CM, CME

North America

Horizontal, multistage centrifugal pumps

60 Hz

GRUNDFOS

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1. Product introduction

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

The pumps are available in these three material versions:

- cast iron (ASTM A48 CL30 / EN-GJL-200)[1)]
- stainless steel (AISI 304 / EN 1.4301)
- stainless steel (AISI 316 / EN 1.4401).

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

CM

TM078902

Grundfos CM pumps

Pos.	Description
1	Cast-iron version
2	Stainless-steel version

The CM pumps are unique products that have been developed to fulfil a wide variety of customer demands.

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

The CM pumps consist of two main components: the motor and the pump unit. The motor is a Grundfos motor designed to EN and ANSI standards. The pump unit incorporates optimized hydraulics and offers various types of connections.

The pumps offer many advantages, some of which are listed below and described in detail in the section on features and benefits.

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

Related information

3. Features and benefits

CME

TM066197

Grundfos CME pump

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 designed to EN standards. The motor incorporates a frequency converter.

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 continuous variable control of the motor speed is to adjust the performance to a given requirement.

You can connect a pressure sensor to the built-in frequency converter on CME pumps. For further information, see the section on sensors.

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

Related information

Communication with CME pumps

Grundfos ISP44 pressure sensor

Highest energy efficiency rating worldwide

CME pumps 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 pump efficiency.

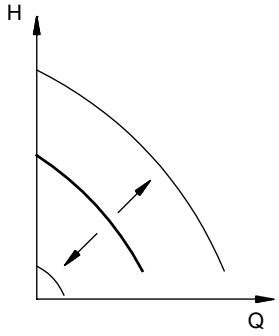
The motor is energy efficiency class IE5 according to IEC 60034-30-2.

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.



TM078878

Constant curve

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.

When to select an E-pump

Select an E-pump if the following is required:

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

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

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

Related information

Communication with CME pumps

CME permanent magnet motor

Supply voltage

MLE 0.75 to 2 hp, 1/60/200-240

MLE 2 hp, 3/60/200-240

MLE 2 to 3 hp, 3/60/440-480

The CME pumps in this range are fitted with the 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.

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

- Signal relay outputs
  - Signal relay 1:

    LIVE:

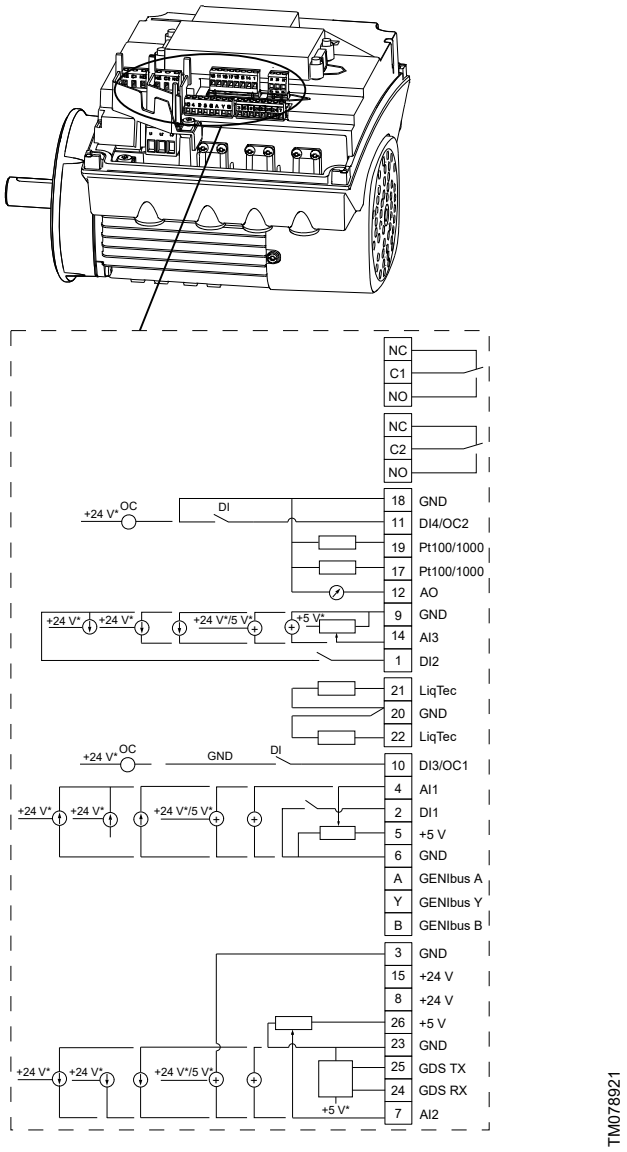
    Power supply voltages up to 250 VAC can be connected to this output.

    PELV:

    The output is galvanically separated from other circuits. Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.
  - Signal relay 2:

    PELV:

    The output is galvanically separated from other circuits. Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.
- Power supply (terminals N, PE, L or L1, L2, L3, PE).



* If you use an external supply source there must be a connection to GND.

Connection terminals, CME pump

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 FM 300 has these connections:

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

Connection terminals

Functional module 300 has been selected as standard for CME pumps.

See fig. Pressure boosting.

Terminal	Type	Function
NC	Normally closed contact	Signal relay 1 (LIVE or PELV)
C1	Common	
NO	Normally open contact	
NC	Normally closed contact	Signal relay 2 (PELV only)
C2	Common	
NO	Normally open contact	
18	GND	Ground
11	DI4/OC2	Digital input / output, configurable. Open collector: Max. 24 V resistive or inductive.
19	Pt100/1000 input 2	Pt100/1000 sensor input
17	Pt100/1000 input 1	Pt100/1000 sensor input
12	AO	Analog output: 0-20 mA / 4-20 mA 0-10 V
9	GND	Ground
14	AI13	Analog input: 0-20 mA / 4-20 mA 0-10 V
1	DI2	Digital input, configurable
21	LiqTec sensor input 1	LiqTec sensor input (white conductor)
20	GND	Ground (brown and black conductors)
22	LiqTec sensor input 2	LiqTec sensor input (blue conductor)
10	DI3/OC1	Digital input / output, configurable. Open collector: Max. 24 V resistive or inductive.
4	AI1	Analog output: 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

Terminal	Type	Function
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

Related information

Pressure boosting

Supply voltage

MLE 3 to 7.5 hp, 3/60/200-240

MLE 5 to 7.5 hp, 3/60/440-480

FM310 and FM311

Inputs and outputs

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

The module has the following connections:

- three analog inputs
- one analog output
- two dedicated digital inputs
- two configurable digital inputs or open-collector outputs
- Grundfos Digital Sensor input and output
- two Pt100/1000 inputs
- two LiqTec sensor inputs
- two signal relay outputs
- GENIbus/Modbus connection
- two Safe Torque Off (STO) inputs[2)]
- Ethernet connection
- Bluetooth (BLE) connection.[3)]

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

3) The FM311 is without Bluetooth.

Connection terminals

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

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

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

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

Signal relay outputs

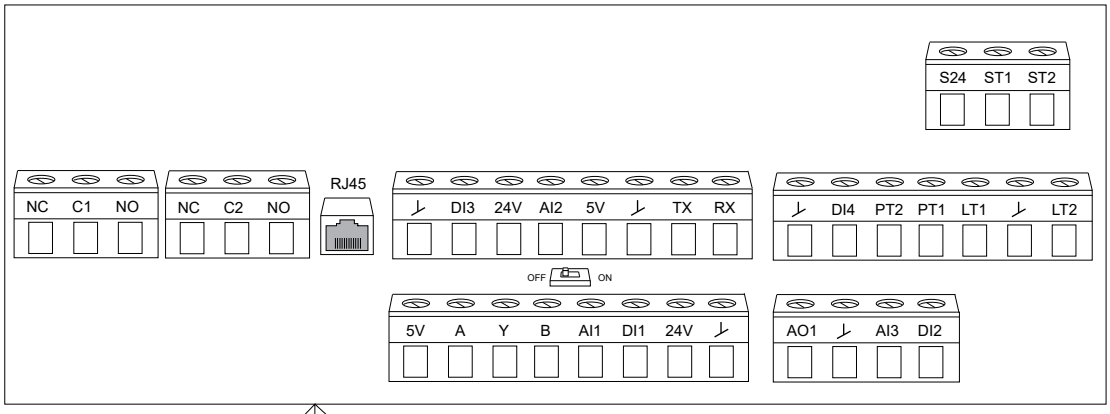
Signal relay 1

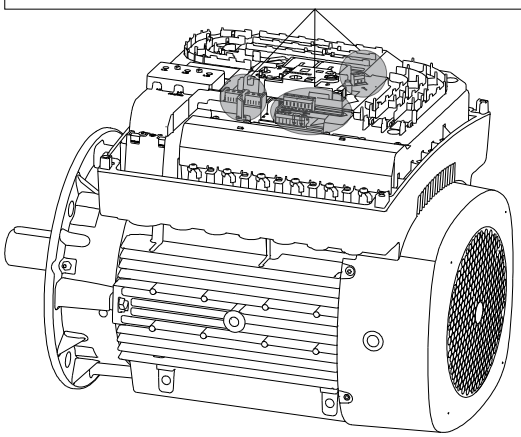
LIVE: You can connect supply voltages up to 250 VAC to the output.

SELV: The output is galvanically separated from other circuits. Therefore, you can connect the supply voltage or safety extra-low voltage to the output as desired.

Signal relay 2

SELV: The output is galvanically separated from other circuits. Therefore, you can connect the supply voltage or safety extra-low voltage to the output as desired.





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

Terminal	Type	Function
GND	GND	Signal ground Brown and black conductors
LT2	LiqTec sensor input 2	LiqTec sensor input 2 Blue conductor
5V	+5 V	Power supply to a potentiometer or sensor
A	GENIbus, A	GENIbus, A (+) / Modbus, D1 (+)
Y	GENIbus, Y	GENIbus, GND / Modbus, GND
B	GENIbus, B	GENIbus, B (-) / Modbus, D0 (-)
AI1	AI1	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V
DI1	DI1	Digital input [4], configurable
24V	+24 V	Power supply
GND	GND	Signal ground
AO1	AO	Analog output: • 0-20 mA or 4-20 mA • 0-10 V
GND	GND	Signal ground
AI3	AI3	Analog input: • 0-20 mA or 4-20 mA • 0.5 - 3.5 V, 0-5 V or 0-10 V
DI2	DI2	Digital input, configurable
S24	+24 V (STO)	Power supply to the Safe Torque Off inputs
ST1	STO1	Safe Torque Off - Input 1
ST2	STO2	Safe Torque Off - Input 2

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

2. Applications

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

Some of the most typical applications are listed below:

- cooling of server racks, chiller units, laser weldings
- hygienic cleaning, car wash, industrial dishwashers, CIP (clean-in-place) units
- pressure boosting in industrial / CBS (commercial building services) / DBS (domestic building services) water supply systems
- level control in tank filling
- water treatment in smaller RO (reverse osmosis) units.

Temperature control

The pumps are used in applications where a heating or cooling liquid is circulated in a closed loop to optimize temperatures. The pumps are also used for the cooling of equipments, or food and beverages in the food production industry.

TM085312

Server cooling racks in a server cooling room

TM085310

Cooling for laser equipment

The pumps can be used in temperature control systems such as the following:

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

The pumps are designed to ensure safe and reliable operation in applications involving temperature control.

The pumps are suitable for the following typical applications:

- liquids at temperatures from -4 °F (-20 °C) to +248 °F (+120 °C)
- water, anti-cooling liquids, coolant, oil, solute chemicals.

When pumping liquids at different temperatures, pump parts need to be made of appropriate materials and have appropriate sealings, such as O-rings and shaft seals. Liquids with viscosity and density different from water will affect pump performance, including, for example, power consumption.

On top of the range of standard pumps available for washers, Grundfos also offers special pumps developed to handle different media. If the water contains oil, the shaft seal material must be able to withstand the specific liquid. Particularly aggressive detergents require that the pump material is also designed for handling such liquids.

For more information on pump selection, see the liquids section in Grundfos Product Center at www.grundfos.com.

Pumping high-temperature liquids

Pumping hot liquids such as water-based liquids up to 248 °F (120 °C) is hard on the pump parts, including shaft seals, rubber parts and sleeve versions.

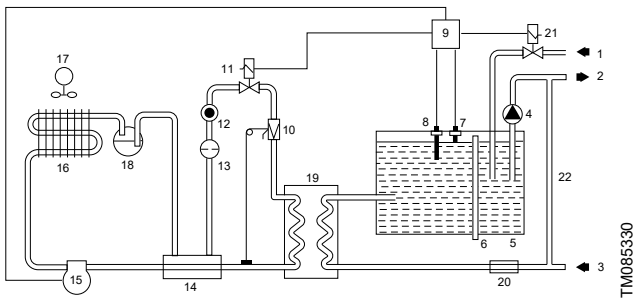
Pumping high-viscous liquids

In applications where high-viscous liquids are pumped, the motor of the pump can get overloaded, which reduces the pump performance.

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

Pumps with oversize motors meet the above requirements.

CM and CME in temperature control systems



TM085330

Temperature control system

Pos.	Description
1	Water inlet
2	Exit flow
3	Return flow
4	Pump
5	Tank
6	Overflow pipe
7	Level sensor
8	Temperature sensor
9	Microprocessor
10	Thermostatic expansion valve
11	Solenoid valve, R407C
12	Sight glass
13	Filter
14	Heat equalizer
15	Compressor
16	Air cooled condenser
17	Fan
18	Receiver
19	Evaporator
20	Flow control
21	Solenoid valve water intake
22	Bypass

Washing and cleaning

CM and CME pumps can be used in washing and cleaning applications, which usually involve high liquid temperatures, many starts and stops, or mounting the pump on a trolly.

TM085308

Cleaning system in a dairy plant

TM085307

Cleaning system in a car wash

Typical washing and cleaning applications are as follows:

- 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 (clean-in-place).

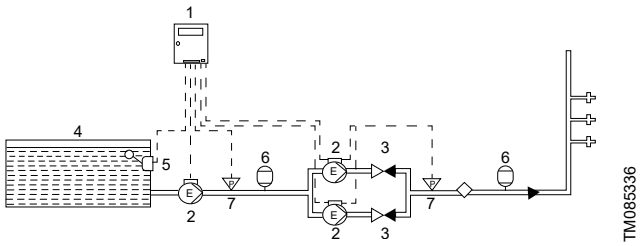
CM and CME in washing and cleaning systems

Grundfos has many years of experience in the washing and cleaning business.

We offer a variety of dedicated solutions, for example, the following:

- vehicle washes
- wash-down systems
- parts washers.

Grundfos pumps include very compact pumps that save space without compromising on performance. Grundfos offers motors, speed control units and monitors that improve the performance of the system. If you are building a new washing and cleaning system, we recommend that you contact Grundfos early in the development process. Most of our pumps can be adjusted to match specific requirements and optimise the entire system.



Washing and cleaning system

Pos.	Description
1	Grundfos LC level controller
2	Pump
3	Valve
4	Tank
5	Level switch
6	Pressure tank
7	Pressure sensor

Grundfos pumps are suitable for parts washer applications in the industry, allowing pumps to be customized in terms of flow rate and pressure to accommodate individual demands.

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.

TM054759

Pressure boosting for tap water

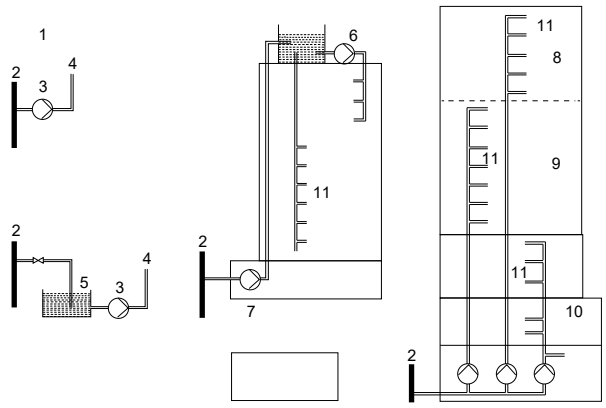
TM085311

Pressure boosting in tall buildings

Typical pressure-boosting applications are as follows:

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

CM and CME in pressure boosting systems



TM085305

Pressure boosting systems

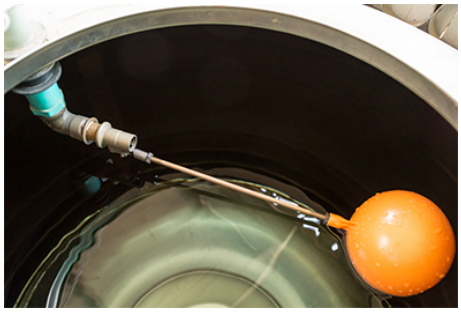
Pos.	Description
1	Direct boosting
2	Water mains
3	Booster system
4	Exit flow to building
5	Break tank system
6	Pressure boosting from roof tank
7	Water transport to roof tank
8	Zone 3
9	Zone 2
10	Zone 1
11	Taps

Pressure boosting in large buildings is necessary if the public water supply is inadequate to supply the building due to low pressure or flow during peak consumption.
The goal is to ensure a constant pressure throughout the building. Commercial buildings have predictable consumption variations during the day.

Level control

TM085306

Roof tanks

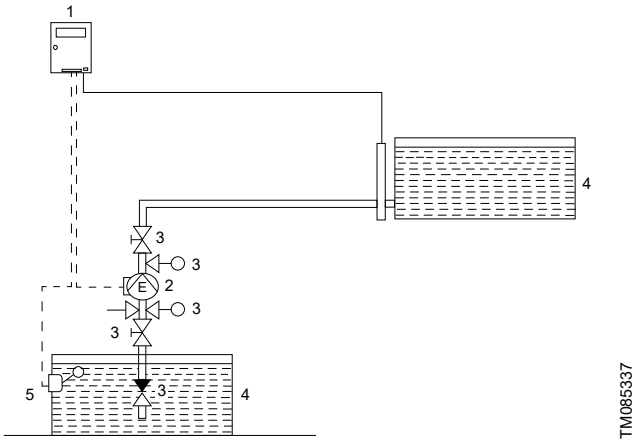


TM085309

Level control float switch

Typical level control applications

- Drainage and tank filling applications
- roof tank filling.



Level control system

Pos.	Description
1	Grundfos LC level controller
2	Pump
3	Valve
4	Tank
5	Level switch

Consumption patterns are different between industries. Some require frequent use of water in smaller amounts while others need to fill or empty one or more large tanks quickly, or keep a constant level in the tanks. For constant level control, Grundfos offers P and PI control for filling and emptying applications. The full range of Grundfos pumps can be used for this application, depending on the specific demands.

The level can be controlled by a variety of sensors:

- pressure sensor
- differential pressure sensors
- capacitive sensors
- ultrasonic sensors
- float switches.

Filling requires direct regulation.

Emptying requires inverse regulation.

CME in selected applications

Electronic speed control pumps for single-phase or three-phase power supply provide intelligent pump operations that always match system loads.

The industry uses a large number of pumps in many different applications. Speed control is necessary in many applications due to different pump performances and operation modes.

Maximum efficiency and minimum energy consumption are guaranteed. Furthermore, operating profiles can be customized.

CME pumps are suited for temperature control, washing and cleaning, pressure boosting and other industrial applications.

Other applications

The CM and CME pumps can be used in many other applications.

Examples:

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

3. Features and benefits

TM078910

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 compactness is important.

Modular construction (customized solutions)

The modular construction of the 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.
- The CM and CME product ranges have been approved and are marked for worldwide usage. See the section on approvals.

High reliability

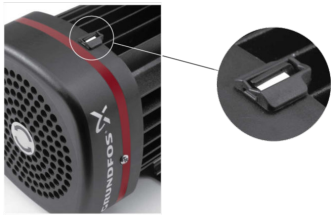
New state-of-the-art shaft-seal design and materials offer these benefits:

- 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 commissioning

- An installation indicator fitted to three-phase CM pumps 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. The indicator for motor rotation shows black if rotation is correct, white if rotation is incorrect.



TM050870

Installation indicator

Service-friendly

- Service was in mind during the development.
- No special service tools are required.
- Spare parts are in stock for quick delivery.
- Service parts are available as kits, single parts or bulks.
- Service instructions and video make it simple to disassemble and assemble the pump.
- Service kit instructions are available where estimated necessary.

Additional features and benefits for self-priming pumps

The CM self-priming pump can create a suction lift of up to 26 feet (8 meters) in less than 5 minutes when installed and commissioned correctly.

- The pump is available in stainless steel AISI 304 / EN 1.4301 with EPDM or Viton O-rings.
- The pump is available for single-phase operation as standard and for three-phase operation on request.

Wide performance range

The pumps can be used in a wide range of applications, such as the following:

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

See the product range in Grundfos Product Center at www.grundfos.com.

Low noise level

The pumps offer very silent operation.

High-performance hydraulics

Pump efficiency is optimized by the compact design of the hydraulic components 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 pumps. For further information, see the section on customization.

- Motor adaptation

- pump modifications.

Grundfos motor

Grundfos motors are remarkably silent and highly efficient.

Grundfos motors are available with an integrated frequency converter designed for speed-controlled operation.

Related information

21. Customization

4. Identification

Type key CM, CME

Example

CM 10-3 A-S-I-E-AQQE E-A-A-N

Code	Explanation
CM	Type range: CM, CME
10	Rated flow rate
3	Number of impellers
A	Code for pump version
S	Code for pipe connection
I	Code for materials in contact with pump media
E	Code for rubber parts in pump (excluding neck ring and shaft seal)
A Q Q E	Code for shaft seal: • Shaft seal • Material of rotating seal face • Stationary seal face material • Secondary seal material
E	Supply voltage
A	Code for motor information
A	Code for mains plug
N	Code for sensor

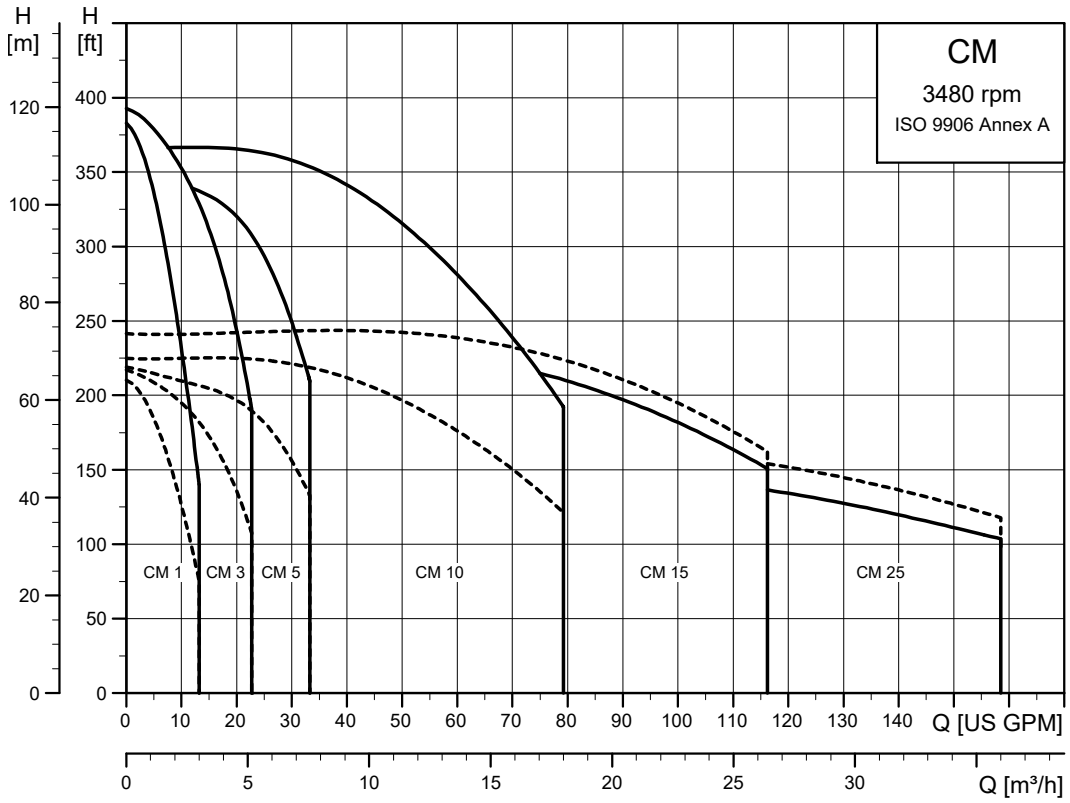
Key to codes

Code	Description
Pump version	
A	Basic version
B	Oversize motor (one kW size larger)
D	Special nameplate
E	Pumps with certificates/approvals
N	CME pump with pressure sensor
P	Undersize motor (one kW size smaller)
T	Oversize motor (two kW sizes larger)
O	Self-priming version (maximum suction lift 26 feet (8 meters))
S	Self-priming version (maximum suction lift 13 feet (4 meters))
X	Special pump
Note that two letters symbolize that two parameters have been combined.	
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	Inlet and outlet parts: EN-GJL-200 Pump shaft: AISI 304 / EN 1.4301 Impellers/chambers: AISI 304 / EN 1.4301
G	Sleeve: AISI 316 / EN 1.4401 Pump shaft: AISI 304 / EN 1.4301 Impellers/chambers: AISI 316 / EN 1.4401
I	Sleeve: AISI 304 / EN 1.4301 Pump shaft: AISI 304 / EN 1.4301 Impellers/chambers: AISI 304 / EN 1.4301
X	Special version
Rubber parts in pump (excluding neck ring and shaft seal)	
E	EPDM (ethylene propylene)
K	FFKM (perfluoroelastomer)
V	FKM (fluoroelastomer)
Note that gaskets between chambers of cast-iron versions are always made of Tesnit® BA-U	
Shaft seal	
A	O-ring seal with fixed driver
R	O-ring seal with fixed driver and reduced seal face
Material of rotating seal face	
Q	Silicon carbide (SIC)
V	Aluminium oxide (AI203)
U	Tungsten carbide
Stationary seal face material	
B	Carbon, resin-impregnated
Q	Silicon carbide (SIC)
U	Tungsten carbide
Secondary seal material	
E	EPDM (ethylene propylene)
K	FFKM (perfluoroelastomer)
V	FKM (fluoroelastomer)
Supply voltage	
A	1 x 220 V, 60 Hz
B	1 x 115/230 V, 60 Hz
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
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 [1)]
I	3 x 400 V, 50/60 Hz [1)]
J	3 x 380-415 V, 50 Hz; 440-480 V, 60 Hz
O	3 x 220-240/380-415 V, 50 Hz; 3 x 220-255/380-440 V, 60 Hz
R	3 x 200-230 V, 50/60 Hz (E-motor)
S	3 x 380-500 V, 50/60 Hz (E-motor)
T	3 x 440-480 V, 50/60 Hz (E-motor)
U	1 x 200-240 V, 50/60 Hz (E-motor)
V	3 x 200-240 V, 50/60 Hz (E-motor)
X	Special voltage
Motor information	
A	Standard motor (IP55)
B	Phase-insulated motor for use with variable frequency drive
C	Condensing environments

Code	Description
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
J	IPX5
Mains plug	
A	Prepared for cable glands
B	Harting plug
C	With cable
D	Cable gland included
Sensor	
N	No sensor

5. Performance range

CM, 3480 rpm



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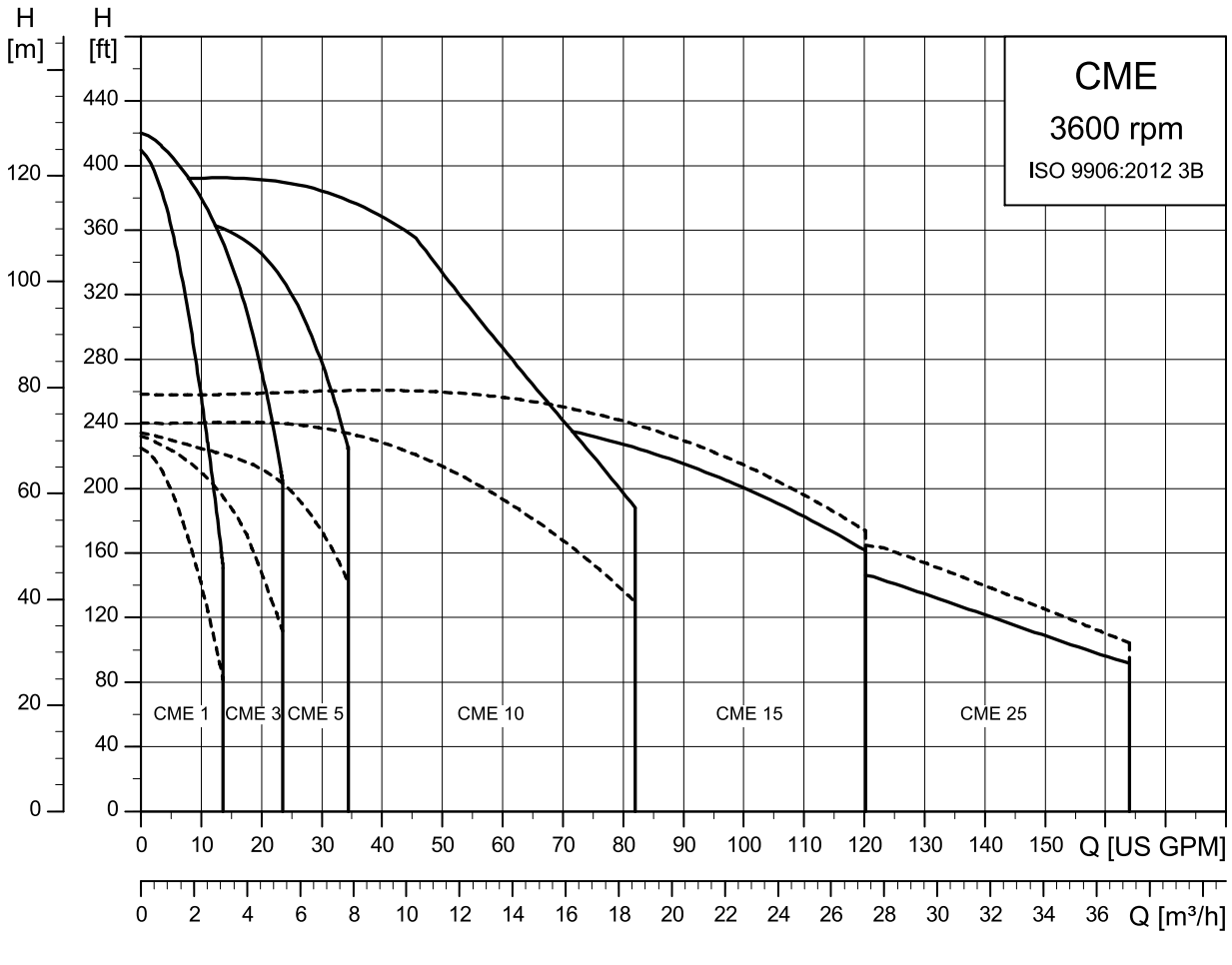
- - - - - CM-A

——— CM-I/G

CME, 3600 rpm

(Supply voltages T, U, V)



- - - - - CME-A

——— CME-I/G

Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

6. Product range

Pump type	60 Hz			Shaft seal			Power supply				Electronically speed controlled motor			Pump type	60 Hz			Shaft seal			Power supply				Electronically speed controlled motor		
	Material						60 Hz				Voltage [V]				Material						60 Hz				Voltage [V]		
	Cast iron EN-GJL-200 (CM-A)	Stainless steel AISI 304 / EN 1.4301 (CM-I)	Stainless steel AISI 316 / EN 1.4401 (CM-G)	AVBE[5], AVBV[5]	AQQE, AQQV, AQQK[5], AQBE[5], AQBV[5], AQBK	RUUE, RUUV	1 x 115/230 V (supply voltage B) [6]	3 x 208-230/440-480 V (supply voltage E) [6]	3 x 575 V (supply voltage H)	3 x 440-480 V (supply voltage J)	3 x 200-240 V, (50/60 Hz) (supply voltage V)	3 x 440-480 V, (50/60 Hz) (supply voltage T)	1 x 200-240 V, (50/60 Hz) (supply voltage U)		Cast iron EN-GJL-200 (CM-A)	Stainless steel AISI 304 / EN 1.4301 (CM-I)	Stainless steel AISI 316 / EN 1.4401 (CM-G)	AVBE[5], AVBV[5]	AQQE, AQQV, AQQK[5], AQBE[5], AQBV[5], AQBK	RUUE, RUUV	1 x 115/230 V (supply voltage B) [6]	3 x 208-230/440-480 V (supply voltage E) [6]	3 x 575 V (supply voltage H)	3 x 440-480 V (supply voltage J)	3 x 200-240 V, (50/60 Hz) (supply voltage V)	3 x 440-480 V, (50/60 Hz) (supply voltage T)	1 x 200-240 V, (50/60 Hz) (supply voltage U)
CM 1-2	•	•	•	•	•	•	•	•	•	•			•	CM 5-2	•	•	•	•	•	•	•	•	•	•			•
CM 1-3	•	•	•	•	•	•	•	•	•	•			•	CM 5-3	•	•	•	•	•	•	•	•	•	•			•
CM 1-4	•	•	•	•	•	•	•	•	•	•			•	CM 5-4	•	•	•	•	•	•	•	•	•	•	•	•	•
CM 1-5	•	•	•	•	•	•	•	•	•	•			•	CM 5-5	•	•	•	•	•	•	•	•	•	•	•	•	
CM 1-6		•	•	•	•	•	•	•	•	•			•	CM 5-6		•	•	•	•	•		•	•	•	•	•	
CM 1-7		•	•	•	•	•	•	•	•	•			•	CM 5-7		•	•	•	•	•		•	•	•	•	•	
CM 1-8		•	•	•	•	•	•	•	•	•			•	CM 5-8		•	•	•	•	•		•	•	•	•	•	
CM 1-9		•	•	•	•	•	•	•	•	•	•	•	•	CM 10-1	•	•	•	•	•	•	•	•	•	•			•
CM 3-2	•	•	•	•	•	•	•	•	•	•			•	CM 10-2	•	•	•	•	•	•		•	•	•	•	•	
CM 3-3	•	•	•	•	•	•	•	•	•	•			•	CM 10-3	•	•	•	•	•	•		•	•	•	•	•	
CM 3-4	•	•	•	•	•	•	•	•	•	•			•	CM 10-4		•	•	•	•	•		•	•	•	•	•	
CM 3-5	•	•	•	•	•	•	•	•	•	•			•	CM 10-5		•	•	•	•	•		•	•	•	•	•	
CM 3-6		•	•	•	•	•	•	•	•	•	•	•	•	CM 15-1	•	•	•	•	•	•		•	•	•	•	•	
CM 3-7		•	•	•	•	•	•	•	•	•	•	•	•	CM 15-2	•	•	•	•	•	•		•	•	•	•	•	
CM 3-8		•	•	•	•	•	•	•	•	•	•	•		CM 15-3	•	•	•	•	•	•		•	•	•	•	•	
CM 3-9		•	•	•	•	•		•	•	•	•	•		CM 25-1	•	•	•	•	•	•		•	•	•	•	•	
														CM 25-2	•	•	•	•	•	•		•	•	•	•	•	

5) On request.

