LM, LP, LMD, LPD, CLM, CDM

(GB) **Installation and operating instructions**
(D) **Montage- und Betriebsanleitung**
(F) **Notice d'installation et d'entretien**
(I) **Istruzioni di installazione e funzionamento**
(E) **Instrucciones de instalación y funcionamiento**
(P) **Instruções de instalação e funcionamento**
(GR) **Οδηγίες εγκατάστασης και λειτουργίας**
(NL) **Installatie- en bedieningsinstructies**
(S) **Monterings- och driftsinstruktion**
(SF) **Asennus- ja käyttöohjeet**
(DK) **Monterings- og driftsinstruktion**

LM/LP

LMD/LPD

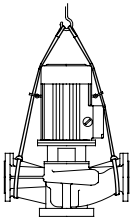
CLM

CDM

Pumps fitted with motors of 4 kW and up should be lifted by means of nylon straps and shackles, see fig. 2.

Fig. 2

LM, LP and CLM



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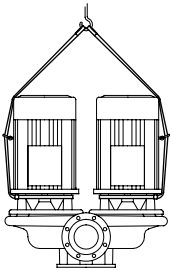
LMD, LPD and CDM



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2. Type designation

See pump nameplate.

2.1 LM, LP, LMD and LPD

Example LM D 100-125/136 A-F-A-BBUE

- Pump range
  LM: 4-pole motor
  LP: 2-pole motor
- Twin-head pump
- Nominal diameter of suction and discharge ports (DN)
- Nominal impeller diameter (mm)
- Actual impeller diameter (mm)
- Code for pump version
  A = Pump housing of GG 25
  G = Pump housing of GGG 50
- Code for pipework connection
  F = Flange connection
- Code for materials
  A = Standard version
- Code for shaft seal and rubber pump parts

2.2 CLM and CDM

Example CL M 125-160-2.2(/6) A-F-A-BBUE

- Pump range
  CL: Single-head pump
  CD: Twin-head pump
- M: 4-pole motor
- Nominal diameter of suction and discharge ports (DN)
- Actual impeller diameter (mm)
- Motor output (kW)
- 6-pole motor
- Code for pump version
  A = Pump housing of GG 25
  G = Pump housing of GGG 50
- Code for pipework connection
  F = Flange connection
- Code for materials
  A = standard version
- Code for shaft seal and rubber pump parts

If the pump versions for +140°C differ from the basic types, this is indicated in the following text by "CLM-G".

The *code for pump version* in the above pump key will be a "G".

2.3 Impeller diameter

At the customer's request, the impeller diameter may have been changed to allow the pump to match a specified duty point. This means that the actual impeller diameter differs from the standard diameters stated in sales catalogues, data sheets, etc. and in these instructions, pages 123 to 125.

The actual impeller diameter can be found on the pump nameplate.

3. Applications

GRUNDFOS single-stage in-line centrifugal pumps, types LM, LP, LMD, LPD, CLM and CDM, are typically used for the following applications:

- Circulation in heating systems, including district heating.
- Circulation in ventilating and air-conditioning systems.
- Circulation and transfer in cooling systems.
- Distribution and pressure boosting in water supply systems.
- Circulation, transfer and pressure boosting in industrial systems.

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3.1 Pumped liquids

Thin, clean, non-aggressive and non-explosive liquids, not containing solid particles or fibres. The liquid must not attack the pump materials chemically.

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

The O-rings and the mechanical shaft seal chosen must be suitable for the liquid to be pumped.

Special shaft seals may be required if the pump is used for pumping treated water at temperatures above 80°C containing additives to prevent system corrosion, calcareous deposits, etc., e.g. in heating and ventilating systems.

In cooling systems, the pumps can be used for liquid temperatures down to –25°C on the following conditions:

- When pumping liquids containing glycol, it is advisable to use RUUE/GQQE shaft seals.
- The pumps should be installed with the pump shaft horizontal to prevent the shaft from freezing fast during periods of inactivity, as condensed water may run down to the shaft seal and freeze.

4. Technical data

4.1 Ambient temperature

Maximum +40°C.

