

CRE, CRIE, CRNE

North America

Vertical, multistage centrifugal E-pumps



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1. Introduction



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CRE, CRIE and CRNE pumps

The CRE, CRIE and CRNE pumps are based on the CR, CRI and CRN pumps.

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

The difference between the CR and CRE pump ranges is the motor.

E-pumps are fitted with an E-motor, meaning a motor with an integrated variable frequency drive.

The E-pump motor is a Grundfos MLE motor.

The integrated variable frequency drive enables continuous variable control of the motor speed.

This means that the pump can be set to operate at any duty point. The purpose of continuous variable speed control of the motor speed is to adjust the performance to a given requirement.

E-pumps are available with an integrated pressure sensor connected to the variable frequency drive that functions as a feedback sensor for constant pressure control.

In new installations, the E-pumps provide a number of advantages. The integrated variable frequency drive has a built-in motor protection function which protects both motor and electronics against overload.

This means that E-pump installations do not require a motor-protective circuit breaker, but only a normal short-circuit protection for the cable. The pump materials are identical to those of the CR, CRI and CRN pump ranges.

Examples of E-pump applications

E-pumps are the ideal choice for a number of applications characterized by a demand for variable flow at constant pressure. The pumps are suited for water supply systems and pressure boosting as well as for industrial applications.

Depending on the application, the pumps offer energy savings, increased comfort and improved processing.

E-pumps in the industry market

The industry market uses a large number of pumps in many different applications. Demands on pumps in terms of pump performance and mode of operation make speed control a must in many applications.

Some of the applications in which E-pumps are often used are listed below.

Constant pressure

- Water supply
- washing and cleaning systems
- distribution from waterworks
- humidifying systems
- water treatment systems
- process boosting systems.

Example: Within industrial water supply, E-pumps with an integrated pressure sensor are used to ensure a constant pressure in the pipe system. From the feedback sensor, the E-pump receives inputs about changes of pressure as a result of changes in the consumption. The E-pump responds to the input by adjusting the speed until the pressure is equalized. The constant pressure is stabilized once more on the basis of a preset setpoint.

Constant temperature

- Air-conditioning systems at industrial plants
- industrial cooling systems
- industrial freezing systems
- casting and moulding tools.

Example: In industrial freezing systems, E-pumps with a temperature sensor increase the comfort and lower the operating costs compared with pumps without a feedback temperature sensor.

An E-pump continuously adapts its performance to the changing demands reflected in the differences in temperature of the liquid circulating in the freezing system. Thus, the lower the demand for cooling, the smaller the quantity of liquid circulated in the system and vice versa.

Constant level

- Boiler feed systems
- condensate systems
- sprinkler irrigation systems
- chemical industry.

Example: In a steam boiler, it is important to be able to monitor and control the pump operation to maintain a constant level of water in the boiler.

By using an E-pump with a level sensor in the boiler, it is possible to maintain a constant water level.

A constant water level ensures an optimum and cost-efficient operation as a result of a stable steam production.

Dosing applications

- Chemical industry, meaning control of pH values
- petrochemical industry
- paint industry
- degreasing systems
- bleaching systems.

Example: In the petrochemical industry, E-pumps with a pressure sensor are used as dosing pumps.

The E-pumps help to ensure that the correct mixture ratio is achieved when more liquids are combined.

E-pumps functioning as dosing pumps improve processing and offer energy savings.

E-pumps in commercial building market

The commercial building market use E-pumps to maintain a constant pressure or a constant temperature based on a variable flow.

Constant pressure

- Water supply in high-rise buildings, such as office buildings and hotels.

E-pumps with a pressure sensor are used for water supply in high-rise buildings to ensure a constant pressure even at the highest draw-off point. As the consumption pattern and thus the pressure changes during the day, the E-pump continuously adapts its performance until the pressure is equalized.

Constant temperature

- Air-conditioning systems in hotels and schools
- building cooling systems.

Example: E-pumps are an excellent choice for buildings where a constant temperature is essential. E-pumps keep the temperature constant in air-conditioned, high-rise glass buildings, irrespective of the seasonal fluctuations of the outdoor temperature and various heat impacts inside the building.

When to select an E-pump

Select an E-pump if the following is required:

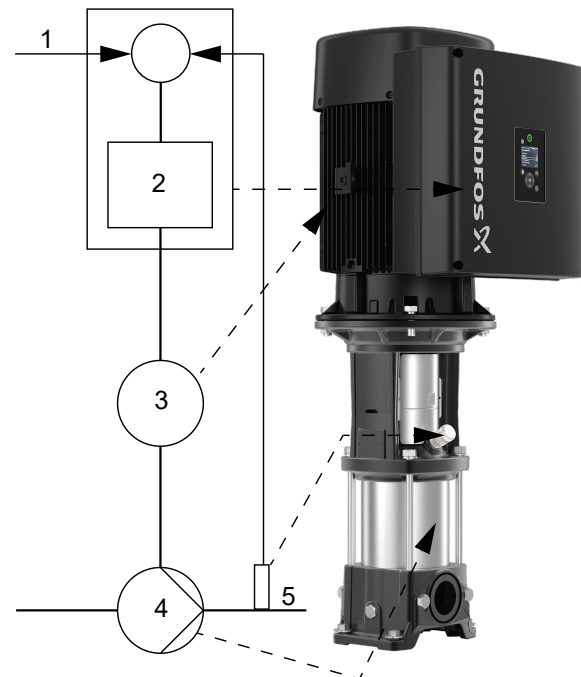
- controlled operation, that is the consumption fluctuates
- constant pressure
- communication with the pump.

Adaptation of performance through frequency-controlled speed control offers obvious benefits, such as the following:

- energy savings
- increased comfort
- control and monitoring of the pump performance.

Components of a Grundfos E-pump

An E-pump is not just a pump, but a system which is able to solve application problems or save energy in a variety of pump installations. All that is required is the power supply connection and the fitting of the E-pump in the pipe system, and the pump is ready for operation. The pump has been tested and pre-configured from the factory. The operator only has to specify the desired setpoint (pressure) and the system is operational.



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Components of a Grundfos E-pump

Pos.	Description
1	Setpoint
2	Variable frequency drive/PI controller
3	Motor
4	Pump
5	Sensor

E-pumps with and without a sensor

CRE, CRIE and CRNE pumps are available with a pressure sensor enabling the control of the pressure on the pump outlet side. The E-pump is also available without a sensor.

The purpose of supplying CRE, CRIE and CRNE pumps with a pressure sensor is to make the installation and startup simple and quick.

Generally, E-pumps without a sensor are used when uncontrolled (open loop) operation is required or when there is a wish to fit a sensor at a later stage to enable the following:

- pressure control
- flow control

- level control of liquid in a tank
- temperature control
- differential pressure control
- differential temperature control.

E-pumps without a sensor are also used when a remote analog signal is connected to the setpoint input terminal. For further information, see the section on control modes.

Related information

[Control modes](#)

Related information

- [CRE 10 dimensional data](#)
- [CRE 15 dimensional data](#)
- [CRE 20 dimensional data](#)
- [CRE 32 dimensional data](#)
- [CRE 45 dimensional data](#)
- [CRE 64 dimensional data](#)
- [CRE 95 dimensional data](#)
- [CRE 125 dimensional data](#)
- [CRE 155 dimensional data](#)

Pump Energy Index

Pump Energy Index (PEI) was established by the U.S. Department of Energy (DOE) and adopted by Canada as the standard metric used to evaluate pump efficiency. The value is the ratio of the pump efficiency rating (PER) divided by the calculated minimally compliant PER (PER_{STD}) for the pump type. This provides a representation of a pump’s actual performance compared to the minimal standard performance required by regulation. The lower the PEI value, the more efficient a pump is at the tested operating points.

PER is determined by defined testing parameters required by the DOE. This includes testing a particular pump model at its best efficiency point (BEP).

For PEI values there are two different versions:

- PEI_{CL} (constant load): Applies to bare-shaft pumps and pumps sold with a motor
- PEI_{VL} (variable load): Applies to pumps sold with a motor and controller (such as VFD, VSD)

The DOE has set the maximum PEI value as 1.00. Any pump, pump and motor, or pump, motor and controller that exceeds a PEI value of 1.00 can no longer be manufactured after January 26, 2020.

PEI is a generalized efficiency value. PEI cannot be used to determine the efficiency of a pump in a specific application.

Product type	PEI _{VL}
CRE, CRNE, CRIE 10	See the section on CRE 10 dimensional data.
CRE, CRNE, CRIE 15	See the section on CRE 15 dimensional data.
CRE, CRNE, CRIE 20	See the section on CRE 20 dimensional data.
CRE, CRNE 32	See the section on CRE 32 dimensional data.
CRE, CRNE 45	See the section on CRE 45 dimensional data.
CRE, CRNE 64	See the section on CRE 64 dimensional data.
CRE, CRNE 95	See the section on CRE 95 dimensional data.
CRE, CRN 125	See the section on CRE 125 dimensional data.
CRE, CRN 155	See the section on CRE 155 dimensional data.

Note that CRE pumps operate at 2-pole speeds.

2. Applications

Water supply

	CRE	CRIE, CRNE
Filtration and transfer at waterworks	●	○
Distribution from waterworks	●	○
Pressure boosting in mains	●	○
Pressure boosting in high-rise buildings, hotels	●	○
Pressure boosting for industrial water supply	●	○

Industry

	CRE	CRIE, CRNE
Pressure boosting		
Process-water systems	●	●
Washing and cleaning systems	●	●
Vehicle-washing tunnels	●	○
Firefighting systems	●	-
Liquid transfer		
Cooling and air-conditioning systems (refrigerants)	●	○
Boiler feed and condensate systems	●	○
Machine tools (cooling lubricants)	●	●
Aquafarming	●	○
Special transfer duties		
Oils and alcohols	●	●
Acids and alkalis	-	●
Glycol and coolants	●	●

Water treatment

	CRE	CRIE, CRNE
Ultra-filtration systems	-	●
Reverse osmosis systems	-	●
Softening, ionising, demineralising systems	-	●
Distillation systems	-	●
Separators	●	●
Swimming baths	-	●

Irrigation

	CRE	CRIE, CRNE
Field irrigation (flooding)	●	○
Sprinkler irrigation	●	○
Drip-feed irrigation	●	○

● Recommended version

○ Alternative version

Application examples

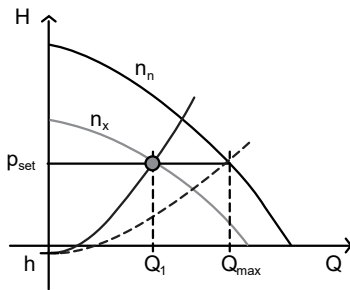
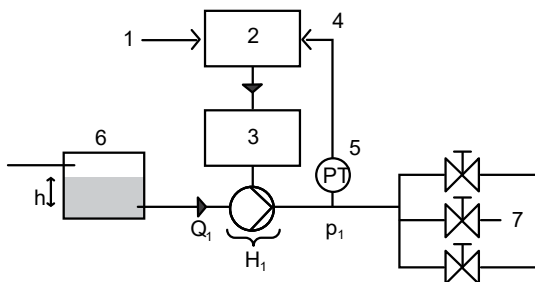
Speed control of pumps is an efficient way of adjusting pump performance to the system.

In this section, we will discuss the possibilities of combining speed-controlled pumps with PI controllers and sensors measuring system parameters, such as pressure, differential pressure and temperature. In the following, the different options will be presented through examples.

Constant-pressure control

A pump supplies tap water from a break tank to various taps in a building.

The demand for tap water varies, and so does the system characteristic, according to the required flow rate. To achieve comfort and energy savings, we recommend a constant supply pressure.



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Constant-pressure control

Pos.	Description
1	Setpoint p_{set}
2	PI controller
3	Speed controller
4	Actual value p_1
5	Pressure transmitter
6	Break tank
7	Taps

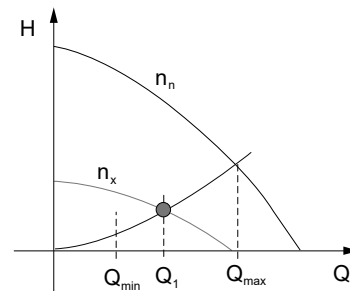
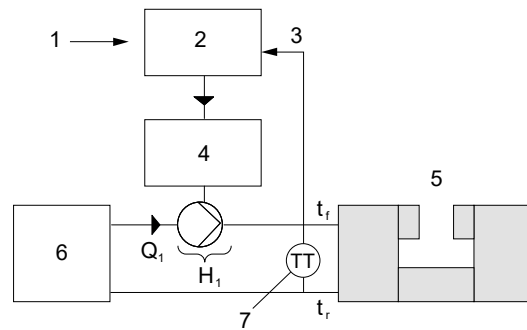
As appears from the figure above, the solution is a speed-controlled pump with a PI controller. The PI controller compares the required pressure, p_{set} , with the actual supply pressure, p_1 , measured by a pressure transmitter, PT.

If the actual pressure is higher than the setpoint, the PI controller reduces the speed and consequently the performance of the pump until p_1 is equal to p_{set} . The figure above shows what happens when the flow rate is reduced from Q_{max} to Q_1 .

The controller reduces the speed of the pump from n_n to n_x to ensure that the required outlet pressure is identical for p_1 and p_{set} . The pump ensures that the supply pressure is constant in the flow range of 0 to Q_{max} . The supply pressure is independent of the level (h) in the break tank. If h changes, the PI controller adjusts the speed of the pump so that p_1 always corresponds to the setpoint.

Constant-temperature control

Performance adjustment by means of speed control is suitable for a number of industrial applications. The figure below shows a system with an injection-molding machine which must be water-cooled to ensure high-quality production.



TM030412

Constant-temperature control

Pos.	Description
1	Setpoint t_{set}
2	PI controller
3	Actual value t_r
4	Speed controller
5	Injection-molding machine
6	Cooling plant
7	Temperature transmitter

The pump will be operating at a fixed system characteristic. The controller will ensure that the actual flow rate, Q_1 , is sufficient to ensure that t_r is equal to t_{set} .

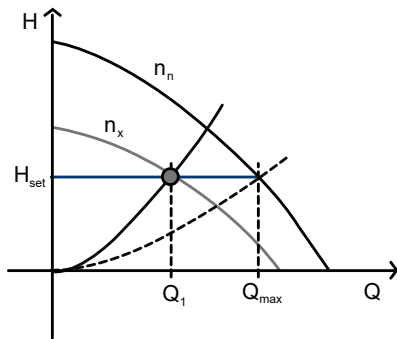
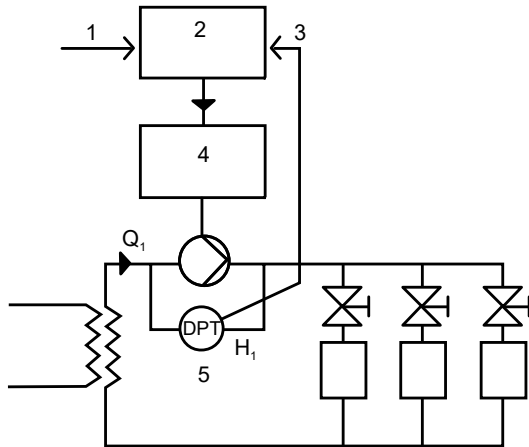
The machine is cooled with water at 59 °F (15 °C) from a cooling plant. To ensure that the molding machine runs properly and is cooled sufficiently, the return-pipe temperature has to be kept at a constant level, t_r equals 68 °F (20 °C). The solution is a speed-controlled pump,

controlled by a PI controller. The PI controller compares the required temperature, t_{set} , with the actual return-pipe temperature, t_r , which is measured by a temperature transmitter, TT. This system has a fixed system characteristic, and therefore the duty point of the pump is located on the curve between Q_{min} and Q_{max} . The higher the heat loss in the machine, the higher the flow of cooling water needed to ensure that the return-pipe temperature is kept at a constant level of 68 °F (20 °C).

Application examples of differential pressure in a circulation system

Circulation systems (closed systems) are well-suited for speed-controlled pump solutions.

It is an advantage that circulation systems with variable system characteristic are fitted with a differential-pressure-controlled circulator pump.



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Constant differential-pressure control

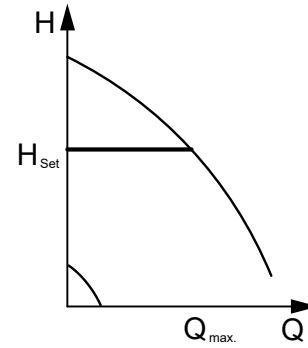
Pos.	Description
1	Setpoint H_{set}
2	PI controller
3	Actual value H_1
4	Speed controller
5	Differential-pressure transmitter

The figure above shows a heating system consisting of a heat exchanger where the circulated water is heated and delivered to three radiators by a speed-controlled pump. A control valve is connected in series at each radiator to control the flow rate according to the heat requirement.

The pump is controlled according to a constant differential pressure measured across the pump. This means that the pump system offers a constant differential pressure in the Q range of 0 to Q_{max} , represented by the horizontal line in the figure above.

Constant differential pressure

The differential pressure of the pump is kept constant, independently of the flow rate.



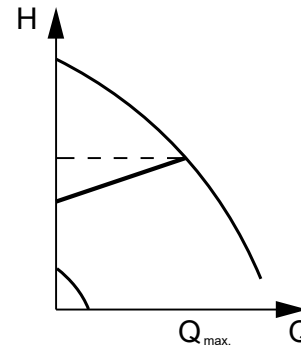
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Constant differential pressure, pump

The pump is controlled according to a constant differential pressure measured across the pump. This means that the pump system offers a constant differential pressure in the Q-range of 0 to Q_{max} , represented by the horizontal line in the QH diagram.

Proportional differential pressure

The differential pressure of the pump is reduced at falling flow rate and increased at rising flow rate.



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Proportional differential pressure

The pump is controlled according to a differential pressure measured across the pump. This means that the pump system offers a proportional differential pressure in the Q-range of 0 to Q_{max} , represented by the sloping line in the QH diagram.

Proportional differential pressure, parabolic curve

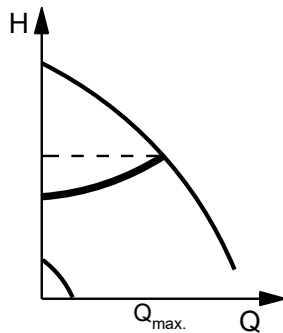
Available on CRE-DP (differential pressure) only

Setting via GO Link.

The proportional differential pressure can be selected with one of these flow dependencies:

- linear (setting via GO Link).
- parabolic (setting via GO Link).

When the flow dependency is selected as parabolic, the differential pressure of the pump will be reduced with a parabolic curve at falling flow rate and increased at rising flow rate.

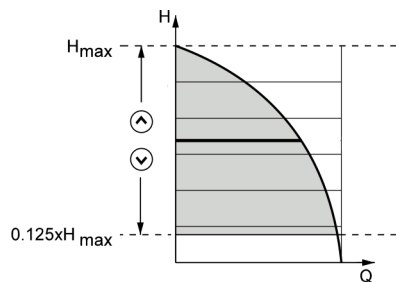


Proportional differential pressure, parabolic curve

The pump is controlled according to a differential pressure measured across the pump. This means that the pump system offers a flow-compensated differential pressure in the Q-range of 0 to Q_{max} , represented by the parabolic curve in the QH diagram.

Constant differential-pressure setpoint range

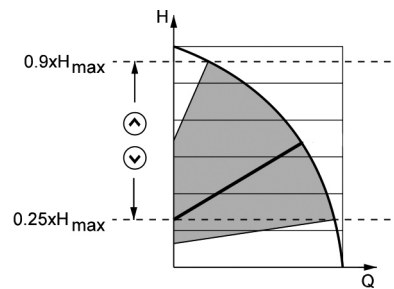
The setpoint range is between 12.5 % and 100 % of maximum head.



Constant differential pressure

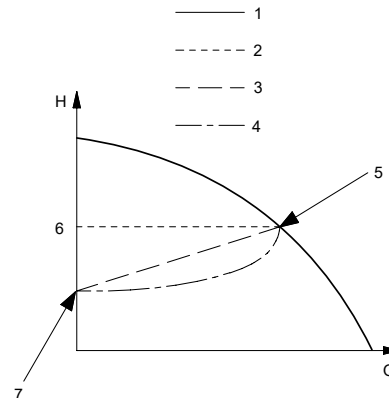
Proportional differential-pressure setpoint range

The setpoint range is between 25 % and 90 % of maximum head.



Proportional differential pressure

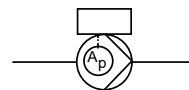
To compensate for this excessive system pressure, the proportional-pressure function automatically adapts the setpoint to the actual flow rate.



Proportional-pressure control

Pos.	Description
1	Pump curve
2	Setpoint
3	Resultant setpoint, linear
4	Resultant setpoint, square
5	$Q_{P_{max}}$
6	H_{set}
7	Starting point of proportional-pressure control (influence at 0 flow = 50 % of H_{set})

The factory-fitted differential-pressure sensor is a variant. Contact Grundfos for additional details.



Proportional pressure

3. Features and benefits

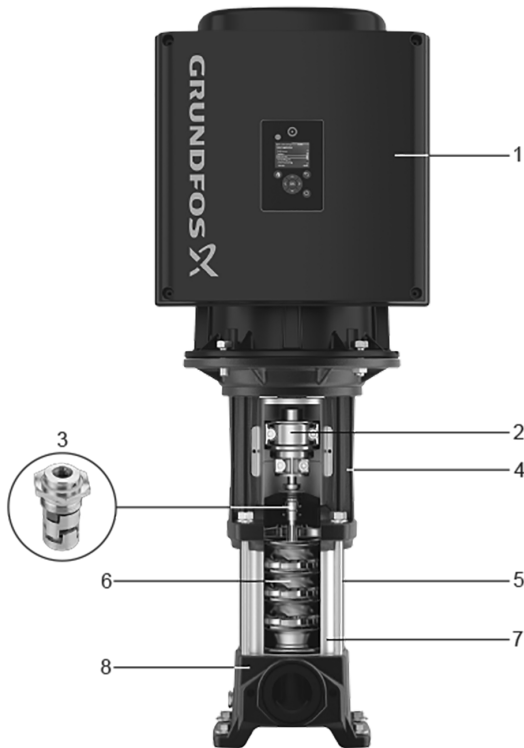
Pump

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

The pumps are available with a Grundfos frequency-controlled motor.

The pumps consist of a pump head and a base.

The chamber stack and the sleeve are secured between the pump head and the base with staybolts. The base has inlet and outlet ports on the same level (in line). All pumps are fitted with a maintenance-free mechanical shaft seal of the cartridge type.



CRE pump

Pos.	Description
1	Motor
2	Coupling
3	Shaft seal (cartridge type)
4	Pump head
5	Staybolts
6	Impellers
7	Sleeve
8	Base

A CRE pump with ANSI/NSF 61 listing is available. See UL file MH26400 or contact Grundfos.

Motor

MLE motors

MLE motors incorporate thermal protection against slow overload and blocking.

CRE, CRIE and CRNE pumps require no external motor protection.

Frequency-controlled MLE motors

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

Permanent-magnet motors

From 1/2 to 2 hp, Grundfos offers CRE pumps fitted with single-phase MLE motors (1 x 200-240 V).

From 1 to 30 hp, Grundfos offers CRE pumps fitted with three-phase MLE motors (3 x 440-480 V).

From 1 1/2 to 7 1/2 hp, Grundfos offers CRE pumps fitted with three-phase MLE motors (3 x 200-240 V).

See Grundfos Product Center at www.grundfos.com.

Electrical data

	MLE motor CRE, CRIE, CRNE
Mounting designation	NEMA
Insulation class	F
Efficiency	See the section on motor data.
Enclosure class	Motor: TEFC (Totally Enclosed Fan-Cooled) Variable frequency drive: 1/2 to 15 hp: NEMA Type 3 20 to 30 hp: NEMA Type 12
Supply voltage	1/2 to 2 hp: 1 x 200-240 V 1 to 30 hp:
Tolerance: - 10 %/+ 10 %	3 x 440-480 V 1 1/2 to 7 1/2 hp: 3 x 200-240 V

Related information

[2-pole E-motors \(Grundfos MLE\)](#)

Advanced use of MLE motors

Grundfos MLE motors have many features for the advanced user.

Grundfos three-phase MLE motors have features such as bearing monitoring, standstill heating, stop function, signal relays, analog sensors and limit exceeded. These features give a unique opportunity to customize the E-pumps.

GO Link gives access to most of the settings available in the products, as well as the possibility of logging and viewing data.

Bearing monitoring

Bearing monitoring is a built-in function indicating the time to relubricate or replace the bearings of the MLE motor. The relubrication feature is only available for three-phase pumps of 15-30 hp.

Purpose and benefits

The purpose of this function is to give an indication to the user when it is time to relubricate or replace the motor bearings. This is important information for maintenance planning.

Bearing monitoring provides these benefits:

- The bearing can be relubricated at the right time according to the manufacturer's recommendations.
- Maximum life of the motor bearings is obtained.
- Maintenance intervals are based on the operating conditions of the bearings.
- No worn-down or damaged bearings, and consequently no costly down-time, due to overseen maintenance.

Description

When the bearing monitoring function determines that it is time to relubricate the bearings, the user will receive a warning via GO Link, a bus or a relay.

When the bearings have been relubricated, a certain number of times, the warning function will inform the user to replace the bearings.

The number of relubrications before bearing replacement is set by Grundfos.

Technical description

The bearing monitoring function is available on two levels for calculating the relubrication interval, basic and advanced:

Bearing monitoring function	
	<p style="text-align: center;">Basic level</p> <p>Calculation of relubrication intervals based on motor revolutions The basic level is a standard feature of the 15-30 hp basic controller and no special functional module is required.</p>
	<p style="text-align: center;">Advanced level [only 15-30 hp]</p> <p>Calculation of relubrication intervals based on motor revolutions and bearing temperature</p> <p>Note that the advanced-level function requires the following:</p> <ul style="list-style-type: none"> • The extended functional module must be fitted in the MLE motor. • Temperature sensors must be fitted at the drive end and at the non-drive end of the motor.

Standstill heating

Standstill heating is a feature ensuring that even during standstill periods the motor windings have a certain minimum temperature.

Purpose and benefits

The purpose of this function is to make the MLE motor more suitable for outdoor installation. During standstill periods, there is a need to keep the motor temperature higher than the ambient temperature to avoid condensation in and on the motor.

Traditionally, this issue has been solved by using an anti-condensation heater on the stator coil heads. Now Grundfos provides this feature by means of a special function within the MLE motor and terminal box.

The MLE motor has standstill heating included. An external heater on the stator coil is not necessary.

Applications

This function is especially suitable in outdoor applications and at installation sites with fluctuating temperatures.

Description

The working principle is that AC voltage is applied to the motor windings. The applied AC voltage will ensure that sufficient heat is generated to avoid condensation in the motor. The terminal box is kept warm and dry by the heat generated via the power supply. However, it is a condition that the terminal box is not exposed to open air. It must be provided with a suitable cover to protect it from rain.

Environmental enclosure ratings

According to UL 778 and C22.2 No 108-14, pumps that are intended for outdoor use must be marked enclosure type 3, and the product must be tested at a rated surface temperature down to -31 °F (-35 °C). The enclosure of the MLE Model H, I and J (1/2 to 15 hp) is approved for type 3 and a rated surface temperature down to 32 °F (0 °C), and thus only for indoor use in UL 778 and C22.2 No 108-14 pump applications. The enclosure of the MGE, MLE Model K (20 to 30 hp) is approved for NEMA type 12 and is suitable for indoor use only. For more information about ambient temperature during operation, see the sections on operating conditions and ambient temperature.

Related information

[Ambient temperature and installation altitude](#)

[Maximum ambient temperature and altitude for Grundfos MLE motors](#)

[Maximum operating pressure and temperature range, CRE, CRNE 95-155](#)

[Maximum operating pressure and temperature range, CRIE, CRNE 1-64](#)

Stop function

The stop function ensures that the pump is stopped at low or no flow. The function is also called low-flow stop function.

Purpose and benefits

The purpose of the stop function is to stop the pump when a low flow rate is detected.

The stop function provides these benefits:

- The energy consumption is optimized and the system efficiency is improved.
- Unnecessary heating of the pumped liquid which damages pumps is avoided.
- Wear of the shaft seals is reduced.
- Noise from operation is reduced.

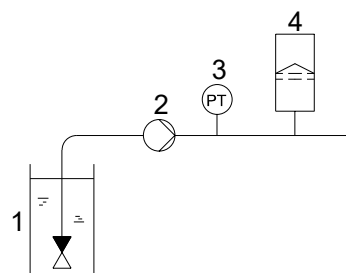
Applications

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

Operating conditions for the stop function

A pressure sensor, a check valve, and a diaphragm tank are required for the stop function to operate properly.

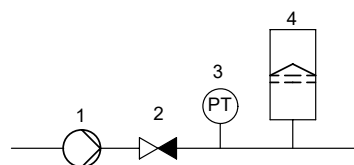
Note that the check valve must always be installed before the pressure sensor. See the following two figures.



TM038582

Position of the check valve and pressure sensor in system with suction lift operation

Pos.	Description
1	Check valve
2	Pump
3	Pressure sensor
4	Diaphragm tank

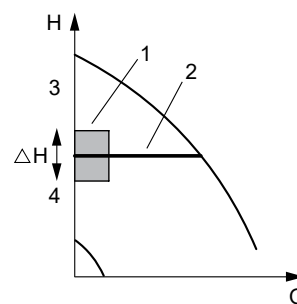


TM038583

Position of the check valve and pressure sensor in system with positive inlet pressure

Pos.	Description
1	Pump
2	Check valve
3	Pressure sensor
4	Diaphragm tank

When a low flow rate is detected, the pump is in start/stop operation. If there is flow, the pump will continue operating according to the setpoint.



TM038477

Constant pressure with stop function. Difference between start and stop pressures (ΔH)

Pos.	Description
1	Start/stop operation
2	Continuous operation
3	Stop pressure
4	Start pressure

Diaphragm tank

The stop function requires a diaphragm tank of a certain minimum size. The tank must be installed near the pump outlet, and the precharge air pressure must be 0.7 x setpoint.

Recommended diaphragm tank size:

CRE pump	Typical diaphragm tank size [gal (liter)]
1, 3, 5	2 (8)
10	4.4 (17)
15, 20	10.3 (39)
32	14 (53)
45	20 (76)
64	34 (129)
95	44 (167)
125	62 (235)
155	81 (307)

If a diaphragm tank of the above size is installed in the system, additional adjustment is unnecessary. If the tank installed is too small, the pump will start and stop often. The tank size will influence at which flow rate the system will go into start/stop operation.

Description

The low-flow stop function can operate in two different ways:

- by means of an integrated low-flow detection function
- by means of an external flow switch connected to the digital input.

Low-flow detection function

- The low-flow detection function will check the flow rate regularly by reducing the speed for a short time. A small change in pressure or no change in pressure means that there is a low flow rate.

Low-flow detection with flow switch

- When a flow switch detects a low flow rate, the digital input will be activated.

Contact Grundfos for further information.

Dry-running protection

This function protects the pump against dry running. When a lack of inlet pressure or water shortage is detected, the pump will be stopped before being damaged.

A lack of inlet pressure or water shortage can be detected with a switch connected to a digital input configured to dry-running protection.

The use of a digital input requires an accessory, such as:

- a Grundfos Liqtec® dry-running switch (for more information on LiqTec, see the section on counterflanges for CRE)
- a pressure switch installed on the inlet side of the pump
- a float switch installed on the inlet side of the pump.

The pump cannot restart as long as the digital input is activated.

Related information

[Counterflanges for CRE](#)

Temperature sensors 1 and 2

One or two Pt100 temperature sensors may be connected to the input terminals.

Purpose and benefits

The temperature sensor inputs 1 and 2 provide these benefits:

- The temperature sensor inputs can be used as input to the limit-exceeded functions 1 and 2.
- In combination with the bearing monitoring function, the temperature sensors provide optimum monitoring of the motor bearings.
- A bearing warning or a bearing alarm can be indicated as the motor bearing temperature is measured.
- Status readings of the measured temperatures are available via Grundfos GO, GO Link and a bus.
- The function has a built-in signal fault detection if the temperature sensors fail or a conductor is broken.

Applications

The temperature inputs can be used in all applications where temperatures in the system or in the motor need to be monitored.

Note that the temperature sensor inputs are available on all MLE motors.

Description

The temperature sensor inputs enable several functions.

- The temperature sensor inputs 1 and 2 can be used as input to the limit-exceeded functions 1 and 2. If a limit is exceeded, this will be indicated. The indication will be in the form of outputs (relay) or alarms/warnings set or defined in the limit-exceeded functions 1 and 2.
- The temperature sensor inputs 1 and 2 can be set to measure bearing temperature. The measured values of temperature sensor 1 and 2 are used in the calculation of relubrication intervals. Additionally, the measured value can activate the indication of a bearing warning or a bearing alarm. In case of high bearing temperature, a warning or an alarm can be logged and force the pump to stop.

Signal relays

Signal relays are used to give an output indication of the current operational status of the MLE. The signal relay is a potential free contact (also called a dry contact). The output signals are typically transmitted to external control systems.

Purpose and benefits

The signal relays offer these features:

- The signal relays can be remotely (via bus) or internally controlled.
- The signal relays can be set to indicate several types of operational status.
- A relay delay can be defined to avoid activating the relay in case of periodic failures.

Applications

Signal relays can be used in all applications involving a need to read out the operational status to, for example, a control room or to a superior control system.

Description

The signal relays can be set with these three parameters:

- relay control
- relay setup
- relay delay.

Relay control

The relay time is 0 seconds and the signal relay is internally controlled.

The advanced relay control can only be set via GO Link.

Relay control has these two setting options:

- Internally controlled
The relay is internally controlled by the variable frequency drive software according to the setup of the relay [Ready, Fault, Operation].
- Remotely controlled
The relay is controlled via commands from the GENibus.

Analog sensor inputs 1 and 2

The analog sensor inputs 1 and 2 are standardized inputs for measuring all types of analog parameters.

Sensor input 1 is the only sensor input set for closed-loop operation. The input will be used as the sensor feedback input.

Sensor input 2 is referred to as the secondary sensor.

Purpose and benefits

The analog sensor inputs 1 and 2 provide these benefits:

- Sensor input 1 can be feedback input for the built-in PI controller.
- It is possible to monitor secondary parameters in the process, such as flow rate or liquid temperature.
- The secondary sensor can be set as a redundant sensor.
- The sensors can give input to the limit-exceeded functions 1 and 2.
- Status readings of the inputs are available via Grundfos GO and GO Link.

Applications

Analog sensor inputs 1 and 2 can be used in applications with a need for monitoring essential parameters.

Description

The analog sensors 1 and 2 enable several functions.

- When the secondary sensor is set as an input to the limit-exceeded functions 1 and 2, defined outputs or warnings or alarms can be given when system parameters are outside defined system limits.
- Connecting a flow sensor. When sensor input 2 is set with a flow sensor, the measured value can be used as an input to the proportional-pressure function. The flow rate displayed in Grundfos GO will be the measured flow rate instead of the estimated flow rate. The flow rate measurement can also be used in the low-flow stop function to detect a low flow rate instead of estimating the flow rate by lowering the speed of the pump.
- Sensor reading via Grundfos GO and GO Link. When sensors are set, the user can get a status reading via Grundfos GO and GO Link.

Analog output

Analog output

The analog output (0-10 mA) can be set via GO Link to one of these indications:

- feedback value
- speed
- frequency
- motor current
- external setpoint input
- limit exceeded.

The analog output is default set to not active.

Feedback value

The output signal is a function of the actual feedback sensor.

Speed

The output signal is a function of the actual pump speed.

Frequency

The output signal is a function of the actual frequency.

Motor current

The output signal is a function of the actual motor current.

External setpoint input

The output signal is a function of the external setpoint input.

Limit exceeded

The output signal indicates whether the limit is exceeded:

- Minimum output = limit is not exceeded.
- Maximum output = limit is exceeded.

Limit exceeded 1 and 2

The limit-exceeded function monitors one or two values or inputs. The function enables different inputs to activate various outputs and alarms or warnings when the signal input has exceeded pre-determined limits.

Purpose and benefits

The purpose of this function is to monitor parameters which are central for the application and enable the controller to react to possible, abnormal operating conditions. It is possible to set two limit-exceeded functions and monitor two parameters or two limits of the same parameter simultaneously. This makes the E-pump an important and integrated part of a system, and the E-pump can replace other existing monitoring units.

The function monitors measured parameters such as temperature, pressure, liquid level and flow, as well as internal values such as speed, motor load or motor current. By monitoring the liquid temperature, the E-pump ensures that the system temperature does not exceed a maximum permissible level.

By monitoring the minimum inlet pressure, the E-pump can prevent damage caused by cavitation or dry running.

Applications

The limit-exceeded function is typically used for monitoring secondary parameters in the systems.

Actions

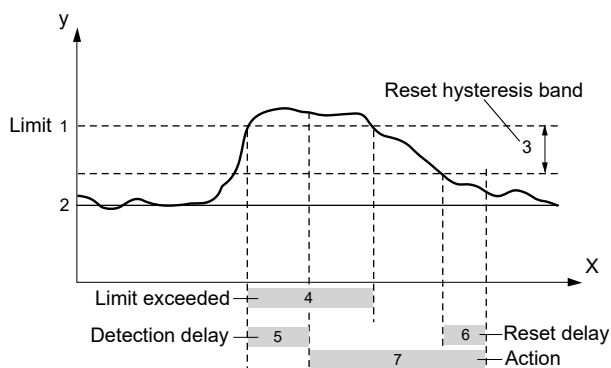
When the signal input exceeds, above or below, the pre-determined limit, the limit-exceeded function is activated and the selected action performed.

The following actions are available:

- **Not active.** The pump remains in its current state. Can be used to only activate a signal relay output when the limit is reached.
- **Stop.** The pump stops.
- **Min.** The pump reduces the speed to minimum speed.
- **Max.** The pump increases the speed to maximum speed.
- **User-defined speed.** The pump runs at a speed set by the user.
- **Alarm and Stop.** An alarm is given, and the pump stops.
- **Alarm and Min.** An alarm is given, and the pump decreases the speed to a minimum.
- **Alarm and Max.** An alarm is given, and the pump increases the speed to a maximum.
- **Alarm and User-defined speed.** An alarm is given, and the pump runs at the speed set by the user.

Example

The function is to monitor the pumped liquid temperature. If the temperature exceeds above the set limit of 180 °F (82 °C) for more than 5 seconds, the action is set to give an alarm and stop the pump. The pump will automatically restart when the temperature has dropped below the reset hysteresis band at 160 °F (71 °C) for more than 6 seconds.

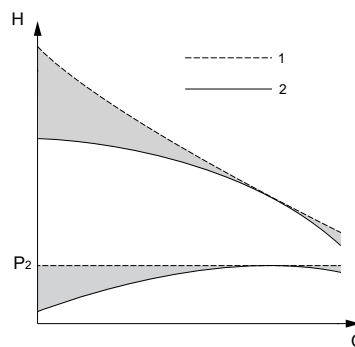


Limit exceeded above the limit

Pos.	Parameter	Setting
y	Measured (monitored)	Pumped liquid temperature
x	Time	Seconds
1	Limit	180 °F (82 °C)
2	Typical value	Typical pumped liquid temperature
3	Reset hysteresis band	20 °F (11 °C)
4	Limit exceeded	Above limit
5	Detection delay	5 seconds
6	Reset delay	6 seconds
7	Action	Alarm and Stop. The limit-exceeded function is active. An alarm is given and the pump stops.

Pump operating at power limit

When a pump is operating at the power limit, the MLE motor will deliver an output corresponding to the maximum load stated on the nameplate. The maximum load will never be exceeded.



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

Pos.	Description
1	Power limit
2	Standard

Purpose and benefits

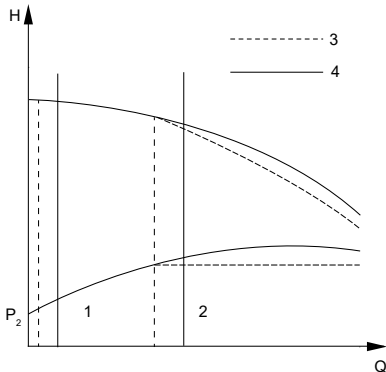
When using a standard pump at a low flow rate, the power consumption will drop and the motor will have excess power available.

By setting the pump to operate at a higher speed, the excess power can be used to provide a higher pressure. The power limit function will make sure 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.

The figure below 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.



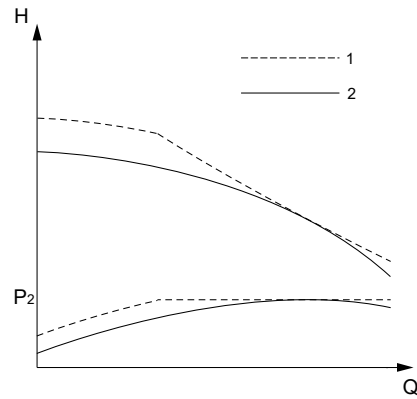
TM052359

Standard performance curve compared to a curve for a pump fitted with an undersize MLE motor.

Pos.	Description
3	Undersize motor
4	Standard motor

The MLE motor can be set to a higher speed than a standard motor, 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 the use of a smaller pump to reach the desired duty point compared to a pump running with standard maximum speed.



TM053314

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

Pos.	Description
1	Maximum speed
2	Standard 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. It is also used 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 applications:

- Washing and cleaning
- Boiler feed.

Setup

The power limit is always active in pumps to protect the motor against overload. Pumps with an undersize motor and pumps with a higher maximum speed are available as factory-configured products.

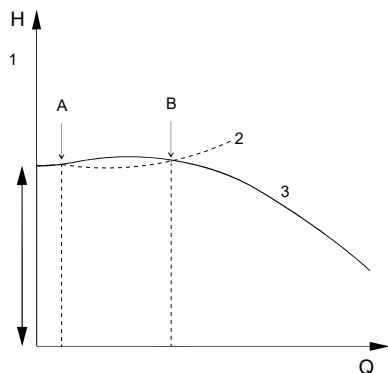
Note that running the pump at over-synchronous speed will affect the NPSH value, thus requiring a sufficient inlet pressure to avoid cavitation.

The 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.

Stabilizing unstable pump curves

When the pump curve has a shape where it intersects the system curve in two points (A and B) with identical pressure but at different flow rates, the pump curve is defined as unstable. See the figure below. 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.

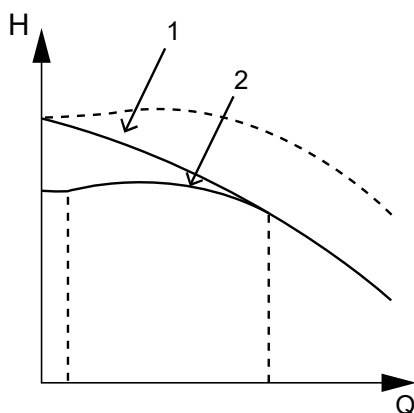


TM069673

Unstable pump curve

Pos.	Description
1	Counter pressure
2	Flat system characteristic
3	Unstable curve

The E-motor can stabilize an unstable pump curve in the low-flow area by changing to a higher speed. The figure below 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.



TM069671

Pump curve with a stabilized operating range

Pos.	Description
1	Stabilized pump curve
2	Unstable standard pump curve

Purpose and benefits

The purpose of stabilizing 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

As mentioned, unstable operation may occur in applications with a high counter pressure and a flat system characteristic.

Examples of applications:

- 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.

Setup

This function is available in factory-configured products.

MLE technical data

Grundfos MLE motors are equipped with NEMA standard C-face flanges.

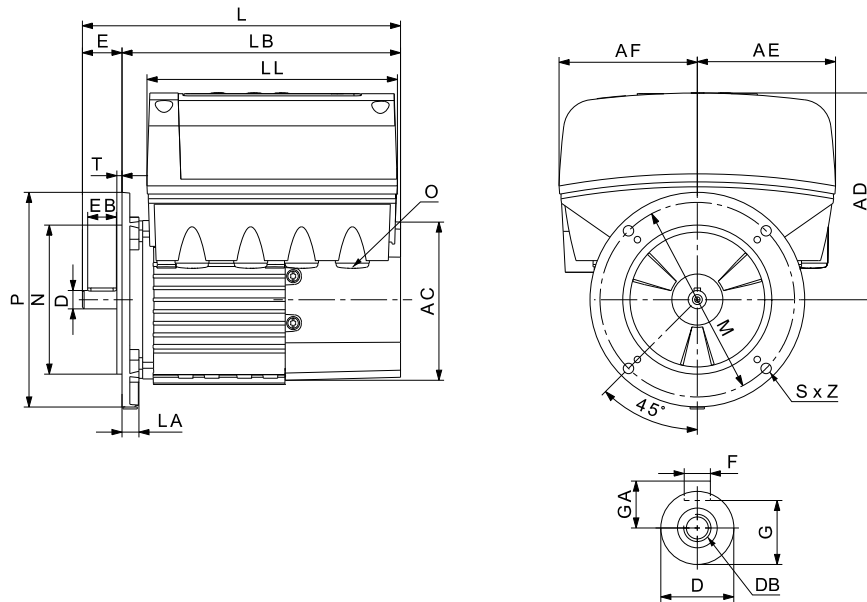
Grundfos MLE motors are recognized under the Component Recognition Program of Underwriters Laboratories Inc. for the United States and Canada.

MLE motors are equipped with a reinforced bearing system with locked bearings at the drive end, either a deep-groove ball bearing or an angular-contact bearing depending on the motor model.

This ensures an even uptake of the load in order to maximize the lifetime of the bearings, which are guaranteed for a minimum of 18,000 hours service life. At the non-drive end, the motors are fitted with bearings with axial clearance to meet production tolerances while allowing for thermal expansion during motor operation. This ensures trouble-free operation and long life.

