

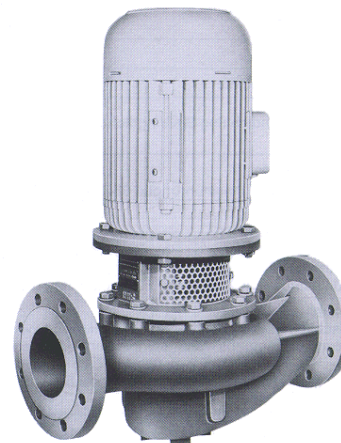
# Volute Pumps



## ZLI 25-125 . . . 150-200

### TECHNICAL DATA

Output:	max. 280 m <sup>3</sup> /h
Head:	max. 60 m
Speed:	max. 3600 1/min
Material:	grey cast iron: 0B, 0C, 0F stainless steel: 4B, 4F
Temperature:	material design 0B, 0C, 0F max. 120 °C 0F, 4F max. 80 °C
Casing pressure:	PN 16
Shaft seal:	standard mechanical seal
Flange connections:	DIN 2501 PN 16
Sense of rotation:	clockwise when seen from drive on the pump



### APPLICATION

Volute pumps of the series ZLI 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 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. 13 pump sizes at present.

### CONSTRUCTION

#### Casing pressure:

Material design

4B, 4F max. 16 bar from -40 °C to 120 °C  
0B, 0C, 0F max. 16/10<sup>1</sup>) bar from -30 °C to 120 °C

#### Please note:

Technical rules and safety regulations.

Casing pressure = inlet pressure plus delivery head + zero flow

#### Position of branches:

Suction and discharge branch radially arranged opposite to each other.

#### Flanges:

The flanges correspond to DIN 2533/PN 16. Flange design drilled as per ANSI 300 is possible.

#### 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 seen from drive on the pump.

#### 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	COMPONENT	MATERIAL DESIGN				
		0B	0C	0F	4B	4F
10.10 16.10	volute casing casing cover	GG 25			G-X 6 Cr Ni Mo 18 10	
23.00	impeller	GG 25	G-Cu Sn 10	PPO, glass fiber reinforced synthetic	PPO, glass fiber reinforced synthetic	
10.91 17.11	stage casing	see 0F, 4B, 4F	-	deep-drawn stainless steel sheet X 10 Cr Ni Mo Ti 18 10		
21.00	shaft	X 20 Cr 13			X 5 Cr Ni Mo 18 10	
34.00	bearing bracket	GG 25				
43.30	shaft sealing mechanical seal <sup>1)</sup>	X 22 Cr Ni 17 / carbon, Perbunan or SiC / SiC, Viton or SiC / carbon, EP			SiC / SiC, Viton or SiC / carbon, EP	

<sup>1)</sup> O-rings of PTFE upon request

The component parts of the mentioned material design 0B, 0C and 4B are interchangeable.

### Casing seal:

Material design 0B, 0C, 0F:

The casing seal consist of special paper flat gasket. Designation of this construction type: 2

Material design 4B, 4F:

The casing seal consist of PTFE. Designation of this construction type: 4

### Drive / speed:

By customary electric motors, type IM B 5 resp. IM V

For the determination of drive power we recommend the following additional power:

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:

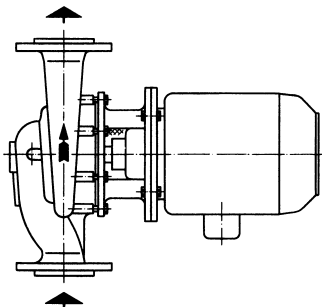
size	max. speed rpm	size	max. speed rpm
25-125	3600	100-200 150-200	3000
25-160			
40-160 40-200			
50-160 50-200			
80-160 85-200 <sup>2)</sup>			
100-160 <sup>2)</sup>			

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

<sup>2)</sup> in material design 4B max. speed 3000 rpm

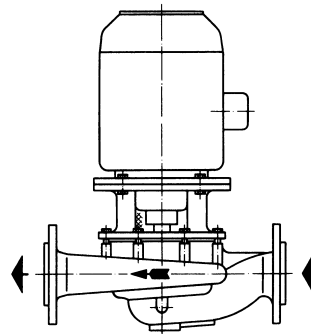
### Positioning

The ZLI-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

For this particular



Vertical installation up to 7,5 kW possible, from 11 kW on necessary. The pump unit can be additionally supported for that 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!**

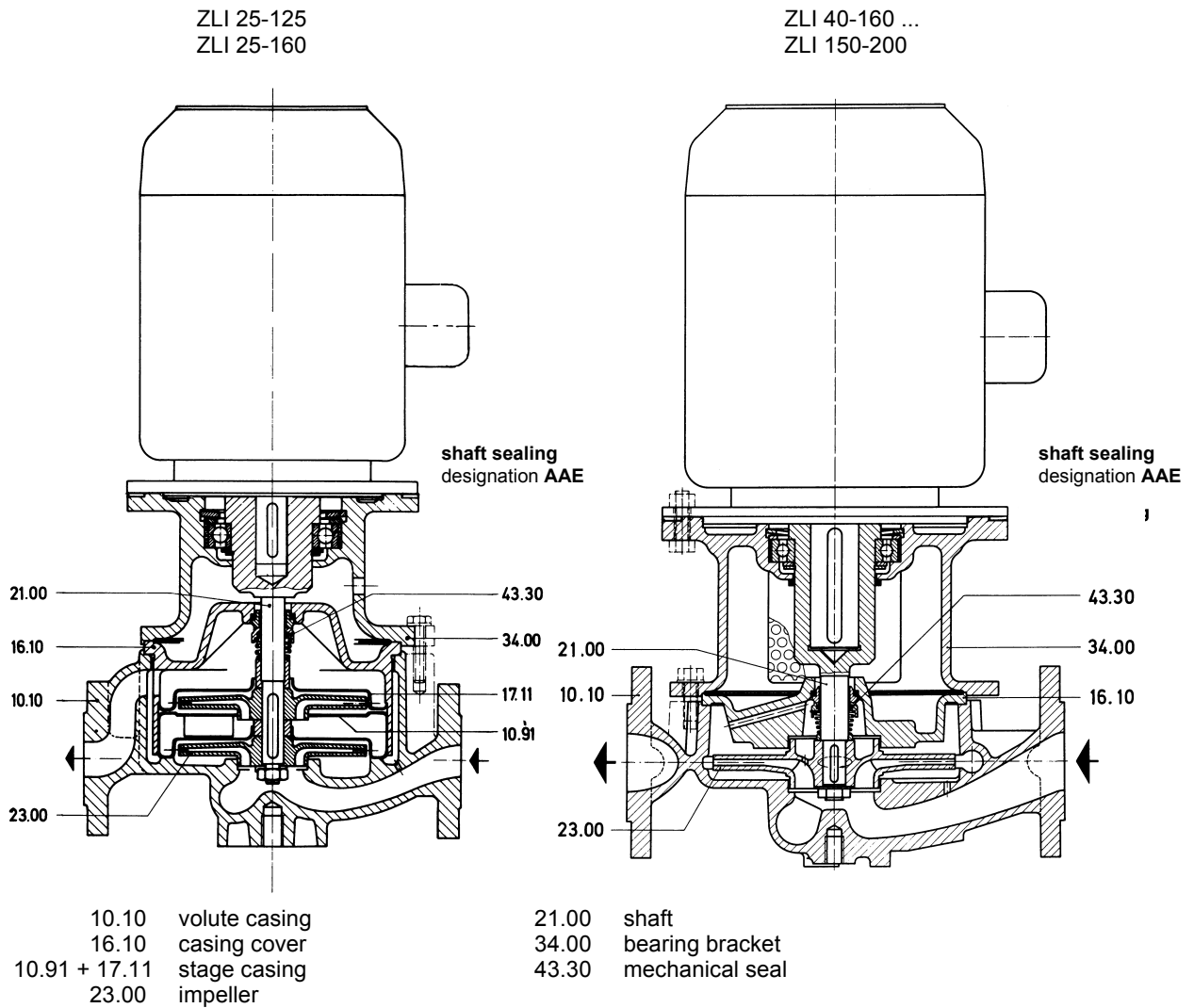
### General comments

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 **ZLK**

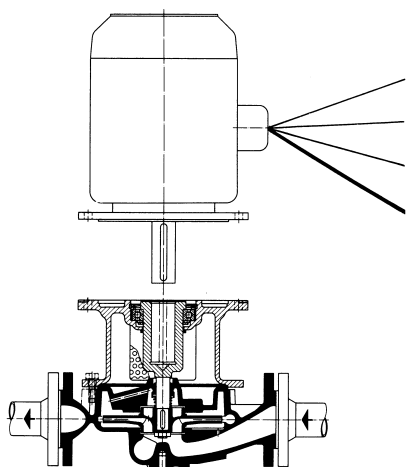
Technical documentation about these programmes will be readily supplied on request.

## Sectional drawing and nomenclature



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

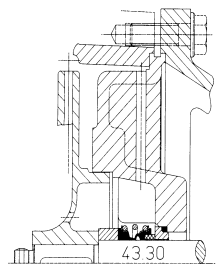
By supplementing the standard set of components consisting of pump casing, casing cover, impeller and mechanical seal by a special bearing bracket (DBP) results an inline pumps which is easy to combine. The bearing bracket removes the standard motor from the load of hydraulic forces and allows suitable 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 sealing  
designation **BH3**  
**BHS**

