

Volute Pumps

for heat carrier oils up to bis 350 °C

ZTI 40-160 . . . 100-160

DISTRIBUTEUR :



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TECHNICAL DATA

Output:	max. 200 m ³ /h
Delivery head:	max. 60 m
Speed:	max. 3600 rpm
Temperature:	max. 350 °C
Casing pressure:	PN 16
Shaft sealing:	mechanical seal, radial shaft seal ring
Flange connections:	DIN 2501 PN 16
Sence of rotation:	clockwise, when seen from drive on the pump



APPLICATION

Volute pumps of the series ZTI in inline design have been developed as space saving and easy-to-install pumping units, especially for the circulation of mineral and synthetic heat carriers in

primary
secondary and
tertiary

circuits.

In compact design they are also applicable successfully in heat transfer plants as main circulation pumps; for reasons of their constructional features they offer the plant manufacturer absolutely new possibilities for his plant conception.

DESIGN

Single-stage pump units in compact design with nominal performances as per DIN 24255 / EN 733. Suction and discharge orifices are arranged in line with each other for direct installation in the pipe work.

Electric motor and pump do not have a common shaft; standard motors as per list are applied.

The back pull out construction permits the dismounting of the complete pull-out unit without removing the pump casing out of the pipe work. The separate pump shaft and motor shaft connected by a plug-in coupling make possible to dismount resp. replace the motor without touching the pump.

The DIN 4754 specifications are complied with.

At present, the programme comprises 9 pump sizes.

CONSTRUCTION

Casing pressure:

Max. 16 bar from 0 °C to 120 °C
Max. 13 bar from 120 °C to 300 °C
Max. 10 bar from 300 °C to 350 °C
Intermediate values can be interpolated

Please note:

Technical rules and safety regulations.
Casing pressure = inlet pressure + zero delivery head
Permissible inlet pressure (system pressure) 5 bar.
Permissible inlet pressure = permissible casing pressure at shaft sealing CDC

Position of branches:

Suction and discharge orifice arranged radially in line.

Flanges:

The flanges correspond to DIN 2533/PN 16. Flange design drilled as per ANSI 150 is possible

Hydraulic:

Code of this construction: A

Bearing:

A groove ball bearing acc. to DIN 625, grease lubricated for service life, a liquid surrounded step bearing in the pump.
Code of this construction: A

Sense of rotation:

Clockwise when seen from drive on the pump.

Shaft sealing:

Code 002: several radial shaft seal rings arranged in series, uncooled
temperature range: 0 °C to 350 °C
Code CDC: unbalanced mechanical seal
temperature range: 0 °C to 350 °C

Material design:

Item	COMPONENT PARTS	MATERIAL DESIGN 1B
10.10	volute casing	GGG 40.3
16.10	casing cover	
21.00	shaft	X 20 Cr 13
23.00	impeller	GG 25
34.00	bearing bracket	
42.13	shaft seal radial shaft seal ring 002	viton
43.30		mechanical seal CDC
44.10, 44.11	casing shaft seal	CK 45
54.51	bush	carbon

Casing seal:

The casing is sealed by a flat type seal of special paper. Code of this construction: 2

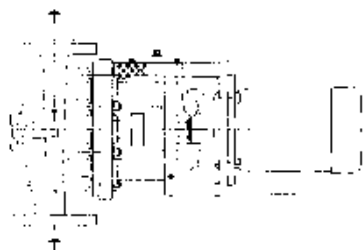
Drive / Speed:

By commercial electric motors, type IM B 5 resp. IM V 1.

The max. admissible speed $n = 3600$ rpm, out of pump size 100-160 (max. speed $n = 3000$ rpm).

Mounting position:

ZTI pumps can be mounted either horizontally or vertically into pipe systems with sufficient carrying capacity, with this the drive power has to be taken into consideration:



Horizontal installation up to 7,5 kW



Vertical installation up to 7,5 kW possible, from 11 kW necessary.
For this particular purpose a taphole is provided in the pump casing (see dimensions table).

Please note:

The installation of the motor below the pump is, for reasons of operating safety, not allowed.

The installation of compensators is **not** necessary. **Saving of costs!**

General comments:

For the equipment of heat carrier plants, a complete programme is available for a flow range between 1 - 1000 m³/h including the following additional series:

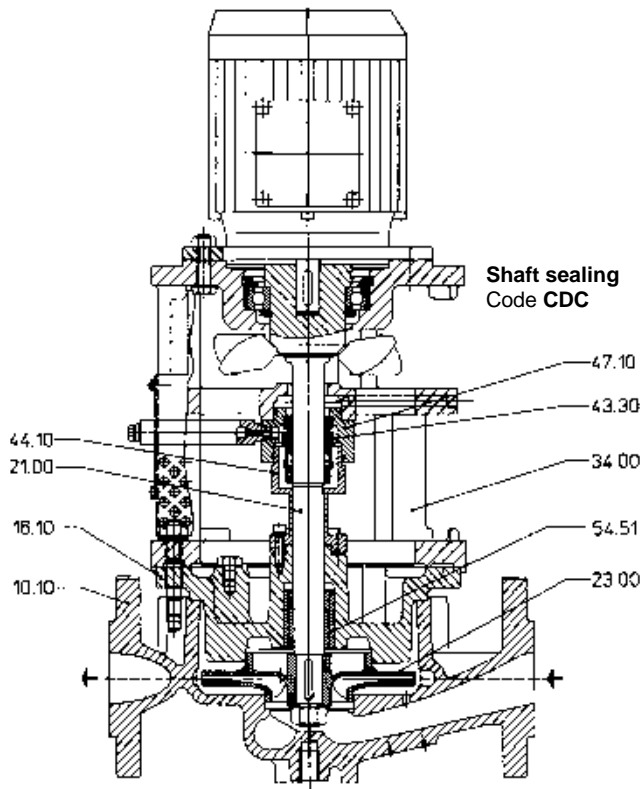
Series **ZTN** standard heat carrier pump; dimensions and nominal performances acc. to DIN 24255/EN 733, additionally pump sizes exceeding the standard

Series **ZTK** close coupled construction, magnetic coupling up to 400 °C

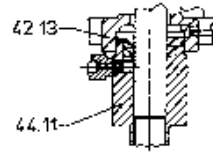
Series **AEH** self-priming special side channel pump, inline design

Technical documentation regarding these programmes will readily be supplied on request.