**MLE 1/2 to 2 hp permanent-magnet motors
(2-pole) 1/60/200-240**

Dimensional sketches



TM056786

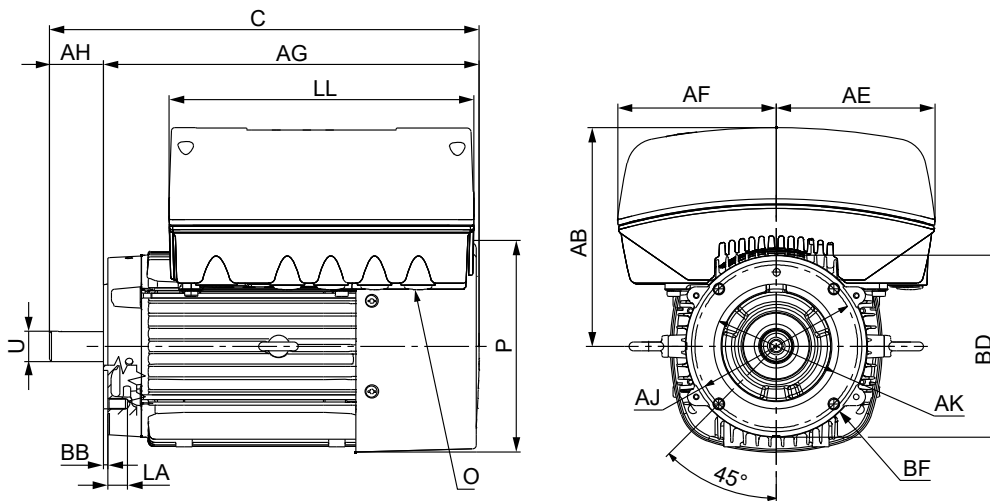
Dimensional data

Power [hp]	Frame size	Stator housing [in (mm)]						Shaft end [in (mm)]	
		AC	AD	AF	L	LB	LL	D	E
1/2	56C	4.80 (122)	6.22 (158)	4.17 (106)	10.55 (268)	8.46 (215)	7.56 (192)	0.63 (15.9)	2.06 (52.3)
3/4	56C	4.80 (122)	6.22 (158)	4.17 (106)	10.55 (268)	8.46 (215)	7.56 (192)	0.63 (15.9)	2.06 (52.3)
1	56C	4.80 (122)	6.22 (158)	4.17 (106)	10.55 (268)	8.46 (215)	7.56 (192)	0.63 (15.9)	2.06 (52.3)
1 1/2	56C	4.80 (122)	6.22 (158)	4.17 (106)	10.55 (268)	8.46 (215)	7.56 (192)	0.63 (15.9)	2.06 (52.3)
2	56C	4.80 (122)	6.22 (158)	4.17 (106)	11.34 (288)	9.25 (235)	7.56 (192)	0.63 (15.9)	2.06 (52.3)

Power [hp]	Frame size	Flange [in (mm)]						Cable entries [in (mm)]
		LA	M	N	P	S	T	O
1/2	56C	0.63 (16)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
3/4	56C	0.63 (16)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
1	56C	0.63 (16)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
1 1/2	56C	0.63 (16)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
2	56C	1.42 (36)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)

**MLE 1 to 30 hp permanent-magnet motors
(2-pole) 3/60/440-480**

Dimensional sketches



TM066518

Dimensional data

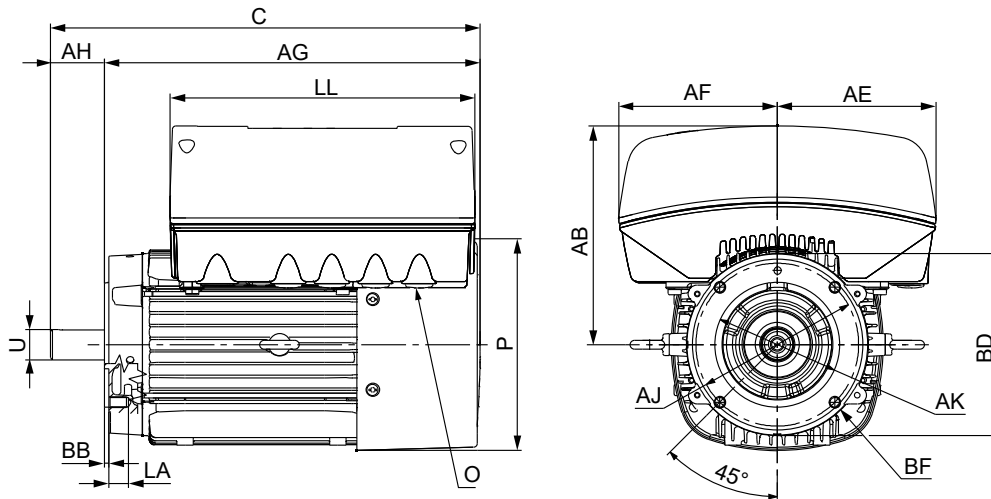
Power [hp]	Frame size	Stator housing [in (mm)]							Shaft end [in (mm)]	
		P	AB	AE	AF	C	AG	LL	U	AH
1	56C	4.80 (122)	6.22 (158)	5.28 (134)	5.28 (134)	12.13 (308)	10.04 (255)	9.13 (232)	0.63 (15.9)	2.06 (52.3)
1 1/2	56C	4.80 (122)	6.22 (158)	5.28 (134)	5.28 (134)	12.13 (308)	10.04 (255)	9.13 (232)	0.63 (15.9)	2.06 (52.3)
2	56C	4.80 (122)	6.22 (158)	5.28 (134)	5.28 (134)	12.91 (328)	10.83 (275)	9.13 (232)	0.63 (15.9)	2.06 (52.3)
3	182TC	4.80 (122)	6.22 (158)	5.28 (134)	5.28 (134)	13.46 (342)	10.83 (275)	9.13 (232)	1.13 (28.6)	2.62 (66.6)
5	182TC	7.53 (191.3)	7.91 (201)	5.73 (145.5)	5.73 (145.5)	15.89 (403.6)	13.15 (334)	11.02 (280)	1.13 (28.6)	2.74 (69.6)
7 1/2	213TC	7.53 (191.3)	7.91 (201)	5.73 (145.5)	5.73 (145.5)	17.75 (450.9)	14.37 (365)	11.02 (280)	1.37 (34.9)	3.38 (85.9)
10	213TC	10.04 (254.9)	9.33 (237)	6.81 (173)	6.81 (173)	18.70 (474.9)	15.31 (389)	12.48 (317)	1.37 (34.9)	3.38 (85.9)
15	254TC	10.04 (254.9)	9.33 (237)	6.81 (173)	6.81 (173)	19.74 (501.3)	15.98 (406)	12.48 (317)	1.63 (41.3)	3.75 (95.3)
20	256TC	12.52 (318)	11.93 (303)	8.27 (210)	8.27 (210)	22.99 (584)	19.21 (488)	16.30 (414)	1.63 (41.3)	3.75 (95.3)
25	284TSC	12.52 (318)	11.93 (303)	8.27 (210)	8.27 (210)	23.23 (590)	20.24 (514)	16.30 (414)	1.63 (41.3)	3 (76.2)
30	286TSC	12.52 (318)	11.93 (303)	8.27 (210)	8.27 (210)	23.23 (590)	20.24 (514)	16.30 (414)	1.63 (41.3)	3 (76.2)

Power [hp]	Frame size	Flange [in (mm)]						Cable entries [in (mm)]
		LA	AJ	AK	BD	BF	BB	O
1	56C	0.63 (16)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
1 1/2	56C	0.63 (16)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
2	56C	1.42 (36)	5.87 (149.2)	4.50 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
3	182TC	0.51 (13)	7.25 (184.2)	-	8.50 (215.9)	0.50	-	1/2" NPT (4)
5	182TC	0.75 (19)	7.25 (184.5)	8.50 (215.9)	8.50 (215.9)	0.50 - 13	0.25 (6.35)	1/2" NPT (5)
7 1/2	213TC	0.75 (19)	7.25 (184.15)	8.50 (215.9)	8.50 (215.9)	0.50 - 13	0.25 (6.35)	1/2" NPT (5)
10	213TC	0.79 (20)	7.25 (184.15)	8.50 (215.9)	8.68 (220.5)	0.50 - 13	0.25 (6.35)	3/4" NPT (1) & 1/2" NPT (5)
15	254TC	0.79 (20)	7.25 (184.15)	8.50 (215.9)	8.68 (220.5)	0.50 - 13	0.25 (6.35)	3/4" NPT (1) & 1/2" NPT (5)
20	256TC	0.94 (24)	7.25 (184.15)	8.50 (215.9)	9.88 (251)	0.50 - 13	0.28 (7)	1 x NPT 1" + 6 x NPT 1/2"
25	284TSC	0.94 (24)	9 (228.6)	10.50 (266.7)	10.75 (273)	0.50 - 13	0.31 (8)	1 x NPT 1" + 6 x NPT 1/2"
30	286TSC	0.94 (24)	9 (228.6)	10.50 (266.7)	10.75 (273)	0.50 - 13	0.31 (8)	1 x NPT 1" + 6 x NPT 1/2"

MLE 1 1/2 to 7 1/2 hp permanent-magnet motors

(2-pole) 3/60/200-240

Dimensional sketches



Dimensional data

Power [hp]	Frame size	Stator housing [in (mm)]							Shaft end [in (mm)]	
		P	AB	AE	AF	C	AG	LL	U	AH
1 1/2	56C	4.80 (122)	6.22 (158)	5.28 (134)	5.28 (134)	12.13 (308)	10.04 (255)	9.13 (232)	0.63 (15.9)	2.06 (52.3)
2	56C	4.80 (122)	6.22 (158)	5.28 (134)	5.28 (134)	12.91 (328)	10.83 (275)	9.13 (232)	0.63 (15.9)	2.06 (52.3)
3	182TC	7.53 (191.3)	7.91 (201)	5.73 (145.5)	5.73 (145.5)	15.89 (408)	13.15 (334)	11.02 (280)	1.13 (28.6)	2.74 (69.6)
5	182TC	7.53 (191.3)	7.91 (201)	5.73 (145.5)	5.73 (145.5)	15.89 (464)	13.15 (334)	11.02 (280)	1.13 (28.6)	2.74 (69.6)
7 1/2	213TC	10.04 (254.9)	9.33 (237)	6.81 (173)	6.81 (173)	18.70 (476)	15.31 (389)	12.48 (317)	1.37 (34.9)	3.38 (85.9)

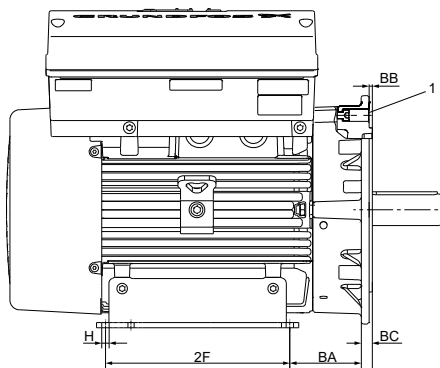
Power [hp]	Frame size	Flange [in (mm)]					Cable entries [in (mm)]	
		LA	AJ	AK	BD	BF	BB	O
1 1/2	56C	0.63 (16)	5.87 (149.2)	4.5 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
2	56C	1.42 (36)	5.87 (149.2)	4.5 (114.3)	6.50 (165)	0.38	0.16 (4)	1/2" NPT (4)
3	182TC	0.75 (19)	7.25 (184.15)	8.50 (215.9)	8.50 (215.9)	0.50-13	0.25 (6.35)	1/2" NPT (5)
5	182TC	0.75 (19)	7.25 (184.15)	8.50 (215.9)	8.50 (215.9)	0.50-13	0.25 (6.35)	1/2" NPT (5)
7 1/2	213TC	0.79 (20)	7.25 (184.15)	8.50 (215.9)	8.68 (220.5)	0.50-13	0.25 (6.35)	3/4" NPT (1) & 1/2" NPT (5)

MLE motors for CRE-H and CRNE-H
C-Face mounting with foot

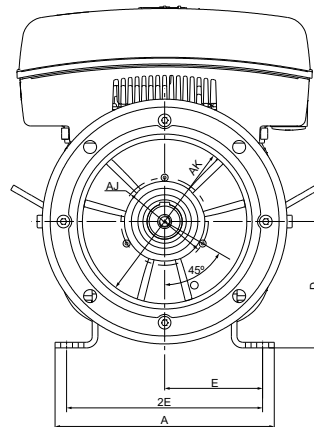


TM085711

Dimensional sketches

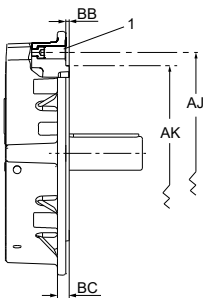


TM085548



TM085549

Dimensions for frames where AJ is greater than AK:



TM085577

Pos.	Description
1	Mounting surface

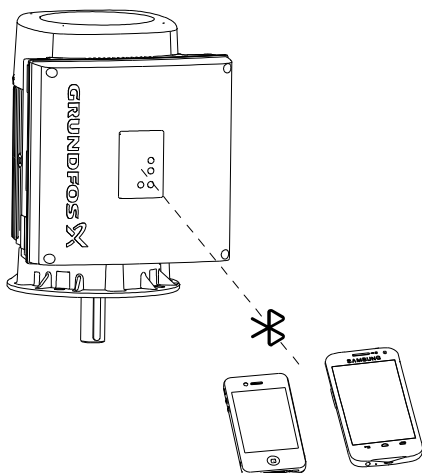
Dimensional data

Power [hp]	PH	Frame size	Foot dimensions [in (mm)]						
			A	D	E	2E	2F	BA + BC	H
1-phase 2-pole MLE motor with foot									
1/2	1	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
3/4	1	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
1	1	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
1 1/2	1	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
2	1	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
3-phase 2-pole MLE motor with foot									
1	3	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
1 1/2	3	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
2	3	56C	6.00 (153)	3.50 (89)	2.44 (62)	4.88 (124)	3.00 (76)	2.56 (65)	0.34 (8.6)
3	3	182TC	8.90 (226)	4.50 (114)	3.75 (95)	7.50 (191)	4.50 (114)	2.87 (73)	0.41 (10)
5	3	184TC	8.90 (226)	4.50 (114)	3.75 (95)	7.50 (191)	5.50 (140)	2.87 (73)	0.41 (10)
7 1/2	3	215TC	9.96 (253)	5.25 (133)	4.25 (108)	8.50 (216)	7.00 (178)	3.75 (95)	0.41 (10)
10	3	215TC	9.60 (244)	5.25 (133)	4.25 (108)	8.50 (216)	7.00 (178)	3.75 (95)	0.41 (10)
15	3	254TC	11.30 (287)	6.25 (159)	5.00 (127)	10.00 (254)	8.25 (210)	4.50 (114)	0.53 (13)
20	3	256TC	11.30 (287)	6.25 (159)	5.00 (127)	10.00 (254)	10.00 (254)	4.50 (114)	0.53 (13)
25	3	284TSC	12.30 (312)	7.00 (178)	5.50 (140)	11.00 (279)	9.50 (241)	5.00 (127)	0.53 (13)
30	3	286TSC	12.30 (312)	7.00 (178)	5.50 (140)	11.00 (279)	11.00 (279)	5.00 (127)	0.53 (13)

Bluetooth

For MLE motors from 20 to 30 hp, the product incorporates a Bluetooth (BLE) module for remote control.

Via the built-in Bluetooth module, the product can communicate with the Grundfos GO. Bluetooth communication can take place at distances up to 32.8 ft.



TM082930

Bluetooth information

Frequency of operation	2400 - 2483.5 MHz
Modulation type	GFSK
Data rate	2 Mbps
Transmit power	5 dBm EIRP with internal antenna

GLoWpan information

Frequency of operation	2405-2480 MHz
Modulation type	GP O-QPSK
Data rate	1 Mbps
Transmit power	5 dBm EIRP with internal antenna

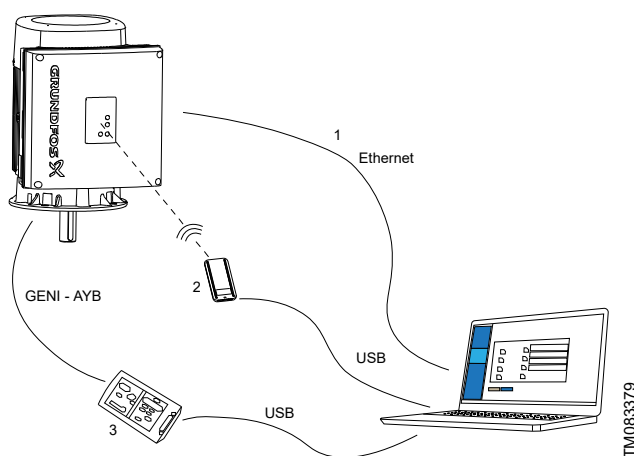
Grundfos GO Link

The product is designed for wired or wireless communication with Grundfos GO Link.

Grundfos GO Link enables you to set functions and gives you access to status overviews, configuration and current operating parameters.

Use Grundfos GO Link together with these interfaces:

- Ethernet cable (Only FM310 and FM311)
- Grundfos MI 301 - USB - Wired/wireless (Only HMI 100, HMI 200 and HMI 300)
- Grundfos MI 301 - USB - Wired/wireless (Only HMI 200 and HMI 300)
- Grundfos PC Tool Link - USB - Wired



TM083379

Grundfos GO Link setup

Pos.	Description
1	Ethernet cable: Standard Ethernet cable CAT5/CAT6.
2	Separate module enabling radio communication. Use the module together with a USB cable to connect to a laptop.
3	Separate module enabling wired connection to the pump. Use the module together with a USB cable to connect to a laptop.

Safe Torque Off (STO) function

The Safe Torque Off (STO) is a safety function to stop the motor from turning without actively braking it. It follows the definition by EN 61800-5-2.

The main difference between the STO function and a functional stop using a digital input (for example DI1) is that the STO is approved to provide a defined safety integrity.

The principle of operation is the following:

1. The STO function is activated (the input circuits are opened, for example by opening contactors).
2. The STO inputs of the motor de-energize.
3. The motor cuts off the control signal for the output transistors.
4. The motor coasts to a stop if it is running. The drive cannot restart while the STO function is activated. After deactivating the STO, the motor can restart immediately.
5. The control software of the motor generates an STO alert and corresponding indications. The STO alert can be configured. See the section on STO alert handling.

The version of the STO function is marked on the motor nameplate after the product version number.

Functional module, FM300

MLE 1/2 to 15 hp

The FM300 is factory-fitted in all pumps from 1/2 to 15 hp. The module has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required.

The FM300 has the following connections:

- three analog inputs
- one analog output
- two dedicated digital inputs
- two configurable digital inputs or open-collector outputs
- Grundfos Digital Sensor input and output
- two Pt100/1000 inputs
- two LiqTec sensor inputs
- two signal relay outputs
- GENIbus connection.

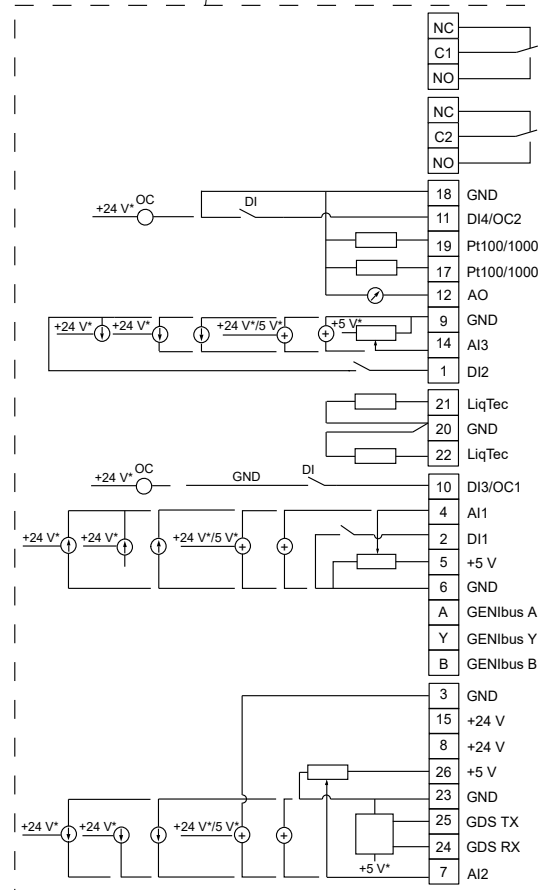
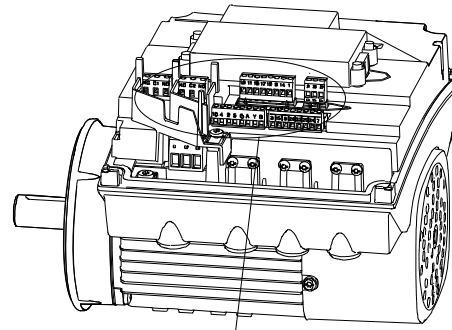
Connection terminals

All inputs and outputs are internally separated from the mains-conducting parts by reinforced insulation, and galvanically separated from other circuits. All control terminals are supplied with protective extra-low voltage (PELV), thus ensuring protection against electric shock.

Signal relay outputs:

- **Signal relay 1:**
 LIVE: Power supply voltages up to 250 VAC can be connected to this output.
 PELV: The output is galvanically separated from other circuits. Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.
- **Signal relay 2:**
 PELV: The output is galvanically separated from other circuits. Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.

Power supply: terminals N, PE, L or L1, L2, L3, PE



TM053509

* If an external supply source is used, there must be a connection to GND.

Connection terminals, FM300 functional module

Terminal	Type	Function
NC	Normally closed contact	
C1	Common	Signal relay 1: LIVE or PELV
NO	Normally open contact	
NC	Normally closed contact	
C2	Common	Signal relay 2: PELV only
NO	Normally open contact	
18	GND	Signal ground

Terminal	Type	Function
110.5 - 3.5 V or 0-5 V or 0-10 V	DI4/OC2	Digital input/output, configurable Open collector: max. 24 V resistive or inductive
19	Pt100/1000 input 2	Pt100/1000 sensor input 2
17	Pt100/1000 input 1	Pt100/1000 sensor input 1
12	AO	Analog output: • 0-20 mA or 4-20 mA • 0-10 V
9	GND	Signal ground
14	AI3	Analog input: • 0-20 mA or 4-20 mA • 0-10 V
1	DI2	Digital input, configurable
21	LiqTec sensor input 1	LiqTec sensor input 1 White conductor
20	GND	Signal ground Brown and black conductors
22	LiqTec sensor input 2	LiqTec sensor input 2 Blue conductor
10	DI3/OC1	Digital input/output, configurable Open collector: max. 24 V resistive or inductive
4	AI1	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V
2	DI1	Digital input, configurable
5	+5 V	Supply to potentiometer and sensor
6	GND	Signal ground
A	GENIbus, A	GENIbus, A (+)
Y	GENIbus, Y	GENIbus, GND
B	GENIbus, B	GENIbus, B (-)
3	GND	Signal ground
15	+24 V	Power supply
8	+24 V	Power supply
26	+5 V	Supply to potentiometer and sensor
23	GND	Signal ground
25	GDS TX	Grundfos Digital Sensor output
24	GDS RX	Grundfos Digital Sensor input
7	AI2	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V

Functional module, FM310 and FM311

MLE 20 to 30 hp

FM310 and FM311 are factory-fitted in all pumps from 20 to 30 hp.

Inputs and outputs

Note that the FM311 functional module does not include Bluetooth connection.

The module has these connections:

- three analog inputs
- one analog output
- two dedicated digital inputs
- two configurable digital inputs or open-collector outputs
- Grundfos Digital Sensor input and output
- two Pt100/1000 inputs
- two LiqTec sensor inputs
- two signal relay outputs
- GENIbus/Modbus connection
- two Safe Torque Off (STO) inputs
(Safe Torque Off (STO) is a safety function to stop the motor from turning without actively braking it. It follows the definition by EN 61800-5-2.)
- Ethernet connection
- Bluetooth (BLE) connection. ¹⁾

¹⁾ FM311 is without Bluetooth.

Connection terminals

All control terminals are supplied with safety extra-low voltage (SELV), ensuring protection against electric shock.

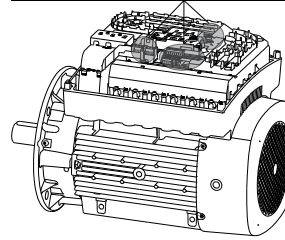
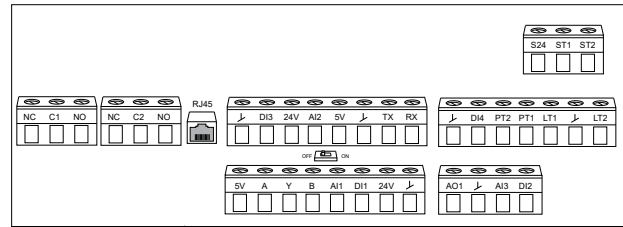
The inputs and outputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits.

Cables for the relays and the Ethernet cable must be rated at least 250V/2A.

The relays are approved for overvoltage category II, whether power is supplied from a transformer or the power supply.

Signal relay outputs:

- Signal relay 1:
LIVE: You can connect supply voltages up to 250 VAC to the output.
SELV: The output is galvanically separated from other circuits. Therefore, you can connect the supply voltage or safety extra-low voltage to the output as desired.
- Signal relay 2:
SELV: The output is galvanically separated from other circuits. Therefore, you can connect the supply voltage or safety extra-low voltage to the output as desired.



TM082862

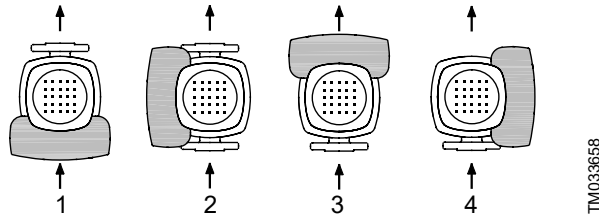
Terminal	Type	Function
NC	Normally closed contact	Signal relay 1: LIVE or SELV
C1	Common	
NO	Normally open contact	
NC	Normally closed contact	Signal relay 2: SELV only
C2	Common	
NO	Normally open contact	
RJ45	Ethernet	Ethernet communication
GND	GND	Signal ground
DI3	DI3/OC1	Digital input/output, configurable Open collector: max. 24 V resistive or inductive
24V	+24 V	Power supply
AI2	AI2	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V
5V	+5 V	Power supply to a potentiometer or sensor
GND	GND	Signal ground
TX	GDS TX	Grundfos Digital Sensor output
RX	GDS RX	Grundfos Digital Sensor input
GND	GND	Signal ground
DI4	DI4/OC2	Digital input/output, configurable Open collector: max. 24 V resistive or inductive
PT2	Pt100/1000 input 2	Pt100/1000 sensor input 2
PT1	Pt100/1000 input 1	Pt100/1000 sensor input 1
LT1	LiqTec sensor input 1	LiqTec sensor input 1 White conductor
GND	GND	Signal ground Brown and black conductors
LT2	LiqTec sensor input 2	LiqTec sensor input 2 Blue conductor
5V	+5 V	Power supply to a potentiometer or sensor
A	GENIbus, A	GENIbus, A (+) / Modbus, D1 (+)

Terminal	Type	Function
Y	GENIbus, Y	GENIbus, GND / Modbus, GND
B	GENIbus, B	GENIbus, B (-) / Modbus, D0 (-)
AI1	AI1	Analog input: <ul style="list-style-type: none"> • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.
DI1	DI1	Digital input ²⁾ , configurable
24V	+24 V	Power supply
GND	GND	Signal ground
AO1	AO	Analog output: <ul style="list-style-type: none"> • 0-20 mA or 4-20 mA • 0-10 V.
GND	GND	Signal ground
AI3	AI3	Analog input: <ul style="list-style-type: none"> • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V.
DI2	DI2	Digital input, configurable
S24	+24 V (STO)	Power supply to the Safe Torque Off inputs
ST1	STO1	Safe Torque Off - Input 1
ST2	STO2	Safe Torque Off - Input 2

2) Digital input 1 is factory-set to be start or stop input where an open circuit results in stop. A jumper has been factory-fitted between terminals DI1 and GND. Remove the jumper if digital input 1 is to be used as external start or stop or any other external function.

Terminal box positions

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



Terminal box positions

Pos.	Description
1	6 o'clock position (standard)
2	9 o'clock position
3	12 o'clock position
4	3 o'clock position

Ambient temperature and installation altitude

The ambient temperature and the installation altitude are important factors for the motor life as they affect the bearings and the insulation system. The installation altitude is the height of the installation site above sea level.

Motors installed up to the maximum ambient temperature and altitude can be loaded 100 %.

If the ambient temperature or the installation altitude exceeds the recommended maximum values, the motor must not be fully loaded due to risk of overheating. Overheating may result from excessive ambient temperatures or high altitudes with low density and low cooling effect of the air.

In such cases, it may be necessary to select an oversized motor with a higher rated output. To determine the motor load, it is necessary to calculate the derated motor power.

Maximum ambient temperature and altitude for Grundfos MLE motors

The table shows the maximum permissible ambient temperature at full load and the maximum permissible installation altitude above sea level at full load.

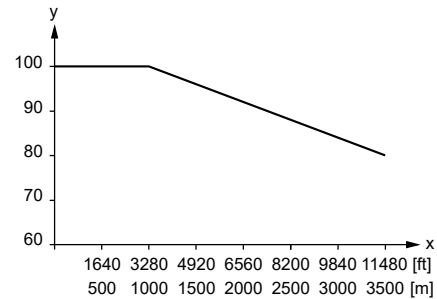
Motor efficiency class: IE5

Motor power [hp]	Motor make	Voltage [V]	Max. ambient temperature [°F (°C)]	Max. altitude above sea level [ft (m)]
1/2 to 2	MLE	1 × 200-240	122 (50)	
1 1/2 to 7 1/2	MLE	3 × 200-240	104 (40)	3280 (1000)
1 to 30	MLE	3 × 440-480	122 (50)	

Motor load for Grundfos MLE motors

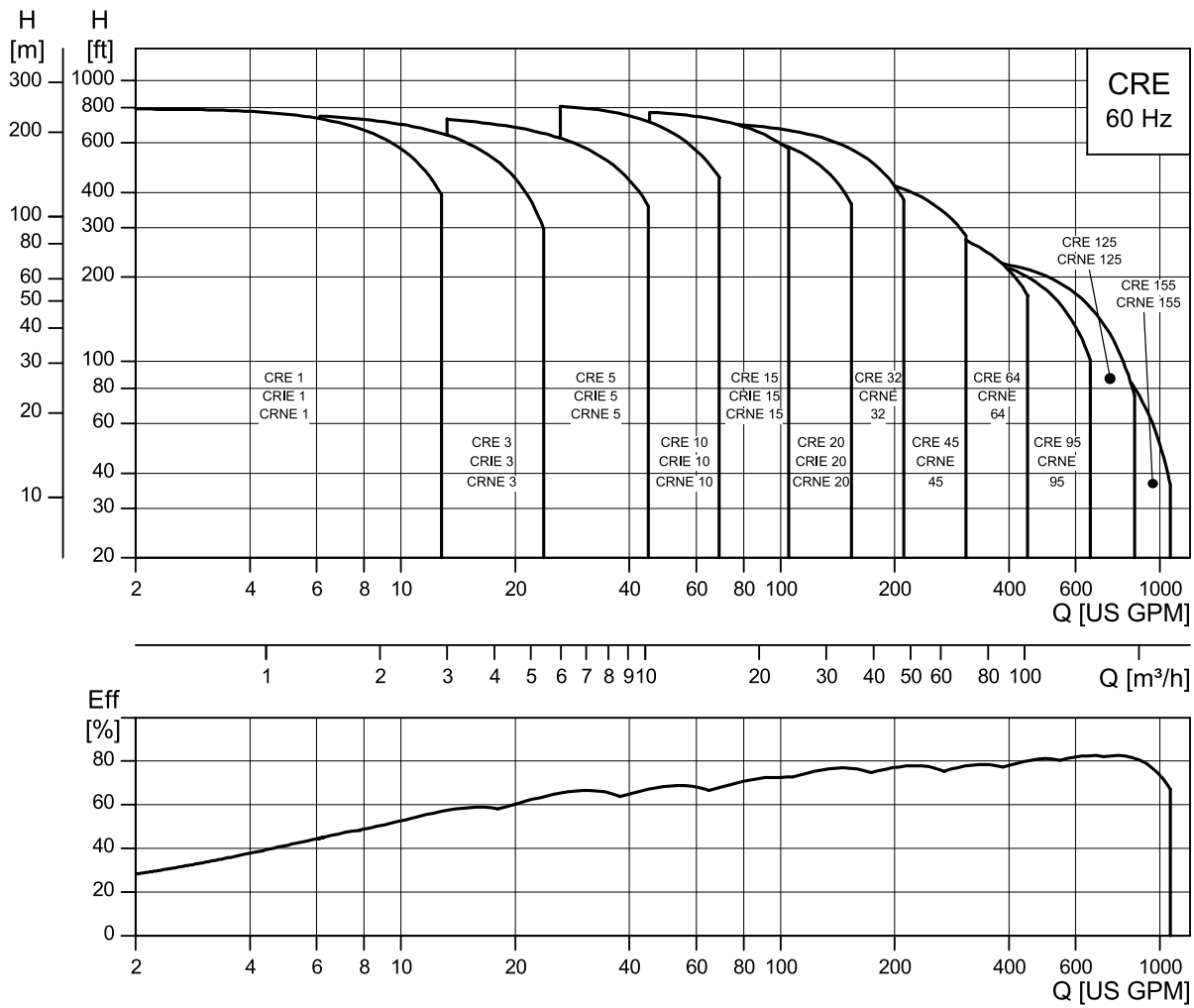
MLE motors can be installed up to 11 480 ft (3500 m) above sea level.

Motors installed above the maximum installation altitude of 3280 ft (1000 m) above sea level must not be fully loaded. Use the below curve to calculate the derated motor power. If the required motor output exceeds the derated motor power, select an oversized motor.



Derating of motor output power P2 % (y-axis) in relation to installation altitude above sea level in feet (x-axis)

4. Performance range



TM051598

5. Product range

CRE, CRIE, CRNE pump size	1	3	5	10	15	20
Rated flow rate [US gpm (m ³ /h)]	8.5 (1.9)	15 (3.4)	30 (6.8)	55 (12.5)	95 (21.6)	110 (25.0)
Flow range [US gpm (m ³ /h)]	0.9 - 12.8 (0.2 - 2.9)	1.5 - 23.8 (0.3 - 5.4)	3-45 (0.7 - 10.2)	5.5-70 (1.2 - 15.9)	9.5-125 (2.2 - 28.4)	11-155 (2.5 - 35.2)
Minimum liquid temperature [°F (°C)]	-4 (-20)	-4 (-20)	-4 (-20)	-4 (-20)	-4 (-20)	-4 (-20)
Maximum liquid temperature [°F (°C)]	+250 (+121)	+250 (+121)	+250 (+121)	+250 (+121)	+250 (+121)	+250 (+121)
Minimum liquid temperature [°F (°C)], on request	-40 (-40)	-40 (-40)	-40 (-40)	-40 (-40)	-40 (-40)	-40 (-40)
Maximum liquid temperature [°F (°C)], on request	+356 (+180)	+356 (+180)	+356 (+180)	+356 (+180)	+356 (+180)	+356 (+180)
Maximum pump efficiency [%]	49	59	67	70	72	72
Maximum working pressure [psi (bar)]	362 (25)	362 (25)	362 (25)	362 (25)	362 (25)	362 (25)
Maximum pump pressure (H [ft (m)])	790 (240)	790 (240)	780 (237)	820 (250)	800 (243)	700 (213)
Motor power [hp]	0.33 - 3	0.33 - 5	0.75 - 7.5	0.75 - 15	2 - 25	3 - 25
Standard versions						
CRE:						
Cast iron and stainless steel	•	•	•	•	•	•
AISI 304						
CRIE:						
Stainless steel	•	•	•	•	•	•
AISI 304						
CRNE:						
Stainless steel	•	•	•	•	•	•
AISI 316						
CRE pipe connection						
Oval flange (NPT)	1"	1"	1.25"	2"	2"	2"
Oval flange (NPT), on request	1.25"	1.25"	1"	1.5"	-	-
ANSI flange size	1.25"	1.25"	1.25"	2"	2"	2"
ANSI flange size, on request	-	-	-	-	-	-
ANSI flange class	250 lb.	250 lb.	250 lb.	250 lb.	250 lb.	250 lb.
CRIE pipe connection						
Oval flange (NPT)	1"	1"	1.25"	2"	2"	2"
Oval flange (NPT), on request	1.25"	1.25"	1"	1.5"	-	-
ANSI flange size	1.25"	1.25"	1.25"	2"	2"	2"
ANSI flange class	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.
Clamp coupling (NPT), on request	1", 1.25"	1", 1.25"	1", 1.25"	1.5", 2"	1.5", 2"	1.5", 2"
Union (NPT ext. Thread), on request	2"	2"	2"	-	-	-
CRNE pipe connection						
PJE (Victaulic)	1.25"	1.25"	1.25"	2"	2"	2"
PJE (Victaulic), on request	-	-	-	-	-	-
ANSI flange size	1.25"	1.25"	1.25"	2"	2"	2"
ANSI flange size, on request	-	-	-	-	-	-
ANSI flange class	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.	300 lb.
Clamp coupling (NPT), on request	1", 1.25"	1", 1.25"	1", 1.25"	1.5", 2"	1.5", 2"	1.5", 2"
Union (NPT ext. Thread), on request	2"	2"	2"	-	-	-

• Standard.

CRE, CRNE pump size	32	45	64	95	125	155
Rated flow rate [US gpm (m ³ /h)]	140 (32)	220 (50)	340 (77)	500 (114)	660 (150)	820 (186)
Flow range [US gpm (m ³ /h)]	14-210 (3.2 - 47.7)	22-310 (5.0 - 70.0)	34-450 (7.7 - 102.2)	50-650 (11.3 - 147.6)	66-851 (15 -193)	82-1070 (18.6 - 243)
Minimum liquid temperature [°F (°C)] ³⁾⁴⁾	-22 (-30)	-22 (-30)	-22 (-30)	-4 (-20)	-4 (-20)	-4 (-20)
Maximum liquid temperature [°F (°C)] ⁵⁾	+248 (+120)	+248 (+120)	+248 (+120)	+248 (+120)	+248 (+120)	+248 (+120)
Minimum liquid temperature [°F (°C)], on request	-40 (-40)	-40 (-40)	-40 (-40)	-	-	-
Maximum liquid temperature [°F (°C)], on request	+356 (+180)	+356 (+180)	+356 (+180)	-	-	-
Maximum pump efficiency [%]	76	78	79	80	78	81
Maximum working pressure [psi (bar)] ⁶⁾	435 (30)	435 (30)	435 (30)	537 (37)	566 (39)	580 (40)
Maximum pump pressure (H [ft (m)])	720 (220)	490 (149)	330 (101)	250 (76.2)	234 (71.3)	145 (44.1)
Motor power [hp]	5-30	7 1/2 - 30	10-30	15-30	20-30	25
Standard versions						
CRE:						
Cast iron and stainless steel AISI 304	•	•	•	•	•	•
CRNE:						
Stainless steel AISI 316	•	•	•	•	•	•
CRE pipe connection						
Oval flange (NPT)	-	-	-	-	-	-
Oval flange (NPT), on request	-	-	-	-	-	-
ANSI flange size	2.5"	3"	4"	4"	6"	6"
ANSI flange size, on request	3"	4"	5"	-	-	-
ANSI flange class	125/ 250 lb.	125/ 250 lb.	125/ 250 lb.	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.
CRNE pipe connection						
PJE (Victaulic)	-	-	-	4"	6"	6"
PJE (Victaulic), on request	3"	4"	4"	-	-	-
ANSI flange size	2.5"	3"	4"	4"	6"	6"
ANSI flange size, on request	3"	-	-	-	-	-
ANSI flange class	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.	150/ 300 lb.
Clamp coupling (NPT), on request	-	-	-	-	-	-
Union (NPT ext. Thread), on request	-	-	-	-	-	-

3) The minimum liquid temperature for CRNE 32 to CRNE 64 pumps with HQQE shaft seal is -4 °F (-20 °C).

4) The minimum liquid temperature for CRNE 95 to 155 pumps with HQQE shaft seal is -40 °F (-40 °C).

5) The maximum liquid temperature for CRNE 95 to 155 pumps with HQQE shaft seal is +248 °F (+120 °C).

6) CRE 95-155: Maximum operating pressure is 363 psi (25 bar). CRNE 95-155: Maximum operating pressure is 580 psi (40 bar). Note that CRNE 95 pumps with motors above 75 hp and CRNE 125-155 pumps with motors above 150 hp require a soft starter or frequency converter.

• Standard.

6. Identification

Type key

Example

CRE 32-4-2 A-G-A-E-HQQE-N-C-B

Code	Explanation
CR	Type range: CR, CRI, CRN, CRT
E	Pump with integrated frequency converter
32	Flow rate [gpm (m ³ /h)]
4	Number of impellers
2	Number of reduced-diameter impellers
A	Code for pump version
G	Code for pipe connection
A	Code for materials
E	Code for rubber parts
Code for shaft seal:	
H	• Shaft seal type designation
Q	• Seal face material (rotating seal face)
Q	• Seal face material (stationary seal face)
E	• Secondary seal material (rubber parts)
N	Code for motor: P2 [hp (kW)]
C	Code for motor: phase and voltage [V]
B	Code for motor: speed variant [rpm]

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 MLE motor
R	Belt-driven pump
S	High-pressure pump
T	Thrust handling device
U	ATEX-approved pump
V	Cascade function

Code	Description
W	Deep-well pump with ejector
X	Special version
6	Special version with NSF 61/372 approval
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

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

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

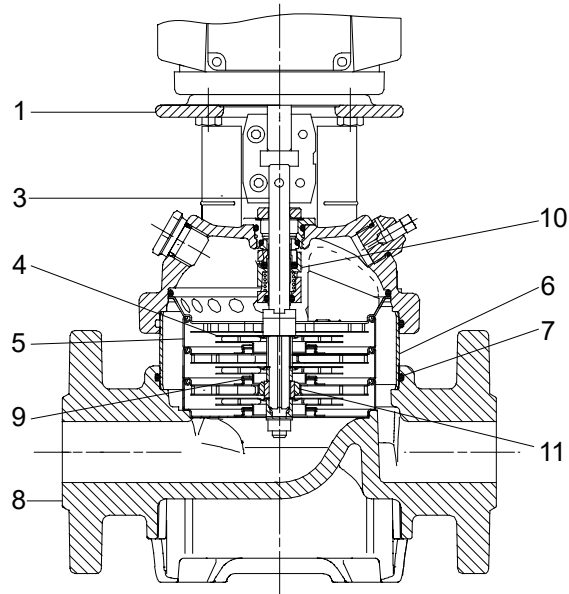
Code	Description
O	Double seal, back-to-back
P	Double seal, tandem
X	Special version
Seal face material (rotating and stationary seal face)	
B	Carbon, synthetic resin-impregnated
U	Cemented tungsten carbide
Q	Silicon carbide
X	Other ceramics
Secondary seal material (rubber parts)	
E	EPDM
F	FXM (Fluoraz®)
K	FFKM (Kalrez®)
V	FKM (Viton®)

Codes for motor

Code	Description
P2 [hp (kW)]	
C	0.33 (0.25)
D	0.5 (0.37)
E	0.75 (0.55)
F	1 (0.75)
G	1.5 (1.1)
H	2 (1.5)
I	3 (2.2)
K	5 (4)
L	7.5 (5.5)
M	10 (7.5)
N	15 (11)
O	20 (15)
P	25 (18.5)
Q	30 (22)
Phase and voltage (V)	
A	1 × 200-240 V
B	3 × 200-240 V
C	3 × 440-480 V
D	3 × 380-500 V
X	Not defined
Speed variant (rpm)	
A	1450-2000
B	2900-4000
C	4000-5900
2	2-pole
4	4-pole

7. Construction

CRE 1, 3, 5, 10, 15, 20



TM021194

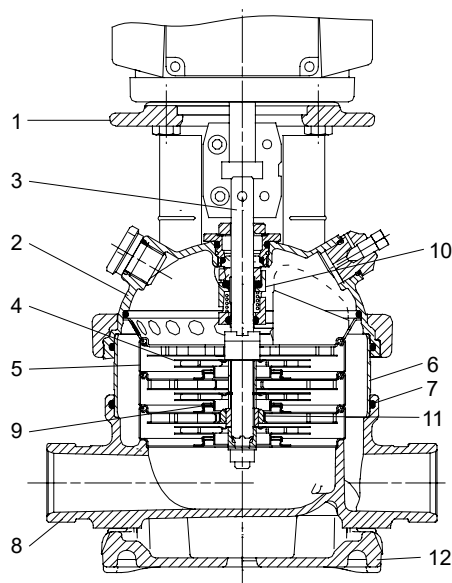
Materials, CRE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Grey cast iron	EN 1561 EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4401 ⁷⁾ EN 10088 1.4057 ⁸⁾	AISI 316 ⁷⁾ AISI 431 ⁸⁾
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Grey cast iron	EN 1561 EN-GJL-250	ASTM 25B
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
11	Bearing ring	Silicon carbide/silicon carbide	-	-
	Staybolts	Bright steel	EN 10277 C35R	-

7) CRE 1, 3, 5.

8) CRE 10, 15, 20.

CRIE 1, 3, 5, 10, 15, 20



TM021195

Materials, CRIE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Grey cast iron ⁹⁾	EN 1563 EN-GJS-450-10	ASTM A536 65-45-12
2	Pump head	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	EN 10088 1.4401 ¹⁰⁾ EN 10088 1.4057 ¹¹⁾	AISI 316 ¹⁰⁾ AISI 431 ¹¹⁾
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
11	Bearing ring	Silicon carbide/silicon carbide	-	-
12	Base plate	Grey cast iron ⁹⁾	EN 1561 EN-GJL-200 ^{11)+ 12)} EN 1563 EN-GJS-500-7 ¹³⁾	ASTM 25B ^{11)+ 12)} ASTM A536 65-45-12 ¹³⁾
	Staybolts	Bright steel	EN 10277 C35R	-

9) Stainless steel available on request.

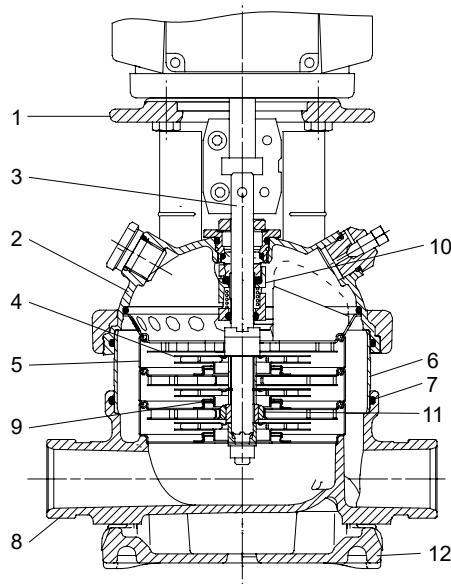
10) CRIE 1, 3, 5.

11) CRIE 10, 15, 20.

12) CRIE 1, 3, 5 with FGJ flange connection.

13) CRIE 1, 3, 5 with clamp connections, such as PJE, CA.

CRNE 1, 3, 5, 10, 15, 20



TM021195

Materials, CRNE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Grey cast iron ¹⁴⁾	EN 1563 EN-GJS-450-10	ASTM A536 65-45-12
2	Pump head	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
3	Shaft	Stainless steel	EN 10088 1.4401 ¹⁵⁾ EN 10088 1.4460 ¹⁶⁾	AISI 316 ¹⁵⁾ AISI 329 ¹⁶⁾
4	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
5	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
6	Sleeve	Stainless steel	EN 10088 1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
11	Bearing ring	Silicon carbide/silicon carbide	-	-
12	Base plate	Grey cast iron ¹⁴⁾	EN 1561 EN-GJL-200 ^{16)+ 17)} EN 1563 EN-GJS-500-7 ¹⁸⁾	ASTM 25B ^{16)+ 17)} ASTM A536 65-45-12 ¹⁸⁾
	Staybolts	Stainless steel	EN 10088 1.4401 ¹⁵⁾ EN 10088 1.4057 ¹⁶⁾	AISI 316 ¹⁵⁾ AISI 431 ¹⁶⁾

¹⁴⁾ Stainless steel available on request.

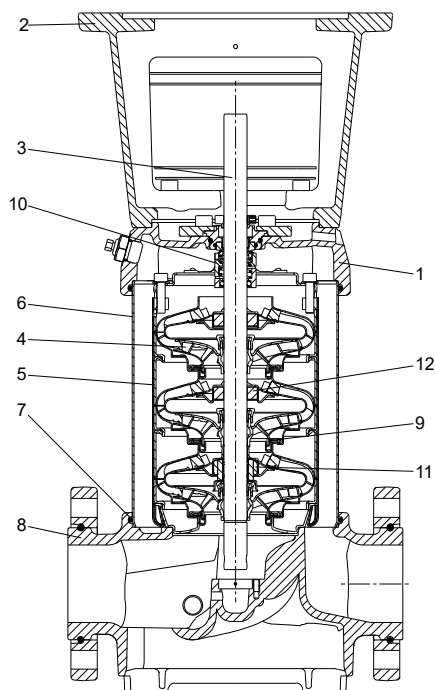
¹⁵⁾ CRNE 1, 3, 5.

¹⁶⁾ CRNE 10, 15, 20.

¹⁷⁾ CRNE 1, 3, 5 with FGJ flange connection.

¹⁸⁾ CRNE 1, 3, 5 with clamp connections, such as PJE, CA.