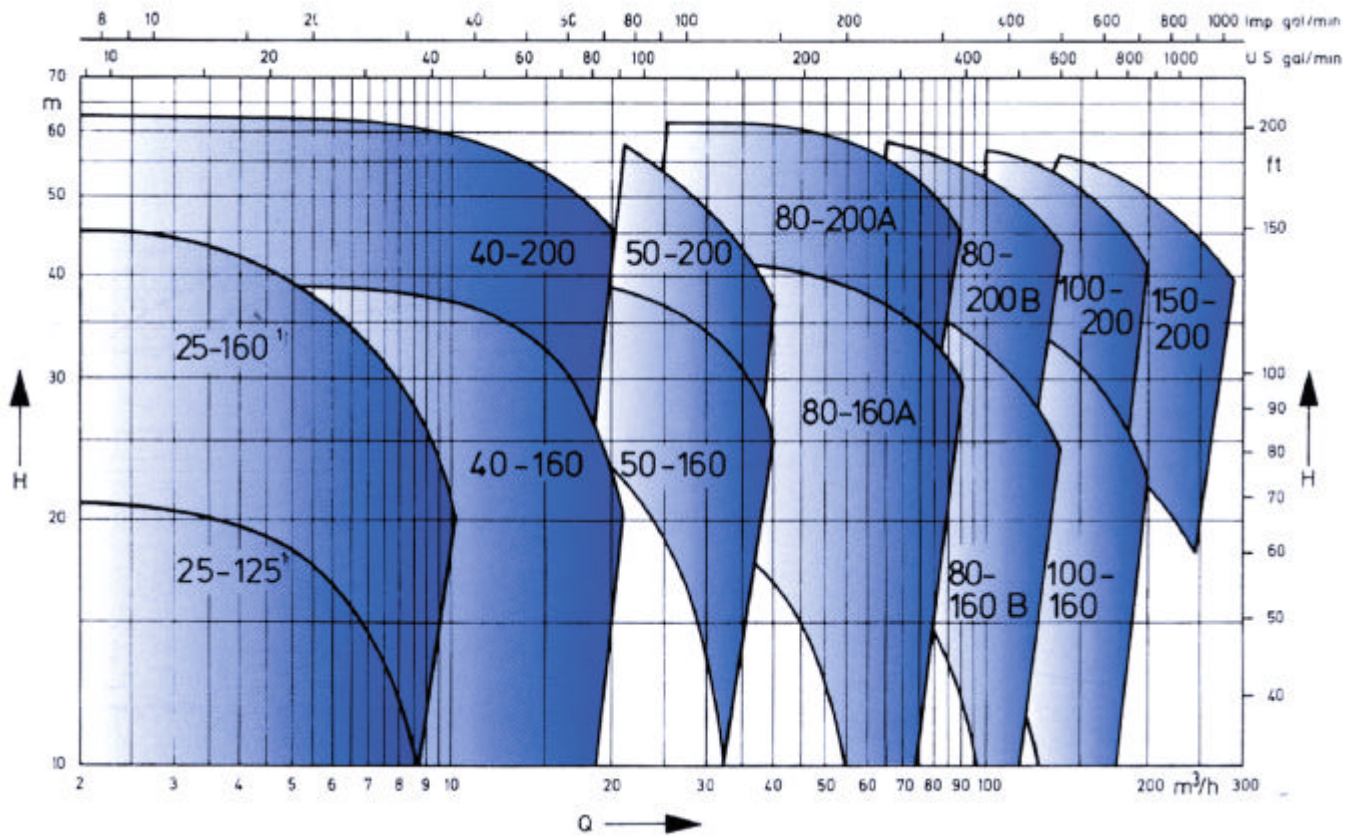


\* shaft end key to DIN 748 T 3 to DIN 6885 T 1

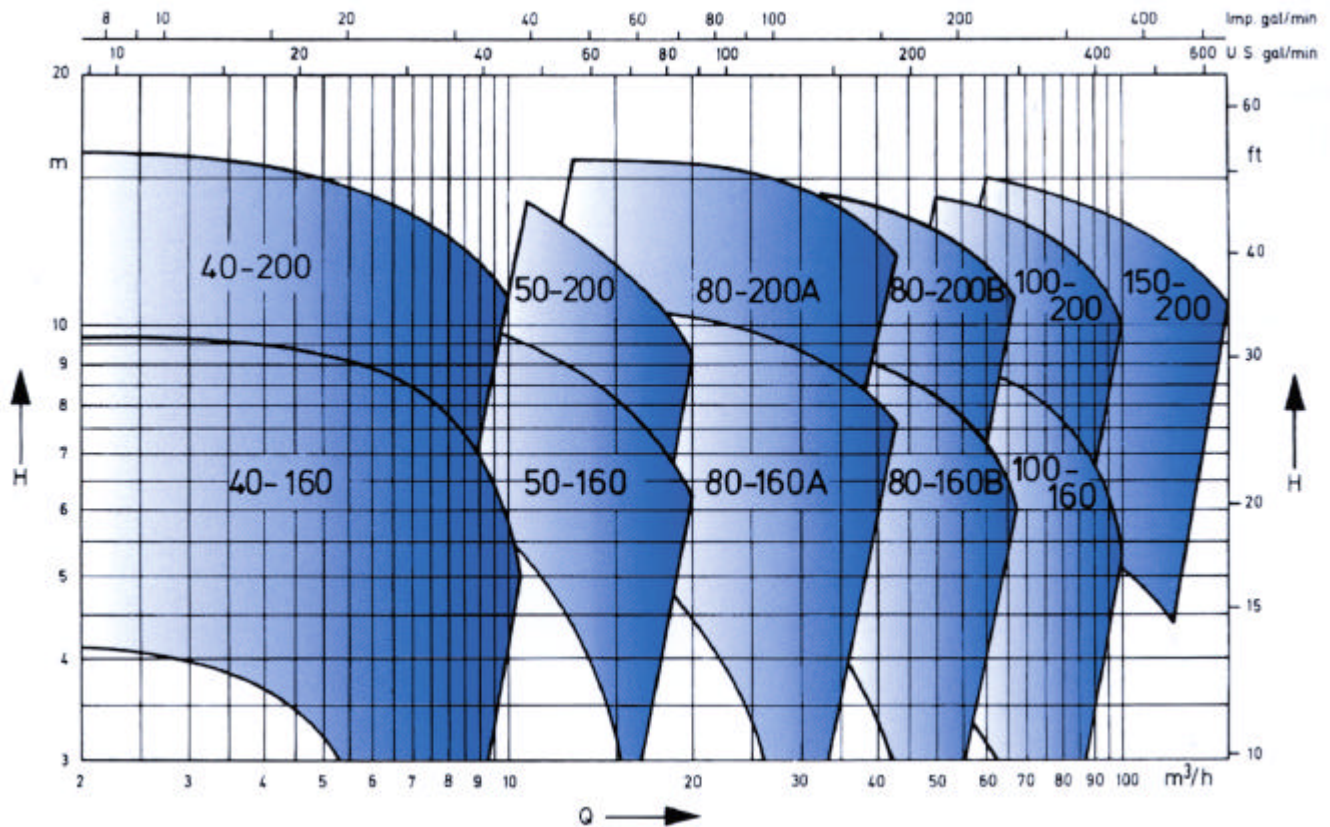
If necessary the motor can be changed in the unit without draining, the pipework. The pump unit remains as „**shaft tight armature**“ in the pipe work and so the readiness for operation is increased.

Performance graph

n = 2900 rpm

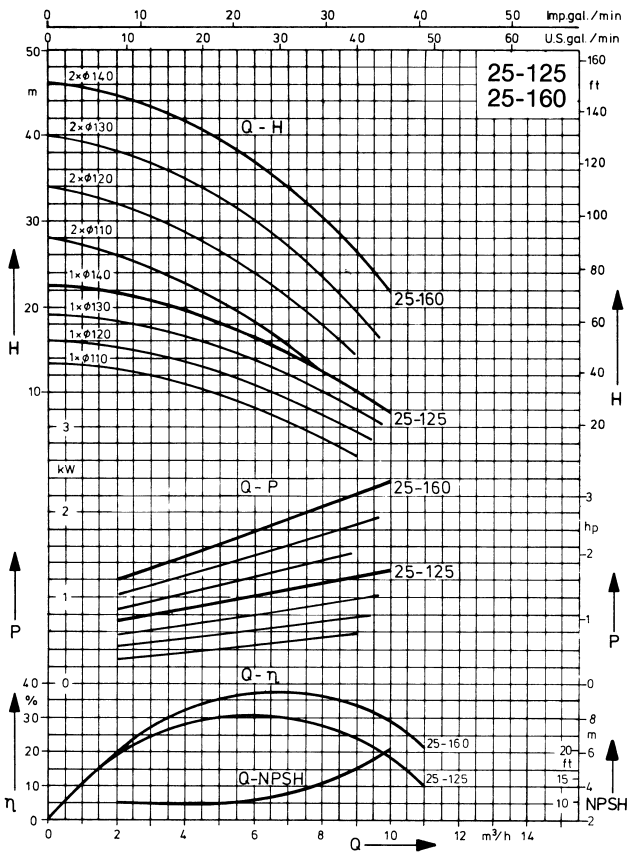


n = 1450 rpm

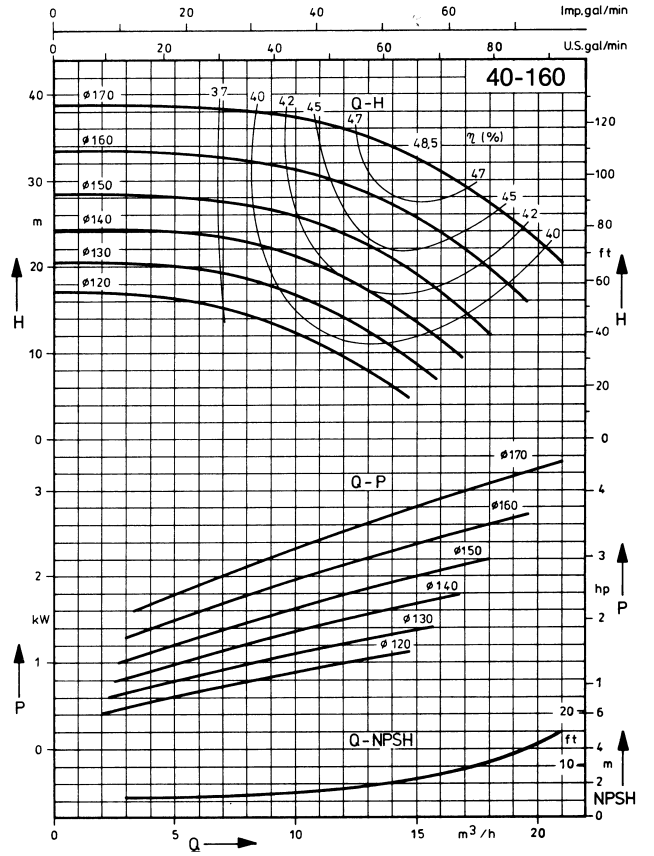


**Characteristic curves**

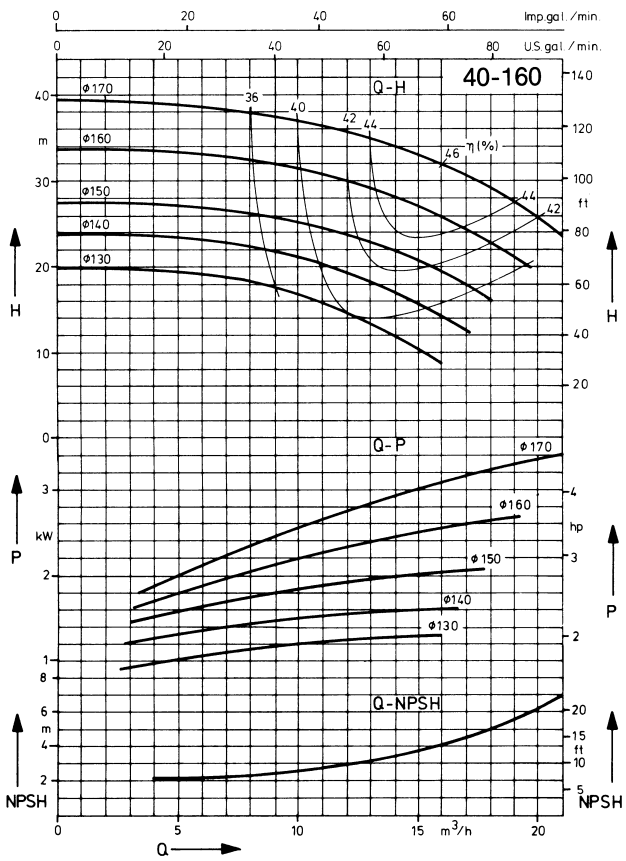
**n = 2900 rpm**



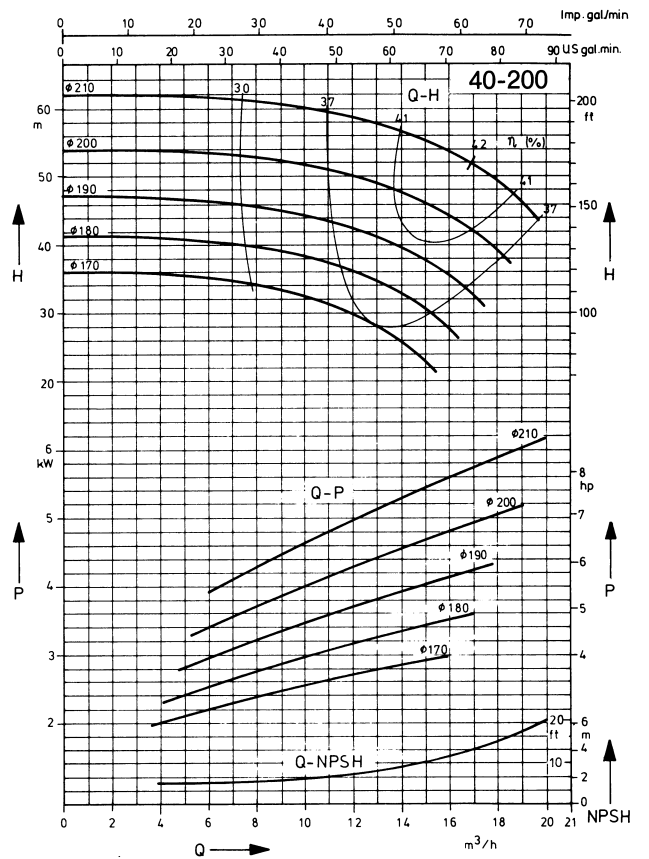
correction factor 3 % at material design 4B



