



CME 5

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:

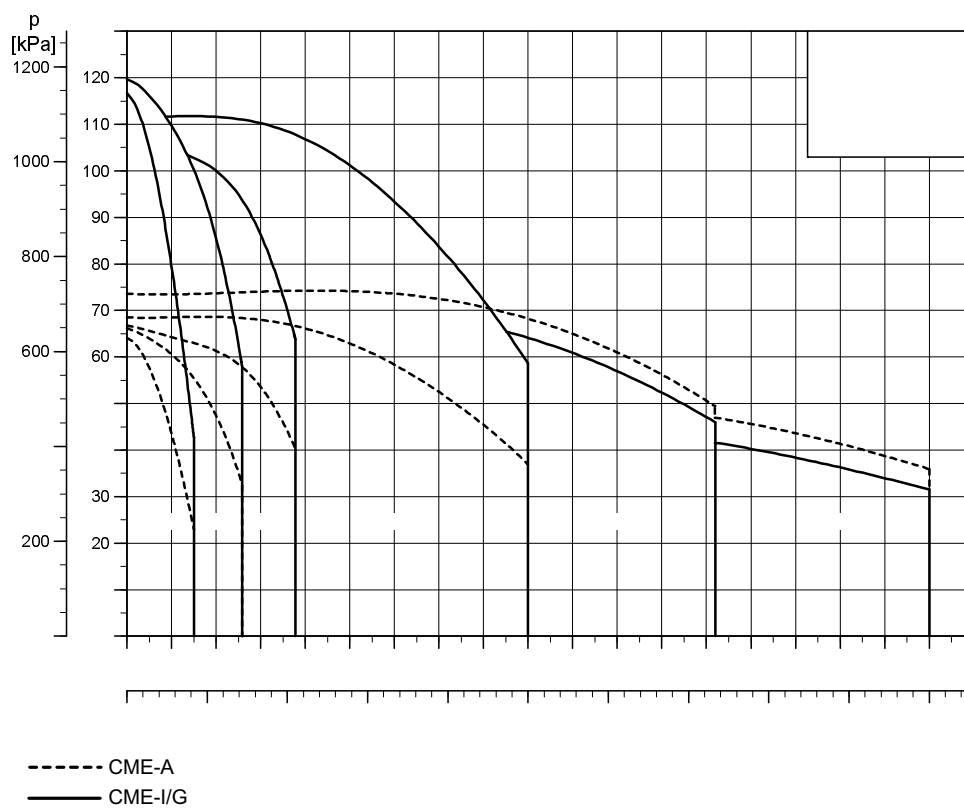
- controlled operation, i.e. consumption fluctuates
- constant pressure
- communication with the pump.

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



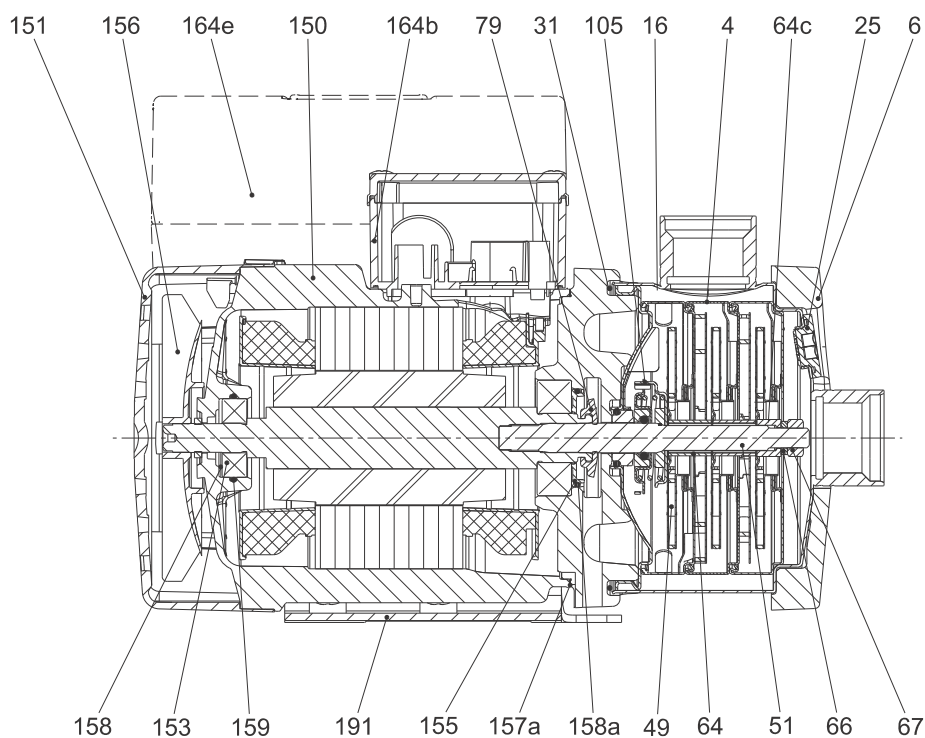
Note: Irrespective of the input frequency, the 100 % speed of CME pumps is approximately 3400 min⁻¹.

