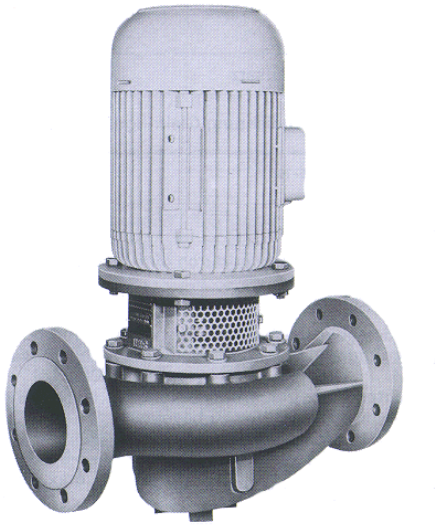
Volute pumps
for hot water

ZLI 25-125 . . . 80-200

TECHNICAL DATA

output:	max. 140 m³/h
delivery head:	max. 60 m
speed:	max. 3600 1/min
material:	spheroidal graphite iron
temperature:	max. 150 °C
casing pressure:	PN 25
shaft seal:	standard mechanical seal
flange connection:	DIN 2501 PN 25
sense of rotation:	clockwise when seen from drive on the pump



APPLICATION

Volute pumps of the series ZLI belong to the programm of heat carrier circulation pumps. These pumps in inline design have been constructed as space saving and easy to install pumping units with standard motor.
They will be mainly used for circulating hot water in closed pipe systems and vessel systems.
The field of applications are

- production of energy
- heat transfer
- and other industries

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 each other for direct installation into the pipe work.
There is no common shaft for motor and pump. The motors used are standard motors.
Due to the process design it is possible to withdraw the whole insert unit without detaching the pump casing from the pipe work.
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 or dismounting 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.
At present the programm comprises 10 construction sizes.

BAUAUSFÜHRUNG

Casing pressure:

Material design max. 24 bar from 140 °C up to 150 °C.

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

Position of branches:

Suction and discharge branch radially arranged opposite to each other.

Flanges:

The flanges correspond to DIN 2534/PN 25. Flange design drilled as per ANSI 300 is possible.

Hydraulic:

First hydraulic.	Code of this construction: R▪
Second hydraulic.	Code of this construction: S▪

Bearing:

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

Sense of rotation:

Clockwise when seen from drive on the pump.

Shaft sealing:

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

Code AAE:	sliding material SiC/carbon for hot water without abrasive admixtures. Temperature range up to 150 °C

Material design

ITEAM	PARTS	MATERIAL DESIGN	
		1B	1B*
10.10	volute casing	spheroidal graphite iron	spheroidal graphite iron
16.10	casing cover		G-X 6 Cr Ni Mo 18 10
23.00	impeller	GG 25	X 6 Cr Ni Mo 18 10
10.91 17.11	intermediate plate	-	deep drawn stainless steel plates X 10 Cr Ni Mo Ti 18 10
21.00	shaft	X 20 Cr 13	
34.00	bearing bracket	GG 25	
43.30	shaft sealing mechanical seal	SiC / carbon, EP-caoutchouc	

*) only for ZLI 25-125 and 25-160

Casing seal:

The casing sealing will be made by a special paper. Denomination of this construction: 2

Drive / Speed:

By commercial electric motors, types IM B 35 resp. IM V 15 for n = 2900 rpm, n = 1450 rpm from size 180 M
IM B 5 resp. IM V 1 for n = 1450 rpm up to size 160 L.

For the determination of drive power we recommend the following additional power:
up to 4 kW: 25 % 4 to 7,5 kW: 20 % 7,5 to 37 kW: 15 %

Please note: the max. admissible motor power of some construction sizes are shown in the individual characteristic curves.

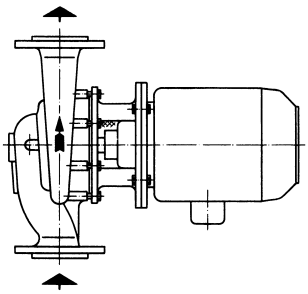
The following speeds are to be observed:

size		max. speed rpm
25-125		3600
25-160		
40-160	40-200	
50-160	50-200	
80-160	85-200[2)]	

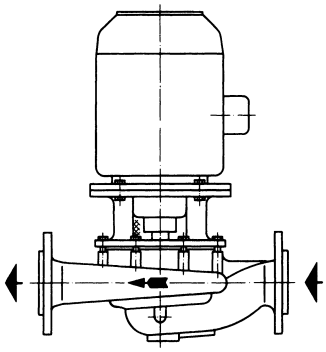
The max. speeds results from the admissible shaft load and from the admissible peripheral speed of the impellers.

Positioning

ZLI-pumps can be mounted either horizontally or vertically into the pip system with sufficient carrying as follows, taking the drive power into consideration::



Horizonta installation up to 7,5 kW



Vertical installation up to 7,5 kW possible, from 11 kW on necessary. The pump unit can be additional supported for this purpose. A threaded bore hole is provided for that in the pump casing (cf. Dimension table)

Please note

The installation of the motor below the pump is not allowed due to operating safety reasons.
The installation of compensators is not neseccary.

General comments

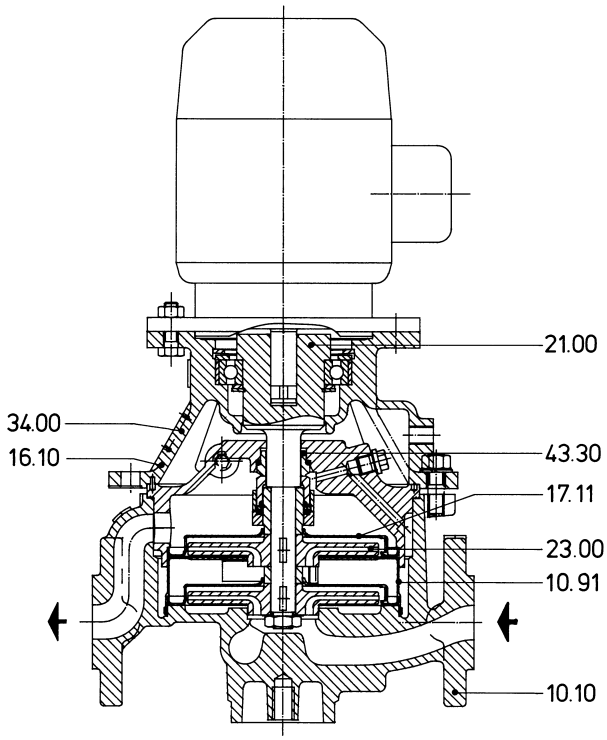
For the equipment of heat transfer plants, which are running with hot water, a programm for the range up to 1200 m³/h is available, e.g. volute pumps:

series **ZEN** as per DIN 24256 / EN 22858 with uncooled mechanical seal up to 230 °C