6) Pumps with supply voltages B and E are supplied for wire connection without a terminal board inside the terminal box (flying wires).

7. Operating conditions

Ambient temperature

The maximum ambient temperature depends on the liquid temperature. The table below shows within which temperature ranges the pumps must be used.

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

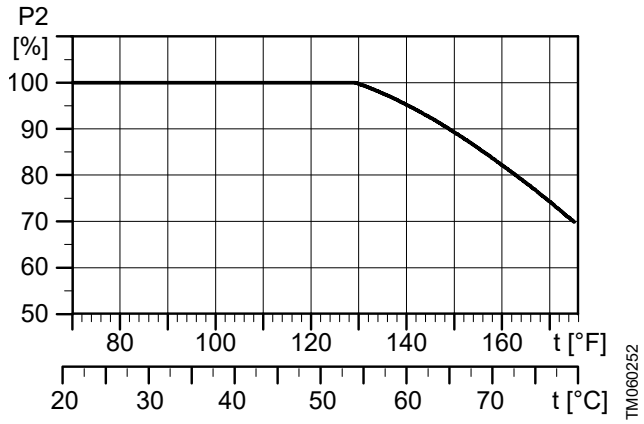
Maximum ambient temperature [°F (°C)]	Minimum ambient temperature [°F (°C)]	Liquid temperature [°F (°C)]	Pump type	
			CM	CME [7]
131 (55)	-4 (-20)	140 (60)	•	-
131 (55)		194 (90)	•	-
122 (50)		212 (100) [7]	•	•
113 (45)		230 (110) [7]	•	•
104 (40)		248 (120) [7]	•	•

7) CME (supply voltages T, U)

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. Contact Grundfos for further information.



Derating of motor, 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 would be reduced.

Maximum ambient temperature

CME 0.75 to 7.5 Hp (supply voltages T, U):

122 °F (50 °C).

CME 2 to 7.5 Hp (supply voltage V):

104 °F (40 °C).

Storage and transport temperature

-22 to +140 °F (-30 to +60 °C).

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 [8] [°F (°C)]	Maximum operating pressure [psi (bar)]
Cast iron (A48 CL30 / EN-GJL-200)	AVBx	-4 to +104 (-20 to +40)	145 (10)
		-4 to +194 (-20 to +90)	87 (6)
	AQQx/ AQBx	-4 to +194 (-20 to +90)	145 (10)
	RUUx	-4 to +140 (-20 to +60)	87 (6)
Stainless steel (AISI 304 / EN 1.4301)	AVBx	+4 to +104 (-20 to +40)	145 (10)
		-4 to +194 (-20 to to +90)	87 (6)
	AQQx/ AQBx	-4 [9] to +194 (-20 to +90)	232 (16)
		-4 to +248 (-20 to +120)	145 (10)
	AUQX	-4 [9] to +194 (-20 to +90)	232 (16)
	RUUx	-4 to +140 (-20 to +60)	87 (6)
Stainless steel (AISI 316 / EN 1.4401)	AVBx	-4 to +104 (-20 to +40)	145 (10)
		-4 to +194 (-20 to to +90)	87 (6)
	AQQx/ AQBx	-4 [9] to +194 (-20 to +90)	232 (16)
		-4 to +248 (-20 to +120)	145 (10)
	AUQX	-4 [9] to +194 (-20 to +90)	232 (16)
	RUUx	-4 to +140 (-20 to +60)	87 (6)

8) 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.

9) 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) may 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 outlet pressure against a closed valve.

For example:

CM 5-3 A-S-A-E-AQQE

Maximum operating pressure: 145 psi (10 bar)

Outlet pressure against closed valve: 57 psi (3.93 bar)

Maximum inlet pressure: 145 psi minus 57 psi = 88 psi (6.06 bar).

Minimum inlet pressure

NPSH

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

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

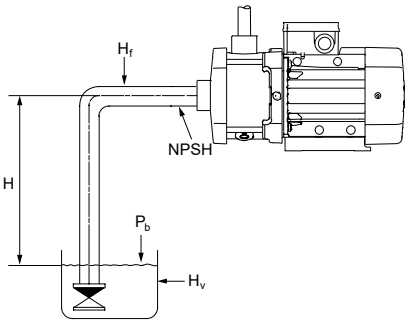
To avoid cavitation, make sure that there is a minimum pressure on the inlet side of the pump. The maximum suction lift "H" in feet of head can be calculated as follows:

$H = p_b – NPSH – H_f – H_v – H_s$

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 rate the pump will be delivering).
H_f	=	Friction loss in inlet pipe in feet of head. (At the highest flow rate the pump will be delivering).
H_v	=	Vapor pressure in feet of head. (To be read from the vapor pressure scale. "H_v" depends on the liquid temperature "T_m").
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.



Minimum inlet pressure (NPSH)

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 rate.

Sound pressure level of CM motors

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 (kW)]	60 Hz
	L_{pA} [dB(A)]
1/2 (0.37)	54
3/4 (0.55)	53
1.0 (0.75)	54
1 1/2 (1.1)	59
2.0 (1.5)	59
3.0 (2.2)	60
4.0 (3.0)	60
5 1/3 (4.0)	64
7 1/2 (5.5)	64
10 (7.5)	65

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 a distance of 3 ft.

Inputs and outputs

Earth reference, GND

All voltages return to GND.

All currents return to GND.

Absolute maximum voltage and current limits

Exceeding the following electrical limits may result in severely reduced operating reliability and motor life:

Relay 1:

Maximum contact load: 250 VAC, 2 A or 30 VDC, 2 A.

Relay 2:

Maximum contact load: 30 VDC, 2 A.

GENI terminals: -5.5 to 9.0 VDC or less than 25 mADC.

Other input or output terminals: -0.5 to 26 VDC or less than 15 mADC.

Digital inputs, DI

Internal pull-up current greater than 10 mA at V_i equal to 0 VDC.

Internal pull-up to 5 VDC (currentless for V_i greater than 5 VDC).

Low logic level: V_i less than 1.5 VDC.

High logic level: V_i greater than 3.0 VDC.

Hysteresis: No.

Screened cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Maximum cable length: 1640 ft (500 m).

Open-collector digital outputs, OC

Current sinking capability: 75 mADC, no current sourcing.

Load types: Resistive or/and inductive.

Low-state output voltage at 75 mADC: Maximum 1.2 VDC.

Low-state output voltage at 10 mADC: Maximum 0.6 VDC.

Overcurrent protection: Yes.

Screened cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Maximum cable length: 1640 ft (500 m).

Analog inputs, AI

Voltage signal ranges:

- 0.5-3.5 VDC, AL AU
- 0-5 VDC, AU
- 0-10 VDC, AU.

Voltage signal: R_i greater than 100 kΩ at 75 °F (25 °C).

Leak currents may occur at high operating temperatures. Keep the source impedance low.

Current signal ranges:

- 0-20 mADC, AU
- 4-20 mADC, AL AU.

Current signal: R_i equal to 292 Ω.

Current overload protection: Yes. Change to voltage signal.

Measurement tolerance:

0-3 % of full scale (maximum-point coverage).

Screened cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Maximum cable length:

1640 ft (500 m) (excl. potentiometer).

Potentiometer connected to +5 V, GND, any AI:

Use maximum 10 kΩ.

Maximum cable length: 328 ft (100 m).

Analog output, AO

Current sourcing capability only.

Voltage signal:

- Range: 0-10 VDC
- minimum load between AO and GND: 1 kΩ
- short circuit protection: Yes.

Current signal:

- Ranges: 0-20 and 4-20 mADC
- maximum load between AO and GND: 500 Ω
- open-circuit protection: Yes.

Tolerance: 0-4 % of full scale (maximum-point coverage).

Screened cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Maximum cable length: 1640 ft (500 m).

Pt100/1000 inputs, PT

Temperature range:

- Minimum -22 °F (-30 °C). 88 Ω / 882 Ω
- maximum 356 °F (180 °C). 168 Ω / 1685 Ω.

Measurement tolerance: ± 2.5 °F (1.5 °C).

Measurement resolution: < 0.5 °F (0.3 °C).

Automatic range detection, Pt100 or Pt1000: Yes.

Sensor fault alarm: Yes.

Screened cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Use Pt100 for short wires.

Use Pt1000 for long wires.

LiqTec sensor inputs [1]

Use Grundfos LiqTec sensor only.

Screened cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Grundfos Digital Sensor input and output, GDS [1]

Use Grundfos Digital Sensor only.

[1] Only applicable for TPE, TPED Series 2000 and TPE3, TPE3 D pumps.

Power supply

+5 V:

- Output voltage: 5 VDC - 5 %/+ 5 %
- maximum current: 50 mADC, sourcing only
- overload protection: Yes.

+24 V:

- Output voltage: 24 VDC - 5 %/+ 5 %
- maximum current: 60 mADC, sourcing only
- overload protection: Yes.

Digital outputs, relays

Potential-free changeover contacts.

Minimum contact load when in use: 5 VDC, 10 mA.

Screened cable: 28-12 AWG, 0.5-2.5 mm^2.

Maximum cable length: 500 m.

Bus input

Grundfos GENIbus protocol, RS-485.

Screened 3-core cable: 28-16 AWG, 0.5 - 1.5 mm^2.

Maximum cable length: 1640 ft (500 m).

EMC (electromagnetic compatibility)

Standard used: EN 61800-3.

The table below indicates the emission category of the motor.

C1: Fulfills the requirements for residential areas.

C3: Fulfills the requirements for industrial areas.

Motor [hp (kW)]	Emission category	
	1450-2000 rpm	2900-4000 rpm 4000-5900 rpm
3/4 (0.55)	C1	C1
1 1/2 (1.1)	C1	C1
2 (1.5)	C1	C1
3 (2.2)	C1	C1
5 (4.0)	C1	C1
7 1/2 (5.5)	C3/C1 [10)]	C1

10) C1, if equipped with an external Grundfos EMC filter.

Immunity: Fulfills the requirements for industrial areas.

Contact Grundfos for further information.

Insulation class

F (IEC 85).

Standby power consumption

5-10 W.

Cable entries

Motor [hp]	Supply voltage	Number and size of cable entries
3/4 - 2	1 x 200-240 V, 50/60 Hz (supply voltage U)	4 x NPT 1/2"
	3 x 200-240 V, 60 Hz (supply voltage V)	4 x NPT 1/2"
	3 x 440-480 V, 50/60 Hz (supply voltage T)	4 x NPT 1/2"
3	3 x 200-240 V, 60 Hz (supply voltage V)	5 x NPT 1/2"
	3 x 440-480 V, 50/60 Hz (supply voltage T)	4 x NPT 1/2"
5	3 x 200-240 V, 60 Hz (supply voltage V)	5 x NPT 1/2"
	3 x 440-480 V, 50/60 Hz (supply voltage T)	5 x NPT 1/2"
7 1/2	3 x 200-240 V, 60 Hz (supply voltage V)	1 x NPT 3/4" + 5 x NPT 1/2"
	3 x 440-480 V, 50/60 Hz (supply voltage T)	5 x NPT 1/2"

Torques

Terminal	Thread size	Maximum torque [ft lb]
L1, L2, L3, L, N	M4	1.33
NC, C1, C2, NO	M2.5	0.37
1-26 and A, Y, B	M2	0.37

Sound pressure level of CME motors

Motor [hp]	Maximum speed stated on nameplate [rpm]	Speed [rpm]	Sound pressure level ISO 3743 [dB(A)]	
			1-phase motors	3-phase motors
3/4	4000	3000	53	53
1 1/2	4000	3000	53	53
2	4000	3000	57	57
3	4000	3000		57
5	4000	3000		60
7 1/2	4000	3000		60

The grey fields indicate that the motor is not available in this MLE motor range.

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.

Alternatively, you can open the bottom drain hole in the motor flange by removing the plug. The enclosure class of the motor is then reduced to IP34. Removing the plug helps prevent condensation in the motor as it will make the motor self-venting and allow water and humid air to escape.

Environmental rating

CME motors hold a UL Type 2 environmental rating for use indoors.

All motors are TEFC (IP55).

When the rubber plug is removed for high humidity the rating becomes IP34. This applies to both CM and CME pumps.

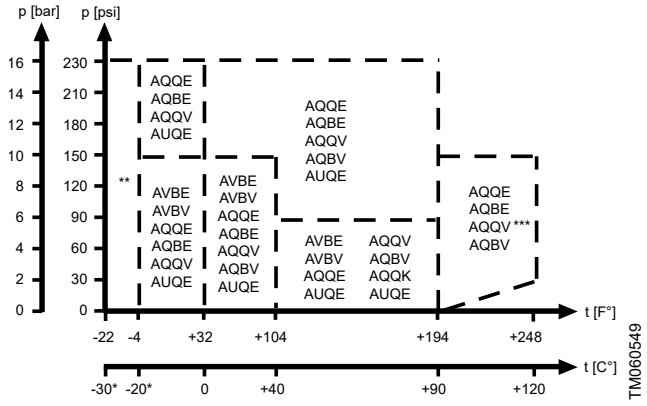
Operating range of the shaft seal

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

The curve in the figure below shows which shaft seals are suitable at a given temperature and a given pressure.

The curve applies to clean water.

For other pumped liquids, concentrations and temperatures, please visit the Grundfos Product Center liquids section at: http://product-selection.grundfos.com/liquids.html

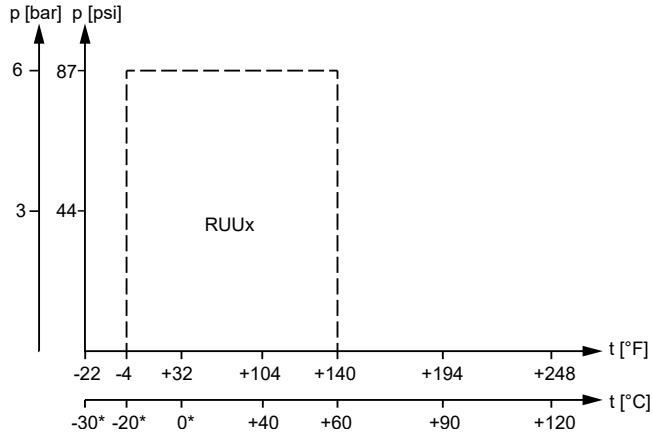


Curve for the selection of AQQx, AQBx and AVBx shaft seals

* Antifreeze must 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.



Curve for RUUx shaft seal

Related information

Selection of shaft seal

Shaft seal run-in

The seal faces are lubricated by the pumped liquid, meaning that there may be a certain amount of leakage from the shaft seal.

When the pump is started up for the first time, or when a new shaft seal is installed, a certain run-in period is required before the leakage is reduced to an acceptable level. The time required for this depends on the operating conditions. For example, every time the operating conditions change, a new run-in period will be started.

Under normal conditions, the leaking liquid will evaporate. As a result, no leakage will be detected.

However, liquids such as kerosene will not evaporate. The leakage may therefore be seen as a shaft seal failure.

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 must be fitted with a larger motor. If in doubt, contact Grundfos or visit the Grundfos Product Center at: http://product-selection.grundfos.com. See the section on Grundfos Product Center.

Related information

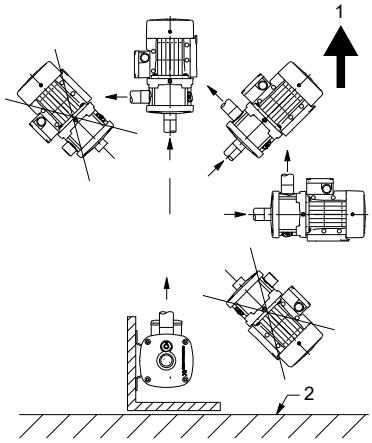
26. Grundfos Product Center

8. Installation

Installation of pump

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

The pump must be installed so that air pockets are avoided in the pump housing and pipes. The figure below shows the permissible pump positions.



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Permissible pump positions

Pos.	Description
1	Floor
2	Up

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

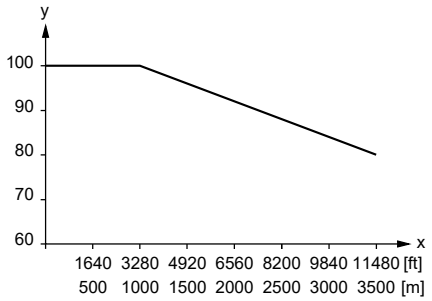
The pump must be installed in a well-ventilated location.

Frequency of starts and stops

Maximum of 100 per hour.

Installation altitude for CME

Installation altitude is the height above sea level of the installation site. Motors installed up to 3280 ft above sea level can be loaded 100 %. The motors can be installed up to 11480 ft above sea level.



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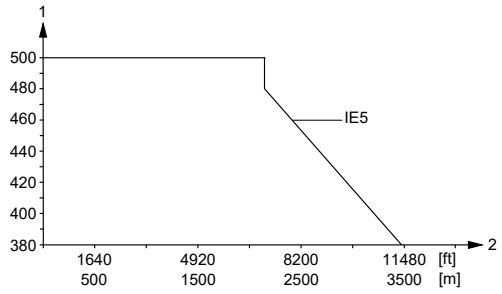
Derating of motor output power P2 % (y-axis) in relation to installation altitude above sea level in feet (x-axis)

In order to maintain the galvanic isolation and ensure correct clearance according to EN 60664-1:2007, you must adapt the supply voltage to the altitude.



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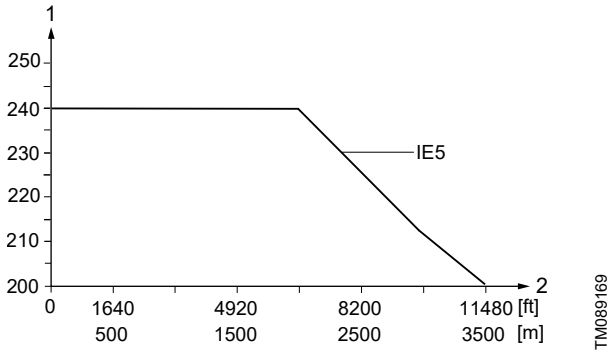
Supply voltage for three-phase motor in relation to altitude

Pos.	Description
1	Supply voltage [V]
2	Altitude

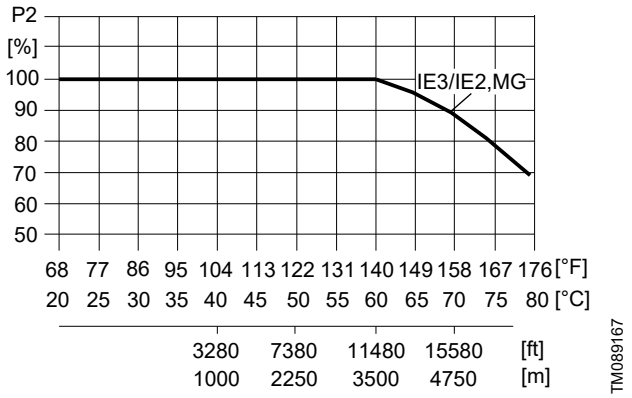


Supply voltage for single-phase motor in relation to altitude

Pos.	Description
1	Supply voltage [V]
2	Altitude

Installation altitude for CM

Installation altitude is the height above sea level of the installation site. Motors installed up to 11480 ft above sea level can be loaded 100 %.



Motor output power in relation to temperature and installation altitude

9. Construction

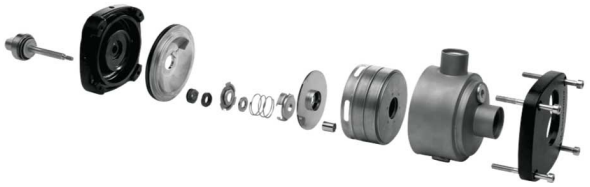
Pump

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

All movable parts are made of stainless steel.

The pumps are available with asynchronous 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.



TM051130

CM and CME pump hydraulics

Motor

The pumps are fitted with totally enclosed, fan-cooled, 2-pole motors. Single-phase CM and CME pumps are available from 0.75 hp to 2 hp. Three-phase CM pumps are available from 0.5 hp to 8.5 hp. Three-phase CME pumps are available from 2 hp to 7.5 hp.

Frequency-controlled MLE motors

The CME pumps are fitted with a totally enclosed, fan-cooled, frequency-controlled MLE motor.

Permanent-magnet motors

Power [hp]	Phase	Voltage [V]
0.75 - 2	1	200-240
2 - 7.5	3	200-240
2 - 7.5	3	440-480

See the Grundfos Product Center at www.grundfos.com.

Electrical data

Mounting designation	NEMA	
Insulation class	F	
Efficiency	See the section on motor data.	
Enclosure class	Motor:	TEFC (Totally Enclosed Fan-Cooled)
	Variable frequency drive:	NEMA Type 2
Supply voltage Tolerance: - 10 %/+ 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 440-480 V, 60 Hz (J)	
	CME	
	0.75 - 2 hp:	1 x 200-240 V, 60 Hz (U)
	2 - 7.5 hp:	3 x 200-240 V, 60 Hz (V)
	2 - 7.5 hp:	3 x 440-480 V, 60 Hz (T)

Efficiency

All three-phase motors 1 hp and above meet the requirements of the Energy Independence and Security Act (EISA).

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.

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 the 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)

The 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 that ML 71- and ML 80-based motors with phase insulation are available on request.

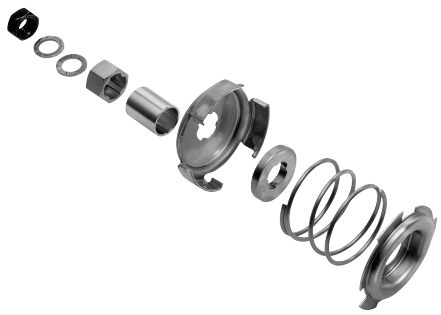
Both increased acoustic noise and detrimental voltage peaks can be eliminated by fitting an LC filter between the variable frequency drive and the motor.

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

Shaft seal

The shaft seal for the 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 the section on the selection of shaft seal, where the key parameters of selecting a shaft seal are also described.



TM051131

Exploded view of shaft seal

Note that the available shaft seals for the 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 the section on the operating range of the shaft seal.

Further information about the shaft seal can be found in the separate booklet covering shaft seals which can be ordered from Grundfos. See the section on Grundfos Product Center.

Title	Publication number
Mechanical shaft seals for pumps	97506935

Related information

Operating range of the shaft seal

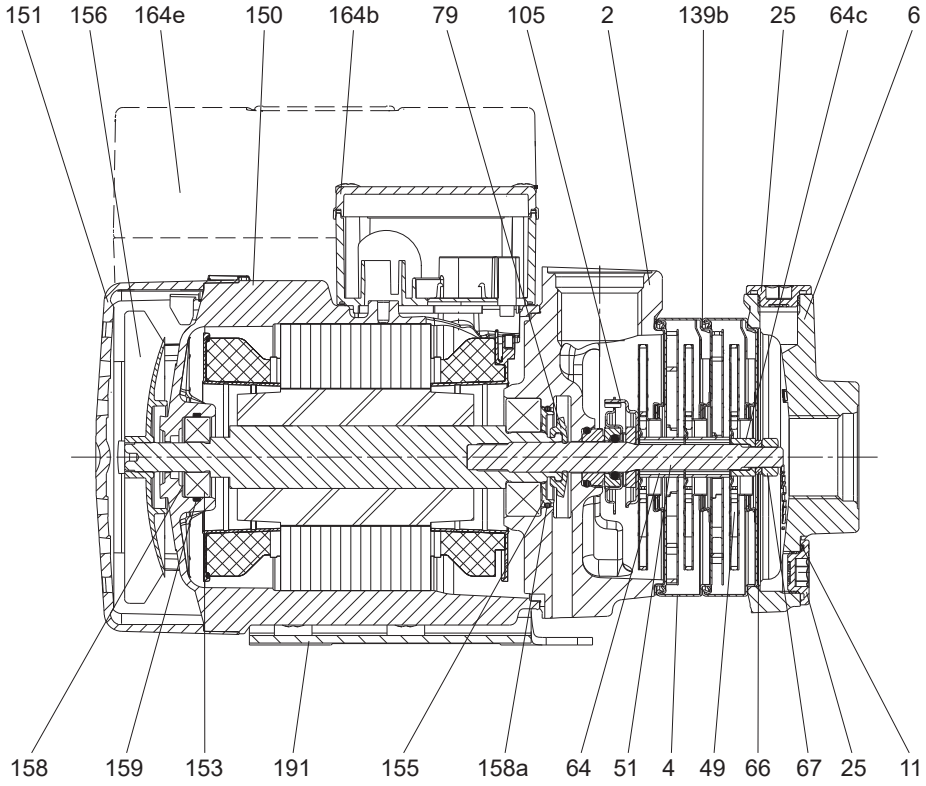
Selection of shaft seal

26. Grundfos Product Center

Sectional drawings

CM-A, CME-A

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



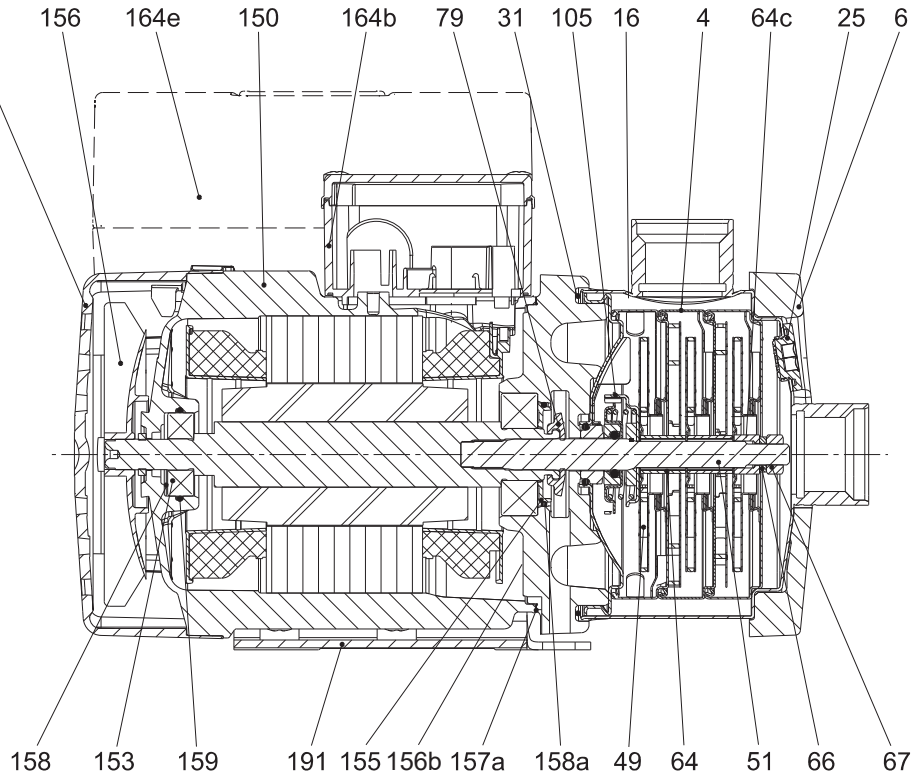
CM, CME 1-3 with ML, MLE 71 motor

Components

Pos.	Component	Pos.	Component	Pos.	Component
2	Outlet 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-I, CME-I and CM-G, CME-G

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



CM, CME 1-3 with ML, MLE 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					
			Cast iron (EN-GJL-200)		Stainless steel (AISI 304 / EN 1.4301)		Stainless steel (AISI 316 /EN 1.4401)	
			ISO/AISI/ASTM	EN	ISO/AISI/ASTM	EN	ISO/AISI/ASTM	EN
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 silumin (Alu)						
164e	Terminal box, MLE							
191	Base plate	Steel, electrocoated		1.0330.3		1.0330.3		
		Steel, powder-coated, 60 to 120 µ, NCS 7005						1.0330.3
79	Diverting disc	Silicone fluid (LSR)						
155	Bearing cover plate	PPS						
Pump parts								
105	Shaft seal, steel parts	Stainless steel	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 316	1.4401
	Shaft seal, seal faces	Al_2O_3/carbon or SiC						
51	Pump shaft	Stainless steel	AISI 304	1.4301	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 316	1.4401
11 31 [14] 158a 159	O-rings	EPDM, FKM or FFKM						
157a [14]	Gasket	Paper						
139b [12]	Gasket	Aramide fibers (nbr)						
2 [12]	Outlet part	Cast iron						
6 [12]	Inlet part	Cast iron						
4	Chamber	Stainless steel	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 316	1.4401
25	Plug	Stainless steel	AISI 316L	1.4404	AISI 316L	1.4404	AISI 316L	1.4404
49	Impeller	Stainless steel	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11]	AISI 316	1.4401
64	Spacing pipe	Stainless steel	AISI 316	1.4401	AISI 316	1.4401	AISI 316	1.4401
64c	Clamp	Stainless steel		STX2000 [13]		STX2000 [13]		STX2000 [14]
6 [14]	Flange	Cast iron						
16	Sleeve	Stainless steel			AISI 304/ AISI 316 [11]	1.4301/ 1.4401 [11] [15]	AISI 316	1.4401
67	Nut	Stainless steel A4						
66	Washer (NORD-LOCK)	Steel		1.4547		1.4547		1.4547

[11] On request.

