CR, CRI, CRN

Vertical, multistage centrifugal pumps

50 Hz

be
think
innovate

GRUNDFOS

Table of contents

1. Product introduction

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

GR5381

Fig. 1 CR, CRI and CRN 1s-64

TM06 9062 1617

Fig. 2 CR, CRN 95-155

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 inlet and outlet ports are in the same horizontal level and have the same pipe dimensions. This design provides a more compact pump design.

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 or Siemens 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. See section *2. Construction*.

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

Applications

CR, CRI and CRN pumps are designed to cover a wide variety of applications such as:

- water supply
- cooling
- heating
- pressure boosting
- water treatment
- liquid transfer of cold or hot clean liquids.

Pumped liquids

CR, CRI CRN pumps are suitable for pumping liquids which are thin, clean, non-flammable, noncombustible or non-explosive liquids, not containing solid particles or fibres.

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

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

See also *7. List of pumped liquids*.

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 Grundfos Product Center (http://product-selection.grundfos.com/).

Performance range

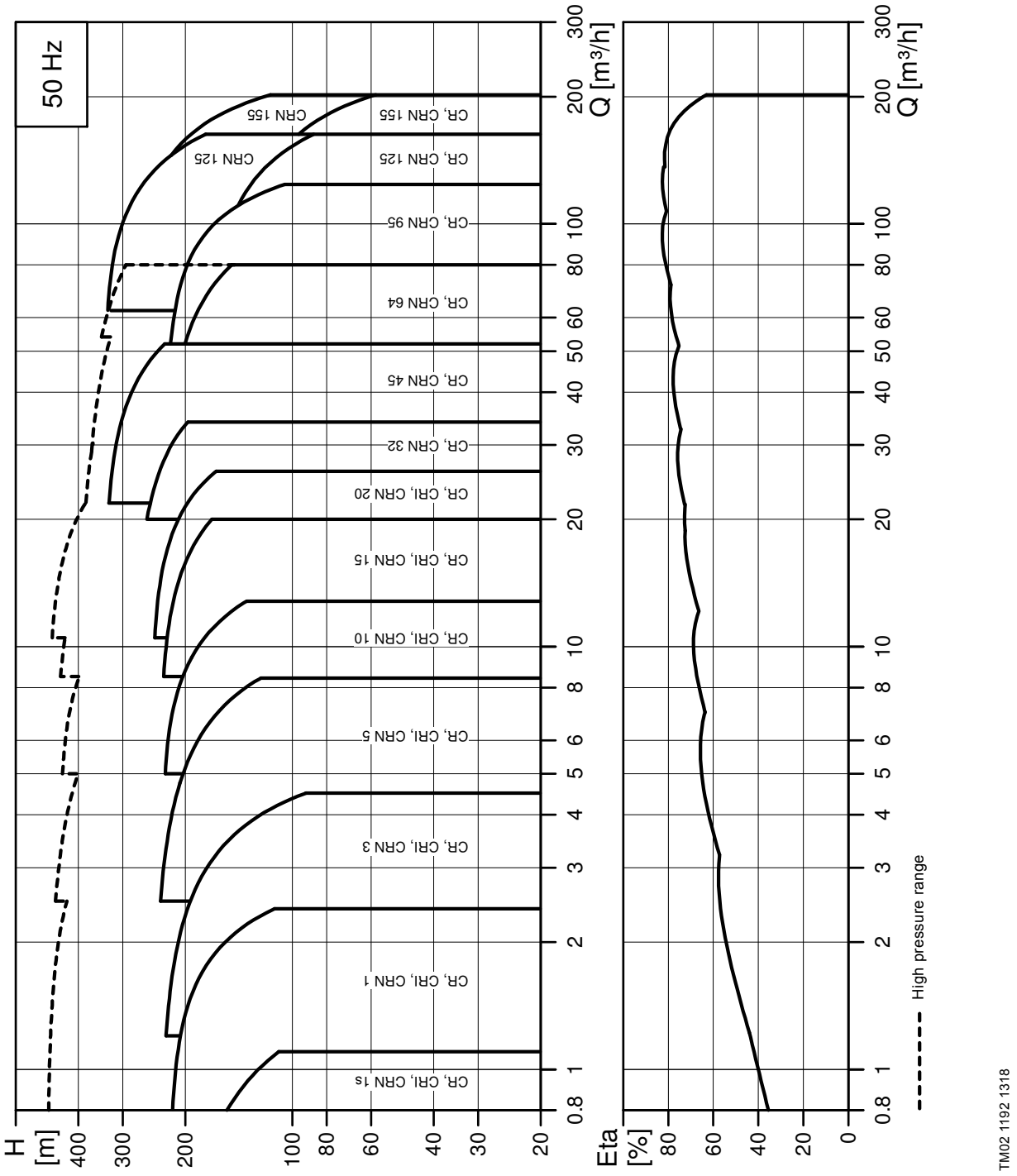

Fig. 3 Performance range, CR, CRN

EuP compliant

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 and 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 ≥ 0.10 as from 1 January 2013 and MEI ≥ 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 ≥ 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 95-3	> 0.70
CR 125-3	> 0.70
CR 155-3	> 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.

* For applications involving CIP (cleaning-in-place) and motors above 55 kW, a bearing flange must be used and a base without thrust handling device or blind flange.
For further information about CRT pumps, see section *7. List of pumped liquids*, page 81, or related CRT, CRTE data booklet available on Grundfos Product Center (http://product-selection.grundfos.com/).

Product range

Range	CR 1s	CR 1	CR 3	CR 5	CR 10	CR 15	CR 20
Rated flow rate [m^3/h]	0.8	1	3	5	10	15	20
Liquid temperature [°C]				-20 to +120			
Liquid temperature [°C], on request				-40 to +180			
Maximum pump efficiency [%]	35	48	58	66	70	72	72
CR pumps							
Flow rate [m^3/h]	0.3 - 1.1	0.7 - 2.4	1.2 - 4.5	2.5 - 8.5	5-13	9-24	11-29
Maximum pressure [bar]	21	22	24	24	22	23	25
High pressure [bar], on request (CRN)	-	47	41	47	44	47	48
Motor power [kW]	0.37 - 1.1	0.37 - 2.2	0.37 - 3	0.37 - 5.5	0.37 - 7.5	1.1 - 15	1.1 - 18.5
Version							
CR: Cast iron and stainless steel EN 10088 1.4301 ≈ AISI 304	•	•	•	•	•	•	•
CRI: Stainless steel EN 10088 1.4301 ≈ AISI 304	•	•	•	•	•	•	•
CRN: Stainless steel EN 10088 1.4401 ≈ AISI 316	•	•	•	•	•	•	•
CRT: Titanium	See the CRT, CRTE data booklet available on Grundfos Product Center > http://product-selection.grundfos.com/.						
CR pipe connection							
Oval flange (BSP)	Rp 1	Rp 1	Rp 1	Rp 1 1/4	Rp 1 1/4	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 type)	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)	∅48.3	∅48.3	∅48.3	∅48.3	∅60.3	∅60.3	∅60.3
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 type)	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)	∅42.2	∅42.2	∅42.2	∅42.2	∅60.3	∅60.3	∅60.3
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, CRN 95	CR, CRN 125	CR, CRN 155
Rated flow rate [m^3/h]	32	45	64	95	125	155
Liquid temperature [°C]	-30 to +120[1)]					
Liquid temperature [°C], on request	-40 to +180					
Maximum pump efficiency [%]	78	79	80	81	82	82
CR pumps						
Flow rate [m^3/h]	15-40	22-58	30-85	45-120	60-160	75-200
Maximum pressure [bar]	28	33	22	37[2)]	39[2)]	40[2)]
High pressure [bar], on request (CRN)	50	49	41	-	-	-
Motor power [kW]	1.5 - 30	3-45	4-45	5.5 - 55	11-110	11-110
Version						
CR: Cast iron and stainless steel EN 10088 1.4301 ≈ AISI 304	•	•	•	•	•	•
CRI: Stainless steel EN 10088 1.4301 ≈ AISI 304	-	-	-	-	-	-
CRN: Stainless steel EN 10088 1.4401 ≈ AISI 316	•	•	•	•	•	•
CRT: Titanium	See the CRT, CRTE data booklet available on Grundfos Product Center > http://product-selection.grundfos.com/.					
CR pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 150	DN 150
Flange, on request	DN 80	DN 100	DN 125	-	-	-
CRN pipe connection						
Oval flange (BSP)	-	-	-	-	-	-
Oval flange (BSP), on request	-	-	-	-	-	-
Flange	DN 65	DN 80	DN 100	DN 100	DN 150	DN 150
Flange, on request	DN 80	DN 100	DN 125	-	-	-
PJE coupling (Victaulic type)	3"	4"	4"	5"	6"	6"
Clamp coupling (L-coupling)	88.9	114.3	114.3	141.3	168.3	168.3
Union (+GF+)	-	-	-	-	-	-

• Standard.
❍ Available.
1) CRN 32 to 155 with HQQE shaft seal: -40 to +120 °C.
2) CR pumps: Maximum operating pressure is 25 bar.

Pump

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

The pumps are available with a Grundfos or Siemens 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 inlet and outlet ports on the same level (in line). All pumps are fitted with a maintenance-free mechanical shaft seal of the cartridge type.

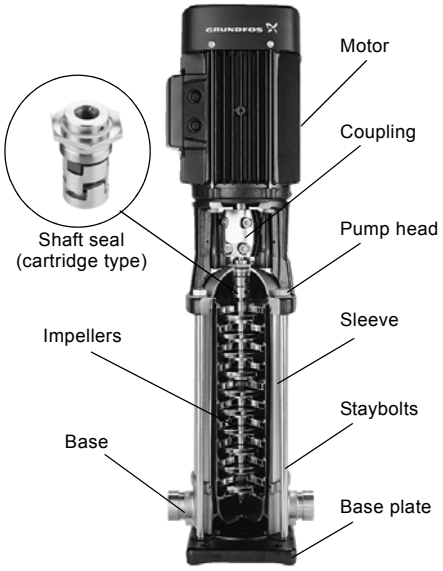

Fig. 4 CR pump

Motor

Grundfos MG standard and Siemens motors

CR, CRI and CRN pumps are fitted with totally enclosed, fan-cooled, 2-pole standard motors 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 up to 22 kW and Siemens motors from 30 to 200 kW.

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 Grundfos Product Center (http://product-selection.grundfos.com/).

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 Grundfos Product Center (http://product-selection.grundfos.com/).

Electrical data

	MG motor CR, CRI, CRN
Mounting designation	Up to 4 kW: V18 From 5.5 kW: V1
Insulation class	F
Efficiency class	IE3 0.37 and 0.55 kW motors are not part of the IE classification
Enclosure class	IP55[1)]
Supply voltage **Tolerance: - 10 %/+ 10 %**	P2: 0.37 - 1.5 kW: 3 x 220-240/380-415 V P2: 2.2 - 5.5 kW: 3 x 380-415 V P2: 7.5 - 22 kW: 3 x 380-415/660-690 V P2: 30 - 200 kW: 3 x 380-415/660-725 V
Supply frequency	50 Hz

1) IP44 and IP54 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 (TP 211 according to IEC 34-11).

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 (TP 211 according to IEC 34-11).

Terminal box positions

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

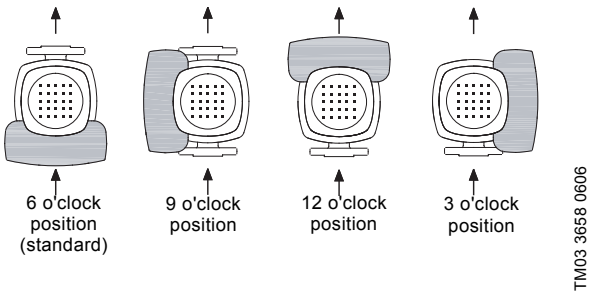

Fig. 5 Terminal box positions

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	IE3	60	3500
30-200	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.

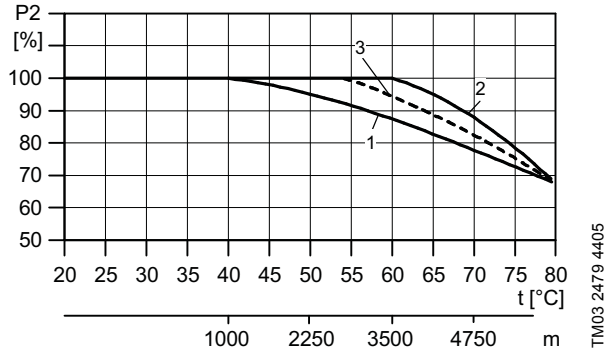

Fig. 6 Motor output in relation to temperature/altitude

Pos.	Motor power [kW]	Motor make
1	0.37 and 0.55	MG
2	0.75 - 22	MG
3	30-200	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 must be fitted with a larger motor. If in doubt, contact Grundfos.

2. Construction

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

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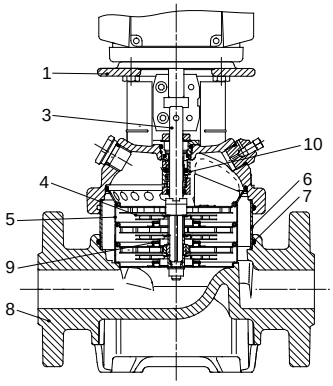


TM02 1194 1403

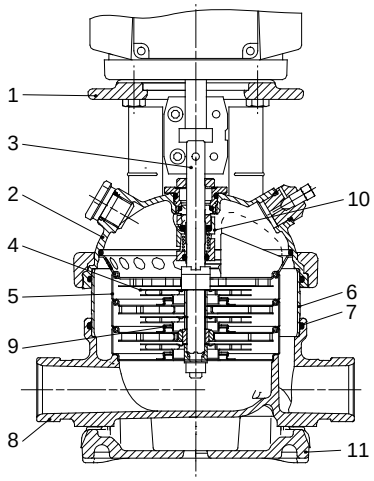
Materials, CR

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

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

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

TM02 1808 2001 - GR7375



TM02 1195 1403

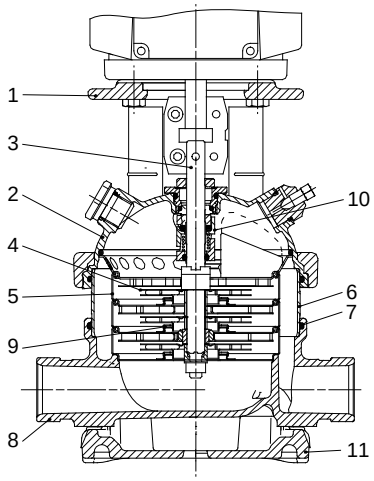
Materials, CRI

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Grey cast iron[1)]	EN-GJL-200	ASTM 25B
2	Pump head cover	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	EN 10088 1.4401[2)] EN 10088 1.4057[3)]	AISI 316 AISI 329 AISI 431
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
11	Base plate	Grey cast iron[1)]	EN-GJL-200	ASTM 25B
	Rubber parts	EPDM or FKM	-	-

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

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

TM02 1808 2001 - GR7373



TM02 1195 1403

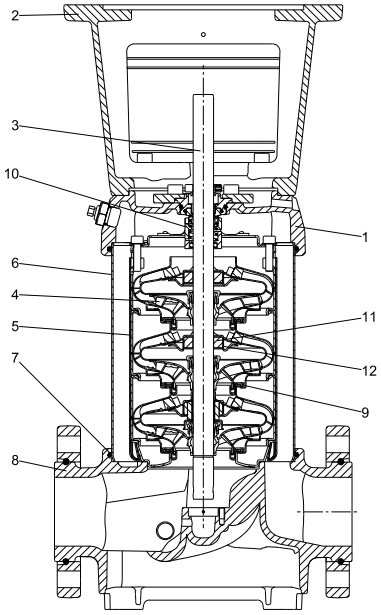
Materials, CRN

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Grey cast iron[1)]	EN-GJL-200	ASTM 25B
2	Pump head cover	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	EN 10088 1.4401[2)] 1.4460[3)]	AISI 316 AISI 329 AISI 431
4	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
5	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
6	Sleeve	Stainless steel	EN 10088 1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
11	Base plate	Grey cast iron[1)]	EN-GJL-200	ASTM 25B
	Rubber parts	EPDM or FKM	-	-

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

CR 32, 45 and 64

TM01 2150 1298



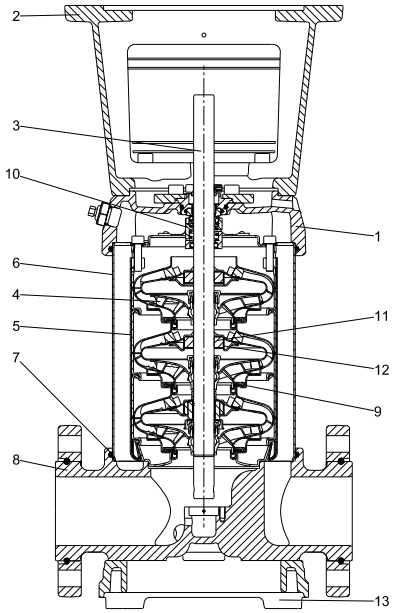
TM06 0711 0814

Materials, CR

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

CRN 32, 45 and 64

TM06 9503 2417



TM06 0712 0814

Materials, CRN

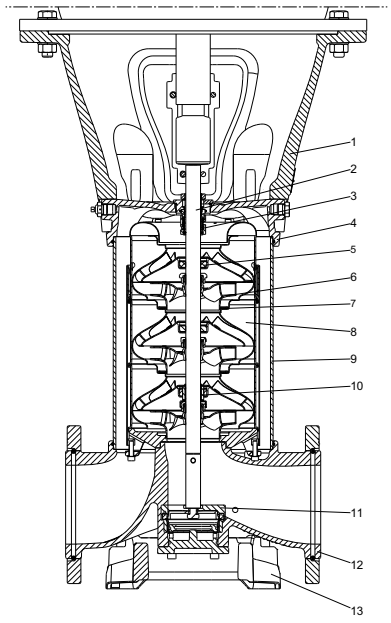
Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head cover	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
2	Motor stool	Grey cast iron[1)]	EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4462	-
4	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
5	Chamber	Stainless steel	EN 10088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

1) Stainless steel available on request.

CR 95, 125, 155

DIN flange

TM06 9206 1917



TM06 5161 1917

Materials, CR

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
2	Shaft	Stainless steel	EN 10088 1.4057[1)] EN 10088 1.4462[2)]	EN 10088 1.4057=431 EN 10088 1.4462=318 LN
3	Shaft seal (seal faces)	Silicon carbide/Silicon carbide	-	-
4	Pump head cover	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
5	Support bearing (bush)	Carbon-graphite filled PTFE		
6	Impeller	Stainless steel	EN 10088 1.4301 EN 10088 1.4401	AISI 304
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN 10088 1.4301 EN 10088 1.4401	AISI 304
9	Sleeve	Stainless steel	EN 10088 1.4301[1)] EN 10088 1.4404[2)]	AISI 304[1)] AISI 316 L[2)]
10	Bearing ring	Tungsten carbide/Tungsten carbide	-	-
11	Thrust handling device[3)]	Stainless steel	EN 10088 1.4401 EN 10283 1.4408	AISI 316/CF 8M
		Silicon carbide/Tungsten carbide	-	-
12	Base	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
13	Base plate	Ductile cast iron	EN-GJS-500-7	ASTM A536-84 70-50-05
	Rubber parts	EPDM or FKM	-	-

1) Applies to CR 95.
2) Applies to CR 125 to CR 155.
3) Only fitted on pumps with 75 kW motors or larger.

CRN 95, 125, 155

Collar flange DIN flange Victaulic type (PJE)

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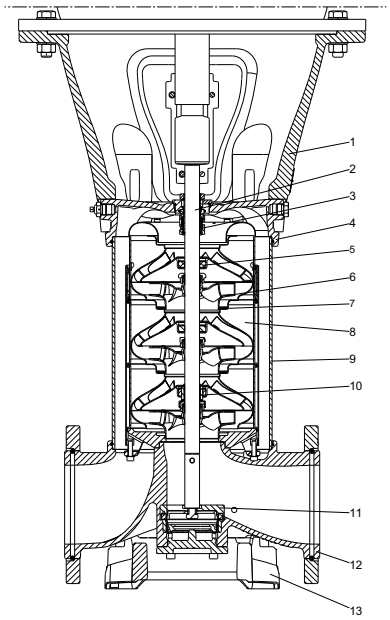

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Materials, CRN

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

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

Type key

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, CRE, CRN, CRNE 32, 45, 64

Code for pump version

Code for pipe connection

Code for materials

Code for rubber parts

Code for shaft seal

Key to codes

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

Code	Description
Materials	
A	Basic version
C	Carbon free pump
D	Carbon-graphite filled PTFE (bearings)/Tungsten carbide
E	Pickled and passivated (Only Japan)
H	Flanges and base plate EN 1.4408
K	Bronze (bearings)/Tungsten carbide
L	Motor stool, base plate and flanges EN 1.4408
M	Motor stool, base plate, coupling and flanges EN 1.4408 and coupling guards in cobber. Bolts, nuts and spacing pipes EN 1.4401 or higher grade
N	Flanges EN 1.4408
P	PEEK neck ring
Q	Silicon carbide/Silicon carbide bearing in pump and Silicon carbide/Silicon carbide seal faces in thrust handling device
R	Silicon carbide/Silicon carbide bearing
S	PTFE neck rings
T	Base plate EN 1.4408
U	Silicon carbide/Silicon carbide bearing in pump and Silicon carbide/Tungsten carbide seal faces in thrust handling device
X	Special version
Code for rubber parts in pump	
E	EPDM
F	FXM (Fluoraz®)
K	FFKM (Kalrez®)
N	Neoprene
V	FKM (Viton®)
Shaft seal type designation	
A	O-ring seal with fixed driver*
H	Balanced cartridge seal with O-ring
O	Double seal, back-to-back*
P	Double seal, tandem*
X	Special version*
Seal face material	
B	Carbon, synthetic resin-impregnated
U	Cemented tungsten carbide
Q	Silicon carbide
X	Other ceramics*
Secondary seal material (rubber parts)	
E	EPDM
F	FXM (Fluoraz®)
K	FFKM (Kalrez®)
V	FKM (Viton®)

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

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

Shaft seal

Example	-H	-Q	-Q	-E

Shaft seal type designation

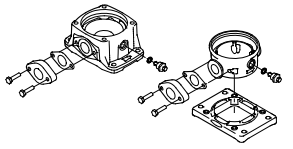
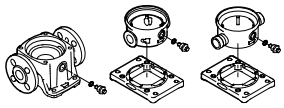
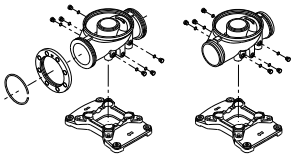
Material of rotating seal face

Material of stationary seal face

Material of secondary seal (rubber parts)

3. Operating and inlet pressures

Maximum operating pressure and liquid temperature

	Oval flange		PJE, clamp, union, DIN		DIN, PJE	
Pump type	 TM02 1379 1101		 TM02 1383 1101		 TM06 9402 2417	
	Maximum permissible operating pressure	**Liquid temperature**	**Maximum permissible operating pressure**	**Liquid temperature**	**Maximum permissible operating pressure**	**Liquid temperature**
	[bar]	**[°C]**	**[bar]**	**[°C]**	**[bar]**	**[°C]**
CR, CRI, CRN 1s	16	-20 to +120	25	-20 to +120	-	-
CR, CRI, CRN 1	16		25		-	-
CR, CRI, CRN 3	16		25		-	-
CR, CRI, CRN 5	16		25		-	-
CR, CRI 10-1 → 10-16	16		16		-	-
CR, CRI 10-17 → 10-22	-	-	25		-	-
CRN 10	-	-	25		-	-
CR, CRI 15-1 → 15-7	10	-20 to +120	-	-	-	-
CR, CRI 15-8 → 15-10	-	-	16	-20 to +120	-	-
CR, CRI 15-12 → 15-17	-	-	25		-	-
CRN 15	-	-	25		-	-
CR, CRI 20-1 → 20-7	10	-20 to +120	-	-	-	-
CR, CRI 20-8 → 20-10	-	-	16	-20 to +120	-	-
CR, CRI 20-12 → 20-17	-	-	25		-	-
CRN 20	-	-	25		-	-
CR, CRN 32-1-1 → 32-7	-	-	16	-30 to +120	-	-
CR, CRN 32-8-2 → 32-14	-	-	30		-	-
CR, CRN 45-1-1 → 45-5	-	-	16		-	-
CR, CRN 45-6-2 → 45-11	-	-	30		-	-
CR, CRN 45-12-2 → 45-13-2	-	-	33		-	-
CR, CRN 64-1-1 → 64-5	-	-	16		-	-
CR, CRN 64-6-2 → 64-8-1	-	-	30		-	-
CR, CRN 95-1-1 → 95-5					16	-30 to +120
CR, CRN 95-6 → 95-8-2					25	
CR, CRN 125-1 → 125-4					16	
CR, CRN 125-5					25	
CRN 125-6 → 125-7					25	
CRN 125-8 → 125-10					40	-40 to +120*
CR, CRN 155-1-1 → 155-4-1					16	-40 to +120
CRN 155-5-2 → 155-6					25	
CRN 155-7 → 155-8-2					40	-40 to +120*

For pump sizes 32, 45, 64, the maximum pressure for PJE (Victaulic type) is 50 bar and only available in CRN version.

* For operating pressures above 30 bar the temperature limits are -40 to +80 °C.

Operating range of the shaft seal

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

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The range shown in figs 7 and 8 applies to clean water and water with anti-freeze liquids. For selection of the right shaft seal, see section *7. List of pumped liquids*, page 81. If the operating range is exceeded, the life of the shaft seal may be reduced.

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

Optional shaft seals

See section *9. Variants*, page 93 for optional shaft seal solutions.

CR, CRI, CRN 1s-155

Shaft seals for ∅12, ∅16 and ∅22 shafts (0.37 - 55 kW)

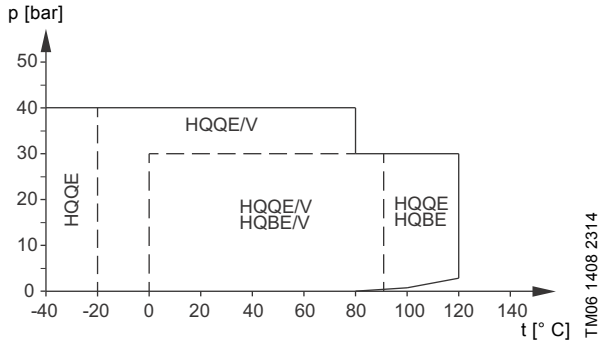


Fig. 7 Operating range of standard shaft seals for CR, CRI, CRN 1-155

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

Shaft seals for ∅28 (75-110 kW) shaft ends

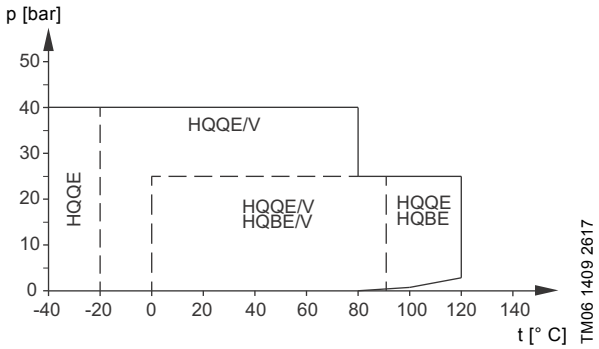


Fig. 8 Operating range of standard shaft seals for ∅28 shaft ends (75-110 kW)

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

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-36	10
CR, CRI, CRN 1	
1-2 → 1-36	10
CR, CRI, CRN 3	
3-2 → 3-29	10
3-31 → 3-36	15
CR, CRI, CRN 5	
5-2 → 5-16	10
5-18 → 5-36	15
CR, CRI, CRN 10	
10-1 → 10-6	8
10-7 → 10-22	10
CR, CRI, CRN 15	
15-1 → 15-3	8
15-4 → 15-17	10
CR, CRI, CRN 20	
20-1 → 20-3	8
20-4 → 20-17	10
CR, CRN 32	
32-1-1 → 32-4	4
32-5-2 → 32-10	10
32-11-2 → 32-14	15
CR, CRN 45	
45-1-1 → 45-2	4
45-3-2 → 45-5	10
45-6-2 → 45-13-2	15
CR, CRN 64	
64-1-1 → 64-2-2	4
64-2-1 → 64-4-2	10
64-4-1 → 64-8-1	15
CR, CRN 95	
95-1- → 95 1-1	4
95-2 → 95-3-2	10
95-3 → 95-6	15
95-7 → 95-8-2	20
CR, CRN 125	
125-1 → 125-2-2	10
125-2 → 125-4	15
125-5 → 125-10	20
CR, CRN 155	
155-1 → 155-1-1	10
155-2 → 155-3	15
155-4-1 → 155-8-2	20

Examples of operating and inlet pressures

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

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

See the following definitions and examples.

Definitions

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

Example 1

The following pump type has been selected: CR 5-16 A-A-A.

Maximum operating pressure: 16 bar.

Maximum inlet pressure: 10 bar.

Pump differential pressure when operating against a closed outlet valve (flow = 0 m^3/h): 10.6 bar. See page 40.

This pump is **not** allowed to start at an inlet pressure of 10 bar, but at an inlet pressure of 16.0 - 10.6 = 5.4 bar.

Example 2

The following pump type has been selected: CR 10-2 A-A-A.

Maximum operating pressure: 16 bar.

Maximum inlet pressure: 8.0 bar.

Pump differential pressure when operating against a closed outlet valve (flow rate = 0 m^3/h): 2 bar. See page 44.

This pump is allowed to start at an inlet pressure of 8.0 bar, as the outlet pressure is lower than the maximum operating pressure.

If the inlet or operating pressure exceeds the pressure permitted, see section *9. Variants*, page 93.

4. Selection and sizing

Selection of pumps

Selection of pumps must 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 pipes, pump efficiency (see below)
- pump materials (see page 24)
- pump connections (see page 24)
- shaft seal (see page 24).

Duty point of the pump

From a duty point, you can select a pump on the basis of the curve charts in section *5. Performance curves and technical data*, page 28.

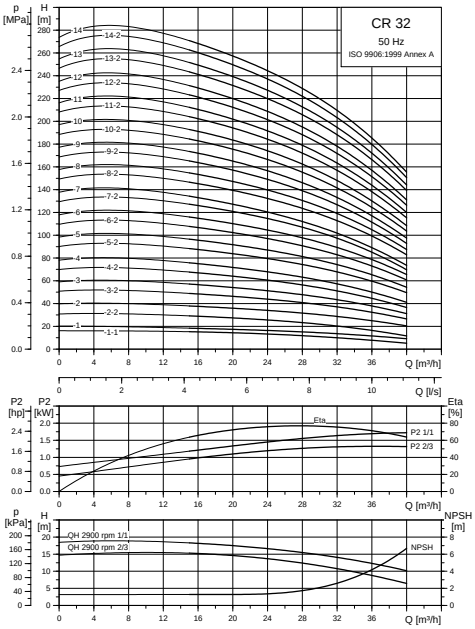


Fig. 9 Example of a curve chart

Sizing 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 pipes (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 25.

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.

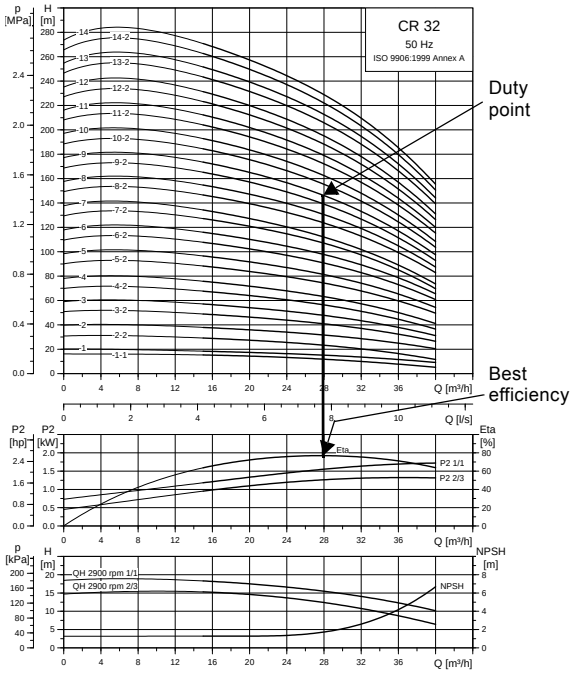


Fig. 10 Example of a CR pump's duty point

As the pump is sized on the basis of the highest possible flow rate, 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 rate drops.

