

CM, CME

Horizontal, multistage centrifugal pumps
60 Hz



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1. Applications

The CM and CME pumps are designed to cover a wide variety of applications, ranging from small domestic installations to large industrial systems. The pumps are suitable for a wide variety of pumping systems where the performance and material of the pump must meet specific demands.

Some of the most typical applications are:

- washing and cleaning
- water treatment
- temperature control
- pressure boosting.

Washing and cleaning



Fig. 1 Washing and cleaning

CM and CME pumps can be used in washing and cleaning applications, which usually involve pumping of water containing soap or other cleaning agents.

Reference applications

Typical washing and cleaning applications:

- degreasing and washing of production equipment in industrial environments (such as the food and beverage industry)
- washing machines
- vehicle-washing tunnels
- mobile-washing units
- units for CIP (Cleaning In Place).

Water treatment



Fig. 2 Water treatment

In water treatment plants, the water undergoes a process which makes it more suited for its end use. In this process, the CM and CME pumps can be utilized either as feed pumps or as booster pumps.

Reference applications

Typical water treatment applications:

- nano-, micro- and ultra-filtration systems
- softening, ionizing, demineralizing systems
- desalination systems
- distillation systems
- separators
- swimming pools.

Temperature control

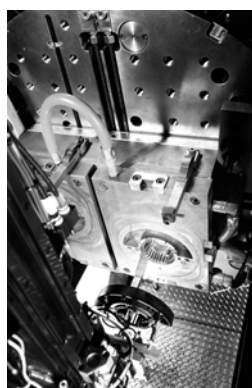


Fig. 3 Temperature control

Temperature control involves applications where the CM and CME pumps circulate a liquid in a closed loop consisting of a heating or cooling element for optimizing a process by means of temperature. Temperature control is also chilling of equipment or food and beverage in the food production industry.

Reference applications

The CM and CME pumps can for example be used in temperature control systems such as:

- electronic data processing
- laser equipment
- medical equipment
- industrial refrigeration
- heating and cooling in industrial processes
- moisturizing and humidifying.

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

We provide solutions for applications involving pumping of these liquids:

- liquids at temperatures down to -4°F (-20°C)
- high-temperature liquids
- high-viscous liquids, etc.

Pumping of liquids at temperatures down to -4°F (-20°C)*

All CM(E) -A, -I, -G pumps are capable of pumping liquids at temperatures down to -4°F (-20°C).

CM(E) -I, -G pumps capable of pumping liquids down to -22°F (-30°C) are available on request.

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

Pumping of high-temperature liquids

The pumping of hot liquids such as water-based liquids up to $+248^{\circ}\text{F}$ ($+120^{\circ}\text{C}$) demands much of the pump parts, such as shaft seals and rubber parts.

Pumping of highly viscous liquids

In applications where highly viscous liquids are pumped, the motor of the pump can be overloaded, and the pump performance will be reduced.

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

To meet the above-mentioned requirements, we offer CM and CME pumps with oversize motors.

Pressure boosting



TM05 4759 4508

Fig. 4 Pressure boosting

In pressure-boosting applications, the pumped liquid must be delivered at a desired pressure on demand. The main priorities in pressure-boosting applications are to ensure maximum reliability and user comfort. The CM and CME pumps are ideal for such applications.

Reference applications

Typical pressure-boosting applications:

- pressure boosting and transfer of drinking water
- process-water systems.

Other applications

Besides the applications mentioned above, the CM and CME pumps can be used in many other applications. Examples:

- distilling systems
- dosing / mixing
- evaporation
- OEM machinery
- chemical industry
- pharmaceutical industry.

2. Product introduction

Introduction

The Grundfos CM and CME pumps are non-self-priming, horizontal, multistage, end-suction centrifugal pumps. The pumps are of the close-coupled type. CM pumps are fitted with mains-operated motors whereas the motor for CME pumps has an integrated variable frequency drive. Both CM and CME pumps have mechanical shaft seals.

The CM and CME pumps are available in these three material versions:

- Cast iron (ASTM A48 CL30 / EN-GJL-200)*
- Stainless steel (AISI 304 / EN 1.4301)
- Stainless steel (AISI 316 / EN 1.4401).

* The impeller, chamber and filling plugs are made of stainless steel (AISI 304 / EN 1.4301).
The pump shaft is made of stainless steel (AISI 431 / EN 1.4057).

CM

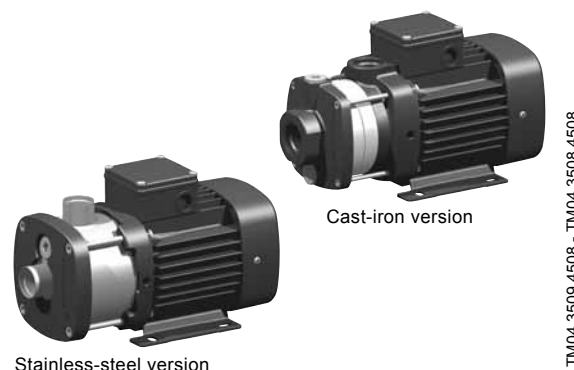


Fig. 1 Grundfos CM pumps

The CM pumps are unique products that have been developed in order to fulfill a wide variety of customer demands. The development of the pumps has resulted in no less than five patent applications.

The CM pumps are available in various sizes and numbers of stages to provide the flow and pressure required.

The CM pumps consist of two main components: the motor and the pump unit.

The motor is a Grundfos motor.

The pump unit incorporates optimized hydraulics and offers various types of connections.

The pumps offer many advantages; see also [Features and benefits](#) on page 10:

- compact design
- worldwide usage
- high reliability
- service-friendly
- wide performance range
- low noise
- customized solutions.

CME

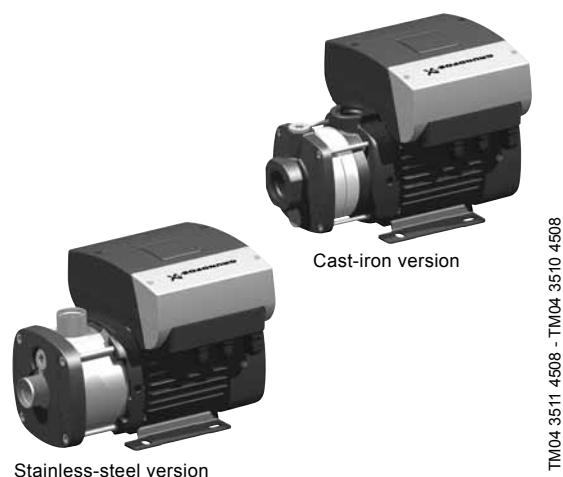


Fig. 2 Grundfos CME pumps

The CME pumps are built on the basis of CM pumps.

CME pumps belong to the so-called E-pump family.

The difference between the CM and the CME pump ranges is the motor.

The CME pump motor is a Grundfos MLE motor. The motor incorporates a variable frequency drive (VFD).

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

It is possible to connect a sensor to the built-in variable frequency drive on CME pumps. For further information about CME pumps, see [Communication with CME pumps](#) on page 26.

The pump materials are identical to those of the CM pump range.

CME pumps are used when uncontrolled operation (open loop) is required or when there is a wish to fit a sensor at a later stage in order to enable:

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

E-pumps without sensor are also used when a remote analog signal is connected to the setpoint input terminal.

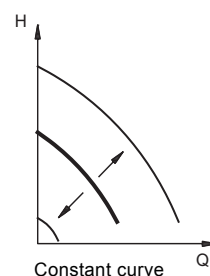


Fig. 3 E-pumps without sensor

The pump materials are identical to those of the CM pump range.

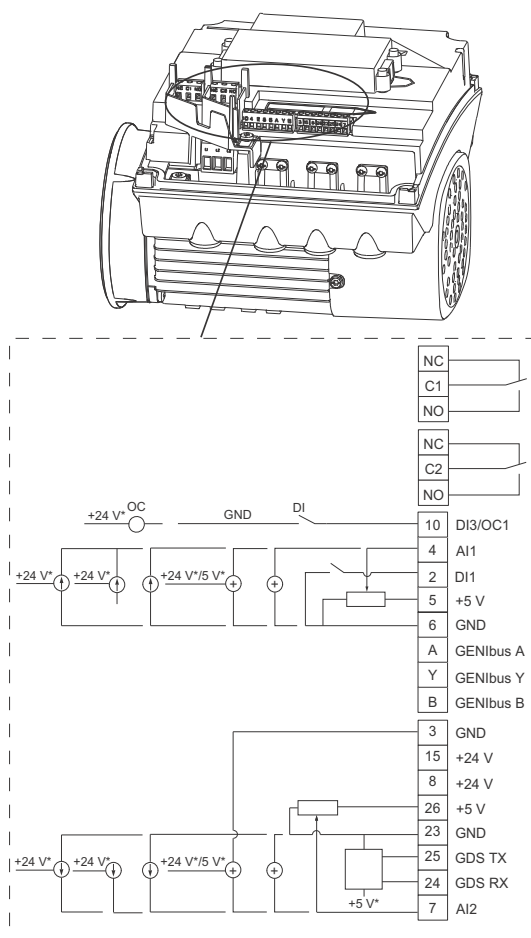
An E-pump is not just a pump, but a system which is able to solve application problems or save energy in a variety of pump installations.

TM01 0684 0808

New generation CME 3/4 to 3 Hp Permanent magnet motor (Supply voltages T, U)

The CME pumps in this range are fitted with the new-generation MLE motors which are permanent-magnet motors incorporating a high-efficiency variable frequency drive. This ensures an even higher efficiency of the pump.

The new motor including variable frequency drive has a total efficiency which exceeds the premium efficiency level defined for fixed-speed motors.



TM06 0242 5113

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

Fig. 4 Connection terminals, CME pump

Standard functional module (FM 200)

The module has a number of inputs and outputs. The FM 200 has these connections:

- one analog input
- two configurable digital inputs
- two signal relay outputs
- GENIbus connection.

Connection terminals

Functional module 200 has been selected as standard for CME pumps.

See fig. 4.

Terminal	Type	Function
NC	Normally closed contact	
C1	Common	Signal relay 1 (LIVE or SELV)
NO	Normally open contact	
NC	Normally closed contact	
C2	Common	Signal relay 2 (SELV only)
NO	Normally open contact	
10	DI3/OC1	Digital input/output, configurable. Open collector: Max. 24 V resistive or inductive.
4	AI1	Analog input: 0-20 mA / 4-20 mA / 0.5 - 3.5 V / 0-5 V / 0-10 V
2	DI1	Digital input, configurable
5	+5 V	Supply to potentiometer and sensor
6	GND	Ground
A	GENIbus, A	GENIbus, A (+)
Y	GENIbus, Y	GENIbus, GND
B	GENIbus, B	GENIbus, B (-)
3	GND	Ground
15	+24 V	Supply
8	+24 V	Supply
26	+5 V	Supply to potentiometer and sensor
23	GND	Ground
25	GDS TX	Grundfos Digital Sensor output
24	GDS RX	Grundfos Digital Sensor input
7	AI2	Analog input: 0-20 mA / 4-20 mA / 0.5 - 3.5 V / 0-5 V / 0-10 V

CME 2 to 7.5 Hp Asynchronous motor (Supply voltages M, N, Q)

The CME pumps in this range are fitted with the former generation of MLE motors which are asynchronous motors. These motors are energy efficient as standard.

The standard I/O module has these connections:

- start/stop terminals
- one digital input
- one setpoint input
- one sensor input
- GENIbus connection.

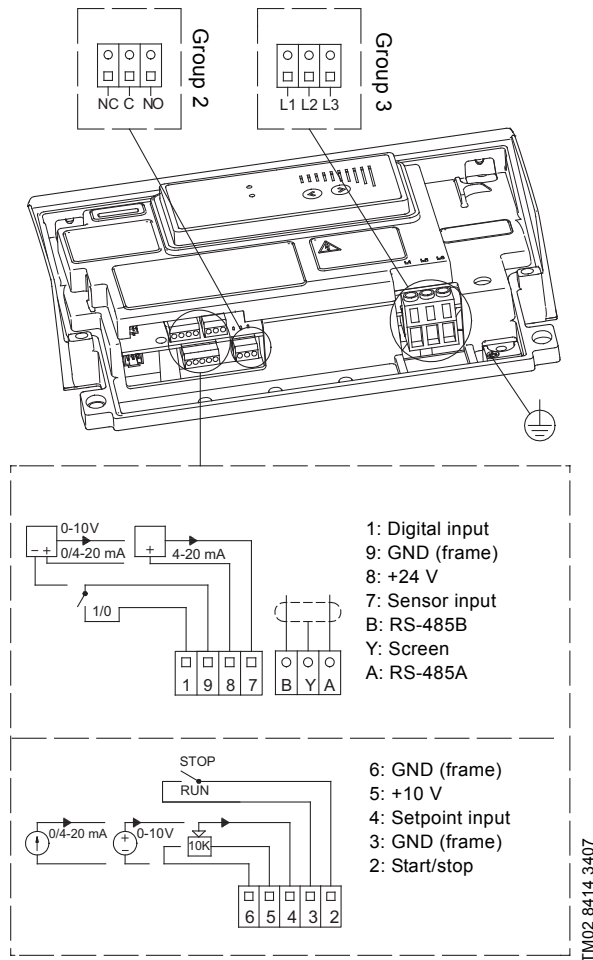


Fig. 5 Connection terminals

Selecting a CME pump

Select a CME pump if the following features are required:

- Controlled operation, i.e. consumption fluctuates
- constant pressure, flow, or temperature
- communication with the pump.

Adaptation of performance through frequency-controlled speed offers obvious benefits such as:

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

For further information about CME pumps, see [Communication with CME pumps](#) on page 26.

CME Plus

CME Plus pumps are built on the basis of CME pumps. In addition to the features of a standard CME, the CME Plus includes a pressure sensor, expansion tank, and discharge piping making it a complete package ready for constant pressure applications.

The CME Plus incorporates a stop function ensuring that the pump automatically stops if the water demand drops to a very low level or disappears altogether. The method gives good total operating economy irrespective of the water demand, and the pump is not subjected to overheating and the subsequent risk of damage to the shaft seal.

Features and benefits

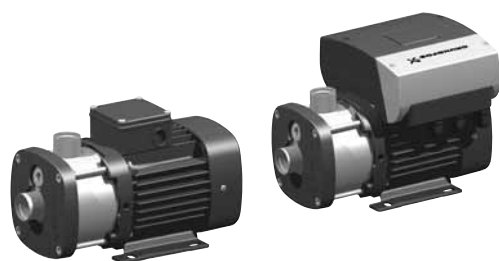


Fig. 6 CM and CME pumps

CM and CME pumps present the following features and benefits:

Compact design

Pump and motor are integrated in a compact and user-friendly design. The pump is fitted to a low-profile base plate, making it ideal for installation in systems where a compact pump is required.

Modular construction/customized solutions

The modular construction of the CM and CME pumps makes it easy to create many different variants based on standard factory parts. This means that it is possible to create pump variants that are customized for the application in question.

Worldwide usage

- With different voltage and frequency combinations, the CM and CME product ranges cover markets worldwide.
- Various certificates covering worldwide usage are available. Contact Grundfos for details.

High reliability

- New state-of-the-art shaft seal design and materials offering these benefits:
 - high wear resistance and long operating life
 - improved sticking and dry-running capabilities.
- The pumps are less sensitive to impurities in the pumped liquid than similar pumps of the canned-rotor type.

Easy installation and service friendly

- An installation indicator is fitted on three-phase pumps, which makes it easy to see if the electrical connection of the motor is correct. Based on the motor cooling air, it indicates the direction of rotation of the motor.
- No special service tools required.
- Kits in stock for quick delivery.
- All parts available as kits, single parts or in bulk.
- Service instructions and video make it simple to disassemble and assemble the pump.
- Service kit instructions available where deemed necessary.

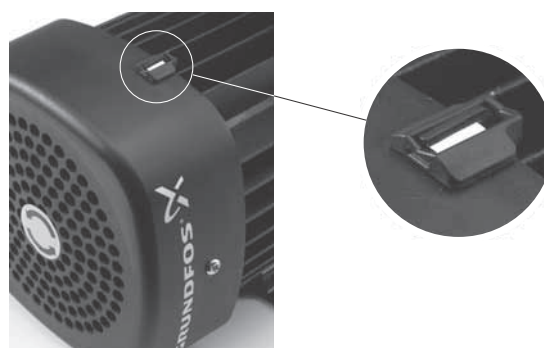


Fig. 7 Indicator for motor rotation shows black if rotation is correct; white if rotation is incorrect

Wide performance range

- Can be used in a wide range of applications:
 - washing and cleaning
 - water treatment
 - temperature control
 - pressure boosting
 - chemical industry
 - pharmaceutical industry
 - etc.
- Product range in WinCAPS and WebCAPS.
See section [23. Further product documentation](#) on page [119](#).

Low noise level

The CM and CME pumps offer very quiet operation.

High-performance hydraulics

Pump efficiency is maximized by the optimized hydraulics and carefully crafted production technology.

Electrocoated cast-iron parts

- Optimized corrosion resistance
- Better efficiency because of smooth surfaces.

Customized solutions

It is possible to create many different variants of the CM and CME pumps. For further information, see section [17. Customization](#) on page [90](#).

- Motor adaptation
- Pump body modifications.

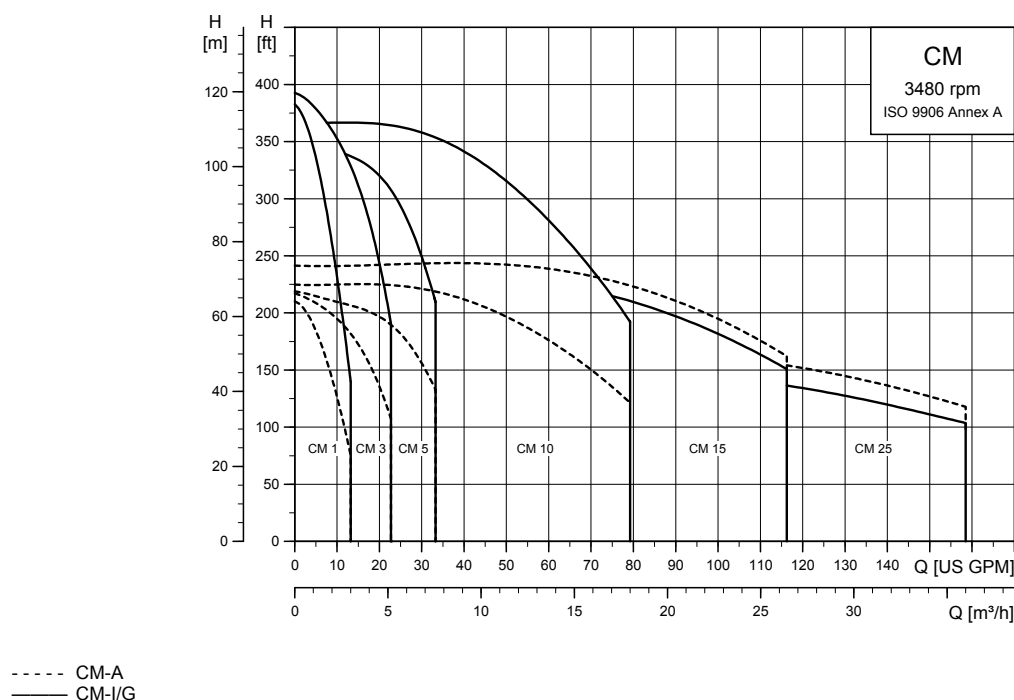
Motors

Grundfos motors are remarkably quiet and highly efficient.

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

3. Performance range

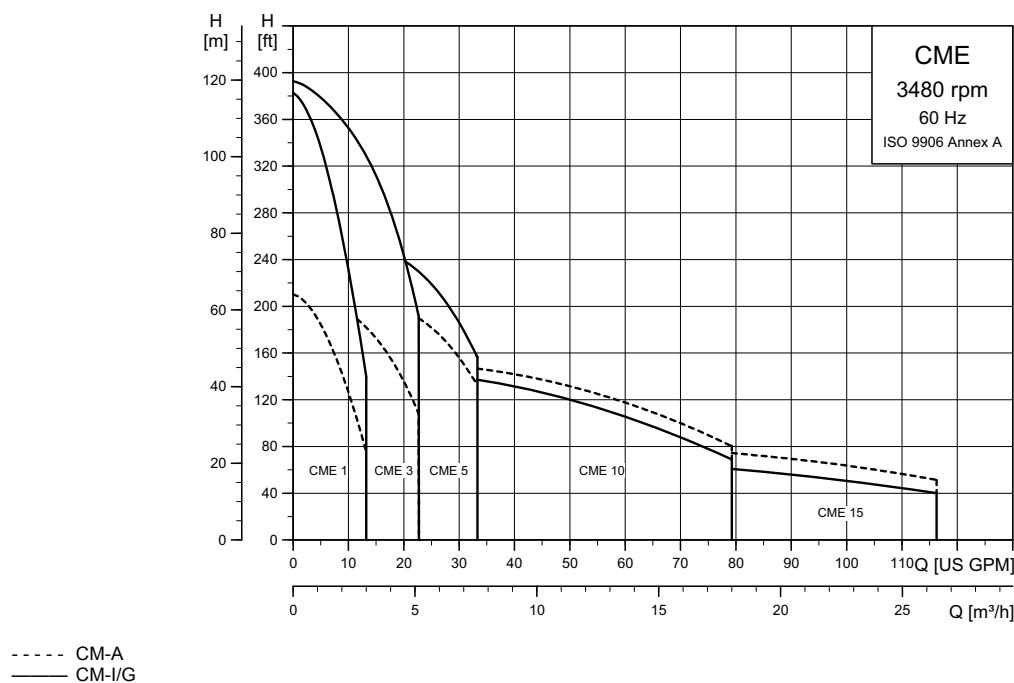
CM, 3480 rpm



TM04 5876 3610

New-generation CME, 60 Hz

(Supply voltages T, U)

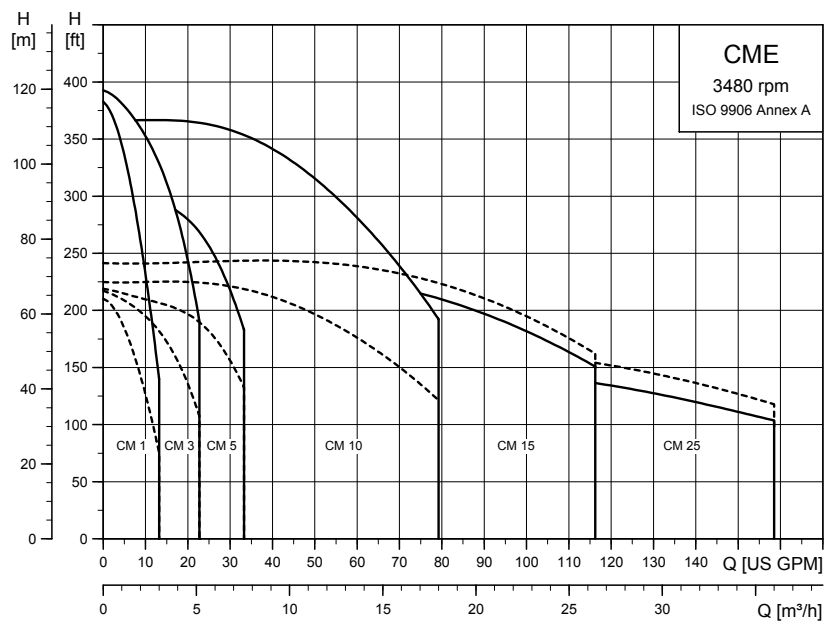


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Note: Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3400 rpm.

CME, 3480 rpm

(Supply voltages M, N, Q)



----- CME-A
 ——— CME-I/G

Note: Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3400 rpm.

TM04 5545 3610

4. Product range

Pump type	60 Hz			Shaft seal			CM power supply to motor					CME power supply to motor				
	Material						60 Hz			50/60 Hz		Voltage [V]				
							Voltage [V]			Voltage [V]						
	Cast iron EN-GJL-200 (CM-A)	Stainless steel EN 1.4301/AISI 304 (CM-I)	Stainless steel EN 1.4401/AISI 316 (CM-G)	AVBE AVBV	AQQE, AQBE AQQV, AQBV	AQQK	1 x 115/230 V (supply voltage B)	3 x 208-230/440-480 V (supply voltage E)	3 x 575 V (supply voltage H) ⁴⁾	3 x 220-240/380-415 V, (50 Hz)/ 3 x 220-255/380-440 V, (60 Hz) (supply voltage O)	3 x 380-415 V, (50 Hz)/ 3 x 440-480 V, (60 Hz) (supply voltage J)	3 x 460-480 V (60 Hz) (supply voltage N)	1 x 208-230 V (60 Hz) (supply voltage M) (To be phased out in 2014)	3 x 208-230 V (60 Hz) (supply voltage Q)	3 x 440-480 V (60 Hz) (supply voltage T) ²⁾	1 x 200-240 V (60 Hz) (supply voltage U) ²⁾
CM 1-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-6	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-7	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-8	-	•	•	• ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-9	-	•	•	• ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-6	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-7	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-8	-	•	•	• ¹⁾	•	•	•	•	•	•	•	•	•	•	•	•
CM 3-9	-	•	•	• ¹⁾	•	•	-	•	•	•	•	•	•	•	•	•
CM 5-2	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 5-3	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 5-4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 5-5	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 5-6	-	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 5-7	-	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 5-8	-	•	•	• ¹⁾	•	•	-	•	•	•	•	•	•	•	•	•
CM 10-1	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 10-2	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 10-3	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 10-4	-	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 10-5	-	•	•	• ¹⁾	•	•	-	•	•	•	•	•	•	•	•	•
CM 15-1	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 15-2	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 15-3	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 25-1	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•
CM 25-2	•	•	•	•	•	•	-	•	•	•	•	•	•	•	•	•

¹⁾ Suitable for 60 Hz mains-operated pumps, for CME pumps running at 100 % speed.

²⁾ The new-generation MLE, currently 3/4 to 3 Hp

5. Identification

Type key CM, CME

Example		CM	10	-	3	A	-	R	-	I	-	E	-	A	V	B	E	F	-	A	-	A	-	N
Type range CM: Centrifugal Modular CME: Centrifugal Modular with integrated variable frequency drive																								Sensor N: No sensor
Rated flow rate Rated flow rate [m³/h]																								Mains plug A: Prepared for cable glands B: Harting plug C: With cable D: Cable gland included
Number of impellers																								Motor information A: Standard motor (IP55) B: Phase-insulated motor for use with variable frequency drive C: Condensing environments D: Pt100 in stator E: Angular contact bearing F: Motor heater G: Three-phase motor with overload protection H: Single-phase motor with no protection I: Radio communication not available
Pump version A: Basic version B: Oversize motor (one flange size larger) E: Pumps with certificates/approvals N: CME pump with pressure sensor P: Undersize motor (one flange size smaller) T: Oversize motor (two flange sizes larger) BE: Oversize motor with certificates/approvals BN: Oversize motor with pressure sensor EN: Pumps with certificates/approvals and pressure sensor EP: Pumps with certificates/approvals and undersize motor ET: Pumps with certificates/approvals and double-oversize motor EX: Pumps with certificates/approvals and two other variants selected NP: Undersize motor with pressure sensor NT: Double-oversize motor with pressure sensor X: Special pump																								Supply voltage A: 1 x 220 V, 60 Hz B: 1 x 115/230 V, 60 Hz B1: 1 x 115/230 V, 60 Hz, with terminal board C: 1 x 220-240 V, 50 Hz D: 1 x 127 V, 60 Hz E: 3 x 208-230/440-480 V, 60 Hz E1: 3 x 208-230/440-480 V, 60 Hz, with terminal board F: 3 x 220-240/380-415 V, 50 Hz G: 3 x 200/346 V, 50 Hz; 200-220/346-380 V, 60 Hz H: 3 x 575 V, 60 Hz I: 3 x 400 V, 50/60 Hz J: 3 x 380-415 V, 50 Hz; 440-480 V, 60 Hz K: 1 x 200-240 V, 50/60 Hz (E-motor) L: 3 x 380-480 V, 50/60 Hz (E-motor) M: 1 x 208-230 V, 60 Hz (E-motor) N: 3 x 460-480 V, 60 Hz (E-motor) O: 3 x 220-240/380-415 V, 50 Hz 3 x 220-255/380-440 V, 60 Hz Q: 3 x 208-230 V, 60 Hz (E-motor) R: 3 x 200-230 V, 50/60 Hz (E-motor) S: 3 x 380-500 V, 50/60 Hz (E-motor) ¹⁾ T: 3 x 440-480 V, 60 Hz (E-motor) ¹⁾ U: 1 x 200-240 V, 60 Hz (E-motor) ¹⁾
Pipe connection C: Tri-Clamp® F: DIN/ANSI/JIS flange P: Victaulic® coupling R: Whitworth thread Rp (ISO 7/1) S: Internal NPT thread																								
Materials in contact with pump media A: Suction and discharge parts Pump shaft Impellers/chambers G: Sleeve Pump shaft Impellers/chambers I: Sleeve Pump shaft Impellers/chambers X: Special version		EN-GJL-200 AISI 304 / EN 1.4301 AISI 304 / EN 1.4301 AISI 316 / EN 1.4401 AISI 316 / EN 1.4401 AISI 316 / EN 1.4401 AISI 304 / EN 1.4301 AISI 304 / EN 1.4301 AISI 304 / EN 1.4301																						
Rubber parts in pump (excluding neck ring and shaft seal) E: EPDM (ethylene propylene) K: FFKM (perflour) V: FKM (flour) Note: Gaskets between chambers of cast-iron versions are always made of Tesnit® BA-U.																								Material of secondary seal E: EPDM (ethylene propylene) K: FFKM (perflour) V: FKM (flour)
Shaft seal A: O-ring seal with fixed driver R: O-ring seal with fixed driver and reduced seal face																								Material of stationary seal face B: Carbon, resin-impregnated Q: Silicon carbide (SiC) U: Tungsten carbide
																								Material of rotating seal face Q: Silicon carbide (SiC) V: Aluminium oxide (Al2O3) U: Tungsten carbide

Note: The type key cannot be used for ordering as not all combinations are possible.

1) The new-generation MLE, currently 3/4 to 3 Hp.

* Standard offering in U.S.

** Standard voltage in Canada.

Approvals



6. Construction

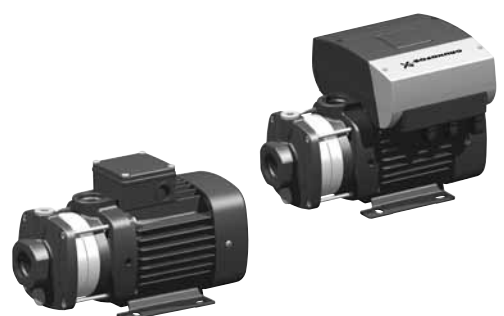
Pump

The CM and CME pumps are non-self-priming, horizontal, multistage centrifugal pumps. The pumps have an axial suction port and a radial discharge port and are mounted on a base plate.

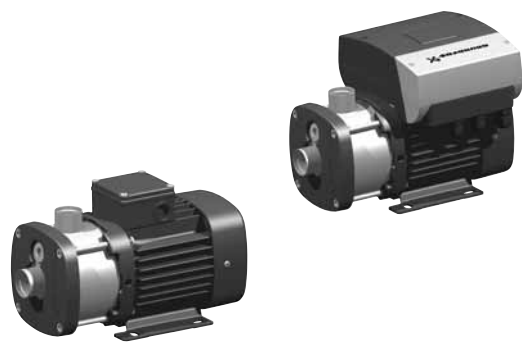
All movable parts are made of stainless steel.

The pumps are available with mains-operated motors (CM pumps) and with variable frequency drive motors (CME pumps).

All pumps incorporate a maintenance-free mechanical O-ring shaft seal with fixed driver.



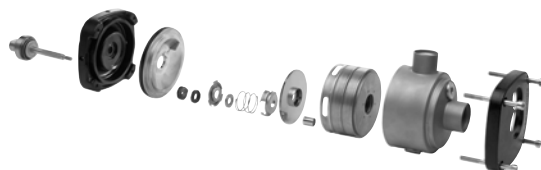
Cast-iron versions



Stainless-steel versions

TM04 3509 4508 - TM04 3511 4508 - TM04 3508 4508 - TM04 3510 4508

Fig. 8 CM and CME pumps



TM05 1130 2211

Fig. 9 CM and CME pump hydraulics

Motor

CM and CME pumps are fitted with totally enclosed, fan-cooled, 2-pole motors.

CM pumps up to and including 2 Hp are available with single-phase motors as standard. CME pumps up to and including 1.5 Hp are available with single-phase motors as standard. CM and CME pumps from 2 to 10 Hp are fitted with three-phase motors.

Efficiency

All three phase motors of 1 Hp and up are energy efficient as standard. Premium efficient motors are available on request.

The new-generation MLE motors have a total efficiency which exceeds the premium efficient level defined for fixed-speed motors including the variable frequency drive.

Approvals

	CM	CME
Approvals		

Electrical data

Insulation class	F
Enclosure class	TEFC (IP55)*
Efficiency	Energy Efficient (IE2)**
Supply voltages (tolerance $\pm 10\%$)	CM 1 x 115/230 V, 60 Hz (B) 3 x 208-230/440-480 V, 60 Hz (E) 3 x 575 V, 60 Hz (H) 3 x 380-415 V, 50 Hz; 3 x 440-480 V, 60 Hz (J)
	CME 1 x 200-240 V, 60 Hz (U) 3 x 208-230 V, 60 Hz (M) 3 x 460-480 V, 60 Hz (N) 3 x 440-480 V, 60 Hz (T)

* IP55 is not recommended for operation in condensing environments. For operation in such environments, see [Operation in condensing environments](#) on page 24.

**Premium efficient (IE3) available on request

Motor protection

CM

Single-phase motors, 1 x 115/230 V, 60 Hz, do not incorporate motor protection and must be connected to a motor-protective circuit breaker which can be manually reset. Set the motor-protective circuit breaker according to the rated current of the motor ($I_{1/1}$). See nameplate.

Other single-phase motors have built-in current- and temperature-dependent motor protection in accordance with IEC 60034-11 and require no further motor protection. The motor protection is of the TP 211 type, which reacts to both slow- and quick-rising temperatures. The motor protection is automatically reset.

Three-phase motors up to 5 Hp must be connected to a motor-protective circuit breaker which can be manually reset. Set the motor-protective circuit breaker according to the rated current of the motor ($I_{1/1}$). See nameplate.

Electronically speed-controlled motors (CME)

CME pumps require no external motor protection. The MLE motor incorporates thermal protection against slow overloading and stalled condition (IEC 34-11).

Variable frequency drive (VFD) operation

All three-phase motors can be connected to a variable frequency drive. Depending on the type of variable frequency drive, this may cause increased acoustic noise from the motor. Furthermore, it may cause the motor to be exposed to detrimental voltage peaks.

As standard ML 90 motors and above include phase insulation.

As standard ML 71- and ML 80-based motors have no phase insulation and must therefore be protected against voltage peaks higher than 650 V (peak value) between the supply terminals.

Note: ML 71- and ML 80-based motors with phase insulation are available on request.

The above disturbances, i.e. both increased acoustic noise and detrimental voltage peaks, can be eliminated by fitting an LC filter between the variable frequency drive and the motor.

For further information, please contact the variable frequency drive supplier or Grundfos.

Shaft seal

The shaft seal for the CM and CME pumps is of the O-ring type, which makes it very flexible when different types of O-rings and seal-face materials are needed. The shaft seal has a fixed seal driver which ensures a reliable rotation of all parts – even under the most extreme operating conditions.

Due to the special design of the shaft seal and the interfaces to the rest of the pump construction, the dry-running capabilities are improved significantly compared to most other similar shaft seals and pump types. Furthermore, improvements have been made to reduce the risk and effect of sticking. The shaft seal types available can be found in [Selection of shaft seal](#) on page 36 where the key parameters of selecting a shaft seal are also described.

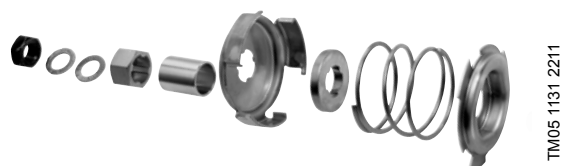


Fig. 10 Exploded view of shaft seal

Note: The available shaft seals for CM and CME pumps are very robust and durable, but dry running must always be avoided.

Details regarding operating conditions for the shaft seal can be found in [Operating range of the shaft seal](#) on page 24.

