KOLMEKS

Pump Catalogue

Contents

IN-LINE PUMPS

PERFORMANCES
- DN 32-400
- 0,05-320 KW
- 0,1-500 l/s
- -35°C-+180°C

MATERIALS
- -35°C-+180°C
- CAST IRON PN 10
- CAST IRON PN 16
- BRONZE PN 10
- STAINLESS STEEL AISI 316 PN16

ECO PRODUCT

- Low life cycle cost
- Exhangeable motors
- Bearings lubricated for lifetime
- Completely repairably

KOLMEKS

IN-LINE CENTRIFUGAL PUMPS

RANGE L and AL

KOLMEKS

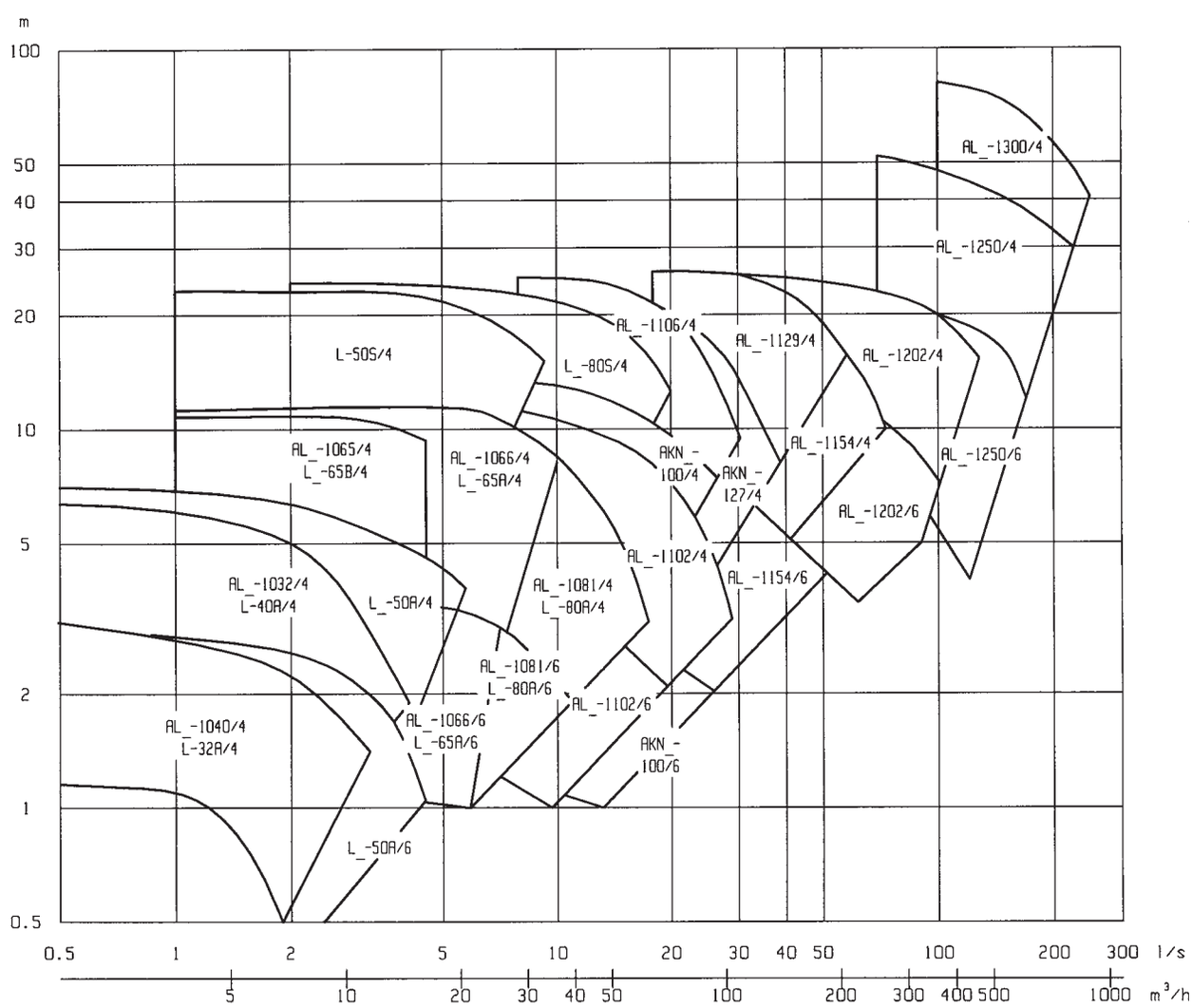
General features

The L-, AL_ - and AKN_ -ranges consist of single-stage In-Line centrifugal pumps made in compact Monobloc design. The new L-range will replace the AL-range starting from the smaller pumps. This catalogue includes the new L-range pumps from DN32 to DN125.

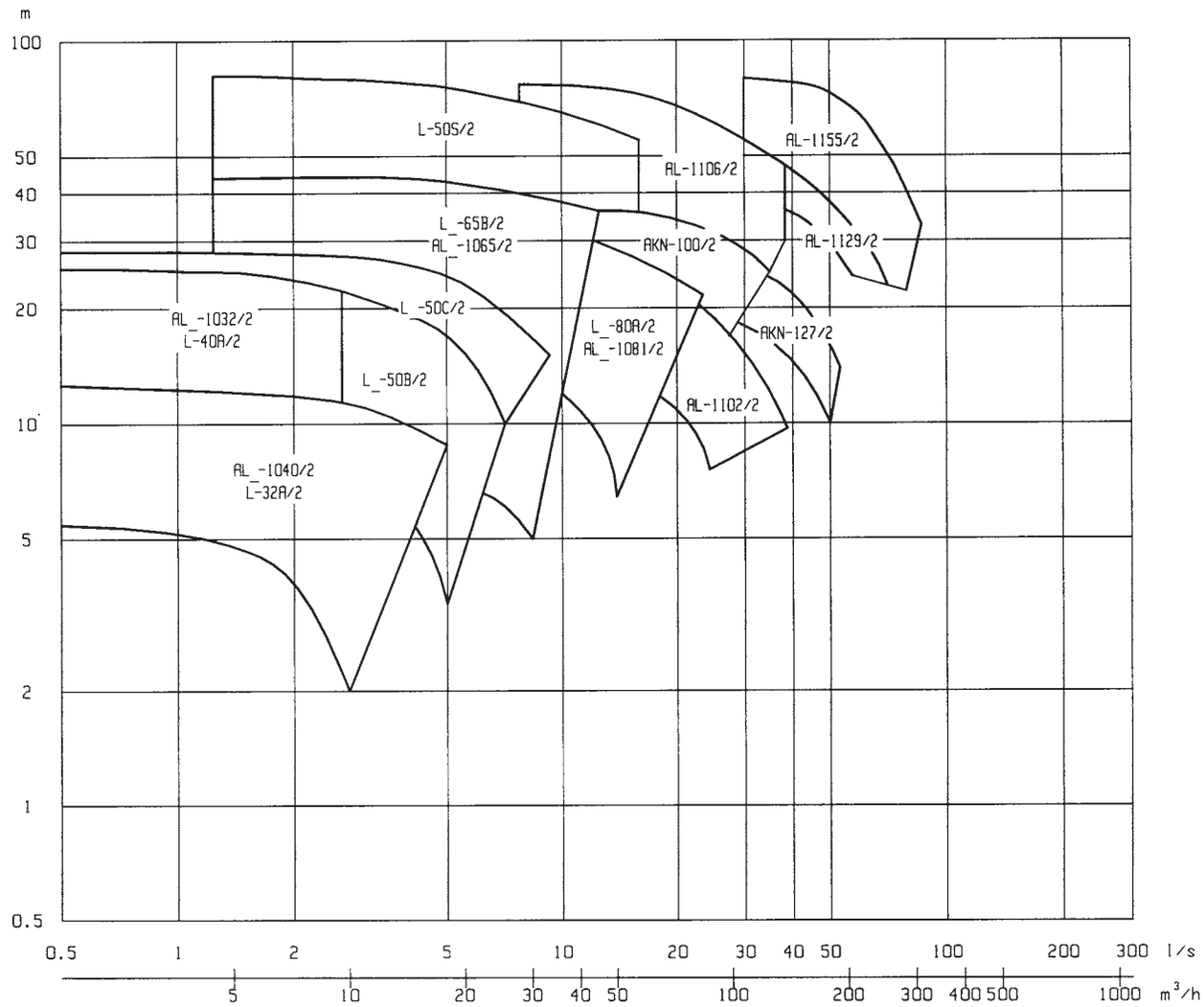
Applications

The L-, AL/ALH- and AKN/AKNH-pumps are made of cast iron and designed for applications for clean non-aggressive liquids including heating and primary hot water circulation, cooling, chilled and condenser water circuits. The pumps of the ALP-series made of bronze are more suitable for hot water supply (HWS), secondary and other applications requiring a construction of corrosion-resistant materials. The ALS-pumps are made of stainless steel and fulfill various industrial pumping requirements. Please contact us for correct specification whenever chemical and temperature details are different from what is given in our catalogue.

Duty chart at 50 Hz , 4- and 6-poles electric motors



Duty chart at 50 Hz , 2-poles electric motors



Please check the correct pump size (type, impeller size, motor) from the performance curves. There is no need for overdimensioning the Kolmeks pump, the duty point should be specified according to the real information and values of the system.

Whenever the duty point required is not found on the charts, check the possibility of using a twin pump, both units running at simultaneously. For further information and performance curves, please check materials of the twin pumps in this catalogue and contact your nearest Kolmeks representative.

Another solution for many performances required is variable speed drives (10..60Hz) of the pump. The electric motor, up to 22 kW of Kolmeks pump could be integrated with frequency converter. There are two different design available, one where the equipment is on the side of the motor (FC) and another where the equipment is on the top of the motor (TC). Please contact your nearest Kolmeks representative to choose the best possible drive for your application.

Whenever there is variation on the required duty point due the changes in the system one should consider the use of variable speed drives. In applications where the pump is continuously running with full load the variable speed drives seldom will offer significant savings in the energy consumption.

Design

Pump

The L-, AL_- and AKN_-range pumps are vertical, single stage, monobloc design centrifugal pumps equipped with dry type electric motor. The impeller is mounted directly on the shaft of the motor (no separate couplings).

Electric motor

The electric motors of the L-, AL_- and AKN_-ranges are especially dimensioned and designed totally enclosed fan cooled squirrel cage motors for pump application. The motor design also ensures high efficiency and silent running and is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz, 3-phase	< 4 kW
	690/400 V, 50 Hz, 3-phase	4 kW and above
Enclosure:	IP 54	
	IP55 4 kW and above (1000, 1500 r/min), 5.5 kW and above (3000 r/min)	
Insulation class:	F	
Type of duty:	S1	
Ambient temperature:	+ 45 °C	

N.B. Other voltages (e.g. single phase) and specifications available by request!

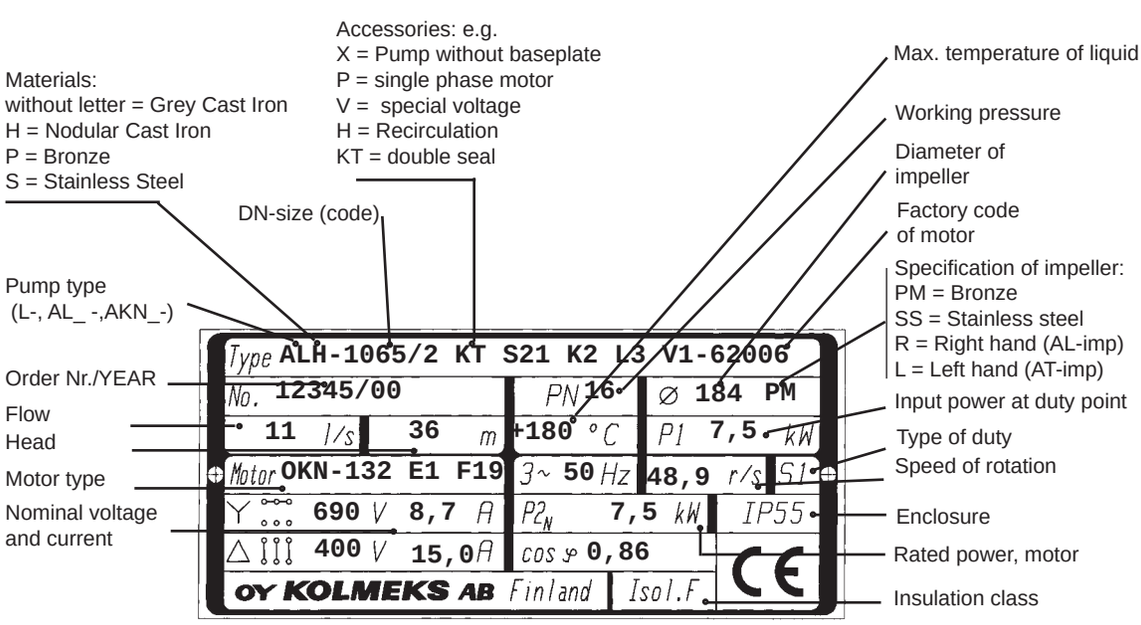
Flanges

The dimensions of flanges in the L-, AL_- and AKN_-ranges follow the standard ISO 7005. Both pump flanges have pressure gauge tappings, G 1/4. The flange diameters of 200 mm and above are available in accordance with PN16 or PN10 dimensions, PN10 as standard. Also other standards can be applied for flanges, by request.

Shaft seals

The shaft seals in the L-, AL_- and AKN_-ranges are maintenance free single mechanical seals with rubber bellows. The pumps can be provided also with other types of seals suitable for various liquids and temperatures.

Name plate



Materials available and seals

TYPE crey cast	MOTOR rpm	kW	ALH nodular cast	ALP bronze	ALS stainless	SHAFT SEAL Ø, materials	O-RING size, Ø	material
L-32A	1500/3000	0,05-0,65	---	---	---	12 mm, carbon/SiC EPDM	100 x 2,5	NBR
AL-1032*	1500/3000	0,2-1,5	---	yes	yes	12 mm, carbon/SiC EPDM	145 x 2,5	NBR
L-40A	1500/3000	0,2-1,5	---	---	---	12 mm, carbon/SiC EPDM	145 x 2,5	NBR
AL-1040*	1500/3000	0,05-0,65	---	yes	yes	12 mm, carbon/SiC EPDM	100 x 2,5	NBR
L-50A	1000/1500	0,11-0,37	yes	yes	---	12 mm, carbon/SiC EPDM	150 x 3	NBR
L-50B	1500/3000	0,2-1,1	yes	yes	yes	12 mm, carbon/SiC EPDM	150 x 3	NBR
L-50C	3000	1,5-2,2	yes	yes	yes	18 mm, carbon/SiC EPDM	150 x 3	NBR
L-50S	1500/3000	1,1-15	---	---	---	28 mm, carbon/SiC EPDM	265 x 4	EPDM
L-65A	1000/1500	0,18-2,2	yes	---	---	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
L-65B	1000/1500/3000	0,18-7,5	yes	---	---	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
AL-1065*	1000/1500/3000	0,18-7,5	---	yes	yes	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
AL-1066*	1000/1500	0,18-2,2	---	yes	---	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
L-80A	1000/1500/3000	0,18-7,5	yes	---	---	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
AL-1081*	1000/1500/3000	0,18-7,5	---	---	yes	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
AL-1082	1000/1500	0,37-3	---	---	---	18 mm, carbon/SiC EPDM	279,3 x 5,7	NBR
L-80S	1500	1,1-5,5	---	---	---	28 mm, carbon/SiC EPDM	265 x 4	EPDM
AL-1102	1000/1500/3000	0,37-7,5	yes	yes	yes	18 mm, carbon/SiC EPDM	179,3 x 5,7	EPDM
AKN-100	1000/1500/3000	0,75-22	yes	---	---	25 mm, carbon/SiC EPDM	240 x 3	NBR
AL-1106	1500/3000	3-37	yes	---	yes	32 mm, carbon/SiC EPDM	309/295 x 1	gasket
AKN-127	1500/3000	4-22	yes	---	---	32 mm, carbon/SiC EPDM	240 x 3	NBR
AL-1129	1500/3000	3-37	yes	yes**	yes	32 mm, carbon/SiC EPDM	309/295 x 1	gasket
AL-1129	3000	45	yes	yes**	yes	40 mm, carbon/SiC EPDM	309/295 x 1	gasket
L-125S	1500	18,5-37	yes	---	yes	40 mm, carbon/SiC EPDM	405 x 7	EPDM
L-125S	1500	45	yes	---	yes	50 mm, carbon/SiC EPDM	405 x 7	EPDM
AL-1154	1000/1500	4-18,5	yes	yes**	yes	32 mm, carbon/SiC EPDM	309/295 x 1	gasket
AL-1155	3000	30-37	yes	---	yes	32 mm, carbon/SiC EPDM	309/295 x 1	gasket
AL-1155	3000	45	yes	---	yes	40 mm, carbon/SiC EPDM	309/295 x 1	gasket
AL-1155	3000	55	yes	---	yes	50 mm, carbon/SiC EPDM	309/295 x 1	gasket
AL-1202	1000	5,5-11	yes	yes	yes	32 mm, carbon/SiC EPDM	315 x 6,3	EPDM
AL-1202	1000	15-18,5	yes	yes	yes	40 mm, carbon/SiC EPDM	315 x 6,3	EPDM
AL-1202	1500	11-18,5	yes	yes	yes	32 mm, carbon/SiC EPDM	315 x 6,3	EPDM
AL-1202	1500	22-37	yes	yes	yes	40 mm, carbon/SiC EPDM	315 x 6,3	EPDM
AL-1202	1500	45	yes	yes	yes	50 mm, carbon/SiC EPDM	315 x 6,3	EPDM
AL-1250	1000	11-22	yes	yes	yes	40 mm, carbon/SiC EPDM	405 x 7	EPDM
AL-1250	1000	30	yes	yes	yes	50 mm, carbon/SiC EPDM	405 x 7	EPDM
AL-1250	1500	37	yes	yes	yes	40 mm, carbon/SiC EPDM	405 x 7	EPDM
AL-1250	1500	45-55	yes	yes	yes	50 mm, carbon/SiC EPDM	405 x 7	EPDM
AL-1250	1500	75-90	yes	yes	yes	65 mm, carbon/ceram. EPDM	405 x 7	EPDM
AL-1300	1500	110-160	yes	---	yes	75 mm, carbon/ceram. EPDM	475 x 8	EPDM

* only in bronze and/or stainless materials available

** available as types ALP-1128 and ALP-1153. Please, check dimensions.

Material standards

SERIES	MATERIAL OF HOUSING Name	Standard	SEALING FLANGE	IMPELLER	SHAFT (pump)	DETAILS TO NOTE
L / AL / AKN	grey cast iron	EN-GJL-200	EN-GJL-200	EN-GJL-200	AISI329	L-32 impeller of Noryl GFN2 AL-1300 impeller of EN-GJS-400
LH / ALH / AKNH	nodular cast iron	EN-GJS-400	EN-GJS-400	EN-GJL-200	AISI329	ALH-1300 impeller of EN-GJS-400
LP / ALP	bronze	CuPb5Sn5Zn5	CuPb5Sn5Zn5	CuPb5Sn5Zn5	AISI329	Bronze impeller available for every pump (exl. AL_-1155)
LS / ALS	stainless steel	AISI316	AISI316	AISI316	AISI329	Also SS2324 and SS2378 by request

Painting

Pumps are painted in accordance with Finnish standard SFS 5873, AK 80/2 Fe Sa2.
The finishing colour is red, RAL 3000. Special coating available by request.

Temperatures and pressure classes

Max. working pressure 10 bar	L-, AL-, AKN-, LP-, ALP-
Max. working pressure 16 bar	LH-, ALH-, AKNH-, LS-, ALS- according to the mech. seal specification
Max. fluid temp. -15 ... +120°C	L-, AL-, AKN-, LP-, ALP- (with Noryl impeller max. +100°C)
Max. fluid temp. -15 ... +150°C	LH-, ALH-, AKNH-, LS-, ALS- (with carbon/ceramic seal max. +120°C and size DN 50 max. +135°C)
Max. fluid temp. -15 ... +180°C	LH-, ALH-, LS-, ALS- with double seal

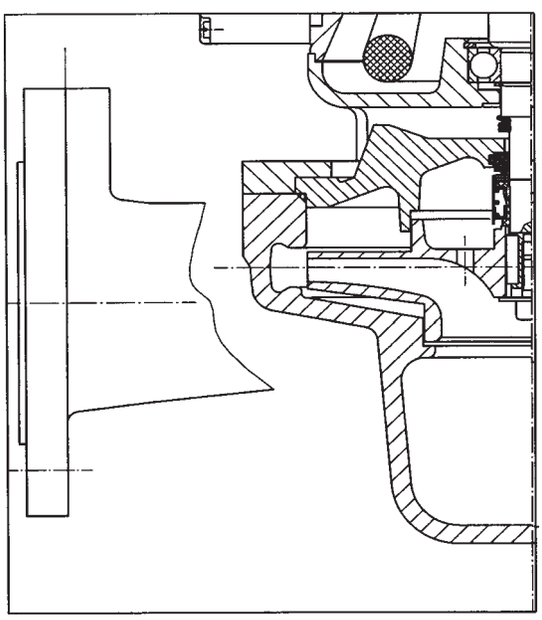
N.B. The max. liquid temperature may be limited not only by material selection but also by local regulations and laws.

Design of sealings

Standard design

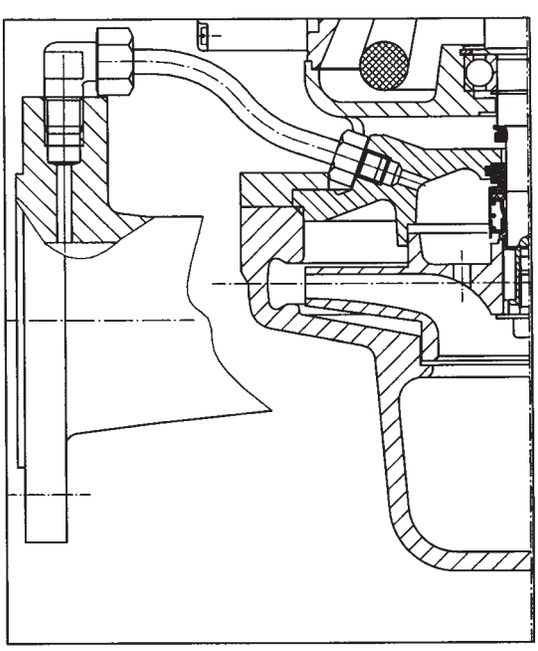
Single mechanical elastomeric bellows type shaft seal, operation water temperature max. +120 °C

The std-design is also suitable for glycol and other cold liquid mixtures in chilled water systems. We recommend the use of propylenglycol, max. 50%
Special accessories available e.g. isolated sealing flange for operation with liquids of low temperature



Recirculation (internal flush)

Single mechanical elastomeric bellows type shaft seal, operation water temperature max. +150 °C
in size DN65 and larger, DN50 only +135°C
Liquid circulation via pipe from the pressure flange to the sealing chamber to ensure cooling and lubrication of the shaft seal
Std-design in the LH- / ALH- / AKNH-series
Available in flange sizes DN50...300
Applications in hot water systems



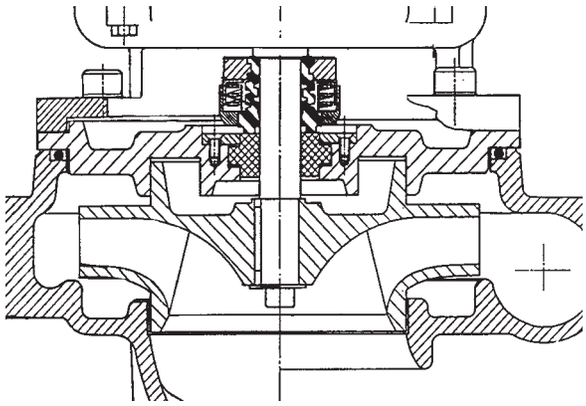
External flush

Single mechanical elastomeric bellows type shaft seal
Flushing liquid from external pressure source instead of pump flange, no outlet

Available in flange sizes DN50...300
Applications with slurries and crystallising solutions

External seal

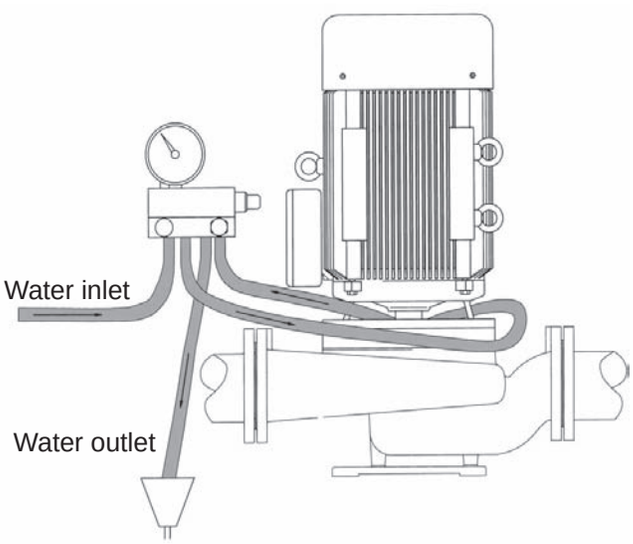
Single mechanical PTFE bellows seal externally mounted
Available in flange sizes DN 65-300 for ALS-series
Applications with extremely corrosive liquids, including acids
Max. working pressure 10 bar

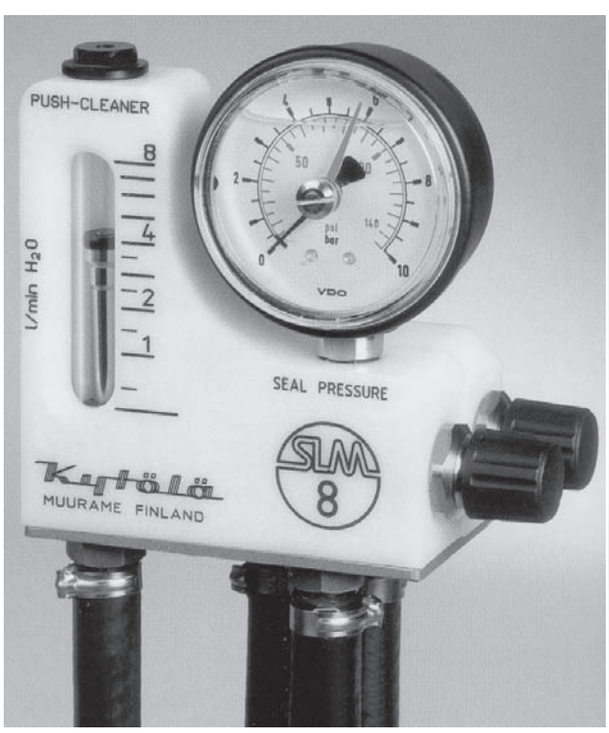


Double seal system

Double cartridge seal
Between the seals a pressure barrier maintained by sealing fluid, external circulation
Available in flange sizes DN 65-300
Operation temperature max. +180°C
Separate sealing fluid control unit required (e.g. Kytola SLM-8 can be supplied by Kolmeks)

Applications with slurries and crystallising hot solutions
Temporary dry running of pump allowed

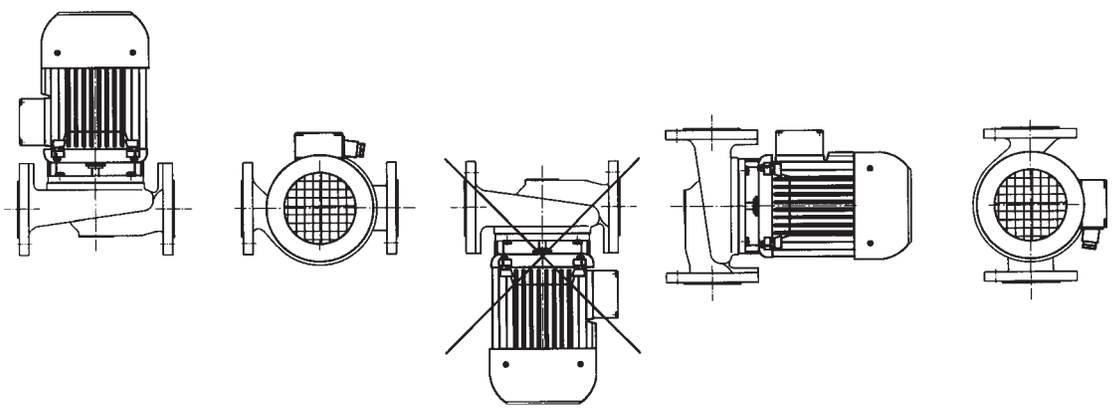




Installation

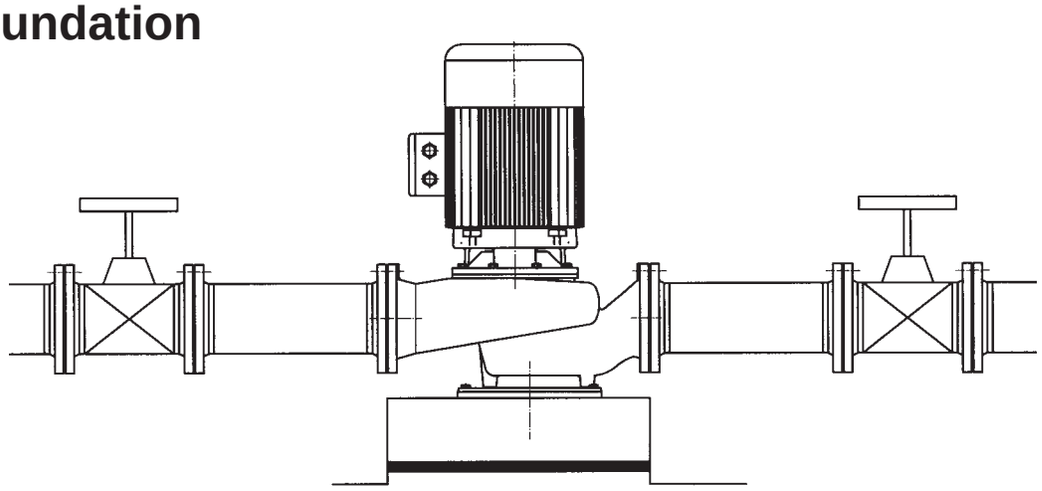
When designing and installing the pump in the system pay attention to the following:
- enough space for service and control should be left around the pump
- enough clearance on top of the motor to lift the motor unit off the pump housing
- for heavier pumps you may also need space for lifting devices
- shut-off valves on both sides of the pump
- vibration and noise isolation and sufficient rigidity of the pipeworks to support the pump

The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it in the desired position



Kolmeks In-line pumps may be fitted in horizontal or vertical (depending on motor size) pipeline configurations and must be arranged so that the adjacent pipework can be vented of air before startup. The smaller pumps may be installed without the baseplate horizontally or vertically, but the motor must never fall below the horizontal plane. The heavier and larger pumps should be installed standing on the baseplate and the pump shaft in vertical position.

Foundation



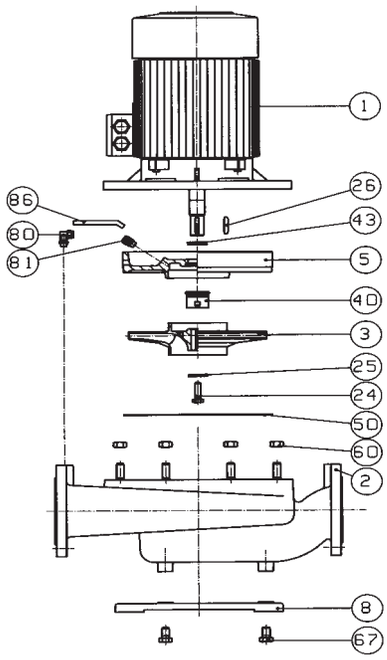
The heavier pumps (= DN150 and over or motors above 7,5 kW) should be mounted on a concrete plinth, approximately 1.5 to 2 times the weight of the pump. The foundation should be isolated from other construction with anti-vibrations mountings (20 mm thick rubber or cork plate) to prevent transmission of noise.

Recommendation limits without baseplate

Flange size	Motor power, max.
DN 15 ... 50	2,2 kW
DN 65, 80	4 kW
DN 100, 125	7,5 kW

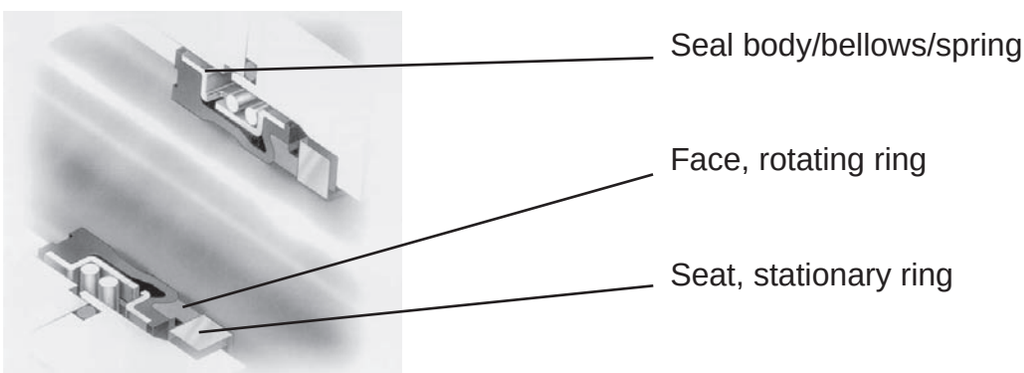
Spare parts and maintenance

List of parts



1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
8	Base plate
24	Nut / Screw
25	Washer
26	Key
40	Mechanical shaft seal
43	V-ring (optional)
50	O-ring / Gasket
60	Nut / Screw
67	Screw
80	Fitting (ALH-series)
81	Fitting (ALH-series)
86	Pipe (ALH-series)

Parts of the mechanical shaft seal (Design T2100)



Pump head/motor unit as a simple reserve, replacement and repair

The shaft seal is a wearing part, easy to change (see Pump service). When changing the shaft seal and opening the sealing flange the O-ring should always be replaced.
In case of any motor or electrical malfunction or heavy wearing of seal and impeller we recommend the change of the whole pump head/motor unit (internal).

Interchangeability between new L-range and the AL-range

New type / DN	Equal pump performance/ DN	Flange to flange		Centerline with baseplate mm	
		L -& T-	AL- & AT-	L- & T-	AL- & AT-
L_-32A / 32	AL_-1040 / 40	220	240	116	103
L_-40A / 40	AL_-1032 / 32	250	280	116	116
L_-50A / 50	AL_-1054 / 50	280	280	93	93
L_-50B / 50	AL_-1053 / 50	280	280	93	93
L_-50C / 50	AL_-1055 / 50	280	280	93	93
L-50S / 50	AL-1057 / 50	450	450	135	155
L_-65A / 65	AL_-1066 / 65	340	360	125	125
L_-65B / 65	AL_-1065 / 65	340	360	125	125
L_-80A / 80	AL_-1081 / 80	360	450	140	140

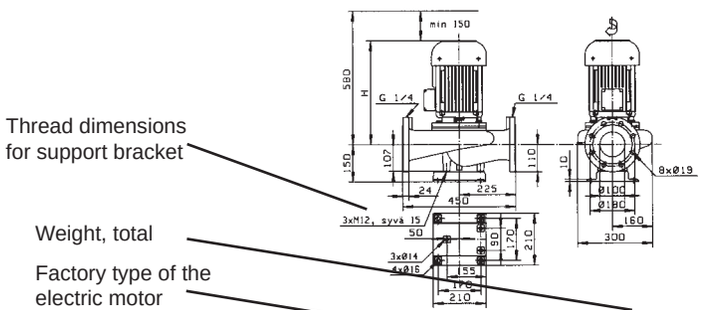
Technical info

Reading the curves

Performance curves are valid for 50 Hz frequency and for +20°C water pumped.
When pumping other liquids with different viscosity direct consultancy with Kolmeks is adviced.

AL_-1102/4 DN100 1500 r/min

Dimensions



Thread dimensions for support bracket

Weight, total

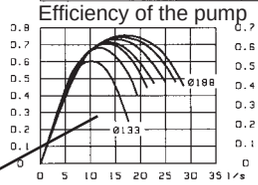
Factory type of the electric motor

Nominal output power of elecric motor P_2

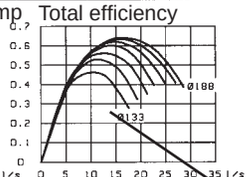
Nominal current of electric motor (3~ 400 V or 1~ 230 V voltage)

	kW	A	kg	H
OKN-112 C2 F19	2.2	5.1	72	430
OKN-101 B2 F19	1.5	3.5	66	385
OKN-101 B2 P F19 1~	1.5	9.0	66	385
OKN-101 C2 F19	1.1	2.6	62	385
OKN-101 C2 P F19 1~	1.1	6.9	62	385
OKN-100 B2 F19	0.75	2.0	59	335
OKN-100 B2 F19	0.55	1.4	59	335
OKN-100 B2 P F19 1~	0.55	3.4	59	335

Efficiency of the pump



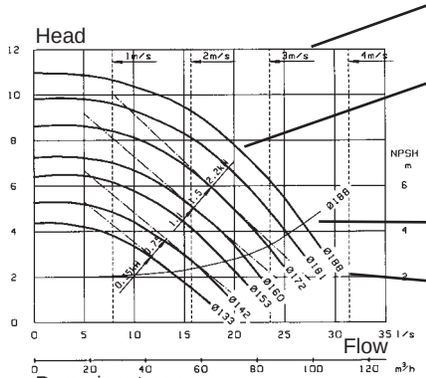
Total efficiency



Efficiency curves of the pump (hydraulic)

Efficiency curves of the whole pump unit (hydraulic + electric)

Note! The density of the liquid correlates to the power required. In case the liquid is heavier than water please check the power output of the motor.

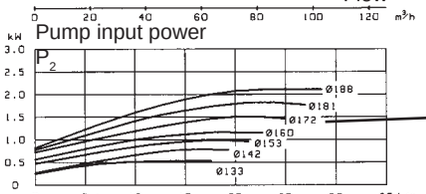


Flow velocity on the pressure flange

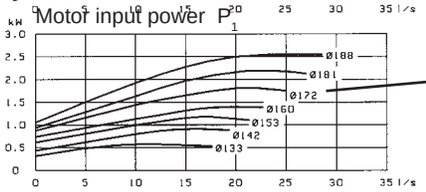
QH-curves

$NPSH_{re}$-curve

Diameters of the impeller



Power curves of the pump



Power curves of the electric motor

The rule of the thumb is that the pump selection is correct when the duty point is as near as possible to the Best Efficiency Point (=BEP). We recommend that the duty point should be at least between 25...90% of the max flow (of that impeller size in question).
This recommendation is based on the poor efficiency of the whole pump at very low or very high flow, see e.g. efficiency curves above. Regardless of the energy consumption will not be an essential criteria of the selection we recommend to avoid the selection where duty point is located on the very beginning or very end of the performance curve of the pump.

Technical info

NPSH (net positive suction head) and cavitation

$$NPSH_{re} < NPSH_{av}$$

$$NPSH_{re} < p + H_{geo} - H_s - p_D$$

$$NPSH_{re} < p_s - p_D$$

For a trouble free function of the pump the liquid should not boil or vaporize in the pump. This may happen if the pressure on the pump suction falls below the vapour pressure of the liquid and cavitation occurs. Operation under cavitation conditions will lead to erosion and pitting of hydraulic parts and a loss in pumping performance.

$NPSH_{av}$ = available NPSH- value in meters. A characteristic of the system, it is defined as a difference between the fluid pressure available at the pump suction and vapour pressure of liquid at pumped temperature

$NPSH_{re}$ = required NPSH- value in meters. A characteristic of the pump, informs how much higher the liquid pressure must be compared to the vapour pressure. It is determined by test and supplied by pump manufacturer as NPSH curve in the pump performance chart.

p = absolute pressure on liquid surface; $p_e + p_b$ (in open tank system equals atmospheric pressure)
p_D = vapour pressure of liquid at pumped temperature (receivable from tables)
H_{geo} = height of liquid surface above pump suction
H_s = pressure losses (friction loss in suction-side pipework)
p_s = suction pressure, absolute
A common recommendation is to raise the $NPSH_{re}$-value from the duty chart curve by a safety margin 0,5 m to compensate possible failures in all calculations.

Example:

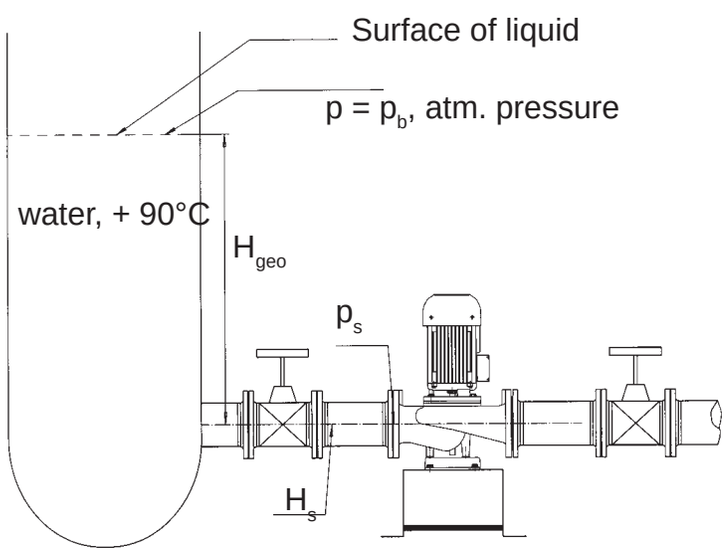
Open strorage (p = atm. pressure = 10 m), where water temperature is +90°C (p_D =7m), losses in suction pipe 1 m, surface of liquid from inlet flange +2m. The duty point of the pump is 20 l/s, 7,8m. Does the pump operate well or do we get cavitation?

Selected pump:
AL-1102/4/Ø188 2,2 kW

$NPSH_{re} < p + H_{geo} - H_s - p_D$

$NPSH_{re} < 10\ m + 2\ m - 1\ m - 7\ m$

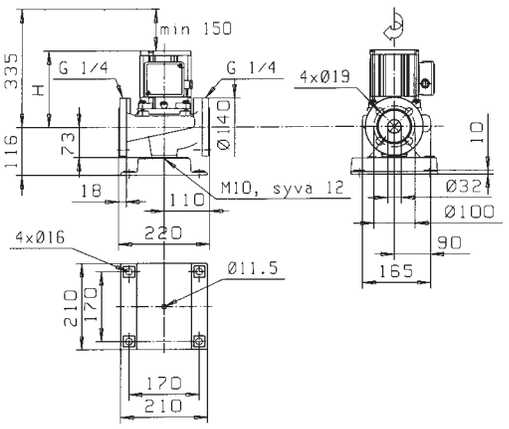
$NPSH_{re} < 4\ m$
We need to deduct the safety margin 0,5m fron the calculated value. So the $NPSH_{re}$-value of the pump must be less than 3,5 m for a proper function without cavitation.
From the duty chart of AL_-1102/4/Ø188 $NPSH_{re}$ = 2,7 m -> OK!
NO CAVITATION!



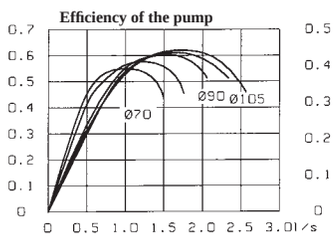
In some applications twin head pumps may be used to avoid cavitation in the pump.
There are also other benefits when using twin head pump, those will be described later on the chapter “Twin pumps”.
For further details please contact your local KOLMEKS representative or our factory in Turenki.

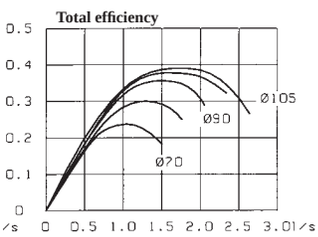
Technical data

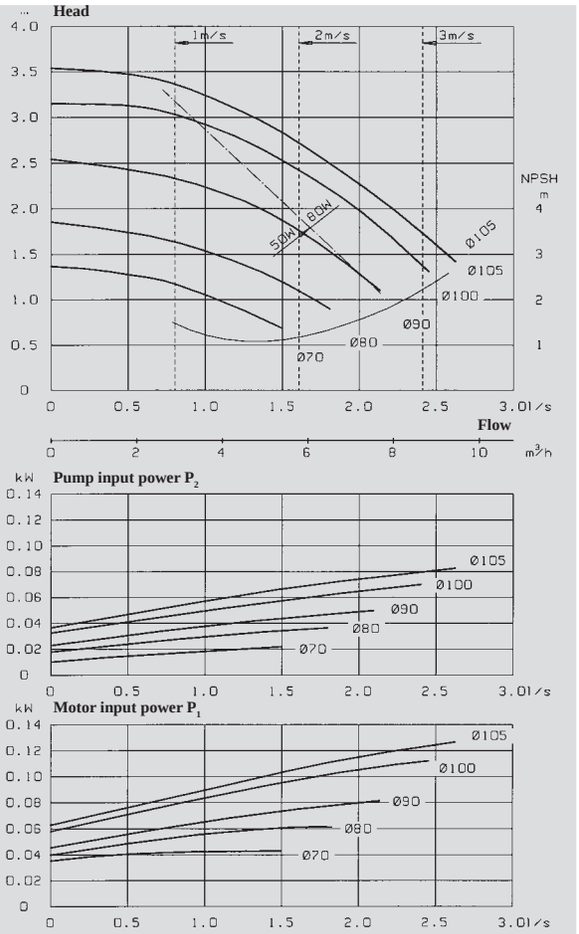
L_-32A/4 DN32 1500 r/min



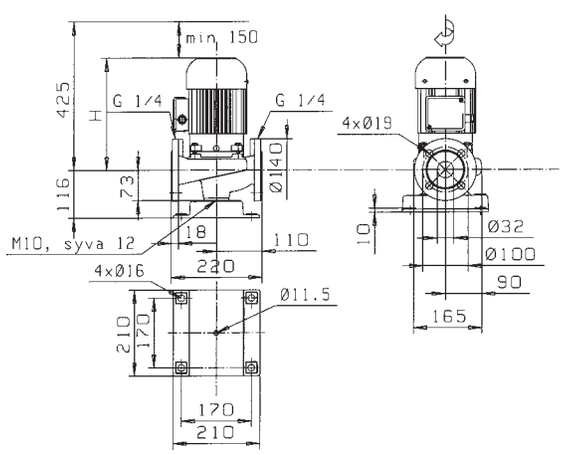
	kW	A	kg	H
OP-742 N12	0.08	0.28	17	185
OP-742 P N12 1~	0.08	0.62	17	185
OP-742 P N12 1~	0.05	0.47	17	185
OP-732 B N12	0.05	0.21	17	185



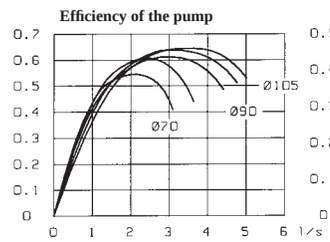


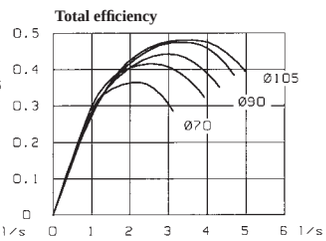


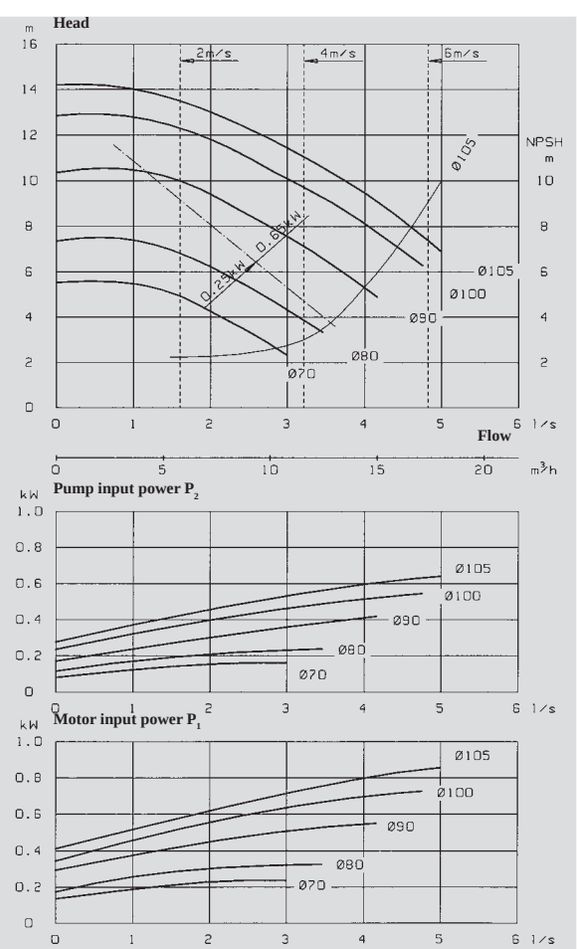
L_-32A/2 DN32 3000 r/min



	kW	A	kg	H
OKN-841 D N12	0.65	1.8	21	275
OKN-841 D P N12 1~	0.65	4.5	21	275
OP-741 N12	0.25	0.7	18	225
OP-741 C P N12 1~	0.25	1.8	18	225

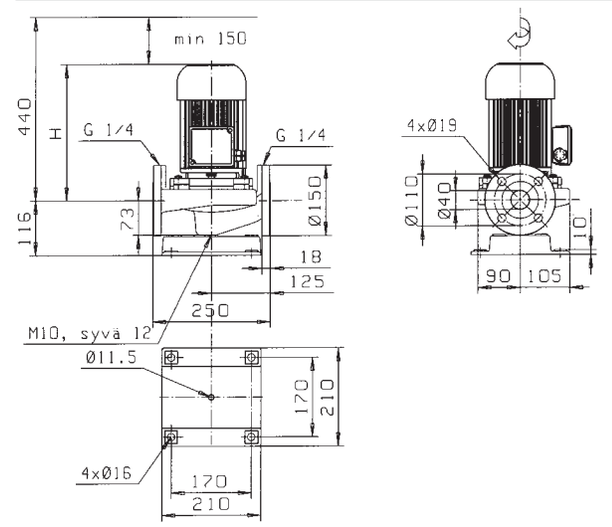




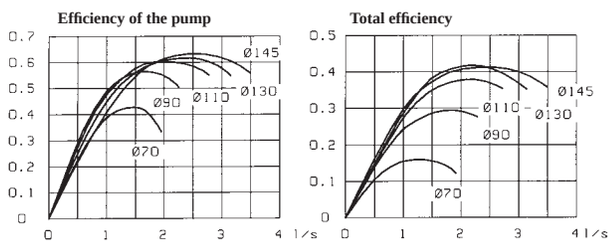


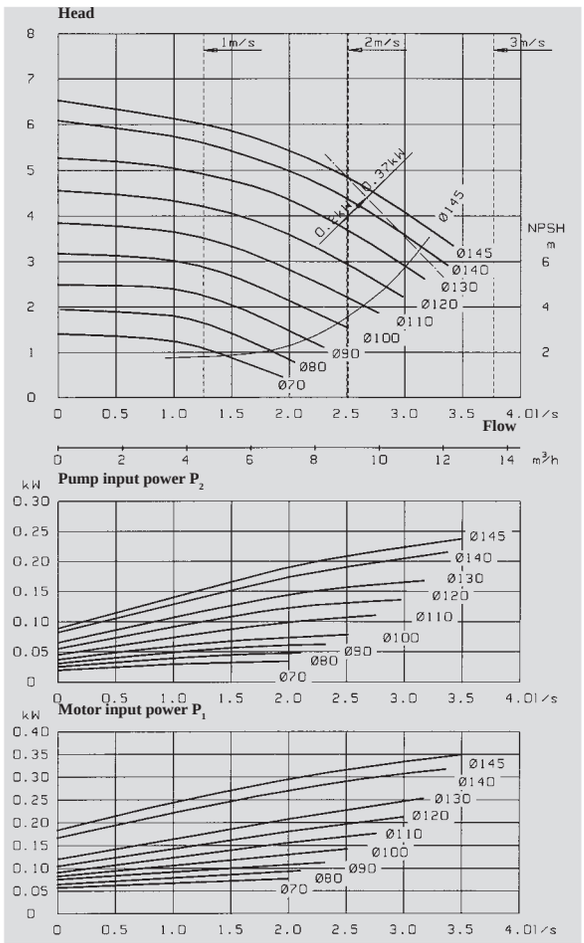
Technical data

L_-40A/4 DN40 1500 r/min

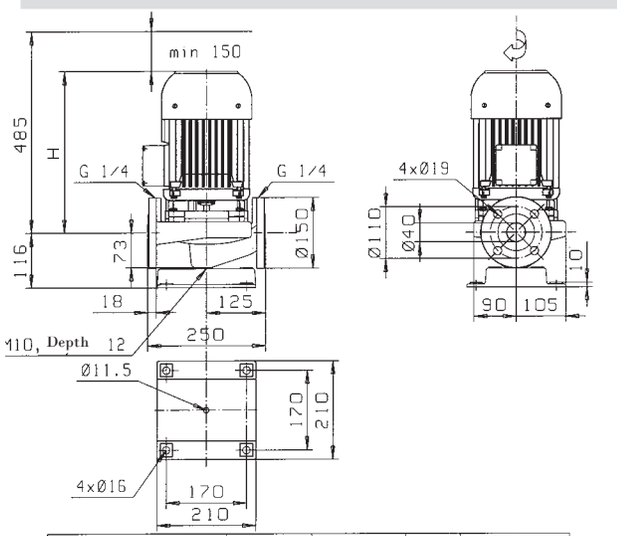


	kW	A	kg	H
OKN-862L D N13	0.37	1.15	25	290
OP-752 N13	0.20	0.65	21	240
OP-752 P N13 1~	0.20	1.45	21	240

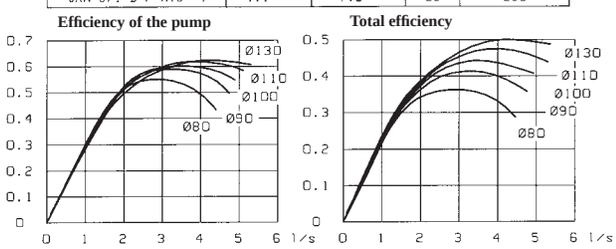


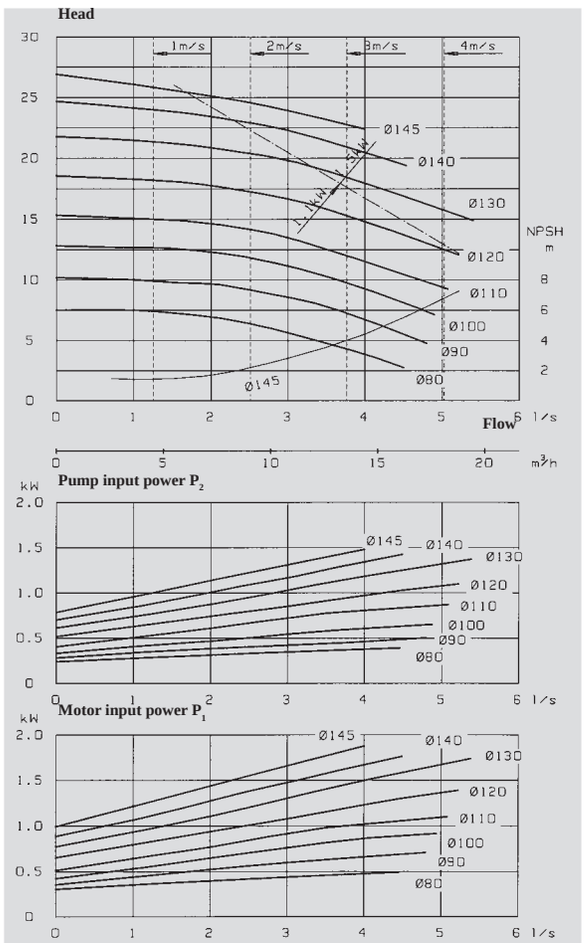


L_-40A/2 DN40 3000 r/min



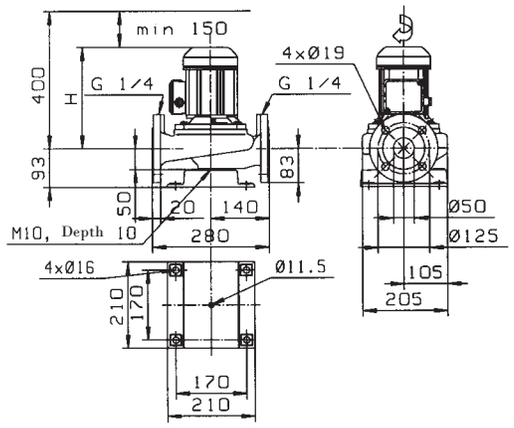
	kW	A	kg	H
OKN-101 C1 N13	1.5	3.3	38	335
OKN-101 C1 P N13 1~	1.5	8.8	38	335
OKN-871 D N13	1.1	2.8	25	290
OKN-871 D P N13 1~	1.1	7.0	25	290



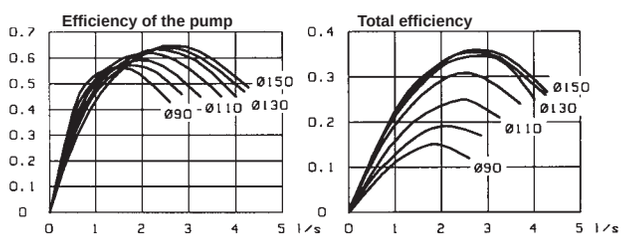


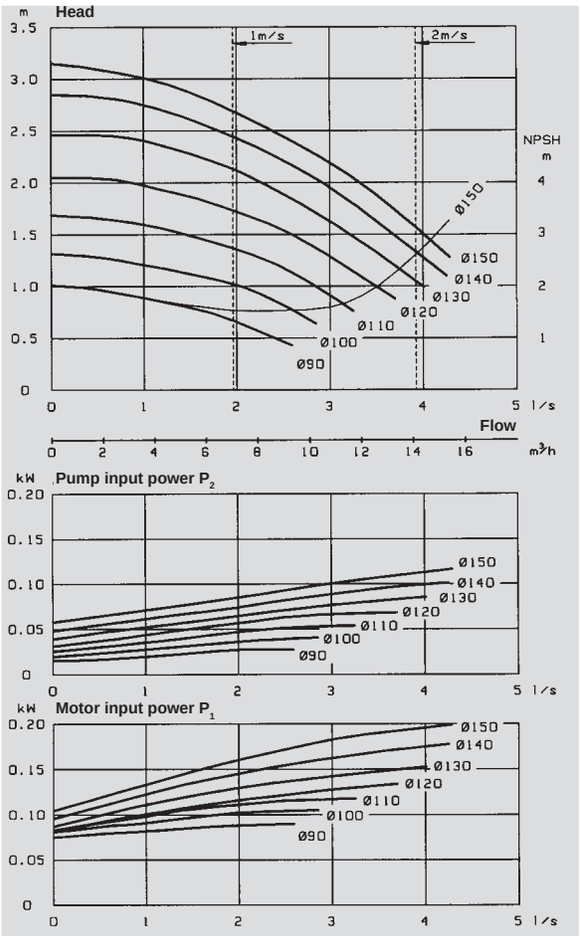
Technical data

L_-50A/6 DN50 1000 r/min

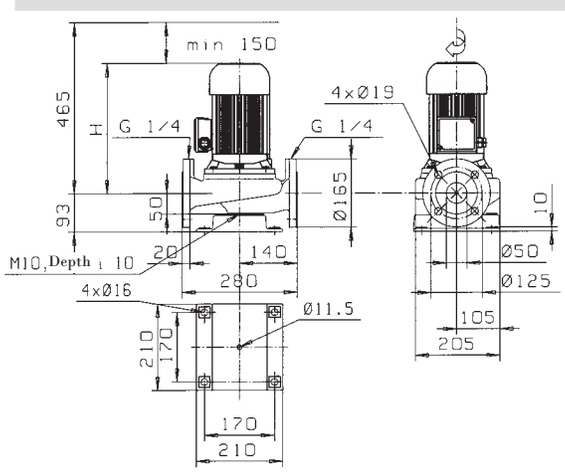


	kW	A	kg	H
OP-753 F15	0.11	0.5	24	250

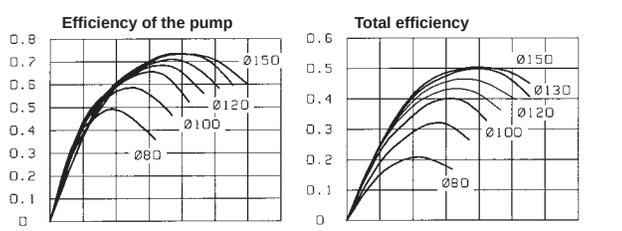


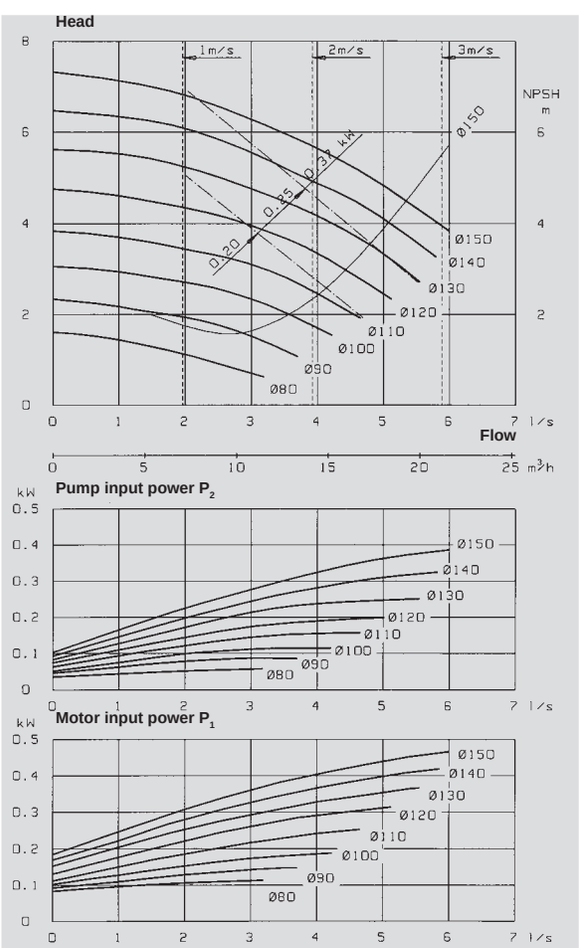


L_-50A/4 DN50 1500 r/min



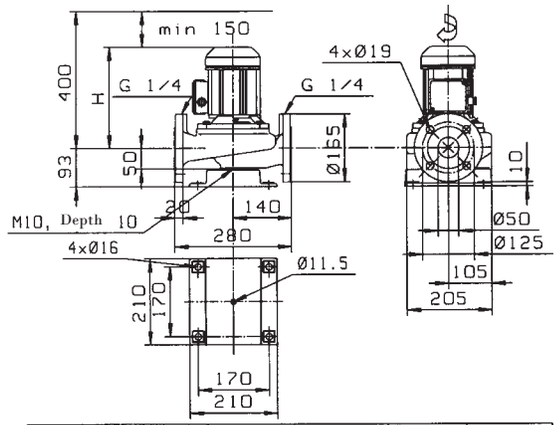
	kW	A	kg	H
OKN-862 D F15	0.37	1.15	30	315
OP-762 F15	0.25	0.82	24	250
OP-752 P F15 1~	0.25	1.85	24	250
OP-752 F15	0.20	0.65	24	250
OP-752 P F15 1~	0.20	1.45	24	250



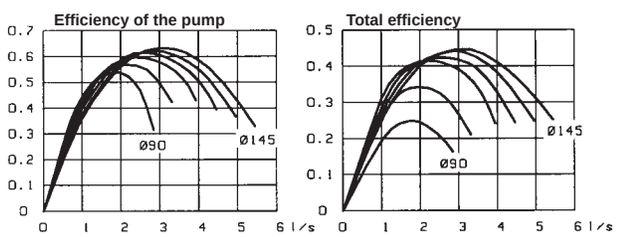


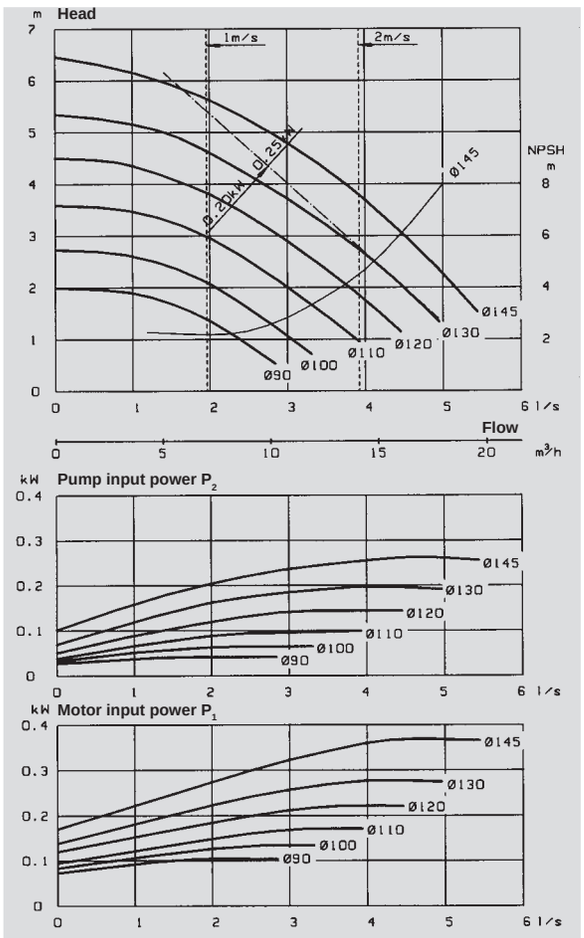
Technical data

L_-50B/4 DN50 1500 r/min

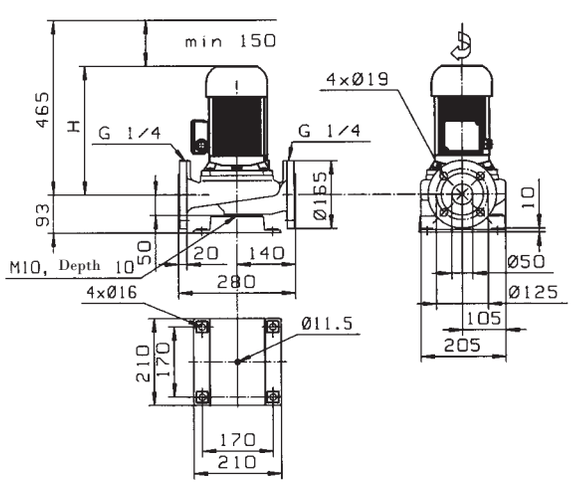


	kW	A	kg	H
OP-762 F15	0.25	0.82	25	250
OP-752 P F15 1~	0.25	1.85	25	250
OP-752 F15	0.20	0.65	25	250
OP-752 P F15 1~	0.20	1.45	25	250

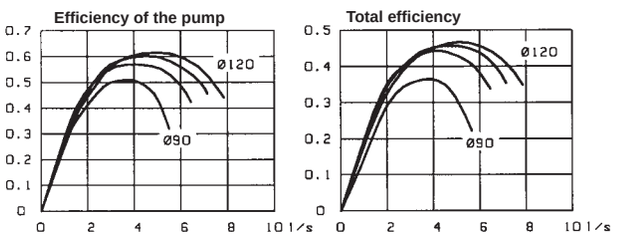


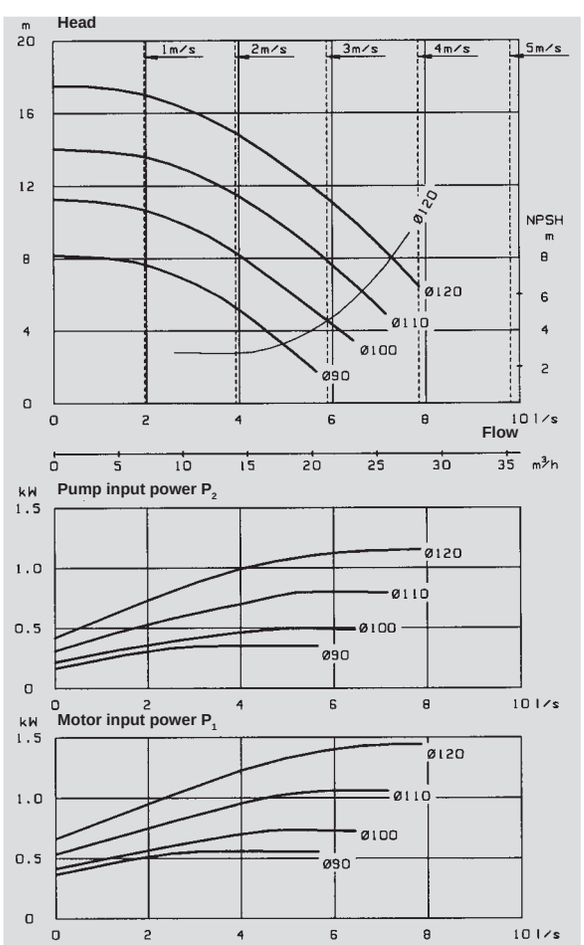


L_-50B/2 DN50 3000 r/min



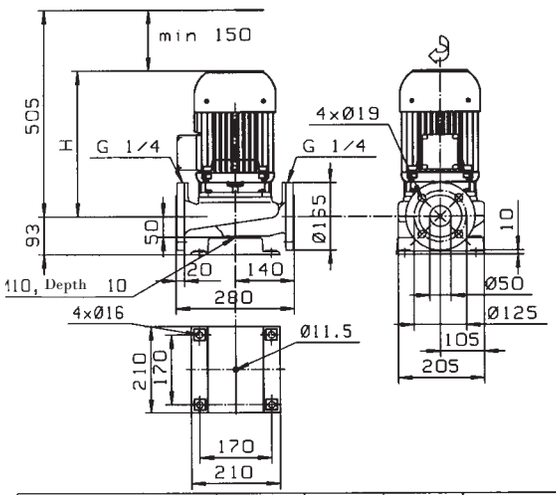
	kW	A	kg	H
OKN-871 D F15	1.1	2.8	30	315
OKN-871 D P F15 1~	1.1	7.0	30	315