CRE 32, 45, 64

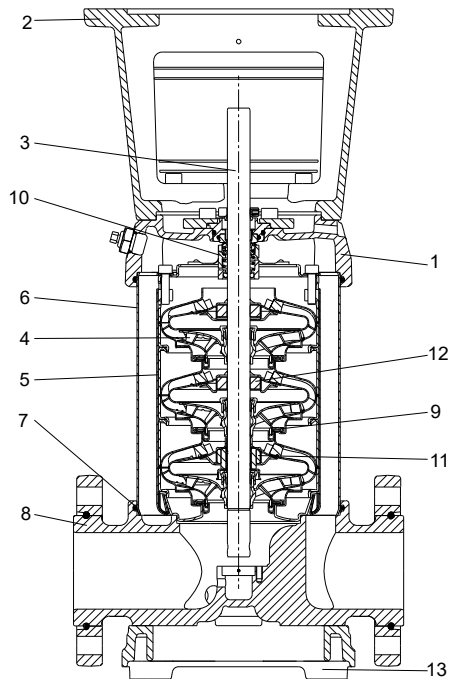


TM060711

Materials, CRE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536 65-45-12
2	Motor stool	Grey cast iron	EN 1561 EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4057	AISI 431
4	Impeller	Stainless steel	EN 10088 1.4301	AISI 304
5	Chamber	Stainless steel	EN 10088 1.4301	AISI 304
6	Sleeve	Stainless steel	EN 10088 1.4301	AISI 304
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536 65-45-12
9	Neck ring	Carbon-graphite-filled PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
11	Bearing ring	Silicon carbide/silicon carbide	-	-
12	Support bushing	Carbon-graphite-filled PTFE	-	-
13	Base plate	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536 65-45-12
	Staybolts	Bright steel	EN 10277 ETG 35	-

CRNE 32, 45, 64



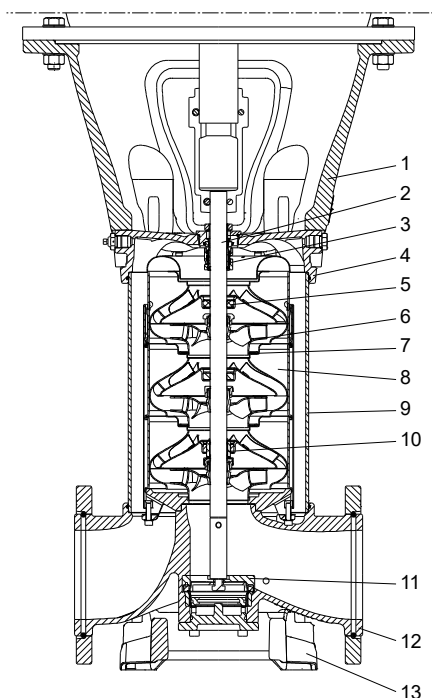
TM060712

Materials, CRNE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Pump head	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
2	Motor stool	Grey cast iron ¹⁹⁾	EN 1561 EN-GJL-200	ASTM 25B
3	Shaft	Stainless steel	EN 10088 1.4462	-
4	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
5	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
6	Sleeve	Stainless steel	EN 10088 1.4401	AISI 316
7	O-ring for sleeve	EPDM or FKM	-	-
8	Base	Stainless steel	EN 10283 1.4408	CF 8M equal to AISI 316
9	Neck ring	Carbon-graphite-filled PTFE	-	-
10	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
11	Bearing ring	Silicon carbide/silicon carbide	-	-
12	Support bushing	Carbon-graphite-filled PTFE	-	-
13	Base plate	Ductile cast iron ¹⁹⁾	EN 1563 EN-GJS-500-7	ASTM A536 65-45-12
	Staybolts	Stainless steel	EN 10088 1.4057	AISI 431

¹⁹⁾ Stainless steel available on request.

CRE 95, 125, 155



TM065161

Materials, CRE

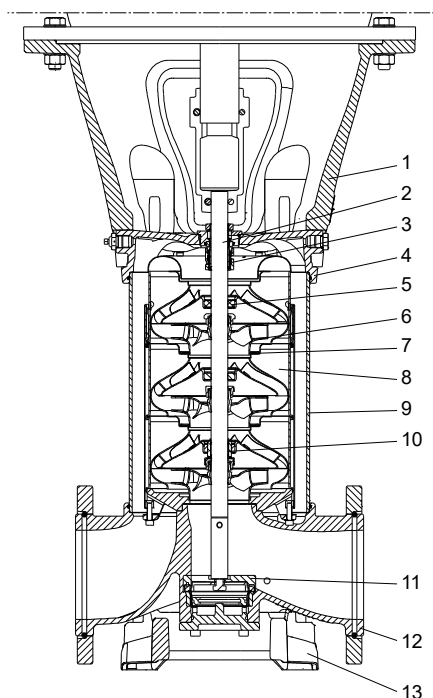
Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536-84 65-45-12
2	Shaft	Stainless steel	EN 10088 1.4057 ²⁰⁾ EN 10088 1.4462 ²¹⁾	AISI 431 ²⁰⁾ AISI 318 LN ²¹⁾
3	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
4	Pump head	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536-84 65-45-12
5	Support bearing (bush)	Carbon-graphite-filled PTFE		
6	Impeller	Stainless steel	EN 10088 1.4301 EN 10088 1.4401	AISI 304 AISI 316
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN 10088 1.4301 EN 10088 1.4401	AISI 304 AISI 316
9	Sleeve	Stainless steel	EN 10088 1.4301 ²⁰⁾ EN 10088 1.4404 ²¹⁾	AISI 304 ²⁰⁾ AISI 316 L ²¹⁾
10	Bearing ring	Tungsten carbide/tungsten carbide	-	-
11	Thrust handling device ²²⁾	Stainless steel	EN 10088 1.4401 EN 10283 1.4408	AISI 316 CF 8M equal to AISI 316
		Silicon carbide/tungsten carbide	-	-
12	Base	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536-84 65-45-12
13	Base plate	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536-84 65-45-12
	Staybolts	Stainless steel	EN 10088 1.4057	AISI 431

20) CRE 95.

21) CRE 125, 155.

22) Only fitted on pumps with 100 hp motors or larger.

CRNE 95, 125, 155



TM065161

Materials, CRNE

Pos.	Designation	Materials	DIN/EN	≈ AISI/ASTM
1	Motor stool	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536-84 65-45-12
2	Shaft	Stainless steel	EN 10088 1.4462	318 LN
3	Shaft seal (seal faces)	Silicon carbide/silicon carbide	-	-
4	Pump head	Stainless steel	EN 10283 1.4408	CF 8M
5	Support bearing (bush)	Carbon-graphite-filled PTFE	-	-
6	Impeller	Stainless steel	EN 10088 1.4401	AISI 316
7	Neck ring	PEEK	-	-
8	Chamber	Stainless steel	EN 10088 1.4401	AISI 316
9	Sleeve	Stainless steel	EN 10088 1.4404	AISI 316 L
10	Bearing ring	Tungsten carbide/tungsten carbide	-	-
11	Thrust handling device ²³⁾	Stainless steel	EN 10088 1.4401	AISI 316
		Silicon carbide/tungsten carbide	-	CF 8M equal to AISI 316
12	Base	Stainless steel	EN 10283 1.4408	CF 8M
13	Base plate	Ductile cast iron	EN 1563 EN-GJS-500-7	ASTM A536-84 65-45-12
	Staybolts	Stainless steel	EN 10088 1.4057	AISI 431

²³⁾ Only fitted on pumps with 100 hp motors or larger.

8. Operating conditions

Pumped liquids

The pumps are designed to pump non-explosive liquids that do not chemically attack the pump materials.

When pumping liquids with a density and/or viscosity higher than that of water, oversized motors may be required.

Whether a pump is suitable for a particular liquid depends on several factors of which the most important are the chloride content, pH-value, temperature and content of chemicals and oils.

Please note that aggressive liquids may attack or dissolve the protective oxide film of the stainless steel and thus cause corrosion.

CRE and CRIE

The pumps are suitable for non-corrosive liquids.

Use them for liquid transfer, circulation and pressure boosting of cold or hot clean water.

CRNE

The pumps are suitable for industrial liquids.

Use them in systems where all parts in contact with the liquid must be made of high-grade stainless steel.

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 power consumption.

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

List of pumped liquids

A number of typical liquids are listed below.

Other pump versions may be applicable, but those stated in the list are considered to be the best choices.

The table is intended as a general guide only and cannot replace actual testing of the pumped liquids and pump materials under specific working conditions.

Therefore, use the list with some caution. Factors such as those mentioned below may affect the chemical resistance of a specific pump version:

- concentration of the pumped liquid
- liquid temperature
- pressure.

Take safety precautions when pumping dangerous liquids.

Notes

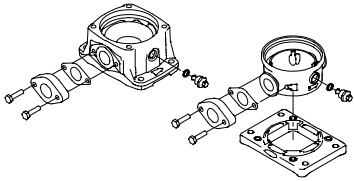
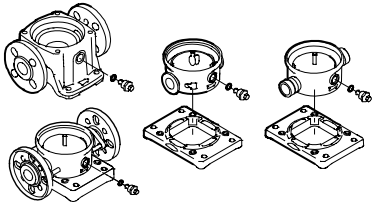
D	Often with additives.
E	The density and/or viscosity differ from that/those of water. Take this factor into account when calculating motor output and pump performance.
F	Pump selection depends on many factors. Contact Grundfos.
H	Risk of crystallisation/precipitation in shaft seal.
1	Highly flammable liquid.
2	Combustible liquid.
3	Insoluble in water.
4	Low self-ignition point.

Pumped liquid	Chemical formula	Note	Liquid concentration, liquid temperature	CRE	CRNE
Acetic acid	CH ₃ COOH	-	5 %, 68 °F (20 °C)	-	HQQE
Acetone	CH ₃ COCH ₃	1, F	100 %, 68 °F (20 °C)	-	HQQE
Alkaline degreasing agent		D, F	-	HQQE	-
Ammonium bicarbonate	NH ₄ HCO ₃	E	20 %, 86 °F (30 °C)	-	HQQE
Ammonium hydroxide	NH ₄ OH	-	20 %, 104 °F (40 °C)	HQQE	-
Aviation fuel		1, 3, 4, F	100 %, 68 °F (20 °C)	HQBV	-
Benzoic acid	C ₆ H ₅ COOH	H	0.5 %, 68 °F (20 °C)	-	HQQV
Boiler water		-	< 248 °F (120 °C)	HQQE	-
		F	248-356 °F (120-180 °C)	-	-
Calcareous water		-	< 194 °F (90 °C)	HQQE	-
Calcium acetate (as coolant with inhibitor)	Ca(CH ₃ COO) ₂	D, E	30 %, 122 °F (50 °C)	HQQE	-
Calcium hydroxide	Ca (OH) ₂	E	Saturated solution, 122 °F (50 °C)	HQQE	-
Chloride-containing water		F	< 86 °F (30 °C), maximum 500 ppm	-	HQQE
Chromic acid	H ₂ CrO ₄	H	1 %, 68 °F (20 °C)	-	HQQV
Citric acid	HOC(CH ₂ CO ₂ H) ₂ COOH	H	5 %, 104 °F (40 °C)	-	HQQE
Completely desalinated water (demineralised water)		-	248 °F (120 °C)	-	HQQE
Condensate		-	248 °F (120 °C)	HQQE	-
Copper sulphate	CuSO ₄	E	10 %, 122 °F (50 °C)	-	HQQE
Corn oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Diesel oil		2, 3, 4, F	100 %, 68 °F (20 °C)	HQBV	-
Domestic hot water (potable water)		-	< 248 °F (120 °C)	HQQE	-
Ethanol (ethyl alcohol)	C ₂ H ₅ OH	1, F	100 %, 68 °F (20 °C)	HQQE	-
Ethylene glycol	HOCH ₂ CH ₂ OH	D, E	50 %, 122 °F (50 °C)	HQQE	-
Formic acid	HCOOH	-	5 %, 68 °F (20 °C)	-	HQQE
Glycerine (glycerol)	OHCH ₂ CH(OH)CH ₂ OH	D, E	50 %, 122 °F (50 °C)	HQQE	-
Hydraulic oil (mineral)		E, 2, 3	100 %, 212 °F (100 °C)	HQQV	-
Hydraulic oil (synthetic)		E, 2, 3	100 %, 212 °F (100 °C)	HQQV	-
Isopropyl alcohol	CH ₃ CHOHCH ₃	1, F	100 %, 68 °F (20 °C)	HQQE	-
Lactic acid	CH ₃ CH(OH)COOH	E, H	10 %, 68 °F (20 °C)	-	HQQV
Linoleic acid	C ₁₇ H ₃₁ COOH	E, 3	100 %, 68 °F (20 °C)	HQQV	-
Methanol (methyl alcohol)	CH ₃ OH	1, F	100 %, 68 °F (20 °C)	HQQE	-
Motor oil		E, 2, 3	100 %, 176 °F (80 °C)	HQQV	-
Naphthalene	C ₁₀ H ₈	E, H	100 %, 176 °F (80 °C)	HQQV	-
Nitric acid	HNO ₃	F	1 %, 68 °F (20 °C)	-	HQQE
Oil-containing water		-	< 212 °F (100 °C)	HQQV	-
Olive oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Oxalic acid	(COOH) ₂	H	1 %, 68 °F (20 °C)	-	HQQE
Ozone-containing water	(O ₃)	-	< 212 °F (100 °C)	-	HQQE
Peanut oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Petrol		1, 3, 4, F	100 %, 68 °F (20 °C)	HQBV	-
Phosphoric acid	H ₃ PO ₄	E	20 %, 68 °F (20 °C)	-	HQQE
Propanol	C ₃ H ₇ OH	1, F	100 %, 68 °F (20 °C)	HQQE	-
Propylene glycol	CH ₃ CH(OH)CH ₂ OH	D, E	50 %, < 194 °F (90 °C)	HQQE	-
Potassium carbonate	K ₂ CO ₃	E	20 %, 122 °F (50 °C)	HQQE	-
Potassium formate (as coolant with inhibitor)	KOOCH	D, E	30 %, 122 °F (50 °C)	HQQE	-
Potassium hydroxide	KOH	E	20 %, 122 °F (50 °C)	-	HQQE
Potassium permanganate	KMnO ₄	-	5 %, 68 °F (20 °C)	-	HQQE

Pumped liquid	Chemical formula	Note	Liquid concentration, liquid temperature	CRE	CRNE
Rape seed oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Salicylic acid	C ₆ H ₄ (OH)COOH	H	0.1 %, 68 °F (20 °C)	-	HQQE
Silicone oil		E, 3	100 %	HQQV	-
Sodium bicarbonate	NaHCO ₃	E	10 %, 140 °F (60 °C)	-	HQQE
Sodium chloride (as coolant)	NaCl	D, E	30 %, < 41 °F (5 °C), pH > 8	HQQE	-
Sodium hydroxide	NaOH	E	20 %, 122 °F (50 °C)	-	HQQE
Sodium hypochlorite	NaOCl	F	0.1 %, 68 °F (20 °C)	-	HQQV
Sodium nitrate	NaNO ₃	E	10 %, 140 °F (60 °C)	-	HQQE
Sodium phosphate	Na ₃ PO ₄	E, H	10 %, 140 °F (60 °C)	-	HQQE
Sodium sulphate	Na ₂ SO ₄	E, H	10 %, 140 °F (60 °C)	-	HQQE
Softened water		-	< 248 °F (120 °C)	-	HQQE
Soya oil		D, E, 3	100 %, 176 °F (80 °C)	HQQV	-
Sulphuric acid	H ₂ SO ₄	F	1 %, 68 °F (20 °C)	-	HQQV
Sulphurous acid	H ₂ SO ₃	-	1 %, 68 °F (20 °C)	-	HQQE
Unsalted swimming-pool water		-	Approx. 2 ppm free chlorine (Cl ₂)	HQQE	-

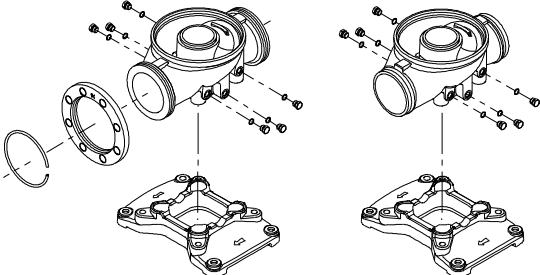
Operating and inlet pressure

Maximum operating pressure and temperature range, CRE, CRIE, CRNE 1-64

Pump type	Oval flange			ANSI, Clamp, PJE		
						
	Max. permissible operating pressure ²⁴⁾ [psi (bar)]	Min. liquid temperature [°F (°C)]	Max. liquid temperature [°F (°C)]	Max. permissible operating pressure ²⁴⁾ [psi (bar)]	Min. liquid temperature [°F (°C)]	Max. liquid temperature [°F (°C)]
CRE, CRIE, CRNE 1	232 (16)	-4 (-20)	+248 (+120)	362 (25)	-4 (-20)	+248 (+120)
CRE, CRIE, CRNE 3	232 (16)	-4 (-20)	+248 (+120)	362 (25)	-4 (-20)	+248 (+120)
CRE, CRIE, CRNE 5	232 (16)	-4 (-20)	+248 (+120)	362 (25)	-4 (-20)	+248 (+120)
CRE 10-1 → 10-6	145 (10)	-4 (-20)	+248 (+120)	-	-	-
CRIE, CRNE 10-1 → 10-10	232 (16)	-4 (-20)	+248 (+120)	-	-	-
CRE, CRIE 10-1 → 10-10	-	-	-	232 (16)	-4 (-20)	+248 (+120)
CRE, CRIE 10-12 → 10-17	-	-	-	362 (25)	-4 (-20)	+248 (+120)
CRNE 10	-	-	-	362 (25)	-4 (-20)	+248 (+120)
CRE 15-1 → 15-5	145 (10)	-4 (-20)	+248 (+120)	-	-	-
CRIE, CRNE 15-1 → 15-8	232 (16)	-4 (-20)	+248 (+120)	-	-	-
CRE, CRIE 15-1 → 15-8	-	-	-	232 (16)	-4 (-20)	+248 (+120)
CRE, CRIE 15-9 → 15-12	-	-	-	362 (25)	-4 (-20)	+248 (+120)
CRNE 15	-	-	-	362 (25)	-4 (-20)	+248 (+120)
CRE 20-1 → 20-5	145 (10)	-4 (-20)	+248 (+120)	-	-	-
CRIE, CRNE 20-1 → 20-7	232 (16)	-4 (-20)	+248 (+120)	-	-	-
CRE, CRIE 20-1 → 20-7	-	-	-	232 (16)	-4 (-20)	+248 (+120)
CRE, CRIE 20-8 → 20-10	-	-	-	362 (25)	-4 (-20)	+248 (+120)
CRNE 20	-	-	-	362 (25)	-4 (-20)	+248 (+120)
CRE, CRNE 32-1-1 → 32-5	-	-	-	232 (16)	-22 (-30)	+248 (+120)
CR, CRN 32-6-2 → 32-11-2	-	-	-	435 (30)	-22 (-30)	+248 (+120)
CRE, CRNE 45-1-1 → 45-4-2	-	-	-	232 (16)	-22 (-30)	+248 (+120)
CRE, CRNE 45-4-1 → 45-8-1	-	-	-	435 (30)	-22 (-30)	+248 (+120)
CRE, CRNE 64-1-1 → 64-3	-	-	-	232 (16)	-22 (-30)	+248 (+120)
CRE, CRNE 64-4-2 → 64-5-2	-	-	-	435 (30)	-22 (-30)	+248 (+120)

²⁴⁾ In standard configuration. For operating conditions outside the standard, contact Grundfos.

Maximum operating pressure and temperature range, CRE, CRNE 95-155

Pump type	ANSI, PJE (Victaulic type)		
			
	Maximum permissible operating pressure²⁵⁾ [psi (bar)]	Minimum liquid temperature [°F (°C)]	Maximum liquid temperature [°F (°C)]
CRE 95-1-1 → CRE 95-2-1	232 (16)	-4 (-20)	+248 (+120)
CRE 125-1-1 → CRE 125-2-2			
CRE 155-1-1			
CRNE 95-1-1 → CRNE 95-2-1			
CRNE 125-1-1 → CRNE 125-2-2			
CRNE 155-1-1			

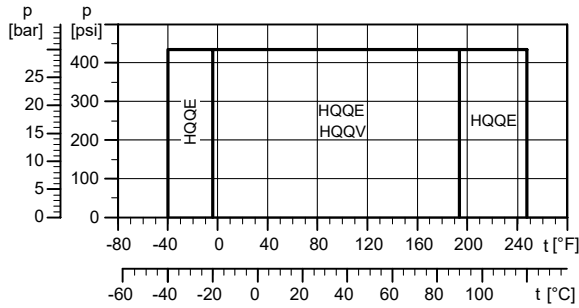
T1M069402

²⁵⁾ In standard configuration. For operating conditions outside the standard, contact Grundfos.

Operating range of the shaft seal

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature. The following curves apply to clean water and water with anti-freeze liquids. For selecting the right shaft seal, see the section on pumped liquids.

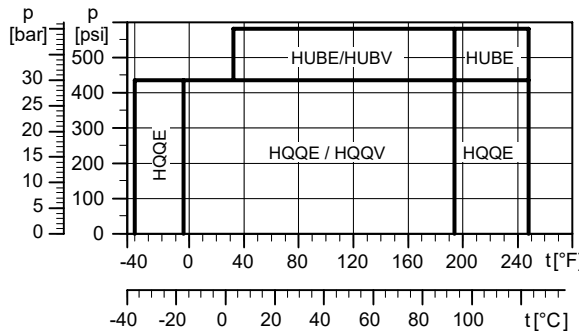
CRE, CRIE, CRNE 1 - CRE, CRIE, CRNE 20



TM059659

Operating range of standard shaft seals for CRE 1s - CRE 20

CRE, CRNE 32 - CRE, CRNE 64 [3 to 30 hp]



TM060999

Operating range of standard shaft seals for CRE 32 - CRE 64 [3 to 30 hp]

Shaft seal	Description	Max. temp. range [°F (°C)]
HQQE	O-ring (cartridge) (balanced seal), SiC/SiC, EPDM	-40 to +248 (-40 to +120)
HQQV	O-ring (cartridge) (balanced seal), SiC/SiC, FKM	-4 to +194 (-20 to +90)
HUBE	O-ring (cartridge) (balanced seal), TC ²⁶⁾ /carbon, EPDM	+32 to +248 (0 to +120)
HUBV	O-ring (cartridge) (balanced seal), TC/carbon, FKM	+32 to +194 (0 to +90)

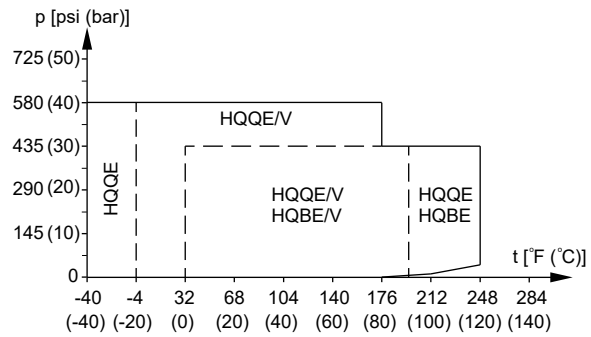
²⁶⁾ TC stands for tungsten carbide.

See the section on lists of variants on request, in case of extreme temperatures:

- low temperatures down to -40 °F (-40 °C) or
- high temperatures up to +356 °F (+180 °C).

CRE, CRNE 95-155

Shaft seals for Ø22 mm shafts [15 to 30 hp]



TM070324

Operating range of standard shaft seals for CRE, CRNE 95-155

Standard shaft seal	Description	Liquid temperature [°F (°C)]
HQQE	O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, EPDM	-40 - +248 (-40 - +120)
HQQV	O-ring (cartridge) (balanced seal), Silicon carbide/Silicon carbide, FKM	-4 - +194 (-20 - +90)
HQBE	O-ring (cartridge) (balanced seal), Silicon carbide/carbon, EPDM	32 - +248 (0 - +120)
HQBV	O-ring (cartridge) (balanced seal), Silicon carbide/carbon, FKM	32 - +194 (0 - +90)

Related information

[Pumped liquids](#)

[Lists of variants on request](#)

Maximum inlet pressure

The following table shows the maximum permissible inlet pressure. However, the actual inlet pressure plus the pressure against a closed valve must always be lower than the maximum permissible operating pressure.

If the maximum permissible operating pressure is exceeded, the conical bearing in the motor may be damaged and the life of the shaft seal reduced.

Pump type	Maximum inlet pressure [psi (bar)]
CRE, CRIE, CRNE 1	
1-2 → 1-25	145 (10)
1-27	218 (15)
CRE, CRIE, CRNE 3	
3-2 → 3-17	145 (10)
3-19 → 3-25	218 (15)
CRE, CRIE, CRNE 5	
5-2 → 5-9	145 (10)
5-10 → 5-24	218 (15)
CRE, CRIE, CRNE 10	
10-1 → 10-5	116 (8)
10-6 → 10-17	145 (10)
CRE, CRIE, CRNE 15	
15-1 → 15-2	116 (8)
15-3 → 15-12	145 (10)
CRE, CRIE, CRNE 20	
20-1	116 (8)
20-2 → 20-10	145 (10)
CRE, CRNE 32	
32-1-1 → 32-2	58 (4)
32-3-2 → 32-6	145 (10)
32-7	218 (15)
CRE, CRNE 45	
45-1-1 → 45-1	58 (4)
45-2-2 → 45-3	145 (10)
45-4-2 →	218 (15)
CRE, CRNE 64	
64-1-1	58 (4)
64-1 → 64-2-1	145 (10)
64-2 → 64-3-2	218 (15)
CRE, CRNE 95	
95-1-1 → 95-2-2	145 (10)
95-2-1	218 (15)
CRE, CRNE 125	
125-1-1 → 125-1	145 (10)
125-2-2	218 (15)
CRE, CRNE 155	
155-1-1	145 (10)

Examples of operating and inlet pressures

The values for the operating pressures and inlet pressures must not be considered individually. The outlet pressure must be equal to or lower than the maximum operating pressure.

Example:

Pump:	CRE 3-9 A-B-A
Maximum operating pressure:	232 psi (16 bar)
Maximum inlet pressure:	145 psi (10 bar)
Outlet pressure against a closed valve:	121.6 psi (8.4 bar)

In this example, the pump outlet pressure against a closed valve is 121.6 psi.

The inlet pressure added to the outlet pressure against a closed valve must not exceed the maximum operating pressure of the pump. The maximum operating pressure of the CRE 3-9 A-B-A is 232 psi.

The first-stage pump is not allowed to operate at the maximum inlet pressure of 145 psi, since the maximum inlet pressure (145 psi) added to the outlet pressure against a closed valve (121.6 psi) is greater than the maximum operating pressure of the pump (232 psi).

The maximum allowed inlet pressure of the pump is 110.4 psi, that is the difference between the maximum operating pressure of the pump (232 psi) and the outlet pressure against a closed valve (121.6 psi).

Related information

[CRE, CRIE, CRNE 3](#)

[Lists of variants on request](#)

Control of E-pumps

Control options

It is possible to communicate with E-pumps via the following platforms:

- the operating panel on the pump
- Grundfos GO
- Grundfos GO Link
- the central management system.

The purpose of controlling an E-pump is to monitor and control the pressure, temperature, flow and liquid level of the system.

Operating panels

The operating panel on the E-pump terminal box makes it possible to change the setpoint settings manually. All settings are saved if the power supply is switched off.

The operating panel available as standard is HMI 300.

The operating panel available on booster pumps is HMI 200.

Note that these panels include an integrated radio module.

The following operating panels without an integrated radio module are available on request:

- HMI 201
- HMI 301.

For further information, see the sections on variants.

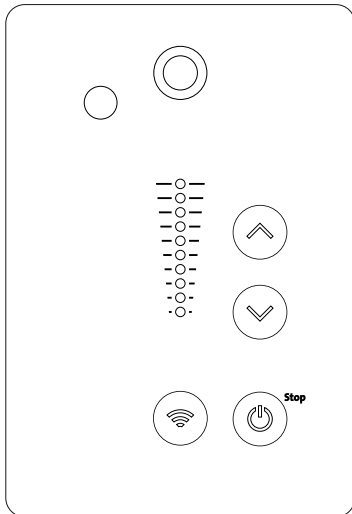
Related information

[HMI 200](#)

[HMI 300](#)

HMI 200

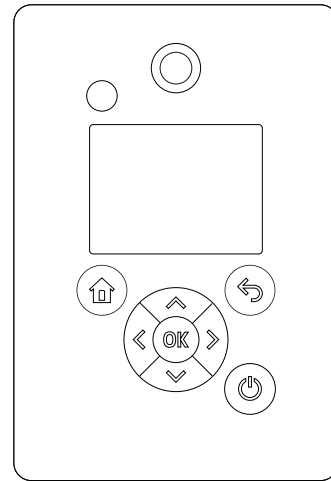
This operating panel is available on booster pumps.



HMI 300

This operating panel is available as standard.

TM084861



TM084862

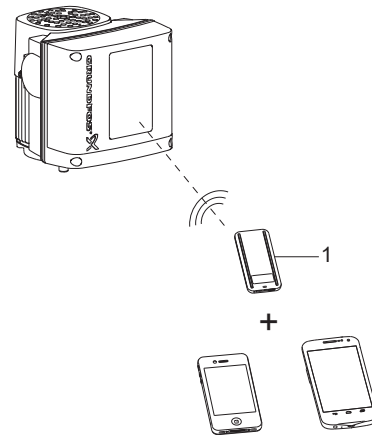
Grundfos GO

Grundfos GO enables you to set functions and gives you access to status overviews, technical product information and current operating parameters.

MLE 1/2 to 15 hp

The product is designed for wireless radio or infrared communication with Grundfos GO.

Use Grundfos GO together with the Grundfos MI 301 mobile interface.



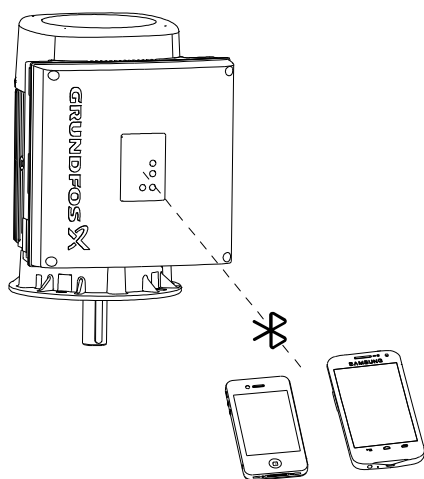
TM066256

Pos.	Description
1	Grundfos MI 301: It is a separate module enabling radio or infrared communication. Use the module together with an Android or iOS-based smart device via a Bluetooth connection.

MLE 20 to 30 hp

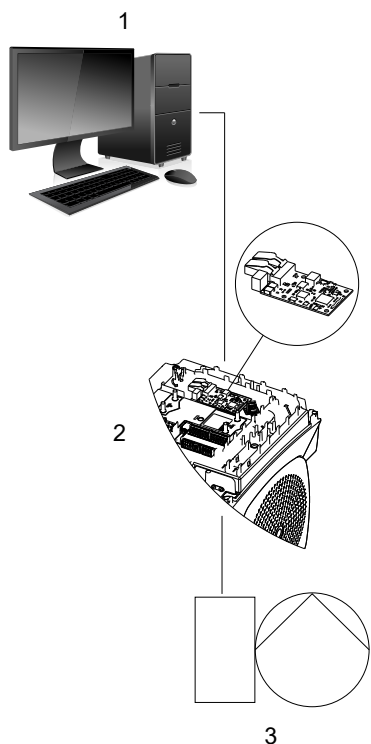
The product is designed for wireless communication with Grundfos GO using Bluetooth (BLE).

Via the built-in Bluetooth module, the product can communicate with Grundfos GO.



Central management system

Communication with the E-pump is possible even if the operator is not present near the E-pump. Communication is enabled by connecting the E-pump to a central building management system. This allows the operator to monitor the pump and change control modes and setpoint settings. Communication between E-pumps and a central building management system is enabled via a Grundfos Communication Interface Module (CIM).



Structure of a central management system

Pos.	Description
1	Central management system

Pos.	Description
2	CIM (See the section on Communication Interface Modules)
3	E-pump

Related information

[Communication Interface Module \(CIM\)](#)

Control modes

E-pumps are available in two variants:

- with integrated pressure sensor
- without sensor.

E-pumps with an integrated pressure sensor

Use an E-pump with an integrated pressure sensor in applications where you want to control the pressure of the pump, irrespective of the flow rate. For further information, see the section on examples of E-pump applications.

Signals of pressure changes in the pipe system are transmitted continuously from the sensor to the pump. The pump responds to the signals by adjusting its performance up and down to compensate for the pressure difference between the actual and the desired pressure. As this adjustment is a continuous process, a constant pressure is maintained in the pipe system.



CRE, CRIE and CRNE pumps

An E-pump with an integrated pressure sensor facilitates installation and startup.

The control mode can be set to either of these:

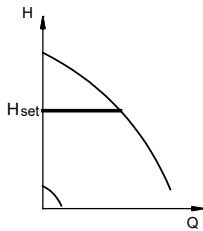
- constant pressure (factory setting)
- constant curve.

In constant-pressure mode, the pump maintains a preset pressure irrespective of the flow rate. See the figure below.

TM082930

TM084691

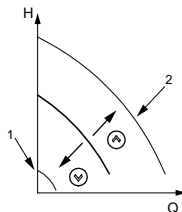
TM070573



TM009322

Constant-pressure mode

In constant-pressure mode, the pump is not controlled. It can be set to pump according to a preset pump characteristic curve within the range from the minimum curve to the maximum curve. See the figure below.



TM009323

Constant-curve mode

Pos.	Description
1	Min.
2	Max.

Related information

Examples of E-pump applications

E-pumps without a sensor

E-pumps without a sensor are suitable in these situations:

- Uncontrolled operation is required.
- The sensor has been retrofitted to control the flow rate, temperature, differential temperature, liquid level and pH value at some arbitrary point in the system.

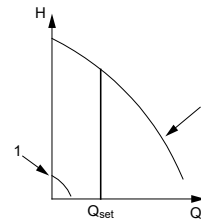
E-pumps without a sensor can be set to any of these control modes:

- constant pressure
- constant differential pressure
- constant temperature
- constant differential temperature
- constant flow rate
- constant level
- constant curve
- constant other value.

E-pumps without a sensor can be set to either of these control modes:

- controlled operation
- uncontrolled operation (factory setting).

In controlled-operation mode, the pump adjusts its performance to the desired setpoint. See the figure below.

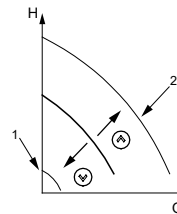


TM027264

Constant-flow mode

Pos.	Description
1	Min.
2	Max.

In uncontrolled-operation mode, the pump operates according to the constant curve set. See the figure below.



TM009323

Constant-curve mode

Pos.	Description
1	Min.
2	Max.

E-pumps can be fitted with a sensor type meeting the requirements mentioned in the Grundfos E-pumps data booklet available in Grundfos Product Center at www.grundfos.com.

9. Selection

Selection of pumps

Base the selection of pumps on these parameters:

- duty point of the pump
- sizing data such as pressure loss as a result of height differences, friction loss in the pipes, pump efficiency
- pump materials
- pump connections
- shaft seal.

Related information

[Duty point of the pump](#)

[Sizing data](#)

[Pump material](#)

[Pump connections](#)

[Shaft seal](#)

Duty point of the pump

From a duty point, you can select a pump on the basis of the curve charts in the section on performance curves and technical data.

Ideally, the duty point should match the best efficiency on the pump curve.

Related information

[Pump efficiency](#)

[CRE, CRIE, CRNE 1](#)

Grundfos Product Center

We recommend that you size your pump in Grundfos Product Center, which is a selection program offered by Grundfos.

Grundfos Product Center features a user-friendly and easy-to-use virtual guide which leads you through the selection of the pump for the application in question.

Related information

[14. Grundfos Product Center](#)

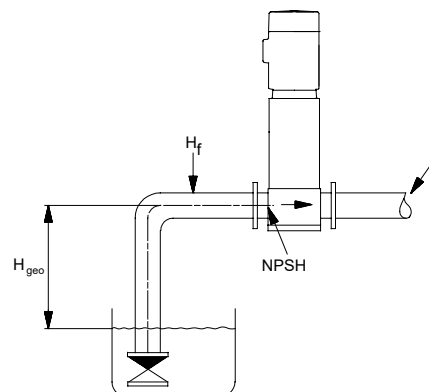
Sizing data

When sizing a pump, take these parameters into account:

- Required flow rate and pressure at the draw-off point.
- Pressure loss as a result of height differences (H_{geo}).
- Friction loss in the pipes (H_f).

It may be necessary to account for pressure loss in connection with long pipes, bends, valves or similar.

- Best efficiency at the estimated duty point.
- NPSH value.



Sizing data

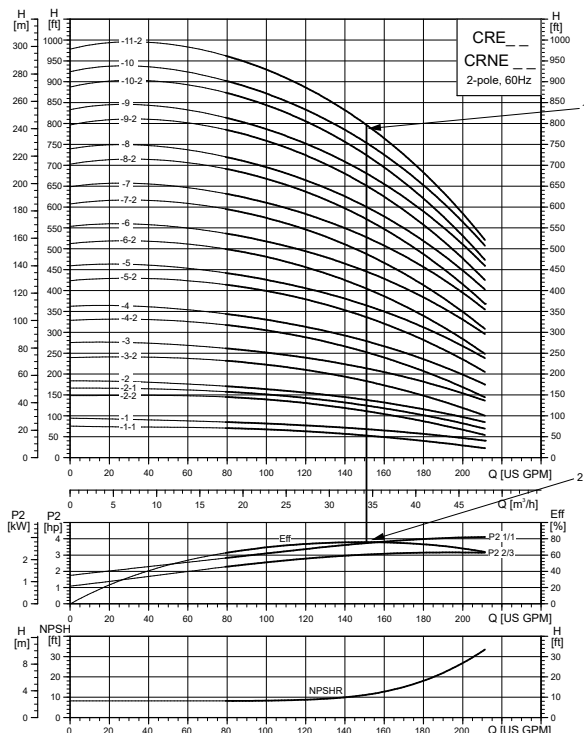
Pos.	Description
1	Required flow rate, required pressure

Related information

[Minimum inlet pressure - NPSHA](#)

Pump efficiency

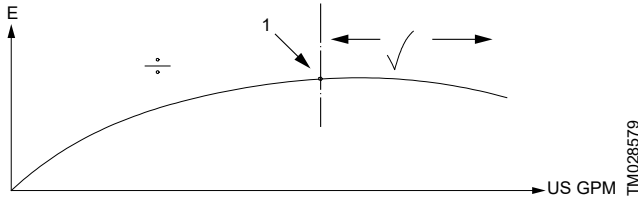
Before determining the best efficiency point, identify the operating pattern of the pump. If you expect the pump to always operate at the same duty point, then select a pump which operates at a duty point corresponding to the best efficiency of the pump.



Example of a CRE pump's duty point

Pos.	Description
1	Duty point
2	Best efficiency

As the pump is sized on the basis of the highest possible flow rate, it is important to always have the duty point to the right of the best efficiency point on the efficiency curve (Eff). This must be considered in order to keep the efficiency high when the flow rate drops.



Best efficiency

Pos.	Description
1	Best efficiency point

Affinity equations

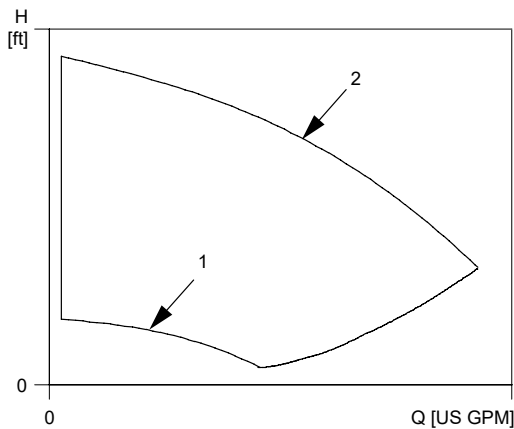
Normally, speed-regulated pumps are used in applications characterized by a variable flow rate. Consequently, you cannot select a pump that is constantly operating at its optimum efficiency.

To achieve optimum operating economy, select the pump on the basis of the following criteria:

- The maximum duty point must be as close to the QH curve of the pump as possible.
- The required duty point must be positioned so that P2 is close to the maximum point of the QH curve.

The flow rate of the required duty point must be close to the optimum efficiency (eta) for most operating hours.

Between the minimum and maximum performance curves, speed-regulated pumps have an infinite number of performance curves, each representing a specific speed. You may therefore not be able to select a duty point close to the maximum curve.



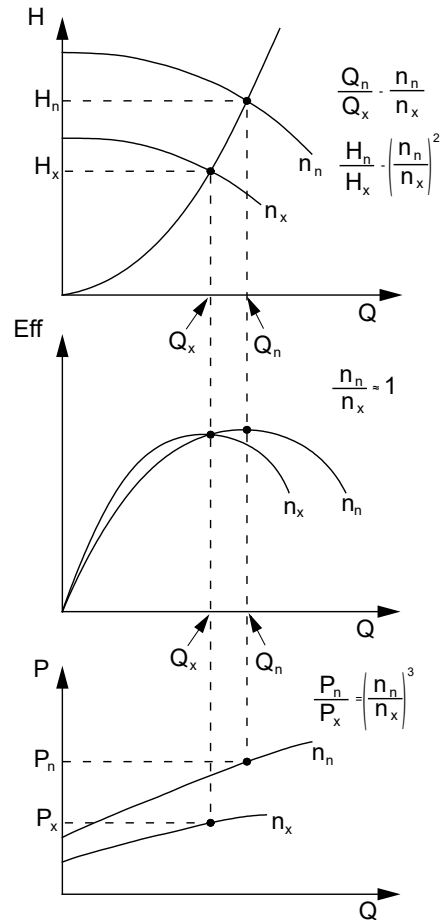
Maximum (1) and minimum (2) performance curves

In situations where you cannot select a duty point close to the maximum curve, use the affinity equations below. The head (H), the flow rate (Q) and the input power (P) are the appropriate variables for calculating the motor speed (n).

Note that the approximated formulas apply on condition that the system characteristic remains unchanged for n_n and n_x , and that it is based on the formula $H = k \times Q^2$ where k is a constant.

The power equation implies that the pump efficiency is unchanged at the two speeds. In practice, this is not quite correct.

To obtain a precise calculation of the power savings resulting from a reduction of pump speed, take into account the efficiencies of the frequency converter and the motor.



Affinity equations

Legend

H_n	Rated head [feet]
H_x	Current head [feet]
Q_n	Rated flow rate [gpm]
Q_x	Current flow rate [gpm]
n_n	Rated motor speed [rpm]
n_x	Current motor speed [rpm]
η_n	Rated efficiency [%]

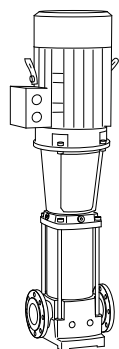
η_x	Current efficiency [%]
P_n	Rated power [hp]
P_x	Current power [hp]

Pump material

Select the material variant on the basis of the liquid to be pumped.

The product range covers the following basic types:

- CRE, CRIE: Use CRE, CRIE pumps for clean, non-aggressive liquids such as potable water and oils.
- CRNE: Use CRNE pumps for industrial liquids and acids. See the section on pumped liquids, or contact Grundfos.



CR pump

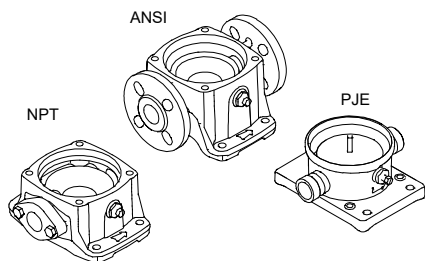
Related information

Pumped liquids

Pump connections

Selection of a pump connection depends on the rated pressure and pipes. To meet any requirement, the pumps offer a wide range of flexible connections, such as the following:

- oval flange (NPT)
- ANSI flange
- PJE coupling
- clamp coupling
- other connections on request.



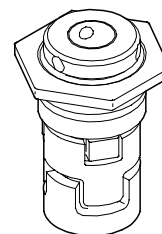
Pump connections

Shaft seal

As standard, the product range is fitted with a Grundfos shaft seal (cartridge type) which is suitable for the most common applications.

The following key parameters must be taken into account when selecting the shaft seal:

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



Shaft seal (cartridge type)

We offer a wide range of shaft seal variants to meet specific demands according to the pumped liquid.

Operating pressure and inlet pressure

Do not exceed the limit values for these pressures:

- maximum operating pressure
- maximum inlet pressure.

TM012100

TM020538

TM085158

Minimum inlet pressure - NPSHA

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

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

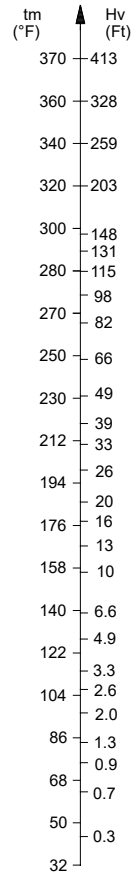
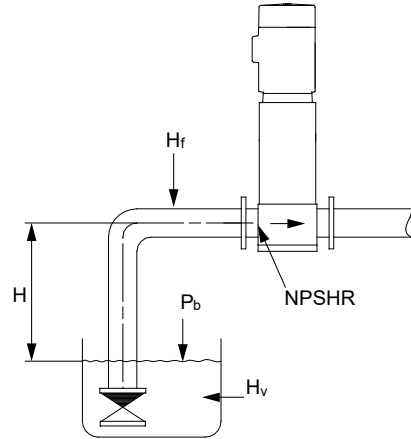
To avoid cavitation, make sure that there is a minimum pressure on the inlet side of the pump.

Calculate the maximum suction lift (H) in feet of head as follows:

- $H = p_b \times 2.31 - NPSHR - H_f - H_v$
- P_b = Barometric pressure in psi.
 P_b can be set to 14.7 psi at sea level.
 In closed systems, p_b indicates system pressure in feet.
- NPSHR** = Net Positive Suction Head Required in feet of head.
 To be read from the NPSHR curve at the highest flow rate the pump will be delivering.
- H_f = Friction loss in the inlet pipe in feet of head at the highest flow rate the pump will be delivering.
- H_v = Vapor pressure in feet of head.
 To be read from the vapor pressure scale. H_v depends on the liquid temperature T_m .

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

If the H calculated is negative, an inlet pressure of minimum H feet is required.



TM027729

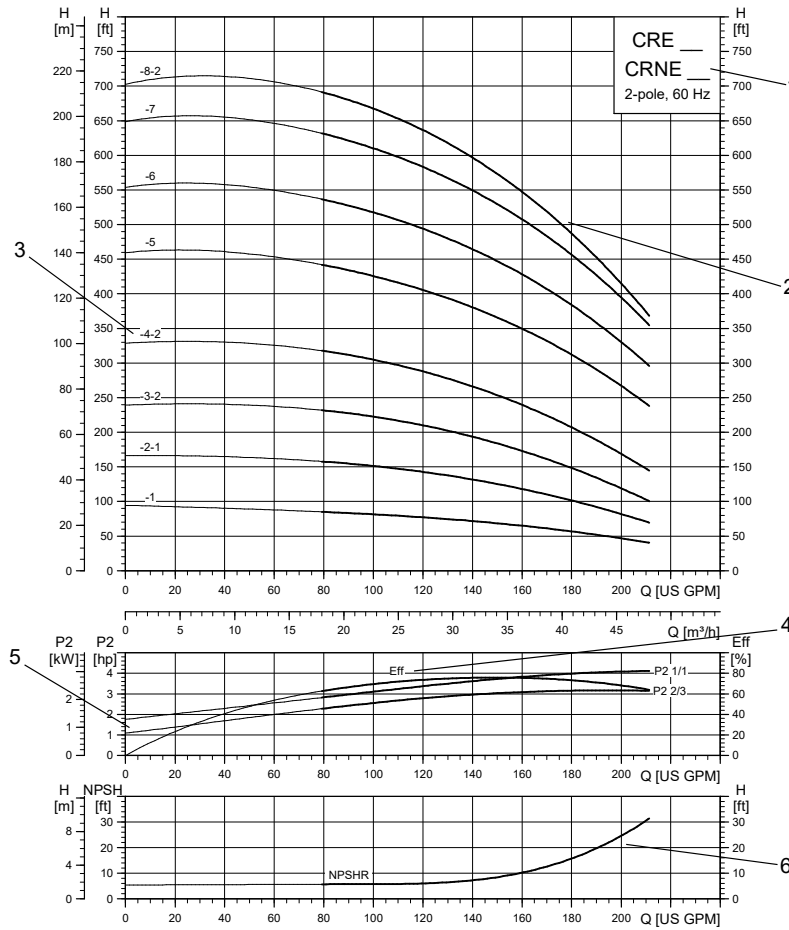
Minimum inlet pressure - NPSHR

Note that to avoid cavitation, never select a pump with a duty point too far to the right on the NPSHR curve. Always check the NPSHR value of the pump at the highest possible flow rate. In case a lower NPSHR value is required, see the section on lists of variants on request.

