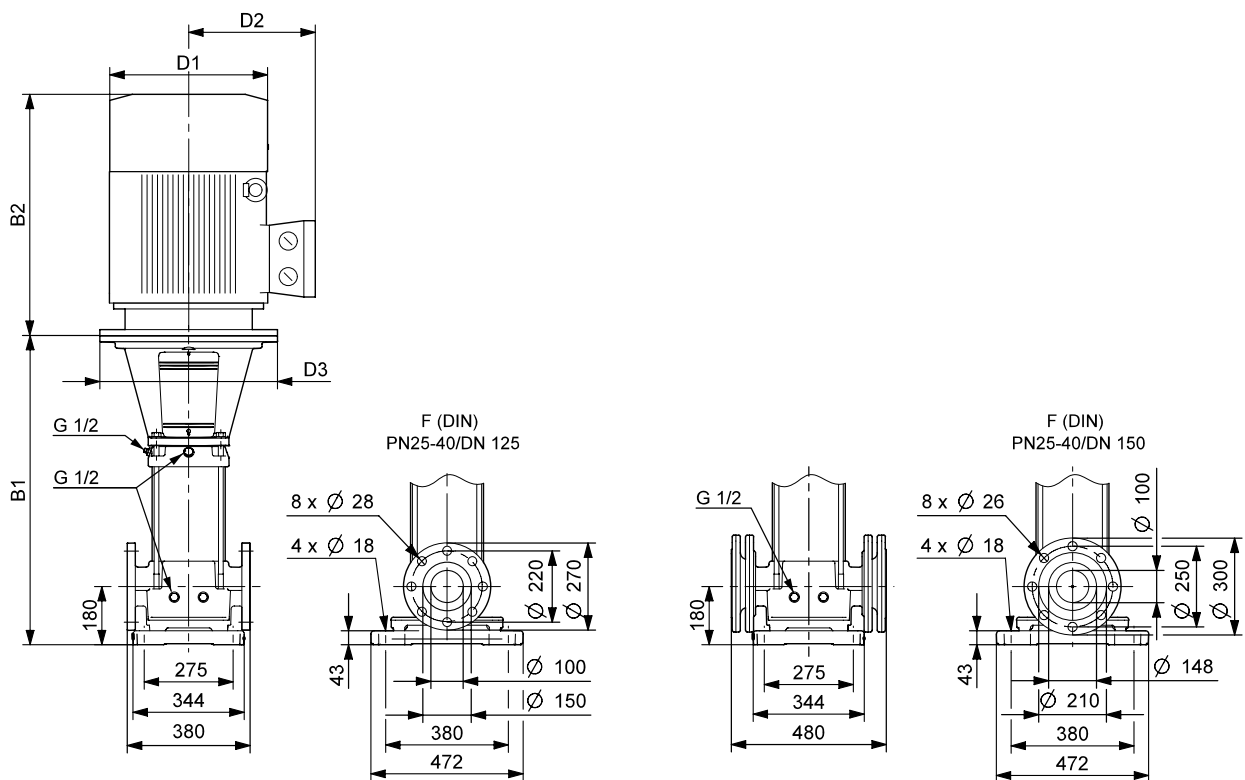
Pump type	Motor P <sub>2</sub> [kW]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 120-1	11	835	1334	260	172	350	193
CRN 120-2-1	18.5	990	1508	320	197	350	211
CRN 120-2	22	990	1600	363	262	350	297
CRN 120-3	30	1146	1756	402	300	400	357
CRN 120-4-1	37	1301	1968	402	300	400	397
CRN 120-5-1	45	1457	2166	442	325	449	486
CRN 120-6-1	55	1642	2389	495	392	550	631
CRN 120-7	75	1798	2618	555	432	550	775