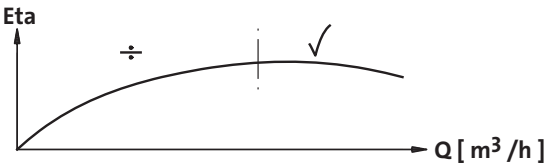


Fig. 11 Best efficiency

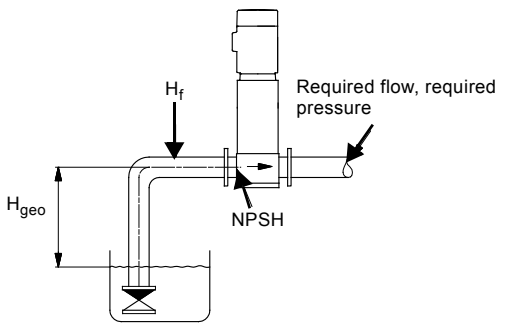


Fig. 12 Dimensional data

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. List of pumped liquids*, page 81, or contact Grundfos.

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

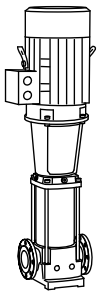


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Fig. 13 CR pump

Pump connections

Selection of pump connection depends on the rated pressure and the pipes. 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 (Victaulic type)
- clamp coupling
- union (+GF+)
- other connections on request.

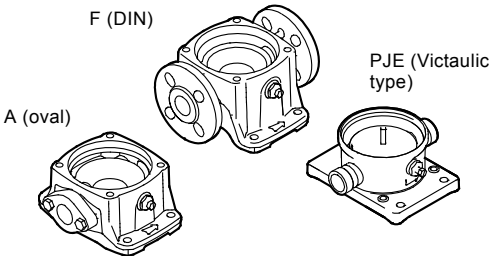

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Fig. 14 Pump connections

Shaft seal

GR7386

Fig. 15 Shaft seal (cartridge type)

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. List of pumped liquids*.

Servicing shaft seals

Replacement shaft seals are available as complete service kits*.

Shaft seals fitted on CR, CRN 95-155 pumps with ∅28 mm or ∅36 mm shaft ends are serviceable. This means that the wear parts in these shaft seals are available as service kits* and can be replaced without having to renew the complete shaft seal.

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

Thrust handling device

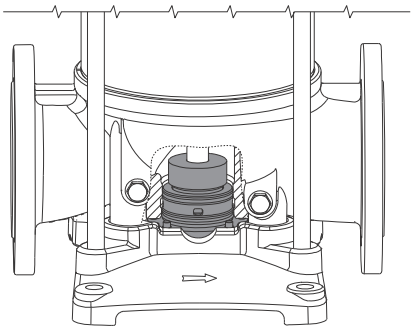

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Fig. 16 Thrust handling device

A thrust handling device (THD) is factory-fitted on pumps with 75 kW motors or larger. The system consists of two parts. A rotating part mounted on the shaft end below the first impeller as well as a non-rotating part mounted in or on the pump base.

The THD absorbs the main part of the thrust force generated by the impellers and thereby reduces the resulting axial force the motor bearings must absorb. This enables the use of standard ball bearings in the motor instead of special angular contact ball bearings.

Note: For applications involving CIP (cleaning-in-place) and motors above 55 kW, use a bearing flange and a base without THD.

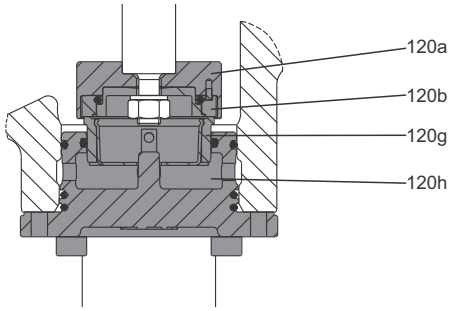

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Fig. 17 Position numbers for THD parts

Pos.	Description	Material
120a	Thrust disc	Stainless steel
120b	Rotating ring	Silicon carbide
120g	Stationary ring	Silicon carbide* Tungsten carbide
120h	Lifting plate	Stainless steel
-	O-rings	EPDM FKM

* On request for CRN.

Operating pressure and inlet pressure

Do not exceed the limit values for these pressures:

- maximum operating pressure
- maximum inlet pressure.

Minimum inlet pressure, NPSH

We recommend that you calculate the inlet pressure "H" in these situations:

- The liquid temperature is high.
- The flow rate is significantly higher than the rated flow rate.
- Water is drawn from depths.
- Water is drawn through long pipes.
- Inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the inlet side of the pump.

Calculate the maximum suction lift "H" in m head as follows:

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

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 inlet pipe in metres head at the highest flow the pump will be delivering.
H_v	=	Vapour pressure in metres head, to be read from the vapour pressure scale. H_v depends on the liquid temperature t_m.

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

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

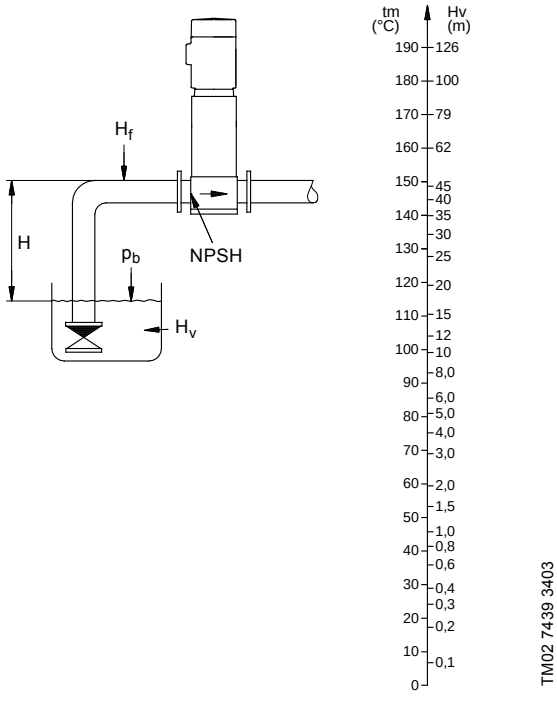

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Fig. 18 Minimum inlet pressure, NPSH

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 rate.

How to read the curve charts

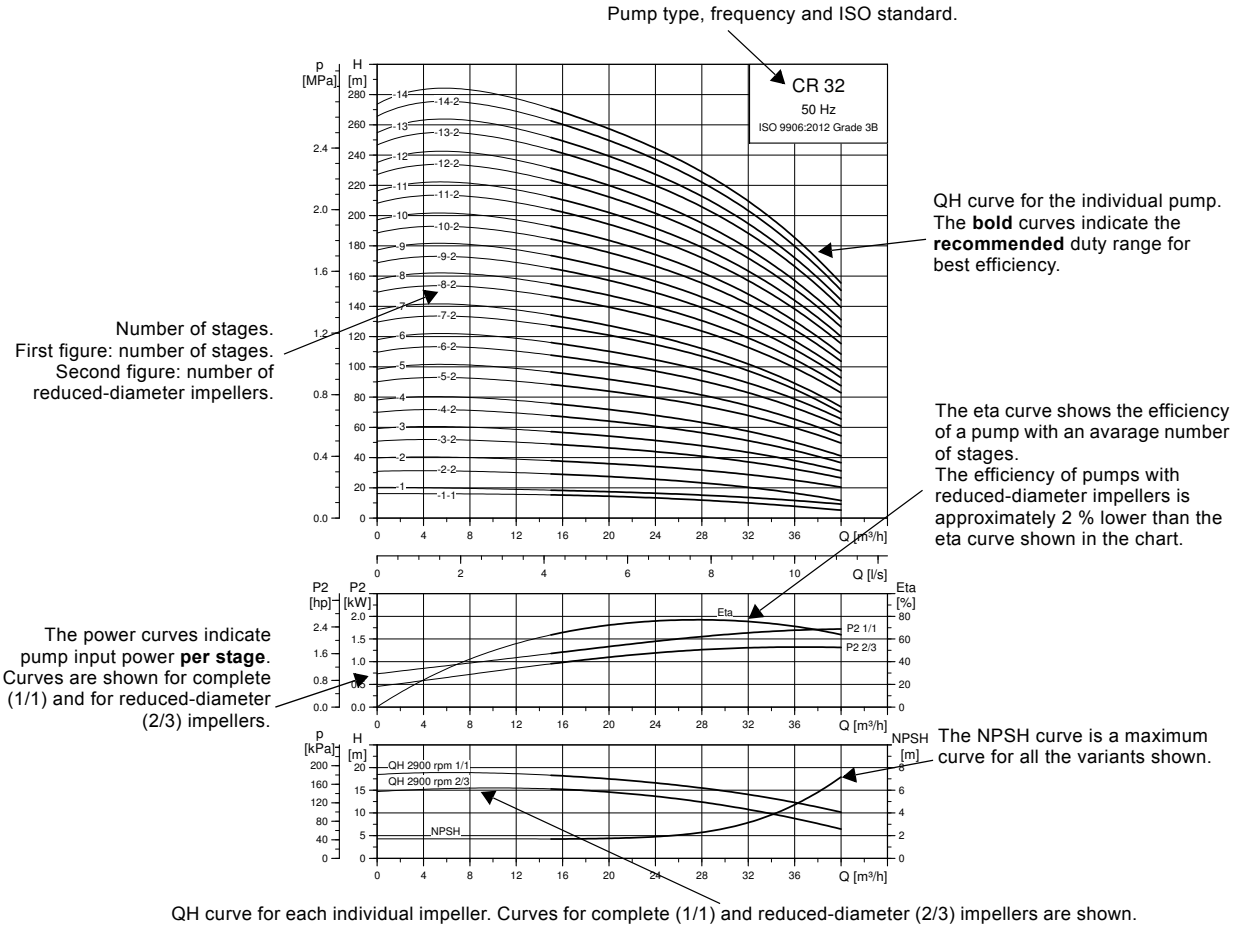


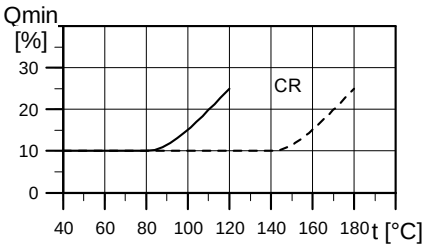
Fig. 19 How to read the curve charts

Guidelines to performance curves

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

- Tolerances to ISO 9906:2012, Grade 3B, if indicated.
- 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: υ = 1 mm^2/s (1 cSt).
- Due to the risk of overheating, the pumps must not be used at a flow rate below the minimum flow rate.
- The QH curves apply to a rated motor speed of a three-phase mains-operated motor. For realistic curves, go to Grundfos Product Center (http://product-selection.grundfos.com/) and insert data.

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.

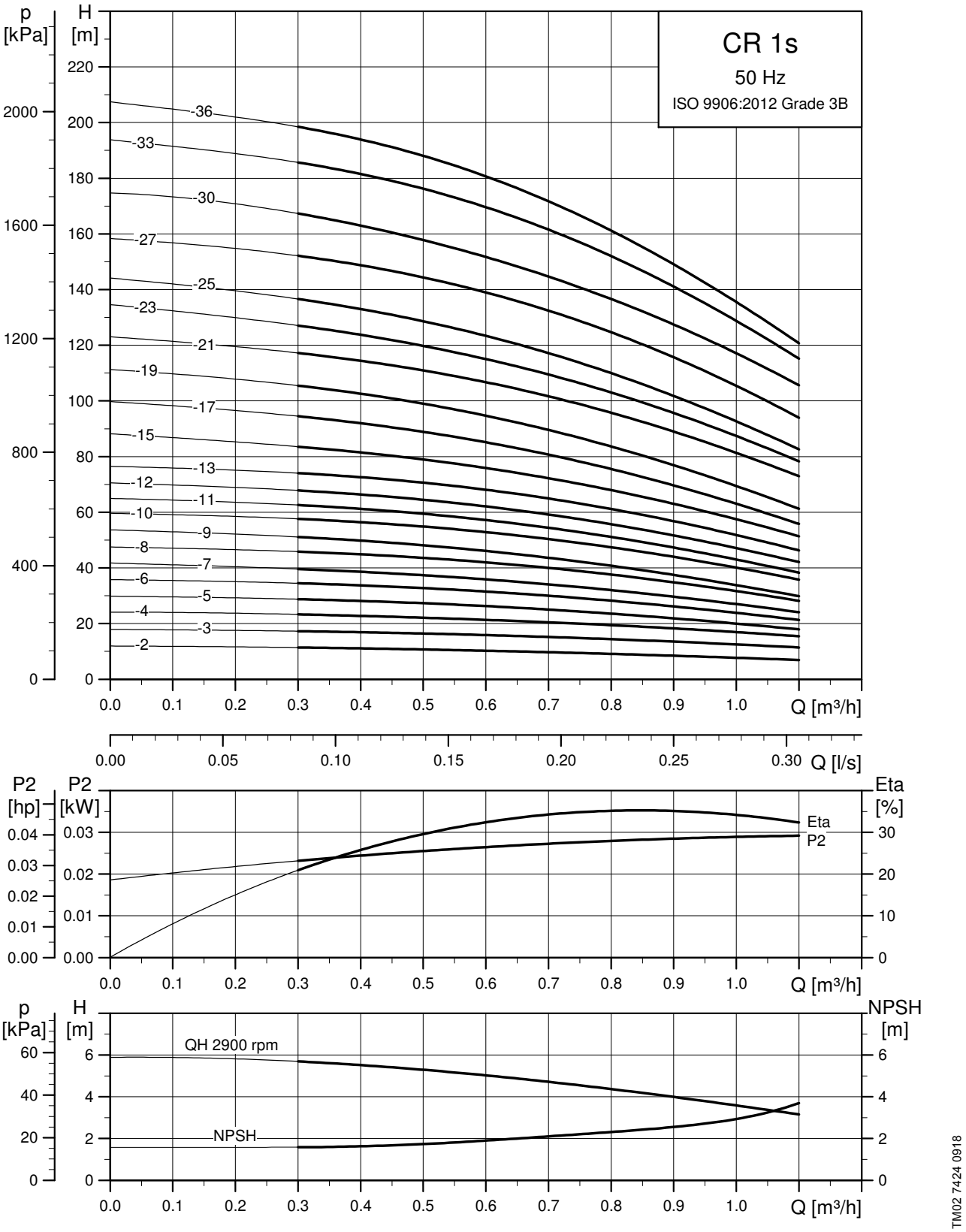


TM01 2816 0303

Fig. 20 Minimum flow rate

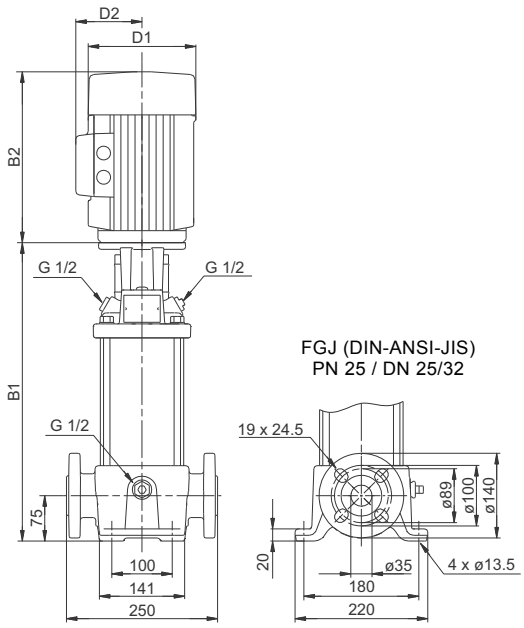
5. Performance curves and technical data

CR 1s



TM02 7424 0918

Dimensional sketch

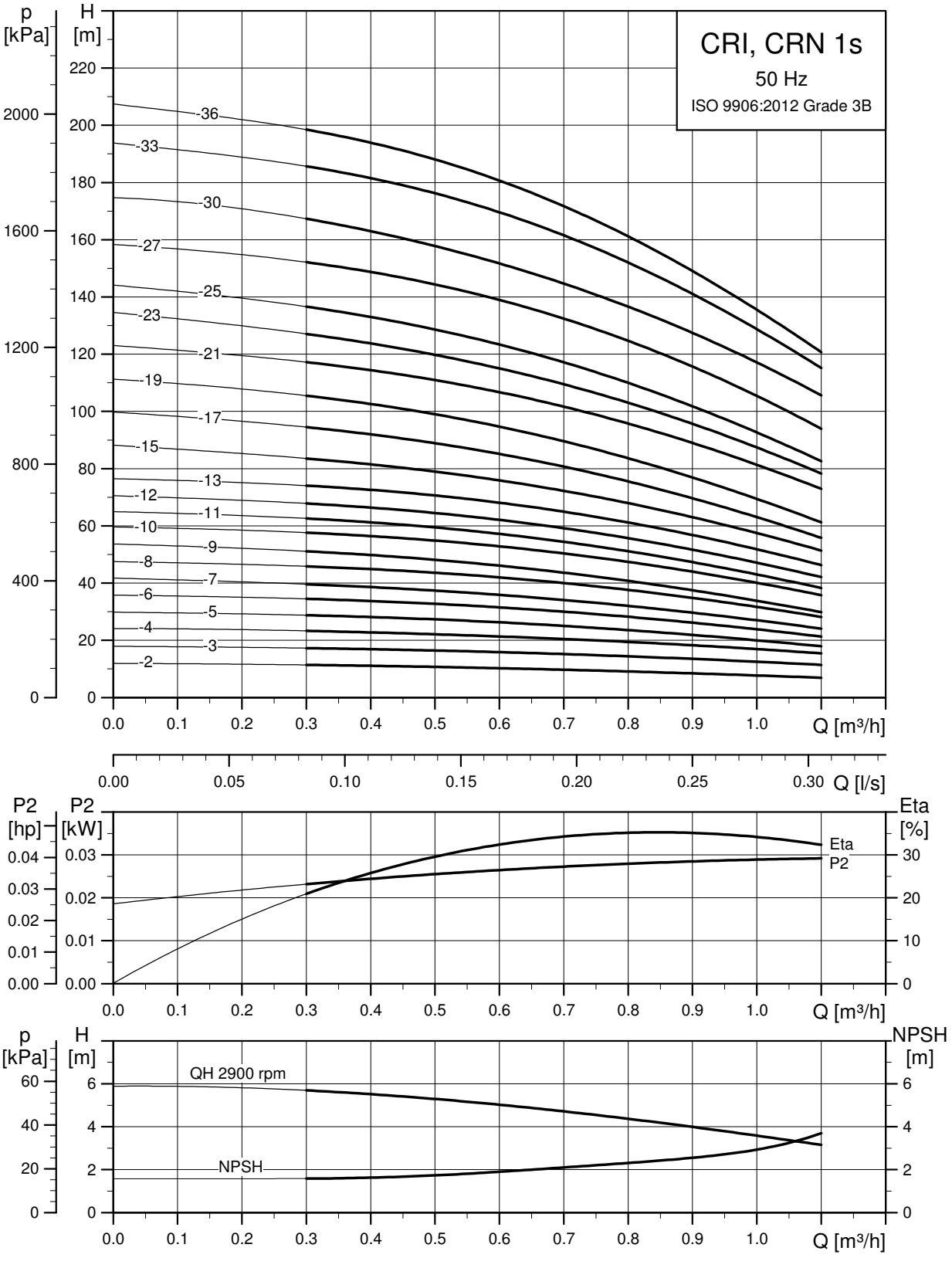


TM06 9591 2517

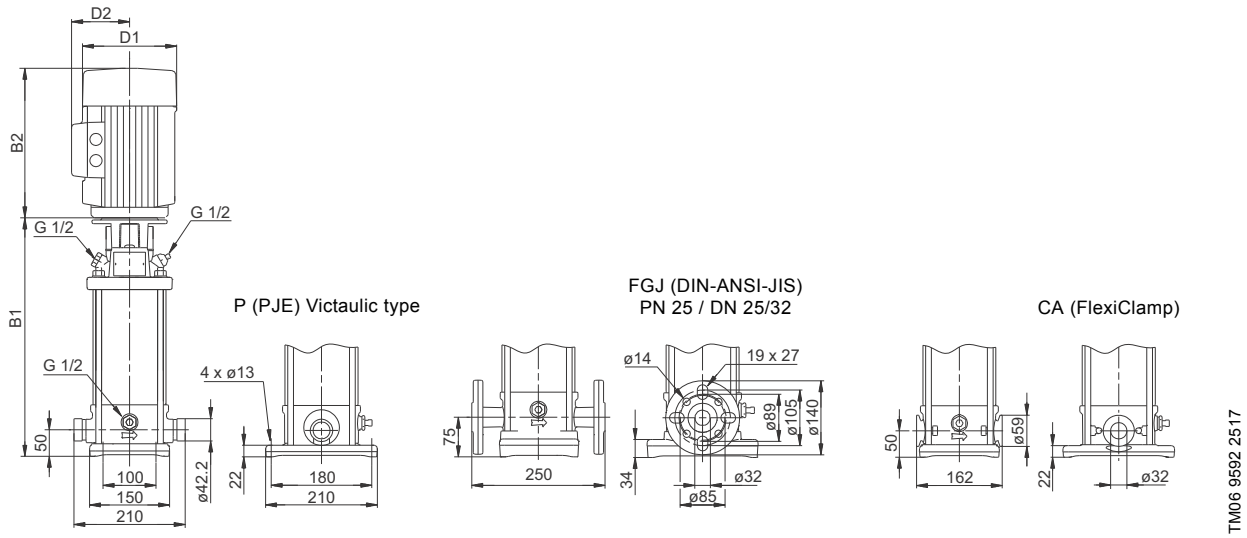
Dimensions and weights

Pump type	Motor P_2 [kW]	Dimension [mm]						Net weight [kg]	
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2				
CR 1s-2	0.37	254	445	279	470	141	109	18	23
CR 1s-3	0.37	254	445	279	470	141	109	18	23
CR 1s-4	0.37	272	463	297	488	141	109	19	23
CR 1s-5	0.37	290	481	315	506	141	109	19	24
CR 1s-6	0.37	308	499	333	524	141	109	19	24
CR 1s-7	0.37	326	517	351	542	141	109	20	24
CR 1s-8	0.37	344	535	369	560	141	109	20	25
CR 1s-9	0.37	362	553	387	578	141	109	21	25
CR 1s-10	0.37	380	571	405	596	141	109	21	26
CR 1s-11	0.37	398	589	423	614	141	109	21	26
CR 1s-12	0.37	416	607	441	632	141	109	22	26
CR 1s-13	0.37	434	625	459	650	141	109	22	27
CR 1s-15	0.55	470	661	495	686	141	109	24	28
CR 1s-17	0.55	506	697	531	722	141	109	25	29
CR 1s-19	0.55	542	733	567	758	141	109	25	30
CR 1s-21	0.75	584	815	609	840	141	109	28	32
CR 1s-23	0.75	620	851	645	876	141	109	29	33
CR 1s-25	0.75	656	887	681	912	141	109	29	34
CR 1s-27	1.10	692	943	717	968	141	109	32	37
CR 1s-30	1.10	-	-	771	1022	141	109	-	38
CR 1s-33	1.10	-	-	825	1076	141	109	-	39
CR 1s-36	1.10	-	-	879	1130	141	109	-	41

CRI, CRN 1s


CRI, CRN 1s
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-36
-33
-30
-27
-25
-23
-21
-19
-17
-15
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
Q [m³/h]
Q [l/s]
P2 [hp]
P2 [kW]
Eta [%]
Eta
P2
p [kPa]
H [m]
QH 2900 rpm
NPSH
NPSH [m]
Q [m³/h]
TM02 7425 0918

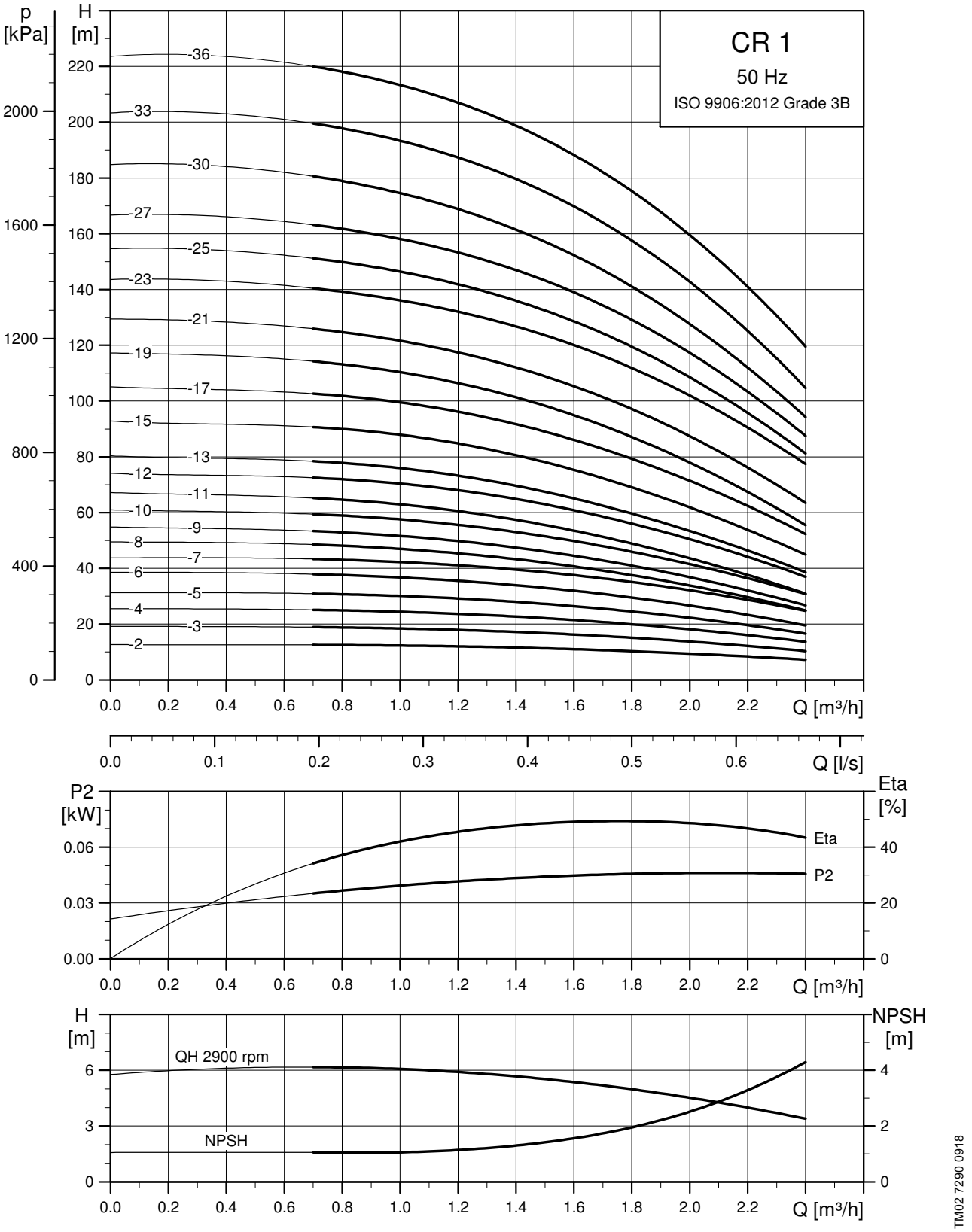
Dimensional sketch



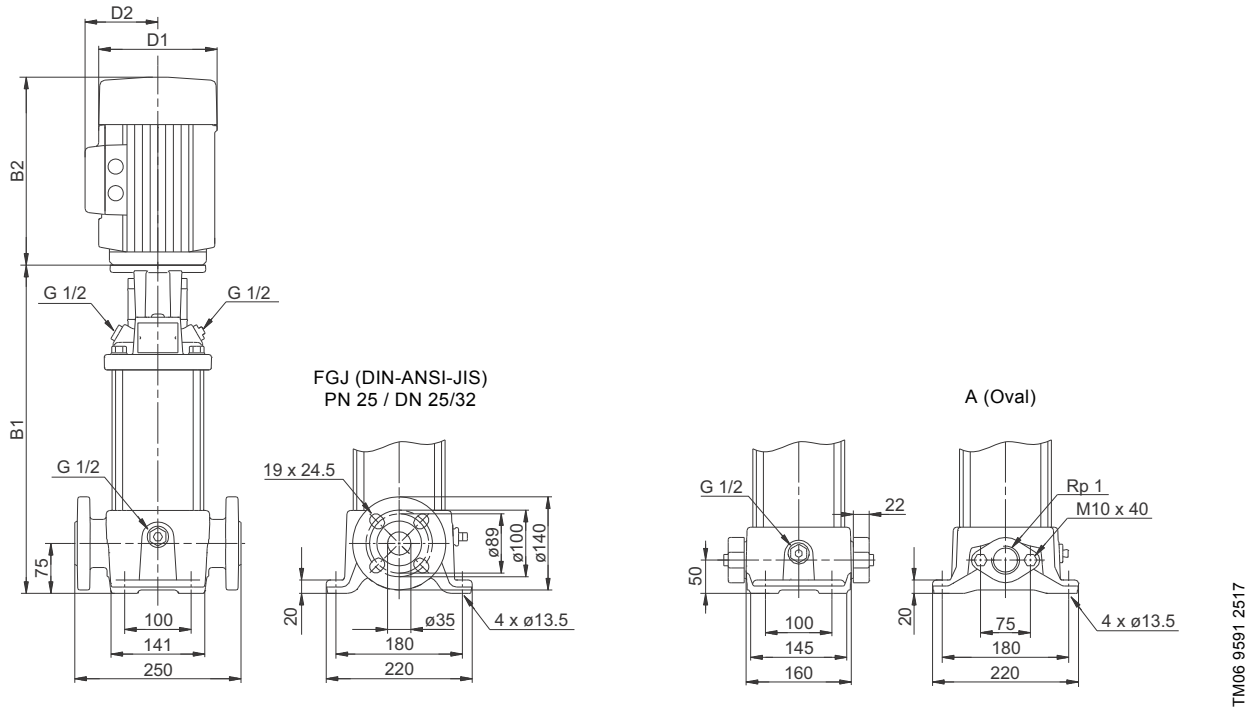
Dimensions and weights

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	0.37	347	538	372	563	141	109	18	23
CRI/CRN 1s-9	0.37	365	556	390	581	141	109	19	23
CRI/CRN 1s-10	0.37	383	574	408	599	141	109	19	23
CRI/CRN 1s-11	0.37	401	592	426	617	141	109	20	24
CRI/CRN 1s-12	0.37	419	610	444	635	141	109	20	24
CRI/CRN 1s-13	0.37	437	628	462	653	141	109	20	25
CRI/CRN 1s-15	0.55	473	664	498	689	141	109	22	26
CRI/CRN 1s-17	0.55	509	700	534	725	141	109	23	27
CRI/CRN 1s-19	0.55	545	736	570	761	141	109	23	28
CRI/CRN 1s-21	0.75	587	818	612	843	141	109	26	31
CRI/CRN 1s-23	0.75	623	854	648	879	141	109	27	31
CRI/CRN 1s-25	0.75	659	890	684	915	141	109	28	32
CRI/CRN 1s-27	1.10	695	946	720	971	141	109	31	35
CRI/CRN 1s-30	1.10	749	1000	774	1025	141	109	32	36
CRI/CRN 1s-33	1.10	803	1054	828	1079	141	109	33	38
CRI/CRN 1s-36	1.10	857	1108	882	1133	141	109	35	39

CR 1


CR 1
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-36
-33
-30
-27
-25
-23
-21
-19
-17
-15
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
Eta
P2
H [m]
NPSH [m]
QH 2900 rpm
NPSH
TM02 7290 0918

