

CR, CRI, CRN

Vertical multi-stage centrifugal pumps
60 Hz



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1. Product introduction

This data booklet deals with Grundfos CR, CRI and CRN pumps.



GR5381

Fig. 1 CR, CRI and CRN pumps

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

CR pumps are available in various sizes and various numbers of stages to deliver the flow and pressure required.

CR pumps are designed for a variety of applications ranging 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.

A CR pump consists of two main components: the motor and the pump unit.

The motor is a Grundfos motor designed to EN standards.

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

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

Performance range

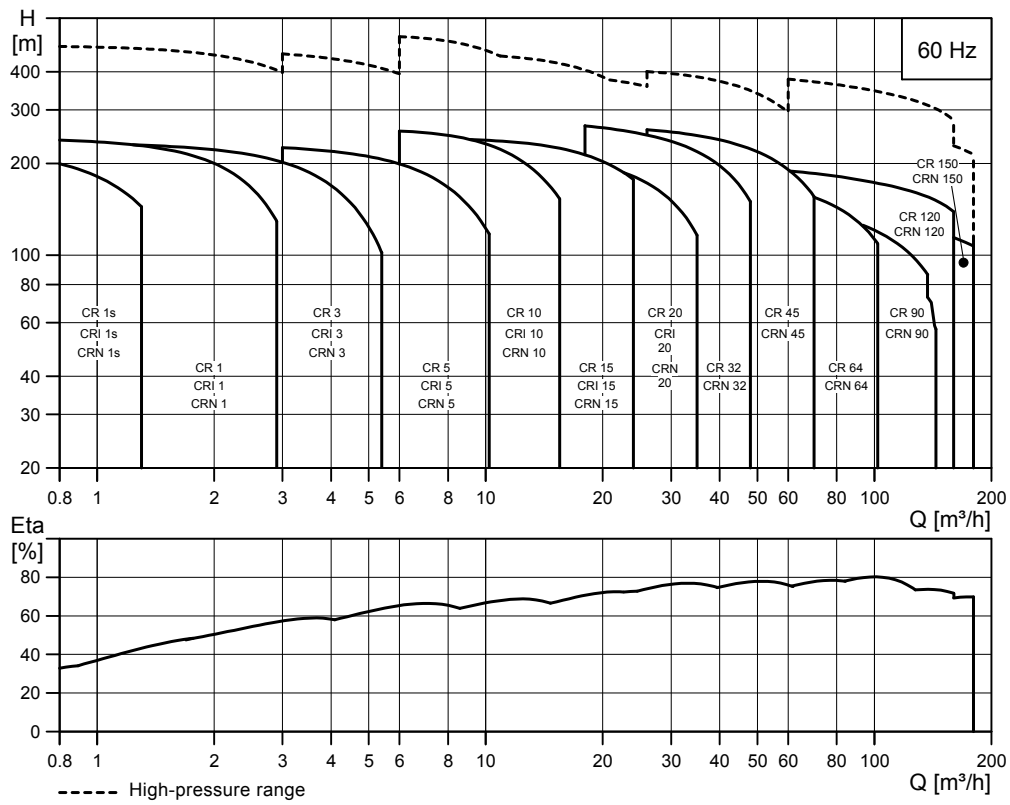


Fig. 2 Performance range, CR, CRI and CRN

TM02 1530 4408

EuP ready

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

Minimum efficiency index

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

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

Minimum efficiency index (MEI)

Pump type	MEI
CR 1s-3	0.54
CR 1-3	> 0.70
CR 3-3	> 0.70
CR 5-3	0.57
CR 10-3	> 0.70
CR 15-3	> 0.70
CR 20-3	> 0.70
CR 32-3	> 0.70
CR 45-3	> 0.70
CR 64-3	> 0.70
CR 90-3	> 0.70

Applications

Application	CR, CRI	CRN
Water supply		
Filtration and transfer at waterworks	●	○
Distribution from waterworks	●	○
Pressure boosting in mains	●	○
Pressure boosting in high-rise buildings, hotels, etc.	●	○
Pressure boosting for industrial water supply	●	○
Industry		
Pressure boosting		
Process-water systems	●	●
Washing and cleaning systems	●	●
Vehicle-washing tunnels	●	○
Firefighting systems	●	-
Liquid transfer		
Cooling and air-conditioning systems (refrigerants)	●	○
Boiler feed and condensate systems	●	○
Machine tools (cooling lubricants)	●	●
Aquafarming*	●	○
Special transfer duties		
Oils and alcohols	●	●
Acids and alkalis*	-	●
Glycol and coolants	●	-
Water treatment		
Ultra-filtration systems	-	●
Reverse osmosis systems*	-	●
Softening, ionising, demineralising systems	-	●
Distillation systems	-	●
Separators	●	●
Swimming baths*	-	●
Irrigation		
Field irrigation (flooding)	●	○
Sprinkler irrigation	●	○
Drip-feed irrigation	●	○

● Recommended version.

○ Alternative version.

* CRT version available.

For further information about CRT pumps, see section 7. *Pumped liquids*, page 75, or related CRT, CRTE data booklet available on www.grundfos.com (WebCAPS).

Product range

Range	CR 1s	CR 1	CR 3	CR 5	CR 10	CR 15	CR 20
Rated flow rate [m ³ /h]	1	1.2	3.6	6	12	18	24
Liquid temperature [°C]	-20 - +120						
Liquid temperature [°C], on request	-40 - +180						
Maximum pump efficiency [%]	35	49	59	67	70	72	72
CR pumps							
Flow rate [m ³ /h]	0.4 - 1.3	0.8 - 2.9	1.4 - 5.4	3 - 10.2	6 - 16	10 - 29	13 - 35
Maximum pressure [bar]	23	24	24	24	25	24	21
High pressure [bar], on request (CRN)	-	48	42	48	47	47	47
Motor power [kW]	0.37 - 1.1	0.37 - 3.0	0.37 - 4.0	0.55 - 7.5	0.75 - 11	1.5 - 18.5	2.2 - 18.5
Version							
CR: Cast iron and stainless steel EN 1.4301/AISI 304	•	•	•	•	•	•	•
CRI: Stainless steel EN 1.4301/AISI 304	•	•	•	•	•	•	•
CRN: Stainless steel EN 1.4401/AISI 316	•	•	•	•	•	•	•
CRT: Titanium	See the CRT, CRTE data booklet available on www.grundfos.com (WebCAPS).						
CR pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Oval flange (BSP), on request	Rp 1 1/4	Rp 1 1/4	Rp 1 1/4	Rp 1	Rp 1 1/4 Rp 2	Rp 2 1/2	Rp 2 1/2
Flange	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 25/ DN 32	DN 40	DN 50	DN 50
Flange, on request	-	-	-	-	DN 50	-	-
CRI pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Oval flange (BSP), on request	Rp 1 1/4	Rp 1 1/4	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 1 1/4 DN 32	R 1 1/4 DN 32	R 1 1/4 DN 32	R 1 1/4 DN 32	R 2 DN 50	R 2 DN 50	R 2 DN 50
Clamp coupling (L-coupling)	Ø48.3	Ø48.3	Ø48.3	Ø48.3	Ø60.3	Ø60.3	Ø60.3
Union (+GF+)	G 2	G 2	G 2	G 2	G 2 3/4	G 2 3/4	G 2 3/4
CRN pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/4	Rp 1 1/2	Rp 2	Rp 2
Oval flange (BSP), on request	Rp 1 1/4	Rp 1 1/4	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 1 1/4 DN 32	R 1 1/4 DN 32	R 1 1/4 DN 32	R 1 1/4 DN 32	R 2 DN 50	R 2 DN 50	R 2 DN 50
Clamp coupling (L-coupling)	Ø48.3	Ø48.3	Ø48.3	Ø48.3	Ø60.3	Ø60.3	Ø60.3
Union (+GF+)	G 2	G 2	G 2	G 2	G 2 3/4	G 2 3/4	G 2 3/4

- Standard.
- Available.

Range	CR 32	CR 45	CR 64	CR 90	CR 120	CR 150
Rated flow rate [m ³ /h]	38	54	77	108	140	180
Liquid temperature [°C]	-30 - +120 ¹⁾			- 0 - +120 ^{1) and 2)}		
Liquid temperature [°C], on request	-40 - +180			-		
Maximum pump efficiency [%]	76	78	79	80	74	70
CR pumps						
Flow rate [m ³ /h]	18 - 48	26 - 70	36 - 102	54 - 146	60 - 160	75 - 180
Maximum pressure [bar]	27	26	18	16	19	16
High pressure [bar], on request (CRN)	49	49	34	34	38	32
Motor power [kW]	2.2 - 30	5.5 - 45	7.5 - 45	11 - 45	11 - 75	11 - 75
Version						
CR: Cast iron and stainless steel EN 1.4301/AISI 304	•	•	•	•	•	•
CRI: Stainless steel EN 1.4301/AISI 304	○	○	○	○	-	-
CRN: Stainless steel EN 1.4401/AISI 316	•	•	•	•	•	•
CRT: Titanium	See the CRT, CRTE data booklet available on www.grundfos.com (WebCAPS).					
CR pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 125	DN 125
Flange, on request	DN 80	DN 100	DN 125	DN 125	DN 150	DN 150
CRI pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	-	-	-	-	-	-
Flange, on request	-	-	-	-	-	-
PJE coupling (Victaulic)	-	-	-	-	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-
CRN pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 125	DN 125
Flange, on request	DN 80	DN 100	DN 125	DN 125	DN 150	DN 150
PJE coupling (Victaulic)	3 ⁿ³⁾	4 ⁿ³⁾	4 ⁿ³⁾	4 ⁿ³⁾	-	-
Clamp coupling (L-coupling)	-	-	-	-	-	-
Union (+GF+)	-	-	-	-	-	-

- Standard.
- Available.

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

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

3) On request. See the CR "Custom-built pumps" data booklet available on www.grundfos.com (WebCAPS).

Pump

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

The pumps are available with a Grundfos standard motor.

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

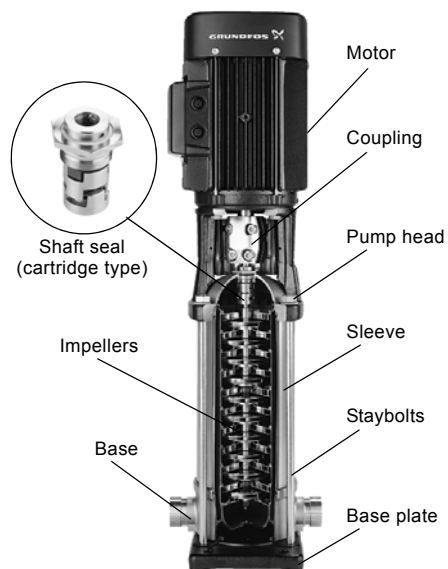


Fig. 3 CR pump

GR5357 - GR3395

Motor

Grundfos MG standard 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 WinCAPS or WebCAPS.

Grundfos E-motors

We also offer frequency-controlled CRE, CRIE and CRNE pumps which are the ideal choice for a number of applications characterised by a demand for variable flow at constant pressure. These 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.

See the CRE, CRIE and CRNE data booklet available on www.grundfos.com (WebCAPS).

Grundfos blueflux®

Grundfos blueflux® technology represents the best from Grundfos within energy-efficient motors and frequency converters. Grundfos blueflux® solutions either meet or exceed legislative requirements, such as the EuP IE3 grade.



Fig. 4 Grundfos blueflux® label

TM04 9901 0814

Electrical data

MG motor CR, CRI, CRN	
Mounting designation	Up to 4 kW: V18 From 5.5 kW: V1
Insulation class	F
Efficiency class	IE2 - IE3 0.37 and 0.55 kW motors are not part of the IE classification
Enclosure class	IP55 ¹⁾
Supply voltage	P2: 0.37 to 1.1 kW: 3 x 220-255/380-440 V
Tolerance: - 10/+ 10 %	P2: 1.5 kW: 3 x 220-277/380-480 V
	P2: 2.2 to 5.5 kW: 3 x 380-480 V
	P2: 7.5 to 22 kW: 3 x 380-480/660-690 V
Supply frequency	60 Hz

¹⁾ IP44, IP54 and IP55 are available on request.

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, we offer 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

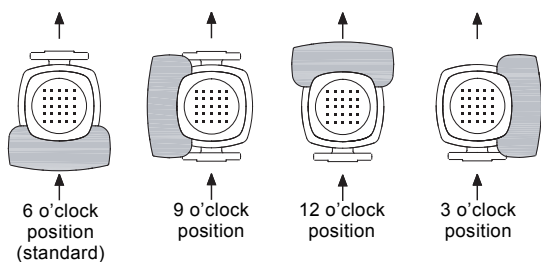
Single-phase Grundfos motors have a built-in thermal overload switch (IEC 34-11: TP 211).

Three-phase motors must be connected to a motor-protective circuit breaker according to local regulations.

Three-phase Grundfos motors as from 3 kW have a built-in thermistor (PTC) according to DIN 44082 (IEC 34-11: TP 211).

Terminal box positions

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



TM03 3658 0606

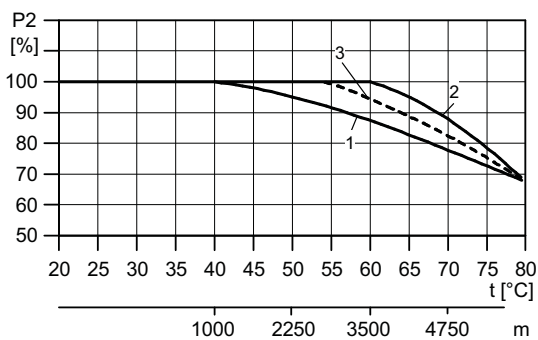
Fig. 5 Terminal box positions

Ambient temperature

Motor power [kW]	Motor make	Motor efficiency class	Maximum ambient temperature [°C]	Maximum altitude above sea level [m]
0.37 - 0.55	MG	-	40	1000
0.75 - 22	MG	IE2 - IE3	60	3500
30-75	Siemens	IE3	55	2750

If the ambient temperature exceeds the above maximum temperatures 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.



TM03 2479 4405

Fig. 6 Motor output in relation to temperature/altitude

Pos.	Motor power [kW]	Motor make
1	0.37 and 0.55	MG
2	0.75 - 22	MG
3	30-75	Siemens

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 fitted with a larger motor. If in doubt, contact Grundfos.

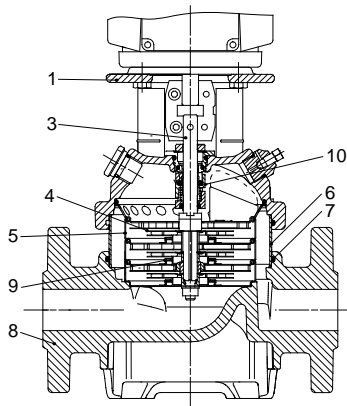
2. Construction

CR 1s, 1, 3, 5, 10, 15 and 20



TM02 1198 0601 - GR7377 - GR7379

Sectional drawing



TM02 1194 1403

Materials, CR

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

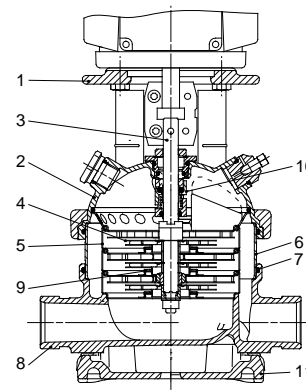
- 1) CR 1s, 1, 3, 5.
2) CR 10, 15, 20.

CRI, CRN 1s, 1, 3, 5, 10, 15 and 20



TM02 1808 2001 - GR7373 - GR7375

Sectional drawing



TM02 1195 1403

Materials, CRI and CRN

Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJL-200 ¹⁾	EN-JL1030	ASTM 25B
2	Pump head cover	Stainless steel	1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	1.4401 ²⁾ 1.4460 ³⁾ 1.4057 ⁴⁾	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 ¹⁾	EN-JL1030	ASTM 25B
	Rubber parts	EPDM or FKM		
CRI				
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Sleeve	Stainless steel	1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM		
CRN				
4	Impeller	Stainless steel	1.4401	AISI 316
5	Chamber	Stainless steel	1.4401	AISI 316
6	Sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM		

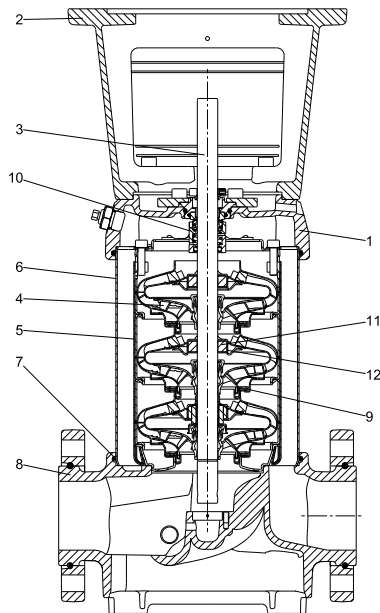
- 1) Stainless steel available on request.
2) CRI, CRN 1s, 1, 3, 5.
3) CRN 10, 15, 20.
4) CRI 10, 15, 20.

CR 32, 45, 64 and 90



TM01 2150 1298 - GrA4355

Sectional drawing



TM06 0711 0814

Materials, CR

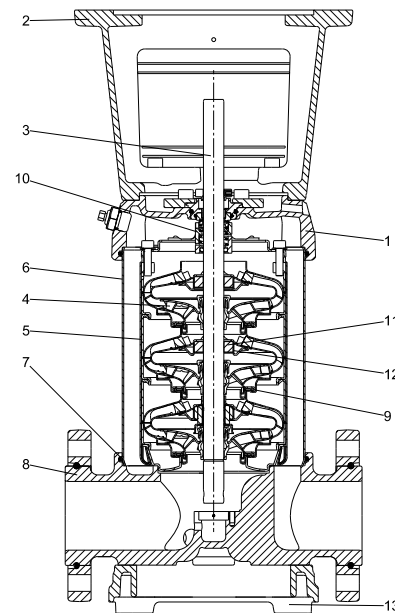
Pos.	Designation	Materials	EN/DIN	AISI/ASTM
1	Pump head	Cast iron EN-GJS-500-7	EN-JS1050	ASTM 80-55-06
2	Motor stool	Cast iron EN-GJL-200	EN-JL1030	ASTM 25B
3	Shaft	Stainless steel	1.4057	AISI 431
4	Impeller	Stainless steel	1.4301	AISI 304
5	Chamber	Stainless steel	1.4301	AISI 304
6	Sleeve	Stainless steel	1.4301	AISI 304
7	O-ring for 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	SiC/SiC		
12	Support bearing	Carbon-graphite-filled PTFE		
	Rubber parts	EPDM or FKM		

CRN 32, 45, 64 and 90



TM02 7399 3403

Sectional drawing



TM06 0712 0814

Materials, CRN

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	Sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for 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	SiC/SiC		
12	Support bearing	Carbon-graphite-filled PTFE		
13	Base plate	Cast iron EN-GJS-500-7 ¹⁾	EN-JS1050	ASTM 88-55-06
	Rubber parts	EPDM or FKM		

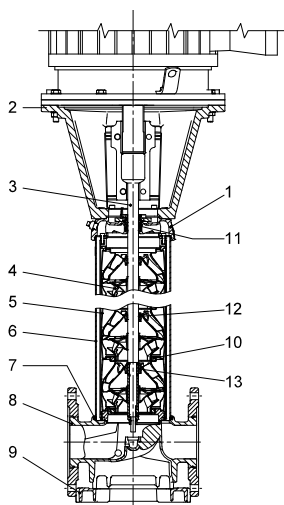
¹⁾ Stainless steel available on request.

CR 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	Sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for 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	Carbon-graphite-filled PTFE		
11	Shaft seal ¹⁾	SiC/SiC (Ø22) Carbon/SiC (Ø32)		
12	Support bearing	Carbon-graphite-filled PTFE		
13	Bearing ring	SiC/SiC		
	Rubber parts	EPDM or FKM		

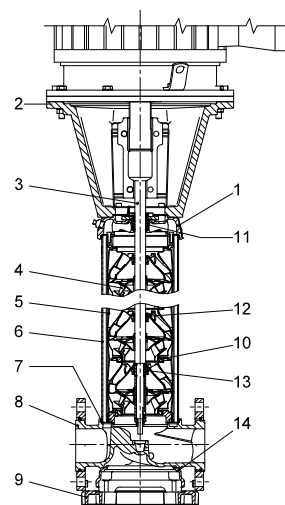
¹⁾ Ø22 mm shaft, 11-45 kW.
Ø32 mm shaft, 55-75 kW.

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	Sleeve	Stainless steel	1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM		
8	Base	Stainless steel	1.4408	A 351 CF 8M
9	Base plate	Cast iron EN-GJS-500-7 ¹⁾	EN-JS1050	A 536 65-45-12
10	Neck ring	Carbon-graphite-filled PTFE		
11	Shaft seal ²⁾	SiC/SiC (Ø22) Carbon/SiC (Ø32)		
12	Support bearing	Carbon-graphite-filled PTFE		
13	Bearing ring	SiC/SiC		
14	Base plate	Cast iron EN-GJS-500-7 ¹⁾	EN-JS1050	A 536 65-45-12
	Rubber parts	EPDM or FKM		

¹⁾ Stainless steel available on request.

²⁾ Ø22 mm shaft, 11-45 kW.
Ø32 mm shaft, 55-75 kW.

Type keys

Pump

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

Key to codes

Code	Description
Pump version	
A	Basic version
B	Oversize motor
D	Pump with pressure intensifier*
DW	Deep-well pump with ejector*
E	Pump with certificate or ATEX approval
F	Pump for high temperatures (with air-cooled top)
G	Multi-E slave*
H	Horizontal version
HS	High-pressure pump with high-speed MGE motor*
I	Different pressure rating
J	Pump with a different maximum speed
K	Pump with low NPSH
M	Magnetic drive
N	With sensor
P	Undersize motor
R	Horizontal version with bearing bracket
SF	High-pressure pump
V	Multi-E master*
X	Special version
Pipe connection	
A	Oval flange
B	NPT thread
CA	FlexiClamp
CX	Triclamp*
F	DIN flange
G	ANSI flange
J	JIS flange
N	Changed diameter of ports
P	PJE coupling
X	Special version
Materials	
A	Basic version
AD	Carbon-graphite filled PTFE (bearings)
G	Wetted parts EN 1.4401/AISI 316
GI	All parts stainless steel, wetted parts EN 1.4401/AISI 316
I	Wetted parts EN 1.4301/AISI 304
II	All parts stainless steel, wetted parts EN 1.4301/AISI 304
K	Bronze (bearings)
S	SiC bearings + PTFE neck rings
X	Special version
SX	Carbon free

Code	Description
Code for rubber parts in pump	
E	EPDM
F	FXM (Fluoraz [®])
K	FFKM (Kalrez [®])
V	FKM (Viton [®])
Shaft seal type designation	
A	O-ring seal with fixed driver*
D	Balanced O-ring seal*
H	Balanced cartridge seal with O-ring
K	Type M as cartridge seal*
O	Double seal, back-to-back*
P	Double seal, tandem*
X	Special version*
Seal face material	
B	Carbon, synthetic resin-impregnated
C	Other types of carbon*
H	Cemented tungsten carbide, embedded (hybrid)*
U	Cemented tungsten carbide
Q	Silicon carbide
X	Other ceramics*
Secondary seal material (rubber parts)	
E	EPDM
F	FXM (Fluoraz [®])
K	FFKM (Kalrez [®])
V	FKM (Viton [®])

* Option. See the CR "Custom-built pumps" data booklet available on www.grundfos.com (WebCAPS).

Shaft seal

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

3. Operating and inlet pressures

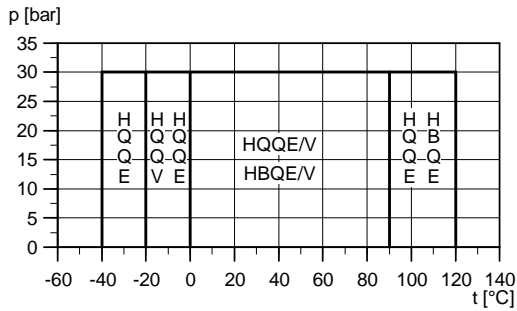
Maximum operating pressure and liquid temperature

Pump type	Oval flange		PJE, clamp, union, DIN	
	Maximum permissible operating pressure [bar]	Liquid temperature [°C]	Maximum permissible operating pressure [bar]	Liquid temperature [°C]
CR, CRI, CRN 1s	16	-20 - +120	25	-20 - +120
CR, CRI, CRN 1	16		25	
CR, CRI, CRN 3	16		25	
CR, CRI, CRN 5	16		25	
CR, CRI 10-1 → 10-10	16	-	16	
CR, CRI 10-12 → 10-17	-	-	25	
CRN 10	16	-20 - +120	25	
CR, CRI 15-1 → 15-5	10	-	-	
CR, CRI 15-1 → 15-8	-	-	16	
CR, CRI 15-9 → 15-12	-	-	25	
CRN 15	10	-20 - +120	25	
CR, CRI 20-1 → 20-5	10	-	-	
CR, CRI 20-1 → 20-7	-	-	16	
CR, CRI 20-8 → 20-10	-	-	25	
CRN 20	10	-20 - +120	25	
CR, CRN 32-1-1 → 32-5	-	-	16	-30 - +120
CR, CRN 32-6-2 → 32-10-2	-	-	30	
CR, CRN 45-1-1 → 45-4	-	-	16	
CR, CRN 45-5-2 → 45-7	-	-	30	
CR, CRN 64-1-1 → 64-3	-	-	16	
CR, CRN 64-4-2 → 64-5-2	-	-	30	
CR, CRN 90-1-1 → 90-3	-	-	16	
CR, CRN 90-4-2	-	-	30	
CR, CRN 120	-	-	30	
CR, CRN 150	-	-	30	

For pump sizes 32, 45, 64, 90, 120, 150, the max. pressure for PJE is 50 bar and only available in CRN version.

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 range shown in fig. 7 applies to clean water and water with anti-freeze liquids. For selection of the right shaft seal, see section 7. *Pumped liquids*, page 75. If the operating range is exceeded, the life of the shaft seal may be reduced.



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Fig. 7 Operating range of standard shaft seals

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

¹⁾ Available as HQQE and HQQV on request.

See section 9. *Variants*, page 86, in case of extreme temperatures:

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

Maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the actual inlet pressure plus 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.

Pump type	Maximum inlet pressure [bar]
CR, CRI, CRN 1s	
1s-2 → 1s-27	10
CR, CRI, CRN 1	
1-2 → 1-25	10
1-27	15
CR, CRI, CRN 3	
3-2 → 3-17	10
3-19 → 3-25	15
CR, CRI, CRN 5	
5-2 → 5-9	10
5-10 → 5-24	15
CR, CRI, CRN 10	
10-1 → 10-5	8
10-6 → 10-17	10
CR, CRI, CRN 15	
15-1 → 15-2	8
15-3 → 15-12	10
CR, CRI, CRN 20	
20-1	8
20-2 → 20-10	10
CR, CRN 32	
32-1-1 → 32-2	4
32-3-2 → 32-6	10
32-7-2 → 32-10-2	15
CR, CRN 45	
45-1-1 → 45-1	4
45-2-2 → 45-3	10
45-4-2 → 45-7	15
CR, CRN 64	
64-1-1	4
64-1 → 64-2-1	10
64-2 → 64-5-2	15
CR, CRN 90	
90-1-1 → 90-2-2	10
90-2-1 → 90-4-2	15
CR, CRN 120	
120-1	10
120-2-2 → 120-3	15
120-4-1 → 120-5-2	20
CR, CRN 150	
150-1-1	10
150-1 → 150-2	15
150-3-2 → 150-4-2	20

Examples of operating and inlet pressures

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

Example 1

The following pump type has been selected:
CR 3-10 A-A-A.

Maximum operating pressure: 16 bar.

Maximum inlet pressure: 10 bar.

Discharge pressure against a closed valve: 9.6 bar.

See page 30.

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

Example 2

The following pump type has been selected:

CR 10-2 A-A-A

Maximum operating pressure: 16 bar.

Maximum inlet pressure: 8.0 bar.

Discharge pressure against a closed valve: 2.9 bar.

See page 38.

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

If the inlet or operating pressure exceeds the pressure permitted, see section 9. *Variants*, page 86.

4. Selection and sizing

Selection of pumps

Selection of pumps should be based on these parameters:

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

Duty point of the pump

From a duty point, it is possible to select a pump on the basis of the curve charts in section 5. *Performance curves and technical data*, page 22.

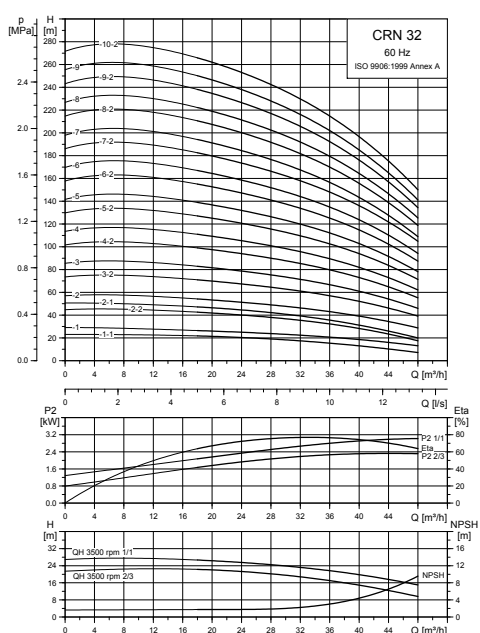


Fig. 8 Example of a curve chart

Dimensional data

When sizing a pump, take these parameters 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 20.

Pump efficiency

Before determining the best efficiency point, identify the operation pattern of the pump. If the pump is expected to operate at the same duty point, select a CR pump which is operating at a duty point corresponding to the best efficiency of the pump.

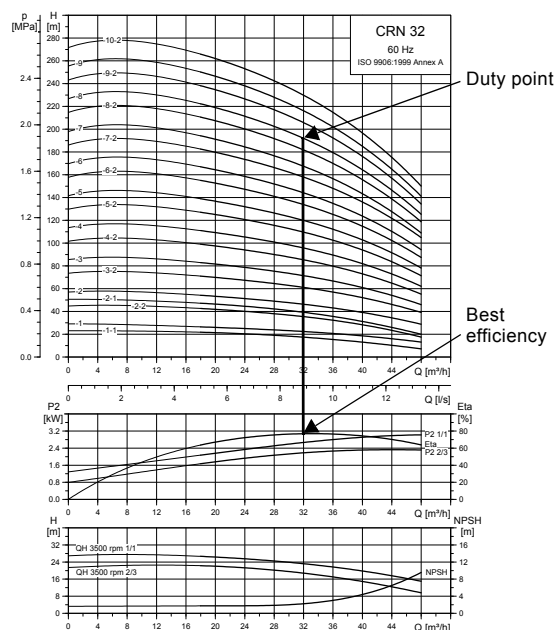


Fig. 9 Example of a CR pump's duty point

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 the efficiency high when the flow drops.

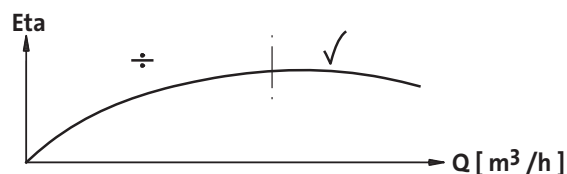


Fig. 10 Best efficiency

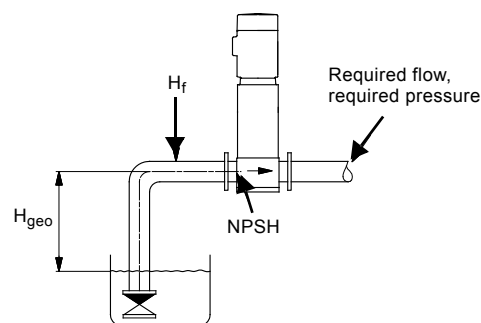


Fig. 11 Dimensional data

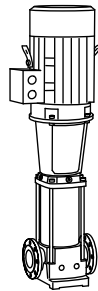
Pump material

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

The product range covers the following three basic types:

- CR, CRI
Use CR, CRI pumps for clean, non-aggressive liquids, such as potable water and oils.
- CRN
Use CRN pumps for industrial liquids and acids.
See section 7. *Pumped liquids*, page 75, or contact Grundfos.

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



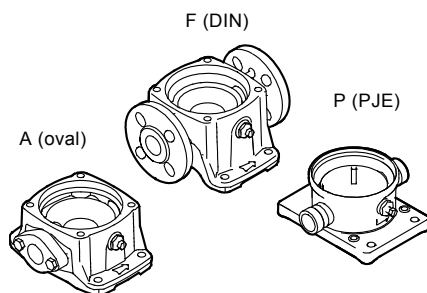
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Fig. 12 CR pump

Pump connections

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



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Fig. 13 Pump connections

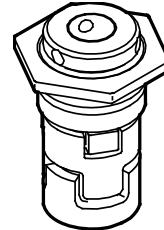
Shaft seal

As standard, the CR 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.

We offer a wide range of shaft seal variants to meet specific demands. See section 7. *Pumped liquids*, page 75.



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Fig. 14 Shaft seal (cartridge type)

Operating pressure and inlet pressure

Do not exceed the limit values for these pressures:

- maximum operating pressure (page 15)
- maximum inlet pressure (page 17).

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.

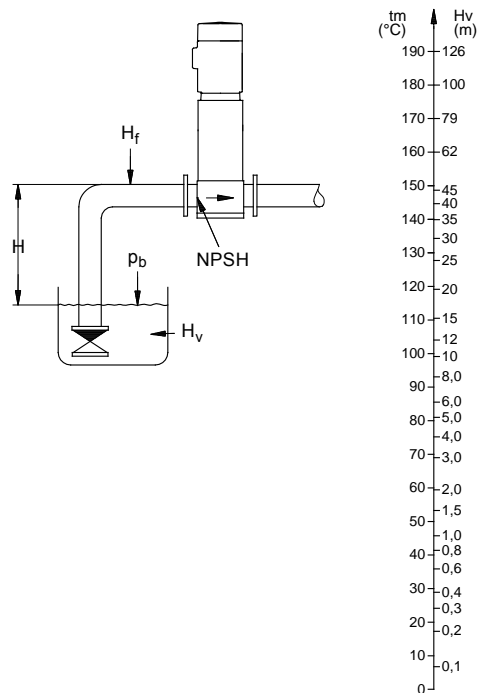
The maximum suction lift "H" in metres head can be calculated as follows:

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

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

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



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Fig. 15 Minimum inlet pressure, NPSH

Note: To avoid cavitation, do not 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.

How to read the curve charts

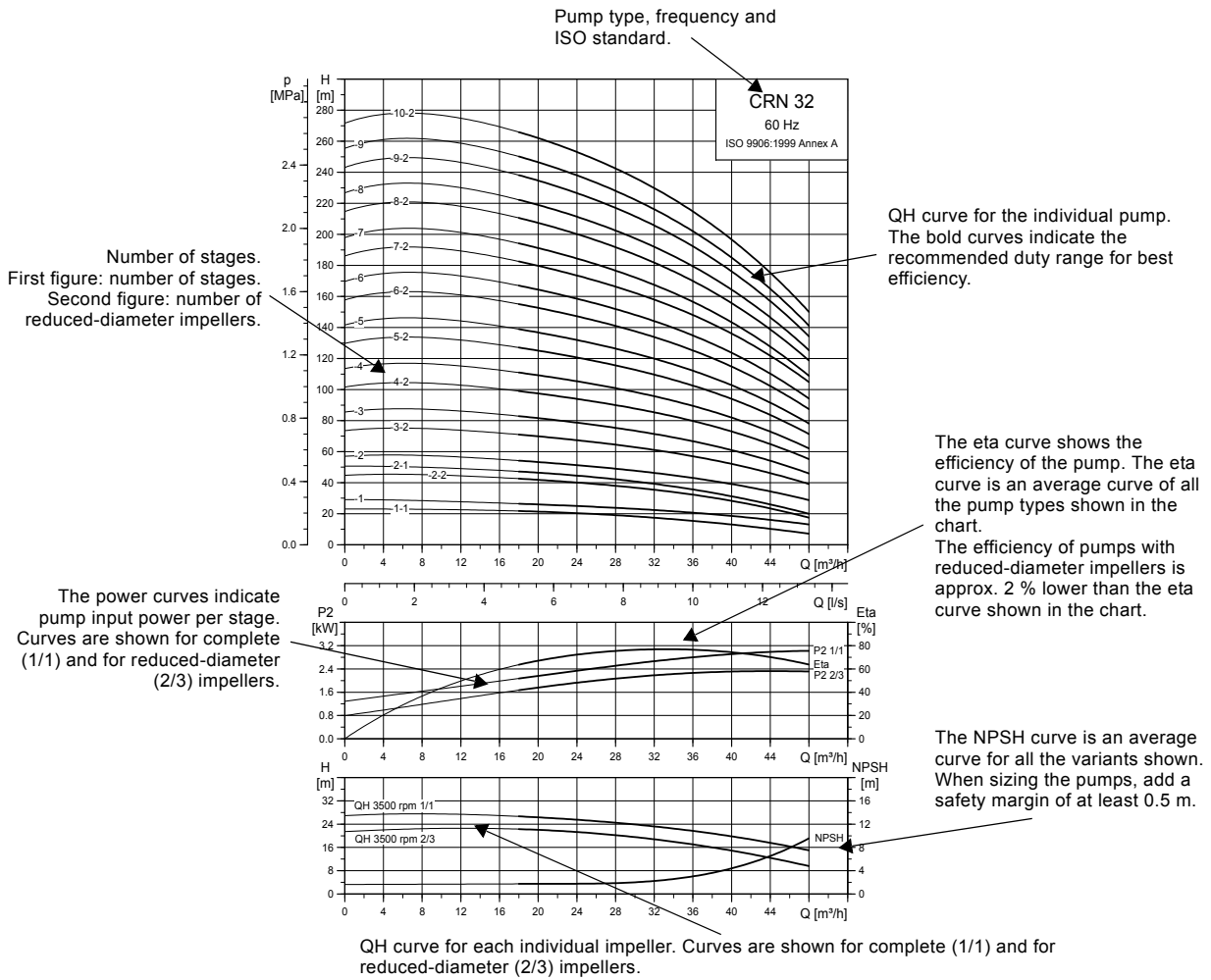


Fig. 16 How to read the curve charts

Guidelines to performance curves

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

- Tolerances to ISO 9906:1999, Annex A, if indicated.
- The motors used for the measurements are standard Grundfos MG motors.
- Measurements have been made with airless water at a temperature of 20 °C.
- The curves apply to the following kinematic viscosity: $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt).
- Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate.
- The QH curves apply to a rated motor speed of a three-phase mains-operated motor.

