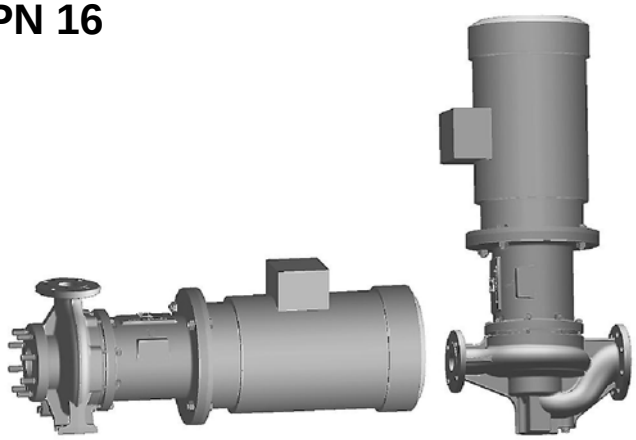
Volute Casing Centrifugal Pumps PN 16
for heat-transfer liquids
Heat-transfer oil up to 350 °C
Hot water up to 183 °C



ALLMAG®
Series CMIT in inline design
Series CMAT with axial inlet

Application
For the circulation of heat-transfer liquids such as hot oil or hot water in heat transfer plants. The fluids to be handled must not contain abrasive particles and must not chemically attack the materials used.

Design / Installation
Uncooled volute casing centrifugal pump with axial inlet, inline design, single stage close coupled with magnetic coupling. The hydraulic coverage corresponds to DIN EN 22858 / ISO 2858.

Separated by a stationary mounted containment shell, the torque transmission from the outer to the inner rotor is accomplished without contact by means of special alloy magnets. The outer magnetic rotor is mounted on to the shaft of the electric motor. The hollow inner magnets rotor is directly connected to a symmetrical double flooded impeller, resulting into an almost zero axial thrust. Because the impeller is mounted between two sleeve bearings, the resulting radial forces in the sleeve bearings are reduced by 50% for ALLMAG - irrespective of the pump series (patent pending).

Horizontal and vertical mounting is possible.

Performance data at 50 Hz

Q	up to 80 m³/h	p_d	up to	16 bar ①
H	up to 55 m	DN_d	from	25 to 50
t	up to 350 °C in thermal oil up to 183 °C in hot water			

① Inlet pressure plus internal pressure at maximum delivery head (= 0-flow) must not exceed the stated pd value.

The mentioned performance data are only to be viewed as a product/performance overview. The exact operating limits are specified in the quotation and/or in the order acknowledgment.

For actual flow rates, please see hydraulic coverage and/or individual hydraulic curves. As a protection against overheating when operating at low flow rates, a minimum flow rate is to be maintained according to the following formula:

$$Q_{min.} = 0.3 \times Q_{\eta\ opt.}$$

The maximum transmissible power of the magnetic coupling = appr. 30 kW at 2900 1/min. Magnets are available in lengths of 30, 40, 60 and 80 mm.

Flanges
Connection flange: dimensions according to EN 1092-2, PN 16 and/or EN 1092-1.

Drive
By three-phase squirrel-cage induction motor with fixed ball bearing. Up to 2,2 kW 230/400V, including 3 kW and above 400/690V, IP55.
Where the client supplies the motor, the following must be observed:
- The motor must contain a fixed bearing on the drive side
- The end plate of the motor should be made from grey cast iron
- The drive-sided bearing may experience temperatures of up to approx.105 °C

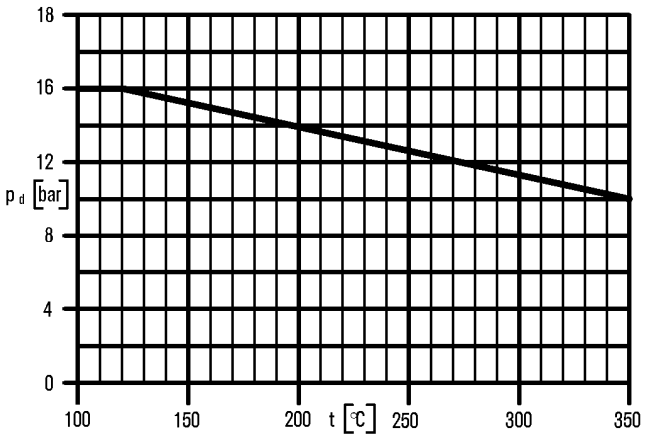
The maximum ambient temperature on site must not exceed 40 °C. Non-restricted heat removal must be assured at any time.

Materials

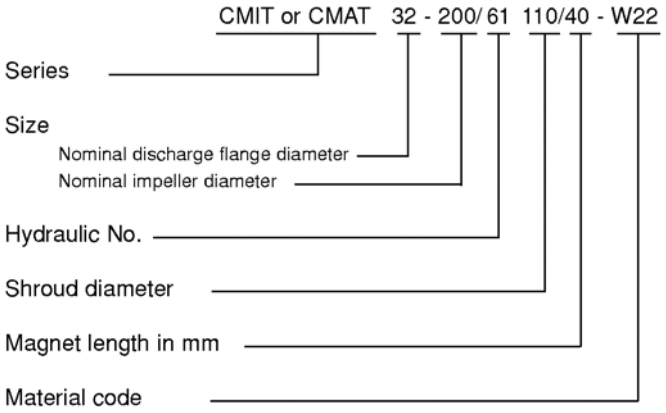
Denomination	Material design
Volute casing	EN-GJS-400-15 (GGG-40) ②
Impeller	EN-GJL-200 (GG-20)
Casing cover	EN-GJS-400-15 (GGG-40)
Adapter	EN-GJL-250 (GG-25)
Sleeve bearing	S SiC
Containment shell	2.4610
Flange for Containment shell	1.1191
Magnets	Special alloy
Fasteners	GA-T2

② For the reasons of production engineering some casings of series CMAT are made of 1.0619 (GS-C25).

Pressure as a function of the media temperatue



Designation



This designation is indicated on the name plate.

Explosion protection

The pump fulfils the requirements according to EU Explosion Protection Directive 2014/34/EU (ATEX 100a) for equipment and equipment group II, category 2 G. Categorisation into temperature classes according to EN 13463-1 depends on the temperature of the pumped medium. The max. permissible temperature of the pumped medium for the respective temperature classes are shown in the below table.