4.2 Liquid temperature – general

Depending on the cast-iron version and the pump application, the maximum liquid temperature may be limited by local regulations and laws.

CLM-G pump housings are made of cast iron GGG 50 and all other pump housings of GG 25.

4.3 Maximum operating pressure

Pump type	Mechanical shaft seal
LM, LMD	BUBE, BBUE, AUUE, RUUE
LP, LPD	BUBE, BBUE, AUUE, BUUE, RUUE, GQQE
CLM, CDM	BBUE, BQQE, GQQE
CLM-G	DAQE

Mechanical shaft seal	Liquid temperature [°C]	Maximum operating pressure [bar]
BUBE/BBUE	0 to 140	16
AUUE/BQQE/ BUUE	0 to 90	16
RUUE/GQQE	–25 to 90	16
DAQE	–40 to 140	20

4.4 Minimum inlet pressure

According to the NPSH curve (see pages 132 to 139) + a safety margin of minimum 0.5 metres head.

Calculation of minimum inlet pressure is described in section *12.*

4.5 Maximum inlet pressure

Pump in operation:

The actual inlet pressure + pressure when the pump is running against a closed valve must always be lower than the “maximum operating pressure”.

For CLM-G, however, the maximum inlet pressure is 16 bar.

Pump not in operation:

Motor size	Maximum inlet pressure	
	Horizontal motor shaft 	Vertical motor shaft 
[kW]	[bar]	[bar]
CLM, CDM		
0.25	4.9	6.0
0.37	4.9	6.1
0.55	4.9	6.5
0.75	4.9	6.7
LP, LPD		
1.1	4.9	6.2

4.6 Maximum flow rate

The maximum flow rate must not exceed the values stated for each individual pump on pages 123 to 125, as otherwise for instance cavitation and overload may occur.

4.7 Electrical data

See motor nameplate.

4.8 Dimensions and weights

Dimensions: See pages 126 to 131.

Weights: See label on the packing.

4.9 Sound level

See page 122.

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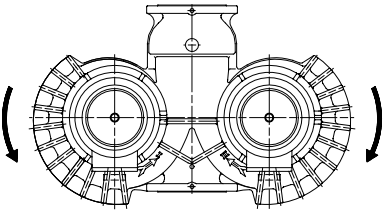
The correct direction of rotation is shown by arrows on the *motor stool*, on the *motor fan cover* and/or on the *pump housing*. When seen from the fan, the pump should rotate as follows:

LM, LP, LMD, LPD: Counter-clockwise.

CLM: Clockwise.

CDM: One motor in either direction, see fig. 7.

Fig. 7



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7.3 Starting

Before starting the pump, completely open the isolating valve on the suction side of the pump and leave the discharge isolating valve almost closed.

Start the pump.

Vent the pump during starting by loosening the air vent screw in the motor stool until a steady stream of liquid runs out of the vent hole, see fig. 6.

Pay attention to the direction of the vent hole and take care to ensure that the escaping water does not cause injury to persons or damage to the motor or other components.
In hot-water installations, special attention should be paid to the risk of injury caused by scalding hot water.

When the piping system has been filled with liquid, slowly open the discharge isolating valve until it is completely open.

Note: If the pumps are fitted with motors with outputs selected on the basis of a specific maximum flow rate, the motors may be overloaded if the differential pressure is lower than anticipated.

Measure motor current consumption and compare the result with the nominal current stated on the motor nameplate. In the event of motor overload, throttle the discharge isolating valve until the motor is no longer overloaded.

It is advisable always to check the motor current consumption during starting.

7.4 Frequency of starts and stops

Motors smaller than 4 kW should not start more than 100 times per hour.
Other motors should not start more than 20 times per hour.

When twin-head pumps are used for single-head operation, the duty and standby pumps should be alternated on a regular basis, i.e. *once a week*, to ensure an even distribution of the operating hours on both pumps. Pump change-over can be effected either manually or automatically by installing a suitable pump controller.

If twin-head pumps are used for pumping domestic hot water, the duty and standby pumps should be alternated on a regular basis, i.e. *once a day*, to avoid blocking of the standby pump due to deposits (calcareous deposits, etc.). Automatic pump change-over is recommended.