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

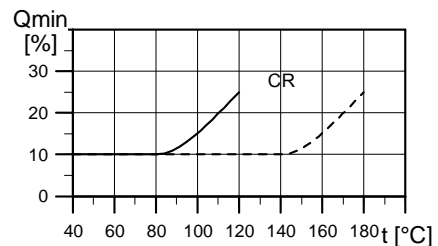


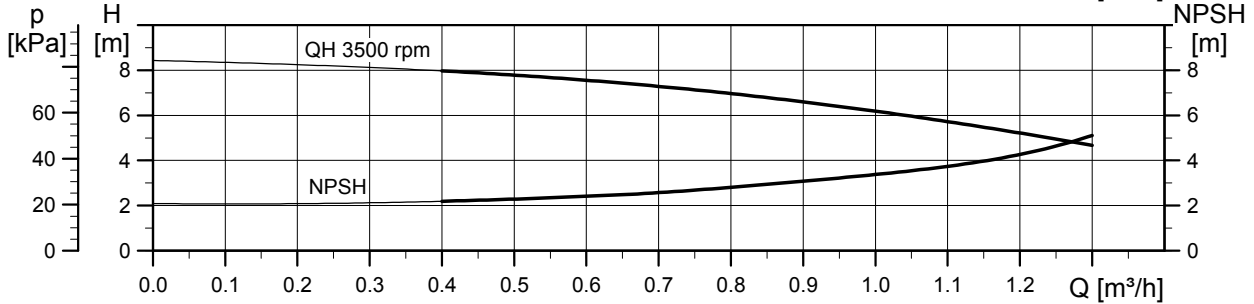
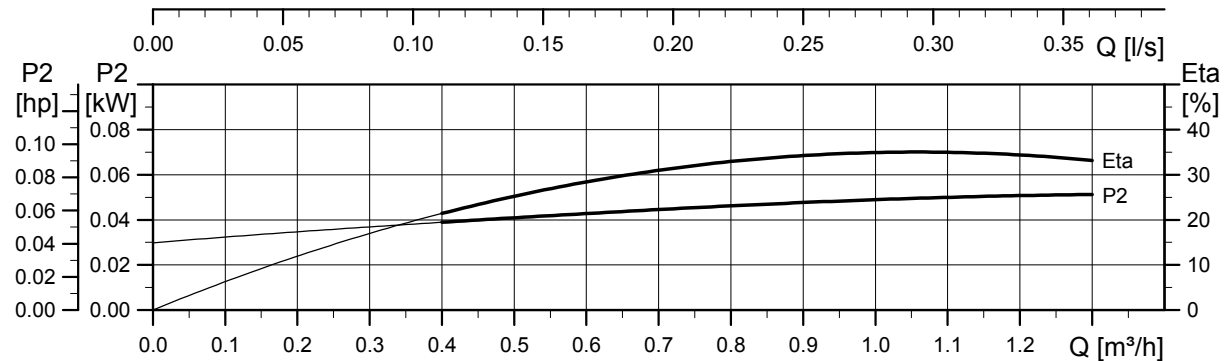
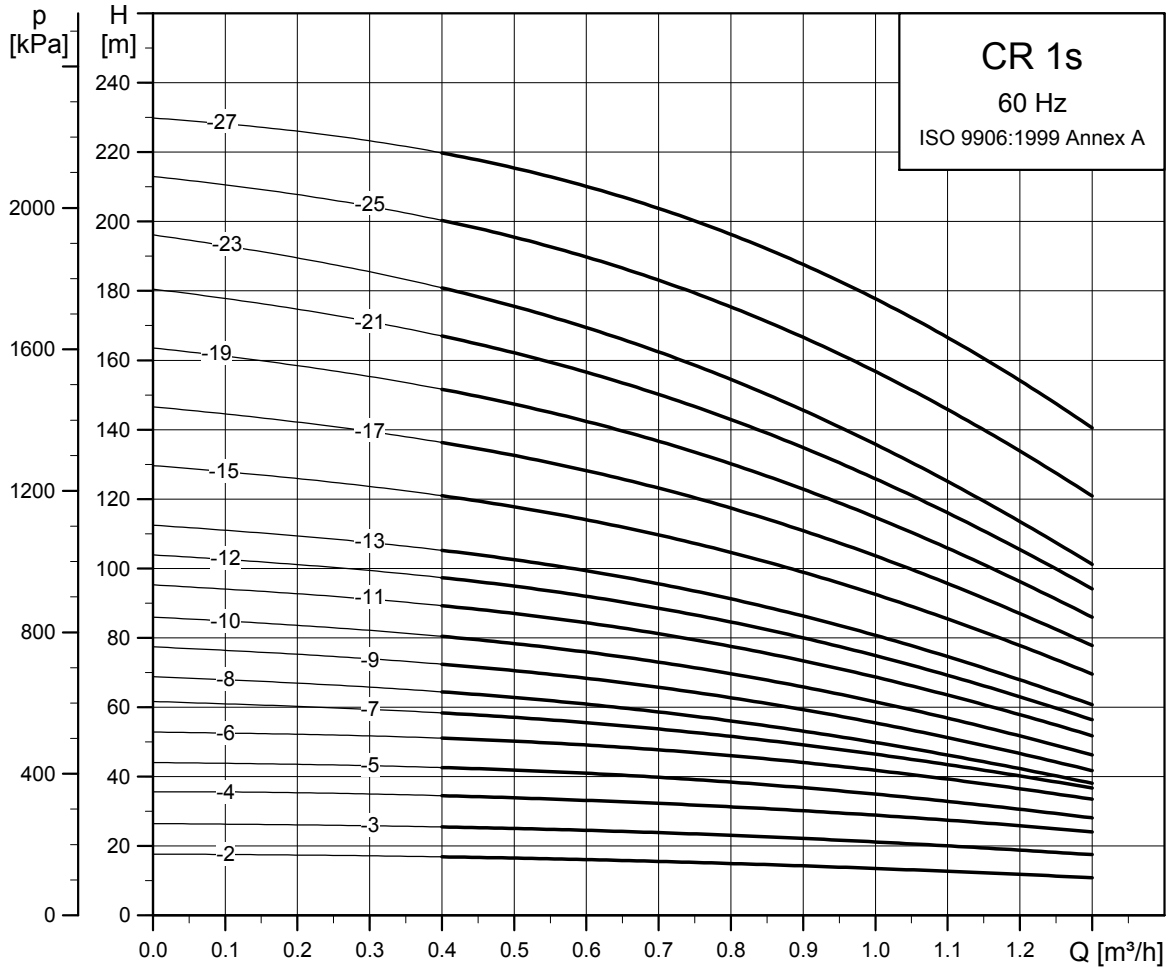
Fig. 17 Minimum flow rate

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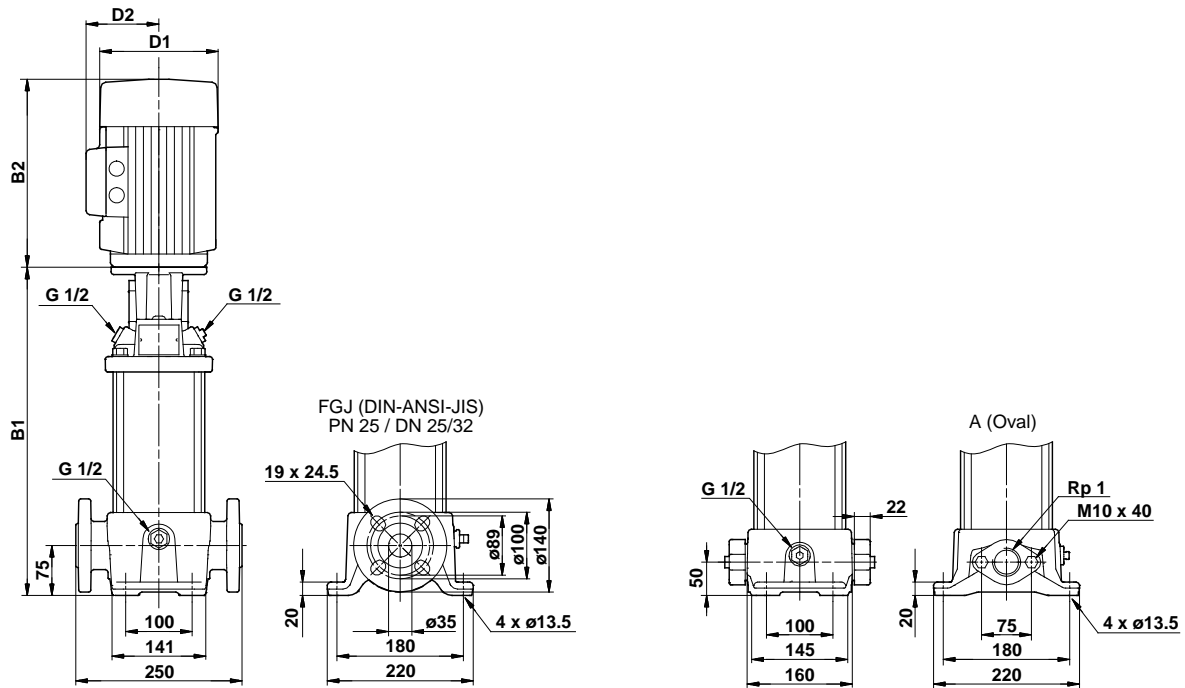
5. Performance curves and technical data

CR 1s



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Dimensional sketch

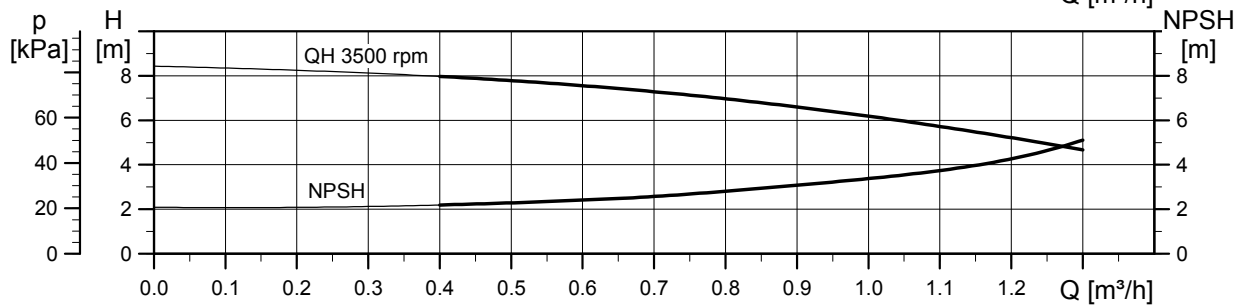
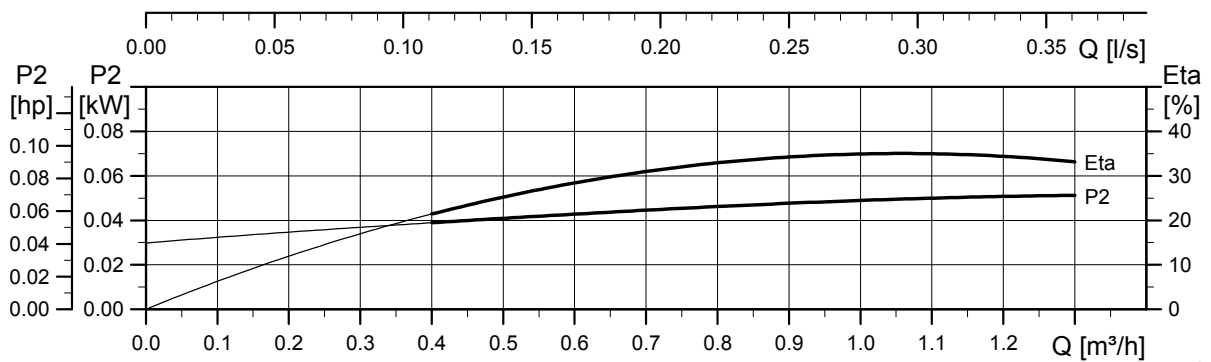
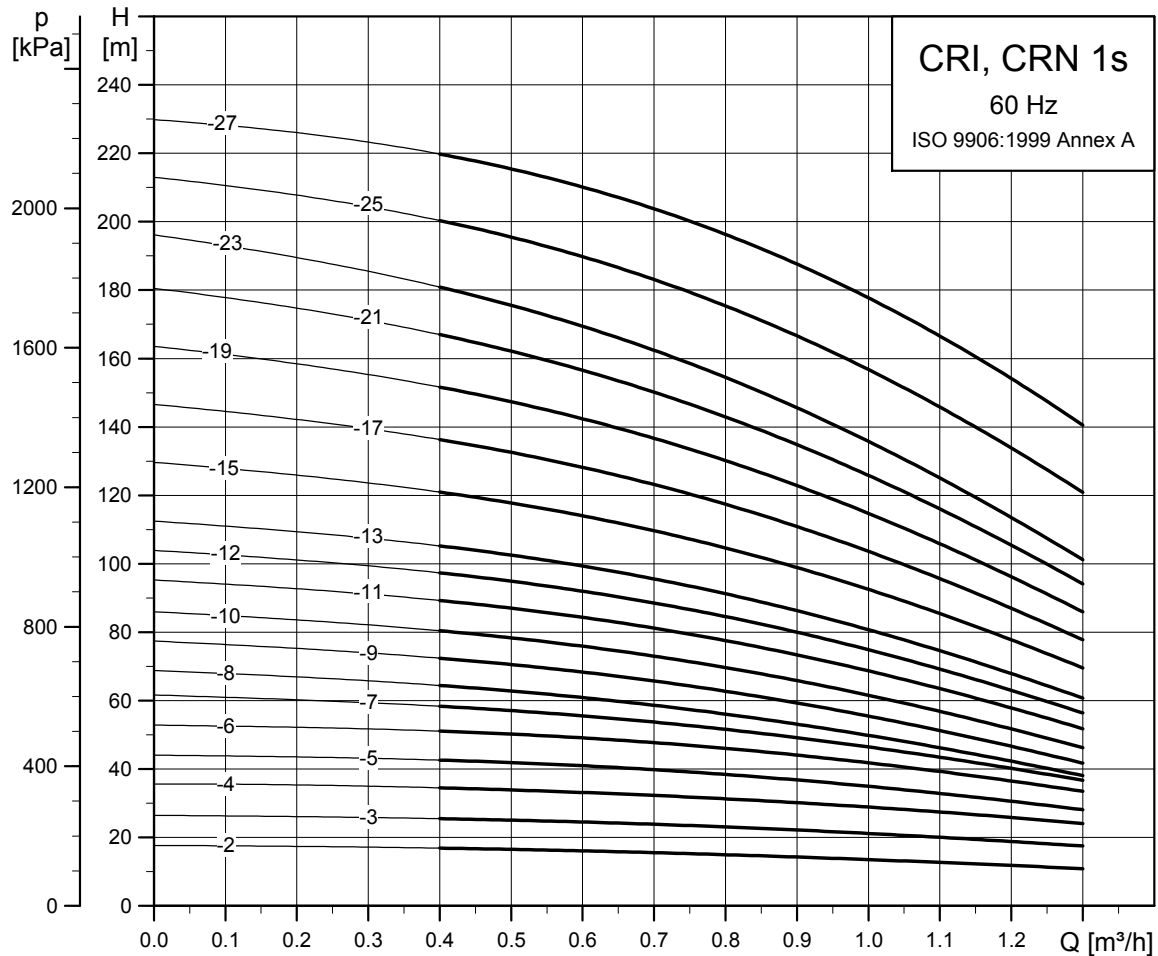


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Dimensions and weights

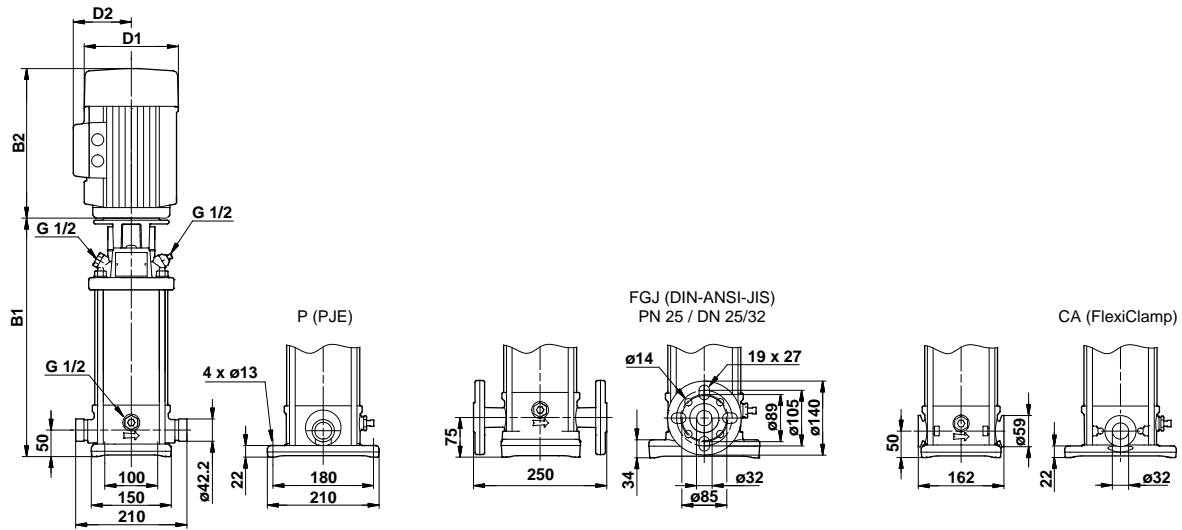
Pump type	Motor P ₂ [kW]	Dimension [mm]				Net weight [kg]			
		Oval flange		DIN flange		Oval flange	DIN flange	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2				
CR 1s-2	0.37	254	445	279	470	141	109	18	23
CR 1s-3	0.37	254	445	279	470	141	109	18	23
CR 1s-4	0.37	272	463	297	488	141	109	19	23
CR 1s-5	0.37	290	481	315	506	141	109	19	24
CR 1s-6	0.37	308	499	333	524	141	109	19	24
CR 1s-7	0.37	326	517	351	542	141	109	20	24
CR 1s-8	0.55	344	535	369	560	141	109	21	25
CR 1s-9	0.55	362	553	387	578	141	109	21	26
CR 1s-10	0.55	380	571	405	596	141	109	22	26
CR 1s-11	0.75	404	635	429	660	141	109	24	28
CR 1s-12	0.75	422	653	447	678	141	109	24	29
CR 1s-13	0.75	440	671	465	696	141	109	25	29
CR 1s-15	1.1	476	727	501	752	141	109	28	32
CR 1s-17	1.1	512	763	537	788	141	109	28	33
CR 1s-19	1.1	-	-	573	824	141	109	-	34
CR 1s-21	1.1	-	-	609	860	141	109	-	35
CR 1s-23	1.5	-	-	661	942	178	110	-	42
CR 1s-25	1.5	-	-	697	978	178	110	-	43
CR 1s-27	1.5	-	-	733	1014	178	110	-	44

CRI, CRN 1s



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Dimensional sketch

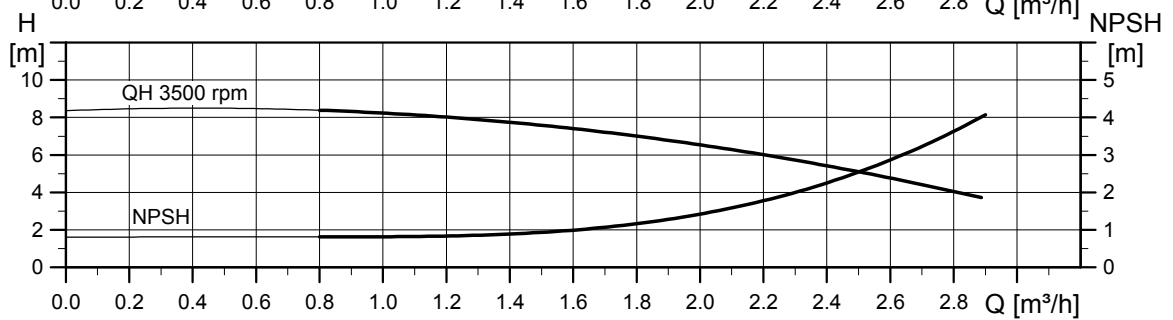
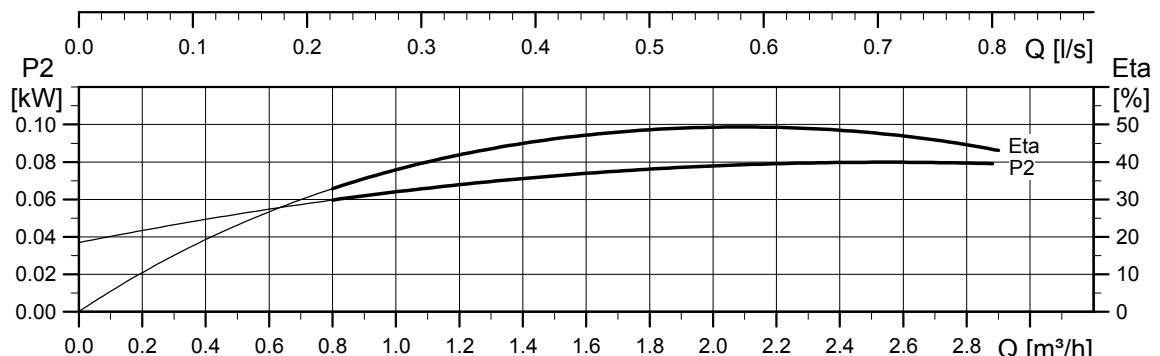
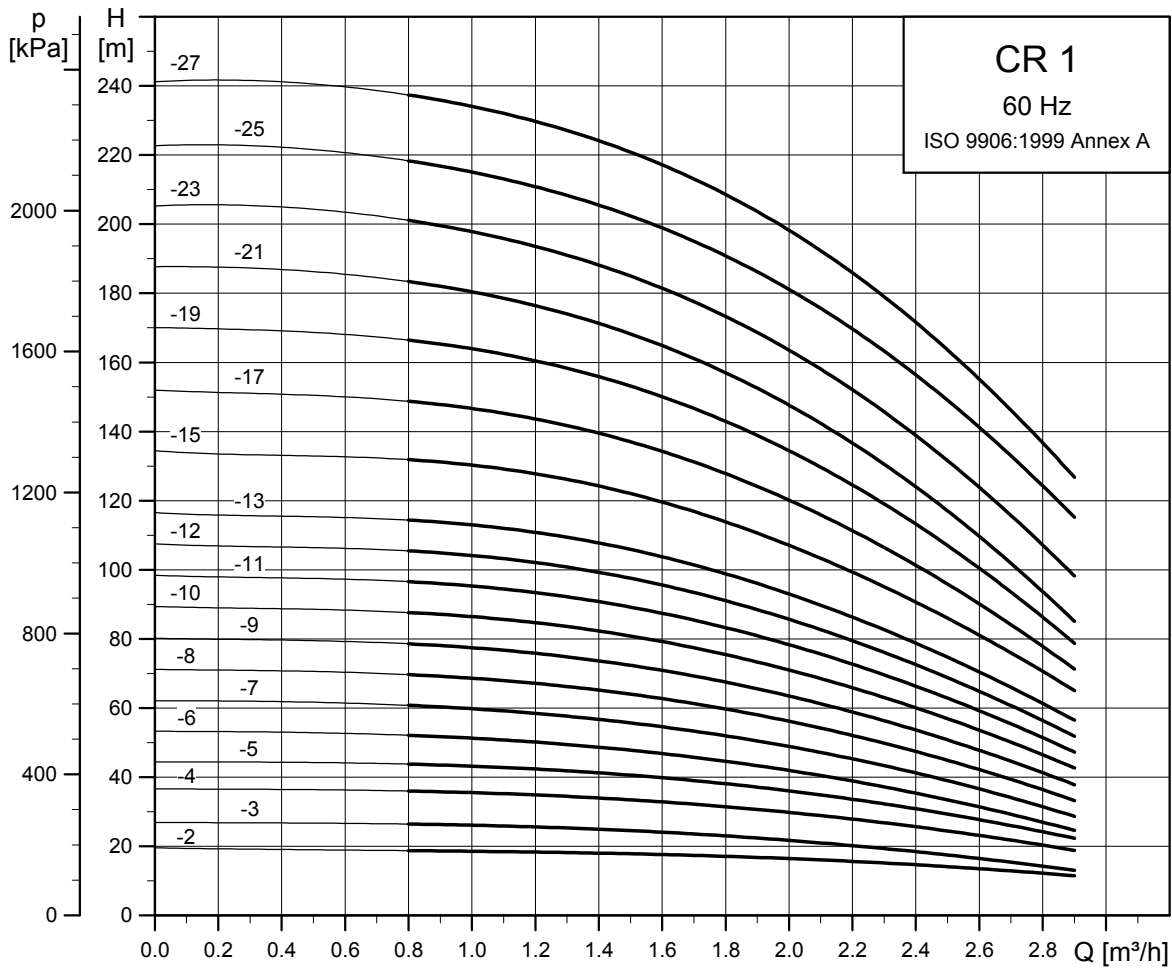


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Dimensions and weights

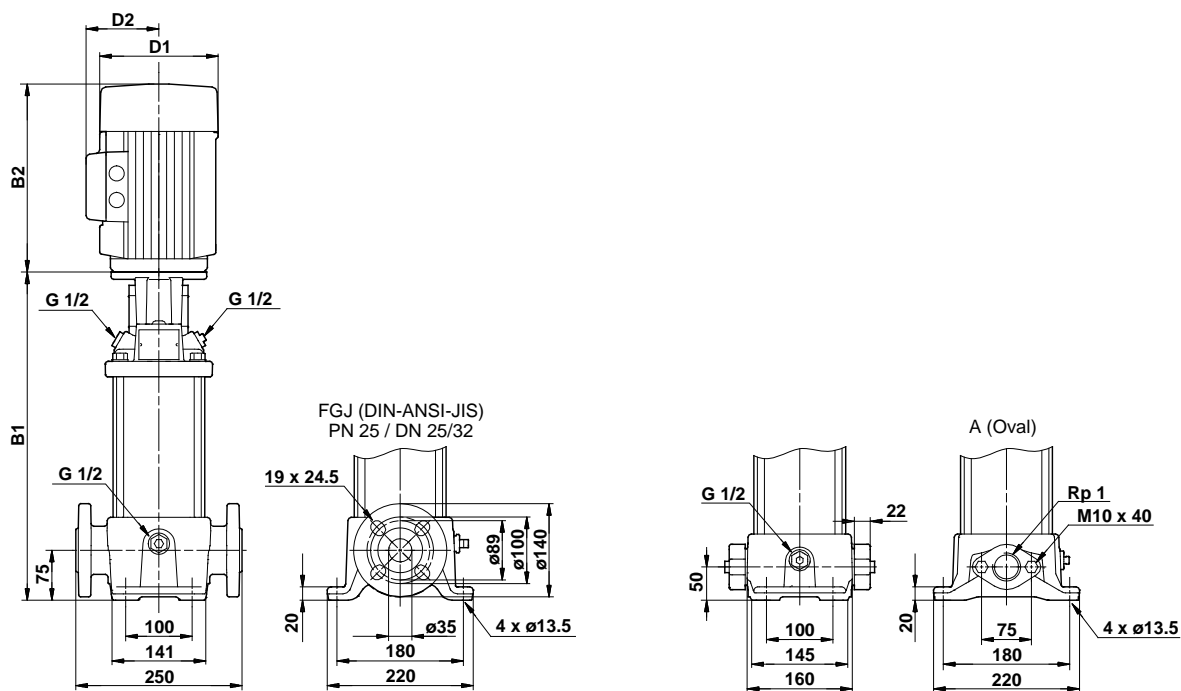
Pump type	Motor P ₂ [kW]	Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2				
CRI/CRN 1s-2	0.37	257	448	282	473	141	109	16	20
CRI/CRN 1s-3	0.37	257	448	282	473	141	109	16	21
CRI/CRN 1s-4	0.37	275	466	300	491	141	109	17	21
CRI/CRN 1s-5	0.37	293	484	318	509	141	109	17	21
CRI/CRN 1s-6	0.37	311	502	336	527	141	109	18	22
CRI/CRN 1s-7	0.37	329	520	354	545	141	109	18	22
CRI/CRN 1s-8	0.55	347	538	372	563	141	109	19	23
CRI/CRN 1s-9	0.55	365	556	390	581	141	109	19	24
CRI/CRN 1s-10	0.55	383	574	408	599	141	109	20	24
CRI/CRN 1s-11	0.75	407	638	432	663	141	109	22	27
CRI/CRN 1s-12	0.75	425	656	450	681	141	109	23	27
CRI/CRN 1s-13	0.75	443	674	468	699	141	109	23	27
CRI/CRN 1s-15	1.1	479	730	504	755	141	109	26	30
CRI/CRN 1s-17	1.1	515	766	540	791	141	109	27	31
CRI/CRN 1s-19	1.1	551	802	576	827	141	109	28	32
CRI/CRN 1s-21	1.1	587	838	612	863	141	109	29	33
CRI/CRN 1s-23	1.5	639	920	664	945	178	110	36	40
CRI/CRN 1s-25	1.5	675	956	700	981	178	110	37	41
CRI/CRN 1s-27	1.5	711	992	736	1017	178	110	37	42

CR 1



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Dimensional sketch

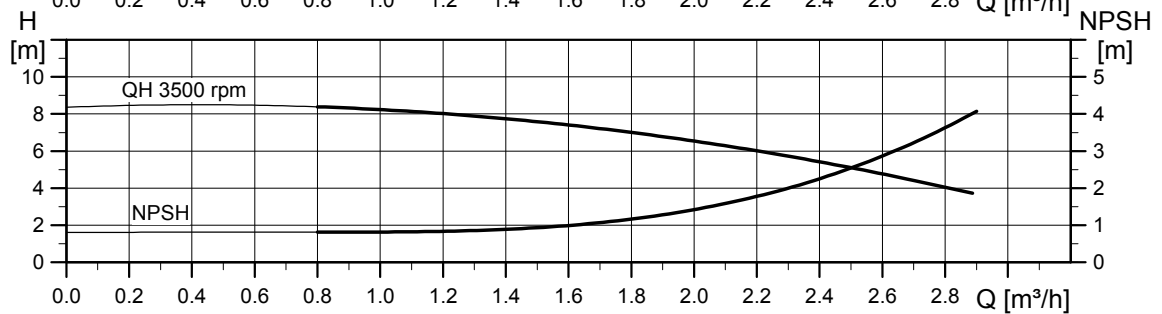
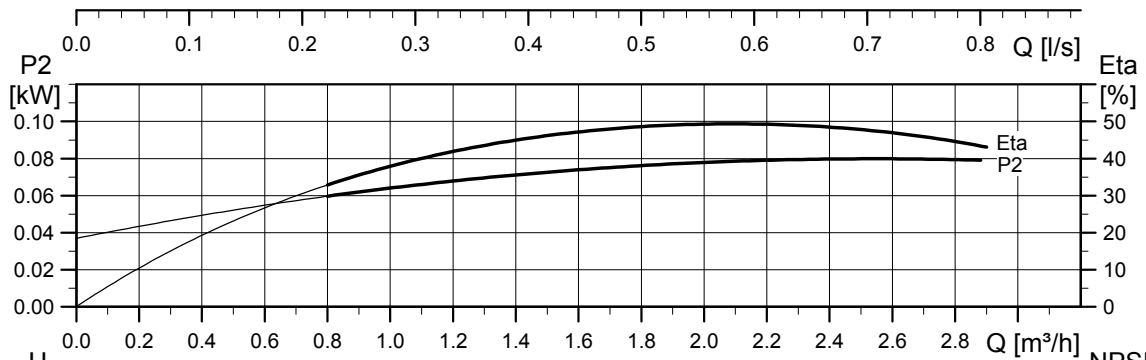
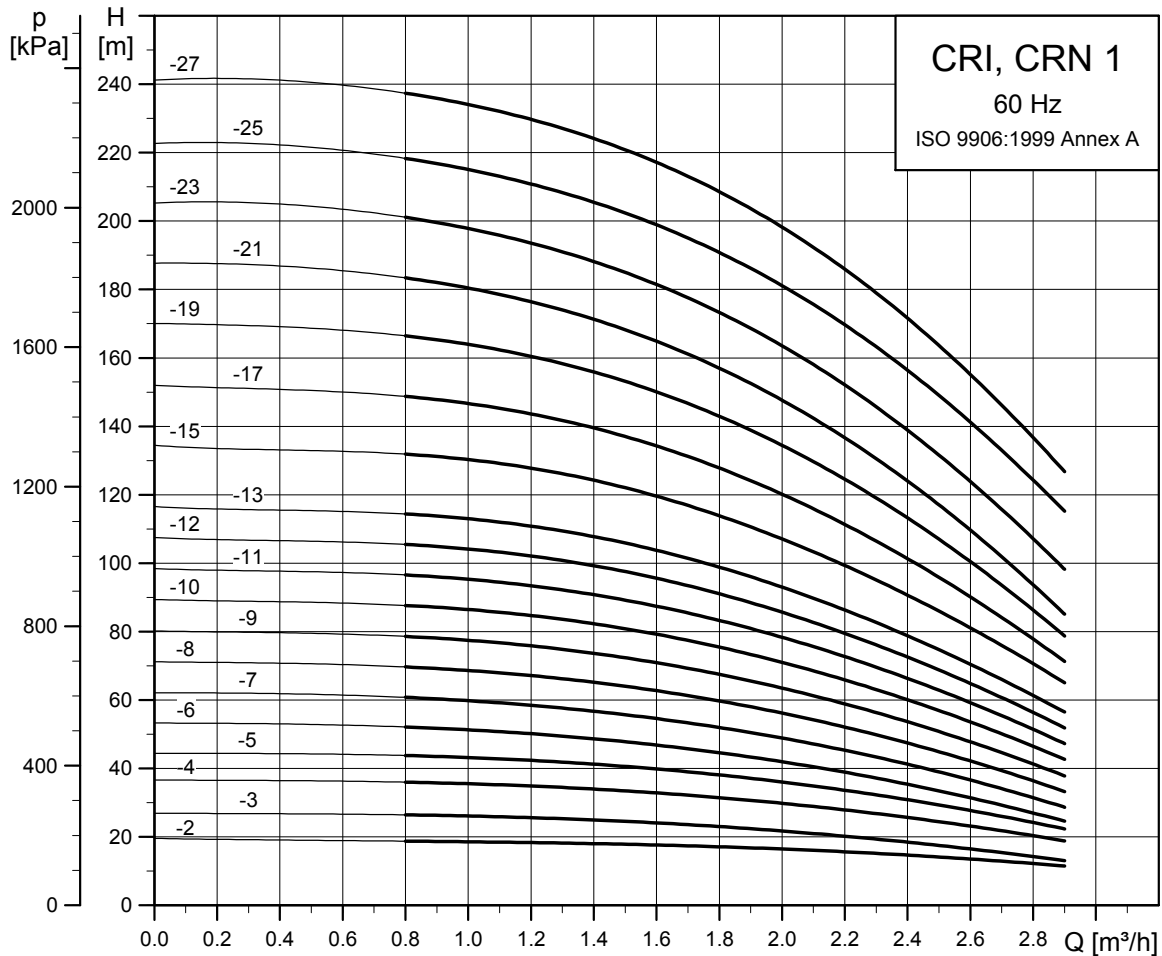


TM03 1721 2805

Dimensions and weights

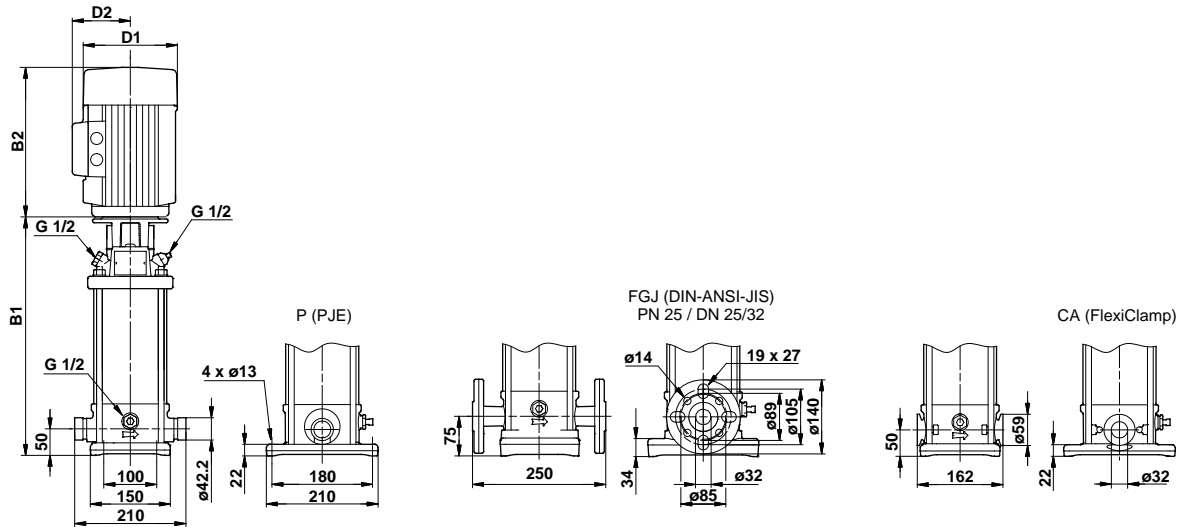
Pump type	Motor P ₂ [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2						
CR 1-2	0.37	254	445	279	470	141	109	18	23
CR 1-3	0.37	254	445	279	470	141	109	18	23
CR 1-4	0.37	272	463	297	488	141	109	19	23
CR 1-5	0.55	290	481	315	506	141	109	20	24
CR 1-6	0.55	308	499	333	524	141	109	20	25
CR 1-7	0.75	332	563	357	588	141	109	22	27
CR 1-8	0.75	350	581	375	606	141	109	23	27
CR 1-9	0.75	368	599	393	624	141	109	23	28
CR 1-10	1.1	386	637	411	662	141	109	26	30
CR 1-11	1.1	404	655	429	680	141	109	26	31
CR 1-12	1.1	422	673	447	698	141	109	27	31
CR 1-13	1.1	440	691	465	716	141	109	27	32
CR 1-15	1.5	492	773	517	798	178	110	35	39
CR 1-17	1.5	528	809	553	834	178	110	36	40
CR 1-19	2.2	-	-	589	910	178	110	-	42
CR 1-21	2.2	-	-	625	946	178	110	-	42
CR 1-23	2.2	-	-	661	982	178	110	-	43
CR 1-25	2.2	-	-	697	1018	178	110	-	44
CR 1-27	3	-	-	737	1072	198	120	-	51