## CR 150



TM03 8745 2407

## Dimensional sketch

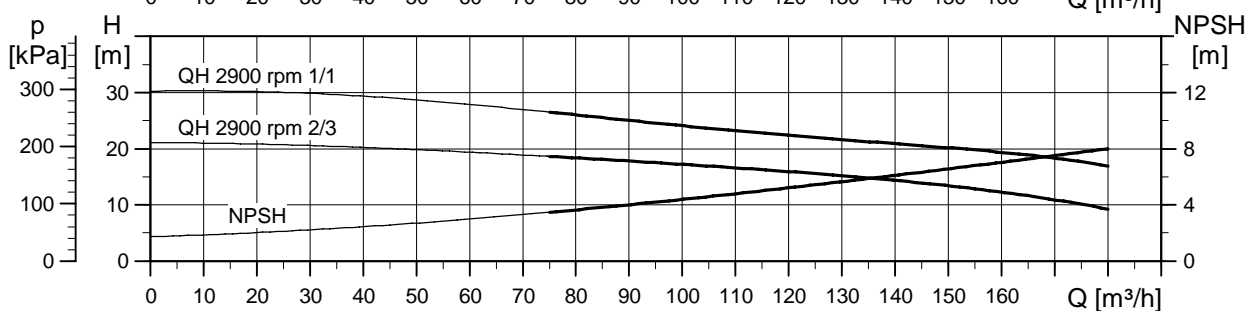
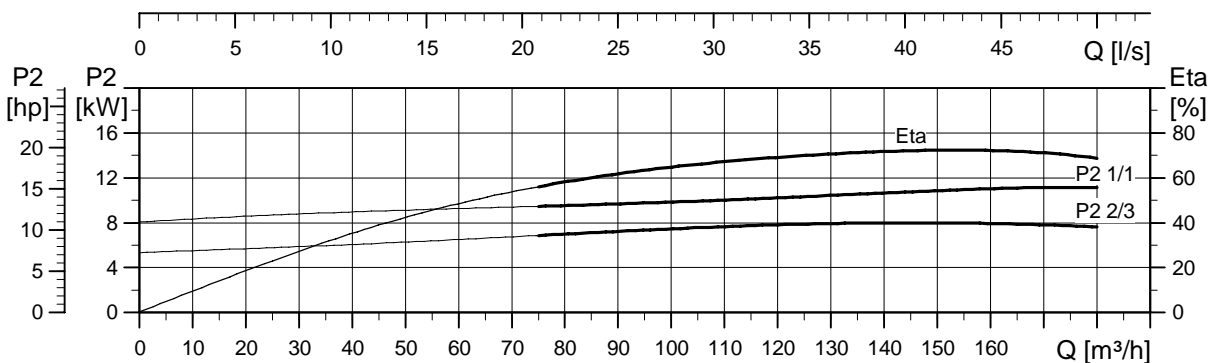
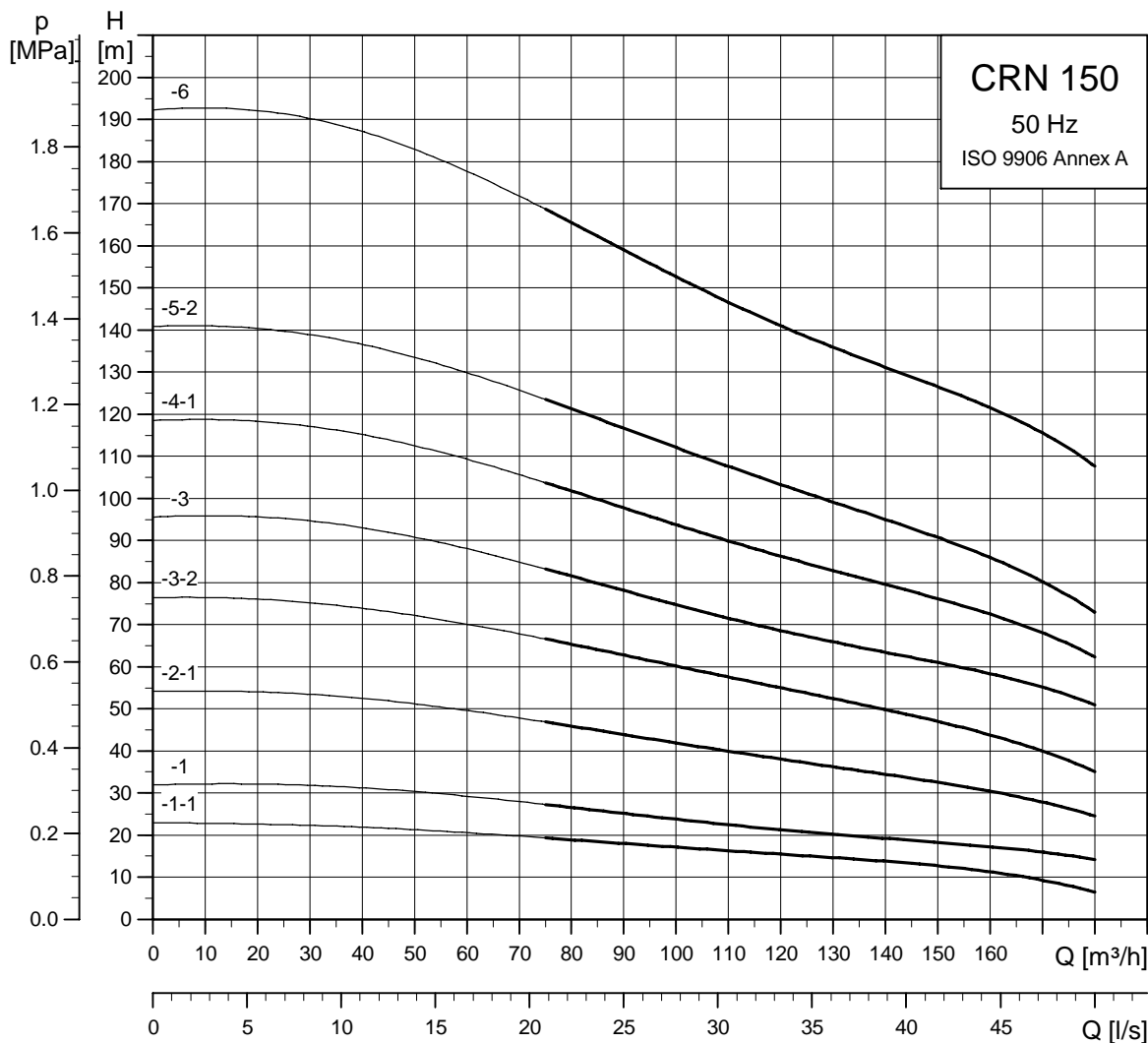