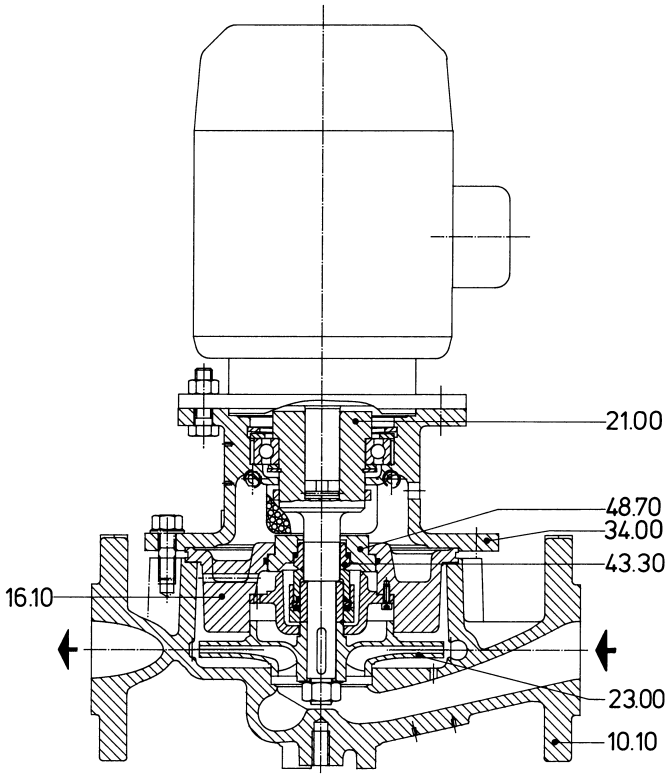
series **ZDN/ZHN** as per DIN 24256 / EN 25828 or DIN 24255 / EN 733 with uncooled mechanical seal up to 180 °C 0r 185 °C

Sectional drawing and nomenclature

ZLI 25-125
ZLI 25-160



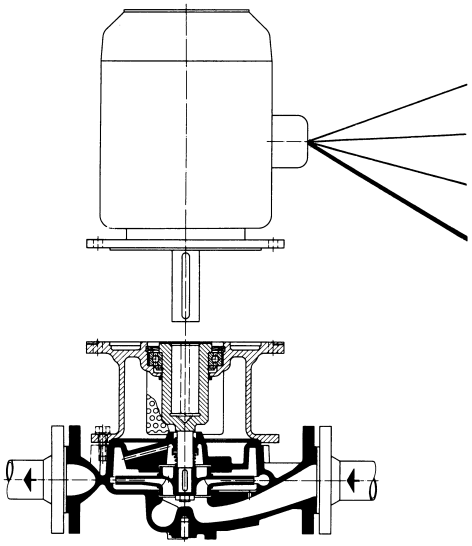
ZLI 40-160 ...
ZLI 80-200



10.10	volute casing	21.00	shaft
16.10	casing cover	34.00	bearing bracket
10.91 + 17.11	intermediate plate	43.30	mechanical seal
23.00	impeller	48.70	stationary seal ring support

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

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



Motor combination

+ type IM B 5 or IM V 1

+ type of protection IP 54 up to eII (Ex)

