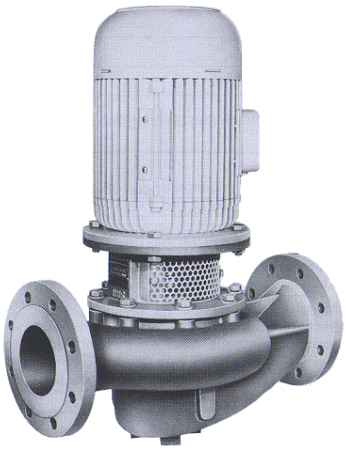
Volute Pumps

SIHI*SuperNova*

ZLIC 040160 . . . 150200

TECHNICAL DATA

Output:	max. 280 m³/h
Head:	max. 60 m
Speed:	max. 3600 rpm
Material:	grey cast iron: 0B, 0C
	stainless steel: 4B
Temperature:	mat. design: 0B, 0C, 4B max. 120 °C
Casing pressure:	PN 16 / PN 10 [1)]
Shaft seal:	standard mechanical seal
Flange connections:	DIN 2501 PN 16
Sense of rotation:	clockwise, when looking at the pump from the drive end



APPLICATION

Volute pumps of the series ZLIC in inline design have been constructed as space saving and easy to install pumping units with standard motor. The pumps are used when clear resp. turbid liquids without any solid particles have to be pumped without problem.
The combination of:

- performance and connection size according to DIN 24255 /EN 733 and additional size DN 25
- construction type: INLINE design with standard motor
- material: grey cast iron, stainless steel
- casing: inline or volute casing (see list ZLK)

was leading to widely spread application fields like

- steel, machine and automobile construction
- food and semi-luxuries industry
- chemical and petrochemical industry
- pharmaceutical industry
- lacquer industry
- plastics and rubber industry
- iron and non-ferrous metal industry
- paper and pulp-industry
- textile industry

DESIGN

Single-stage resp. two-stage pumping units in compact design with nominal performances according to DIN 24255 / EN 733 as well as additional size DN 25, where suction and discharge branch are arranged opposite to direct installment into the pipework.

There is no common shaft for motor and pump. The motors used are of the standard type listed.

Thanks to the process design it is possible to withdraw the whole insert unit without removing the casing of the pump from pipework.

By means of the unit construction system of the additional size DN 25 the single-stage and the two-stage design have the same dimensions. The performance of the pump is optimally adapted to the service point by mounting and dismounting of a stage.

The individual shafts of the unit connected by a plug-in coupling facilitate the dismantling or the replacement of the motor without affecting the pump.

The programme comprises. 15 pump sizes at present.

[1)] For size 150200 only

CONSTRUCTION

Casing pressure:

Material design

4B	max. 16 bar from -40 °C to 120 °C
0B, 0C	max. 16 bar from -30 °C to 120 °C

Please note:
Technical rules and safety regulations.
Casing pressure = inlet pressure plus delivery head + zero flow

Flanges location:

Suction and discharge flange radially arranged opposite to each other.

Flanges:

The flanges correspond to DIN 2533 PN 16. Flange drilled ANSI 150 lbs. on request.

Hydraulic:

First hydraulic. Designation of this construction type: A▪
Second hydraulic. Designation of this construction type: B▪

Bearing:

Two grease-lubricated antifriction bearings according to DIN 625 in the motor, one antifriction bearing grease-lubricated for service-life according to DIN 625 arranged in the bearing bracket. Designation of this construction type: ▪K, ▪V

Sense of rotation:

Clockwise when looking at the pump from the drive end.

Shaft sealing:

The shaft sealing is a single mechanical seal, flushed from internal source, uncooled and unbalanced.