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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						
164e	Terminal box, MGE	silumin (Alu)						
		Steel, electro-coated	1.0330.3		1.0330.3			
191	Base plate	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.

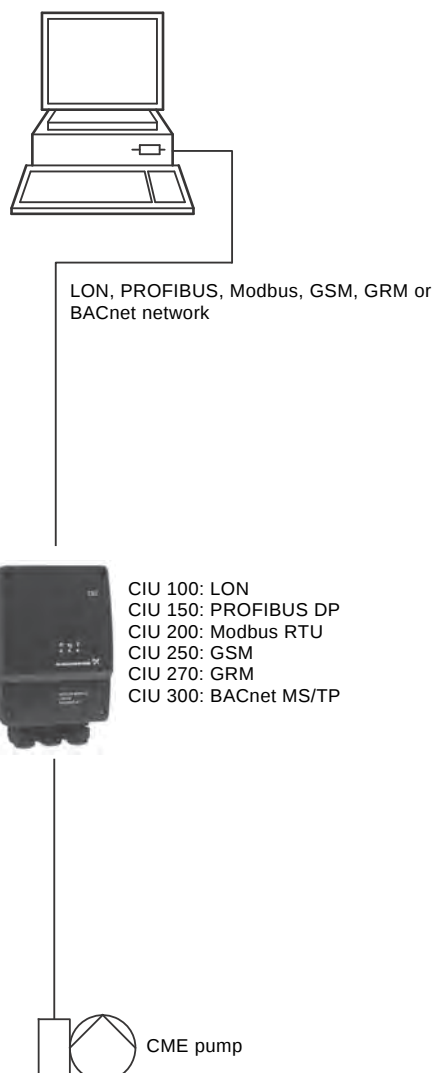
Communication with CME pumps

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.

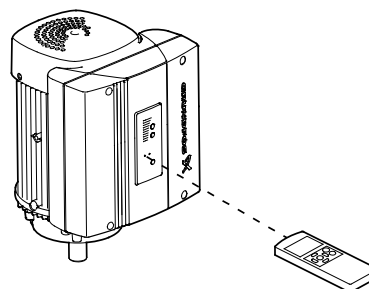


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Remote control

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.

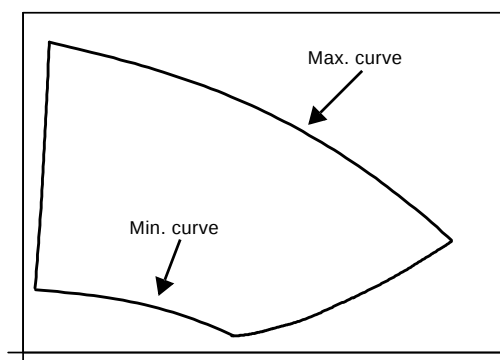


Fig. 19 Min. and max. performance curves

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.

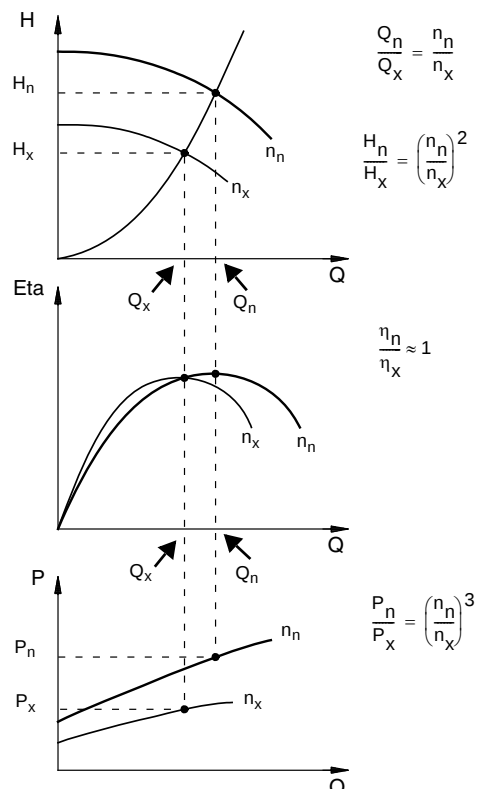


Fig. 20 Affinity equations

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.