Sectional drawing and Nomenclature

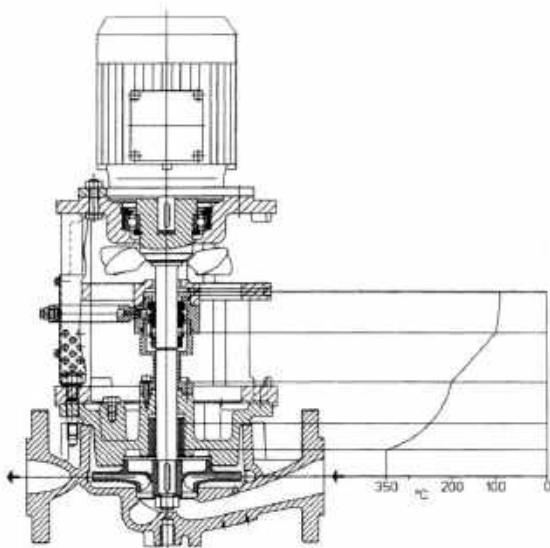


Shaft sealing
Code **002**



- | | |
|-------------|------------------------|
| 10.10 | Volute casing |
| 16.10 | casing cover |
| 21.00 | shaft |
| 23.00 | impeller |
| 34.00 | bearing bracket |
| 42.13 | radial shaft seal ring |
| 43.30 | mechanical seal |
| 44.10,44.11 | casing shaft seal |
| 54.51 | bush |

Heat blocking / shaft sealing / bearings

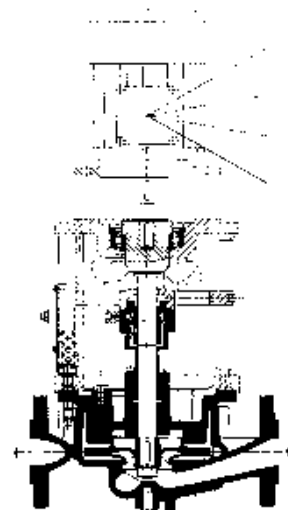


Motor combination

- + type IM B 5 or IM V 1
- + protection IP type up to e II (Ex)
- + speed 50 and 60 cycles
- = motor at your choice
- + shaft sealing pumping unit
- = readiness for operation

Heat transfer plants have reached a high state of technical development. Therefore pumps handling heat carriers are facing, with regard to safety of operation, environmental neutrality, maintenance facility, and operating costs, much severer requirements now than in former times. The type ZTI based on many years of experience and on the most up-to-date know-how, fully complies with these requirements.

By the heat blocking, behind the cover, with integrate throttling clearance a favourable temperature lowering towards the drive end is reached (see above figure). Heat losses of the product handled are effectively prevented (energy saving). The temperature lowering makes possible the safe use of a single, uncooled type of shaft sealing. As the lubricating qualities of heat carrier oils are not very good for antifriction bearings, at impeller side a liquid surrounded step bearing is installed. The external antifriction bearing in the bearing bracket is not in contact with the heat carrier and causes no problems. Noiseless operation and long durability are attained.

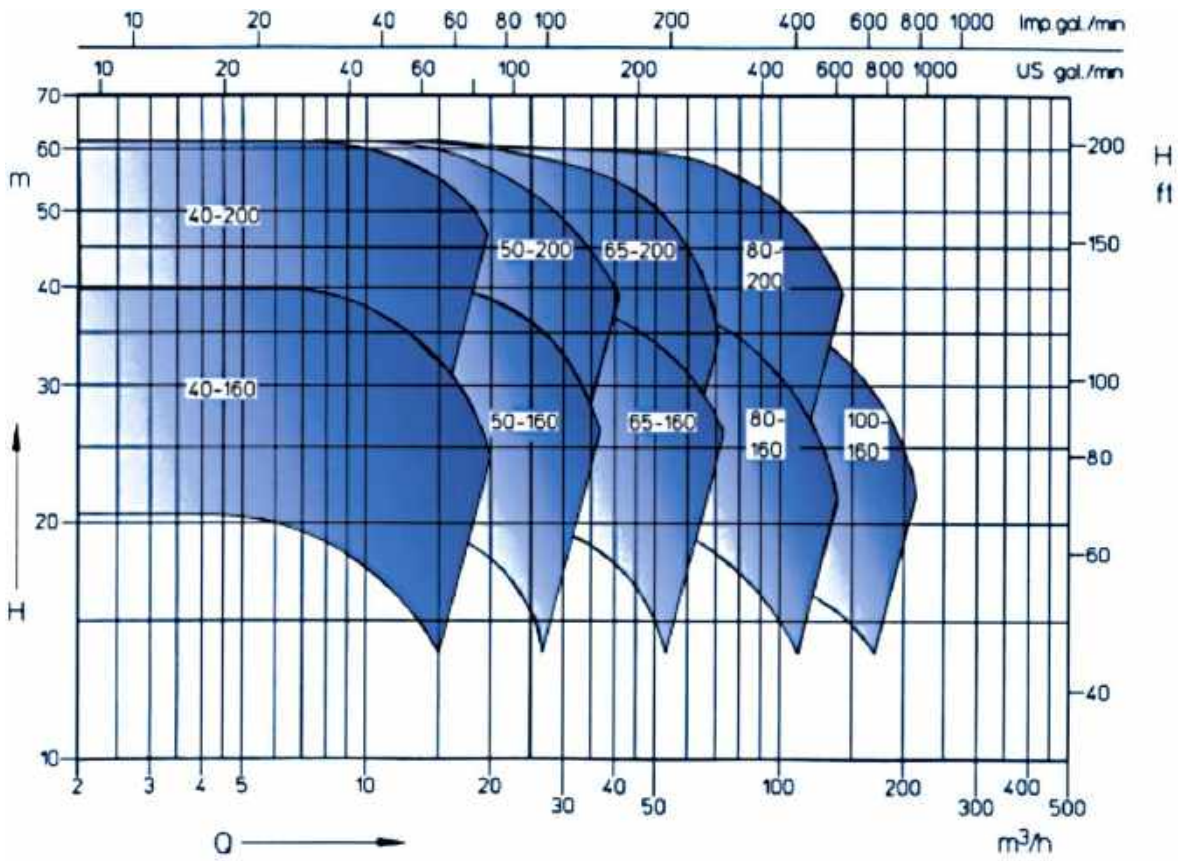


- | | |
|------------|---------------------|
| *shaft end | as per DIN 748 T 3 |
| key | as per DIN 6885 T 1 |
| flanges | as per DIN 42677 |

In case of necessity the motor can 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.