Hazard category	Temperature class acc. to EN 13463-1	Max. permissible medium temperature
II 2G / c/b II 3G / c	T4	103 °C
	T3	178 °C
	T2	281 °C
	T1	350 °C ①

① corresponds to the pump's temperature limit
Type of protection b = Monitoring of ignition sources
Type of protection c = Safe design

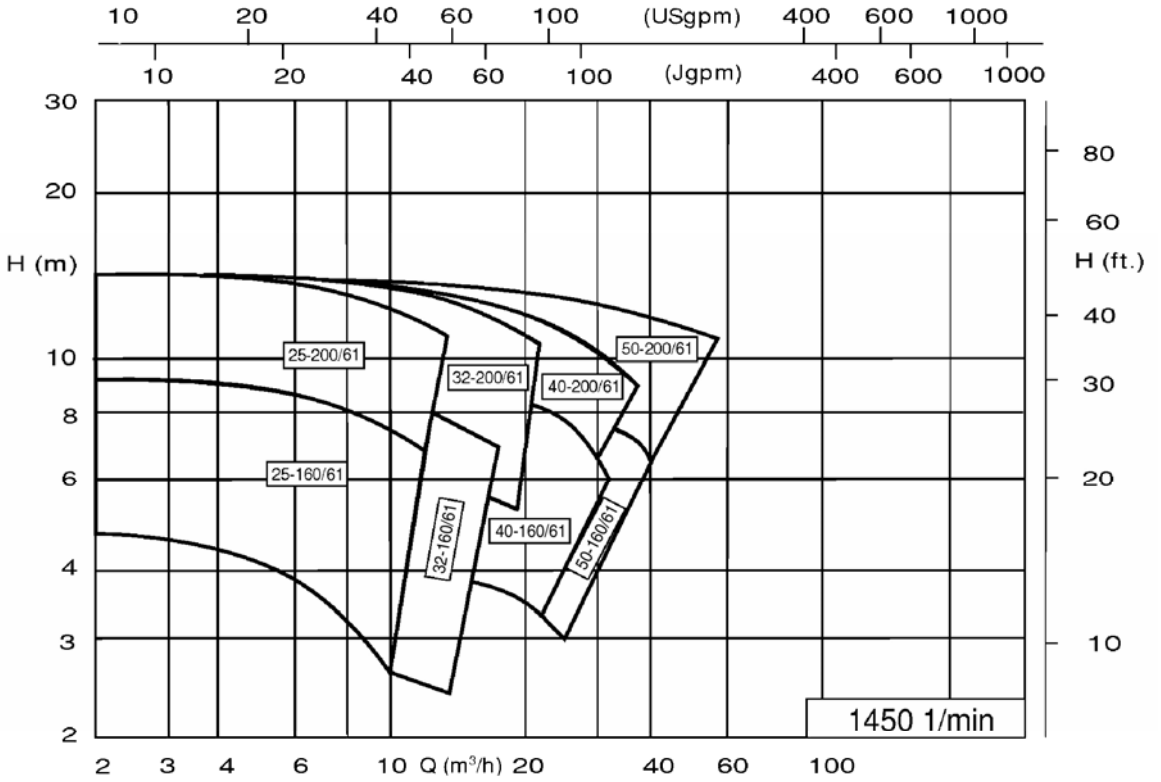
The temperatures specified above are based on a max. ambient temperature of 40°C.

Note: In case of the operation of a category 2 pump, the unacceptable heating of the pump surfaces caused by a possible operational fault must be prevented by a control mechanism. In case of an operation with know parameters (Q, H, υ, ρ = const.), a pump performance controller can be supplied with the pump to detect any operational faults.

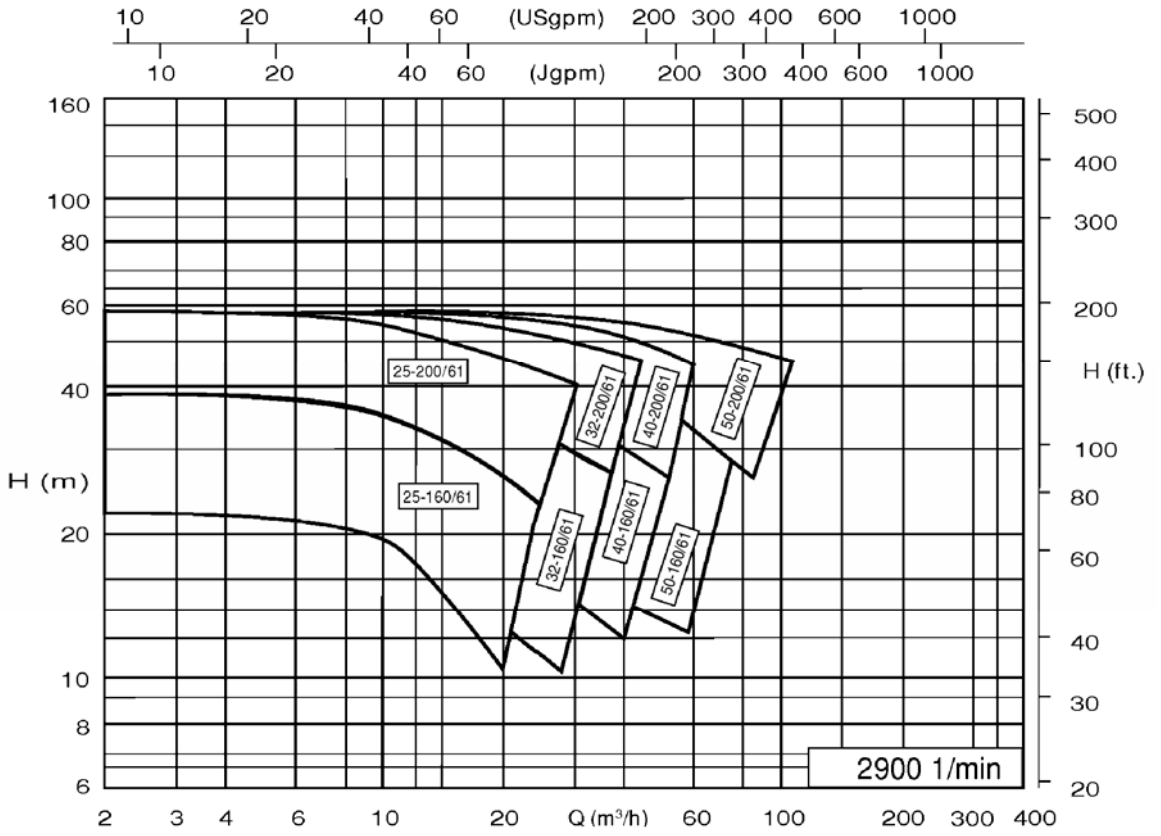
Voluntary product certification by TÜV Product Service GmbH, Ridler Str. 65, D-80339 München, ID no. 0123.