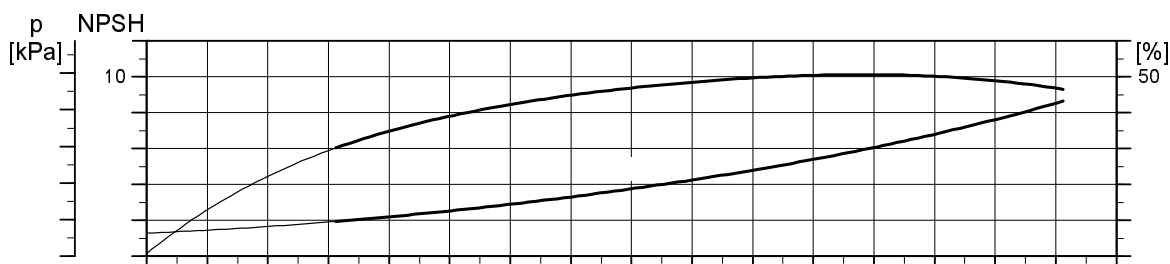
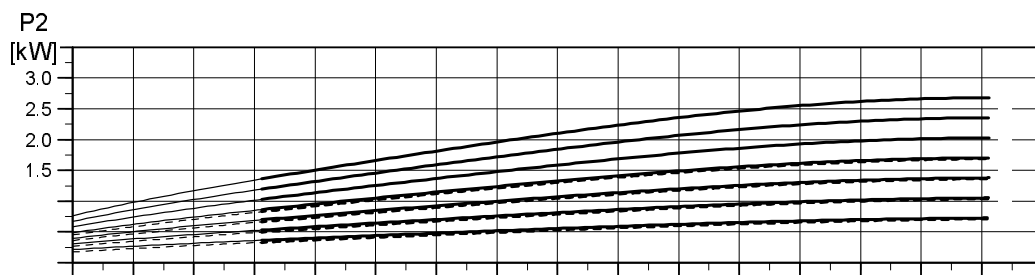
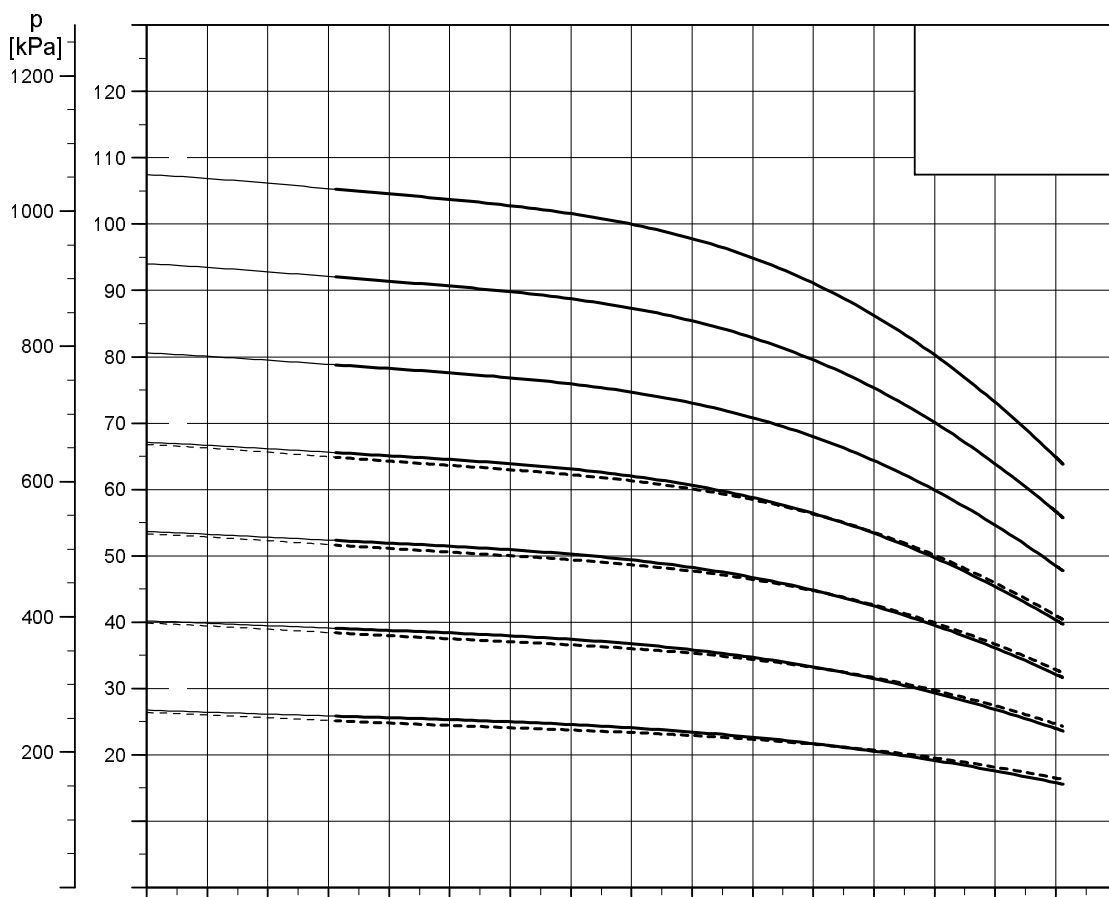
The two programs make it possible to calculate the specific duty point and energy consumption of a CME pump.

