



CME 10

Horizontal, multistage centrifugal pumps
50/60 Hz



CME



Stainless-steel version

Cast-iron version

Fig. 2 Grundfos CME pumps

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

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

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

The CME pump motor is a Grundfos MGE 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 continuously variable control of the motor speed is to adjust the performance to a given requirement.

It is possible to connect a pressure sensor to the built-in frequency converter on CME pumps. For further information, see *Sensors for CME* on page 124.

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

Selecting a CME pump

Select a CME pump if the following features are required:

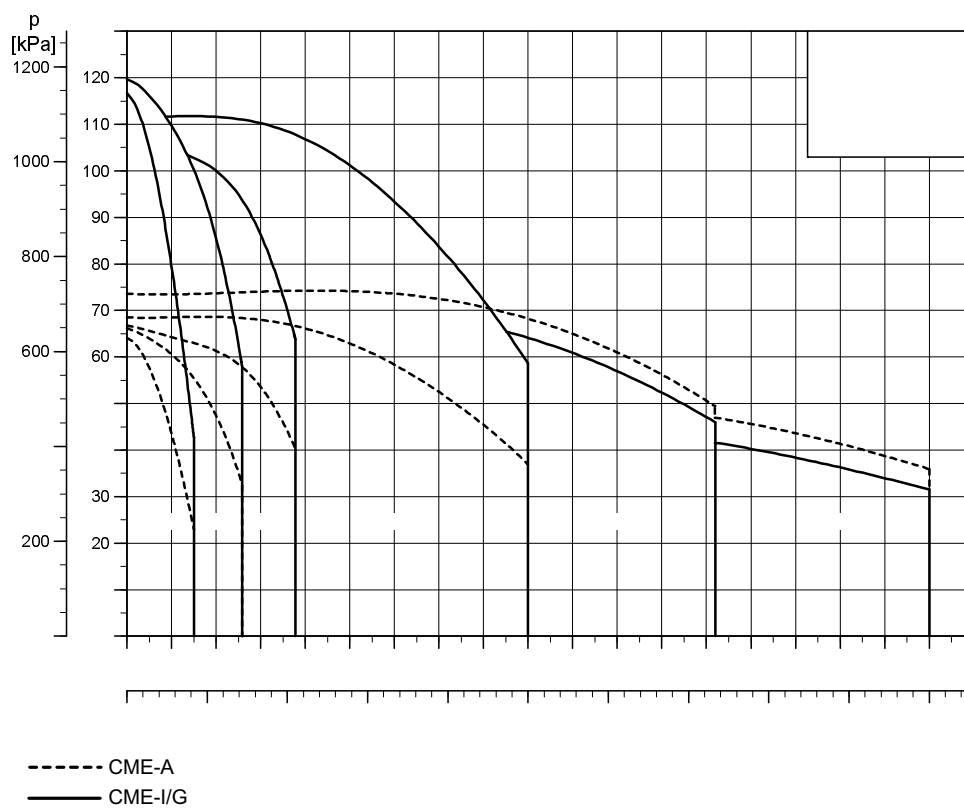
- controlled operation, i.e. consumption fluctuates
- constant pressure
- communication with the pump.

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

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

For further information about CME pumps, see *CME pumps* on page 27.