material design 0B, 0C



material design 4B

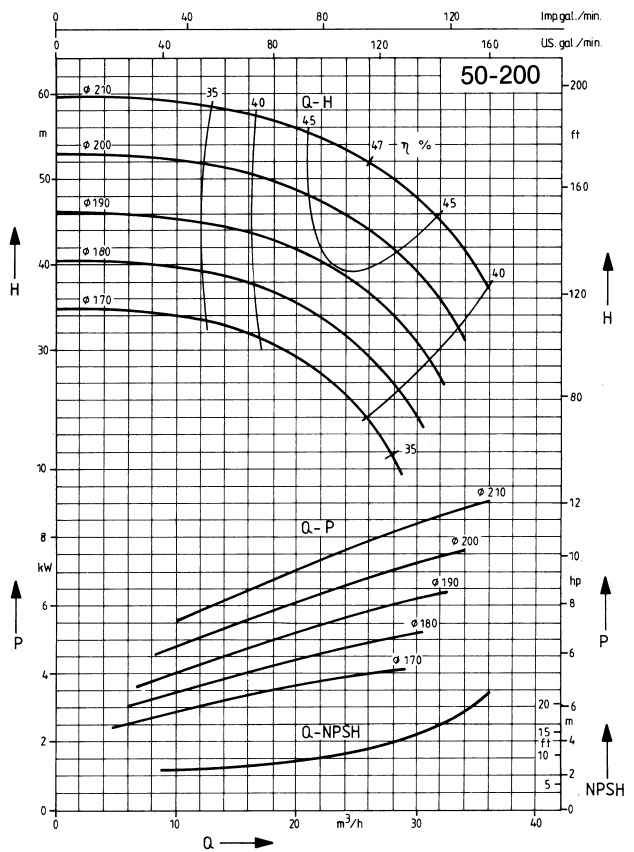
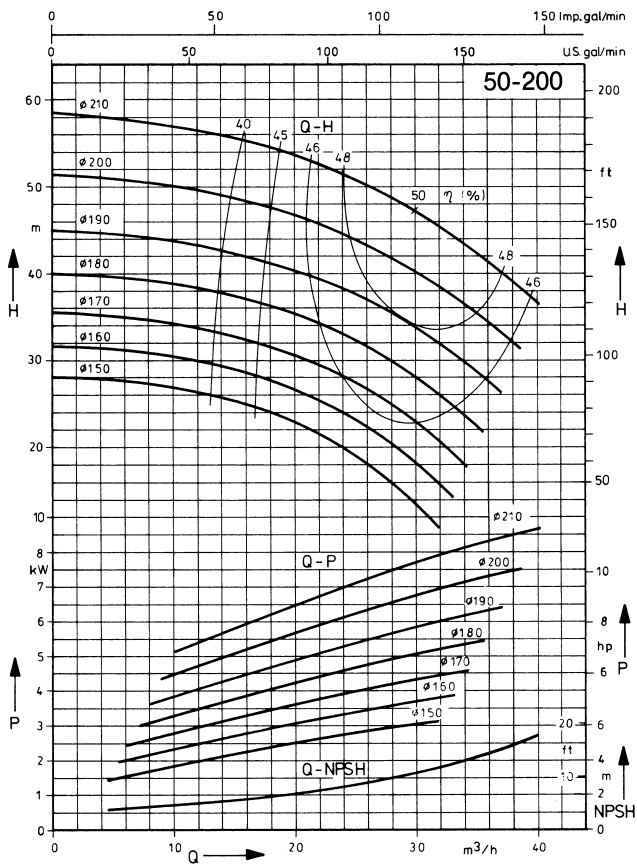
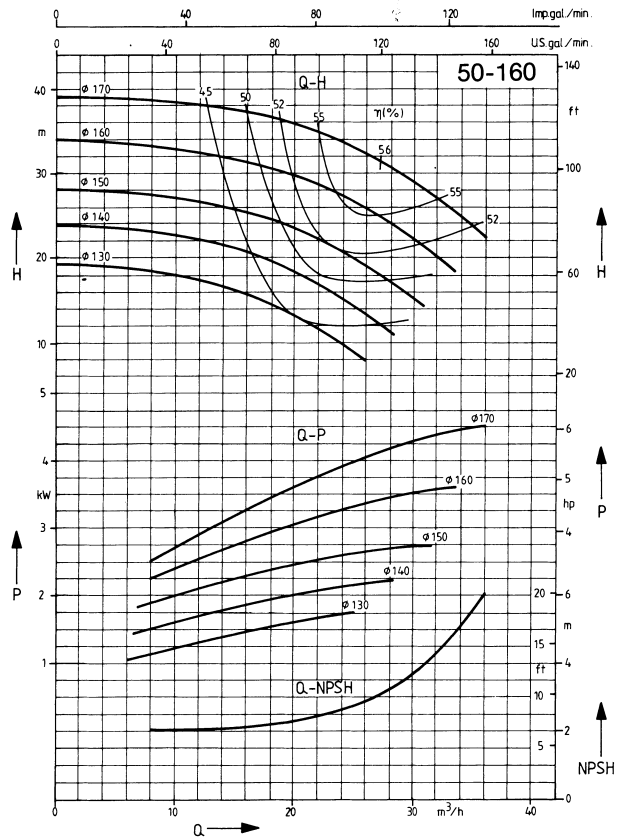
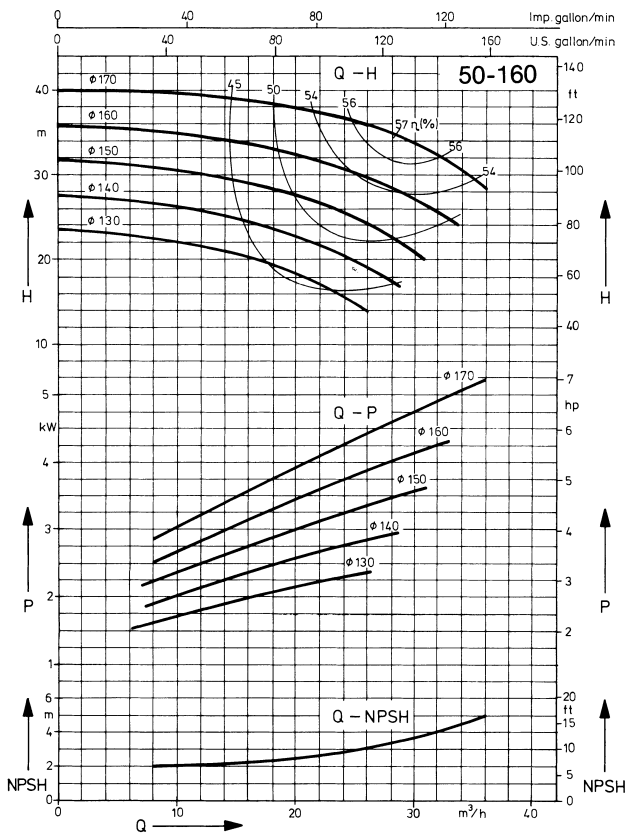