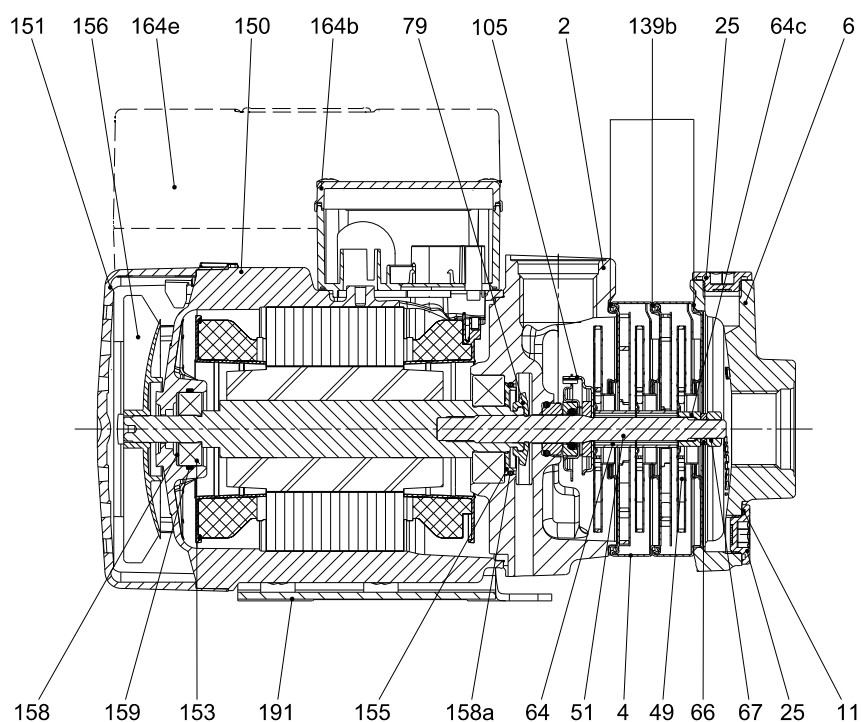
Further information about the shaft seal can be found in separate documentation covering shaft seals which can be downloaded from WebCAPS. See [23. Further product documentation](#) on page 119.

Title	Publication number
Shaft seals	96519875

Sectional drawings

CM(E) A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 3723 3809

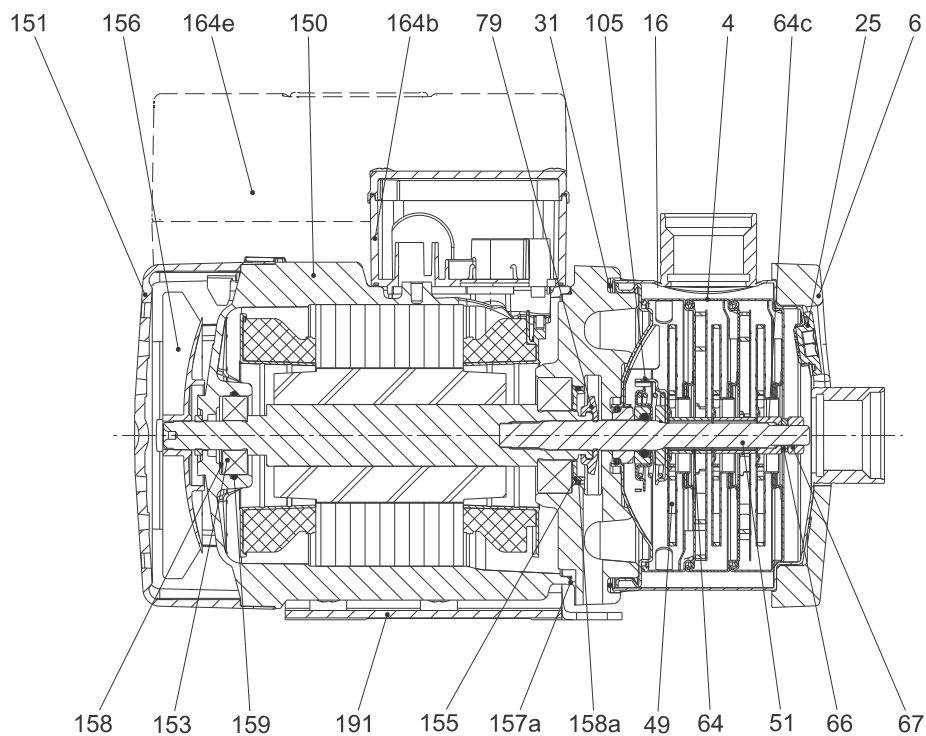
Fig. 11 CM(E) 1-3 with ML(E) 71 motor

Components

Pos.	Component	Pos.	Component	Pos.	Component
2	Discharge part	64c	Clamp	153	Ball bearing
4	Chamber	66	Washer (NORD-LOCK®)	155	Bearing cover plate
6	Inlet part	67	Nut	156	Fan
11	O-ring	79	Diverting disc	158	Corrugated spring
25	Plug	105	Shaft seal	158a	O-ring
49	Impeller	139b	Gasket	159	O-ring
51	Pump shaft	150	Stator housing	164b, 164e	Terminal box
64	Spacing pipe	151	Fan cover	191	Base plate

CM(E) I and CM(E) G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



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Fig. 12 CM(E) 1-3 with ML(E) 71 motor

Components

Pos.	Component	Pos.	Component	Pos.	Component
4	Chamber	64c	Clamp	155	Bearing cover plate
6	Flange	66	Washer (NORD-LOCK®)	156	Fan
16	Sleeve	67	Nut	157a	Gasket
25	Plug	79	Diverting disc	158	Corrugated spring
31	O-ring	105	Shaft seal	158a	O-ring
49	Impeller	150	Stator housing	159	O-ring
51	Pump shaft	151	Fan cover	164b, 164e	Terminal box
64	Spacing pipe	153	Ball bearing	191	Base plate

Material specification

Pos.	Description	Material	Pump material version					
			CM(E) A Cast iron (ASTM A48 CL30/ EN-GJL-200)		CM(E) I Stainless steel (AISI 304 / EN 1.4301)		CM(E) G Stainless steel (AISI 316) / EN 1.4401	
			DIN W.-Nr.	ISO/AISI/ASTM	DIN W.-Nr.	ISO/AISI/ASTM	DIN W.-Nr.	ISO/AISI/ASTM
Motor parts								
156b	Motor flange	Cast iron						
150	Stator housing	Silumin (Alu)						
151	Fan cover	Composite PBT/PC						
153	Ball bearing							
156	Fan	Composite PA 66 30 % GF						
158	Corrugated spring	Steel						
164b	Terminal box, MG	Composite PC/ASA or						
164e	Terminal box, MGE	silumin (Alu)						
191	Base plate	Steel, electro-coated	1.0330.3	ASTM A366 / A611-C1	1.0330.3	ASTM A366 / A611-C1		
		Steel, powder-coated, 60 to 120 µ, NCS 7005					1.0330.3	ASTM A366 / A611-C1
79	Diverting disc	Silicone fluid (LSR)						
155	Bearing cover plate	PPS						
Pump parts								
105	Shaft seal, steel parts	Stainless steel	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4401	AISI 316
	Shaft seal, seal faces	SiC/SiC or Al ₂ O ₃ /carbon						
51	Pump shaft	Stainless steel	1.4301	AISI 304	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4401	AISI 316
11 31 ¹⁾ 158a 159	O-rings	EPDM, FKM or FFKM						
157a ¹⁾	Gasket	Paper						
139b ²⁾	Gasket	Aramide fibers (nbr)						
2 ²⁾	Discharge part	Cast iron						
6 ²⁾	Inlet part	Cast iron						
4	Chamber	Stainless steel	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4401	AISI 316
25	Plug	Stainless steel	1.4404	AISI 316L	1.4404	AISI 316L	1.4404	AISI 316L
49	Impeller	Stainless steel	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4401	AISI 316
64	Spacing pipe	Stainless steel	1.4401	AISI 316	1.4401	AISI 316	1.4401	AISI 316
64c	Clamp	Stainless steel	STX2000 ³⁾		STX2000 ³⁾		STX2000 ³⁾	
6 ¹⁾	Flange	Cast iron						
16	Sleeve	Stainless steel			1.4301/ 1.4401 ^{*)}	AISI 304/ AISI 316 ^{*)}	1.4401	AISI 316
67	Nut	Stainless steel A4						
66	Washer (NORD-LOCK®)	Steel	1.4547 ⁴⁾		1.4547 ⁴⁾		1.4547 ⁴⁾	

*) On request.

1) Only in CM(E)-I/G pumps.

2) Only in CM(E)-A pumps.

3) STX2000 ~ CrNiMo 22 19 4.

4) 1.4547 ~ CrNiMoCuN 20-18-7.

7. Operating conditions

Ambient temperature

The maximum ambient temperature depends on the liquid temperature. The table below shows within which temperature ranges the CM and CME pumps should be used.

Note: The maximum permissible liquid temperature for CM-A and CME-A is +194 °F (+90 °C).

Maximum ambient temperature [°F (°C)]	Liquid temperature	Pump type		
		CM	CME ¹⁾	CME ²⁾
+131 (+55)	+194 (+90)	•	-	-
+122 (+50)	+212 (+100)	•	•	-
+113 (+45)	+230 (+110)	•	•	-
+104 (+40)	+248 (+120)	•	•	•

¹⁾ New-generation CME supply voltages T, U.

²⁾ New-generation CME supply voltages M, N, Q.

CM

If the ambient temperature for CM pumps exceeds +131 °F (+55 °C) the motor must not be fully loaded due to the risk of overheating.

In such cases, it may be necessary to derate the motor output or use an oversize motor with higher rated output. The CM pumps can be derated in relation to ambient temperature without consequence. Contact Grundfos for further information.

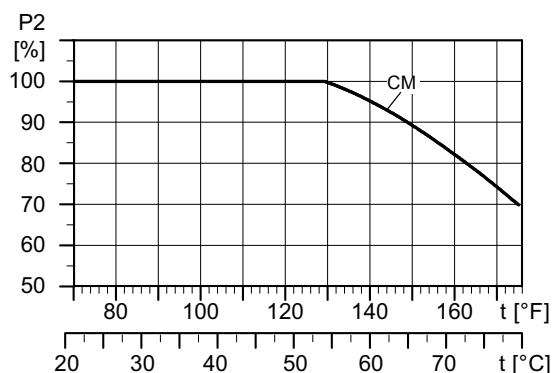


Fig. 13 Derating of CM pump, in relation to ambient temperature

CME (variable frequency drive motors)

The electronics incorporated in the CME pumps is limiting the maximum ambient temperature. This means that the maximum ambient temperature must not be exceeded. If the pump is operated at temperatures exceeding the maximum ambient temperature, the motor life will be reduced.

Maximum ambient temperature

CME 3/4 to 3 Hp (supply voltages T, U):
+122 °F (+50 °C).

CME 3/4 to 7.5 Hp (supply voltages M, N, Q):
+104 °F (+40 °C.)

Storage and transport temperature

CM: +58 to +158 °F (-50 to +70 °C).

CME: -22 to +140 °F (-30 to +60 °C).

Installation altitude

Installation altitude is the height above sea level of the installation site. Motors installed at maximum altitude can be loaded 100 %. Motors installed above maximum altitude must not be fully loaded due to the low density and consequently low cooling effect of the air.

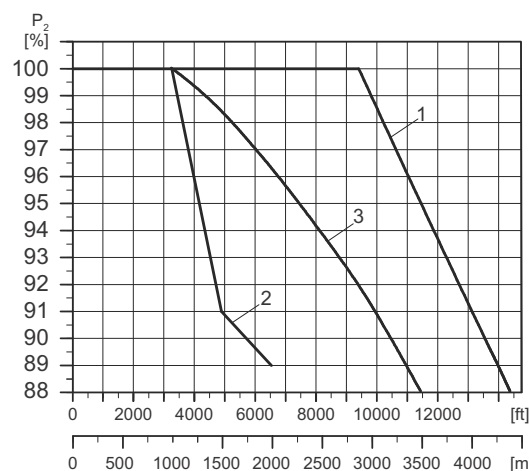


Fig. 14 Relationship between motor output (P_2) and altitude

Pos.	Motor output [Hp]	Pump type
1	0.58 - 8.4	CM
2	0.75 - 8.0	CME ¹⁾
3	0.75 - 7.5	CME

¹⁾ New-generation CME supply voltages T, U.

Temperatures and pressures

Maximum operating pressure and permissible liquid temperature

The maximum operating pressure and the permissible liquid temperature depend on the pump material, the type of shaft seal and the pumped liquid.

Material variant	Shaft seal	Permissible liquid temperature ¹⁾ [°F (°C)]	Maximum operating pressure [psi (bar)]
Cast iron (A48 CL30 / EN-GJL-200)	AVBx	–4 to +104 (–20 to +40)	145 (10)
		+105 to +194 (+41 to +90)	87 (6)
	AQQx	–4 to +194 (–20 to +90)	145 (10)
Stainless steel (AISI 304 / EN 1.4301)	AVBx	+4 to +104 (–20 to +40)	145 (10)
		+105 to +194 (+41 to +90)	87 (6)
	AQQx	–4 to +194 (–20 to +90) ³⁾	232 (16)
		+195 to +248 (+91 to +120) ²⁾	145 (10)
Stainless steel (AISI 316 / EN 1.4401)	AVBx	–4 to +104 (–20 to +40)	145 (10)
		+105 to +194 (+41 to +90)	87 (6)
	AQQx	–4 to +194 (–20 to +90) ³⁾	232 (16)
		+195 to +248 (+91 to +120) ²⁾	145 (10)

¹⁾ At liquid temperatures below +32 °F (0 °C), higher motor outputs may be needed due to increased viscosity, for instance if glycol has been added to the water.

²⁾ +248 °F (+120 °C) applies only if the pump has an AQQE shaft seal.

³⁾ CM-I, -G and CME-I, -G pumps for liquid temperatures below –4 °F (–20 °C) are available on request. Please contact Grundfos.

Maximum liquid temperature change gradient

Cast-iron pumps (CM-A, CME-A) should not be used in applications where rapid temperature changes of more than +81 °F (+45 °C) may occur. If exposed to such rapid temperature changes, a cast-iron pump may leak.

Under such operating conditions, we recommend to use stainless-steel pumps (CM-I, -G and CME-I, -G).

Liquid temperature range

O-ring material / liquid	Permissible liquid temperature [°F (°C)]
EPDM	–4 to +248 (–20 to +120)
FFKM	+32 to +248 (0 to +120)
FKM / liquids containing water	–4 to +194 (–20 to +90)
FKM / oil without water	–4 to +248 (–20 to +120)

Maximum inlet pressure

The maximum inlet pressure of the CM pumps is equal to the maximum operating pressure of the pump minus the pumps discharge pressure against a closed valve.

For example:

CM5-3 A-S-A-E-AQQE

Max. operating pressure: 145 psi

Discharge pressure against closed valve: 57 psi

Max. inlet pressure=145-57=88 psi

Minimum inlet pressure

NPSH

Calculation of the inlet pressure "H" is recommended in these situations:

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

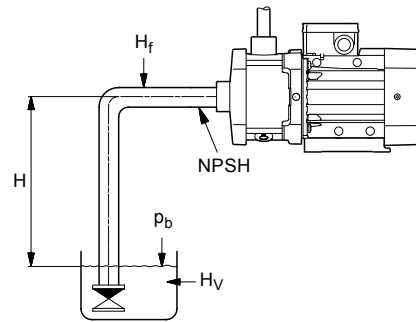
To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift "H" in feet of head can be calculated as follows:

$$H = p_b - \text{NPSH} - H_f - H_v - H_s$$

p_b	= Barometric pressure in feet absolute. (Barometric pressure can be set to 33.9). In closed systems, p_b indicates the system pressure in feet.
NPSH	= Net Positive Suction Head in feet of head. (To be read from the NPSH curve at the highest flow the pump will be delivering).
H_f	= Friction loss in suction pipe in feet of head. (At the highest flow 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 ").
H_s	= Safety margin = minimum 2 ft of head.

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

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



TM04 3487 4508

Fig. 15 Minimum inlet pressure (NPSH)

Note: To avoid cavitation, **never** select a pump with a duty point too far to the right on the NPSH curve.

Always check the NPSH value of the pump at the highest possible flow.

Sound pressure

The sound pressure values in the table below apply for CM pumps. If the motor output (P_2) for a given CM pump is not found in the table, use the nearest rounded-up value. The values for sound pressure include a tolerance of 3 dB[A] according to EN ISO 4871.

P_2 [Hp]	60 Hz	50 Hz
	$\bar{L}_{pA}$ [dB(A)]	$\bar{L}_{pA}$ [dB(A)]
.5	55	50
.75	53	50
1	54	50
1.5	57	52
2	59	54
3	59	54
4	60	55
5.4	66	62
7.4	65	60

The audible noise from CM pumps is primarily noise from the motor fan. The selection of CME pumps will reduce the noise at partial load, as the motor, and consequently, the motor fan runs at a lower speed. Possible flow noise from control valves is also reduced at partial load in the case of the CME pump. Sound pressure values are measured at 3 ft.

Operation in condensing environments

If the liquid temperature becomes lower than the ambient temperature, condensation may form in the motor during inactivity. In such cases a motor suited for condensing environments must be used.

When installing CM and CME pumps outdoors, provide them with a suitable cover to protect them from build-up of water condensation. See fig. 16.

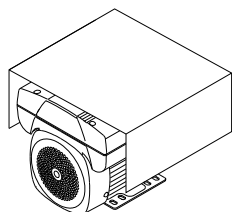


Fig. 16 CME pump with protective cover

Motors in outdoor installations radiate heat to and absorb heat from their surroundings. By day, a stopped motor will absorb more heat than it radiates; by night, especially clear nights, radiation from a stopped motor may be so high that the surface temperature falls a few degrees below the air temperature. This may cause the formation of condensation. Condensation on the inner surfaces may result in moisture on the electronic components, including the printed-circuit boards, which means a risk of failure or even destruction of the motor and electronics.

Furthermore, the cover protects the motor against direct sunlight.

Environmental rating

Three-phase ML/MLE motors hold a UL NEMA 3R environmental rating.

Single-phase MGE/MLE motors have not been tested against the UL NEMA environmental rating.

All motors are IP55.

When the rubber plug is removed the rating becomes IP34. This applies to both CM and CME pumps. The use of a cover does not affect the IP rating.

Operating range of the shaft seal

The operating range of the shaft seal depends on operating pressure, type of shaft seal and liquid temperature.

The curve in fig. 17 shows which shaft seals are suitable at a given temperature and a given pressure.

The curve applies to clean water.

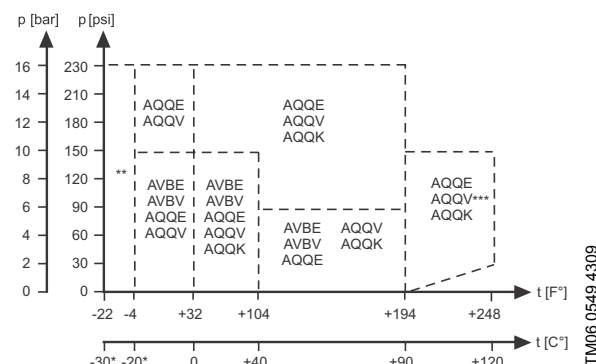


Fig. 17 Selection of shaft seals

* Antifreeze should be added at liquid temperatures below +32 °F (0 °C).

** CM and CME pumps for liquid temperatures below -4 °F (-20 °C) are available on request. Please contact Grundfos.

*** AQQV above 194 °F (+90 °C) only in media not containing water.

Viscosity

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

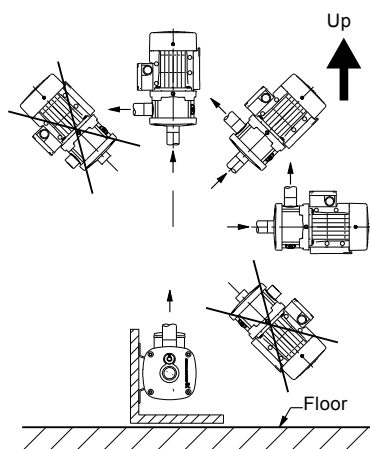
For instance at liquid temperatures below +32 °F (0 °C), higher motor outputs may be needed due to increased viscosity if glycol has been added to the water.

In such situations, the pump should be fitted with a larger motor. If in doubt, contact Grundfos or visit WebCAPS. See page 119.

Installation of pump

The pump must be installed on a plane surface and fixed so that it cannot be displaced during start-up and operation.

The pump must be installed so that air locks are avoided in the pump housing and pipework; fig. 18 shows the permissible pump positions.



TM03 8773 3409

Fig. 18 Permissible pump positions

The pump should be installed with easy access for inspection, maintenance and service.

The pump should be installed in a well-ventilated location.

Frequency of starts and stops

Maximum of 100 per hour.

8. CME pumps

Communication with CME pumps

Communication with CME pumps is possible by means of:

- control panel on the pump
- Grundfos GO remote
- Grundfos R100 remote control
- a central building management system.

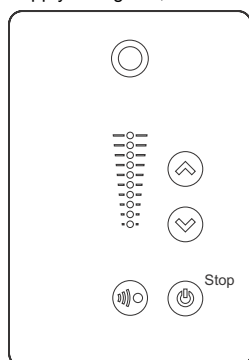
Control panel

The operator can change the setpoint settings manually on the control panel of the CME pump terminal box.

The design and functionality of the control panels vary, depending on the MLE motor fitted to the CME pump.

The control panel of the new-generation CME pumps enables radio communication. The Grundfos Eye at the top of the control panel is a pump status indicator light providing information about the pump operating status. Less or more advanced control panels are available on request.

New-generation CME with supply voltages T, U



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CME with supply voltages M, N, Q



TM00 7600 0404

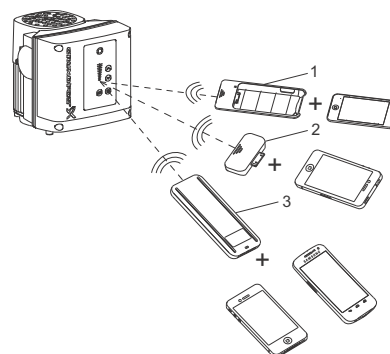
Fig. 19 Standard control panels of CME pumps

Grundfos GO Remote

CME pumps can communicate with the Grundfos GO Remote via radio or infrared light.

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

The Grundfos GO Remote offers three different mobile interfaces (MI). See fig. 20.



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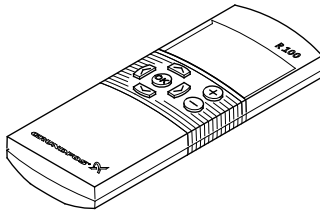
Fig. 20 Grundfos GO Remote

Pos.	Description
1	Grundfos MI 201: Consists of an Apple iPod touch 4G and a Grundfos cover.
2	Grundfos MI 202: Add-on module which can be used in conjunction with Apple iPod touch 4, iPhone 4G or later. Grundfos MI 204: Add-on module which can be used in conjunction with Apple iPod touch 5G or iPhone 5.
3	Grundfos MI 301: Separate module enabling radio or infrared communication. The module can be used in conjunction with an Android or iOS-based Smartphone with Bluetooth connection.

The Grundfos GO Remote is available as an accessory. See page 104.

R100 remote control

The operator communicates with the CME pump by pointing the R100 at the control panel of the CME terminal box.



TM00 4498 2802

Fig. 21 R100 remote control

With the R100 it is possible to monitor and change control modes and settings of the CME.

Central building management system

The operator can communicate with a CME pump at a distance. Communication can take place via a central building management system allowing the operator to monitor and change control modes and setpoint settings.

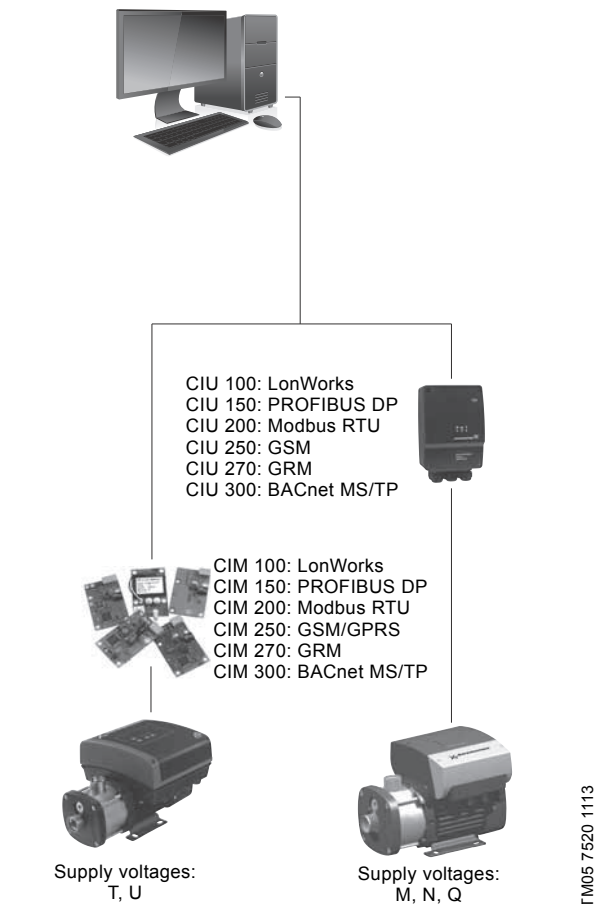
The communication interface between the CME pump and central building management systems varies, depending on pump size.

New-generation CME 3/4 to 3 Hp (supply voltages T, U)

This range of CME pumps can be fitted with a communication interface module (CIM). This means that no external communication interface is required.

CME 3/4 to 7.5 Hp (supply voltages M, N, Q)

This range of CME pumps communicates via an external communication interface unit (CIU).



TM05 7520 1113

Fig. 22 Communication via a central building management system

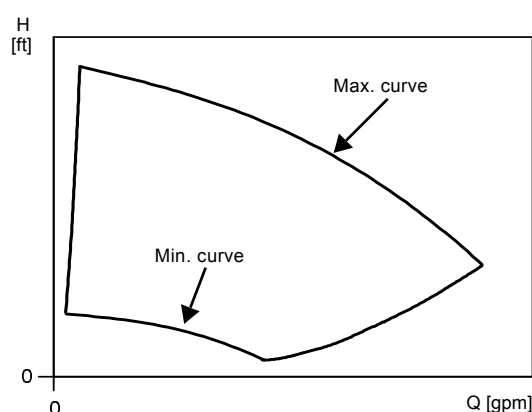
Speed control of CME pumps

Affinity equations

Normally, CME pumps are used in applications characterized by a variable flow. Consequently, it is not possible to select a pump that is constantly operating at its optimum efficiency.

In order to achieve optimum operating economy, the duty point should be close to the optimum efficiency (η) for most operating hours.

Between the min. and max. performance curves, CME pumps have an infinite number of performance curves, each representing a specific speed. It may therefore not be possible to select a duty point close to the max. curve.



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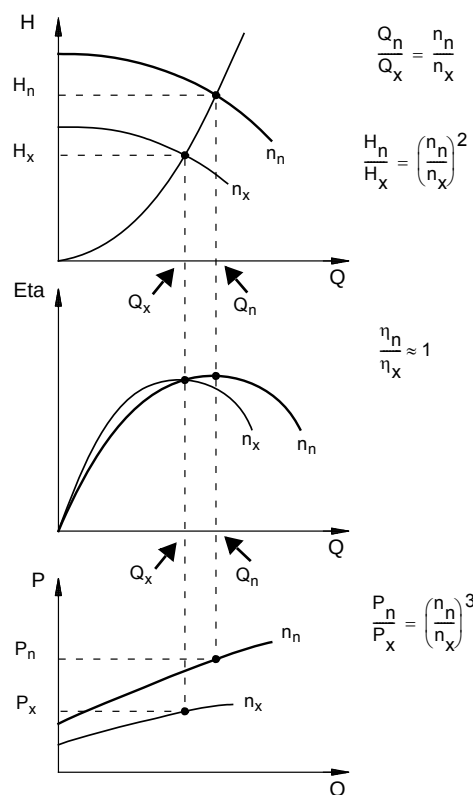
Fig. 23 Min. and max. performance curves

In situations where it is not possible to select a duty point close to the max. 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: 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.

Finally, it is worth noting that the efficiency of the variable frequency drive and the motor must be taken into account if a precise calculation of the power saving resulting from a reduction of the pump speed is wanted.



TM00 8720 3496

Fig. 24 Affinity equations

Legend

H_n	Rated head
H_x	Current head
Q_n	Rated flow rate
Q_x	Current flow rate
n_n	Rated motor speed
n_x	Current motor speed
η_n	Rated efficiency
η_x	Current efficiency

WinCAPS and WebCAPS

WinCAPS and WebCAPS are selection programs offered by Grundfos.

The two programs make it possible to calculate the specific duty point and energy consumption of a CME pump.

When you enter the dimensions of the pump, WinCAPS and WebCAPS can calculate the exact duty point and energy consumption. For further information, see page 119.

CM connected to Grundfos CUE external variable frequency drive



GrA 4404

Fig. 25 Grundfos CUE product range

Grundfos CUE is a complete range of external variable frequency drives (VFDs) for pump control in a wide range of applications. Grundfos CUE is designed for wall mounting.

Grundfos CUE provides a variety of benefits to the end-user.

The benefits include:

- Grundfos CME pump functionality and user interface
- application and pump family-related functions
- increased comfort compared to mains-operated pump solutions
- simple installation and commissioning compared to standard VFDs.

Functions

Intuitive start-up guide

The start-up guide enables easy installation and commissioning as well as plug-and-pump convenience. Few settings need to be made by the installer as the rest is done automatically or preset from the factory.

Smart user interface



TM04 3283 4108

Fig. 26 Grundfos CUE control panel

Grundfos CUE features a unique user-friendly control panel with graphic display and easy-to-use buttons. Panel layout resembles the well-known Grundfos R100 remote control, which is used with Grundfos CME pumps.

Controlling the value you choose

Grundfos CUE has a built-in PI controller offering closed-loop control of a desired value.

The values include:

- constant differential-pressure
- proportional pressure
- constant temperature
- constant flow.

Wide product range

The CUE product range is quite comprehensive, covering five different voltage ranges, enclosure classes IP20/21 (Nema 1) and IP54/55 (Nema 12), and a wide range of output powers.

The table below provides a general overview.

Input voltage [V]	Output voltage [V]	Motor [Hp]
1 x 200-240	3 x 200-240	1.5 - 10
3 x 200-240	3 x 200-240	1 - 60
3 x 380-500	3 x 380-500	.75 - 300
3 x 525-600	3 x 525-600	1 - 10

9. Approvals and markings

Approvals

C-tick mark, New Zealand and Australian EMC.
TR certificate.

cULus

The cULus approval covers the following supply voltages:

- 1 x 115/230 V, 60 Hz (supply voltage B)
- 3 x 208-230/440-480 V, 60 Hz (supply voltage E)
- 3 x 575 V, 60 Hz (supply voltage H)
- 1 x 115/230 V, 60 Hz (supply voltage B1)
- 3 x 208-230/440-480 V, 60 Hz (supply voltage E1)
- 3 x 400 V, 50/60 Hz (supply voltage I)
- 3 x 380-415 V, 50 Hz/3 x 440-480 V, 60 Hz (supply voltage J).

Pumps

UL778 and C22.2 No 108-01
NEMA 250 (IP code).

Overheating protection

UL2111 and C22.2 No 77-95.

Note: cULus/cURus-approved motors have no internal protection. Motors fitted with PTC/PTO have no cULus/cURus approval.

cURus motors

CME motors comply with UL508C and C22.2 No 14.
The cURus approval covers the following supply voltages:

- 3 x 380-480 V, 50/60 Hz (supply voltage L)
- 3 x 460-480 V, 60 Hz (supply voltage N)
- 1 x 208-230 V, 50/60 Hz (supply voltage M)
- 3 x 208-230 V, 50/60 Hz (supply voltage Q)
- 3 x 200-460 V, 60 Hz (supply voltage G)
- 1 x 115-230 V, 60 Hz (supply voltage B)
- 1 x 200-240 V, 50/60 Hz (supply voltage K)
- 3 x 380-500 V, 50/60 Hz (supply voltage S)
- 3 x 440-480 V, 50/60 Hz (supply voltage T)
- 1 x 200-230 V, 50/60 Hz (supply voltage U).

Other approvals and compliance with directives

- GOST (Russia)
- Compliance with RoHS, directive 2002/96/EC
- CCC
- CEL
- EuP.

Drinking water approvals

- WRAS
- ACS
- NSF61.

Markings



C-tick



CE



cULus



cURus



UL



TR



CCC

10. Certificates

Certificate	Description
Certificate of compliance with the order	According to EN 10204, 2.1. Grundfos document certifying that the pump supplied is in compliance with the order specifications.
Test certificate. Non-specific inspection and testing	According to EN 10204, 2.2. Certificate with inspection and test results of a non-specific pump.
Inspection certificate 3.1	Grundfos document certifying that the pump supplied is in compliance with the order specifications. Inspection and test results are mentioned in the certificate.
Inspection certificate	Grundfos document certifying that the pump supplied is in compliance with the order specifications. Inspection and test results are mentioned in the certificate. Certificate from the surveyor is included. We offer the following inspection certificates: • Lloyds Register of Shipping (LRS) • Det Norske Veritas (DNV) • Germanischer Lloyd (GL) • Bureau Veritas (BV) • American Bureau of Shipping (ABS) • Registro Italiano Navale Agenture (RINA) • China Classification Society (CCS) • Russian maritime register of Shipping (RS) • Biro Klassifikasio Indonesia (BKI) • United States Coast Guard (USCG) • Nippon Kaiji Koykai (NKK)
Standard test report	Certifies that the main components of the specific pump are manufactured by Grundfos, and that the pump has been QH-tested, inspected and conforms to the full requirements of the appropriate catalogues, drawings and specifications.
Material specification report	Certifies the material used for the main components of the specific pump.
Material specification report with certificate from raw material supplier	Certifies the material used for the main components of the specific pump. A material certificate, EN 10204, 3.1, will be supplied for each main component.
Duty-point verification report	Certifies a test point specified by the customer. Issued according to ISO 9906:1999 concerning "Duty point verification".
Surface-roughness	Shows the measured roughness of the cast pump base of the specific pump. The report indicates the values measured at the base inlet and outlet according to ISO 1302.
Vibration report	Vibration report indicating the values measured during the performance test of the specific pump according to ISO 10816.
Motor test report	Shows the performance test of the specific motor, including power output, current, temperature, stator windings resistance and insulation test.
Cleaned and dried pump	Confirms that the specific pump has been cleaned and dried, and how it was done.
Electro-polished pump	Confirms that the specific pump has been electro-polished. The maximum surface roughness is specified in the report.

Examples of the certificates are shown on page [32](#).

Note: Other certificates are available on request.

Examples of certificates

Certificate of compliance with the order

BE > THINK > INNOVATE > GRUNDFOS

Certificate of compliance with the order

EN 10204 2.1

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

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

GRUNDFOS
Date:
Signature:
Name:
Dept.:

Part no. 96 50 78 95/1001002

TM03 4165 1706

Test certificate

BE > THINK > INNOVATE > GRUNDFOS

Test certificate

Non-specific inspection and testing

EN 10204 2.2

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

Pump		
Pump type		Part number
Motor make		Part number
Flow	m ³ /h	
Head	m	
Power P ₂	kW	
Voltage	V	
Frequency	Hz	
Full load current	A	
Motor speed	min ⁻¹	

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

GRUNDFOS
Date:
Signature:
Name:
Dept.:

Part no. 96 50 78 96/1001002

TM03 4163 1706

Inspection certificate 3.1

BE > THINK > INNOVATE > GRUNDFOS

Inspection certificate.

EN 10204 3.1

Manufactured by	
GRUNDFOS order no.	
GRUNDFOS DUT id.	
Customer order no.	
Customer name and address	
Shipyard / factory	
Ship / new building	
Customer TAG no.	
Classifying society	GRUNDFOS authorized department

Pump	Motor
Pump type	Make
Part number	Part number
Serial no.	Serial No.
Flow rate (m ³ /h)	P ₂ (kW)
Head (m)	Voltage (V)
Max. ope. P/t (bar / °C)	Current (A)
	n(min ⁻¹)
Base/Pump head cover	Frequency (Hz)
Impeller/guide vanes	Insulation class
Shaft/sleeve	Power factor

Din / W. - No.

Customer's requirements	
Flow rate (m ³ /h)	Head (m)

Test result ref. requirements

Q(m ³ /h)	H(m)	n(min ⁻¹)	I(A)	P ₁ (kW)
----------------------	------	-----------------------	------	---------------------

Hydrostatic test Bar – no leaks or deformation observed

GRUNDFOS
Date:
Signature:
Name:
Dept.:

Part no. 96 50 78 97/1014145

TM03 4162 3607

Inspection certificate

BE > THINK > INNOVATE > GRUNDFOS

Inspection certificate.

Russian Maritime Register of Shipping

Manufactured by	
GRUNDFOS order no.	
GRUNDFOS DUT id.	
Customer order no.	
Customer name and address	
Shipyard / factory	
Ship / new building	
Customer TAG no.	
Classifying society	Russian Maritime Register of Shipping (RS)

Pump	Motor
Pump type	Make
Part number	Part number
Serial no.	Serial No.
Flow rate (m ³ /h)	P ₂ (kW)
Head (m)	Voltage (V)
Max. ope. P/t (bar / °C)	Current (A)
Service	n(min ⁻¹)
Medium	Frequency (Hz)
Base/Pump head cover	Insulation class
Impeller/guide vanes	Power factor
Shaft/sleeve	

Din / W. - No.