TM03 5999 4106

## Dimensions and weights

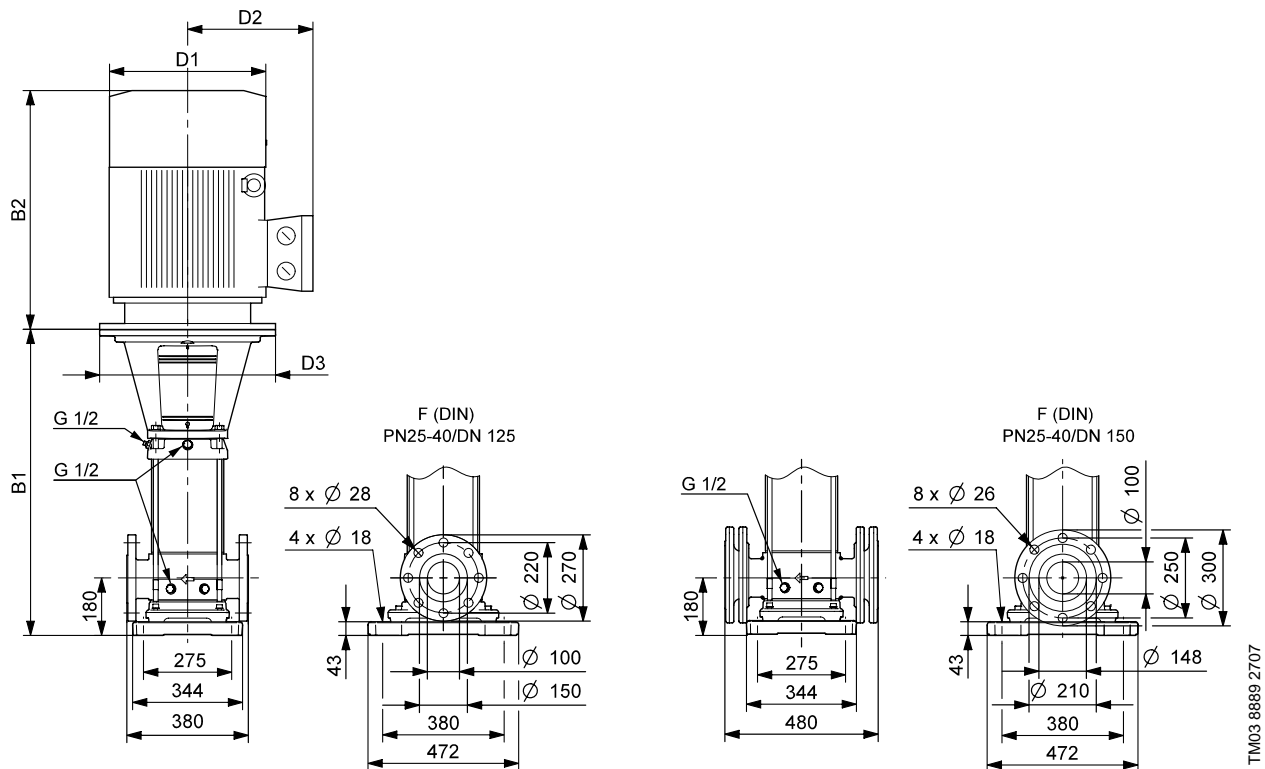
Pump type	Motor P <sub>2</sub> [kW]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 150-1-1	11	835	1334	260	172	350	193
CR 150-1	15	835	1313	320	197	350	194
CR 150-2-1	22	990	1600	363	262	350	297
CR 150-3-2	30	1146	1756	402	300	400	357
CR 150-3	37	1146	1813	402	300	400	387
CR 150-4-1	45	1301	2010	442	325	449	476
CR 150-5-2	55	1487	2234	495	392	550	621
CR 150-6	75	1642	2462	555	432	550	766

## CRN 150



TM03 8746 2407



## Dimensional sketch



## Dimensions and weights

Pump type	Motor P <sub>2</sub> [kW]	Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 150-1-1	11	835	1334	260	172	350	193
CRN 150-1	15	835	1313	320	197	350	194
CRN 150-2-1	22	990	1600	363	262	350	297
CRN 150-3-2	30	1146	1756	402	300	400	357
CRN 150-3	37	1146	1813	402	300	400	387
CRN 150-4-1	45	1301	2010	442	325	449	476
CRN 150-5-2	55	1487	2234	495	392	550	621
CRN 150-6	75	1642	2462	555	432	550	766

## Standard motors for CR, CRI, CRN, 50 Hz

Motor P <sub>2</sub> [kW]	Frame size	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η[%]	I <sub>start</sub>	Speed [rpm]	
0.37	71	220-240Δ/380-415Y	1.7/1	0.80-0.70	78.5	8.5-9.2/4.9-5.3	2850-2880	<p>MG</p>  <p>TM03 1711 2805</p>
0.55	71	220-240Δ/380-415Y	2.5/1.4	0.80-0.70	80	12-13/6.9-7.5	2830-2850	
0.75	80	220-240Δ/380-415Y	3.3/1.9	0.81-0.71	81	19.1-20.5/11.0-11.8	2840-2870	
1.1	80	220-240Δ/380-415Y	4.5/2.6	0.84-0.76	82.8	28.5-31.5/16.3-17.9	2820-2860	
1.5	90	220-240Δ/380-415Y	5.5/3.2	0.87-0.82	85.5	46.3-50.7/26.8-29.3	2890-2910	
2.2	90	380-415Δ	4.5-4.5	0.89-0.87	87.5	37.8-42.3	2890-2910	
3.0	100	380-415Δ	6.3-6.3	0.87-0.82	87.5	52.9-58.0	2900-2920	
4.0	112	380-415Δ	8-8	0.88-0.84	89	89.6-98.4	2910-2930	
5.5	132	380-415Δ	11.2-11.2	0.88-0.84	90	119.8-131.0	2910-2930	
7.5	132	380-415Δ	15.2-15.2	0.87-0.80	89.5	152-168.7	2900-2920	
11	160	380-415Δ	21.4-21.4	0.90-0.90	91.4	156.2-171.2	2920-2930	
15	160	380-415Δ/660-690Y	26.5/15.2	0.90-0.90	91.5	185.5/106.4	2945	<p>Siemens</p>  <p>TM03 1710 2805</p>
18.5	160	380-415Δ/660-690Y	31.5/18.4	0.92-0.92	92.5	220.5/128.8	2940	
22	180	380-415Δ/660-690Y	38.5/22	0.88-0.88	94	277.2/158.4	2955	
30	200	380-415Δ/660-690Y	53/30.5	0.88-0.88	93.5	371/213.5	2960	
37	200	380-415Δ/660-690Y	64/37	0.89-0.89	94	460.8/266.4	2960	
45	225	380-415Δ/660-690Y	77/44.5	0.89-0.89	95	562.1/324.9	2965	
55	250	380-415Δ/660-690Y	93/54	0.90-0.90	95.5	632.4/367.2	2975	
75	280	380-415Δ/660-690Y	128/74	0.89-0.89	95	896-832/518-481	2975	