Related information

[Lists of variants on request](#)

How to read the curve charts



TM1040208

How to read the curve charts

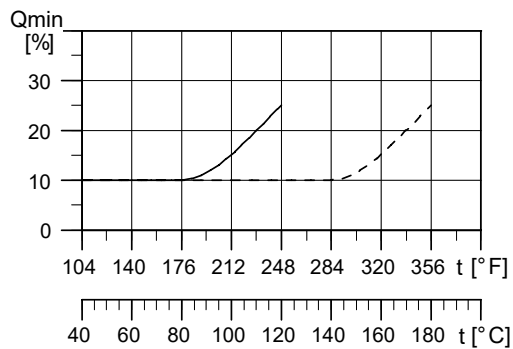
Pos.	Description
1	Pump type, number of poles and frequency.
2	QH curve for the individual pump. The bold curves indicate the recommended duty range for best efficiency.
3	Number of stages. First figure: number of stages. Second figure: number of reduced-diameter impellers.
4	The eff curve shows the efficiency of the pump with an average number of stages. The efficiency of pumps with reduced-diameter impellers is approximately 2 % lower than the eff curve shown in the chart.
5	The power curves indicate the pump input power per stage . Curves are shown for complete (1/1) and for reduced-diameter (2/3) impellers.
6	The NPSHR curve is a maximum curve for all the variants shown.

Guidelines to performance curves

The guidelines below apply to the performance curves:

- Tolerances to ANSI or ISO standards, such as ISO 9906:2012, Grade 3B, if indicated on the curve chart.
- The motors used for the measurements are standard Grundfos-specified motors.
- Measurements have been made with airless water at a temperature of 68 °F (20 °C).
- The curves apply to the following kinematic viscosity: $\nu = 1 \text{ mm}^2/\text{s}$ (1 cSt).
- Due to risk of overheating, the pumps must not be used at a flow rate below the minimum flow rate.
- The QH curves apply to a rated motor speed of a three-phase mains-operated motor. For realistic curves, go to the Grundfos Product Center (<http://product-selection.grundfos.com>) and insert data.

The curve below shows the minimum flow rate as a percentage of the rated flow rate in relation to the liquid temperature. The dotted line shows a CRN pump fitted with an air-cooled top assembly.

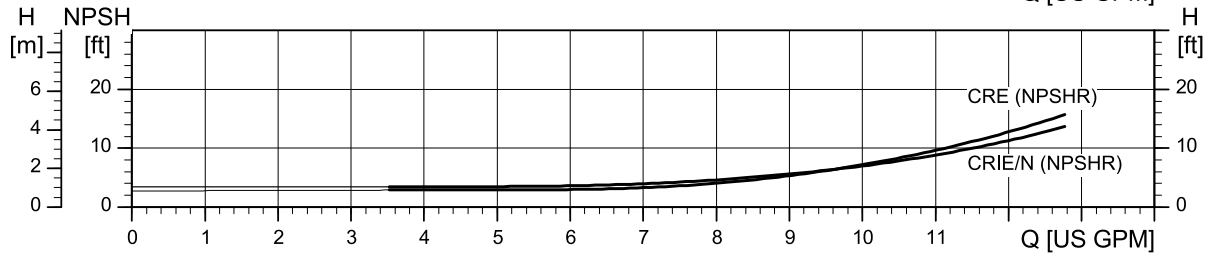
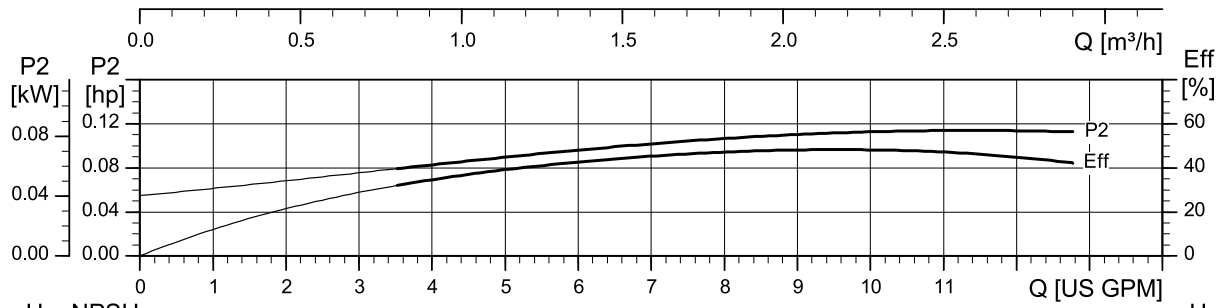
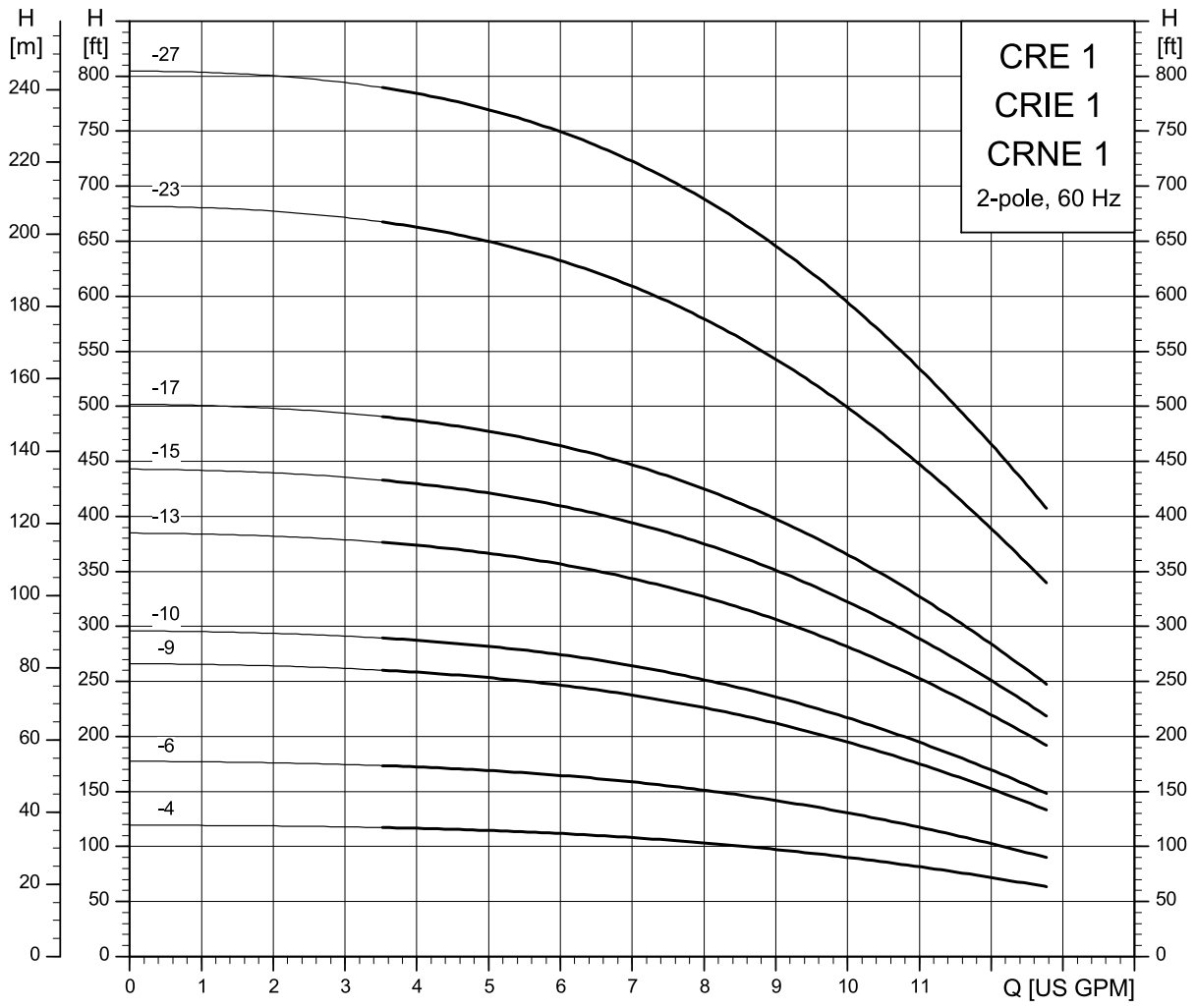


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Minimum flow rate

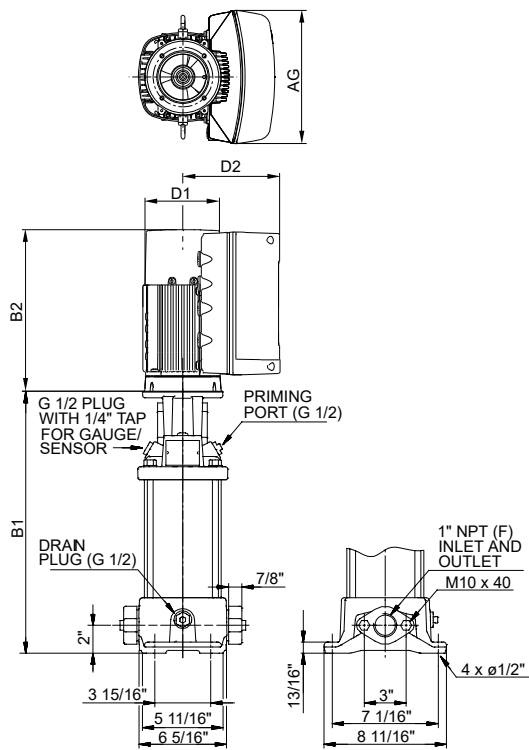
10. Performance curves and technical data

CRE, CRIE, CRNE 1

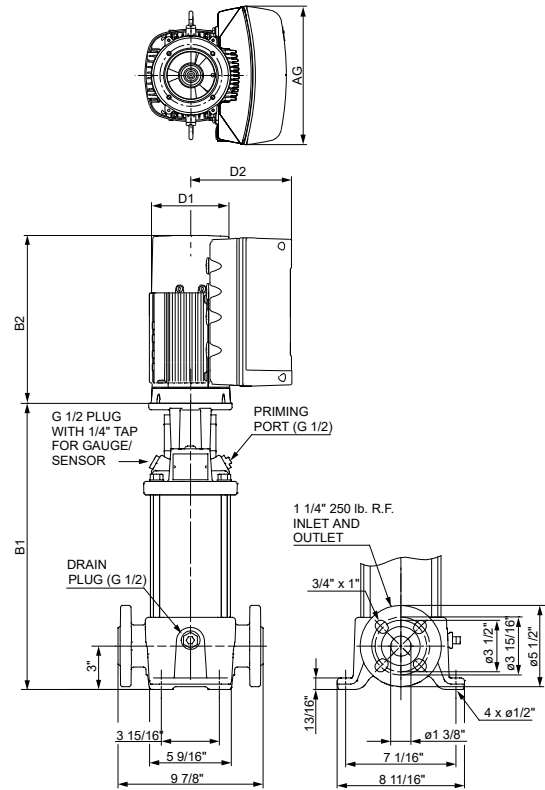


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CRE 1 dimensional data



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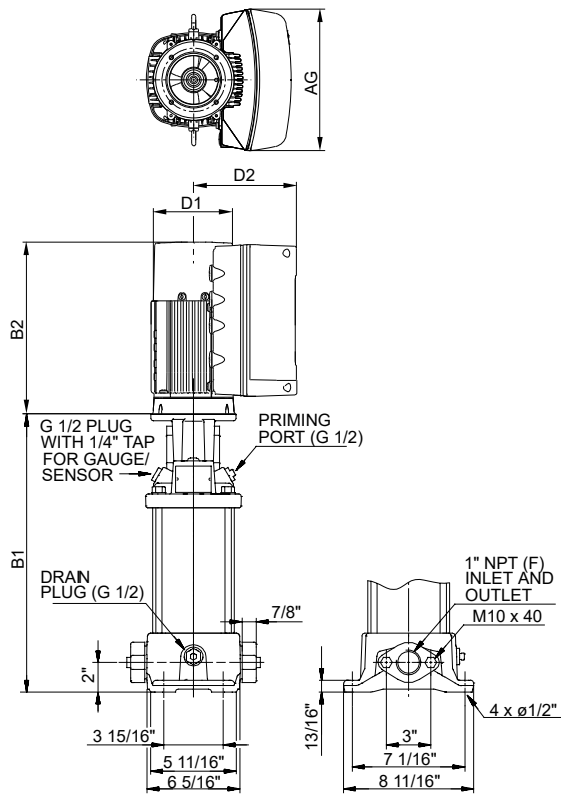
Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ²⁷⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 1-4	0.5	1	200-240	56C	*	12.68 (322.07)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	21.14 (536.96)	74 (33)
CRE 1-6	0.75	1	200-240	56C	*	14.09 (357.89)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	22.55 (572.77)	76 (34)
CRE 1-9	1	1	200-240	56C	*	16.22 (411.99)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	24.68 (626.87)	79 (36)
		3	440-480	56C	*	16.22 (411.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	26.26 (667)	83 (38)
CRE 1-10	1.5	3	200-240	56C	*	16.93 (430.02)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	26.97 (685.04)	85 (39)
		1	200-240	56C	*	19.06 (484.12)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	27.52 (699.01)	88 (40)
CRE 1-13	1.5	3	200-240	56C	*	19.06 (484.12)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	29.10 (739.14)	91 (41)
		3	440-480	56C	*	19.06 (484.12)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	29.10 (739.14)	92 (42)
CRE 1-15	2	3	200-240	56C	*	20.47 (519.94)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	31.30 (795.02)	97 (44)
		3	440-480	56C	*	20.47 (519.94)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	31.30 (795.02)	97 (44)
CRE 1-17	2	1	200-240	56C	*	21.89 (556.01)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	31.14 (790.96)	95 (43)
		3	200-240	56C	*	21.89 (556.01)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	32.72 (831.09)	99 (45)
		3	440-480	56C	*	21.89 (556.01)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	32.72 (831.09)	99 (45)

Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ²⁷⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 1-23	3	3	200-240	182TC	-	27.24 (691.90)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	40.39 (1025.91)	128 (58)
		3	440-480	182TC	-	27.24 (691.90)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	38.07 (966.98)	120 (54)
CRE 1-27	3	3	200-240	182TC	-	30.08 (764.03)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	48.23 (1225.04)	131 (59)
		3	440-480	182TC	-	30.08 (764.03)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	43.23 (1098.04)	123 (56)

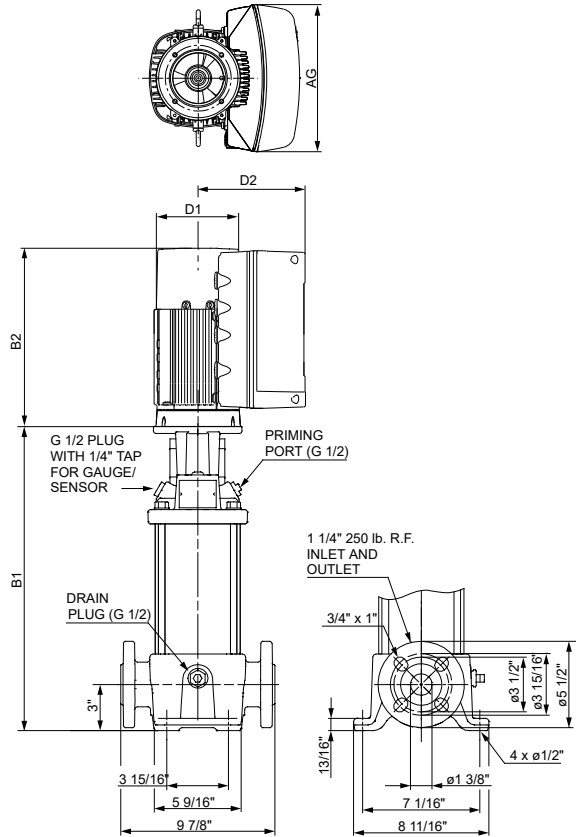
²⁷⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

* Available.

CRIE 1 dimensional data



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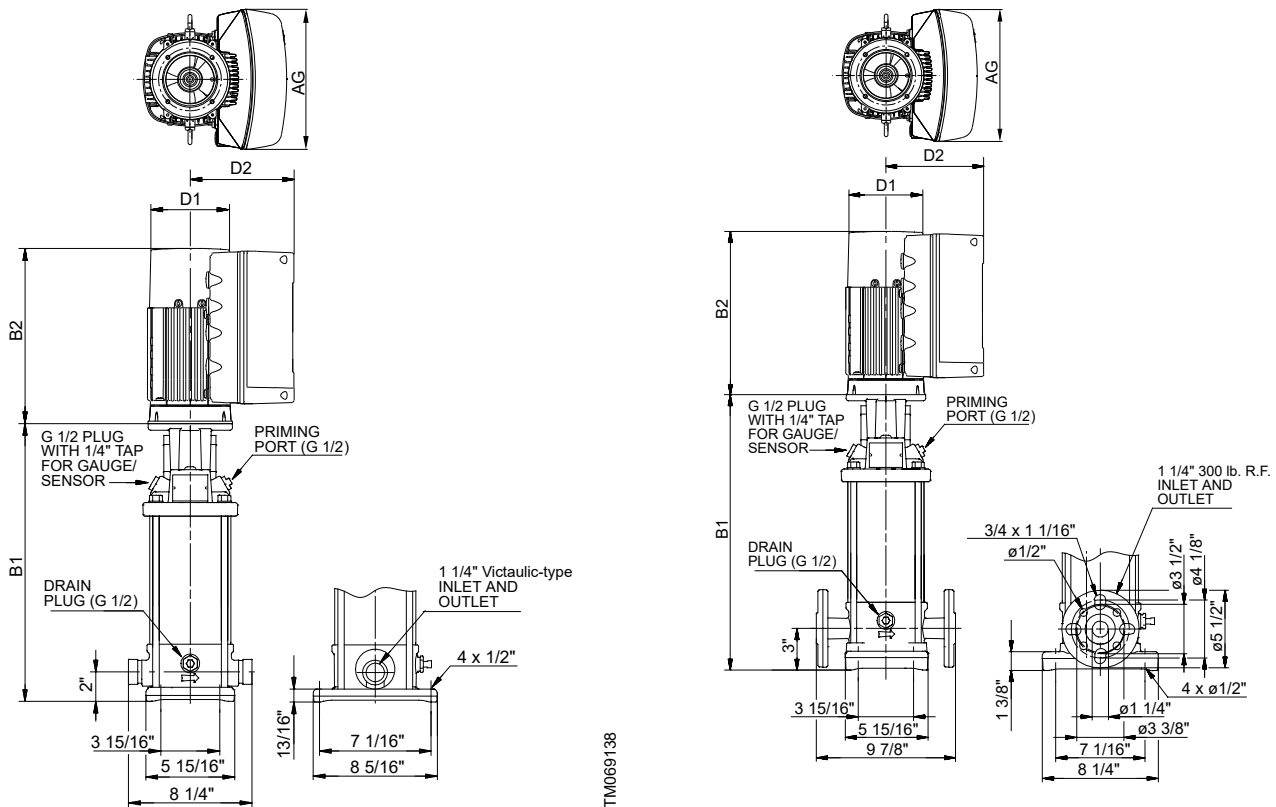
Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ²⁸⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 1-4	0.5	1	200-240	56C	*	12.80 (325)	4.80 (122)	6.22 (158)	8.34 (212)	21.26 (540)	69 (31)
CRIE 1-6	0.75	1	200-240	56C	*	14.21 (361)	4.80 (122)	6.22 (158)	8.34 (212)	22.67 (576)	71 (32)
CRIE 1-9	1	1	200-240	56C	*	16.34 (415)	4.80 (122)	6.22 (158)	8.34 (212)	24.80 (630)	74 (34)
		3	440-480	56C	*	16.34 (415)	4.80 (122)	6.22 (158)	10.56 (268)	26.38 (670)	78 (35)
CRIE 1-10	1.5	3	200-240	56C	*	17.05 (433)	4.80 (122)	6.22 (158)	10.56 (268)	27.09 (688)	80 (36)
		1	200-240	56C	*	19.17 (487)	4.80 (122)	6.22 (158)	8.34 (212)	27.63 (702)	83 (38)
CRIE 1-13	1.5	3	200-240	56C	*	19.17 (487)	4.80 (122)	6.22 (158)	10.56 (268)	29.21 (742)	86 (39)
		3	440-480	56C	*	19.17 (487)	4.80 (122)	6.22 (158)	10.56 (268)	29.21 (742)	86 (39)
CRIE 1-15	2	3	200-240	56C	*	20.59 (523)	4.80 (122)	6.22 (158)	10.56 (268)	31.42 (798)	92 (42)
		3	440-480	56C	*	20.59 (523)	4.80 (122)	6.22 (158)	10.56 (268)	31.42 (798)	92 (42)

Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ²⁸⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 1-17	2	1	200-240	56C	*	22.01 (559)	4.80 (122)	6.22 (158)	8.34 (212)	31.26 (794)	90 (41)
		3	200-240	56C	*	22.01 (559)	4.80 (122)	6.22 (158)	10.56 (268)	32.84 (834)	944 (428)
	3	440-480	56C	*	22.01 (559)	4.80 (122)	6.22 (158)	10.56 (268)	32.84 (834)	94 (43)	
CRIE 1-23	3	3	200-240	182TC	-	27.36 (695)	7.53 (191)	7.91 (201)	11.46 (291)	40.51 (1029)	121 (55)
		3	440-480	182TC	-	27.36 (695)	4.80 (122)	6.22 (158)	10.56 (268)	38.19 (970)	113 (51)
CRIE 1-27	3	3	200-240	182TC	-	30.20 (767)	7.53 (191)	7.91 (201)	11.46 (291)	43.35 (1101)	124 (56)
		3	440-480	182TC	-	30.20 (767)	4.80 (122)	6.22 (158)	10.56 (268)	41.03 (1042)	116 (53)

²⁸⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 7 lb (3 kg) less.

* Available.

CRNE 1 dimensional data



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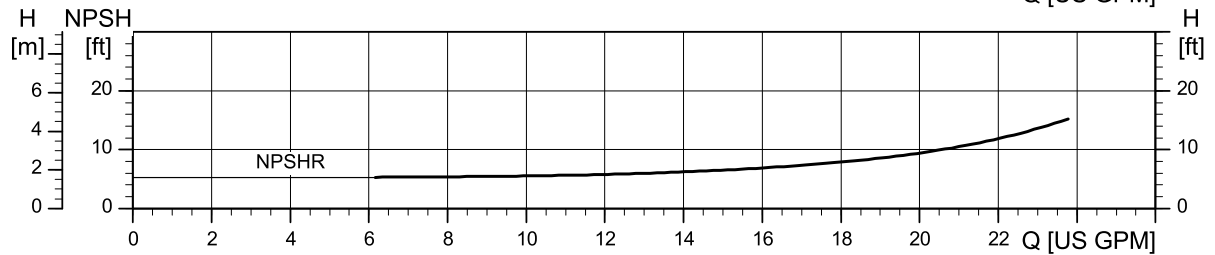
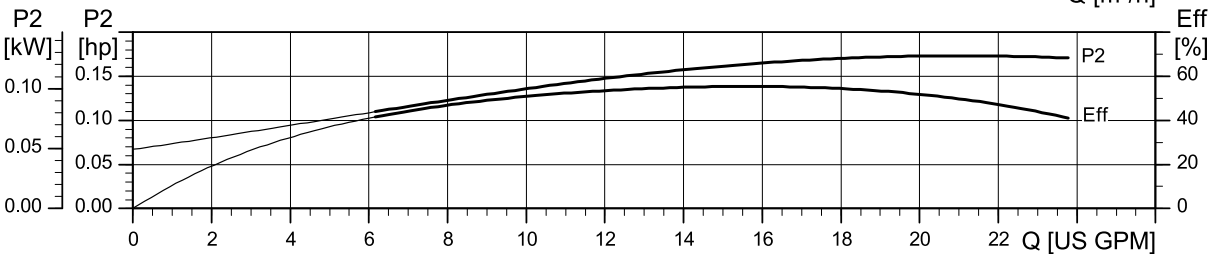
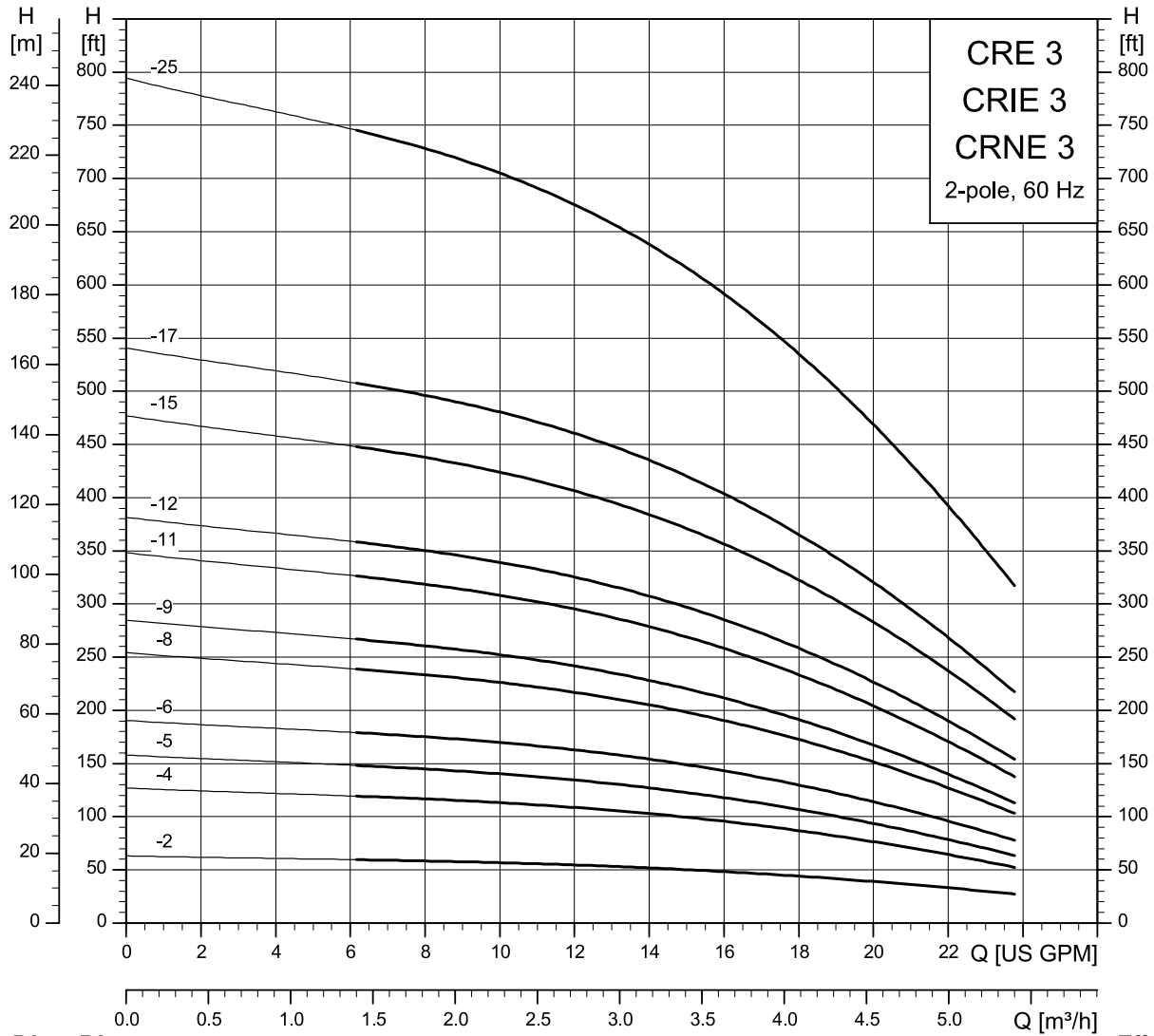
Pump type	[hp]	PH	Voltage [V]	Frame size	PJE ²⁹⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 1-4	0.5	1	200-240	56C	*	12.80 (325.12)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	21.26 (540.00)	69 (31)
CRNE 1-6	0.75	1	200-240	56C	*	14.21 (360.93)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	22.67 (575.82)	71 (32)
CRNE 1-9	1	1	200-240	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	24.80 (629.92)	74 (34)
		3	440-480	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	26.38 (670.05)	77 (35)
CRNE 1-10	1.5	3	200-240	56C	*	17.05 (433.07)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	27.09 (688.09)	80 (36)
CRNE 1-13	1.5	1	200-240	56C	*	19.17 (486.92)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	27.63 (701.80)	82 (37)
		3	200-240	56C	*	19.17 (486.92)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	29.21 (741.93)	86 (39)
		3	440-480	56C	*	19.17 (486.92)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	29.21 (741.93)	86 (39)
CRNE 1-15	2	3	200-240	56C	*	20.59 (522.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	31.42 (798.07)	91 (41.2)
		3	440-480	56C	*	20.59 (522.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	31.42 (798.07)	92 (41.7)
CRNE 1-17	2	1	200-240	56C	*	22.01 (559.05)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	31.26 (794.00)	90 (40)
		3	200-240	56C	*	22.01 (559.05)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	32.84 (834.14)	93 (42)
		3	440-480	56C	*	22.01 (559.05)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	32.84 (834.14)	94 (43)

Pump type	[hp]	PH	Voltage [V]	Frame size	PJE ²⁹⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 1-23	3	3	200-240	182TC	*	27.36 (694.94)	7.53 (10.09)	7.91 (200.91)	11.46 (291.08)	40.51 (1028.95)	120 (54)
		3	440-480	182TC	*	27.36 (694.94)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	38.19 (970.03)	112 (51)
CRNE 1-27	3	3	200-240	182TC	*	30.20 (767.08)	7.53 (10.09)	7.91 (200.91)	11.46 (291.08)	43.35 (1101.09)	124 (56)
		3	440-480	182TC	*	30.20 (767.08)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	41.03 (1042.16)	116 (53)

²⁹⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

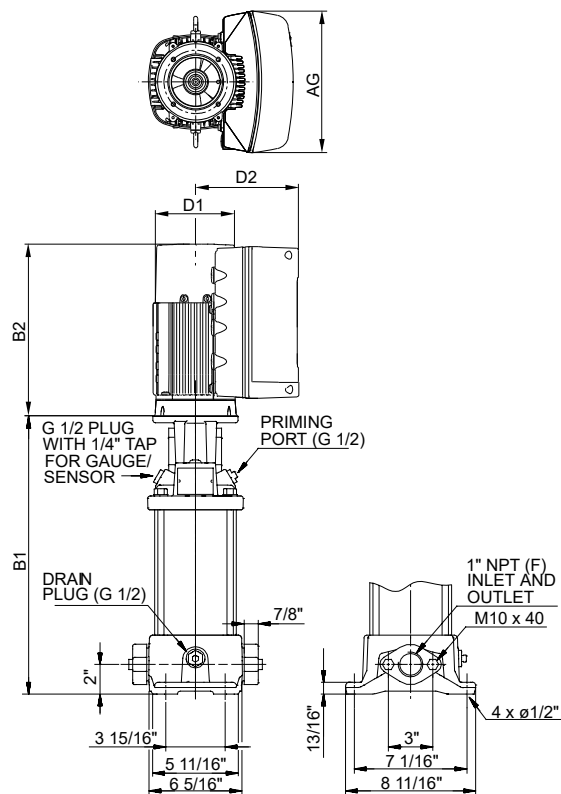
* Available.

CRE, CRIE, CRNE 3

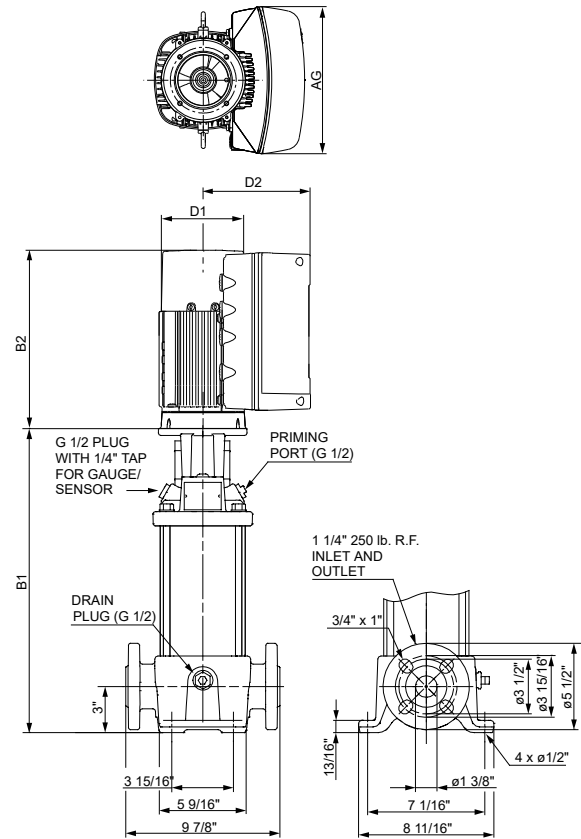


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CRE 3 dimensional data



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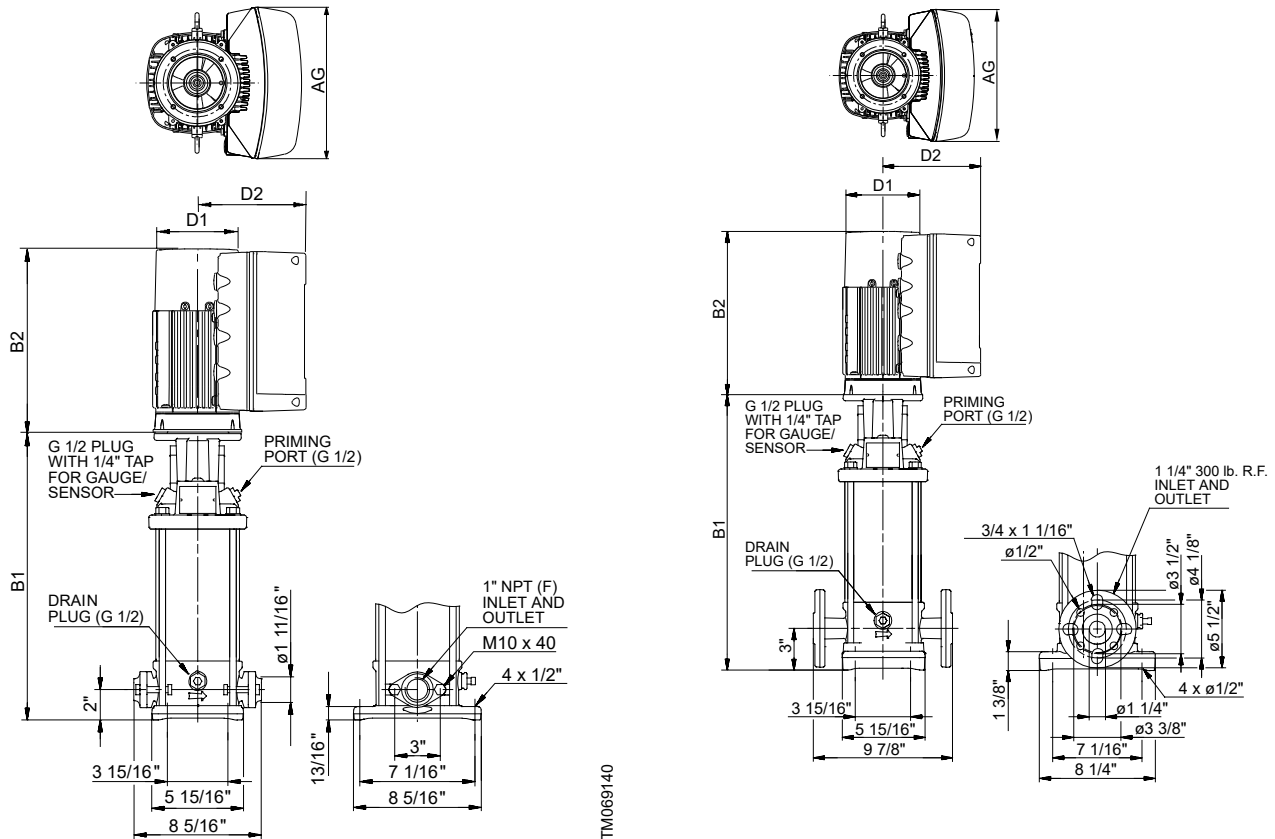
Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³⁰⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	Ship wt. [lbs (kg)]
CRE 3-2	0.5	1	200-240	56C	*	11.97 (304.04)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	20.43 (518.92)	73 (33.1)
CRE 3-4	0.75	1	200-240	56C	*	12.68 (322.07)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	21.14 (536.96)	74 (33)
CRE 3-5	1	1	200-240	56C	*	13.39 (340.11)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	21.85 (554.99)	75 (34)
CRE 3-6	1.5	3	200-240	56C	*	14.09 (357.89)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	24.13 (612.90)	82 (37)
	1	3	440-480	56C	*	14.09 (357.89)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	24.13 (612.90)	80 (36)
CRE 3-8	1.5	1	200-240	56C	*	15.51 (393.95)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	23.97 (608.84)	80 (36)
CRE 3-9	1.5	3	200-240	56C	*	16.22 (411.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	26.26 (667)	84 (38)
		3	440-480	56C	*	16.22 (411.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	26.26 (667)	85 (39)
CRE 3-11	2	1	200-240	56C	*	17.64 (448.06)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	26.89 (683.01)	90 (41)
CRE 3-12	2	3	200-240	56C	*	18.35 (466.09)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	29.18 (741.17)	94 (42)
		3	440-480	56C	*	18.35 (466.09)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	29.18 (741.17)	95 (43)

Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³⁰⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	Ship wt. [lbs (kg)]
CRE 3-15	3	3	200-240	182TC	*	21.57 (547.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	34.72 (881.89)	117 (53)
		3	440-480	182TC	*	21.57 (547.88)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	32.40 (822.96)	109 (49)
CRE 3-17	3	3	200-240	182TC	*	22.99 (583.95)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	36.14 (917.96)	119 (54)
		3	440-480	182TC	*	22.99 (583.95)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	33.82 (859.03)	111 (50)
CRE 3-25	5	3	200-240	182TC	-	28.66 (727.96)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	41.81 (1061.97)	136 (62)
		3	440-480	182TC	-	28.66 (727.96)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	41.81 (1061.97)	147 (67)

³⁰⁾For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

* Available.

CRIE 3 dimensional data



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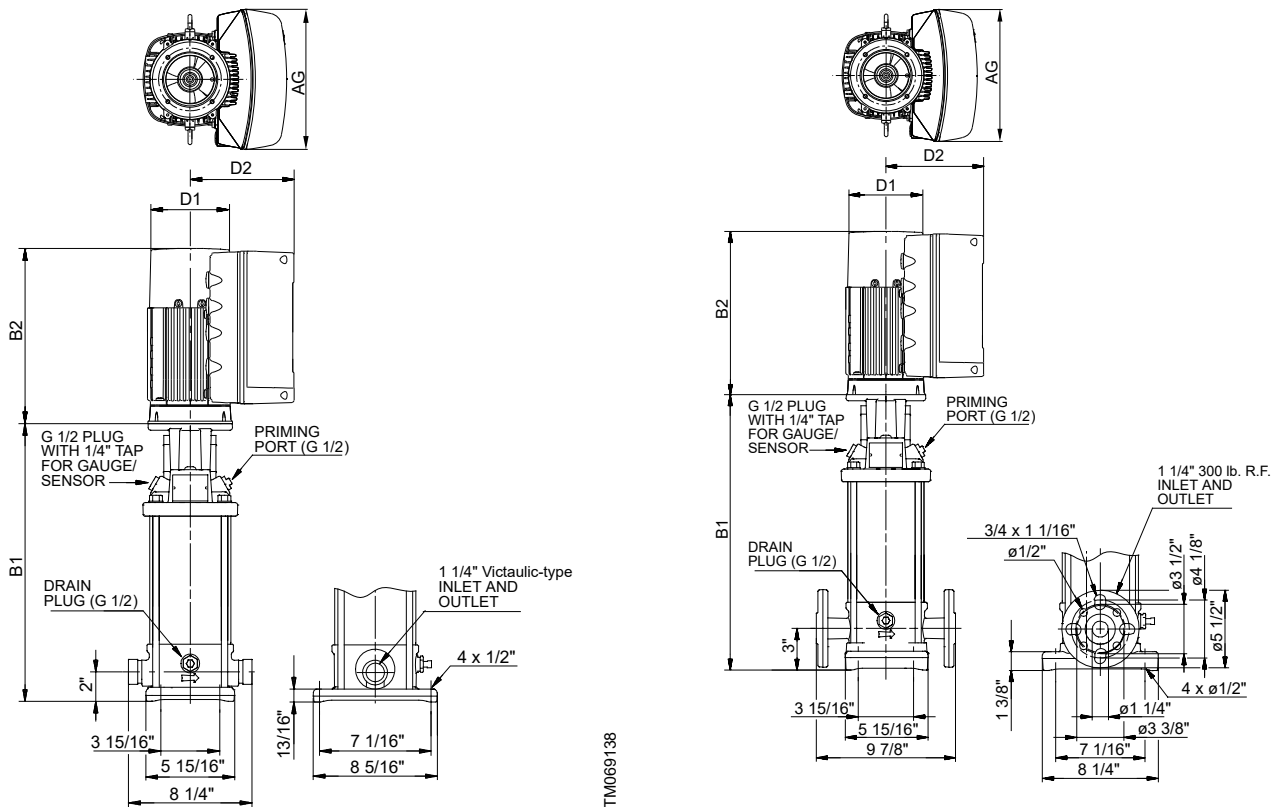
Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³¹⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 3-2	0.5	1	200-240	56C	*	12.09 (307)	4.80 (122)	6.22 (158)	8.34 (212)	20.55 (522)	68 (30)
CRIE 3-4	0.75	1	200-240	56C	*	12.80 (325)	4.80 (122)	6.22 (158)	8.34 (212)	21.26 (540)	69 (31)
CRIE 3-5	1	1	200-240	56C	*	13.50 (343)	4.80 (122)	6.22 (158)	8.34 (212)	21.96 (558)	70 (32)
CRIE 3-6	1.5	3	200-240	56C	*	14.21 (361)	4.80 (122)	6.22 (158)	10.56 (268)	24.25 (616)	76 (34.4)
	1	3	440-480	56C	*	14.21 (361)	4.80 (122)	6.22 (158)	10.56 (268)	24.25 (616)	75 (34)
CRIE 3-8	1.5	1	200-240	56C	*	15.63 (397)	4.80 (122)	6.22 (158)	8.34 (212)	24.09 (612)	75 (34)
CRIE 3-9	1.5	3	200-240	56C	*	16.34 (415)	4.80 (122)	6.22 (158)	10.56 (268)	26.38 (670)	79 (36)
		3	440-480	56C	*	16.34 (415)	4.80 (122)	6.22 (158)	10.56 (268)	26.38 (670)	79 (36)
CRIE 3-11	2	1	200-240	56C	*	17.76 (451)	4.80 (122)	6.22 (158)	8.34 (212)	27.01 (686)	84 (38)
CRIE 3-12	2	3	200-240	56C	*	18.46 (469)	4.80 (122)	6.22 (158)	10.56 (268)	29.29 (744)	89 (40)
		3	440-480	56C	*	18.46 (469)	4.80 (122)	6.22 (158)	10.56 (268)	29.29 (744)	89 (40)

Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³¹⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 3-15	3	3	200-240	182TC	*	21.69 (551)	7.53 (191)	7.91 (201)	11.46 (291)	34.84 (885)	110 (50)
		3	440-480	182TC	*	21.69 (551)	4.80 (122)	6.22 (158)	10.56 (268)	32.52 (826)	102 (46)
CRIE 3-17	3	3	200-240	182TC	*	23.11 (587)	7.53 (191)	7.91 (201)	11.46 (291)	36.26 (921)	112 (51)
		3	440-480	182TC	*	23.11 (587)	4.80 (122)	6.22 (158)	10.56 (268)	33.94 (862)	104 (47)
CRIE 3-25	5	3	200-240	182TC	-	28.78 (731)	7.53 (191)	7.91 (201)	11.46 (291)	41.93 (1065)	129 (59)
		3	440-480	182TC	-	28.78 (731)	7.53 (191)	7.91 (201)	11.46 (291)	41.93 (1065)	140 (64)

³¹⁾For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

* Available.