Customer's requirements	
Flow rate (m ³ /h)	Head (m)

Test result ref. requirements

Q(m ³ /h)	H(m)	n(min ⁻¹)	I(A)	P ₁ (kW)
----------------------	------	-----------------------	------	---------------------

Hydrostatic test Bar – no leaks or deformation observed

The pump has been marked

Surveyor signature:
Tested date:

GRUNDFOS
Date:
Signature:
Name:
Dept.:

Part no. 96 50 78 25/1014142

TM03 4156 3607

Standard test report

BE THINK INNOVATE		GRUNDFOS
Standard test report		
Customer name		
Customer order no.		
Customer Tag no.		
GRUNDFOS order no.		
Product type		
GRUNDFOS DUT id.		
Part number		
We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured by GRUNDFOS, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto. The attached test result is from the above mentioned pump.		
GRUNDFOS Date: Signature: Name: Dept.:		
Part no. 96 50 79 30 P01 /A72775		

TM03 4143 1706

Material specification report

BE THINK INNOVATE		GRUNDFOS
Material specification report.		
Customer name		
Customer order no.		
Customer TAG no.		
GRUNDFOS order no.		
Pump type		
GRUNDFOS DUT id.		
Part number		
Production code		
Pump	Materials	DIN W.-Nr. / AISI / ASTM
Pump head		
Pump head cover		
Shaft		
Impeller		
Chamber		
Outer sleeve		
Base		
We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.		
GRUNDFOS Date: Signature: Name: Dept.:		
Part no. 96 50 79 28/A72775		

TM03 4150 1706

Material specification report with certificate from raw material supplier

BE THINK INNOVATE		GRUNDFOS
Material specification report with EN10204 3.1 material certificate from raw material supplier		
Customer name		
Customer order no.		
Customer TAG no.		
GRUNDFOS order no.		
Pump type		
GRUNDFOS DUT id.		
Part number		
Production code		
Pump	Raw material no.	Supplier certificate no.
Pump head		
Pump head cover		
Shaft		
Impeller		
Chamber		
Outer sleeve		
Base		
We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.		
GRUNDFOS Date: Signature: Name: Dept.:		
Part no. 96 50 79 29/A72775		

TM03 4149 3607

Duty-point verification report

BE THINK INNOVATE		GRUNDFOS
Duty point verification report		
Customer name		
Customer order no.		
Customer Tag no.		
GRUNDFOS order no.		
Product type		
GRUNDFOS DUT id.		
Part number		
We the undersigned hereby guarantee and certify that the materials and/or parts for the above mentioned product were manufactured by GRUNDFOS, tested, inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.		
GRUNDFOS Date: Signature: Name: Dept.:		
Part no. 96 53 96 99 /A72775		

TM03 4148 1706

11. Selection and sizing

Selection of pumps

Selection of pumps should be based on these elements:

- the duty point of the pump (see fig. 27)
- dimensional data such as pressure loss as a result of height differences, friction loss in the pipework, pump efficiency, etc. (see fig. 28)
- pump materials (see 6. [Construction](#) on page 16)
- pump connections (see page 35)
- shaft seal (see page 36).

Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts starting on page 40.

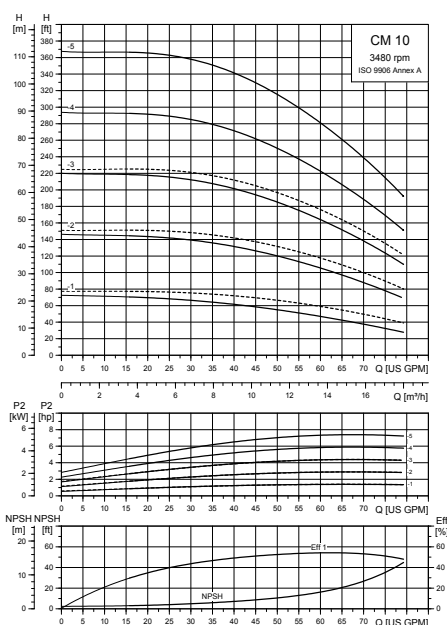


Fig. 27 Example of a curve chart

Dimensional data

When sizing a pump, take the following factors into account:

- Required flow and pressure at the draw-off point.
- Pressure loss as a result of height differences (H_{geo}).
- Friction loss in the pipework (H_f).
- It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- Best efficiency at the estimated duty point.*
- NPSH value.

For calculation of the NPSH value, see [Minimum inlet pressure](#) on page 23.

* See [Selection of CME pumps](#) on page 36 for further information about sizing CME pumps.

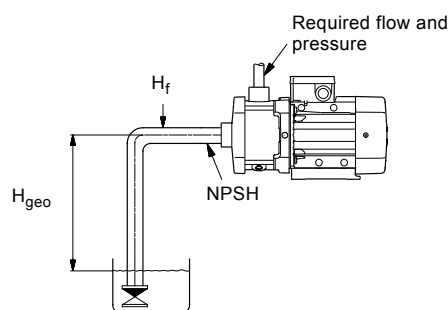


Fig. 28 Dimensional data

Pump efficiency

When sizing the pump, the efficiency (η) should be considered so that the pump will operate at or near its maximum efficiency, for instance on the right-hand side in the curve example in fig. 29.

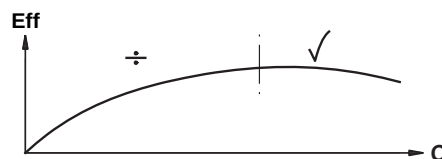


Fig. 29 Best efficiency

Before determining the best efficiency point, the operation pattern of the pump needs to be identified. If the pump is expected to operate at the same duty point, then select a CM pump which is operating at a duty point corresponding with the best efficiency of the pump. The example in fig. 30 shows how to check the pump efficiency when selecting a CM pump.

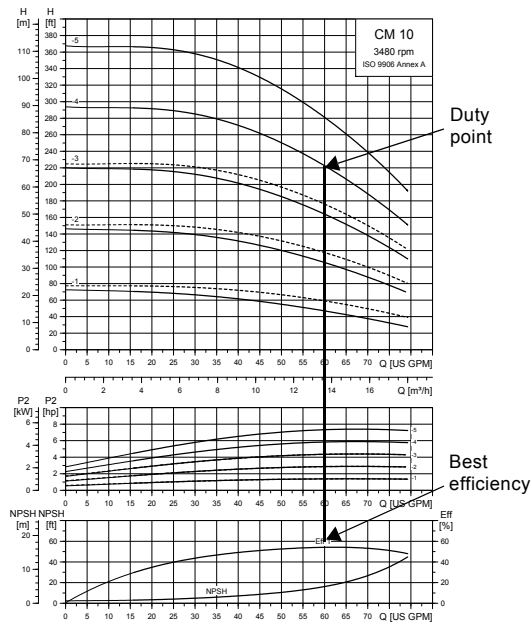


Fig. 30 Example of a CM pump's duty point

Pump materials

Select the material variant on the basis of the liquid to be pumped. The table below gives a general recommendation regarding selection of pump material.

Liquid to be pumped	Material in contact with pump media	Pump type
Clean, non-aggressive liquids such as potable water and oils	Cast iron* (A48 CL30 / EN-GJL-200)	CM(E)-A
Industrial liquids and acids	Stainless steel (AISI 304 / EN 1.4301)	CM(E)-I
	Stainless steel (AISI 316 / EN 1.4401)	CM(E)-G

* The impeller, chamber and filling plugs are made of stainless steel (EN 1.4301/AISI 304).
The pump shaft is made of stainless steel (AISI 431 / EN 1.4057).

For more specific selection based on the pumped liquid, see [19. Pumped liquids](#) on page 97, or contact Grundfos.

Pump connections



Fig. 31 Examples of pump connections

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

- internal NPT thread
- Whitworth thread Rp
- DIN flange
- Tri-Clamp®
- ANSI flange
- JIS flange
- PJE coupling.

CM and CME pumps come standard with NPT fittings (see dimensions on pages [52](#) to [77](#)).

Selection of shaft seal

As standard, the CM and CME pumps are fitted with a Grundfos O-ring type shaft seal with fixed driver suitable for the most common applications.



TM04 3934 0409

Fig. 32 Shaft seal (O-ring type with fixed driver)

The table below shows the available shaft seal types for CM and CME pumps.

Pump type	Shaft seal type	Material	Rubber parts
CM, CME	AQQE	Stainless steel	EPDM (E) FKM (V) FFKM (K)
	AQQV		
	AQQK		
	AVBE		
	AVBV		

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

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

Use fig. 17 on page 24 to select a suitable shaft seal. If the pumped liquid differs from water, a suitable shaft seal can be found in section 19. Pumped liquids on page 97.

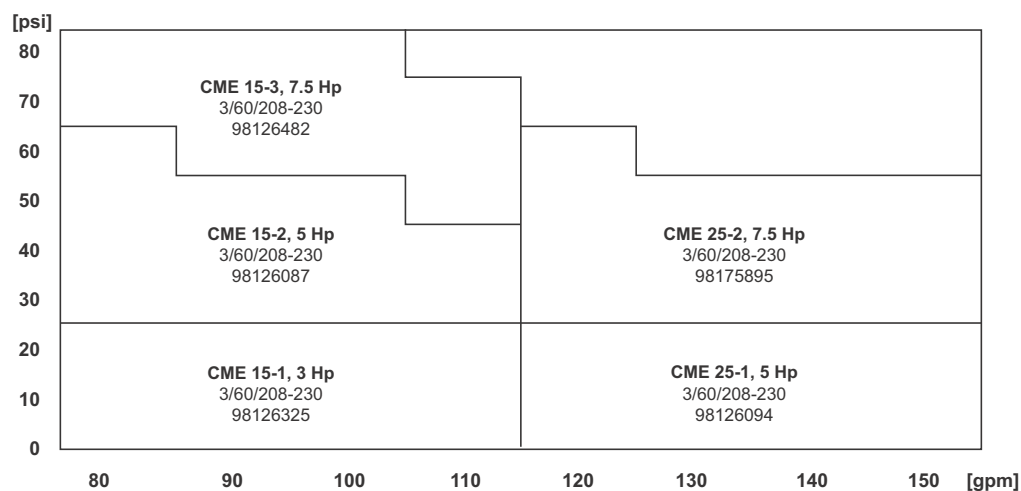
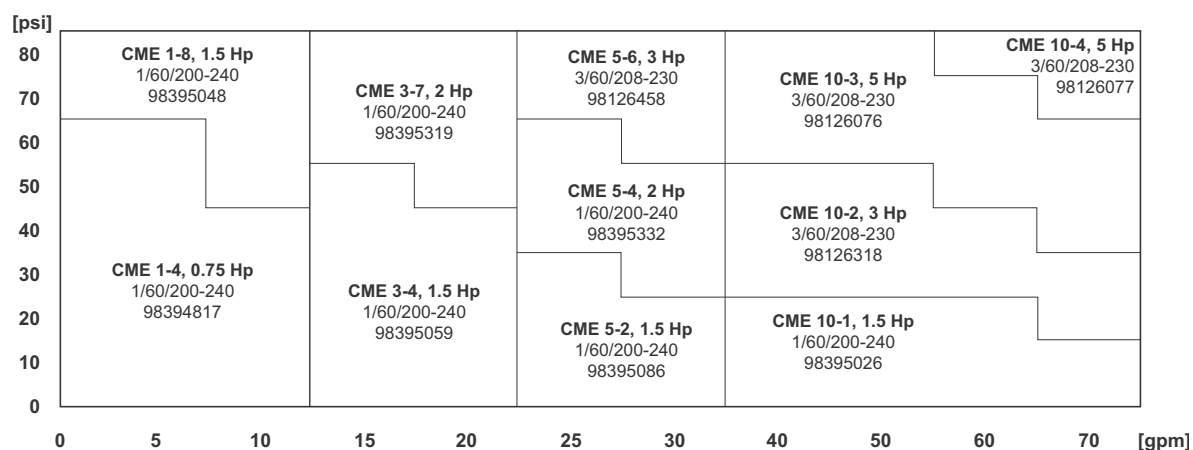
Note: The list should be applied with some caution, as factors such as concentration of the pumped liquid, liquid temperature or pressure may affect the chemical resistance of a specific pump version.

Selection of CME pumps

CME pumps are normally used in applications characterized by a variable flow. Consequently, it is not possible to select a pump that is constantly operating at its optimum efficiency. In order to achieve optimum operating economy, the duty point should therefore be close to the optimum efficiency (eff) for most operating hours. For further information see section 8. CME pumps on page 26.

Note: Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3400 rpm, corresponding to an input frequency of 60 Hz, i.e. if the input frequency is 50 Hz, the 100 % speed will still be approximately 3400 rpm. See CME performance curves on pages 46 to 51.

CME pump* quick selection chart



* Pump components in contact with pumped liquid: AISI 316 stainless steel.

TM06 0253 5113

Constant-pressure control application

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. To achieve comfort and energy savings, a constant supply pressure is recommended.

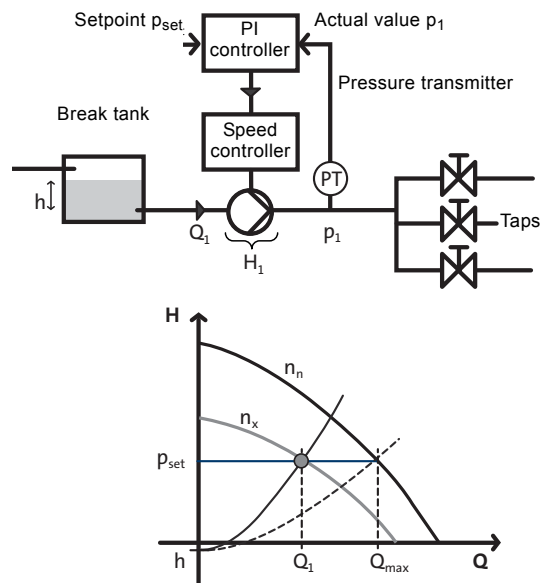


Fig. 33 Constant-pressure control

As appears from fig. 33, 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 $p_1 = p_{set}$. Figure 33 shows what happens when the flow is reduced from Q_{max} to Q_1 .

The controller reduces the speed of the pump from n_n to n_x in order to ensure that the required discharge pressure is $p_1 = p_{set}$. 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.

TM03 0410 5004

12. How to read the curve charts

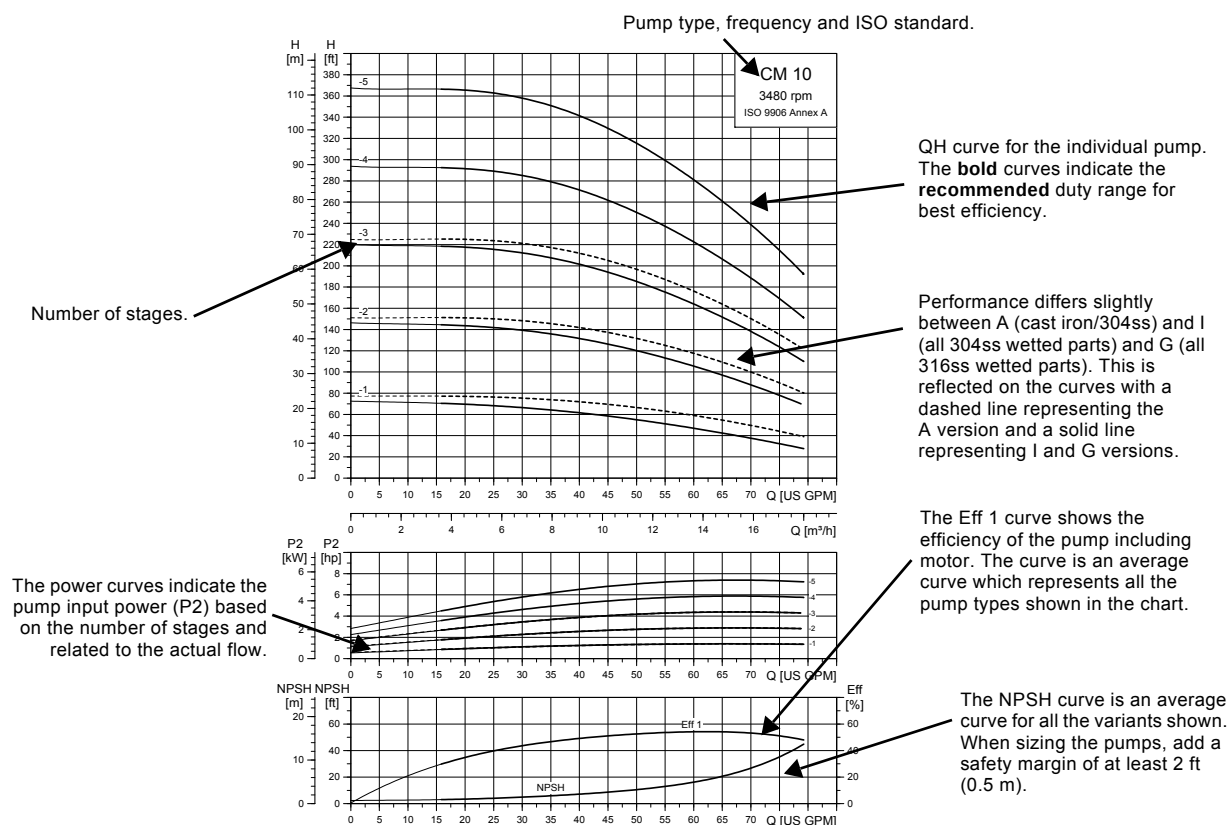


Fig. 34 How to read the curve charts

Guidelines to performance curves

The guidelines below apply to the curves shown on the following pages:

- Tolerances to ISO 9906, Annex A, if indicated.
- The motors used for the measurements are the specifically designed motors for CM and CME pumps. The motors are based on Grundfos standard motors (ML or MLE).
- Measurements have been made with airless water at a temperature of +68 °F (+20 °C).
- The curves apply to the following kinematic viscosity: $\nu = 1 \text{ cSt (1 mm}^2/\text{s)}$.
- The QH curves apply to rated motor speeds of approximately 3400 rpm (60 Hz). All curves are based on current motor speeds. The QH curves apply to a fixed speed of 3480 rpm for CM pumps. CME QH curves apply to a fixed speed of 3480 rpm.
Note: Please refer to WebCAPS for more precise curves. In WebCAPS, it is also possible to adjust the curves depending on the density and viscosity.
- When the motor is running at the lowest or highest rated voltage, the pump performance will usually vary by $\pm 2 - 4 \text{ ft}$ at a given duty point.

- All curves are based on pumps fitted with a three-phase motor.
- CM pumps using single phase or three phase motors may differ in performance. For curves corresponding to specific motors please refer to WebCAPS.
- Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate. The curve in fig. 35 shows the minimum flow rate as a percentage of the rated flow rate in relation to the liquid temperature.

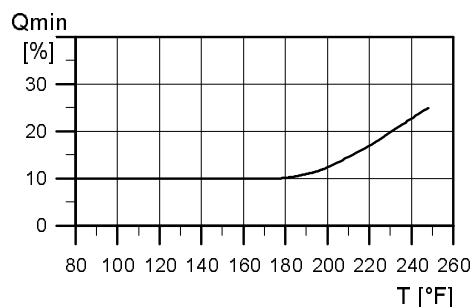
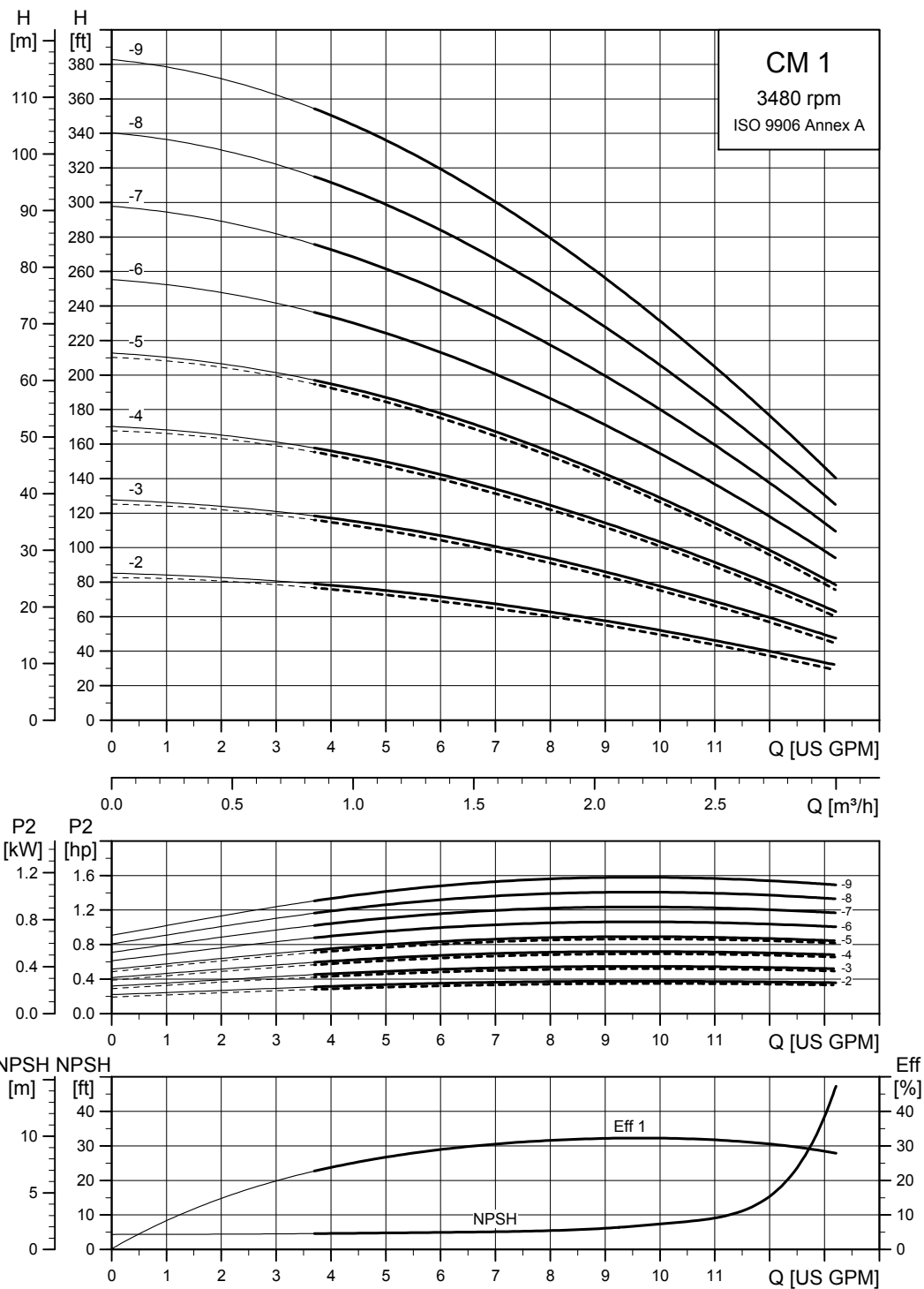


Fig. 35 Minimum flow rate

13. Performance curves

CM 1



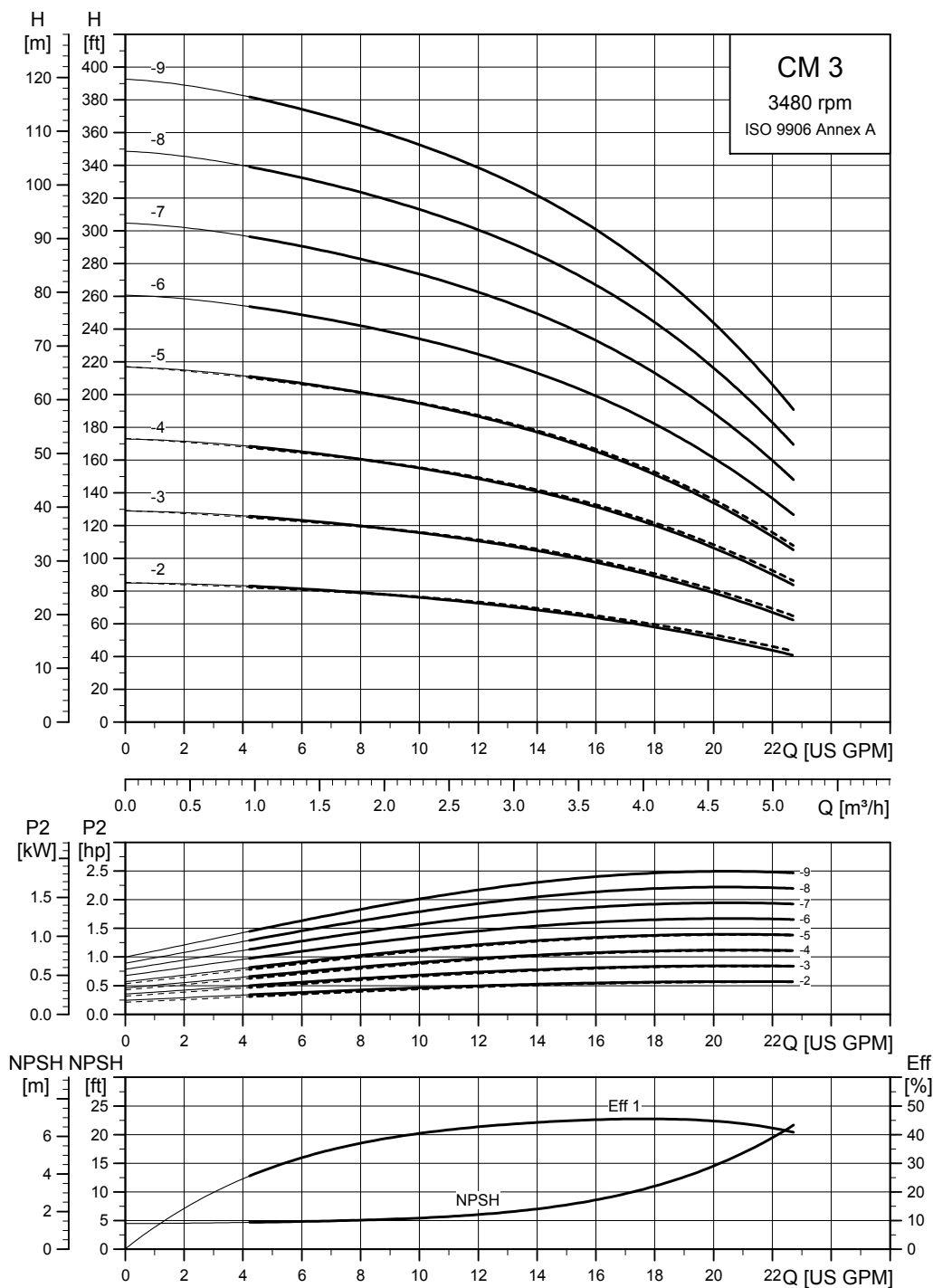
Eff1 = Wire to water efficiency of the pump including motor (see page 39).

----- A version

———— I, G versions

TM04 5896 3610

CM 3



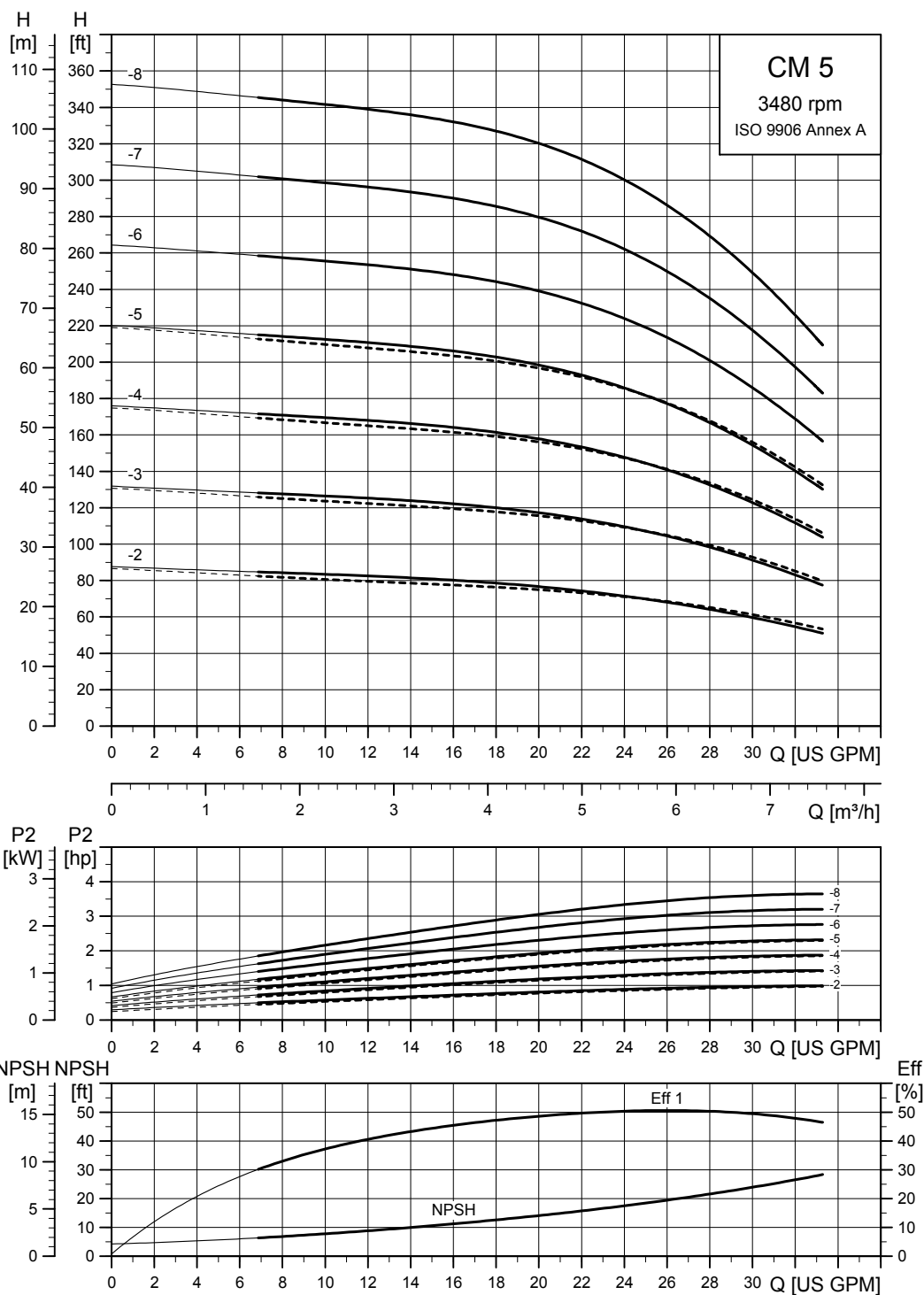
Eff1 = Wire to water efficiency of the pump including motor (see page 39).

----- A version

———— I, G versions

TM04 5897 3610

CM 5



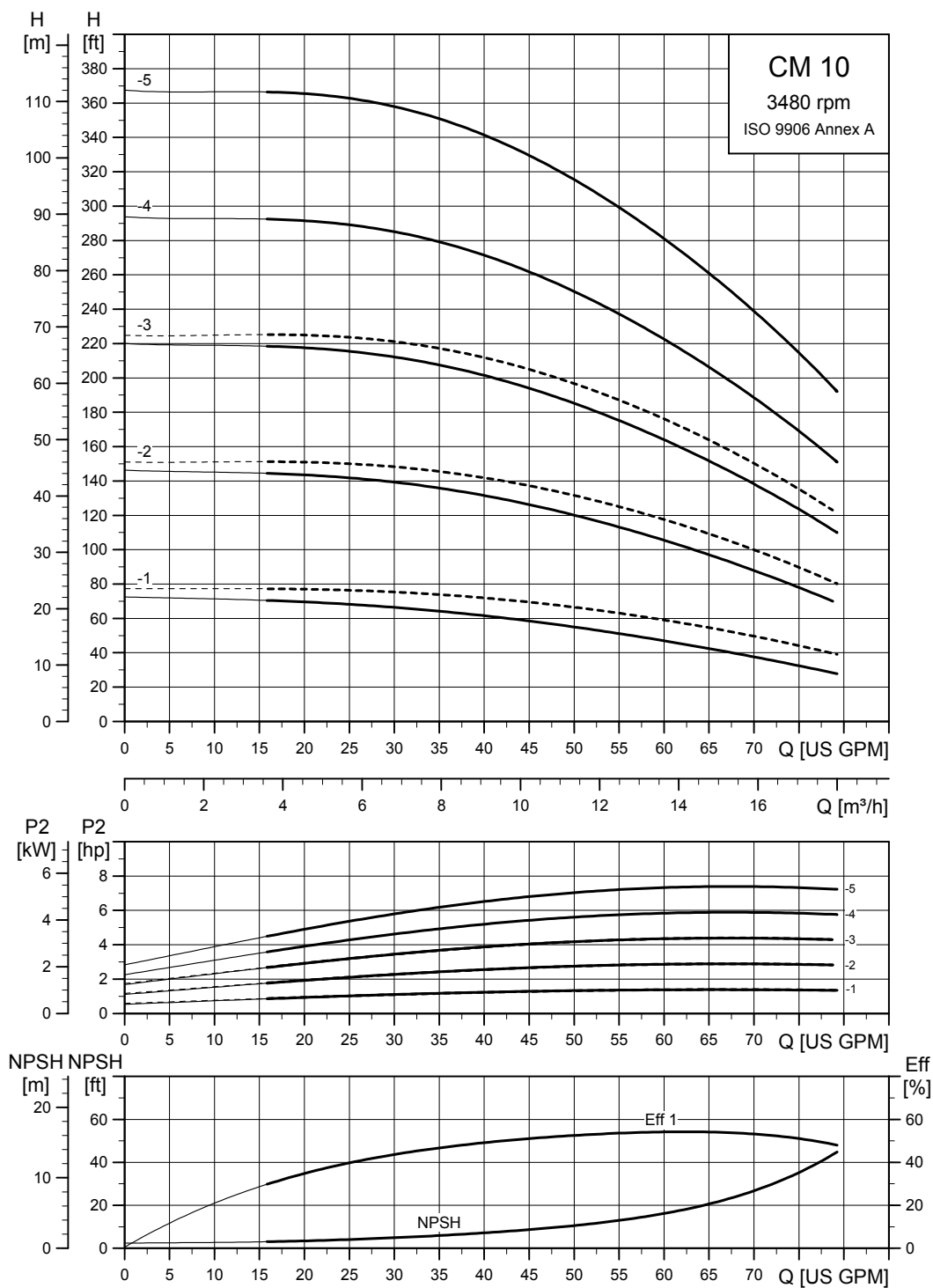
Eff1 = Wire to water efficiency of the pump including motor (see page 39).

----- A version

———— I, G versions

TM04 5898 3610

CM 10



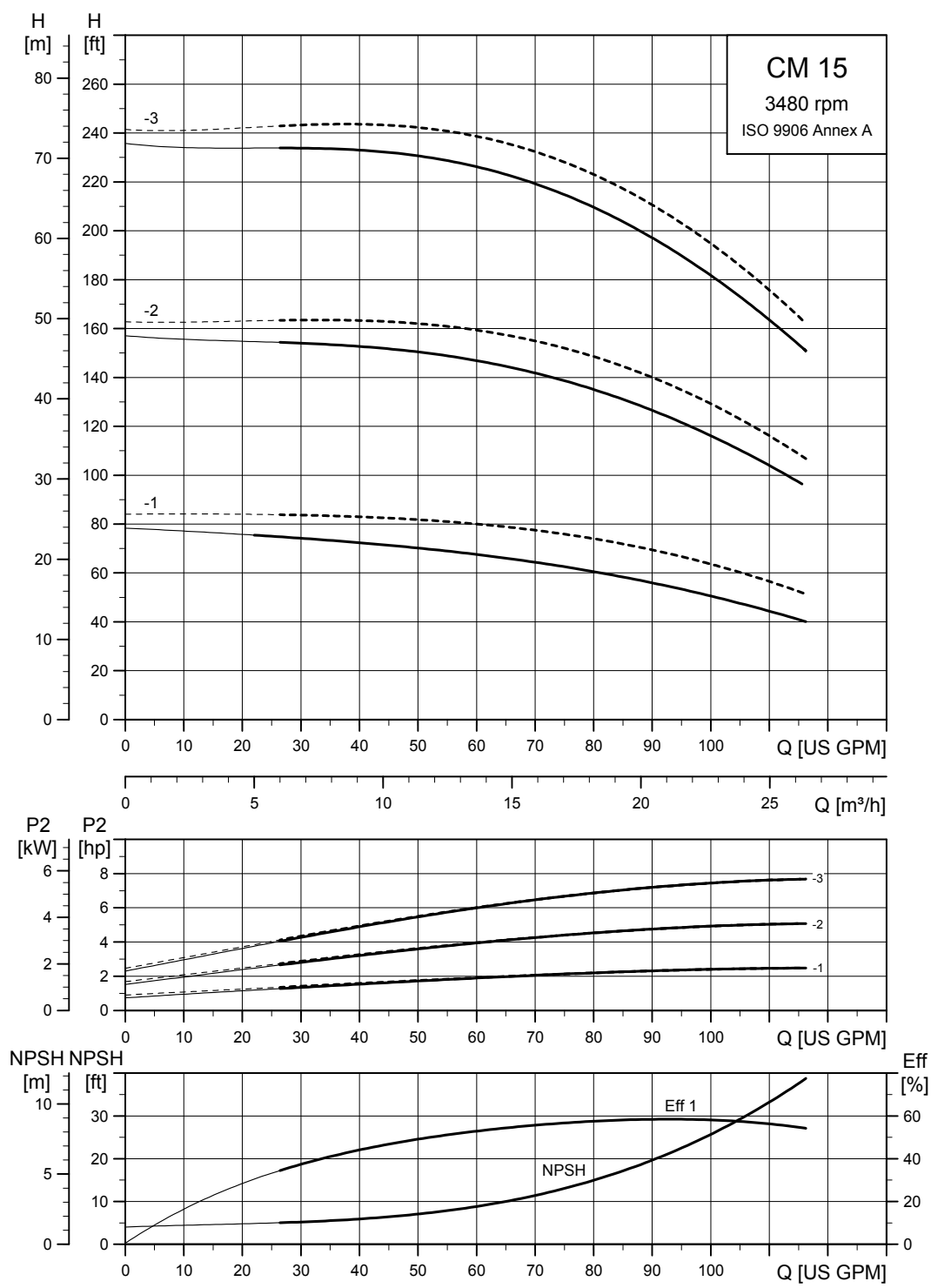
Eff1 = Wire to water efficiency of the pump including motor (see page 39).