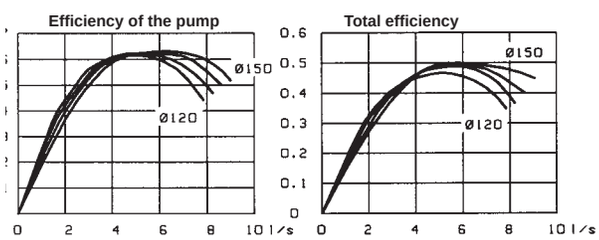


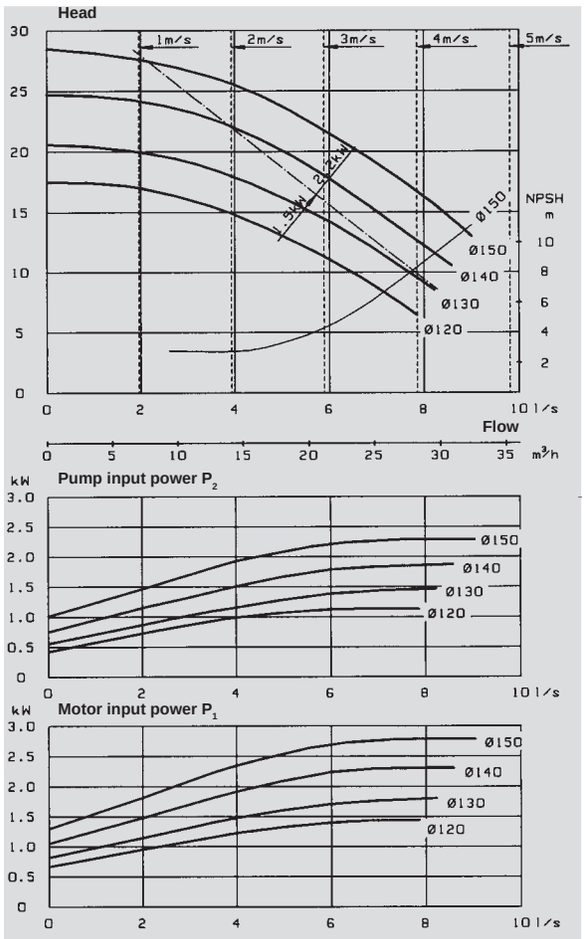
Technical data

L_-50C/2 DN50 3000 r/min

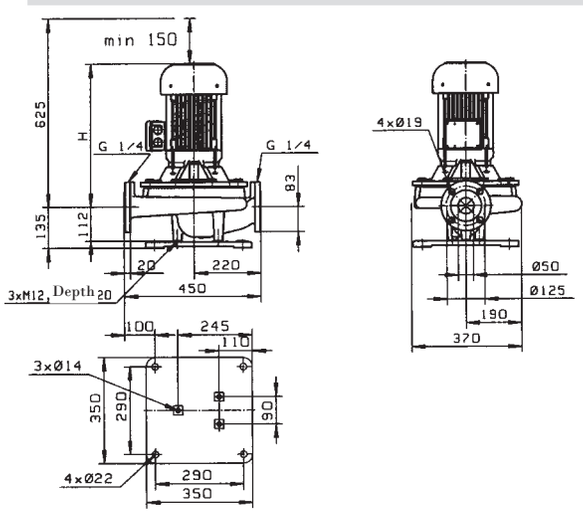


	kW	A	kg	H
OKN-101 D1 F16	2.2	4.7	43	355
OKN-101 C1 F16	1.5	3.3	37	355
OKN-101 C1 P F16 1~	1.5	8.8	37	355

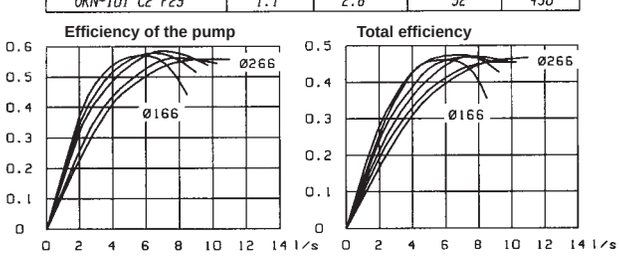


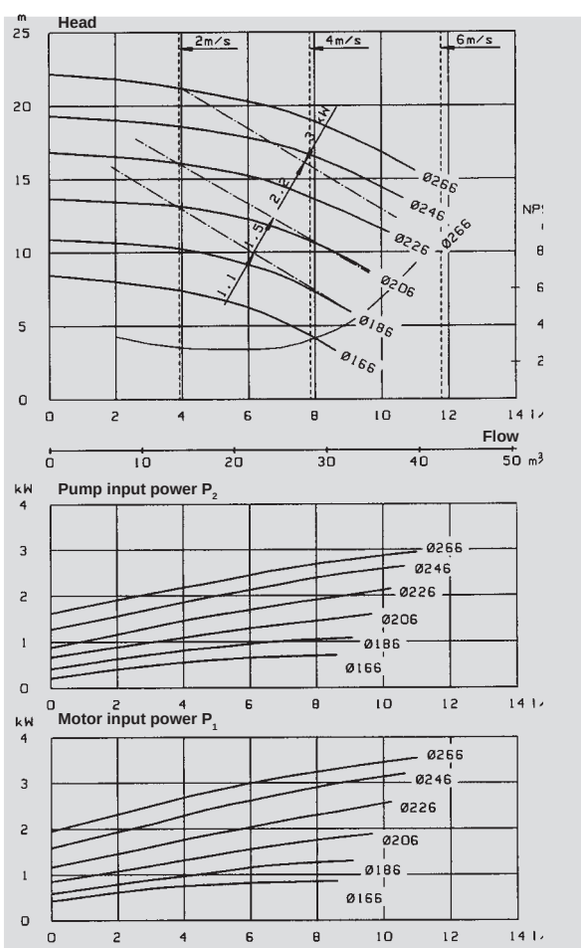


L_-50S/4 DN50 1500 r/min



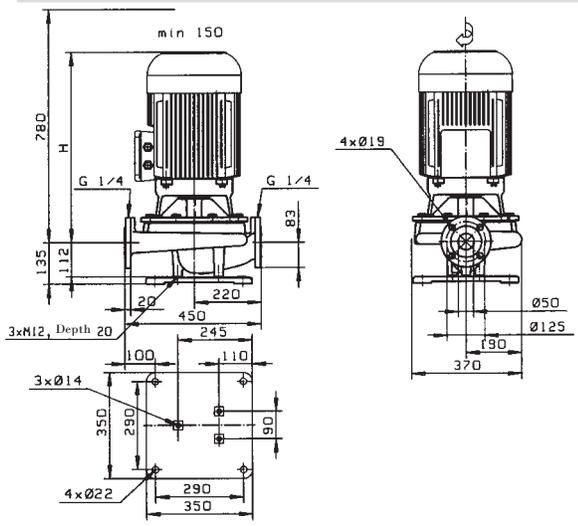
	kW	A	kg	H
OKN-112 E2 F29	3	6.6	108	475
OKN-112 C2 F29	2.2	5.1	102	475
OKN-101 D2 F29	1.5	3.5	96	430
OKN-101 C2 F29	1.1	2.6	92	430





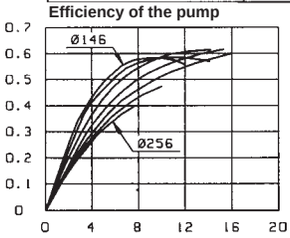
Technical data

L_-50S/2 DN50 3000 r/min

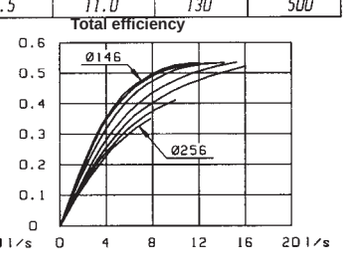


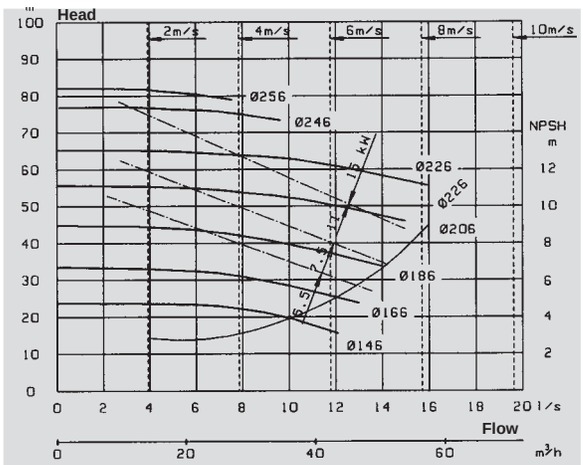
	kW	A	kg	H
OKN-164 G1 F29	15	30.5	189	630
OKN-164 F1 F29	11	22.0	184	630
OKN-132 E1 F29	7.5	15.0	138	500
OKN-132 C1 F29	5.5	11.0	130	500

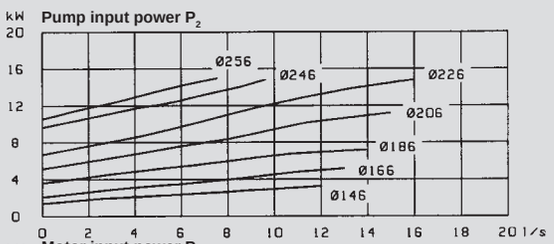
Efficiency of the pump

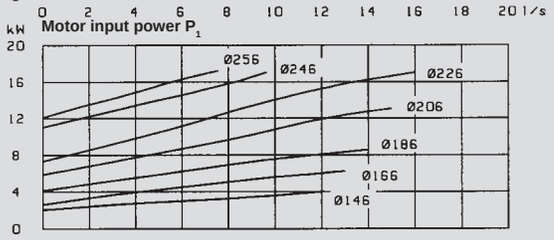


Total efficiency

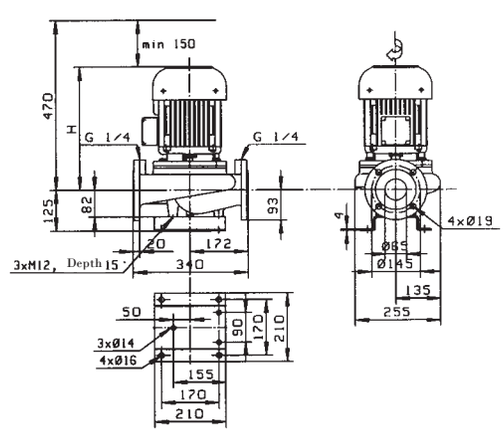






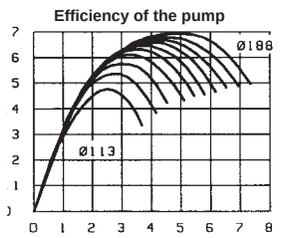


L_-65A/6 DN65 1000 r/min

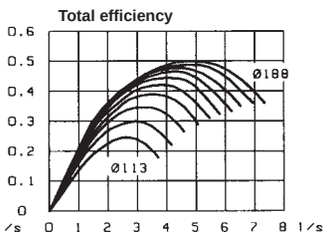


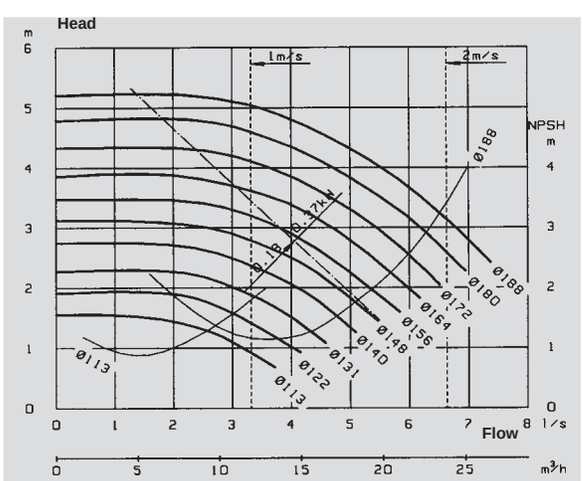
	kW	A	kg	H
OKN-100 B3 F19	0.37	1.20	44	320
OKN-100 B3 F19	0.18	0.95	44	320

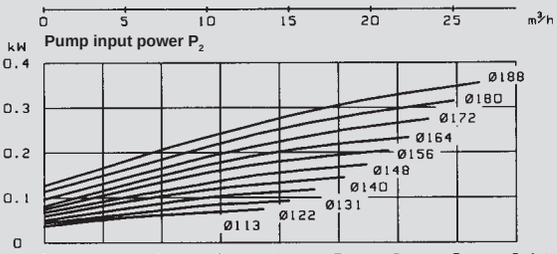
Efficiency of the pump

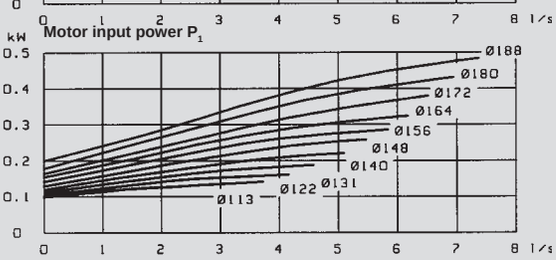


Total efficiency



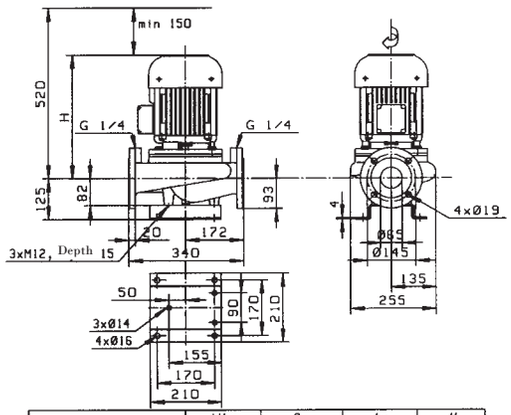






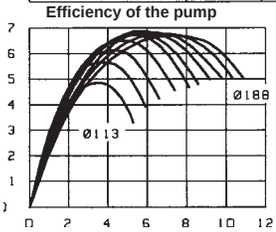
Technical data

L_-65A/4 DN65 1500 r/min

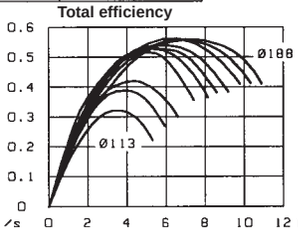


	kW	A	kg	H
OKN-101 D2 F19	1.5	3.5	52	370
OKN-101 D2 P F19 1~	1.5	9.0	52	370
OKN-101 C2 F19	1.1	2.6	48	370
OKN-101 C2 P F19 1~	1.1	6.9	48	370
OKN-100 B2 F19	0.75	2.0	44	320
OKN-100 B2 P F19 1~	0.75	4.7	44	320
OKN-100 B2 F19	0.55	1.4	44	320
OKN-100 B2 P F19 1~	0.55	3.4	44	320
OKN-852 D F19	0.37	1.0	37	310
OKN-852 D P F19 1~	0.37	2.5	37	310
OKN-852 D F19	0.2	0.75	37	310

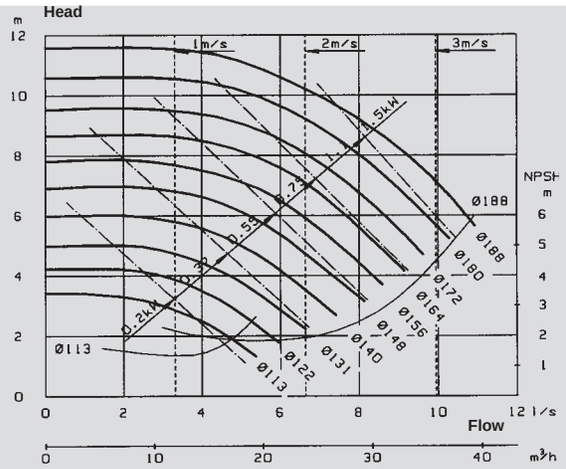
Efficiency of the pump



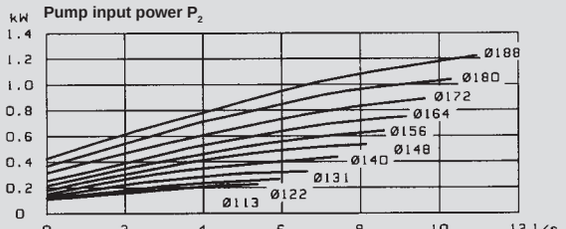
Total efficiency



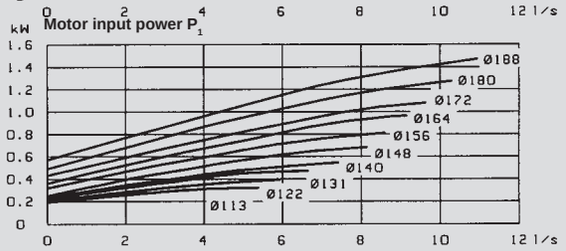
Head



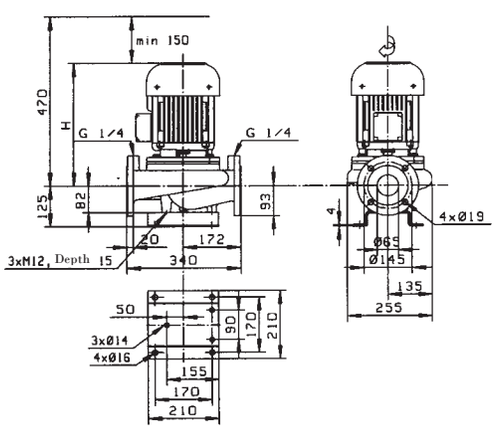
Pump input power P_2



Motor input power P_1

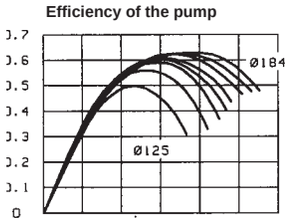


L_-65B/6 DN65 1000 r/min

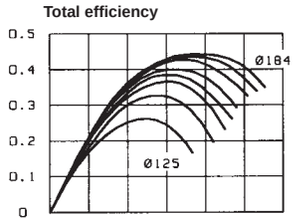


	kW	A	kg	H
OKN-100 B3 F19	0.37	1.20	44	320
OKN-100 B3 F19	0.18	0.95	44	320

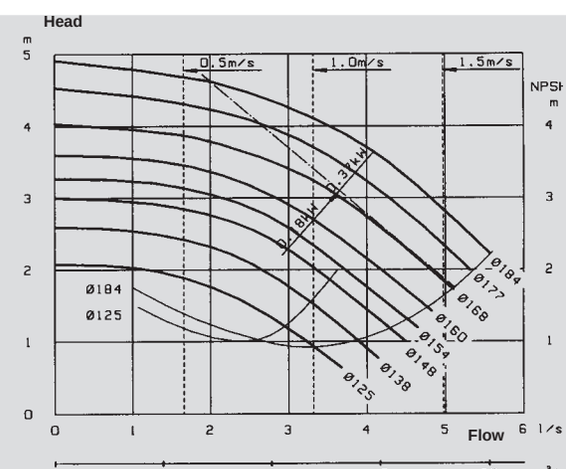
Efficiency of the pump



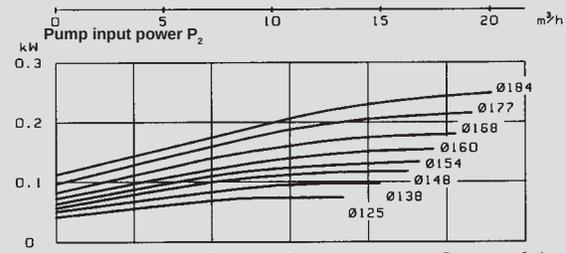
Total efficiency



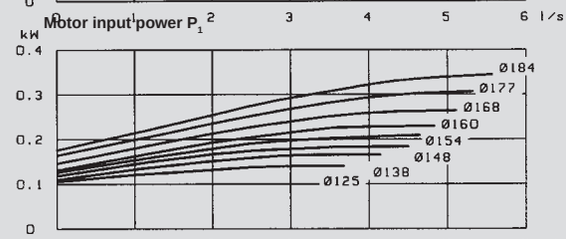
Head



Pump input power P_2

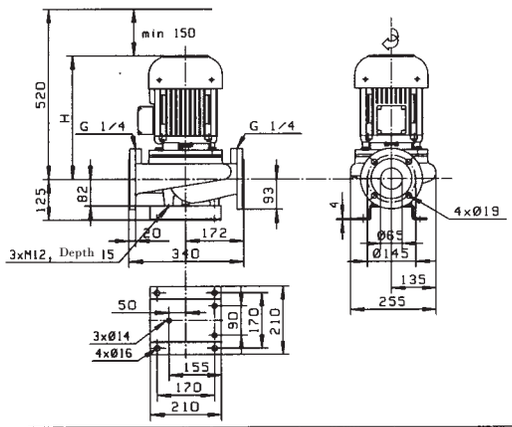


Motor input power P_1



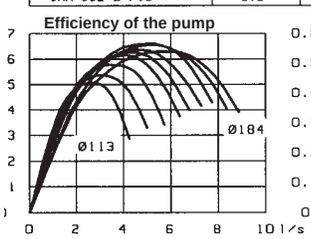
Technical data

L_-65B/4 DN65 1500 r/min

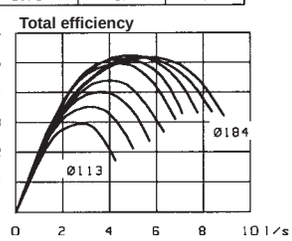


	kW	A	kg	H
OKN-101 C2 F19	1.1	2.6	48	370
OKN-101 C2 P F19 1~	1.1	6.9	48	370
OKN-100 B2 F19	0.75	2.0	44	320
OKN-100 B2 P F19 1~	0.75	4.7	44	320
OKN-100 B2 F19	0.55	1.4	44	320
OKN-100 B2 P F19 1~	0.55	3.4	44	320
OKN-852 D F19	0.37	1.0	37	310
OKN-852 D F19	0.2	0.75	37	310

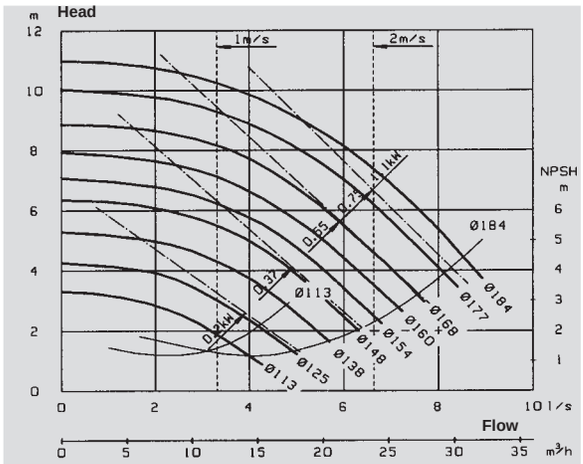
Efficiency of the pump



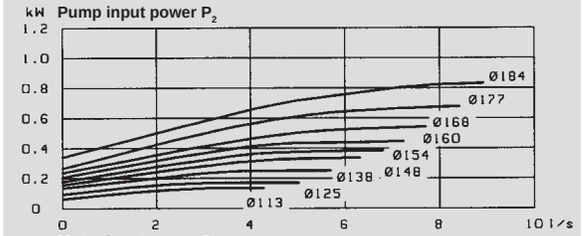
Total efficiency



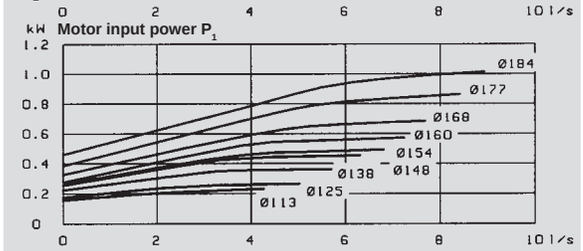
Head



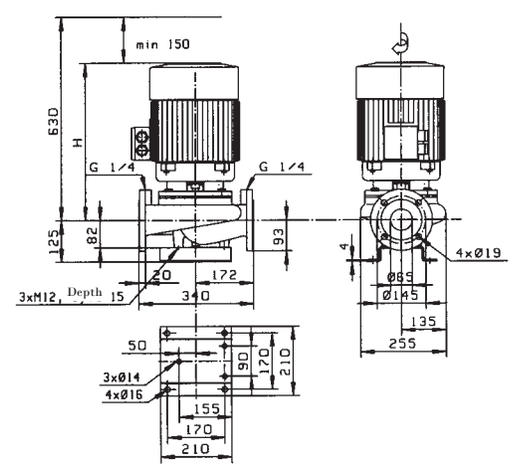
Pump input power P_2



Motor input power P_1

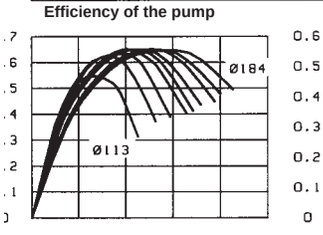


L_-65B/2 DN65 3000 r/min

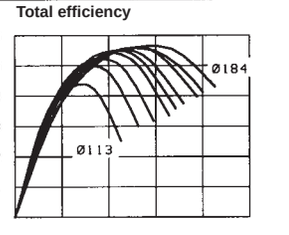


	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	94	480
OKN-132 C1 F19	5.5	11.0	86	480
OKN-112 E1 F19	4.0	8.2	62	415
OKN-112 C1 F19	3.0	6.4	58	415
OKN-101 D1 F19	2.2	4.7	52	370
OKN-101 C1 F19	1.5	3.3	51	370

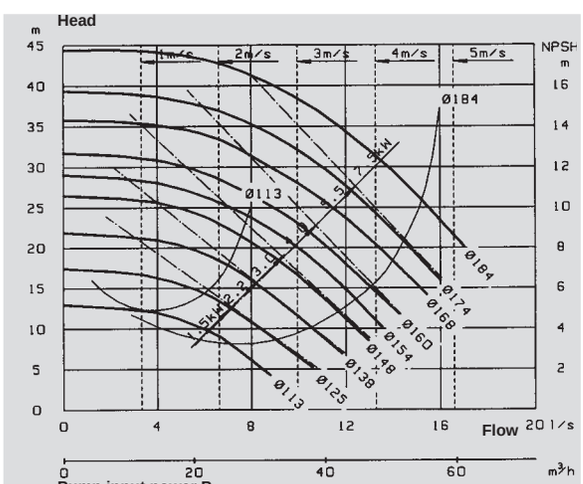
Efficiency of the pump



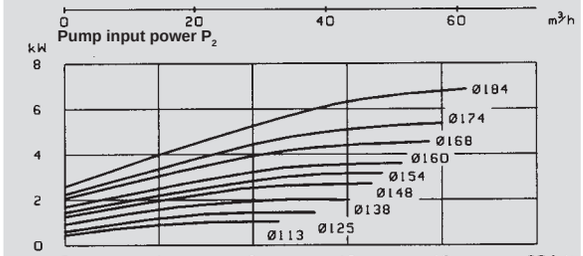
Total efficiency



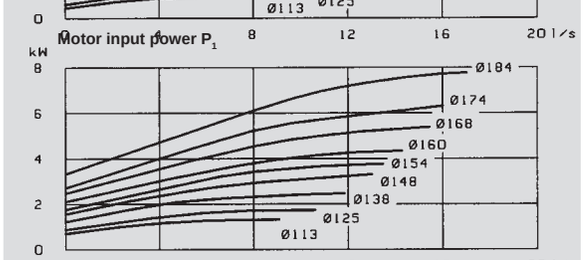
Head



Pump input power P_2

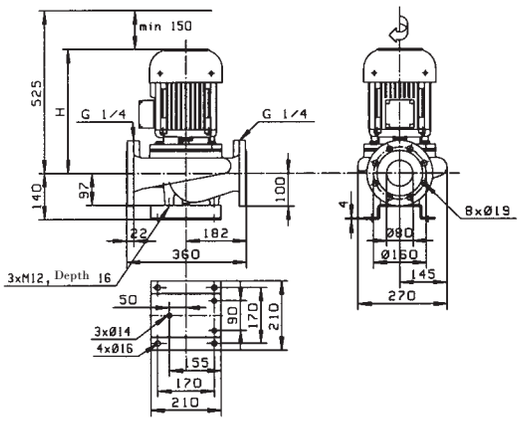


Motor input power P_1

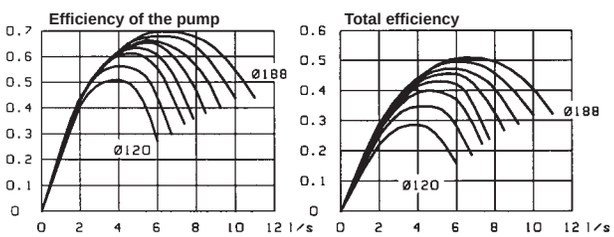


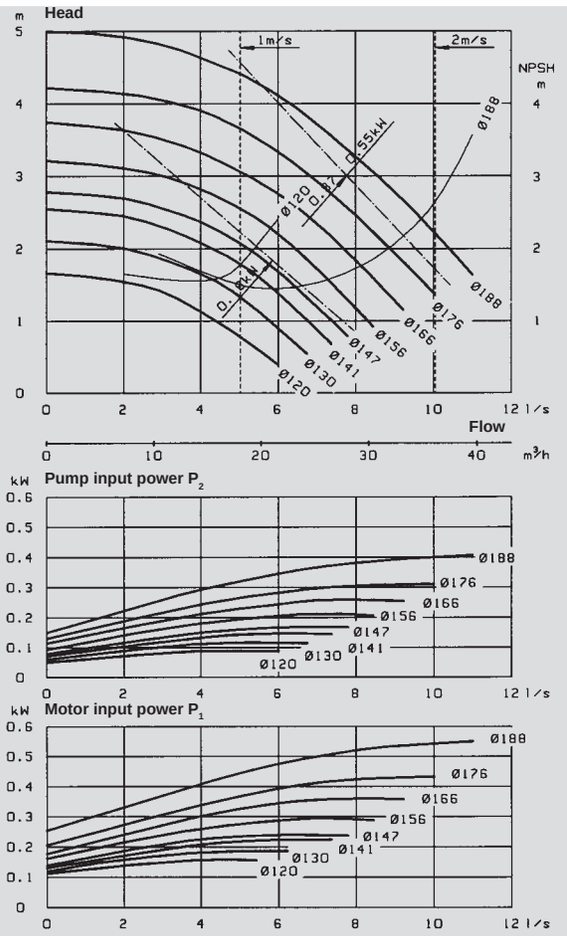
Technical data

L_-80A/6 DN80 1000 r/min

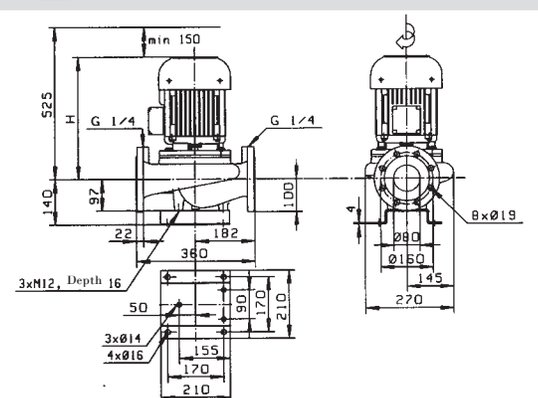


	kW	A	kg	H
OKN-101 C3 F19	0.55	1.75	52	375
OKN-100 B3 F19	0.37	1.2	48	325
OKN-100 B3 F19	0.18	0.95	48	325

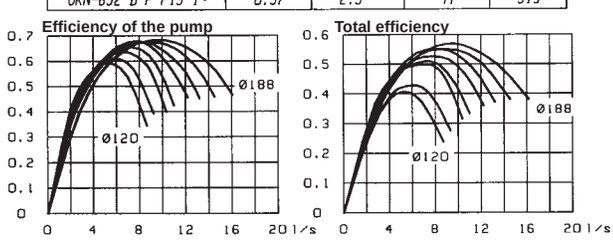


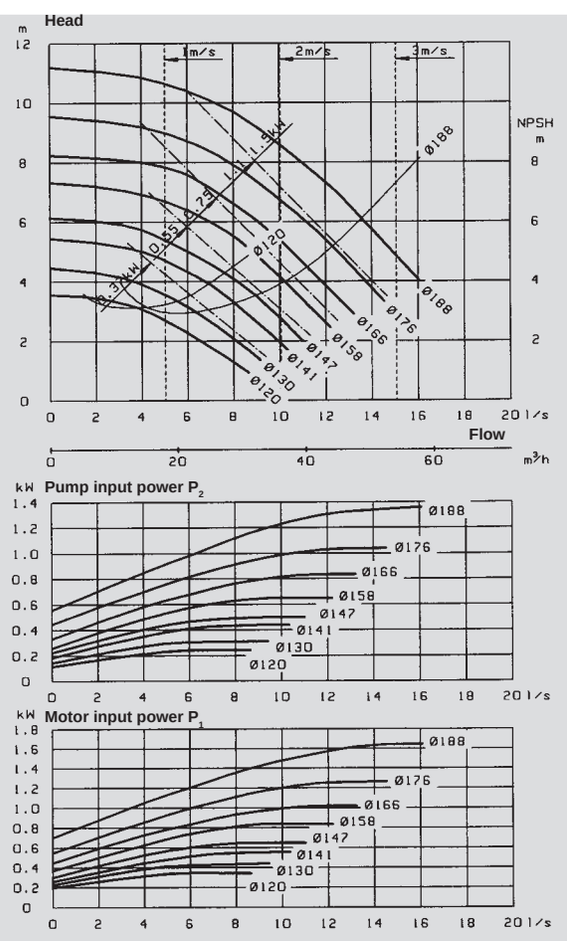


L_-80A/4 DN80 1500 r/min



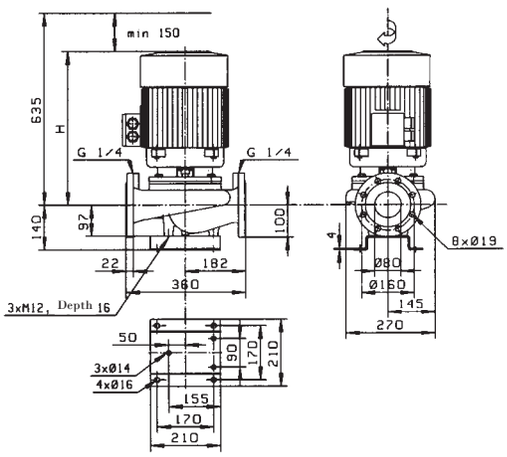
	kW	A	kg	H
OKN-101 D2 F19	1.5	3.5	56	375
OKN-101 D2 P F19 1~	1.5	9.0	56	375
OKN-101 C2 F19	1.1	2.6	52	375
OKN-101 C2 P F19 1~	1.1	6.9	52	375
OKN-100 B2 F19	0.75	2.0	48	325
OKN-100 B2 P F19 1~	0.75	4.7	48	325
OKN-100 B2 F19	0.55	1.4	48	325
OKN-100 B2 P F19 1~	0.55	3.4	48	325
OKN-852 D F19	0.37	1.0	41	315
OKN-852 D P F19 1~	0.37	2.5	41	315



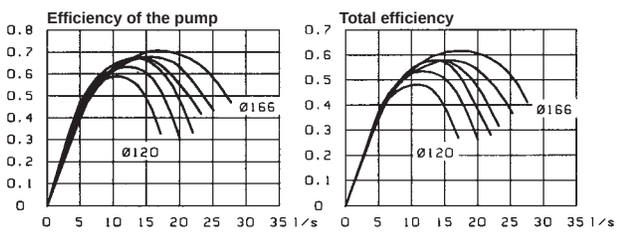


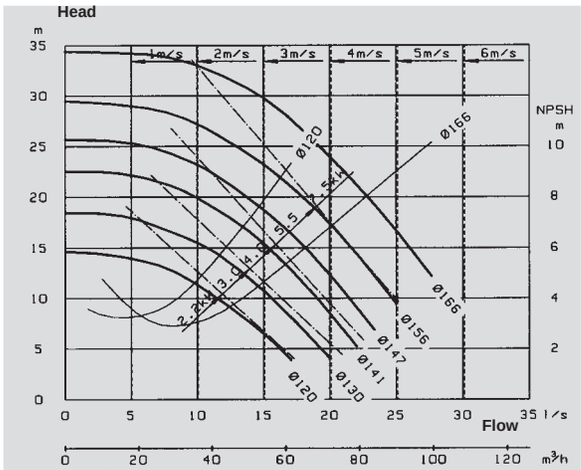
Technical data

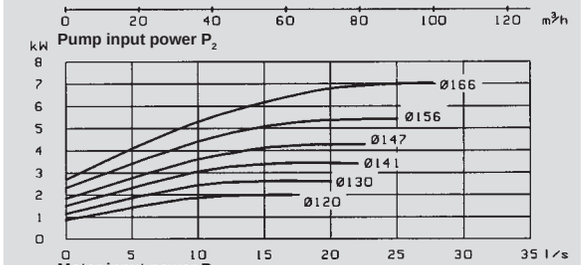
L_-80A/2 DN80 3000 r/min

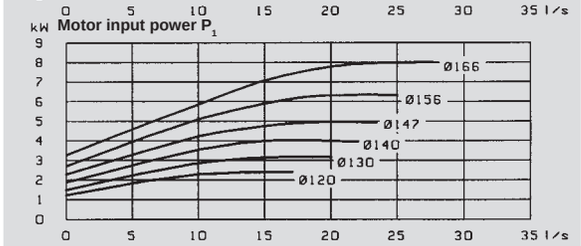


	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	98	485
OKN-132 C1 F19	5.5	11.0	90	485
OKN-112 E1 F19	4.0	8.2	66	420
OKN-112 C1 F19	3.0	6.4	62	420
OKN-101 D1 F19	2.2	4.7	56	375

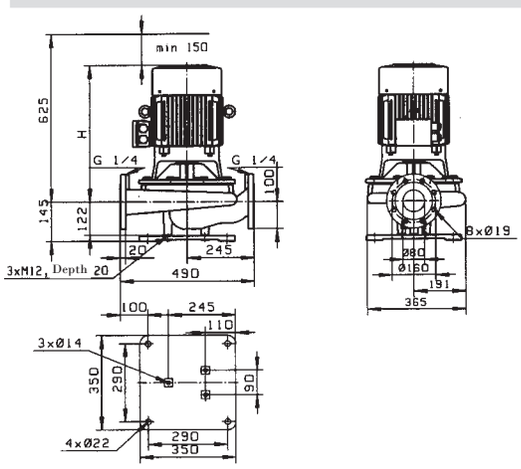




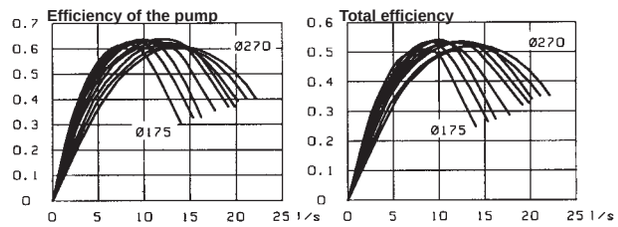


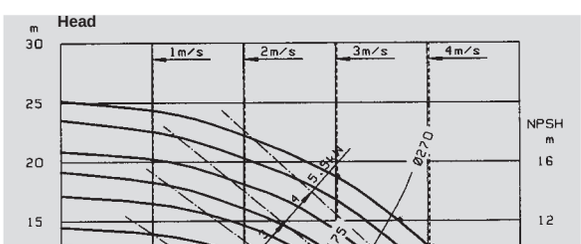


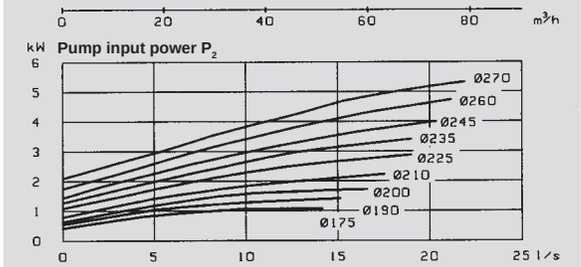
L_-80S/4 DN80 1500 r/min

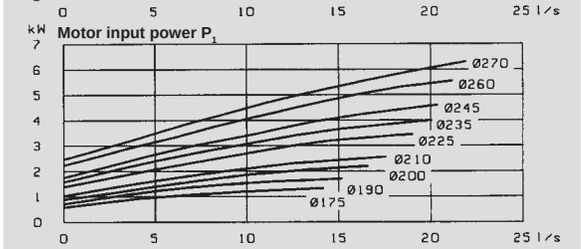


	kW	A	kg	H
OKN-132 E2 F29	5.5	11.9	138	510
OKN-132 C2 F29	4	8.7	128	510
OKN-112 E2 F29	3	6.6	108	445
OKN-112 C2 F29	2.2	5.1	102	445
OKN-101 D2 F29	1.5	3.5	96	385
OKN-101 C2 F29	1.1	2.6	92	385



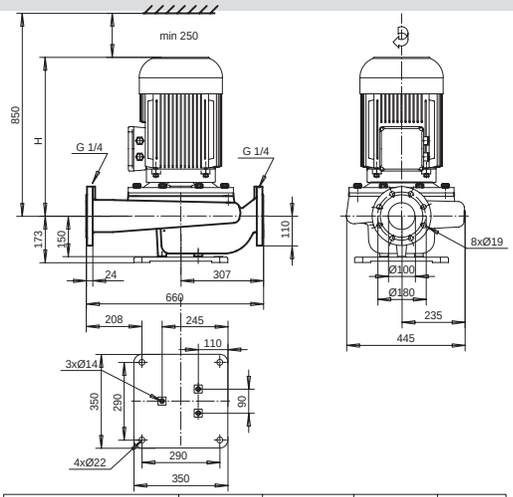






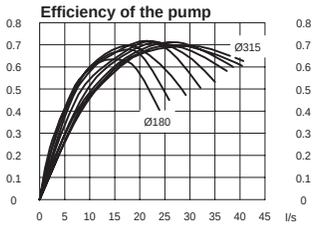
Technical data

L_-100S/4 DN100 1500 r/min

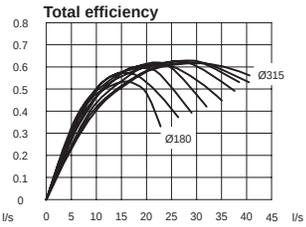


	kW	A	kg	H
OKN-164B J2 F31	15.0	31.0	230	600
OKN-164B G2 F31	11.0	22.6	215	600
OKN-133 G2 BF31	7.5	15.7	195	555
OKN-132 E2 BF31	5.5	11.9	180	505
OKN-132 C2 BF31	4.0	8.7	170	505
OKN-112 E2 F31	3.0	6.6	150	440

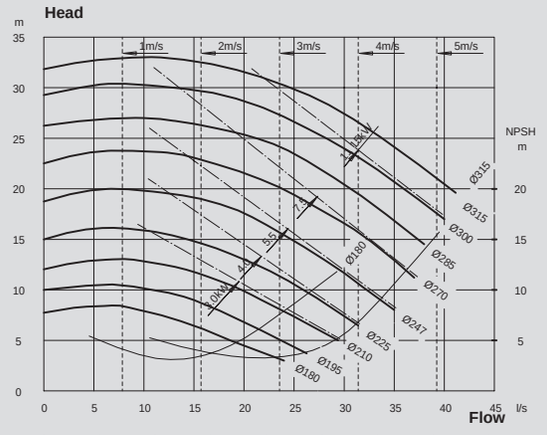
Efficiency of the pump



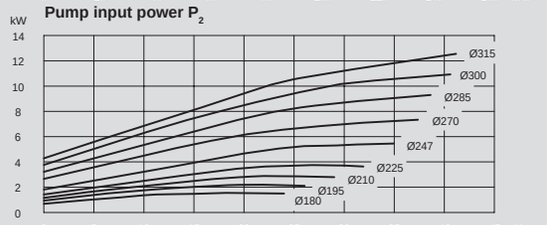
Total efficiency



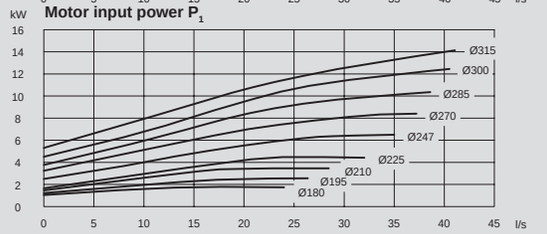
Head



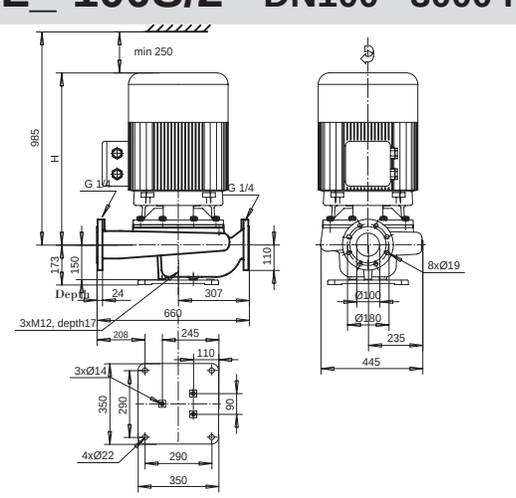
Pump input power P_2



Motor input power P_1

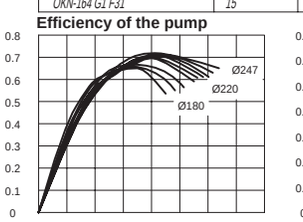


L_-100S/2 DN100 3000 r/min

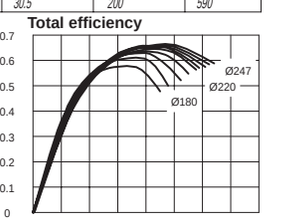


	kW	A	kg	H
OKM-227 K1 F32	45	77.5	405	735
OKM-207 J1 F31	37	64	365	735
OKM-206 K1 F31	30	53	345	645
OKM-187 G1 F31	22	38	275	645
OKM-165 H1 F31	18.5	34	245	630
OKN-164 G1 F31	15	30.5	200	590

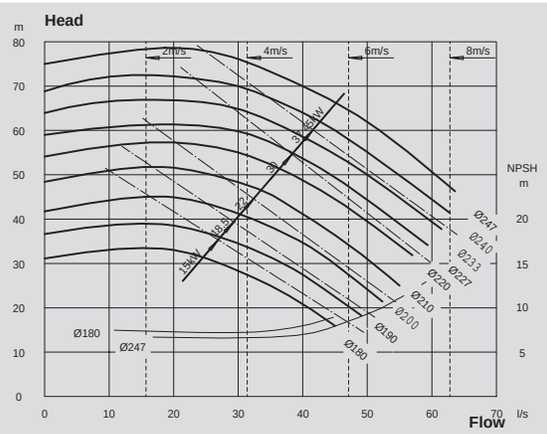
Efficiency of the pump



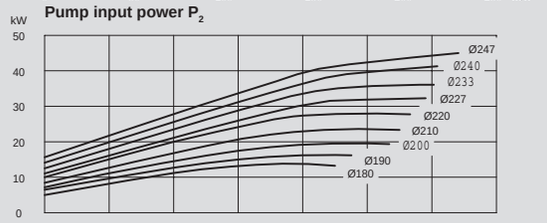
Total efficiency



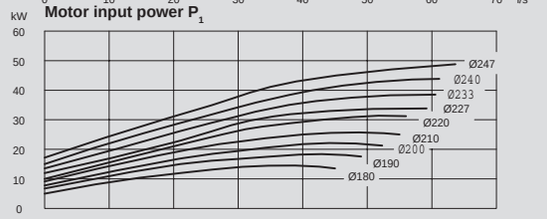
Head



Pump input power P_2

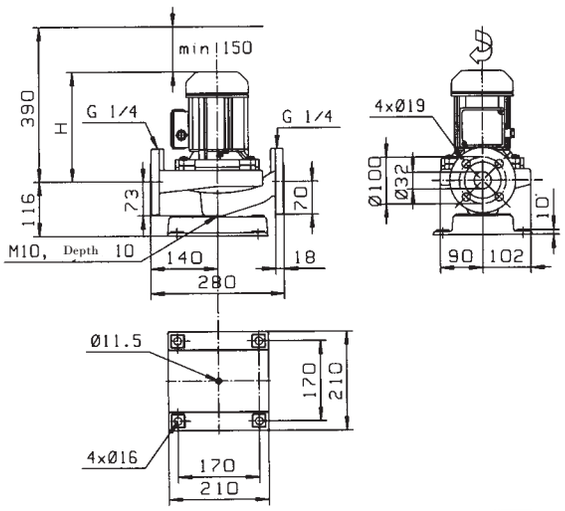


Motor input power P_1

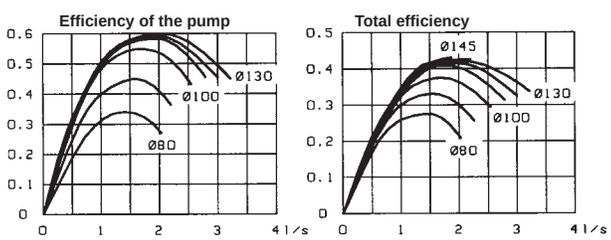


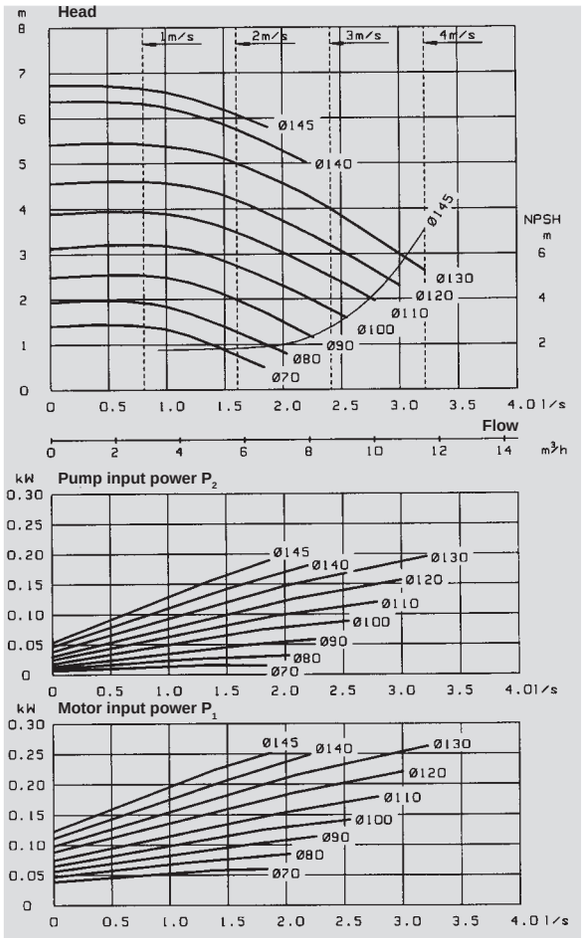
Technical data

AL_-1032/4 DN32 1500 r/min

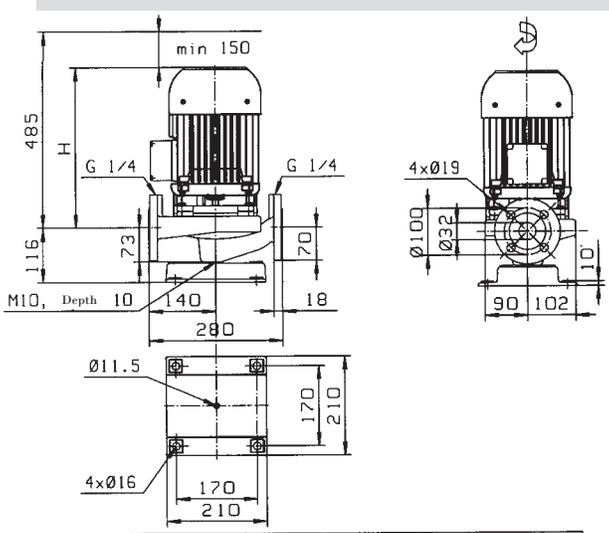


	kW	A	kg	H
OP-752 N13	0.20	0.65	22	240
OP-752 P N13 1~	0.20	1.45	22	240

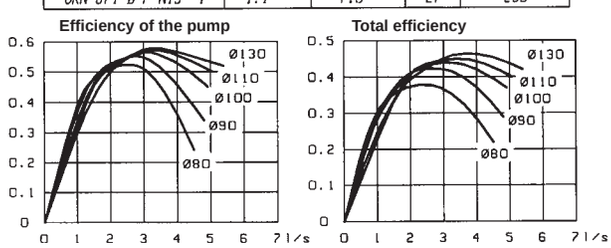


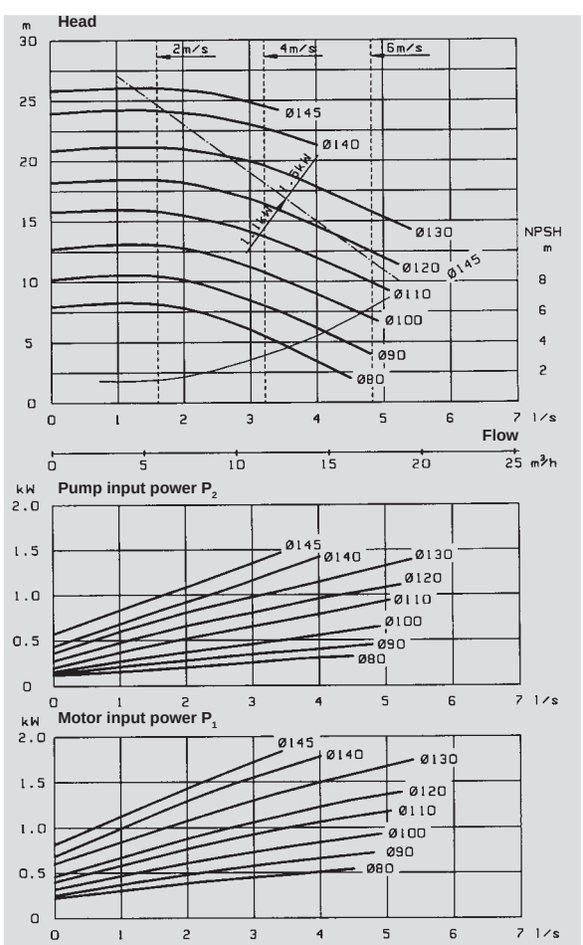


AL_-1032/2 DN32 3000 r/min



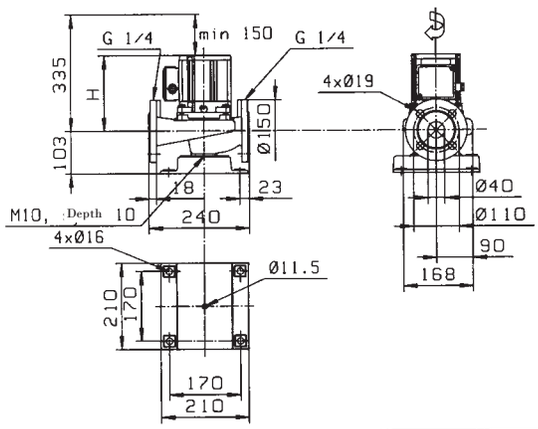
	kW	A	kg	H
OKN-101 C1 N13	1.5	3.3	39	335
OKN-101 C1 P N13 1~	1.5	8.8	39	335
OKN-871 D N13	1.1	2.8	27	290
OKN-871 D P N13 1~	1.1	7.0	27	290



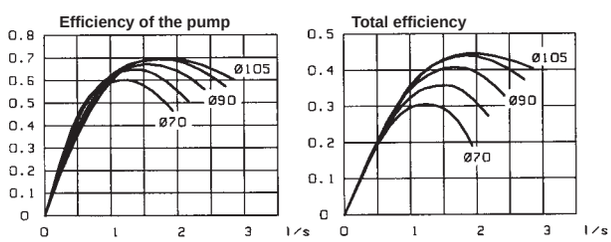


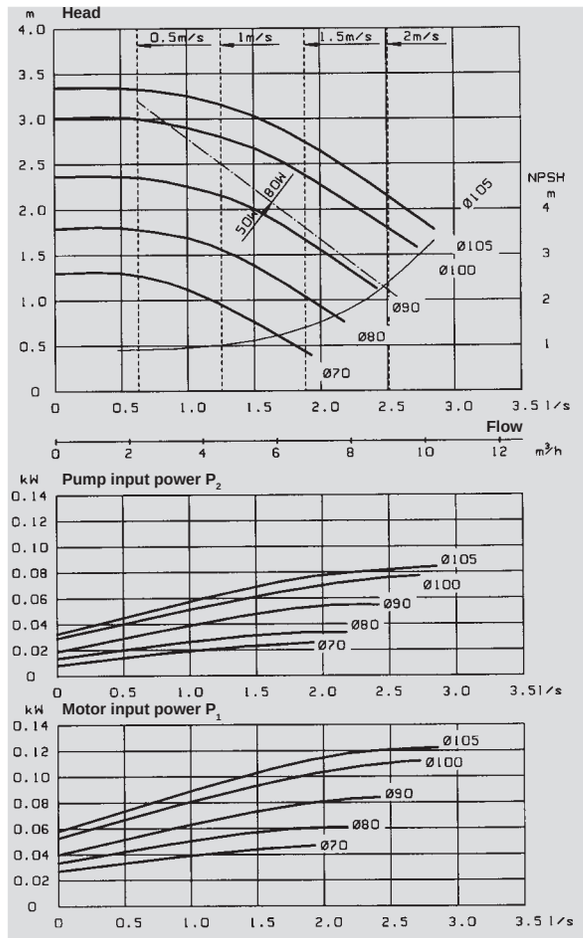
Technical data

AL_-1040/4 DN40 1500 r/min

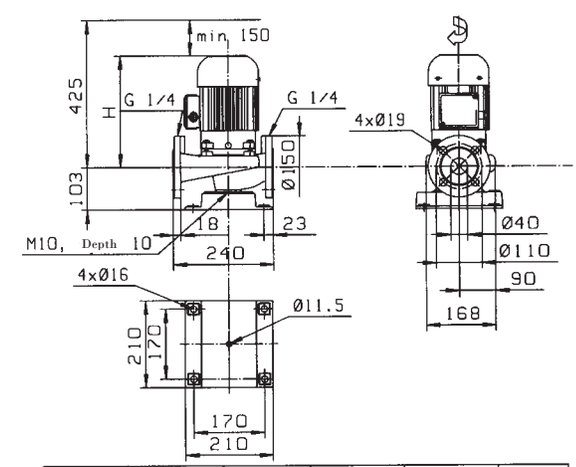


	kW	A	kg	H
OP-742 N12	0.08	0.28	18.5	185
OP-742 P N12 1~	0.08	0.62	18.5	185
OP-742 P N12 1~	0.05	0.47	18.5	185
OP-732 B N12	0.05	0.21	17	185

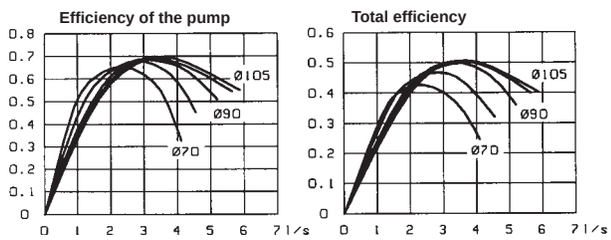


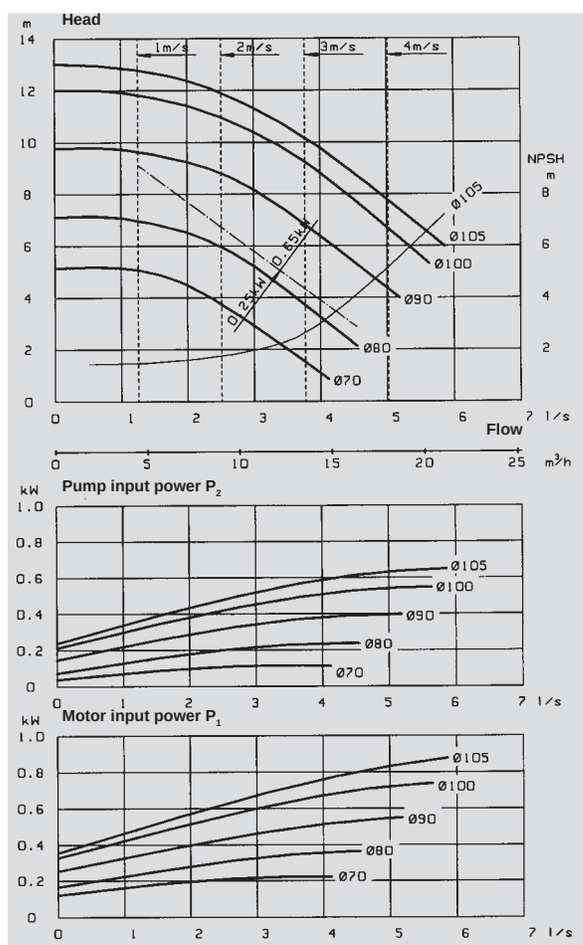


AL_-1040/2 DN40 3000 r/min



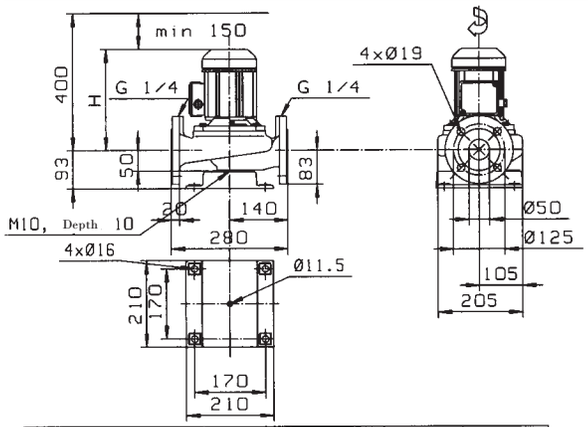
	kW	A	kg	H
OKN-841 D N12	0.65	1.8	22	275
OKN-841 D P N12 1~	0.65	4.5	22	275
OP-741 N12	0.25	0.7	18	225
OP-741 C P N12 1~	0.25	1.8	18	225



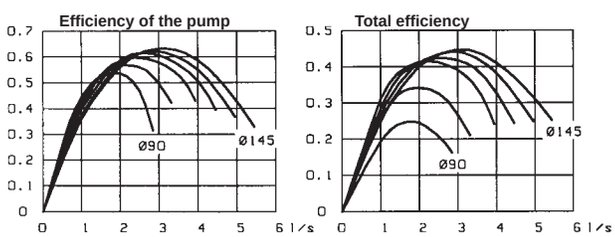


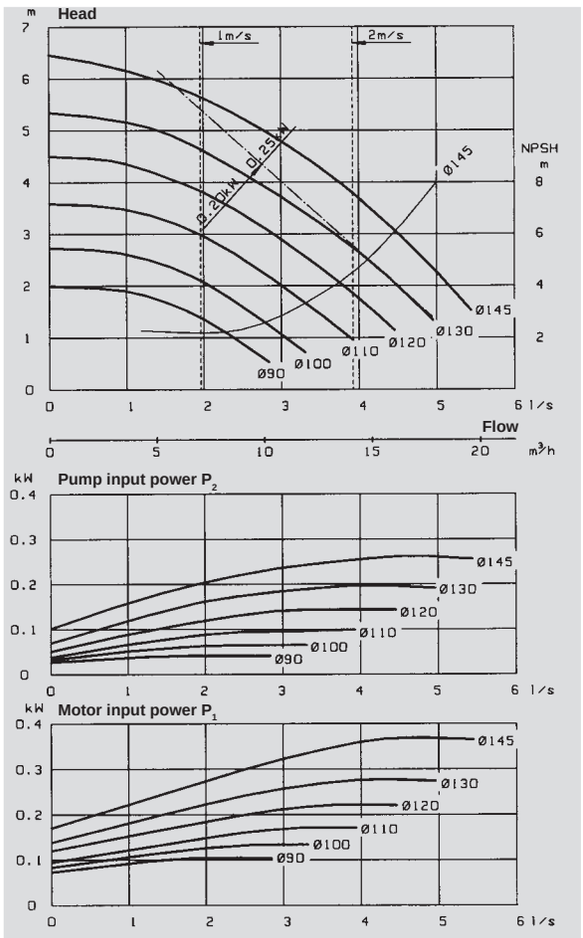
Technical data

AL_-1053/4 DN50 1500 r/min

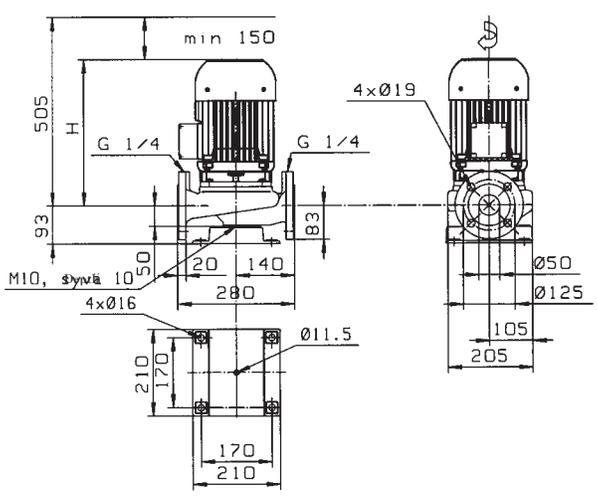


	kW	A	kg	H
OP-762 F15	0.25	0.82	25	250
OP-752 P F15 1~	0.25	1.85	25	250
OP-752 F15	0.20	0.65	25	250
OP-752 P F15 1~	0.20	1.45	25	250

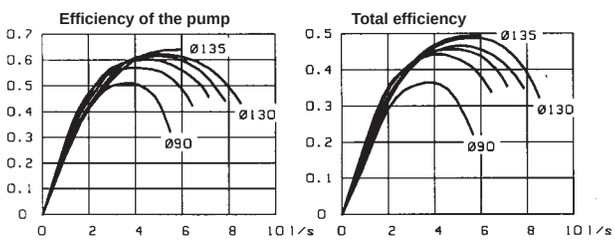


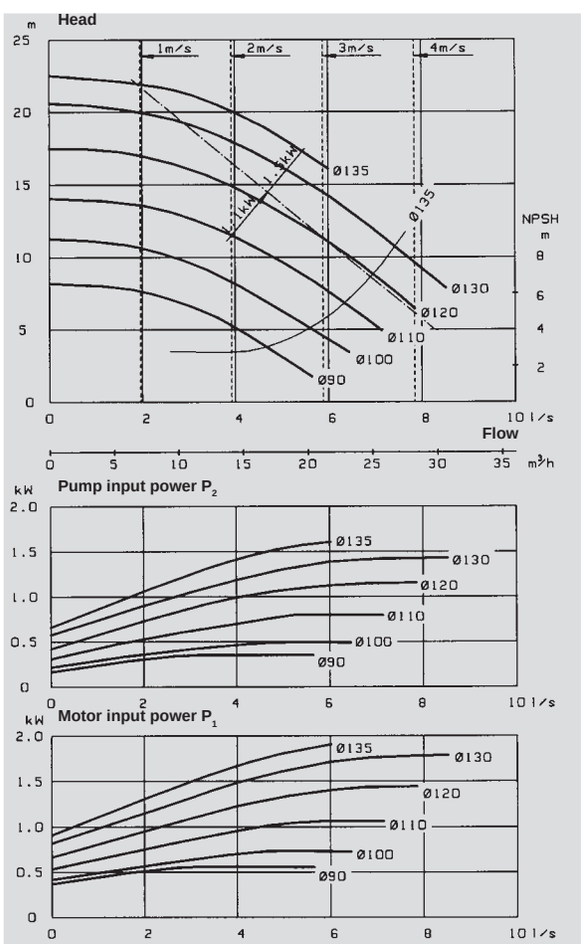


AL_-1053/2 DN50 3000 r/min



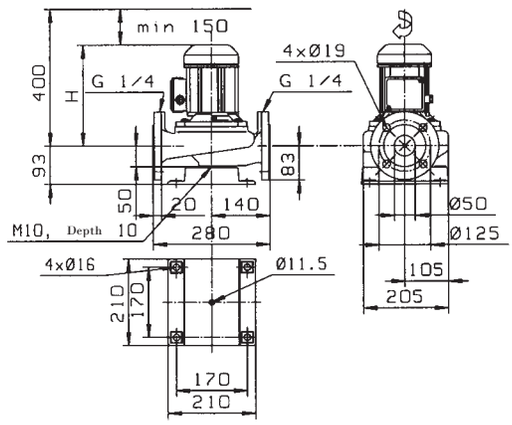
	kW	A	kg	H
OKN-101 C1 F15	1.5	3.3	42	355
OKN-101 C1 P F15 1~	1.5	8.8	42	355
OKN-871 D F15	1.1	2.8	30	315
OKN-871 D P F15 1~	1.1	7.0	30	315



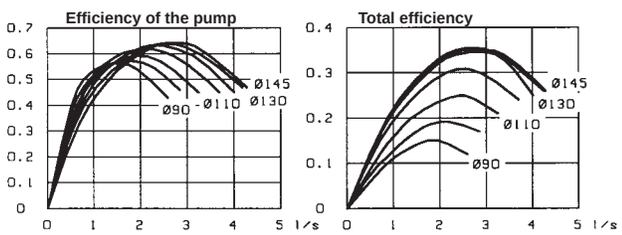


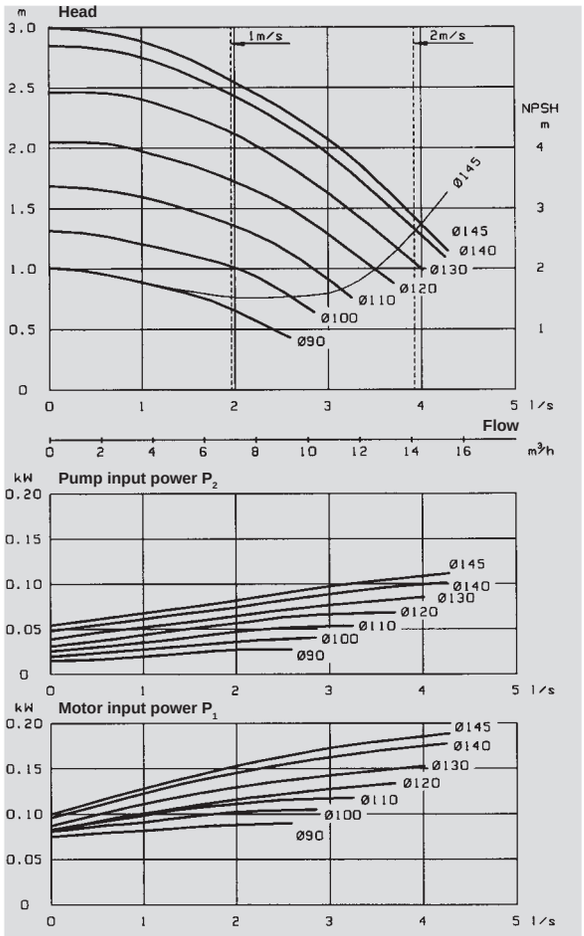
Technical data

AL_-1054/6 DN50 1000 r/min

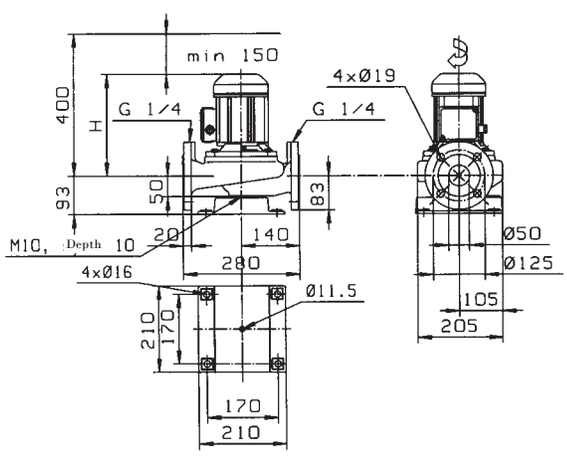


	kW	A	kg	H
OP-753 F15	0.11	0.5	25	250

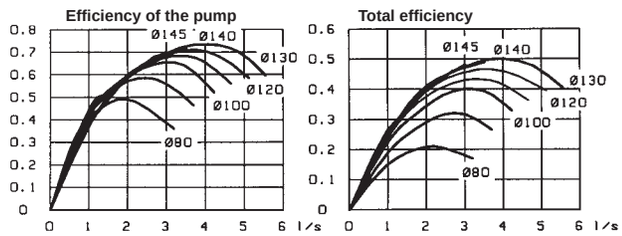


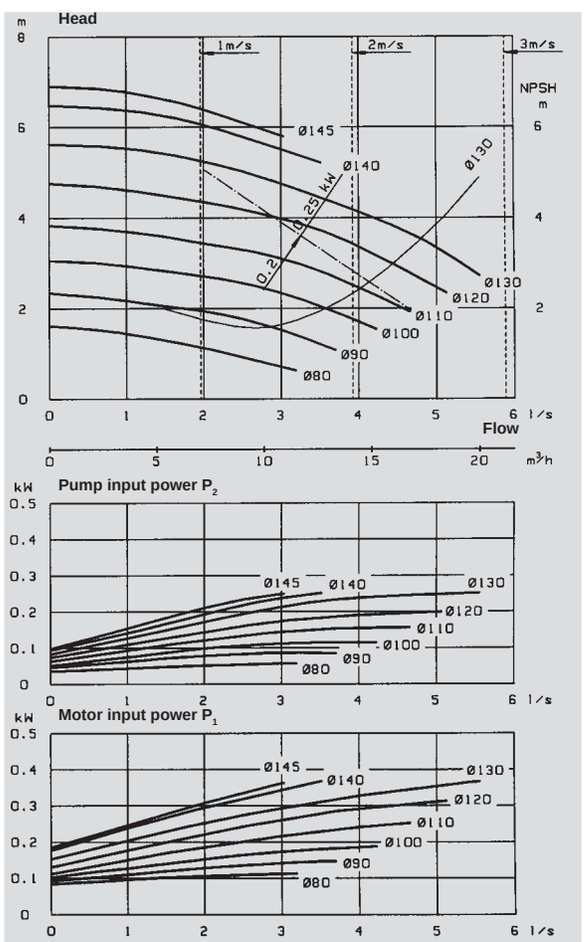


AL_-1054/4 DN50 1500 r/min



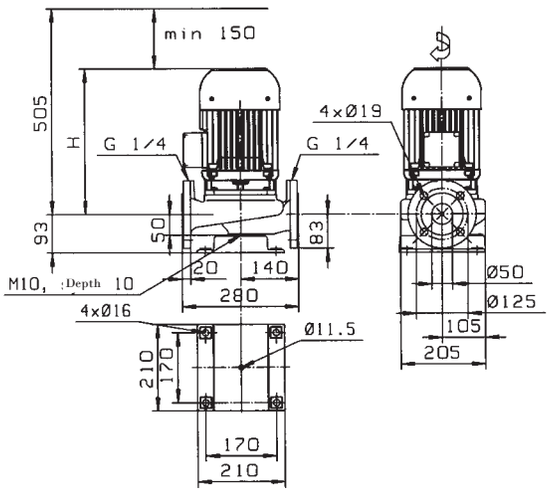
	kW	A	kg	H
OP-762 F15	0.25	0.82	25	250
OP-752 P F15 1~	0.25	1.85	25	250
OP-752 F15	0.20	0.65	25	250
OP-752 P F15 1~	0.20	1.45	25	250



