



CR, CRI, CRN CRE, CRIE, CRNE

Vertical multistage centrifugal pumps
60 Hz



Introduction

This data booklet deals with CR, CRI and CRN as well as CRE, CRIE and CRNE pumps.



Fig. 1 CR, CRI and CRN pumps

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

Grundfos CR pumps come with various pump sizes and various numbers of stages to provide the flow and the pressure required.

CR pumps are suitable for a variety of applications from pumping of potable 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.

The CR pumps consist of two main components: the motor and the pump unit. The motor on a CR pump is a heavy-duty Grundfos specified motor.

The pump unit consists of optimized hydraulics, various types of connections, an outer sleeve, a top and various other parts.

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

CRE, CRIE, CRNE pumps



Fig. 2 CRE, CRIE and CRNE pumps

CRE, CRIE, CRNE pumps are built on the basis of CR, CRI, CRN pumps.

CRE, CRIE, CRNE pumps belong to the so-called E-pump family and are referred to as E-pumps.

The difference between the CR and the CRE pump range is the motor. CRE, CRIE, CRNE pumps are fitted with an E-motor, i.e. a motor with built-in frequency control.

The motor of the CRE pump is a Grundfos MLE motor.

Frequency control enables continuously variable control of motor speed, which makes it possible to set the pump to operation at any duty point. The aim of continuously variable control of the motor speed is to adjust the performance to a given requirement.

CRE, CRIE and CRNE pumps are available with an integrated pressure sensor connected to the frequency control.

The pump materials are the same as those of the CR, CRI, CRN pump range.

Selection a CRE pump

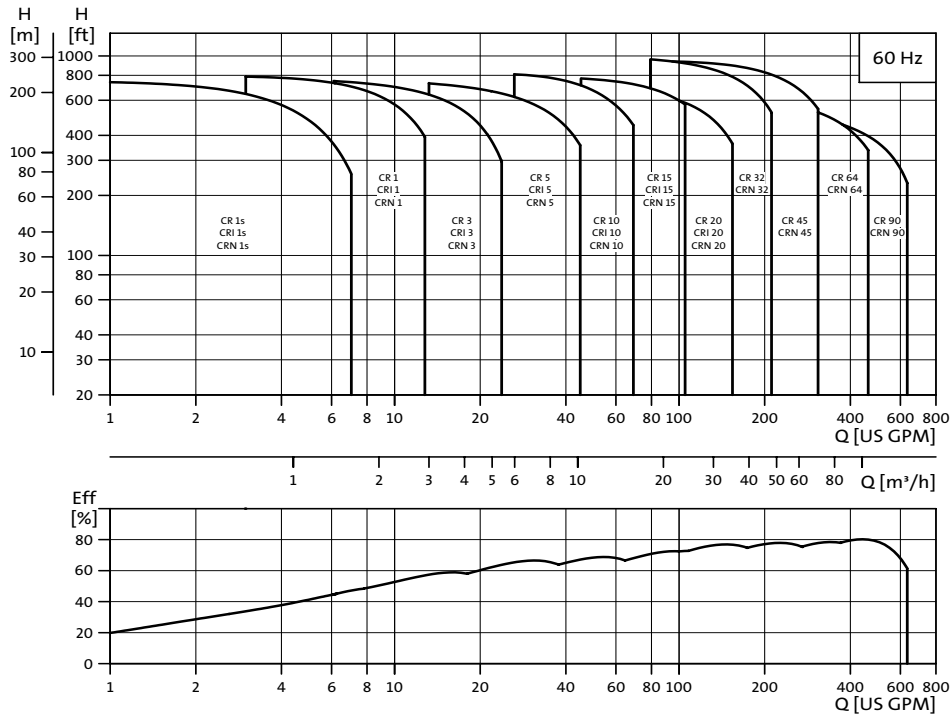
Select a CRE pump if:

- controlled operation is required, i.e. consumption fluctuates;
- constant pressure is required,
- communication with the pump is required.

