

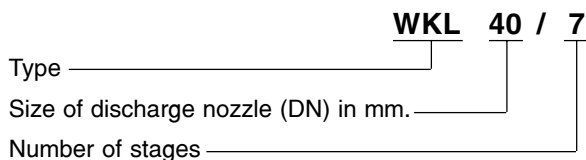
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1. Application

These pumps find applications in community as well as factory water supply systems, for pumping of condensate, as boiler feed pumps and for irrigation and sprinkler installations, for pumping of thin liquids and non-aggressive liquids.

2. Designation



3. Operating Data

3.1 Discharge head / pressure

- Maximum shut off head - 250 m.l.c.
- Maximum suction pressure - 10 bar
- Maximum permissible end pressure at shut off - 28 bar
- Temperature limits
 - Normal design - Up to 90 °C
 - Normal with cooled Gland - Up to 100 °C
 - Hot water design - Up to 140 °C

4. Design

4.1 Direction of rotation

Clockwise looking from the drive side.

4.2 No. of stages

Execution	Speed	
	1450 rpm	2900 rpm
Normal	16	11
HWD	14	9

Table no. 1

4.3 Branch position

Suction Nozzle : Horizontal to the right seen from driven end.
Discharge Nozzle : Vertically upwards.

4.4 Pump feet

Pump feet are always below pump casing.

4.5 Packings:

Size: 39 / 55 Ø x 8 mm ; 4 nos. on each side.
Length of packing - 600 mm approx.

4.6 Flanges

Suction flange - DN 50 - DIN 2532/10
Discharge flange - DN 40 - DIN 2534/25

4.7 Cooling water requirements:

Approx. 200 litres/hr. at pumped medium temperature of 140°C.

4.8 Weights & GD² Values:

Stages	Weights* (kg)	GD ² (kgm ²) (with water)
1	47	0.024
2	56	0.045
3	65	0.067
4	74	0.088
5	83	0.109
6	92	0.130
7	101	0.150
8	110	0.170
9	119	0.190
10	128	0.220
11	137	0.240
12	146	0.260
13	155	0.280
14	164	0.300
15	173	0.320
16	182	0.340

Table no. 3

*Add 10 kgs for HWD execution

5 Material executions

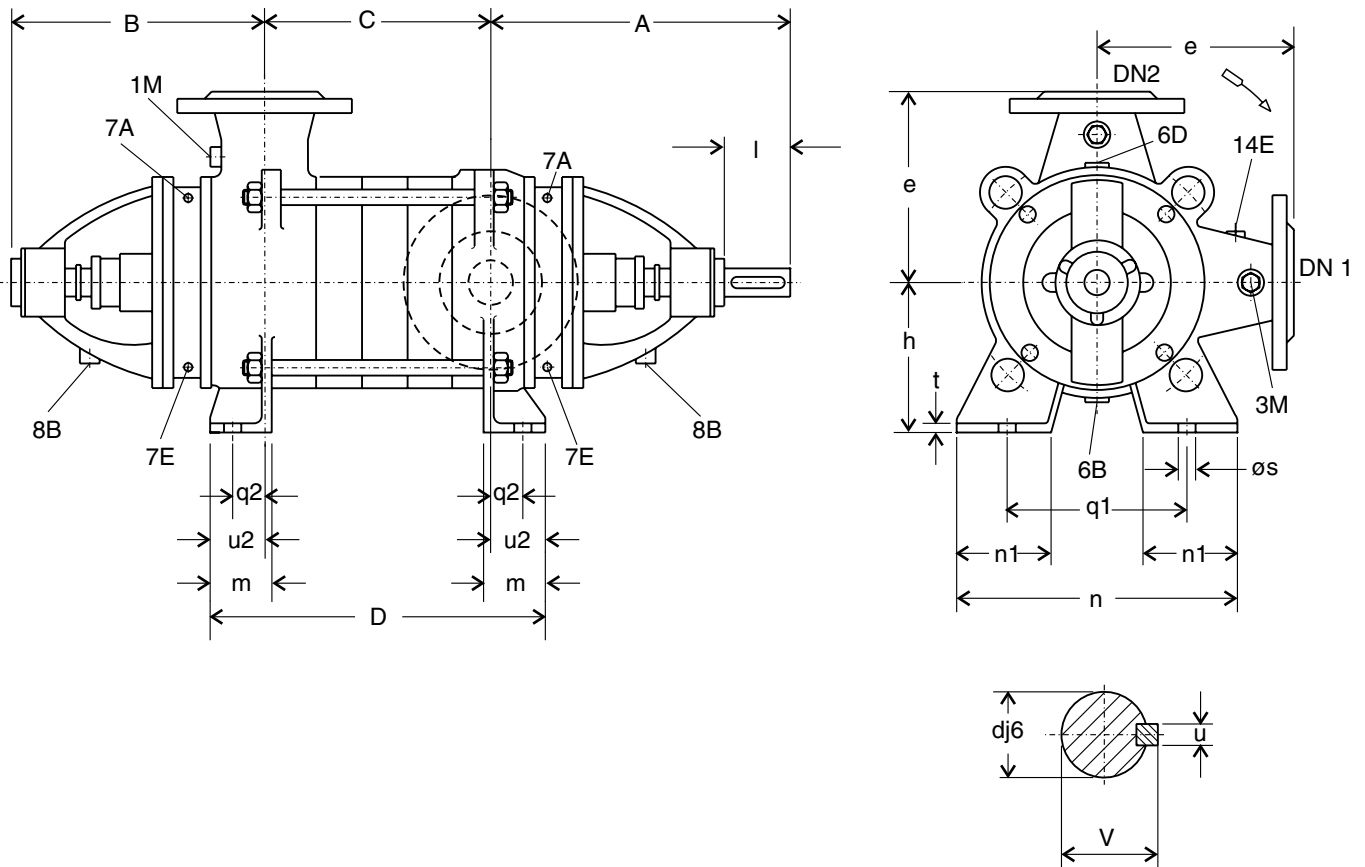
Part no.	Description	Execution	
		0	1
106	Suction casing	C. I.	C. I.
107	Discharge casing	C. I.	C. I.
108	Stage casing	C. I.	C. I.
230	Impeller	C. I.	LG2
171	Diffuser	C. I.	C. I.
210	Shaft	45 C 8	45 C 8
524	Shaft protection sleeve	C. I.	C. I.
521	Stage sleeve	C. I.	C. I.
905	Tie rod	45 C 8	45 C 8
-	Studs, nuts	5.8 , 6.0	5.8 , 6.0