CRNE 3 dimensional data



TM069138

TM069139

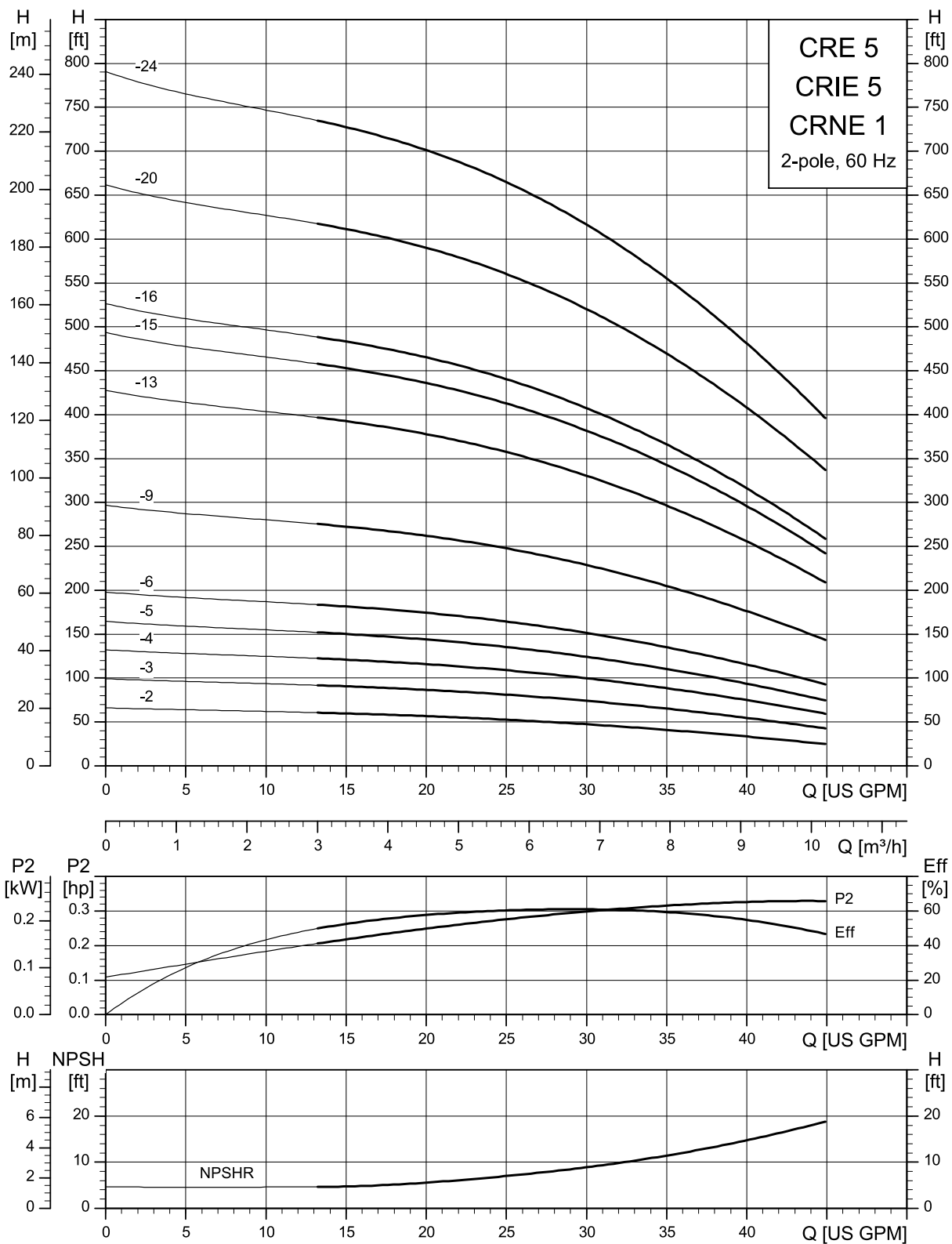
Pump type	[hp]	PH	Voltage [V]	Frame size	PJE ³²⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 3-2	0.5	1	200-240	56C	*	12.09 (307.09)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	20.55 (521.97)	68 (30)
CRNE 3-4	0.75	1	200-240	56C	*	12.80 (325.12)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	21.26 (540)	69 (31)
CRNE 3-5	1	1	200-240	56C	*	13.50 (342.90)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	21.96 (557.78)	70 (32)
CRNE 3-6	1.5	3	200-240	56C	*	14.21 (360.93)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	24.25 (615.95)	76 (34.4)
	1	3	440-480	56C	*	14.21 (360.93)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	24.25 (615.95)	75 (34)
CRNE 3-8	1.5	1	200-240	56C	*	15.63 (397)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	24.09 (611.89)	74 (33)
		3	200-240	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	26.38 (670.05)	79 (36)
CRNE 3-9	1.5	3	440-480	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	26.38 (670.05)	79 (36)
		3	440-480	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	26.38 (670.05)	79 (36)
CRNE 3-11	2	1	200-240	56C	*	17.76 (451.10)	4.80 (121.92)	6.22 (157.99)	8.34 (211.84)	27.01 (686.05)	84 (38)
CRNE 3-12	2	3	200-240	56C	*	18.46 (468.88)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	29.29 (743.97)	89 (408)
		3	440-480	56C	*	18.46 (468.88)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	29.29 (743.97)	89 (40)
CRNE 3-15	3	3	200-240	182TC	*	21.69 (550.93)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	34.84 (884.94)	110 (50)
		3	440-480	182TC	*	21.69 (550.93)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	32.52 (826.01)	102 (46)

Pump type	[hp]	PH	Voltage [V]	Frame size	PJE ³²⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 3-17	3	3	200-240	182TC	*	23.11 (586.99)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	36.26 (921)	112 (51)
		3	440-480	182TC	*	23.11 (586.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268.22)	33.94 (862.08)	103 (47)
CRNE 3-25	5	3	200-240	182TC	*	28.78 (731.01)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	41.93 (1065.02)	129 (58)
		3	440-480	182TC	*	28.78 (731.01)	7.53 (191.26)	7.91 (200.91)	11.46 (291.08)	41.93 (1065.02)	140 (64)

³²⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

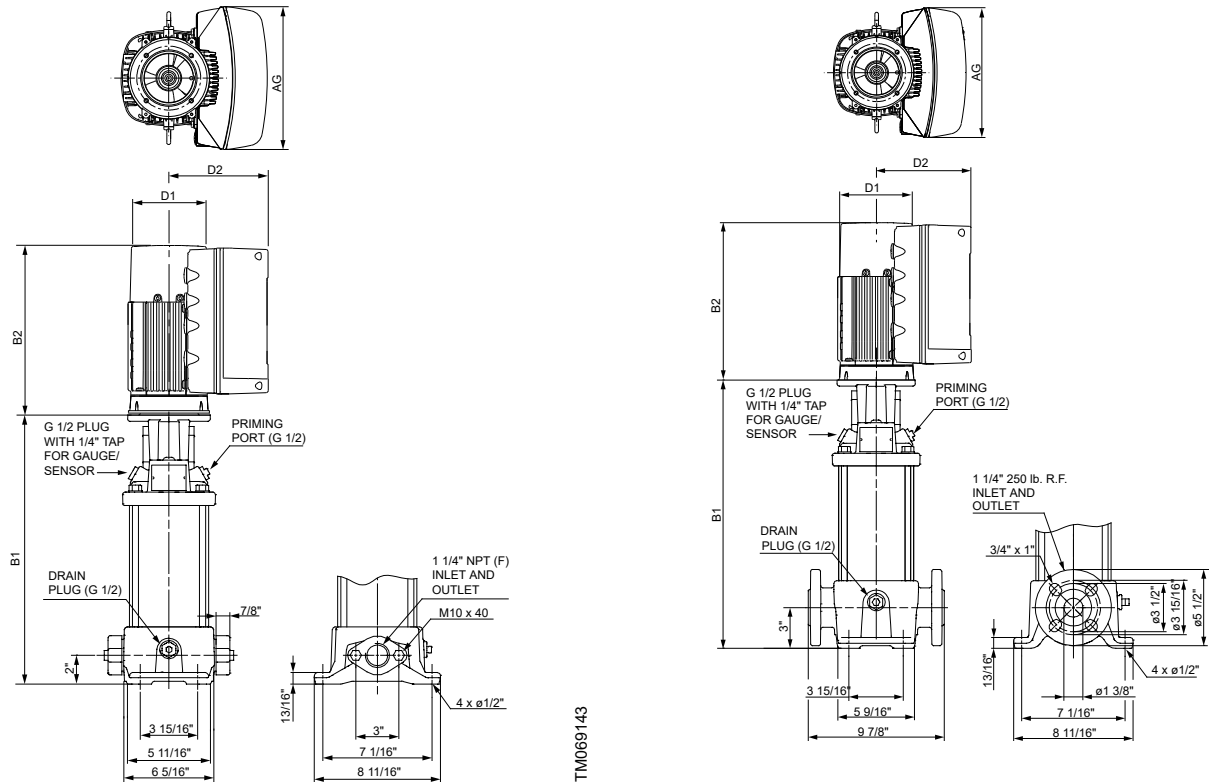
* Available.

CRE, CRIE, CRNE 5



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CRE 5 dimensional data



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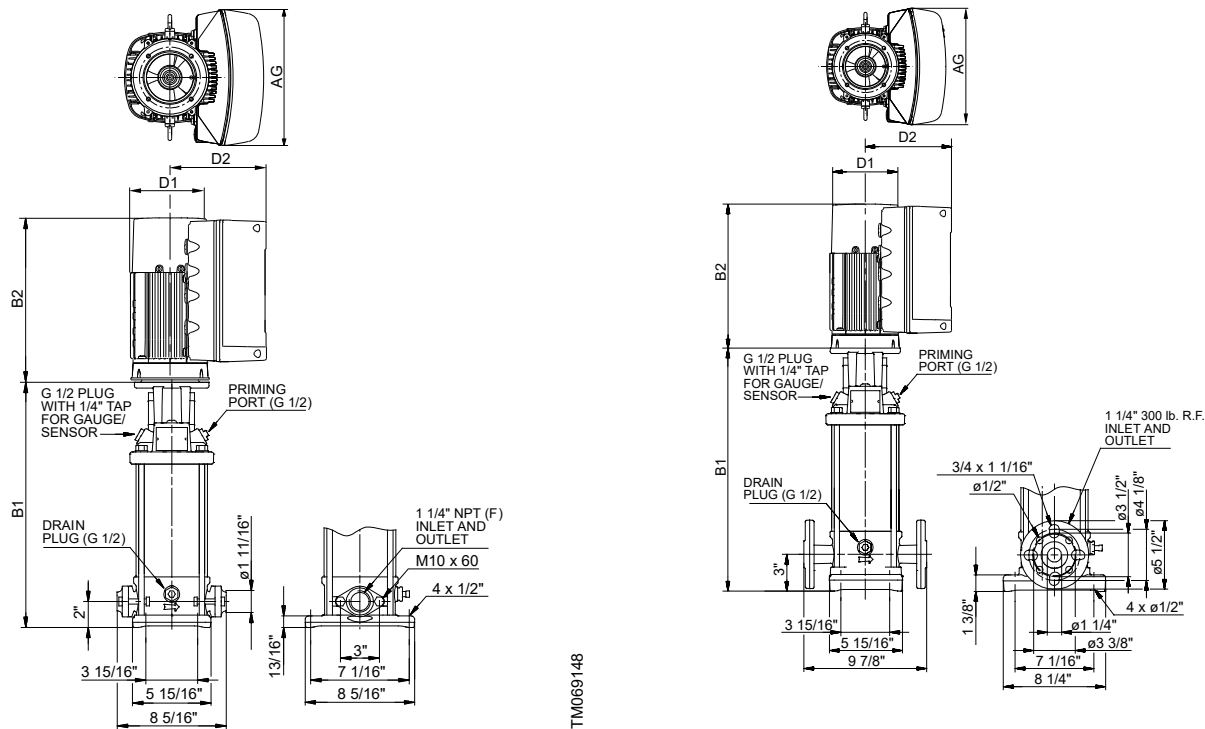
Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³³⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 5-2	0.75	1	200-240	56C	*	11.97 (304.04)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	20.43 (518.92)	73 (33)
CRE 5-3	1.5	3	200-240	56C	*	13.03 (330.96)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	23.07 (585.98)	80 (36)
	1	3	440-480	56C	*	13.03 (330.96)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	23.07 (585.98)	79 (36)
CRE 5-4	1.5	1	200-240	56C	*	14.09 (357.89)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	22.55 (572.77)	78 (35)
		3	200-240	56C	*	14.09 (357.89)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	24.13 (612.90)	81 (37)
		3	440-480	56C	*	14.09 (357.89)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	24.13 (612.90)	82 (37)
CRE 5-5	2	1	200-240	56C	*	15.16 (385.06)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	24.41 (620.01)	83 (38)
CRE 5-6	2	3	200-240	56C	*	16.22 (411.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.05 (687.07)	91 (41)
		3	440-480	56C	*	16.22 (411.99)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.05 (687.07)	91 (41)
CRE 5-9	3	3	200-240	182TC	*	20.51 (520.95)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.66 (854)	115 (52)
		3	440-480	182TC	*	20.51 (520.95)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	31.34 (796.04)	107 (48)
CRE 5-13	5	3	200-240	182TC	*	24.76 (628.90)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	37.91 (962.91)	130 (59)
		3	440-480	182TC	*	24.76 (628.90)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	37.91 (962.91)	141 (64)

Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³³⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 5-16	5	3	200-240	182TC	*	27.95 (709.93)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	41.10 (1043.94)	133 (60)
		3	440-480	182TC	*	27.95 (709.93)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	41.10 (1043.94)	145 (66)
CRE 5-20	7.5	3	200-240	213TC	-	32.72 (831.09)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	48.03 (1219.96)	184 (83)
		3	440-480	213TC	-	32.72 (831.09)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	47.09 (1196.09)	175 (79)
CRE 5-24	7.5	3	200-240	213TC	-	36.97 (939.04)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	52.28 (1327.91)	264 (120)
		3	440-480	213TC	-	36.97 (939.04)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	51.34 (1304.04)	255 (116)

³³⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

* Available.

CRIE 5 dimensional data



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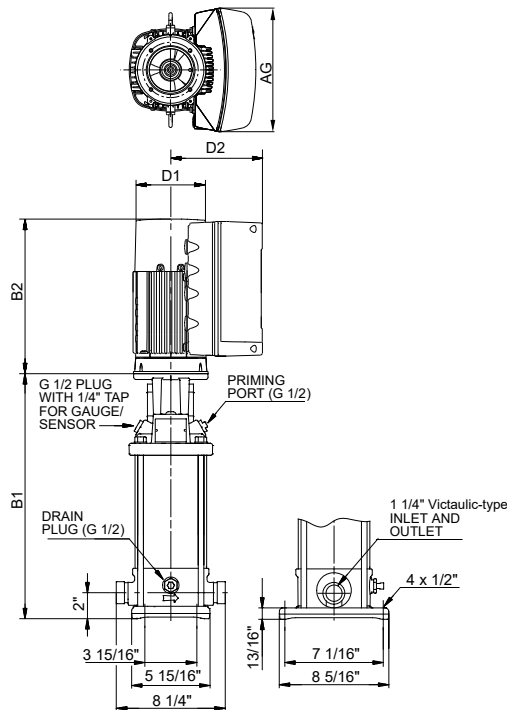
Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³⁴⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 5-2	0.75	1	200-240	56C	*	12.09 (307)	4.80 (122)	6.22 (158)	8.34 (212)	20.55 (522)	68 (31)
CRIE 5-3	1.5	3	200-240	56C	*	13.15 (334)	4.80 (122)	6.22 (158)	10.56 (268)	23.19 (589)	75 (34)
	1	3	440-480	56C	*	13.15 (334)	4.80 (122)	6.22 (158)	10.56 (268)	23.19 (589)	73 (33)
CRIE 5-4	1.5	1	200-240	56C	*	14.21 (361)	4.80 (122)	6.22 (158)	8.34 (212)	22.67 (576)	72 (32)
		3	440-480	56C	*	14.21 (361)	4.80 (122)	6.22 (158)	10.56 (268)	24.25 (616)	76 (34.4)
CRIE 5-5	2	1	200-240	56C	*	15.28 (388)	4.80 (122)	6.22 (158)	8.34 (212)	24.53 (623)	78 (35)
CRIE 5-6	2	3	200-240	56C	*	16.34 (415)	4.80 (122)	6.22 (158)	10.56 (268)	27.17 (690)	86 (39)
		3	440-480	56C	*	16.34 (415)	4.80 (122)	6.22 (158)	10.56 (268)	27.17 (690)	86 (39)
CRIE 5-9	3	3	200-240	182TC	*	20.63 (524)	7.53 (191)	7.91 (201)	11.46 (291)	33.78 (858)	108 (49)
		3	440-480	182TC	*	20.63 (524)	4.80 (122)	6.22 (158)	10.56 (268)	31.46 (799)	100 (45)
CRIE 5-13	5	3	200-240	182TC	*	24.88 (632)	7.53 (191)	7.91 (201)	11.46 (291)	38.03 (966)	123 (56)
		3	440-480	182TC	*	24.88 (632)	7.53 (191)	7.91 (201)	11.46 (291)	38.03 (966)	134 (61)

Pump type	[hp]	PH	Voltage [V]	Frame size	Oval ³⁴⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 5-16	5	3	200-240	182TC	*	28.07 (713)	7.53 (191)	7.91 (201)	11.46 (291)	41.22 (1047)	126 (57)
		3	440-480	182TC	*	28.07 (713)	7.53 (191)	7.91 (201)	11.46 (291)	41.22 (1047)	138 (63)
CRIE 5-20	7.5	3	200-240	213TC	-	32.83 (834)	10.04 (255)	9.33 (237)	13.62 (346)	48.14 (1223)	177 (80)
		3	440-480	213TC	-	32.83 (834)	7.53 (191)	7.91 (201)	11.46 (291)	47.20 (1199)	168 (76)
CRIE 5-24	7.5	3	200-240	213TC	-	37.09 (942)	10.04 (255)	9.33 (237)	13.62 (346)	52.40 (1331)	257 (117)
		3	440-480	213TC	-	37.09 (942)	7.53 (191)	7.91 (201)	11.46 (291)	51.46 (1307)	248 (112)

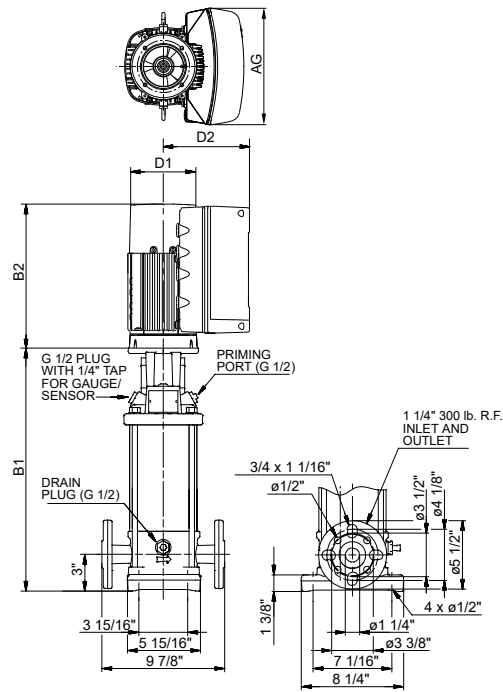
³⁴⁾For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

* Available.

CRNE 5 dimensional data



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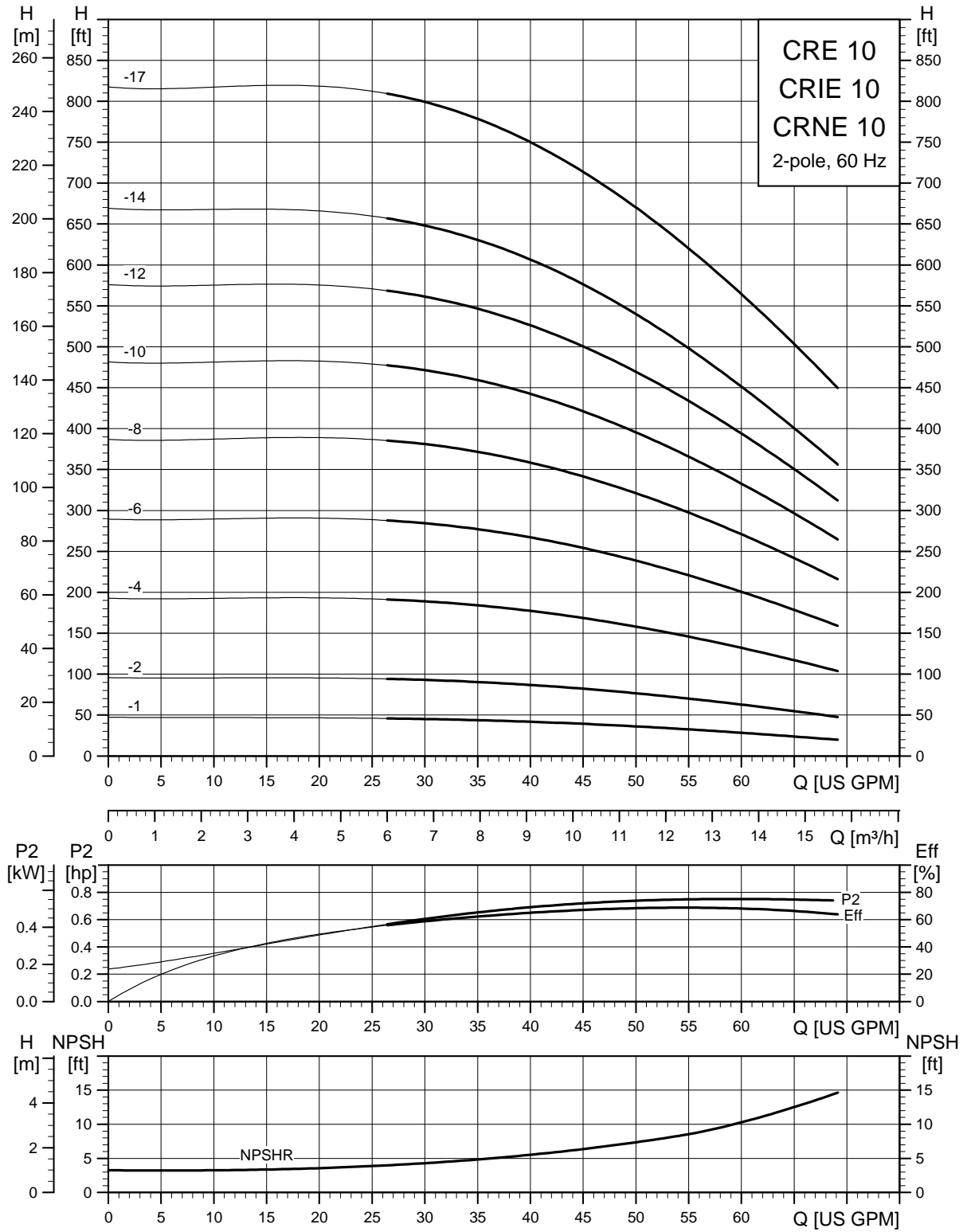
TM069139

Pump type	[hp]	PH	Voltage [V]	Frame size	PJE	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 5-2	0.75	1	200-240	56C	*	12.09 (307.09)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	20.55 (521.97)	68 (31)
CRNE 5-3	1.5	3	200-240	56C	*	13.15 (334.01)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	23.19 (589.03)	75 (34)
	1	3	440-480	56C	*	13.15 (334.01)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	23.19 (589.03)	73 (33)
CRNE 5-4	1.5	1	200-240	56C	*	14.21 (360.93)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	22.67 (575.82)	72 (32)
		3	200-240	56C	*	14.21 (360.93)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	24.25 (615.95)	76 (34.4)
CRNE 5-5	2	1	200-240	56C	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	24.53 (623.06)	77 (35)
		3	200-240	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.17 (690.12)	86 (39)
CRNE 5-6	2	3	440-480	56C	*	16.34 (415.04)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.17 (690.12)	86 (39)
		3	200-240	182TC	*	20.63 (524)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.78 (858)	108 (49)
CRNE 5-9	3	3	440-480	182TC	*	20.63 (524)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	31.46 (799.08)	100 (45)
		3	200-240	182TC	*	24.88 (631.95)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	38.03 (965.96)	123 (56)
CRNE 5-13	5	3	440-480	182TC	*	24.88 (631.95)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	38.03 (965.96)	134 (61)
		3	200-240	182TC	*	28.07 (712.98)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	41.22 (1046.99)	126 (57)
CRNE 5-16	5	3	440-480	182TC	*	28.07 (712.98)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	41.22 (1046.99)	138 (63)

Pump type	[hp]	PH	Voltage [V]	Frame size	PJE	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 5-20	7.5	3	200-240	213TC	*	32.83 (833.88)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	48.14 (1222.76)	176 (80)
		3	440-480	213TC	*	32.83 (833.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	47.20 (1198.88)	167 (76)
CRNE 5-24	7.5	3	200-240	213TC	*	37.09 (942.09)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	52.40 (1330.96)	256 (116)
		3	440-480	213TC	*	37.09 (942.09)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	51.46 (1307.08)	247 (112)

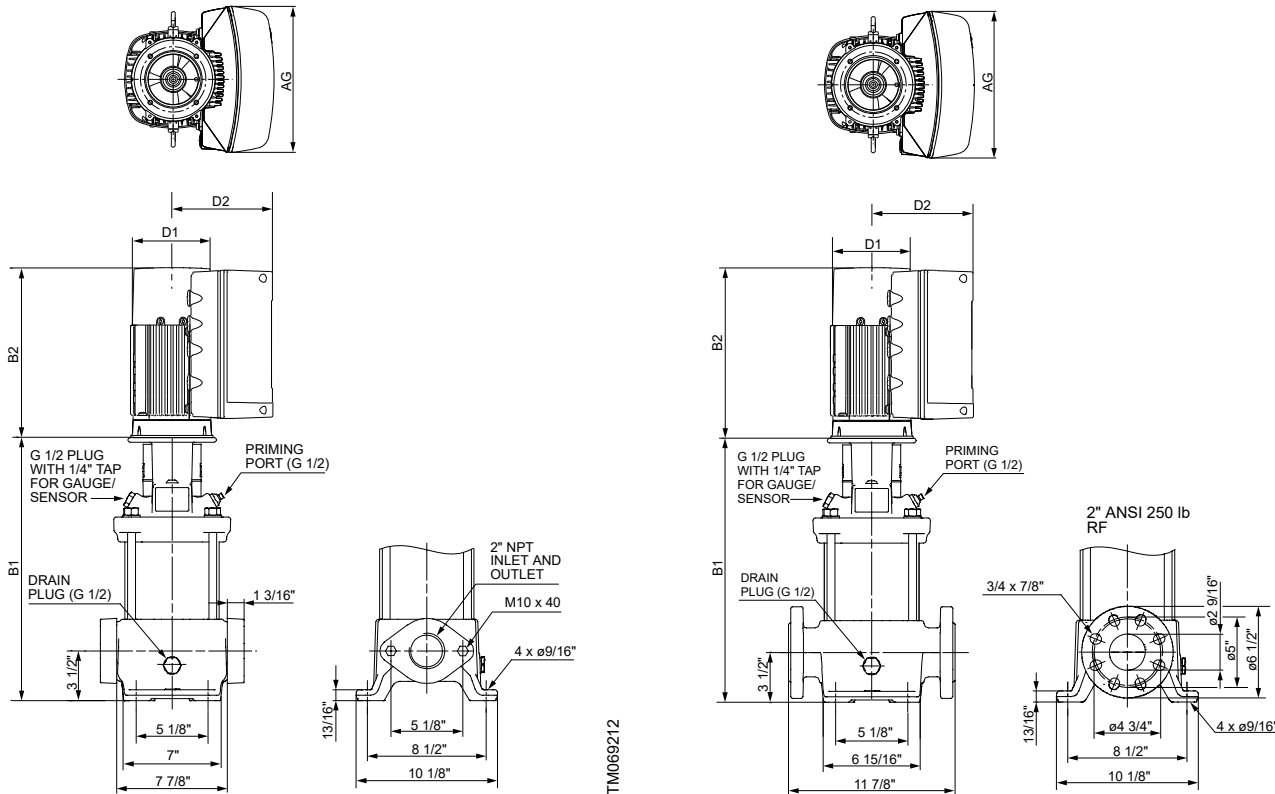
* Available.

CRE, CRIE, CRNE 10



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CRE 10 dimensional data



TM069212

TM069217

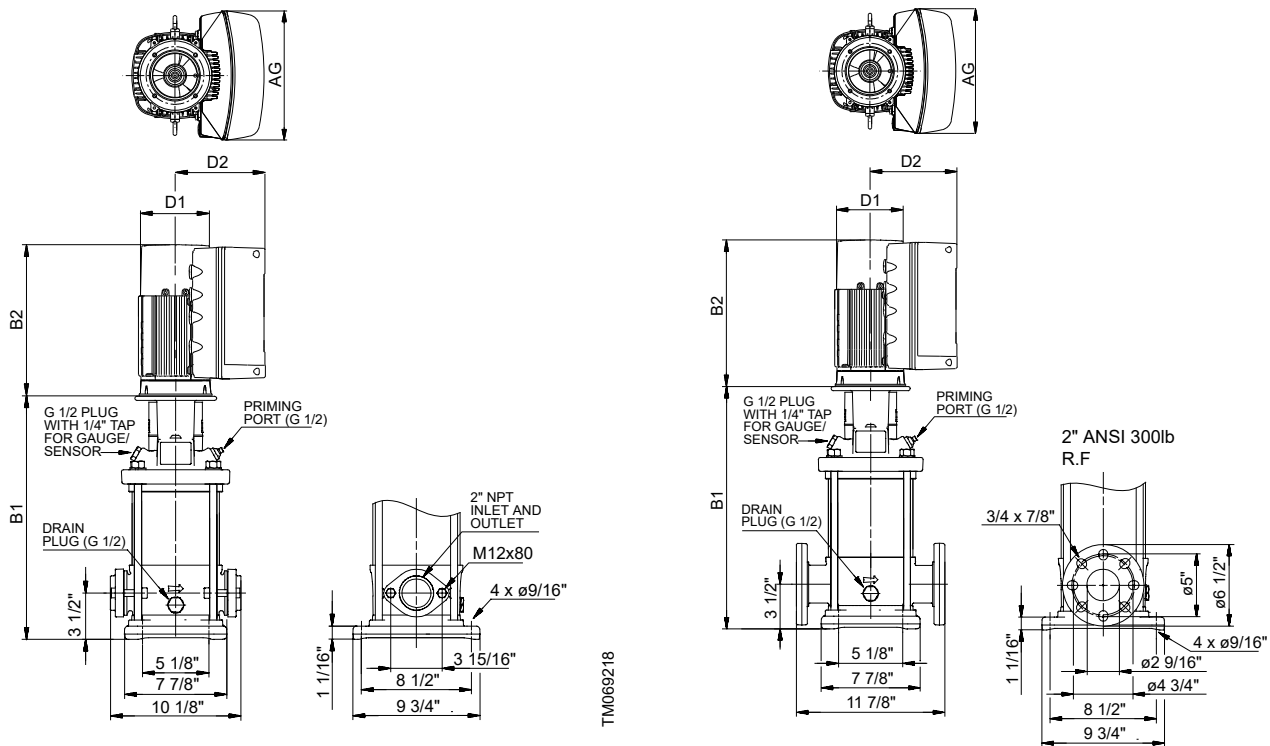
Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	Oval ³⁵⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 10-1	1	1	200-240	56C	0.42	3.66 (92.90)	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	23.74 (603)	111 (50)
	1.5	3	200-240	56C	0.43	3.66 (92.90)	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.32 (643.13)	116 (53)
	1	3	440-480	56C	0.41	3.66 (92.90)	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.32 (643.13)	114 (52)
CRE 10-2	2	1	200-240	56C	0.41	3.66 (92.90)	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	24.53 (623.06)	116 (53)
	1.5	3	200-240	56C	0.43	3.66 (92.90)	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.32 (643.13)	116 (53)
	1.5	3	440-480	56C	0.41	3.66 (92.90)	*	15.28 (388.11)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.32 (643.13)	116 (53)
CRE 10-4	3	3	200-240	182TC	0.41	3.66 (92.90)	*	18.39 (467.11)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	31.54 (801.12)	152 (69)
		3	440-480	182TC	0.41	3.66 (92.90)	*	18.39 (467.11)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	29.22 (742.19)	144 (65)
CRE 10-6	5	3	200-240	182TC	0.41	3.66 (92.90)	*	20.75 (527.05)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.90 (861.06)	164 (74)
		3	440-480	182TC	0.41	3.66 (92.90)	*	20.75 (527.05)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.90 (861.06)	175 (79)
CRE 10-8	7.5	3	200-240	213TC	0.41	3.66 (92.90)	-	23.43 (595.12)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	38.74 (984)	216 (98)
		3	440-480	213TC	0.41	3.66 (92.90)	-	23.43 (595.12)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	37.80 (960.12)	207 (94)

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	Oval ³⁵⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 10-10	7.5	3	200-240	213TC	0.41	3.66 (92.90)	-	25.79 (655.07)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	41.10 (1043.94)	220 (100)
		3	440-480	213TC	0.41	3.66 (92.90)	-	25.79 (655.07)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	40.16 (1020.06)	211 (96)
CRE 10-12	10	3	440-480	213TC	0.41	3.66 (92.90)	-	28.15 (715.01)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	43.46 (1103.88)	324 (147)
CRE 10-14	15	3	440-480	254TC	0.41	3.66 (92.90)	-	33.06 (839.72)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	49.04 (1245.62)	356 (161)
CRE 10-17	15	3	440-480	254TC	0.41	3.66 (92.90)	-	37.80 (960.12)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	53.78 (1366.01)	372 (169)

³⁵⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than ANSI flanged pumps, and the weight is approximately 3 lb (1.3 kg) less.

* Available.

CRIE 10 dimensional data



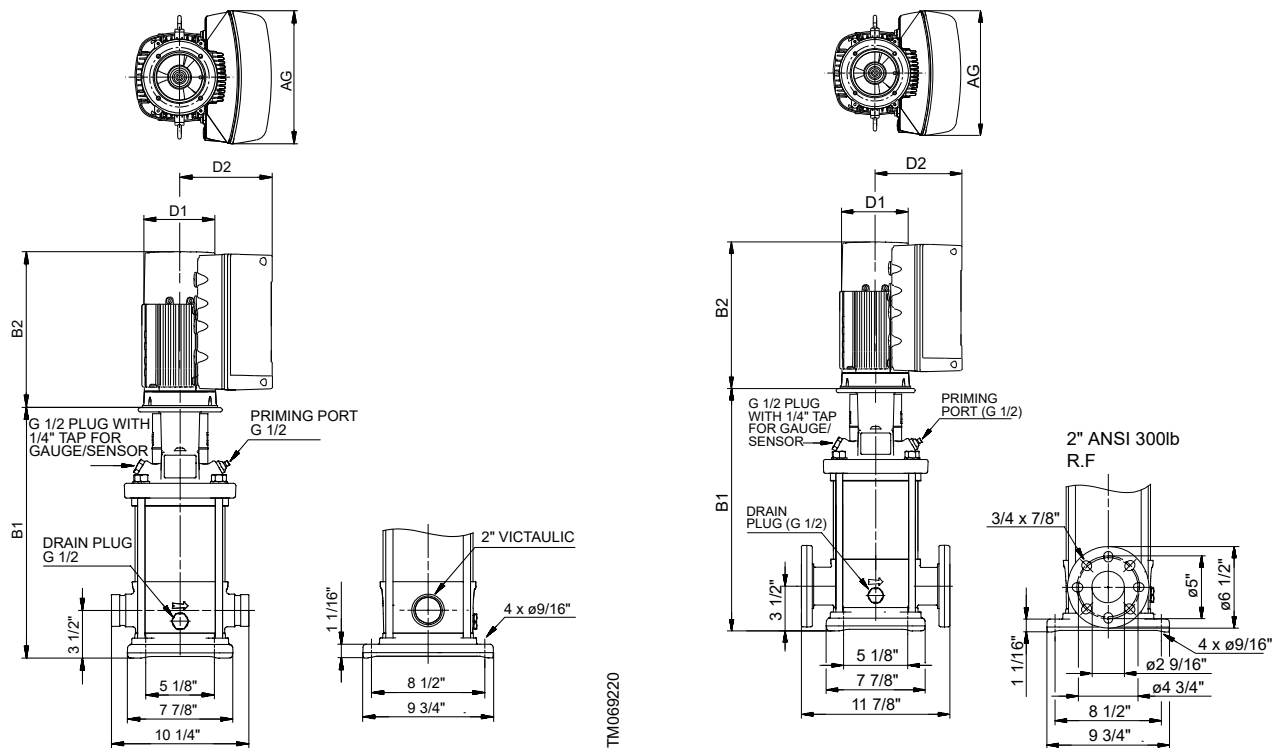
Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{V,L}	Impeller diameter Oval ³⁶⁾ [in (mm)]		B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 10-1	1	1	200-240	56C	0.42	3.66 (92.90)	*	15.20 (386)	4.80 (122)	6.22 (158)	8.34 (212)	23.66 (601)	100 (45)
	1.5	3	200-240	56C	0.43	3.66 (92.90)	*	15.20 (386)	4.80 (122)	6.22 (158)	10.56 (268)	25.24 (641)	105 (48)
	1	3	440-480	56C	0.41	3.66 (92.90)	*	15.20 (386)	4.80 (122)	6.22 (158)	10.56 (268)	25.24 (641)	103 (47)
CRIE 10-2	2	1	200-240	56C	0.41	3.66 (92.90)	*	15.20 (386)	4.80 (122)	6.22 (158)	8.34 (212)	24.45 (621)	105 (48)
	1.5	3	200-240	56C	0.43	3.66 (92.90)	*	15.20 (386)	4.80 (122)	6.22 (158)	10.56 (268)	25.24 (641)	105 (48)
	1.5	3	440-480	56C	0.41	3.66 (92.90)	*	15.20 (386)	4.80 (122)	6.22 (158)	10.56 (268)	25.24 (641)	105 (48)
CRIE 10-4	3	3	200-240	182TC	0.41	3.66 (92.90)	*	18.31 (465)	7.53 (191)	7.91 (201)	11.46 (291)	31.46 (799)	146 (66)
		3	440-480	182TC	0.41	3.66 (92.90)	*	18.31 (465)	4.80 (122)	6.22 (158)	10.56 (268)	29.14 (740)	138 (63)
CRIE 10-6	5	3	200-240	182TC	0.41	3.66 (92.90)	*	20.67 (525)	7.53 (191)	7.91 (201)	11.46 (291)	33.82 (859)	157 (71)
		3	440-480	182TC	0.41	3.66 (92.90)	*	20.67 (525)	7.53 (191)	7.91 (201)	11.46 (291)	33.82 (859)	168 (76)
CRIE 10-8	7.5	3	200-240	213TC	0.41	3.66 (92.90)	-	23.35 (593)	10.04 (255)	9.33 (237)	13.62 (346)	38.66 (982)	207 (94)
		3	440	213TC	0.41	3.66 (92.90)	-	23.35 (593)	7.53 (191)	7.91 (201)	11.46 (291)	37.72 (958)	198 (90)

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	Oval ³⁶⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 10-10	7.5	3	200-240	213TC	0.41	3.66 (92.90)	-	25.71 (653)	10.04 (255)	9.33 (237)	13.62 (346)	41.02 (1042)	211 (96)
		3	440-480	213TC	0.41	3.66 (92.90)	-	25.71 (653)	7.53 (191)	7.91 (201)	11.46 (291)	40.08 (1018)	203 (92)
CRIE 10-12	10	3	440-480	213TC	0.41	3.66 (92.90)	-	28.07 (713)	10.04 (255)	9.33 (237)	13.62 (346)	43.38 (1102)	315 (143)
CRIE 10-14	15	3	440-480	254TC	0.41	3.66 (92.90)	-	32.95 (837)	10.04 (255)	9.33 (237)	13.62 (346)	48.93 (1243)	350 (159)
CRIE 10-17	15	3	440-480	254TC	0.41	3.66 (92.90)	-	37.68 (957)	10.04 (255)	9.33 (237)	13.62 (346)	53.66 (1363)	365 (166)

³⁶⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 7 lb (3 kg) less.

* Available.

CRNE 10 dimensional data



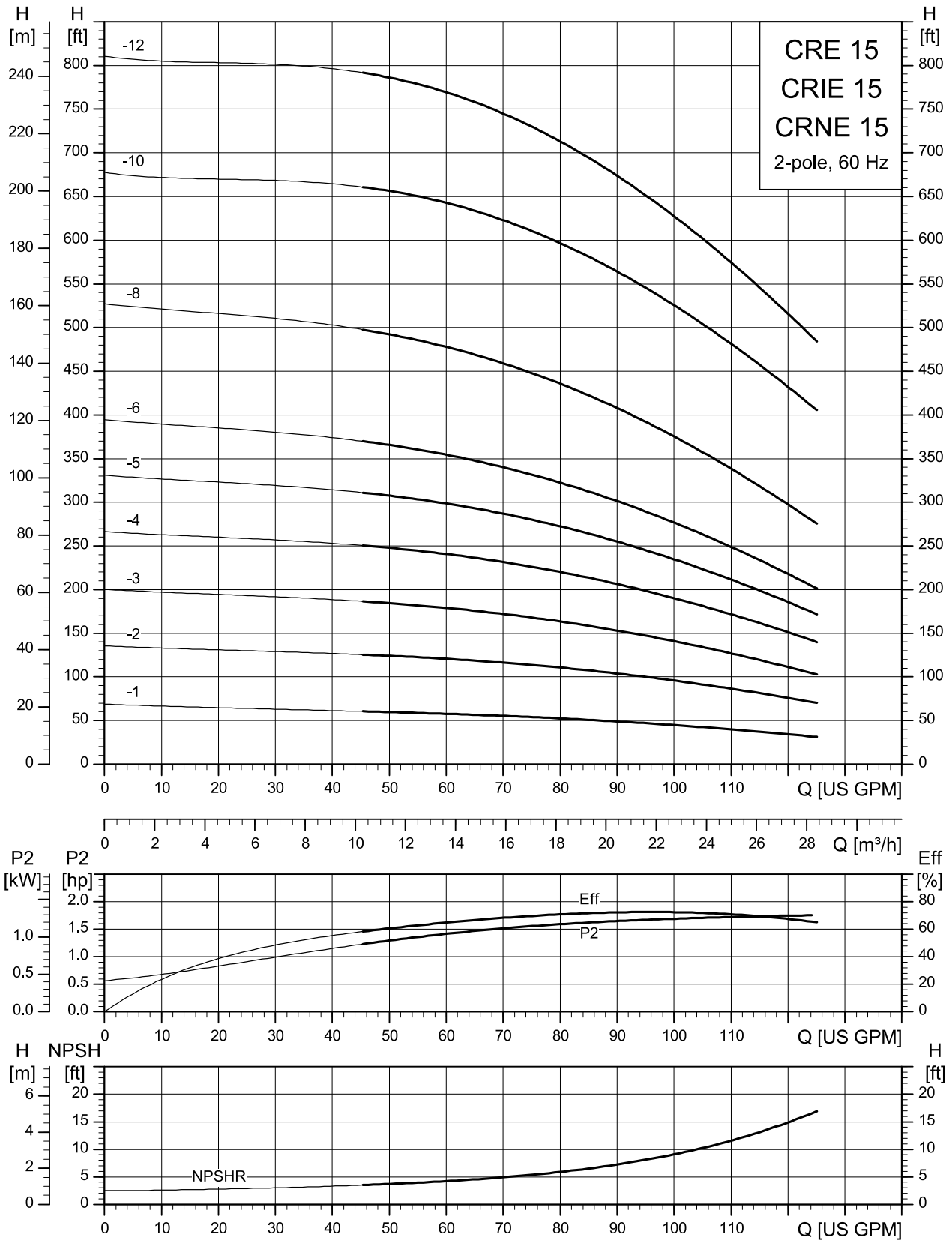
Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	PJE ³⁷⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 10-1	1	1	200-240	56C	0.42	3.66 (92.90)	*	15.20 (386.08)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	23.66 (600.96)	100 (45)
	1.5	3	200-240	56C	0.43	3.66 (92.90)	*	15.20 (386.08)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.24 (641.10)	105 (48)
CRNE 10-2	1	3	440-480	56C	0.41	3.66 (92.90)	*	15.20 (386.08)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.24 (641.10)	103 (47)
	2	1	200-240	56C	0.41	3.66 (92.90)	*	15.20 (386.08)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	24.45 (621.03)	105 (48)
	1.5	3	200-240	56C	0.43	3.66 (92.90)	*	15.20 (386.08)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	25.24 (641.10)	105 (48)
CRNE 10-4	3	3	200-240	182TC	0.41	3.66 (92.90)	*	18.31 (465.07)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	31.46 (799.08)	146 (66)
		3	440-480	182TC	0.41	3.66 (92.90)	*	18.31 (465.07)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	29.14 (740.16)	138 (63)
CRNE 10-6	5	3	200-240	182TC	0.41	3.66 (92.90)	*	20.67 (525.02)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.82 (859.03)	157 (71)
		3	440-480	182TC	0.41	3.66 (92.90)	*	20.67 (525.02)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.82 (859.03)	168 (76)
CRNE 10-8	7.5	3	200-240	213TC	0.41	3.66 (92.90)	*	23.35 (593.09)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	38.66 (981.96)	207 (94)
		3	440-480	213TC	0.41	3.66 (92.90)	*	23.35 (593.09)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	37.72 (958.09)	198 (90)

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	PJE ³⁷⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 10-10	7.5	3	200-240	213TC	0.41	3.66 (92.90)	*	25.71 (653.03)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	41.02 (1041.91)	211 (96)
		3	440-480	213TC	0.41	3.66 (92.90)	*	25.71 (653.03)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	40.08 (1018.03)	203 (92)
CRNE 10-12	10	3	440-480	213TC	0.41	3.66 (92.90)	*	28.07 (712.98)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	43.38 (1101.85)	315 (143)
CRNE 10-14	15	3	440-480	254TC	0.41	3.66 (92.90)	*	32.95 (836.93)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	48.93 (1242.82)	350 (159)
CRNE 10-17	15	3	440-480	254TC	0.41	3.66 (92.90)	*	37.68 (957.07)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	53.66 (1362.96)	365 (166)

³⁷⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

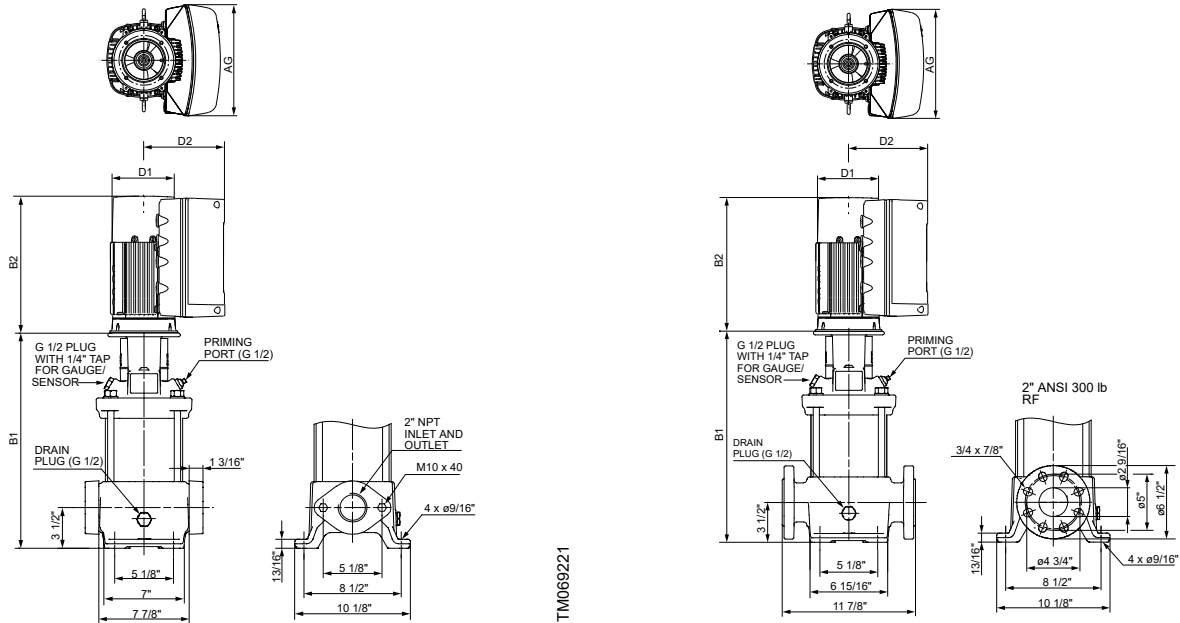
* Available.

CRE, CRIE, CRNE 15



TM059416

CRE 15 dimensional data

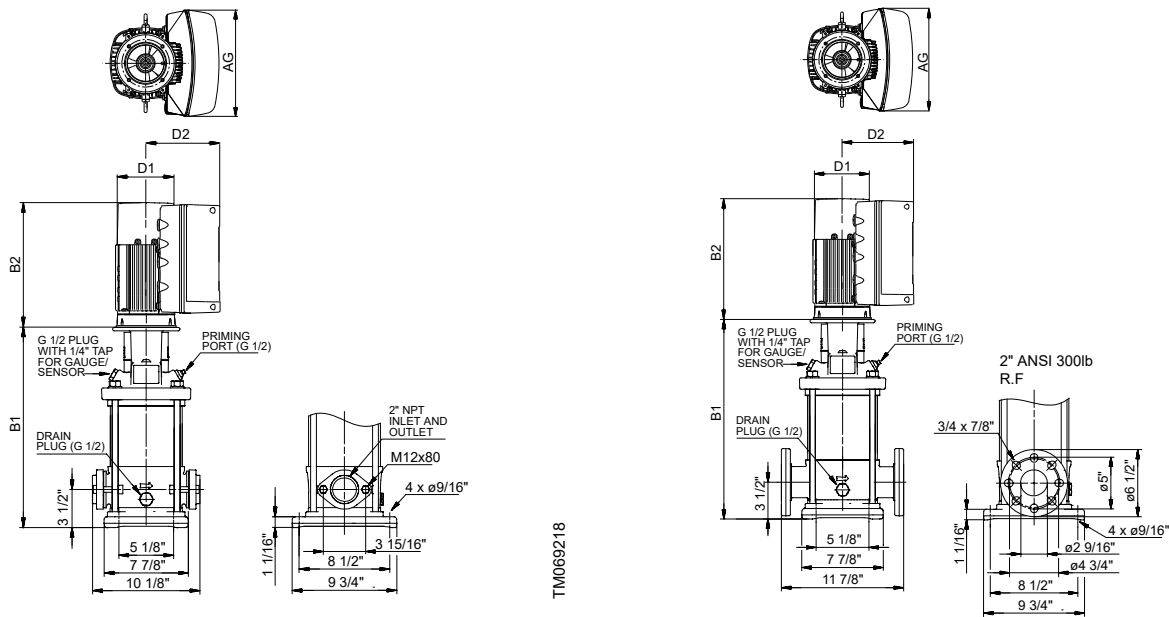


Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _V L	Impeller diameter [in (mm)]	Oval ³⁸⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 15-1	2	1	200-240	56C	0.45	4.13 (104.80)	*	16.46 (418.08)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	25.71 (653.03)	119 (54)
		3	200-240	56C	0.44	4.13 (104.80)	*	16.46 (418.08)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.29 (693.17)	122 (55)
		3	440-480	56C	0.46	4.13 (104.80)	*	16.46 (418.08)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.29 (693.17)	122 (55)
CRE 15-2	5	3	200-240	182TC	0.42	4.13 (104.80)	*	17.20 (436.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.35 (770.89)	157 (71)
		3	440-480	182TC	0.40	4.13 (104.80)	*	17.20 (436.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.35 (770.89)	168 (76)
CRE 15-3	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	19.29 (489.97)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	34.60 (878.84)	200 (91)
CRE 15-4	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	21.06 (534.92)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	36.37 (923.80)	211 (96)
		3	440-480	213TC	0.40	4.13 (104.80)	*	21.06 (534.92)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	35.43 (899.92)	202 (92)
CRE 15-5	10	3	440-480	213TC	0.40	4.13 (104.80)	*	22.83 (579.88)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	38.14 (968.76)	228 (103)
CRE 15-6	15	3	440-480	254TC	0.40	4.13 (104.80)	-	27.17 (690.12)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	43.15 (1096.01)	255 (116)
CRE 15-8	15	3	440-480	254TC	0.40	4.13 (104.80)	-	30.71 (780.03)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	46.69 (1185.93)	356 (161)
CRE 15-10	20	3	440-480	254TC	0.40	4.13 (104.90)	*	34.25 (869.95)	12.52 (318)	11.93 (303)	16.54 (420)	53.46 (1357.88)	418.95 (190.03)
CRE 15-12	25	3	440-480	284TC	0.40	4.13 (104.90)	*	37.17 (944.12)	12.52 (318)	11.93 (303)	16.54 (420)	57.40 (1457.96)	456.44 (207.04)

³⁸⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 3 lb (1.3 kg) less.