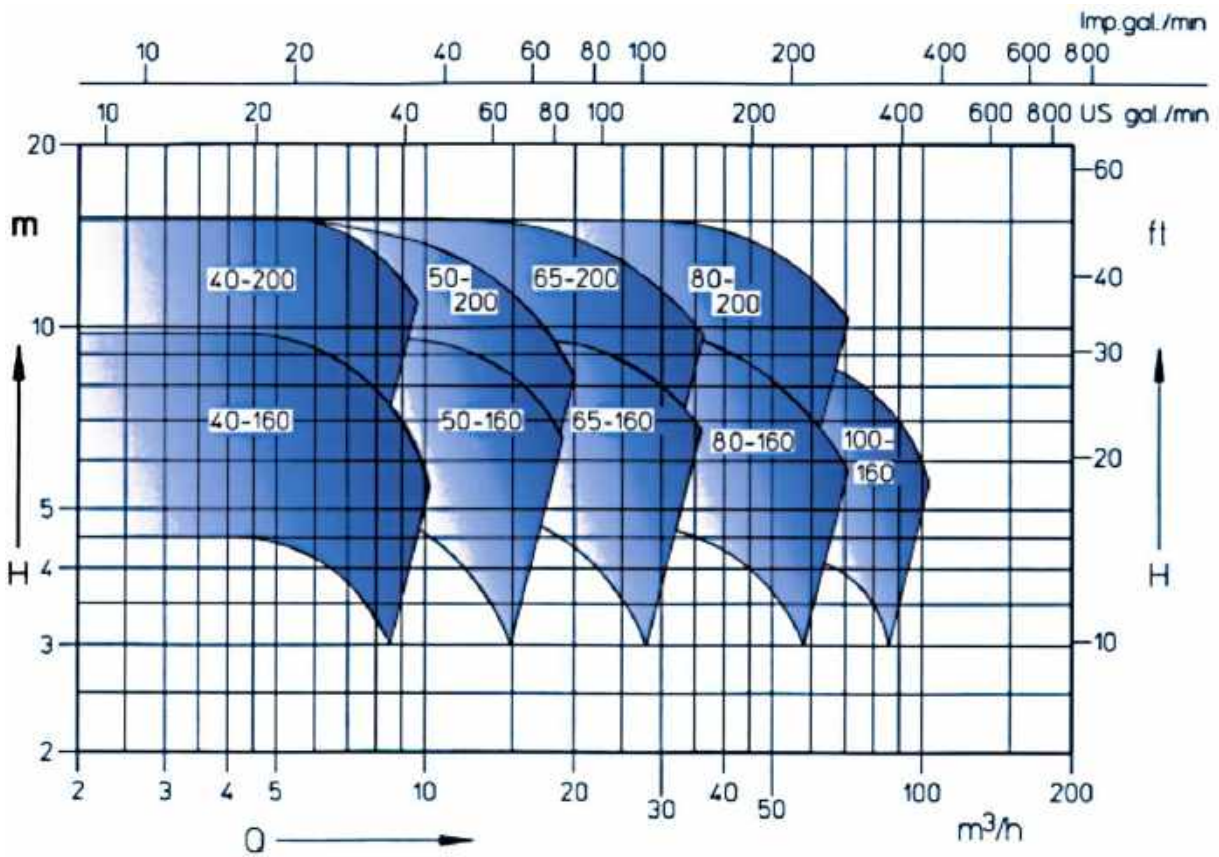
Performance graph

n = 2900 rpm



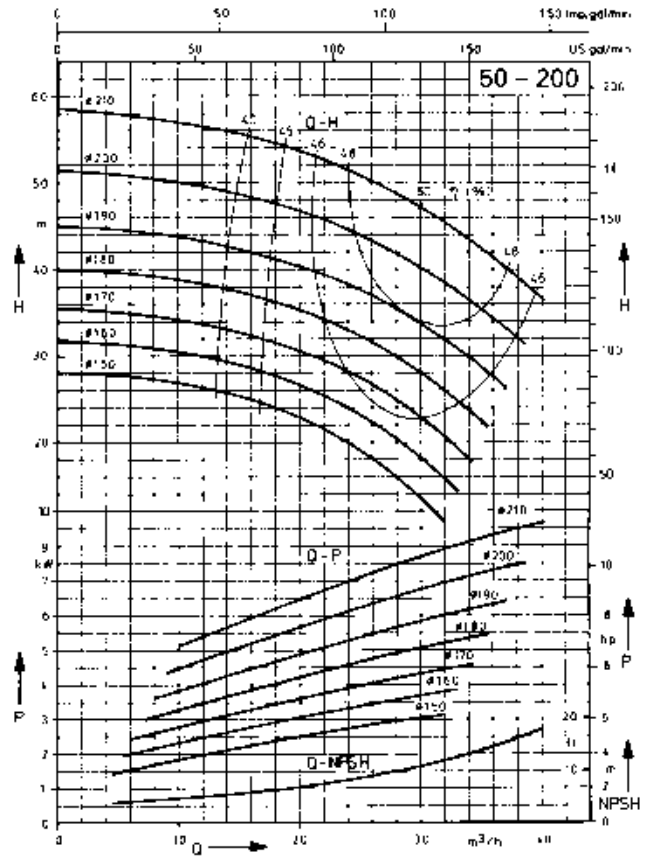
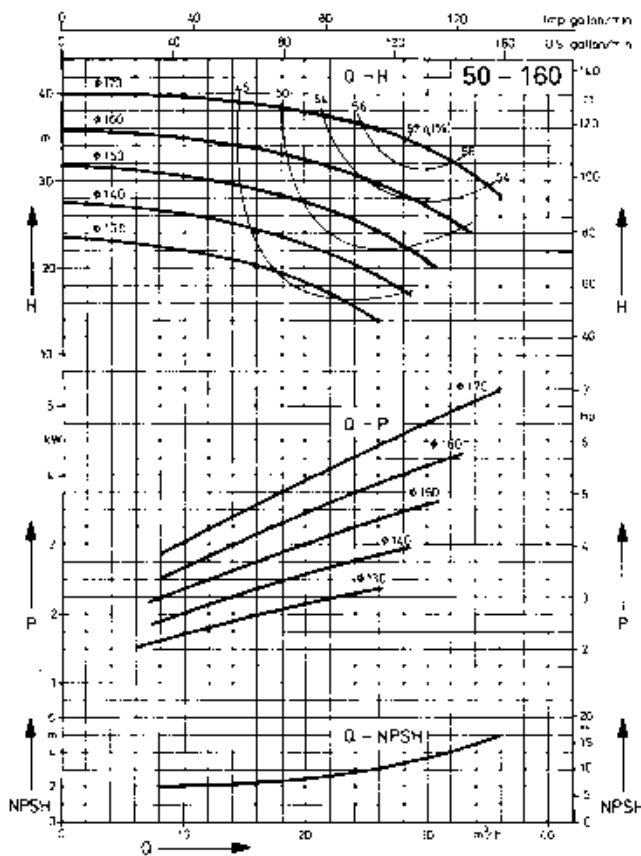
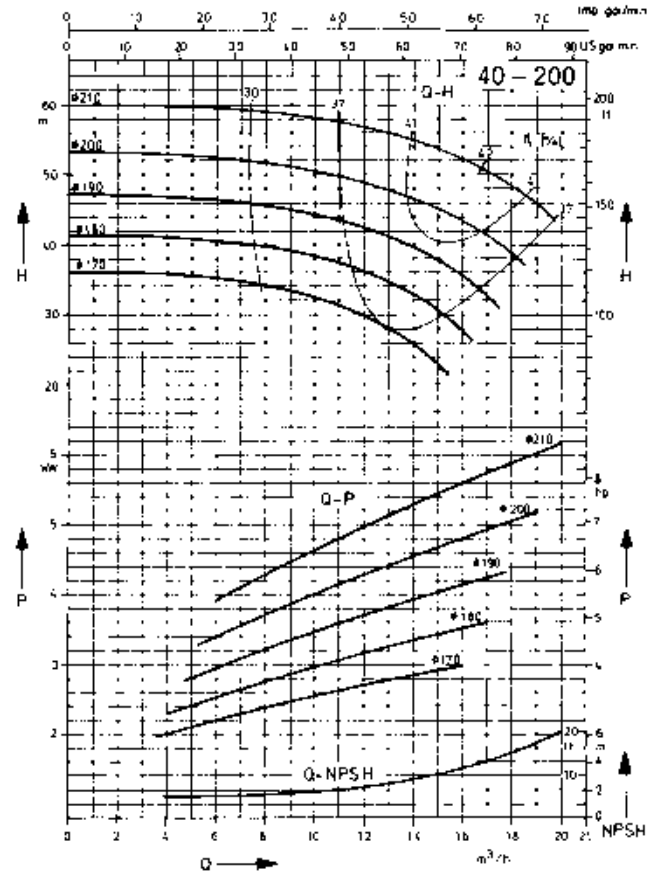
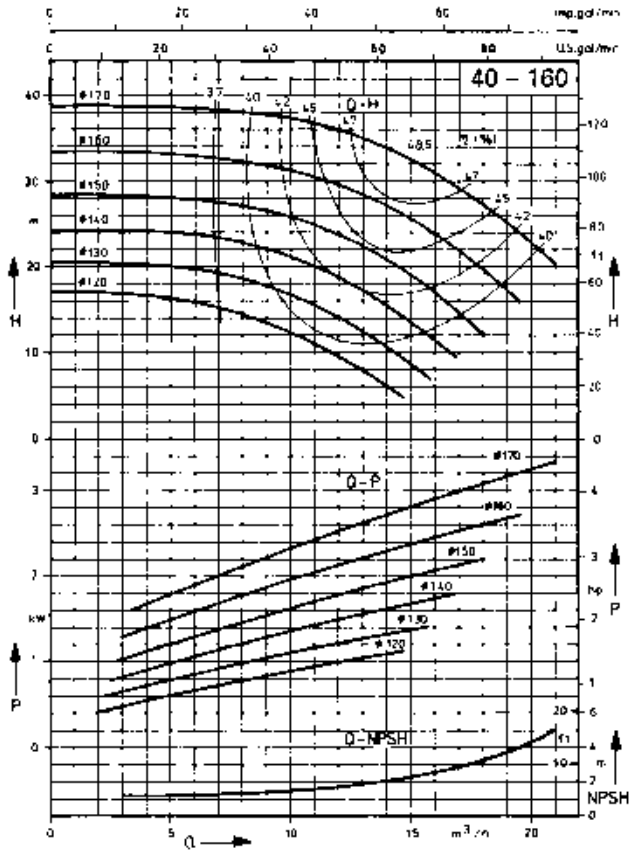
Performance graph