Table no. 4

Material Specifications

Material	Grade	Reference Standard	Equivalent International Standard
Cast Iron	FG 260	IS : 210	ASTM A 48 : 40 B
Carbon Steel	45 C 8	IS : 5517	ASTM A 576 - 90B
Bronze	LG2	BS 1400	

Table no. 5

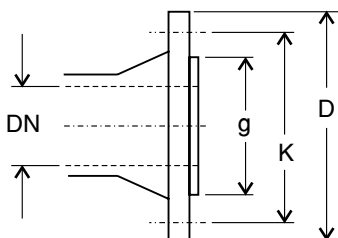
6. Dimensions and Connections:

Pump Dimensions in mm

B*	A*	l	q2	u2	m	D	e	h	t	q1	n	n1	dj6	v	u	ø _s
200	250	50	30	43	48	C+86	170	115	12	170	210	60	210	32.5	8	30

* For HWD Design Dimension B = 235 mm and Dimension A = 300 mm

Stage Dimension in mm

Stages	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Dimn. C	70	120	170	220	270	320	370	420	470	520	570	620	670	720	770	820

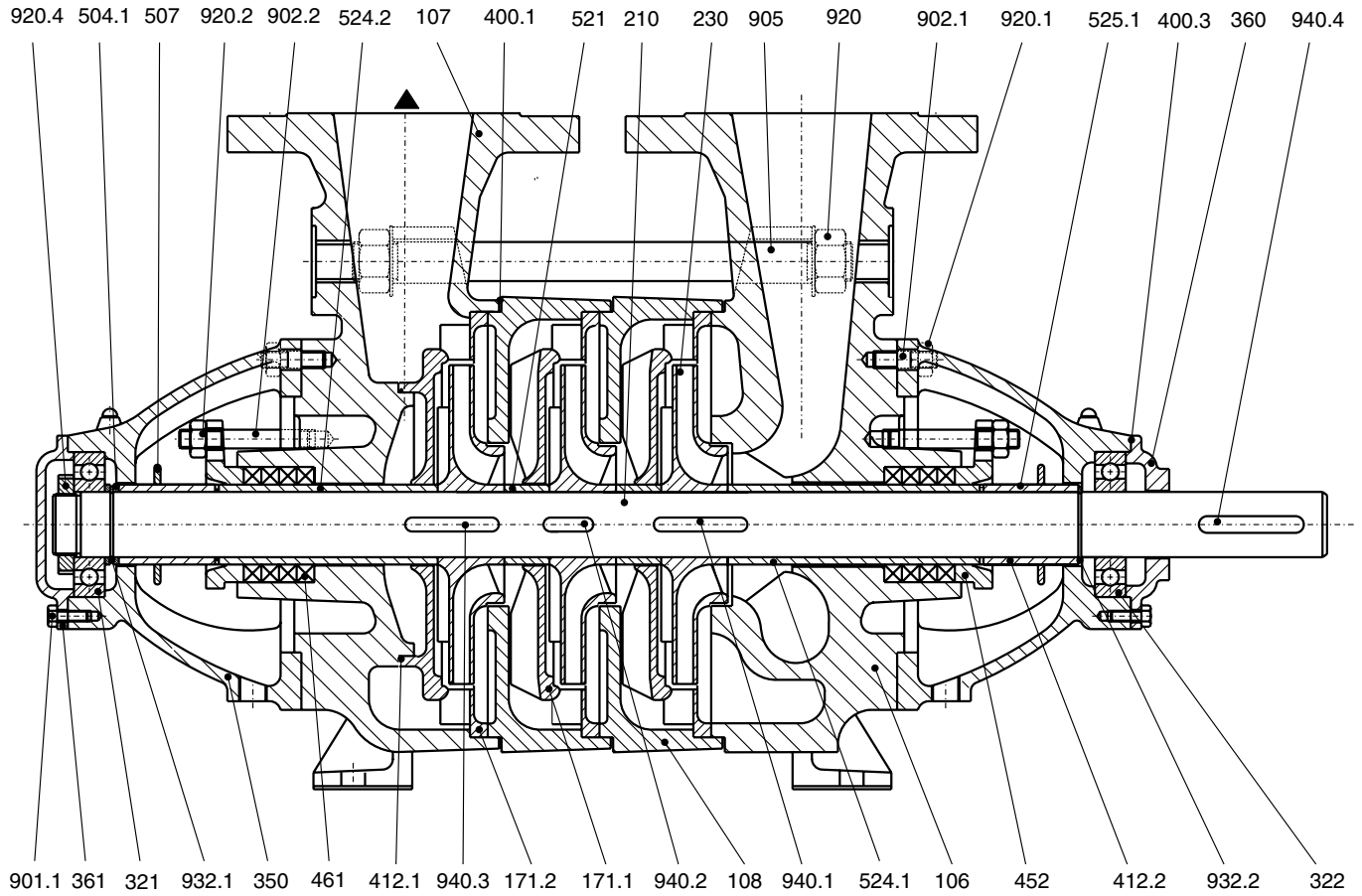

Flange Dimension in mm

Flanges	Standard	DN	D	K	g	b	Holes	Dia.
Suction	DIN 2532/10	50	165	125	102	20	4	18
Discharge	DIN 2534/25	40	150	110	88	20	4	18

Location	Connection	Size
1M	Pressure gauge	G 1/2"
8B	Drain bearing housing	G 1/2"
3M	Vacuum gauge	G 1/2"
7E/7A	Cooling inlet/outlet	G 3/8"
6B	Drain suction / Discharge	G 3/8"
9E/9A	Sealing inlet/outlet	G 1/8"
6D	Priming vent	G 3/8"
14E/14A	Balancing liquid connection	G 1/8"