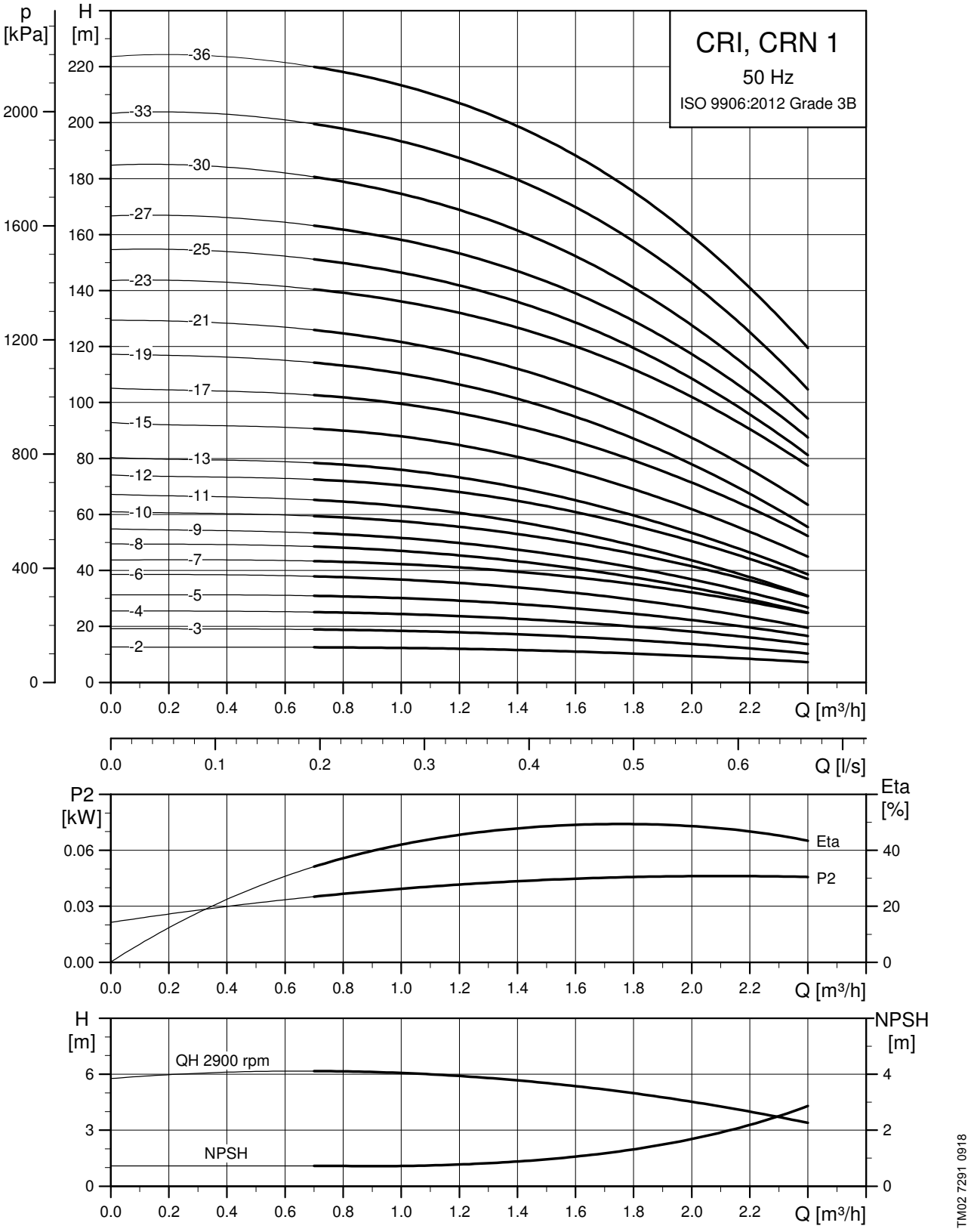
Dimensional sketch



Dimensions and weights

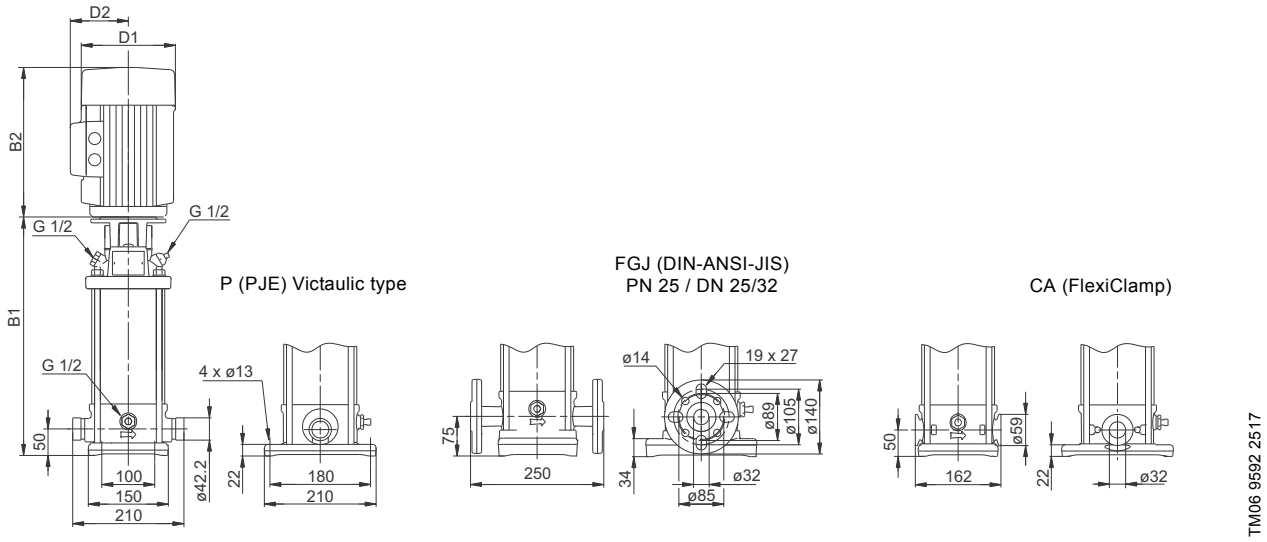
Pump type	Motor P_2 [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		Oval flange		DIN flange		D1	D2	Oval flange	DIN flange
		B1	B1+B2	B1	B1+B2				
CR 1-2	0.37	254	445	279	470	141	109	18	23
CR 1-3	0.37	254	445	279	470	141	109	18	23
CR 1-4	0.37	272	463	297	488	141	109	19	23
CR 1-5	0.37	290	481	315	506	141	109	19	24
CR 1-6	0.37	308	499	333	524	141	109	20	24
CR 1-7	0.37	326	517	351	542	141	109	20	25
CR 1-8	0.55	344	535	369	560	141	109	21	26
CR 1-9	0.55	362	553	387	578	141	109	21	26
CR 1-10	0.55	380	571	405	596	141	109	22	26
CR 1-11	0.55	398	589	423	614	141	109	22	27
CR 1-12	0.75	422	653	447	678	141	109	24	29
CR 1-13	0.75	440	671	465	696	141	109	25	29
CR 1-15	0.75	476	707	501	732	141	109	26	30
CR 1-17	1.10	512	763	537	788	141	109	29	33
CR 1-19	1.10	548	799	573	824	141	109	30	34
CR 1-21	1.10	584	835	609	860	141	109	30	35
CR 1-23	1.10	620	871	645	896	141	109	31	36
CR 1-25	1.50	-	-	697	978	178	110	-	44
CR 1-27	1.50	-	-	733	1014	178	110	-	44
CR 1-30	1.50	-	-	787	1068	178	110	-	46
CR 1-33	2.20	-	-	841	1162	178	110	-	47
CR 1-36	2.20	-	-	895	1216	178	110	-	49

CRI, CRN 1



TM02 7291 0918

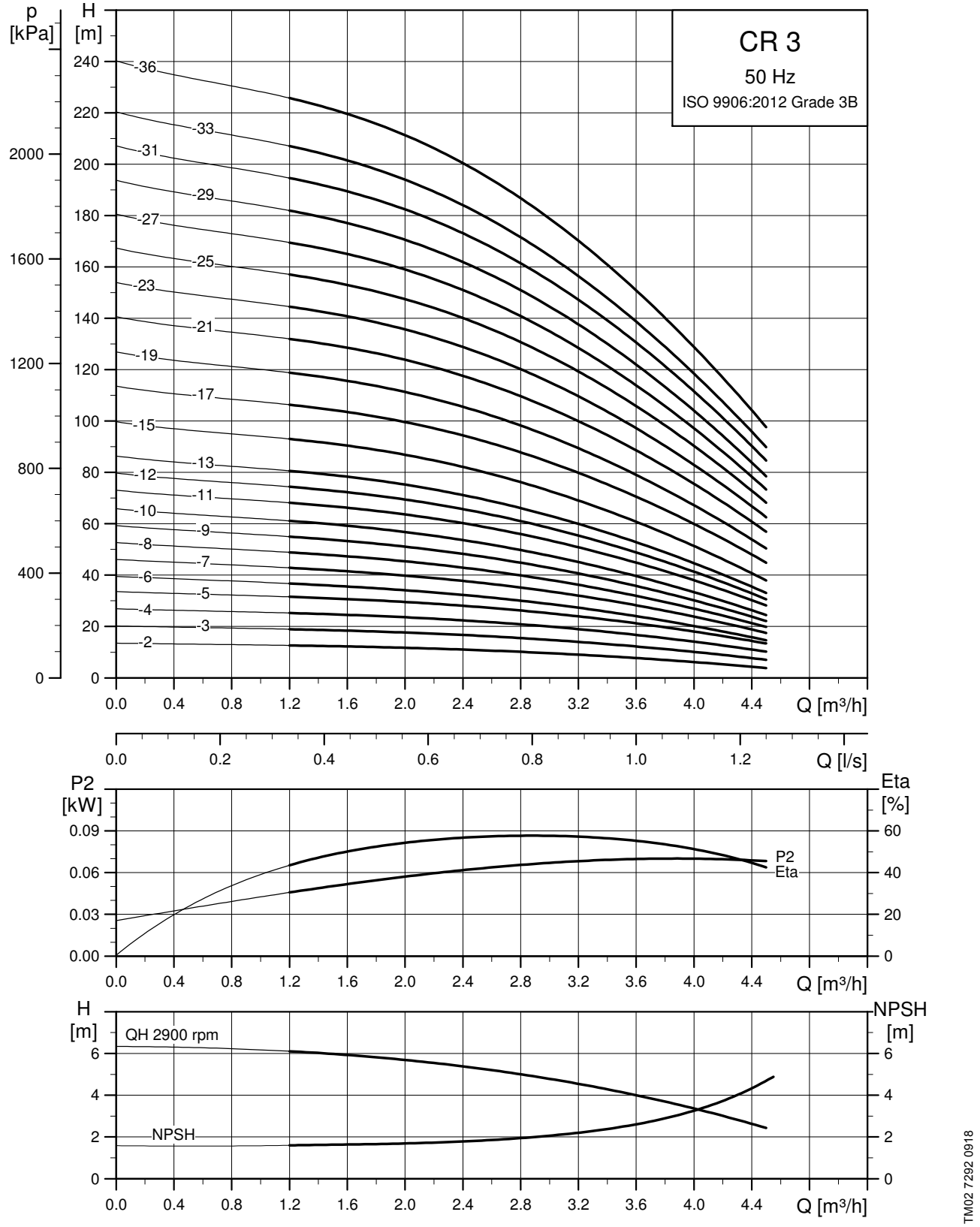
Dimensional sketch



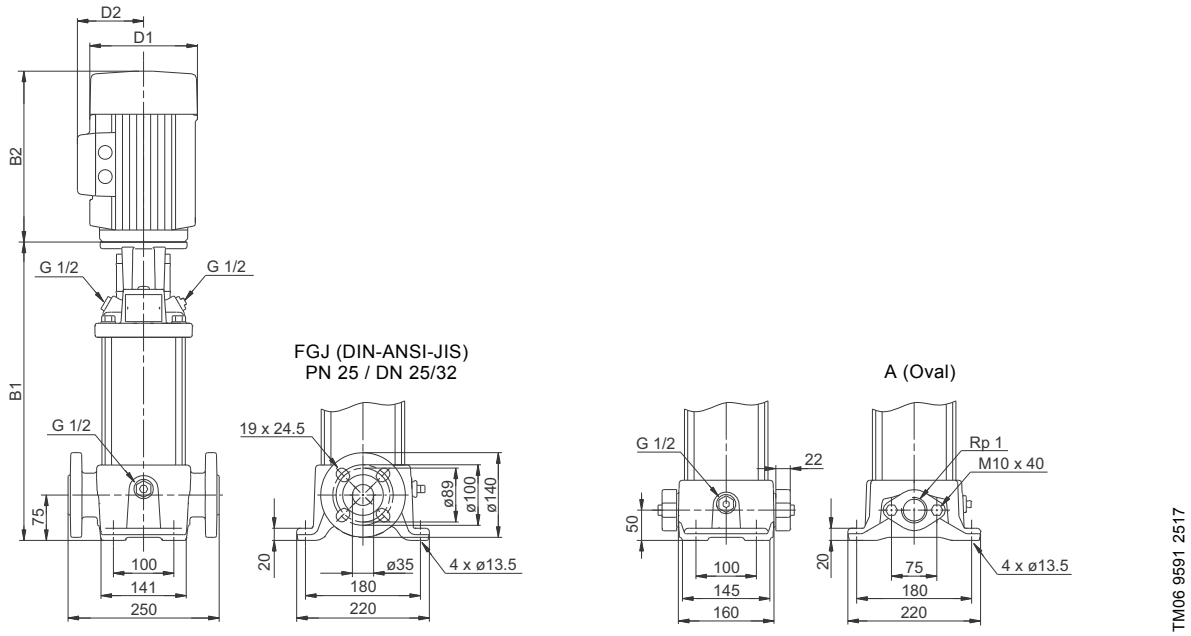
Dimensions and weights

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 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	0.37	293	484	318	509	141	109	17	21
CRI/CRN 1-6	0.37	311	502	336	527	141	109	18	22
CRI/CRN 1-7	0.37	329	520	354	545	141	109	18	22
CRI/CRN 1-8	0.55	347	538	372	563	141	109	19	23
CRI/CRN 1-9	0.55	365	556	390	581	141	109	20	24
CRI/CRN 1-10	0.55	383	574	408	599	141	109	20	24
CRI/CRN 1-11	0.55	401	592	426	617	141	109	20	24
CRI/CRN 1-12	0.75	425	656	450	681	141	109	23	27
CRI/CRN 1-13	0.75	443	674	468	699	141	109	23	28
CRI/CRN 1-15	0.75	479	710	504	735	141	109	24	28
CRI/CRN 1-17	1.10	515	766	540	791	141	109	27	31
CRI/CRN 1-19	1.10	551	802	576	827	141	109	28	32
CRI/CRN 1-21	1.10	587	838	612	863	141	109	29	33
CRI/CRN 1-23	1.10	623	874	648	899	141	109	30	34
CRI/CRN 1-25	1.50	675	956	700	981	178	110	37	41
CRI/CRN 1-27	1.50	711	992	736	1017	178	110	38	42
CRI/CRN 1-30	1.50	765	1046	790	1071	178	110	39	43
CRI/CRN 1-33	2.20	819	1140	844	1165	178	110	41	45
CRI/CRN 1-36	2.20	873	1194	898	1219	178	110	42	46

CR 3


CR 3
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-36
-33
-31
-29
-27
-25
-23
-21
-19
-17
-15
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
P2
Eta
H [m]
QH 2900 rpm
NPSH
NPSH [m]
TM02 7292 0918

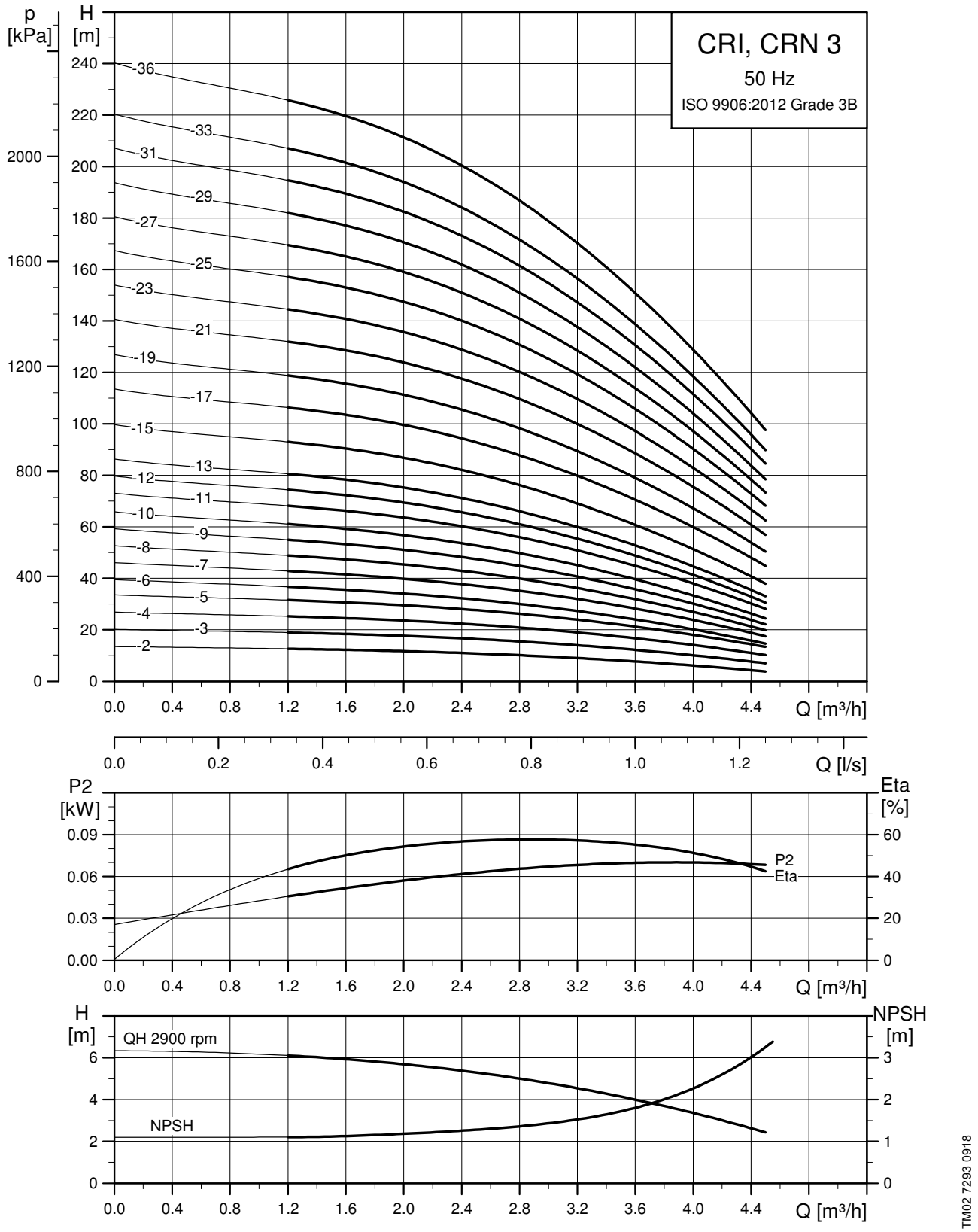
Dimensional sketch



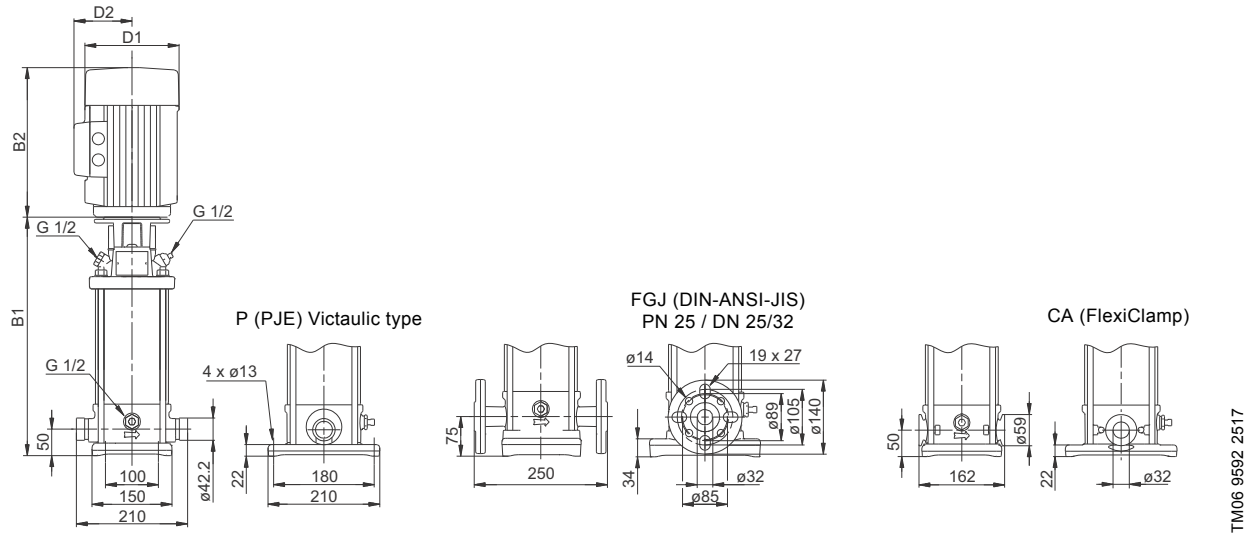
Dimensions and weights

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	0.37	254	445	279	470	141	109	18	23
CR 3-4	0.37	272	463	297	488	141	109	19	23
CR 3-5	0.37	290	481	315	506	141	109	19	24
CR 3-6	0.55	308	499	333	524	141	109	20	25
CR 3-7	0.55	326	517	351	542	141	109	21	25
CR 3-8	0.75	350	581	375	606	141	109	23	27
CR 3-9	0.75	368	599	393	624	141	109	23	28
CR 3-10	0.75	386	617	411	642	141	109	24	28
CR 3-11	1.1	404	655	429	680	141	109	26	31
CR 3-12	1.1	422	673	447	698	141	109	27	31
CR 3-13	1.1	440	691	465	716	141	109	27	32
CR 3-15	1.1	476	727	501	752	141	109	28	32
CR 3-17	1.5	528	809	553	834	178	110	36	40
CR 3-19	1.5	564	845	589	870	178	110	37	41
CR 3-21	2.2	600	921	625	946	178	110	38	42
CR 3-23	2.2	636	957	661	982	178	110	39	43
CR 3-25	2.2	-	-	697	1018	178	110	-	44
CR 3-27	2.2	-	-	733	1054	178	110	-	45
CR 3-29	2.2	-	-	769	1090	178	110	-	46
CR 3-31	3	-	-	809	1144	198	120	-	53
CR 3-33	3	-	-	845	1180	198	120	-	53
CR 3-36	3	-	-	899	1234	198	120	-	55

CRI, CRN 3


CRI, CRN 3
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-36
-33
-31
-29
-27
-25
-23
-21
-19
-17
-15
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
P2
Eta
H [m]
QH 2900 rpm
NPSH
NPSH [m]
TM02 7293 0918

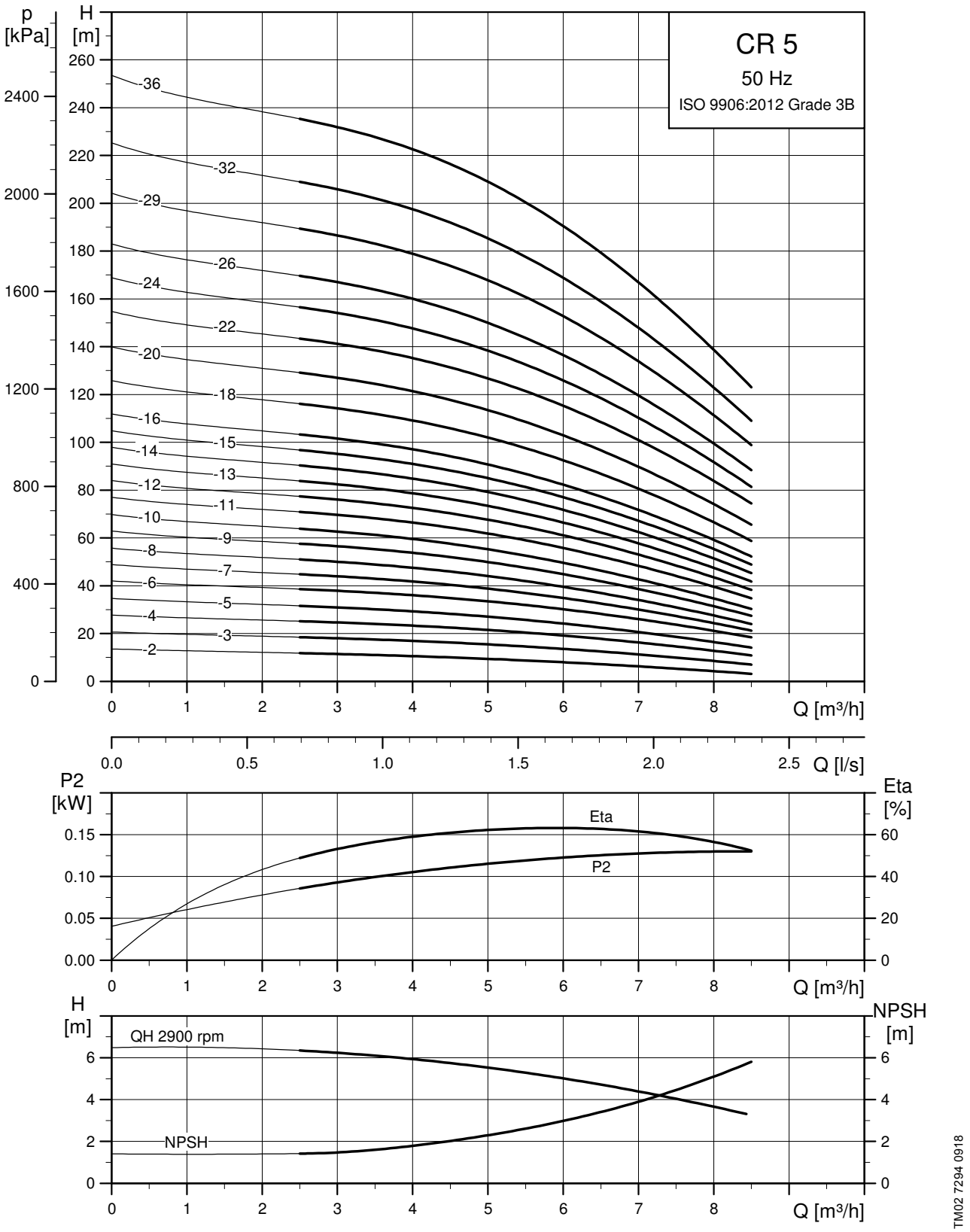
Dimensional sketch



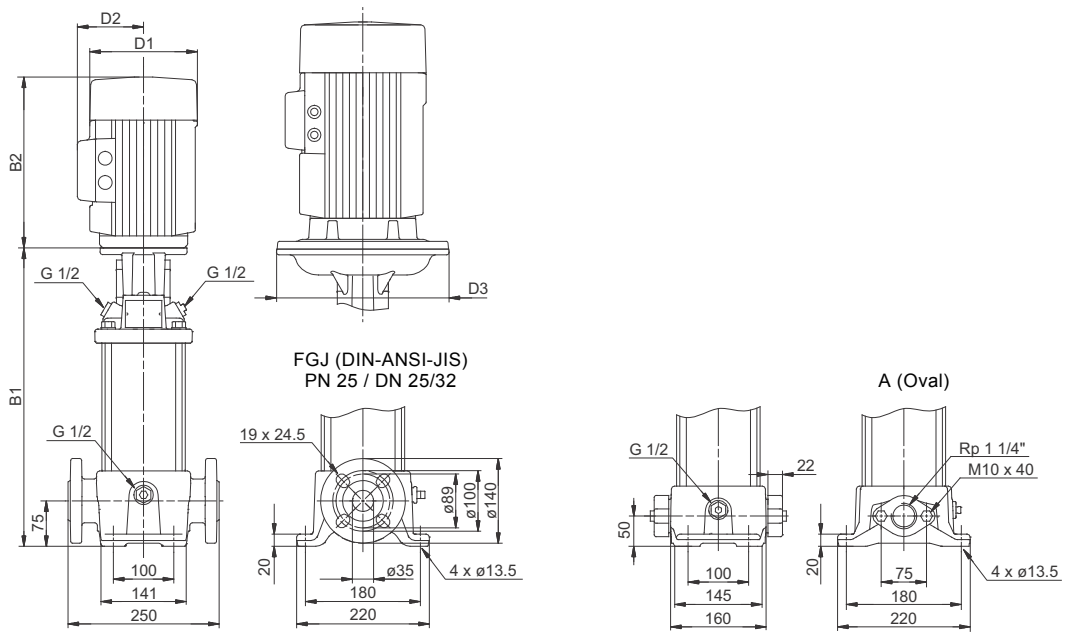
Dimensions and weights

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	0.37	257	448	282	473	141	109	16	21
CRI/CRN 3-4	0.37	275	466	300	491	141	109	17	21
CRI/CRN 3-5	0.37	293	484	318	509	141	109	17	21
CRI/CRN 3-6	0.55	311	502	336	527	141	109	18	23
CRI/CRN 3-7	0.55	329	520	354	545	141	109	19	23
CRI/CRN 3-8	0.75	353	584	378	609	141	109	21	26
CRI/CRN 3-9	0.75	371	602	396	627	141	109	22	26
CRI/CRN 3-10	0.75	389	620	414	645	141	109	22	26
CRI/CRN 3-11	1.10	407	658	432	683	141	109	25	29
CRI/CRN 3-12	1.10	425	676	450	701	141	109	25	29
CRI/CRN 3-13	1.10	443	694	468	719	141	109	26	30
CRI/CRN 3-15	1.10	479	730	504	755	141	109	26	31
CRI/CRN 3-17	1.50	531	812	556	837	178	110	34	38
CRI/CRN 3-19	1.50	567	848	592	873	178	110	34	39
CRI/CRN 3-21	2.20	603	924	628	949	178	110	36	40
CRI/CRN 3-23	2.20	639	960	664	985	178	110	37	41
CRI/CRN 3-25	2.20	675	996	700	1021	178	110	37	42
CRI/CRN 3-27	2.20	711	1032	736	1057	178	110	38	42
CRI/CRN 3-29	2.20	747	1068	772	1093	178	110	39	43
CRI/CRN 3-31	3.00	788	1123	813	1148	198	120	46	50
CRI/CRN 3-33	3.00	824	1159	849	1184	198	120	47	51
CRI/CRN 3-36	3.00	878	1213	903	1238	198	120	48	52

CR 5


CR 5
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-36
-32
-29
-26
-24
-22
-20
-18
-16
-15
-14
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
Eta
P2
H [m]
QH 2900 rpm
NPSH
NPSH [m]
TM02 7294 0918

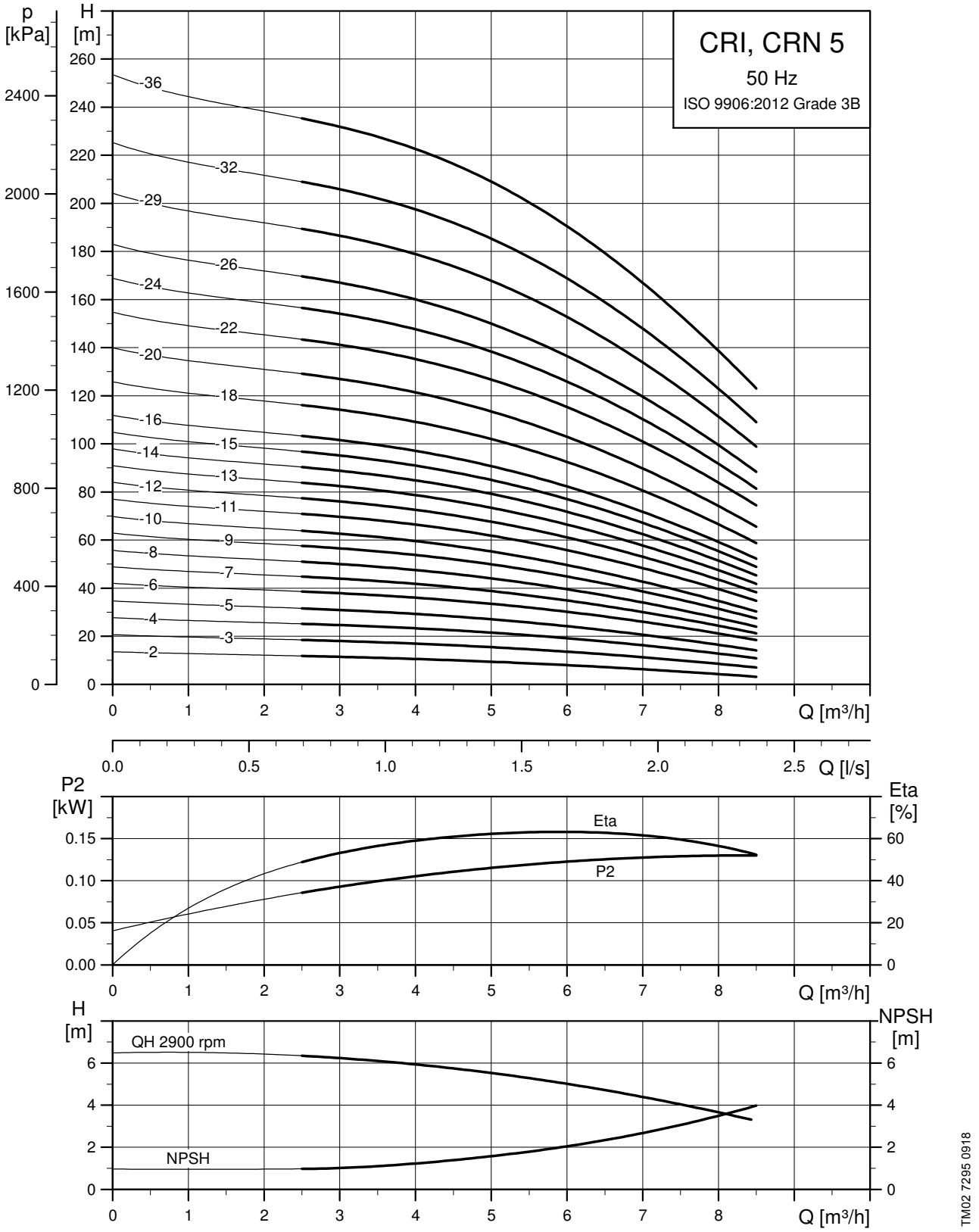
Dimensional sketch



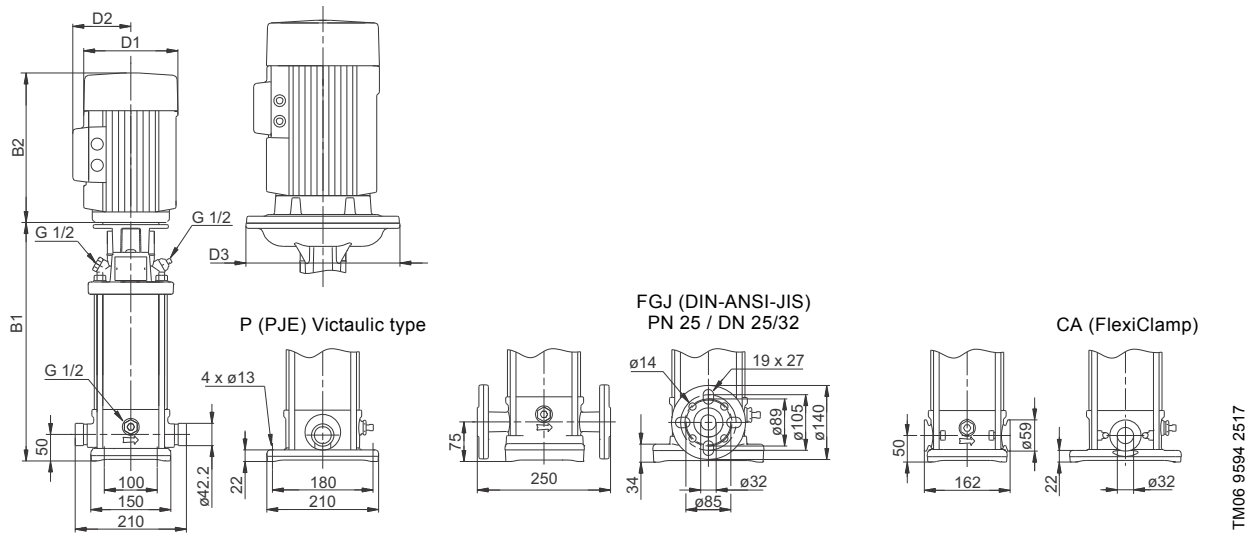
Dimensions and weights

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	0.37	254	445	279	470	141	109	-	18	23
CR 5-3	0.55	281	472	306	497	141	109	-	20	24
CR 5-4	0.55	308	499	333	524	141	109	-	20	25
CR 5-5	0.75	341	572	366	597	141	109	-	22	27
CR 5-6	1.10	368	619	393	644	141	109	-	25	30
CR 5-7	1.10	395	646	420	671	141	109	-	26	30
CR 5-8	1.10	422	673	447	698	141	109	-	26	31
CR 5-9	1.50	465	746	490	771	178	110	-	34	38
CR 5-10	1.50	492	773	517	798	178	110	-	34	39
CR 5-11	2.20	519	840	544	865	178	110	-	36	40
CR 5-12	2.20	546	867	571	892	178	110	-	36	41
CR 5-13	2.20	573	894	598	919	178	110	-	37	41
CR 5-14	2.20	600	921	625	946	178	110	-	37	42
CR 5-15	2.20	627	948	652	973	178	110	-	38	43
CR 5-16	2.20	654	975	679	1000	178	110	-	38	43
CR 5-18	3.00	712	1047	737	1072	198	120	-	46	50
CR 5-20	3.00	766	1101	791	1126	198	120	-	47	52
CR 5-22	4.00	820	1192	845	1217	220	134	-	57	62
CR 5-24	4.00	-	-	899	1271	220	134	-	-	63
CR 5-26	4.00	-	-	953	1325	220	134	-	-	64
CR 5-29	4.00	-	-	1034	1406	220	134	-	-	66
CR 5-32	5.50	-	-	1145	1536	220	134	300	-	82
CR 5-36	5.50	-	-	1253	1644	220	134	300	-	84

