

CR, CRI, CRN, CRT CRE, CRIE, CRNE, CRTE

Custom-built pumps

50/60 Hz



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1. Introduction

This catalogue is a supplement to the data booklets listed below. It gives an overview of some of the customised solutions offered by Grundfos. If the catalogue does not provide a solution to your specific pumping needs, contact us with a detailed description of your problem, and we will get down to work - for you!

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure	V7174003

For QR codes to the data booklets, see page 11.

Customised CR pumps

We offer a wide range of customised variants of the CR type range for a variety of demanding industrial applications.

With these multistage in-line pumps, based on the well-known CR type range, we meet the customers' needs for pumps capable of handling special installation requirements and these liquids:

- high-temperature liquids
- crystallising liquids
- high-viscosity liquids such as paints and varnishes
- aggressive liquids
- volatile liquids
- flammable liquids.

Most of the pumps are available with either mains-operated motors (CR, CRI and CRN) or electronically speed-controlled motors (CRE, CRIE and CRNE).

The below pump types are available as customised pumps.

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185	•		•

Pumps for individual requirements

CR pumps can be customised to meet individual requirements. This is due to the "mix-and-match" approach to customisation, where the many pump features and options are to be regarded as modules that can be combined to create the ideal pump for the job at hand.

Motor options

CR motors are available in many different configurations to meet the requirements presented by the power supply, the pump environment and/or the pumped liquid itself.

- Power supply systems vary in terms of both frequency and voltage, and required protection methods.
- Your environment may be explosive, very hot and/or very humid. Special conditions also apply at high altitudes.
- The pumped liquid can call for a special motor solution. High or low viscosities and/or high or low densities may require non-standard motor sizes. You may also need an explosion-proof variant.
- The installation site of the pump may require alternative positions of pump and motor parts, such as terminal box positions and vent screw positions.

For further information, see section [Overview](#), page 6.

Shaft seal options

Extreme liquids sometimes call for extreme measures.

- High temperatures damage seal faces unless precautions are taken.
- Concern for safety can necessitate special measures for aggressive, toxic or flammable liquids.
- Liquids can be harmful to shaft seals because they crystallise, harden or are extremely abrasive.

For further information, see section [Overview](#), page 6.

Pump options

The CR pump elements can handle the most demanding liquids and pressures and be adapted to suit many other requirements.

- Horizontal installation if height is a limitation.
- Poor inlet conditions mean that NPSH values must be adjusted to avoid cavitation.
- Very high pressures demand special solutions.
- Special surface treatments or certificates may be required.

For further information, see section [Overview](#), page 6.

Connection options

Your chosen pump elements can be fitted with exactly the connection options you need. All standards are covered, and special connection variants are available for maximum compactness, for example high liquid pressures.

For further information, see section [Overview](#), page 6.

Features and benefits

Customised CR pumps have the following features and benefits:



Grundfos motor

Grundfos motors are remarkably silent and highly efficient.

3-phase pumps from 1.1 to 200 kW have premium efficiency IE3 motors as standard and optionally super premium efficiency IE4 and IE5.

Grundfos motors are available with integrated frequency converter designed for speed-controlled operation.

Speed-controlled operation can also be obtained by connecting a fixed speed motor to an external Grundfos CUE or Danfoss frequency converter.

Shaft seal solutions

The specially designed cartridge seal increases reliability, ensures safe handling and enables easy service and access.

The cartridge shaft seal comes in a wide choice of materials. It is available in single and double seal arrangements and magnetic drive configurations.

Connections

The Grundfos CR pump can be connected to any system.

Material options

The Grundfos CR pump is available in four different material variants:

CRT, CRTE: Titanium

CRN, CRNE: Stainless steel AISI 316

CRI, CRIE: Stainless steel AISI 304

CR, CRE: Stainless steel AISI 304/cast iron.

Wide range of pump sizes

The CR pump comes in 14 flow sizes and hundreds of pressure sizes, ensuring that you can always find exactly the right pump for the job.

High-performance hydraulics

Pump efficiency is maximised by the optimised hydraulics and carefully crafted production technology.

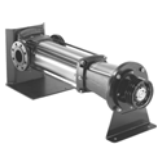
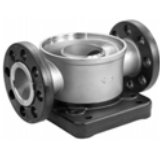
Dry-running protection

The patented Grundfos LiqTec system eliminates the risk of breakdowns due to dry running. If there is no liquid in the pump, the LiqTec will stop the pump immediately.

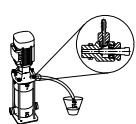
GR5357

2. Overview

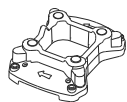


4-pole motors	Explosion-proof motors	Anti-condensation heater	Multiplug connections	CSA/UL-approved motors
				
See page 29.	See page 23.	See page 26.	See page 24.	See page 22.
Shaft seals	Rubber parts	Titanium	Non-cartridge solution	CR pumps with air-cooled top
				
See page 30.	See page 31.	See page 30.	See page 30.	See page 37.
CR high-pressure pumps	Horizontal mounting	All-stainless steel CR pumps	CR-H, horizontal end-suction pumps	Low temperature
				
See pages 13 and 42.	See pages 18 and 46.	See page 44.	See page 50.	See pages 15 and 42.
Collar connection (CR)	Oval flanges (CR)	Flanges (CR)	PJE connections (CRI, CRN)	Flanges (CRI, CRN)
				
See page 59.	See page 62.	See page 62.	See page 61.	See page 62.

VIK-approved motors	Motor protection	Oversize or undersize motors	Special voltage	Enclosure class	Terminal box positions	IE5 motors	CRE pump solutions
							
See page 22 .	See page 26 .	See page 28 .	See page 24 .	See page 28 .	See page 28 .	See page 29 .	See page 72 .

MAGdrive	Back-to-back seal arrangement	CR pump with pressure intensifier	CR pump with barrier liquid	Tandem seal arrangement	Dry-running protection	Accessories
						
See page 40 .	See page 31 .	See page 34 .	See page 33 .	See page 35 .	See page 56 .	See page 20 .

Alternative colour	Bearing flange	Pump rubber parts	CR low-NPSH pumps	CR deep-well pumps	Belt-driven CR pumps	Bearing materials	Surface treatment
							
See page 44 .	See page 54 .	See page 54 .	See pages 14 and 45 .	See pages 19 and 53 .	See pages 18 and 51 .	See page 56 .	See page 43 .

Clamp connections (CRI, CRN)	Oval flanges (CRI, CRN)	TriClamp connections (CRN)	Union connections (CRI, CRN)	PJE connections (CRT)	Customised solutions	Certificates	CR 95 base plate with small footprint
							
See page 59 .	See page 62 .	See page 58 .	See page 62 .	See page 62 .	See page 62 .	See page 63 .	See page 62 .

3. Performance range

CR

50 Hz

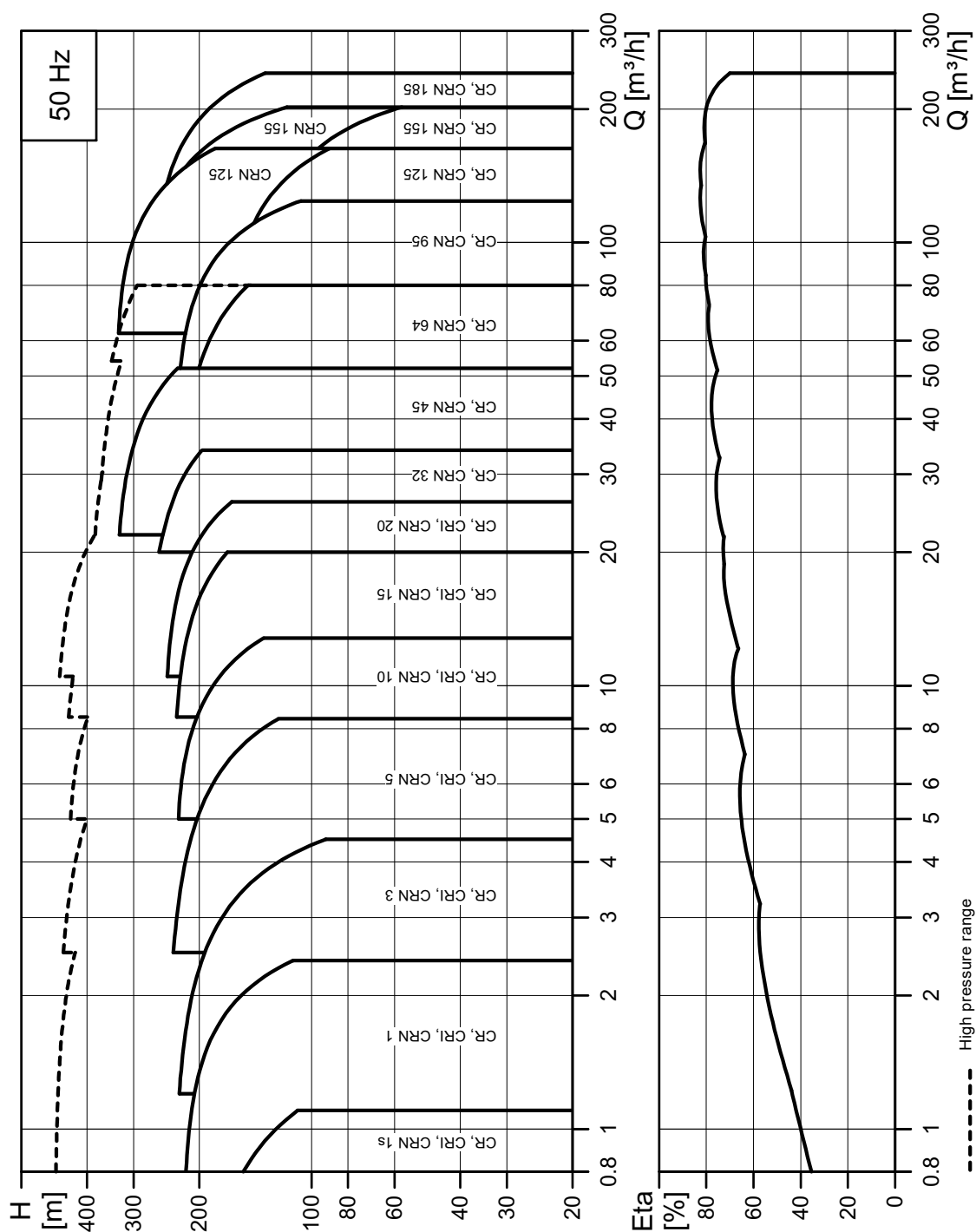
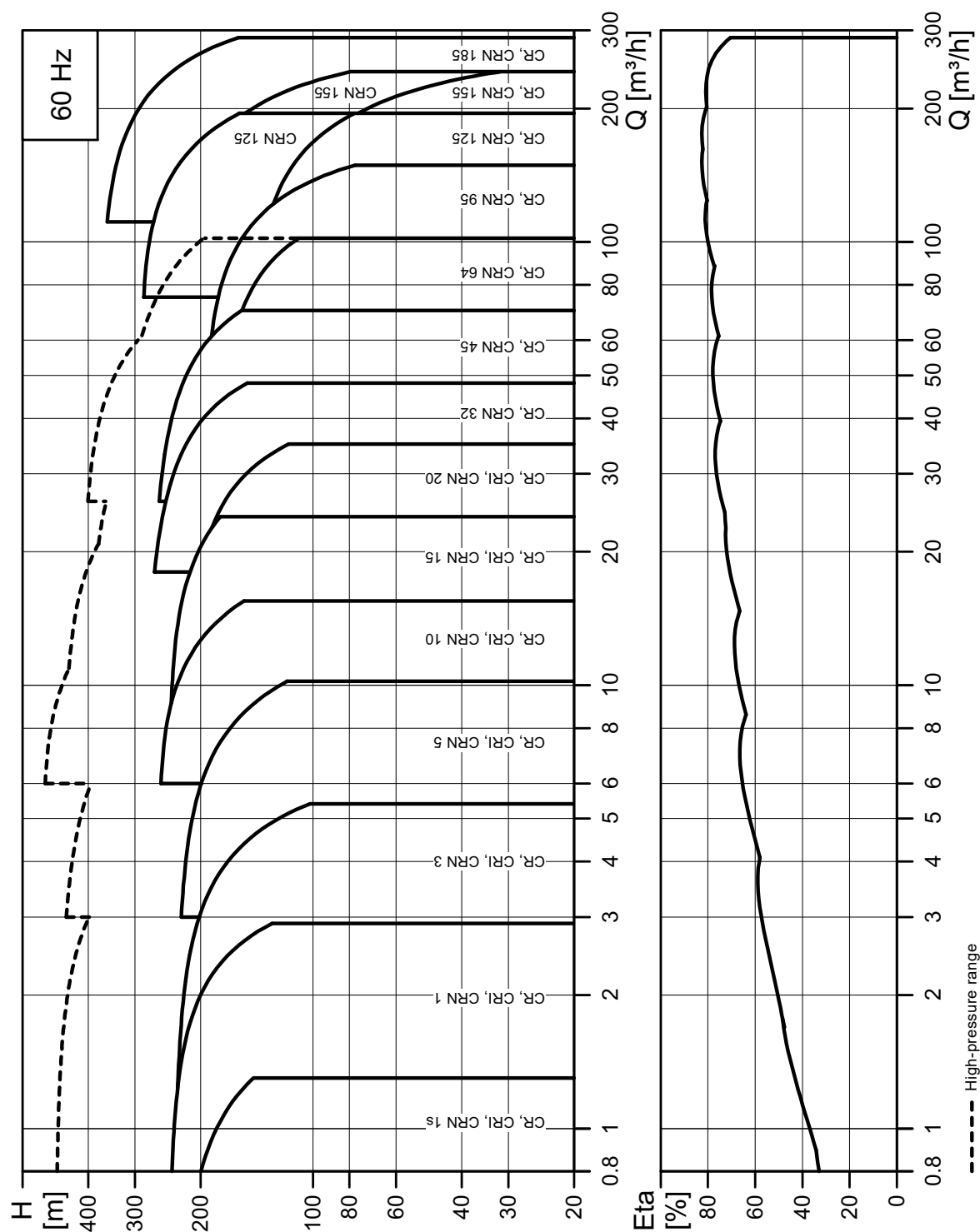


Fig. 1 Performance range, CR, CRN

Note: CRE, CRIE, CRNE pumps are available up to 22 kW.

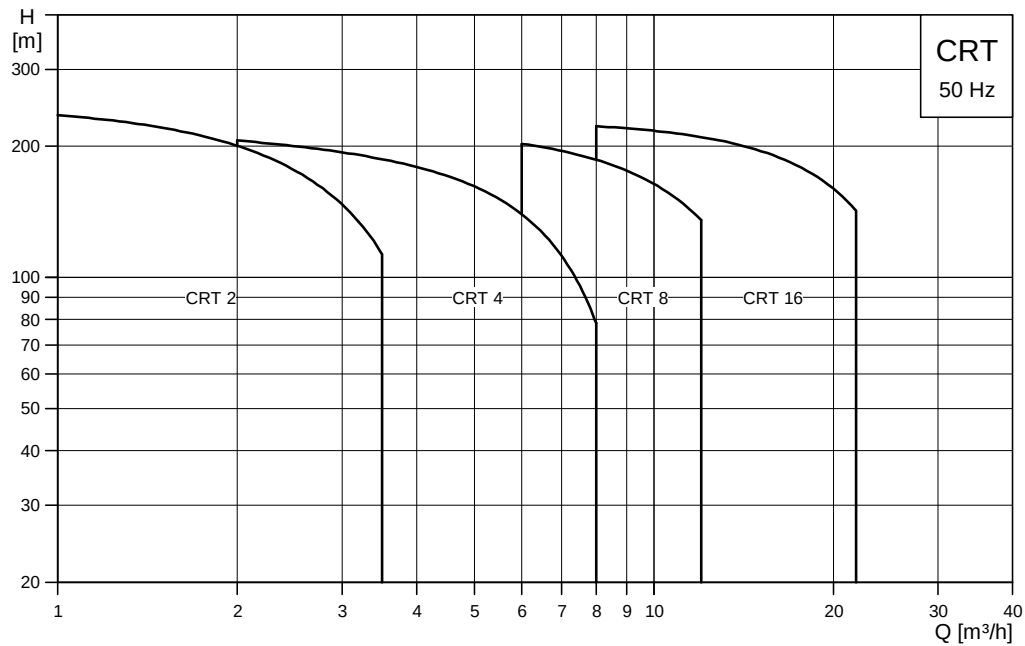
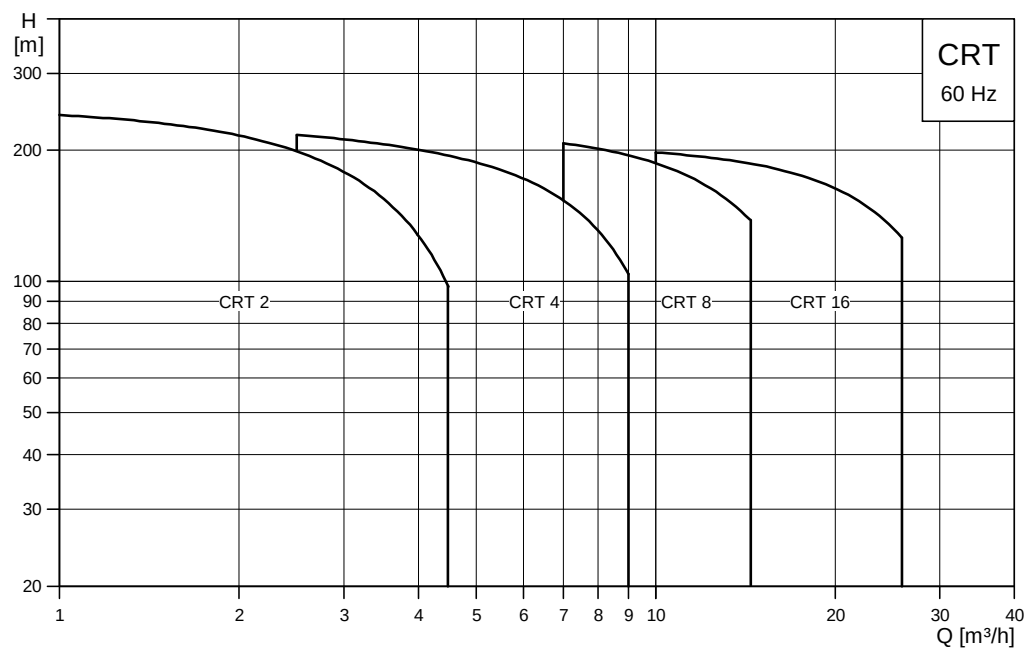
TM02 1192 2620

60 Hz



Note: CRE, CRIE, CRNE pumps are available up to 22 kW.

TM02 1530 2720

CRT, CRTE**50 Hz****Note:** CRTE pumps are available.**60 Hz****Note:** CRTE pumps are available.

TM03 3817 1106

TM03 3818 1106

EuP ready

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

Minimum efficiency index

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

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

MEI index for CR pumps

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
CR 185-3	> 0.70

Further documentation

For further information, see the following data booklets available in Grundfos Product Center.

Data booklet	Publication number	QR code
CR, CRI, CRN (50 Hz)	99301179	
CR, CRI, CRN (60 Hz)	99301180	
CRT, CRTE (50/60 Hz)	V7149894	
CRE, CRIE, CRNE (50/60 Hz)	98423696	
CR, CRN, CRNE high pressure	V7174003	
Mechanical shaft seals for pumps	97506935	

4. Identification

Type key

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

Key to codes

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

Code	Description
Materials	
A	Basic version
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
W	Tungsten carbide/tungsten carbide
X	Special version
Code for rubber parts in pump	
E	EPDM
F	FXM (Fluoraz®)
K	FFKM (Kalrez®)
N	CR (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.

Shaft seal

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

5. Applications

High-pressure applications



GR7767 - TM02 8470 4004

Fig. 2 CR high-pressure pumps

Reference applications

- Filtration
- reverse osmosis
- cleaning and washing
- boiler feed.

Customised solutions

High-pressure applications often expose pumps to a variety of extreme conditions, such as high inlet pressure, high operating pressure, frequent starts/stops and pressure pulsing. Overload of the pump may cause increased wear of pump parts, such as motor bearings and shaft seal, and thus reduce the pump life.

To avoid unexpected breakdowns, we offer customised solutions designed to meet your needs!

High-pressure handling

We offer high-pressure pumps specially designed to cope with pressures up to 50 bar at maximum 120 °C. When necessary, CR high-pressure pumps are fitted with a bearing flange. A bearing flange is an additional flange with an oversize ball bearing designed to absorb axial forces in both directions.

CR high-pressure pumps come in two variants: as a single-pump solution or as a two-pump solution. The single-pump solution is used for flow rates up to 5 m³/h, while the two-pump solution is for flow rates above 5 m³/h.

Single-pump solution

Our single-pump solutions include the pump types CRNE 1 HS and CRNE 3 HS.

CRNE HS pumps are fitted with a high-speed motor with integrated frequency converter.

To minimise the pressure on the shaft seal, the direction of rotation is the opposite of the direction of standard pumps, and the chamber stack is turned upside down. Consequently, the pumped liquid flows in the opposite direction.

Two-pump solutions

We offer two-pump solutions for the following pumps:

- CRN 3, 5, 10, 15, 20, 32, 45, 64 SF

The solution consists of two pumps in series. The first pump is a standard pump for feeding. The second pump is either a high-pressure pump (SF) specially designed for high pressure or a standard pump.

To minimise the pressure on the shaft seal, the direction of rotation on CR SF pumps is the opposite of that of standard pumps, and the chamber stack is turned upside down. Consequently, the pumped liquid flows in the opposite direction.

Further documentation

Information about	See page
CR high-pressure pumps (standard documentation)	42
Pumps with bearing flange	54
Customised pump parts	22-75
Special installation requirements	18
E-pump solutions	72
Grundfos Product Center	180

Supplementary Grundfos pumps

For pressures above 50 bar, we recommend Grundfos BM modules or Grundfos BME, BMET pumps.

Further information about BM modules and BME, BMET pumps is available in Grundfos Product Center.

Hot-water applications

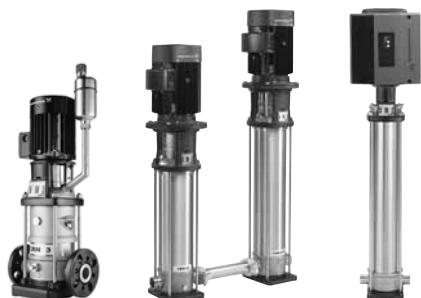


Fig. 3 CR pumps for hot-water applications

Reference applications

- Boiler feeding
- applications involving poor inlet conditions
- cleaning and washing applications
- high-temperature applications.

Customised solutions

Hot-water applications often expose pumps to a variety of extreme conditions, such as high temperatures, long operating hours, frequent starts/stops, pressure pulsing, poor inlet conditions and high inlet pressure. Such conditions may result in cavitation and/or cause increased wear of pump parts, for instance motor bearings and shaft seal, and thus reduce the pump life. To avoid breakdowns, we offer customised solutions designed to meet your needs! We provide solutions for applications involving special requirements, for example:

- steady steam production
- poor inlet conditions
- high temperature.

Steady steam production

To ensure steady steam production and a constant water level in the boiler tank, we recommend speed-controlled pumps.

We recommend speed-controlled pumps because:

- Steady and continuous flow of water increases efficiency of the boiler.
- The reaction to changes in the steam consumption is faster compared to the on/off pump control.
- The water level in the boiler feed tank is kept stable, which ensures higher steam quality and less humidity in the steam.
- The installation and maintenance costs are lower compared to systems with on/off controlled pumps and valves as well as systems with level control and modulating feed valves.
- No bypass pipe is needed.

GR5228 - GR7767 - TM02 8470 4004

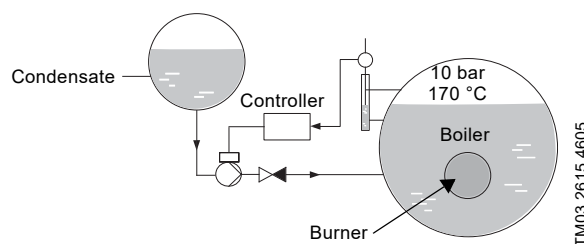


Fig. 4 Boiler-feed application with speed-controlled pump

Applications involving poor inlet conditions

Cavitation is often a problem in applications where pumps have to cope with the combination of high liquid temperatures, poor inlet pressure and/or a high flow rate.

Low-NPSH pumps eliminate the risk of cavitation and ensure stable and reliable operation.

The CR low-NPSH pump is a pump with a special first stage design that reduces the NPSH value and prevents erosion and destruction of the pump, pipes and valves.

For further information about NPSH and the calculation of NPSH-values, see the following data booklets available in Grundfos Product Center.

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For QR codes to the data booklets, see page 11.

High-temperature applications

The pumping of hot liquids demands much of pump parts, such as the shaft seal and rubber parts.

To ensure reliable and stable production, we offer CR pumps with an air-cooled top.

A CR pump with an air-cooled top has a standard mechanical shaft seal handling liquid temperatures up to 180 °C at 25 bar without external cooling. At the same time, the pump delivers a high pressure. As the name implies, the pump is fitted with a special air-cooled shaft seal chamber generating the same insulation effects as that of a vacuum flask.

Further documentation

Information about	See page
CR low-NPSH pumps	45
CR pumps with air-cooled top	37
Pumps with bearing flange	54
CR pumps with under-/oversize motor	28
Customised pump parts	22-75
Special installation requirements	18
E-pump solutions	72
Grundfos Product Center	180

Applications involving temperature control



TM02 7397 3403

Fig. 5 CRE, CRIE, CRNE pumps with sensor

Reference applications

Cooling systems:

- Electronic data processing
- laser equipment
- medical equipment
- industrial cooling and freezing processes.

Temperature-control systems:

- Casting and moulding tools
- oil processing.

Customised solutions

To ensure safe and reliable operation in applications involving temperature control, we offer customised solutions designed to meet your needs!

We provide solutions for applications involving pumping of the following liquids:

- liquids at temperatures down to $-40\text{ }^{\circ}\text{C}$
- high-temperature liquids
- high-viscous liquids, and similar.

Pumping of liquids down to $-40\text{ }^{\circ}\text{C}$

In applications where liquids are pumped at temperatures down to $-40\text{ }^{\circ}\text{C}$, it is crucial for successful production that pump parts are of the right materials and dimensions.

At such low temperatures, wrong materials and dimensions may cause deformation because of thermal expansion, and eventually stoppage of operation.

For low-temperature liquids below $-20\text{ }^{\circ}\text{C}$, we recommend CRN pumps.

Pumping of high-temperature liquids

The pumping of hot liquids demands much of pump parts, such as shaft seals and rubber parts. Examples of such liquids:

- water-based liquids up to $180\text{ }^{\circ}\text{C}$ at PN 25
- thermal oils up to $240\text{ }^{\circ}\text{C}$ at PN 16.

To ensure reliable and stable production, we offer CR pumps with an air-cooled top and special rubber parts.

A CR pump with an air-cooled top is a pump which can handle high temperatures and deliver a high pressure. The pump is fitted with a special air-cooled shaft seal chamber generating the same insulation effects as that of a vacuum flask.

Pumping of high-viscous liquids

In applications where high-viscous liquids are pumped, precautions must be taken to ensure that the motor of the pump is not overloaded, and that the pump performance is not reduced too much.

The viscosity of a pumped liquid depends strongly on the liquid temperature.

To ensure stable and reliable operation, we offer CR pumps with oversize motors.

Further documentation

Information about	See page
ATEX-approved pumps	23
CR pumps with air-cooled top	37
Pump rubber parts	54
CR pumps with oversize motor	28
Customised pump parts	22-75
Special installation requirements	18
E-pump solutions	72
Grundfos Product Center	180

Aggressive/hazardous liquids



GR5954 - GR7369 - GR5216

Fig. 6 CR pumps for aggressive/hazardous liquids

Reference applications

- Chemical industry
- pharmaceutical industry
- refineries
- petrochemical industry
- distilling plants
- paint industry
- mining.

Customised solutions

In industries where pumping of dangerous and aggressive liquids is an integrated part of the daily production, safety is top priority. Leaking pumps pose a danger to the environment.

To prevent breakdowns, we offer customised solutions designed to meet your needs!

We provide solutions for the following liquids:

- aggressive and abrasive liquids
- toxic and hazardous liquids
- flammable liquids
- odorous liquids.

To ensure safe handling of the above liquids, we offer the following pumps:

- pumps with tandem seal arrangement and flushing
- pumps with back-to-back seal arrangement and pressure intensifier
- pumps with magnetic drive (MAGdrive)
- pumps with ATEX approval.

Pumps with tandem seal arrangement

Pumps with tandem seal arrangements connected to a flushing device are used for crystallising, hardening or sticky liquids.

If the primary seal leaks, the leaking liquid will be flushed away by a flushing liquid.

Pumps with back-to-back seal arrangement

We recommend pumps with back-to-back seal arrangements for toxic, aggressive or flammable liquids.

Pumps with back-to-back seal arrangements are connected to systems that provide a higher pressure than the maximum pump pressure preventing leakage from the pump to the atmosphere side.

MAGdrive pumps

We recommend pumps with magnetic drive (MAGdrive) for toxic and hazardous liquids.

The MAGdrive pump is a hermetically sealed pump. In the MAGdrive pump, the power from the motor is transmitted to the pump shaft by means of magnetic force instead of a traditional coupling.

The motor shaft and the pump shaft are hermetically separated from each other.

ATEX-approved pumps

We recommend ATEX-approved pumps for potentially explosive atmospheres. Explosive atmospheres consist of air and combustible matter such as gases, vapours, mists or dusts in which the explosion spreads after ignition.

Electropolished pumps

We recommend electropolished pumps for applications with strict requirements concerning corrosion and cleanability.

We offer electropolished pumps in all CRN pump sizes.

Further documentation

Information about	See page
CR pumps with back-to-back seal arrangement	31
CR pumps with tandem seal arrangement	35
Pumps with magnetic drive (MAGdrive)	40
ATEX-approved pumps	23
Customised pump parts	22-75
Special installation requirements	18
E-pump solutions	72
Grundfos Product Center	180

Hygienic applications



TM02 1808 2001 - GR7375 - TM02 8470 4004

Fig. 7 CR pumps for hygienic applications

CR pumps are not designed for the pumping of hygienic and sterile liquids, but their construction and the choice of materials make them an ideal solution for secondary processes in hygienic applications.

Reference applications

- Pharmaceutical industries
- biotechnological industries
- electronics industries
- food and beverage industries
- process industries.

Customised solutions

In hygienic industries, pumps must meet strict requirements on for example design, materials, surface quality and cleanability.

To ensure hygienic and reliable production, we offer customised solutions specially designed to meet your requirements!

We provide solutions for applications involving special requirements to hygienic design and cleanability.

Hygienic design

The surface quality of pump parts is of utmost importance - both for corrosion resistance and microbial adhesion and growth.

To meet the strict hygienic requirements to material and surface quality in secondary hygienic processes, we offer electropolished stainless steel CRN pumps with the following surface quality:

Pump type	Cast stainless steel	Stainless-steel parts (not cast)	Surface quality
CRN 1s, 1, 3, 5	•	•	$Ra \leq 0.8 \mu m$
CRN 10, 15, 20	•	•	$Ra \leq 0.8 \mu m$
CRN 32, 45, 64	•	•	$Ra \leq 8.0 \mu m$
CRN 95, 125, 155	•	•	$Ra \leq 8.0 \mu m$
CRN 185	•	•	$Ra \leq 8.0 \mu m$

- Available.

Note that CRN pumps are not sanitary pumps regardless of the surface quality.

Furthermore, we offer a wide variety of connections, such as TriClamp connections, specially designed for pharmaceutical, food and beverage industries. For further information about TriClamp connections, see page 58.

We offer the following pumps:

- cleaned and dried pumps
- mechanically or electropolished pumps.

Electropolished pumps have a higher corrosion resistance than non-polished pumps.

Cleanability

In secondary hygienic applications, it is extremely important to clean the pumps sufficiently to prevent deposits from contaminating the pumped liquid.

For secondary hygienic applications, we recommend CRN and CRE pumps which have all pump parts in stainless steel. As the surface and properties of the metal is not affected by cleaning agents, stainless steel is the ideal solution.

ATEX-approved pumps

We recommend ATEX-approved pumps for potentially explosive atmospheres. Explosive atmospheres consist of air and combustible matter such as gases, vapours, mists or dusts in which the explosion spreads after ignition.

Further documentation

Information about	See page
Cleaned and dried CR pumps	43
Electropolished CR pumps	44
Stainless steel CRN pumps	44
ATEX-approved pumps	23
Customised pump parts	22-75
Special installation requirements	18
E-pump solutions	72
Grundfos Product Center	180

Special installation requirements



TM06 0754 0914

Fig. 8 CR pumps for special installations

Reference applications

- Places with limited access and space
- ships
- mobile applications
- fire protection
- earthquake-prone areas
- applications in remote areas.

Customised solutions

Due to safety, location and arrangement requirements, some installations require pumps of another design than traditional vertical pumps.

To meet special installation requirements, we offer customised solutions designed to meet your needs!

We provide solutions for the following pump types:

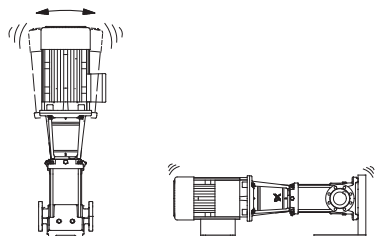
- horizontally mounted pumps
- belt-driven pumps
- pumps with alternative mounting.

Horizontally mounted pumps

We recommend horizontally mounted pumps in the following cases:

- installations with limited access and space, for instance cabinets and compact systems
- installations with limited height
- earthquake-prone areas
- mobile systems, for instance ships and vehicles.

Horizontally mounted pumps lower the centre of gravity and thus minimise swings during an earthquake. See the example in fig. 9.



TM03 2645 4705

Fig. 9 Vibrations of pumps in earthquake-prone areas

Horizontal mounting requires special mounting plates. For further details, see [Horizontal in-line pumps](#) on page 46.

Belt-driven pumps

Belt-driven pumps are often selected in the following cases:

- non-electrically driven applications for instance air-, solar-, wind-, diesel- and pneumatically driven applications
- installations requiring an alternative supply, for instance firefighting systems and emergency pumps.

The construction of belt-driven pumps is like that of electrically driven pumps, but belt-driven pumps have a pulley and belt connected to a combustion motor or other device.

Alternative mounting for limited access and space

For installations with limited access and space, we offer pumps with alternative mounting of pump parts such as terminal box and vent screw.

Certificates, approvals and reports

We offer customised pumps with a wide variety of certificates and approvals, for example:

- Inspection certificate 3.1C
 - Lloyds Register of Shipping (LRS)
 - Det Norske Veritas (DNV)
- ATEX, VIK and UL approvals
- Duty-point verification report
- Vibration test report.

Further documentation

Information about	See page
Horizontally mounted CR pumps	46
Belt-driven CR pumps	51
Stainless steel CRN pumps	44
Pump parts designed to match your needs	22-75
CR pumps with certificates	63
E-pump solutions	72
Grundfos Product Center	180

Special applications



Fig. 10 CRT, CRNE and CRN pumps

GR7369 - TM02 8470 - TM02 1808

Reference applications

- Off-shore and maritime applications
- cooling applications
- deep-well pumping systems
- pumps operating under special conditions.

Customised solutions

We offer customised solutions for a number of applications not mentioned on the previous pages, for example the following:

- Off-shore and maritime applications
- pumping of liquids down to -40 °C
- deep-well pumping in small water supply systems
- special conditions
- special requirements as to approvals, voltage and frequency.

To ensure stable and reliable operation, we offer customised solutions designed to meet your needs!

Off-shore and maritime applications

In off-shore and maritime applications, pumps must meet strict requirements to reliability in connection with for instance cooling, firefighting, cleaning and desalination systems. Pumps are often installed in a corrosive environment.

We offer customised pumps with a wide variety of 3.1C inspection certificates, such as Lloyds Register of Shipping (LRS) and Det Norske Veritas (DNV). For further information, see page 63.

Furthermore, we offer customised pumps with a wide variety of materials, connections and enclosure classes.

For the pumping of seawater, we recommend CRT and CRE pumps which have all pump parts in titanium. As the corrosion resistance of CRT and CRE pumps is not affected by seawater, titanium is the ideal solution.

Pumping of liquids down to -40 °C

In applications with liquid temperatures down to -40 °C, the material of shaft seal faces, the dimensions of the neck ring and other factors must meet high requirements. At such low temperatures, choosing the wrong materials and dimensions may cause deformation in the pipes because of thermal expansion, and eventually stoppage of operation.

For liquids below -20 °C, we recommend CRN pumps.

Deep-well pumping in small water supply systems

Water is pumped from depths down to 90 metres. The system consists of a dry-mounted CR pump connected to a submerged ejector.

Pumps operating under special conditions

- Installations at high altitudes:
 - > 3,500 metres if fitted with Grundfos MG IE3 motors
 - > 2,750 metres if fitted with Siemens IE3 motors
 - > 1,000 metres if fitted with Grundfos MGE motors.
- applications with low, high or fluctuating ambient temperatures
- the pumping of high-viscous/-density liquids.

In such cases, the motor may be overloaded and an oversize motor may be required.

Special requirements

We offer customised pumps meeting special requirements to approvals, voltage and frequency.

Further documentation

Information about	See page
CR pumps for cooling applications	42
CR pumps for deep-well pumping	53
CR pumps with under-/oversize motors	28
Pump parts designed to match your needs	22-75
Special installation requirements	18
E-pump solutions	72
CR pumps with certificates	63
Grundfos Product Center	180

Supplementary Grundfos pumps

If the suction head exceeds 90 metres, we recommend Grundfos SP and SQ submersible pumps.

Further information about SP and SQ pumps is in Grundfos Product Center.

6. Accessories

ATEX-approved dry-running protection

For environments of group II, category 2G, always use dry-running protection.

The link between ATEX groups, categories and zones is explained in the 1999/92/EC directive. Please note that this is a minimum directive. Some EEC countries may therefore have stricter local rules. The user or installer is always responsible for checking that the group and category of the pump correspond to the zone classification of the installation site.

The dry-running protection with ATEX approval mentioned below is offered by Grundfos.

Components

Designation	Ex marking	Connection	[°C]	Product number
Flow sensor	II 2G Ex ib IIC T6	G 1/2 AISI 316Ti	85	96607921
		G 1/2 AISI 316Ti	120	96607922
Amplifier for flow sensor	-	II (1) GD [Ex ia] IIC	[V]	-
			230	96607923
Extension box	-	Terminals	Type	-
	II 2GEx e IIT6	4	GKEI 100	97754528
	II 2GEx ia IIC T6	4	GKI 60	97754527
	II 2GEx e [ia] IIC T6	4	GKE 60	97752524

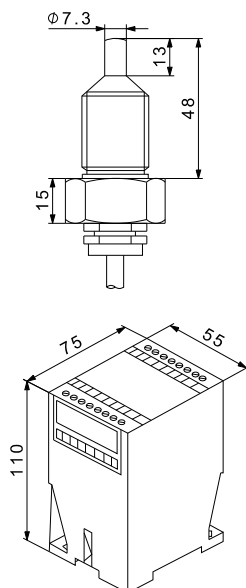


Fig. 11 ATEX-approved flow sensor and amplifier

TM05 1169 3511

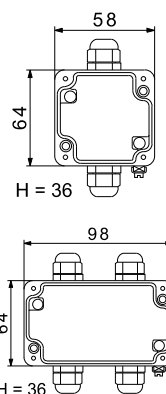


Fig. 12 ATEX-approved extension box

TM05 1120 0611

The extension box is designed for connection of intrinsically safe and/or non-intrinsically safe circuits in explosion-hazardous areas of category 2 (zone 1 and 21).

Venting valve with connecting pipe

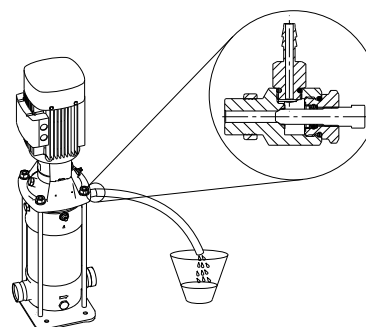


Fig. 13 Venting valve with connecting pipe

TM05 1160 0611

The connecting pipe of this special venting valve allows the operator to de-aerate the pump into a closed container. This accessory is ideal when pumping aggressive or hazardous liquids.

Designation	Connection	Type	Product number
Venting valve with connecting pipe	G 1/2	EPDM	97773787
		FKM	97775104
		FFKM	97775105
		FXM	97775106

Dosing pump system for barrier fluid

The dosing pump system is used to supply pressurised barrier liquid to a CR pump with a back-to-back seal arrangement.

For further information see [CR pump with dosing pump in back-to-back seal arrangement](#) on page 33.

Designation	Product number
Dosing pump system for barrier fluid, 50 Hz	96449957
Dosing pump system for barrier fluid, 60 Hz	96462388

Flushing-liquid tank for pumps with tandem seal arrangements

Stainless steel tank for flushing-liquid systems. For further information see [Flushing-liquid systems](#) on page 36.

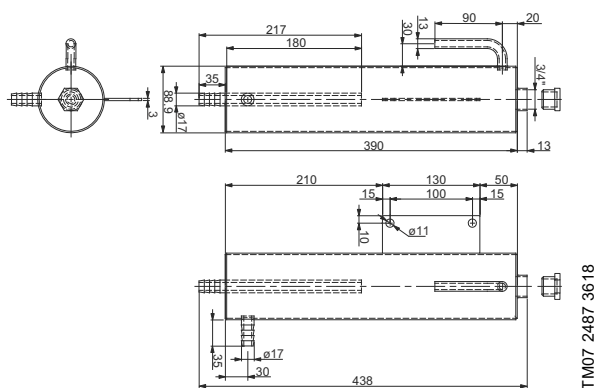


Fig. 14 Tank dimensions

Designation	Product number
Flushing-liquid tank excl. fittings and hose	96609459

7. Motor

The Grundfos standard range of motors meets a wide variety of application demands. For special applications or operating conditions, we offer various customised solutions:

- a wide range of motor approvals
- motors with special voltage
- motors with an anti-condensation heater
- motors with Harting® 10-pin multiplug connection
- motors with built-in PTC sensor
- motors with built-in thermal switch
- undersize and oversize motors
- motors with alternative enclosure class
- motors with bearings suitable for high-temperature operating conditions (bearings are packed with grease suitable for high temperatures)
- IE4 motors
- IE5 motors with permanent magnet rotor.

VIK-approved motors

We recommend VIK-approved motors for industrial climates where aggressive gasses and/or aggressive vapours are likely to occur.

The VIK standard applies to three-phase mains-operated motors and three-phase motors connected to a frequency converter.

We offer VIK-approved motors from 0.37 to 200 kW in accordance with the requirements of the German industrial standard, Verband der Industriellen Energie- und Kraftwirtschaft. To comply with the standard, VIK-approved motors must meet these requirements:

- Group II, Category 2, version EEx e or EEx d, temperature class T3 in the ATEX directive.
In case of doubt, consult the above standard or contact Grundfos.
- Enclosure class IP55 as a minimum.
- Protected against sucking. This phenomenon may occur when the pressure inside the motor is lower than the atmospheric pressure. In such cases, moisture is sucked from the atmospheric side into the motor through for example bearing housings.

For further information about the VIK-standard, see www.vik.de or contact Grundfos.

Tropicalised motors

A tropicalised motor does not contain paper, wood or similar materials containing wood pulp.

Grundfos defines a tropicalised motor as a motor which fulfils the climate group "World-Wide" in DIN/IEC 721-2-1 and has the following characteristics:

- enamel-covered windings
- double winding impregnation
- double winding insulation
- FPM V-ring
- terminal board made of polyester
- liquid sealing between frame and flange/end shield
- all outside screws made of stainless steel
- 30 µm paint layer on aluminium stator housings
- 120 µm paint layer on cast-iron stator housings
- heating element.

cURus-, UR- and CSA-approved motors

We offer mains-operated motors with these approvals:

Approval	Motor power - P ₂ [kW]
cURus	0.37 - 22
UR	30-200
CSA	30-200

Energy

We offer mains-operated motors that comply with these energy standards:

- CEL
- EISA 2007
- KEMCO
- INMETRO
- NOM-016-ENER
- cURus ENERGY.

Other motor approvals

We offer a wide range of motor approvals, for example the following:

- CCC
- C-tick
- GOST
- BΔ
- TSU
- METI/JQA
- CB
- TSENK.

ATEX-approved pumps



TM01 619 4202

ATEX-approved pumps are for use in potentially explosive atmospheres. Explosive atmospheres consist of air and combustible matter, such as gases, vapours, mists or dusts in which the explosion spreads after ignition.

We offer explosion-proof motors in accordance with the EU directive 2014/34/EU, the so-called ATEX directive. The ATEX-approved pumps can be used in areas (zones) classified according to the directive 1999/92/EC. In case of doubt, consult the above-mentioned directives or contact Grundfos.

ATEX-approved pumps are supplied with serial number, special installation and operating instructions, and a nameplate showing the ATEX classification. The nameplate includes an "X" to indicate that the product is subject to special conditions for safe use.

An ATEX certificate is available on request.

Scope of ATEX categories

Group I	
	Category M2
Underground installations in mines liable to be endangered by explosive gasses or combustible dust.	Pumps made of materials that do not create sparks and thus do not constitute any danger of explosion.
CR pumps available	CR, CRI, CRN
Motors available	None ¹⁾

¹⁾ Air-driven or hydraulically driven motors are not available from Grundfos.

Group II		
	Category 2	
Installation areas liable to be endangered by explosive atmospheres.	Pumps intended for use in areas in which explosive atmospheres are likely to occur.	
	G (gas)	D (dust)
1999/92/EC ¹⁾	Zone 1	Zone 21
CR pumps available	CR, CRI, CRN, CRT ²⁾	CR, CRI, CRN, CRT
Motors available	II 2G Ex eb IIC T3 Gb II 2G Ex db IIC T4 Gb	II 2D Ex tb IIIC T125 °C Db

Group II		
	Category 3	
Installation areas liable to be endangered by explosive atmospheres.	Pumps intended for use in areas in which explosive atmosphere <u>only rarely occur</u> .	
	G (gas)	D (dust)
1999/92/EC ¹⁾	Zone 2	Zone 22
Pumps available	CR, CRI, CRN, CRT	CR, CRI, CRN, CRT
Motors available	II 2G Ex eb IIC T3 Gb II 2G Ex db IIC T4 Gb	II 3D Ex tc IIIC T125 °C Dc

¹⁾ The link between groups, categories and zones is explained in the 1999/92/EC directive. Some EEC countries may therefore have stricter local rules. The user or installer is always responsible for checking that the group and category of the pump correspond to the zone classification of the installation site.

²⁾ For group II, category 2 G (zone 1), the pump must be protected against dry running. Use one of the following methods:

- An ATEX-approved dry-running protection. Always use this protection on pumps with MAGdrive or pumps with a single mechanical shaft seal.
- Pumps with double seal system.
 - Back-to-back:
The system for pressurising the system must be ATEX approved.
 - Tandem:
Make sure that the flow rate of flushing liquid is always sufficient, and make sure that the elevated tank never runs dry of flushing liquid.

We offer the following ATEX-approved motors:

Motor [kW]	Version			
	(II 2G Ex eb IIC T3 Gb)	(II 2G Ex db IIC T4 Gb)	(II 2D Ex tb IIIC T125 °C Db)	(II 3D Ex tc IIIC T125 °C Dc)
0.37 - 28	•			
0.37 - 200		•	•	•

All explosion-proof motors have PTC sensors. For further information about PTC sensors, see page 26.

Special voltage

We offer pumps with following voltages:

Frequency	Voltage
Mains-operated motor	
50 Hz	3 x 220-240 Δ/380-415 YV
	3 x 200-220/346-380 V
	3 x 380-415 ΔV
	3 x 380-415 Δ/660-690 YV
60 Hz	3 x 200-230/346-400 V
	3 x 208-230/460 V
	3 x 220-255 Δ/380-440 YV
	3 x 220-277 Δ/380-480 YV
	3 x 220-277 Δ/380-480 YV
	3 x 380-440 ΔV
	3 x 380-480 ΔV
	3 x 380-480 Δ/660-690 YV
	3 x 575 YV
Motor with integrated frequency converter	
50/60 Hz	1 x 200-240 V
	3 x 380-500 V (0.37 - 2.2 kW)
	3 x 380-480 V (3-22 kW)

Note that other voltages are available on request.

Certificate

Grundfos offers a certificate for an ATEX-approved pump. The certificate has to be confirmed for every order. If a certificate is needed, order it when ordering the pump.

BE > THINK > INNOVATE >

GRUNDFOS

ATEX-approved pump



Customer name	
Customer order no.	
Customer TAG no.	
GRUNDFOS order no.	
Pump type	
GRUNDFOS DUT id.	
Part number	
Production code	
Pump serial no.	
Motor serial no.	
ATEX approval of pump	
Technical file no.	96499604

GRUNDFOS hereby confirms that the pump mentioned above is manufactured according to the ATEX directive. This means the pump is conformity with the ATEX 94/9EEC (ATEX 100) appendix VIII directive as mentioned in the "ATEX Supplement to installation and operating instructions" supplied with the pump.

GRUNDFOS

Date:

Signature:

Name:

Dept.:

Part no 96 53 22 40/A72775

TM03 4166 1706

Order the certificate via the product number.

Description	Product number
Certificate for ATEX-approved pump	96512240

Motor with multiplug connection



Gr7550

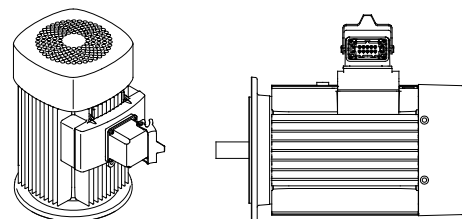
Fig. 15 Mains-operated motor with Harting® 10-pin multiplug

Mains-operated motors fitted with a Harting® 10-pin multiplug connection, HAN 10 ES, enable easy connection to the mains.

Note that for Grundfos motors with integrated frequency converter up to 7.5 kW, we offer the solutions shown on page 25.

The purpose of a multiplug connection is to make the electrical installation and service of the pump easier. The multiplug functions as a plug-and-pump device.

The drawings below show the position of the multiplug on the mains-operated motor.



TM01 8713 0700 - TM02 8518 0304

Fig. 16 Motor with multiplug connection

The multiplug connection is available for the following motor sizes:

Motor power P2 [kW]	Voltage [V], starting method
0.37 - 7.5	3 x 220-240 Δ/380-415 YV
0.37 - 7.5	3 x 380-415 ΔV

Logo for multiplug

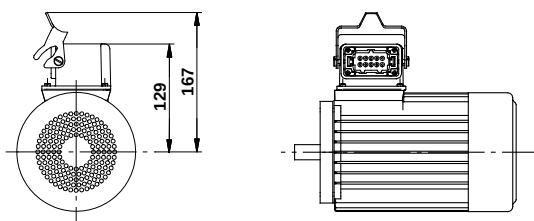


Fig. 17 Logo

TM02 0470 0700

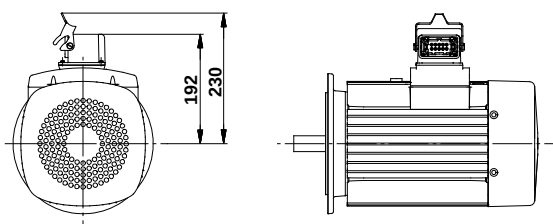
Dimensions

All dimensions are in mm.



TM01 8716 0700

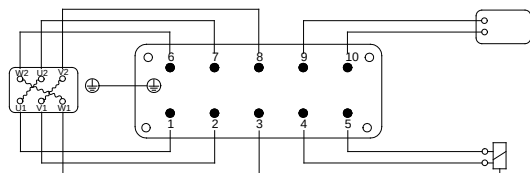
Fig. 18 Dimensions, 0.37 - 1.1 kW



TM01 8714 0700

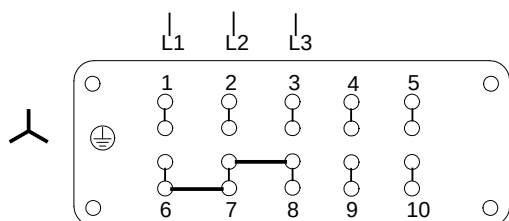
Fig. 19 Dimensions, 1.5 - 7.5 kW

Plug connections



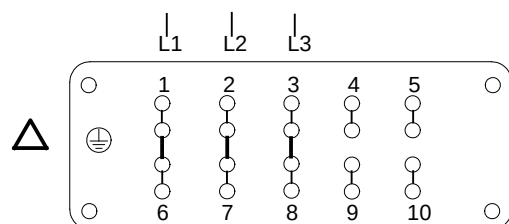
TM01 8702 0700

Fig. 20 Plug connection from motor



TM01 8703 0700

Fig. 21 Plug connection for star connection



TM01 8704 0700

Fig. 22 Plug connection for delta connection

Note that fishplates for connections are located in the plug.

Plug-and-pump solutions for CRE pumps

To facilitate electrical installation and service of our three-phase CRE pumps from 3-22 kW, all motor terminal boxes are equipped with a detachable cable inlet bar.

When the cable inlet bar is removed, you can disconnect all electrical connections.

Figure 23 shows the location of the detachable cable inlet bar on the motor terminal box as well as plugs for mains connection, sensor and communication.

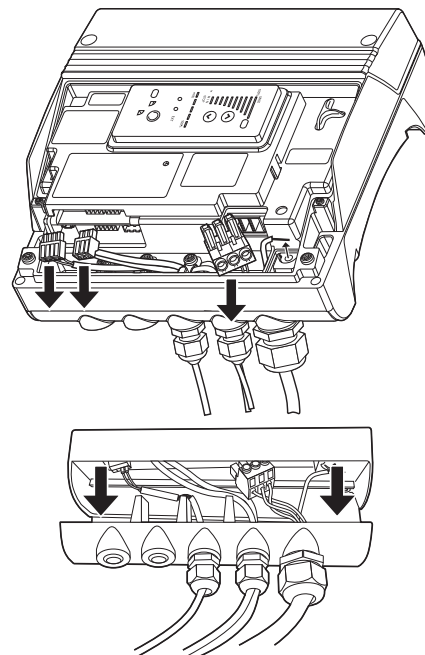


Fig. 23 Location of the detachable cable inlet bar on the motor terminal box as well as plugs for mains connection, sensor and communication

TM03 1964 3405 - TM03 1962 3405

Motor with anti-condensation heater



TM03 2440 4305

Fig. 24 Mains-operated MG motor with an anti-condensation heater

In applications where condensation in the motor may occur, we recommend that you install a motor with an anti-condensation heater on the stator coil ends. The heater keeps the motor temperature higher than the ambient temperature and prevents condensation.

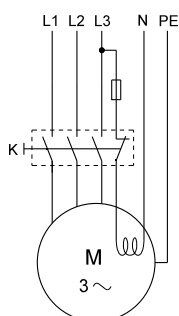
Note that an anti-condensation heater is standard on all MGE motors and can be activated remotely.

High humidity may cause condensation in the motor. Slow condensation occurs as a result of a decreasing ambient temperature; rapid condensation occurs as a result of shock cooling caused by direct sunlight followed by rain. We recommend that you always use motors with an anti-condensation heater in areas with ambient temperatures below 0 °C.

Note that rapid condensation is not to be confused with the phenomenon which occurs when the pressure inside the motor is lower than the atmospheric pressure. In such cases, moisture is sucked from the atmosphere into the motor through for example bearings and housings.

In applications with constant high humidity levels above 85 %, the drain holes in the drive-end flange must be open. This changes the enclosure class to IP44. If IP55 protection is required due to operation in dusty environments, we recommend that you install a motor with an anti-condensation heater.

The figure below shows a typical circuit of a three-phase motor with an anti-condensation heater.



TM03 4058 1406

Fig. 25 Three-phase motor with an anti-condensation heater

Key

Symbol	Designation
K	Contactors
M	Motor

Connect the anti-condensation heater to the supply voltage so that it is on when the motor is switched off. Motors from 0.37 to 200 kW are available with an anti-condensation heater.

Motor size, 50/60 Hz [kW]		Power of heating unit [W]		
2-pole	4-pole	1 x 24 V	1 x 115 V	1 x 190-250 V
0.37 - 1.1	0.25 - 0.75			23
1.5 - 3.0	1.1 - 3.0	38		31
4.0 - 5.5	4.0		-	38
7.5 - 22	5.5 - 15 ¹⁾	38		38
30-37	18.5 ¹⁾		55	55
45-55	-	-	92	92
75	-		109	109

¹⁾ 15 and 18.5 kW 4-pole are oversize motors in the CR pump range.

Motors with PTC sensors



TM02 7038 2403

Fig. 26 PTC sensor incorporated in winding

Built-in PTC sensors (thermistors) protect the motor against rapid as well as steady overload.

We offer motors with temperature-controlled PTC sensors in the motor windings.

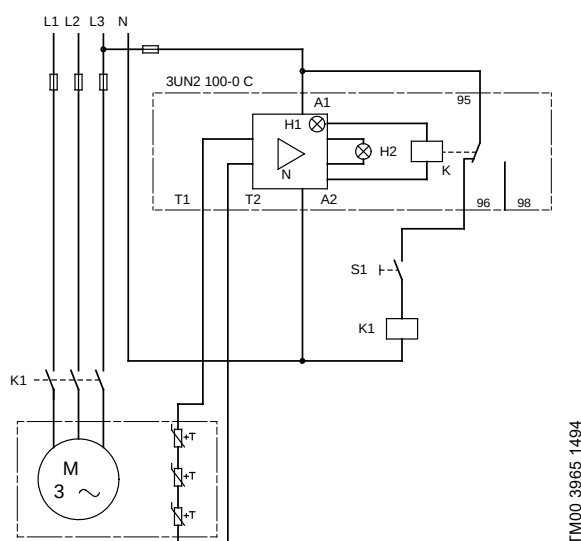
Three-phase mains-operated motors from 3 kW and up have PTC sensors as standard.

Note that temperature-controlled PTC sensors must be connected to an external tripping or LiqTec unit connected to the control circuit. For further information about LiqTec, see page 56.

- PTC sensors offer protection against steady and rapid overload. PTO sensors offer protection against steady overload.

PTC sensors comply with DIN 44 082. Maximum voltage at the terminals: $U_{\max} = 2.5 \text{ VDC}$. All tripping units available for DIN 44 082 PTC sensors meet this requirement.

The figure below shows a typical circuit of a three-phase motor with PTC sensors.



TM00 3965 1494

Fig. 27 Three-phase motor with PTC sensors

Key

Symbol	Designation
S1	On/off switch
K1	Contactor
+T	PTC sensor (thermistor) in motor
M	Motor
3UN2 100-0 C	Tripping unit with automatic reset
N	Amplifier
K	Output relay
H1	LED "Ready"
H2	LED "Tripped"
A1, A2	Connection for control voltage
T1, T2	Connection for PTC sensor loop

Motors with thermal switches



TM02 7042 2403

Fig. 28 Thermal switch incorporated in winding

Built-in thermal switches protect the motor against rapid as well as steady overload.

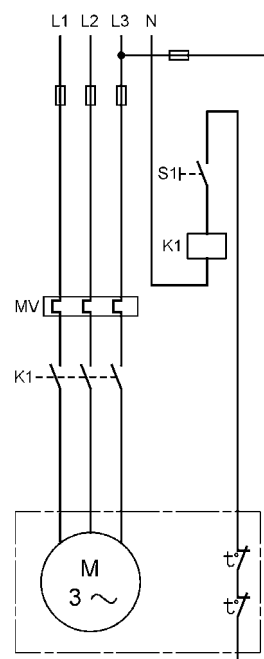
We offer three-phase mains-operated motors from 0.37 to 11 kW with built-in thermal switches.

Note that thermal switches must be connected to an external control circuit to protect the motor against steady overload. The thermal switches require no tripping unit.

Protection according to IEC 60034-11: TP 211 (steady and rapid overload). As protection against seizure, connect the motor to a motor-protective circuit breaker. Thermal switches tolerate the following maximum loads:

U_{max}	250 VAC
I_N	1.5 A
I_{max}	5.0 A (locked-rotor and breaking current)

Figure 29 below shows a typical circuit of a three-phase motor with built-in bimetallic thermal switches.



TM00 3964 1494

Fig. 29 Three-phase motor with thermal switches

Key

Symbol	Designation
S1	On/off switch
K1	Contactor
t°	Thermal switch in motor
M	Motor
MV	Motor-protective circuit breaker

Oversize motors

We recommend that you use an oversize motor if operating conditions fall outside the operating conditions described in these data booklets. The data booklets are available in Grundfos Product Center.

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For QR codes to the data booklets, see page 11.

We especially recommend oversize motors in these cases:

- The pump is installed at an altitude above 3,500 m (MG IE3), 2,875 m (Siemens IE3), and 1,000 m (MG IE2).
- The ambient temperature exceeds 60 °C (MG IE3), 55 °C (Siemens IE3) or 40 °C (MG IE2).
- The viscosity or density of the pumped liquid is higher than that of water.

Undersize motors

We recommend that you use an undersize motor if operating conditions fall much inside the standard conditions described in these data booklets. The data booklets are available in Grundfos Product Center.

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For QR codes to the data booklets, see page 11.

We especially recommend undersize motors in these cases:

- The viscosity or density is lower than that of water.
- The duty point of the pump is constant, and the flow rate is significantly lower than the maximum recommended flow rate.

Alternative enclosure class (IP)

The motor enclosure class complies with IEC 60034-5.

The enclosure class states the degrees of protection of the motor against ingress of solid objects and water.

All motors comply with IP55 as standard.

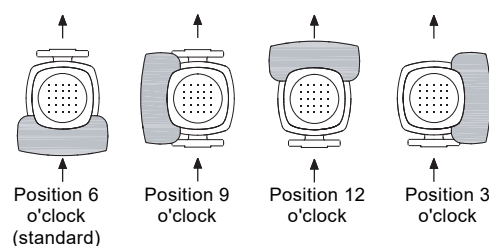
On request, we offer motors with the following enclosure classes:

IP class	Description
IP54	• The motor is protected against the ingress of dust, meaning harmful layers of dust. • The motor is protected against water splashing from any direction.
IP55	• The motor is protected against the ingress of dust, meaning harmful layers of dust. • The motor is protected against heavy seas or projected by a nozzle from any direction.
IP56	• The motor is protected against the ingress of dust. • The motor is protected against heavy seas or high-pressure water jets from any direction.
IP65	• The motor is completely dust-proof. • The motor is protected against water being projected by a nozzle from any direction.
IP66	• The motor is completely dust-proof. • The motor is protected against heavy seas or high-pressure water jets from any direction.

Alternative terminal box positions

The terminal box is in position 6 o'clock as standard.

The possible terminal box positions are shown below.



TM03 3658 0606

Fig. 30 Possible terminal box positions

4-pole motors



TM03 1711 2805

Fig. 31 4-pole motor

We offer all CR pumps with 4-pole motors.

4-pole motors are often preferred in these cases:

- A low sound pressure level is required.
- Inlet conditions are poor.
- Beating of the liquid is not allowed.

For performance curves and technical data on 4-pole CR pumps, see page [128](#) to [152](#) and [140](#) to [152](#).

For electrical data on 4-pole CR pumps, see pages [174](#) and [176](#).

Permanent magnet motors

CR pumps with MGE IE5 motors are available on request. The offered range spans from 0.37-11 kW.

Nidec IE5 motors with frequency drive are available up to 200 kW.

Motor efficiency classes

The new EN standard 60034-30:2009 defines the following efficiency classes of low-voltage three-phase asynchronous motors from 0.75 to 375 kW:

- IE1: standard efficiency
- IE2: high efficiency
- IE3: premium efficiency
- IE4: super premium efficiency
- IE5: ultra premium efficiency.

IE = International Efficiency.

Three-phase motors of CR pumps are 0.75 to 200 kW IE3 motors as standard.

CR pumps with IE2, IE4 and IE5 motors are available on request.

Other motor makes

We also offer pumps with a motor of any make which can fulfil requirements such as the following:

- flange dimensions
- bearing specifications
- pump shaft.

Alternatively, Grundfos pumps can be supplied without a motor.

8. Shaft seals

Shaft seal arrangements

Depending on the application, CR pumps are available with these shaft seals:

- single seal arrangement
- double seal arrangement
- magnetic drive.

CR, CRE, CRI, CRIE, CRN and CRNE pumps are fitted with a cartridge shaft seal mounted in a single seal arrangement as standard:

- HQQE or HQQV (0.25 - 45 kW)
- HBQE or HBQV (55-75 kW).

CRT and CRTE are fitted with one AUUE or AUUV O-ring seal as standard.

In applications where the pumped liquid may harm the environment, double seal arrangements or magnetic-drive pumps are selected.

To ensure reliability, these conditions must be considered when selecting a shaft seal:

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

Overview of shaft seals

The below table shows the shaft seals available.

Shaft seal type	Shaft diameter	x = E	x = V	x = K	x = F
HQQx	Ø12, Ø16	30 bar -40 °C to +120 °C	30 bar -20 °C to +90 °C	30 bar -5 °C to +120 °C	30 bar -10 °C to +120 °C
		30 bar -40 °C to +120 °C	30 bar -20 °C to +90 °C	30 bar -5 °C to +120 °C	30 bar -10 °C to +120 °C
	Ø22	30 to 40 bar -40 °C to +80 °C	30 to 40 bar -20 °C to +80 °C	30 to 40 bar -5 °C to +80 °C	30 to 40 bar -10 °C to +80 °C
		30 to 40 bar -40 °C to +80 °C	30 to 40 bar -20 °C to +80 °C	30 to 40 bar -5 °C to +80 °C	30 to 40 bar -10 °C to +80 °C
	Ø28, Ø36	25 bar -40 °C to +120 °C	25 bar -20 °C to +90 °C	-	25 bar -10 °C to +120 °C
		25 to 40 bar -40 °C to +80 °C	25 to 40 bar -20 °C to +80 °C	-	-
HUUx	Ø12, Ø16	30 bar -40 °C to +90 °C	30 bar -20 °C to +90 °C	30 bar -5 °C to +90 °C	30 bar -10 °C to +90 °C
		30 bar -40 °C to +90 °C	30 bar -20 °C to +90 °C	30 bar -5 °C to +90 °C	30 bar -10 °C to +90 °C
	Ø22	30 to 40 bar -40 °C to +70 °C	30 to 40 bar -20 °C to +70 °C	30 to 40 bar -5 °C to +70 °C	30 to 40 bar -10 °C to +70 °C
		30 to 40 bar -40 °C to +70 °C	30 to 40 bar -20 °C to +70 °C	30 to 40 bar -5 °C to +70 °C	30 to 40 bar -10 °C to +70 °C
	Ø28, Ø36	25 bar -40 °C to +80 °C	25 bar -20 °C to +80 °C	-	-
		25 to 40 bar -40 °C to +60 °C	25 to 40 bar -20 °C to +60 °C	-	-
HQUx ¹⁾ HUQx ²⁾	Ø12, Ø16	30 bar -40 °C to +110 °C	30 bar -20 °C to +90 °C	30 bar -5 °C to +110 °C	30 bar -10 °C to +110 °C
		30 bar -40 °C to +110 °C	30 bar -20 °C to +90 °C	30 bar -5 °C to +110 °C	30 bar -10 °C to +110 °C
	Ø22	30 to 40 bar -40 °C to +70 °C	30 to 40 bar -20 °C to +70 °C	30 to 40 bar -5 °C to +70 °C	30 to 40 bar -10 °C to +70 °C
		30 to 40 bar -40 °C to +70 °C	30 to 40 bar -20 °C to +70 °C	30 to 40 bar -5 °C to +70 °C	30 to 40 bar -10 °C to +70 °C
	Ø28, Ø36	25 bar -40 °C to +110 °C	25 bar -20 °C to +90 °C	-	-
		25 to 40 bar -40 °C to +70 °C	25 to 40 bar -20 °C to +70 °C	-	-
HQBx HUBx	Ø12, Ø16	30 bar 0 °C to +120 °C	30 bar 0 °C to +90 °C	30 bar 0 °C to +120 °C	30 bar 0 °C to +120 °C
		30 bar 0 °C to +120 °C	30 bar 0 °C to +90 °C	30 bar 0 °C to +120 °C	30 bar 0 °C to +120 °C
	Ø22	30 to 40 bar 0 °C to +80 °C	30 to 40 bar 0 °C to +80 °C	30 to 40 bar 0 °C to +80 °C	30 to 40 bar 0 °C to +80 °C
		30 to 40 bar 0 °C to +80 °C	30 to 40 bar 0 °C to +80 °C	30 to 40 bar 0 °C to +80 °C	30 to 40 bar 0 °C to +80 °C
	Ø28, Ø36	25 bar 0 °C to +120 °C	25 bar 0 °C to +90 °C	-	-
		25 to 40 bar 0 °C to +80 °C	25 to 40 bar 0 °C to +80 °C	-	-

¹⁾ HQUx shaft seal types are available for shaft diameters Ø12, Ø16 and Ø22.

²⁾ HUQx shaft seal types are available for shaft diameters Ø22, Ø28 and Ø36.
Codes for shaft seals, see page 12.

Shaft seal variants

Liquids or applications exceeding the range of normal operating conditions require special-purpose shaft seal solutions.

In order to meet any specific requirements, we offer variants of seal face material and secondary seal material (rubber parts).

The following recommendations apply to clean water and water containing glycol.

Note that for ultra pure water (conductivity lower than 2 µS/cm), do not use an xQQx seal face combination. Instead, use an xQUx seal face combination.

FKM (xxxV) is limited to 90 °C in water.

If abrasive particles are present, use an xQQx seal face combination.

For explanation of codes, shaft seal types and materials, see the type key on page 12, or see the data booklet "Shaft seals" which is available in Grundfos Product Center.

Single shaft seals with EPDM O-ring material (HxxE)

We recommend single shaft seals with EPDM O-ring material for water and aqueous solutions. EPDM rubber is not resistant to mineral oils.

Temperature range for rubber material:
water and watery medias from -40 °C to +120 °C.

Singles shaft seals with FKM O-ring material (HxxV)

We recommend single shaft seals with FKM O-ring material for a wide range of temperatures and pumped liquids, such as acids, saline solutions, mineral oil, vegetable oil and most solvents.

Temperature range for rubber material:

- heat-resistant from -20 °C to +240 °C (oil only)
- water-resistant from -20 °C to +90 °C.

Single shaft seals with FFKM O-ring material (HxxK)

We recommend single shaft seals with FFKM O-ring material for a wide range of pumped liquids, such as nitric acid, solvents, varnishes, paints and dyes.

Temperature range for rubber material:

- water-resistant up to -5 °C to +275 °C.

Single shaft seals with FXM O-ring material (HxxF)

We recommend single shaft seals with FXM O-ring material for high temperatures as well as for acid liquids and gasses within oil and gas extraction.

Temperature range for rubber material:

- -10 to +220 °C.

Plug and sleeve O-rings made of FXM are available for the full range.

Further information

For further information about O-ring materials, see the following data booklets available in Grundfos Product Center.

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003
Mechanical shaft seals for pumps	97506935

For QR codes to the data booklets, see page 11.

Double seal arrangements

We offer two double seal arrangements:

- back-to-back (OQQx)
- tandem (PQQx).

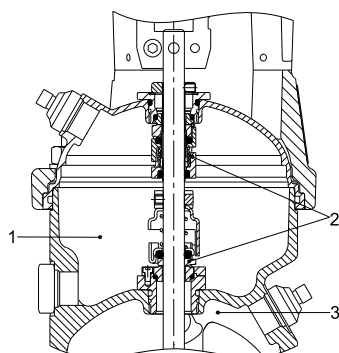
Back-to-back seal arrangement

Back-to-back seal arrangements consist of two Grundfos cartridge shaft seals, type O, fitted back to back in a separate seal chamber.

We recommend this type of seal arrangement for handling these types of liquids:

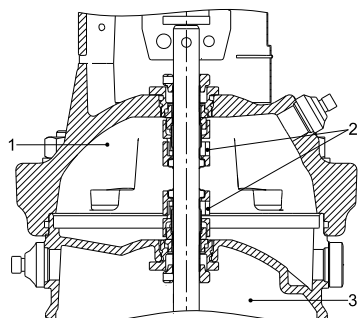
- toxic, aggressive or flammable liquids
- abrasive or sticky liquids which would either wear out, damage or block a mechanical shaft seal.

The back-to-back double seal protects the surrounding environment and the people working in the vicinity of the pump. It is specially designed for operating pressures up to 25 bar and 120 °C with the aim of minimising the risk of leakage from the pump to the environment.



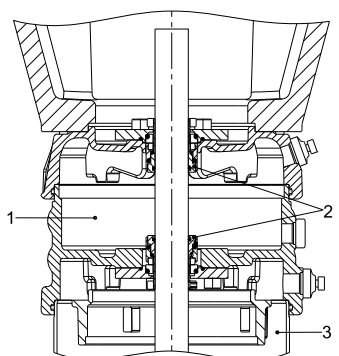
TM04 4404 1609

Fig. 32 CR 1s to 5 with back-to-back seal arrangement



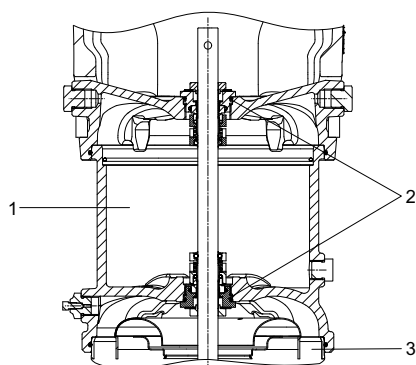
TM04 4405 1609

Fig. 33 CR 10 to 20 with back-to-back seal arrangement



TM04 4406 1609

Fig. 34 CR 32, 45 and 64 with back-to-back seal arrangement



TM07 2100 2718

Fig. 35 CR 95, 125, and 155 with back-to-back seal arrangement

Key to figs 32, 33 and 34

Pos.	Designation
1	Seal chamber
2	Shaft seals
3	Pump

The back-to-back seal arrangement is available for the following CR pumps:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95 ¹⁾ , 125 ¹⁾ , 155 ¹⁾	•		•
185			

• Available.

¹⁾ Available for pumps up to and including 55 kW.

Dimensions

All dimensions are in mm.

Pump type	Additional height of seal chamber [mm]
CRI, CRN 1s, 1, 3, 5	108
CRI, CRN 10, 15, 20	90
CR, CRN 32	140
CR, CRN 45	160
CR, CRN 64	166
CR, CRN 95	209
CR, CRN 125	244
CR, CRN 155	244

Pressurising

In back-to-back seal arrangements, the pressure in the seal chamber must be higher than the pump pressure to prevent the pumped liquid from leaking through the shaft seal to the environment.

Note that the barrier liquid will seep through the lower (primary) shaft seal and be mixed with the pumped liquid. Always use the right barrier liquid.

The pressure in the seal chamber can be generated in three ways:

- by an existing pressure source
- by a dosing pump
- by a pressure intensifier.

Further information

For further information about back-to-back seal arrangements, see the following data booklet available in Grundfos Product Center.

Data booklet	Publication number
Mechanical shaft seals for pumps	97506935

For the QR code to the data booklet, see page 11.

CR pump with dosing pump in back-to-back seal arrangement

The example below shows a CR pump with a back-to-back seal arrangement. The barrier liquid is supplied and pressurised by a dosing pump.

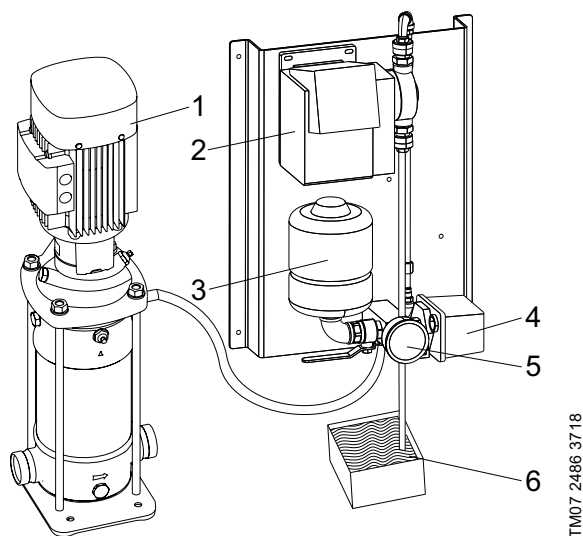


Fig. 36 CR pump with a dosing pump

Pos.	Designation
1	Pump
2	Dosing pump
3	Pressure tank
4	Pressure switch
5	Manometer
6	Reservoir with barrier liquid

The setpoint of the barrier liquid pressure is set by means of pressure switch (4). When the pressure drops below the setpoint, the dosing pump will start and thus maintain a higher pressure in the seal chamber (maximum pressure 16 bar). Barrier liquid is supplied from reservoir (6).

One dosing pump can supply several pumps with back-to-back seal arrangements.

Connections are all RG 1/2".

Note that connecting pipes and hoses are not included.

Dimensions of back plate with components

All dimensions are in mm.

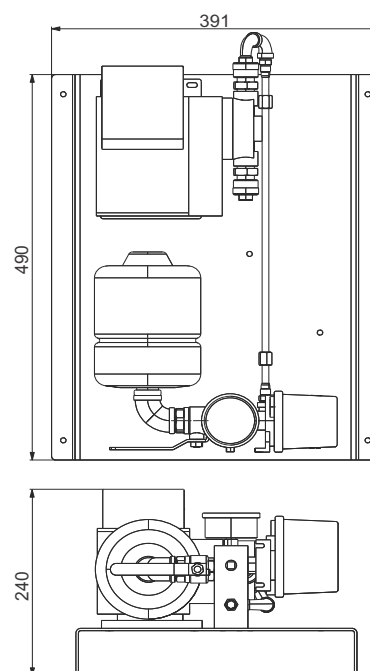
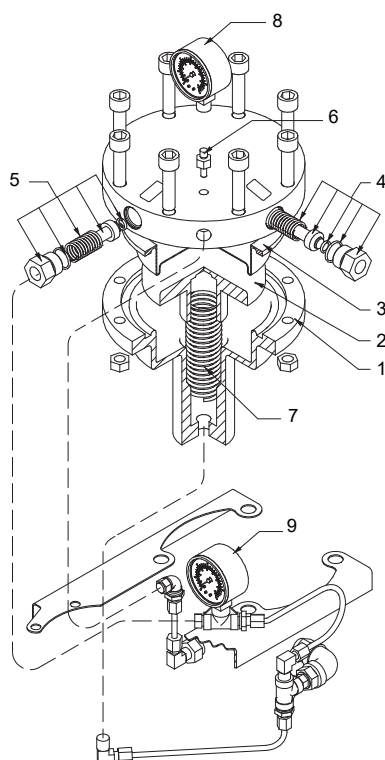


Fig. 37 Dimensional sketch of a back plate

CR pump with pressure intensifier in back-to-back seal arrangement

GR5954

Fig. 38 CR pump with pressure intensifier

TM03 8299 1007

Fig. 39 Components of pressure intensifier

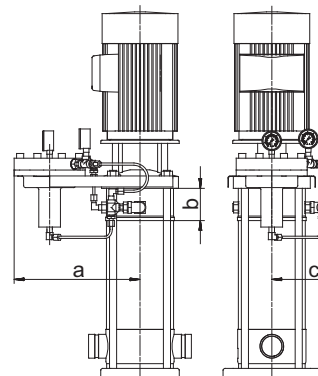
Pos.	Designation
1	Pressure intensifier
2	Piston
3	Diaphragm
4	Non-return valve
5	Relief valve
6	Vent screw, Rp 1/8
7	Spring for piston
8	Pressure gauge (barrier liquid)
9	Pressure gauge (pumped liquid)

The seal chamber is primed with barrier liquid via the non-return valve (4) until the pressure gauge (8) reaches 1.5 to 2 bar. The spring (7) is now preloaded with barrier liquid pressure. The pump is primed and vented. When the pump is started, the pump pressure plus the pressure from the preloaded spring will result in a pressure 1.5 to 2 bar higher in the seal chamber. Note that one pressure intensifier can only supply one pump. The pressure intensifier is fitted on the pump from factory.

Maximum operating pressure: 25 bar.

Dimensions

All dimensions are in mm.



TM01 4459 0399

Fig. 40 Dimensional sketch of a pump with a pressure intensifier

Pump type	a	b	c
CR, CRI, CRN 1, 3, 5	297	108	128
CR, CRI, CRN 10, 15, 20	330	90	140
CR, CRN 32	342	185	155
CR, CRN 45	349	215	164
CR, CRN 64	349	141	164

The dimension "b" is the additional height compared to the standard pump.

Tandem seal arrangement

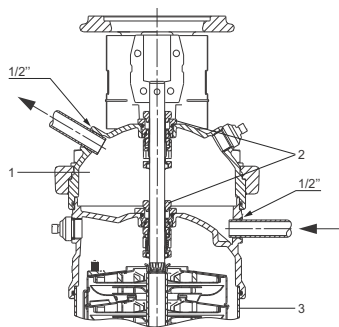
Tandem seal arrangements consist of two Grundfos cartridge shaft seals, type P, mounted tandem in a separate seal chamber.

We recommend tandem seals for crystallising, hardening or sticky liquids.

The tandem seal arrangement is specially designed for operating pressures up to 25 bar and 150 °C.

Note that at temperatures from 120 °C to 150 °C, the O-ring material in the shaft seal must be FXM (Fluoraz).

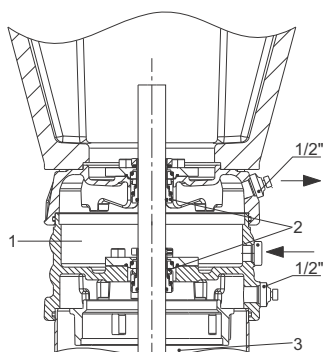
CR 1s, 1, 3, 5, 10, 15 and 20



TM03 3657 2718

Fig. 41 CR 1s to 20 with tandem seal arrangement

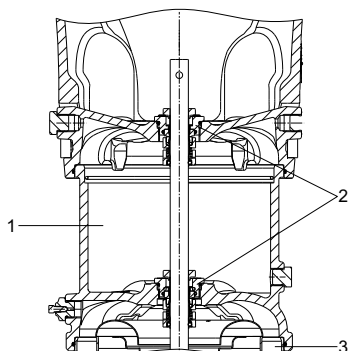
CR 32, 45, 64



TM04 4164 3718

Fig. 42 CR 32, 45, 64 with tandem seal arrangement

CR 95, 125 and 155



TM07 2101 2718

Fig. 43 CR 95, 125 and 155 with tandem seal arrangement

Key

Pos.	Designation
1	Seal chamber
2	Shaft seals
3	Pump

The tandem type of seal is available for these CR pumps:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95 ¹⁾ , 125 ¹⁾ , 155 ¹⁾	•		•
185			

• Available.

¹⁾ Available for pumps up to and including 55 kW.

Dimensions

All dimensions are in mm.

Pump type	Additional height of seal chamber
CRI, CRN 1s, 1, 3, 5	108
CRI, CRN 10, 15, 20	90
CR, CRN 32	140
CR, CRN 45	160
CR, CRN 64	166
CR, CRN 95	209
CR, CRN 125	244
CR, CRN 155	244

Flushing-liquid systems

CR pumps with tandem seal arrangement must be equipped with a flushing-liquid system. See page 21.

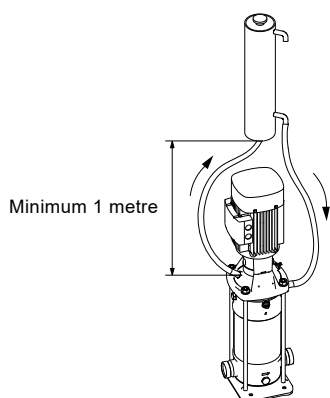
Note that the pumped liquid will seep through the lower (primary) shaft seal and be mixed with the flushing liquid.

The flushing-liquid flow rate must also be matched to the application (recommended flow rate 25-200 l/h).

The pressure of the flushing liquid must always be lower than the pressure of the pumped liquid.

Notethat the flushing-liquid supply must never be connected directly to the public water supply system. Observe the local regulations.

The following figures show examples of flushing systems for tandem seal arrangements.

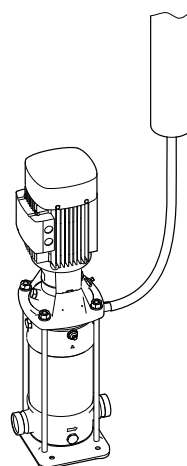


TM04 3217 2408

Fig. 44 Tandem seal arrangement with circulating flushing liquid

In figure 44, the flushing liquid circulates between an elevated tank and the pump by natural circulation. Heated flushing liquid rises from the seal chamber to the tank where it cools down. The cooled-down flushing liquid returns to the seal chamber.

At high temperatures, the circulation of flushed liquid through the seal chamber cools the seal faces of the shaft seal and reduces noise.

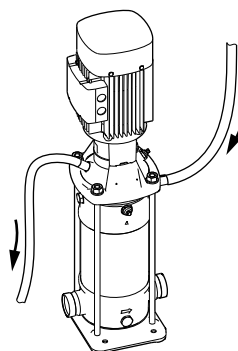


TM03 3809 1106

Fig. 45 Tandem seal arrangement with flushing-liquid supply

In figure 45, the flushing liquid enters the seal chamber via a pipe from an elevated tank.

No heat is dissipated from the system.



TM03 3813 1106

Fig. 46 Tandem seal arrangement with flushing liquid connected to a drain

In figure 46, the flushing liquid enters the seal chamber via a pipe from an elevated tank.

In case of leakage, the pumped liquid is washed away to the drain by the flushing liquid.

Further information

For further information about Grundfos tandem seal arrangements, see the following data booklet available in Grundfos Product Center.

Data booklet	Publication number
Mechanical shaft seals for pumps	97506935

For the QR code to the data booklet, see page 11.

Air-cooled top

CR pumps with an air-cooled top are used where the pumping of hot liquids is crucial for successful production. A CR pump with an air-cooled top is a pump with a special air-cooled shaft seal chamber generating the same insulation effect as a vacuum flask. No external cooling is necessary; the ambient temperature is sufficient.



GR5228

Fig. 47 CR pump with an air-cooled top

CR pumps with an air-cooled top have a mechanical silicon carbide/silicon carbide/EPDM cartridge shaft seal, type HQQE, as standard.

The pumps are able to handle liquid temperatures up to 180 °C at maximum PN 25.

If the pumped liquid is oil, the pumps can handle liquid temperatures up to 240 °C at maximum PN 16. The following rubber part variants are available for our air-cooled top solutions:

Liquid temperature [°C]	Rubber part material
Water-based liquids	
120-140	EPDM
120-180	FXM/EPDM
Thermal oils	
120-240	FKM

Temperatures above 120 °C normally result in a substantial reduction of seal life due to poor lubrication of the seal faces. As the temperature in the seal chamber does not exceed 120 °C during operation, a standard Grundfos shaft seal can be used.

An automatic vent is required for venting the pump seal chamber.

Note that for safety reasons, fit a pipe in order to lead away steam from the vent to a drain. Observe local regulations.

CR 1s, 1, 3 and 5

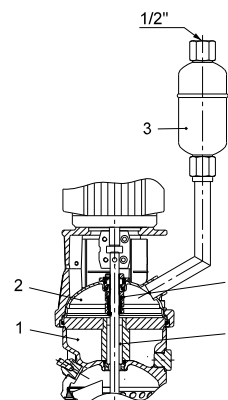


Fig. 48 CR 1s, 1, 3 and 5 with an air-cooled top

TM03 9159 3507

CR 10, 15 and 20

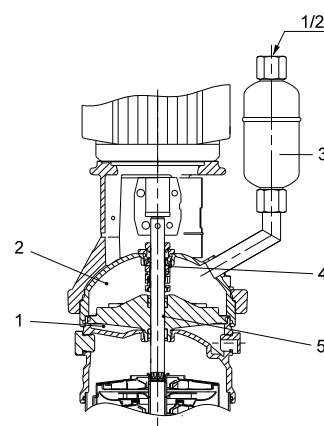


Fig. 49 CR 10, 15 and 20 with an air-cooled top

TM03 9160 3507

CR 32, 45 and 64

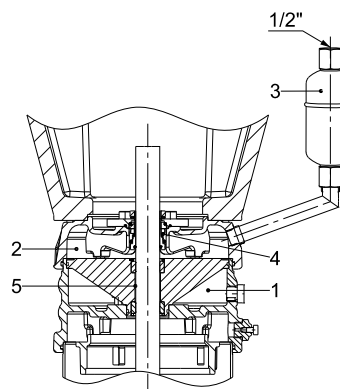
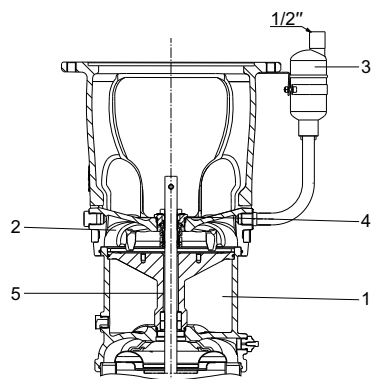


Fig. 50 CR 32, 45 and 64 with an air-cooled top

TM04 4165 0909

CR 95, 125 and 155



TM07 2099 2718

Fig. 51 CR 95, 125 and 155 with an air-cooled top

Key

Pos.	Designation
1	Air chamber
2	Liquid
3	Vent
4	Shaft seal
5	Cooling channel

Pump range

The air-cooled top is available for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5		•	•
10, 15, 20		•	•
32, 45, 64	•		•
95 ¹⁾ , 125 ¹⁾ , 155 ¹⁾	•		•
185			

• Available.

¹⁾ Available for pumps up to and including 55 kW.

Note that CRT and CRTE pumps are not available with an air-cooled top.

Bearing flanges for CR pumps with air-cooled top

When pumping hot liquids, the pump requires a net positive inlet pressure according to the vapour pressure of the specific liquid.

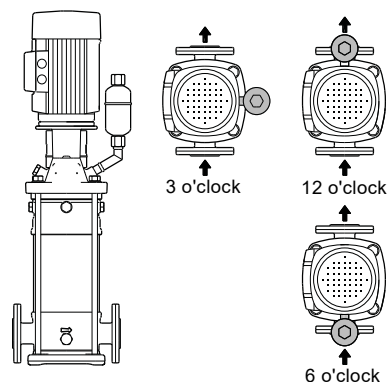
If the vapour pressure of the liquid exceeds the maximum inlet pressure of the pump, a bearing flange is required.

Vent positions on CR pumps with air-cooled top

The vent of vertical CR pumps with an air-cooled top is in line with the outlet port (12 o'clock position) as standard. The possible vent positions are shown below.

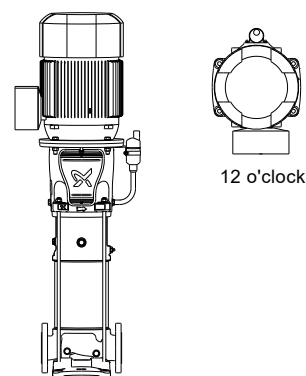
On horizontal pumps, the vent is mounted on top. See fig. 55.

Vertical CR pumps with air-cooled top



TM03 3659 0606

Fig. 52 Vent positions on vertical CR 1s-64 pumps



TM07 3057 4518

Fig. 53 Vent positions on vertical CR 95-155 pumps

Dimensions

All dimensions are in mm.

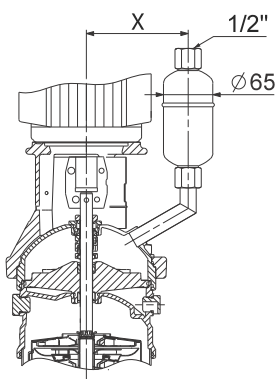


Fig. 54 Air-cooled top

Pump type	X
CRI, CRN 1s, 1, 3, 5 (< 3 kW)	142
CRI, CRN 1s, 1, 3, 5 (3 - 7.5 kW)	172
CRI, CRN 10, 15, 20 (< 4 kW)	156
CRI, CRN 10, 15, 20 (4 - 7.5 kW)	186
CRI, CRN 10, 15, 20 (11 - 18.5 kW)	217
CR, CRN 32	176
CR, CRN 45, 64	186
CR, CRN 95, 125, 155 (5.5 - 7.5 kW)	220
CR, CRN 95, 125, 155 (11 - 22 kW)	245
CR, CRN 95, 125, 155 (30 - 37 kW)	270
CR, CRN 95, 125, 155 (55 kW)	320

Additional pump height

Pump type	Additional pump height
CRI, CRN 1, 3, 5	108
CRI, CRN 10, 15, 20	90
CR, CRN 32	140
CR, CRN 45	160
CR, CRN 64	166
CR, CRN 95	209
CR, CRN 125, 155	244

Horizontal CR pumps with air-cooled top

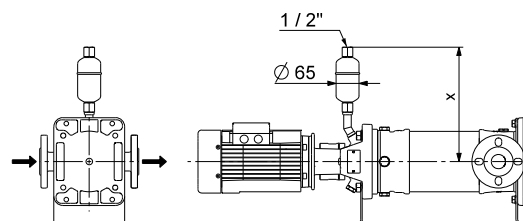


Fig. 55 Vent positions on horizontal CR pumps with an air-cooled top

Key to fig. 55

Pump type	X
CRI, CRN 1s, 1, 3, 5	308
CRI, CRN 10, 15, 20	324
CR, CRN 32	391
CR, CRN 45, 64	398
CR, CRN 95	356
CR, CRN 125, 155	382

Magnetic-drive pump (MAGdrive)

Grundfos CRN MAGdrive pumps operate according to a patented, magnetic-drive system that eliminates the need for shaft seals. The power from the motor is transmitted to the pump by magnetic force and not by a conventional coupling. Combined with a semi-hermetically sealed liquid end, the pump is essentially leak-free.