correction factor 3 % at material design 4B



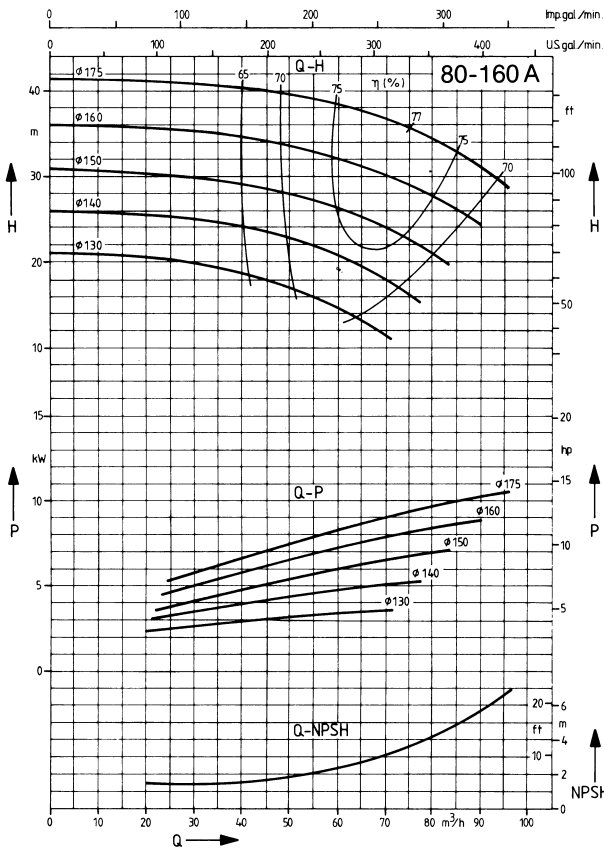
Characteristic curves

n = 2900 rpm

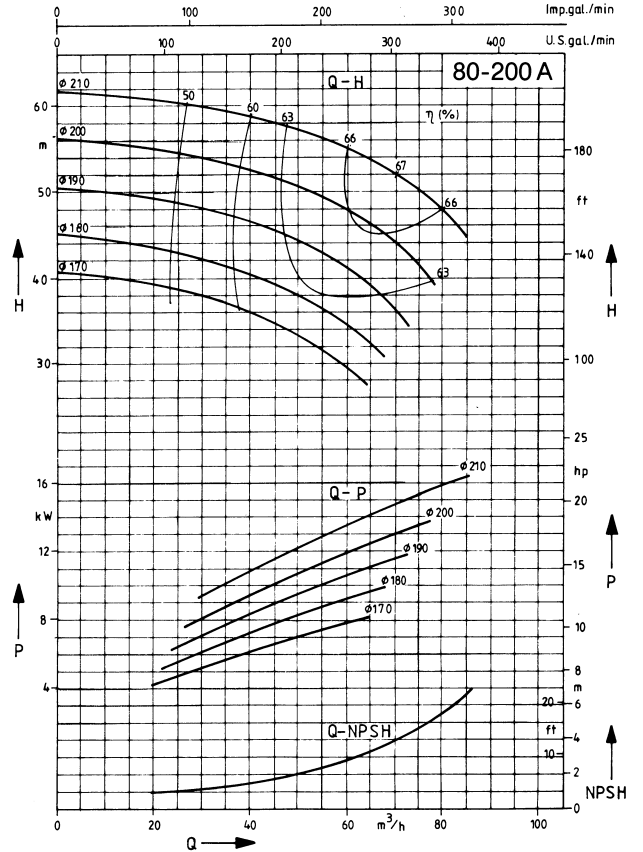


**Characteristic curves**

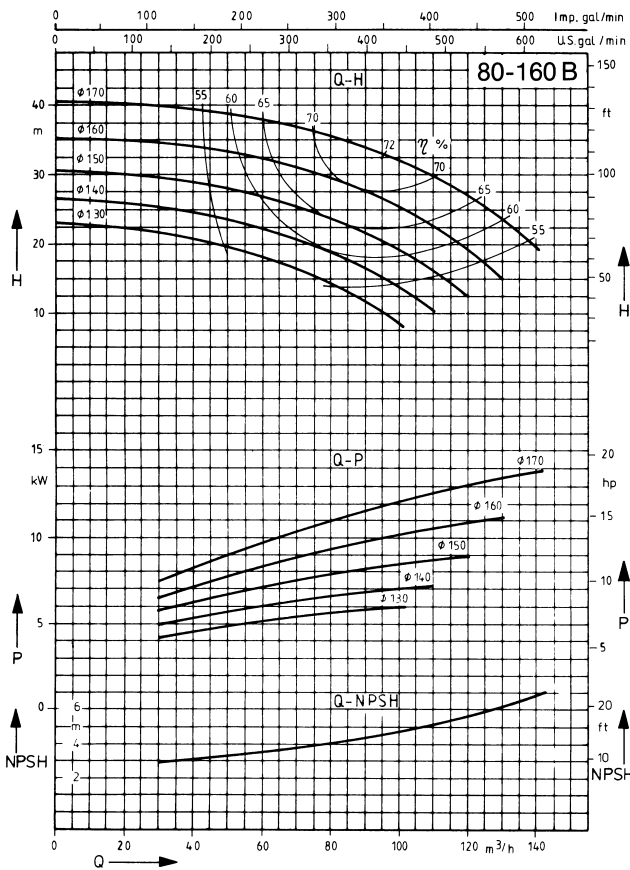
**n = 2900 rpm**



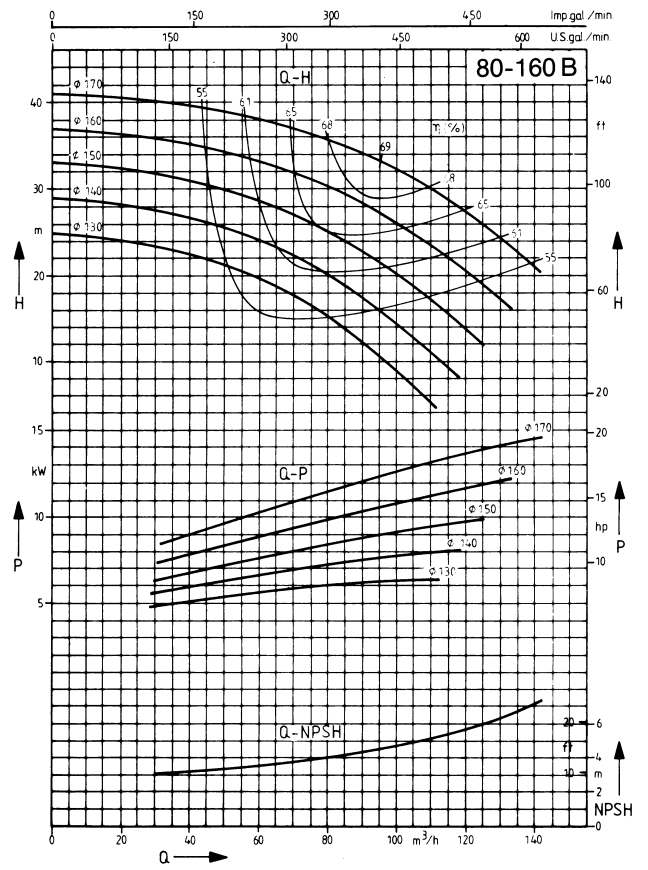
correction factor 3 % at material design 4B