CRI, CRN 1



TM02 7311 1013

Dimensional sketch

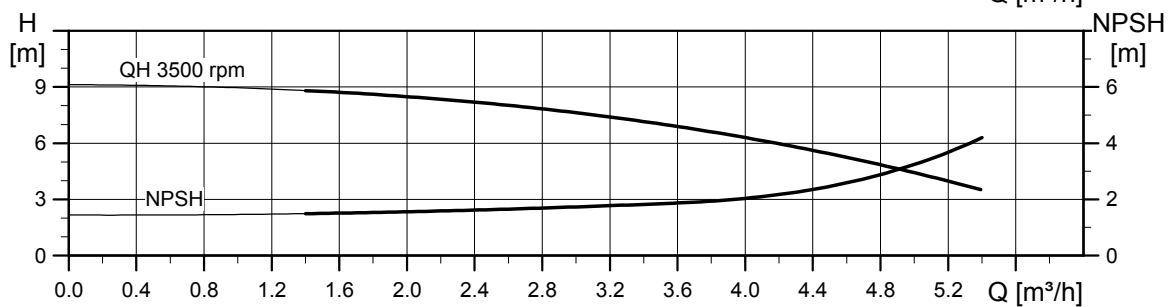
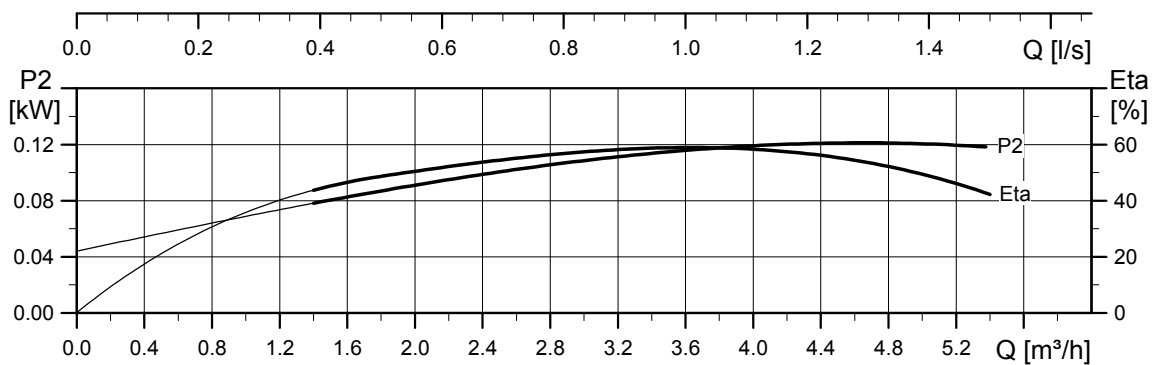
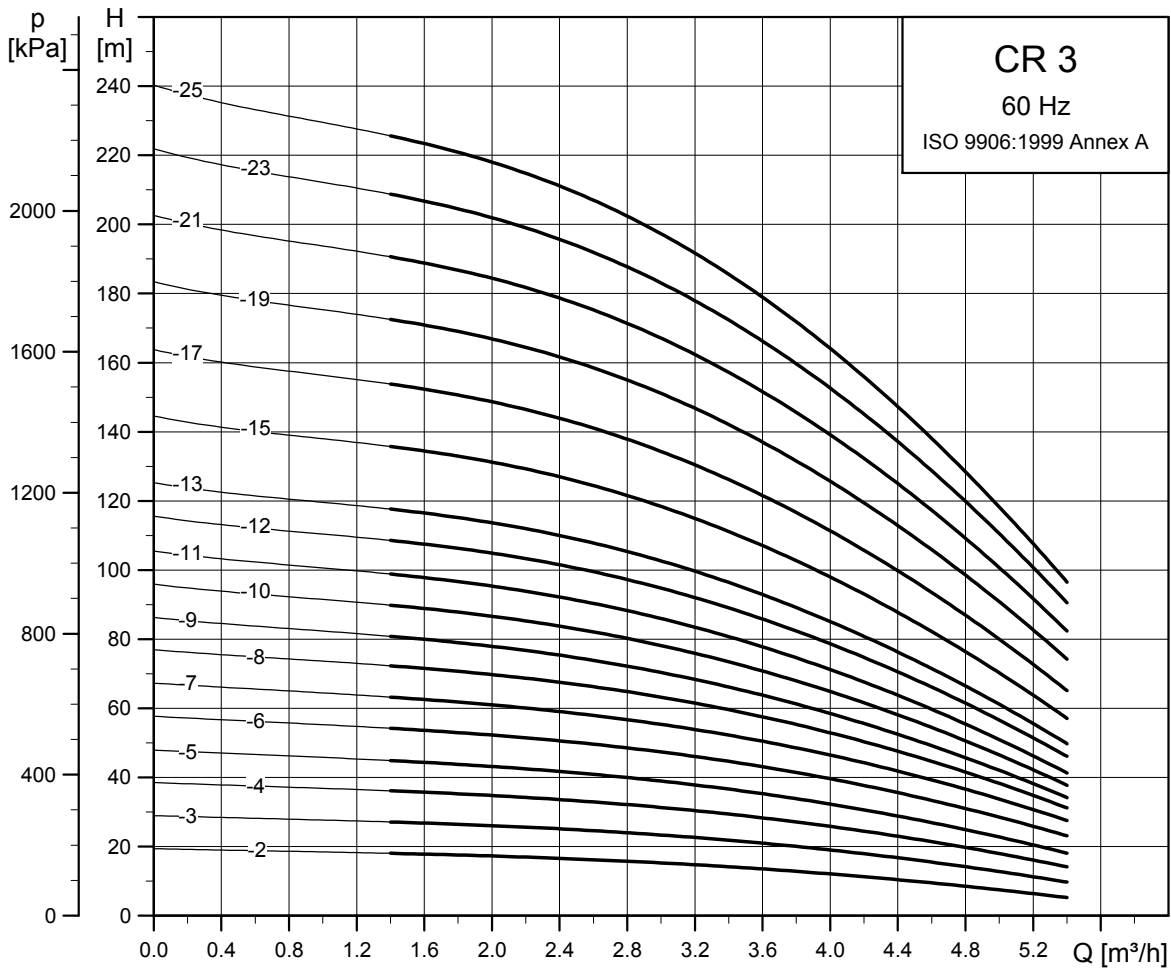


TM03 1722 2805

Dimensions and weights

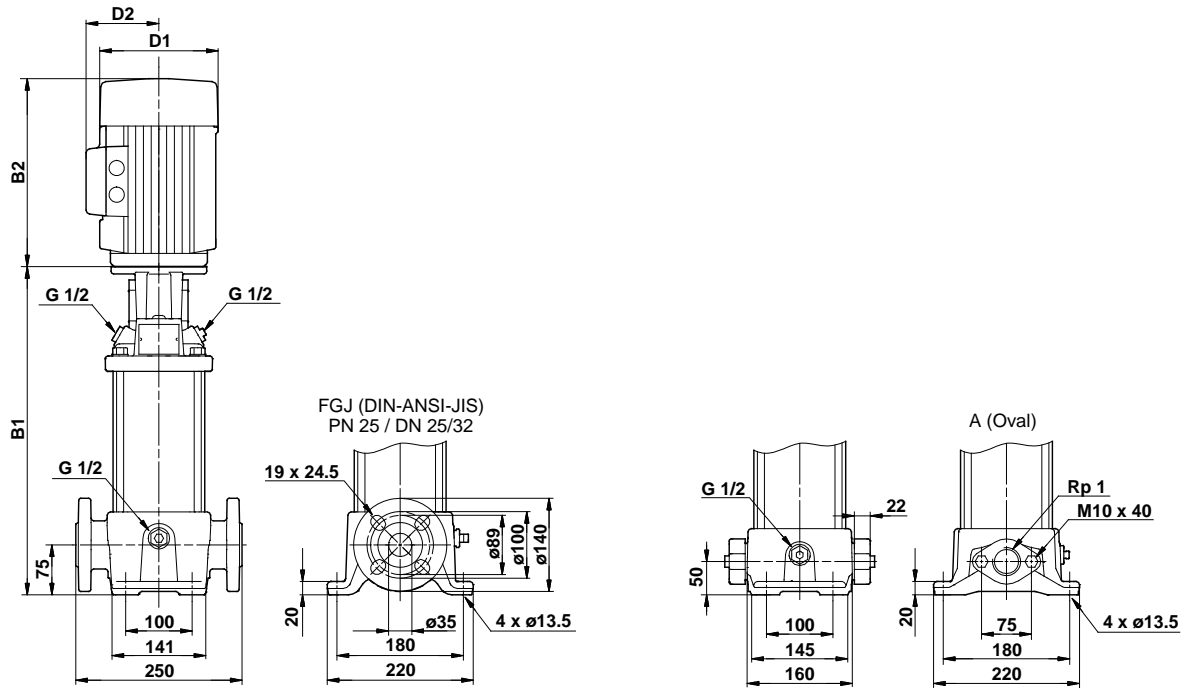
Pump type	Motor P ₂ [kW]	CRI/CRN							
		Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2						
CRI/CRN 1-2	0.37	257	448	282	473	141	109	16	20
CRI/CRN 1-3	0.37	257	448	282	473	141	109	16	21
CRI/CRN 1-4	0.37	275	466	300	491	141	109	17	21
CRI/CRN 1-5	0.55	293	484	318	509	141	109	18	22
CRI/CRN 1-6	0.55	311	502	336	527	141	109	18	22
CRI/CRN 1-7	0.75	335	566	360	591	141	109	21	25
CRI/CRN 1-8	0.75	353	584	378	609	141	109	21	26
CRI/CRN 1-9	0.75	371	602	396	627	141	109	22	26
CRI/CRN 1-10	1.1	389	640	414	665	141	109	24	29
CRI/CRN 1-11	1.1	407	658	432	683	141	109	25	29
CRI/CRN 1-12	1.1	425	676	450	701	141	109	25	29
CRI/CRN 1-13	1.1	443	694	468	719	141	109	26	30
CRI/CRN 1-15	1.5	495	776	520	801	178	110	33	37
CRI/CRN 1-17	1.5	531	812	556	837	178	110	34	38
CRI/CRN 1-19	2.2	567	888	592	913	178	110	35	39
CRI/CRN 1-21	2.2	603	924	628	949	178	110	36	40
CRI/CRN 1-23	2.2	639	960	664	985	178	110	37	41
CRI/CRN 1-25	2.2	675	996	700	1021	178	110	37	42
CRI/CRN 1-27	3	716	1051	741	1076	198	120	45	49

CR 3



TM02 7312 1013

Dimensional sketch

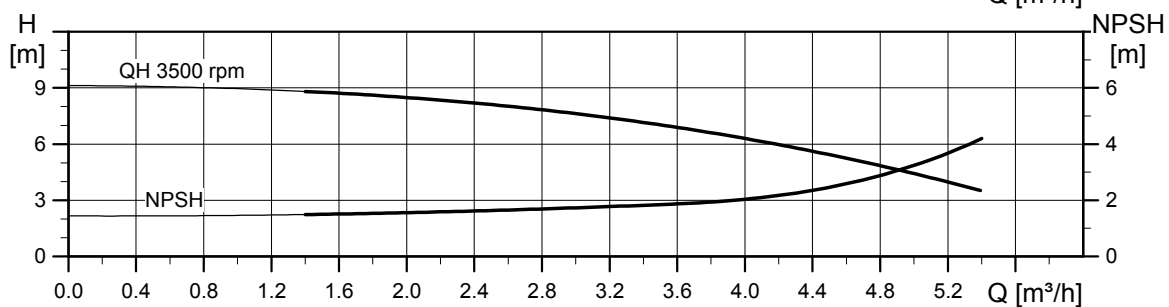
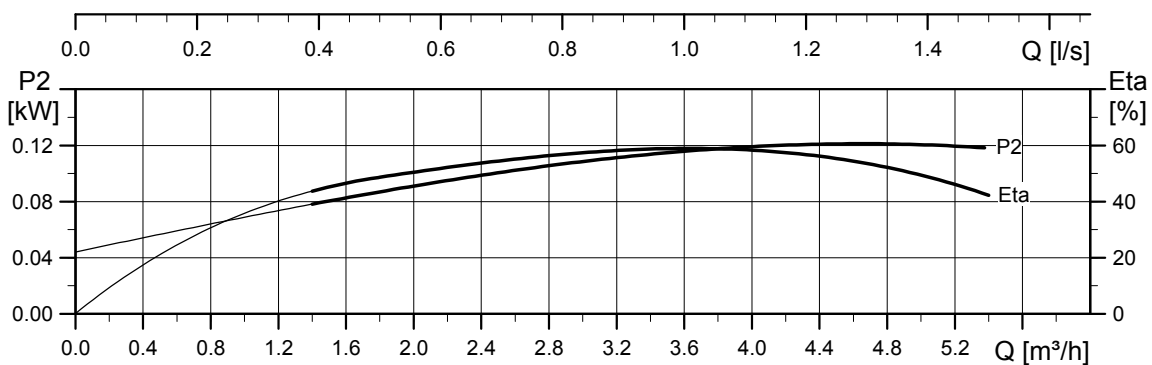
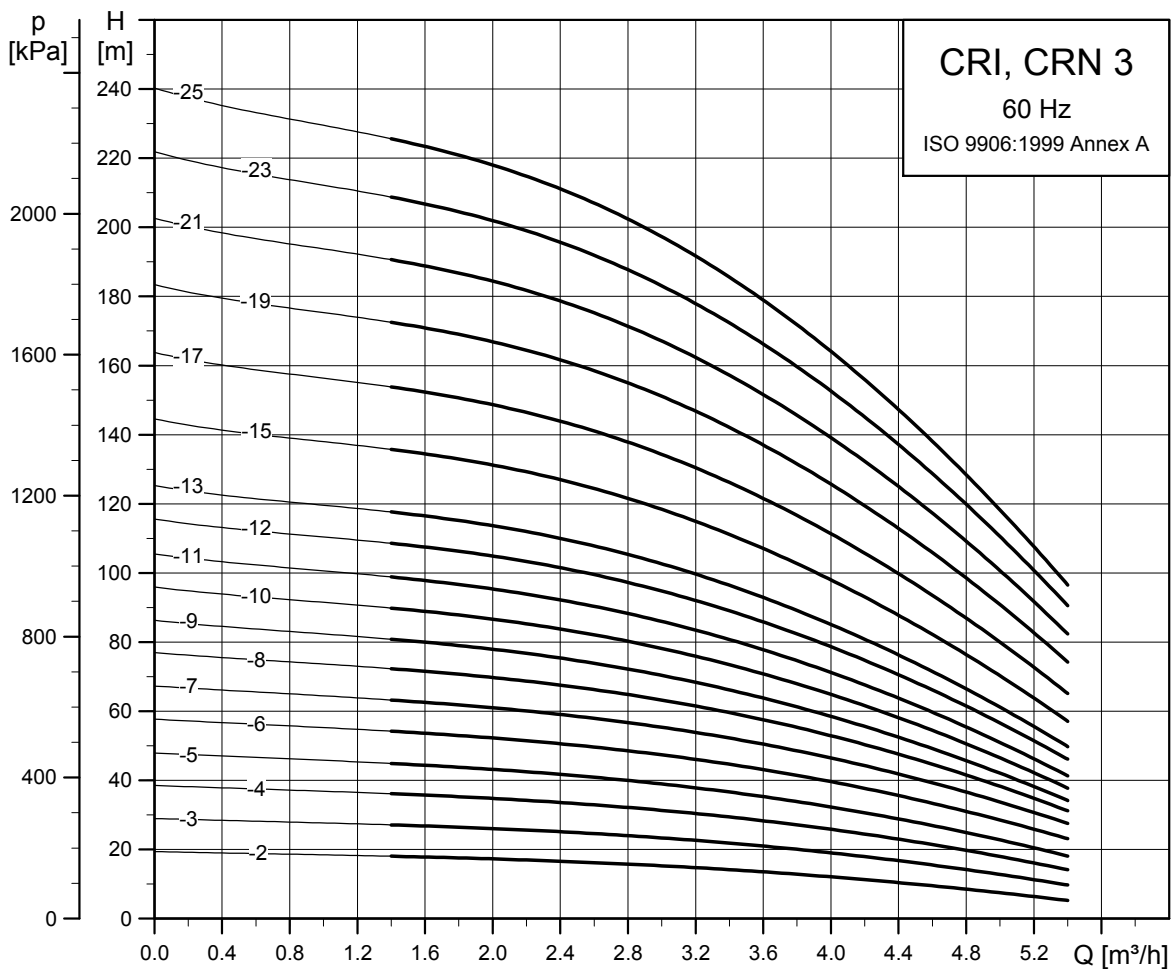


TM03 1721 2805

Dimensions and weights

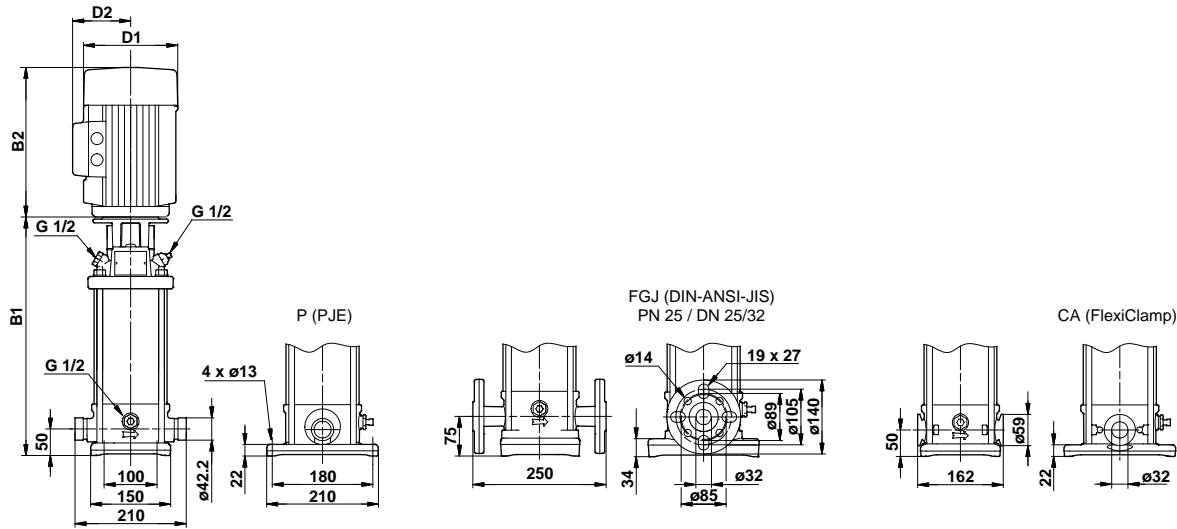
Pump type	Motor P ₂ [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2						
CR 3-2	0.37	254	445	279	470	141	109	18	23
CR 3-3	0.55	254	445	279	470	141	109	19	24
CR 3-4	0.55	272	463	297	488	141	109	19	24
CR 3-5	0.75	296	527	321	552	141	109	22	26
CR 3-6	1.1	314	565	339	590	141	109	24	29
CR 3-7	1.1	332	583	357	608	141	109	24	29
CR 3-8	1.1	350	601	375	626	141	109	25	30
CR 3-9	1.5	384	665	409	690	178	110	32	37
CR 3-10	1.5	402	683	427	708	178	110	33	37
CR 3-11	1.5	420	701	445	726	178	110	33	38
CR 3-12	2.2	438	759	463	784	178	110	34	39
CR 3-13	2.2	456	777	481	802	178	110	34	39
CR 3-15	2.2	492	813	517	838	178	110	35	40
CR 3-17	2.2	528	849	553	874	178	110	36	41
CR 3-19	3	-	-	593	928	198	120	-	48
CR 3-21	3	-	-	629	964	198	120	-	49
CR 3-23	3	-	-	665	1000	198	120	-	49
CR 3-25	4	-	-	701	1073	220	134	-	59

CRI, CRN 3



TM02.7313 1013

Dimensional sketch

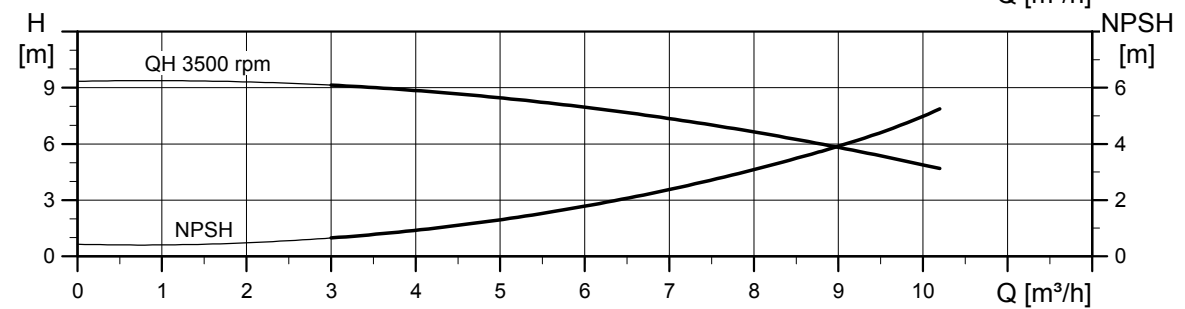
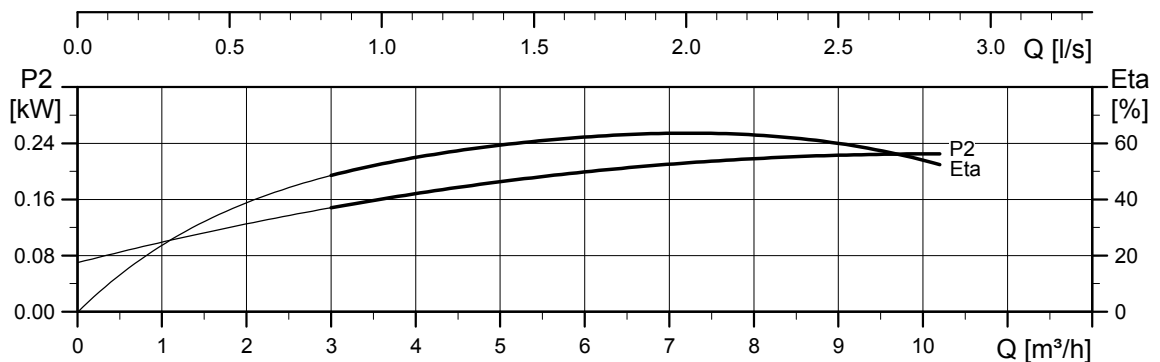
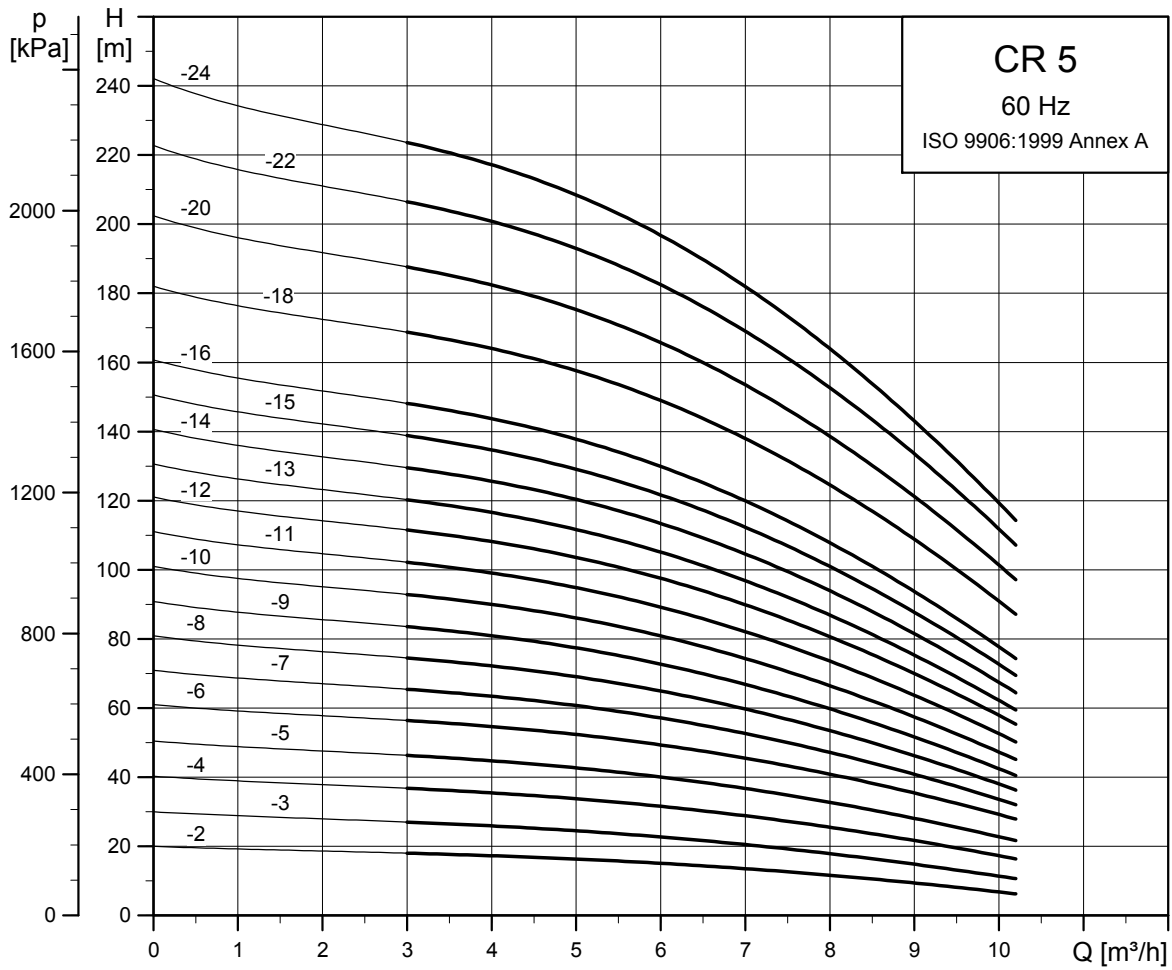


Dimensions and weights

Pump type	Motor P ₂ [kW]	CRI/CRN							
		Dimension [mm]						Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	PJE/CA	DIN flange
B1	B1+B2	B1	B1+B2						
CRI/CRN 3-2	0.37	257	448	282	473	141	109	16	20
CRI/CRN 3-3	0.55	257	448	282	473	141	109	17	21
CRI/CRN 3-4	0.55	275	466	300	491	141	109	17	22
CRI/CRN 3-5	0.75	299	530	324	555	141	109	20	24
CRI/CRN 3-6	1.1	317	568	342	593	141	109	23	27
CRI/CRN 3-7	1.1	335	586	360	611	141	109	23	27
CRI/CRN 3-8	1.1	353	604	378	629	141	109	24	28
CRI/CRN 3-9	1.5	387	668	412	693	178	110	30	35
CRI/CRN 3-10	1.5	405	686	430	711	178	110	31	35
CRI/CRN 3-11	1.5	423	704	448	729	178	110	31	35
CRI/CRN 3-12	2.2	441	762	466	787	178	110	32	36
CRI/CRN 3-13	2.2	459	780	484	805	178	110	33	37
CRI/CRN 3-15	2.2	495	816	520	841	178	110	33	38
CRI/CRN 3-17	2.2	531	852	556	877	178	110	34	38
CRI/CRN 3-19	3	572	907	597	932	198	120	41	46
CRI/CRN 3-21	3	608	943	633	968	198	120	42	46
CRI/CRN 3-23	3	644	979	669	1004	198	120	43	47
CRI/CRN 3-25	4	680	1052	705	1077	220	134	53	57

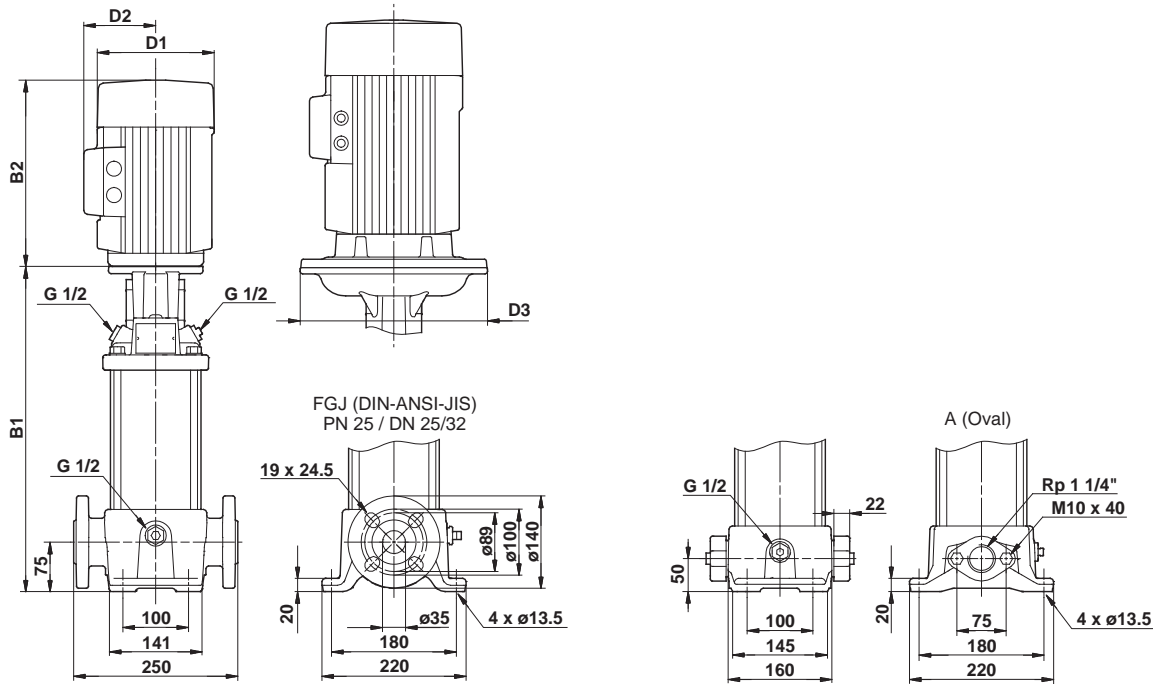
TM03 1722 2805

CR 5



TM02 7314 1013

Dimensional sketch

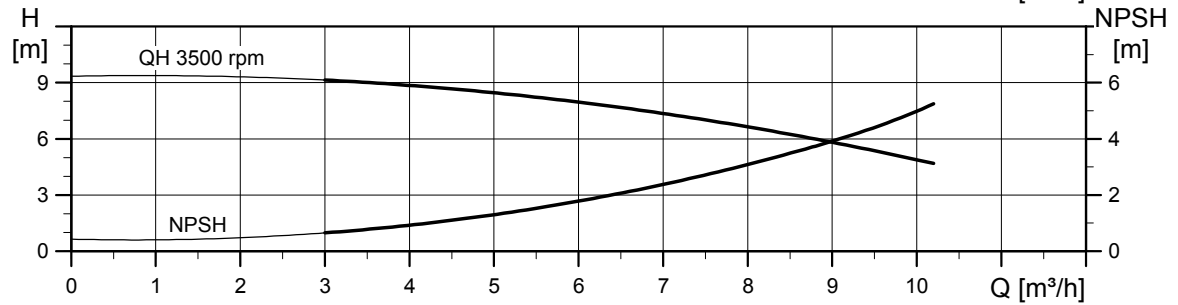
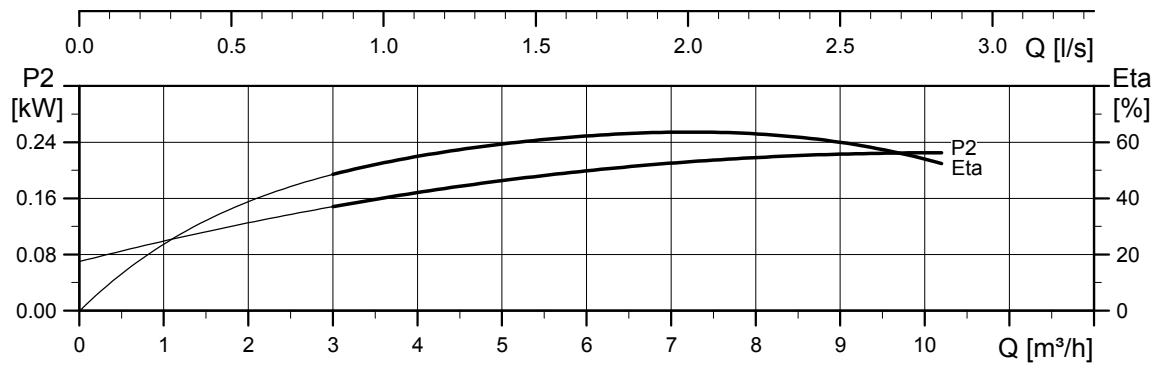
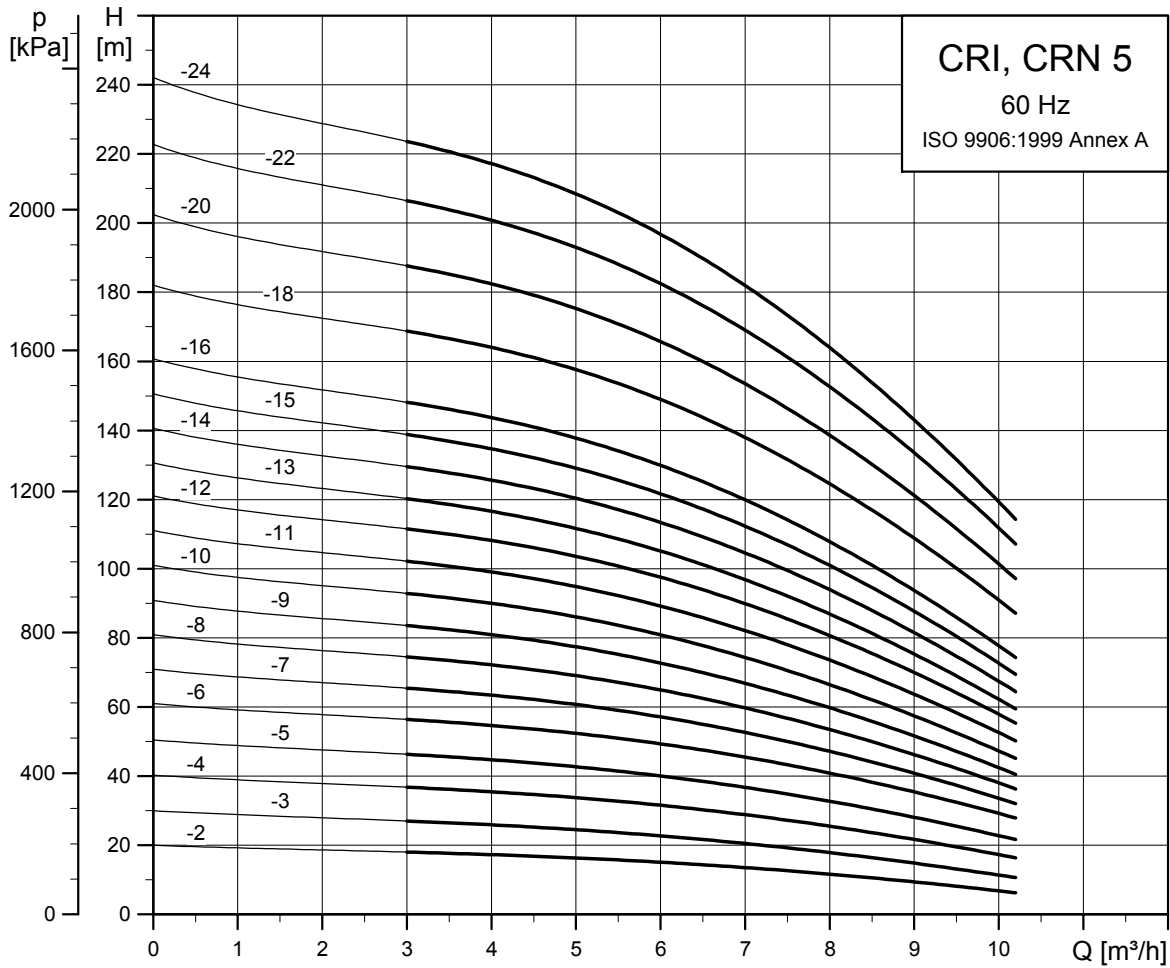