----- A version

———— I, G versions

TM04 5899 3610

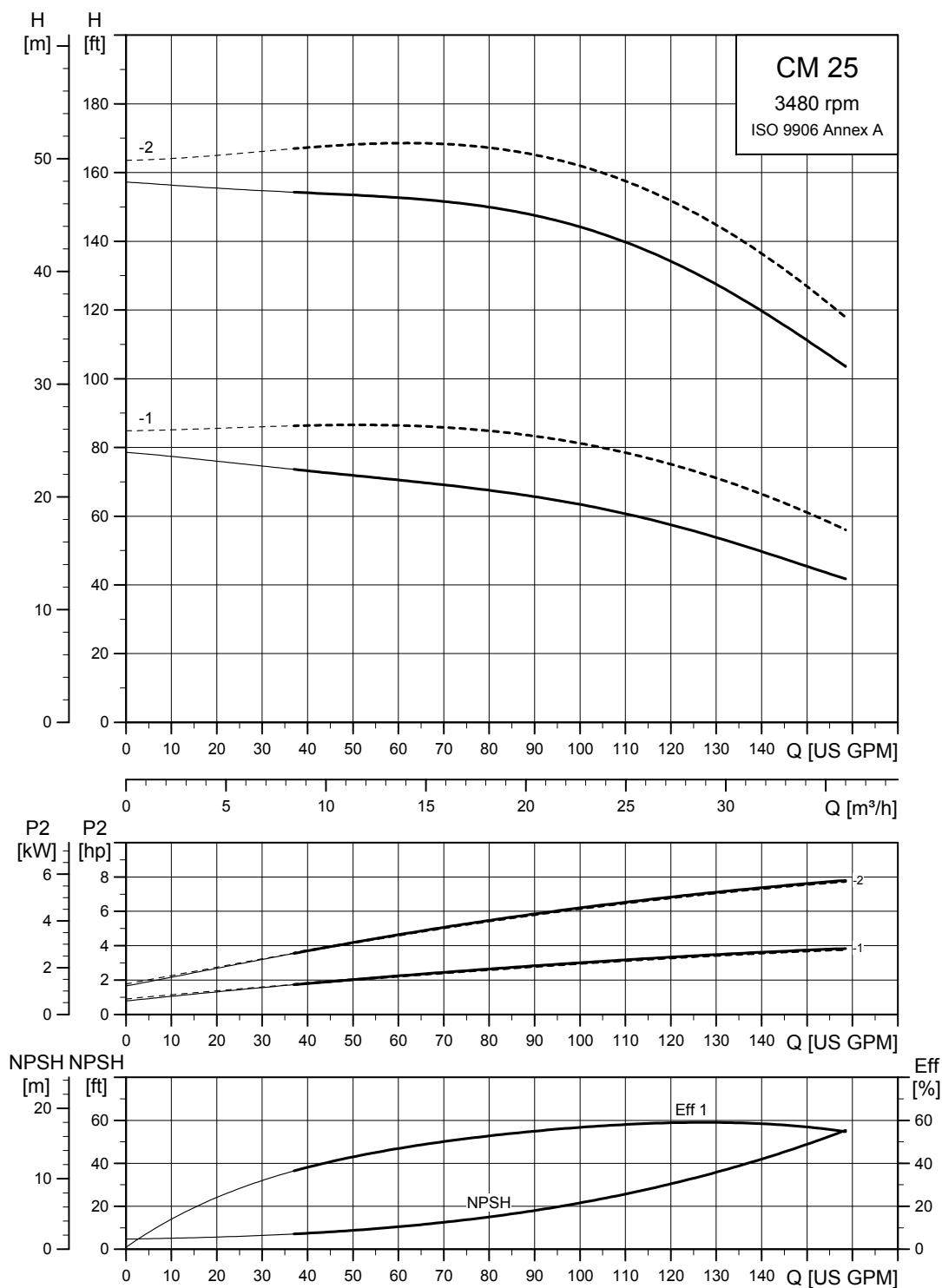
CM 15



Eff1 = Wire to water efficiency of the pump including motor (see page 39).
----- A version
———— I, G versions

TM04 5900 3610

CM 25



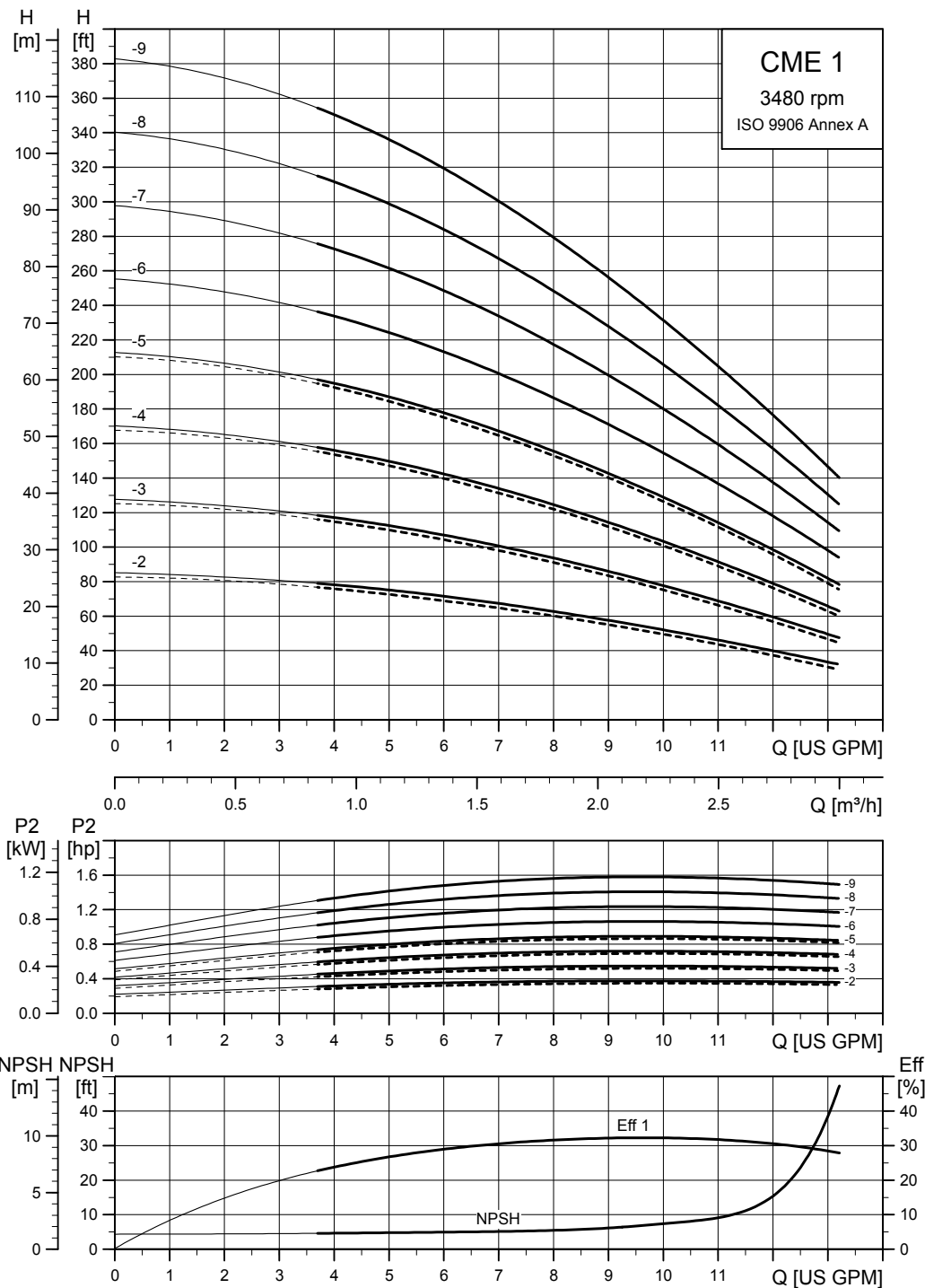
Eff1 = Wire to water efficiency of the pump including motor (see page 39).

----- A version

———— I, G versions

TM04 5901 2612

CME 1



Eff1 = Wire to water efficiency of the pump including motor (see page 39).

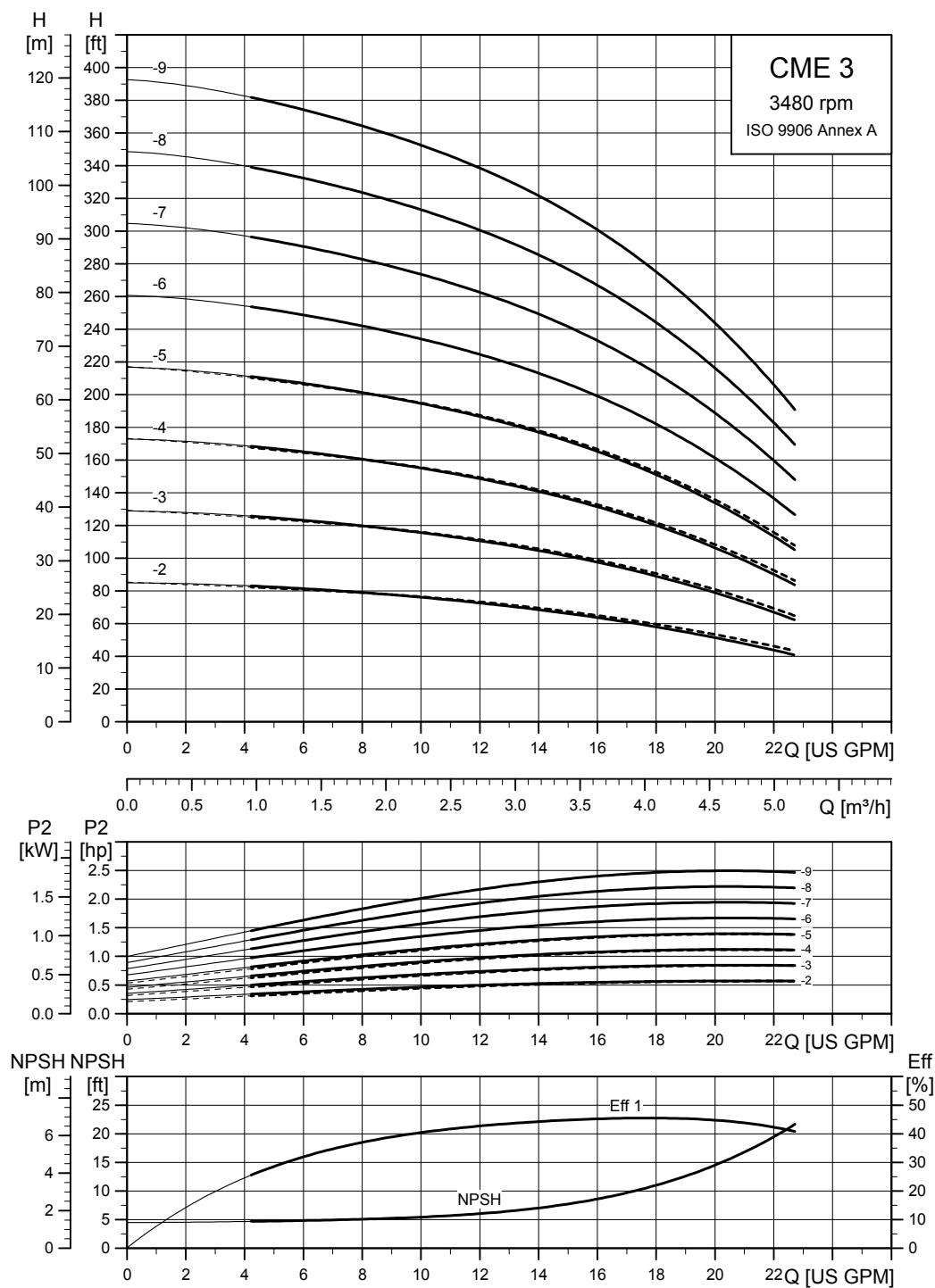
----- A version

———— I, G versions

Note: Irrespective of the input frequency, the 100% speed of the CME pumps is approximately 3400 rpm.

TM04 5902 3610

CME 3



TM04 5903 3610

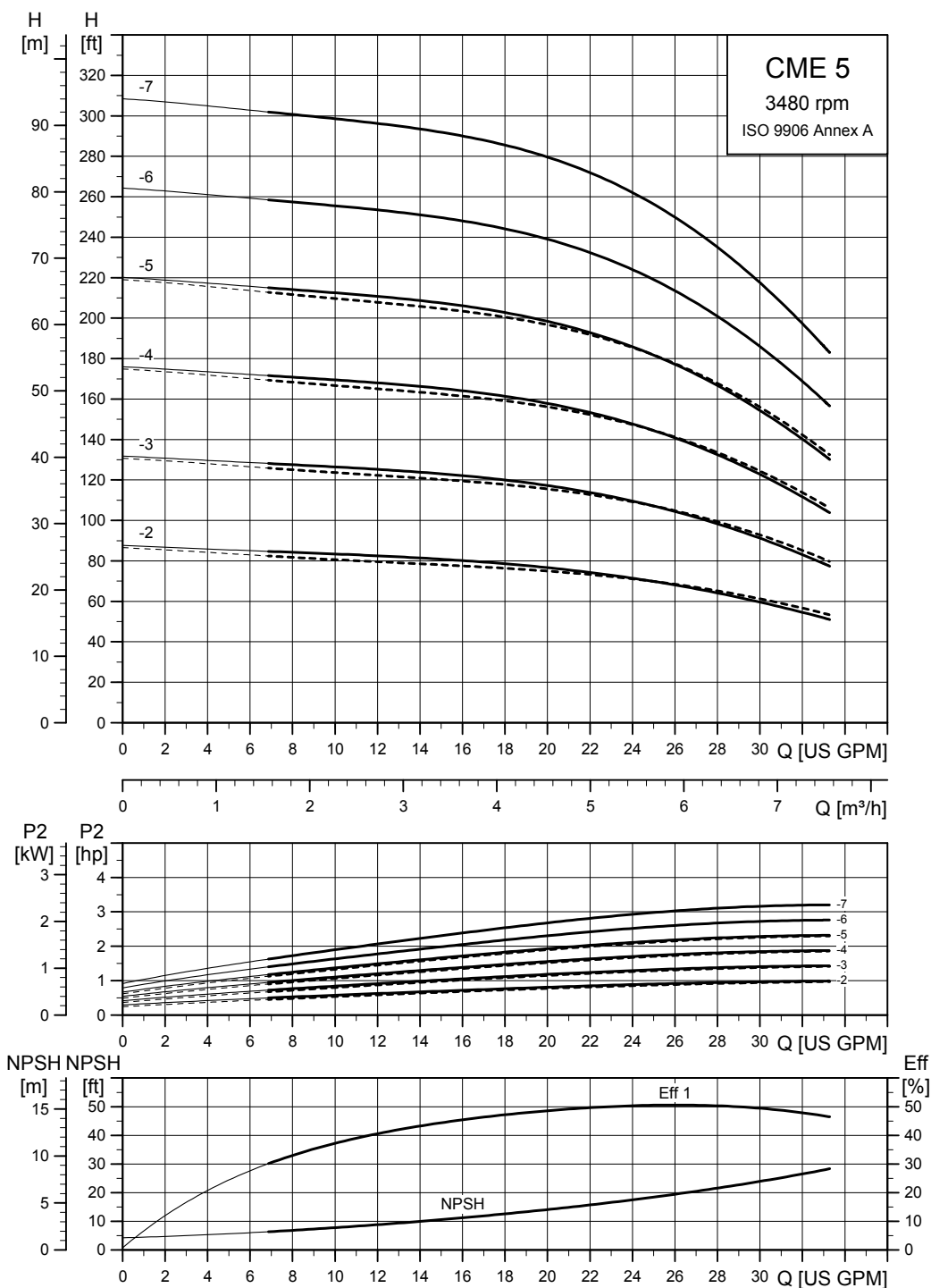
Eff1 = Wire to water efficiency of the pump including motor (see page 39).

----- A version

———— I, G versions

Note: Irrespective of the input frequency, the 100% speed of the CME pumps is approximately 3400 rpm.

CME 5



Eff1 = Wire to water efficiency of the pump including motor (see page 39).

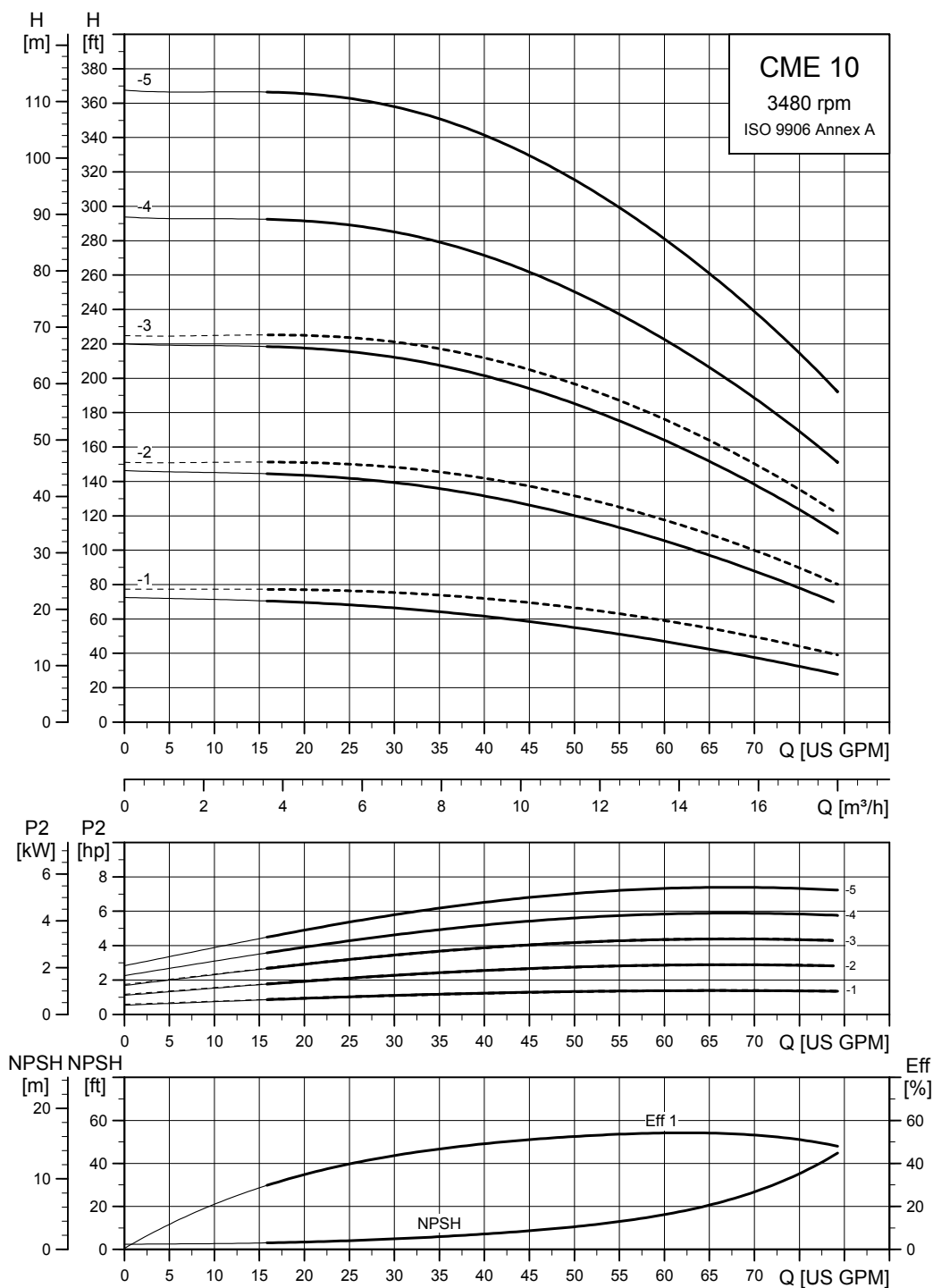
----- A version

———— I, G versions

Note: Irrespective of the input frequency, the 100% speed of the CME pumps is approximately 3400 rpm.

TM04 5904 3610

CME 10



Eff1 = Wire to water efficiency of the pump including motor (see page 39).

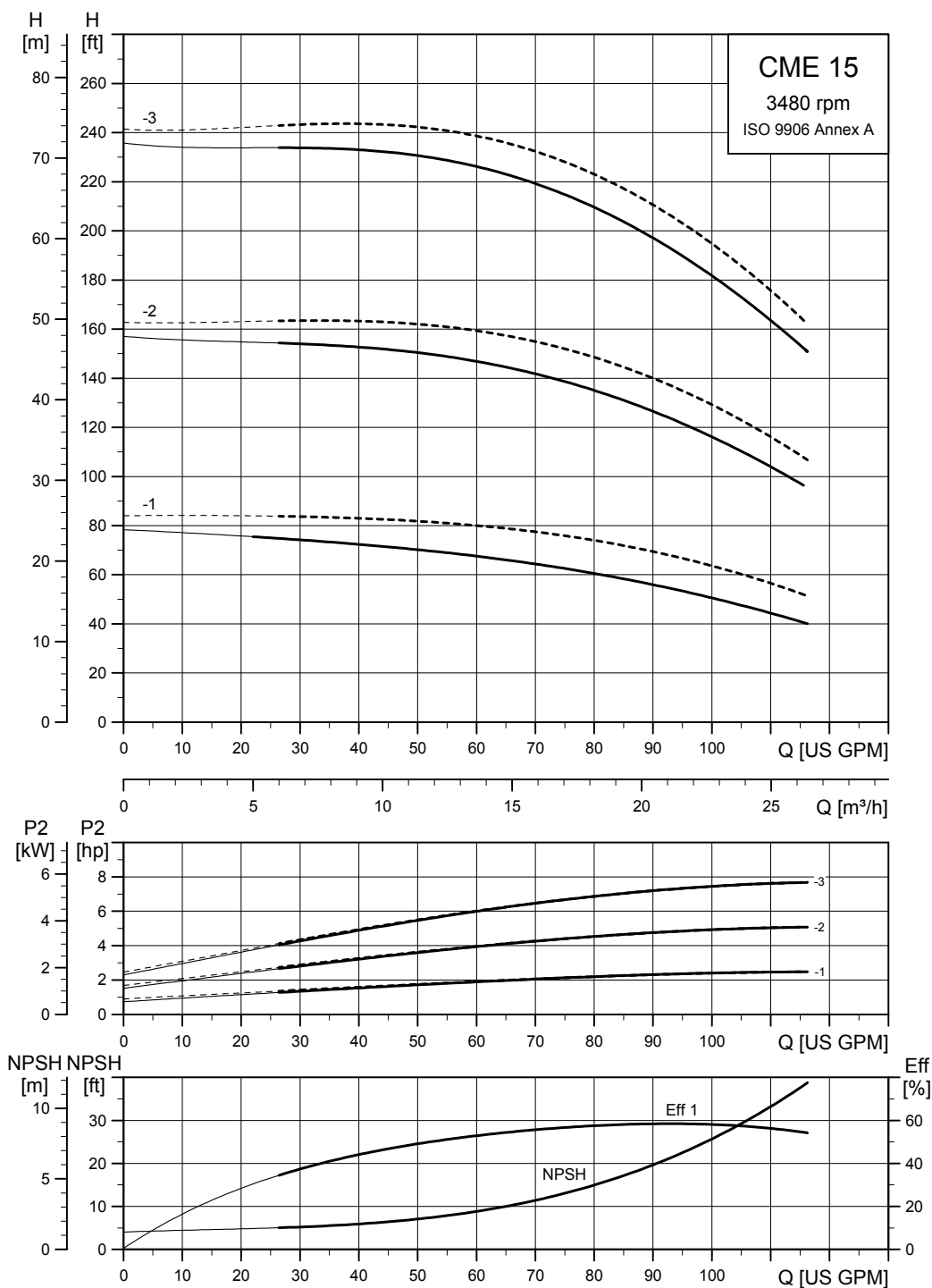
----- A version

———— I, G versions

Note: Irrespective of the input frequency, the 100% speed of the CME pumps is approximately 3400 rpm.

TM04 5905 3610

CME 15



Eff1 = Wire to water efficiency of the pump including motor (see page 39).

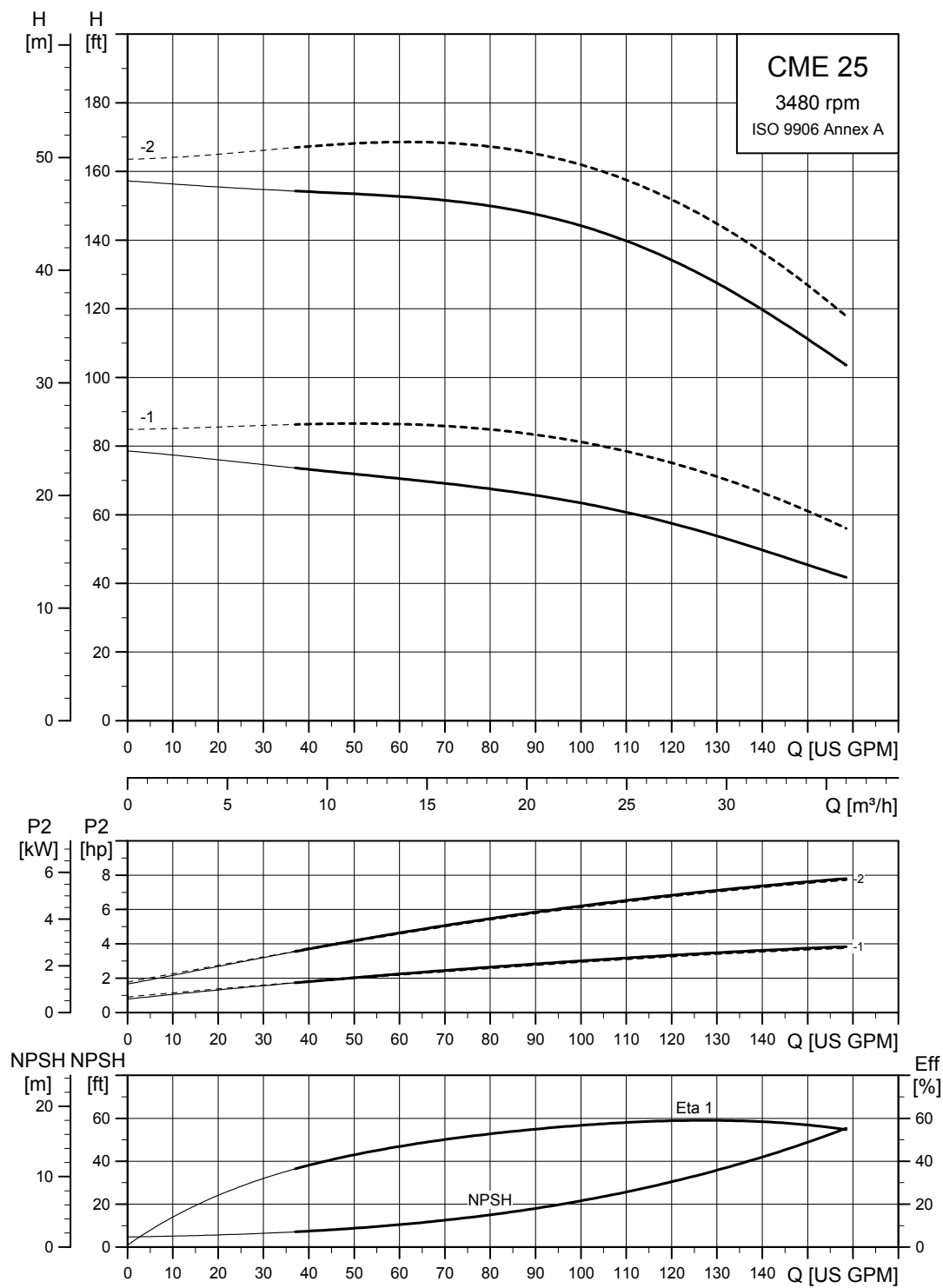
----- A version

———— I, G versions

Note: Irrespective of the input frequency, the 100% speed of the CME pumps is approximately 3400 rpm.

TM04 5906 3610

CME 25

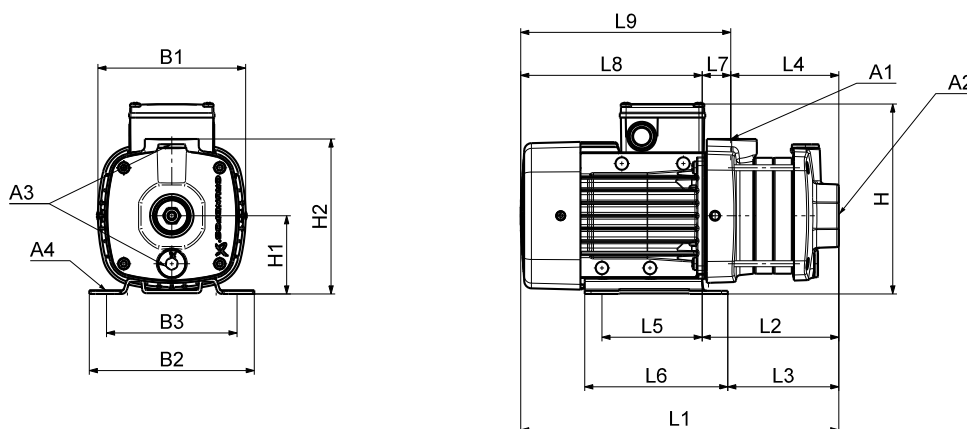


TM04 5907 3610

14. Technical data

CM 1-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2248 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

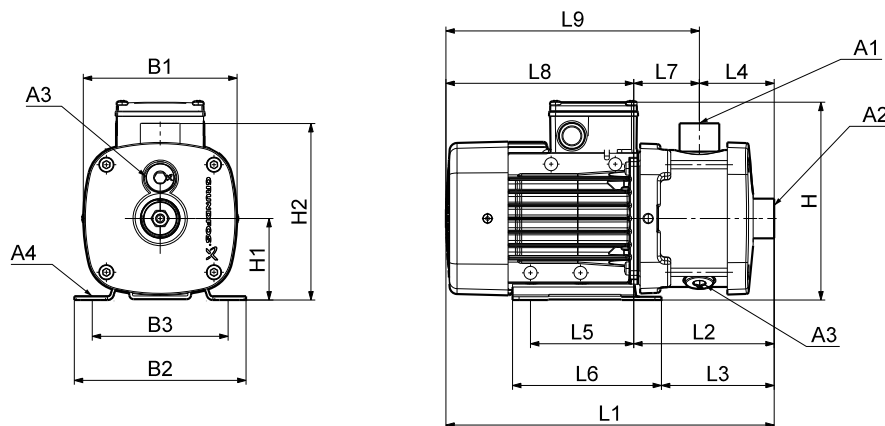
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 1-2	71	0.58	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 1-3	71	0.58	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	12.05 (306)	5.20 (132)	4.21 (107)	4.04 (96)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 1-4	71	1.0	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	12.76 (324)	5.91 (150)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 1-5	71	1.0	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	13.46 (342)	6.61 (168)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)

1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 1-2	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 1-3	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	12.05 (306)	5.20 (132)	4.21 (107)	4.04 (96)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 1-4	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	12.76 (324)	5.91 (150)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 1-5	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	13.46 (342)	6.61 (168)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)

CM 1-I and CM 1-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2246 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]																
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CM 1-2	71	0.58	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-3	71	0.58	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-4	71	1.0	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.72 (323)	5.87 (149)	4.92 (125)	3.54 (90)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-5	71	1.0	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	13.43 (341)	6.57 (167)	5.63 (143)	4.25 (108)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-6*	71	1.0	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	14.84 (377)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-7*	71	1.0	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	14.84 (377)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-8*	80	1.4	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	17.83 (453)	9.41 (239)	8.46 (215)	7.09 (180)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)		
CM 1-9*	80	1.7	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	17.83 (453)	9.41 (239)	8.46 (215)	7.09 (180)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)		

* Only CM-I and CM-G versions are available with this number of stages.

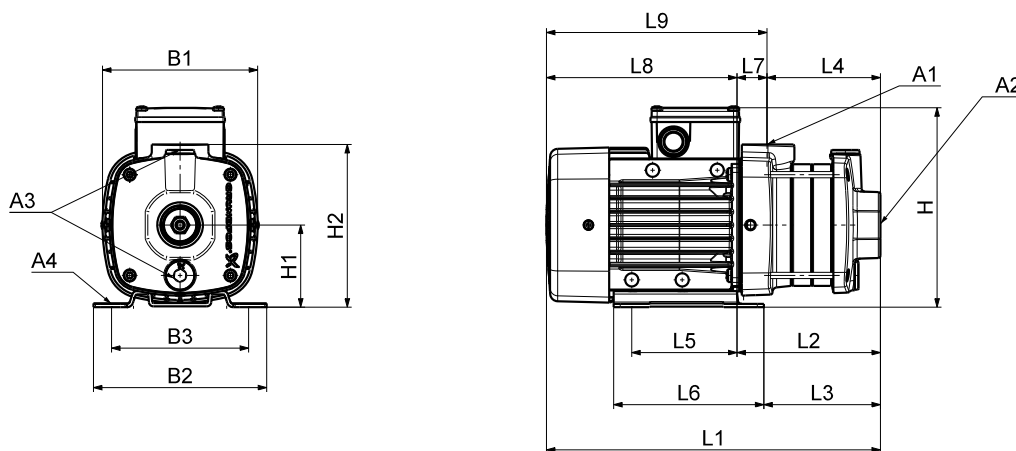
1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]																
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CM 1-2	71	0.8	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-3	71	0.8	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-4	71	0.8	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.72 (323)	5.87 (149)	4.92 (125)	3.54 (90)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-5	71	0.8	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	13.43 (341)	6.57 (167)	5.63 (143)	4.25 (108)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)		
CM 1-6*	80	1.06	1"	1"	3/8"	.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	16.42 (417)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)		
CM 1-7*	80	1.5	1"	1"	3/8"	.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	16.42 (417)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)		
CM 1-8*	80	1.5	1"	1"	3/8"	.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	17.83 (453)	9.41 (239)	8.46 (215)	7.09 (180)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)		
CM 1-9*	80	1.5	1"	1"	3/8"	.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	17.83 (453)	9.41 (239)	8.46 (215)	7.09 (180)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)		

* Only CM-I and CM-G versions are available with this number of stages.

CM 3-A

(A = cast iron, EN-GJL-200)



TM04 2248 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

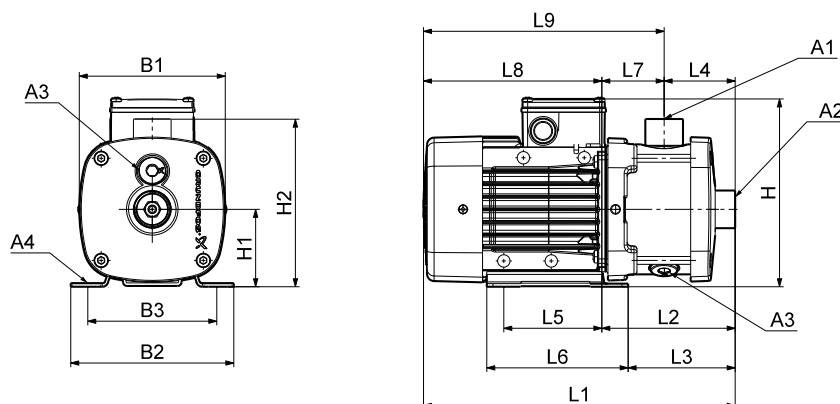
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 3-2	71	0.58	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 3-3	71	1.0	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	12.05 (306)	5.20 (132)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 3-4	71	1.0	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	12.76 (324)	5.91 (150)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 3-5	80	1.4	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	15.04 (382)	6.61 (168)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)

1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 3-2	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 3-3	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	12.05 (306)	5.20 (132)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 3-4	80	1.06	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	14.33 (364)	5.91 (150)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)
CM 3-5	80	1.5	1"	1"	3/8"	0.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	15.04 (382)	6.61 (168)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)

CM 3-I and CM 3-G

(I = AISI 304 / EN 1.4301) and G = AISI 316 / EN 1.4401)



TM04 2246 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 3-2	71	0.58	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.00 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 3-3	71	1.0	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.00 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 3-4	71	1.0	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.72 (323)	5.87 (149)	4.92 (125)	3.54 (90)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 3-5	80	1.4	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	15.0 (381)	6.57 (167)	5.63 (143)	4.25 (108)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 3-6*	80	1.7	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	16.42 (417)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 3-7*	90	2.3	1"	1"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 3-8*	90	3.4	1"	1"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	19.80 (503)	10.98 (279)	10.39 (264)	7.09 (180)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 3-9*	90	3.4	1"	1"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	19.80 (503)	10.98 (279)	10.39 (264)	7.09 (180)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)

* Only CM-I and CM-G versions are available with this number of stages.