+ speed at 50 and 60 cycles

= motor at your choice

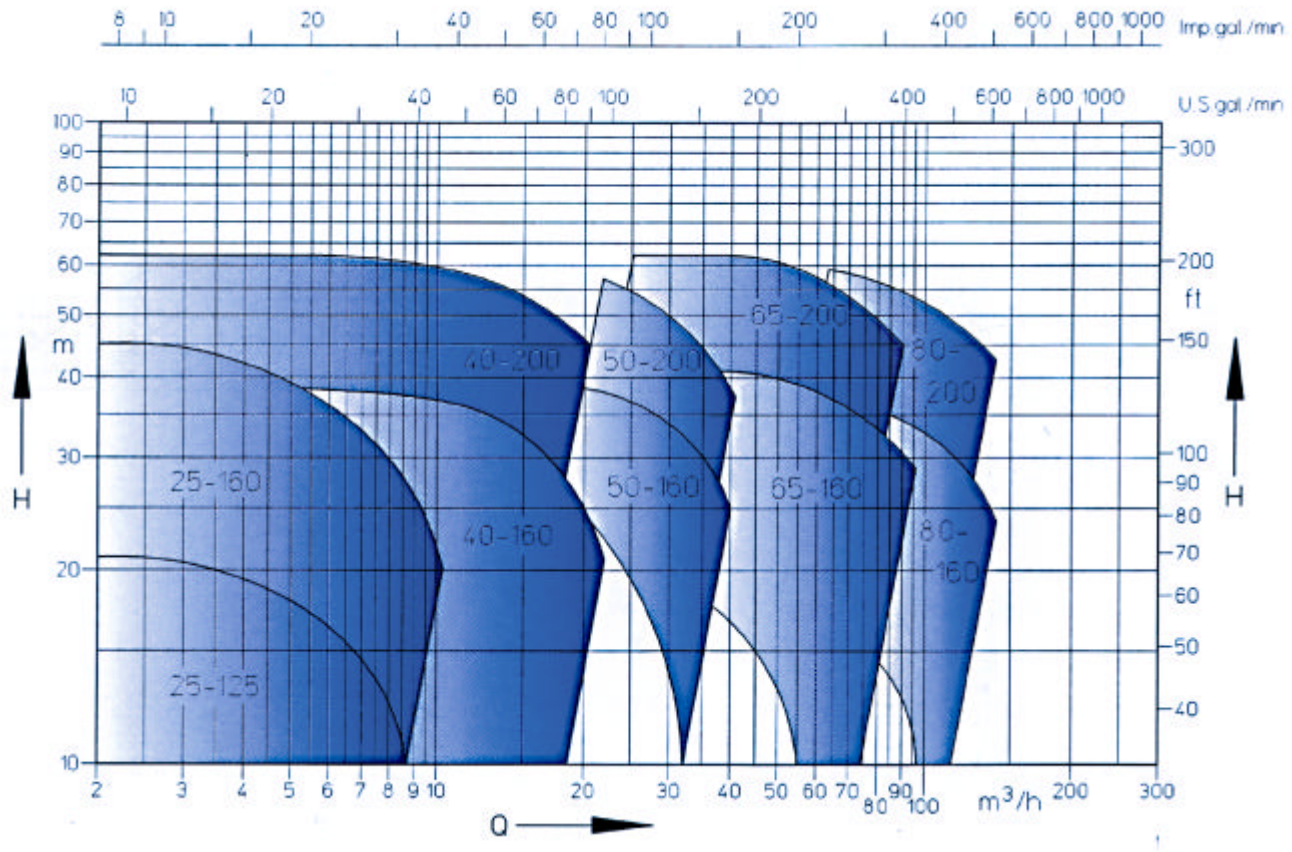
+ shaft sealing pump unit

= readiness for operation

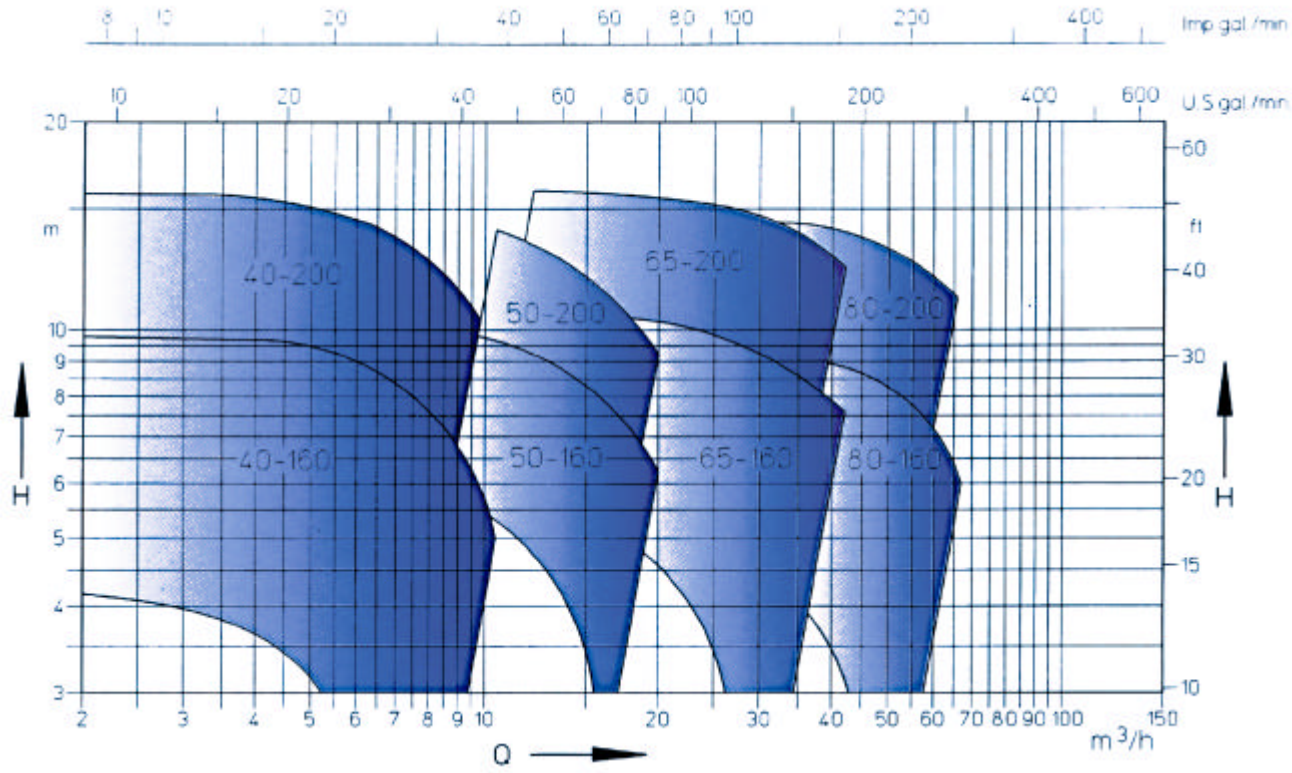
* shaft end according to DIN 748 T 3
key according to DIN 6885 T 1