8. Maintenance

Before starting work on the pump, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

8.1 Lubrication

The pump is maintenance-free.

If the pump is to be drained for a long period of inactivity, inject a few drops of silicone oil on the shaft between the motor stool and the coupling. This will prevent the shaft seal faces from sticking.

LM, LP, LMD and LPD: First remove the coupling guards.

Motor bearings:

As standard, the pump is fitted with a motor without grease nipples. Therefore, the motor bearings are maintenance-free.

If a motor with grease nipples has been fitted to the pump, the motor should be lubricated with a high-temperature lithium-based grease.

8.2 Shaft adjustment (LM, LP, LMD and LPD)

This section applies only to LM, LP, LMD and LPD as the shaft height of CLM and CDM pumps requires no adjustment.

If the motor is removed during installation or for repair of the pump, the pump shaft must be adjusted after the motor has been replaced.

Adjust the pump shaft as follows:

1. Slacken the set screw and remove the forked distance piece.
2. Fit the hexagon socket head screws in the coupling and leave loose. Raise the coupling and the pump shaft (towards the motor) by means of a screwdriver or a similar tool, fig. 8.

(GB) **Airborne noise emitted by pumps fitted with GRUNDFOS Motors:**
(D) **Luftschallemission von Pumpen mit GRUNDFOS Motoren:**
(F) **Bruit aérien émis par les pompes accouplées aux moteurs GRUNDFOS:**
(I) **Rumore aereo prodotto dalla pompa dotata di motore GRUNDFOS:**
(E) **Ruido aéreo para bombas montadas con motores GRUNDFOS:**
(P) **Ruído aéreo emitido por bombas montadas com motores GRUNDFOS:**
(GR) **Στάθμη ακουστικής πίεσης για αντλίες συνδυασμένες με κινητήρες GRUNDFOS:**
(NL) **Uitgestraalde luchtgeluid van pompen met GRUNDFOS-motoren:**
(S) **Ljudnivå för pumpar monterade med GRUNDFOS-motor:**
(SF) **Ilmassa kantautuva ääni GRUNDFOS-moottoreilla varustetuille pumpuille:**
(DK) **Luftbåren støj fra pumper monteret med GRUNDFOS motor:**

	50 Hz				60 Hz	
Motor	**LP**	**LPD***	**LM, CLM**	**LMD, CDM***	**LP**	**LM, CLM**
[kW]	$\overline{L}_{pA}$ **[dB(A)]**	$\overline{L}_{pA}$ **[dB(A)]**	$\overline{L}_{pA}$ **[dB(A)]**	$\overline{L}_{pA}$ **[dB(A)]**	$\overline{L}_{pA}$ **[dB(A)]**	$\overline{L}_{pA}$ **[dB(A)]**
0.25	<70	<70	<70	<70	<70	<70
0.37	<70	<70	<70	<70	<70	<70
0.55	<70	<70	<70	<70	<70	<70
0.75	<70	<70	<70	<70	<70	<70
1.1	<70	<70	<70	<70	<70	<70
1.5	<70	<70	<70	<70	71	<70
2.2	<70	<70	<70	<70	71	<70
3.0	<70	<70	<70	<70	71	<70
4.0	73	76	<70	<70	71	<70
5.5	73	76	<70	<70	78	<70
7.5	73	76	<70	<70	78	<70
11	80	83	<70	<70	84	<70
15	77	80	<70	<70	82	72
18.5	77	80	85			
22			85			
[kW]	$\overline{L}_{WA}$ **[dB(A)]**	$\overline{L}_{WA}$ **[dB(A)]**	$\overline{L}_{WA}$ **[dB(A)]**	$\overline{L}_{WA}$ **[dB(A)]**	$\overline{L}_{WA}$ **[dB(A)]**	$\overline{L}_{WA}$ **[dB(A)]**
18.5				97		99
22	96	99		97		99
30	96	99	95	98		100
37			95	98		100
45			97	100		102

* Both pump heads operating.
Beide Pumpen in Betrieb.
Deux pompes en fonctionnement.
Funzionamento di entrambe le pompe.
Ambas bombas en funcionamiento.
Duas bombas em funcionamento.
Και οι δύο κεφαλές σε λειτουργία.
Beide pompen in bedrijf.
Båda pumparna i drift.
Molemmat pumput käytössä.
Begge pumper i drift.