* Available.

CRIE 15 dimensional data

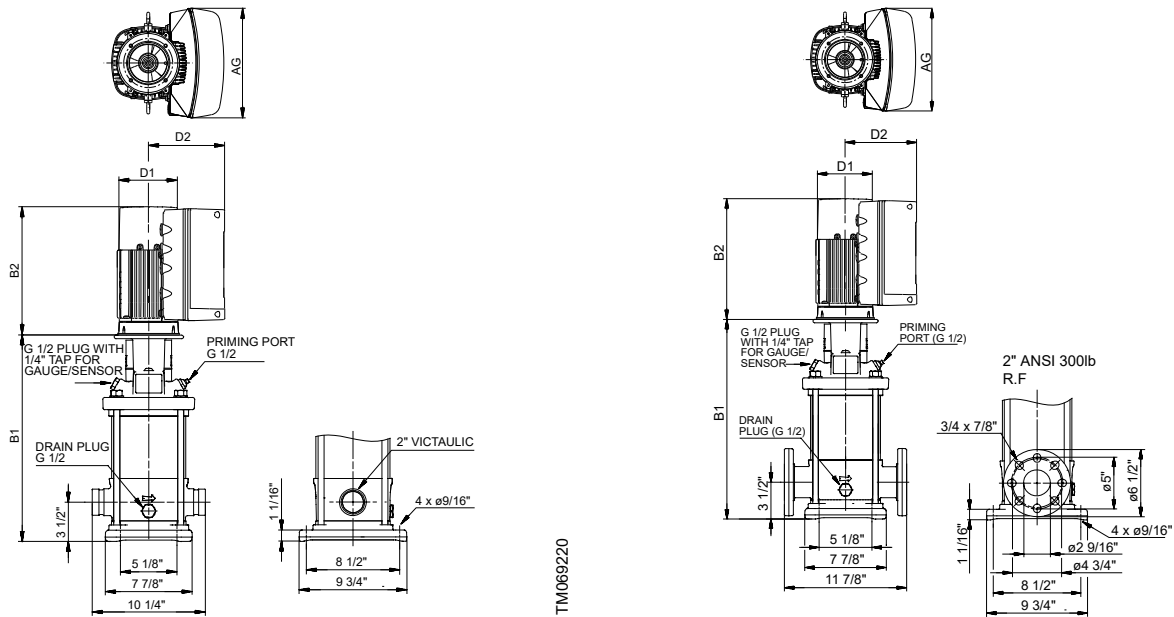


Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _V L	Impeller diameter [in (mm)]	Oval ³⁹⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 15-1	2	1	200-240	56C	0.45	4.13 (104.80)	*	16.38 (416)	4.80 (122)	6.22 (158)	8.34 (212)	25.63 (651)	110 (50)
		3	200-240	56C	0.44	4.13 (104.80)	*	16.38 (416)	4.80 (122)	6.22 (158)	10.56 (268)	27.21 (691)	113 (51)
		3	440-480	56C	0.46	4.13 (104.80)	*	16.38 (416)	4.80 (122)	6.22 (158)	10.56 (268)	27.21 (691)	113 (51)
CRIE 15-2	5	3	200-240	182TC	0.42	4.13 (104.80)	*	17.13 (435)	7.53 (191)	7.91 (201)	11.46 (291)	30.28 (769)	150 (68)
		3	440-480	182TC	0.40	4.13 (104.80)	*	17.13 (435)	7.53 (191)	7.91 (201)	11.46 (291)	30.28 (769)	161 (73)
CRIE 15-3	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	19.21 (488)	10.04 (255)	9.33 (237)	13.62 (346)	34.52 (877)	192 (87)
CRIE 15-4	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	20.98 (533)	10.04 (255)	9.33 (237)	13.62 (346)	36.29 (922)	202 (92)
		3	440-480	213TC	0.40	4.13 (104.80)	*	20.98 (533)	7.53 (191)	7.91 (201)	11.46 (291)	35.35 (898)	193 (88)
CRIE 15-5	10	3	440-480	213TC	0.40	4.13 (104.80)	*	22.76 (578)	10.04 (255)	9.33 (237)	13.62 (346)	38.07 (967)	228 (103)
CRIE 15-6	15	3	440-480	254TC	0.40	4.13 (104.80)	-	27.05 (687)	10.04 (255)	9.33 (237)	13.62 (346)	43.03 (1093)	330 (150)
CRIE 15-8	15	3	440-480	254TC	0.40	4.13 (104.80)	-	30.59 (777)	10.04 (255)	9.33 (237)	13.62 (346)	46.57 (1183)	348 (158)
CRIE 15-10	20	3	440-480	254TC	0.40	4.13 (104.90)	*	34.13 (866.90)	12.52 (318)	11.93 (303)	16.54 (420)	53.35 (1355.09)	412.34 (187.03)
CRIE 15-12	25	3	440-480	284TC	0.40	4.13 (104.90)	*	37.05 (941.07)	12.52 (318)	11.93 (303)	16.54 (420)	57.28 (1454.91)	449.82 (204.03)

³⁹⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 7 lb (3 kg) less.

* Available.

CRNE 15 dimensional data

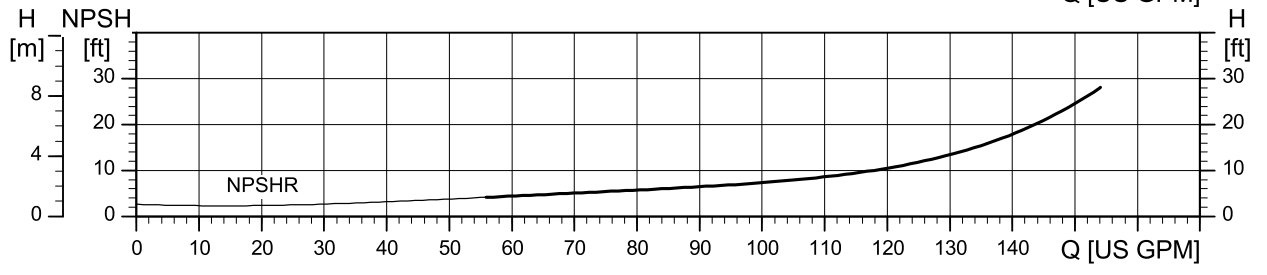
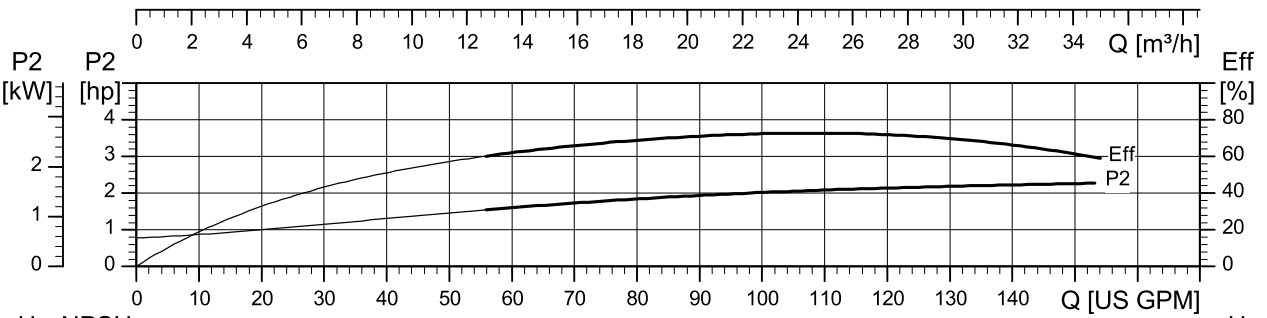
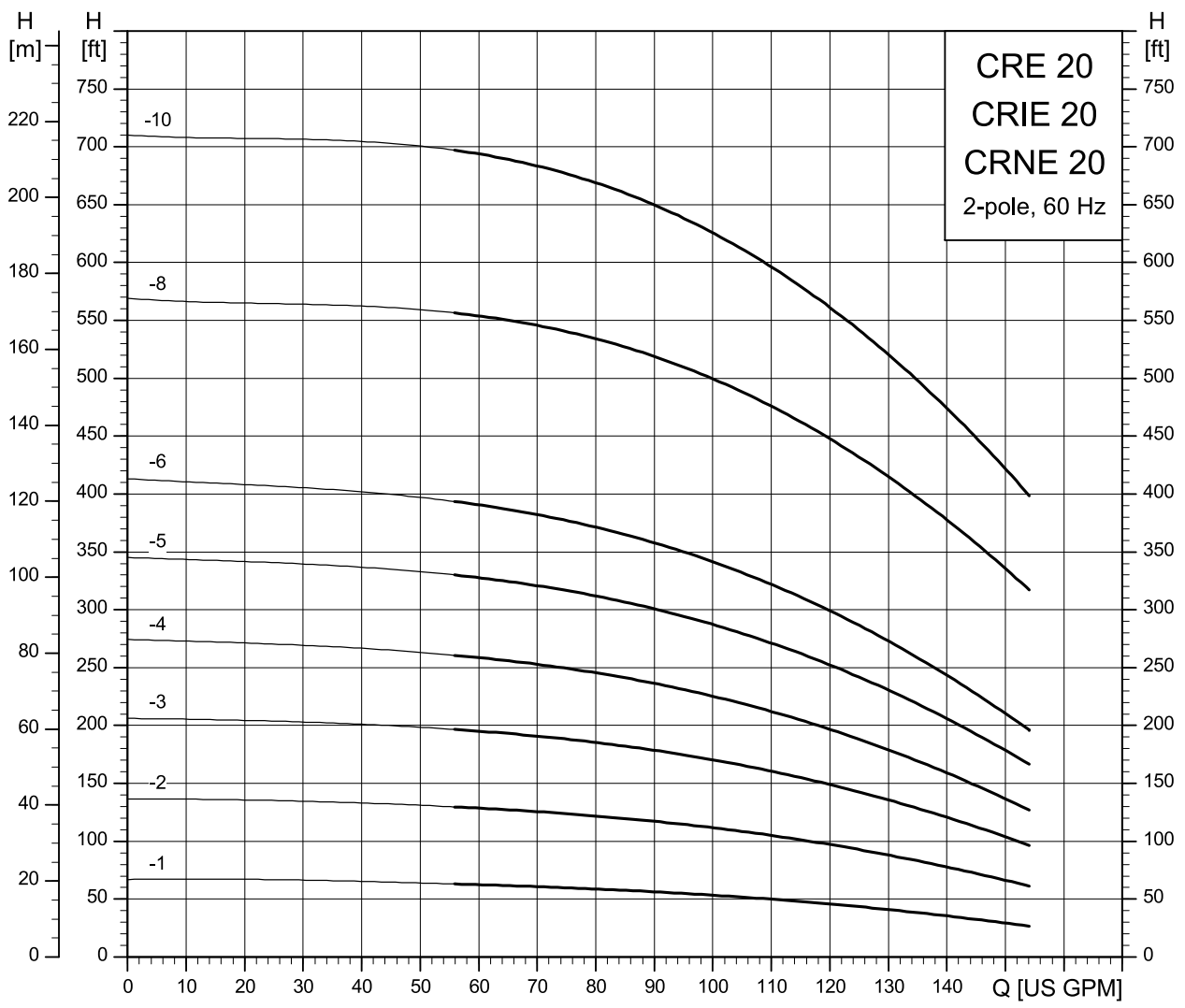


Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{VL}	Impeller diameter [in (mm)]	PJE ⁴⁰⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 15-1	2	1	200-240	56C	0.45	4.13 (104.80)	*	16.38 (416.05)	4.80 (121.92)	6.22 (157.99)	8.34 (212)	25.63 (651)	110 (50)
		3	200-240	56C	0.44	4.13 (104.80)	*	16.38 (416.05)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.21 (691.13)	113 (51)
		3	440-480	56C	0.46	4.13 (104.80)	*	16.38 (416.05)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	27.21 (691.13)	113 (51)
CRNE 15-2	5	3	200-240	182TC	0.42	4.13 (104.80)	*	17.13 (435.10)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.28 (769.11)	150 (68)
		3	440-480	182TC	0.40	4.13 (104.80)	*	17.13 (435.10)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.28 (769.11)	161 (73)
CRNE 15-3	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	19.21 (487.93)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	34.52 (876.81)	192 (87)
CRNE 15-4	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	20.98 (532.89)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	36.29 (921.77)	202 (92)
		3	440-480	213TC	0.40	4.13 (104.80)	*	20.98 (532.89)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	35.35 (897.89)	193 (88)
CRNE 15-5	10	3	440-480	213TC	0.40	4.13 (104.80)	*	22.76 (578.10)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	38.07 (966.98)	307 (139)
CRNE 15-6	15	3	440-480	254TC	0.40	4.13 (104.80)	*	27.05 (687.07)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	43.03 (1092.96)	330 (150)
CRNE 15-8	15	3	440-480	254TC	0.40	4.13 (104.80)	*	30.59 (776.99)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	46.57 (1182.88)	348 (158)
CRNE 15-10	20	3	440-480	254TC	0.40	4.13 (104.90)	*	34.13 (866.90)	12.52 (318)	11.93 (303)	16.54 (420)	53.35 (1355.09)	412.34 (187.03)
CRNE 15-12	25	3	440-480	284TC	0.40	4.13 (104.90)	*	37.05 (941.07)	12.52 (318)	11.93 (303)	16.54 (420)	57.28 (1454.91)	449.82 (204.03)

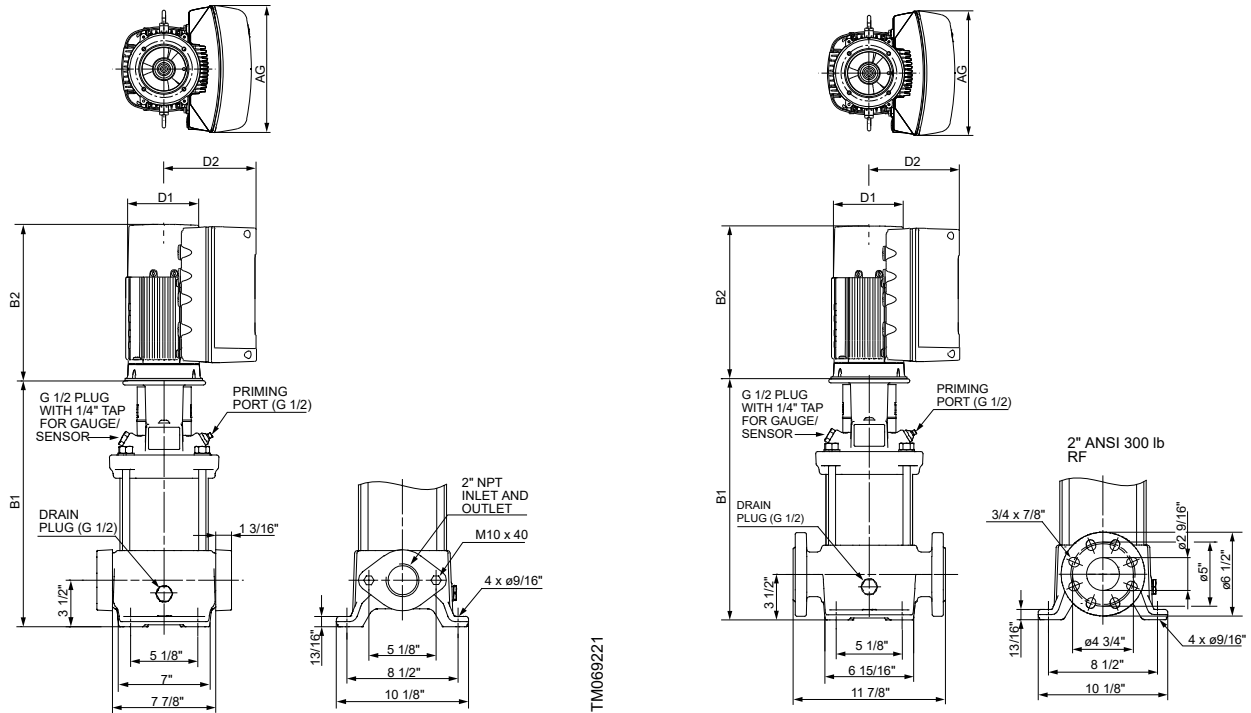
⁴⁰⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

* Available.

CRE, CRIE, CRNE 20



CRE 20 dimensional data

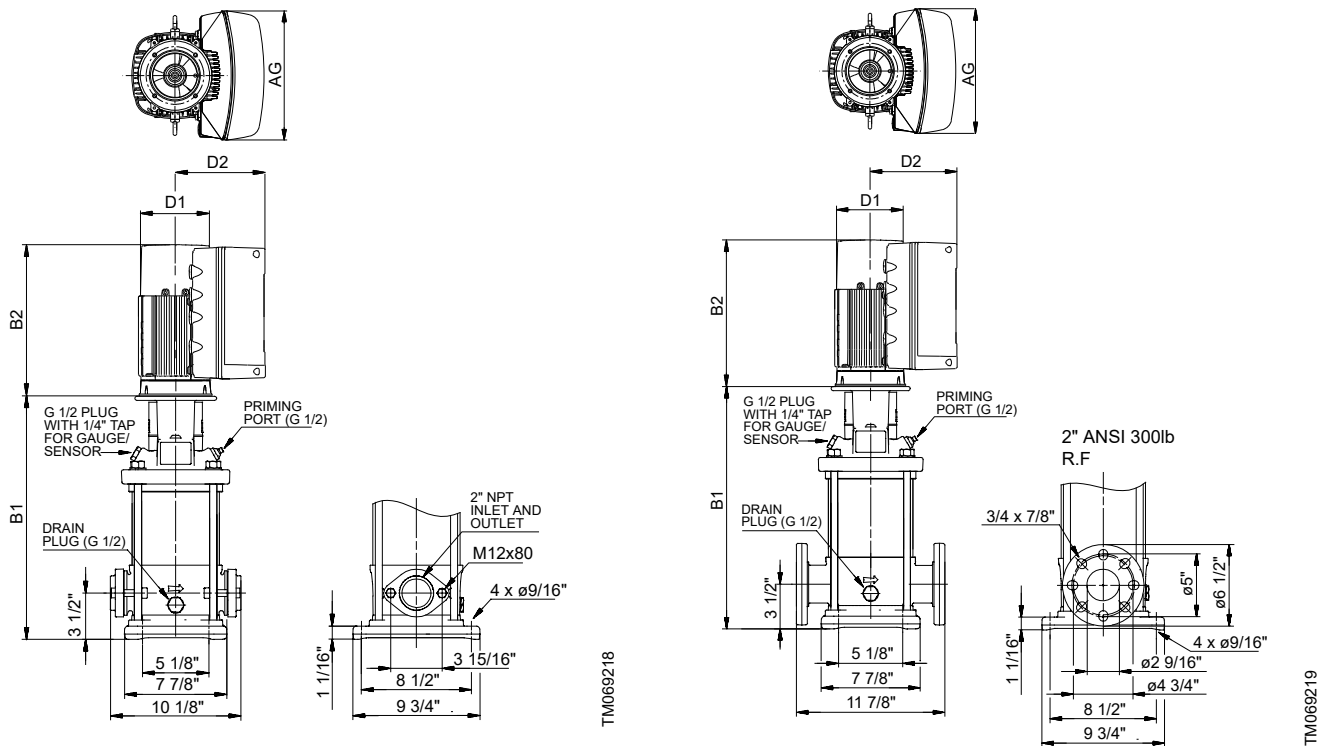


Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	Oval ⁴¹⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 20-1	3	3	200-240	182TC	0.42	4.13 (104.80)	*	17.20 (436.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.35 (770.89)	150 (68)
		3	440-480	182TC	0.41	4.13 (104.80)	*	17.20 (436.88)	4.80 (121.92)	6.22 (157.99)	10.56 (268)	28.03 (711.96)	142 (64)
CRE 20-2	5	3	200-240	182TC	0.42	4.13 (104.80)	*	17.20 (436.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.35 (770.89)	157 (71)
		3	440-480	182TC	0.41	4.13 (104.80)	*	17.20 (436.88)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	30.35 (770.89)	168 (76)
CRE 20-3	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	19.29 (489.97)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	34.60 (878.84)	206 (93)
		3	440-480	213TC	0.41	4.13 (104.80)	*	19.29 (489.97)	7.53 (191.26)	7.91 (200.91)	11.46 (291)	33.66 (854.96)	197 (89)
CRE 20-4	10	3	440-480	213TC	0.41	4.13 (104.80)	*	21.06 (534.92)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	36.37 (923.80)	232 (105)
CRE 20-5	15	3	440-480	254TC	0.41	4.13 (104.80)	*	25.39 (644.91)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	41.37 (1050.80)	341 (155)
CRE 20-6	15	3	440-480	254TC	0.41	4.13 (104.80)	-	27.17 (690.12)	10.04 (255.02)	9.33 (236.98)	13.62 (346)	43.15 (1096.01)	343 (156)
CRE 20-8	20	3	440-480	254TC	0.41	4.13 (104.90)	*	30.71 (780.03)	12.52 (318)	11.93 (303)	16.54 (420)	49.92 (1267.97)	410.13 (186.03)
CRE 20-10	25	3	440-480	284TC	0.41	4.13 (104.90)	*	33.62 (853.95)	12.52 (318)	11.93 (303)	16.54 (420)	53.86 (1368.04)	449.82 (204.03)

⁴¹⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 3 lb (1.3 kg) less.

* Available.

CRIE 20 dimensional data

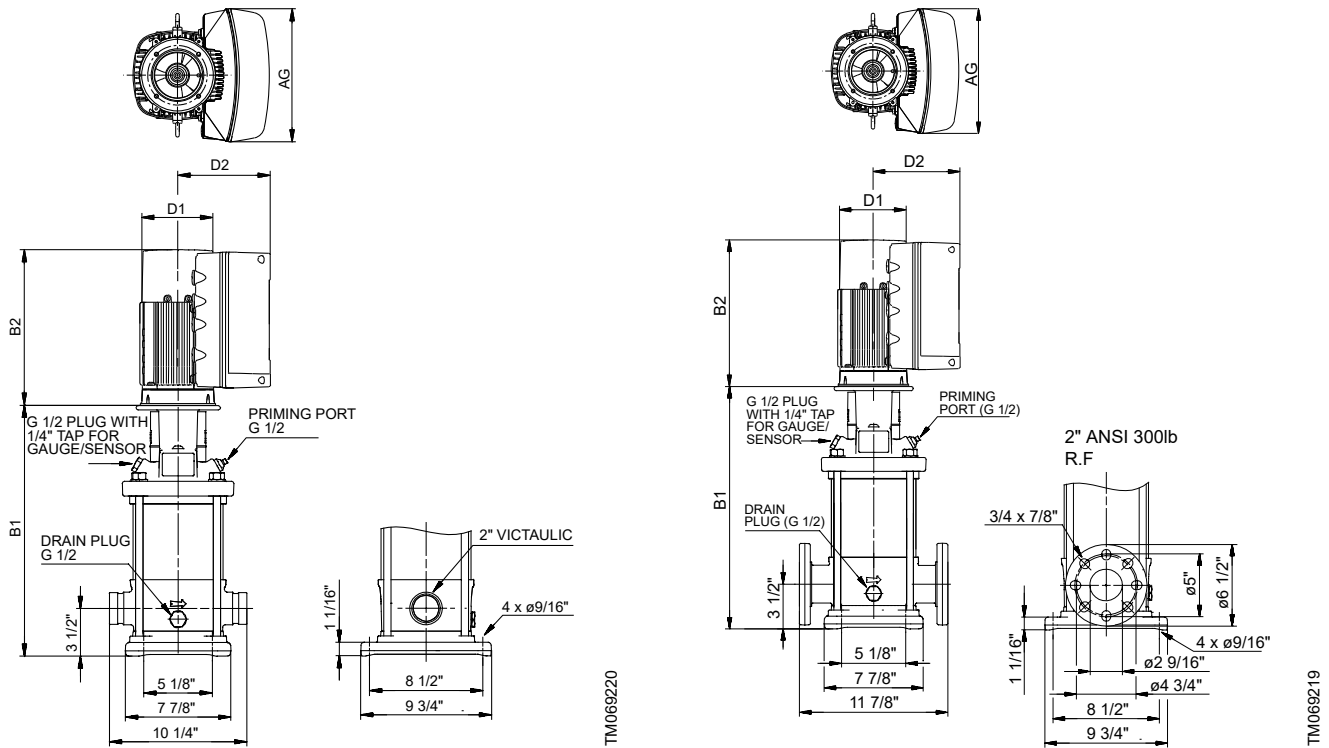


Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	Oval ⁴²⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRIE 20-1	3	3	200-240	182TC	0.42	4.13 (104.80)	*	17.13 (435)	7.53 (191)	7.91 (201)	11.46 (291)	30.28 (769)	144 (65)
		3	440-480	182TC	0.41	4.13 (104.80)	*	17.13 (435)	4.80 (122)	6.22 (158)	10.56 (268)	27.96 (710)	135 (61)
CRIE 20-2	5	3	200-240	182TC	0.42	4.13 (104.80)	*	17.13 (435)	7.53 (191)	7.91 (201)	11.46 (291)	30.28 (769)	150 (68)
		3	440-480	182TC	0.41	4.13 (104.80)	*	17.13 (435)	7.53 (191)	7.91 (201)	11.46 (291)	30.28 (769)	161 (73)
CRIE 20-3	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	19.21 (488)	10.04 (255)	9.33 (237)	13.62 (346)	34.52 (877)	200 (91)
		3	440-480	213TC	0.41	4.13 (104.80)	*	19.21 (488)	7.53 (191)	7.91 (201)	11.46 (291)	33.58 (853)	191 (87)
CRIE 20-4	10	3	440-480	213TC	0.41	4.13 (104.80)	*	20.98 (533)	10.04 (255)	9.33 (237)	13.62 (346)	36.29 (922)	225 (102)
CRIE 20-5	15	3	440-480	254TC	0.41	4.13 (104.80)	*	25.28 (642)	10.04 (255)	9.33 (237)	13.62 (346)	41.26 (1048)	332 (151)
CRIE 20-6	15	3	440-480	254TC	0.41	4.13 (104.80)	-	27.05 (687)	10.04 (255)	9.33 (237)	13.62 (346)	43.03 (1093)	337 (153)
CRIE 20-8	20	3	440-480	254TC	0.41	4.13 (104.90)	*	30.59 (776.99)	12.52 (318)	11.93 (303)	16.54 (420)	49.80 (1264.92)	403.52 (183.03)
CRIE 20-10	25	3	440-480	284TC	0.41	4.13 (104.90)	*	33.50 (850.90)	12.52 (318)	11.93 (303)	16.54 (420)	53.74 (1365)	441 (200.03)

⁴²⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 7 lb (3 kg) less.

* Available.

CRNE 20 dimensional data

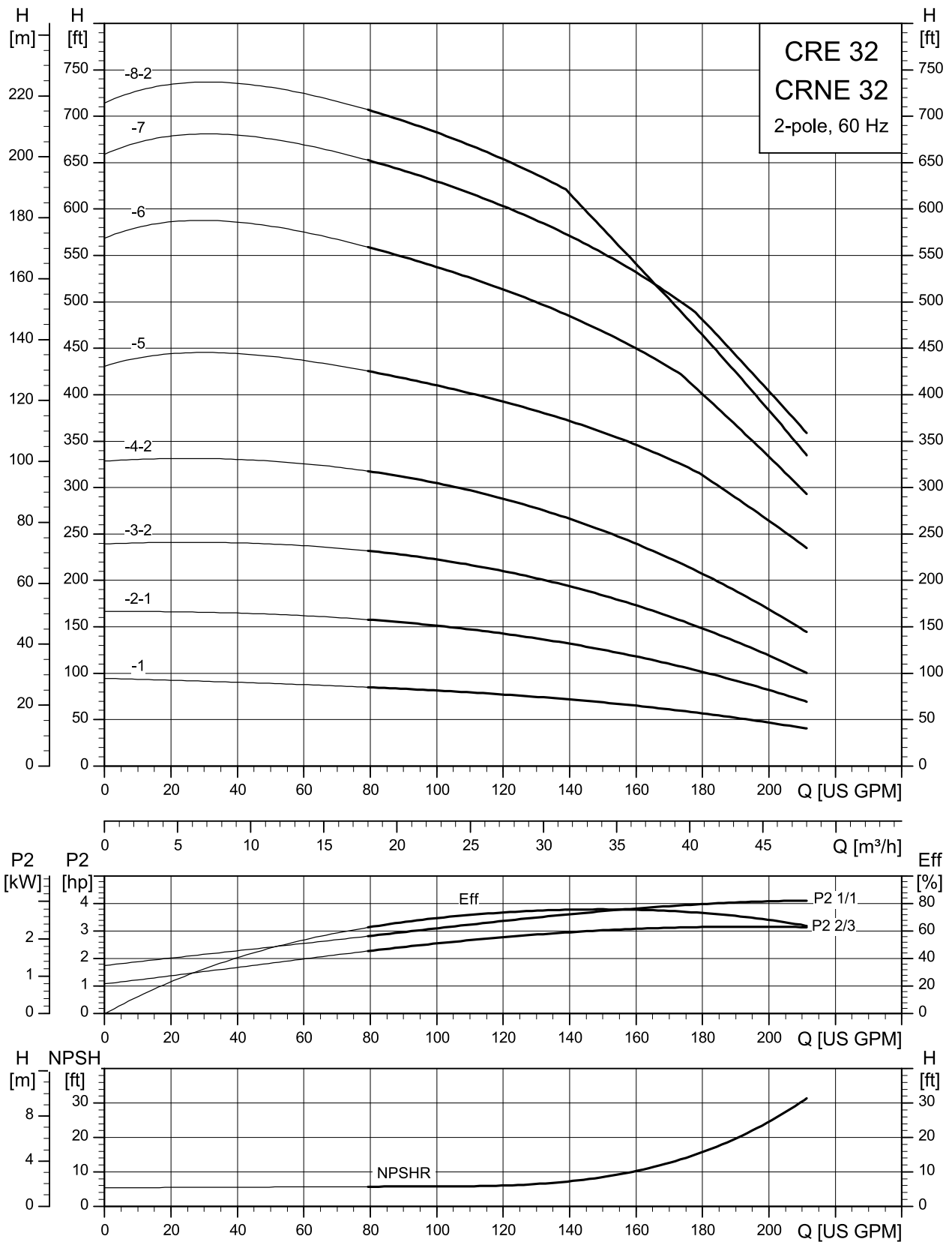


Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{V,L}	Impeller diameter [in (mm)]	PJE ⁴³⁾	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 20-1	3	3	200-240	182TC	0.42	4.13 (104.80)	*	17.13 (435)	7.53 (192)	7.91 (201)	11.46 (291)	30.28 (769)	144 (65)
		3	440-480	182TC	0.41	4.13 (104.80)	*	17.13 (435)	4.80 (122)	6.22 (158)	10.56 (268)	27.96 (710)	135 (61)
CRNE 20-2	5	3	200-240	182TC	0.42	4.13 (104.80)	*	17.13 (435)	7.53 (192)	7.91 (201)	11.46 (291)	30.28 (769)	150 (68)
		3	440-480	182TC	0.41	4.13 (104.80)	*	17.13 (435)	7.53 (192)	7.91 (201)	11.46 (291)	30.28 (769)	161 (73)
CRNE 20-3	7.5	3	200-240	213TC	0.42	4.13 (104.80)	*	19.21 (488)	10.04 (255)	9.33 (237)	13.62 (346)	34.52 (877)	200 (91)
		3	440-480	213TC	0.41	4.13 (104.80)	*	19.21 (488)	7.53 (192)	7.91 (201)	11.46 (291)	33.58 (853)	191 (87)
CRNE 20-4	10	3	440-480	213TC	0.41	4.13 (104.80)	*	20.98 (533)	10.04 (255)	9.33 (237)	13.62 (346)	36.29 (922)	225 (102)
CRNE 20-5	15	3	440-480	254TC	0.41	4.13 (104.80)	*	25.28 (642)	10.04 (255)	9.33 (237)	13.62 (346)	41.26 (1048)	332 (151)
CRNE 20-6	15	3	440-480	254TC	0.41	4.13 (104.80)	*	27.05 (687)	10.04 (255)	9.33 (237)	13.62 (346)	43.03 (1093)	337 (153)
CRNE 20-8	20	3	440-480	254TC	0.41	4.13 (104.90)	*	30.59 (776.99)	12.52 (318)	11.93 (303)	16.54 (420)	49.8 (1264.92)	403.52 (183.03)
CRNE 20-10	25	3	440-480	284TC	0.41	4.13 (104.90)	*	33.5 (850.90)	12.52 (318)	11.93 (303)	16.54 (420)	53.74 (1365)	441 (200.03)

⁴³⁾ For oval flanged pumps, the B1 and B1+B2 dimensions are one inch less than for ANSI flanged pumps, and the weight is approximately 9 lb (4 kg) less.

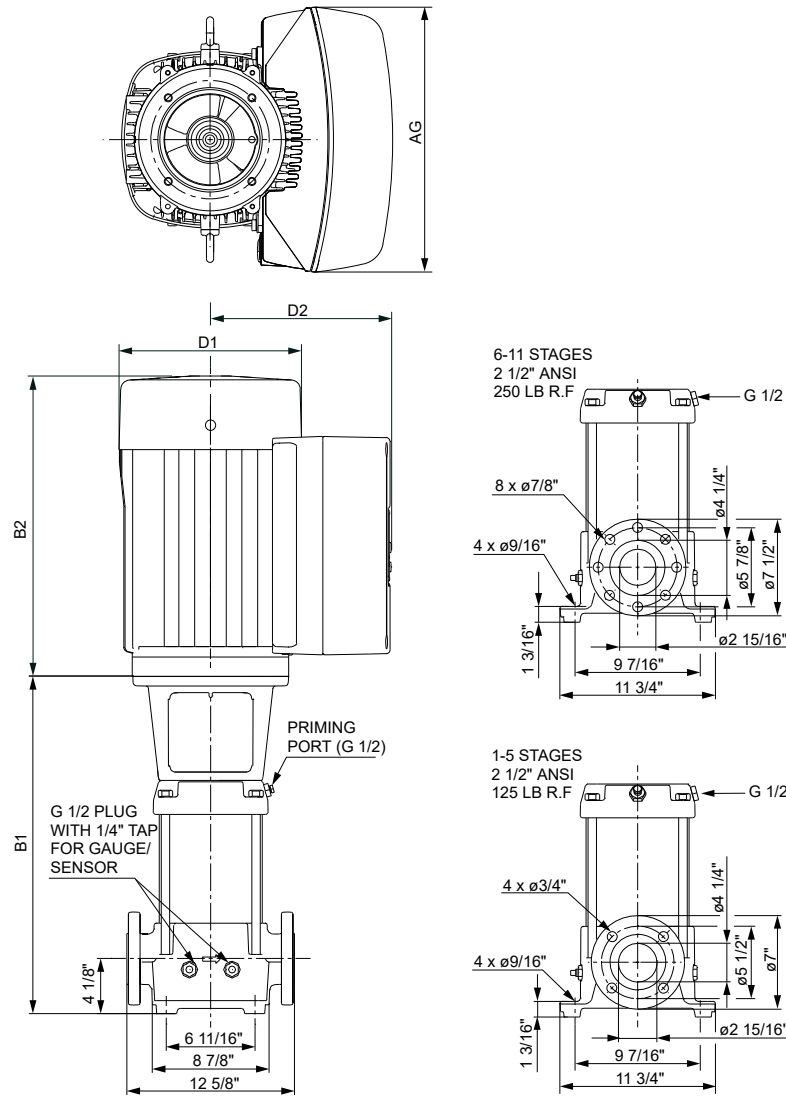
* Available.

CRE, CRNE 32



TM059418

CRE 32 dimensional data

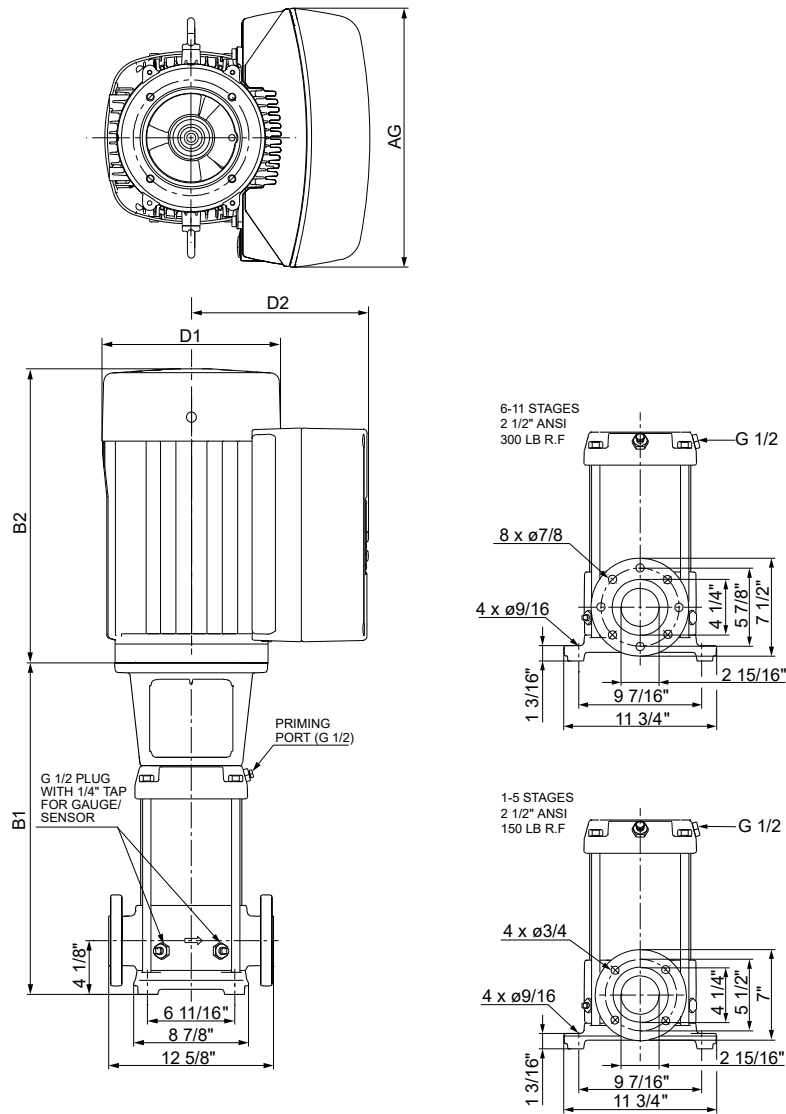


TM069224

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 32-1	5	3	200-240	182TC	0.41	4.66 (118.40)	19.88 (505)	7.53 (193)	7.91 (201)	11.46 (291)	33.03 (839)	169 (77)
		3	440-480	182TC	0.40	4.66 (118.40)	19.88 (505)	7.53 (193)	7.91 (201)	11.46 (291)	33.03 (839)	180 (82)
CRE 32-2-1	7.5	3	200-240	213TC	0.41	4.66 (118.40)	22.64 (575)	10.04 (255)	9.33 (237)	13.62 (346)	37.95 (964)	214 (97)
		3	440-480	213TC	0.40	4.66 (118.40)	22.64 (575)	7.53 (193)	7.91 (201)	11.46 (291)	37.01 (940)	205 (93)
CRE 32-3-2	10	3	440-480	213TC	0.40	4.66 (118.40)	25.39 (645)	10.04 (255)	9.33 (237)	13.62 (346)	40.70 (1034)	240 (109)
CRE 32-4-2	15	3	440-480	254TC	0.40	4.66 (118.40)	32.48 (825)	10.04 (255)	9.33 (237)	13.62 (346)	48.46 (1231)	393 (178)
CRE 32-5	20	3	440-480	254TC	0.40	4.66 (118.36)	35.24 (395.10)	12.52 (318)	11.93 (303)	16.54 (420)	54.45 (1383.03)	349.96 (158.74)

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 32-6	25	3	440-480	284TC	0.40	4.66 (118.36)	37.99 (964.95)	12.52 (318)	11.93 (303)	16.54 (420)	58.23 (1479.04)	390.31 (177.04)
CRE 32-7	30	3	440-480	284TC	0.40	4.66 (118.36)	40.75 (1035.15)	12.52 (318)	11.93 (303)	16.54 (420)	60.98 (1548.89)	406.4 (184.34)
CRE 32-8-2	30	3	440-480	284TC	0.40	4.66 (118.36)	43.5 (1140.90)	12.52 (318)	11.93 (303)	16.54 (420)	63.74 (1619)	419.19 (190.14)

CRNE 32 dimensional data

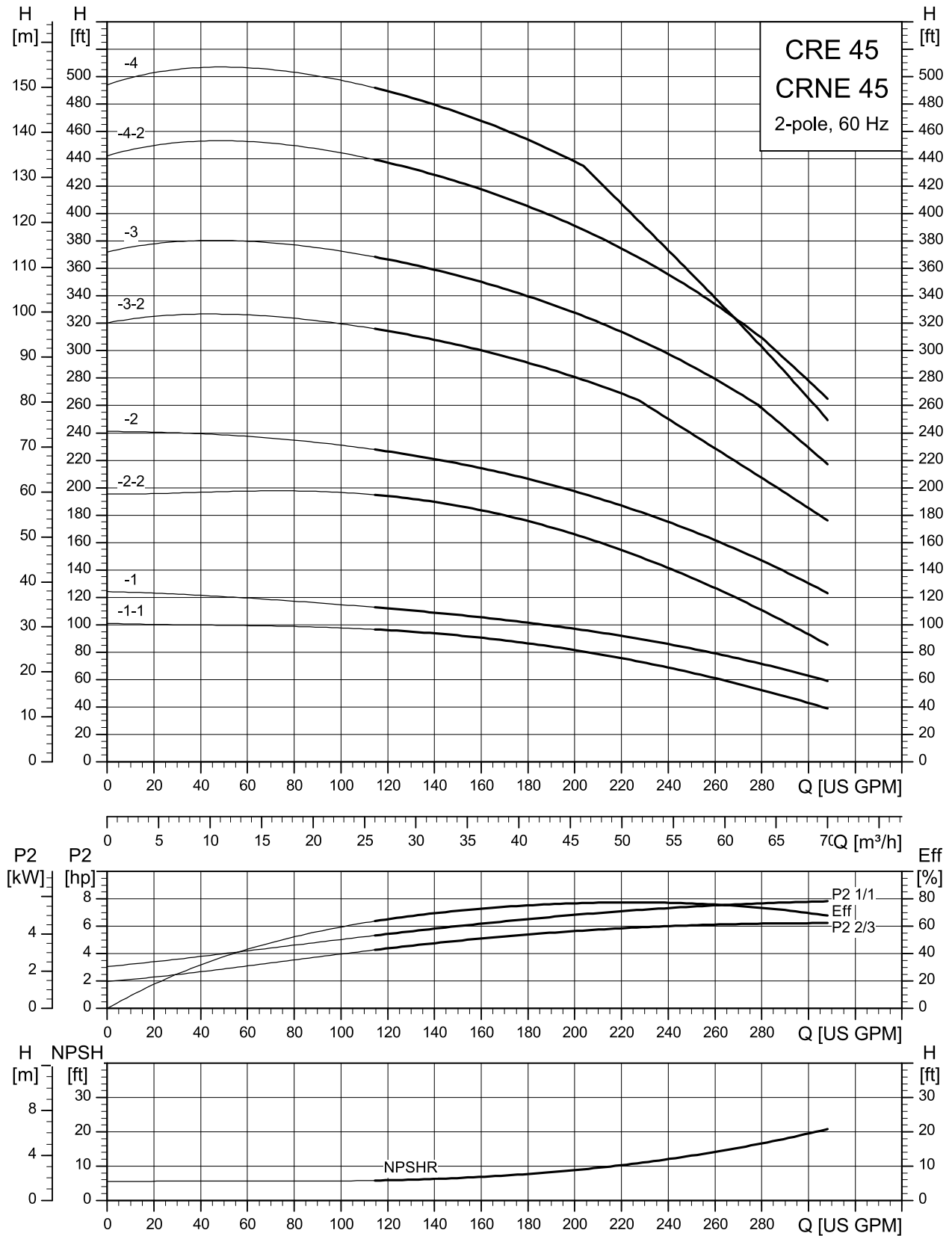


TM069604

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 32-1	5	3	200-240	182TC	0.41	4.66 (118.40)	19.88 (505)	7.53 (191)	7.91 (201)	11.46 (291)	33.03 (839)	174 (79)
		3	440-480	182TC	0.40	4.66 (118.40)	19.88 (505)	7.53 (191)	7.91 (201)	11.46 (291)	33.03 (839)	185 (84)
CRNE 32-2-1	7.5	3	200-240	213TC	0.41	4.66 (118.40)	22.64 (575)	10.04 (255)	9.33 (237)	13.62 (346)	37.95 (964)	219 (99)
		3	440-480	213TC	0.40	4.66 (118.40)	22.64 (575)	7.53 (191)	7.91 (201)	11.46 (291)	37.01 (940)	211 (96)
CRNE 32-3-2	10	3	440-480	213TC	0.40	4.66 (118.40)	25.39 (645)	10.04 (255)	9.33 (237)	13.62 (346)	40.70 (1034)	245 (111)
CRNE 32-4-2	15	3	440-480	254TC	0.40	4.66 (118.40)	32.48 (825)	10.04 (255)	9.33 (237)	13.62 (346)	48.46 (1231)	398 (181)
CRNE 32-5	20	3	440-480	254TC	0.40	4.66 (118.36)	35.24 (395.10)	12.52 (318)	11.93 (303)	16.54 (420)	54.45 (1383.03)	354.59 (160.84)

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 32-6	25	3	440-480	284TC	0.40	4.66 (118.36)	37.99 (964.95)	12.52 (318)	11.93 (303)	16.54 (420)	58.23 (1479.04)	393.84 (178.64)
CRNE 32-7	30	3	440-480	284TC	0.40	4.66 (118.36)	40.75 (1035.15)	12.52 (318)	11.93 (303)	16.54 (420)	60.98 (1548.89)	409.93 (185.94)
CRNE 32-8-2	30	3	440-480	284TC	0.40	4.66 (118.36)	43.5 (1140.90)	12.52 (318)	11.93 (303)	16.54 (420)	63.74 (1619)	422.72 (191.74)

