

# CUSTOMIZED SOLUTIONS

Grundfos innovations Custom-Built for your needs

be  
think  
innovate

**GRUNDFOS** 

# Custom solutions for industrial applications

### Combining features to customize pumps

With expert assistance from our engineers, customers can choose among an unmatched range of designs, features, options, materials, and much more, combining them to create a tailor-made solution. Custom CR solutions add up to over a million possible configurations.

### A solution for every need

Grundfos CR has the most extensive range on the market, but standard pump ranges can't match all conceivable applications. Grundfos customers needing a non-standard solution are able to pick and choose pump elements or "modules" to cover nearly any situation.

Our custom solutions engineering department works exclusively to custom design pumps for industry. Every day Grundfos customers order pumps that will handle:

- extreme temperatures
- extreme pressures
- aggressive/hazardous liquids
- vaporous liquids
- low NPSH level
- belt drive
- paints
- varnishes
- high viscosity liquids
- explosive liquids
- horizontal mounting

### Cost-efficient custom solutions

Grundfos customized pumps are constructed specifically to your exact requirements. Working in close cooperation with you, our skilled specialists carefully analyze the situation to make sure the solution fully meets your expectations.

This does not mean every customized pump is designed from scratch at prohibitive cost. Grundfos customers can go right to the assembly stages. Custom designed pumps from Grundfos are the result of judicious selection from a range of high-quality elements, combined with great ease and speed to create ideal solutions at low costs.

If you do not find a suggestion to suit your particular problem in our brochure, simply contact Grundfos with your requirements. We will do everything we can to provide a solution.



# We've got SOLUTIONS...



**Over a million combinations for CR**

## Motors for special applications

The motor is a crucial element of the final pump solution. Grundfos offers choices to ensure maximum performance for all customers.

### Your many motor choices

The standard range of Grundfos motors will cover most application demands – and customized solutions are available for highly specific requirements such as:

- Special supply voltages
- Extreme operating conditions (temperature, humidity, atmosphere)
- Special motor protection
- Specific approvals
- Special motor design
- High motor efficiency

### Full range of variants available

The table at right shows an overview of some of the most popular alternative motor variants and designs that Grundfos can supply. The table is by no means complete. A range of special designs and motor features is available — just contact Grundfos.

Table A

Motor Size HP	PH	Material Number
1	1	85700004X
	3	85600004X
1-1/2	1	85700005X
	3	85600005X
2	1	85700006X
	3	85600006X
3	1	84Z03251
	3	85600008X
5	1	85700012X
	3	85600012X
7-1/2	3	85600017X
10	3	85600022X
15	3	856000244
20	3	85600025X
25	3	85600026X
30	3	84Z03216



### VARIANT

Different motor brand

Different position of motor

Explosion-proof motor

Different enclosure class

Anti-condensation heating (space heaters)

Integrated variable speed drive

Special supply voltage

Motor insulation class

Efficiency class

Oversized motor

Tropicalized windings

Wye/Delta starting

Test sheets

DESCRIPTION	AVAILABLE FOR MODEL
If technically possible, Grundfos can fit the pump with a motor of a brand other than the standard. This will normally increase the time of delivery. Alternatively, the pump can be supplied without a motor.	0 - 60 HP
Where possible, the terminal box can be placed on either side of the pump.	0 - 60 HP
For operation in hazardous atmospheres.	SEE TABLE A
As standard, Grundfos can supply: <ul style="list-style-type: none"> <li>• ODP: Open Drip-Proof</li> <li>• TEFC: Total-Enclosed Fan-Cooled</li> </ul> On request, we can supply: <ul style="list-style-type: none"> <li>• Chemical processing/mill and chem duty</li> <li>• Washdown duty (Up through 10 hp only)</li> </ul>	▲
Built-in heating unit, especially for humid environments. All heating units are supplied with 1 x 115V, 60Hz.	▲
Some Grundfos CR pumps are available as standard with an integrated variable speed drive (type MLE) motor.	▲
Motors suitable for other voltages are available upon request.	▲
Upgrade from Class F to Class H.	▲
<ul style="list-style-type: none"> <li>• EPC/NRC—motor efficiency according to EPC/NRC standards</li> <li>• Premium efficiency</li> </ul>	▲
Ambient temperatures above 104°F (40°C) or installation at altitudes of more than 3,300 feet above sea level require the use of an oversized motor (i.e. derating).	▲
Motors recommended for operating in areas with high humidity.	▲
Motor wired for Wye/Delta starting (6 leads).	▲
Grundfos' laboratory is authorized to issue test sheets for motors; for instance, for insurance companies.	▲

The CR program includes as standard a range of “smart” pumps with integrated variable frequency drives.