## E-motors for CRE, CRIE, CRNE, 50 Hz

Motor P <sub>2</sub> [kW]	Frame size	Phase	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η[%]
0.37	71	1	200-240	2.7-2.5	0.96	68
0.55	71	1	200-240	3.9-3.6	0.96	70
0.75	80	1	200-240	5.1-4.7	0.97	72
1.1	80	1	200-240	7.4-6.8	0.97	73
0.75*	90	3	380-480	2.1-1.8	0.80-0.70	77
1.1*	90	3	380-480	2.6-2.3	0.88-0.77	78
1.5	90	3	380-480	3.3-2.7	0.91-0.87	81
2.2	90	3	380-480	4.6-3.8	0.92-0.90	83
3.0	100	3	380-480	6.2-5.0	0.94-0.92	83
4.0	112	3	380-480	8.1-6.6	0.94-0.92	85
5.5	132	3	380-480	11-8.8	0.94-0.93	85.5
7.5	132	3	380-480	15-12	0.94-0.93	85
11	160	3	380-415	21.4	0.93	84
15	160	3	380-415	28	0.94	85.5
18.5	160	3	380-415	34	0.95	85.5
22	180	3	380-415	42	0.94	85

MGE



TM03 1712 2805

MMGE



TM03 1713 2805

\* 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 for 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

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

Pumped liquid	Note	Liquid concentration, liquid temperature	CR(E), CRI(E)	CRN(E)
Acetic acid, CH <sub>3</sub> COOH	-	5 %, +20 °C	-	HQQE
Acetone, CH <sub>3</sub> COCH <sub>3</sub>	1, F	100 %, +20 °C	-	HQQE
Alkaline degreasing agent	D, F	-	HQQE	-
Ammonium bicarbonate, NH <sub>4</sub> HCO <sub>3</sub>	E	20 %, +30 °C	-	HQQE
Ammonium hydroxide, NH <sub>4</sub> OH	-	20 %, +40 °C	HQQE	-
Aviation fuel	1, 3, 4, F	100 %, +20 °C	HQBV	-
Benzoic acid, C <sub>6</sub> H <sub>5</sub> COOH	H	0.5 %, +20 °C	-	HQQV
Boiler water	-	< +120 °C	HQQE	-
	F	+120 °C - +180 °C	-	-
Calcareous water	-	< +90 °C	HQQE	-
Calcium acetate (as coolant with inhibitor) Ca(CH <sub>3</sub> COO) <sub>2</sub>	D, E	30 %, +50 °C	HQQE	-
Calcium hydroxide, Ca(OH) <sub>2</sub>	E	Saturated solution, +50 °C	HQQE	-
Chloride-containing water	F	< +30 °C, max. 500 ppm	-	HQQE
Chromic acid, H <sub>2</sub> CrO <sub>4</sub>	H	1 %, +20 °C	-	HQQV
Citric acid, HOC(CH <sub>2</sub> CO <sub>2</sub> H) <sub>2</sub> COOH	H	5 %, +40 °C	-	HQQE
Completely desalinated water (demineralized water)	-	+120 °C	-	HQQE

# Pumped liquids

CR, CRI, CRN,  
CRE, CRIE, CRNE

Pumped liquid	Note	Liquid concentration, liquid temperature	CR(E), CRI(E)	CRN(E)
Condensate	-	120 °C	HQQE	-
Copper sulphate, CuSO <sub>4</sub>	E	10 %, +50 °C	-	HQQE
Corn oil	D, E, 3	100 %, +80 °C	HQQV	-
Diesel oil	2, 3, 4, F	100 %, +20 °C	HQBV	-
Domestic hot water (potable water)	-	< +120 °C	HQQE	-
Ethanol (ethyl alcohol), C <sub>2</sub> H <sub>5</sub> OH	1, F	100 %, +20 °C	HQQE	-
Ethylene glycol, HOCH <sub>2</sub> CH <sub>2</sub> OH	D, E	50 %, +50 °C	HQQE	-
Formic acid, HCOOH	-	5 %, +20 °C	-	HQQE
Glycerine (glycerol), OHCH <sub>2</sub> CH(OH)CH <sub>2</sub> 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 <sub>3</sub> CHOHCH <sub>3</sub>	1, F	100 %, +20 °C	HQQE	-
Lactic acid, CH <sub>3</sub> CH(OH)COOH	E, H	10 %, +20 °C	-	HQQV
Linoleic acid, C <sub>17</sub> H <sub>31</sub> COOH	E, 3	100 %, +20 °C	HQQV	-
Methanol (methyl alcohol), CH <sub>3</sub> OH	1, F	100 %, +20 °C	HQQE	-
Motor oil	E, 2, 3	100 %, +80 °C	HQQV	-
Naphthalene, C <sub>10</sub> H <sub>8</sub>	E, H	100 %, +80 °C	HQQV	-
Nitric acid, HNO <sub>3</sub>	F	1 %, +20 °C	-	HQQE
Oil-containing water	-	< +100 °C	HQQV	-
Olive oil	D, E, 3	100 %, +80 °C	HQQV	-
Oxalic acid, (COOH) <sub>2</sub>	H	1 %, +20 °C	-	HQQE
Ozone-containing water, (O <sub>3</sub> )	-	< +100 °C	-	HQQE
Peanut oil	D, E, 3	100 %, +80 °C	HQQV	-
Petrol	1, 3, 4, F	100 %, +20 °C	HQBV	-
Phosphoric acid, H <sub>3</sub> PO <sub>4</sub>	E	20 %, +20 °C	-	HQQE
Propanol, C <sub>3</sub> H <sub>7</sub> OH	1, F	100 %, +20 °C	HQQE	-
Propylene glycol, CH <sub>3</sub> CH(OH)CH <sub>2</sub> OH	D, E	50 %, +90 °C	HQQE	-
Potassium carbonate, K <sub>2</sub> CO <sub>3</sub>	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 <sub>4</sub>	-	5 %, +20 °C	-	HQQE
Rape seed oil	D, E, 3	100 %, +80 °C	HQQV	-
Salicylic acid, C <sub>6</sub> H <sub>4</sub> (OH)COOH	H	0.1 %, +20 °C	-	HQQE
Silicone oil	E, 3	100 %	HQQV	-
Sodium bicarbonate, NaHCO <sub>3</sub>	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 <sub>3</sub>	E	10 %, +60 °C	-	HQQE
Sodium phosphate, Na <sub>3</sub> PO <sub>4</sub>	E, H	10 %, +60 °C	-	HQQE
Sodium sulphate, Na <sub>2</sub> SO <sub>4</sub>	E, H	10 %, +60 °C	-	HQQE
Softened water	-	< +120 °C	-	HQQE
Soya oil	D, E, 3	100 %, +80 °C	HQQV	-
Sulphuric acid, H <sub>2</sub> SO <sub>4</sub>	F	1 %, +20 °C	-	HQQV
Sulphurous acid, H <sub>2</sub> SO <sub>3</sub>	-	1 %, +20 °C	-	HQQE
Unsalted swimming pool water	-	Approx. 2 ppm free chlorine (Cl <sub>2</sub> )	HQQE	-