7. Sectional drawings

7.1 Normal Design

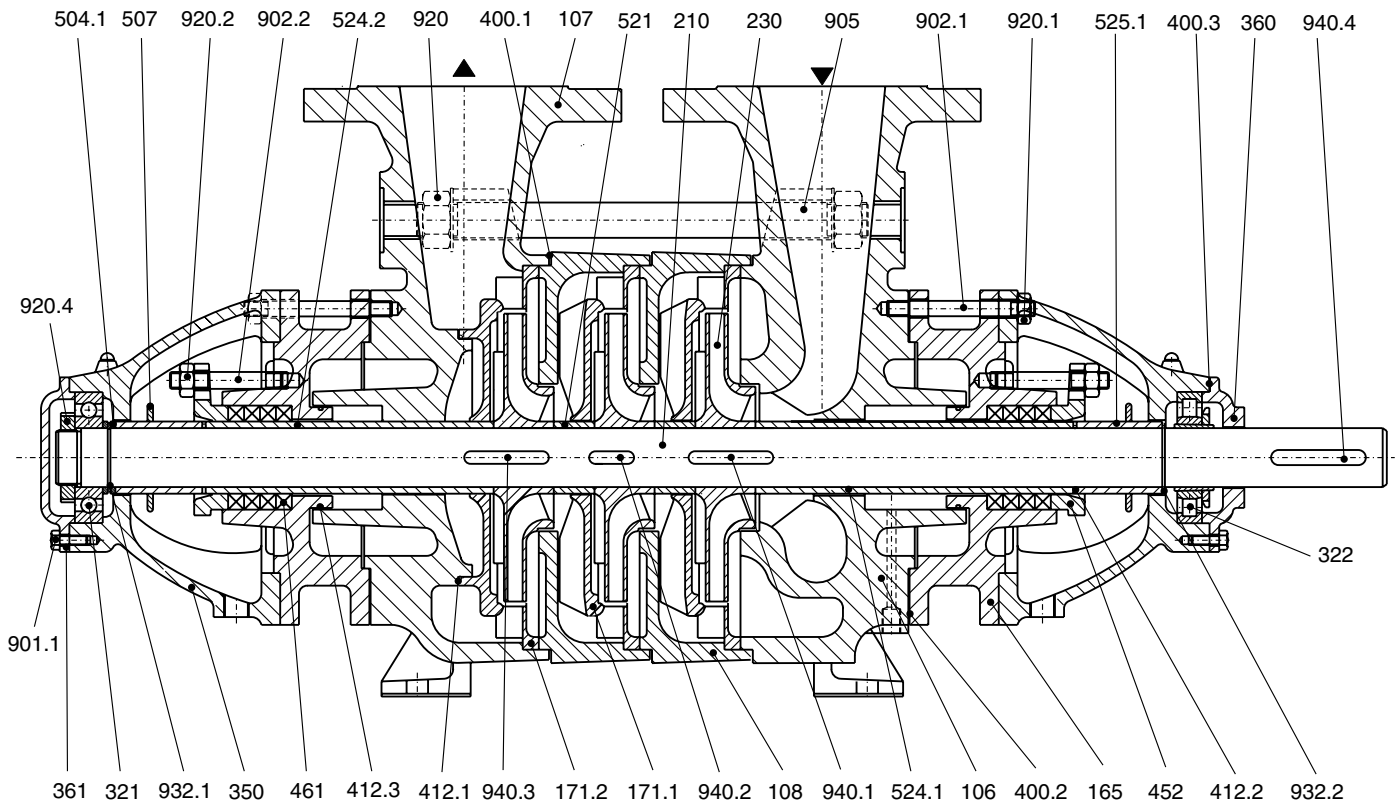


Part list

Part. No.	Description
106	Suction Casing
107	Discharge Casing
108	Stage Casing
171.1	Diffuser
171.2	Diffuser Last Stage
210	Shaft
230	Impeller
321	Deep Groove Ball Brg.
322	Cylindrical Roller Brg.
350	Bearing Housing
360	Bearin Cover/Motor Side
361	Bearing Cover/End Side
400.1/3	Flat Gasket
412.1/2/3	O Ring