correction factor 3 % at material design 4B



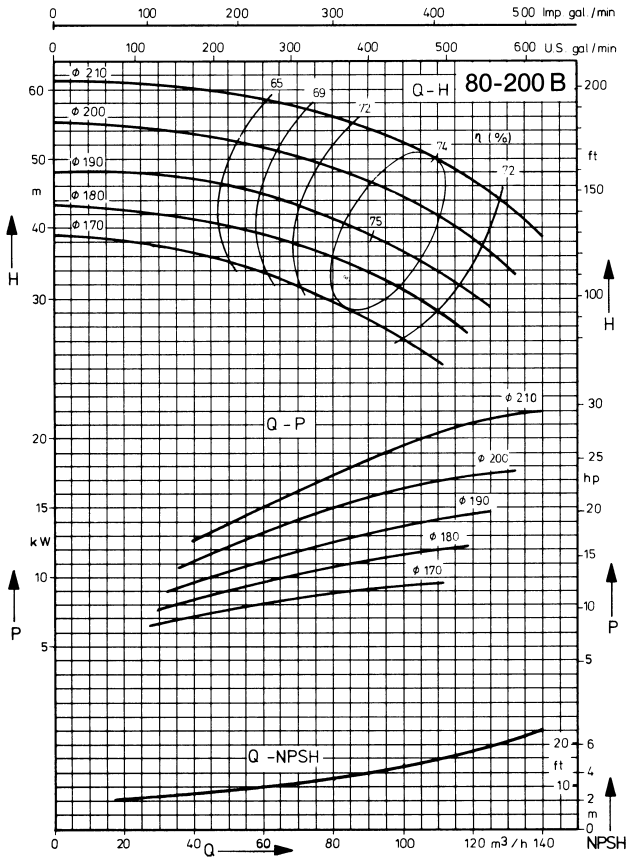
material design 0B, 0C



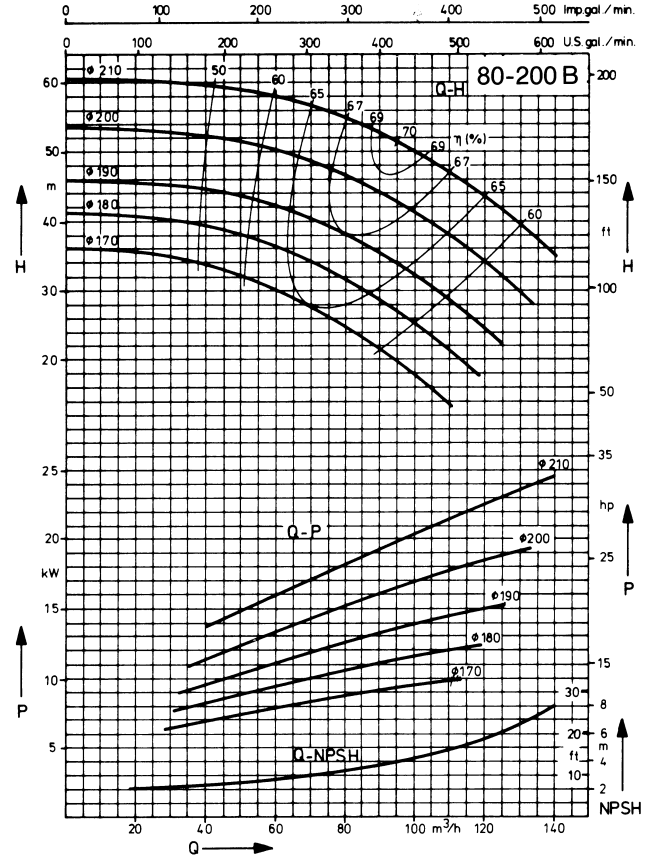
material design 4B

Characteristic curves

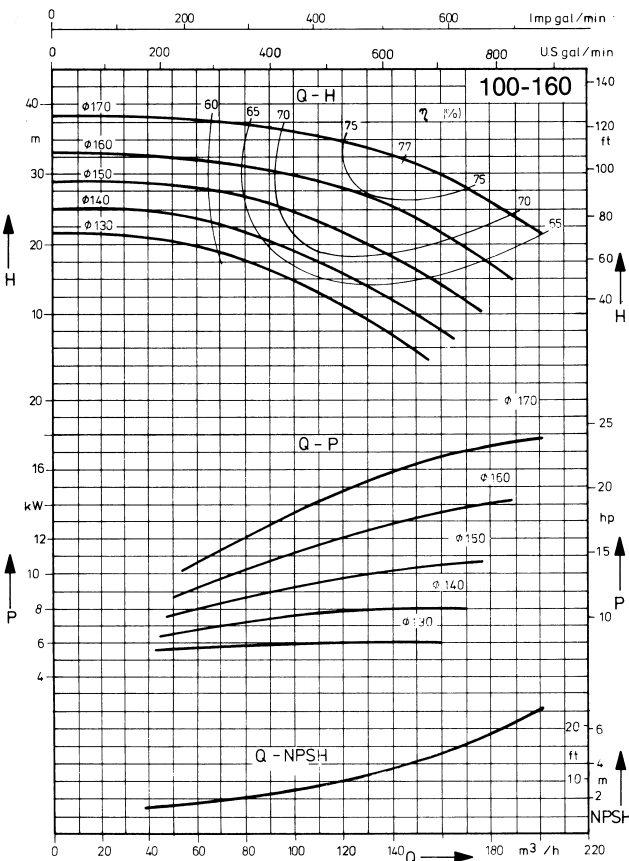
n = 2900 rpm



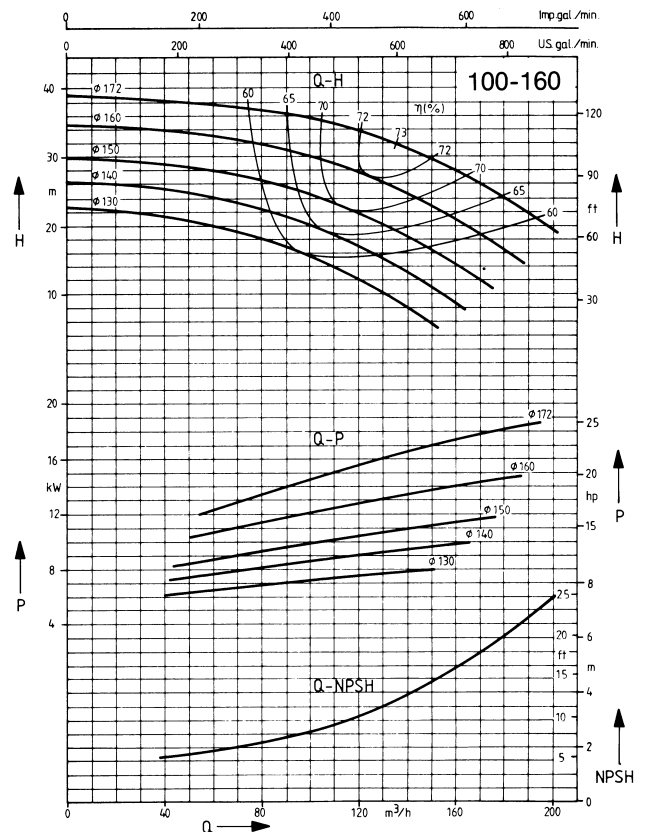
material design 0B, 0C



material design 4B



material design 0B, 0C

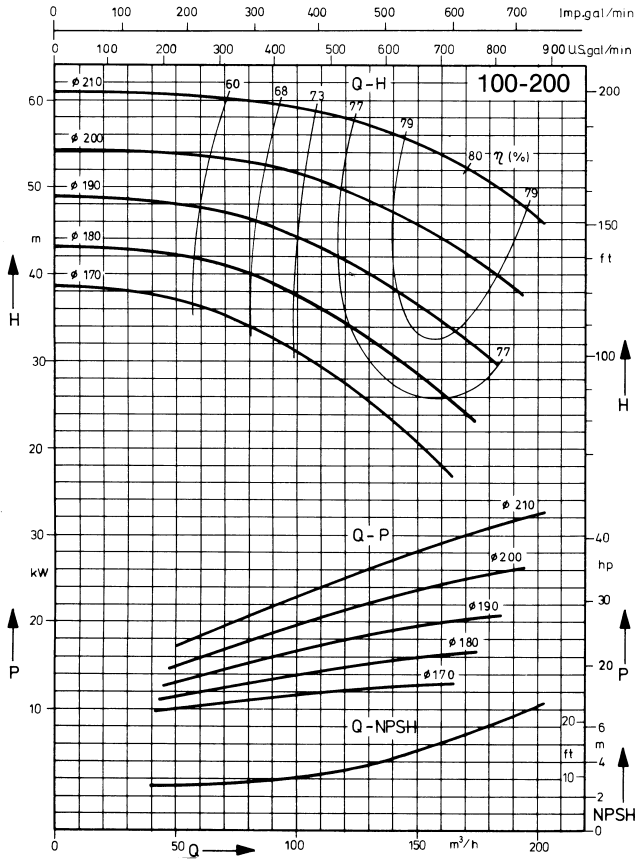


material design 4B

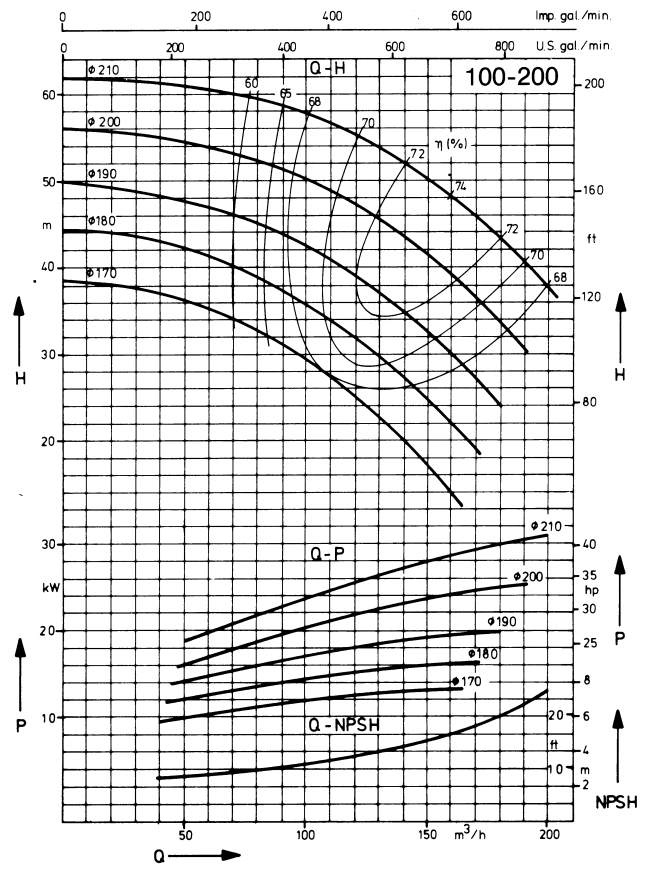


**Characteristic curves**

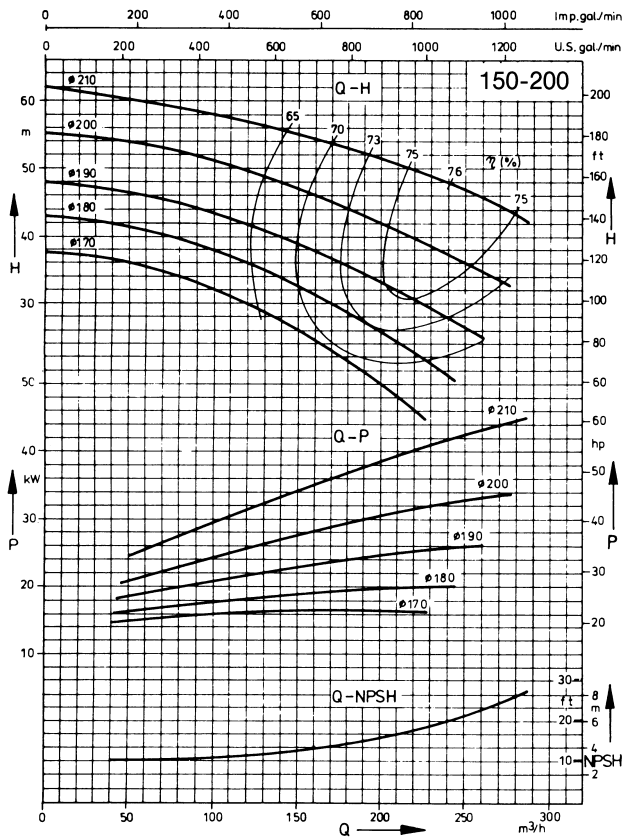
**n = 2900 rpm**



material design 0B, 0C



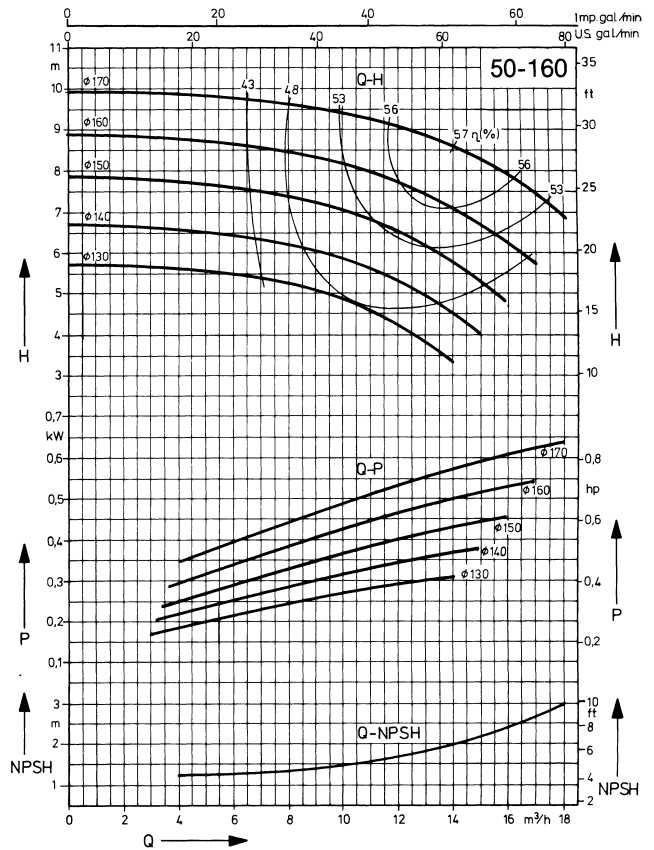
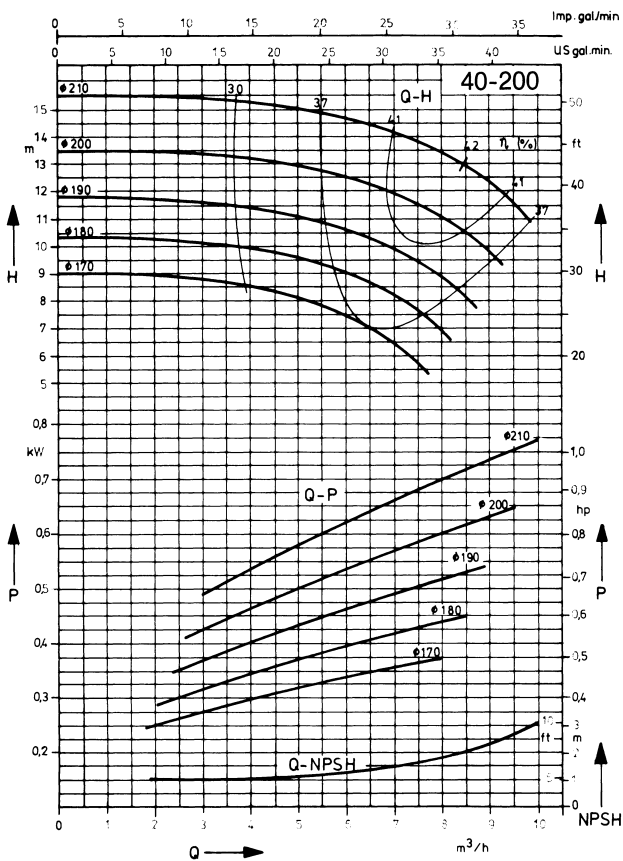
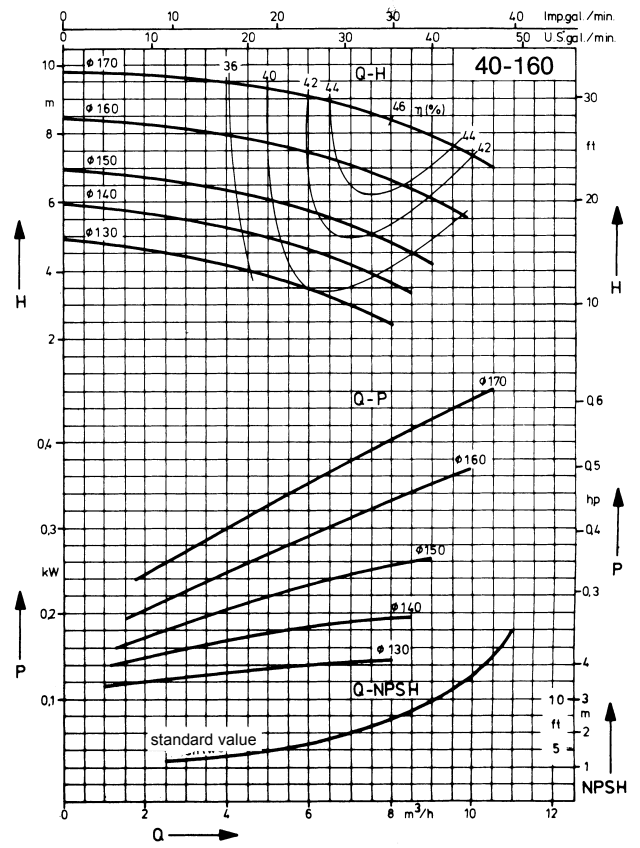
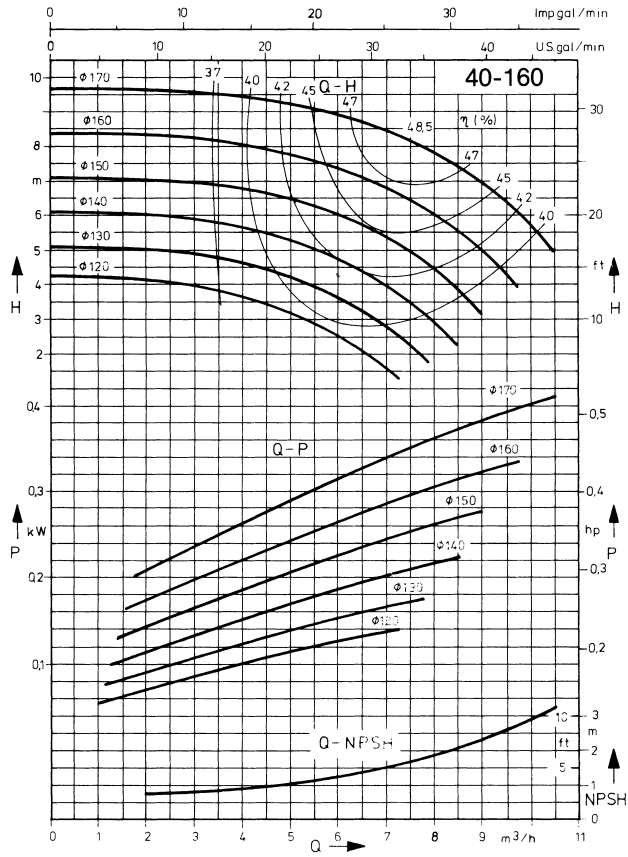
material design 4B