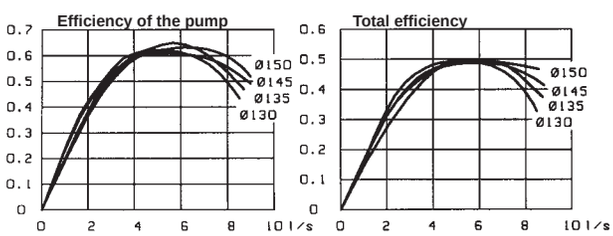


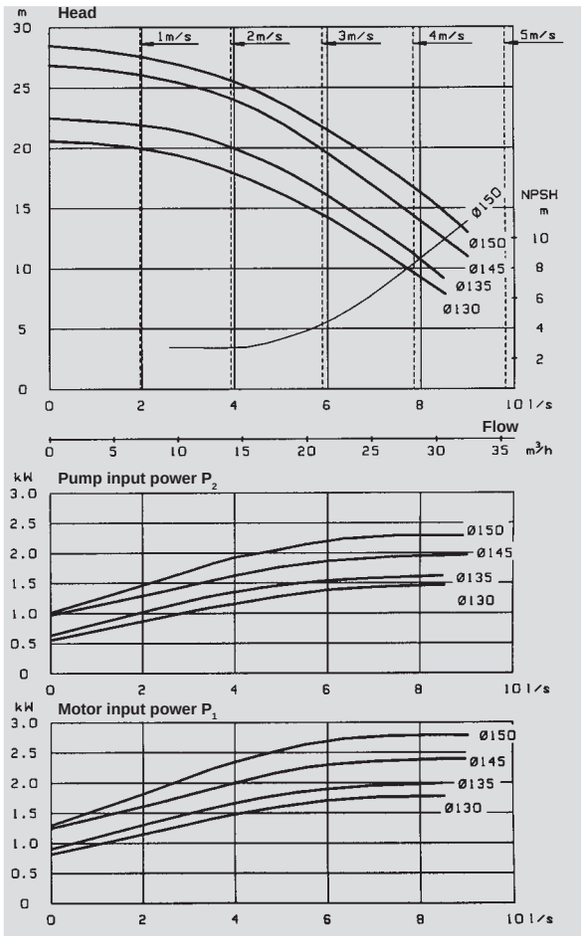
Technical data

AL_-1055/2 DN50 3000 r/min

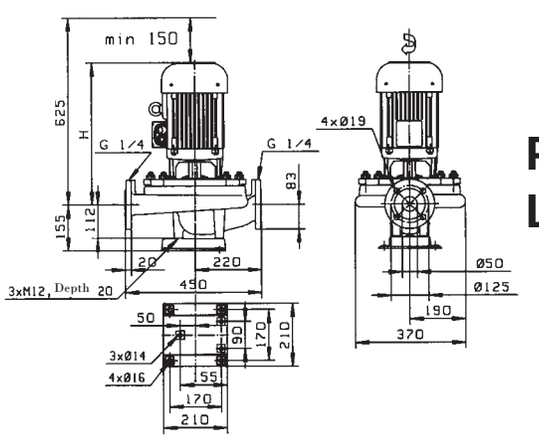


	kW	A	kg	H
OKN-101 D1 F16	2.2	4.7	43	355

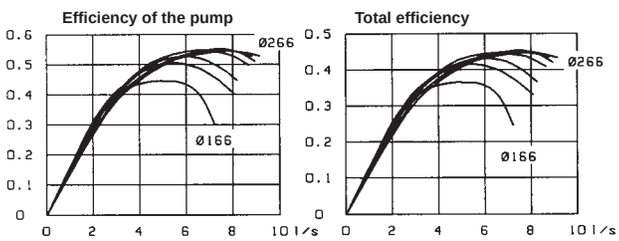




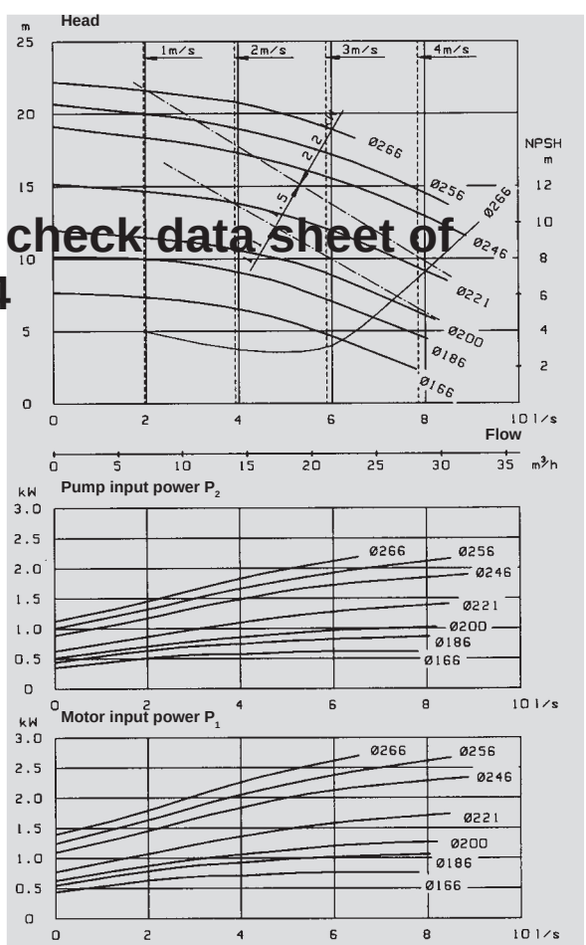
AL_-1057/4 DN50 1500 r/min



	kW	A	kg	H
OKN-112 C2 R14	2.2	5.1	77	475
OKN-101 D2 R14	1.5	3.5	71	430
OKN-101 C2 R14	1.1	2.6	69	430

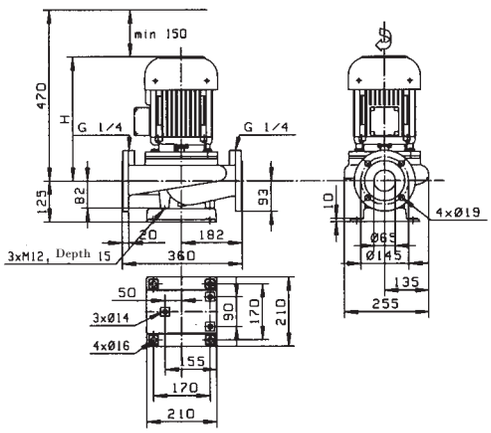


Please check data sheet of L-50S/4

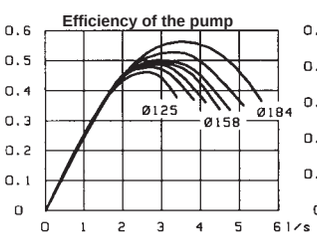


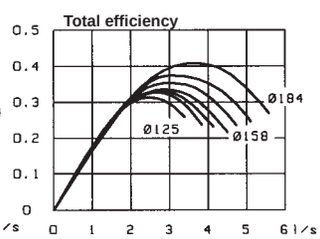
Technical data

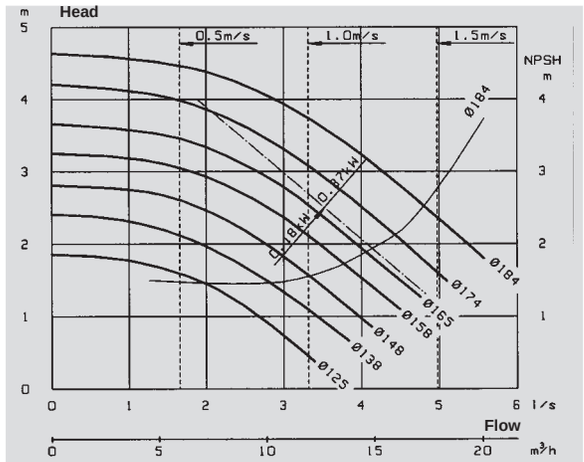
AL_-1065/6 DN65 1000 r/min

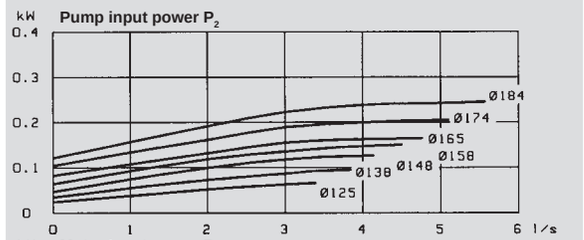


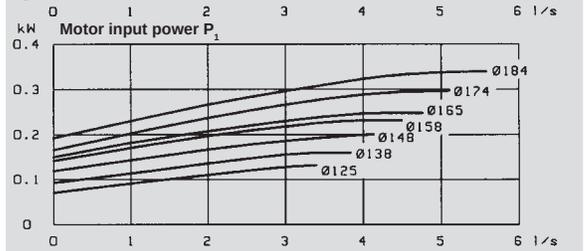
	kW	A	kg	H
OKN-100 B3 F19	0.37	1.20	44	320
OKN-100 B3 F19	0.18	0.95	44	320



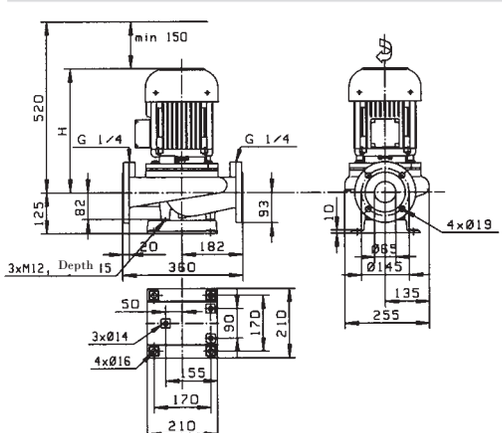




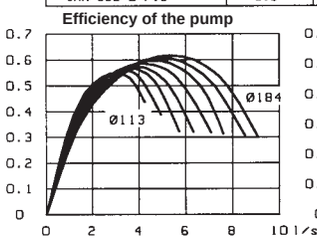


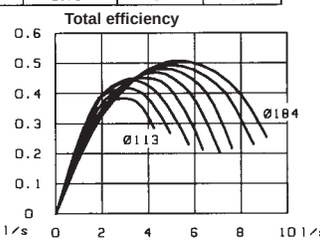


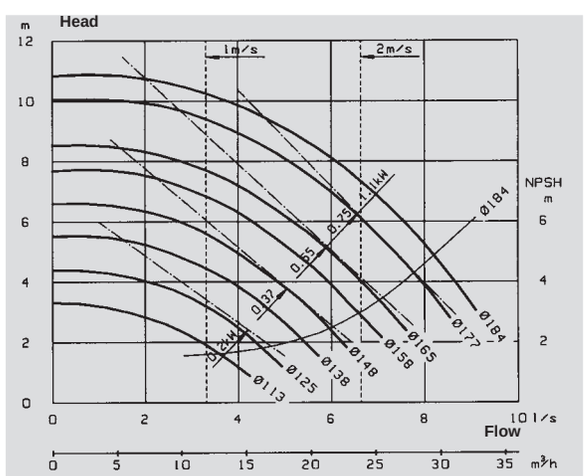
AL_-1065/4 DN65 1500 r/min

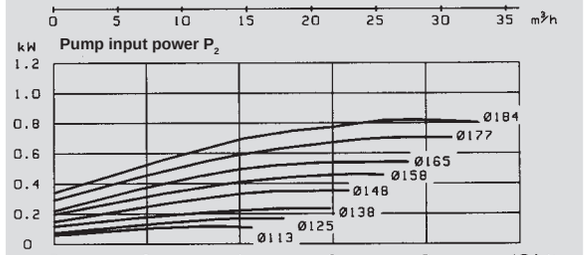


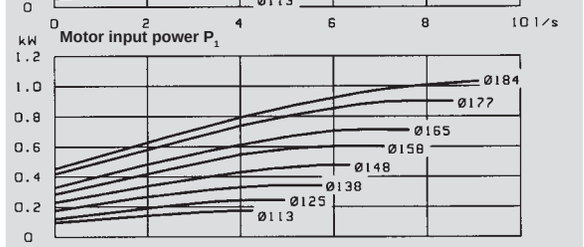
	kW	A	kg	H
OKN-101 C2 F19	1.1	2.6	48	370
OKN-101 C2 P F19 1~	1.1	6.9	48	370
OKN-100 B2 F19	0.75	2.0	44	320
OKN-100 B2 P F19 1~	0.75	4.7	44	320
OKN-100 B2 F19	0.55	1.4	44	320
OKN-100 B2 P F19 1~	0.55	3.4	44	320
OKN-852 D F19	0.37	1.0	37	310
OKN-852 D F19	0.2	0.75	37	310





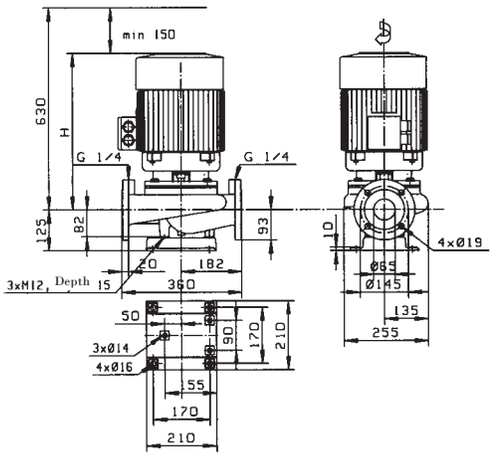




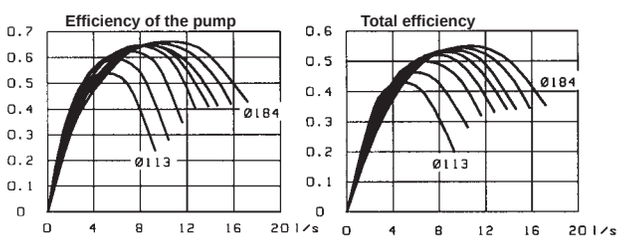


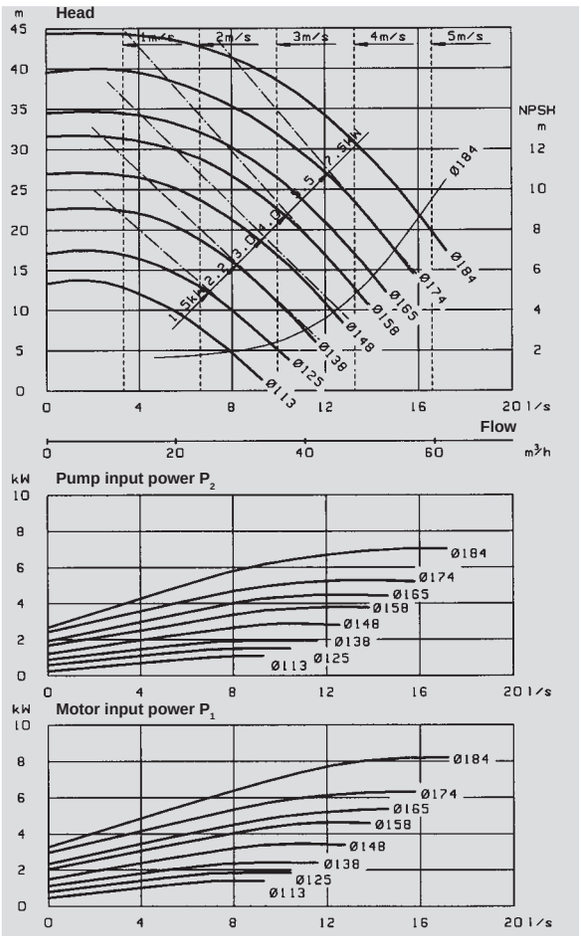
Technical data

AL_-1065/2 DN65 3000 r/min

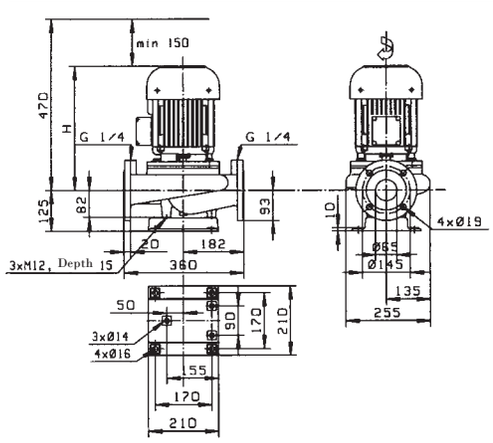


	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	94	480
OKN-132 C1 F19	5.5	11.0	86	480
OKN-112 E1 F19	4.0	8.2	62	415
OKN-112 C1 F19	3.0	6.4	58	415
OKN-101 D1 F19	2.2	4.7	52	370
OKN-101 C1 F19	1.5	3.3	51	370

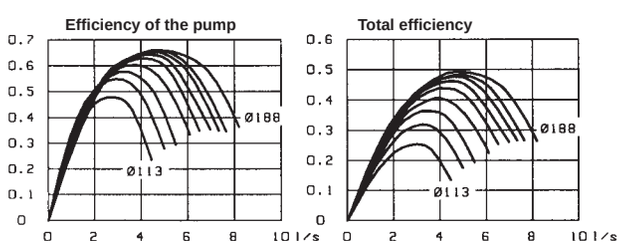


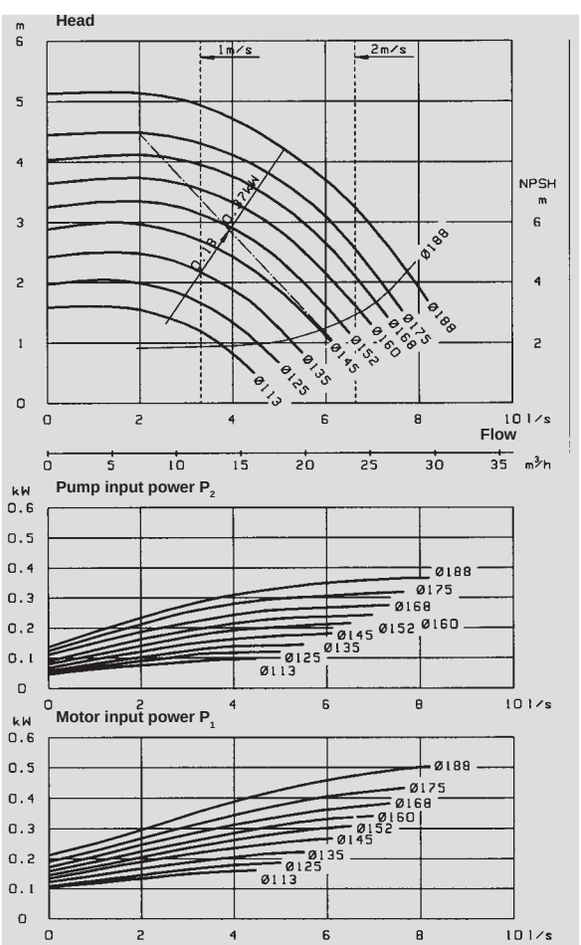


AL_-1066/6 DN65 1000 r/min



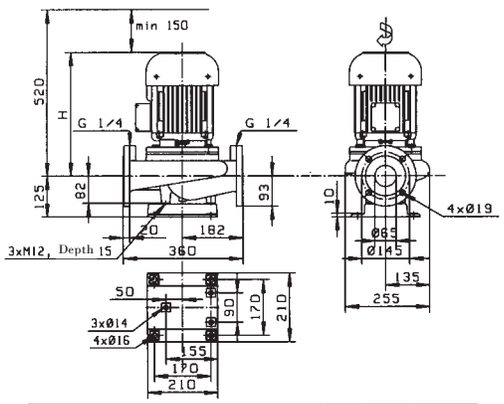
	kW	A	kg	H
OKN-100 B3 F19	0.37	1.20	44	320
OKN-100 B3 F19	0.18	0.95	44	320



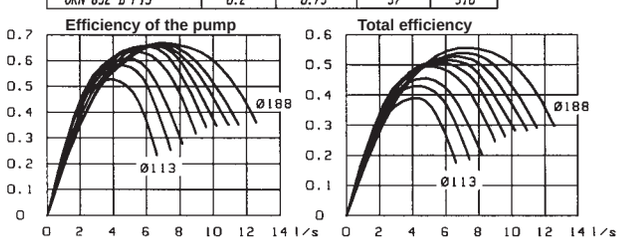


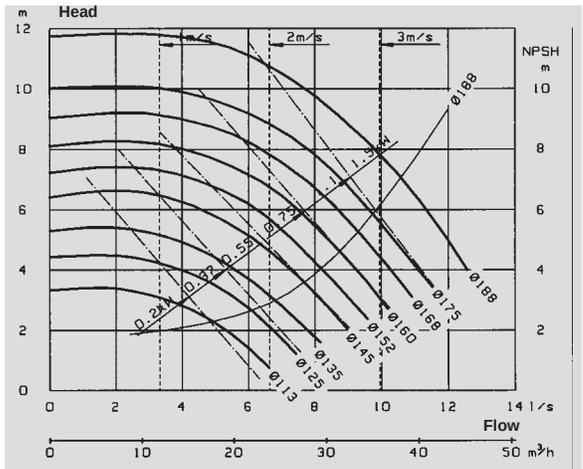
Technical data

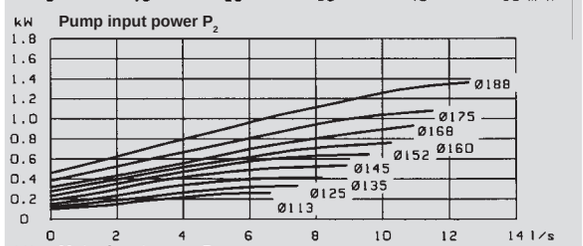
AL_-1066/4 DN65 1500 r/min

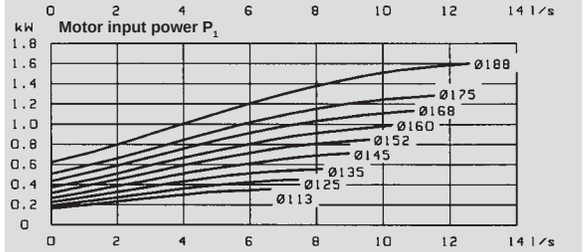


	kW	A	kg	H
OKN-101 D2 F19	1.5	3.5	52	370
OKN-101 D2 P F19 1~	1.5	9.0	52	370
OKN-101 C2 F19	1.1	2.6	48	370
OKN-101 C2 P F19 1~	1.1	6.9	48	370
OKN-100 B2 F19	0.75	2.0	44	320
OKN-100 B2 P F19 1~	0.75	4.7	44	320
OKN-100 B2 F19	0.55	1.4	44	320
OKN-100 B2 P F19 1~	0.55	3.4	44	320
OKN-852 D F19	0.37	1.0	37	310
OKN-852 D P F19 1~	0.37	2.5	37	310
OKN-852 D F19	0.2	0.75	37	310

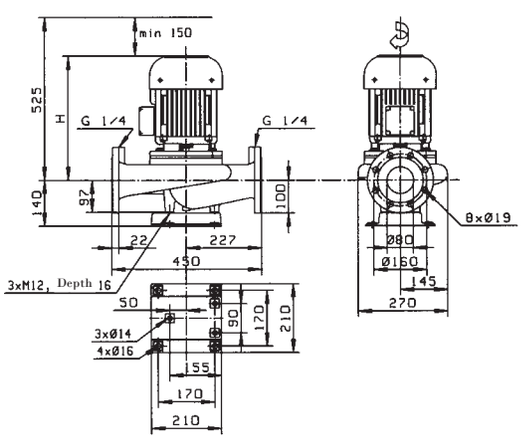




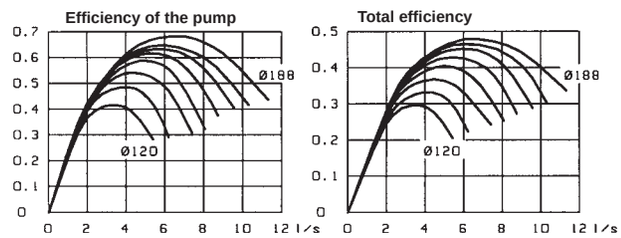


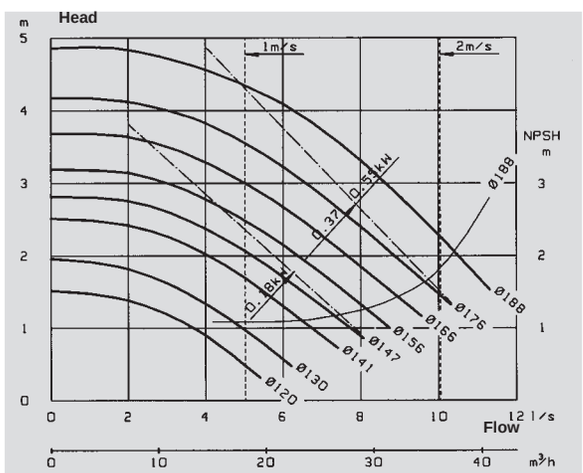


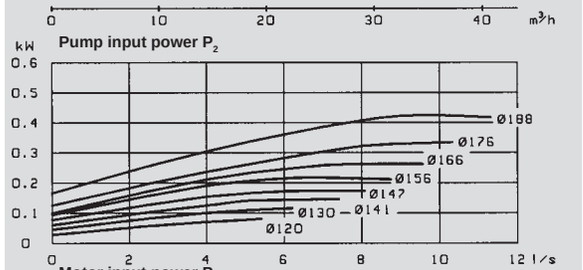
AL_-1081/6 DN80 1000 r/min

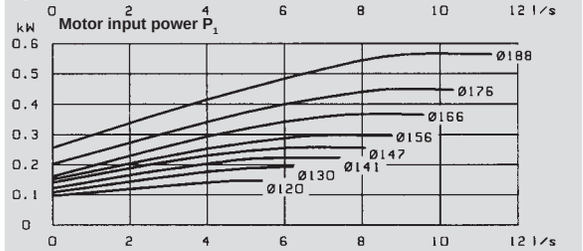


	kW	A	kg	H
OKN-101 C3 F19	0.55	1.75	54	325
OKN-100 B3 F19	0.37	1.2	51	325
OKN-100 B3 F19	0.18	0.95	51	325



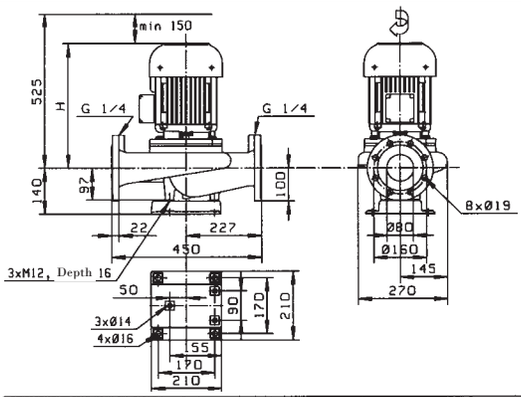




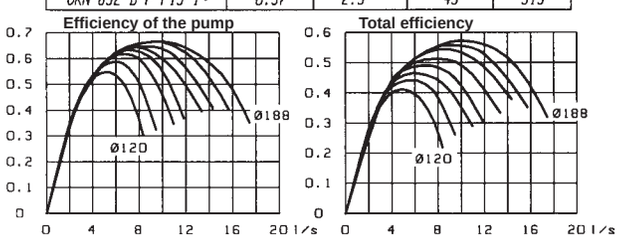


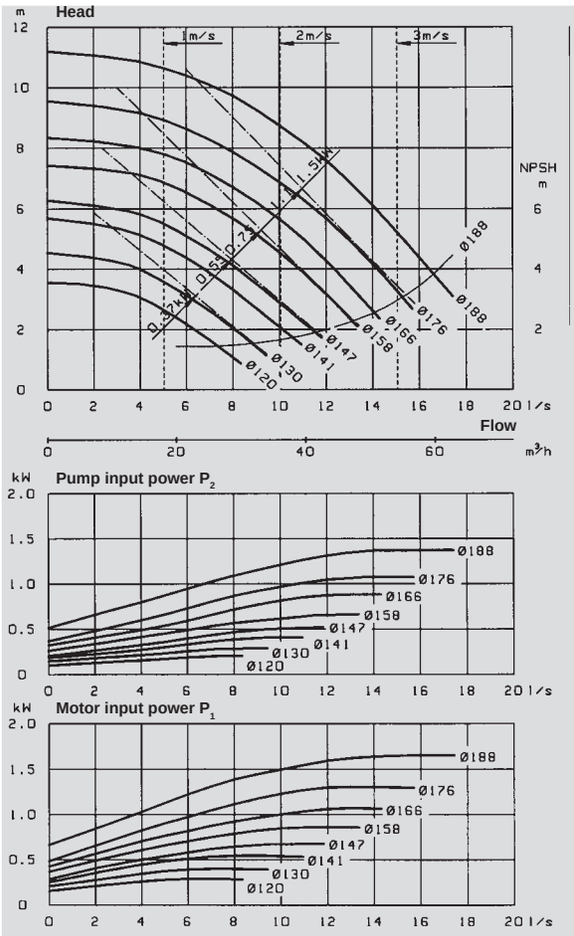
Technical data

AL_-1081/4 DN80 1500 r/min

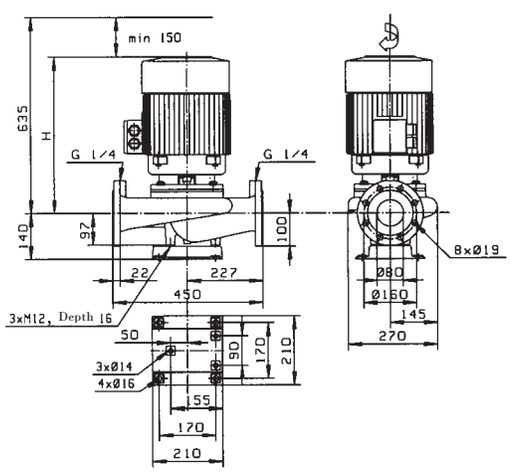


	kW	A	kg	H
OKN-101 D2 F19	1.5	3.5	58	375
OKN-101 D2 P F19 1~	1.5	9.0	58	375
OKN-101 C2 F19	1.1	2.6	54	375
OKN-101 C2 P F19 1~	1.1	6.9	54	375
OKN-100 B2 F19	0.75	2.0	50	325
OKN-100 B2 P F19 1~	0.75	4.7	50	325
OKN-100 B2 F19	0.55	1.4	50	325
OKN-100 B2 P F19 1~	0.55	3.4	50	325
OKN-852 D F19	0.37	1.0	43	315
OKN-852 D P F19 1~	0.37	2.5	43	315

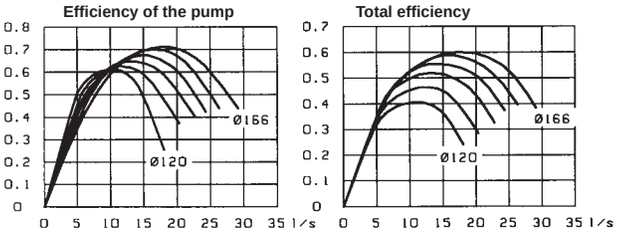


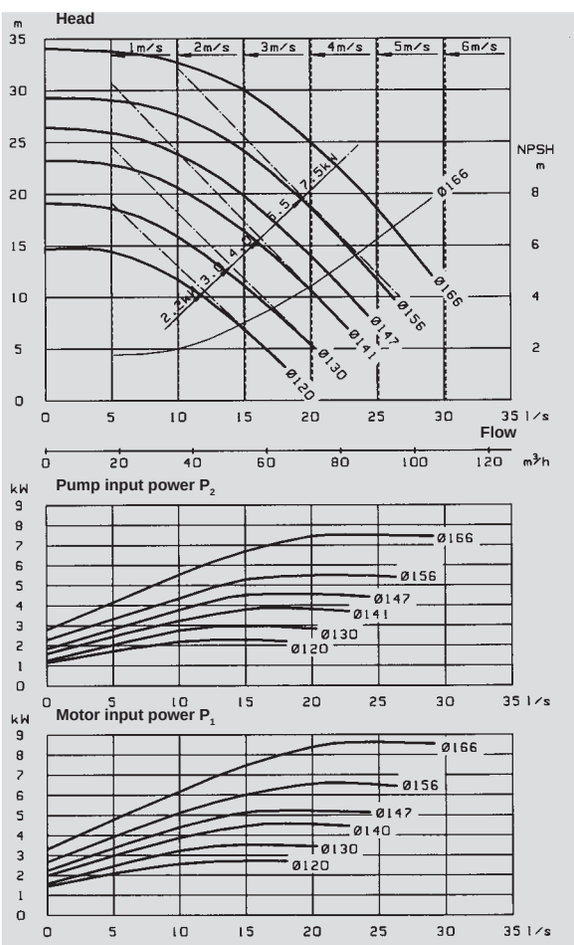


AL_-1081/2 DN80 3000 r/min



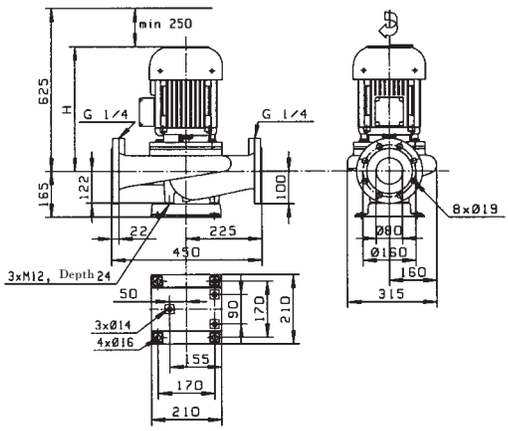
	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	99	485
OKN-132 C1 F19	5.5	11.0	92	485
OKN-112 E1 F19	4.0	8.2	68	420
OKN-112 C1 F19	3.0	6.4	64	420
OKN-101 D1 F19	2.2	4.7	58	375



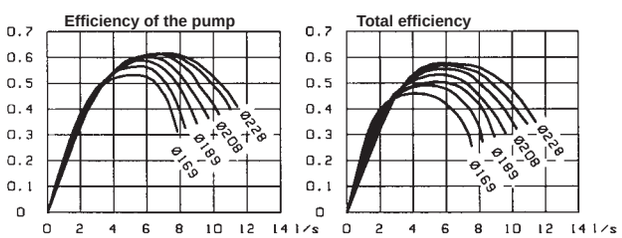


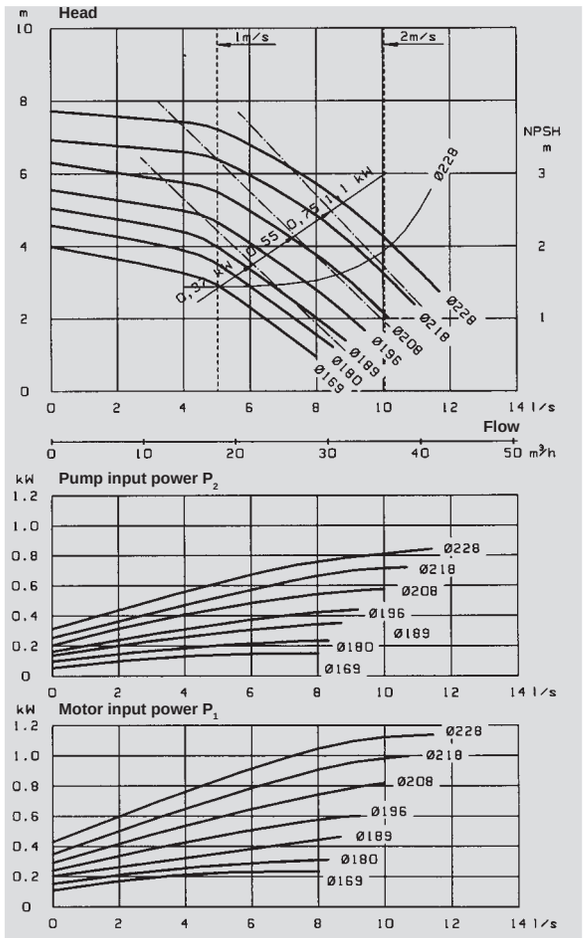
Technical data

AL_-1082/6 DN80 1000 r/min

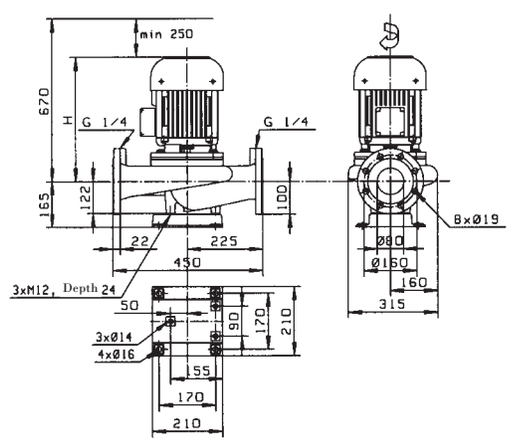


	kW	A	kg	H
OKN-101 D3 F28	1.1	3.5	69	375
OKN-101 D3 F28	0.75	2.4	69	375
OKN-101 C3 F28	0.55	1.75	67	375
OKN-100 B3 F28	0.37	1.2	64	325

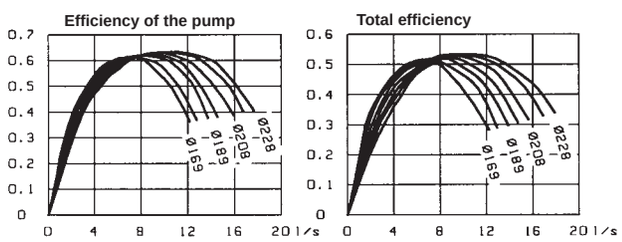


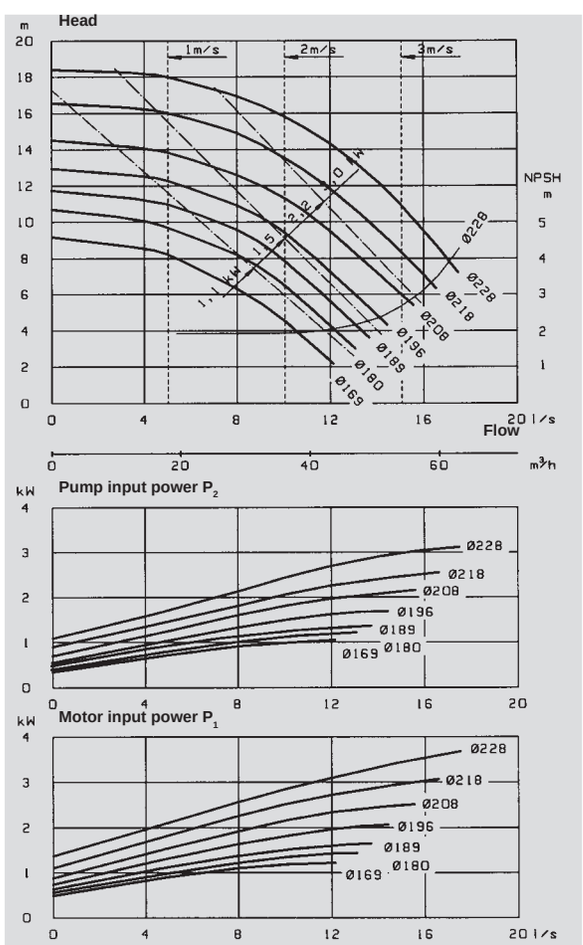


AL_-1082/4 DN80 1500 r/min



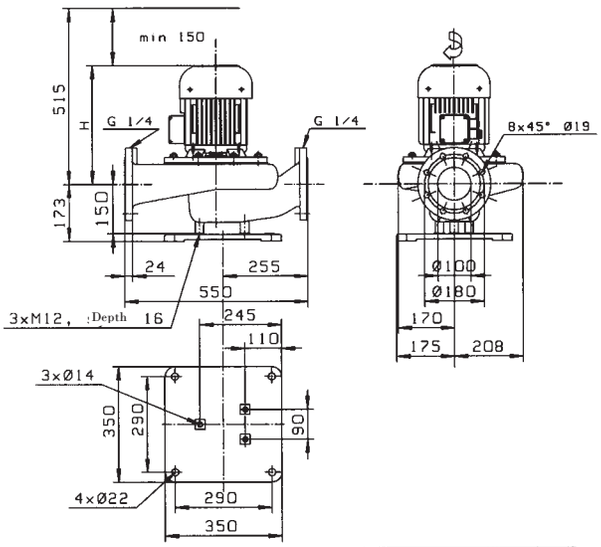
	kW	A	kg	H
OKN-112 E2 F28	3.0	6.5	83	420
OKN-112 C2 F28	2.2	5.1	77	420
OKN-101 D2 F28	1.5	3.5	71	375
OKN-101 D2 P F28 1~	1.5	9.0	71	375
OKN-101 C2 F28	1.1	2.6	69	375
OKN-101 C2 P F28 1~	1.1	6.9	69	375



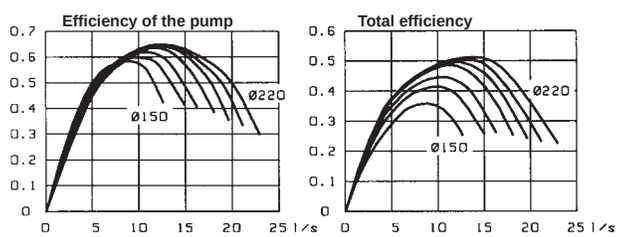


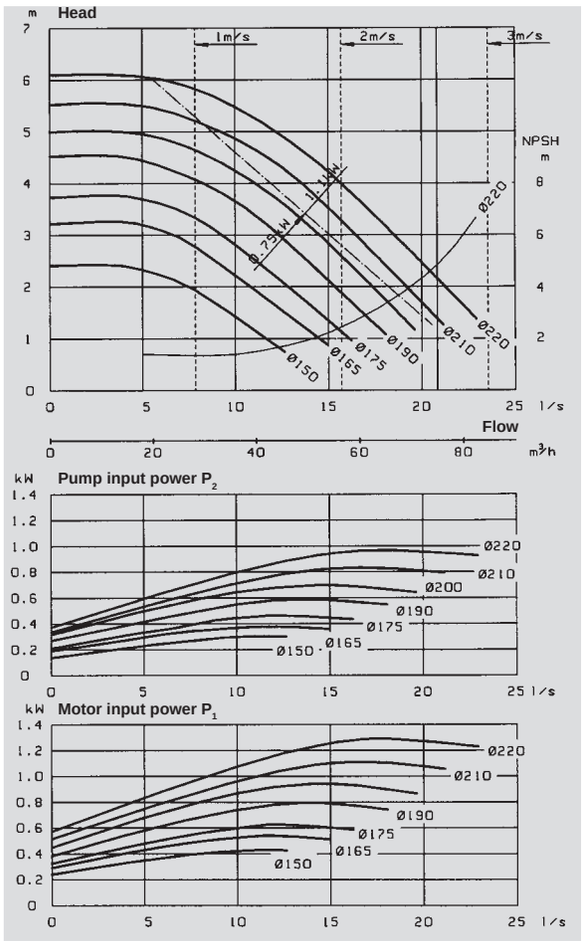
Technical data

AKN_-100/6 DN100 1000 r/min

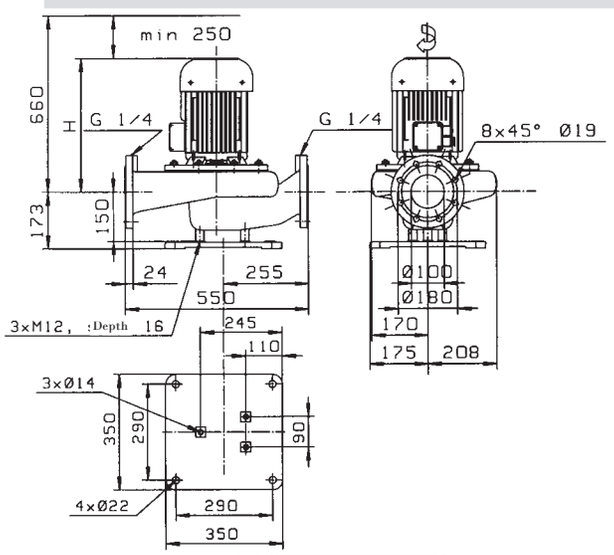


	kW	A	kg	H
OKN-101 D3 N26	1.1	3.5	71	365
OKN-101 D3 N26	0.75	2.4	71	365

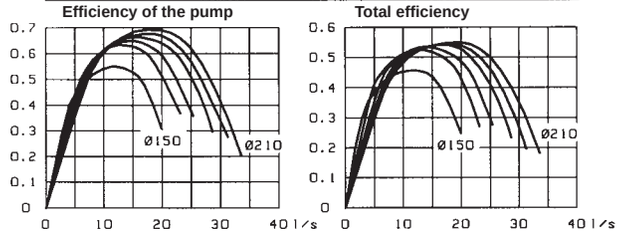


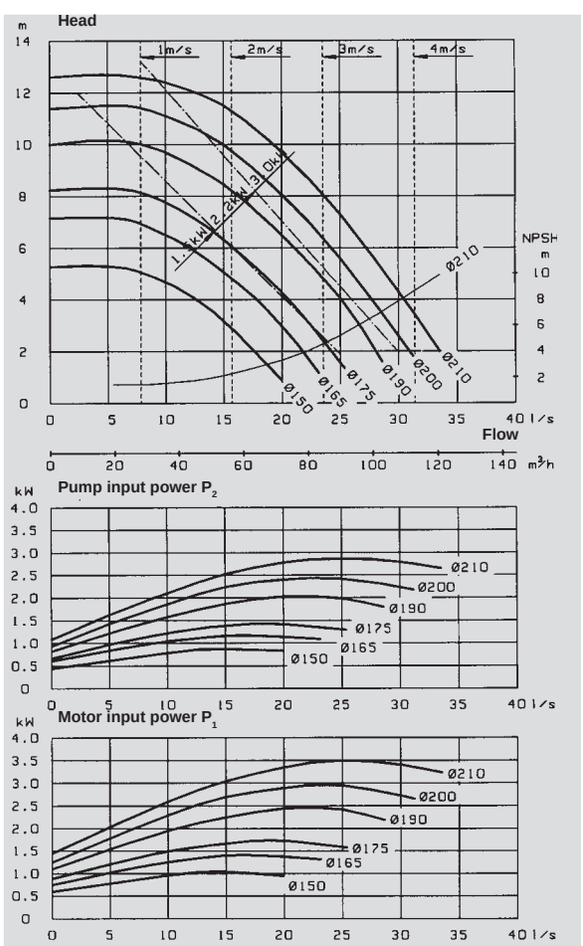


AKN_-100/4 DN100 1500 r/min



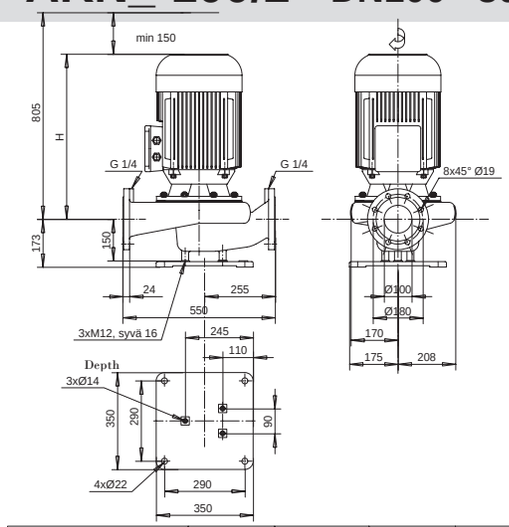
	kW	A	kg	H
OKN-112 E2 N26	3.0	6.6	84	410
OKN-112 C2 N26	2.2	5.1	79	410
OKN-101 D2 N26	1.5	3.5	73	365



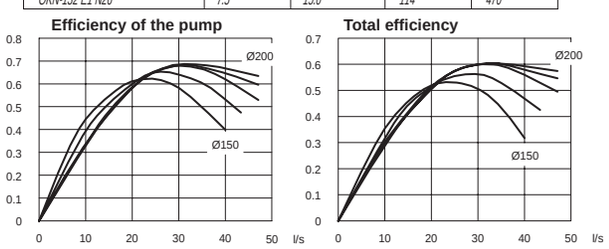


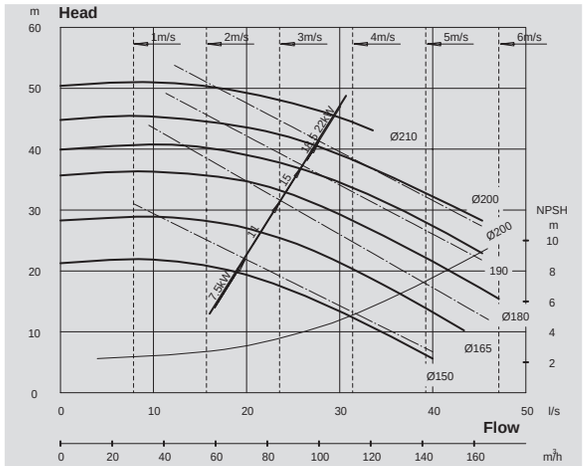
Technical data

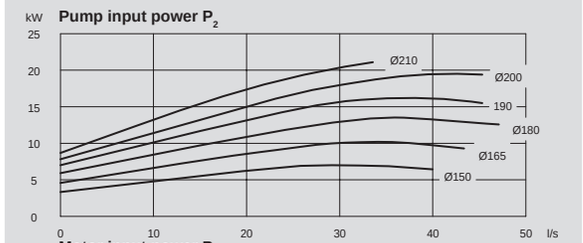
AKN_-100/2 DN100 3000 r/min

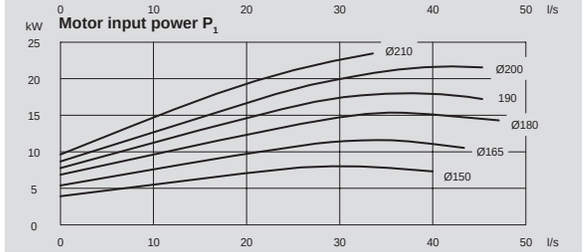


	kW	A	kg	H
OKM-187 G1 N26	22	38	240	655
OKM-187 G1 N26	18.5	32	240	655
OKN-164 G1 N26	15	30.5	165	600
OKN-164 F1 N26	11	22.0	160	600
OKN-132 E1 N26	7.5	15.0	114	470

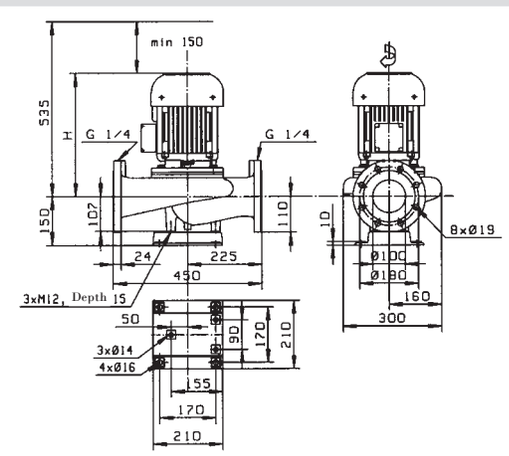




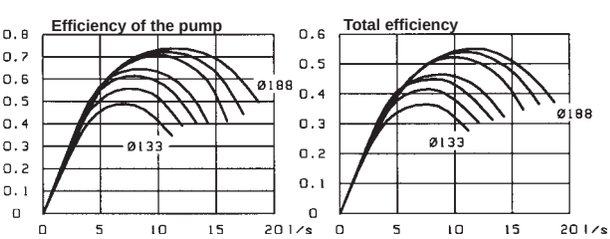


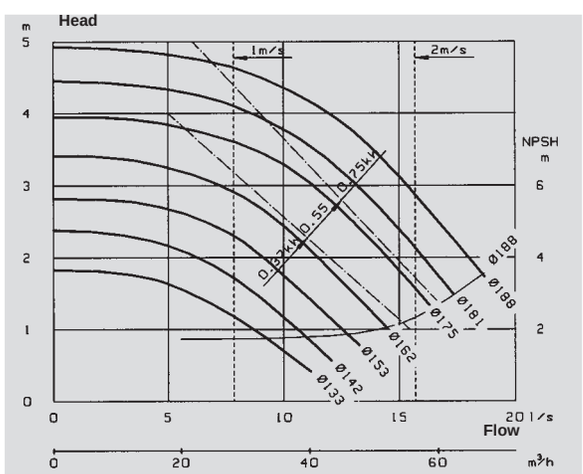


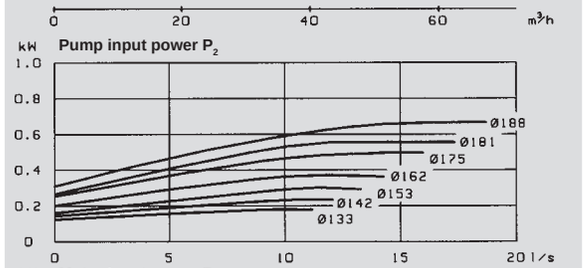
AL_-1102/6 DN100 1000 r/min

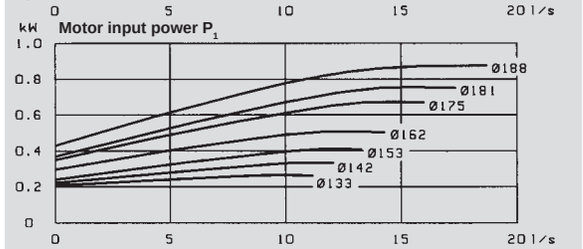


	kW	A	kg	H
OKN-101 D3 F19	0.75	2.4	66	385
OKN-101 C3 F19	0.55	1.75	62	385
OKN-100 B3 F19	0.37	1.2	59	335



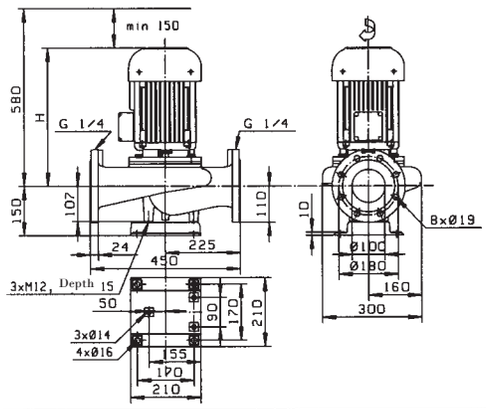




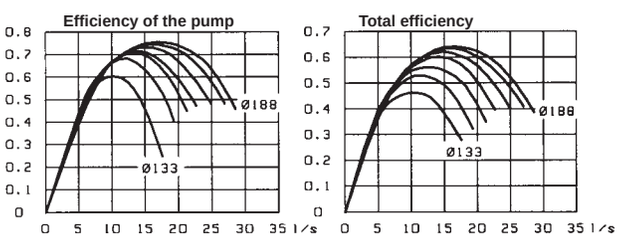


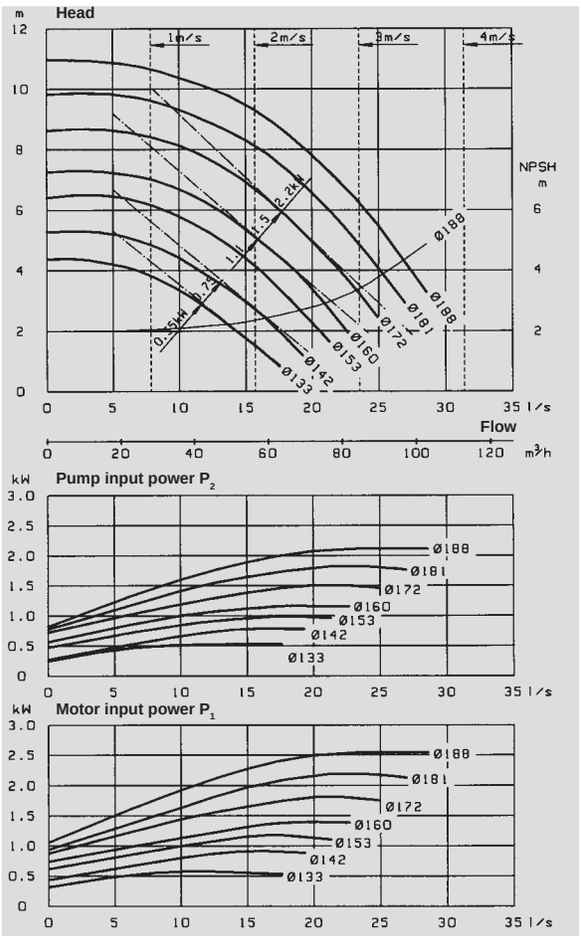
Technical data

AL_-1102/4 DN100 1500 r/min

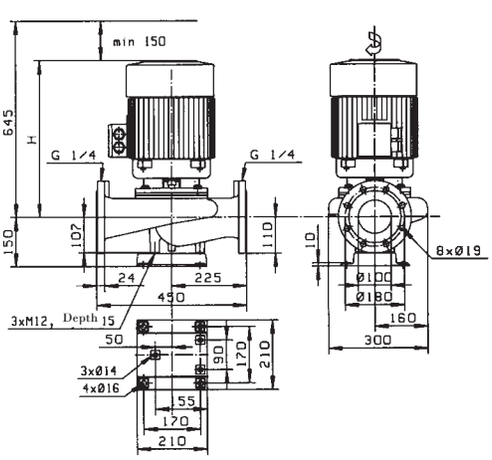


	kW	A	kg	H
OKN-112 C2 F19	2.2	5.1	72	430
OKN-101 D2 F19	1.5	3.5	66	385
OKN-101 D2 P F19 1~	1.5	9.0	66	385
OKN-101 C2 F19	1.1	2.6	62	385
OKN-101 C2 P F19 1~	1.1	6.9	62	385
OKN-100 B2 F19	0.75	2.0	59	335
OKN-100 B2 F19	0.55	1.4	59	335
OKN-100 B2 P F19 1~	0.55	3.4	59	335

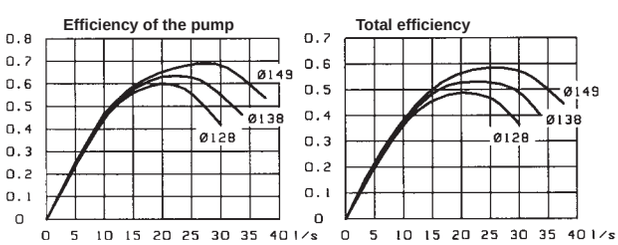


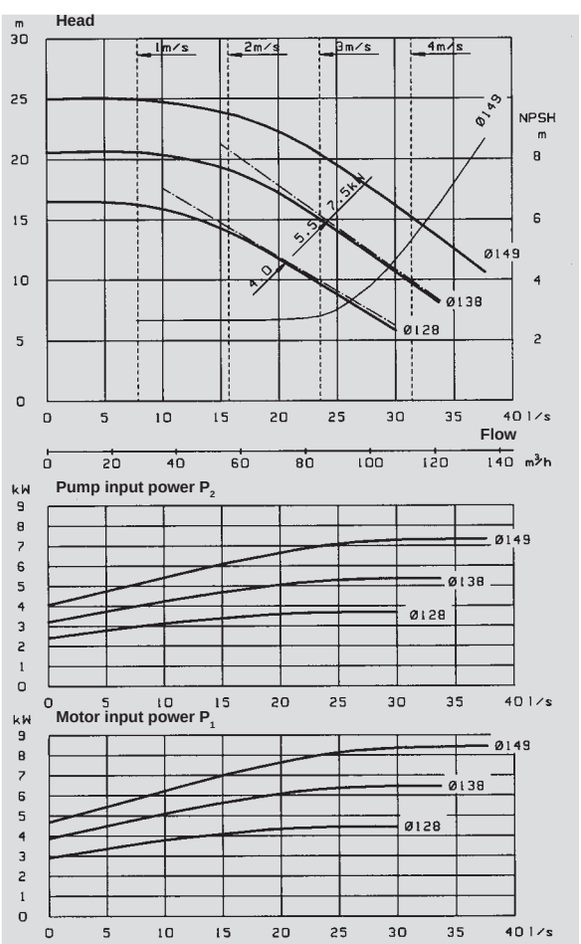


AL_-1102/2 DN100 3000 r/min



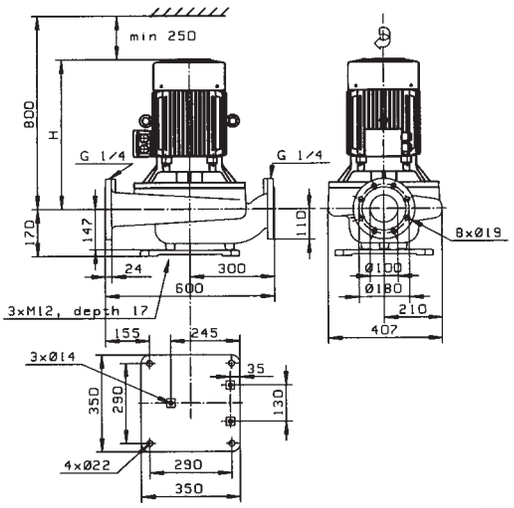
	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	109	495
OKN-132 C1 F19	5.5	11.0	99	495
OKN-112 E1 F19	4.0	8.2	75	430



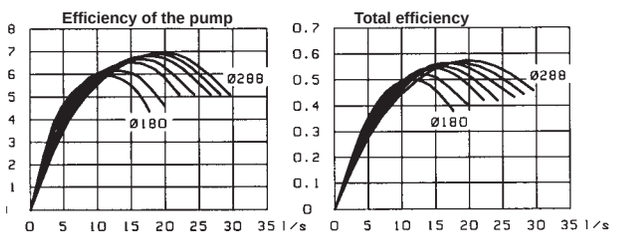


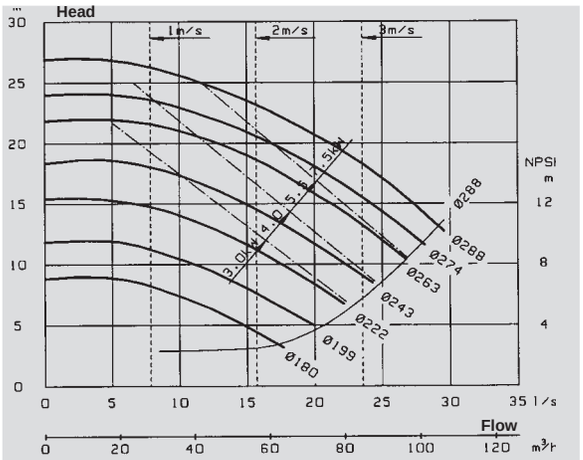
Technical data

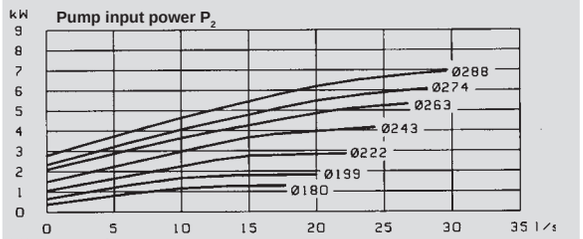
AL_-1106/4 DN100 1500 r/min

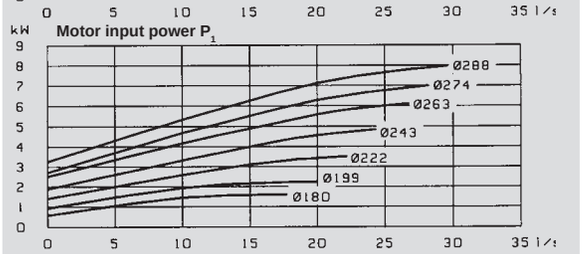


	kW	A	kg	H
OKN-133 G2 BF31	7.5	15.7	190	550
OKN-132 E2 BF31	5.5	11.9	175	500
OKN-132 C2 BF31	4.0	8.7	165	500
OKN-112 E2 F31	3.0	6.6	145	430

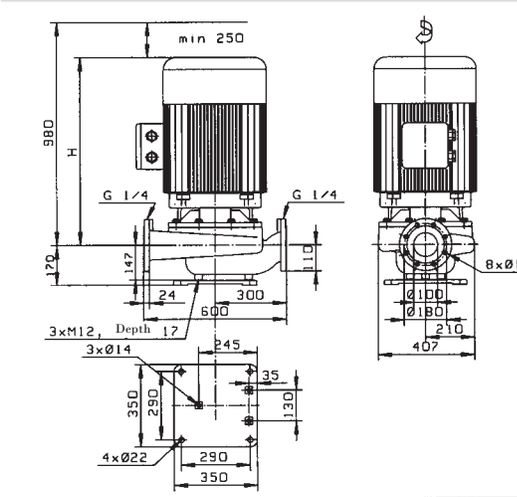




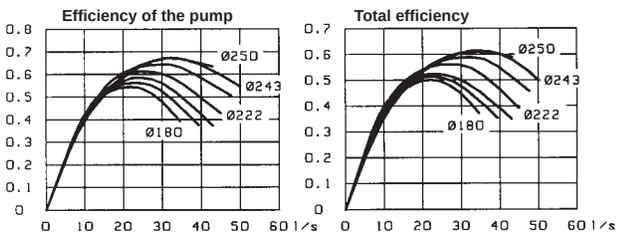


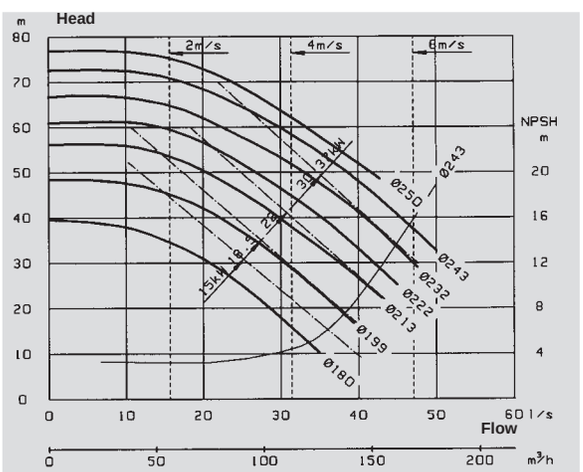


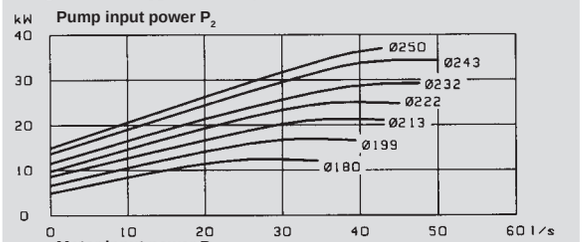
AL_-1106/2 DN100 3000 r/min

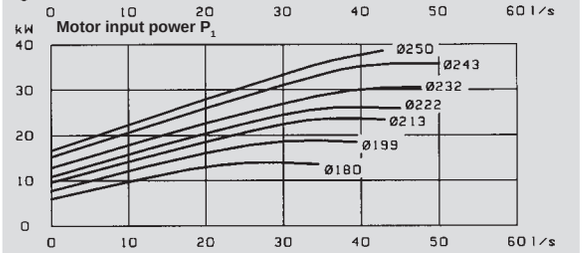


	kW	A	kg	H
OKM-207 J1 F31	37	64	360	730
OKM-206 K1 F31	30	53	340	640
OKM-187 G1 F31	22	38	270	640
OKM-165 H1 F31	18.5	34	240	625
OKM-164 G1 F31	15	30.5	195	585



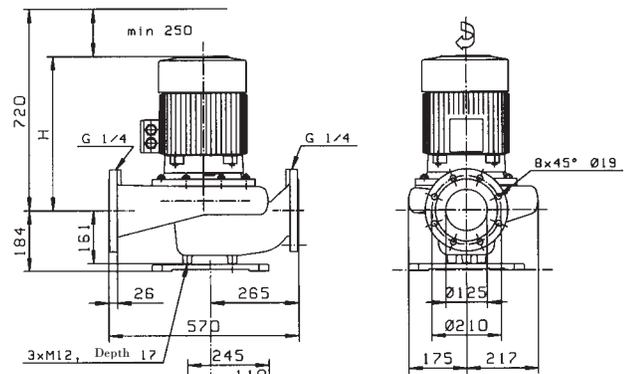




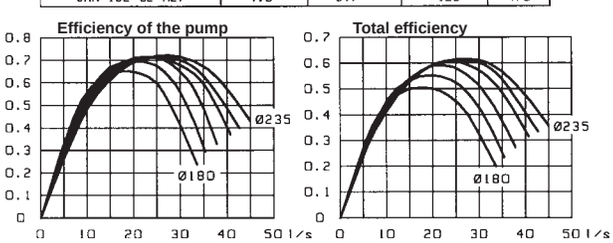


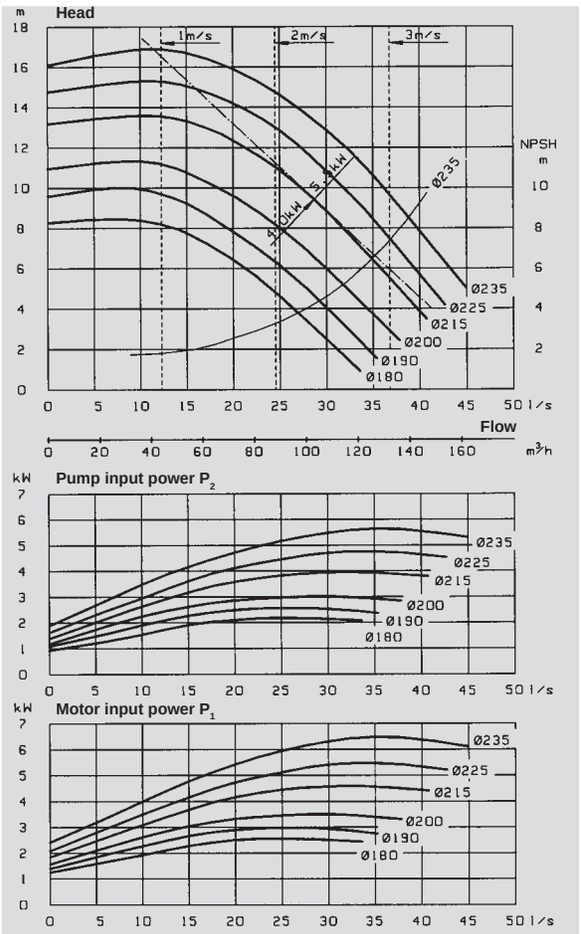
Technical data

AKN_-127/4 DN125 1500 r/min

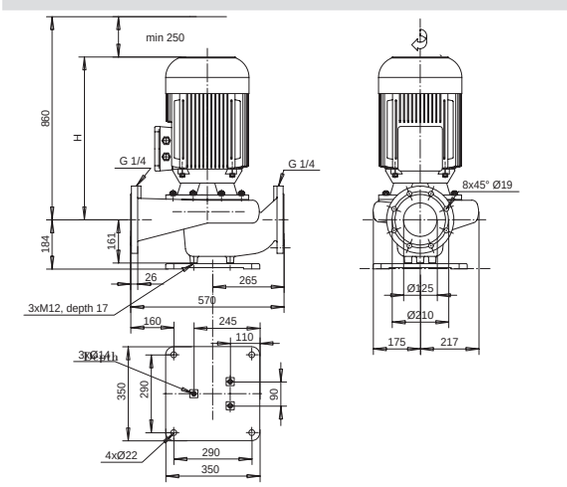


	kW	A	kg	H
OKN-132 E2 N27	5.5	11.9	133	470
OKN-132 C2 N27	4.0	8.7	126	470

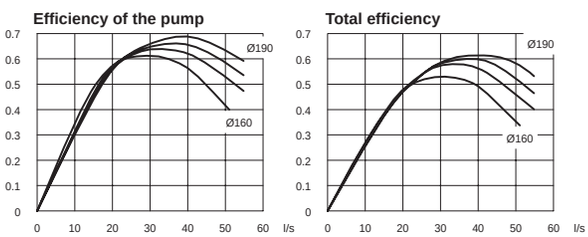


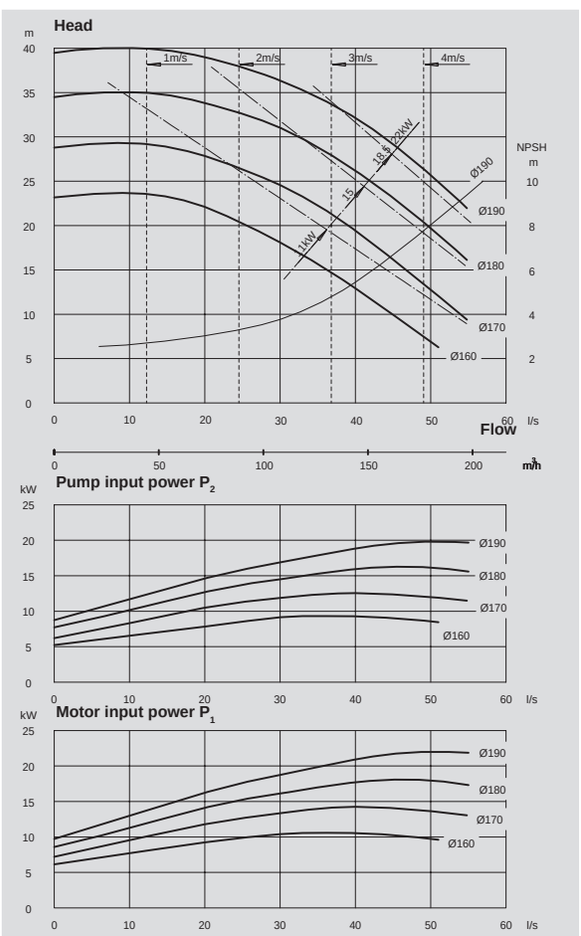


AKN_-127/2 DN125 3000 r/min



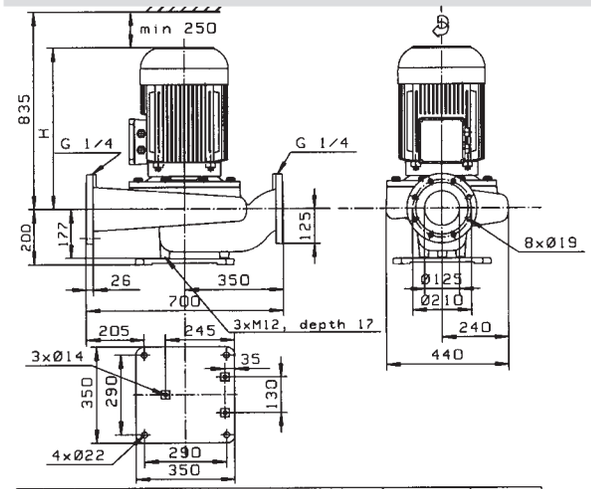
	kW	A	kg	H
OKM-187 G1 N27	22	38	270	665
OKM-187 G1 N27	18.5	32	270	665
OKN-164 G1 N27	15	30.5	195	610
OKN-164 F1 N27	11	22.0	190	610