[12] Only in CM-A, CME-A pumps.

[13] STX2000 ~ CrNiMO 22 19 4.

[14] Only in CM-I, CME-I and CM-G, CME-G pumps.

[15] As standard, the pumps listed below are fitted with sleeves made of stainless steel 1.4401:
CM, CME 1-9 up to and including CM, CME 1-14
CM, CME 3-9 up to and including CM, CME 3-14

CM, CME 5-9 up to and including CM, CME 5-13
CM, CME 10-6 up to and including CM, CME 10-8.

10. CME pumps

Communication with CME pumps

Communication with CME pumps is possible by:

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

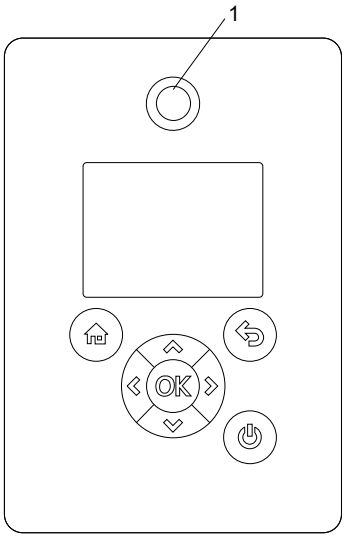
Operating panel

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

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

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

New-generation CME with supply voltages T, U, V



Graphical operating panel of CME pumps

Pos.	Description
1	Grundfos Eye

Grundfos GO

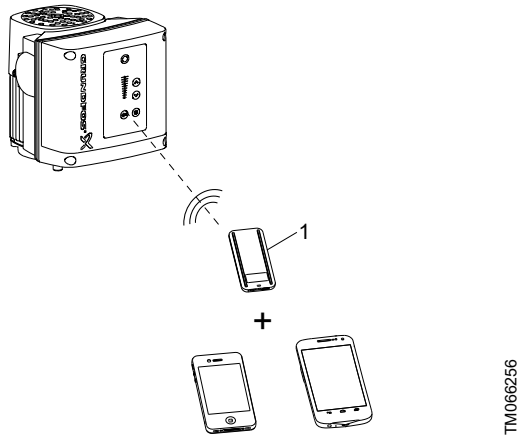
The pump is designed for wireless radio or infrared communication with Grundfos GO.

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

Grundfos GO offers the following mobile interfaces (MI).

MLE motors:

- MLE 0.75 to 2 hp 1/60/200-240
- MLE 2 hp 3/60/200-240
- MLE 2 to 3 hp 3/60/440-480.



Grundfos GO communicating with the pump via radio or infrared connection (IR)

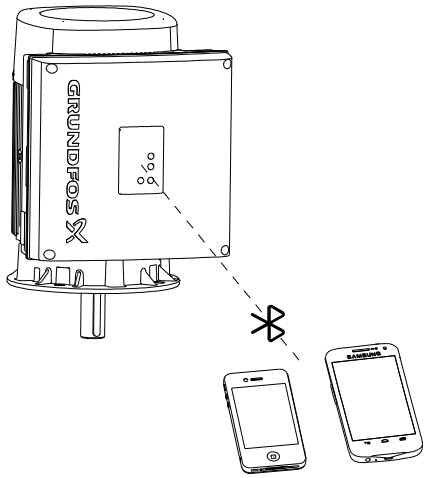
Pos.	Description
1	Grundfos MI 301: Separate module enabling radio or infrared communication. You can use the module in conjunction with an Android or iOS-based smart device with Bluetooth connection.

MLE motors:

- MLE 3 hp to 7.5 hp 3/60/200-240
- MLE 5 hp to 7.5 hp 3/60/440-480.

These motors are designed for wireless communication with the Grundfos GO using Bluetooth (BLE).

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



TM082930

Related information

Grundfos GO

Grundfos GO Link

MLE motors:

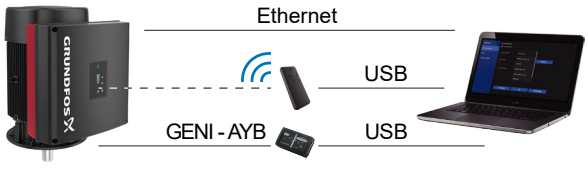
- MLE 3 hp to 7.5 hp 3/60/200-240
- MLE 5 hp to 7.5 hp 3/60/440-480.

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

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

Use the Grundfos GO Link together with the following interfaces:

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



TM087681

Grundfos GO Link setup

Pos.	Description
1	Ethernet cable: Standard Ethernet cable CAT5/CAT6
2	Grundfos MI 301: Separate radio equipment enabling radio communication [16)]
3	Grundfos PC Tool Link: Separate module enabling wired connection to the pump [16)]

16) Use the module together with a USB cable to connect to a laptop.

Safe Torque Off (STO) function

The Safe Torque Off (STO) is a safety function to stop the motor from turning without actively braking it. It follows the definition by the EN61800-5-2.

The principle of operation is the following:

- The Safe Torque Off (STO) function is activated (the input circuits are opened, for example, by opening contractors).
- The Safe Torque Off (STO) inputs of the motor de-energize.
- The motor cuts off the control signal for the output transistors.
- The motor coasts to a stop if it is running. The drive cannot restart while the Safe Torque Off (STO) function is activated. After deactivating the Safe Torque Off (STO), the motor can restart immediately.
- Finally, the control software of the motor generates a Safe Torque Off (STO) alert and corresponding indications. The Safe Torque Off (STO) alert can be configured.

For instructions on how to activate and operate the Safe Torque Off (STO) function, read the following installation and operating instructions.

QR92916582

Safe Torque Off

Installation and operating instructions

http://net.grundfos.com/qr/i/92916582

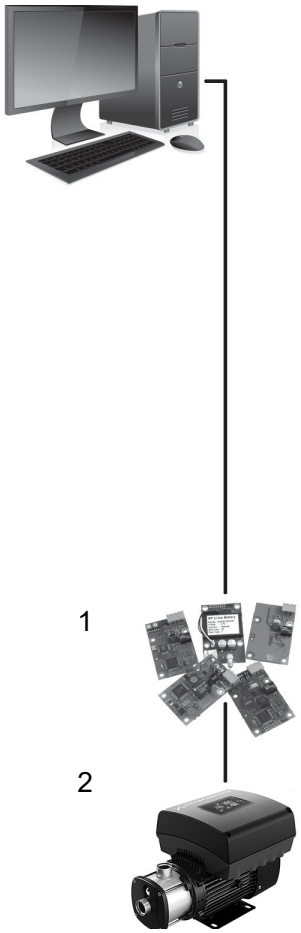
Central building management system

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 0.75 to 7.5 Hp (supply voltages T, U, V)

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



Communication via a central building management system

Pos.	Description
1	CIM modules, see the section on communication interface modules (CIM)
2	Supply voltages: T, U, V

Related information

Communication Interface Module (CIM)

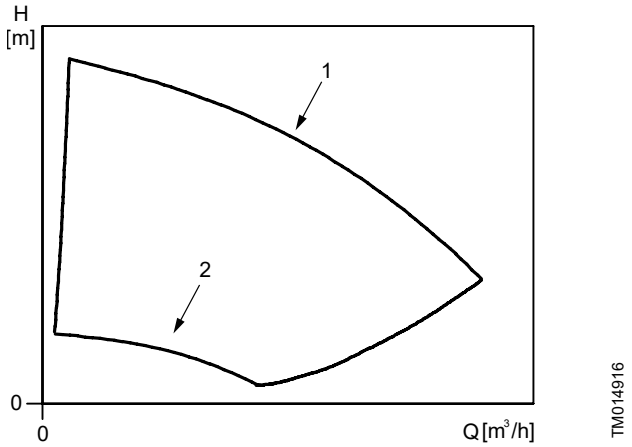
Speed control of CME pumps

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 must be close to the optimum efficiency (eta) 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.



Min. and max. performance curves

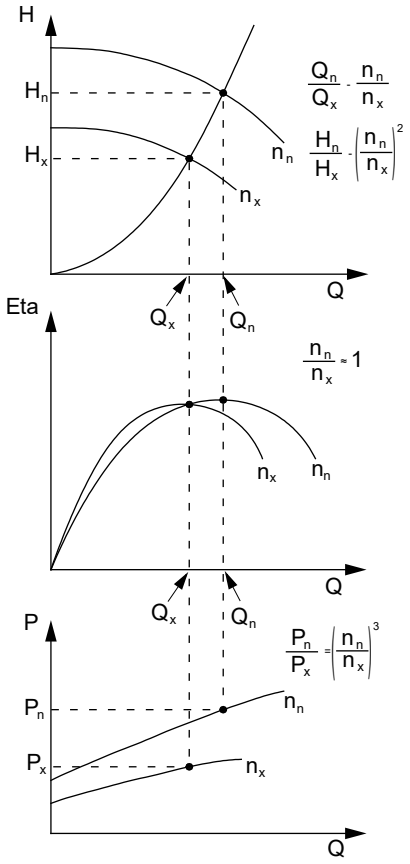
Pos.	Description
1	Max. curve
2	Min. curve

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

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

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.



TM008720

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

Grundfos Product Center

Grundfos Product Center is an online selection tool offered by Grundfos that makes it possible to calculate the specific duty point and energy consumption of a CME pump.

When you enter the dimensions of the pump, Grundfos Product Center can calculate the exact duty point and energy consumption. For further information, see the section on Grundfos Product Center. Visit the Grundfos Product Center at http://product-selection.grundfos.com

Related information

26. Grundfos Product Center

CM connected to Grundfos CUE external variable frequency drive

TM1040611

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 pump solutions without a variable frequency drive
- simple installation and commissioning compared to standard VFDs.

Functions

Intuitive startup guide

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

Smart user interface

TM043283

Grundfos CUE operating panel

The Grundfos CUE features a unique user-friendly operating panel with graphic display and easy-to-use buttons.

Controlling the value you choose

The 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	0.75 - 300
3 x 525-600	3 x 525-600	1-10

11. Approvals and markings

CM, CME pumps

Approvals

- RCM mark, New Zealand and Australian EMC.
- EAC certificate.

cULus

The cULus approval covers the standard product range within the following supply voltages:

- 1 x 115/230 V, 60 Hz (supply voltage B, B1)
- 3 x 208-230/440-480 V, 60 Hz (supply voltage E & E1)
- 3 x 575 V, 60 Hz (supply voltage H)
- 3 x 440-480V 60 Hz (supply voltage J)

Contact Grundfos for further information.

Pumps

UL778 and C22.2 No 108-01

NEMA 250 (IP code).

Overheating protection

UL2111 and C22.2 No 77-95.

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

cURus IE3 motors

The cURus approval covers the IE3 motors mentioned in the following:

IE3 motors for the below listed supply voltages comply with UL1004-1 and CSA22.2 No. 100-04.

- 1 x 115/230 V, 60 Hz (supply voltage B, B1)
- 3 x 208-230/440-480 V, 60 Hz (supply voltage E & E1)
- 3 x 575 V, 60 Hz (supply voltage H)
- 3 x 440-480 V 60 Hz (supply voltage J)
- 3 x 200/346 V 50 Hz; 200-220/346-380 V, 60 Hz (supply voltage G)
- 3 x 220-240/380-415 V, 50 Hz; 3 x 220-255/380-440 V, 60 Hz (supply voltage O)

cURus E-motors

The cURus approval covers the CME motors mentioned in the following:

CME motors for the below listed supply voltages comply with UL 60730-1 and CSA E 60730-1.

- 3 x 440-480 V, 50/60 Hz (supply voltage T)
- 1 x 200-230 V, 50/60 Hz (supply voltage U)
- 3 x 200-240 V, 50/60 Hz (supply voltage V)

Other approvals and compliance with directives

- EAC (Russia, Belarus, Kazakhstan)
- Compliance with RoHS, directive 2002/96/EC
- CCC
- CEL
- EuP
- KEA
- PSE.

Drinking water approvals

- WRAS
- ACS
- NSF61 and NSF372 [17)]

17) The NSF approvals cover the standard product range.

Energy approvals

The following energy approvals are available on request:

- Energy Independence and Security Act (EISA) for the USA (CC marking)
- Minimum energy performance standard (MEPS) for Korea, Taiwan, China and Brazil (pending).

Markings


18)


18)

18)


18)

18) Not applicable to 60 Hz pumps with supply voltages A, B, B1 and B2.

12. Certificates

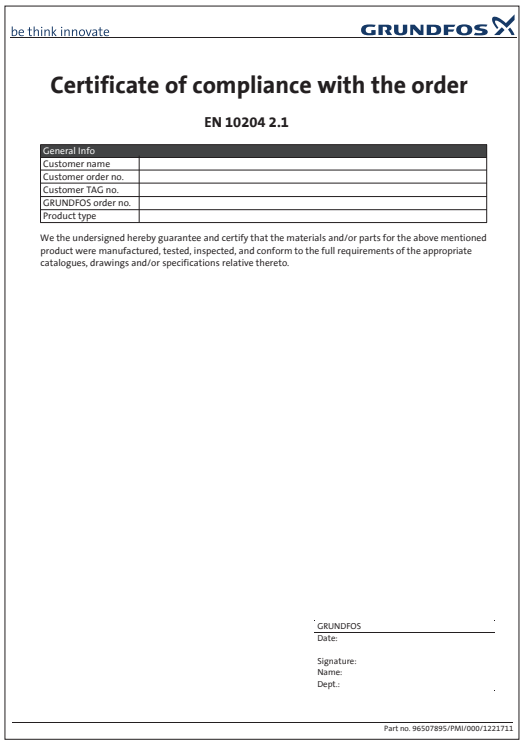
Certificate	Description
Certificate of compliance with the order	According to EN 10204, 2.1. Grundfos document certifying that the pump supplied is in compliance with the order specifications.
Test certificate. Non-specific inspection and testing	According to EN 10204, 2.2. Certificate with inspection 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) • 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 in the section on examples of certificates.

Note that 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

General Info	
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.

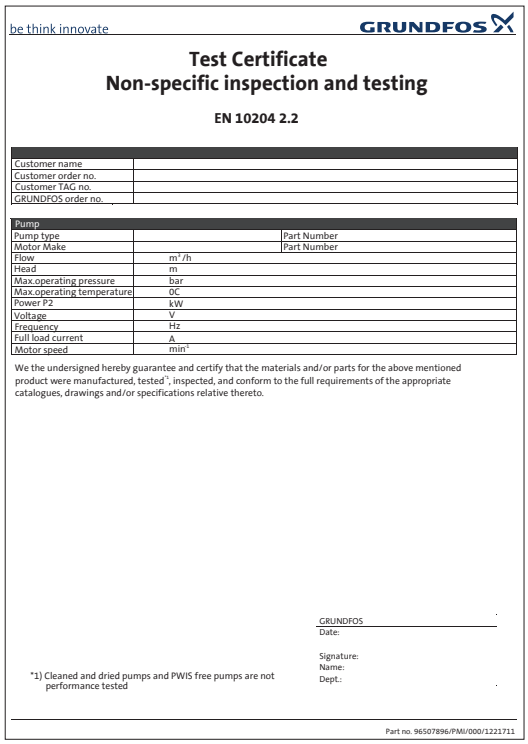
GRUNDFOS
Date:

Signature:
Name:
Dept.:

Part no. 96507895/PMI/000/1221711

TM034165

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	
Max.operating pressure	bar	
Max.operating temperature	0C	
Power P2	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*1), inspected, and conform to the full requirements of the appropriate catalogues, drawings and/or specifications relative thereto.

GRUNDFOS
Date:

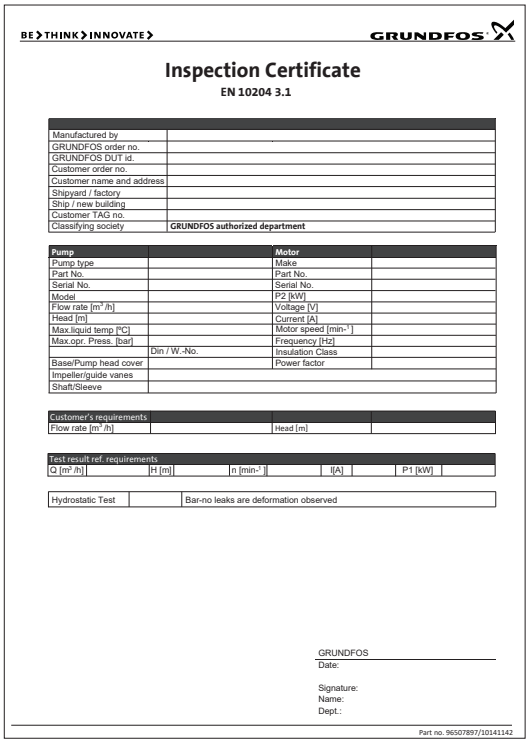
Signature:
Name:
Dept.:

*1) Cleaned and dried pumps and PWIS free pumps are not performance tested

Part no. 96507896/PMI/000/1221711

TM034163

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 No.		Part No.	
Serial No.		Serial No.	
Model		P2 [kW]	
Flow rate [m^3/h]		Voltage [V]	
Head [m]		Current [A]	
Max.liquid temp [°C]		Motor speed [min^{-1}]	
Max.opr. Press. [bar]		Frequency [Hz]	
	Din / W.-No.	Insulation Class	
Base/Pump head cover		Power factor	
Impeller/guide vanes			
Shaft/Sleeve			

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]		P1 [kW]

Hydrostatic Test		Bar-no leaks are deformation observed

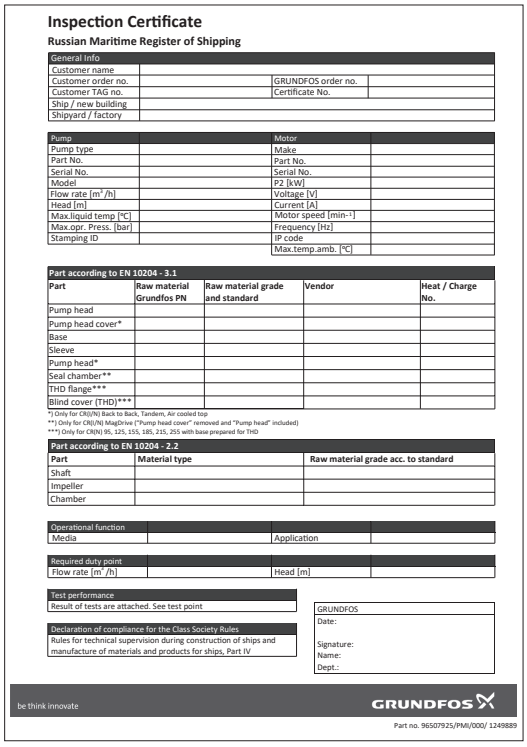
GRUNDFOS
Date:

Signature:
Name:
Dept.:

Part no. 96507897/10141142

TM034162

Inspection certificate



Inspection Certificate

Russian Maritime Register of Shipping

General Info			
Customer name			
Customer order no.		GRUNDFOS order no.	
Customer TAG no.		Certificate No.	
Ship / new building			
Shipyard / factory			

Pump		Motor	
Pump type		Make	
Part No.		Part No.	
Serial No.		Serial No.	
Model		P2 [kW]	
Flow rate [m^3/h]		Voltage [V]	
Head [m]		Current [A]	
Max.liquid temp [°C]		Motor speed [min^{-1}]	
Max.opr. Press. [bar]		Frequency [Hz]	
Stamping ID		IP code	
		Max.temp.amb. [°C]	

Part according to EN 10204 - 3.1

Part	Raw material Grundfos PN	Raw material grade and standard	Vendor	Heat / Charge No.
Pump head				
Pump head cover*				
Base				
Sleeve				
Pump head*				
Seal chamber**				
THD flange***				
Blind cover (THD)***				

*) Only for CR(I/N) Back to Back, Tandem, Air cooled top
**) Only for CR(I/N) MagDrive ("Pump head cover" removed and "Pump head" included)
***) Only for CR(N) 95, 125, 155, 185, 215, 255 with base prepared for THD

Part according to EN 10204 - 2.2

Part	Material type	Raw material grade acc. to standard
Shaft		
Impeller		
Chamber		

Operational function			
Media		Application	

Required duty point			
Flow rate [m^3/h]		Head [m]	

Test performance
Result of tests are attached. See test point

Declaration of compliance for the Class Society Rules
Rules for technical supervision during construction of ships and manufacture of materials and products for ships, Part IV

GRUNDFOS
Date:

Signature:
Name:
Dept.:

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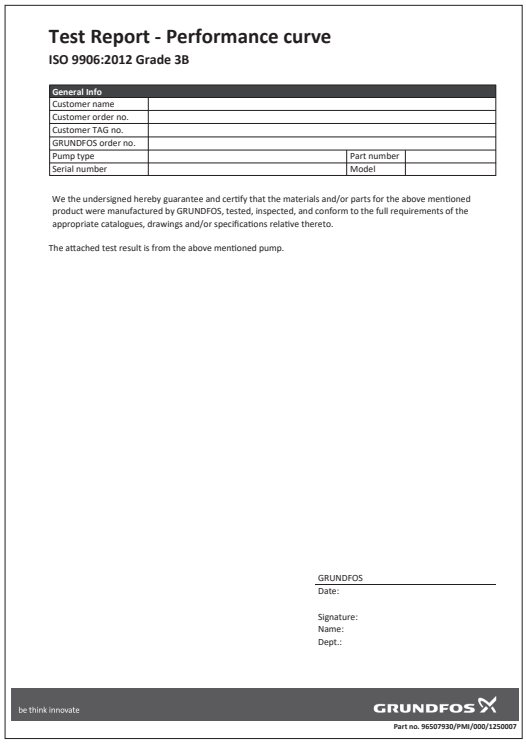
Part no. 96507925/PMI/000/ 1249889

TM034156

Standard test report



Test Report - Performance curve

ISO 9906:2012 Grade 3B

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

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.:

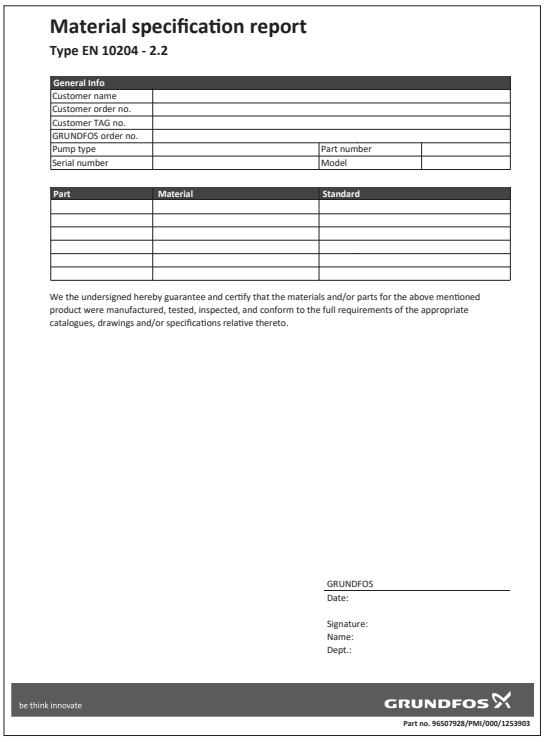
be think innovate

GRUNDFOS

Part no. 96507930/PMI/000/1250007

TM034143

Material specification report



Material specification report

Type EN 10204 - 2.2

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

Part	Material	Standard

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.:

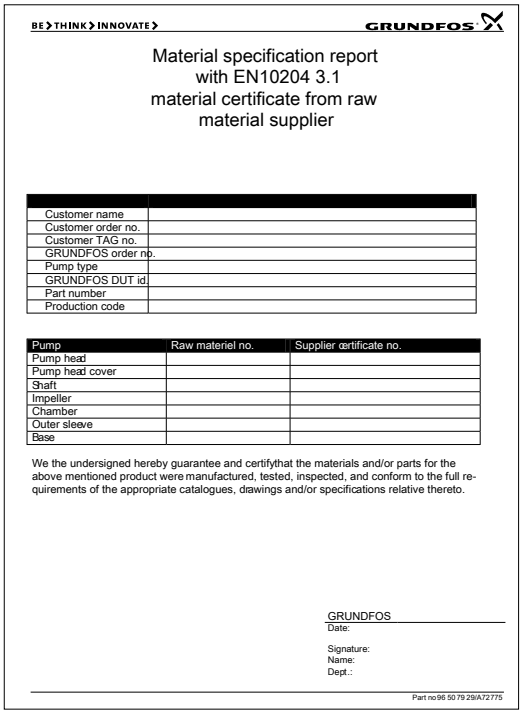
be think innovate

GRUNDFOS

Part no. 96507928/PMI/000/1253903

TM034150

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 materiel no.	Supplier certificate no.
Pump head		
Pump head cover		
Shaft		
Impeller		
Chamber		
Outer sleeve		
Base		

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

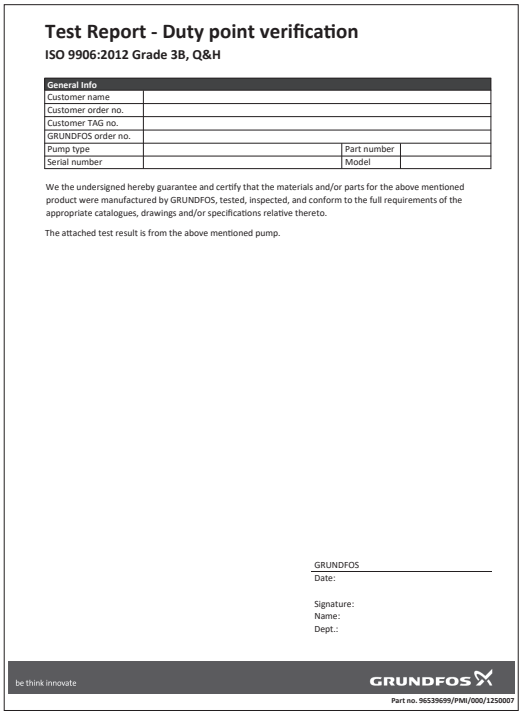
GRUNDFOS
Date:

Signature:
Name:
Dept.:

Part no 96 50 79 29/A72775

TM034149

Duty-point verification report



Test Report - Duty point verification

ISO 9906:2012 Grade 3B, Q&H

General Info			
Customer name			
Customer order no.			
Customer TAG no.			
GRUNDFOS order no.			
Pump type		Part number	
Serial number		Model	

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.:

be think innovate

GRUNDFOS

Part no. 96539699/PMI/000/1250007

TM034148

13. Selection and sizing

Selection of pumps

Selection of pumps must be based on these elements:

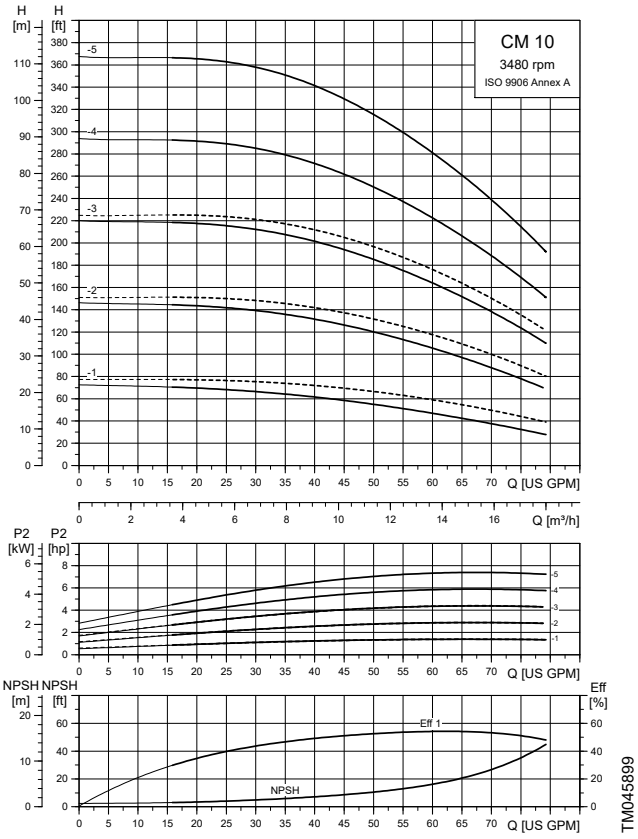
- the duty point of the pump (see fig. Example of a curve chart)
- dimensional data such as pressure loss as a result of height differences, friction loss in the pipes, pump efficiency, etc. (see fig. Dimensional data)
- pump materials (see the section on pump)
- pump connections (see the section on pump connections)
- shaft seal (see the section on the selection of shaft seal).

Related information

Pump
Selection of shaft seal
Duty point of the pump
Sizing data
Pump connections

Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts in the section on performance curves.



Example of a curve chart

Related information

CM 1

Grundfos Product Center

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

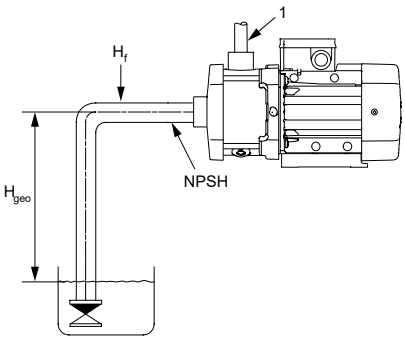
The Grundfos Product Center features an easy-to-use virtual guide that leads you through the selection of the pump for the application in question.

Sizing data

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

- Required flow rate and pressure at the draw-off point.
- Pressure loss as a result of height differences (H_{geo}).
- Friction loss in the pipes (H_f). It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- Best efficiency at the estimated duty point. [19)]
- NPSH value.
  For calculation of the NPSH value, see NPSH in the section on minimum inlet pressure.

19) See the section on the selection of CME pumps for further information about sizing CME pumps.



TM043486

Dimensional data

Pos.	Description
1	Required flow rate and pressure

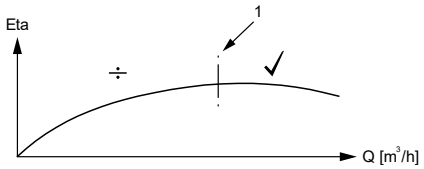
Related information

NPSH

Selection of CME pumps

Pump efficiency

When sizing the pump, the efficiency (eff) must 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 the figure below.