CRI, CRN 5


CRI, CRN 5
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-36
-32
-29
-26
-24
-22
-20
-18
-16
-15
-14
-13
-12
-11
-10
-9
-8
-7
-6
-5
-4
-3
-2
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
Eta
P2
H [m]
QH 2900 rpm
NPSH
NPSH [m]
TM02 7295 0918

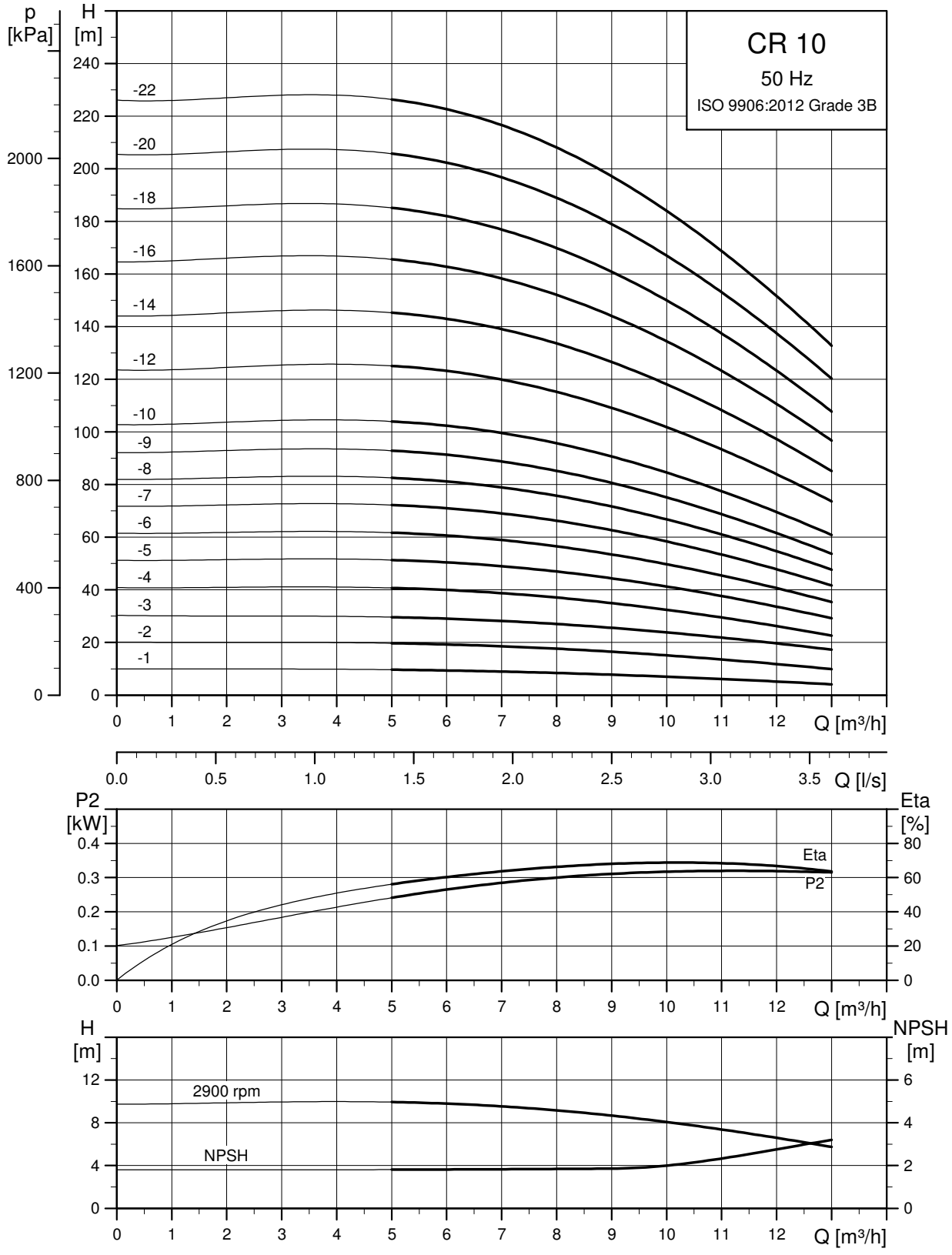
Dimensional sketch



Dimensions and weights

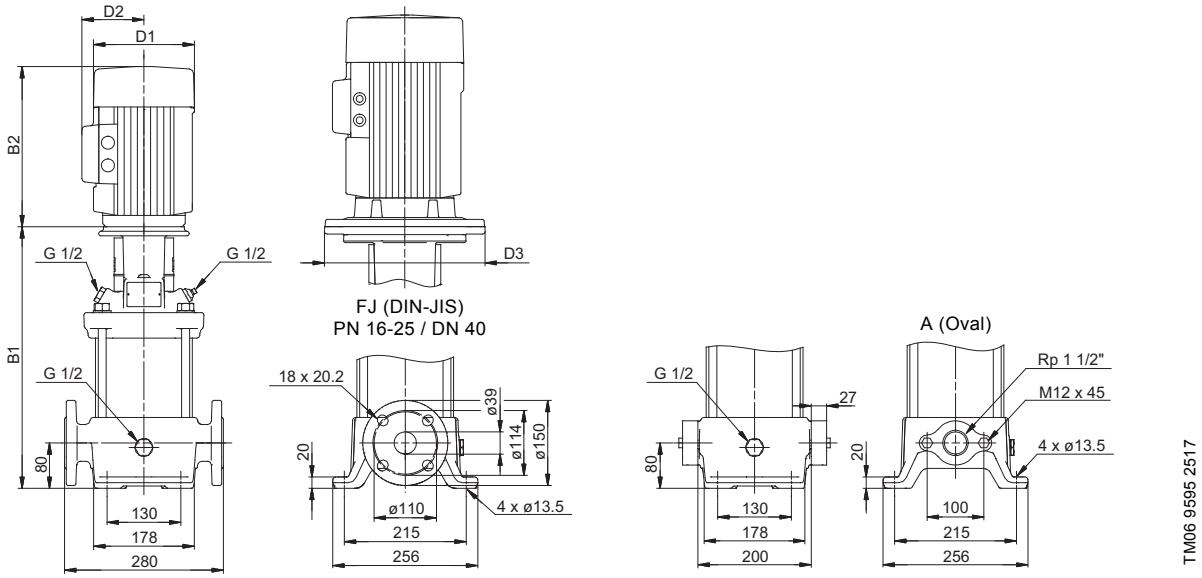
Pump type	Motor P_2 [kW]	CRI/CRN								
		Dimension [mm]							Net weight [kg]	
		PJE/CA		DIN flange		D1	D2	D3	PJE/ CA	DIN flange
		B1	B1+B2	B1	B1+B2					
CRI/CRN 5-2	0.37	257	448	282	473	141	109	-	16	21
CRI/CRN 5-3	0.55	284	475	309	500	141	109	-	18	22
CRI/CRN 5-4	0.55	311	502	336	527	141	109	-	18	22
CRI/CRN 5-5	0.75	344	575	369	600	141	109	-	21	25
CRI/CRN 5-6	1.10	371	622	396	647	141	109	-	24	28
CRI/CRN 5-7	1.10	398	649	423	674	141	109	-	24	29
CRI/CRN 5-8	1.10	425	676	450	701	141	109	-	25	29
CRI/CRN 5-9	1.50	468	749	493	774	178	110	-	32	36
CRI/CRN 5-10	1.50	495	776	520	801	178	110	-	32	37
CRI/CRN 5-11	2.20	522	843	547	868	178	110	-	34	38
CRI/CRN 5-12	2.20	549	870	574	895	178	110	-	34	38
CRI/CRN 5-13	2.20	576	897	601	922	178	110	-	35	39
CRI/CRN 5-14	2.20	603	924	628	949	178	110	-	35	40
CRI/CRN 5-15	2.20	630	951	655	976	178	110	-	36	40
CRI/CRN 5-16	2.20	657	978	682	1003	178	110	-	36	41
CRI/CRN 5-18	3.00	716	1051	741	1076	198	120	-	44	48
CRI/CRN 5-20	3.00	770	1105	795	1130	198	120	-	45	49
CRI/CRN 5-22	4.00	824	1196	849	1221	220	134	-	55	59
CRI/CRN 5-24	4.00	878	1250	903	1275	220	134	-	56	61
CRI/CRN 5-26	4.00	932	1304	957	1329	220	134	-	58	62
CRI/CRN 5-29	4.00	1013	1385	1038	1410	220	134	-	59	64
CRI/CRN 5-32	5.50	1123	1514	1148	1539	220	134	300	75	79
CRI/CRN 5-36	5.50	1231	1622	1256	1647	220	134	300	77	81

CR 10



TM02 7296 0918

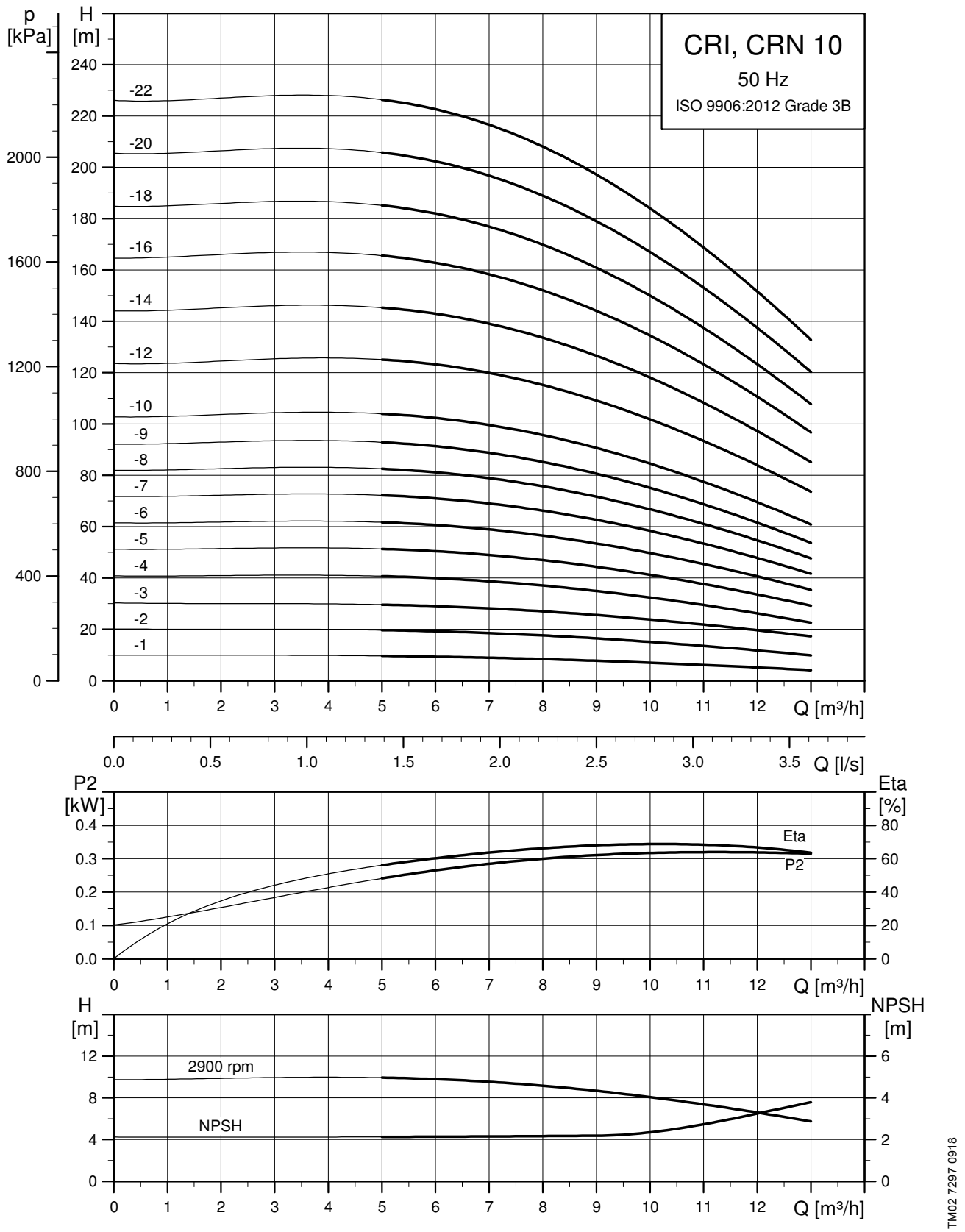
Dimensional sketch



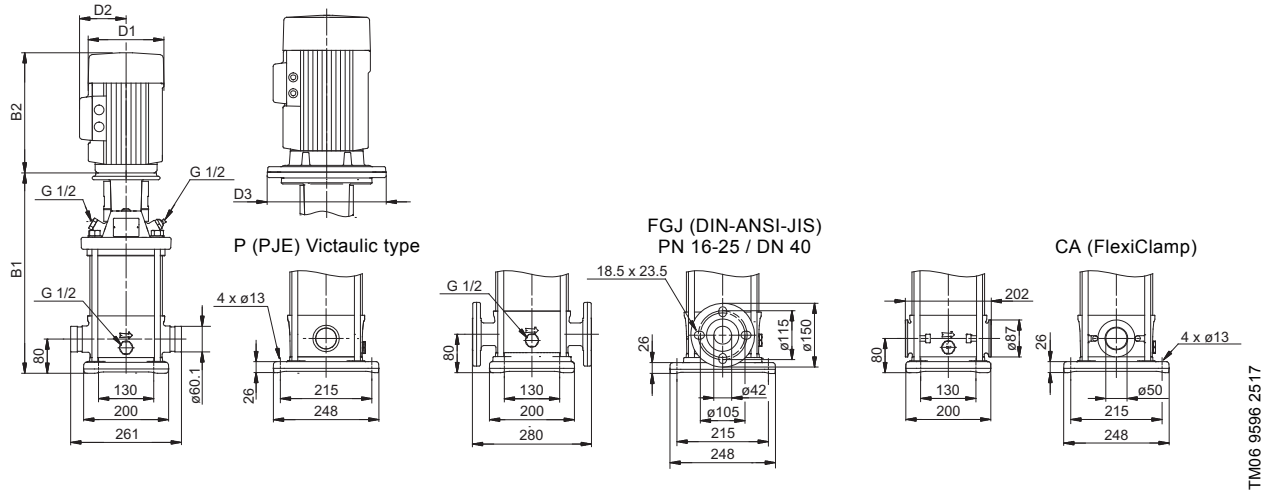
Dimensions and weights

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	0.37	343	534	343	534	141	109	-	31	34
CR 10-2	0.75	347	578	347	578	141	109	-	34	36
CR 10-3	1.10	377	628	377	628	141	109	-	37	39
CR 10-4	1.50	423	704	423	704	178	110	-	45	47
CR 10-5	2.20	453	774	453	774	178	110	-	46	49
CR 10-6	2.20	483	804	483	804	178	110	-	47	50
CR 10-7	3.00	518	853	518	853	198	120	-	54	57
CR 10-8	3.00	548	883	548	883	198	120	-	55	58
CR 10-9	3.00	578	913	578	913	198	120	-	56	59
CR 10-10	4.00	608	980	608	980	220	134	-	66	69
CR 10-12	4.00	668	1040	668	1040	220	134	-	69	71
CR 10-14	5.50	760	1151	760	1151	220	134	300	91	94
CR 10-16	5.50	820	1211	820	1211	220	134	300	93	96
CR 10-18	7.50	-	-	880	1259	260	159	300	-	109
CR 10-20	7.50	-	-	940	1319	260	159	300	-	112
CR 10-22	7.50	-	-	1000	1379	260	159	300	-	114

CRI, CRN 10


CRI, CRN 10
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-22
-20
-18
-16
-14
-12
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
Eta
P2
H [m]
NPSH [m]
2900 rpm
NPSH
TM02 7297 0918

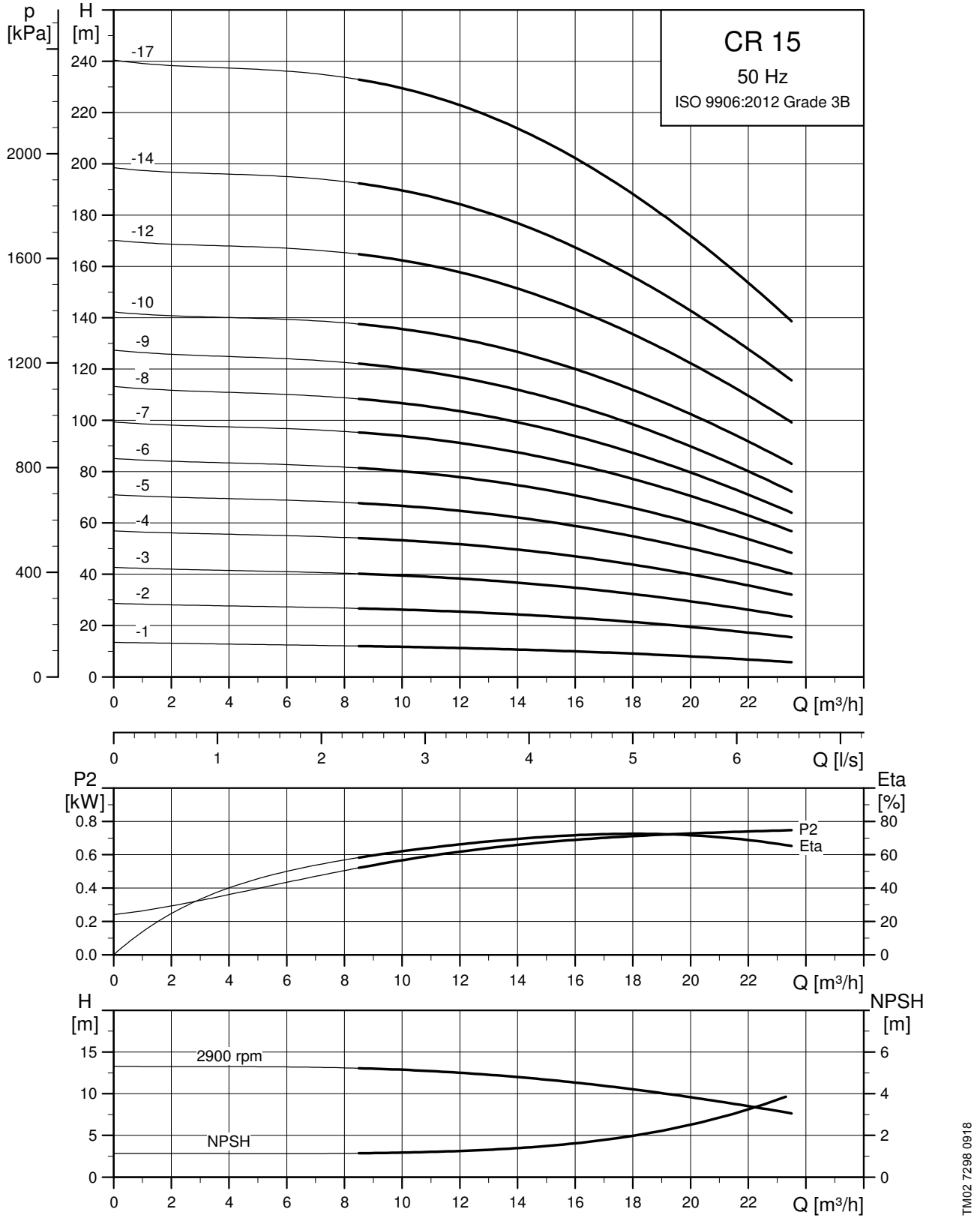
Dimensional sketch



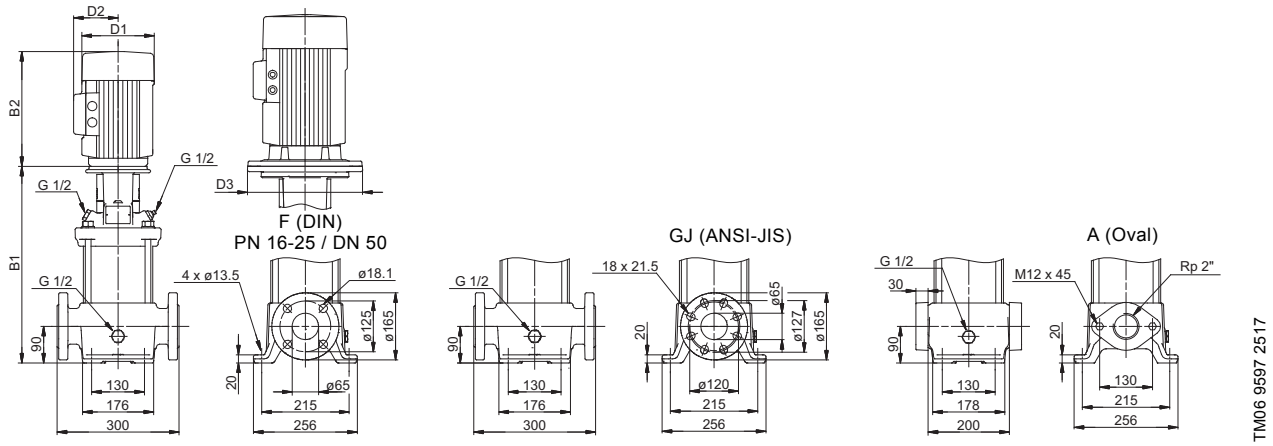
Dimensions and weights

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	0.37	353	544	353	544	141	109	-	28	32
CRI/CRN 10-2	0.75	357	588	357	588	141	109	-	31	34
CRI/CRN 10-3	1.10	387	638	387	638	141	109	-	34	38
CRI/CRN 10-4	1.50	433	714	433	714	178	110	-	42	46
CRI/CRN 10-5	2.20	463	784	463	784	178	110	-	44	48
CRI/CRN 10-6	2.20	493	814	493	814	178	110	-	45	49
CRI/CRN 10-7	3.00	528	863	528	863	198	120	-	52	56
CRI/CRN 10-8	3.00	558	893	558	893	198	120	-	54	57
CRI/CRN 10-9	3.00	588	923	588	923	198	120	-	55	58
CRI/CRN 10-10	4.00	618	990	618	990	220	134	-	65	68
CRI/CRN 10-12	4.00	678	1050	678	1050	220	134	-	67	70
CRI/CRN 10-14	5.50	770	1161	770	1161	220	134	300	89	93
CRI/CRN 10-16	5.50	830	1221	830	1221	220	134	300	91	95
CRI/CRN 10-18	7.50	890	1269	890	1269	260	159	300	104	108
CRI/CRN 10-20	7.50	950	1329	950	1329	260	159	300	106	110
CRI/CRN 10-22	7.50	1010	1389	1010	1389	260	159	300	108	112

CR 15


CR 15
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-17
-14
-12
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
P2
Eta
H [m]
NPSH [m]
2900 rpm
NPSH
TM02 7298 0918

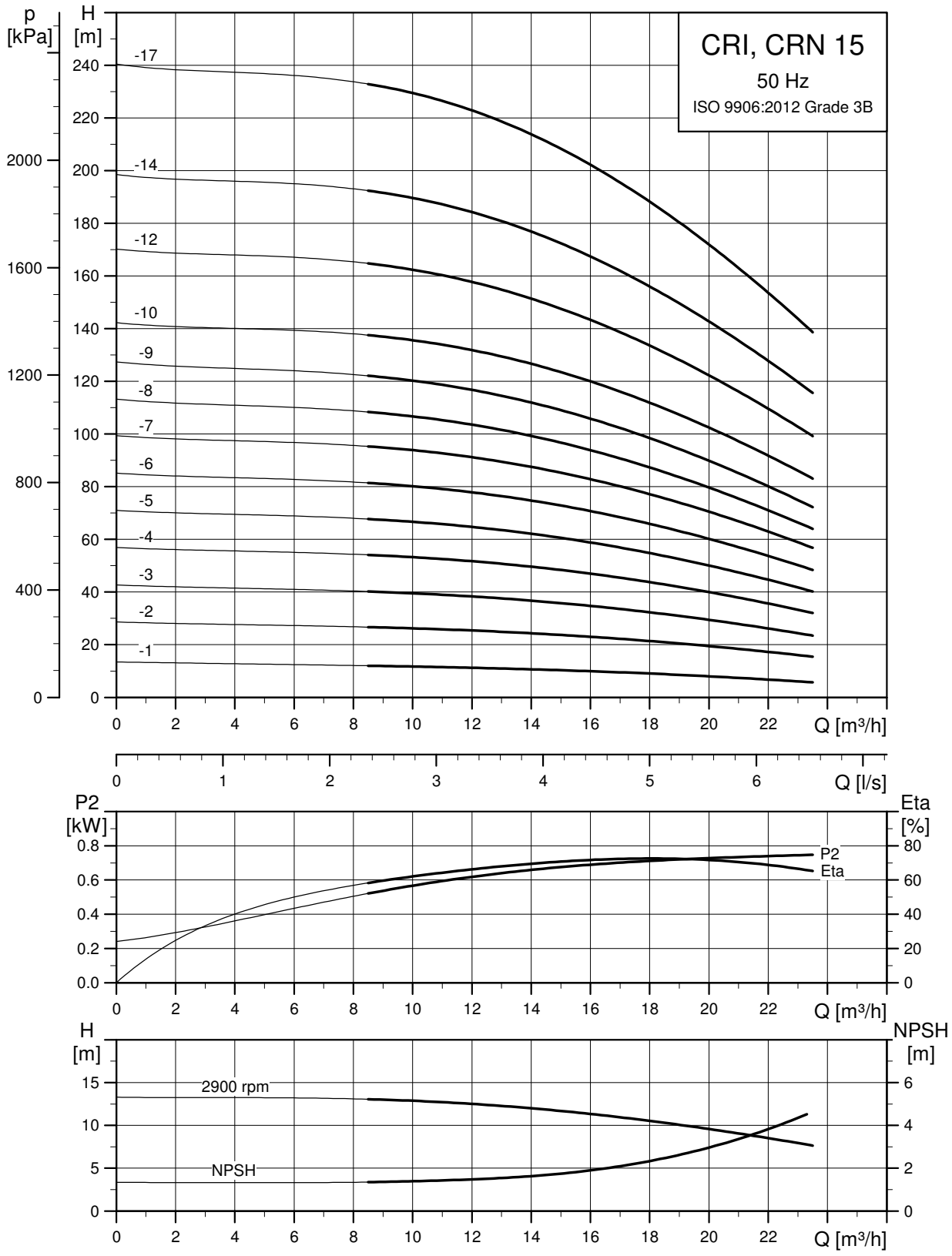
Dimensional sketch



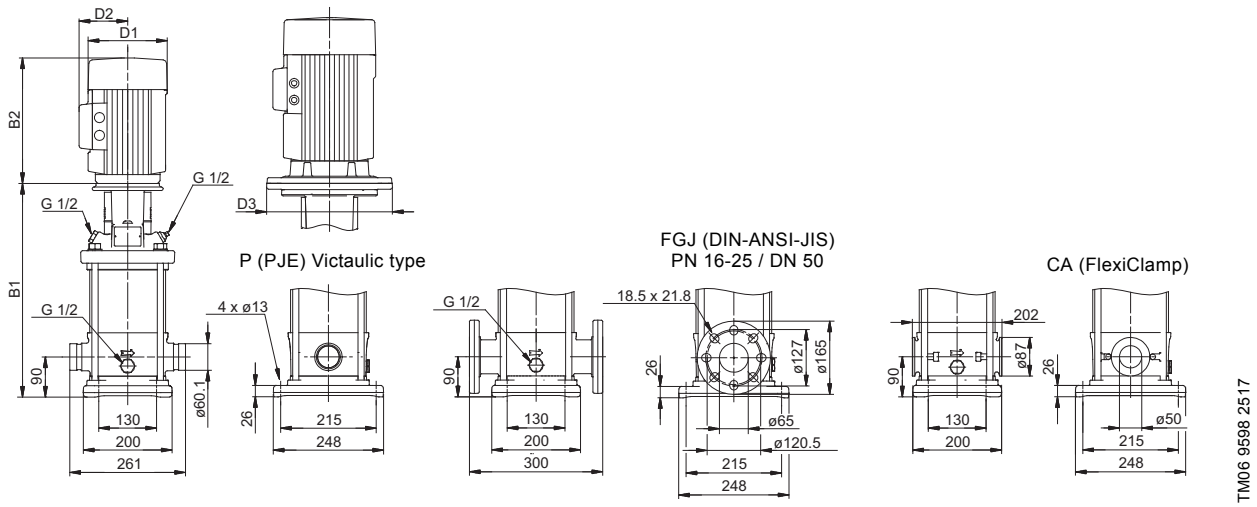
Dimensions and weights

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	1.10	400	651	400	651	141	109	-	41	42
CR 15-2	2.20	415	736	415	736	178	110	-	49	50
CR 15-3	3.00	465	800	465	800	198	120	-	56	57
CR 15-4	4.00	510	882	510	882	220	134	-	67	68
CR 15-5	4.00	555	927	555	927	220	134	-	68	69
CR 15-6	5.50	632	1023	632	1023	220	134	300	90	91
CR 15-7	5.50	677	1068	677	1068	220	134	300	92	93
CR 15-8	7.50	-	-	722	1101	260	159	300	-	105
CR 15-9	7.50	-	-	767	1146	260	159	300	-	107
CR 15-10	11.00	-	-	889	1360	314	204	350	-	149
CR 15-12	11.00	-	-	979	1450	314	204	350	-	153
CR 15-14	11.00	-	-	1069	1540	314	204	350	-	157
CR 15-17	15.00	-	-	1204	1675	314	204	350	-	175