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

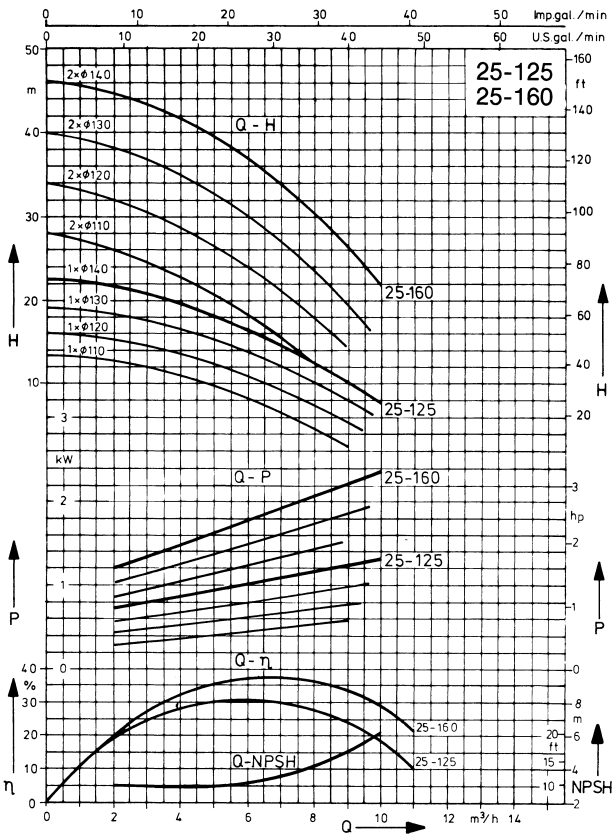
Performance graph **n = 2900 rpm**

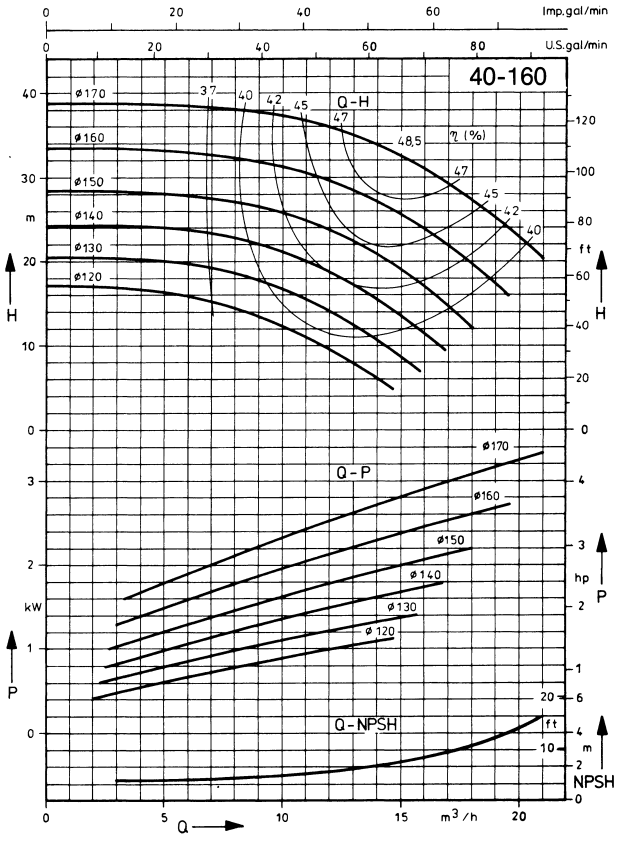


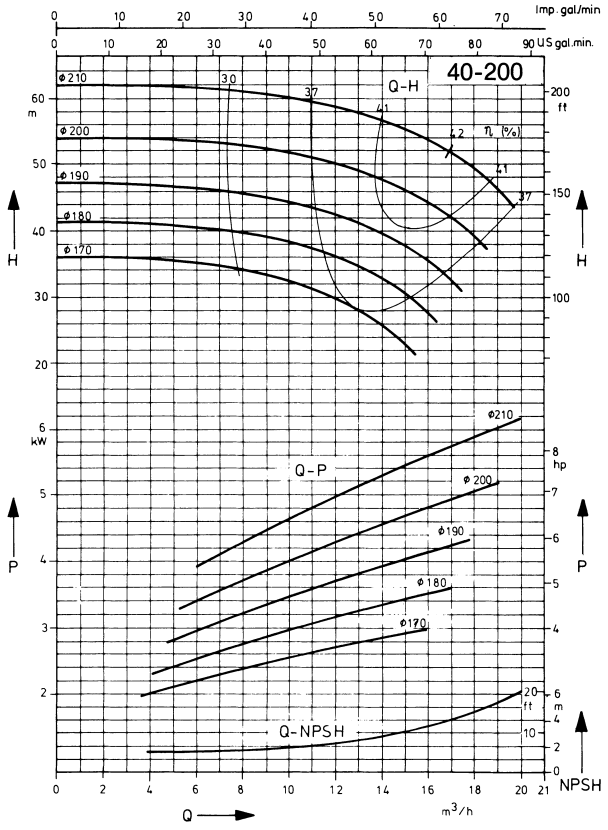
Performance graph **n = 1450 rpm**

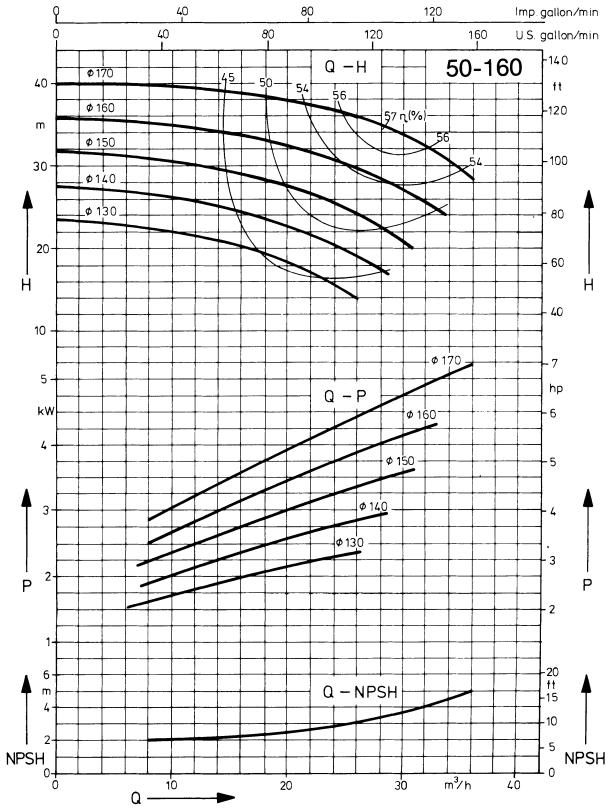


Characteristic curves **n = 2900 rpm**