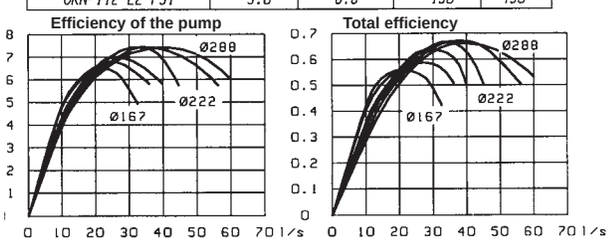


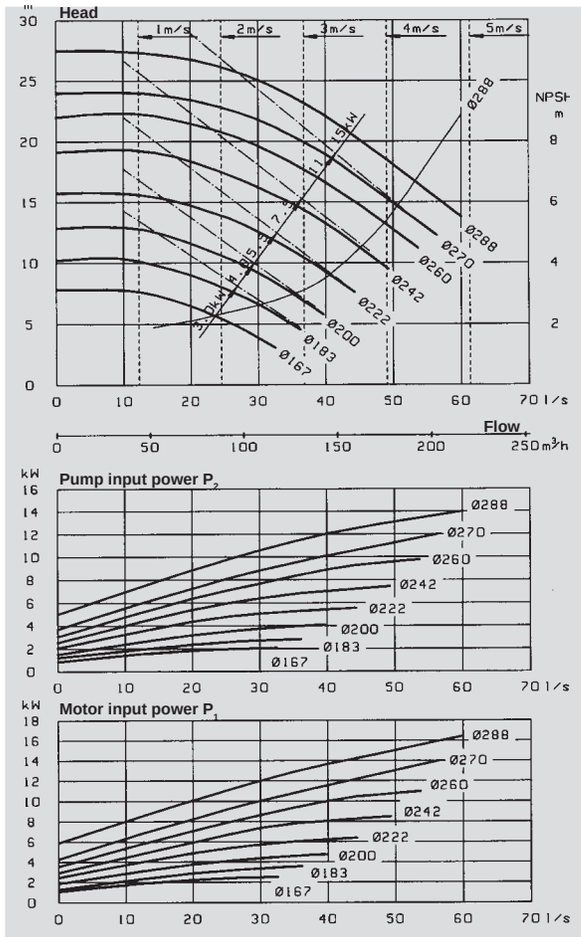
Technical data

AL_-1129/4 DN125 1500 r/min

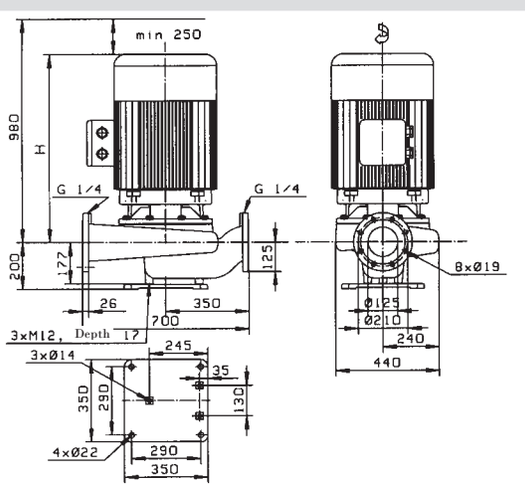


	kW	A	kg	H
OKN-164B J2 F31	15.0	31.0	230	585
OKN-164B G2 F31	11.0	22.6	215	585
OKN-133 G2 BF31	7.5	15.7	195	550
OKN-132 E2 BF31	5.5	11.9	180	500
OKN-132 C2 BF31	4.0	8.7	170	500
OKN-112 E2 F31	3.0	6.6	150	430

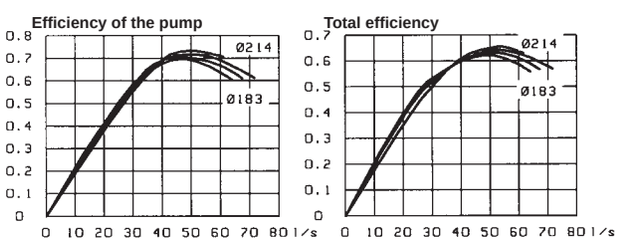


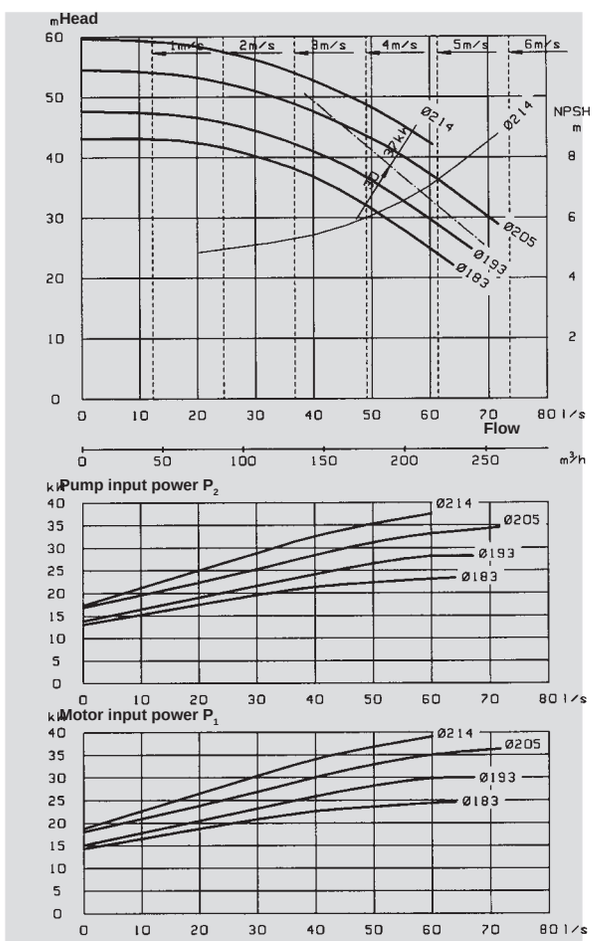


AL_-1129/2 DN125 3000 r/min



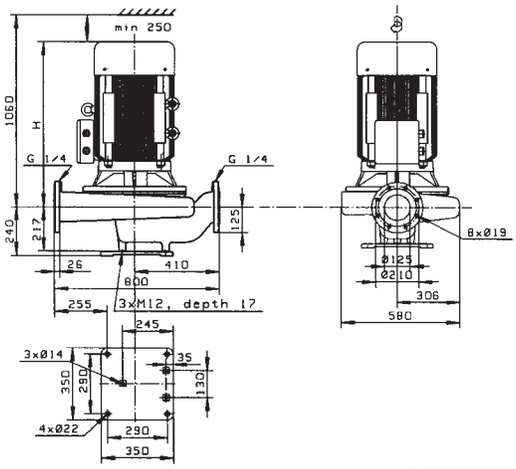
	kW	A	kg	H
OKM-207 J1 F31	37.0	64	370	730
OKM-206 K1 F31	30.0	53	350	640





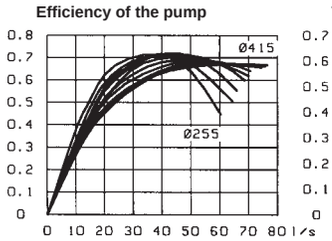
Technical data

L_-125S/4 DN125 1500 r/min

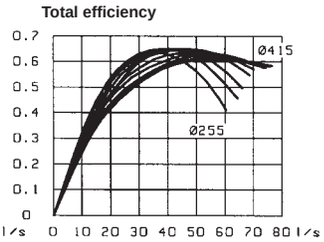


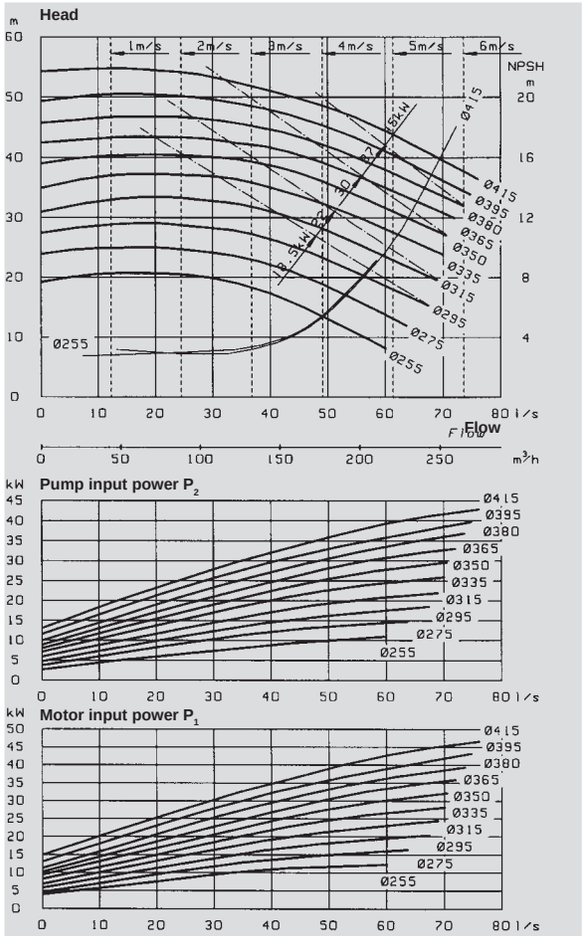
	kW	A	kg	H
OKM-227 K2 F42	45	81	550	810
OKM-207 K2 F41	37	69.5	510	810
OKM-206 K2 F41	30	55	450	720
OKM-186 J2 F41	22	42	390	720
OKM-187 H2 F41	18.5	34	375	705

Efficiency of the pump

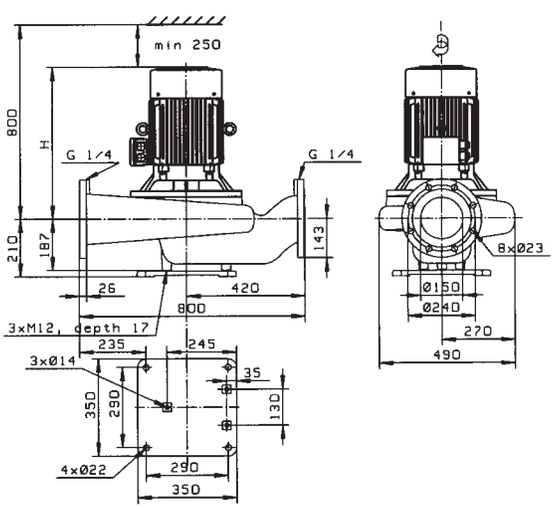


Total efficiency



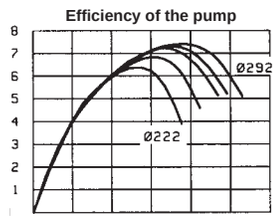


AL_-1154/6 DN150 1000 r/min

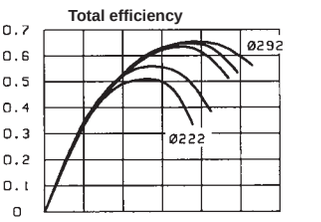


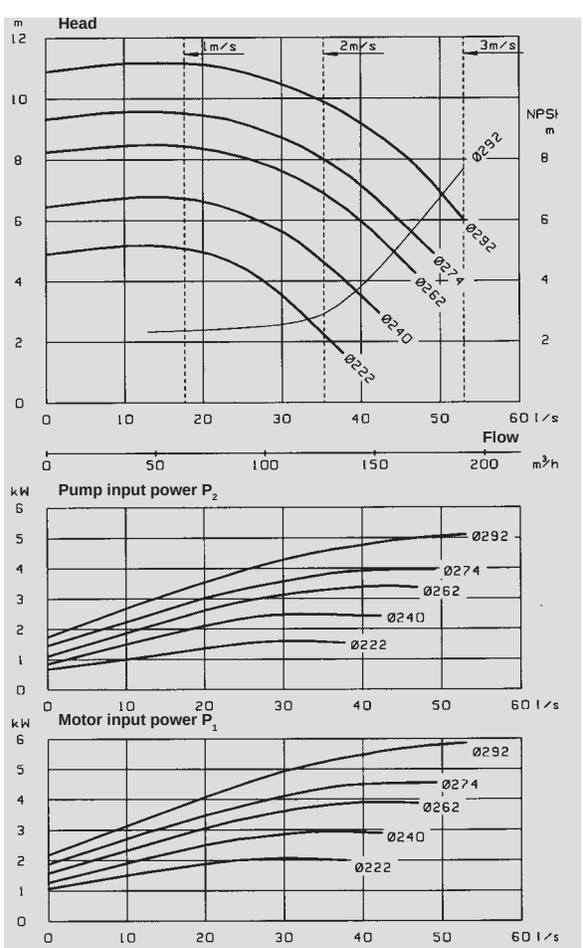
	kW	A	kg	H
OKN-133 G3 BF31	5.5	12.7	220	550

Efficiency of the pump



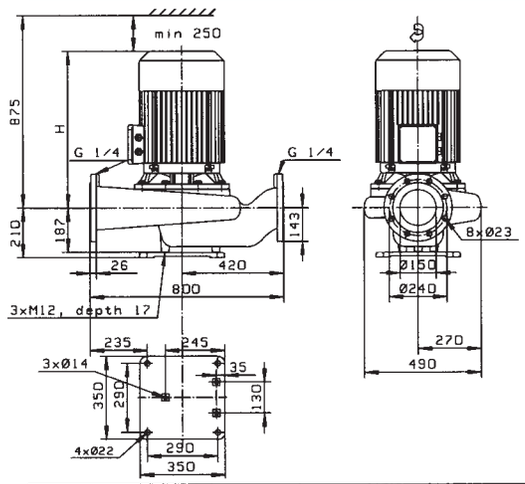
Total efficiency



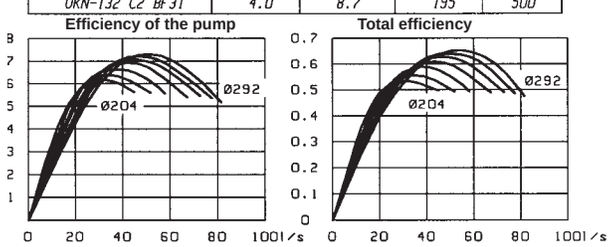


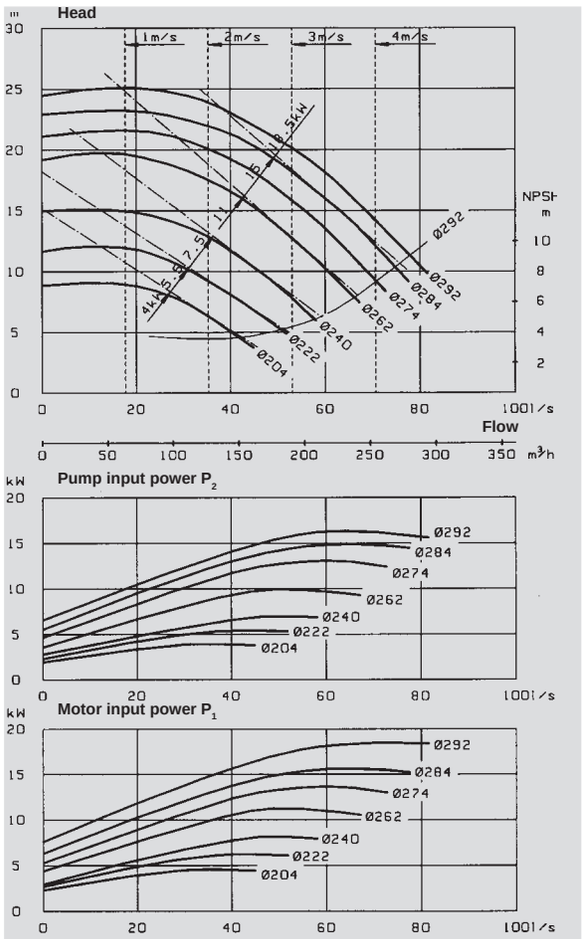
Technical data

AL_-1154/4 DN150 1500 r/min

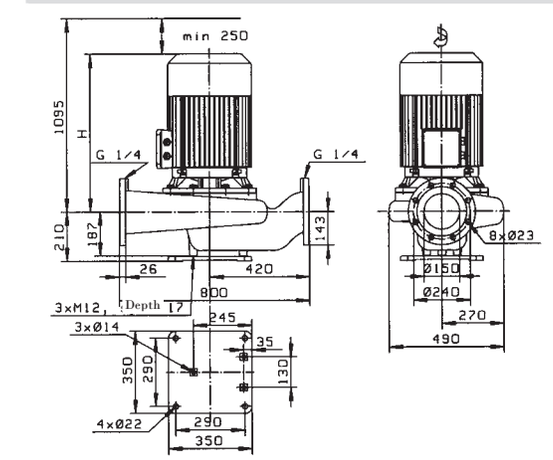


	kW	A	kg	H
OKM-187 H2 F31	18.5	34	270	625
OKN-164B J2 F31	15.0	31.0	255	585
OKN-164B G2 F31	11.0	22.6	240	585
OKN-133 G2 BF31	7.5	15.7	220	550
OKN-132 E2 BF31	5.5	11.9	205	500
OKN-132 C2 BF31	4.0	8.7	195	500

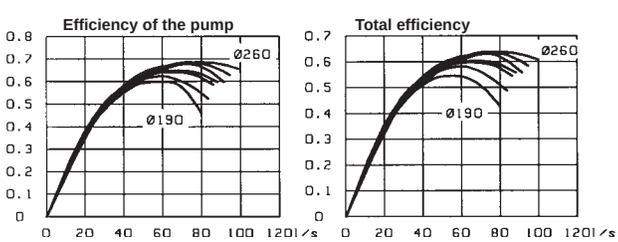


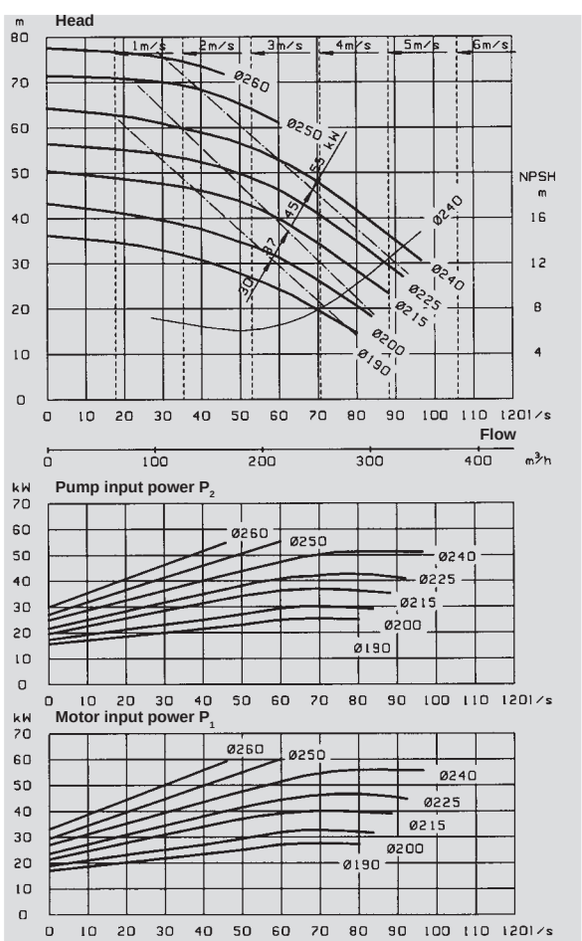


AL_-1155/2 DN150 3000 r/min



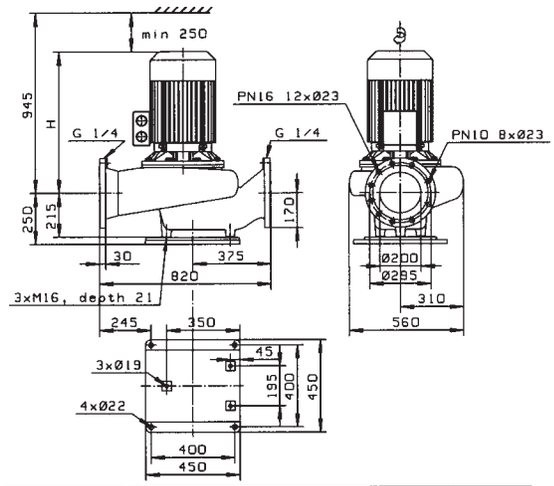
	kW	A	kg	H
OKM-257 K1 F33	55.0	93	465	845
OKM-227 K1 F32	45.0	77.5	435	730
OKM-207 J1 F31	37.0	64	395	730
OKM-206 K1 F31	30.0	53	375	640



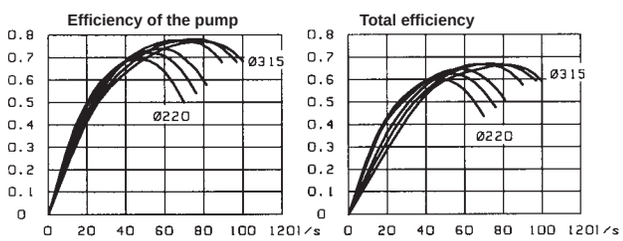


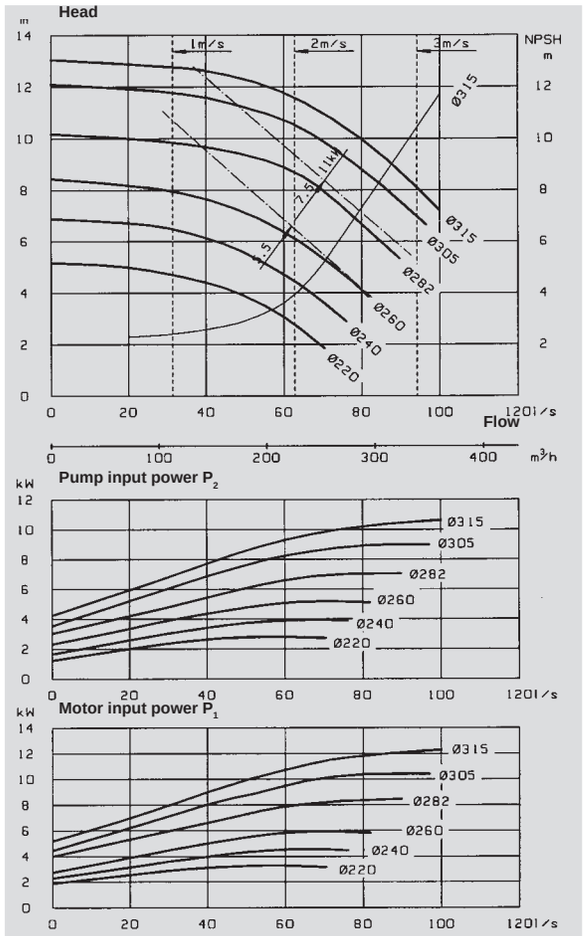
Technical data

AL_-1202/6 DN200 1000 r/min

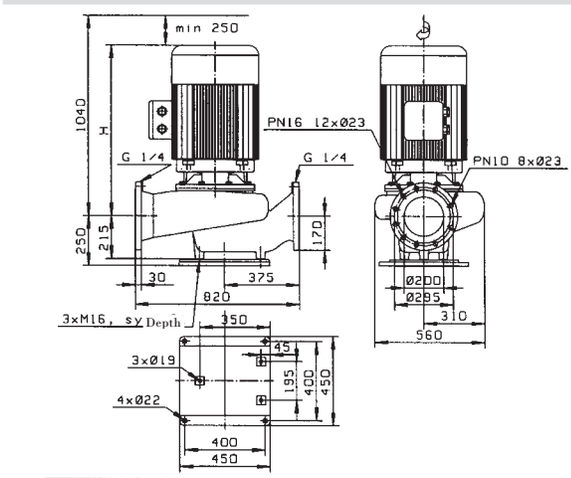


	kW	A	kg	H
OKM-165 G3 F31	11	22	345	695
OKM-165 G3 F31	7.5	17	345	695
OKN-133 G3 BF31	5.5	12.7	295	610

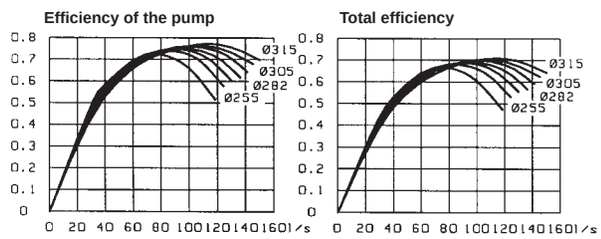


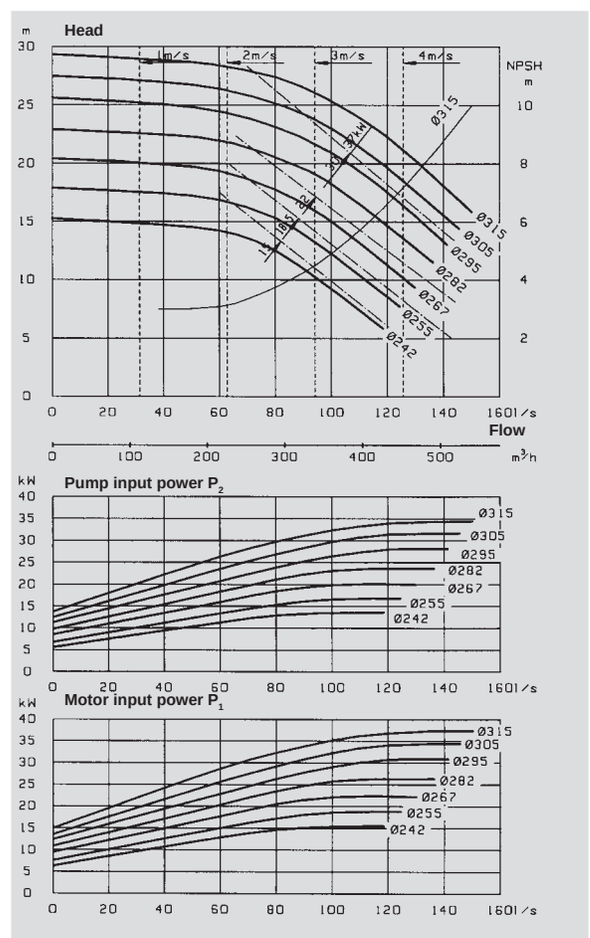


AL_-1202/4 DN200 1500 r/min



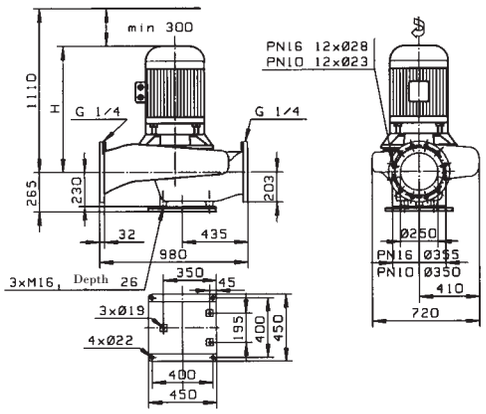
	kW	A	kg	H
OKM-207 K2 F32	37	69.5	500	790
OKM-206 K2 F32	30	55	460	700
OKM-186 J2 F32	22	42	380	700
OKM-187 H2 F31	18.5	34	365	685
OKN-164B J2 F31	15	31.0	330	645



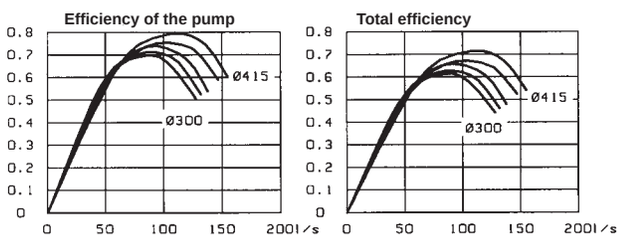


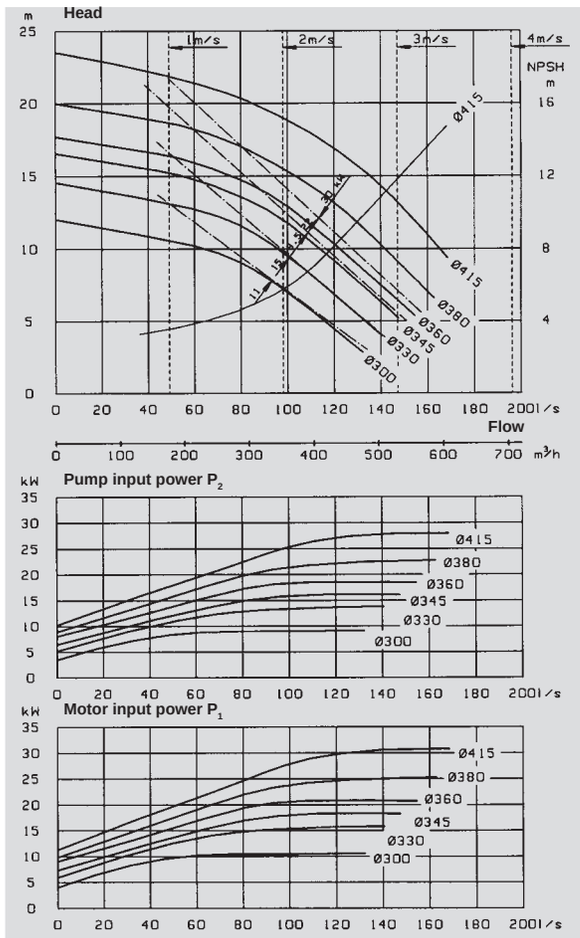
Technical data

AL_-1250/6 DN250 1000 r/min

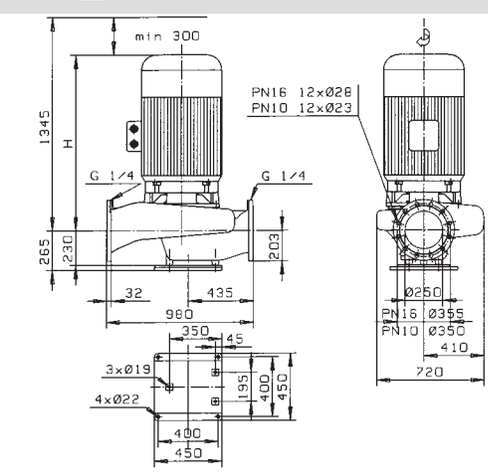


	kW	A	kg	H
OKM-226 K3 F42	30	55	580	810
OKM-207 K3 F41	22	43.5	515	810
OKM-206 K3 F41	18.5	35.5	505	720
OKM-187 H3 F41	15	30.5	430	720
OKM-165 H3 F41	11	22	385	705

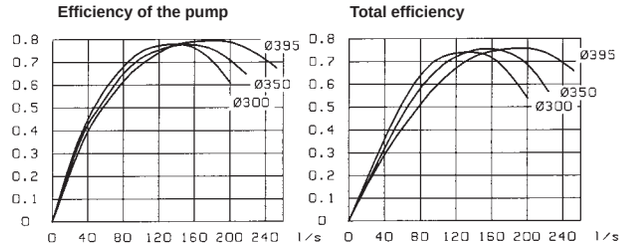


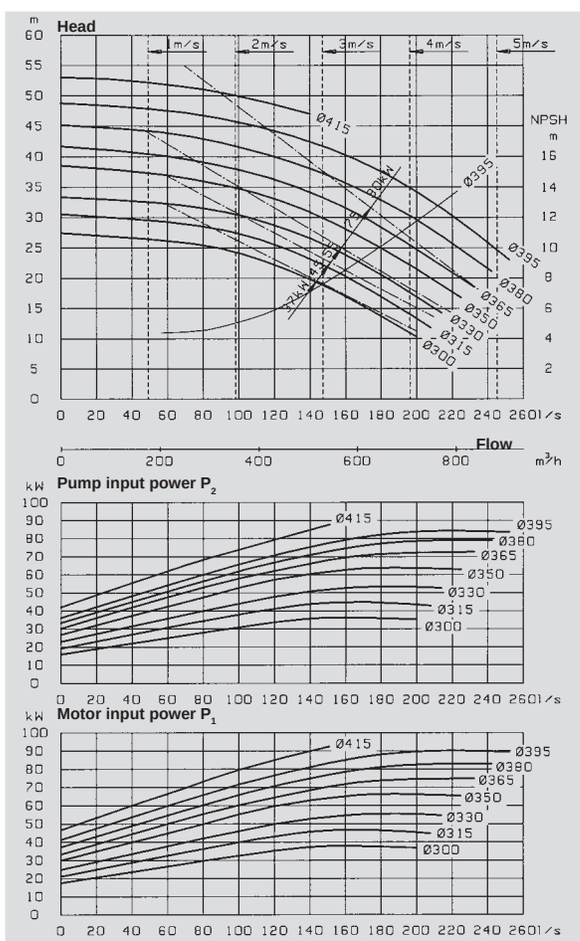


AL_-1250/4 DN250 1500 r/min



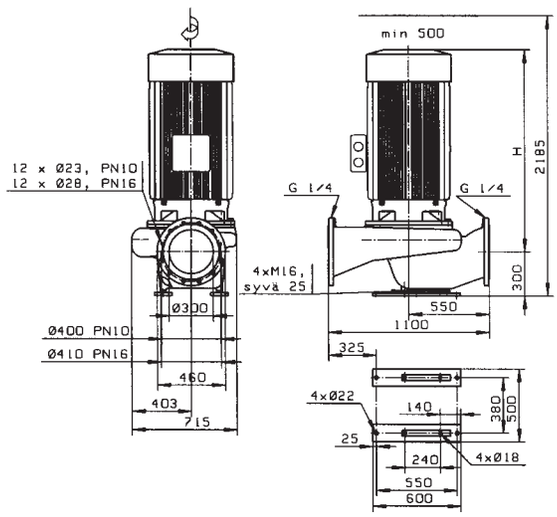
	kW	A	kg	H
OKM-300 K2 F43	90	160	950	1000
OKM-289 K2 F43	75	134	870	1000
OSG-257 K2 F42	55	100	730	1045
OKM-227 K2 F42	45	81	650	810
OKM-207 K2 F41	37	69.5	610	810





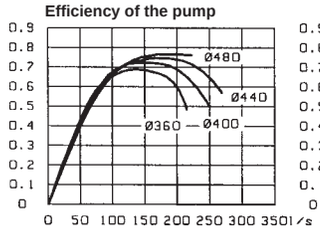
Technical data

AL_-1300/4 DN300 1500 r/min

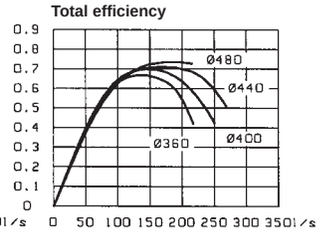


	kW	A	kg	H
OKMR-315 MX4 F53	160	279	1500	1385
OKMR-315 M4 F53	132	231	1350	1305
OKMR-315 S4 F53	110	195	1250	1250

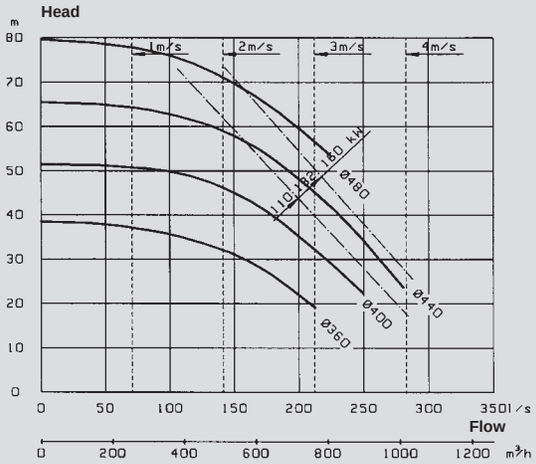
Efficiency of the pump



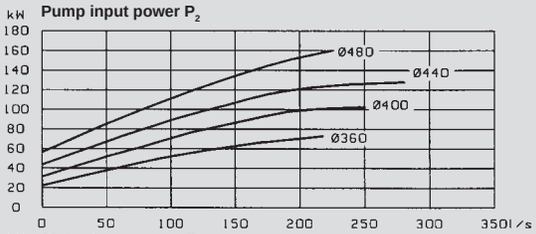
Total efficiency



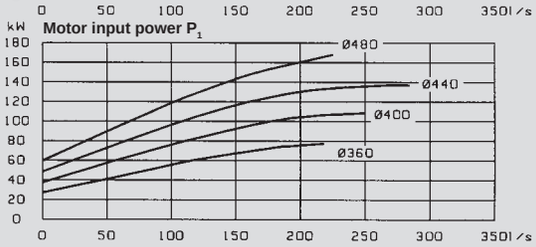
Head



Pump input power P_2



Motor input power P_1



KOLMEKS

TWIN IN-LINE CENTRIFUGAL PUMPS

RANGE T and AT

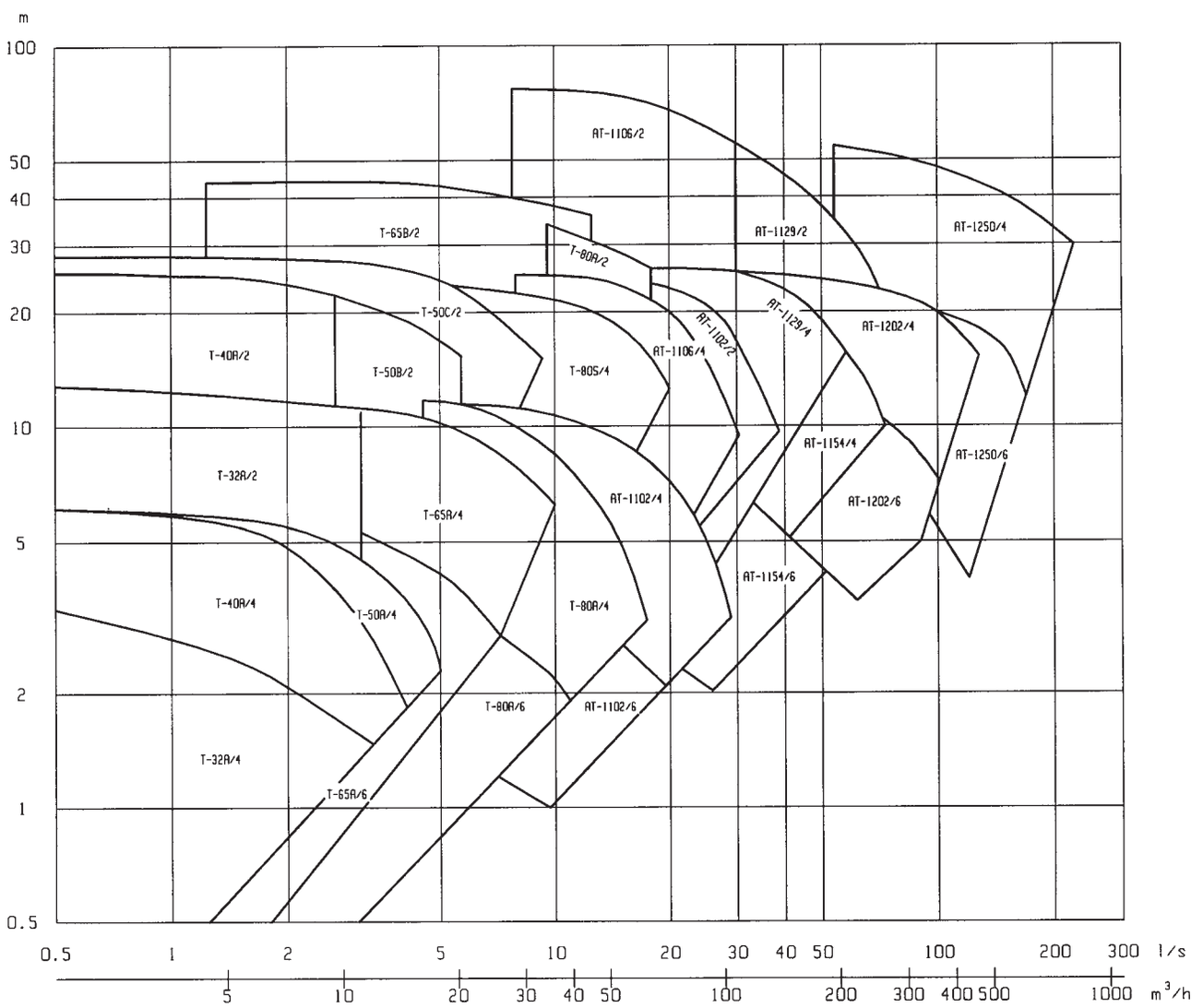
General features

The T- and AT - ranges consist of Twin In-Line pumps, where two single-stage centrifugal pump heads of Monobloc design are mounted on a common pump housing. The chambers of pumps are hydraulically separated by a simple non-return valve. Pump heads can have operation on single duty only or on parallel duty as well. The data sheets are showing the single duty performance.

The new T-range will replace the AT-range started from the smaller pumps. This catalogue includes the new T-range pumps in sizes DN32 - DN80.

Up to DN150 the critical mounting dimensions of single and twin pumps are equal for the same duty and type. This ensures the easy change of pump from single to twin or vice versa.

Duty chart at 50 Hz



Applications

The T- and AT- pumps are made of cast iron and designed for applications of clean non-aggressive liquids including heating and primary hot water circulation, cooling, chilled and condenser water circuits in e.g. district heating and air conditioning. The twin pump will be used in applications with requirements on high safety and continuous operation.
The use of different size of pump heads in the twin pump makes it possible to have regulation of pumping in steps. This is useful in applications where also stand-by duty is required.

Design

Pump

The pumps of the T- and AT - ranges are vertical, single stage, centrifugal twin head pumps equipped with dry type electric motor. The impeller is mounted directly on the shaft of the motor (no separate couplings). In some types of AT-range (-1082....-1154) the direction of rotation is different between the heads i.e. the impellers are not interchangeable between left and right hand side.

The hydraulic separation with non-return flap valve between the two chambers is to prevent recirculation of liquid through the another, non-operating pump. This flap valve will not replace the non-return valve needed in the circulation system. The alterate operation of pump heads can be easily automated because no other valves in the system needed to be opened nor closed.

Electric motor

The electric motors of the T- and AT - ranges are especially dimensioned and designed for pump application, totally enclosed fan cooled squirrel cage motor. The motor design ensures high efficiency and silent running and is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz, 3-phase	< 4 kW
	690/400 V, 50 Hz, 3-phase	4 kW and above
Enclosure:	IP 54	
	IP55 4 kW and above (1000, 1500 r/min), 5.5 kW and above (3000 r/min)	
Insulation class:	F	
Type of duty:	S1	
Ambient temperature:	+ 45 °C	

N.B. Other voltages (e.g. single phase) and specifications available by request!

Flanges

The dimensions of flanges in the T- and AT-ranges follow the standard ISO 7005. Both pump flanges have pressure gauge tappings, G 1/4. The flange diameters of 200 mm and above are available in accordance with PN16 or PN10 dimensions, PN10 as standard. Also other standards can be applied for flanges, by request.

Shaft seals

The shaft seals in the T- and AT - ranges are maintenance free single mechanical seals with rubber bellows. The pumps can be provided also with other types of seals suitable for various liquids and temperatures. Please check the possible sealing designs on the following

Materials and seals

TYPE	MOTOR r/min	kW	CASING material	SHAFT SEAL Ø, materials		O-RING size, Ø material	
T-32A	1500/3000	0,05-0,65	Grey cast iron	12 mm, carbon/SiC	EPDM	100 x 2,5	NBR
T-40A	1500/3000	0,2-1,5	Grey cast iron	12 mm, carbon/SiC	EPDM	145 x 2,5	NBR
T-50A	1000/1500	0,11-0,37	Grey cast iron	12 mm, carbon/SiC	EPDM	150 x 3	NBR
T-50B	1500/3000	0,2-1,1	Grey cast iron	12 mm, carbon/SiC	EPDM	150 x 3	NBR
T-50C	3000	1,5-2,2	Grey cast iron	18 mm, carbon/SiC	EPDM	150 x 3	NBR
T-65A	1000/1500	0,18-2,2	Grey cast iron	18 mm, carbon/SiC	EPDM	179,3 x 5,7	EPDM
T-65B	1000/1500/3000	0,18-7,5	Grey cast iron	18 mm, carbon/SiC	EPDM	179,3 x 5,7	EPDM
T-80A	1000/1500/3000	0,18-7,5	Grey cast iron	18 mm, carbon/SiC	EPDM	179,3 x 5,7	EPDM
AT-1082	1000/1500	0,37-3	Grey cast iron	18 mm, carbon/SiC	EPDM	279,3 x 5,7	NBR
T-80S	1500	1,1-5,5	Grey cast iron	28 mm, carbon/SiC	EPDM	265 x 4	EPDM
AT-1102	1000/1500/3000	0,37-7,5	Grey cast iron	18 mm, carbon/SiC	EPDM	179,3 x 5,7	EPDM
AT-1106	1500/3000	3-37	Nodular cast iron	32 mm, carbon/SiC	EPDM	309/295 x 1	gasket
AT-1129	1500/3000	3-37	Nodular cast iron	32 mm, carbon/SiC	EPDM	309/295 x 1	gasket
AT-1129	3000	45	Nodular cast iron	40 mm, carbon/SiC	EPDM	309/295 x 1	gasket
AT-1154	1000/1500	4-18,5	Nodular cast iron	32 mm, carbon/SiC	EPDM	309/295 x 1	gasket
AT-1202	1000	5,5-11	Nodular cast iron	32 mm, carbon/SiC	EPDM	315 x 6,3	EPDM
AT-1202	1000	15-18,5	Nodular cast iron	40 mm, carbon/SiC	EPDM	315 x 6,3	EPDM
AT-1202	1500	11-18,5	Nodular cast iron	32 mm, carbon/SiC	EPDM	315 x 6,3	EPDM
AT-1202	1500	22-37	Nodular cast iron	40 mm, carbon/SiC	EPDM	315 x 6,3	EPDM
AT-1202	1500	45	Nodular cast iron	50 mm, carbon/SiC	EPDM	315 x 6,3	EPDM
AT-1250	1000	11-22	Nodular cast iron	40 mm, carbon/SiC	EPDM	405 x 7	EPDM
AT-1250	1000	30	Nodular cast iron	50 mm, carbon/SiC	EPDM	405 x 7	EPDM
AT-1250	1500	37	Nodular cast iron	40 mm, carbon/SiC	EPDM	405 x 7	EPDM
AT-1250	1500	45-55	Nodular cast iron	50 mm, carbon/SiC	EPDM	405 x 7	EPDM
AT-1250	1500	75-90	Nodular cast iron	65 mm, carbon/ceram.	EPDM	405 x 7	EPDM

Material standards

Types	MATERIAL OF HOUSING Name	Standard	SEALING FLANGE	IMPELLER	SHAFT (pump)	DETAILS TO NOTE
T-32...T-80, AT-1082.... AT-1102	grey cast iron	EN-GJL-200	EN-GJL-200	EN-GJL-200	AISI329	T-32A impellers of Noryl GFN2 Bronze impeller available for every pump
AT-1106... AT-1250	nodular cast iron	EN-GJS-400	EN-GJS-400	EN-GJL-200	AISI329	

Painting

Pumps are painted in accordance with Finnish standard SFS 5873, AK 80/2 Fe Sa2. The finishing colour is red, RAL 3000. Special coating available by request.

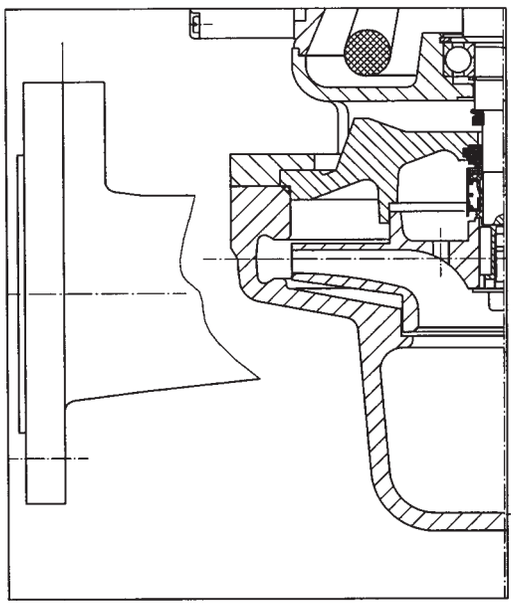
Temperatures and pressure classes

Max. working pressure 10 bar	T- and AT- range
Max. fluid temp. -15 ... +120°C	T- and AT-range (Noryl imp. max. +100°C)

N.B. The max. liquid temperature may be limited not only by material selection but also by local regulations and laws.

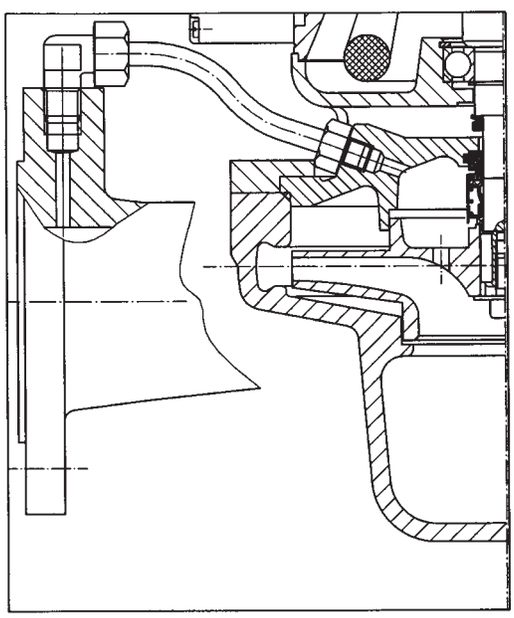
Design of sealings

Standard design



Single mechanical elastomeric bellows type shaft seal, carbon agains ceramic or Silicon carbide
Max. +120 °C water temperature in short time operation.
The std-design is also suitable for glycol and other cold liquid mixtures in chilled water systems. We recommend the use of propylenglycol, max. 50%

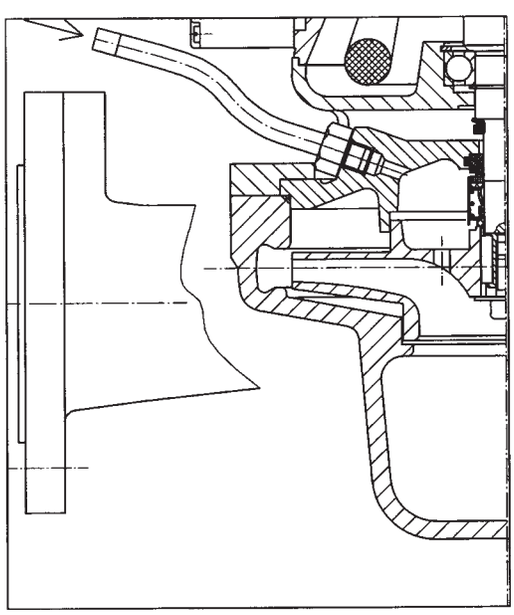
Recirculation (internal flush)



Shaft seal as above described
Operation temperature max. +120 °C

Liquid circulation via pipe from the pressure flange to the sealing chamber to ensure cooling and lubrication of the shaft seal
Available in flange sizes DN50...250
Applications in hot water systems

External flush



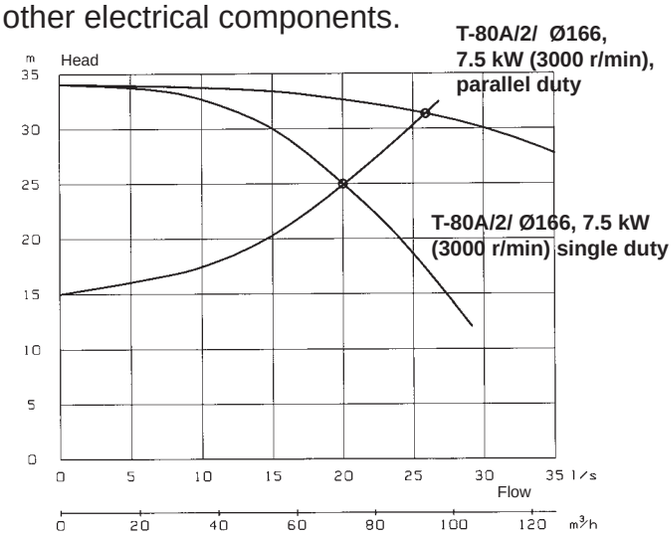
Shaft seal design as above described
Flushing liquid from external pressure source instead of pump flange, no outlet

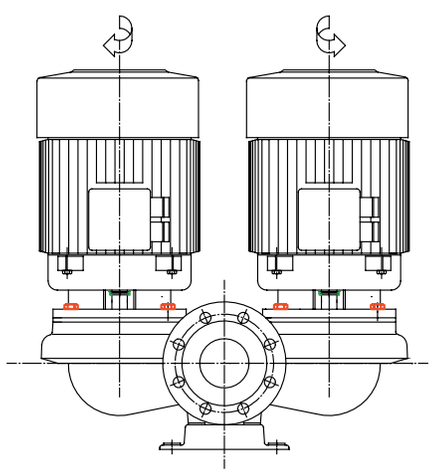
Available in flange sizes DN50...250
Applications with slurries and crystallising solutions

Various duties of twin pumps

a) Parallel operation

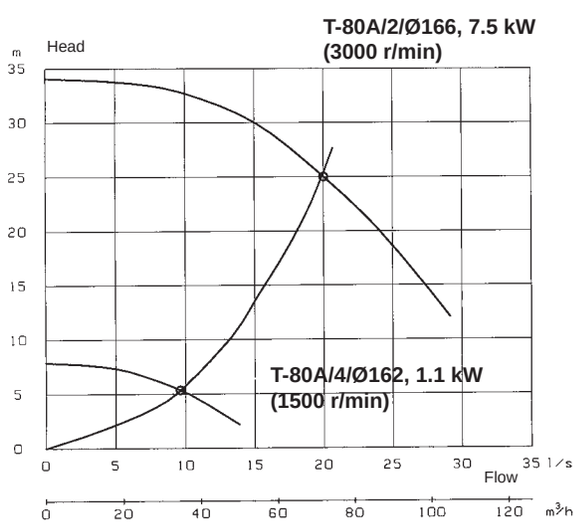
In this application the units are equal in performance and for the duty both units will be used simultaneously. This design can be utilized as alternative for single In-Line pump. The achieved duty point of parallel running pump heads is a combination of the performance curves of the units, and the operating curve of the system itself. Data sheet of parallel performance by request.
This arrangement is suitable for applications where high static pressure is needed, e.g. pumping liquid from one tank to another one on a higher level. Due this arrangement the motor(s) could be selected smaller which further may reduce the size and costs of other electrical components.

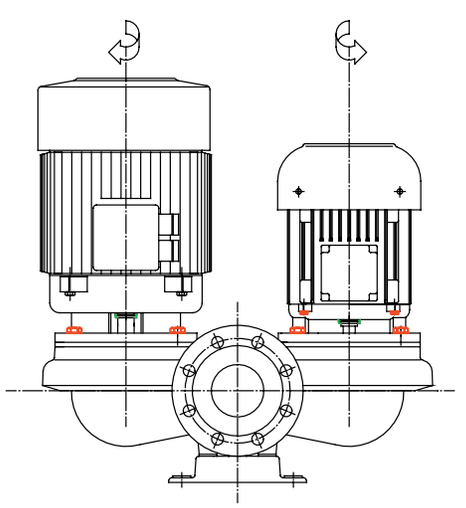




b) Operation according to needed flow

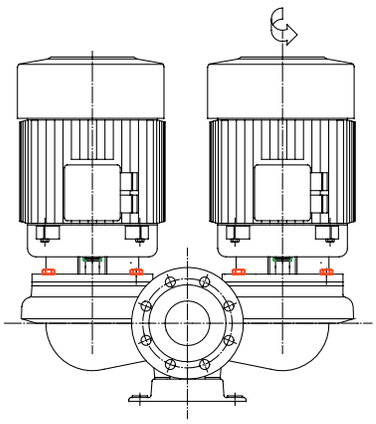
In this application the pump units are different. The larger unit will be used only for high duty peaks and the smaller one will run continuously for lower normal duty. This arrangement will offer savings in operation costs and also throttling (=noise) of a larger single pump can be avoided. The reserve pump function can be used and automated within some restrictions. The usual data input used as control information for operation is temperature, pressure or pressure difference, time.

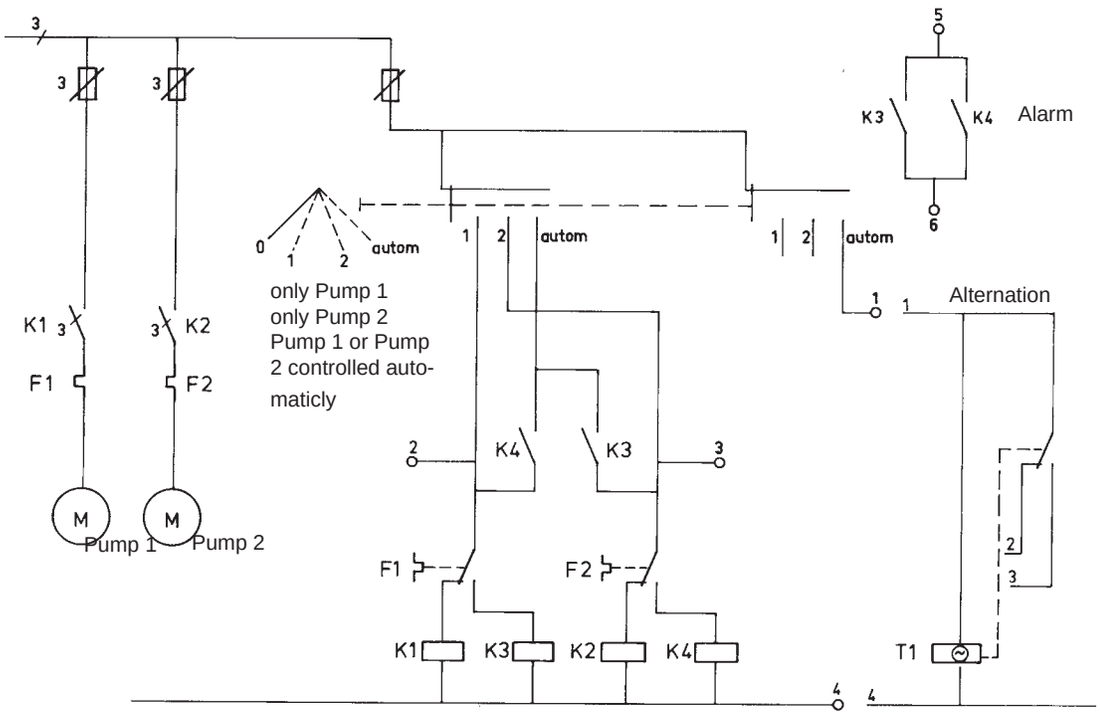




c) Reserve pump and alternate operation

This application is based on a twin pump where both motor units are equal in performance, which is the most common design. While the other one is operating the other one is turned of in reserve. With automated programming the reserve unit can be switched on whenever the other one is stopped, e.g. because of tripping of motor protection.
The optimal operation of the pump is even alteration between the units, both units will get uniform operating hours and remain in equal condition. The alternating operation can be arranged by means of a timer, e.g. weekly.





Control of the pumps is connected to terminals 1 ... 4 (in the drawing alternate use).
Relays 3 or 4 start reserve pump and alarm when thermal relay is triggered.

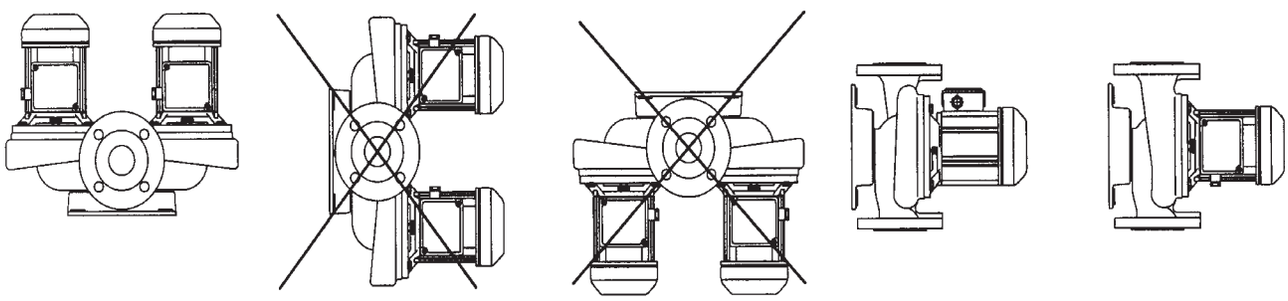
d) Integrated frequency converter and automated alternate operation

The variable speed drives i.e. electric motors with frequency converters are the best solution when ever regulation of operation and lower energy consumtion are required. With twin pumps there are two options for this arrangement; one is to use separate FC-units and the another is to use pumps with integrated frequency converters. Selected pumps of AT- and T-range can be delivered with integrated frequency converter. In both operations the alteration controll can be easily added in the delivery scope of the frequency controller.
In many applications the design where one pump head is provided with variable speed drive and the another one with constant speed drive could be the most recommendable solution.
To receive more detailed information, please contact your Kolmeks contact person.

Installation

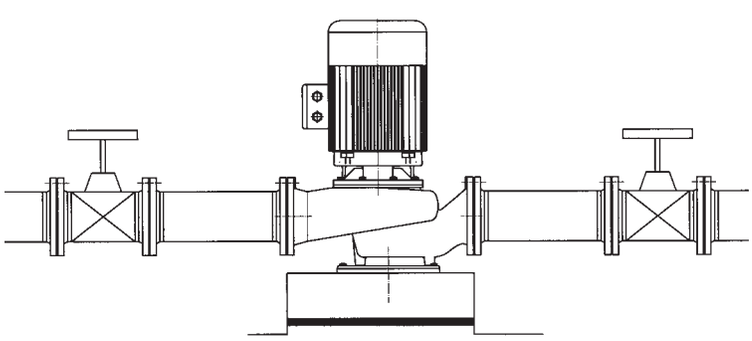
When designing and installing the pump in the system pay attention to the following:
- enough space for service and control should be left around the pump
- enough clearance on top of the motor to lift the motor unit off the pump housing
- for heavier pumps you may also need space for lifting devices
- shut-off valves on both sides of the pump
- vibration and noise isolation and sufficient rigidity of the pipeworks to support the pump

The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it in the desired position.



Kolmeks In-line pumps may be fitted in horizontal or vertical (depending on motor size) pipeline configurations and must be arranged so that the adjacent pipework can be vented of air before startup. The smaller pumps (< DN 80, < 1,5 kW motors) may be installed without support and baseplate horizontally or vertically, but the motor must never fall below the horizontal plane. The heavier and larger pumps should be installed standing on the baseplate and the pump shaft in vertical position.

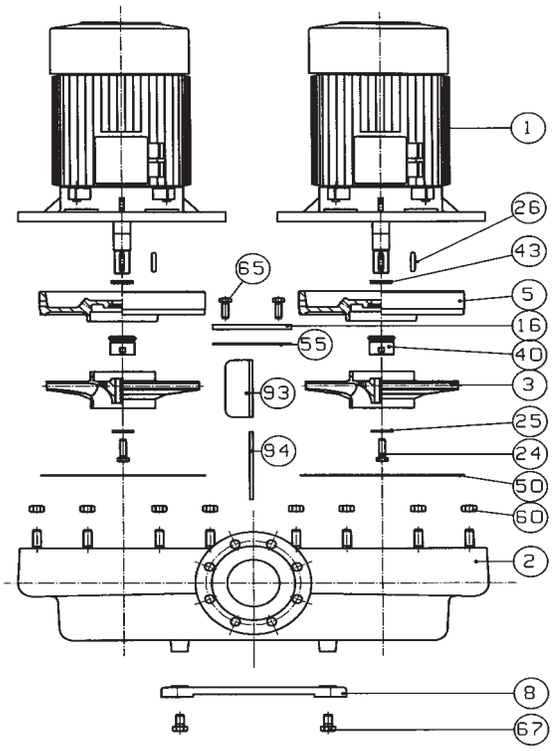
Foundation



The heavier pumps (= DN 80 and over or motors above 1,5 kW) should be mounted on a concrete plinth, approximately 1.5 to 2 times the weight of the pump. The foundation should be isolated from other construction with anti-vibration mounting (20 mm thick rubber or cork plate) to prevent transmission of noise.

Spare parts and maintenance

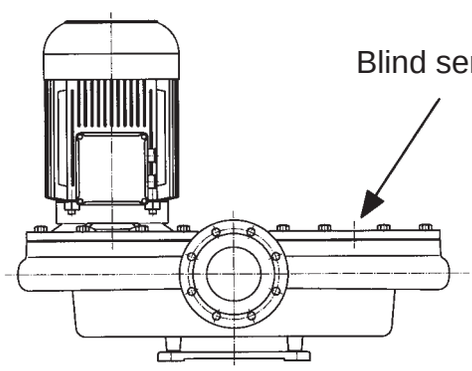
List of parts



1	Electric motor
2	Pump housing
3	Impeller (Note below)
5	Sealing flange
8	Base plate
16	Flap cover
24	Nut / Screw
25	Washer
26	Key
40	Mechanical shaft seal
43	V-ring (optional)
50	O-ring / Gasket
55	Flap cover gasket
60	Nut or Screw
65	Screw
67	Screw
93	Flap device
94	Flap pin

Blind service cover

One or both pump heads can be replaced by blind service cover. This is for each twin pump specific blind sealing flange, which can be ordered as a spare part later on when needed or already together with the pump. The other pump head can be dismounted for repair while the another pump head can be used for the duty.