CME, 50/60 Hz



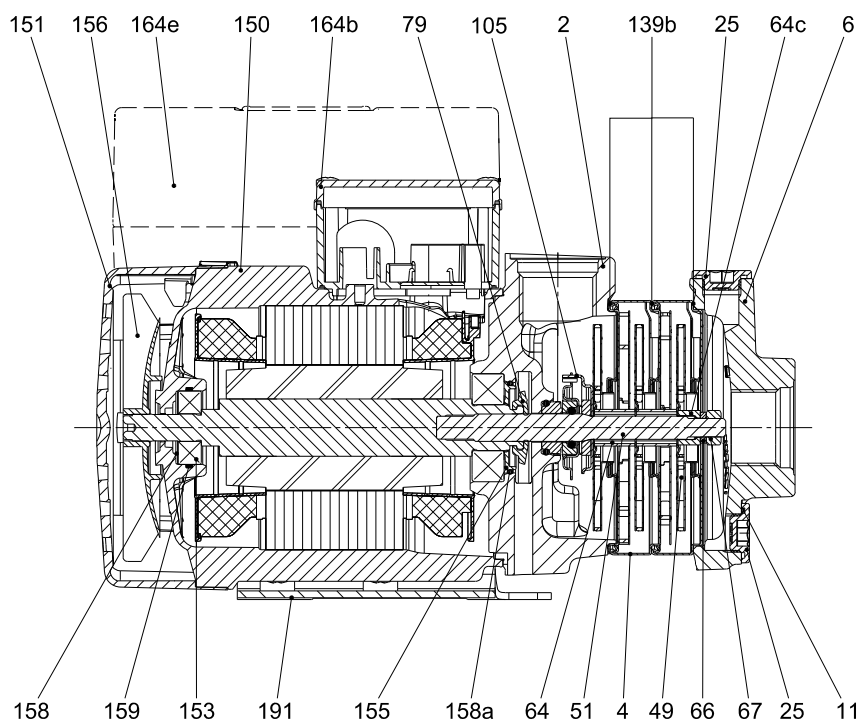
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Note: Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3400 min^{-1} .

CM(E) 1-A

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

Sectional drawing



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Fig. 15 CM(E) 1-3 with MG(E) 71 motor