n = 1450 rpm



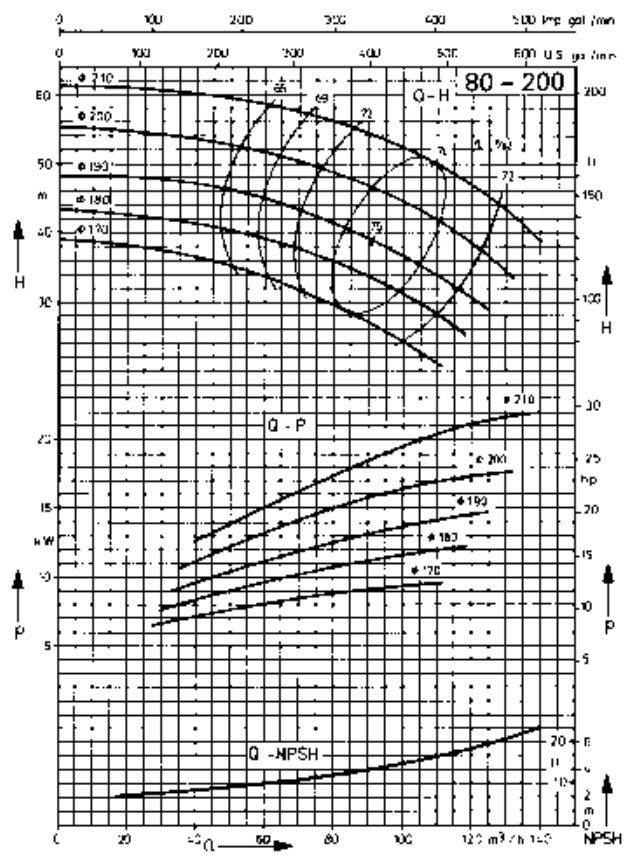
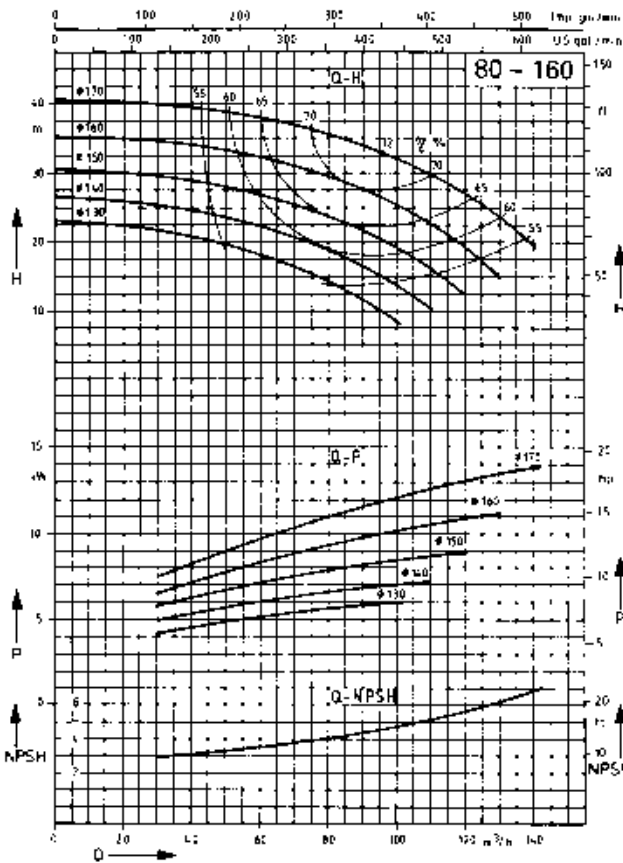
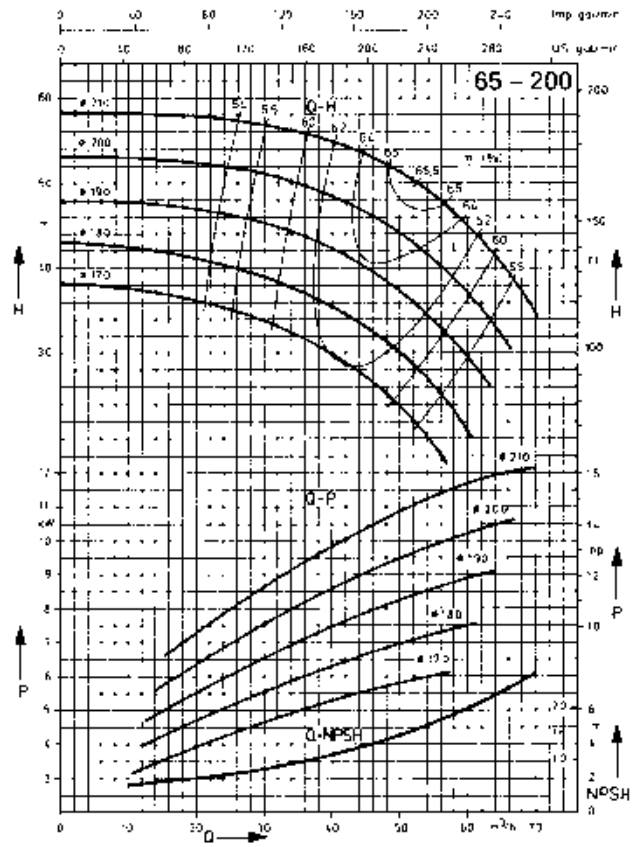
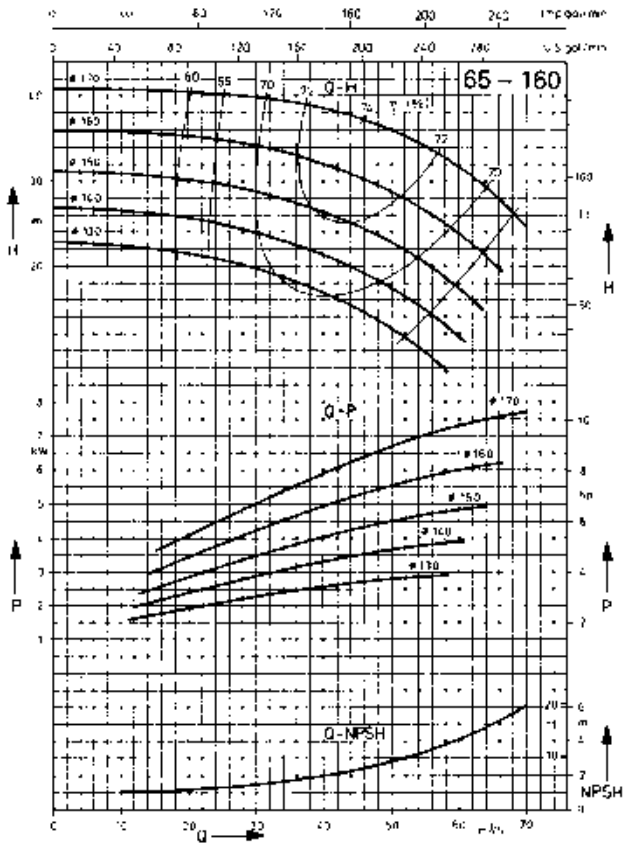
Characteristic curves