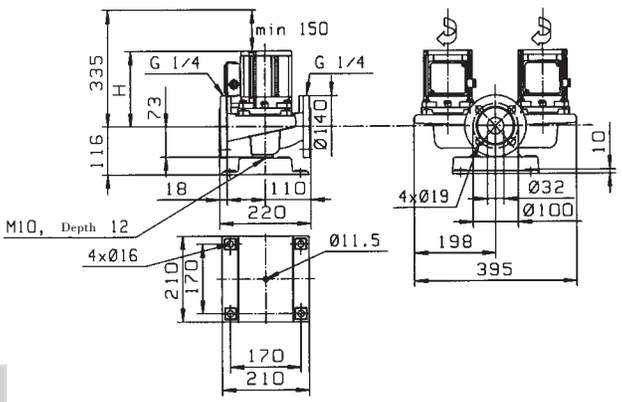


Interchangeability between new T-range and the AT-range

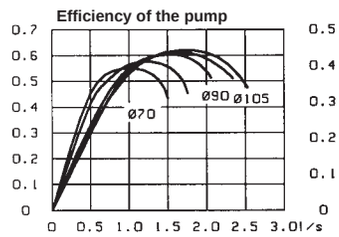
New type / DN	Equal pump performance/ DN	Flange to flange		Centerline with baseplate mm	
		L -& T-	AL- & AT-	L- & T-	AL- & AT-
T-32A / 32	AT-1040 / 40	220	240	116	103
T-40A / 40	AT-1032 / 32	250	280	116	116
T-50B / 50	AT-1053 / 50	280	280	93	93
T-50C / 50	AT-1055 / 50	280	280	93	93
T-65A / 65	AT-1066 / 65	340	360	125	125
T-65B / 65	AT-1065 / 65	340	360	125	125
T-80A / 80	AT-1081 / 80	360	450	140	140

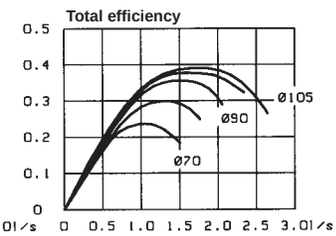
Technical data

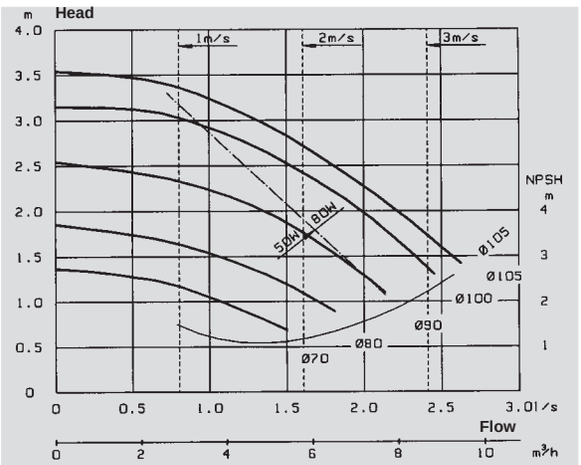
T-32A/4 DN32 1500 r/min

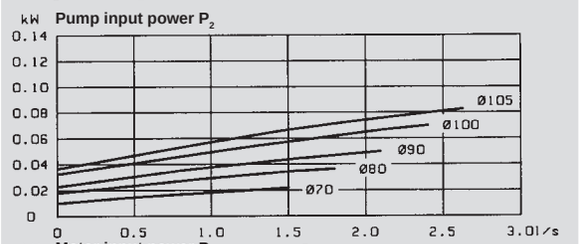


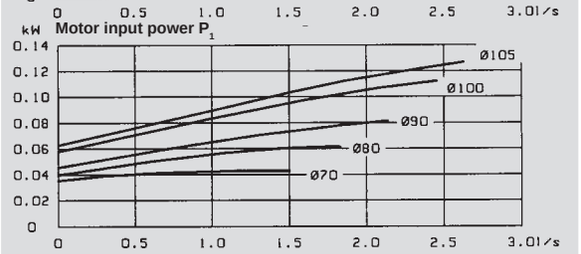
	kW	A	kg	H
OP-742 N12	0.08	0.28	28	185
OP-742 P N12 1~	0.08	0.62	28	185
OP-742 P N12 1~	0.05	0.47	28	185
OP-732 B N12	0.05	0.21	28	185



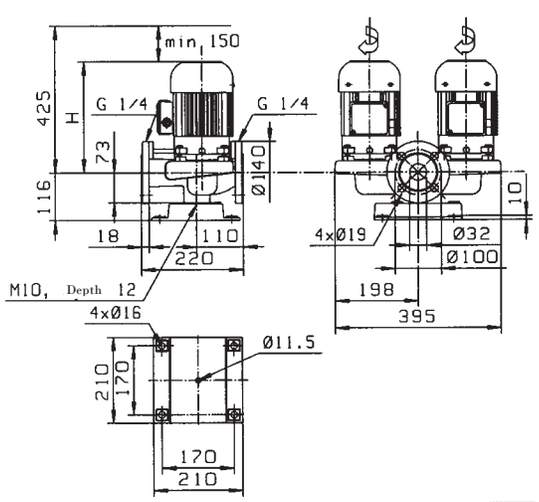




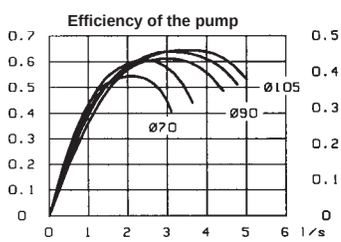


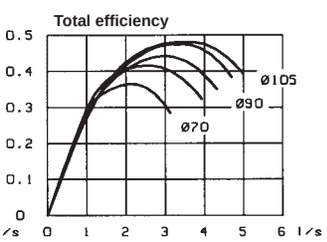


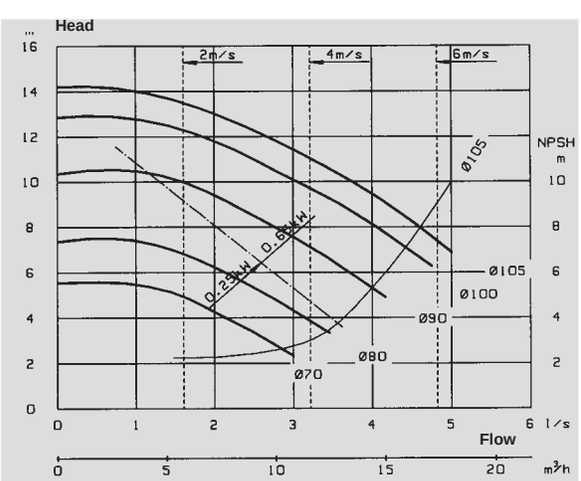
T-32A/2 DN32 3000 r/min

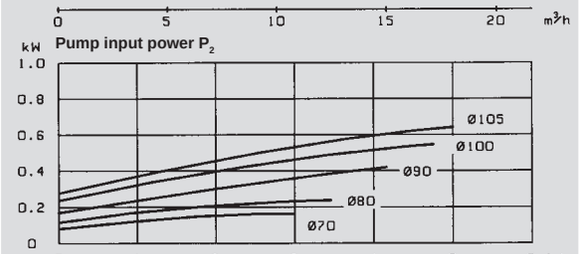


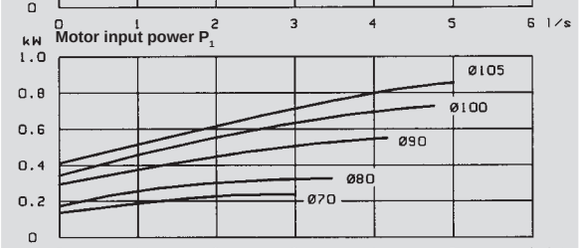
	kW	A	kg	H
OKN-841 D N12	0.65	1.8	36	275
OKN-841 D P N12 1~	0.65	4.5	36	275
OP-741 N12	0.25	0.7	30	225
OP-741 C P N12 1~	0.25	1.8	30	225





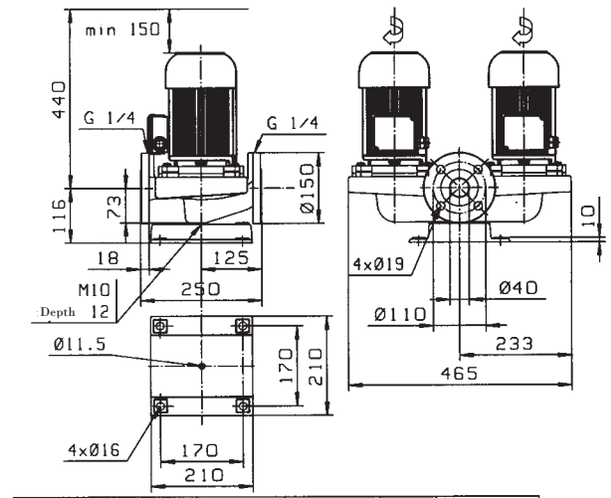




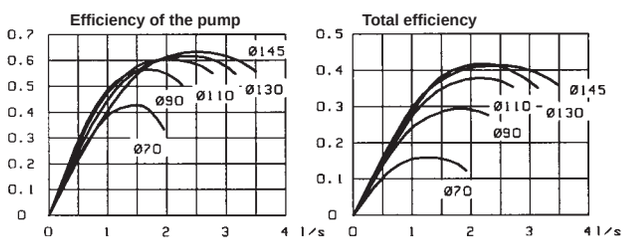


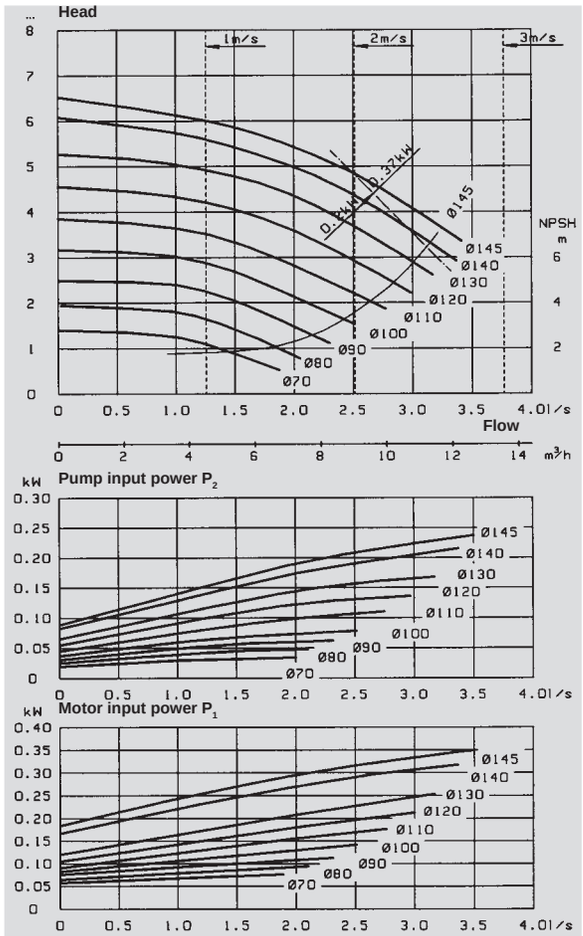
Technical data

T-40A/4 DN40 1500 r/min

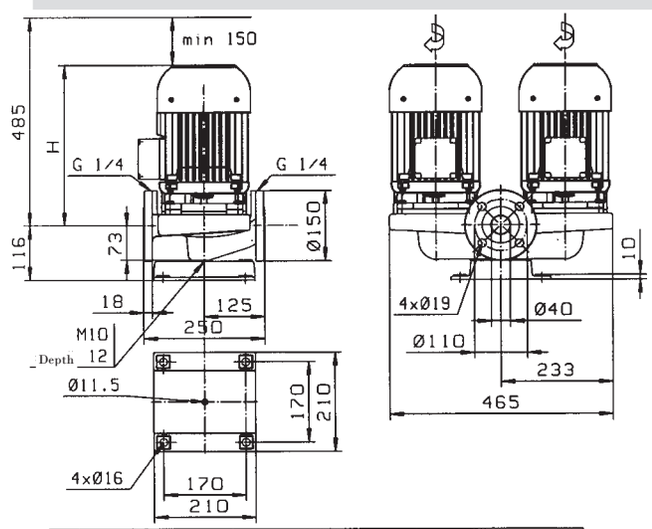


	kW	A	kg	H
OKN-862L D N13	0.37	1.15	46	290
OP-752 N13	0.20	0.65	38	240
OP-752 P N13 1~	0.20	1.45	38	240

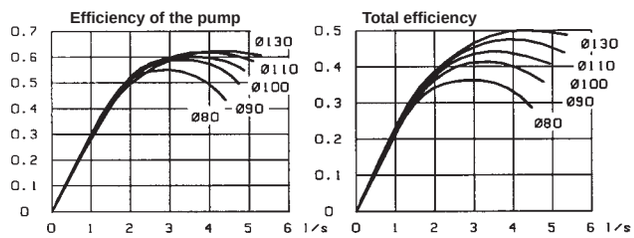


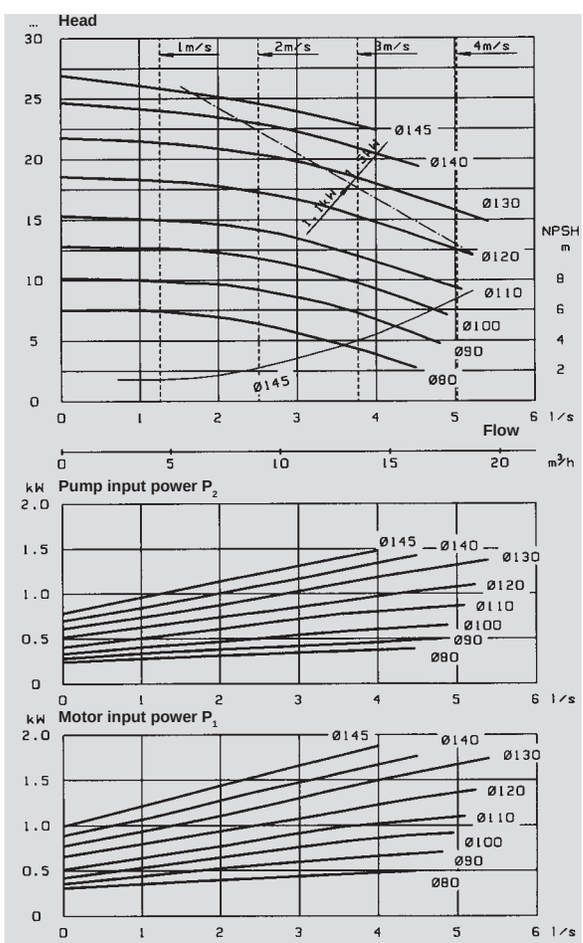


T-40A/2 DN40 3000 r/min



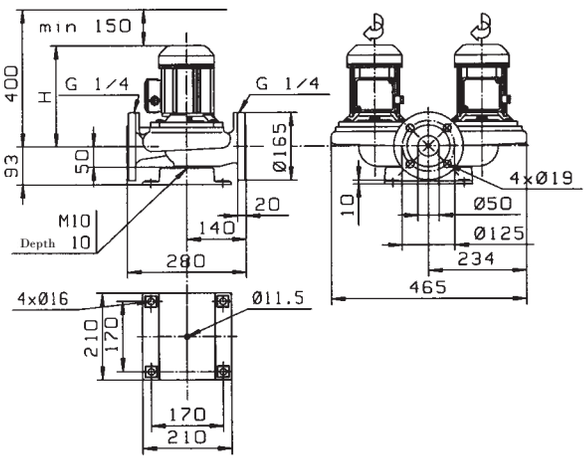
	kW	A	kg	H
OKN-101 C1 N13	1.5	3.3	71	335
OKN-101 C1 P N13 1~	1.5	8.8	71	335
OKN-871 D N13	1.1	2.8	46	290
OKN-871 D P N13 1~	1.1	7.0	46	290



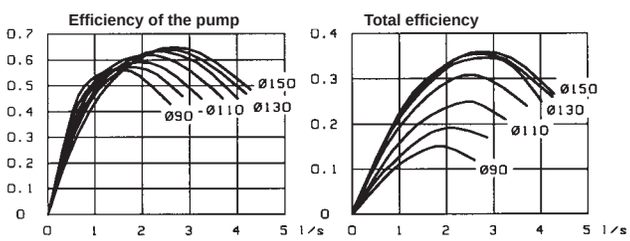


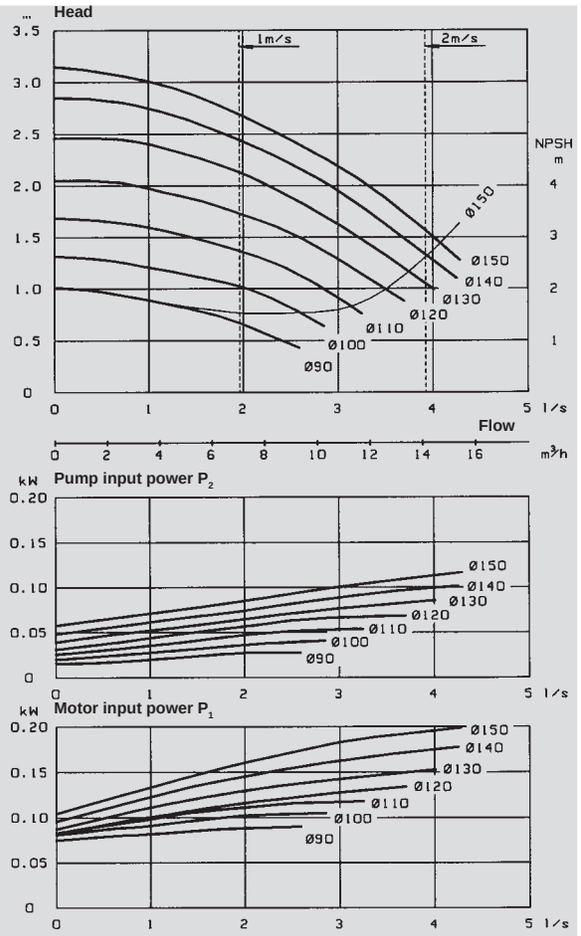
Technical data

T-50A/6 DN50 1000 r/min

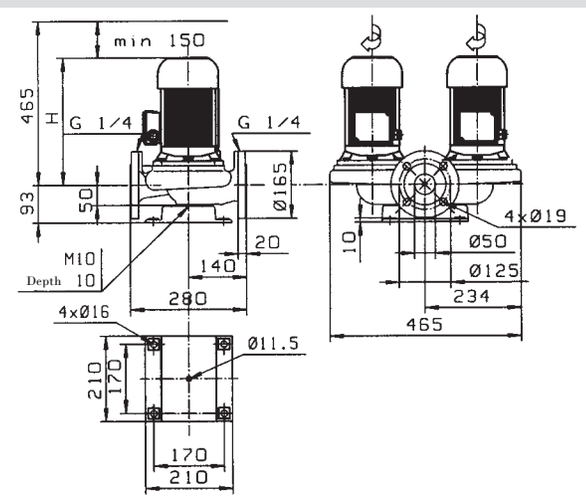


	kW	A	kg	H
OP-753 F15	0.11	0.5	46	250

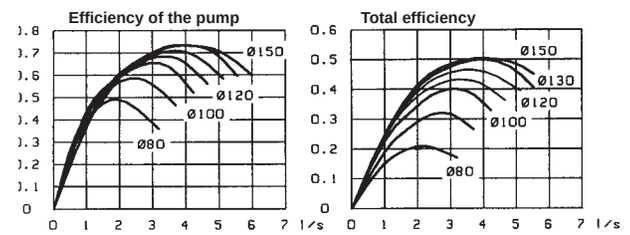


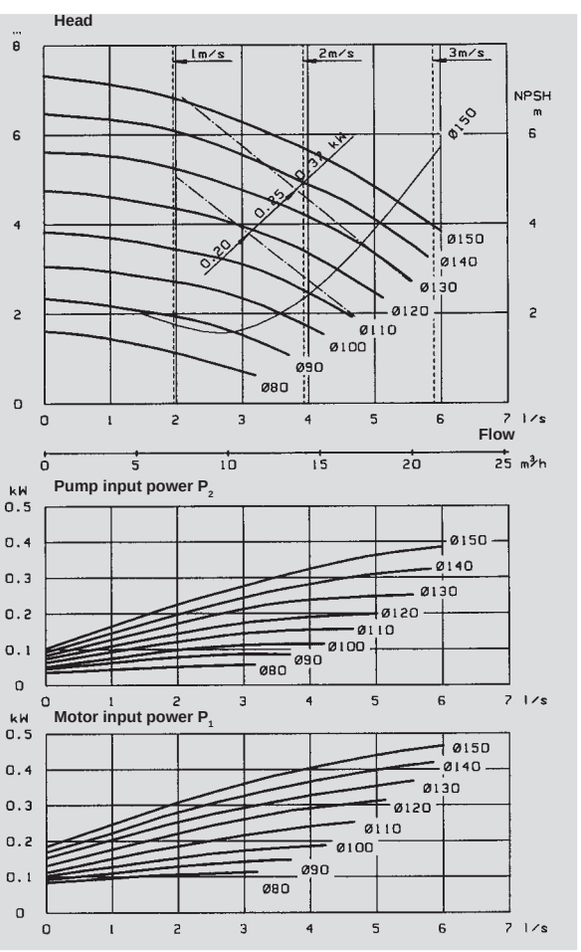


T-50A/4 DN50 1500 r/min



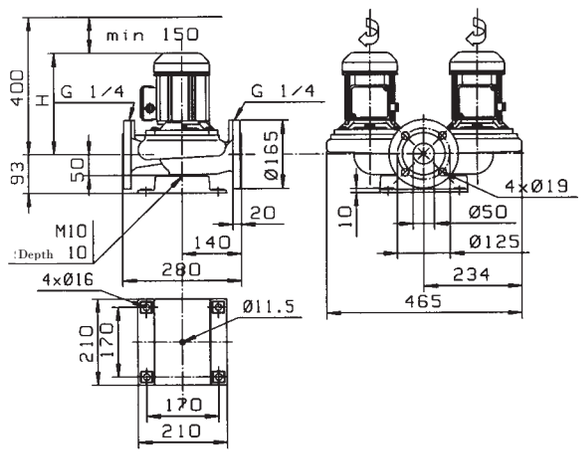
	kW	A	kg	H
OKN-862 D F15	0.37	1.15	58	315
OP-762 F15	0.25	0.82	47	250
OP-752 P F15 1~	0.25	1.85	46	250
OP-752 F15	0.20	0.65	46	250
OP-752 P F15 1~	0.20	1.45	46	250



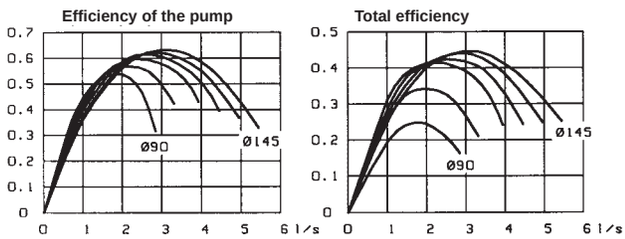


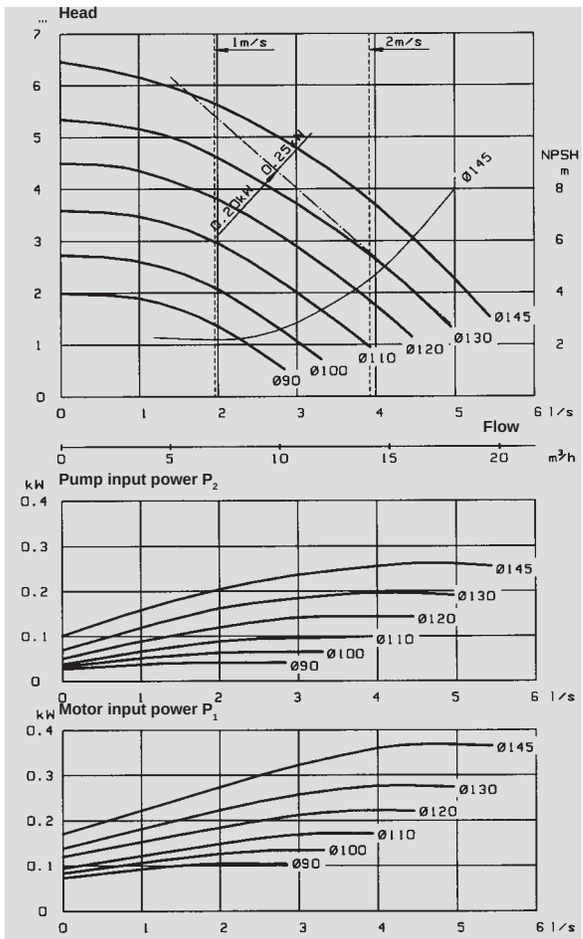
Technical data

T-50B/4 DN50 1500 r/min

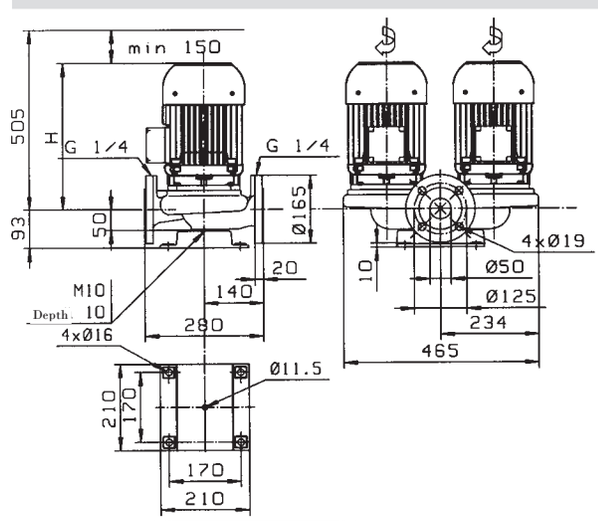


	kW	A	kg	H
OP-762 F15	0.25	0.82	47	250
OP-752 P F15 1~	0.25	1.85	46	250
OP-752 F15	0.20	0.65	46	250
OP-752 P F15 1~	0.20	1.45	46	250

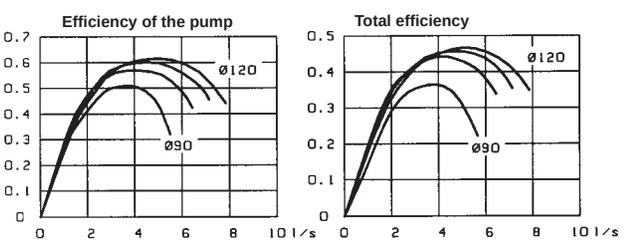


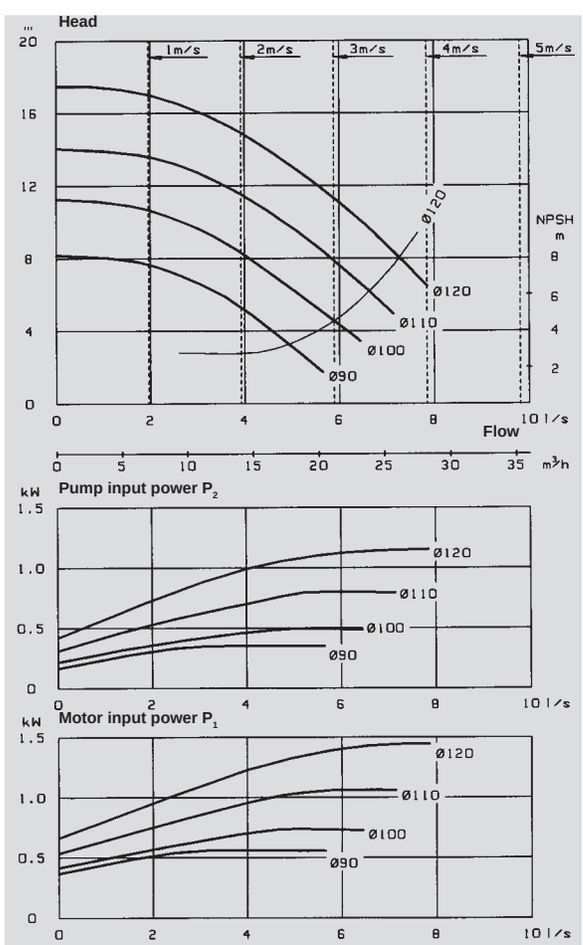


T-50B/2 DN50 3000 r/min



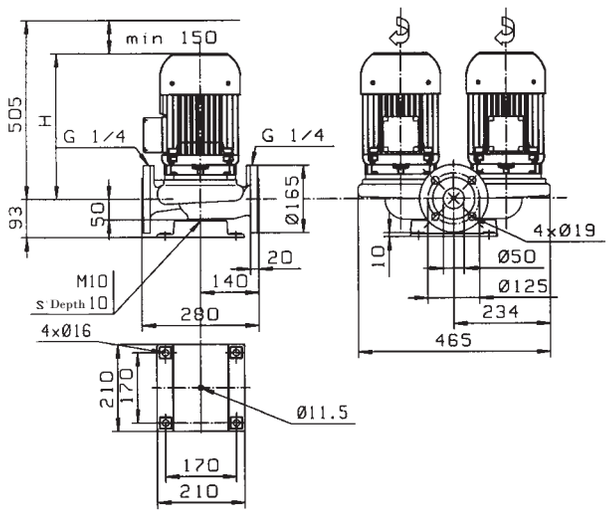
	kW	A	kg	H
OKN-871 D F15	1.1	2.8	62	315
OKN-871 D P F15 1~	1.1	7.0	62	315



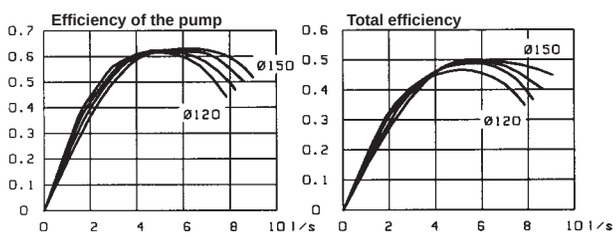


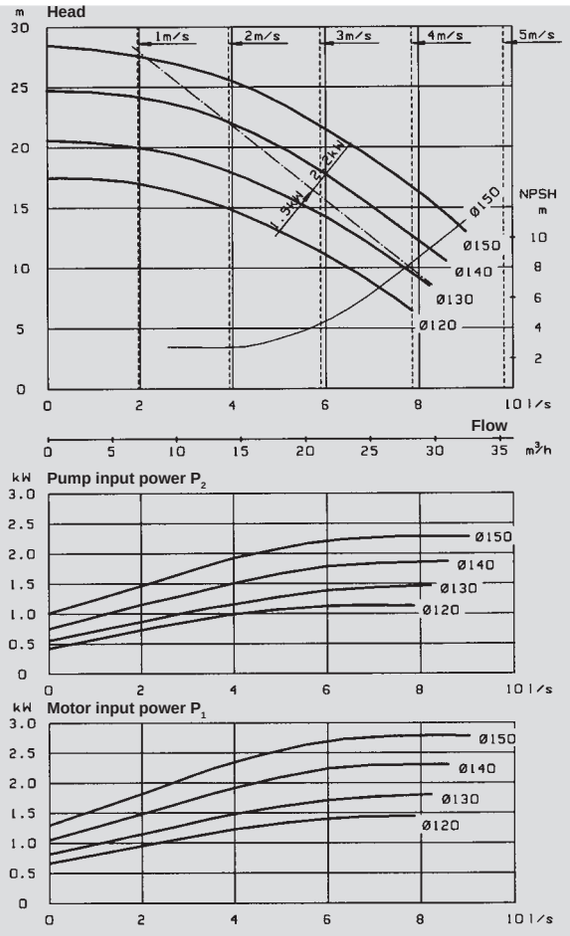
Technical data

T-50C/2 DN50 3000 r/min

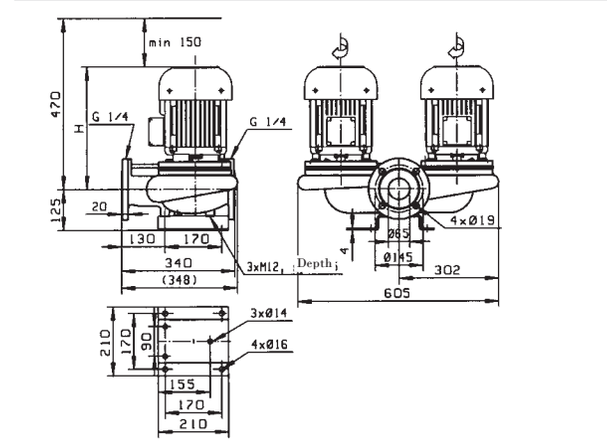


	kW	A	kg	H
OKN-101 D1 F16	2.2	4.7	78	355
OKN-101 C1 F16	1.5	3.3	72	355
OKN-101 C1 P F16 1~	1.5	8.8	72	355

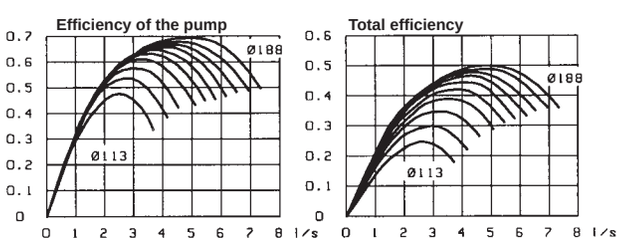


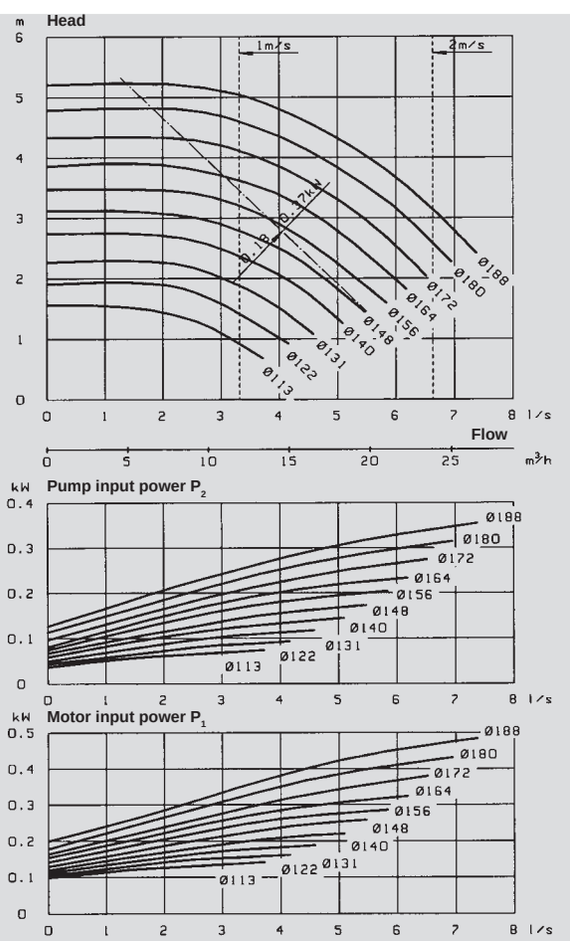


T-65A/6 DN65 1000 r/min



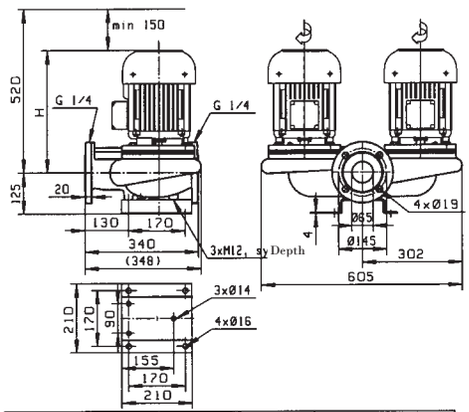
	kW	A	kg	H
OKN-100 B3 F19	0.37	1.20	92	320
OKN-100 B3 F19	0.18	0.95	92	320





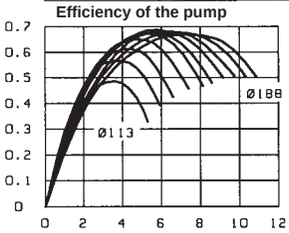
Technical data

T-65A/4 DN65 1500 r/min

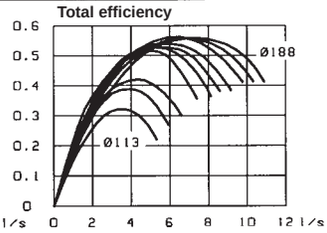


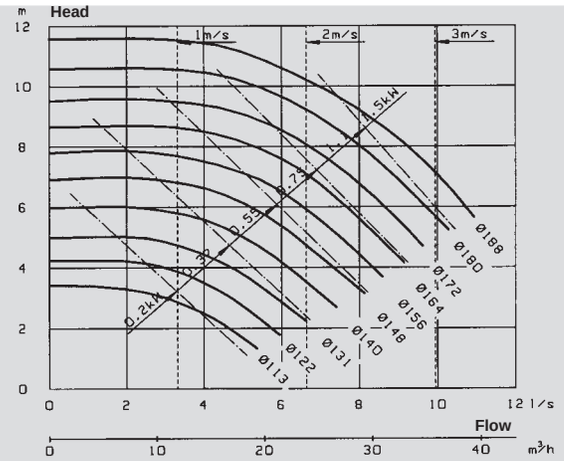
	kW	A	kg	H
OKN-101 D2 F19	1.5	3.5	107	370
OKN-101 D2 P F19 1~	1.5	9.0	107	370
OKN-101 C2 F19	1.1	2.6	102	370
OKN-101 C2 P F19 1~	1.1	6.9	102	370
OKN-100 B2 F19	0.75	2.0	92	320
OKN-100 B2 P F19 1~	0.75	4.7	92	320
OKN-100 B2 F19	0.55	1.4	92	320
OKN-100 B2 P F19 1~	0.55	3.4	92	320
OKN-852 D F19	0.37	1.0	76	310
OKN-852 D P F19 1~	0.37	2.5	76	310
OKN-852 D F19	0.2	0.75	76	310

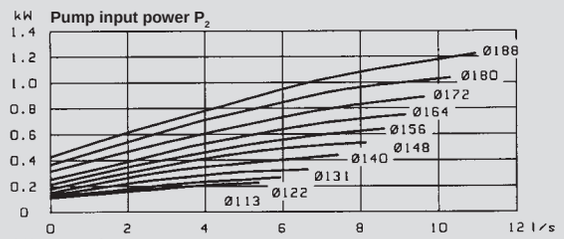
Efficiency of the pump

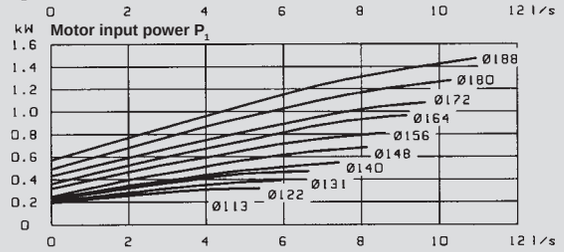


Total efficiency

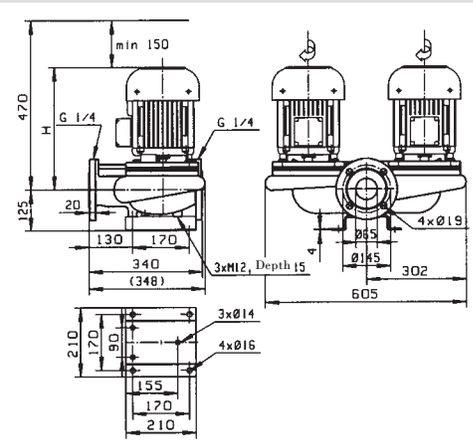






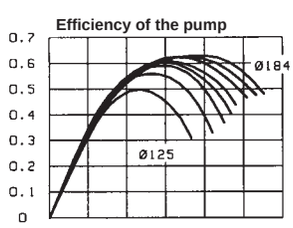


T-65B/6 DN65 1000 r/min

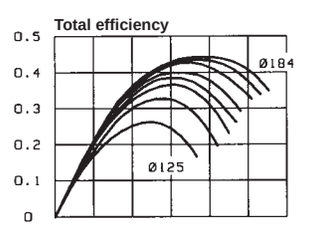


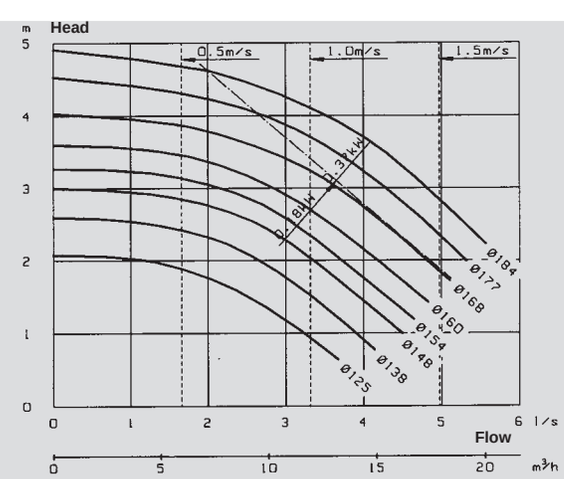
	kW	A	kg	H
OKN-100 B3 F19	0.37	1.20	92	320
OKN-100 B3 F19	0.18	0.95	92	320

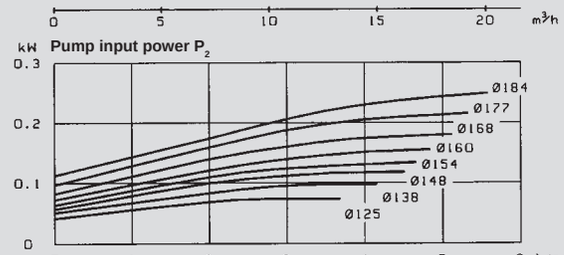
Efficiency of the pump

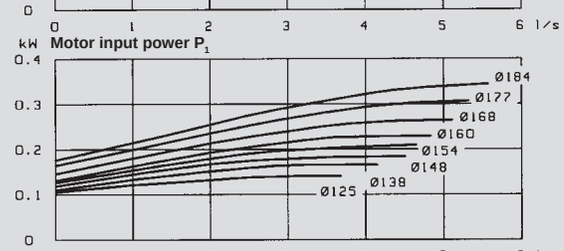


Total efficiency



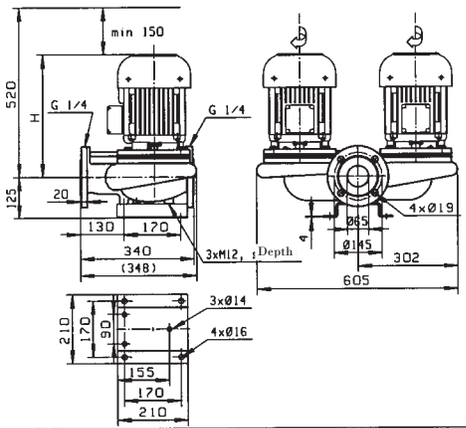




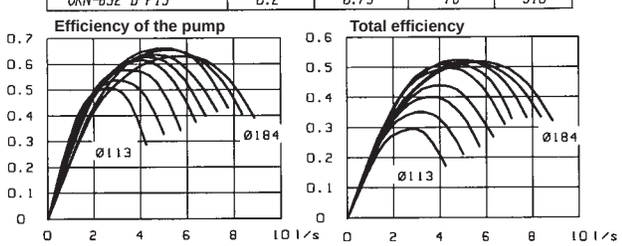


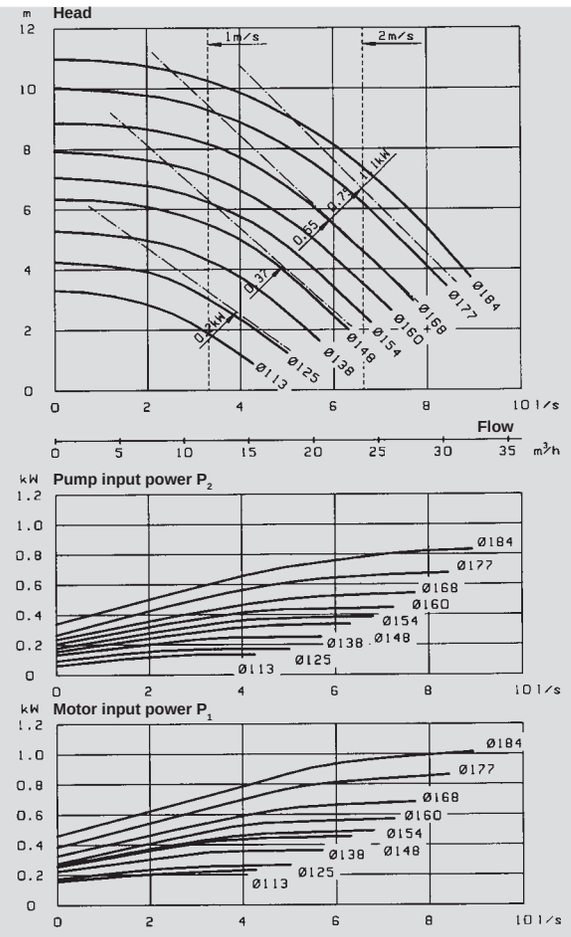
Technical data

T-65B/4 DN65 1500 r/min

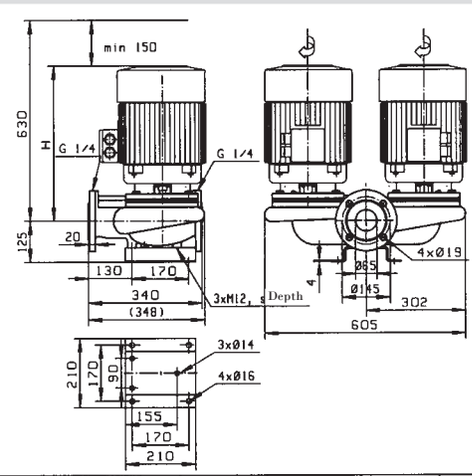


	kW	A	kg	H
OKN-101 C2 F19	1.1	2.6	102	370
OKN-101 C2 P F19 1~	1.1	6.9	102	370
OKN-100 B2 F19	0.75	2.0	92	320
OKN-100 B2 P F19 1~	0.75	4.7	92	320
OKN-100 B2 F19	0.55	1.4	92	320
OKN-100 B2 P F19 1~	0.55	3.4	92	320
OKN-852 D F19	0.37	1.0	76	310
OKN-852 D F19	0.2	0.75	76	310

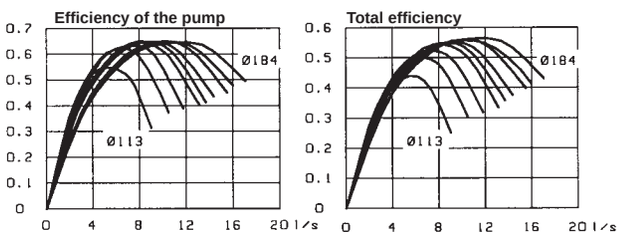


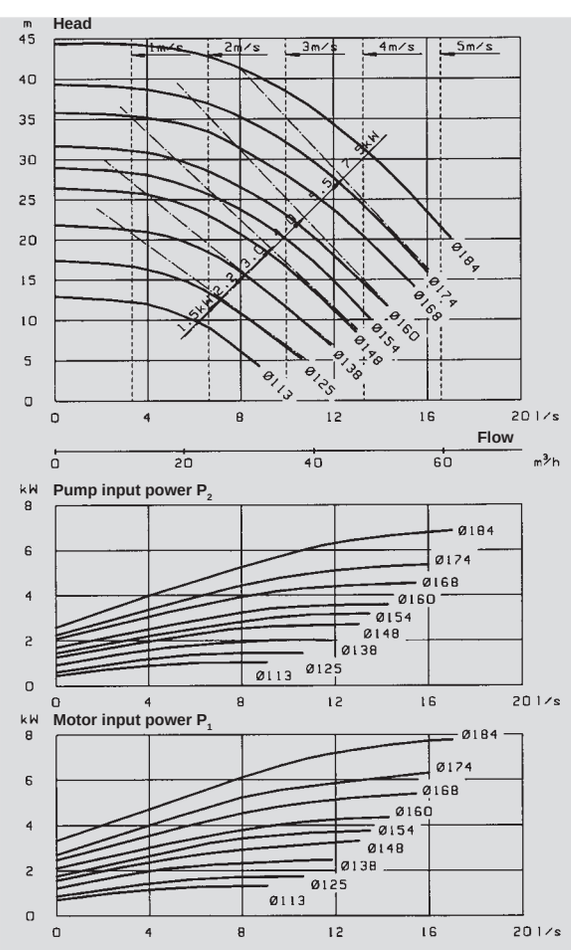


T-65B/2 DN65 3000 r/min



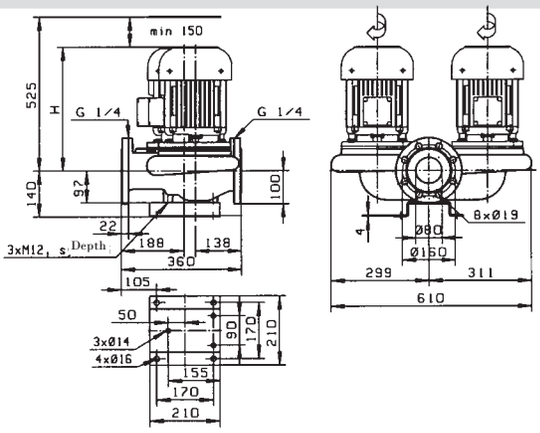
	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	193	480
OKN-132 C1 F19	5.5	11.0	177	480
OKN-112 E1 F19	4.0	8.2	128	415
OKN-112 C1 F19	3.0	6.4	120	415
OKN-101 D1 F19	2.2	4.7	108	370
OKN-101 C1 F19	1.5	3.3	101	370



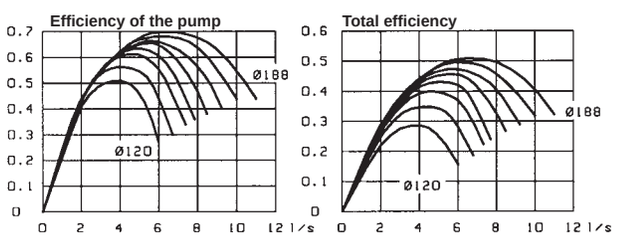


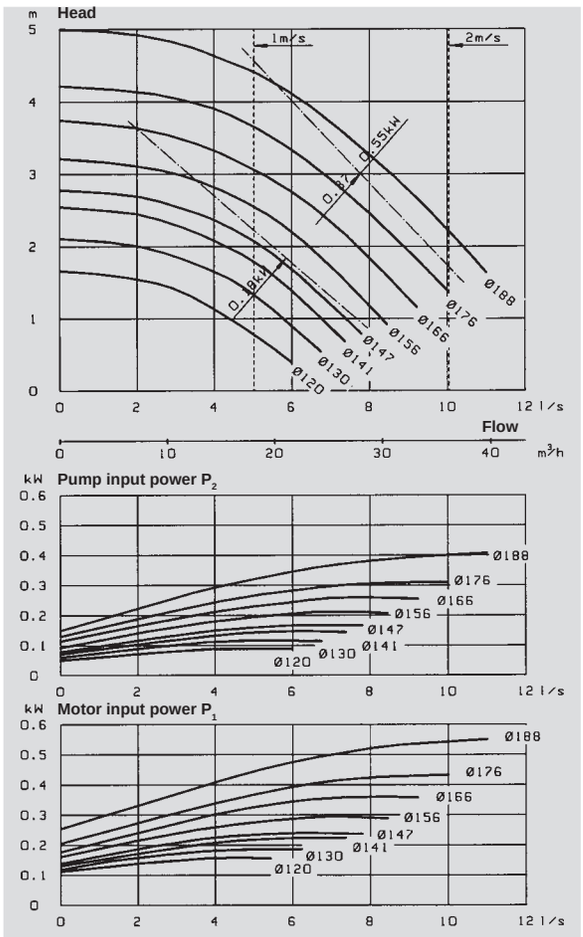
Technical data

T-80A/6 DN80 1000 r/min

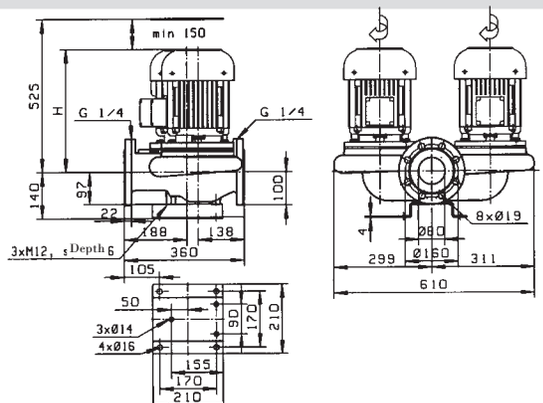


	kW	A	kg	H
OKN-101 C3 F19	0.55	1.75	105	375
OKN-100 B3 F19	0.37	1.2	95	325
OKN-100 B3 F19	0.18	0.95	95	325

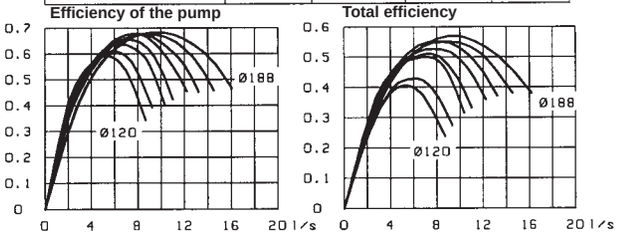


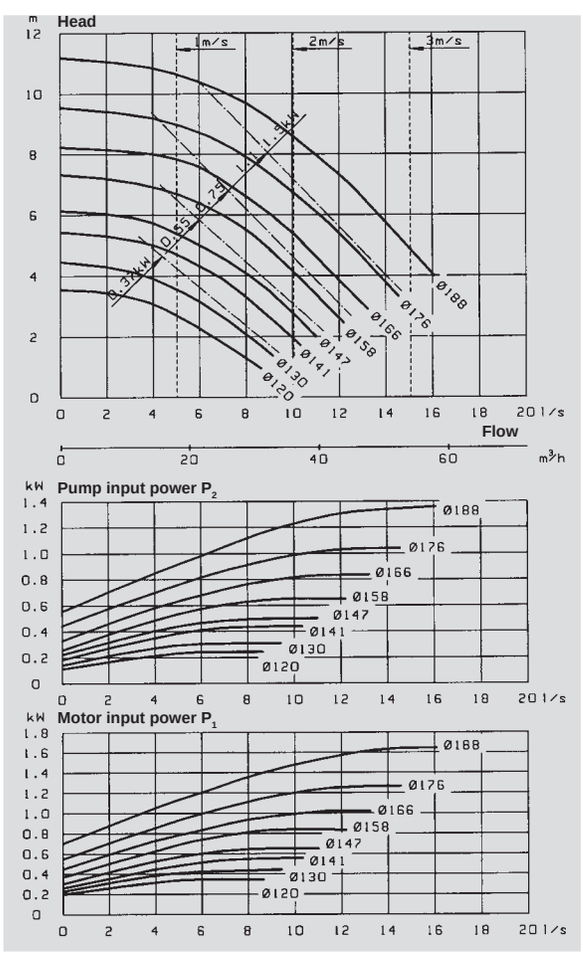


T-80A/4 DN80 1500 r/min



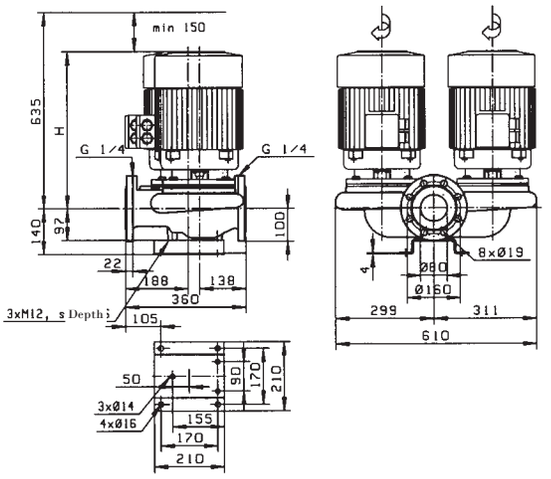
	kW	A	kg	H
OKN-101 D2 F19	1.5	3.5	110	375
OKN-101 D2 P F19 1~	1.5	9.0	110	375
OKN-101 C2 F19	1.1	2.6	105	375
OKN-101 C2 P F19 1~	1.1	6.9	105	375
OKN-100 B2 F19	0.75	2.0	95	325
OKN-100 B2 P F19 1~	0.75	4.7	95	325
OKN-100 B2 F19	0.55	1.4	95	325
OKN-100 B2 P F19 1~	0.55	3.4	95	325
OKN-852 D F19	0.37	1.0	79	315
OKN-852 D P F19 1~	0.37	2.5	79	315



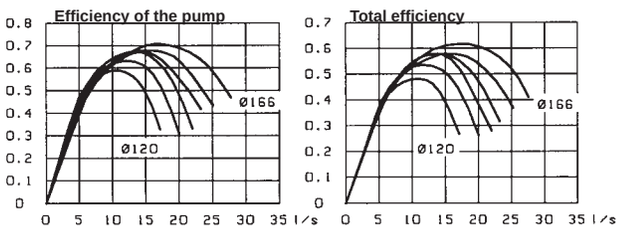


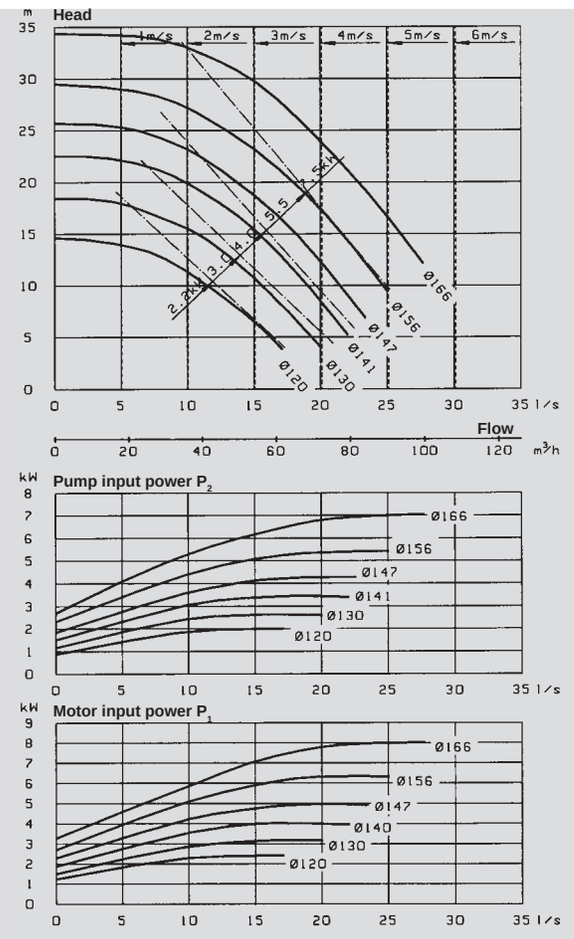
Technical data

T-80A/2 DN80 3000 r/min

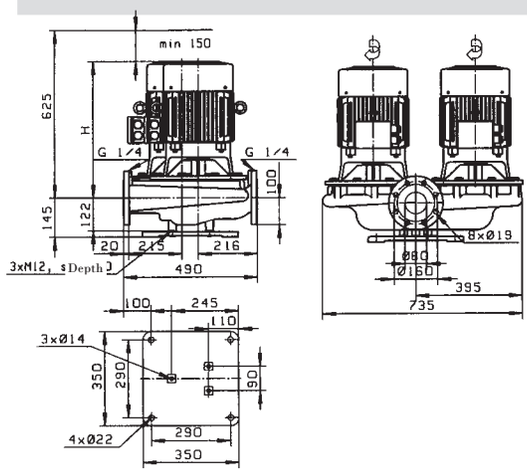


	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	196	485
OKN-132 C1 F19	5.5	11.0	180	485
OKN-112 E1 F19	4.0	8.2	131	420
OKN-112 C1 F19	3.0	6.4	123	420
OKN-101 D1 F19	2.2	4.7	111	375

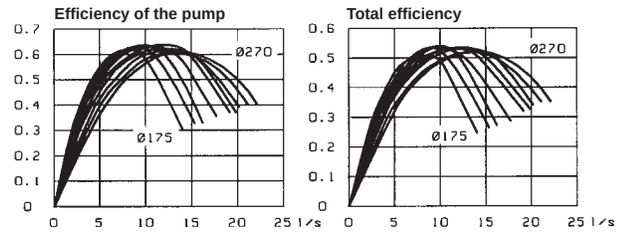


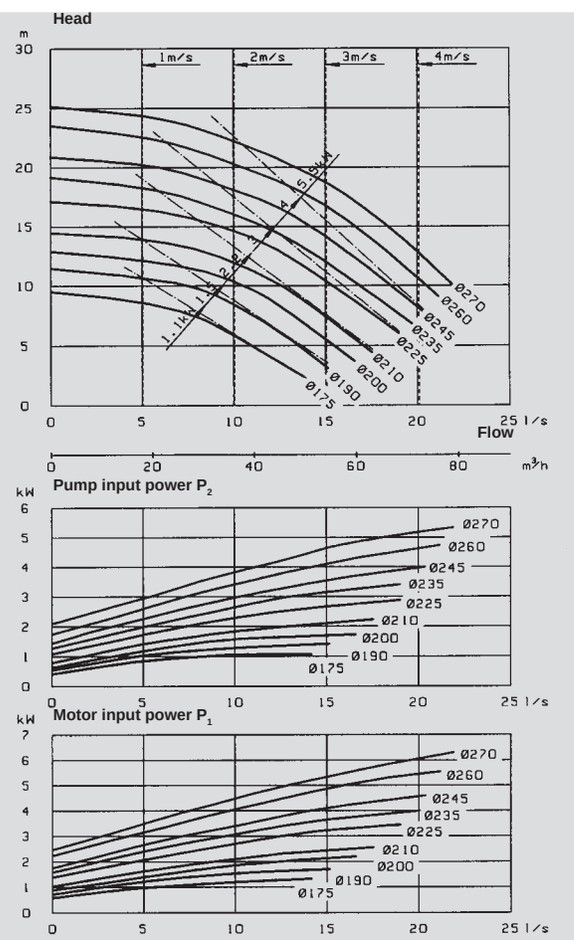


T-80S/4 DN80 1500 r/min



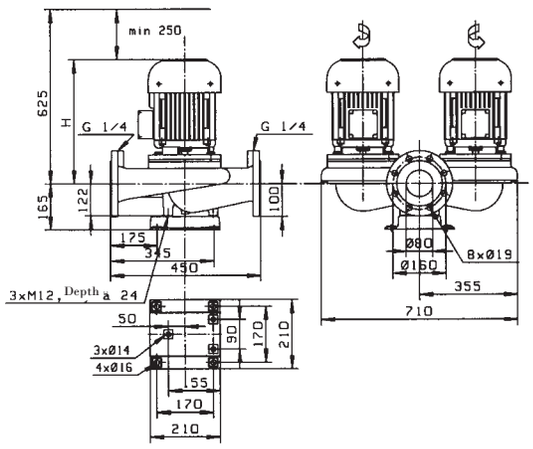
	kW	A	kg	H
OKN-132 E2 F29	5.5	11.9	263	510
OKN-132 C2 F29	4	8.7	243	510
OKN-112 E2 F29	3	6.6	203	445
OKN-112 C2 F29	2.2	5.1	191	445
OKN-101 D2 F29	1.5	3.5	179	385
OKN-101 C2 F29	1.1	2.6	171	385



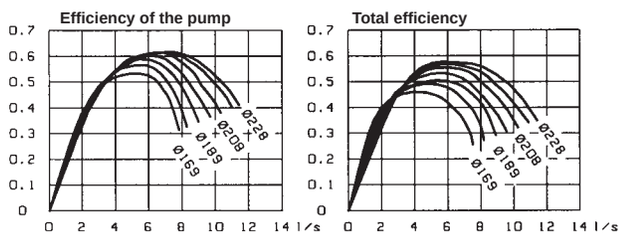


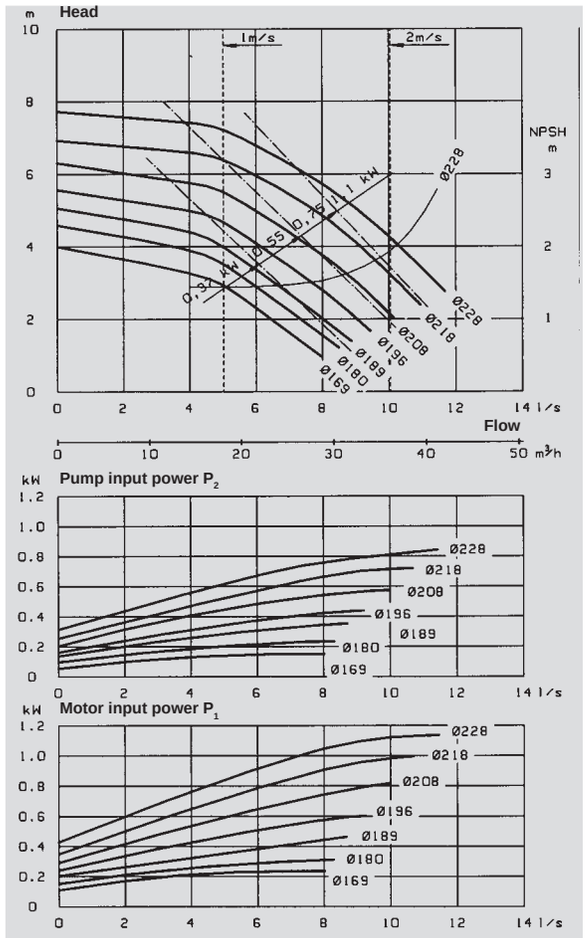
Technical data

AT-1082/6 DN80 1000 r/min

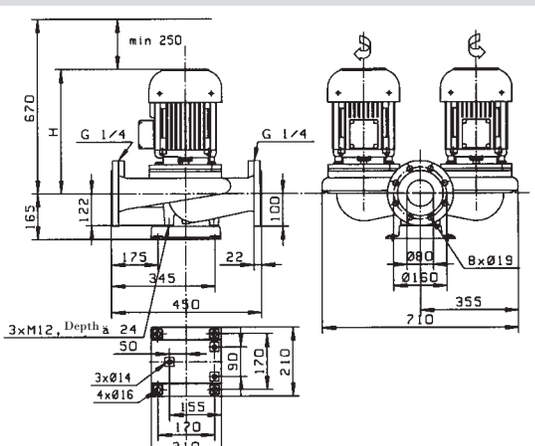


	kW	A	kg	H
OKN-101 D3 F28	1.1	3.5	141	375
OKN-101 D3 F28	0.75	2.4	141	375
OKN-101 C3 F28	0.55	1.75	133	375
OKN-100 B3 F28	0.37	1.2	127	325

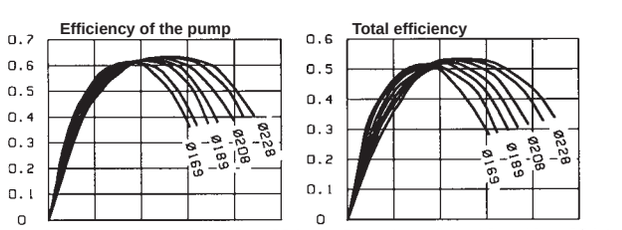


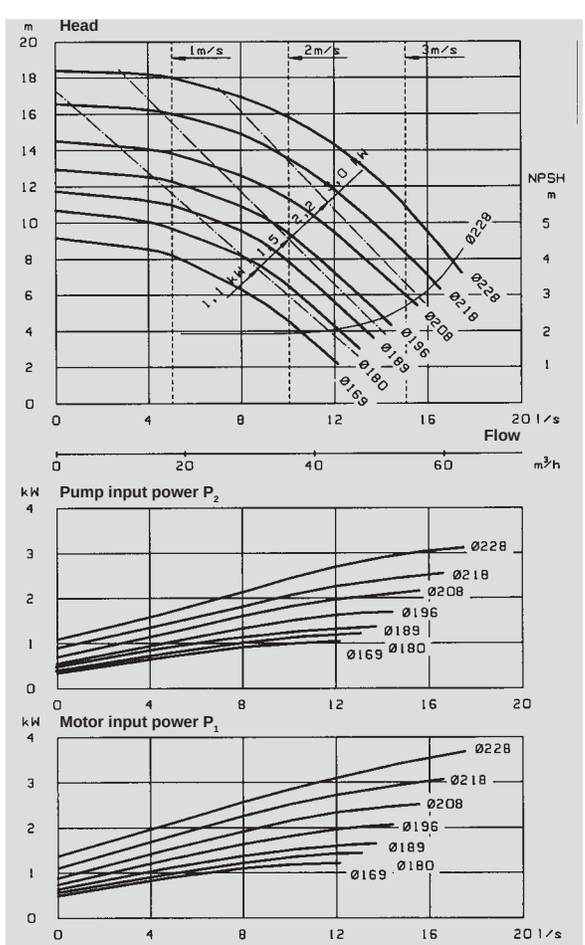


AT-1082/4 DN80 1500 r/min



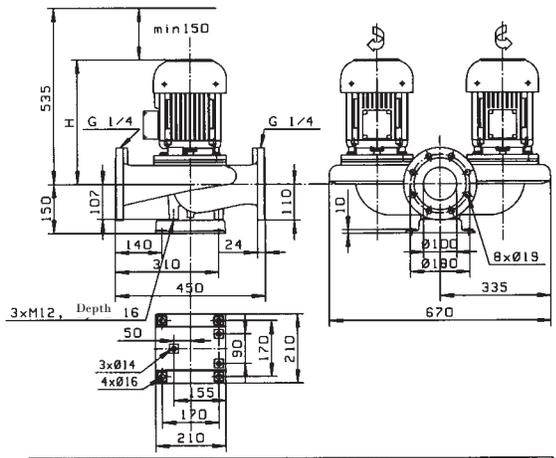
	kW	A	kg	H
OKN-112 E2 F28	3.0	6.5	165	420
OKN-112 C2 F28	2.2	5.1	153	420
OKN-101 D2 F28	1.5	3.5	141	375
OKN-101 D2 P F28 1~	1.5	9.0	141	375
OKN-101 C2 F28	1.1	2.6	141	375
OKN-101 C2 P F28 1~	1.1	6.9	141	375



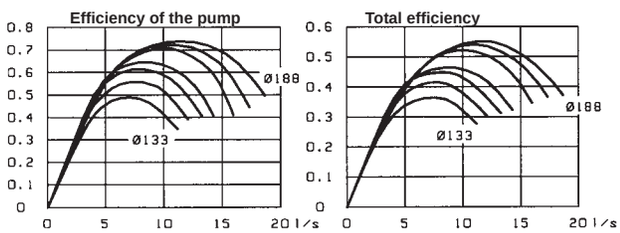


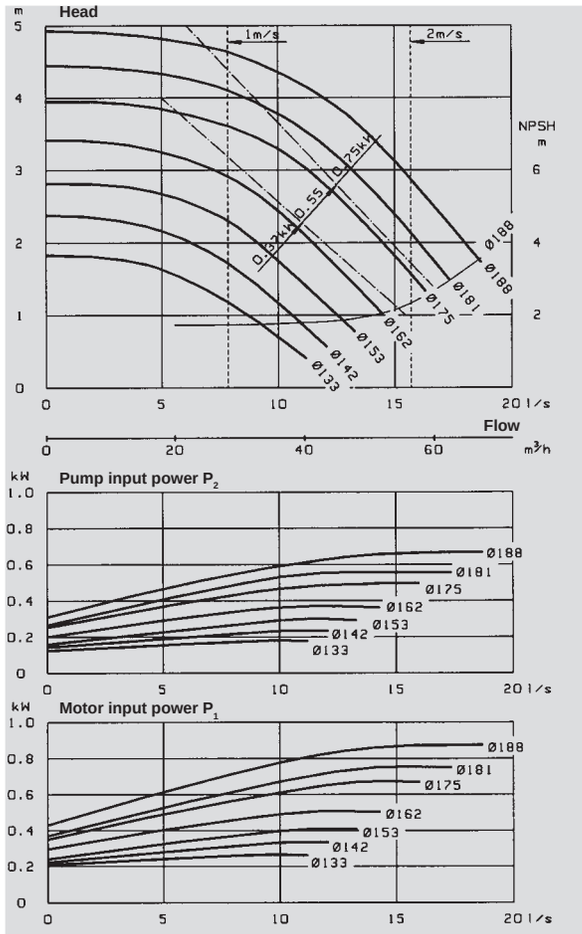
Technical data

AT-1102/6 DN100 1000 r/min

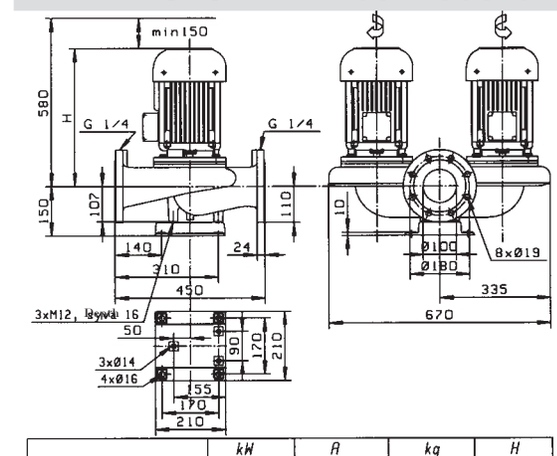


	kW	A	kg	H
OKN-101 D3 F19	0.75	2.4	125	385
OKN-101 C3 F19	0.55	1.75	117	385
OKN-100 B3 F19	0.37	1.2	111	335

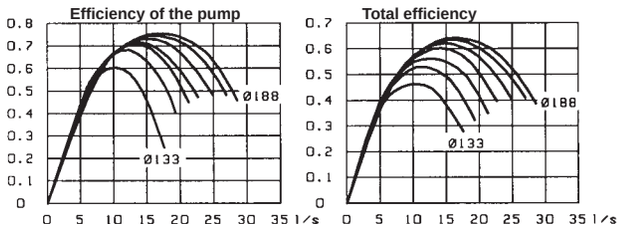


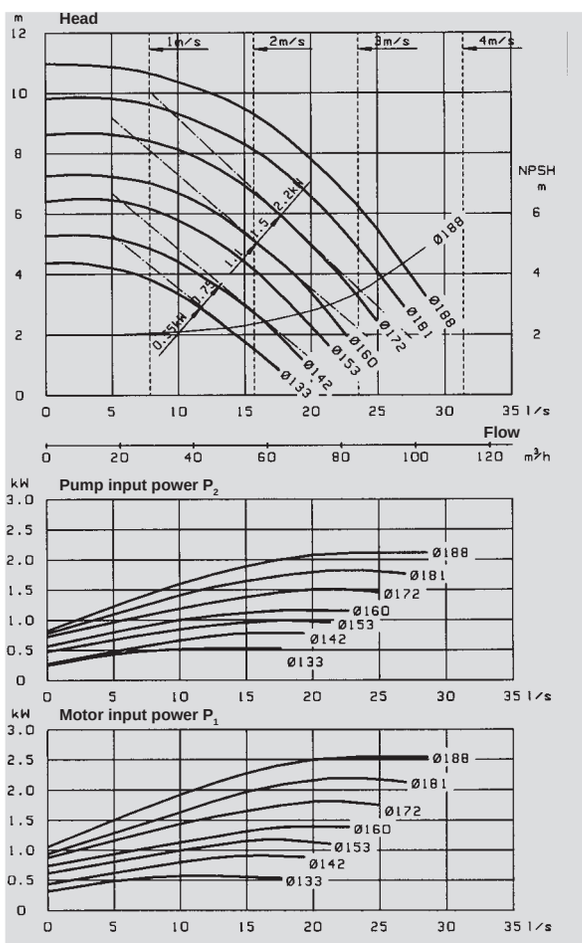


AT-1102/4 DN100 1500 r/min



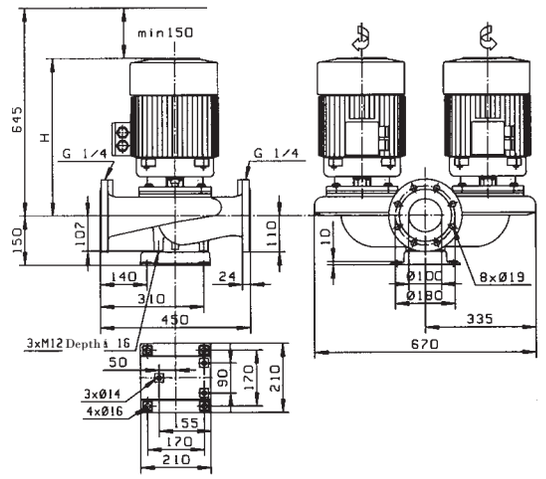
	kW	A	kg	H
OKN-112 C2 F19	2.2	5.1	137	430
OKN-101 D2 F19	1.5	3.5	125	385
OKN-101 D2 P F19 1~	1.5	9.0	125	385
OKN-101 C2 F19	1.1	2.6	117	385
OKN-101 C2 P F19 1~	1.1	6.9	117	385
OKN-100 B2 F19	0.75	2.0	111	335
OKN-100 B2 F19	0.55	1.4	111	335
OKN-100 B2 P F19 1~	0.55	3.4	111	335



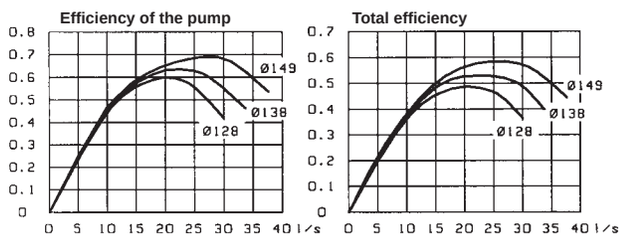


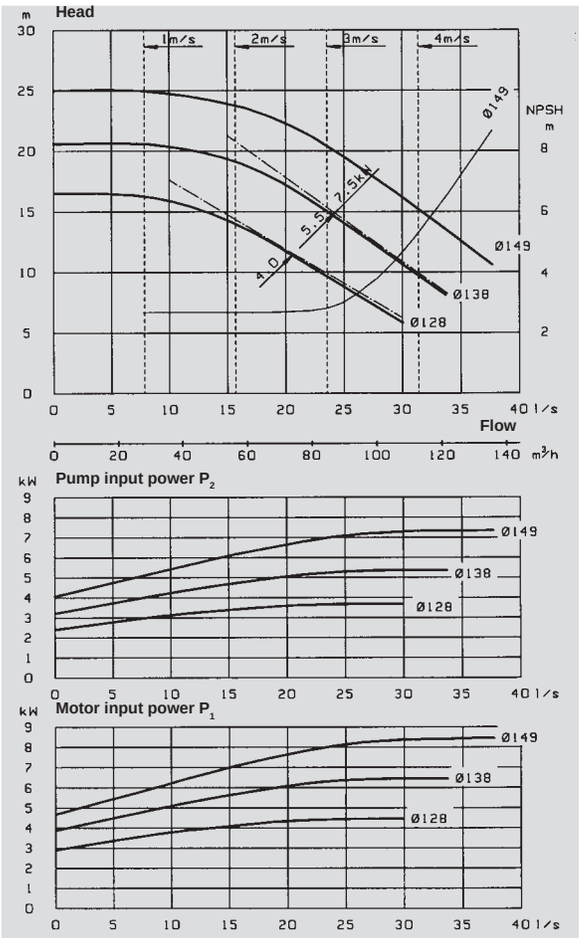
Technical data

AT-1102/2 DN100 3000 r/min

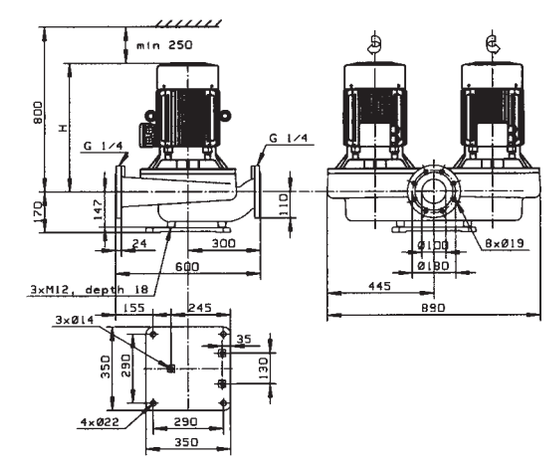


	kW	A	kg	H
OKN-132 E1 F19	7.5	15.0	202	495
OKN-132 C1 F19	5.5	11.0	186	495
OKN-112 E1 F19	4.0	8.2	138	430

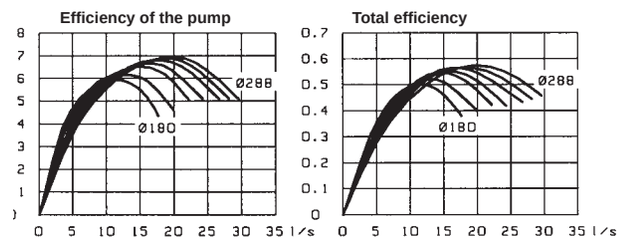


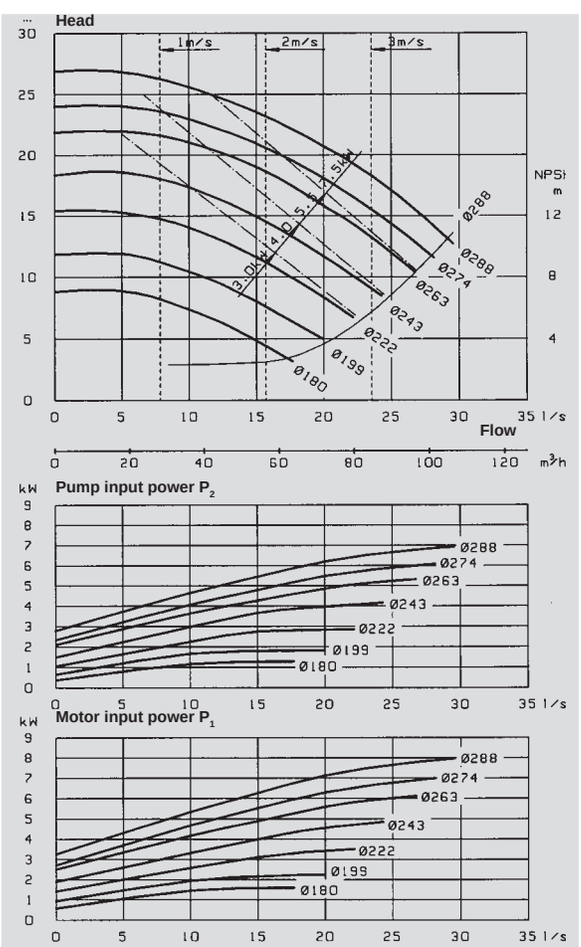


AT-1106/4 DN100 1500 r/min



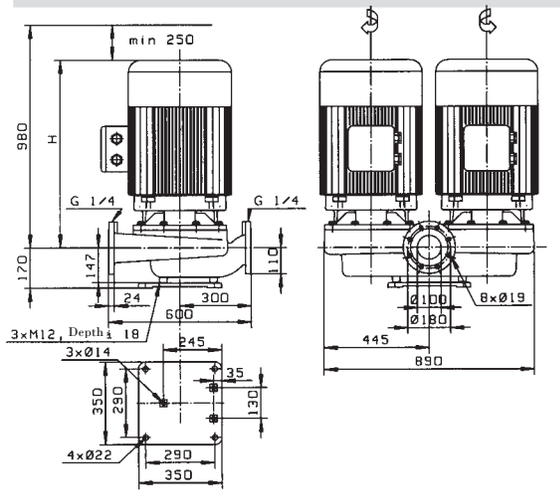
	kW	A	kg	H
OKN-133 G2 BF31	7.5	15.7	360	550
OKN-132 E2 BF31	5.5	11.9	330	500
OKN-132 C2 BF31	4.0	8.7	320	500
OKN-112 E2 F31	3.0	6.6	280	435