▲ Call for information \* Upon request

## Ingenious shaft seal solutions

The Grundfos CR range features as standard the patented Grundfos cartridge shaft seal. Seal components are combined in a single unit for extra durability, reliability and convenience.

### Special seals for special situations

Most pumps are used for watery liquids at temperatures below +248°F (+120°C) and pressures lower than 362 psi (25 bar). When the pumped liquid goes beyond these limits, special solutions are required. With the Grundfos modular approach, we offer a wide range of special shaft seals to handle challenges like:

- Aggressive or corrosive liquids
- Particle-carrying liquids
- Poisonous or explosive liquids
- High-viscosity or sticky liquids
- Extremely high pressures
- Extremely high or low temperatures

The table at right shows some of the shaft seal solutions Grundfos offers. If you face a specific problem not covered here, we will work with you to find a solution. Our dedication to the modular approach means that, with the help of our customers, we are always adding to our range of options and features.



*Our cartridge seal solutions extend far beyond our ingenious cartridge seal, standard on the CR range.*

### VARIANT

LiqTec™

FFKM shaft seal (Kalrez®)

Hybrid shaft seal

High-pressure

Cool-Top™ air-cooled

Double shaft seal (back-to-back)

Optional with pressure intensifier or with dosing pump

Double shaft seal with flushing chamber (quench seal)

SiC/SiC shaft seal for CRT

CR MAG Drive

DESCRIPTION	AVAILABLE FOR MODELS
The most common cause of pump failure is dry running. LiqTec™ has a run-dry sensor that stops the pump immediately if there is no liquid present.	CR(I)(N) 1/3/5 CR(I)(N) 10, 15, 20 CR(N) 32, 45, 64, 90
Chemically resistant FFKM rubber O-rings. Recommended for applications where the pumped liquids may damage the standard O-ring material.	CR(I)(N) 1/3/5 CR(I)(N) 10/15/20 CR(N) 32/45/64/90
Recommended for applications involving the risk of dry-running. The stationary seat of the shaft seal is equipped with an extra special-carbon seal face, which expands at high temperatures; for instance, as a result of dry-running. Prevents the usual damaging effects of dry-running such as leakage and noise.  **available as standard in CR(N) 32/45/64/90.	CR(N) 32/45/64/90**
Recommended for applications involving shaft seal pressures between 360 psi (25 bar) and 580 psi (40 bar).*	CR(N) 32/45/64/90
Recommended for applications involving shaft seal system extremely high temperatures above 356°F (180°C). To ensure a low liquid temperature around the standard shaft seal, the pump is fitted with a special air-cooled shaft seal chamber. No separate cooling is required.	CR(I), CR(N) 1/3/5/ 10/15/20 CR 32/45/64/90 CR(N) 32, 45, 64, 90
Recommended for applications involving poisonous or explosive liquids. Protects the chamber surrounding environment and the people working around the pump. Consists of two seals mounted “back-to-back” inside a separate pressure seal. As the pressure in the chamber is higher than the pump pressure, leakage is prevented. A dosing pump or a special pressure-intensifier can generate the seal chamber pressure	CR(N) 1/3/5/10/15/20 CRT 32/45/64/90 CR 32/45/64/90 CR(N) 32/45/64/90
Recommended for applications involving a high risk of crystallization (sugar water) or hardening (oil products). Consists of two seals mounted in a tandem arrangement inside a flushing chamber, connected to an external flushing source.	CR(I)(N) 1/3/5 CR(I)(N) 10/15/20 CR(N) 32/45/64/90
Recommended for applications involving a high risk of corrosion.*  Available in EPDM, FKM, NBR qualities.	CRT 2/4/8/16
Magnetic drive pumps for industrial applications. Key applications are industrial process pumps handling aggressive, environmentally dangerous or volatile liquids	CRN 1s-2 to CRN 1s-27 CRN 1-2 to CRN 1-27 CRN 3-2 to CRN 3-23 CRN 3-25 CRN 5-2 to CRN 5-12 CRN 5-13 to CRN 5-22

*Although the CR range is rugged enough to withstand short periods of dry-running, the LicTec™ run-dry sensor offers real peace of mind. It shuts down the pump before damage occurs.*



\* Extra delivery time may be required.