Adaptation of performance through frequency-controlled speed control offers obvious advantages:

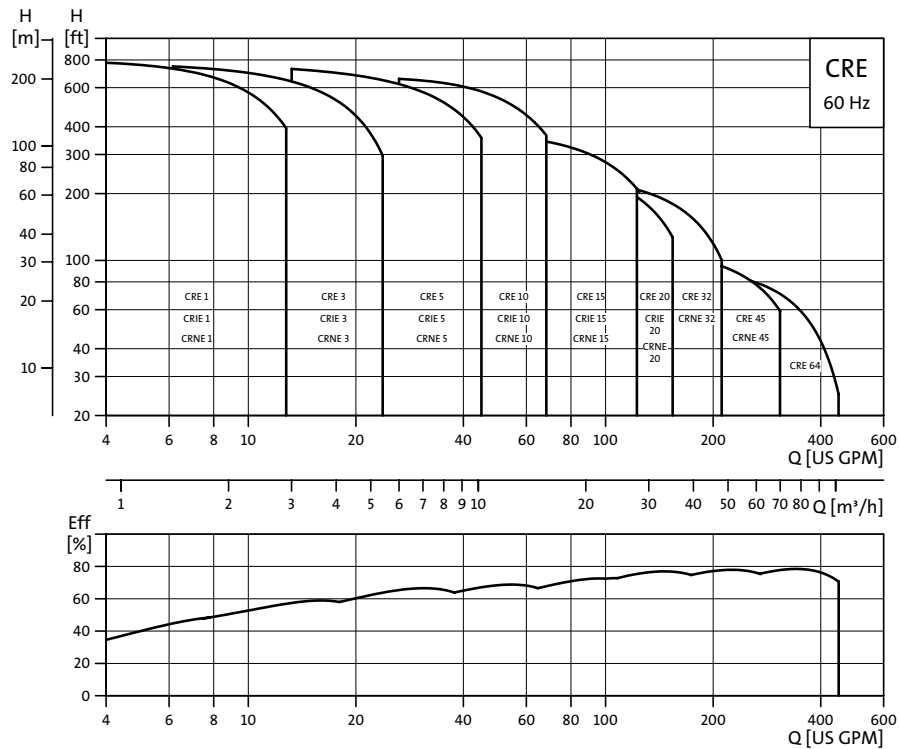
- Energy savings.
- Increased comfort.
- Control and monitoring of the pump performance.

Performance range - CR, CRI, CRN



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Performance range - CRE, CRIE, CRNE



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Applications

Application	CR, CRI	CRN	CRE, CRNE
Water supply			
Filtration and transfer at waterworks	●	○	●
Distribution from waterworks	●	○	●
Pressure boosting in mains	●	○	●
Pressure boosting in high-rise buildings, hotels, etc.	●	○	●
Pressure boosting for industrial water supply	●	○	●
Industry			
Pressure boosting in...			
process water systems	●	●	●
washing and cleaning systems	●	●	●
vehicle washing tunnels	●	○	●
fire fighting systems	●		
Liquid transfer in...			
cooling and air-conditioning systems (refrigerants)	●	○	●
boiler feed and condensate systems	●	○	●
machine tools (cooling lubricants)	●	●	●
aquafarming★	●	○	
Transfer of...			
oils and alcohols	●	●	●
acids and alkalis★		●	●
glycol and coolants	●		●
Water treatment			
Ultra-filtration systems		●	●
Reverse osmosis systems★		●	●
Softening, ion exchange, demineralizing systems		●	●
Distillation systems		●	●
Separators	●	●	●
Swimming pools★		●	●
Irrigation			
Field irrigation (flooding)	●	○	
Sprinkler irrigation	●	○	●
Drip-feed irrigation	●	○	

● Recommended version.

○ Alternative version.

★ CRT, CRTE version available. For further information about CRT, CRTE pumps see, "Pumped liquids" page 66 or related CRT, CRTE data booklet.