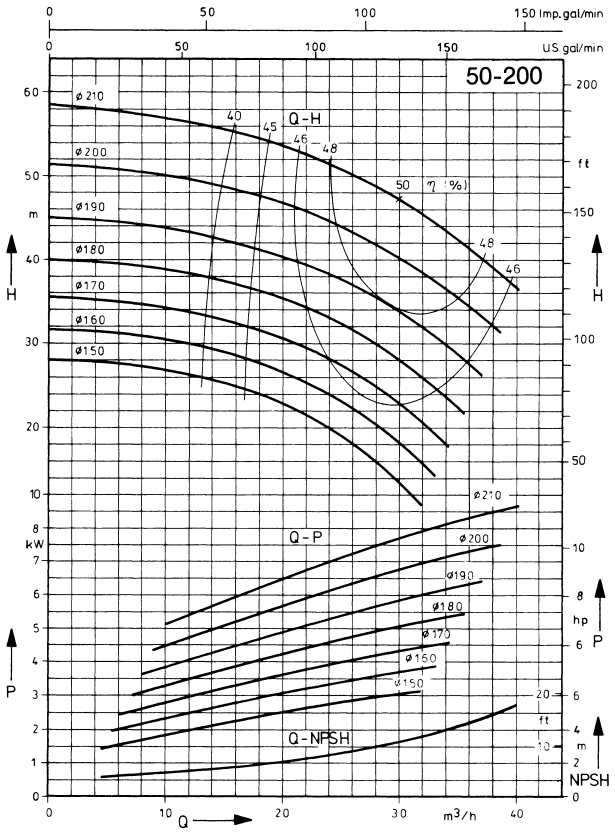


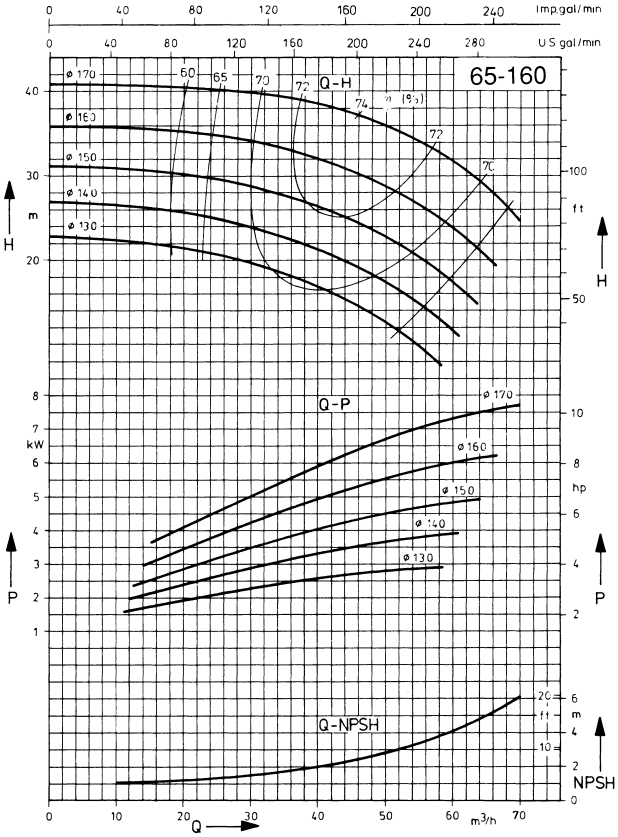


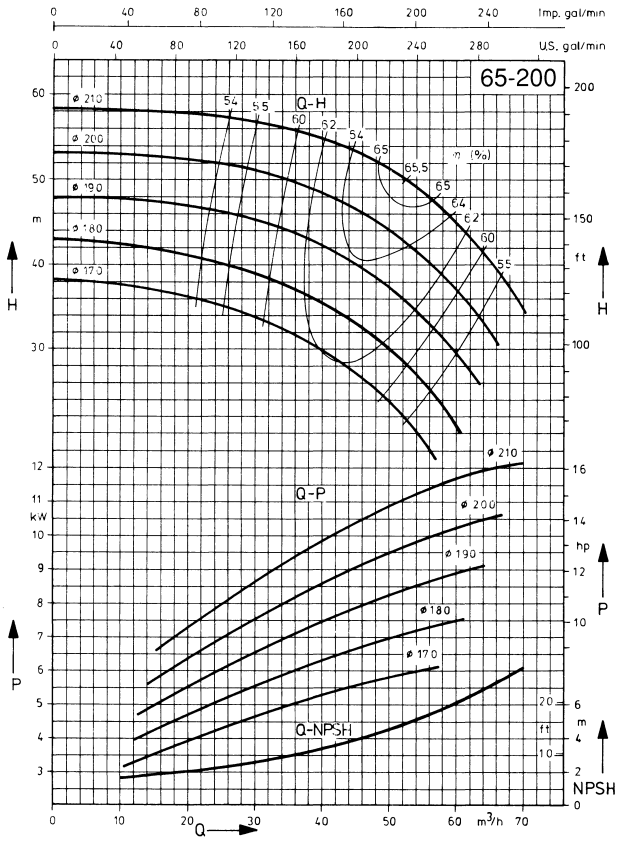


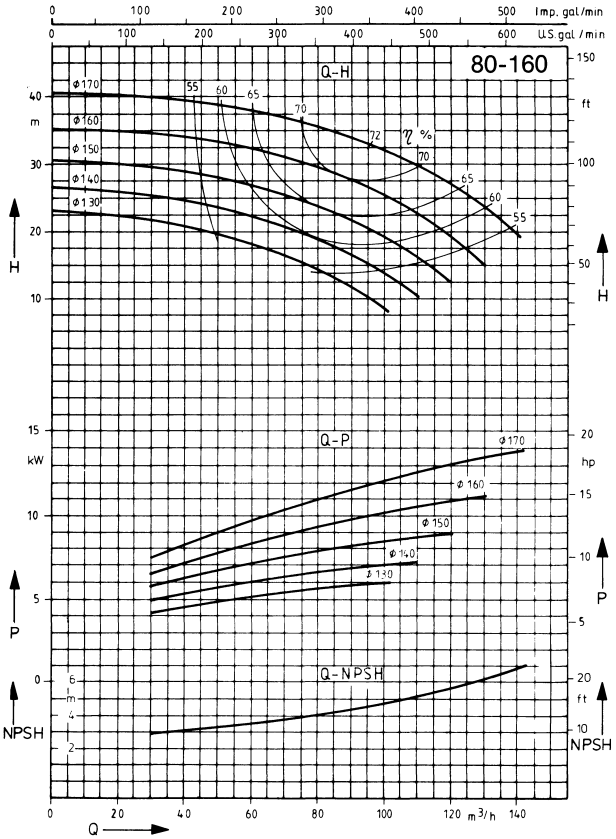


Characteristic curves **n = 2900 rpm**

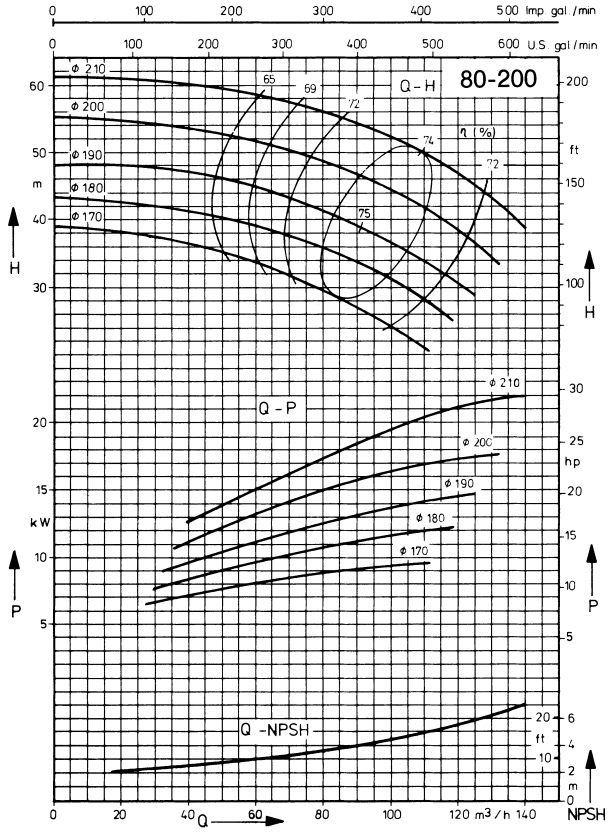




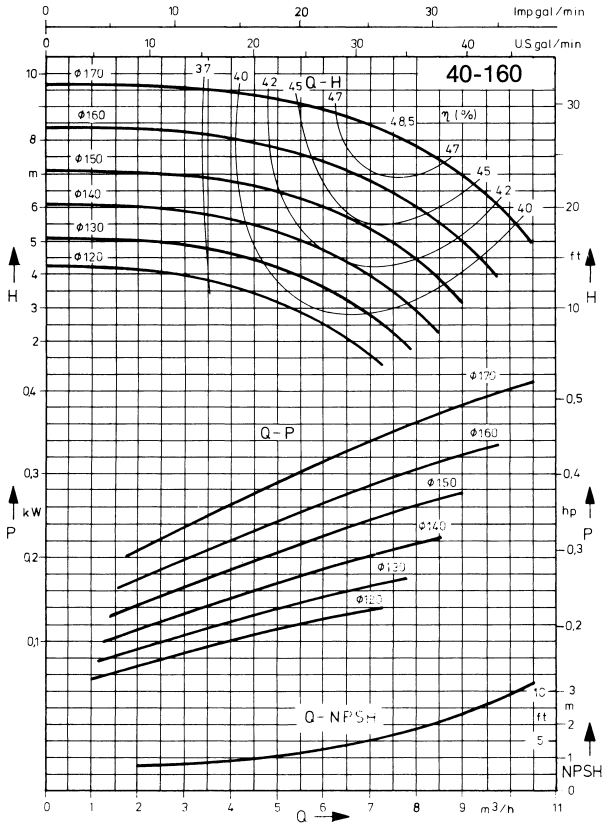


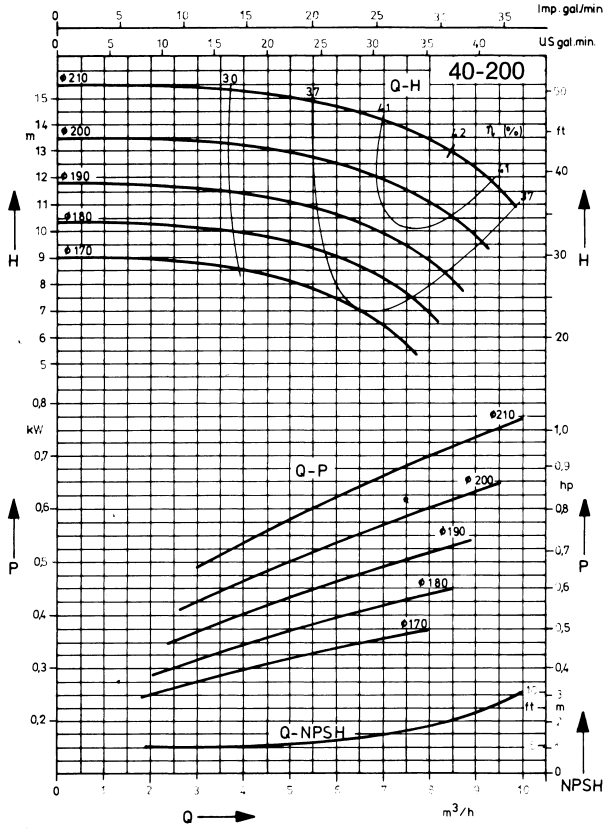