452	Stuffing Box Gland

Part. No.	Description
458	Lantern Ring
461	Stuffing Box Packing
504.1	Spacer Ring
507	Splash Ring
521	Stage Sleeve
524.1	Shaft Protection Sleeve/Inlet
524.2	Shaft Protection Sleeve/Outlet
525.1	Spacer Sleeve
901.1	Hex. Bolt
902.1/2	Stud
905	Tie Rod
920.1/2	Hex Nut
920.4	Shaft Nut
932.1/2	Circlip
940.1/2/3/4	Key

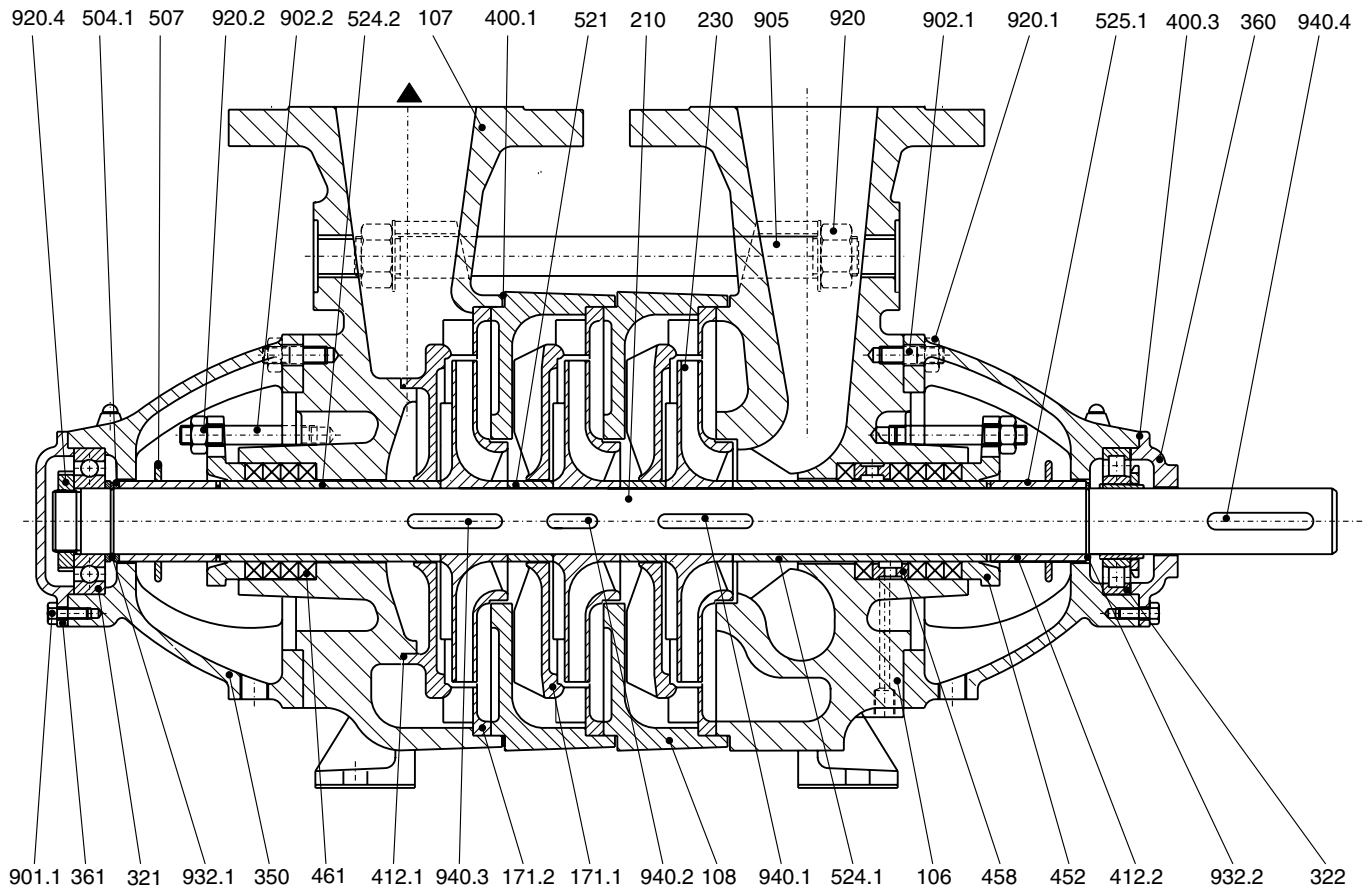
7.2 Hot Water Design (HWD)