correction factor 3 % at material design 4B

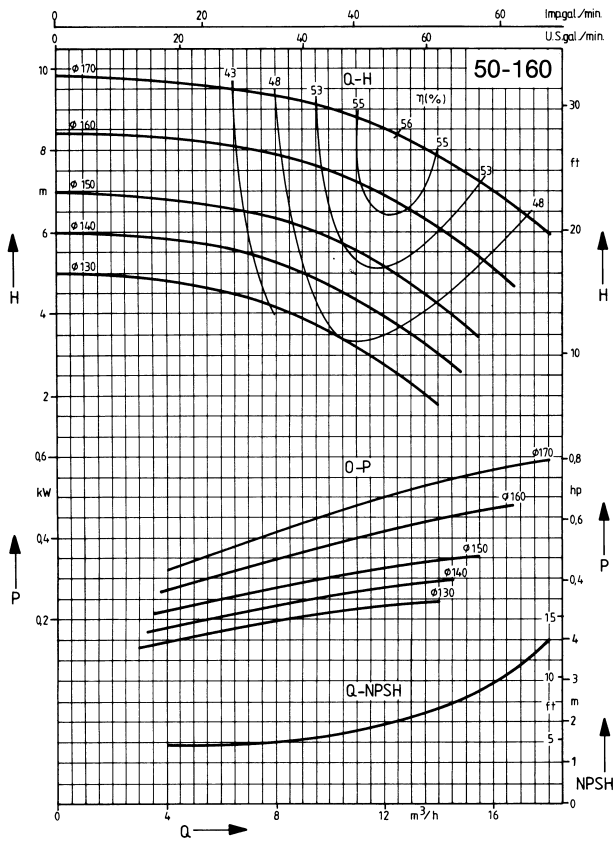
Characteristic curves

n = 1450 rpm

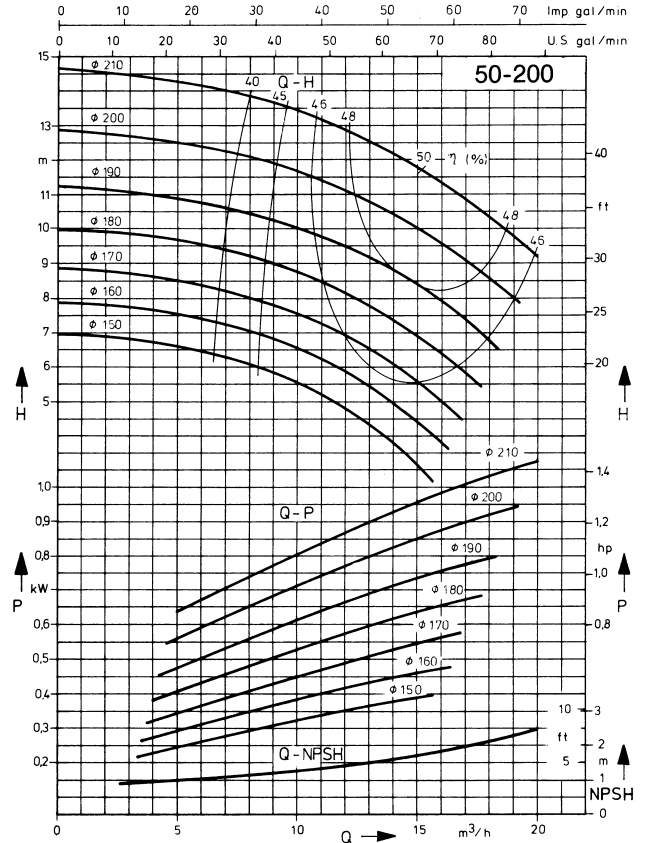


Characteristic curves

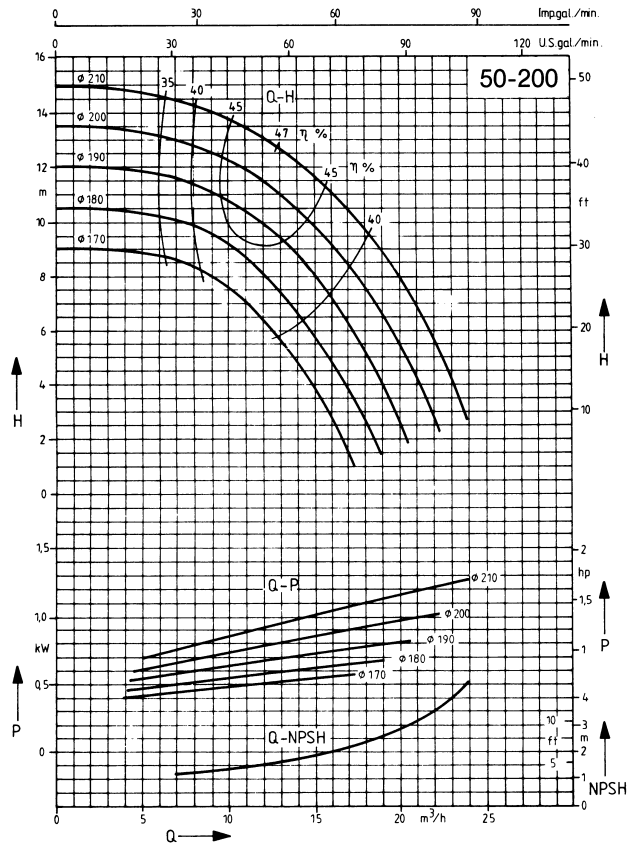
n = 1450 rpm



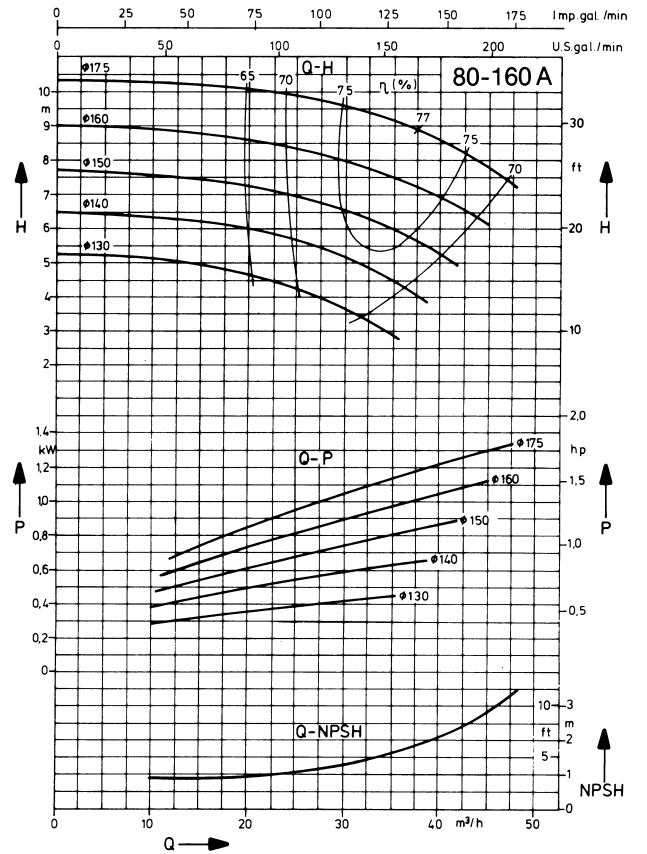
material design 0B, 0C



material design 4B



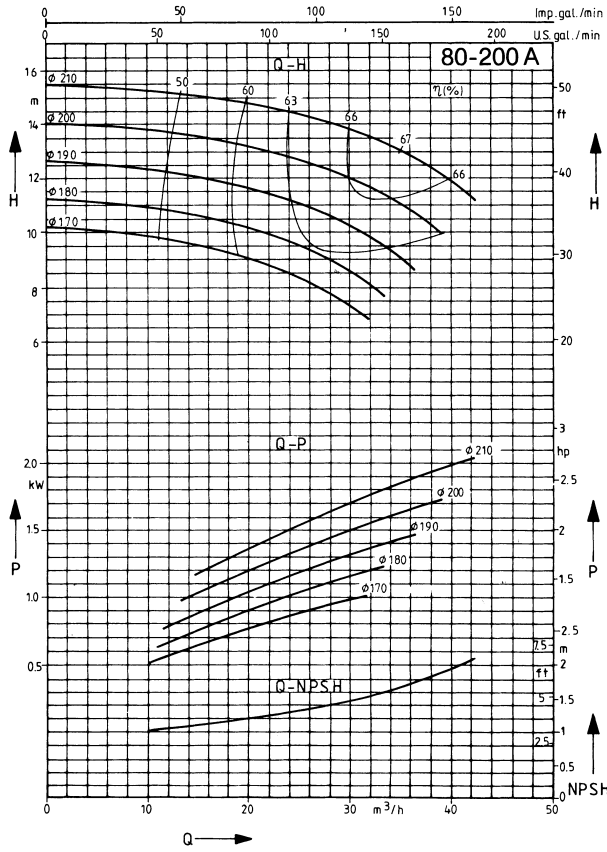
material design 4B



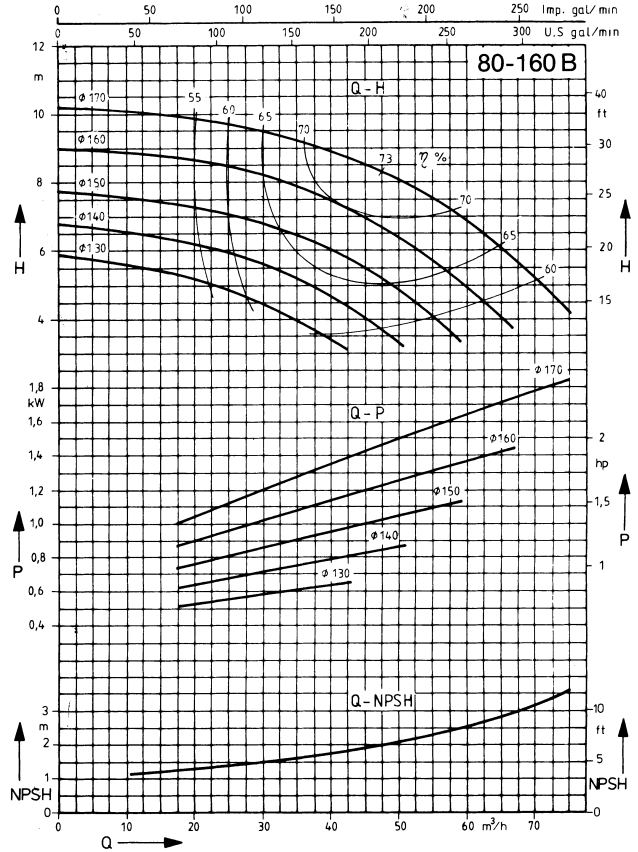
correction factor 3 % at material design 4B