As all axial forces are absorbed in the MAGdrive system, the pump incorporates a standard IEC or NEMA motor with keyway and deep-groove ball bearing.



GrA4445

Fig. 56 CRN MAGdrive pumps

The MAGdrive solution is available for these pumps:

Pump type	CRN
1s, 1, 3, 5	•
10, 15, 20	•
32*, 45*, 64*	•
95, 125, 155	
185	

- Available.
- * Available up to 22 kW.

As a minimum, a soft starter is required for these motors:

- 2-pole motors: 18.5 and 22 kW
- 4-pole motors: 1.1 kW to 11 kW.

Features and benefits

CRN MAGdrive offers the following special features and benefits:

- a semi-hermetically sealed drive system for essentially leak-free pump operation
- special choice of materials and design for low energy loss
- simple pump design for ease of service
- unique pump design for efficient cooling of magnet by means of the pumped liquid
- ATEX version available.

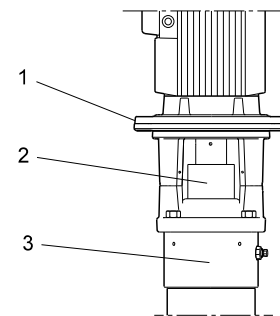
Applications

The CRN MAGdrive pump is suitable for a wide selection of industrial applications such as:

- **Aggressive or corrosive liquids**
For example concentrated sulphuric acid, nitric acid and phosphoric acid.

- **Toxic liquids**
For example trichloroethylene, chloroform and phenol.
- **Flammable and combustible liquids**
For example petrol, jet fuels, LPG and alcohols.
- **Hardening/curing liquids**
For example paint, glue and resins.
- **Crystallising liquids**
For example glycol additives, naphthalene, sugar products and salts.
- **Refrigerants**
For example ammonia and synthetic chemicals (HCFC, HFC).

Design



TM03 9149 3407

Fig. 57 MAGdrive system

Pos.	Designation	Materials
1	Motor stool	Cast iron. Stainless steel on request
2	MAGdrive	
3	Pump head	Stainless steel (EN 1.4408)

The configuration of the CRN MAGdrive pump is almost identical to that of the standard CRN pump. The following rubber parts solutions are available:

- EPDM
- FXM (Fluoraz[®])
- FFKM (Kalrez[®])
- FKM (Viton[®])
- CR* (Neoprene).
- * Available for CRN 1 - 20.

Connections available for CRN MAGdrive pumps:

Connection type	CRN	
	1s, 1, 3, 5, 10, 15, 20	32, 45, 64
DIN, ANSI, JIS flange	•	•
PJE	•	•
FlexiClamp, union, oval flange, TriClamp	•	

- Available.

Construction

The magnetic field is generated by two magnets; the outer magnet is driven by the motor, and the inner magnet is connected to the pump. The two shafts are not connected.

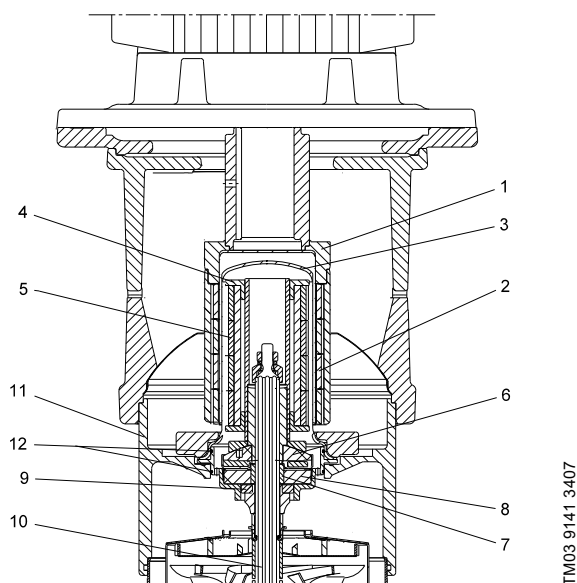


Fig. 58 Sectional drawing of MAGdrive system

Pos.	Designation	Material
1	Outer drive	1.4301
2	Outer magnets	NdFeB (neodymium)
3	Can	1.4539
4	Inner drive	1.4401
5	Inner magnets	NdFeB (Neodymium)
6	Rotating thrust bearing	SiC Q ₁ ^G (silicon carbide, carbon-filled)
7	Stationary thrust bearing	SiC Q ₁ ^G (silicon carbide, carbon-filled)
8	Radial bearing	SiC (silicon carbide)
9	Upthrust bearing	Graflon (carbon-graphite-filled PTFE)
10	Drive/pump shaft	CRN 1s-5: 1.4401 CRN 10-20: 1.4460 CRN 32-64: 1.4462
11	Pump head	1.4408
12	O-ring	EPDM, FKM, FXM, FFKM

Operating conditions

Maximum pressure: 25 bar.

Temperature range: -40 to 120 °C

Viscosity range: 0.15 to 300 mPas.

Technical data

Motor range: 0.37 kW to 22 kW.

Dimensions

The height of the MAGdrive system typically makes the pump a little higher than a standard CRN pump. Some pump sizes have a larger motor than the standard range.

For dimensions and weights for CRN MAGdrive pumps, see page 155 to 167.

When ordering a Grundfos MAGdrive, state the following data:

- liquid temperature [°C]
- liquid viscosity [mPas]
- liquid density [kg/m³]
- frequency [Hz].

Above information is required for selection of correct MAGdrive/motor combination.

9. Pump

PN 25 and PN 40 pumps

We offer customised pump solutions for the following inlet pressures:

- CR 1 to CR 20: up to 25 bar.
- CR 32 to CR 185: up to 40 bar.

In applications with high inlet pressures, a bearing flange must be fitted or a high pressure pump (CR SF) must be used.

For further information, see the following data booklet available in Grundfos Product Center.

Data booklet	Publication number
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For the QR code to the data booklet, see page 11.

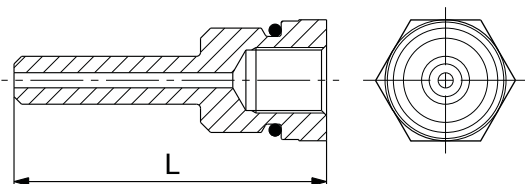
Measurement of inlet pressure

As CR 1s to CR 20 pumps are not equipped with a connection for the measurement of pump inlet pressure, we offer customised pumps with a tapping for a pressure gauge or pressure sensor.



TM03 4726 2506

Fig. 59 CR pump with pressure gauge



TM03 4091 1606

Fig. 60 Insert for measurement of inlet pressure

The material of the insert is stainless steel (AISI 316).

Designation	Rubber material	Connection	L [mm]	Product number
Insert for measurement of inlet pressure	CR 1s, 1, 3, 5			
	EPDM	ISO 228-G 1/4"	57	96488082
	FKM			96562250
	FFKM			96562251
	FXM			96562252
	CRI, CRN 1s, 1, 3, 5			
	EPDM	ISO 228-G 1/4"	51.5	96562253
	FKM			96562254
	FFKM			96562255
	FXM			96562256
	CR 10, 15, 20			
	EPDM	ISO 228-G 1/4"	62	96584117
	FKM			96584119
	CRI, CRN 10, 15, 20			
	EPDM	ISO 228-G 1/4"	53	96584121
	FKM			96584122

We offer these pump types with tapplings:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64			
95, 125, 155			
185			

- Available.

CR, CRE, CRN, CRNE 32, 45, 64, 95, 125, 155 and 185 have connection ports for measurement of pump inlet and outlet pressure as standard.

Pumping of liquids down to -40 °C

We offer customised pumps for the pumping of liquids down to -40 °C. The pumps have an oversize neck ring ensuring that impellers do not seize up as a result of thermal expansion.

We offer the above solution for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5		•	•
10, 15, 20		•	•
32, 45, 64			○
95, 125, 155			○
185			○

- Available.

○ Standard CRN 32, 45, 64, 95, 125, 155 and 185 pumps with shaft seal type HQQE are suitable for liquid temperatures down to -40 °C.

Carbon-free pumps

Certain processes, such as pumping of pure water in electronics industries, require pumps that do not contain carbon.

To meet such requirements, we offer these 100 % carbon-free pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	○	○	○
10, 15, 20	○	○	○
32, 45, 64	•		•
95, 125, 155	•		•
185	•		•

- Available.

○ Pumps with HQQx shaft seal are carbon-free as standard.

Surface treatment

Application overview

Applications	Surface treatment				
	Cleaned and dried	Cleaned and dried, PWIS free	Vacuum-dried	Electropolished	Alternative colouring
Offshore					•
Pharmaceutical industry, food and beverage industry	•	•		•	
Automotive industry		•			
Cooling industry			•		

Cleaned and dried pumps

Cleaned and dried pumps are used in applications involving strict demands to cleanliness and surface quality, such as low content of silicone.

To meet these strict demands, we offer these cleaned and dried pump types:

Pump type	CRI	CRN
1s, 1, 3, 5	•	•
10, 15, 20	•	•
32, 45, 64		•
95, 125, 155		
185		

- Available.

Before being assembled, all pump parts are cleaned in 60 to 70 °C water with a cleaning agent. All pump parts are then thoroughly rinsed in de-ionised water and air-dried. The pump is assembled without any use of silicone lubricants. Finally, the pump is packed in silicone-free plastic.

De-oiled shaft seals are available as an option for CRI, CRN 1s to 64 pumps.

CRN 95 to 185 pumps which are ordered as cleaned and dried, PWIS free, are fitted with a de-oiled shaft seal as standard.

Cleaned and dried, PWIS-free pumps

PWIS means Paint-Wetting Impairment Substances.

The term is used to describe substances that inhibit or destroy the ability of paint to adhere to surfaces.

A PWIS-free environment is mainly required in the automotive industry and in paint shops.

PWIS-free pumps are manufactured according to the specifications below:

- All components of the pump including shaft seal, motor, rubber materials for shaft seals, do not contain or release PWIS.
- Before being assembled, pump components are washed in pure, hot soap water, rinsed in de-ionised water and dried.
- Consumables like oil, grease and soap water not containing PWIS, are used during assembly.
- Tools for product assembly do not contain any PWIS.
- The product is not performance tested.
- The finished product is wrapped in a special PWIS-free plastic bag before being packed for shipment.

We offer these PWIS-free pumps:

Pump type	CRI	CRN
1s, 1, 3, 5		•
10, 15, 20		•
32, 45, 64		•
95, 125, 155		•
185		•

- Available.

Vacuum-dried pumps

In general, all CR products are tested before leaving the assembly line.

After the test, all pumps are drained. Due to the design of the chamber stack, it is not possible to completely drain the product. Primarily within cooling applications, no residual water from the test is accepted in the pump, and all pumps must be completely dry. After the pump performance test, vacuum-dried pumps are therefore handled as described below:

1. Water is blown out of the pump with compressed air.
2. The pump is ventilated with hot air for a predefined period of time.
3. The pump is exposed to vacuum for a predefined period of time.
4. The humidity inside the pump is measured.

If necessary, steps 2 and 3 are repeated until the humidity level reaches a predefined value ensuring that no liquid is present inside the pump.

We offer these vacuum-dried pumps:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64			•
95, 125, 155			•
185			•

- Available.

Electropolished pumps

Electropolished pumps are often used in the pharmaceutical industry and in the food and beverage industry where materials and surface quality must meet strict requirements to hygiene or corrosion resistance.

Electropolishing removes burrs as well as metallic and non-metallic inclusions, providing a smooth, clean and corrosion-resistant stainless steel surface.

First, all components are pickled in a mixture of nitric and hydrofluoric acid. Subsequently, the components are electropolished in a mixture of sulphuric and phosphoric acid. Finally, the components are passivated in nitric acid.

All cast parts of CRN are polished mechanically before being electropolished.

Note that the pump incorporates a standard shaft seal which has not been polished.

To meet the strict hygienic requirements to material and surface quality, we offer electropolished stainless steel CRN pumps with the following surface quality:

Pump type	Cast stainless steel parts	Stainless-steel parts (not cast)	Surface quality
CRN 1s, 1, 3, 5	•	•	Ra ≤ 0.8 µm
CRN 10, 15, 20	•	•	Ra ≤ 0.8 µm
CRN 32, 45, 64	•	•	Ra ≤ 8.0 µm
CRN 95, 125*, 155*	•	•	Ra ≤ 8.0 µm
CRN 185*	•	•	Ra ≤ 8.0 µm

• Available.

* Available for pumps up to and including 55 kW.

We offer these electropolished pumps:

Pump type	CR	CRI	CRN
1s, 1, 3, 5			•
10, 15, 20			•
32, 45, 64			•
95, 125, 155			•
185			•

• Available.

Alternative colouring

We offer customised pumps in any NCS- or RAL-specified colour to suit your requirements!

The used paint is water-based. Painted parts correspond to corrosion class III.

All pump types and sizes are available with alternative colouring.

Corrosion protection

We offer corrosion protection in form of painting and in several categories according to the specific requirements of the pump installation.

The categories refer to area/environment, layer thickness and lifetime expectancy.

Corrosion protection will be according to DS/EN ISO standard 12944.

Corrosion category	Validity	Chemical resistance test [hours]	Tropical test [hours]	Salt mist test [hours]
C2	Low	-	48	-
	Medium	-	48	-
	High	-	120	-
C3	Low	-	48	120
	Medium	-	120	240
	High	-	240	480
C4	Low	-	120	240
	Medium	-	240	480
	High	-	480	720
C5-I	Low	168	240	480
	Medium	168	480	720
	High	168	720	1440
C5-M	Low	-	240	480
	Medium	-	480	720
	High	-	720	1440

CRN all-stainless steel pumps

We offer customised stainless-steel CRN pumps for maritime applications and very humid environments:

- pump with stainless-steel motor stool
- pump with stainless-steel base
- pump with stainless-steel flanges.

We offer the above solutions for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5			•
10, 15, 20			•
32, 45, 64			•
95*, 125*, 155*			•
185*			•

• Available.

* For CR, CRN 95 - 185, we do not offer a stainless-steel motor stool. Instead we offer improved corrosion protection in form of painted coating.

The dimensions of customised stainless-steel CRN pumps do not differ from those of standard CRN pumps.

CR low NPSH

Cavitation is often a problem in applications where pumps have to deal with the combination of high liquid temperatures, poor inlet pressure and/or a high flow rate.

For further information about NPSH and the calculation of the NPSH value, see the following data booklets available in Grundfos Product Center.

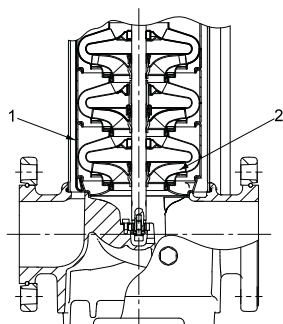
Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For QR codes to the data booklets, see page 11.

Low-NPSH pumps are designed to reduce the risk of cavitation and ensure stable and reliable operation.

The CR low-NPSH pump is a pump with a special first-stage design that reduces the pump's NPSH value and prevents erosion and destruction of the pump, pipes and valves. Thanks to the improved inlet design, low-NPSH pumps can handle more stress than conventional pumps without affecting the stability of operation.

The CR low-NPSH pump reduces the excess pressure itself and does not require an additional tank to provide supplementary pressure. In boiler feed applications where many large tanks are gathered, a compact system is an advantage.



TM03 4063 1406

Fig. 61 Sectional drawing of CR low-NPSH pump

Key

Pos.	Designation
1	Special inlet part
2	Special inlet impeller

Pump range

These pump types are available as low-NPSH pumps:

Pump type	CR	CRI	CRN
1s, 1			
3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155			
185			
• Available.			
Maximum pressure	25 bar		
Maximum liquid temperature	120 °C ¹⁾		

¹⁾ With an air-cooled top, the maximum liquid temperature is +180 °C.

For further information about CR low-NPSH pumps, see pages 86 to 101.

For information about sectional drawings, dimensions and weights, see pages 128 to 139.

Horizontal in-line pumps



GR5379

Fig. 62 Horizontal CR pump

Horizontal pumps are used in applications for safety and/or space-saving reasons.

In earthquake areas, horizontal pumps are more reliable than vertical pumps. In case of earthquake, the design and mounting of the pump will dampen the oscillations of the pump.

In installations with limited access or space, we recommend horizontal pumps to improve installation and service.

Pump range

These Grundfos pumps are available for horizontal mounting:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185	•		•

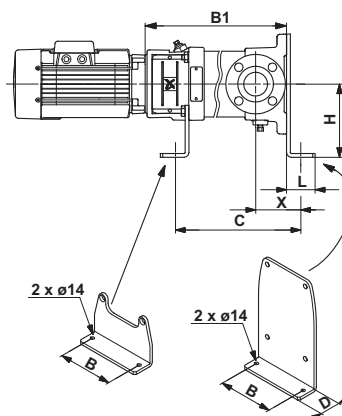
- Available.

CRT and CRTE 2, 4, 8 and 16 pumps are also available for horizontal mounting. The pumps are supplied with separate mounting plates for support of motor and pump.

Dimensional drawings

CR, CRE, CRI, CRIE, CRN, CRNE

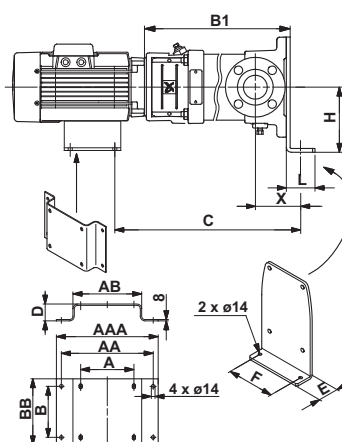
1s, 1, 3, 5 (≤ 4 kW) and 10, 15, 20 (≤ 4 kW)



TM03 4641 3507

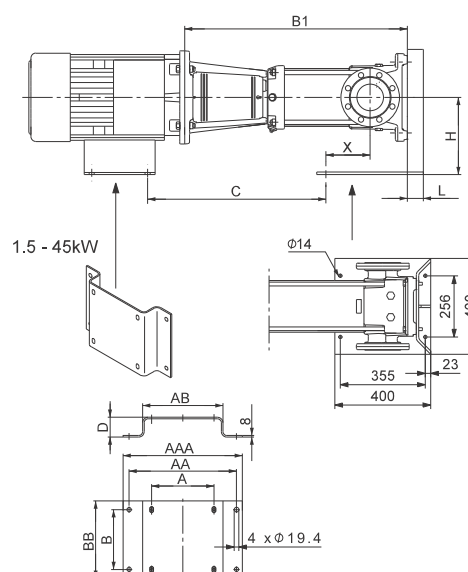
CR, CRE, CRI, CRIE, CRN, CRNE

5 (5.5 - 7.5 kW) and 10, 15, 20 (≥ 5.5 kW)



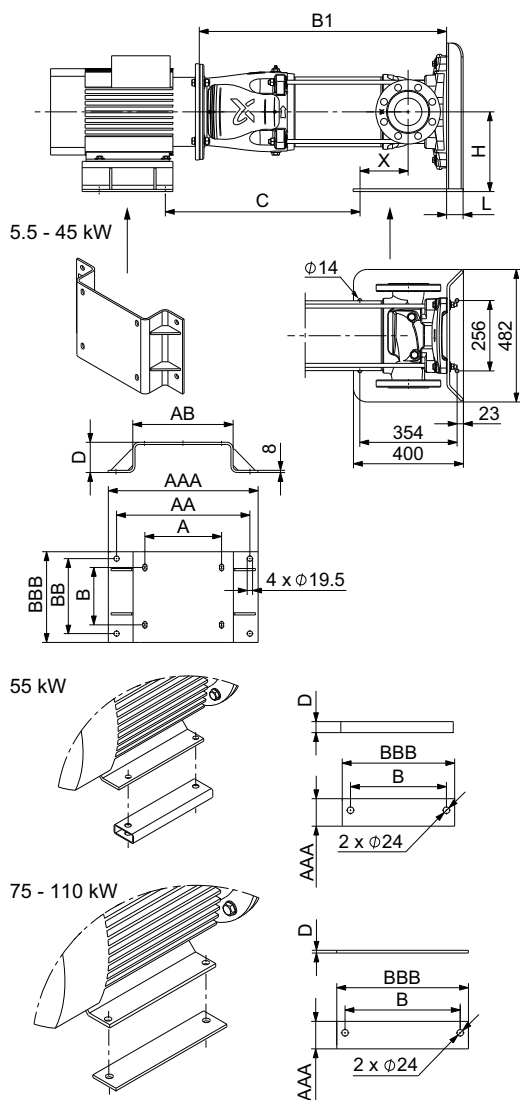
TM03 4642 3507

CR, CRE, CRN, CRNE 32, 45, 64

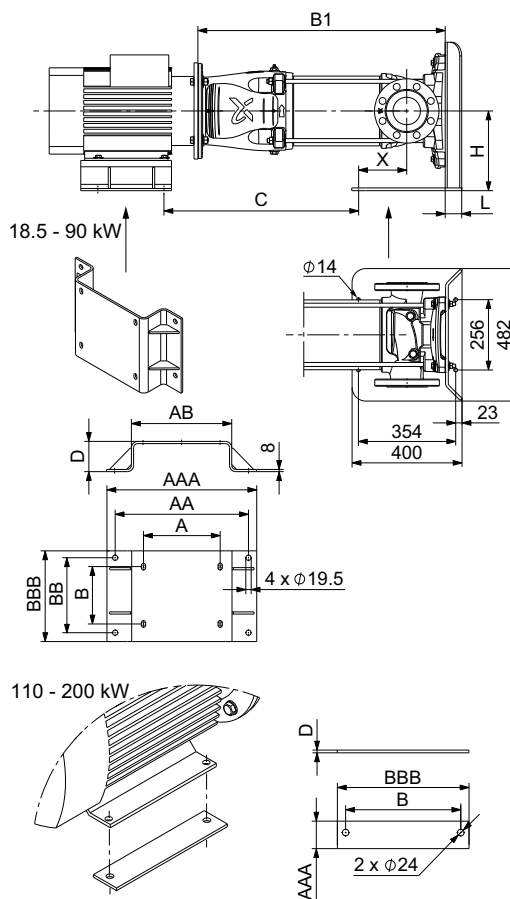


TM07 3804 0419

CR, CRE, CRN, CRNE 95, 125, 155



CR, CRE, CRN, CRNE 185



Dimensions

All dimensions are in mm.

CR, CRE, CRI, CRIE, CRN, CRNE 1s, 1, 3, 5 (≤ 4 kW), support for base plate and pump head

Motor [kW]	B	C	D	H	L	X	
						Connections	
						DIN	Oval, PJE, FlexiClamp
0.37 - 0.55	138	B1-58	45	140	50	105	80
0.75 - 1.1		B1-64	45				
1.5 - 2.2		B1-80	45				
3-4		B1-84	45				

For pump height (B1), see the data booklets referred to in the [Introduction](#) on page 4.

CR, CRE, CRI, CRIE, CRN, CRNE 5 (5.5 - 7.5 kW)

Motor [kW]	CR, CRE, CRI, CRIE, CRN, CRNE 5												X	
													Connections	
													DIN	
	A	AA	AAA	AB	B	BB	C	D	E	F	H	L	Oval	
5.5	216	326	366	276	140	180	B1+119	68	45	138	200	50	105	80
7.5	216	326	366	276	140	180	B1+119	68	45	138	200	50		

For pump height (B1), see the data booklets referred to in the [Introduction](#) on page 4.

CR, CRE, CRI, CRIE, CRN, CRNE 10, 15, 20 (≤ 4 kW), support for base plate and pump head

Motor [kW]	B	C	D	H	L	CR, CRE, CRI, CRIE, CRN, CRNE	
						10	15, 20
						X	
						Connections	
						DIN, oval, PJE, FlexiClamp	DIN, oval, PJE, FlexiClamp
0.37 - 0.55	170	B1-65	45	174	50	110	120
0.75 - 1.1		B1-69	45				
1.5 - 2.2		B1-84.5	45				
3-4		B1-89.5	45				

For pump height (B1), see the data booklets referred to in the [Introduction](#) on page 4.

CR, CRE, CRI, CRIE, CRN, CRNE 10, 15, 20 (≥ 5.5 kW), support for base plate and motor

Motor [kW]	A	AA	AAA	AB	B	BB	C	D	E	F	H	L	CR, CRE, CRI, CRIE, CRN, CRNE	
													10	15, 20
													X	
													Connections	
													DIN, oval, PJE, FlexiClamp	DIN, oval, PJE, FlexiClamp
5.5	216	326	366	276	140	180	B1+119	68	45	170	200	50	110	120
7.5	216	326	366	276	140	180	B1+119	68	45	170	200	50		
11	254	384	424	334	210	260	B1+138	40	45	170	200	50		
15	254	384	424	334	210	260	B1+138	40	45	170	200	50		
18.5	254	384	424	334	254	310	B1+138	40	45	170	200	50		

For pump height (B1), see the data booklets referred to in the [Introduction](#) on page 4.

CR, CRE, CRN, CRNE 32, 45, 64 (≤ 45 kW), support for base plate and motor

Motor [kW]	A	AA	AAA	AB	B	BB	C	D	E	H	L	CRE, CRNE, CRN, CRNE	
												32	45, 64
												X	
												Connections	
												DIN	DIN
1.5	140	320	380	220	100	165	B1-261	200	400	290	60	212	177
2.2	140	320	380	220	125	165	B1-261	200	400				
3	160	340	400	245	140	180	B1-254	190	400				
4	190	370	430	275	140	180	B1-247	178	400				
5.5	216	395	455	300	140	180	B1-228	158	400				
7.5	216	395	455	300	140	180	B1-228	158	400				
11	254	440	500	340	210	275	B1-209	130	400				
15	254	455	515	340	210	266	B1-209	130	400				
18.5	254	455	515	340	254	310	B1-209	130	400				
22	279	485	545	365	240	310	B1-196	110	400				
30	318	540	600	410	305	365	B1-184	90	400				
37	318	540	600	410	305	365	B1-184	90	400				
45	356	580	640	450	310	370	B1-168	65	400				

For pump height (B1), see the CR, CRNE, CRI, CRIE, CRN, CRNE data booklets referred to in the [Introduction](#) on page 4.

CR, CRE, CRN, CRNE 95, 125, 155, support for base plate and motor

Motor [kW]	A	AA	AAA	AB	B	BB	BBB	C	D	H	L	CR, CRE, CRN, CRNE	
												95	125, 155
												X	X
												Connections	
												DIN	DIN
5.5	216	395	455	300	140	BB	195	B1-234	158	290	60	177	-
7.5	216	395	455	300	140	128	195	B1-234	159	290	60	177	-
11	254	440	500	340	210	203	270	B1-212.5	130	290	60	177	137
15	254	455	515	340	210	203	270	B1-212.5	130	290	60	177	137
18.5	254	455	515	340	254	243	310	B1-214.5	130	290	60	177	137
22	279	485	545	365	241	263	330	B1-185	110	290	60	177	137
30	318	540	600	410	305	303	370	B1-185	90	290	60	177	137
37	318	540	600	410	305	303	370	B1-185	90	290	60	177	137
45	356	580	640	450	311	303	370	B1-172	65	290	60	177	137
55	406	-	-	-	349	-	409	B1-182.5	40	290	60	177	137
75	457	-	-	-	368	-	479	B1-127	10	290	60	-	137
90	457	-	-	-	419	-	479	B1-127	10	290	60	-	137
110	508	-	-	-	406	-	535	B1-101	20	335	60	-	137

For pump height (B1), see the data booklets referred to in the [Introduction](#) on page 4.

CR, CRE, CRN, CRNE 185, support for base plate and motor

Motor [kW]	A	AA	AAA	AB	B	BB	BBB	C	D	H	L	CR, CRE, CRN, CRNE	
												185	
												X	
												Connections	
												DIN	
18.5	254	455	515	340	254	243	310	B1-214.5	175	335	60	117	
22	279	485	545	365	241	263	330	B1-185	155	335	60	117	
30	318	540	600	410	305	303	370	B1-185	135	335	60	117	
37	318	540	600	410	305	303	370	B1-185	135	335	60	117	
45	356	580	640	450	311	303	370	B1-172	110	335	60	117	
55	406	625	685	530	349	353	420	B1-147	85	335	60	117	
75	457	675	735	545	368	423	490	B1-99.5	85	335	60	117	
90	457	675	735	545	419	423	490	B1-125	55	335	60	117	
110	508	-	-	-	406	-	535	B1-101	20	335	60	117	
132	508	-	-	-	457	-	655	B1-101	20	335	60	117	
160	508	-	-	-	457	-	655	B1-101	20	335	60	117	
200	508	-	-	-	457	-	655	B1-101	20	335	60	117	

For pump height (B1), see the data booklets referred to in the [Introduction](#) on page 4.

Multistage horizontal end-suction pumps



TM05 1717 3511

Fig. 63 Multistage horizontal end-suction pumps

CR-H, CRI-H, CRN-H 50/60 Hz

CR-H, CRI-H, CRN-H pumps are horizontal end-suction pumps typically mounted on base plates. The pumps are available in a complete 50 and 60 Hz range with both IEC or NEMA motors.

Interchangeable ANSI solution

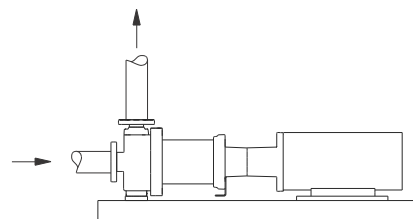
The patented loose-flange concept provides easy installation in ANSI, DIN or JIS standard pipes.

Pump connection configurations comply with the ANSI/ASME B73.1 standard and ensure interchangeability with traditional end-suction pumps with an axial inlet port and radial centre-line outlet port. This makes the CR-H a high-efficiency solution designed for drop-in replacement of ANSI configured pumps. The back pull-out design enables service of most versions without removing the base from the pipes.

CR-H, CRI-H, CRN-H pumps are suitable for a variety of applications from pumping of drinking water to pumping of chemicals. The pumps are therefore used in a wide variety of pumping systems where the performance and material of the pump meet specific demands.

Energy efficiency

To reduce loss and increase pump efficiency, CR-H, CRI-H, CRN-H pumps are available in an energy-optimised version with inlet and outlet ports with a larger diameter than ANSI specifications.



TM05 1378 3511

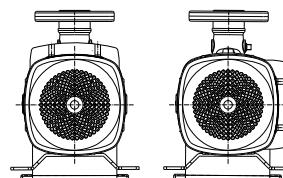
Fig. 64 CR-H pump with an axial inlet port and radial outlet port

Maximum pressure: 30 bar.

Maximum liquid temperature: 120 °C (air-cooled top 180 °C (oil 240 °C)).

Maximum motor size: 45 kW.

Terminal box positions



TM05 1988 4111

IEC motor

Pump type	CR-H	CRI-H	CRN-H
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155			
185			

For dimensions of CR-H pumps with IEC motors, see section [CRH, CRHN pumps](#).

NEMA motor

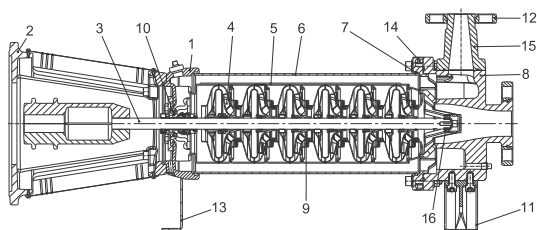
Pump type	CR, CR-H	CRN, CRN-H
1s, 1, 3, 5	•	•
10, 15, 20	•	•
32, 45, 64	•	•
95, 125, 155		
185		

For dimensions of CR-H pumps with NEMA motors, see Grundfos Product Center.

Variants

The same variants and accessories are available for the CR-H, CRI-H, CRN-H pump range as for the standard CR pump range. The only difference between the CR horizontal end-suction pump and the CR in-line pump is the base. However, the base for horizontal end-suction pumps is not available in titanium.

Construction



TM05 1989 4111

Fig. 65 Sectional drawing

Pos.	Designation	Pos.	Designation
1	Pump head	9	Neck ring
2	Motor stool	10	Shaft seal
3	Shaft	11	Foot
4	Impeller	12	Flange ring
5	Chamber	13	Support bracket
6	Sleeve	14	Sleeve flange
7	O-ring for sleeve	15	Outlet port
8	Base	16	Bottom bearing ring

Belt-driven pumps



GR5886 - GR5887

Fig. 66 Belt-driven CR pump

Belt-driven pumps are used in applications for space-saving reasons or where no electrical power is available.

The belt-driven pump has a pulley for connection to an internal combustion engine. The belt-driven CR pumps are of the same construction as electrically driven CR pumps.

Pump range

These Grundfos pumps are available as belt-driven pumps:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155			
185			

- Available.

CRT 2, 4, 8 and 16 pumps are also available as belt-driven pumps.

An additional bearing has been added on top of an existing bearing flange. The two bearings are fitted back-to-back. This bearing design makes it possible to withstand the extra radial forces caused by a pulley.

A pulley can be attached to the end of the shaft.

Note that the pulley is not supplied with the pump.

By means of pulley belts, the pump can be driven by a motor mounted next to it rather than on top of it.

The pump can be mounted horizontally or vertically by the extra support plates.

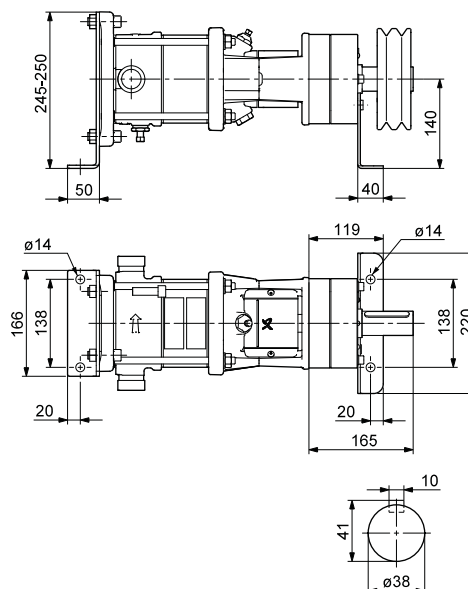
The pulley head is positioned on the motor stool where the motor would normally be fitted. By means of the existing holes in the motor stool, the pulley head can be secured to the motor stool with bolts, washers and nuts. The pulley wheel is then attached to the shaft using an appropriate bush and key.

For extended bearing life, we recommend these pulley wheel sizes:

	Type III	Type IV	Type II	Type I
Pulley head	0.37 - 5.5 [kW]	7.5 - 18.5 [kW]	1.5 - 7.5 [kW]	11 - 45 [kW]
CR, CRI, CRN		CR, CRN		
Pump type	1s, 1, 3, 5, 10, 15, 20	10, 15, 20	32, 45, 64	
Pulley wheel diameter	Ø112-135	Min. Ø200	Min. Ø160	Min. Ø200
V-belts	2	Min. 3	Min. 2	Min. 3
Pump speed [min ⁻¹]	Max. 3000			

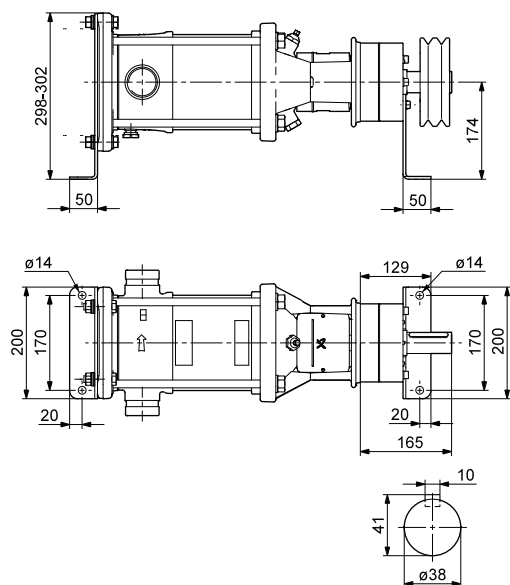
Dimensional drawings

CR, CRI, CRN 1s, 1, 3 and 5 (type III)



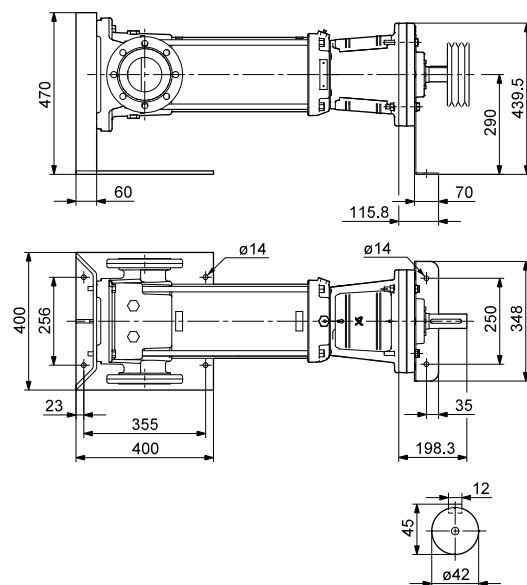
TM03 4137 1706

CR, CRI, CRN 10, 15 and 20 (type III)



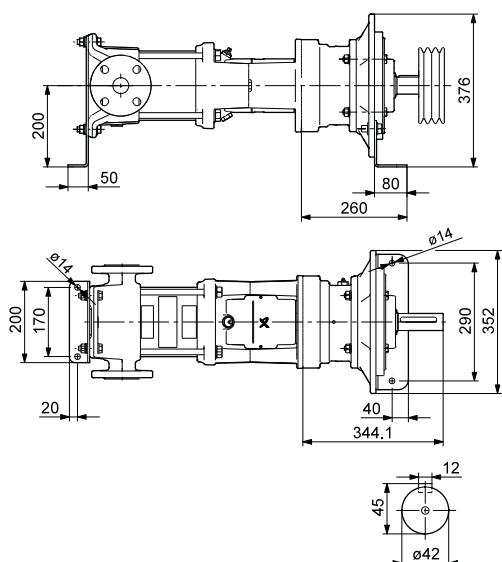
TM03 4168 1706

CR, CRN 32, 45 and 64 (type II)



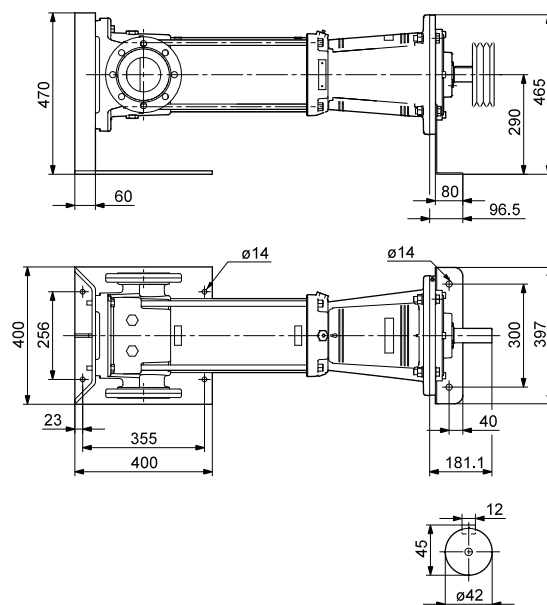
TM03 4170 1706

CR, CRI, CRN 10, 15 and 20 (type IV)



TM03 4169 1706

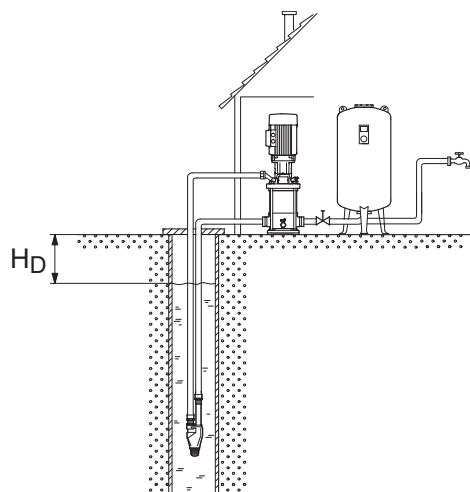
CR, CRN 32, 45 and 64 (type I)



TM03 4171 1706

CR, CRI deep-well pumps

CR, CRI deep-well pumps are used for deep-well pumping in small water supply systems where water is pumped from depths (H_D) down to 90 metres.

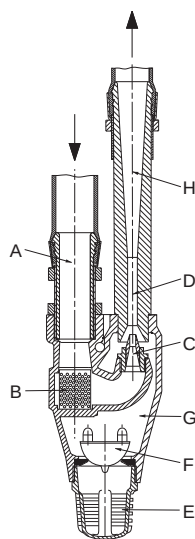


TM03 2954 4905

Fig. 67 System with CR, CRI deep-well pump

The pump system consists of a dry-installed CR, CRI multistage centrifugal pump connected to a one-size submerged ejector via two pipes.

We recommend that you connect a pressure tank to the outlet side of the pump to maintain a suitable pressure at the tapping point.



TM03 2953 4905

Fig. 68 Sectional drawing of an ejector

Water is pumped through the pressure pipe (A) and the strainer (B) to the nozzle (C). The water passes the nozzle at high speed and flows into the diffuser (D). Via the strainer (E) and bottom valve (F), water, which is to be pumped up, is in connection with the chamber (G).

From the chamber, it is pressed into the diffuser (D) by the water jet from the nozzle (C). There, the two water flows mix, and the velocity is converted into pressure, driving the water up through the riser pipe (H) to the inlet port of the pump.

Technical data

Maximum system pressure:	16 bar
Maximum ambient temperature:	40 °C
Maximum liquid temperature:	40 °C
Minimum size of borehole:	3"

Pump range

These deep-well pumps are available with an ejector:

Pump type	CR	CRI	CRN
1s, 1, 3			
5	•	•	
10, 15, 20			
32, 45, 64			
95, 125, 155			
185			

- Available.

Use of inlet pipe

If the well capacity is lower than the pump capacity, dry running of the pump can be prevented by fitting an inlet pipe below the ejector. To enable this, the ejector strainer (E) is replaced with a special threaded nipple.

Performance curves and technical data

For information about the performance curves and technical data of CR deep-well pumps, see page [85](#) and [153](#).

Ejectors

Based on the performance curves on page [85](#), we offer the following ejectors:

Ejector type	Product number
45B	90230045
44B	90230044
29B	90230029
22B	90230022
20B	90230020
11B	90230011

Contact Grundfos for further information about CR, CRI ejector pumps.

Pump rubber parts

We offer pumps with a wide range of customised rubber materials such as EPDM, FKM, FFKM, FXM and CR to suit your requirements.

Pump type	Rubber material				
	EPDM	FKM	FFKM	FXM	CR ²⁾
CR, CRI, CRN 1s, 1, 3, 5	•	•	•	•	•
CR, CRI, CRN 10, 15, 20	•	•	•	•	•
CR, CRN 32, 45, 64	•	•	• ¹⁾	•	-
CR, CRN 95, 125, 155	•	•	• ¹⁾	•	-
CR, CRN 185	•	•			

• Available.

¹⁾ These pumps are fitted with FXM sleeve gaskets. All other rubber parts are of FFKM.

²⁾ Only available for CRN MAGDrive pumps.

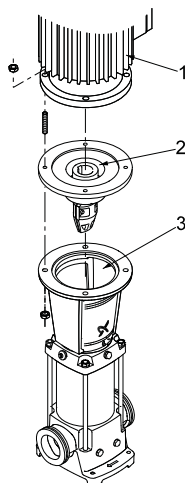
We offer customised rubber materials for these pump types:

• Available.

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185			

Bearing flange

To ensure a long pump life and reliable operation, fit a bearing flange between the motor and the pump head.



TM03 4062 1406

Fig. 69 Bearing flange

Key

Pos.	Designation
1	Motor
2	Bearing flange
3	Pump head

A bearing flange is an additional flange with an oversize ball bearing to absorb axial forces in both directions. The coupling is part of the bearing flange fitted to obtain optimum alignment.

Note that the bearing flange requires a motor with keyway and ball bearings according to IEC 34 and NEMA.

A bearing flange is used in two situations:

1. A standard motor with standard ball bearing is required. The bearing flange absorbs the hydraulic load from the pump, ensuring an acceptable motor bearing life.
2. The pump is to run at a higher inlet pressure than the maximum pressure recommended.

For motor sizes above 11 kW, the bearing flange is equipped with grease nipples and must be lubricated regularly. Follow the instructions on the bearing flange.

Pump range

The following pump types are available with bearing flange:

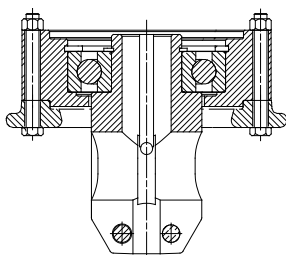
Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185	•		•

• Available.

CRT, CRTE 2, 4, 8 and 16 are also available as customised pumps with bearing flange.

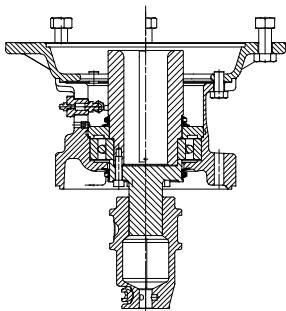
Bearing flange for CR pumps

CR, CRI, CRN 1s, 1, 3, 5 (≤ 7.5 kW)
CR, CRI, CRN 10, 15, 20 (≤ 4 kW)



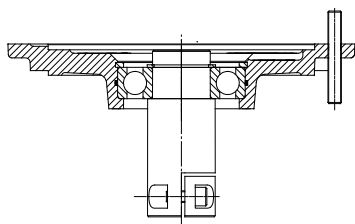
TM02 7436 3403

CR, CRI, CRN 10, 15, 20 (≥ 5.5 kW)



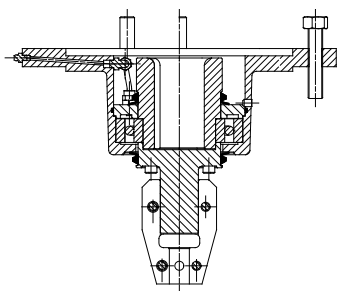
TM02 7437 3403

CR, CRN 32, 45, 64 (≤ 7.5 kW)



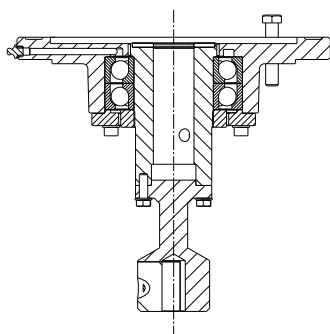
TM01 4352 0199

CR, CRN 32, 45, 64 (> 7.5 kW)



TM01 4353 0199

CR, CRN 95, 125, 155, 185



TM07 3754 0319

Dimensions

The following additional heights in mm must be added to the total height of the pump.

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

Motor power	Additional height
IEC [kW]	
0.37 - 0.55	31
0.75 - 1.1	32
1.5 - 4.0	40
5.5 - 7.5	23 ¹⁾ /150 ²⁾
11.0 - 18.5	180
NEMA [hp]	
0.33, - 2.0	40
3-10	45
15-40	135

1) CR, CRI, CRN 1s, 1, 3, 5

2) CR, CRI, CRN 10, 15, 20.

CR, CRN 32, 45, 64

Motor power	Additional height
IEC [kW]	
3.0 - 7.5	23
11 - 45	20
NEMA [hp]	
3-10	22
15-60	17

CR, CRN 95, 125, 155, 185

Motor power	Additional height
IEC [kW]	
5.5 - 45	21
55-200	25
NEMA [hp]	
15-75	21
100-300	25

For information about the total height of a given CR pump, see the following data booklets available in Grundfos Product Center.

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For QR codes to the data booklet, see page 11.

Support bearings

We offer customised pumps with support bearings of bronze for corrosive applications for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5			
10, 15, 20			
32, 45, 64	•		•
95, 125, 155	•		•
185			

- Available.

Bearing material

We offer pumps with a wide range of customised bearing materials such as bronze, tungsten carbide and carbon-filled PTFE to suit your requirements.

Pump size	Bearing material
CR, CRN 1, 3, 5, 10, 15, 20	Bronze/tungsten carbide Graflon/tungsten carbide
CR, CRN 32, 45, 64	Tungsten carbide/tungsten carbide
CR, CRN 95, 125, 155	Silicon carbide/silicon carbide

We offer customised bearing materials for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185			

- Available.

Pump head positions

The pump head is mounted so that the vent screw is in line with the outlet port as standard.

The pump head can be mounted in three other positions in steps of 90 °.

Note that the vent of horizontal pumps must always point upwards.

Customised nameplate

We offer additional customised nameplates attached to the pump:

- A nameplate supplied by you
- A Grundfos nameplate customised in terms of a specific duty point
- A Grundfos nameplate with a tag number.

A Grundfos standard nameplate is always fitted on the pump.

Dry-running protection

LiqTec



GR94/15

Fig. 70 LiqTec dry-running protection device

Grundfos LiqTec immediately cuts off the pilot current to the motor protection relay in these cases:

- There is no liquid in the pump.
- The liquid temperature exceeds $130 \pm 5^\circ\text{C}$.
- The sensor, sensor cable, electronic unit or power supply fails.

When connected to the PTC sensors in the motor, LiqTec also protects the motor against overheating.

The sensor is easily inserted through the 1/2" connection in the pump head close to the shaft seal. It can, however, also be used externally.

LiqTec sends a heat impulse through the sensor, measuring the temperature of the sensor. Liquid in the pump cools the sensor as well as the shaft seal and other pump parts.

If there is no liquid present, LiqTec detects a high temperature in the sensor and turns off the pump motor immediately to prevent damage. LiqTec also prevents excessive liquid temperatures from damaging the pump. If LiqTec senses a liquid temperature above 130°C , it turns off the pump motor immediately. LiqTec is a fail-safe device, meaning that the pump stops as soon as the sensor detects an error in the sensor cable or the electronics, or if the power supply of the control unit is switched off.

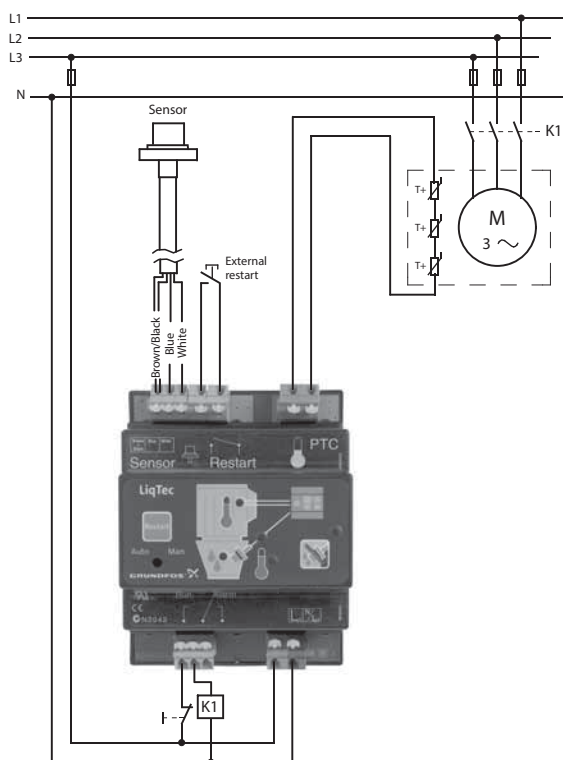
Restarting the pump can be automatic or manual when the sensor detects liquid in the pump again.

Remote restarting is possible via digital input.

The electronic control unit can also be connected to the PTC sensor measuring the motor temperature. In case of overheating of the motor, the system turns off the pump motor.

Figs 71, 72 and 73 show installation examples.

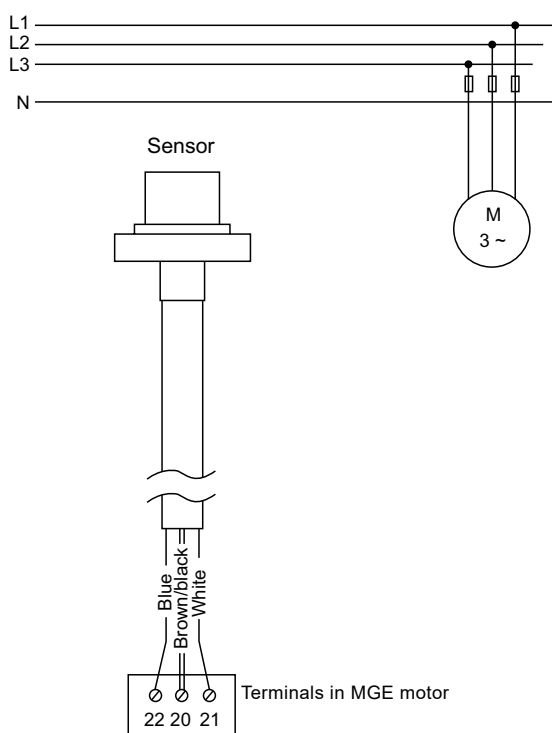
Connection to standard motors



TM03 0112 4004

Fig. 71 LiqTec connected to a standard motor

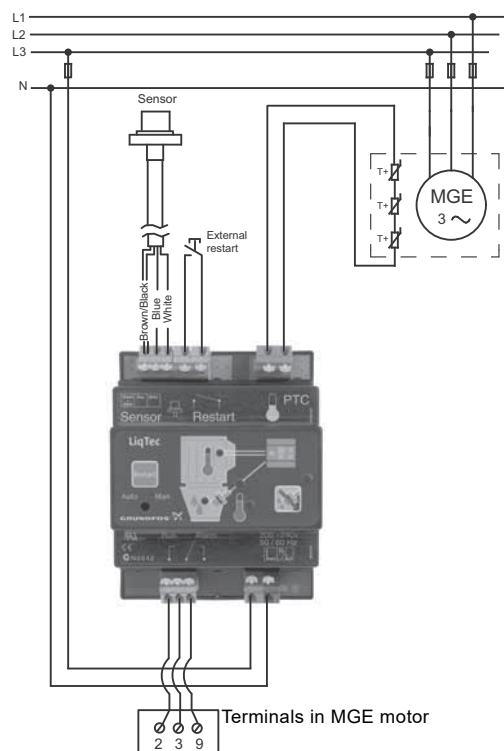
Connection to MGE motors (0.37 - 2.2 kW)



TM06 0807 0914

Fig. 72 LiqTec connected to an MGE motor (0.37 - 2.2 kW)

Connection to MGE motors (3-22 kW)



TM04 4472 1309

Fig. 73 LiqTec connected to an MGE motor (3-22 kW)

Dimensions

116 x 90 mm. LiqTec can be mounted on a DIN rail in a control cabinet.

Technical data

Supply voltage	1 x 80-130 V or 1 x 200-240 V
Power consumption	5 W
Max. pressure	40 bar
Min./max. liquid temperature	-20 °C / 120 °C
Max. ambient temperature	50 °C
Humidity	99 %
Enclosure class	IPX0
Pumped liquid	Any water-based liquid handled by Grundfos pumps
Cable length	5 m ¹⁾

¹⁾ 15-metre cable is available on request.

Connections

CR pumps with TriClamp connection

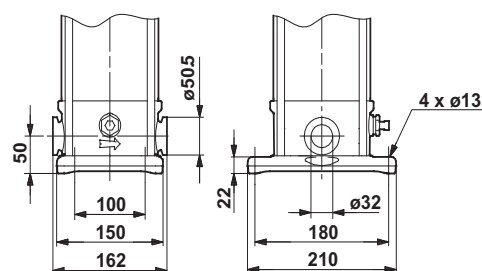
A base with TriClamp connection is of hygienic design with a sanitary coupling for use in the pharmaceutical and food and beverage industry.

A set consists of one clamping ring, one gasket and one pipe stub.

The connection is in accordance with EN/DIN 32676.

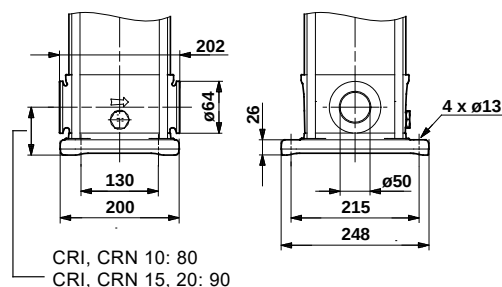
Dimensions

All dimensions are in mm.



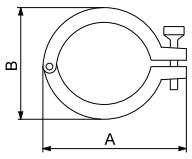
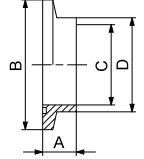
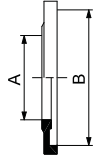
TM03 4648 3507

Fig. 74 TriClamp connection for CRI, CRN 1s, 1, 3 and 5



TM03 4649 2406

Fig. 75 TriClamp connection for CRI, CRN 10, 15 and 20

Clamping ring				Port				Gasket	
									
TM03 4645 2406				TM03 4646 2406				TM03 4647 2406	
Pump type	PN	A	B	A	B	C	D	A	B
CRI(E), CRN(E) 1s, 1, 3, 5	16	92.0	59.5	21.5	50.5	35.6	38.6	35.3	50.5
	50	102.0	60.0		32.0	36.0	32.2	—	—
CRI(E), CRN(E) 10, 15, 20	16	104.4	74.0		64.0	48.6	51.6	48.0	64.0
	50	123.0	75.0		65.0	50.0	54.0	50.2	—

The clamping ring is made of stainless steel EN/DIN 1.4301/AISI 304.

The port is made of stainless steel EN/DIN 1.4401/AISI 316.

The gasket is made of PTFE or EPDM.

Connection	Pump type	Pipe connection	Connection material	Gaskets	Pressure [bar]	Coupling sets required	Product number	
	CRI(E), CRN(E) 1, 3, 5	DN 32	Stainless steel	PTFE	16	2	96515375	
				EPDM	50	2	96515374	
	CRI(E), CRN(E) 10, 15, 20	DN 50		PTFE	16	2	96515377	
				EPDM	50	2	96515376	
				PTFE	16	2	97549395	
				EPDM	50	2	97549397	

We offer TriClamp connections for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5		•	•
10, 15, 20		•	•
32, 45, 64			
95, 125, 155			
185			

- Available.

CR pumps with FlexiClamp according to EN/DIN 11851

A base with connections according to EN/DIN 11851 is of hygienic design for use in dairies and in the food and beverage industry.

A set consists of one pipe stub with external thread designed for a FlexiClamp base with union connection.

Dimensions

All dimensions are in mm.

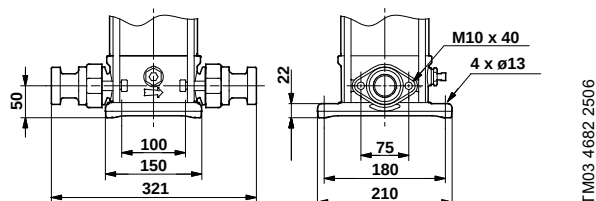


Fig. 76 Connection to EN/DIN 11851 for CRI, CRN 1s, 1, 3 and 5

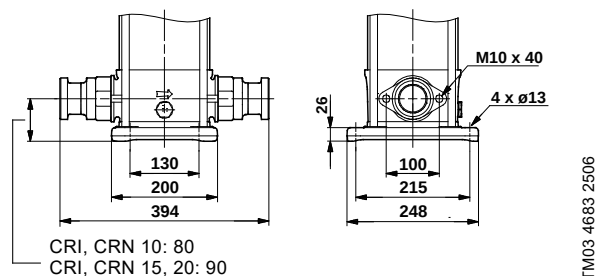


Fig. 77 Connection to EN/DIN 11851 for CRI, CRN 10, 15 and 20

Pump type	Pipe connection	Connection material	Gaskets	Pressure [bar]	Coupling sets required	Product number
CRI(E), CRN(E) 1, 3, 5	DN 32	Stainless steel	EPDM	16	2	96551545
			FKM		2	96551547
CRI(E), CRN(E) 10, 15, 20	DN 50		EPDM		2	96551549
			FKM		2	96551570

We offer the above connections for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5			•
10, 15, 20			•
32, 45, 64			
95, 125, 155			
185			

- Available.

CR pumps with collar connection (aseptic)

A base with connections according to EN/DIN 11853-2 is of non-sanitary design but is often used in the dairy, food, beverage and pharmaceutical industry. The collar connection is not approved for process use. Instead, the collar connection is used in secondary systems such as washing and cleaning, CIP cleaning and steam applications.

Dimensions

All dimensions are in mm.

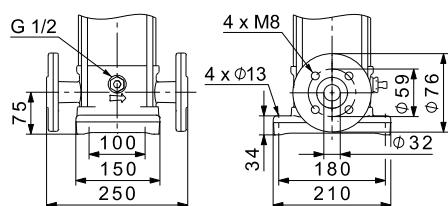


Fig. 78 Collar connection for CRI, CRN 1s, 1, 3 and 5

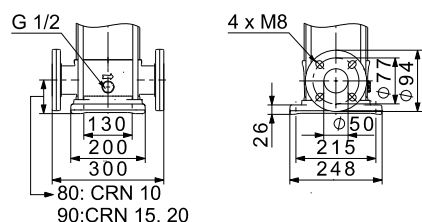


Fig. 79 Collar connection for CRI, CRN 10, 15 and 20

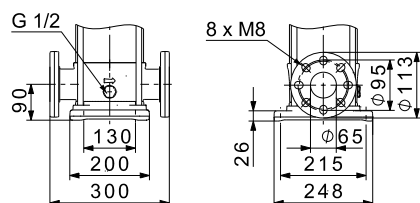


Fig. 80 Collar connection for CRI, CRN 15 and 20

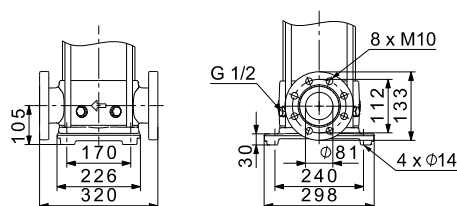


Fig. 81 Collar connection for CRI, CRN 32

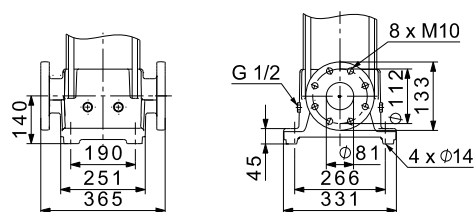


Fig. 82 Collar connection for CRI, CRN 45

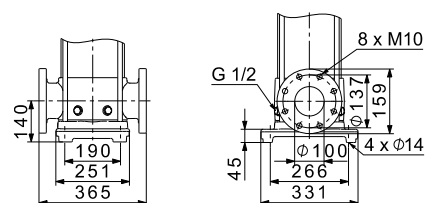


Fig. 83 Collar connection for CRI, CRN 64

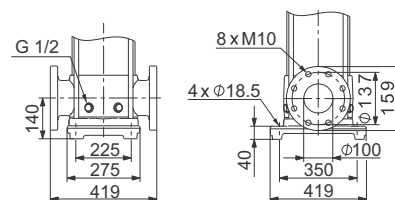


Fig. 84 Collar connection for CRN 95

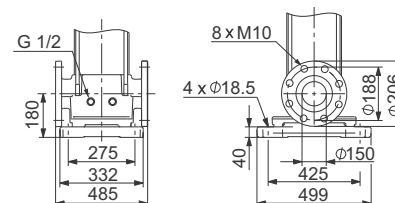


Fig. 85 Collar connection for CRN 125 and 155

Pump type	Pipe connection	Connection material
CRN(E) 1s, 1, 3, 5	DN 32	Stainless steel
CRN(E) 10, 15, 20	DN 50	
CRN(E) 15, 20	DN 65	
CRN(E) 32	DN 80	
CRN(E) 45	DN 100	
CRN(E) 64	DN 100	
CRN(E) 95	DN 100	
CRN(E) 125, 155	DN 150	

We offer the above connections for these pump types:

Pump type	CR	CRI,	CRN
1s, 1, 3, 5			•
10, 15, 20			•
32, 45, 64			•
95, 125, 155			•
185			

- Available.

Dimensions of an O-ring:

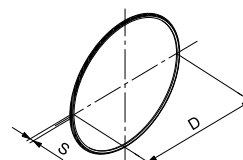


Fig. 86 Dimension sketch of an O-ring

DN	Dimensions [mm]	
	Inner diameter (D)	Thickness (S)
32	34	5
50	52	5
65	68	5
80	83	5
100	102	5
150	158	7

CR pump with PJE coupling

A base with PJE couplings is designed for use in a wide range of industrial applications.

A set consists of two coupling halves, one gasket, one coupling liner for welding and bolts and nuts.

Dimensions

All dimensions are in mm.

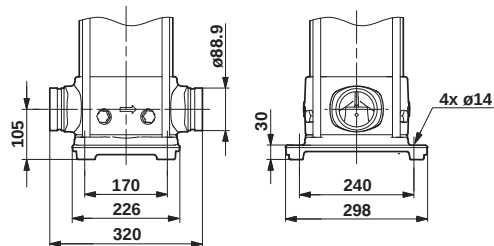


Fig. 87 PJE coupling for CRN 32

TM03 4719 2506

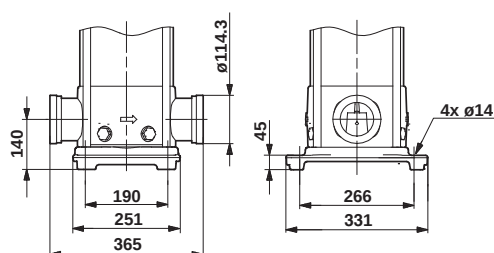


Fig. 88 PJE coupling for CRN 45

TM03 4720 2506

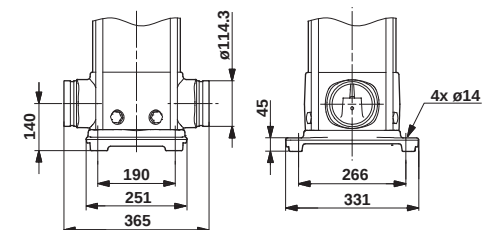


Fig. 89 PJE coupling for CRN 64

TM03 4721 2506

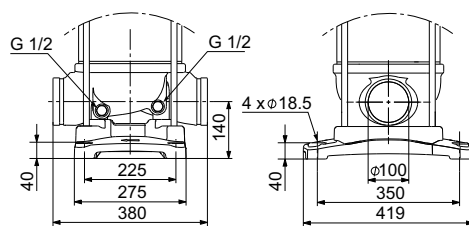


Fig. 90 PJE coupling for CRN 95

TM07 3159 4718

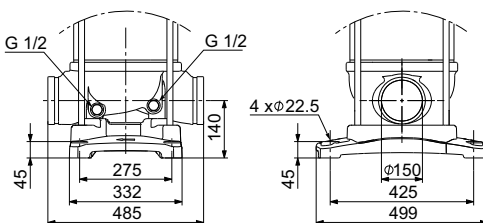


Fig. 91 PJE coupling for CRN 125 and 155

TM07 3160 4718

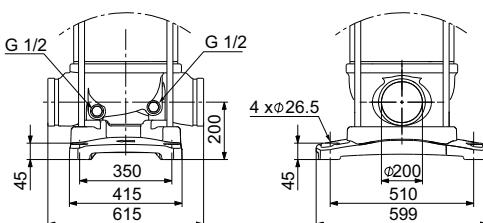


Fig. 92 PJE coupling for CRN 185

TM07 7329 3720

Part	Designation	Designed for pump type	Rubber parts	Product number
 TM00 3712 0894	Victaulic type 77 coupling 3": Ø89 4": Ø114	CRN 32	NBR seal 3"	00ID7664
		CRN 45, 64, 95	NBR seal 4"	96415463
 TM00 3709 0894	Victaulic coupling liner for welding	CRN 32	N version 3"	00150574
		CRN 45, 64, 95	N version 4"	96416743

We offer PJE couplings with NBR rubber parts for these pump types:

Pump type	CR, CRE	CRI, CRIE	CRN, CRNE
1s, 1, 3, 5			
10, 15, 20			
32, 45, 64, 95			•
125, 155			
185			

- Available.

PJE connections are available with EPDM and FKM rubber parts on CRI, CRN, 1s to 185 pumps as standard.

CR pumps with ANSI or JIS connection

We offer pumps with ANSI or JIS flanges for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5, 10			
15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185	•		•

- Available.

ANSI and JIS connections are available on CRI, CRN, 1s, 1, 3, 5, 10, 15 and 20 pumps as standard.

Technical data

Connection	Max. rated pressure
ANSI	Class 300
JIS	30 K

Note that CR, CRE, CRI, CRIE, CRN, CRNE 1s, 1, 3, 5 and 10 pumps are available with flanges that meet the requirements of both DIN, ANSI and JIS as standard.

The dimensions of pumps with DIN, ANSI or JIS flanges are the same, apart from the flange bolt holes.

Customised connections

We offer a wide range of customised connections for these pump types:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64, 95	•		•
125, 155			
185			

Contact Grundfos for further information about customised connections.

We also offer these connections:

- oval flanges (BSP)
- DIN flanges
- PJE couplings (Victaulic®) for CRN(E)
- clamp couplings (L-couplings)
- unions (+GF+).

For further information about connections, see the following data booklets available in Grundfos Product Center.

Data booklet	Publication number
CR, CRI, CRN (50 Hz)	99301179
CR, CRI, CRN (60 Hz)	99301180
CRT, CRTE (50/60 Hz)	V7149894
CRE, CRIE, CRNE (50/60 Hz)	98423696
CR, CRN, CRNE high pressure (50/60 Hz)	V7174003

For QR codes to the data booklet, see page 11.

Base plate for CR 95 with small footprint

The base plate has the same footprint as the base plate for a CR 90 pump. This makes it possible to replace a CR 90 pump with a CR 95 pump and still have the same footprint.

The base plate is available for CR 95 pumps up to and including 55 kW.

The material is ductile cast iron EN-GJS-500-7.

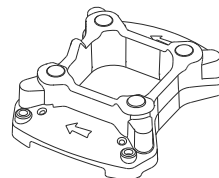


Fig. 93 Base plate for CR 95 with small footprint

TM07 2495 3718

10. Certificates

CR pumps with certificates

We offer certificates for a number of applications requiring documentation on the pump quality.

Examples:

- pharmaceutical industries
- maritime and offshore applications
- potentially explosive environments
- energy and power suppliers.

Note that the certificates must be ordered with the pump.

Certificates

Certificate	Description
Certificate of compliance with the order	According to EN 10204, 2.1. Grundfos document certifying that the pump supplied is in compliance with the order specifications.
Test certificate. Non-specific inspection and testing	According to EN 10204, 2.2. Certificate with inspection and test results of a non-specific pump.
Inspection certificate 3.1	Grundfos document certifying that the pump supplied is in compliance with the order specifications. Inspection and test results are mentioned in the certificate.
Inspection certificate	Grundfos document certifying that the pump supplied is in compliance with the order specifications. Inspection and test results are mentioned in the certificate. Certificate from the surveyor is included. We offer the following inspection certificates: • Lloyds Register of Shipping (LRS) • Det Norske Veritas and Germanischer Lloyd (DNV-GL) • Bureau Veritas (BV) • American Bureau of Shipping (ABS) • Registro Italiano Navale Agenture (RINA) • China Classification Society (CCS) • Russian maritime register of Shipping (RS) • Biro Klassifikasi Indonesia (BKI) • United States Coast Guard (USCG) • Nippon Kaiji Koykai (NKK) • Korea Register of Shipping (KR) • Polski Rejestr Statkow (PRS) • Vietnam Register (VR) • Indian Register of Shipping (ERS) • China corporation registre of shipping (CR)
Standard test report	Certifies that the main components of the specific pump are manufactured by Grundfos, and that the pump has been QH-tested, inspected and conforms to the full requirements of the appropriate catalogues, drawings and specifications.
Material specification report	Certifies the material used for the main components of the specific pump.
Material specification report with certificate from raw material supplier	Certifies the material used for the main components of the specific pump. A material specification report with EN 10204 material certificate from the raw material supplier will be supplied for each main component.
Duty-point verification report	Certifies a test point specified by the customer. Issued according to ISO 9906 concerning "Duty point verification" grades 3B, 2B and 1B.
Surface-roughness	Shows the measured roughness of the cast pump base of the specific pump. The report indicates the values measured at the base inlet and outlet according to ISO 1302.
Vibration report	Vibration report indicating the values measured during the performance test of the specific pump according to ISO 10816.
Motor test report	Shows the performance test of the specific motor, including power output, current, temperature, stator windings resistance and insulation test.
Cleaned and dried pump	Confirms that the specific pump has been cleaned and dried, and how it was done.
PWIS free pump	PWIS means Paint-Wetting Impairment Substances. The term is used to describe substances that inhibit or destroy the ability of paint to adhere to surfaces.
Statement Regulation EC 1935/2004	Food Contact Materials Regulation
Positive Material identification (PMI report EN 10204 3.2)	Confirms that the material types of the listed pump components have been verified by testing.
Vacuum-dried pump	Confirms that the specific pump has been vacuum-dried, and how it was done.
Electropolished pump	Confirms that the specific pump has been electropolished. The maximum surface roughness is specified in the report.
ATEX-approved pump	Confirms that the specific pump is ATEX-approved according to the EU directive 94/9/EC, the "ATEX directive".

See examples of the certificates on pages [64](#) to [68](#).

Note that other certificates are available on request.

These pumps are available with certificates:

Pump type	CR	CRI	CRN
1s, 1, 3, 5	•	•	•
10, 15, 20	•	•	•
32, 45, 64	•		•
95, 125, 155	•		•
185	•		•

- Available.

Certified and approved CRT(E) 2, 4, 8 and 16 pumps are also available.

Examples of certificates

Certificate of compliance with the order



Certificate of compliance with the order

EN 10204 2.1

Customer name	
Customer order no.	
Customer Tag no.	
GRUNDFOS order no.	
Product type	

We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.

GRUNDFOS

Date:

Signature:

Name:

Dept.:

Part no. 96 52 78 91-P980-0000 1/2231

TM03 4165 1320

Test certificate

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GRUNDFOS

Test certificate

Non-specific inspection and testing

EN 10204 2.2

Customer name	
Customer order no.	
Customer TAG no.	
GRUNDFOS order no.	

Pump		
Pump type		Part number
Motor make		Part number
Flow	m ³ /h	
Head	m	
Max. operating pressure	bar	
Max. operating temperature	°C	
Power P ₂	kW	
Voltage	V	
Frequency	Hz	
Full load current	A	
Motor speed	min ⁻¹	

We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured, tested*, inspected, and conform to the full requirements of the appropriate catalogues, drawings and / or specifications relative thereto.

Continued on page

Date: _____

Signature:

Name: _____

Dept.: _____

*1) Cleaned and dried pumps and FWS free pumps are not performance tested.

Pump no. 90 10 10 90/PMB 0001 123 123

TM03 4163 1320

Inspection certificate 3.1

[illegible]

TM06 0200 1320

Inspection certificate

Inspection Certificate

Russian Maritime Register of Shipping

General info				
Customer name				
Customer order no.		GRUNDFOS order no.		
Customer TAG no.		Certificate No.		
Ship / new building				
Shipyard / factory				
Pump		Motor		
Pumps type		Make		
Part No.		Part No.		
Serial No.		Serial No.		
Model		P2 [kW]		
Flow rate [m³/h]		Voltage [V]		
Head [m]		Current [A]		
Max. liquid temp [°C]		Motor speed [min⁻¹]		
Max. op. Press. [bar]		Frequency [Hz]		
Stamping ID		IP code		
		Max. temp. amb. [°C]		
Part according to EN ISO2004 - 3.1				
Part	Raw material Grundfos PN	Raw material grade and standard	Vendor	Heat / Charge No.
Pump head				
Pump head cover*				
Base				
Sleeve				
Pump head**				
Seal chamber***				
THD flange***				
Blind cover (THD)***				
* Only for CR/NR back to Back, Tandem, Air cooled up ** Only for CR/NR Magdrive ("Pump head cover" removed and "Pump head" included) *** Only for CR/NR B6, L25, E35, LB6, 255, 295 with hose prepared for THD				
Part according to EN ISO2004 - 2.2				
Part	Material type	Raw material grade acc. to standard		
Shaft				
Impeller				
Chamber				
Operational function				
Media		Application		
Required duty point				
Flow rate [m³/h]		Head [m]		
Test performance				
Result of tests are attached. See test point			GRUNDFOS	
Declaration of compliance for the Class Society Rules			Date:	
Rules for technical supervision during construction of ships and manufacture of materials and products for ships, Part IV			Signature:	
			Name:	
			Dept.:	

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Part no. 96507925/PMA/000/12459388

TM03 4156 1320

Standard test report

Test Report - Performance curve
ISO 9906:2012 Grade 3B

General info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured by GRUNDFOS, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.

The attached test result is from the above mentioned pump.

GRUNDFOS
Date: _____

Signature:
Name: _____
Dept.: _____

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GRUNDFOS
Part no. 96507930/PMI/000/1250007

TM03 4143 1320

Material specification report

Material specification report
Type EN 10204 - 2.2

General info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

Part	Material	Standard

We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.

GRUNDFOS
Date: _____

Signature:
Name: _____
Dept.: _____

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GRUNDFOS
Part no. 96507928/PMI/000/1253903

TM03 4150 1320

Material specification report with certificate from raw material
supplierMaterial specification report
Type EN 10204 - 3.1/2.2

General info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

Part according to EN 10204 - 3.1				
Part	Raw material Grundfos PN	Raw material grade and standard	Vendor	Heat / Charge No.
Pump head				
Pump head cover*				
Base				
Sleeve				
Pump head**				
Seal chamber***				
THD flange***				
Blind cover (THD)***				

*) Only for CR(I/N) MagDrive ("Pump head cover" removed and "Pump head" included)

**) Only for CR(I/N) Back to Back, Tandem, Air cooled top

***) Only for CR(N) 95, 125, 155, 185, 215, 255 with base prepared for THD

Part according to EN 10204 - 2.2		
Part	Material type	Raw material grade acc. to standard
Shaft		
Impeller		
Chamber		

We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.

GRUNDFOS
Date: _____

Signature:
Name: _____
Dept.: _____

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GRUNDFOS
Part no. 96507925/PMI/000/1249522

TM06 0753 1320

Duty point verification report

Test Report - Duty point verification
ISO 9906:2012 Grade 3B, Q&H

General info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured by GRUNDFOS, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.

The attached test result is from the above mentioned pump.

GRUNDFOS
Date: _____

Signature:
Name: _____
Dept.: _____

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GRUNDFOS
Part no. 96538699/PMI/000/1250007

TM03 4148 1320

PWIS free pump

Statement regulation EC 1935/2004

Certificate

Pump with no paint wetting impairment substances (PWIS)

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

We the undersigned hereby confirm that the above-mentioned product is manufactured according to specifications mentioned below:

- All components of the pump including shaft seal, motor, rubber materials for shaft seals, do not containing PWIS, or release PWIS.
- Consumables, like oil, grease, soap water etc, without containing PWIS are used for assembly.
- Tools for assembling of the products are not containing any paint wetting impairment substances.
- The product is not performance tested.
- Finished product is wrapped in special PWIS free plastic bag before being packed for shipment

GRUNDFOS

Date:

Signature:

Name:

Dept.:

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GRUNDFOS

Part no. 98508505/PM/000/1253903

TM07 3988 0619

Statement

Regulation (EC) 1935/2004

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

Statement

For pumps with EPDM

The pumps have been successfully tested for contact at a maximum of 120°C for a maximum of 5 minutes with:

- aqueous foodstuffs with a pH above 4,5
- alcohol containing foodstuffs with an alcohol content of a maximum 50%
- milk-related foodstuffs, with NO free fats on the surface (e.g. milk and milk based drinks whole, partly dried and skimmed or partly skimmed)

Please be aware that the above mentioned pump is not a sanitary pump, and that remains from machining may be present inside the pump, why appropriate precautions should be taken.

The above mentioned pump manufactured by Grundfos contain various materials that have all been evaluated in relation to contact with foodstuffs.

Plastic parts are manufactured according to Regulation (EU) No. 10/2011 as amended by up to and including Regulation (EU) No. 2016/1416/EC. All substances used for the plastic parts are listed in Annex I. The plastic parts do not contain any dual use additives. Overall migration tests have been conducted on the plastic parts. The results of the overall migration tests comply with the limit of 10 mg/dm².

Rubber parts are manufactured according to ResAP (2004) 4 on Rubber Products Intended to come into Contact with Foodstuffs or the German BfR recommendation XXI on Commodities based on Natural and Synthetic Rubber.

Silicone parts are manufactured according to ResAP (2004) 5 on Silicones to be used for Food Contact or the German BfR recommendation XV on Silicones.

The chemical composition of the metal parts is known and recognised by Grundfos. The metal parts do not release metals or heavy metals in quantities that may endanger human health when tested as described in CM/Res(2013)9 from EDQM.

Substances restricted by specific migration limits are present in the polymer parts. These limits are all complied with. Substances listed in Annex XIV on Substances of Very High Concern of Regulation (EC) No. 1907/2006 are not present in the products.

The products are manufactured according to Regulation (EC) No. 2023/2006 on Good Manufacturing Practice.

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GRUNDFOS

Part no. 985081818/PM/000/1253803

TM07 3989 0619

Positive Material Identification
(PMI report EN 10204 3.2)

Surface-roughness

Report

Positive Material Identification

Type EN 10204 - 3.2

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

Type	Company Name	PMI Report ID

We the undersigned hereby certify that listed parts and materials used for above mentioned product has been tested and inspected according to conditions described in appendix together with PMI test results.
Note: For sheeted components consisting of several sub-components only the main sub-component is measured and included in this report.

GRUNDFOS

Date:

Signature:

Name:

Dept.:

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GRUNDFOS

Part no. 99277139/PM/000/1253903

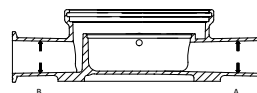
TM07 4004 0619

Report – Surface roughness

According to ISO 1302

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	
Base part number			

The surface roughness is measured as the maximum roughness of the inlet and outlet surface of the base.



Surface Treatment	
None	
Electro-polished	

Measured values A	
R _{max}	(µm)
R _A	(µm)
R _Z	(µm)

Measured values B	
R _{max}	(µm)
R _A	(µm)
R _Z	(µm)

Roughness value RA [µm]	Roughness degree
50	N 12
25	N 11
12.5	N 10
6.3	N 9
3.2	N 8
1.6	N 7
0.8	N 6
0.4	N 5
0.2	N 4
0.1	N 3
0.05	N 2
0.025	N 1

GRUNDFOS

Date:

Signature:

Name:

Dept.:

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GRUNDFOS

Part no. 96507931/PM/000/1253874

TM03 4147 1320

Vibration report

Vibration report

According to ISO 20816-1 / ISO 10816-7

Customer name	
Customer order no.	
Customer TAG no.	
GRUNDFOS order no.	
Pump type	Part number
Serial number	Model

Test Conditions: The pump is floor mounted on a steel plate supported by Sylomer foam. For vibration measurement positions see Figure.

P2 (kW)		Voltage (V)	
Frequency (Hz)		Number of poles	
Flow (m ³ /h)		Head (m)	
Remarks:			

Result of Measurement:

Position	RMS vibration Velocity (mm/s)
1	
2	
3	
4	
5	
6	
7	
8	
9	



Typical Zone boundary - ISO 20816-1:

Vel. (mm/s)	Range of typical zone boundary values for non-rotating parts.
0,28	
0,45	
0,71	
1,12	Zone boundary
1,80	
2,80	Zone boundary
4,50	
7,10	Zone boundary
9,30	
11,2	Zone boundary
14,7	
18,0	
28,0	
45,0	

GRUNDFOS
Date:Signature:
Name:
Dept.:

be think innovate

GRUNDFOS

Part no. 96507932/PM/000/ 1249870

Motor test report

be think innovate

GRUNDFOS

Motor test report

Customer name	
Customer order no.	
Customer Tag no.	
GRUNDFOS order no.	
GRUNDFOS DUT id.	
Part number	
Motor no.	
Motor serie no.	

We the undersigned hereby guarantee and certify that the above motor has been tested.
The performance of the motor can be seen in the motor test report on the next page.

GRUNDFOS
Date:
Signature:
Name:
Dept.:

Part no. 96 50 79 33 POL/PM/000/1335258

TM03 4167 1320

TM03 4146 1320

Cleaned and dried pump

Report

Cleaned and dried pump

General info	
Customer name	
Customer order no.	
Customer TAG no.	
GRUNDFOS order no.	
Pump type	Part number
Serial number	Model

We the undersigned hereby confirm that the above-mentioned product is manufactured according to specifications mentioned in data booklet for the relevant product type. This means that prior to assembly, pump components are washed in pure, hot soapy water, rinsed in de-ionized water and dried.

The pump is wrapped in a plastic bag before being packed.

The pump has not been performance-tested.

GRUNDFOS
Date:Signature:
Name:
Dept.:

be think innovate

GRUNDFOS

Part no. 96507934/PM/000/1252874

Vacuum-dried pump

be think innovate

GRUNDFOS

Vacuum Dried Pump

Customer name	
Customer order no.	
Customer TAG no.	
GRUNDFOS order no.	
Pump type	Part number
GRUNDFOS DUT id.	
Part number	

GRUNDFOS hereby confirms that the pump mentioned above is manufactured according to the specifications mentioned in the "CR, CRI, CRN Custom built pumps" data booklet. This means that after the performance test of the pump, a heat and vacuum drying process will ensure that no liquid water is present inside the pump.

The in- and outlet of the pump is sealed by means of a sticker after the drying process.

GRUNDFOS
Date:
Signature:
Name:
Dept.:

Part no. 96 50 79 33 POL/PM/000/1335258

TM03 4145 1320

TM06 0335 1320

Electropolished pump

Report

Electro-polished pump

General info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

Grundfos hereby confirms that the pump mentioned above is manufactured according to below specifications prior to assembly.

All components are treated according listed steps:

- 1) Degreased in a mechanical washing tunnel with soap.
- 2) Pickled in a mixture of nitric-or hydrofluoric acid (HF)
- 3) Electropolished in Sulfuric acid (H₂SO₄) and Phosphoric acid (H₃PO₄)
- 4) Passivated in 10-12% Nitric acid (HNO₃)
- 5) Washed in a mechanical washing tunnel without soap

The casted parts for a CRN 1s to a CRN 20, are all mechanically polished before being electropolished.

The pump will then obtain following surface roughness

Pump type	Stainless steel casted parts	Stainless steel plate and other non-casted parts	Surface roughness Ra [µm]
CRN1s, 1, 3, 5	X	X	Equal to or below 0,8
CRN10, 15, 20	X	X	Equal to or below 0,8

GRUNDFOS

Date:

Signature:

Name:

Dept.:

be think innovate

GRUNDFOS

Part no. 96507935/PMA/000/ 1250017

TM03 4144 1320

ATEX-approved pump

Report

ATEX approved pump

General info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type			
Serial number		Model	
Pump part No.		Serial No.	
Motor part No.		Serial No.	
ATEX approval of pump		Technical file No.	

GRUNDFOS hereby confirms that the pump mentioned above is manufactured according to the ATEX directive. This means the pump is conformity with the ATEX 2014/34/EU ANNEX VIII directive as mentioned in the "ATEX Supplement to installation and operating instructions" supplied with the pump.

GRUNDFOS

Date:

Signature:

Name:

Dept.:

be think innovate

GRUNDFOS

Part no. 96512240/PMA/000/1281066

TM03 4166 1320

Pump performance testing

CR testers are all capable of performing hydraulic performance tests according to ISO 9906:2012 requirements.

The standard ISO 9906:2012 sets standards for "rotodynamic pumps, Hydraulic performance acceptance tests, Grades 1, 2 and 3".

Performance acceptance grades

Six pump-performance-test acceptance grades, 3B, 2B, 2U, 1B, 1E and 1U are defined in ISO 9906:2012.

Acceptance grade	Mandatory measurements		Optional measurements	
	Q	H	P1	Eta-tot
3B	± 9 %	± 7 %	+ 9 %	- 7 %
2B	± 8 %	± 5 %	+ 8 %	- 5 %
1B	± 5 %	± 3 %	+ 4 %	- 3 %

Q: Flow rate

H: Head

P1: Total consumed power

Eta-tot: Total efficiency

These tolerance grades can be used in the contract between the pump manufacturer and the purchaser, or they can be used in a default tolerance factor which will apply if no specific tolerance grade has been agreed between the manufacturer and the customer.

The guarantee point

According to ISO 9906:2012 the acceptance-grade tolerance applies to one guarantee point.

A guarantee point is defined by a guaranteed flow rate and a guaranteed head.

In addition, either minimum total efficiency or maximum total input power may be guaranteed at the specified conditions.

This means that the standard sets guidelines for a duty point guaranteed for the following:

- Q and H - or
- Q, H and total efficiency (Eta-total) - or
- Q, H and total consumed power (P1).

The guarantee point is defined by a minimum of five measured test points.

Example on a duty point test living up to ISO 9906:2012 requirements

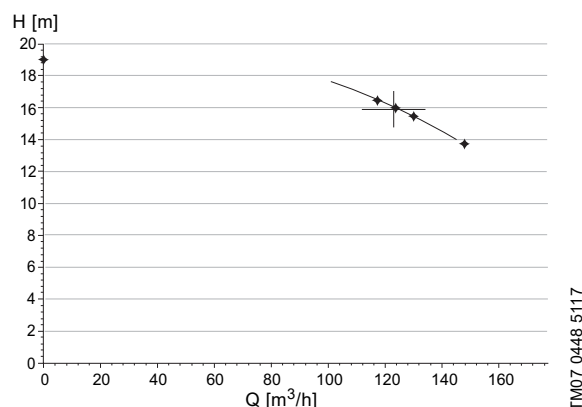


Fig. 94 Five measured test points are used to verify one guarantee point

Evaluation of performance

The test must show that the measured pump curve touches or passes through a tolerance surrounding the guarantee point as defined by the selected acceptance grade.

Guarantee-point evaluation must be made at the rated speed, which for CR pumps means 50 Hz or 60 Hz.

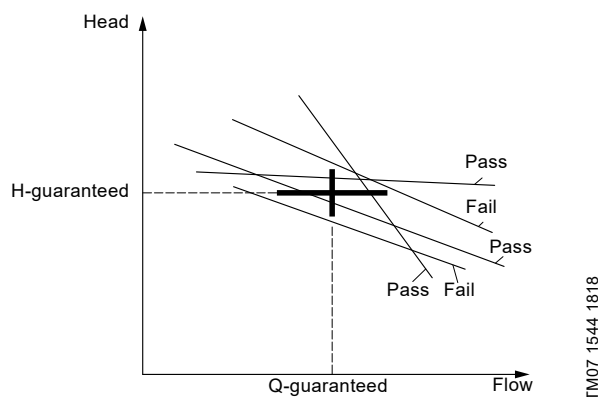


Fig. 95 Pump curves that either pass or fail to cross the tolerance cross of the guarantee point

Performance-test types for pumps

Two types of performance tests are available for CR pumps:

- duty-point-verification test
- curve test.

Tests carried out on pumps

- Tests are saved for at least five years and can be traced using the pump's unique serial number.
- It is not possible to change the acceptance grade on an already tested and supplied pump - if this should be required, a re-test of the pump is needed.
- Witness testing can be arranged.

Duty-point-verification test, Grades 3B, 2B and 1B

This test method offers the possibility to perform a duty-point verification of the following:

- Q and H - or
- Q, H and total efficiency (η_{tot}) - or
- Q, H and total consumed power (P_1).

Acceptance grade	Mandatory measurements		Optional measurements	
	Q	H	P_1	η_{tot}
3B	Standard		On request	
2B	On request		On request	
1B	On request		On request	

What Grundfos is able to guarantee for the different acceptance grades will be evaluated case by case. Contact your local sales company for further information.

Grundfos makes duty-point verification according to ISO 9906:2012 for one guarantee point at full speed, 50 or 60 Hz. The customer must tell Grundfos which duty point to verify.

The requested duty point is verified by five measured points.

Curve test, Grade 3B

This test method is developed by Grundfos and is based on ISO 9906:2012 performance acceptance grade 3B tolerances: $Q = \pm 9\%$, $H = \pm 7\%$.

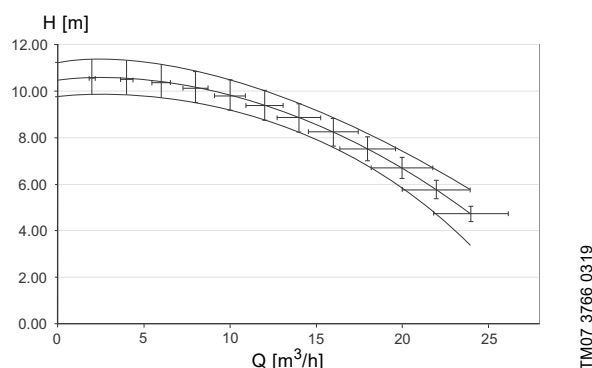


Fig. 96 Q-H curve with tolerance crosses on the complete performance range

On fig. 96, tolerance crosses according to Grade 3B have been distributed across the complete performance range of a pump. We generate the upper and lower limit of the performance curve by drawing two curves at the outlines of these crosses.