Product range

Range	CR 1s	CR, CRE 1	CR, CRE 3	CR, CRE 5	CR, CRE 10	CR, CRE 15	CR, CRE 20	CR, CRE 32	CR, CRE 45	CR, CRE 64	CR, CRE 90
Nominal flow rate [US GPM]	4.5	8.5	15	30	55	95	110	140	220	340	440
Temperature range [°F]				-4 to +250					-22 to +250		
Temperature range [°F] – on request				-40 to +356					-40 to +356		
Max. working pressure [psi]	360	360	360	360	360	360	360	435	435	360	360
Max. working pressure [psi] – on request	-	725	725	725	725	725	725	580	580	580	580
Max. pump efficiency [%]	35	49	59	67	70	72	72	76	78	79	80
CR pumps											
CR: Flow range [US GPM]	0.5 - 5.7	1 - 12.8	1.5 - 23.8	3 - 45	5.5 - 70	9.5 - 125	11 - 155	14 - 210	22 - 310	34 - 450	44 - 630
CR: Max. pump pressure (H[ft])	760	790	790	780	865	800	700	995	940	565	595
CR: Motor power [Hp]	1/3 - 2	1/3 - 3	1/3 - 5	3/4 - 7 1/2	3/4 - 15	2 - 25	3 - 25	3 - 40	7 1/2 - 60	7 1/2 - 50	15 - 60
CRE pumps											
CRE: Flow range [US GPM]	-	0 - 12.8	0 - 23.8	0 - 45	0 - 70	0 - 125	0 - 155	0 - 210	0 - 310	0 - 450	-
CRE: Max. pump pressure (H[ft])	-	790	790	780	665	390	270	240	120	100	-
CRE: Motor power [Hp]	-	1/3 - 3	1/3 - 5	3/4 - 7 1/2	3/4 - 10	2 - 10	3 - 10	3 - 10	7 1/2	7 1/2	-
Version											
CR, CRE: Cast iron and stainless steel AISI 304	●	●	●	●	●	●	●	●	●	●	●
CRI, CRIE: Stainless steel AISI 304	●	●	●	●	●	●	●	-	-	-	-
CRN, CRNE: Stainless steel AISI 316	●	●	●	●	●	●	●	●	●	●	●
CRT, CRTE: Titanium	-	●★	●★	●★	●★	●★	-	-	-	-	-
CR, CRE pipe connection											
Oval flange (NPT)	1"	1"	1"	1 1/4"	2"	2"	2"	-	-	-	-
Oval flange (NPT) - on request	1 1/4"	1 1/4"	1 1/4"	1"	1 1/2"	-	-	-	-	-	-
ANSI flange size	1 1/4"	1 1/4"	1 1/4"	1 1/4"	2"	2"	2"	2 1/2"	3"	4"	4"
ANSI flange size - on request	-	-	-	-	-	-	-	3"	4"	5"	5"
ANSI flange class	250 lb.	250 lb.	250 lb.	250 lb.	250 lb.	250 lb.	250 lb.	125/ 250 lb.	125/ 250 lb.	125/ 250 lb.	125/ 250 lb.
CRI, CRIE pipe connection											
Oval flange (NPT)	1"	1"	1"	1 1/4"	2"	2"	2"	-	-	-	-
Oval flange (NPT) - on request	1 1/4"	1 1/4"	1 1/4"	1"	1 1/2"	-	-	-	-	-	-
ANSI flange size	1 1/4"	1 1/4"	1 1/4"	1 1/4"	2"	2"	2"	-	-	-	-
ANSI flange class	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	-	-	-	-
Clamp coupling (NPT) - on request	1", 1 1/4"	1", 1 1/4"	1", 1 1/4"	1", 1 1/4"	1 1/2", 2"	1 1/2", 2"	2", 2 1/2"	-	-	-	-
Union (NPT ext. thread) - on request	2"	2"	2"	2"	-	-	-	-	-	-	-
CRN, CRNE pipe connection											
PJE (Vitaallic)	1 1/4"	1 1/4"	1 1/4"	1 1/4"	2"	2"	2"	-	-	-	-
PJE (Vitaallic) - on request	-	-	-	-	-	-	-	3"	4"	4"	4"
ANSI flange size	1 1/4"	1 1/4"	1 1/4"	1 1/4"	2"	2"	2"	2 1/2"	3"	4"	4"
ANSI flange size - on request	-	-	-	-	-	-	-	3"	-	-	-
ANSI flange class	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.
Clamp coupling (NPT) - on request	1", 1 1/4"	1", 1 1/4"	1", 1 1/4"	1", 1 1/4"	1 1/2", 2"	2", 2 1/2"	2", 2 1/2"	-	-	-	-
Union (NPT ext. thread) - on request	2"	2"	2"	2"	-	-	-	-	-	-	-
CRT pipe connection											
PJE coupling (Vitaallic)	-	1 1/4"	1 1/4"	1 1/4"	2"	2"	-	-	-	-	-
ANSI flange size - on request	-	-	-	-	2"	2"	-	-	-	-	-