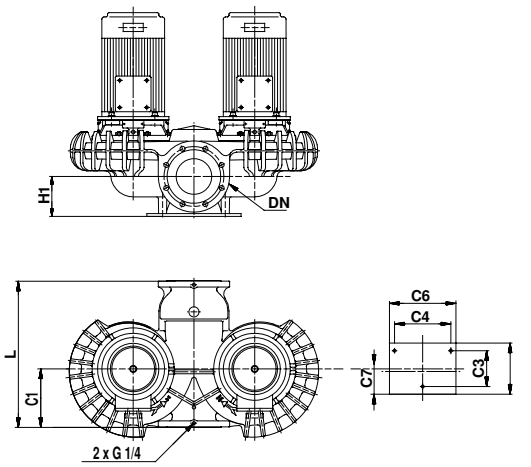
60 Hz	Max. flow
	[m³/h]
CLM 100-158-3.0	94
CLM 100-165-3.0	98
CLM 100-181-4.0	108
CLM 100-204-5.5	123
CLM 125-160-4.0	125
CLM 125-180-4.0	150
CLM 125-200-5.5	165
CLM 125-214-7.5	188
CLM 125-233-11.0	220
CLM 150-195-11.0	310
CLM 150-203-11.0	325
CLM 150-224-15.0	355
CLM 150-238-18.5	380
CLM 150-250-22.0	415
CLM 200-240-37.0	600
CLM 200-258-37.0	630
CLM 200-272-45.0	650

50 Hz	Max. flow
	[m³/h]
CLP 65-110-3.0	48
CLP 65-130-3.0	58
CLP 65-139-4.0	65
CLP 65-150-5.5	73
CLP 65-169-7.5	81
CLP 65-190-11.0	90
CLP 80-120-7.5	83
CLP 80-155-7.5	110
CLP 80-175-11.0	130
CLP 80-190-15.0	140
CLP 80-203-18.5	150
CLP 100-159-15.0	160
CLP 100-170-15.0	177
CLP 100-182-18.5	190
CLP 100-192-22.0	198
CLP 100-205-30.0	208

50 Hz	Max. flow
1 pump	[m³/h]
CDM 125-155-2.2	82
CDM 125-180-2.2	93
CDM 125-198-3.0	101
CDM 125-213-4.0	112
CDM 125-225-5.5	120
CDM 150-160-2.2	100
CDM 150-188-2.2	124
CDM 150-201-3.0	135
CDM 150-214-4.0	150
CDM 150-229-5.5	168
CDM 150-242-7.5	185
CDM 150-248-11.0	195
CDM 200-195-5.5	265
CDM 200-210-7.5	285
CDM 200-240-11.0	325
CDM 200-263-15.0	358
CDM 200-271-18.5	370
CDM 200-278-22.0	420
CDM 210-240-18.5	530
CDM 210-257-22.0	540
CDM 210-287-30.0	565
CDM 210-305-37.0	575
CDM 210-313-45.0	580

50 Hz	Max. flow
2 pumps	[m³/h]
CDM 125-155-2.2	155
CDM 125-180-2.2	186
CDM 125-198-3.0	202
CDM 125-213-4.0	225
CDM 125-225-5.5	240
CDM 150-160-2.2	200
CDM 150-188-2.2	248
CDM 150-201-3.0	270
CDM 150-214-4.0	300
CDM 150-229-5.5	336
CDM 150-242-7.5	370
CDM 150-248-11.0	390
CDM 200-195-5.5	390
CDM 200-210-7.5	530
CDM 200-240-11.0	650
CDM 200-263-15.0	716
CDM 200-271-18.5	740
CDM 200-278-22.0	840