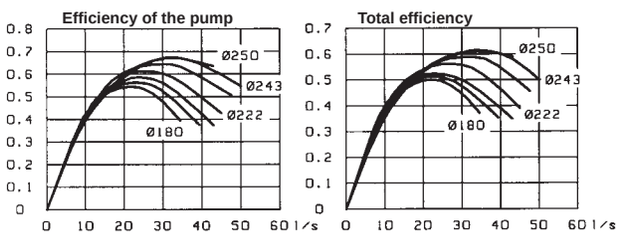


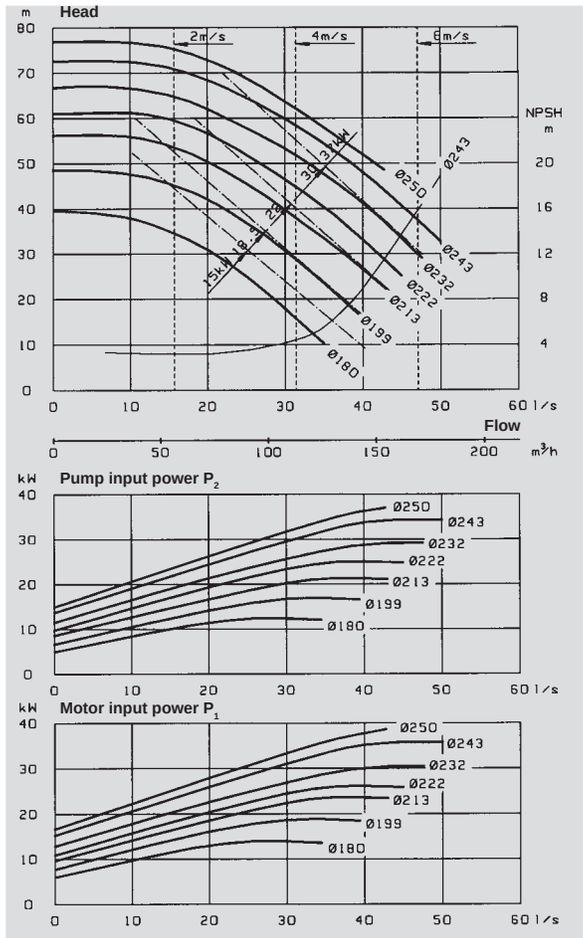
Technical data

AT-1106/2 DN100 3000 r/min

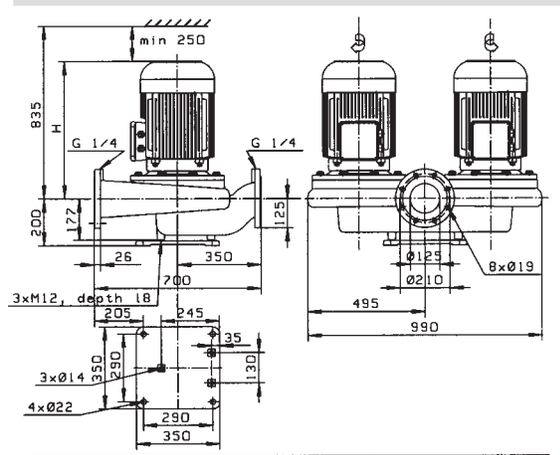


	kW	A	kg	H
OKM-207 J1 F31	37	64	700	730
OKM-206 K1 F31	30	53	660	640
OKM-187 G1 F31	22	38	520	640
OKM-165 H1 F31	18.5	34	460	625
OKN-164 G1 F31	15	30.5	370	585

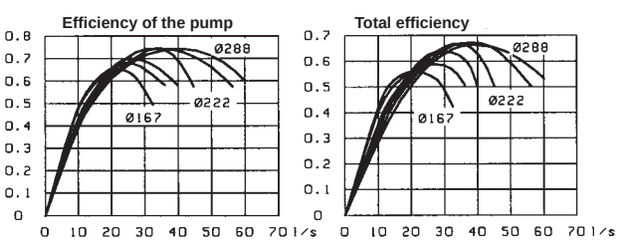


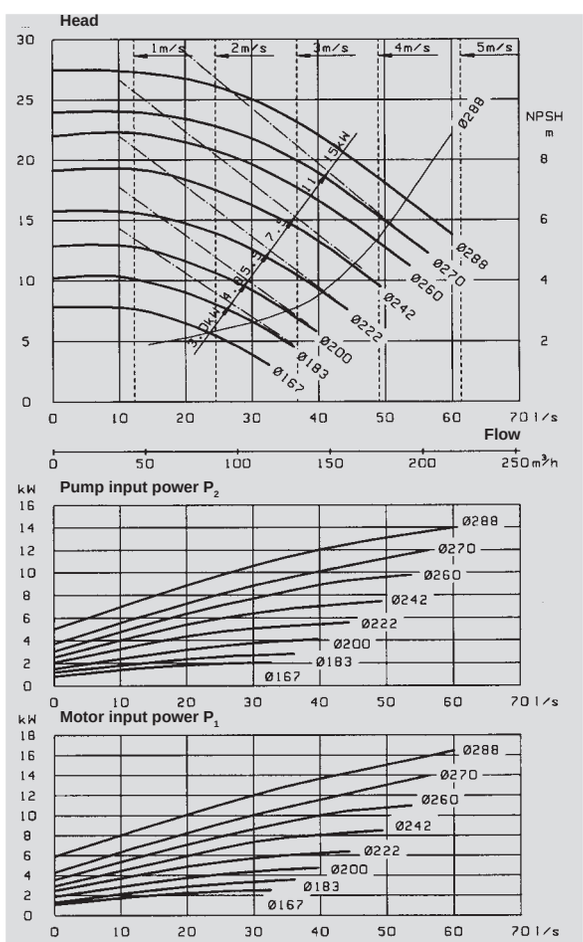


AT-1129/4 DN125 1500 r/min



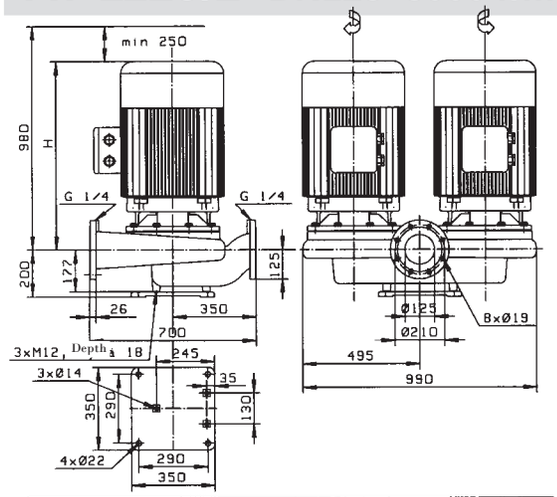
	kW	A	kg	H
OKN-164B J2 F31	15.0	31.0	465	585
OKN-164B G2 F31	11.0	22.6	435	585
OKN-133 G2 BF31	7.5	15.7	395	550
OKN-132 E2 BF31	5.5	11.9	365	500
OKN-132 C2 BF31	4.0	8.7	350	500
OKN-112 E2 F31	3.0	6.6	310	430



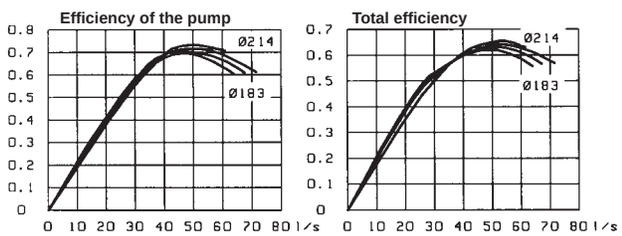


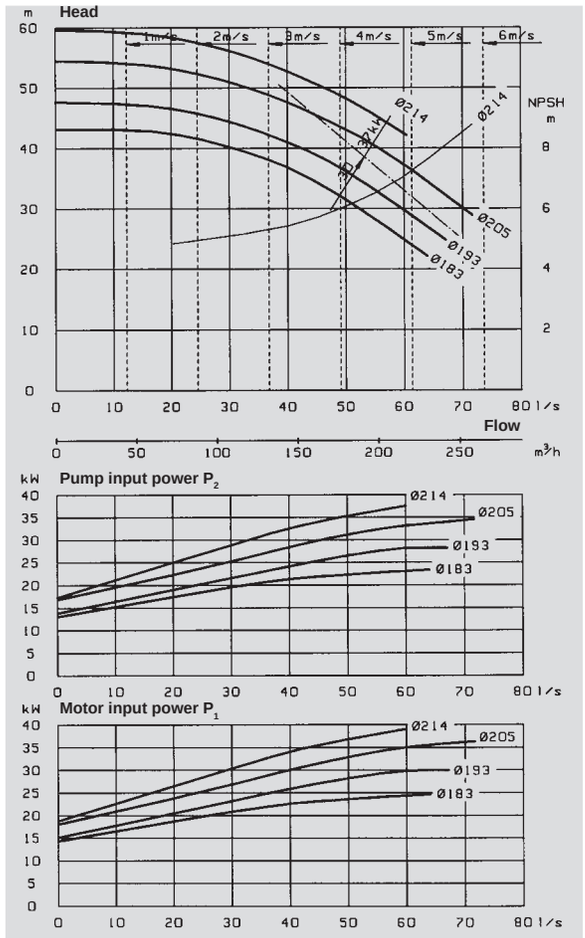
Technical data

AT-1129/2 DN125 3000 r/min

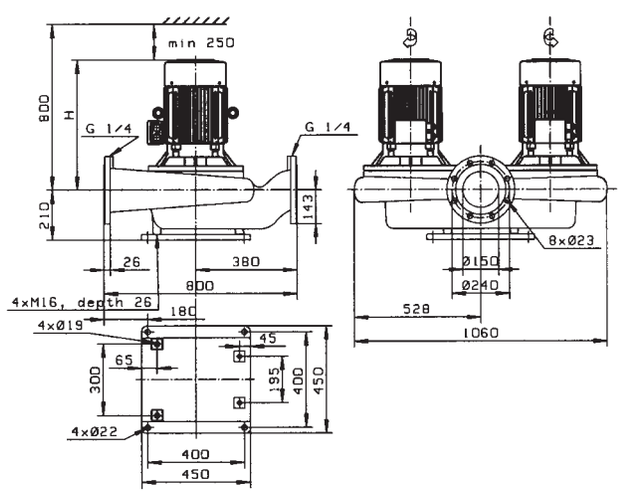


	kW	A	kg	H
OKM-207 J1 F31	37.0	64	745	730
OKM-206 K1 F31	30.0	53	705	640

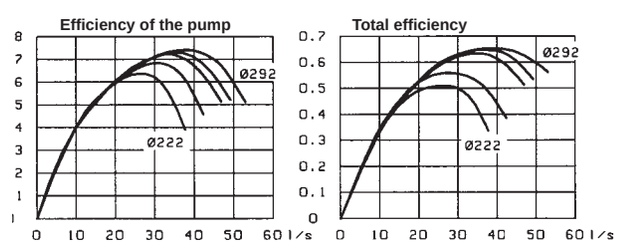


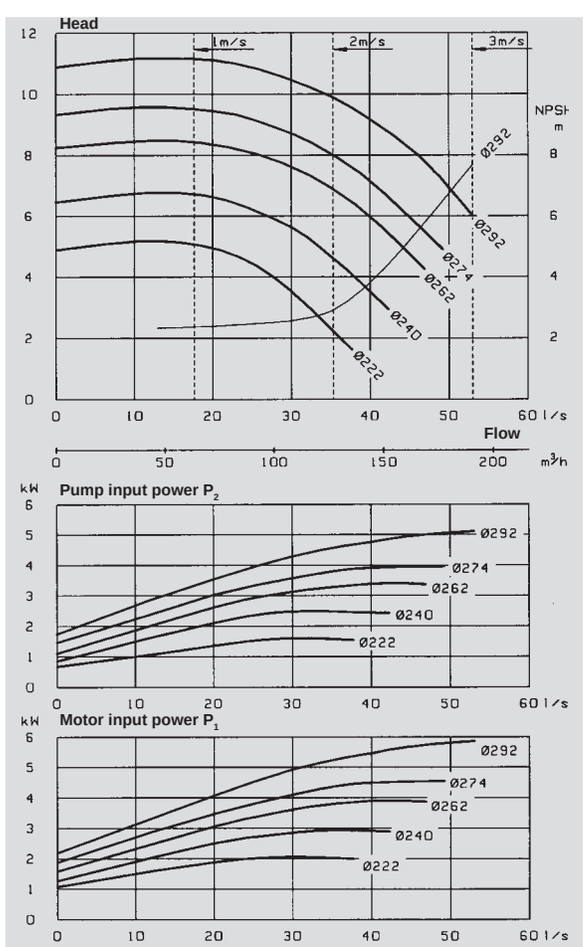


AT-1154/6 DN150 1000 r/min



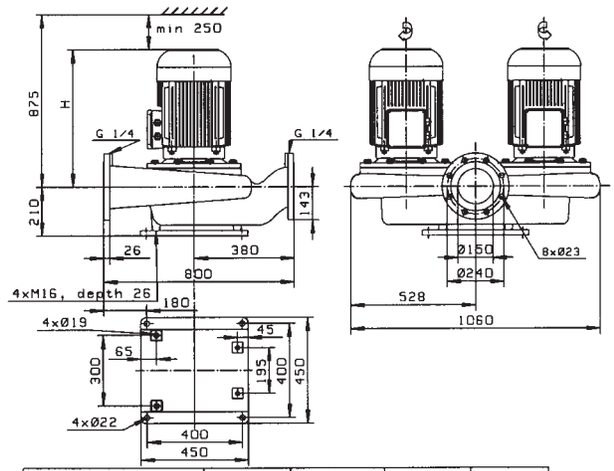
	kW	A	kg	H
OKN-133 G3 BF31	5.5	12.7	415	550



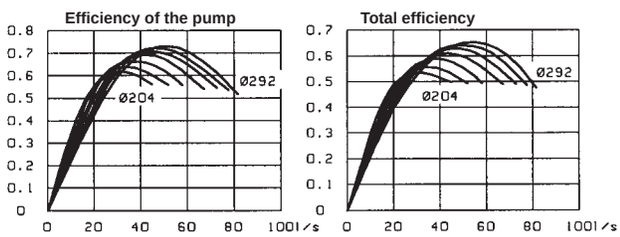


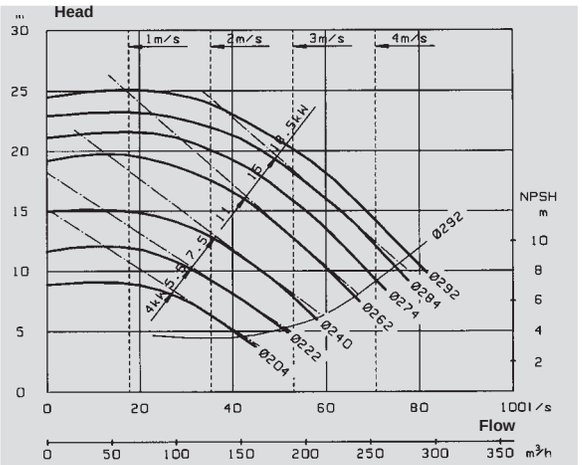
Technical data

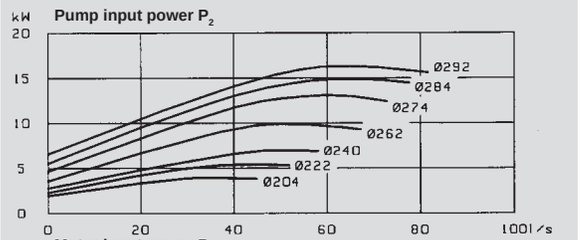
AT-1154/4 DN150 1500 r/min

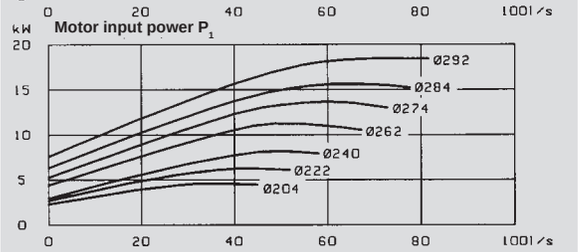


	kW	A	kg	H
OKM-187 H2 F31	18.5	34	515	625
OKN-164B J2 F31	15.0	31.0	485	585
OKN-164B G2 F31	11.0	22.6	455	585
OKN-133 G2 BF31	7.5	15.7	415	550
OKN-132 E2 BF31	5.5	11.9	385	500
OKN-132 C2 BF31	4.0	8.7	375	500

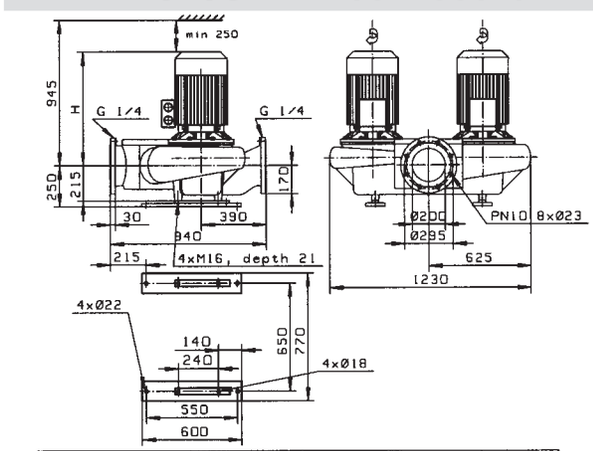




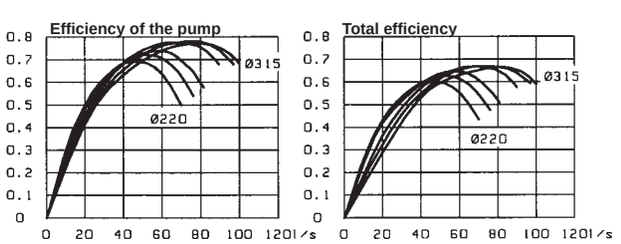


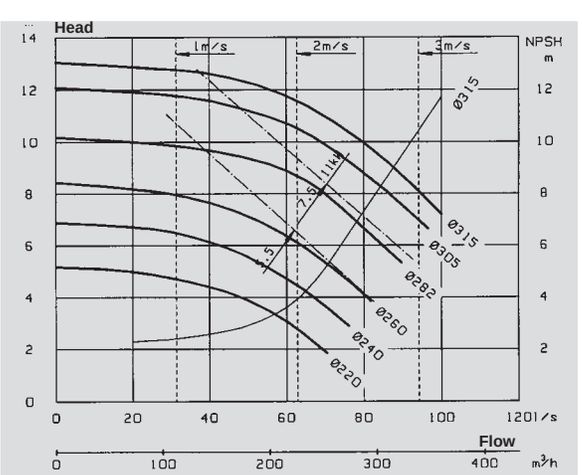


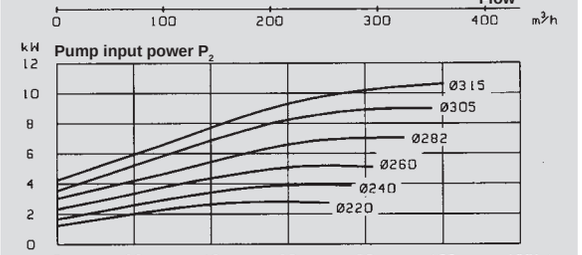
AT-1202/6 DN200 1000 r/min

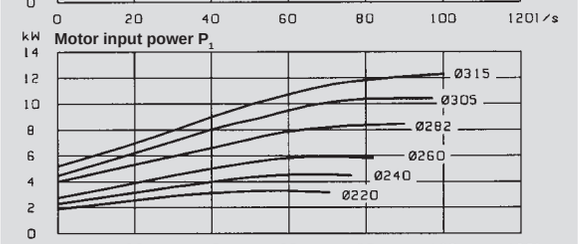


	kW	A	kg	H
OKM-165 G3 F31	11	22	680	695
OKM-165 G3 F31	7.5	17	680	695
OKN-133 G3 BF31	5.5	12.7	580	610



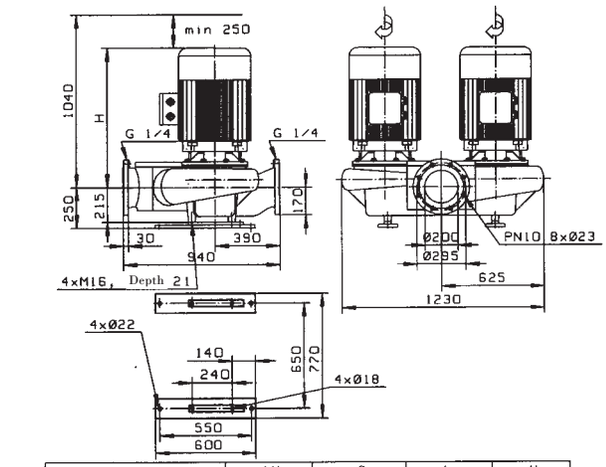




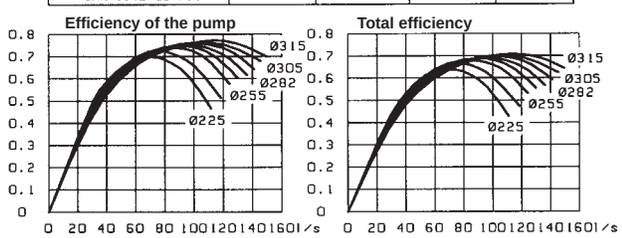


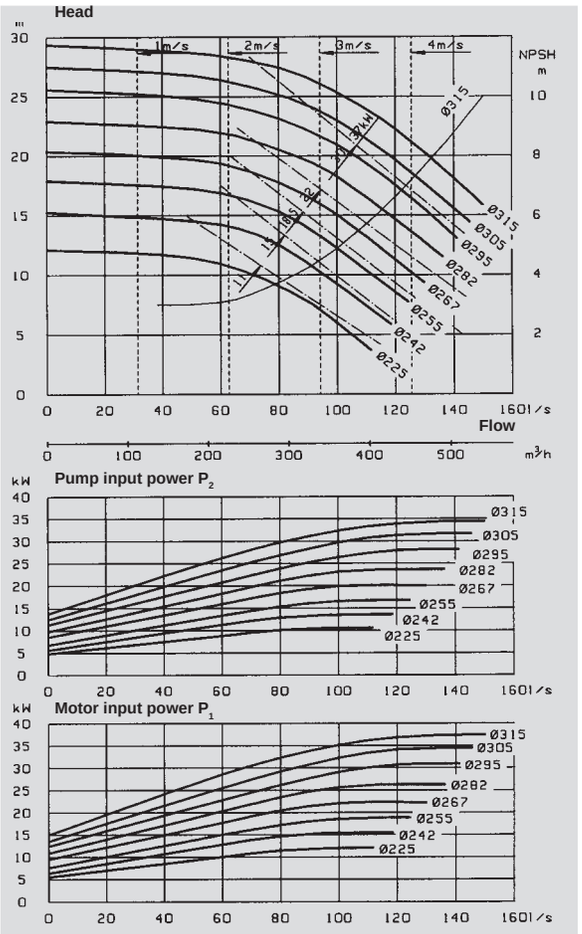
Technical data

AT-1202/4 DN200 1500 r/min

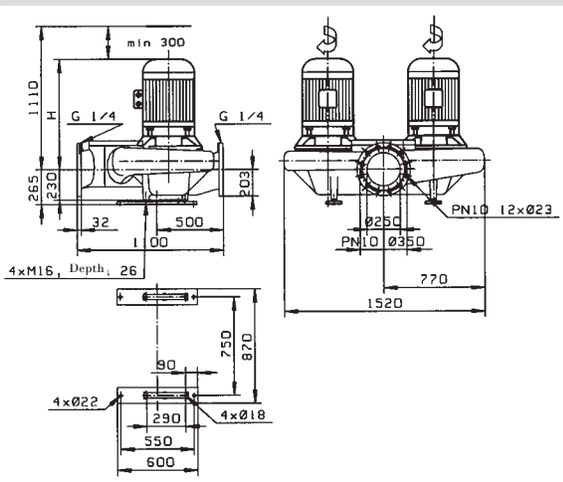


	kW	A	kg	H
OKM-207 K2 F32	37	69.5	990	790
OKM-206 K2 F32	30	55	910	700
OKM-186 J2 F32	22	42	750	700
OKM-187 H2 F31	18.5	34	720	685
OKN-164B J2 F31	15	31.0	650	645
OKN-164B G2 F31	11	22.6	620	645

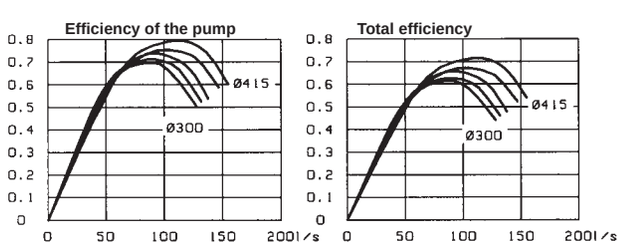


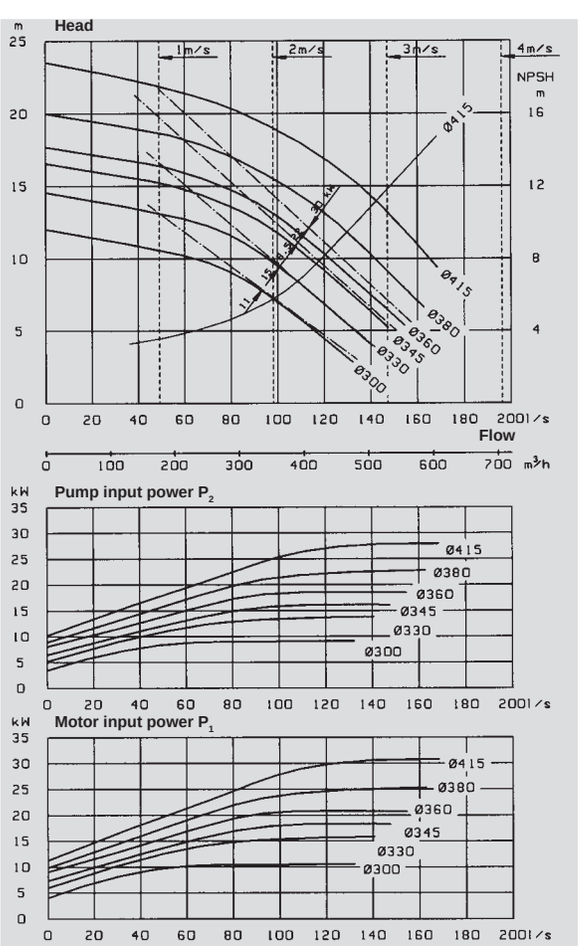


AT-1250/6 DN250 1000 r/min



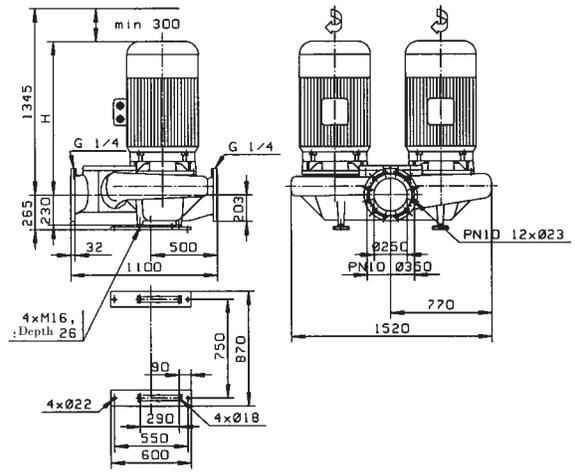
	kW	A	kg	H
OKM-226 K3 F42	30	55	1110	810
OKM-207 K3 F41	22	43.5	980	810
OKM-206 K3 F41	18.5	35.5	960	720
OKM-187 H3 F41	15	30.5	810	720
OKM-165 H3 F41	11	22	720	705



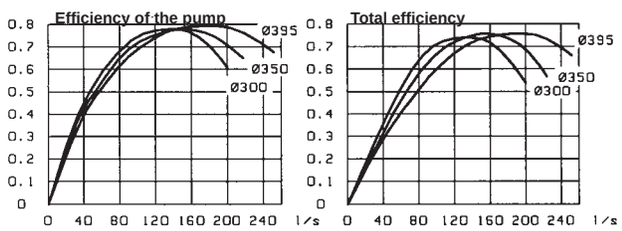


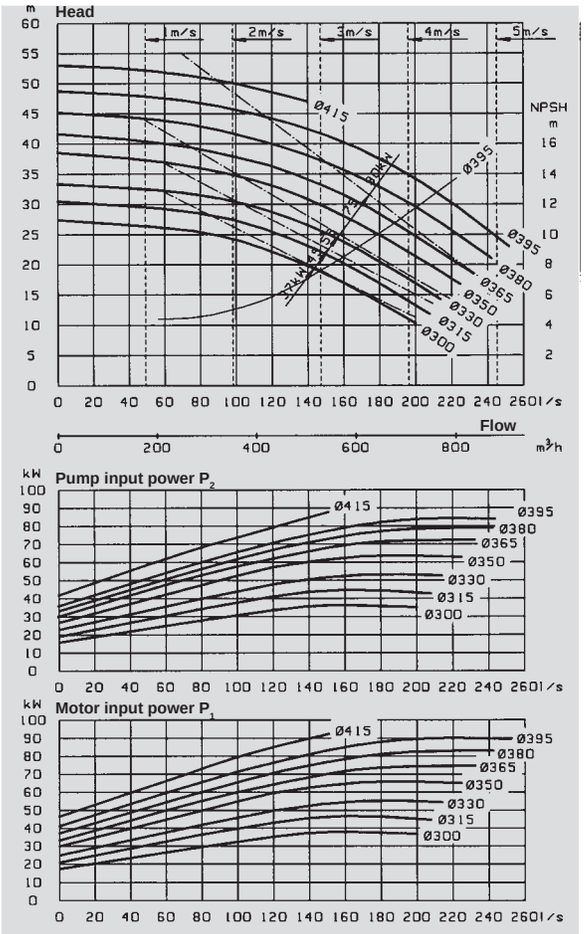
Technical data

AT-1250/4 DN250 1500 r/min

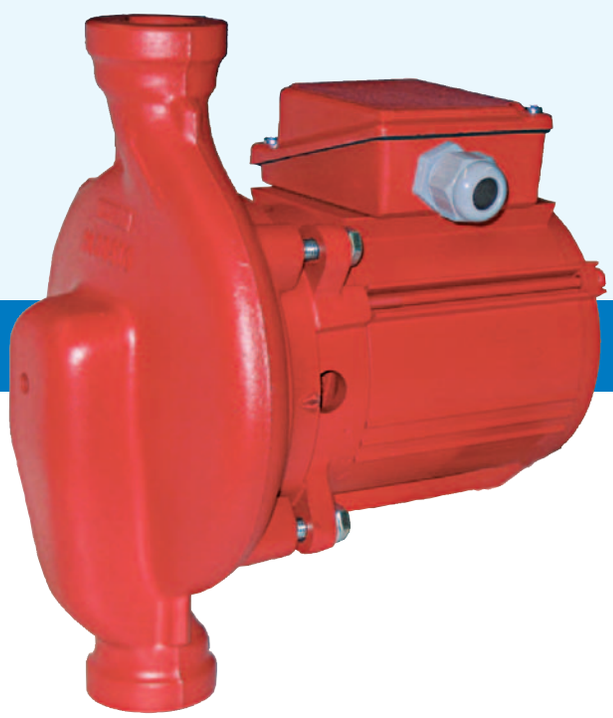


	kW	A	kg	H
OKM-300 K2 F43	90	160	1850	1000
OKM-289 K2 F43	75	134	1690	1000
OSG-257 K2 F42	55	100	1410	1045
OKM-227 K2 F42	45	81	1250	810
OKM-207 K2 F41	37	69.5	1170	810





KOLMEKS



CENTRIFUGAL PUMPS with PIPE CONNECTION

RANGE AMK, AHV and AE

KOLMEKS

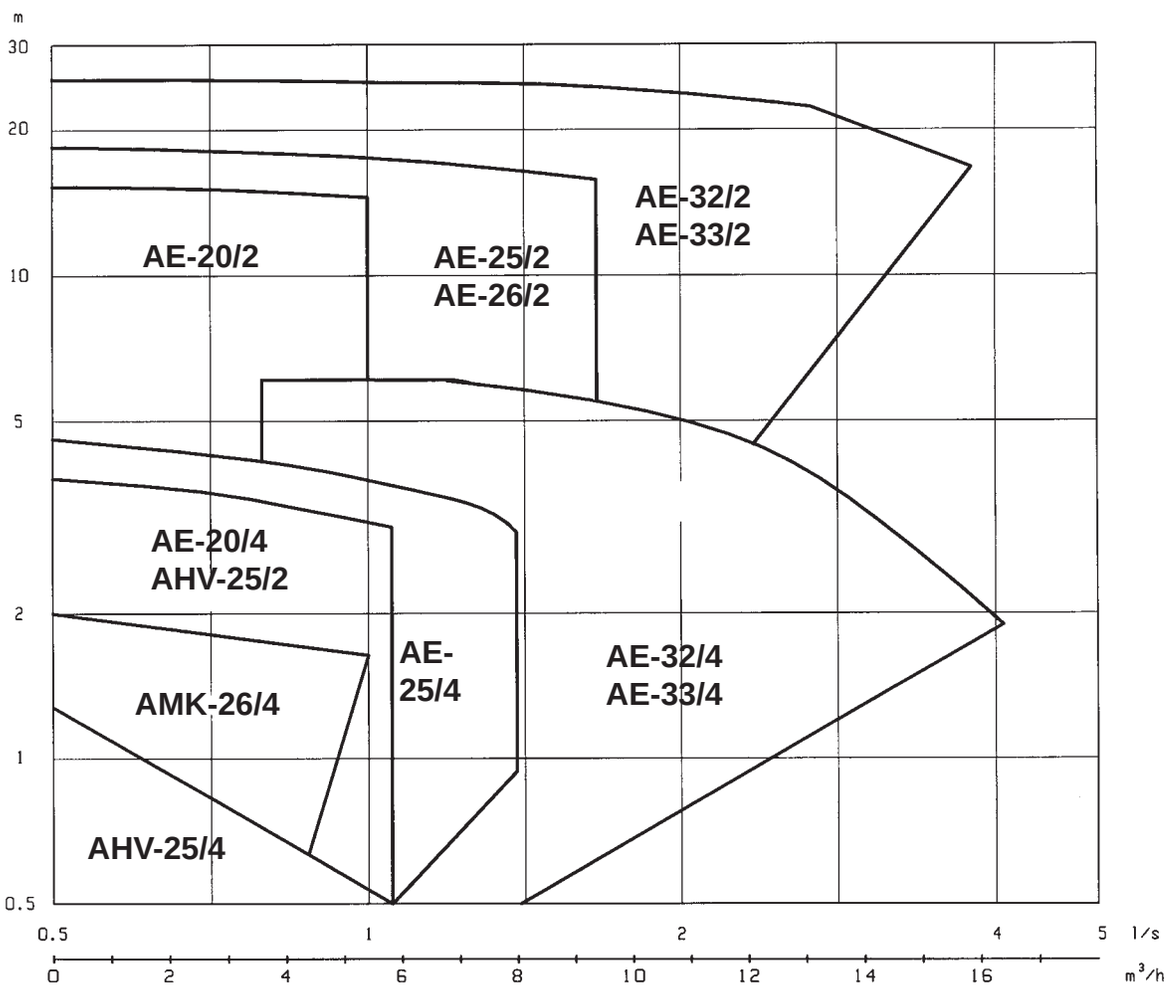
General features

AMK-, AHV- and AE-ranges consist of small In-Line pumps made of cast iron with pipe connections (G-threads).

Applications

Pumps of AMK-, AHV- and AE-range are capable for pumping hot and cold clean liquids in circulation systems, e.g. of heating and air conditioning and for liquid transfer.

Duty chart at 50 Hz



Design

Pump

The AMK-, AHV- and AE-range pumps are single stage, monobloc design centrifugal pumps equipped with dry type electric motor. The impeller is mounted directly on the shaft of the motor
(no separate couplings).

Electric motor

The electric motors of AMK-, AHV- and AE -ranges are especially dimensioned and designed for pump application. It is totally enclosed fan cooled squirrel cage motor. The motor design ensures high efficiency and silent running and is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz, 3-phase
Enclosure:	IP 54
Insulation class:	F
Type of duty:	S1
Ambient temperature:	+ 45 °C

N.B. Other voltages (e.g. single phase) and specifications available by request!

Connection

AMK-, AHV- and AE-range of pumps are equipped with thread connection (ISO 228/1). Please note that some of the pumps are available only with pipe connectors, some only with fixed inside threads and some of the pumps are available with both these connection types.

Shaft seal

The shaft seals are maintenance-free mechanical seals with rubber bellows shaft seating.

TYPE	MOTOR rpm	kW	SHAFT SEAL size, Ø material	O-RING size, Ø material	
AMK-26	1500	0,03	10 mm, carbon/Ceram NBR	100 x 2,5	EPDM/NBR
AHV-25	1500/3000	0,02-0,06	12 mm, carbon/SiC EPDM	66 x 2,5	EPDM/NBR
AE-20	1500/3000	0,03-0,65	12 mm, carbon/SiC EPDM	123 x 2,5	EPDM/NBR
AE-25,-26	1500/3000	0,05-0,65	12 mm, carbon/SiC EPDM	123 x 2,5	EPDM/NBR
AE-32,-33	1500/3000	0,2-1,5	12mm, carbon/SiC EPDM	145 x 2,5	EPDM/NBR

Material standards

SERIES	MATERIAL OF HOUSING Name	Standard	SEALING FLANGE	IMPELLER	SHAFT (pump)	DETAILS TO NOTE
AMK- AHV- AE-	grey cast iron	EN-GJL-200	EN-GJL-200	Noryl GFN2	AISI329	Bronze impeller available for every pump (excl. AHV-25) AE-32,-33 impellers of cast iron

Painting

Pumps are painted in accordance with Finnish standard SFS 5873, AK 80/2 Fe Sa2. The finishing colour is red, RAL 3000. Special coating available by request.

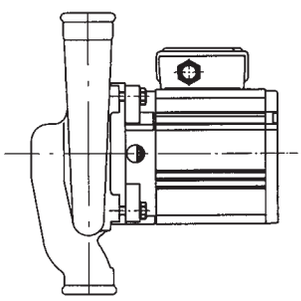
Temperatures and pressure classes

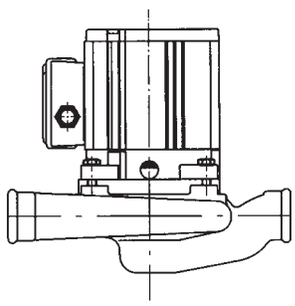
Max. working pressure 10 bar	AMK-, AHV-, AE-
Max. fluid temp. -15 ... +100°C	AMK-, AHV-, AE-
Max. fluid temp. -15 ... +120°C	All pumps with bronze impeller and AE-32,-33 pumps with cast iron imp.

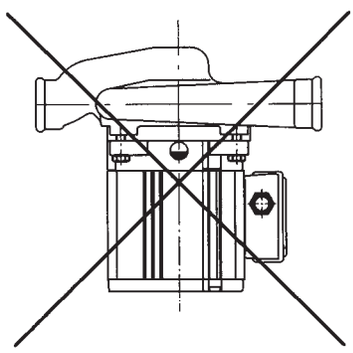
Installation

When designing and installing the pump in the system pay attention to the following:
- enough space for service and control should be left around the pump
- enough clearance to remove the motor unit off the pump housing
- shut-off valves on both sides of the pump
- sufficient rigidity of the pipeworks to support the pump

The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it in the desired position

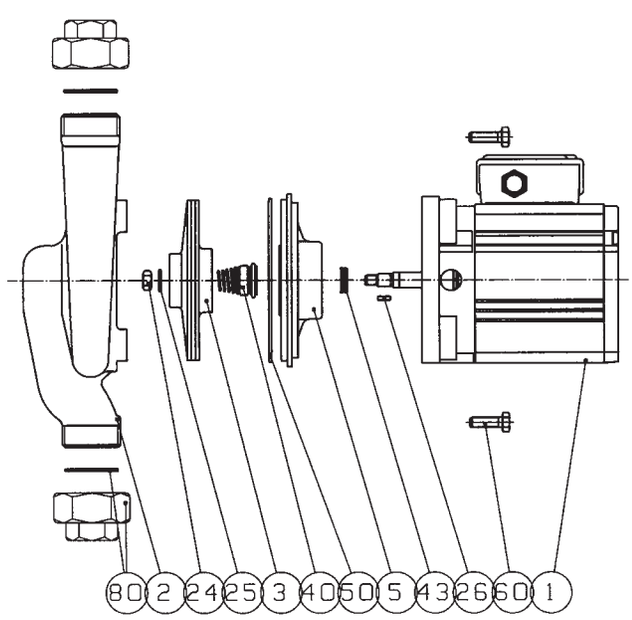






Spare parts and maintenance

List of parts



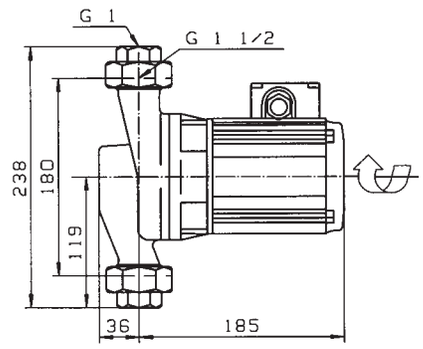
1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
24	Nut
25	Washer
26	Key
40	Mechanical shaft seal
43	V-ring (optional)
50	O-ring
60	Screw
80	Pipe connector

(AMK-26, AHV-25, AE-26, AE-33)

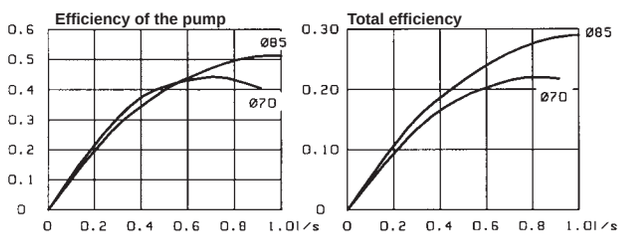
Detailed information for installation and maintenance of the Kolmeks pump can be found from the Instruction manual attached with the pump.

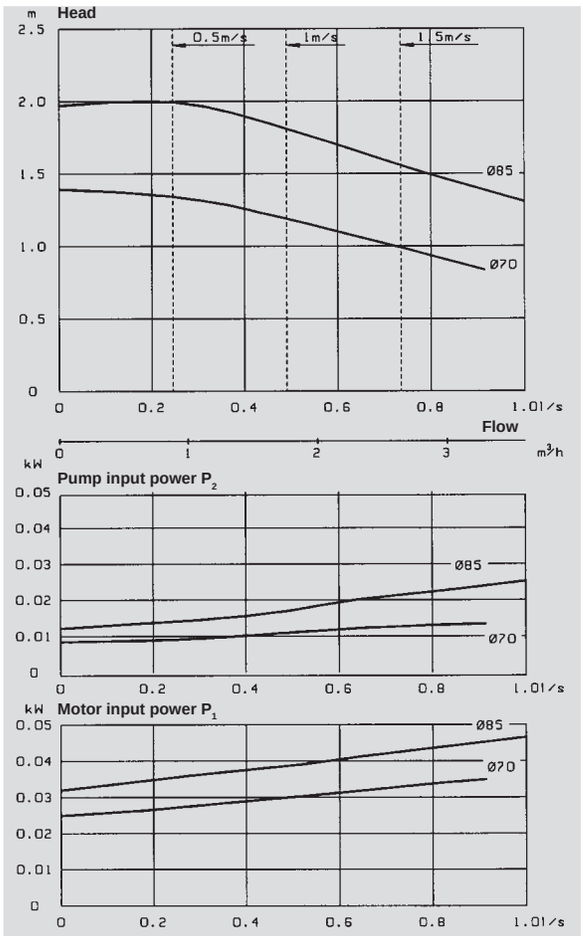
Technical data

AMK-26/4 G1 1500 r/min

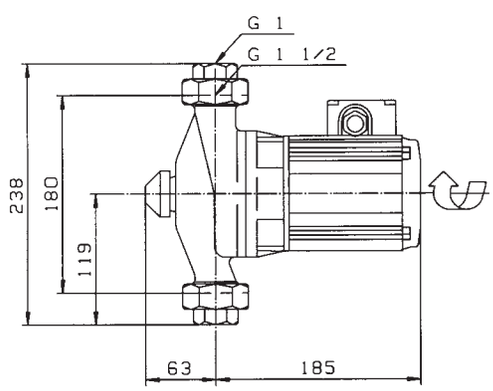


	kW	A	kg
OPK-642 N9 3~	0.03	0.16	6.5
OPK-652P N9 1~	0.03	0.30	6.5

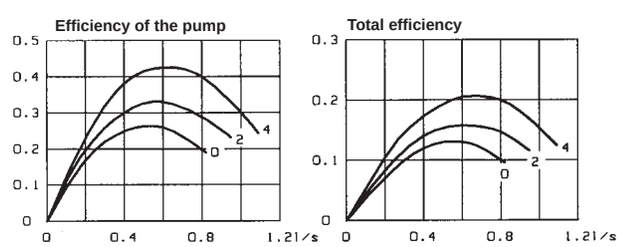


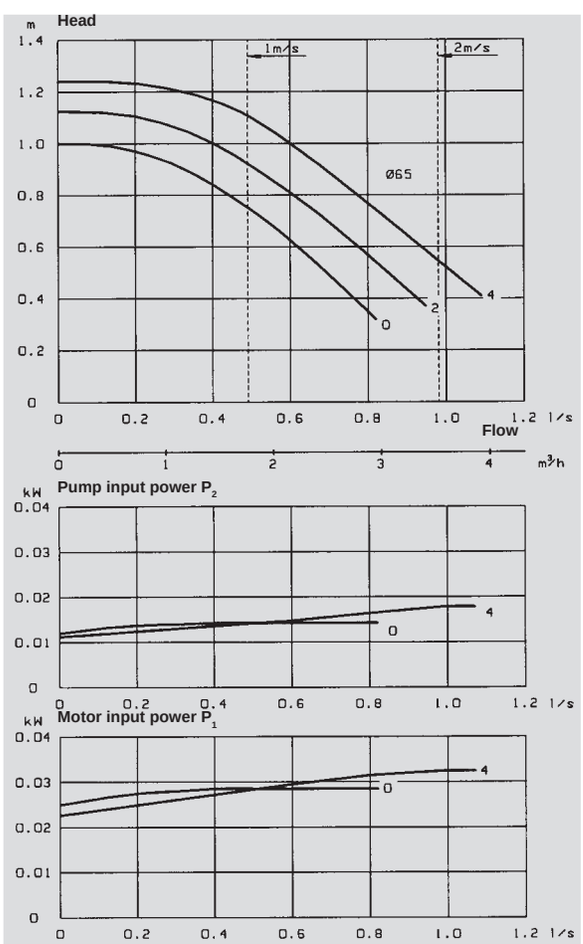


AHV-25/4 G1 1500 r/min



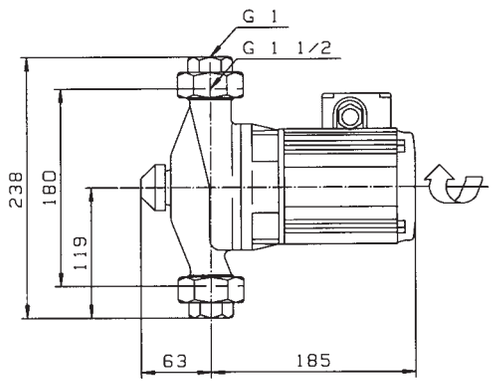
	kW	A	kg
OPK-642 N11 3~	0.02	0.14	8
OPK-652 P N11 1~	0.02	0.30	8



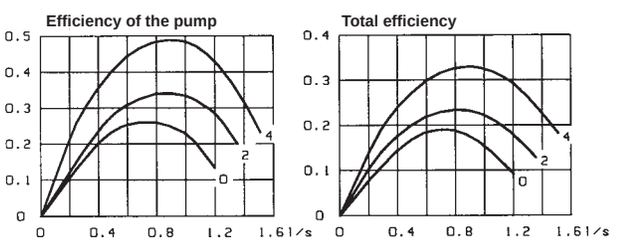


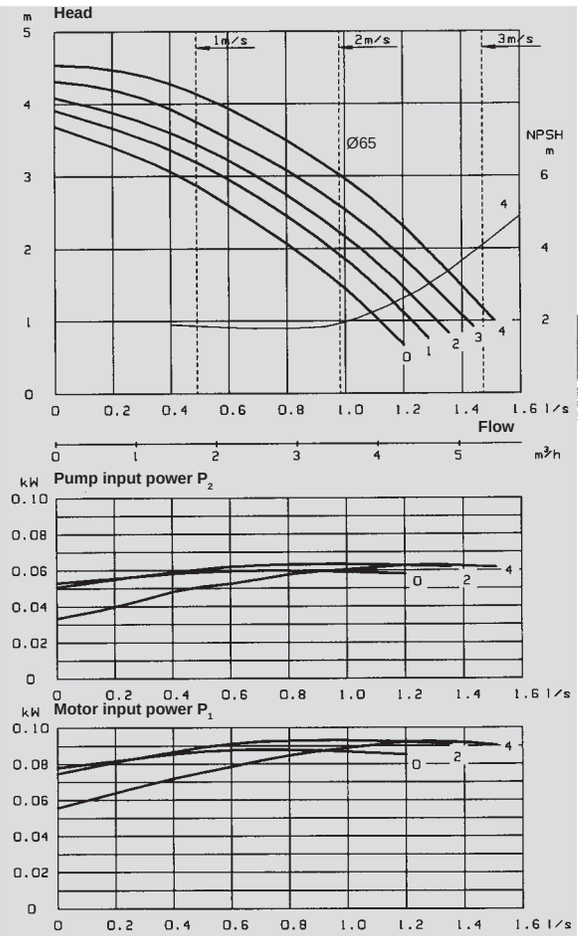
Technical data

AHV-25/2 G1 3000 r/min

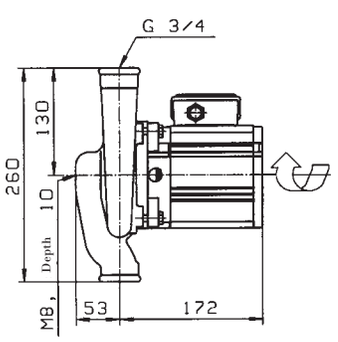


	kW	A	kg
OPK-651 N11	0.06	0.21	9

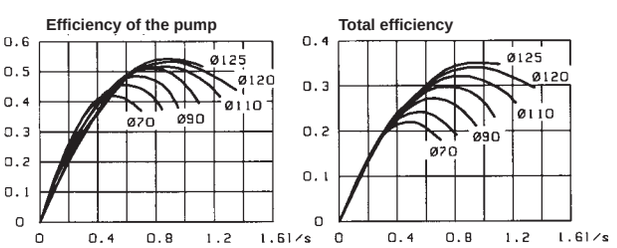


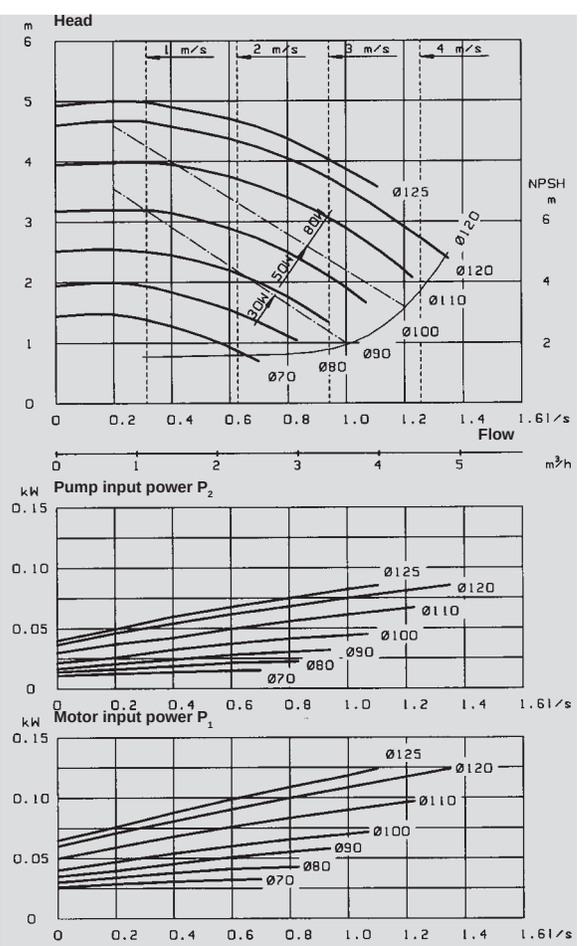


AE-20/4 G3/4 1500 r/min



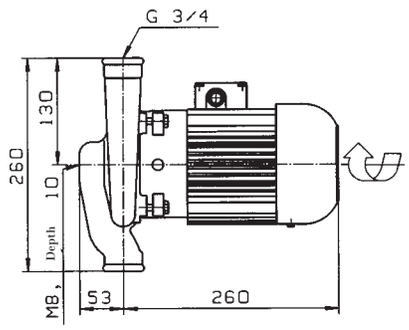
	kW	A	kg
OP-742 N12	0.08	0.28	11
OP-742 P N12 1~	0.08	0.62	11
OP-732 B N12	0.05	0.21	10
OP-732 N12	0.03	0.18	10



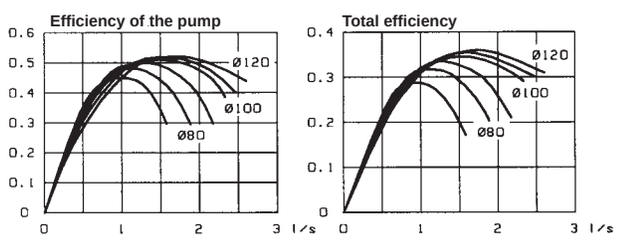


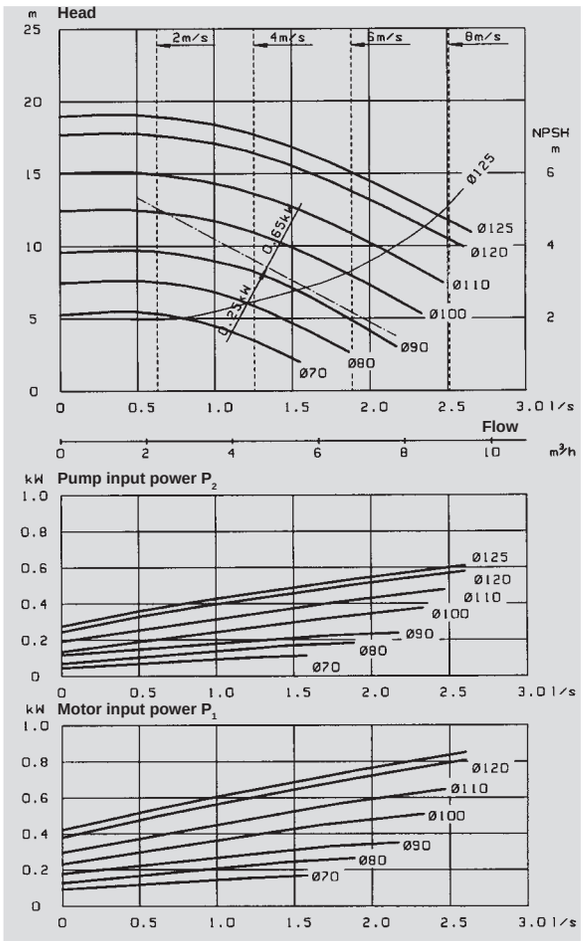
Technical data

AE-20/2 G3/4 3000 r/min

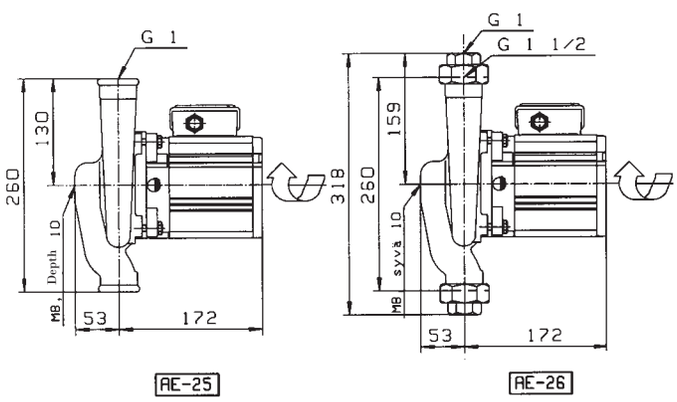


	kW	A	kg
OKN-841 D N12	0.65	1.8	15
OKN-841 D P N12 1~	0.65	4.5	15
OP-741 N12	0.25	0.7	11
OP-741 P N12 1~	0.25	1.75	11

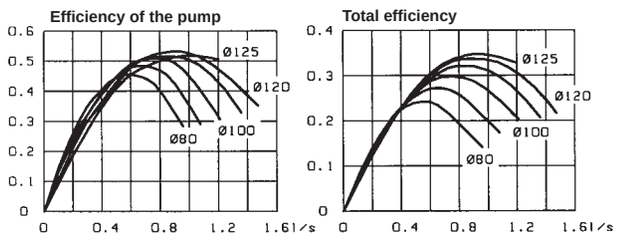


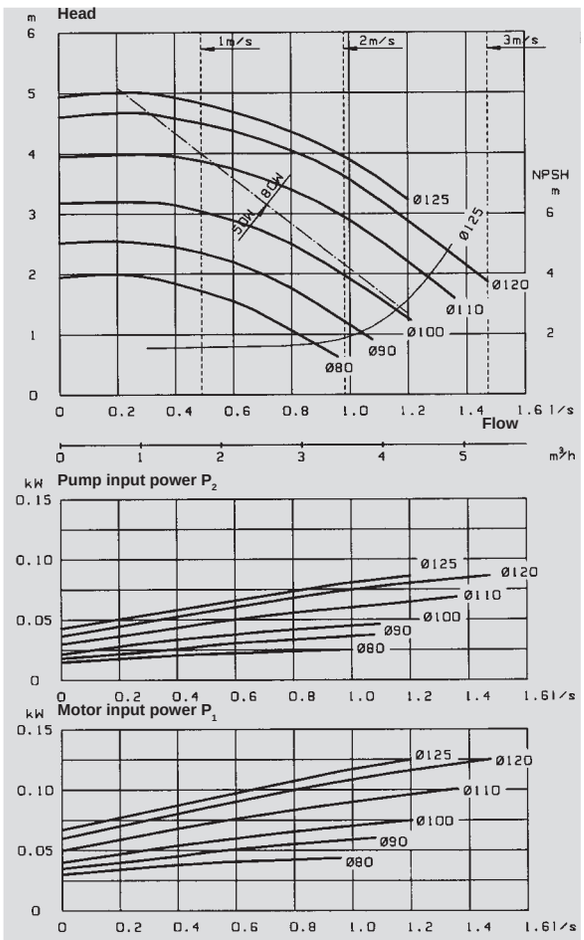


AE-25/4, -26/4 G1 1500 r/min



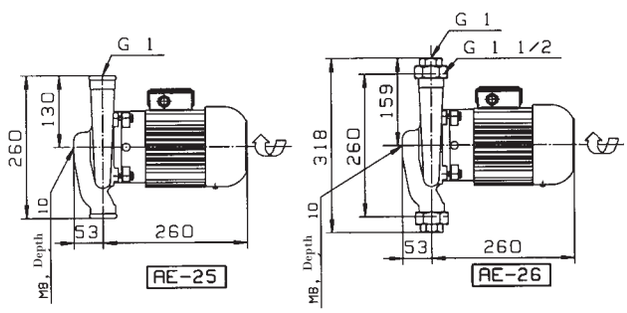
	kW	A	kg
OP-742 N12	0.08	0.28	11
OP-742 P N12 1~	0.08	0.62	11
OP-742 P N12 1~	0.05	0.47	11
OP-732 B N12	0.05	0.21	9.5



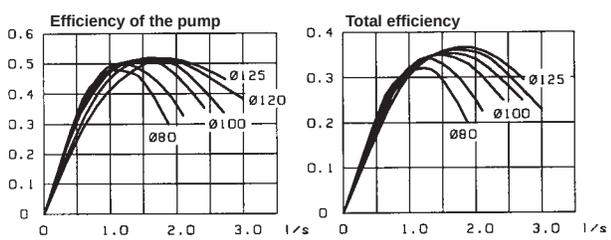


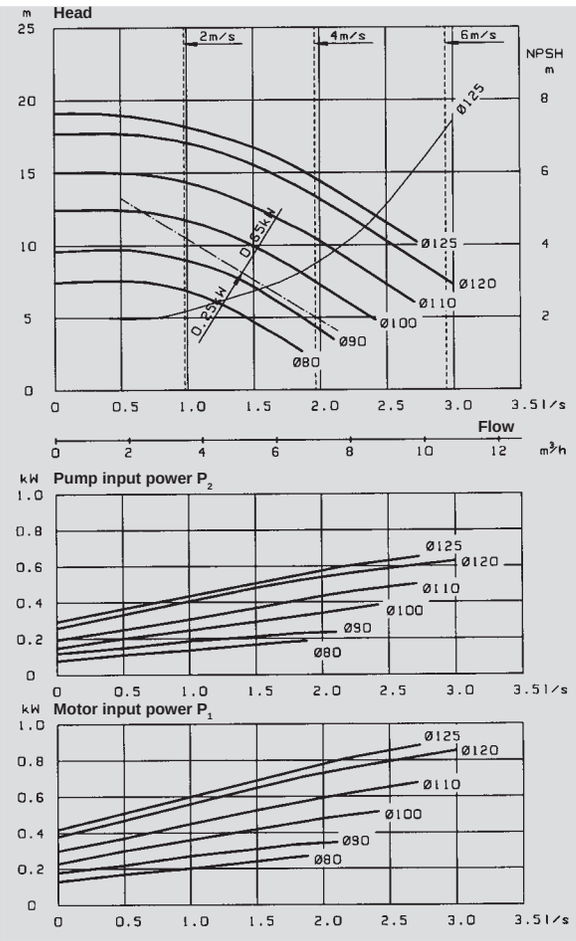
Technical data

AE-25/2, -26/2 G1 3000 r/min

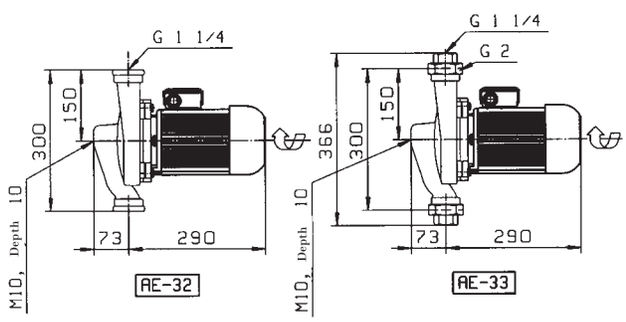


	kW	A	kg
OKN-841 D N12	0.65	1.8	15
OKN-841 D P N12 1~	0.65	4.5	15
OP-741 N12	0.25	0.7	11
OP-741 C P N12 1~	0.25	1.8	11

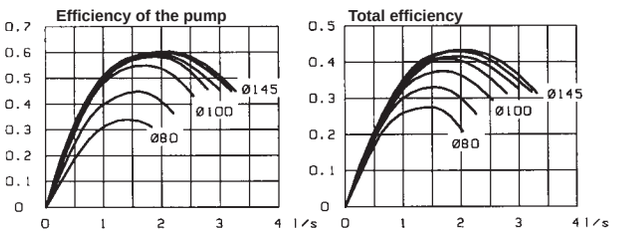


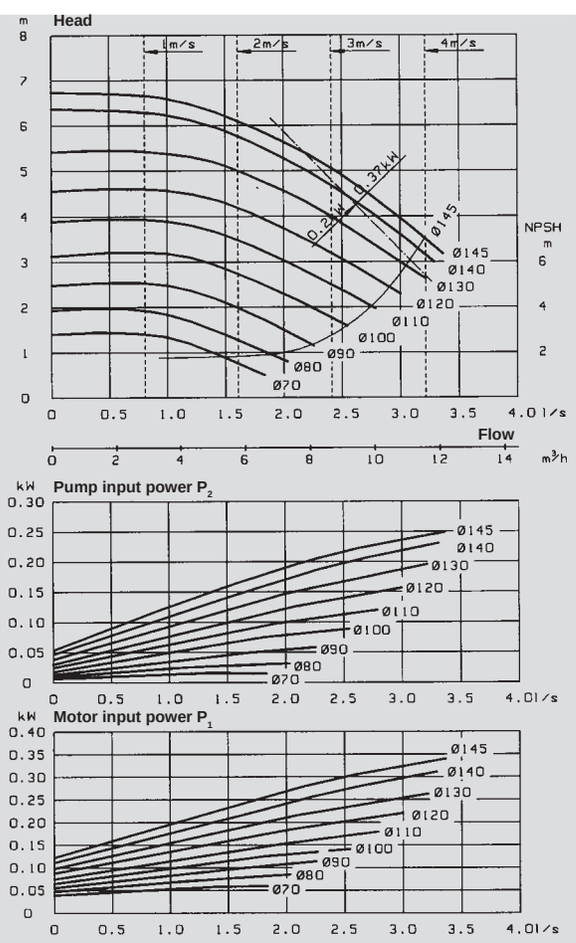


AE-32/4, -33/4 G1 1/4 1500 r/min



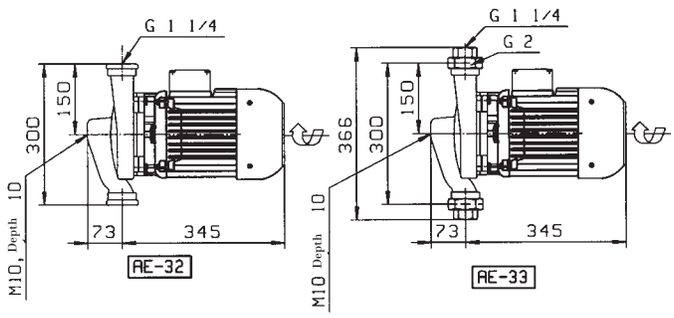
	kW	A	kg
OKN-862L D N13	0.37	1.30	22
OKN-862L D P N13 1~	0.37	2.50	22
OP-752 N13	0.20	0.65	17
OP-752 P N13 1~	0.20	1.45	17



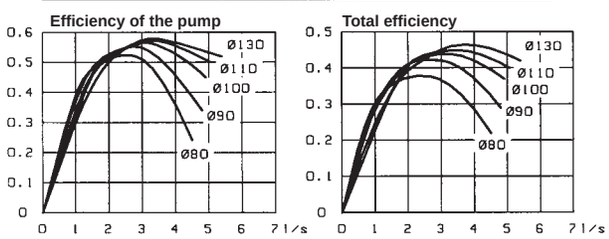


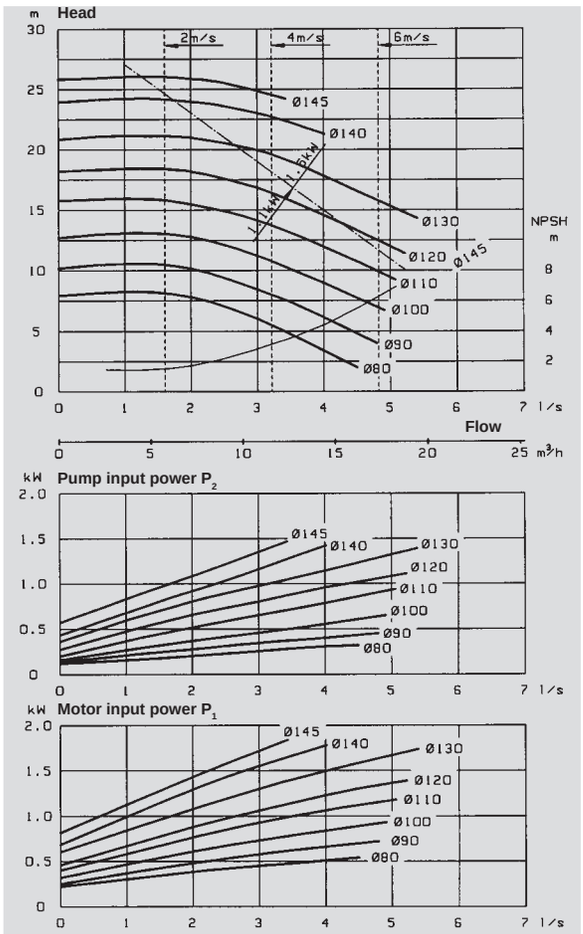
Technical data

AE-32/2, -33/2 G1 1/4 3000 r/min



	kW	A	kg
OKN-101 C1 N13	1.5	3.3	33
OKN-101 C1 P N13 1~	1.5	8.8	33
OKN-871 D N13	1.1	2.8	25
OKN-871 D P N13 1~	1.1	7.0	25





KOLMEKS

SERVICE WATER PUMPS with PIPE CONNECTION

Range AKP and AP

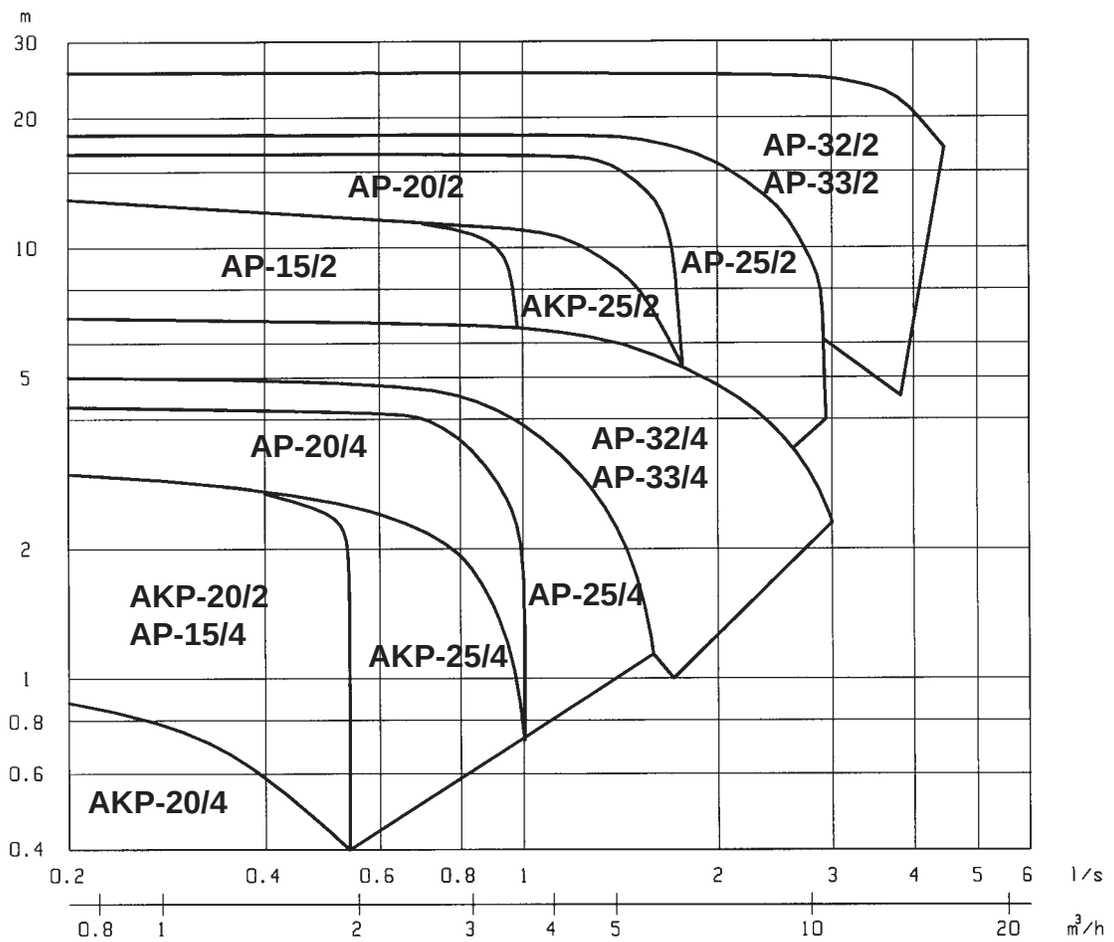
General features

The AKP- and AP-ranges consist of small centrifugal pumps made of bronze with pipe connections (G-threads).