n = 2900 rpm



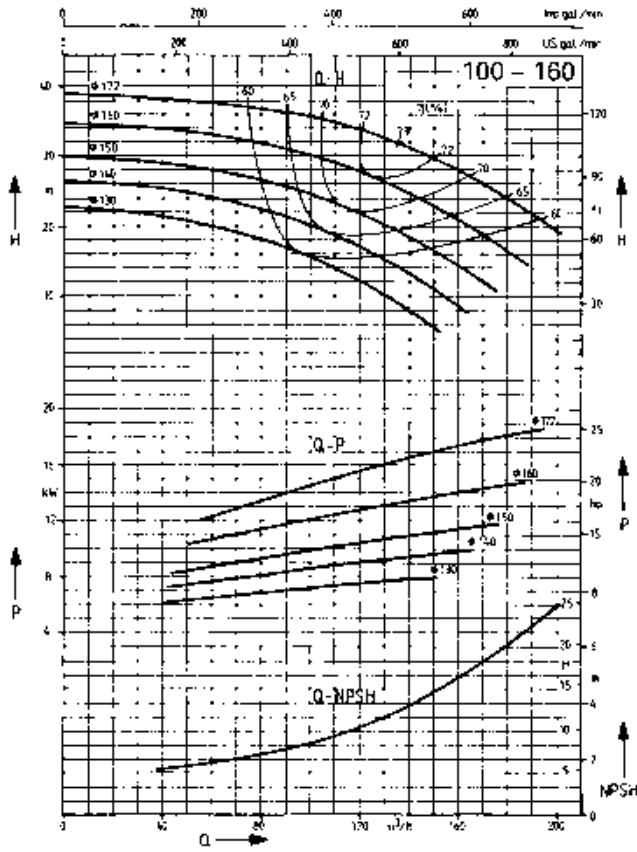
Characteristic curves

n = 2900 rpm



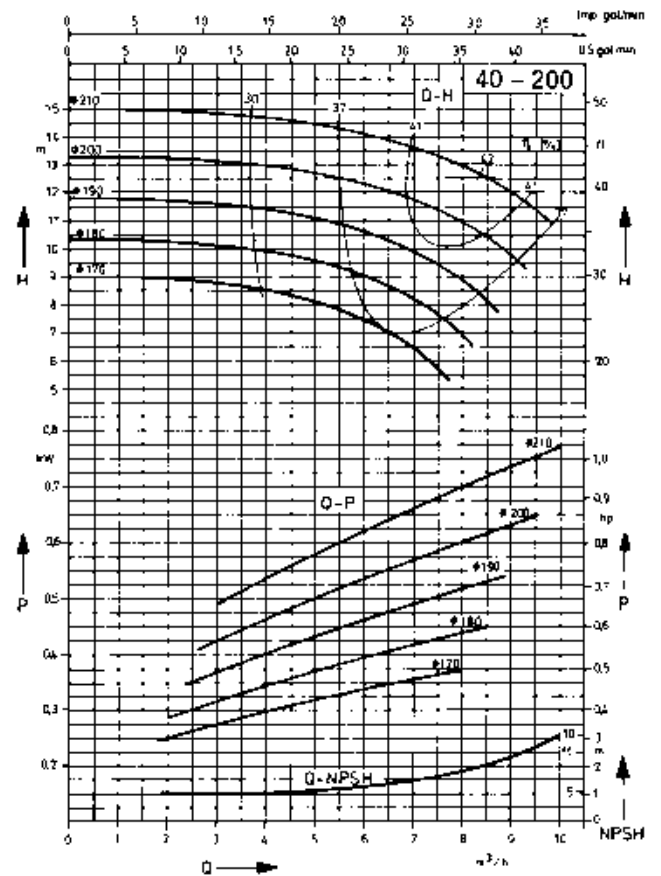
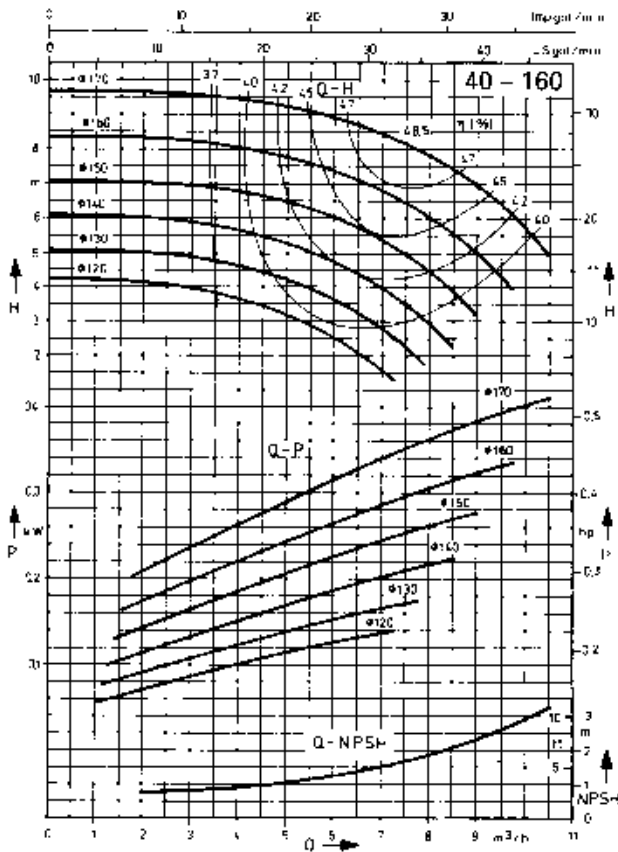
Characteristic curves