Designation AAE:	cast chrome / carbon, O-rings Perbunan temperature range: -40 °C to 120 °C
Designation BH3:	SiC / carbon, elastomer EP temperature range: -20 °C to 120 °C
Designation BHS:	SiC / SiC, elastomer Viton temperature range: -20 °C to 120 °C

Material design

Item	Components	Material						Execution		
		EN material-number	EN material-denomination	DIN material-number	DIN material-denomination	US denomination		0B	0C	4B
						ASTM Standard	AISI			
10.10	Volute casing	EN-JL 1040	EN-GJL 250	0.6025	GG 25	A 278 Class 30		X	X	
16.10	Casing cover	1.4408	GX5CrNiMo19-11-2	1.4408	GX6CrNiMo18 10	A 351 CF8M	316			X
34.00	Bearing bracket	EN-JL 1040	EN-GJL 250	0.6025	GG 25	A 278 Class 30		X	X	X
21.00	Shaft	1.4021	X20 Cr13	1.4021	X20 Cr13	A 276 Type 420	420	X	X	
		1.4401	X5CrNiMo18 10	1.4401	X5CrNiMo18 10	A 167 Gr316	316			X
23.00	Impeller	EN-JL 1040	EN-GJL 250	0.6025	GG 25	A 278 Class 30		X		
		2.1050	CC480K	2.1050	G-CuSn10	B 427 C91600			X	
		1.4408	GX5CrNiMo19-11-2	1.4408	GX6CrNiMo18 10	A 351 CF8M	316			X
43.30	Shaft seal	X22CrNi17 / Carbon - Perbunan						X	X	
	Mechanical seal [1]	SiC / SiC - Viton or SiC / carbon - EP						X	X	X

[1] O-rings of PTFE upon request;

Casing seal:

Material design 0B, 0C: The casing is sealed by a flat gasket of EWP 210. Designation of this construction type: 2
Material design 4B: The casing is sealed by a flat gasket of PTFE. Designation of this construction type: 4

Motor power:

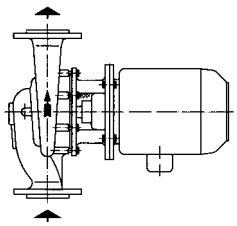
Using commercial electric motors, type of construction IM B5 resp. IM V 1
To determine the drive power we recommend the following safety margin:
up to 4 kW: 25 % 4 up to 7,5 kW: 20 % 7,5 up to 37 kW: 15 %
Please note: the max. motor power allowed for some construction sizes as shown in the individual characteristic curves.
The following speeds are to be observed:

Max. speed rpm	Size		Max. speed rpm	Size
3600	040160	040200	3000	
	050160	050200		
	065160	065200		
	080160	080200[2]		
	100160[2]			100200
				150200

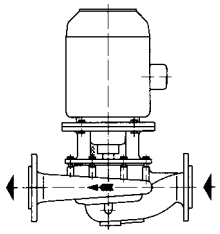
The max. speeds results from the admissible shaft load and from the permitted peripheral speed of the impellers.
[2] in material design 4B max. speed 3000 rpm

Positioning

ZLIC pumps can be mounted either horizontally or vertically into the pipe system with sufficient carrying capacity as follows, taking the drive power into consideration:



Horizontal installation up to 7,5 kW



Vertical installation up to 7,5 kW possible, from 11 kW on necessity.
The pump unit can be additionally supported for that. For this particular purpose a threaded bore hole is provided in the pump casing (see dimension table).

