ENERGY EFFICIENT
GRUNDFOS CR
SOLUTIONS
Motor
Grundfos provides many motor solutions depending upon the application and demand. In addition, Grundfos makes its own motors to ensure maximum performance. The ML motors* are remarkably quiet and highly efficient. They are also available in the self-regulating MLE configuration, featuring an integrated variable frequency drive.

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

Shaft seal solutions
The cartridge shaft seal configuration comes in a wide choice of materials. It is available in flushed seal and double seal configurations as well as a Cool-top version that can handle temperatures up to +356°F (+180°C).

Connection options
The Grundfos CR can be connected to any piping system.

Dry-running sensor
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 immediately stop it.

High-performance hydraulics
Pump efficiency is maximized by state-of-the-art hydraulic design and carefully crafted production technology.

Durable bearings
The CR bearings provide remarkable long life thanks to hardwearing materials and a wide range of options for difficult liquids.

Material options
The CR is available in four different materials: AISI 304/cast iron, stainless steel AISI 304, stainless steel AISI 316, and titanium.

Wide range of sizes
The CR comes in 13 hydraulic sizes and hundreds of pressure sizes, ensuring that you can always find exactly the right pump for the job.

To many, innovation is just a buzzword. At Grundfos, innovation is an integrated feature of all our products. After all, it’s what’s inside that matters.

* Grundfos ML motors are not available in Canada.

The complete Grundfos CR range: The last word in multi-stage pump technology
Grundfos was the first pump manufacturer ever to create a multi-stage in-line pump. Known as the CR pump, this innovative design has inspired followers all over the world. Even so, continuous development and innovation ensure that the Grundfos CR remains unmatched.

The CR of today reflects the needs and requirements of customers worldwide. We know this, because we asked you first! Read on to learn about our comprehensive CR range.

The CR range has the right pump for the job
Choosing the right pump can be difficult. It may be easy enough to find a pump that will do the job, but it gets trickier when you want an exact match. There are many good reasons to avoid over-capacity, with energy conservation at the top of the list. The CR range lets you choose pumps which exactly match your system demands.

The CR is available in 13 hydraulic sizes, four basic materials and over one million configurations. For more information on the many options to provide you with the right solution for your system demands, see pages 12 and 13.

Innovation Inside the CR

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Reduce the real costs

Electricity is the most expensive part of any pump—a simple fact that is often overlooked when pumps and prices are compared.

It may be surprising that the purchase price and maintenance costs account for less than 15% of the total lifetime cost of a pump. Electricity accounts for a staggering 85% or more of the total costs. So if you want to save money, that’s where you should look.

The Grundfos CR makes a real difference; the table below shows just how much electricity a CR can save you annually.

These savings will continue for years and years – for every pump you own. Its low lifetime cost makes a CR pump a very sensible investment.

The table at right shows the unique efficiency of the Grundfos CR range.

Efficiency saves money year after year

Getting the best possible overall efficiency out of your pump makes financial sense. The narrow interval between CR pump sizes allows you to eliminate the efficiency drop associated with over-sized pumps.

By minimizing the difference between pump capacity and the required pressure and volume, you get a pump which runs as close to its optimum duty point as possible. That makes it as cost-efficient as possible.

The result of years of Grundfos development work is a 10% increase in pump efficiency. This translates into a power reduction of 15-20% for the CR pumps. When pumps are in operation many hours a day, such improvements provide substantial savings – year in and year out.

Grundfos CRE-pumps are your all-in-one energy saving solution: a pump and motor with an integrated frequency converter, controller and sensor.

Grundfos CRE-pumps offer all the advantages of a total system integration. They come with an integrated frequency converter, PID controller and sensor perfectly matched, tested and configured at the factory which greatly facilitates the subsequent installation and commissioning.

An E-pump solution constitutes the ideal variable-speed solution for all types of industry and building applications.

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An E-pump solution constitutes the ideal variable-speed solution for all types of industry and building applications.