Applications

The pumps of AKP- and AP-ranges are capable for pumping domestic hot water and other corrosive clean liquids in circulation systems and for liquid transfer.

Duty chart at 50 Hz



Design

Pump

The AKP- and AP -range pumps are single stage, monobloc design centrifugal pumps equipped with dry type electric motor. The impeller is mounted directly on the shaft of the motor
(no separate couplings).

Electric motor

The electric motors of AKP- and AP -ranges are especially dimensioned and designed for pump application. It is totally enclosed fan cooled squirrel cage motor. The motor design ensures high efficiency and silent running and it is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz, 3-phase
Enclosure:	IP 54
Insulation class:	F
Type of duty:	S1
Ambient temperature:	+ 45 °C

N.B. Other voltages (e.g. single phase) and specifications available by request!

Connection

The AKP- and AP-range of pumps are equipped with thread connection (ISO 228/1).

Shaft seal

The shaft seals are maintenance-free mechanical seals with rubber bellows shaft seating.

TYPE	MOTOR rpm	kW	SHAFT SEAL size, Ø material	O-RING size, Ø	material
AKP-20	1500/3000	0,02-0,06	12 mm, carbon/SiC EPDM	56 x 2,5	EPDM/NBR
AKP-25, AP-15	1500/3000	0,03-0,65	12 mm, carbon/SiC EPDM	100 x 2,5	EPDM/NBR
AP-20,-25	1500/3000	0,05-0,65	12 mm, carbon/SiC EPDM	123 x 2,5	EPDM/NBR
AP-32,-33	1500/3000	0,2-1,5	12mm, carbon/SiC EPDM	145 x 2,5	EPDM/NBR

Material standards

SERIES	MATERIAL OF HOUSING Name	Standard	SEALING FLANGE	IMPELLER	SHAFT (pump)	DETAILS TO NOTE
AKP- AP-	bronze (gun metal)	bronze CuPb5Sn5Zn5	bronze CuPb5Sn5Zn5	Noryl GFN2	AISI329	Bronze impeller available for every pump

Painting

Pumps are painted in accordance with Finnish standard SFS 5873, AK 80/2 Fe Sa2.
The finishing colour is red, RAL 3000. Special coating available by request.

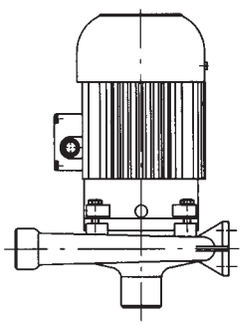
Temperatures and pressure classes

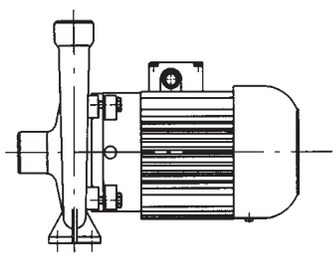
Max. working pressure 10 bar	AKP- and AP- pumps
Max. fluid temp. -15 ... +100°C	AKP- and AP- pumps with Noryl impeller as standard
Max. fluid temp. -15 ... +120°C	All pumps with bronze impeller

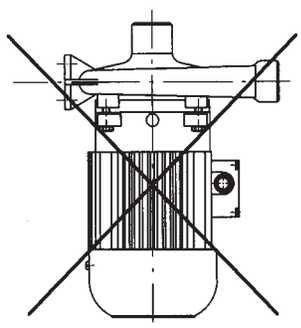
Installation

When designing and installing the pump into the system pay attention to the following:
- enough space for service and control should be left around the pump
- enough clearance to remove the motor unit off the pump housing
- shut-off valves on both sides of the pump
- sufficient rigidity of the pipeworks to support the pump

The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it in the desired position

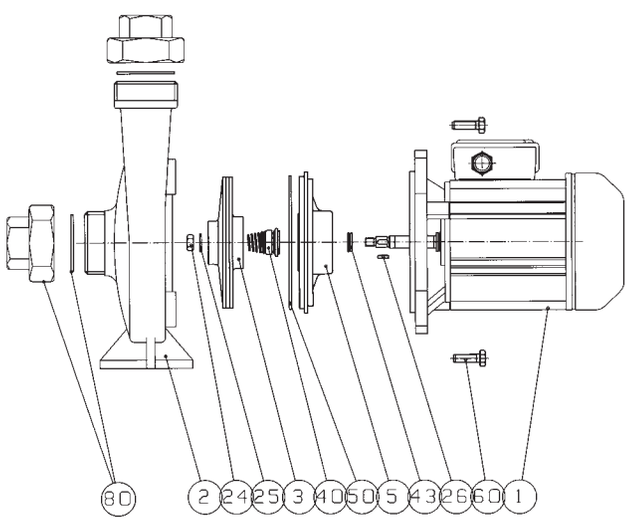






Spare parts and maintenance

List of parts

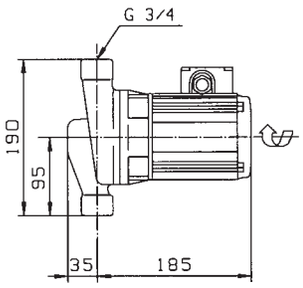


1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
24	Nut
25	Washer
26	Key
40	Mechanical shaft seal
43	V-ring (optional)
50	O-ring
60	Screw
80	Pipe connector (AP-33)

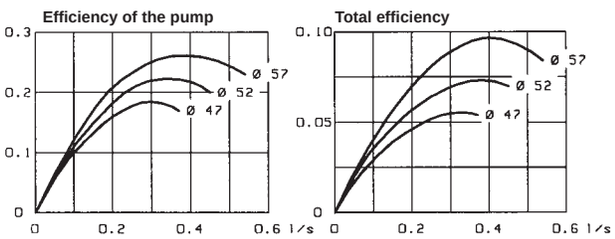
Detailed information for installation and maintenance of the Kolmeks pump can be found from the Instruction manual attached with the pump.

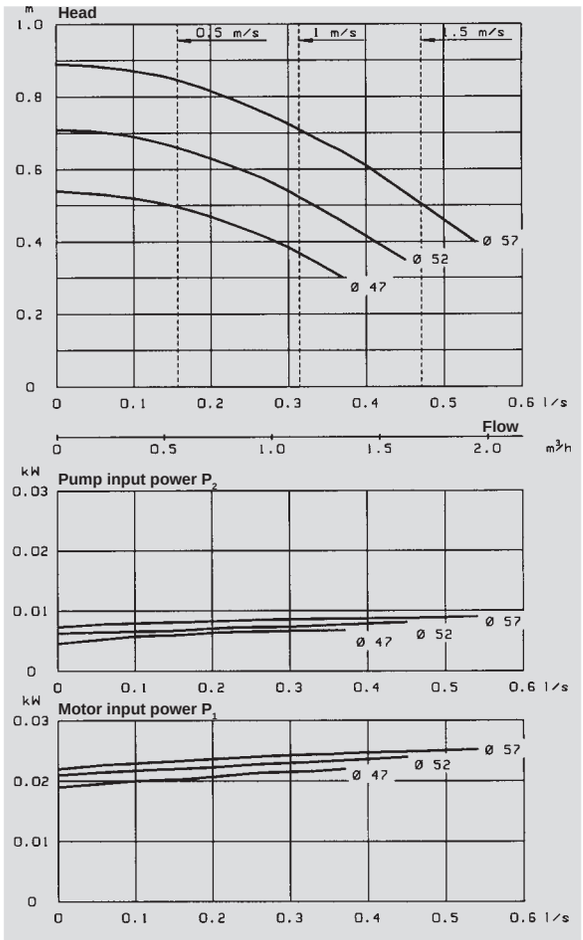
Technical data

AKP-20/4 G3/4 1500 r/min

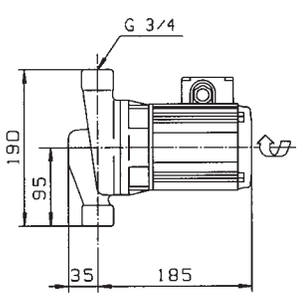


	kW	A	kg
OPK-642 N11 3~	0.02	0.14	7.5
OPK-652 P N11 1~	0.02	0.30	7.5

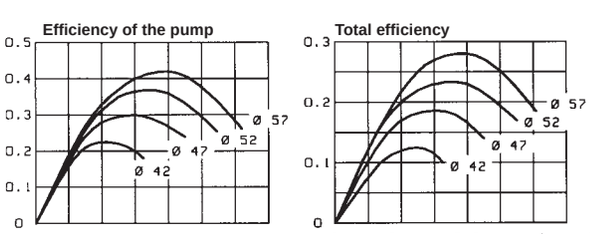


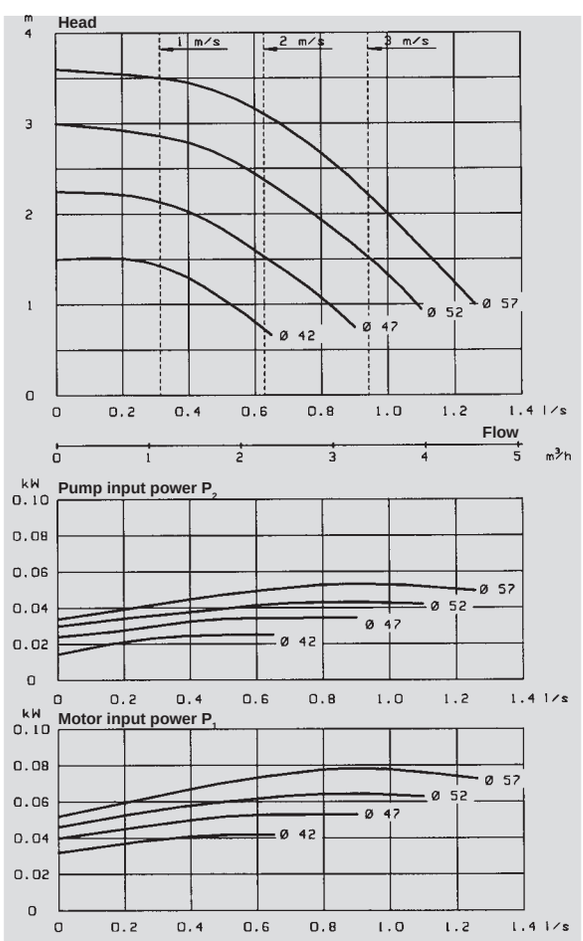


AKP-20/2 G3/4 3000 r/min



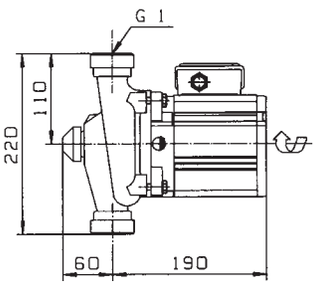
	kW	A	kg
OPK-651 N11	0.06	0.21	7.5



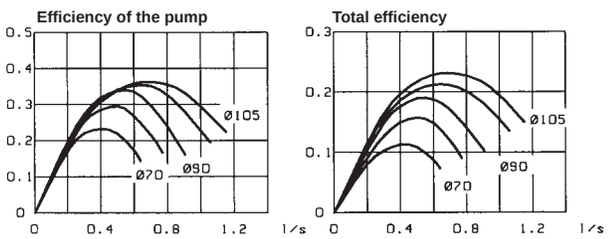


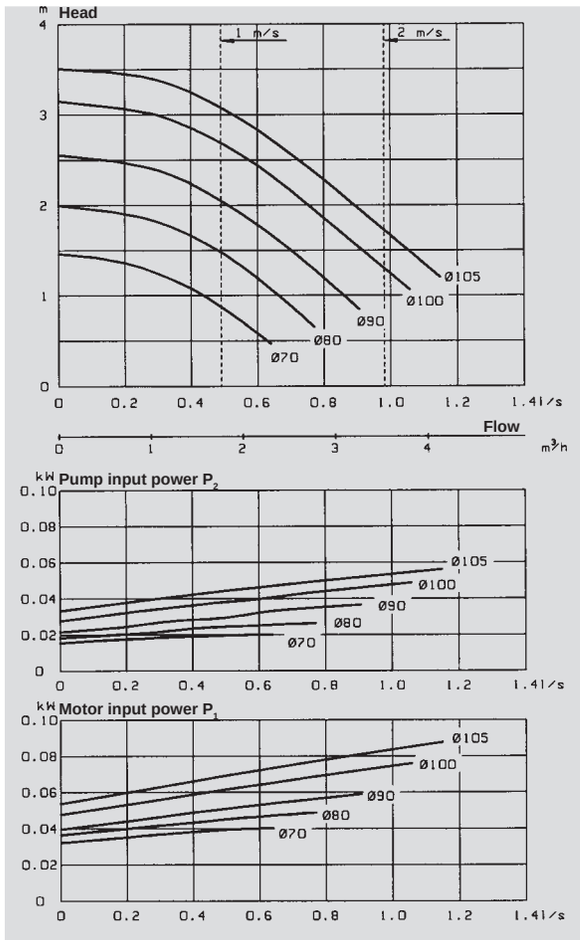
Technical data

AKP-25/4 G1 1500 r/min

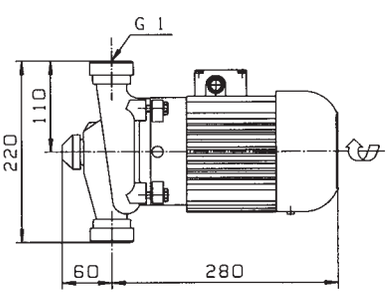


	kW	A	kg
OP-232 B N12	0.05	0.21	9.5
OP-742 P N12 1~	0.05	0.47	10

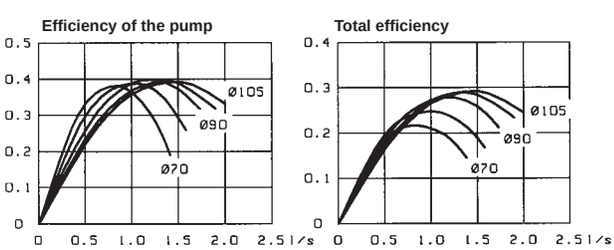


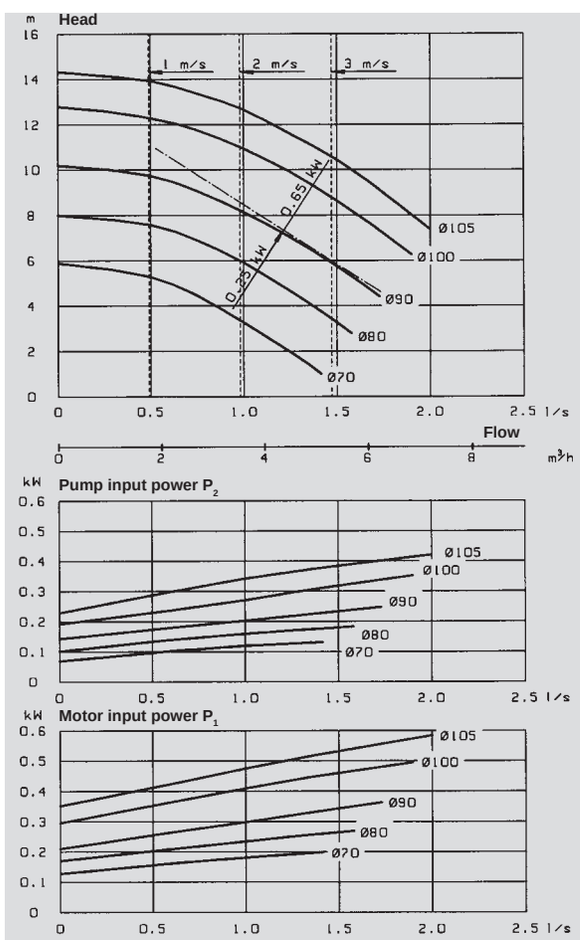


AKP-25/2 G1 3000 r/min



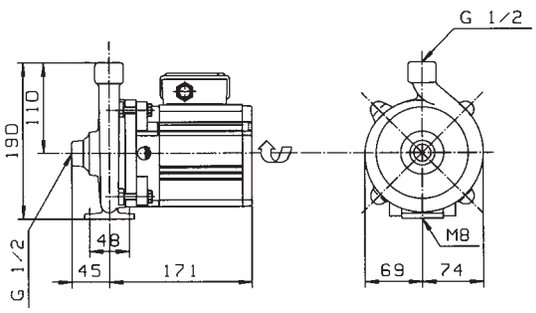
	kW	A	kg
OKN-841 D N12	0.65	1.8	13.5
OKN-841 D P N12 1~	0.65	4.5	13.5
OP-741 N12	0.25	0.7	10.5
OP-741 C P N12 1~	0.25	1.8	10.5



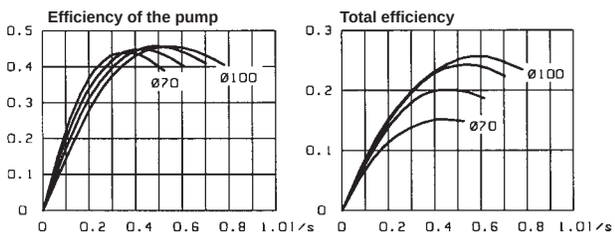


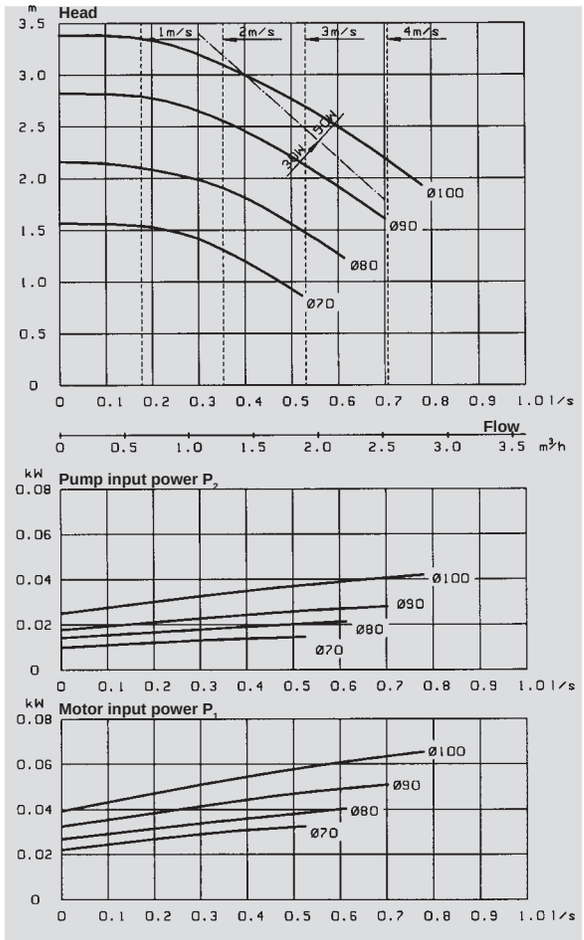
Technical data

AP-15/4 G1/2 1500 r/min

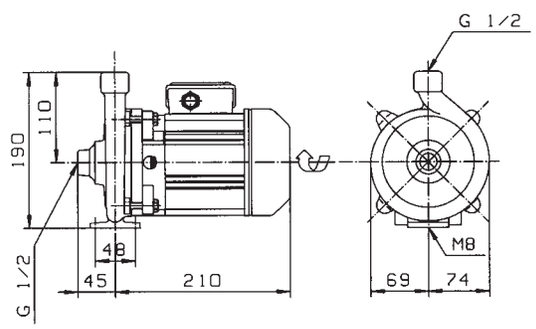


	kW	A	kg
OP-732 B N12	0.05	0.21	8
OP-742 P N12 1~	0.05	0.47	8.5
OP-732 N12	0.03	0.18	8

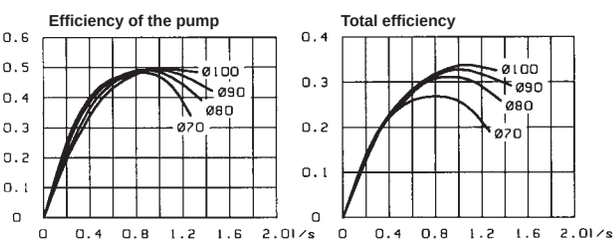


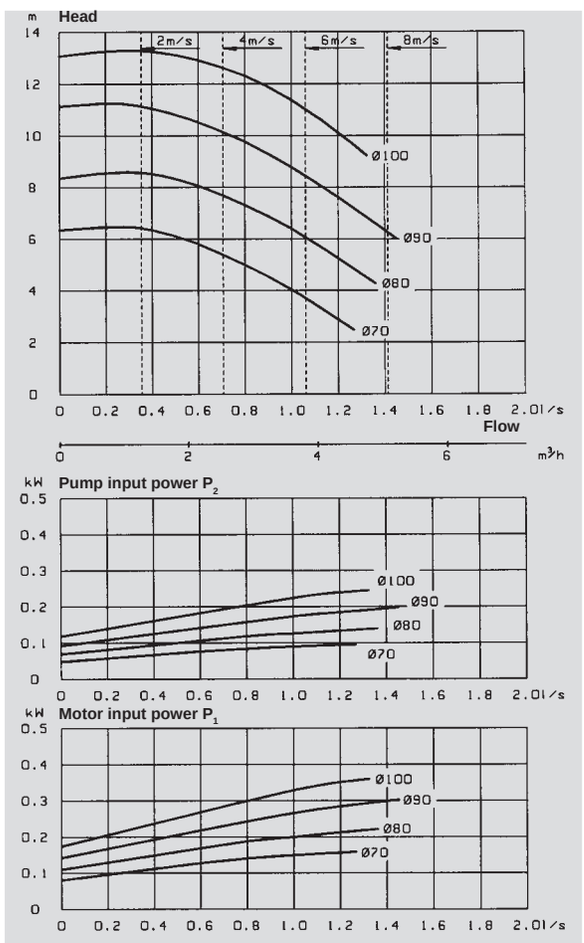


AP-15/2 G1/2 3000 r/min



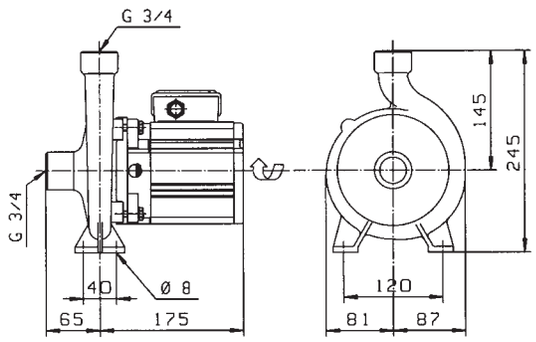
	kW	A	kg
OP-741 N12	0.25	0.7	9
OP-741 C P N12 1~	0.25	1.8	9



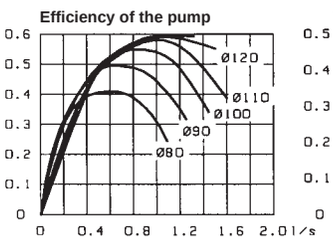


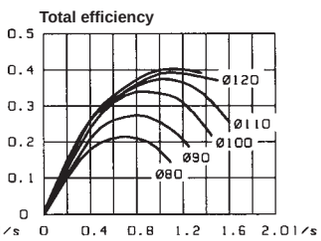
Technical data

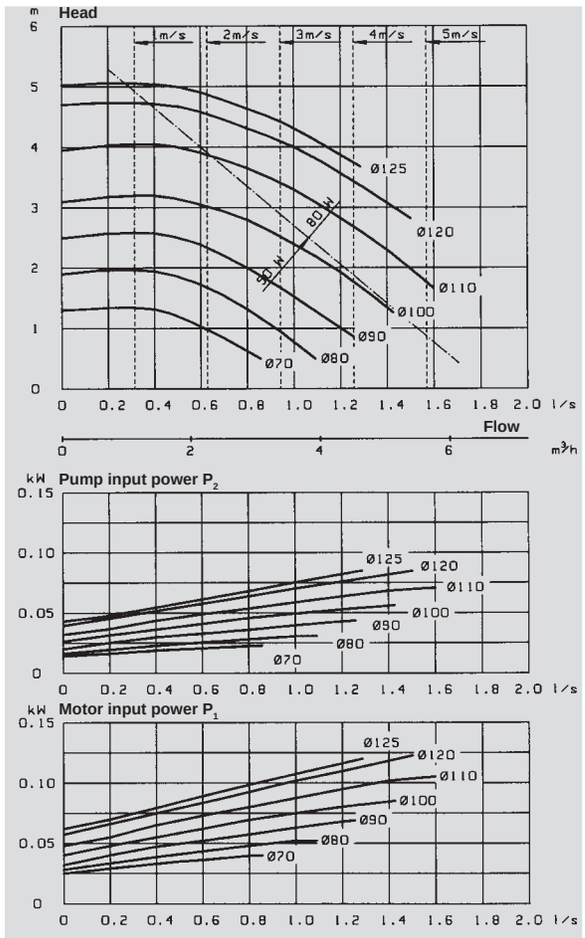
AP-20/4 G3/4 1500 r/min



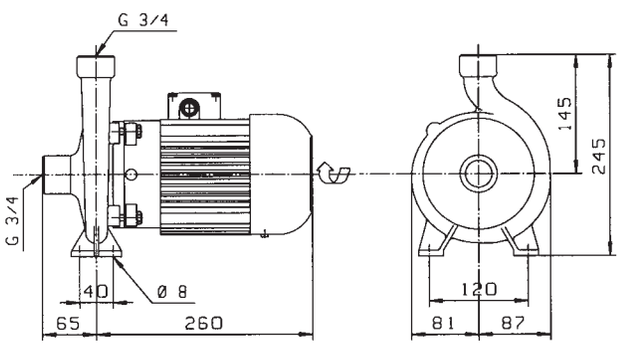
	kW	A	kg
OP-742 N12	0.08	0.28	11
OP-742 P N12 1~	0.08	0.62	11
OP-742 P N12 1~	0.05	0.47	11
OP-732 B N12	0.05	0.21	10.5



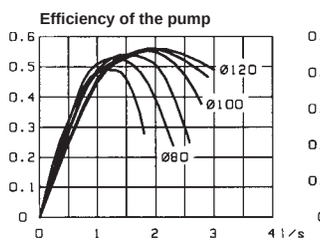


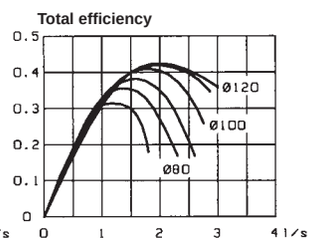


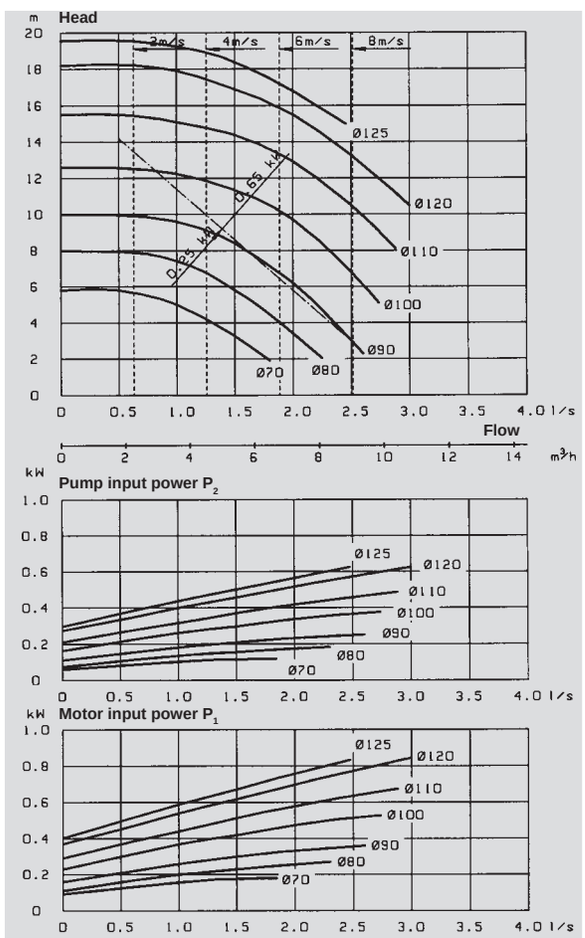
AP-20/2 G3/4 3000 r/min



	kW	A	kg
OKN-841 D N12	0.65	1.8	14.5
OKN-841 D P N12 1~	0.65	4.5	14.5
OP-741 N12	0.25	0.7	12
OP-741 C P N12 1~	0.25	1.8	12

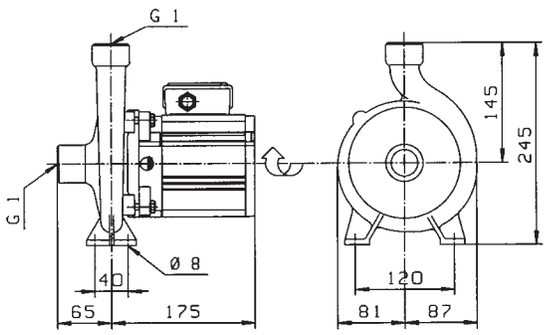




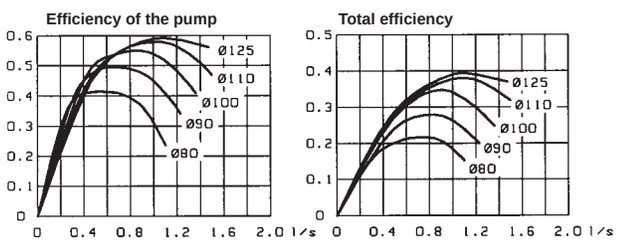


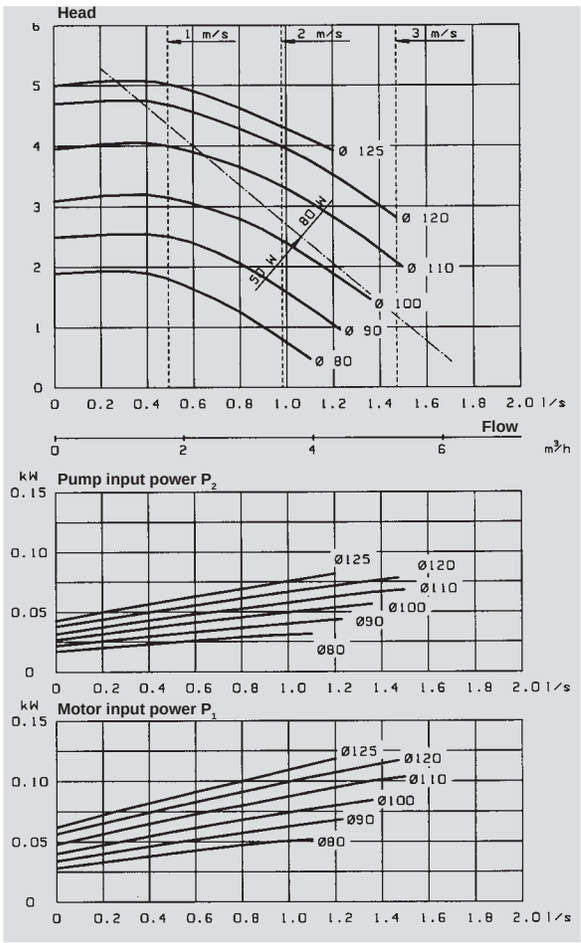
Technical data

AP-25/4 G1 1500 r/min

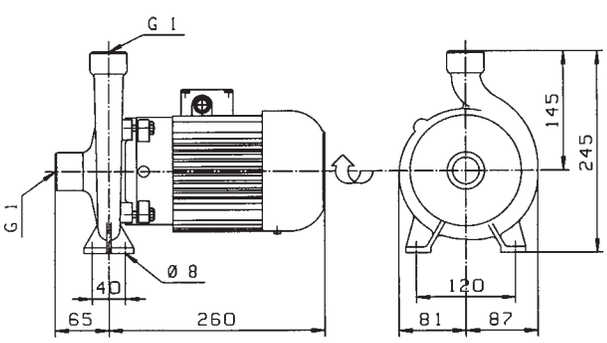


	kW	A	kg
OP-742 N12	0.08	0.28	11
OP-742 P N12 1~	0.08	0.62	11
OP-742 P N12 1~	0.05	0.47	11
OP-732 B N12	0.05	0.21	10.5

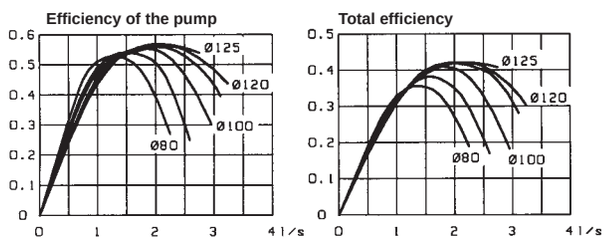


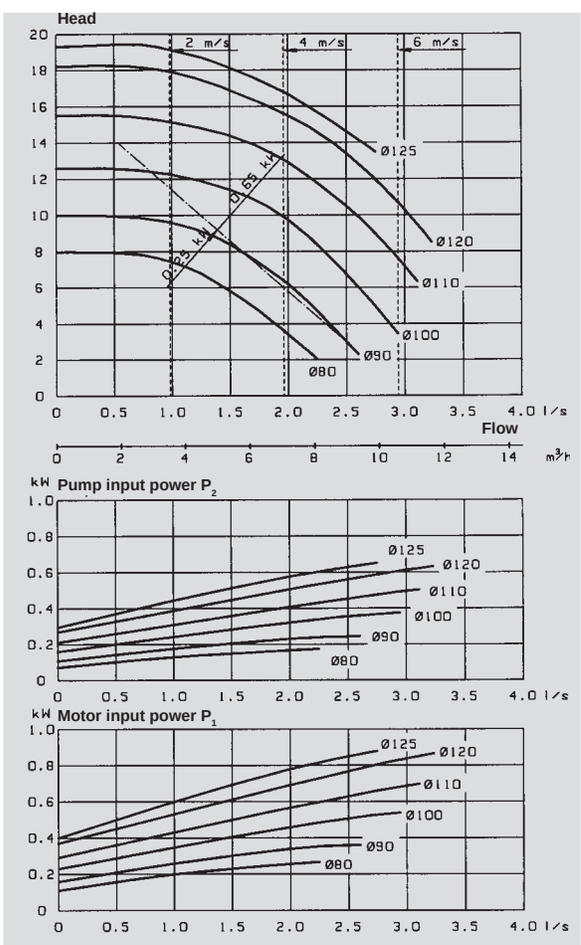


AP-25/2 G1 3000 r/min



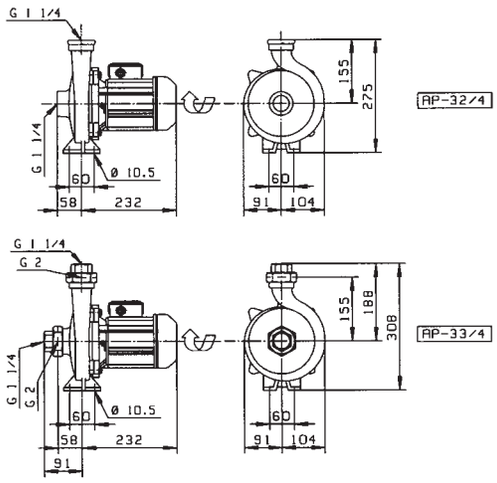
	kW	A	kg
OKN-841 D N12	0.65	1.8	14.5
OKN-841 D P N12 1~	0.65	4.5	14.5
OP-741 N12	0.25	0.7	12
OP-741 C P N12 1~	0.25	1.8	12



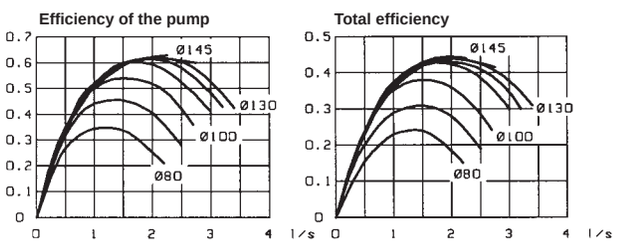


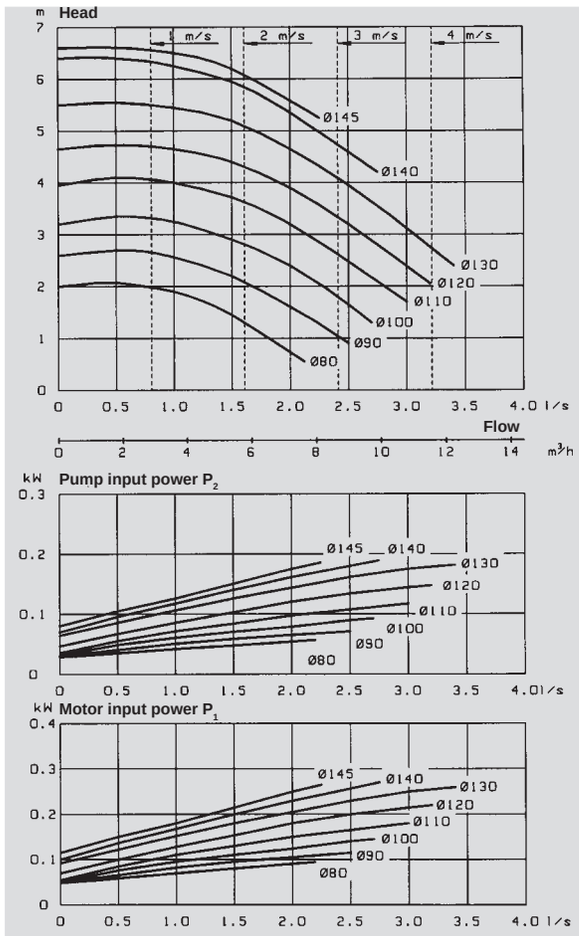
Technical data

AP-32/4, -33/4 G1 1/4 1500 r/min

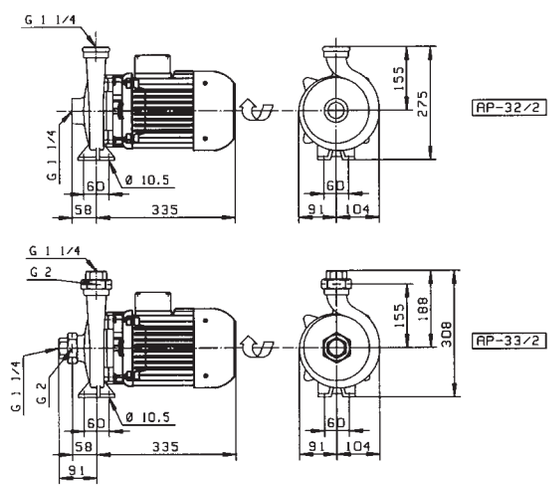


	kW	A	kg
OP-752 N13	0.20	0.65	15.5
OP-752 P N13 1~	0.20	1.45	15.5

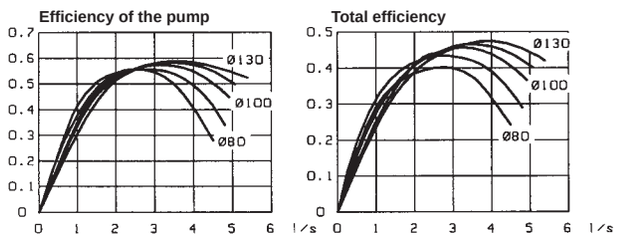


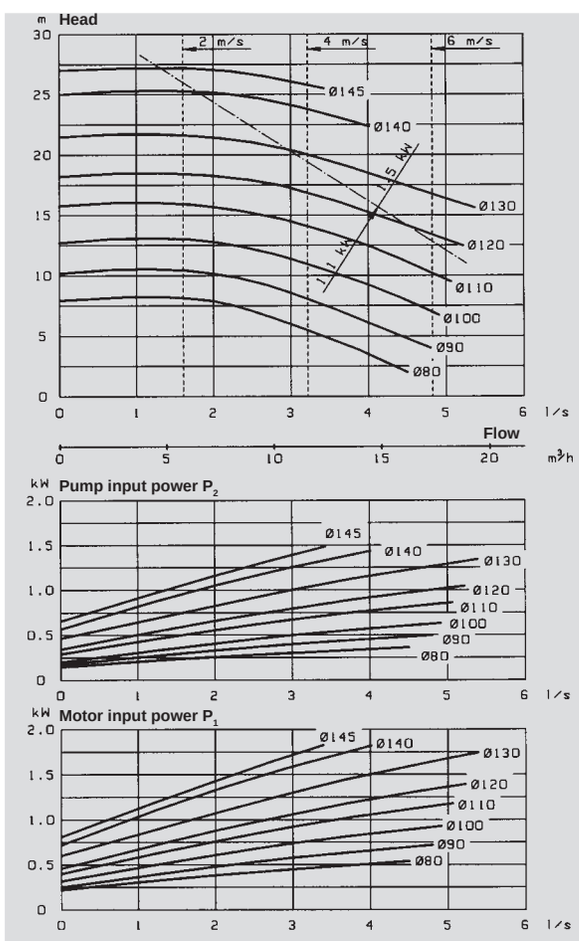


AP-32/2, -33/2 G1 1/4 3000 r/min

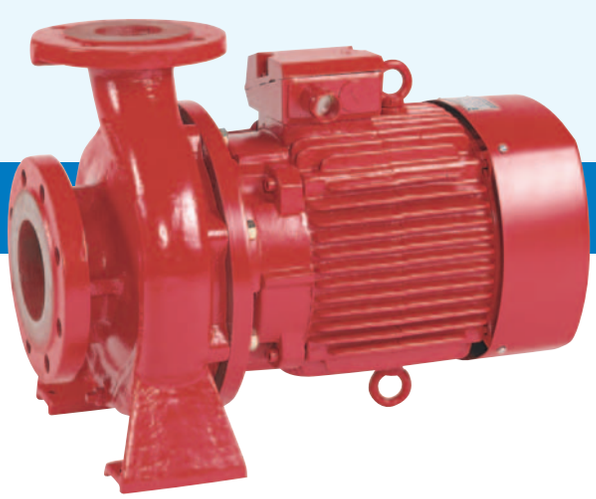


	kW	A	kg
OKN-101 C1 N13	1.5	3.3	34
OKN-101 C1 P N13 1~	1.5	8.8	34
OKN-871 D N13	1.1	2.8	22
OKN-871 D P N13 1~	1.1	7.0	22





KOLMEKS



END-SUCTION CENTRIFUGAL PUMPS

Range AS_ and KN_

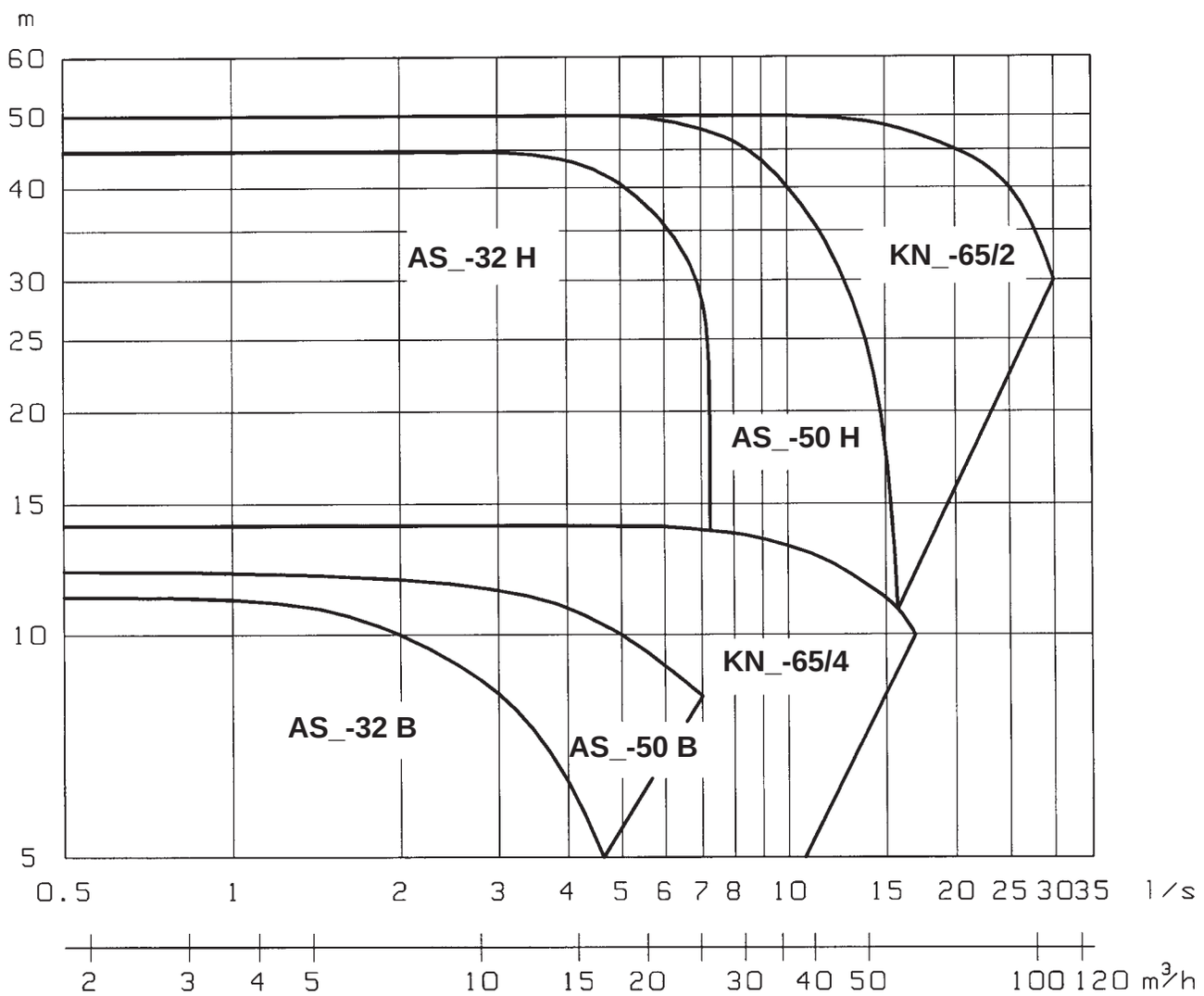
General features

The AS_ - and KN_ -ranges consist of single-stage End-suction centrifugal pumps made in compact Monobloc design. The range covers pumps with flange sizes DN 32... DN65.

Applications

The AS- and KN-pumps are made of cast iron and designed for applications for clean non-aggressive liquids including pressure boosting in heating and primary hot water circulation.
The pumps of the ASP- and KNP-series made of bronze are more suitable for hot water supply (HWS), secondary and other applications requiring a construction of corrosion-resistant materials.

Duty chart at 50 Hz



Design

Pump

The AS_- and KN_-range pumps are single stage, monobloc design end-suction centrifugal pumps equipped with dry type electric motor. The impeller is mounted direct on the shaft of the motor (no separate couplings).

Electric motor

The electric motors of AS_- and KN_-range are especially dimensioned and designed totally enclosed fan cooled squirrel cage motors for pump application. The motor design also ensures high efficiency and silent running and is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz, 3-phase	< 4 kW
	690/400 V, 50 Hz, 3-phase	4 kW and above
Enclosure:	IP 54	
	IP55 4 kW and above (1000, 1500 r/min), 5.5 kW and above (3000 r/min)	
Insulation class:	F	
Type of duty:	S1	
Ambient temperature:	+ 45 °C	

N.B. Other voltages (e.g. single phase) and specifications available by request!

Flanges

The dimensions of flanges in the AS_- and KN_-ranges follow the standard ISO 7005. Also other standards can be applied for flanges, by request.

Shaft seals

The shaft seals in the AS_- and KN_-ranges are maintenance free single mechanical seals with rubber bellows. The pumps can be provided also with other types of seals suitable for various liquids and temperatures.

TYPE	MOTOR rpm	kW	SHAFT SEAL size, Ø material	O-RING size, Ø material	
AS_-32B, -H	1500/3000	0,55-4,0	25 mm, carbon/SiC EPDM	184,5 x 3	EPDM/NBR
AS_-50B, -H	1500/3000	0,55-7,5	25 mm, carbon/SiC EPDM	203 x 3	EPDM/NBR
KN_-65	1500/3000	2,2- 15	28 mm, carbon/Ceram. EPDM (Series Nr.6, Crane)	203 x 3	EPDM/NBR

Material standards

SERIES	MATERIAL OF HOUSING Name	Standard	SEALING FLANGE	IMPELLER	SHAFT (pump)	DETAILS TO NOTE
AS- and KN-	Grey cast iron	EN-GJL-200	EN-GJL-200	EN-GJL-200	AISI329	Bronze impeller available for every pump
ASP- and KNP-	bronze (gun metal)	CuPb5Sn5Zn5	CuPb5Sn5Zn5	CuPb5Sn5Zn5	AISI329	

Painting

Pumps are painted in accordance with Finnish standard SFS 5873, AK 80/2 Fe Sa2.
The finishing colour is red, RAL 3000. Special coating available by request.

Temperatures and pressure classes

Max. working pressure 10 bar	AS-, ASP-, KN- and KNP- pumps
Max. fluid temp. -15 ... +120°C	All pumps above

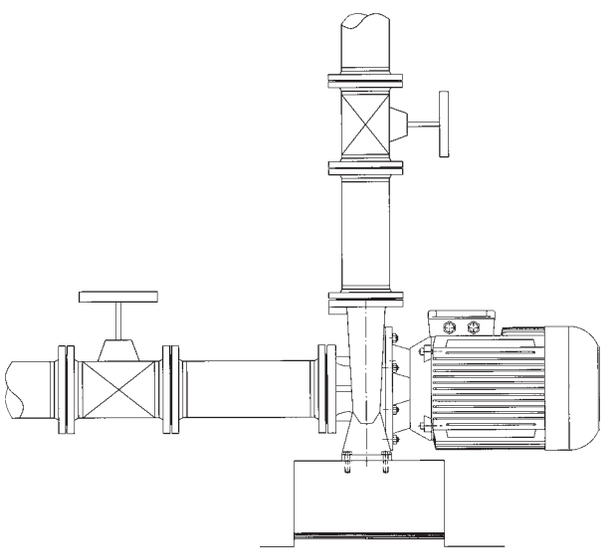
Installation

When designing and installing the pump in the system pay attention to the following:
- enough space for service and control should be left around the pump
- enough clearance on top of the motor to lift the motor unit off the pump housing
- for heavier pumps you may also need space for lifting devices
- shut-off valves on both sides of the pump
- vibration and noise isolation and sufficient rigidity of the pipeworks to support the pump

The pump should be mounted in a such way that the electric motor (i.e. the pump shaft) is in a horizontal position. The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it to the desired position.

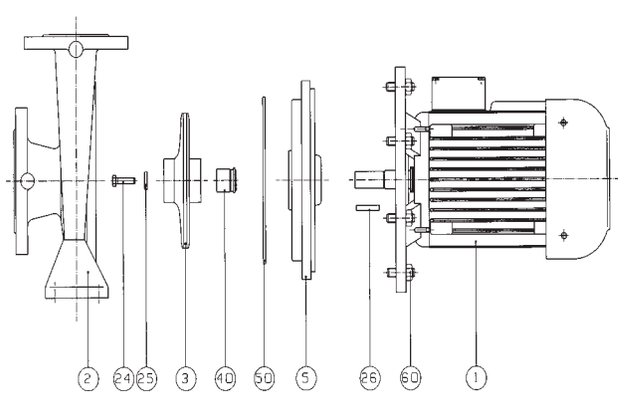
The smaller pumps (< 1,1 kW motors) may be installed without support and baseplate, but the motor must never fall below the horizontal plane.

The heavier pumps (motors above 7,5 kW) should be mounted on a concrete plinth, approximately 1.5 to 2 times the weight of the pump. The foundation should be isolated from other construction with anti-vibrations mountings (20 mm thick rubber or cork plate) to prevent transmission of noise



Spare parts and maintenance

List of parts

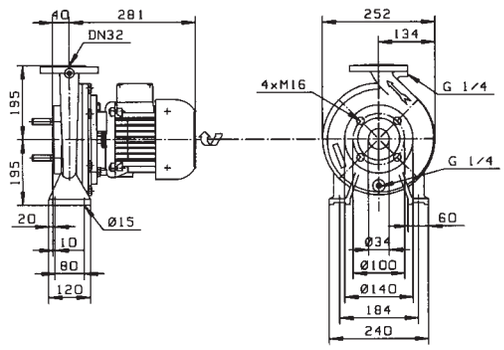


1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
24	Screw
25	Washer
26	Key
40	Mechanical shaft seal
43	V-ring (optional)
50	O-ring
60	Nut/Screw

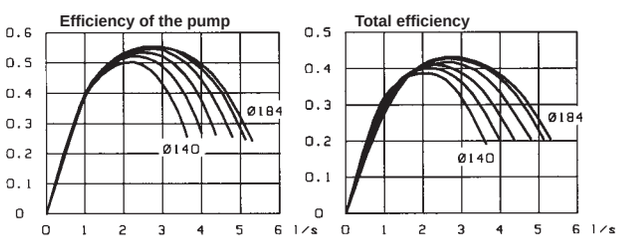
Detailed information for installation and maintenance of the Kolmeks pump can be found from the Instruction manual attached with the pump.

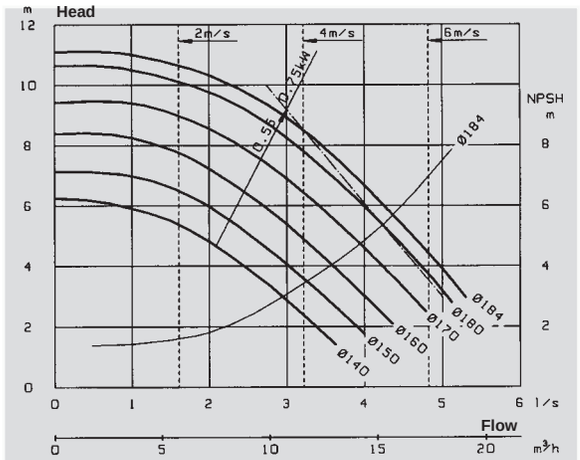
Technical data

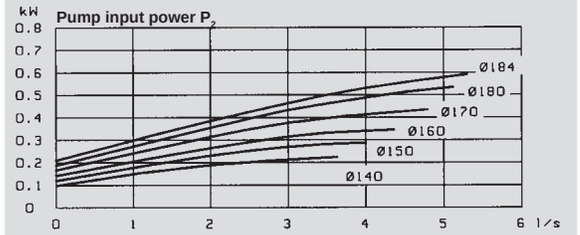
AS_-32 B DN32 1500 r/min

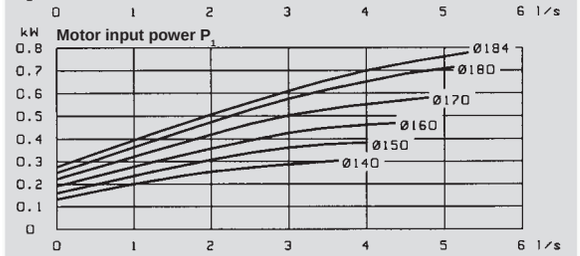


	kW	A	kg
OKN-100 B2 Ne	0.75	2.0	38
OKN-100 B2 Ne	0.55	1.4	38
OKN-100 B2 P Ne 1~	0.55	3.4	38

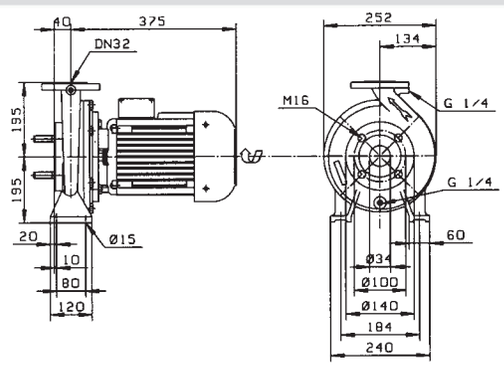




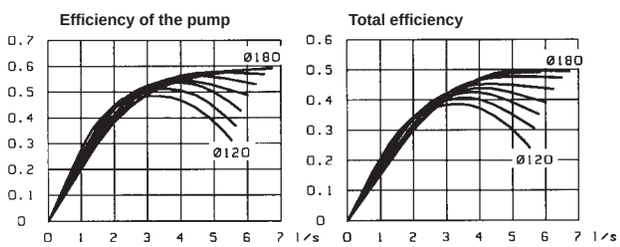


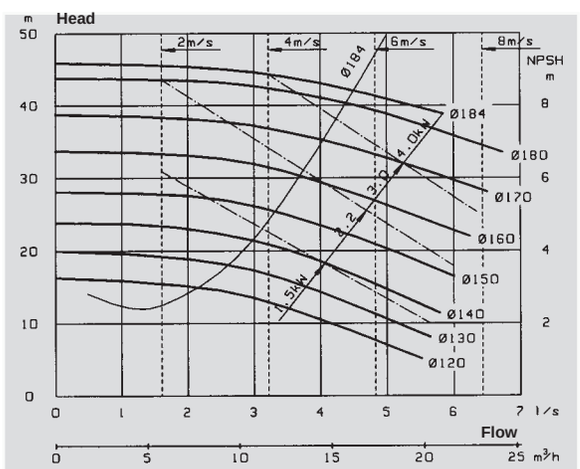


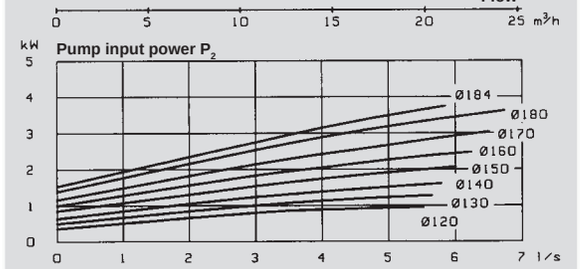
AS_-32 H DN32 3000 r/min

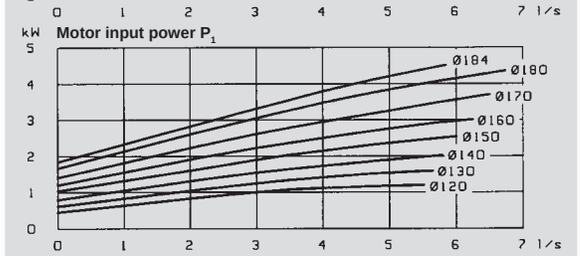


	kW	A	kg
OKN-112 E1 Ne	4.0	8.2	57
OKN-112 C1 Ne	3.0	6.4	53
OKN-101 D1 Ne	2.2	4.7	46
OKN-101 C1 Ne	1.5	3.3	43



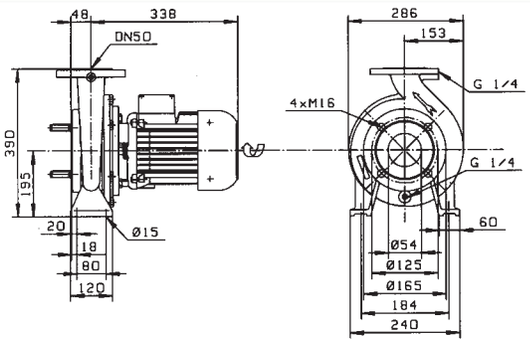




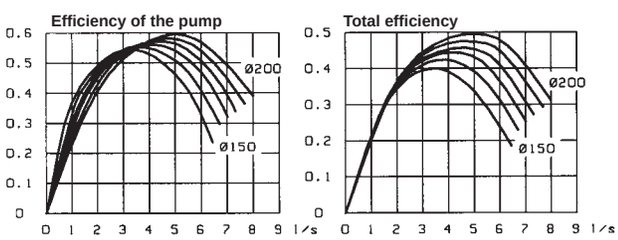


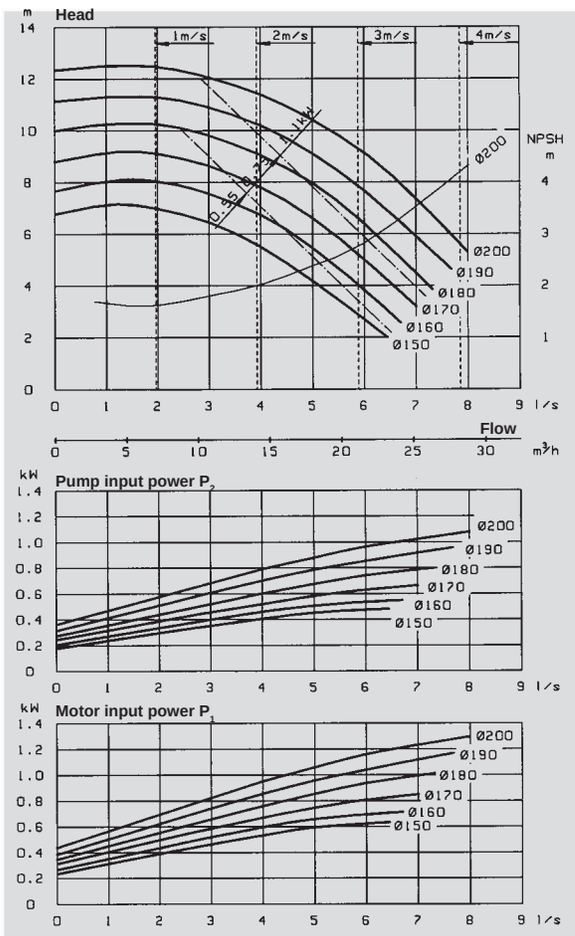
Technical data

AS_-50 B DN50 1500 r/min

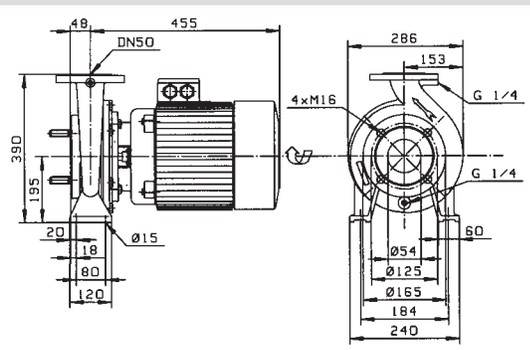


	kW	A	kg
OKN-101 C2 Ne	1.1	2.6	46
OKN-101 C2 P Ne 1~	1.1	6.9	46
OKN-100 B2 Ne	0.75	2.0	41
OKN-100 B2 Ne	0.55	1.4	41
OKN-100 B2 P Ne 1~	0.55	3.4	41

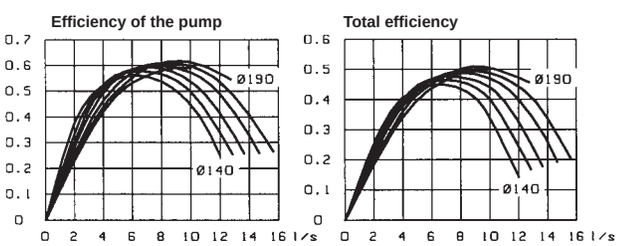


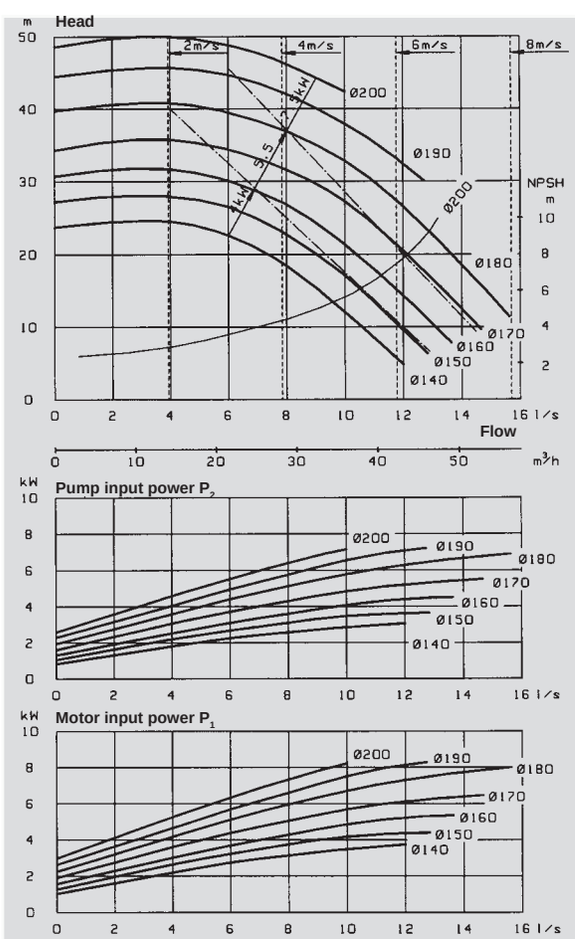


AS_-50 H DN50 3000 r/min



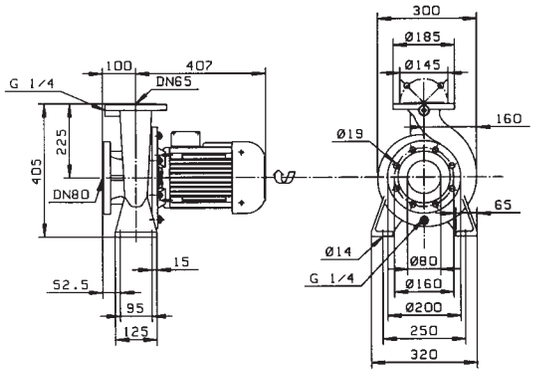
	kW	A	kg
OKN-132 E1 Ne	7.5	15	92
OKN-132 C1 Ne	5.5	11	85
OKN-112 E1 Ne	4.0	8.2	62



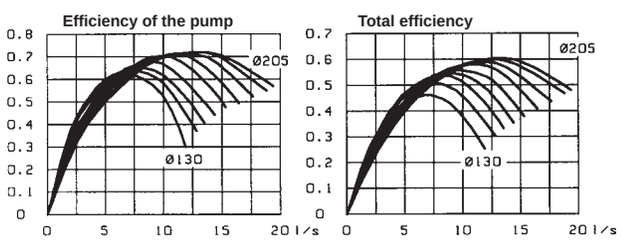


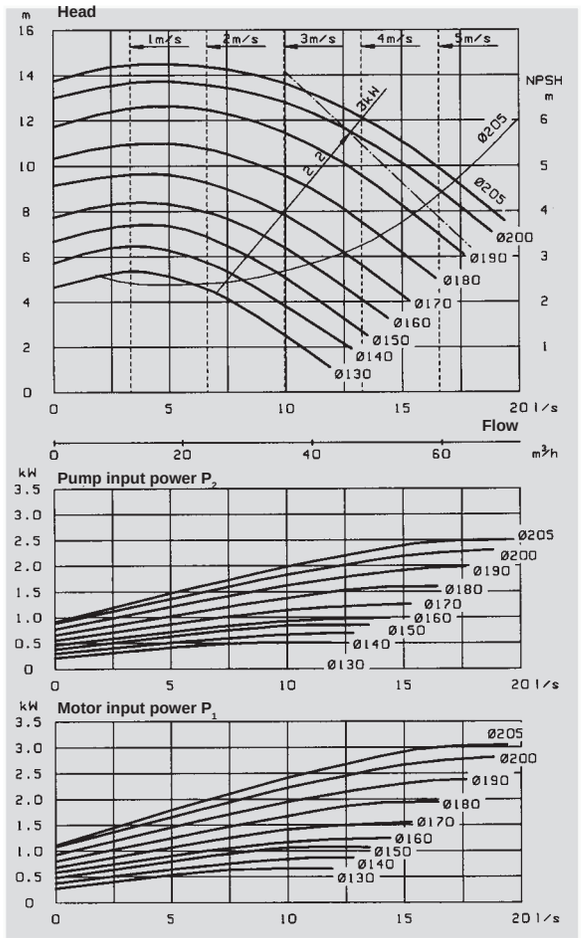
Technical data

KN_-65/4 DN80/65 1500 r/min

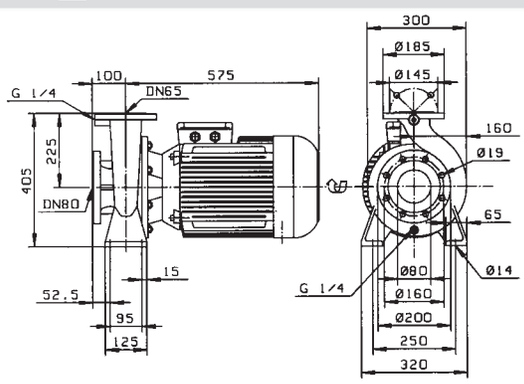


	kW	A	kg
OKN-112 E2 N22	3.0	6.5	71
OKN-112 C2 N22	2.2	5.1	66

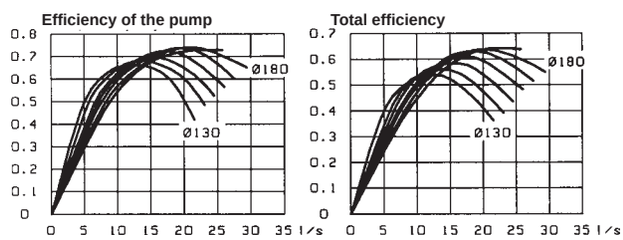


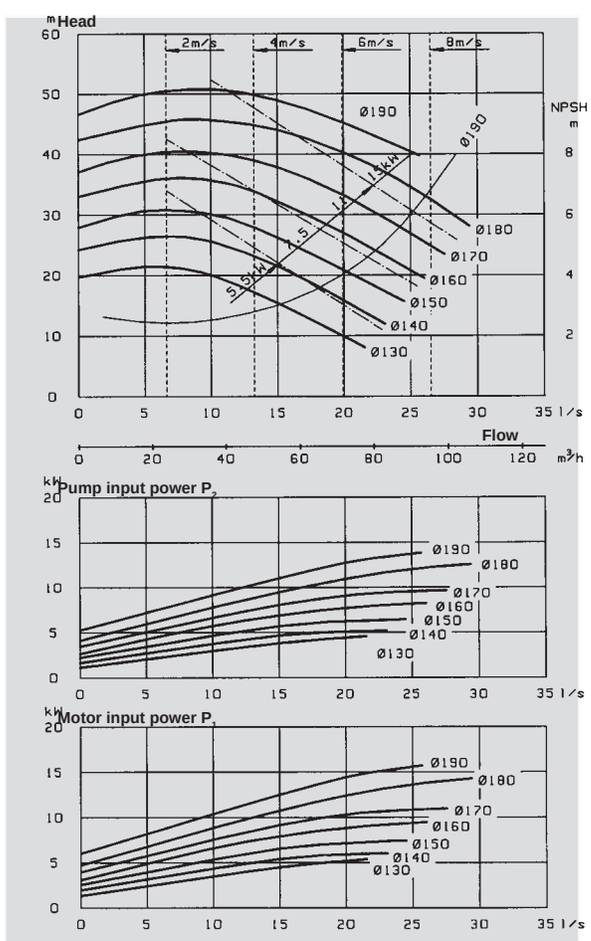


KN_-65/2 DN80/65 3000 r//min

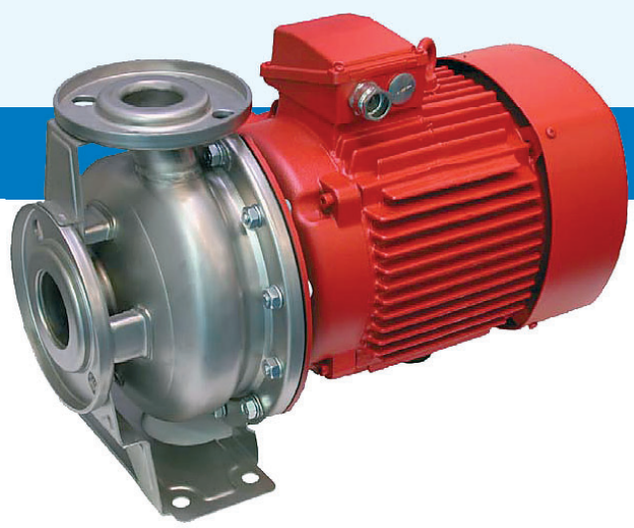


	kW	A	kg
OKN-164 G1 N22	15	30.5	157
OKN-164 F1 N22	11	22.0	152
OKN-132 E1 N22	7.5	15.0	102
OKN-132 C1 N22	5.5	11.0	95





KOLMEKS



END-SUCTION CENTRIFUGAL STAIN-LESS STEEL PUMPS

Range KL

KOLMEKS

TECHNICAL INFORMATION

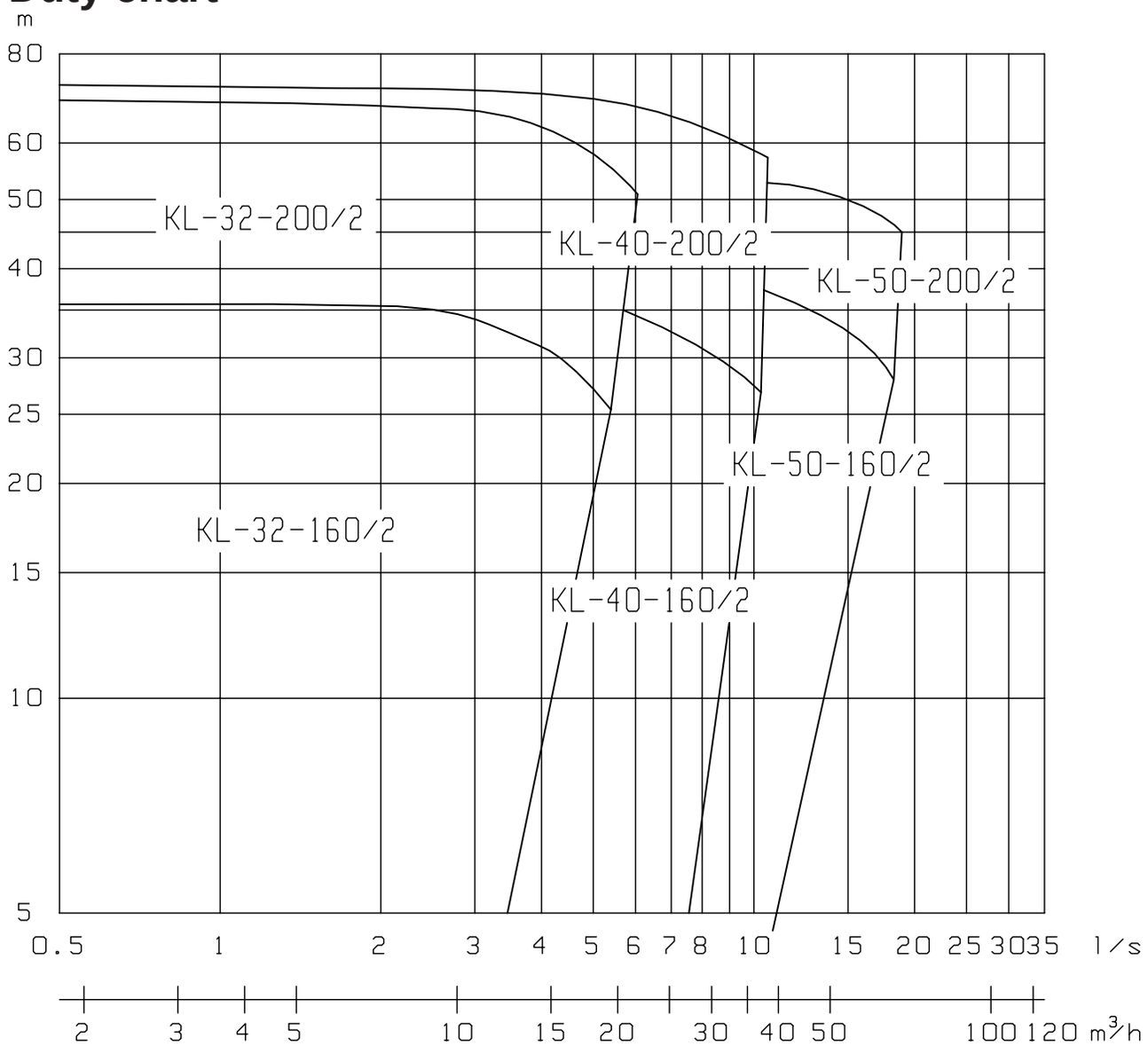
General features

The KL-range pumps are end-suction centrifugal pumps.