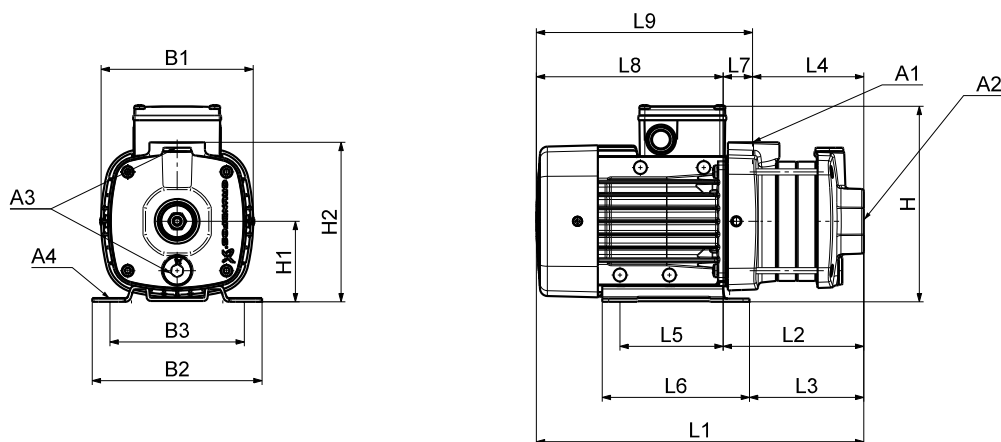
1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 3-2	71	0.6	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.00 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 3-3	71	0.6	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.00 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 3-4	80	1.06	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	14.29 (363)	5.87 (149)	4.92 (125)	3.54 (90)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 3-5	80	1.5	1"	1"	3/8"	0.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	15.0 (381)	6.57 (167)	5.63 (143)	4.25 (108)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 3-6*	90	2.03	1"	1"	3/8"	0.39 (10)	7.01 (178)	7.01 (178)	5.51 (140)	9.02 (229)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 3-7*	90	2.03	1"	1"	3/8"	0.39 (10)	7.01 (178)	7.01 (178)	5.51 (140)	9.02 (229)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 3-8*	90	2.03	1"	1"	3/8"	0.39 (10)	7.01 (178)	7.01 (178)	5.51 (140)	9.02 (229)	3.54 (90)	7.09 (180)	19.80 (503)	10.98 (279)	10.39 (264)	7.09 (180)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)

* Only CM-I and CM-G versions are available with this number of stages.

CM 5-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2248 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

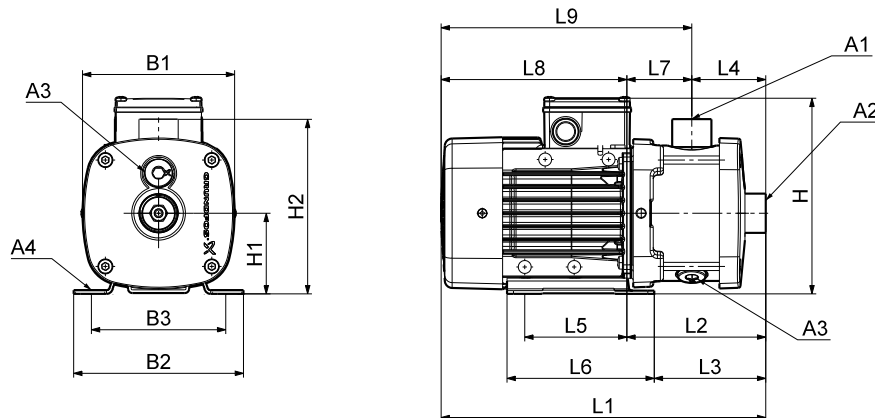
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 5-2	71	1.0	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	11.34 (288)	4.89 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CM 5-3	80	1.4	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	13.62 (346)	5.20 (132)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)
CM 5-4	90	2.3	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.91 (201)	16.34 (415)	7.52 (191)	6.93 (176)	9.94 (109)	4.92 (125)	6.10 (155)	3.23 (82)	8.82 (224)	12.05 (306)
CM 5-5	90	3.4	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.91 (201)	17.05 (433)	8.23 (209)	7.64 (194)	5.00 (127)	4.92 (125)	6.10 (155)	3.23 (82)	8.82 (224)	12.05 (306)

1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2		A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 5-2	80	1.06	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	12.91 (328)	4.89 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)	
CM 5-3	80	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	5.87 (149)	13.62 (346)	5.20 (132)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)	
CM 5-4	90	2.03	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	8.19 (208)	3.54 (90)	7.91 (201)	16.34 (415)	7.52 (191)	6.93 (176)	9.94 (109)	4.92 (125)	6.10 (155)	3.23 (82)	8.82 (224)	12.05 (306)	
CM 5-5	90	2.03	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	8.19 (208)	3.54 (90)	7.91 (201)	17.05 (433)	8.23 (209)	7.64 (194)	5.00 (127)	4.92 (125)	6.10 (155)	3.23 (82)	8.82 (224)	12.05 (306)	

CM 5-I and CM 5-G

(I = AISI 304 / EN 1.4301 and AISI 316 / G = EN 1.4401)



TM04 2246 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)
3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 5-2	71	1.0	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	12.00 (305)	5.16 (131)	4.22 (107)	2.84 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 5-3	80	1.4	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	6.50 (165)	13.58 (345)	5.16 (131)	4.22 (107)	2.84 (72)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 5-4	90	2.3	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	16.26 (413)	7.44 (189)	6.85 (174)	3.54 (90)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 5-5	90	3.4	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	16.97 (431)	8.15 (207)	7.56 (192)	4.25 (108)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 5-6*	90	3.4	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 5-7*	90	3.4	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	7.87 (200)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 5-8*	100	5.4	1"	1 1/4"	3/8"	0.39 (10)	7.80 (198)	7.83 (199)	6.30 (160)	8.66 (220)	3.94 (100)	7.48 (190)	22.09 (561)	11.38 (289)	10.79 (274)	7.09 (180)	5.51 (140)	6.69 (170)	4.29 (109)	10.71 (272)	15 (381)

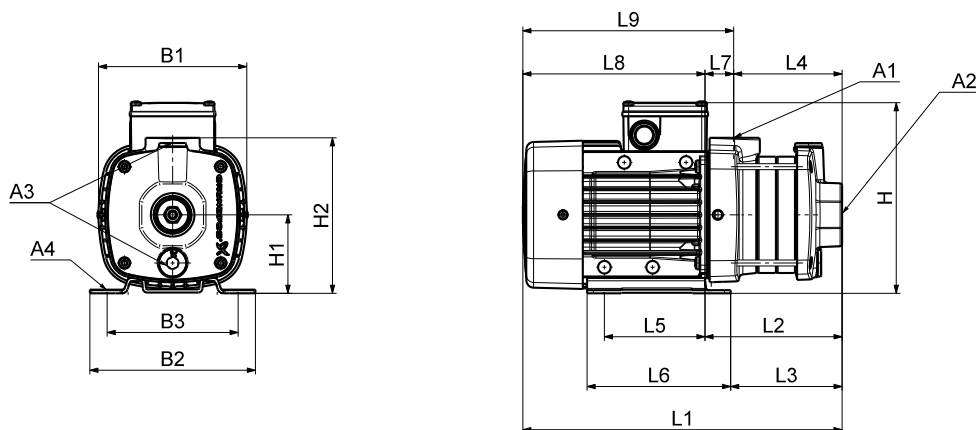
* Only CM-G versions are available with this number of stages.

1 x 115/230 V, 60 Hz (supply voltage B)
1 x 220 V, 60 Hz (supply voltage A)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 5-2	80	1.06	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	4.25 (208)	2.95 (75)	6.50 (165)	13.58 (345)	5.16 (131)	4.22 (107)	2.84 (72)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 5-3	80	1.5	1"	1 1/4"	3/8"	0.39 (10)	205 (158)	6.22 (158)	4.92 (125)	4.25 (208)	2.95 (75)	6.50 (165)	13.58 (345)	5.16 (131)	4.22 (107)	2.84 (72)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CM 5-4	90	2.03	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	9.02 (229)	3.54 (90)	7.09 (180)	16.26 (413)	7.4 (189)	6.85 (174)	3.54 (90)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CM 5-5	90	2.03	1"	1 1/4"	3/8"	0.39 (10)	7.00 (178)	7.00 (178)	5.51 (140)	9.02 (229)	3.54 (90)	7.09 (180)	16.97 (431)	8.15 (207)	7.56 (192)	4.25 (108)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)

CM 10-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2248 2208

CM 10-A Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 10-1	80	1.7	1 1/2"	1 1/2"	3/8"	0.39 (10)	7.48 (190)	6.22 (158)	7.92 (125)	8.50 (216)	3.94 (100)	9.65 (245)	14.53 (369)	6.10 (155)	5.16 (131)	3.82 (97)	3.78 (96)	5.39 (137)	2.28 (58)	8.43 (214)	10.71 (272)
CM 10-2*	90	3.4	1 1/2"	1 1/2"	3/8"	0.39 (10)	7.48 (190)	7.84 (199)	6.30 (160)	8.27 (210)	3.94 (100)	9.65 (245)	16.58 (421)	8.62 (219)	8.03 (204)	3.82 (97)	5.51 (140)	6.69 (170)	3.66 (93)	9.13 (232)	12.76 (324)
CM 10-3*	100	5.4	1 1/2"	1 1/2"	3/8"	0.39 (10)	7.80 (198)	7.84 (199)	6.30 (160)	8.66 (220)	3.94 (100)	9.65 (245)	16.96 (507)	9.25 (235)	8.66 (220)	5 (127)	5.51 (140)	6.69 (170)	4.25 (108)	10.71 (272)	14.96 (380)

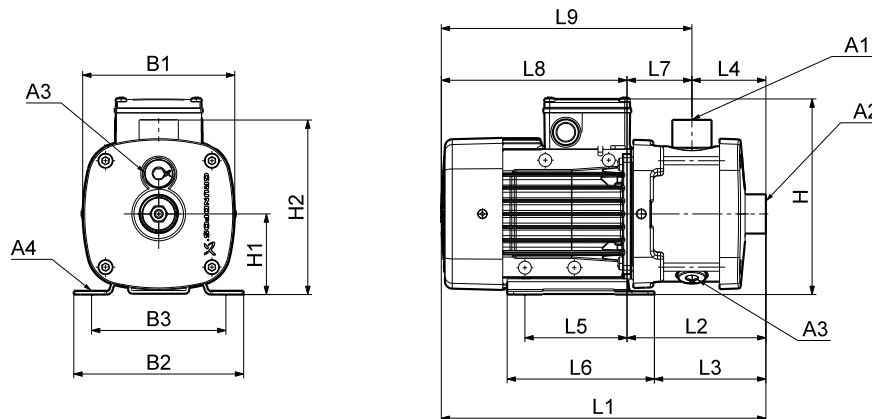
* This pump type is not available with supply voltage O.

1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2		A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 10-1	80	1.5	1 1/2"	1 1/2"	3/8"	0.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	9.17 (233)	3.94 (100)	9.65 (245)	14.53 (369)	6.10 (155)	5.16 (131)	3.82 (97)	3.78 (96)	5.39 (137)	2.28 (58)	8.43 (214)	10.71 (272)	

CM 10-I and CM 10-G

(I = EN 1.4301/AISI 304 and G = EN 1.4401/AISI 316)



TM04 2246 2208

Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 10-1	80	1.7	1 1/2"	1 1/2"	3/8"	0.39 (10)	7.09 (180)	6.22 (158)	4.92 (125)	8.50 (216)	3.94 (100)	8.58 (218)	15.71 (399)	7.28 (185)	6.34 (161)	4.13 (105)	3.78 (96)	5.39 (137)	4.15 (80)	8.43 (214)	11.57 (294)
CM 10-2*	90	3.4	1 1/2"	1 1/2"	3/8"	0.39 (10)	7.09 (180)	7.84 (199)	6.30 (160)	8.27 (210)	3.94 (100)	8.58 (218)	17.72 (450)	7.05 (179)	6.46 (164)	4.13 (105)	5.51 (140)	6.69 (170)	2.91 (74)	10.71 (272)	13.58 (345)
CM 10-3*	100	5.4	1 1/2"	1 1/2"	3/8"	0.39 (10)	7.80 (198)	7.84 (199)	6.30 (160)	8.66 (220)	3.94 (100)	8.58 (218)	19.96 (507)	9.25 (235)	8.66 (220)	4.13 (105)	5.51 (140)	6.69 (170)	5.12 (130)	10.71 (272)	15.83 (402)
CM 10-4*	112	8.4	1 1/2"	1 1/2"	3/8"	.47 (12)	8.66 (220)	8.98 (228)	7.48 (190)	9.69 (246)	4.41 (112)	9.06 (230)	23.19 (589)	11.30 (287)	10.67 (271)	5.32 (135)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)
CM 10-5*	112	8.4	1 1/2"	1 1/2"	3/8"	.47 (12)	8.66 (220)	8.98 (228)	7.48 (190)	9.69 (246)	4.41 (112)	9.06 (230)	25.55 (649)	13.66 (347)	13.03 (331)	7.68 (195)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)

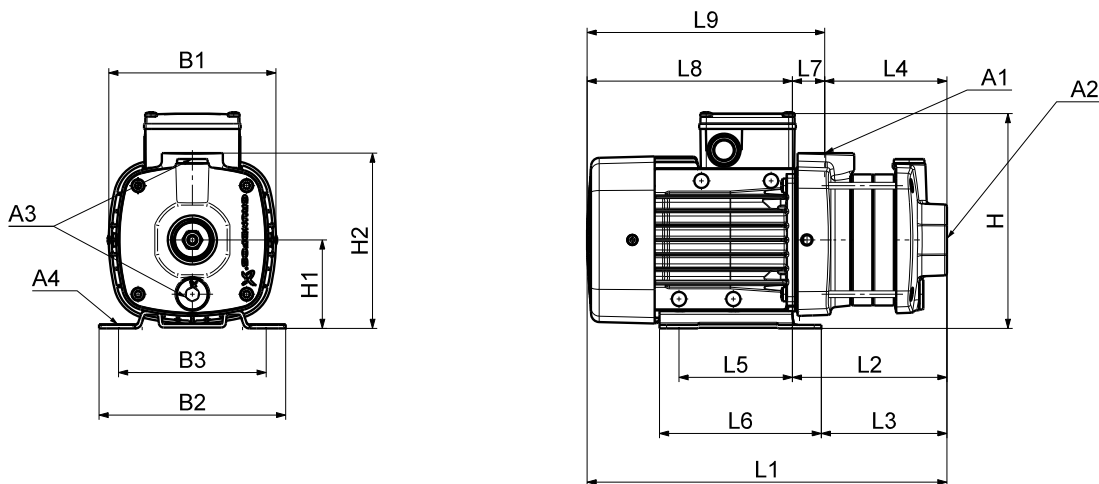
* This pump type is not available with supply voltage O.

1 x 115/230 V, 60 Hz (supply voltage B)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]															
			A1	A2		A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 10-1	80	1.5	1 1/2"	1 1/2"	3/8"	0.39 (10)	8.07 (205)	6.22 (158)	4.92 (125)	9.17 (233)	3.94 (100)	8.58 (218)	15.71 (399)	7.28 (185)	6.34 (161)	4.13 (105)	3.78 (96)	5.39 (137)	4.15 (80)	8.43 (214)	11.57 (294)

CM 15-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2248 2208

Dimensions

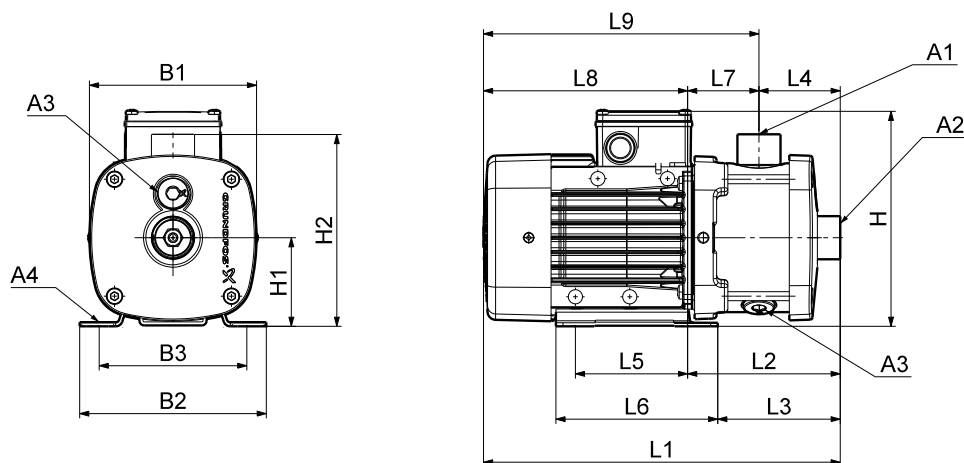
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 15-1	90	3.4	2"	2"	3/8"	0.39 (10)	7.48 (190)	7.84 (199)	6.30 (160)	8.23 (210)	3.94 (100)	9.65 (245)	16.57 (421)	7.48 (190)	6.89 (175)	3.82 (97)	5.52 (140)	6.69 (170)	3.66 (93)	9.13 (232)	12.76 (324)
CM 15-2	100	5.4	2"	2"	3/8"	0.39 (10)	7.80 (198)	7.84 (199)	6.30 (160)	8.66 (220)	3.94 (100)	9.65 (245)	18.78 (477)	8.07 (205)	7.48 (190)	3.82 (97)	5.52 (140)	6.69 (170)	4.25 (108)	10.71 (272)	14.96 (380)
CM 15-3	112	8.4	2"	2"	3/8"	0.47 (12)	8.66 (220)	8.98 (228)	7.48 (190)	9.69 (246)	4.91 (112)	10.19 (257)	22.05 (560)	10.16 (258)	9.53 (242)	5.00 (127)	5.52 (140)	6.77 (72)	5.16 (131)	11.89 (302)	17.05 (433)

CM 15-I and CM 15-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2246 2208

Dimensions

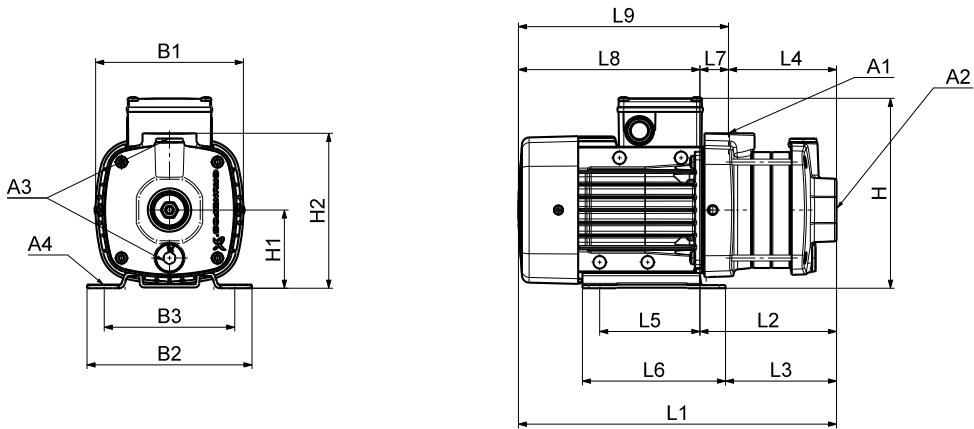
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CM 15-1	90	3.4	2"	2"	3/8"	0.39 (10)	7.09 (180)	7.84 (199)	6.30 (160)	8.23 (210)	3.94 (100)	8.58 (218)	17.72 (450)	8.62 (219)	8.03 (204)	4.13 (105)	5.52 (140)	6.69 (170)	4.49 (114)	9.13 (232)	13.58 (345)
CM 15-2	100	5.4	2"	2"	3/8"	0.39 (10)	7.80 (198)	7.84 (199)	6.30 (160)	8.66 (220)	3.94 (100)	8.58 (218)	19.96 (507)	9.25 (235)	8.66 (220)	4.13 (105)	5.52 (140)	6.69 (170)	5.12 (130)	10.71 (272)	15.83 (402)
CM 15-3	112	8.4	2"	2"	3/8"	0.47 (12)	8.66 (220)	8.98 (228)	7.48 (190)	9.69 (246)	4.91 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.52 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)

CM 25-A

(A = cast iron, A48-CL30 / EN-GJL-200)



TM04 2248 2208

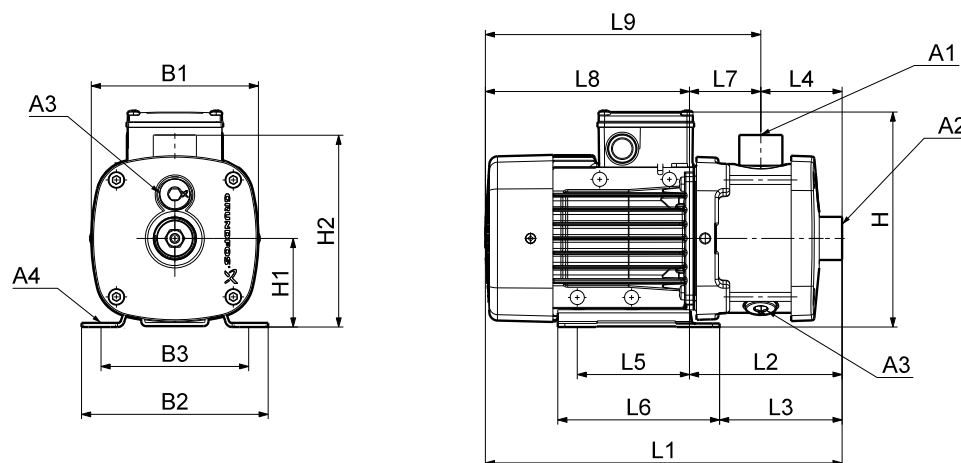
Dimensions

3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)
3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]															
			A1	A2		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 25-1	100	5.4	2"	2"	3/8"	0.39 (10)	7.80 (198)	7.84 (199)	6.30 (160)	8.66 (220)	3.94 (100)	9.65 (245)	18.78 (477)	8.07 (205)	7.48 (190)	3.82 (97)	5.52 (140)	6.69 (170)	4.25 (108)	10.71 (272)	14.96 (380)
CM 25-2	112	8.4	2"	2"	3/8"	0.47 (12)	8.66 (220)	8.98 (228)	7.48 (190)	9.69 (246)	4.91 (112)	10.12 (257)	20.87 (530)	8.98 (228)	8.35 (212)	3.82 (97)	5.52 (140)	6.77 (172)	5.16 (131)	11.89 (302)	17.05 (433)

CM 25-I and CM 25-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2246 2208

Dimensions

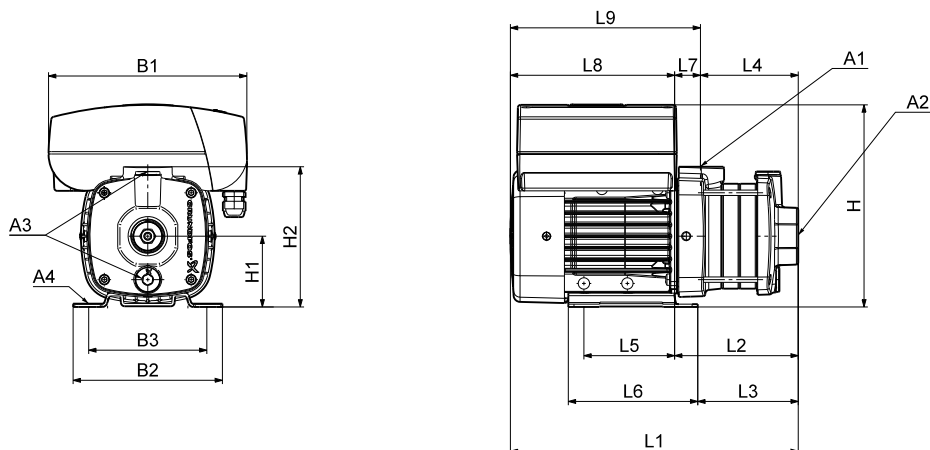
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)

3 x 575 V, 60 Hz (supply voltage H)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 25-1	100	5.4	2"	2"	3/8"	0.39 (10)	7.80 (198)	7.84 (199)	6.30 (160)	8.66 (220)	3.94 (100)	8.58 (218)	19.96 (507)	9.25 (235)	8.66 (220)	4.13 (105)	5.52 (140)	6.69 (170)	5.12 (130)	10.71 (272)	15.83 (402)
CM 25-2	112	8.4	2"	2"	3/8"	0.47 (12)	8.66 (220)	8.98 (228)	7.48 (190)	1.81 (246)	4.91 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.52 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)

CME 1-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2249 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

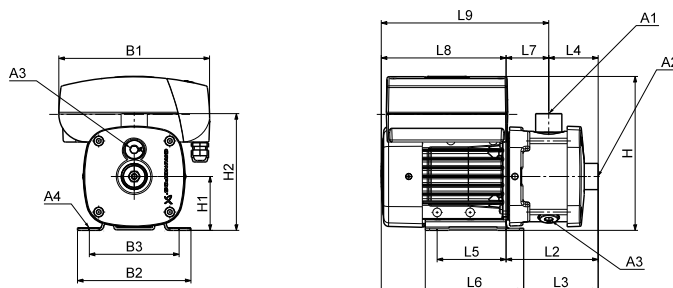
Pump type	Frame size	P ₂ [HP]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 1-2	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CME 1-3	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	12.05 (306)	5.20 (132)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CME 1-4	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	12.76 (324)	5.91 (150)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CME 1-5	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	15.04 (382)	6.61 (168)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 1-2	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	12.17 (309)	4.45 (113)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)
CME 1-3	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	12.87 (327)	5.16 (131)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)
CME 1-4	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	13.58 (345)	5.87 (149)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)
CME 1-5	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	14.29 (363)	6.57 (167)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)

CME 1-I and CME 1-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2247 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 1-2	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CME 1-3	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CME 1-4	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	12.72 (323)	5.87 (149)	4.92 (125)	3.54 (90)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CME 1-5	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	15.00 (381)	6.57 (167)	5.63 (143)	4.25 (108)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CME 1-6	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	16.42 (417)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CME 1-7	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	16.42 (417)	7.99 (203)	7.05 (179)	5.67 (144)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CME 1-8	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	17.83 (453)	9.41 (239)	8.46 (215)	7.09 (180)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)

3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]															
			A1	A2		A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 1-9	90	2.0	1"	1"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	19.80 (503)	10.98 (279)	10.39 (264)	7.09 (180)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)

3 x 440-480 V, 60 Hz (supply voltage T)

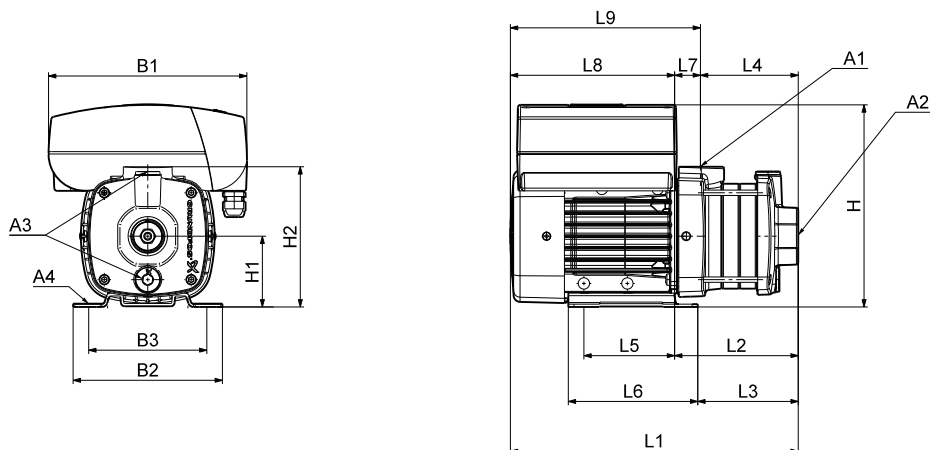
Pump type	Frame size	P2 [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CME 1-9	90C	2	1"	1"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	18.90 (480)	11.10 (282)	10.51 (267)	7.09 (180)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)	

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P2 [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 1-2	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	12.83 (326)	5.12 (130)	4.17 (106)	2.83 (72)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-3	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	12.83 (326)	5.12 (130)	4.17 (106)	2.83 (72)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-4	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	13.54 (344)	5.83 (148)	4.88 (124)	3.54 (90)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-5	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	14.25 (362)	6.54 (166)	5.59 (142)	4.25 (108)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-6	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	15.67 (398)	7.95 (202)	7.01 (178)	5.67 (144)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-7	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	15.67 (398)	7.95 (202)	7.01 (178)	5.67 (144)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-8	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	17.09 (434)	9.37 (238)	8.43 (214)	7.09 (180)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 1-9	90C	2	1"	1"	3/8"	0.39 (10)	8.35 (212)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	17.32 (440)	11.10 (282)	10.51 (267)	7.09 (180)	4.92 (125)	6.10 (155)	4.06 (103)	6.18 (157)	10.24 (260)

CME 3-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2249 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

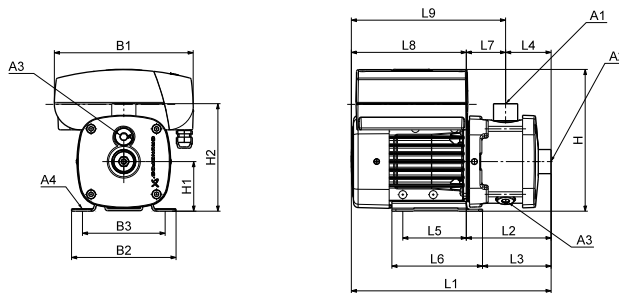
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 3-2	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	6.85 (174)	7.95 (202)
CME 3-3	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	13.62 (346)	5.20 (132)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)
CME 3-4	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	14.33 (364)	5.91 (150)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)
CME 3-5	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	15.04 (382)	6.61 (168)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P2 [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 3-2	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	12.17 (309)	4.45 (113)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)
CME 3-3	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	12.87 (327)	5.16 (131)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)
CME 3-4	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	13.58 (345)	5.87 (149)	4.92 (125)	4.80 (122)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)
CME 3-5	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	14.29 (363)	6.57 (167)	5.63 (143)	5.51 (140)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)

CME 3-I and CME 3-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2247 2208

1 x 208-230 V, 60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 3-2	71	0.75	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CME 3-3	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	13.58 (345)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CME 3-4	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	14.29 (363)	5.87 (149)	4.92 (125)	3.54 (90)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CME 3-5	80	1.5	1"	1"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	15.00 (381)	6.57 (167)	5.63 (143)	4.25 (108)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)

3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 3-6	90	2.0	1"	1"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CME 3-7	90	2.0	1"	1"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	18.39 (467)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CME 3-8	90	2.0	1"	1"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	19.80 (503)	10.98 (279)	10.39 (264)	7.09 (180)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CME 3-9	90	3.0	1"	1"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	21.38 (543)	10.98 (279)	10.39 (264)	7.09 (180)	4.92 (125)	6.10 (155)	3.90 (99)	10.39 (264)	14.29 (363)

3 x 440-480 V, 60 Hz (supply voltage T)

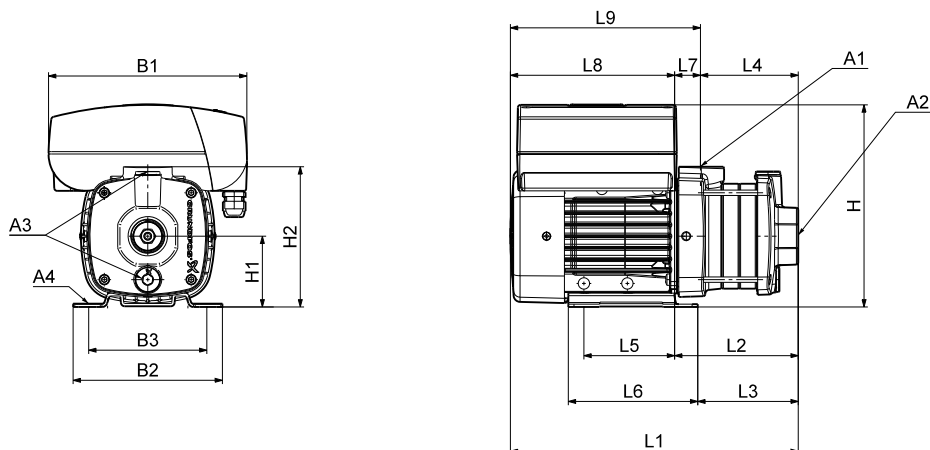
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 3-6	90C	2	1"	1"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	17.48 (444)	9.69 (246)	9.09 (231)	5.67 (144)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)
CME 3-7	90C	2	1"	1"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	17.48 (444)	9.69 (246)	9.09 (231)	5.67 (144)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)
CME 3-8	90D	3	1"	1"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	18.90 (480)	11.10 (282)	10.51 (267)	7.09 (180)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)
CME 3-9	90D	3	1"	1"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	18.90 (480)	11.10 (282)	10.51 (267)	7.09 (180)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 3-2	71A	0.75	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	12.83 (326)	5.12 (130)	4.17 (106)	2.83 (72)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 3-3	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	12.83 (326)	5.12 (130)	4.17 (106)	2.83 (72)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 3-4	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	13.54 (344)	5.83 (148)	4.88 (124)	3.54 (90)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 3-5	80B	1.5	1"	1"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	14.25 (362)	6.54 (166)	5.59 (142)	4.25 (108)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 3-6	90C	2	1"	1"	3/8"	0.39 (10)	8.35 (212)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	15.91 (404)	9.69 (246)	9.09 (231)	5.67 (144)	4.92 (125)	6.10 (155)	4.06 (103)	6.18 (157)	10.24 (260)
CME 3-7	90C	2	1"	1"	3/8"	0.39 (10)	8.35 (212)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	15.91 (404)	9.69 (246)	9.09 (231)	5.67 (144)	4.92 (125)	6.10 (155)	4.06 (103)	6.18 (157)	10.24 (260)

CME 5-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2249 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]															
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-2	80	1.5	1"	1 1/4"	3/8"		0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	12.91 (328)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)
CME 5-3	80	1.5	1"	1 1/4"	3/8"		0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	5.87 (149)	13.58 (345)	5.16 (131)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	8.43 (214)	9.53 (242)

3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 5-4	90	2.0	1"	1 1/4"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.91 (201)	16.34 (415)	7.52 (191)	6.93 (176)	4.29 (109)	4.92 (125)	6.10 (155)	3.23 (82)	8.82 (224)	12.05 (306)
CME 5-5	90	2.0	1"	1 1/4"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.91 (201)	17.05 (433)	8.23 (209)	7.64 (194)	5.00 (127)	4.92 (125)	6.10 (155)	3.23 (82)	8.82 (224)	12.05 (306)

3 x 440-480 V, 60 Hz (supply voltage T)

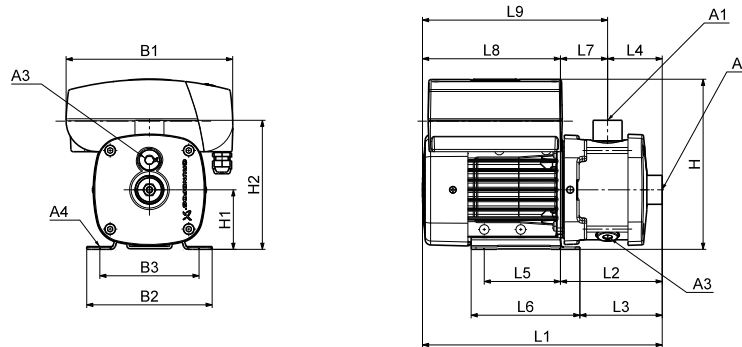
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 5-4	90C	2	1"	1 1/4"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.91 (201)	15.39 (391)	7.64 (194)	7.05 (179)	4.25 (108)	4.92 (125)	6.10 (155)	3.39 (86)	7.76 (197)	11.14 (283)
CME 5-5	90D	3	1"	1 1/4"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.91 (201)	16.65 (423)	8.86 (225)	8.27 (210)	5.51 (140)	4.92 (125)	6.10 (155)	3.39 (86)	7.76 (197)	11.14 (283)