n = 2900 rpm



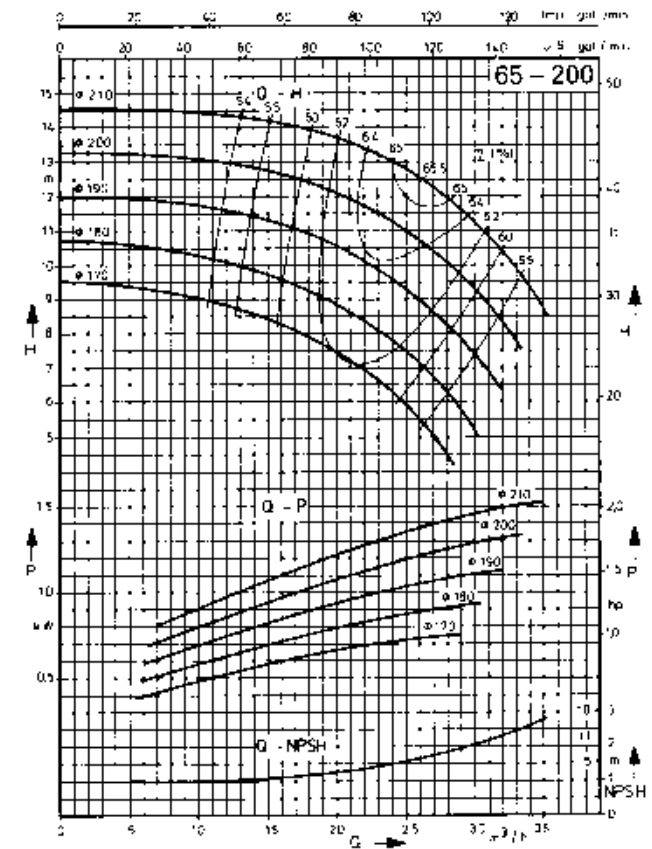
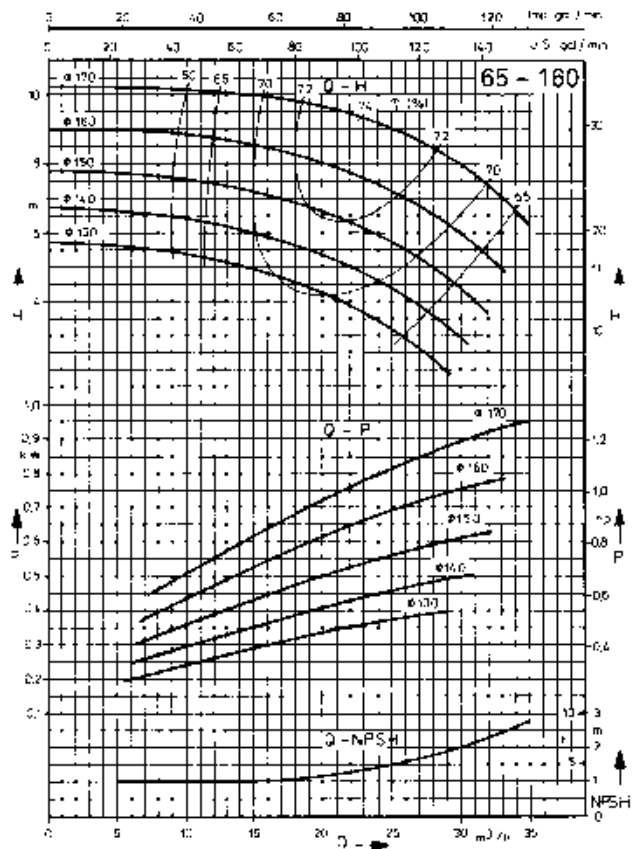
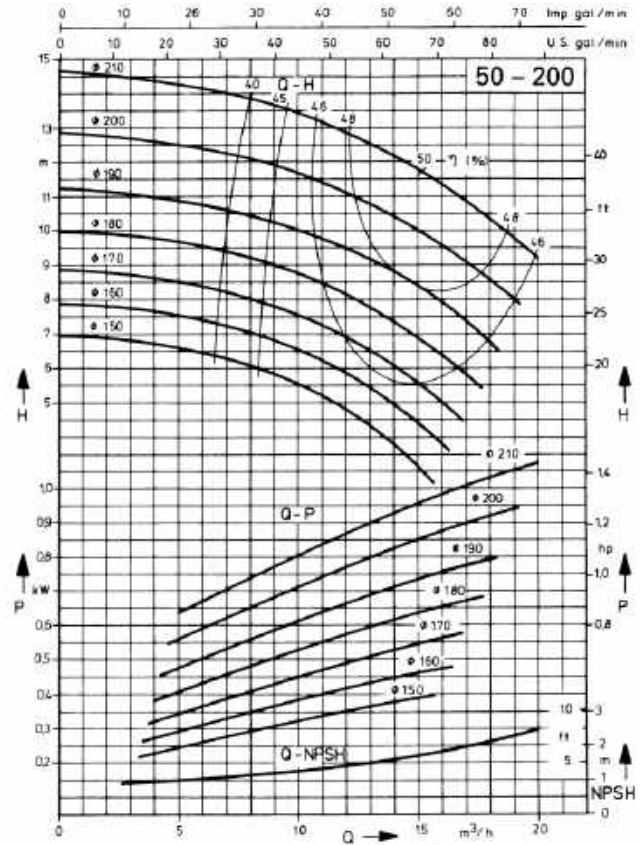
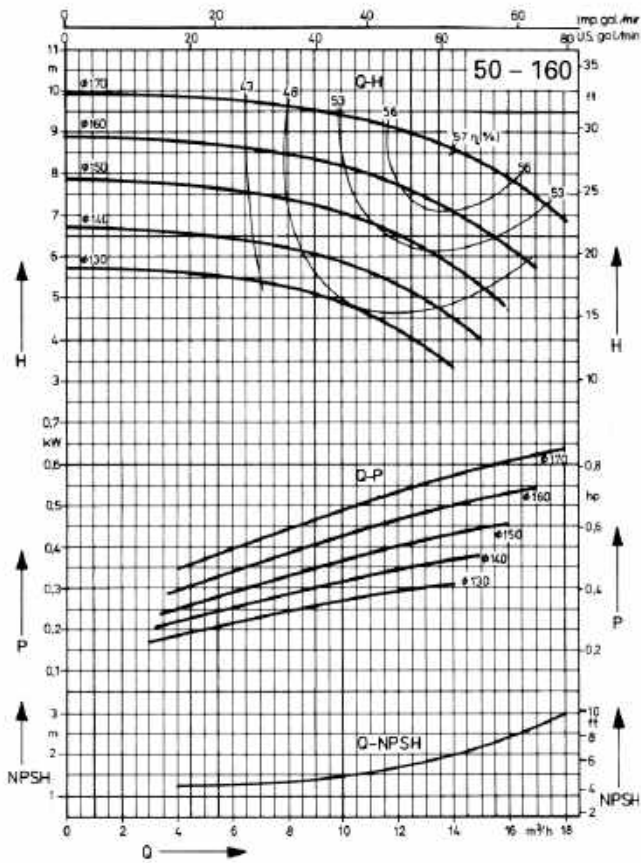
Characteristic curves