When the pump is tested and the measured point is located within the range between upper and lower limit, it is qualified to ISO 9906:2012 Grade 3B tolerances. This way of qualifying the pump performance is stricter than a duty-point-verification test for Grade 3B.

How does Grundfos make curve testing for CR pumps

Grundfos makes the curve test in one of the following two ways:

- a reference-curve test
- a performance-curve test.

Reference-curve test, Grade 3B

A reference test is made when no curve-test report is specified with the order. Two test points are measured and no curve-test report is supplied with the pump.

Measurements are made to maintain and observe continuous quality and to ensure that the supplied pump is within test-grade tolerances. Test-grade tolerances are set as for Grade 3B but without certification.

Example of a reference-curve test

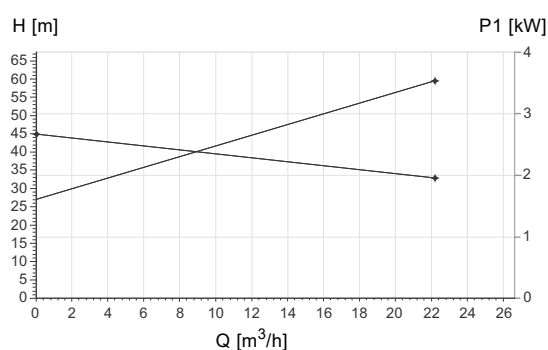


Fig. 97 Measured values for a tested pump

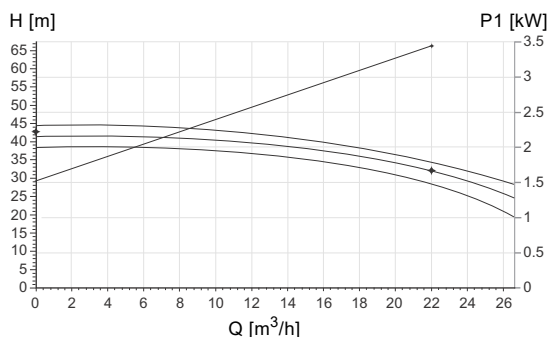


Fig. 98 The values in fig. 97 calculated to a reference speed for comparison to a reference performance curve

If a pump-performance report is requested at a later stage, only reference-test data are available.

Performance-curve test, Grade 3B

A performance-curve test is made when a curve test report is specified with the order.

The pump is tested at pre-specified flow rates, distributed over the full pump curve - minimum five points, and test grade tolerances are set as for Grade 3B but without certification.

Example of a CR curve test

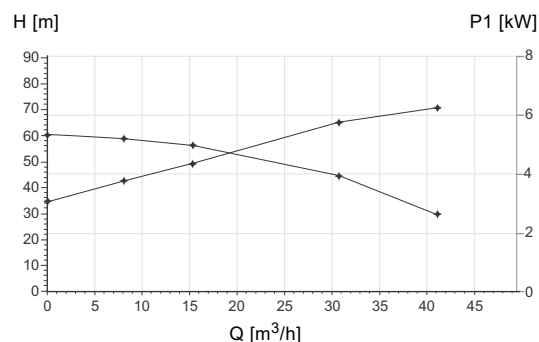


Fig. 99 Measured values for a tested pump

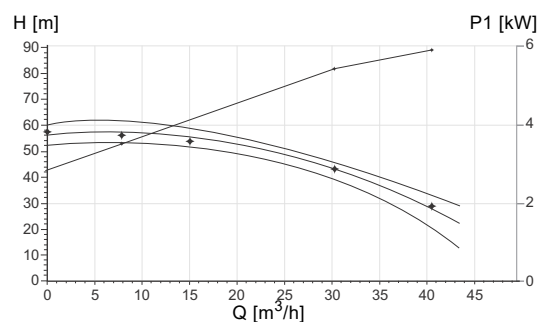


Fig. 100 The values in fig. 99 calculated to a reference speed for comparison to a reference performance curve

If the customer requires more points on the curve to be checked, individual measurements must be made that are not part of the performance curve test.

Static high pressure test

All pumps are static pressure tested at 150 % of maximum pressure stamped on the nameplate or at a maximum of 45 bar.

11. CRE pump solutions



TM05 6774 5012

Fig. 101 Motors for CRE, CRIE, CRNE, CRTE pumps

Besides continuously variable performance, CRE, CRIE, CRNE, CRTE pumps offer a number of advantages depending on the hardware and software combinations of the motor.

CRE pumps are not dependent on the frequency of the supply voltage and are designed for operation at frequencies between 750 min^{-1} and 6000 min^{-1} . This offers a number of advantages:

- compact pump
- higher performance in relation to physical size
- larger dynamic range
- less noise at reduced speed
- more gentle handling of the pumped liquid at reduced speed.

The speed may be chosen freely, taking into consideration the maximum motor load and the hydraulic properties of the pump. Pumps can be delivered with oversize or undersize motors depending on load profile. Ball bearing configuration can also be altered to fit load and demands.

Customised CRE pump solutions

As an alternative to the standard CRE pump solutions, we offer CRE pumps customised for your requirements.

You can configure CRE pumps as follows:

- Selecting an operating panel on the front of the terminal box of the motor.
- Selecting a communication module for bus standards such as GENIbus, LONWorks, PROFIBUS. See [Communication with CRE pumps](#) on page 75.
- Selecting a customised functionality by means of special configuration files (gsc-files).

User interfaces for CRE pumps

Pump settings can be made by means of the following user interfaces:

Operating panels

CRE pumps can be delivered with different operating panels. The available options depend on the motor type and size. See the table below:

	Operating panel type					
	Basic		Standard		Advanced	
	With radio module Advanced functional module	Without radio module Advanced functional module	With radio module Advanced functional module	Without radio module Advanced functional module	With radio module Advanced functional module	Without radio module Advanced functional module
MGE motor						
0.37 - 11 kW	○	○	●	○	○	○
15-22 kW		○		●		○

- Mounted as standard.
- Optional.

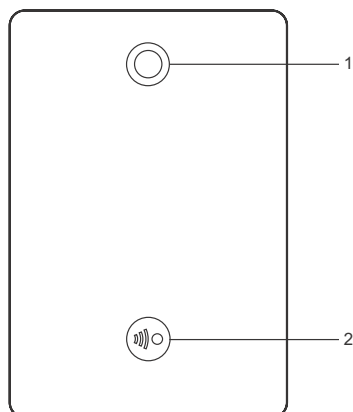
CRE pumps from 0.37 to 11 kW

The available operating panels enable monitoring and setting of the pump. Settings can either be made directly on the operating panel or via Grundfos GO Remote.

The operating panels can be delivered with or without a module for communication between the pump and Grundfos GO Remote or communication to other pumps in a multipump system. All operating panels enable communication via infrared (IR) connection which can be used in connection with Grundfos GO Remote.

The different operating panels and remote controls are described below.

Basic operating panel

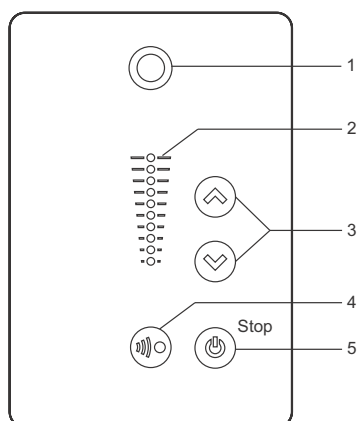


TM05 4847 2712

Fig. 102 Basic operating panel

Pos.	Symbol	Description
1		Grundfos Eye Shows the operating status of the pump.
2		Enables radio communication with Grundfos GO Remote and other products of the same type.

Standard operating panel

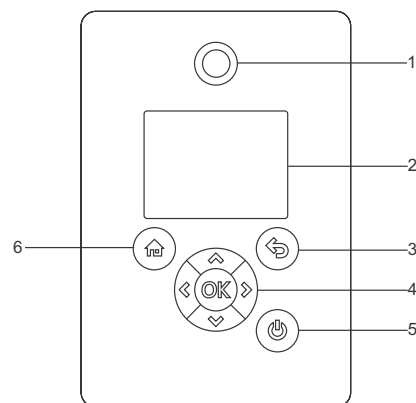


TM05 4848 3512

Fig. 103 Standard operating panel

Pos.	Symbol	Description
1		Grundfos Eye The indicator light shows the operating status of the product.
2	-	Light fields for indication of the setpoint.
3		Up/Down The buttons change the setpoint.
4		Radio communication The button enables radio communication with Grundfos GO Remote and other products of the same type. Start/Stop: Press the button to make the product ready for operation or to start and stop the product. Start: If you press the button when the product is stopped, the product starts if no other functions with higher priority have been enabled. Stop: If you press the button when the product is running, the product always stops. When you press the button, the stop icon appears at the bottom of the display.
5		

Advanced operating panel

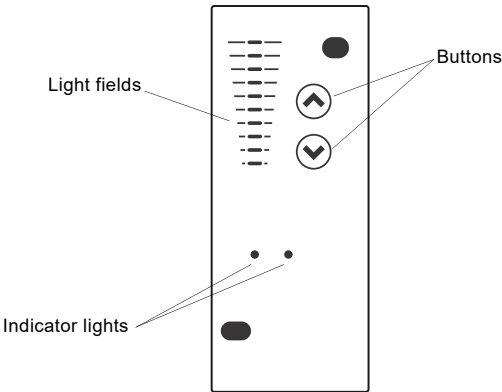


TM05 4849 1013

Fig. 104 Advanced operating panel

Pos.	Symbol	Description
1		Grundfos Eye The indicator light shows the operating status of the product.
2	-	Graphical colour display.
3		Back: Press the button to go one step back.. Left/Right: Press the buttons to navigate between main menus, displays and digits. When you change the menu, the display shows the top display of the new menu.
		Up/Down: Press the buttons to navigate between submenus or change the value settings. If you have disabled the possibility to make settings with the Enable/disable settings function, you can enable it again temporarily by pressing these buttons simultaneously for at least 5 seconds.
4		OK: Press the button to do as follows: • save changed values, reset alarms and expand the value field • enable radio communication with Grundfos GO Remote and other products of the same type. When you try to establish radio communication between the product and Grundfos GO Remote or another product, the green indicator light in Grundfos Eye flashes. In the controller display, a note states that a wireless device wants to connect to the product. Press OK on the product operating panel to allow radio communication with Grundfos GO Remote and other products of the same type.
5		Start/Stop: Press the button to make the product ready for operation or to start and stop the product. • Start: If you press the button when the product is stopped, the product starts if no other functions with higher priority have been enabled. Stop: If you press the button when the product is running, the product always stops. When you press the button, the stop icon appears at the bottom of the display.
6		Home: Press the button to go to the Home menu.

CRE pumps from 15 to 22 kW



TM05 8590 2613

Fig. 105 Standard/advanced operating panel

The operating panel on the pump (fig. 105) incorporates the following buttons and indicator lights:

- Buttons: ⬆ and ⬇ for setpoint setting.
- Light fields: Yellow = setpoint indication
- Indicator lights: Green = operation. Red = fault.

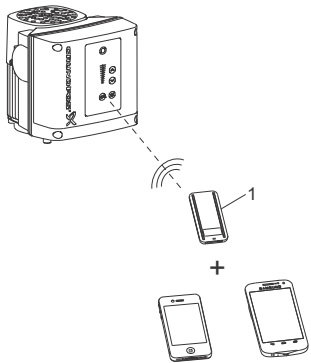
Remote control

Grundfos GO Remote

The Grundfos GO Remote can communicate with CRE pumps using either wireless radio or infrared connection.

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

Grundfos GO Remote offers the following mobile interfaces (MI). See fig. 106.



TM06 6256 2419

Fig. 106 Grundfos GO Remote communicating with the pump via radio or infrared connection (IR)

Pos.	Description
1	Grundfos MI 301: Separate module enabling radio or infrared communication. You can use MI 301 in conjunction with an Android or an iOS-based smart device with Bluetooth connection.

Communication with CRE pumps

Communication with CRE pumps is possible via a central building management system, remote control or operating panel.

Central building management system

The operator can communicate with a CRE pump at a distance. Communication can take place via a central building management system allowing the operator to monitor and change control modes and setpoint settings. Communication between CRE pumps and a central building management system is enabled via a Grundfos CIM module, see fig. 107.

CRE pumps with motor sizes from up to and including 11 kW are fitted with a GENIbus module from factory. CRE pumps with motor sizes from 15 to 22 kW are fitted with a CIM 050 GENIbus module from factory.

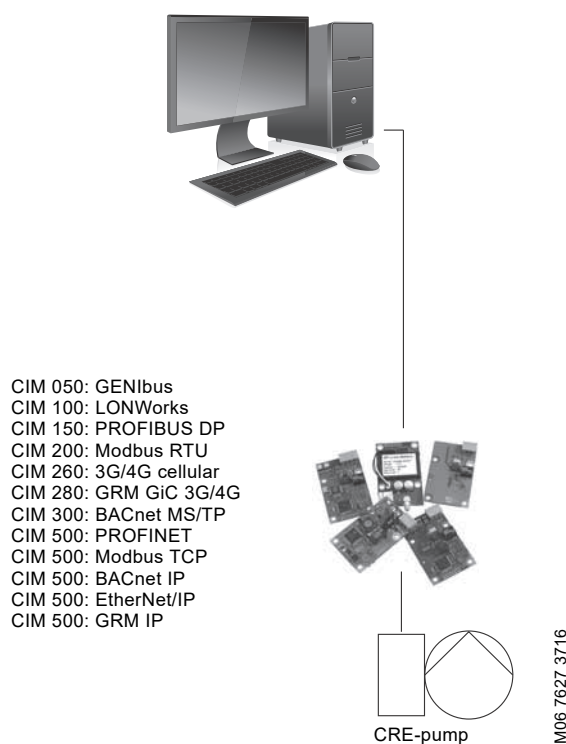


Fig. 107 Structure of a central building management system

Grundfos PC Tool E-products

Connection of Grundfos PC Tool E-products offers a number of advantages during commissioning, operation and service of E-pumps.

PC tool E-products enables these functions:

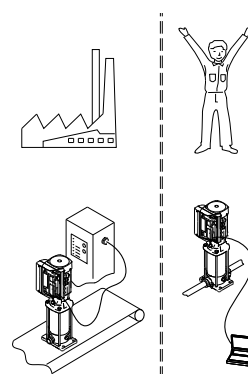
- monitoring of operational status of your E-product
- standard configuration of E-products
- custom configuration of E-products
- saving of logged data from E-products.

Via the PC Tool, it is possible to download special predefined configuration files (gsc files) to the pump. The configuration files may contain application-optimised operating parameters based on your specifications!

When configuration files have been read, it is still possible to adjust parameters.

Description

Grundfos PC Tool E-products is a common user platform/user interface used throughout the entire production process of an E-pump. Furthermore, PC Tool E-products can be used by the customer to set, commission and service the E-pump.



TM03 9290 3707

Fig. 108 PC Tool E-products used in production and on site by the customer

Grundfos PC Tool E-products enable configuration or reconfiguration of your product to optimise it to exactly your application. It is furthermore indispensable for fault finding and service.

The software for Grundfos PC Tool E-products must be ordered with the PC Tool Link package which contains hardware and cables. Contact Grundfos for further information.

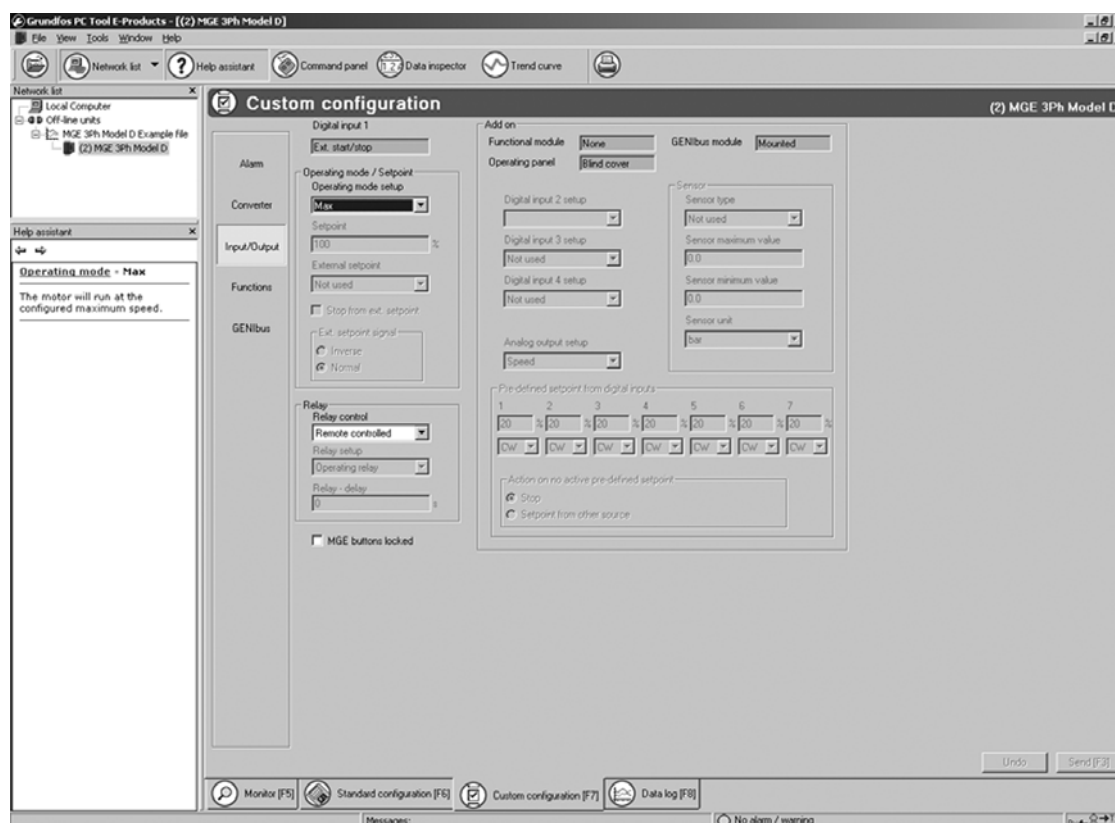


Fig. 109 PC Tool interface

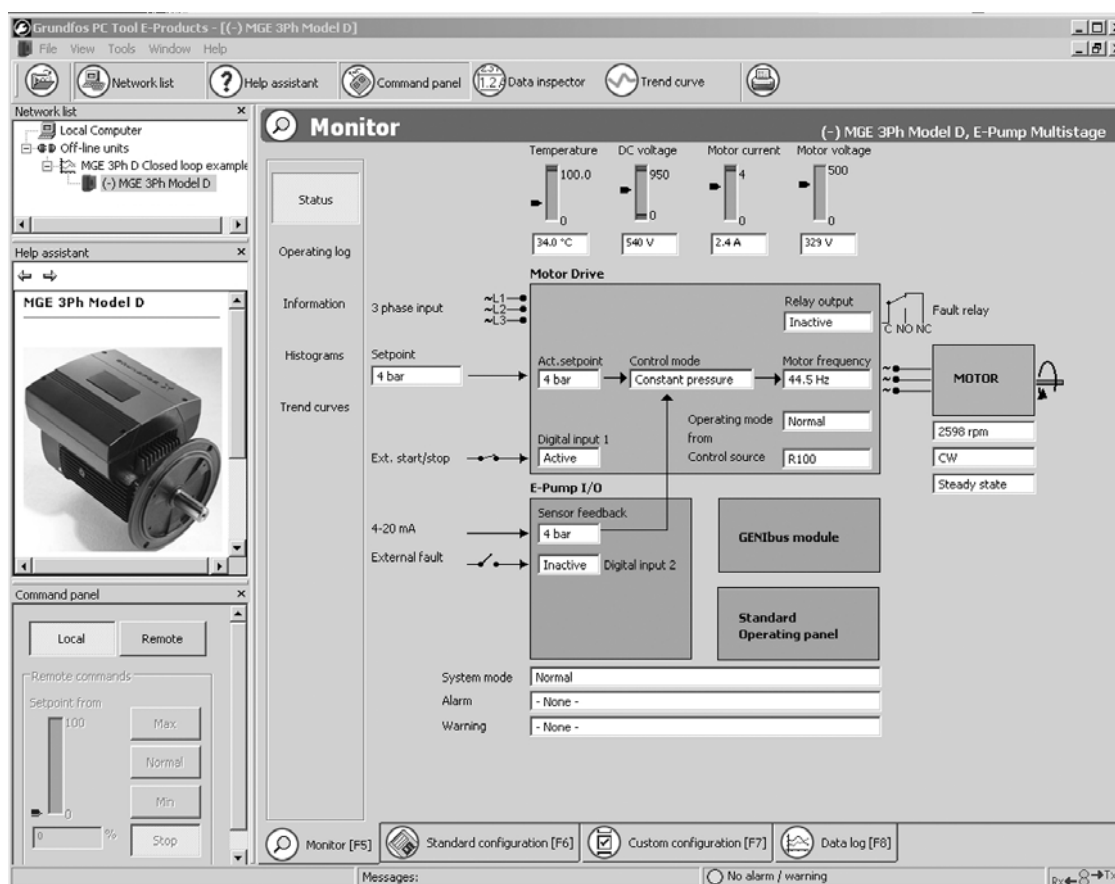


Fig. 110 Monitoring function

TM03 3712 0806

TM04 4607 1809

Industrial custom-built E-solutions

Pump running at over-synchronous speed

Pumps running at over-synchronous speed run at speeds exceeding the standard, maximum speed for example 50/60 Hz.

By increasing the pump speed, the pump performance will increase even more due to the laws of affinity. If you increase the speed of the pump with 20 % from 2,900 rpm to 3,470 rpm, the pump performance will increase by more than 70 %.

Affinity equation

The following affinity equations apply with close approximation to the change of speed of centrifugal pumps:

$$\frac{Q_x}{Q_n} = \frac{n_x}{n_n} \quad \frac{H_x}{H_n} = \left(\frac{n_x}{n_n}\right)^2 \quad \frac{P_x}{P_n} = \left(\frac{n_x}{n_n}\right)^3$$

H = pump head

Q = pump flow rate

P = pump input power

n = speed.

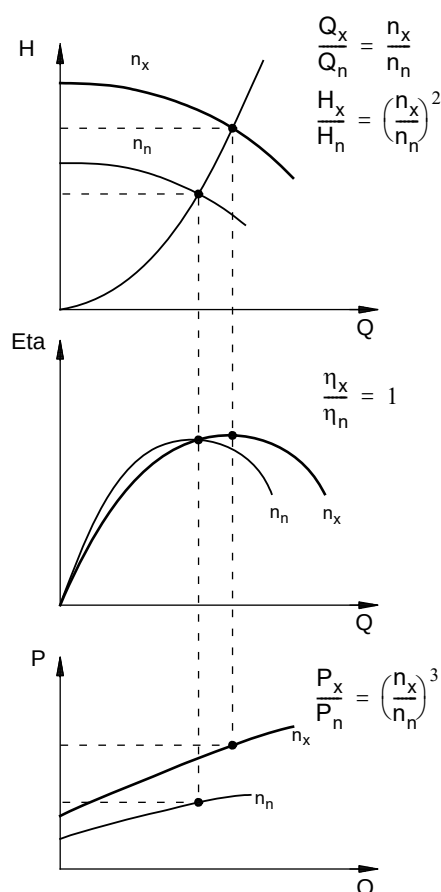


Fig. 111 Affinity equations

TM00 8720 3496

Pump hydraulic limitations

Running over-synchronous speed will increase the differential pressure over the chambers and the entire chamber stack. This might affect the lifetime of the pump depending on the application. Therefore, do not exceed the pressure limits stated in the table below. Special chambers and software setup might be required.

Pump type	Maximum differential pressure over the chamber [bar]		
	Standard chamber	Reinforced chamber	Laser-welded chamber
CR, CRI, CRN 1s	0.9	-	-
CR, CRI, CRN 1	0.9	2.2	2.2
CR, CRI, CRN 3	0.9	2.2	2.2
CR, CRI, CRN 5	0.9	2.2	-
CR, CRI, CRN 10	2.2	-	-
CR, CRI, CRN 15	2.2	-	-
CR, CRI, CRN 20	2.2	-	-
CR, CRI, CRN 32	5.0	-	-
CR, CRI, CRN 45	5.0	-	-
CR, CRI, CRN 64	5.0	-	-

The durability of the different chamber types depends on the number of starts and stops of the pump. The estimated maximum number of pump starts and stops is stated below:

Chamber type	Maximum number of starts and stops
Standard chamber	1,000,000
Reinforced chamber	300,000
Laser-welded chamber	800,000

The table below states the maximum differential pressure over the entire chamber stack.

Purpose and benefits

Pump type	Maximum differential pressure over the entire chamber stack [bar]
CR, CRI, CRN 1-3	50
CR, CRI, CRN 5	25
CR, CRI, CRN 10-20	30
CR, CRI, CRN 32-64	33

Traditionally, pumps are sized so that the maximum pressure and flow rate required in the application can be handled with a standard pump. For pumps working in conditions with various pressure and flow requirements, this can have the effect that the most common duty point is where the pumping efficiency is not optimal. By choosing a pumping solution that can reach over-synchronous speeds, the pump can be sized from most common duty point and speed up when higher flow rate or pressure is required.

- Compact solution. Increasing RPM enables high pressure with few stages, requiring less space.

In applications where a high flow rate or pressure is needed momentarily, sizing can be done from the most used duty point with the ability to run over-synchronous speed for momentary high flow rate or pressure.

Applications

This solution is ideal in cases where the pump weight and dimensions are to be kept at a minimum and the pump performance is to be maintained.

The figure below illustrates how a pump can be down-sized and still deliver the same performance.

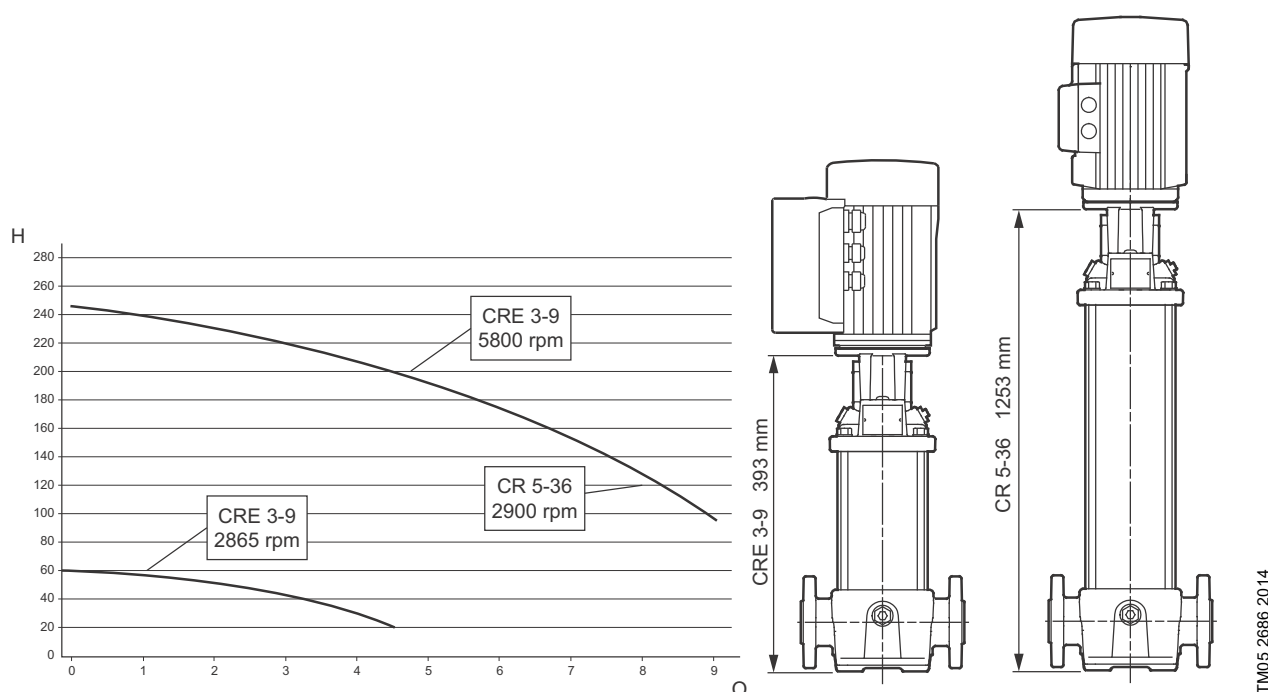


Fig. 112 Comparison of performance: A CRE 3-9 running at over-synchronous speed equals the performance of a CR 5-36 running at rated maximum speed

Availability

This function is available in these pump sizes:

Single-phase pumps	
2-pole	4-pole
0.37 - 1.5 kW	0.25 - 1.1 kW
Three-phase pumps	
2-pole	4-pole
0.37 - 22 kW	0.55 - 18.5 kW

Setup

This function is available in factory-configured products.

Running at over-synchronous speed will affect the NPSH value. Sufficient inlet pressure is therefore required. Sound pressure level emitted from the pump and motor will increase when increasing the speed.

Pump operating at power limit

When a pump operates at the power limit, the MGE motor will deliver an output corresponding to the maximum load stated on the nameplate. The maximum load will never be exceeded. See fig. 113.

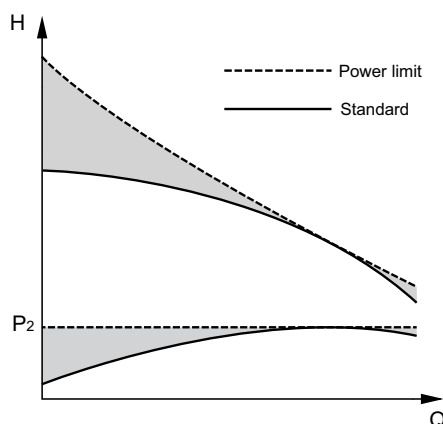


Fig. 113 Curves of a standard E-pump and a pump operating at power limit

Purpose and benefits

When using a standard pump at a low flow rate, the power consumption will drop and the motor will have excess power available.

By setting the CRE pump to operate at a higher speed, the excess power can be used to provide a higher pressure. The power limit function will ensure that the motor load never exceeds its maximum by decreasing the speed until the motor is at its power limit.

In cases where an undersize motor is used with standard speed, the power limit function will still reduce the speed and protect the motor against overload at a high flow rate. The solution offers the following benefits:

- reduced motor size
- reduced pump size.

Figure 114 shows that a pump operating at low flow rates and relatively high pressures (1) can be fitted with an undersize motor with a rated power that matches this operating range. At higher flow rates and relatively lower pressures (2), the motor will reduce its speed when the power limit is exceeded and follow a steeper curve corresponding to the power available.

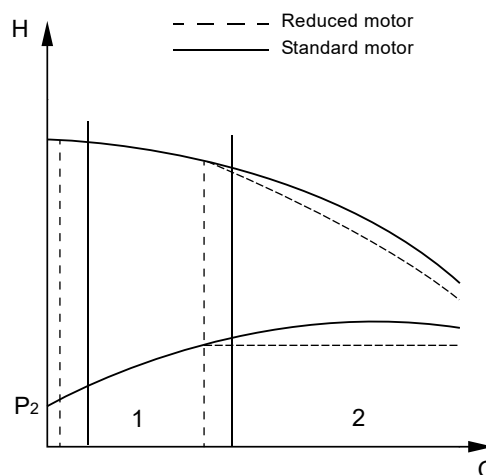


Fig. 114 Standard performance curve compared to a curve for a pump fitted with an undersize MGE motor

The MGE motor can be set to a higher speed than standard, enabling the pump to deliver more pressure. The pump will operate at this higher speed until the pump reaches the flow rate where the motor is loaded to its full rated power. If the flow rate is increased further, the motor will reduce its speed so as not to exceed its rated power.

Using this function can in some instances enable use of a smaller pump to reach the desired duty point compared to a pump running with standard maximum speed. See fig. 115.

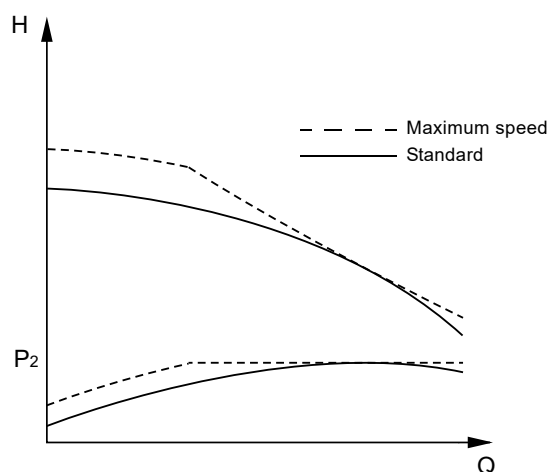


Fig. 115 Standard performance curve (60 Hz) compared to a performance curve for a pump running at maximum speed.

Applications

The power limit function is primarily used in applications where the motor size is dimensioned to be as small as possible to reduce size or cost. Or in applications demanding a high maximum speed to achieve a high pressure at a low flow rate. In both cases, the motor is protected by the power limit function at a higher flow rate where a lower speed is needed to prevent the motor from overloading.

Examples of application:

- Washing and cleaning
- boiler feed.

Availability

This function is available in these pump sizes:

Single-phase pumps	
2-pole	4-pole
0.37 - 1.5 kW	0.25 - 1.1 kW
Three-phase pumps	
2-pole	4-pole
0.37 - 22 kW	0.55 - 18.5 kW

Setup

The power limit is always active in CRE pumps to protect the motor against overload. Pumps with undersize motor and pumps with higher maximum speed are available as factory-configured products. Note that running at over-synchronous speed will affect the NPSH value. Sufficient inlet pressure is therefore required.

Sound pressure level emitted from the pump and motor may increase at higher speeds.

Furthermore, the differential pressure over the chambers must be taken into consideration. See [Pump hydraulic limitations](#) on page 77.

Low-flow stop function

The stop function ensures that the pump stops when low or no flow is detected for example if the pump is pumping against a closed valve.

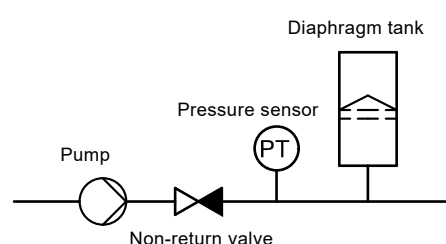
Purpose and benefits

The stop function provides these benefits:

- Energy consumption is limited and system efficiency is improved.
- Unnecessary heating of pumped liquid is avoided.
- Wear of shaft seals is reduced.
- Noise from operation is reduced.

Applications

The stop function is used in systems with a diaphragm tank and where periodically low or no consumption can occur thus preventing the pump from running against a closed valve.



TM03 8583 1907

Availability

This function is available in these pump sizes:

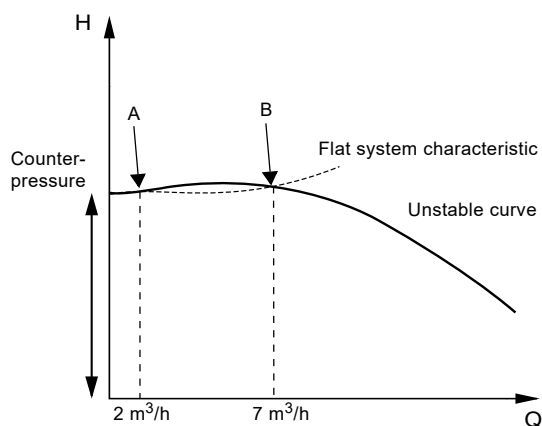
Single-phase pumps	
2-pole	4-pole
0.37 - 1.5 kW	0.25 - 1.1 kW
Three-phase pumps	
2-pole	4-pole
0.37 - 22 kW	0.55 - 18.5 kW

Setup

This function is available in factory-configured products.

Stabilising unstable pump curves

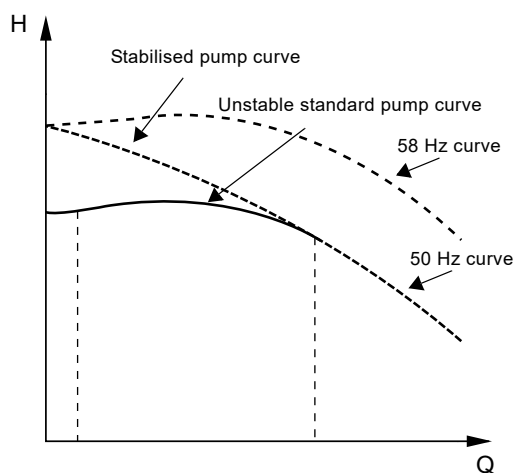
When the pump curve has a shape where it intersects the system curve at two points (A and B) with identical pressure but at different flow rates, the pump curve is defined as unstable, see fig. 116. This is especially problematic in systems with a flat system characteristic as it prevents the pump from being controlled to a flow rate which is lower than the flow rate at point B.



TM03 8516 1707

Fig. 116 Unstable pump curve

The E-motor can stabilise an unstable pump curve in the low flow area by changing to a higher speed. Figure 117 illustrates how the pump curve is straightened out in this area. As the flow rate increases, the E-motor gradually reduces the speed to normal speed and the pump performance will follow the standard pump curve.



TM05 2434 5111

Fig. 117 Pump curve with a stabilised operating range

Purpose and benefits

The purpose of stabilising an unstable pump is to enable normal control throughout the entire operating range. Thus fully stable operation is achieved, even in the low flow range. This enables the use of modern high-efficiency pumps in applications where this would otherwise not be possible.

Applications

Unstable operation may occur in applications with a high counterpressure and a flat system characteristic.

Examples of application:

- pumping of water to a water tower
- boiler feed.

Note that the sound pressure level emitted from the pump and motor may increase at higher speeds.

Availability

This function is available in these pump sizes:

Single-phase pumps	
2-pole	4-pole
0.37 - 1.5 kW	0.25 - 1.1 kW
Three-phase pumps	
2-pole	4-pole
0.37 - 22 kW	0.55 - 18.5 kW

Setup

This function is available in factory-configured products.

12. How to read the curve charts

CR deep-well

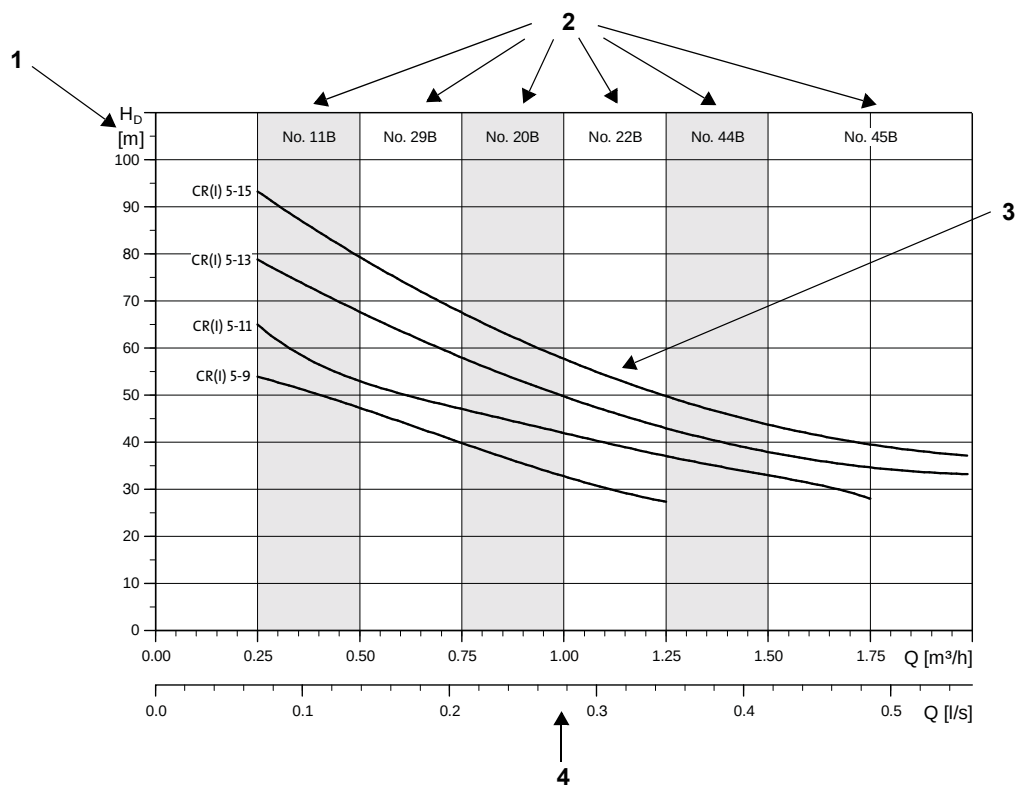
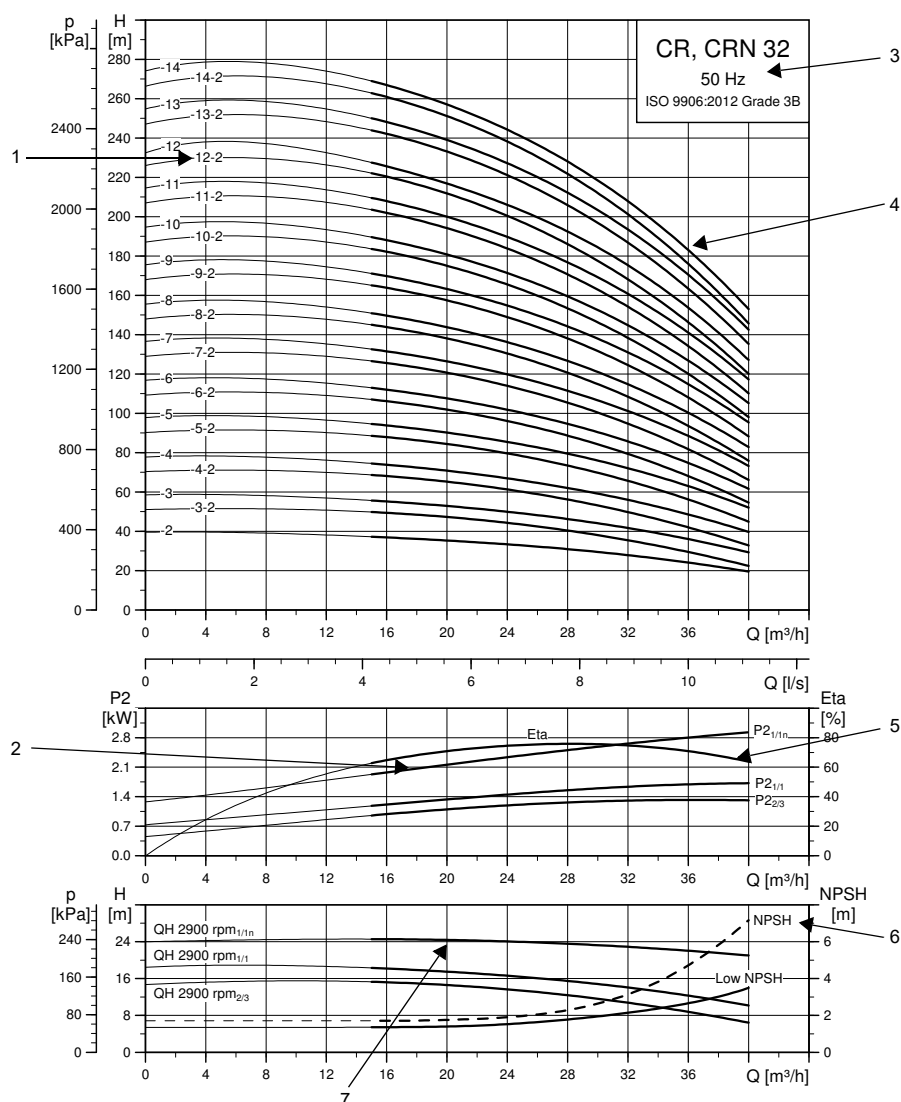


Fig. 118 Example of a curve chart of CR deep-well

Pos.	Description
1	The y-axis indicates the suction depth, H_D , in metres.
2	Ejector numbers.
3	QH curve of the individual pump. The bold curves indicate the recommended performance range for best efficiency.
4	The x-axis indicates the flow rate in m^3/h and l/s .

TM01 9129 0303

CR low-NPSH and CR pumps with 4-pole motor



TM01 9129 5218

Fig. 119 Example of a curve chart of CR low-NPSH

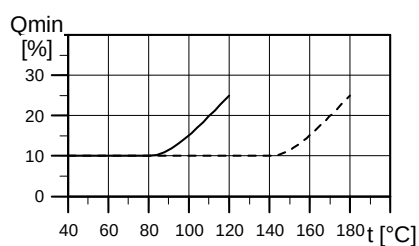
Pos.	Description
1	Number of stages. First figure: Number of stages. Second figure: Number of reduced-diameter impellers.
2	The power curves indicate pump input power per stage. Curves are shown for a pump with one stage (P_{21}), low-NPSH stage (P_{21n}) and reduced-diameter impellers ($P_{22/3}$).
3	Pump type, frequency and ISO standard.
4	QH curve for the individual pump. The bold curves indicate the recommended duty range for best efficiency.
5	The eta curve shows the efficiency of the pump. The eta curve is an average curve of all the pump types shown in the chart. The efficiency of pumps with reduced-diameter impellers is approx. 2 % lower than the eta curve shown in the chart.
6	The NPSH curve is an average curve for all variants shown. When sizing pumps, add a safety margin of at least 0.5 m.
7	QH curve for each individual impeller. Curves for complete (1/1) and reduced-diameter (2/3) impellers are shown.

Guidelines to curve charts

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

- Tolerances to ISO 9906:1999, Annex A, if indicated.
- The motors used for the measurements are standard Grundfos motors (MG or MGE).
- Measurements have been made with airless water at a temperature of 20 °C.
- Kinematic viscosity of $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt).
- Due to the risk of overheating, do not use the pumps at a flow rate below the minimum flow rate.
The QH curves apply to a rated motor speed of 2900 min^{-1} . All curves are based on current motor speeds.

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



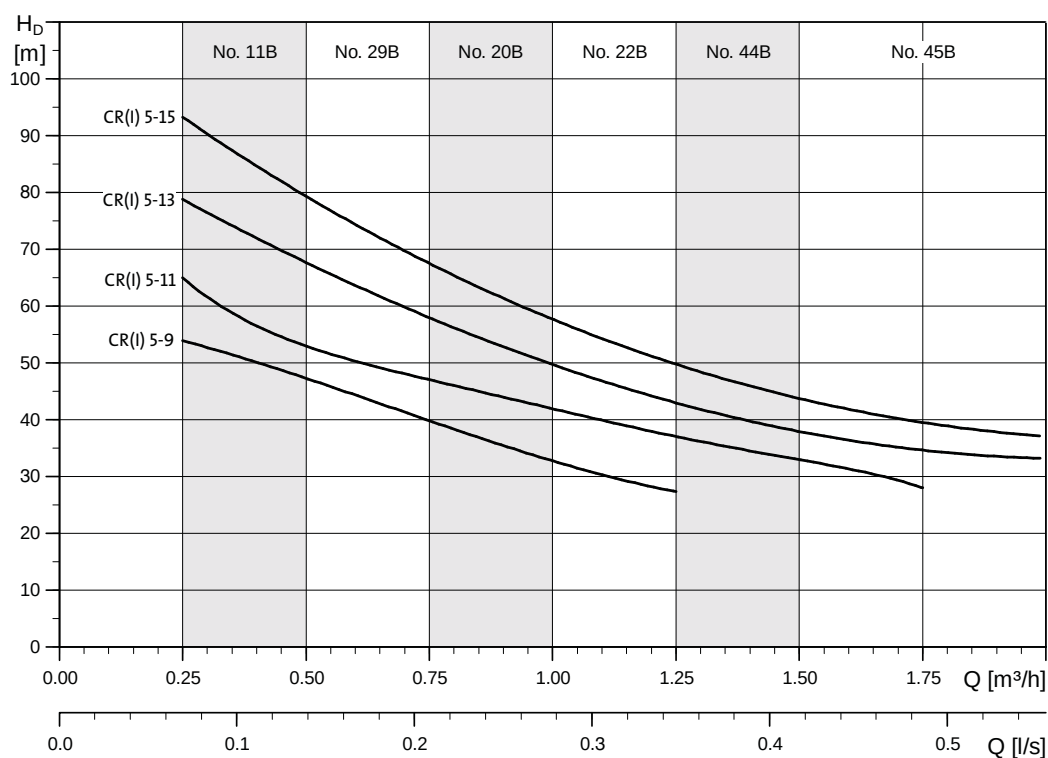
TMD1 2816 0303

Fig. 120 Minimum flow rate

13. Performance curves and technical data

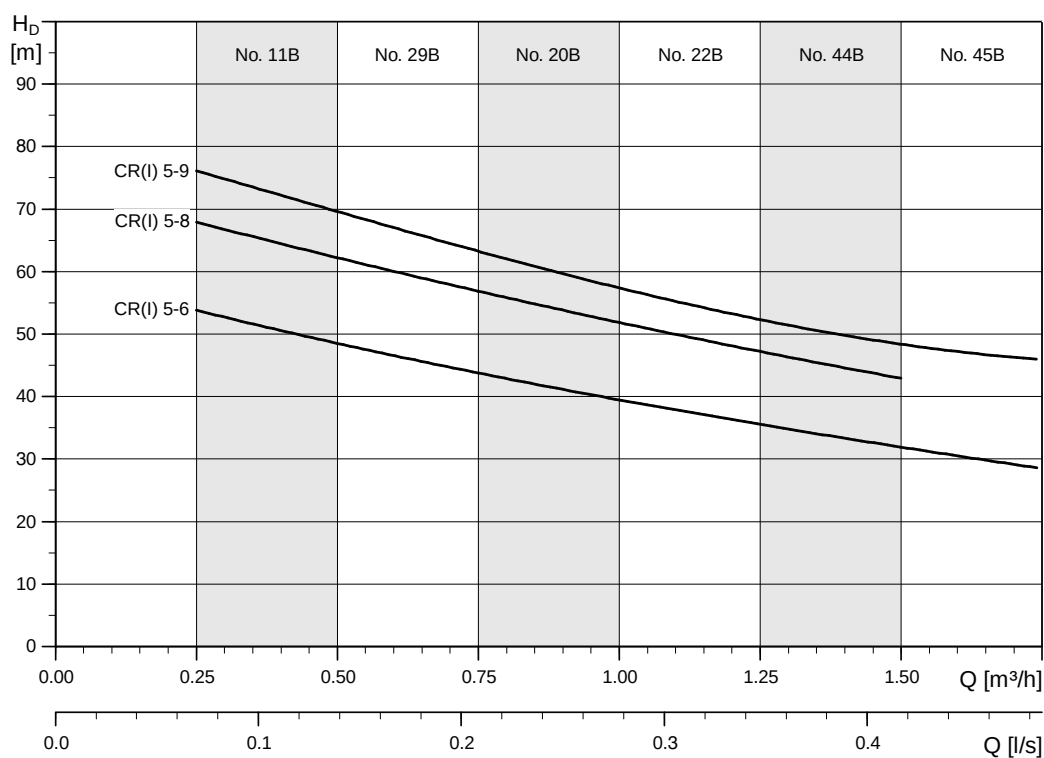
CR deep-well

50 Hz



TM03 3096 1806

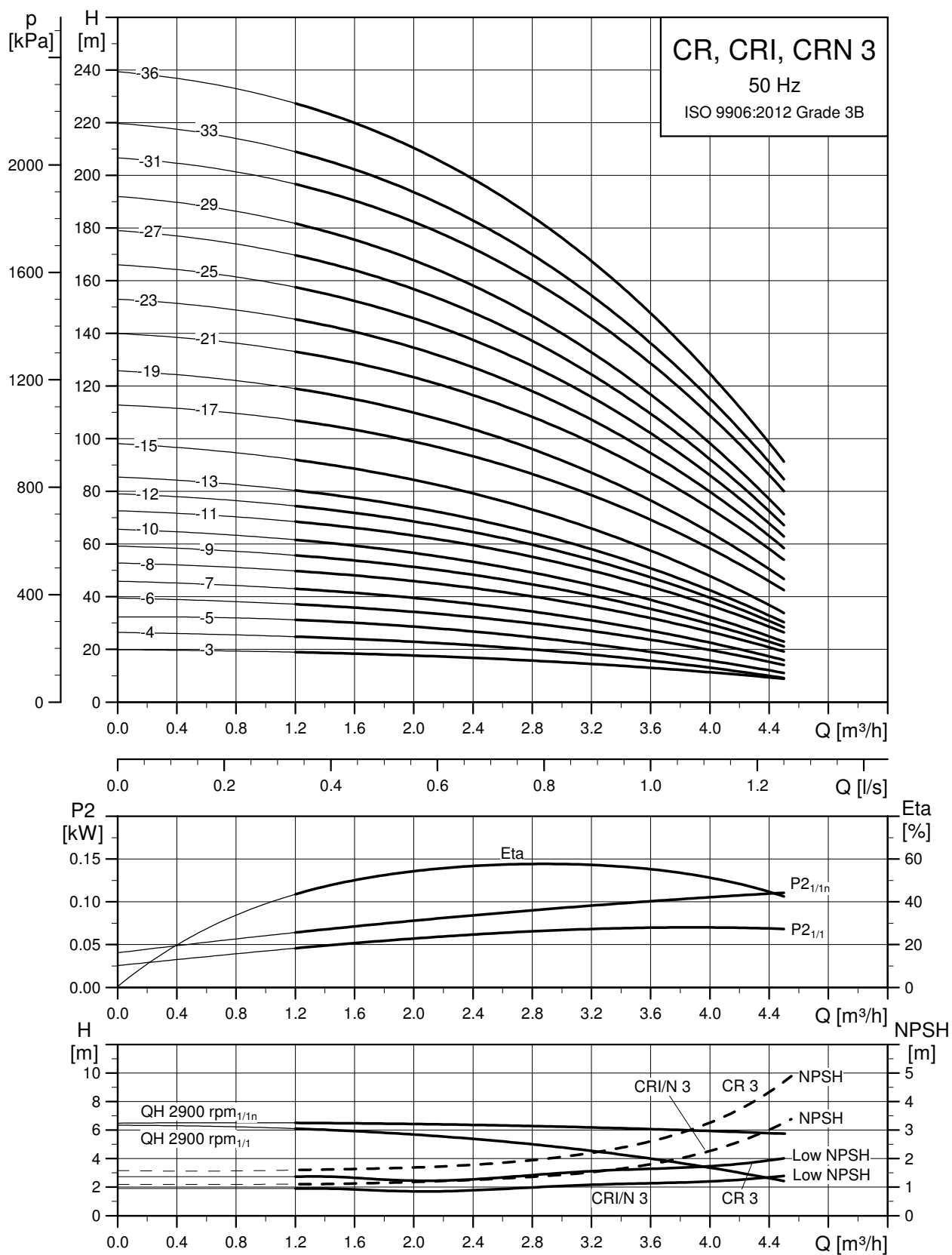
60 Hz



TM03 3971 1806

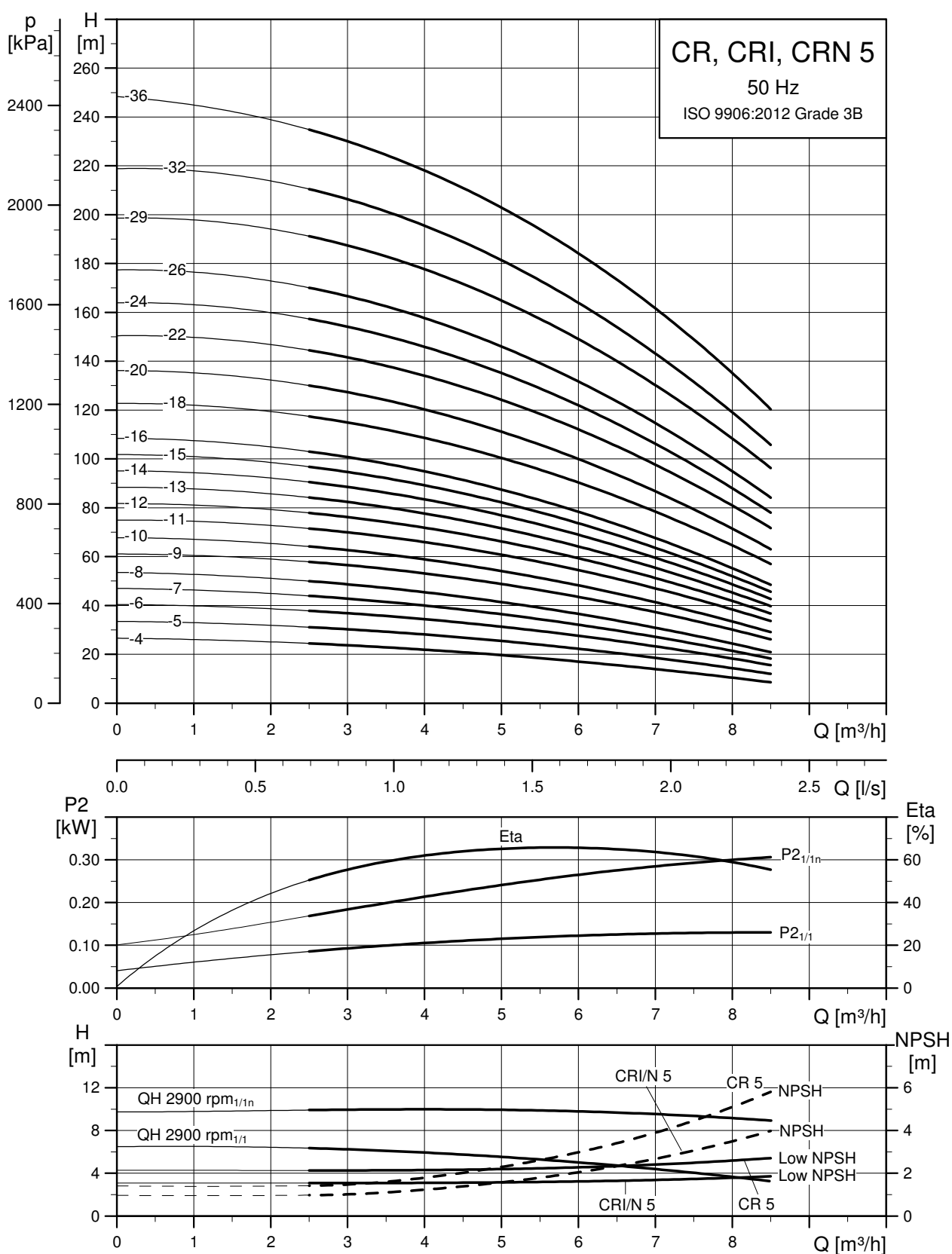
For information about dimensions of the individual pumps, see page [153](#).

Low-NPSH pumps



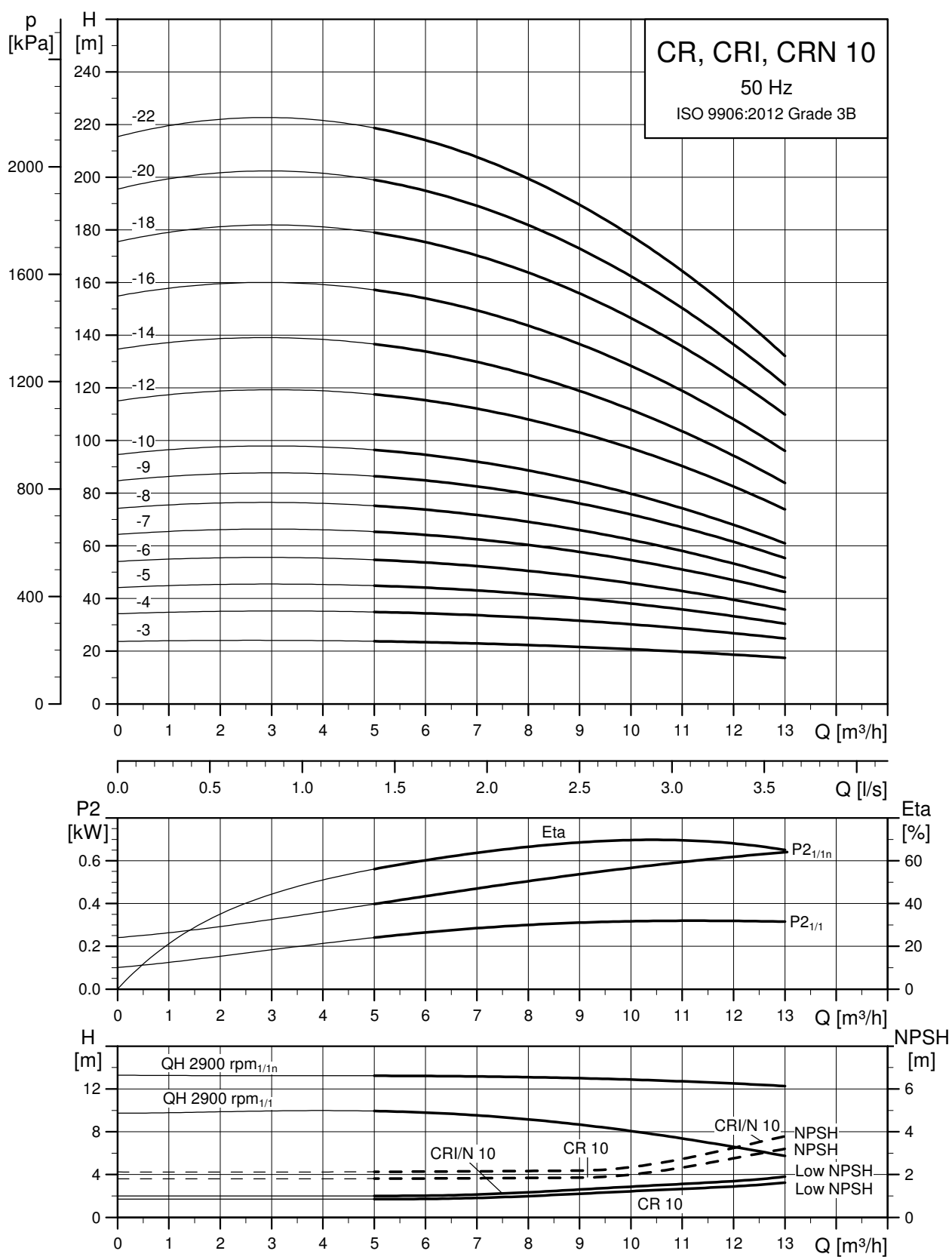
TMX2 1186 5218

For information about dimensions of the individual pumps, see page 132.



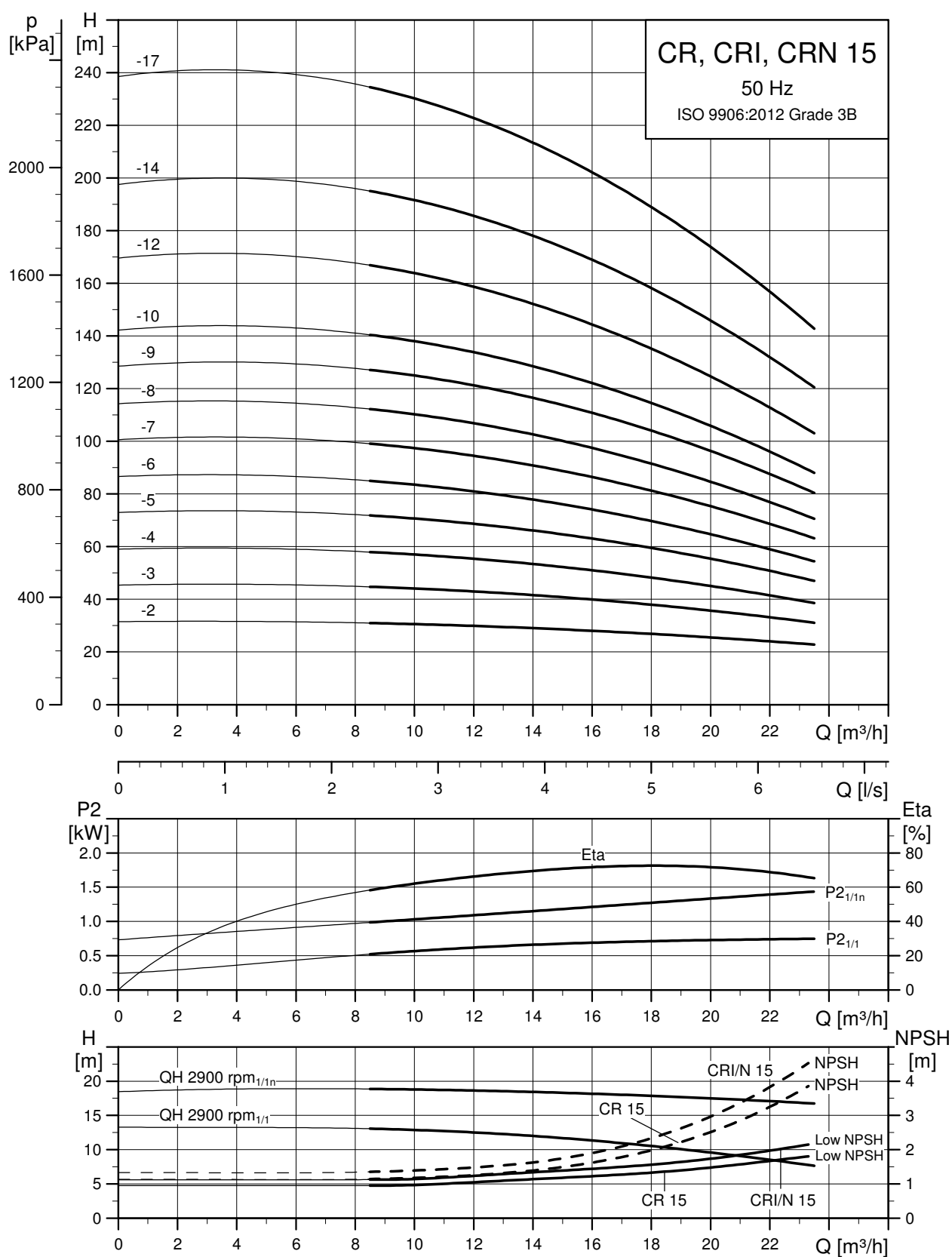
TMX2 1189 5218

For information about dimensions of the individual pumps, see page 132.



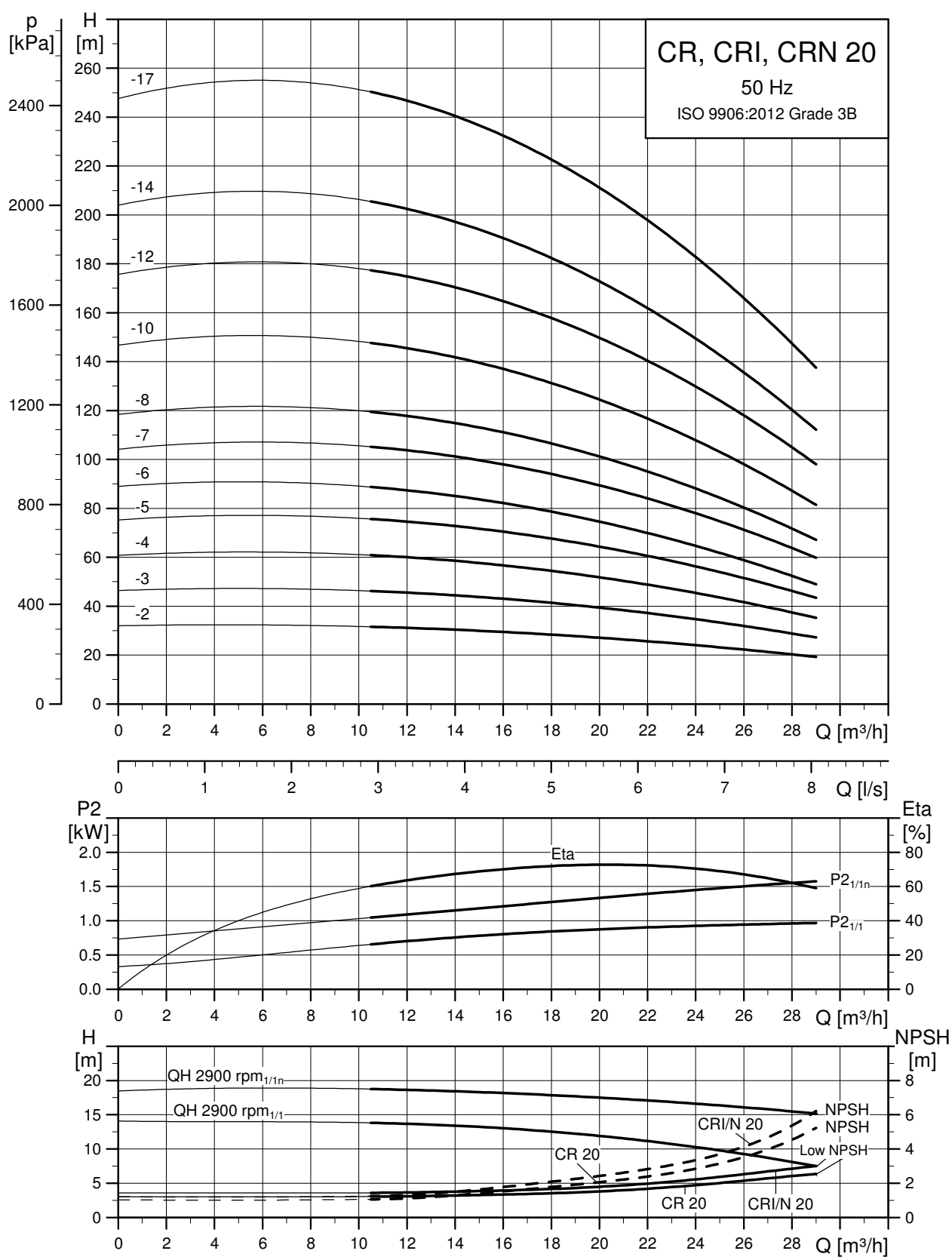
TM02 7391 5218

For information about dimensions of the individual pumps, see page 133.



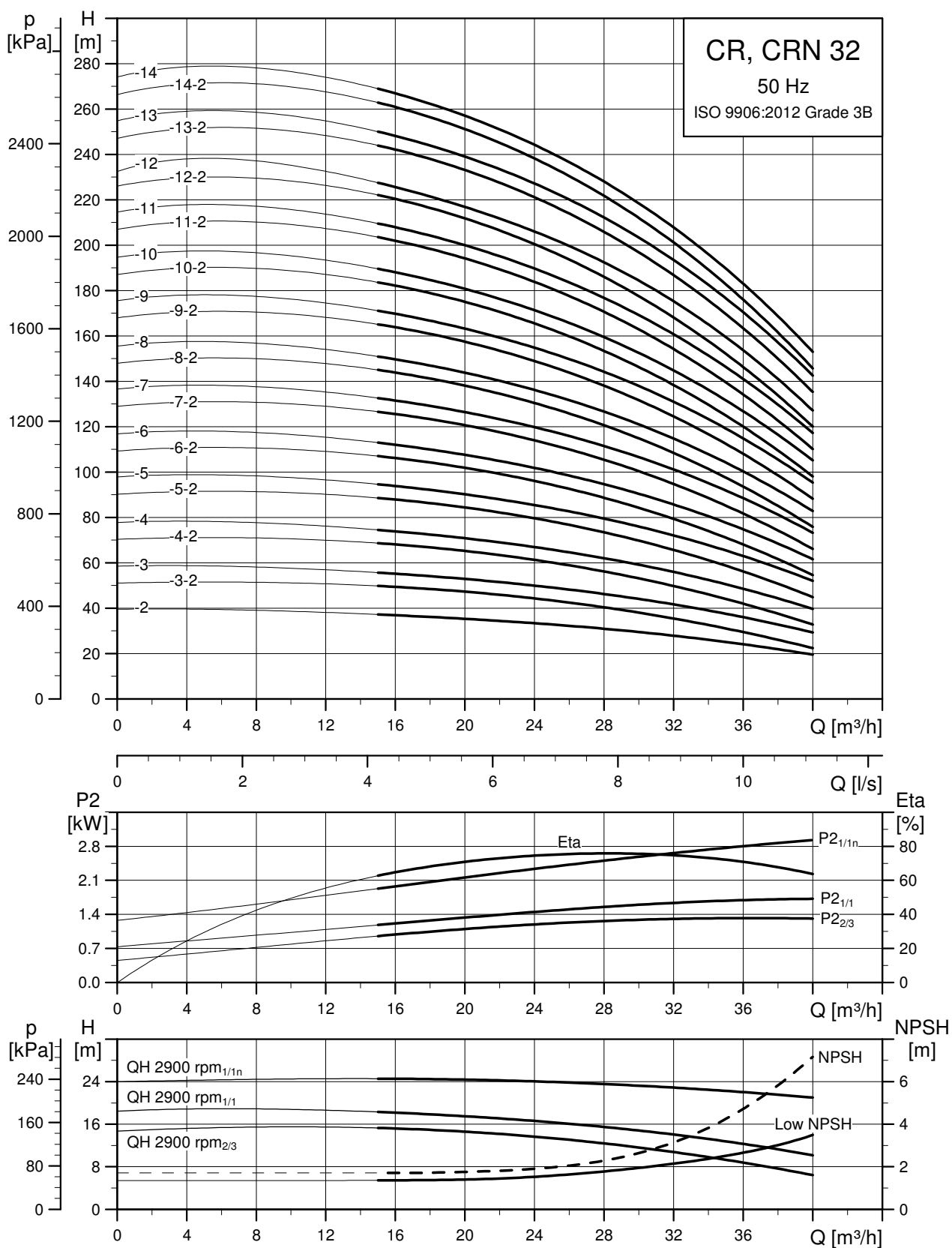
TM02 7392 5218

For information about dimensions of the individual pumps, see page 133.



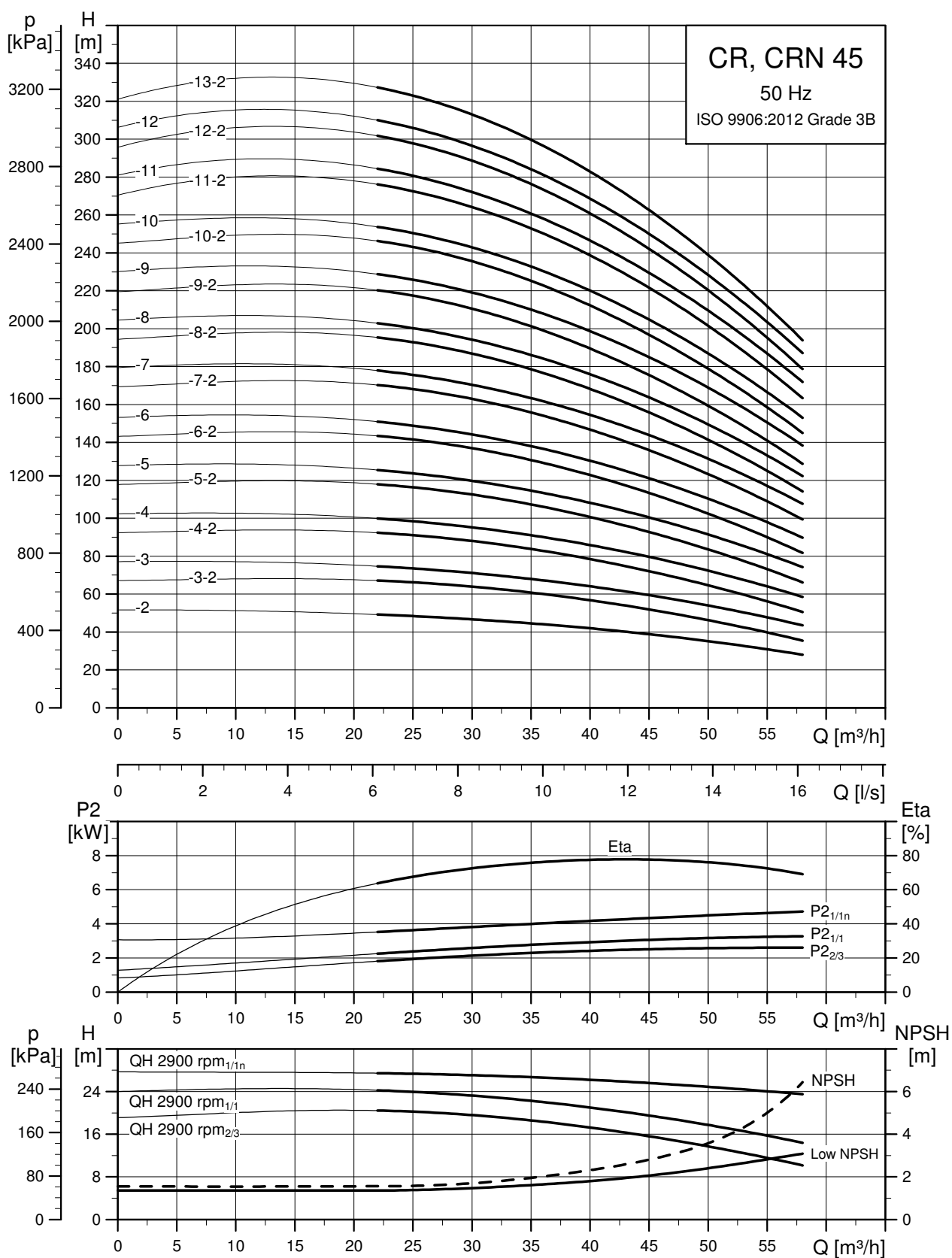
TM02 7393 5218

For information about dimensions of the individual pumps, see page 133.



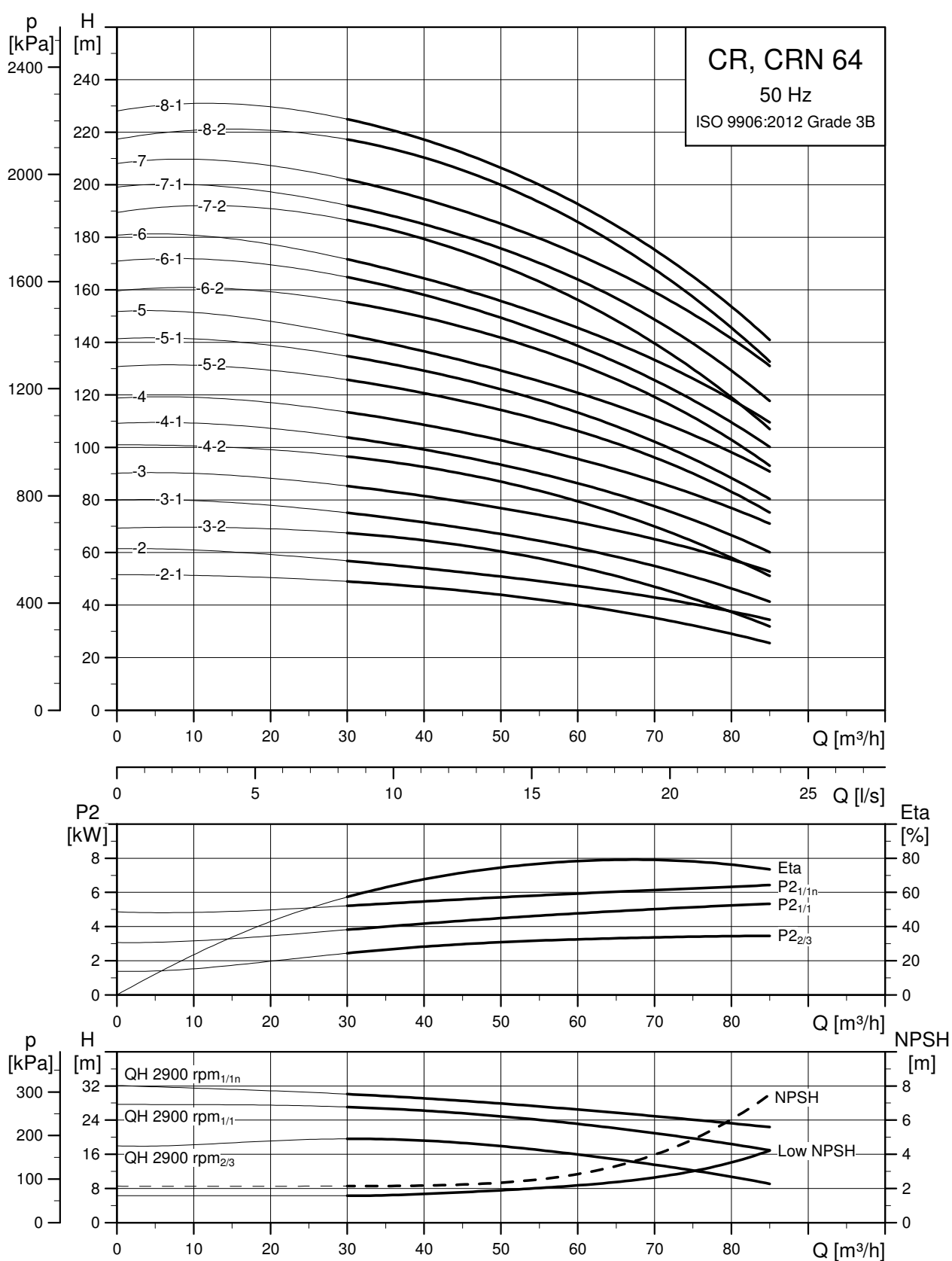
TM01 9129 5218

For information about dimensions of the individual pumps, see page 134.



TMX1 1451 52/18

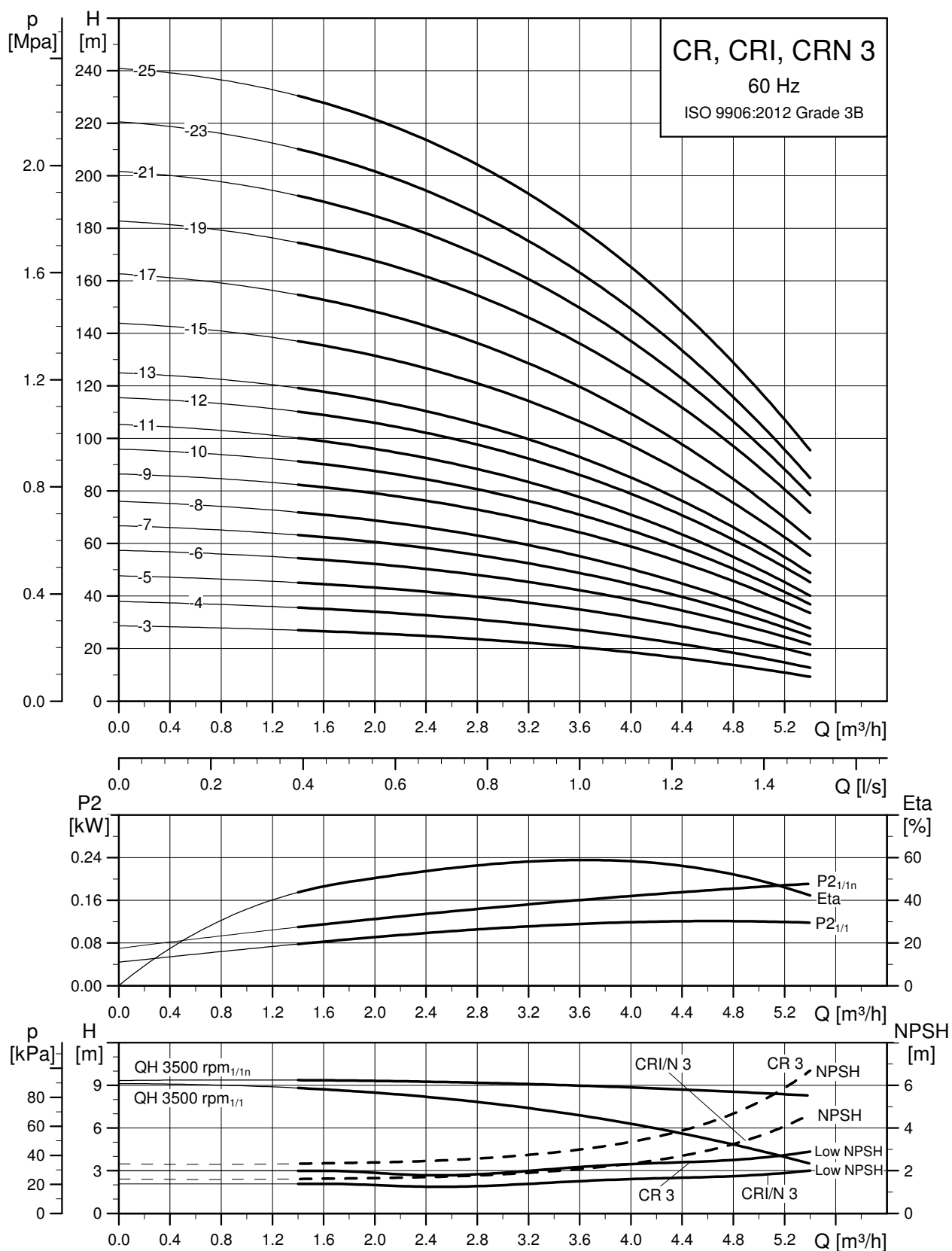
For information about dimensions of the individual pumps, see page 134.



TM02 0753 5218

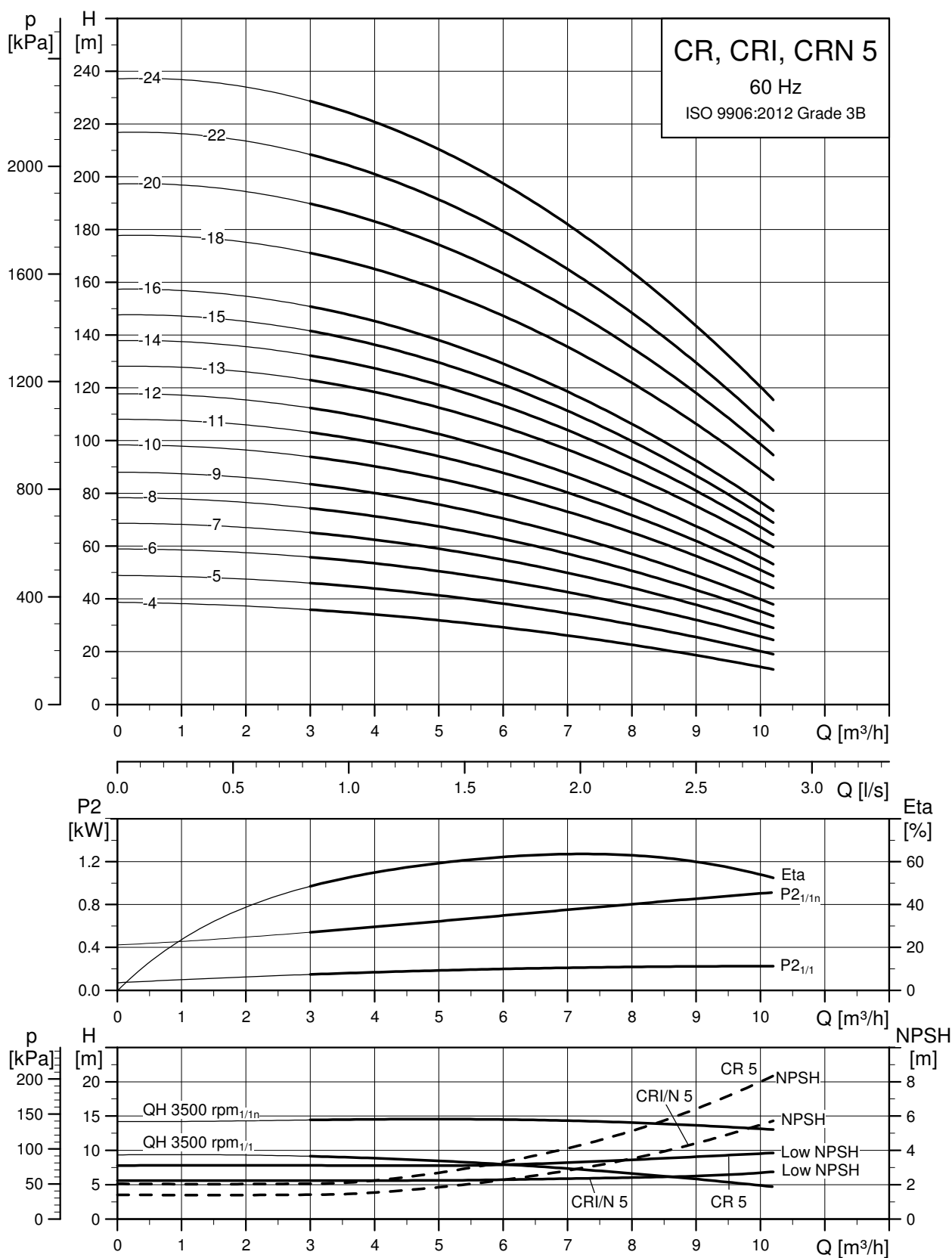
For information about dimensions of the individual pumps, see page 135.

Low-NPSH pumps



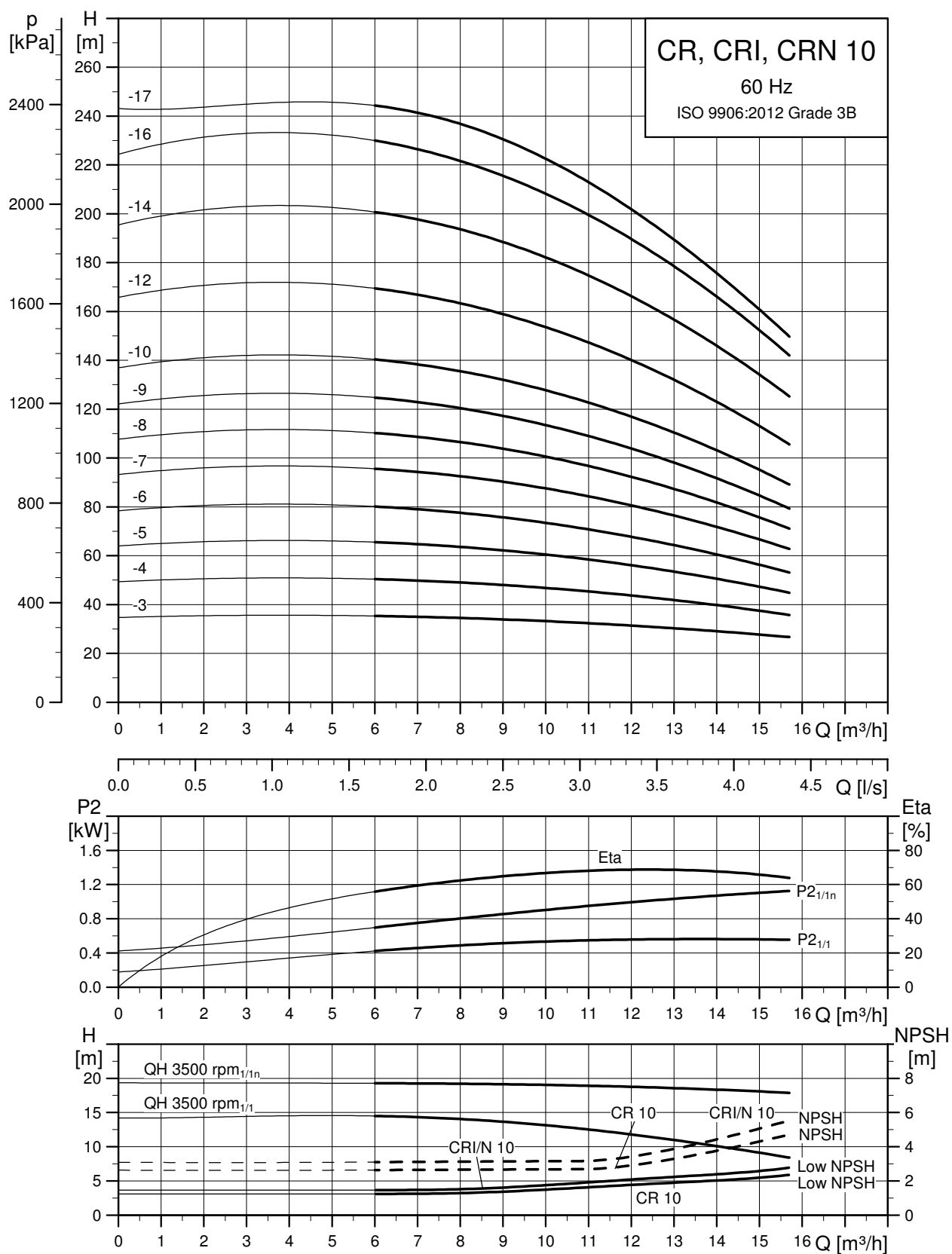
TM02 2574 5218

For information about dimensions of the individual pumps, see page 136.