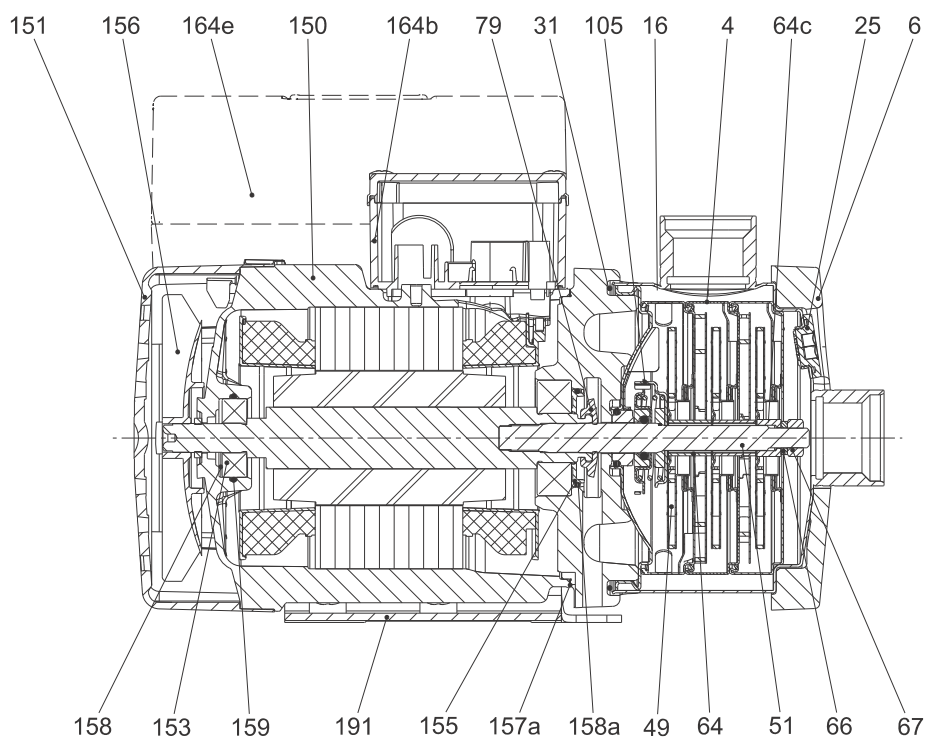
Components

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

CM(E) 1-I and CM(E) 1-G

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

Sectional drawing



TM04 3722 3809

Fig. 16 CM(E) 1-3 with MG(E) 71 motor

Components

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

Material specification

Pos.	Description	Material	Pump material version					
			Cast iron (EN-GJL-200)		Stainless steel (EN 1.4301/AISI 304)		Stainless steel (EN 1.4401/AISI 316)	
			DIN W.-Nr.	ISO/AISI/ ASTM	DIN W.-Nr.	ISO/AISI/ ASTM	DIN W.-Nr.	ISO/AISI/ ASTM
Motor parts								
156b	Motor flange	Cast iron						
150	Stator housing	Silumin (Alu)						
151	Fan cover	Composite PBT/PC						
153	Ball bearing							
156	Fan	Composite PA 66 30 % GF						
158	Corrugated spring	Steel						
164b	Terminal box, MG	Composite PC/ASA or silumin (Alu)						
164e	Terminal box, MGE							
191	Base plate	Steel, electro-coated	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	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4401	AISI 316
	Shaft seal, seal faces	Al ₂ O ₃ /carbon or SiC						
51	Pump shaft	Stainless steel	1.4057	AISI 431	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4401	AISI 316
11 31 ³⁾ 158a 159	O-rings	EPDM, FKM or FFKM						
157a ³⁾	Gasket	Paper						
139b ⁴⁾	Gasket	Aramide fibres (nbr)						
2 ⁴⁾	Discharge part	Cast iron						
6 ⁴⁾	Inlet part	Cast iron						
4	Chamber	Stainless steel	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4401	AISI 316
25	Plug	Stainless steel	1.4404	AISI 316L	1.4404	AISI 316L	1.4404	AISI 316L
49	Impeller	Stainless steel	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4301/ 1.4401 ¹⁾	AISI 304/ AISI 316 ¹⁾	1.4401	AISI 316
64	Spacing pipe	Stainless steel	1.4401	AISI 316	1.4401	AISI 316	1.4401	AISI 316
64c	Clamp	Stainless steel	STX2000 ⁵⁾		STX2000 ⁵⁾		STX2000 ³⁾	
6 ³⁾	Flange	Cast iron						
16	Sleeve	Stainless steel			1.4301/ 1.4401 ¹⁾⁺²⁾	AISI 304/ AISI 316 ¹⁾	1.4401	AISI 316
67	Nut	Stainless steel A4						
66	Washer (NORD-LOCK®)	Steel	1.4547		1.4547		1.4547	

1) On request.

2) As standard, the pumps listed below are fitted with impellers made of stainless steel 1.4401:

CM(E) 1-9 to and including CM(E) 1-14
 CM(E) 3-9 to and including CM(E) 3-14
 CM(E) 5-9 to and including CM(E) 5-13
 CM(E) 10-6 to and including CM(E) 10-8

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

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

5) STX2000 ~ CrNiMo 22 19 4.

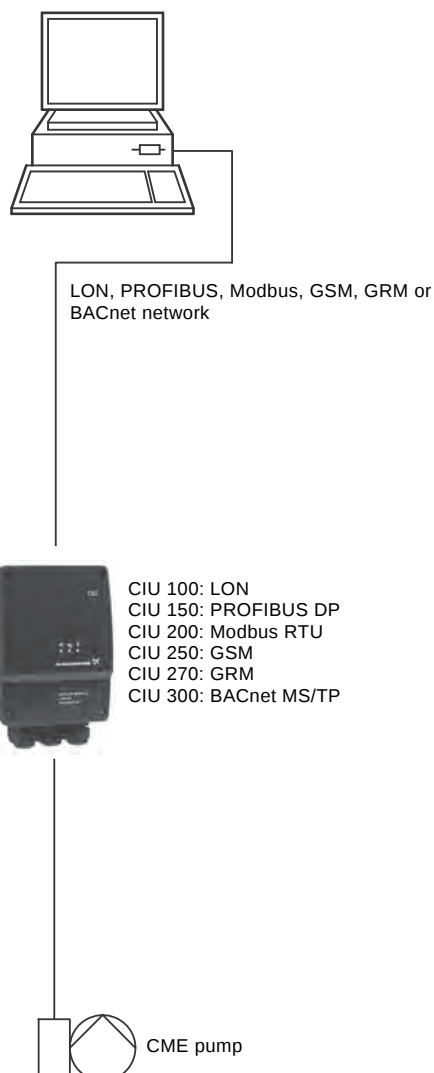
Communication with CME pumps

Communication with CME pumps is possible by means of

- a central building management system
- a remote control (Grundfos R100)
- a control panel.