NOTE: Kalrez® is a registered trademark of DuPont.

## CUSTOM-BUILT PUMPS

### Rugged pump modules for many purposes

The pumps we manufacture for the Grundfos CR range meet the demands of most industrial applications and can be combined with other CR modules to target specific solutions. Special pump designs are available for situations such as:

- Inlet pressure exceeds the maximum level recommended for the pump
- High-pressures up to 580 psi (40 bar)
- Pumping gas or particle-filled liquids
- Pumping high-viscosity or sticky liquids
- NPSH levels causing cavitation or vortexing
- Horizontal mounting of pump necessary — for example, on ships or in earthquake zones
- No carbon or silicone allowed

#### Custom-built pumps: mix-and-match special components

The CR range is available in 11 flow sizes and various grades of corrosion-resistant stainless steel, as well as corrosion-free titanium.

The table at right shows some of our special pump versions. All can be seamlessly integrated with other CR components. Please contact Grundfos for help in selecting the right CR components for your customized pump.



#### VARIANT

Horizontally mounted pump

High pressure required

Low temperature pump down to -40°F (-40°C)

Carbon-fiber-free pump

Customer's nameplate

Custom-colored pumps

Low-NPSH pump (improved suction)

EU models

Pump with bearing flange

Silicone-free pump

Combination bearing of titanium/PTFE-filled carbon and PTFE gaskets

Belt-driven operation





DESCRIPTION	AVAILABLE FOR MODELS
Some situations require the pump to be mounted horizontally for safety — for instance, on a ship. The pump comes with brackets that support the motor as well as the pump for easy installation.	CR(I)(N) 1/3/5 CR(I)(N) 10/15/20 ≤ 5.5 hp CR(I)(N) 32/45/64/90 ≥ 7.5 hp
For high pressure applications up to 725 psi (50 bar), Grundfos offer solutions in single or double pump systems.*	CRN 1/3/5 CRN 10/15/20 CR(N) 32/45/64/90
Chiller pumps may be exposed to temperatures as low as -40°F (-40°C), so it is necessary to alter neck ring dimensions in order to prevent impeller drag.*	CRI, CRN 1/3/5/10/15/20 Standard with: CRN 32/45/64/90
Some processes (for example, in the electronics industries) require the use of pumps containing absolutely no carbon fibers. We can provide 100% carbon-fiber-free CR pumps.*	CRI, CRN 32/45/64/90 Standard with: CRI, CRN 1/3/5/10/15/20
Nameplate with relevant pump data supplied by the customer replaces the usual GRUNDFOS nameplate on the pump.*	CR(I)(N) 1/3/5/10/15/20 CR(N) 32/45/64/90
We can apply a water-based top coat for special colors. Contact GRUNDFOS for available colors.*	CR(I)(N) 1/3/5/10/15/20 CR(N) 32/45/64/90
Recommended for boiler-feed applications where cavitation may occur due to poor inlet pressure.*	CR(I)(N) 3/5 CR(N) 10, 15, 20 CR(I)(N) 32/45/64/90
Incorporating IEC motor and DIN/metric base.*	CR(I)(N) 1/3/5/10/15/ 20/32/45/64/90
Recommended for standard motors. The bearing flange increases the life span of motor bearings. Can also be used for applications where the inlet pressure is higher than the maximum recommended.*	Motor sizes: MG 100/112, NEMA 182 MG 132, NEMA 213, 215 MG 160/180, NEMA 254/256 MG 200, NEMA 284/286 MG 225, NEMA 324/326 and 364/365
For processes that require the use of pumps not containing silicone, we provide 100% silicone-free pumps.*	CR(I)(N) 1/3/5/10/15/20 CR(N) 32/45/64/90
Recommended for applications involving the pumping of very aggressive liquids.*	CRT 2/4/8/16
Designed for situations where space is limited or where no electricity is available.*	CR(I)(N) 1/3/5/10/15/20 CR(N) 32/45/64/90

*We provide an array of special pumps such as horizontally mounted pumps, high pressure pumps, corrosion-free titanium pumps, low NPSH pumps and many, many others.*



\* Extra delivery time may be required.