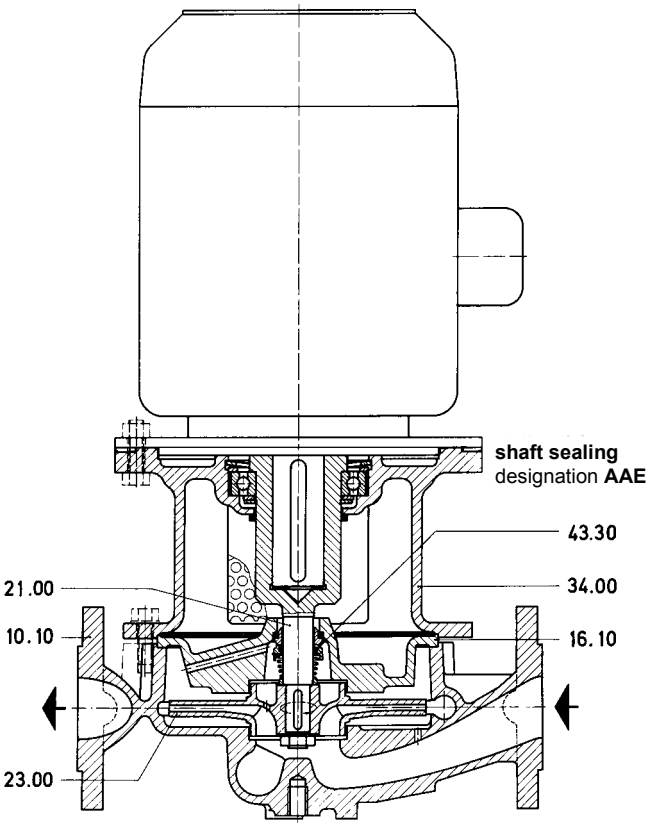
Please note

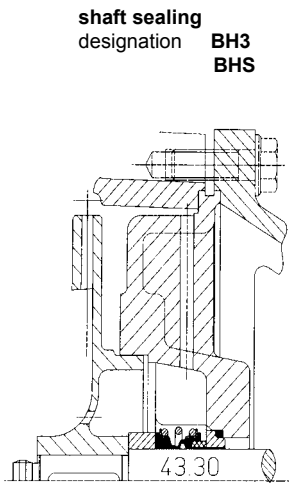
The installation of the motor below the pump is not allowed because of operation safety reasons.
The installation of compensators is not necessary. **Saving of costs**!

General comments

For units in compact design with the same installation set consisting of bearing bracket with bearing, stub shaft and mechanical seal, casing cover, impeller and impeller fastener, please refer to our series **ZLKD.** Technical documentation about these programmes will be readily supplied on request.

Sectional drawing and nomenclature

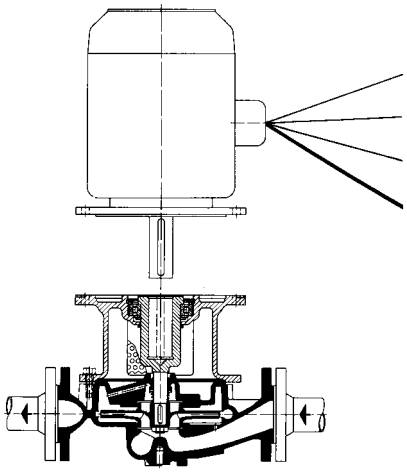




10.10	volute casing	21.00	shaft
16.10	casing cover	34.00	bearing bracket
43.30	mechanical seal	23.00	impeller

Standard set of components / bearing bracket - plug coupling / standard motor* / space requirement

By supplementing the standard set of components consisting of pump casing, casing cover, impeller and mechanical seal by a special bearing bracket (DBP) results an inline pumps which is easy to combine. The bearing bracket removes the standard motor from the load of hydraulic forces and allows suitable motor combinations at the complete mounted pumping unit.



motor combinations

+ type IM B 5 or IM V 1

+ type of enclosure IP 54 to eII (Ex)