Characteristic curves

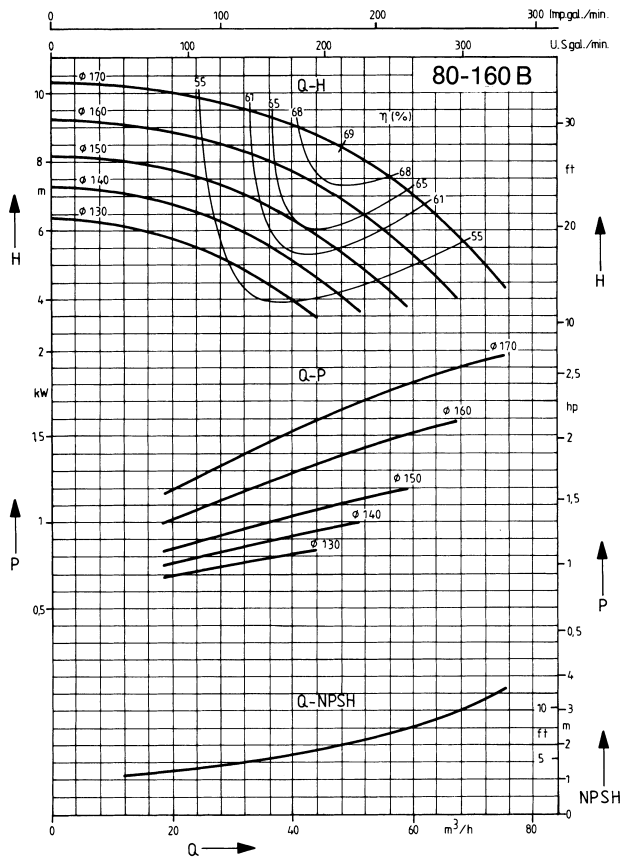
n = 1450 rpm



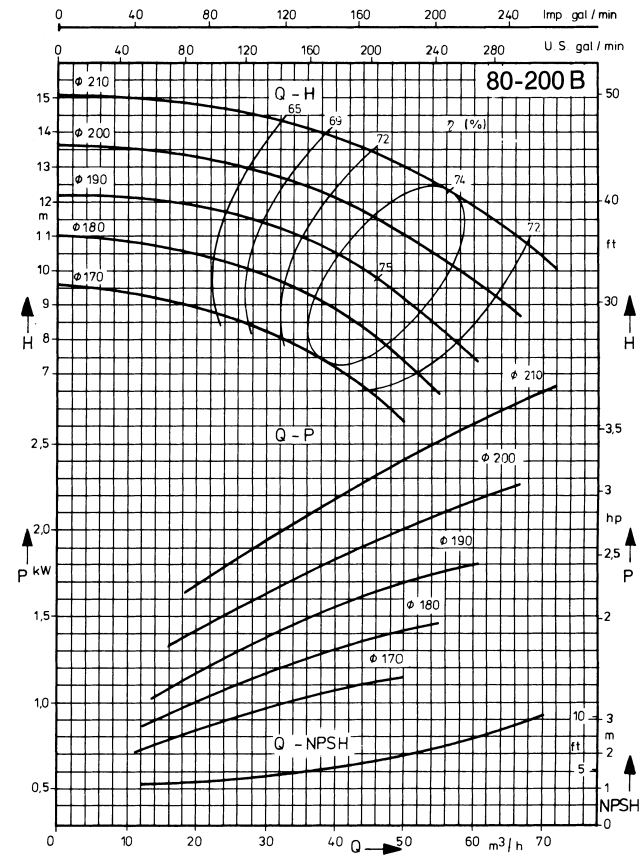
correction factor 3% at material design 4B