Performance graphs

n = 1450 1/min



n = 2900 1/min



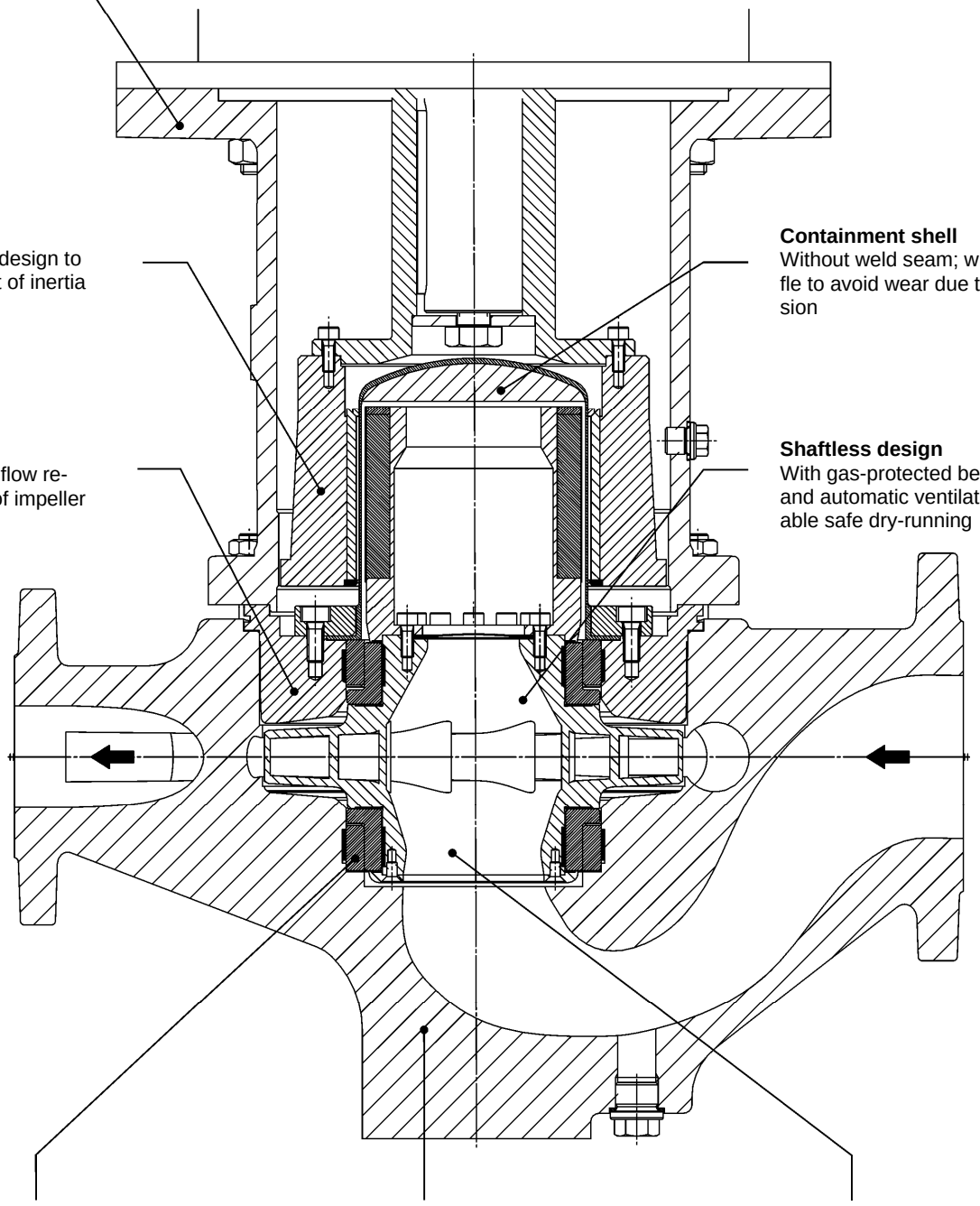
For exact performance data, please refer to the individual characteristics.

Series CMIT

Adapter
Flange diameter of adapter trimmedto flange diameter of motor

Construction
Design without shaft using standardized parts, few components, end-suction design possible by interchanging the volute casing

Flush flow
Patented in practical applications proven flow guidance



Outer rotor
Special massive design to increase moment of inertia on outer rotor

Containment shell
Without weld seam; with baffle to avoid wear due to erosion

Casing cover
Smooth reduced flow resistance design of impeller side chamber

Shaftless design
With gas-protected bearings and automatic ventilation enable safe dry-running

Sleeve bearing
Hydrodynamic lubrication over the entire allowable performance range. Support of bearing parts in spezial designed tension rings

Inline-volute casing
With hydraulically optimized uniform flow entry into the impeller suction side