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.

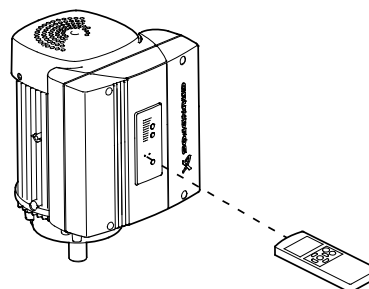


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Remote control

The Grundfos R100 remote control is available as an accessory. See page 123.

The operator can communicate with the CME pump by pointing the IR-signal transmitter at the control panel of the terminal box.



TM03 0141 4104

Fig. 17 R100 remote control

The operator can monitor and change control modes and settings of the CME pump with the R100.

Control panel

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



TM00 7600 0404

Fig. 18 Control panel of a CME pump

Speed control of CME pumps

Affinity equations

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

In order to achieve optimum operating economy, the duty point should be close to the optimum efficiency (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.

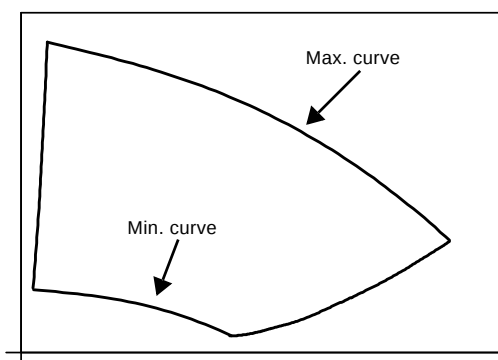


Fig. 19 Min. and max. performance curves

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

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

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

Finally, it is worth noting that the efficiency of the frequency converter 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.

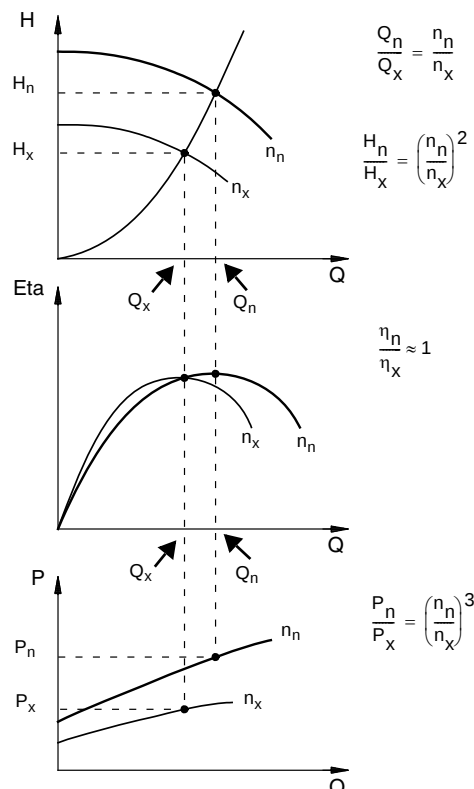


Fig. 20 Affinity equations

Legend

H_n	Rated head in metres
H_x	Current head in metres
Q_n	Rated flow rate in m ³ /h
Q_x	Current flow rate in m ³ /h
n_n	Rated motor speed in min ⁻¹
n_x	Current motor speed in min ⁻¹
η_n	Rated efficiency in %
η_x	Current efficiency in %

WinCAPS and WebCAPS

WinCAPS and WebCAPS are selection programs offered by Grundfos.