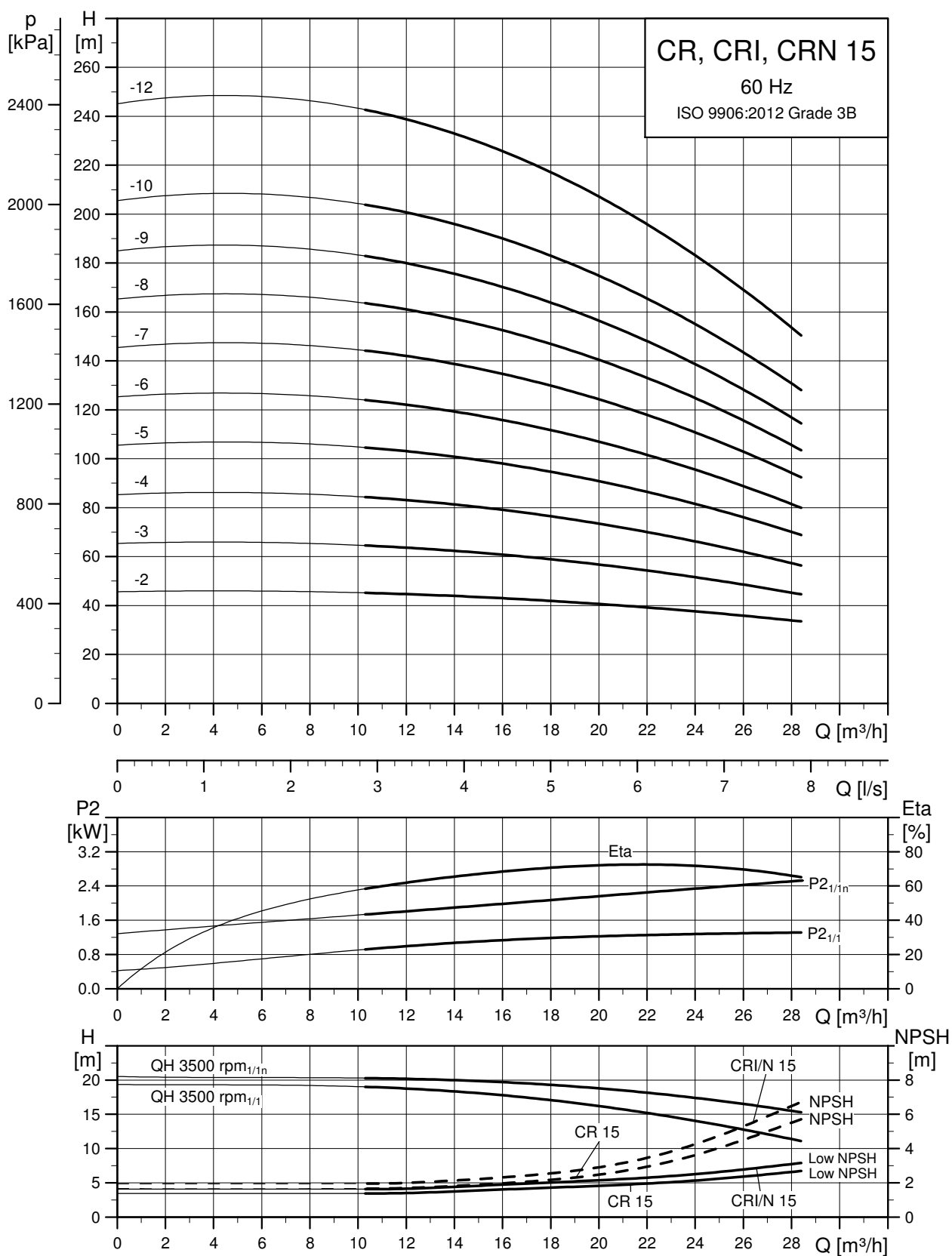
For information about dimensions of the individual pumps, see page 136.

TM02 2575 5218



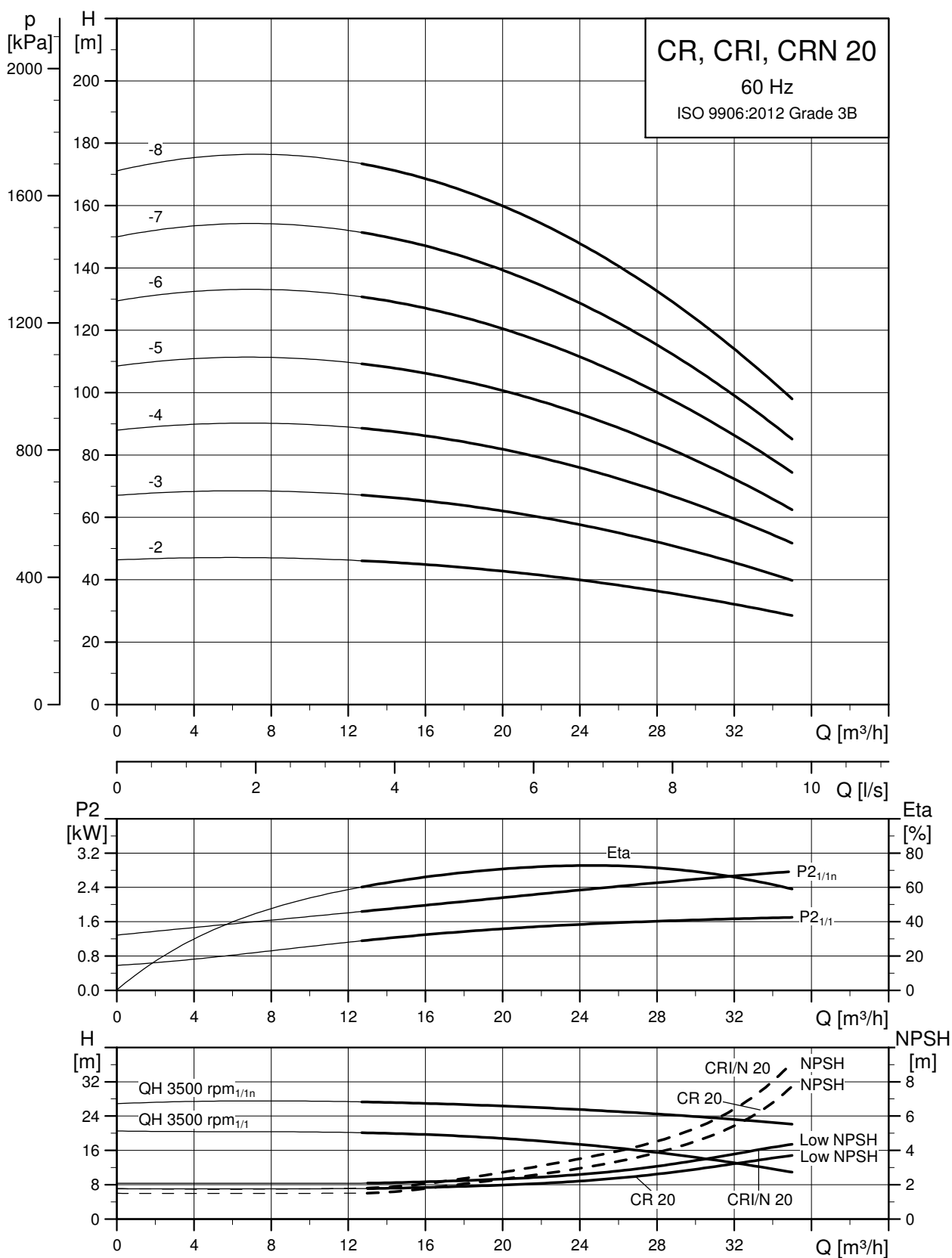
TM02 7394 5218

For information about dimensions of the individual pumps, see page 137.



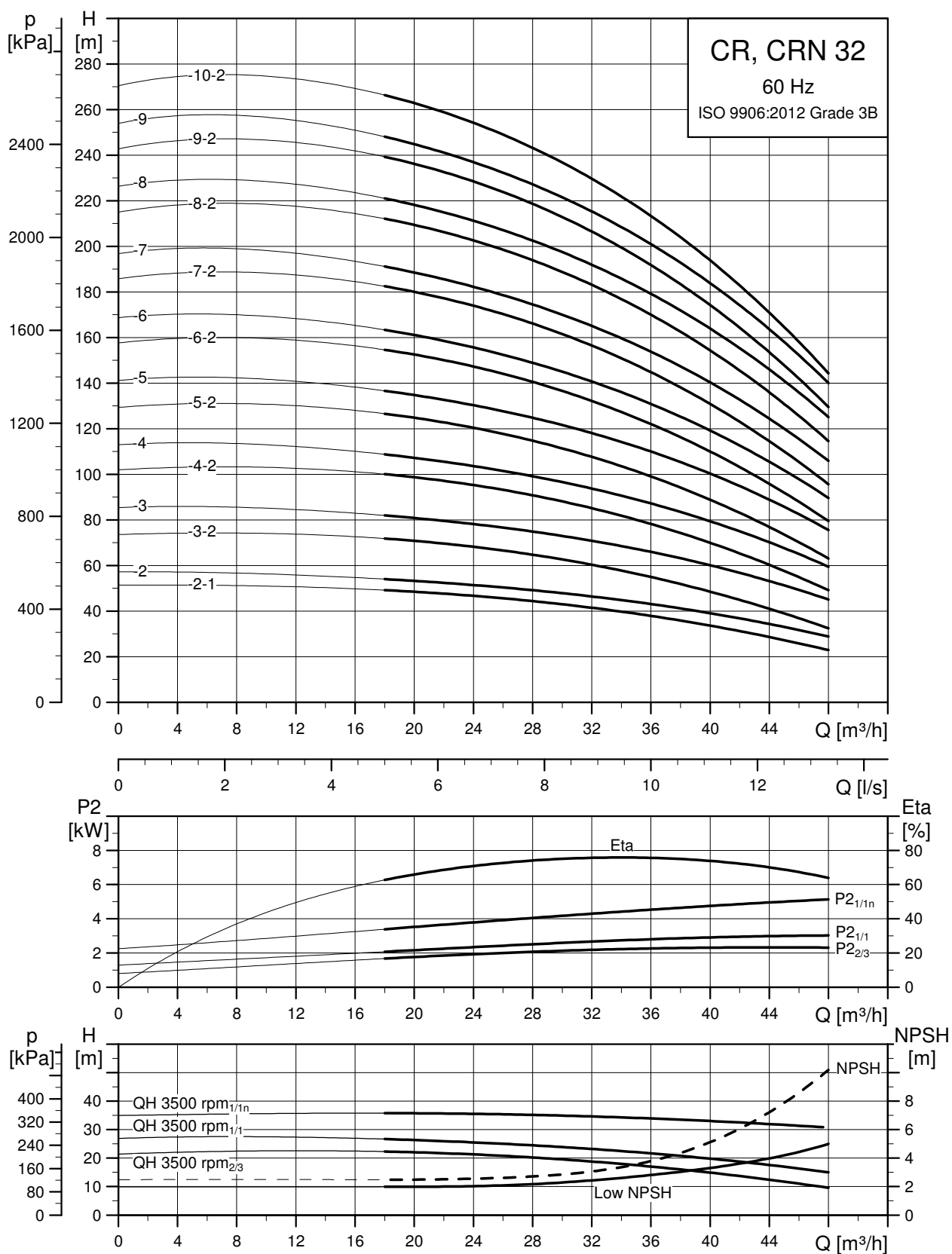
TM02 7395 5218

For information about dimensions of the individual pumps, see page 137.



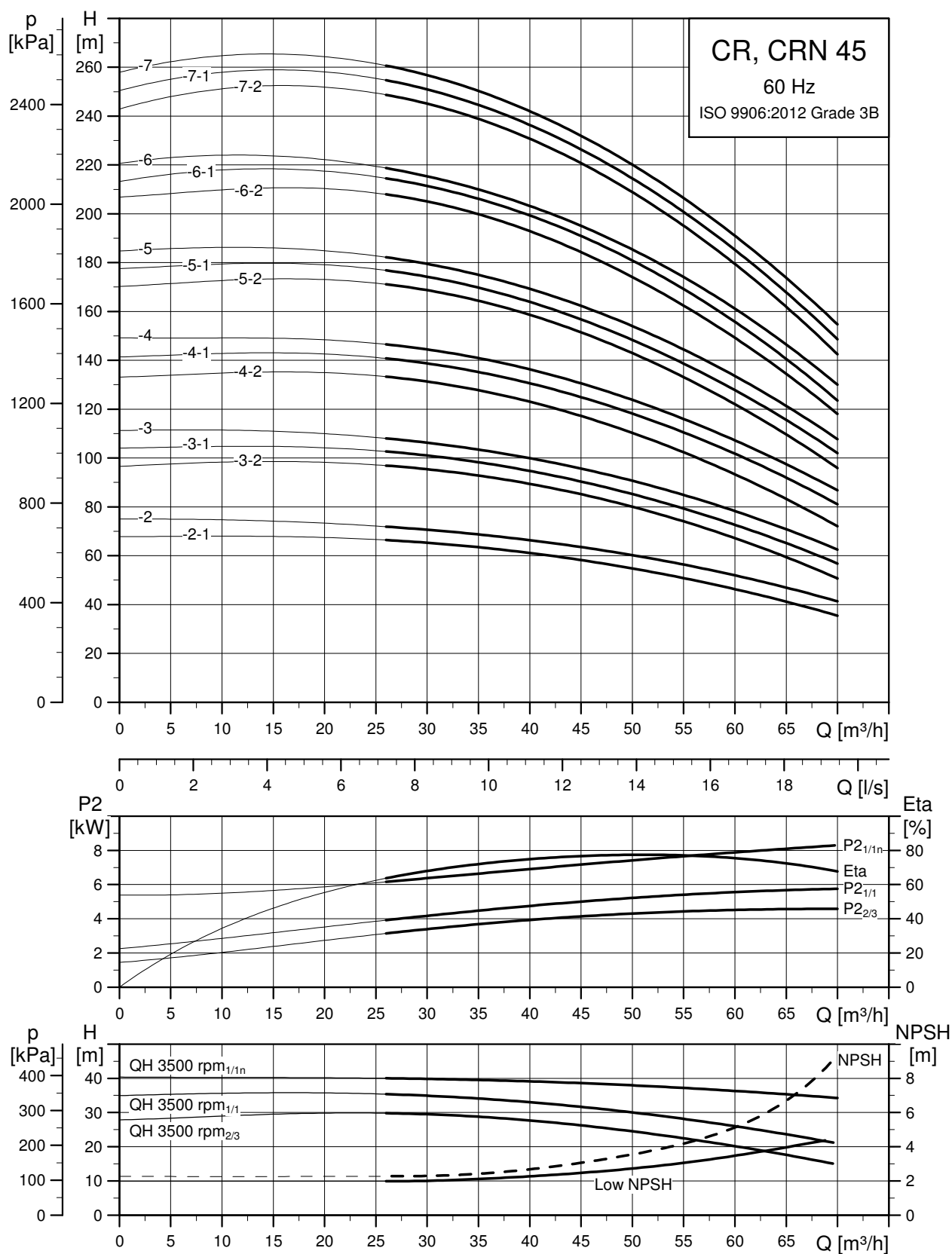
TM02 7396 5218

For information about dimensions of the individual pumps, see page 137.



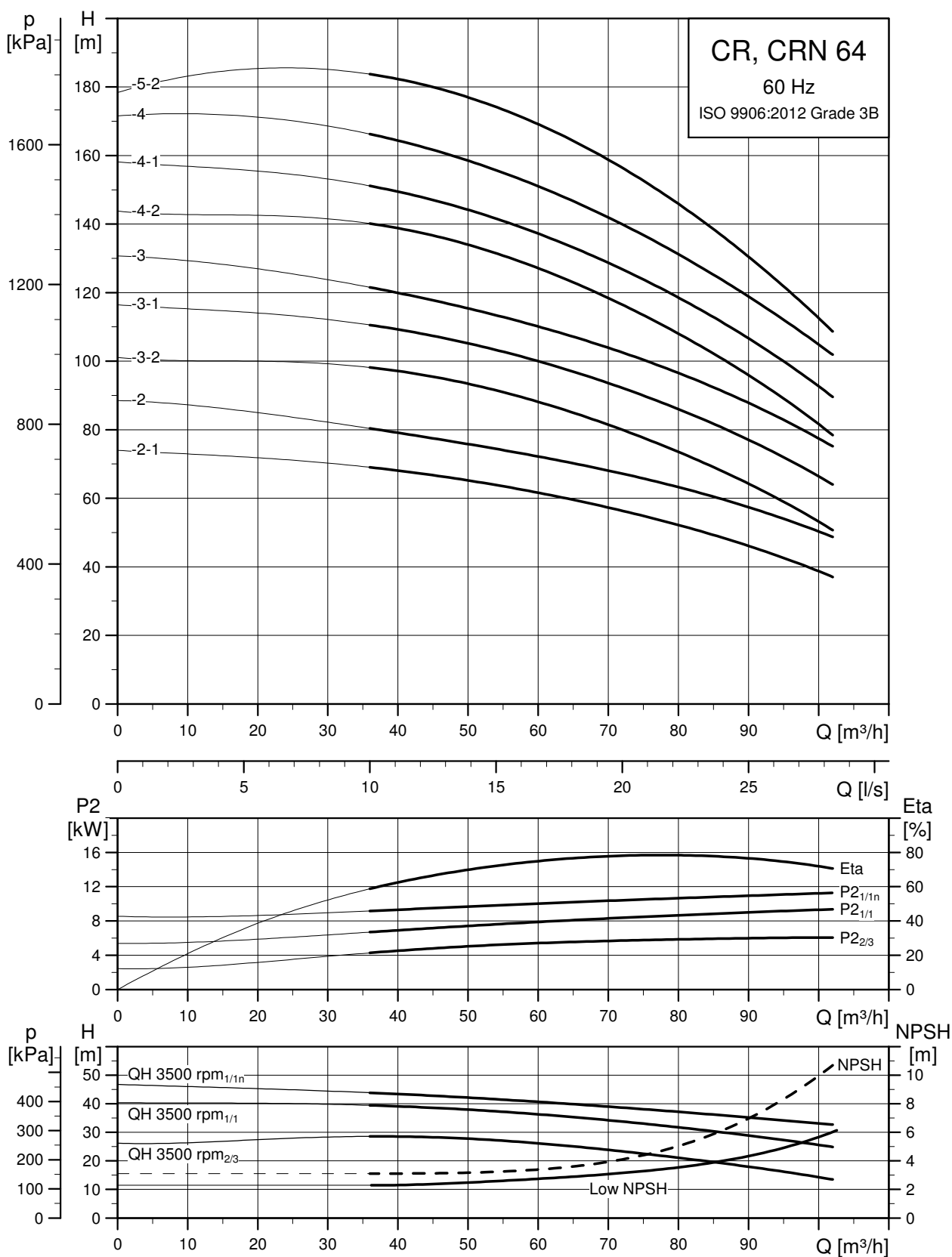
TM02 2578 5218

For information about dimensions of the individual pumps, see page 138.



TM02 2579 5218

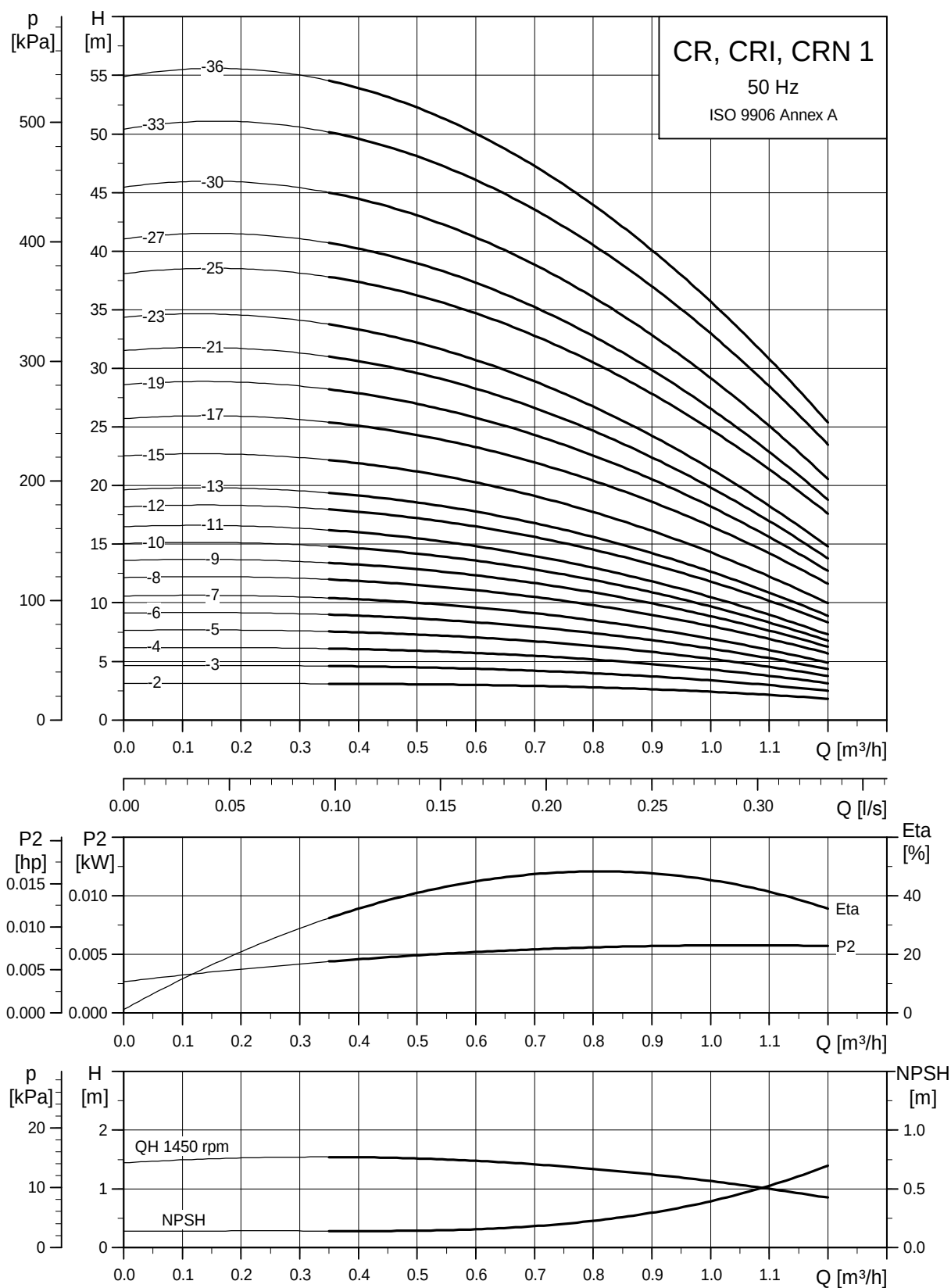
For information about dimensions of the individual pumps, see page 138.



TM02 2580 5218

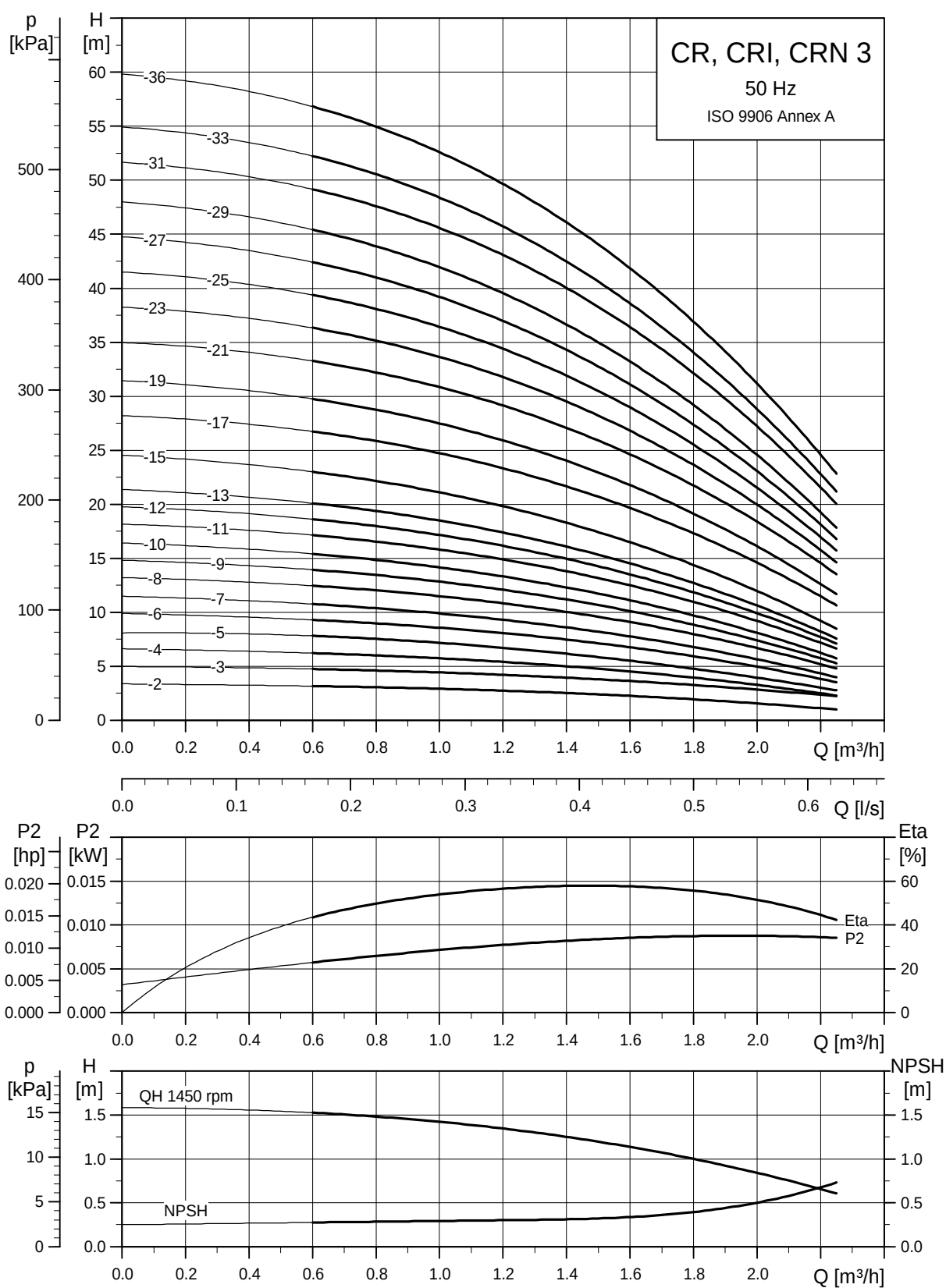
For information about dimensions of the individual pumps, see page 139.

CR pumps with 4-pole motor



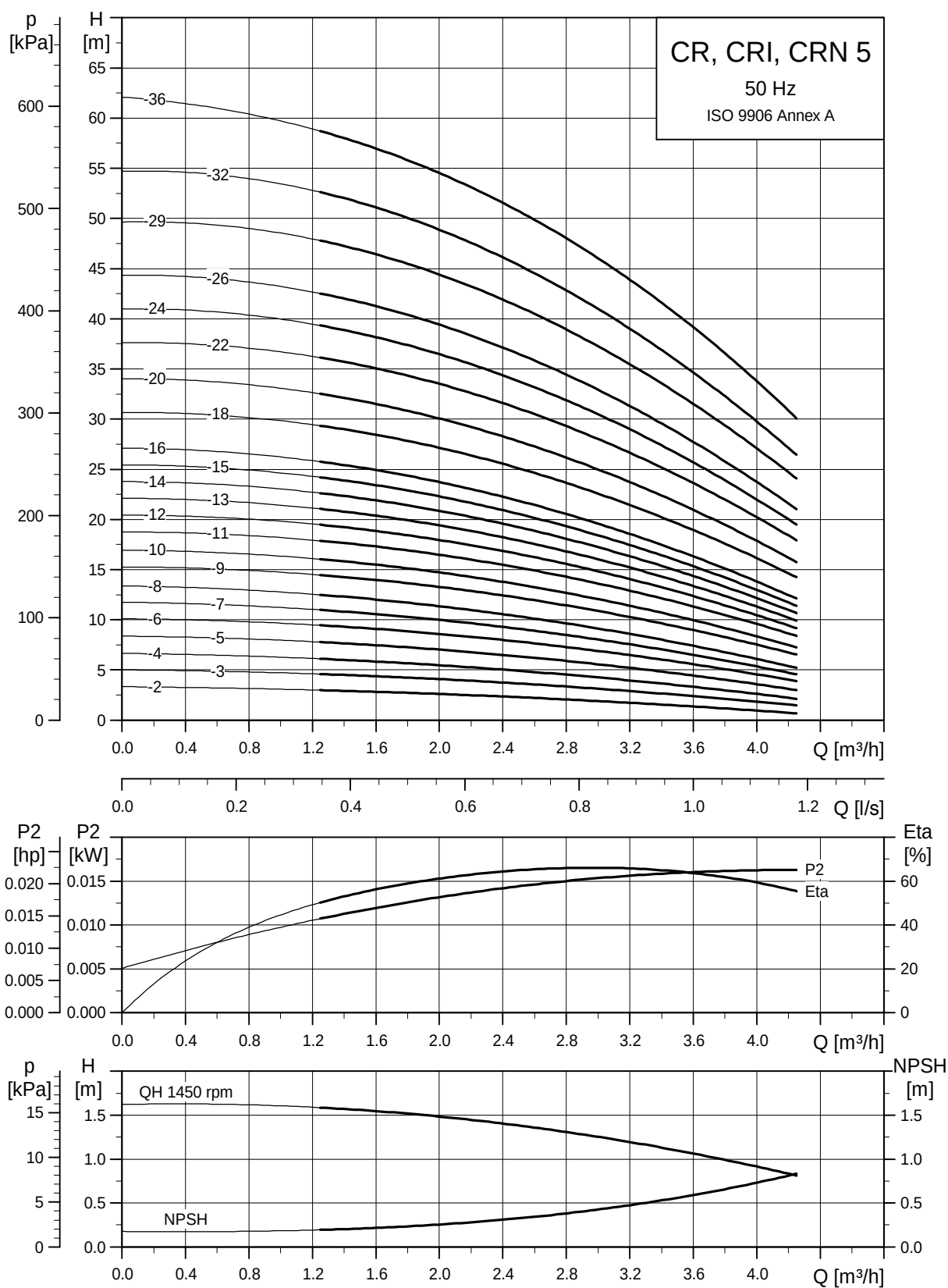
TM02 2543 1309

For information about dimensions of the individual pumps, see page [140](#).



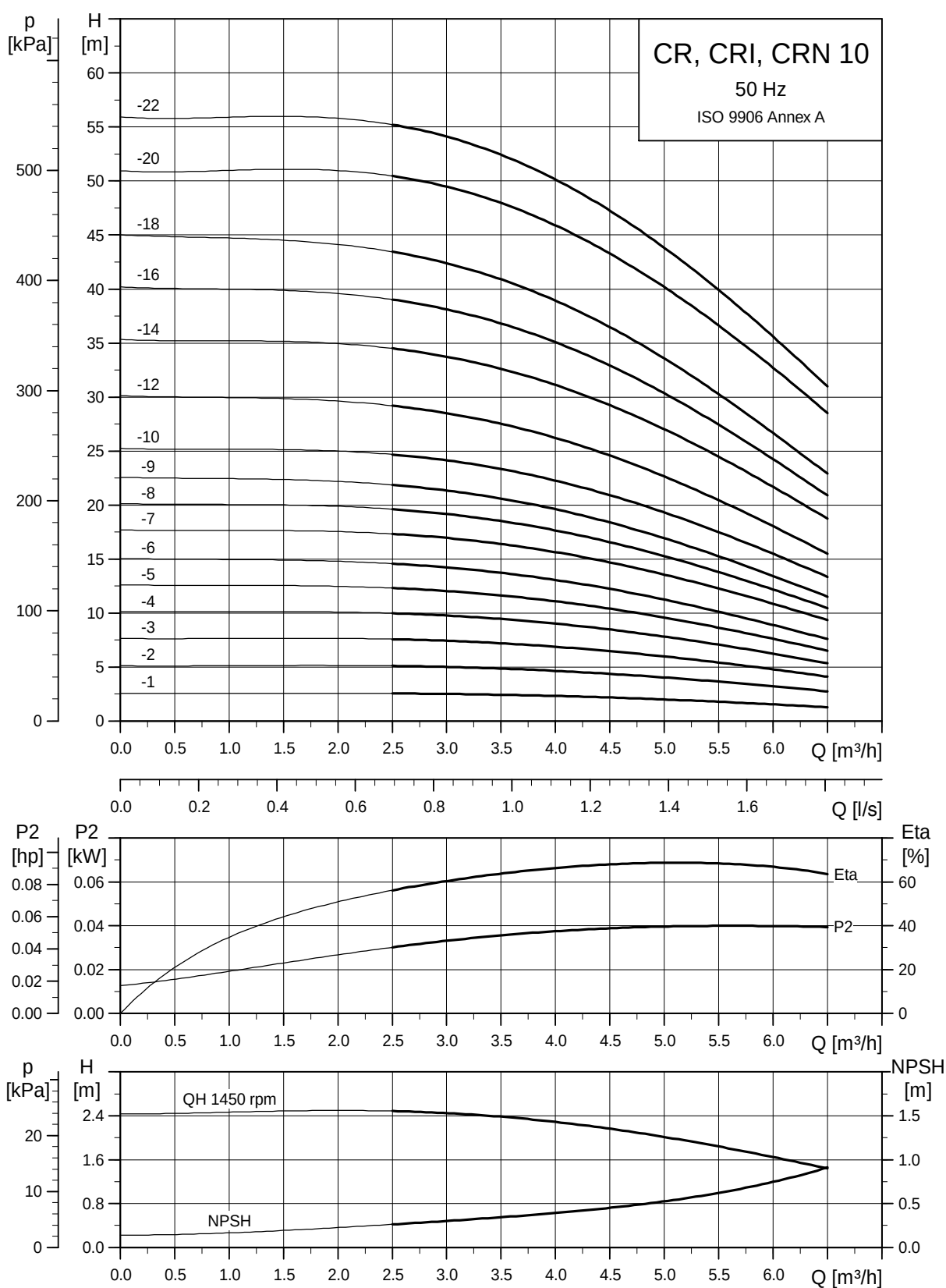
TM02 2542 1309

For information about dimensions of the individual pumps, see page 141.



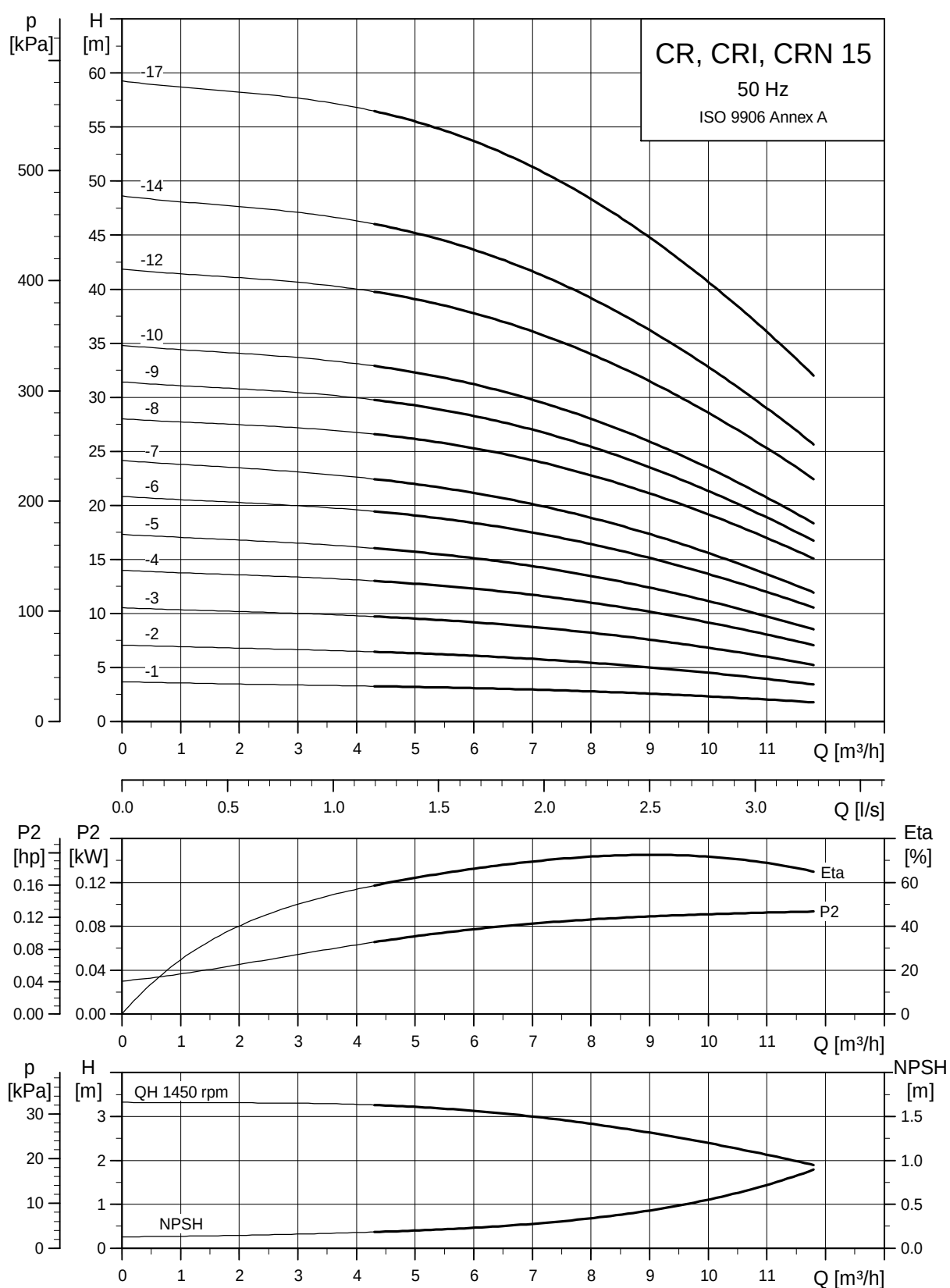
TM02 2541 1309

For information about dimensions of the individual pumps, see page 141.



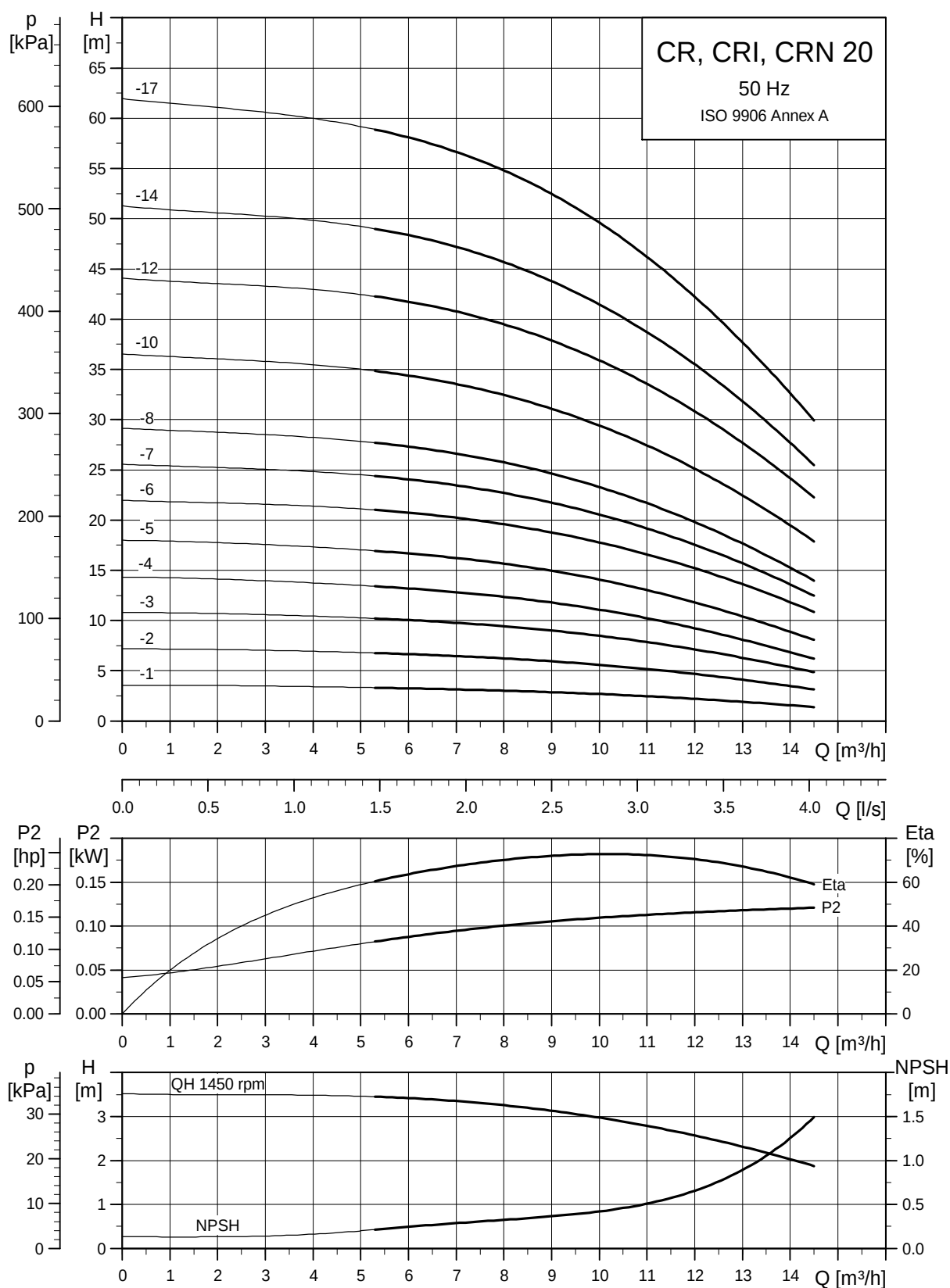
For information about dimensions of the individual pumps, see page [142](#).

TM02 7273 1309



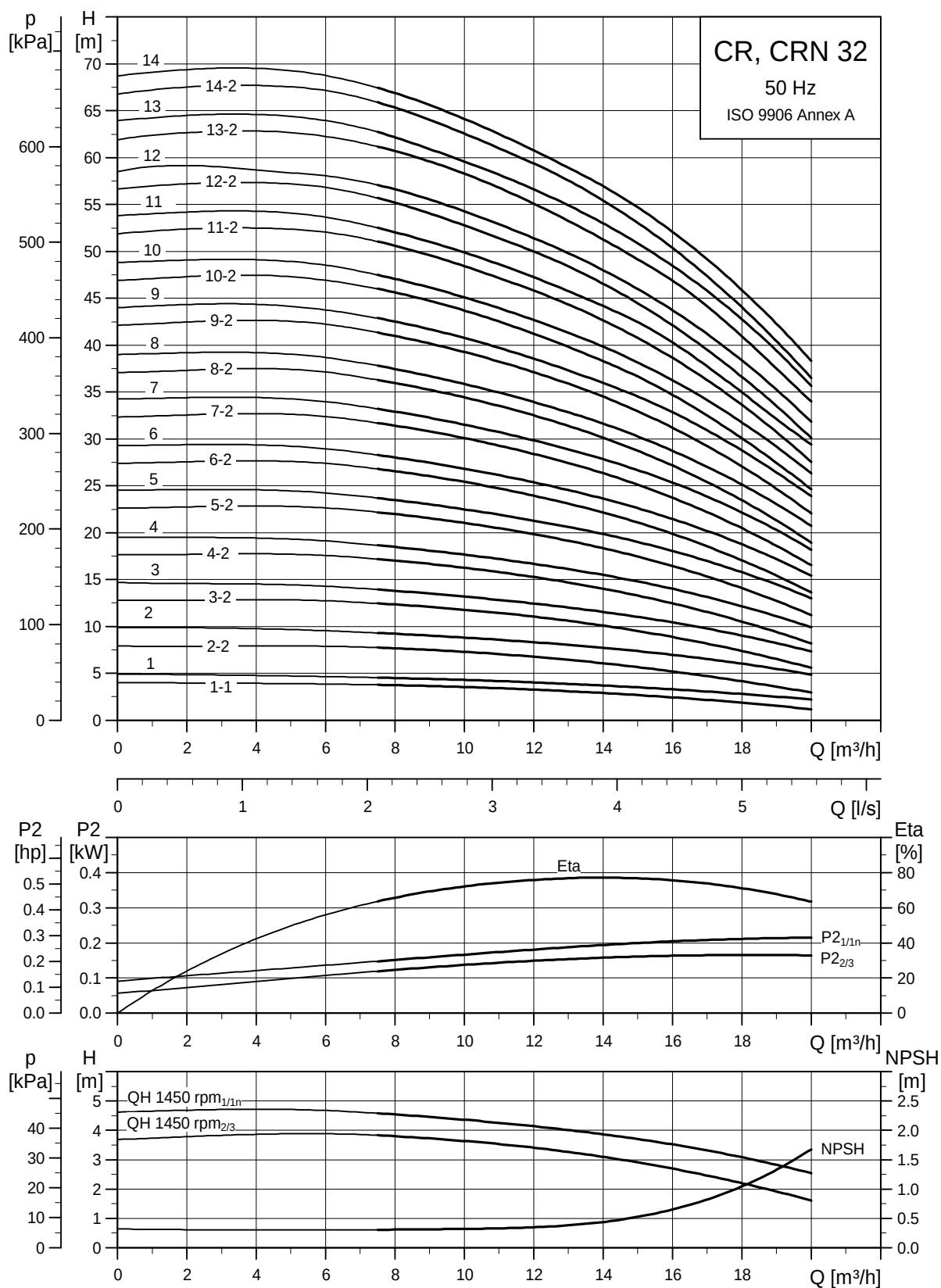
For information about dimensions of the individual pumps, see page [142](#).

TM02 7274 1309



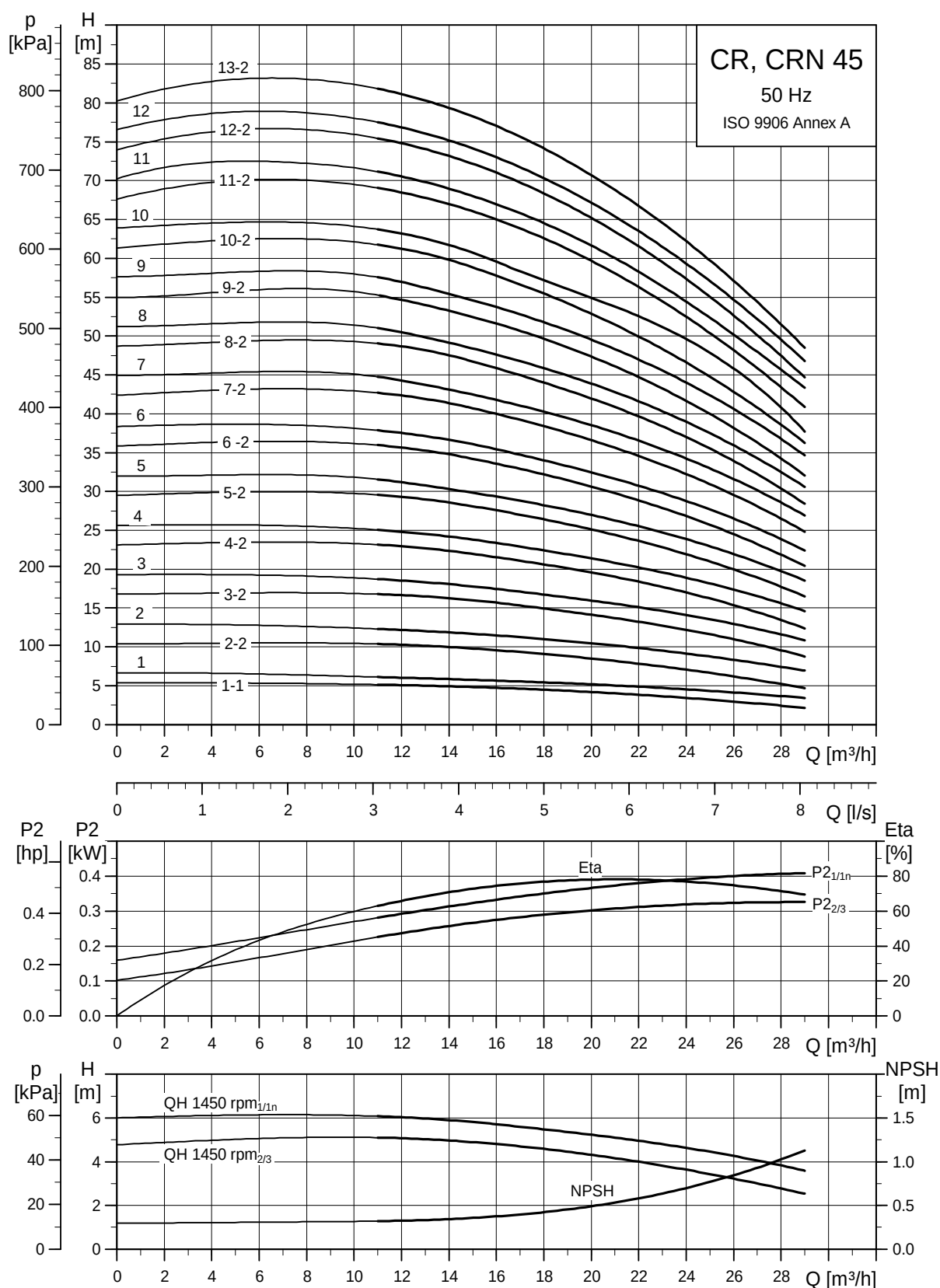
For information about dimensions of the individual pumps, see page 143.

TM02 7275 1309



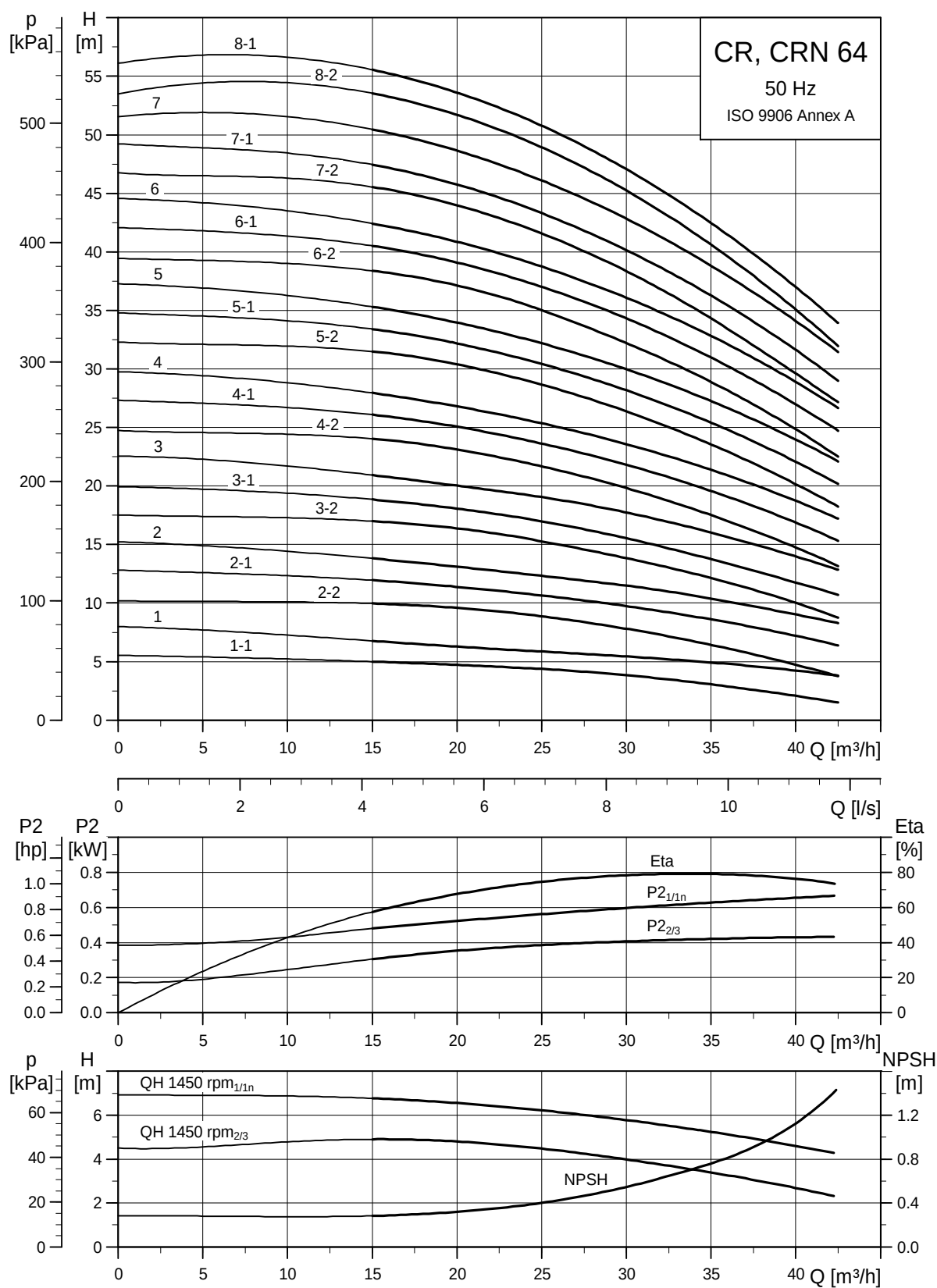
For information about dimensions of the individual pumps, see page 143.

TM01 8153 1309



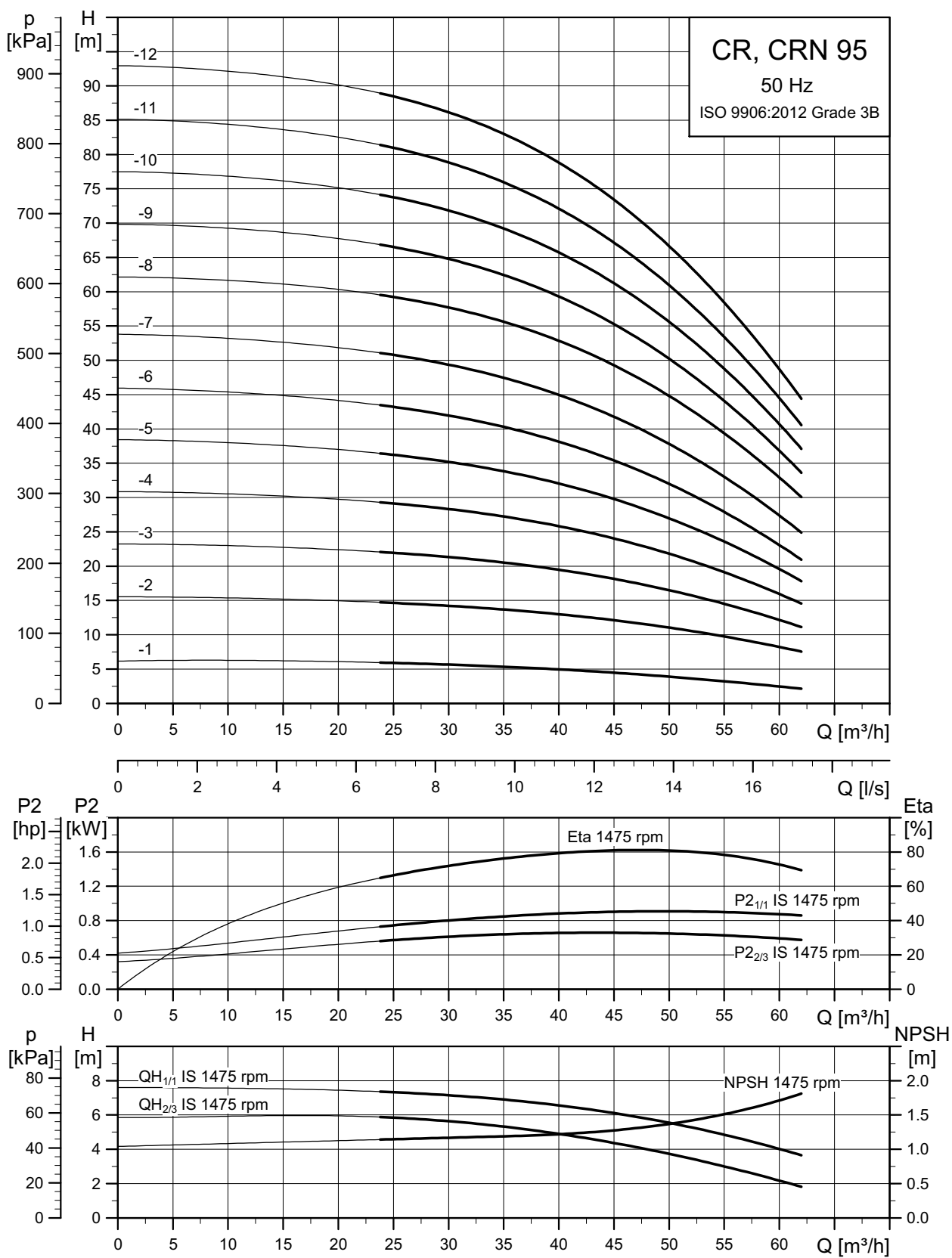
For information about dimensions of the individual pumps, see page [144](#).

TM01 8154 1309



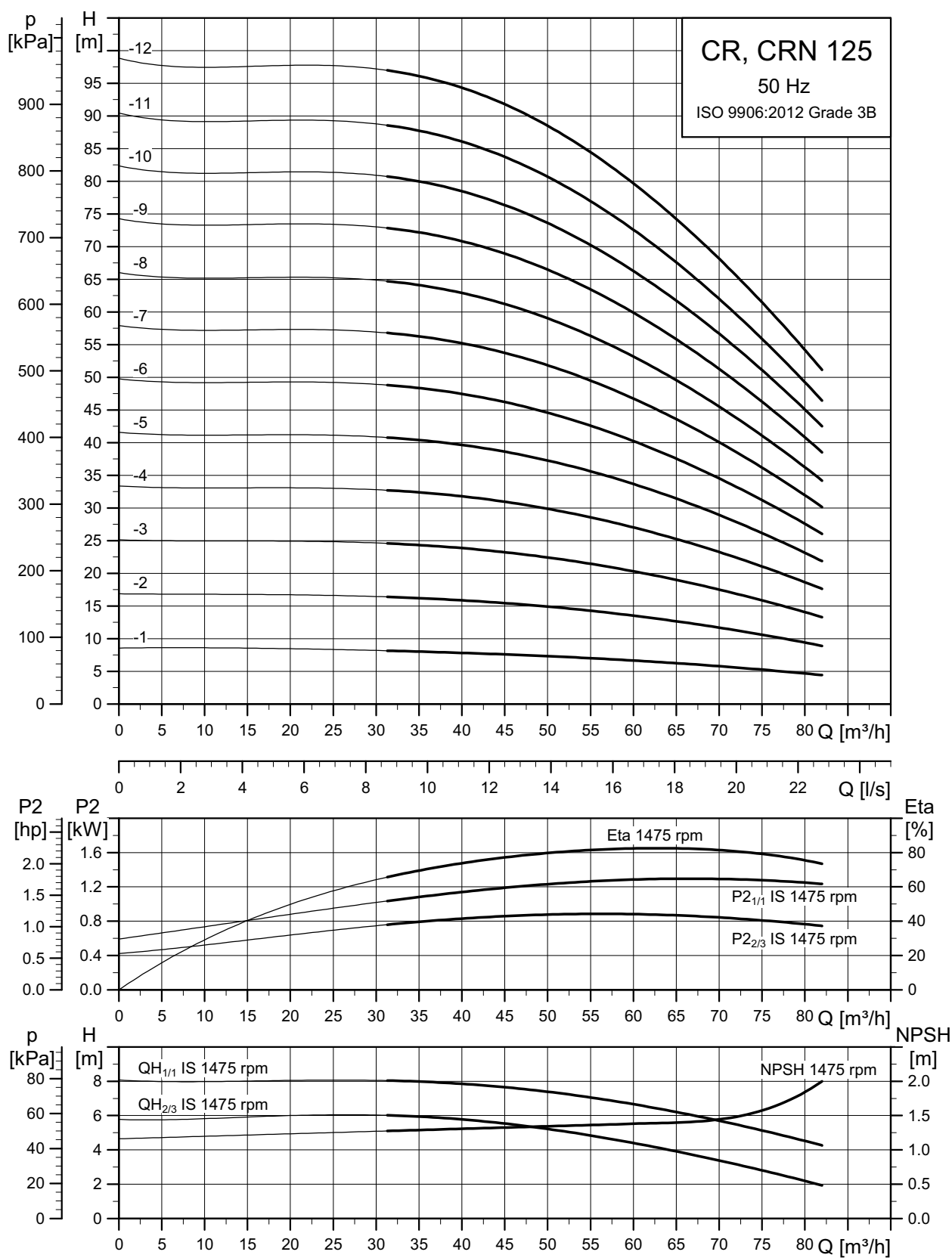
For information about dimensions of the individual pumps, see page [144](#).

TM01 8155 1309



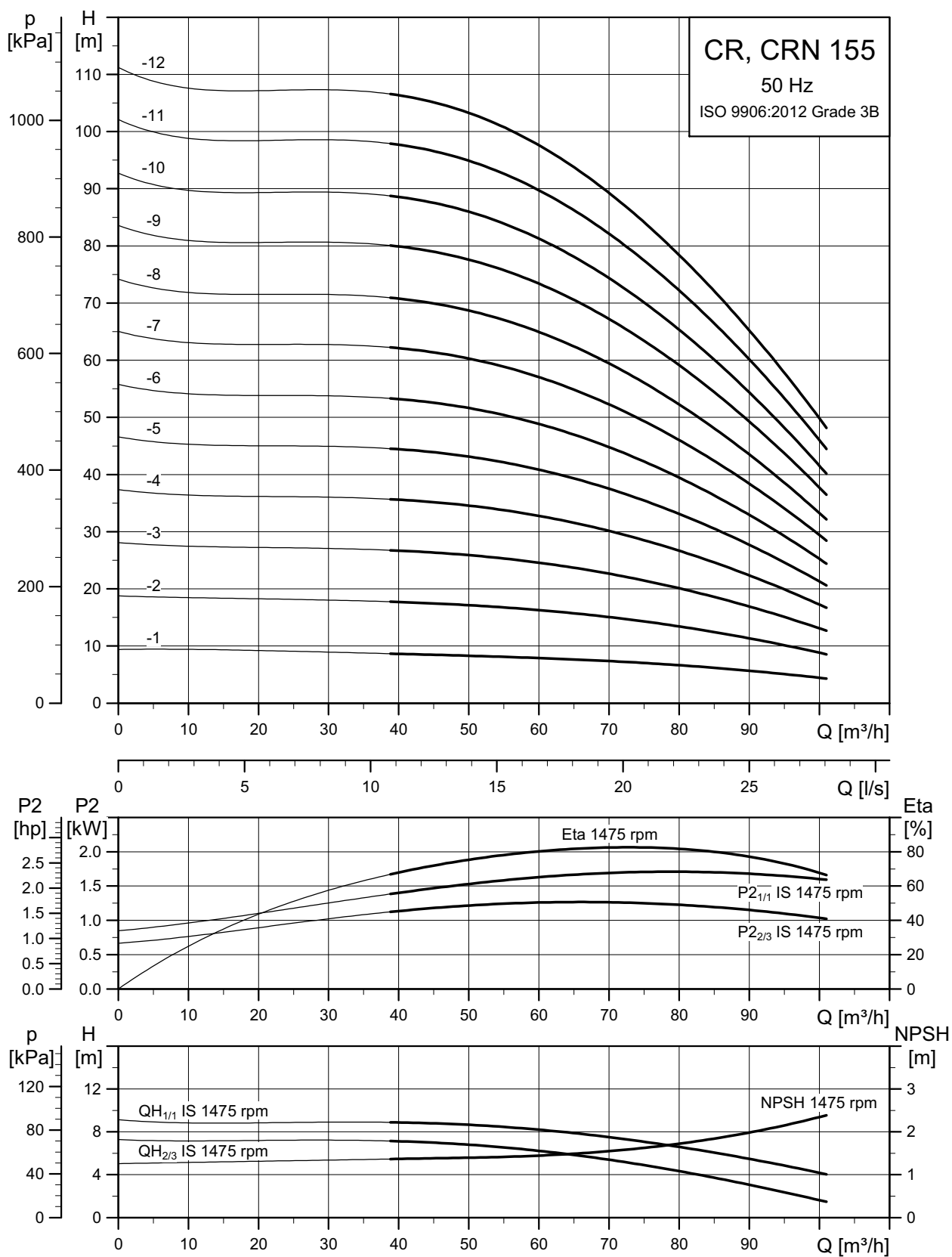
For information about dimensions of the individual pumps, see page 145.

TM07 6979 2720



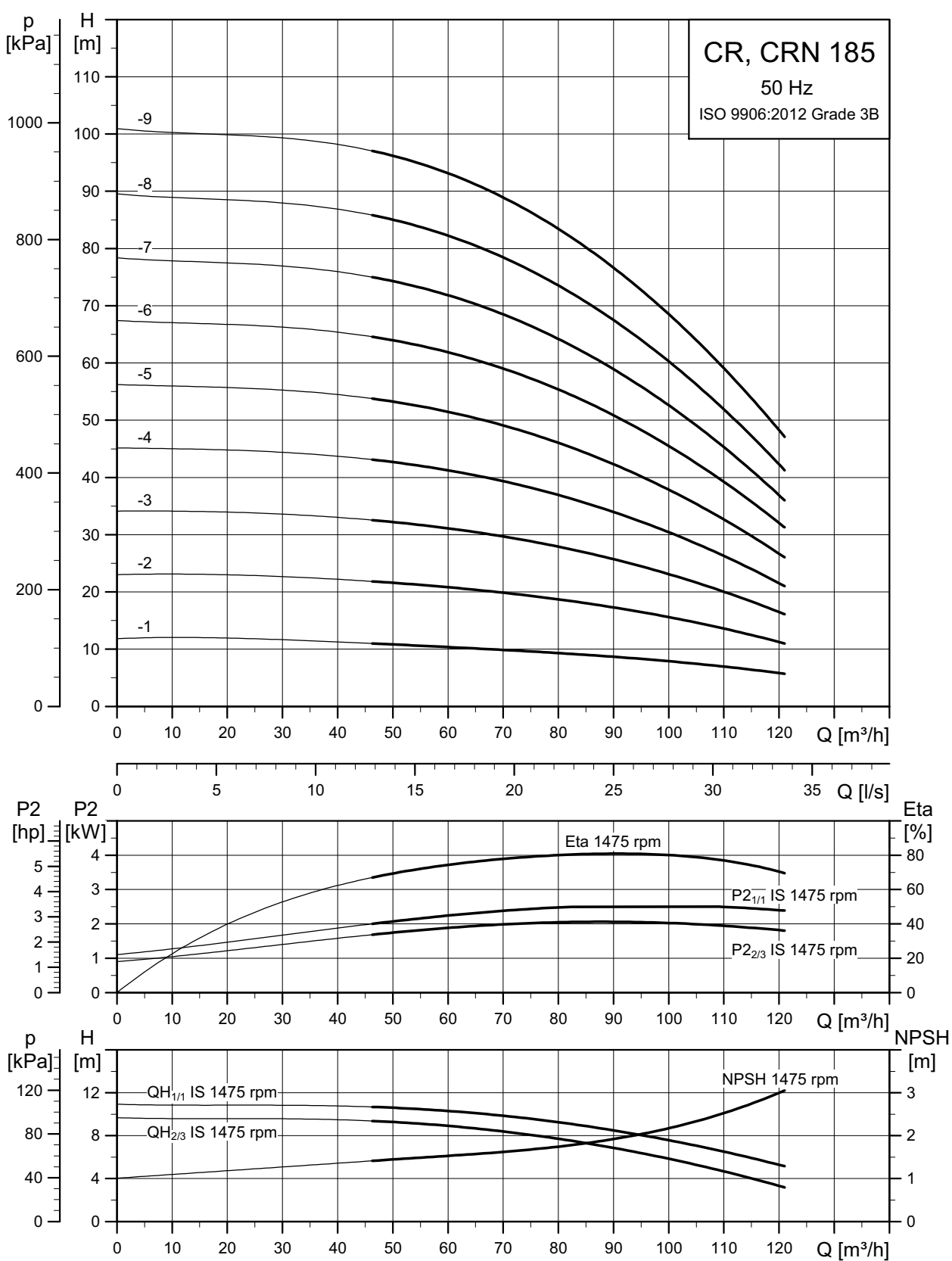
TM07 6980 2720

For information about dimensions of the individual pumps, see page 145.



TM07 6981 2720

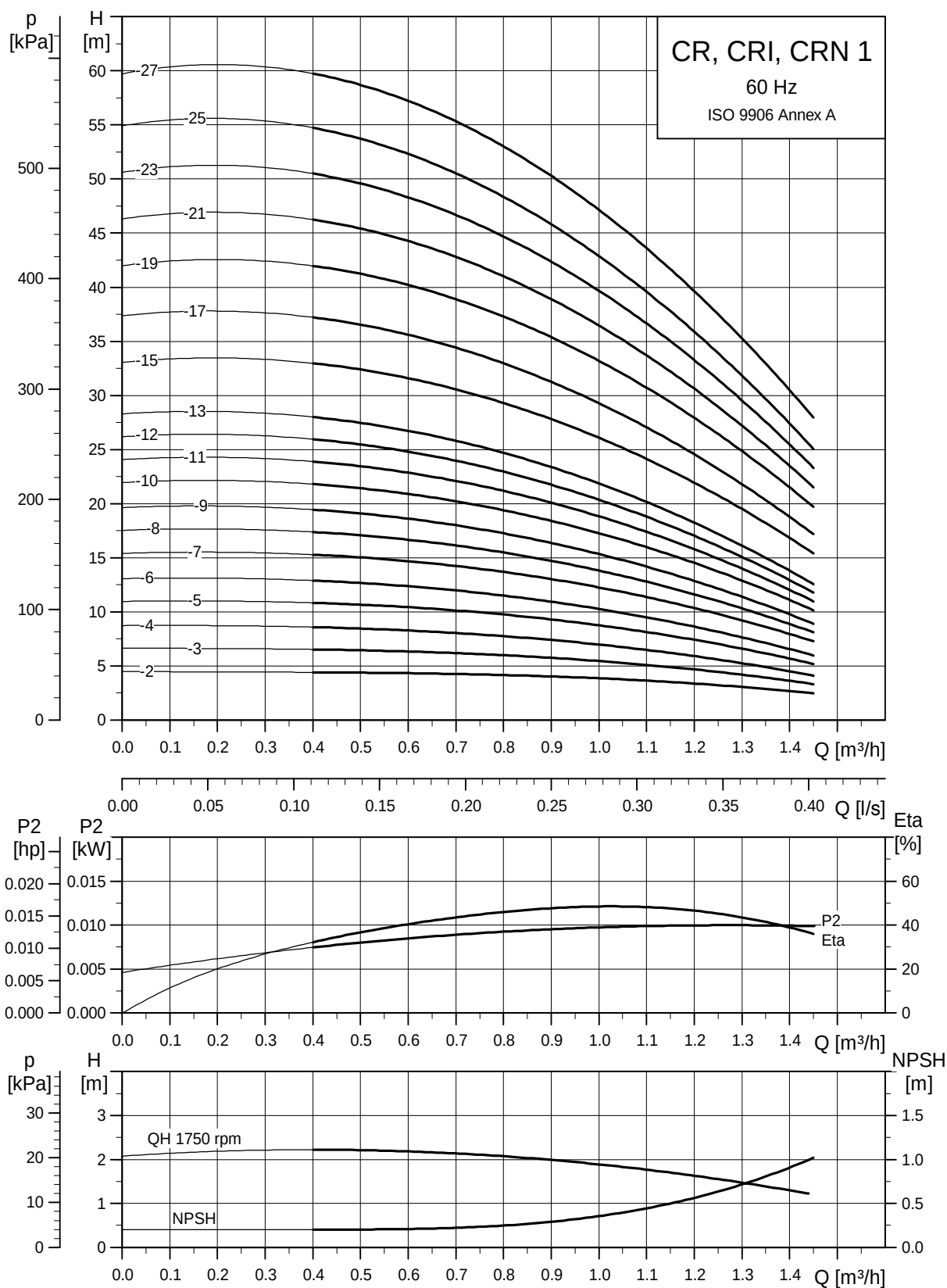
For information about dimensions of the individual pumps, see page 145.



TM07 6982 2720

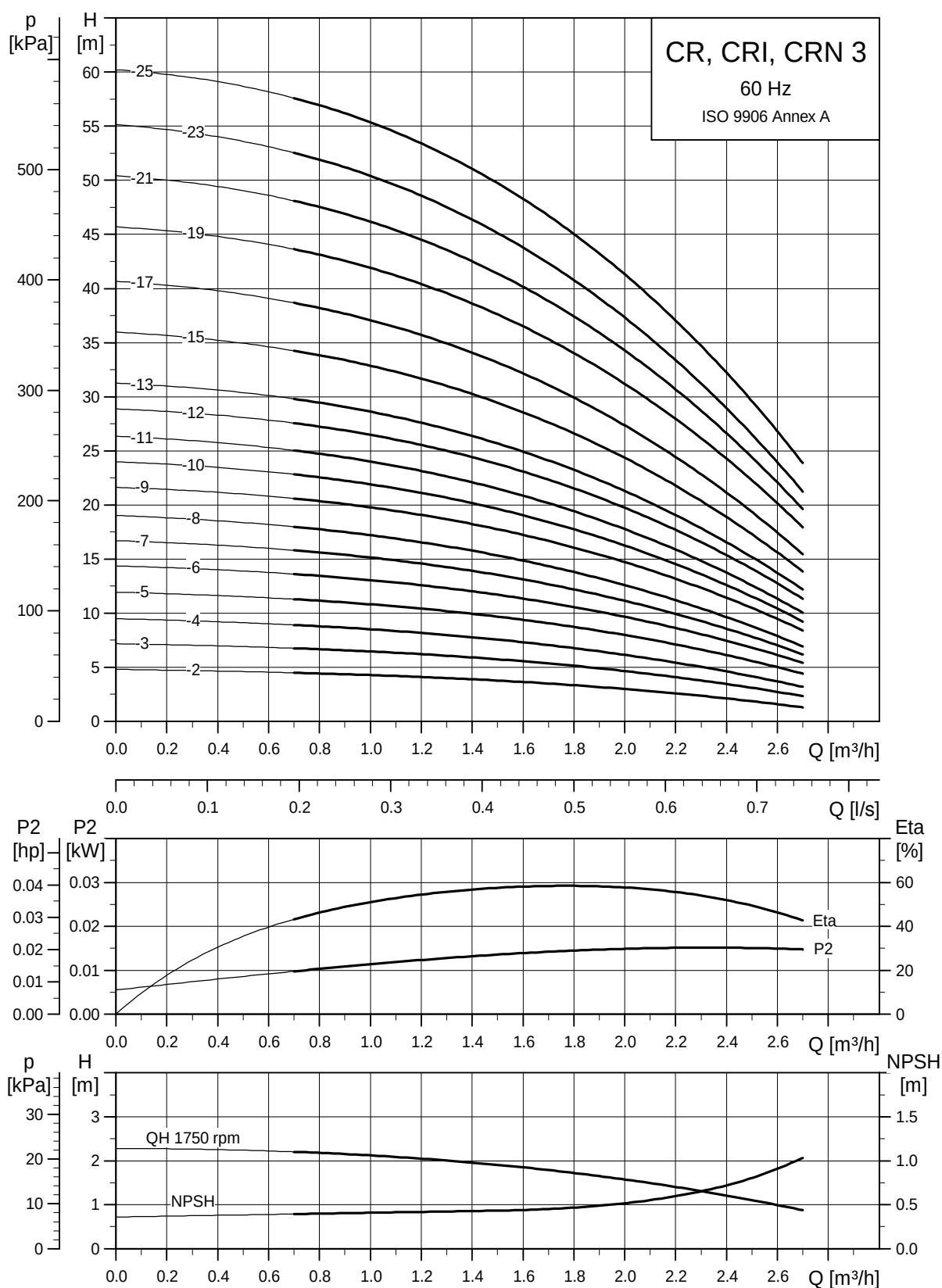
For information about dimensions of the individual pumps, see page 145.

CR pumps with 4-pole motor



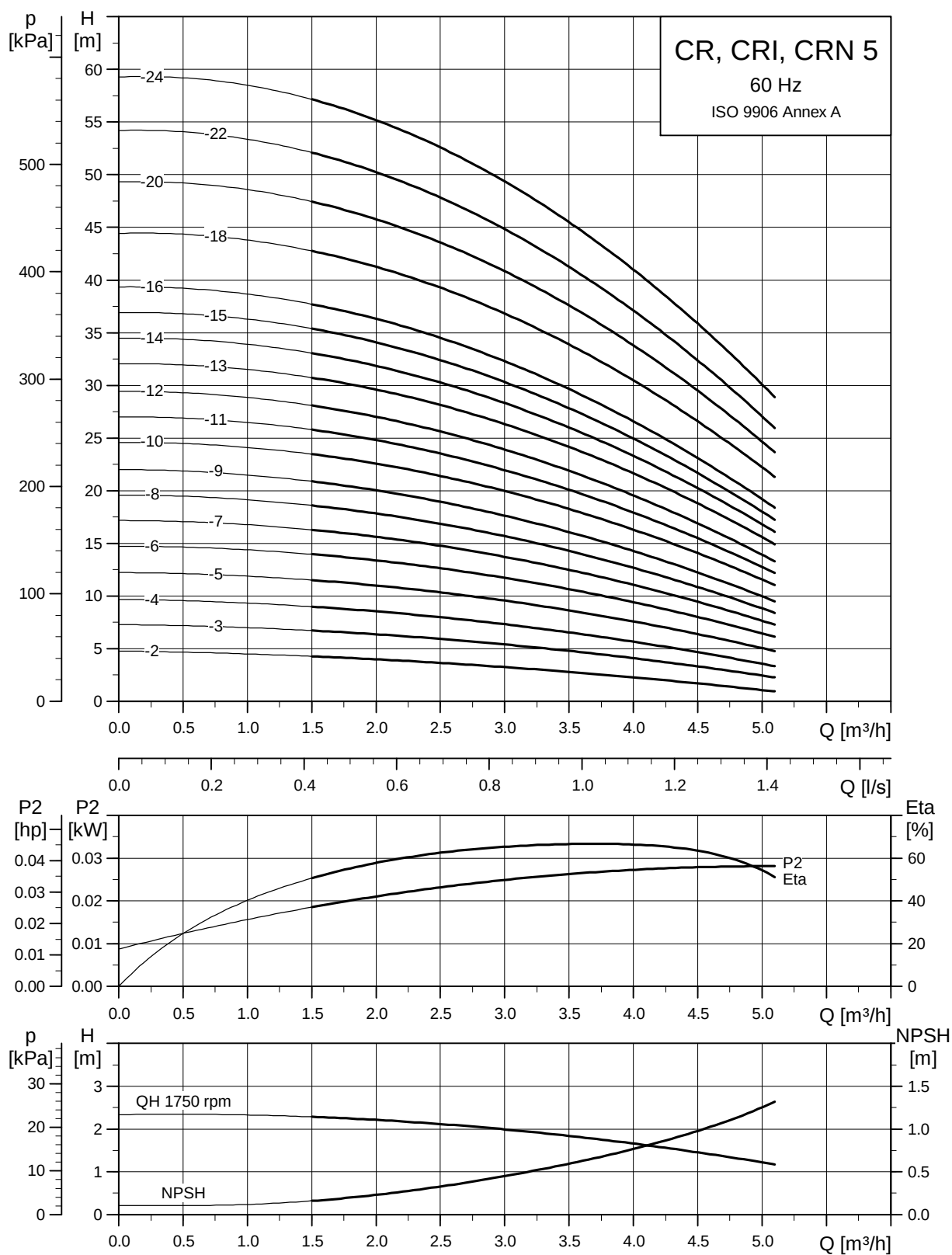
For information about dimensions of the individual pumps, see page 147.

TM02 2540 1309



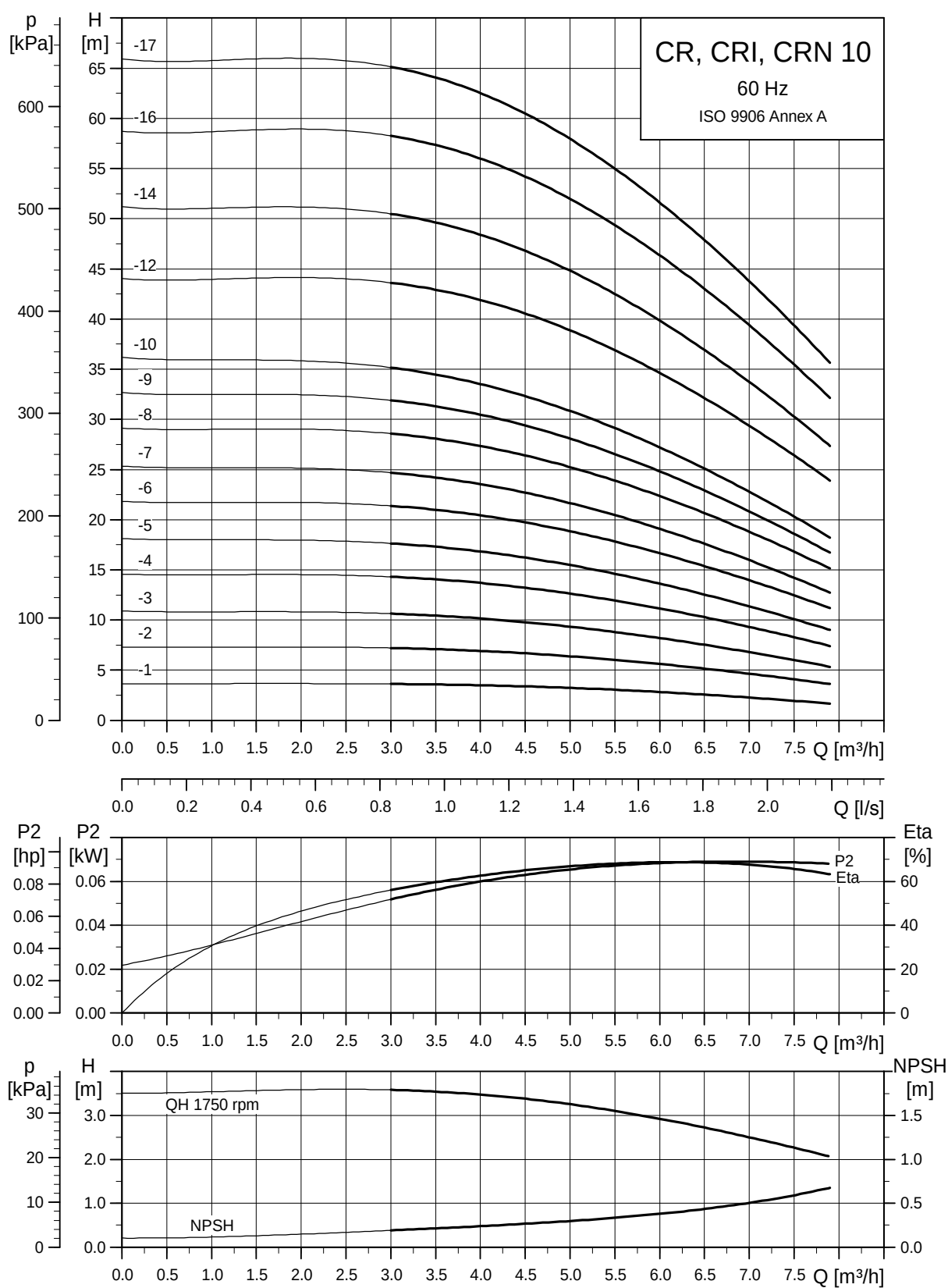
TM02 2539 1309

For information about dimensions of the individual pumps, see page 147.



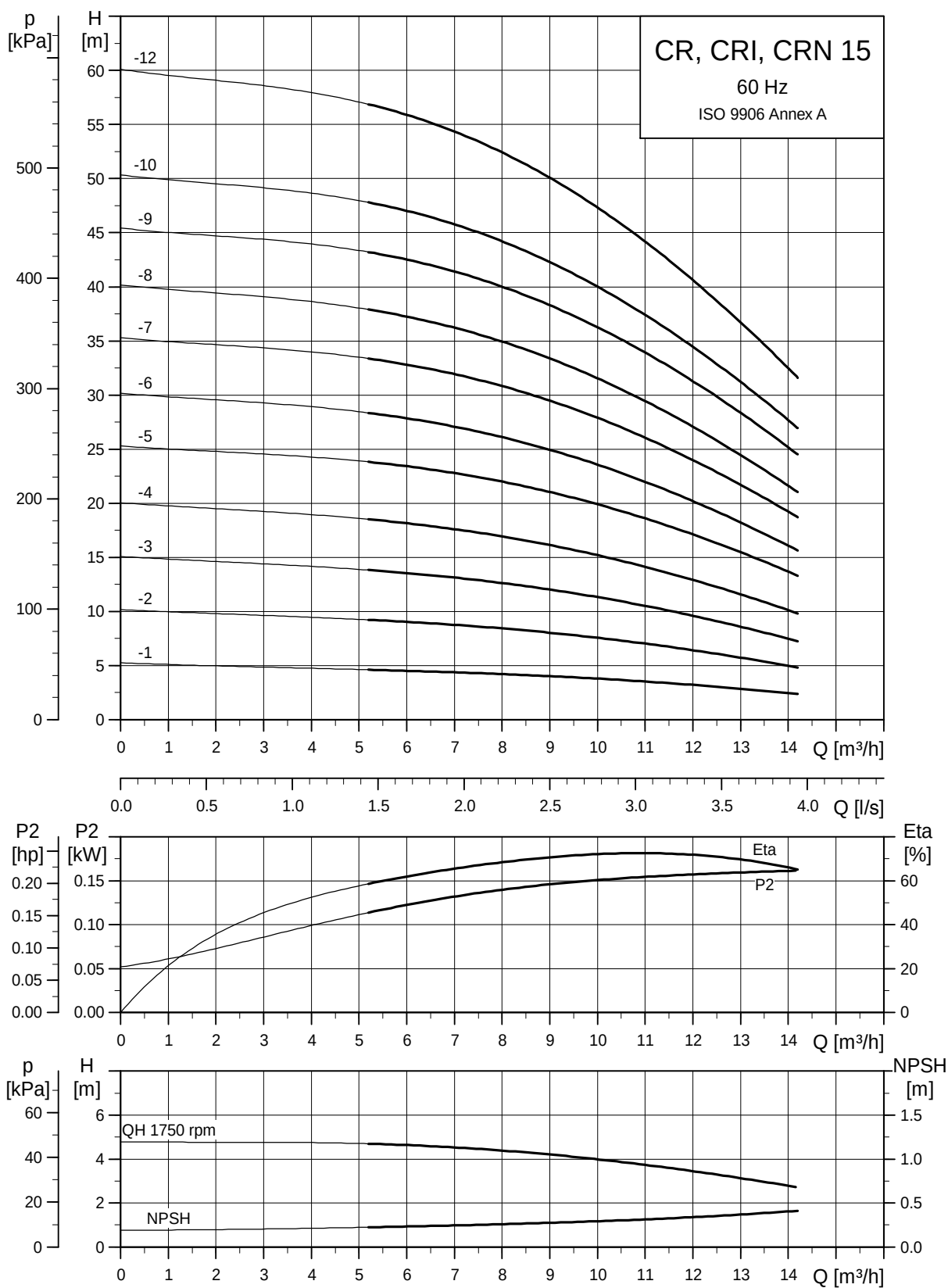
For information about dimensions of the individual pumps, see page 148.

TM02 2538 1309



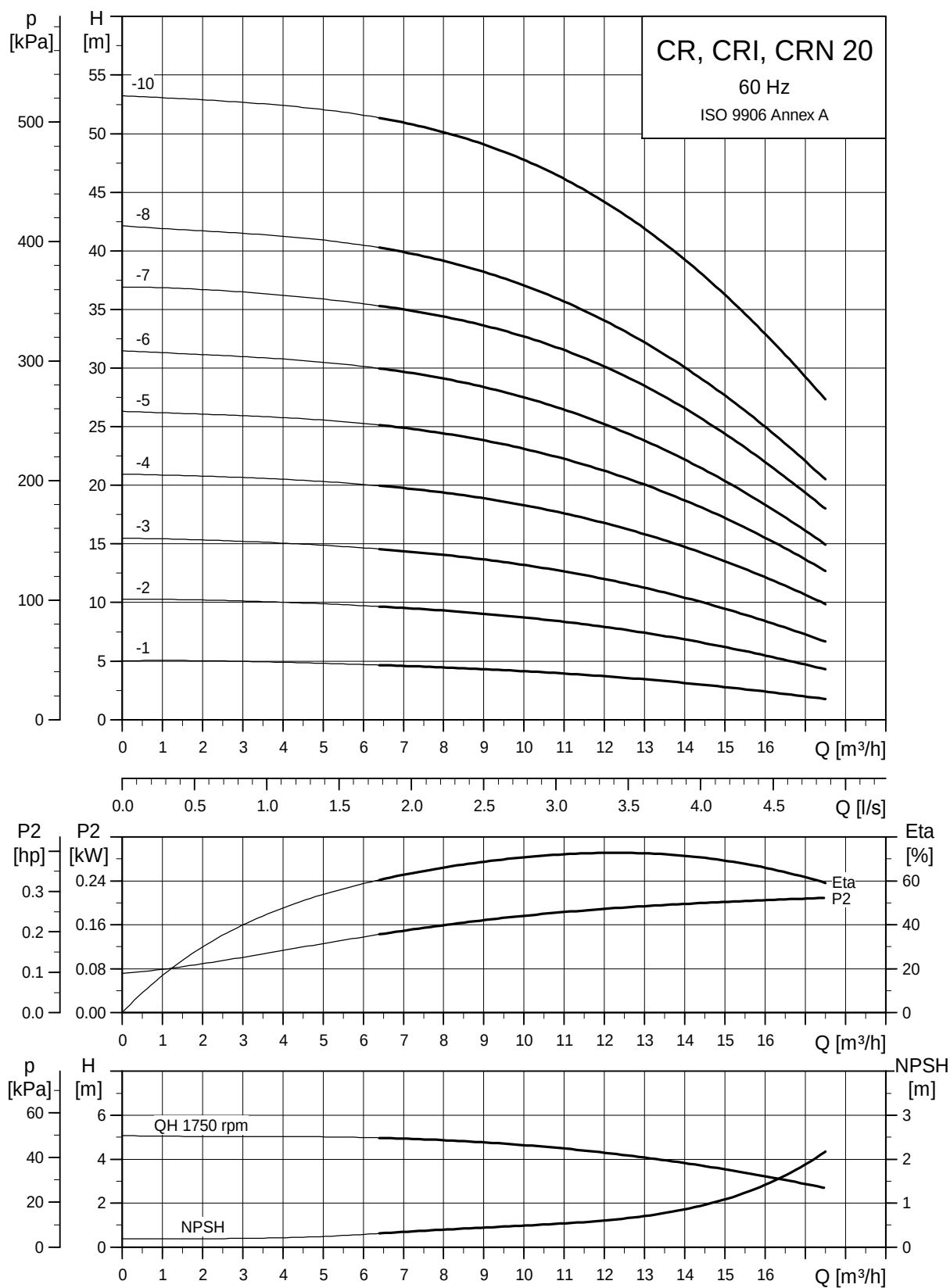
For information about dimensions of the individual pumps, see page [148](#).

TM02 7276 1309



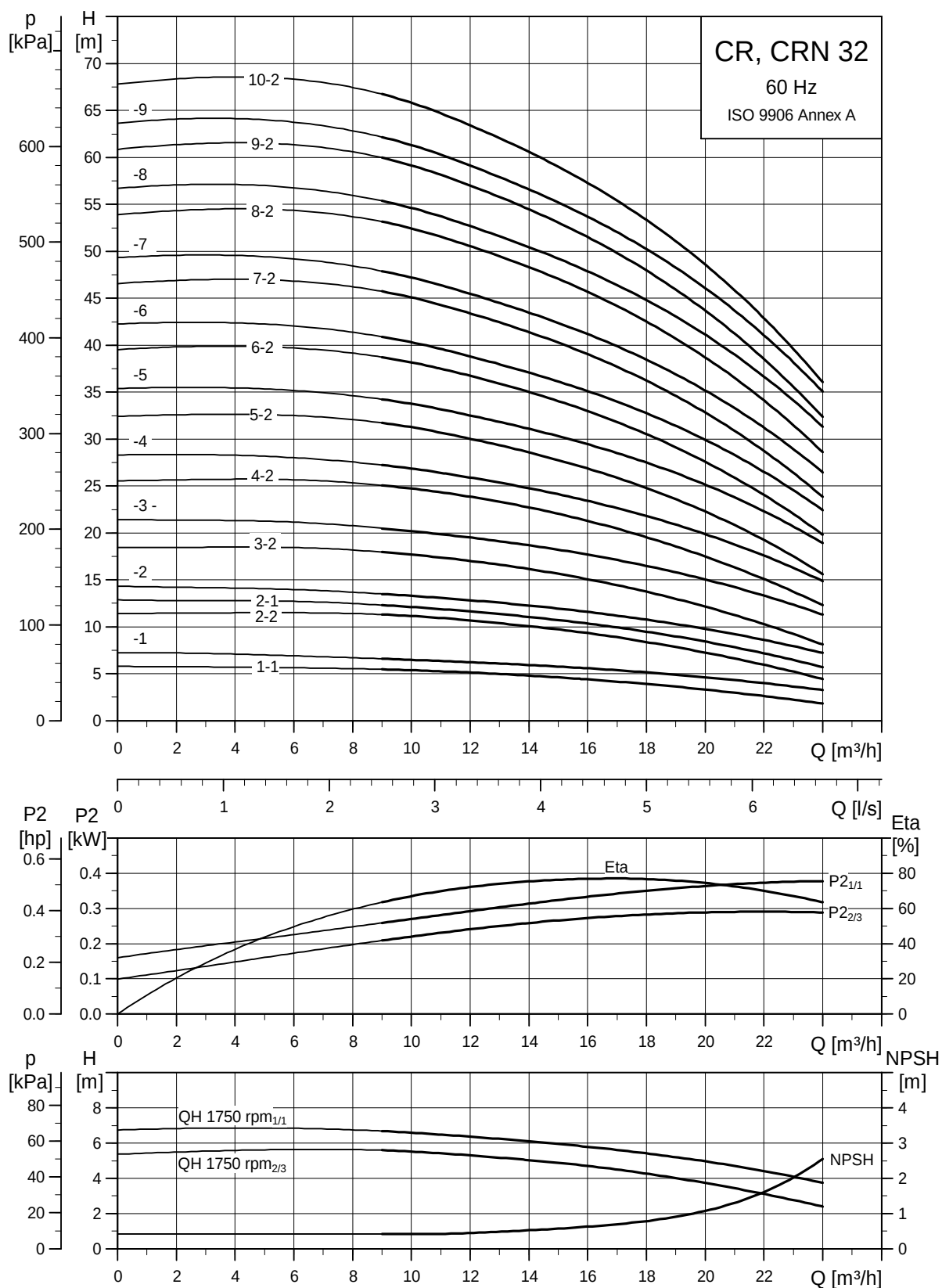
For information about dimensions of the individual pumps, see page 149.