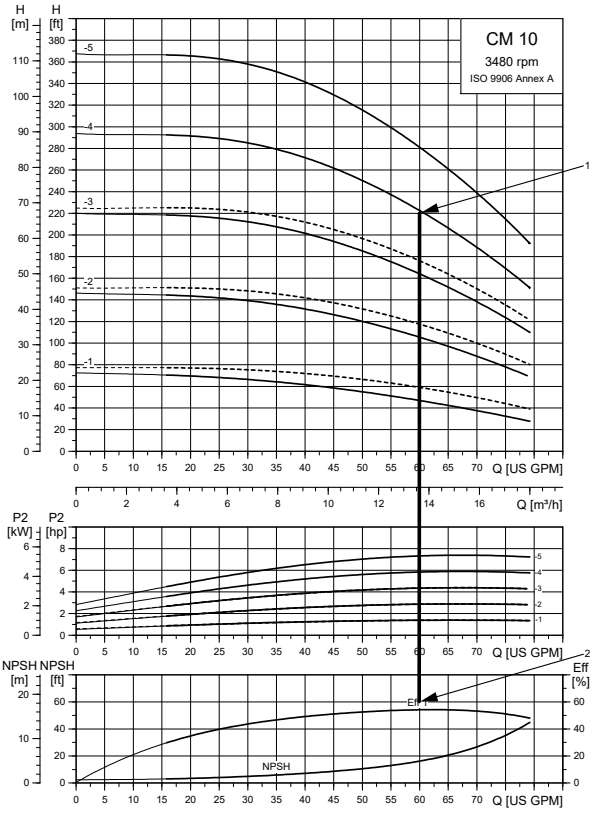


TM009190

Best efficiency

Pos.	Description
1	Best efficiency point

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 the figure below shows how to check the pump efficiency when selecting a CM pump.



TM078882

Example of a CM pump's duty point

Pos.	Description
1	Duty point
2	Best efficiency

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 [20] (A48 CL30 / EN-GJL-200)	CM-A, CME-A
Industrial liquids and acids	Stainless steel (AISI 304 / EN 1.4301)	CM-I, CME-I
	Stainless steel (AISI 316 / EN 1.4401)	CM-G, CME-G

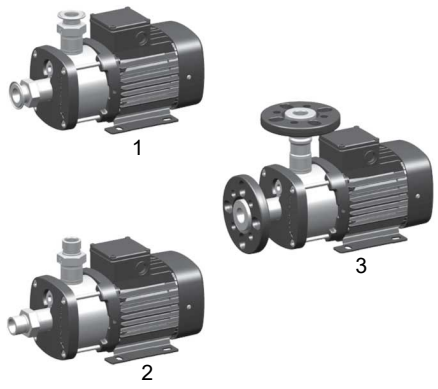
[20] The impeller, chamber and filling plugs are made of stainless steel (AISI 304 / EN 1.4301). The pump shaft is made of stainless steel (AISI 431 / EN 1.4057).

For more specific selection based on the pumped liquid, see the section on accessories, or contact Grundfos.

Related information

Flange sets for CM, CME (DIN/ANSI/JIS)

Pump connections



TM043937

Examples of pump connections

Pos.	Description
1	Tri-Clamp®
2	PJE coupling
3	ANSI, DIN, JIS flange

Selection of pump connection depends on the rated pressure and the pipes. 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.

The pumps come standard with NPT fittings (see the section on technical data).

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.

TM043934

Shaft seal (O-ring type with fixed driver)

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

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

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

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

Use fig. Curve for the selection of shaft seals in the section on the operating range of the shaft seal to select a suitable shaft seal. If the pumped liquid differs from water, a suitable shaft seal can be found in the section on accessories.

Note that the list must 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.

Related information

Operating range of the shaft seal

Flange sets for CM, CME (DIN/ANSI/JIS)

Selection of CME pumps

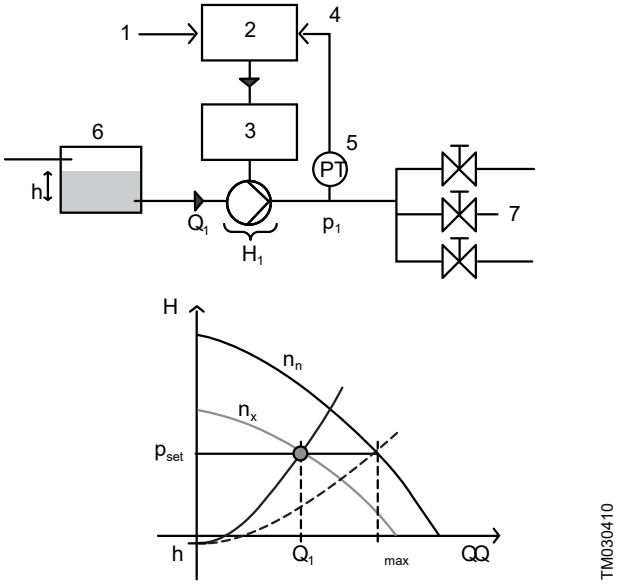
CME pumps are normally used in applications characterized by a variable flow. Consequently, it is not possible to select a pump that is constantly operating at its optimum efficiency. In order to achieve optimum operating economy, the duty point must therefore be close to the optimum efficiency (eff)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

Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3600 rpm, corresponding to an input frequency of 60 Hz. For example, if the input frequency is 50 Hz, the 100 % speed will still be approximately 3600 rpm. See CME performance curves.

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



Constant-pressure control

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

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

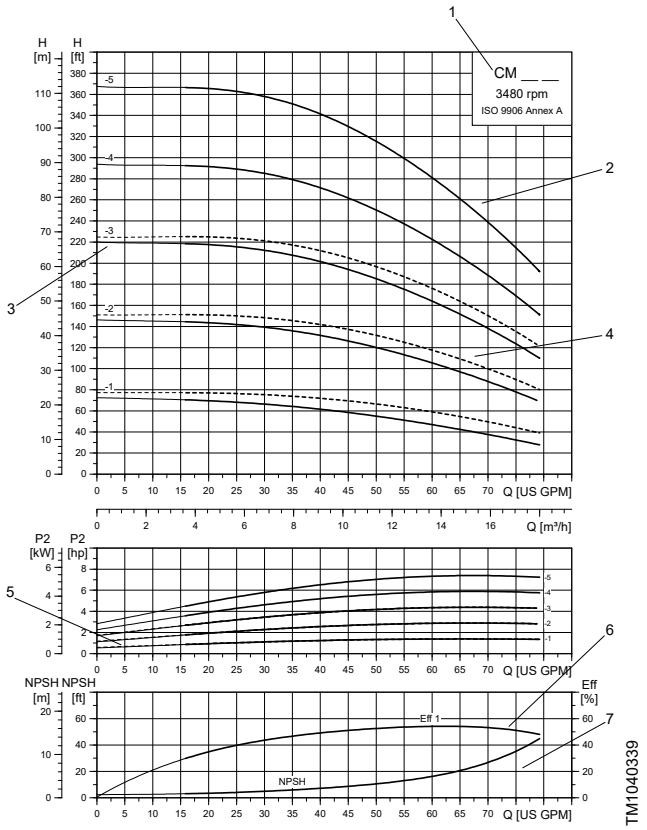
If the actual pressure is higher than the setpoint, the PI controller reduces the speed and consequently the performance of the pump until $p_1 = p_{set}$. The figure above shows what happens when the flow rate is reduced from $Q_{max.}$ to Q_1.

The controller reduces the speed of the pump from n_n to n_x in order to ensure that the required outlet 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.

Related information

Communication with CME pumps

14. How to read the curve charts



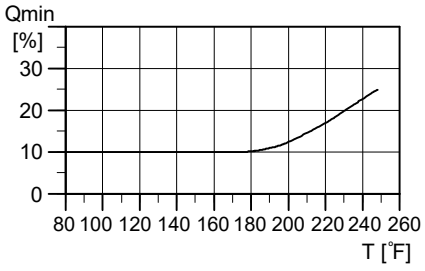
How to read the curve charts

Pos.	Description
1	Pump type, frequency and ISO standard.
2	QH curve for the individual pump. The **bold** curves indicate the **recommended** duty range for best efficiency.
3	Number of stages.
4	Performance differs slightly between A (cast iron/304ss) and I (all 304ss wetted parts) and G (all 316ss wetted parts). This is reflected on the curves with a dashed line representing the A version and a solid line representing I and G versions.
5	The power curves indicate the pump input power (P2) based on the number of stages and related to the actual flow rate.
6	The Eff 1 curve shows the efficiency of the pump including motor. The curve is an average curve which represents all the pump types shown in the chart.
7	The NPSH curve is an average curve for all the variants shown. When sizing the pumps, add a safety margin of at least 2 ft (0.5 m).

Guidelines to performance curves

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

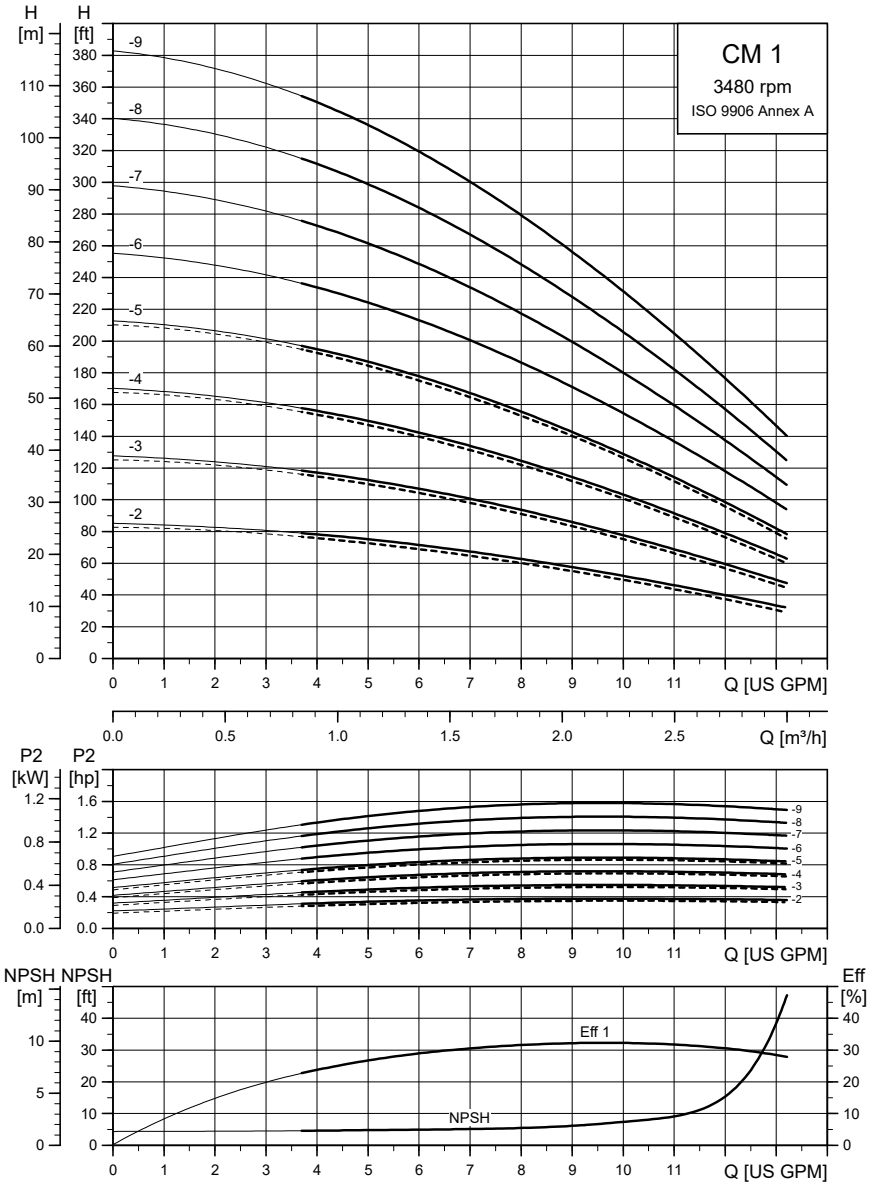
- Tolerances to ISO 9906, Annex A, if indicated.
- The motors used for the measurements are the specifically designed motors for CM and CME pumps. The motors are based on Grundfos standard motors (ML or MLE).
- Measurements have been made with airless water at a temperature of 68 °F (20 °C).
- The curves apply to the following kinematic viscosity: υ = 1 cSt (1 mm^2/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. Please refer to the Grundfos Product Center online selection tool for more precise curves. In Grundfos Product Center, 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 ± 2-4 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 Grundfos Product Center.
- Due to the risk of overheating, the pumps may not be used at a flow rate below the minimum flow rate. The curve in the figure below shows the minimum flow rate as a percentage of the rated flow rate in relation to the liquid temperature.



Minimum flow rate

15. Performance curves, CM

CM 1



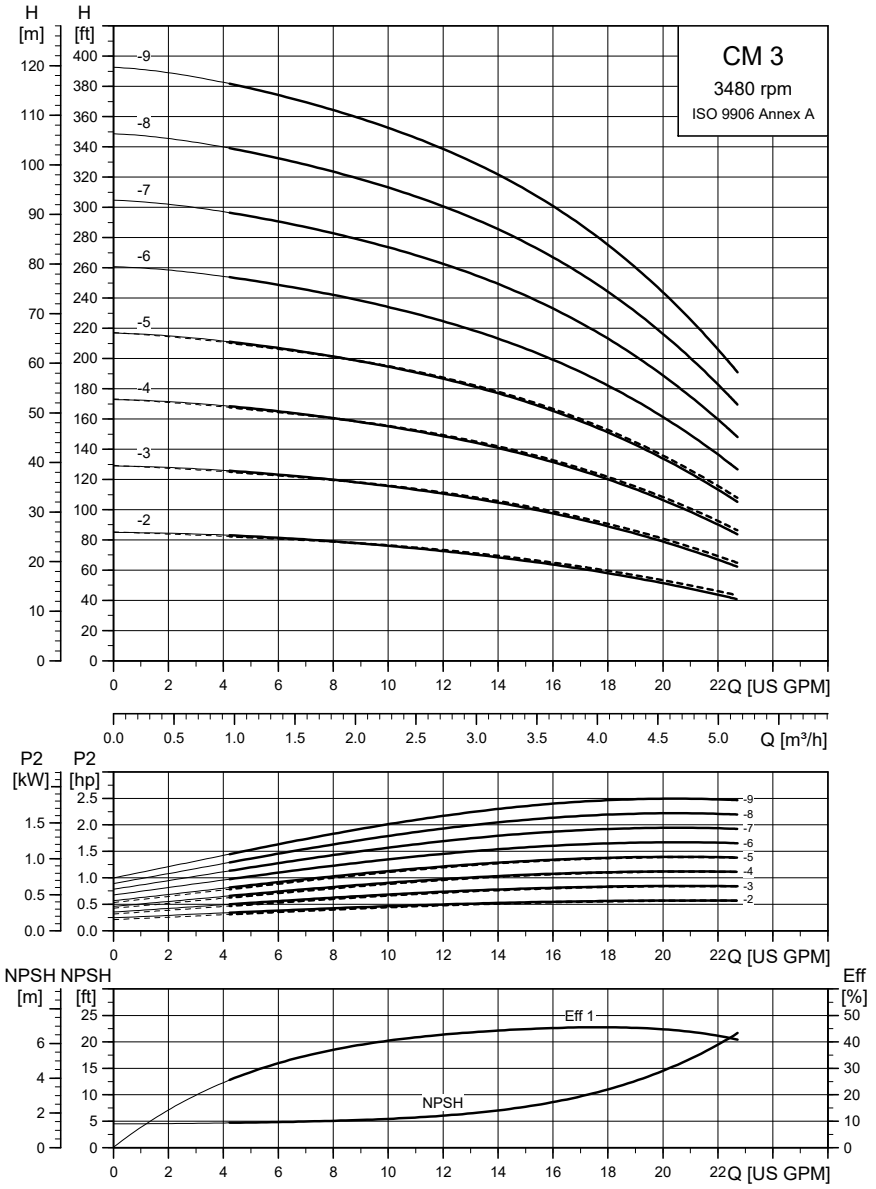
TM045896

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

CM 3



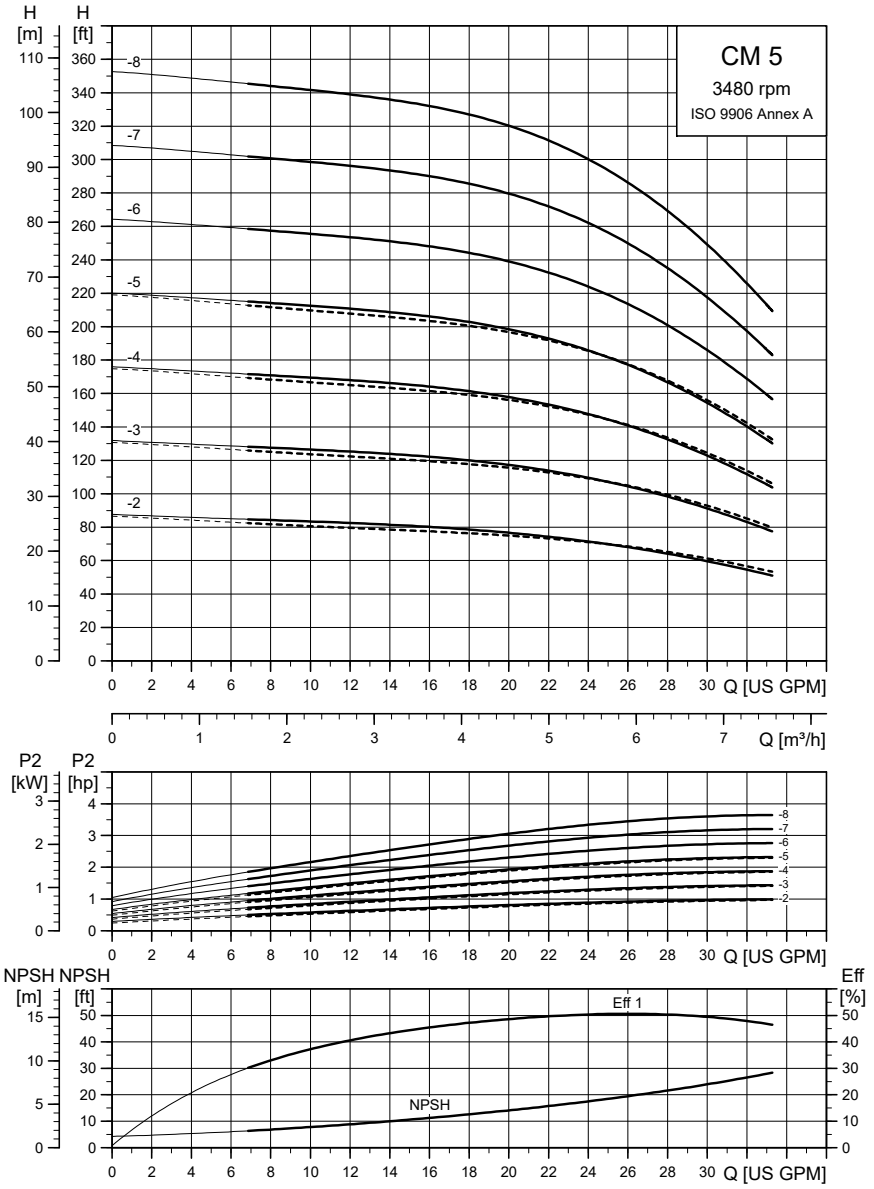
TM045897

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

CM 5



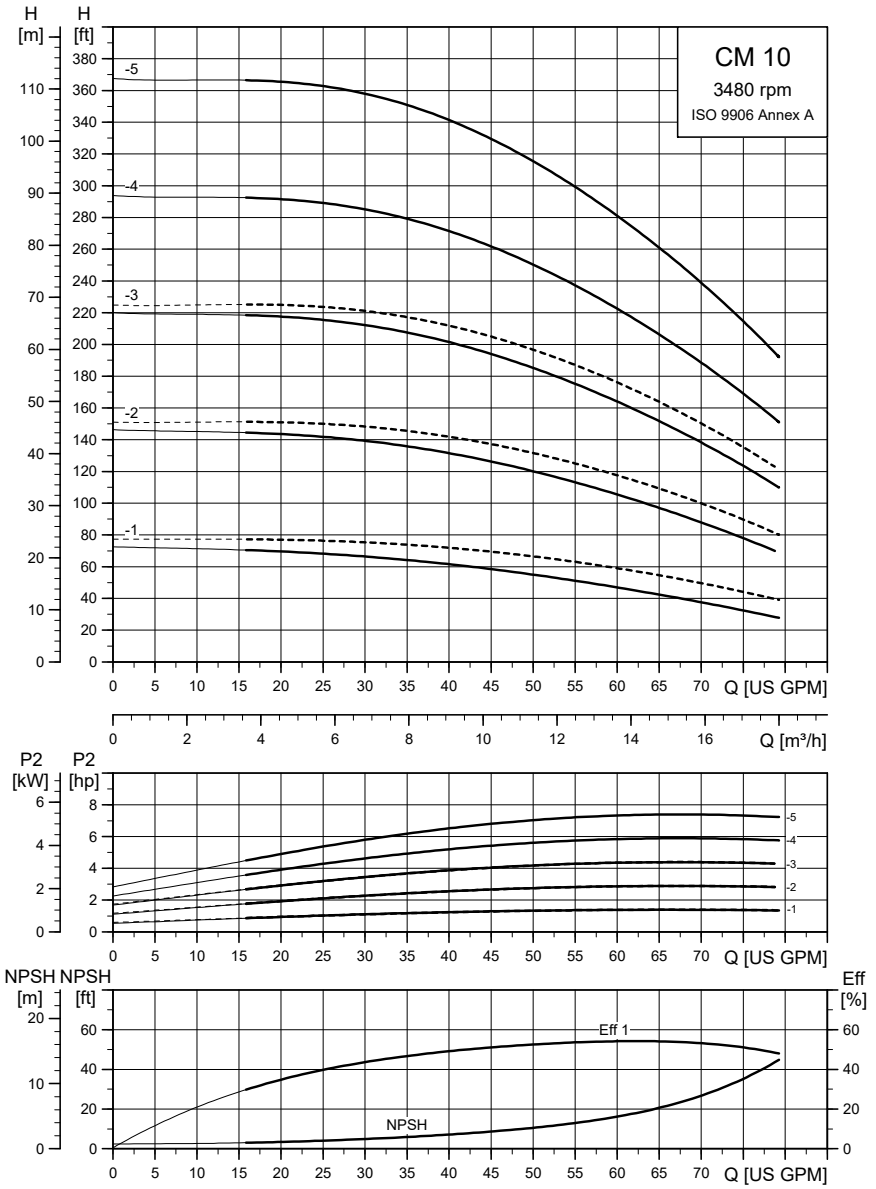
TM045898

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

CM 10



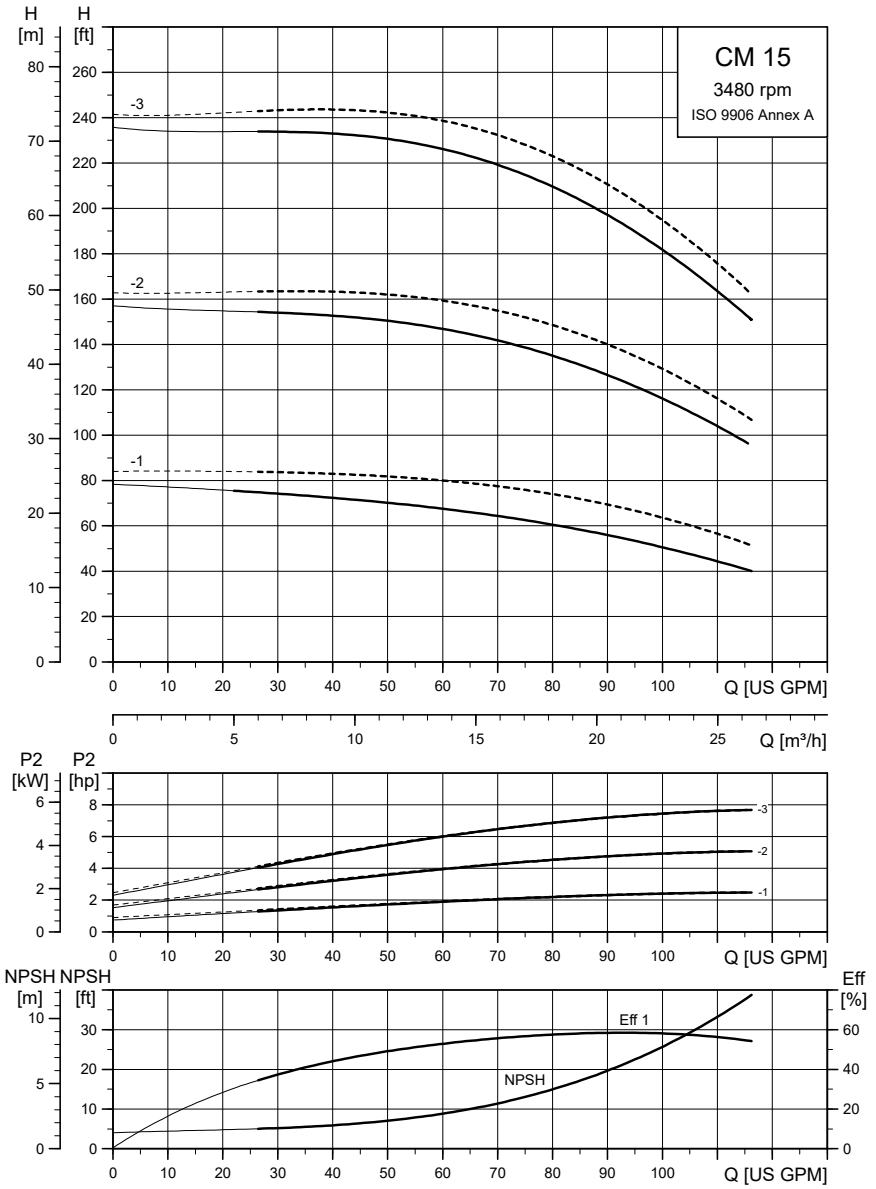
TM045899

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

CM 15

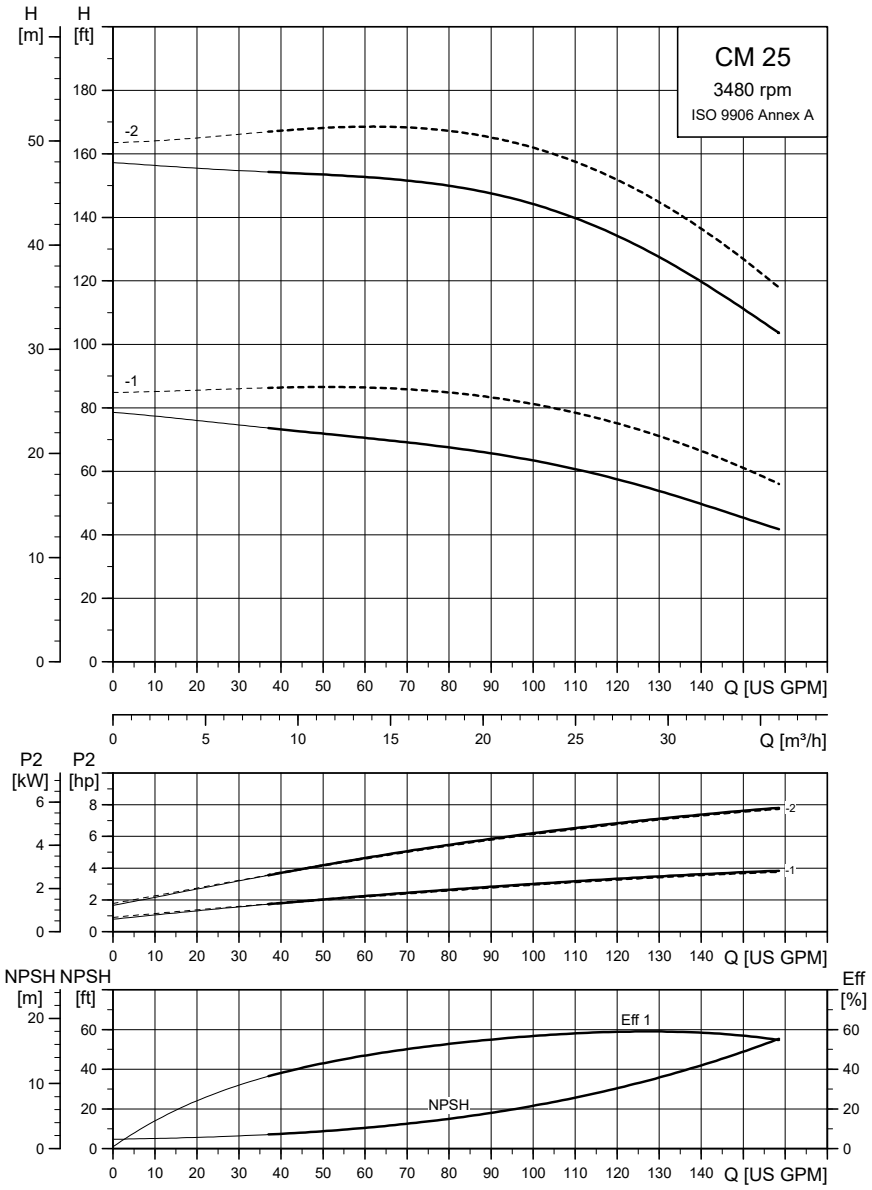


Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

CM 25



TM045901

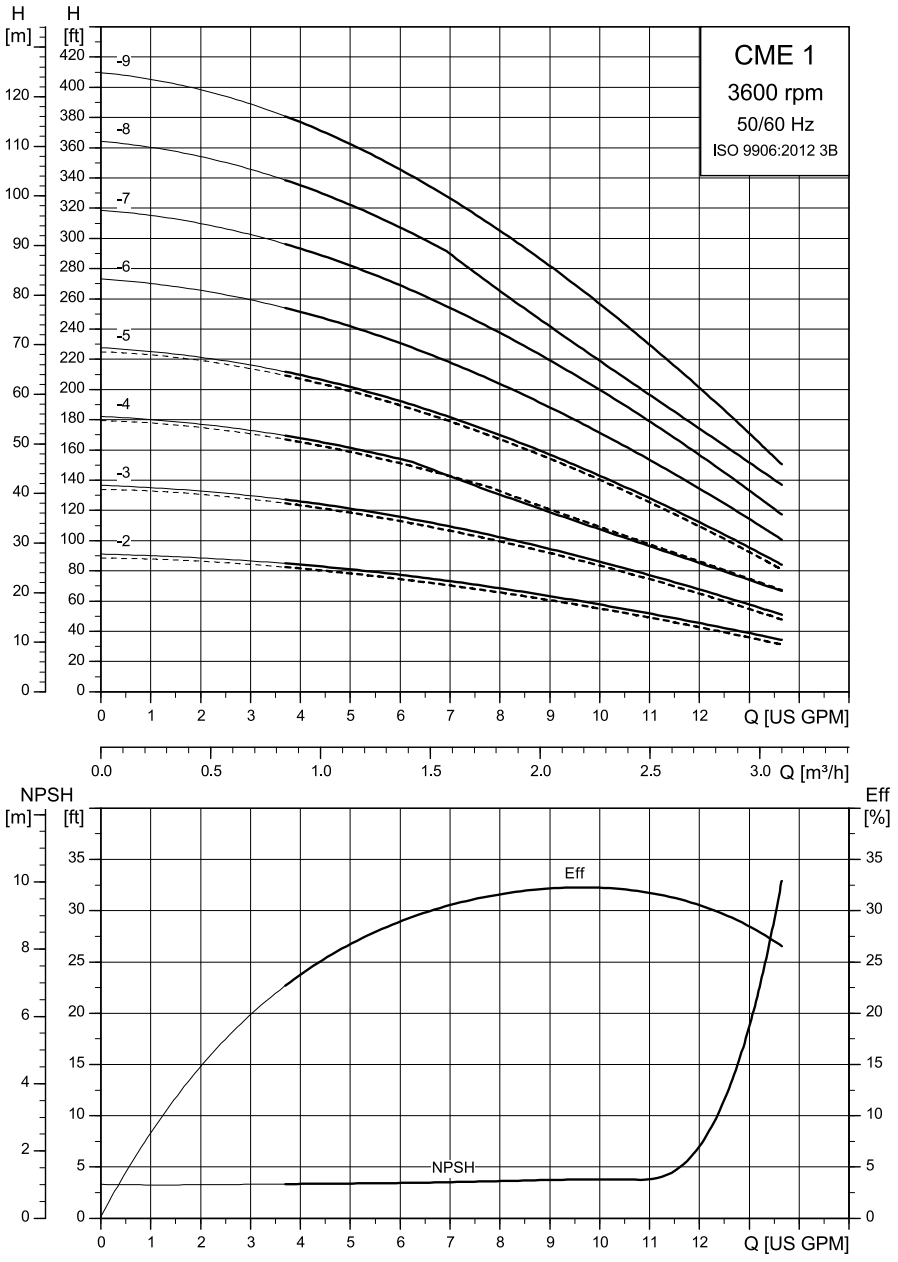
Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