TM03 1723 2805

Dimensions and weights

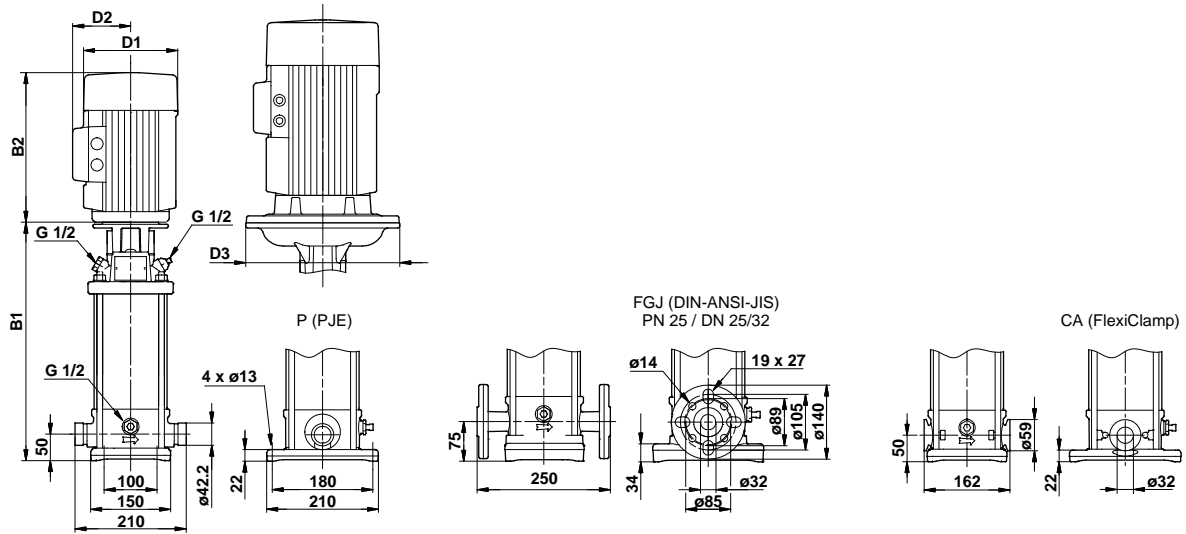
Pump type	Motor P ₂ [kW]	CR								
		Dimension [mm]							Net weight [kg]	
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2					
CR 5-2	0.55	254	445	279	470	141	109	-	19	23
CR 5-3	1.1	287	538	312	563	141	109	-	23	28
CR 5-4	1.1	314	565	339	590	141	109	-	24	29
CR 5-5	1.5	357	638	382	663	178	110	-	32	36
CR 5-6	2.2	384	705	409	730	178	110	-	33	37
CR 5-7	2.2	411	732	436	757	178	110	-	33	38
CR 5-8	2.2	438	759	463	784	178	110	-	34	38
CR 5-9	2.2	465	786	490	811	178	110	-	34	39
CR 5-10	3	496	831	521	856	198	120	-	41	46
CR 5-11	3	523	858	548	883	198	120	-	42	46
CR 5-12	3	550	885	575	910	198	120	-	42	47
CR 5-13	4	577	949	602	974	220	134	-	52	56
CR 5-14	4	604	976	629	1001	220	134	-	53	57
CR 5-15	4	631	1003	656	1028	220	134	-	53	58
CR 5-16	4	658	1030	683	1055	220	134	-	54	58
CR 5-18	5.5	-	-	767	1158	220	134	300	-	74
CR 5-20	5.5	-	-	821	1212	220	134	300	-	75
CR 5-22	5.5	-	-	875	1266	220	134	300	-	76
CR 5-24	7.5	-	-	929	1308	260	159	300	-	88

CRI, CRN 5



TM02 7315 1013

Dimensional sketch

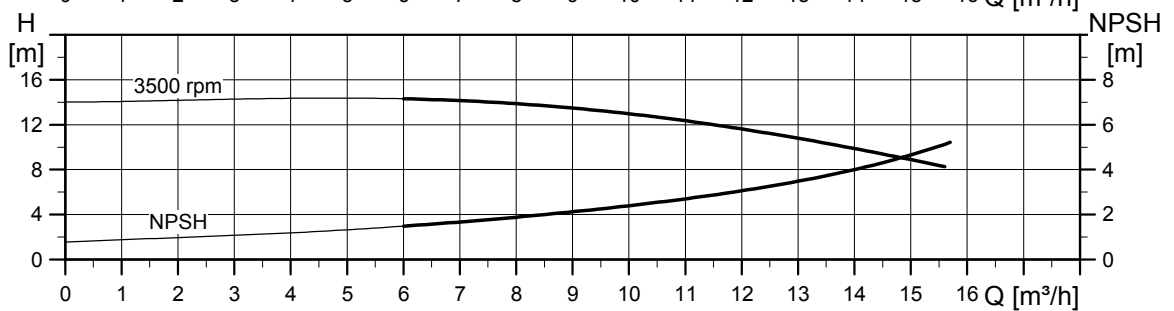
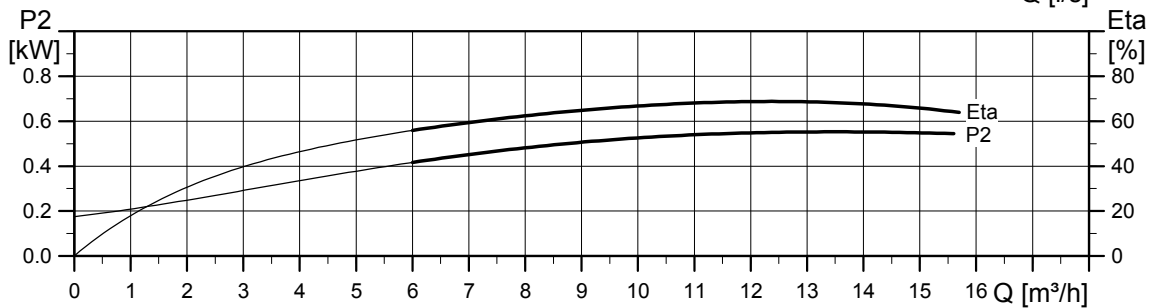
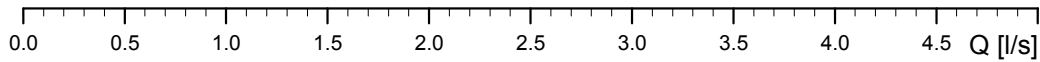
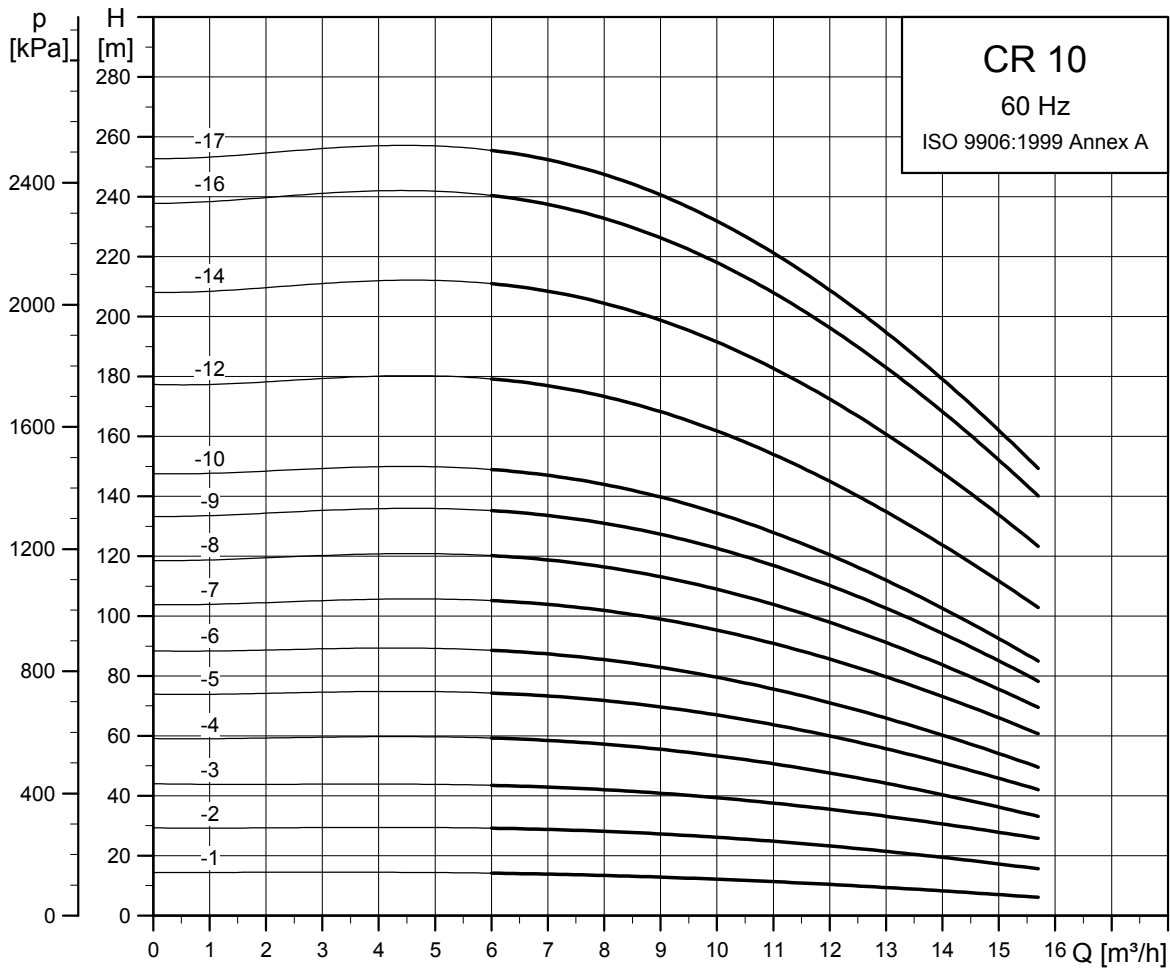


TM03 1724 2805

Dimensions and weights

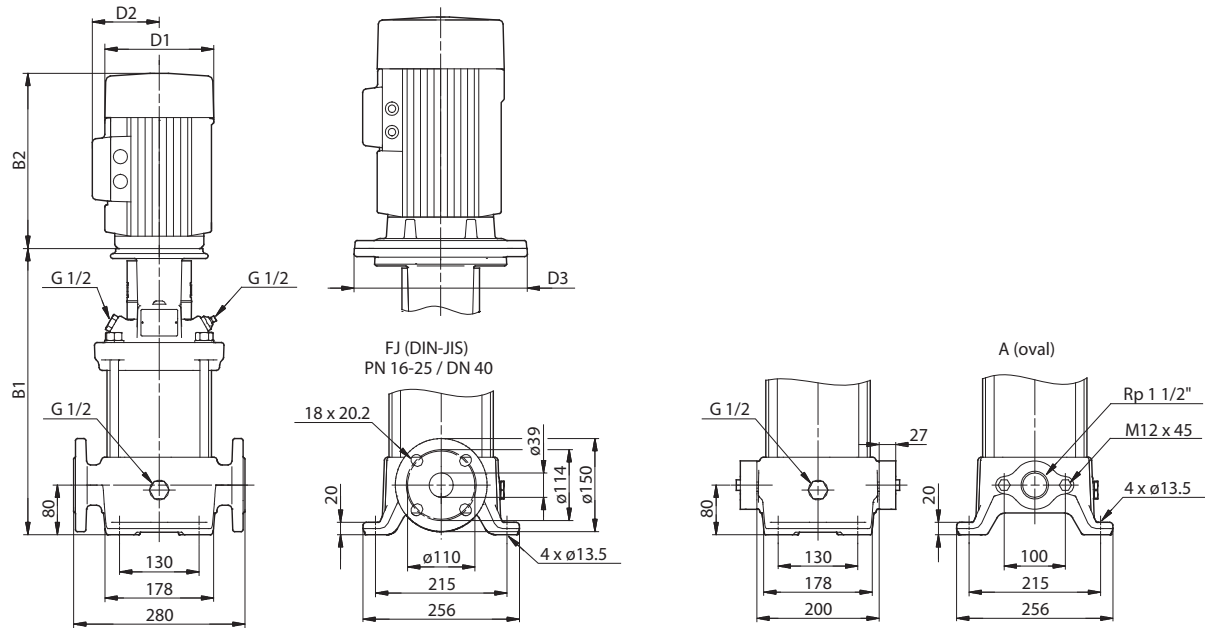
Pump type	Motor P ₂ [kW]	CRI/CRN									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	
		B1	B1+B2	B1	B1+B2						
CRI/CRN 5-2	0.55	257	448	282	473	141	109	-	17	21	
CRI/CRN 5-3	1.1	290	541	315	566	141	109	-	22	26	
CRI/CRN 5-4	1.1	317	568	342	593	141	109	-	23	27	
CRI/CRN 5-5	1.5	360	641	385	666	178	110	-	30	34	
CRI/CRN 5-6	2.2	387	708	412	733	178	110	-	31	35	
CRI/CRN 5-7	2.2	414	735	439	760	178	110	-	31	35	
CRI/CRN 5-8	2.2	441	762	466	787	178	110	-	32	36	
CRI/CRN 5-9	2.2	468	789	493	814	178	110	-	32	37	
CRI/CRN 5-10	3	500	835	525	860	198	120	-	39	44	
CRI/CRN 5-11	3	527	862	552	887	198	120	-	40	44	
CRI/CRN 5-12	3	554	889	579	914	198	120	-	41	45	
CRI/CRN 5-13	4	581	953	606	978	220	134	-	50	54	
CRI/CRN 5-14	4	608	980	633	1005	220	134	-	51	55	
CRI/CRN 5-15	4	635	1007	660	1032	220	134	-	51	55	
CRI/CRN 5-16	4	662	1034	687	1059	220	134	-	52	56	
CRI/CRN 5-18	5.5	745	1136	770	1161	220	134	300	67	71	
CRI/CRN 5-20	5.5	799	1190	824	1215	220	134	300	68	72	
CRI/CRN 5-22	5.5	853	1244	878	1269	220	134	300	69	73	
CRI/CRN 5-24	7.5	907	1286	932	1311	260	159	300	81	85	

CR 10



TM02 7316 1013

Dimensional sketch

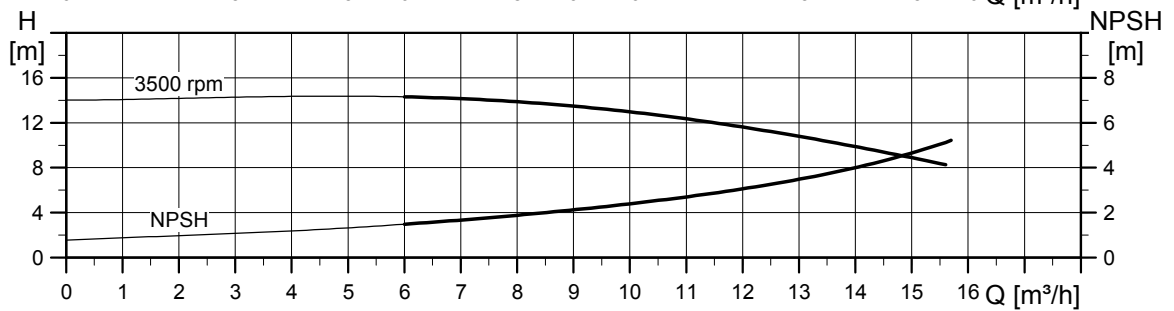
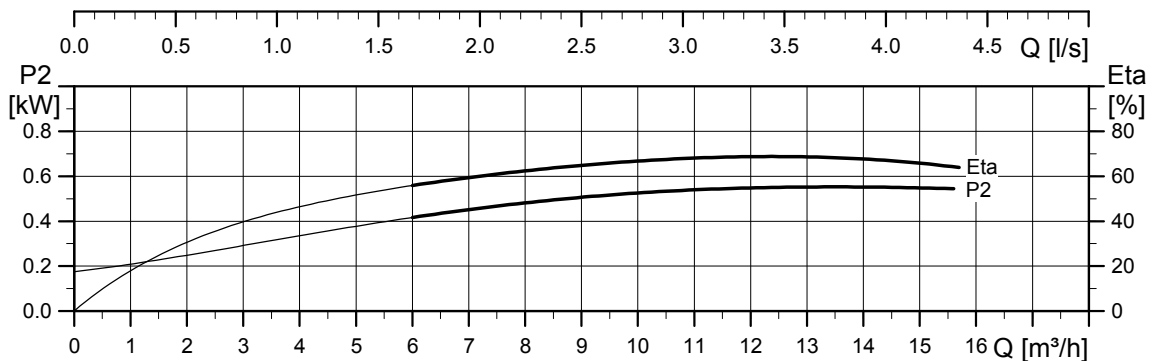
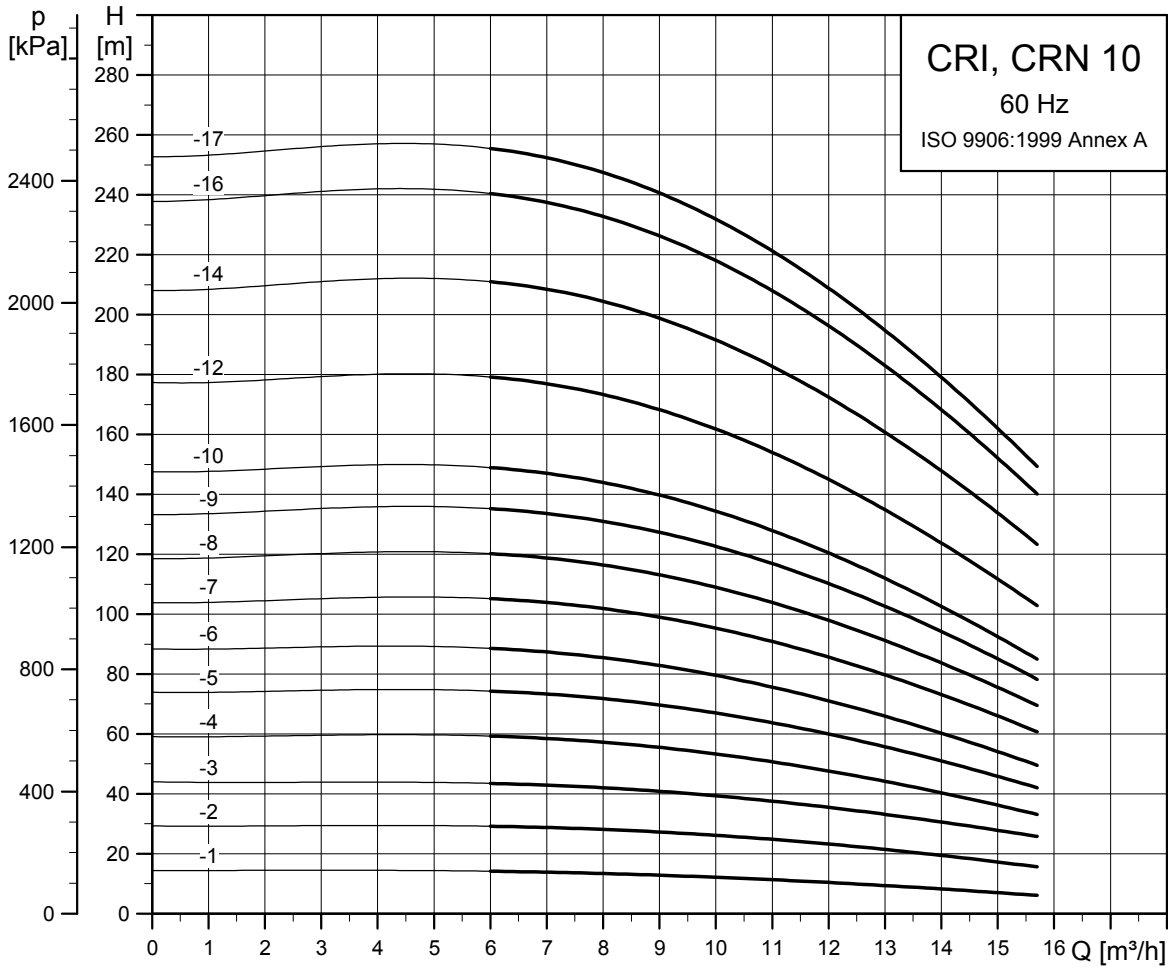


TM03 1725 2805

Dimensions and weights

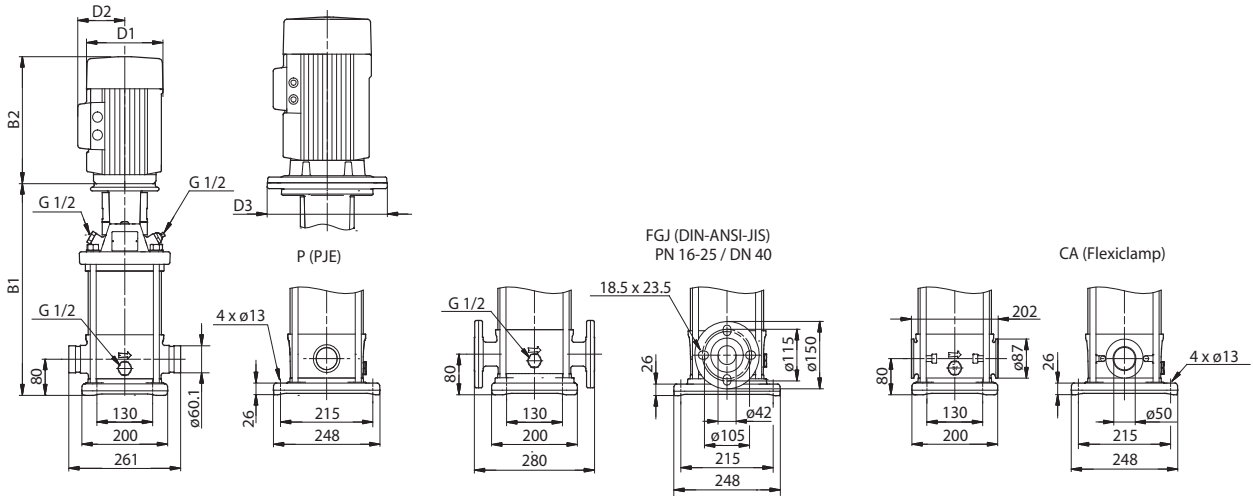
Pump type	Motor P ₂ [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2							
CR 10-1	0.75	347	578	347	578	141	109	-	33	36
CR 10-2	1.5	363	644	363	644	178	110	-	43	45
CR 10-3	2.2	393	714	393	714	178	110	-	44	47
CR 10-4	3	428	763	428	763	198	120	-	51	54
CR 10-5	3	458	793	458	793	198	120	-	52	55
CR 10-6	4	488	860	488	860	220	134	-	62	65
CR 10-7	5.5	550	941	550	941	220	134	300	84	87
CR 10-8	5.5	580	971	580	971	220	134	300	85	88
CR 10-9	5.5	610	1001	610	1001	220	134	300	86	89
CR 10-10	7.5	640	1019	640	1019	260	159	300	98	100
CR 10-12	7.5	-	-	700	1079	260	159	300	-	103
CR 10-14	11	-	-	837	1308	314	204	350	-	146
CR 10-16	11	-	-	897	1368	314	204	350	-	148
CR 10-17	11	-	-	957	1428	314	204	350	-	150

CRI, CRN 10



TM02 7317 1013

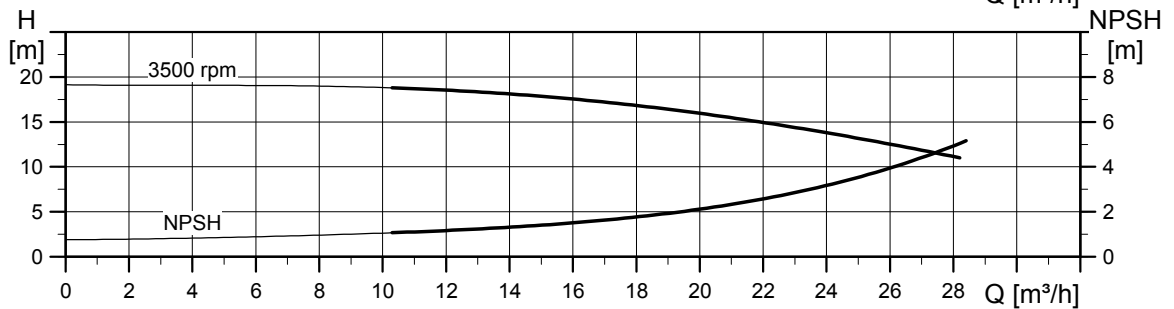
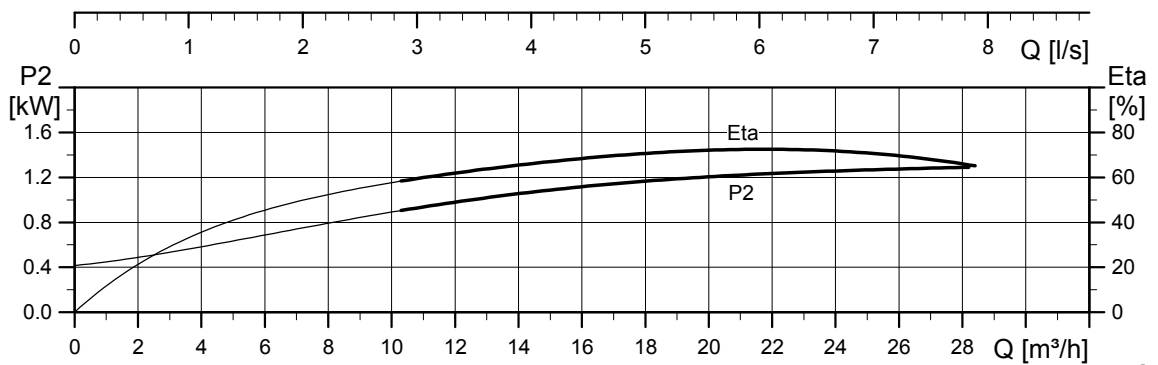
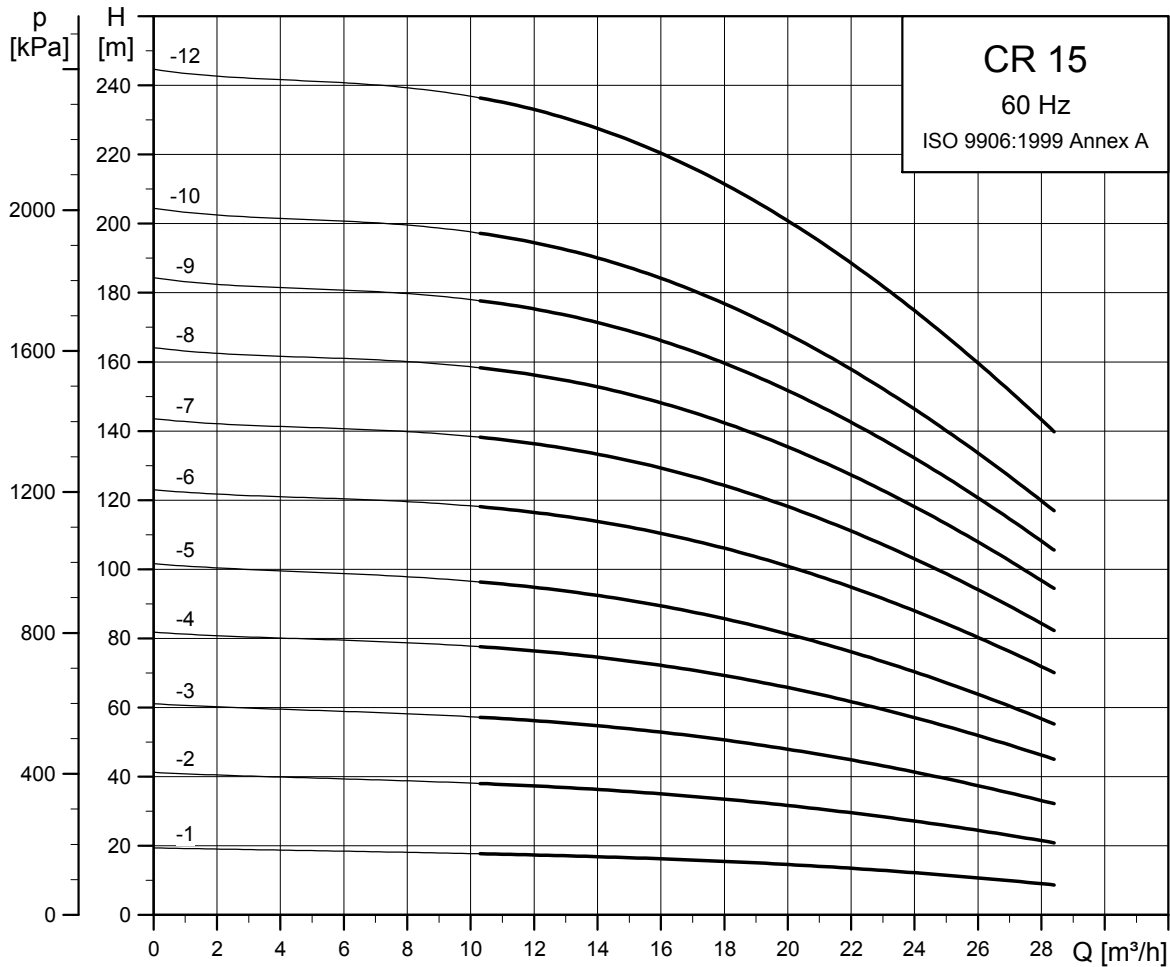
Dimensional sketch



Dimensions and weights

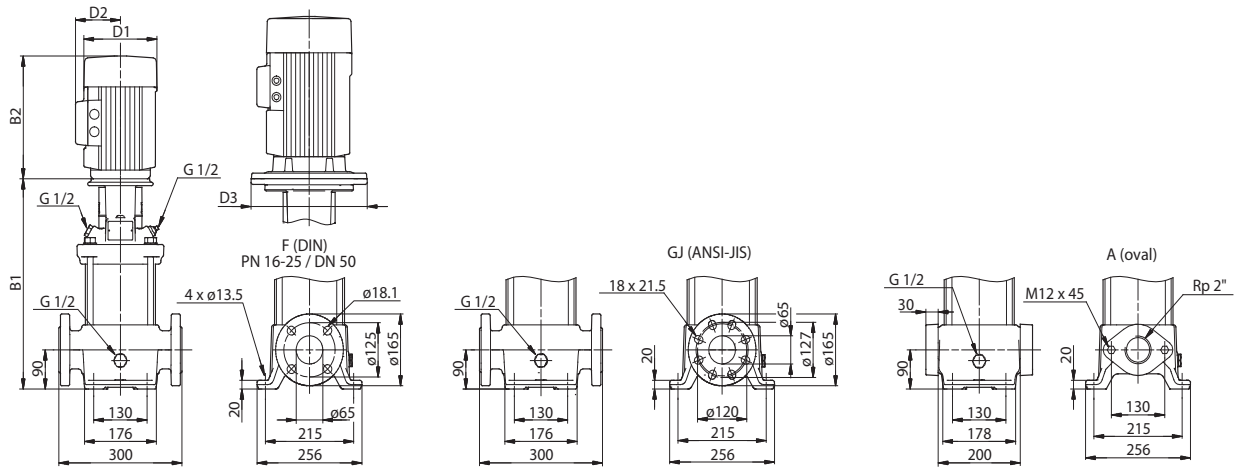
Pump type	Motor P ₂ [kW]	CRI/CRN									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	
		B1	B1+B2	B1	B1+B2						
CRI/CRN 10-1	0.75	357	588	357	588	141	109	-	31	34	
CRI/CRN 10-2	1.5	373	654	373	654	178	110	-	40	44	
CRI/CRN 10-3	2.2	403	724	403	724	178	110	-	42	45	
CRI/CRN 10-4	3	438	773	438	773	198	120	-	49	53	
CRI/CRN 10-5	3	468	803	468	803	198	120	-	50	54	
CRI/CRN 10-6	4	498	870	498	870	220	134	-	60	64	
CRI/CRN 10-7	5.5	560	951	560	951	220	134	300	82	85	
CRI/CRN 10-8	5.5	590	981	590	981	220	134	300	83	86	
CRI/CRN 10-9	5.5	620	1011	620	1011	220	134	300	84	87	
CRI/CRN 10-10	7.5	650	1029	650	1029	260	159	300	95	99	
CRI/CRN 10-12	7.5	710	1089	710	1089	260	159	300	98	101	
CRI/CRN 10-14	11	847	1318	847	1318	314	204	350	140	144	
CRI/CRN 10-16	11	907	1378	907	1378	314	204	350	143	146	
CRI/CRN 10-17	11	967	1438	967	1438	314	204	350	145	148	

CR 15



TM02 7318 1013

Dimensional sketch

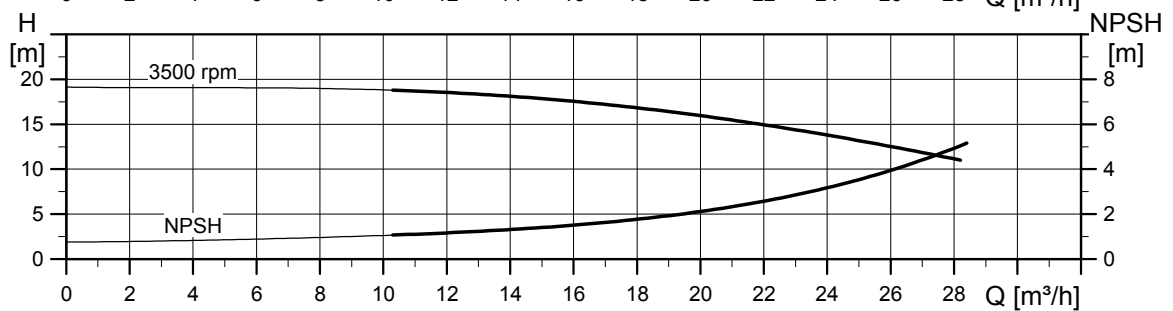
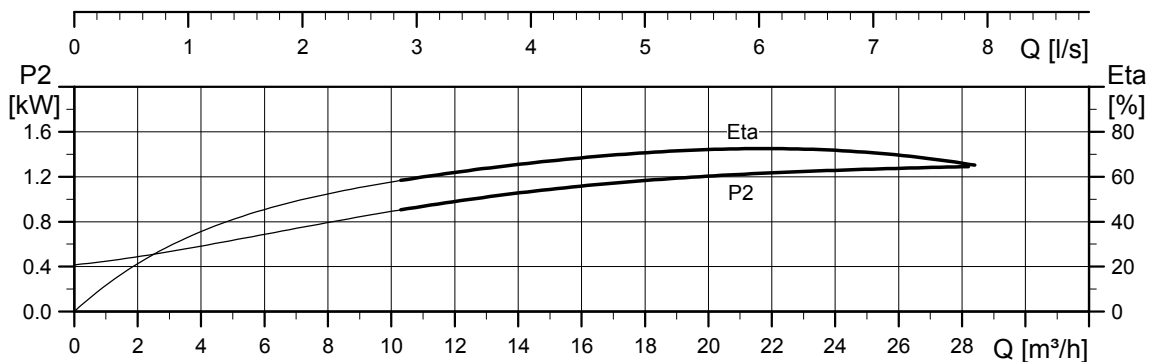
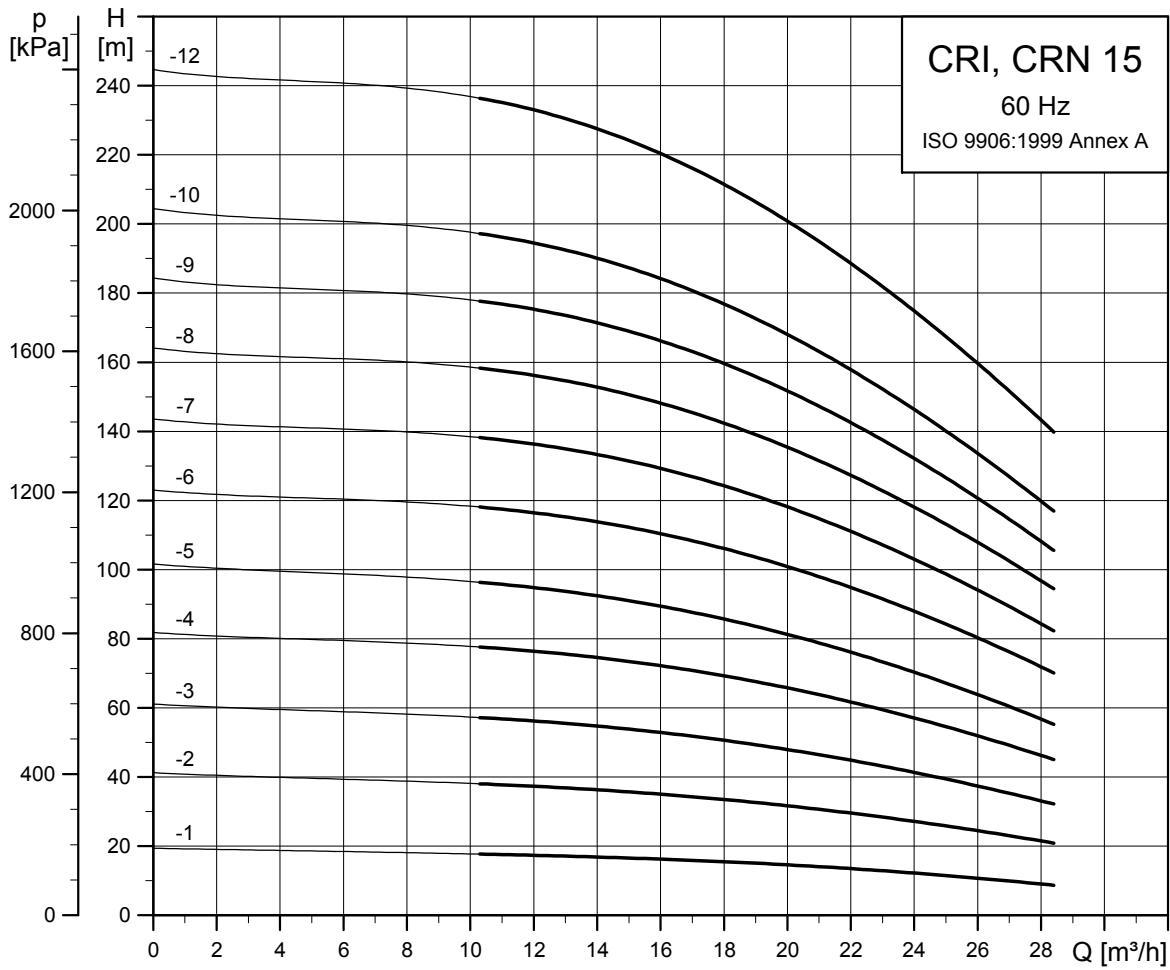