TM02 7277 1309



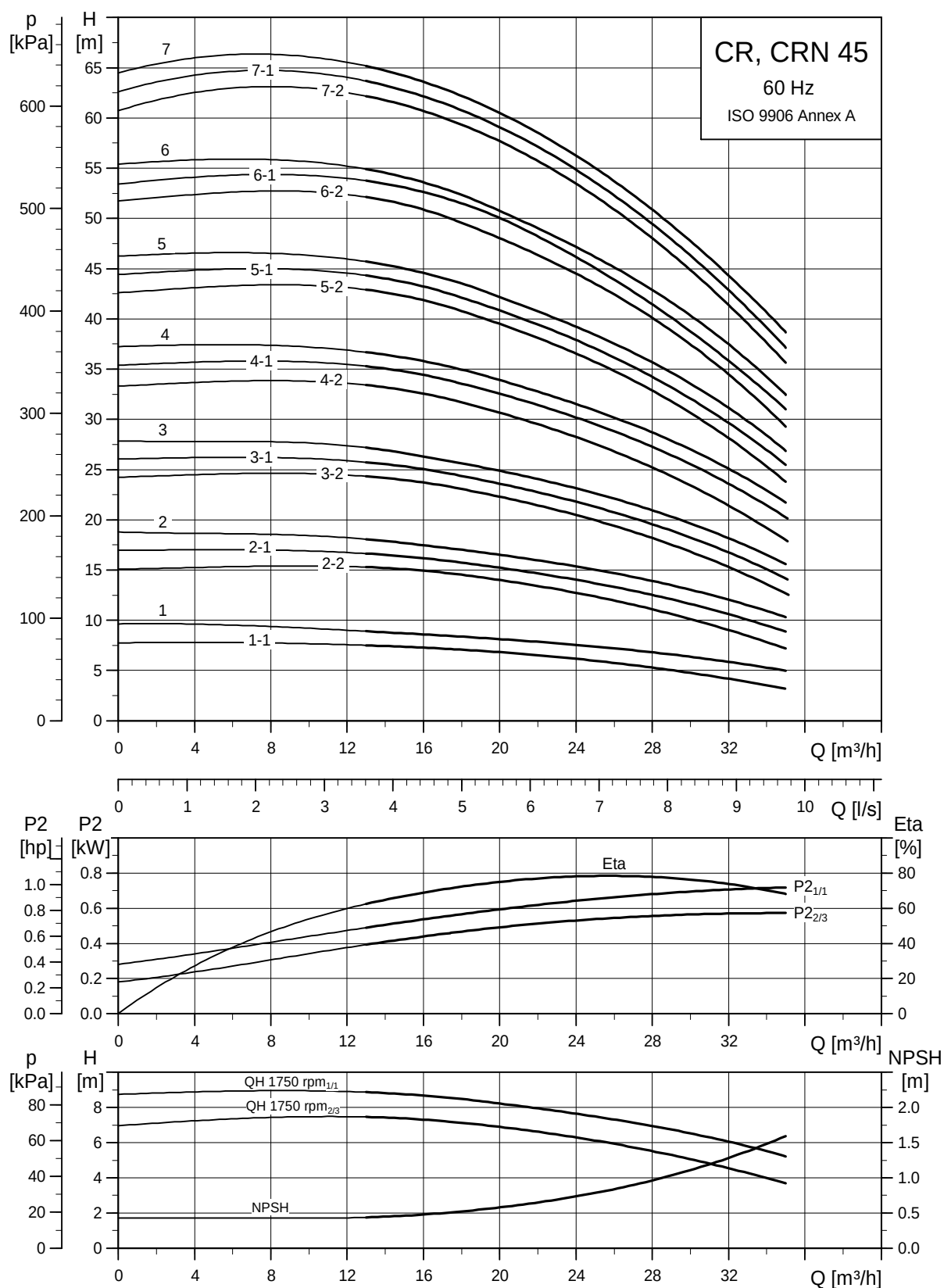
For information about dimensions of the individual pumps, see page [149](#).

TM02 7278 1309



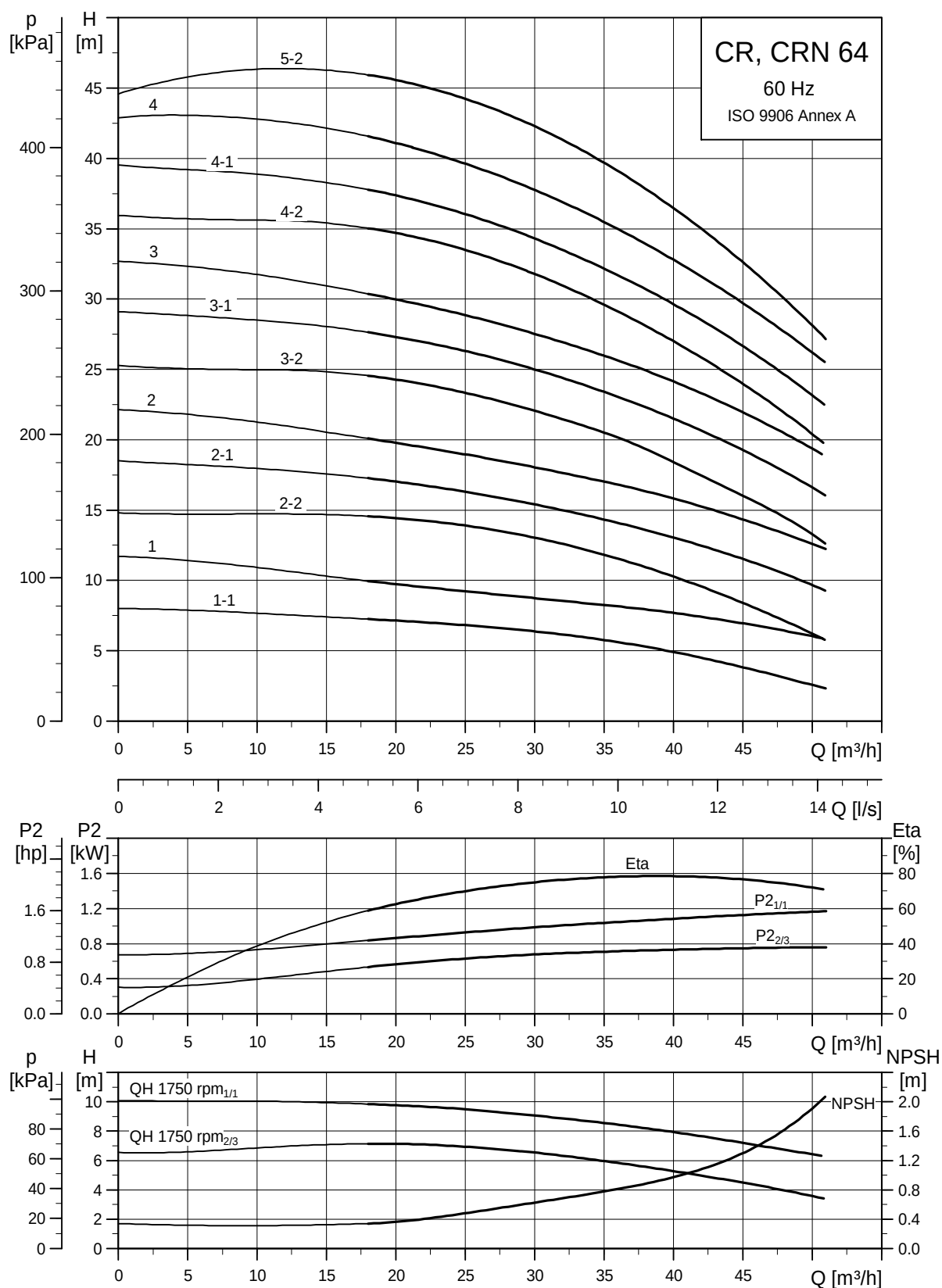
TM01 8157 1309

For information about dimensions of the individual pumps, see page 150.



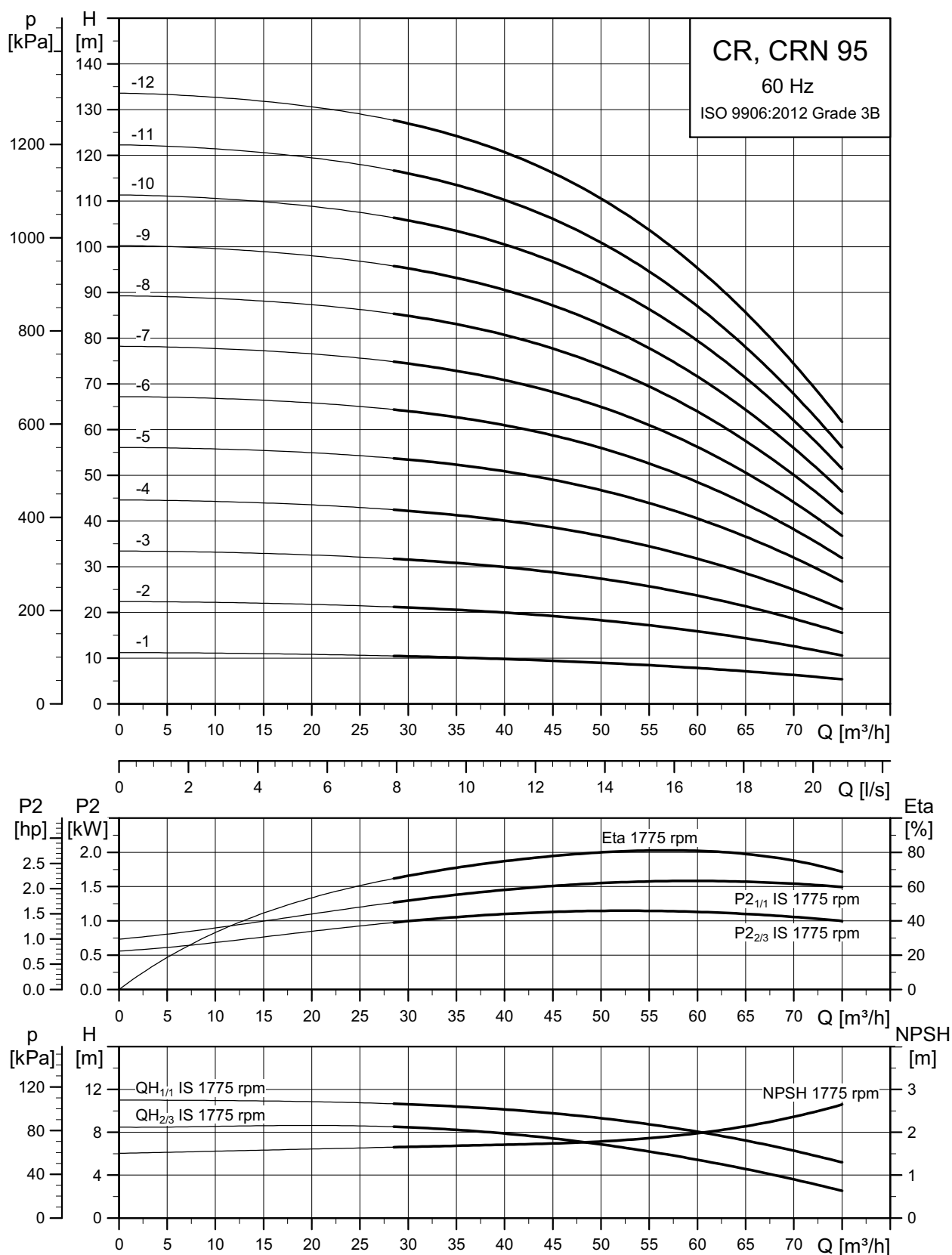
TM01 8158 1309

For information about dimensions of the individual pumps, see page 150.



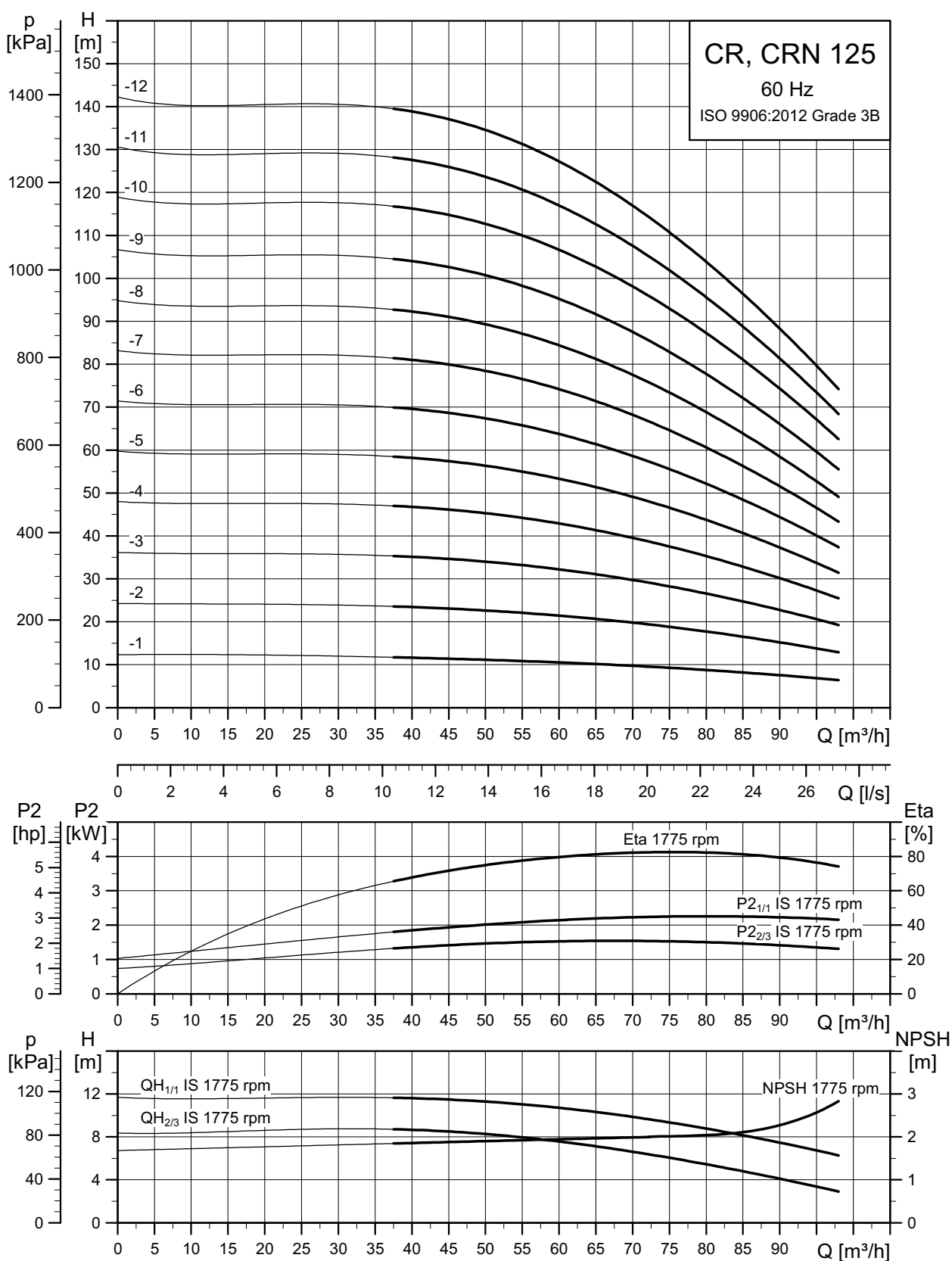
For information about dimensions of the individual pumps, see page 151.

TM01 8159 1309



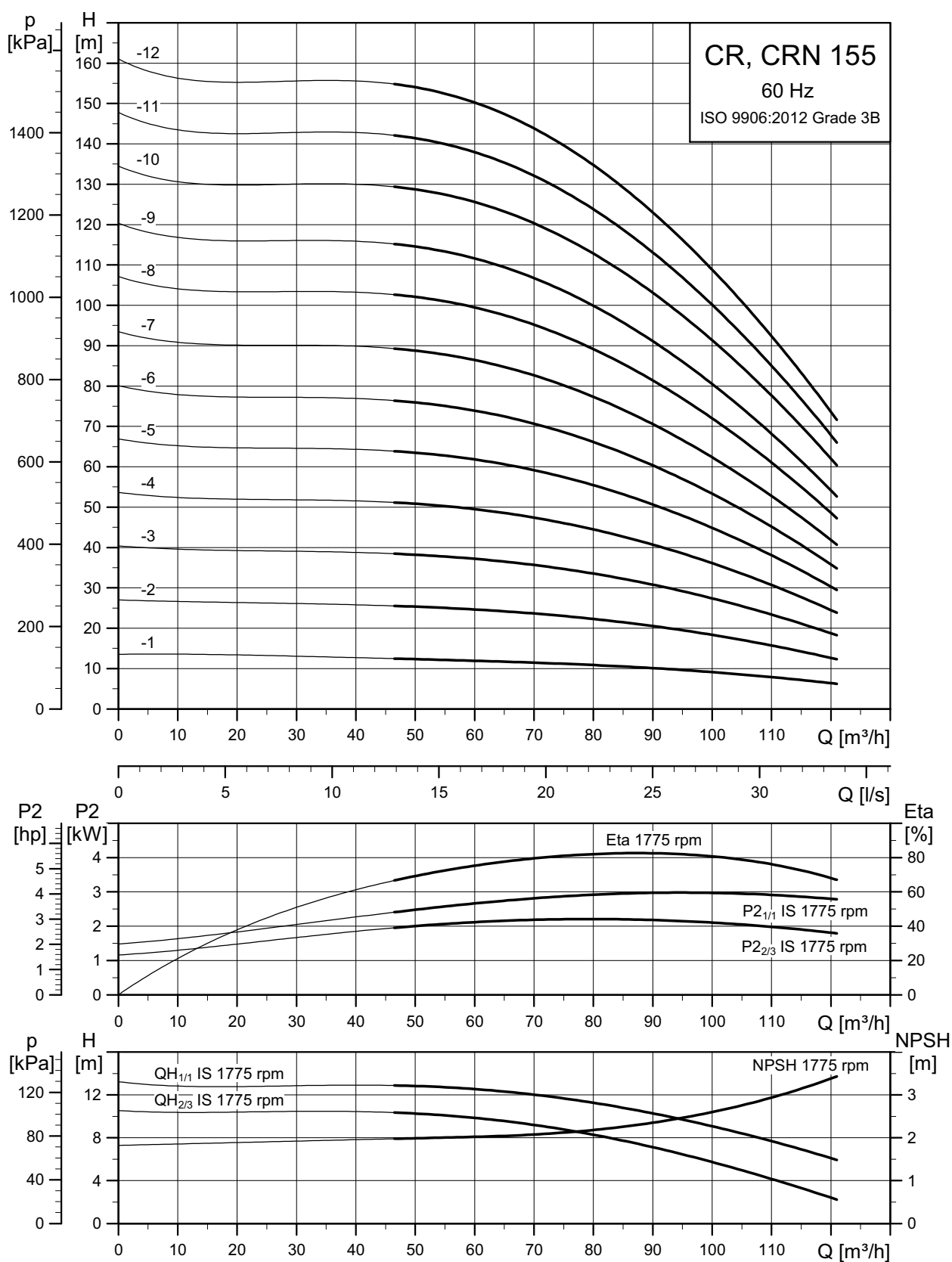
TM07 6983 2720

For information about dimensions of the individual pumps, see page 151.



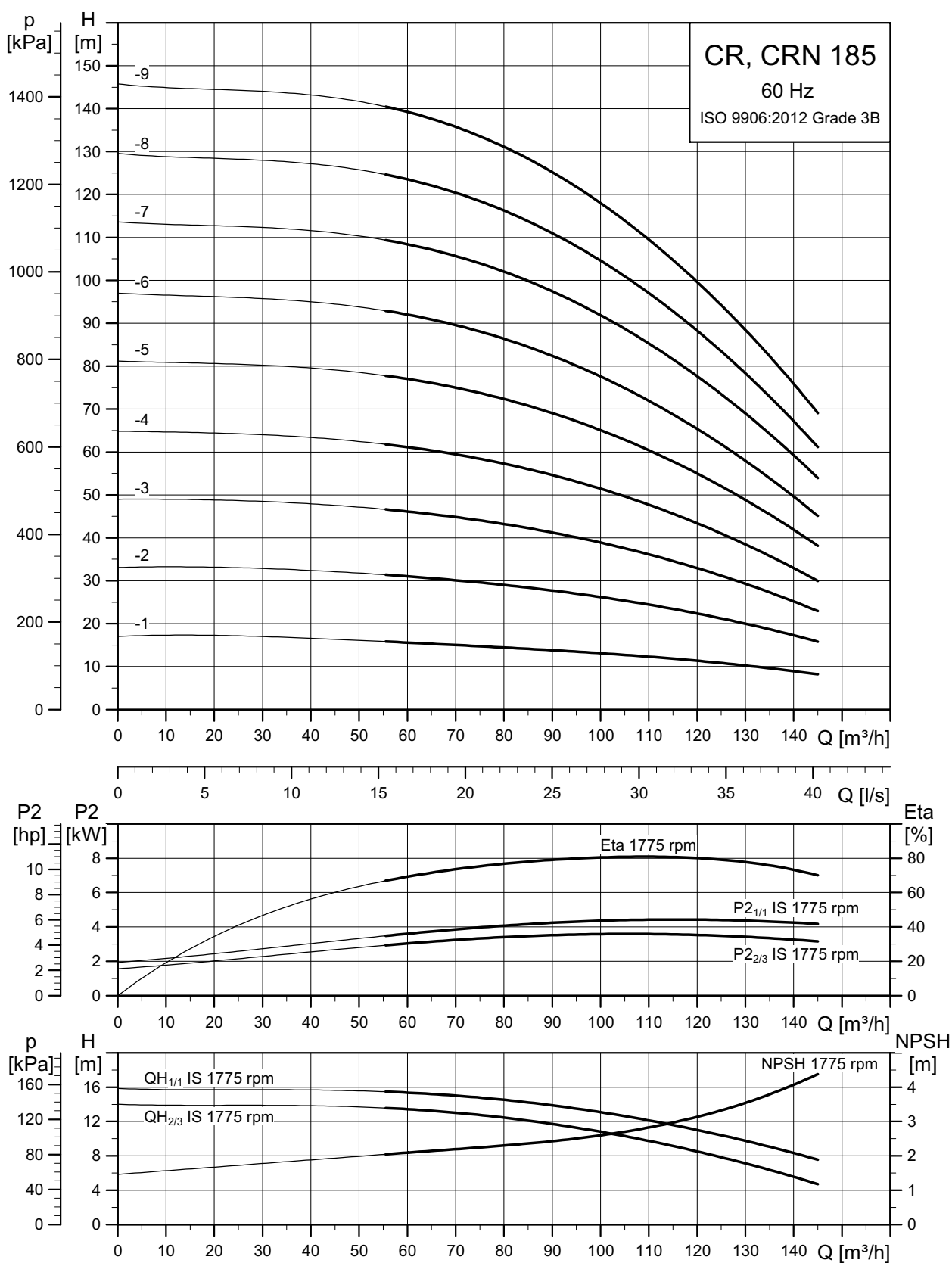
TM07 6984 2720

For information about dimensions of the individual pumps, see page 151.



TM07 6985 2720

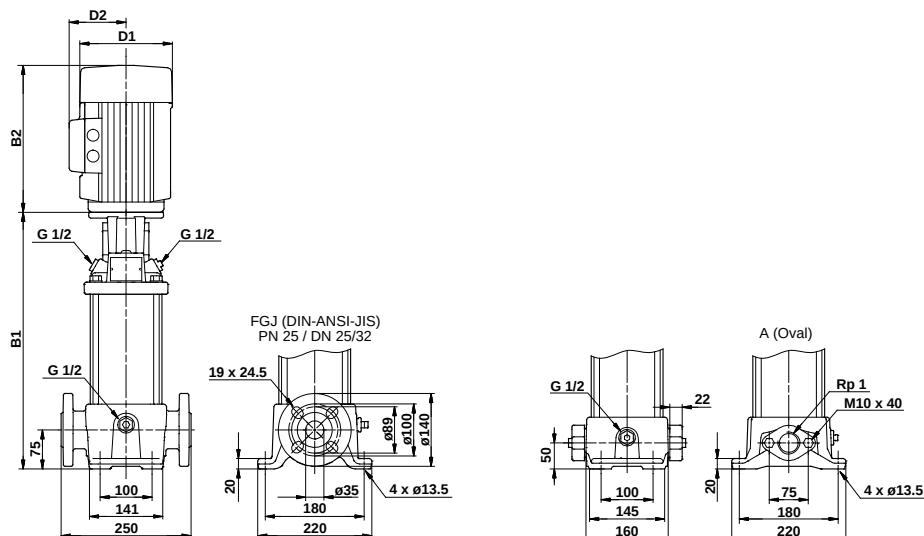
For information about dimensions of the individual pumps, see page 152.



For information about dimensions of the individual pumps, see page [152](#).

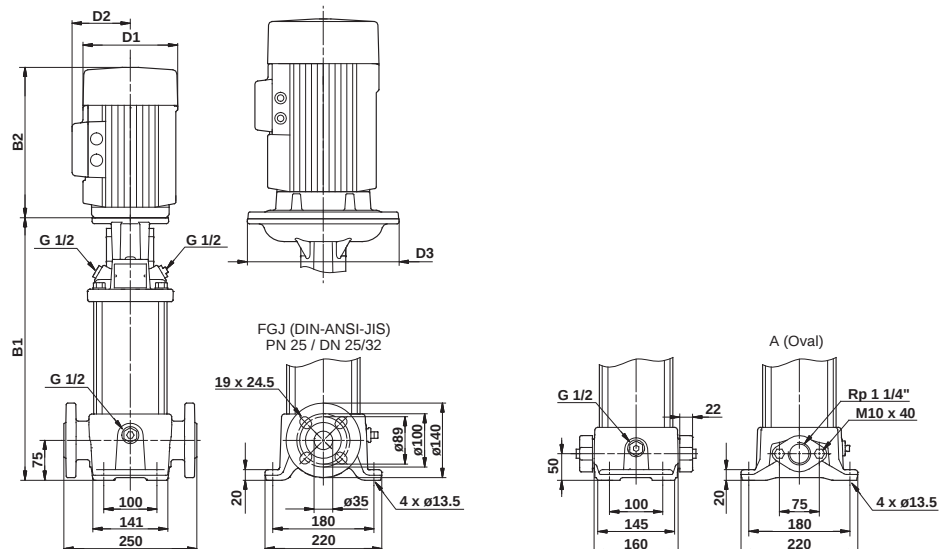
TM07 6986 2720

Dimensional drawings

CR 1
CR 3

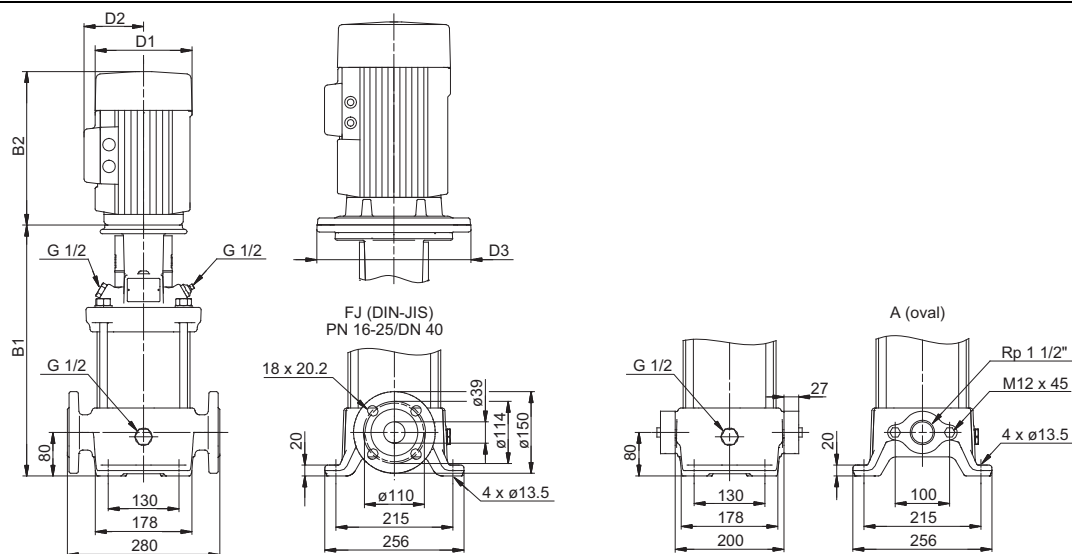
TM03 1721 2805

CR 5



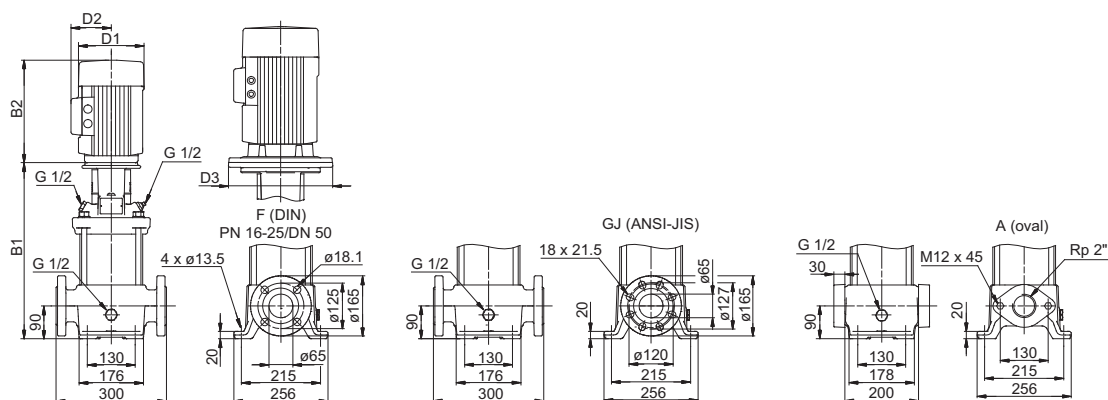
TM03 1723 2805

CR 10



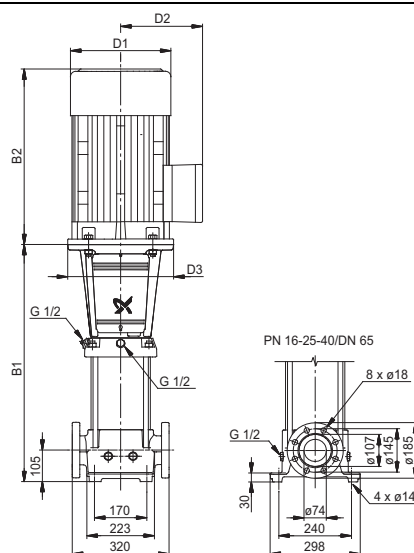
TM03 1725 2805

CR 15
CR 20



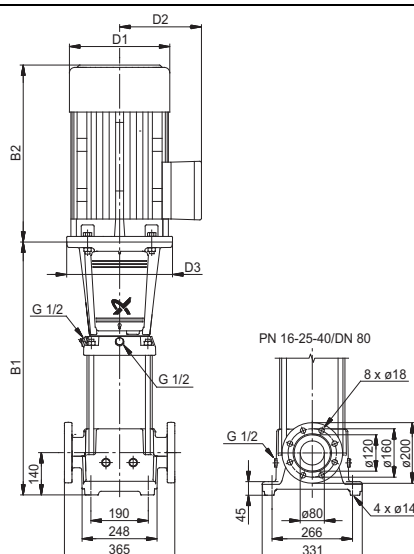
TM03 1727 2805

CR 32



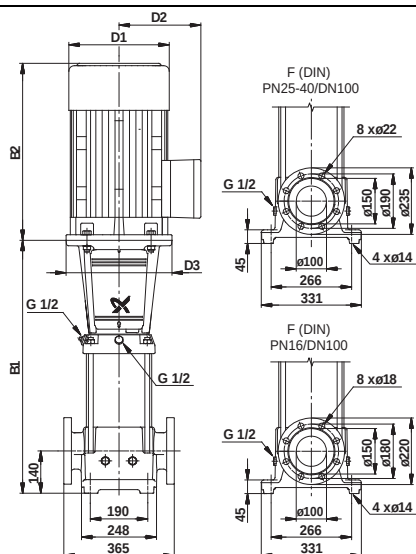
TM01 1749 5197

CR 45



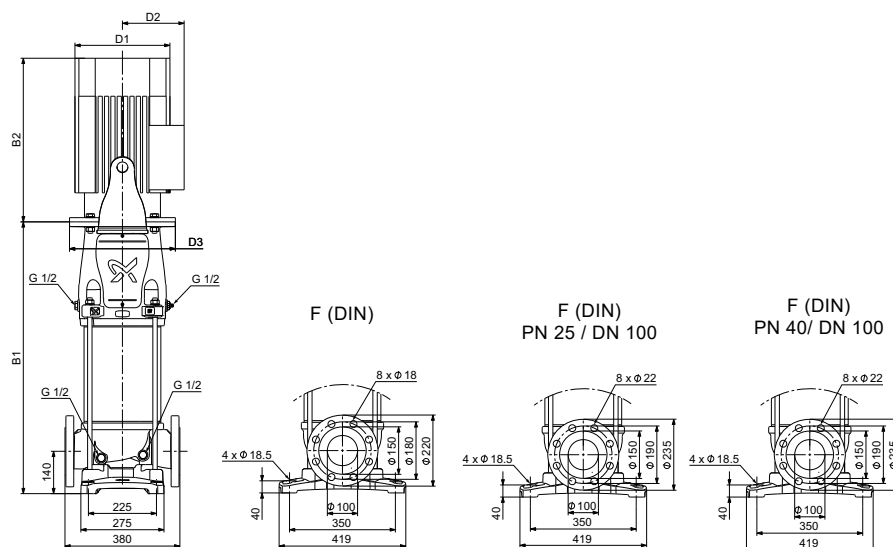
TM01 1751 5197

CR 64

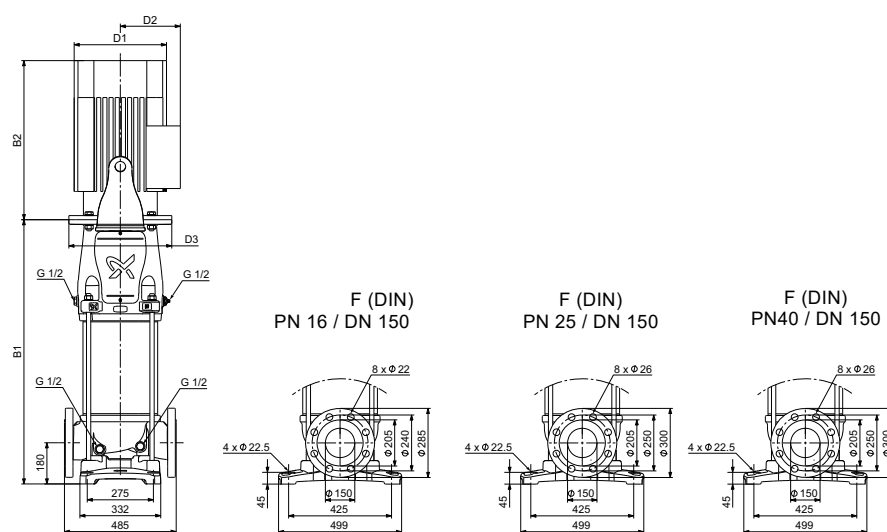


TM01 1753 5197

CR 95

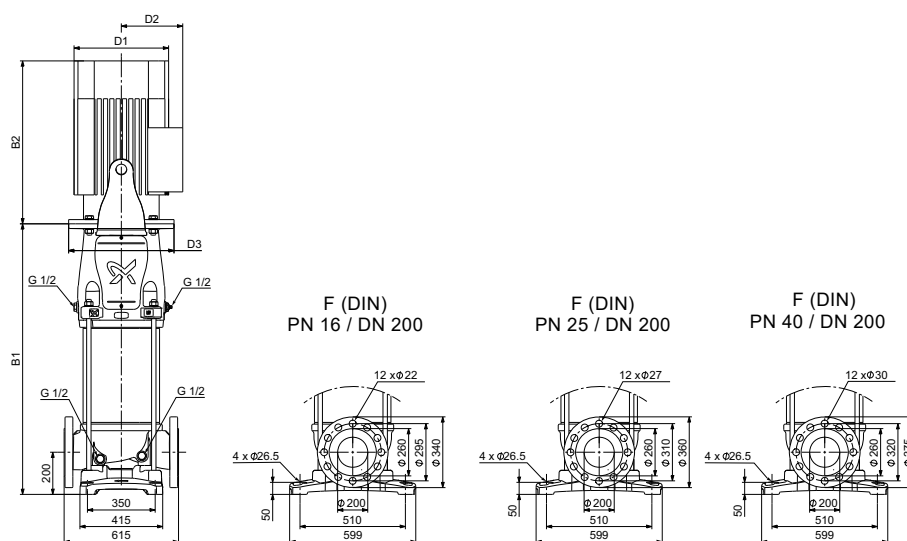


TM06 5174 2620

CR 125
CR 155

TM06 5175 2520

CR 185



TM07 6604 3720

CR low-NPSH pump**Dimensions and weights****CR 3 low-NPSH pumps, 50 Hz**

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 3-3	0,37	279	470	254	445	141	109	-	23	18
CR 3-4	0,37	297	488	272	463	141	109	-	23	19
CR 3-5	0,55	315	506	290	481	141	109	-	24,5	19,5
CR 3-6	0,55	333	524	308	499	141	109	-	25	20
CR 3-7	0,55	351	542	326	517	141	109	-	25	21
CR 3-8	0,75	375	606	350	581	141	109	-	27	23
CR 3-9	0,75	393	624	368	599	141	109	-	28	23
CR 3-10	0,75	411	642	386	617	141	109	-	28	24
CR 3-11	1,1	429	680	404	635	141	109	-	31	26
CR 3-12	1,1	447	698	422	653	141	109	-	31	26
CR 3-13	1,1	465	716	440	671	141	109	-	31	27
CR 3-15	1,1	501	752	476	707	141	109	-	32	28
CR 3-17	1,5	553	834	528	809	178	110	-	40	36
CR 3-19	1,5	589	870	564	845	178	110	-	41	37
CR 3-21	2,2	625	946	600	921	178	110	-	42	38
CR 3-23	2,2	661	982	636	957	178	110	-	43	39
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	-	51	-
CR 3-33	3	845	1180	-	-	198	120	-	51	-
CR 3-36	3	899	1234	-	-	198	120	-	53	-

CR 3 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 5 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange		Oval flange
		B1	B1 + B2	B1	B1 + B2						
CR 5-4	0.75	339	570	308	539	141	109	-	26.5	21.5	
CR 5-5	0.75	366	597	341	572	141	109	-	27	22	
CR 5-6	1.1	393	644	368	599	141	109	-	30	25	
CR 5-7	1.1	420	671	395	626	141	109	-	30	26	
CR 5-8	1.1	447	698	422	653	141	109	-	31	26	
CR 5-9	1.5	490	771	465	746	178	110	-	38	34	
CR 5-10	1.5	517	798	492	773	178	110	-	39	34	
CR 5-11	2.2	544	865	519	840	178	110	-	40	36	
CR 5-12	2.2	571	892	546	867	178	110	-	41	36	
CR 5-13	2.2	598	919	573	894	178	110	-	41	37	
CR 5-14	2.2	625	946	600	921	178	110	-	42	37	
CR 5-15	2.2	652	973	627	948	178	110	-	43	38	
CR 5-16	2.2	679	1000	654	975	178	110	-	43	38	
CR 5-18	3	737	1072	712	1047	198	120	-	48	44	
CR 5-20	3	791	1126	766	1101	198	120	-	50	45	
CR 5-22	4	845	1217	820	1194	220	134	-	62	56	
CR 5-24	4	899	1271	-	-	220	134	-	63	-	
CR 5-26	4	953	1325	-	-	220	134	-	64	-	
CR 5-29	4	1034	1406	-	-	220	134	-	66	-	
CR 5-32	5.5	1145	1536	-	-	220	134	300	82	-	
CR 5-36	5.5	1253	1644	-	-	220	134	300	84	-	

CR 5 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 10 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		DIN flange			Oval flange			D1	D2
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2		
CR 10-3	1.1	407	658	407	658	141	109	-	39
CR 10-4	1.5	423	704	423	704	178	110	-	47
CR 10-5	2.2	453	774	453	734	178	110	-	49
CR 10-6	2.2	483	804	483	764	178	110	-	50
CR 10-7	3	518	853	518	853	198	120	-	55
CR 10-8	3	548	883	548	883	198	120	-	56
CR 10-9	4	578	950	578	950	220	134	-	68
CR 10-10	4	608	980	608	980	220	134	-	69
CR 10-12	4	668	1040	668	1040	220	134	-	71
CR 10-14	5.5	760	1151	760	1151	220	134	300	94
CR 10-16	5.5	820	1211	820	1211	220	134	300	96
CR 10-18	7.5	880	1259	-	-	220	134	300	113
CR 10-20	7.5	940	1319	-	-	220	134	300	115
CR 10-22	7.5	1000	1379	-	-	220	134	300	117

CR 10 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 15 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		DIN flange			Oval flange			D1	D2
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2		
CR 15-2	3	420	755	415	750	198	120	-	54
CR 15-3	4	465	837	465	837	220	134	-	66
CR 15-4	4	510	882	510	882	220	134	-	68
CR 15-5	5.5	587	978	555	946	220	134	-	75
CR 15-6	5.5	632	1023	632	1023	220	134	300	91
CR 15-7	7.5	677	1056	677	1068	220	134	300	108
CR 15-8	7.5	722	1101	-	-	220	134	300	109
CR 15-9	11	844	1315	-	-	314	204	350	128
CR 15-10	11	889	1360	-	-	314	204	350	132
CR 15-12	11	979	1450	-	-	314	204	350	136
CR 15-14	15	1069	1540	-	-	314	204	350	177
CR 15-17	15	1204	1675	-	-	314	204	350	177

CR 15 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 20 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		DIN flange			Oval flange			D1	D2
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2		
CR 20-2	3	420	755	415	736	178	110	-	50
CR 20-3	4	465	837	465	837	220	134	-	66
CR 20-4	5.5	542	933	542	933	220	134	300	88
CR 20-5	7.5	587	966	587	978	220	134	300	102
CR 20-6	7.5	632	1011	632	1023	220	134	300	105
CR 20-7	11	754	1225	677	1148	314	204	300	139
CR 20-8	11	799	1270	-	-	314	204	350	129
CR 20-10	11	889	1360	-	-	314	204	350	132
CR 20-12	15	979	1450	-	-	314	204	350	168
CR 20-14	15	1069	1540	-	-	314	204	350	172
CR 20-17	18.5	1204	1719	-	-	314	204	350	199

CR 20 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 32 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 32-2	4	575	947	-	-	220	134	158	87	-
CR 32-3-2	5.5	645	1036	-	-	220	134	298	107	-
CR 32-3	5.5	645	1036	-	-	220	134	298	107	-
CR 32-4-2	7.5	715	1094	-	-	220	134	298	129	-
CR 32-4	7.5	715	1094	-	-	220	134	298	129	-
CR 32-5-2	11	895	1366	-	-	314	204	350	157	-
CR 32-5	11	895	1366	-	-	314	204	350	157	-
CR 32-6-2	11	965	1436	-	-	314	204	350	160	-
CR 32-6	11	965	1436	-	-	314	204	350	160	-
CR 32-7-2	15	1035	1506	-	-	314	204	350	195	-
CR 32-7	15	1035	1506	-	-	314	204	350	195	-
CR 32-8-2	15	1105	1576	-	-	314	204	350	198	-
CR 32-8	15	1105	1576	-	-	314	204	350	198	-
CR 32-9-2	18.5	1175	1690	-	-	314	204	350	223	-
CR 32-9	18.5	1175	1690	-	-	314	204	350	223	-
CR 32-10-2	18.5	1245	1760	-	-	314	204	350	226	-
CR 32-10	18.5	1245	1760	-	-	314	204	350	226	-
CR 32-11-2	22	1315	1856	-	-	314	204	350	247	-
CR 32-11	22	1315	1856	-	-	314	204	350	247	-
CR 32-12-2	22	1385	1926	-	-	314	204	350	251	-
CR 32-12	22	1385	1926	-	-	314	204	350	251	-
CR 32-13-2	30	1455	2066	-	-	415	300	400	322	-
CR 32-13	30	1455	2066	-	-	415	300	400	322	-
CR 32-14-2	30	1525	2136	-	-	415	300	400	325	-
CR 32-14	30	1525	2136	-	-	415	300	400	325	-

CR 32 low-NPSH pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 45 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 45-2	7.5	639	1018	-	-	220	134	298	122	-
CR 45-3-2	11	829	1300	-	-	314	204	350	151	-
CR 45-3	11	829	1300	-	-	314	204	350	151	-
CR 45-4-2	15	909	1380	-	-	314	204	350	189	-
CR 45-4	15	909	1380	-	-	314	204	350	189	-
CR 45-5-2	18.5	989	1504	-	-	314	204	350	216	-
CR 45-5	18.5	989	1504	-	-	314	204	350	216	-
CR 45-6-2	22	1069	1610	-	-	314	204	350	237	-
CR 45-6	22	1069	1610	-	-	314	204	350	237	-
CR 45-7-2	30	1149	1760	-	-	415	300	400	321	-
CR 45-7	30	1149	1760	-	-	415	300	400	321	-
CR 45-8-2	30	1229	1840	-	-	415	300	400	336	-
CR 45-8	30	1229	1840	-	-	415	300	400	336	-
CR 45-9-2	30	1309	1920	-	-	415	300	400	341	-
CR 45-9	37	1309	1945	-	-	415	300	400	361	-
CR 45-10-2	37	1389	2025	-	-	415	300	400	366	-
CR 45-10	37	1389	2025	-	-	415	300	400	366	-
CR 45-11-2	45	1469	2177	-	-	442	325	450	478	-
CR 45-11	45	1469	2177	-	-	442	325	450	478	-
CR 45-12-2	45	1549	2257	-	-	442	325	450	483	-
CR 45-12	45	1549	2257	-	-	442	325	450	483	-
CR 45-13-2	45	1629	2337	-	-	442	325	450	488	-

CR 45 low-NPSH pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 64 low-NPSH pumps, 50 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 64-2-1	11	754	1225	-	-	314	204	350	151	-	
CR 64-2	11	754	1225	-	-	314	204	350	151	-	
CR 64-3-2	15	836	1307	-	-	314	204	350	194	-	
CR 64-3-1	15	836	1307	-	-	314	204	350	194	-	
CR 64-3	18.5	836	1351	-	-	314	204	350	216	-	
CR 64-4-2	18.5	919	1434	-	-	314	204	350	226	-	
CR 64-4-1	22	919	1460	-	-	314	204	350	242	-	
CR 64-4	22	919	1460	-	-	314	204	350	242	-	
CR 64-5-2	30	1001	1612	-	-	415	300	400	316	-	
CR 64-5-1	30	1001	1612	-	-	415	300	400	316	-	
CR 64-5	30	1001	1612	-	-	415	300	400	316	-	
CR 64-6-2	30	1084	1695	-	-	415	300	400	336	-	
CR 64-6-1	37	1084	1720	-	-	415	300	400	356	-	
CR 64-6	37	1084	1720	-	-	415	300	400	356	-	
CR 64-7-2	37	1166	1802	-	-	415	300	400	376	-	
CR 64-7-1	37	1166	1802	-	-	415	300	400	376	-	
CR 64-7	45	1166	1874	-	-	442	325	450	440	-	
CR 64-8-2	45	1249	1957	-	-	442	325	450	473	-	
CR 64-8-1	45	1249	1957	-	-	442	325	450	473	-	

CR 64 low-NPSH pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 3 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 3-3	0.55	279	470	254	445	141	109	-	24	19
CR 3-4	0.55	297	488	272	463	141	109	-	24	19
CR 3-5	0.75	321	552	296	527	141	109	-	26	22
CR 3-6	1.1	339	590	314	545	141	109	-	29	24
CR 3-7	1.1	357	608	332	563	141	109	-	29	24
CR 3-8	1.1	375	626	350	581	141	109	-	29	25
CR 3-9	1.5	409	690	384	665	178	110	-	37	32
CR 3-10	1.5	427	708	402	683	178	110	-	37	33
CR 3-11	1.5	445	726	420	701	178	110	-	38	33
CR 3-12	2.2	463	784	438	759	178	110	-	39	34
CR 3-13	2.2	481	802	456	777	178	110	-	39	34
CR 3-15	2.2	517	838	492	813	178	110	-	40	35
CR 3-17	2.2	553	874	528	849	178	110	-	41	36
CR 3-19	3	593	928	-	-	198	120	-	46	-
CR 3-21	3	629	964	-	-	198	120	-	47	-
CR 3-23	3	665	1000	-	-	198	120	-	47	-
CR 3-25	4	701	1073	-	-	220	134	-	59	-

CR 3 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 5 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 5-4	1.1	339	590	314	545	141	109	-	28	24
CR 5-5	1.5	382	663	357	638	178	110	-	36	32
CR 5-6	2.2	409	730	384	705	178	110	-	37	33
CR 5-7	2.2	436	757	411	732	178	110	-	38	33
CR 5-8	2.2	463	784	438	759	178	110	-	38	34
CR 5-9	2.2	490	811	465	786	178	110	-	39	34
CR 5-10	3	521	856	496	831	198	120	-	44	39
CR 5-11	3	548	883	523	858	198	120	-	44	40
CR 5-12	3	575	910	550	885	198	120	-	45	40
CR 5-13	4	602	974	577	949	220	134	-	56	52
CR 5-14	4	629	1001	604	976	220	134	-	57	53
CR 5-15	4	656	1028	631	1003	220	134	-	58	53
CR 5-16	4	683	1055	658	1030	220	134	-	58	54
CR 5-18	5.5	767	1158	-	-	220	134	300	74	-
CR 5-20	5.5	821	1212	-	-	220	134	300	75	-
CR 5-22	5.5	875	1266	-	-	220	134	300	76	-
CR 5-24	7.5	929	1308	-	-	220	134	300	79	-

CR 5 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 10 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 10-3	2.2	423	744	423	744	198	120	-	47	44
CR 10-4	3	428	763	428	763	198	120	-	52	49
CR 10-5	4	458	830	458	830	220	134	-	64	61
CR 10-6	4	488	860	488	860	220	134	-	65	62
CR 10-7	5.5	550	941	550	941	220	134	300	87	84
CR 10-8	5.5	580	971	580	971	220	134	300	88	85
CR 10-9	5.5	610	1001	610	1001	220	134	300	89	86
CR 10-10	7.5	640	1019	640	1019	220	134	300	104	101
CR 10-12	7.5	700	1079	-	-	220	134	300	106	-
CR 10-14	11	837	1308	-	-	314	204	350	129	-
CR 10-16	11	897	1368	-	-	314	204	350	131	-
CR 10-17	11	957	1428	-	-	314	204	350	133	-

CR 10 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 15 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 15-2	5.5	452	843	420	811	220	134	-	71	70
CR 15-3	5.5	497	888	465	856	220	134	-	72	71
CR 15-4	7.5	542	921	542	921	220	134	300	103	102
CR 15-5	11	664	1135	587	1058	314	204	300	136	135
CR 15-6	11	709	1180	-	-	314	204	350	126	-
CR 15-7	15	754	1225	-	-	314	204	350	152	-
CR 15-8	15	799	1270	-	-	314	204	350	154	-
CR 15-9	15	844	1315	-	-	314	204	350	163	-
CR 15-10	18.5	889	1404	-	-	314	204	350	175	-
CR 15-12	18.5	979	1494	-	-	314	204	350	190	-

CR 15 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 20 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 20-2	5.5	452	843	420	811	220	134	-	71	70
CR 20-3	7.5	497	876	497	876	220	134	300	102	101
CR 20-4	11	619	1090	542	1013	314	204	350	134	133
CR 20-5	11	664	1135	664	1135	314	204	350	124	123
CR 20-6	15	709	1180	-	-	314	204	350	151	-
CR 20-7	15	754	1225	-	-	314	204	350	159	-
CR 20-8	18.5	799	1314	-	-	314	204	350	171	-

CR 20 low-NPSH pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 32 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 32-2-1	5.5	575	966	-	-	220	148	298	98	-
CR 32-2	7.5	575	954	-	-	220	134	298	112	-
CR 32-3-2	11	755	1226	-	-	314	204	350	146	-
CR 32-3	11	755	1226	-	-	314	204	350	146	-
CR 32-4-2	11	825	1296	-	-	314	204	350	154	-
CR 32-4	15	825	1296	-	-	314	204	350	186	-
CR 32-5-2	15	895	1366	-	-	314	204	350	189	-
CR 32-5	18.5	895	1410	-	-	314	204	350	211	-
CR 32-6-2	18.5	965	1480	-	-	314	204	350	214	-
CR 32-6	18.5	965	1480	-	-	314	204	350	214	-
CR 32-7-2	22	1035	1576	-	-	314	204	350	233	-
CR 32-7	22	1035	1576	-	-	314	204	350	233	-
CR 32-8-2	30	1105	1716	-	-	415	300	400	305	-
CR 32-8	30	1105	1716	-	-	415	300	400	305	-
CR 32-9-2	30	1175	1786	-	-	415	300	400	308	-
CR 32-9	30	1175	1786	-	-	415	300	400	308	-
CR 32-10-2	30	1245	1856	-	-	415	300	400	311	-

CR 32 low-NPSH pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 45 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 45-2-1	11	749	1220	-	-	314	204	350	147	-
CR 45-2	15	749	1220	-	-	314	204	350	179	-
CR 45-3-2	18.5	829	1344	-	-	314	204	350	205	-
CR 45-3-1	18.5	829	1344	-	-	314	204	350	205	-
CR 45-3	18.5	829	1344	-	-	314	204	350	205	-
CR 45-4-2	22	909	1450	-	-	314	204	350	227	-
CR 45-4-1	30	909	1520	-	-	415	300	400	296	-
CR 45-4	30	909	1520	-	-	415	300	400	296	-
CR 45-5-2	30	989	1600	-	-	415	300	400	301	-
CR 45-5-1	30	989	1600	-	-	415	300	400	301	-
CR 45-5	30	989	1600	-	-	415	300	400	301	-
CR 45-6-2	37	1069	1705	-	-	415	300	400	326	-
CR 45-6-1	37	1069	1705	-	-	415	300	400	326	-
CR 45-6	37	1069	1705	-	-	415	300	400	326	-
CR 45-7-2	45	1149	1857	-	-	442	325	450	405	-
CR 45-7-1	45	1149	1857	-	-	442	325	450	405	-
CR 45-7	45	1149	1857	-	-	442	325	450	405	-

CR 45 low-NPSH pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 64 low-NPSH pumps, 60 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 64-2-1	18.5	754	1269	-	-	314	204	350	205	-	
CR 64-2	22	754	1295	-	-	314	204	350	221	-	
CR 64-3-2	22	836	1377	-	-	314	204	350	232	-	
CR 64-3-1	30	836	1447	-	-	415	300	400	301	-	
CR 64-3	30	836	1447	-	-	415	300	400	301	-	
CR 64-4-2	37	919	1555	-	-	415	300	400	331	-	
CR 64-4-1	37	919	1555	-	-	415	300	400	331	-	
CR 64-4	45	919	1627	-	-	442	325	450	395	-	
CR 64-5-2	45	1001	1709	-	-	442	325	450	400	-	

CR 64 low-NPSH pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR pumps with 4-pole motor

Dimensions and weights

CR 1 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 1-2	0.25	279	470	254	445	141	109	160	22	17	
CR 1-3	0.25	279	470	254	445	141	109	160	22	17	
CR 1-4	0.25	297	488	272	463	141	109	160	22	18	
CR 1-5	0.25	315	506	290	481	141	109	160	23	18	
CR 1-6	0.25	333	524	308	499	141	109	160	23	19	
CR 1-7	0.25	351	542	326	517	141	109	160	24	19	
CR 1-8	0.25	369	560	344	535	141	109	160	25	20	
CR 1-9	0.25	387	578	362	553	141	109	160	25	20	
CR 1-10	0.25	405	596	380	571	141	109	160	25	21	
CR 1-11	0.25	423	614	398	589	141	109	160	26	21	
CR 1-12	0.25	447	638	422	613	141	109	160	28	23	
CR 1-13	0.25	465	656	440	631	141	109	160	28	24	
CR 1-15	0.25	501	692	476	667	141	109	160	29	25	
CR 1-17	0.25	537	728	512	703	141	109	160	32	28	
CR 1-19	0.25	573	764	548	739	141	109	160	33	28	
CR 1-21	0.25	609	800	584	775	141	109	160	34	29	
CR 1-23	0.25	645	836	620	811	141	109	160	35	30	
CR 1-25	0.25	697	888	-	-	141	109	160	43	-	
CR 1-27	0.25	733	924	-	-	141	109	160	43	-	
CR 1-30	0.25	787	978	-	-	141	109	160	45	-	
CR 1-33	0.25	841	1032	-	-	141	109	160	46	-	
CR 1-36	0.25	895	1086	-	-	141	109	160	48	-	

4-pole CR 1 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 3 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 3-2	0.25	279	470	254	445	141	109	160	22	17
CR 3-3	0.25	279	470	254	445	141	109	160	22	17
CR 3-4	0.25	297	488	272	463	141	109	160	22	18
CR 3-5	0.25	315	506	290	481	141	109	160	23	18
CR 3-6	0.25	333	524	308	499	141	109	160	24	19
CR 3-7	0.25	351	542	326	517	141	109	160	24	20
CR 3-8	0.25	375	566	350	541	141	109	160	26	22
CR 3-9	0.25	393	584	368	559	141	109	160	27	22
CR 3-10	0.25	411	602	386	577	141	109	160	27	23
CR 3-11	0.25	429	620	404	595	141	109	160	30	25
CR 3-12	0.25	447	638	422	613	141	109	160	30	25
CR 3-13	0.25	465	656	440	631	141	109	160	30	26
CR 3-15	0.25	501	692	476	667	141	109	160	31	27
CR 3-17	0.25	553	744	528	719	141	109	160	39	35
CR 3-19	0.25	589	780	564	755	141	109	160	40	36
CR 3-21	0.25	625	816	600	791	141	109	160	41	37
CR 3-23	0.25	661	852	636	827	141	109	160	42	38
CR 3-25	0.25	697	888	-	-	141	109	160	43	-
CR 3-27	0.25	733	924	-	-	141	109	160	44	-
CR 3-29	0.37	769	960	-	-	141	109	160	46	-
CR 3-31	0.37	809	1000	-	-	141	109	160	51	-
CR 3-33	0.37	845	1036	-	-	141	109	160	51	-
CR 3-36	0.37	899	1090	-	-	141	109	160	53	-

4-pole CR 3 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 5 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 5-2	0.25	279	470	254	445	141	109	160	22	17
CR 5-3	0.25	306	497	281	472	141	109	160	23	19
CR 5-4	0.25	333	524	308	499	141	109	160	24	19
CR 5-5	0.25	366	557	341	532	141	109	160	26	21
CR 5-6	0.25	393	584	368	559	141	109	160	29	24
CR 5-7	0.25	420	611	395	586	141	109	160	29	25
CR 5-8	0.25	447	638	422	613	141	109	160	30	25
CR 5-9	0.25	490	681	465	656	141	109	160	37	33
CR 5-10	0.25	517	708	492	683	141	109	160	38	33
CR 5-11	0.25	544	735	519	710	141	109	160	39	35
CR 5-12	0.25	571	762	546	737	141	109	160	40	35
CR 5-13	0.25	598	789	573	764	141	109	160	40	36
CR 5-14	0.25	625	816	600	791	141	109	160	41	36
CR 5-15	0.25	652	843	627	818	141	109	160	42	37
CR 5-16	0.37	679	870	654	845	141	109	160	43	38
CR 5-18	0.37	737	928	712	903	141	109	160	48	44
CR 5-20	0.37	791	982	766	957	141	109	160	50	45
CR 5-22	0.37	845	1036	820	1011	141	109	160	62	56
CR 5-24	0.55	899	1130	-	-	141	109	200	62	-
CR 5-26	0.55	953	1184	-	-	141	109	200	63	-
CR 5-29	0.55	1034	1265	-	-	141	109	200	65	-
CR 5-32	0.55	1145	1376	-	-	141	109	200	81	-
CR 5-36	0.75	1253	1534	-	-	178	109	200	83	-

4-pole CR 5 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 10 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 10-1	0.25	343	534	343	534	141	109	160	33	30
CR 10-2	0.25	347	538	347	538	141	109	160	35	33
CR 10-3	0.25	377	568	377	568	141	109	160	38	36
CR 10-4	0.25	423	614	423	614	141	109	160	46	44
CR 10-5	0.25	453	644	453	644	141	109	160	48	45
CR 10-6	0.25	483	674	483	674	141	109	160	49	46
CR 10-7	0.37	518	709	518	709	141	109	160	55	52
CR 10-8	0.37	548	739	548	739	141	109	160	56	53
CR 10-9	0.37	578	769	578	769	141	109	160	57	54
CR 10-10	0.55	608	839	608	839	141	109	200	68	65
CR 10-12	0.6	668	899	668	899	141	109	200	70	68
CR 10-14	0.75	760	1041	760	1041	178	109	200	93	90
CR 10-16	0.75	820	1101	820	1101	178	109	200	95	92
CR 10-18	0.75	880	1161	-	-	178	109	200	100	-
CR 10-20	1.1	940	1261	-	-	178	110	200	98	-
CR 10-22	1.1	1000	1321	-	-	178	110	200	100	-

4-pole CR 10 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 15 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 15-1	0.25	400	591	400	591	141	109	160	41	40
CR 15-2	0.25	415	606	415	606	141	109	160	49	48
CR 15-3	0.37	465	656	465	656	141	109	160	55	54
CR 15-4	0.55	510	741	510	741	141	109	200	67	66
CR 15-5	0.55	555	786	555	786	141	109	200	68	67
CR 15-6	0.75	632	913	632	913	178	109	200	90	89
CR 15-7	0.75	677	958	677	958	178	109	200	92	91
CR 15-8	1.1	722	1043	-	-	178	110	200	92	-
CR 15-9	1.1	767	1088	-	-	178	110	200	93	-
CR 15-10	1.1	889	1210	-	-	178	110	200	125	-
CR 15-12	1.5	979	1260	-	-	178	110	200	134	-
CR 15-14	1.5	1069	1350	-	-	178	110	200	138	-
CR 15-17	2.2	1204	1525	-	-	198	120	250	157	-

4-pole CR 15 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 20 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 20-1	0.25	400	591	400	591	141	109	160	41	40
CR 20-2	0.37	415	606	415	606	141	109	160	50	49
CR 20-3	0.55	465	696	465	696	141	109	200	65	64
CR 20-4	0.6	542	773	542	773	141	109	200	87	86
CR 20-5	0.75	587	868	587	868	178	109	200	89	88
CR 20-6	1.1	632	953	632	953	178	110	200	88	-
CR 20-7	1.1	677	998	677	998	178	110	200	90	-
CR 20-8	1.1	799	1120	-	-	178	110	200	122	-
CR 20-10	1.5	889	1170	-	-	178	110	200	130	-
CR 20-12	2.2	979	1300	-	-	198	120	250	148	-
CR 20-14	2.2	1069	1390	-	-	198	120	250	152	-
CR 20-17	2.2	1204	1525	-	-	198	120	250	187	-

4-pole CR 20 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 32 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 32-1-1	1.5	505	786	-	-	178	110	200	61	-
CR 32-1	1.5	505	786	-	-	178	110	200	62	-
CR 32-2-2	1.5	575	856	-	-	178	110	200	76	-
CR 32-2	1.5	575	856	-	-	178	110	200	87	-
CR 32-3-2	1.5	645	926	-	-	178	110	200	107	-
CR 32-3	1.5	645	926	-	-	178	110	200	107	-
CR 32-4-2	1.5	715	996	-	-	178	110	200	117	-
CR 32-4	1.5	715	996	-	-	178	110	200	117	-
CR 32-5-2	1.5	895	1176	-	-	178	110	200	155	-
CR 32-5	1.5	895	1176	-	-	178	110	200	155	-
CR 32-6-2	1.5	965	1246	-	-	178	110	200	158	-
CR 32-6	1.5	965	1246	-	-	178	110	200	158	-
CR 32-7-2	1.5	1035	1316	-	-	178	110	200	175	-
CR 32-7	1.5	1035	1316	-	-	178	110	200	175	-
CR 32-8-2	2.2	1105	1426	-	-	198	120	250	178	-
CR 32-8	2.2	1105	1426	-	-	198	120	250	178	-
CR 32-9-2	2.2	1175	1496	-	-	198	120	250	211	-
CR 32-9	2.2	1175	1496	-	-	198	120	250	211	-
CR 32-10-2	2.2	1245	1566	-	-	198	120	250	214	-
CR 32-10	2.2	1245	1566	-	-	198	120	250	214	-
CR 32-11-2	2.2	1315	1636	-	-	198	120	250	250	-
CR 32-11	3	1315	1650	-	-	198	120	250	249	-
CR 32-12-2	3	1385	1720	-	-	198	120	250	253	-
CR 32-12	3	1385	1720	-	-	198	120	250	253	-
CR 32-13-2	3	1455	1790	-	-	198	120	250	321	-
CR 32-13	3	1455	1790	-	-	198	120	250	321	-
CR 32-14-2	3	1525	1860	-	-	198	120	250	324	-
CR 32-14	3	1525	1860	-	-	198	120	250	324	-

4-pole CR 32 pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 45 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 45-1-1	1.5	559	840	-	-	178	110	200	80	-
CR 45-1	1.5	559	840	-	-	178	110	200	91	-
CR 45-2-2	1.5	639	920	-	-	178	110	200	108	-
CR 45-2	1.5	639	920	-	-	178	110	200	110	-
CR 45-3-2	1.5	829	1110	-	-	178	110	200	149	-
CR 45-3	1.5	829	1110	-	-	178	110	200	149	-
CR 45-4-2	1.5	909	1190	-	-	178	110	200	169	-
CR 45-4	2.2	909	1230	-	-	198	120	250	169	-
CR 45-5-2	2.2	989	1310	-	-	198	120	250	204	-
CR 45-5	2.2	989	1310	-	-	198	120	250	204	-
CR 45-6-2	3	1069	1404	-	-	198	120	250	239	-
CR 45-6	3	1069	1404	-	-	198	120	250	239	-
CR 45-7-2	3	1149	1484	-	-	198	120	250	320	-
CR 45-7	3	1149	1484	-	-	198	120	250	320	-
CR 45-8-2	4	1229	1601	-	-	220	134	250	336	-
CR 45-8	4	1229	1601	-	-	220	134	250	336	-
CR 45-9-2	4	1309	1681	-	-	220	134	250	341	-
CR 45-9	4	1309	1681	-	-	220	134	250	361	-
CR 45-10-2	4	1389	1761	-	-	220	134	250	366	-
CR 45-10	4	1389	1761	-	-	220	134	250	366	-
CR 45-11-2	5.5	1469	1860	-	-	260	159	300	487	-
CR 45-11	5.5	1469	1860	-	-	260	159	300	487	-
CR 45-12-2	5.5	1549	1940	-	-	260	159	300	492	-
CR 45-12	5.5	1549	1940	-	-	260	159	300	492	-
CR 45-13-2	5.5	1629	2020	-	-	260	159	300	497	-

4-pole CR 45 pumps are also available as CRN pumps with PJE connection.

For information about electrical data, see pages [173](#) to [176](#).

CR 64 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 64-1-1	1.5	561	842	-	-	178	110	200	91	-
CR 64-1	1.5	561	842	-	-	178	110	200	102	-
CR 64-2-2	1.5	644	925	-	-	178	110	200	114	-
CR 64-2-1	1.5	754	1035	-	-	178	110	200	149	-
CR 64-2	1.5	754	1035	-	-	178	110	200	149	-
CR 64-3-2	2.2	836	1157	-	-	198	120	250	174	-
CR 64-3-1	2.2	836	1157	-	-	198	120	250	174	-
CR 64-3	2.2	836	1157	-	-	198	120	250	204	-
CR 64-4-2	3	919	1254	-	-	198	120	250	213	-
CR 64-4-1	3	919	1254	-	-	198	120	250	244	-
CR 64-4	3	919	1254	-	-	198	120	250	244	-
CR 64-5-2	3	1001	1336	-	-	198	120	250	315	-
CR 64-5-1	4	1001	1373	-	-	220	134	250	316	-
CR 64-5	4	1001	1373	-	-	220	134	250	316	-
CR 64-6-2	4	1084	1456	-	-	220	134	250	336	-
CR 64-6-1	4	1084	1456	-	-	220	134	250	356	-
CR 64-6	4	1084	1456	-	-	220	134	250	356	-
CR 64-7-2	5.5	1166	1557	-	-	260	159	300	385	-
CR 64-7-1	5.5	1166	1557	-	-	260	159	300	385	-
CR 64-7	5.5	1166	1557	-	-	260	159	300	449	-
CR 64-8-2	5.5	1249	1640	-	-	260	159	300	482	-

4-pole CR 90 pumps are also available as CRN pumps with PJE connection.

For information about electrical data, see pages [173](#) to [176](#).

CR 95 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 95-1	5.5	689	1068	-	-	260	159	300	151	-	
CR 95-2	5.5	793	1172	-	-	260	159	300	157	-	
CR 95-3	5.5	898	1277	-	-	260	159	300	163	-	
CR 95-4	5.5	1002	1381	-	-	260	159	300	169	-	
CR 95-5	5.5	1107	1486	-	-	260	159	300	175	-	
CR 95-6	5.5	1211	1590	-	-	260	159	300	181	-	
CR 95-7	7.5	1316	1745	-	-	260	159	300	203	-	
CR 95-8	11	1422	1948	-	-	318	204	350	251	-	
CR 95-9	11	1527	2053	-	-	318	204	350	257	-	
CR 95-10	11	1631	2157	-	-	318	204	350	262	-	
CR 95-11	11	1736	2262	-	-	318	204	350	268	-	
CR 95-12	15	1840	2392	-	-	318	204	350	296	-	

For information about electrical data, see pages 173 to 176.

CR 125 with 4-pole motor, 50 HZ

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 125-1	11	783	1309	-	-	318	204	350	254	-	
CR 125-2	11	905	1431	-	-	318	204	350	264	-	
CR 125-3	11	1027	1553	-	-	318	204	350	275	-	
CR 125-4	11	1149	1675	-	-	318	204	350	285	-	
CR 125-5	11	1271	1797	-	-	318	204	350	295	-	
CR 125-6	11	1393	1919	-	-	318	204	350	305	-	
CR 125-7	11	1515	2041	-	-	318	204	350	316	-	
CR 125-8	11	1637	2163	-	-	318	204	350	326	-	
CR 125-9	15	1759	2311	-	-	318	204	350	358	-	
CR 125-10	15	1881	2433	-	-	318	204	350	368	-	
CR 125-11	15	2003	2555	-	-	318	204	350	379	-	
CR 125-12	18.5	2125	2683	-	-	368	286	350	259	-	

For information about electrical data, see pages 173 to 176.

CR 155 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 155-1	11	783	1309	-	-	318	204	350	255	-	
CR 155-2	11	905	1431	-	-	318	204	350	265	-	
CR 155-3	11	1027	1553	-	-	318	204	350	276	-	
CR 155-4	11	1149	1675	-	-	318	204	350	287	-	
CR 155-5	11	1271	1797	-	-	318	204	350	298	-	
CR 155-6	11	1393	1919	-	-	318	204	350	308	-	
CR 155-7	15	1515	2067	-	-	318	204	350	341	-	
CR 155-8	15	1637	2189	-	-	318	204	350	352	-	
CR 155-9	18.5	1759	2317	-	-	368	286	350	232	-	
CR 155-10	18.5	1881	2439	-	-	368	286	350	243	-	
CR 155-11	22	2003	2591	-	-	368	286	350	254	-	
CR 155-12	22	2125	2713	-	-	368	286	350	265	-	

For information about electrical data, see pages 173 to 176.

CR 185 with 4-pole motor, 50 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CR 185-1	11	854	1380	-	-	318	204	350	341	-	
CR 185-2	11	982	1508	-	-	318	204	350	356	-	
CR 185-3	11	1110	1636	-	-	318	204	350	371	-	
CR 185-4	11	1238	1764	-	-	318	204	350	385	-	
CR 185-5	15	1366	1918	-	-	318	204	350	422	-	
CR 185-6	18.5	1494	2052	-	-	368	286	350	308	-	
CR 185-7	18.5	1622	2180	-	-	368	286	350	323	-	
CR 185-8	22	1750	2338	-	-	368	286	350	337	-	
CR 185-9	30	1882	2518	-	-	408	315	400	354	-	

For information about electrical data, see pages [173](#) to [176](#).

CR 1 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		DIN flange		Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2				
CR 1-2	0.25	279	470	254	445	141	109	105	22
CR 1-3	0.25	279	470	254	445	141	109	105	22
CR 1-4	0.25	297	488	272	463	141	109	105	22
CR 1-5	0.25	315	506	290	481	141	109	105	23
CR 1-6	0.25	333	524	308	499	141	109	105	24
CR 1-7	0.25	357	548	332	523	141	109	105	26
CR 1-8	0.25	375	566	350	541	141	109	105	26
CR 1-9	0.25	393	584	368	559	141	109	105	27
CR 1-10	0.25	411	602	386	577	141	109	105	29
CR 1-11	0.25	429	620	404	595	141	109	105	30
CR 1-12	0.25	447	638	422	613	141	109	105	30
CR 1-13	0.25	465	656	440	631	141	109	105	30
CR 1-15	0.25	517	708	492	683	141	109	105	38
CR 1-17	0.25	553	744	528	719	141	109	105	39
CR 1-19	0.25	589	780	-	-	141	109	105	41
CR 1-21	0.25	625	816	-	-	141	109	105	41
CR 1-23	0.25	661	852	-	-	141	109	105	42
CR 1-25	0.25	697	888	-	-	141	109	105	43
CR 1-27	0.37	737	928	-	-	141	109	105	49

4-pole CR 1 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 3 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR							
		Dimension [mm]						Net weight [kg]	
		DIN flange		Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2				
CR 3-2	0.25	279	470	254	445	141	109	105	22
CR 3-3	0.25	279	470	254	445	141	109	105	23
CR 3-4	0.25	297	488	272	463	141	109	105	23
CR 3-5	0.25	321	512	296	487	141	109	105	25
CR 3-6	0.25	339	530	314	505	141	109	105	28
CR 3-7	0.25	357	548	332	523	141	109	105	28
CR 3-8	0.25	375	566	350	541	141	109	105	28
CR 3-9	0.25	409	600	384	575	141	109	105	36
CR 3-10	0.25	427	618	402	593	141	109	105	36
CR 3-11	0.25	445	636	420	611	141	109	105	37
CR 3-12	0.25	463	654	438	629	141	109	105	38
CR 3-13	0.25	481	672	456	647	141	109	105	38
CR 3-15	0.25	517	708	492	683	141	109	105	39
CR 3-17	0.37	553	744	528	719	141	109	105	41
CR 3-19	0.37	593	784	-	-	141	109	105	46
CR 3-21	0.37	629	820	-	-	141	109	105	47
CR 3-23	0.37	665	856	-	-	141	109	105	47
CR 3-25	0.55	701	932	-	-	141	109	120	58

4-pole CR 3 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 5 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 5-2	0.25	279	470	254	445	141	109	105	22	18
CR 5-3	0.25	312	503	287	478	141	109	105	27	22
CR 5-4	0.25	339	530	314	505	141	109	105	27	23
CR 5-5	0.25	382	573	357	548	141	109	105	35	31
CR 5-6	0.25	409	600	384	575	141	109	105	36	32
CR 5-7	0.25	436	627	411	602	141	109	105	37	32
CR 5-8	0.25	463	654	438	629	141	109	105	37	33
CR 5-9	0.25	490	681	465	656	141	109	105	38	33
CR 5-10	0.37	521	712	496	687	141	109	105	44	39
CR 5-11	0.37	548	739	523	714	141	109	105	44	40
CR 5-12	0.37	575	766	550	741	141	109	105	45	40
CR 5-13	0.37	602	793	577	768	141	109	105	56	52
CR 5-14	0.55	629	860	604	835	141	109	120	56	52
CR 5-15	0.55	656	887	631	862	141	109	120	57	52
CR 5-16	0.55	683	914	658	889	141	109	120	57	53
CR 5-18	0.55	767	998	-	-	141	109	120	73	-
CR 5-20	0.75	821	1052	-	-	141	109	120	74	-
CR 5-22	0.75	875	1106	-	-	141	109	120	75	-
CR 5-24	0.75	929	1160	-	-	141	109	120	78	-

4-pole CR 5 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 10 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 10-1	0.25	347	538	347	538	141	109	105	35	32
CR 10-2	0.25	363	554	363	554	141	109	105	44	42
CR 10-3	0.25	393	584	393	584	141	109	105	46	43
CR 10-4	0.37	428	619	428	619	141	109	105	52	49
CR 10-5	0.37	458	649	458	649	141	109	105	53	50
CR 10-6	0.55	488	719	488	719	141	109	120	64	61
CR 10-7	0.55	550	781	550	781	141	109	120	86	83
CR 10-8	0.75	580	811	580	811	141	109	120	87	84
CR 10-9	0.75	610	841	610	841	141	109	120	88	85
CR 10-10	0.75	640	871	640	871	141	109	120	91	88
CR 10-12	1.1	700	981	-	-	178	110	135	89	-
CR 10-14	1.1	837	1118	-	-	178	110	135	122	-
CR 10-16	1.5	897	1178	-	-	178	110	135	129	-
CR 10-17	1.5	957	1238	-	-	178	110	135	131	-

4-pole CR 10 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 15 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 15-1	0.25	415	606	415	606	141	109	105	48	47
CR 15-2	0.37	420	611	420	611	141	109	105	54	53
CR 15-3	0.55	465	696	465	696	141	109	120	65	64
CR 15-4	0.75	542	773	542	773	141	109	120	87	86
CR 15-5	1.1	587	868	587	868	178	110	135	87	86
CR 15-6	1.1	709	990	-	-	178	110	135	119	-
CR 15-7	1.5	754	1035	-	-	178	110	135	125	-
CR 15-8	1.5	799	1080	-	-	178	110	135	127	-
CR 15-9	2.2	844	1179	-	-	198	120	160	143	-
CR 15-10	2.2	889	1224	-	-	198	120	160	145	-
CR 15-12	2.2	979	1314	-	-	198	120	160	178	-

4-pole CR 15 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 20 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 20-1	0.25	415	606	415	606	141	109	105	49	48
CR 20-2	0.55	420	651	420	651	141	109	120	64	63
CR 20-3	0.75	497	728	497	728	141	109	120	86	85
CR 20-4	1.1	542	823	542	823	178	110	135	85	84
CR 20-5	1.5	664	945	664	945	178	110	135	122	121
CR 20-6	1.5	709	990	-	-	178	110	135	124	-
CR 20-7	2.2	754	1089	-	-	198	120	160	139	-
CR 20-8	2.2	799	1134	-	-	198	120	160	141	-
CR 20-10	3	889	1224	-	-	198	120	160	174	-

4-pole CR 20 pumps are also available as CRI and CRN pumps with PJE and CA connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 32 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 32-1-1	1.5	505	786	-	-	178	110	135	62	-
CR 32-1	1.5	505	786	-	-	178	110	135	66	-
CR 32-2-2	1.5	575	856	-	-	178	110	135	98	-
CR 32-2-1	1.5	575	856	-	-	178	110	135	98	-
CR 32-2	1.5	575	856	-	-	178	110	135	100	-
CR 32-3-2	1.5	755	1036	-	-	178	110	135	144	-
CR 32-3	1.5	755	1036	-	-	178	110	135	144	-
CR 32-4-2	1.5	825	1106	-	-	178	110	135	152	-
CR 32-4	2.2	825	1160	-	-	198	120	160	166	-
CR 32-5-2	2.2	895	1230	-	-	198	120	160	169	-
CR 32-5	2.2	895	1230	-	-	198	120	160	199	-
CR 32-6-2	2.2	965	1300	-	-	198	120	160	202	-
CR 32-6	2.2	965	1300	-	-	198	120	160	202	-
CR 32-7-2	3	1035	1370	-	-	198	120	160	235	-
CR 32-7	3	1035	1370	-	-	198	120	160	235	-
CR 32-8-2	3	1105	1440	-	-	198	120	160	304	-
CR 32-8	3	1105	1440	-	-	198	120	160	304	-
CR 32-9-2	4	1175	1547	-	-	220	134	160	308	-
CR 32-9	4	1175	1547	-	-	220	134	160	308	-
CR 32-10-2	4	1245	1617	-	-	220	134	160	311	-

4-pole CR 32 pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 45 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 45-1-1	1.5	559	840	-	-	178	110	135	102	-
CR 45-1	1.5	559	840	-	-	178	110	135	104	-
CR 45-2-2	1.5	749	1030	-	-	178	110	135	145	-
CR 45-2-1	1.5	749	1030	-	-	178	110	135	145	-
CR 45-2	2.2	749	1084	-	-	198	120	160	159	-
CR 45-3-2	2.2	829	1164	-	-	198	120	160	193	-
CR 45-3-1	2.2	829	1164	-	-	198	120	160	193	-
CR 45-3	2.2	829	1164	-	-	198	120	160	193	-
CR 45-4-2	3	909	1244	-	-	198	120	160	229	-
CR 45-4-1	3	909	1244	-	-	198	120	160	295	-
CR 45-4	3	909	1244	-	-	198	120	160	295	-
CR 45-5-2	4	989	1361	-	-	220	134	160	301	-
CR 45-5-1	4	989	1361	-	-	220	134	160	301	-
CR 45-5	4	989	1361	-	-	220	134	160	301	-
CR 45-6-2	4	1069	1441	-	-	220	134	160	326	-
CR 45-6-1	5.5	1069	1448	-	-	260	159	300	335	-
CR 45-6	5.5	1069	1448	-	-	260	159	300	335	-
CR 45-7-2	5.5	1149	1528	-	-	260	159	300	414	-
CR 45-7-1	5.5	1149	1528	-	-	260	159	300	414	-
CR 45-7	5.5	1149	1528	-	-	260	159	300	414	-

4-pole CR 45 pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 64 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange				Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2				Oval flange
CR 64-1-1	1.5	561	842	-	-	-	-	178	110	135	104
CR 64-1	1.5	671	952	-	-	-	-	178	110	135	139
CR 64-2-2	2.2	754	1089	-	-	-	-	198	120	160	163
CR 64-2-1	2.2	754	1089	-	-	-	-	198	120	160	193
CR 64-2	3	754	1089	-	-	-	-	198	120	160	223
CR 64-3-2	3	836	1171	-	-	-	-	198	120	160	234
CR 64-3-1	4	836	1208	-	-	-	-	220	134	160	301
CR 64-3	4	836	1208	-	-	-	-	220	134	160	301
CR 64-4-2	4	919	1291	-	-	-	-	220	134	160	331
CR 64-4-1	5.5	919	1298	-	-	-	-	260	159	300	340
CR 64-4	5.5	919	1298	-	-	-	-	260	159	300	404
CR 64-5-2	5.5	1001	1380	-	-	-	-	260	159	300	409

4-pole CR 64 pumps are also available as CRN pumps with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CR 95 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange				Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2				Oval flange
CR 95-1	5.5	689	1068	-	-	-	-	260	159	300	151
CR 95-2	5.5	793	1172	-	-	-	-	260	159	300	157
CR 95-3	5.5	898	1277	-	-	-	-	260	159	300	163
CR 95-4	7.5	1002	1431	-	-	-	-	260	159	300	185
CR 95-5	11	1109	1635	-	-	-	-	318	204	350	233
CR 95-6	11	1213	1739	-	-	-	-	318	204	350	239
CR 95-7	15	1318	1870	-	-	-	-	318	204	350	267
CR 95-8	15	1422	1974	-	-	-	-	318	204	350	273
CR 95-9	15	1527	2079	-	-	-	-	318	204	350	279
CR 95-10	18.5	1631	2189	-	-	-	-	368	286	350	156
CR 95-11	18.5	1736	2294	-	-	-	-	368	286	350	162
CR 95-12	22	1840	2428	-	-	-	-	368	286	350	168

For information about electrical data, see pages [173](#) to [176](#).

CR 125 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR									
		Dimension [mm]						Net weight [kg]			
		DIN flange				Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2				Oval flange
CR 125-1	11	783	1309	-	-	-	-	318	204	350	254
CR 125-2	11	905	1431	-	-	-	-	318	204	350	264
CR 125-3	11	1027	1553	-	-	-	-	318	204	350	275
CR 125-4	11	1149	1675	-	-	-	-	318	204	350	285
CR 125-5	15	1271	1823	-	-	-	-	318	204	350	317
CR 125-6	15	1393	1945	-	-	-	-	318	204	350	327
CR 125-7	18.5	1515	2073	-	-	-	-	368	286	350	209
CR 125-8	18.5	1637	2195	-	-	-	-	368	286	350	219
CR 125-9	22	1759	2347	-	-	-	-	368	286	350	229
CR 125-10	30	1883	2519	-	-	-	-	408	315	400	243
CR 125-11	30	2005	2641	-	-	-	-	408	315	400	253
CR 125-12	30	2127	2763	-	-	-	-	408	315	400	264

For information about electrical data, see pages [173](#) to [176](#).

CR 155 with 4-pole motor, 60 Hz

Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 155-1	11	783	1309	-	-	318	204	350	255	-
CR 155-2	11	905	1431	-	-	318	204	350	265	-
CR 155-3	11	1027	1553	-	-	318	204	350	276	-
CR 155-4	15	1149	1701	-	-	318	204	350	309	-
CR 155-5	18.5	1271	1829	-	-	368	286	350	191	-
CR 155-6	18.5	1393	1951	-	-	368	286	350	201	-
CR 155-7	22	1515	2103	-	-	368	286	350	212	-
CR 155-8	30	1639	2275	-	-	408	315	400	227	-
CR 155-9	30	1761	2397	-	-	408	315	400	237	-
CR 155-10	37	1906	2616	-	-	449	338	450	263	-
CR 155-11	37	2028	2738	-	-	449	338	450	274	-
CR 155-12	37	2150	2860	-	-	449	338	450	284	-

For information about electrical data, see pages [173](#) to [176](#).

CR 185 with 4-pole motor, 60 Hz

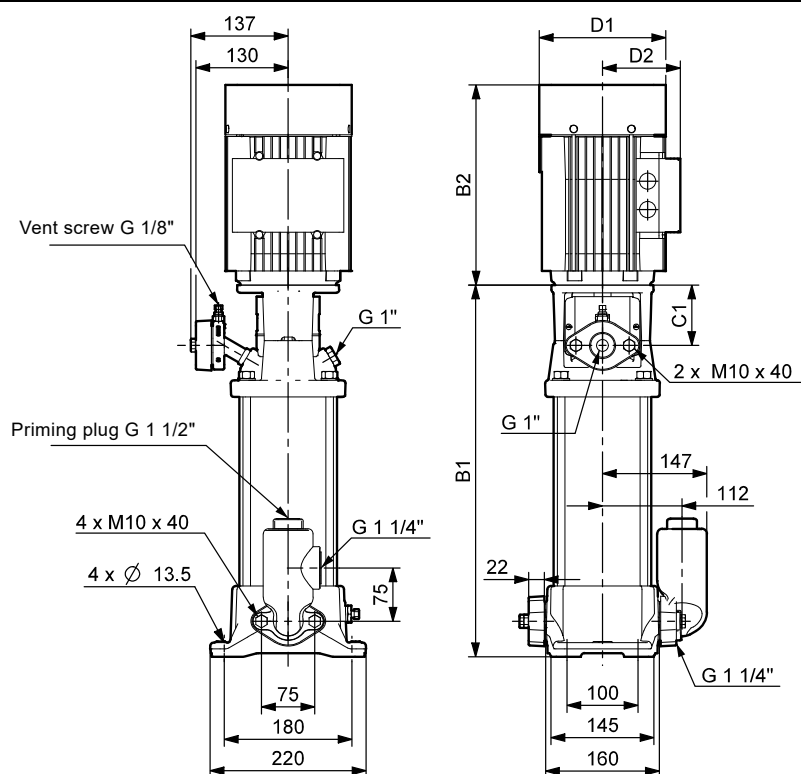
Pump type	Motor P2 [kW]	CR								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CR 185-1	11	854	1380	-	-	318	204	350	341	-
CR 185-2	11	982	1508	-	-	318	204	350	356	-
CR 185-3	15	1110	1662	-	-	318	204	350	393	-
CR 185-4	18.5	1238	1796	-	-	368	286	350	279	-
CR 185-5	30	1370	2006	-	-	408	315	400	296	-
CR 185-6	30	1498	2134	-	-	408	315	400	311	-
CR 185-7	37	1626	2262	-	-	408	315	400	325	-
CR 185-8	37	1774	2484	-	-	449	338	450	355	-
CR 185-9	45	1902	2610	-	-	449	338	450	369	-

For information about electrical data, see pages [173](#) to [176](#).

CR deep-well pumps

Dimensional drawing

CR 5



TM03 8261 0907

CR deep-well pumps, 50 Hz

Dimensions and weights

Pump	Motor P2 [kW]	Dimensions [mm]					Suction depth [m]	Flow rate [m ³ /h]	Ejector No	Pressure class, plastic pipe [kp/cm ²]	Pipe dimensions [mm]		Largest ejector diameter [mm]
		B1	B1 + B2	C1	D1	D2					Ejector inlet: external/internal	Ejector outlet: external/internal	
CR(I) 5-9	1.5	465	746	85	178	110	54	0.25	11	6 + 6	32/26	40/32.6	76
							42	0.68	29	6 + 6	32/26	40/32.6	76
							35	0.92	20	6 + 6	32/26	40/32.6	76
							27	1.25	22	6 + 6	32/26	40/32.6	76
CR(I) 5-11	2.2	519	840	85	178	110	65	0.25	11	10 + 10	32/22.8	40/28.4	80
							50	0.62	29	10 + 6	32/22.8	40/32.6	76
							45	0.85	20	6 + 6	32/26	40/32.6	76
							40	1.10	22	6 + 6	32/26	40/32.6	76
							35	1.37	44	6 + 6	32/26	40/32.6	76
							28	1.75	45	6 + 6	32/26	40/32.6	76
CR(I) 5-13	2.2	573	894	85	178	110	79	0.25	11	10 + 10	32/22.8	40/28.4	80
							63	0.62	29	10 + 10	32/22.8	40/28.4	80
							54	0.87	20	10 + 6	32/22.8	40/32.6	76
							45	1.17	22	10 + 6	32/22.8	40/32.6	76
							40	1.39	44	6 + 6	32/26	40/32.6	76
							33	1.99	45	6 + 6	32/26	40/32.6	76
CR(I) 5-15	2.2	627	948	85	178	110	93	0.25	11	10 + 10	32/22.8	40/28.4	80
							73	0.63	29	10 + 10	32/22.8	40/28.4	80
							62	0.88	20	10 + 10	32/22.8	40/28.4	80
							53	1.14	22	10 + 6	32/22.8	40/32.6	76
							46	1.40	44	10 + 6	32/22.8	40/32.6	76
							37	1.99	45	10 + 6	32/22.8	40/32.6	76

For information about electrical data, see pages 173 to 176.