Impeller
Symetrical, double flooded, no impulse forces at impeller hub

Series CMAT

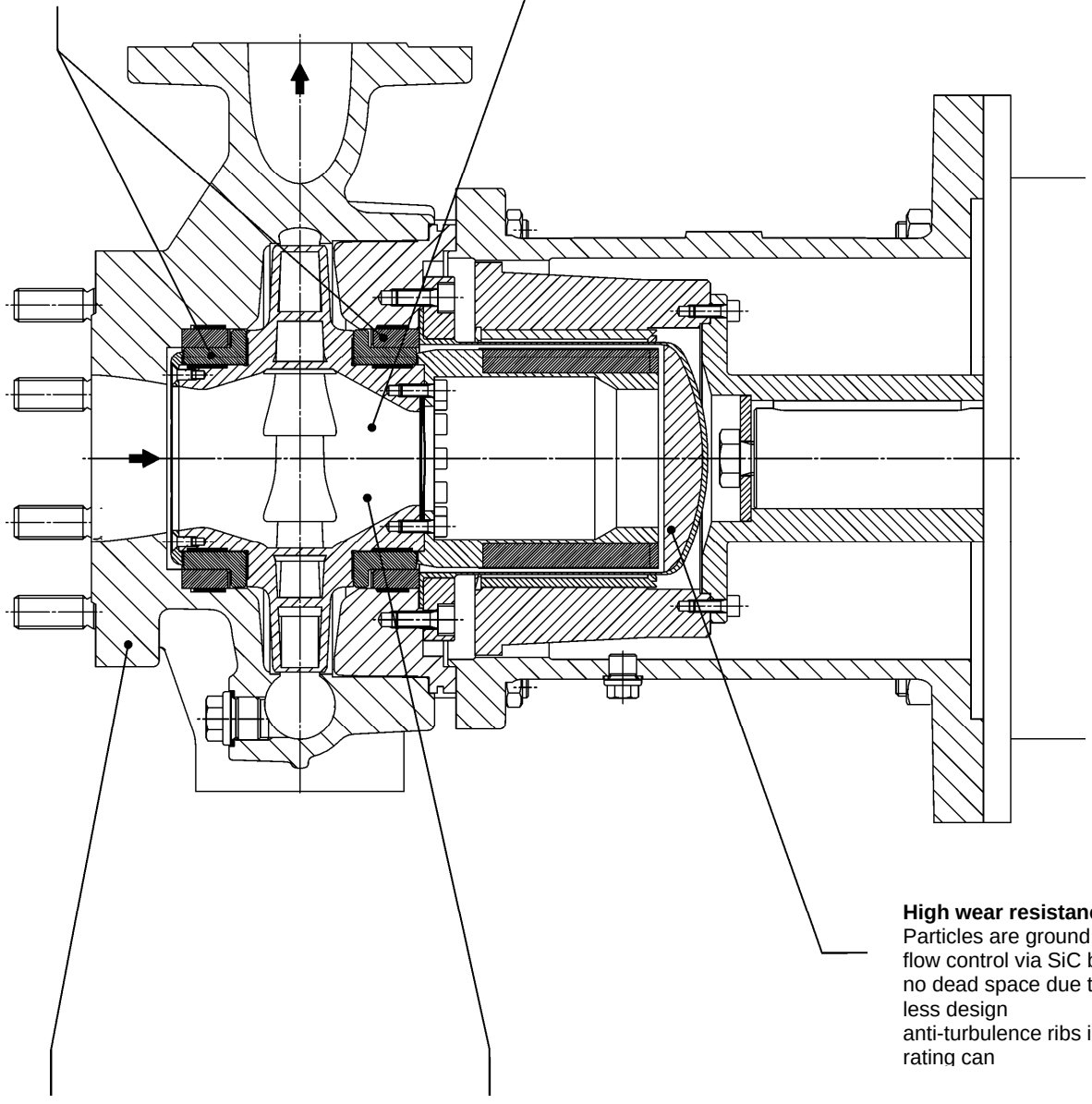
Innovation
Patented new pump concept intelligent design solutions

Shaftless design
With gas-protected bearings and automatic ventilation enable safe dry-running

Installation
Easy installation due to the block-type construction no coupling alignment required

Bearing
Due to between bearing mounting of the impeller, reduction of resulting radial forces (bearing lead)

Starting safety
Reduced GD^2 at the inner rotor due to non shaft design



High wear resistance
Particles are ground by flush flow control via SiC bearings
no dead space due to shaftless design
anti-turbulence ribs in separating can

Dimensions
Flanges according to EN 1092-1; pump of direct coupled design; casing dimensions and hydraulic data according to ISO 2858 (EN 22 858)

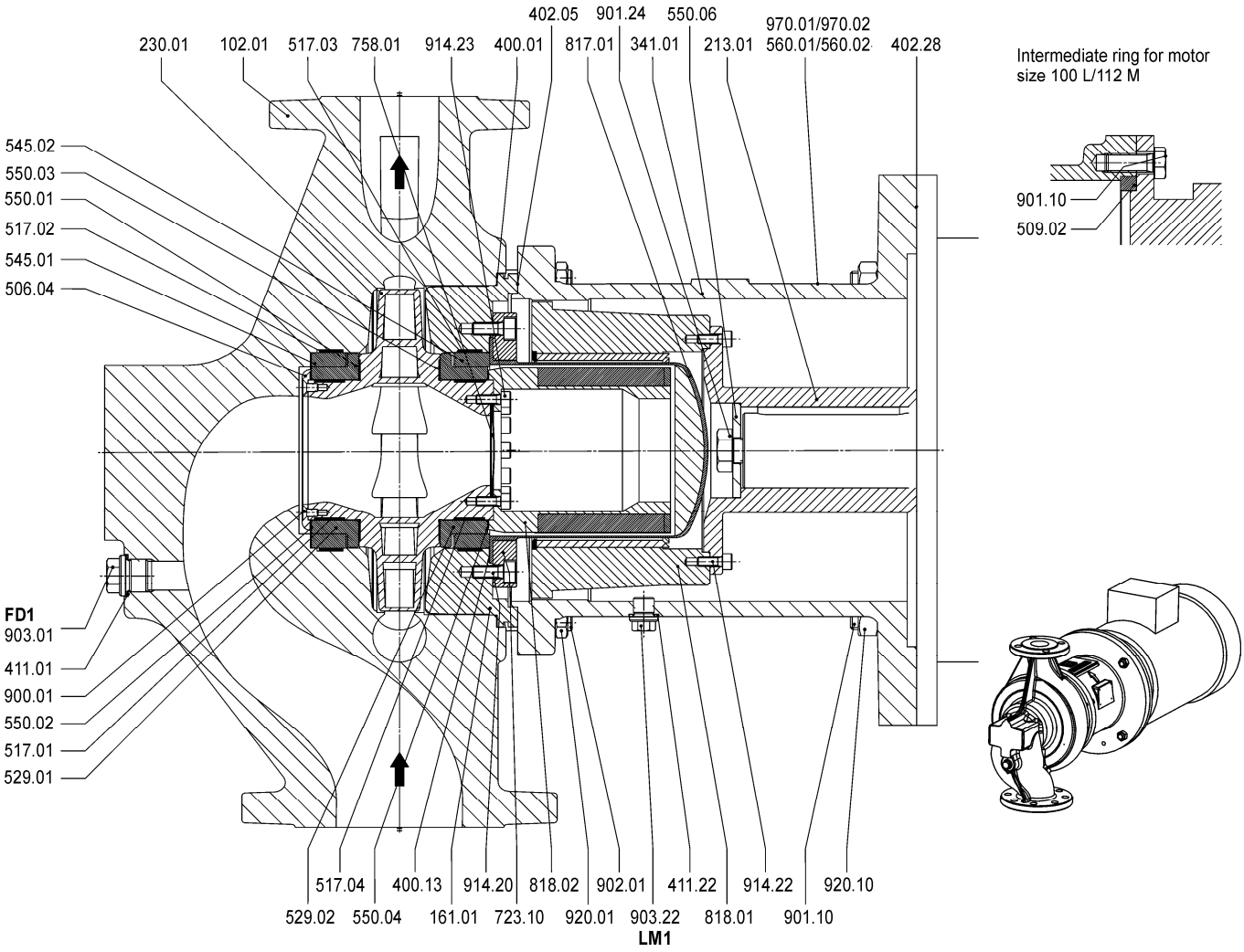
No axial forces
No axial forces as a result of a non-shaft design and symmetrical impeller