Part list

Part. No.	Description
106	Suction Casing
107	Discharge Casing
108	Stage Casing
165	Cooling Cover
171.1	Diffuser
171.2	Diffuser Last Stage
210	Shaft
230	Impeller
321	Deep Groove Ball Brg.
322	Cylindrical Roller Brg.
350	Bearing Housing
360	Bearin Cover/Motor Side
361	Bearing Cover/End Side
400.1/.2/.3	Flat Gasket
412.1/.2/.3	O Ring

Part. No.	Description
452	Stuffing Box Gland
458	Lantern Ring
461	Stuffing Box Packing
504.1	Spacer Ring
507	Splash Ring
521	Stage Sleeve
524.1	Shaft Protection Sleeve/Inlet
524.2	Shaft Protection Sleeve/Outlet
525.1	Spacer Sleeve
901.1	Hex. Bolt
902.1/.2	Stud
905	Tie Rod
920.1/2	Hex Nut
920.4	Shaft Nut
932.1/.2	Circlip
940.1/.2/.3/.4	Key

7.3 Export Design (E)

Part list

Part. No.	Description
106	Suction Casing
107	Discharge Casing
108	Stage Casing
171.1	Diffuser
171.2	Diffuser Last Stage
210	Shaft
230	Impeller
321	Deep Groove Ball Brg.
322	Cylindrical Roller Brg.
350	Bearing Housing
360	Bearin Cover/Motor Side
361	Bearing Cover/End Side
400.1/3	Flat Gasket
412.1/2/3	O Ring
452	Stuffing Box Gland

Part. No.	Description
458	Lantern Ring
461	Stuffing Box Packing
504.1	Spacer Ring
507	Splash Ring
521	Stage Sleeve
524.1	Shaft Protection Sleeve/Inlet
524.2	Shaft Protection Sleeve/Outlet
525.1	Spacer Sleeve
901.1	Hex. Bolt
902.1/2	Stud
905	Tie Rod
920.1/2	Hex Nut
920.4	Shaft Nut
932.1/2	Circlip
940.1/2/3/4	Key

8 Selection procedure

8.1 Enquiry

Enquiry must clearly include the following minimum information.

- Client :
- Client's enquiry No. & date :
- Plant / Project :
- KSB Project Ref. No. :
- Liquid handled :
- Required capacity :
- Required differential head :
- Suction pressure :
- Discharge pressure :
- Temperature :
- Specific gravity :
- Viscosity :
- NPSH available :
- Vapour pressure of the liquid at pumping temperature :
- Performance test standard :

8.2 Selection Procedure

Operating Conditions

Liquid		
Capacity (m ³ /hr.)	Q	
Total head (m)	H	
Liquid temperature (°C)	t	
Specific gravity	ρ	
NPSHa (m)		

To determine no. of stages

Select material of construction
Check whether
Hot water design is required
Operating point is between 3.5 - 22 m ³ /hr.
No. of stages allowed
NPSH is sufficient (NPSHr < NPSHa)