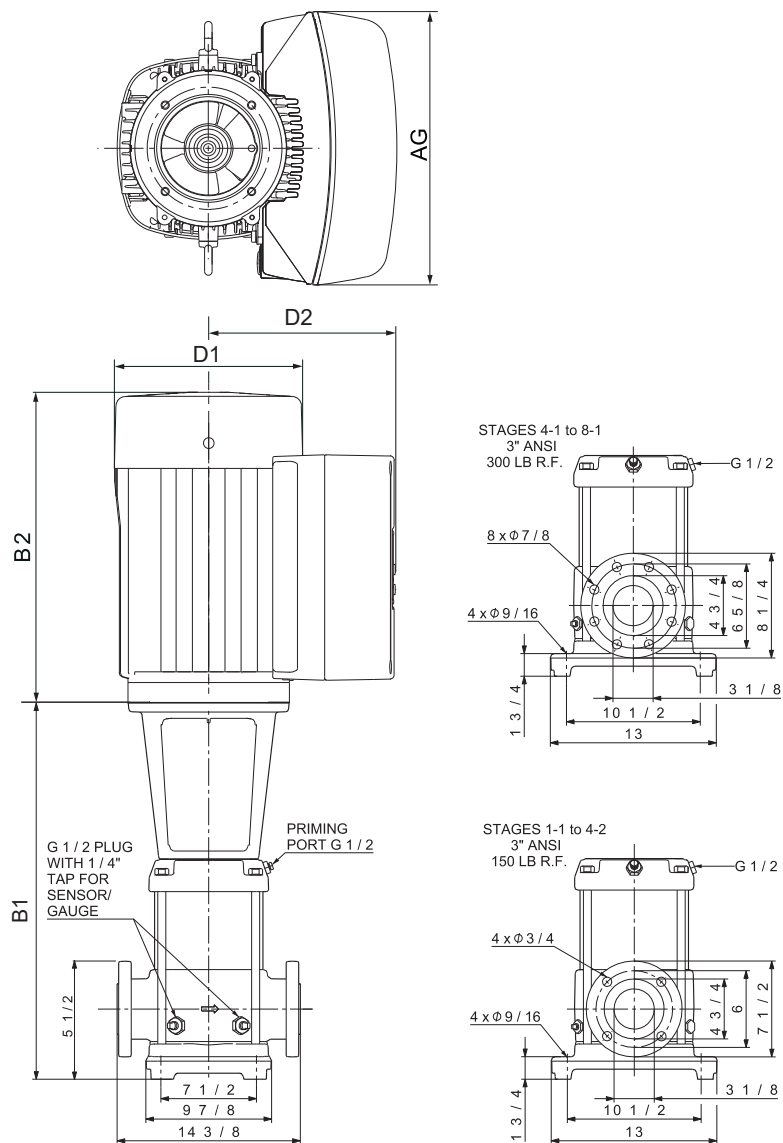
CRE, CRNE 45



TM059423

Pump type	[hp]	PH	Voltage [V]	Frame size	PEL _V L	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 45-3	25	3	440-480	284TC	0.41	5.34 (135.64)	32.64 (829.06)	12.52 (318)	11.93 (303)	16.54 (420)	52.87 (1342.90)	392.07 (177.84)
CRE 45-4-2	30	3	440-480	284TC	0.41	5.34 (135.64)	35.79 (909.07)	12.52 (318)	11.93 (303)	16.54 (420)	56.02 (1422.91)	409.49 (185.74)
CRE 45-4	30	3	440-480	284TC	0.41	5.34 (135.64)	35.79 (909.07)	12.52 (318)	11.93 (303)	16.54 (420)	56.02 (1422.91)	415.22 (188.34)

CRNE 45 dimensional data

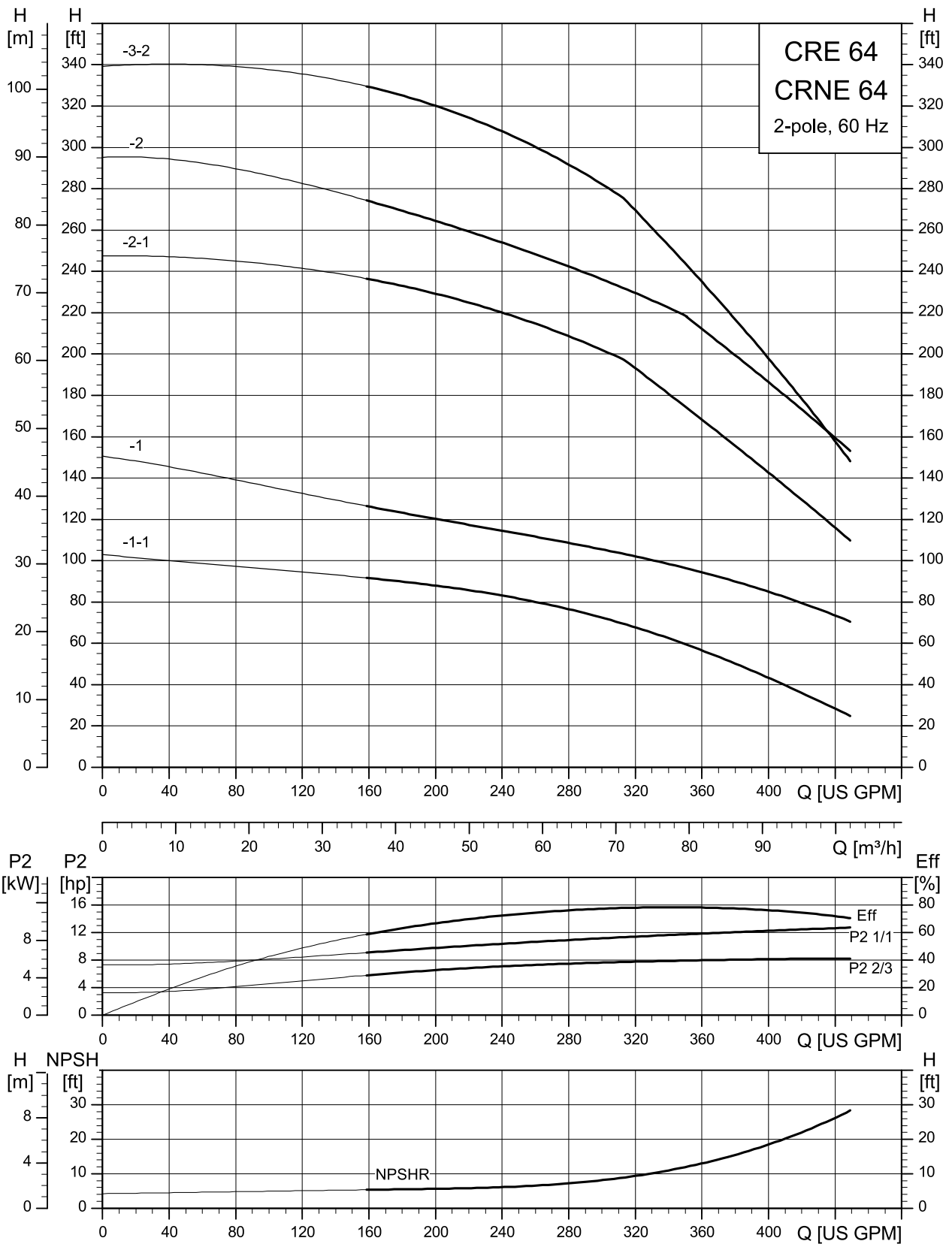


TM069239

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 45-1-1	7.5	3	200-240	213TC	0.41	5.34 (136)	22.01 (559)	10.04 (255)	9.33 (237)	13.62 (346)	37.32 (948)	322 (146)
		3	440-480	213TC	0.41	5.34 (136)	22.01 (559)	7.53 (191)	7.91 (201)	11.46 (291)	36.38 (924)	313 (142)
CRNE 45-1	10	3	440-480	213TC	0.41	5.34 (136)	22.01 (559)	10.04 (255)	9.33 (237)	13.62 (346)	37.32 (948)	337 (153)
CRNE 45-2-2	15	3	440-480	254TC	0.41	5.34 (136)	29.49 (749)	10.04 (255)	9.33 (237)	13.62 (346)	45.47 (1155)	402 (182)
CRNE 45-2	15	3	440-480	254TC	0.41	5.34 (136)	29.49 (749)	10.04 (255)	9.33 (237)	13.62 (346)	45.47 (1155)	402 (182)
CRNE 45-3-2	20	3	440-480	254TC	0.41	5.34 (135.64)	32.64 (829.06)	12.52 (318)	11.93 (303)	16.54 (420)	51.85 (1316.99)	360.54 (163.54)

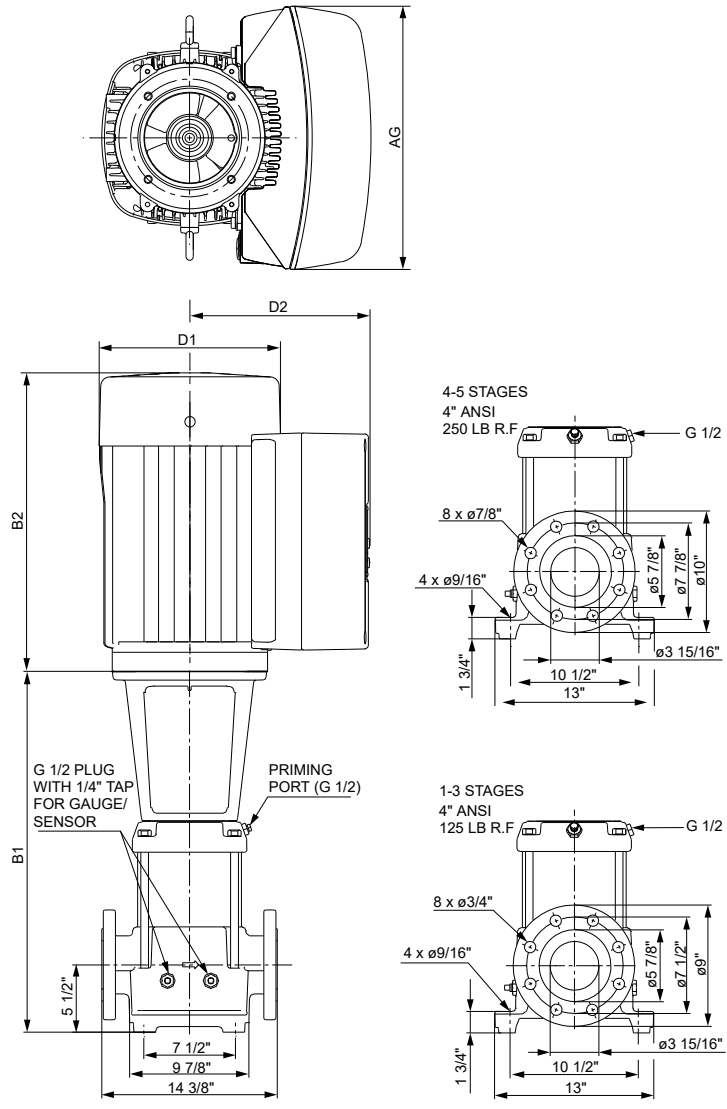
Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 45-3	25	3	440-480	284TC	0.41	5.34 (135.64)	32.64 (829.06)	12.52 (318)	11.93 (303)	16.54 (420)	52.87 (1342.90)	392.51 (178.04)
CRNE 45-4-2	30	3	440-480	284TC	0.41	5.34 (135.64)	35.79 (909.07)	12.52 (318)	11.93 (303)	16.54 (420)	56.02 (1422.91)	409.93 (185.94)
CRNE 45-4	30	3	440-480	284TC	0.41	5.34 (135.64)	35.79 (909.07)	12.52 (318)	11.93 (303)	16.54 (420)	56.02 (1422.91)	413.46 (187.54)

CRE, CRNE 64



TM059419

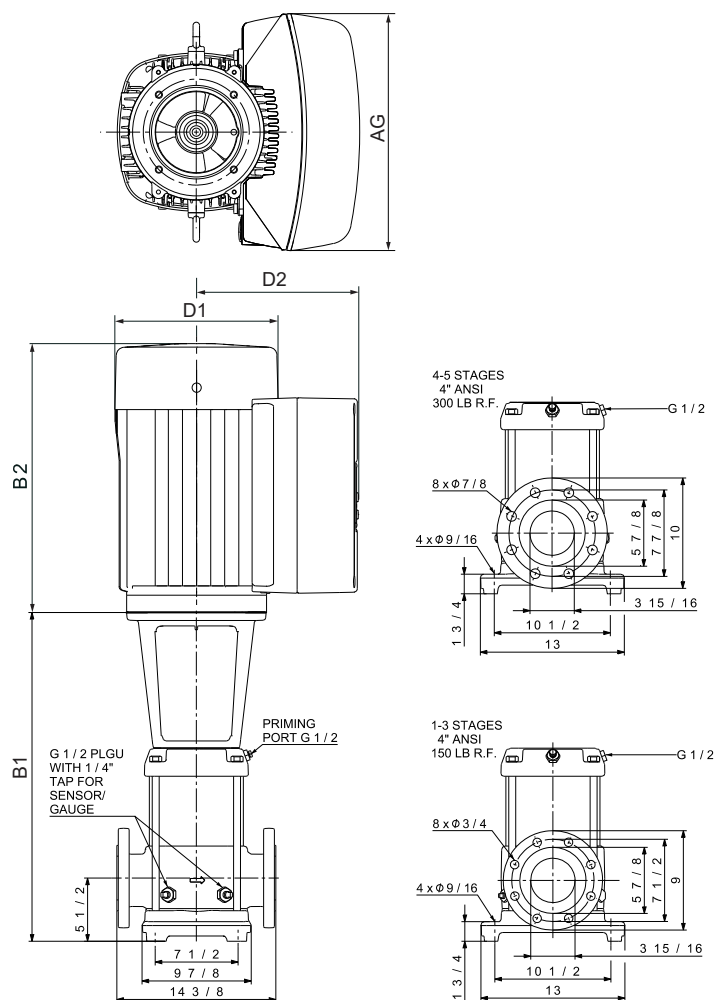
CRE 64 dimensional data



TM069241

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	Ship wt. [lbs (kg)]
CRE 64-1-1	10	3	440-480	213TC	0.43	5.59 (142)	22.09 (561)	10.04 (255)	9.33 (237)	13.62 (346)	37.40 (950)	346 (157)
CRE 64-1	15	3	440-480	254TC	0.43	5.59 (142)	26.42 (671)	10.04 (255)	9.33 (237)	13.62 (346)	42.40 (1077)	386 (175)
CRE 64-2-1	20	3	440-480	254TC	0.43	5.59 (141.99)	29.69 (754.13)	12.52 (318)	11.93 (303)	16.54 (420)	48.9 (1242.06)	362.52 (164.44)
CRE 64-2	25	3	440-480	284TC	0.43	5.59 (141.99)	29.69 (754.13)	12.52 (318)	11.93 (303)	16.54 (420)	49.92 (1267.97)	394.5 (178.94)
CRE 64-3-2	30	3	440-480	284TC	0.43	5.59 (141.99)	32.91 (835.91)	12.52 (318)	11.93 (303)	16.54 (420)	53.15 (1350.01)	413.46 (187.54)

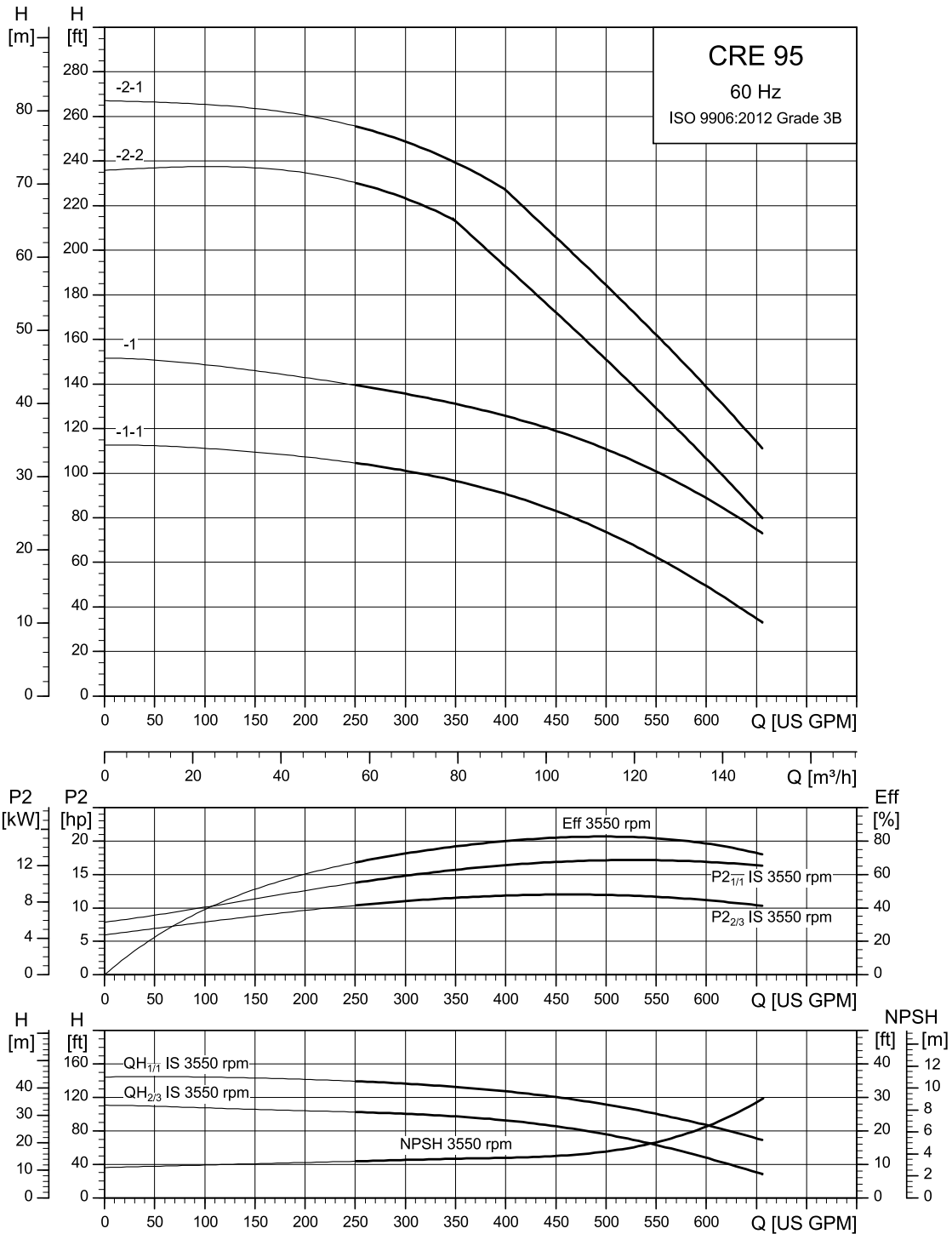
CRNE 64 dimensional data



TM069243

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 64-1-1	10	3	440-480	213TC	0.43	5.59 (142)	22.09 (561)	10.04 (255)	9.33 (237)	13.62 (346)	37.40 (950)	347 (157)
CRNE 64-1	15	3	440-480	254TC	0.43	5.59 (142)	26.42 (671)	10.04 (255)	9.33 (237)	13.62 (346)	42.40 (1077)	387 (176)
CRNE 64-2-1	20	3	440-480	254TC	0.43	5.59 (141.99)	29.69 (754.13)	12.52 (318)	11.93 (303)	16.54 (420)	48.9 (1242.06)	363.85 (165.04)
CRNE 64-2	25	3	440-480	284TC	0.43	5.59 (141.99)	29.69 (754.13)	12.52 (318)	11.93 (303)	16.54 (420)	49.92 (1267.97)	395.82 (179.54)
CRNE 64-3-2	30	3	440-480	284TC	0.43	5.59 (141.99)	32.91 (835.91)	12.52 (318)	11.93 (303)	16.54 (420)	53.15 (1350.01)	414.78 (188.14)

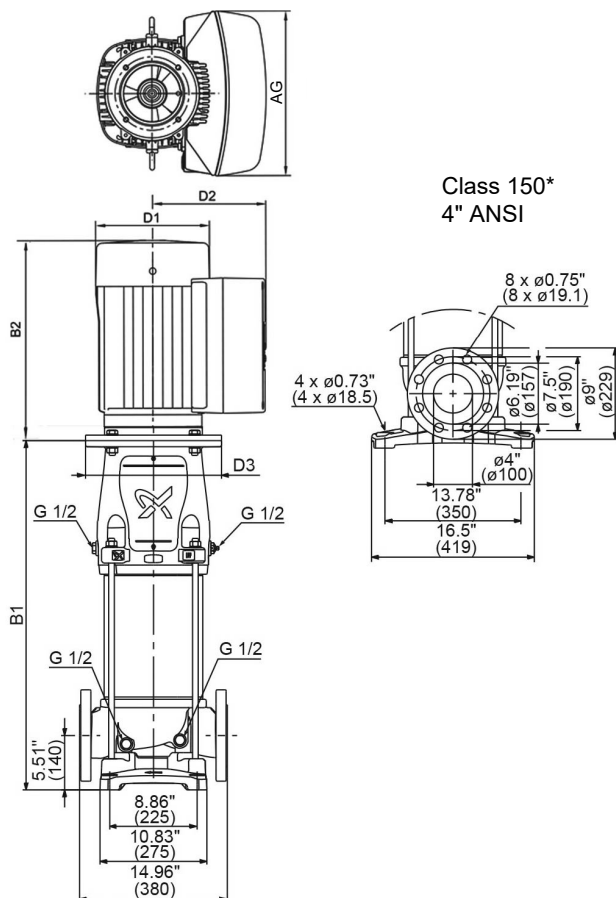
CRE 95



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

TM074479

CRE 95 dimensional data

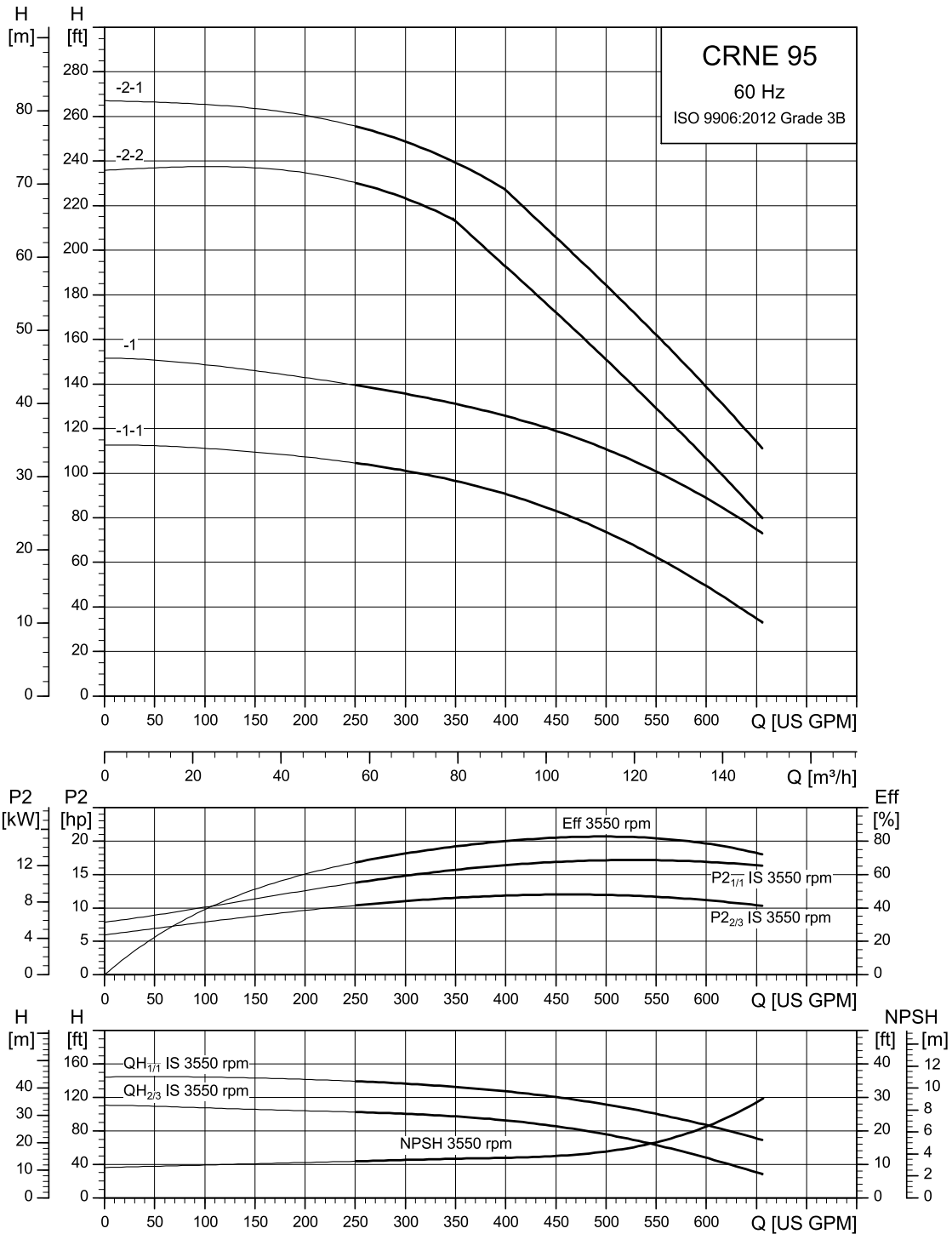


TM074464

* CRE, CRNE 95 pumps with one to two stages (with one reduced-diameter impeller) are fitted with 150 lb (68 kg) flanges as standard.

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 95-1-1	15	3	440-480	254TC	0.42	6.07 (154)	27.40 (696)	10.04 (255)	9.33 (237)	13.62 (346)	43.38 (1102)	632 (287)
CRE 95-1	20	3	440-480	256TC	0.42	6.07 (154)	27.40 (696)	12.52 (318)	11.93 (303)	16.54 (420)	46.61 (1184)	683 (309.80)
CRE 95-2-2	25	3	440-480	284TSC	0.42	6.07 (154)	31.50 (800)	12.52 (318)	11.93 (303)	16.54 (420)	51.73 (1314)	726 (329.31)
CRE 95-2-1	30	3	440-480	286TSC	0.42	6.07 (154)	31.50 (800)	12.52 (318)	11.93 (303)	16.54 (420)	51.73 (1314)	736 (333.84)

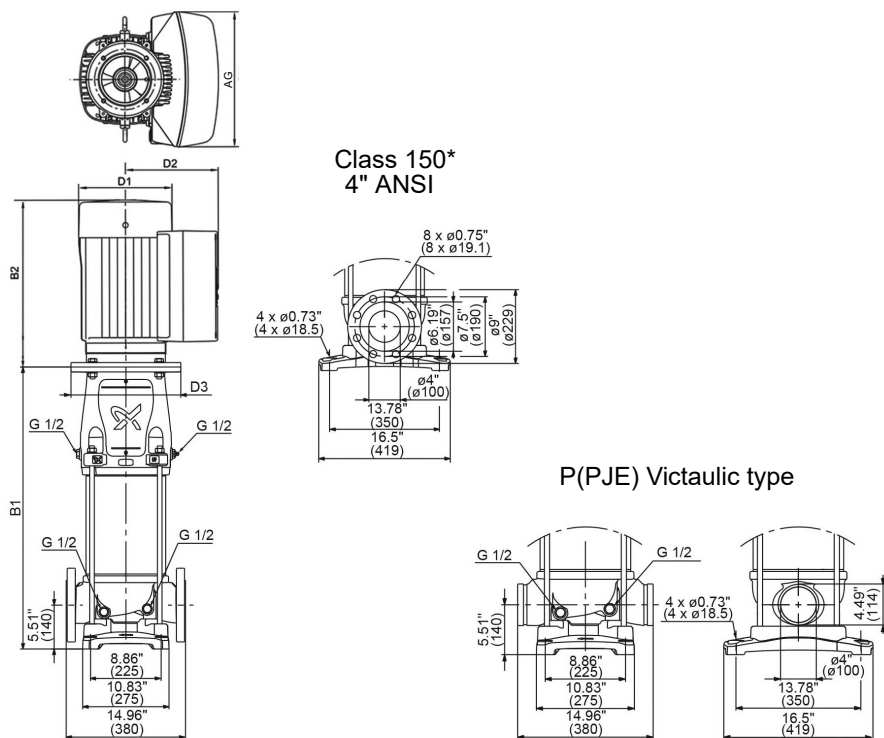
CRNE 95



TM074478

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

CRNE 95 dimensional data

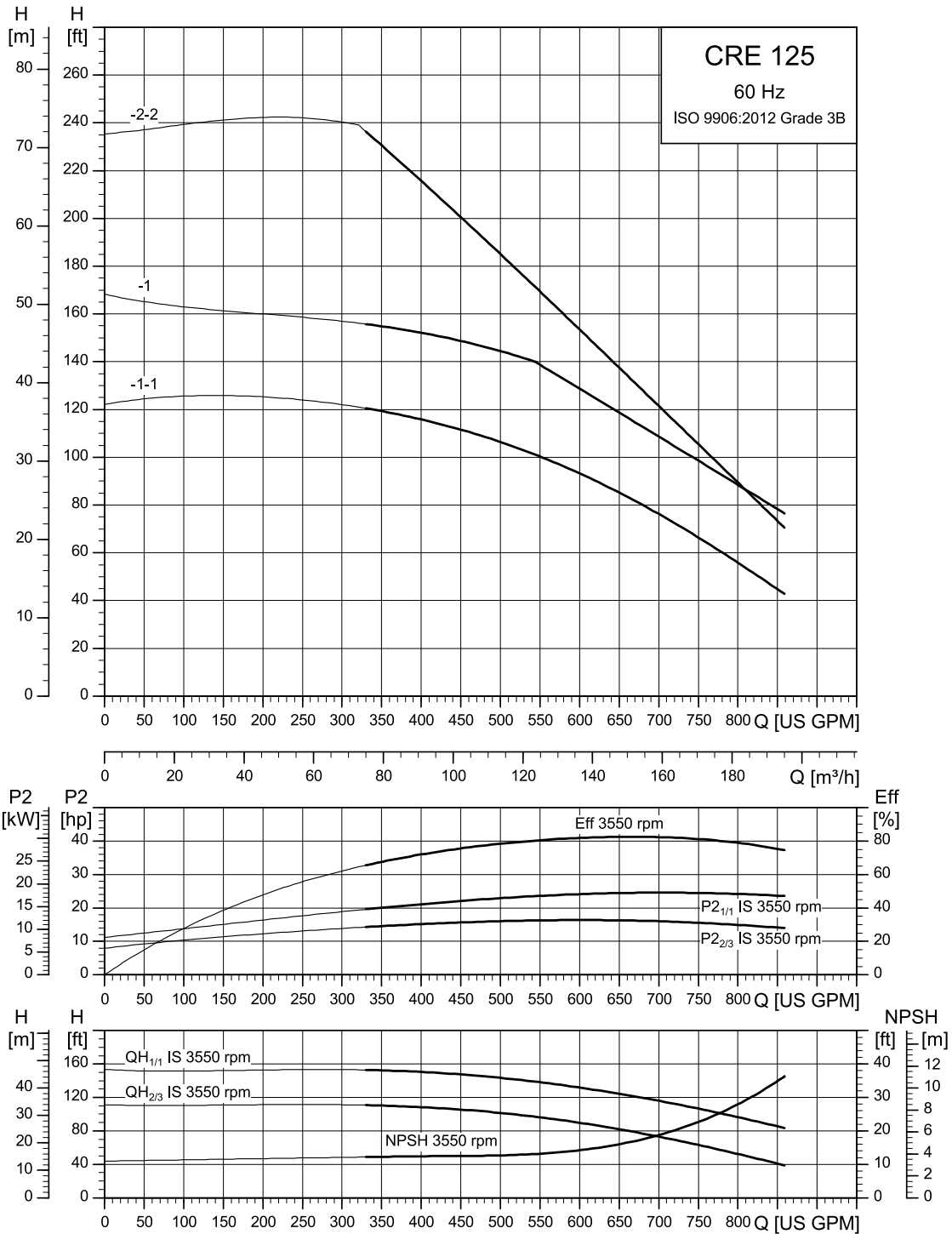


TM074466

* CRE, CRNE 95 pumps with one to two stages (with one reduced-diameter impeller) are fitted with 150 lb (68 kg) flanges as standard.

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 95-1-1	15	3	440-480	254TC	0.42	6.07 (154)	27.40 (696)	10.04 (255)	9.33 (237)	13.62 (346)	43.38 (1102)	616 (279)
CRNE 95-1	20	3	440-480	256TC	0.42	6.07 (154)	27.40 (696)	12.52 (318)	11.93 (303)	16.54 (420)	46.61 (1184)	683 (309.80)
CRNE 95-2-2	25	3	440-480	284TSC	0.42	6.07 (154)	31.50 (800)	12.52 (318)	11.93 (303)	16.54 (420)	51.73 (1314)	726 (329.31)
CRNE 95-2-1	30	3	440-480	286TSC	0.42	6.07 (154)	31.50 (800)	12.52 (318)	11.93 (303)	16.54 (420)	51.73 (1314)	736 (333.84)

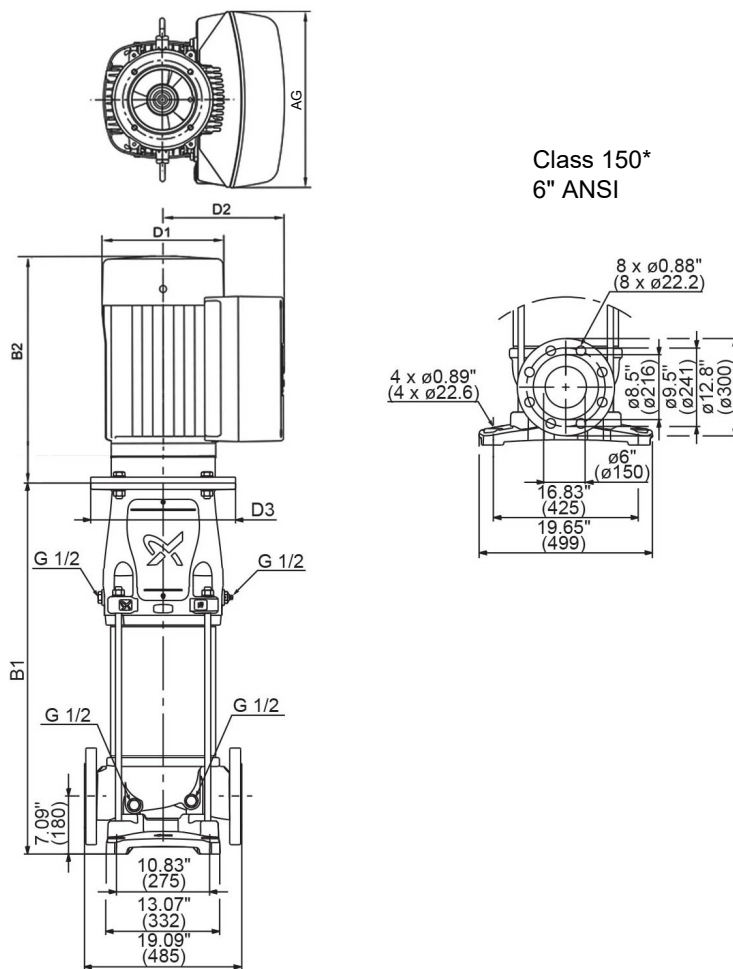
CRE 125



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

TM074480

CRE 125 dimensional data



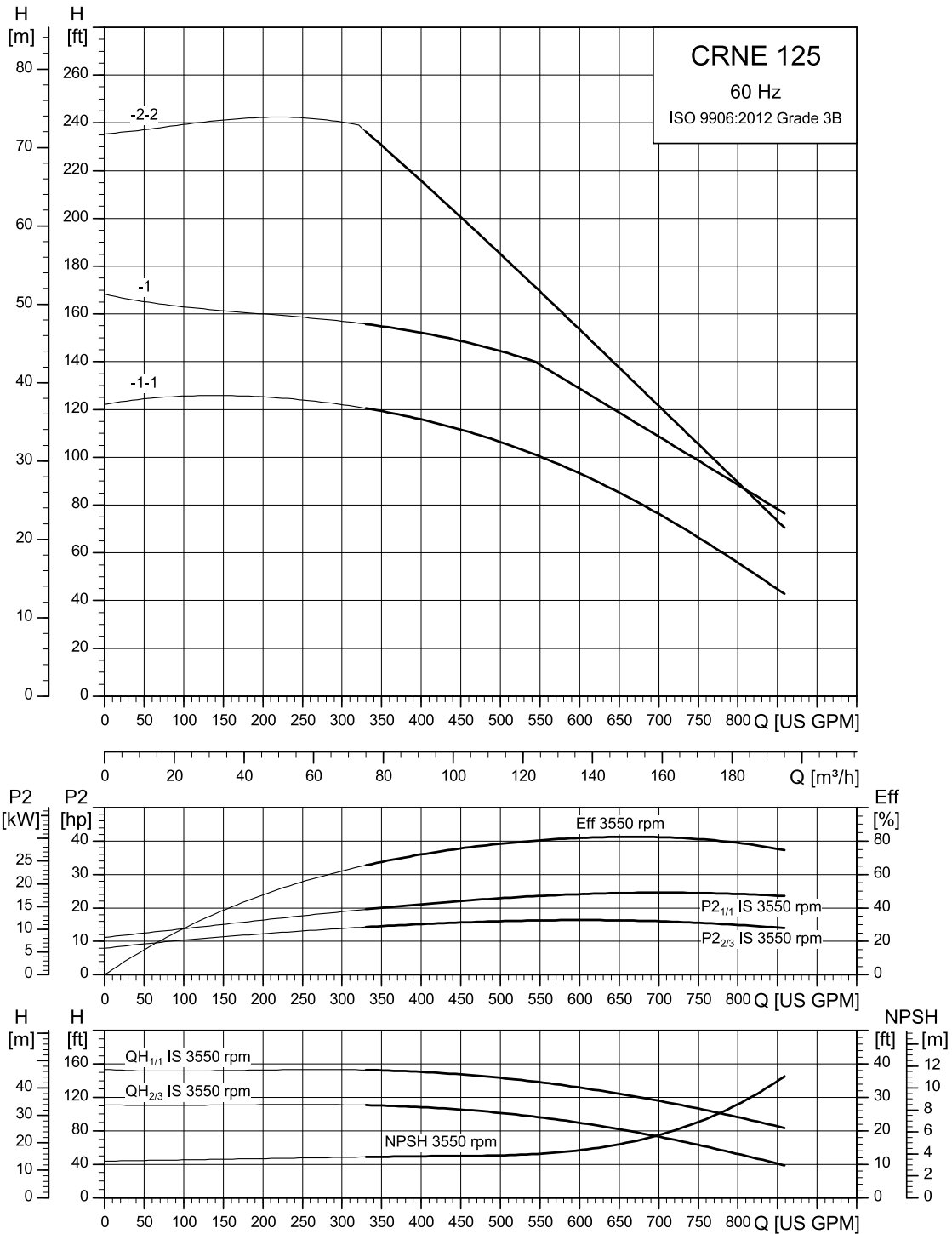
Class 150*
6" ANSI

TM074467

* CRE, CRNE 125 pumps with one to two stages are fitted with 150 lb (68 kg) flanges as standard.

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _V L	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 125-1-1	20	3	440-480	256TC	0.43	6.38 (162.05)	30.83 (783)	12.52 (318)	11.93 (303)	16.54 (420)	50.04 (1271)	763 (346.09)
CRE 125-1	25	3	440-480	284TSC	0.43	6.38 (162.05)	30.91 (785)	12.52 (318)	11.93 (303)	16.54 (420)	51.14 (1299)	807 (366.05)
CRE 125-2-2	30	3	440-480	286TSC	0.43	6.38 (162.05)	35.71 (907)	12.52 (318)	11.93 (303)	16.54 (420)	55.94 (1421)	839 (380.56)

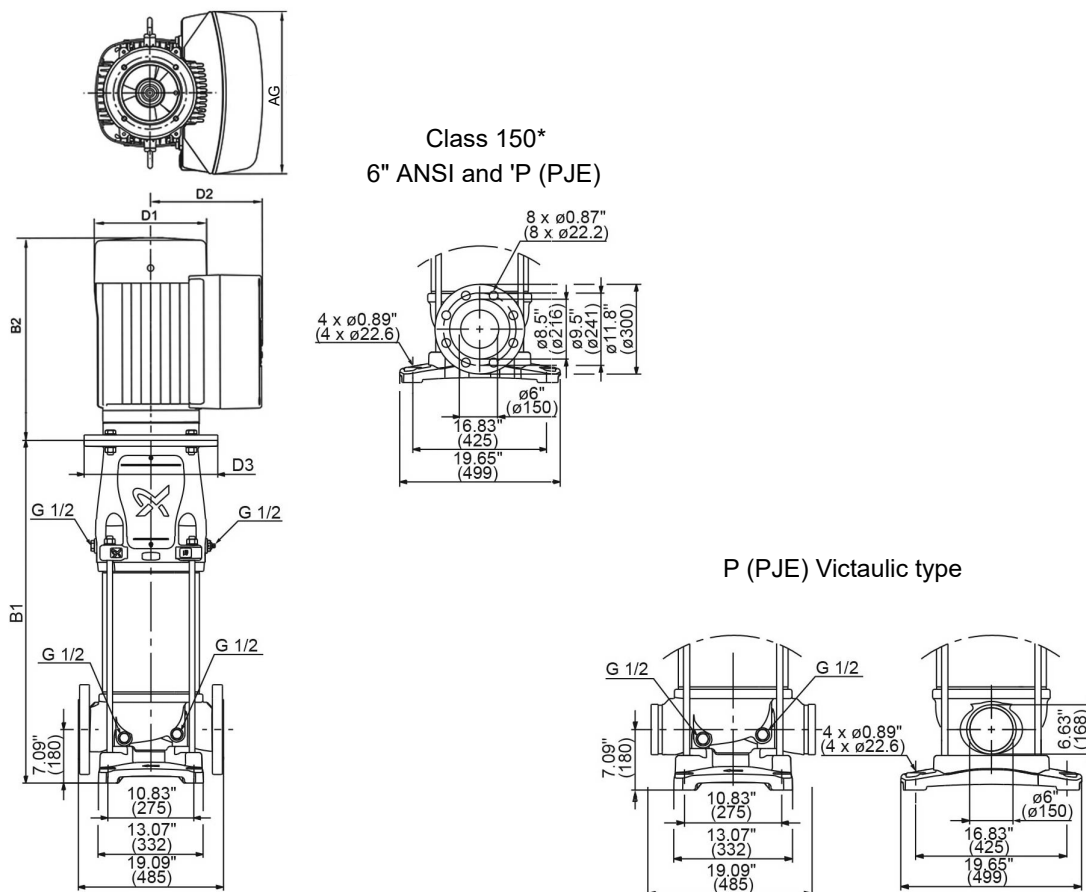
CRNE 125



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

TM074481

CRNE 125 dimensional data

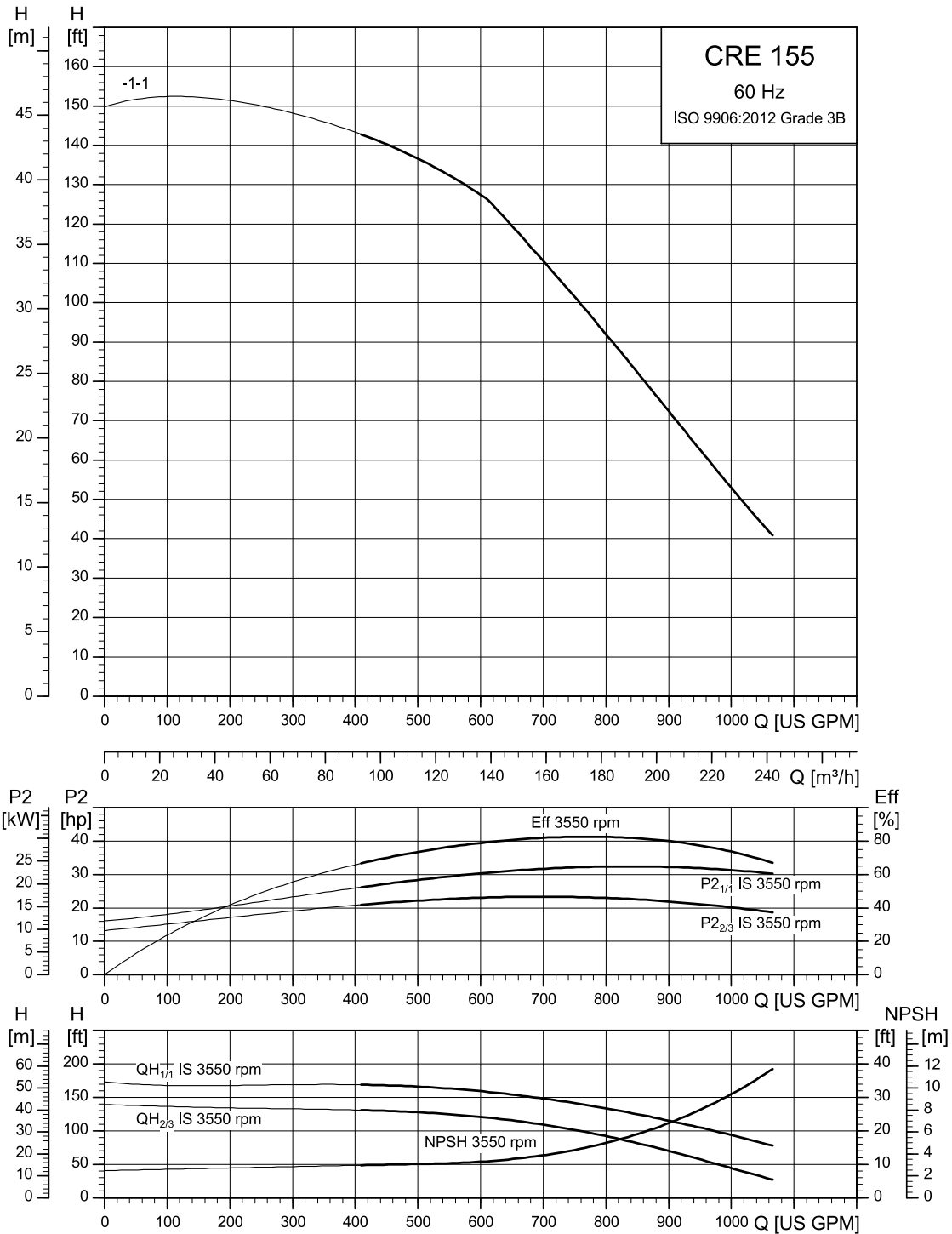


TM074468

* CRE, CRNE 125 pumps with one to three stages are fitted with 150 lb (68 kg) flanges as standard.