+ speed 50 and 60 Hz

= motor at your choice

+ shaft sealed pumping unit

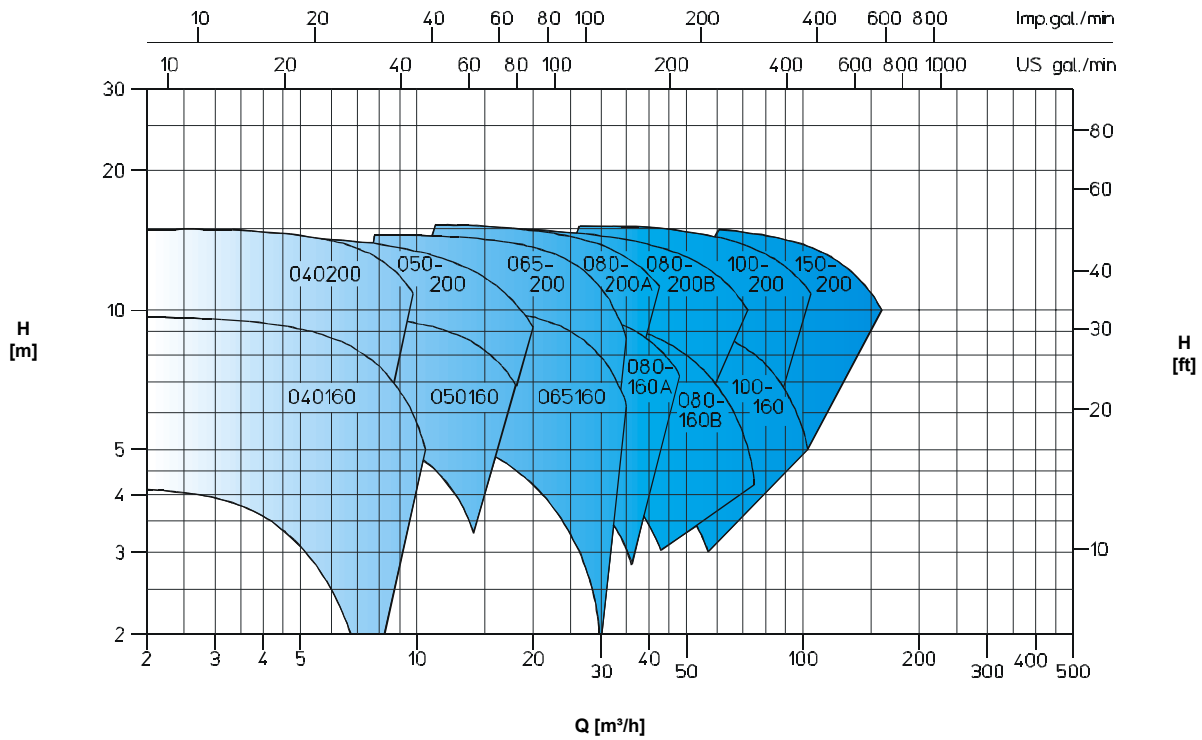
= readiness for operation

* shaft end to DIN 748 part 3
key to DIN 6885 sheet 1

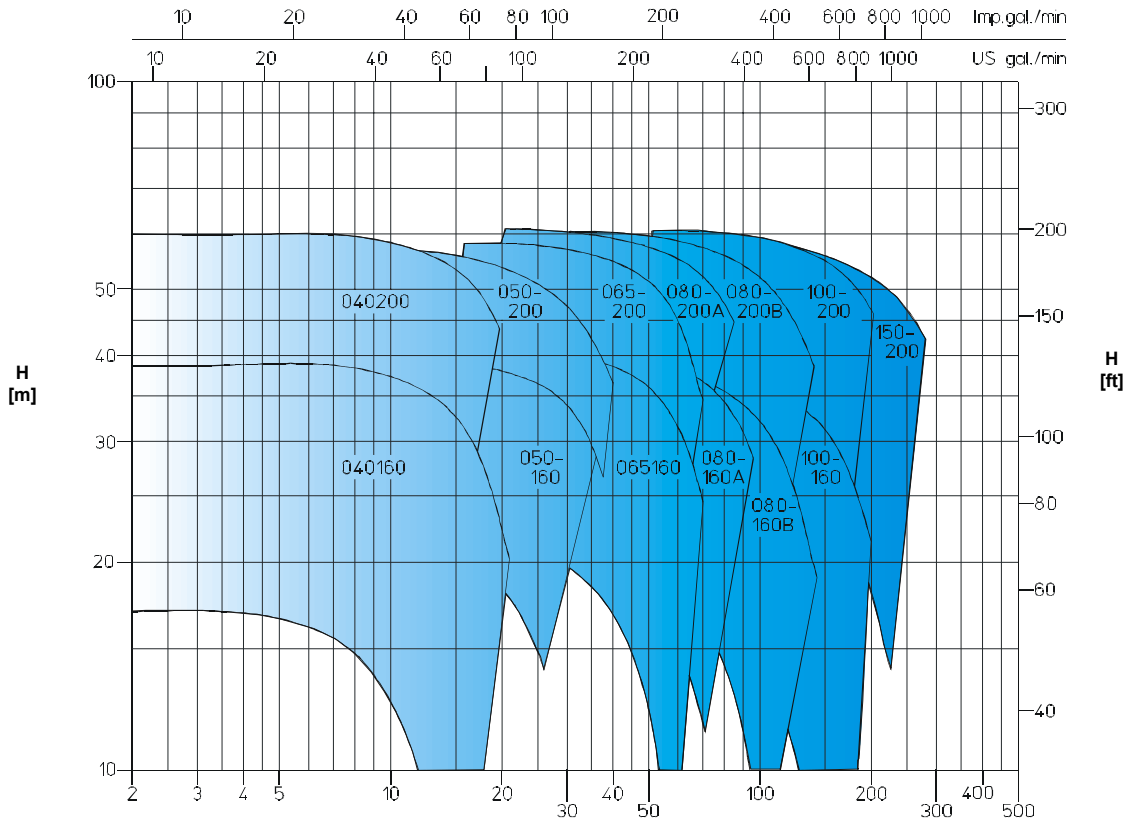
If necessary the motor can be changed in the unit without draining, the pipework. The pump unit remains as „**shaft tight armature**“ in the pipe work and so the readiness for operation is increased.