E-PUMP AVAILABILITY

Pumps

- Grundfos multi-stage pumps: CRE/CREE/CREIE

Range

- 1-phase, 1x208-230V+/-10%, 60 Hz, 0.5-20 Hp for 2-pole motors and 0.33-1.0 Hp for 4-pole motors
- 3-phase, 3x208-230V+/-10%, 60 Hz, 1.0-30 Hp for 2-pole motors
- 3-phase, 3x460-480V+/-10%, 60 Hz, 1.0-30 Hp for 2-pole motors
- 3-phase, 3x600-690V+/-10%, 60 Hz, 1-10 Hp for 2-pole motors

Enclosure Class

- TEFC, IP55

FLEXIBILITY AND FUNCTIONALITY

The Grundfos CUE is your ideal solution: a wall-mounted frequency converter, which has E-pump functionality.

CUE solutions cover most pump types, application areas, and power ranges outside the E-pump range.

A CUE solution is a great fit in situations where an integrated solution is either undesirable or prohibited - such as sanitary and hazardous areas.

The CUE solution offers you a space-saving installation, the freedom of choice, and speed-control functionality with new or existing Grundfos pumps.

GRUNDFOS CUE FEATURES

- E-pump functionality
- Start-up installation guide
- Automatic setting of rotation direction during installation
- Integrated display with an easy-to-use R100 style menu
- Constant pressure or level control with stop function
- Dedicated functions for groundwater applications
- Remote control and monitoring via bus interface

CUE AVAILABILITY

Pumps

- Applicable for Grundfos fixed-speed pumps

Range

- 1-phase, 1x200-240V+/-10%, 60 Hz, 1.5-10 Hp
- 3-phase, 3x200-240V+/-10%, 60Hz, 1.0-60 Hp
- 3-phase, 3x380-500+/-10%, 60Hz, 0.75-300 Hp
- 3-phase, 3x525-600+/-10%, 60Hz, 1-10 Hp
- 3-phase, 3x525-690+/-10%, 60Hz, 15-300 Hp

Enclosure Class

- NEMA 1 / NEMA 12

E-PUMP AVAILABILITY

Pumps

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Enclosure Class

- TEFC, IP55
RELIABILITY

Reliability in real life

The CR is well known for its reliability. And rightly so. The CR design has all the durability that customers expect from a high-quality multistage pump — and then some. We have added unique features to ensure unsurpassed reliability: dry-running protection, a unique cartridge seal, and a full-titanium variant.

The virtually endless range of standard and customized CR pumps means that you can find the right CR to provide reliable operation for most any requirement.

Superior dry-running protection

Dry running is the most common cause of pump failure. In most pumps, the shaft seal and bearings will burn out almost immediately if liquid stops flowing in the pump.

The Grundfos CR is different. As part of our constant dedication to innovation, we have tested new and alternative materials to bring you the best possible solution. This means that we can equip CR pumps with a shaft seal and bearing system that can withstand extreme heat and friction for longer periods of time. This makes them more forgiving if the pump does run dry.

Grundfos LiqTec™ checks for liquid 24 hours a day

For those who need to avoid dry-running altogether, the Grundfos LiqTec is the answer. Available with all CR pumps, the LiqTec is plug-and-play technology at its very best. Ever vigilant, the LiqTec constantly checks that there is liquid in the pump. If there isn’t, it stops the pump immediately.

It’s reliable.

And we can prove it.

Unique cartridge seal design

The seal used in the CR line combines the best features of standard seals, wrapped up in an ingenious cartridge design. All of these ensure extra reliability.

The durable seal is made from hardwearing materials which prevent downtime and extend the lifetime of the seal. All axial movement has been eliminated, preventing wear of the shaft and rubber parts — a problem for traditional seals. The cartridge seal is a balanced type seal, which makes it less sensitive to pressure.

We know, however, that even the best of materials are subject to wear. That is why the innovative team at Grundfos sets out to eliminate the small, yet crucial, factors that can have a negative impact on pump reliability. Many of these have to do with handling, assembly and service.

The cartridge design ensures that the seal components will never be assembled incorrectly, the spring will never be incorrectly preloaded, and that sensitive surfaces will never be subjected to greasy fingers or dirt. These factors are common causes of short seal life in other pumps.

The cartridge design also enables rapid replacement when the seal ultimately does need changing. All in all, downtime is minimized, which translates into significant savings for your business.

Spacer coupling minimizes downtime too

Minimizing downtime is part of a reliable operation. That is why Grundfos has eliminated a major nuisance for owners of large pumps. Now, it is no longer necessary to remove heavy motors to replace the seal. With the innovative spacer coupling, motors 15 hp and larger can be left in place during seal replacement.