Flushing stream
Patented flush flow proven in 1000 practical applications

Reliable
Hydrodynamic lubrication of the SiC bearings; accommodation of the SiC bearings in modern tolerance rings

Structure
Standardized components; few components; pressure-proof casing components

Sectional drawing, series CMIT



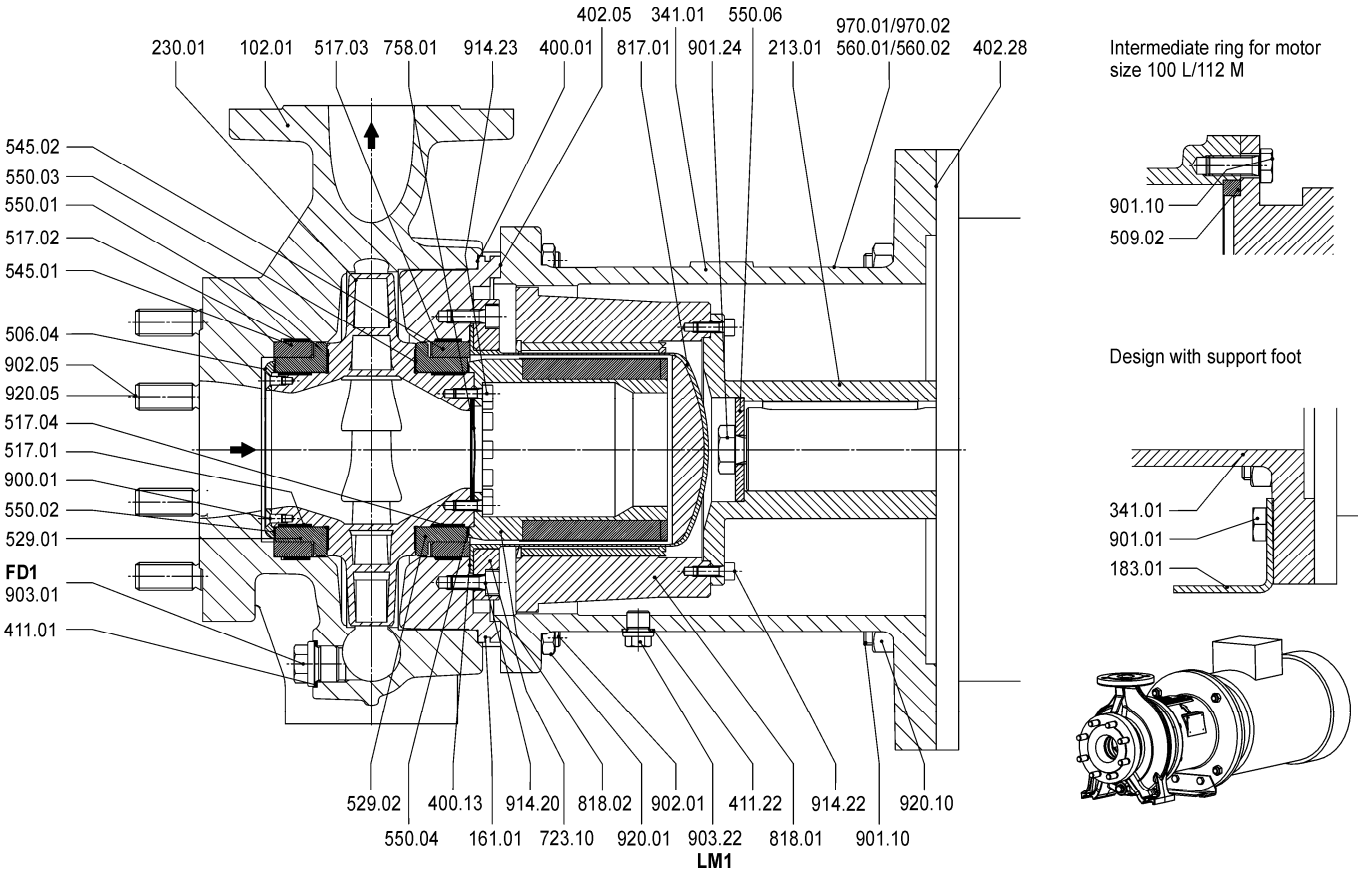
Denomination	Part No.
Volute casing	102.01
Casing cover	161.01
Drive shaf	213.01
Impeller	230.01
Adapter	341.01
Gasket	400.01
Gasket	400.13
Gasket	402.05
Gasket	402.28
Joint ring	411.01
Joint ring	411.22
Retaining ring	506.04
Intermediate ring	509.02
Tolerance ring	517.01
Tolerance ring	517.02
Tolerance ring	517.03
Tolerance ring	517.04
Bearing sleeve	529.01
Bearing sleeve	529.02
Bearing bush	545.01
Bearing bush	545.02
Disc	550.01
Disc	550.02