CRI, CRN 15


CRI, CRN 15
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-17
-14
-12
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
P2
Eta
H [m]
NPSH [m]
2900 rpm
NPSH
TM02 7299 0918

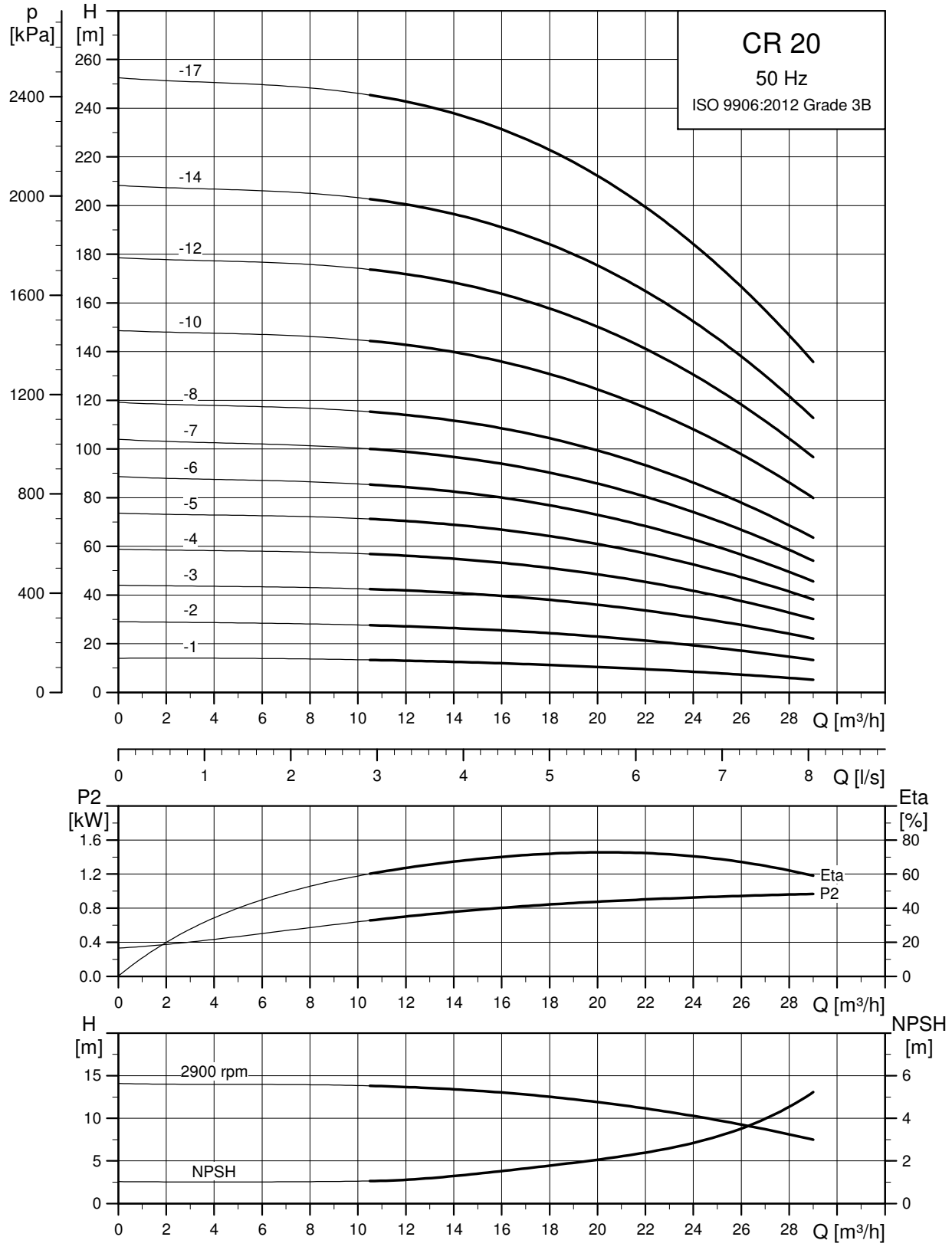
Dimensional sketch



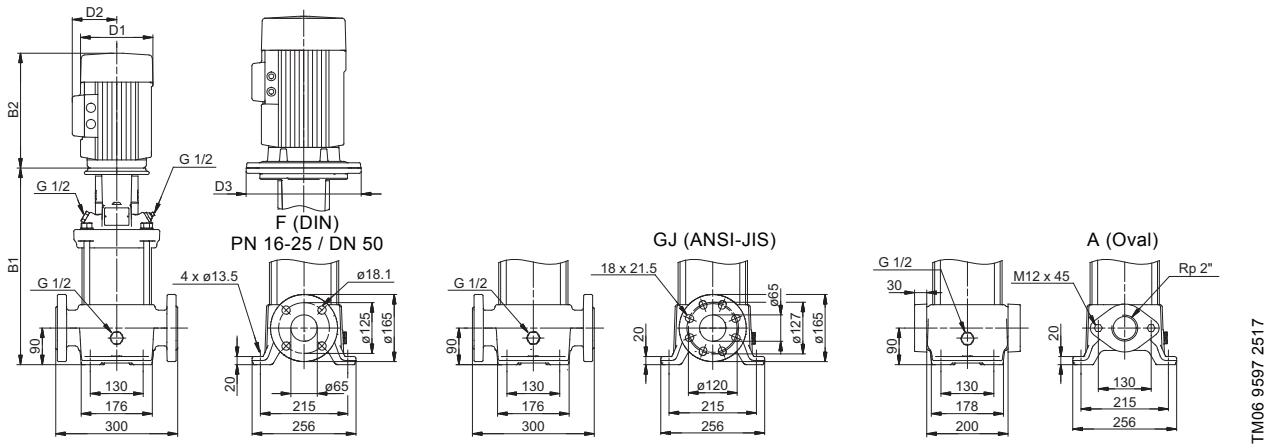
Dimensions and weights

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 15-1	1.10	397	648	397	648	141	109	-	34	39
CRI/CRN 15-2	2.20	413	734	413	734	178	110	-	42	47
CRI/CRN 15-3	3.00	463	798	463	798	198	120	-	50	55
CRI/CRN 15-4	4.00	508	880	508	880	220	134	-	61	65
CRI/CRN 15-5	4.00	553	925	553	925	220	134	-	62	67
CRI/CRN 15-6	5.50	630	1021	630	1021	220	134	300	84	89
CRI/CRN 15-7	5.50	675	1066	675	1066	220	134	300	86	90
CRI/CRN 15-8	7.50	720	1099	720	1099	260	159	300	98	103
CRI/CRN 15-9	7.50	765	1144	765	1144	260	159	300	100	104
CRI/CRN 15-10	11.00	887	1358	887	1358	314	204	350	142	147
CRI/CRN 15-12	11.00	977	1448	977	1448	314	204	350	145	150
CRI/CRN 15-14	11.00	1067	1538	1067	1538	314	204	350	149	153
CRI/CRN 15-17	15.00	1202	1673	1202	1673	314	204	350	167	171

CR 20


CR 20
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-17
-14
-12
-10
-8
-7
-6
-5
-4
-3
-2
-1
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
Eta
P2
H [m]
NPSH [m]
2900 rpm
NPSH
TM02 7300 0918

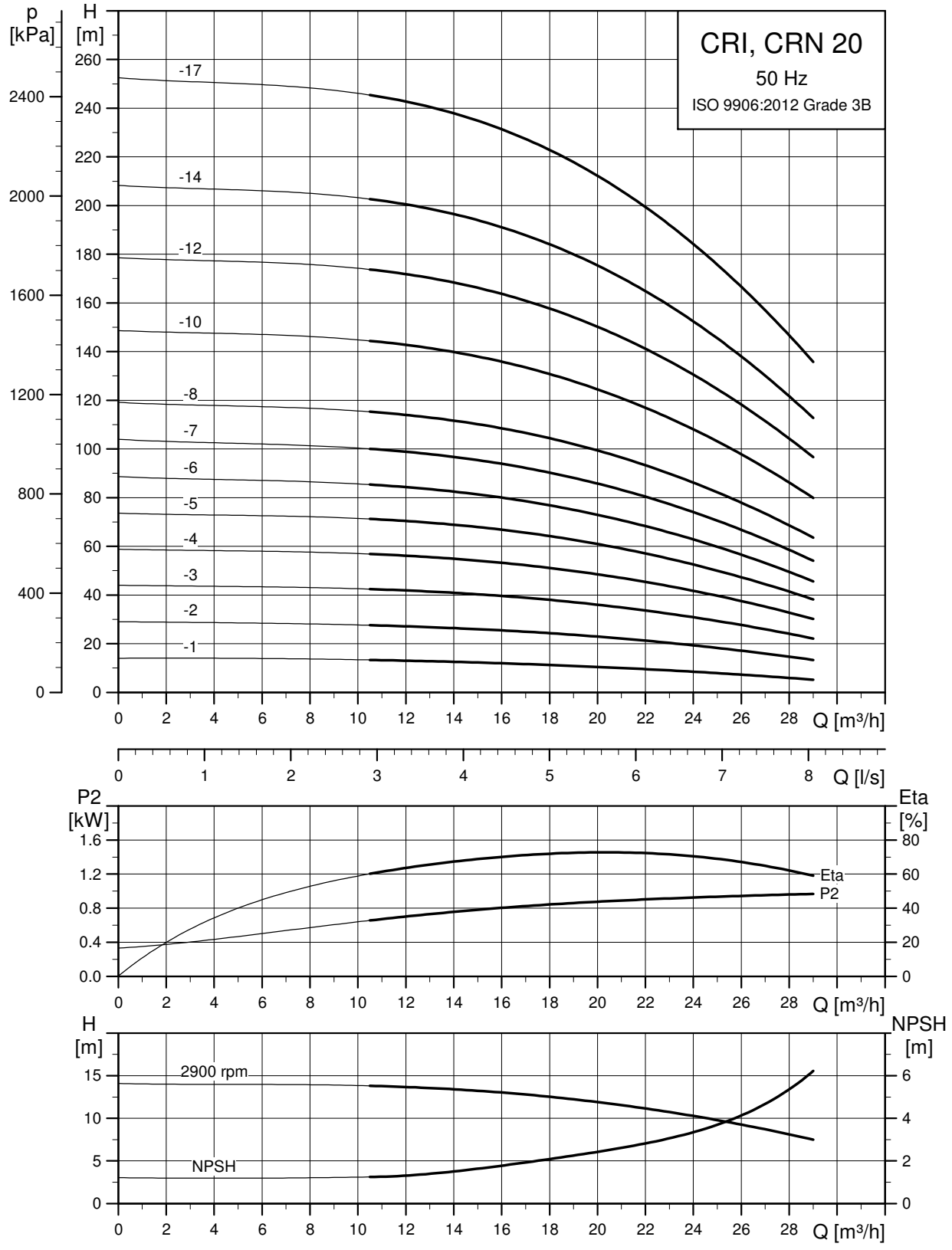
Dimensional sketch



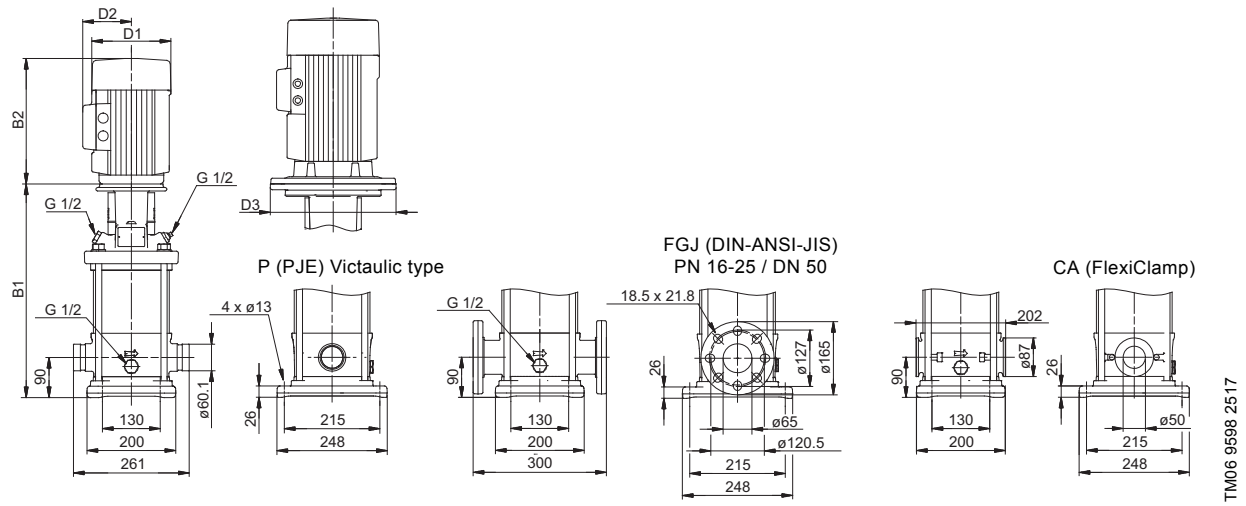
Dimensions and weights

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	1.10	400	651	400	651	141	109	-	41	42
CR 20-2	2.20	415	736	415	736	178	110	-	49	50
CR 20-3	4.00	465	837	465	837	220	134	-	65	66
CR 20-4	5.50	542	933	542	933	220	134	300	87	88
CR 20-5	5.50	587	978	587	978	220	134	300	89	90
CR 20-6	7.50	632	1011	632	1011	260	159	300	101	102
CR 20-7	7.50	677	1056	677	1056	260	159	300	103	103
CR 20-8	11.00	-	-	799	1270	314	204	350	-	146
CR 20-10	11.00	-	-	889	1360	314	204	350	-	149
CR 20-12	15.00	-	-	979	1450	314	204	350	-	166
CR 20-14	15.00	-	-	1069	1540	314	204	350	-	170
CR 20-17	18.50	-	-	1204	1719	314	204	350	-	188

CRI, CRN 20


CRI, CRN 20
50 Hz
ISO 9906:2012 Grade 3B
p [kPa]
H [m]
-17
-14
-12
-10
-8
-7
-6
-5
-4
-3
-2
-1
Q [m³/h]
Q [l/s]
P2 [kW]
Eta [%]
Eta
P2
H [m]
NPSH [m]
2900 rpm
NPSH
TM02 7301 0918

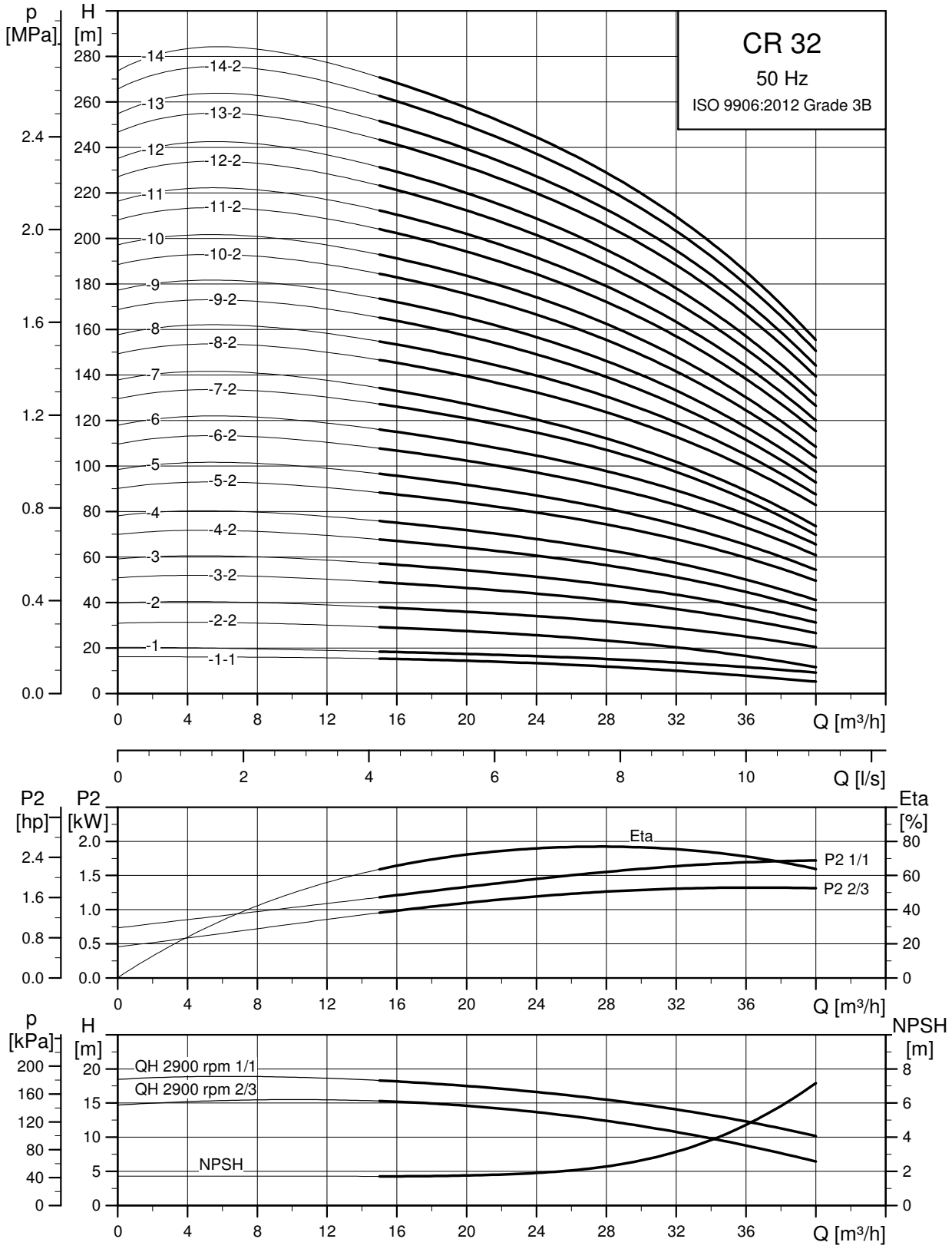
Dimensional sketch



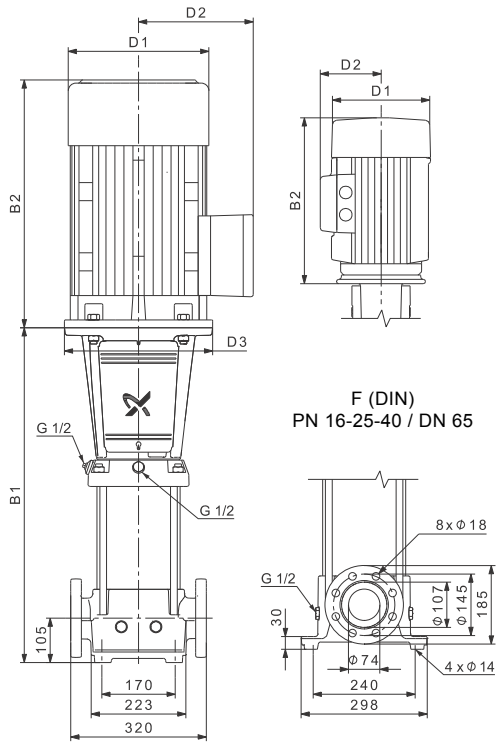
Dimensions and weights

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 20-1	1.10	397	648	397	648	141	109	-	34	39
CRI/CRN 20-2	2.20	413	734	413	734	178	110	-	42	47
CRI/CRN 20-3	4.00	463	835	463	835	220	134	-	59	64
CRI/CRN 20-4	5.50	540	931	540	931	220	134	300	81	86
CRI/CRN 20-5	5.50	585	976	585	976	220	134	300	82	87
CRI/CRN 20-6	7.50	630	1009	630	1009	260	159	300	94	99
CRI/CRN 20-7	7.50	675	1054	675	1054	260	159	300	96	101
CRI/CRN 20-8	11.00	797	1268	797	1268	314	204	350	138	143
CRI/CRN 20-10	11.00	887	1358	887	1358	314	204	350	142	147
CRI/CRN 20-12	15.00	977	1448	977	1448	314	204	350	158	163
CRI/CRN 20-14	15.00	1067	1538	1067	1538	314	204	350	162	166
CRI/CRN 20-17	18.50	1202	1717	1202	1717	314	204	350	180	184

CR 32


CR 32
50 Hz
ISO 9906:2012 Grade 3B
p [MPa]
H [m]
-14
-14-2
-13
-13-2
-12
-12-2
-11
-11-2
-10
-10-2
-9
-9-2
-8
-8-2
-7
-7-2
-6
-6-2
-5
-5-2
-4
-4-2
-3
-3-2
-2
-2-2
-1
-1-1
Q [m³/h]
Q [l/s]
P2 [hp]
P2 [kW]
Eta [%]
Eta
P2 1/1
P2 2/3
p [kPa]
H [m]
NPSH [m]
QH 2900 rpm 1/1
QH 2900 rpm 2/3
NPSH
TM02 7302 0918

Dimensional sketch

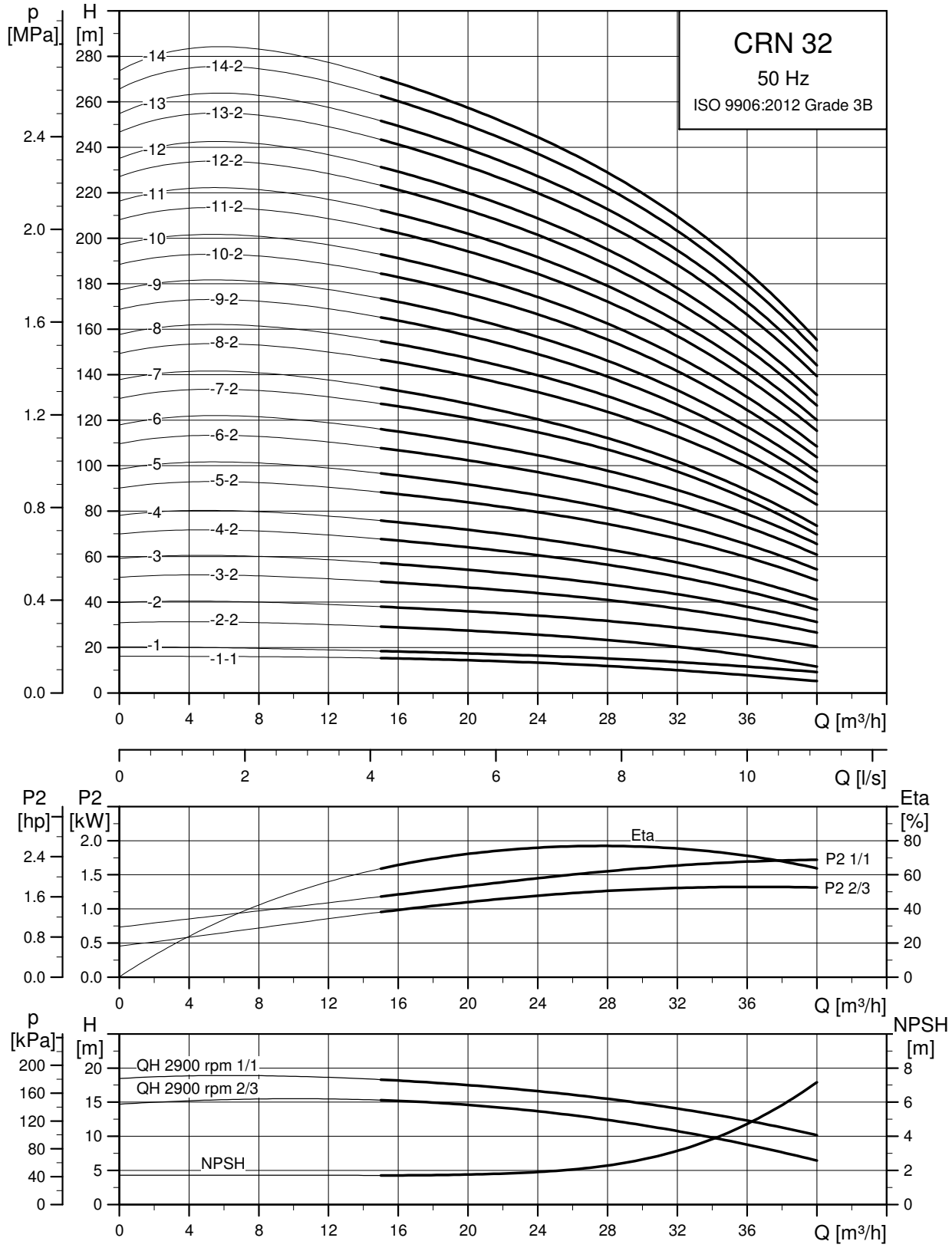


TM06 9605 2517

Dimensions and weights

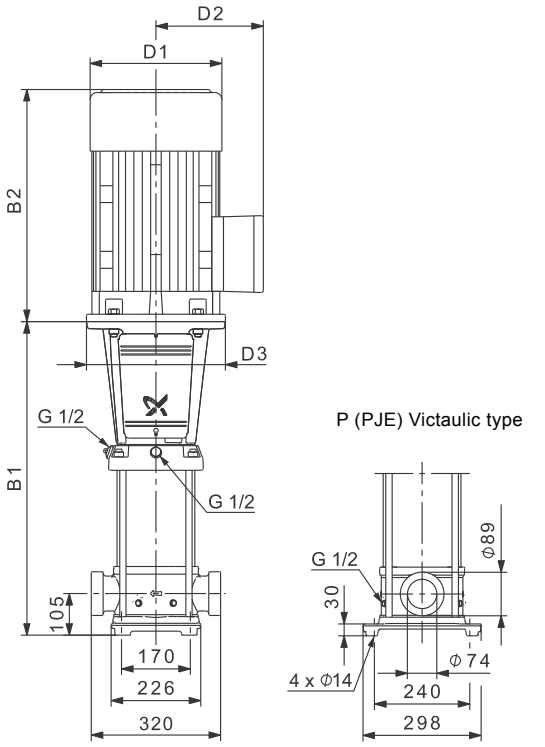
Pump type	Motor P_2 [kW]	CR					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CR 32-1-1	1.50	505	786	178	110	-	64
CR 32-1	2.20	505	826	178	110	-	64
CR 32-2-2	3.00	575	910	198	120	-	73
CR 32-2	4.00	575	947	220	134	-	82
CR 32-3-2	5.50	645	1036	220	134	300	96
CR 32-3	5.50	645	1036	220	134	300	96
CR 32-4-2	7.50	715	1094	260	159	300	110
CR 32-4	7.50	715	1094	260	159	300	111
CR 32-5-2	11.00	895	1366	314	204	350	158
CR 32-5	11.00	895	1366	314	204	350	158
CR 32-6-2	11.00	965	1436	314	204	350	161
CR 32-6	11.00	965	1436	314	204	350	161
CR 32-7-2	15.00	1035	1506	314	204	350	177
CR 32-7	15.00	1035	1506	314	204	350	177
CR 32-8-2	15.00	1105	1576	314	204	350	183
CR 32-8	15.00	1105	1576	314	204	350	183
CR 32-9-2	18.50	1175	1690	314	204	350	200
CR 32-9	18.50	1175	1690	314	204	350	200
CR 32-10-2	18.50	1245	1760	314	204	350	203
CR 32-10	18.50	1245	1760	314	204	350	203
CR 32-11-2	22.00	1315	1856	314	204	350	220
CR 32-11	22.00	1315	1856	314	204	350	220
CR 32-12-2	22.00	1385	1926	314	204	350	224
CR 32-12	22.00	1385	1926	314	204	350	224
CR 32-13-2	30.00	1455	2066	396	315	400	344
CR 32-13	30.00	1455	2066	396	315	400	344
CR 32-14-2	30.00	1525	2136	396	315	400	347
CR 32-14	30.00	1525	2136	396	315	400	347

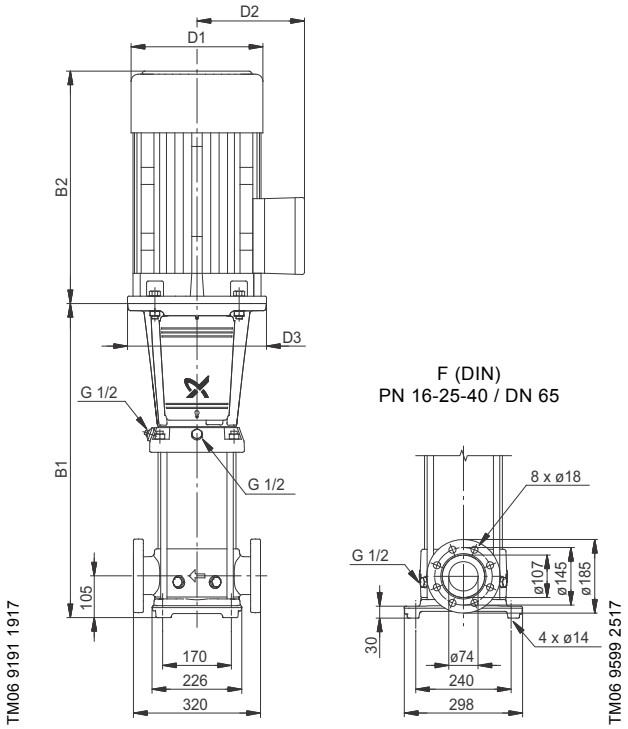
CRN 32



TM02 7303 0918

Dimensional sketch

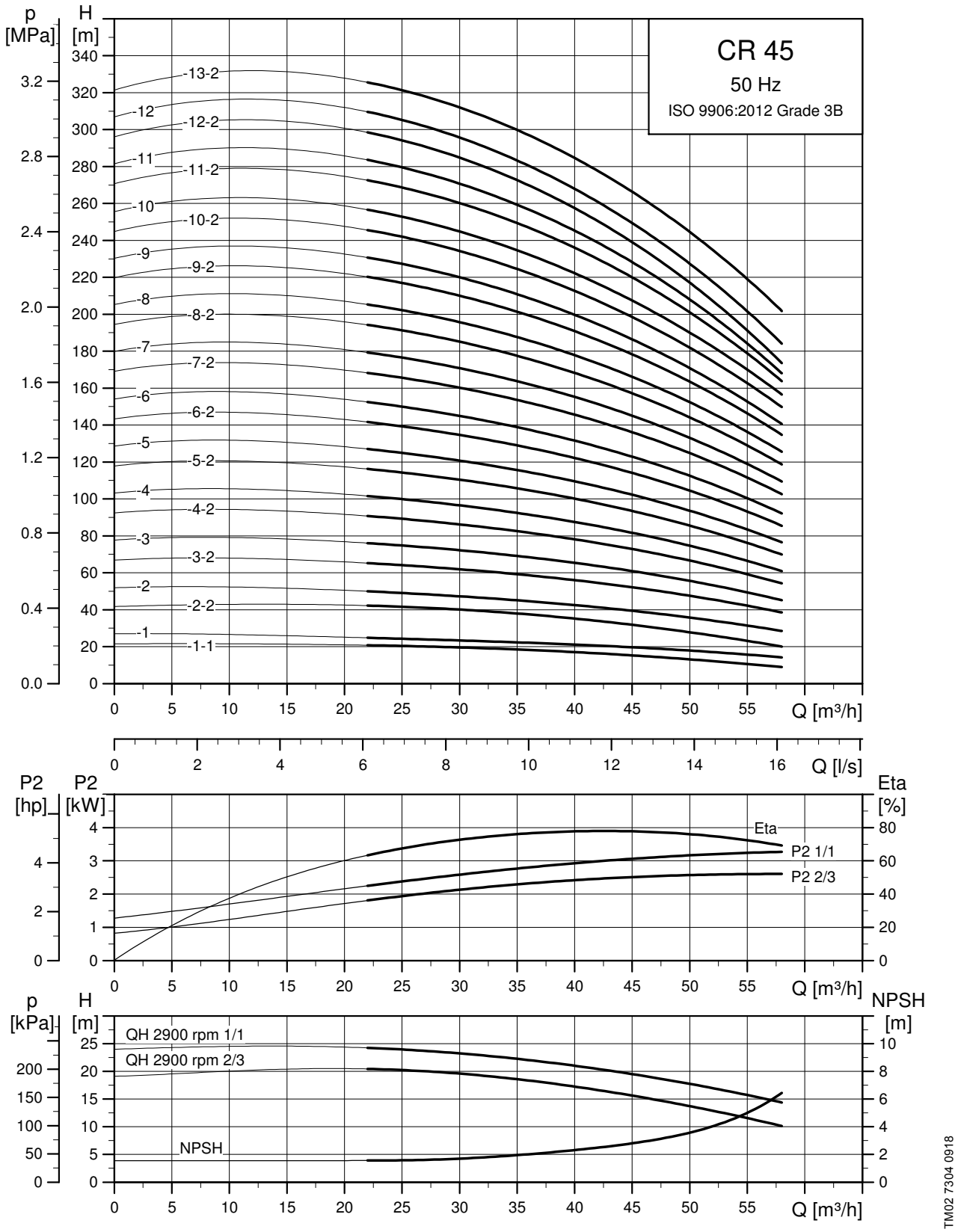




Dimensions and weights

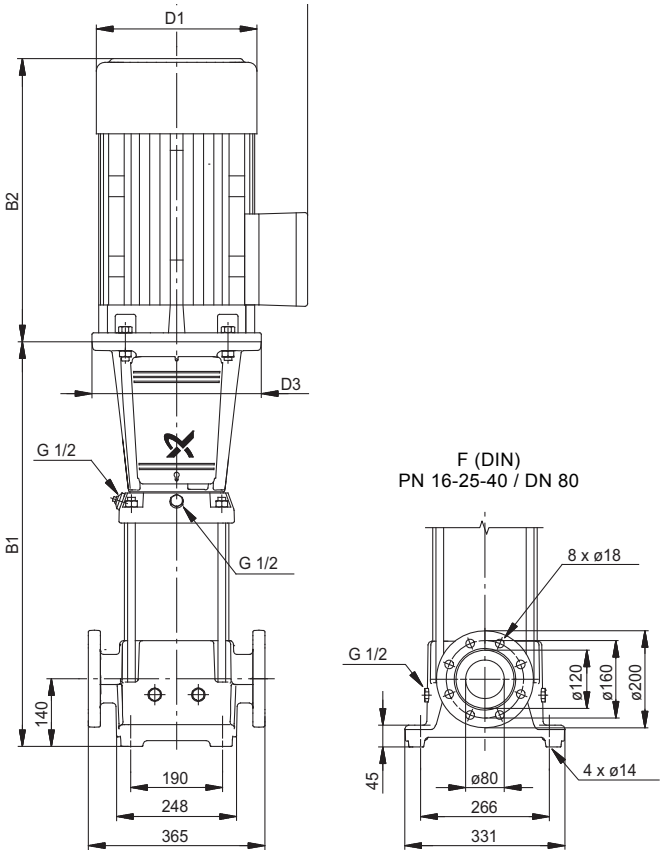
Pump type	Motor P_2 [kW]	CRN Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 32-1-1	1.50	505	786	178	110	-	66
CRN 32-1	2.20	505	826	178	110	-	66
CRN 32-2-2	3.00	575	910	198	120	-	75
CRN 32-2	4.00	575	947	220	134	-	84
CRN 32-3-2	5.50	645	1036	220	134	300	99
CRN 32-3	5.50	645	1036	220	134	300	99
CRN 32-4-2	7.50	715	1094	260	159	300	112
CRN 32-4	7.50	715	1094	260	159	300	112
CRN 32-5-2	11.00	895	1366	314	204	350	160
CRN 32-5	11.00	895	1366	314	204	350	160
CRN 32-6-2	11.00	965	1436	314	204	350	163
CRN 32-6	11.00	965	1436	314	204	350	163
CRN 32-7-2	15.00	1035	1506	314	204	350	179
CRN 32-7	15.00	1035	1506	314	204	350	179
CRN 32-8-2	15.00	1105	1576	314	204	350	185
CRN 32-8	15.00	1105	1576	314	204	350	185
CRN 32-9-2	18.50	1175	1690	314	204	350	202
CRN 32-9	18.50	1175	1690	314	204	350	202
CRN 32-10-2	18.50	1245	1760	314	204	350	205
CRN 32-10	18.50	1245	1760	314	204	350	205
CRN 32-11-2	22.00	1315	1856	314	204	350	222
CRN 32-11	22.00	1315	1856	314	204	350	222
CRN 32-12-2	22.00	1385	1926	314	204	350	226
CRN 32-12	22.00	1385	1926	314	204	350	226
CRN 32-13-2	30.00	1455	2066	396	315	400	346
CRN 32-13	30.00	1455	2066	396	315	400	346
CRN 32-14-2	30.00	1525	2136	396	315	400	350
CRN 32-14	30.00	1525	2136	396	315	400	350