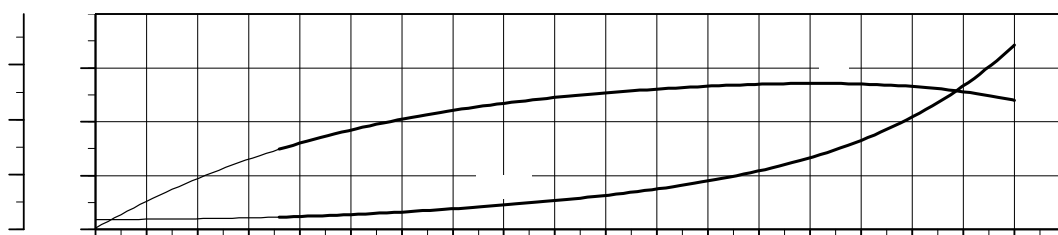
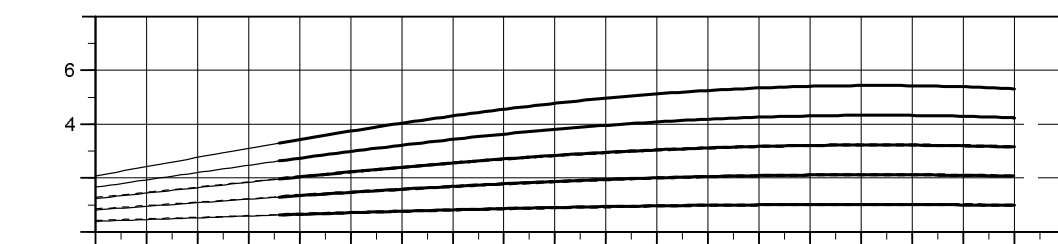
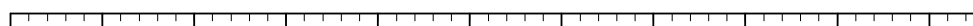
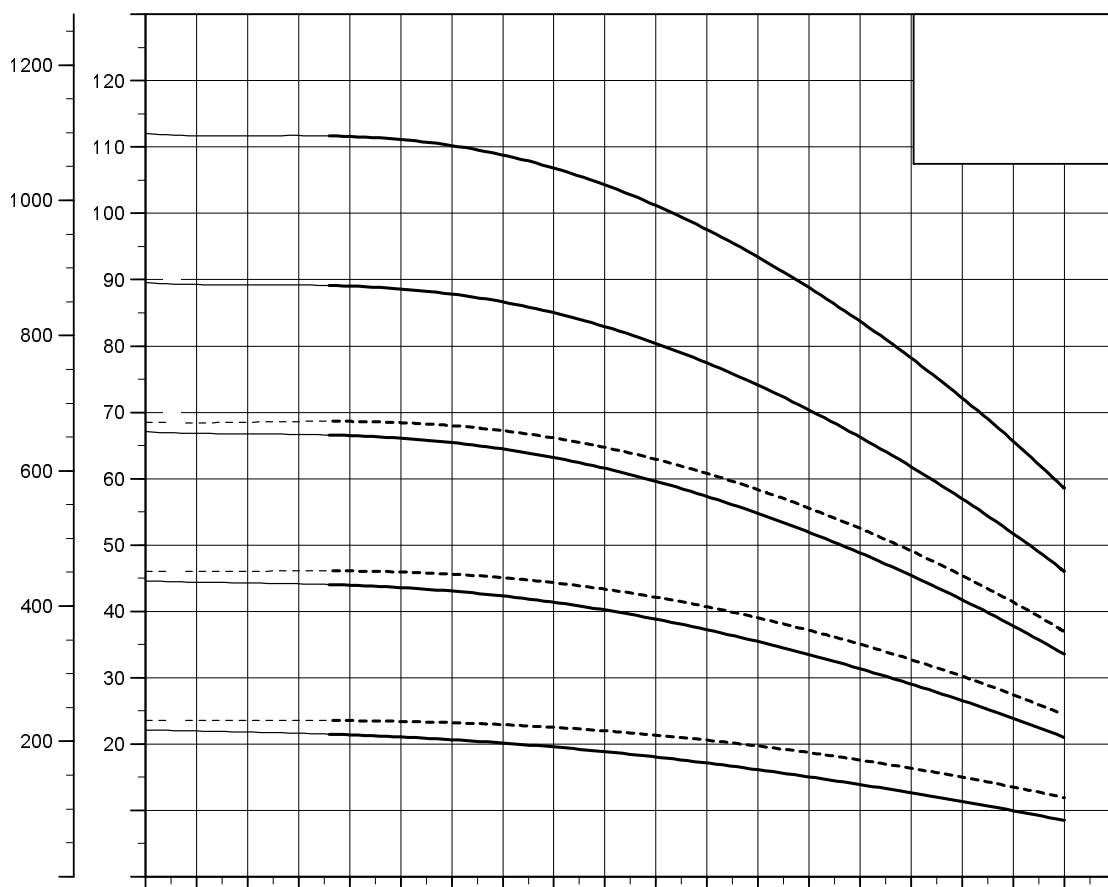
The two programs make it possible to calculate the specific duty point and energy consumption of a CME pump.