TM03 1727 2805

Dimensions and weights

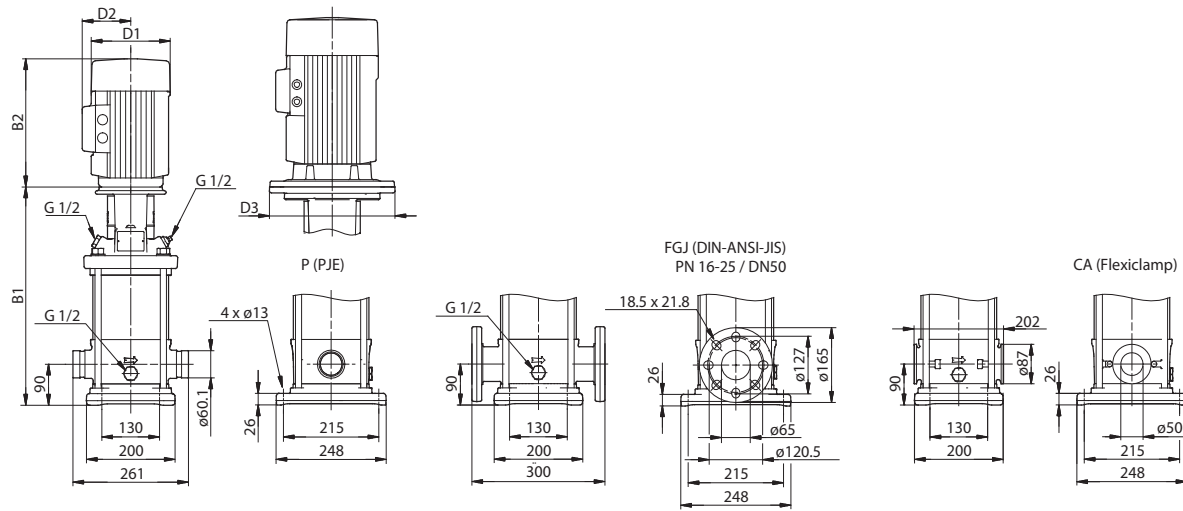
Pump type	Motor P ₂ [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
B1	B1+B2	B1	B1+B2							
CR 15-1	1.5	415	696	415	696	178	110	-	48	49
CR 15-2	3	420	755	420	755	198	120	-	55	56
CR 15-3	4	465	837	465	837	220	134	-	65	66
CR 15-4	5.5	542	933	542	933	220	134	300	87	88
CR 15-5	7.5	587	966	587	966	260	159	300	99	100
CR 15-6	11	-	-	709	1180	314	204	350	-	143
CR 15-7	11	-	-	754	1225	314	204	350	-	144
CR 15-8	11	-	-	799	1270	314	204	350	-	146
CR 15-9	15	-	-	844	1315	314	204	350	-	161
CR 15-10	15	-	-	889	1360	314	204	350	-	163
CR 15-12	18.5	-	-	979	1494	314	204	350	-	179

CRI, CRN 15



TM02 7319 1013

Dimensional sketch

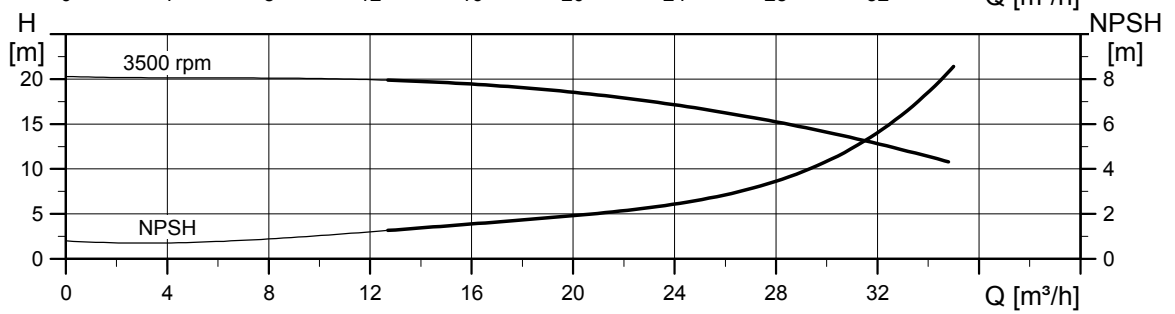
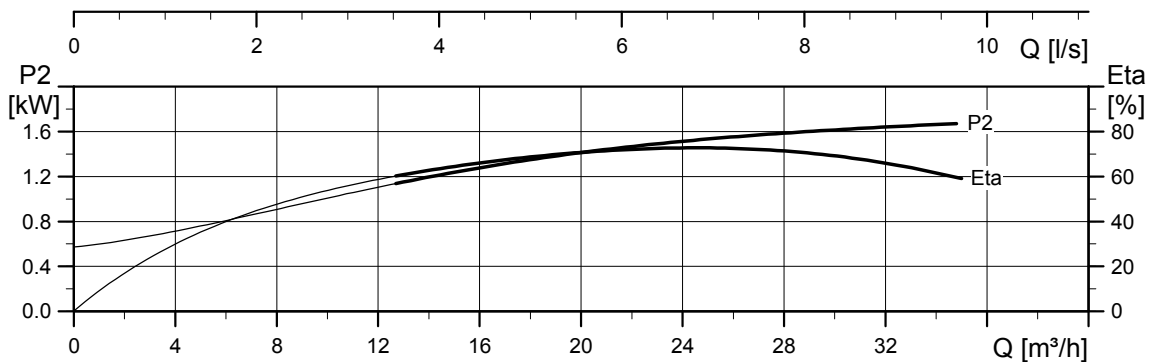
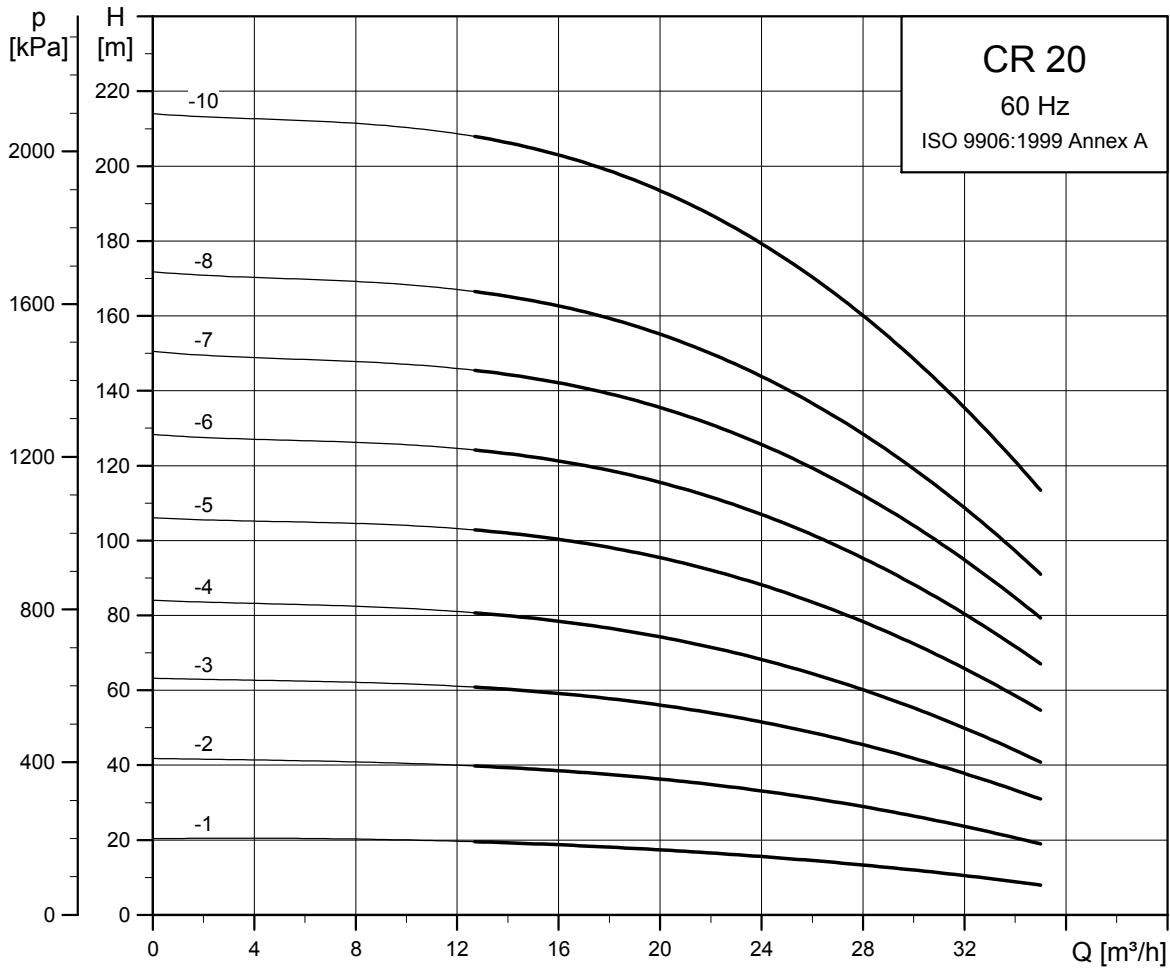


TM03 1728 2805

Dimensions and weights

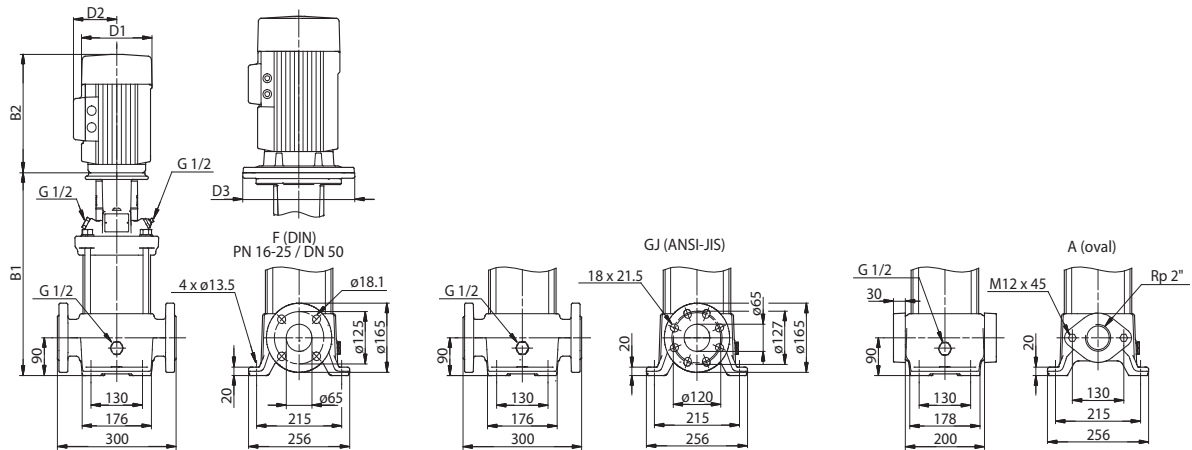
Pump type	Motor P ₂ [kW]	CRI/CRN								
		Dimension [mm]						Net weight [kg]		
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange
		B1	B1+B2	B1	B1+B2					
CRI/CRN 15-1	1.5	413	694	413	694	178	110	-	41	46
CRI/CRN 15-2	3	418	753	418	753	198	120	-	49	53
CRI/CRN 15-3	4	463	835	463	835	220	134	-	59	64
CRI/CRN 15-4	5.5	540	931	540	931	220	134	300	81	86
CRI/CRN 15-5	7.5	585	964	585	964	260	159	300	93	98
CRI/CRN 15-6	11	707	1178	707	1178	314	204	350	135	140
CRI/CRN 15-7	11	752	1223	752	1223	314	204	350	137	142
CRI/CRN 15-8	11	797	1268	797	1268	314	204	350	138	143
CRI/CRN 15-9	15	842	1313	842	1313	314	204	350	153	158
CRI/CRN 15-10	15	887	1358	887	1358	314	204	350	155	160
CRI/CRN 15-12	18.5	977	1492	977	1492	314	204	350	171	176

CR 20



TM02 7320 1013

Dimensional sketch

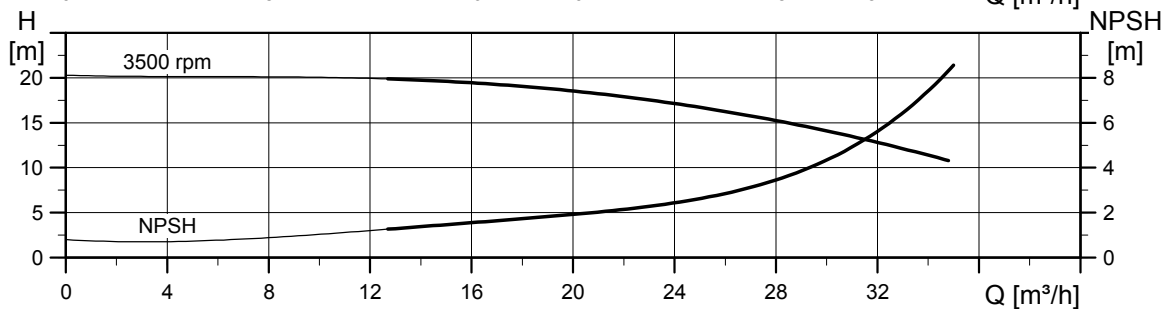
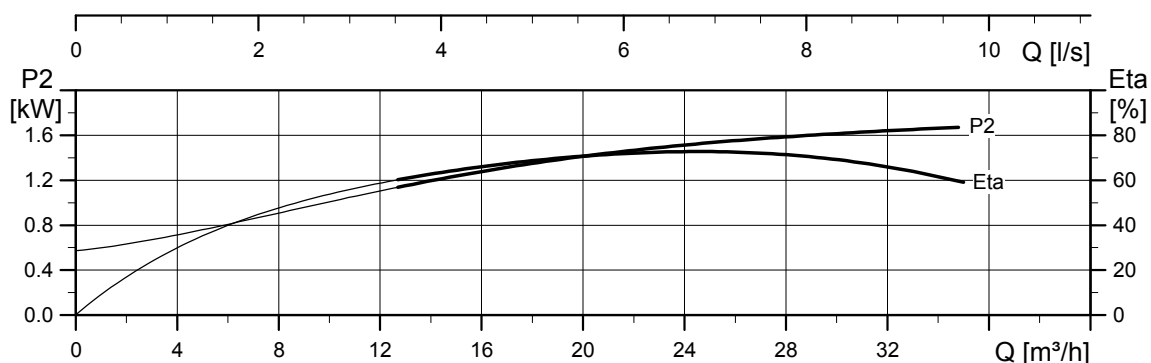
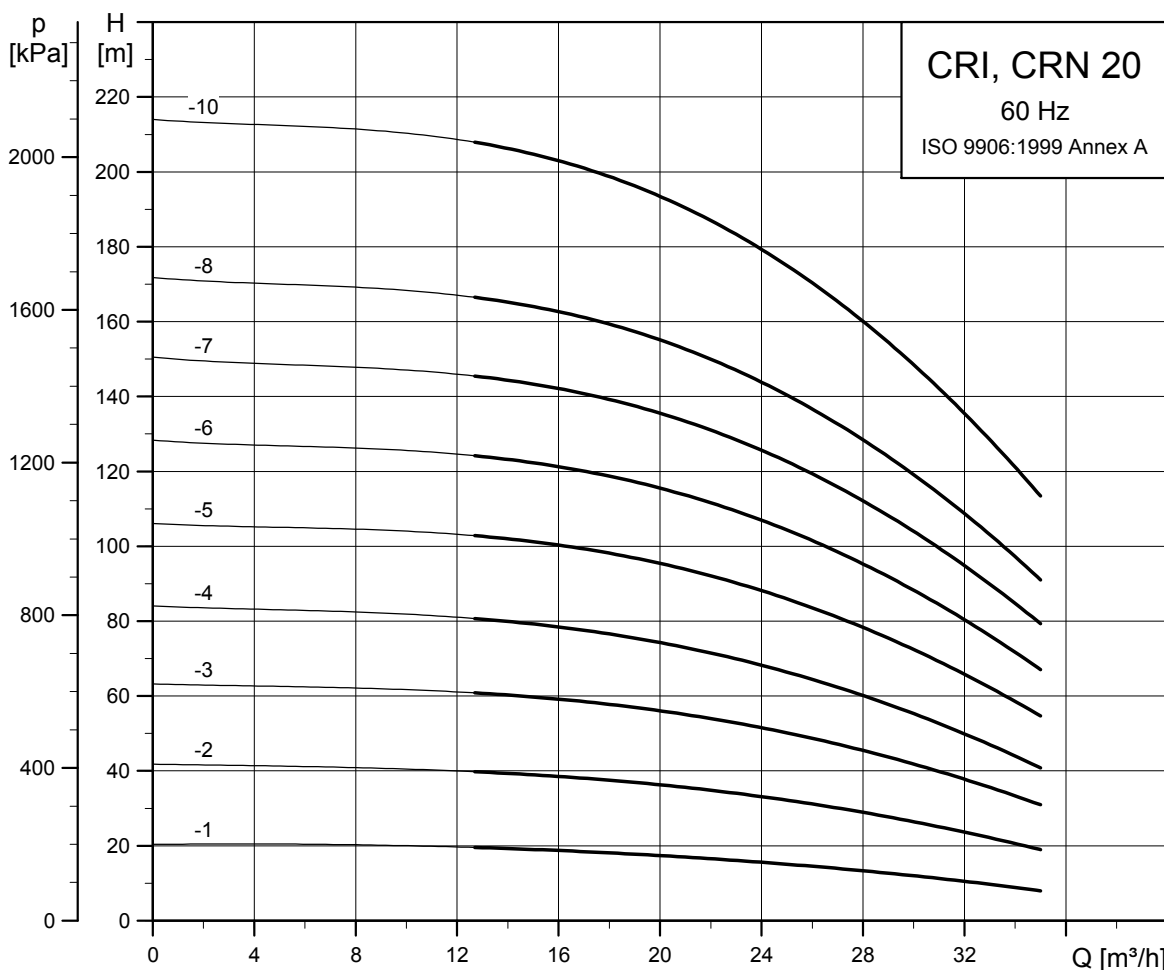


TM03 1727 2805

Dimensions and weights

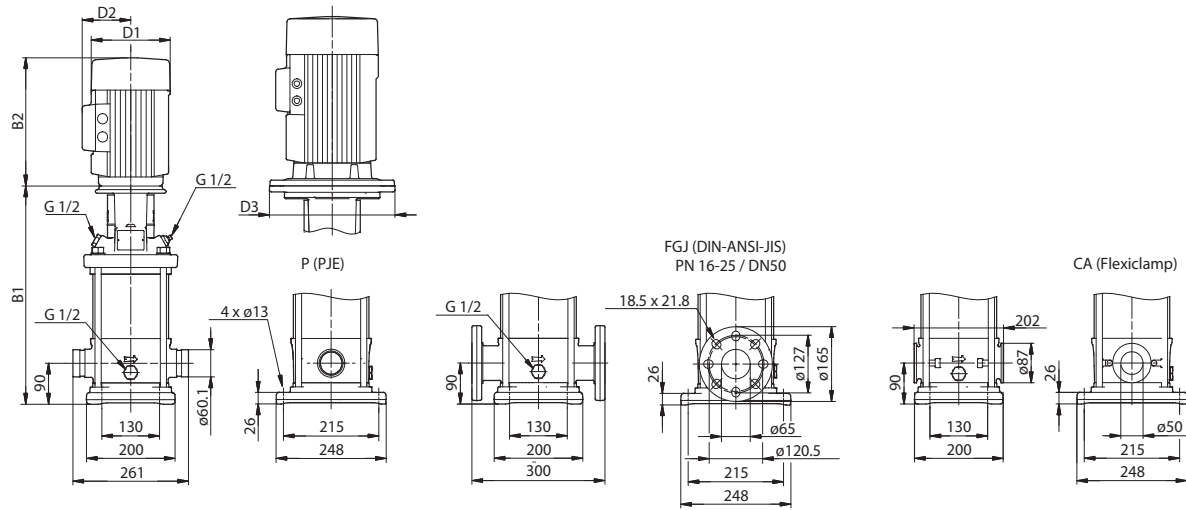
Pump type	Motor P ₂ [kW]	CR								
		Dimension [mm]							Net weight [kg]	
		Oval flange		DIN flange		D1	D2	D3	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2					
CR 20-1	2.2	415	736	415	736	178	110	-	49	50
CR 20-2	4	420	792	420	792	220	134	-	64	65
CR 20-3	5.5	497	888	497	888	220	134	300	86	87
CR 20-4	7.5	542	921	542	921	260	159	300	98	99
CR 20-5	11	664	1135	664	1135	314	204	350	140	141
CR 20-6	11	-	-	709	1180	314	204	350	-	143
CR 20-7	15	-	-	754	1225	314	204	350	-	157
CR 20-8	15	-	-	799	1270	314	204	350	-	159
CR 20-10	18.5	-	-	889	1404	314	204	350	-	176

CRI, CRN 20



TM02 7321 1013

Dimensional sketch

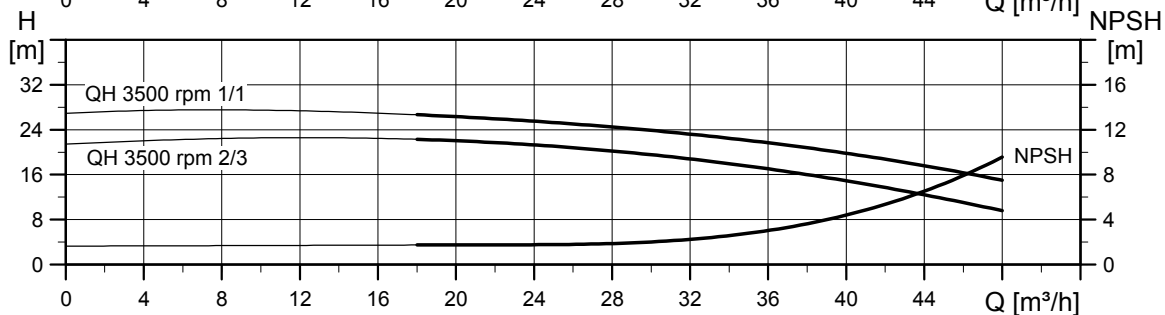
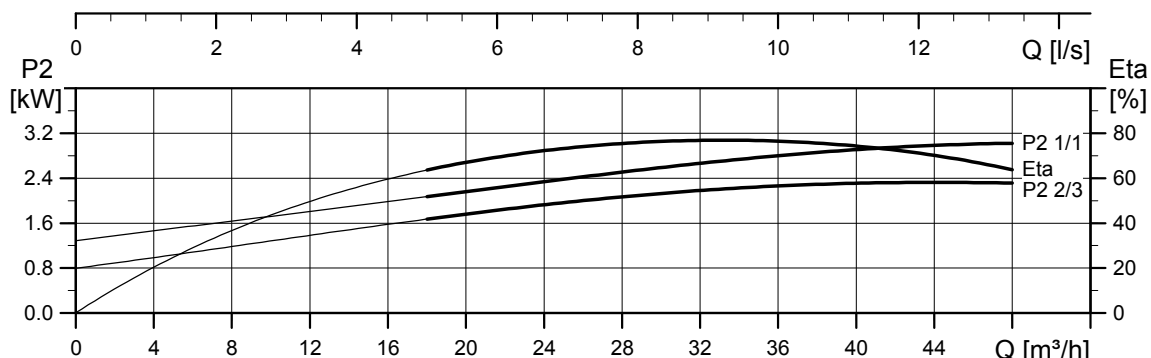
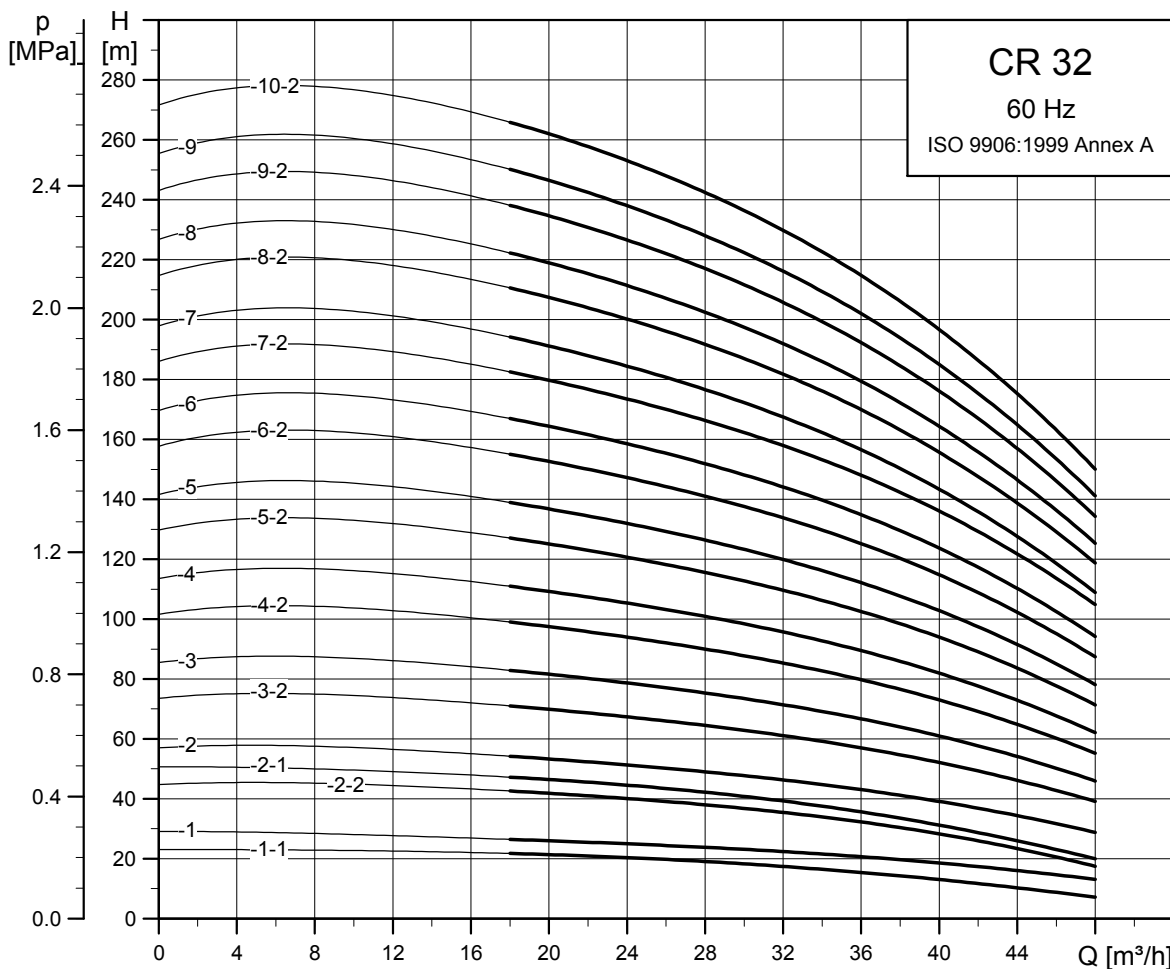


TM03 1728 2805

Dimensions and weights

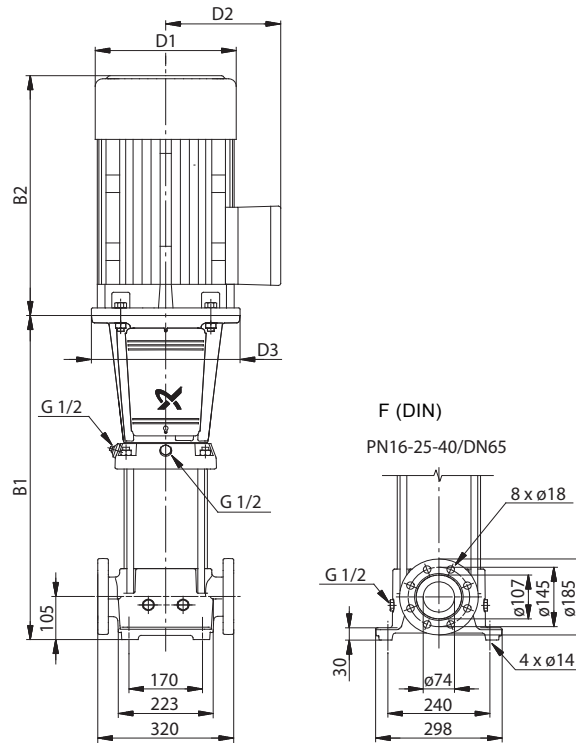
Pump type	Motor P ₂ [kW]	CRI/CRN									
		Dimension [mm]								Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/CA	DIN flange	
		B1	B1+B2	B1	B1+B2						
CRI/CRN 20-1	2.2	413	734	413	734	178	110	-	42	47	
CRI/CRN 20-2	4	418	790	418	790	220	134	-	58	62	
CRI/CRN 20-3	5.5	495	886	495	886	220	134	300	79	84	
CRI/CRN 20-4	7.5	540	919	540	919	260	159	300	91	96	
CRI/CRN 20-5	11	662	1133	662	1133	314	204	350	133	138	
CRI/CRN 20-6	11	707	1178	707	1178	314	204	350	135	140	
CRI/CRN 20-7	15	752	1223	752	1223	314	204	350	150	155	
CRI/CRN 20-8	15	797	1268	797	1268	314	204	350	151	156	
CRI/CRN 20-10	18.5	887	1402	887	1402	314	204	350	168	173	

CR 32



TM02 7322 1013

Dimensional sketch

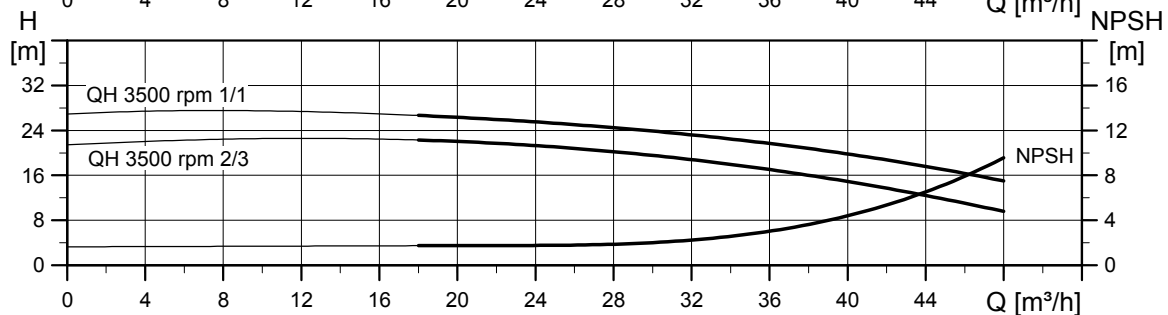
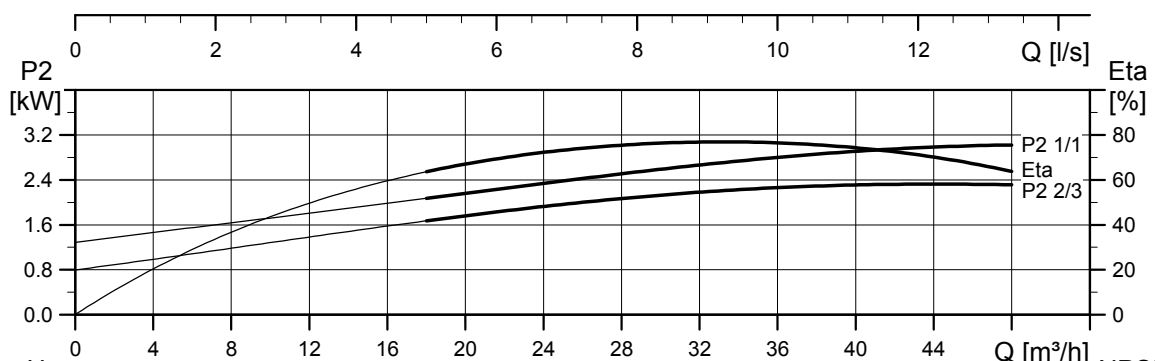
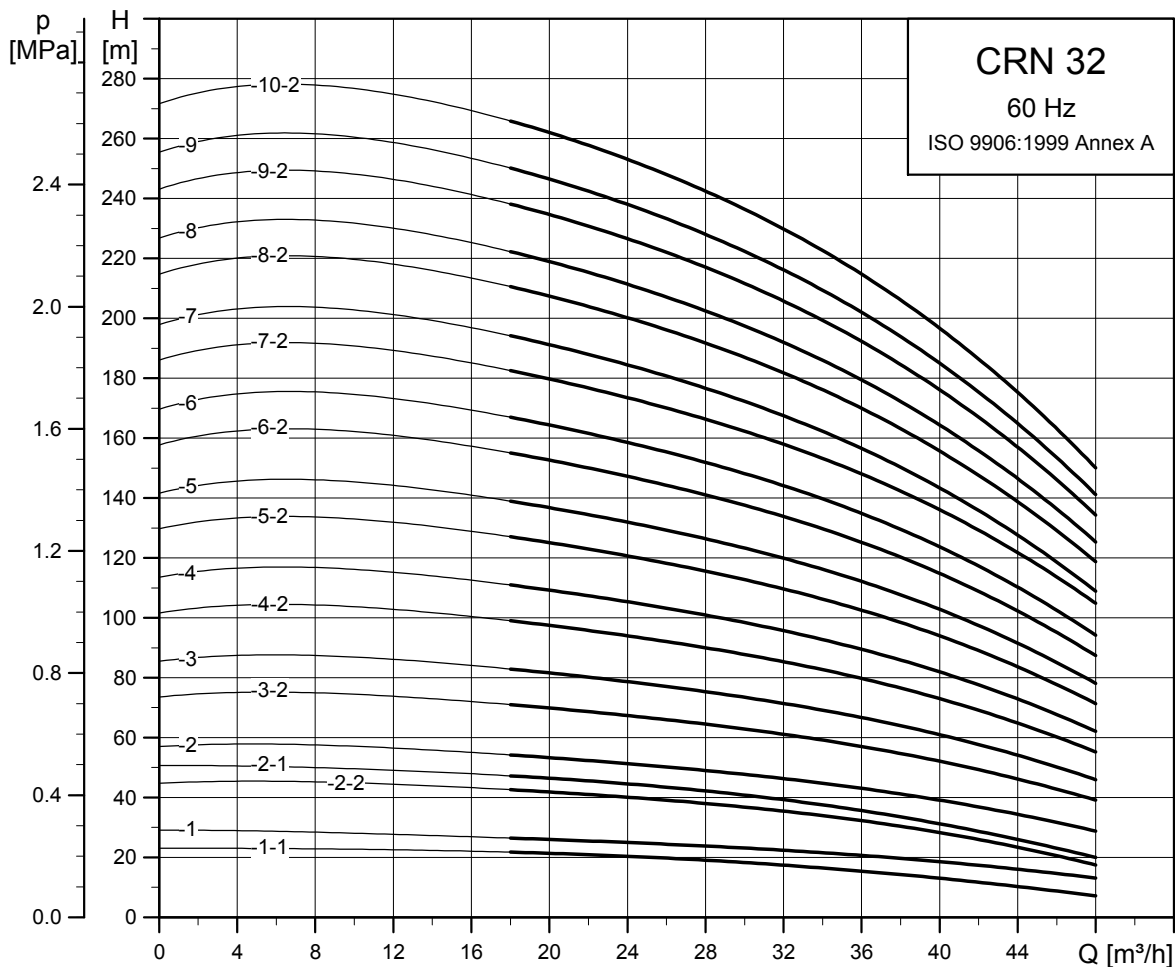


Dimensions and weights

Pump type	Motor P ₂ [kW]	CR					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 32-1-1	2.2	505	826	178	110	-	64
CR 32-1	3	505	840	198	120	-	70
CR 32-2-2	5.5	575	966	220	134	300	93
CR 32-2-1	5.5	575	966	220	134	300	93
CR 32-2	7.5	575	954	260	159	300	104
CR 32-3-2	11	755	1226	314	204	350	152
CR 32-3	11	755	1226	314	204	350	152
CR 32-4-2	11	825	1296	314	204	350	155
CR 32-4	15	825	1296	314	204	350	168
CR 32-5-2	15	895	1366	314	204	350	171
CR 32-5	18.5	895	1410	314	204	350	184
CR 32-6-2	18.5	965	1480	314	204	350	187
CR 32-6	18.5	965	1480	314	204	350	187
CR 32-7-2	22	1035	1576	314	204	350	204
CR 32-7	22	1035	1576	314	204	350	204
CR 32-8-2	30	1105	1716	396	315	400	327
CR 32-8	30	1105	1716	396	315	400	327
CR 32-9-2	30	1175	1786	396	315	400	330
CR 32-9	30	1175	1786	396	315	400	330
CR 32-10-2	30	1245	1856	396	315	400	334