Characteristic curves **n = 2900 rpm**

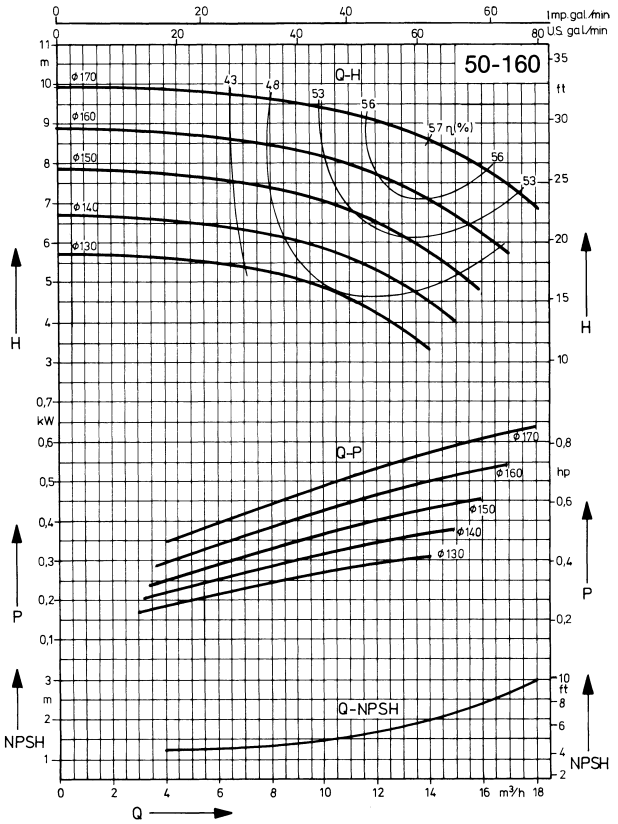


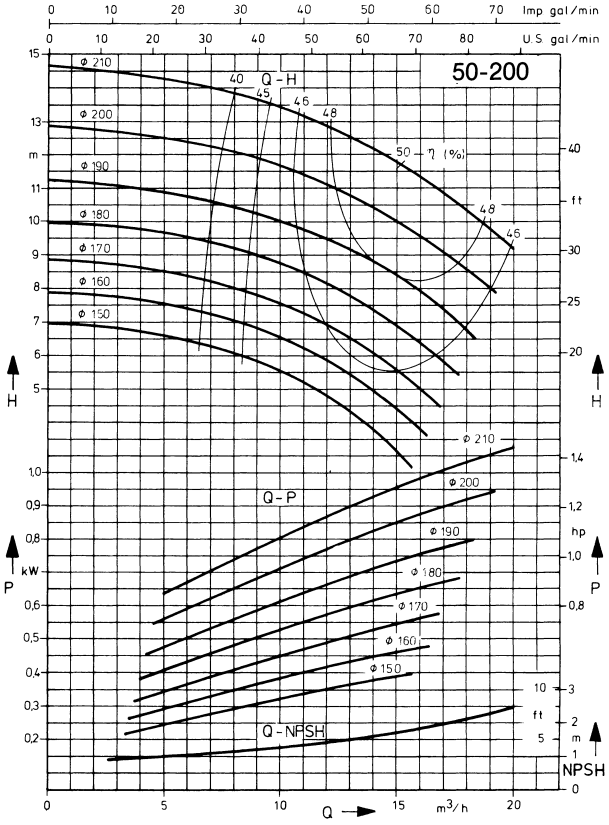
Characteristic curves **n = 1450 rpm**

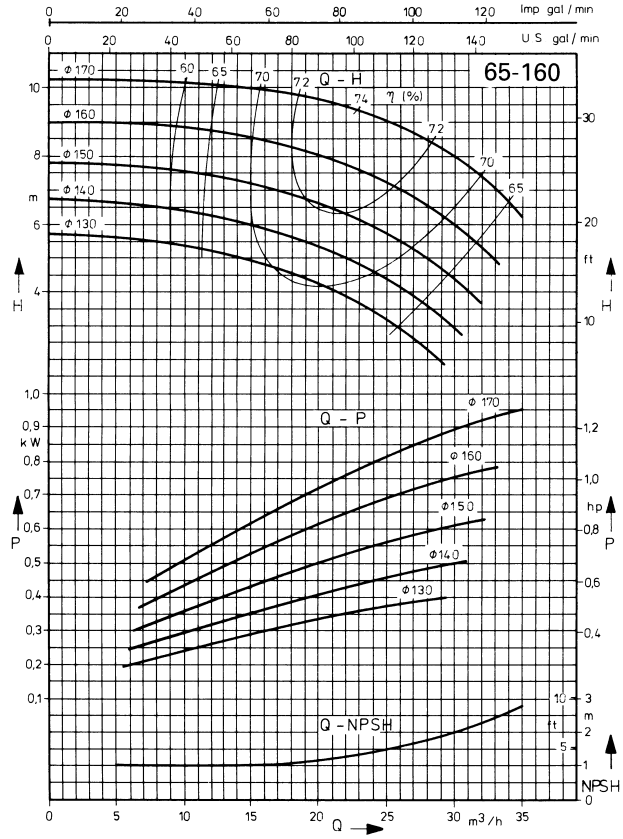


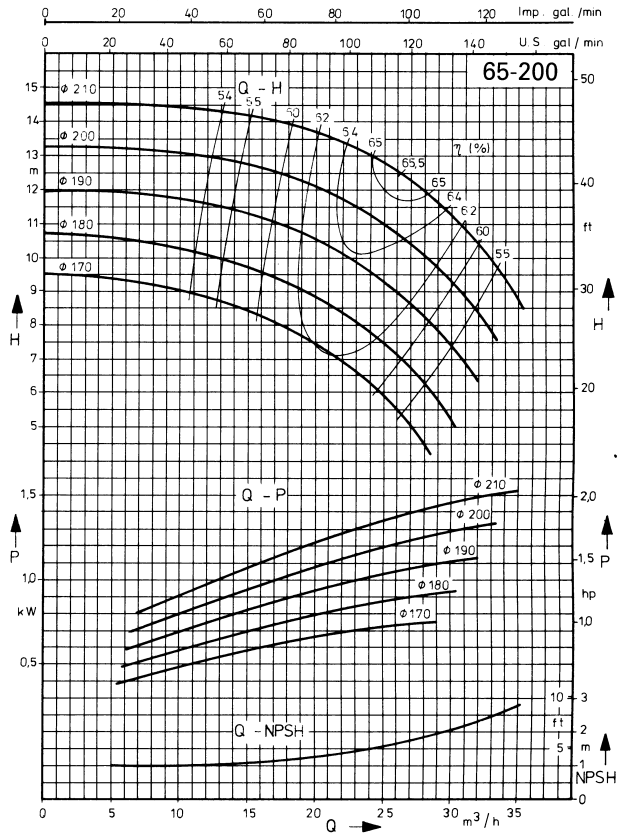


Characteristic curves **n = 1450 rpm**

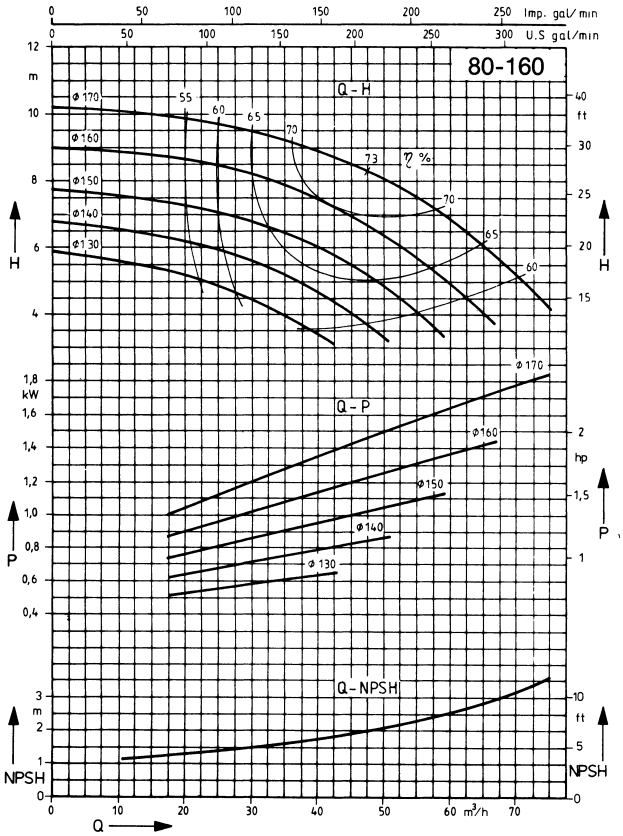