16. Performance curves, CME

CME 1



TM090102

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

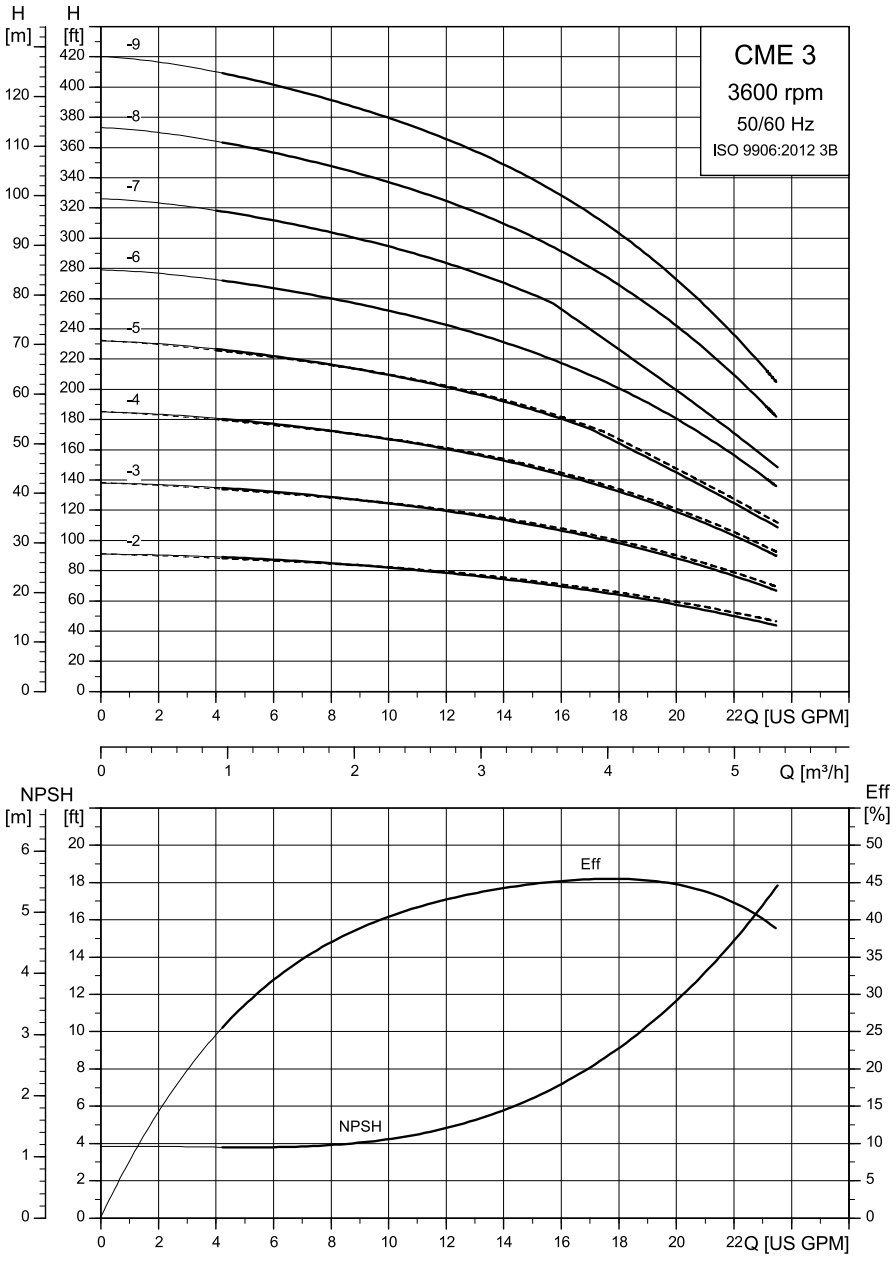
- - - - - A version

——— I, G versions

Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

For power curves, go to the Grundfos Product Center at http://product-selection.grundfos.com.

CME 3



TM090103

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

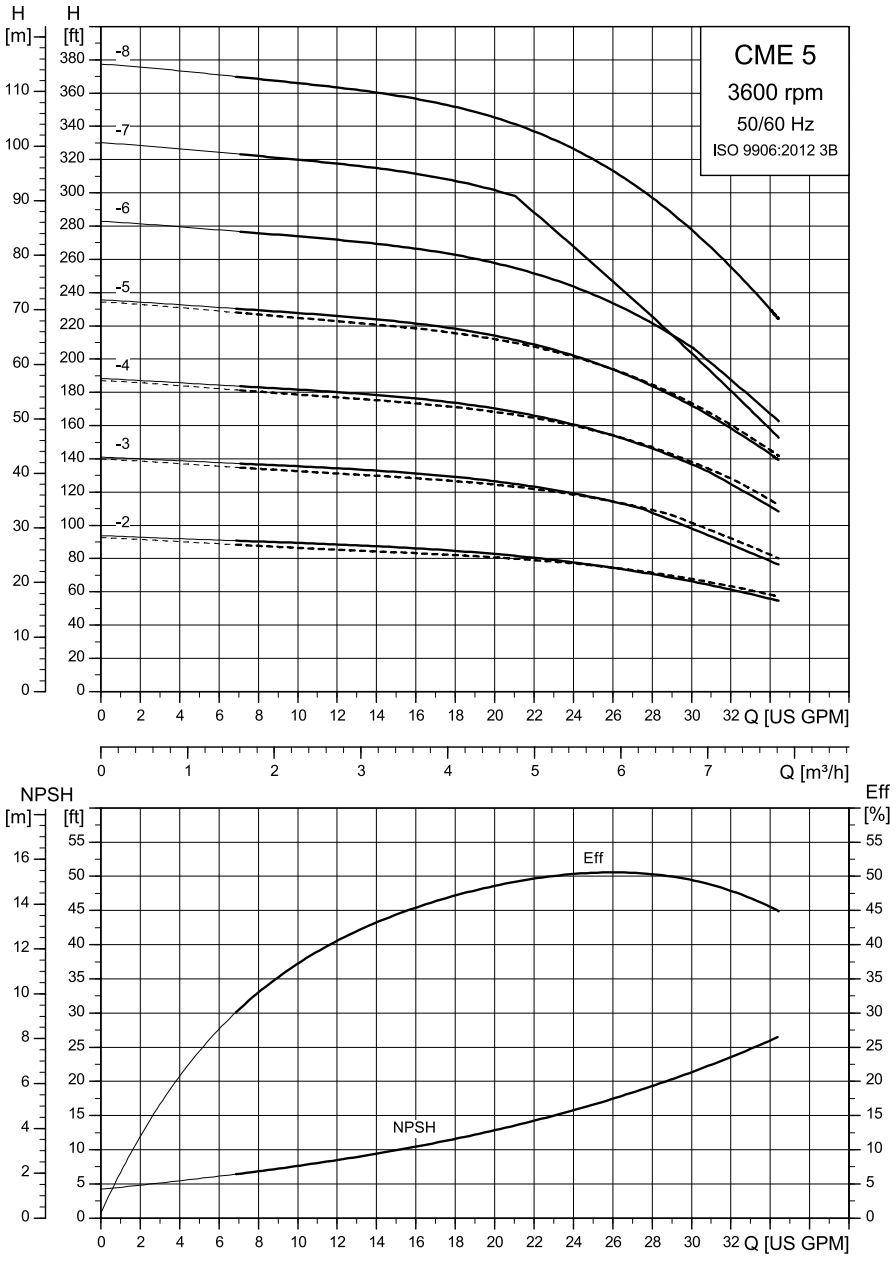
- - - - - A version

——— I, G versions

Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

For power curves, go to the Grundfos Product Center at http://product-selection.grundfos.com.

CME 5



TM090104

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

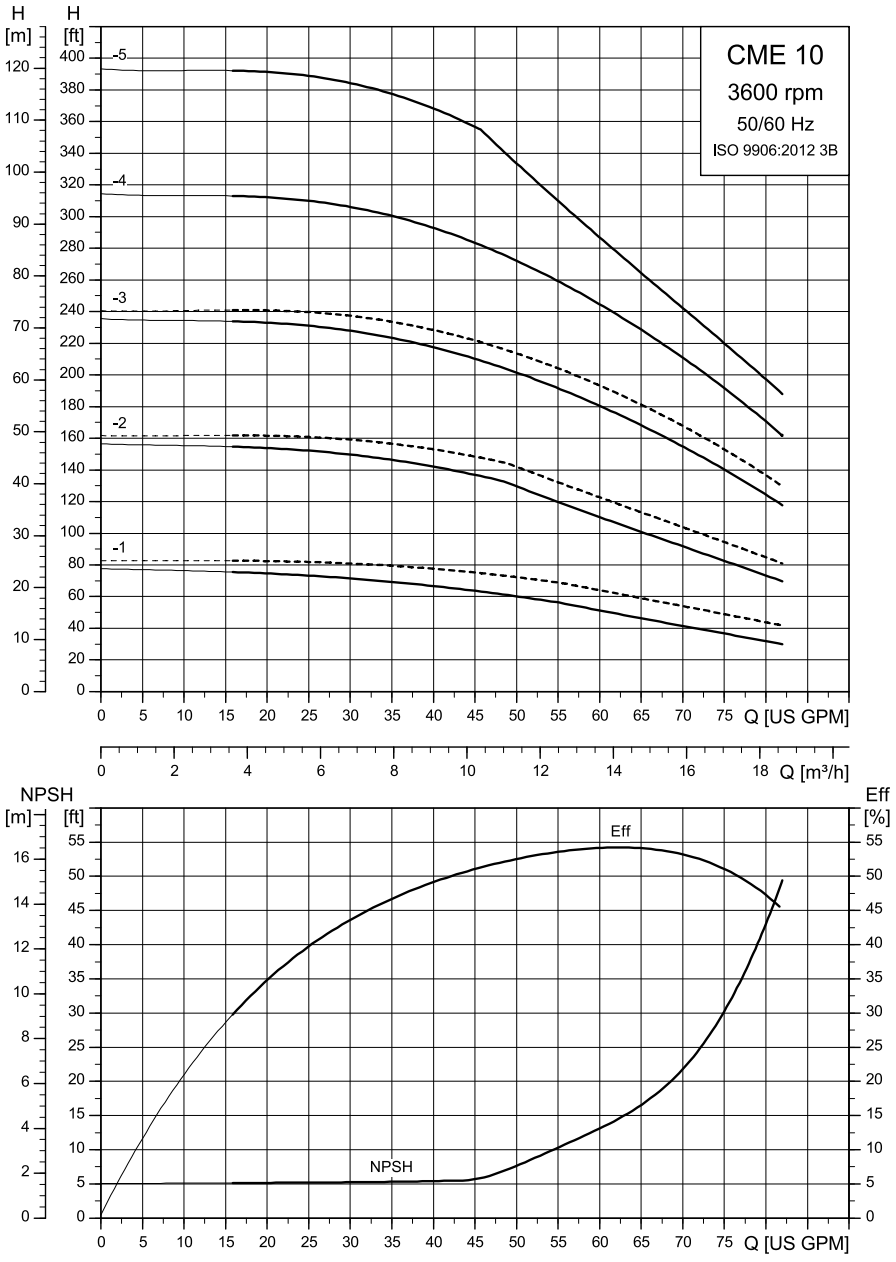
- - - - - A version

——— I, G versions

Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

For power curves, go to the Grundfos Product Center at http://product-selection.grundfos.com.

CME 10



TM090105

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

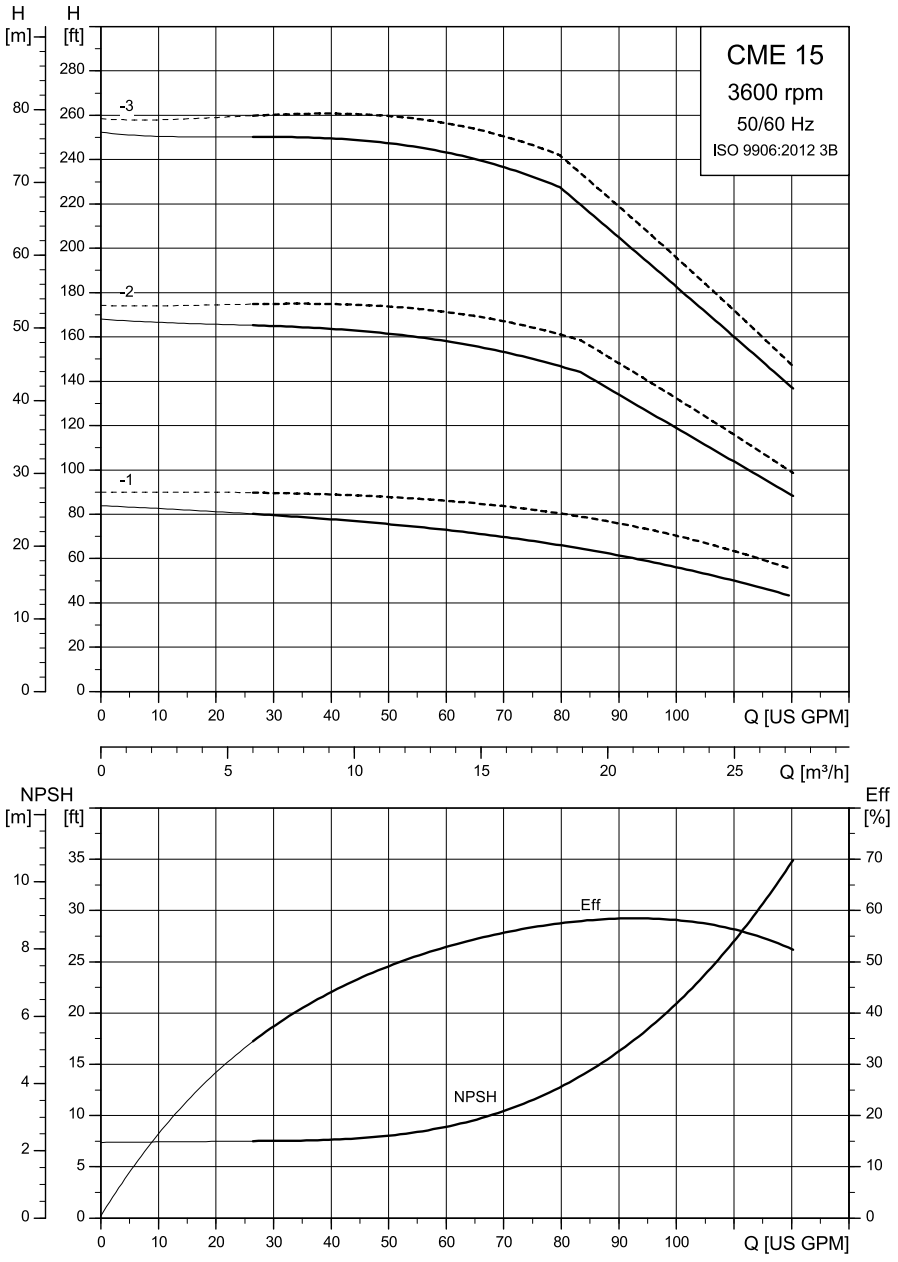
- - - - - A version

——— I, G versions

Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

For power curves, go to the Grundfos Product Center at http://product-selection.grundfos.com.

CME 15



TM090106

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

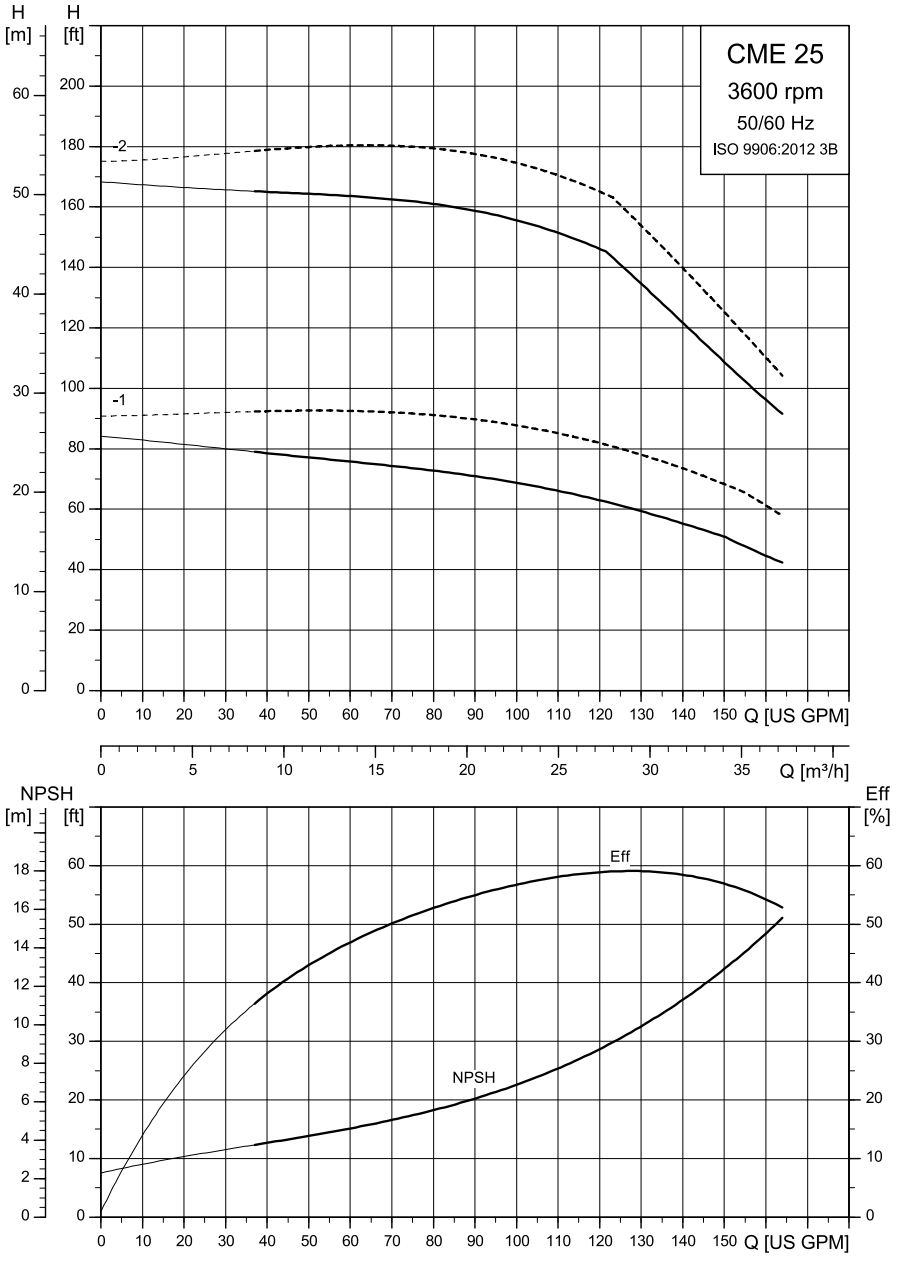
- - - - - A version

——— I, G versions

Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

For power curves, go to the Grundfos Product Center at http://product-selection.grundfos.com.

CME 25



TM090107

Eff1 = Wire-to-water efficiency of the pump including motor (see the section on reading the curve charts).

- - - - - A version

——— I, G versions

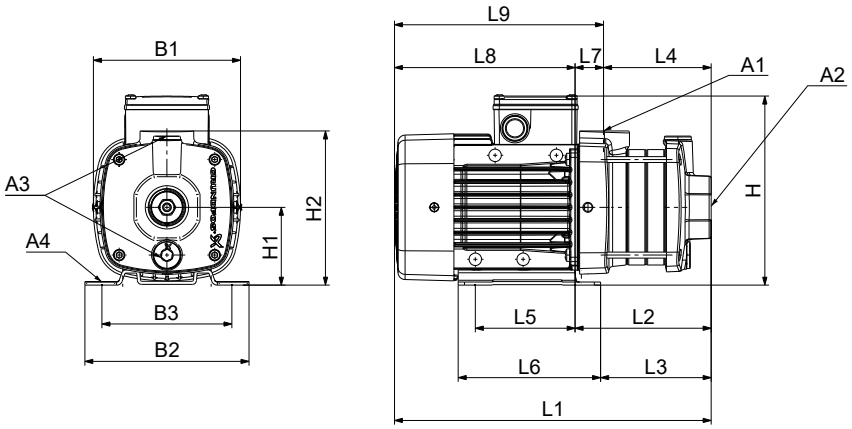
Note that the 100 % speed of CME pumps is approximately 3600 rpm, irrespective of the input frequency.

For power curves, go to the Grundfos Product Center at http://product-selection.grundfos.com.

17. Technical data, CM

CM 1-A

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



TM042248

Dimensions

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

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

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

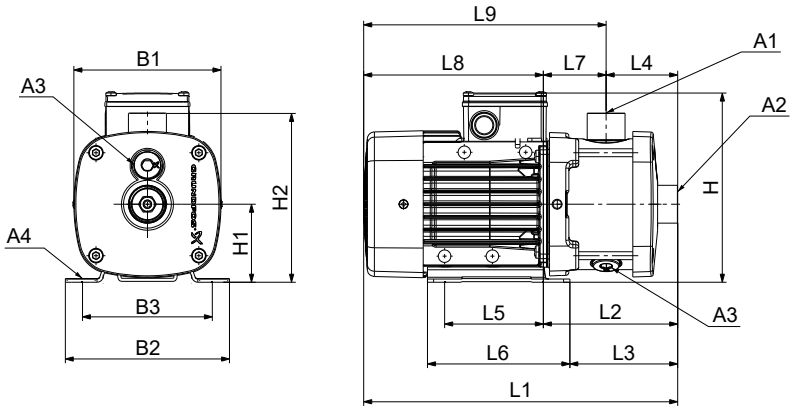
Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 1-2	71	0.58	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	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)	4.09 (104)	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 [inches (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"	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)	4.09 (104)	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)



TM042246

Dimensions

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

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

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

Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	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"	0.39 (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"	0.39 (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"	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 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)	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 [21) 22)]	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)	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 [22)]	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)	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 [22)]	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)	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 [22)]	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)	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)

[22)] Only CM-I and CM-G versions are available with this number of stages.

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

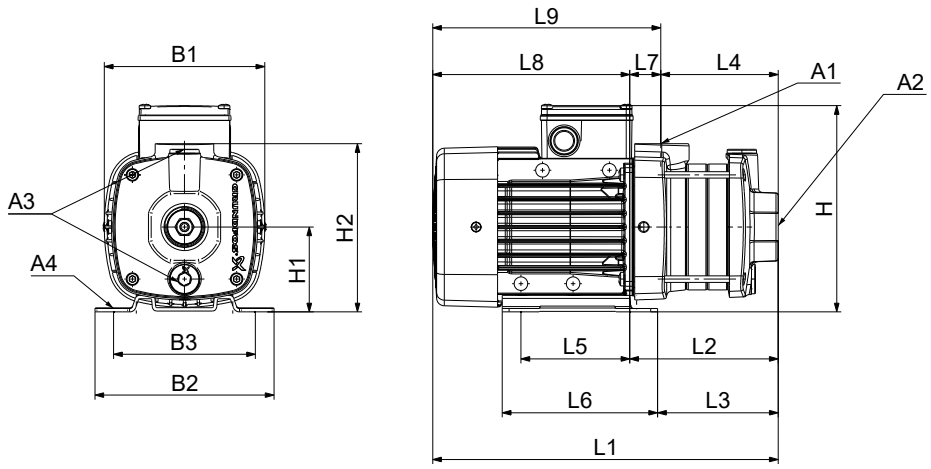
Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 1-2	71	0.8	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.01 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	2.36 (60)	6.85 (174)	9.21 (234)
CM 1-3	71	0.8	1"	1"	3/8"	0.39 (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"	0.39 (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"	0.39 (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"	0.39 (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)

Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]														
		[Hp]	A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 1-7	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)	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"	0.39 (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"	0.39 (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)

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

CM 3-A

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



Dimensions

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

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

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

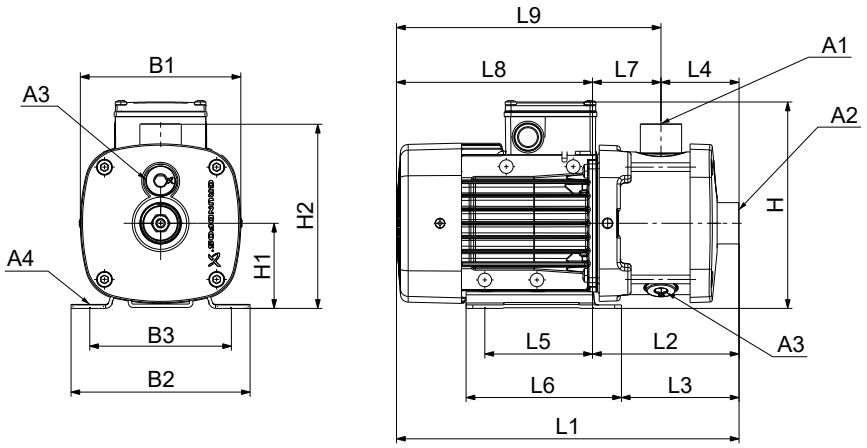
Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 3-2	71	0.58	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	11.34 (288)	4.49 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	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 [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 3-2	71	0.8	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)



Dimensions

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

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

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

Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
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 [23]	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 [23]	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 [23]	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 [23]	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)

[23] Only CM-I and CM-G versions are available with this number of stages.

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

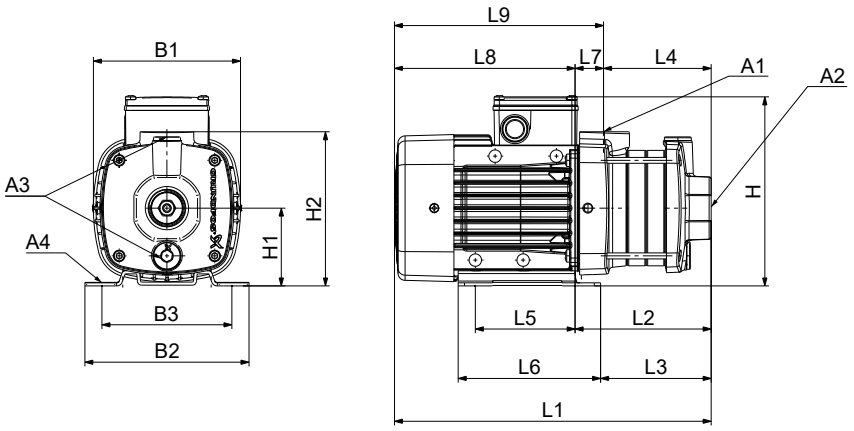
Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 3-2	71	0.6	1"	1"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	8.19 (208)	2.95 (75)	6.50 (165)	12.00 (305)	5.16 (131)	4.21 (107)	2.83 (72)	3.78 (96)	5.39 (137)	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)

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]														
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 3-6 [24]	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 [24]	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 [24]	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)

[24] 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)



TM042248

Dimensions

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

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

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

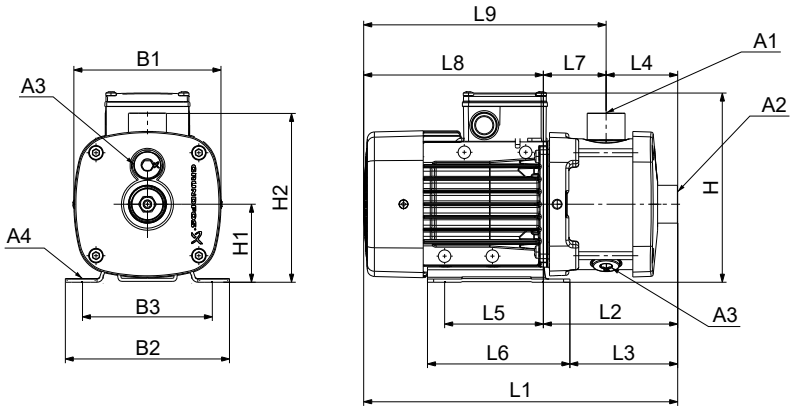
Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 5-2	71	1.0	1"	1 1/4"	3/8"	0.39 (10)	5.59 (142)	6.22 (158)	4.92 (125)	7.52 (191)	2.95 (75)	5.87 (149)	11.34 (288)	4.89 (114)	3.50 (89)	3.39 (86)	3.78 (96)	5.39 (137)	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	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	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)



TM042246

Dimensions

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

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

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
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 [25]	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 [25]	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 [25]	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)

[25] Only CM-G versions are available with this number of stages.

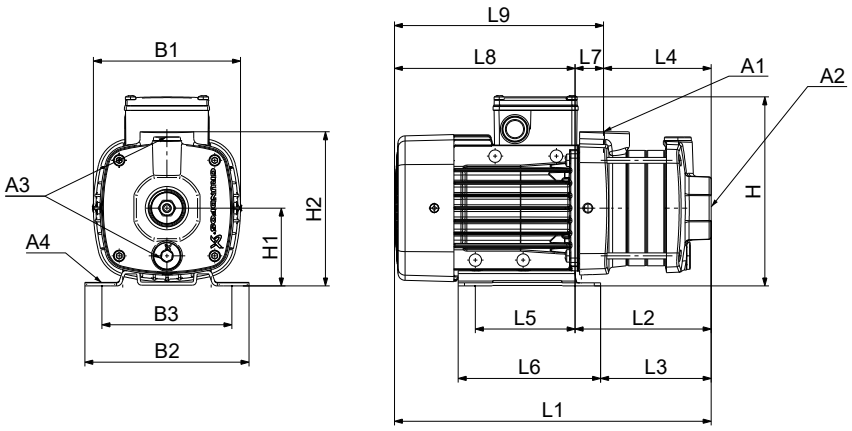
1 x 115/230 V, 60 Hz (supply voltage B)

1 x 220 V, 60 Hz (supply voltage A)

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (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)	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	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)



TM042248

Dimensions

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

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

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]														
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 10-1	80	1.7	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 [26]	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 [26]	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)

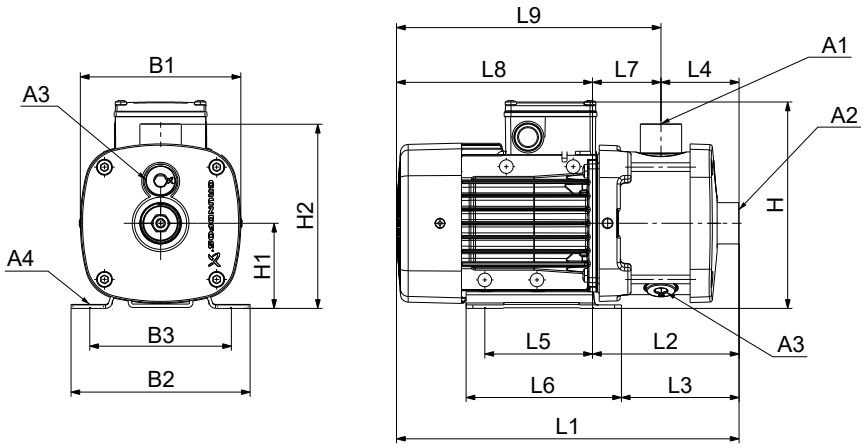
[26] This pump type is not available with supply voltage O.