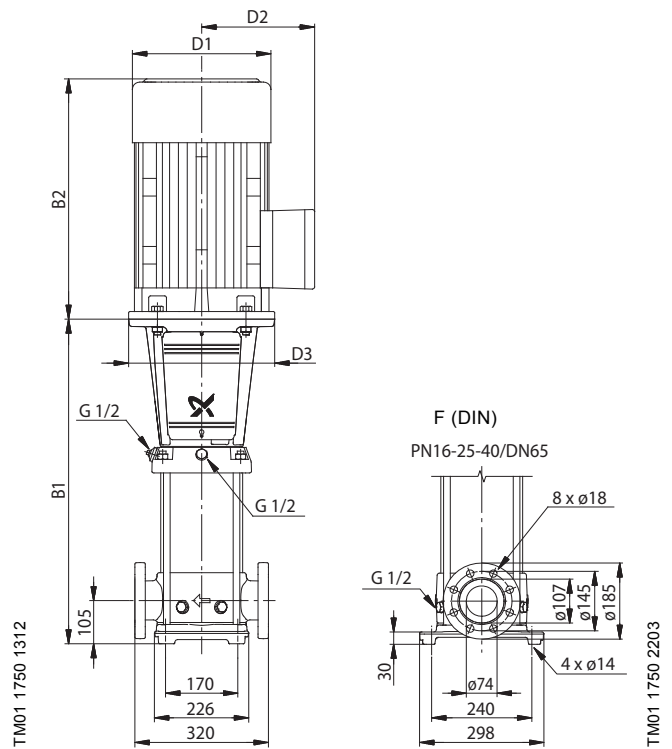
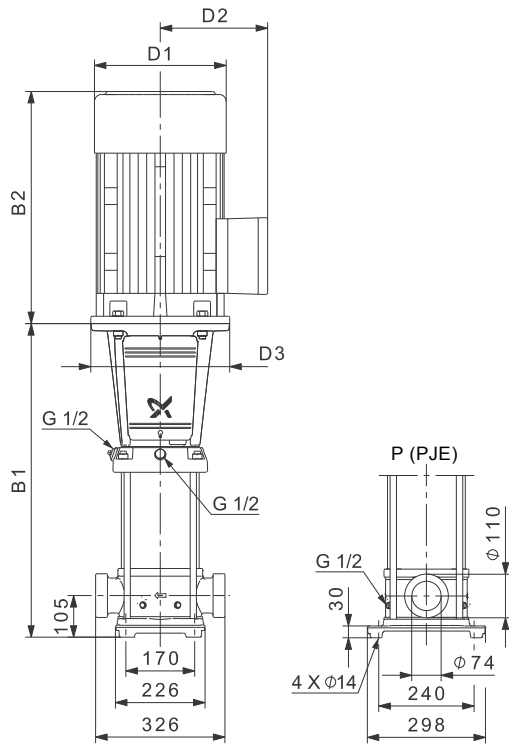
TM01 1749 3298

CRN 32



TM02 7323 1013

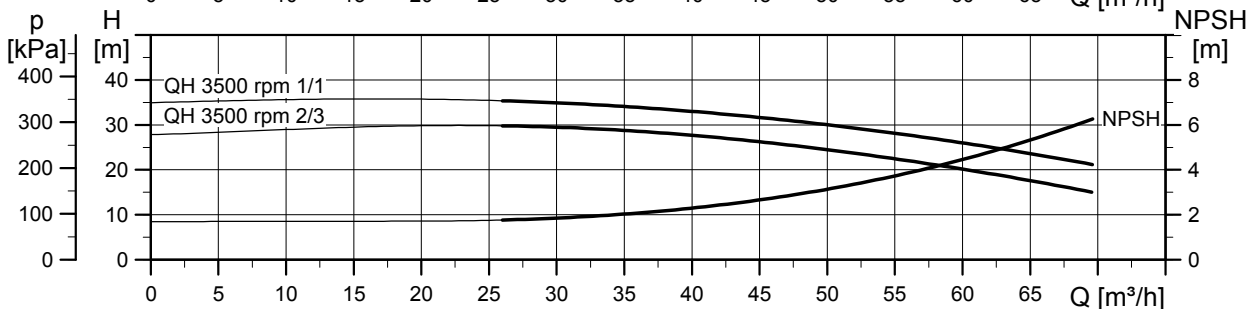
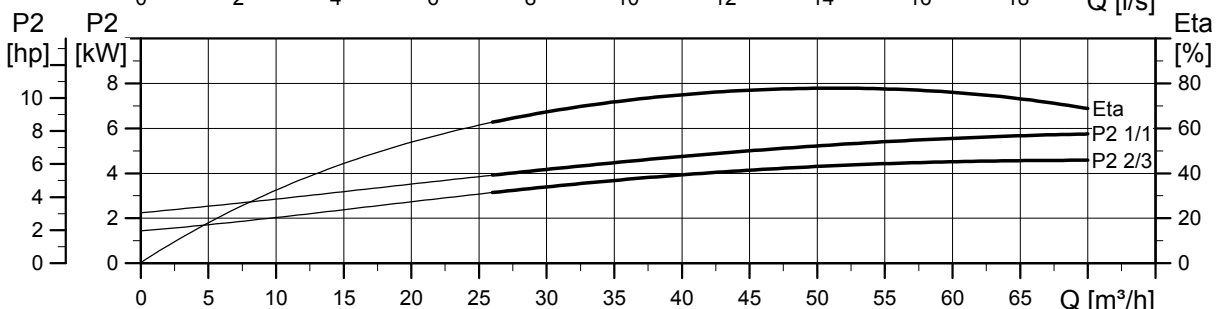
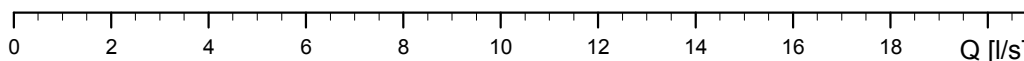
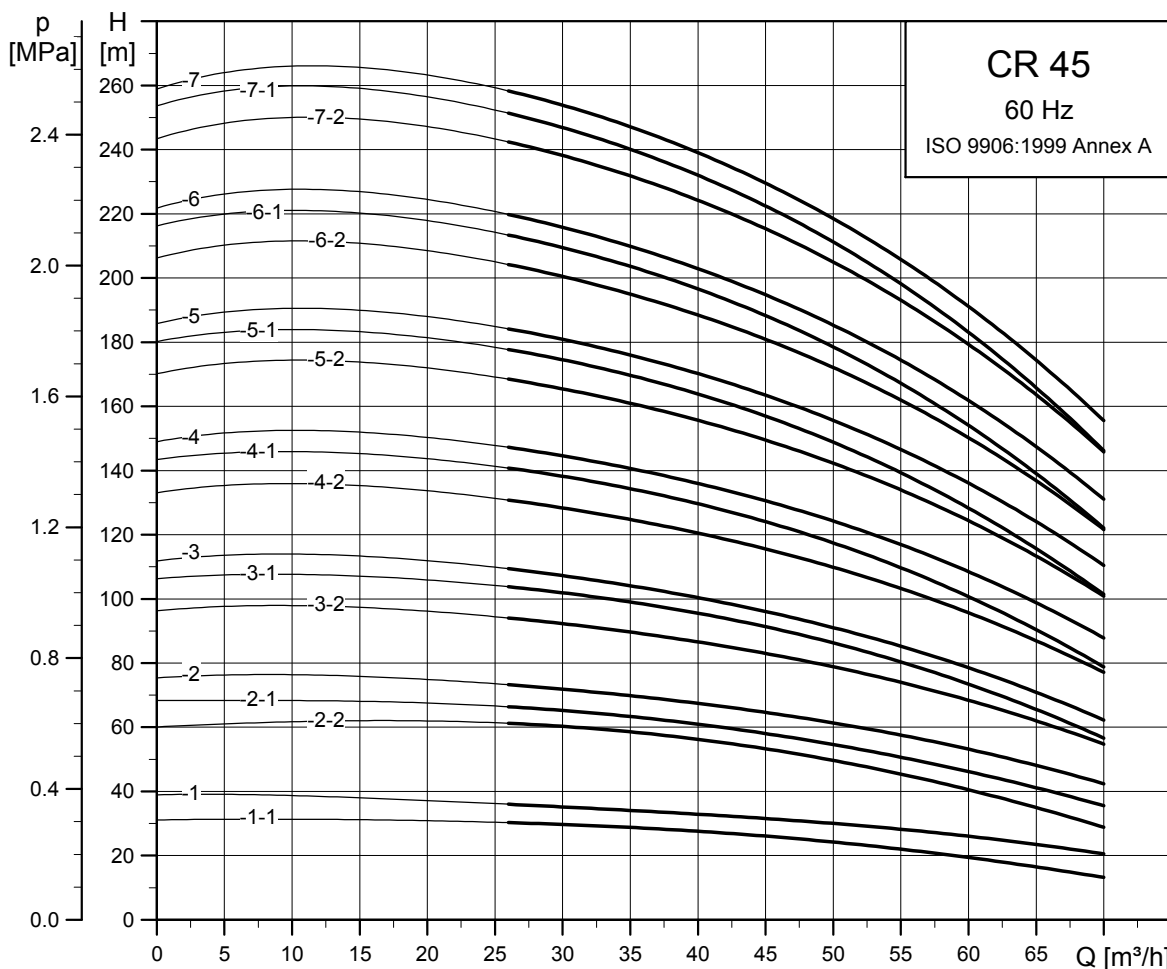
Dimensional sketch



Dimensions and weights

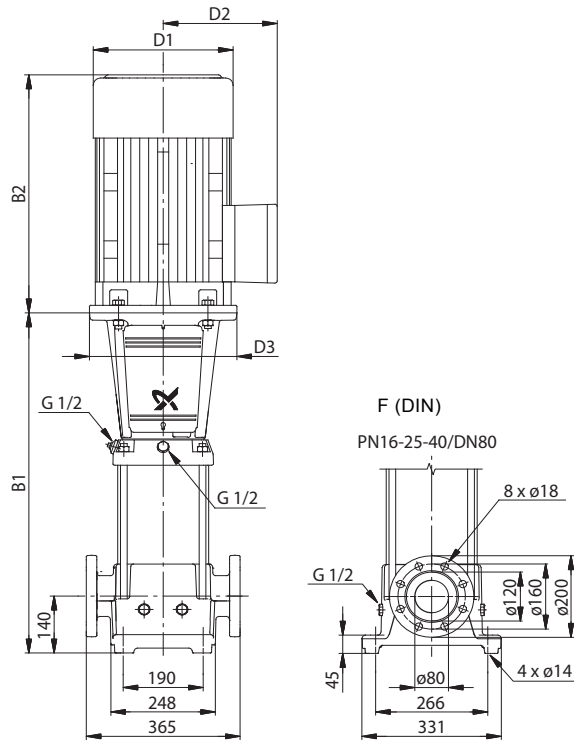
Pump type	Motor P ₂ [kW]	CRN					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CRN 32-1-1	2.2	505	826	178	110	-	66
CRN 32-1	3	505	840	198	120	-	72
CRN 32-2-2	5.5	575	966	220	134	300	95
CRN 32-2-1	5.5	575	966	220	134	300	95
CRN 32-2	7.5	575	954	260	159	300	106
CRN 32-3-2	11	755	1226	314	204	350	154
CRN 32-3	11	755	1226	314	204	350	154
CRN 32-4-2	11	825	1296	314	204	350	157
CRN 32-4	15	825	1296	314	204	350	170
CRN 32-5-2	15	895	1366	314	204	350	173
CRN 32-5	18.5	895	1410	314	204	350	186
CRN 32-6-2	18.5	965	1480	314	204	350	189
CRN 32-6	18.5	965	1480	314	204	350	189
CRN 32-7-2	22	1035	1576	314	204	350	206
CRN 32-7	22	1035	1576	314	204	350	206
CRN 32-8-2	30	1105	1716	396	315	400	329
CRN 32-8	30	1105	1716	396	315	400	329
CRN 32-9-2	30	1175	1786	396	315	400	333
CRN 32-9	30	1175	1786	396	315	400	333
CRN 32-10-2	30	1245	1856	396	315	400	336

CR 45



TM02 7324 3103

Dimensional sketch

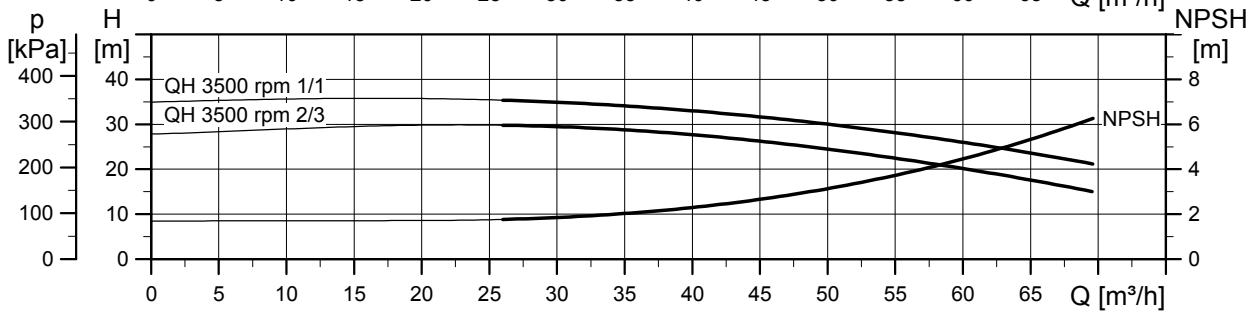
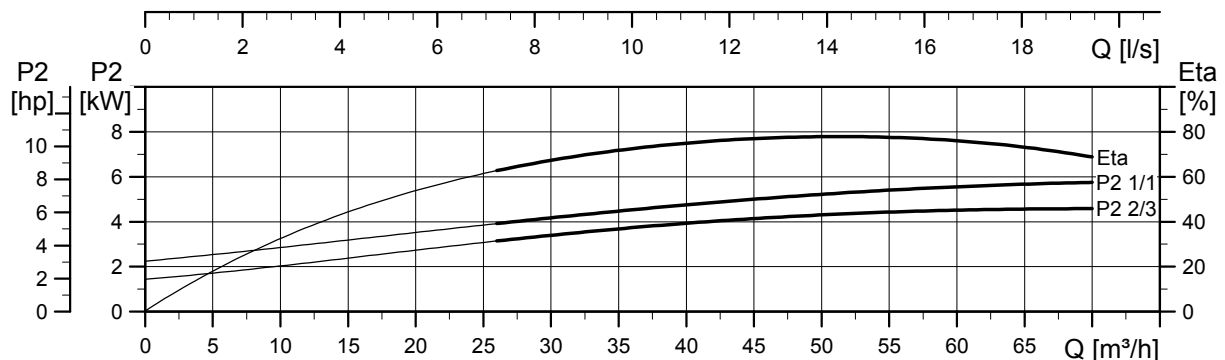
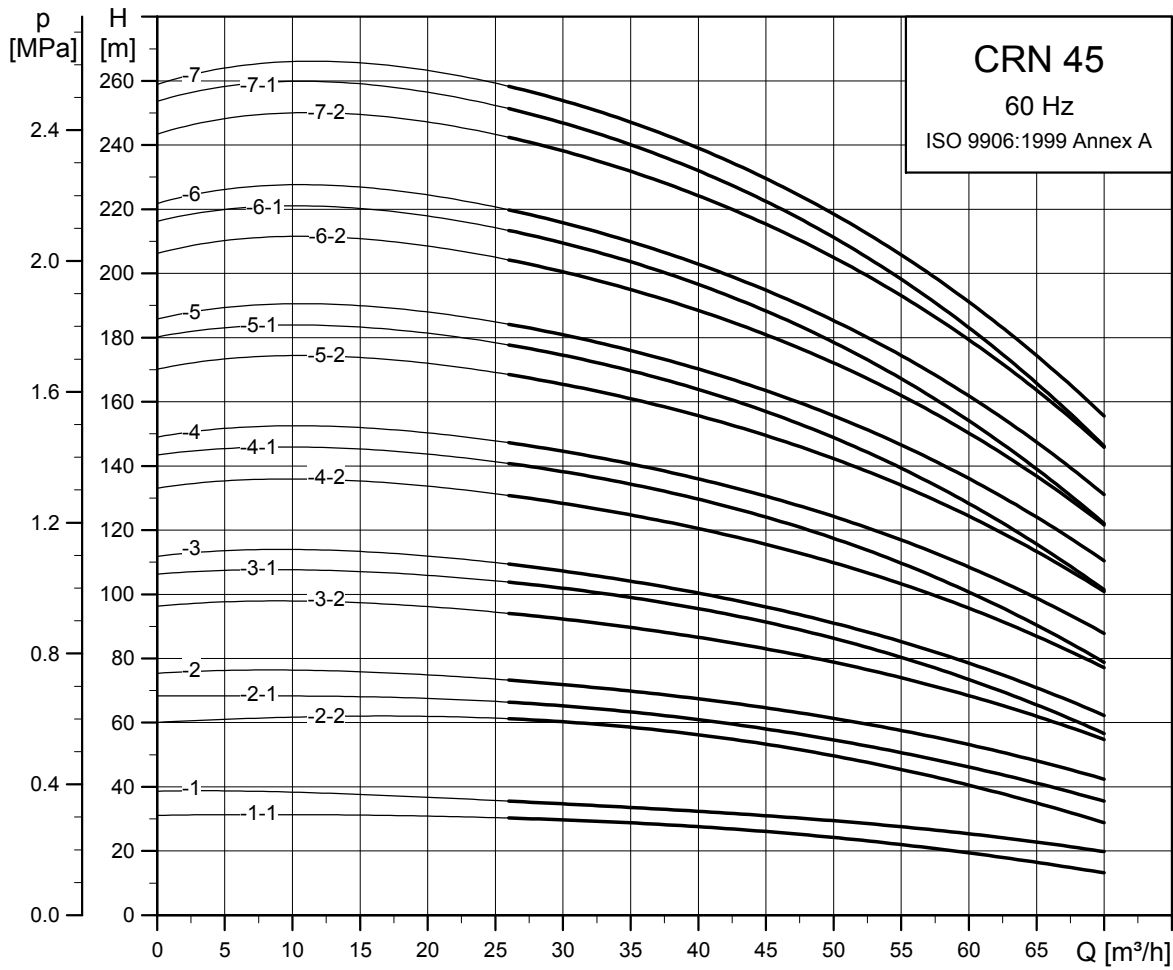


Dimensions and weights

Pump type	Motor P ₂ [kW]	CR					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 45-1-1	5.5	559	950	220	134	300	100
CR 45-1	7.5	559	938	260	159	300	111
CR 45-2-2	11	749	1220	314	204	350	159
CR 45-2-1	11	749	1220	314	204	350	159
CR 45-2	15	749	1220	314	204	350	172
CR 45-3-2	18.5	829	1344	314	204	350	189
CR 45-3-1	18.5	829	1344	314	204	350	189
CR 45-3	18.5	829	1344	314	204	350	189
CR 45-4-2	22	909	1450	314	204	350	207
CR 45-4-1	30	909	1520	396	315	400	324
CR 45-4	30	909	1520	396	315	400	324
CR 45-5-2	30	989	1600	396	315	400	328
CR 45-5-1	30	989	1600	396	315	400	328
CR 45-5	30	989	1600	396	315	400	328
CR 45-6-2	37	1069	1705	396	315	400	349
CR 45-6-1	37	1069	1705	396	315	400	349
CR 45-6	37	1069	1705	396	315	400	349
CR 45-7-2	45	1149	1857	439	338	450	438
CR 45-7-1	45	1149	1857	439	338	450	438
CR 45-7	45	1149	1857	439	338	450	438

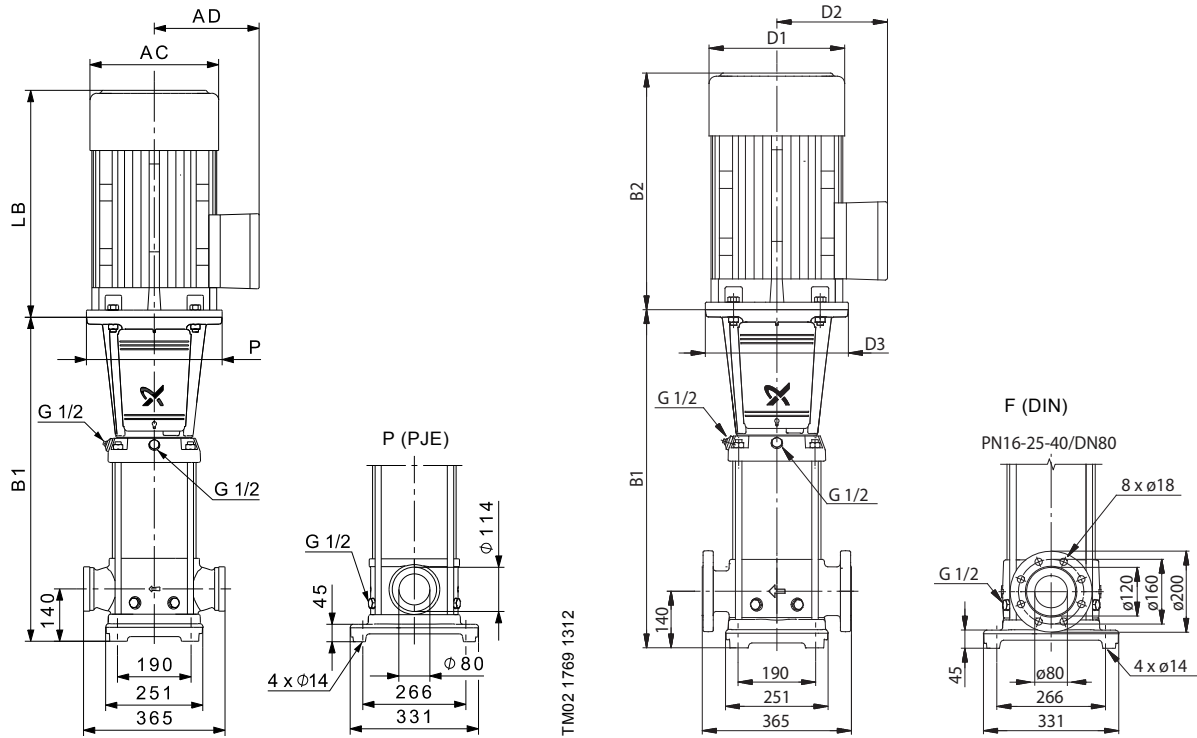
TM01 1751 3202

CRN 45



TM02 7325 1013

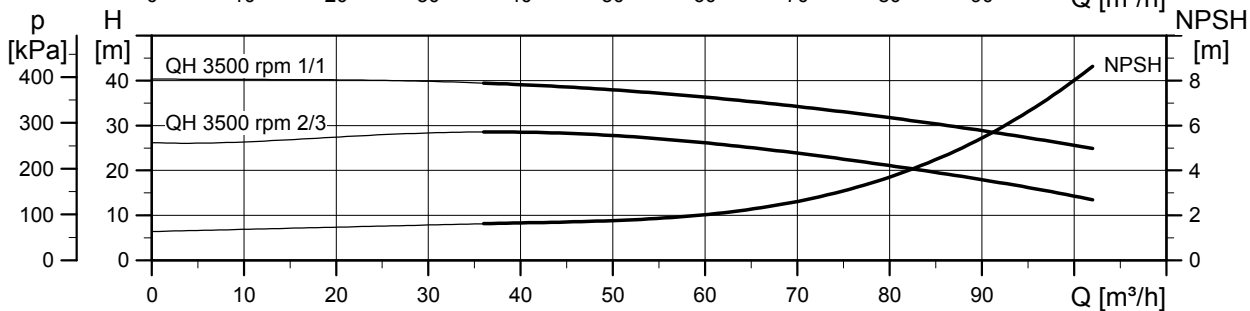
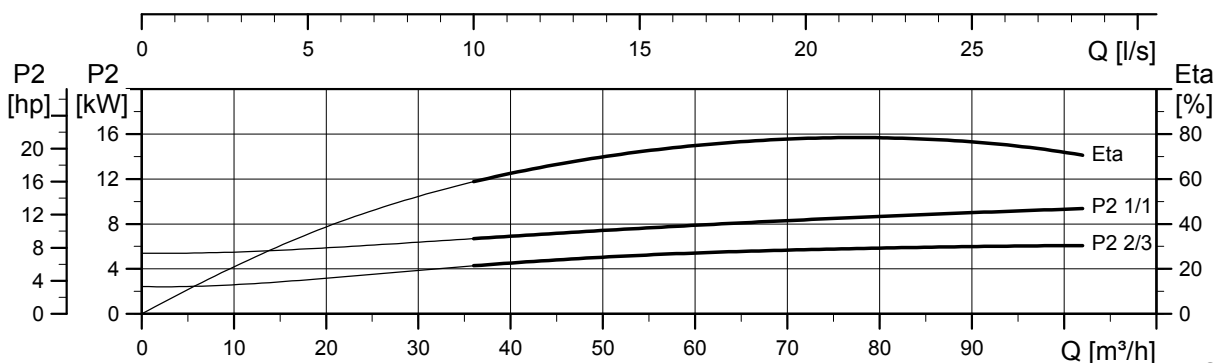
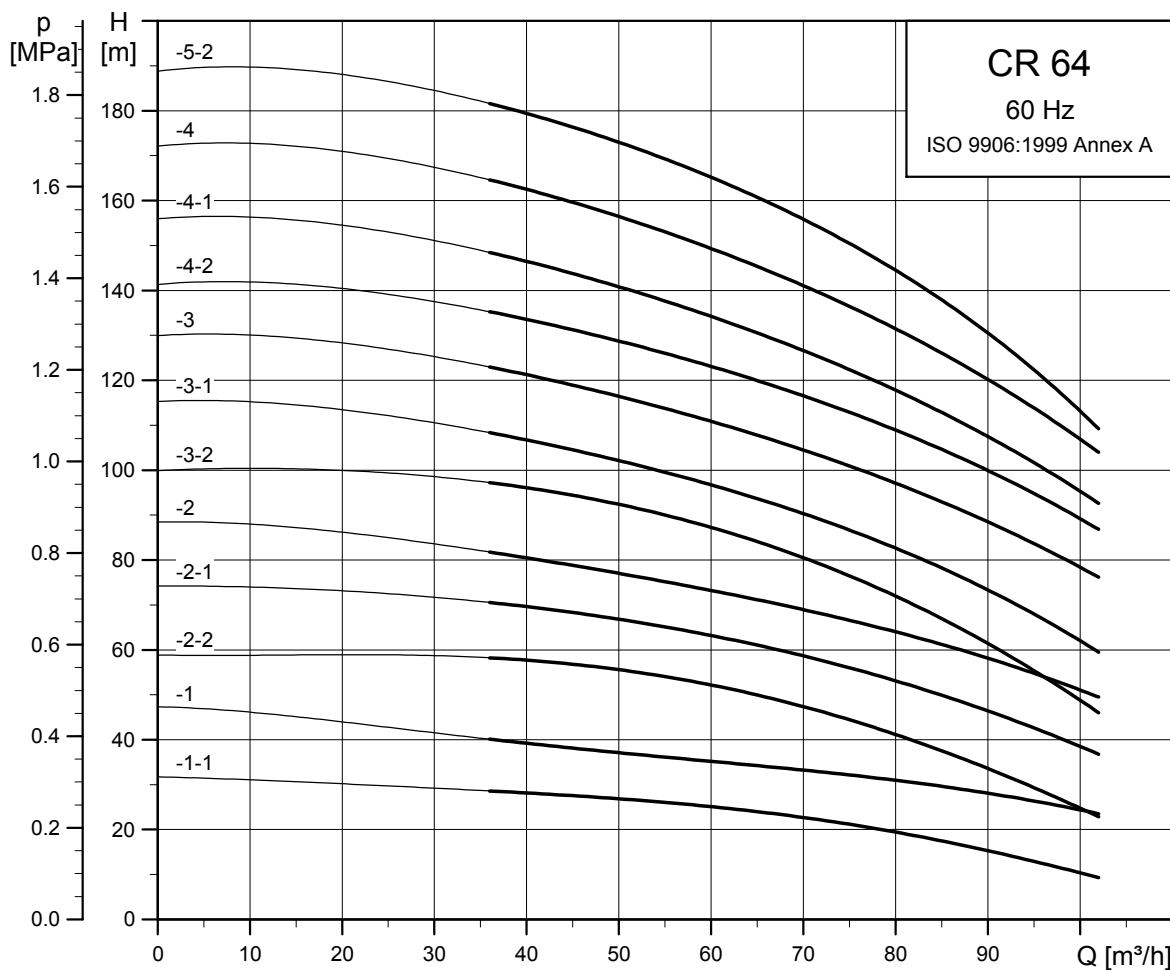
Dimensional sketch



Dimensions and weights

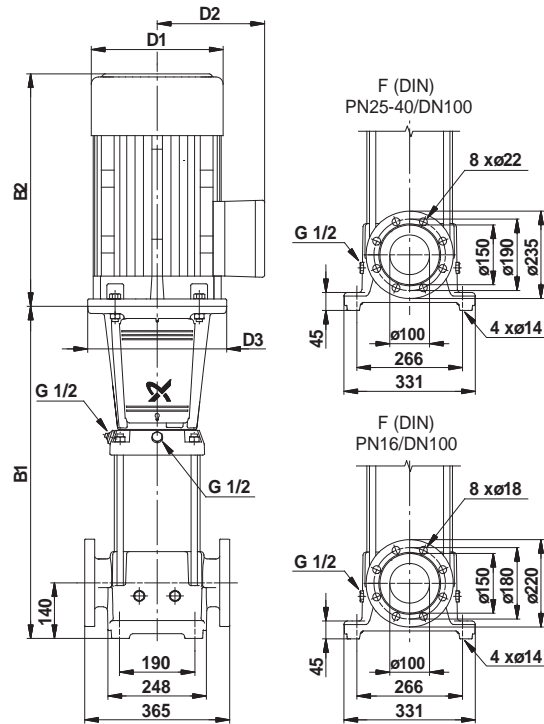
Pump type	Motor P ₂ [kW]	CRN					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CRN 45-1-1	5.5	559	950	220	134	300	100
CRN 45-1	7.5	559	938	260	159	300	111
CRN 45-2-2	11	749	1220	314	204	350	160
CRN 45-2-1	11	749	1220	314	204	350	160
CRN 45-2	15	749	1220	314	204	350	173
CRN 45-3-2	18.5	829	1344	314	204	350	190
CRN 45-3-1	18.5	829	1344	314	204	350	190
CRN 45-3	18.5	829	1344	314	204	350	190
CRN 45-4-2	22	909	1450	314	204	350	207
CRN 45-4-1	30	909	1520	396	315	400	324
CRN 45-4	30	909	1520	396	315	400	324
CRN 45-5-2	30	989	1600	396	315	400	328
CRN 45-5-1	30	989	1600	396	315	400	328
CRN 45-5	30	989	1600	396	315	400	328
CRN 45-6-2	37	1069	1705	396	315	400	350
CRN 45-6-1	37	1069	1705	396	315	400	350
CRN 45-6	37	1069	1705	396	315	400	350
CRN 45-7-2	45	1149	1857	439	338	450	438
CRN 45-7-1	45	1149	1857	439	338	450	438
CRN 45-7	45	1149	1857	439	338	450	438

CR 64



TM02 7326 1013

Dimensional sketch

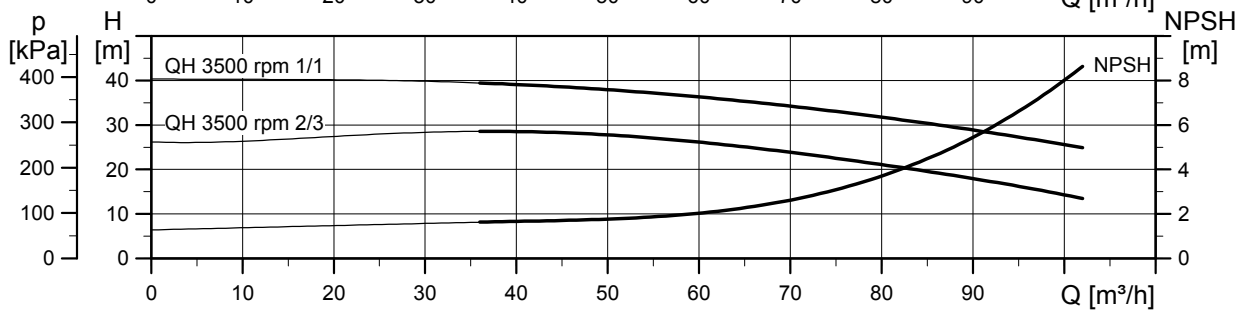
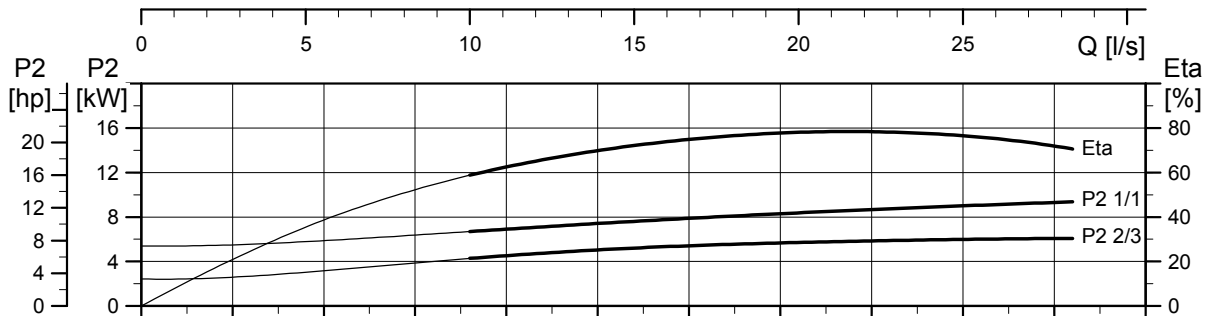
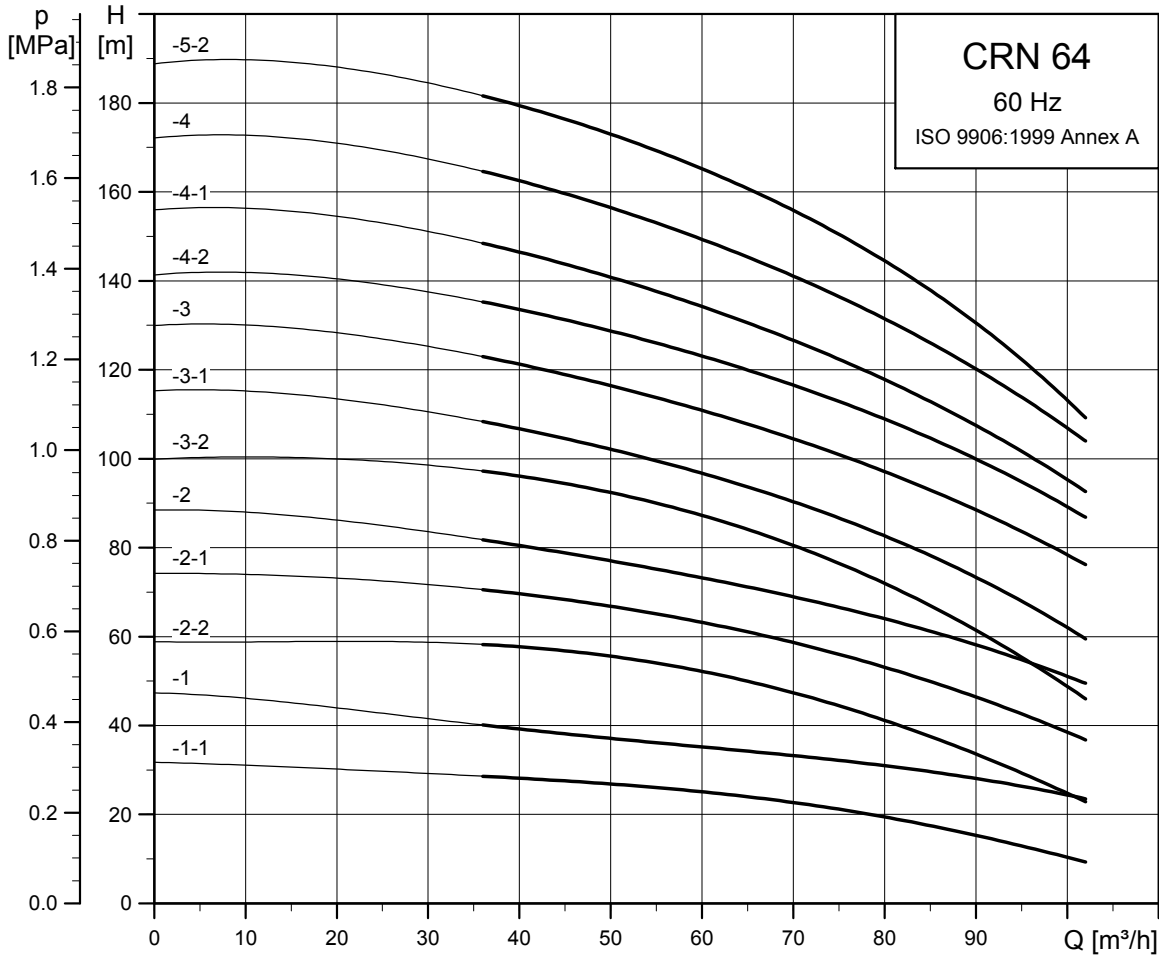


Dimensions and weights

Pump type	Motor P ₂ [kW]	CR					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CR 64-1-1	7.5	561	940	260	159	300	113
CR 64-1	11	671	1142	314	204	350	158
CR 64-2-2	15	754	1225	314	204	350	175
CR 64-2-1	18.5	754	1269	314	204	350	188
CR 64-2	22	754	1295	314	204	350	202
CR 64-3-2	22	836	1377	314	204	350	207
CR 64-3-1	30	836	1447	396	315	400	324
CR 64-3	30	836	1447	396	315	400	324
CR 64-4-2	37	919	1555	396	315	400	345
CR 64-4-1	37	919	1555	396	315	400	345
CR 64-4	45	919	1627	439	338	450	429
CR 64-5-2	45	1001	1709	439	338	450	434