8.3 Computation of performance

1. Determine head per stage (m) = $\frac{\text{Total Head}}{\text{No. of stages}}$


2. Impeller diameter in mm

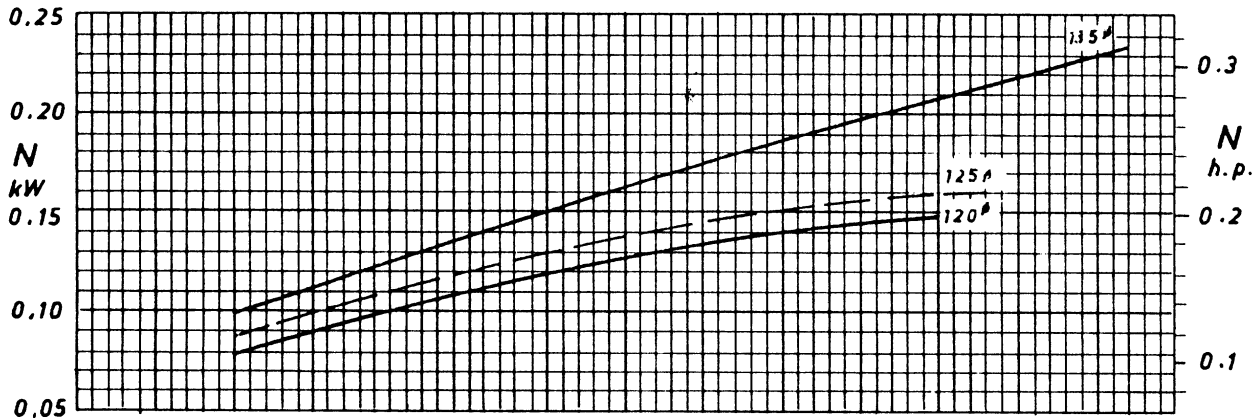
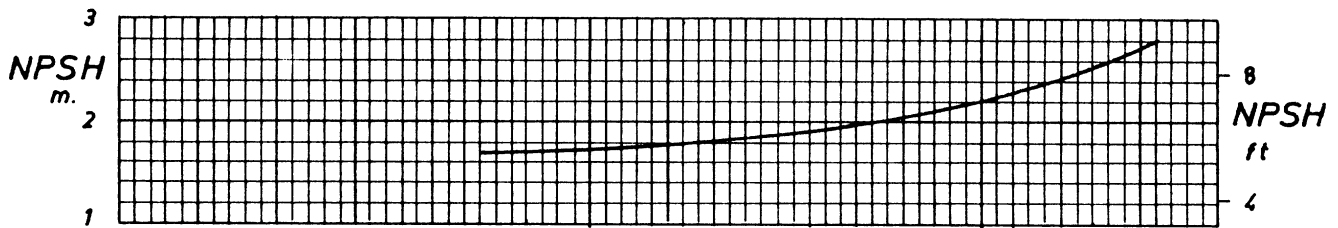
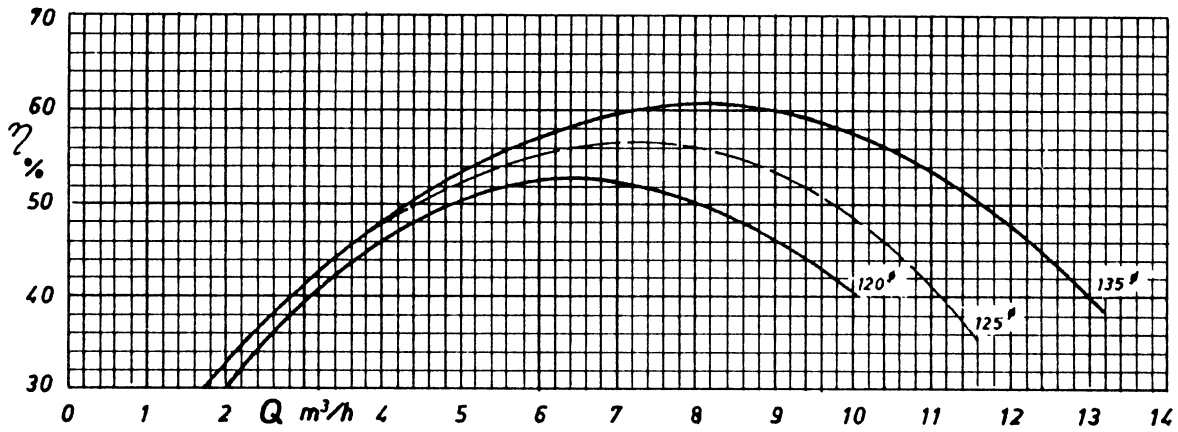
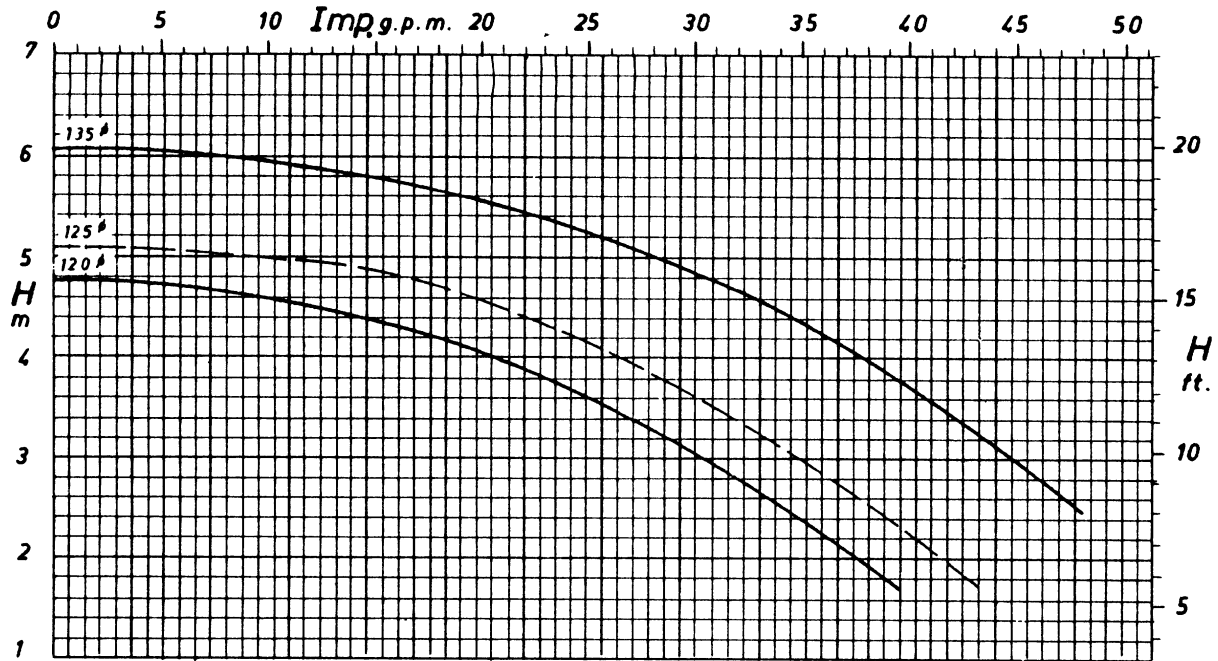
3. Efficiency (%)