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (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 = AISI 304 / EN 1.4301 and G = AISI 316 / EN 1.4401)



Dimensions

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

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

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CM 10-1	80	1.7	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 [27]	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 [27]	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 [27]	112	8.0	1 1/2"	1 1/2"	3/8"	0.47 (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 [27]	112	8.0	1 1/2"	1 1/2"	3/8"	0.47 (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)

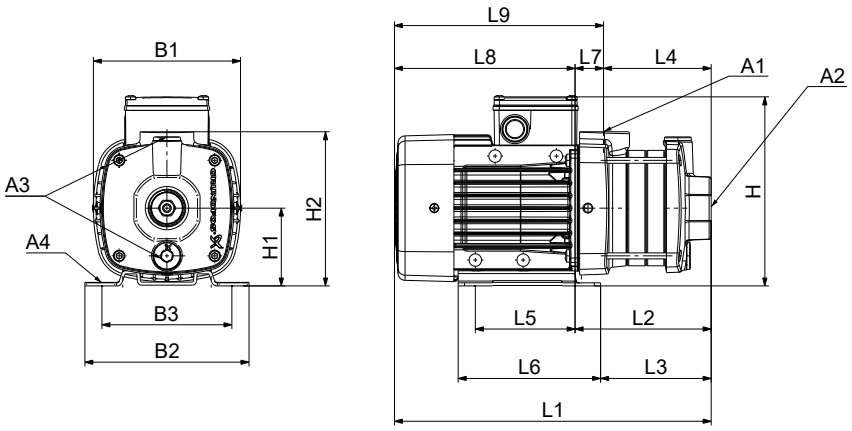
[27] This pump type is not available with supply voltage O.

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (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)	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)



TM042248

Dimensions

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

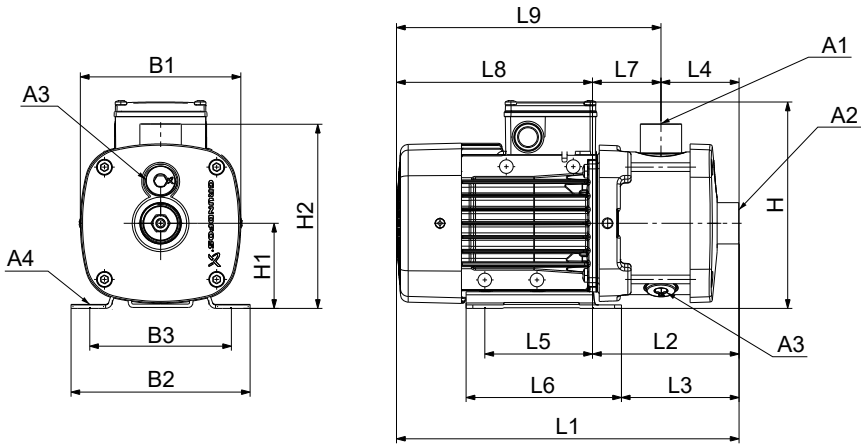
3 x 575 V, 60 Hz (supply voltage H)

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

Pump type	Frame size	P_2	NPT		Rp	Dimensions [inches (mm)]															
		[Hp]	A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
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	8.0	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)



Dimensions

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

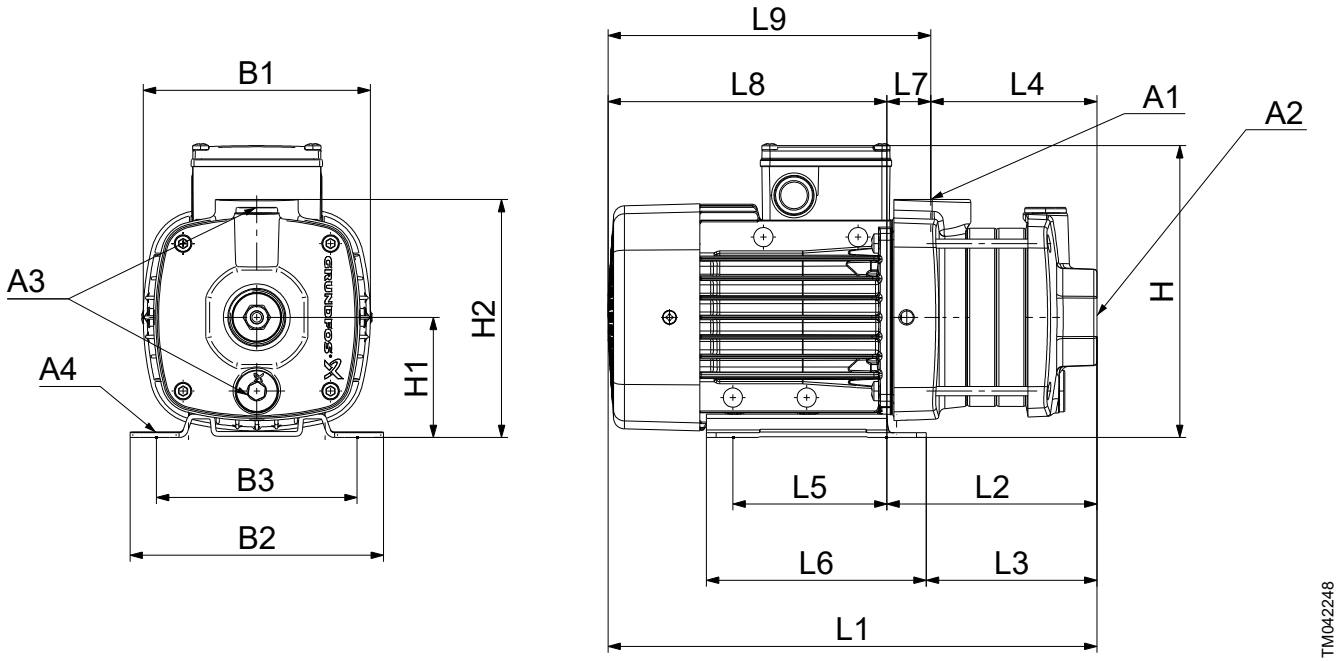
3 x 575 V, 60 Hz (supply voltage H)

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
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	8.0	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)



Dimensions

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

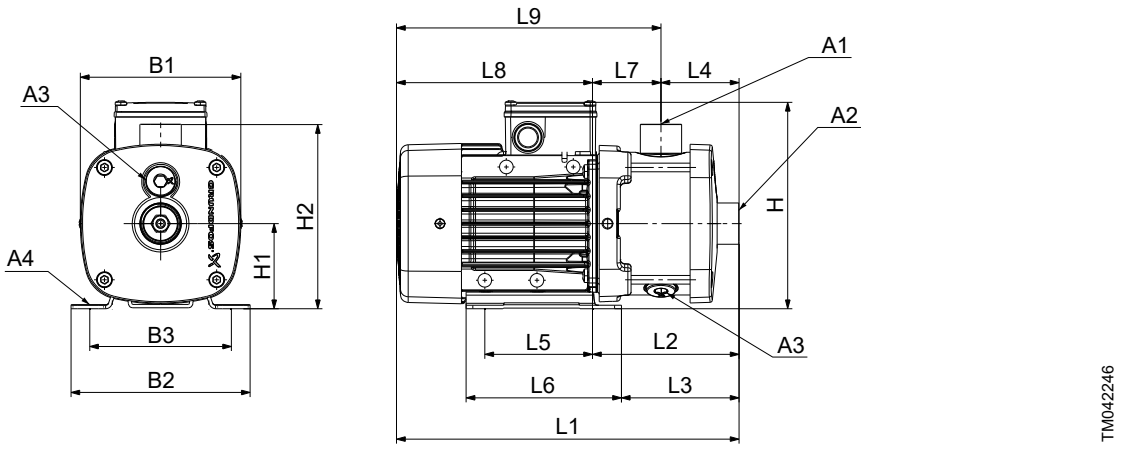
3 x 575 V, 60 Hz (supply voltage H)

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

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (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)	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	8.0	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)



Dimensions

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

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

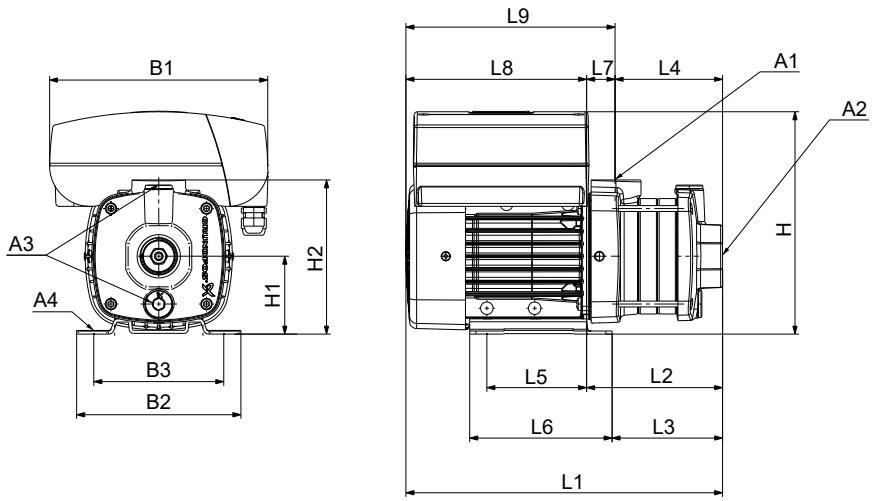
3 x 440-480 V, 60 Hz (supply voltage J)

Pump type	Frame size	P_2 [Hp]	NPT		Rp	Dimensions [inches (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	8.0	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)

18. Technical data, CME

CME 1-A

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



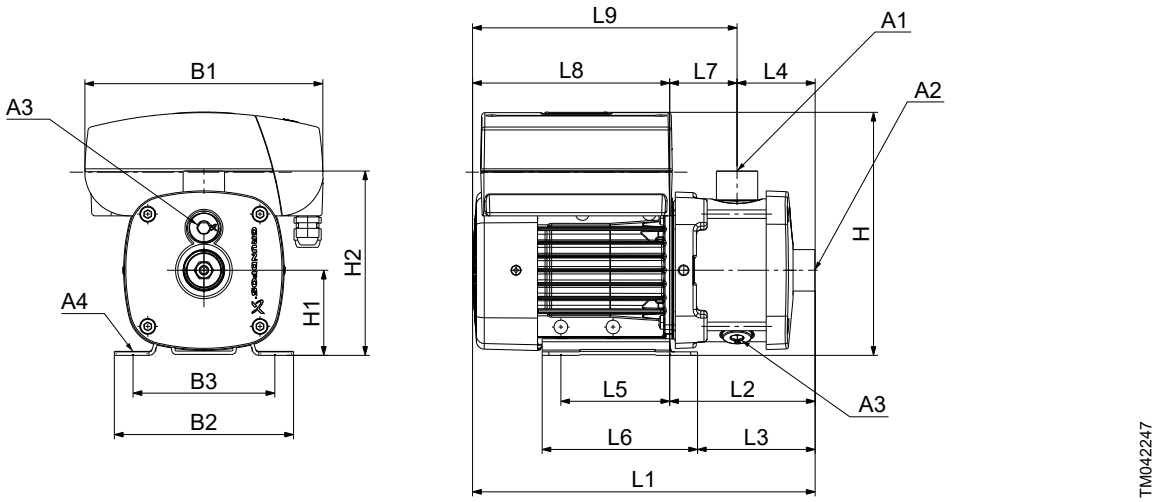
Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 1-2	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	12.13	4.41	3.44	3.34	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(308.2)	(111.9)	(87.4)	(84.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 1-3	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	12.84	5.11	4.15	4.05	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(326.2)	(129.9)	(105.4)	(102.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 1-4	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	13.55	5.82	4.86	4.76	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(344.2)	(147.9)	(123.4)	(120.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 1-5	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	14.26	6.53	5.57	5.46	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(362.2)	(165.9)	(141.4)	(138.8)	(96)	(137)	(27.1)	(196.3)	(223.4)

CME 1-I and CME 1-G

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (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"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	19.00	11.21	10.62	7.07	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(482.5)	(284.7)	(269.7)	(179.6)	(125)	(155)	(105.1)	(197.8)	(302.9)

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

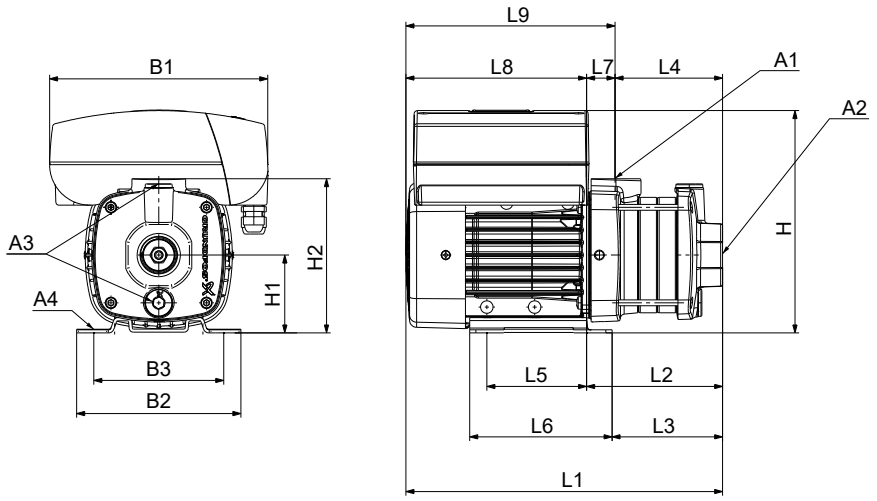
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 1-9	90C	2	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	19.00	11.21	10.62	7.07	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(482.5)	(284.7)	(269.7)	(179.6)	(125)	(155)	(105.1)	(197.8)	(302.9)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 1-2	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	12.91	5.19	4.22	2.82	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(328)	(131.7)	(107.2)	(71.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-3	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	12.91	5.19	4.22	2.82	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(328)	(131.7)	(107.2)	(71.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-4	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	13.62	5.89	4.93	3.53	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(346)	(149.7)	(125.2)	(89.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-5	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	14.33	6.60	5.64	4.24	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(364)	(167.7)	(143.2)	(107.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-6	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	15.75	8.02	7.06	(5.65)	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(400)	(203.7)	(179.2)	(143.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-7	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	15.75	8.02	7.06	5.65	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(400)	(203.7)	(179.2)	(143.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-8	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	17.17	9.44	8.47	7.07	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(436)	(239.7)	(215.2)	(179.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 1-9	90C	2	1"	1"	3/8"	0.41	8.35	7.01	5.50	9.78	3.56	7.11	17.42	11.21	10.62	7.07	4.92	6.10	4.14	6.21	10.35
						(10.5)	(212)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(442.5)	(284.7)	(269.7)	(179.6)	(125)	(155)	(105.1)	(157.8)	(262.9)

CME 3-A

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



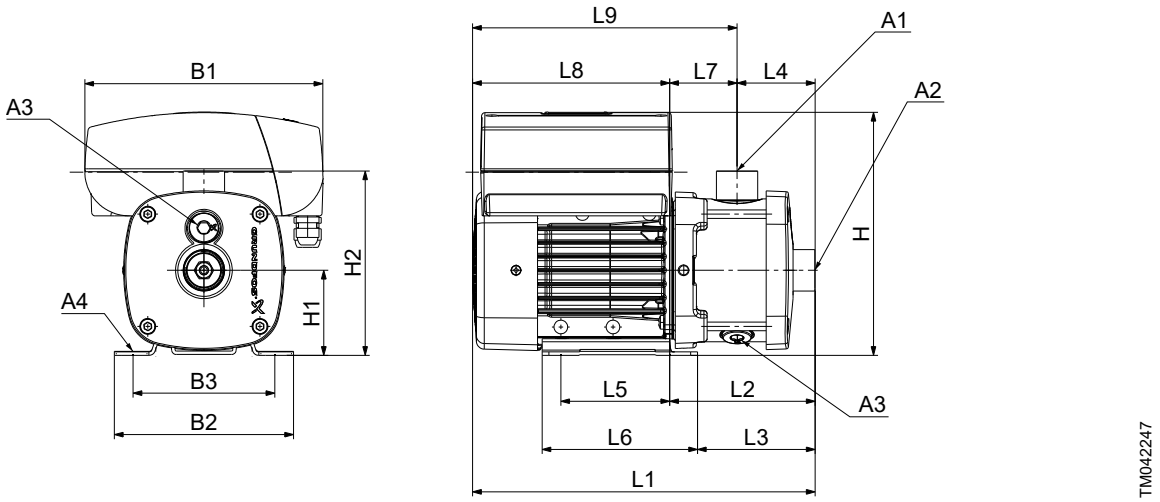
Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 3-2	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	12.13	4.41	3.44	3.34	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(308.2)	(111.9)	(87.4)	(84.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 3-3	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	12.84	5.11	4.15	4.05	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(326.2)	(129.9)	(105.4)	(102.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 3-4	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	13.55	5.82	4.86	4.76	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(344.2)	(147.9)	(123.4)	(120.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 3-5	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	14.26	6.53	5.57	5.46	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(362.2)	(165.9)	(141.4)	(138.8)	(96)	(137)	(27.1)	(196.3)	(223.4)

CME 3-I and CME 3-G

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 3-6	90C	2	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	17.58	9.79	9.20	5.65	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(446.5)	(248.7)	(233.7)	(143.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 3-7	90C	2	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	17.58	9.79	9.20	5.65	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(446.5)	(248.7)	(233.7)	(143.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 3-8	100A	3	1"	1"	3/8"	0.47	11.45	7.87	6.30	11.82	3.93	7.48	22.10	11.46	10.81	7.07	5.51	6.81	4.39	10.65	15.03
						(12)	(290.8)	(200)	(160)	(300.3)	(99.8)	(190.1)	(561.4)	(291)	(274.5)	(179.6)	(140)	(173)	(111.4)	(270.4)	(381.8)
CME 3-9	100A	3	1"	1"	3/8"	0.47	11.45	7.87	6.30	11.82	3.93	7.48	22.10	11.46	10.81	7.07	5.51	6.81	4.39	10.65	15.03
						(12)	(290.8)	(200)	(160)	(300.3)	(99.8)	(190.1)	(561.4)	(291)	(274.5)	(179.6)	(140)	(173)	(111.4)	(270.4)	(381.8)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 3-6	90C	2	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	17.58	9.79	9.20	5.65	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(446.5)	(248.7)	(233.7)	(143.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 3-7	90C	2	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	17.58	9.79	9.20	5.65	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(446.5)	(248.7)	(233.7)	(143.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME3-8	90D	3	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	19.00	11.21	10.62	7.07	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(482.5)	(284.7)	(269.7)	(179.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 3-9	90D	3	1"	1"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	19.00	11.21	10.62	7.07	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(482.5)	(284.7)	(269.7)	(179.6)	(125)	(155)	(105.1)	(197.8)	(302.9)

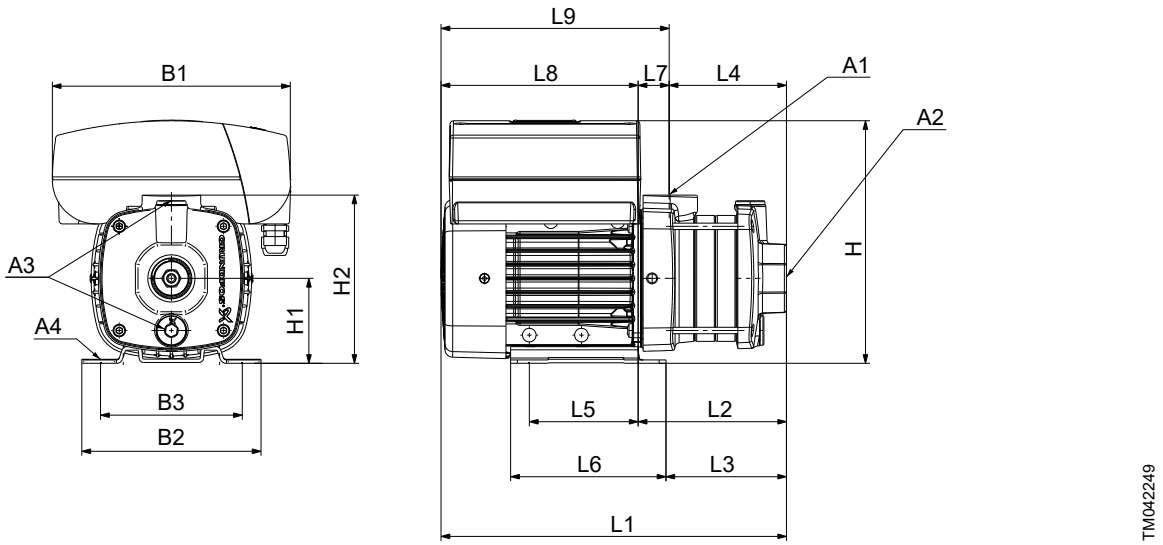
1 x 200-240 V, 60 Hz (supply voltage U)

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 3-2	71A	0.75	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	12.91	5.19	4.22	2.82	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(328)	(131.7)	(107.2)	(71.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 3-3	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	12.91	5.19	4.22	2.82	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(328)	(131.7)	(107.2)	(71.6)	(96)	(137)	(60.1)	(196.3)	(256.4)

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 3-4	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	13.62	5.89	4.93	3.53	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(346)	(149.7)	(125.2)	(89.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 3-5	80B	1.5	1"	1"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	14.33	6.60	5.64	4.24	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(364)	(167.7)	(143.2)	(107.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 3-6	90C	2	1"	1"	3/8"	0.41	8.35	7.01	5.50	9.78	3.56	7.11	16	9.79	9.20	5.65	4.92	6.10	4.14	6.21	10.35
						(10.5)	(212)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(406.5)	(248.7)	(233.7)	(143.6)	(125)	(155)	(105.1)	(157.8)	(262.9)
CME 3-7	90C	2	1"	1"	3/8"	0.41	8.35	7.01	5.50	9.78	3.56	7.11	16	9.79	9.20	5.65	4.92	6.10	4.14	6.21	10.35
						(10.5)	(212)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(406.5)	(248.7)	(233.7)	(143.6)	(125)	(155)	(105.1)	(157.8)	(262.9)

CME 5-A

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-4	90C	2	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.94	15.38	7.59	7.00	4.23	4.92	6.10	3.36	7.79	11.15
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(201.6)	(390.7)	(192.9)	(177.9)	(107.5)	(125)	(155)	(85.4)	(197.8)	(283.2)
CME 5-5	100A	3	1"	1.25"	3/8"	0.47	11.45	7.87	6.30	11.82	3.93	8.31	19.14	8.49	7.84	4.94	5.51	6.81	3.55	10.65	14.20
						(12)	(290.8)	(200)	(160)	(300.3)	(99.8)	(211.1)	(486.1)	(215.7)	(199.2)	(125.5)	(140)	(173)	(90.2)	(270.4)	(360.6)

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

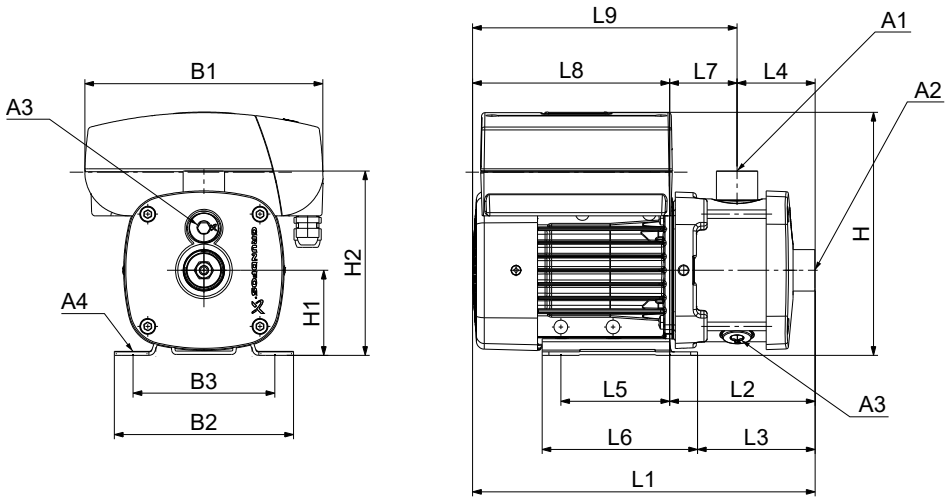
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-4	90C	2	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.94	15.38	7.59	7.00	4.23	4.92	6.10	3.36	7.79	11.15
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(201.6)	(390.7)	(192.9)	(177.9)	(107.5)	(125)	(155)	(85.4)	(197.8)	(283.2)
CME5-5	90D	3	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.94	16.09	8.30	7.71	4.94	4.92	6.10	3.36	7.79	11.15
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(201.6)	(408.7)	(210.9)	(195.9)	(125.5)	(125)	(155)	(85.4)	(197.8)	(283.2)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (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"	1.25"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	12.13	4.41	3.44	3.34	3.78	5.39	1.07	7.73	8.80
						(0.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(308.2)	(111.9)	(87.4)	(84.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 5-3	80B	1.5	1"	1.25"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	5.85	12.84	5.11	4.15	4.05	3.78	5.39	1.07	7.73	8.80
						(10.5)	(212)	(158)	(125)	(233)	(75)	(148.5)	(326.2)	(129.9)	(105.4)	(102.8)	(96)	(137)	(27.1)	(196.3)	(223.4)
CME 5-4	90C	2	1"	1.25"	3/8"	0.41	8.35	7.01	5.50	9.78	3.56	7.94	13.81	7.59	7.00	4.23	4.92	6.10	3.36	6.21	9.57
						(10.5)	(212)	(178)	(139.8)	(248.3)	(90.3)	(201.6)	(350.7)	(192.9)	(177.9)	(107.5)	(125)	(155)	(85.4)	(157.8)	(243.2)

CME 5-I and CME 5-G

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-4	90C	2	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	15.45	7.67	7.07	3.53	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(392.5)	(194.7)	(179.7)	(89.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 5-5	100A	3	1"	1.25"	3/8"	0.47	11.45	7.87	6.30	11.82	3.93	7.48	19.27	8.62	7.97	4.24	5.51	6.81	4.39	10.65	15.03
						(12)	(290.8)	(200)	(160)	(300.3)	(99.8)	(190.1)	(489.4)	(219)	(202)	(107.6)	(140)	(173)	(111.4)	(270.4)	(381.8)
CME 5-6	100A	3	1	1.25"	3/8"	0.47	11.45	7.87	6.30	11.82	3.93	7.48	20.69	10.04	9.39	5.65	5.51	6.81	4.39	10.65	15.03
						(12)	(290.8)	(200)	(160)	(300.3)	(99.8)	(90.1)	(525.4)	(255)	(238.5)	(143.6)	(140)	(173)	(111.4)	(270.4)	(381.8)
CME5-7	100A	3	1	1.25"	3/8"	0.47	11.45	7.87	6.30	11.82	3.93	7.48	20.69	10.04	9.39	5.65	5.51	6.81	4.39	10.65	15.03
						(12)	(290.8)	(200)	(160)	(300.3)	(99.8)	(190.1)	(525.4)	(255)	(238.5)	(143.6)	(140)	(173)	(111.4)	(270.4)	(381.8)
CME 5-8	112C	5	1"	1.25"	3/8"	0.47	11.46	9.06	7.48	9.37	3.15	6.71	19.70	12.05	11.26	7.07	5.51	7.09	4.98	7.65	12.63
						(12)	(291)	(230)	(190)	(238.1)	(80.1)	(170.4)	(500.3)	(306.1)	(286.1)	(179.6)	(140)	(180)	(126.5)	(194.2)	(320.7)

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

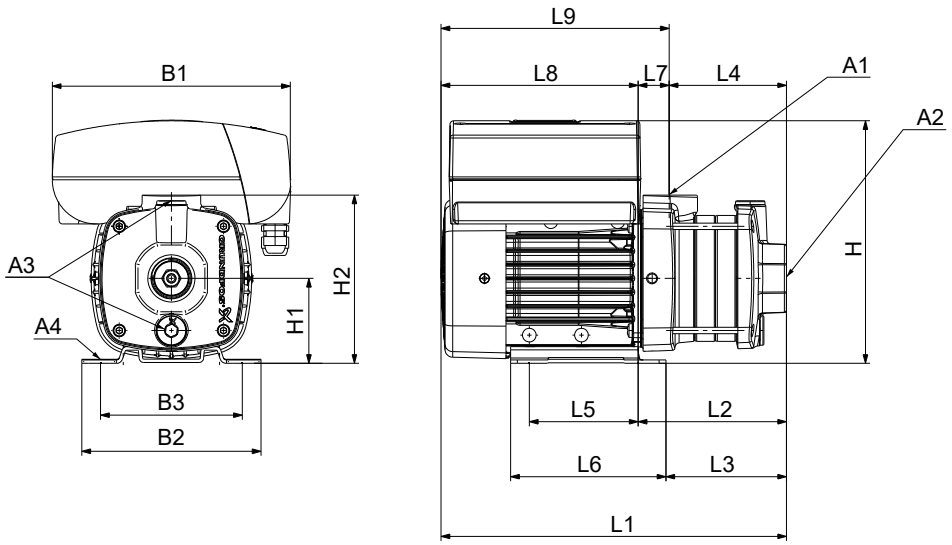
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 5-4	90C	2	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	15.45	7.67	7.07	3.53	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(392.5)	194.70	(179.7)	(89.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME5-5	90D	3	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	16.16	8.37	7.78	4.24	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(410.5)	212.70	(197.7)	(107.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 5-6	90D	3	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	17.58	9.79	9.20	5.65	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(446.5)	248.70	(233.7)	(143.6)	(125)	(155)	(105.1)	(197.8)	(302.9)
CME 5-7	90D	3	1"	1.25"	3/8"	0.41	10.51	7.01	5.50	9.78	3.56	7.11	17.58	9.79	9.20	5.65	4.92	6.10	4.14	7.79	11.93
						(10.5)	(267)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(446.5)	248.70	(233.7)	(143.6)	(125)	(155)	(105.1)	(197.8)	(302.9)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (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"	1.25"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	12.91	5.19	4.22	2.82	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(328)	(131.7)	(107.2)	(71.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 5-3	80B	1.5	1"	1.25"	3/8"	0.41	8.35	6.22	4.92	9.17	2.95	6.51	12.91	5.19	4.22	2.82	3.78	5.39	2.37	7.73	10.09
						(10.5)	(212)	(158)	(125)	(233)	(75)	(165.3)	(328)	(131.7)	(107.2)	(71.6)	(96)	(137)	(60.1)	(196.3)	(256.4)
CME 5-4	90C	2	1"	1.25"	3/8"	0.41	8.35	7.01	5.50	9.78	3.56	7.11	13.88	7.67	7.07	3.53	4.92	6.10	4.14	6.21	10.35
						(10.5)	(212)	(178)	(139.8)	(248.3)	(90.3)	(180.6)	(352.5)	(194.7)	(179.7)	(89.6)	(125)	(155)	(105.1)	(157.8)	(262.9)