Denomination	Part No.
Disc	550.03
Disc	550.04
Disc	550.06
Pin	560.01
Pin	560.02
Flange	723.10
Strainer insert	758.01
Containment shell	817.01
Rotor	818.01
Rotor	818.02
Flat head	900.01
Hexagonal screw	901.10
Hexagonal screw	901.24
Stud	902.01
Stud	902.05
Screwed plug	903.01
Screwed plug	903.22
Socket head cap screw	914.20
Socket head cap screw	914.22
Socket head cap screw	914.23
Hexagonal nut	920.01
Hexagonal nut	920.10
Name plate	970.01

Denomination	Part No.
Rotation arrow	970.02

Connections
FD1 Draining
LM1 Leak tightness monitoring

Sectional drawing, series CMAT



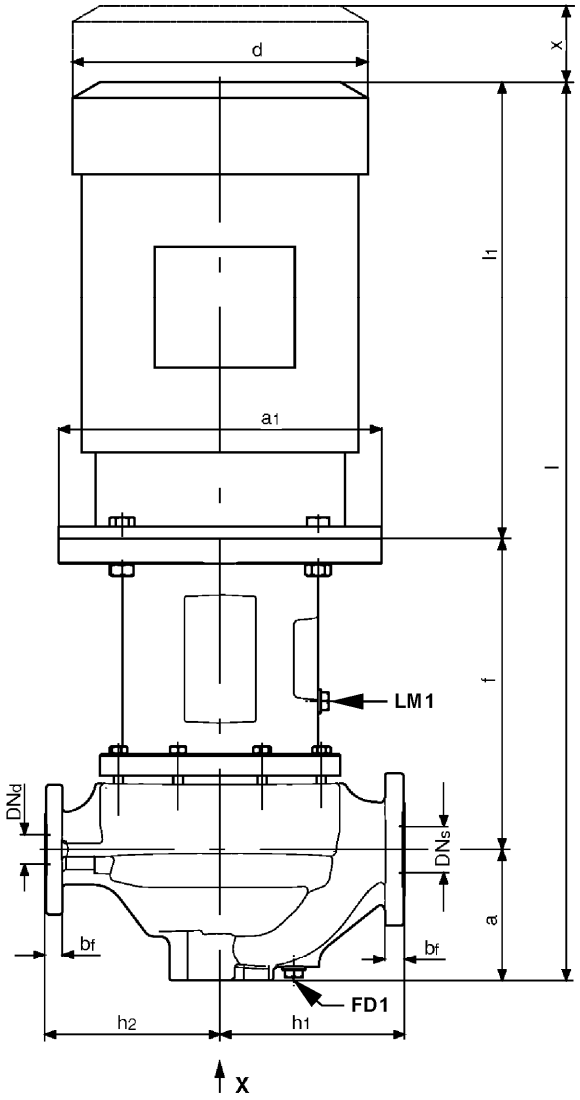
Denomination	Part No.
Volute casing	102.01
Casing cover	161.01
Support foot	183.01
Drive shaft	213.01
Impeller	230.01
Adapter	341.01
Gasket	400.01
Gasket	400.13
Gasket	402.05
Gasket	402.28
Joint ring	411.01
Joint ring	411.22
Retaining ring	506.04
Intermediate ring	509.02
Tolerance ring	517.01
Tolerance ring	517.02
Tolerance ring	517.03
Tolerance ring	517.04
Bearing sleeve	529.01
Bearing sleeve	529.02
Bearing bush	545.01
Bearing bush	545.02
Disc	550.01
Disc	550.02

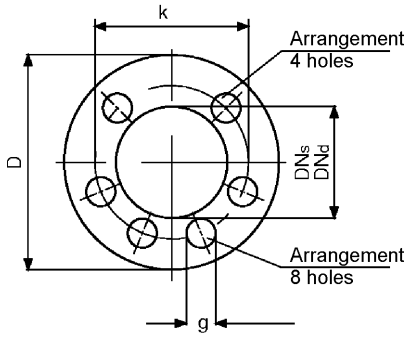
Denomination	Part No.
Disc	550.03
Disc	550.04
Disc	550.06
Pin	560.01
Pin	560.02
Flange	723.10
Strainer insert	758.01
Containment shell	817.01
Rotor	818.01
Rotor	818.02
Flat head	900.01
Hexagonal screw	901.10
Hexagonal screw	901.24
Stud	902.01
Stud	902.05
Screwed plug	903.01
Screwed plug	903.22
Socket head cap screw	914.20
Socket head cap screw	914.22
Socket head cap screw	914.23
Hexagonal nut	920.01
Hexagonal nut	920.05
Hexagonal nut	920.10
Name plate	970.01

Denomination	Part No.
Rotation arrow	970.02

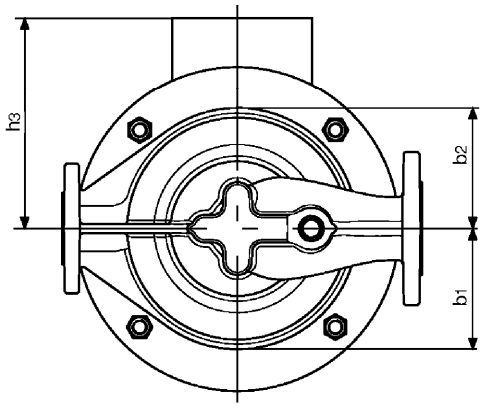
Connections
FD1 Draining
LM1 Leak tightness monitoring

Unit dimensions, series CMIT





Ansicht X



Flange dimensions					
DNs DNd	D	bf	k	g	No. of holes
25	115	16	85	14	4
32	140	18	100	19	4
40	150	18	110	19	4
50	165	20	125	19	4
65	185	20	145	19	4
80	200	22	160	19	8

Connections		
DNs DNd	Drainage	Leak tightness monitoring
25-80	FD1	LM1
	G 1/2	G 1/4

Tolerances of joint dimensioins acc. to DIN EN 735.