# Choices for **connections** and surface treatments

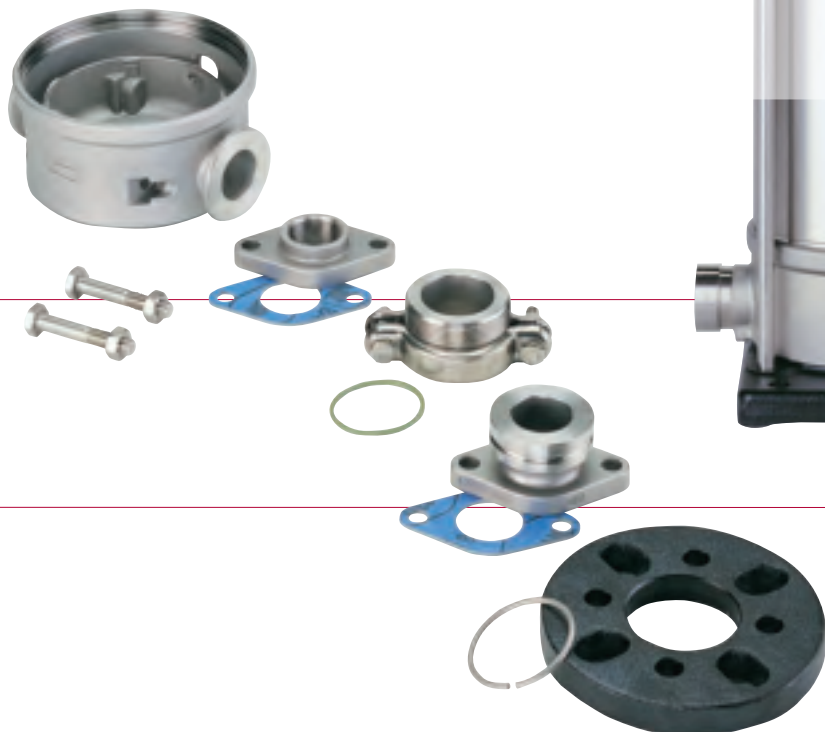
### Standard connections

GRUNDFOS offers a variety of connections to meet worldwide standards such as DIN, JIS, and ANSI. The CR range includes pipe connections for PJE coupling, DIN flanges, union connections and clamp couplings. All can be supplied in corrosion-resistant stainless steel or other materials as required.

Other standard and non-standard connection solutions are available upon request. If you have special requirements or a specific design to match, contact GRUNDFOS, and we will help you find the proper connection solution.

### Surface treatments

All GRUNDFOS pump parts are thoroughly cleaned before assembly to remove lubricants, cooling liquids, and machining fragments. GRUNDFOS pumps are safe for most applications. Some processes, however, require special cleaning procedures or surface treatments which we provide upon request to meet even the strictest demand.



### VARIANT

Flange connections

Electro-polishing

Cleaned and dried pump

Special hygiene requirements



DESCRIPTION	AVAILABLE FOR MODELS
In addition to the wide range of standard flange connections, customized flanges are available according to specifications.* See standard connections on this page.	Entire CR range
Electro-polishing can increase corrosion-resistance and provides an extremely smooth, clean, polished stainless steel surface. Removes burrs as well as metallica and non-metallic inclusions.*	CRN 1/3/5/20/15/20 32/45/64/90
Prior to assembly, pump components are cleaned in hot water containing a cleaning agent. After being rinsed thoroughly in deionized water, the the pump components are air-dried.*	CR(I)(N) 1/3/5/10/15/20 CR(N) 32/45/64/90
For applications in the pharmaceutical and biotechnology industries, Grundfos offers solutions for optimal hygiene; for example, very low surface roughness, electro-polished parts, and Tri-Clamp connections.*	CRN 1/3/5/10/15/20



\* Extra delivery time may be required.



*We provide connections to meet a variety of standards such as DIN, JIS, and ANSI, plus victaulic connections, threaded oval flange connections, FlexiClamp connections, and custom connections. Our expanded connection options make it easy to fit any industrial application.*



### **The CR range from Grundfos**

Grundfos was the first company to develop a multi-stage in-line pump, and today the CR remains second to none. It is the most extensive in-line pump program on the market, matching customer requirements with many innovative features unique to Grundfos. CR provides superior reliability and the lowest possible cost of ownership to customers worldwide.

Impressive as the CR range is, Grundfos offers much more. Our complete range of pump solutions means that you can rely on Grundfos know-how and our complete dedication to quality and service for all pump applications — industrial and domestic.

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