CME 10-A

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 10-2	100A	3	1.5"	1.5"	3/8"	0.47	11.46	7.87	6.30	8.90	2.68	8.26	16.54	8.64	7.99	3.83	5.51	6.81	4.81	7.90	12.71
						(12)	(291)	(200)	(160)	(226.1)	(68.1)	(209.9)	(420.1)	(219.4)	(202.9)	(97.2)	(140)	(173)	(122.2)	(200.7)	(322.9)
CME 10-3	112C	5	1.5"	1.5"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	19.91	9.52	8.74	5.01	5.51	7.09	4.52	10.39	14.91
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(253.6)	(505.8)	(241.9)	(221.9)	(127.2)	(140)	(180)	(114.7)	(263)	(378.6)

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

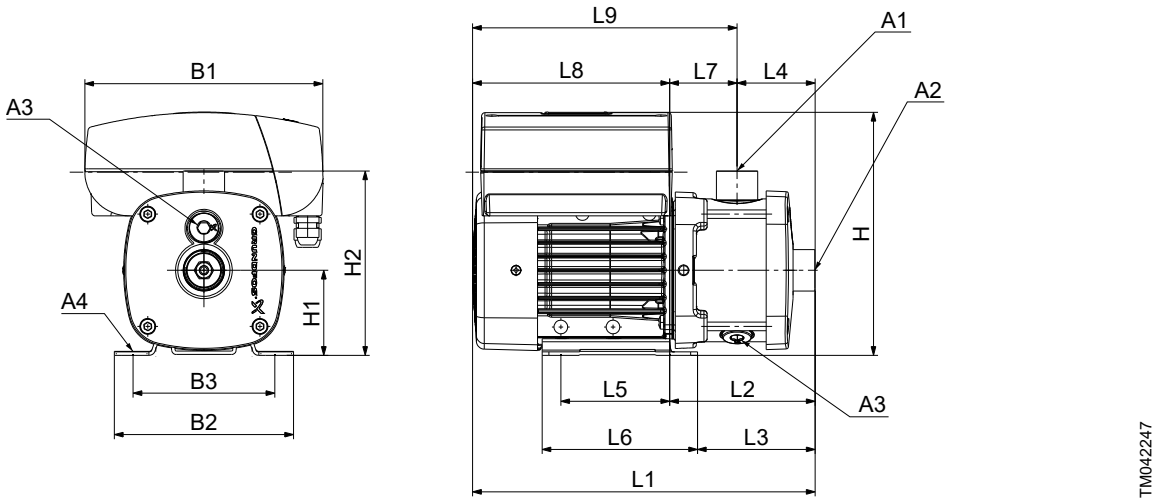
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 10-2	90D	3	1.5"	1.5"	3/8"	0.47	10.51	7.83	6.30	10.17	3.95	9.53	15.69	7.47	6.88	3.83	5.51	6.69	3.64	8.22	11.86
						(12)	(267)	(199)	(159.9)	(258.3)	(100.3)	(242.1)	(398.4)	(189.7)	(174.7)	(97.2)	(140)	(170)	(92.5)	(208.7)	(301.2)
CME 10-3	112C	5	1.5"	1.5"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	19.91	9.52	8.73	5.01	5.51	7.09	4.51	10.39	14.90
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(253.6)	(505.7)	(241.8)	(221.8)	(127.2)	(140)	(180)	(114.6)	(263.9)	(378.5)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (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	1.5"	1.5"	3/8"	0.41	8.35	6.22	4.92	10.16	3.94	9.52	13.85	6.12	5.15	3.83	3.74	5.39	2.29	7.73	10.02
						(10.5)	(212)	(158)	(125)	(258)	(100)	(241.8)	(351.7)	(155.4)	(130.9)	(97.2)	(95)	(137)	(58.2)	(196.3)	(254.5)

CME 10-I and CME 10-G

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 10-2	100A	3	1.5"	1.5"	3/8"	0.47	11.46	7.87	6.30	8.90	2.68	7.35	17.72	9.82	9.17	4.13	5.51	6.81	5.69	7.90	13.59
						(12)	(291)	(200)	(160)	(226.1)	(68.1)	(186.7)	(450.1)	(249.4)	(232.9)	(105)	(140)	(173)	(144.4)	(200.7)	(345.1)
CME 10-3	112C	5	1.5"	1.5"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.07	19.91	9.52	8.74	4.13	5.51	7.09	5.39	10.39	15.78
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(230.4)	(505.8)	241.90	(221.9)	(105)	(140)	(180)	(136.9)	(263.9)	(400.8)
CME 10-4	132F	7.5	1.5"	1.5"	3/8"	0.47	13.62	10.08	8.50	14.50	5.19	9.86	22.80	10.98	10.20	5.31	5.51	7.09	5.67	11.81	17.48
						(12)	(346)	(256)	(216)	(368.3)	(131.8)	(250.4)	(579)	279.00	(259)	(135)	(140)	(180)	(144)	(300)	(444)
CME 10-5	132F	7.5	1.5"	1.5"	3/8"	0.47	13.62	10.08	8.50	14.50	5.19	9.86	25.16	13.35	12.56	7.68	5.51	7.09	5.67	11.81	17.48
						(12)	(346)	(256)	(216)	(368.3)	(131.8)	(250.4)	(639)	(339)	(319)	(195)	(140)	(180)	(144)	(300)	(444)

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

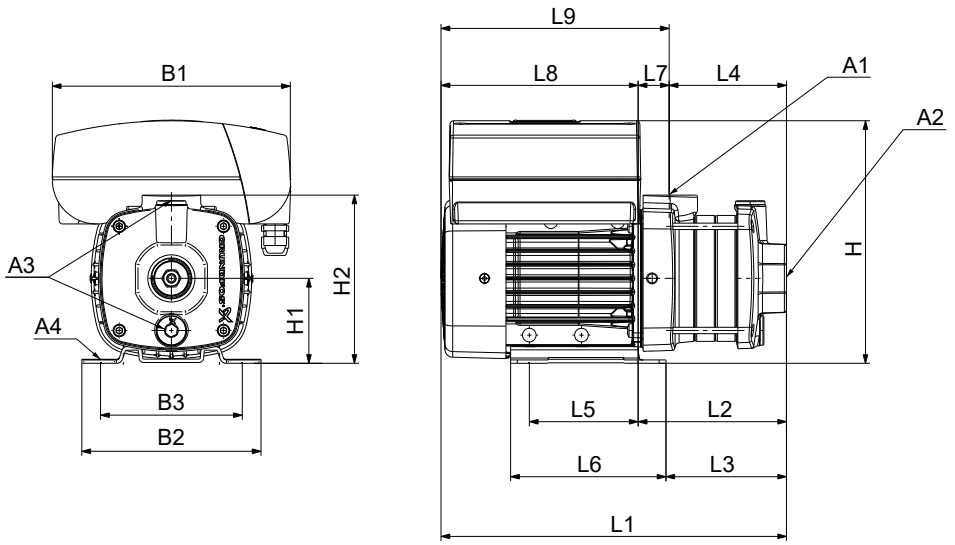
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 10-2	90D	3	1.5"	1.5"	3/8"	0.47	10.51	7.83	6.30	10.17	3.95	8.62	16.87	8.65	8.06	4.13	5.51	6.69	4.52	8.22	12.73
						(12)	(267)	(199)	(159.9)	(258.3)	(100.3)	(218.9)	(428.4)	(219.7)	(204.7)	(105)	(140)	(170)	(114.7)	(208.7)	(323.4)
CME 10-3	112C	5	1.5"	1.5"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.07	19.91	9.52	8.73	4.13	5.51	7.09	5.39	10.39	15.78
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(230.4)	(505.7)	(241.8)	(221.8)	(105)	(140)	(180)	(136.8)	(263.9)	(400.7)
CME10-4	112E	7.5	1.5"	1.5"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.07	21.76	11.37	10.58	5.31	5.51	7.09	6.06	10.39	16.44
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(230.4)	(552.7)	(288.8)	(268.8)	(135)	(140)	(180)	(153.8)	(263.9)	(417.7)
CME 10-5	112E	7.5	1.5"	1.5"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.07	24.12	13.73	12.94	7.68	5.51	7.09	6.06	10.39	16.44
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(230.4)	(612.7)	(348.8)	(328.8)	(195)	(140)	(180)	(153.8)	(263.9)	(417.7)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (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	1.5"	1.5"	3/8"	0.41	8.35	6.22	4.92	10.16	3.94	8.61	15.03	7.30	6.33	4.13	3.74	5.39	3.17	7.73	10.89
						(10.5)	(212)	(158)	(125)	(258)	(100)	(218.6)	(381.7)	(185.4)	(160.9)	(105)	(95)	(137)	(80.4)	(196.3)	(276.7)

CME 15-A

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



Dimensions

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

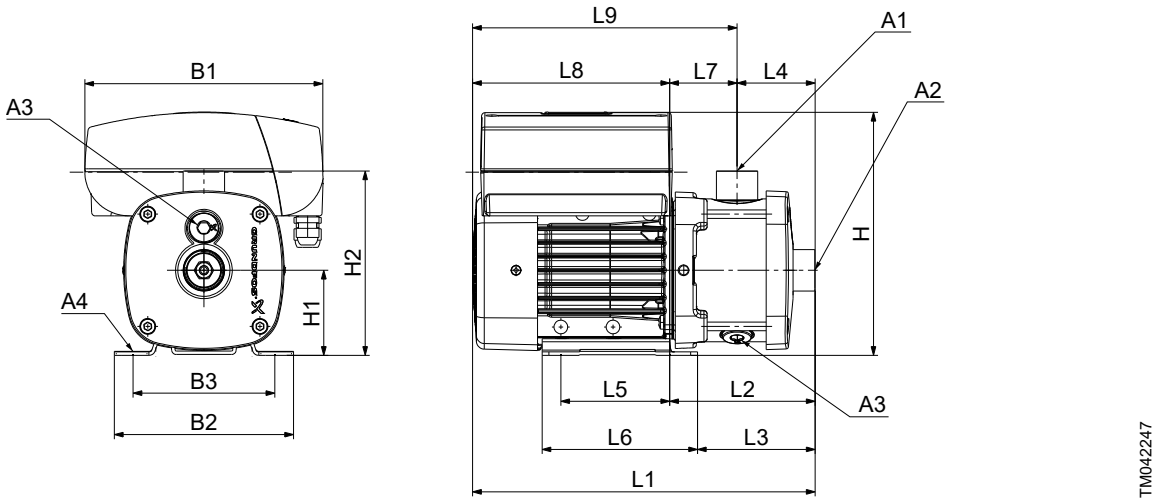
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 15-1	100A	3	2"	2"	3/8"	0.47	11.46	7.87	6.30	8.90	2.68	8.26	16.54	8.64	7.99	3.83	5.51	6.81	4.81	7.90	12.71
						(12)	(291)	(200)	(160)	(226.1)	(68.1)	(209.9)	(420.1)	(219.4)	(202.9)	(97.2)	(140)	(173)	(122.2)	(200.7)	(322.9)
CME15-2	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	18.73	8.34	7.56	3.83	5.51	7.09	4.52	10.39	14.91
						(12)	(291)	(230)	(190)	(312.3)	(111.8)	(253.6)	(475.8)	(211.9)	(191.9)	(97.2)	(140)	(180)	(114.7)	(263.9)	(378.6)
CME 15-3	132F	7.5	2"	2"	3/8"	0.47	13.62	10.08	8.50	14.50	5.19	10.77	21.61	9.80	9.02	5.01	5.51	7.09	4.80	11.81	16.61
						(12)	(346)	(256)	(216)	(368.3)	(131.8)	(273.6)	(549)	(249)	(229)	(127.2)	(140)	(180)	(121.8)	(300)	(421.8)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 15-1	90D	3	2"	2"	3/8"	0.47	10.51	7.83	6.30	10.17	3.95	9.53	15.69	7.47	6.88	3.83	5.51	6.69	3.64	8.22	11.86
						(12)	(267)	(199)	(160)	(258.3)	(100.3)	(242.1)	(398.4)	(189.7)	(174.7)	(97.2)	(140)	(170)	(92.5)	(208.7)	(301.2)
CME 15-2	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	18.73	8.34	7.55	3.83	5.51	7.09	4.51	10.39	14.90
						(12)	(291)	(230)	(190)	(312.3)	(111.8)	(253.6)	(475.7)	(211.8)	(191.8)	(97.2)	(140)	(180)	(115)	(264)	(379)
CME 15-3	112E	7.5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	20.58	10.19	9.40	5.01	5.51	7.09	5.18	10.39	15.57
						(12)	(291)	(230)	(190)	(312)	(112)	(254)	(523)	(259)	(239)	(127)	(140)	(180)	(132)	(264)	(396)

CME 15-I and CME 15-G

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



Dimensions

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

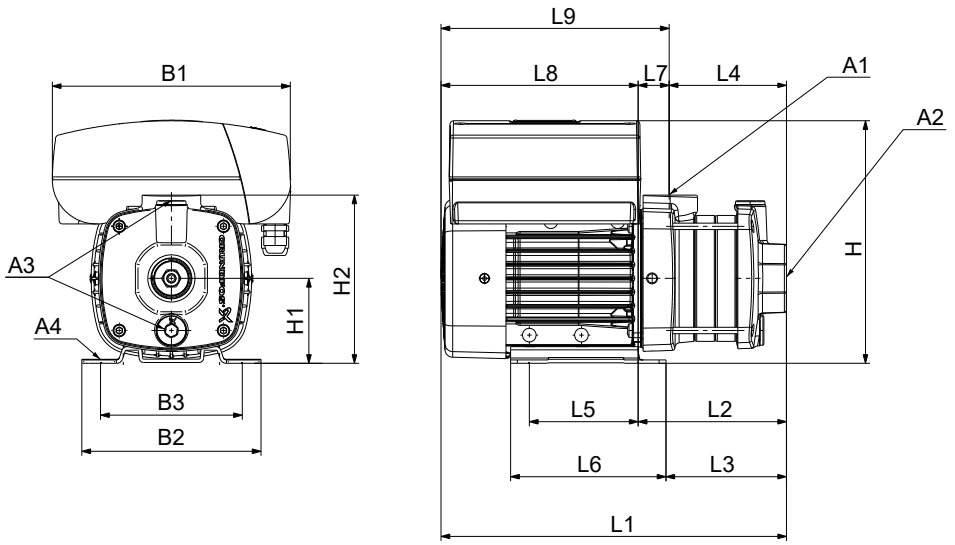
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 15-1	100A	3	2	2	3/8"	0.47	11.46	7.87	6.30	8.90	2.68	7.28	17.72	9.82	9.17	4.13	5.51	6.81	5.69	7.90	13.59
						(12)	(291)	(200)	(160)	(226.1)	(68.1)	(185)	(450.1)	(249.4)	(232.9)	(105)	(140)	(173)	(144.4)	(200.7)	(345.1)
CME15-2	112C	5	2	2	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.00	19.91	9.52	8.74	4.13	5.51	7.09	5.39	10.39	15.78
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(228.7)	(505.8)	(241.9)	(221.9)	(105)	(140)	(180)	(136.9)	(263.9)	(400.8)
CME 15-3	132F	7.5	2	2	3/8"	0.47	13.62	10.08	8.50	14.50	5.19	9.79	21.61	9.80	9.02	4.13	5.51	7.09	5.67	11.81	17.48
						(12)	(346)	(256)	(216)	(368.3)	(131.8)	(248.7)	(549)	(249)	(229)	(105)	(140)	(180)	(144)	(300)	(444)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 15-1	90D	3	2"	2"	3/8"	0.47	10.51	7.83	6.30	10.17	3.95	8.55	16.87	8.65	8.06	4.13	5.51	6.69	4.52	8.22	12.73
						(12)	(267)	(199)	(159.9)	(258.3)	(100.3)	(217.2)	(428.4)	(219.7)	(204.7)	(105)	(140)	(170)	(114.7)	(208.7)	(323.4)
CME 15-2	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.00	19.91	9.52	8.73	4.13	5.51	7.09	5.39	10.39	15.78
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(228.7)	(505.7)	(241.8)	(221.8)	(105)	(140)	(180)	(136.8)	(263.9)	(400.7)
CME 15-3	112E	7.5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.00	20.58	10.19	9.40	4.13	5.51	7.09	6.06	10.39	16.44
						(12)	(291)	(230)	(190)	(312)	(112)	(229)	(523)	(259)	(239)	(105)	(140)	(180)	(154)	(264)	(418)

CME 25-A

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



Dimensions

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

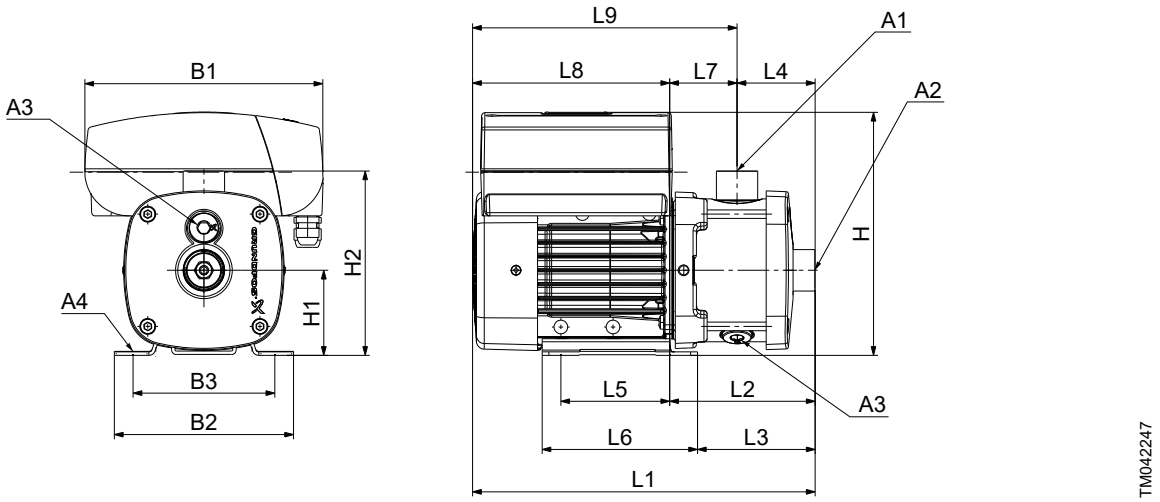
Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 25-1	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	18.73	8.34	7.56	3.83	5.51	7.09	4.52	10.39	14.91
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(253.6)	(475.8)	(211.9)	(191.9)	(97.2)	(140)	(180)	(114.7)	(263.9)	(378.6)
CME 25-2	132F	7.5	2"	2"	3/8"	0.47	13.62	10.08	8.50	14.50	5.19	10.77	20.43	8.62	7.83	3.83	5.51	7.09	4.80	11.81	16.61
						(12)	(346)	(256)	(216)	(368.3)	(131.8)	(273.6)	(519)	(219)	(199)	(97.2)	(140)	(180)	(121.8)	(300)	(421.8)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 25-1	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	18.73	8.34	7.55	3.83	5.51	7.09	4.51	10.39	14.90
						(12)	(291)	(230)	(190)	(312)	(112)	(254)	(476)	(212)	(192)	(97)	(140)	(180)	(115)	(264)	(379)
CME 25-2	112E	7.5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.98	19.40	9.01	8.22	3.83	5.51	7.09	5.18	10.39	15.57
						(12)	(291)	(230)	(190)	(312)	(112)	(254)	(493)	(229)	(209)	(97)	(140)	(180)	(132)	(264)	(396)

CME 25-I and CME 25-G

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



Dimensions

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 25-1	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.00	19.91	9.52	8.74	4.13	5.51	7.09	5.39	10.39	15.78
						(12)	(290.8)	(230)	(190)	(312.3)	(111.8)	(228.7)	(505.8)	(241.9)	(221.9)	(105)	(140)	(180)	(136.9)	(263.9)	(400.8)
CME 25-2	132F	7.5	2"	2"	3/8"	0.47	13.62	10.08	8.50	14.50	5.19	9.79	21.61	9.80	9.02	4.13	5.51	7.09	5.67	11.81	17.48
						(12)	(346)	(256)	(216)	(368.3)	(131.8)	(248.7)	(549)	(249)	(229)	(105)	(140)	(180)	(144)	(300)	(444)

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

Pump type	Frame size	Hp	NPT		Rp	Dimensions [inches (mm)]															
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME 25-1	112C	5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.00	19.91	9.52	8.73	4.13	5.51	7.09	5.39	10.39	15.78
						(12	291	230	190	312	112	229	506	242	222	105	140	180	137	264	401
CME 25-2	112E	7.5	2"	2"	3/8"	0.47	11.45	9.06	7.48	12.30	4.40	9.00	20.58	10.19	9.40	4.13	5.51	7.09	6.06	10.39	16.44
						(12)	(291)	(230)	(190)	(312)	(112)	(229)	(523)	(259)	(239)	(105)	(140)	(180)	(154)	(264)	(418)

19. Weights and shipping volume

All weights and volumes refer to CM, CME pumps with standard pipe connections.

CM pumps, cast iron

CM 1-A

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

Supply voltage	Pump type	Net weight		Shipping weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft^3]	[m^3]
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) 3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft^3]	[m^3]
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) 3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping weight		Shipping volume	
		[lb]	[kg]	[lb]	[kg]	[ft^3]	[m^3]
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) 3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping 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
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E)	CM 10-1	51.6	23.4	57.1	25.9	1.31	0.0370
3 x 575 V, 60 Hz (supply voltage H)	CM 10-2	70.3	31.9	75.8	34.4	1.58	0.0444
3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping 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 15-1	67.5	30.6	73.0	33.1	1.31	0.0370
3 x 575 V, 60 Hz (supply voltage H)	CM 15-2	87.1	39.5	92.6	42.0	1.58	0.0444
3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping 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)							
3 x 440-480 V, 60 Hz (supply voltage J)	CM 25-2	104.9	47.6	110.5	50.1	1.75	0.0495

CM pumps, stainless steel

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

Supply voltage	Pump type	Net weight		Shipping 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) 3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping 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
3 x 208-230 V / 440-480 V, 60 Hz (supply voltage E) 3 x 575 V, 60 Hz (supply voltage H) 3 x 440-480 V, 60 Hz (supply voltage J)	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
	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		Shipping 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) 3 x 440-480 V, 60 Hz (supply voltage J)	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		Shipping 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) 3 x 440-480 V, 60 Hz (supply voltage J)	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 pumps

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

Supply voltage	Pump type	Net weight		Shipping weight	
		[lb]	[kg]	[lb]	[kg]
3 x 440-480 V, 60 Hz (supply voltage T)	CME 5-4	44	20	48	22
	CME 5-5	43	19	47	21
	CME 10-2	64	29	68	31
	CME 10-3	91	41	99	45
	CME 15-1	61	28	65	29
	CME 15-2	88	40	96	43
	CME 15-3	111	50	118	54
	CME 25-1	87	39	94	43
	CME 25-2	117	53	129	49
1 x 200-240 V, 60 Hz (supply voltage U)	CME 1-2	30	14	38	17
	CME 1-3	31	14	38	17
	CME 1-4	31	14	39	18
	CME 1-5	34	15	42	19
	CME 3-2	30	14	38	17
	CME 3-3	33	15	40	18
	CME 3-4	33	15	41	19
	CME 3-5	34	15	42	19
	CME 5-2	32	14	39	18
	CME 5-3	32	15	40	18
	CME 5-4	40	18	48	22
	CME 10-1	52	24	56	25
3 x 200-240 V, 60 Hz (supply voltage V)	CME 5-4	45	20	49	22
	CME 5-5	60	27	68	31
	CME 10-2	88	40	96	44
	CME 10-3	86	39	93	42
	CME 15-1	85	39	93	42
	CME 15-2	83	37	90	41
	CME 15-3	116	53	124	56
	CME 25-1	81	37	89	40
	CME 25-2	114	52	123	56

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

Supply voltage	Pump type	Net weight		Shipping weight	
		[lb]	[kg]	[lb]	[kg]
3 x 440-480 V, 60 Hz (supply voltage T)	CME 1-9	45	20	49	22
	CME 3-6	43	20	48	22
	CME 3-7	44	20	48	22
	CME 3-8	48	22	52	24
	CME 3-9	48	22	52	24
	CME 5-4	41	19	45	20
	CME 5-5	45	20	49	22
	CME 5-6	46	21	51	23
	CME 5-7	47	21	51	23
	CME 10-2	53	24	56	26
	CME 10-3	79	36	86	39
	CME 10-4	101	46	109	49
	CME 10-5	104	47	112	51
	CME 15-1	52	24	56	25
	CME 15-2	78	35	86	39
	CME 15-3	100	45	108	49
	CME 25-1	78	35	85	39
	CME 25-2	99	45	117	48
1 x 200-240 V, 60 Hz (supply voltage U)	CME 1-2	31	14	39	18
	CME 1-3	32	14	39	18
	CME 1-4	32	15	40	18
	CME 1-5	35	16	43	19
	CME 1-6	36	16	44	20
	CME 1-7	37	17	44	20
	CME 1-8	38	17	46	21
	CME 1-9	41	19	49	22
	CME 3-2	31	14	39	18
	CME 3-3	34	15	41	19
	CME 3-4	34	16	42	19
	CME 3-5	35	16	43	19
	CME 3-6	39	18	47	21
	CME 3-7	40	18	47	21
	CME 5-2	33	15	41	19
	CME 5-3	33	15	41	19
	CME 5-4	37	17	45	20
	CME 10-1	42	19	45	21

Supply voltage	Pump type	Net weight		Shipping weight	
		[lb]	[kg]	[lb]	[kg]
3 x 200-240 V, 60 Hz (supply voltage V)	CME 1-9	46	21	50	23
	CME 5-4	42	19	46	21
	CME 5-5	58	26	65	30
	CME 5-6	59	27	67	30
	CME 5-7	59	27	67	30
	CME 5-8	80	36	87	40
	CME 10-2	77	35	85	39
	CME 10-3	73	33	81	37
	CME 10-4	107	49	115	52
	CME 10-5	110	50	118	54
	CME 15-1	77	35	84	38
	CME 15-2	73	33	80	36
	CME 15-3	105	48	113	51
	CME 25-1	72	33	80	36
	CME 25-2	104	47	113	51

20. Electrical data

Asynchronous motors, 60 Hz

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

Frame size	P_2 [Hp]	Service factor	$I_{1/1}$ [A]	Cos $\phi_{1/1}$	I_{start} [A]	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 $\phi_{1/1}$	I_{start} [A]	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 $\phi_{1/1}$	I_{start} [A]	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

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

Frame size	P_2 [Hp]	Service factor	$I_{1/1}$ [A]	Cos $\phi_{1/1}$	I_{start} [A]	Speed [rpm]
71A	0.58	1.0	0.95 / 0.80	0.85 / 0.82	5.6 / 5.2	3360-3420
71B	1.0	1.0	1.7 / 1.8	0.89 / 0.83	10 / 11.7	3220-3380
80B	1.4	1.0	2 / 2.1	0.85 / 0.75	14.6 / 16.8	3420-3460
80C	1.5	1.0	2.22 / 2.22	0.8 / 0.72	16.7 / 19.3	3440-3470
80C	1.7	1.0	2.55 / 2.45	0.82 / 0.76	19.1 / 21.3	3440-3470
90G	2.3	1.0	3.30 / 3.20	0.82 / 0.77	26.1 / 28.5	3490-3510
90H	3.0	1.0	4.15 / 4.00	0.84 / 0.80	38.6 / 42	3500-3530
90H	3.4	1.0	4.80 / 4.60	0.83 / 0.82	30.7 / 37.3	3490-3500
100D	3.9	1.0	5.25 / 5.3	0.85 / 0.79	63 / 46.1	3520-3540
112C	5.4	1.0	6.95 / 6.65	0.88 / 0.84	84.1 / 89.1	3540-3550

Frame size	P_2 [Hp]	Service factor	$I_{1/1}$ [A]	Cos $\phi_{1/1}$	I_{start} [A]	Speed [rpm]
100B	5.4	1.0	7.3 / 7.5	0.86 / 0.80	87.6 / 65.3	3520-3530
132D	7.4	1.0	9.7 / 9.45	0.86 / 0.82	133.4 / 145.5	3530-3550
132B	8.0	1.0	10.2 / 10.2	0.86 / 0.79	123.4 / 136.7	3520-3530
132E	8.6	1.0	11.8 / 12.0	0.82 / 0.74	153.4 / 174	3540-3550

Speed-controlled motors

3 x 200-240 V, 50/60 Hz (supply voltage V)

Frame size	P_2 [Hp]	Service factor	Full load amps [A]	Service factor amps [A]
90	2	1.00	5.40 - 4.50	-
100	3	1.15	7.90-6.60	9.10 - 7.60
112	5	1.15	13.2-10.9	14.9 - 12.4
132	7.5	1.15	20.0-16.6	23.0 - 19.3

3 x 440-480 V, 50/60 Hz (supply voltage T)

Frame size	P_2 [Hp]	Service factor	Full load amps [A]	Service factor amps [A]
90	2	1.15	2.65	3.00
90	3	1.15	3.8	4.30
112	5	1.15	6.2-5.8	7.0-6.6
112	7.5	1.15	9.1-8.5	10.4-9.7

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

Frame size	P_2 [Hp]	Service factor	Full load amps [A]	Service factor amps [A]
71	0.75	1.00	3.45-2.9	-
80	1.50	1.00	6.70-5.6	-
90	2.00	1.00	9.10-7.6	-

Additional data for speed-controlled motors

Single-phase supply voltage

1 x 200-240 V, 50/60 Hz (supply voltage U).

Recommended fuse size

Motor size [Hp]	Min. [A]	Max. [A]
0.5 - 1.0 Hp	6	10
1.5 - 2.0 Hp	10	16

You can use standard as well as quick-blow or slow-blow fuses.

Leakage current

Earth leakage current must be less than 3.5 mA, AC.

Earth leakage current must be less than 10 mA, DC.

The leakage currents are measured in accordance with EN 61800-5-1:2007.

Three-phase supply voltage

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

Recommended fuse size

Motor size [Hp]	Min. [A]	Max. [A]
2	6	10
3	6	16
5	13	16
7.5	16	32

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

Recommended fuse size

Motor size [Hp]	Min. [A]	Max. [A]
2	10	20
3	13	35
5	25	35
7.5	32	35

You can use standard as well as quick-blow or slow-blow fuses.

Leakage current, AC

Speed [rpm]	Power [Hp]	Supply voltage [V]	Leakage current [mA]
2900-4000	2.0-3.0	≤ 400	< 3.5
		> 400	< 5
	5.0-7.5	≤ 400	< 3.5
		> 400	< 3.5
4000-5900	2.0-3.0	≤ 400	< 3.5
		> 400	< 5
	5.0-7.5	≤ 400	< 3.5
		> 400	< 3.5

The leakage currents are measured in accordance with the EN 61800-5-1:2007.

21. 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 pumps. Contact Grundfos for further information or for requests other than the ones mentioned below.

Motors

Motor with anti-condensation heater

CM

TM032440

Asynchronous motor with anti-condensation heater

In applications where condensation in the motor may occur, we recommend that you install a motor with an anti-condensation heater on the stator coil ends. The heater keeps the motor temperature higher than the ambient temperature and prevents condensation.