Performance graph

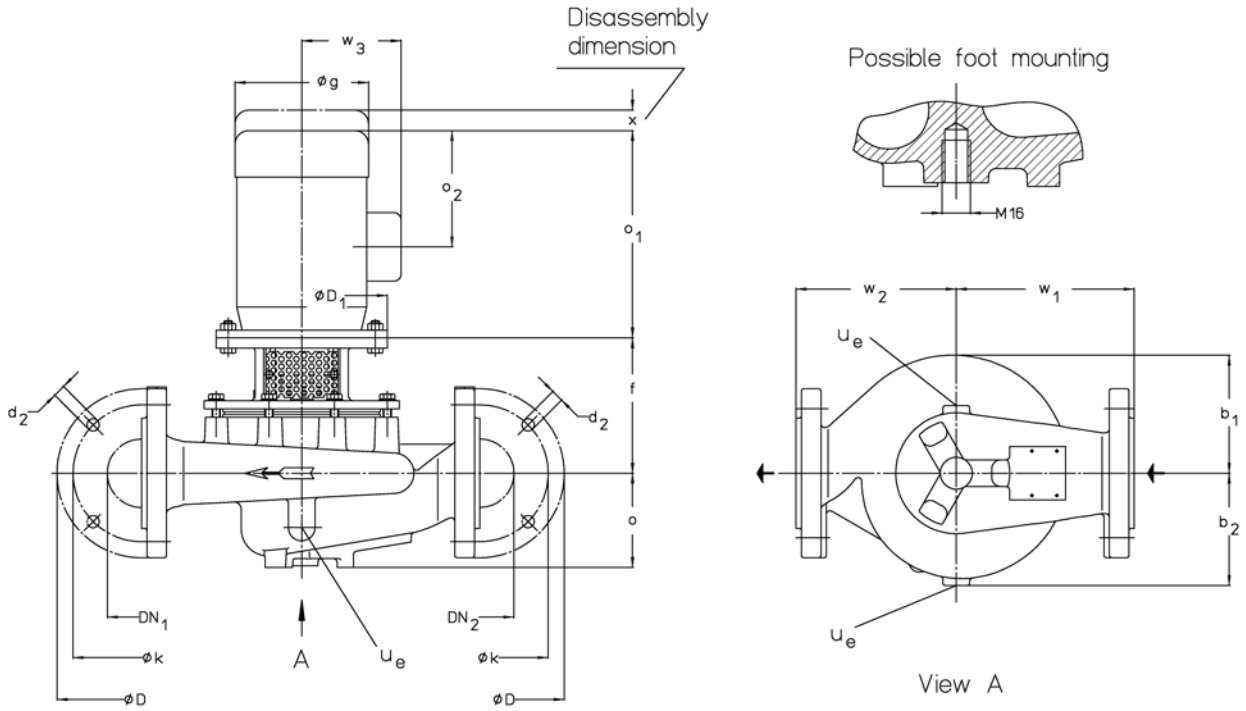
n = 1450 rpm



n = 2900 rpm



Dimension table



u_e = connection for drainage G 3/8

n = 1450 rpm

Size	Motor Size	Motor kW	$DN_{1,2}$	b_1	b_2	D_1	f	g*	o	o_1*	o_2*	w_3*	w_1	w_2	x	Weight abt. kg Pump 0B,0C	Weight abt. kg Pump 4B	Weight abt. kg Motor
040160	80	0,55	40	113	114	200	167	175	90	253	178	133	180	160	80	36	37	10
040200	80	0,55		133	127								200	180		43	47	10
	80	0,75																11
	90 S	1,1						190		298	220	140						15
050160	80	0,55	50	121	119			175		253	178	133	190	160		40	42	10
	80	0,75																11
050200	80	0,75		138	138								200	180		44	47	11
	90 S	1,1						190		298	220	140						15
	90 L	1,5																17
065160	80	0,75	65	132	127			175	106	253	178	133				42	48	11
	90 S	1,1						190		298	220	140						15
065200	90 S	1,1		147	143								215	200		48	52	15
	90 L	1,5																17
	100 L	2,2				250		210		325	229	170						24
080160 A	80	0,75	80	139	120	200		175	150	253	178	133	240			40	46	11
	90 S	1,1						190		298	220	140						15
	90 L	1,5																17
080200 A	90 L	1,5		150	136				136				255	225		45	49	17
	100 L	2,2				250		210		325	229	170						24
	100 L	3,0																28
080160 B	90 S	1,1		148	137	200		190	120	298	220	140	240	200		50	53	15
	90 L	1,5																17
	100 L	2,2				250	162	210		325	229	170						24
080200 B	90 L	1,5		165	155	200		190		298	220	140	255	225	100	51	54	17
	100 L	2,2				250	167	210		325	229	170						24
	100 L	3,0																28
100160	90 L	1,5	100		145	200		190	150	298	220	140	275			52	61	17
	100 L	2,2				250	162	210		325	229	170						24
	100 L	3,0																28
100200	100 L	3,0		180	162		183							250		63	68	
	112 M	4,0						236		350	248	180						36
	132 S	5,5				300	226	275		435	327	195						49
150200	112 M	4,0	150	203	173	250	183	236	188	350	248	180	350	280	120	78	84	36
	132 S	5,5				300	226	275		435	327	195						49
	132 M	7,5																58