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 5
50/60 Hz

CME 5



----- CME-A
———— CME-I/G

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

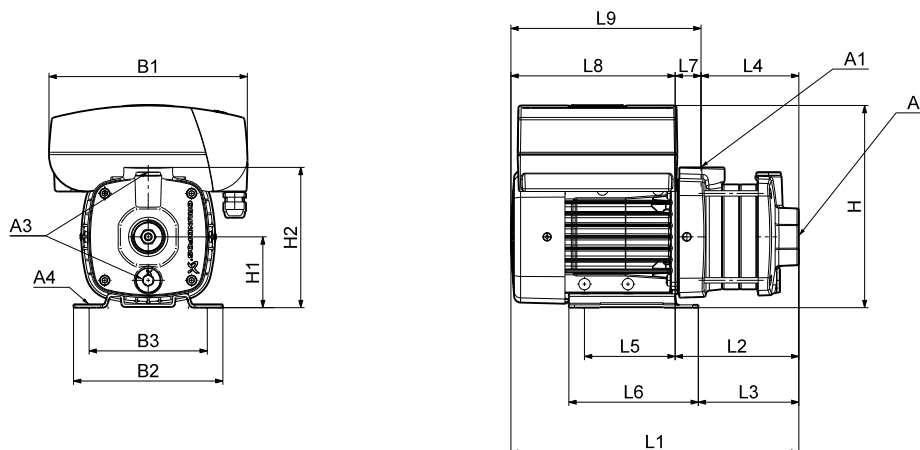
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Dimensions, CME 60 Hz and 50/60 Hz

CME 5-A
60 Hz
50/60 Hz

CME 5-A

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



TM04 2249 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
CME5-2	80B	1.10	Rp 1	Rp 1 1/4	Rp 3/8	10	210	158	125	215	75	149	328	114	89	86	96	137	28	214	242
CME5-3	80B	1.10	Rp 1	Rp 1 1/4	Rp 3/8	10	210	158	125	215	75	149	346	132	107	104	96	137	28	214	242

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
CME5-4	90SB	1.50	Rp 1	Rp 1 1/4	Rp 3/8	10	264	178	140	257	90	201	428	204	189	122	125	155	82	224	306
CME5-5	90LC	2.20	Rp 1	Rp 1 1/4	Rp 3/8	10	264	178	140	257	90	201	486	222	207	140	125	155	82	264	346