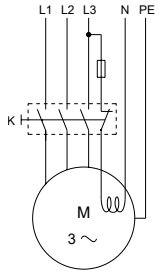
In areas with ambient temperatures below 32 °F (0 °C), we recommend that you always use motors with an anti-condensation heater.

High humidity may cause condensation in the motor. Slow condensation occurs as a result of a decreasing ambient temperature; rapid condensation occurs as a result of shock cooling caused by direct sunlight followed by rain.

Rapid condensation is not to be confused with the phenomenon which occurs when the pressure inside the motor is lower than the atmospheric pressure. In such cases, moisture is sucked from the atmosphere into the motor through bearings and housings, etc.

In applications with constant humidity levels above 85 %, the drain holes in the drive-end flange must be open. This changes the enclosure class to IPX5. If IP55 protection is required due to operation in dusty environments, we recommend that you install a motor with an anti-condensation heater.

The figure below shows a typical circuit of a three-phase motor with anti-condensation heater.



TM034058

Three-phase motor with anti-condensation heater

Legend

Symbol	Designation
K	Contactor
M	Motor

Connect the anti-condensation heater to the power supply so that it is on when the motor is switched off.

The following motor sizes are available with an anti-condensation heater:

Motors, 50/60 Hz	Power of heating unit [W]	
Frame size	**1 x 24 V**	**1 x 190-250 V**
71/80	38	23
90		31
100		38
112	2 x 38	2 x 38

CME

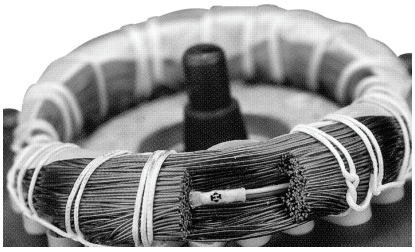
The MLE motors fitted to CME pumps incorporate a standstill heating function. No external heater on the stator coil is necessary.

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 connected. However, it is a condition that the terminal box is not exposed to open air. It must be equipped with a suitable cover to protect it from rain, and the drain plugs must be removed to obtain ventilation in motor and terminal box. See the section on operation in condensing environments.

Related information

Operation in condensing environments

Motors with PTC sensors



TM027038

PTC sensor incorporated in windings

Built-in PTC sensors (thermistors) protect the motor against overheating. Single-phase motors are protected against slow and rapid overheating. Three-phase motors are protected against slow overheating.

We offer built-in PTC sensors to protect the motor.

Three-phase asynchronous motors with supply voltages F, G and O of 5 Hp and up have PTC sensors as standard (UL-approved motors have no internal protection).

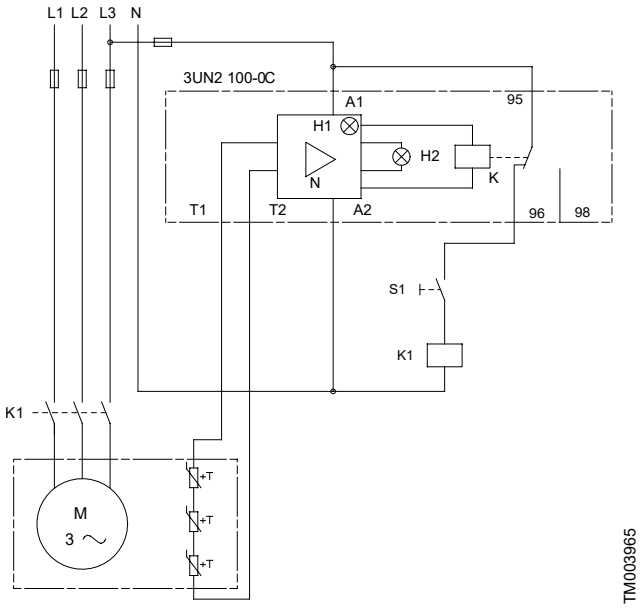
Note that PTC sensors must be connected to an external tripping unit connected to the control circuit.

Protection according to IEC 60034-11:

- slow and rapid overheating.

PTC sensors comply with DIN 44082. Maximum voltage at the terminals, U_{max} = 2.5 VDC. All tripping units available for DIN 44082 PTC sensors meet this requirement.

The figure below shows a typical circuit of a three-phase motor with PTC sensors.



TM003965

Three-phase motor with PTC sensors

Legend

Symbol	Designation
S1	On/off switch
K1	Contactor
+T	PTC sensor (thermistor) in motor
M	Motor
3UN2 100-0 C	Tripping unit with automatic resetting
N	Amplifier
K	Output relay
H1	LED "Ready"
H2	LED "Tripped"
A1, A2	Connection for control voltage
T1, T2	Connection for PTC sensor loop

Motors with thermal switches (PTO)

TM027042

Thermal switch incorporated in windings

Built-in thermal switches protect the motor against overheating. Single-phase motors are protected against slow and rapid overheating. Three-phase motors are protected against slow overheating.

We offer asynchronous motors with bimetallic thermal switches in the motor windings.

Three-phase asynchronous motors with supply voltages F, G and O are available with built-in thermal switches.

Note that thermal switches must be connected to an external control circuit to protect the motor against slow overheating. The thermal switches require no tripping unit.

Protection according to IEC 60034-11:

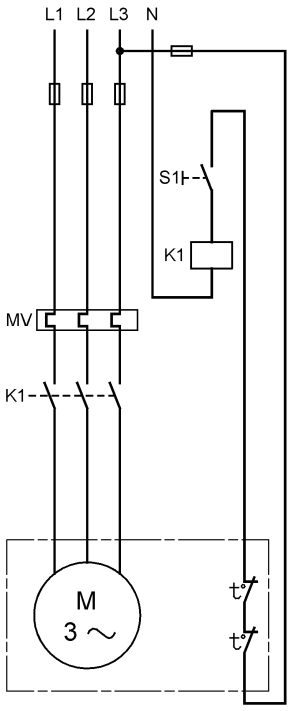
- slow and rapid overheating.

As protection against seizure, the motor must be connected to a motor-protective circuit breaker.

Thermal switches tolerate the following maximum loads:

U_{max}	250 VAC
I_N	1.5 A
I_{max}	5.0 A (locked-rotor and breaking current)

The figure below shows a typical circuit of a three-phase motor with built-in bimetallic thermal switches.



TM003964

Three-phase motor with thermal switches

Legend

Symbol	Designation
S1	On/off switch
K1	Contactor
t°	Thermal switch in motor
M	Motor
MV	Motor-protective circuit breaker

Undersize and oversize motors

The available motor sizes are shown in the section on motor data.

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

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

We recommend that you 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 m) 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).

We recommend that you use an undersize motor if the operating conditions do not at all reach the standard conditions.

Undersize motors can be used in these cases:

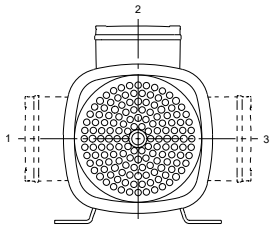
- The viscosity or density of the pumped liquid is lower than that of water.
- The duty point of the pump is constant, and the flow rate is significantly lower than the recommended maximum flow rate.

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 the figure below.

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



TM040357

Terminal box positions of frame sizes 71 and 80

Pos.	Description
1	9 o'clock (standard)
2	12 o'clock (on request)
3	3 o'clock (on request)

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 the section on operation in condensing environments.

Related information

Operation in condensing environments

Functional modules for CME pumps

The 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 0.75-7.5 Hp (supply voltages T, U, V)

As standard, these CME pumps are fitted with the advanced functional module FM 300.

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 the following connections:

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

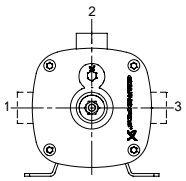
Pumping of liquids down to -22 °F (-30 °C)

We offer custom-built pumps for the pumping of liquids down to -22 °F (-30 °C). The pumps have an oversize neck ring ensuring that impellers do not seize up as a result of thermal expansion.

We offer the above solution for CM and CME in I and G versions (stainless steel).

Alternative connection positions

The pump is available with various connection positions on special request. See the figure below.



TM038709

Alternative connection positions as seen from pump inlet side

Pos.	Description
1	9 o'clock (on request)
2	12 o'clock (on request)
3	3 o'clock (standard)

Note that on CM 1, 3 and 5 pumps fitted with motor frame sizes 71 and 80, the outlet can be positioned according to the customer's request. All other pump types cannot be factory-tested if they are ordered with non-standard outlet positions.

Surface treatments

Cleaned and dried pumps

We recommend that you use cleaned and dried pumps 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!

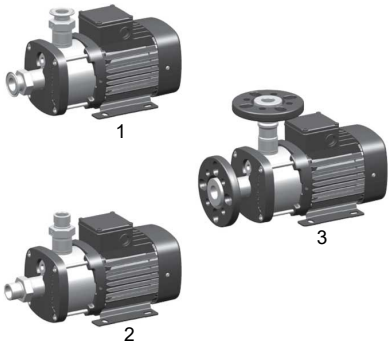
The paint used is water-based. Painted parts correspond to corrosion class III.

Alternative pipe connections

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

- Tri-Clamp®
- DIN, JIS, ANSI flange (combination flange)
- Victaulic® coupling
- Whitworth thread Rp
- internal NPT thread.

The available pipe connections are shown in the figure below.



TM043937

Examples of pipe connections

Pos.	Description
1	Tri-Clamp®
2	Victaulic® coupling
3	DIN, JIS, ANSI flange

22. Advanced use of CME pumps

Introduction

The Grundfos CME pumps have many features for the advanced user.

The 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 a high humidity 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 a high humidity application 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.

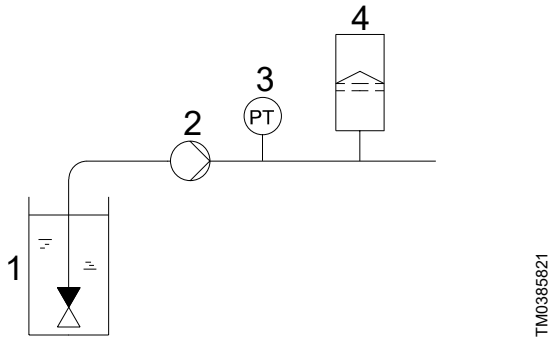
Applications

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

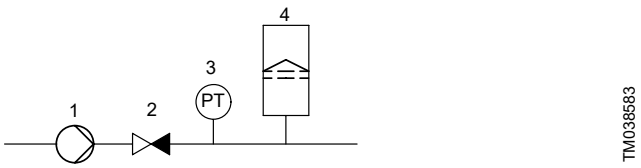
A pressure sensor, a non-return valve, and a diaphragm tank are required for the stop function to operate properly.

Note that the non-return valve must always be installed before the pressure sensor. See fig. Position of the non-return valve and pressure sensor in system with suction lift operation and fig. Position of the non-return valve and pressure sensor in system with positive inlet pressure.



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

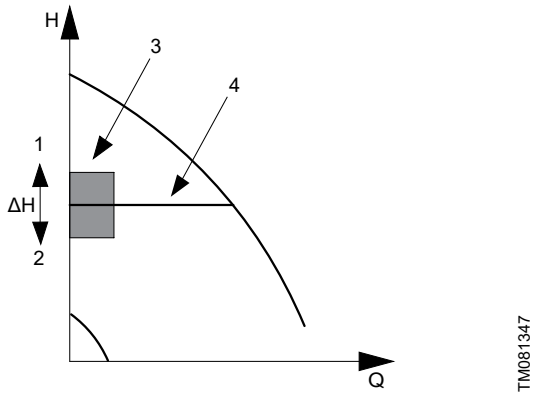
Pos.	Description
1	Non-return valve
2	Pump
3	Pressure sensor
4	Diaphragm tank



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

Pos.	Description
1	Pump
2	Non-return valve
3	Pressure sensor
4	Diaphragm tank

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 the figure below.



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

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

Diaphragm tank

The stop function requires a diaphragm tank of a certain minimum size. The tank must be installed near the outlet 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 rate the system will go into start/stop operation.

Description

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

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

Low-flow detection function

- The low-flow detection function will check the flow 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 the section on accessories.)
- a pressure switch installed on the inlet side of the pump
- a float switch installed on the inlet side of the pump.

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

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 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, for example, 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].

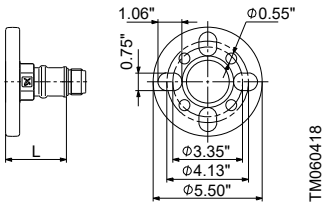
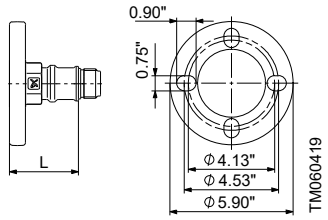
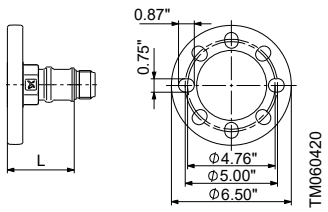
23. Accessories

Pipe connections

Flange sets for CM, CME (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	Pipe connection	Pump thread	L [28) [inches (mm)]		Product number
				Flange mounted on pump inlet	Flange mounted on pump outlet	
	CM 1 CM 3 CM 5	1 1/4" ANSI 300 lb.	NPT	1.93 (49.03)	3.07 (77.98)	96904705 96904708
	CM 10	1 1/2" ANSI 300 lb.	NPT	1.73 (43.95)	2.68 (68.08)	96904711
	CM 15 CM 25	2" ANSI 300 lb.	NPT	1.89 (48.01)	2.68 (68.08)	96904714

28) Length from outer edge of flange to pump inlet or outlet port.

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

CM pumps compatible with ANSI flanges

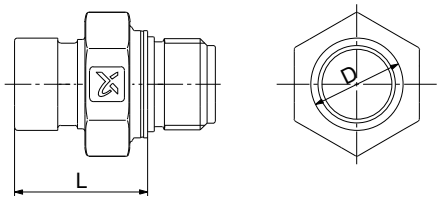
Pump type	Material version	ML 71/80 1-ph	ML 71/80 3-ph	ML 90 1-ph	ML 90 3-ph	ML 100	ML 112
CM 1, 3, 5	Cast iron		•	•	•		
	Stainless steel	•	•		•	•	
CM 10, 15, 25	Cast iron	•	•	•	•	•	•
	Stainless steel	•	•	•	•	•	•

CME pumps compatible with ANSI flanges

Pump type	Material version	Supply voltages Q			Supply voltages T, U	
		MLE 90S	MLE 90L	MLE 112	MLE 71/80	MLE 90
CME 1, 3, 5	Cast iron	• [29)]	•			
	Stainless steel		•			
CME 10, 15, 25	Cast iron		•	•	•	•
	Stainless steel		•	•	•	•

29) Only 0.35 inches (9 mm) clearance between flange and terminal box.

PJE connection adapter sets for CM, CME

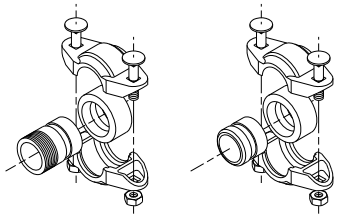
PJE connection	Pump type	Pump thread	D [in. (mm)]	L [30)] [in. (mm)]	Product number
 TM043865	CM 1 CM 3	1" x 1" NPT	1.33 (33.7)	1.90 (48.5)	96904706
	CM 5	1.25" x 1" NPT	1.67 (42.4)	1.90 (48.5)	96904709
	CM 10	1.5" x 1.5" NPT	1.90 (48.3)	1.90 (48.5)	96904712
	CM 15 CM 25	2" x 2" NPT	2.37 (60.3)	1.97 (50.1)	96904715

30) Length from outer edge of PJE connection to pump inlet or outlet port.

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

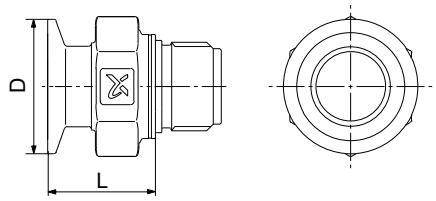
PJE coupling sets for CM, CME

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	Pipe connection	Rubber parts	Number of coupling sets required	Product number
 TM003808	CM, CME 15 CM, CME 25	Threaded	1015 psi (70 bar)	2" NPT	EPDM	2	331301
					FKM	2	0ID00128
		For welding	1015 psi (70 bar)	DN 50	EPDM	2	00339910
					FKM	2	00339917

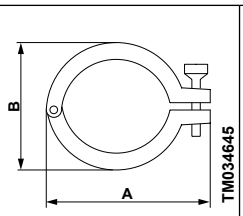
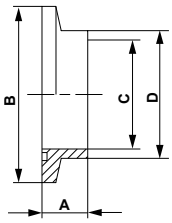
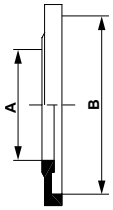
A PJE coupling set consists of two coupling halves (Victaulic, type 77), one gasket, one pipe stub (for welding or threaded), bolts and nuts.

Tri-Clamp® connections for CM, CME

Tri-Clamp®		Pump type	Pump thread	Tri-Clamp®	D [in. (mm)]	L [31] [in. (mm)]	Product number
 TM043866		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

[31] Length from outer edge of Tri-Clamp® connection to pump inlet or outlet port.

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

		Clamping ring		Pipe stub				Gasket	
		 TM034645		 TM034646				 TM034647	
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, CME 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, CME 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.

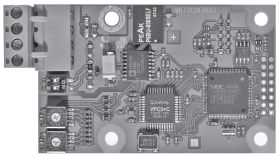
Pump type	Pipe connection	Connection material	Gasket	Pressure [psi (bar)]	Number of coupling sets required	Product number
CM, CME 1, 3, 5, 10	DN 32	Stainless steel	EPDM	232 (16)	2	96515374
			PTFE		2	96515375
CM, CME 15, 25	DN 50		EPDM		2	96515376
			PTFE		2	96515377

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	625468

Communication Interface Module (CIM)



GRA6121

Grundfos CIM

These modules enable communication of operating data, such as measured values and setpoints, between the pump and a building management system. The CIM is an add-on communication module fitted in the terminal box of the pump. Note that a CIM must be fitted by authorized persons.

We offer the following types of CIM:

Description	Fieldbus protocol	Product number
CIM 040	TTL Adaptor Module	98415941
CIM 050	GENIbus Interface	96824631
CIM 060 [32)]	Grundfos GO Remote Connection	98778356
CIM 100	LON interface for pumps	96824797
CIM 110	LON interface for boosters	96824798
CIM 200	Modbus RTU	96824796
CIM 280 [33)]	US GiC/GRM 3G/4G	99895386
CIM 300	BACnet Interface	96893770
CIM 500	Ethernet, Modbus TCP/IP, BACnet IP, PROFINET, GiC/GRM IP, EtherNet IP	98301408
CIM 550	Ethernet GIC (DHCP only)	92546689

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

33) Antenna is not included. See Antennas for the CIM 280.

Antennas for the CIM 280

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

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

Grundfos GO

The Grundfos GO is used for wireless infrared or radio communication with the pumps.

Various Grundfos GO variants are available. The variants are described below.

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 smart device with a Bluetooth connection. The MI 301 has a rechargeable Li-ion battery and must be charged separately.

TM053890

MI 301

Supplied with the product:

- Grundfos MI 301
- battery charger
- quick guide.

Product numbers

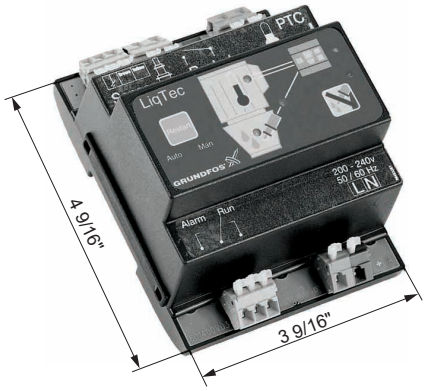
Grundfos GO variant	Product number
Grundfos MI 301	98046408

LiqTec

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

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

Mount the LiqTec box in a cabinet.



TM028872

The maximum system pressure is 580 psi.

Sensor enclosure class: IP68.

Wetted parts: AISI 316L.

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

● Available

- Not available

Pressure sensors

Grundfos ISP44 pressure sensor

Accessory	Supplier	Type	Pressure range [psi (bar)]	Product number
• Pressure sensors • Pressure transmitter with 8.2 ft (2.5 m) unscreened cable and M12 connector • Connection: 1/4" - 18 NPT • M12 connector for custom wiring	Grundfos	ISP44	0-87 (0-6)	99970220
			0-145 (0-10)	99970234
			0-232 (0-16)	99970236
			0-362 (0-25)	99970238

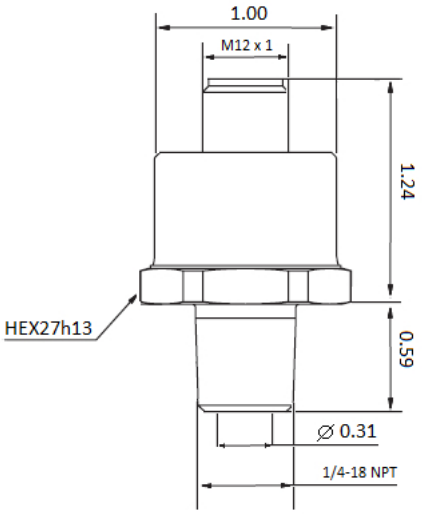
Technical data

Pressure sensor (Product number)	99970220	99970234	99970236	99970238
Pressure range [psi (bar)]	0-87 (0-6)	0-145 (0-10)	0-232 (0-16)	0-362 (0-25)
Maximum operating pressure [psi (bar)]	348 (24)	580 (40)	928 (64)	1450 (100)
Supply voltage [VDC]	8-28			
Output signal [mA]	4-20			
Accuracy, typical +/- FS [%]	0.5			
Response time, maximum [ms]	< 2			
Pumped liquid temperature range [°F (°C)]	-40 to +212 (-40 to +100)			
Ambient temperature range [°F (°C)]	-40 to +185 (-40 to +85)			
Wetted parts, material	AISI 316L			
Housing material	AISI 304L			
Enclosure rating	IP67			
Weight [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			
UL file number	E527399 (QUYX2/8)			

Maximum pumped liquid temperature

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

Dimensions



TM082270

ISP44 sensor with M12 connection

Grundfos differential-pressure sensor, DPI

Grundfos differential-pressure sensor, DPI

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

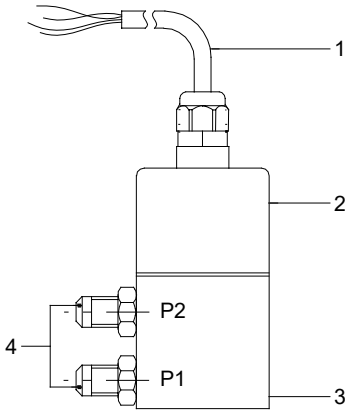
Pressure range [psi (bar)]	Product number
0 - 8.7 (0 - 0.6)	96611522
0 - 14.5 (0 - 1.0)	96611523
0-23 (0 - 1.6)	96611524
0-36 (0 - 2.5)	96611525
0-58 (0 - 4.0)	96611526
0-87 (0 - 6.0)	96611527
0-145 (0-10)	96611550

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

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

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

A specially coated silicon chip is used for greater accuracy.



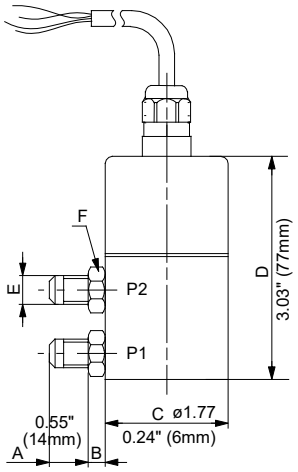
TM032057

DPI sensor

Technical data

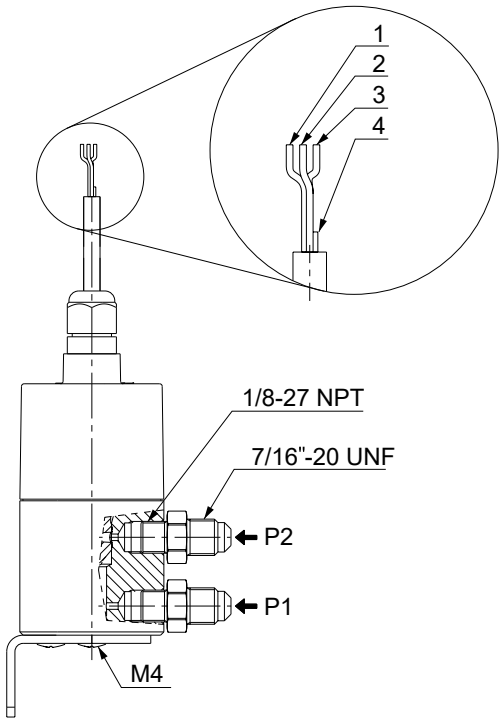
Grundfos differential-pressure sensor, DPI (Product number)	96611522	96611523	96611524	96611525	96611526	96611527	96611550
Pressure ranges, differential pressure [psi (bar)]	0 - 8.7 (0 - 0.6)	0 - 14.5 (0 - 1.0)	0-23 (0 - 1.6)	0-36 (0 - 2.5)	0-58 (0 - 4.0)	0-87 (0 - 6.0)	0-145 (0-10)
Supply voltage	12-30 VDC						
Output signal	4-20 mA						
Load [Ω]	24 V: max. 500 [Ω], 16 V: max. 200 [Ω], 12 V: max. 100 [Ω]						
Maximum system pressure, P1 and P2 simultaneously [psi (bar)]	232 (16)						
Rupture pressure [psi]	1.5 x system pressure						
Measuring accuracy	2.5 % BFSL						
Response time	< 0.5 seconds						
Liquid temperature range	+14 °F to +158 °F (-10 °C to +70 °C)						
Storage temperature range	-40 °F to +176 °F (-40 °C to +80 °C)						
Electrical connection	26 GA, 3 ft (0.9 m) cable - M12 x 1.5 in (38 mm) sensor top						
Short-circuit-proof	Yes						
Protected against reverse polarity	Yes						
Over supply voltage	Yes						
Materials in contact with liquid	DIN 1.4305 FKM and PPS						
Enclosure class	IP55						
Weight [lb (kg)]	1.2 (0.54)						
EMC (electromagnetic compatibility)	According to EN 60335-1						
Emission/immunity	According to EN 61800-3						
Connections	7/16"-UNF						
Sealing material	FKM						

Dimensions



TM032059

Dimensional sketch



TM032225

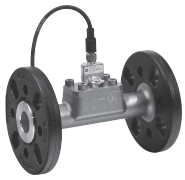
Wiring

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

Flow transmitters

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

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



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

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

Gauges

Accessory	Measuring range [psi (bar)]	Product number
Liquid filled pressure gauge • AISI 304 (EN 1.4301)/Copper	30" Hg - 30 psi	91123566
	0-60 (0 - 4.14)	00ID8562
	0-100 (0 - 6.90)	00ID8563
	0-160 (0 -1 1.04)	00ID8564
	0-200 psi (0 -1 3.79)	00ID8565
	0-300 psi (0 - 20.69)	00ID8566
	0-400 psi (0 - 27.58)	00ID8567
	0-600 psi (0 - 41.37)	00ID8568
Liquid filled pressure gauge • AISI 316 (EN 1.4401)	30" Hg - 30 psi	91130835
	0-30 psi (0 - 2.07)	00ID8569
	0-60 psi (0 - 4.14)	00ID8570
	0-100 psi (0 - 6.90)	00ID8571
	0-160 psi (0 - 11.04)	00ID8572
	0-200 psi (0 - 13.79)	00ID8573
	0-300 psi (0 - 20.69)	00ID8574
	0-400 psi (0 - 27.58)	00ID8575
	0-600 psi (0 -4 1.37)	00ID8576

MP 204 motor protector

TM031471

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 that 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 GO.
- 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 ϕ)
- current unbalance.

Warnings

- Overload
- underload
- temperature
- overvoltage
- undervoltage
- power factor (cos ϕ)
- 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

Angled cable gland

TM050729

Angled cable gland with O-ring and lock nut

Description	Product number
Angled cable gland with O-ring and lock nut	97842998

24. Submittal data

CM, CME			
	Company name		
	Prepared by:		
	Phone number	(____)	
	Fax number:	(____)	Page 1 of:
	Date:		
	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:

Application Information						
Operating conditions				**Pumped fluid**		
				Fluid type:		
	Max.	**Norm.**	**Min.**		**Rated**	**Max.**	**Norm.**
Capacity (gpm)				Fluid temp. (°F) at designated temp.			
Inlet pressure (psig)							
Outlet pressure (psig)				Specific gravity			
Differential head (ft)				Vapor pressure (psia)			
Hydraulic power (Hp) at designated capacity				Viscosity (cp)			
NPSH available (ft)				Fluid ph:		Chlorides (ppm):	
Service				Hazardous:		Corrosion/erosion caused by:	
Continuous				Flammable:			
Intermittent (starts/day):				Other:			

Pump Information	
Model information from Type Key and Codes:	
Quantity required:	
Minimum required flow rate:	NPSH required at duty point:

Data booklet or product guide additional information pages	
Materials page number:	Performance curve page number:
Technical data page number:	Motor data page number:

Motor information			
Hp:	Phase:	Voltage:	Enclosure:

Custom-built pump information (optional):	Additional information

25. 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: _____ lb

Shipping volume: _____

Model: _____

26. Grundfos Product Center

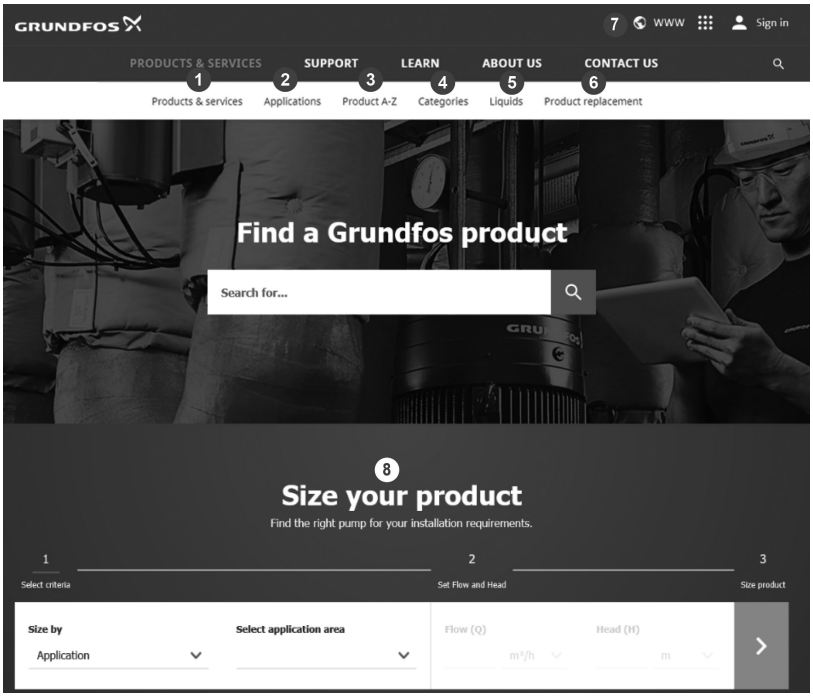
Online search and sizing tool to help you make the right choice.
From the international view, you can select your specific country to view the product range available to you.
International view: *https://product-selection.grundfos.com*

All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

Downloads

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc., in PDF format.



When you select your country, you will see the menus below. Note that some menus may not be available depending on the country.
Example: *https://product-selection.grundfos.com/uk*

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

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