CR 45



TM02 7304 0918

Dimensional sketch

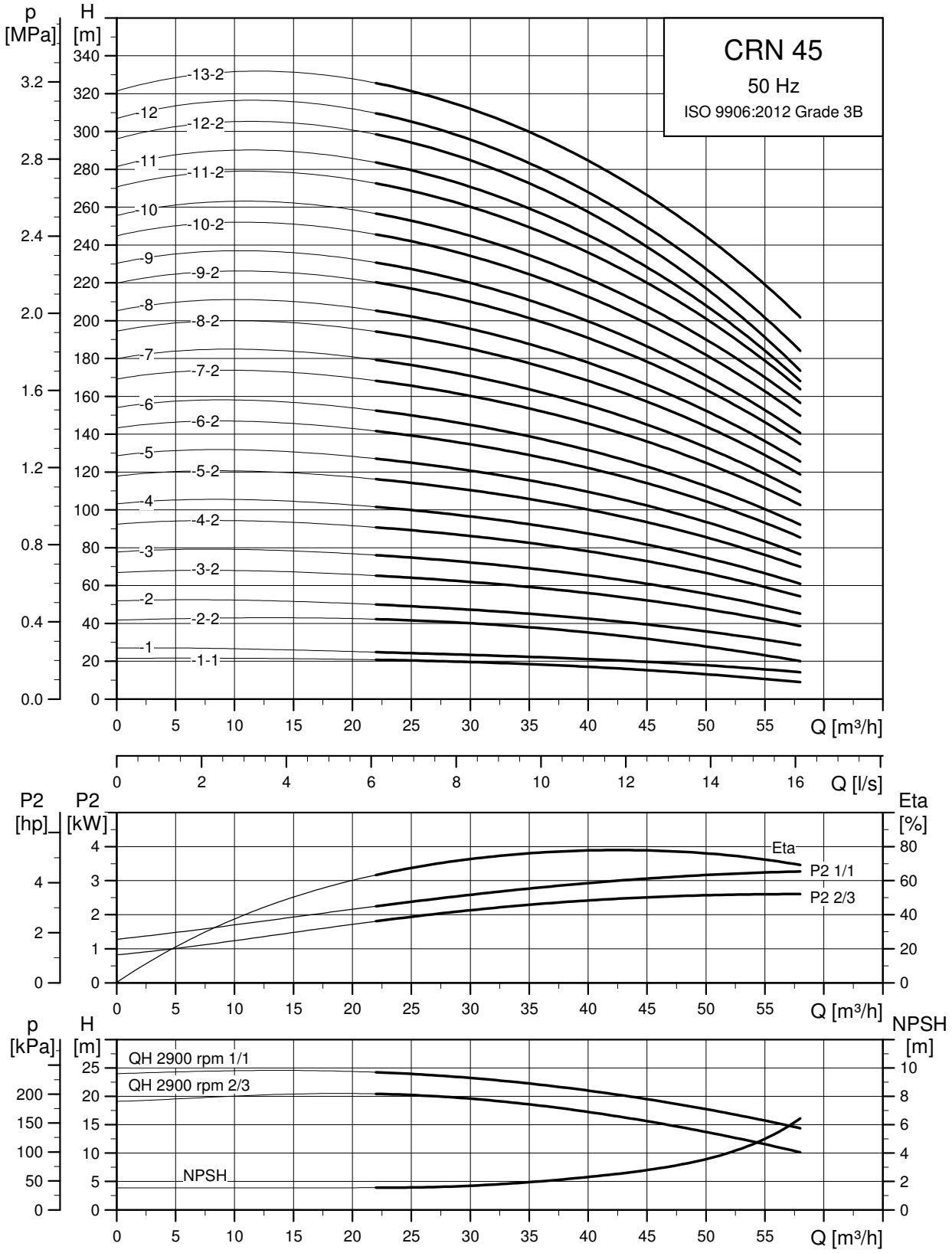


TM06 9600 2517

Dimensions and weights

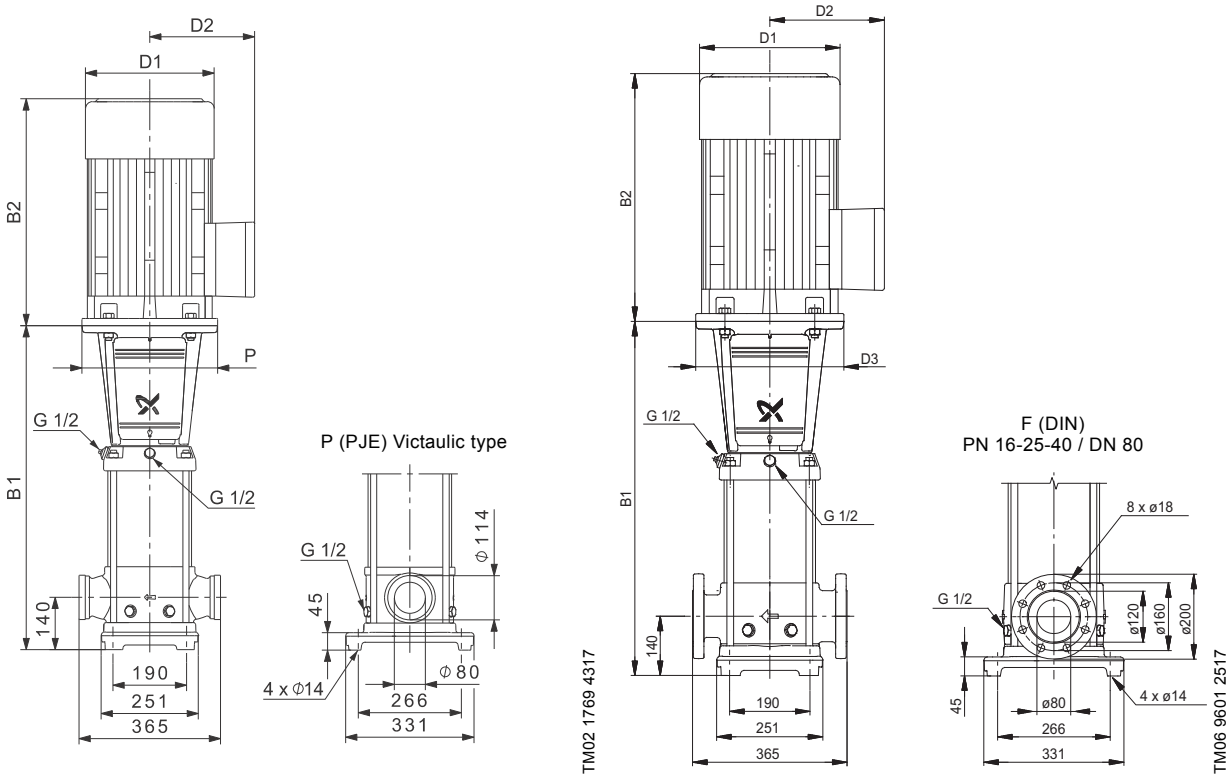
Pump type	Motor P_2 [kW]	CR					
		Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 45-1-1	3.00	559	894	198	120	-	80
CR 45-1	4.00	559	931	220	134	-	89
CR 45-2-2	5.50	639	1030	220	134	300	104
CR 45-2	7.50	639	1018	260	159	300	114
CR 45-3-2	11.00	829	1300	314	204	350	163
CR 45-3	11.00	829	1300	314	204	350	163
CR 45-4-2	15.00	909	1380	314	204	350	180
CR 45-4	15.00	909	1380	314	204	350	180
CR 45-5-2	18.50	989	1504	314	204	350	197
CR 45-5	18.50	989	1504	314	204	350	197
CR 45-6-2	22.00	1069	1610	314	204	350	217
CR 45-6	22.00	1069	1610	314	204	350	217
CR 45-7-2	30.00	1149	1760	396	315	400	339
CR 45-7	30.00	1149	1760	396	315	400	339
CR 45-8-2	30.00	1229	1840	396	315	400	343
CR 45-8	30.00	1229	1840	396	315	400	343
CR 45-9-2	30.00	1309	1920	396	315	400	347
CR 45-9	37.00	1309	1945	396	315	400	362
CR 45-10-2	37.00	1389	2025	396	315	400	367
CR 45-10	37.00	1389	2025	396	315	400	367
CR 45-11-2	45.00	1469	2177	439	338	450	455
CR 45-11	45.00	1469	2177	439	338	450	455
CR 45-12-2	45.00	1549	2257	439	338	450	460
CR 45-12	45.00	1549	2257	439	338	450	460
CR 45-13-2	45.00	1629	2337	439	338	450	464

CRN 45



TM02 7305 0918

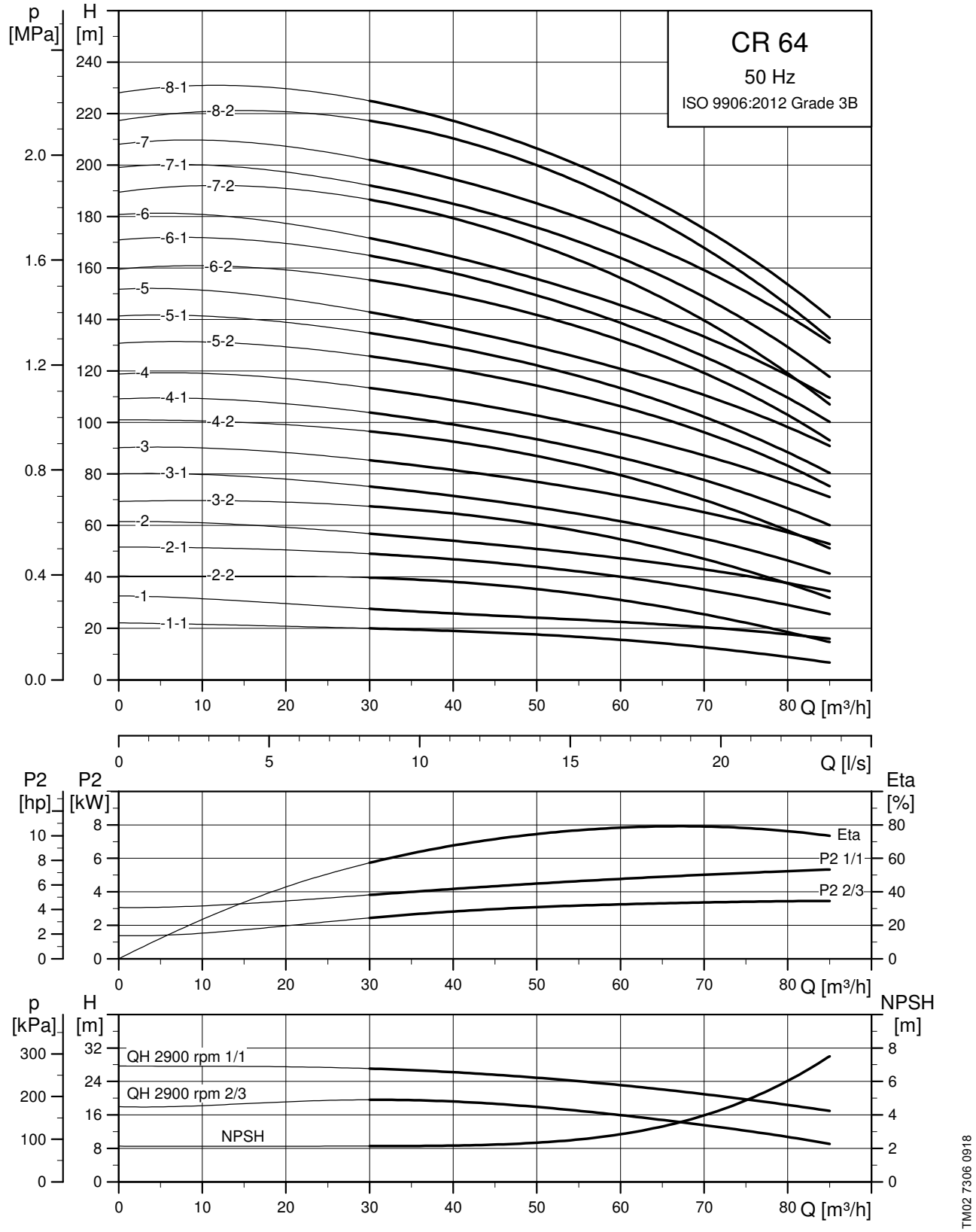
Dimensional sketch



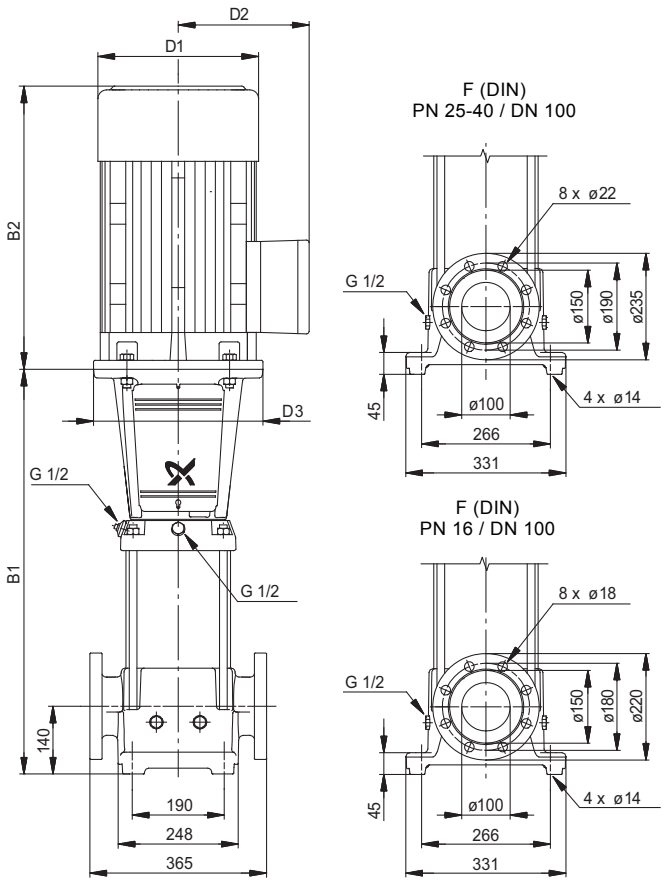
Dimensions and weights

Pump type	Motor P_2 [kW]	CRN Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 45-1-1	3.00	559	894	198	120	-	80
CRN 45-1	4.00	559	931	220	134	-	89
CRN 45-2-2	5.50	639	1030	220	134	300	104
CRN 45-2	7.50	639	1018	260	159	300	114
CRN 45-3-2	11.00	829	1300	314	204	350	164
CRN 45-3	11.00	829	1300	314	204	350	164
CRN 45-4-2	15.00	909	1380	314	204	350	180
CRN 45-4	15.00	909	1380	314	204	350	180
CRN 45-5-2	18.50	989	1504	314	204	350	197
CRN 45-5	18.50	989	1504	314	204	350	197
CRN 45-6-2	22.00	1069	1610	314	204	350	218
CRN 45-6	22.00	1069	1610	314	204	350	218
CRN 45-7-2	30.00	1149	1760	396	315	400	339
CRN 45-7	30.00	1149	1760	396	315	400	339
CRN 45-8-2	30.00	1229	1840	396	315	400	343
CRN 45-8	30.00	1229	1840	396	315	400	343
CRN 45-9-2	30.00	1309	1920	396	315	400	348
CRN 45-9	37.00	1309	1945	396	315	400	363
CRN 45-10-2	37.00	1389	2025	396	315	400	367
CRN 45-10	37.00	1389	2025	396	315	400	367
CRN 45-11-2	45.00	1469	2177	439	338	450	455
CRN 45-11	45.00	1469	2177	439	338	450	455
CRN 45-12-2	45.00	1549	2257	439	338	450	460
CRN 45-12	45.00	1549	2257	439	338	450	460
CRN 45-13-2	45.00	1629	2337	439	338	450	464

CR 64


CR 64
50 Hz
ISO 9906:2012 Grade 3B
p [MPa]
H [m]
-8-1
-8-2
-7
-7-1
-7-2
-6
-6-1
-6-2
-5
-5-1
-5-2
-4
-4-1
-4-2
-3
-3-1
-3-2
-2
-2-1
-2-2
-1
-1-1
Q [m³/h]
Q [l/s]
P2 [hp]
P2 [kW]
Eta [%]
Eta
P2 1/1
P2 2/3
p [kPa]
H [m]
QH 2900 rpm 1/1
QH 2900 rpm 2/3
NPSH
NPSH [m]
TM02 7306 0918

Dimensional sketch

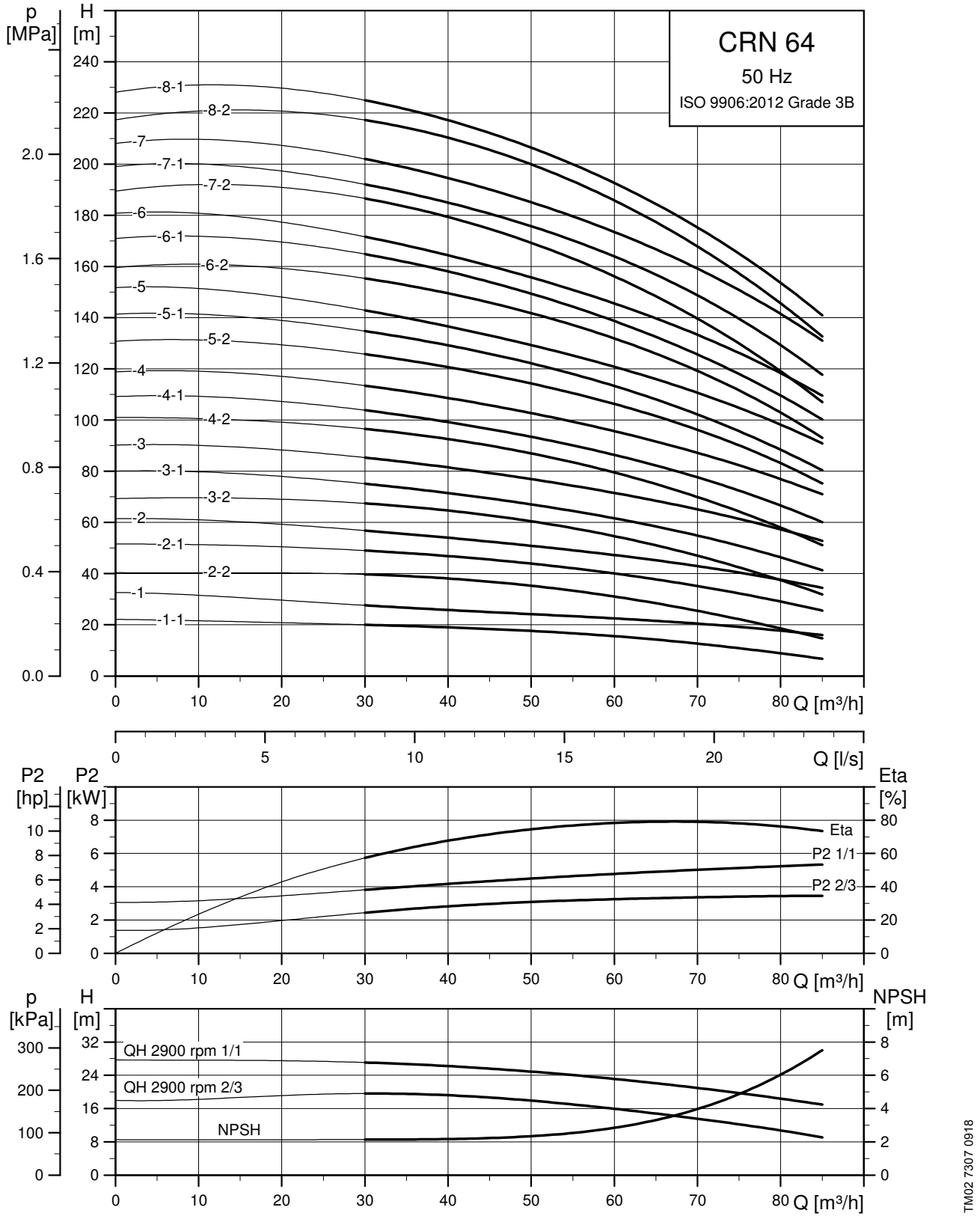


TM06 9606 2517

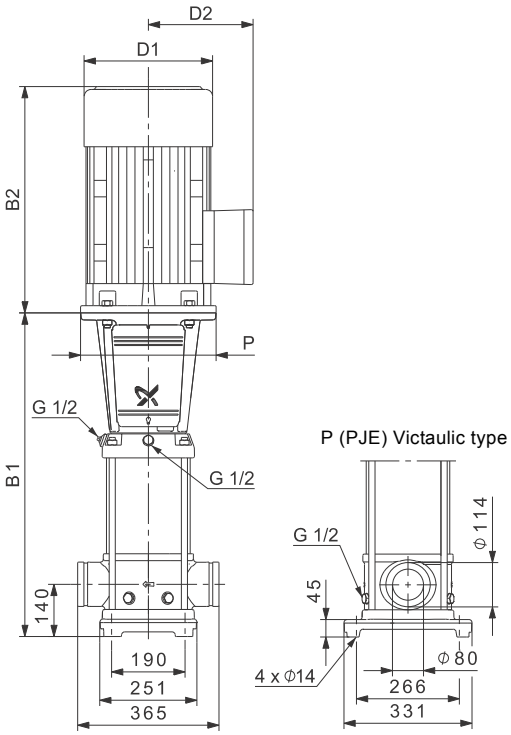
Dimensions and weights

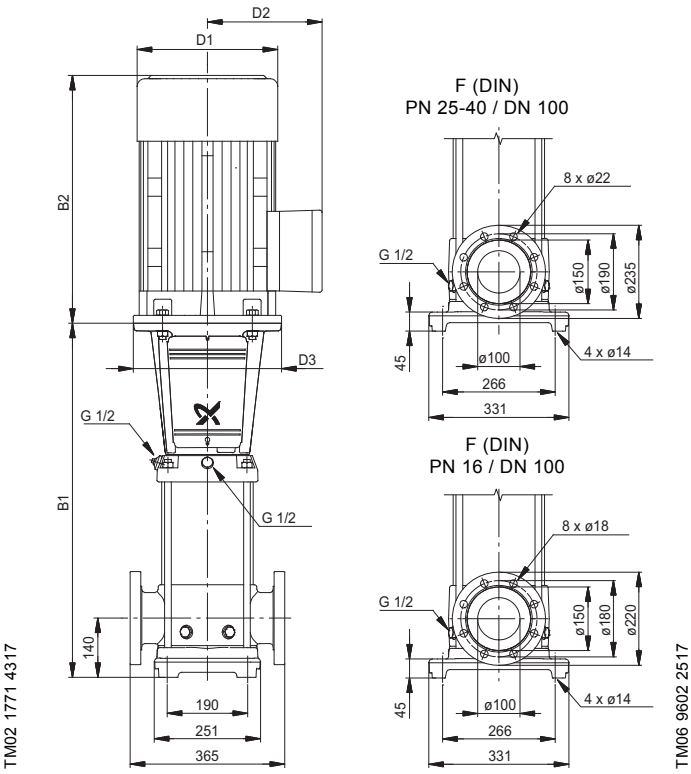
Pump type	Motor P_2 [kW]	CR					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CR 64-1-1	4.00	561	933	220	134	-	91
CR 64-1	5.50	561	952	220	134	300	102
CR 64-2-2	7.50	644	1023	260	159	300	117
CR 64-2-1	11.00	754	1225	314	204	350	162
CR 64-2	11.00	754	1225	314	204	350	162
CR 64-3-2	15.00	836	1307	314	204	350	180
CR 64-3-1	15.00	836	1307	314	204	350	180
CR 64-3	18.50	836	1351	314	204	350	193
CR 64-4-2	18.50	919	1434	314	204	350	197
CR 64-4-1	22.00	919	1460	314	204	350	211
CR 64-4	22.00	919	1460	314	204	350	211
CR 64-5-2	30.00	1001	1612	396	315	400	333
CR 64-5-1	30.00	1001	1612	396	315	400	333
CR 64-5	30.00	1001	1612	396	315	400	333
CR 64-6-2	30.00	1084	1695	396	315	400	339
CR 64-6-1	37.00	1084	1720	396	315	400	354
CR 64-6	37.00	1084	1720	396	315	400	354
CR 64-7-2	37.00	1166	1802	396	315	400	359
CR 64-7-1	37.00	1166	1802	396	315	400	359
CR 64-7	45.00	1166	1874	439	338	450	443
CR 64-8-2	45.00	1249	1957	439	338	450	448
CR 64-8-1	45.00	1249	1957	439	338	450	448

CRN 64


CRN 64
50 Hz
ISO 9906:2012 Grade 3B
p [MPa]
H [m]
-8-1
-8-2
-7
-7-1
-7-2
-6
-6-1
-6-2
-5
-5-1
-5-2
-4
-4-1
-4-2
-3
-3-1
-3-2
-2
-2-1
-2-2
-1
-1-1
Q [m³/h]
Q [l/s]
P2 [hp]
P2 [kW]
Eta [%]
Eta
P2 1/1
P2 2/3
p [kPa]
H [m]
NPSH [m]
QH 2900 rpm 1/1
QH 2900 rpm 2/3
NPSH
TM02 7307 0918

Dimensional sketch

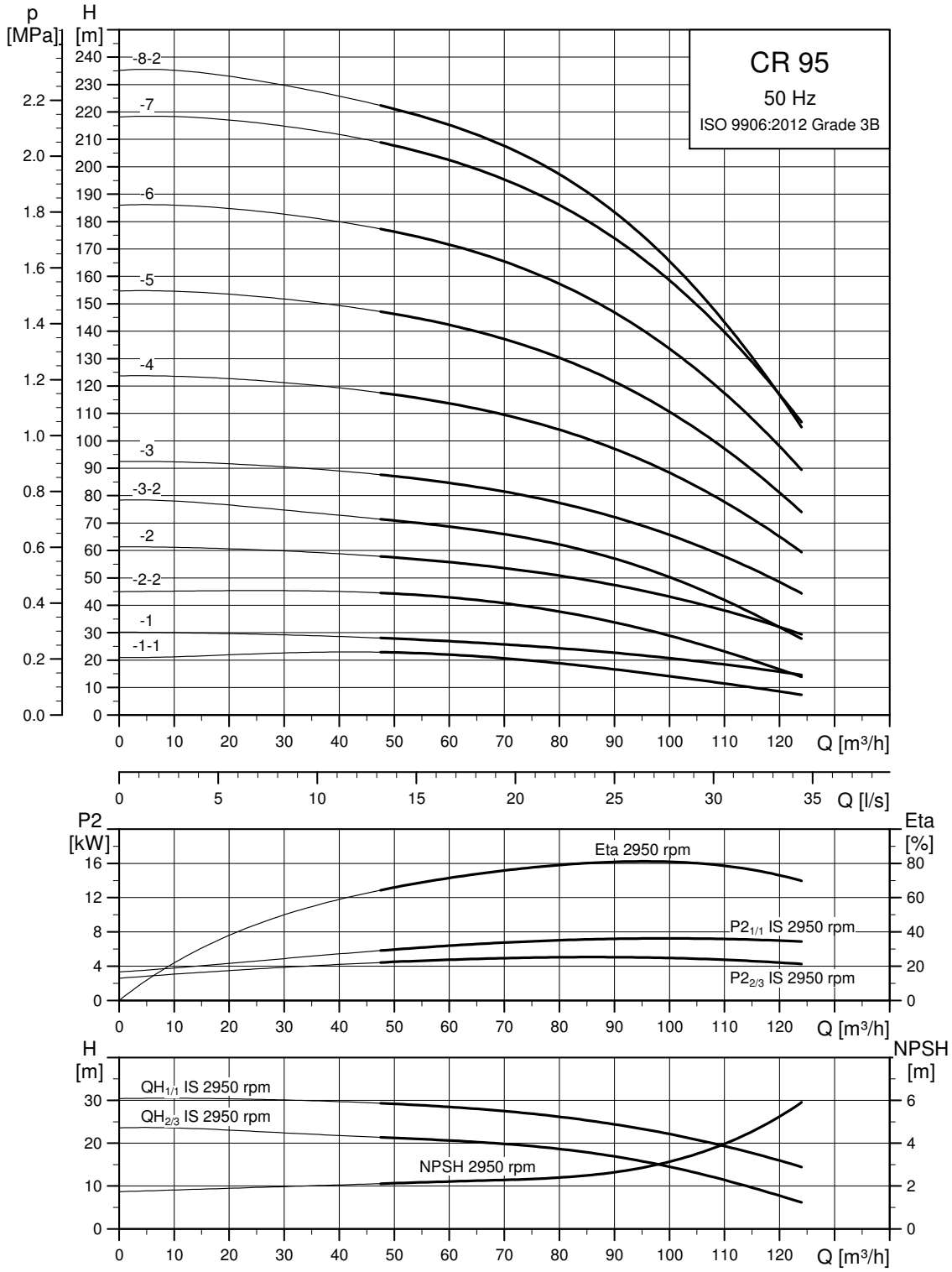




Dimensions and weights

Pump type	Motor P_2 [kW]	CRN Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 64-1-1	4.00	561	933	220	134	-	91
CRN 64-1	5.50	561	952	220	134	300	102
CRN 64-2-2	7.50	644	1023	260	159	300	117
CRN 64-2-1	11.00	754	1225	314	204	350	162
CRN 64-2	11.00	754	1225	314	204	350	162
CRN 64-3-2	15.00	836	1307	314	204	350	180
CRN 64-3-1	15.00	836	1307	314	204	350	180
CRN 64-3	18.50	836	1351	314	204	350	193
CRN 64-4-2	18.50	919	1434	314	204	350	197
CRN 64-4-1	22.00	919	1460	314	204	350	211
CRN 64-4	22.00	919	1460	314	204	350	211
CRN 64-5-2	30.00	1001	1612	396	315	400	333
CRN 64-5-1	30.00	1001	1612	396	315	400	333
CRN 64-5	30.00	1001	1612	396	315	400	333
CRN 64-6-2	30.00	1084	1695	396	315	400	340
CRN 64-6-1	37.00	1084	1720	396	315	400	355
CRN 64-6	37.00	1084	1720	396	315	400	355
CRN 64-7-2	37.00	1166	1802	396	315	400	359
CRN 64-7-1	37.00	1166	1802	396	315	400	359
CRN 64-7	45.00	1166	1874	439	338	450	444
CRN 64-8-2	45.00	1249	1957	439	338	450	448
CRN 64-8-1	45.00	1249	1957	439	338	450	448

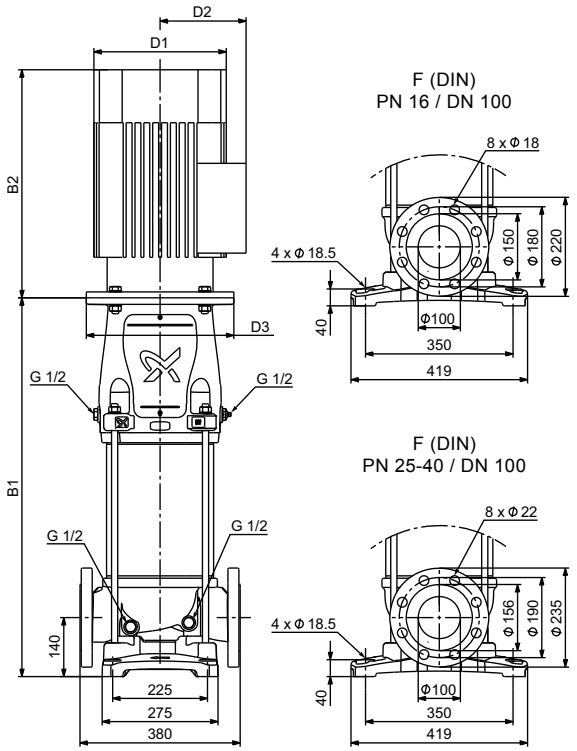
CR 95



TM06 5113 1318

The maximum pump efficiency (ETA) is based on a three-stage pump.