material design 0B, 0C



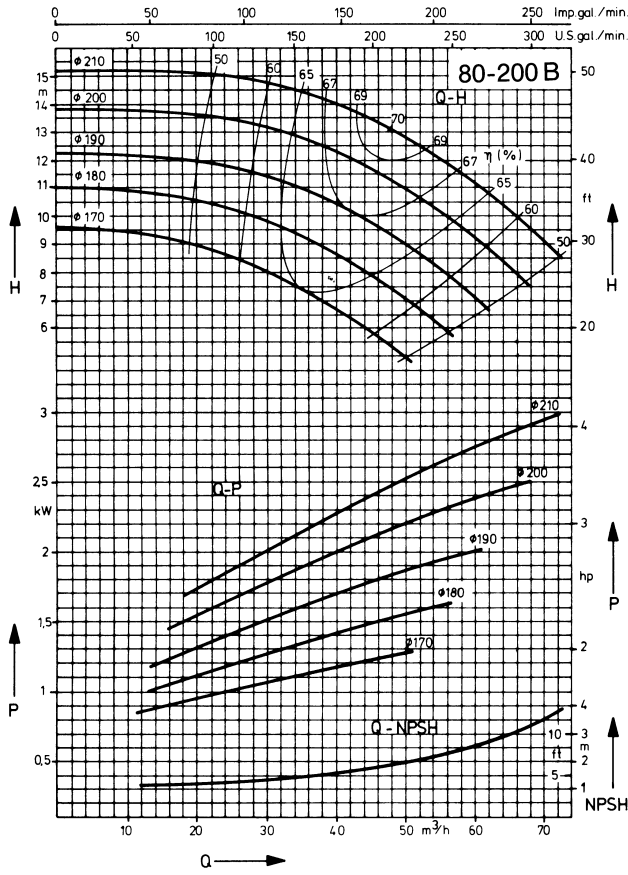
material design 4B



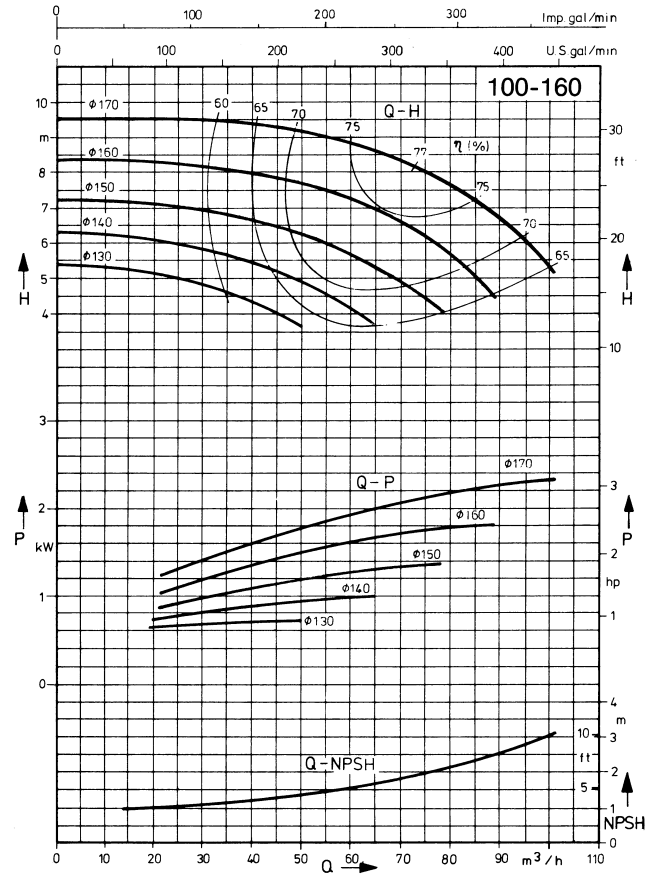
material design 0B, 0C

Characteristic curves

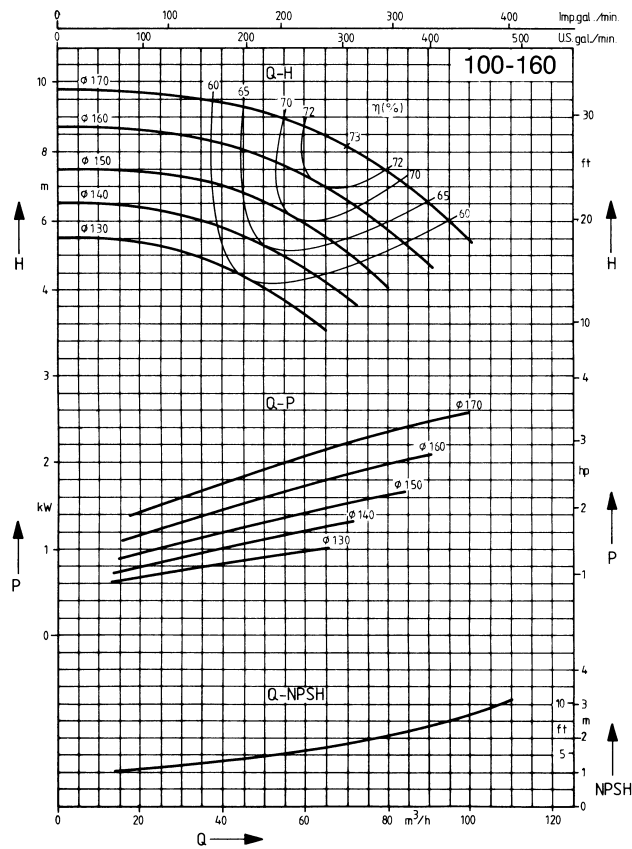
n = 1450 rpm



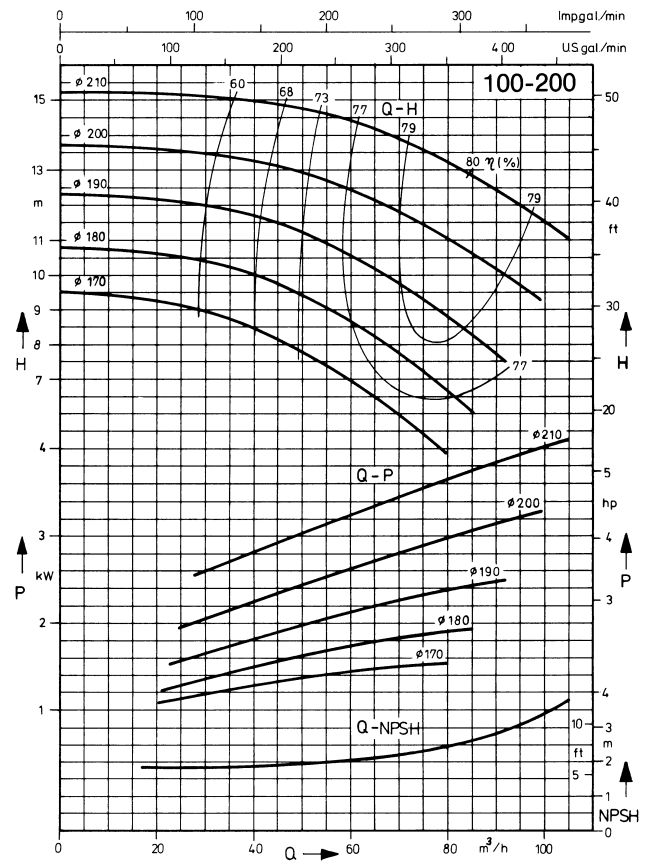
material design 4B



material design 0B, 0C



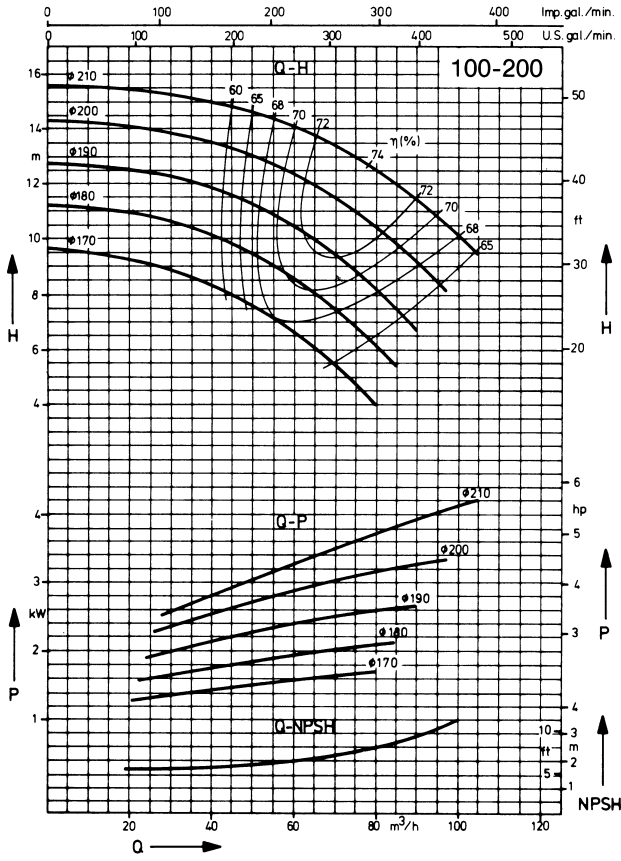
material design 4B



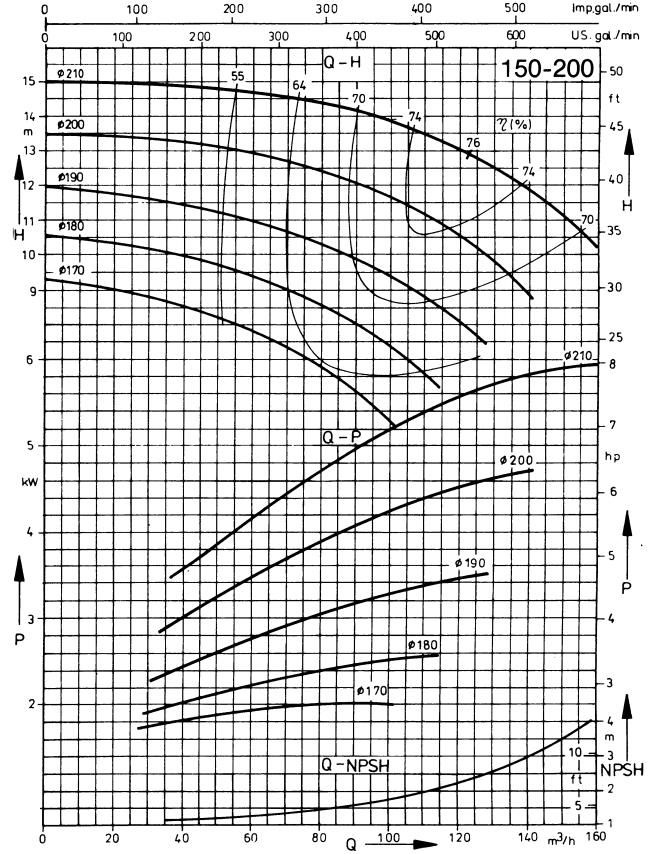
material design 0B, 0C

Characteristic curves

n = 1450 rpm



material design 4B



correction factor 3 % at material design 4B

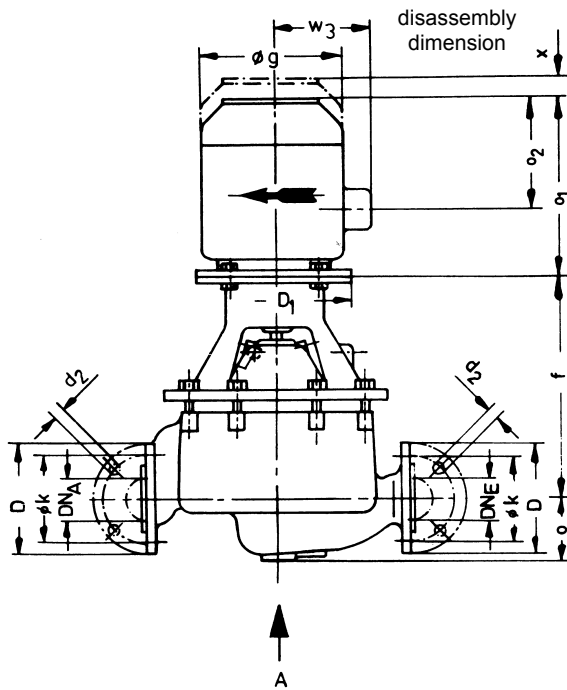
Values are applicable for water  $\rho = 1\text{kg/l}$



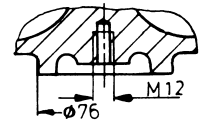
Dimension table

n = 2900 rpm

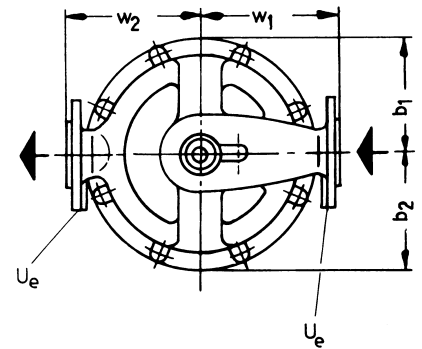
ZLI 25-125 / 25-160



possible foot mounting

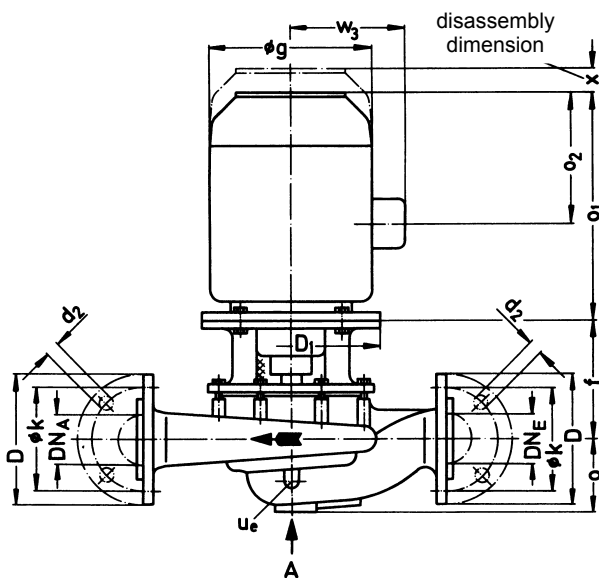


view A



ue = connection for drainage G 1/4

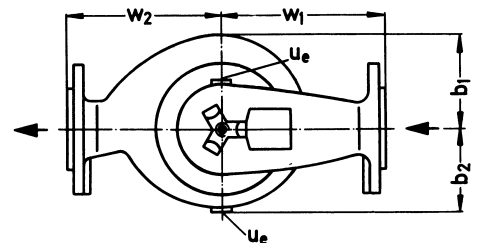
ZLI 40-160 ... 150-200



possible foot mounting



view A



ue = connection for drainage G 3/8

Dimension table

n = 2900 rpm

size	motor		DN <sub>A,E</sub>	b <sub>1</sub>	b <sub>2</sub>	D <sub>1</sub>	f	g*	o	o <sub>1</sub> *	o <sub>2</sub> *	W <sub>3</sub> *	W <sub>1</sub>	W <sub>2</sub>	x	weight abt. kg				
	size	kW														pump 0B,0C,0F	pump 4B,4F	motor		
25-125	80 b	1,1	25	128	128	200	212	157	73	228	128	123	140	140	120	27	29	10		
	90 S	1,5						186		249	143	125						14		
25-160	90 L	2,2	25	128	128	200	212	186	73	274	147		140	140	120	27	29	14		
	100 L	3,0						206		323	234	133						18		
40-160	90 L	2,0	40	115	115	200	167	186	82	274	185	125	180	160	80	31	37	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	40	138	138		210	260	90	386	227	213	200	180	80	31	37	41		
	132 S1	5,5				300												56		
	132 S2	7,5																59		
50-160	100 L	3,0	50	120	120	250	162	206	82	323	234	133	190	160	80	31	37	24		
	112 M	4,0																41		
	132 S1	5,5				300		210		260	386	227						213	56	
50-200	132 S1	5,5	50	138	138	300	210	260	90	386	227	213	200	180	80	31	37	56		
	132 S2	7,5																59		
	160 M1	11,0				350		310		521	308	245						110		
80-160 A	132 S1	5,5	80	138	125	300	210	260	150	386	227	213	240	200	80	31	37	56		
	132 S2	7,5																59		
	160 M	11,0				350		310		521	308	245						110		
80-200 A	132 S1	7,5	80	150	143	300	210	260	150	386	227	213	255	225	80	31	37	59		
	160 M1	11,0				350		310		521	308	245						110		
	160 M2	15,0																112		
80-160 B	132 S2	7,5	80	148	135	300	210	260	120	386	227	213	240	200	80	31	37	59		
	160 M1	11,0				350												110		
	160 M2	15,0																112		
80-200 B	160 M2	15,0	80	165	155		210		120				255	225	100	31	37	112		
	160 L	18,5																135		
	180 M	22,0									341	592						350	280	155
	200 L1	30,0				400		392		690	404	302						250		
100-160	160 M1	11,0	100	165	145	350	210	310	150	521	308	245	275	200	80	31	37	110		
	160 M2	15,0																112		
	160 L	18,5																135		
100-200	160 L	18,5	100	180	165		226		150				250	200	80	31	37	135		
	180 M	22,0									341	592						350	280	155
	200 L1	30,0				400		392		690	404	302						250		
150-200	180 M	22,0	150	203	173	350	210	341	188	592	350	280	350	280	120	31	37	155		
	200 L1	30,0				400		392		690	404	302						250		
	200 L2	37,0																260		

flange connections as per DIN 2501 PN 16						
DN <sub>A,E</sub>	25	40	50	80	100	150
k	85	110	125	160	180	240
D	115	150	165	200	220	285
d <sub>2</sub> x number	14 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 54  
dimensions depend on the motor make



## Data regarding size - order notes

Series + size	Hydraulic + bearing	Shaft sealing	Material design			casing seal
	<ul style="list-style-type: none"> <li>A ▪ hydraulic A</li> <li>B ▪ hydraulic B</li> <li>▪ K two grease-lubricated antifriction bearings in the motor</li> <li>▪ V one grease-lubricated antifriction bearing in the bearing bracket</li> </ul>	<ul style="list-style-type: none"> <li>AAE standard mechanical seal O-rings Perbunan</li> <li>BH3 bellows mechanical seal SiC-carbon, EP</li> <li>BHS bellows mechanical seal SiC/SiC, Viton</li> </ul>	<ul style="list-style-type: none"> <li>0B main parts of GG without nonferrous metal</li> <li>0C as 0B, but impellers of G-Cu Sn 10</li> <li>0F main parts of GG, impeller PPO</li> <li>4B main parts of Cr Ni Mo cast steel</li> <li>4F main parts of Cr Ni Mo cast steel, impeller PPO</li> </ul>	<ul style="list-style-type: none"> <li>2 flat seal</li> <li>4 PTFE</li> </ul>		
		AAE, BH3, BHS	0B 2	0C 2		0F 2
		BH3, BHS			4B 4	4F 4
ZLI	25-125		•		•	•
	25-160		•		•	•
	40-160		•		•	•
	40-200		•	•	•	
	50-160		•	•	•	
	50-200		•	•	•	
	80-160		•	•	•	
	80-200		•	•	•	
	80-160		•	•	•	
	80-200		•	•	•	
	100-160		•	•	•	
	100-200		•	•	•	
	150-200		•	•	•	

Applicable motors please take from the dimension table on page 15 - 17.

Motor selection table					
n = 2900 rpm			n = 1450 rpm		
kW	size	designation	kW	size	designation
0,75	80 a	FA	80 a	0,55	FB
1,1	80 b	GA	80 b	0,75	GB
1,5	90 S	HA	90 S	1,1	HB
2,2	90 L	JA	90 L	1,5	JB
3,0	100 L1	KA	100 L1	2,2	KB
4,0	112 M	MA	100 L2	3,0	LB
5,5	132 S1	NA	112 M	4,0	MB
7,5	132 S2	OA	132 S	5,5	NB
11,0	160 M1	SA	132 M	7,5	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 AV AAE 0C 2 with three-phase AC motor (50 Hz, 380 V Δ) 2900 rpm has the complete order No:

**ZLI ▪ 50-200 AV AAE 0C 2 OA**

In case of construction IM V 1 (vertical installation) special hint.

On delivery, the point (•) in the fourth place of the type designation is replaced by a letter in the factory.

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

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