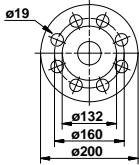
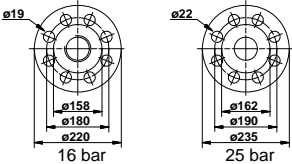
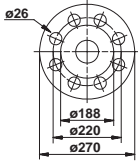
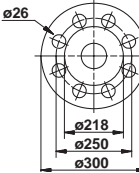
## Pipework connection

Various sets of counter flanges and couplings are available for pipework connection.

### Counter flanges for CR(E)

A counter flange 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	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
	TM03 0400 3705	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
	TM03 0401 3705	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
	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
	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

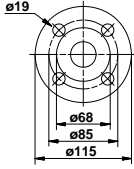
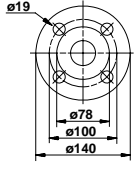
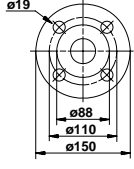
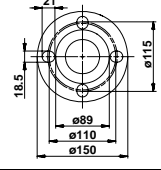
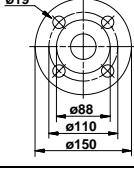
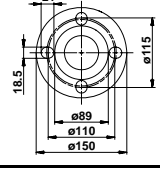
Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number	
	TM03 2117 3705	Threaded	16 bar	Rp 3	350540	
		CR(E) 45	For welding	16 bar	80 mm, nominal	350541
		For welding	40 bar	80 mm, nominal	350542	
	TM03 2118 3705	Threaded	16 bar, EN 1092-2	Rp 4	369901	
		CR(E) 64 CR(E) 90	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 120 CR 150	For welding	40 bar, EN 1092-2	125 mm, nominal	96750475
	TM03 8891 2707		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)

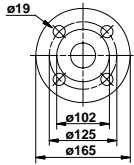
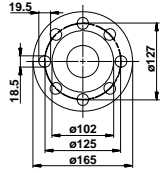
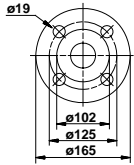
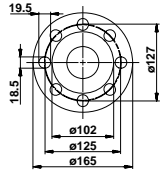
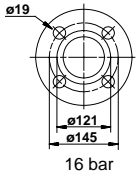
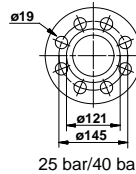
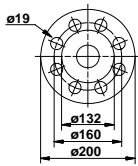
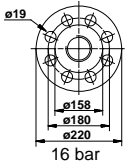
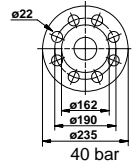
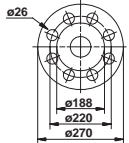
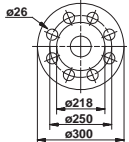
Counter flanges for CRN(E) pumps are made of stainless steel to EN 1.4401 (AISI 316).

A counter flange 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	Threaded	16 bar, EN 1092-2	Rp 1	405284
		CRI(E), CRN(E) 1s, 1, 3, 5	For welding	25 bar, EN 1092-2	25 mm, nominal
	TM03 0400 3705	Threaded	16 bar, EN 1092-2	Rp 1½	415304
		CRI(E), CRN(E) 1s, 1, 3, 5	For welding	25 bar, EN 1092-2	32 mm, nominal
	TM03 0401 3705		16 bar, EN 1092-2	Rp 1½	425245
	TM02 7202 2803		16 bar, EN 1092-2	Rp 2	96509570
		CRI(E) 10 CRN(E) 10			
	TM03 0401 3705		25 bar, EN 1092-2	40 mm, nominal	425246
	TM02 7202 2803		25 bar, special flange	50 mm, nominal	96509571