With unfailing attention to reliability, Grundfos engineers have designed an innovative cartridge seal that can be replaced within minutes — just one of the remarkable benefits it offers.
Grundfos CR has the most extensive range on the market, but standard pump ranges can’t match all conceivable applications. Customers needing a non-standard solution are able to pick and choose pump elements or “modules” to cover nearly any situation.

Working in close cooperation with you, our skilled specialists carefully analyze the situation to make sure the solution fully meets your expectations. If you do not find a suggestion to suit your particular problem in our brochure, contact Grundfos with your requirements, and we will do everything we can do to provide a solution.

Full range of motor variants available

While the standard range of Grundfos motors will cover most application demands, customized solutions are available for special needs. Contact Grundfos if you have specific requirements. Integrated variable frequency drives (“smart” pumps) are included in our standard range of pumps.

Solutions

We’ve got solutions — wide-ranging, specific to your needs and superior in reliability

From magnetic drives or air-cooled shaft seal chambers and double shaft seals to special pumps for high-pressure performance and aggressive liquids, there is a CR for your unique requirements.

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

The CR range is available in four different basic materials:

- AISI 304 stainless steel with a cast iron top and base
- AISI 304L stainless steel throughout
- AISI 316L stainless steel throughout
- Titanium throughout

Specialized seals for unique 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, and our modular approach offers wide-ranging solutions to handle the challenge.

Motor options

- Special supply voltages and protection methods
- Non-standard motor size (e.g., for pumping high or low viscosity)
- Explosion-proof, dust ignition-proof
- For extreme temperatures, humidity, or altitudes
- Specific approval requirements
- Non-Grundfos motor

Shaft seal options

- Chemical resistant O-rings for aggressive chemicals
- Special seal face or LipTec™ run-dry sensor to protect against dry running
- Balanced high-pressure shaft seal for 362 to 580 psi
- Air-cooled shaft seal system for extreme high temperatures
- Double shaft seal with pressure chamber for pumping explosive or poisonous liquids

Pump options

- Horizontal position for height limitations
- Low-Flow pumps
- High-pressure pumps
- Special surface treatments or approvals
- Pumps for extreme temperatures
- Silicone-free pumps
- Corrosion-free titanium CRT pumps for seawater or highly corrosive liquids
- Wide variety of connections

What can you pump with a CR?

**Aggressive or corrosive liquids:** Seawater, hypochlorites, hydrochloric acid, ferric chloride, nitric acid, chromic acid, phosphoric acid

**Abrasive liquids:** Metal Halide-containing cleaning agents, abrasive alkaline cleaners, phosphates

**Toxic or explosive liquids:** Trichloroethylene, toluene, petroleum, ethyl alcohol, methyl alcohol

**High viscosity liquids:** Glycerols, carboxylates (for cooling), lubricating oils, rapeseed oil

**Hardening liquids:** Water-based paint, glue, vegetable oils

**Crystallizing liquids:** Glycol additives, naphthalene, sugar products (e.g., dextrin), salts

**High pressures:** Water treatment, cleaning/washing

**Extreme temperatures:** Petrochemicals, oils, boiler feed, secondary coolants

Solutions — over a million combinations for CR

Grundfos CRN MAGICdrive solution eliminates the need for shaft seals via a patent pending magnetic drive system where the power from the motor is transmitted to the pump by magnetic force. Combined with a hermetically-sealed liquid end, the pump is totally leak free, and offers the best solution for pumping dangerous, aggressive, or volatile liquids.

Rugged pump modules

The CR range is available in 13 flow sizes and various grades of corrosion-resistant stainless steel, as well as corrosion-free titanium. Contact Grundfos for help in selecting the right CR components for your customized pump.

**CRN 3 Cool-top**

**CRN 3 double shaft seal**

**CR High-pressure**

**CRN 3 Cool-top**

**CRN 3 double shaft seal**

**CR High-pressure**

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**CrN 3 Cool-top CRN 3 double shaft seal CR High-pressure**
**PERFORMANCE CURVES AND TECHNICAL DATA**

### CR Product Range

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**Notes:**
- Not available
- Available

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1) CR 1s CR 3s CR 6s CR 12s CR 32 with HQQE shaft seal: -40 °F to +115 °F
2) CR 1s CR 3s CR 6s CR 12s CR 32 with HQQE shaft seal: -40 °F to +125 °F
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.