CDM



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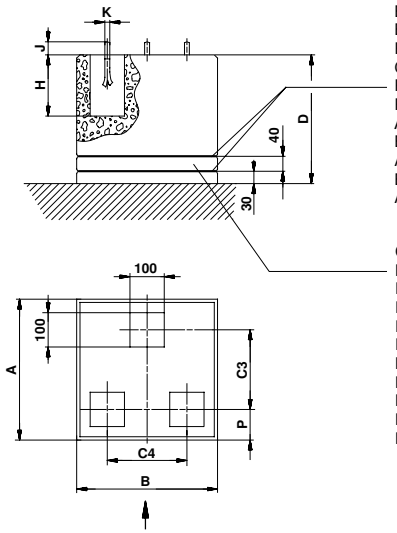

Bituminized paper
Bitumenpapier
Papier bitumé
Carta bitumata
Papel bituminoso
Papel betumado
Ασφαλτόπανο
Bitumen papier
Asfaltisoleringspapper
Bitumipaperi
Asfaltpapir

Cork plate
Korkplatte
Plaque de liège
Piastra in sughero
Placa de corcho
Placa em cortiça
Πλάκα φελλού
Kurkplaat
Korkplatta
Korkkilevy
Korkplade

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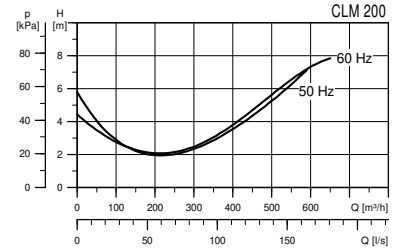
50 Hz	DN	L	H1	C1	C3	C4	C5	C6	C7	A	B	D	H	J	K	P
PN 16		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]
CDM 125	125	515	140	205	140	250	200	330	110	500	600	600	150	30	M12	180
CDM 150	150	630	160	260	200	280	250	380	140	500	650	600	200	35	M16	150
CDM 200	200	790	187	310	200	330	250	430	130	600	750	700	200	35	M16	200
CDM 210	200	920	187	350	240	350	300	650	155	700	800	700	200	35	M16	230



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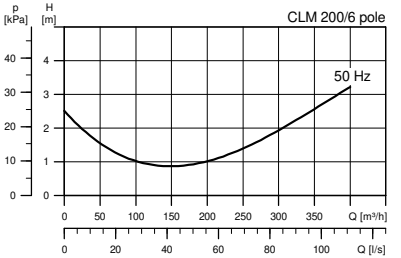

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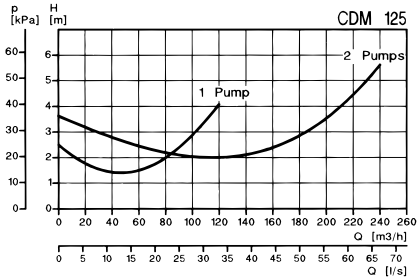

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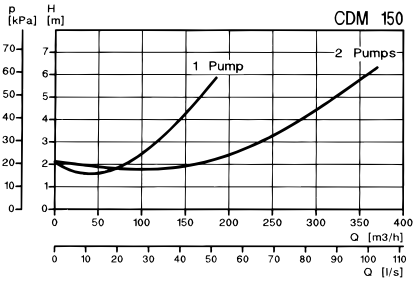

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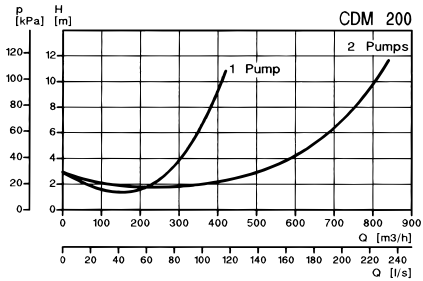

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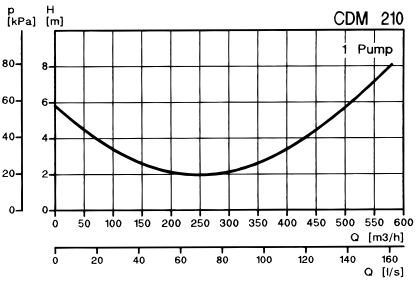

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