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2		A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-2	80B	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	12.17 (309)	4.45 (113)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)	
CME 5-3	80B	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	5.87 (149)	12.87 (327)	5.16 (131)	4.21 (107)	4.09 (104)	3.78 (96)	5.39 (137)	1.10 (28)	7.72 (196)	8.78 (223)	
CME 5-4	90C	2	1"	1 1/4"	3/8"	0.39 (10)	8.35 (212)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.91 (201)	13.82 (351)	7.64 (194)	7.05 (179)	4.25 (108)	4.92 (125)	6.10 (155)	3.39 (86)	6.18 (157)	9.57 (243)	

CME 5-I and CME 5-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2247 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-2	80	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	13.58 (345)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)
CME 5-3	80	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	8.46 (215)	2.95 (75)	6.50 (165)	13.58 (345)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	8.43 (214)	10.79 (274)

3 x 460-480 V, 60 Hz (supply voltage N) 3 x 208-230 V, 60 Hz (supply voltage Q)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 5-4	90	2.0	1"	1 1/4"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	16.25 (413)	7.44 (189)	6.85 (174)	3.54 (90)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CME 5-5	90	2.0	1"	1 1/4"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	16.97 (431)	8.15 (207)	7.56 (192)	4.25 (108)	4.92 (125)	6.10 (155)	3.90 (99)	8.82 (224)	12.72 (323)
CME 5-6	90	3.0	1"	1 1/4"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	19.96 (507)	9.57 (243)	8.98 (228)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	10.39 (264)	14.29 (363)
CME 5-7	90	3.0	1"	1 1/4"	3/8"	0.39 (10)	10.39 (264)	7.01 (178)	5.51 (140)	10.12 (257)	3.54 (90)	7.09 (180)	19.96 (507)	9.57 (243)	9.25 (235)	5.67 (144)	4.92 (125)	6.10 (155)	3.90 (99)	10.39 (264)	14.29 (363)

3 x 440-480 V, 60 Hz (supply voltage T)

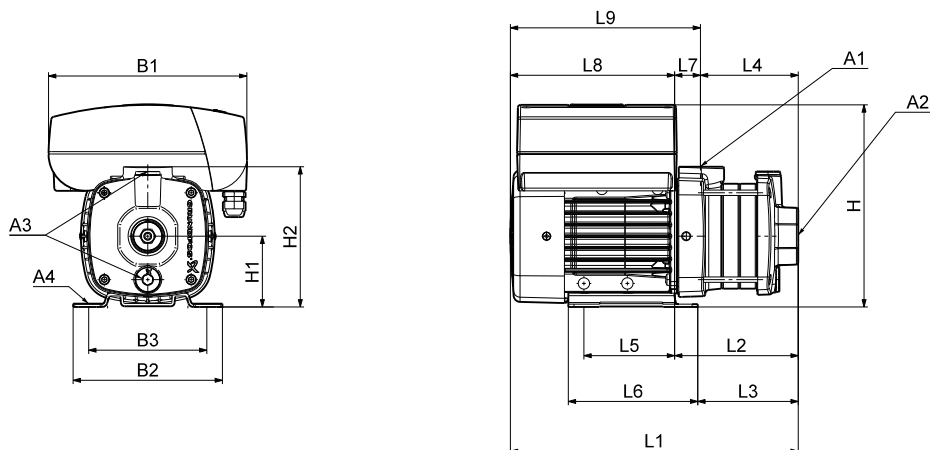
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 5-4	90C	2	1"	1 1/4"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	15.35 (390)	7.56 (192)	6.97 (177)	3.54 (90)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)
CME 5-5	90C	2	1"	1 1/4"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	16.06 (408)	8.27 (210)	7.68 (195)	4.25 (108)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)
CME 5-6	90D	3	1"	1 1/4"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	17.48 (444)	9.69 (246)	9.09 (231)	5.67 (144)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)
CME 5-7	90D	3	1"	1 1/4"	3/8"	0.39 (10)	10.55 (268)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	17.48 (444)	9.69 (246)	9.09 (231)	5.67 (144)	4.92 (125)	6.10 (155)	4.06 (103)	7.76 (197)	11.81 (300)

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 5-2	80B	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	12.83 (326)	5.12 (130)	4.17 (106)	2.83 (72)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 5-3	80B	1.5	1"	1 1/4"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	2.95 (75)	6.50 (165)	12.83 (326)	5.12 (130)	4.17 (106)	2.83 (72)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.00 (254)
CME 5-4	90C	2	1"	1 1/4"	3/8"	0.39 (10)	8.35 (212)	7.01 (178)	5.51 (140)	9.76 (248)	3.54 (90)	7.09 (180)	13.78 (350)	7.56 (192)	6.97 (177)	3.54 (90)	4.92 (125)	6.10 (155)	4.06 (103)	6.18 (157)	10.24 (260)

CME 10-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2249 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CME 10-1	80	1.5	1 1/2"	1 1/2"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	9.45 (240)	3.94 (100)	9.65 (245)	13.35 (339)	4.92 (125)	3.98 (101)	2.64 (67)	3.78 (96)	5.39 (137)	2.28 (58)	8.43 (214)	10.71 (272)	

3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 10-2	90	3.0	1 1/2"	1 1/2"	3/8"	0.39 (10)	10.39 (264)	7.84 (199)	6.30 (160)	10.51 (267)	3.94 (100)	9.65 (245)	18.15 (461)	7.48 (190)	6.89 (175)	3.82 (97)	5.51 (140)	6.69 (170)	3.66 (93)	10.71 (272)	14.33 (364)
CME 10-3	112	5.0	1 1/2"	1 1/2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	10.12 (257)	22.05 (560)	10.16 (258)	9.53 (242)	5.00 (127)	5.51 (140)	6.77 (172)	5.16 (131)	11.89 (302)	17.05 (433)

3 x 440-480 V, 60 Hz (supply voltage T)

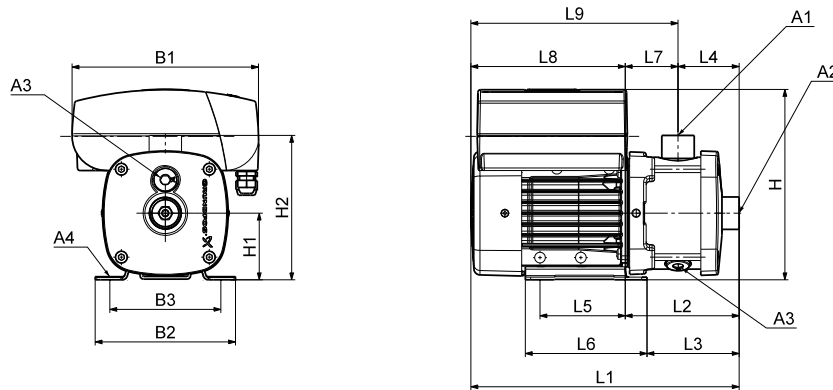
Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CME 10-2	90D	3	1 1/2"	1 1/2"	3/8"	0.39 (10)	10.55 (268)	7.83 (199)	6.30 (160)	10.16 (258)	3.94 (100)	9.65 (245)	15.67 (398)	7.48 (190)	6.89 (175)	3.82 (97)	5.51 (140)	6.69 (170)	3.66 (93)	8.19 (208)	11.85 (301)	

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 10-1	80B	1.5	1 1/2"	1 1/2"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	3.94 (100)	9.65 (245)	13.86 (352)	6.14 (156)	5.16 (131)	3.82 (97)	3.78 (96)	5.39 (137)	2.32 (59)	7.72 (196)	10.04 (255)

CME 10-I and CME 10-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2247 2208

Dimensions

1 x 208-230 V, 60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 10-1	80	1.5	1 1/2"	1 1/2"	3/8"	0.39 (10)	8.27 (210)	6.22 (158)	4.92 (125)	9.45 (240)	3.94 (100)	8.58 (218)	15.71 (399)	7.28 (185)	6.34 (161)	4.13 (105)	3.78 (96)	5.39 (137)	3.15 (80)	8.43 (214)	11.58 (294)

3 x 460-480 V, 60 Hz (supply voltage N) 3 x 208-230 V, 60 Hz (supply voltage Q)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 10-2	90	3.0	1 1/2"	1 1/2"	3/8"	0.39 (10)	10.39 (264)	7.84 (199)	6.30 (160)	10.51 (267)	3.94 (100)	8.58 (218)	19.29 (490)	8.62 (219)	8.03 (204)	4.13 (105)	5.51 (140)	6.69 (170)	4.49 (114)	10.71 (272)	15.76 (385)
CME 10-3	112	5.0	1 1/2"	1 1/2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)
CME 10-4	112	5.0	1 1/2"	1 1/2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	23.19 (589)	11.30 (287)	10.67 (271)	5.32 (135)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)
CME 10-5	132	7.5	1 1/2"	1 1/2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	25.55 (649)	13.66 (347)	13.03 (331)	7.68 (195)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)

3 x 440-480 V, 60 Hz (supply voltage T)

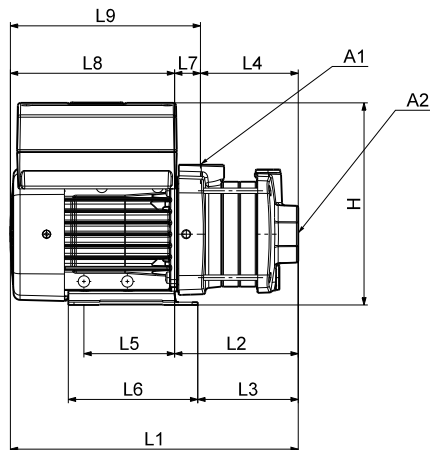
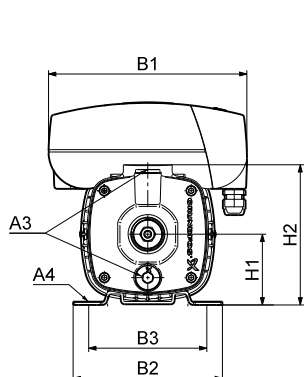
Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CME 10-2	90D	3	1 1/2"	1 1/2"	3/8"	0.39 (10)	10.55 (268)	7.83 (199)	6.30 (160)	10.16 (258)	3.94 (100)	8.58 (218)	16.69 (424)	8.46 (215)	7.87 (200)	4.13 (105)	5.51 (140)	6.69 (170)	4.33 (110)	8.19 (208)	12.56 (319)	

1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]																
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9	
CME 10-1	80B	1.5	1 1/2"	1 1/2"	3/8"	0.39 (10)	8.35 (212)	6.22 (158)	4.92 (125)	9.17 (233)	3.94 (100)	8.58 (218)	14.84 (377)	7.13 (181)	6.18 (157)	4.13 (105)	3.78 (96)	5.39 (137)	2.99 (76)	7.72 (196)	10.71 (272)	

CME 15-A

(A = cast iron, A48 CL30 / EN-GJL-200)



TM04 2249 2208

Dimensions

3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)

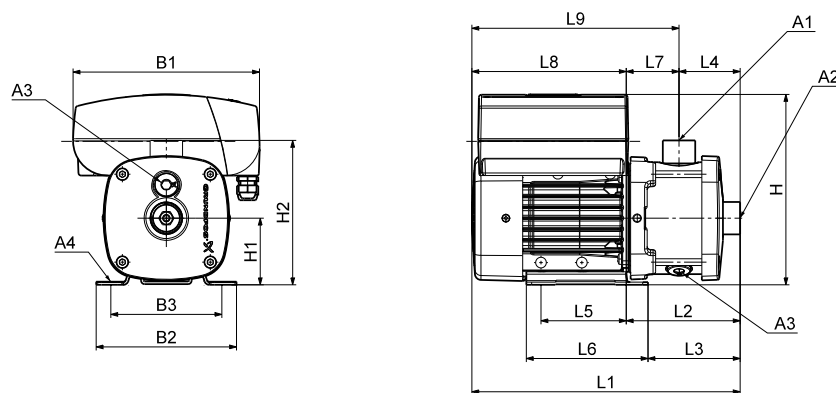
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 15-1	90	3.0	2"	2"	3/8"	.39 (10)	10.39 (264)	7.83 (199)	6.30 (160)	10.51 (267)	3.94 (100)	9.65 (245)	18.15 (461)	7.48 (190)	6.89 (175)	3.82 (97)	5.51 (140)	6.69 (170)	3.66 (93)	10.71 (272)	14.33 (364)
CME 15-2	112	5.0	2"	2"	3/8"	.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	10.12 (257)	20.87 (530)	8.98 (228)	8.35 (212)	3.82 (97)	5.51 (140)	6.77 (172)	5.16 (131)	11.89 (302)	17.05 (433)
CME 15-3	132	7.5	2"	2"	3/8"	.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	10.12 (257)	22.05 (560)	10.16 (258)	9.53 (242)	5.00 (127)	5.51 (140)	6.77 (172)	5.16 (131)	11.89 (302)	17.05 (433)

3 x 440-480 V, 60 Hz (supply voltage T)

Pump type	Frame size	P ₂ [Hp]	NPT		Rp	Dimensions [in (mm)]															
			A1	A2		A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 15-1	90D	3	2"	2"	3/8"	0.39 (10)	10.55 (268)	7.83 (199)	6.30 (160)	10.16 (258)	3.94 (100)	9.65 (245)	15.67 (398)	7.48 (190)	6.89 (175)	3.82 (97)	5.51 (140)	6.69 (170)	3.66 (93)	8.19 (208)	11.85 (301)

CME 15-I and CME 15-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2247 2208

Dimensions

3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)

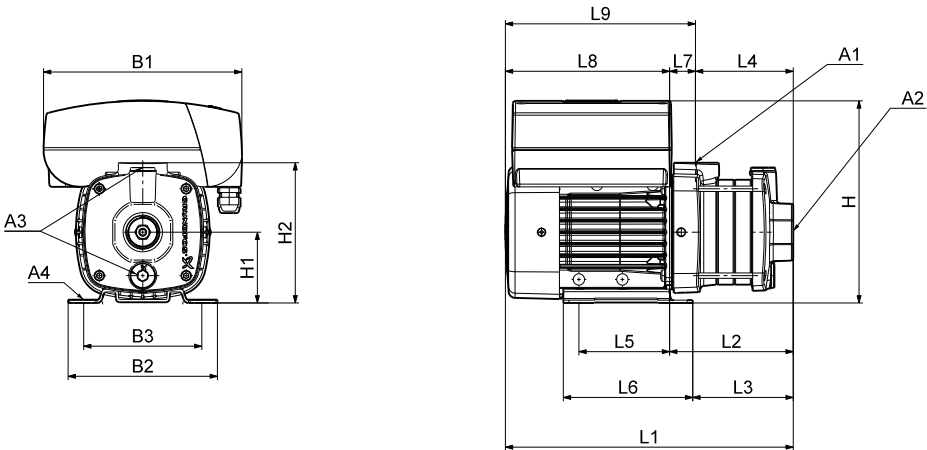
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 15-1	90	3.0	2"	2"	3/8"	0.39 (10)	10.39 (264)	7.83 (199)	6.30 (160)	10.51 (267)	3.94 (100)	8.58 (218)	19.29 (490)	8.62 (219)	8.03 (204)	4.13 (105)	5.51 (140)	6.69 (170)	4.49 (114)	10.71 (272)	15.16 (385)
CME 15-2	112	5.0	2"	2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)
CME 15-3	132	7.5	2"	2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)

3 x 440-480 V, 60 Hz (supply voltage T)

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 15-1	90D	3	2"	2"	3/8"	0.39 (10)	10.55 (268)	7.83 (199)	6.30 (160)	10.16 (258)	3.94 (100)	8.58 (218)	16.69 (424)	8.46 (215)	7.87 (200)	4.13 (105)	5.51 (140)	6.69 (170)	4.33 (110)	8.19 (208)	12.56 (319)

CME 25-A

(A = cast iron, A48 CL30 / EN-GJL-200)



Dimensions

3 x 460-480 V, 60 Hz (supply voltage N)
3 x 208-230 V, 60 Hz (supply voltage Q)*

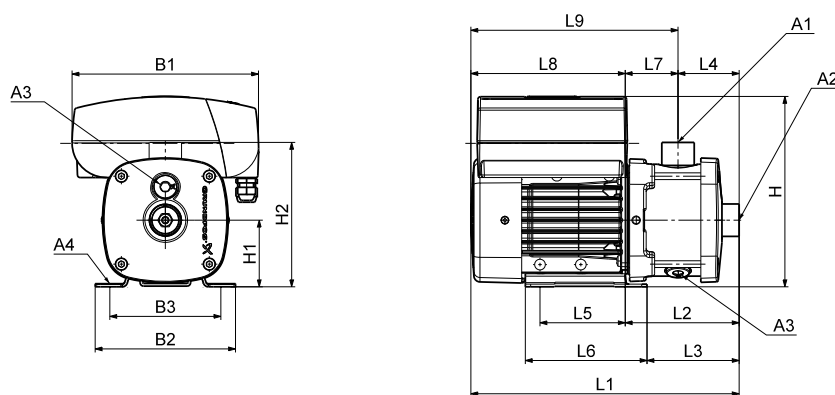
Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 25-1	112	5.0	2"	2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	10.12 (257)	20.87 (530)	8.98 (228)	8.35 (212)	3.82 (97)	5.51 (140)	6.77 (172)	5.16 (131)	11.89 (302)	17.05 (433)
CME 25-2	132	7.5	2"	2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	10.12 (257)	20.87 (530)	8.98 (228)	8.35 (212)	3.82 (97)	5.51 (140)	6.77 (172)	5.16 (131)	11.89 (302)	17.05 (433)

* Available for CME 25-1 only.

TM04 2249 2208

CME 25-I and CME 25-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



TM04 2247 2208

Dimensions

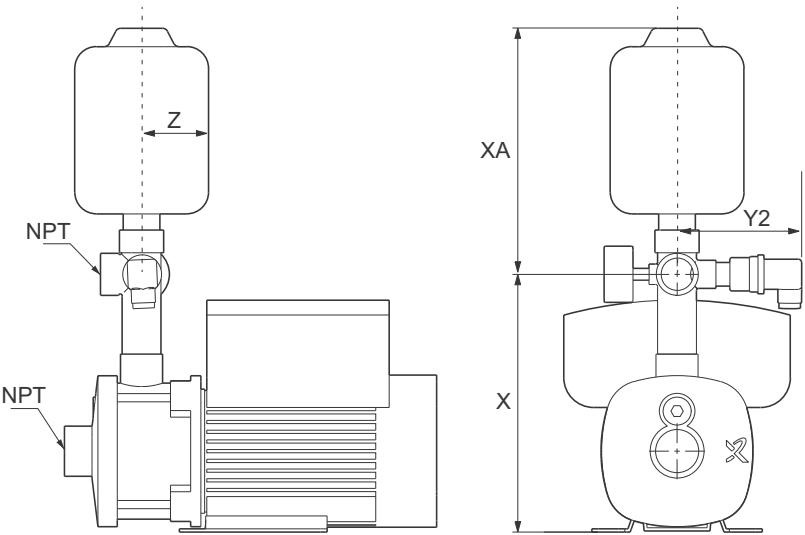
3 x 460-480 V, 60 Hz (supply voltage N)

3 x 208-230 V, 60 Hz (supply voltage Q)*

Pump type	Frame size	P ₂ [Hp]	NPT			Rp	Dimensions [in (mm)]														
			A1	A2	A3		A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8
CME 25-1	112	5.0	2"	2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)
CME 25-2	132	7.5	2"	2"	3/8"	0.47 (12)	11.42 (290)	8.98 (228)	7.48 (190)	11.81 (300)	4.41 (112)	9.06 (230)	22.01 (559)	10.12 (257)	9.49 (241)	4.13 (105)	5.51 (140)	6.77 (172)	5.98 (152)	11.89 (302)	17.87 (454)

* Available for CME 25-1 only.

CME Plus technical data



TM06 0636 0614

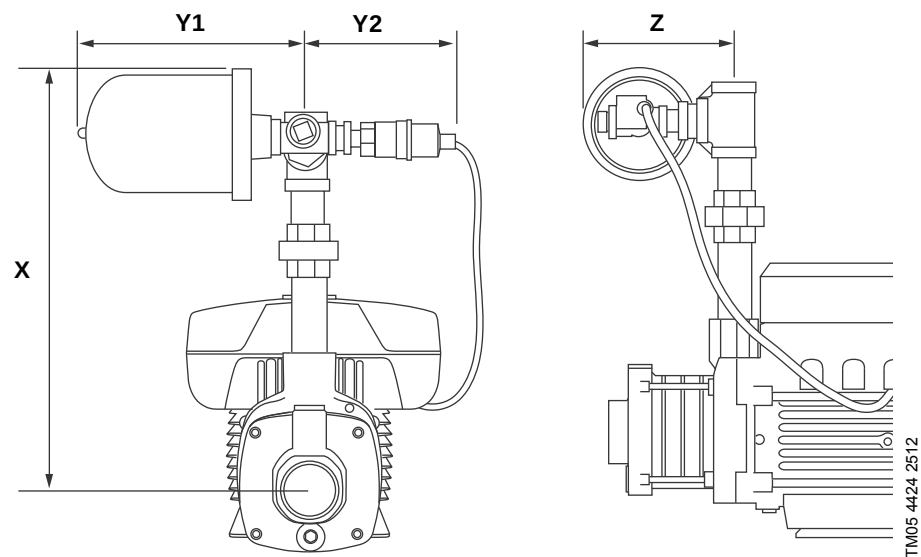
CME Plus 1, 3, 5, 10 kit dimensions

	X (With 5-way valve) [in (mm)]	X A- (With 5-way valve) [in (mm)]	Y2 [in (mm)]	Z [in (mm)]	Kit weight [lb (kg)]
CME 1	10.50 (267)	9.25 (235)	6.00 (153)	2.25 (58)	7.2 (3.3)
CME 3	10.50 (267)	10.50 (267)	6.00 (153)	2.50 (64)	9.1 (4.1)
CME 5	11.75 (299)	10.50 (267)	6.00 (153)	2.50 (64)	12.1 (5.5)
CME 10	13.25 (337)	15.00 (381)	6.00 (153)	4.00 (102)	16.0 (7.3)

Note: Dimensions, tolerance +/- 0.5 inches

Additional materials

	Description	Material
Pressure transducer	4-20mA signal	316 SS
Diaphragm tank		A10008 Steel
5-way valve		304 SS / EPDM



CME Plus 15, 25 kit dimensions

	X [in (mm)]	Y1 [in (mm)]	Y2 [in (mm)]	Z [in (mm)]	Kit weight [lb (kg)]
CME 15	21.50 (547)	9.75 (248)	6.00 (153)	10.88 (277)	22.1 (10.0)
CME 25	21.50 (547)	9.75 (248)	6.00 (153)	10.88 (277)	25.6 (11.6)

Note: Dimensions, tolerance +/- 0.5 inches

Additional materials

	Description	Material
Pressure transducer	4-20mA signal	316 SS
Diaphragm tank		A10008 Steel
Hardware	Nipple	304 SS
	Bushing	304 SS
	Union	304 SS
	Tee	304 SS
	Close nipple	304 SS
	Cross	316 SS
	Plug	304 SS
	Pipe nipple	316 SS
	Bushing for Sensor	316 SS

15. Weights and shipping volume

All weights and volumes refer to CM(E) pumps with standard pipe connections.

CM 1-A (A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 1-2	25.8	11.7	31.3	14.2	1.05	0.0296
	CM 1-3	26.5	12.0	32.0	14.5	1.05	0.0296
	CM 1-4	26.9	12.2	32.4	14.7	1.31	0.0370
	CM 1-5	27.6	12.5	33.1	15.0	1.31	0.0370
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 1-2	24.3	11.0	29.8	13.5	1.05	0.0296
	CM 1-3	24.9	11.3	30.4	13.8	1.05	0.0296
	CM 1-4	26.9	12.2	32.4	14.7	1.31	0.0370
	CM 1-5	27.6	12.5	33.1	15.0	1.31	0.0370

CM 3-A (A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 3-2	25.8	11.7	31.3	14.2	1.05	0.0296
	CM 3-3	26.5	12.0	32.0	14.5	1.05	0.0296
	CM 3-4	27.6	12.5	33.1	15.0	1.31	0.0370
	CM 3-5	30.0	13.6	35.5	16.1	1.31	0.0370
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 3-2	24.3	11.0	29.8	13.5	1.05	0.0296
	CM 3-3	26.5	12.0	32.0	14.5	1.05	0.0296
	CM 3-4	26.9	12.2	32.4	14.7	1.31	0.0370
	CM 3-5	30.6	13.9	36.2	16.4	1.31	0.0370

CM 5-A (A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 5-2	28.7	13.0	34.2	15.5	1.05	0.0296
	CM 5-3	31.7	14.4	37.3	16.9	1.31	0.0370
	CM 5-4	53.6	24.3	59.1	26.8	1.31	0.0370
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 5-2	25.6	11.6	31.1	14.1	1.05	0.0296
	CM 5-3	29.3	13.3	34.8	15.8	1.31	0.0370
	CM 5-4	53.6	24.3	59.1	26.8	1.31	0.0370
	CM 5-5	54.0	24.5	59.5	27.0	1.58	0.0444

CM 10-A**(A = cast iron, A48 CL30 / EN-GJL-200)**

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 10-1	51.6	23.4	57.1	25.9	1.31	0.0370
	CM 10-1	51.6	23.4	57.1	25.9	1.31	0.0370
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)	CM 10-2	70.3	31.9	75.8	34.4	1.58	0.0444
3 x 575 V, 60 Hz (supply voltage H)	CM 10-3	89.9	40.8	95.5	43.3	1.58	0.0444

CM 15-A**(A = cast iron, A48 CL30 / EN-GJL-200)**

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
	CM 15-1	67.5	30.6	73.0	33.1	1.31	0.0370
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)	CM 15-2	87.1	39.5	92.6	42.0	1.58	0.0444
3 x 575 V, 60 Hz (supply voltage H)	CM 15-3	106.5	48.3	112.0	50.8	1.75	0.0495

CM 25-A**(A = cast iron, A48 CL30 / EN-GJL-200)**

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)	CM 25-1	85.5	38.8	91.1	41.3	1.58	0.0444
3 x 575 V, 60 Hz (supply voltage H)	CM 25-2	104.9	47.6	110.5	50.1	1.75	0.0495

CM 1-I and CM 1-G
(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 1-2	27.1	12.3	32.6	14.8	1.05	0.0296
	CM 1-3	27.3	12.4	32.9	14.9	1.05	0.0296
	CM 1-4	28.0	12.7	33.5	15.2	1.31	0.0370
	CM 1-5	28.9	13.1	34.4	15.6	1.31	0.0370
	CM 1-6	33.3	15.1	38.8	17.6	1.31	0.0370
	CM 1-7	35.7	16.2	41.2	18.7	1.31	0.0370
	CM 1-8	37.0	16.8	42.6	19.3	1.58	0.0444
	CM 1-9	37.3	16.9	42.8	19.4	1.58	0.0444
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 1-2	25.6	11.6	31.1	14.1	1.05	0.0296
	CM 1-3	25.8	11.7	31.3	14.2	1.05	0.0296
	CM 1-4	28.0	12.7	33.5	15.2	1.31	0.0370
	CM 1-5	28.9	13.1	34.4	15.6	1.31	0.0370
	CM 1-6	30.2	13.7	35.7	16.2	1.31	0.0370
	CM 1-7	30.2	13.7	35.7	16.2	1.31	0.0370
	CM 1-8	34.6	15.7	40.1	18.2	1.58	0.0444
	CM 1-9	37.3	16.9	42.8	19.4	1.58	0.0444

CM 3-I and CM 3-G
(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 3-2	27.1	12.3	32.6	14.8	1.05	0.0296
	CM 3-3	27.3	12.4	32.9	14.9	1.05	0.0296
	CM 3-4	31.1	14.1	36.6	16.6	1.31	0.0370
	CM 3-5	34.4	15.6	39.9	18.1	1.31	0.0370
	CM 3-6	52.5	23.8	58.0	26.3	1.58	0.0444
	CM 3-7	52.9	24.0	58.4	26.5	1.58	0.0444
	CM 3-8	54.2	24.6	59.8	27.1	1.58	0.0444
	CM 3-9	54.6	24.7	60.0	27.2	1.58	0.0444
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 3-2	25.6	11.6	32.0	14.1	1.05	0.0296
	CM 3-3	27.3	12.4	32.9	14.9	1.05	0.0296
	CM 3-4	28.0	12.7	33.5	15.2	1.31	0.0370
	CM 3-5	32.0	14.5	37.5	17.0	1.31	0.0370
	CM 3-6	35.7	16.2	41.2	18.7	1.31	0.0370
	CM 3-7	52.9	24.0	58.4	26.5	1.58	0.0444
	CM 3-8	54.2	24.6	59.8	27.1	1.58	0.0444
	CM 3-9	54.6	24.7	60.0	27.2	1.58	0.0444

CM 5-I and CM 5-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 5-2	30.2	13.7	35.7	16.2	1.31	0.0370
	CM 5-3	32.9	14.9	38.5	17.4	1.31	0.0370
	CM 5-4	50.7	23.0	56.2	25.5	1.31	0.0370
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 5-2	27.1	12.3	32.6	14.8	1.05	0.0296
	CM 5-3	30.4	13.8	35.9	16.3	1.31	0.0370
	CM 5-4	50.7	23.0	56.2	25.5	1.31	0.0370
	CM 5-5	51.4	23.3	56.9	25.8	1.58	0.0444
	CM 5-6	52.7	23.9	58.2	26.4	1.58	0.0444
	CM 5-7	52.9	24.0	58.4	26.5	1.58	0.0444
	CM 5-8	72.3	32.8	77.8	35.3	1.75	0.0495

CM 10-I and CM 10-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 115/230 V, 60 Hz (supply voltage B)	CM 10-1	41.5	18.8	46.7	21.3	1.31	0.0370
	CM 10-1	41.5	18.8	47.0	21.3	1.31	0.0370
	CM 10-2	59.3	26.9	64.8	29.4	1.58	0.0444
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 10-3	77.8	35.3	83.3	37.8	1.58	0.0444
	CM 10-4	97.7	44.3	103.2	46.8	1.75	0.0495
	CM 10-5	100.8	45.7	106.3	48.2	2.99	0.0847

CM 15-I and CM 15-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 15-1	58.6	26.6	64.1	29.1	1.58	0.0444
	CM 15-2	77.2	35.0	82.7	37.5	1.58	0.0444
	CM 15-3	95.5	43.3	101.0	45.8	1.75	0.0495

CM 25-I and CM 25-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H)	CM 25-1	76.7	34.8	82.2	37.3	1.58	0.0444
	CM 25-2	95.0	43.1	100.5	45.6	1.75	0.0495

CME 1-A
(A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 1-2	31.8	14.4	39.5	17.9	1.05	0.0296
	CME 1-3	32.4	14.7	40.1	18.2	1.05	0.0296
	CME 1-4	32.9	14.9	40.6	18.4	1.31	0.0370
	CME 1-5	38.8	17.6	46.5	21.1	1.31	0.0370
1 x 200-240 V, 60 Hz (supply voltage U)	CME 1-2	28.2	12.8	35.9	16.3	0.71	0.0200
	CME 1-3	28.9	13.1	36.6	16.6	0.71	0.0200
	CME 1-4	29.3	13.3	37.0	16.8	0.71	0.0200
	CME 1-5	31.8	14.4	39.5	17.9	1.06	0.0300

CME 3-A
(A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 3-2	31.8	14.4	39.5	17.9	1.05	0.0296
	CME 3-3	37.7	17.1	45.4	20.6	1.31	0.0370
	CME 3-4	38.1	17.3	46.0	20.8	1.31	0.0370
	CME 3-5	38.8	17.6	46.5	21.1	1.31	0.0370
1 x 200-240 V, 60 Hz (supply voltage U)	CME 3-2	28.2	12.8	35.9	16.3	0.71	0.0200
	CME 3-3	30.6	13.9	38.4	17.4	0.71	0.0200
	CME 3-4	31.1	14.1	38.8	17.6	0.71	0.0200
	CME 3-5	31.8	14.4	39.5	17.9	1.06	0.0300

CME 5-A
(A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 5-2	36.8	16.7	44.5	20.2	1.05	0.0296
	CME 5-3	37.5	17.0	45.2	20.5	1.31	0.0370
3 x 460-480 V, 60 Hz (supply voltage N)	CME 5-4	69.0	31.3	76.7	34.8	2.99	0.0847
3 x 208-230 V, 60 Hz (supply voltage Q)	CME 5-5	69.5	31.5	77.2	35.0	2.99	0.0847
1 x 200-240 V, 60 Hz (supply voltage U)	CME 5-2	29.8	13.5	37.5	17.0	0.71	0.0200
	CME 5-3	30.4	13.8	38.1	17.3	0.71	0.0200
	CME 5-4	38.4	17.4	46.1	20.9	1.06	0.0300
3 x 440-480 V, 60 Hz (supply voltage T)	CME 5-4	40.1	18.2	47.8	21.7	1.06	0.0300
	CME 5-5	38.8	17.6	46.5	21.1	1.06	0.0300

CME 10-A
(A = cast iron, A48 CL30 / EN-GJL-200)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 10-1	57.1	25.9	64.8	29.4	1.31	0.0370
3 x 460-480 V, 60 Hz (supply voltage N)	CME 10-2	91.9	41.7	99.7	45.2	2.99	0.0847
3 x 208-230 V, 60 Hz (supply voltage Q)	CME 10-3	132.7	60.2	140.4	63.7	2.99	0.0847
1 x 200-240 V, 60 Hz (supply voltage U)	CME 10-1	50.1	22.7	57.8	26.2	0.71	0.0200
3 x 440-480 V, 60 Hz (supply voltage T)	CME 10-2	59.8	27.1	67.5	30.6	1.06	0.0300

CME 15-A**(A = cast iron, A48 CL30 / EN-GJL-200)**

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 460-480 V, 60 Hz (supply voltage N) 3 x 208-230 V, 60 Hz (supply voltage Q)	CME 15-1	80.3	36.4	88.0	39.9	2.99	0.0847
	CME 15-2	119.7	54.3	127.4	57.8	2.99	0.0847
	CME 15-3	128.3	58.2	136.0	61.7	2.99	0.0847
3 x 440-480 V, 60 Hz (supply voltage T)	CME 15-1	56.9	25.8	64.6	29.3	1.06	0.0300

CME 25-A**(A = cast iron, A48 CL30 / EN-GJL-200)**

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 460-480 V, 60 Hz (supply voltage N)	CME 25-1	119.3	54.1	127.0	57.6	2.99	0.0847
3 x 208-230 V, 60 Hz (supply voltage Q)*	CME 25-2	127.9	58.0	135.6	61.5	2.99	0.0847

* For CME 25-1 only

CME 1-I and CME 1-G
(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 1-2	33.07	15.0	40.79	18.5	1.05	0.0296
	CME 1-3	33.29	15.1	41.01	18.6	1.05	0.0296
	CME 1-4	33.95	15.4	41.67	18.9	1.31	0.0370
	CME 1-5	40.12	18.2	47.84	21.7	1.31	0.0370
	CME 1-6	41.45	18.8	49.16	22.3	1.31	0.0370
	CME 1-7	41.45	18.8	49.16	22.3	1.31	0.0370
	CME 1-8	42.77	19.4	50.49	22.9	1.58	0.0444
	CME 1-9	69.89	31.7	77.60	35.2	2.99	0.0847
3 x 460-480 V, 60 Hz (supply voltage N)	CME 1-2	29.8	13.5	37.5	17	0.71	0.0200
	CME 1-3	30.0	13.6	37.7	17.1	0.71	0.0200
	CME 1-4	30.6	13.9	38.4	17.4	0.71	0.0200
	CME 1-5	33.1	15	40.8	18.5	0.71	0.0200
	CME 1-6	34.4	15.6	42.1	19.1	1.06	0.0300
	CME 1-7	34.6	15.7	42.3	19.2	1.06	0.0300
	CME 1-8	35.9	16.3	43.7	19.8	1.06	0.0300
	CME 1-9	39.2	17.8	47.0	21.3	1.06	0.0300
3 x 440-480 V, 60 Hz (supply voltage T)	CME 1-9	41.0	18.6	48.7	22.1	1.06	0.0300

CME 3-I and CME 3-G
(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft³]	[m³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 3-2	33.1	15.0	40.8	18.5	1.05	0.0296
	CME 3-3	38.6	17.5	46.3	21.0	1.31	0.0370
	CME 3-4	39.2	17.8	47.0	21.3	1.31	0.0370
	CME 3-5	40.1	18.2	47.8	21.7	1.31	0.0370
3 x 460-480 V, 60 Hz (supply voltage N)	CME 3-6	68.3	31.0	76.1	34.5	2.99	0.0847
	CME 3-7	68.3	31.0	76.1	34.5	2.99	0.0847
	CME 3-8	69.7	31.6	77.4	35.1	2.99	0.0847
	CME 3-9	76.3	34.6	84.0	38.1	2.99	0.0847
1 x 200-240 V, 60 Hz (supply voltage U)	CME 3-2	29.8	13.5	37.5	17.0	0.71	0.02
	CME 3-3	31.5	14.3	39.2	17.8	0.71	0.02
	CME 3-4	32.2	14.6	39.9	18.1	0.71	0.02
	CME 3-5	33.1	15.0	40.8	18.5	0.71	0.02
	CME 3-6	37.7	17.1	45.4	20.6	1.06	0.03
	CME 3-7	37.7	17.1	45.4	20.6	1.06	0.03
3 x 440-480 V, 60 Hz (supply voltage T)	CME 3-6	39.5	17.9	47.2	21.4	1.06	0.03
	CME 3-7	39.5	17.9	47.2	21.4	1.06	0.03
	CME 3-8	43.9	19.9	51.6	23.4	1.06	0.03
	CME 3-9	44.1	20	51.8	23.5	1.06	0.03