When you enter the dimensions of the pump, WinCAPS and WebCAPS can calculate the exact duty point and energy consumption. For further information, see page 126.

Performance curves, CME 50/60 Hz

CME 10
50/60 Hz

CME 10



----- CME-A
———— CME-I/G

Note: Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3400 min⁻¹.

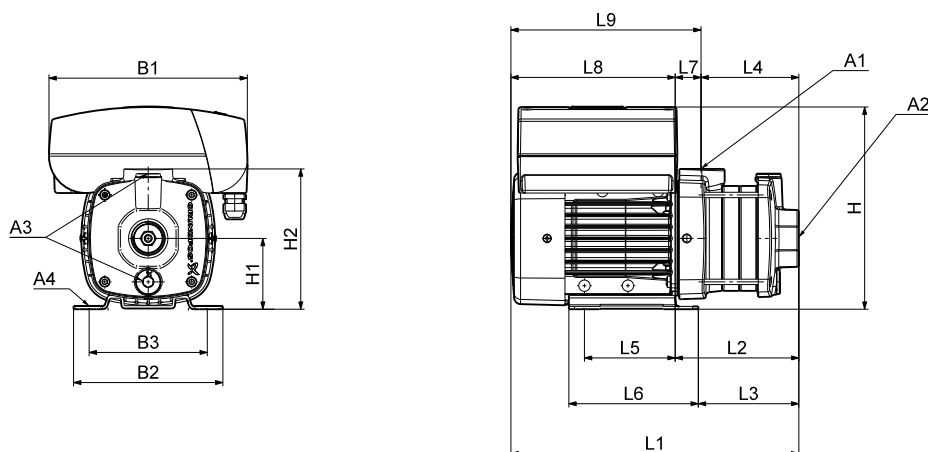
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Dimensions, CME 60 Hz and 50/60 Hz

CME 10-A
60 Hz
50/60 Hz

CME 10-A

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



TM04 6110 2208

Dimensions

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

1 x 208-230 V, 50/60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME10-1	80B	1.10	Rp 1 1/2	Rp 1 1/2	Rp 3/8	10	210	158	125	240	100	245	369	155	131	97	96	137	58	214	272

Note: The dimension H is smaller than H2 for CM 10-1.

3 x 380-480 V, 50/60 Hz (supply voltage L)

Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME10-2	90LC	2.20	Rp 1 1/2	Rp 1 1/2	Rp 3/8	10	264	199	160	267	100	245	461	190	175	97	140	170	93	272	364
CME10-3	112MC	4.0	Rp 1 1/2	Rp 1 1/2	Rp 3/8	12	290	228	190	300	112	257	560	258	242	127	140	172	131	302	433

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

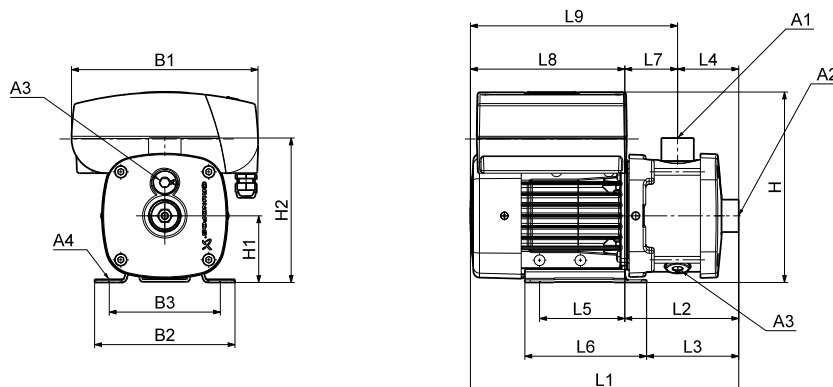
Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME10-2	90FA	2.20	NPT 1 1/2	NPT 1 1/2	Rp 3/8	10	264	199	160	267	100	245	461	190	175	97	140	170	93	272	364
CME10-3	112CA	4.0	NPT 1 1/2	NPT 1 1/2	Rp 3/8	12	290	228	190	300	112	257	560	258	242	127	140	172	131	302	433