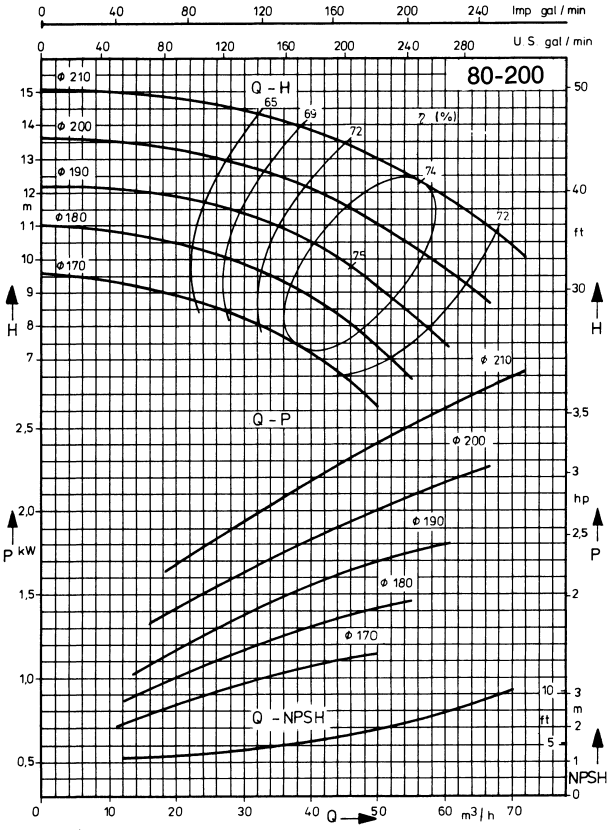






Characteristic curves **n = 1450 rpm**



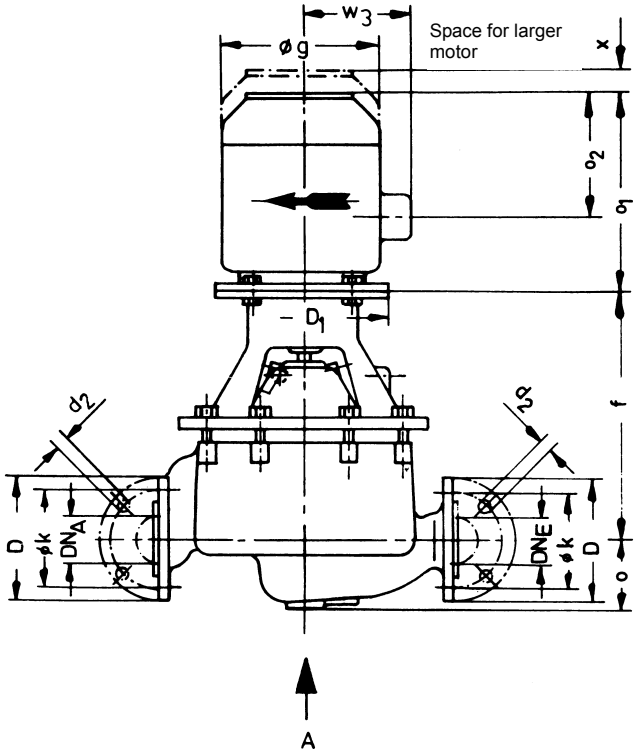


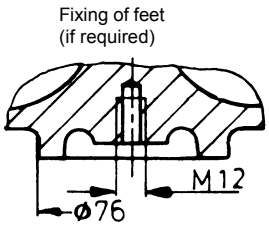
The NPSH-value has been determined in close circuit. As safety addition for the pressure corresponding to NPSH are to be considered 0.5 m for the plant.