Dimensional sketch

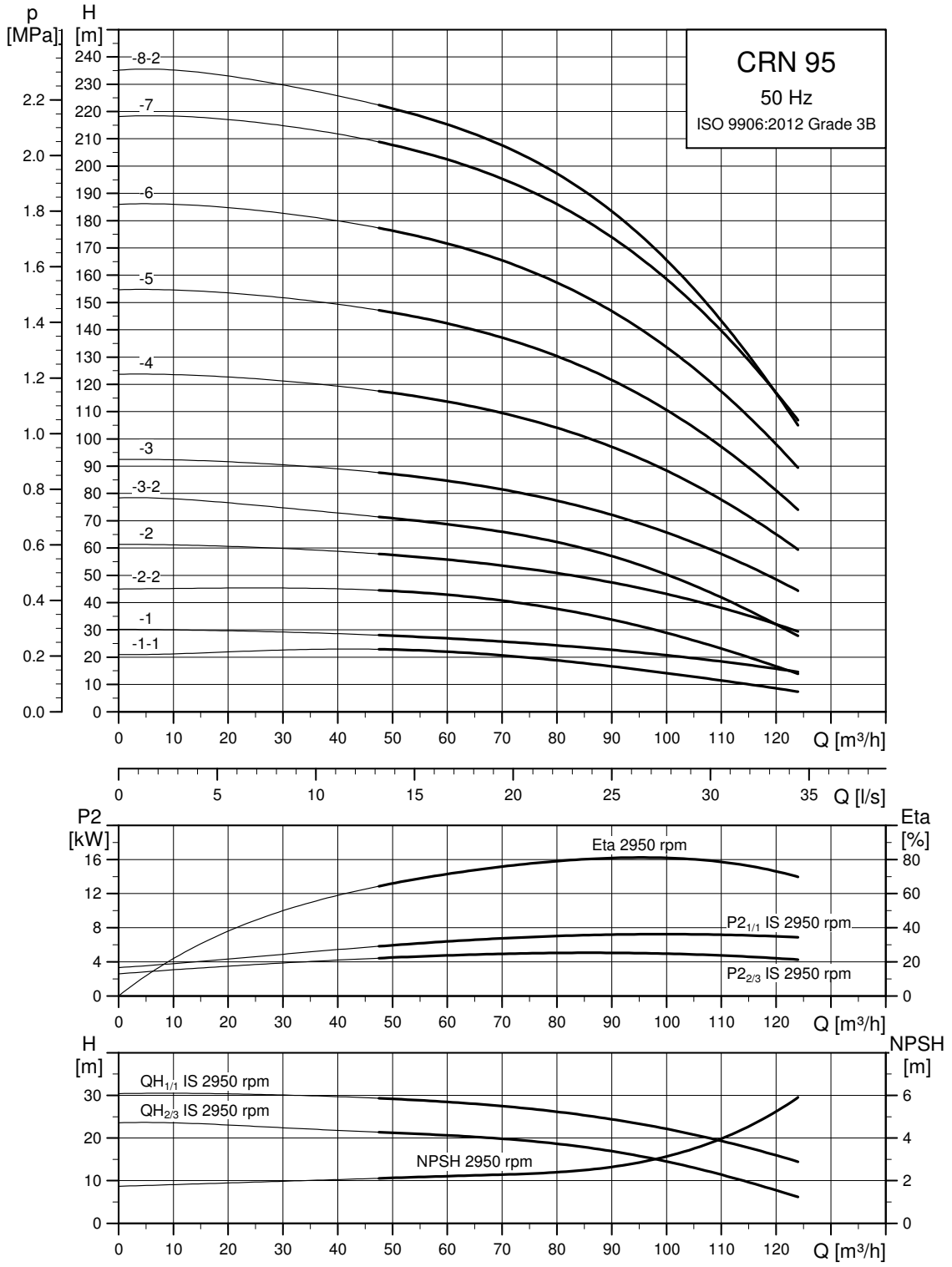


TM06 5174 1917

Dimensions and weights

Pump type	Motor P_2 [kW]	CR					Net weight [kg]
		Dimension [mm]					
		B1	B1+B2	D1	D2	D3	
CR 95-1-1	5.5	689	1080	220	134	300	125
CR 95-1	7.5	689	1068	260	159	300	135
CR 95-2-2	11	795	1266	314	204	350	182
CR 95-2	15	795	1266	314	204	350	193
CR 95-3-2	18.5	900	1415	314	204	350	212
CR 95-3	22	900	1441	314	204	350	227
CR 95-4	30	1009	1620	396	315	400	349
CR 95-5	37	1114	1750	396	315	400	380
CR 95-6	45	1238	1946	449	338	450	462
CR 95-7	55	1342	2089	497	410	550	562
CR 95-8-2	55	1446	2193	497	410	550	568

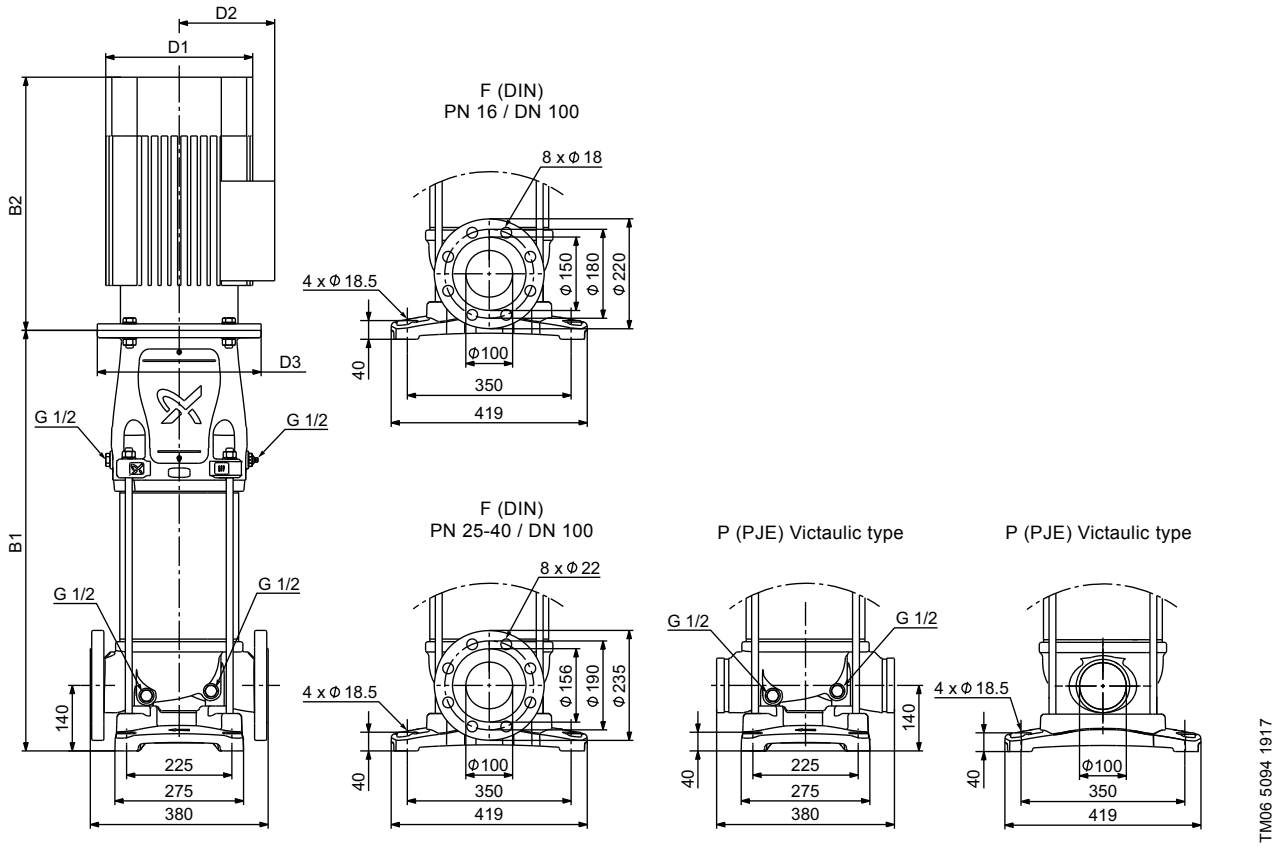
CRN 95



TM06 5125 1318

The maximum pump efficiency (ETA) is based on a three-stage pump.

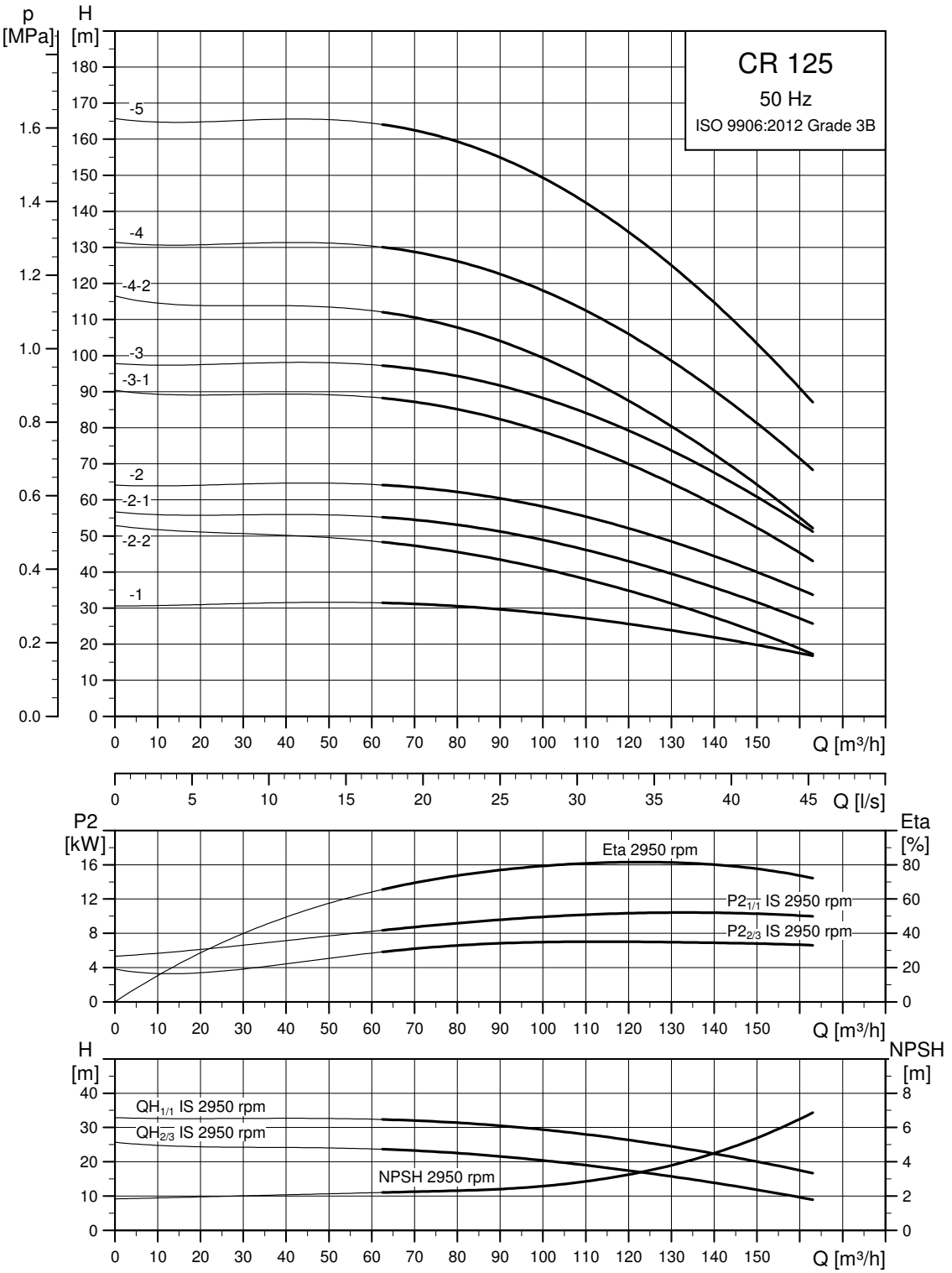
Dimensional sketch



Dimensions and weights

Pump type	Motor P_2 [kW]	CRN Dimension [mm] B1	B1+B2	D1	D2	D3	Net weight [kg]
CRN 95-1-1	5.5	689	1080	220	134	300	125
CRN 95-1	7.5	689	1068	260	159	300	135
CRN 95-2-2	11	795	1266	314	204	350	182
CRN 95-2	15	795	1266	314	204	350	193
CRN 95-3-2	18.5	900	1415	314	204	350	212
CRN 95-3	22	900	1441	314	204	350	227
CRN 95-4	30	1009	1620	396	315	400	349
CRN 95-5	37	1114	1750	396	315	400	380
CRN 95-6	45	1238	1946	449	338	450	462
CRN 95-7	55	1342	2089	497	410	550	562
CRN 95-8-2	55	1446	2193	497	410	550	568

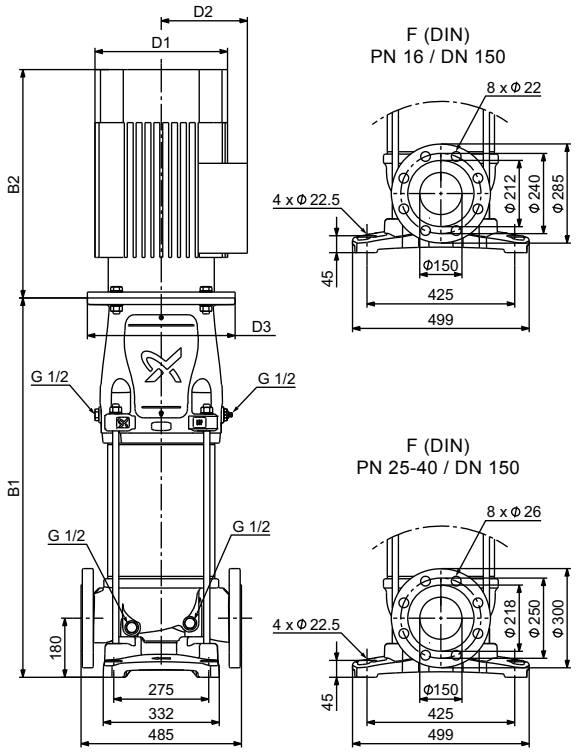
CR 125



TM06 5114 1318

The maximum pump efficiency (ETA) is based on a three-stage pump.

Dimensional sketch

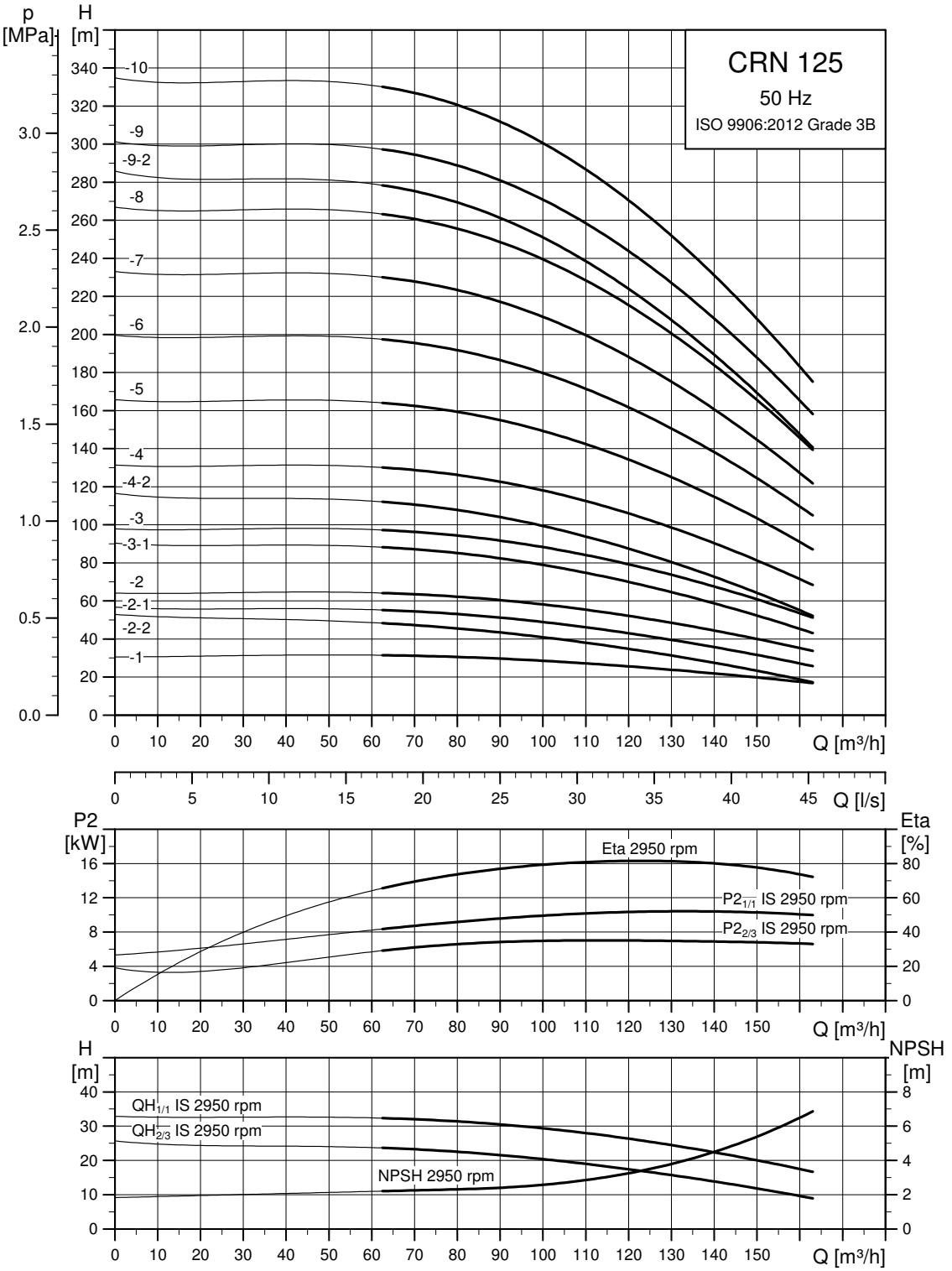


TM06 5175 4317

Dimensions and weights

Pump type	Motor P_2 [kW]	CR					
		Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 125-1	11	783	1254	314	204	350	213
CR 125-2-2	15	905	1376	314	204	350	235
CR 125-2-1	18.5	905	1420	314	204	350	248
CR 125-2	22	905	1446	314	204	350	263
CR 125-3-1	30	1029	1640	396	315	400	390
CR 125-3	37	1029	1665	396	315	400	415
CR 125-4-2	37	1151	1787	396	315	400	425
CR 125-4	45	1174	1882	449	338	450	501
CR 125-5	55	1294	2041	497	410	550	603

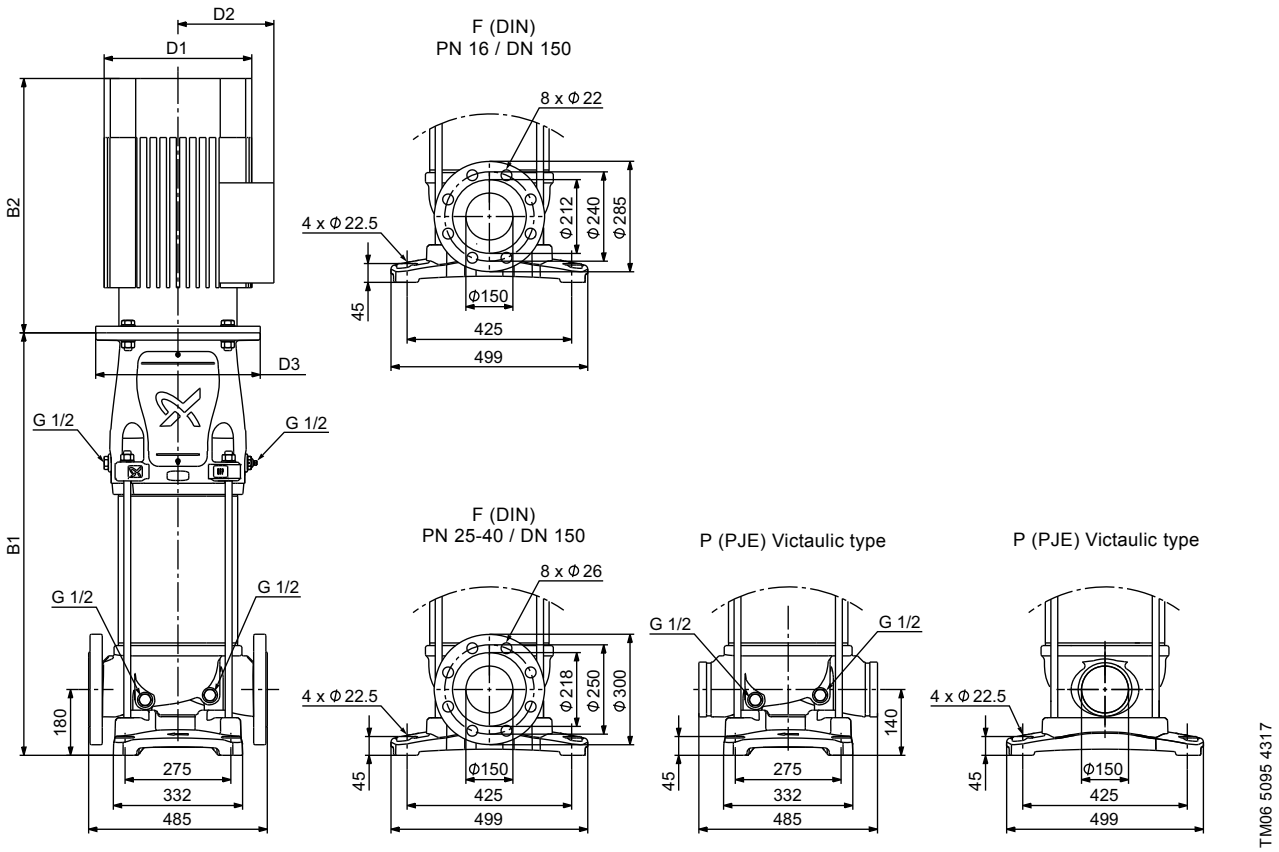
CRN 125



TM06 5126 1318

The maximum pump efficiency (ETA) is based on a three-stage pump.

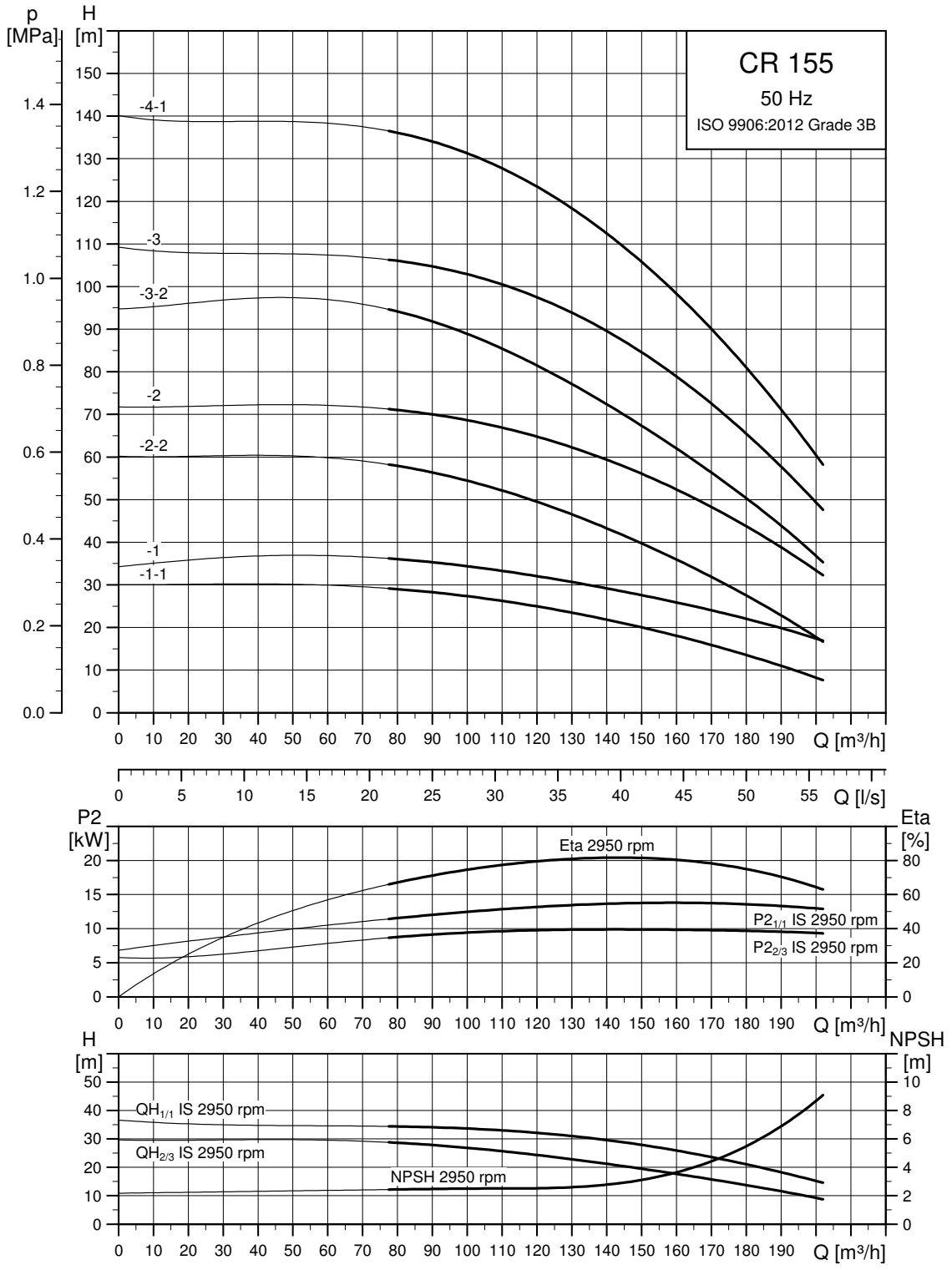
Dimensional sketch



Dimensions and weights

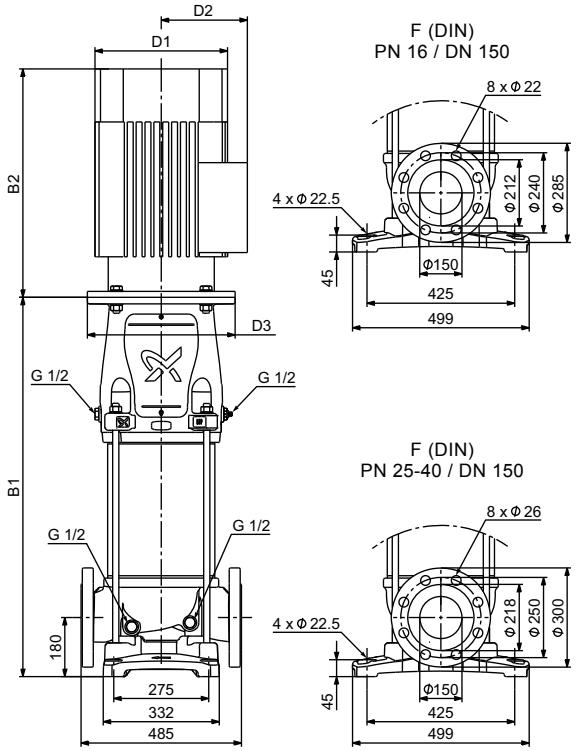
Pump type	Motor P_2 [kW]	CRN Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 125-1	11	783	1254	314	204	350	213
CRN 125-2-2	15	905	1376	314	204	350	235
CRN 125-2-1	18.5	905	1420	314	204	350	248
CRN 125-2	22	905	1446	314	204	350	263
CRN 125-3-1	30	1029	1640	396	315	400	390
CRN 125-3	37	1029	1665	396	315	400	415
CRN 125-4-2	37	1151	1787	396	315	400	425
CRN 125-4	45	1174	1882	449	338	450	501
CRN 125-5	55	1294	2041	497	410	550	603
CRN 125-6	75	1416	2236	551	433	550	723
CRN 125-7	75	1538	2358	551	433	550	733
CRN 125-8	90	1660	2590	551	433	550	828
CRN 125-9-2	90	1782	2712	551	433	550	839
CRN 125-9	110	1812	2724	616	515	660	1025
CRN 125-10	110	1934	2846	616	515	660	1035

CR 155



Preliminary performance curves.
The maximum pump efficiency (ETA) is calculated and based on a three-stage pump.