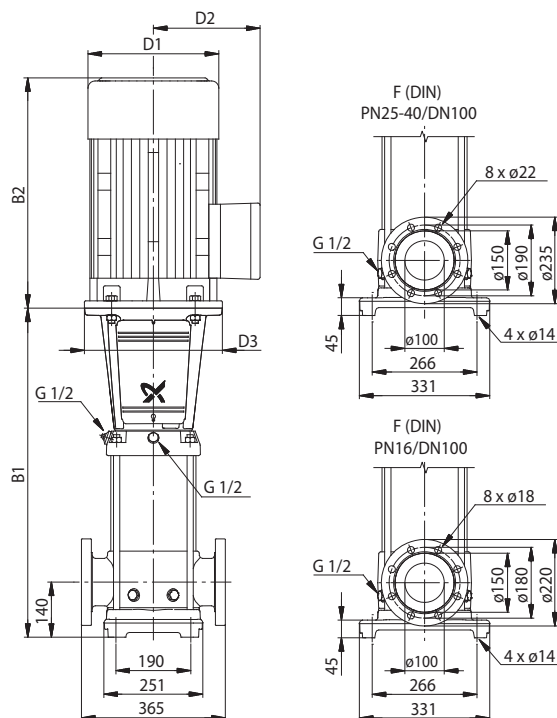
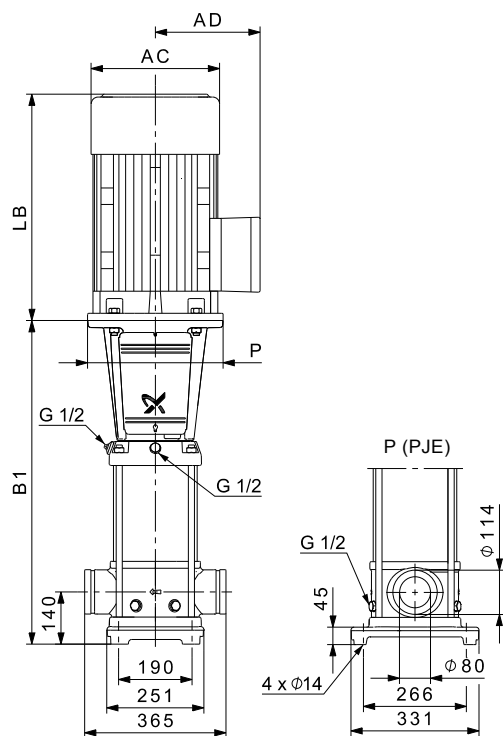
TM01 1753 5197

CRN 64



TM02 7327 1013

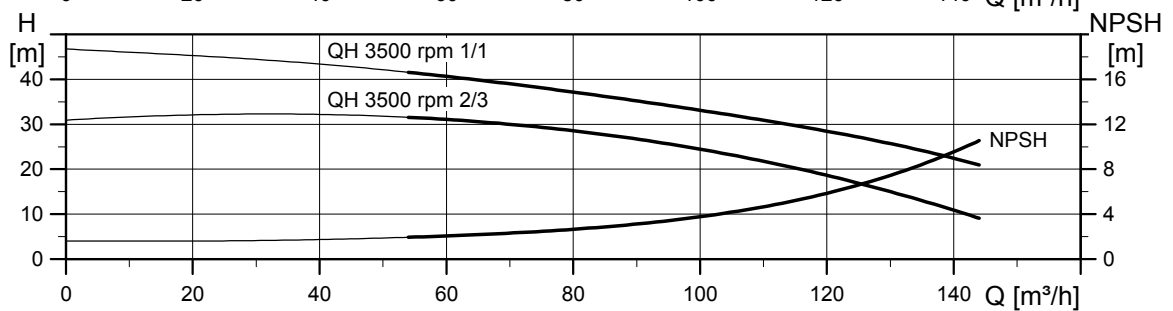
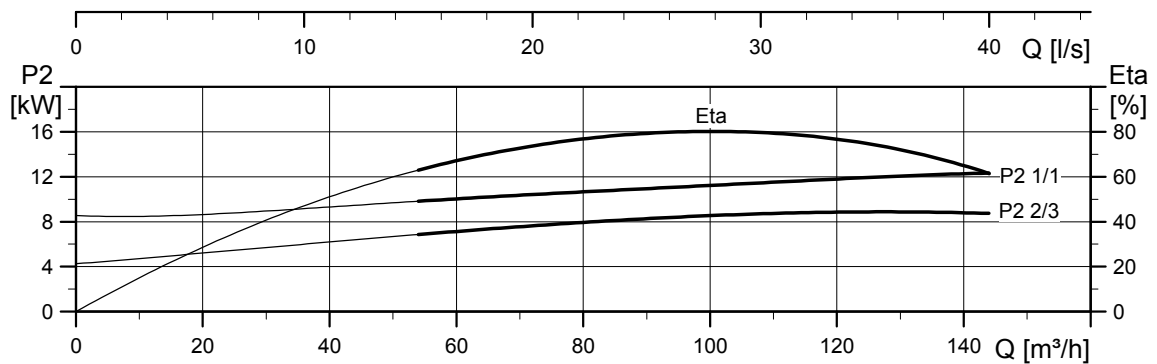
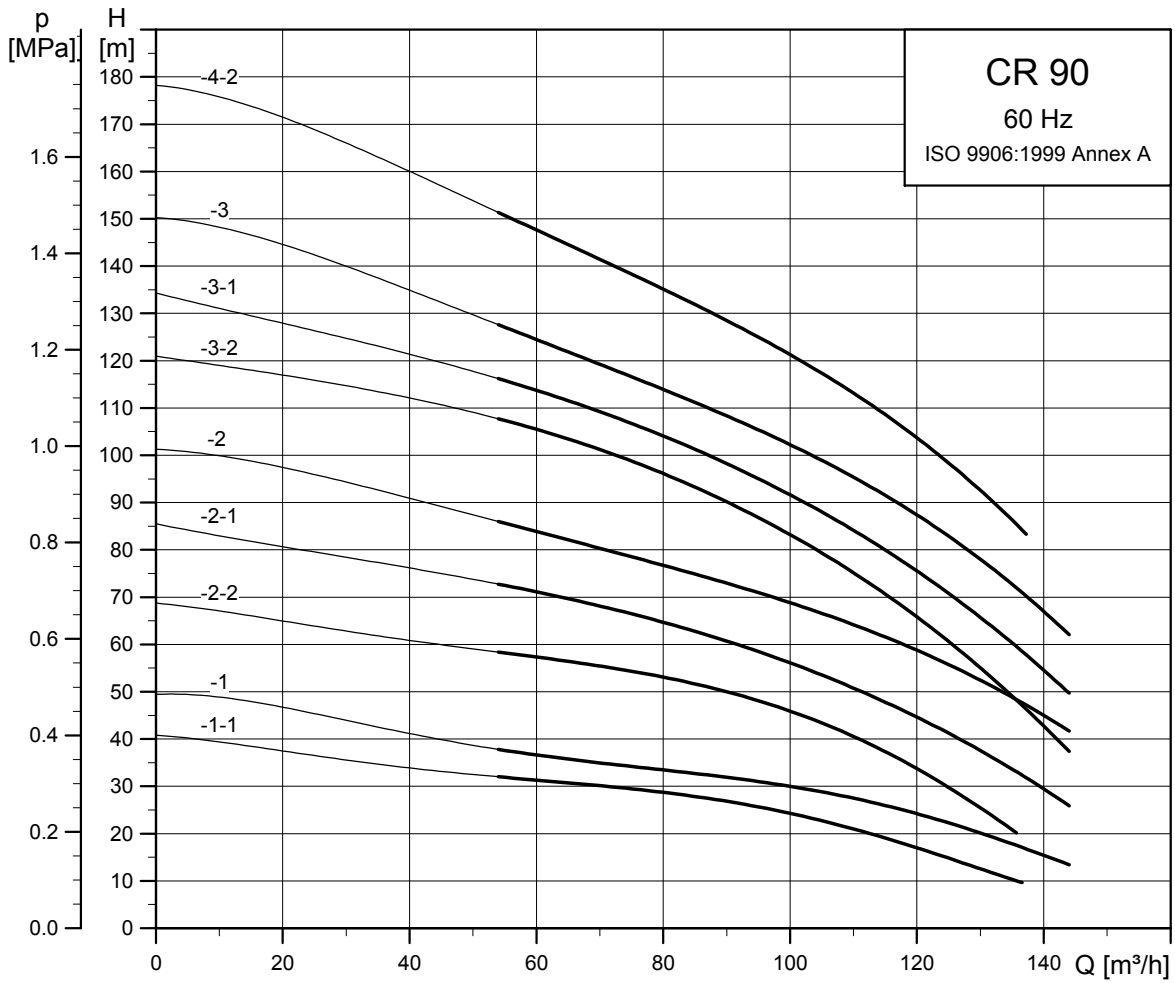
Dimensional sketch



Dimensions and weights

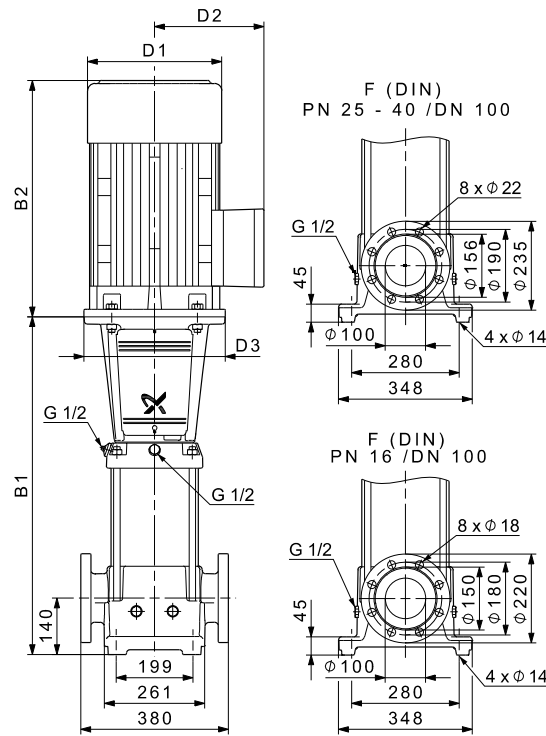
Pump type	Motor P ₂ [kW]	CRN					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CRN 64-1-1	7.5	561	940	260	159	300	113
CRN 64-1	11	671	1142	314	204	350	158
CRN 64-2-2	15	754	1225	314	204	350	175
CRN 64-2-1	18.5	754	1269	314	204	350	188
CRN 64-2	22	754	1295	314	204	350	202
CRN 64-3-2	22	836	1377	314	204	350	206
CRN 64-3-1	30	836	1447	396	315	400	324
CRN 64-3	30	836	1447	396	315	400	324
CRN 64-4-2	37	919	1555	396	315	400	346
CRN 64-4-1	37	919	1555	396	315	400	346
CRN 64-4	45	919	1627	439	338	450	430
CRN 64-5-2	45	1001	1709	439	338	450	435

CR 90



TM02 7328 1013

Dimensional sketch

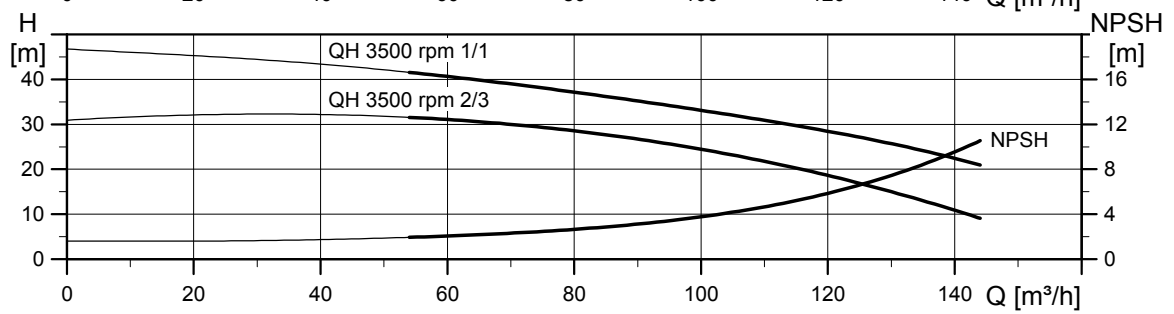
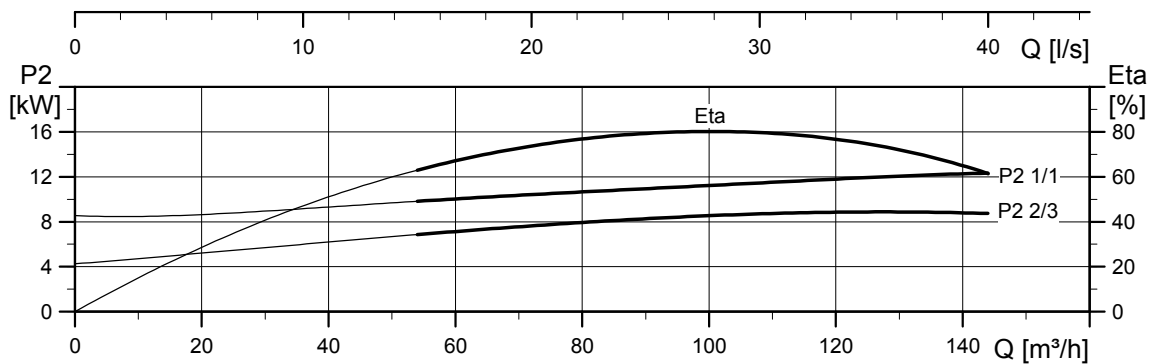
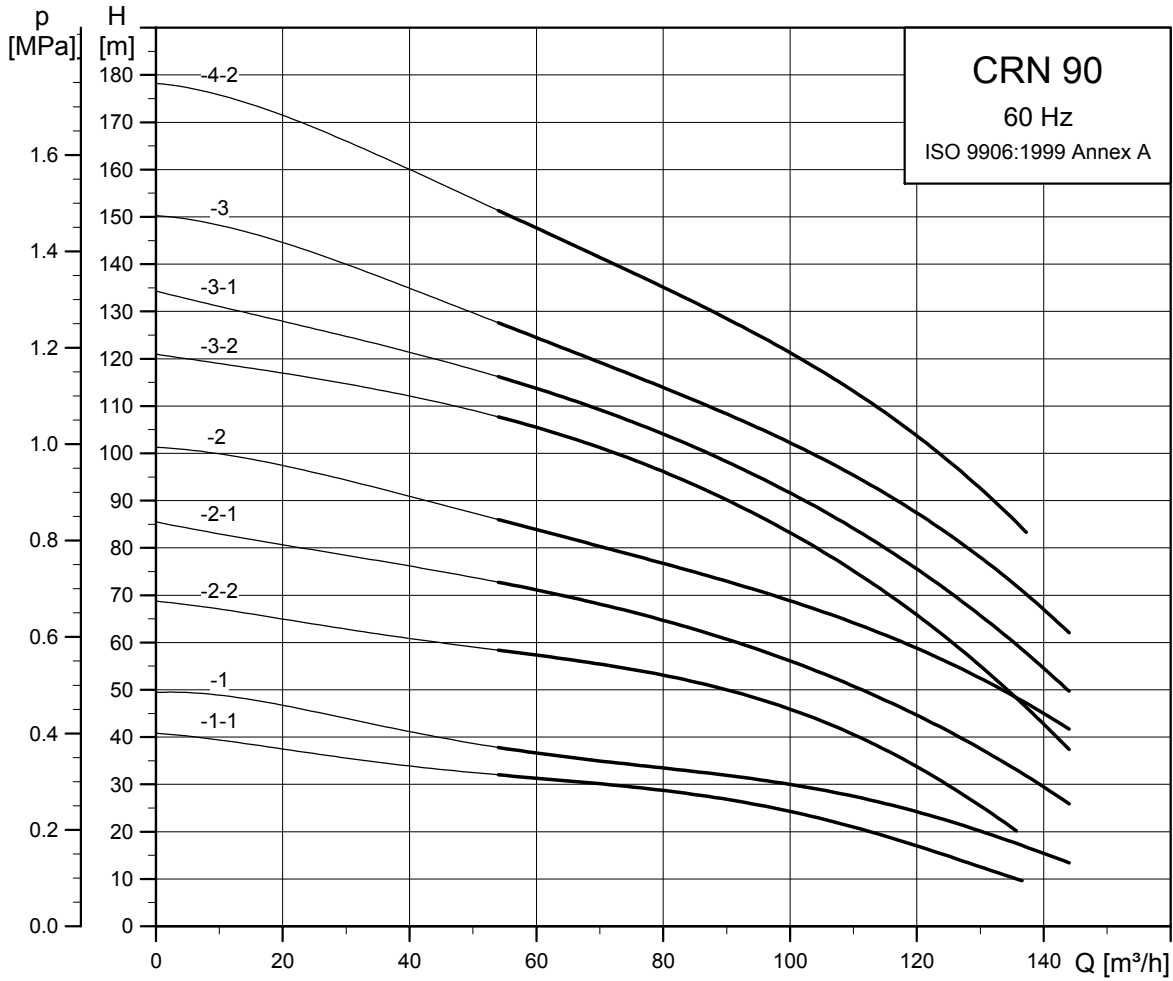


Dimensions and weights

Pump type	Motor P ₂ [kW]	CR					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 90-1-1	11	681	1152	314	204	350	163
CR 90-1	15	681	1152	314	204	350	176
CR 90-2-2	18.5	773	1288	314	204	350	194
CR 90-2-1	22	773	1314	314	204	350	207
CR 90-2	30	773	1384	396	315	400	324
CR 90-3-2	37	865	1501	396	315	400	345
CR 90-3-1	37	865	1501	396	315	400	345
CR 90-3	45	865	1573	439	338	450	429
CR 90-4-2	45	957	1665	439	338	450	436

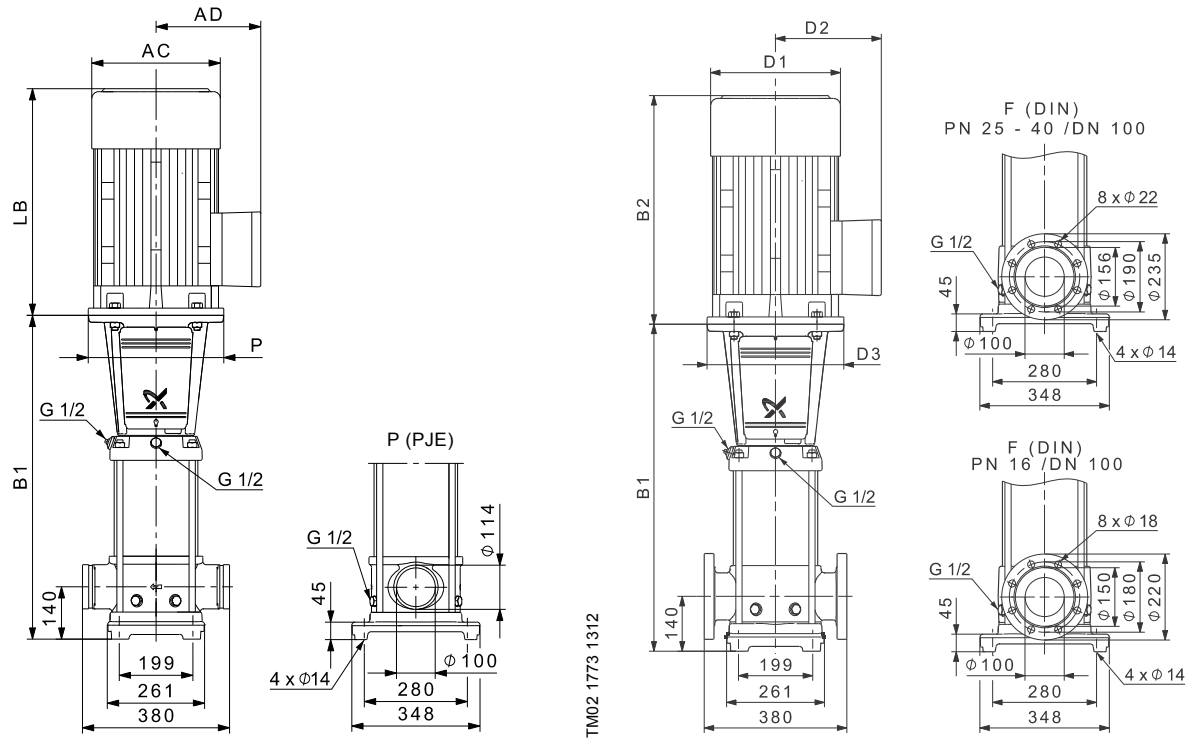
TM01 1755 4809

CRN 90



TM02 7329 1013

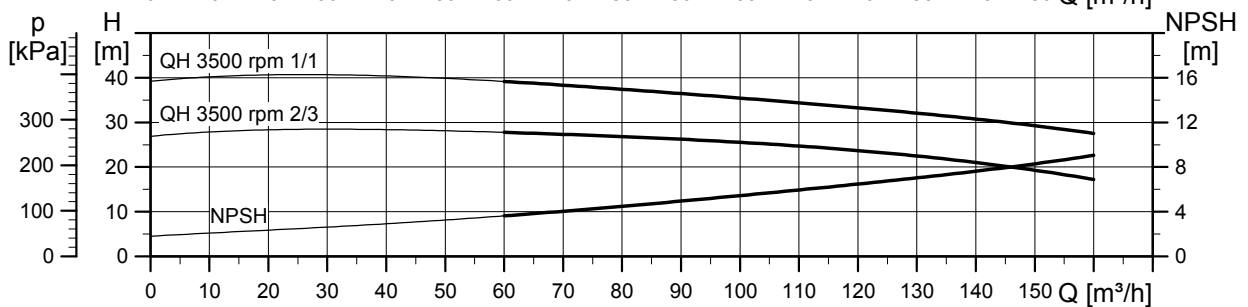
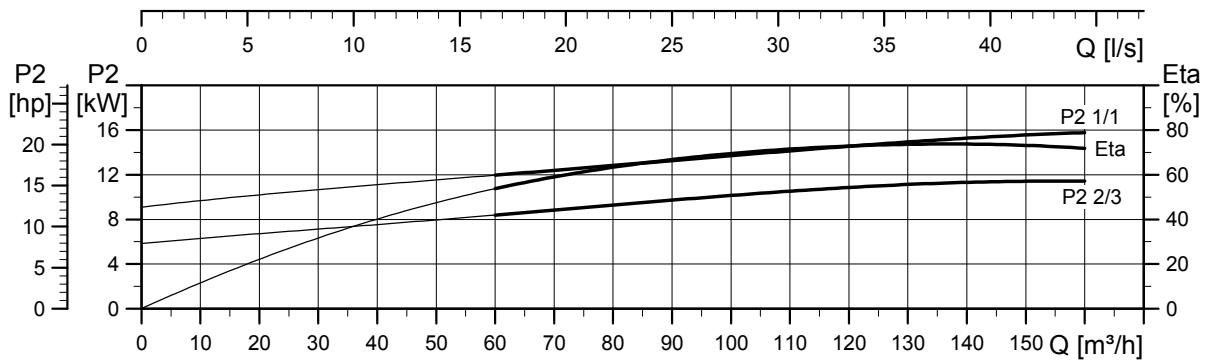
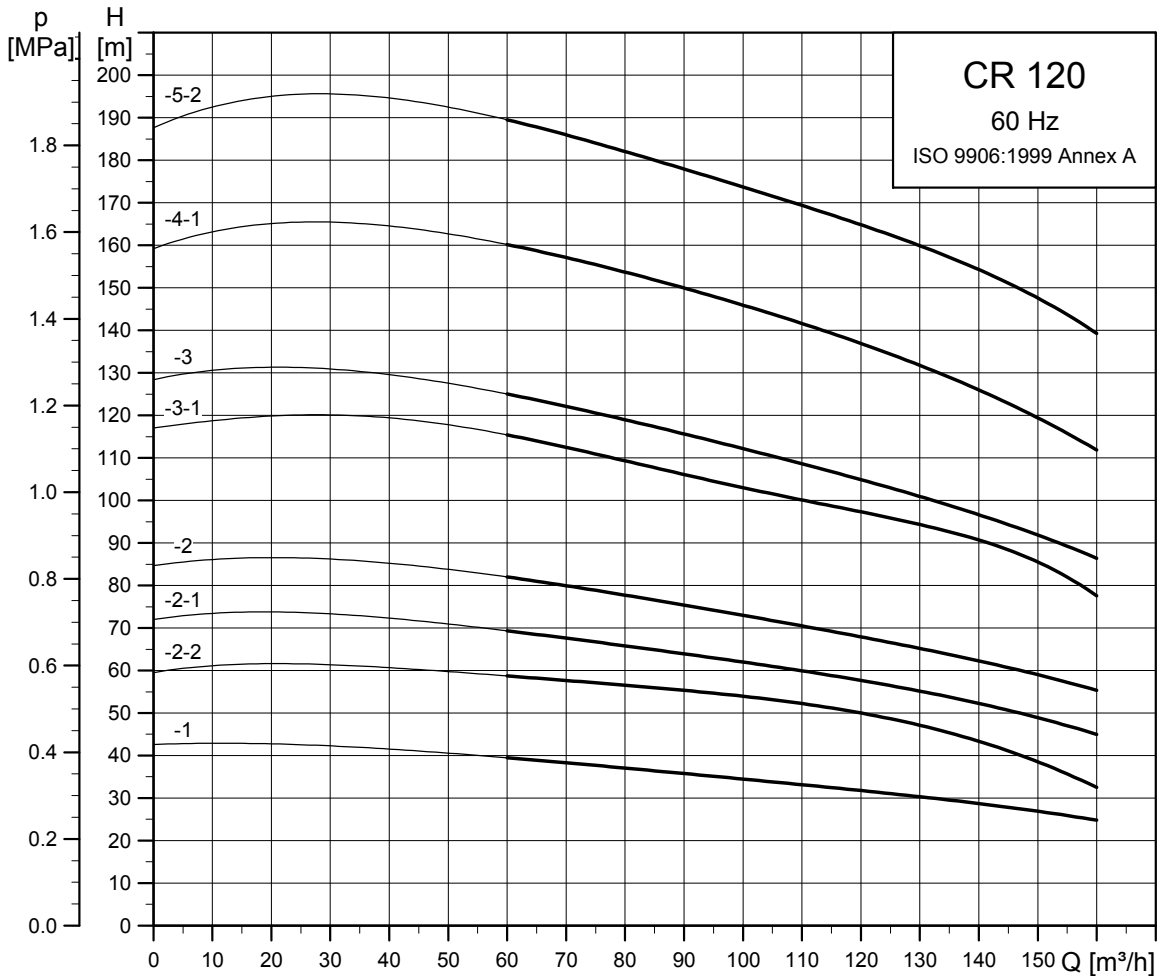
Dimensional sketch



Dimensions and weights

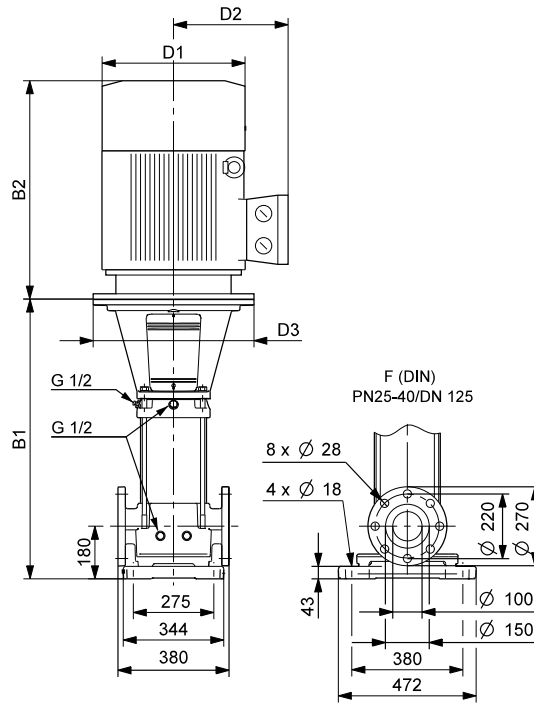
Pump type	Motor P ₂ [kW]	CRN					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CRN 90-1-1	11	681	1152	314	204	350	164
CRN 90-1	15	681	1152	314	204	350	177
CRN 90-2-2	18.5	773	1288	314	204	350	195
CRN 90-2-1	22	773	1314	314	204	350	209
CRN 90-2	30	773	1384	396	315	400	326
CRN 90-3-2	37	865	1501	396	315	400	346
CRN 90-3-1	37	865	1501	396	315	400	346
CRN 90-3	45	865	1573	439	338	450	431
CRN 90-4-2	45	957	1665	439	338	450	438

CR 120



TM03 8748 1013

Dimensional sketch

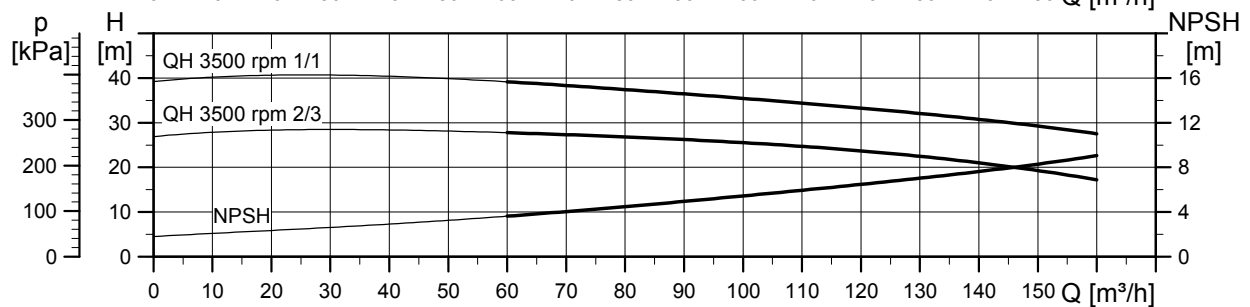
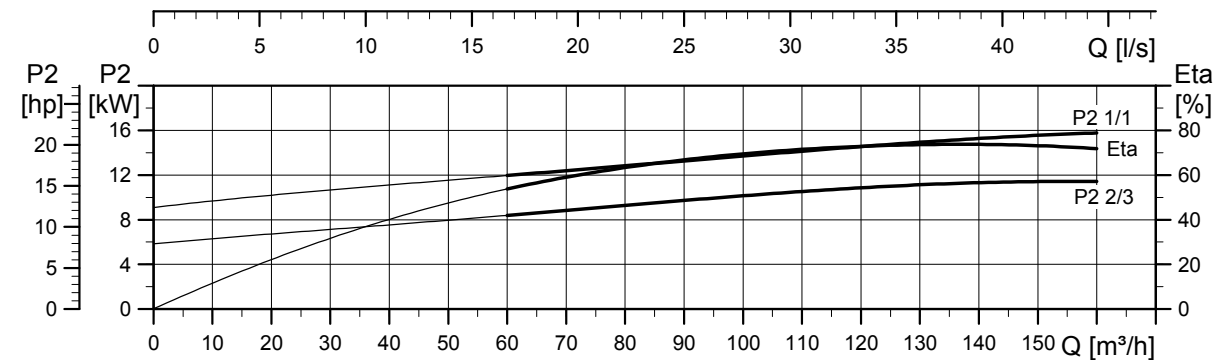
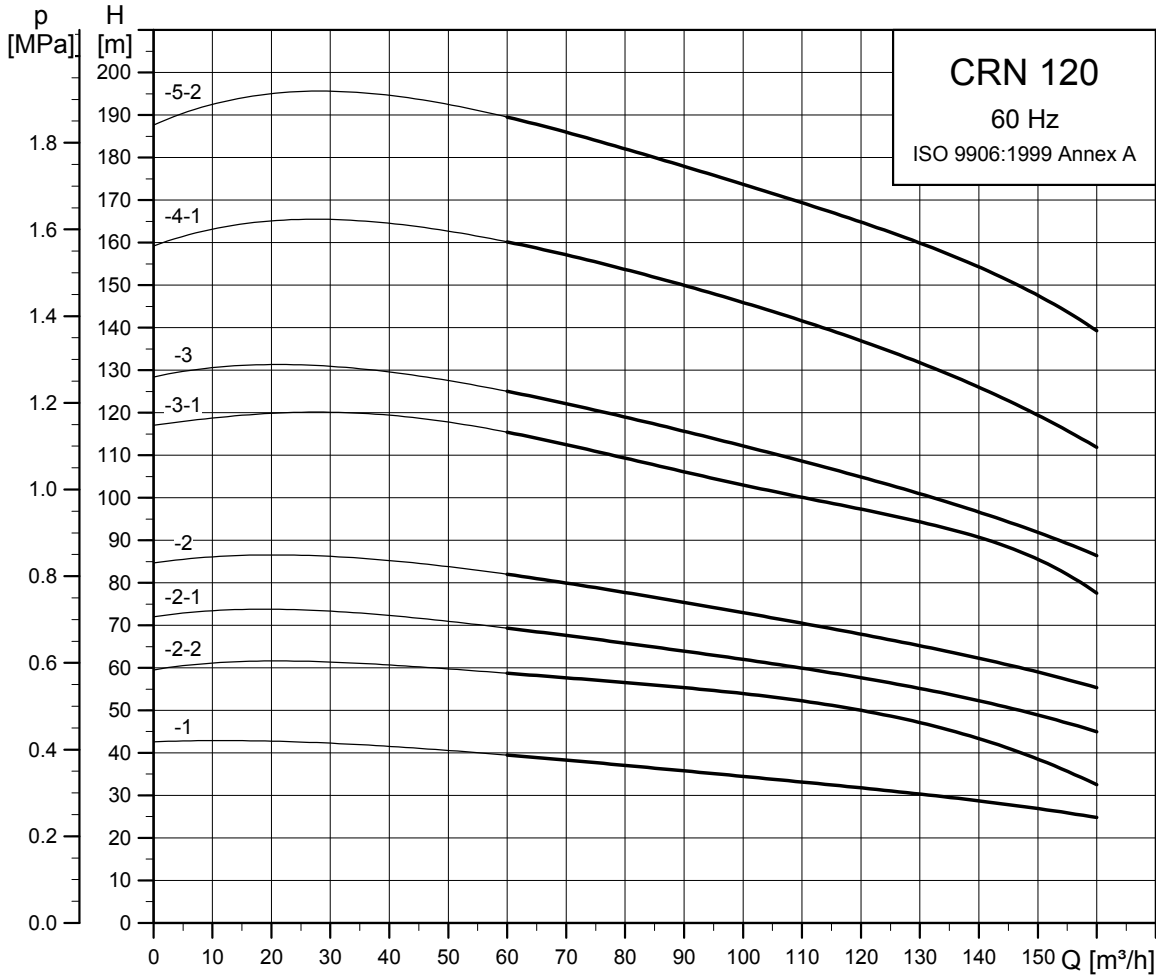


TM03 9704 2 108

Dimensions and weights

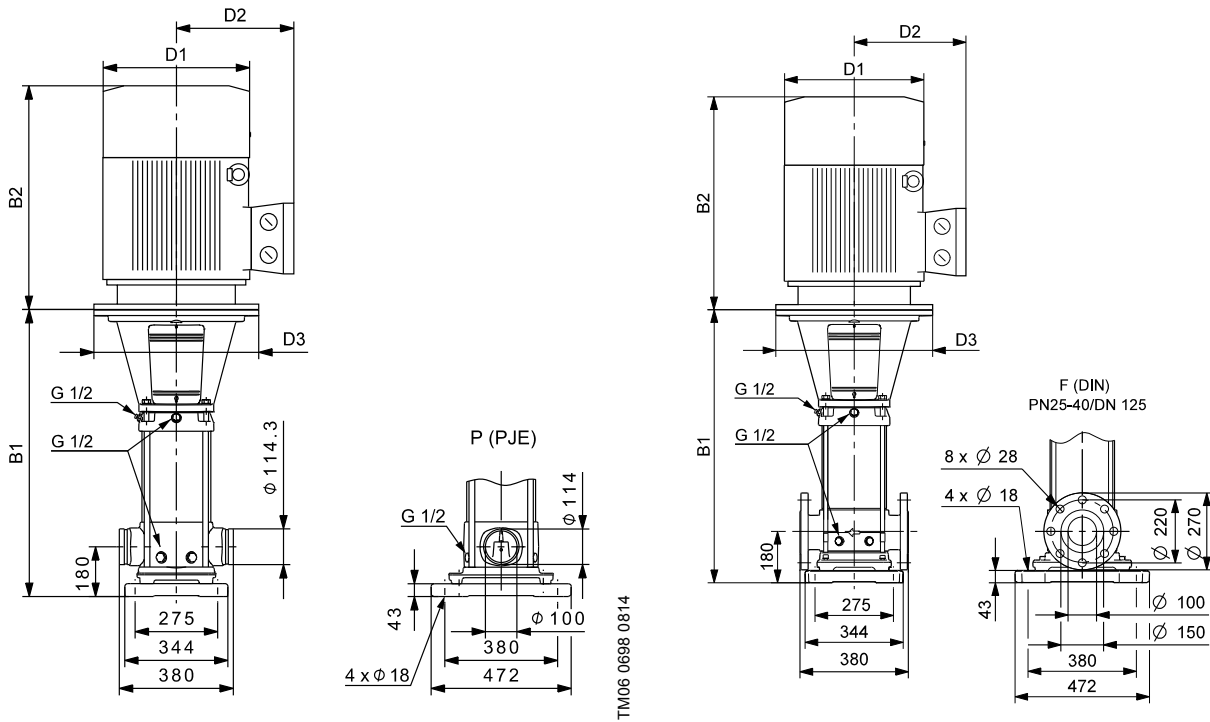
Pump type	Motor P ₂ [kW]	CR					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 120-1	18.5	834	1349	314	204	350	217
CR 120-2-2	30	990	1601	396	315	400	358
CR 120-2-1	30	990	1601	396	315	400	358
CR 120-2	37	990	1626	396	315	400	373
CR 120-3-1	45	1145	1853	439	338	450	467
CR 120-3	55	1175	1922	487	410	550	592
CR 120-4-1	75	1331	2151	540	433	550	712
CR 120-5-2	75	1486	2306	540	433	550	722