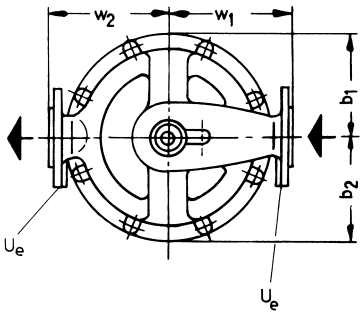
Values are valid for water ρ = 1 kg/l

Dimension table **n = 2900 rpm**

ZLI 25-125 / 25-160

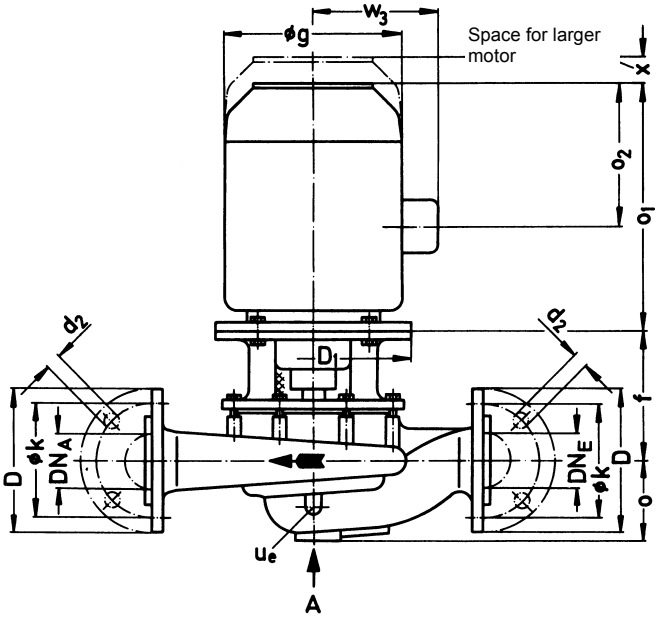


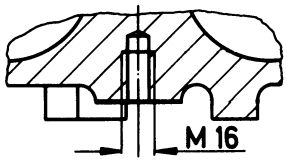


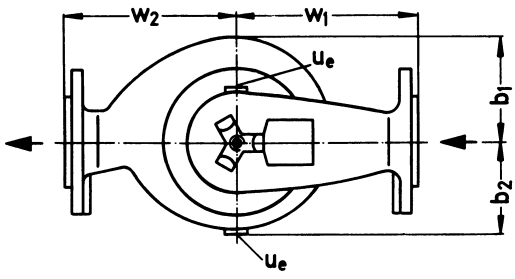


u_e = connection for drainage G 1/4

ZLI 40-165 ... 80-200







u_e = connection for drainage G 1/4

Dimension table

n = 2900 rpm

size	motor		$DN_{A,E}$	b_1	b_2	D_1	f	g*	o	o_1*	o_2*	w_3*	w_1	w_2	x	weight app. kg	
	size	kW														pump	motor
25-125	80 b	1,1	25	128	128	200	212	157	73	228	128	123	140	140	120	27	10
	90 S	1,5						186		249	143	125					14
25-160	90 L	2,2								274	147						18
	100 L	3,0						206		323	234	133					24
40-160	90 L	2,0	40	115	115	200	167	186	83	274	185	125	180	160	80	31	18
	100 L	3,0				250	162	206		323	234	133					24
	112 M	4,0						220			183	186					41
40-200	112 M	4,0		138	138				90				200	180		42	41
	132 S1	5,5				300	210	260		386	227	213					56
	132 S2	7,5															59
50-160	100 L	3,0	50	120	120	250	162	206		323	234	133	190	160		36	24
	112 M	4,0						220			183	186					41
	132 S1	5,5				300	210	260		386	227	213					56
50-200	132 S1	5,5		138	138	300		260		386	227	213	200	180		44	56
	132 S2	7,5															59
	160 M1	11,0				350		310		521	308	245					110
65-160	112 M	4,0	65	140	127	250		220	106	323	183	186				43	41
	132 S1	5,5				300		260		386	227	213					56
	132 S2	7,5															59
65-200	132 S2	7,5			145								215	200		47	59
	160 M1	11,0						360		521	308	245					110
	160 M2	15,0				350											112
80-160	132 S2	7,5	80	148	135	300		260	120	386	227	213	240			49	59
	160 M1	11,0				350		310		521	308	245					110
	160 M2	15,0															112
80-200	160 M2	15,5		165	155								255	225	100	51	112
	160 L	18,5								565	330						135
	180 M	22,0						341		592	350	280					155
	200 L1	30,0,				400		392		690	404	302					250

Dimension table

n = 1450 1/min

size	motor		$DN_{A,E}$	b_1	b_2	D_1	f	g*	o	o_1*	o_2*	w_3*	w_1	w_2	x	weight app. kg	
	size	kW														pump	motor
40-160	80 a	0,55	40	115	115	200	167	157	82	204	108	126	180	160	80	31	9
40-200	80a	0,55	40	138	138			186	90				200	180		42	9
	80 b	0,75								219	115						10
	90 S	1,1								249	161	125					14
50-160	80 a	0,55	50	120	120			157		204	108	126	190	160		36	9
	80 b	0,75									115						10
50-200	80 b	0,75	50	138	138					219			200	180		44	10
	90 S	1,1						186		249	161	125					14
	90 L	1,5								274	185						18
65-160	80 b	0,75	80	138	125			157	150	219	115	139	240	200		43	10
	90 S	1,1								274	185	125					14
65-200	90 S	1,1	80	150	143			186		249	161		255	225		51	14
	90 L	1,5								274	185						18
	100 L1	2,2				250		206		323	234	133					24
80-160	90 S	1,1	80	148	135	200		186	120	249	161	125	240	200		50	14
	90 L	1,5								274	185						18
	100 L1	2,2				250	162	206		323	234	133					24
80-200	90 L	1,5	80	165	155	200	167	186		274	185	125	255	225	100	51	18
	100 L1	2,2				250		206		323	234	133					24
	100 L2	3,0											275				25

Flange connection to DIN 2501 PN 25				
$DN_{A,E}$	25	40	50	80
k	85	110	125	160
D	115	150	165	200
d_2 x number	14 x 4	18 x 4	18 x 4	18 x 8

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

* motor protection IP 54
dimension depend on the motor make.

Angaben zur Baugröße - Bestellhinweise

series + size		hydraulic + bearing	shaft sealing	material design	casing seal
		R ▪ hydraulic A S ▪ hydraulic B ▪ K two grease-lubricated antifriction bearings in the motor, one grease-lubricated antifriction bearing in the bearing braccket	BH3 standrad mechanical seal SiC/carbon, EP-caoutchouc	1B main parts of sph. graphite iron 1B** main parts of sph. graphite iron casing cover and impeller of stainless steel	2 flat seal
ZLI	25-125 25-160	RK	BG3	1 B	2
	40-160 40-200				
	50-160 50-200				
	65-160 65-200				
	80-160 80-200	SK			
	100-160* 100-200*	RK			
	150-200*				

Applicable motors please take from the dimension table on page 10 and 11.

*) in preparation

**) only ZLI 25-125 and 25-160

motor selection table					
n = 2900 rpm			n = 1450 rpm		
kW	size	code	kW	size	code
0,75	80 a	FA	0,55	80 a	FB
1,1	80 b	GA	0,75	80 b	GB
1,5	90 S	HA	1,1	90 S	HB
2,2	90 L	JA	1,5	90 L	JB
3,0	100 L1	KA	2,2	100 L1	KB
4,0	112 M	MA	3,0	100 L2	LB
5,5	132 S1	NA	4,0	112 M	MB
7,5	132 S2	OA	5,5	132 S	NB
11,0	160 M1	SA	7,5	132 M	PB
15,0	160 M2	TA			
18,5	160 L	UA			
22,0	180 M	VA			
30,0	200 L1	XA			
37,0	200 L1	YA			

Example of ordering:

The size ZLI 50-200 RK BG3 1B 2 with 3-phase-AC-motor of 7.5 kW (50 Hz, 380 V Δ) 2900 rpm
has got the complete no. : **ZLI ▪ 50-200 RK BG3 1B 2 OA**

If you need the type od construction IM V 1 (vertical installation), please inform us accordinglybesonderer Hinweis.

On delivery the point (▪) in the fourth place of the type designation will be replaced by a letter in the factory.

Any changes in the interest of the technical development are reserved.

Sterling SIHI GmbH
Lindenstraße 170, D-25524 Itzehoe, Germany, Telephone +49 (0)48 21 / 7 71 - 01, Telefax +49 (0) 48 21 / 7 71-274