n = 1450 rpm



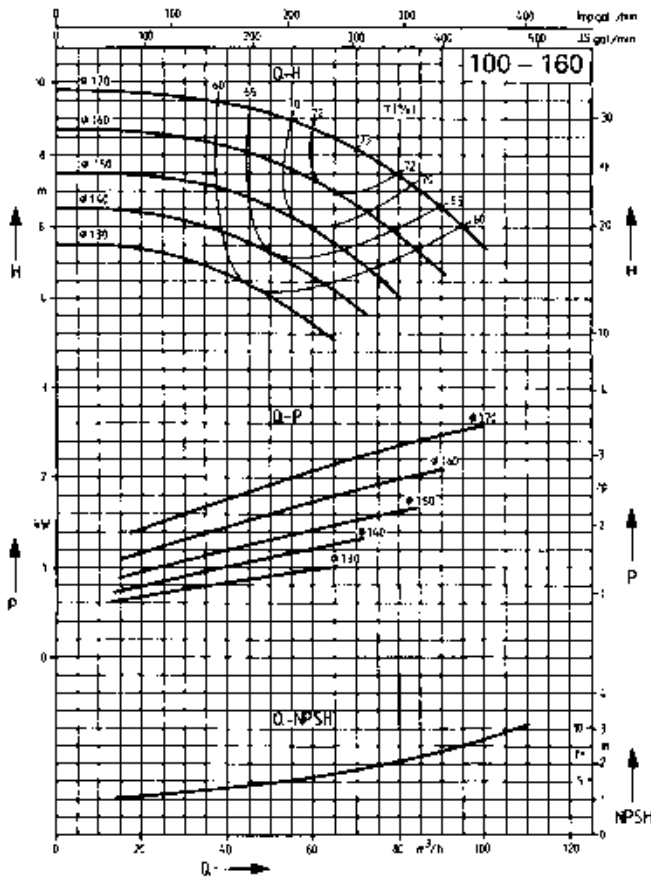
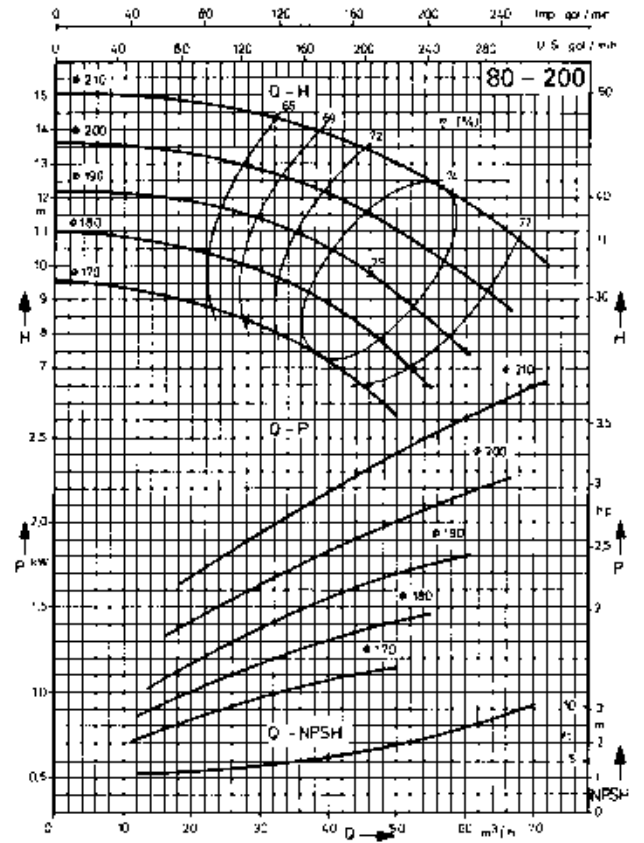
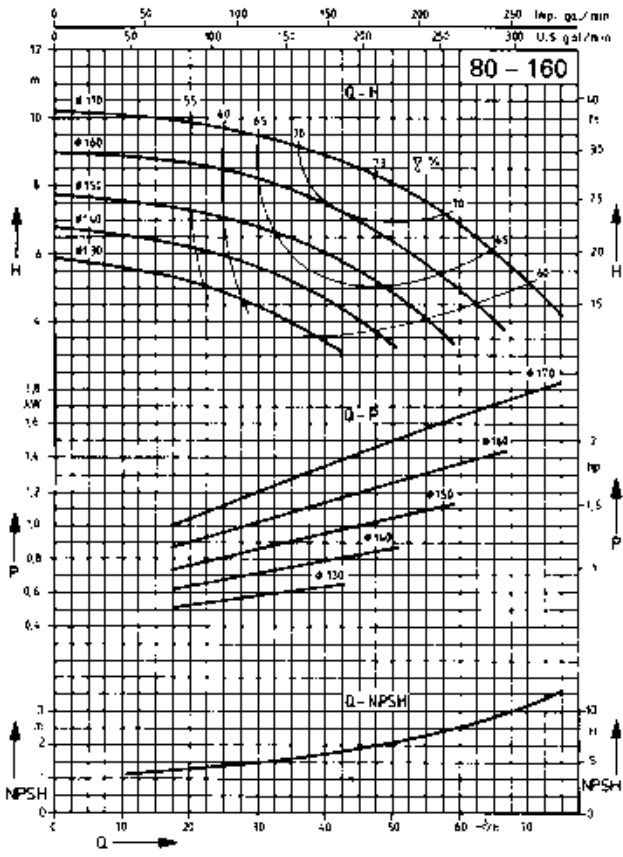
Characteristic curves