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 125-1-1	20	3	440-480	256TC	0.43	6.38 (162.05)	30.83 (783)	12.52 (318)	11.93 (303)	16.54 (420)	50.04 (1271)	763 (346.09)
CRNE 125-1	25	3	440-480	284TSC	0.43	6.38 (162.05)	30.91 (785)	12.52 (318)	11.93 (303)	16.54 (420)	51.14 (1299)	807 (366.05)
CRNE 125-2-2	30	3	440-480	286TSC	0.43	6.38 (162.05)	35.71 (907)	12.52 (318)	11.93 (303)	16.54 (420)	55.94 (1421)	839 (380.56)

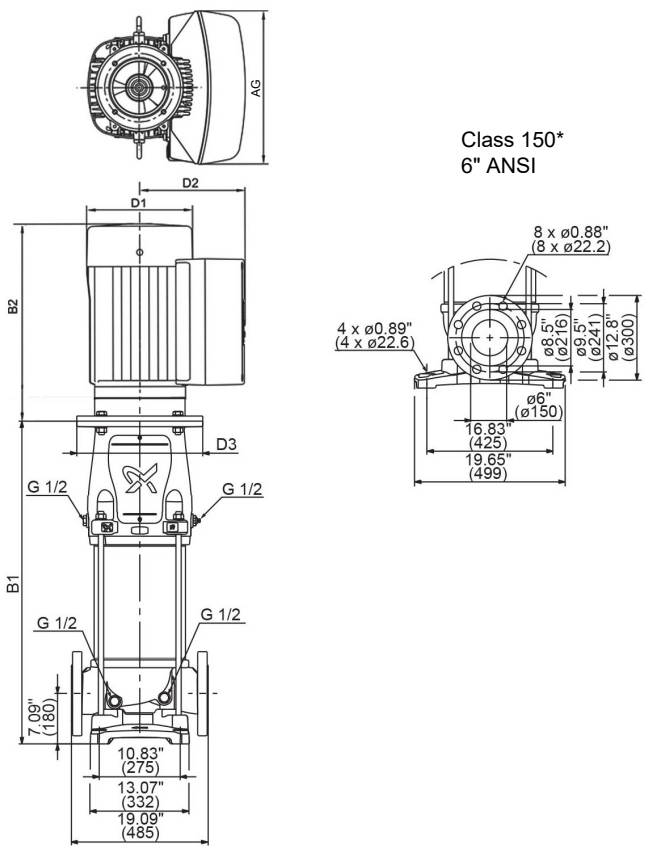
CRE 155



TM074482

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

CRE 155 dimensional data

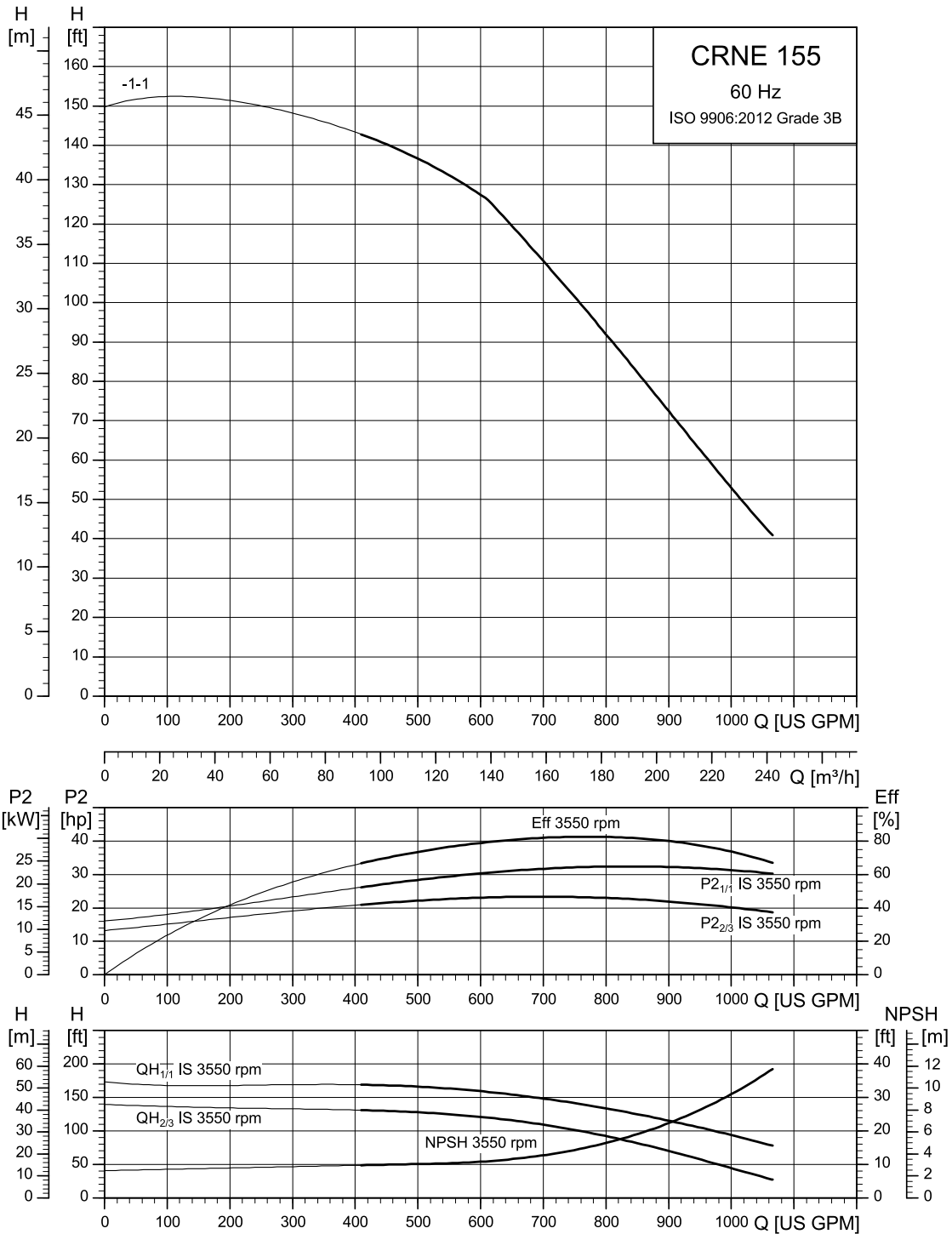


TM074467

* CRE, CRNE 155 pumps with stages (with 1 reduced-diameter impeller) are fitted with 150 lb. (68 kg) flanges as standard.

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{VL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRE 155-1-1	25	3	440-480	284TSC	0.48	6.64 (168.66)	30.91 (785)	12.52 (318)	11.93 (303)	16.54 (420)	51.14 (1299)	808 (366.50)

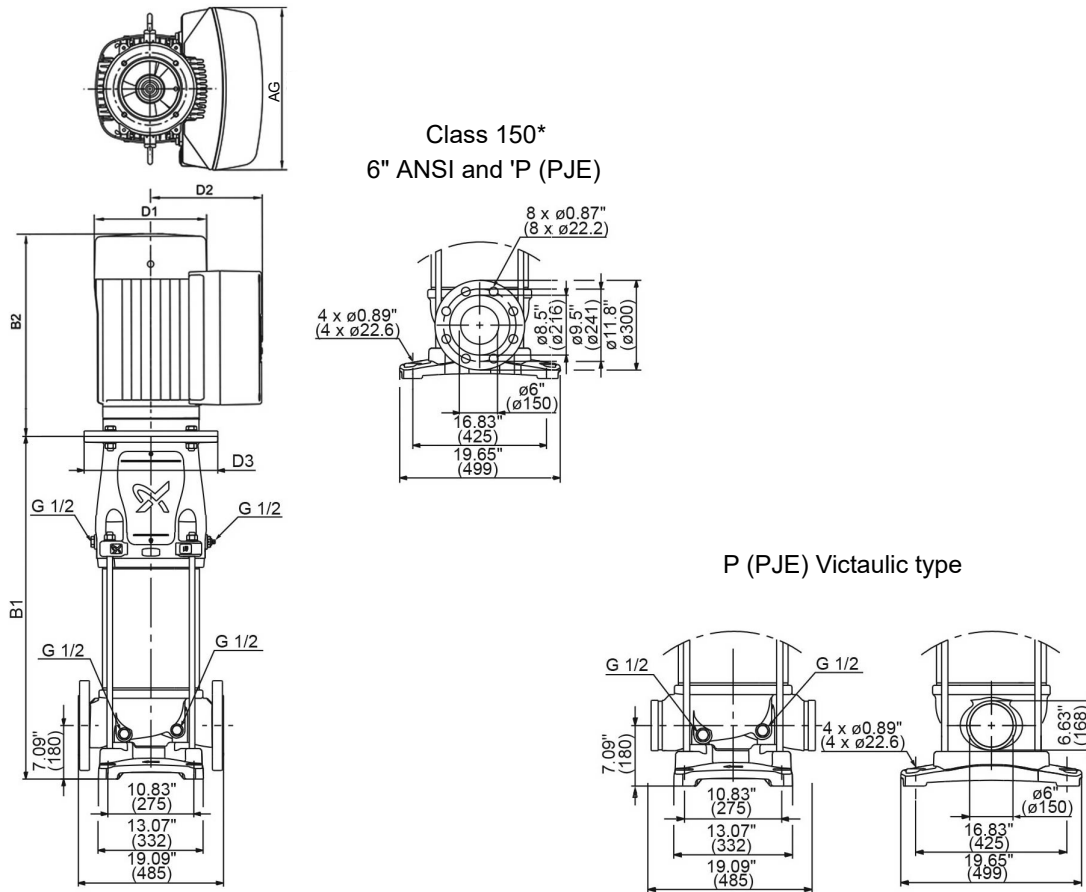
CRNE 155



TM074483

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

CRNE 155 dimensional data



TM074468

* CRE, CRNE 155 pumps with stages (with one reduced-diameter impeller) are fitted with 150 lb (68 kg) flanges as standard.

Pump type	[hp]	PH	Voltage [V]	Frame size	PEI _{vL}	Impeller diameter [in (mm)]	B1 [in (mm)]	D1 [in (mm)]	D2 [in (mm)]	AG [in (mm)]	B1+B2 [in (mm)]	ship wt. [lbs (kg)]
CRNE 155-1-1	25	3	440-480	284TSC	0.48	6.64 (168.66)	30.91 (785)	12.52 (318)	11.93 (303)	16.54 (420)	51.14 (1299)	808 (366.50)

11. Motor data

2-pole E-motors (Grundfos MLE)

Permanent-magnet motors with integrated variable frequency drive (VFD)
 Totally Enclosed Fan Cooled, constant speed



TM085712

hp ⁴⁴⁾	Voltage [V]	PH	Frame size	Service factor	Motor full-load efficiency [%] ⁴⁵⁾	Full-load current amps [A]	Service factor current amps [A]	Power factor	Full-load speed [rpm]	Sound pressure level [dB(A)]
1/2	200-240	1	56C	1	84	2.40 - 2.10		0.96	3400	58
3/4	200-240	1	56C	1	85.3	3.45 - 2.90		0.98	3400	58
1	200-240	1	56C	1	85.2	4.70 - 3.90		0.99	3400	58
1	440-480	3	56C	1.25	86.4	1.65	2.10	0.73	3480	58
1 1/2	200-240	1	56C	1	86.9	6.70 - 5.60		0.99	3400	58
1 1/2	200-240	3	56C	1.15	89.3	4.00 - 3.40	4.60 - 3.90	0.91	3480	55
1 1/2	440-480	3	56C	1.15	89.6	2.05	2.40	0.84	3480	58
2	200-240	1	56C	1	87.4	9.10 - 7.60		0.99	3400	64
2	200-240	3	56C	1.00	88.90	5.40 - 4.50		0.92	3480	55
2	440-480	3	56C	1.15	89.4	2.65	3.00	0.87	3480	64
3	200-240	3	182TC	1.15	88.70	7.90 - 6.60	9.10 - 7.60	0.94	3480	62
3	440-480	3	182TC	1.15	90.7	3.8	4.30	0.89	3480	64
5	200-240	3	182TC	1.15	90.90	13.2 - 10.9	14.90 - 12.40	0.94	3480	66
5	440-480	3	182TC	1.15	92.5	6.20 - 5.80	7.00 - 6.60	0.90	3500	60
7 1/2	200-240	3	213TC	1.15	90.20	20.0 - 16.6	23.0 - 19.3	0.94	3480	70
7 1/2	440-480	3	213TC	1.15	92.4	9.10 - 8.50	10.4 - 9.70	0.91	3500	60
10	440-480	3	213TC	1.15	92.5	12.4 - 11.5	14.2 - 13.0	0.91	3500	65
15	440-480	3	254TC	1.15	93.2	17.9 - 16.6	20.5 - 19.0	0.92	3500	65
20	440-480	3	256TC	1.15	93	23.1 - 21.8	27.3 - 24.8	0.93	3600	74
25	440-480	3	284TSC	1.15	93	28.5 - 26.4	32.9 - 30.2	0.94	3600	72
30	440-480	3	286TSC	1.15	94.1	34.3 - 31.6	39.4 - 36.2	0.94	3600	72

⁴⁴⁾ Permanent-magnet motor

⁴⁵⁾ Efficiency of motor and VFD

12. Accessories

Counterflanges for CRE

A set consists of two counterflanges, two gaskets, bolts and nuts.

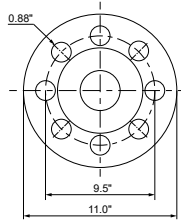
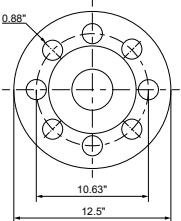
Pump type	Description	Pressure class	Pipe connection	Product number	Counterflange	
CRE 1, 3, 5	Threaded	ANSI 250 lb.	1 1/4" NPT	91122260		
	Threaded	ANSI 250 lb.	2" NPT	335021		
CRE 32	Threaded	ANSI 125 lb.	2 1/2" NPT	559601	ANSI 125 lb.	ANSI 250 lb.
	Threaded	ANSI 250 lb.	2 1/2" NPT	345050		
CRE 45	Threaded	ANSI 125 lb.	3" NPT	569601	ANSI 125 lb.	ANSI 250 lb.
	Threaded	ANSI 250 lb.	3" NPT	91121952		
CRE 64, 95	Threaded	ANSI 125 lb.	4" NPT	579801	ANSI 125 lb.	ANSI 250 lb.
	Threaded	ANSI 250 lb.	4" NPT	3600028		

Pump type	Description	Pressure class	Pipe connection	Product number	Counterflange	
	Threaded	ANSI 125 lb.	6" NPT		ANSI 125 lb.	ANSI 250 lb.
	Threaded	ANSI 250 lb.	6" NPT			
CRE 125, 155						

Counterflanges for CRNE

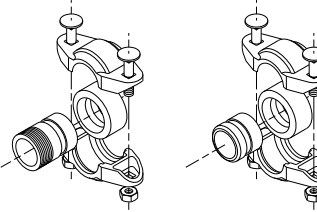
Counterflanges for CRNE pumps are made of stainless steel according to AISI 316. A set consists of two counterflanges, two gaskets, bolts and nuts.

Pump type	Description	Pressure class	Pipe connection	Product number	Counterflange	
CRIE, CRNE 1, 3, 5	Threaded	ANSI 300 lb.	1 1/4" NPT	91129013		
	Threaded	ANSI 300 lb.	2" NPT	339919		
CRNE 32	Threaded	ANSI 150 lb.	2 1/2" NPT	91121951	ANSI 150 lb.	ANSI 250 lb.
	Threaded	ANSI 250 lb.	2 1/2" NPT	01D00138		
CRNE 45	Threaded	ANSI 125 lb.	3" NPT	91121953	ANSI 125 lb.	ANSI 300 lb.
	Threaded	ANSI 300 lb.	3" NPT	91121954		
CRNE 64, 95	Threaded	ANSI 150 lb.	4" NPT	01D00148	ANSI 150 lb.	ANSI 300 lb.
	Threaded	ANSI 300 lb.	4" NPT	91121955		

Pump type	Description	Pressure class	Pipe connection	Product number	Counterflange	
	Threaded	ANSI 125 lb.	6" NPT		ANSI 125 lb.	ANSI 250 lb.
	Threaded	ANSI 250 lb.	6" NPT			
CRNE 125, 155						

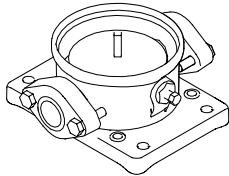
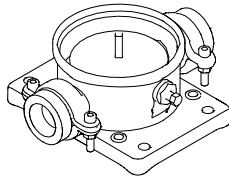
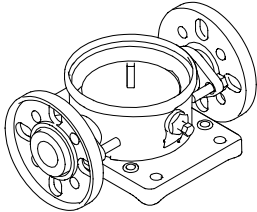
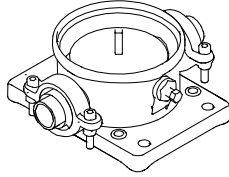
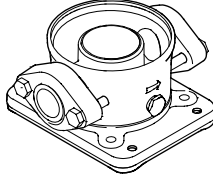
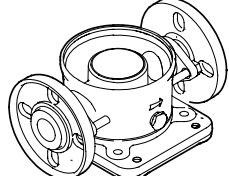
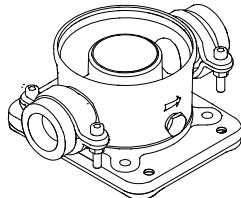
PJE couplings for CRNE

Couplings for CRNE pumps are made of stainless steel according to AISI 316. A set consists of two couplings, two gaskets, two pipe stub and bolts and nuts.

Pump type	Pipe stub	Rated pressure	Pipe connection	Rubber parts	Number of coupling sets needed	Product number	Couplings
CRIE, CRNE 1, 3, 5	Threaded	1160 psi	1 1/4" NPT	EPDM	1	4013010	
				FKM	1	0ID00118	
CRIE, CRNE 10, 15, 20	Threaded	1015 psi	2" NPT	EPDM	1	331301	
				FKM	1	0ID00128	
CRN 32	Threaded	-	3" NPT	EPDM	-	-	
CRN 45 CRN 64 CRN 95	Threaded	-	4" NPT	EPDM	-	-	
				FKM	-	-	
CRN 125 CRN 155	Threaded	-	6" NPT	EPDM	-	-	
				FKM	-	-	

FlexiClamp base connections

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

Pump type	Connection	Pipe connection	Rubber parts	Product number	Base connections
CRIE, CRNE 1, 3, 5	Oval (cast iron)	1" NPT	Klingersil	96468491	
		1 1/4" NPT	Klingersil	96470781	
	Oval (stainless steel)	1" NPT	Klingersil	96480850	
		1 1/4" NPT	Klingersil	96480851	
CRIE, CRNE 1, 3, 5	Union ext threaded	2" NPT	EPDM	96480852	
			FKM	96480853	
CRIE, CRNE 1, 3 and 5	ANSI (FGJ) (stainless steel)	1 1/4" NPT	EPDM	96480858	
			FKM	96480859	
CRIE, CRNE 1, 3, 5	Clamp, threaded pipe stub	1" NPT	EPDM	96480854	
			FKM	96480855	
		1 1/4" NPT	EPDM	96480856	
			FKM	96480857	
CRIE, CRNE 10, 15 and 20	Oval (cast iron)	2" NPT	Klingersil	96498838	
	Oval (stainless steel)	2" NPT	Klingersil	96498839	
CRIE, CRNE 10, 15, 20	ANSI (FGJ) (stainless steel)	2" NPT	EPDM	96511402	
			FKM	96511403	
CRIE, CRNE 10, 15, 20	Clamp, threaded pipe stub	1 1/2" NPT	EPDM	96500271	
			FKM	96500272	
		2" NPT	EPDM	96500273	
			FKM	96500274	
		2" NPT	EPDM	96508602	
			FKM	96508603	

Potentiometer for CRE, CRIE, CRNE

Potentiometer for setpoint setting and start and stop of the CRE, CRIE, CRNE pump.

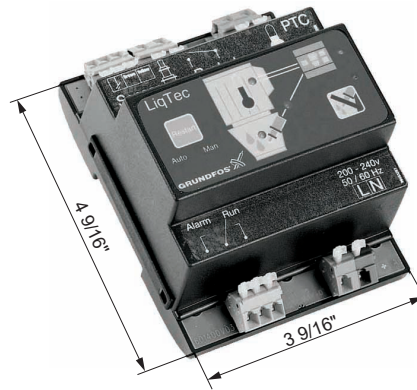
Product	Product number
External potentiometer with cabinet for wall mounting	625468

LiqTec

The LiqTec dry-running protection unit protects the pump and process against dry running and temperatures exceeding 266 ± 9 °F (130 ± 5 °C). Connected to the motor PTC sensor, LiqTec also monitors the motor temperature.

The product features a fail-safe design. If the sensor, sensor cable, electronic unit or power supply fails, the pump stops immediately.

Mount the LiqTec box in a cabinet.



TM028672

The maximum system pressure is 580 psi.

Sensor enclosure class: IP68.

Wetted parts: AISI 316L.


Voltage [V]	LiqTec	Sensor 1/2"	Cable 16.4 ft (5 m)	Extension cable 49.2 ft (15 m)	Product number
1/60/200-240	•	•	•	-	96556429
1/60/120	•	•	•	-	96556430
-	-	-	-	•	96443676
-	-	•	•	-	99337830

• Available.

- Not available.

Pressure sensors

Grundfos ISP44 pressure sensor

Accessory	Supplier	Type	Pressure range [psi (bar)]	Product number
 <ul style="list-style-type: none"> Pressure sensors Pressure transmitter with 8.2 ft (2.5 m) unscreened cable and M12 connector Connection: 1/4" - 18 NPT M12 connector for custom wiring. 	Grundfos	ISP44	0-87 (0-6)	99970220
			0-145 (0-10)	99970234
			0-232 (0-16)	99970236
			0-362 (0-25)	99970238

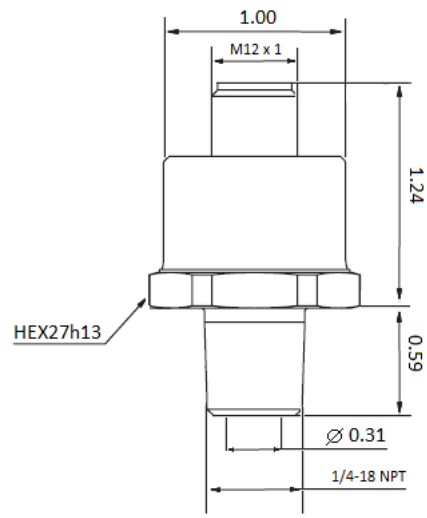
Technical data

Pressure sensor (Product number)	99970220	99970234	99970236	99970238
Pressure range [psi (bar)]	0-87 (0-6)	0-145 (0-10)	0-232 (0-16)	0-362 (0-25)
Maximum operating pressure [psi (bar)]	348 (24)	580 (40)	928 (64)	1450 (100)
Supply voltage [VDC]	8-28			
Output signal [mA]	4-20			
Accuracy, typical +/- FS [%]	0.5			
Response time, maximum [ms]	< 2			
Pumped liquid temperature range [°F (°C)]	-40 to +212 (-40 to +100)			
Ambient temperature range [°F (°C)]	-40 to +185 (-40 to +85)			
Wetted parts, material	AISI 316L			
Housing material	AISI 304L			
Enclosure rating	IP67			
Weight [lbs (kg)]	0.3 (0.14)			
EMC - Emission	EN 61000-6-3			
EMC Immunity	EN 61000-6-2			
Pressure connection	NPT 1/4-18			
CE-marked	EMC-protected in accordance with EU EMC Directive			
UL file number	E527399 (QUYX2/8)			

Maximum pumped liquid temperature

Pumped liquid temperature [°F (°C)]	230 (110)	248 (120)	266 (130)
Ambient temperature [°F (°C)]	< 149 (65)	< 113 (45)	< 77 (25)


Dimensions



ISP44 sensor with M12 connection

TM082270

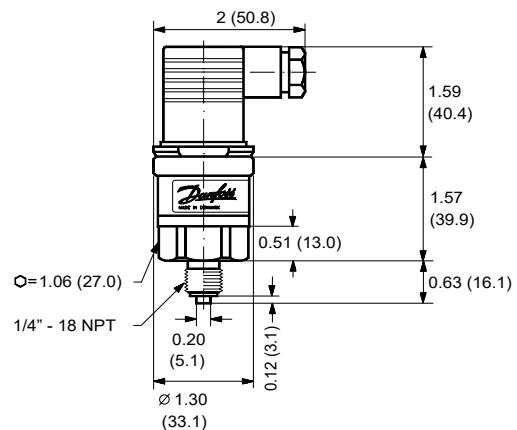
Danfoss MBS3000 pressure sensor

Accessory	Supplier	Type	Pressure range [psi (bar)]	Product number
 <ul style="list-style-type: none"> • Pressure sensors • Pressure transmitter with 6 ft (1.8 m) screened cable. • Connection: 1/4" - 18 NPT 	Danfoss	MBS3000	0-580 (0-40)	91136173
			0-870 (0-60)	91136174
			<p>TM051533_2911</p>	

Technical data

Pressure sensor (Product number)	91136173	91136174
Pressure range [psi (bar)]	0-580 (0-40)	0-870 (0-60)
Maximum operating pressure [psi (bar)]	2900 (200)	2900 (200)
Supply voltage [VDC]	9-32	
Output signal [mA]	4-20	
Insulation resistance	> 100 MΩ at 100 V	
Accuracy, typical +/- FS [%]	0.5	
Response time, maximum [ms]	4	
Medium temperature range [°F (°C)]	-40 to +185 (-40 to +85)	
Ambient temperature range [°F (°C)]	-40 to +185 (-40 to +85)	
Wetted parts, material	AISI 316L	
Housing material	AISI 316L	
Enclosure rating	IP65	
Weight [lbs (kg)]	0.3 (0.14)	
EMC - Emission	EN 61000-6-3	
EMC Immunity	EN 61000-6-2	
Pressure connection	NPT 1/4-18	
CE-marked	EMC-protected in accordance with EU EMC Directive	

Dimensions



Dimensional sketch

Grundfos differential-pressure sensor, DPI



Grundfos differential-pressure sensor, DPI

- 1 sensor incl. 3 ft (0.9 m) screened cable (7/16" connections)
- 1 original DPI bracket (for wall mounting)
- 1 Grundfos bracket (for mounting on motor)
- 2 M4 screws for mounting of sensor on bracket
- 1 M6 screw (self-cutting) for mounting on 3 hp and smaller
- 1 M8 screw (self-cutting) for mounting on 5-10 hp
- 1 M10 screw (self-cutting) for mounting on 15 - 25 hp
- 1 M12 screw (self-cutting) for mounting on 30 hp
- 3 capillary tubes (short/long)
- 2 fittings (1/4" - 7/16")
- 5 cable clips (black)
- Installation and operating instructions

Pressure range [psi (bar)]

Product number

0 - 8.7 (0 - 0.6)	96611522
0 - 14.5 (0 - 1.0)	96611523
0-23 (0 - 1.6)	96611524
0-36 (0 - 2.5)	96611525
0-58 (0 - 4.0)	96611526
0-87 (0 - 6.0)	96611527
0-145 (0-10)	96611550

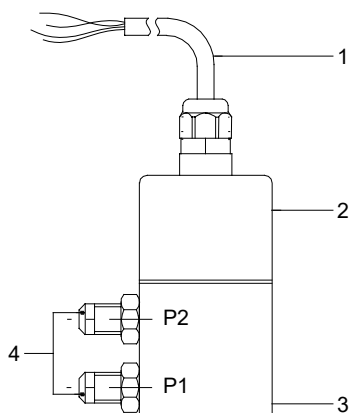
Select the differential-pressure sensor so that the maximum pressure of the sensor is higher than the maximum differential pressure of the pump.

The sensor housing (3) and parts in contact with the liquid are made of Inox DIN 1.4305 with composite PA top (2). The connections (4) are DIN 1.4305, 7/16" UNF connection and gaskets are FKM. A black and screened cable (1) goes through a screwed connection PG with M12 x 1.5 connection.

The sensor is supplied with an angular bracket for mounting on the motor or bracket for wall mounting.

A specially coated silicon chip is used for greater accuracy.

Technical data



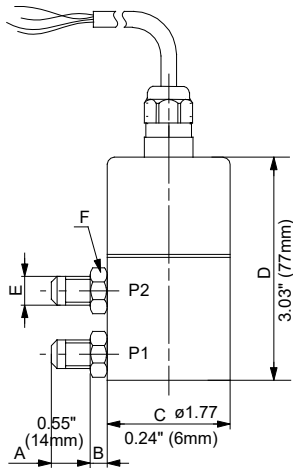
TM032057

DPI sensor

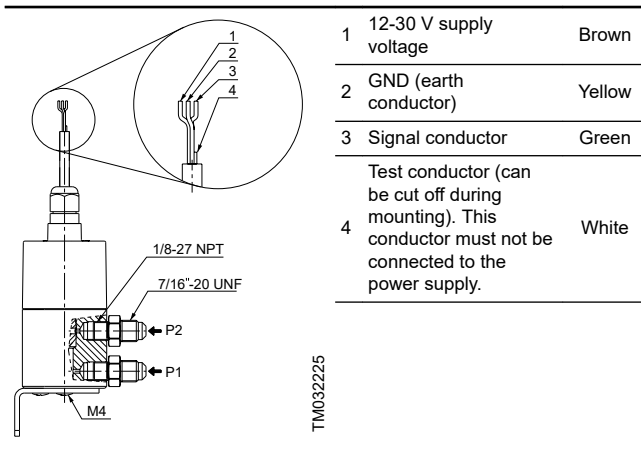
Grundfos differential-pressure sensor, DPI (Product number)	96611522	96611523	96611524	96611525	96611526	96611527	96611550
Pressure ranges, differential pressure [psi (bar)]	0 - 8.7 (0 - 0.6)	0 - 14.5 (0 - 1.0)	0-23 (0 - 1.6)	0-36 (0 - 2.5)	0-58 (0 - 4.0)	0-87 (0 - 6.0)	0-145 (0-10)
Supply voltage	12-30 VDC						
Output signal	4-20 mA						
Load [Ω]	24 V: max. 500 [Ω], 16 V: max. 200 [Ω], 12 V: max. 100 [Ω]						
Maximum system pressure, P1 and P2 simultaneously [psi (bar)]	232 (16)						
Rupture pressure [psi]	1.5 x system pressure						
Measuring accuracy	2.5 % BFSL						
Response time	< 0.5 seconds						
Liquid temperature range	+14 °F to +158 °F (-10 °C to +70 °C)						
Storage temperature range	-40 °F to +176 °F (-40 °C to +80 °C)						

Grundfos differential-pressure sensor, DPI (Product number)	96611522	96611523	96611524	96611525	96611526	96611527	96611550
Electrical connection	26 GA, 3 ft (0.9 m) cable - M12 x 1.5 in (38 mm) sensor top						
Short-circuit-proof	Yes						
Protected against reverse polarity	Yes						
Over supply voltage	Yes						
Materials in contact with liquid	DIN 1.4305 FKM and PPS						
Enclosure class	IP55						
Weight [lb (kg)]	1.2 (0.54)						
EMC (electromagnetic compatibility)	According to EN 60335-1						
Emission/immunity	According to EN 61800-3						
Connections	7/16"-UNF						
Sealing material	FKM						

Dimensions



Dimensional sketch



Wiring

Grundfos differential-pressure sensor, DPI g.2 version



TM047866

- 1 sensor
- 1 capillary tube, short version,
- 1 fitting for capillary tube 6 ft (1.8 m) cable,
- 1 installation and operation instructions

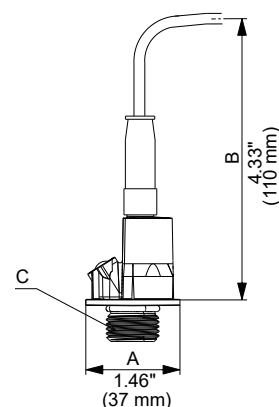
Grundfos differential-pressure sensor, DPI g.2 version	Pressure range [psi (bar)]	Product number
	0 - 8.7 (0 - 0.6)	97747194
	0 - 14.5 (0 - 1.0)	97747195
	0-23 (0 - 1.6)	97747196
	0-36 (0 - 2.5)	97747197
	0-58 (0 - 4.0)	97747198
	0-87 (0 - 6.0)	97747199
	0-145 (0-10)	97747200

Select the differential-pressure sensor so that the maximum pressure of the sensor is higher than the maximum differential pressure of the pump.

All materials used for DPI 2 are AISI 316 L.

The fitting connection for the capillary tube is 7/16" UNF.

The cable has M12 x 4 connectors. The sensor is supplied with fittings for capillary tubing. Measuring technology is based on a coated silicon chip.



TM049237

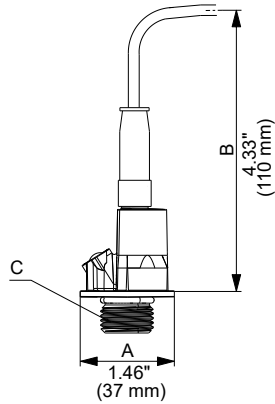
DPI sensor g.2 version

Technical data

Grundfos differential-pressure sensor, DPI g.2 version (Product number)	97747194	97747195	97747196	97747197	97747198	97747199	97747200
Pressure ranges, differential pressure [psi (bar)]	0 - 8.7 (0 - 0.6)	0 - 14.5 (0 - 1.0)	0-23 (0 - 1.6)	0-36 (0 - 2.5)	0-58 (0 - 4.0)	0-87 (0 - 6.0)	0-145 (0-10)
Supply voltage	12-30 VDC						
Output signal	4-20 mA						
Load [Ω]	30 V DC: max. 900 ohms [Ω], 1.3 V: max. 100 [Ω], 12.5 V: max. 60 [Ω]						
Maximum system pressure, P1 and P2 simultaneously [psi (bar)]	870 (60)						
Rupture pressure [psi]	1.5 x system pressure						
Measuring accuracy	2.0 % FS						
Response time	< 100 ms (typical 50 ms)						
Liquid temperature range	-22 to +212 °F (-30 to +100 °C)						
Storage temperature range	-67 to +158 °F (-55 to +70 °C)						
Electrical connection	27 GA 6 ft (1.8) cable M12 x 4						
Short-circuit-proof	Yes						
Protected against reverse polarity	Yes						
Over supply voltage	Yes						
Materials in contact with liquid	AISI 316 L						
Enclosure class	IP67						
Weight [lbs]	1.2						

Grundfos differential-pressure sensor, DPI g.2 version (Product number)	97747194	97747195	97747196	97747197	97747198	97747199	97747200
EMC (electromagnetic compatibility)	According to EN 61326-1						
Connections	7/16"-UNF						
Sealing material	EPDM						

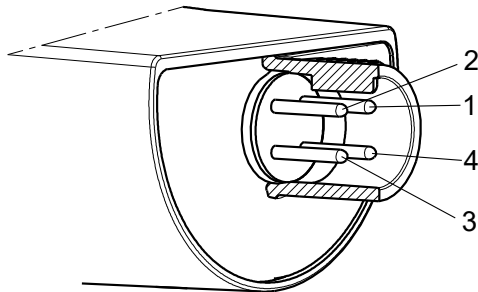
Dimensions



TM049237

DPI sensor g.2 version

Electrical connections



TM047156

Electrical connections

Pin	1	2	3	4
Wire color	Brown	Grey	Blue	Black
Output 4-20 mA	+	Not used	-	Not used
Output 2 x 0-10 V	+	Pressure signal	- 46)	Temperature signal

46) Common ground for both pressure and temperature signal.

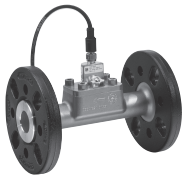
Power supply (screened cable): SELV or PELV.

Flow transmitters

The flow tube of AISI 316 is mounted with a transmitter with the following properties:

- the transmitter is of AISI 316 L
- the output signal is 4-20 mA
- there are two flanges
- comes with a 15 ft (4.5 m) cable with free ends
- comes with a quick guide.

Type	Flow range [gpm (m ³ /h)]	Connection	O-ring		Flange material		Product number
			EPDM	FKM	Cast iron	Stainless steel	
VFI 0.3-6	1.3 - 26 (0.3 - 7.0)	3/4"	•		•		97686127
	1.3 - 2.6 (0.35 - 0.7)	3/4"	•			•	97688293
VFI 0.6-12	2.6 - 53 (0.70 - 14.4)	1"	•		•		97686129
	2.6 - 53 (0.7 - 14.4)	1"	•			•	97688295
VFI 1.3-25	5.7 - 110 (1.5 - 30)	1 - 1/4"	•		•		97686141
	5.7 - 110 (1.5 - 30)	1 - 1/4"	•			•	97688297
VFI 2-40	8.8 - 176 (2.4 - 48)	1 - 3/4"	•		•		97686143
	8.8 - 176 (2.4 - 48)	1 - 3/4"	•			•	97688299
VFI 3.2-64	14-282 (3.8 - 76.9)	2"	•		•		97686145
	14-282 (3.8 - 76.9)	2"	•			•	97688301
VFI 5.2-104	23-458 (6.2 - 124.9)	2 - 1/2"	•		•		96788476
VFI 8-160	35-704 (9.5 - 192)	3"	•		•		97788478
VFI 8-160	53-1060 (14.4 - 289)	4"	•		•		97788492




For more information about the VFI sensor, see the Grundfos Direct Sensors™ data booklet, publication number 97790189, in Grundfos Product Center at www.grundfos.com.

Gauges for CRE, CRIE, CRNE

Accessory	Measuring range	Product number
Liquid-filled pressure gauge • AISI 304/copper	30" Hg - 30 psi (2 bar)	91123566
	0-60 psi (0-4 bar)	00ID8562
	0-100 psi (0-7 bar)	00ID8563
	0-160 psi (0-11 bar)	00ID8564
	0-200 psi (0-14 bar)	00ID8565
	0-300 psi (0-21 bar)	00ID8566
	0-400 psi (0-27 bar)	00ID8567
	0-600 psi (0-41 bar)	00ID8568
Liquid-filled pressure gauge • AISI 316	30" Hg - 30 psi (2 bar)	91130835
	0-60 psi (0-4 bar)	00ID8569
	0-100 psi (0-7 bar)	00ID8570
	0-160 psi (0-11 bar)	00ID8571
	0-200 psi (0-14 bar)	00ID8572
	0-300 psi (0-21 bar)	00ID8573
	0-400 psi (0-27 bar)	00ID8574
	0-600 psi (0-41 bar)	00ID8575
	0-200 psi (0-14 bar)	00ID8576

Temperature sensor

	
Accessory:	Temperature sensor
Supplier:	Danfoss
Type:	MBT3270
Temperature range:	-58 °F to 392 °F (-50 to 200 °C)
Product number:	99501120
Output signal:	PT100 Class B, two-wire
Wetted parts, material:	AISI 316L
Cable:	6.5 ft. (1.9 m) silicone cable
Connection:	G 1/2 A thread Threads into CRE, CRNE pump head
O-rings:	EPDM and FKM included

Remote controls

Grundfos GO

Use Grundfos GO for the following types of wireless communication with the pump:

- infrared
- radio
- Bluetooth.

MLE 1/2 to 15 hp

These motors will connect to the pump through wireless infrared or radio communication.

MI 301

MI 301 is a module with built-in infrared and radio communication. It is required for Grundfos GO communication. MI 301 can be used together with Android or iOS-based smart devices with a Bluetooth connection. MI 301 has a rechargeable Li-ion battery that must be charged separately.



TM053890

MI 301

Supplied with the product:

- Grundfos MI 301
- sleeve
- battery charger
- quick guide.

Product numbers

Grundfos GO variant	Product number
Grundfos MI 301	98046408

MLE 20 to 30 hp

These motors will connect to the pump via Bluetooth (BLE).

Related information

[Bluetooth](#)

Communication Interface Unit (CIU)



GRA6118

Grundfos CIU

The CIU standard interface units with internal power supply are suitable for Grundfos products that do not support the internal mounting of a communication interface module (CIM).

The CIU incorporates a 24-240 VAC/VDC power supply module. The CIU can either be mounted on a DIN rail or on a wall.

We offer the following communication interface units:

CIU 900

It is for mounting an add-on CIM. The CIU 900 includes an internal power supply.

A CIM is required.

CIU 901

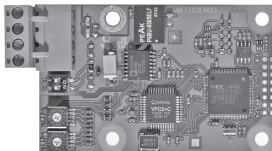
It is for mounting an add-on CIM 200, CIM 280 or CIM 500. The CIM 500 only supports Modbus TCP/IP and GiC/GRM IP when mounted in the CIU 901.

The CIU 901 includes an internal power supply and an integrated input/output board. The built-in multi-purpose input/output board enables monitoring of standard pumps, sensors, meters and switches.

A CIM is required.

Description	Fieldbus protocol	Product number
CIU 900	CIU unit only	99448387
CIU 901	CIU unit with input/output board	99448389

Communication Interface Module (CIM)



GRA6121

Grundfos CIM

These modules enable communication of operating data, such as measured values and setpoints, between CRE, CRIE or CRNE pumps of 15-30 hp and a building management system. The CIM is an add-on communication

module that is fitted in the terminal box of CRE, CRIE, CRNE pumps of 15-30 hp. Note that a CIM must be fitted by authorized persons.

We offer the following types of CIM:

Description	Fieldbus protocol	Product number
CIM 040	TTL Adaptor Module	98415941
CIM 050	GENIbus Interface	96824631
CIM 060 ⁴⁷⁾	Grundfos GO Remote Connection	98778356
CIM 100	LON interface for pumps	96824797
CIM 110	LON interface for boosters	96824798
CIM 200	Modbus RTU	96824796
CIM 280 ⁴⁸⁾	US GiC/GRM 3G/4G	99895386
CIM 300	BACnet Interface	96893770
CIM 500	Ethernet, Modbus TCP/IP, BACnet IP, PROFINET, GiC/GRM IP, EtherNet IP	98301408
CIM 550	Ethernet GIC (DHCP only)	92546689

⁴⁷⁾Extended range antenna is available as an option for CIM 060. Product number: 98778357.

⁴⁸⁾Antenna is not included. See Antennas for CIM 280.

Antennas for the CIM 280

Description	Product number
Antenna for GRM 3G/4G, flush mount	99606613
External mounting bracket for antenna (optional)	99606614
Directional antenna for 3G/4G High gain, mount and 25-foot cable included	98851149
Battery for the CIM 280 3G/4G, for power loss to the CIU (optional)	99499908

For further information about data communication via CIM and fieldbus protocols, see the CIM documentation available at the Grundfos Product Center at www.grundfos.com.

13. Variants

Lists of variants on request

Although the Grundfos CR, CRE, CRI, CRIE, CRN, CRNE product range offers a number of pumps for different applications, customers require specific pump solutions to satisfy their needs.

Below please find the range of options available for customizing the CR, CRE pumps to meet the customers' demands. Contact Grundfos for further information or for requests other than the ones mentioned below.

Motors

Variant	Description
Explosion-proof motors	For operation in hazardous atmospheres, explosion-proof or dust-ignition-proof motors may be required.
Motors with anti-condensation heating unit	For operation in humid environments motors with built-in anti-condensation heating may be required.
Premium efficient motors	Grundfos offers motors from 1 to 100 hp with a Premium efficiency class.
Different motor brand	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 (motor thrust rating must be checked).
Oversized motor	Ambient temperatures above 104 °F (40 °C) or installation at altitudes of more than 3280 ft above sea level require the use of an oversized motor (that is, derating).
4-pole motors	Grundfos offers standard motors fitted with 4-poles.

Connections and other variants

Variant	Description
Pipe connections	In addition to the wide range of standard flange connections, a 232 psi (16 bar) DIN standard clamping flange is available. Customized flanges are available according to specifications.
TriClamp connections	TriClamp connections are of a hygienic design with a sanitary coupling for use in the pharmaceutical and food industry.
Electropolished pumps	Electropolishing substantially reduces the risk of corrosion of the materials. Electropolishing is used in the pharmaceutical and food industry.

Shaft seals

Variant	Description
Shaft seal with FFKM O-ring material	We recommend shaft seals with FFKM or FXM O-ring material for applications where the pumped liquid may damage the standard O-ring material.
Seal with flush, quench seal	Recommended for applications involving crystallizing, hardening or sticky liquids.
Cool-Top® shaft seal system	Recommended for applications involving extremely high temperatures. No conventional mechanical shaft seal can withstand liquid temperatures of up to 356 °F (180 °C) for any length of time. For that type of application, we recommend Grundfos' unique air-cooled shaft seal system. To ensure a low liquid temperature around the standard shaft seal, the pump is fitted with a special air-cooled shaft seal chamber. No separate cooling is required.
Double shaft seal with pressure chamber	Recommended for applications involving poisonous or explosive liquids. Protects the surrounding environment and the people working in the vicinity of the pump. Consists of two seals mounted in a "back-to-back" arrangement inside a separate pressure seal chamber. As the pressure in the chamber is higher than the pump pressure, leakage is prevented. A dosing pump or a special pressure-intensifier generates the seal chamber pressure.
CRN MAGdrive	Magnetically driven pumps for industrial applications. Key applications are industrial processes involving the handling of aggressive, environmental, dangerous or volatile liquids, such as organic compounds, solvents, etc.

Pumps

Variant	Description
Horizontally mounted pump	For safety or height reasons, certain applications, for instance on ships, require the pump to be mounted in the horizontal position. For easy installation, the pump is equipped with brackets that support the motor and pump.
Low-temperature pump to -40 °F	Exposed to temperatures down to -40 °F (-40 °C) coolant pumps may require neck-rings with a different diameter in order to prevent impeller drag.
High-speed pump up to 681 psi	For high-pressure applications, a unique pump capable of generating up to 681 psi (47 bar) pressure is available. The pump is equipped with a high-speed motor, type MLE. The direction of rotation is the opposite of that of standard pumps, and the chamber stack is turned upside-down, as a result of which the pumped liquid flows in the opposite direction.
High-pressure pump up to 696 psi	For high-pressure applications, a unique double pump system capable of generating up to 696 psi (48 bar) pressure is available.
Low-NPSH pump (improved suction)	Recommended for boiler-feed applications where cavitation may occur due to poor inlet conditions.
Belt-driven pumps	Belt-driven pumps designed to operate in places with limited space or where no electrical power is available.
Pumps for pharmaceutical and biotechnological applications	CRN, CRNE pumps designed for applications requiring the sterilization and CIP capability of pipes, valves and pumps. (CIP = Clean-In-Place).

CRE, CRIE, CRNE	Company name:
Vertical multistage centrifugal pumps	Prepared by:
	Phone number: ()
	Fax number: ()
	Date: Page 1 of:
	Quote number:

Client information	
Project title:	Client name:
Reference number:	Client number:
Client contact:	Client phone number: ()

Location information			
For:	Unit:		
Site:	Service:		
Address:	City:	State:	Zip Code:

Application information							
Operating conditions				Pumped liquid			
	Max.	Norm.	Min.		Rated	Max.	Norm.
Capacity [(gpm (m ³ /h))]				Liquid type:			
inlet pressure (psig)				Liquid Temperature [(°F (°C))]			
Outlet pressure (psig)				at designated temperature			
Differential head [(ft (m))]				Specific gravity			
Hydraulic power [hp]				Vapor pressure (psia)			
at designated capacity				Viscosity (cp)			
NPSH available [(ft (m))]				Liquid ph:		Chlorides (ppm):	
Service				Hazardous:		Corrosion/erosion	
Continuous				Flammable:		caused by:	
Intermittent (starts/day):				Other:			

Pump information	
Model information from type key and codes:	----> (Example: CRE 5-10 A-FGJ-A-E-HQQE)
Quantity required:	
Minimum required flow:	NPSH required at duty point:
Product guide additional information pages	
Materials page number:	Performance curve page number:
Technical data page number:	Motor data page number:

Motor information			
hp:	Phase:	Voltage:	Enclosure:

Custom-built pump information (optional):

Additional Information

14. Grundfos Product Center

It is an online search and sizing tool to help you make the right choice.

From the international view, you can select your specific country to view the product range available to you.

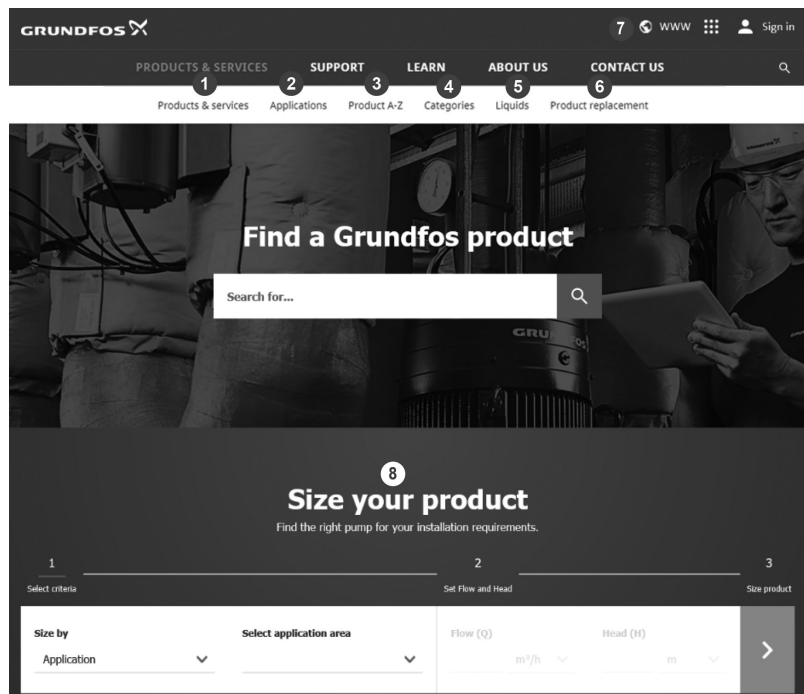
International view: <https://product-selection.grundfos.com>

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.



When you select your country, you see the menus below. Note that some menus may not be available depending on the country.

Example: <https://product-selection.grundfos.com/us>

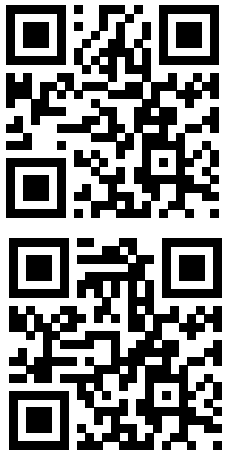
Pos.	Description
1	Products & services enables you to find products and documents by typing a product number or name into the search field.
2	Applications enables you to choose an application to see how Grundfos can help you design and optimize your system.
3	Products A-Z enables you to look through a list of all the Grundfos products.
4	Categories enables you to look for a product category.
5	Liquids enables you to find pumps designed for aggressive, flammable or other special liquids.
6	Product replacement enables you to find a suitable replacement.
7	WWW enables you to select the country, which changes the language, the available product range and the structure of the website.
8	Sizing enables you to size a product based on your application and operating conditions.

Grundfos GO

Mobile solution for professionals on the GO!

Grundfos GO is the mobile tool box for professional users on the go. It is the most comprehensive platform for mobile pump control and pump selection, including sizing,

replacement and documentation. It offers intuitive, handheld assistance and access to Grundfos online tools, and it saves valuable time for reporting and data collection.



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