Sence of rotation: clockwise as seen from the driving side.

Dimensions in mm
without commitment.

Unit dimensions, series CMIT

Dimmensions in mm without commitment.

Pump-size	Motor-size	Unit dimensions														Allocation motor shaft/ drive shaft Contained in abbreviation
		Flanges								Motor dimensions approximate dimensions different depending upon manufacturer					Extension. dim.	
		DNs	DNd	a	f	b1	b2	h1	h2	a1	d	h3	l1	l	x	
25-160/61	100 L	40	25	132	272	130	130	190	180	250	203	158	312	719	195	28/250
	112 M										228	171	335	742		28/250
	132 S				315					300	266	196	413	863	237	38/300
25-200/61	100 L	40	25	132	268	130	133	190	180	250	203	158	312	715	195	28/250
	112 M										228	171	335	738		28/250
	132 S				311					300	266	196	413	859	237	38/300
	160 M				322					350	320	234	525	982	247	42/350
32-160/61	100 L	50	32	140	278	130	130	200	190	250	203	158	312	735	195	28/250
	112 M										228	171	335	758		28/250
	132 S				321					300	266	196	413	879	237	38/300
	160 M				333					350	320	234	525	1003	247	42/350
32-200/61	100 L	50	32	138	268	130	137	200	190	250	203	158	312	725	195	28/250
	112 M										228	171	335	748		28/250
	132 S				311					300	266	196	413	869	237	38/300
	160 M				322					350	320	234	525	992	247	42/350
40-160/61	100 L	65	40	157	282	130	130	210	200	250	203	158	312	754	195	28/250
	112 M										228	171	335	777		28/250
	132 S				325					300	266	196	413	898	237	38/300
	160 M				336					350	320	234	525	1021	247	42/350
40-200/61	100 L	65	40	157	271	130	139	220	205	250	203	158	312	743	195	28/250
	112 M										228	171	335	766		28/250
	132 S				314					300	266	196	413	887	237	38/300
	160 M				325					350	320	234	525	1010	247	42/350
	160 L										320	234	525	1010		42/350
	180 M										375	275	610	1095		48/350
50-160/61	100 L	80	50	187	283	130	130	230	220	250	203	158	312	785	195	28/250
	112 M										228	171	335	808		28/250
	132 S				326					300	266	196	413	929	237	38/300
	160 M				338					350	320	234	525	1053	247	42/350
	160 L										320	234	525	1053		42/350
	180 M										375	275	610	1138		48/350
50-200/61	100 L	80	50	187	273	134	152	240	225	250	203	158	312	775	195	28/250
	112 M										228	171	335	798		28/250
	132 S				316					300	266	196	413	919	237	38/300
	160 M				328					350	320	234	525	1043	247	42/350
	160 L										320	234	525	1043		42/350
	180 M										375	275	610	1128		48/350
	200 L				330					400	415	310	665	1185		55/400

Motor rated output in kW

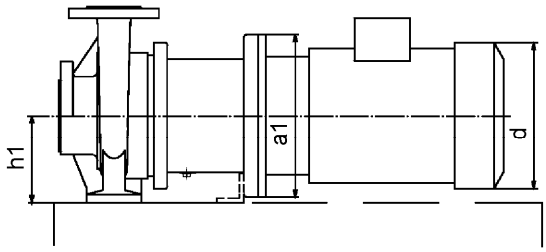
	100 L	112 M	132 S	160 M	160 L	180 M	200 L
n = 1450 1/min	2,2 3	4	5,5	11	15	18,5	30
n = 2900 1/min	3	4	5,5 7,5	11 15	18,5	22	30 37

Base plate and/or foundation design, series CMAT

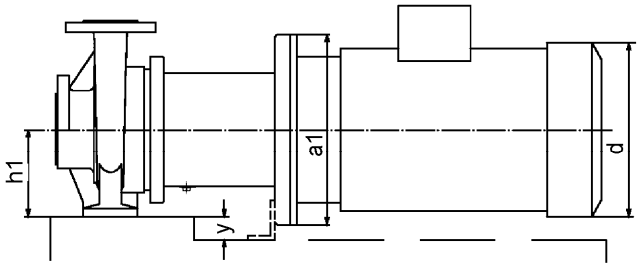
The motor dimensions as indicated are approximate values. Exact data depend on the motor make.

When using special motors, it must be noted that depending upon the enclosures, different performances are allocated to the individual sizes. The main dimensions are changes accordingly. In case of order, binding tables of motor dimensions must be transmitted to us.

$h1 > \frac{a1}{2}$ or $\frac{d}{2}$	Base plate and/or foundation design without support foot	$h1 \leq \frac{a1}{2}$ or $\frac{d}{2}$
y = 0	with support foot	y > 0