CME 5-I and CME 5-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 5-2	38.4	17.4	46.1	20.9	1.31	0.0370
	CME 5-3	38.6	17.5	46.3	21.0	1.31	0.0370
3 x 460-480 V, 60 Hz (supply voltage N) 3 x 208-230 V, 60 Hz (supply voltage Q)	CME 5-4	66.1	30.0	73.9	33.5	2.99	0.0847
	CME 5-5	66.8	30.3	74.5	33.8	2.99	0.0847
	CME 5-6	74.5	33.8	82.2	37.3	2.99	0.0847
	CME 5-7	74.7	33.9	82.5	37.4	2.99	0.0847
	CME 5-2	31.3	14.2	39.0	17.7	0.71	0.0200
1 x 200-240 V, 60 Hz (supply voltage U)	CME 5-3	31.5	14.3	39.2	17.8	0.71	0.0200
	CME 5-4	35.5	16.1	43.2	19.6	1.06	0.0300
3 x 440-480 V, 60 Hz (supply voltage T)	CME 5-4	37.3	16.9	45.0	20.4	1.06	0.0300
	CME 5-5	41.0	18.6	48.7	22.1	1.06	0.0300
	CME 5-6	42.3	19.2	50.1	22.7	1.06	0.0300
	CME 5-7	-	-	-	-	-	-

CME 10-I and CME 10-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
1 x 208-230 V, 60 Hz (supply voltage M)	CME 10-1	47.0	21.3	54.7	24.8	1.31	0.0370
	CME 10-2	80.9	36.7	88.6	40.2	2.99	0.0847
3 x 460-480 V, 60 Hz (supply voltage N) 3 x 208-230 V, 60 Hz (supply voltage Q)	CME 10-3	120.5	54.6	129.0	58.1	2.99	0.0847
	CME 10-4	122.4	55.5	130.7	59.0	2.99	0.0847
	CME 10-5	133.6	60.6	141.3	64.1	2.99	0.0847
1 x 200-240 V, 60 Hz (supply voltage U)	CME 10-1	39.9	18.1	47.6	21.6	1.06	0.0300
3 x 440-480 V, 60 Hz (supply voltage T)	CME 10-2	48.7	22.1	-	-	1.06	0.0300

CME 15-I and CME 15-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 460-480 V, 60 Hz (supply voltage N) 3 x 208-230 V, 60 Hz (supply voltage Q)	CME 15-1	80.3	36.4	88.0	39.9	2.99	0.0847
	CME 15-2	119.7	54.3	127.4	57.8	2.99	0.0847
	CME 15-3	128.3	58.2	136.0	61.7	2.99	0.0847
3 x 440-480 V, 60 Hz (supply voltage T)	CME 15-1	48.1	21.8	55.8	25.3	1.06	0.0300

CME 25-I and CME 25-G

(I = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)

Supply voltage	Pump type	Net weight		Gross weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft ³]	[m ³]
3 x 460-480 V, 60 Hz (supply voltage N)	CME 25-1	119.3	54.1	127.0	57.6	2.99	0.0847
3 x 208-230 V, 60 Hz (supply voltage Q)*	CME 25-2	127.9	58.0	135.6	61.5	2.99	0.0847

* For CME 25-1 only

16. Motor data

Mains-operated motors, 60 Hz

1 x 115/230V, 60 Hz (supply voltage B)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}	I _{start}	Speed [rpm]
71	0.8	1.0	7.6 / 3.9	0.76	21.1 / 11.1	3240
80	1.06	1.0	10.6 / 5.4	0.65	33.0 / 16.8	3240
80	1.5	1.0	14.0 / 7.0	0.94	45.4 / 23.0	3320
90	2.03	1.0	19.5 / 9.8	0.97	75.2 / 39.2	3360

3 x 208-230 V/440-480 V, 60 Hz (supply voltage E)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}	I _{start}	Speed [rpm]
71	0.58	1.0	1.9 - 1.7 / 1.0 - 0.8	0.85 - 0.81 / 0.85 - 0.81	11.0 - 10.0 / 6.2 - 5.2	3360-3420
71	1.0	1.0	3.6 - 3.4 / 1.8 - 1.7	0.89 - 0.83 / 0.89 - 0.83	20.1 - 16.5 / 11.4 - 9.5	3220-3370
80	1.4	1.0	4.1 - 3.9 / 2.0 - 2.0	0.85 - 0.85 / 0.85 - 0.85	27.1 - 23.0 / 13.7 - 12.1	3220-3340
80	1.7	1.0	5.1 - 4.9 / 2.48 - 2.46	0.85 - 0.79 / 0.85 - 0.79	38.9 - 35.3 / 20.8 - 20.0	3380-3430
90	2.3	1.0	6.25 - 5.85 / 3.1 - 2.8	0.88 - 0.85 / 0.88 - 0.85	79.4 - 72.1 / 42.8 - 40.5	3490-3520
90	3.4	1.0	9.8 - 8.9 / 2.98 - 2.85	0.87 - 0.80 / 0.87 - 0.80	58.8 - 66.8 / 32.3 - 33.8	3470-3500
100	5.4	1.0	14.8 - 14.2 / 7.2 - 7.0	0.86 - 0.80 / 0.86 - 0.80	175.2 - 163.2 / 61.8 - 59.2	3520-3530
112	8.4	1.0	21.0 - 20.4 / 10.5 - 10.2	0.86 - 0.76 / 0.86 - 0.76	181.7 - 174.0 / 100.3 - 93.5	3490-3510

3 x 575 V, 60 Hz (supply voltage H)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}	I _{start}	Speed [rpm]
71	0.58	1.0	0.70	0.84	4.6	3340
71	1.0	1.0	1.30	0.84	7.8	3340
80	1.4	1.0	1.55	0.86	11.1	3220
80	1.7	1.0	1.84	0.86	16.8	3360
90	2.0	1.0	2.98	0.89	21.6	3490
90	3.4	1.0	3.50	0.90	27.8	3450
100	5.4	1.0	5.70	0.88	47.9	3500
112	8.4	1.0	8.20	0.87	77.4	3490

Speed-controlled motors

1 x 208-230 V, 60 Hz (supply voltage M)
(phased out in 2014)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}
71	0.75	1.0	3.9 - 3.5	0.97
80	1.5	1.0	7.5 - 6.8	0.97

3 x 208-230 V, 60 Hz (supply voltage Q)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}
90	2.0	1.0	5.6-5.1	0.95
90	3.0	1.0	8.3-7.6	0.90
112	5.0	1.0	13.4-12.8	0.90
132	7.5	1.0	19.7-18.1	0.92

3 x 460-480 V, 60 Hz (supply voltage N)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}
90	2.0	1.15	3.6 - 3.6	0.87
90	3.0	1.15	4.3 - 4.3	0.91
112	5.0	1.15	7.0 - 7.0	0.92
132	7.5	1.15	10.2 - 10.2	0.94

3 x 440-480 V, 60 Hz (supply voltage T)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}
71	0.75	1.25	1.2	0.76
80	1.5	1.15	1.9	0.85
90	2	1.15	2.6	0.87
90	3	1.15	3.7	0.89

1 x 200-240 V, 60 Hz (supply voltage U)

Frame size	P ₂ [Hp]	Service factor	I _{1/1} [A]	Cos φ _{1/1}
71	0.75	1	3.4 - 2.9	0.98
80	1.5	1	6.55 - 5.45	0.99
90	2	1	8.9 - 7.45	0.99

Additional data for speed-controlled motors

New-generation CME (supply voltages T, U)

	Single-phase 3/4 to 2 Hp (supply voltage U)	Three-phase 3/4 to 3 Hp (supply voltage T)
Power supply to pump	1 x 200-240 V - 10 %/+ 10 %, 60 Hz, PE.	3 x 380-480 V - 10 %/+ 10 %, 60 Hz, PE. 3 x 380-500 V - 10 %/+ 10 %, 60 Hz, PE.
Backup fuse	Motor sizes of 3/4 Hp: Max. 10 A. Motor sizes of 1.5 to 2 Hp: Max. 16 A. Standard as well as quick-blow or slow-blow fuses may be used.	Motor sizes of 3/4 to 1.5 Hp: Max. 6 A. Motor sizes of 2 to 3 Hp: Max. 10 A. Standard as well as quick-blow or slow-blow fuses may be used.
External start/stop input	External potential-free contact. Maximum contact load: Voltage 5 VDC, current < 10 mA. Screened cable.* Maximum cable length: 1640 ft (500 m).	
Digital input	External potential-free contact. Maximum contact load: Voltage 5 VDC, current < 10 mA. Screened cable.*	
Setpoint signals	- Potentiometer 0-5 VDC, 10 kΩ (via internal voltage supply). Screened cable.* Maximum cable length: 328 ft (100 m). - Voltage signal 0.5 - 3.5 VDC / 0-5 VDC / 0-10 VDC, $R_i > 100 \text{ k}\Omega$. Tolerance: + 0 %/- 3 % at maximum voltage signal. Screened cable.* Maximum cable length: 1640 ft (500 m). - Current signal 0-20 mADC / 4-20 mADC, $R_i = 292 \Omega$. Tolerance: + 0 %/- 3 % at maximum current signal. Screened cable.* Maximum cable length: 1640 ft (500 m).	
Power supply to sensors	The sensors are supplied with electricity via the motor terminal box. 5 VDC - 5 %/+ 5 %. Maximum load: 50 mADC. 24 VDC - 5 %/+ 5 %. Maximum load: 60 mADC.	
Sensor signals	- Voltage signal 0.5 - 3.5 VDC / 0-5 VDC / 0-10 VDC, $R_i > 100 \text{ k}\Omega$. Tolerance: + 0 %/- 3 % at maximum voltage signal. Screened cable.* Maximum cable length: 1640 ft (500 m). - Current signal 0-20 mADC / 4-20 mADC, $R_i = 292 \Omega$. Tolerance: + 0 %/- 3 % at maximum current signal. Screened cable.* Maximum cable length: 1640 ft (500 m).	
Signal output	Potential-free changeover contact. Minimum contact load when in use: 5 VDC, 10 mA. Screened cable: 0.5 - 2.5 mm ² / 28-12 AWG. Maximum cable length: 1640 ft (500 m).	
Bus input	Grundfos GENIbus protocol, RS-485. Screened 3-core cable: 0.5 - 1.5 mm ² / 28-16 AWG. Maximum cable length: 1640 ft (500 m).	
EMC	EN 61800-3: - Residential areas, unlimited distribution, corresponding to CISPR 11, class B, group 1. - Industrial areas, unlimited distribution, corresponding to CISPR 11, class A, group 1.	
Enclosure class	IP55 (IEC 34-5).	
Insulation class	F (IEC 85).	
Ambient temperature	During operation: +4 to +122 °F (-20 to +50 °C). During storage/transport: -22 to +140 °F (-30 to +60 °C).	
Relative air humidity	Maximum 95 %.	

* Cross-section min. 28 - 16 AWG (0.5 mm² and max. 1.5 mm²).

Additional data for speed-controlled motors

Supply voltages M, N, Q

	Single-phase supply voltage M	Three-phase supply voltage N, Q
Electricity supply to pump	1 x 208-230 V – 10 %/+ 10 %, 60 Hz, PE.	3 x 460-480V – 10 %/+ 10 %, 60 Hz, PE. 3 x 208-230V – 10 %/+ 10 %, 60 Hz, PE.
Back-up fuse	Motor sizes of 0.75 to 1.5 Hp: Max. 10 A. Standard as well as quick-blow or slow-blow fuses may be used.	Motor sizes of 2.0 to 7.5 Hp: Max. 16 A. Standard as well as quick-blow or slow-blow fuses may be used.
External start/stop input	External potential-free contact. Maximum contact load: Voltage 5 VDC, current < 5 mA. Screened cable*.	
Digital input	External potential-free contact. Maximum contact load: Voltage 5 VDC, current < 5 mA. Screened cable*.	
Setpoint signals	• Potentiometer 0-10 VDC, 10 kΩ (via internal voltage supply). Screened cable*. Maximum cable length: 330 ft (100 m). • Voltage signal 0-10 VDC, R_i > 50 kΩ. Tolerance: + 0 %/– 3 % at maximum voltage signal. Screened cable*. Maximum cable length: 1650 ft (500 m). • Current signal DC 0-20 mA/4-20 mA, R_i = 175 Ω. Tolerance: + 0 %/– 3 % at maximum current signal. Screened cable*. Maximum cable length: 1650 ft (500 m).	• Potentiometer 0-10 VDC, 10 kΩ (via internal voltage supply). Screened cable*. Maximum cable length: 330 ft (100 m). • Voltage signal 0-10 VDC, R_i > 50 kΩ. Tolerance: + 0 %/– 3 % at maximum voltage signal. Screened cable*. Maximum cable length: 1650 ft (500 m). • Current signal DC 0-20 mA/4-20 mA, R_i = 250 Ω. Tolerance: + 0 %/– 3 % at maximum current signal. Screened cable*. Maximum cable length: 1650 ft (500 m).
Electricity supply to sensors	The sensors are supplied with electricity via the motor terminal box. • 24 VDC ± 10 %. Maximum load: 40 mA.	The sensors are supplied with electricity via the motor terminal box. • 24 VDC ± 10 %. Maximum load: 40 mA.
Sensor signals	• Voltage signal 0-10 VDC, R_i > 50 kΩ. Tolerance: + 0 %/– 3 % at maximum voltage signal. Screened cable*. Maximum cable length: 1650 ft (500 m). • Current signal DC 0-20 mA/4-20 mA, R_i = 175 Ω. Tolerance: + 0 %/– 3 % at maximum current signal. Screened cable*. Maximum cable length: 1650 ft (500 m).	• Voltage signal 0-10 VDC, R_i > 50 kΩ. Tolerance: + 0 %/– 3 % at maximum voltage signal. Screened cable*. Maximum cable length: 1650 ft (500 m). • Current signal DC 0-20 mA/4-20 mA, R_i = 250 Ω. Tolerance: + 0 %/– 3 % at maximum current signal. Screened cable*. Maximum cable length: 1650 ft (500 m).
Signal output	Potential-free changeover contact. Maximum contact load: 250 VAC, 2 A. Minimum contact load: 5 VDC, 10 mA. Screened cable: 28 - 12 AWG (0.5 - 2.5 mm ²). Maximum cable length: 1650 ft (500 m).	
Bus input	Grundfos bus protocol, GENIbus protocol, RS-485. 28 - 12 (0.5 - 1.5 mm ²) screened 2-core cable. Maximum cable length: 1650 ft (500 m).	
EMC	EN 61800-3	
	Note: When pumps fitted with 10 Hp motors are installed in first environment (residential areas), an additional EMC filter is required to obtain class B, group 1 status.	
	Motors of 0.75 to 1.5 Hp: Electromagnetic disturbance – first environment (residential areas) – unrestricted distribution, corresponding to CISPR 11, class B, group 1.	
	Motors of 10 Hp: Electromagnetic disturbance – first environment (residential areas) – restricted distribution. Immunity to electromagnetic disturbance – second environment (industrial areas) – unrestricted distribution, corresponding to CISPR 11, class A, group 1.	
Enclosure class	TEFC (IP55 (IEC 34-5)).	
Insulation class	F (IEC 85).	
Ambient temperature	During operation: –4 °F to 104 °F (–20 °C to +40 °C). During storage/transport: –40 °F to 140 °F (–40 °C to +60 °C).	
Relative air humidity	Maximum 95 %.	

* Cross section min. 28 - 16 AWG (0.5 mm² and max. 1.5 mm²).

17. Customization

Although the Grundfos CM and CME product range offers a number of pumps for different applications, customers require specific pump solutions to satisfy their needs. Below are the options available for customizing the CM and CME pumps. Contact Grundfos for further information or for requests other than the ones mentioned below.

Motors

Motor with thermal protection	Grundfos offers motors with bimetallic thermal switches or temperature-controlled PTC sensors (thermistors) in the motor windings.
Oversize motor	In installations where one of the conditions mentioned below is present, the motor size must be evaluated to make sure there will be no risk of overload. • ambient temperatures above +131 °F (+55 °C) • liquid temperatures below +32 °F (0 °C) • installation at altitudes of more than 3300 ft (1000 m) above sea level • use of glycol or other high-viscous liquids. Alternative motors are available on request. See more information in this section.
Undersize motor	Available on request. See more information in this section.
Terminal box position	Other terminal box positions are possible for CM pumps with MG 71 and MG 80 motors. See more information in this section.
Use of external variable frequency drive	For most three-phase CM pumps, a variable frequency drive (VFD) supplied by either single- or three-phase supply can be used. In many cases where an external VFD is used, it is necessary to protect the motor against voltage peaks higher than 650 V (peak value). Grundfos offers pumps with phase insulation to protect the pump against voltage peaks up to 1000 V (peak values). The supplier of the VFD must be consulted to verify the maximum voltage peaks. Grundfos CUE is a suitable VFD. See page 26.
Harting plug	Harting plugs are available for easier installation and maintenance of pumps.
High-efficiency motors	CM and CME pumps with three-phase motors ranging from 1.5 to 10 Hp are available with premium efficient (IE3) motors.
Motor with anti-condensation heater	The heater keeps the motor temperature higher than the ambient temperature and prevents condensation.
Motors with PTC sensors	Built-in PTC sensors (thermistors) protect the motor against rapid as well as slow overheating. PTC sensors must be connected to an external tripping or LiqTec unit connected to the control circuit.
Motors with thermal switches	Built-in thermal switches protect the motor against rapid as well as slow overheating. Thermal switches must be connected to an external control circuit to protect the motor against slow overheating. The thermal switches require no tripping unit.
Low noise motors	Motors have the fans removed. These motors do not have UL approval.

Under- and over-size motors

The available motor sizes are shown in the 16. Motor data section beginning on page 86.

Undersize and oversize motors are defined as the next horsepower size below or above the fitted standard motor.

Note: The CM 1, 3 and 5 cannot be combined with frame sizes 112 and 132.

It is advisable to use an oversize motor if the operating conditions fall outside the standard conditions.

We especially recommend oversize motors in these cases:

- The pump is installed at an altitude of more than 3,280 ft (1000 meters) above sea level.
- The viscosity or density of the pumped liquid is higher than that of water.
- The ambient temperature exceeds +104 °F (+40 °C) (CME).
- The ambient temperature exceeds +131 °F (+55 °C) (CM).

It is advisable to use an undersize motor if the operating conditions do not at all reach the standard conditions.

Undersize motors can be used in these cases:

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

The duty point of the pump is constant, and the flow rate is significantly lower than the recommended maximum flow rate.

Terminal box positions

As standard the terminal box is mounted in 12 o'clock position as shown in fig. 36.

CM pumps with motor frame sizes of 71 and 80 are available with other terminal box positions on special request.

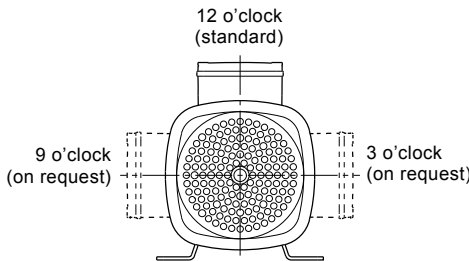


Fig. 36 Terminal box positions of frame sizes 71 and 80

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Standstill heating function

The MLE motors fitted to CME pumps incorporate a standstill heating function. No external heater on the stator coil is necessary.

The working principle is that AC voltage is applied to the motor windings. The applied AC voltage will not make the motor run, but will ensure that sufficient heat is generated to prevent condensation in the motor. The terminal box is kept warm and dry by the heat generated via the power supply voltage connected. 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 and the drain plugs have to be removed to obtain ventilation in motor and terminal box. See [Operation in condensing environments](#) on page 24.

Functional modules for CME pumps

CME pumps offer a number of advantages, depending on hardware combinations and software configuration of the motor. For example, various functional modules are available.

New-generation CME 3/4 - 3 Hp (supply voltages T, U)

As standard, these CME pumps are fitted with the standard functional module FM 200. The basic or advanced module is available as a customized solution.

Basic functional module (FM 100)

The basic module has only the most necessary inputs for closed- and open-loop operation. The module also enables communication via a GENIbus connection.

The basic module has these connections:

- analog voltage input
- two digital inputs or one digital input and one open-collector output
- GENIbus connection.

Standard functional module (FM 200)

The standard module has more inputs and outputs than the basic module and is suitable for even more demanding applications.

The standard module has these connections:

- two analog inputs
- two digital inputs or one digital input and one open-collector output
- Grundfos Digital Sensor input and output
- two signal relay outputs
- GENIbus connection.

Advanced functional module (FM 300)

The advanced 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 advanced 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
- LiqTec sensor inputs
- two signal relay outputs
- GENIbus connection.

CME 3/4 to 7.5 Hp (supply voltages M, N, Q)

As standard, these CME pumps are fitted with the standard functional module. The advanced functional module is available as a customized solution.

Standard functional module

The standard module is used for simple control of one parameter, for instance pressure, differential pressure, temperature, differential temperature or flow rate.

The standard module has these connections:

- one digital input
- one analog input.

Advanced functional module

The advanced module is identical to the standard module, but has additional connections for further control options.

The advanced module has these connections:

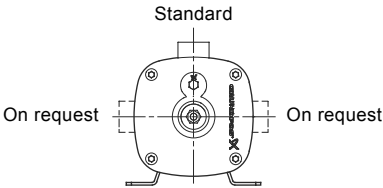
- three digital inputs
- one analog input
- one analog output.

Pumps

Low-temperature pump	As standard, the CM and CME pumps can be exposed to temperatures down to -4 °F (-20 °C). If required, CM and CME pumps can be delivered in a special variant for pumping liquids at -22 °F (-30 °C). These pumps have an oversize neck ring ensuring that impellers do not seize up as a result of thermal expansion. Available for CM-I and CM-G versions only. Contact Grundfos.
Aggressive liquids	When it is necessary to pump very aggressive liquids, the pump must be fitted with special rubber parts. It is possible to order the pumps with FKM and FFKM rubber parts.
Alternative connection positions	The CM and CME pumps are available with the discharge port rotated to the 3 o'clock or 9 o'clock position. This is possible on all CM-I and CM-G models and CM-A models with 71 or 80 frame motors. See more information in this section.
Surface treatments	CM pumps are available with several surface treatment options: • cleaned and dried pumps • electro-polished pumps • alternative coloring. See more information in this section.

Alternative connection positions

The pump is available with various connection positions on special request. See fig. 37.



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Fig. 37 Alternative connection positions

Surface treatments

Cleaned and dried pumps

Cleaned and dried pumps are recommended for use in applications involving strict demands on cleanliness and surface quality, such as low content of silicone. Prior to assembly, all pump parts are cleaned in +140 °F to +158 °F (+60 to +70 °C) water with a cleaning agent. All pump parts are then thoroughly rinsed in de-ionized water and air-dried. The pump is assembled without any use of silicone lubricants. Finally, the pump is packed in silicone-free plastic.

Cleaned and dried pumps are not performance-tested.

Electro-polished pumps

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

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

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

All cast parts are polished mechanically before being electro-polished.

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

Surface quality: Ra ≤ 0,8 µm.

Alternative coloring

All pump types and sizes are available with alternative coloring. We offer custom-built pumps in any NCS- or RAL-specified color to suit your requirements!

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

Connections and other variants

Pipe connections	The CM and CME pumps can be ordered with the following pipe connections on request:
	• Tri-Clamp® • DIN flange • ANSI flange • JIS flange • PJE coupling.

A wide range of pipe connections are available for the CM and CME pumps:

- internal NPT thread (standard in North America)
- Whitworth thread Rp
- Tri-Clamp® (accessory)
- ANSI flange (accessory)
- DIN flange (accessory)
- JIS flange (accessory)
- PJE coupling (accessory).

Some of the available pipe connections are shown in fig. 38.



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Fig. 38 Examples of pipe connections

Certificates and nameplates

Certificates	Certificate of compliance with the order
	Test certificate
	Inspection certificate
	Standard test report
Extra nameplate	...and many more.
	Available on request.
UR-marked motor	If the UL-listed product according to UL778 is not available, a pump with UR-marked motor according to UL1004 can be offered as an alternative.

18. Advanced use of CME pumps

Introduction

Grundfos CME pumps have many features for the advanced user. Grundfos MLE motors have features such as standstill heating, stop function, and signal relays. These features give a unique opportunity to customize the CME pump. The PC Tool E-products gives access to most of the settings available in the products, as well as the possibility of logging and viewing data. These features are described below.

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.

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 low flow 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.
- 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 closed valve.

Operating conditions for the stop function

A pressure sensor, a non-return valve, and a diaphragm tank are required for the stop function to operate properly. **Note:** The non-return valve must always be installed before the pressure sensor. See fig. 39 and fig. 40.

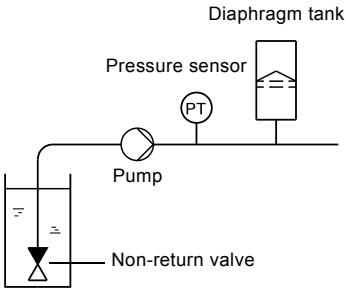


Fig. 39 Position of the non-return valve and pressure sensor in system with suction lift operation

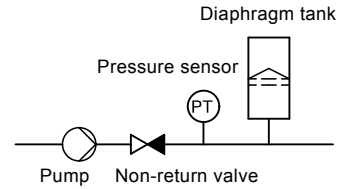
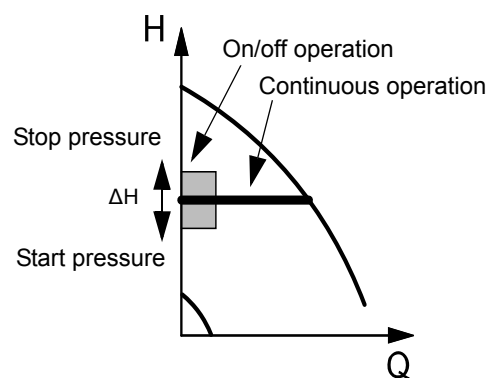


Fig. 40 Position of the non-return valve and pressure sensor in system with positive inlet pressure

When low flow is detected, the pump is in on/off operation. If there is flow, the pump will continue operating according to the setpoint. See fig. 41.



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Fig. 41 Constant pressure with stop function.
Difference between start and stop pressures (ΔH)

Diaphragm tank

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

Recommended diaphragm tank size:

CME	Tank size [gal (liter)]
CME 1	1/4 (1)
CME 3, CME 5	1/2 (2)
CME 10	2 (8)
CME 15, CME 25	4.5 (17)

If a diaphragm tank of the above size is installed in the system, no additional adjustment should be necessary. If the tank installed is too small, the pump will start and stop often. Tank size will influence at which flow 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 regularly by reducing the speed for a short time. A small change in pressure or no change in pressure means that there is low flow.

Low-flow detection with flow switch

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

Contact Grundfos for further information.

Dry-running protection

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

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 section [20. Accessories](#))
- a pressure switch installed on the suction side of the pump
- a float switch installed on the suction side of the pump.

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

Signal relay

A signal relay is used to give an output indication of the current operational status of the CME pump. 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 can be set up to indicate several types of operational status.

Applications

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

Relay control

The relay time is 0 seconds.

The relay is controlled by the variable frequency drive software according to the setup of the relay [Ready, Fault, Operation].

19. Pumped liquids

CM, CME pumps are designed to move thin, non-explosive liquids, not containing solid particles or fibers. The liquid must not chemically attack the pump materials.

When pumping liquids with a density and/or viscosity higher than those of water, oversized motors must be used, if required.

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

Please note that aggressive liquids (for instance seawater and some acids) may attack or dissolve the protective oxide film of the stainless steel and thus cause corrosion.

List of pumped liquids

A number of typical liquids are listed in the chart.

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.

The list should, however, be applied with some caution as factors such as concentration of the pumped liquid, liquid temperature or pressure may affect the chemical resistance of a specific pump version.

Safety precautions must be taken when pumping dangerous liquids.

Notes

a	To minimize the risk of corrosion the pump must be running continuously, i.e. standstills must not exceed 6 to 8 hours.
b	May contain additives or impurities which can cause shaft seal problems.
c	The density and viscosity may differ from those of water. Consider this when calculating motor and pump performance.
d	In order to avoid corrosion, the liquid must be free of oxygen.
	Flammable or combustible liquid. Safety precautions must be considered to ensure safe handling of flammable liquids. Handling the liquid above the flashpoint and/or boiling point will require the greatest restrictions. A sealless pump may be required. Contact Grundfos.
e	
f	Risk of crystallization/precipitation on the shaft seal.
g	If oil residues are present, EPDM cannot be used.

Pumped liquids	Chemical formula	Notes	Additional information	Cast iron (EN-GJL-200)	Stainless steel (EN 1.4301/AISI 304)	Stainless steel (EN 1.4401/AISI 316)
Water						
Boiler feed water				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Brackish water		a	86 °F (30 °C), 2000 ppm chloride			AVBE/AQQE
Condensate				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Cooling and cutting lubricant		b		AQQV	AQQV	AQQV
Groundwater			< 300 ppm chloride	AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Demineralized water			< 2 microS/cm (> 0.5 Meg)	AQQE	AQQE	AQQE
Demineralized water			> 2 microS/cm (< 0.5 Meg)	AVBE	AVBE	AVBE
District heating water				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Oil-containing water				AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Softened water				AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Swimming pool water, chlorinated			104 °F (40 °C), 150 ppm chloride, < 2 ppm free chlorine	AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Coolants						
Calcium chloride	CaCl ₂	b, c, d, f	< 32 °F (0 °C), 30 %		AQQE	AQQE
Ethylene glycol	C ₂ H ₄ (OH) ₂	b, c	< 122° (50 °C)	AQQE	AQQE	AQQE
Glycerine (glycerol)	C ₃ H ₅ (OH) ₃	b, c	< 122° (50 °C)	AQQE	AQQE	AQQE
Hydrocarbon-based coolant		c, e	122° (50 °C)	AQQV	AQQV	AQQV
Potassium acetate (inhibited)	CH ₃ COOK	b, c, d, f	< 68 °F (20 °C)	AQQE	AQQE	AQQE
Potassium formate (inhibited)	HCOOK	b, c, d, f	< 68 °F (20 °C)	AQQE	AQQE	AQQE
Propylene glycol	CH ₃ CHOHCH ₂ OH	b, c	< 122° (50 °C)	AQQE	AQQE	AQQE
Sodium chloride	NaCl	b, c, d, f	< 32 °F (0 °C), 30 %		AQQE	AQQE

Pumped liquids	Chemical formula	Notes	Additional information	Cast iron (EN-GJL-200)	Stainless steel (EN 1.4301/AISI 304)	Stainless steel (EN 1.4401/AISI 316)
Fuels						
Diesel oil		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Jet fuel		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Kerosene		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Naphta		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Petrol		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Biodiesel		e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Mineral oils						
Crude oil		b, c, e	< 68 °F (20 °C)	AQQV	AQQV	AQQV
Mineral lubricating oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Mineral motor oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Synthetic oils						
Synthetic lubricating oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Synthetic motor oil		c, e		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Silicone oil		c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Vegetable oils						
Corn oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Olive oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Peanut oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Rapeseed oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Soy oil		b, c		AVBV/AQQV	AVBV/AQQV	AVBV/AQQV
Cleaning						
Alkaline degreasing agent		b, g		AQQE	AQQE	AQQE
Soap (salts of fatty acids)		b	< 176 °F (80 °C)	AQQV	AQQV	AQQV
Organic solvents						
Acetone	C ₃ H ₆ O	e	104 °F (40 °C)	AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Ethyl alcohol (ethanol)	C ₂ H ₆ O	e	104 °F (40 °C)	AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Isopropyl alcohol	C ₃ H ₇ OH	e	104 °F (40 °C)	AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Methyl alcohol (methanol)	CH ₃ OH	e	104 °F (40 °C)	AVBE/AQQE	AVBE/AQQE	AVBE/AQQE
Oxidants						
Hydrogen peroxide	H ₂ O ₂	c	68 °F (20 °C), 25 %	AQQE	AQQE	AQQE
Salts						
Ammonium bicarbonate	NH ₄ HCO ₃	b, c	68 °F (20 °C), 15 % 140 °F (60 °C), 30 %	AQQE	AQQE	AQQE
Copper sulphate	CuSO ₄	b, c, f	140 °F (60 °C), 30 %		AQQE/AQQV	AQQE/AQQV
Ferric sulphate	Fe ₂ (SO ₄) ₃	b, c, f	68 °F (20 °C), 30 %		AQQE/AQQV	AQQE/AQQV
Potassium bicarbonate	KHCO ₃	b, c	68 °F (20 °C), 20 % 140 °F (60 °C), 30 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Sodium carbonate	Na ₂ CO ₃	b, c, f	68 °F (20 °C), 20 % 140 °F (60 °C), 30 %	AQQE	AQQE	AQQE
Potassium permanganate	KMnO ₄	b, c	140 °F (60 °C), 10 %		AQQE	AQQE
Sodium nitrate	NaNO ₃	b, c	68 °F (20 °C), 5 % 140 °F (60 °C), 30 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Sodium nitrite	NaNO ₂	b, c	68 °F (20 °C), 20 % 140 °F (60 °C), 30 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Sodium phosphate (mono)	NaH ₂ PO ₄	b, c, f	140 °F (60 °C), 20 %		AQQE/AQQV	AQQE/AQQV
Sodium phosphate (di)	Na ₂ HPO ₄	b, c, f	86 °F (30 °C), 30 % 140 °F (60 °C), 30 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Sodium phosphate (tri)	Na ₃ PO ₄	b, c, f	68 °F (20 °C), 10 % 158 °F (70 °C), 20 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Sodium sulphate	Na ₂ SO ₄	b, c, f	140 °F (60 °C), 30 %		AQQE/AQQV	AQQE/AQQV
Sodium sulphite	Na ₂ SO ₃	b, c, f	68 °F (20 °C), 1 % 140 °F (60 °C), 20 %	AQQE/AQQV	AQQE/AQQV	AQQE/AQQV
Acids						
Acetic acid	C ₂ H ₄ O ₂		68 °F (20 °C), 15 % 140 °F (60 °C), 50 %		AQQE	AQQE
Citric acid	C ₆ H ₈ O ₇	c, f	104 °F (40 °C), 50 %		AQQE	AQQE

Pumped liquids	Chemical formula	Notes	Additional information	Cast iron (EN-GJL-200)	Stainless steel (EN 1.4301/AISI 304)	Stainless steel (EN 1.4401/AISI 316)
Formic acid	CH ₂ O ₂	c	68 °F (20 °C), 30 % 104 °F (40 °C), 30 %		AQQE	AQQE AQQK
Nitric acid	HNO ₃	c	77 °F (25 °C), 40 % 104 °F (40 °C), 40 %		AQQE AQQK	AQQE AQQK
Oxalic acid		f	68 °F (20 °C), 10 % 122 °F (50 °C), 10 %		AQQE AQQK	AQQE AQQK
Phosphoric acid	H ₃ PO ₄	b, c, f	158 °F (70 °C), 40 %		AQQE/AQQV	AQQE/AQQV
Sulphuric acid	H ₂ SO ₄	b	68 °F (20 °C), 1 % 68 °F (20 °C), 5 %		AQQE/AQQV	AQQE/AQQV
Sulphurous acid			68 °F (20 °C), 10 % 122 °F (50 °C), 10 %		AQQE AQQK	AQQE AQQK
Alkalies						
Ammonium hydroxide	NH ₄ OH		86 °F (30 °C), 30 %	AQQE	AQQE	AQQE
Calcium hydroxide	Ca(OH) ₂	b	86 °F (30 °C), 5 %	AQQE	AQQE	AQQE
Potassium hydroxide	KOH	c, f	68 °F (20 °C), 20 % 140 °F (60 °C), 20 %	AQQE	AQQE	AQQE
Sodium hydroxide	NaOH	c, f	68 °F (20 °C), 20 % 176 °F (80 °C), 20 %	AQQE	AQQE	AQQE

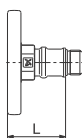
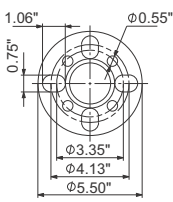
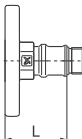
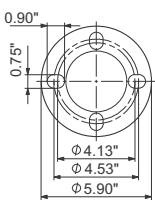
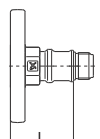
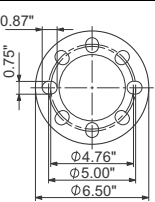
20. Accessories

Pipework connections

Flange sets for CM(E) (DIN/ANSI/JIS)

All materials in contact with the pumped liquids are made of stainless steel AISI 316 / EN 1.4408.

The pipe stub is made of stainless steel AISI 316 / EN 1.4408 and the flange part is made of cast iron EN-GJL-200.