Dimensional sketch

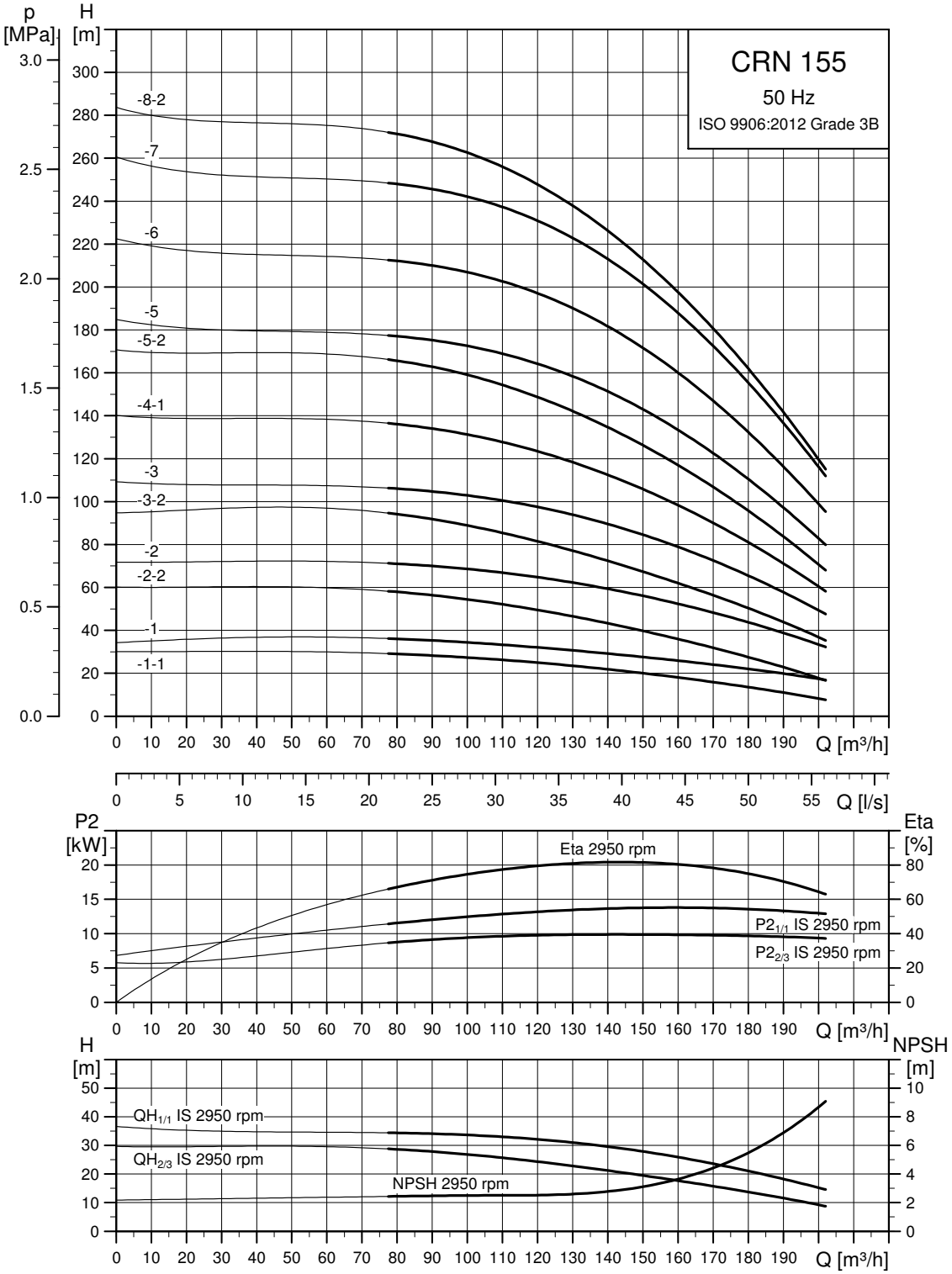


TM06 5175 4317

Dimensions and weights

Pump type	Motor P_2 [kW]	CR					
		Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CR 155-1-1	11	783	1254	314	204	350	214
CR 155-1	15	783	1254	314	204	350	226
CR 155-2-2	22	905	1446	314	204	350	264
CR 155-2	30	907	1518	396	315	400	381
CR 155-3-2	37	1029	1665	396	315	400	416
CR 155-3	45	1052	1760	449	338	450	492
CR 155-4-1	55	1172	1919	497	410	550	594

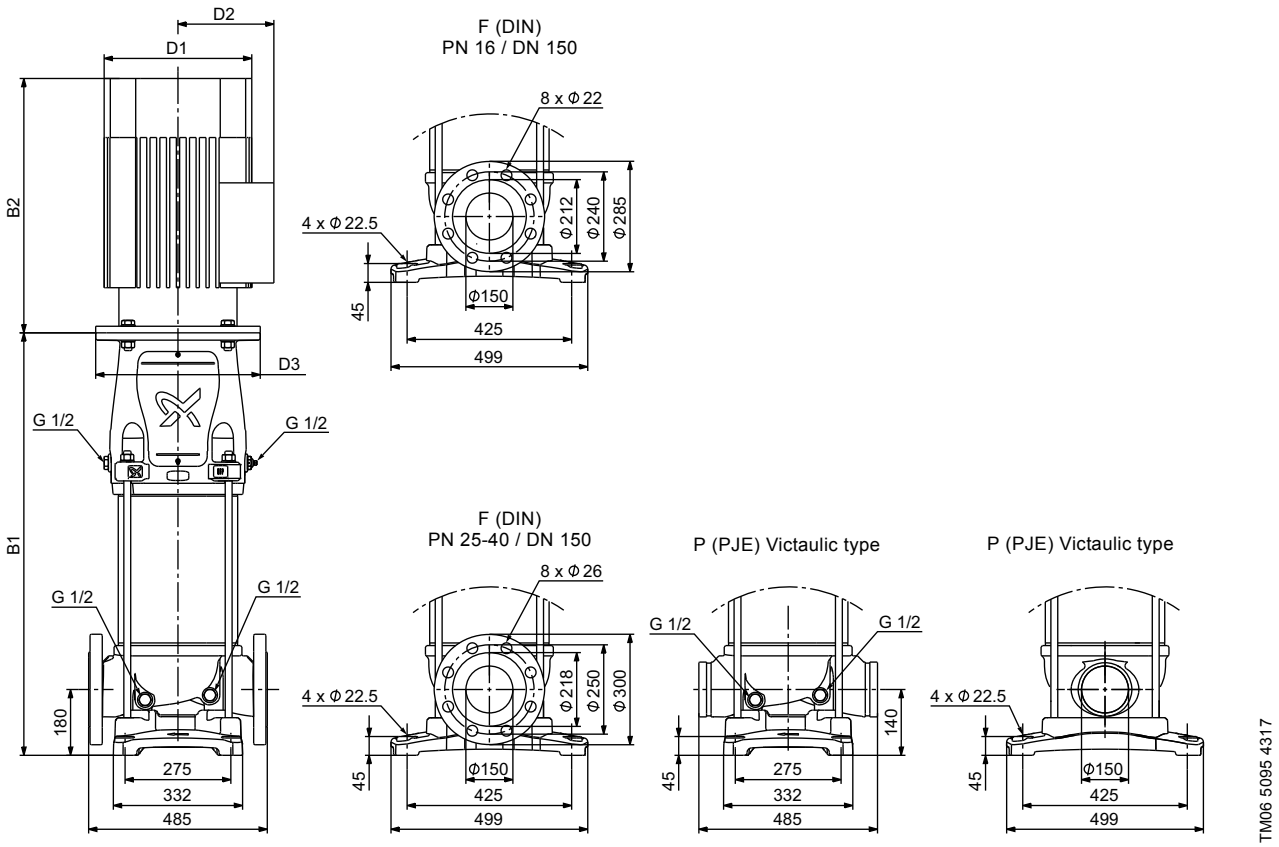
CRN 155



TM06 5127 1318

Preliminary performance curves.
The maximum pump efficiency (ETA) is calculated and based on a three-stage pump.

Dimensional sketch



Dimensions and weights

Pump type	Motor P_2 [kW]	CRN Dimension [mm]					Net weight [kg]
		B1	B1+B2	D1	D2	D3	
CRN 155-1-1	11	783	1254	314	204	350	214
CRN 155-1	15	783	1254	314	204	350	226
CRN 155-2-2	22	905	1446	314	204	350	264
CRN 155-2	30	907	1518	396	315	400	381
CRN 155-3-2	37	1029	1665	396	315	400	416
CRN 155-3	45	1052	1760	449	338	450	492
CRN 155-4-1	55	1172	1919	497	410	550	594
CRN 155-5-2	75	1294	2114	551	433	550	715
CRN 155-5	75	1294	2114	551	433	550	715
CRN 155-6	90	1416	2346	551	433	550	811
CRN 155-7	110	1568	2480	616	515	660	1008
CRN 155-8-2	110	1690	2602	616	515	660	1019

6. Motor data

Standard motors for CR, CRI, CRN, 50 Hz

MG

TM03 1711 2805

Motor P2 [kW]	Frame size	Standard voltage [V]	$I_{1/1}$ [A]	Cos $\varphi_{1/1}$	Efficiency class	η [%]	I_{start} [%]	Speed [min^{-1}]	Mounting designation
0.37[1)]	71	220-240Δ / 380-415Y	1.74 / 1.00	0.80-0.70	-	78.5	490-530	2850-2880	B14/V18 Tapped hole flange
0.55[1)]	71	220-240Δ / 380-415Y	2.50 / 1.44	0.80-0.70	-	80.0	580-620	2830-2850	
0.75[1)]	80	220-240Δ / 380-415Y	3.30 / 1.90	0.81-0.71	IE3	80.7	580-620	2840-2870	
1.1[1)]	80	220-240Δ / 380-415Y	4.35 / 2.50	0.83-0.76	IE3	82.7	450-500	2840-2870	
1.5[1)]	90	220-240Δ / 380-415Y	5.45 / 3.15	0.87-0.82	IE3	84.2	850-930	2890-2910	
2.2[1)]	90	380-415Δ	4.45	0.89-0.87	IE3	85.9	850-950	2890-2910	
3[1)]	100	380-415Δ	6.30	0.87-0.82	IE3	87.1	840-920	2900-2920	
4[2)]	112	380-415Δ	7.90	0.87	IE3	88.1	1000-1110	2920-2940	
5.5[2)]	132	380-415Δ	11	0.87-0.82	IE3	89.2	1080-1180	2920-2940	B5/V1 Free-hole flange
7.5[2)]	132	380-415Δ/660-690Y	14.4-14/8.30-8.10	0.88-0.82	IE3	90.4	780-910	2910-2920	
11[2)]	160	380-415Δ/660-690Y	20.8-19.8/12-11.8	0.88-0.84	IE3	91.2	660-780	2940-2950	
15[2)]	160	380-415Δ/660-690Y	28-26/16.2-15.6	0.89-0.87	IE3	91.9	660-780	2930-2950	
18.5[2)]	160	380-415Δ/660-690Y	34.5-32.5/20-18.8	0.89-0.85	IE3	92.4	830-980	2940-2950	
22[2)]	180	380-415Δ/660-690Y	39.5/22.8	0.90	IE3	92.7	830-830	2950	

Siemens

TM03 1710 2805

30[2)]	200	380-420Δ/660-725Y	56-52/32.5-30	0.86	IE3	93.3	780-780	2955	B5/V1 Free-hole flange
37[2)]	200	380-420Δ/660-725Y	68-63/39-36.5	0.86	IE3	93.7	760-760	2950	
45[2)]	225	380-420Δ/660-725Y	81-75/47-43.5	0.89	IE3	94	730-730	2960	
55[2)]	250	380-420Δ/660-725Y	99-91/57-53	0.89	IE3	94.3	700-700	2975	
75[3)]	280	380-420Δ/660-725Y	134-126/77-72	0.89	IE3	94.7	680-680	2975	
90[3)]	280	380-420Δ/660-725Y	160-148/92-85	0.90	IE3	95	720-720	2975	
110[3)]	315	380-420Δ/660-725Y	192-176/110-102	0.91	IE3	95.2	710-710	2980	

1) Deep-groove ball bearings
2) Angular contact bearing mounted in drive end
3) Standard ball bearings

7. 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.

Therefore, 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 flammable liquid.
2	Combustible liquid.
3	Insoluble in water.
4	Low self-ignition point.

Pumped liquid	Chemical formula	Note	Liquid concentration, liquid temperature	CR	CRN
Acetic acid	CH_3COOH	-	5 %, 20 °C	-	HQQE
Acetone	CH_3COCH_3	1, F	100 %, 20 °C	-	HQQE
Alkaline degreasing agent		D, F	-	HQQE	-
Ammonium bicarbonate	NH_4HCO_3	E	20 %, 30 °C	-	HQQE
Ammonium hydroxide	NH_4OH	-	20 %, 40 °C	HQQE	-
Aviation fuel		1, 3, 4, F	100 %, 20 °C	HQBV	-
Benzoic acid	C_6H_5COOH	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)	$Ca(CH_3COO)_2$	D, E	30 %, 50 °C	HQQE	-
Calcium hydroxide	$Ca(OH)_2$	E	Saturated solution, 50 °C	HQQE	-
Chloride-containing water		F	< 30 °C, maximum 500 ppm	-	HQQE
Chromic acid	H_2CrO_4	H	1 %, 20 °C	-	HQQV
Citric acid	$HOC(CH_2CO_2H)_2COOH$	H	5 %, 40 °C	-	HQQE
Completely desalinated water (demineralised water)		-	120 °C	-	HQQE
Condensate		-	120 °C	HQQE	-
Copper sulphate	$CuSO_4$	E	10 %, 50 °C	-	HQQE
Corn oil		D, E, 3	100 %, 80 °C	HQQV	-
Diesel oil		2, 3, 4, F	100 %, 20 °C	HQBV	-
Domestic hot water (potable water)		-	< 120 °C	HQQE	-
Ethanol (ethyl alcohol)	C_2H_5OH	1, F	100 %, 20 °C	HQQE	-
Ethylene glycol	$HOCH_2CH_2OH$	D, E	50 %, 50 °C	HQQE	-
Formic acid	$HCOOH$	-	5 %, 20 °C	-	HQQE
Glycerine (glycerol)	$OHCH_2CH(OH)CH_2OH$	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	$CH_3CHOHCH_3$	1, F	100 %, 20 °C	HQQE	-
Lactic acid	$CH_3CH(OH)COOH$	E, H	10 %, 20 °C	-	HQQV
Linoleic acid	$C_{17}H_{31}COOH$	E, 3	100 %, 20 °C	HQQV	-
Methanol (methyl alcohol)	CH_3OH	1, F	100 %, 20 °C	HQQE	-
Motor oil		E, 2, 3	100 %, 80 °C	HQQV	-
Naphthalene	$C_{10}H_8$	E, H	100 %, 80 °C	HQQV	-
Nitric acid	HNO_3	F	1 %, 20 °C	-	HQQE
Oil-containing water		-	< 100 °C	HQQV	-
Olive oil		D, E, 3	100 %, 80 °C	HQQV	-
Oxalic acid	$(COOH)_2$	H	1 %, 20 °C	-	HQQE
Ozone-containing water	(O_3)	-	< 100 °C	-	HQQE
Peanut oil		D, E, 3	100 %, 80 °C	HQQV	-
Petrol		1, 3, 4, F	100 %, 20 °C	HQBV	-
Phosphoric acid	H_3PO_4	E	20 %, 20 °C	-	HQQE
Propanol	C_3H_7OH	1, F	100 %, 20 °C	HQQE	-
Propylene glycol	$CH_3CH(OH)CH_2OH$	D, E	50 %, 90 °C	HQQE	-
Potassium carbonate	K_2CO_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	$C_6H_4(OH)COOH$	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_3PO_4	E, H	10 %, 60 °C	-	HQQE
Sodium sulphate	Na_2SO_4	E, H	10 %, 60 °C	-	HQQE
Softened water		-	< 120 °C	-	HQQE
Soya oil		D, E, 3	100 %, 80 °C	HQQV	-
Sulphuric acid	H_2SO_4	F	1 %, 20 °C	-	HQQV
Sulphurous acid	H_2SO_3	-	1 %, 20 °C	-	HQQE
Unsalted swimming-pool water		-	Approx. 2 ppm free chlorine (Cl_2)	HQQE	-

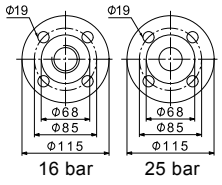
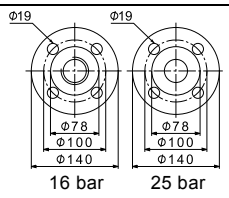
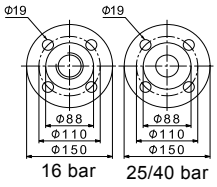
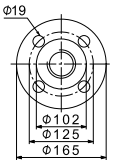
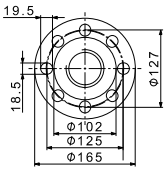
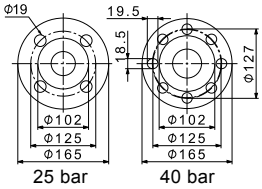
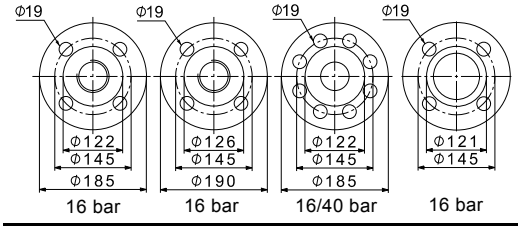
8. Accessories

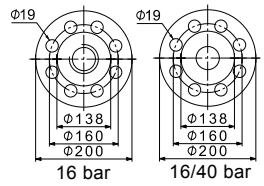
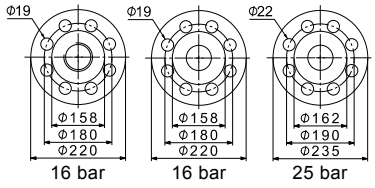
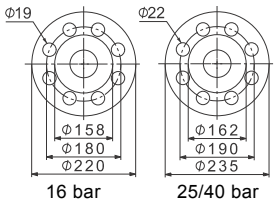
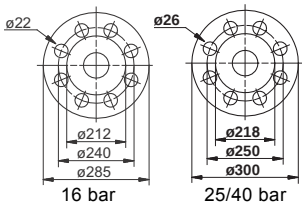
Pipe connection

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

Counterflanges for CR

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

Counterflange	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
	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

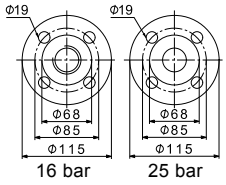
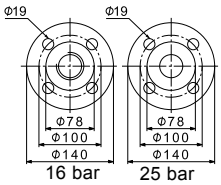
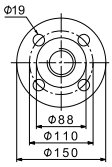
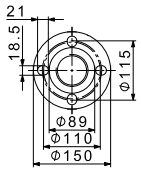
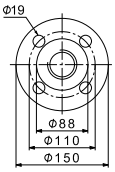
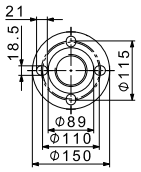
Counterflange		Pump type	Description	Rated pressure	Pipe connection	Product number
	TM05 0996 2011	**CR 45**	Threaded	16 bar	Rp 3	350540
			For welding	16 bar	80 mm, nominal	350541
			For welding	40 bar	80 mm, nominal	350542
	TM05 0995 2011	**CR 64**	Threaded	16 bar, EN 1092-2	Rp 4	369901
			For welding	16 bar, EN 1092-2	100 mm, nominal	369902
			For welding	25 bar, EN 1092-2	100 mm, nominal	369905
	TM06 5157 3915	**CR 95**	For welding	16 bar, EN 1092-2	100 mm, nominal	369902
			For welding	25/40 bar, EN 1092-2	100 mm, nominal	-
	TM03 8891 2707 TM06 5171 4015	**CR 125** **CR 155**	For welding	16 bar, EN 1092-2	150 mm, nominal	-
			For welding	25/40 bar, EN 1092-2	150 mm, nominal	-

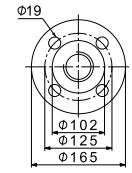
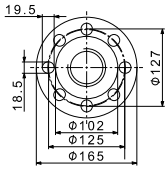
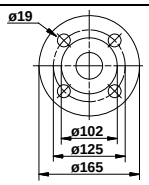
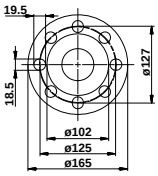
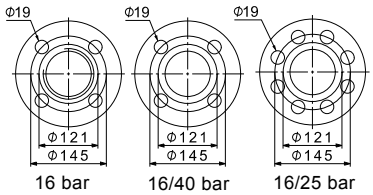
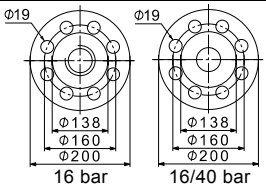
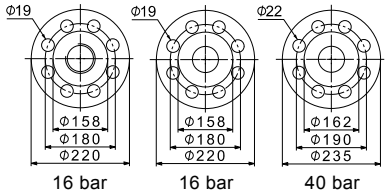
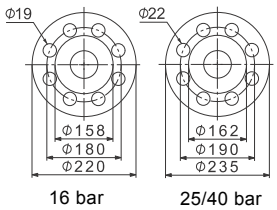
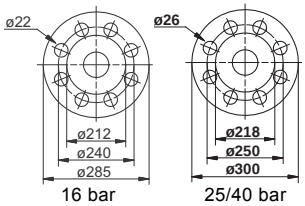
* Flange with 20 mm higher collar. With this collar, the installation dimensions of a CR 20 will be identical to those of a CR 32. If a CR 32 is replaced by a CR 20, the base must be raised by 15 mm.

Counterflanges for CRN

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

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

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

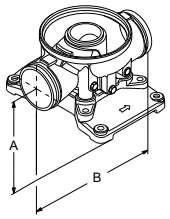
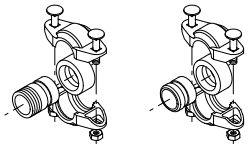
Counterflange		Pump type	Description	Rated pressure	Pipe connection	Product number
	TM05 0999 2011	CRN 15, 20	Threaded	16 bar, EN 1092-1	Rp 2	335254
	TM05 1005 2011		Threaded	16 bar, special flange	Rp 2 1/2	96509575
			Threaded	16 bar, special flange	Rp 2 1/2*	96509579
	TM03 0402 2011		For welding	25 bar, EN 1092-1	50 mm, nominal	335255
	TM00 7203 2803		For welding	25 bar, special flange	65 mm, nominal	96509573
	TM05 0994 2011	CRN 32	Threaded	16 bar	Rp 2 1/2	349910
			Threaded	16 bar, special flange	Rp 3	349911
			For welding	16 bar	65 mm, nominal	349906
			For welding	40 bar	65 mm, nominal	349908
	TM05 0996 2011	CRN 45	Threaded	16 bar	Rp 3	350543
			For welding	16 bar	80 mm, nominal	350544
			For welding	40 bar	80 mm, nominal	350545
	TM05 0995 2011	CRN 64	Threaded	16 bar	Rp 4	369904
			For welding	16 bar	100 mm, nominal	369903
			For welding	40 bar	100 mm, nominal	369906
	TM06 5157 3915	CRN 95	For welding	16 bar, EN 1092-1	100 mm, nominal	360003
			For welding	25/40 bar, EN 1092-1	100 mm, nominal	369906
	TM03 8891 2707 TM06 5171 4015	CRN 125 CRN 155	For welding	1625 bar, EN 1092-1	150 mm, nominal	98052936
			For welding	25/40 bar, EN 1092-1	150 mm, nominal	96750478

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

PJE couplings for CRN

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

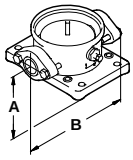
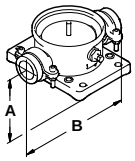
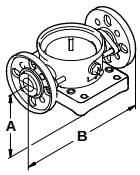
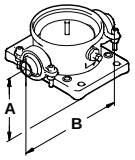
A set consists of two coupling halves (Victaulic type 77), one gasket, one pipe stub (for welding or threaded), bolts and nuts.

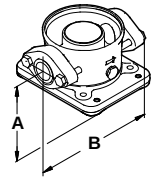
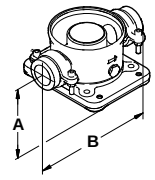
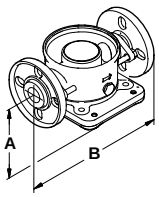
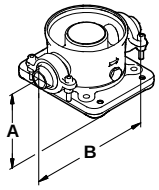
Coupling	Pump type	Pipe stub	Maximum pressure [bar]	A	B	Pipe connection	Rubber parts	Number of coupling sets required	Product number
	**CRN 1s, 1, 3, 5**	Threaded	69	50	320	R 1 1/4	EPDM	2	419911
							FKM	2	419905
		For welding	69	50	280	DN 32	EPDM	2	419912
							FKM	2	419904
	CRN 10, 15, 20	Threaded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

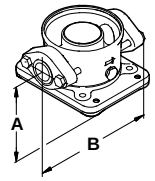
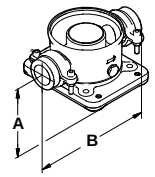
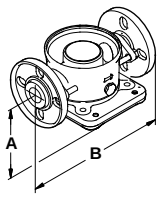
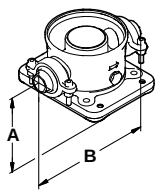
TM06 9172 1817 - TM00 3808 1094

FlexiClamp base connections

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

Base connection	Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number
 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
							FKM	2	415297
			1" NPT				EPDM	2	405291
							FKM	2	405292
			1 1/4" NPT				EPDM	2	415311
							FKM	2	415312
		Clamp, pipe stub for welding	28.5			-	EPDM	2	405282
							FKM	2	405283
			37.2				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
 TM02 7372 3303	**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
		Oval (stainless steel)	Rp 1 1/4					2	96498776
			Rp 1 1/2					2	96498728
			Rp 2					2	96498835
 TM02 7374 3303	**CRI 10 CRN 10**	Union	G 2 3/4	25	80	288	EPDM	2	96500275
							FKM	2	96500276
 TM02 7373 3303	**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)	DN 50				EPDM	2	96500265
							FKM	2	96500266
		FGJ (stainless steel)					EPDM	2	96500267
							FKM	2	96500269
 TM02 7375 3303	**CRI 10 CRN 10**	Clamp, threaded pipe stub	Rp 1 1/2	25	80	259	EPDM	2	425238
							FKM	2	425239
			Rp 2				EPDM	2	335241
							FKM	2	335242
			Rp 2 1/2			346	EPDM	2	96508600
							FKM	2	96508601
		Clamp, pipe stub for welding	48.3 (DN 40)			-	EPDM	2	425242
							FKM	2	425243
			60.3 (DN 50)				EPDM	2	335251
							FKM	2	335252

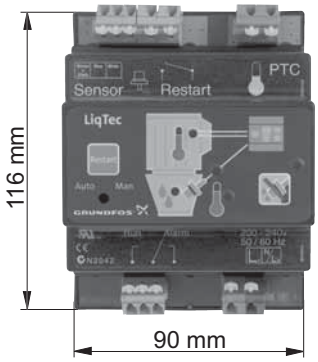
Base connection		Pump type	Connection	Pipe connection	PN	A	B	Rubber parts	Number of coupling sets required	Product number
	TM02 7372 3303	**CRI 15, 20 CRN 15, 20**	Oval (cast iron)	Rp 1 1/4	10	90	260	Klingersil	2	96498775
				Rp 1 1/2					2	96498727
				Rp 2					2	96498836
			Oval (stainless steel)	Rp 1 1/4					2	96498776
				Rp 1 1/2					2	96498728
				Rp 2					2	96498835
	TM02 7374 3303	**CRI 15, 20 CRN 15, 20**	Union	G 2 3/4	25	90	288	EPDM	2	96500275
								FKM	2	96500276
	TM02 7373 3303	**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)	DN 50				EPDM	2	96500265
								FKM	2	96500266
			FGJ (stainless steel)					EPDM	2	96500267
								FKM	2	96500269
	TM02 7375 3303	**CRI 15, 20 CRN 15, 20**	Clamp, threaded pipe stub	Rp 1 1/2	25	90	259	EPDM	2	425238
								FKM	2	425239
				Rp 2				EPDM	2	335241
								FKM	2	335242
				Rp 2 1/2			346	EPDM	2	96508600
								FKM	2	96508601
			Clamp, pipe stub for welding	48.3 (DN 40)			-	EPDM	2	425242
								FKM	2	425243
				60.3 (DN 50)				EPDM	2	335251
								FKM	2	335252

LiqTec

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

LiqTec is prepared for DIN rail mounting in control cabinet.

Enclosure class: IPX0.

LiqTec unit	Pump type	Voltage [V]	LiqTec	Sensor 1/2"	Cable 5 m	Extension cable 15 m	Product number
 TM03 2108 3705	**CR CRI CRN**	200-240	•	•	•	-	96556429
		80-130	•	•	•	-	96556430
		-	-	-	-	•	96443676

Sensors

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

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

Danfoss pressure sensor kits

Content	Liquid temperature	Pressure [bar]	Product number
• 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 to +85 °C	0-4	96428014
		0-6	96428015
		0-10	96428016
		0-16	96428017
		0-25	96428018

DPI differential-pressure sensor kit

Content	Pressure [bar]	Product number
• 1 sensor incl. 0.9 m screened cable (7/16" connections) • 1 original DPI bracket for wall mounting • 1 Grundfos bracket for mounting on motor • 2 M4 screws for mounting of sensor on bracket • 1 M6 screw (self-cutting) for mounting on MGE 90/100 • 1 M8 screw (self-cutting) for mounting on MGE 112/132 • 3 capillary tubes (short/long) • 2 fittings (1/4" - 7/16") • 5 cable clips (black) • Installation and operating instructions (00480675) • Service kit instructions.	0 - 0.6	96611522
	0 - 1.0	96611523
	0 - 1.6	96611524
	0 - 2.5	96611525
	0 - 4.0	96611526
	0 - 6.0	96611527
	0-10	96611550

Adapter kit for sensor[1)]

Content	Type	Product number
Adapter for sensor	G 1/2 EPDM	99352712
	G 1/2 FKM	99352737

1) Applies to CRN 95.

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 (that is derating).
4-pole motor	We offer 4-pole standard motors.

Shaft seals

Variant	Description
Shaft seal with FFKM O-ring	We recommend shaft seals with FFKM or FXM O-ring for applications where the pumped liquid may damage the standard O-ring material.
Seal with flush, quench seal	We recommend this for applications involving crystallising, hardening or sticky liquids.
Air-cooled shaft seal system	We recommend this 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, we recommend Grundfos' unique air-cooled shaft seal system . In order to ensure a low liquid temperature around the standard shaft seal, the pump is fitted with a special air-cooled shaft seal chamber. No separate cooling is required.
Double seal with pressure chamber	We recommend this for applications involving poisonous or explosive liquids. It protects the surrounding environment and the people working in the vicinity of the pump. It consists of two seals mounted in a "back-to-back" arrangement inside a separate pressure seal chamber. As the pressure in the chamber is higher than the pump pressure, leakage is prevented. A dosing pump or a special pressure intensifier generates the seal chamber pressure.
CR MAGdrive	Magnetically driven pumps for industrial applications. Key applications are industrial processes involving the handling of aggressive, environmental, dangerous or volatile liquids, such as organic compoundsand solvents.

Pumps

Variant	Description
Horizontally mounted pump	For safety or height reasons, certain applications, for instance on ships, require the pump to be mounted in 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)	We recommend this for boiler-feed applications where cavitation may occur due to poor inlet conditions.
Pump with bearing flange	The bearing flange is suitable for applications where the inlet pressure is higher than the maximum pressure recommended. The bearing flange increases the life of motor bearings. We recommend this 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. Customised flanges are available according to specifications.
TriClamp connection	TriClamp connections are of a hygienic design with a sanitary coupling for use in the pharmaceutical and food industry.
Electropolished pump	To substantially reduce the risk of corrosion of the materials, we offer electropolished pumps. We recommend this for applications in the pharmaceutical and food industry.

10. Grundfos Product Center

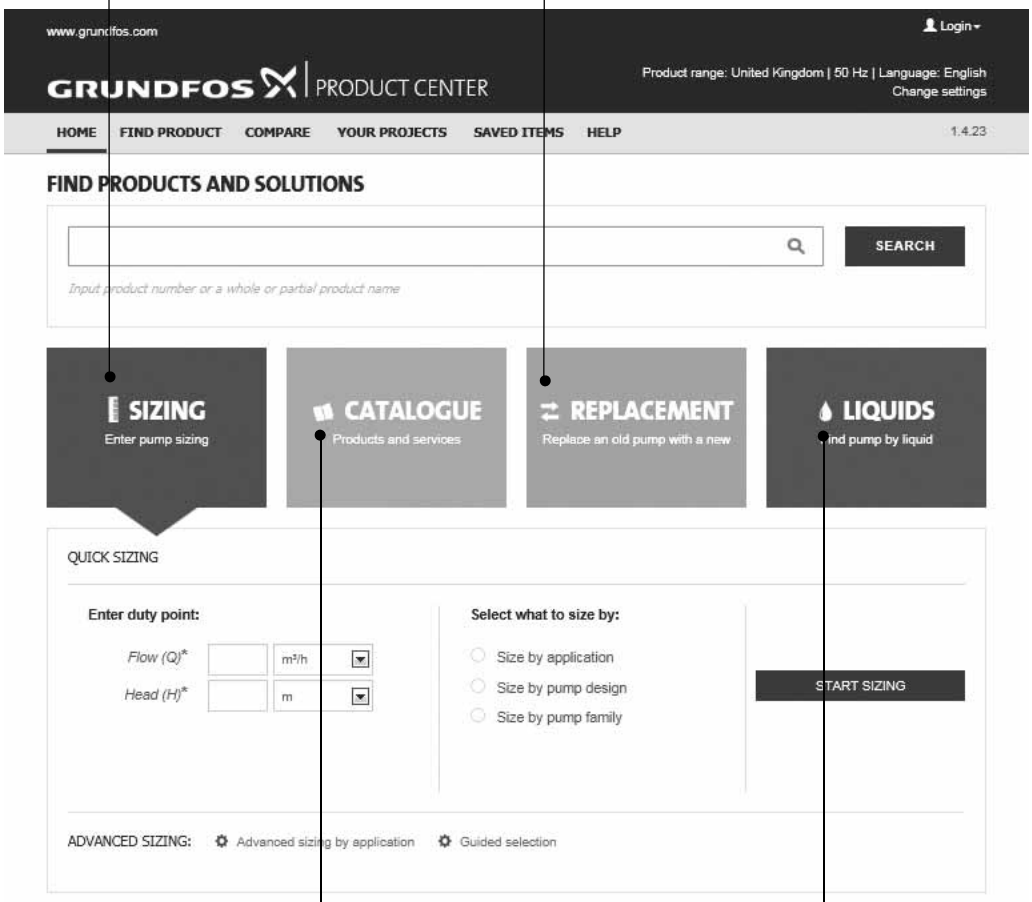
Online search and sizing tool to help you make the right choice.

http://product-selection.grundfos.com

"SIZING" enables you to size a pump based on entered data and selection choices.

"REPLACEMENT" enables you to find a replacement product. Search results will include information on the following:

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.



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