# Accessories

CR, CRI, CRN,  
CRE, CRIE, CRNE

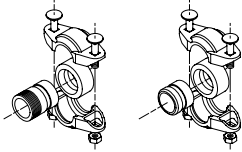
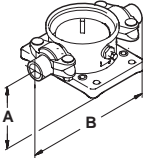
Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number	
	TM00 0402 3705	Threaded	16 bar, EN 1092-2	Rp 2	335254	
	TM02 7203 2803	Threaded	16 bar, special flange	Rp 2½	96509575	
		Threaded	16 bar, special flange	Rp 2½ ★	96509579	
		<b>CRI(E) 15, 20 CRN(E) 15, 20</b>				
	TM03 0402 3705	For welding	25 bar, EN 1092-2	50 mm, nominal	335255	
	TM00 7203 2803	For welding	25 bar, special flange	65 mm, nominal	96509573	
	TM03 2119 3705	<b>CRN(E) 32</b>	Threaded	16 bar	Rp 2½	349910
			Threaded	16 bar, special flange	Rp 3	349911
			For welding	16 bar	65 mm, nominal	349906
			For welding	40 bar	65 mm, nominal	349908
			For welding	16 bar, special flange	80 mm, nominal	349907
			For welding	25 bar, special flange	80 mm, nominal	349909
	TM03 2117 3705	<b>CRN(E) 45</b>	Threaded	16 bar	Rp 3	350543
	For welding		16 bar	80 mm, nominal	350544	
	For welding		40 bar	80 mm, nominal	350545	
	TM03 2118 3705	<b>CRN(E) 64 CRN(E) 90</b>	Threaded	16 bar	Rp 4	369904
			For welding	16 bar	100 mm, nominal	369903
			For welding	40 bar	100 mm, nominal	369906
	TM03 8892 2707	<b>CRN 120 CRN 150</b>	For welding	40 bar, EN 1092-2	125 mm, nominal	96750477
	TM03 8891 2707		For welding	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)

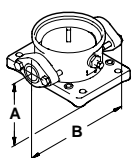
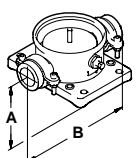
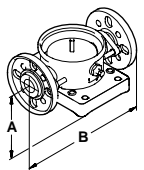
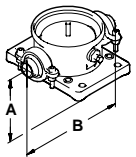
Materials in contact with the pumped liquid are made of stainless steel to EN 1.4401 (AISI 316) and rubber.

A PJE coupling set consists of two coupling halves (Vic-taulic, type 77), one gasket, one pipe stud (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
	TM00 3808 1094	Threaded	80 bar	50	320	R 1½	EPDM	2	419911
							FKM	2	419905
		For welding	80 bar	50	280	DN 32	EPDM	2	419912
							FKM	2	419904
	TM03 8890 2707	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

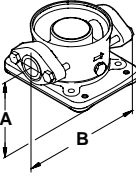
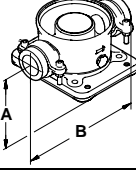
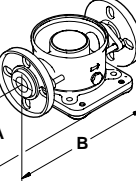
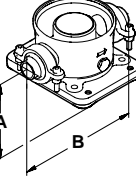
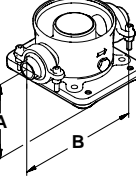
## FlexiClamp base connections

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
	TM02 7368 3303	Oval (cast iron)	Rp 1	16	50	210	Klingsil	1	96449748
			Rp 1½				Klingsil	1	96449749
		Oval (stainless steel)	Rp 1	Klingsil	2	96449746			
			Rp 1½	Klingsil	2	96449747			
	TM02 7369 3303	Union	G 2	25	50	228	EPDM	2	96449743
							FKM	2	96449744
	TM02 7370 3303	DIN (stainless steel)	DN 25	16	75	250	EPDM	2	96449745
			DN 32				FKM	2	96449900
	TM02 7371 3303	Clamp, threaded pipe stub	Rp 1	25	50	208	EPDM	2	405280
			FKM				2	405281	
			Rp 1½				EPDM	2	415296
			1" NPT				FKM	2	415297
			1½" NPT				EPDM	2	405291
			EPDM				2	405292	
			FKM				2	415311	
			FKM				2	415312	
			28.5				EPDM	2	405282
			37.2				FKM	2	405283
EPDM	2	415300							
FKM	2	415301							

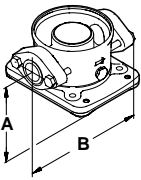
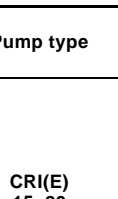
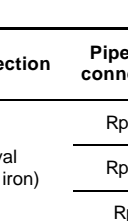
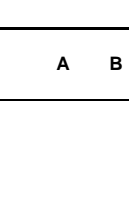
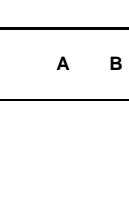