n = 1450 rpm



Characteristic curves

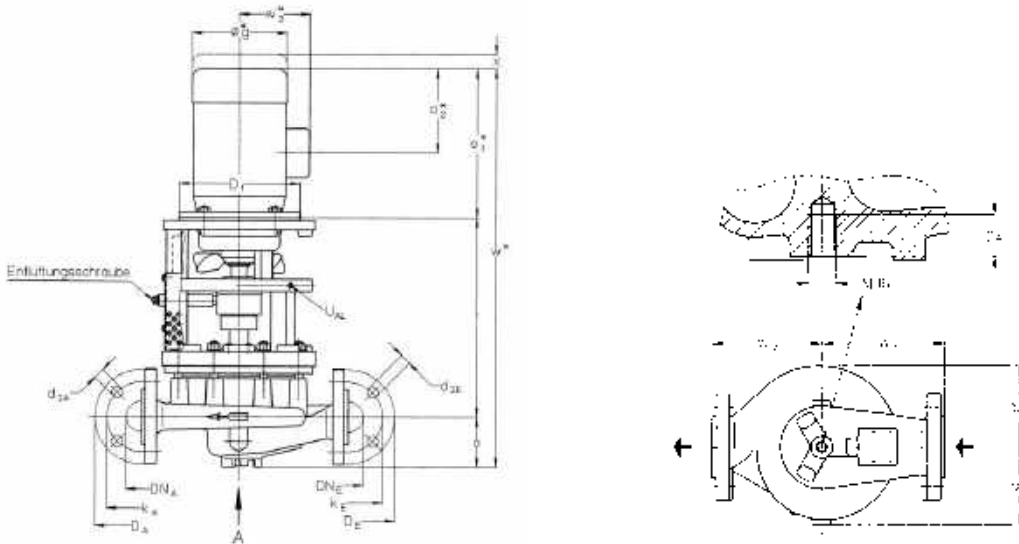
n = 1450 rpm



values are valid for water $\rho = 1 \text{ kg/l}$

Dimension table

n = 2900 rpm



U_{AL} = connection for leak liquid G ¼

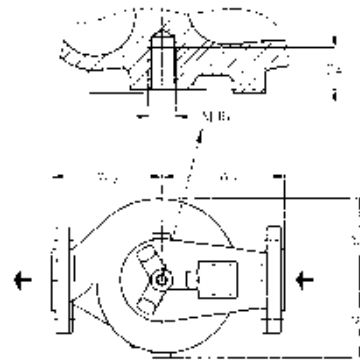
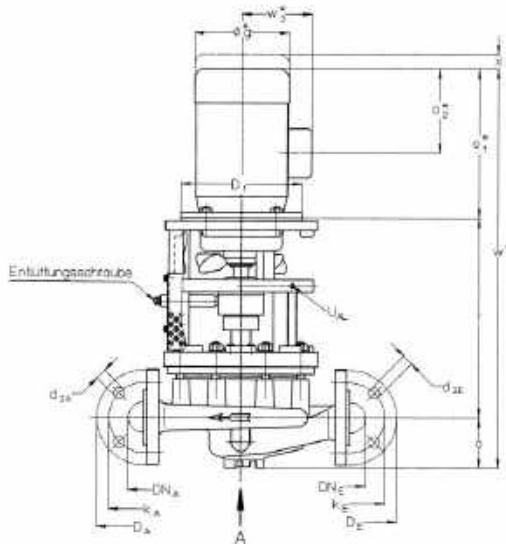
size	motor		DN _{A, E}	b ₁	b ₂	D ₁	f	g*	o	o ₁ *	o ₂ *	w*	w ₁	w ₂	w ₃ *	x	weight kg		
	size	kW															pump	motor	
40-160	80 a	0,75	40	115	115	200	327	157	82	204	108	613	180	160	126	80	49	9	
	80 b	1,1																10	
	90 S	1,5																14	
	90 L	2,2																18	
	100 L	3,0																24	
40-200	90 L	2,2	138	138	200	250	186	274	185	691	323	234	740	200	180	125	55	18	
	100 L	3,0																24	
	112 M	4,0																41	
	132 S1	5,5																56	
	132 S2	7,5																59	
50-160	90 L	2,2	50	120	120	200	327	186	90	274	185	666	190	160	125	80	50	18	
	100 L	3,0																24	
	112 M	4,0																41	
	132 S1	5,5																56	
	132 S2	7,5																59	
50-200	90 L	2,2	138	138	200	250	186	274	185	691	323	234	740	200	180	125	60	18	
	100 L	3,0																24	
	112 M	4,0																41	
	132 S1	5,5																56	
	132 S2	7,5																59	
65-160	90 L	2,2	65	132	126	200	327	186	106	274	185	707	215	180	125	80	54	18	
	100 L	3,0																24	
	112 M	4,0																41	
	132 S1	5,5																56	
	132 S2	7,5																59	
65-200	132 S1	5,5	150	143	300	352	260	260	120	386	227	844	200	180	213	100	64	56	
	132 S2	7,5																59	
	160 M1	11,0																71	110
80-160	132 S1	5,5	80	150	135	300	352	260	120	386	227	858	240	200	213	80	69	56	
	132 S2	7,5																59	
	160 M1	11,0																73	110
	160 M2	15,0																112	
80-200	160 M1	11,0	165	155	350	377	310	310	150	521	308	1018	255	225	245	100	79	110	
	160 M2	15,0																135	
	160 L	18,5																155	
	180 M	22,0																155	
100-160	160 M1	11,0	100	145	310	310	150	310	150	521	308	1048	275	245	100	82	110	112	
	160 M2	15,0																112	
	160 L	18,5																135	

Standard motors DIN 42677.
 Truth of rotation, centricity and right angle of shaft ends and mounting flanges to DIN 42955, normal precision.
 *protection type of the motors IP 54, dimensions depending on motor make.

Flange connections according to DIN 2501 PN 16					
DN _A /DN _E	40	50	65	80	100
D	150	165	185	200	220
k	110	125	145	160	180
d ₂ x numberl	18x4	18x4	18x4	18x8	18x8

Dimension table

n = 1450 rpm



U_{AL} = connection for leak liquid G ¼

size	motor		DN _{A, E}	b ₁	b ₂	D ₁	f	g*	o	o ₁ *	o ₂ *	w*	w ₁	w ₂	w ₃ *	x	weight kg											
	size	kW															pump	motor										
40-160	80 a	0,55	40	115	115	200	327	160	82	227	131	636	180	160	143	80	49	9										
	80 a	0,55		138	138												178	90	227	123	644	200	180	150	54	10		
	80 b	0,75																							51	9		
40-200	90 S	1,1	138	138	178	90	227	123	644	200	180	150	143	80	54	10												
50-160	80 a	0,55	50	120	120	200	327	160	90	227	131	636	190	160	143	80	51	9										
	80 b	0,75		138	138												178	90	227	123	644	200	180	150	143	54	10	
	80 a	0,55																								51	9	
50-200	80 b	0,75	138	138	178	90	227	123	644	200	180	150	143	80	54	10												
65-160	80 a	0,55	65	132	126	250	327	160	106	227	131	660	215	180	150	80	55	10										
	80 b	0,75		150	143												178	106	227	123	660	215	180	150	143	61	14	
	90 S	1,1																								61	14	
65-200	90 S	1,1	150	143	178	106	227	123	660	215	180	150	143	80	61	14												
80-160	80 b	0,75	80	150	135	200	327	160	120	227	123	674	240	200	188	100	59	10										
	90 S	1,1															165	155	178	120	227	123	674	240	188	143	150	14
	90 L	1,5																										
80-200	100 L1	2,2	165	155	178	120	227	123	674	240	200	188	143	100	66	18												
100-160	90 S	1,1	100	165	145	200	327	178	150	243	154	690	255	225	188	100	66	14										
	90 L	1,5															165	155	198	150	243	154	690	255	188	150	18	
	100 L1	2,2																										66
100-200	100 L2	3,0	165	155	198	150	243	154	690	255	225	188	150	100	66	24												
100-160	90S	1,1	100	165	145	200	327	178	150	243	154	720	275	225	188	100	69	14										
	90 L	1,5															165	145	198	150	243	154	720	275	188	150	18	
	100 L1	2,2																										69
100-200	100 L2	3,0	165	145	198	150	243	154	720	275	225	188	150	100	69	24												

Flange connections according to DIN 2501 PN 16					
DN _A /DN _E	40	50	65	80	100
D	150	165	185	200	220
k	110	125	145	160	180
d ₂ x number	18x4	18x4	18x4	18x8	18x8

Standard motors DIN 42677.

Truth of rotation, centricity and right angle of shaft ends and mounting flanges to DIN 42955, normal precision.

*protection type of the motors IP 54, dimensions depending on motor make.

Data regarding the pump size - Instructions for placing orders

series + size	hydraulic + bearing	shaft sealing	material design	casing seal
	A hydraulic A A one grease-lubricated groove ball bearing and one liquid surrounded step bearing	002 radial shaft seal rings CDC unbalanced mechanical seal	1B main parts of spheroidal graphite iron	2 flat seal
ZTI 40-160 40-200 50-160 50-200 65-160 65-200 80-160 80-200 100-160	AA	alternatively 002 CDC	1B	2

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

Example for ordering:

The pump size ZTI 40-160 AA 002 1B 2 with 11 kW 3-phase a.c. motor of (50 cs, 380 VΔ) 2900 rpm has the complete order No.:

ZTI 40-160 AA 002 1B 2 GA

If type of construction IM V 1 (vertical installation) is concerned, please indicate expressly.

On delivery, the point (·) in the fourth place of the type designation will be replaced by a letter in our works..

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



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