CR deep-well pumps, 60 Hz

Dimensions and weights

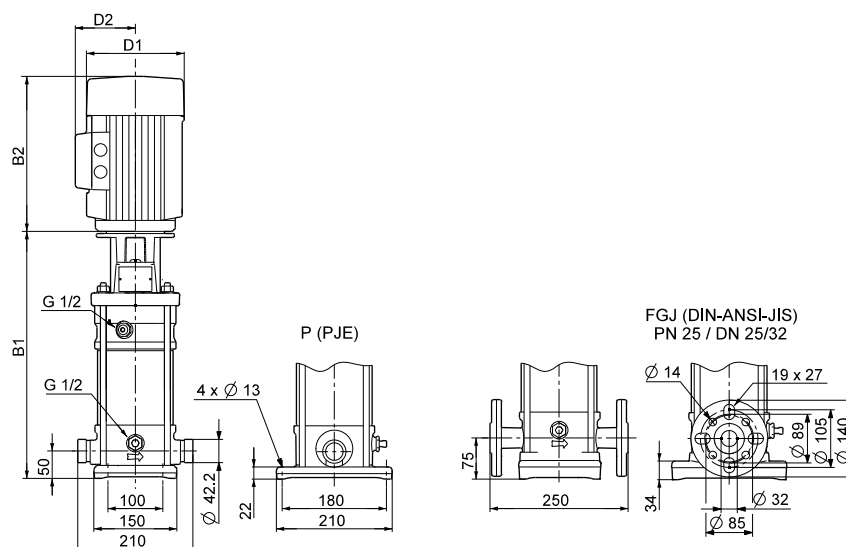
Pump	Motor P2 [kW]	Dimensions [mm]					Suction depth, [m]	Flow rate [m ³ /h]	Ejector No	Pressure class, plastic pipe [kp/cm ²]	Pipe dimensions [mm]		Largest ejector diameter [mm]
		B1	B1 + B2	C1	D1	D2					Ejector inlet: external/internal	Ejector outlet: external/internal	
CR(I) 5-6	2.2	384	705	85	179	110	52	0.33	11	6 + 6	32/26	40/32.6	76
							45	0.69	29	6 + 6	32/26	40/32.6	76
							41	0.91	20	6 + 6	32/26	40/32.6	76
							37	1.16	22	6 + 6	32/26	40/32.6	76
							34	1.35	44	6 + 6	32/26	40/32.6	76
							30	1.65	45	6 + 6	32/26	40/32.6	76
CR(I) 5-8	2.2	438	759	85	179	110	65	0.38	11	10 + 10	32/22.8	40/28.4	80
							60	0.60	29	10 + 6	32/22.8	40/32.6	76
							53	0.94	20	6 + 6	32/26	40/32.6	76
							50	1.10	22	6 + 6	32/26	40/32.6	76
							45	1.37	44	6 + 6	32/26	40/32.6	76
CR(I) 5-9	2.2	465	786	85	179	110	73	0.37	11	10 + 10	32/22.8	40/28.4	80
							65	0.68	29	10 + 10	32/22.8	40/28.4	80
							60	0.88	20	10 + 6	32/22.8	40/32.6	76
							55	1.11	22	10 + 6	32/22.8	40/32.6	76
							50	1.39	44	6 + 6	32/26	40/32.6	76
							47	1.63	45	6 + 6	32/26	40/32.6	76

For information about electrical data, see pages 173 to 176.

CRN pumps with magnetic drive

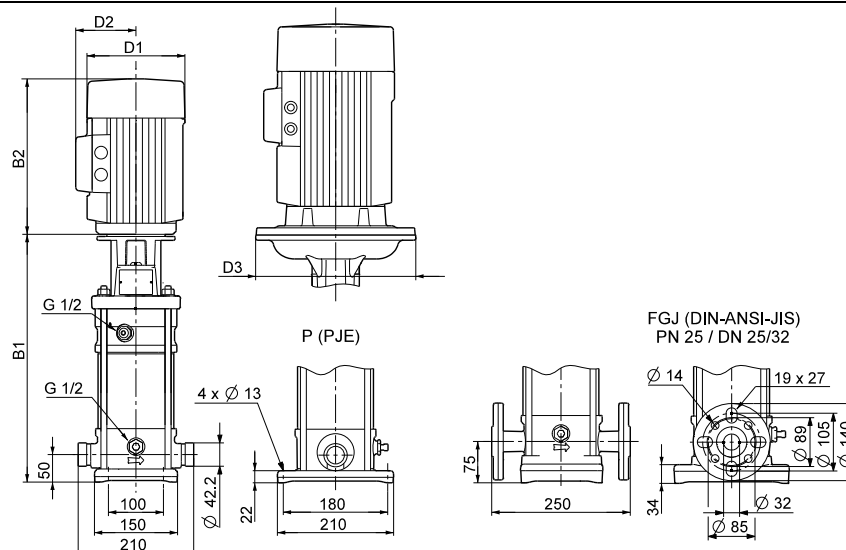
Dimensional drawings

CRN 1
CRN 3



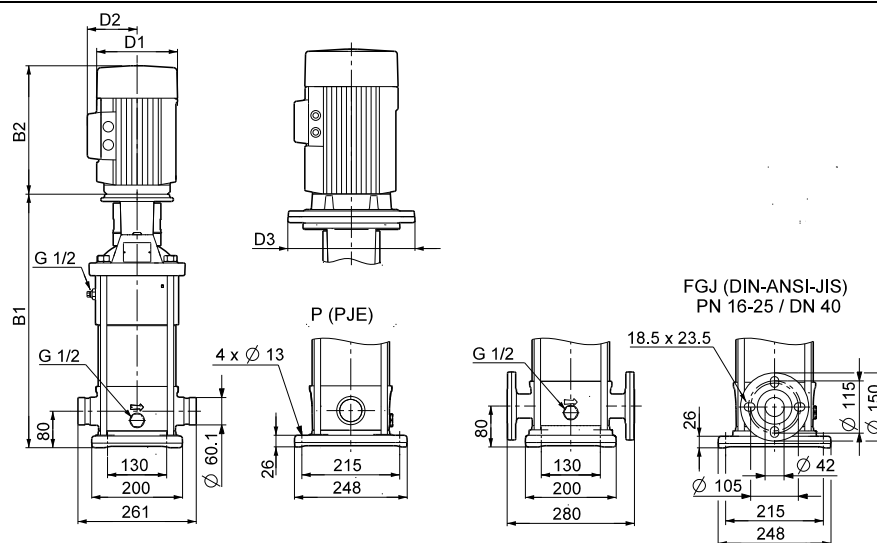
TM03 9137 3407

CRN 5

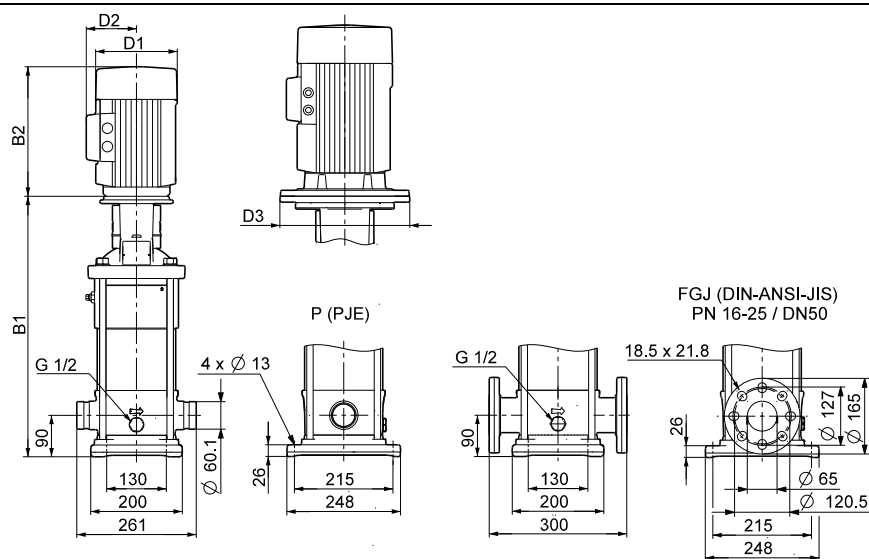


TM03 9138 3407

CRN 10

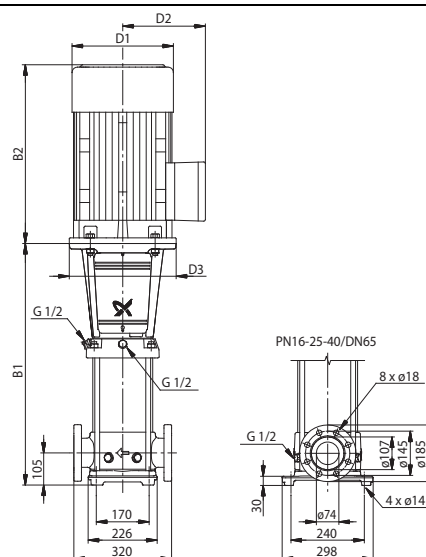


TM03 9140 3407

CRN 15
CRN 20

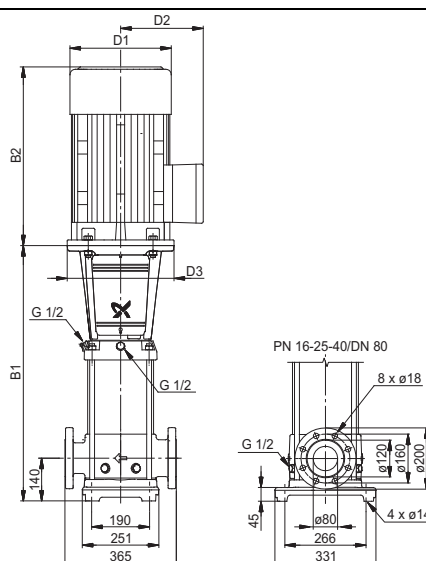
TM03 9139 3407

CRN 32



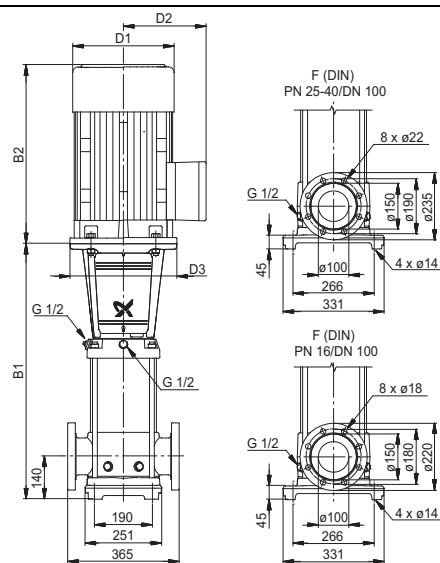
TM01 1750 2203

CRN 45



TM01 1752 2203

CRN 64



TM01 1754 0904

CRN pumps with magnetic drive

Dimensions and weights

CRN 1s - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CRN 1s-2	0.37	367	558	342	533	141	109	-	24	20	
CRN 1s-3	0.37	367	558	342	533	141	109	-	25	20	
CRN 1s-4	0.37	385	576	360	551	141	109	-	25	21	
CRN 1s-5	0.37	403	594	378	569	141	109	-	25	21	
CRN 1s-6	0.37	421	612	396	587	141	109	-	26	22	
CRN 1s-7	0.37	439	630	414	605	141	109	-	26	22	
CRN 1s-8	0.37	457	648	432	623	141	109	-	27	22	
CRN 1s-9	0.37	475	666	450	641	141	109	-	27	23	
CRN 1s-10	0.37	493	684	468	659	141	109	-	27	23	
CRN 1s-11	0.55	511	702	486	677	141	109	-	29	24	
CRN 1s-12	0.55	529	720	504	695	141	109	-	29	25	
CRN 1s-13	0.55	547	738	522	713	141	109	-	30	25	
CRN 1s-15	0.55	583	774	558	749	141	109	-	30	26	
CRN 1s-17	0.55	619	810	594	785	141	109	-	31	27	
CRN 1s-19	0.75	655	886	630	861	141	109	-	33	28	
CRN 1s-21	0.75	697	928	672	903	141	109	-	35	30	
CRN 1s-23	0.75	733	964	708	939	141	109	-	35	31	
CRN 1s-25	1.1	769	1000	744	975	141	109	-	39	35	
CRN 1s-27	1.1	805	1036	780	1011	141	109	-	39	35	
CRN 1s-30	1.1	859	1090	834	1065	141	109	-	40	36	
CRN 1s-33	1.1	913	1144	888	1119	141	109	-	41	37	
CRN 1s-36	1.1	967	1198	942	1173	141	109	-	43	38	

For information about electrical data, see pages [173](#) to [176](#).

CRN 1 - MAGdrive, 50 Hz

Pump type		Motor P2 [kW]		CRN MAGdrive							
				Dimension [mm]					Net weight [kg]		
				DIN flange		Oval flange		D1	D2	D3	DIN flange
B1	B1 + B2	B1	B1 + B2								
CRN 1-2	0.37	367	558	342	533	141	109	-	24	20	
CRN 1-3	0.37	367	558	342	533	141	109	-	25	20	
CRN 1-4	0.37	385	576	360	551	141	109	-	25	21	
CRN 1-5	0.37	403	594	378	569	141	109	-	25	21	
CRN 1-6	0.37	421	612	396	587	141	109	-	26	22	
CRN 1-7	0.55	439	630	414	605	141	109	-	26	22	
CRN 1-8	0.55	457	648	432	623	141	109	-	27	22	
CRN 1-9	0.55	475	666	450	641	141	109	-	27	23	
CRN 1-10	0.55	493	684	468	659	141	109	-	27	23	
CRN 1-11	0.75	511	702	486	677	141	109	-	29	24	
CRN 1-12	0.75	535	720	504	695	141	109	-	29	25	
CRN 1-13	0.75	553	738	522	713	141	109	-	30	25	
CRN 1-15	0.75	589	774	558	749	141	109	-	30	26	
CRN 1-17	1.1	625	810	594	785	141	109	-	31	27	
CRN 1-19	1.1	661	886	630	861	141	109	-	33	28	
CRN 1-21	1.1	697	928	672	903	141	109	-	35	30	
CRN 1-23	1.1	733	964	708	939	141	109	-	35	31	
CRN 1-25	1.5	785	1000	744	975	141	109	-	39	35	
CRN 1-27	1.5	821	1036	780	1011	141	109	-	39	35	
CRN 1-30	1.5	875	1090	834	1065	141	109	-	40	36	
CRN 1-33	2.2	929	1144	888	1119	141	109	-	41	37	
CRN 1-36	2.2	983	1198	942	1173	141	109	-	43	38	

For information about electrical data, see pages [173](#) to [176](#).

CRN 3 - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CRN 3-2	0.37	367	558	342	533	141	109	-	24	20	
CRN 3-3	0.37	367	558	342	533	141	109	-	25	20	
CRN 3-4	0.37	385	576	360	551	141	109	-	25	21	
CRN 3-5	0.55	403	594	378	569	141	109	-	26	22	
CRN 3-6	0.55	421	612	396	587	141	109	-	27	22	
CRN 3-7	0.55	439	630	414	605	141	109	-	27	23	
CRN 3-8	0.75	463	694	438	669	141	109	-	30	25	
CRN 3-9	0.75	481	712	456	687	141	109	-	30	26	
CRN 3-10	0.75	499	730	474	705	141	109	-	30	26	
CRN 3-11	1.1	517	748	492	723	141	109	-	33	29	
CRN 3-12	1.1	535	766	510	741	141	109	-	33	29	
CRN 3-13	1.1	553	784	528	759	141	109	-	34	30	
CRN 3-15	1.1	589	820	564	795	141	109	-	35	30	
CRN 3-17	1.5	641	922	616	897	178	110	-	43	39	
CRN 3-19	1.5	677	958	652	933	178	110	-	44	39	
CRN 3-21	2.2	713	1034	688	1009	178	110	-	45	41	
CRN 3-23	2.2	749	1070	724	1045	178	110	-	46	42	
CRN 3-25	2.2	785	1106	760	1081	178	110	-	47	42	
CRN 3-27	2.2	821	1142	796	1117	178	110	-	47	43	
CRN 3-29	2.2	857	1178	832	1153	178	110	-	48	44	
CRN 3-31	3	897	1232	872	1207	198	120	-	53	49	
CRN 3-33	3	933	1268	908	1243	198	120	-	54	50	
CRN 3-36	3	987	1322	962	1297	198	120	-	55	51	

For information about electrical data, see pages 173 to 176.

CRN 5 - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CRN 5-2	0.37	367	558	342	533	141	109	-	26	21	
CRN 5-3	0.55	394	585	369	560	141	109	-	27	23	
CRN 5-4	0.75	421	652	396	627	141	109	-	28	24	
CRN 5-5	0.75	454	685	429	660	141	109	-	30	26	
CRN 5-6	1.1	481	712	456	687	141	109	-	33	29	
CRN 5-7	1.1	508	739	483	714	141	109	-	33	29	
CRN 5-8	1.1	535	766	510	741	141	109	-	34	30	
CRN 5-9	1.5	578	859	553	834	178	110	-	41	37	
CRN 5-10	1.5	605	886	580	861	178	110	-	42	37	
CRN 5-11	2.2	632	953	607	928	178	110	-	43	39	
CRN 5-12	2.2	659	980	634	955	178	110	-	43	39	
CRN 5-13	2.2	686	1007	661	982	178	110	-	44	40	
CRN 5-14	2.2	713	1034	688	1009	178	110	-	45	40	
CRN 5-15	2.2	740	1061	715	1036	178	110	-	45	41	
CRN 5-16	3	767	1102	742	1077	178	110	-	49	44	
CRN 5-18	3	825	1160	800	1135	198	120	-	51	47	
CRN 5-20	3	879	1214	854	1189	198	120	-	52	48	
CRN 5-22	4	933	1305	908	1280	220	134	-	65	61	
CRN 5-24	4	987	1359	962	1334	220	134	-	67	62	
CRN 5-26	4	1041	1413	1016	1388	220	134	-	68	64	
CRN 5-29	5.5	1122	1513	1097	1488	220	134	300	77	72	
CRN 5-32	5.5	1254	1645	1229	1620	220	134	300	92	88	
CRN 5-36	5.5	1362	1753	1337	1728	220	134	300	94	90	

For information about electrical data, see pages 173 to 176.

CRN 10 - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CRN 10-1	0.55	443	634	443	634	141	109	-	40	36
CRN 10-2	0.75	447	678	447	678	141	109	-	41	38
CRN 10-3	1.1	477	708	477	708	141	109	-	45	41
CRN 10-4	1.5	523	804	523	804	178	110	-	53	49
CRN 10-5	2.2	553	874	553	874	178	110	-	55	51
CRN 10-6	2.2	583	904	583	904	178	110	-	56	52
CRN 10-7	3	618	953	618	953	198	120	-	61	57
CRN 10-8	3	648	983	648	983	198	120	-	62	59
CRN 10-9	4	678	1050	678	1050	198	120	-	74	71
CRN 10-10	4	708	1080	708	1080	220	134	-	74	71
CRN 10-12	5.5	768	1159	768	1159	220	134	300	76	73
CRN 10-14	5.5	860	1251	860	1251	220	134	300	99	95
CRN 10-16	5.5	920	1311	920	1311	220	134	300	101	97
CRN 10-18	7.5	980	1359	980	1359	260	159	300	121	118
CRN 10-20	7.5	1040	1419	1040	1419	260	159	300	123	120
CRN 10-22	11	1100	1571	1100	1571	314	204	350	191	157

For information about electrical data, see pages [173](#) to [176](#).**CRN 15 - MAGdrive, 50 Hz**

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CRN 15-1	1.1	490	721	490	721	141	109	-	45	40
CRN 15-2	2.2	505	826	505	826	178	110	-	53	48
CRN 15-3	3	555	890	555	890	198	120	-	59	54
CRN 15-4	4	600	972	600	972	220	134	-	71	67
CRN 15-5	5.5	645	1036	645	1036	220	134	300	73	68
CRN 15-6	5.5	722	1113	722	1113	220	134	300	95	90
CRN 15-7	7.5	767	1146	767	1146	260	159	300	111	107
CRN 15-8	7.5	812	1191	812	1191	260	159	300	115	110
CRN 15-9	7.5	857	1236	857	1236	260	159	300	117	112
CRN 15-10	11	979	1450	979	1450	314	204	350	141	136
CRN 15-12	11	1069	1540	1069	1540	314	204	350	143	139
CRN 15-14	15	1159	1630	1159	1630	314	204	350	165	161
CRN 15-17	15	1294	1765	1294	1765	314	204	350	184	180

For information about electrical data, see pages [173](#) to [176](#).**CRN 20 - MAGdrive, 50 Hz**

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CRN 20-1	1.1	487	718	487	718	141	109	-	46	41
CRN 20-2	2.2	503	824	503	824	178	110	-	54	49
CRN 20-3	4	553	925	553	925	220	134	-	71	66
CRN 20-4	5.5	630	1021	630	1021	220	134	300	93	88
CRN 20-5	5.5	675	1066	675	1066	220	134	300	94	89
CRN 20-6	7.5	720	1099	720	1099	260	159	300	113	108
CRN 20-7	7.5	765	1144	765	1144	260	159	300	114	110
CRN 20-8	11	887	1358	887	1358	314	204	350	137	132
CRN 20-10	11	977	1448	977	1448	314	204	350	141	136
CRN 20-12	15	1067	1538	1067	1538	314	204	350	176	171
CRN 20-14	15	1157	1628	1157	1628	314	204	350	179	175
CRN 20-17	18.5	1292	1807	1292	1807	314	204	350	206	202

For information about electrical data, see pages [173](#) to [176](#).

CRN 32 - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2			D3
		B1	B1 + B2	B1	B1 + B2					
CRN 32-1-1	1.5	505	786	-	-	178	110	270	69	-
CRN 32-1	2.2	505	826	-	-	178	110	270	69	-
CRN 32-2-2	3	575	910	-	-	198	120	270	76	-
CRN 32-2	4	575	947	-	-	220	134	270	87	-
CRN 32-3-2	5.5	666	1057	-	-	220	134	300	102	-
CRN 32-3	5.5	666	1057	-	-	220	134	300	102	-
CRN 32-4-2	7.5	715	1094	-	-	260	159	300	121	-
CRN 32-4	7.5	715	1094	-	-	260	159	300	121	-
CRN 32-5-2	11	895	1366	-	-	314	204	350	148	-
CRN 32-5	11	895	1366	-	-	314	204	350	148	-
CRN 32-6-2	11	965	1436	-	-	314	204	350	151	-
CRN 32-6	11	965	1436	-	-	314	204	350	151	-
CRN 32-7-2	15	1035	1506	-	-	314	204	350	193	-
CRN 32-7	15	1035	1506	-	-	314	204	350	193	-
CRN 32-8-2	15	1105	1576	-	-	314	204	350	199	-
CRN 32-8	15	1105	1576	-	-	314	204	350	199	-
CRN 32-9-2	18.5	1175	1690	-	-	314	204	350	199	-
CRN 32-9	18.5	1175	1690	-	-	314	204	350	199	-
CRN 32-10-2	18.5	1245	1760	-	-	314	204	350	202	-
CRN 32-10	18.5	1245	1760	-	-	314	204	350	202	-
CRN 32-11-2	22	1315	1856	-	-	314	204	350	276	-
CRN 32-11	22	1315	1856	-	-	314	204	350	176	-
CRN 32-12-2	22	1385	1926	-	-	314	204	350	280	-
CRN 32-12	22	1385	1926	-	-	314	204	350	280	-

CRN 32 pumps are also available with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CRN 45 - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2			D3
		B1	B1 + B2	B1	B1 + B2					
CRN 45-1-1	3	559	894	-	-	198	120	270	81	-
CRN 45-1	4	559	931	-	-	220	134	270	92	-
CRN 45-2-2	5.5	660	1051	-	-	220	134	300	107	-
CRN 45-2	7.5	639	1018	-	-	260	159	300	121	-
CRN 45-3-2	11	829	1300	-	-	314	204	350	153	-
CRN 45-3	11	829	1300	-	-	314	204	350	153	-
CRN 45-4-2	15	909	1380	-	-	314	204	350	185	-
CRN 45-4	15	909	1380	-	-	314	204	350	195	-
CRN 45-5-2	18.5	989	1504	-	-	314	204	350	195	-
CRN 45-5	18.5	989	1504	-	-	314	204	350	195	-
CRN 45-6-2	22	1069	1610	-	-	314	204	350	273	-
CRN 45-6	22	1069	1610	-	-	314	204	350	273	-

CRN 45 pumps are also available with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CRN 64 - MAGdrive, 50 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange			Oval flange			D1	D2	D3
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2			
CRN 64-1-1	4	561	933	-	-	220	134	270	95	-
CRN 64-1	7.5	561	940	-	-	260	159	300	118	-
CRN 64-2-2	11	644	1115	-	-	314	204	350	152	-
CRN 64-2-1	11	754	1225	-	-	314	204	350	152	-
CRN 64-2	15	754	1225	-	-	314	204	350	170	-
CRN 64-3-2	15	836	1307	-	-	314	204	350	193	-
CRN 64-3-1	18.5	836	1351	-	-	314	204	350	191	-
CRN 64-3	18.5	836	1351	-	-	314	204	350	191	-
CRN 64-4-2	22	919	1460	-	-	314	204	350	266	-
CRN 64-4-1	22	919	1460	-	-	314	204	350	266	-

CRN 64 pumps are also available with PJE connection.

For information about electrical data, see pages [173](#) to [176](#).

CRN 1s - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange			Oval flange			D1	D2	D3
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2			
CRN1s-2	0.37	367	558	342	533	141	109	-	24	20
CRN1s-3	0.37	367	558	342	533	141	109	-	25	20
CRN1s-4	0.37	385	576	360	551	141	109	-	25	21
CRN1s-5	0.37	403	594	378	569	141	109	-	25	21
CRN1s-6	0.55	421	612	396	587	141	109	-	27	23
CRN1s-7	0.55	439	630	414	605	141	109	-	27	23
CRN1s-8	0.55	457	648	432	623	141	109	-	28	23
CRN1s-9	0.75	475	666	450	641	141	109	-	29	25
CRN1s-10	0.75	493	684	468	659	141	109	-	29	25
CRN1s-11	0.75	511	702	486	677	141	109	-	30	25
CRN1s-12	0.75	529	720	504	695	141	109	-	30	26
CRN1s-13	0.75	547	738	522	713	141	109	-	31	26
CRN1s-15	1.1	583	774	558	749	141	109	-	40	36
CRN1s-17	1.1	619	810	594	785	141	109	-	40	36
CRN1s-19	1.1	655	886	630	861	141	109	-	41	36
CRN1s-21	1.5	713	994	688	969	178	110	-	44	39
CRN1s-23	1.5	749	1030	724	1005	178	110	-	44	40
CRN1s-25	1.5	785	1066	760	1041	178	110	-	44	40
CRN1s-27	2.2	821	1142	796	1117	178	110	-	45	41

For information about electrical data, see pages [173](#) to [176](#).

CRN 1 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CRN1-2	0.37	367	558	342	533	141	109	-	24	20	
CRN1-3	0.37	367	558	342	533	141	109	-	25	20	
CRN1-4	0.55	385	576	360	551	141	109	-	26	22	
CRN1-5	0.55	403	594	378	569	141	109	-	26	22	
CRN1-6	0.75	421	612	396	587	141	109	-	28	24	
CRN1-7	0.75	439	630	414	605	141	109	-	28	24	
CRN1-8	0.75	457	648	432	623	141	109	-	28	24	
CRN1-9	1.1	475	666	450	641	141	109	-	37	33	
CRN1-10	1.1	493	684	468	659	141	109	-	37	33	
CRN1-11	1.1	511	742	486	717	141	109	-	37	33	
CRN1-12	1.1	535	766	510	741	141	109	-	39	35	
CRN1-13	1.5	569	850	544	825	178	110	-	41	36	
CRN1-15	1.5	605	886	580	861	178	110	-	41	37	
CRN1-17	1.5	641	922	616	897	178	110	-	42	38	
CRN1-19	2.2	677	998	652	973	178	110	-	42	38	
CRN1-21	2.2	713	1034	688	1009	178	110	-	43	39	
CRN1-23	2.2	749	1070	724	1045	178	110	-	44	40	
CRN1-25	3	790	1125	765	1100	198	120	-	54	50	
CRN1-27	3	826	1161	801	1136	198	120	-	55	51	

For information about electrical data, see pages [173](#) to [176](#).

CRN 3 - MAGdrive, 60 Hz

		CRN MAGdrive									
Pump type	Motor P2 [kW]	Dimension [mm]						Net weight [kg]			
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange	
		B1	B1 + B2	B1	B1 + B2						
CRN3-2	0.37	367	558	342	533	141	109	-	24	20	
CRN3-3	0.55	367	558	342	533	141	109	-	26	21	
CRN3-4	0.75	385	576	360	551	141	109	-	27	23	
CRN3-5	0.75	403	594	378	569	141	109	-	27	23	
CRN3-6	1.1	421	612	396	587	141	109	-	36	31	
CRN3-7	1.1	439	630	414	605	141	109	-	36	32	
CRN3-8	1.1	463	694	438	669	141	109	-	38	33	
CRN3-9	1.5	497	778	472	753	178	110	-	39	35	
CRN3-10	1.5	515	796	490	771	178	110	-	39	35	
CRN3-11	1.5	533	814	508	789	178	110	-	39	35	
CRN3-12	2.2	551	872	526	847	178	110	-	39	35	
CRN3-13	2.2	569	890	544	865	178	110	-	40	36	
CRN3-15	2.2	605	926	580	901	178	110	-	41	36	
CRN3-17	3	646	981	621	956	198	120	-	51	47	
CRN3-19	3	682	1017	657	992	198	120	-	52	47	
CRN3-21	3	718	1053	693	1028	198	120	-	52	48	
CRN3-23	4	754	1126	729	1101	198	120	-	69	65	
CRN3-25	4	790	1162	765	1137	198	120	-	70	65	

For information about electrical data, see pages [173](#) to [176](#).

CRN 5 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]							Net weight [kg]		
		DIN flange				Oval flange			D1	D2	D3
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2	B1			
CRN5-2	0.75	367	558	342	533	141	109	-	27	22	
CRN5-3	1.1	394	585	369	560	141	109	-	35	31	
CRN5-4	1.1	421	652	396	627	141	109	-	35	31	
CRN5-5	1.5	470	751	445	726	178	110	-	39	35	
CRN5-6	2.2	497	818	472	793	178	110	-	39	35	
CRN5-7	2.2	524	845	499	820	178	110	-	39	35	
CRN5-8	2.2	551	872	526	847	178	110	-	40	36	
CRN5-9	3	583	918	558	893	198	120	-	49	45	
CRN5-10	3	610	945	585	920	198	120	-	50	45	
CRN5-11	3	637	972	612	947	198	120	-	50	46	
CRN5-12	4	664	1036	639	1011	198	120	-	65	61	
CRN5-13	4	691	1063	666	1038	198	120	-	66	62	
CRN5-14	4	719	1089.6	694	1064.6	198	120	-	67	62	
CRN5-15	4	745	1116.6	720	1091.6	198	120	-	67	62	
CRN5-16	5.5	817	1208.4	792	1183.4	220	134	300	76	71	
CRN5-18	5.5	875	1266.4	850	1241.4	220	134	300	76	72	
CRN5-20	5.5	929	1320.4	904	1295.4	220	134	300	77	73	

For information about electrical data, see pages [173](#) to [176](#).

CRN 10 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]							Net weight [kg]		
		DIN flange				Oval flange			D1	D2	D3
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2	B1			
CRN10-1	0.75	443	634	443	634	141	109	-	41	37	
CRN10-2	1.5	463	743.5	463	743.5	178	110	-	50	47	
CRN10-3	2.2	493	813.5	493	813.5	178	110	-	51	47	
CRN10-4	3	528	863	528	863	198	120	-	61	57	
CRN10-5	4	558	930	558	930	198	120	-	78	74	
CRN10-6	4	588	1026	588	1026	198	120	-	79	75	
CRN10-7	5.5	635	1026	635	1026	220	134	300	86	82	
CRN10-8	5.5	665	1056	665	1056	220	134	300	87	84	
CRN10-9	7.5	695	1074	695	1074	260	159	300	97	94	
CRN10-10	7.5	725	1104	725	1104	260	159	300	97	94	
CRN10-12	7.5	785	1164	785	1164	260	159	300	97	94	
CRN10-14	11	902	1373	902	1373	314	204	350	152	148	
CRN10-16	11	962	1433	962	1433	314	204	350	154	150	

For information about electrical data, see pages [173](#) to [176](#).

CRN 15 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive									
		Dimension [mm]							Net weight [kg]		
		DIN flange				Oval flange			D1	D2	D3
		B1	B1 + B2	B1	B1 + B2	B1	B1 + B2	B1			
CRN15-1	1.5	506	786.5	506	786.5	178	110	-	46	41	
CRN15-2	3	510	845	510	845	198	120	-	56	51	
CRN15-3	5.5	572	963	572	963	220	134	300	75	70	
CRN15-4	7.5	617	996	617	996	260	159	300	87	83	
CRN15-5	7.5	645	1024	645	1024	260	159	300	87	83	
CRN15-6	11	764	1235	764	1235	314	204	350	148	143	
CRN15-7	11	809	1280	809	1280	314	204	350	152	148	
CRN15-8	15	854	1325	854	1325	314	204	350	173	168	
CRN15-9	15	899	1370	899	1370	314	204	350	175	170	
CRN15-10	15	979	1450	979	1450	314	204	350	175	170	
CRN15-12	18.5	1069	1584	1069	1584	314	204	350	169	164	

For information about electrical data, see pages [173](#) to [176](#).

CRN 20 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive							
		Dimension [mm]						Net weight [kg]	
		DIN flange		Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2				
CRN20-1	2.2	503	823.5	503	823.5	178	110	-	52
CRN20-2	4	508	880	508	880	198	120	-	76
CRN20-3	7.5	570	949	570	949	260	159	300	87
CRN20-4	11	740	1211	740	1211	314	204	350	146
CRN20-5	11	785	1256	785	1256	314	204	350	147
CRN20-6	15	830	1301	830	1301	314	204	350	170
CRN20-7	15	875	1346	875	1346	314	204	350	171
CRN20-8	18.5	887	1402	887	1402	314	204	350	163

For information about electrical data, see pages [173](#) to [176](#).

CRN 32 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive							
		Dimension [mm]						Net weight [kg]	
		DIN flange		Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2				
CRN32-1-1	3	505	840	-	-	198	120	-	77
CRN32-1	5.5	505	896	-	-	220	134	300	96
CRN32-2-2	5.5	575	966	-	-	220	134	300	101
CRN 32-2-1	5.5	575	966	-	-	220	134	300	101
CRN32-2	7.5	575	954	-	-	260	159	300	108
CRN32-3-2	11	690	1161	-	-	314	204	350	155
CRN32-3	11	690	1161	-	-	314	204	350	155
CRN32-4-2	15	757	1228	-	-	314	204	350	179
CRN32-4	15	757	1228	-	-	314	204	350	179
CRN32-5-2	15	895	1366	-	-	314	204	350	180
CRN32-5	18.5	895	1410	-	-	314	204	350	172
CRN32-6-2	18.5	965	1480	-	-	314	204	350	172
CRN32-6	22	965	1506	-	-	314	204	350	238
CRN32-7-2	22	1035	1576	-	-	314	204	350	266
CRN32-7	22	1035	1576	-	-	314	204	350	266

CRN 32 pumps are also available with PJE connection.

For information about electrical data, see pages [173](#) to [176](#).

CRN 45 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive							
		Dimension [mm]						Net weight [kg]	
		DIN flange		Oval flange		D1	D2	D3	DIN flange
		B1	B1 + B2	B1	B1 + B2				
CRN45-1-1	5.5	559	950	-	-	220	134	300	106
CRN45-1	7.5	559	938	-	-	260	159	300	116
CRN45-2-2	11	770	1241	-	-	314	204	350	160
CRN45-2-1	15	749	1220	-	-	314	204	350	178
CRN45-2	15	749	1220	-	-	314	204	350	178
CRN45-3-2	18.5	829	1344	-	-	314	204	350	169
CRN45-3-1	18.5	829	1344	-	-	314	204	350	169
CRN45-3	18.5	829	1344	-	-	314	204	350	169
CRN45-4-2	22	909	1450	-	-	314	204	350	268

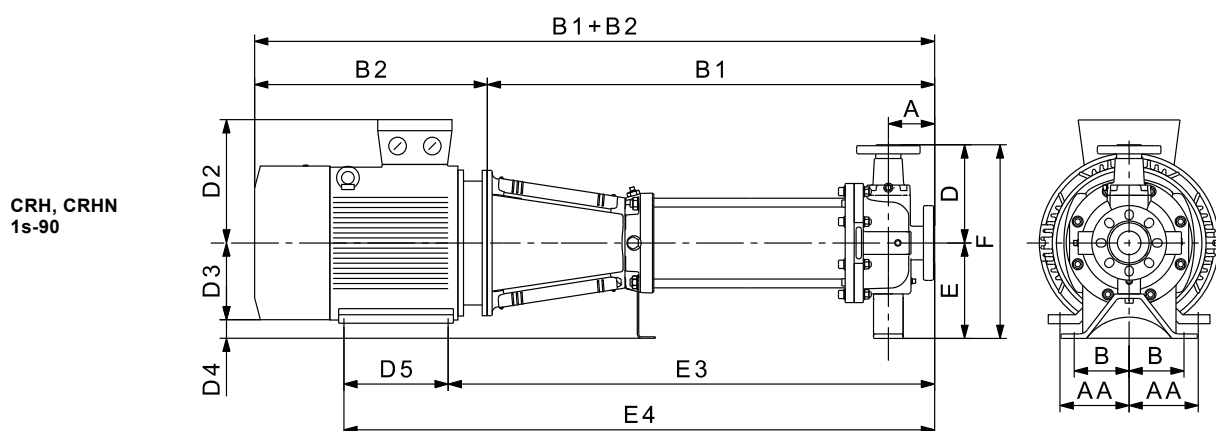
CRN 45 pumps are also available with PJE connection.

For information about electrical data, see pages [173](#) to [176](#).

CRN 64 - MAGdrive, 60 Hz

Pump type	Motor P2 [kW]	CRN MAGdrive								
		Dimension [mm]						Net weight [kg]		
		DIN flange		Oval flange		D1	D2	D3	DIN flange	Oval flange
		B1	B1 + B2	B1	B1 + B2					
CRN64-1-1	7.5	561	940	-	-	260	159	300	111	-
CRN64-1	11	671	1142	-	-	314	204	350	158	-
CRN64-2-2	15	644	1115	-	-	314	204	350	173	-
CRN64-2-1	18.5	754	1269	-	-	314	204	350	168	-
CRN64-2	22	754	1295	-	-	314	204	350	243	-
CRN64-3-2	22	836	1377	-	-	314	204	350	166	-

CRN 64 pumps are also available with PJE connection.
For information about electrical data, see pages [173](#) to [176](#).

CRH, CRHN pumps**Dimensional drawings**

	CRH(N) 1s-5	CRH(N) 10-20	CRH(N) 32	CRH(N) 45	CRH(N) 64-90
Inlet [mm]	40	50	50	80	100
Outlet [mm]	25	50	50	80	100
Ref.	Dim. [mm]				
A	102	102	102	102	102
B	76	124	124	124	124
AA	According to specifications for CR horizontal pumps.				
D	165	191	191	229	280
E	134	210	210	210	210
F	299	401	401	439	490
Note	Ref. AA is only applicable with motors 5.5 - 45 kW.				

CR-H, CR-HN pumps**Dimensions and weights****CR-H, CR-HN 1s, 50 Hz**

Pump type	Motor P2 [kW]	CR										
		Dimension [mm]									Net weight [kg]	
		DIN flange			D2	D3	D4	D5	E3	E4	DIN	DIN
		B1	B2	B1 + B2							CR	CRN
CRH(N)1s-2	0.37	309	191	500	109	71	63	-	-	-	24	21
CRH(N)1s-3	0.37	309	191	500	109	71	63	-	-	-	24	22
CRH(N)1s-4	0.37	327	191	518	109	71	63	-	-	-	25	22
CRH(N)1s-5	0.37	345	191	536	109	71	63	-	-	-	25	22
CRH(N)1s-6	0.37	363	191	554	109	71	63	-	-	-	26	23
CRH(N)1s-7	0.37	381	191	572	109	71	63	-	-	-	26	23
CRH(N)1s-8	0.37	399	191	590	109	71	63	-	-	-	26	23
CRH(N)1s-9	0.37	417	191	608	109	71	63	-	-	-	27	24
CRH(N)1s-10	0.37	435	191	626	109	71	63	-	-	-	27	24
CRH(N)1s-11	0.37	453	191	644	109	71	63	-	-	-	27	25
CRH(N)1s-12	0.37	471	191	662	109	71	63	-	-	-	28	25
CRH(N)1s-13	0.37	489	191	680	109	71	63	-	-	-	28	25
CRH(N)1s-15	0.55	525	191	716	109	71	63	-	-	-	30	27
CRH(N)1s-17	0.55	561	191	752	109	71	63	-	-	-	31	28
CRH(N)1s-19	0.55	597	191	788	109	71	63	-	-	-	31	28
CRH(N)1s-21	0.75	655	231	886	109	80	54	-	-	-	34	32
CRH(N)1s-23	0.75	691	231	922	109	80	54	-	-	-	35	32
CRH(N)1s-25	0.75	727	231	958	109	80	54	-	-	-	35	33
CRH(N)1s-27	1.1	763	231	994	109	80	54	-	-	-	38	36
CRH(N)1s-30	1.1	817	231	1048	109	80	54	-	-	-	40	37
CRH(N)1s-33	1.1	871	231	1102	109	80	54	-	-	-	41	38
CRH(N)1s-36	1.1	925	231	1156	109	80	54	-	-	-	42	40

For information about electrical data, see pages [173](#) to [176](#).**CR-H, CR-HN 1, 50 Hz**

Pump type	Motor P2 [kW]	CR										
		Dimension [mm]									Net weight [kg]	
		DIN flange			D2	D3	D4	D5	E3	E4	DIN	DIN
		B1	B2	B1 + B2							CR	CRN
CRH(N)1-2	0.37	309	191	500	109	71	63	-	-	-	24	21
CRH(N)1-3	0.37	309	191	500	109	71	63	-	-	-	24	22
CRH(N)1-4	0.37	327	191	518	109	71	63	-	-	-	25	22
CRH(N)1-5	0.37	345	191	536	109	71	63	-	-	-	25	22
CRH(N)1-6	0.37	363	191	554	109	71	63	-	-	-	26	23
CRH(N)1-7	0.37	381	191	572	109	71	63	-	-	-	26	23
CRH(N)1-8	0.55	399	191	590	109	71	63	-	-	-	27	24
CRH(N)1-9	0.55	417	191	608	109	71	63	-	-	-	27	25
CRH(N)1-10	0.55	435	191	626	109	71	63	-	-	-	28	25
CRH(N)1-11	0.55	453	191	644	109	71	63	-	-	-	28	25
CRH(N)1-12	0.75	477	231	708	109	80	54	-	-	-	30	28
CRH(N)1-13	0.75	495	231	726	109	80	54	-	-	-	31	28
CRH(N)1-15	0.75	531	231	762	109	80	54	-	-	-	32	29
CRH(N)1-17	1.1	567	231	798	109	80	54	-	-	-	35	32
CRH(N)1-19	1.1	603	231	834	109	80	54	-	-	-	36	33
CRH(N)1-21	1.1	639	231	870	109	80	54	-	-	-	36	34
CRH(N)1-23	1.1	675	231	906	109	80	54	-	-	-	37	35
CRH(N)1-25	1.5	727	321	1048	110	90	44	-	-	-	45	42
CRH(N)1-27	1.5	763	321	1084	110	90	44	-	-	-	46	43
CRH(N)1-30	1.5	817	321	1138	110	90	44	-	-	-	47	44
CRH(N)1-33	2.2	871	321	1192	110	90	44	-	-	-	49	46
CRH(N)1-36	2.2	925	321	1246	110	90	44	-	-	-	50	47

For information about electrical data, see pages [173](#) to [176](#).

CR-H, CR-HN 3, 50 Hz

Pump type	Motor P2 [kW]	CR											Net weight [kg]	
		Dimension [mm]												
		DIN flange			D2	D3	D4	D5	E3	E4	DIN CR	DIN CRN		
		B1	B2	B1 + B2										
CRH(N)3-2	0.37	309	191	500	109	71	63	-	-	-	24	21		
CRH(N)3-3	0.37	309	191	500	109	71	63	-	-	-	24	22		
CRH(N)3-4	0.37	327	191	518	109	71	63	-	-	-	25	22		
CRH(N)3-5	0.37	345	191	536	109	71	63	-	-	-	25	22		
CRH(N)3-6	0.55	363	191	554	109	71	63	-	-	-	26	23		
CRH(N)3-7	0.55	381	191	572	109	71	63	-	-	-	27	24		
CRH(N)3-8	0.75	405	231	636	109	80	54	-	-	-	29	26		
CRH(N)3-9	0.75	423	231	654	109	80	54	-	-	-	29	27		
CRH(N)3-10	0.75	441	231	672	109	80	54	-	-	-	30	27		
CRH(N)3-11	1.1	459	231	690	109	80	54	-	-	-	32	30		
CRH(N)3-12	1.1	477	231	708	109	80	54	-	-	-	33	30		
CRH(N)3-13	1.1	495	231	726	109	80	54	-	-	-	33	31		
CRH(N)3-15	1.1	531	231	762	109	80	54	-	-	-	34	32		
CRH(N)3-17	1.5	583	321	904	110	90	44	-	-	-	42	39		
CRH(N)3-19	1.5	619	321	940	110	90	44	-	-	-	43	40		
CRH(N)3-21	2.2	655	321	976	110	90	44	-	-	-	44	41		
CRH(N)3-23	2.2	691	321	1012	110	90	44	-	-	-	45	42		
CRH(N)3-25	2.2	727	321	1048	110	90	44	-	-	-	46	42		
CRH(N)3-27	2.2	763	321	1084	110	90	44	-	-	-	46	43		
CRH(N)3-29	2.2	799	321	1120	110	90	44	-	-	-	47	44		
CRH(N)3-31	3	840	335	1175	120	100	34	-	-	-	54	51		
CRH(N)3-33	3	876	335	1211	120	100	34	-	-	-	55	52		
CRH(N)3-36	3	930	335	1265	120	100	34	-	-	-	56	53		

For information about electrical data, see pages 173 to 176.

CR-H, CR-HN 5, 50 Hz

Pump type	Motor P2 [kW]	CR											Net weight [kg]	
		Dimension [mm]												
		DIN flange			D2	D3	D4	D5	E3	E4	DIN CR	DIN CRN		
		B1	B2	B1 + B2										
CRH(N)5-2	0.37	309	191	500	109	71	63	-	-	-	24	21		
CRH(N)5-3	0.55	336	191	527	109	71	63	-	-	-	26	23		
CRH(N)5-4	0.55	363	191	554	109	71	63	-	-	-	26	23		
CRH(N)5-5	0.75	396	231	627	109	80	54	-	-	-	28	26		
CRH(N)5-6	1.1	423	231	654	109	80	54	-	-	-	31	29		
CRH(N)5-7	1.1	450	231	681	109	80	54	-	-	-	32	29		
CRH(N)5-8	1.1	477	231	708	109	80	54	-	-	-	32	30		
CRH(N)5-9	1.5	520	321	841	110	90	44	-	-	-	40	37		
CRH(N)5-10	1.5	547	321	868	110	90	44	-	-	-	40	38		
CRH(N)5-11	2.2	574	321	895	110	90	44	-	-	-	42	39		
CRH(N)5-12	2.2	601	321	922	110	90	44	-	-	-	42	39		
CRH(N)5-13	2.2	628	321	949	110	90	44	-	-	-	43	40		
CRH(N)5-14	2.2	655	321	976	110	90	44	-	-	-	43	40		
CRH(N)5-15	2.2	682	321	1003	110	90	44	-	-	-	44	41		
CRH(N)5-16	2.2	709	321	1030	110	90	44	-	-	-	45	41		
CRH(N)5-18	3	768	335	1103	120	100	34	-	-	-	52	49		
CRH(N)5-20	3	822	335	1157	120	100	34	-	-	-	53	50		
CRH(N)5-22	4	876	372	1248	134	112	22	-	-	-	63	60		
CRH(N)5-24	4	930	372	1302	134	112	22	-	-	-	64	62		
CRH(N)5-26	4	984	372	1356	134	112	22	-	-	-	66	63		
CRH(N)5-29	4	1065	372	1437	134	112	22	-	-	-	67	64		
CRH(N)5-32	5.5	1175	391	1566	134	132	2	140	1294	1434	83	80		
CRH(N)5-36	5.5	1283	391	1674	134	132	2	140	1402	1542	86	82		

For information about electrical data, see pages 173 to 176.

CR-H, CR-HN 10, 50 Hz

Pump type	Motor P2 [kW]	CR										
		Dimension [mm]									Net weight [kg]	
		DIN flange			D2	D3	D4	D5	E3	E4	DIN	DIN
		B1	B2	B1 + B2							CR	CRN
CRH(N)10-1	0.37	414	191	605	109	71	139	-	-	-	58	52
CRH(N)10-2	0.75	430	231	661	109	80	130	-	-	-	60	54
CRH(N)10-3	1.1	464	231	695	109	80	130	-	-	-	63	58
CRH(N)10-4	1.5	494	321	815	109	90	120	-	-	-	71	66
CRH(N)10-5	2.2	524	321	845	110	90	120	-	-	-	73	68
CRH(N)10-6	2.2	584	321	905	110	90	120	-	-	-	74	69
CRH(N)10-7	3	614	335	949	120	100	110	-	-	-	81	76
CRH(N)10-8	3	644	335	979	120	100	110	-	-	-	82	77
CRH(N)10-9	3	674	335	1009	120	100	110	-	-	-	83	78
CRH(N)10-10	4	816	372	1188	134	112	98	-	-	-	93	88
CRH(N)10-12	4	876	372	1248	134	112	98	-	-	-	95	90
CRH(N)10-14	5.5	936	391	1327	134	132	78	140	1055	1195	118	113
CRH(N)10-16	5.5	996	391	1387	134	132	78	140	1115	1255	120	115
CRH(N)10-18	7.5	1056	379	1435	159	132	78	178	1125	1303	133	128
CRH(N)10-20	7.5	1116	379	1495	159	132	78	178	1185	1363	136	130
CRH(N)10-22	7.5	1176	379	1555	159	132	78	178	1245	1423	138	132

For information about electrical data, see pages [173](#) to [176](#).**CR-H, CR-HN 15, 50 Hz**

Pump type	Motor P2 [kW]	CR										
		Dimension [mm]									Net weight [kg]	
		DIN flange			D2	D3	D4	D5	E3	E4	DIN	DIN
		B1	B2	B1 + B2							CR	CRN
CRH(N)15-1	1.1	442	231	673	109	80	130	-	-	-	62	57
CRH(N)15-2	2.2	458	231	689	110	90	120	-	-	-	70	65
CRH(N)15-3	3	508	335	843	120	100	110	-	-	-	77	73
CRH(N)15-4	4	553	372	925	134	112	98	-	-	-	88	83
CRH(N)15-5	4	598	372	970	134	112	98	-	-	-	89	85
CRH(N)15-6	5.5	672	391	1063	134	132	78	140	791	931	111	107
CRH(N)15-7	5.5	717	391	1108	134	132	78	140	836	0	113	108
CRH(N)15-8	7.5	762	379	1141	159	132	78	178	831	0	125	121
CRH(N)15-9	7.5	807	379	1186	159	132	78	178	876	0	127	122
CRH(N)15-10	11	965	471	1436	204	160	50	210	1103	0	169	165
CRH(N)15-12	11	1055	471	1526	204	160	50	210	1193	0	173	168
CRH(N)15-14	11	1145	471	1616	204	160	50	210	1283	0	177	171
CRH(N)15-17	11	1280	471	1751	204	160	50	210	1418	0	195	189

For information about electrical data, see pages [173](#) to [176](#).

CR-H, CR-HN 20, 50 Hz

Pump type	Motor P2 [kW]	CR										
		Dimension [mm]									Net weight [kg]	
		DIN flange			D2	D3	D4	D5	E3	E4	DIN	DIN
		B1	B2	B1 + B2							CR	CRN
CRH(N)20-1	1.1	509	231	740	109	80	130	-	-	-	62	57
CRH(N)20-2	2.2	525	321	846	110	90	120	-	-	-	70	65
CRH(N)20-3	4	575	372	947	134	112	98	-	-	-	86	82
CRH(N)20-4	5.5	649	391	1040	134	132	78	140	768	908	108	104
CRH(N)20-5	5.5	694	391	1085	134	132	78	140	813	953	110	105
CRH(N)20-6	7.5	739	379	1118	159	132	78	178	808	986	122	117
CRH(N)20-7	7.5	784	379	1163	159	132	78	178	853	1031	123	119
CRH(N)20-8	11	942	471	1413	204	160	50	210	1080	1290	166	161
CRH(N)20-10	11	1032	471	1503	204	160	50	210	1170	1380	169	165
CRH(N)20-12	15	1122	471	1593	204	160	50	210	1260	1470	186	181
CRH(N)20-14	15	1212	471	1683	204	160	50	210	1350	1560	190	184
CRH(N)20-17	18.5	1347	545	1892	204	180	30	254	1485	1739	208	202

For information about electrical data, see pages 173 to 176.

CR-H, CR-HN 32, 50 Hz

Pump type	Motor P2 [kW]	CR											Net weight [kg]	
		Dimension [mm]											DIN CR	DIN CRN
		DIN flange			D2	D3	D4	D5	E3	E4				
		B1	B2	B1 + B2										
CRH(N)32-1-1	1.5	533	321	854	110	90	120	-	-	-	81	77		
CRH(N)32-1	2.2	533	321	854	110	90	120	-	-	-	82	77		
CRH(N)32-2-2	3	603	335	938	120	100	110	-	-	-	90	86		
CRH(N)32-2	4	603	372	975	134	112	98	-	-	-	99	95		
CRH(N)32-3-2	5.5	673	391	1064	134	132	78	140	792	932	114	109		
CRH(N)32-3	5.5	673	391	1064	134	132	78	140	792	932	114	109		
CRH(N)32-4-2	7.5	743	391	1134	159	132	78	178	812	990	129	124		
CRH(N)32-4	7.5	743	391	1134	159	132	78	178	812	990	129	124		
CRH(N)32-5-2	11	923	471	1394	204	160	50	210	1061	1271	176	171		
CRH(N)32-5	11	923	471	1394	204	160	50	210	1061	1271	176	171		
CRH(N)32-6-2	11	993	471	1464	204	160	50	210	1131	1341	179	174		
CRH(N)32-6	11	993	471	1464	204	160	50	210	1131	1341	179	174		
CRH(N)32-7-2	15	1063	471	1534	204	160	50	210	1201	1411	195	190		
CRH(N)32-7	15	1063	471	1534	204	160	50	210	1201	1411	195	190		
CRH(N)32-8-2	15	1133	471	1604	204	160	50	210	1271	1481	201	196		
CRH(N)32-8	15	1133	471	1604	204	160	50	210	1271	1481	201	196		
CRH(N)32-9-2	18.5	1203	515	1718	204	160	50	254	1341	1595	217	213		
CRH(N)32-9	18.5	1203	515	1718	204	160	50	254	1341	1595	217	213		
CRH(N)32-10-2	18.5	1273	515	1788	204	160	50	254	1411	1665	220	216		
CRH(N)32-10	18.5	1273	515	1788	204	160	50	254	1411	1665	220	216		
CRH(N)32-11-2	22	1343	541	1884	204	180	30	241	1494	1735	238	233		
CRH(N)32-11	22	1343	541	1884	204	180	30	241	1494	1735	238	233		
CRH(N)32-12-2	22	1413	541	1954	204	180	30	241	1564	1805	241	237		
CRH(N)32-12	22	1413	541	1954	204	180	30	241	1564	1805	241	237		
CRH(N)32-13-2	30	1483	610	2093	300	200	10	305	1675	1980	347	342		
CRH(N)32-13	30	1483	610	2093	300	200	10	305	1675	1980	347	342		
CRH(N)32-14-2	30	1553	610	2163	300	200	10	305	1745	2050	350	345		
CRH(N)32-14	30	1553	610	2163	300	200	10	305	1745	2050	350	345		

For information about electrical data, see pages 173 to 176.

CR-H, CR-HN 45, 50 Hz

Pump type	Motor P2 [kW]	CR											Net weight [kg]	
		Dimension [mm]												
		DIN flange			D2	D3	D4	D5	E3	E4	DIN CR	DIN CRN		
		B1	B2	B1 + B2										
CRH(N)45-1-1	3	549	335	884	120	100	154	-	-	-	99	101		
CRH(N)45-1	4	549	372	921	134	112	142	-	-	-	108	110		
CRH(N)45-2-2	5.5	629	391	1020	134	132	122	140	748	888	123	125		
CRH(N)45-2	7.5	629	379	1008	159	132	122	178	698	876	135	137		
CRH(N)45-3-2	11	819	471	1290	204	160	94	210	957	1167	182	184		
CRH(N)45-3	11	819	471	1290	204	160	94	210	957	1167	182	184		
CRH(N)45-4-2	15	899	471	1370	204	160	94	210	1037	1247	199	201		
CRH(N)45-4	15	899	471	1370	204	160	94	210	1037	1247	199	201		
CRH(N)45-5-2	18.5	979	515	1494	204	160	94	254	1117	1371	216	218		
CRH(N)45-5	18.5	979	515	1494	204	160	94	254	1117	1371	216	218		
CRH(N)45-6-2	22	1059	541	1600	204	180	74	241	1210	1451	236	238		
CRH(N)45-6	22	1059	541	1600	204	180	74	241	1210	1451	236	238		
CRH(N)45-7-2	30	1139	610	1749	300	200	54	305	1331	1636	343	345		
CRH(N)45-7	30	1139	610	1749	300	200	54	305	1331	1636	343	345		
CRH(N)45-8-2	30	1219	610	1829	300	200	54	305	1411	1716	347	349		
CRH(N)45-8	30	1219	610	1829	300	200	54	305	1411	1716	347	349		
CRH(N)45-9-2	30	1299	610	1909	300	200	54	305	1491	1796	351	353		
CRH(N)45-9	37	1299	667	1966	300	200	54	305	1489	1794	381	383		
CRH(N)45-10-2	37	1379	667	2046	300	200	54	305	1569	1874	386	387		
CRH(N)45-10	37	1379	667	2046	300	200	54	305	1569	1874	386	387		
CRH(N)45-11-2	45	1465	709	2174	325	225	29	286	1673	1959	474	476		
CRH(N)45-11	45	1459	709	2168	325	225	29	286	1667	1953	474	476		
CRH(N)45-12-2	45	1539	709	2248	325	225	29	286	1747	2033	479	480		
CRH(N)45-12	45	1539	709	2248	325	225	29	286	1747	2033	479	480		
CRH(N)45-13-2	45	1619	709	2328	325	225	29	286	1827	2113	483	485		

For information about electrical data, see pages 173 to 176.

CR-H, CR-HN 64, 50 Hz

Pump type	Motor P2 [kW]	CR											Net weight [kg]	
		Dimension [mm]												
		DIN flange			D2	D3	D4	D5	E3	E4	DIN CR	DIN CRN		
		B1	B2	B1 + B2										
CRH(N)64-1-1	4	580	372	952	134	112	142	-	-	-	121	114		
CRH(N)64-1	5.5	580	391	971	134	132	122	140	699	839	133	125		
CRH(N)64-2-2	7.5	662	379	1041	159	132	122	178	731	909	149	142		
CRH(N)64-2-1	11	772	471	1243	204	160	94	210	910	1120	193	186		
CRH(N)64-2	11	772	471	1243	204	160	94	210	910	1120	193	186		
CRH(N)64-3-2	15	854	471	1325	204	160	94	210	992	1202	210	203		
CRH(N)64-3-1	15	854	471	1325	204	160	94	210	992	1202	210	203		
CRH(N)64-3	18.5	854	515	1369	204	160	94	254	992	1246	223	216		
CRH(N)64-4-2	18.5	936	515	1451	204	160	94	254	1074	1328	228	221		
CRH(N)64-4-1	22	936	541	1477	204	180	74	241	1087	1328	242	234		
CRH(N)64-4	22	936	541	1477	204	180	74	241	1087	1328	242	234		
CRH(N)64-5-2	30	1018	610	1628	204	200	54	305	1210	1515	348	341		
CRH(N)64-5-1	30	1018	610	1628	300	200	54	305	1210	1515	348	341		
CRH(N)64-5	30	1018	610	1628	300	200	54	305	1210	1515	348	341		
CRH(N)64-6-2	30	1100	610	1710	300	200	54	305	1292	1597	354	348		
CRH(N)64-6-1	37	1100	667	1767	300	200	54	305	1292	1597	384	378		
CRH(N)64-6	37	1100	667	1767	300	200	54	305	1292	1597	384	378		
CRH(N)64-7-2	37	1182	667	1849	300	200	54	305	1374	1679	389	382		
CRH(N)64-7-1	37	1182	667	1849	300	200	54	305	1374	1679	389	382		
CRH(N)64-7	45	1188	709	1897	325	225	29	286	1378	1664	473	467		
CRH(N)64-8-2	45	1270	709	1979	325	225	29	286	1478	1764	478	471		
CRH(N)64-8-1	45	1270	709	1979	325	225	29	286	1478	1764	478	471		

For information about electrical data, see pages 173 to 176.

14. Motor data

Standard 2-pole motors for CR, CRI, CRN, 50 Hz

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
MG 									
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	B5/V1 Free-hole flange
5.5 ²⁾	132	380-415Δ	11	0.87 - 0.82	IE3	89.2	1080-1180	2920-2940	
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 									
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 ¹⁾	280	380-420Δ/660-725Y	134-126/77-72	0.89	IE3	94.7	680-680	2975	
90 ¹⁾	280	380-420Δ/660-725Y	160-148/92-85	0.90	IE3	95	720-720	2975	
110 ¹⁾	315	380-420Δ/660-725Y	192-176/110-102	0.91	IE3	95.2	710-710	2980	
132 ¹⁾	315	380-420Δ/660-725Y	230-210/133-121	0.91	IE3	95.4	720-720	2980	
160 ¹⁾	315	380-420Δ/660-725Y	280-255/161-147	0.92	IE3	95.6	780-780	2982	
200 ¹⁾	315	380-420Δ/660-725Y	345-310/199-179	0.92	IE3	95.8	720-720	2982	

¹⁾ Deep-groove ball bearings

²⁾ Angular contact bearing mounted in drive end

Standard 4-pole motors for CR, CRI, CRN, 50 Hz

Motor P2 [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	cos φ _{1/1}	η [%]	I _{start} [%]	Speed [min ⁻¹]
MG  TM03 1711 2805							
0.25	71	220-240Δ/380-415Y	1.48 / 0.85	0.75 - 0.65	61.5 - 68.5	400-440	1400-1420
0.37	71	220-240Δ/380-415Y	1.90 / 1.10	0.77 - 0.67	66.0	400-440	1400-1420
0.55	80	220-240Δ/380-415Y	2.60 / 1.50	0.79 - 0.70	70.0	430-470	1390-1410
0.75	90	220-240Δ/380-415Y	3.30 / 1.90	0.71 - 0.64	82.5	620-670	1455-1463
1.1	90	220-240Δ/380-415Y	4.85 / 2.80	0.71 - 0.64	84.1	820-900	1450-1460
1.5	90	220-240Δ/380-415Y	6.15 - 6.30 / 3.55 - 3.65	0.75 - 0.68	85.3	730-790	1450-1460
2.2	100	380-415Δ	4.9	0.79 - 0.73	86.7	600-660	1450
3	100	380-415Δ	6.3	0.82 - 0.76	87.7	700-770	1440-1450
4	112	380-415Δ	9.3	0.75 - 0.68	88.6	790-870	1460
5.5	132	380-415Δ/660-690Y	11.0 / 6.35	0.86 - 0.80	89.6	700-760	1460
7.5	132	380-415Δ/660-690Y	14.9 - 14.2 / 8.60 - 8.40	0.86 - 0.82	90.4	680-780	1460
11	160	380-415Δ/660-690Y	21.2 - 20.4 / 12.2 - 12.0	0.86 - 0.81	91.4	710-810	1470-1475
15	160	380-415Δ/660-690Y	29.0 - 28.0 / 16.8 - 16.4	0.86 - 0.82	92.1	760-870	1460-1470
Siemens  TM03 1710 2805							
18.5	180	380-420Δ/660-725Y	37.0 - 33.5 / 21.5 - 19.5	0.82	92.6	690-690	1470
22	180	380-420Δ/660-725Y	42.5 - 40.5 / 24.5 - 23.5	0.83	93.0	680-680	1470
30	200	380-420Δ/660-725Y	57.5 - 54.0 / 33.5 - 31.5	0.84	93.6	690-690	1470

Standard 2-pole motors for CR, CRI, CRN, 60 Hz

Motor P2 [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	Efficiency class	η [%]	I _{start} [%]	Speed [rpm]	Mounting designation
MG  TM03 1711 2805									
0.37	71	220-255Δ/380-440Y	1.5 - 1.44 / 0.87 - 0.83	0.85 - 0.76	IE3	73.4	550-650	3410-3470	B14/V18 Tapped-hole flange
0.55	71	220-255Δ/380-440Y	2.15 - 2.05 / 1.25 - 1.2	0.85 - 0.76	IE3	76.8	500-600	3390-3460	
0.75	80	220-255Δ/380-440Y	2.95 - 2.75 / 1.7 - 1.6	0.86 - 0.77	IE3	77.0	600-740	3410-3470	
1.1	80	220-255Δ/380-440Y	4.15 - 4.0 / 2.4 - 2.3	0.88 - 0.80	IE3	84.0	430-500	3420-3470	
1.5	90	220-277Δ/380-480Y	5.35 - 4.7 / 3.1 - 2.7	0.90 - 0.81	IE2 - IE3	84.0 - 85.5	780-1050	3470-3530	
2.2	90	220-277Δ/380-480Y	7.7 - 6.35 / 4.45 - 3.7	0.91 - 0.85	IE2 - IE3	85.5 - 86.5	780-1100	3470-3530	
3.0	100	220-277Δ/380-480Y	10.8 - 9.35 / 6.2 - 5.4	0.91 - 0.84	IE2 - IE3	87.5 - 88.5	860-1100	3480-3530	
4.0	112	220-277Δ/380-480Y	13.6 - 11.8 / 7.8 - 6.8	0.91 - 0.82	IE3	88.5	1000-1470	3510-3540	B5/V1 Free-hole flange
5.5	132	220-277Δ/380-480Y	18.4 - 16.2 / 10.6 - 9.3	0.90 - 0.80	IE3	89.5	1020-1480	3510-3550	
7.5	132	220-277Δ/380-480Y	24.6 - 20.8 / 14.2 - 12.0	0.90 - 0.82	IE2 - IE3	89.5 - 90.2	680-1050	3490-3530	
11	160	380-480Δ/660-690Y	20.8 - 17.2 / 12.0 - 11.6	0.89 - 0.83	IE2 - IE3	90.2 - 91.0	580-890	3520-3550	
15	160	380-480Δ/660-690Y	28.0 - 22.4 / 16.2 - 15.6	0.90 - 0.86	IE2 - IE3	90.2 - 91.0	580-890	3520-3550	
18.5	160	380-480Δ/660-690Y	34.5 - 28.0 / 20.0 - 16.6	0.89 - 0.84	IE2 - IE3	91.0 - 91.7	670-1100	3520-3560	
22	180	380-480Δ/660-690Y	40.0 - 32.5 / 23.0 - 22.2	0.91	IE3	91.7	650-1040	3520-3560	
Siemens  TM03 1710 2805									
30*	200	380-420Δ/660-725Y	56.0 - 50.0 / 32.0 - 29.0	0.89	IE3	92.4	610-610	3540	B5/V1 Free-hole flange
37*	200	380-420Δ/660-725Y	68.0 - 62.0 / 38.5 - 35.0	0.90	IE3	93	630-630	3540	
45*	225	380-420Δ/660-725Y	81.0 - 73.0 / 47.0 - 43.0	0.90	IE3	93.6	560-560	3550	
55*	250	380-420Δ/660-725Y	99.0 - 90.0 / 57.0 - 52.0	0.90	IE3	93.6	560-560	3570	
75*	280	380-420Δ/660-725Y	136-122 / 79.0 - 70.0	0.90	IE3	93.8	740-740	3570	
90*	280	380-420Δ/660-725Y	161-145 / 93.0 - 84.0	0.91	IE3	94.4	780-780	3570	
110*	315	380-420Δ/660-725Y	193-174/112-101	0.91	IE3	95.1	780-780	3580	
132*	315	380-420Δ/660-725Y	230-210/133-121	0.92	IE2	94.5	800-800	3576	
160	315	400Δ	270	0.90	IE2	95.0	670	3580	
200	315	400Δ	333	0.91	IE2	95.4	580	3576	

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

Standard 4-pole motors for CR, CRI, CRN, 60 Hz

Motor P2 [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	cos φ _{1/1}	η [%]	I _{start} [%]	Speed [min ⁻¹]
MG  TM03 1711 2805							
0.25	71	220-255Δ/380-440Y	1.21 / 0.70	0.80 - 0.69	73.4	400-470	1680-1720
0.37	71	220-255Δ/380-440Y	1.72 / 0.99	0.82 - 0.70	72	400-470	1680-1720
0.55	80	220-255Δ/380-440Y	2.40 / 1.40	0.83 - 0.75	75.5	390-470	1660-1710
0.75	90	220-277Δ/380-480Y	3.10 - 3.1 / 1.80 - 1.8.	0.76 - 0.61	83.9	570-720	1746-1768
1.1	90	220-277Δ/380-480Y	4.50 / 2.60	0.76 - 0.60	84.0	710-910	1740-1770
1.5	90	220-277Δ/380-480Y	5.90 - 5.65 / 3.40 - 3.25	0.78 - 0.65	84.0 - 86.5	660-930	1740-1770
2.2	100	380-480Δ	4.70 - 4.30	0.83 - 0.71	87.52	590-760	1740-1760
3.0	100	380-480Δ	6.10 - 5.50	0.85 - 0.73	87.5 - 89.5	620-880	1730-1760
4.0	112	380-480Δ	8.60 - 8.30	0.79 - 0.64	87.5 - 89.5	770-910	1750-1770
5.5	132	380-480Δ/660-690Y	11.0 - 9.40 / 6.35 - 6.20	0.88 - 0.79	89.5	670-850	1750-1770
7.5	132	380-480Δ/660-690Y	14.7 - 12.5 / 8.50 - 8.25	0.88 - 0.80	89.5 - 91.7	590-890	1740-1770
11.0	160	380-480Δ/660-690Y	20.8 - 17.8 / 12.0 - 11.8	0.90 - 0.81	91.0 - 91.7	650-970	1760-1780
15.0	160	380-480Δ/660-690Y	29.0 - 24.2 / 16.6 - 16.4	0.88 - 0.81	91.0 - 93.0	650-980	1760-1770
Siemens  TM03 1710 2805							
18.5	180M	380-420Δ/660-725Y	36.5 - 33.0 / 21.5 - 19.0	0.85	92.4	620-620	1760
22	180L	380-420Δ/660-725Y	42.5 - 40.5 / 24.5 - 23.5	0.85	92.4	600-600	1760
30	200L	380-420Δ/660-725Y	57.5 - 54.0 / 33.5 - 31.5	0.86	93.0	610-610	1760
37	225S	380-420Δ/660-725Y	69.0 - 63.0 / 39.5 - 36.5	0.86	93.6 - 94.0	540-540	1772
45	225M	380-420Δ/660-725Y	85.0 - 76.0 / 48.0 - 44.0	0.86	93.8 - 94.3	530-530	1771

15. Pumped liquids

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

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

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

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

CR, CRE, CRI, CRIE

CR, CRE, CRI, CRIE pumps are suitable for non-corrosive liquids.

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

CRN, CRNE

CRN, CRNE pumps are suitable for industrial liquids.

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

CRT, CRTE

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

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

List of pumped liquids

A number of typical liquids are listed below.

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

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

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

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

Take safety precautions when pumping dangerous liquids.

Notes

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

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

Pumped liquid	Chemical formula	Note	Liquid concentration, liquid temperature	CR(E), CRI(E)	CRN(E)
Sodium bicarbonate	NaHCO ₃	E	10 %, 60 °C	-	HQQE
Sodium chloride (as coolant)	NaCl	D, E	30 %, < 5 °C, pH > 8	HQQE	-
Sodium hydroxide	NaOH	E	20 %, 50 °C	-	HQQE
Sodium hypochlorite	NaOCl	F	0.1 %, 20 °C	-	HQQV
Sodium nitrate	NaNO ₃	E	10 %, 60 °C	-	HQQE
Sodium phosphate	Na ₃ PO ₄	E, H	10 %, 60 °C	-	HQQE
Sodium sulphate	Na ₂ SO ₄	E, H	10 %, 60 °C	-	HQQE
Softened water		-	< 120 °C	-	HQQE
Soya oil		D, E, 3	100 %, 80 °C	HQQV	-
Sulphuric acid	H ₂ SO ₄	F	1 %, 20 °C	-	HQQV
Sulphurous acid	H ₂ SO ₃	-	1 %, 20 °C	-	HQQE
Unsalted swimming-pool water		-	Approx. 2 ppm free chlorine (Cl ₂)	HQQE	-

16. Grundfos Product Center

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

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

All the information you need in one place

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

Downloads

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



TM07 2384

The screenshot shows the Grundfos Product Center website. At the top is the navigation bar with the Grundfos logo and 'PRODUCT CENTER' text. Below this is a secondary navigation bar with links: HOME, FIND PRODUCT, COMPARE, YOUR PROJECTS, SAVED ITEMS, TOOLS, and HELP. The main content area is titled 'Find products and solutions'. It features a search bar (1) with a dropdown menu for 'Products' and 'Literature'. Below the search bar are four large tiles: 'Sizing' (2) with the subtext 'Enter pump sizing', 'Catalogue' (3) with 'Products and services', 'Replacement' (4) with 'Replace an old pump with a new', and 'Liquids' (5) with 'Find pump by liquid'. Below these tiles are three tabs: 'Quick sizing', 'Advanced sizing by application', and 'Guided selection'. The 'Quick sizing' tab is active, showing a form to 'Enter duty point' with fields for 'Flow (Q)' and 'Head (H)', each with a unit dropdown (m³/h and m respectively). To the right of the form are three radio button options: 'Size by application', 'Size by pump design', and 'Size by pump family'. A 'START SIZING' button is located at the bottom right of the form.

TM07 2383

Pos. Description

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

96486346 09.2020

ECM: 1295635

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GRUNDFOS 

CR, CRI, CRN

Installation and operating instructions



English (GB) Installation and operating instructions

Original installation and operating instructions

These installation and operating instructions describe Grundfos CR, CRI and CRN pumps, 0.37 - 75 kW.

Sections 1-4 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 5-10 give important information about the product, as well as information on service, fault finding and disposal of the product.

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Read this document before installing the product. Installation and operation must comply with local regulations and accepted codes of good practice.

1. General information

1.1 Hazard statements

The symbols and hazard statements below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.

DANGER



Indicates a hazardous situation which, if not avoided, will result in death or serious personal injury.

WARNING



Indicates a hazardous situation which, if not avoided, could result in death or serious personal injury.

CAUTION



Indicates a hazardous situation which, if not avoided, could result in minor or moderate personal injury.

The hazard statements are structured in the following way:

SIGNAL WORD

Description of hazard



Consequence of ignoring the warning.
- Action to avoid the hazard.

1.2 Notes

The symbols and notes below may appear in Grundfos installation and operating instructions, safety instructions and service instructions.



Observe these instructions for explosion-proof products.



A blue or grey circle with a white graphical symbol indicates that an action must be taken.



A red or grey circle with a diagonal bar, possibly with a black graphical symbol, indicates that an action must not be taken or must be stopped.



If these instructions are not observed, it may result in malfunction or damage to the equipment.



Tips and advice that make the work easier.

2. Receiving the product

2.1 Transporting the product

WARNING

Falling objects



- Death or serious personal injury
- Keep the product in a stable and fixed position during transportation.
 - Wear personal protective equipment.

2.2 Unpacking the product

WARNING

Falling objects



- Death or serious personal injury
- Keep the product in a stable position during unpacking.
 - Wear personal protective equipment.

2.3 Inspecting the product

Before you install the product, do the following:

1. Check that the product is as ordered.
2. Check that no visible parts have been damaged.

If parts are damaged or missing, contact your local Grundfos sales company.

2.4 Lifting the product

WARNING

Falling objects



- Death or serious personal injury
- Follow the lifting instructions.
 - Use lifting equipment which is approved for the weight of the product.
 - Persons must keep a safe distance to the product during lifting operations.
 - Wear personal protective equipment.

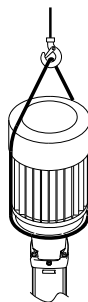


Note that typically the centre of gravity of the pump is close to the motor.

When lifting the entire product with motor, follow these instructions:

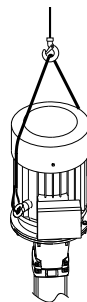
- Pumps with 0.37 - 5.5 kW motors, all types: Lift the pump by straps or similar lifting equipment in the motor flange.
- Pumps with 7.5 - 22 kW motors, Grundfos MG and MGE: Lift the pump by the motor eyebolts.
- Pumps with 7.5 - 45 kW motors, other types than Grundfos MG and MGE: Lift the pump by the lifting brackets on the motor flange.

0.37 - 5.5 kW



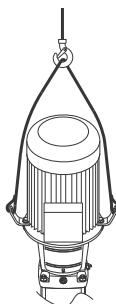
TM04 0339 0608

7.5 - 22 kW



TM04 0341 0608

7.5 - 45 kW*



TM05 9564 4113

Fig. 1 Lifting points

- * In case of pumps with other motors than Grundfos MG and MGE.

3. Installing the product

3.1 Mechanical installation

WARNING

Contamination when pumping drinking water

- Death or serious personal injury
- Before the pump is used for supplying drinking water, flush the pump thoroughly with clean water.
 - Do not use the pump for drinking water if the internal parts have been in contact with particles or substances not suitable for water intended for human consumption.



The pump must be installed according to national water regulations and standards.

3.1.1 Lifting the product

WARNING

Falling objects

- Death or serious personal injury
- Follow the lifting instructions.
 - Use lifting equipment which is approved for the weight of the product.
 - Persons must keep a safe distance to the product during lifting operations.
 - Wear personal protective equipment.



For lifting instructions, see section [2.4 Lifting the product](#).

3.1.2 Drive-end motor bearing

Make sure to use the correct type of drive-end (DE) motor bearing for the bare-shaft pump. Please check the specific pump range and pump version stated on the nameplate and select the corresponding DE bearing.

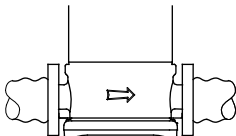
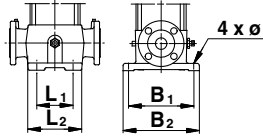
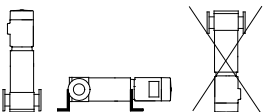
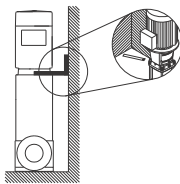
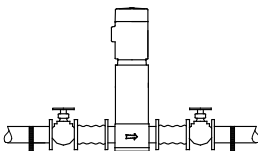
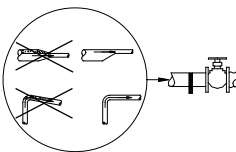
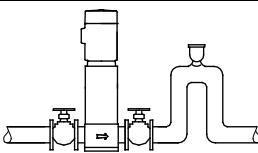
Pump version ¹⁾	DE bearing CR 1-64 pump range		DE bearing CR 95-255 pump range	
	Deep-groove ball bearing (62/63xx)	Angular contact bearing (73xx)	Deep-groove ball bearing (62/63xx)	Angular contact bearing (73xx)
A Standard pump	0.37 - 3 kW	4-45 kW	75-200 kW	5.5 - 55 kW
T Pump with thrust handling device (THD) ²⁾	-	-	5.5 - 55 kW	Not allowed
Z Pump with bearing flange ²⁾	0.37 - 45 kW	Not allowed	5.5 - 200 kW	Not allowed

¹⁾ Refer to the codes for pump version in section [5.1.2 Type key for CR, CRN 32, 45 and 64](#).

²⁾ Factory product variants (FPV).

3.1.3 Installation guidelines

The pump must be secured to a horizontal, plane and solid foundation with bolts through the holes in the base plate. When installing the pump, be aware of the information below in order to avoid damaging the pump.

Illustration	Information
	Arrows on the pump base show the direction of flow of liquid through the pump.
	This information is stated in fig. 3 in the appendix: • port-to-port lengths • dimensions of the base plate • pipe connections • diameter and position of anchor bolts.
	You can install the pump vertically or horizontally. However, the motor must neither fall below the horizontal plane nor be installed upside down. Make sure that an adequate supply of cool air reaches the motor cooling fan. Motors above 4 kW must be supported.
	Additional support. As the centre of gravity of the pump is relatively high, we recommend that pumps installed on ships, in areas with risk of earth quake or in systems which can be moved, are equipped with an additional support bracket. You can fit the bracket from the motor stool to the bulkhead of the ship, a rigid wall in a building or to a rigid part.
	To minimise possible noise from the pump, we recommend that you fit expansion joints on either side of the pump. Build a foundation and carry out mechanical installation as described in section 3.1.4 Foundation. Fit the isolating valves on either side of the pump to avoid draining the system if the pump needs to be removed for cleaning, repair or replacement. Always protect the pump against backflow by means of a non-return valve.
	Install the pipes so that air pockets do not occur, especially on the inlet side of the pump.
	Fit a vacuum valve close to the pump if the installation has one of these characteristics: • The outlet pipe slopes downwards away from the pump. • There is a risk of siphon effect. • Protection against backflow of unclean liquids is needed.

3.1.4 Foundation

WARNING

Falling objects



Death or serious personal injury

- Keep the product in a stable and fixed position before installing it.
- Make sure that the foundation is suitable for the weight of the product.

We recommend that you install the pump on a concrete foundation which is heavy enough to provide permanent and rigid support for the entire pump. The foundation must be capable of absorbing any vibration, normal strain or shock. The concrete foundation must have an absolutely level and even surface.

Place the pump on the foundation, and fasten it. The base plate must be supported on the whole area.

The following instruction applies when mounting the pump in both vertical and horizontal position. Place the pump on the foundation, and fasten it. See fig. 2.

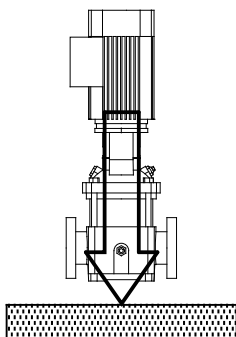


Fig. 2 Correct installation

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The recommended length and width of the foundation are shown in fig. 3. Note that for pumps with motor size below or equal to 30 kW, the length and width of the foundation must be 200 mm larger than the base plate.

For pumps with motor size equal to 37 kW or above, the length and width must always be 1.5 x 1.5 (L_f x B_f) m.

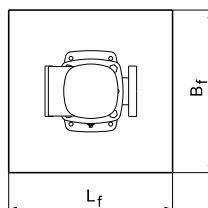
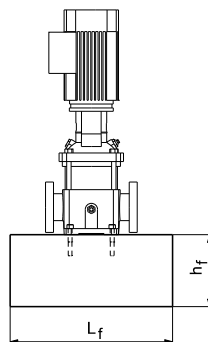


Fig. 3 Foundation, vertical mounting

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The foundation length and width must always be 200 mm larger than the length and width of the pump. See fig. 4.

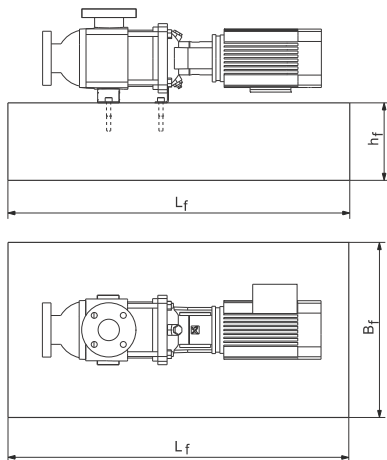


Fig. 4 Foundation, horizontal mounting

The mass of the foundation must be at least 1.5 times the total mass of the pump. The minimum height of the foundation (hf) can then be calculated:

$$hf = \frac{M_{\text{pump}} \times 1.5}{L_f \times B_f \times \delta_{\text{concrete}}}$$

The density (δ) of concrete is usually taken as 2200 kg/m³.

In installations where noise-less operation is particularly important, we recommend that you use a foundation with a mass up to 5 times that of the pump.

The foundation must be provided with anchor bolts for fixing the base plate. See fig. 5.

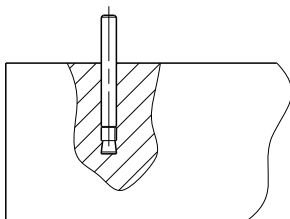


Fig. 5 Bolt in foundation

When the anchor bolts are in position, place the pump on the foundation. Then align the base plate using shims, if necessary, so that it is completely horizontal. See fig. 6.

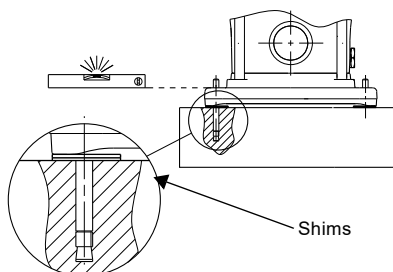


Fig. 6 Alignment with shims

3.1.5 Vibration dampening

Elimination of noise and vibrations is best achieved by means of a concrete foundation, vibration dampers and expansion joints.

If you use vibration dampers, install them under the foundation. For pumps with motor size below or equal to 30 kW, you can use vibration dampers as shown in fig. 7.

For pumps with motor sizes equal to 37 kW or above, use a Sylomer® plate as shown in fig. 8.

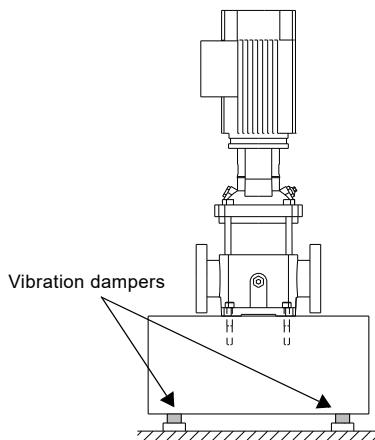


Fig. 7 Pump on vibration dampers

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TM03 4589 2206

TM04 1691 1008

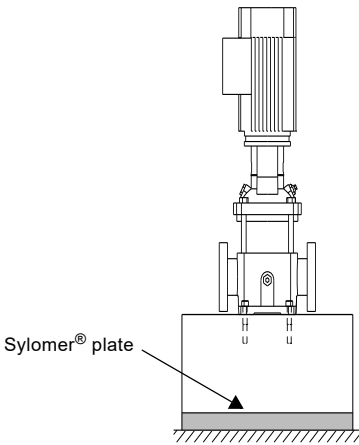


Fig. 8 Pump on Sylomer® plate

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3.1.6 Outdoor installation

When the pump is installed outdoors, we recommend that you provide the motor with a rain cover. We also recommend that you open one of the drain holes in the motor flange.

3.1.7 Tightening torques

WARNING



Flange gasket blowout

Death or serious personal injury
- Tighten flange bolts according to the torque values stated in the installation and operating instructions.

The table shows the recommended torques for base plate anchor bolts and flange bolts.

The bolt quality must be minimum class 8.8.

CR, CRI, CRN	Base [Nm]	Flange bolts [Nm]		
		Bolt size	DIN, JIS, ANSI	Oval
1s-5	40	M10	-	50-60
		M12	60	-
10-20	50	M12	60	60-70
		M16	100	70-80
32-64	70	M20	150	-
		M24	200	-

3.1.8 Flange forces and torques

If not all loads reach the maximum permissible value stated in the tables below, one of these values may exceed the normal limit. Contact Grundfos for further information.

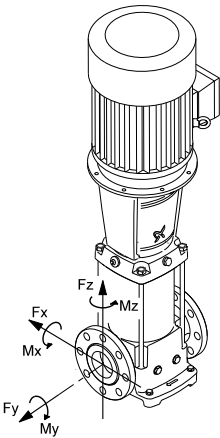


Fig. 9 Flange forces and torques

- Y-direction: Inlet or outlet
Z-direction: Direction of chamber stack
X-direction: 90 ° from inlet or outlet

The following tables represent the values that apply according to the material quality.

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Force limits

Flange, DN [mm]	Type	CR - Cast iron pump housing			CRI, CRN - Stainless steel pump housing		
		Force, Y- direction [N]	Force, Z- direction [N]	Force, X- direction [N]	Force, Y- direction [N]	Force, Z- direction [N]	Force, X- direction [N]
25/32	1s-5	338	394	319	675	788	638
40	10	413	469	375	825	938	750
50	15 and 20	563	581	506	1125	1163	1013
65	32	694	788	638	1388	1575	1275
80	45	938	769	844	1875	1538	1688
100	64	1256	1013	1125	2513	2025	2250

Torque limits

Flange, DN [mm]	Type	CR - Cast iron pump housing			CRI, CRN - Stainless steel pump housing		
		Torque, Y- direction [Nm]	Torque, Z- direction [Nm]	Torque, X- direction [Nm]	Torque, Y- direction [Nm]	Torque, Z- direction [Nm]	Torque, X- direction [Nm]
25/32	1s-5	300	175	125	600	350	250
40	10	400	275	200	800	550	400
50	15 and 20	450	325	250	900	650	500
65	32	500	350	300	1000	700	600
80	45	325	400	550	650	800	1100
100	64	375	475	625	750	950	1250

3.1.9 Positioning the terminal box

You can turn the terminal box to four positions, in 90 ° steps. Follow this procedure:

1. If necessary, remove the coupling guards. Do not remove the coupling.
2. Remove the bolts securing the motor to the pump.
3. Turn the motor to the required position.
4. Replace and tighten the bolts.
5. Replace the coupling guards.

Carry out the electrical connection as shown in the diagram inside the terminal box cover.

3.2 Electrical connection

 Follow the instructions for the motor when carrying out the electrical connections.

The electrical connection must be carried out by an authorised electrician in accordance with local regulations.

WARNING

Electric shock

- Death or serious personal injury
- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.
 - Connect the pump to an external main switch close to the pump and to a motor-protective circuit breaker or a CUE frequency converter. Make sure you can lock the main switch in OFF position (isolated). Type and requirements as specified in EN 60204-1, 5.3.2.



WARNING

Electric shock

- Death or serious personal injury
- The motor must be protected against overload by means of an external motor-protective circuit breaker with IEC trip class 10 or 20.
 - Grundfos recommends trip class 20.
 - The current setting of the motor-protective circuit breaker must be adjusted to the nominal current stated on the motor nameplate.



WARNING

Electric shock

- Death or serious personal injury
- Connect the pump to the same protective-earth (PE) potential as the motor if both motor bearings are of the insulated type, such as ceramic bearings.



 Consider whether it is necessary to install an emergency stop switch.

The operating voltage and frequency are marked on the motor nameplate. Make sure that the motor is suitable for the power supply on which it is used and that the motor terminal connection is correct. You will find a wiring diagram in the terminal box.

3.2.1 Maximum absorbed current

 Some motors can absorb a maximum current which is larger than the full load current $I_{1/1}$ stated on the nameplate. See the table below.

Motor type according to the nameplate	Upper limit for absorbed current
• Motors marked with both of the below: – full load current $I_{1/1}$ – maximum current I_{max}	I_{max}
• Grundfos MMG-G motors • Grundfos MMG-E motors	$1.05 \times I_{1/1}$
• Motors marked only with the below: – full load current $I_{1/1}$	$I_{1/1}$

3.2.2 Cable entry/screwed connection

All motors are supplied without screwed cable entries. The table below shows the numbers and sizes of cable entry holes of the terminal box according to the standard EN 50262.

Motor [kW]	Number and size of cable entries	Description
0.25 - 0.55	2 x M20 x 1.5	The holes have precast threads and are closed with knock-out cable entries.
0.75 - 3.0	2 x M20	The holes are closed with knock-out cable entries.
4.0 - 7.5	4 x M25	The holes are closed with knock-out cable entries.
11-22	2 x M20 4 x M40	The holes are closed with knock-out cable entries.
30-45	2 x M50 x 1.5	Blanking plug.
55-75	2 x M63 x 1.5	Blanking plug.

3.2.3 Three-phase connection

	Mains supply [V]		
	Delta connection		Star connection
50 Hz	220-240	/	380-415
	380-415	/	660-690
60 Hz	220-277	/	380-480 ¹⁾
	380-480	/	660-690

1) 60 Hz motors, 0.37 - 1.1 kW: 220-277/380-440 V.

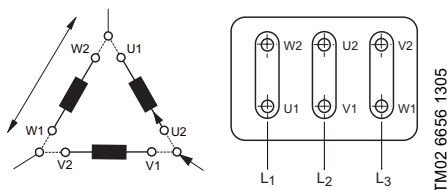


Fig. 10 Delta connection

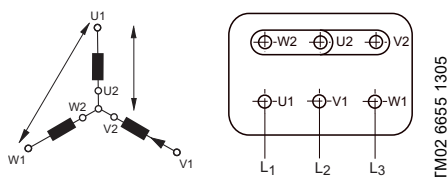


Fig. 11 Star connection

If the motor is provided with PTC sensors or PTO contacts, the connection must be in accordance with the wiring diagram in the terminal box.

Connect three-phase motors to a motor-protective circuit breaker.