Flange	Pump type	Pipework connection	Pump thread	L* [in]		Product number
				Flange mounted on pump inlet	Flange mounted on pump outlet	
 	CM 1 CM 3	1 1/4" ANSI 300 lb.	NPT	1.93	3.07	96904705
	CM 5					96904708
	TM06 0418 0214					
 	CM 10	1 1/2" ANSI 300 lb.	NPT	1.73	2.68	96904711
	TM06 0419 0214					
 	CM 15 CM 25	2" ANSI 300 lb.	NPT	1.89	2.68	96904714
	TM06 0420 0214					

* Length from outer edge of flange to pump suction or discharge port.

Note: Please pay attention to the compatibility between pump and flange before ordering. See tables below.

CM pumps compatible with ANSI flanges

Pump type	Material version	ML 71/80 1-ph	ML 71/80 3-ph	ML 90 1-ph	ML 90 3-ph	ML 100	ML 112
CM 1, 3, 5	Cast iron		•	•	•		
	Stainless steel	•	•		•	•	
CM 10, 15, 25	Cast iron	•	•	•	•	•	•
	Stainless steel	•	•	•	•	•	•

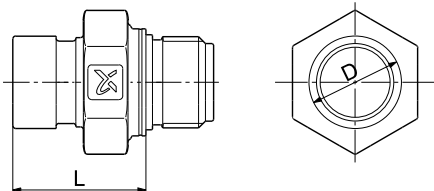
CME pumps compatible with ANSI flanges

Pump type	Material version	Supply voltages M, N, Q					Supply voltages T, U	
		MLE 71/80	MLE 90S	MLE 90L	MLE 100	MLE 112/132	MLE 71/80	MLE 90
CME 1, 3, 5	Cast iron		• ²⁾	•	•			
	Stainless steel	• ¹⁾		•	•			
CME 10, 15, 25	Cast iron	•		•	•	•	•	•
	Stainless steel	•		•	•	•	•	•

¹⁾ Only 0.39" (10 mm) clearance between flange and terminal box.

²⁾ Only 0.35" (9 mm) clearance between flange and terminal box.

PJE connection adapter sets for CM(E)

PJE connection	Pump type	Pump thread	D [in (mm)]	L* [in (mm)]	Product number
	CM 1 CM 3	1" x 1" NPT	1.33 (33.7)	1.90 (48.5)	96904706
	CM 5	1.25" x 1" NPT	1.67 (42.4)	1.90 (48.5)	96904709
	CM 10	1.5" x 1.5" NPT	1.90 (48.3)	1.90 (48.5)	96904712
	CM 15 CM 25	2" x 2" NPT	2.37 (60.3)	1.97 (50.1)	96904715

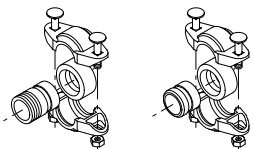
TM03 3865 0309

* Length from outer edge of PJE connection to pump suction or discharge port.

PJE connector adapter sets consist of two (2) PJE connection adapters, two (2) EPDM O-rings, and two (2) FKM O-rings.

PJE coupling sets for CM(E)

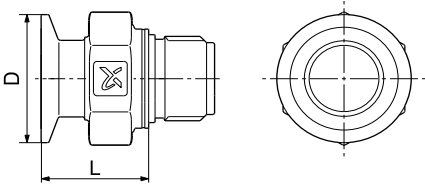
Parts in contact with the pumped liquid are made of stainless steel, AISI 316 / EN 1.4401, and rubber.

Coupling and pipe stub	Pump type	Pipe stub	PN	Pipework connection	Rubber parts	Number of coupling sets required	Product number
	CM(E) 15 CM(E) 25	Threaded	1015 psi (70 bar)	2" NPT	EPDM	2	331301
					FKM	2	01D00128
		For welding	1015 psi (70 bar)	DN 50	EPDM	2	00339910
					FKM	2	00339917

TM00 3808 1094

A PJE coupling set consists of two coupling halves (Victaulic, type 77), one gasket, one pipe stub (for welding or threaded), bolts and nuts.

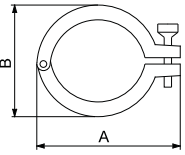
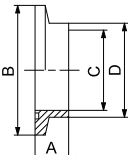
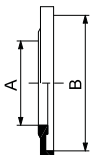
Tri-Clamp® connections for CM(E)

Tri-Clamp®	Pump type	Pump thread	Tri-Clamp®	D [in (mm)]	L* [in (mm)]	Product number
	CM 1 CM 3	NPT	1.5"	2.0 (50.4)	1.6 (40.3)	96904707
	CM 5	NPT	1.5"	2.0 (50.4)	1.4 (35.3)	96904710
	CM 10	NPT	1.5"	2.0 (50.4)	1.5 (37.4)	96904713
	CM 15 CM 25	NPT	2"	2.5 (63.9)	1.5 (37.4)	96904716

TM04 3866 0309

* Length from outer edge of Tri-Clamp® connection to pump suction or discharge port.

Clamping ring, pipe stub and gasket for Tri-Clamp® connections

		Clamping ring		Pipe stub				Gasket	
									
		TM03 4645 2406		TM03 4646 2406				TM03 4647 2406	
Pump type	Nominal diameter [mm]	A [in (mm)]	B [in (mm)]	A [in (mm)]	B [in (mm)]	C [in (mm)]	D [in (mm)]	A [in (mm)]	B [in (mm)]
CM(E) 1, 3, 5, 10	1.5 (38.0)	3.7 (92.0)	2.4 (59.5)	0.9 (21.5)	2.9 (50.5)	1.4 (35.6)	1.6 (38.6)	1.4 (35.3)	2.0 (50.5)
CM(E) 15, 25	2.0 (51.0)	4.1 (104.4)	3.0 (74.0)	0.9 (21.5)	2.6 (64.0)	2.0 (48.6)	2.1 (51.6)	1.9 (48.0)	2.6 (64.0)

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

The pipe stub is made of stainless steel, AISI 316 / EN 1.4401.

The gasket is made of PTFE or EPDM.

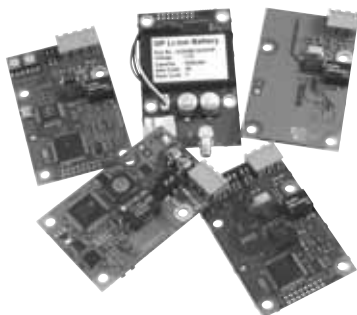
Pump type	Pipework connection	Connection material	Gasket	Pressure [psi (bar)]	Number of coupling sets required	Product number
CM(E) 1, 3, 5, 10	DN 32	Stainless steel	EPDM	232 (16)	2	96515374
			PTFE		2	96515375
CM(E) 15, 25	DN 50		EPDM		2	96515376
			PTFE		2	96515377

Potentiometer for CME

The potentiometer is for setpoint setting and start/stop of the CME pump.

Product	Product number
External potentiometer with cabinet for wall mounting	00625468

Communication interface modules (CIM) for CME



TM05 7508 1113

Fig. 42 Grundfos CIM modules

A CIM module is an add-on communication interface module for the new-generation MLE motors. The CIM module enables data transmission between the pump and an external system, for example a BMS (building management system) or SCADA system.

We offer the following CIM modules:

Unit type	Fieldbus protocol	Product number
CIM 50	GENIbus	96824631
CIM 100	LonWorks	96824797
CIM 150	PROFIBUS DP	96824793
CIM 200	Modbus RTU	96824796
CIM 250	GSM/GPRS	96824795
CIM 270	GRM	96898815
CIM 300	BACnet MS/TP	96893770

Communication interface units (CIU) for CME



GrA6118

Fig. 43 Grundfos CIU unit

A CIU unit enables communication of operating data, such as measured values and setpoints, between CME pumps and a building management system. The CIU unit incorporates a 24-240 VAC/VDC power supply module and a CIM module. It can either be mounted on a DIN rail or on a wall.

We offer the following CIU units:

Unit type	Fieldbus protocol	Product number
CIU 100	LonWorks	96753735
CIU 150	PROFIBUS DP	96753081
CIU 200	Modbus RTU	96753082
CIU 250	GSM	96787106
CIU 270	GRM	Contact Grundfos
CIU 300	BACnet MS/TP	96893769

Note: The CIU is not required for the new-generation CME pumps (supply voltages T, U use the CIM module).

For further information about data communication via CIU units and fieldbus protocols, see the CIU documentation available in WebCAPS.

Grundfos GO Remote

The Grundfos GO Remote is used for wireless infrared or radio communication with the pumps.
Various Grundfos GO Remote variants are available.
The variants are described in the following.

MI 201

The MI 201 is a complete solution, consisting of an Apple iPod touch 4G and a Grundfos cover for infrared and radio communication with Grundfos pumps or systems.



Fig. 44 MI 201

Supplied with the product:

- Apple iPod touch 4G incl. accessories
- Grundfos MI 201 cover
- battery charger
- Quick Guide.

MI 202 and MI 204

The MI 202 and MI 204 are an add-on modules with built-in infrared and radio communication. The MI 202 can be used in conjunction with Apple iPod Touch 4, iPhone 4 and 4S.

The MI 204 can be used in conjunction with Apple iPod Touch 5G, iPhone 5 or later.



Fig. 45 MI 202 and MI 204

Supplied with the product:

- Grundfos MI 202 or 204
- sleeve
- Quick Guide
- charger cable.

MI 301

The MI 301 is a module with built-in infrared and radio communication. The MI 301 must be used in conjunction with an Android or iOS-based Smartphone with a Bluetooth connection. The MI 301 has rechargeable Li-ion battery and must be charged separately.



Fig. 46 MI 301

Supplied with the product:

- Grundfos MI 301
- battery charger
- quick guide.

Product numbers

Grundfos GO Remote variant	Product number
Grundfos MI 201	98140638
Grundfos MI 202	98046376
Grundfos MI 204	98424092
Grundfos MI 301	98046408

Supported units

Make	Model	Operating system	MI 201	MI 202	MI 204	MI 301
Apple	iPod touch 4G	iOS 5.0 or later	•	•		•
	iPhone 4, 4S			•		•
	iPod touch 5G	iOS 6.0 or later			•	•
	iPhone 5				•	•
HTC	Desire S	Android 2.3.3 or later				•
	Sensation	Android 2.3.4 or later				•
Samsung	Galaxy S II	Android 4.0 or later				•
	Galaxy Nexus					•
LG	Google Nexus 4	Android 4.2 or later				•

Note: Similar Android and iOS-based devices may work as well, but are not supported by Grundfos.

TM05 3886 1712

TM05 3890 1712

TM05 3887 1612 - TM05 7704 1513

LiqTec

Description

LiqTec features:

- Protects the pump against dry-running.
- Protects the pump against too high liquid temperature (+266 °F $\pm$ 9 °F (130 °C $\pm$ 5 °C)).
- Has a fail-safe design. If the sensor, sensor cable, electronic unit or power supply fails, the pump stops immediately.
- The LiqTec is **not** to be used with the MGFlex motor.

Mounting the LiqTec sensor

The LiqTec can be fitted to a DIN rail to be incorporated in a control cabinet.

Electrical connection

Example of electrical connection, see page 107.

Calibration of sensor and controller

Follow the procedure on the next page.

Functions

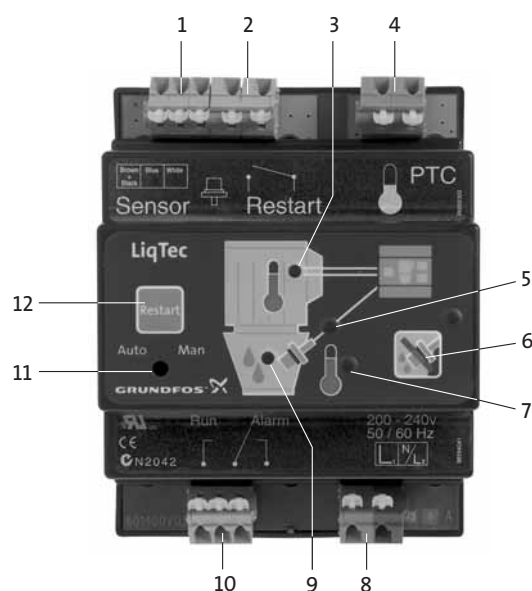


Fig. 47 LiqTec functions

1. Connection for dry-running sensor

2. Connection for external restarting

3. Motor PTC

Green light indicates OK or short-circuited terminals.

Red light indicates too high motor temperature. The alarm relay is activated.

4. Connection for PTC sensor

This input is not used in connection with E-pumps as the variable frequency drive protects the motor against overload.

5. Sensor indicator light

Red light indicates defective sensor or cable. The alarm relay is activated.

6. Deactivation of the dry-running monitoring function

Press the button to deactivate the dry-running monitoring function. Red flashing light. The PTC monitoring function is still active.

Press [Restart] to reactivate the dry-running monitoring function.

7. High liquid temperature indicator light

Red light indicates too high liquid temperature (+266 °F $\pm$ 9 °F (130 °C $\pm$ 5 °C)).

The alarm relay is activated.

8. Supply voltage

200-240 VAC, 50/60 Hz and 80-130 VAC 50/60 Hz.

9. Dry-running indicator light

Green light indicates OK (liquid in pump).

Red light indicates dry running (no liquid in pump). The alarm relay is activated.

10. Alarm/Run relay output

Potential-free changeover contact.

Maximum contact load: 250 V, 1 A, AC (inductive load).

11. Auto/Man

Changeover between automatic and manual restarting.

The default setting is "Man".

Changeover is carried out by means of a small screwdriver.

When "Auto" has been selected, the alarm indication will automatically be reset 10 to 20 seconds after detection of liquid.

12. Restart

Press [Restart] to restart the pump. The button has no influence on the PTC monitoring.

Calibration of sensor and controller

Step	Action	Result
1	Connect the sensor to pos. 1 on Controller and connect the power supply to pos. 8 on the Controller. See page 107.	
2	Submerge the sensor into the pumped liquid. The pumped liquid and the air temperature are to be +70 °F. Note: It is important that the pumped liquid is stagnant as the calibration will be misleading if the sensor is cooled by flowing water.	
3	Press the buttons at pos. 6 and pos. 12 on the Controller for approximately 20 seconds.	All red indicator lights (except pos. 7) start flashing.
4	When the green indicator lights at pos. 3 and pos. 9 on the Controller are constantly on, release the buttons at pos. 6 and pos. 12.	The calibration is completed.

Further information

Information related to IEC 60730-1:

- Software class A
- Pollution degree 2
- Type 1.

The LiqTec has been cURus-approved according to UL 508.

Maximum pressure: 580 psi (40 bar).

Maximum liquid temperature: (+266 °F ±9 °F (130 °C ± 5 °C)).

Maximum ambient temperature: +131 °F (+55 °C).

Power consumption: 5 Watt.

Enclosure class: IPX0.

Maximum cable length: 65.6 ft (20 meters).

Standard cable: 16.4 ft (5 meters).

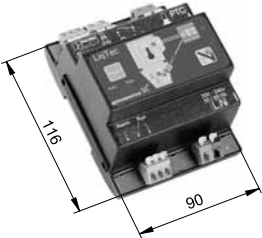
Extension cable: 49.2 ft (15 meters).

Note:

The LiqTec is not be connected to the PTC sensor. Assemble a jumper wire between the two terminals at pos. 4 on the Controller.

The MLE motor software provides protection against high motor temperature.

The LiqTec is designed for DIN rail mounting in a control cabinet.

Dry-running protection	Single phase power supply	LiqTec	Sensor 1/2"	Cable 16.4 ft (5 m)	Extension cable 49.2 ft (15 m)	Product number
	200-240 VAC	•	•	•	-	96556429
	80-130 VAC	•	•	•	-	96556430
	-	-	-	-	•	96443676
	-	-	•	•	-	96556427

TM02 1731 2001

Connection of E-pump to LiqTec

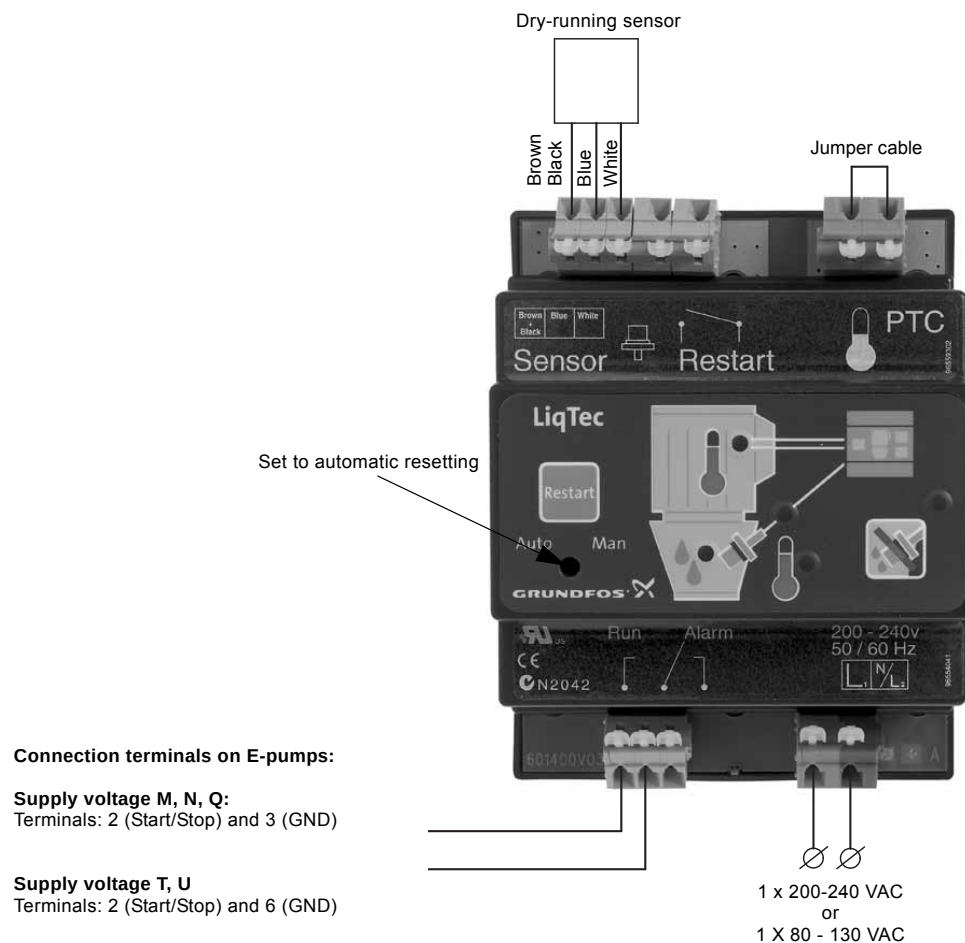


Fig. 48 Connection of E-pump to LiqTec

Setting the digital input

The digital input must be set to "External fault" via the R100.



Note: After dry-running fault, the E-pump must be restarted manually.

Disposal

This product or parts of it must be disposed of in an environmentally sound way:

1. Use the public or private waste collection service.
2. If this is not possible, contact the nearest Grundfos company or service workshop.

TM03 0437 5104

Grundfos pressure sensor



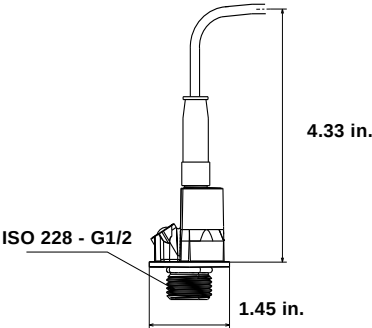
TM04 7865 2510

Accessory	Supplier	Type	Pressure range [psi (bar)]	Product number EPDM	Product number FKM
Pressure sensors			0 - 87 (0 - 6)	97748922	97748953
Pressure Transmitter with 6 ft screened cable	Grundfos	RPI	0 - 145 (0 - 10)	97748923	97748954
			0 - 232 (0 - 16)	97748924	97748955
			Connection: 1/4" - 18 NPT		
0 - 362 (0 - 25)			97748925	97748956	

Technical data

Pressure sensor				
Product number	97748922 97748953	97748923 97748954	97748924 97748955	97748925 97748956
Pressure range [psi (bar)]	0 - 87 (0 - 6)	0 - 145 (0 - 10)	0 - 232 (0 - 16)	0 - 362 (0 - 25)
Max. operating pressure [psi (bar)]	870 (60)			
Supply voltage	12.5 - 30 VDC			
Output signal [mA]	4 - 20			
Load Impedance	60 Ω at 12.5 VDC			
	100 Ω at 13.3 V			
	Max 900 Ω at 30 VDC			
Response time	100 ms typical 50 ms			
Resolution Accuracy	1/1000 FS			
	+32 to +176 °F +/- 2.0 % FS			
	-22 to +212 °F +/-2.5% FS			
Operation temperature	-22 to +212 °F (-30 to +100 °C)			
Ambient temperature	-13 to +140 °F (-25 to 60 °C)			
Wetted parts material	AISI 316 L			
Housing material	AISI 316 L			
Enclosure	IP 67			
Weight [lb (kg)]	0.3 (14)			
EMC -	EN 61326-1			
Pressure - mechanical connection	Adaptor solution for 1/2" and 1/4" NPT			
Markings	CE CSA[®] C US			

Dimensions



TM04 9237 1612

Fig. 49 Dimensions RPI transmitter

Pressure sensor

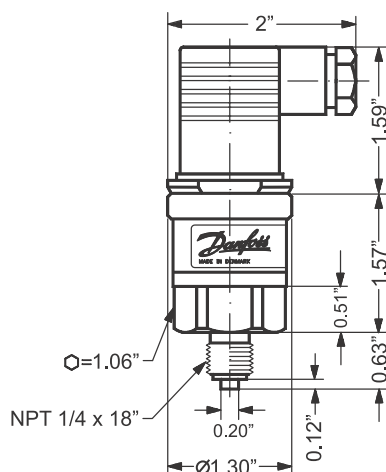


Accessory	Supplier	Type	Pressure range [psi (bar)]	Product number
Pressure sensors Pressure Transmitter with 6 ft screened cable Connection: 1/4" - 18 NPT	Danfoss	MBS3000	0 - 87 (0 - 6)	91136169
			0 - 145 (0 - 10)	91136170
			0 - 232 (0 - 16)	91136171
			0 - 362 (0 - 25)	91136172
			0 - 580 (0 - 40)	91136173
			0 - 870 (0 - 60)	91136174

Technical data

Pressure sensor						
Product number	91136169	91136170	91136171	91136172	91136173	91136174
Pressure range [psi (bar)]	0 - 87 (0 - 6)	0 - 145 (0 - 10)	0 - 232 (0 - 16)	0 - 362 (0 - 25)	0 - 580 (0 - 40)	0 - 870 (0 - 60)
Max. operating pressure [psi (bar)]	300 (20.1)	300 (20.1)	750 (51.7)	1450 (100)	2900 (200)	2900 (200)
Supply voltage	9 - 32 VDC					
Output signal [mA]	4 - 20					
Insulation resistance	> 100 MΩ at 100 V					
Accuracy, typical +/- FS [%]	0.5 %					
Response time, max. [ms]	4 ms					
Medium temperature range [°F (°C)]	-40 to +185 °F (-40 °C to +85 °C)					
Ambient temperature range [°F (°C)]	-40 to +185 °F (-40 °C to +85 °C)					
Wetted parts, material	AISI 316L					
Housing material	AISI 316L					
Enclosure rating	IP65					
Weight [lb (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



TM05 1532 2911

Fig. 50 Dimensional sketch

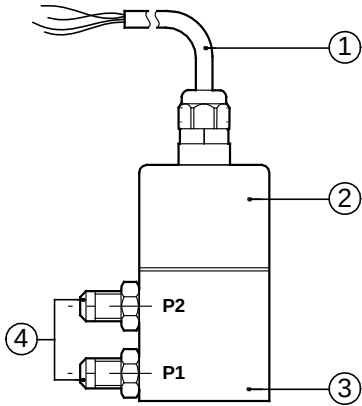
Grundfos differential-pressure sensor, DPI



Grundfos differential-pressure sensor, DPI	Pressure range [psi (bar)]	Product number
• 1 sensor incl. 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 Hp - 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	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 and parts in contact with the liquid are made of Inox DIN 1.4305 (pos. 3) with composite PA top (pos. 2). The connections (pos. 4) are DIN 1.4305, 7/16" UNF connection and gaskets are FKM. A black and screened cable (pos. 1) goes through a screwed connection PG with M 12 x 1.5 connection. The sensor is supplied with angular bracket for mounting on motor or bracket for wall mounting. A specially coated silicon chip is used for greater accuracy.



TM03 2057 3505

Fig. 51 DPI sensor

Technical data

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]						
Max. system pressure, P1 and P2 simultaneously [psi (bar)]	232 (16)						
Rupture pressure [bar]	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)						
Electrical connection	26 GA, 3 ft cable - M12 x 1.5 in 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]	1.2						
EMC (electromagnetic compatibility)	According to EN 60335-1						
Emission/immunity	According to EN 61800-3						
Connections	7/16"-UNF						
Sealing material	FKM						

Dimensions

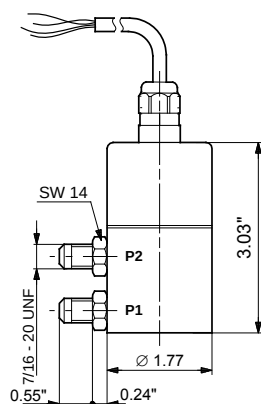


Fig. 52 Dimensional sketch

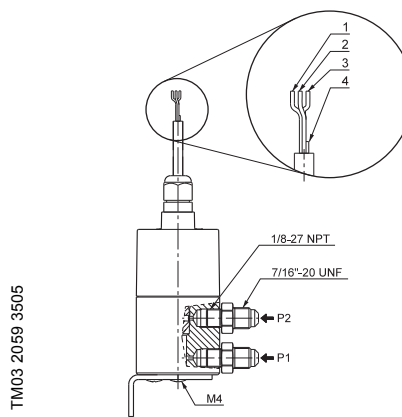
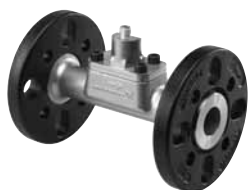


Fig. 53 Wiring

1	12-30 V supply voltage	Brown
2	GND (earth lead)	Yellow
3	Signal lead	Green
4	Test lead (can be cut off during mounting). This lead must not be connected to the power supply.	White

Flow transmitters

- Flow tube in AISI 316 mounted with transmitter
- Transmitter AISI 316 L
- 4-20mA output signal
- 2 x flanges
- 15 ft cable free ends
- Quick Guide



TM04 7362 2210

Type	Flow range [gpm]	Connection	O-ring		Flange Material		Product number
			EPDM	FKM	Cast Iron	Stainless	
VFI 0.3-6	1.3-26	3/4"	•		•		97686127
	1.3-2.6	3/4"	•			•	97688293
VFI 0.6-12	2.6-53	1"	•		•		97686129
	2.6-53	1"	•			•	97688295
VFI 1.3-25	5.7-110	1-1/4"	•		•		97686141
	5.7-110	1-1/4"	•			•	97688297
VFI 2-40	8.8-176	1-3/4"	•		•		97686143
	8.8-176	1-3/4"	•			•	97688299
VFI 3.2-64	14-282	2"	•		•		97686145
	14-282	2"	•			•	97688301
VFI 5.2-104	23-458	2-1/2"	•		•		96788476
VFI 8-160	35-704	3"	•		•		97788478
VFI 8-160	53-1060	4"	•		•		97788492

1) For more information about the VFI sensor, see the Grundfos Direct Sensors™ data booklet, publication number 97790189, on www.grundfos.com (WebCAPS).

Gauges

Accessory	Measuring range [psi]	Product number
Liquid filled pressure gauge • AISI 304/Copper	30" Hg - 30 psi	91123566
	0 - 60 psi	00ID8562
	0 - 100 psi	00ID8563
	0 - 160 psi	00ID8564
	0 - 200 psi	00ID8565
	0 - 300 psi	00ID8566
	0 - 400 psi	00ID8567
	0 - 600 psi	00ID8568
Liquid filled pressure gauge • AISI 316	30" Hg - 30 psi	91130835
	0 - 30 psi	00ID8569
	0 - 60 psi	00ID8570
	0 - 100 psi	00ID8571
	0 - 160 psi	00ID8572
	0 - 200 psi	00ID8573
	0 - 300 psi	00ID8574
	0 - 400 psi	00ID8575
	0 - 600 psi	00ID8576

MP 204 motor protector



TM03 1471 2205

Fig. 54 MP 204

The MP 204 is an electronic motor protector and data collecting unit. Apart from protecting the motor, it can also send information to a control unit via GENIbus, like for instance:

- trip
- warning
- energy consumption
- input power
- motor temperature.

The MP 204 protects the motor primarily by measuring the motor current by means of a true RMS measurement.

The pump is protected secondarily by measuring the temperature with a Tempcon sensor, a Pt100/Pt1000 sensor and a PTC sensor/thermal switch.

The MP 204 is designed for single- and three-phase motors.

Note: The MP 204 must not be used together with variable frequency drives.

Features

- Phase-sequence monitoring
- indication of current or temperature
- input for PTC sensor/thermal switch
- indication of temperature in °C or °F
- 4-digit, 7-segment display
- setting and status reading with the Grundfos R100 remote control
- setting and status reading via the Grundfos GENIbus fieldbus.

Tripping conditions

- Overload
- underload (dry running)
- temperature
- missing phase
- phase sequence
- overvoltage
- undervoltage
- power factor ($\cos \varphi$)
- current unbalance.

Warnings

- Overload
- underload
- temperature
- overvoltage
- undervoltage
- power factor ($\cos \varphi$)
- run capacitor (single-phase operation)
- starting capacitor (single-phase operation)
- loss of communication in network
- harmonic distortion.

Learning function

- Phase sequence (three-phase operation)
- run capacitor (single-phase operation)
- starting capacitor (single-phase operation)
- identification and measurement of Pt100/Pt1000 sensor circuit.

Product number

Description	Product number
MP 204 motor protection	96079927

21. Submittal data

CM, CME	Company name:
	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 Fluid			
	Max.	Norm.	Min.	Fluid type:			
Capacity (gpm)				Fluid Temperature (°F)	Rated	Max.	Norm.
Suction Pressure (psig)				at designated temperature			
Discharge Pressure (psig)				Specific Gravity			
Differential Head (ft)				Vapor Pressure (psia)			
Hydraulic Power (Hp)				Viscosity (cp)			
at designated capacity				Fluid ph:		Chlorides (ppm):	
NPSH Available (ft)				Hazardous:		Corrosion/Erosion	
				Flammable:		caused by:	
				Other:			

Service

Continuous
Intermittent (starts/day):

Pump Information

Model Information from Type Key and Codes:
Quantity Required:
Minimum required flow:

NPSH required at duty point:

Product Guide additional information pages

Materials page number:
Technical data page number:

Performance curve page number:
Motor data page number:

Motor Information

Hp:	Phase:	Voltage:	Enclosure:
-----	--------	----------	------------

Custom-built pump information (optional):

Additional Information

22. Quotation text

CM, CME

Vertical, non-self-priming, multistage, in-line, centrifugal pump for installation in pipe systems and mounting on a foundation.

The pump has the following characteristics:

- impellers and intermediate chambers are made of AISI _____ Stainless steel
- Pump head and base are made of _____
- Power transmission is via cast iron split coupling.
- pipework connections is via _____
- The motor is a _____ -phase AC motor.

Technical

Rated flow: _____ gpm
 Rated head: _____ Feet
 Minimum liquid temperature: _____ °F
 Maximum liquid temperature: _____ °F
 Type of shaft seal: _____

Materials

Material, pump housing: _____
 Material, shaft: AISI _____ Stainless Steel
 Material, impeller: AISI _____ Stainless Steel
 Material, sleeve: AISI _____ Stainless Steel
 Material, seal metal: AISI _____ Stainless Steel
 - seal face: _____
 - seal face: _____
 - seal elastomer: _____

Installation

Maximum ambient temperature: _____ °F
 Max. pressure at stated temp.: _____ PSI/ °F
 Standard, pipe connection: _____
 Size, pipe connection: _____
 Rated pressure, pipe connection: _____ PSI
 Frame size for motor: _____ NEMA

Electrical data

Motor type: _____
 Rated power (P2): _____ HP
 Frequency: _____ Hz
 Rated voltage: _____ V
 Rated current: _____ A
 Service factor: _____
 Starting current: _____ A
 Rated speed: _____ RPM
 Full load motor efficiency: _____ %
 Insulation class: _____

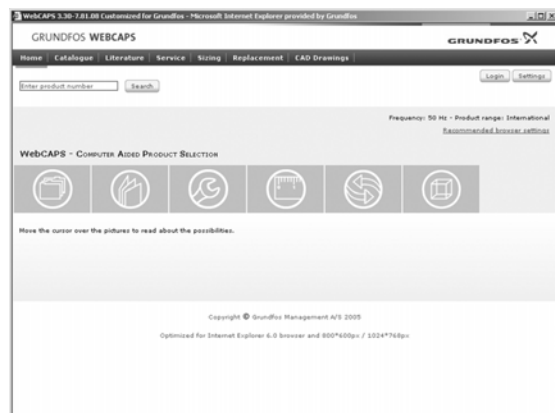
Additional

Gross weight: _____ Lbs.
 Shipping volume: _____
 Model: _____

Quotation text

23. Further product documentation

WebCAPS

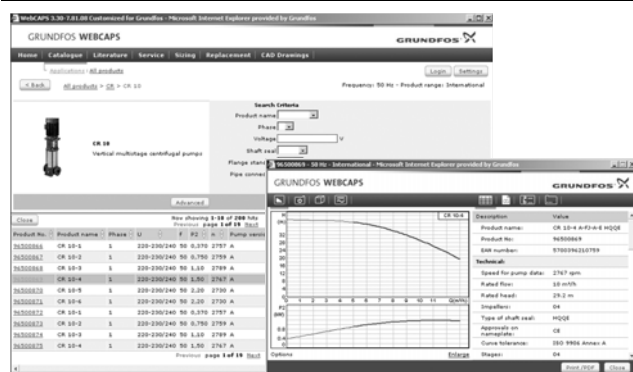


WebCAPS is a **Web-based Computer Aided Product Selection** program available on www.grundfos.com.

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

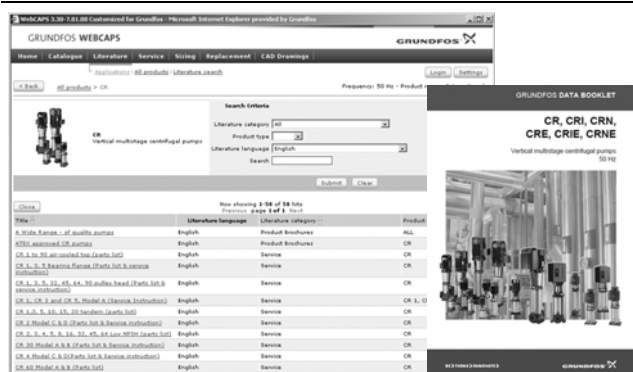
- Catalog
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalog

Based on fields of application and pump types, this section contains the following:

- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

This section contains all the latest documents of a given pump, such as

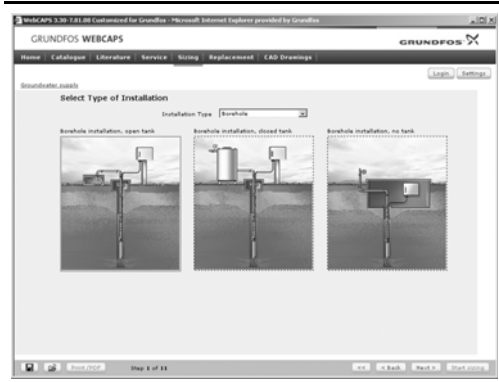
- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalog and Service kit instructions
- quick guides
- product brochures.



Service

This section contains an easy-to-use interactive service catalog. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.

Furthermore, the section contains service videos showing you how to replace service parts.



Sizing

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

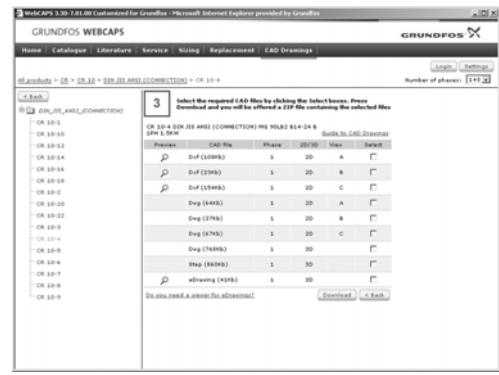
- Select the most suitable and efficient pump for your installation
- Carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- Analyze your selected pump via the built-in life cycle cost tool
- Determine the flow velocity in wastewater applications, etc.



Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump. The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



CAD drawings

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

- 2-dimensional drawings:
- .dxf, wireframe drawings
 - .dwg, wireframe drawings.
- 3-dimensional drawings:
- .dwg, wireframe drawings (without surfaces)
 - .stp, solid drawings (with surfaces)
 - .eprt, E-drawings.



WinCAPS



Fig. 55 WinCAPS CD-ROM

WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on CD-ROM and updated once a year.

GO CAPS

Mobile solution for professionals on the GO!



CAPS functionality on the mobile workplace.



Subject to alterations.

L-CM-PG-001

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