4. BkW = $\frac{Q \times H \times \rho}{367 \times \eta}$


5. BkW x Power margin

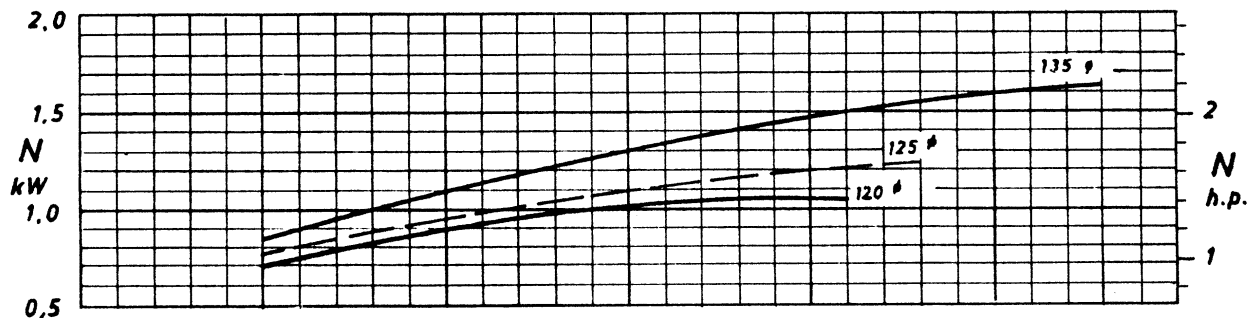
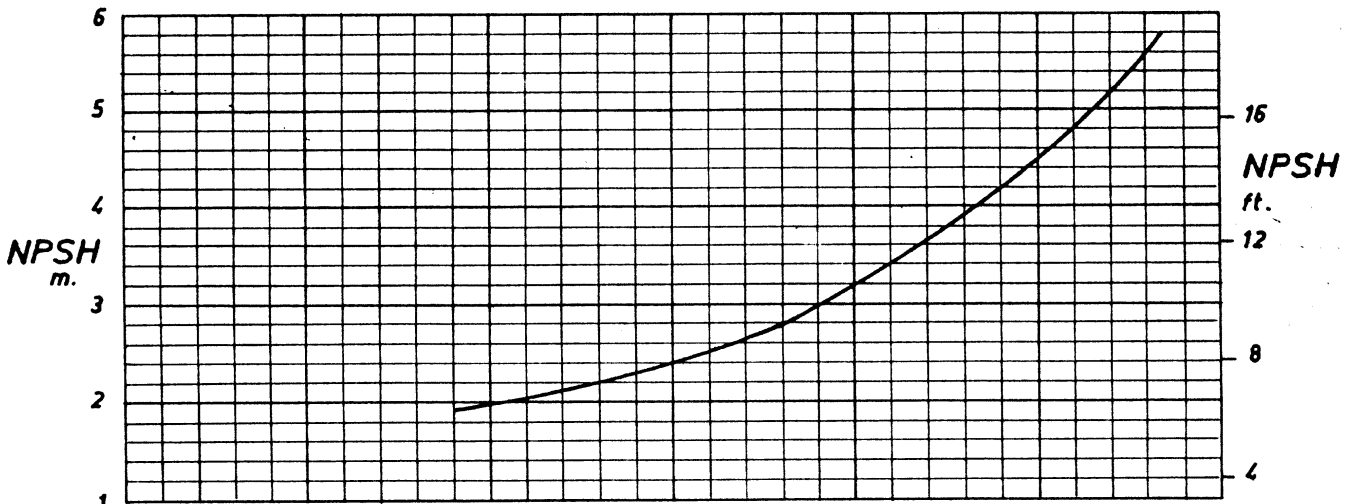
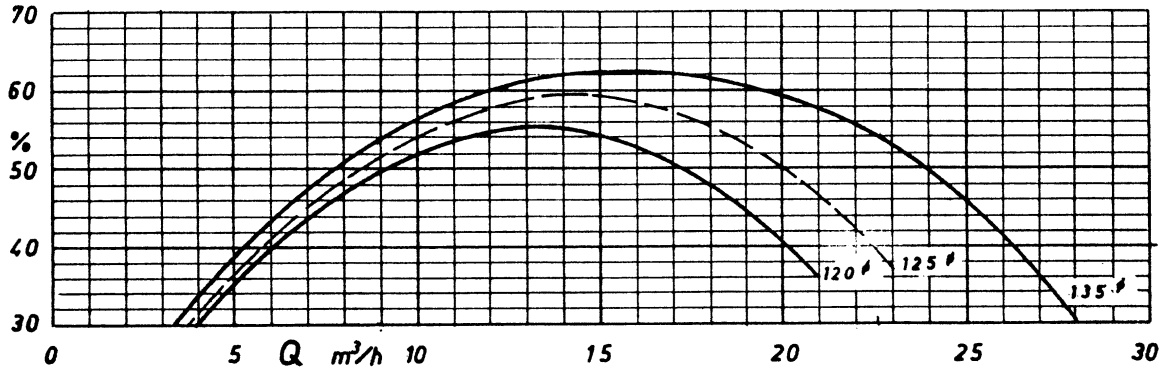
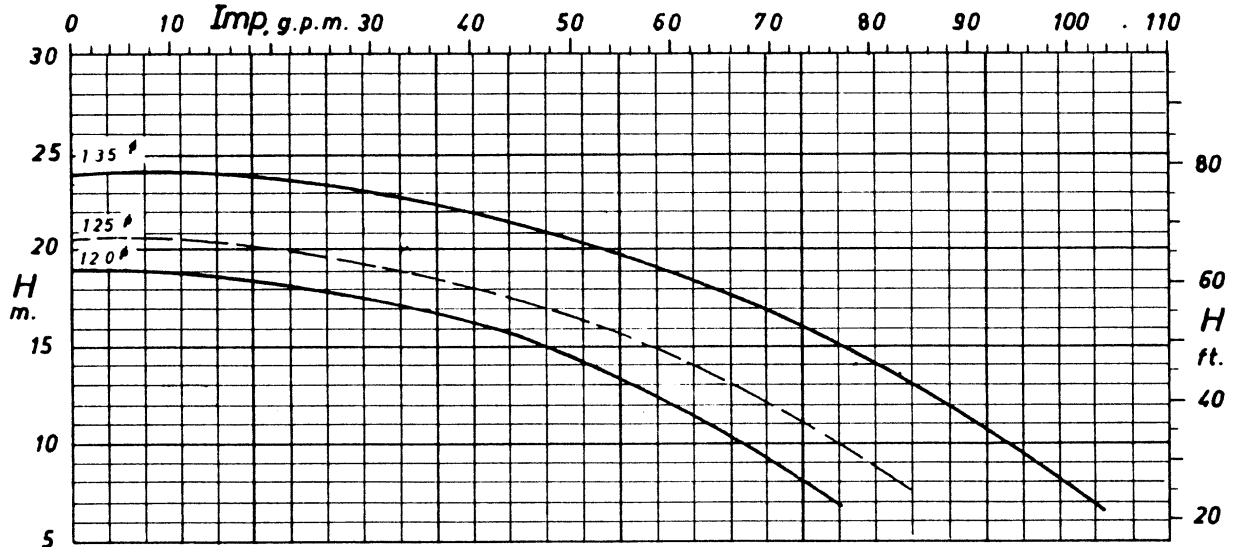
6. Select motor rating rounded off to the nearest kW available

Pump type : WKL 40	Nominal speed : 1450 rpm Frequency : 50 Hz	
Curve no. : R 1770.452/141/07	Impeller outlet width : 6	



NPSH Values are actual measured values, for factor of safety add 0.5 m.

Pump type : WKL 40	Nominal speed : 2900 rpm Frequency : 50 Hz	
Curve no. : R 1770.452/141/06	Impeller outlet width : 6	



NPSH Values are actual measured values, for factor of safety add 0.5 m.