3.2.4 Single-phase connection

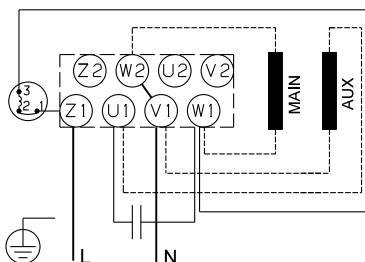


Fig. 12 Connection, 220-230 V, 0.37 - 0.75 kW

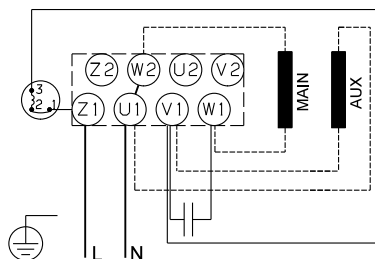


Fig. 13 Connection, 240 V, 0.37 - 0.75 kW

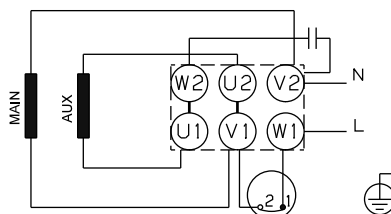


Fig. 14 Connection, 220-230 V, 1.1 - 2.2 kW

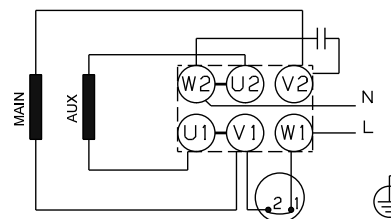


Fig. 15 Connection, 240 V, 1.1 - 2.2 kW

Single-phase Grundfos motors incorporate a thermal switch and require no additional motor protection.

3.2.5 Frequency converter operation

You can use three-phase motors for frequency converter operation following the conditions below. This section applies to motors defined in IEC 60034.

3.2.6 General conditions

Protect all motors used with frequency converters against voltage peaks and dU/dt according to IEC 60034-17. Grundfos recommends that you use insulated bearings for motors from frame size 225 (45 kW/2-pole, 30 kW/4-pole and 22 kW/6-pole).

3.2.7 Mains voltage dependent conditions

200-240 V

No output filters are required for frequency converter operated motors with mains voltages up to 240 V.

380-500 V

For frequency converter operated motors with power cable length less than 25 m and mains supply up to 460 V, no additional motor protection against voltage peaks is required. For frequency converter operated motors with power cable length of more than 25 m or mains supply higher than 460 V, sine-wave filters are required.

500 V and higher

Always use sine-wave filters for motors marked with 500 V or higher voltages.



Motors with reinforced insulation can be supplied as an option. These motors are according to IEC 60034-25 and therefore there is no need for sine-wave filters. This does not eliminate the requirement for insulated bearings from frame size 225.

Exception

- Protect Grundfos motors types MG 71 and MG 80 (up to 1.1 kW/2-pole and up to 0.75 kW/4-pole) for supply voltages up to and including 440 V without phase insulation against voltage peaks above 650 V between the supply terminals.
- If you use MG 71 and MG 80 without phase insulation for input voltages above 240 V, it requires that you use sine-wave filters at the output of the frequency converter.

MG 71 and MG 80 with phase insulation for use with variable frequency drives are available as standard products.

Motors supplied by Grundfos

You can connect all three-phase MG motors with phase insulation to a frequency converter.

Other motor makes than those supplied by Grundfos

Contact Grundfos or the motor manufacturer.

3.2.8 Phase insulation, MG 71 and 80

MG motors, frame sizes 71 and 80, do not have phase insulation as standard. The motors are not suitable for frequency converter operation as they are not protected against the voltage peaks caused by the frequency converter operation. Only motors with a rated voltage equal to 460 V or above have phase insulation.



Frequency converter operation of MG motors without phase insulation will cause damage to the motor.

We recommend that you protect all other motors against voltage peaks higher than 1200 V by 2000 V/ μ sec.

You can eliminate the above disturbances, that is both increased acoustic noise and detrimental voltage peaks, by fitting an LC filter between the frequency converter and the motor.

For further information, contact the frequency converter or motor supplier.

4. Starting up the product

WARNING



Corrosive liquids

- Death or serious personal injury
- Wear personal protective equipment.

WARNING



Toxic liquids

- Death or serious personal injury
- Wear personal protective equipment.

CAUTION



Hot or cold liquid

- Minor or moderate personal injury
- Wear personal protective equipment.
 - Pay attention to the direction of the vent hole when you fill the pump with liquid and vent it.
 - Make sure that no persons are hurt by the escaping liquid.



Fill the pump with liquid and vent it before you start the pump.



Pay attention to the direction of the vent hole during liquid filling and venting. Make sure that the escaping liquid does not cause damage to the motor or other components.



If the pump runs dry, the pump bearings and the shaft seal may be damaged.

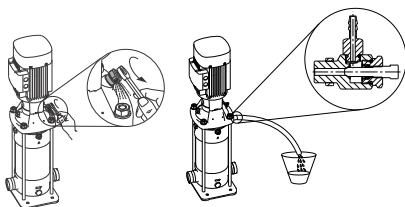


Fig. 16 Vent valve, standard and an optional solution with hose connection

Follow the startup instructions in the appendix.

CR, CRI, CRN 1s to 5

For these pumps, we recommend that you open the bypass valve during startup. See fig. 18 for bypass valve location. The bypass valve connects the inlet and outlet sides of the pump, thus making the filling procedure easier. Close the bypass valve again when the operation is stable.

When pumping liquids containing air, we recommend that you leave the bypass valve open if the operating pressure is lower than 6 bar.

Close the bypass valve if the operating pressure constantly exceeds 6 bar. Otherwise, the material at the opening will be worn because of the high liquid velocity.

4.1 Shaft seal run-in

WARNING



Corrosive liquids

- Death or serious personal injury
- Wear personal protective equipment.

WARNING



Toxic liquids

- Death or serious personal injury
- Wear personal protective equipment.



CAUTION

Hot or cold liquid

- Minor or moderate personal injury
- Wear personal protective equipment.



Make sure that a leakage does not cause damage to the equipment.

The seal faces are lubricated by the pumped liquid, meaning that there may be a certain amount of leakage from the shaft seal.

When you start the pump for the first time, or when you install a new shaft seal, a certain run-in period is required before the leakage is reduced to an acceptable level. The time required for this depends on the operating conditions, that is every time the operating conditions change, a new run-in period will be started.

Under normal conditions, the leaking liquid will evaporate. As a result, no leakage will be detected.

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4.2 Frequency of starts and stops

Motor size [kW]	Maximum number of starts per hour
0.37 - 2.2	250
3-4	100
5.5 - 11	50
18.5 - 22	40
30	90
37	50
45	80
55	50
75	50

4.3 Operating the product

For operating the product safely, observe the following hazard statements:

WARNING

Contamination when pumping drinking water



- Death or serious personal injury
- Do not use the pump for drinking water if the internal parts have been in contact with particles or substances not suitable for water intended for human consumption.

WARNING

Airborne noise



- Death or serious personal injury
- Wear personal protective equipment.

See fig. 4 in the appendix.

WARNING

Too high pressure and leakage



- Death or serious personal injury
- Do not run the pump against a closed outlet valve.

CAUTION

Hot or cold surface



- Minor or moderate personal injury
- Make sure that no one can accidentally come into contact with hot or cold surfaces.



Hot or cold surfaces

CAUTION

Hot or cold liquid



- Minor or moderate personal injury
- Wear personal protective equipment.



Figure 17 shows which pump parts get as hot or cold as the pumped liquid.

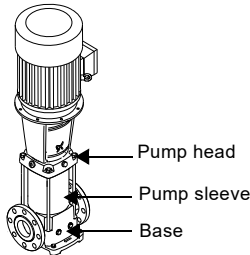


Fig. 17 Hot or cold surfaces on a CR, CRI and CRN pump

For motor bearing maintenance at ambient temperatures above 40 °C, see section [10. Disposing of the product.](#)

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5. Product introduction

5.1 Identification

5.1.1 Type key for CR, CRI, CRN 1s, 1, 3, 5, 10, 15 and 20

Example	CR	3-	10	X-	X-	X-	X-	XXXX
Type range: CR, CRI, CRN								
Rated flow rate in m ³ /h								
Number of impellers								
Code for pump version								
Code for pipe connection								
Code for materials								
Code for rubber pump parts								
Code for shaft seal								

5.1.2 Type key for CR, CRN 32, 45 and 64

Example	CR	32-	2	1-	X-	X-	X-	X-	XXXX
Type range: CR, CRN									
Rated flow rate in m ³ /h									
Number of stages									
Number of impellers with reduced diameter									
Code for pump version									
Code for pipe connection									
Code for materials									
Code for rubber pump parts									
Code for shaft seal									

5.2 Intended use of the product

Only use the CR, CRI and CRN pumps according to the specification stated in these installation and operating instructions.

5.2.1 Applications

Grundfos multistage in-line centrifugal pumps, types CR, CRI and CRN, are designed for a wide range of applications.

CR, CRI, CRN

CR, CRI and CRN pumps are suitable for liquid transfer, circulation and pressure boosting of cold or hot clean liquids.

CRN

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

5.2.2 Pumped liquids

DANGER

Fire and explosion

Death or serious personal injury

- Do not use the pump for flammable, combustible or explosive liquids.

WARNING

Chemical attack and leakage

Death or serious personal injury

- Do not use the pump for liquids which can attack the pump materials chemically.
- Contact Grundfos if in doubt.

WARNING

Corrosive liquids

Death or serious personal injury

- Wear personal protective equipment.

WARNING

Toxic liquids

Death or serious personal injury

- Wear personal protective equipment.

CAUTION

Hot or cold liquid

Minor or moderate personal injury

- Wear personal protective equipment.

CR, CRI and CRN pump are suitable for pumping thin, clean, non-flammable, non-combustible 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.

6. Servicing the product

DANGER

Electric shock

Death or serious personal injury

- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.

WARNING

Electric shock

Death or serious personal injury

- Connect the pump to the same protective-earth (PE) potential as the motor if both motor bearings are of the insulated type, such as ceramic bearings.

WARNING

Falling objects

Death or serious personal injury

- Follow the lifting instructions.
- Use lifting equipment which is approved for the weight of the product.
- Persons must keep a safe distance to the product during lifting operations.
- Wear personal protective equipment.

For lifting instructions, see section [2.4 Lifting the product](#).

WARNING

Falling objects

Death or serious personal injury

- Keep the product in a stable and fixed position when working on it.

WARNING

Corrosive liquids

Death or serious personal injury

- Wear personal protective equipment.

WARNING

Toxic liquids

Death or serious personal injury

- Wear personal protective equipment.

WARNING**Contamination when pumping drinking water**

Death or serious personal injury



- Before the pump is used for supplying drinking water, flush the pump thoroughly with clean water.
- Do not use the pump for drinking water if the internal parts have been in contact with particles or substances not suitable for water intended for human consumption.
- Always use original spare parts suitable for drinking water.

**CAUTION****Hot or cold liquid**

Minor or moderate personal injury

- Wear personal protective equipment.

**CAUTION****Hot or cold surface**

Minor or moderate personal injury

- Make sure that no one can accidentally come into contact with hot or cold surfaces.



We recommend that you repair pumps with motors of 7.5 kW and above at the installation site. Necessary lifting equipment must be available.

6.1 Contaminated products**CAUTION****Biological hazard**

Minor or moderate personal injury

- Flush the product thoroughly with water and rinse the product parts in water after dismantling.



The product will be classified as contaminated if it has been used for a liquid which is injurious to health or toxic.

If you request Grundfos to service the product, contact Grundfos with details about the liquid before returning the product for service. Otherwise, Grundfos can refuse to accept the product for service.

Any application for service must include details about the liquid.

Clean the product in the best possible way before you return it.

Costs of returning the product are to be paid by the customer.

6.2 Service documentation**6.2.1 Pump**

Service documents and service kits are available in Grundfos Product Center (<http://product-selection.grundfos.com>).

6.2.2 Motor**Grundfos motors**

Service documentation is available in Grundfos Product Center (<http://product-selection.grundfos.com/>).

If you have any questions, please contact the nearest Grundfos company or service workshop.

Other motors makes than MG

Contact the motor manufacturer.

6.3 Maintaining the product**DANGER****Electric shock**

Death or serious personal injury

- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.

**WARNING****Falling objects**

Death or serious personal injury

- Follow the lifting instructions.
- Use lifting equipment which is approved for the weight of the product.
- Persons must keep a safe distance to the product during lifting operations.
- Wear personal protective equipment.



For lifting instructions, see section [2.4 Lifting the product](#).

WARNING



Falling objects

Death or serious personal injury
- Keep the product in a stable and fixed position when working on it.

WARNING



Corrosive liquids

Death or serious personal injury
- Wear personal protective equipment.

WARNING



Toxic liquids

Death or serious personal injury
- Wear personal protective equipment.



CAUTION

Hot or cold liquid

Minor or moderate personal injury
- Wear personal protective equipment.



CAUTION

Hot or cold surface

Minor or moderate personal injury
- Make sure that no one can accidentally come into contact with hot or cold surfaces.



6.3.1 Pump

The pump bearings and the shaft seal are maintenance-free.

6.3.2 Motor

Carry out maintenance as described in the instructions for the motor which are supplied with the pump.

Motor bearings

Motors not fitted with grease nipples are maintenance-free.

Motors fitted with grease nipples must be lubricated with a high-temperature, lithium-based grease. See the instructions on the fan cover.

In the case of seasonal operation where the motor is idle for more than 6 months of the year, we recommend that you grease the motor when you take the pump out of operation.

Depending on the ambient temperature, replace or lubricate the motor bearings according to the table below. The table applies to 2-pole motors. The number of operating hours stated for bearing replacement are guidelines only.

Motor size [kW]	Bearing replacement interval [operating hours]				
	40 °C	45 °C	50 °C	55 °C	60 °C
0.37 - 0.75	18000	-	-	-	-
1.1 - 7.5	20000	15500	12500	10000	7500
Motor size [kW]	Lubrication interval [operating hours]				
	40 °C	45 °C	50 °C	55 °C	60 °C
11 - 18.5	4500	3400	2500	1700	1100
22	4000	3100	2300	1500	1000
30-55	4000	3000	2000	1500	-
75	2000	1500	1000	500	-

Intervals for 4-pole motors are twice as long as those for 2-pole motors.

If the ambient temperature is lower than 40 °C, then replace or lubricate the bearings at the intervals mentioned under 40 °C.

7. Taking the product out of operation

7.1 Frost protection

CAUTION



Hot or cold liquid

- Minor or moderate personal injury
- Pay attention to the direction of the vent hole and drain plug when draining the pump. Make sure that the escaping liquid does not cause injury to persons.
 - Wear personal protective equipment.



Pay attention to the direction of the vent hole and drain plug when draining the pump. Make sure that the escaping liquid does not cause damage to the motor or other components.

Drain pumps which are not being used during periods of frost to avoid damage.

To drain the pump loosen the vent screw in the pump head and remove all drain plugs from one side of the pump base.

Do not tighten the vent screw and replace the drain plug until the pump is to be used again.

CR, CRI, CRN 1s to 5

Before replacing the drain plug in the base, screw the bypass valve out against the stop. See fig. 18.

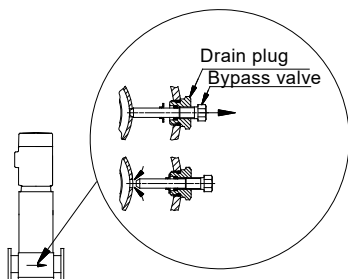


Fig. 18 Location of drain plug and bypass valve

Fit the drain plug by tightening the large union nut followed by the bypass valve.

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7.2 Taking the product permanently out of operation

Observe the following if the pump is to be permanently taken out of operation and removed from the pipe system.

DANGER

Electric shock



- Death or serious personal injury
- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.

WARNING

Falling objects



- Death or serious personal injury
- Follow the lifting instructions.
 - Use lifting equipment which is approved for the weight of the product.
 - Persons must keep a safe distance to the product during lifting operations.
 - Wear personal protective equipment.

For lifting instructions, see section [2.4 Lifting the product](#).

WARNING

Falling objects



- Death or serious personal injury
- Keep the product in a stable and fixed position when working on it.

WARNING

Corrosive liquids



- Death or serious personal injury
- Wear personal protective equipment.

WARNING

Toxic liquids



- Death or serious personal injury
- Wear personal protective equipment.



CAUTION

Hot or cold liquid



- Minor or moderate personal injury
- Wear personal protective equipment.



CAUTION

Hot or cold surface



- Minor or moderate personal injury
- Make sure that no one can accidentally come into contact with hot or cold surfaces.

8. Fault finding the product

DANGER

Electric shock

- Death or serious personal injury
- Before starting any work on the product, make sure that the power supply has been switched off and that it cannot be accidentally switched on.



WARNING

Corrosive liquids

- Death or serious personal injury
- Wear personal protective equipment.



WARNING

Toxic liquids

- Death or serious personal injury
- Wear personal protective equipment.



WARNING

Falling objects

- Death or serious personal injury
- Keep the product in a stable and fixed position when working on it.



CAUTION

Hot or cold liquid

- Minor or moderate personal injury
- Wear personal protective equipment.



CAUTION

Hot or cold surface

- Minor or moderate personal injury
- Make sure that no one can accidentally come into contact with hot or cold surfaces.



Fault	Cause	Remedy
1. The motor does not run when started.	a) Supply failure.	Connect the power supply.
	b) The fuses are blown.	Replace fuses.
	c) The motor-protective circuit breaker has tripped.	Reactivate the motor-protective circuit breaker.
	d) The thermal protection has tripped.	Reactivate the thermal protection.
	e) The main contacts in the motor-protective circuit breaker are not making contact or the coil is faulty.	Replace the contacts or the magnetic coil.
	f) The control circuit is defective.	Repair the control circuit.
	g) The motor is defective.	Replace the motor.
2. The motor-protective circuit breaker trips immediately when the power supply is switched on.	a) One fuse is blown or the automatic circuit breaker has tripped.	Replace the fuse or cut in the circuit breaker.
	b) The contacts in the motor-protective circuit breaker are faulty.	Replace the motor-protective circuit breaker contacts.
	c) The cable connection is loose or faulty.	Fasten or replace the cable connection.
	d) The motor winding is defective.	Replace the motor.
	e) The pump is mechanically blocked.	Remove the mechanical blocking of the pump.
	f) The motor-protective circuit breaker setting is too low.	Set the motor-protective circuit breaker correctly.
3. The motor-protective circuit breaker trips occasionally.	a) The motor-protective circuit breaker setting is too low.	Set the motor-protective circuit breaker correctly.
	b) Low voltage at peak times.	Ensure a stable power supply.
4. The motor-protective circuit breaker has not tripped, but the pump does not run.	a) See 1 a), b), d), e) and f).	

Fault	Cause	Remedy
5. The pump performance is not constant.	a) The pump inlet pressure is too low (cavitation).	Check the inlet conditions.
	b) The inlet pipe or pump is partly blocked by impurities.	Clean the inlet pipe or pump.
	c) The pump draws in air.	Check the inlet conditions.
6. The pump runs, but gives no water.	a) The inlet pipe or pump is blocked by impurities.	Clean the inlet pipe or pump.
	b) The foot or non-return valve is blocked in closed position.	Repair the foot or non-return valve.
	c) There is a leakage in the inlet pipe.	Repair the inlet pipe.
	d) There is air in the inlet pipe or pump.	Check the inlet conditions.
	e) The motor runs in the wrong direction of rotation.	Change the direction of rotation of the motor.
7. The pump runs backwards when switched off.	a) There is a leakage in the inlet pipe.	Repair the inlet pipe.
	b) The foot or non-return valve is defective.	Repair the foot or non-return valve.
8. Leakage in shaft seal.	a) The shaft seal is defective.	Replace the shaft seal.
9. Noise.	a) Cavitation.	Check the inlet conditions.
	b) The pump does not rotate freely due to frictional resistance as a result of incorrect pump shaft position.	Adjust the pump shaft. Follow the procedure in fig. 6, 7, 8 or in the appendix.
	c) Frequency converter operation.	See section 3.2.5 Frequency converter operation .

9. Technical data

9.1 Operating conditions

9.1.1 Liquid temperature

Figure 1 in the appendix states the relationship between liquid temperature range and maximum permissible operating pressure.



The maximum permissible operating pressure and liquid temperature ranges apply to the pump only.

9.1.2 Ambient temperature and altitude

Motor power [kW]	Motor make	Motor efficiency class	Maximum ambient temperature [°C]	Maximum altitude above sea level [m]
0.37 - 0.55	Grundfos MG	-	+40	1000
0.75 - 22	Grundfos MG	IE3	+60	3500
30.0 - 75.0	Siemens	IE3	+55	2750



The maximum permissible ambient temperature is stated on the motor nameplate, and it must not be exceeded during operation to avoid damaging the motor.

If the maximum permissible ambient temperature is not stated on the motor nameplate, the motor must not be used in an ambient temperature above 40 °C.

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

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

Pos.	Motor power [kW]	Motor make
1	0.37 - 0.55	MG
	0.37 - 22	MGE
2	0.75 - 22	MG
3	30.0 - 75.0	Siemens

Example

Figure 19 shows that the load of an IE3 motor at an ambient temperature of 70 °C must not exceed 89 % of the rated output.

If the pump is installed 4750 m above sea level, the motor must not be loaded more than 89 % of the rated output.

In cases where both the maximum temperature and the maximum altitude are exceeded, the derating factors must be multiplied ($0.89 \times 0.89 = 0.79$).

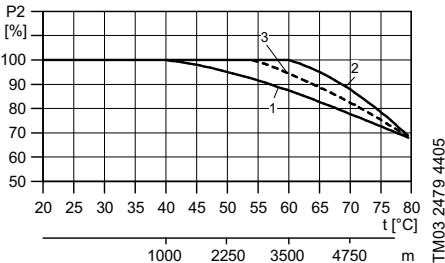


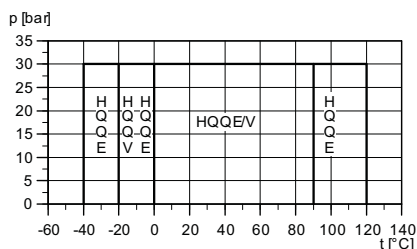
Fig. 19 Motor output in relation to temperature and altitude

9.1.3 Maximum permissible operating pressure and liquid temperature for the shaft seal



The diagram below applies to clean water and water containing antifreeze liquids.

CR, CRI, CRN 1s to 20 and CR, CRN 32 to 64



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Fig. 20 Maximum permissible operating pressure and liquid temperature

Standard shaft seal	Motor [kW]	Temperature range [°C]
HQQE	0.37 - 45	-40 to +120
HBQE	55-75	0 to 120
HQQV	0.37 - 45	-20 to +90
HBQV	55-75	0 to 90

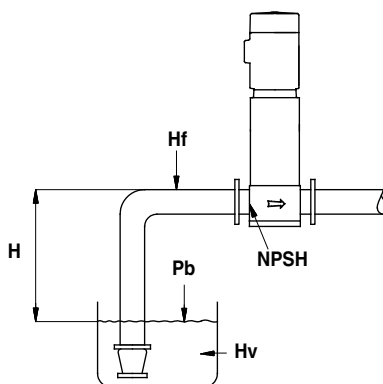
You can clean CRI and CRN pumps in place (CIP) with a type H shaft seal with EPDM rubber parts, HxxE and liquids up to 64 °C for maximum 15 minutes.



The pumping of liquids above 120 °C may result in periodical noise and reduced pump life.

CR, CRI, CRN pumps are not suitable for the pumping of liquids above 120 °C for long periods.

9.1.4 Minimum inlet pressure



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Fig. 21 Schematic view of open system with a CR pump

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

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

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.
(10 bar = 1 MPa)

$NPSH$ = Net Positive Suction Head in m head, to be read from the NPSH curve in the appendix (at the highest flow the pump will be delivering).

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

H_v = Vapour pressure for water in m head. See fig. 5 in the appendix.
If the pumped liquid is not water, then use the vapour pressure for the liquid which is being pumped.

t_m = Liquid temperature.

H_s = Safety margin = minimum 0.5 m head.

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. There must be a pressure equal to the calculated "H" during operation.

Example

$P_b = 1 \text{ bar}$.

Pump type: CR 15, 50 Hz.

Flow rate: $15 \text{ m}^3/\text{h}$.

NPSH (see the appendix): 1.1 m head.

$H_f = 3.0 \text{ m head}$.

Liquid temperature: 60°C .

H_v (from fig. 5 in the appendix): 2.1 m head.

$H = P_b \times 10.2 - \text{NPSH} - H_f - H_v - H_s [\text{m head}]$.

$H = 1 \times 10.2 - 1.1 - 3.0 - 2.1 - 0.5 = 3.5 \text{ m head}$.

This means that the pump can operate at a suction lift of maximum 3.5 m head.

Pressure calculated in bar: $3.5 \times 0.0981 = 0.343 \text{ bar}$.

Pressure calculated in kPa: $3.5 \times 9.81 = 34.3 \text{ kPa}$.

9.1.5 Maximum permissible inlet pressure

The tables in the appendix state the maximum permissible inlet pressure. However, the actual inlet pressure + the maximum pump pressure at no flow must always be lower than the values stated in fig. 1 in the appendix.

The pumps are pressure-tested at a pressure of 1.5 times the values stated in fig. 1 in the appendix.

9.1.6 Minimum flow rate**WARNING****Too high pressure and leakage**

Death or serious personal injury

- Do not run the pump against a closed outlet valve.

Due to the risk of overheating, do not use the pump at flows below the minimum flow rate.

The curves below show the minimum flow rate as a percentage of the rated flow rate in relation to the liquid temperature.

- - - = air-cooled top.

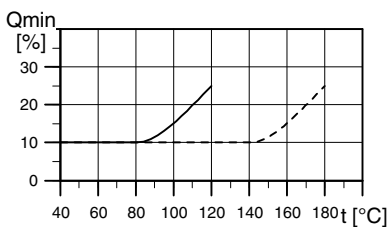


Fig. 22 Minimum flow rate

9.1.7 Maximum flow rate

The table in the appendix states the maximum flow rate. See fig. 2 in the appendix.

9.2 Electrical data

See the motor nameplate.

9.3 Dimensions and weights

Dimensions: See fig. 3 in the appendix.

Weights: See label on the packing.

9.3.1 Sound pressure level

See fig. 4 in the appendix.

10. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.



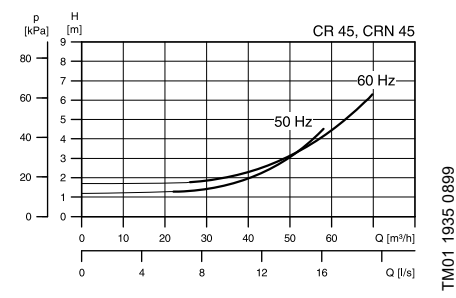
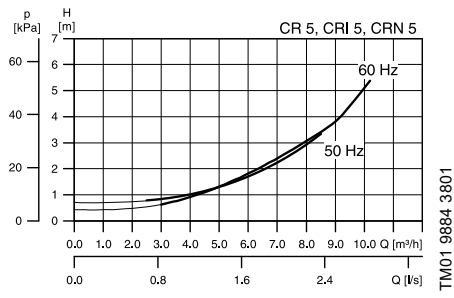
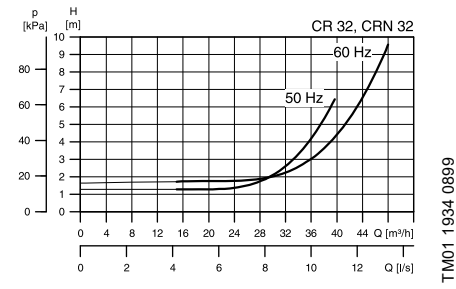
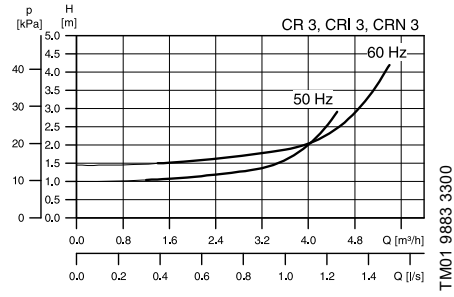
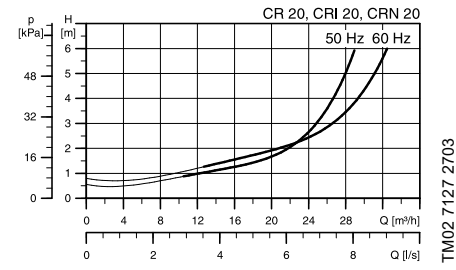
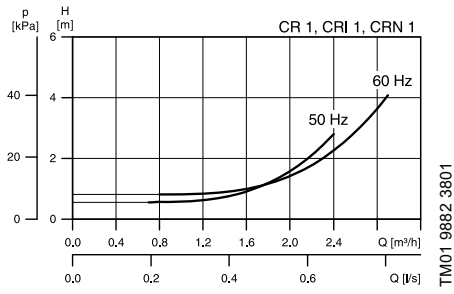
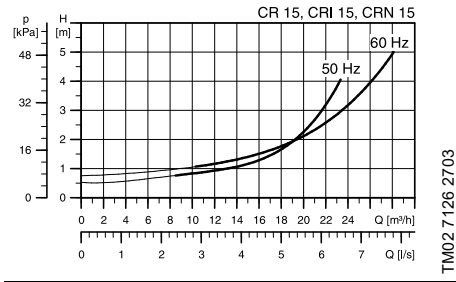
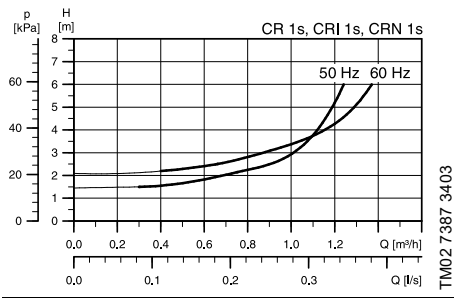
The crossed-out wheellie bin symbol on a product means that it must be disposed of separately from household waste. When a product marked with this symbol reaches its end of life, take it to a collection point designated by the local

waste disposal authorities. The separate collection and recycling of such products will help protect the environment and human health.

See also end-of-life information at www.grundfos.com/product-recycling.

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NPSH



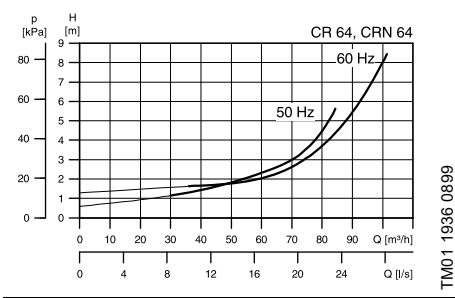
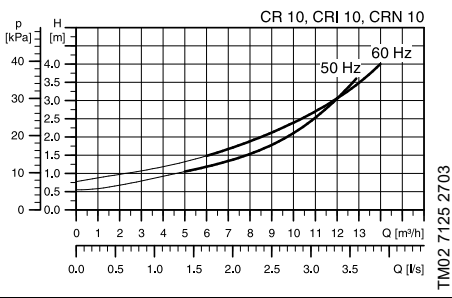
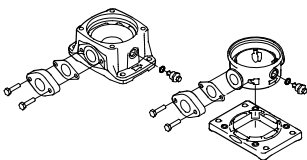
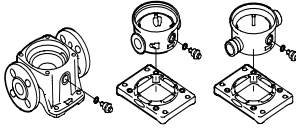
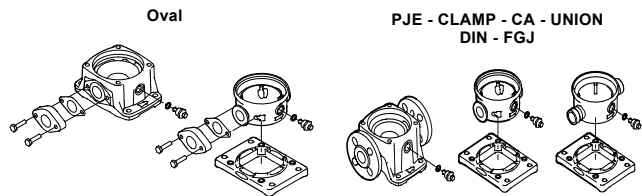


Fig. 1 Maximum permissible operating pressure and liquid temperature

50 Hz

	Oval		PJE - CLAMP - CA - UNION DIN - FGJ	
				
	Operating pressure	Liquid temperature range	Operating pressure	Liquid temperature range
CR, CRI, CRN 1s	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI, CRN 1	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI, CRN 3	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI, CRN 5	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI 10-1 → 10-16	16 bar	-20 to +120 °C	16 bar	-20 to +120 °C
CR, CRI 10-17 → 10-22	-	-	25 bar	-20 to +120 °C
CRN 10	-	-	25 bar	-20 to +120 °C
CR, CRI 15-1 → 15-7	10 bar	-20 to +120 °C	-	-
CR, CRI 15-1 → 15-10	-	-	16 bar	-20 to +120 °C
CR, CRI 15-12 → 15-17	-	-	25 bar	-20 to +120 °C
CRN 15	-	-	25 bar	-20 to +120 °C
CR, CRI 20-1 → 20-7	10 bar	-20 to +120 °C	-	-
CR, CRI 20-1 → 20-10	-	-	16 bar	-20 to +120 °C
CR, CRI 20-12 → 20-17	-	-	25 bar	-20 to +120 °C
CRN 20	-	-	25 bar	-20 to +120 °C
CR, CRN 32-1-1 → 32-7	-	-	16 bar	-30 to +120 °C
CR, CRN 32-8-2 → 32-14	-	-	30 bar	-30 to +120 °C
CR, CRN 45-1-1 → 45-5	-	-	16 bar	-30 to +120 °C
CR, CRN 45-6-2 → 45-11	-	-	30 bar	-30 to +120 °C
CR, CRN 45-12-2 → 45-13-2	-	-	33 bar	-30 to +120 °C
CR, CRN 64-1-1 → 64-5	-	-	16 bar	-30 to +120 °C
CR, CRN 64-6-2 → 64-8-1	-	-	30 bar	-30 to +120 °C



	Operating pressure	Liquid temperature range	Operating pressure	Liquid temperature range
CR, CRI, CRN 1s	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI, CRN 1	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI, CRN 3	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI, CRN 5	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI 10-1 → 10-10	16 bar	-20 to +120 °C	16 bar	-20 to +120 °C
CR, CRI 10-12 → 10-17	-	-	25 bar	-20 to +120 °C
CRN 10	16 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI 15-1 → 15-5	10 bar	-20 to +120 °C	-	-
CR, CRI 15-1 → 15-8	-	-	16 bar	-20 to +120 °C
CR, CRI 15-9 → 15-12	-	-	25 bar	-20 to +120 °C
CRN 15	10 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRI 20-1 → 20-5	10 bar	-20 to +120 °C	-	-
CR, CRI 20-1 → 20-7	-	-	16 bar	-20 to +120 °C
CR, CRI 20-8 → 20-10	-	-	25 bar	-20 to +120 °C
CRN 20	10 bar	-20 to +120 °C	25 bar	-20 to +120 °C
CR, CRN 32-1-1 → 32-5	-	-	16 bar	-30 to +120 °C
CR, CRN 32-6-2 → 32-10-2	-	-	30 bar	-30 to +120 °C
CR, CRN 45-1-1 → 45-4	-	-	16 bar	-30 to +120 °C
CR, CRN 45-5-2 → 45-7	-	-	30 bar	-30 to +120 °C
CR, CRN 64-1-1 → 64-3	-	-	16 bar	-30 to +120 °C
CR, CRN 64-4-2 → 64-5-2	-	-	30 bar	-30 to +120 °C

Fig. 2 Maximum inlet pressure and flow rate for CR, CRI and CRN

50 Hz			
Pump type	Maximum inlet pressure		Maximum flow rate
	[bar]	[MPa]	[m ³ /h]
CR, CRI, CRN 1s			1.1
1s-2 → 1s-36	10	1	
CR, CRI, CRN 1			2.4
1-2 → 1-36	10	1	
CR, CRI, CRN 3			4.5
3-2 → 3-29	10	1	
3-31 → 3-36	15	1.5	
CR, CRI, CRN 5			8.5
5-2 → 5-16	10	1	
5-18 → 5-36	15	1.5	
CR, CRI, CRN 10			13
10-1 → 10-6	8	0.8	
10-7 → 10-22	10		
CR, CRI, CRN 15			24
15-1 → 15-3	8	0.8	
15-4 → 15-17	10	1	
CR, CRI, CRN 20			29
20-1 → 20-3	8	0.8	
20-4 → 20-17	10	1	
CR, CRN 32			40
32-1-1 → 32-4	4	0.4	
32-5-2 → 32-10	10	1	
32-11-2 → 32-14	15	1.5	
CR, CRN 45			58
45-1-1 → 45-2	4	0.4	
45-3-2 → 45-5	10	1	
45-6-2 → 45-13-2	15	1.5	
CR, CRN 64			85
64-1-1 → 64-2-2	4	0.4	
64-2-1 → 64-4-2	10	1	
64-4-1 → 64-8-1	15	1.5	
CR, CRN 95			120
95-1- → 95 1-1	4	0.4	
95-2 → 95-3-2	10	1	
95-3 → 95-6	15	1.5	
95-7 → 95-8-2	20	2	
CR, CRN 125			160
125-1 → 125-2-2	10	1	
125-2 → 125-4	15	1.5	
125-5 → 125-10	20	2	
CR, CRN 155			200
155-1 → 155-1-1	10	1	
155-2 → 155-3	15	1.5	
155-4-1 → 155-8-2	20	2	

60 Hz			
Pump type	Maximum inlet pressure		Maximum flow rate
	[bar]	[MPa]	[m ³ /h]
CR, CRI, CRN 1s			1.3
1s-2 → 1s-27	10	1	
CR, CRI, CRN 1			2.9
1-2 → 1-25	10	1	
1-27	15	1.5	
CR, CRI, CRN 3			5.4
3-2 → 3-17	10	1	
3-19 → 3-25	15	1.5	
CR, CRI, CRN 5			10.2
5-2 → 5-9	10	1	
5-10 → 5-24	15	1.5	
CR, CRI, CRN 10			16
10-1 → 10-5	8	0.8	
10-6 → 10-17	10	1	
CR, CRI, CRN 15			29
15-1 → 15-2	8	0.8	
15-3 → 15-12	10	1	
CR, CRI, CRN 20			35
20-1	8	0.8	
20-2 → 20-10	10	1	
CR, CRN 32			48
32-1-1 → 32-2	4	0.4	
32-3-2 → 32-6	10	1	
32-7-2 → 32-10-2	15	1.5	
CR, CRN 45			70
45-1-1 → 45-1	4	0.4	
45-2-2 → 45-3	10	1	
45-4-2 → 45-7	15	1.5	
CR, CRN 64			102
64-1-1	4	0.4	
64-1 → 64-2-1	10	1	
64-2 → 64-5-2	15	1.5	
CR, CRN 95			64
95-1- → 95 1-1	10	1	
95-2 → 95-3-2	15	1.5	
95-4 → 95-5-3	20	2	
CR, CRN 125			190
125-1 → 125-2-2	10	1	
125-2 → 125-4	15	1.5	
125-5 → 125-6	20	2	
CR, CRN 155			230
155-1 → 155-1-1	10	1	
155-2 → 155-3-3	15	1.5	

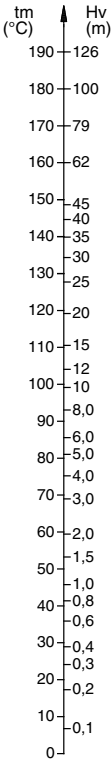
Fig. 3 Dimensions

Pump Type	Oval			PJE			CLAMP - FlexiClamp			UNION			DIN - FGJ			TM00 2256 3393			TM00 2255 3393		
	L [mm]	H [mm]	D [Rp]	L [mm]	H [mm]	D [mm]	L [mm]	H [mm]	D [mm]	L [mm]	H [mm]	D [G]	L [mm]	H [mm]	D [mm]	L [mm]	H [mm]	DN	L [mm]	H [mm]	DN
CR 1s	160	50	1	-	-	-	162	50	30	228	50	2	250	75	25/32	100	145	180	220	13	
CR1, CRN 1s	-	-	-	210	50	42.2	-	-	-	-	-	-	250	75	25/32	100	64	180	220	13	
CR 1	160	50	1	-	-	-	162	50	30	228	50	2	250	75	25/32	100	145	180	220	13	
CR1, CRN 1	-	-	-	210	50	42.2	-	-	-	-	-	-	250	75	25/32	100	64	180	220	13	
CR 3	160	50	1	-	-	-	162	50	30	228	50	2	250	75	25/32	100	145	180	220	13	
CR1, CRN 3	-	-	-	210	50	42.2	-	-	-	-	-	-	250	75	25/32	100	64	180	220	13	
CR 5	160	50	1 1/4	-	-	-	162	50	30	228	50	2	250	75	25/32	100	145	180	220	13	
CR1, CRN 5	-	-	-	210	50	42.2	-	-	-	-	-	-	250	75	25/32	100	64	180	220	13	
CR 10	200	80	1 1/2	-	-	-	-	-	-	-	-	-	280	80	40	130	178	215	256	13.5	
CR1, CRN 10	-	-	-	261	80	60.1	202	80	50	-	-	-	280	80	40	130	200	215	248	13	
CR 15	200	90	2	-	-	-	-	-	-	-	-	-	300	90	50	130	176	215	256	13.5	
CR1, CRN 15	-	-	-	261	90	60.1	202	90	50	-	-	-	300	90	50	130	200	215	248	13	
CR 20	200	90	2	-	-	-	-	-	-	-	-	-	300	90	50	130	176	215	256	13.5	
CR1, CRN 20	-	-	-	261	90	60.1	202	90	50	-	-	-	300	90	50	130	200	215	248	13	
CR 32	-	-	-	-	-	-	-	-	-	-	-	-	320	105	65	170	223	240	298	14	
CRN 32	-	-	-	326	105	88.9	-	-	-	-	-	-	320	105	65	170	226	240	298	14	
CR 45	-	-	-	-	-	-	-	-	-	-	-	-	365	140	80	190	248	266	331	14	
CRN 45	-	-	-	365	135	114.3	-	-	-	-	-	-	365	140	80	190	251	266	331	14	
CR 64	-	-	-	-	-	-	-	-	-	-	-	-	365	140	100	190	248	266	331	14	
CRN 64	-	-	-	365	135	114.3	-	-	-	-	-	-	365	140	100	190	251	266	331	14	

Fig. 4 Airborne noise emitted by pumps with motors fitted by Grundfos

50 Hz		60 Hz	
Motor [kW]	L _{pA} [dB(A)] (ISO3743-2/ ISO1680 50 Hz)	Motor [kW]	L _{pA} [dB(A)] (ISO3743-2/ ISO1680 60 Hz)
0.37	50	0.37	55
0.55	50	0.55	53
0.75	50	0.75	54
1.1	52	1.1	57
1.5	54	1.5	59
2.2	54	2.2	59
3.0	55	3.0	60
4.0	62	4.0	66
5.5	60	5.5	65
7.5	60	7.5	65
11	60	11	65
15	60	15	65
18.5	60	18.5	65
22	66	22	70
30	67	33.5	78
37	67	41.5	78
45	67.5	51	72
55	71.5	62	76
75	74	84	78
90	73	101	77.5
110	74	123	78.5
132	73.5	148	78
160	77	180	81.5
200	76.5	224	81.5

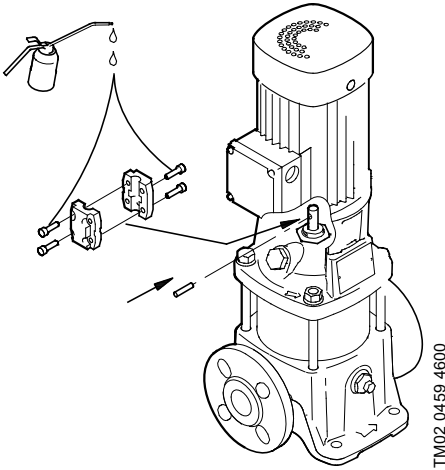
Fig. 5



TM02 7445 3503

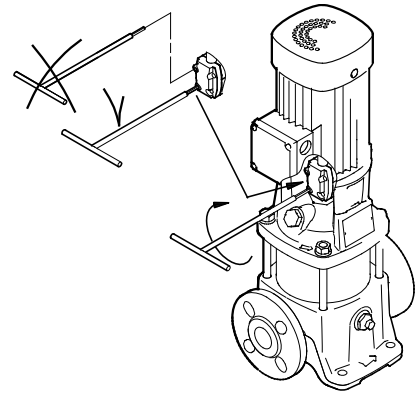
Fig. 6 CR, CRI, CRN 1s, 1, 3 and 5

A



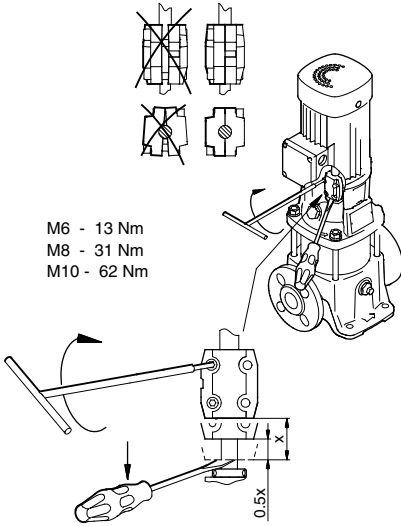
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B



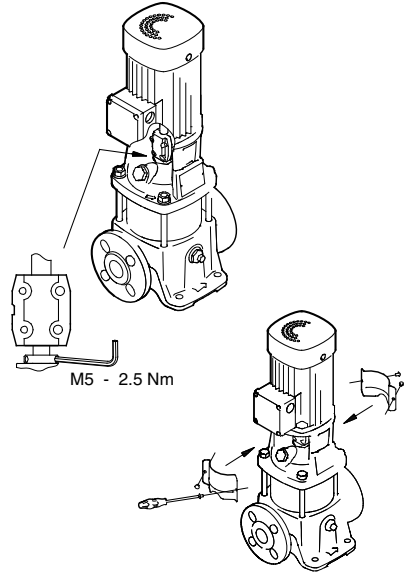
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C



TM02 1051 0501

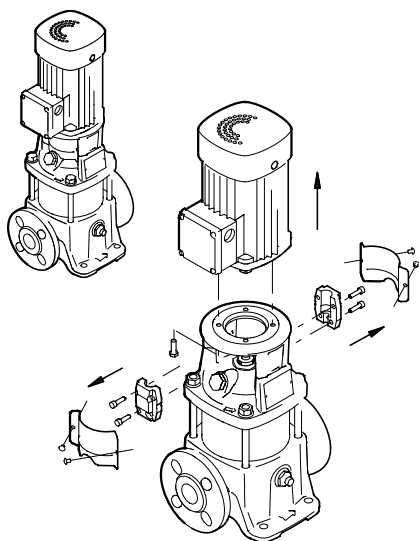
D



TM02 1052 0501

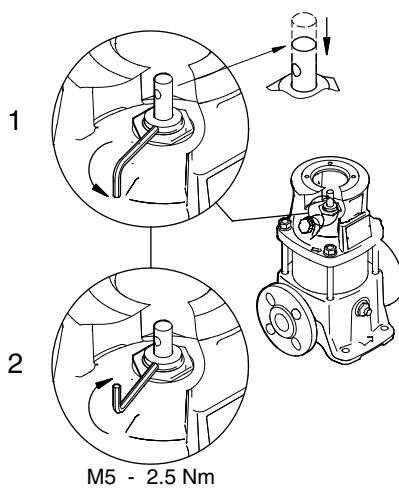
Fig. 7 CR, CRI, CRN 10, 15 and 20

A



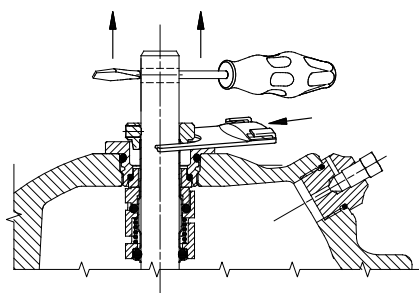
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B



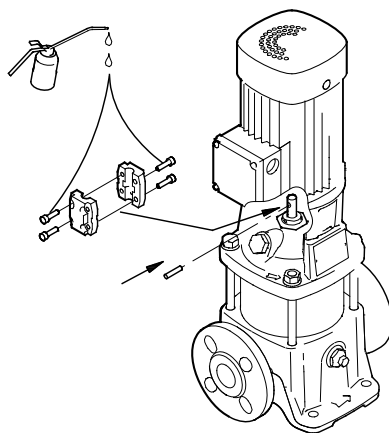
TM02 8500 0304

C



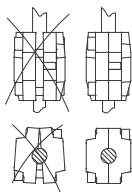
TM02 7923 4403

D

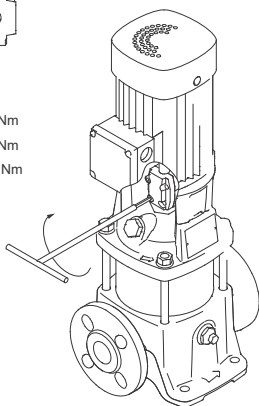


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E

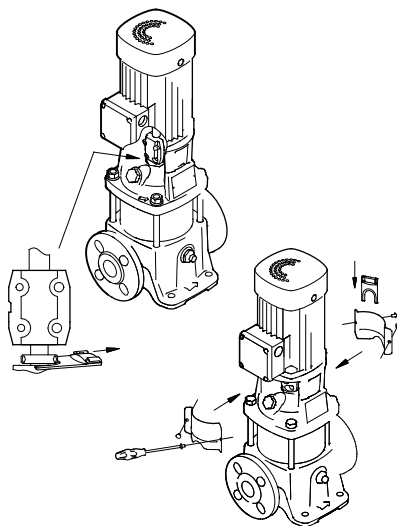


M6 - 13 Nm
M8 - 27 Nm
M10 - 62 Nm



TM02 8542 3620

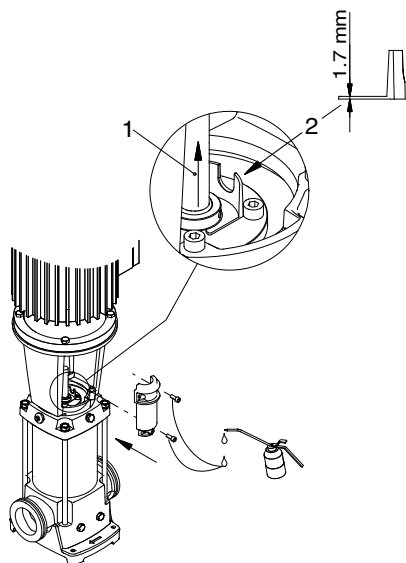
F



TM02 8515 0304

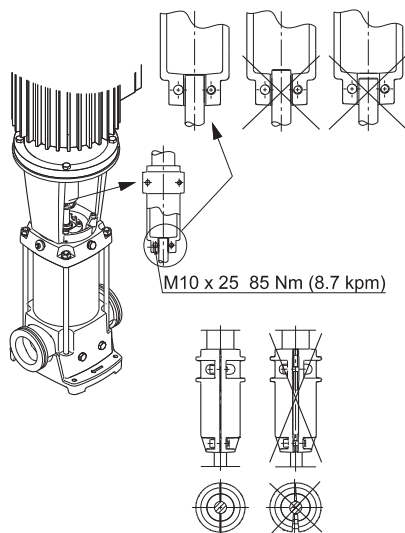
Fig. 8 CR, CRN 32, 45, 64

A



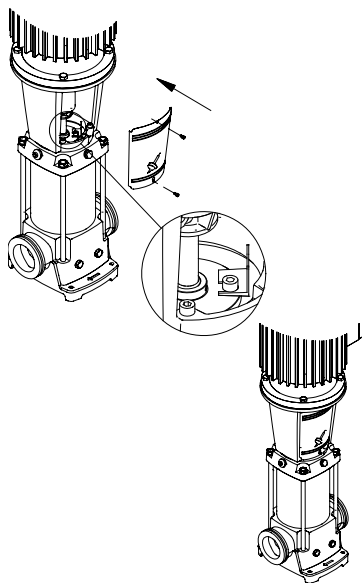
TM01 2144 3600

B



TM01 9878 4409

C



TM01 2146 3600

Pos.	Designation				
	GB	BG	CZ	DE	DK
1	Adapter flange	Преходен фланец	Mezipříruba	Zwischenflansch	Mellemlange
1a	Motor stool	Столче на двигателя	Lucernaty motoru	Laterne	Mellemstykke
2	Pump head	Глава на помпата	Hlava čerpadla	Kopfstück	Topstykke
3	Chamber, top	Горна камера	Horní článek	Oberste Kammer	Kammer, øverste
3a	Chamber without neck ring	Камера без пръстен	Článek bez mezerového kroužku	Kammer ohne Spaltring	Kammer uden tætningsring
4	Chamber complete	Камера - комплект	Kompletní článek	Kammer komplett	Kammer komplet
4a	Chamber with bearing ring	Камера с лагерен пръстен	Článek s kroužkem ložiska	Kammer mit Lagerring	Kammer med lejeringsring
5a	Chamber complete	Камера - комплект	Kompletní článek	Kammer komplett	Kammer komplet
6	Base	Основа	Patka	Fußstück	Fodstykke
6a	Stop pin	Шплент	Zarážkový kolík	Sperzapfen	Rotationslås
6d	Guide plate for base	Водеща плоча за основата	Vodící deska patky	Führungsplatte für Fußstück	Styreplade til fodstykke
6g	Bearing ring	Ролков лагер	Kroužek ložiska	Lagerring	Lejering
7	Coupling guard	Предпазен капак на съединителя	Kryt spojky	Schutzschirm	Skærm
7a	Screw	Винт	Šroub	Schraube	Skruer
8	Coupling complete	Съединител - комплект	Kompletní spojka	Kupplung komplett	Kobling komplet
9	Screw	Винт	Šroub	Schraube	Skruer
10	Shaft pin	Шплент на вала	Válcový kolík	Zylinderstift	Stift
10a	Coupling half	Половина на съединението	Půlspojka	Kupplungshälfte	Koblingshalvpart
12	Flange (oval)	Фланец (овален)	Příruba (oválná)	Flansch (oval)	Flange (oval)
18	Air vent screw	Винт за обезвъздушаване	Odvzdušňovací šroub	Entlüftungsschraube	Luftskrue
19	Pipe plug	Тапа на тръбата	Zátka	Stopfen	Rørprop
21	Plug	Пробка	Zátka	Stopfen	Prop
23	Plug	Пробка	Zátka	Stopfen	Prop
25	Drain plug	Пробка за дренване	Vypouštěcí zátka	Entleerungsstopfen	Tømmeprop
26	Staybolt	Шпилка	Rozpěrný šroub	Stehbolzen	Støttebolt
26a	Strap	Лента	Stahovací pás	Spannband	Spændebånd
26b	Screw	Винт	Šroub	Schraube	Skruer
26c	Washer	Шайба	Podložka	Unterlegscheibe	Spændeskive
28	Screw	Винт	Šroub	Schraube	Skruer
28a	Screw	Винт	Šroub	Schraube	Skruer
31	Screw	Винт	Šroub	Schraube	Skruer
32	Washer	Шайба	Podložka	Unterlegscheibe	Spændeskive
32a	Washer	Шайба	Podložka	Unterlegscheibe	Spændeskive
35	Screw	Винт	Šroub	Schraube	Skruer
36	Nut	Гайка	Matice	Mutter	Metrik
36a	Nut	Гайка	Matice	Mutter	Metrik
37	O-ring/gasket	О-пръстен/уплътнение	O-kroužek/těsnící kroužek	O-Ring/Dichtung	O-ring/pakning
38	O-ring	О-пръстен	O-kroužek	O-Ring	O-ring
38a	O-ring	О-пръстен	O-kroužek	O-Ring	O-ring
39	Gasket	Уплътнение	Těsnění	Dichtung	Pakning
44	Inlet part complete	Входяща част - комплект	Kompletní vtoková část	Einlauteil komplett	Indløbsdel komplet
44a	Inlet part upper	Входна част, горна	Vtoková část horní	Oberes Einlauteil	Øvre indløbsdel
44b	Inlet part lower	Входна част, долна	Vtoková část spodní	Unteres Einlauteil	Nedre indløbsdel
45	Neck ring	Пръстен	Mezerový kroužek	Spaltring	Tætningsring
45a	Neck ring complete	Пръстен - комплект	Kompletní mezerový kroužek	Spaltring komplett	Tætningsring komplet

Pos.	Designation				
	GB	BG	CZ	DE	DK
47	Bearing ring	Търкалящ лагер	Kroužek ložiska	Lagerring	Lejering
47a	Bearing with driver	Търкалящ лагер с винт за застопоряване	Ložisko s unašečem	Lager mit Mitnehmer	Leje med medbringer
47b	Bearing ring, rotating	Търкалящ лагер - въртящ	Kroužek ložiska otočný	Lagerring, rotierend	Lejering, roterende
47c	Bush	Лагерна втулка	Pouzdro	Buchse	Bøsning
47d	Retaining ring	Спирателен пръстен	Přidržený kroužek	Haltering	Låsering
47e	Retaining ring	Спирателен пръстен	Přidržený kroužek	Haltering	Låsering
48	Split cone nut	Гайка на разрязания конус	Matice upínacího pouzdra	Mutter für Klemmbuchse	Møtrik for klembøsning
49	Impeller	Работно колело	Oběžné kolo	Lauftrad	Løber
49a	Impeller	Работно колело	Oběžné kolo	Lauftrad	Løber
49b	Split cone	Разрязан конус	Upínací pouzdro	Klemmbuchse	Klembøsning
49c	Wear ring	Износващ се пръстен	Těsnící kruh	Verschleißring	Slidring
50a	Outlet part/top guide vanes	Нагнетателна част/горен направляващ апарат	Výtláčná část/horní vodící lopatky	Auslass/oberster Leitapparat	Afgangsdell/øvre ledeapparat
51	Pump shaft	Вал на помпата	Hřídel čerpadla	Pumpenwelle	Pumpeaksel
55	Sleeve	Външна втулка	Vnější plášť	Mantel	Svøb
56	Base plate	Основна плоча	Základová deska	Grundplatte	Fodplade
56a	Base plate	Основна плоча	Základová deska	Grundplatte	Fodplade
56c	Screw	Винт	Šroub	Schraube	Skruer
56d	Washer	Шайба	Podložka	Unterlegscheibe	Spændeskive
57	O-ring	О-пръстен	O-kroužek	O-Ring	O-ring
58	Seal carrier	Носач на уплътнението	Unašeč ucpávky	Halter für Wellenabdichtung	Holder for akseltætning
58a	Screw	Винт	Šroub	Schraube	Skruer
60	Spring	Пружина	Pružina	Feder	Fjeder
61	Seal driver	Водач	Unašeč	Mitnehmer	Medbringer
62	Stop ring	Зегерка	Dorazový kroužek	Stopring	Stopring
64	Spacing pipe	Дистанционна тръба	Distanční pouzdro	Distanzhülse	Afstandsøsning
64a	Spacing pipe	Дистанционна тръба	Distanční pouzdro	Distanzhülse	Afstandsøsning
64b	Spacing pipe	Дистанционна тръба	Distanční pouzdro	Distanzhülse	Afstandsøsning
64c	Clamp, splined	Шлицова клема	Drážková spona	Spannstück, Vielnut	Spændestykke, spline
64d	Spacing pipe	Дистанционна тръба	Distanční pouzdro	Distanzhülse	Afstandsøsning
65	Neck ring retainer	Държач на пръстена	Přidrčka mezerového kroužku	Halter für Spaltring	Holder for tætningsring
66	Washer	Шайба	Podložka	Unterlegscheibe	Spændeskive
66a	Washer	Шайба	Podložka	Unterlegscheibe	Spændeskive
66b	Lock washer	Контра - шайба	Pojistná podložka	Sicherungsblech	Låseskive
67	Nut/screw	Гайка/Винт	Matices/Šroub	Mutter/Schraube	Møtrik/Skrue
69	Spacing pipe	Дистанционна тръба	Distanční pouzdro	Distanzhülse	Afstandsøsning
76	Nameplate set	Табела - комплект	Sada štítků	Schildersatz	Skiltesæt
76a	Rivet	Нит	Nýt	Niete	Nitte
77	Pump head cover	Капак на главата на помпата	Kryt hlavy čerpadla	Mantel für Pumpenkopf	Overdækning til pumpehoved
100	O-ring	О-пръстен	O-kroužek	O-Ring	O-ring
105	Shaft seal	Уплътнение на вала	Hřídelová ucpávka	Wellenabdichtung	Akseltætning
201	Flange	Фланец	Příruba	Flansch	Flange
203	Retaining ring	Спирателен пръстен	Přidržený kroužek	Haltering	Låsering

Pos.	Designation				
	EE	ES	FI	FR	GR
1	Ülemineku äärik	Brida acoplamiento	Välilaippa	Bride d'adaptation	Φλάντζα προσαρμογής
1a	Mootoripukk	Acoplamiento	Mootorin jalusta	Lanterne moteur	Στήριγμα κινητήρα
2	Pumba pea	Cabezal bomba	Pumpupää	Tête de pompe	Κεφαλή αντλίας
3	Ülemine vahepesa	Cámara superior	Pesä/ylin	Chambre supérieure	Θάλαμος, άνω
3a	Tihendusrõngata vahepesa	Cámara sin anillo de junta	Pesä, ilman kaularengasta	Chambre sans bague d'étanchéité	Θάλαμος χωρίς δακτύλιο λαιμού
4	Komplektne vahepesa	Cámara completa	Täydellinen pesä	Chambre complète	Θάλαμος πλήρης
4a	Laagriga vahepesa	Cámara con anillo cojinete	Pesä laakerirenkailla	Chambre avec bague de palier	Θάλαμος με δακτύλιο εδράνου
5a	Komplektne vahepesa	Cámara completa	Täydellinen pesä	Chambre complète	Θάλαμος πλήρης
6	Alus	Base	Jalkakappale	Pied de pompe	Βάση
6a	Lukustustihvt	Pasador tope	Pidätintappi, lukitustappi	Goupille d'arrêt	Πείρος συγκράτησης
6d	Aluse juhtplaat	Placa guía para base	Ohjauslevy jalustaan	Plaque pour pied de pompe	Πλάκα οδηγός για τη βάση
6g	Alumine laager	Anillo cojinete	Laakerirengas	Joint de palier	Δακτύλιος εδράνου
7	Ühendusmuhvi kate	Protector acoplamiento	Kytikimen suoja	Protège-accouplement	Προφυλακτικός συνδέσμου
7a	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
8	Komplektne ühendusmuhv	Acoplamiento completo	Täydellinen kytkin	Accouplement complet	Σύνδεσμος πλήρης
9	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
10	Võlli tihvt	Pasador eje	Akselitappi	Goupille cylindrique	Πείρος άξονα
10a	Siduri osa	Semiacoplamiento	Kytikimen puolisko	Demi-accouplement	Ημισύνδεσμος
12	Flants (ovaal)	Brida (ovalada)	Laippa (soikea)	Bride (ovale)	Φλάντζα (οβάλ)
18	Õhutusventiil	Tornillo purga aire	Ilmausruuvi	Vis de purge	Τάπα εξαερισμού
19	Ääriku kork	Tapón tubería	Putkitulppa	Bouchon	Τάπα σωλήνα
21	Kork	Tapón	Tulppa	Bouchon	Τάπα
23	Kork	Tapón	Tulppa	Bouchon	Τάπα
25	Tühjendusava kork	Tapón purga	Tyhjennystulppa	Bouchon de vidange	Τάπα αποστράγγισης
26	Distantspoit	Espárrago sujeción	Pinnapulitti	Goujon	Κοχλίες συγκράτησης
26a	Klamber	Tirante	Haka (säppi)	Tirant d'assemblage	Τιράντα
26b	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
26c	Seib	Arandela	Aluslevy	Rondelle	Ροδέλα
28	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
28a	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
31	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
32	Seib	Arandela	Aluslevy	Rondelle	Ροδέλα
32a	Seib	Arandela	Aluslevy	Rondelle	Ροδέλα
35	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
36	Mutter	Tuerca	Mutteri	Ecrou	Περικόχλιο
36a	Mutter	Tuerca	Mutteri	Ecrou	Περικόχλιο
37	O-ring/tihend	Junta tórica/junta	O-rengas tiiviste	Joint/bague	Δακτύλιος-Ο/ παρέμβυσμα
38	O-ring	Junta tórica	O-rengas	Joint	Δακτύλιος-Ο
38a	O-ring	Junta tórica	O-rengas	Joint	Δακτύλιος-Ο
39	Tihend	Junta	Tiiviste	Bague	Τσιμούχα
44	Komplektne imiosa	Parte aspiración completa	Täydellinen sisäosa	Partie aspiration complète	Πλήρες εσωτερικό μέρος
44a	Sisendosa ülemine	Pieza de entrada, superior	Ylempi imuosa	Pièce d'aspiration supérieure	Τμήμα εισόδου, πάνω
44b	Sisendosa alumine	Pieza de entrada, inferior	Alempi imuosa	Pièce d'aspiration inférieure	Τμήμα εισόδου, κάτω
45	Tihendusrõngas	Anillo tope	Kaularengas	Bague d'étanchéité	Δακτύλιος λαιμού

Pos.	Designation				
	EE	ES	FI	FR	GR
45a	Tihendusrõngas	Anillo tope completo	Täydellinen kaularengas	Bague d'étrangéité complète	Δακτύλιος λαιμού πλήρης
47	Laager	Anillo cojinete	Laakerirengas	Bague de palier	Δακτύλιος εδράνου
47a	Juhikuga vahelaager	Cojinete con engranaje	Ohjainlaakeri	Bague de palier avec driver	Εδρανο με οδηγό
47b	Laager, pöörlev	Anillo cojinete giratorio	Laakerirengas, pyörivä	Bague de palier tournante	Δακτύλιος εδράνου στρεφόμενος
47c	Puks	Manguito	Holkki	Douille	Φωλιά
47d	Lukustusrõngas	Anillo cierre	Lukitusrengas	Bague de blocage	Δακτύλιος συγκράτησης
47e	Lukustusrõngas	Anillo cierre	Lukitusrengas	Bague de blocage	Δακτύλιος συγκράτησης
48	Lõhismutter	Tuerca casquillo cónico	Kartioholkki mutteri	Ecrou de cône de serrage	Περικόχλιο διαιρούμενου κώνου
49	Tõõratas	Impulsor	Juoksupyörä	Roue	Πτερωτή
49a	Tõõratas	Impulsor	Juoksupyörä	Roue	Πτερωτή
49b	Survepuks	Casquillo cónico	Kartioholkki	Cône de serrage	Διαιρούμενος κώνος
49c	Kulutusrõngas	Anillo desgaste	Kulutusringas	Bague d'usure	Δακτύλιος φθοράς
50a	Surveosa/ ülemised juhtlabad	Pieza de descarga/ álabes guía superiores	Painepuoli / ylemmät johdesivut	Pièce de refoulement/ aubes directrices supérieures	Τμήμα κατάθλιψης/πάνω οδηγά πτερύγια
51	Pumba võll	Eje bomba	Pumppuakseli	Arbre de pompe	Αξονας αντλίας
55	Kattesärk	Camisa exterior	Ulompi vaippa	Chemise	Εξωτερικό χιτώνιο
56	Alusplaat	Placa base	Jalustalevy	Plaque de base	Πλάκα βάσης
56a	Alusplaat	Placa base	Jalustalevy	Plaque de base	Πλάκα βάσης
56c	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
56d	Seib	Arandela	Aluslevy	Rondelle	Ροδέλα
57	O-ring	Junta tórica	O-rengas	Joint	Δακτύλιος-Ο
58	Tihendi kandur	Soporte cierre	Tiivistekannatin	Toc d'entraînement	Φορέας στυπιοθλίπτη
58a	Kruvi	Tornillo	Ruuvi	Vis	Κοχλίας
60	Vedru	Muelle	Jousi	Ressort	Ελατήριο
61	Võllitihendi juhik	Guía de cierre	Tiivisteen vetotappi	Toc d'entraînement	Οδηγός στεγανοποιητικού
62	Lukustusrõngas	anillo de tope	Pysäytinrengas	Bague d'arrêt	Τερματικός δακτύλιος
64	Distantspuks	Casquillo espaciador	Väliholkki	Douille d'entretoise	Αποστάτης
64a	Distantspuks	Casquillo espaciador	Väliholkki	Douille d'entretoise	Αποστάτης
64b	Distantspuks	Casquillo espaciador	Väliholkki	Douille d'entretoise	Αποστάτης
64c	Soontega puks	Casquillo ranurado	Kiristin, riilattu	Pièce de serrage	Στεφάνη με εγκοπές
64d	Distantspuks	Casquillo espaciador	Väliholkki	Douille entretoise	Αποστάτης
65	Tihendusrõnga klamber	Retén anillo junta	Kaulusrenkaan pidin	Support pour bague d'étrangéité	Στήριγμα δακτυλίου λαιμού
66	Seib	Arandela	Aluslevy	Rondelle	Ροδέλα
66a	Seib	Arandela	Aluslevy	Rondelle	Ροδέλα
66b	Vedruselib	Arandela cierre	Lukitusaluslevy	Rondelle de blocage	Συγκράτηση ροδέλας
67	Mutter/Kruvi	Tuerca/Tornillo	Mutteri/Ruuvi	Ecrou/Vis	Περικόχλιο/Κοχλίας
69	Distantspuks	Casquillo espaciador	Väliholkki	Douille entretoise	Αποστάτης
76	Pumba sildik	Juego placa identificación	Arvokilpisarja	Plaque d'identification	Σει πινακίδας
76a	Neet	Remache	Niitti	Rivet	Πριτσίνι
77	Pumba kaas	Cubierta del cabezal de la bomba	Moottoriosan suoja	Couvercle hydraulique	Καπάκι κεφαλής αντλίας
100	O-ring	Junta tórica	O-rengas	Joint	Δακτύλιος-Ο
105	Võllitihend	Cierre	Akselitivistite	Garniture mécanique	Στυπιοθλίπτης
201	Äärik	Brida	Laippa	Bride	Φλάντζα
203	Lukustusrõngas	Anillo cierre	Lukitusrengas	Bague de blocage	Δακτύλιος συγκράτησης

Pos.	Designation				
	HR	HU	IT	LT	LV
1	međuprirubnica	csatlakozó karima	Flangie adattatrici	Tarpinis flanšas	Pārejas savienotājelementa atloks
1a	međukomad	motortartó közdarab	Lanterna del motore	Variklio atrama	Motora paliktnis
2	glava crpke	szivattyúfej	Testa pompa	Siurblio galvutė	Sūkņa galva
3	gornja komora	felső kamra	Camera superiore	Viršutinė kamera	Kamera, augšējā
3a	komora bez rascjepljenog prstena	közkamra részgyűrű nélkül	Camera senza collarino	Kamera be kaklelio žiedo	Kamera bez gredzena ar frēžējumu
4	kompletna komora	komplett közkamra	Camera completa	Kamera	Nokomplektēta kamera
4a	komora s ležajnim prstenom	csapágyás közkamra	Camera con cuscinetto	Kamera su guolio žiedu	Kamera ar gultna gredzenu
5a	kompletna komora	komplett közkamra	Camera completa	Kamera	Nokomplektēta kamera
6	nožni dio	talp	Base	Korpusas	Balstplātne
6a	zatic	rögzítő túske	Molla di arresto	Fiksatorius	Atdures tapa
6d	vodilica za nožni dio	áramlásrendező tányér	Guida per basamento	Korpuso centravimo plokštelė	Balstplātnes vadotne
6g	prsten ležaja	csapágyagyűrű	Cuscinetto	Atraminis guolis	Gultna gredzens
7	zaštita spojke	tengelykapcsoló burkolat	Giunti di protezione	Movos apsauga	Savienotājuzmavas aizsargs
7a	vijak	csavar	Vite	Varžtas	Skrūve
8	spojka kompletna	komplett tengelykapcsoló	Giunto completo	Visa mova	Nokomplektēta savienotājuzmava
9	vijak	csavar	Vite	Varžtas	Skrūve
10	zatic vratila	tengelyretesz	Molla albero	Veleno kaištis	Vārsptas tapa
10a	Spojnica	Tengelykapcsolófél	Semigiunto	Movos pusė	Savienotājuzmavas daļa
12	Prirubnica (ovalna)	Karima (ovális)	Flangia (ovale)	Flanšas (ovalinis)	Atloks (ovāls)
18	odračni vijak	légtelenítő csavar	Vite della ventola	Oro išleidimo angos varžtas	Atgaisošanas skrūve
19	čep	karima zárócsavar	Tappo	Vamzdžio kamštelis	Caurules noslēgs
21	čep	zárócsavar	Tappo	Kamštelis	Noslēgs
23	čep	zárócsavar	Tappo	Kamštelis	Noslēgs
25	čep za pražnjenje	űrítőcsavar	Tappo spurgo	Skysčio išleidimo kamštelis	Izliešanas noslēgs
26	sprežni vijak	összefogó rúd	Tiranti	Savarža	Enkurskrūve
26a	zatezna traka	összefogó pánt	Tirante	Juostinė apkaba	Siksna
26b	vijak	csavar	Vite	Varžtas	Skrūve
26c	podložna pločica	távtartó	Rondella	Poveržlė	Paplāksne
28	vijak	csavar	Vite	Varžtas	Skrūve
28a	vijak	csavar	Vite	Varžtas	Skrūve
31	vijak	csavar	Vite	Varžtas	Skrūve
32	podložna pločica	távtartó	Rondella	Poveržlė	Paplāksne
32a	podložna pločica	távtartó	Rondella	Poveržlė	Paplāksne
35	vijak	csavar	Vite	Varžtas	Skrūve
36	matica	csavaranya	Dado	Veržlė	Uzgrieznis
36a	matica	csavaranya	Dado	Veržlė	Uzgrieznis
37	O-prsten/brtva	O-gyűrű/tömítés	O ring/guranizione	Žiedas/tarpiklis	Apalā šķērsgriezuma blīvgredzens / starplika
38	O-prsten	O-gyűrű	O ring	Žiedas	Apalā šķērsgriezuma blīvgredzens
38a	O-prsten	O-gyűrű	O ring	Žiedas	Apalā šķērsgriezuma blīvgredzens
39	Brtva	Tömítés	Guarnizione	Tarpiklis	Starplika
44	ulazni dio kompletan	komplett belső rész	Parte interna completa	Visa įsiurbimo dalis	Nokomplektēta ieplūdes daļa
44a	Gornji ulazni dio	Szívó oldal, felső	Parte superiore sezione di aspirazione	Viršutinė įvado dalis	Augšējā ieplūdes daļa

Pos.	Designation				
	HR	HU	IT	LT	LV
44b	Donji ulazni dio	Szivó oldal, alsó	Parte inferiore sezione di aspirazione	Apatinė įvado dalis	Apakšējā ieklūdes daļa
45	rascijepljeni prsten	résgyűrű	Collarino	Kakliuko žiedas	Gredzens ar frēžējumu
45a	rascijepljeni prsten kompletan	komplett résgyűrű	Collarino completo	Visas kakliuko žiedas	Nokomplektēts gredzens ar frēžējumu
47	prsten ležaja	csapágygyűrű	Cuscinetto	Guolis	Gultņa gredzens
47a	prsten ležaja sa zahvatnikom	csapágy, megvezetővel	Cuscinetto con guida	Įstatoma guolis	Gultnis ar vadotni
47b	prsten ležaja, rotirajući	csapágygyűrű, forgórész	Cuscinetto rotante	Besisukantis guolis	Gultņa gredzens, rotējošs
47c	tuljak	persely	Boccola	Įvorė	Ieliktnis
47d	pridržni prsten	rögzítő gyűrű	Anello di arresto	Laikantysis žiedas	Sprostgredzens
47e	pridržni prsten	rögzítő gyűrű	Anello di arresto	Laikantysis žiedas	Sprostgredzens
48	matica za konusni prsten	szorítókúp anyja	Dado bussola conica	Skelta kūginė veržlė	Šķeltnis konusveida uzgrieznis
49	rotor	járókerék	Girante	Darbaratis	Darbrats
49a	rotor	járókerék	Girante	Darbaratis	Darbrats
49b	konusni prsten	szorítókúp	Bussola conica	Skelta kūginė įvorė	Šķeltnis konuss
49c	potrošni prsten	kopógyűrű	Anello di usura	Dėvėjimosi žiedas	Nodiluma kompensators
50a	Ispuni dio/gornja krilca vodilice	Nyomó oldal/felső vezetőlapátok	Parti superiori sezione di mandata	Išvado dalis/viršutinės kreipiamosios mentės	Izplūdes daļa / augšējās virzošās lāpstiņas
51	vratilo crpke	szivattyú tengely	Albero pompa	Siurblio velenas	Sūkņa vārpsta
55	plašt	köpenycső	Camicia esterna	Išorinis cilindras	Uzmava
56	osnovna ploča	alaplap	Basamento	Korpuso pagrindas	Balstplātne
56a	osnovna ploča	alaplap	Basamento	Korpuso pagrindas	Balstplātne
56c	vijak	csavar	Vite	Varžtas	Skrūve
56d	podložna pločica	távtartó	Rondella	Poveržlė	Paplāksne
57	O-prsten	O-gyűrű	O ring	Žiedas	Apalā šķēsgriezuma blīvgredzens
58	držač brtve	tömítés zárófedél	Porta tenuta	Riebokšlio laikikis	Blīves turētājs
58a	vijak	csavar	Vite	Varžtas	Skrūve
60	opruga	rugó	Molla	Spyruoklė	Atspere
61	zahvatnik	vezető gyűrű	Guida guarnizione	Riebokšlio tarpiklis	Blīvējuma vadotne
62	zaustavni prsten	stopgyűrű	Anello di arresto	Fiksavimo žiedas	Aizsarggredzens
64	odstojnik	távtartó gyűrű	Tubo distanziale	Tarpinė įvorė	Atdalīšanas caurule
64a	odstojnik	távtartó gyűrű	Tubo distanziale	Tarpinė įvorė	Atdalīšanas caurule
64b	odstojnik	távtartó gyűrű	Tubo distanziale	Tarpinė įvorė	Atdalīšanas caurule
64c	zatezni komad, višeutorni	hornyos rögzítőgyűrű	Giunto	Apkaba, skelta	Skava, rievota
64d	odstojnik	távtartó gyűrű	Tubo distanziale	Tarpinė įvorė	Atdalīšanas caurule
65	držač za rascijepljeni prsten	résgyűrű rögzítő	Fermo per collarino	Kakliuko žiedo laikikis	Gredzena ar frēžējumu vadplāksne
66	podložna pločica	távtartó	Rondella	Poveržlė	Paplāksne
66a	podložna pločica	távtartó	Rondella	Poveržlė	Paplāksne
66b	sigurnosna pločica	rögzítő alátét	Blocco per rondella	Fiksuojamoji poveržlė	Sprostpaplāksne
67	matica/vijak	csavaranya/csavar	Dado/Vite	Fiksuojamoji veržlė/ Varžtas	Uzgrieznis/skrūve
69	odstojnik	távtartó gyűrű	Tubo distanziale	Tarpinė įvorė	Atdalīšanas caurule
76	natpisne pločice	adatábia készlet	Targhetta	Vardinė plokštėlė	Datu plāksnīšu komplekts
76a	Zakovica	Szegecs	Rivetto	Kniedė	Kniede
77	Poklopac glave crpke	Szivattyú fej fedél	Copertura testa pompa	Siurblio galvutės gaubtas	Sūkņa galvas pārsegs
100	O-prsten	O-gyűrű	O ring	Žiedas	Apalā šķēsgriezuma blīvgredzens
105	brtva vratila	tengelytömítés	Tenuta meccanica	Riebokšlis	Vārpstas blīve
201	prirubnica	karima	Flangia	Flanšas	Atloks
203	pridržni prsten	rögzítő gyűrű	Blocca flangia	Laikantysis žiedas	Sprostgredzens

Pos.	Designation				
	NL	PL	PT	RO	RS
1	Adapterflens	Kolnierz przejściowy	Flange do adaptador	Fianşa de adaptare	Prirubnica podešavanja
1a	Lantaarnstuk	Podstawa silnika	Adaptador do motor	Scaunul motorului	Oslonac motora
2	Pompkop	Głowica pompy	Cabeça da bomba	Capul pompei	Glava pumpe
3	Bovenste kamer	Komora górna	Câmara superior	Camera superioară	Gornje kućište
3a	Kamer zonder spaltring	Komora bez pierścienia bieżnego	Câmara sem aro	Camera fără inel de uzură	Kućište sa ležišnim prstena
4	Kamer compleet	Komora, kompletna	Câmara completa	Camera completă	Kompletno kućište
4a	Kamer met lager	Komora z pierścieniem oporowym łożyska	Câmara com casquilho	Camera cu lagăr	Kućište sa ležišnim prstenom
5a	Kamer compleet	Komora, kompletna	Câmara completa	Camera completă	Kompletno kućište
6	Voetstuk	Podstawa	Base	Baza pompei	Element oslonca
6a	Anti rotatie stift	Kolek ustalający	Pino	Știft de blocare	Zaustavni štift
6d	Geleideplaat voor voetstuk	Dolna płyta kierująca	Prato-guia da base	Placa de ghidaj pentru baza pompei	Vodeća ploča osnove
6g	Lager	Pierścień oporowy łożyska	Casquilho	Lagăr	Prsten kugličnog ležaja
7	Koppeling beschermer	Oslona sprzęgła	Protecção do acoplamento	Apărătoare de protecție	Zaštita spojnice
7a	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
8	Koppeling compleet	Sprzęgło, komplet	Acoplamento completo	Cuplaj complet	Komplet spojnice
9	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
10	Stift	Klin mocujący walu	Pino do veio	Știftul axului	Cilindrični štift
10a	Koppelingshelft	Półówka sprzęgła	Semi-acoplamento	Semicuplă	Polutka spojnice
12	Flens (ovaal)	Kolnierz (owalny)	Flange (oval)	Fianșă (ovală)	Prirubnica (ovalna)
18	Ontluchttings-schroef	Śruba odpowietrzająca	Parafuso de purga	Șurub de aerisire	Zavrtanj za odzračivanje
19	Plug	Korek	Bujão da tubagem	Dop filetat pentru țeavă	Žep cevi
21	Plug	Korek	Bujão da tubagem	Dop	Čep
23	Plug	Korek	Bujão da tubagem	Dop	Čep
25	Aftapplug	Korek spustowy	Bujão de drenagem	Dop (bușon) de golire	Drenažni čep
26	Trekstgag	Śruba ściągająca	Perno	Prezoane	Osnovni zavrtanj
26a	Spanband	Ściąg	Tirante	Clemă	Osigurač
26b	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
26c	Sluitring	Podkładka	Anilha	Șaibă	Podloška
28	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
28a	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
31	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
32	Sluitring	Podkładka	Anilha	Șaibă	Podloška
32a	Sluitring	Podkładka	Anilha	Șaibă	Podloška
35	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
36	Moer	Nakrętka	Fêmea	Piuliță	Matica
36a	Moer	Nakrętka	Fêmea	Piuliță	Matica
37	O-ring pakking	Pierścień O-ring/uszczelka	O-ring/junta	O-ring/garnitură	O-zaptivni prsten
38	O-ring	Pierścień O-ring	O-ring	O-ring	O-prsten
38a	O-ring	Pierścień O-ring	O-ring	O-ring	O-prsten
39	Pakking	Uszczelka	Junta	Garnitură	Zaptivač
44	Inlaatdeel compleet	Komora wlotowa	Aspiração completa	Parte de intrare completă	Komplet ulazni deo
44a	Bovenste inlaatgedeelte	Część wlotowa (górna)	Peça de entrada, superior	Parte aspirație superioară	Gornji deo ulaza
44b	Onderste inlaatgedeelte	Część wlotowa (dolna)	Peça de entrada, inferior	Parte aspirație inferioară	Donji deo ulaza
45	Spaltring	Pierścień bieżny	Aro	Inel de etanșare	Osloni prsten
45a	Spaltring compleet	Pierścień bieżny, obrotowy	Aro completo	Inel de etanșare complet	Komplet oslonog prstena
47	Lager	Pierścień oporowy łożyska	Casquilho	Lagăr	Prsten kugličnog ležaja

Pos.	Designation				
	NL	PL	PT	RO	RS
47a	Lager met meenemer	Łożysko z zabierakiem	Casquillo com guia	Lagăr cu cuzinet	Kuglični ležaj sa prstenom
47b	Lager roterend	Pierścień łożyskowy	Casquillo rotativo	Lagăr rotativ	Kuglični ležaj rotirajući
47c	Bus	Tulejka	Manga	Bucșă	Čaura
47d	Borgring	Pierścień mocujący	Retentor	Inel de blocare	Noseći prsten
47e	Borgring	Pierścień mocujący	Retentor	Inel de blocare	Noseći prsten
48	Klembusmoer	Nakrętka tulei stożkowej	Fêmea cônica	Piuliță cu strângere pe con	Matica konusne čaure
49	Waaier	Wirnik	Impulsor	Rotor	Obrotno kolo pumpe
49a	Waaier	Wirnik	Impulsor	Rotor	Obrotno kolo pumpe
49b	Klembus	Tuleja stożkowa	Casquillo cónico	Con de strângere	Konusna čaura
49c	Slijtring	Pierścień bieżny	Aro de desgaste	Inel de uzură	Habajući prsten
50a	Uitlaatgedeelte/ bovenste geleideschoep	Część wylotowa/górne krawędzie w korpusie	Peça de descarga/pás guia da parte superior	Parte refulare	Potisni deo/Gornje usmereno kolo
51	Pompas	Wał pompy	Veio	Axul pompei	Osovina pumpe
55	Mantel	Plaszcz	Camisa exterior	Manta exterioră	Spoljna zaštita
56	Voetplaat	Podstawa	Base	Placa de bază	Osnovna ploča
56a	Voetplaat	Podstawa	Base	Placa de bază	Osnovna ploča
56c	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
56d	Sluitring	Podkładka	Anilha	Șaibă	Podloška
57	O-ring	Pierścień O-ring	O-ring	O-ring	O-prsten
58	Houder voor asafdichting	Mocowanie uszczelnienia	Suporte do empanque	Suport pentru etanșare	Kućište zaptivanja osovine
58a	Schroef	Śruba	Parafuso	Șurub	Zavrtanj
60	Veer	Sprężyna	Mola	Arc	Opruga
61	Meenemer	Zabierak	Batente do espaçador	Distanțier pentru etanșarea mecanică	Pogonaš zaptivaca
62	Stopring	Pierścień stopowy	Mola de encosto	Semering	Zaustavni prsten
64	Afstandsbus	Tulejka dystansowa	Espaçador	Tub distanțier	Odstojna čaura
64a	Afstandsbus	Tulejka dystansowa	Espaçador	Tub distanțier	Odstojna čaura
64b	Afstandsbus	Tulejka dystansowa	Espaçador	Tub distanțier	Odstojna čaura
64c	Spanstuk, splined	Tulejka wielowypustowa	Casquillo escatelado	Suport canelat	Osigurač saumetkom
64d	Afstandsbus	Tulejka dystansowa	Espaçador	Tub distanțier	Odstojna čaura
65	Houder voor spaltring	Tulejka dystansowa	Retentor do aro	Suport pentru inelul de etanșare	Držač oslonog prstena
66	Sluitring	Podkładka	Anilha	Șaibă	Podloška
66a	Sluitring	Podkładka	Anilha	Șaibă	Podloška
66b	Borgring	Podkładka zabezpieczająca	Anilha retentora	Șaibă de blocare	Osiguravajuća podloška
67	Moer/Schroef	Nakrętka/Śruba	Fêmea/Parafuso	Piuliță/Șurub	Matica/Zavrtanj
69	Afstandsbus	Tulejka dystansowa	Espaçador	Tub distanțier	Odstojna čaura
76	Typeplaat set	Tabliczka znamionowa	Chapa de identificação	Eticheta	Pločica označavanja
76a	Klinknagel	Nit	Rebite	Nit	Zakivak
77	Deksel pompkop	Pokrywa głowicy pompy	Coertura da cabeça da bomba	Acoperire capul pompei	Poklopac glave pumpe
100	O-ring	Pierścień O-ring	O-ring	O-ring	O-prsten
105	Asafdichting	Uszczelnienie walu	Empanque mecânico	Etanșare mecanică	Zaptivač osovine
201	Flens	Kolnierz	Flange	Flanșă	Prirubnica
203	Borgring	Pierścień mocujący	Anel retentor	Inel de blocare	Osloni prsten

Pos.	Designation			
	RU	SE	SI	SK
1	Промежуточный фланец	Mellanfläns	Vmesna prirobnica	Medzipríruba
1a	Фонарь	Mellanstycke	Konzola motorja	Lucerna
2	Головная часть насоса	Toppstycke	Glava črpalke	Horné teleso čerpadla
3	Верхняя камера	Kammare, övre	Najvišja stopnja	Horná komora
3a	Камера без щелевого уплотнения	Mallankammare utan tätningsring	Stopnja brez režnega obroča	Komora bez rozperného krúžka
4	Камера в сборе	Kammare komplett	Stopnja komplet	Kompletná komora
4a	Камера с подшипниковым кольцом	Mallankammare med lager	Stopnja z ležajnim obročem	Komora s ložiskovým krúžkom
5a	Камера в сборе	Kammare komplett	Stopnja komplet	Kompletná komora
6	Основание	Fotstycke	Podnožje črpalke	Spodné teleso čerpadla
6a	Стопорный штифт	Stoppsprint	Zaporni zatič	Uzáverný kolík
6d	Направляющая плита для опоры/лапы	Styrplatta till fotstycke	Vodilna plošča za podnožje črpalke	Vodiaca platňa pre spodné teleso
6g	Подшипниковое кольцо	Bottenlager	Ležajni obroč	Ložiskový krúžok
7	Защитный кожух	Kopplingskärm	Zaščitni pokrov	Ochranný kryt spojky
7a	Винт	Skruv	Vijak	Skrutka
8	Муфта в сборе	Koppling komplett	Sklopka komplet	Kompletná spojka
9	Винт	Skruv	Vijak	Skrutka
10	Цилиндрический штифт	Cylinderstift	Cilindrični zatič	Zylindrický kolík
10a	Полумуфта	Kopplingshalva	Polovnica sklopke	Polspojka
12	Овальный фланец	Fläns (oval)	Prirobnica (ovalna)	Príruba (oválna)
18	Винт вентиляционного отверстия	Luftskruv	Odzračevalni vijak	Odvdzušňovacia skrutka
19	Заглушка	Rörpropp	Čep	Zátka
21	Заглушка	Propp	Čep	Zátka
23	Заглушка	Propp	Čep	Zátka
25	Заглушка сливного отверстия	Tömningspropp	Izpraznjevalni čep	Vypúšťacia skrutka
26	Стяжной болт	Stödbult	pritrjevalni vijak	Ťahovacie skrutky
26a	Стяжная лента	Spännband	Zatezni pas	Ťahovacie spony
26b	Винт	Skruv	Vijak	Skrutka
26c	Шайба	Bricka	Podložka	Podložka
28	Винт	Skruv	Vijak	Skrutka
28a	Винт	Skruv	Vijak	Skrutka
31	Шруба	Skruv	Vijak	Skrutka
32	Шайба	Bricka	Podložka	Podložka
32a	Шайба	Bricka	Podložka	Podložka
35	Винт	Skruv	Vijak	Skrutka
36	Гайка	Mutter	Matica	Matica
36a	Гайка	Mutter	Matica	Matica
37	Уплотнительное кольцо круглого сечения/прокладка	O-ring/packning	O-tesnilo/ tesnilo	O-krúžok/tesnenie
38	Уплотнительное кольцо круглого сечения	O-ring	O-tesnilo	O-krúžok
38a	Уплотнительное кольцо круглого сечения	O-ring	O-tesnilo	O-krúžok
39	Прокладка	Packning	Tesnilo	Tesnenie
44	Деталь всасывающей полости в сборе	Inloppsdel komplett	Vstopni del komplet	Vtoková časť komplet
44a	Впускная часть, верхняя	Övre inloppsdel	Zgornji dovodni del	Horný prívod čerpadla
44b	Впускная часть, нижняя	Undre inloppsdel	Spodnji dovodni del	Dolný prívod čerpadla
45	Щелевое уплотнение	Tätningsring	Režni obroč	Tesniaci krúžok
45a	Щелевое уплотнение в сборе	Tätningsring, komplett	Režni obroč komplet	Tesniaci krúžok komplet
47	Кольцо подшипника	Lager	Ležajni obroč	Ložiskový krúžok
47a	Подшипник с "поводком"	Lager med medbringare	Ležaj z nosilcem	Ložisko s unášačom