CRN 120



TM03 8749 1013

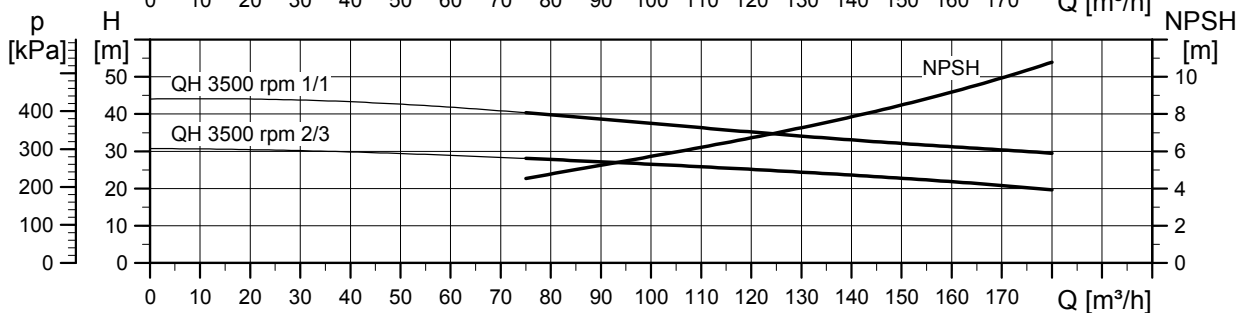
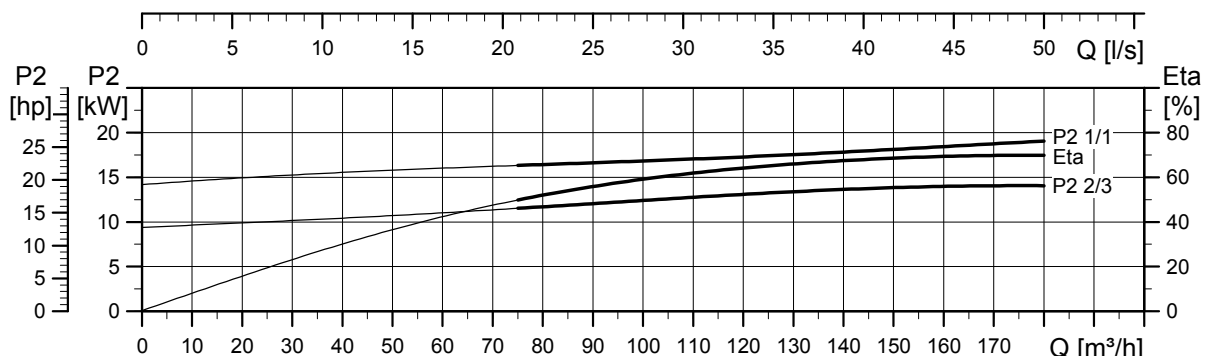
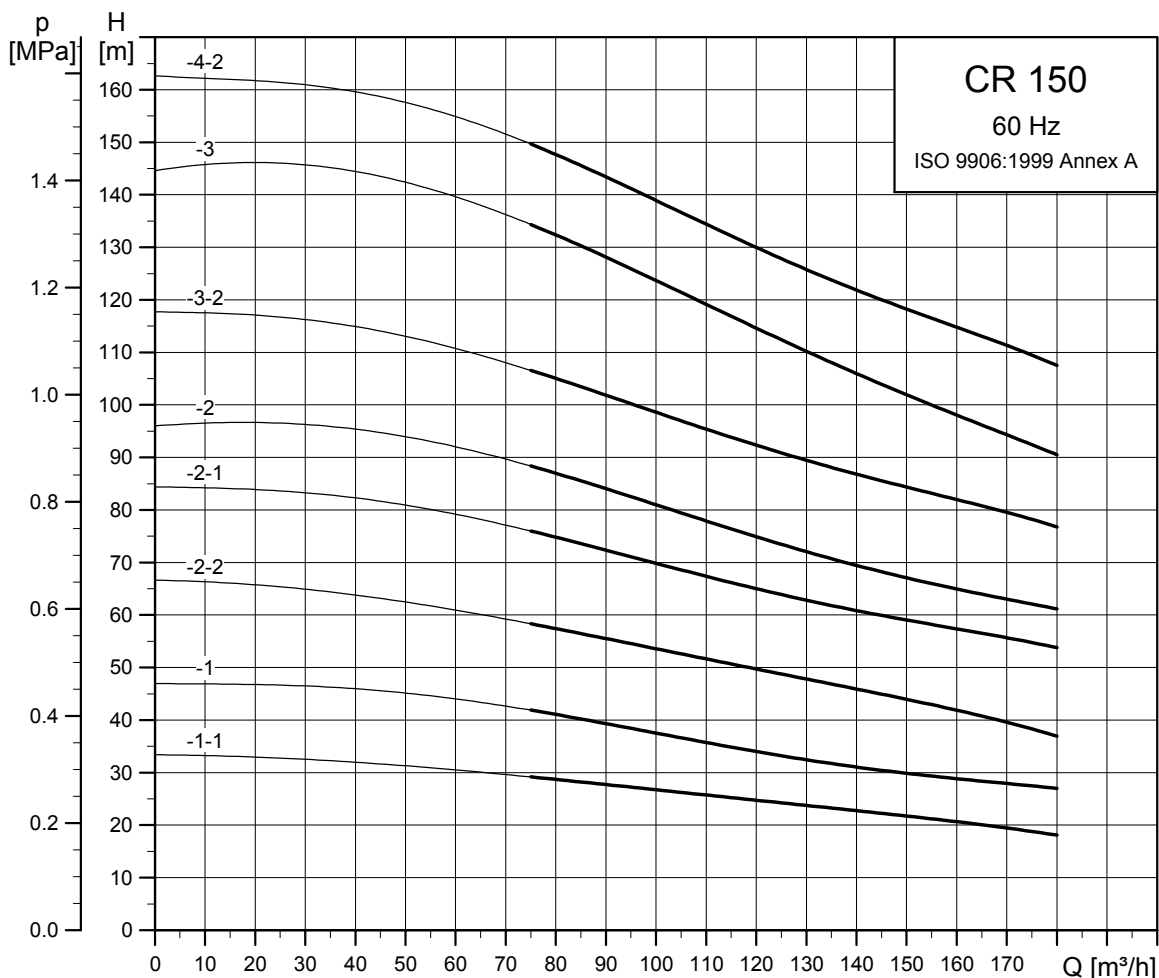
Dimensional sketch



Dimensions and weights

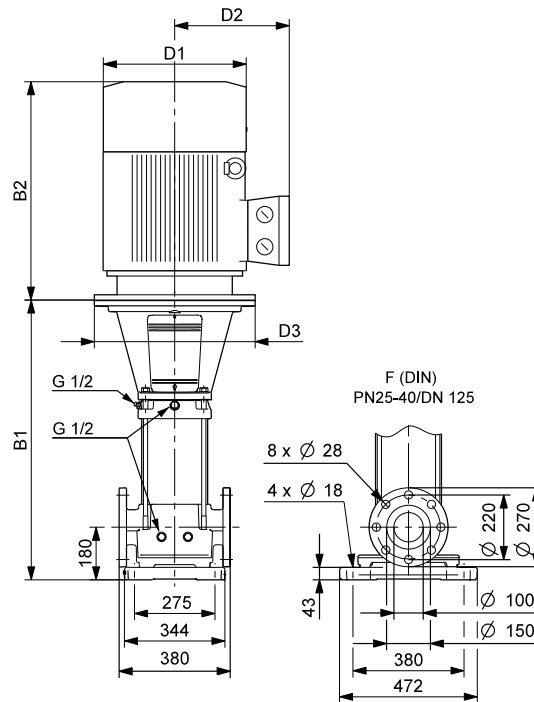
Pump type	Motor P ₂ [kW]	CRN					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CRN 120-1	18.5	834	1349	314	204	350	221
CRN 120-2-2	30	990	1601	396	315	400	362
CRN 120-2-1	30	990	1601	396	315	400	362
CRN 120-2	37	990	1626	396	315	400	377
CRN 120-3-1	45	1145	1853	439	338	450	471
CRN 120-3	55	1175	1922	487	410	550	596
CRN 120-4-1	75	1331	2151	540	433	550	716
CRN 120-5-2	75	1486	2306	540	433	550	726

CR 150



TM03 8750 3513

Dimensional sketch

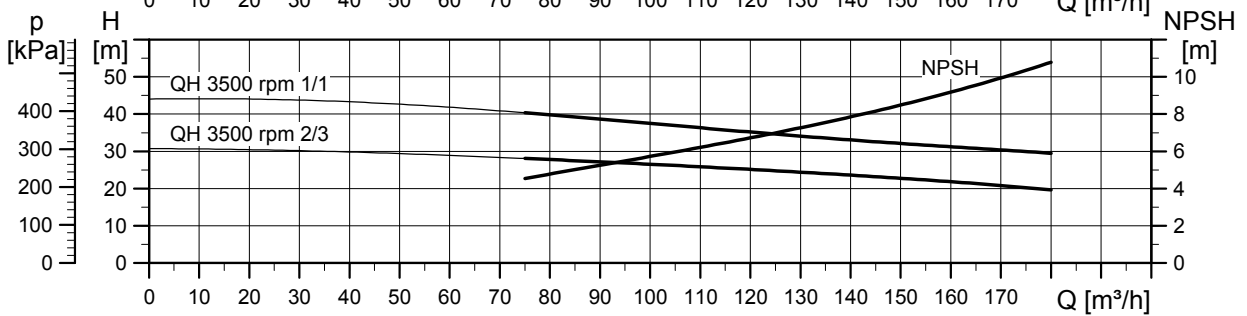
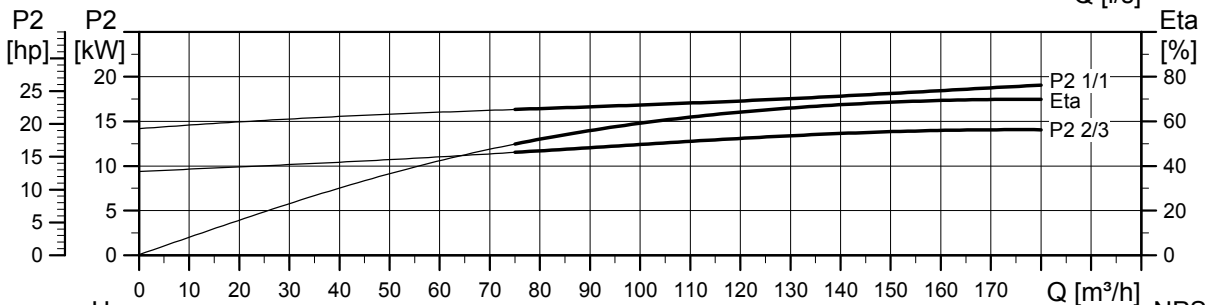
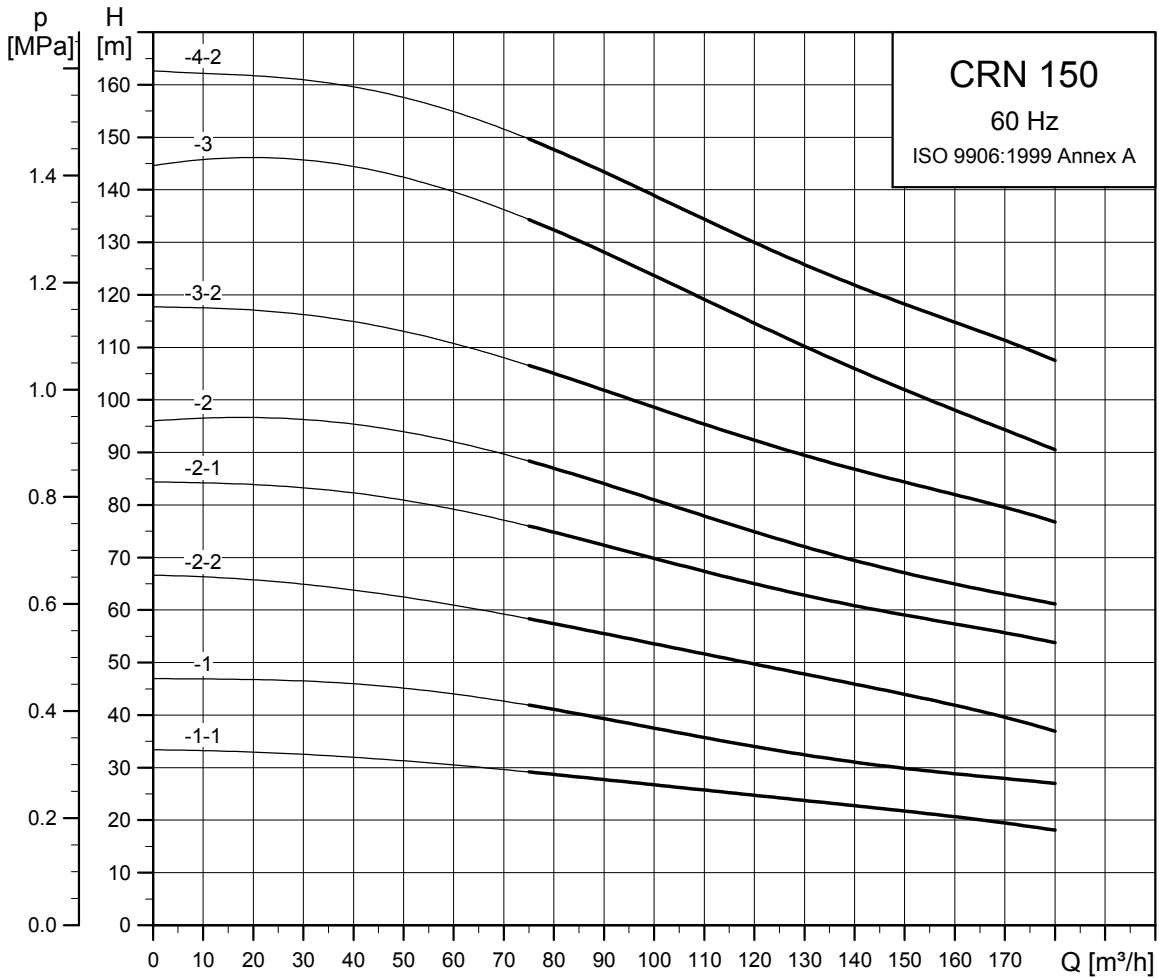


TM03 9704 2108

Dimensions and weights

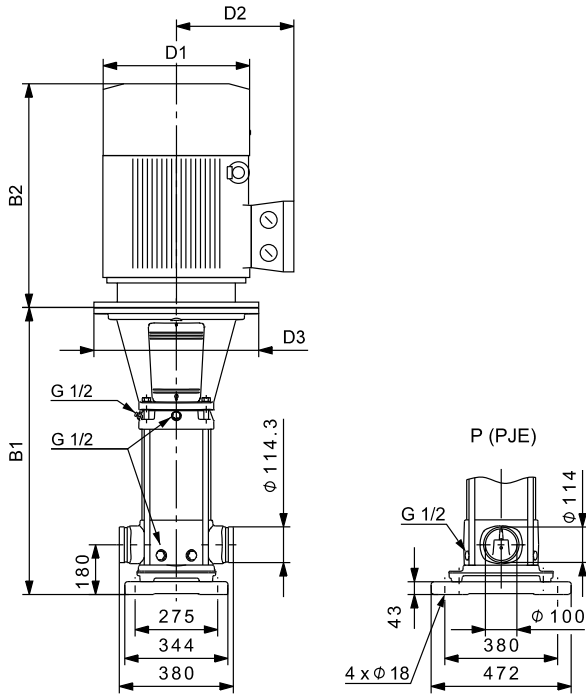
Pump type	Motor P ₂ [kW]	CR					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 150-1-1	18.5	834	1349	314	204	350	217
CR 150-1	22	834	1375	314	204	350	231
CR 150-2-2	30	990	1601	396	315	400	358
CR 150-2-1	37	990	1626	396	315	400	373
CR 150-2	45	990	1698	439	338	450	457
CR 150-3-2	55	1175	1922	487	410	550	593
CR 150-3	75	1175	1995	540	433	550	702
CR 150-4-2	75	1331	2151	540	433	550	712

CRN 150

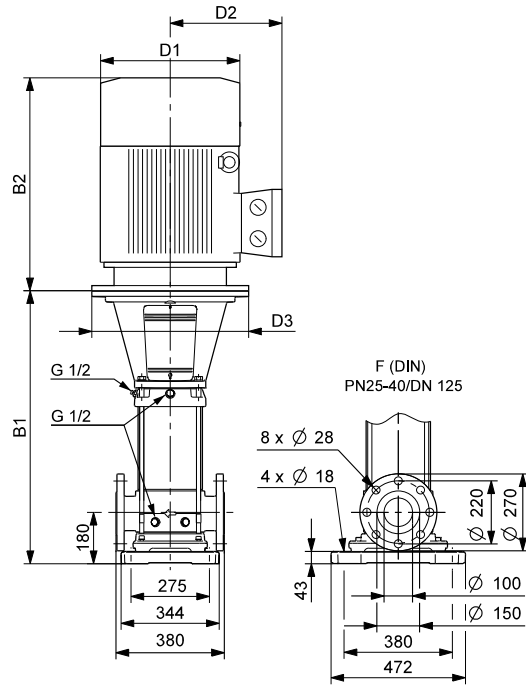


TM03 8751 3513

Dimensional sketch



TM06 0698 0814





TM03 9705 4407

Dimensions and weights

Pump type	Motor P ₂ [kW]	CRN					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CRN 150-1-1	18.5	834	1349	314	204	350	221
CRN 150-1	22	834	1375	314	204	350	235
CRN 150-2-2	30	990	1601	396	315	400	362
CRN 150-2-1	37	990	1626	396	315	400	377
CRN 150-2	45	990	1698	439	338	450	462
CRN 150-3-2	55	1175	1922	487	410	550	596
CRN 150-3	75	1175	1995	540	433	550	706
CRN 150-4-2	75	1331	2151	540	433	550	716

6. Motor data

Standard motors for CR, CRI, CRN, 60 Hz

Motor P2 [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	Efficiency class	η [%]	I _{start} [%]	Speed [rpm]	MG
0.37	71	220-255Δ/ 380-440Y	1.50 - 1.44 / 0.87 - 0.83	0.85 - 0.76	-	79.0 - 80	550-650	3410-3470	
0.55	71	220-255Δ/ 380-440Y	2.15 - 2.05 / 1.25 - 1.20	0.85 - 0.76	-	81.5 - 83	500-600	3390-3460	
0.75	80	220-255Δ/ 380-440Y	2.95 - 2.75 / 1.70 - 1.60	0.86 - 0.77	IE3	77.0	600-740	3410-3470	
1.1	80	220-255Δ/ 380-440Y	4.15 - 4.00 / 2.40 - 2.30	0.88 - 0.80	IE2 - IE3	82.5	430-500	3420-3470	
1.5	90	220-277Δ/ 380-480Y	5.35 - 4.70 / 3.10 - 2.70	0.90 - 0.81	IE2 - IE3	82.5 - 85.5	780-1050	3470-3530	
2.2	90	220-277Δ/ 380-480Y	7.70 - 6.35 / 4.45 - 3.70	0.91 - 0.85	IE2 - IE3	85.2 - 86.5	780-1100	3470-3530	
3.0	100	220-277Δ/ 380-480Y	10.8 - 9.35 / 6.20 - 5.40	0.91 - 0.84	IE2 - IE3	87.5	860-1100	3480-3530	
4.0	112	220-277Δ/ 380-480Y	13.6 - 11.8 / 7.80 - 6.80	0.91 - 0.82	IE3	88.5	1000-1470	3510-3540	
5.5	132	220-277Δ/ 380-480Y	18.4 - 16.2 / 10.6 - 9.30	0.90 - 0.80	IE3	89.5	1020-1480	3510-3550	
7.5	132	220-277Δ/ 380-480Y	24.6 - 20.8 / 14.2 - 12.0	0.90 - 0.82	IE2 - IE3	89.5 - 90.2	680-1050	3490-3530	
11	160	220-277Δ/ 380-480Y	36.0 - 30.0 / 20.8 - 17.2	0.89 - 0.83	IE2 - IE3	90.2 - 91.0	580-890	3520-3550	
15	160	220-277Δ/ 380-480Y	48.5 - 39.0 / 28.0 - 22.4	0.90 - 0.86	IE2 - IE3	90.2 - 91.0	580-890	3520-3550	
18.5	160	220-277Δ/ 380-480Y	59.5 - 48.5 / 34.5 - 28.0	0.89 - 0.84	IE2 - IE3	91.0 - 91.7	670-1100	3520-3560	
22	180	220-277Δ/ 380-480Y	69.5 - 56.5 / 40.0 - 32.5	0.91	IE3	91.7	650-1040	3520-3560	
TM03 1711 2805									
Siemens									
30*	200	380-420Δ/ 660-725Y	55.0 - 50.0 / 31.5 - 29.0	0.88	IE3	92.4	610-610	3540	
37*	200	380-420Δ/ 660-725Y	67.0 - 61.0 / 38.5 - 35.0	0.88	IE3	93.0	630-630	3540	
45*	225	380-420Δ/ 660-725Y	81.0 - 74.0 / 47.0 - 42.5	0.90	IE3	93.6	560-560	3550	
55*	250	380-420Δ/ 660-725Y	99.0 - 89.0 / 57.0 - 51.0	0.90	IE3	93.6	590-590	3570	
75*	280	380-420Δ/ 660-725Y	136 - 122 / 79.0 - 70.0	0.90	IE3	94.1	570-570	3570	
TM03 1710 2805									

* Siemens motors operating at 440-480Δ voltage may be loaded with a service factor of 1.15.

7. Pumped liquids

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

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

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

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.

CR and CRI

CR and CRI pumps are suitable for non-corrosive liquids.

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

CRN

CRN pumps are suitable for industrial liquids.

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

CRT

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

See the separate data booklet on CRT, CRTE available on www.grundfos.com (WebCAPS).

List of pumped liquids

A number of typical liquids are listed below.

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

The table is intended as a general guide only and cannot replace actual testing of the pumped liquids and pump materials under specific working conditions. However, use the list with some caution. Factors such as those mentioned below may affect the chemical resistance of a specific pump version:

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

Take safety precautions when pumping dangerous liquids.

Notes

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

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

8. Accessories

Pipe connection

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

Adapter kit

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

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

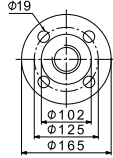
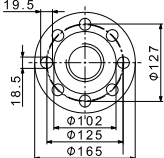
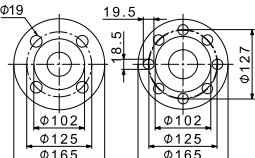
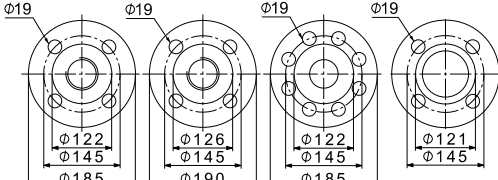
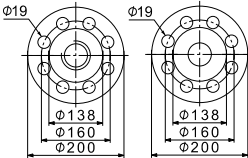
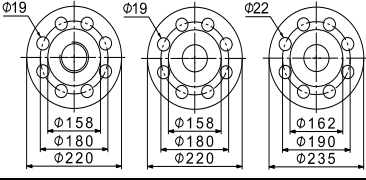
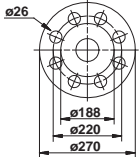
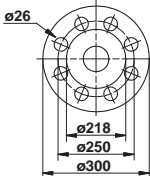
We offer an optional 6" pump base for the CRN 90, 120 and 150 pump ranges with DN 150 connections according to DIN, ANSI and JIS standards. This base eliminates the need for an adapter kit.

For more information, see CR "Custom-built pumps" data booklet on www.grundfos.com (WebCAPS).

Counter-flanges for CR

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

Counter-flange	Pump type	Description	Rated pressure	Pipe connection	Product number	
	TM05 0998 2011	CR 1s CR 1 CR 3 CR 5	Threaded	16 bar, EN 1092-2	Rp 1	409901
			For welding	25 bar, EN 1092-2	25 mm, nominal	409902
	TM05 1003 2011	CR 1s CR 1 CR 3 CR 5	Threaded	16 bar, EN 1092-2	Rp 1 1/4	419901
			For welding	25 bar, EN 1092-2	32 mm, nominal	419902
	TM05 1002 2011	CR 10	Threaded	16 bar, EN 1092-2	Rp 1 1/2	429902
			Threaded	16 bar, EN 1092-2	Rp 2	429904
			For welding	25 bar, EN 1092-2	40 mm, nominal	429901
			For welding	40 bar, special flange	50 mm, nominal	429903

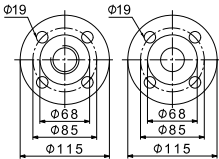
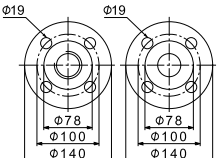
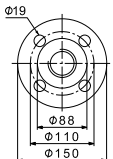
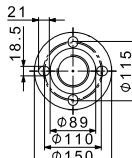
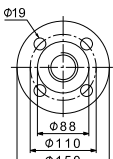
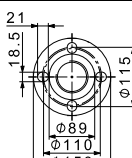
Counter-flange	Pump type	Description	Rated pressure	Pipe connection	Product number	
	TM05 0999 2011	Threaded	16 bar, EN 1092-2	Rp 2	339903	
		Threaded	16 bar, special flange	Rp 2 1/2	339904	
	TM05 1005 2011	CR 15 CR 20	Threaded	16 bar, special flange	Rp 2 1/2*	96509578
	TM05 1000 2011	For welding	25 bar, EN 1092-2	50 mm, nominal	339901	
		For welding	40 bar, special flange	65 mm, nominal	339902	
	TM05 0997 2011	CR 32	Threaded	16 bar, EN 1092-2	Rp 2 1/2	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
	TM05 0996 2011	CR 45	Threaded	16 bar	Rp 3	350540
			For welding	16 bar	80 mm, nominal	350541
			For welding	40 bar	80 mm, nominal	350542
	TM05 0995 2011	CR 64 CR 90	Threaded	16 bar, EN 1092-2	Rp 4	369901
			For welding	16 bar, EN 1092-2	100 mm, nominal	369902
			For welding	25 bar, EN 1092-2	100 mm, nominal	369905
	TM03 8892 2707	CR 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

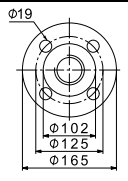
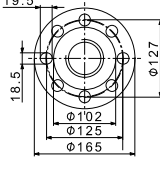
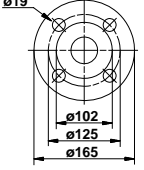
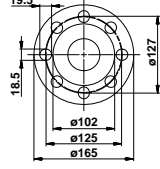
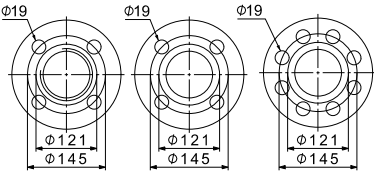
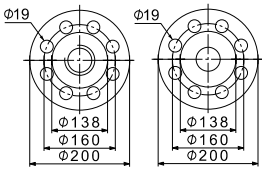
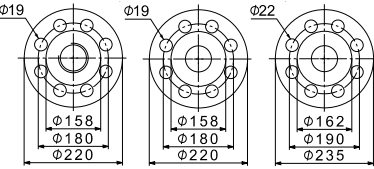
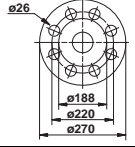
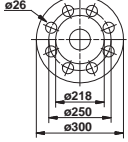
* Flange with 20 mm higher collar. With this collar, the installation dimensions of a CR 20 will be identical to those of a CR 32. If a CR 32 is replaced by a CR 20, the base must be raised by 15 mm.

Counter-flanges for CRN

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

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

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

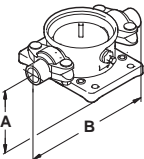
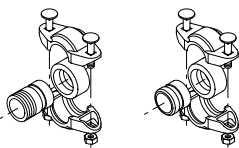
Counter-flange	Pump type	Description	Rated pressure	Pipe connection	Product number
		Threaded	16 bar, EN 1092-2	Rp 2	335254
		Threaded	16 bar, special flange	Rp 2 1/2	96509575
		Threaded	16 bar, special flange	Rp 2 1/2*	96509579
		For welding	25 bar, EN 1092-2	50 mm, nominal	335255
		For welding	25 bar, special flange	65 mm, nominal	96509573
		Threaded	16 bar	Rp 2 1/2	349910
		Threaded	16 bar, special flange	Rp 3	349911
		For welding	16 bar	65 mm, nominal	349906
		For welding	40 bar	65 mm, nominal	349908
		For welding	16 bar, special flange	80 mm, nominal	349907
		For welding	25 bar, special flange	80 mm, nominal	349909
		Threaded	16 bar	Rp 3	350543
		For welding	16 bar	80 mm, nominal	350544
		For welding	40 bar	80 mm, nominal	350545
		Threaded	16 bar	Rp 4	369904
		For welding	16 bar	100 mm, nominal	369903
		For welding	40 bar	100 mm, nominal	369906
		For welding	40 bar, EN 1092-2	125 mm, nominal	96750477
		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 by a CR 20, the base must be raised by 15 mm.

PJE couplings for CRN

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

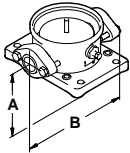
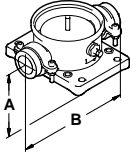
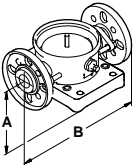
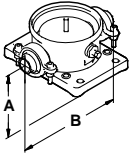
A set consists of two coupling halves (Victaulic type 77), one gasket, one pipe stub (for welding or threaded), bolts and nuts.

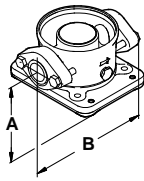
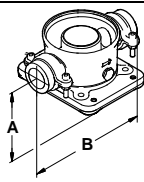
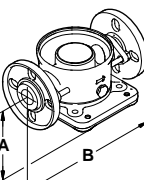
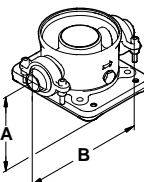
Coupling	Pump type	Pipe stub	Max. pressure [bar]	A	B	Pipe connection	Rubber parts	Number of coupling sets required	Product number		
 	CRN 1s, 1, 3, 5	Threaded	69	50	320	R 1 1/4	EPDM	2	419911		
								FKM	2	419905	
		For welding	69	50	280	DN 32		EPDM	2	419912	
								FKM	2	419904	
		CRN 10, 15, 20	Threaded	69	80	377	R 2		EPDM	2	339911
									FKM	2	339918
	CRN 32	For welding		69	80	371	DN 50	EPDM	2	339910	
								FKM	2	339917	
	CRN 45, 64	For welding		69	105	420	DN 80	EPDM	2	98144746	
								FKM	2	98144749	
	CRN 90	For welding		69	140	465	DN 100	EPDM	2	98144752	
								FKM	2	98144755	
CRN 120, 150	For welding		69	140	480	DN 100	EPDM	2	98144752		
							FKM	2	98144755		

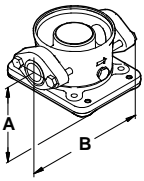
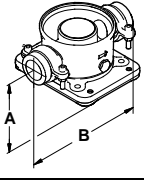
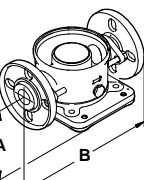
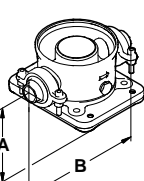
TM03 8890 2707 - TM00 3808 1094

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

Base connection	Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number	
	CRI 10 CRN 10	Oval (cast iron)	Rp 1 1/4	16	80	260	Klingersil	2	96498775	
			Rp 1 1/2					2	96498727	
			Rp 2					2	96498836	
			Rp 1 1/4					2	96498776	
			Rp 1 1/2					2	96498728	
			Rp 2					2	96498835	
	CRI 10 CRN 10	Union	G 2 3/4	25	80	288	EPDM	2	96500275	
							FKM	2	96500276	
	CRI 10 CRN 10	FGJ (cast iron)	DN 40	16	80	316	EPDM	2	96498840	
							FKM	2	96500119	
							FGJ (stainless steel)	EPDM	2	96500263
								FKM	2	96500264
							FGJ (cast iron)	EPDM	2	96500265
								FKM	2	96500266
FGJ (stainless steel)	EPDM	2	96500267							
	FKM	2	96500269							
	CRI 10 CRN 10	Clamp, threaded pipe stub	Rp 2	25	80	346	EPDM	2	425238	
							FKM	2	425239	
							Rp 1 1/2	EPDM	2	335241
								FKM	2	335242
							Rp 2 1/2	EPDM	2	96508600
								FKM	2	96508601
							Clamp, pipe stub for welding	EPDM	2	425242
								FKM	2	425243
								EPDM	2	335251
								FKM	2	335252

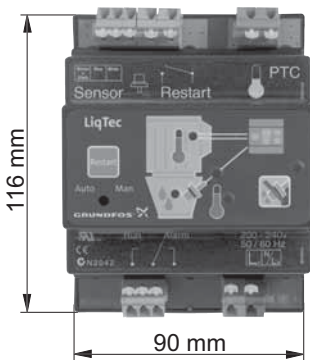
Base connection	Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number		
	CRI 15, 20 CRN 15, 20	Oval (cast iron)	Rp 1 1/4	10	90	260	Klingsil	2	96498775		
			Rp 1 1/2					2	96498727		
			Rp 2					2	96498836		
			Rp 1 1/4					2	96498776		
			Rp 1 1/2		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

LiqTec

The LiqTec dry-running protection unit protects the pump and process against dry running and temperatures exceeding $130\text{ °C} \pm 5\text{ °C}$. Connected to the motor PTC sensor, the LiqTec also monitors the motor temperature.

The LiqTec is prepared for DIN rail mounting in control cabinet.

Enclosure class: IPX0.

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

Sensors

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

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

Danfoss pressure sensor kits

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

9. Variants

The variants are available on request.

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

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

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

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

Motors

Variant	Description
ATEX-approved motor	For operation in hazardous atmospheres, explosion-proof or dust-ignition-proof motors may be required.
Motor with anti-condensation heating unit	For operation in humid environments motors with built-in anti-condensation heating unit may be required.
Motor with thermal protection	We offer motors with built-in bimetallic thermal switches or temperature-controlled PTC sensors (thermistors) incorporated in the motor windings.
Oversize motor	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).
4-pole motor	We offer 4-pole standard motors.

Shaft seals

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

Pumps

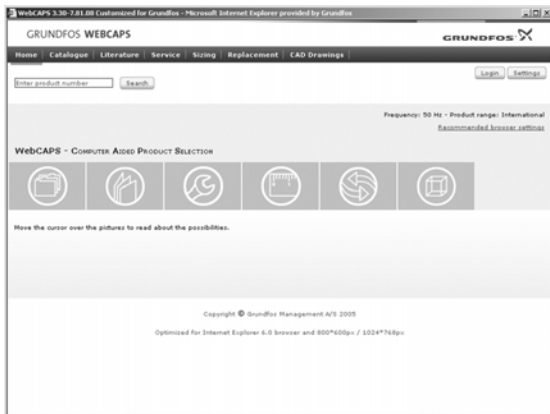
Variant	Description
Horizontally mounted pump	For safety or height reasons, certain applications, for instance on ships, require the pump to be mounted in the horizontal position. For easy installation the pump is fitted with brackets that support motor and pump.
Low-temperature pump	Exposed to temperatures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

Connections and other variants

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

10. Further product information

WebCAPS



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

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

Information in WebCAPS is divided into six sections:

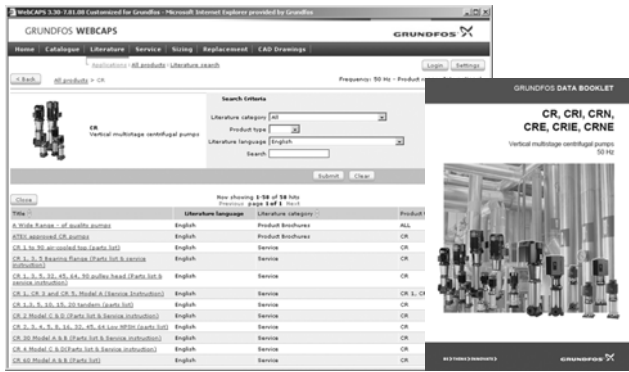
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

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

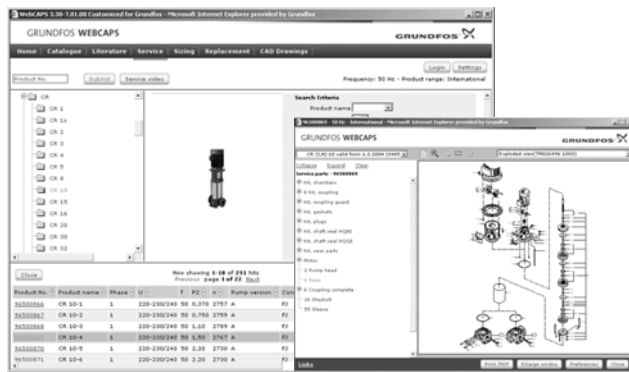
- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

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

- data booklets
- installation and operating instructions
- service documentation, such as Service kit 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, the 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 size a product:

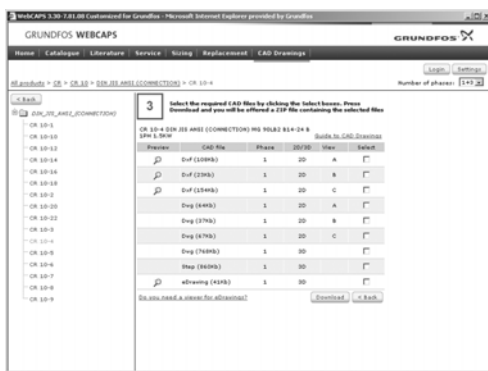
- Select the most suitable and efficient pump for your installation.
- Carry out advanced calculations based on energy, consumption, payback periods, load profiles, life cycle costs, etc.
- Analyse your selected pump via the built-in life cycle cost tool.
- Determine the flow velocity in wastewater applications, 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. 18 WinCAPS DVD

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

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

WinCAPS is available on DVD and updated once a year.

GO CAPS

Mobile solution for professionals on the GO!



CAPS functionality on the mobile workplace.



Subject to alterations.

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