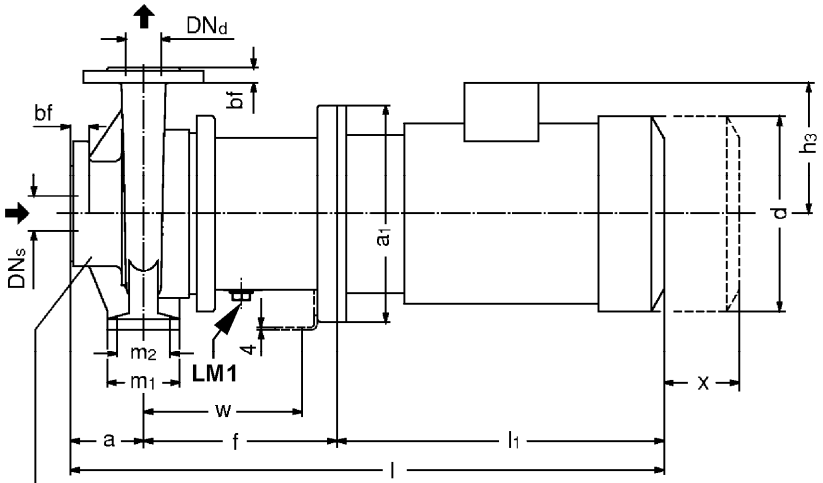


marking in table ●

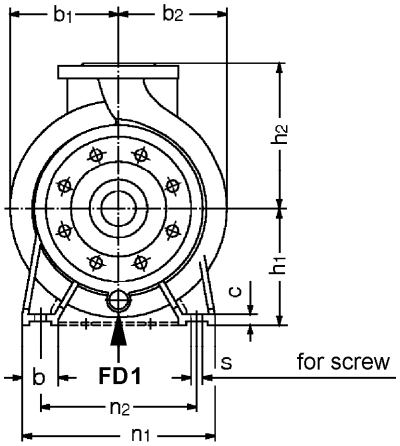


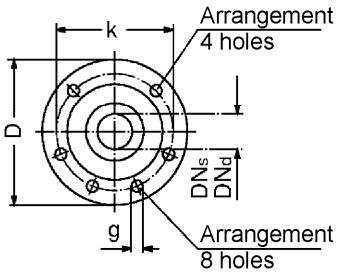
marking in table X

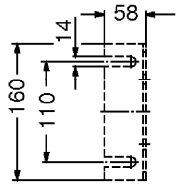
Unit dimensions, series CMAT



Casing design on suction side in size
25-160/01, 25-200/01, 32-160/01 und 32-200/01







Flange dimensions					
DNs DNd	D	bf	k	g	No. of holes
25	115	16	85	14	4
32	140	18	100	19	4
40	150	19	110	19	4
50	165	19	125	19	4
65	185	19	145	19	4
80	200	19	160	19	8

Connections		
DNs DNd	Drainage	Leak tightness monitoring
25-80	FD1	LM1
	G 1/2	G 1/4

Tolerances of joint dimensioins acc. to DIN EN 735.

Sence of rotation: clockwise as seen from the driving side.

Dimensions in mm
without commitment.

Unit dimensions, series CMAT

Dimmensions in mm without commitment.

Pump size	Motor size	Base plate ond/or foundation design see page 10	Support foot	Unit dimensions																								Allocation motor shaft/ drive shaft Contained in abbrevi-ation
				Pump dimensions									Foot dimensions								Motor dimensions approximate dim. different depending upon manufacturer					Extention dim.	
				Flanges																								
				DNs	DNd	a	f	b1	b2	h1	h2	b	c	m1	m2	n1	n2	w	y	s	a1	d	h3	l1	l	x	
25-160/61	100 L	•	①	40	25	80	279	135	135	132	160	50	15	100	70	240	190	280	28	M12	250	203	158	312	671	195	28/250
	112 M		①																			228	171	335	694		28/250
	132 S	×	①				322														300	266	196	413	815	237	38/300
25-200/61	100 L	•	①	40	25	80	268	135	140	160	180	50	15	100	70	240	190	270	-	M12	250	203	158	312	660	195	28/250
	112 M		①																			228	171	335	683		28/250
	132 S		②				311														300	266	196	413	804	237	38/300
	160 M	×	②				322												20		350	320	234	525	927	247	42/350
32-160/61	100 L	•	①	50	32	80	284	135	135	132	160	50	15	100	70	240	190	285	28	M12	250	203	158	312	676	195	28/250
	112 M		①																			228	171	335	699		28/250
	132 S	×	②				327														300	266	196	413	820	237	38/300
	160 M		②				339												48		350	320	234	525	944	247	42/350
32-200/61	100 L	•	①	50	32	80	268	135	145	160	180	50	15	100	70	240	190	270	-	M12	250	203	158	312	660	195	28/250
	112 M		①																			228	171	335	683		28/250
	132 S		②				325														300	266	196	413	804	237	38/300
	160 M	×	②				336												20		350	320	234	525	927	247	42/350
40-160/61	100 L	•	①	65	40	80	282	135	135	132	160	50	15	100	70	240	190	285	28	M12	250	203	158	312	674	195	28/250
	112 M		①																			228	171	335	697		28/250
	132 S	×	①				325														300	266	196	413	818	237	38/300
	160 M		②				336												48		350	320	234	525	941	247	42/350
40-200/61	100 L	•	①	65	40	100	271	135	150	160	180	50	15	100	70	265	212	270	-	M12	250	203	158	312	683	195	28/250
	112 M		①																			228	171	335	706		28/250
	132 S		②				314														300	266	196	413	827	237	38/300
	160 M		②																		350	320	234	525	950		42/350
	160 L	×	②				325												20			320	234	525	950	247	42/350
	180 M		②																			375	275	610	1035		48/350
50-160/61	100 L	•	①	80	50	100	283	135	135	160	180	50	15	100	70	265	212	285	-	M12	250	203	158	312	695	195	28/250
	112 M		①																			228	171	335	718		28/250
	132 S		②				326														300	266	196	413	839	237	38/300
	160 M		②																		350	320	234	525	963		42/350
	160 L	×	②				338												20			320	234	525	963	247	42/350
	180 M		②																			375	275	610	1048		48/350
50-200/61	100 L	•	①	80	50	100	273	139	157	160	200	50	15	100	70	265	212	275	-	M12	250	203	158	312	685	195	28/250
	112 M		①																			228	171	335	708		28/250
	132 S		②				316														300	266	196	413	829	237	38/300
	160 M	×	②																		350	320	234	525	953		42/350
	160 L		②				328												20			320	234	525	953	247	42/350
	180 M		②																			375	275	610	1038		48/350
	200 L		②				330												40		400	415	310	665	1095		55/400

① without support foot ② available with or without support foot depending upon the speed (see selection programme for magnetic drives)

Other pump-motor combinations are documented in our selection programme ALL2CAD.

Motor rated output in kW

	100 L	112 M	132 S	160 M	160 L	180 M	200 L
n = 1450 1/min	2,2 3	4	5,5	11	15	18,5	30
n = 2900 1/min	3	4	5,5 7,5	11 15	18,5	22	30 37

Subject to technical alterations.

ALLWEILER
A Colfax Business Unit

ALLWEILER AG
Postfach 1140 · 78301 Radolfzell
Allweilerstr. 1 · 78315 Radolfzell
Germany
Tel. +49 (0)7732 86-0
Fax. + 49 (0)7732 86-436
E-mail: service@allweiler.de
Internet: http://www.allweiler.com

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