Pos.	Designation			
	RU	SE	SI	SK
47b	Вращающееся кольцо подшипника	Lagerring, roterande	Ležajni obroč, rotirajoč	Ložiskový krúžok, rotujúci
47c	Втулка	Bussning	Puša	Medzikrúžok/vložka
47d	Стопорное кольцо	Låsbricka	Držalni obroč	Držný krúžok
47e	Стопорное кольцо	Låsbricka	Držalni obroč	Držný krúžok
48	Гайка для зажимной втулки	Mutter för klämbussning	Matica za pritrdilno pušo	Matica so stahovacou vložkou
49	Рабочее колесо	Pumphjul	Rotor črpalke	Obežné koleso
49a	Рабочее колесо	Pumphjul	Rotor črpalke	Obežné koleso
49b	Разжимная втулка	Klämbussning	Pritrdilna puša	Stahovacia vložka
49c	Антифрикционное кольцо	Slittring	Obrabni obroč	Uzatvárací krúžok
50a	Выпускная часть/верхние направляющие лопатки	Utlöppsdel/övre ledskenor	Tlačni del/zgornjega voda	Výpust/vrchné vodiace lopatky
51	Вал насоса	Pumpaxel	Os črpalke	Hriadeľ
55	Кожух	Mantel	Plašč	Plašť
56	Плита-основание	Fotstycke	Osnovna plošča	Základová platňa
56a	Плита-основание	Fotstycke	Osnovna plošča	Základová platňa
56c	Шруба	Skruv	Víjak	Skrutka
56d	Шайба	Bricka	Podložka	Podložka
57	Уплотнительное кольцо круглого сечения	O-ring	O-tesnilo	O-krúžok
58	Базовая деталь уплотнения вала	Hållare för axeltätning	Držalo drsnega tesnila	Držiak upchávky hriadeľa
58a	Винт	Skruv	Víjak	Skrutka
60	Пружина	Fjäder	Vzmet	Spružina
61	Пружина торцового уплотнения	Medbringare	Gonilo tesnila	Unášač
62	Стопорное кольцо	Stoppring	Stop prstan	Dorazový krúžok
64	Промежуточная втулка	Avståndsbussning	Distančník	Dištančné puzdro
64a	Промежуточная втулка	Avståndsbussning	Distančník	Dištančná puzdro
64b	Промежуточная втулка	Avståndsbussning	Distančník	Dištančná puzdro
64c	Шлицевая зажимная гильза	Avståndsbussning (spline)	Natezni kos, utorni	Španovací kus, drážkovaný
64d	Промежуточная втулка	Avståndsbussning	Distančník	Dištančné puzdro
65	Базовая деталь щелевого уплотнения	Hållare för tätningssring	Držalo režnega obroča	Držiak pre tesniaci krúžok
66	Шайба	Bricka	Podložka	Podložka
66a	Шайба	Bricka	Podložka	Podložka
66b	Стопорная шайба	Låsbricka	Varnostna podložka	Zaistovací plech
67	Гайка/Шруба	Mutter/Skruv	Matica/Víjak	Matica/Skrutka
69	Промежуточная втулка	Avståndsbussning	Distančník	Dištančné puzdro
76	Фирменная табличка с техническими параметрами в сборе	Typskylt	Tipiska ploščica	Štítok čerpadla
76a	Заклепка	Nit	Zakovica	Nit
77	Крышка головной части насоса	Kåpa, pumphuvud	Pokrov glave črpalke	Kryt čerpadla
100	Уплотнительное кольцо круглого сечения	O-ring	O-tesnilo	O-krúžok
105	Уплотнение вала	Axeltätning	Dršno tesnilo	Upchávka hriadeľa
201	Фланец	Fläns	Prirobnica	Príruba
203	Стопорное кольцо	Låsbricka	Držalni obroč	Tesniaci krúžok/tesnenie

Pos.	Designation			CN
	TR	UA	KZ	
1	Küçültme flanşı	Перехідник	Аралық фланец	接头法兰
1a	Motor oturağı	Опора електродвигуна	Шам	电机座
2	Pompa başı	Головна частина насоса	Сорғының жоғарғы бөлігі	泵头
3	Bölme, üst	Камера, верх	Жоғарғы камера	腔体、顶部
3a	Boyun halkası	Камера без ущільнювального кільця	Саңылаусыз тығыздау камерасы	颈环
4	Komple bölme	Набір камер	Жинақталған камера	完整腔体
4a	Yatak halkalı bölme	Камера з кільцем підшипника	Подшипник сақинасы бар камера	带轴承环的腔体
5a	Komple bölme	Набір камер	Жинақталған камера	完整腔体
6	Taban	Основа	Табаны	底座
6a	Stop pimi	Штифт зупинки	Ұстағыш штифт	止动销
6d	Taban için kilavuz plakası	Направляюча плита для основы	Тіреулердің/аяқтардың бағыттағыш плитасы	基架导板
6g	Yatak halkası	Кільце опори	Подшипник сақина	轴承环
7	Kaplin koruması	Захисний кожух	Қорғағыш қаптама	联轴器护罩
7a	Vida	Гвинт	Винт	螺丝
8	Komple kaplin	Муфта в сборі	Жинақталған муфта	联轴器套件
9	Vida	Гвинт	Винт	螺丝
10	Şaft pimi	Штифт валу	Цилиндрлі штифт	轴销
10a	Kaplin yarıısı	Напівмуфта	Жартылай муфта	联轴器
12	Flanş (oval)	Фланец (овальный)	Фланец (сопақ)	法兰 (椭圆)
18	Hava tahliye vidası	Гвинт вентиляційного клапана	Желдету саңылауының винті	排气螺丝
19	Boru tapası	Труба заглушка	Тығын	管塞
21	Tapa	Кабельний ввід	Тығын	插头
23	Tapa	Кабельний ввід	Тығын	插头
25	Tahliye tapası	Пробка дренажного отвору	Ағызу саңылауының тығыны	排水螺栓
26	Germe civatası, saplama	Шпилька	Тарту бұрандасы	拉杆螺栓
26a	Şerit	Стрічка	Тартқыш бай	拉紧板条
26b	Vida	Гвинт	Винт	螺丝
26c	Pul	Шайба	Шайба	垫圈
28	Vida	Гвинт	Винт	螺丝
28a	Vida	Гвинт	Винт	螺丝
31	Vida	Гвинт	Винт	螺丝
32	Pul	Шайба	Шайба	垫圈
32a	Pul	Шайба	Шайба	垫圈
35	Vida	Гвинт	Винт	螺丝
36	Somun	Гайка	Гайка	螺母
36a	Somun	Гайка	Гайка	螺母
37	O-ring/conta	Ущільнювальне кільце/прокладка	Дөңгелек қималы тығыздағыш сақина/аралық қабат	O型圈/垫圈
38	O-ring	Ущільнювальне кільце	Дөңгелек қималы тығыздағыш сақина	O型圈
38a	O-ring	Ущільнювальне кільце	Дөңгелек қималы тығыздағыш сақина	O型圈
39	Conta	Прокладка	Аралық қабат	垫圈
44	Komple emme kısmı	Всмоктуюча частина повна	Жиналған сорғыш қуыстағы бөлшек	进口部分
44a	Giriş kısmı üst	Верхня частина впуску	Жоғарғы кіріс бөлік	上进口部件
44b	Giriş kısmı alt	Нижня частина впуску	Төменгі кіріс бөлік	下进口部件
45	Boyun halkası	Ущільнювальне кільце	Саңылау тығыздағыш	颈环
45a	Komple boyun halkası	Ущільнювальне кільце повне	Жинақталған саңылау тығыздағыш	颈环成品
47	Yatak halkası	Кільце опори	Подшипник сақинасы	轴承环
47a	Sürücülü yatak halkası	Опора з двигуном	"Жібі бар" подшипник	带驱动器的轴承
47b	Yatak halkası, döner	Кільце опори, що обертається	Подшипниктің айналыс сақинасы	轴承动环
47c	Burç	Втулка	Втулка	衬套

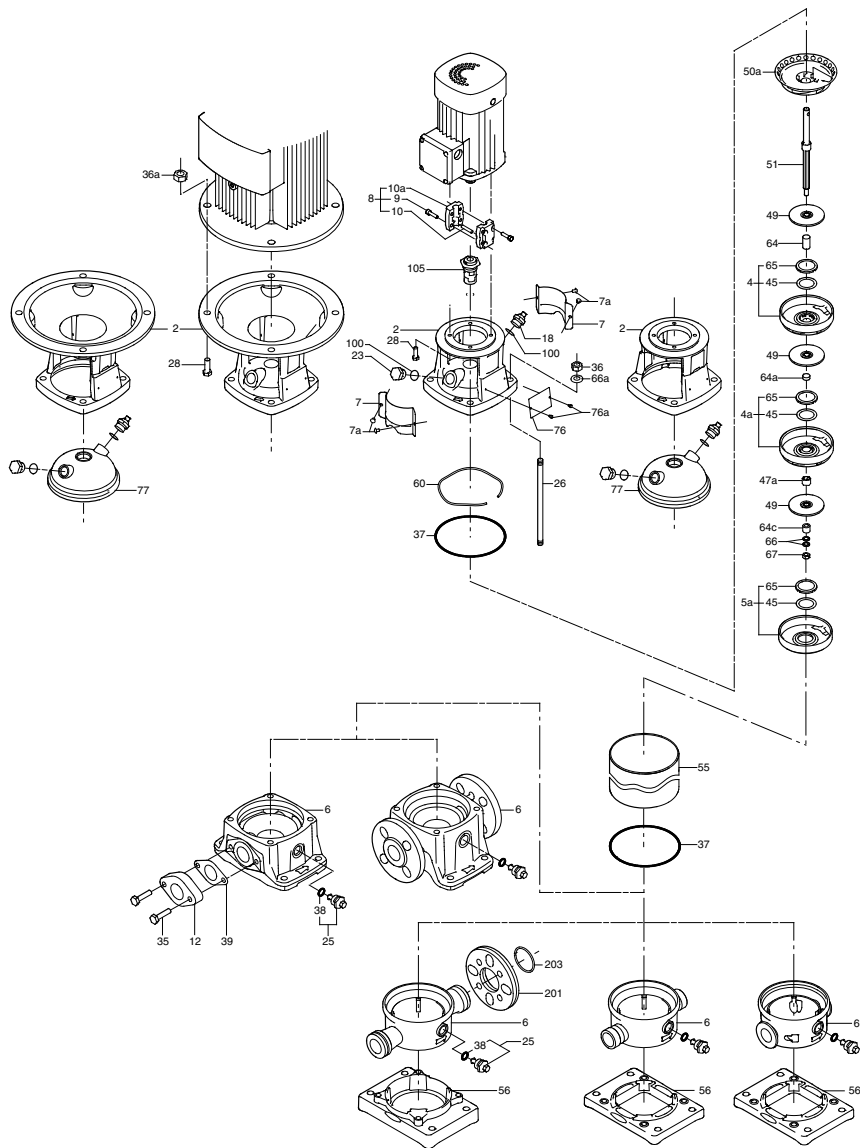
Pos.	Designation			CN
	TR	UA	KZ	
47d	Tespit halkası	Стопорне кільце	Ұстағыш сақина	固定环
47e	Tespit halkası	Стопорне кільце	Ұстағыш сақина	固定环
48	Yanık koni somunu	Гайка для розтискної втулки	Қысқыш втулка гайкасы	花键圆锥螺母
49	Kanat	Робоче колесо	Жұмыс дөңгелегі	叶轮
49a	Kanat	Робоче колесо	Жұмыс дөңгелегі	叶轮
49b	Kapalı somun	Розтискна втулка	Босату втулкасы	花键圆锥
49c	Aşınma halkası	Кільце щілинного ушілення	Антифрикциалық сақина	耐磨环
50a	Basma kısmı/üst kılavuz kanatlar	Випуск/верхній блок направляючих лопаток	Шығару бөлігі/жоғарғы бағыттағыш қалақтар	出口部件/顶部导流叶片
51	Mil	Вал насоса	Сорғы білігі	泵轴
55	Diş çeket	Зовнішня втулка	Қаптама	套筒
56	Şase	Плита-основа	Астыңғы плита	底板
56a	Şase	Плита-основа	Астыңғы плита	底板
56c	Vida	Гвинт	Винт	螺丝
56d	Pul	Шайба	Шайба	垫圈
57	O-ring	Ущільнювальне кільце	Дөңгелек қималы тығыздағыш сақина	O型圈
58	Salmastra taşıyıcı	Тримач ушілення	Білік тығыздағышының негізгі бөлшегі	机封压盖
58a	Vida	Гвинт	Винт	螺丝
60	Yay	Пружина	Serippe	弹簧
61	Salmastra yuvası	Оправлення ушілення	Бүйірлік тығыздау серіппесі	密封驱动
62	Kitleme somunu	Стопорне кільце	Ұстағыш сақина	止动环
64	Ayar ara parçası	Втулка	Аралық втулка	隔管
64a	Ayar ara parçası	Втулка	Аралық втулка	隔管
64b	Ayar ara parçası	Втулка	Аралық втулка	隔管
64c	Kelepçe boru	Щлицевий хомут	Тісті қысқыш гильза	花键夹
64d	Ayar ara parçası	Втулка	Аралық втулка	隔管
65	Boğaz aşınma halkası	Фіксатор ушілювального кільця	Саңылау тығыздағышының негізгі бөлшегі	颈环挡圈
66	Pul	Шайба	Шайба	垫圈
66a	Pul	Шайба	Шайба	垫圈
66b	Kitleme pulu	Стопорна шайба	Ұстағыш шайба	锁紧垫圈
67	Somun/Vida	Гайка/гвинт	Гайка/ винт	螺母/螺丝
76a	Perçin	Заклепка	Тойтарма шеге	隔管
77	Pompa kafası kapağı	Кришка головної частини насоса	Сорғы басының қақпағы	铭牌套件
69	Ayar ara parçası	Втулка	Аралық втулка	铆钉
76	Etiket	Шилдик насоса	Жинақталған техникалық параметрлері бар фирмалық тақташа	泵顶盖
100	O-ring	Ущільнювальне кільце	Дөңгелек қималы тығыздағыш сақина	O型圈
105	Mekanik salmastra	Торцеве ушілення валу	Білік тығыздағышы	轴封
201	Fiaş	Фланец	Фланец	法兰
203	Tutucu halka	Стопорне кільце	Ұстағыш сақина	固定环

Pos.	Designation				
	ID	MK	NO	IS	AR
1	Flensa adaptor	Адаптерска прирабница	Adapterflens	Millistykkiisflans	الثقفة المهيئنة
1a	Wadah motor	Подлога за моторот	Motorbukk	Mótorstallur	كرسي المحرك
2	Head pompa	Глава на пумпата	Pumpehode	Dæluhaus	رأس المضخة
3	Chamber, atas	Комора, горна	Kammer, topp	Hólf, efsti hluti	الحجرة العليا
3a	Chamber tanpa ring leher	Комора без вратен прстен	Kammer uten kragering	Hólf án hálshrings	الحجرة دون وجود الحلقة العنقشة
4	Chamber lengkap	Целосна комора	Kammer, komplett	Allt hólfíð	الحجرة بالكامل
4a	Chamber dengan ring bantalan motor	Комора со прстен на лежиштето	Kammer med lagerring	Hólf með leguvörn	الحجرة مع وجود حلقة كرسي التحميل
5a	Chamber lengkap	Целосна комора	Kammer, komplett	Allt hólfíð	الحجرة بالكامل
6	Alas	Подножје	Fotstykke	Botn	القاعدة
6a	Pin penghenti	Игличка за запирање	Stoppstift	Festipinni	مسامر الإيقاف
6d	Pelat pemandu untuk alas	Основа-водилка за подножјето	Føringsplate for fotstykke	Stýriplata fyrir botn	اللووح التوجيهي الخاص بالقاعدة
6g	Ring bantalan poros	Прстен на лежиштето	Lagerring	Leguvörn	حلقة كرسي التحميل
7	Pemandu sambungan	Заштитник на спојницата	Koblingsvern	Tengjahlíf	والقي القارئة
7a	Sekrup	Завртка	Skrue	Skrúfa	مسامر
8	Sambungan selesai	Целосна спојка	Kobling, komplett	Tengingu lokið	القارئة بالكامل
9	Sekrup	Завртка	Skrue	Skrúfa	مسامر
10	Pin poros	Игличка на основата	Akselstift	Skaftpinni	مسامر العمود
10a	Sambungan setengah	Полуспојка	Koblingshalvdel	Skrúftengi	نصف القارئة
12	Flensa (oval)	Прирабница (овална)	Flens (oval)	Flans (sporöskjulaga)	الثقفة (البيضاوية)
18	Sekrup lubang udara	Завртка за обезвоздушвање	Luftekrue	Loftunarskrá	برغي تنقيس الهواء
19	Sumbat pipa	Цевен чеп	Rørplugg	Rörtappi	طرف الأنبوب
21	Sumbat	Приклучок	Plugg	Tappi	السدادة
23	Sumbat	Приклучок	Plugg	Tappi	السدادة
25	Sumbat pengurusan	Чеп за празнење	Tappeplugg	Botntappi	سدادة التفريغ
26	But penguat	Спојка	Ankerbolt	Stagbolti	مسامر التثبيت
26a	Pengikat	Ремен	Stropp	Ól	الحزام
26b	Sekrup	Завртка	Skrue	Skrúfa	مسامر
26c	Cincin	Подлошка	Skive	Skinna	حلقة إحكام الربط
28	Sekrup	Завртка	Skrue	Skrúfa	مسامر
28a	Sekrup	Завртка	Skrue	Skrúfa	مسامر
31	Sekrup	Завртка	Skrue	Skrúfa	مسامر
32	Cincin	Подлошка	Skive	Skinna	حلقة إحكام الربط
32a	Cincin	Подлошка	Skive	Skinna	حلقة إحكام الربط
35	Sekrup	Завртка	Skrue	Skrúfa	مسامر
36	Mur	Навртка	Mutter	Ró	صمولة
36a	Mur	Навртка	Mutter	Ró	صمولة
37	O-ring/gasket	О-прстен/дихтунг	O-ring/pakning	O-hringur/pakning	حلقة دائرية/الحشوية
38	O-ring	О-прстен	O-ring	O-hringur	حلقة دائرية

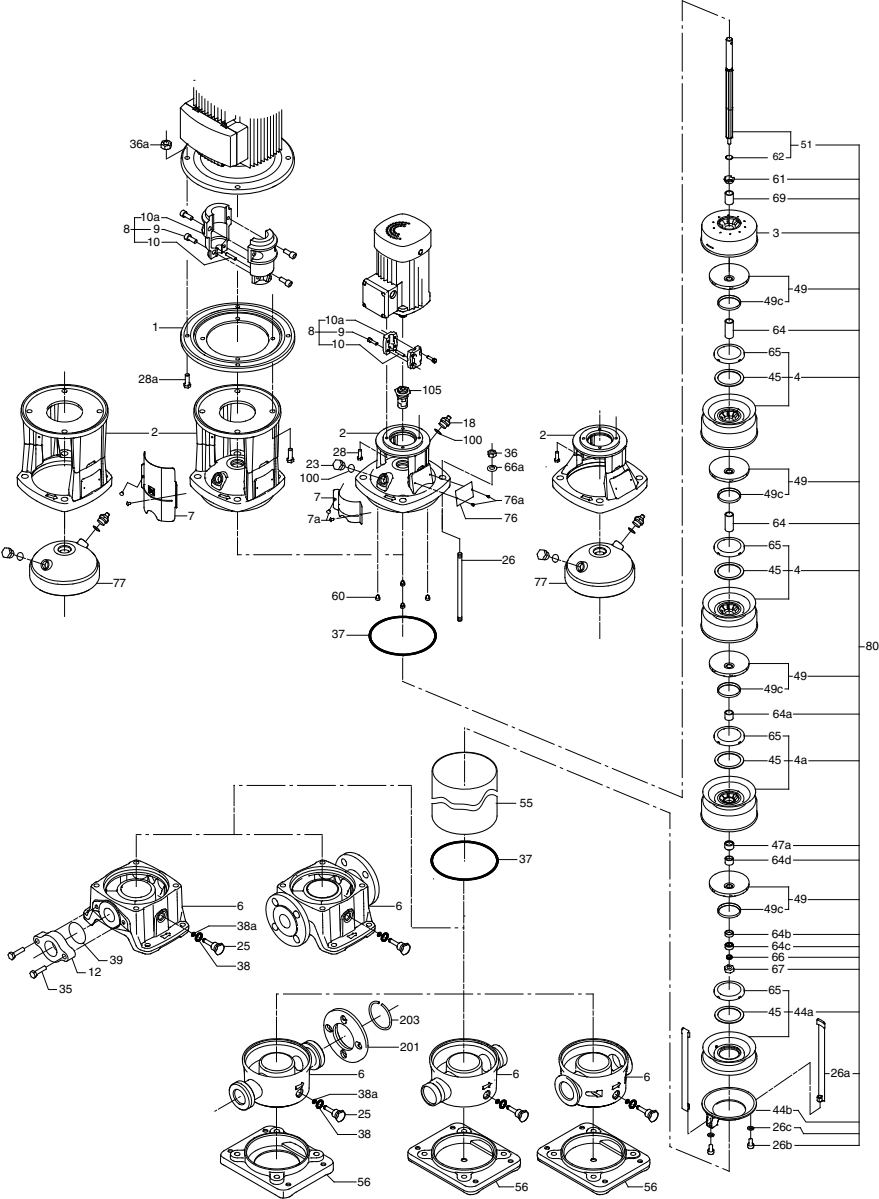
Pos.	Designation				
	ID	MK	NO	IS	AR
38a	O-ring	O-прстен	O-ring	O-hringur	حلقة دائرية
39	Gasket	Дихтунг	Pakning	Pakkning	حشية
44	Komponenten saluran hisap selesai	Целосен доведен дел	Innløpsdel, komplett	Allur inntakshluti	جزء المدخل بالكامل
44a	Komponenten saluran hisap bagian atas	Горен доведен дел	Innløpsdel, øvre	Efri hluti inntakshluta	جزء المدخل العلوي
44b	Komponenten saluran hisap bagian bawah	Долен доведен дел	Innløpsdel, nedre	Neðri hluti inntakshluta	جزء المدخل السفلي
45	Ring leher	Вратен прстен	Kragering	Hálshringur	الحلقة العنقية
45a	Ring leher selesai	Целосен вратен прстен	Kragering, komplett	Allur hálshringurinn	الحلقة العنقية بالكامل
47	Ring bantalan poros	Прстен на лежиштето	Lagerring	Leguvörn	حلقة كرسى التحويل
47a	Bantalan poros dengan pengendali	Лежиште со управувач	Lager med drev	Lega með drifi	كرسى تحويل مزودة بنقل حركة
47b	Ring bantalan poros, berputar	Прстен на лежиштето, ротирачки	Lagerring, roterende	Leguvörn, snúanleg	حلقة كرسى التحويل، دوارة
47c	Selongsong	Славина	Hylse	Hólkur	جلبية
47d	Ring penahan	Потпорен прстен	Sikringsring	Festthringur	حلقة تثبيت
47e	Ring penahan	Потпорен прстен	Sikringsring	Festthringur	حلقة تثبيت
48	Mur split cone	Навртка на конус-разделник	Konisk mutter	Rofin keiluró	صمولة المخروط ذي الفتحة
49	Impeller	Ротор	Pumpehjul	Dæluhjól	المروحة
49a	Impeller	Ротор	Pumpehjul	Dæluhjól	المروحة
49b	Split cone	Конус-разделник	Del konus	Rofin keila	المخروط ذو الفتحة
49c	Wear ring	Прстенеста заптивка	Slitering	Slithringur	حلقة التآكل
50a	Bagian pelepasan/bilah pemandu atas	Одводен дел/горни лопатки-водилки	Utløpsdel / øvre lameller	Úttakshluti / stýriblöd	جزء المخرج/الأذرع العلوية التوجيهية
51	Poros pompa	Осовина на пумпата	Pumpeaksel	Dælskaft	عمود إدارة المضخة
55	Lengan	Ракав	Hylse	Slif	الجلبية
56	Alas/penampang pompa	Подножна плоча	Fotplate	Undirstöðuplata	لوحة القاعدة
56a	Alas/penampang pompa	Подножна плоча	Fotplate	Undirstöðuplata	لوحة القاعدة
56c	Sekrup	Завртка	Skrue	Skrúfa	مسامير
56d	Cincin	Подлошка	Skive	Skinna	حلقة إحكام الربط
57	O-ring	O-прстен	O-ring	O-hringur	حلقة دائرية
58	Seal carrier	Носач на спојот	Tetningsbærer	Umgjörð um öxulþétti	حامل مانع التسرب
58a	Sekrup	Завртка	Skrue	Skrúfa	مسامير
60	Pegas	Пружина	Fjær	Gormur	زنبرك
61	Pengendali siil	Управувач на спојот	Tetningsbærer	Flansi	ناقل الحركة الخاص بمائع التسرب
62	Ring penghenti	Прстен за запирање	Stoppring	Stöðvunarhringur	حلقة الإيقاف
64	Pipa pengatur jarak	Цевка за растојание	Avstandsrør	Stöðuhólkur	أنبوب المبادعة
64a	Pipa pengatur jarak	Цевка за растојание	Avstandsrør	Stöðuhólkur	أنبوب المبادعة
64b	Pipa pengatur jarak	Цевка за растојание	Avstandsrør	Stöðuhólkur	أنبوب المبادعة
64c	Klem, terentang	Клема, со жлебно вратило	Klemme, riflet	Klemma, klofin	مشبك، مخدد
64d	Pipa pengatur jarak	Цевка за растојание	Avstandsrør	Stöðuhólkur	أنبوب المبادعة
65	Penahan ring leher	Потпора на вратен прстен	Krageringsikring	Festing fyrir hálshring	مثبت الحلقة العنقية

Pos.	Designation				
	ID	MK	NO	IS	AR
66	Cincin	Подлошка	Skive	Skinna	حلقة إحكام الربط
66a	Cincin	Подлошка	Skive	Skinna	حلقة إحكام الربط
66b	Cincin pengunci	Подлошка за блокирање	Låseskive	Lásskinna	حلقة إحكام الربط الخاصة بالقفصل
67	Mur/sekrup	Навртка/завртка	Mutter/skrue	Ró/skrúfa	الصمولة/المسمار
76a	Pipa pengatur jarak	Цевка за растојание	Avstandsrør	Stöðuhólkur	أنبوب المبادعة
77	Set pelat label	Прибор со написни плочки	Typeskiltsett	Merkiplötusett	مجموعة لوحة البيانات
69	Rivet	Клин	Nagle	Hnoðnagli	مسمار برشام
76	Penutup head pompa	Капак за главата на пумпата	Pumpehodedeksel	Hlíf á dæluhaus	غطاء رأس المضخة
100	O-ring	O-прстен	O-ring	O-hringur	حلقة دائرية
105	Flensa adaptor	Заптивка за вратило	Akseltetning	Öxulþétti	مائع تسرب عمود الإدارة
201	Wadah motor	Прирабница	Flens	Festibúnaður	الثقفة
203	Head pompa	Потпорен прстен	Sikringsring	Festihringur	حلقة تثبيت

CR, CRI, CRN 1s, 1, 3 and 5

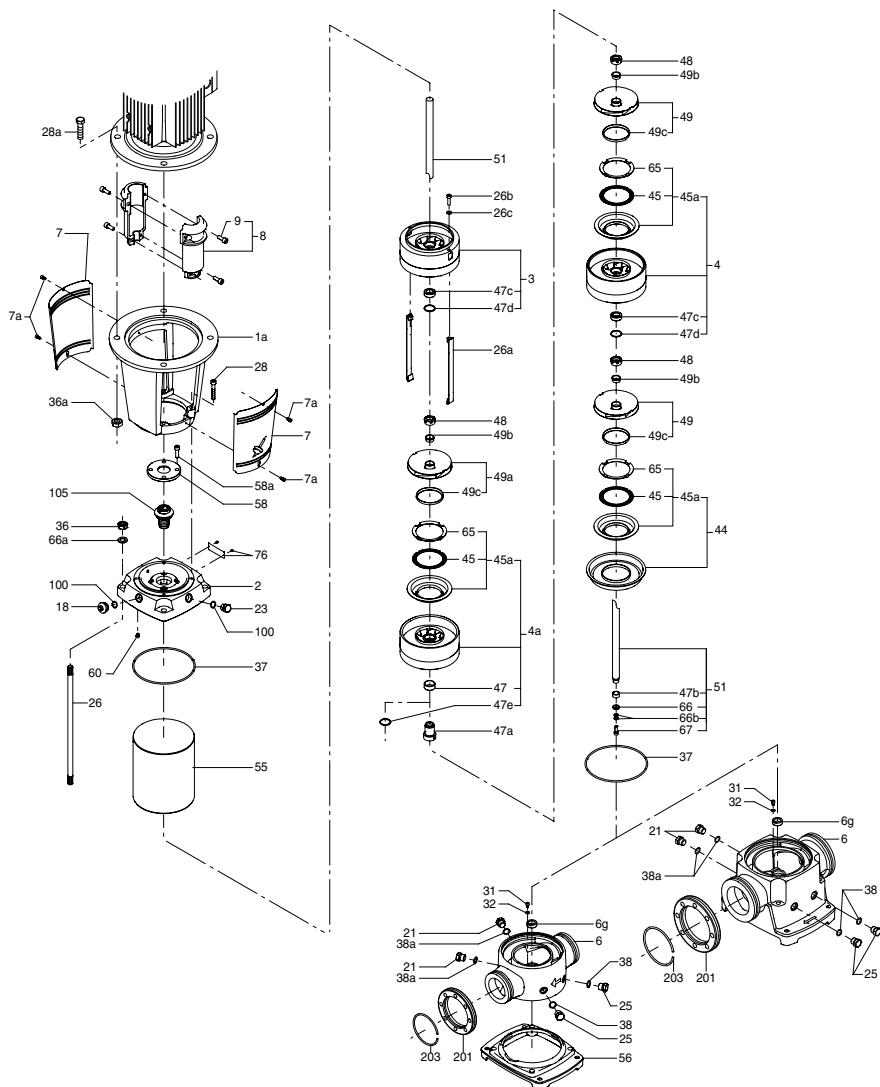


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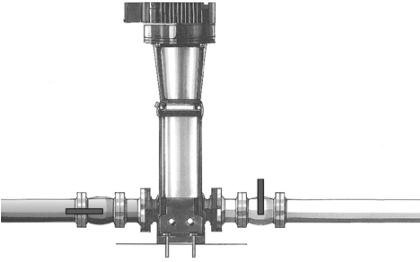
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CR, CRN 32, 45, 64



TM01 9996 3600

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TM01 1403 4497

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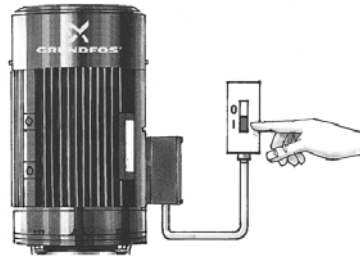
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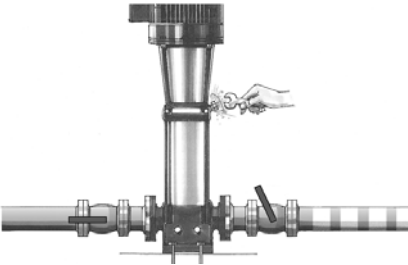
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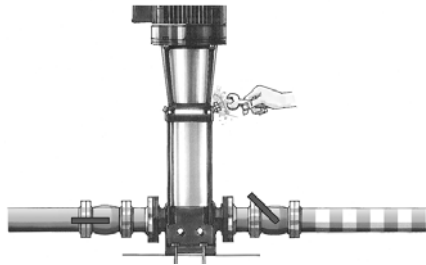
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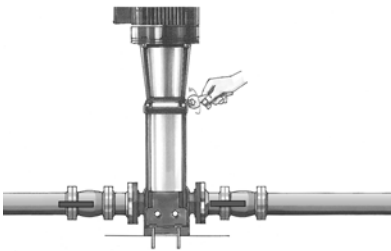
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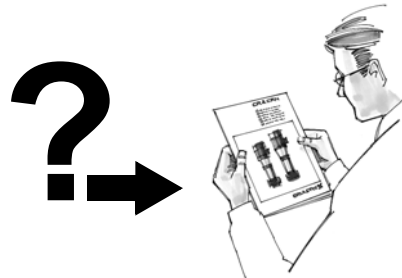
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TM01 1409 4497

8



TM01 9988 3600

GB Startup

1 Close the isolating valve on the outlet side of the pump and open the isolating valve on the inlet side.	2 Remove the priming plug from the pump head and slowly fill the pump with liquid. Replace the priming plug and tighten securely.
3 See the correct direction of rotation of the pump on the motor fan cover.	4 Start the pump and check the direction of rotation.
5 Vent the pump by means of the vent valve in the pump head. At the same time, open the outlet isolating valve a little.	6 Continue to vent the pump. At the same time, open the outlet isolating valve a little more.
7 Close the vent valve when a steady stream of liquid runs out of it. Completely open the outlet isolating valve.	8 For further information, see section 4. <i>Starting up the product.</i>

BG Пускане в действие

1 Затваря се спирателния кран на напорната страна, а този на смукателната се отваря.	2 Демонтира се пробката за пълнене и помпата бавно се пълни.
3 Вижте правилната посока на въртене на капака на мотора.	4 Включете помпата и проверете правилността на посоката на въртене.
5 Обезвъздушете през обезвъздушителния вентил като същевременно малко отворете крана на напорната страна.	6 Продължете да обезвъздушавате като отваряте крана на напорната страна повече.
7 Затворете обезвъздушителния вентил, когато от него протече флуид. Отворете изцяло крана на напорната страна.	8 За повече информация вж. раздел 4. <i>Стартиране на продукта.</i>

CZ Uvedení do provozu

1 Uzavřete uzavírací armaturu na výtlačné straně čerpadla a otevřete uzavírací armaturu na sací straně čerpadla.	2 Z hlavy čerpadla vyšroubujte plnicí zátku a do čerpadla pomalu nalévejte kapalinu. Plnicí zátku vraťte na své místo a pevně utáhněte.
3 Podle šipky na krytu ventilátoru motoru čerpadla zjistěte směr otáčení hřídele čerpadla.	4 Zapněte čerpadlo a zkontrolujte, zda směr otáčení odpovídá směru uvedenému na krytu ventilátoru motoru.
5 Čerpadlo odvzdušněte pomocí odvzdušňovacího ventilu umístěného ve hlavě čerpadla. Současně mírně pootevřete uzavírací armaturu na výtlačné straně čerpadla.	6 Pokračujte v odvzdušňování čerpadla. Současně otevřete poněkud více uzavírací armaturu na výtlačné straně čerpadla.
7 Odvzdušňovací ventil uzavřete, jakmile jím začne vytékat kapalina bez vzduchu. Otevřete naplno uzavírací armaturu na výtlačné straně čerpadla tak, abyste dosáhli pracovního bodu čerpadla.	8 Další informace jsou uvedeny v kapitole 4. <i>Spouštění výrobku.</i>

DE Inbetriebnahme

1 Das druckseitige Absperrventil schließen und das saugseitige Absperrventil öffnen.	2 Einfüllstopfen demontieren und Pumpe langsam auffüllen. Einfüllstopfen wieder einschrauben und fest anziehen.
3 Siehe richtige Drehrichtung auf der Lüfterhaube des Motors.	4 Pumpe einschalten und Drehrichtung der Pumpe prüfen.
5 Pumpe über Entlüftungsventil im Kopfstück der Pumpe entlüften. Gleichzeitig das druckseitige Absperrventil ein wenig öffnen.	6 Die Entlüftungsvorgehensweise fortsetzen. Gleichzeitig das druckseitige Absperrventil ein bisschen mehr öffnen.
7 Entlüftungsventil schließen, wenn das Medium aus dem Ventil herausläuft. Das druckseitige Absperrventil ganz öffnen.	8 Weitere Informationen hierzu finden Sie in Abschnitt 4. Inbetriebnahme des Produkts .

DK Idriftsætning

1 Luk afspærringsventilen på pumpens afgangsside og åbn afspærringsventilen på pumpens tilgangsside.	2 Afmontér spædeproppen i topstykket og spæd pumpen langsomt. Monter derefter spædeproppen igen.
3 Se pumpens korrekte omdrejningsretning på motorens ventilatorskærm.	4 Start pumpen og kontrollér pumpens omdrejningsretning.
5 Udluft pumpen på udluftningsventilen, som er placeret i topstykket. Åbn samtidig afspærringsventilen på pumpens afgangsside lidt.	6 Fortsæt med at udlufte pumpen. Åbn samtidig afspærringsventilen på pumpens afgangsside lidt mere.
7 Luk udluftningsventilen, når der løber en jævn væskestrøm ud af den. Åbn afspærringsventilen på pumpens afgangsside helt.	8 For yderligere information, se afsnit 4. Idriftsætning af produktet .

EE Käivitamine

1 Sulgege ventiil pumba survepoolel ja avage ventiil pumba imipoolel.	2 Eemaldage pumbalt täiteava kork ja täitke pump aegamööda vedelikuga. Pange kork tagasi oma kohale ja kinnitage hoolikalt.
3 Pöörlemissuund on tähistatud nooltega ventilaatori kattel.	4 Käivitage pump ja kontrollige selle pöörlemissuunda.
5 Ventileerige pumba selle peas paikneva õhutusventiili abil. Samal ajal avage veidi survepoole ventiili.	6 Jätkake pumba ventileerimist. Samal ajal avage veelgi rohkem survepoole ventiili.
7 Sulgege õhutusventiil niipea, kui vedelik hakkab ühtlaselt välja voolama. Avage survepoole ventiil täielikult.	8 Lisainfo vt jaotisest 4. Pumba käivitamine .

ES Puesta en marcha

1 Cerrar la válvula de corte en el lado de descarga de la bomba y abrir la válvula de corte en el lado de aspiración.	2 Quitar el tapón de cebado del cabezal de la bomba y llenar la bomba despacio de agua. Volver a poner el tapón de cebado y apretarlo bien.
3 Comprobar el sentido de giro correcto de la bomba en la tapa del ventilador del motor.	4 Poner la bomba en marcha y comprobar el sentido de giro.
5 Purgar la bomba mediante la válvula de purga en el cabezal de la bomba. Al mismo tiempo, abrir un poco la válvula de corte de la descarga.	6 Seguir purgando la bomba. Al mismo tiempo abrir un poco más la válvula de corte de la descarga.
7 Cerrar la válvula de purga cuando salga por la misma un flujo constante de líquido. Abrir la válvula de corte de la descarga completamente.	8 Para obtener más información, consulte la sección 4. Puesta en marcha del producto .

FI Käyttöönotto

1 Sulje pumpun painepuolen sulkuventtiili ja avaa tulopuolen sulkuventtiili.	2 Irroita pumpun yläkappaleen täyttötulppa ja täytä pumppu hitaasti. Asenna täyttötulppa tämän jälkeen.
3 Tarkista tuuletinkannesta pumpun oikea pyörimissuunta.	4 Käynnistä pumppu ja varmista oikea pyörimissuunta.
5 Ilmaa pumppu yläkappaleessa sijaitsevan ilmausruuvín kautta. Aukaise samalla hiukan pumpun painepuolen sulkuventtiiliä.	6 Jatka pumpun ilmaamista ja avaa pumpun painepuolen sulkuventtiiliä hiukan enemmän.
7 Sulje ilmausventtiili kun siitä suihkuu tasainen vesivirta. Aukaise pumpun painepuolen sulkuventtiili kokonaan.	8 Lisätietoja on kohdassa 4. Käyttöönotto .

FR Mise en route

1 Fermer la vanne d'isolement du côté refoulement et ouvrir la vanne d'isolement du côté aspiration de la pompe.	2 Démonter le bouchon d'amorçage de la tête de pompe et amorcer lentement la pompe. Remettre en place le bouchon d'amorçage.
3 Voir le sens correct de rotation de la pompe sur le capot du ventilateur du moteur.	4 Démarrer la pompe et vérifier son sens de rotation.
5 Purger la pompe par la vis de purge située dans la tête de pompe. Ouvrir simultanément légèrement la vanne d'isolement du côté refoulement.	6 Continuer à purger la pompe. Ouvrir simultanément un peu plus la vanne d'isolement du côté refoulement.
7 Fermer la vis de purge lorsqu'un filet d'eau homogène s'écoule. Ouvrir entièrement la vanne d'isolement du côté refoulement.	8 Pour plus d'informations, voir paragraphe 4. Démarrage .

GR Εκκίνηση

1 Κλείστε τη βάνα απομόνωσης στην πλευρά κατάθλιψης της αντλίας και ανοίξτε τη βάνα απομόνωσης στην πλευρά αναρρόφησης.	2 Αφαιρέστε την τάπα πλήρωσης από την κεφαλή της αντλίας και γεμίστε σιγάσιγά την αντλία με υγρό. Επανατοποθετήστε την τάπα πλήρωσης και σφίγγετε τη καλά.
3 Δείτε τη σωστή φορά περιστροφής της αντλίας στο κάλυμμα ανεμιστήρα του κινητήρα.	4 Θέστε την αντλία σε λειτουργία και ελέγξτε τη φορά περιστροφής.
5 Εξαερώστε την αντλία με τη βοήθεια της βαλβίδας εξαέρωσης στην κεφαλή της αντλίας. Ταυτόχρονα, ανοίξτε λίγο τη βάνα απομόνωσης κατάθλιψης.	6 Συνεχίστε την εξαέρωση της αντλίας. Ταυτόχρονα, ανοίξτε λίγο ακόμη τη βάνα απομόνωσης κατάθλιψης.
7 Κλείστε τη βαλβίδα εξαέρωσης όταν πια η ροή του υγρού που εξέρχεται είναι σταθερή. Ανοίξτε τελείως τη βάνα απομόνωσης κατάθλιψης.	8 Για περισσότερες πληροφορίες, βλέπε κεφάλαιο 4. Εκκίνηση του προϊόντος .

HR Puštanje u pogon

1 Zatvoriti zaporni ventil na tlačnoj strani a otvoriti zaporni ventil na usisnoj strani.	2 Skinuti čep za punjenje pa crpku polagano napuniti. Ponovno vratiti čep za punjenje te ga čvrsto pritegnuti.
3 Prekontrolirati ispravnii smjer vrtnje na poklopcu ventilatora motora.	4 Uključiti crpku pa ispitati ispravnii smjer vrtnje crpke.
5 Odzračiti crpku preko odzračnog ventila u glavi crpke. Istovremeno malo otvoriti zaporni ventil na tlačnoj strani.	6 Nastaviti s odzračivanjem. Istovremeno još malo jače otvoriti zaporni ventil na tlačnoj strani.
7 Zatvoriti odzračni ventil kad medij počne izlaziti na ventilu. Potpuno otvoriti zaporni ventil na tlačnoj strani.	8 Za više informacija, pogledajte poglavlje 4. Pokretanje proizvoda .

HU Üzembehelyezés

1 A nyomóoldali elzárószelepet zárjuk el, a szívóoldali elzárószelepet nyissuk ki.	2 A betöltőcsavart vegyük ki és a szivattyút lassan töltjük fel. A betöltőcsavart csavarjuk vissza és szorosan húzzuk meg.
3 Nézzük meg a motor ventilátorfedelén a helyes forgásirányt.	4 Kapcsoljuk be a szivattyút és ellenőrizzük forgásirányát.
5 A szivattyú fejrészen lévő légtelenítőszelepen át légtelenítsük a szivattyút. Egyidejűleg kissé nyissuk meg a nyomóoldali elzárószelepet.	6 Folytassuk a légtelenítést, egyidejűleg kissé jobban nyissuk meg a nyomóoldali elzárószelepet.
7 Amikor a légtelenítőszelepen már a levegőmentes szállított közeg lép ki, zárjuk el a szelepet. A nyomóoldali elzárószelepet teljesen nyissuk ki.	8 További információkat a 4. A termék beüzemelése című részben talál.

IT Avviamento

1 Chiudere la valvola di intercettazione sul lato di mandata della pompa e aprire quella sul lato di aspirazione.	2 Rimuovere il tappo di adescamento dalla testa pompa e versare lentamente il liquido nella pompa. Reinserire il tappo e chiuderlo accuratamente.
3 Osservare il corretto senso di rotazione della pompa sul coperchio della ventola motore.	4 Avviare la pompa e controllare il senso di rotazione.
5 Sfiatare la pompa per mezzo della valvola di sfiato sulla testa pompa. Contemporaneamente, aprire leggermente la valvola di mandata.	6 Continuare a sfiatare la pompa, continuando contemporaneamente ad aprire la valvola di mandata.
7 Chiudere la valvola di sfiato quando fuoriesce un flusso di liquido costante. Aprire completamente la valvola di mandata.	8 Per ulteriori informazioni, vedi sezione 4. Avviamento del prodotto .

LT Paleidimas

1 Uždarykite vožtuvą siurblio išvado pusėje ir atidarykite vožtuvą siurblio įvado pusėje.	2 Siurblio galvutėje atsukite pripildymo kamštėlį ir siurblij lėtai pripildykite skysčio. Įstatykite pripildymo kamštėlį ir gerai užveržkite.
3 Pažiūrėkite ant variklio ventiliatoriaus gaubto, kokia yra teisinga siurblio sukimosi kryptis.	4 Paleiskite siurblij ir patikrinkite sukimosi kryptį.
5 Per siurblio galvutėje esantį oro išleidimo vožtuvą išleiskite iš siurblio orą. Tuo pačiu metu truputį atidarykite išvado vožtuvą.	6 Tęskite oro išleidimą. Tuo pačiu metu truputį daugiau atidarykite išvado vožtuvą.
7 Oro išleidimo vožtuvą uždarykite, kai iš jo pradeda tekėti nusistovėjęsi skysčio čiurškliai. Visiškai atidarykite išvado vožtuvą.	8 Daugiau informacijos pateikta skyriuje 4. Produkto paleidimas .

LV Iedarbināšana

1 Aizveriet sprostvārstu sūkņa izplūdes pusē un atveriet sprostvārstu ieplūdes pusē.	2 Noņemiet iepildīšanas aizgriezni no sūkņa galvas un lēnām piepildiet sūkni ar šķidrumu. Ievietojiet iepildīšanas aizgriezni atpakaļ un cieši aizgrieziet to.
3 Sūkņa pareizo rotācijas virzienu skatiet uz motora ventilatora vāka.	4 Ieslēdziet sūkni un pārbaudiet rotācijas virzienu.
5 Vent the pump by means of the vent valve in the pump head. At the same time, open the outlet isolating valve a little.	6 Turpiniet sūkņa atgaisošanu. Tajā pašā laikā atveriet izplūdes sprostvārstu nedaudz vairāk.
7 Atgaisojiet sūkni, izmantojot sūkņa galvā esošo atgaisošanas vārstu. Vienlaikus nedaudz atveriet izplūdes sprostvārstu.	8 Papildinformāciju skatiet sadaļā 4. Produkta ieslēgšana .

NL In bedrijf nemen

1 Sluit de scheidingsafsluiter aan de perszijde van de pomp en open de afsluiter aan de zuigzijde.	2 Verwijder de ontluchtingsschroef van de pompkop en vul de pomp langzaam met vloeistof. Breng de ontluchtingsschroef terug op zijn plaats en zorg dat deze stevig vast zit.
3 Kijk of de draairichting van de pomp klopt (zie beschermkap van de motorventilator).	4 Start de pomp en controleer de draairichting.
5 Ontlucht de pomp met behulp van de ontluchtingsklep in de pompkop. Open tegelijkertijd de persafsluiter een beetje.	6 Ontlucht de pomp verder. Doe tegelijkertijd de persafsluiter iets verder open.
7 Sluit de ontluchtingsklep wanneer het medium gelijkmatig uit de ontluchtingsopening stroomt. Open de persafsluiter volledig.	8 Voor meer informatie, zie paragraaf 4. Het product in bedrijf nemen .

PL Uruchomienie

1 Zamknąć zawór odcinający na tłoczeniu pompy i otworzyć zawór odcinający na ssaniu.	2 Z głowicy pompy zdjąć korek zalewowy i napełnić pompę cieczą. Złożyć korek i dokręcić go mocno.
3 Poprzez pokrywę wentylatora silnika sprawdzić, czy kierunek obrotów pompy jest prawidłowy.	4 Uruchomić pompę i jeszcze raz sprawdzić kierunek obrotów.
5 Poprzez otwór odpowietrzający na głowicy pompy odpowietrzyć pompę. Jednocześnie lekko otworzyć zawór odcinający na tłoczeniu.	6 Dalej odpowietrzać pompę. Jednocześnie jeszcze trochę otworzyć zawór odcinający na tłoczeniu.
7 Gdy z otworu odpowietrzającego zacznie wypływać stały strumień cieczy, zamknąć go. Całkowicie otworzyć zawór odcinający na tłoczeniu.	8 Dalsze informacje - zob. rozdział 4. Uruchamianie produktu .

PT Arranque inicial

1 Feche a válvula de seccionamento do lado da descarga e abra a válvula de seccionamento do lado da aspiração.	2 Retire o bujão de purga da cabeça da bomba e lentamente encha esta com o líquido. Monte o bujão de purga.
3 Certifique-se de que o sentido de rotação da bomba está correcto, i.e., está de acordo com o que se indica na tampa do ventilador do motor.	4 Efectue o arranque da bomba e verifique o sentido de rotação.
5 Purgue a bomba por meio da respectiva válvula, existente na cabeça da bomba. Ao mesmo tempo, abra ligeiramente a válvula de seccionamento do lado da descarga.	6 Continue a purgar a bomba. Ao mesmo tempo, abra um pouco mais a válvula de seccionamento do lado da descarga.
7 Feche a válvula de purga quando um caudal uniforme começar a sair por ela. Abra agora completamente a válvula de seccionamento do lado da descarga.	8 Para mais informações, consulte a secção 4. Proceder ao arranque do produto .

RO Punerea în funcțiune

1 Închideți vana de refulare și deschideți vana de aspirație complet.	2 Desfaceți ventilul de amorsare din capul pompei și încet umpleți pompa cu lichid. Strângeți bine ventilul după umplere.
3 Urmăriți sensul corect de rotație al pompei indicat la partea superioară a motorului la ventilator.	4 Porniți pompa și verificați sensul de rotație.
5 Aerisiți pompa prin intermediul ventilului de aerisire situat în capul pompei. În același timp deschideți vana de refulare.	6 Continuați să aerisiți pompa. În același timp deschideți vana de refulare progresiv.
7 Închideți ventilul de aerisire când apa începe să arunce prin orificiu. Se va deschide complet vana de refulare.	8 Pentru informații suplimentare, vezi secțiunea 4. Pornirea în funcțiune a produsului .

RS Puštanje u rad

1 Zatvoriti zaustavni ventil na potisnoj strani i otvoriti zaustavni ventil na usisnoj strani.	2 Demontirati ulivni priključak i polako napuniti pumpu. Ponovo ušrafiti ulivni priključak i čvrsto ga pritegnuti.
3 Uočiti pravilan smer obrtanja na poklopcu ventilatora motora.	4 Uključiti pumpu i proveriti smer obrtanja pumpe.
5 Odzračiti pumpu preko odzračnog ventila na glavi pumpe. Istovremeno malo otvoriti zaustavni ventil na potisnoj strani.	6 Nastaviti sa postupkom odzračivanja. Istovremeno zaustavni ventil na potisnoj strani otvoriti još malo više.
7 Kada radni fluid počne da ističe iz ventila zatvoriti odzračni ventil. Zaustavni ventil na potisnoj strani potpuno otvoriti.	8 Za više informacija, pogledajte poglavlje 4. Puštanje proizvoda u rad .

SE Igångkörning

1 Stäng avstängningsventilen på pumpens trycksida och öppna avstängningsventilen på sugsidan.	2 Avlägsna spädproppen i toppstycket och fyll pumpen långsamt. Sätt sedan tillbaka proppen.
3 Kontrollera rätt rotationsriktning enligt motorns fläktkåpa.	4 Starta pumpen och kontrollera pumpens rotationsriktning.
5 Avlufta pumpen med hjälp av ventilen på toppstycket. Öppna samtidigt avstängningsventilen på pumpens trycksida något.	6 Fortsätt avlufta pumpen. Öppna samtidigt avstängningsventilen på trycksidan lite till.
7 Stäng avluftsventilen när en jämn vätskeström kommer ut ur den. Öppna avstängningsventilen på trycksidan helt.	8 Mer information finns i avsnitt 4. Igångkörning av produkten .

SI Zagon

1 Tlačni zaporni ventil zapreti in odpreti sesalni zaporni ventil.	2 Čep odprtine za nalivanje odpreti in črpalko počasi napolniti. Ponovno priviti čep in močno pritegniti.
3 Kontrolirati je potrebno pravilno smer vrtenja na pokrovu hlajenja motorja.	4 Vkllopiti črpalko in preveriti smer vrtenja črpalke.
5 Črpalko odzračiti s pomočjo odzračevalnega ventila na glavi črpalke. Istočasno nekoliko odpreti zaporni ventil na tlačni strani.	6 Odzračevalni postopek nadaljevati. Istočasno na tlačni strani še bolj odpreti zaporni ventil.
7 Odzračevalni ventil zapreti, ko prične iztekati medij. Zaporni ventil na tlačni strani popolnoma odpreti.	8 Za več informacij glejte poglavje 4. Zagon izdelka .

SK Uvedenie do prevádzky

1 Uzavrite uzatváraciu armatúru na výtlačnej strane čerpadla a otvorte uzatváraciu armatúru na sacej strane čerpadla.	2 Z hlavy čerpadla vyskrutkujte plniacu zátku a do čerpadla pomaly nalievajte kvapalinu. Plniacu zátku naskrutkujte späť a pevne ju dotiahnite.
3 Podľa šípky na kryte ventilátora motora čerpadla zistíte smer otáčania sa hriadeľa čerpadla.	4 Zapnite čerpadlo a skontrolujte, či smer otáčania sa hriadeľa zodpovedá smeru uvedenom na kryte ventilátora motora.
5 Čerpadlo odvzdušnite pomocou odvzdušňovacieho ventila umiestneného v hlave čerpadla. Súčasne mierne pootvorte uzatváraciu armatúru na výtlačnej strane čerpadla.	6 Pokračujte v odvzdušňovaní čerpadla. Súčasne trochu pootvorte uzatváraciu armatúru na výtlačnej strane čerpadla.
7 Odvzdušňovací ventil uzatvorte akonáhle z neho začne vytekať kvapalina. Naplno otvorte uzatváraciu armatúru na výtlačnej strane čerpadla tak, aby ste dosiahli pracovný bod čerpadla.	8 Ďalšie informácie sú uvedené v časti 4. Spustenie čerpadla .

TR İlk çalıştırma

1 Pompanın basma tarafındaki izolasyon vanasını kapatın ve emme tarafındaki izolasyon vanasını açın.	2 Doldurma tapasını pompa başından sökün ve pompayı sıvı ile doldurun. Doldurma tapasını tekrar yerine takın ve sağlam bir şekilde sıkın.
3 Motor fan kapağında bulunan doğru pompa dönüş yönüne bakın.	4 Pompayı çalıştırın ve dönüş yönünü kontrol edin.
5 Pompa başında bulunan tahliye valfi yardımıyla pompanın havasını alın. Aynı anda, basma izolasyon valfini biraz açın.	6 Pompanın havasını almaya devam edin. Aynı anda, basma izolasyon valfini biraz daha açın.
7 Düzenli bir sıvı akışı gerçekleştiğinde, tahliye valfini kapatın. Basma izolasyon valfini tamamen açın.	8 Daha fazla bilgi için bkz. bölüm 4. Ürünün çalıştırılması .

UA Запуск

1 Закрити запірний кран на виході насоса та відкрити запірний кран на всмоктувальному трубопроводі.	2 Викрутити заглушку з верхньої частини насоса та повільно заповнити насос рідиною. Вкрутити заглушку.
3 Перевірити правильний напрямок обертання насоса, що вказаний на кришці вентилятора.	4 Запустити насос та перевірити напрямок обертання.
5 Видалити повітря з насоса з допомогою повітряного клапана в верхній частині насоса. Одночасно привідкрити вихідний запірний кран.	6 Продовжувати видаляти повітря з насоса. Одночасно відкрити вихідний кран ще трохи більше.
7 Закрити повітряний клапан, коли постійний потік рідини потече з насоса. Повністю відкрити вихідний запірний кран.	8 Додаткову інформацію див. у розділі 4. Запуск виробу .

CN 启动

1 关闭水泵出水侧的隔离阀，打开进水侧的隔离阀。	2 从泵头上拆下注水塞并缓慢加注水泵。装好注水塞并确保拧紧。
3 在电机风扇盖上察看水泵正确的转动方向。	4 启动水泵，检查转动方向。
5 通过位于泵头的排气阀对泵排气。与此同时，再略微打开出水侧隔离阀。	6 继续对水泵排气。与此同时，再将出水侧隔离阀打开得更大一点。
7 在看到液体持续平稳地从排气阀流出后关闭此阀。完全打开出水隔离阀。	8 更多信息请参见章节 4. 启动产品 。

MK Вклучување

1 Затворете го изолацискиот вентил на одводната страна од пумпата и полека отворете го изолацискиот вентил на доводната страна.	2 Извадете го чепот за вшмукување од главата на пумпата и полека наполнете ја пумпата со течност. Заменете го чепот за вшмукување и цврсто затегнете го.
3 Точниот правец на ротација е прикажан со стрелки на капакот на вентилаторот на моторот.	4 Вклучете ја пумпата и проверете ја насоката на ротирање.
5 Обезвоздушете ја пумпата со помош на вентил за обезвоздушвање во главата на пумпата. Истовремено, потвორете го одводниот изолациски вентил.	6 Продолжете со обезвоздушвање на пумпата. Истовремено, отворете го малку повеќе одводниот изолациски вентил.
7 Затворете го вентилот за обезвоздушвање штом од него ќе протече рамномерен млаз течност. Целосно отворете го одводниот изолациски вентил.	8 За дополнителни информации, видете во делот 4. Вклучување на производот .

ID Mulai

1 Tutup katup penutup di bagian pelepasan pompa lalu buka katup penutup di bagian hisap.	2 Lepas sumbat pemancing dari kepala pompa lalu secara perlahan isilah pompa dengan air. Pasang kembali sumbat pemancing dan kencangkan.
3 Lihat arah rotasi pompa yang benar pada penutup kipas motor.	4 Jalankan pompa lalu periksa arah rotasi pompa.
5 Pancing pompa dengan menggunakan sumbat pemancing di head pompa. Pada saat bersamaan, buka sedikit katup pemisah dengan sisi pelepasan.	6 Lanjutkan memancing pompa. Pada saat bersamaan, buka lebih lebar katup pemisah dengan sisi pelepasan.
7 Tutup katup pemancing setelah air keluar deras. Membuka sepenuhnya katup pemisah pelepasan.	8 Untuk informasi lebih lanjut, lihat bagian 4. Menghidupkan produk .

NO Oppstart

1 Steng isoleringsventilen på utløpssiden av pumpen og åpne isoleringsventilen på innløpssiden.	2 Fjern fyllepluggen fra pumpehodet og fyll pumpen langsomt med væske. Sett på plass fyllepluggen og trekk godt til.
3 Se riktig rotasjonsretning for pumpen på motorviftedekselet.	4 Start pumpen og kontroller rotasjonsretningen.
5 Luft ut pumpen ved hjelp av lufteventilen i pumpehodet. Åpne samtidig utløpsventilen litt.	6 Fortsett å lufte pumpen. Åpne samtidig utløpsventilen litt mer.
7 Steng lufteventilen når en jevn strøm av væske kommer ut av den. Åpne utløpsventilen helt.	8 Du finner flere opplysninger i avsnitt 4. Oppstart av produktet .

IS Ræsing

1 Lokið einangrunarlokanum á úttakshlið dælnunnar og opnið einangrunarlokann á inntakshliðinni.	2 Fjarlægjið forgjafartappann úr dæluhausnum og fyllið dæluna hægt með vökva. Setjið forgjafartappann aftur í og herðið tryggilega.
3 Upplýsingar um rétta snúningsstefnu dælnunnar eru á viftuhlíf mótorsins.	4 Ræsið dæluna og athugið snúningsstefnuna.
5 Loftið út úr dælunni með því að nota loftlokann í dæluhausnum. Opnið úttakseinangrunarlokann lítillega um leið.	6 Haldið áfram að lofta út úr dælunni. Opnið um leið aðeins meira fyrir úttakseinangrunarlokann.
7 Lokið loftlokann þegar stöðugur straumur af vökva rennur út um hann. Opnið úttakseinangrunarlokann alveg.	8 Nánari upplýsingar eru í kafla 4. Gangsetning vörunnar .

AR

بدء التشغيل

2	1
قم بإزالة سدادة التحضير من فوهة المضخة واملاها ببطء بالسائل. أعد تركيب سدادة التحضير وأحكم ربطها.	أغلق الصمام الفاصل في ناحية خروج المضخة وافتح الصمام الفاصل في ناحية الدخول.
4	3
شغل المضخة وتحقق من اتجاه الدوران.	لاحظ اتجاه الدوران الصحيح للمضخة على غطاء مروحة المحرك.
6	5
استمر في تنفيس المضخة. وفي نفس الوقت، زد فتح الصمام الفاصل عند ناحية الخروج بنسبة قليلة.	نفس المضخة عن طريق صمام التنفيس الموجود عند فوهة المضخة. وفي نفس الوقت، افتح الصمام الفاصل عند ناحية الخروج بنسبة قليلة.
8	7
لمزيد من المعلومات، انظر القسم 4. بدء تشغيل المنتج.	قم بإغلاق صمام التنفيس عندما يخرج منه تدفق مستمر من السائل. افتح الصمام الفاصل من ناحية الخروج بالكامل.

YETKİLİ GRUNDFOS SERVİSLERİ

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96462123	11.2020
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CR, CRI, CRN 32, 45, 64, 90

Service kit instructions

Chamber and rotating bearing



English (GB) Service kit instructions

CONTENT

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2. Assembly	16

English (GB)



Warning

Before starting service work, read the safety instructions supplied with the product.

Dansk (DK)



Advarsel

Læs sikkerhedsanvisningerne der blev leveret med produktet, før du foretager servicearbejde.

Deutsch (DE)



Warnung

Vor der Durchführung irgendwelcher Reparaturarbeiten ist die mit dem Produkt mitgelieferte Serviceanleitung sorgfältig durchzulesen.

Español (ES)



Advertencia

Antes de comenzar el trabajo, lea las instrucciones de seguridad suministradas con el producto.

Ελληνικά (GR)



Ειδοποίηση

Πριν ξεκινήσετε εργασίες επισκευής, διαβάστε τις οδηγίες ασφαλείας που συνοδεύουν το προϊόν.

Français (FR)

**Avertissement**

Avant toute intervention, consulter les consignes de maintenance fournies avec le produit.

Italiano (IT)

**Avviso**

Prima di iniziare i lavori di manutenzione, leggere le istruzioni di sicurezza fornite con il prodotto.

Nederlands (NL)

**Waarschuwing**

Lees de veiligheidsinstructies die bij het product meegeleverd zijn voordat u begint met servicewerkzaamheden.

Português (PT)

**Aviso**

Antes de iniciar o serviço de manutenção, leia as instruções de segurança fornecidas com o produto.

Русский (RU)

**Предупреждение**

Перед началом работ по сервисному обслуживанию необходимо прочитать сервисное руководство, поставляемое с продуктом.

Suomi (FI)

**Varoitus**

Lue tuotteen mukana toimitetut turvallisuusohjeet ennen huoltotöiden aloittamista.

Svenska (SE)

**Varning**

Läs de säkerhetsanvisningar som medföljer produkten innan servicearbetet inleds.

1. Dismantling

DK: Demontering

DE: Demontage

ES: Desmontaje

GR: Αποσυναρμολόγηση

FR: Démontage

IT: Smontaggio

NL: Demontage

PT: Desmontagem

RU: Демонтаж

FI: Purkaminen

SE: Demontering

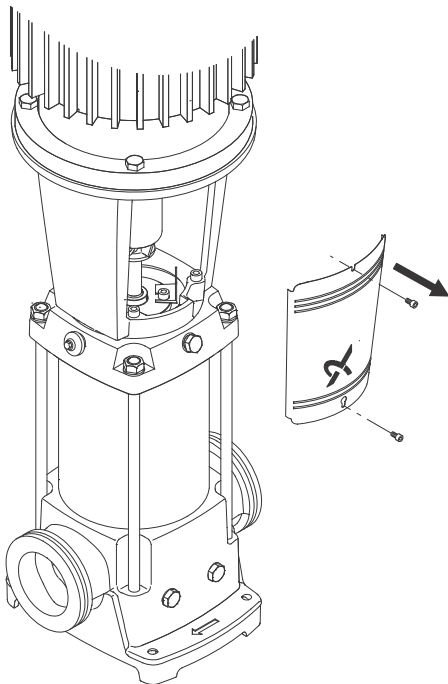


Fig. 1

TM01 412 25113

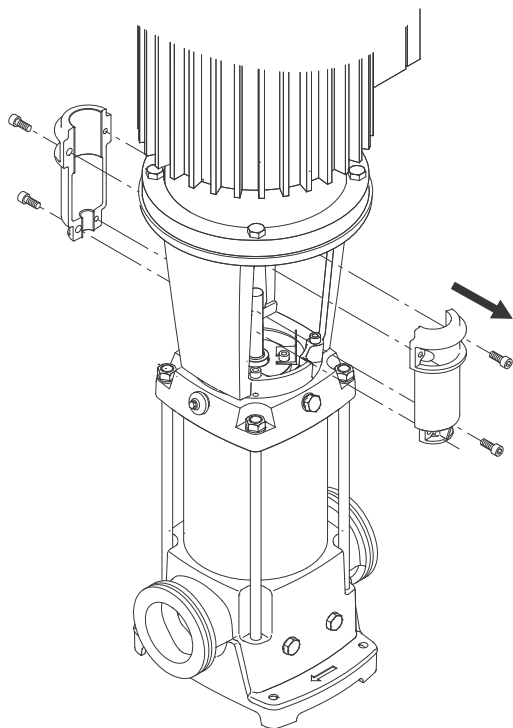
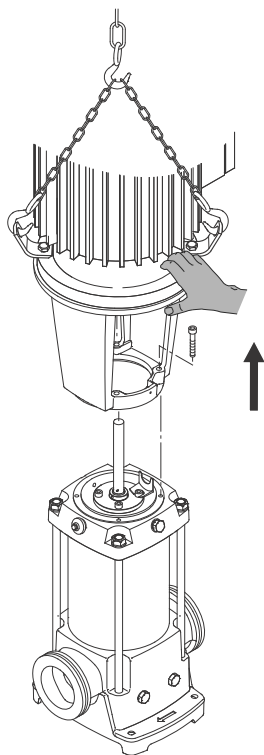


Fig. 2

TM01 3118 5113

**Fig. 3**

TM01 4124 5113

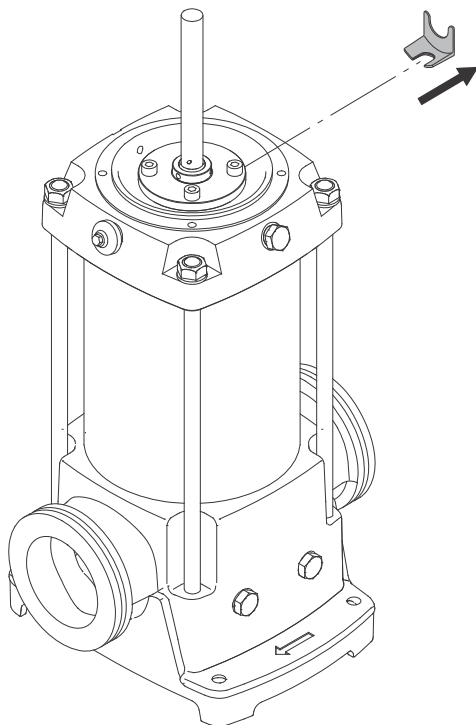
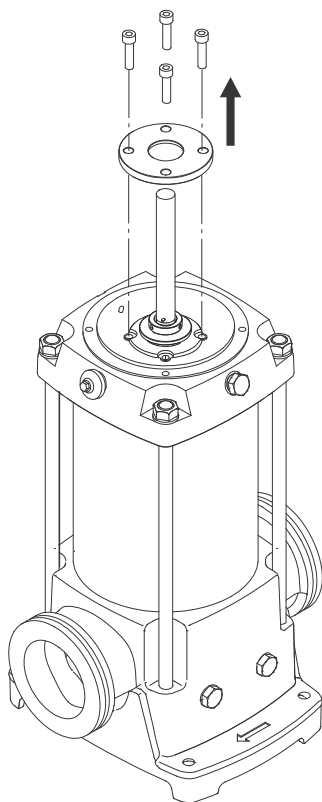


Fig. 4

TM06 0257 5113

**Fig. 5**

TM01 4125 5113

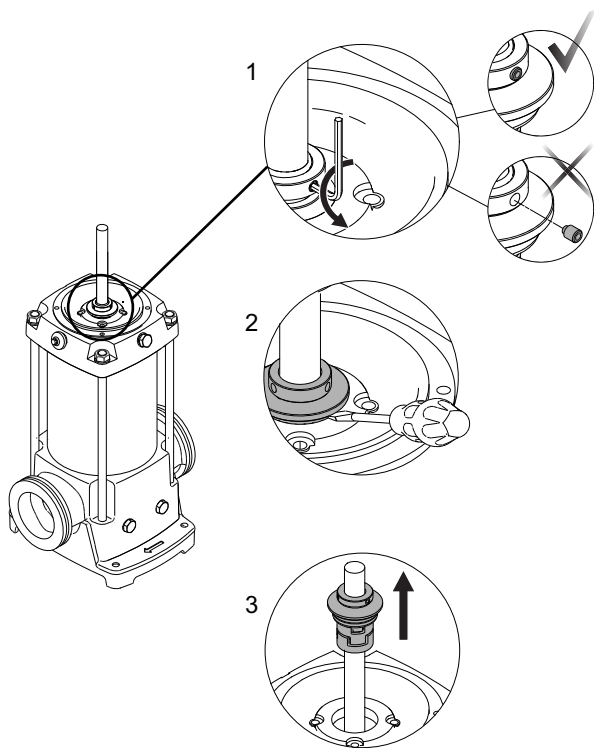
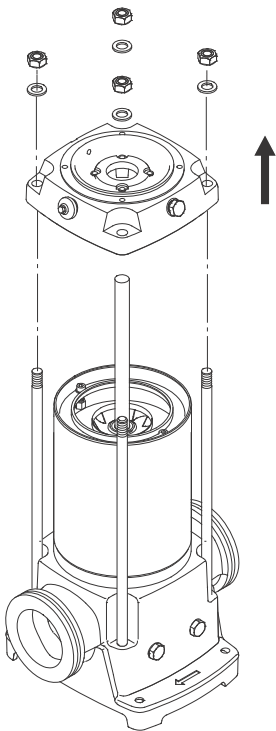
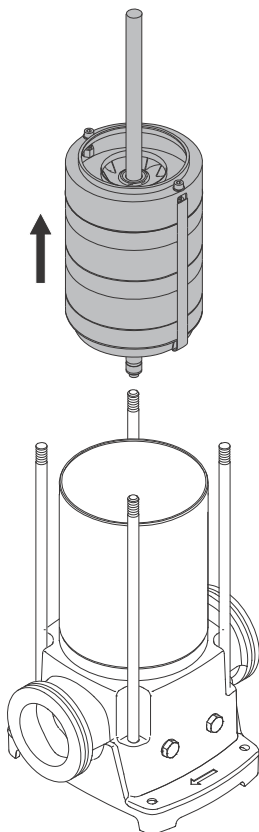


Fig. 6

TM01 4127 5113

**Fig. 7**

TM01 4128 5113

**Fig. 8**

TM06 0421 0214

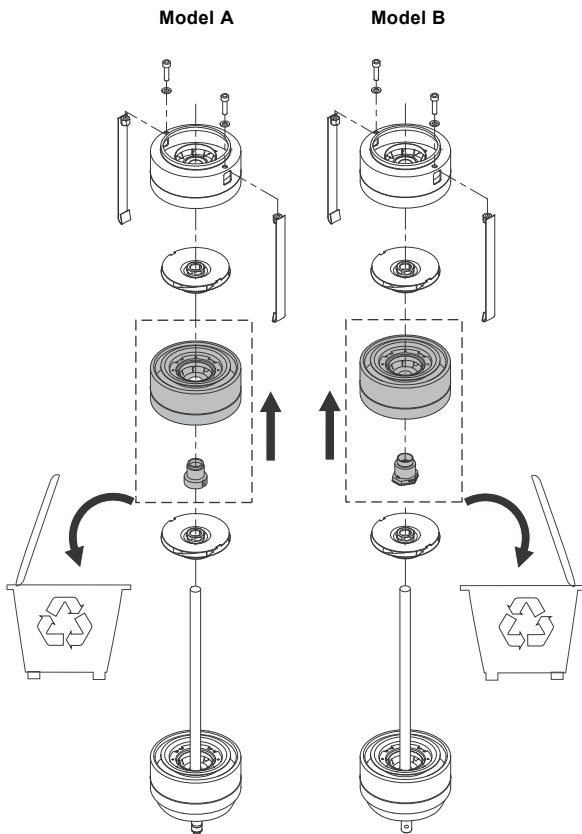


Fig. 9

TM05 9105 0214

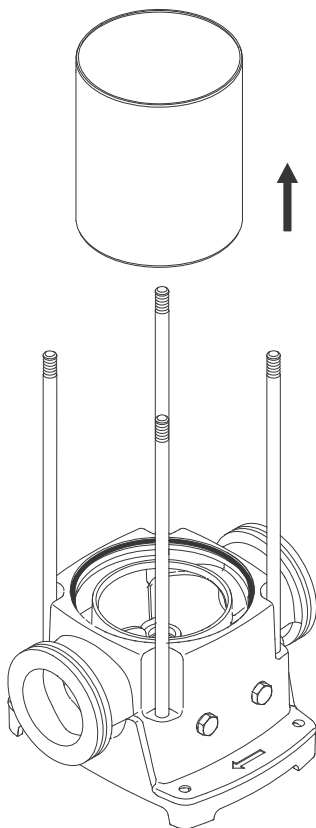
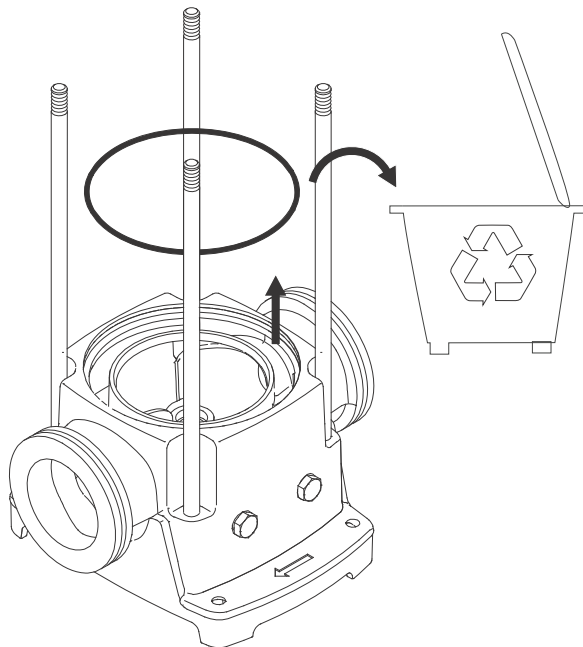


Fig. 10

TM06 0262 5113

**Fig. 11**

TM06 0524 0414

2. Assembly

DK: Montering

DE: Montage

ES: Montaje

GR: Συναρμολόγηση

FR: Montage

IT: Montaggio

NL: Montage

PT: Montagem

RU: Подключение

FI: Kokoaminen

SE: Montering

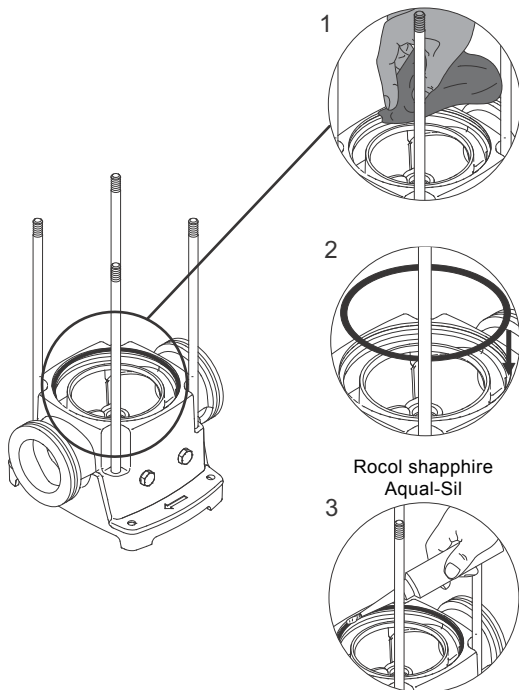


Fig. 12

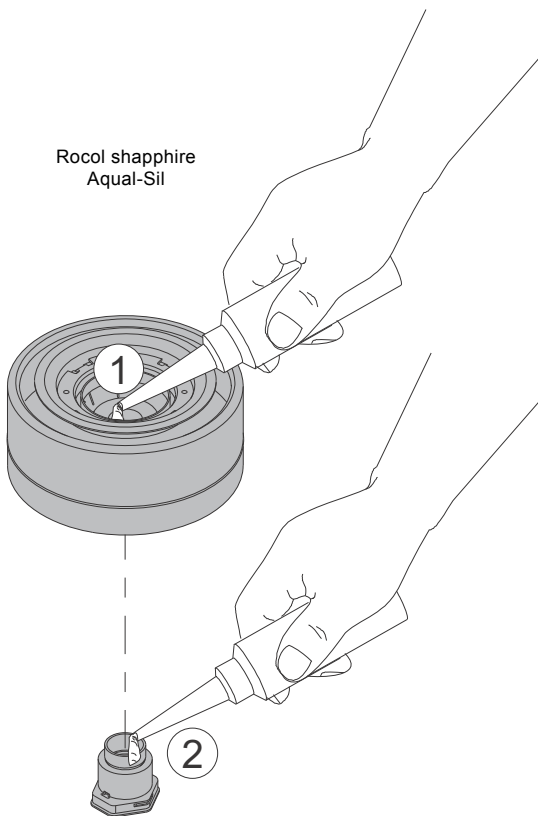


Fig. 13

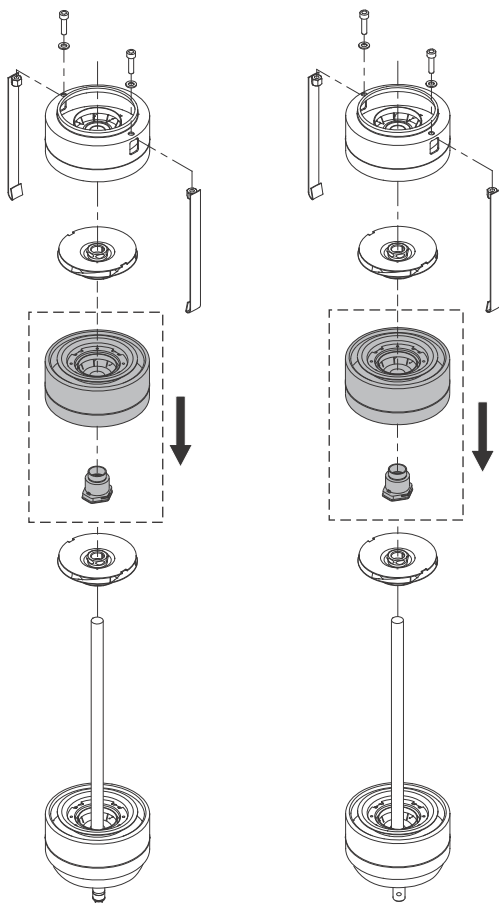


Fig. 14

TM06 0501 0314

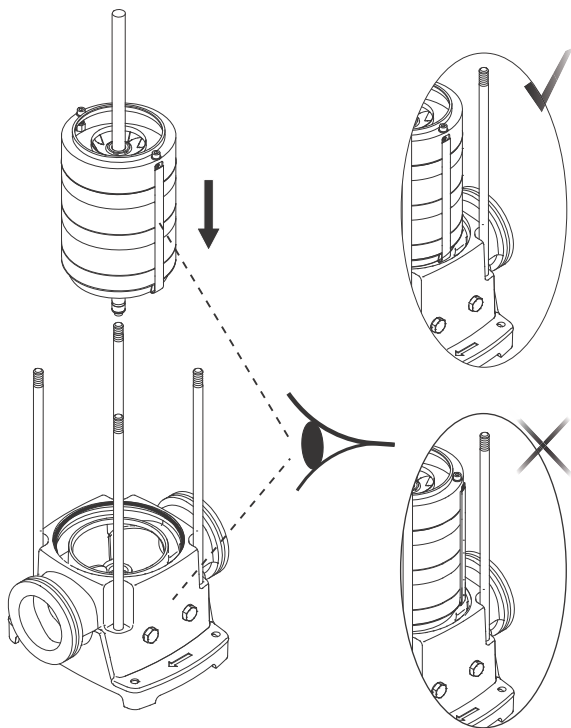


Fig. 15

TM06 0422 0214

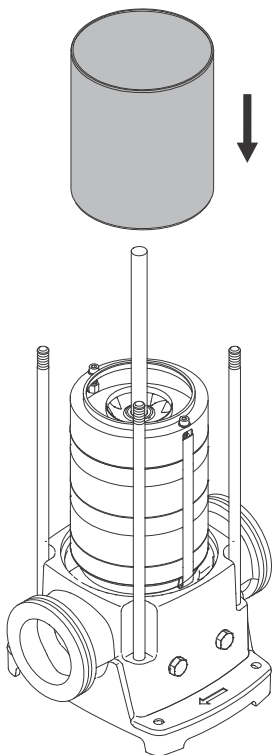
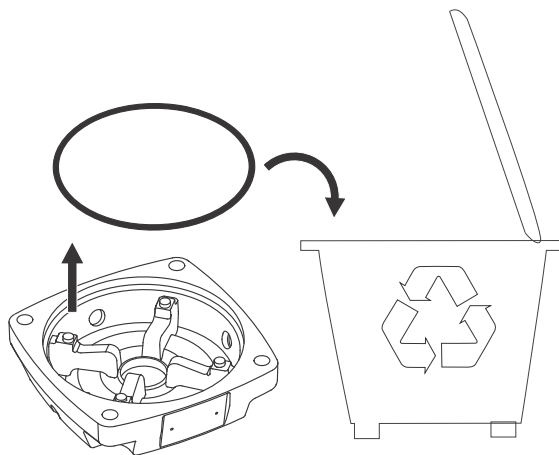


Fig. 16

TM06 0267 5113

**Fig. 17**

TM06 0268 5113

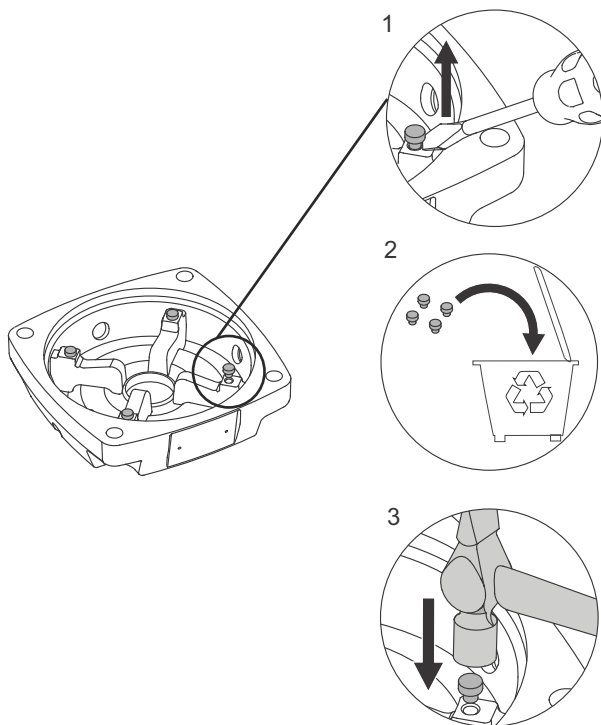


Fig. 18

TM01 4131 5113

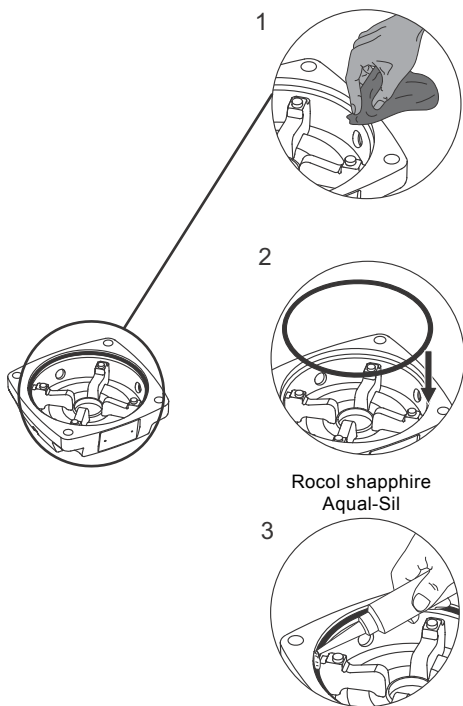


Fig. 19

TM06 0270 5113

Size	Torque
M16	100 Nm

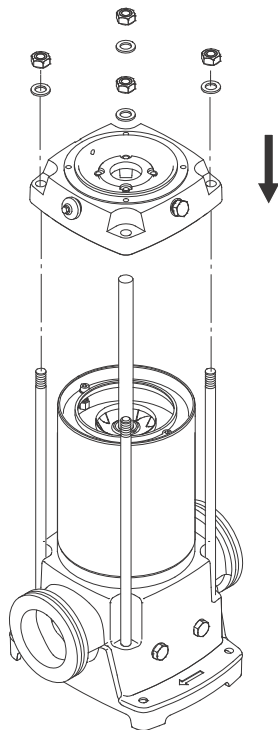


Fig. 20

TM06 0271 5113

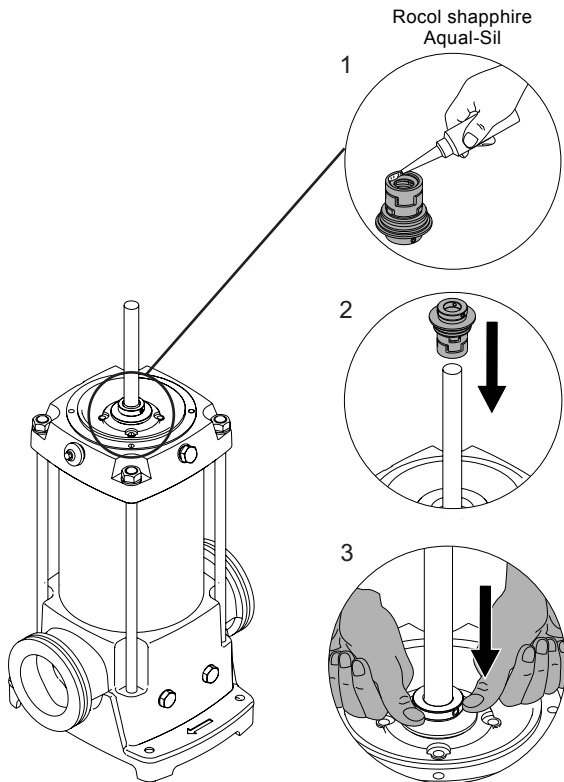


Fig. 21

TM01 4133 5113

Size	Torque
M10	62 Nm
M3	6 Nm

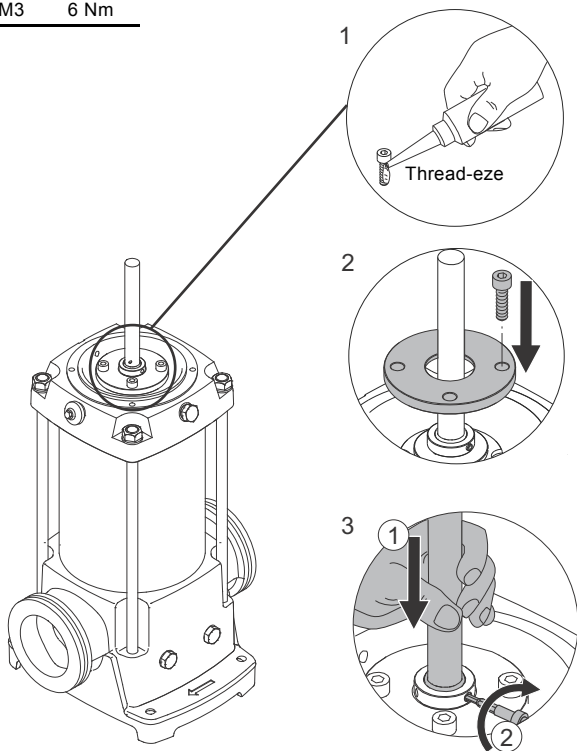
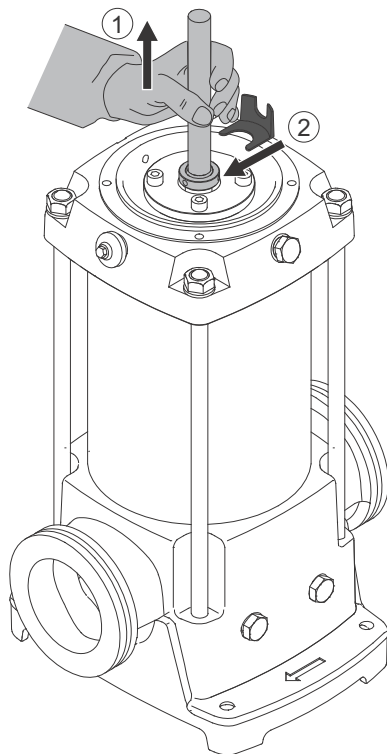


Fig. 22

TM01 4161 5113

**Fig. 23**

TM01 4134 5113

Size	Torque
M10	62 Nm

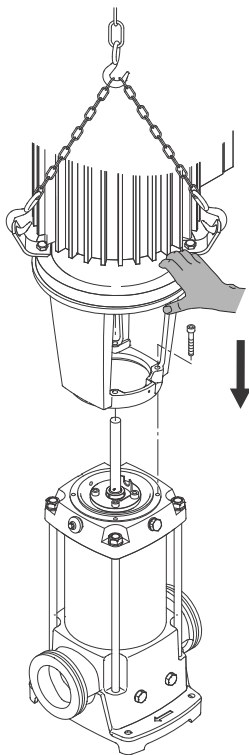


Fig. 24

TM01 4135 5113

Size	Torque
M10	85 Nm

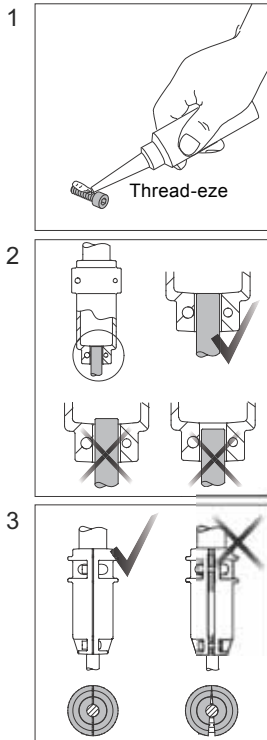
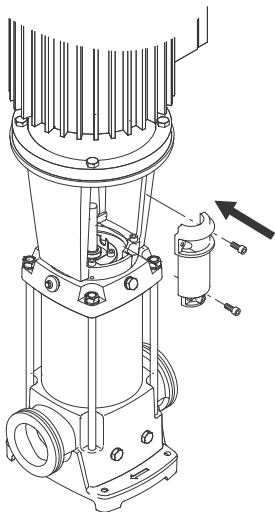


Fig. 25

TM01 4136 5113

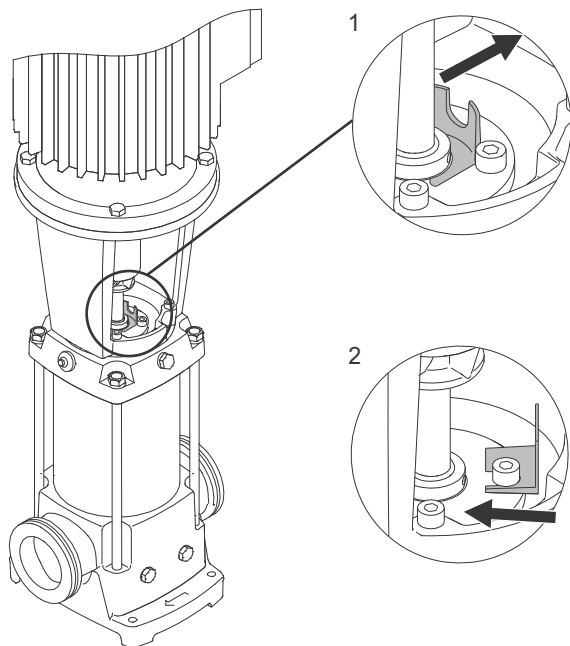


Fig. 26

TM01 3039 5113

Torque

6 Nm

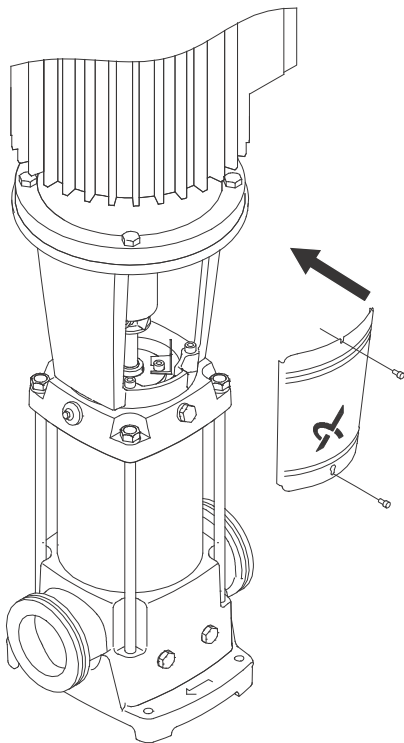


Fig. 27

TM06 0278 5113

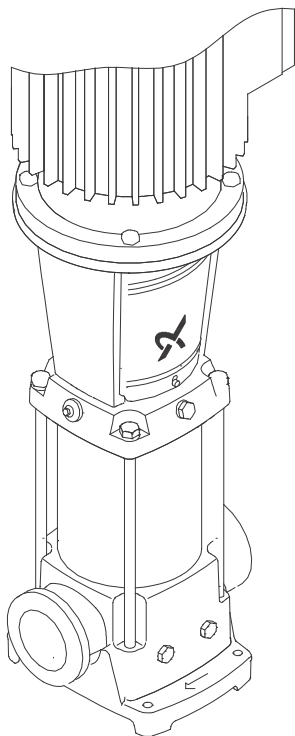


Fig. 28

TM06 0279 5113

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