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

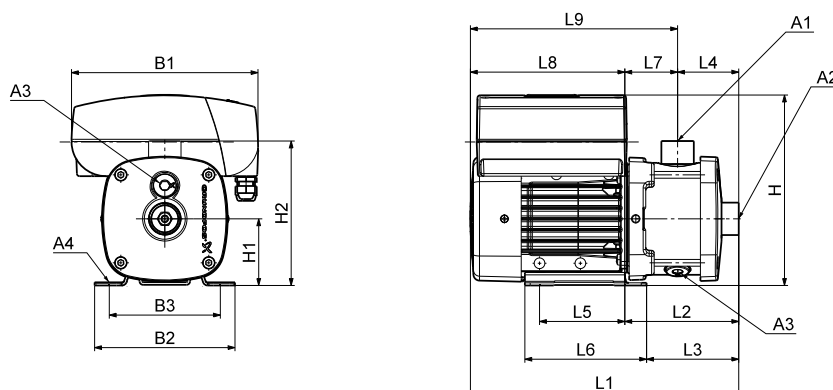
Pump type	Frame size	P ₂ [kW]	Dimensions																		
			A1	A2	A3	A4	B1	B2	B3	H	H1	H2	L1	L2	L3	L4	L5	L6	L7	L8	L9
CME5-4	90CC	1.50	NPT 1	NPT 1 1/4	Rp 3/8	10	264	178	140	257	90	201	428	204	189	122	125	155	82	224	306
CME5-5	90CC	1.50	NPT 1	NPT 1 1/4	Rp 3/8	10	264	178	140	257	90	201	446	222	207	140	125	155	82	224	306

Dimensions, CME 60 Hz and 50/60 Hz

CME 5-I and CME 5-G
60 Hz
50/60 Hz

CME 5-I and CME 5-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
CME5-2	80B	1.10	Rp 1	Rp 1 1/4	Rp 3/8	10	210	158	125	215	75	165	345	131	107	72	96	137	60	214	274
CME5-3	80B	1.10	Rp 1	Rp 1 1/4	Rp 3/8	10	210	158	125	215	75	165	345	131	107	72	96	137	60	214	274

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
CME5-4	90SB	1.50	Rp 1	Rp 1 1/4	Rp 3/8	10	264	178	140	257	90	180	413	189	174	90	125	155	99	224	323
CME5-5	90LC	2.20	Rp 1	Rp 1 1/4	Rp 3/8	10	264	178	140	257	90	180	471	207	192	108	125	155	99	264	363
CME5-6	90LC	2.20	Rp 1	Rp 1 1/4	Rp 3/8	10	264	178	140	257	90	180	507	243	228	144	125	155	99	264	363
CME5-7	100LC	3.0	Rp 1	Rp 1 1/4	Rp 3/8	12	264	199	160	277	100	190	525	253	238	144	140	170	109	272	381
CME5-8	100LC	3.0	Rp 1	Rp 1 1/4	Rp 3/8	12	264	199	160	277	100	190	561	289	274	180	140	170	109	272	381

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
CME5-4	90CC	1.50	NPT 1	NPT 1 1/4	Rp 3/8	10	264	178	140	257	90	180	413	189	174	90	125	155	99	224	323
CME5-5	90CC	1.50	NPT 1	NPT 1 1/4	Rp 3/8	10	264	178	140	257	90	180	431	207	192	108	125	155	99	224	323
CME5-6	90FA	2.20	NPT 1	NPT 1 1/4	Rp 3/8	10	264	178	140	257	90	180	507	243	228	144	125	155	99	264	363
CME5-7	90FA	2.20	NPT 1	NPT 1 1/4	Rp 3/8	10	264	178	140	257	90	180	507	243	228	144	125	155	99	264	363

CME 5-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 5-2	16.7	20.2	0.0296
1 x 208-230 V, 50/60 Hz (supply voltage M)	CME 5-3	17.0	20.5	0.0370
3 x 380-480 V, 50/60 Hz (supply voltage L)	CME 5-4	30.0	33.5	0.0847
	CME 5-5	34.2	37.7	0.0847
3 x 460-480 V, 60 Hz (supply voltage N)	CME 5-4	31.3	34.8	0.0847
	CME 5-5	31.5	35.0	0.0847

CME 5-I and CME 5-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 5-2	17.4	20.9	0.0370
	CME 5-3	17.5	21.0	0.0370
3 x 380-480 V, 50/60 Hz (supply voltage L)	CME 5-4	28.7	32.2	0.0370
	CME 5-5	33.0	36.5	0.0444
	CME 5-6	33.6	37.1	0.0444
	CME 5-7	36.9	40.4	0.0495
	CME 5-8	37.5	41.0	0.0495
	CME 5-4	30.0	33.5	0.0847
3 x 460-480 V, 60 Hz (supply voltage N)	CME 5-5	30.3	33.8	0.0847
	CME 5-6	33.8	37.3	0.0847
	CME 5-7	33.9	37.4	0.0847



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