Dimensions, CME 60 Hz and 50/60 Hz

CME 10-I and CME 10-G
60 Hz
50/60 Hz

CME 10-I and CME 10-G

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



TM04 2247 2208

Dimensions

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

1 x 208-230 V, 50/60 Hz (supply voltage M)

Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME10-1	80B	1.10	Rp 1 1/2	Rp 1 1/2	Rp 3/8	10	210	158	125	240	100	218	399	185	161	105	96	137	80	214	294

3 x 380-480 V, 50/60 Hz (supply voltage L)

Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME10-2	90LC	2.20	Rp 1 1/2	Rp 1 1/2	Rp 3/8	10	264	199	160	267	100	218	490	219	204	105	140	170	114	272	385
CME10-3	112MC	4.0	Rp 1 1/2	Rp 1 1/2	Rp 3/8	12	290	228	190	300	112	230	559	257	241	105	140	172	152	302	454
CME10-4	132SC	5.5	Rp 1 1/2	Rp 1 1/2	Rp 3/8	12	290	228	190	300	112	230	589	287	271	135	140	172	152	302	454
CME10-5	132SC	5.5	Rp 1 1/2	Rp 1 1/2	Rp 3/8	12	290	228	190	300	112	230	649	347	331	195	140	172	152	302	454

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

Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME10-2	90FA	2.20	NPT 1 1/2	NPT 1 1/2	Rp 3/8	10	264	199	160	267	100	218	490	219	204	105	140	170	114	272	385
CME10-3	112CA	4.0	NPT 1 1/2	NPT 1 1/2	Rp 3/8	12	290	228	190	300	112	230	559	257	241	105	140	172	152	302	454
CME10-4	112CA	4.0	NPT 1 1/2	NPT 1 1/2	Rp 3/8	12	290	228	190	300	112	230	589	287	271	135	140	172	152	302	454
CME10-5	132DA	5.5	NPT 1 1/2	NPT 1 1/2	Rp 3/8	12	290	228	190	300	112	230	649	347	331	195	140	172	152	302	454

CME 10-A

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

Supply voltage	Pump type	Net weight [kg]	Gross weight [kg]	Shipping volume [m ³]
1 x 200-240 V, 50/60 Hz (supply voltage K)	CME 10-1	25.9	29.4	0.0370
1 x 208-230 V, 50/60 Hz (supply voltage M)	CME 10-2	41.6	45.1	0.0847
3 x 380-480 V, 50/60 Hz (supply voltage L)	CME 10-3	63.5	67.0	0.0847
3 x 460-480 V, 60 Hz (supply voltage N)	CME 10-2	41.7	45.2	0.0847
	CME 10-3	60.2	63.7	0.0847

CME 10-I and CME 10-G

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

Supply voltage	Pump type	Net weight [kg]	Gross weight [kg]	Shipping volume [m ³]
1 x 200-240 V, 50/60 Hz (supply voltage K) 1 x 208-230 V, 50/60 Hz (supply voltage M)	CME 10-1	21.3	24.8	0.0370
	CME 10-2	36.6	40.1	0.0847
3 x 380-480 V, 50/60 Hz (supply voltage L)	CME 10-3	57.9	61.4	0.0847
	CME 10-4	58.8	62.3	0.0847
	CME 10-5	60.2	63.7	0.0847
	CME 10-2	36.7	40.2	0.0847
3 x 460-480 V, 60 Hz (supply voltage N)	CME 10-3	54.6	58.1	0.0847
	CME 10-4	55.5	59.0	0.0847
	CME 10-5	60.6	64.1	0.0847
	CME 10-2	36.7	40.2	0.0847



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