# Accessories

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							
	<b>CRI(E) 10</b> <b>CRN(E) 10</b>	Oval (cast iron)	Rp 1¼	16	80	260	Klingersil	2	96498775							
			Rp 1½				Klingersil	2	96498727							
			Rp 2				Klingersil	2	96498836							
			Rp 1¼				Klingersil	2	96498776							
			Rp 1½				Klingersil	2	96498728							
	<b>CRI(E) 10</b> <b>CRN(E) 10</b>	Union	G 2¼	25	80	288	EPDM	2	96500275							
							FKM	2	96500276							
								<b>CRI(E) 10</b> <b>CRN(E) 10</b>	FGJ (cast iron)	DN 40	16	80	316	EPDM	2	96498840
														FKM	2	96500119
														EPDM	2	96500263
	<b>CRI(E) 10</b> <b>CRN(E) 10</b>	FGJ (stainless steel)	DN 50	25	80	346	FKM	2	96500264							
							EPDM	2	96500265							
							FKM	2	96500266							
							EPDM	2	96500267							
							FKM	2	96500269							
	<b>CRI(E) 10</b> <b>CRN(E) 10</b>	Clamp, threaded pipe stub	Rp 1½	25	80	346	EPDM	2	425238							
			Rp 2				FKM	2	425239							
			Rp 2½				EPDM	2	335241							
			Rp 2½				FKM	2	335242							
			48.3 (DN 40)				EPDM	2	96508600							
			48.3 (DN 40)				FKM	2	96508601							
			60.3 (DN 50)				EPDM	2	425242							
			60.3 (DN 50)				FKM	2	425243							
			60.3 (DN 50)				EPDM	2	335251							
			60.3 (DN 50)				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		
	<b>CRI(E) 15, 20</b> <b>CRN(E) 15, 20</b>	Oval (cast iron)	Rp 1¼	10	90	260	Klingsil	2	96498775		
			Rp 1½				Klingsil	2	96498727		
			Rp 2				Klingsil	2	96498836		
			Rp 1¼				Klingsil	2	96498776		
			Oval (stainless steel)				Rp 1½	Klingsil	2	96498728	
							Rp 2	Klingsil	2	96498835	
	<b>CRI(E) 15, 20</b> <b>CRN(E) 15, 20</b>	Union	G 2¼	25	90	288	EPDM	2	96500275		
							FKM	2	96500276		
	<b>CRI(E) 15, 20</b> <b>CRN(E) 15, 20</b>	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	
	<b>CRI(E) 15, 20</b> <b>CRN(E) 15, 20</b>	FGJ (stainless steel)	DN 50	10	90	334	EPDM	2	96500267		
							FKM	2	96500269		
							Rp 1½	EPDM	2	425238	
									FKM	2	425239
							Clamp, threaded pipe stub	Rp 2	EPDM	2	335241
										FKM	2
	<b>CRI(E) 15, 20</b> <b>CRN(E) 15, 20</b>	Rp 2½	25	90	346	EPDM	2	96508600			
						FKM	2	96508601			
						48.3 (DN 40)	EPDM	2	425242		
								FKM	2	425243	
						Clamp, pipe stub for welding	EPDM	2	335251		
								FKM	2	335252	
	<b>CRI(E) 15, 20</b> <b>CRN(E) 15, 20</b>	60.3 (DN 50)	25	90	346	EPDM	2	335251			
						FKM	2	335252			

## Potentiometer for CRE, CRIE, CRNE

The potentiometer is 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

Use the G10-LON interface 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)

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

LiqTec is prepared for DIN rail mounting in control cabinet.

Enclosure class: IP X0.

## Remote control, R100

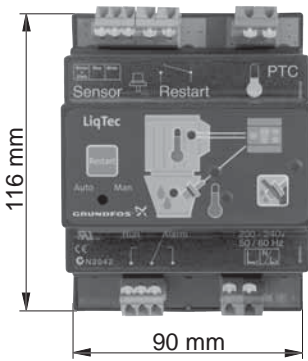
Use the R100 for wireless communication with the CRE, CRIE, CRNE pump. The communication takes place by means of infrared light.

Product	Product number
R100	625333

## EMC filter for CRE, CRIE, CRNE

The EMC filter is required for installation of 11 to 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
 <p>116 mm</p> <p>90 mm</p> <p>TM03 2108 3705</p>	CR(E) CRI(E) CRN(E)	200-240	●	●	●	-	96556429
		80-130	●	●	●	-	96556430
		-	-	-	-	●	96443676

## Sensors for CRE, CRIE, CRNE

Accessory	Type	Supplier	Measuring range	Product number
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	1-5 m <sup>3</sup> (DN 25)	ID8285
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	3-10 m <sup>3</sup> (DN 40)	ID8286
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	6-30 m <sup>3</sup> (DN 65)	ID8287
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	20-75 m <sup>3</sup> (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 Ø9 x 50 mm	Carlo Gavazzi		96430201
	Protecting tube Ø9 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 output.

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

The kit comprises:	Pressure range	Temperature range	Product number
<ul style="list-style-type: none"> <li>Danfoss pressure transmitter, type MBS 3000, with 2 m screened cable Connection: G ½ A (DIN 16288 - B6kt)</li> <li>5 cable clips (black)</li> <li>Instruction manual PT (00 40 02 12)</li> </ul>	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"> <li>1 sensor incl. 0.9 m screened cable (7/16" connections)</li> <li>1 original DPI bracket (for wall mounting)</li> <li>1 Grundfos bracket (for mounting on motor)</li> <li>2 M4 screws for mounting of sensor on bracket</li> <li>1 M6 screw (self-cutting) for mounting on MGE 90/100</li> <li>1 M8 screw (self-cutting) for mounting on MGE 112/132</li> <li>3 capillary tubes (short/long)</li> <li>2 fittings (1/4" - 7/16")</li> <li>5 cable clips (black)</li> <li>Installation and operating instructions (00480675)</li> <li>Service kit instructions.</li> </ul>	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
<b>ATEX motor</b>	For operation in hazardous atmospheres, explosion-proof or dust-ignition-proof motors may be required.
<b>Motor with anti-condensation heating unit</b>	For operation in humid environments motors with built-in anti-condensation heating unit may be required.
<b>Motor with thermal protection</b>	Grundfos offers motors with built-in bimetallic thermal switches or temperature-controlled PTC sensors (thermistors) incorporated in the motor windings.
<b>Oversize motor</b>	Ambient temperatures above 40°C or installation at altitudes of more than 1000 metres above sea level require the use of an oversize motor (i.e. derating).
<b>4-pole motor</b>	Grundfos offers 4-pole standard motors.