● :Available

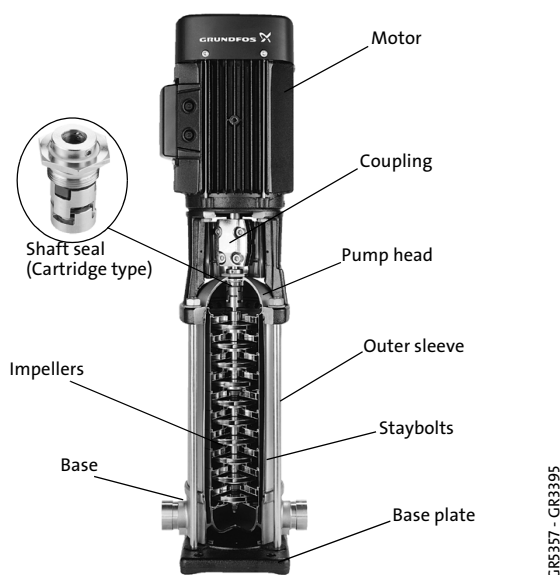
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Pump

The CR and CRE pump is a non-self-priming, vertical multistage centrifugal pump. The pumps are available with a Grundfos standard motor (CR pumps) or a frequency-controlled motor (CRE pumps).

The pump consists of a base and a pump head. The chamber stack and the outer sleeve are secured between the pump head and the base by means of staybolts. The base has suction and discharge ports on the same level (in-line).

All pumps are equipped with a maintenance-free mechanical shaft seal of the cartridge type.



CR5357 - CR3395

Fig. 3 CR pump

Motor

Grundfos standard motors - ML and Baldor® motors

CR, CRI and CRN pumps are fitted with a Grundfos specified motor. The motors are all heavy-duty 2-pole, NEMA C-face motors.

Frequency-controlled motors - MLE motors

CRE, CRIE and CRNE pumps are fitted with a totally enclosed, fan-cooled, 2-pole frequency-controlled motor.

From 0.5 Hp to 1.5 Hp Grundfos offers CRE pumps fitted with single-phase MLE motors (1 x 208-230 V). From 1.0 Hp to 10 Hp Grundfos offers CRE pumps fitted with three-phase MLE motors (3 x 460-480 V).

Electrical data

Mounting designation	NEMA
Insulation class	F & B
Efficiency class*	Standard efficiency Energy efficient / EPAct - on request Premium efficiency - on request
Enclosure class	TEFC - Totally Enclosed Fan Cooled (Grundfos standard) ODP - Open Drip Proof - on request
60 Hz Standard voltages	1 x 115/208-230 V 3 x 208-230/460 V 3 x 575 V

The motors are rated for:

Approvals



* 1, 1.5 and 2 HP ML motors are premium efficiency as standard

Optional motors

The Grundfos standard range of motors covers a wide variety of application demands. However, for special applications or operating conditions, custom-built motor solutions can be provided.

For special applications or operating conditions, Grundfos offers custom-built motors such as:

- explosion proof motors,
- motors with anti-condensation heating unit,
- low-noise motors,
- energy efficient and premium efficiency motors,
- motors with thermal protection.

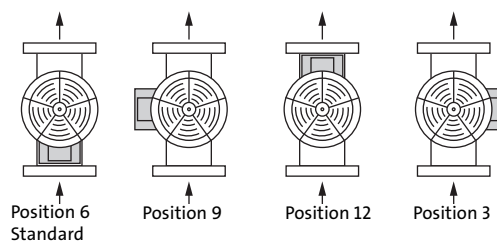
Motor protection

Single-phase Grundfos motors have a built-in thermal overload switch.

Three-phase motors **must** be connected to a motor starter in accordance with local regulations.

Terminal box positions

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



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Fig. 4 Terminal box positions

Ambient temperature

Ambient temperature: Maximum +104°F.

If the ambient temperature exceeds +104°F or if the motor is located 3280 feet above sea level or higher, the motor output (P2) must be reduced due to the low cooling effect of the air. In such cases, it may be necessary to use a motor with a higher output.

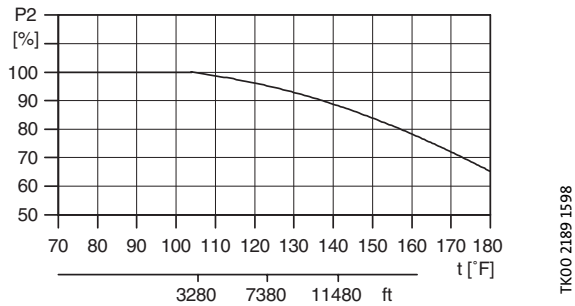


Fig. 5 Relationship between motor output (P2) and ambient temperature

Viscosity

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption.

In such situations the pump should be equipped with a larger motor. If in doubt, contact Grundfos.



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