n = 2900 rpm

Size	Motor Size	Motor kW	$DN_{1,2}$	b_1	b_2	D_1	f	g*	o	o_1*	o_2*	w_3*	w_1	w_2	x	Weight abt. kg Pump 0B,0C	Weight abt. kg Pump 4B	Weight abt. kg Motor
040160	90 L	2,2	40	113	114	200	167	190	82	298	220	140	180	160	80	36	37	18
	100 L	3,0				250	162	210		325	229	170						24
	112 M	4,0						236		350	248	180						41
040200	112 M	4,0		133	127		167		90				200	180		43	47	
	132 S	5,5				300	210	275		435	327	195						56
	132 S	7,5																59
050160	100 L	3,0	50	121	119	250	162	210		325	229	170	190	160		40	42	24
	112 M	4,0						236		350	248	180						41
	132 S	5,5				300	210	275		435	327	195						56
050200	132 S	5,5		138	138								200	180		44	47	
	132 S	7,5																59
	160 M	11,0				350	210	335		545	400	250						110
065160	112 M	4,0	65	132	127	250		236	106	350	248	180				42	48	41
	132 S	5,5				300		275		435	327	195						56
	132 S	7,5																59
	160 M	11,0				350		335		545	400	250						110
065200	132 S	7,5		147	143	300		275		435	327	195	215	200		48	52	59
	160 M	11,0				350		335		545	400	250						110
	160 M	15,0																112
080160 A	132 S	5,5	80	139	120	300		275	150	435	327	195	240			40	46	56
	132 S	7,5																59
	160 M	11,0				350		335		545	400	250						110
080200 A	160 M	11,0		150	136				136				255	225		45	49	
	160 M	15,0																112
	160 L	18,5																135
080160 B	132 S	7,5		148	137	300		275	120	435	327	195	240	200		50	53	59
	160 M	11,0				350		335		545	400	250						110
	160 M	15,0																112
080200 B	160 M	15,0		165	155								255	225	100	51	54	
	160 L	18,5																135
	180 M	22,0						380		600	450	275						155
	200 L	30,0				400		415		673	488	300						250
100160	160 M	11,0	100		145	350		335	150	545	400	250	275			52	61	110
	160 M	15,0																112
	160 L	18,5																135
100200	160 L	18,5		180	162		226							250		63	68	
	180 M	22,0						380		600	450	275						155
	200 L	30,0				400		415		673	488	300						250
150200	180 M	22,0	150	203	173	350		380	188	600	450	275	350	280	120	78	84	155
	200 L	30,0				400		415		673	488	300						250
	200 L	37,0																260

Flange connections to DIN 2501 PN 16						
$DN_{1,2}$	40	50	65	80	100	150
k	110	125	145	160	180	240
D	150	165	185	200	220	285
d_2 x number	18 x 4	18 x 4	18 x 4	18 x 8	18 x 8	23 x 8

Standard motors as per DIN 42677.
Truth of rotation, centricity and right angle of shaft ends and mounting flanges to DIN 42955, normal precision.

* Motors protection type IP 55
Dimensions depend on the motor make

Data regarding pump size

Type	Pump size	Hydraulic + Bearing	Shaft sealing	Material design		Casing seal
		A ▪ First hydraulic B ▪ Second hydraulic ▪ K, V Two grease-lubricated antifriction bearings in the motor. One grease-lubricated antifriction bearing in the bearing bracket.	AAE: Standard mechanical seal, O-rings Perbunan BH3: Unbalanced mechanical seal, SiC-Carbon, elastomer EPDM bellows. BHS: Unbalanced mechanical seal, SiC/SiC, elastomer Viton bellows.	0B: Main parts of cast iron GG25. 0C: Main parts of cast iron GG25, Bronze G-CuSn10 4B: Main parts of stainless steel 1.4408		2: Confined flat gasket of EWP 210. 4: Confined flat gasket of PTFE.
			AAE, BH3, BHS	0B 2	0C 2	--
			BH3, BHS	--	--	4B 4
ZLIC	040160	AV		●	●	●
	040200			●	●	●
	050160			●	●	●
	050200			●	●	●
ZLIB	065160			●	●	●
	065200			●	●	●
ZLIC	080160			●	●	●
	080200			●	●	●
	080160	BV		●	●	●
	080200			●	●	●
	100160	AV		●	●	●
	100200	AK		●	●	●
	150200			●	●	●

Applicable motors please take from the dimension table

Motor selection table					
n = 2900 rpm			n = 1450 rpm		
kW	Size	Designation	kW	Size	Designation
0.75	80	FA	0.55	80	FB
1,1	80	GA	0,75	80	GB
1,5	90 S	HA	1,1	90 S	HB
2,2	90 L	JA	1,5	90 L	JB
3,0	100 L	KA	2,2	100 L	KB
4,0	112 M	MA	3,0	100 L	LB
5,5	132 S	NA	4,0	112 M	MB
7,5	132 S	OA	5,5	132 S	NB
11,0	160 M	SA	7,5	132 M	PB
15,0	160 M	TA	---	---	---
18,5	160 L	UA			
22,0	180 M	VA			
30,0	200 L	XA			
37,0	200 L	YA			

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