### Shaft seals

Variant	Description
<b>Shaft seal with FFKM O-ring material</b>	Shaft seals with FFKM or FXM O-ring material are recommended for applications where the pumped liquid may damage the standard O-ring material.
<b>Seal with flush, quench seal</b>	Recommended for applications involving crystallizing, hardening or sticky liquids.
<b>Air-cooled shaft seal system</b>	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.
<b>Double seal with pressure chamber</b>	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.
<b>CR MAGdrive</b>	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
<b>Horizontally mounted pump</b>	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.
<b>Low-temperature pump</b>	Exposed to temperatures down to -40 °C, coolant pumps may require neck-rings with a different diameter in order to prevent impeller drag.
<b>High-speed pump up to 47 bar</b>	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.
<b>High-pressure pump up to 47 bar</b>	For high-pressure applications, Grundfos offers a unique double pump system capable of generating a pressure of up to 47 bar pressure.
<b>Low-NPSH pump (improved suction)</b>	Recommended for boiler-feed applications where cavitation may occur due to poor inlet conditions.
<b>Pump with bearing flange</b>	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.)
<b>Belt-driven pump</b>	Belt-driven pumps designed to operate in places with limited space or where no electrical power is available.
<b>Pump for pharmaceutical and biotechnological applications</b>	CRN(E) pumps designed for applications requiring the sterilization and CIP capability of pipes, valves and pumps. (CIP = Cleaning-In-Place.)

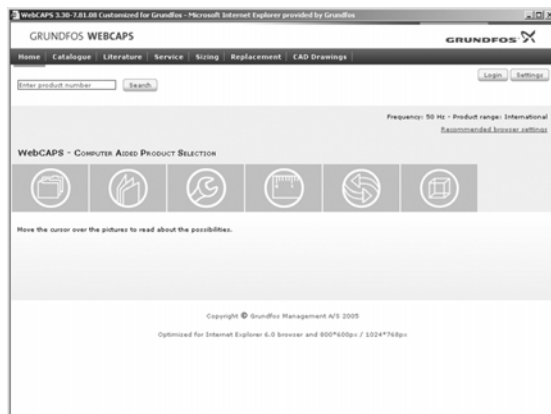
### Connections and other variants

Variant	Description
<b>Pipe connections</b>	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.
<b>TriClamp connection</b>	TriClamp connections are of a hygienic design with a sanitary coupling for use in the pharmaceutical and food industry.
<b>Electropolished pump</b>	To substantially reduce the risk of corrosion of the materials. For use in the pharmaceutical/food industry.

# Further product documentation

CR, CRI, CRN,  
CRE, CRIE, CRNE

## WebCAPS

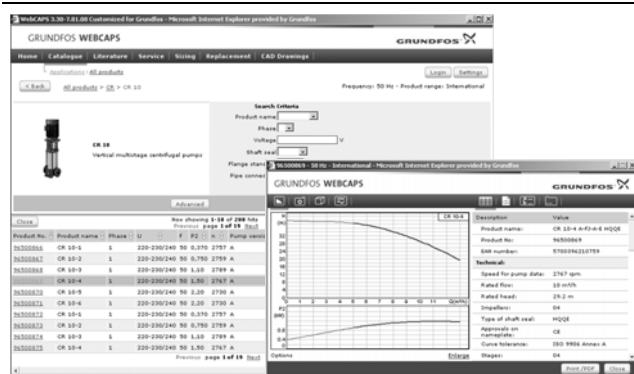


WebCAPS is a **Web-based Computer Aided Product Selection** program available on [www.grundfos.com](http://www.grundfos.com).

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:

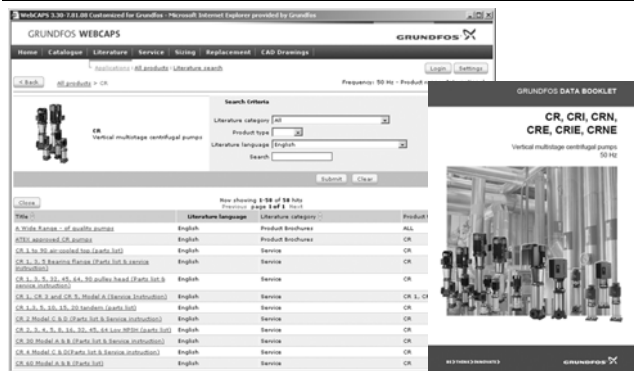
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



### Catalogue

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

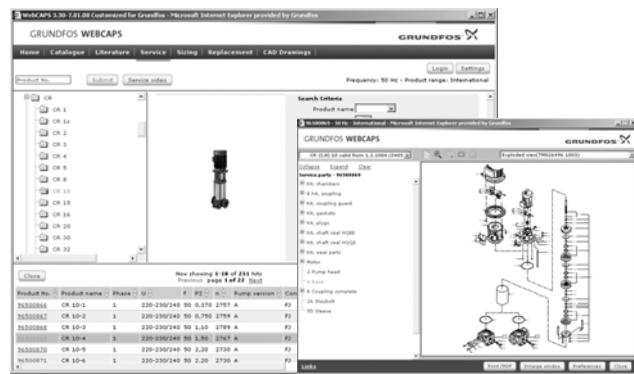
- technical data
- curves (QH, Eta, P1, P2, etc) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



### 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

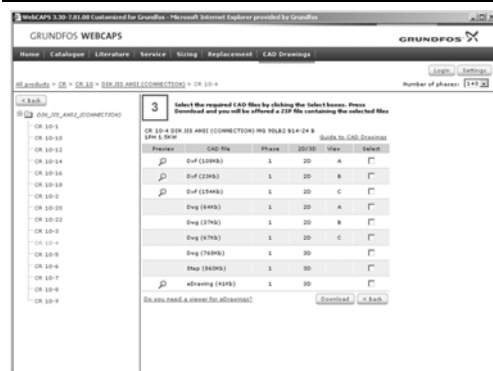
- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- analyse your selected pump via the built-in life cycle cost tool
- determine the flow velocity in wastewater applications, 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. 28 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.

<b>V7023751</b> 1007	<b>GB</b>
Repl. V7023751 0706	

Subject to alterations.