Applications

The KL-range pumps can be used for applications for clean oxygen rich,or for non-aggressive liquids, as service water-, circulation-, pressure increasing- and transmission pumps.

Duty chart



Design

Pump

The KL-range pumps are monobloc design end-suction centrifugal pumps equipped with dry type motors. The impeller is mounted directly on the shaft of the electric motor (no separate couplings).

TECHNICAL INFORMATION

Electric motor

The KL-range pump´s electric motor is totally enclosed fan cooled squirrel cage motor for pump application. The electric motor has a high efficiency and a silent running and it is suitable for use with frequency converters.

Voltages:	400/230 V, 50 Hz < 4 kW
	690/400 V, 50 Hz 4 kW and above
Enclosure:	IP 54
	IP55 4 kW and above (1000, 1500 r/min)
	5.5 kW and above (3000 r/min)
Insulation class:	F

Max. ambient temperature +45°C

N.B. Other voltages and specifications available by request!

Flanges

The dimensions of flanges in the KL-range follow the standard ISO 7005.

Shaft seals

The shaft seals in the KL-range are maintenance free single mechanical seals with rubber bellows. The pump housing sealing is an O-ring.

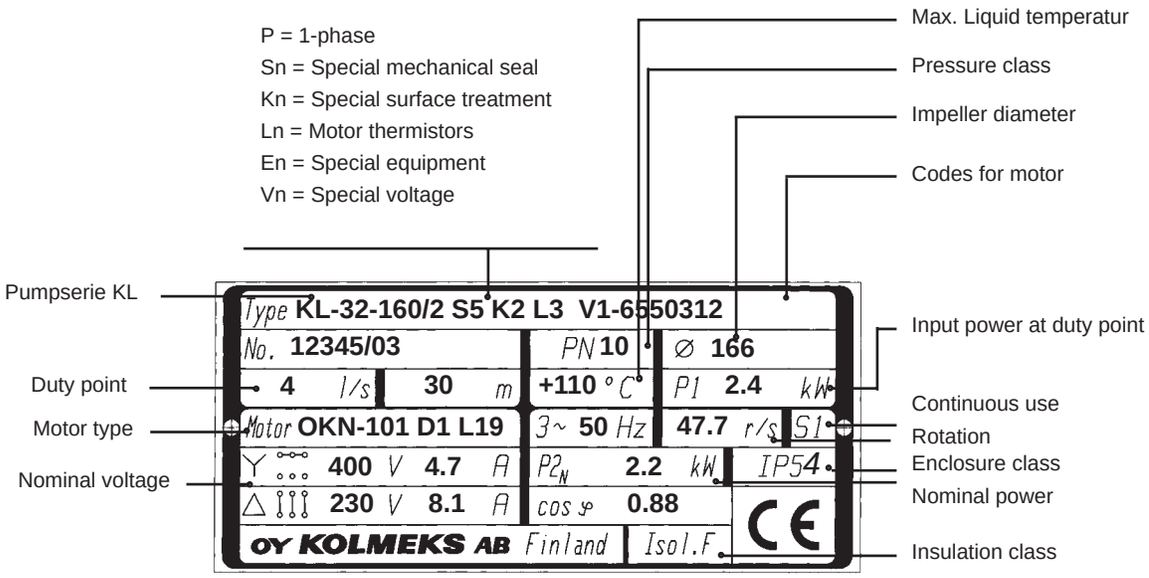
Material standards

The pump housing and impeller	stainless steel AISI 316L
Shaft	stainless steel AISI 329 (SIS 2324)
Mechanical seal	Ø22 mm carbon/SiC, EPDM-rubber steel parts AISI 316
Housing O-ring	Nitrile-rubber
Max. working pressure	10 bar
Working temperature	-15 ... +110°C (*

N.B.
The KL-range pumps can be provided also with other types of mechanical seals suitable for various liquids and temperatures. (*The pumps working temperature area depends on the pumped liquid. Water 0 ... +110°C).

TECHNICAL INFORMATION

Remarks



Installation

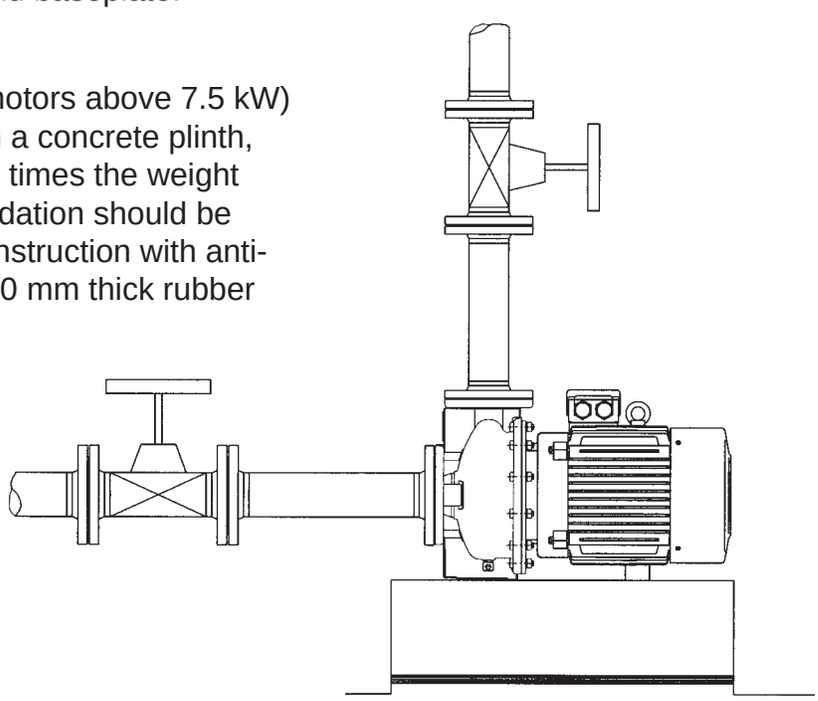
The KL- pump range should be mounted in such a way that the motor is in a horizontal position. The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it to the desired position.

When installing the pump please pay attention to following:

- enough space for service and control should be left around the pump
- if needed you should be able to use lifting devices
- shut-off valves on both sides of the pump

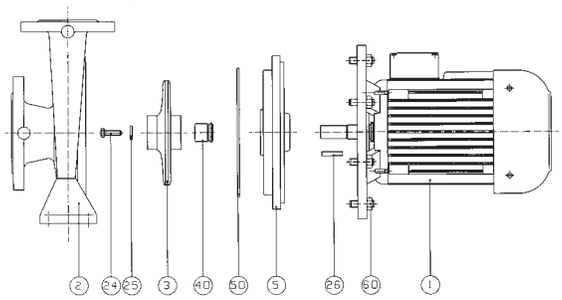
The smaller pumps (below 1.1 kW motors) may be installed into the pipe lines without any support and baseplate.

The heavier pumps (motors above 7.5 kW) should be mounted on a concrete plinth, approximately 1.5 to 2 times the weight of the pump. The foundation should be isolated from other construction with anti-vibrating mountings (20 mm thick rubber or cork plate).



Spare parts and maintenance

List of parts



1 Electric motor
2 Pump housing
3 Impeller
5 Sealing flange
24 Screw
25 Washer
26 Key
40 Mechanical shaft seal
50 O-ring for housing
60 Nut / Screw

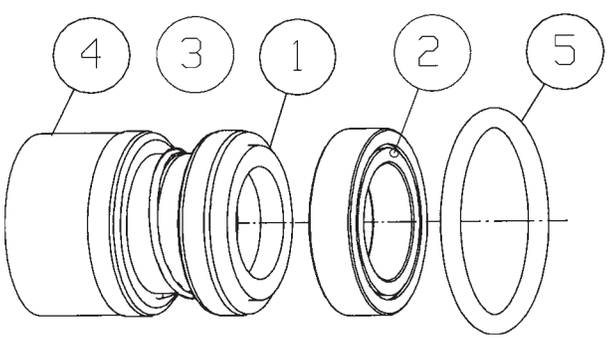
Sealings

KL-32-160, KL-40-160

Mechanical seal No. 7	for 22 mm shaft
O-ring for housing	189.86 x 5.34

KL-32-200, KL-40-200, KL-50-160, KL-50-200

Mechanical seal No. 7	for 22 mm shaft
O-ring for housing	227.96 x 5.34



1 Face, primary ring
2 Seat, stationary ring
3 Seal body/bellows
4 Spring
5 O-ring

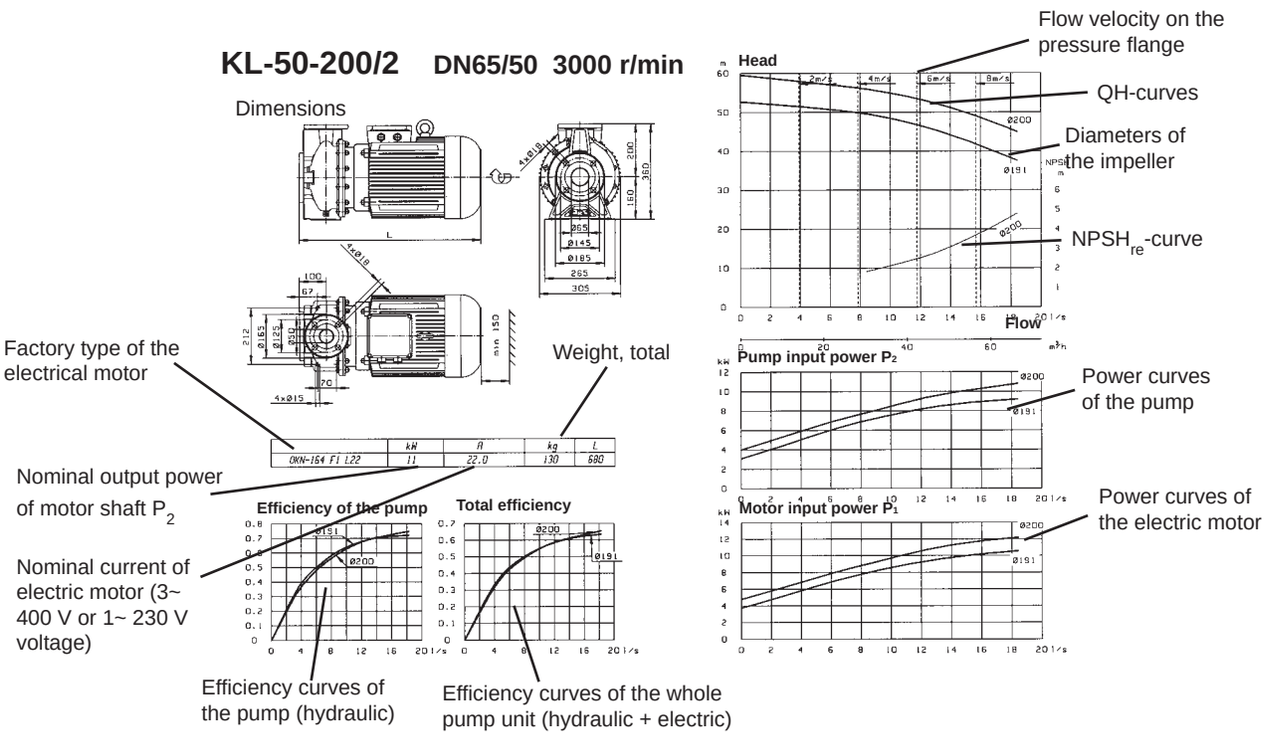
Spare units

The motor unit is a new motor unit that contains a motor, sealing flange, impeller and seals. In case of motor failure or seal leaking the change of the motor unit is very simple and fast and will not result in a long shut-down. The pump housing will not be removed from the pipes, only the motor unit will be changed.

The replacement unit is similiar to the motor unit, but in a replacement unit recycable parts have been used. Parts like mechanical seals and bearings are new. The client will return the old replacement unit to KOLMEKS and will be charged only for repair and dispatch costs.

How to read duty charts

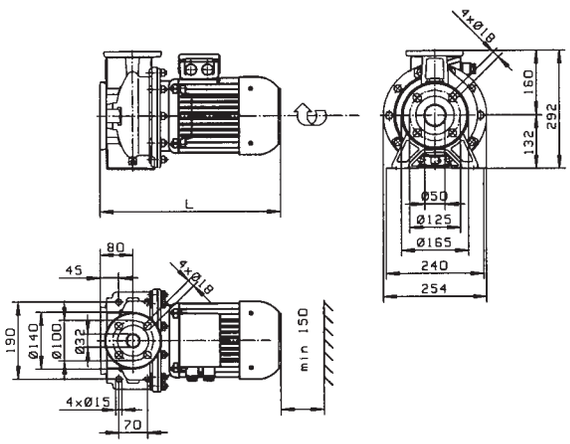
The performance curves applies to 50 Hz frequency (the curves are also available as 60 Hz frequency) and +20°C water. When pumping other liquids with different viscosity direct consultancy with Kolmeks is advised.



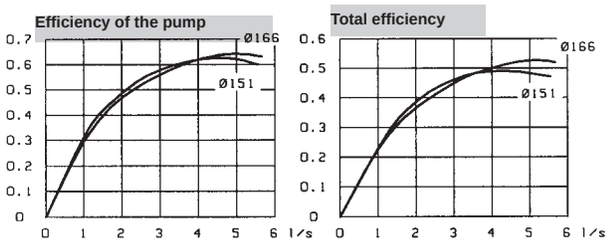
Note! The density of the liquid correlates to the power required. In case the liquid is heavier than water please check the power output of the motor.

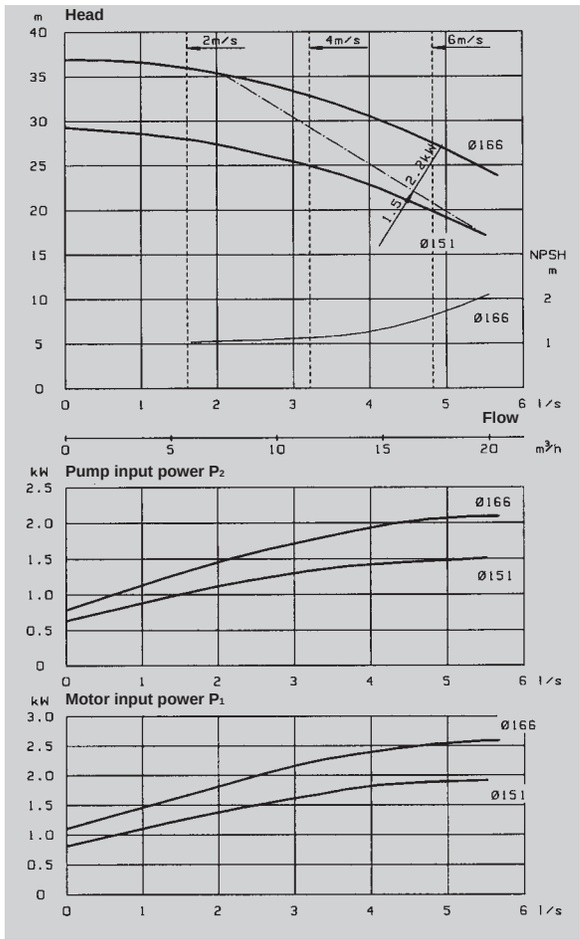
PERFORMANCE CURVES

KL-32-160/2 DN50/32 3000 r/min

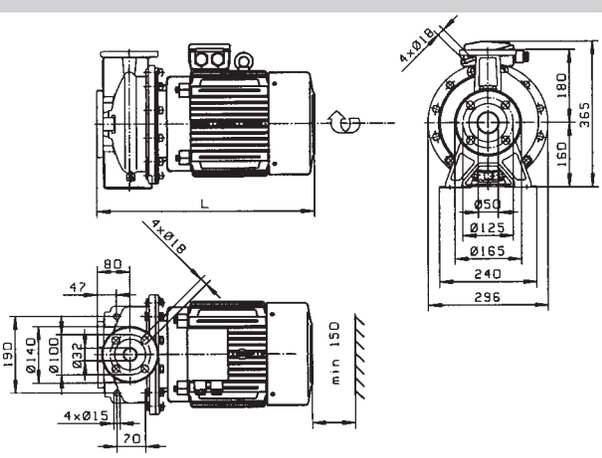


	kW	A	kg	L
OKN-101 D1 L19	2.2	4.7	41	445
OKN-101 C1 L19	1.5	3.3	39	445

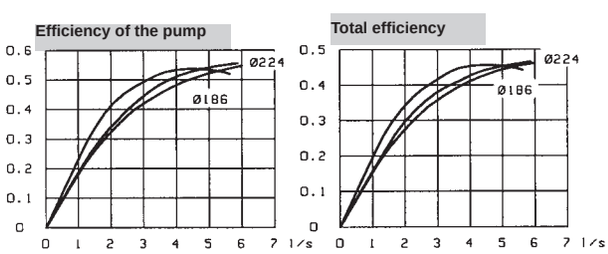


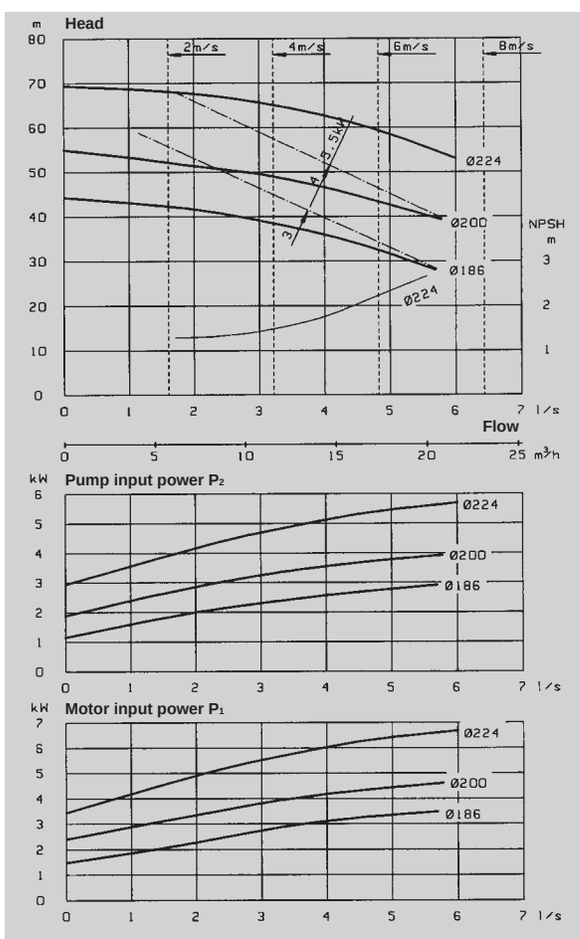


KL-32-200/2 DN50/32 3000 r/min



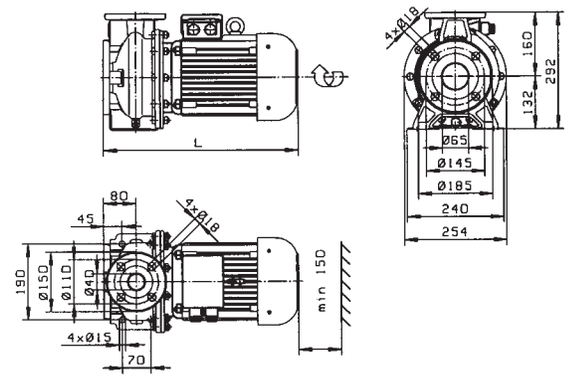
	kW	A	kg	L
OKN-132 C1 L22	5.5	11.0	68	535
OKN-112 E1 L22	4	8.2	53	470
OKN-112 C1 L22	3	6.4	49	470



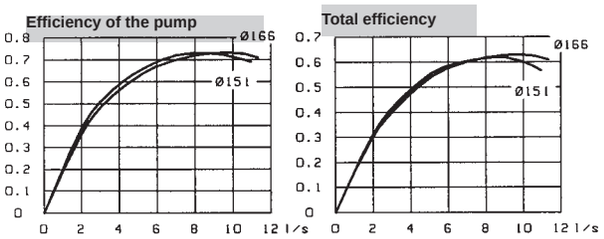


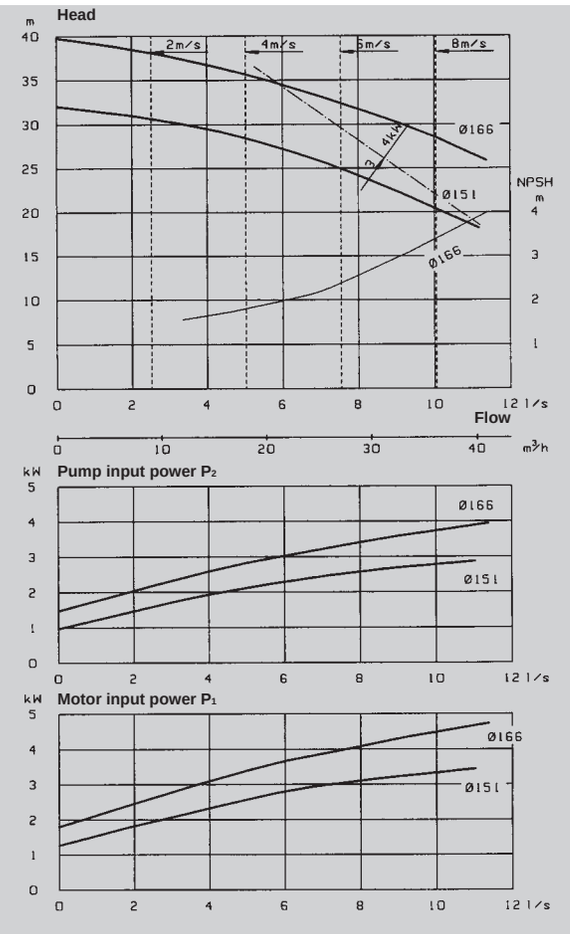
PERFORMANCE CURVES

KL-40-160/2 DN65/40 3000 r/min

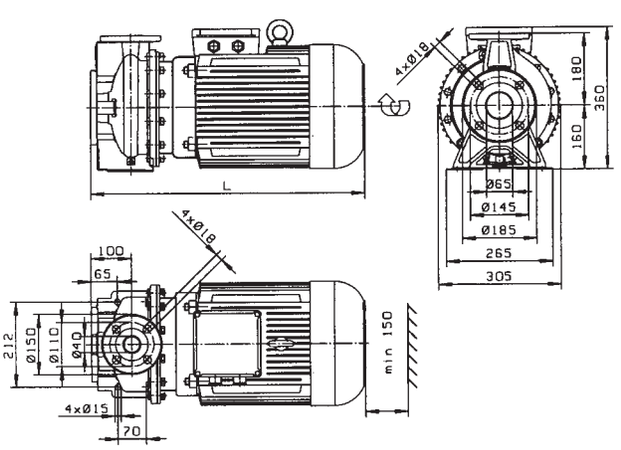


	kW	A	kg	L
OKN-112 E1 L19	4	8.2	57	480
OKN-112 C1 L19	3	6.4	53	480

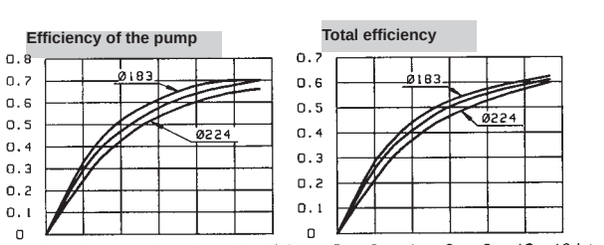


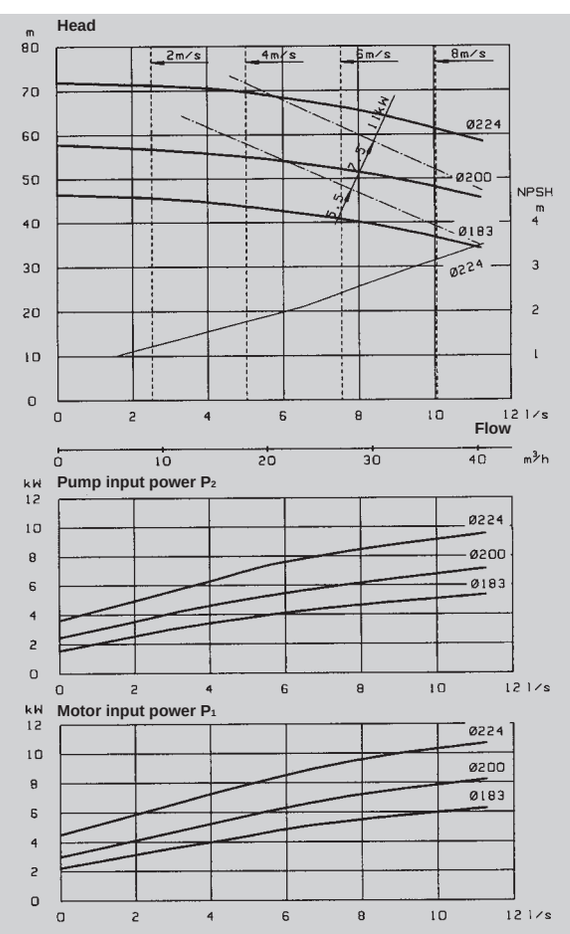


KL-40-200/2 DN65/40 3000 r/min



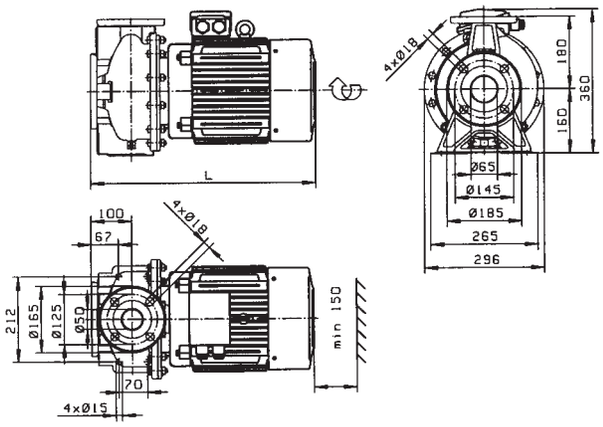
	kW	A	kg	L
OKN-164 F1 L22	11	22.0	125	680
OKN-132 E1 L22	7.5	15.0	80	550
OKN-132 C1 L22	5.5	11.0	72	550



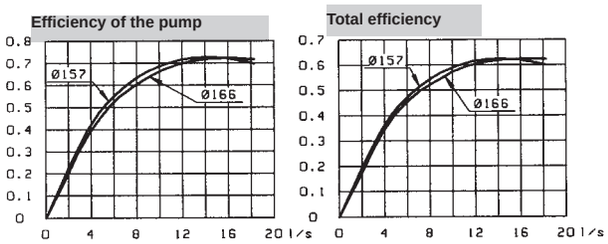


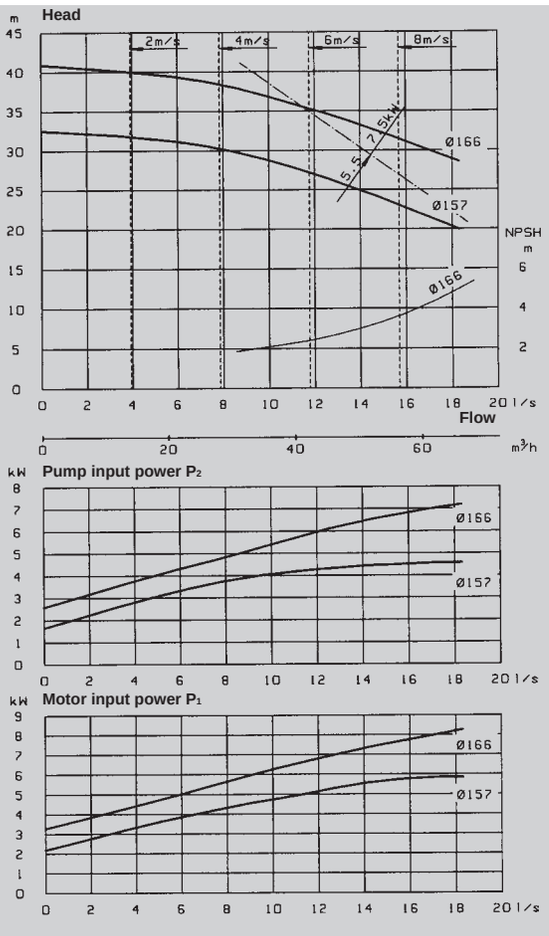
PERFORMANCE CURVES

KL-50-160/2 DN65/50 3000 r/min

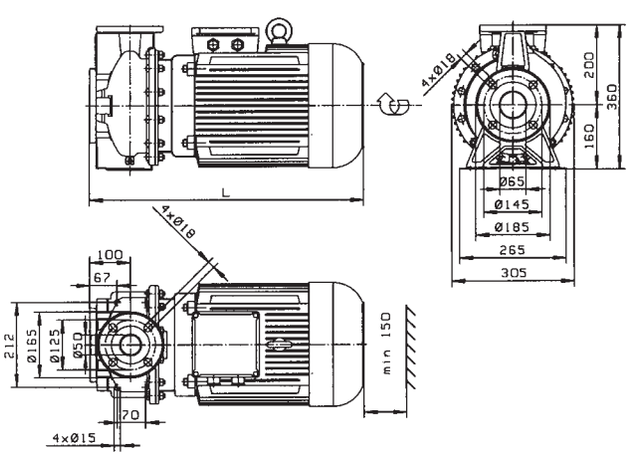


	kW	A	kg	L
OKN-132 E1 L22	7.5	15.0	84	555
OKN-132 C1 L22	5.5	11.0	76	555

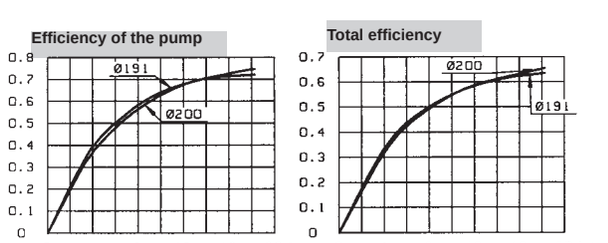


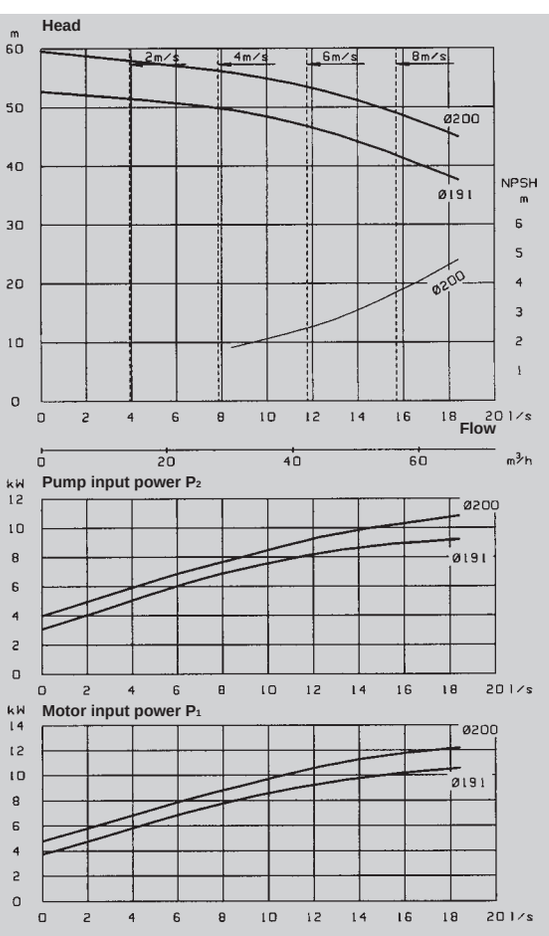


KL-50-200/2 DN65/50 3000 r/min



	kW	A	kg	L
OKN-164 F1 L22	11	22.0	130	680





KOLMEKS

TWIN PUMPS WITH FREQUENCY CONVERTER

Range T and AT

Technical information

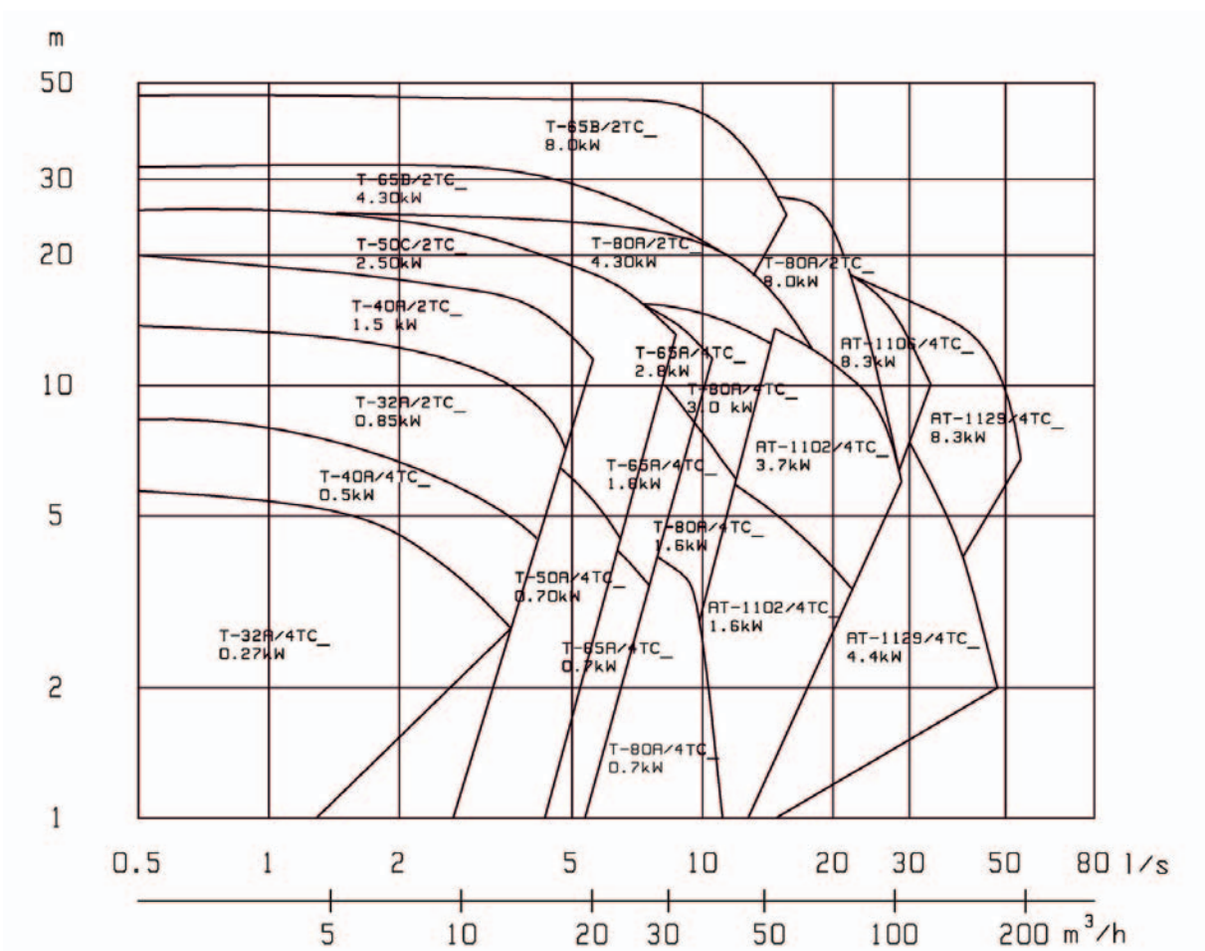
General features

The T- and AT - ranges consist of Twin In-Line pumps, where two single-stage centrifugal pump heads of Monobloc design are mounted on a common pump housing. The chambers of pumps are hydraulically separated by a simple non-return valve. The frequency converter is integrated to one motor unit and the other unit is equipped with the fixed speed electric motor. In a normal situation the inverter unit is running and the fixed speed unit is in stand-by position. If the inverter indicates a fault, the constant speed unit automatically starts to run. The data sheets are showing the duty performances of the both units. From time to time, the constant speed unit is recommended to run (for example 5 minutes a week) to ensure good condition of bearings and the mechanical seal.

Applications

The pumps are made of cast iron and designed for applications of clean non-aggressive liquids including heating and primary hot water circulation, cooling, chilled and condenser water circuits in e.g. district heating and air conditioning. The use of frequency converter and fixed speed pump head in the twin pump performs safety and continuous operation.

Duty chart



Technical information

Advantages of frequency converter twin pump

1) Spare unit always in ”ready to run ” -mode
- mechanical seal: wet and workable even after 15 years

2) In fault situation: automatic spare unit start-up and alarm to the service staff via ADP
- class B alarm: no need for immediate visit to the site
- no danger for ice in cooling systems

3) No storage problems of motor units
- long storage time doesn’t disorder the rubber parts
- wet conditions doesn’t affect problems in internal parts of the motor

4) Assembly distance between flanges same as in single pumps
- especially suitable for renovation and quality standard improvement projects

Principle in fault situation
- a fault alarm => signalling to the ADP
- spare unit starts automatically

Electric motors and frequency converters

The electric motors are especially dimensioned and designed for pump application, totally enclosed fan cooled squirrel cage motor. The motor design ensures high efficiency and silent operation and is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz, 3-phase	< 4 kW
	690/400 V, 50 Hz, 3-phase	4 kW and above
Enclosure:	IP 54	
	IP55, 4 kW and above (1000, 1500 r/min), 5.5 kW and above (3000 r/min)	
Insulation class:	F	
Type of duty:	S1	

The HYDROVAR frequency converter is integrated to the motor.

Supply voltages:	< 2.2 kW:	1 x 220-240 VAC ±15%, 48-62 Hz
	2.2 kW and above:	3 x 400...460 VAC ± 15%, 48-62 Hz
Motor voltages:	< 2.2 kW:	3 x 230 V
	2.2 kW and above:	3 x 400 V
Shaft power range:	0.55 ... 22 kW	
Enclosure:	IP 54/55	
Insulation class:	F	
Ambient temperature:	max. + 40 °C	

Technical information

Flanges

The dimensions of flanges follow the standard ISO 7005. Both pump flanges have pressure gauge tappings, G 1/4. Also other standards can be applied for flanges, by request.

Shaft seals

The shaft seals are maintenance free single mechanical seals with rubber bellows.

Standard materials, temperature and pressure classes

Pump housing:	cast iron	EN-GJL-200
Impeller:	cast iron	EN-GJL-200
	Noryl GFN2 (T-32A)	
Shaft:	stainless steel AISI 329 (SS2324)	
Shaft seal:	carbon / silicon carbide – EPDM –rubber	
	metal parts AISI 316	
O-ring of the pump housing	EPDM- or Nitrile -rubber	
Max. working pressure:	10 bar	
Max. fluid temperature:	+120°C	

N.B. The pumps can be provided also with other types of seals suitable for various liquids and temperatures, if needed, please contact Kolmeks.

Painting

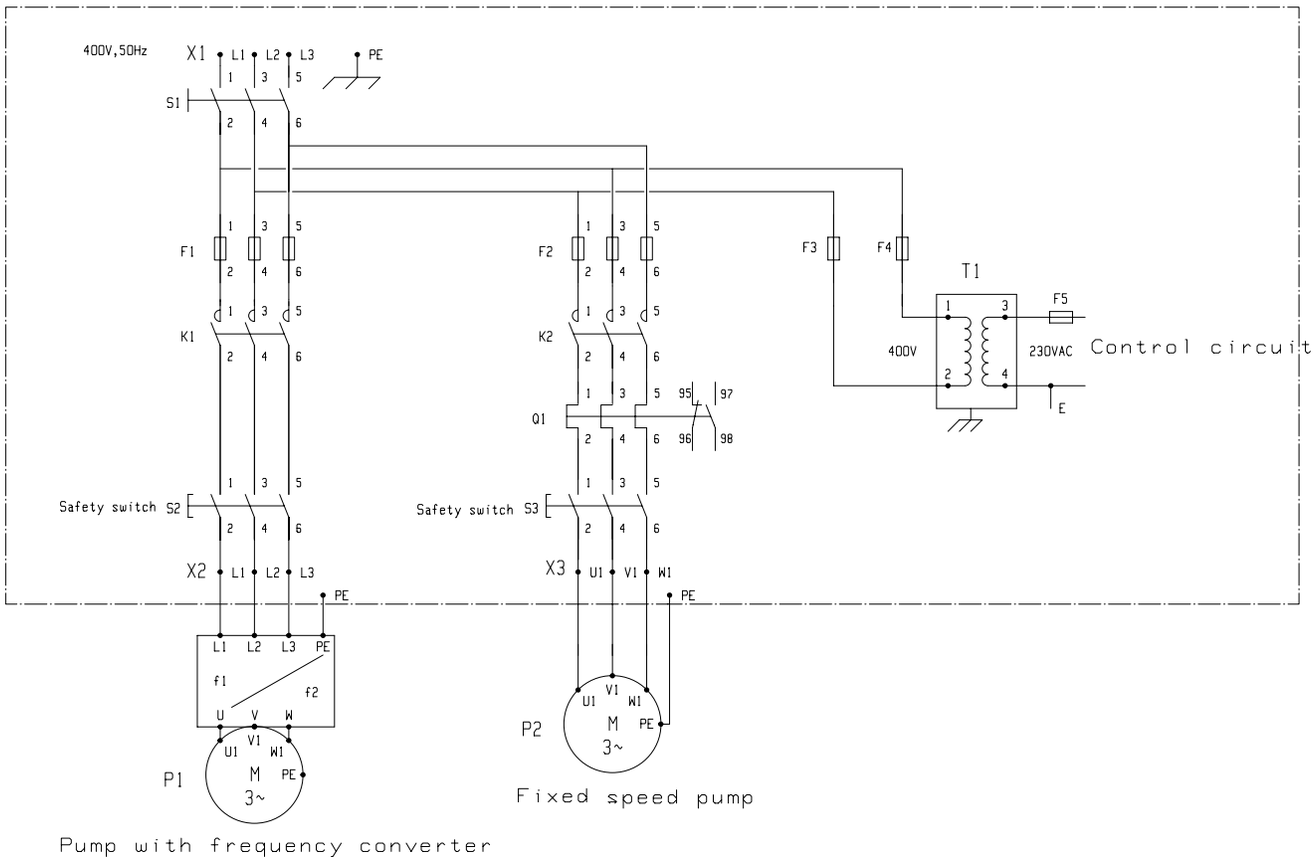
Pumps are painted in accordance with Finnish standard SFS 4962, A80/2 Fe Sa2. The finishing colour is red, RAL 3003. Special coating available by request.

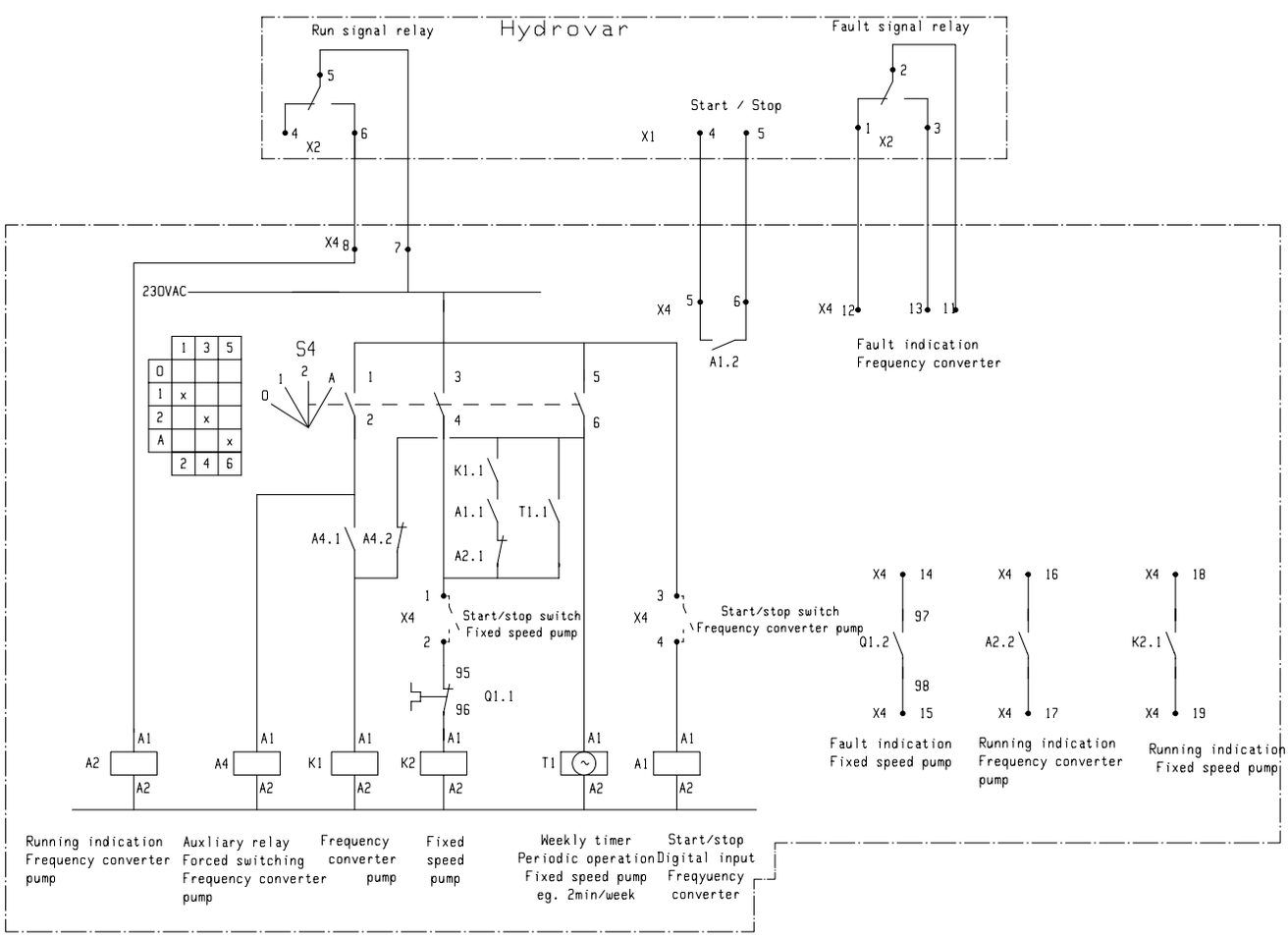
Control unit for frequency converter twin pump

One unit of twin pump is equipped with frequency converter (TC) and the other one is equipped with fixed speed motor (FS). In a normal situation the TC –unit is running and unit is in stand by mode. If the TC –unit indicates a fault, the FS –the control unit starts automatically. The periodic running for the FS –unit is meant to keep the seals and other components in order.

Technical information

Example: The main and control diagram of the control unit





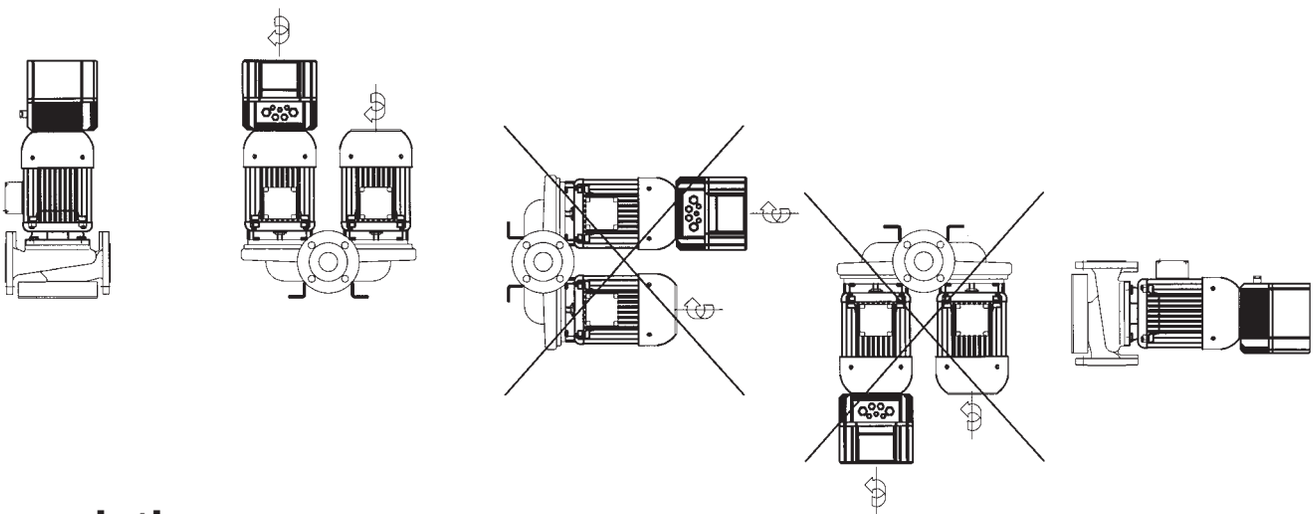
Technical information

Installation

When designing and installing a pump into the pipeline pay attention to following:

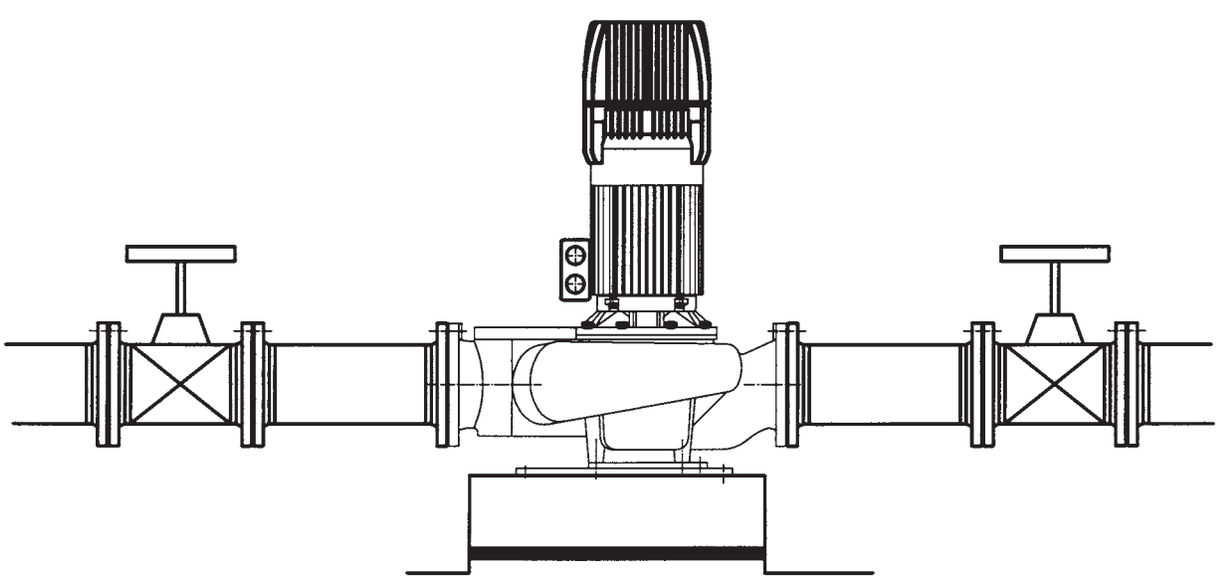
- enough space for the service and control around the pump
- enough clearance on the top of the motor to lift the motor unit from the pump housing
- shut-off valves on both sides of the pump
- vibration and noise isolation and rigidity of the pipe works to support the pump
- pump to be placed in a position that the frequency converter is not against any hot pipe etc.

The position of the motor unit and the terminal box can be changed by removing the motor unit from the pump housing and setting it to the desired position.



Foundation

The heavier pumps (= DN 80 and over or motors above 1,5 kW) should be mounted on a concrete plinth, approximately 1.5 to 2 times the weight of the pump. The foundation should be isolated from other construction with anti-vibration mounting (20 mm thick rubber or cork plate) to prevent transmission of noise.



Technical information

Connections

All externally used cables have to be shielded.
For external off/on switches, contacts suitable for switching <10 VDC are necessary.
If unshielded control cables are used, signal interference may occur and interfere with the function of the inverter.

0.55 ... 1.5 kW (HV1.05 – 1.15)

Terminals X2

1 GND (not earthened)
2 Actual value input 0.5-4.5V
3 Power supply for external control 5VDC,
4 GND
5 External on/off (release) Ri=10kOhm, 5 Volt DC (gold plated contact necessary!)
6 GND
7 Low water; Ri=10kOhm, 5 Volt DC (e.g. incoming pressure switch or water level switch)
8 Thermoswitch or PTC (in motor terminal box) Ri=10k, 5 VDC
9 Thermoswitch or PTC
10 Fault signal relay NC max. 125VAC, 500mA free of inductivity
2 Fault signal relay CC max. 125VAC, 500mA free of inductivity
3 Fault signal relay NO max. 125VAC, 500mA free of inductivity

Terminals X3:

1 RS 485 SIO - LOW

2 RS 485 SIO + HIGH

3 RS 485 GND

4 RS 485 + 5 VDC

Factory defaults:

Technical information

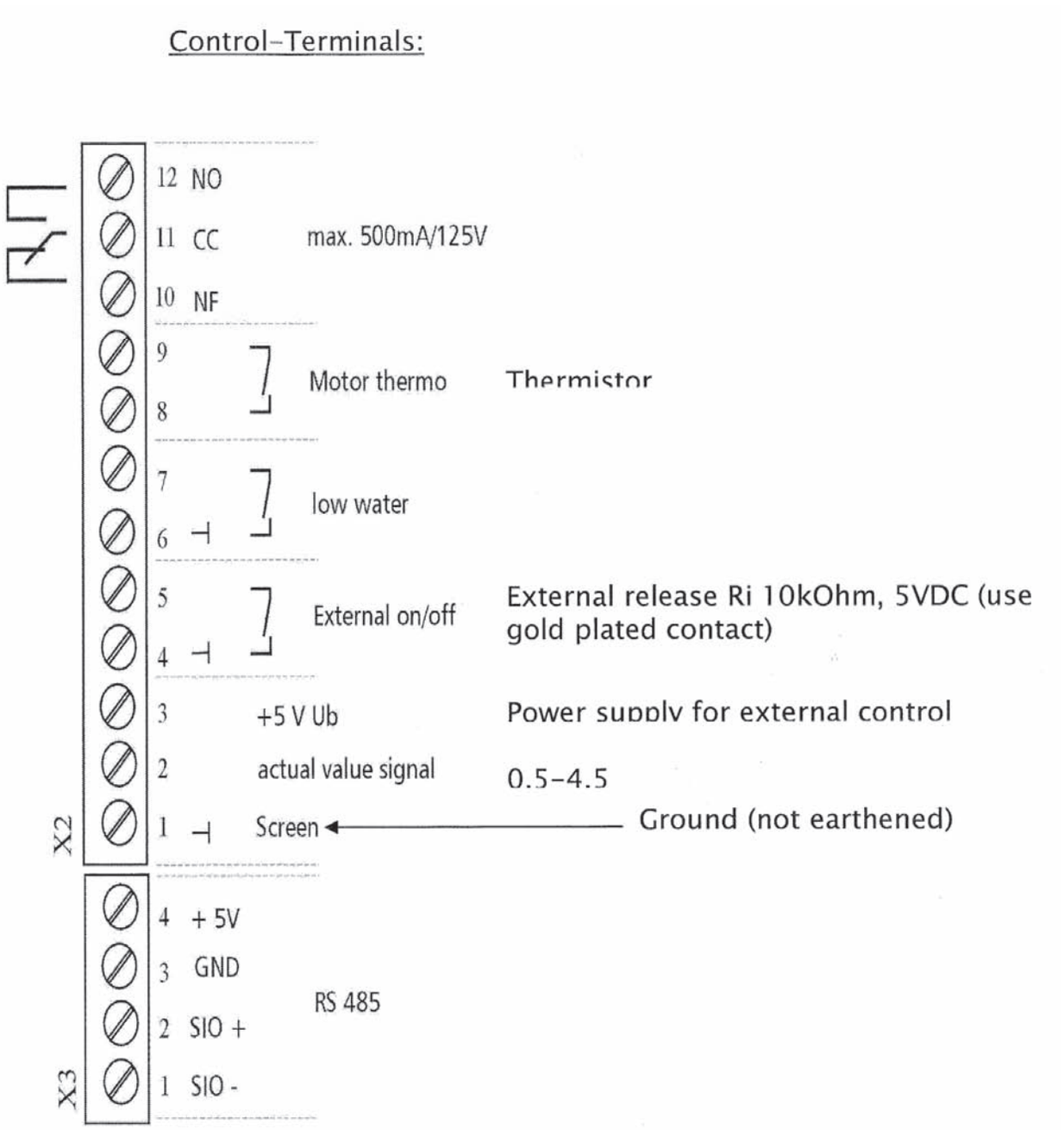
Terminals X2/1,2,3: Actual value input (feedback) for pressure, pressure difference. In Actuator Mode speed reference 0.5-4.5V or 2.5V

Terminals X2/4,5: External on/off. Jumper wire connected.

Terminals X2/6,7: Low water or dry running protection, e.g. incoming pressure switch or water level switch. Jumper wire connected in circulation pumps.

Terminals X2/8,9: Thermoswitch in motor terminal box as standard. It is also possible to use thermoswitch, which is inside the windings.

Terminals X2/10,11,12: Fault signal relay.



2.2 -7.5 kW (HV 3.2- HV 3.7)

Connections

All externally used cables have to be shielded.
For external on/off switches, contacts suitable for switching <10 VDC are necessary.
If unshielded control cables are used, signal interference may occur and interfere with the function of the inverter.

Terminals X1:
1 GND
2 Actual value input 4...20mA, 50 Ohm load resistance
3 Power supply for external control 15VDC, max. 100mA
4 GND
5 External on/off (release) Ri=10kOhm, 5 Volt DC (gold plated contact necessary!)
6 GND
7 Low water; Ri=10kOhm, 5 Volt DC (e.g. incoming pressure switch or water level switch)
8 Thermo switch or PTC (in motor terminal box) Ri=10k, 5 VDC
9 Thermo switch or PTC
10 GND
11 Analogue output 0...10 V, max. 2mA
12 Current signal input 4...20mA
13 Voltage signal input 0....10V or 2.....10V
14 Digital input

Terminals X2:
1 Fault signal relay NC max. 250VAC, 1A free of inductivity
2 Fault signal relay CC max. 250VAC, 1A free of inductivity
3 Fault signal relay NO max. 250VAC 1A free of inductivity
4 Pump operation signal relay NC max. 250VAC 1A free of inductivity
5 Pump operation signal relay CC max. 250VAC 1A free of inductivity
6 Pump operation signal relay NO max. 250VAC 1A free of inductivity

!! Fault relay (X2/2 - X2/3) is closed, when there is no error!!

Terminals X5/6:
1 RS 485 SIO - LOW
2 RS 485 SIO + HIGH
3 RS 485 GND
4 RS 485 + 5 VDC max. 20mA out for supply of external interface converter

Technical information

Factory defaults:

Terminals X1/1,2,3: Actual value input (feedback) for pressure, pressure difference. In Actuator Mode speed reference 4-20 mA (U/I –converter can be delivered if 0-10V signal is needed).

Terminals X1/4,5: External on/off. Jumper wire connected.

Terminals X1/6,7: Low water or dry running protection, e.g. incoming pressure switch or water level switch. Jumper wire connected in circulation pumps.

Terminals X1/8,9: Thermo switch in motor terminal box as standard. It is also possible to use thermo switch, which is inside the windings.

Terminals X1/10,11: Analogue output 0...10 V. As a standard actual value (feedback). Another option is frequency. As a default no operation.

Terminals X1/10,12: Analogue input 4 (0) ... 20 mA. For external pressure reference (required value 2) and Offset –control. As a default no operation

Terminals X1/10,13: Analogue input 0 (2) ... 10 V. For external pressure reference (required value 2) and Offset –control. As a default no operation

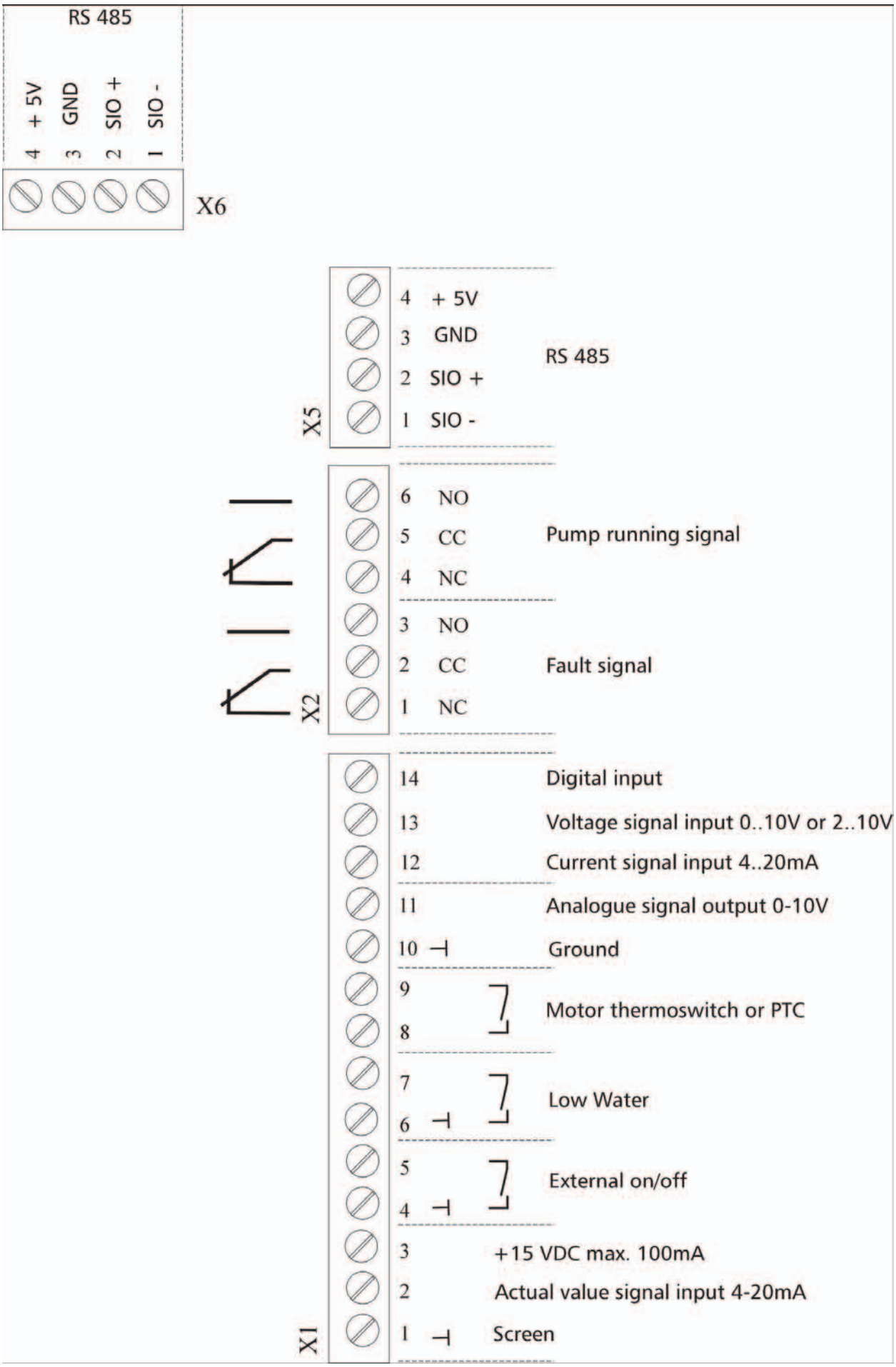
Terminals X1/10,14: Digital input. Selection switch for analogue inputs. If connected, the selected analogue input is activated.

Terminals X2/1,2,3: Fault signal relay.

Terminals X2/4,5,6: Operation (running) signal relay (default). Can be configured as Simple Multicontroller => allows to start / stop in a parallel constant speed pump.

(Tähän kuva kytkäristä.)

Technical information

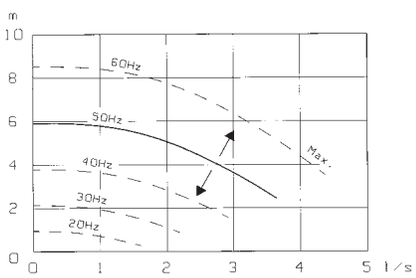


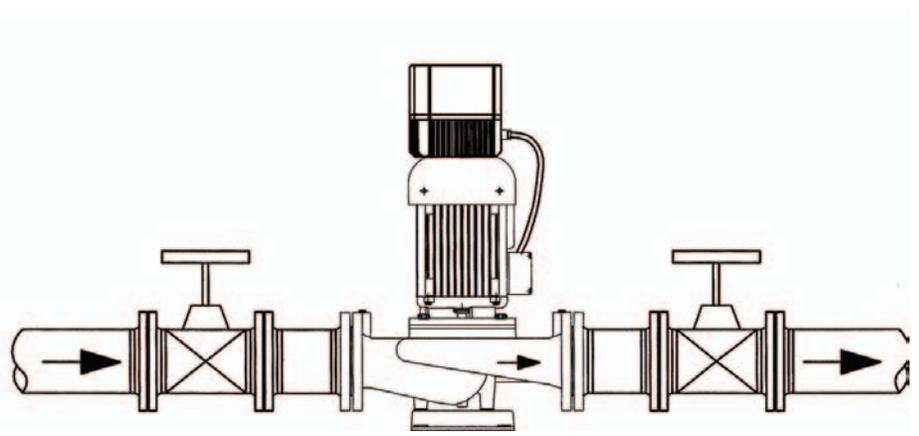
Technical information

Applications

TCA –pump

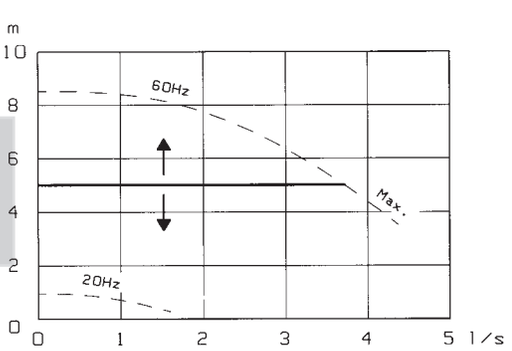
In systems, where the duty point remains constant and where is no need for continuous automatic regulation. The speed of electric motor can be adjusted manually at the site. Useful feature for commissioning of the pump. The pump will run with constant speed.

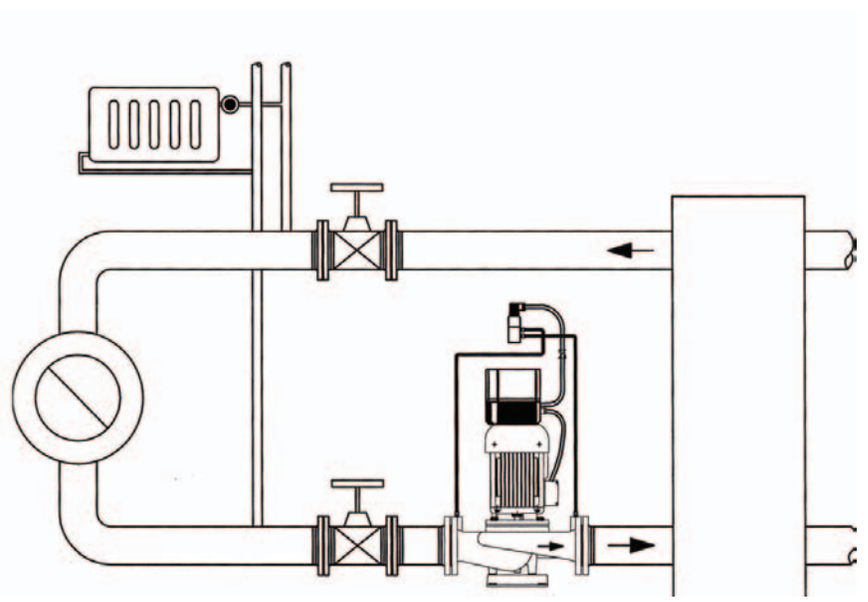




TCB –pump

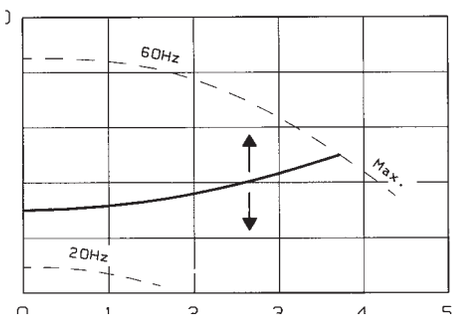
In systems, where there are variations in flow and where pressure losses are generated mainly of consumption equipment. Heating circulation, where the pressure loss on the heat exchanger is small. The differential pressure transducer pipes are connected to the pump flanges. The level of the constant pressure difference between the pump flanges can be adjusted as a reference value of the frequency converter. The pump will run with variable speed. QH-curve of the pump is controlled to a horizontal line.

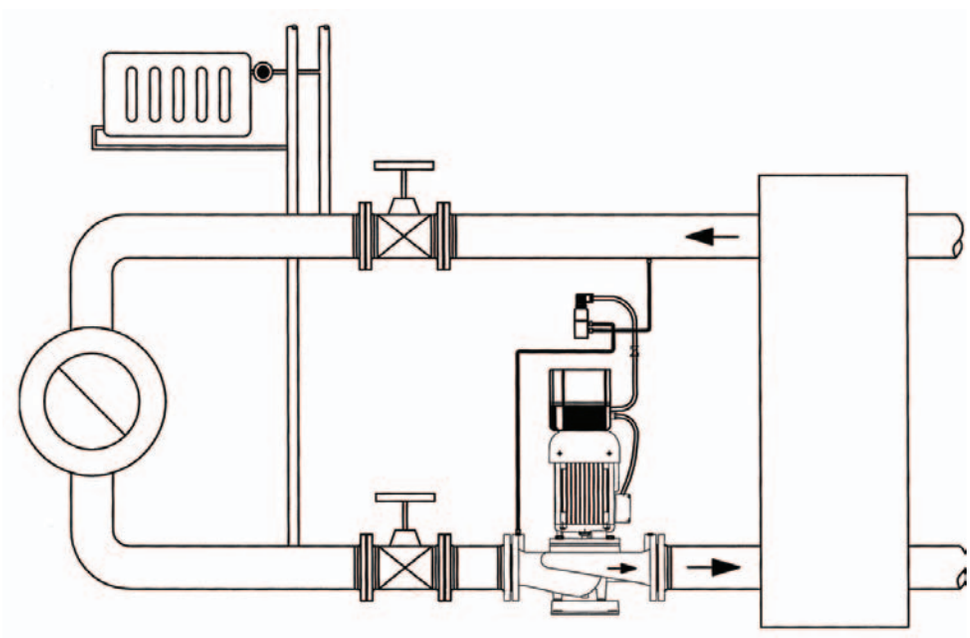


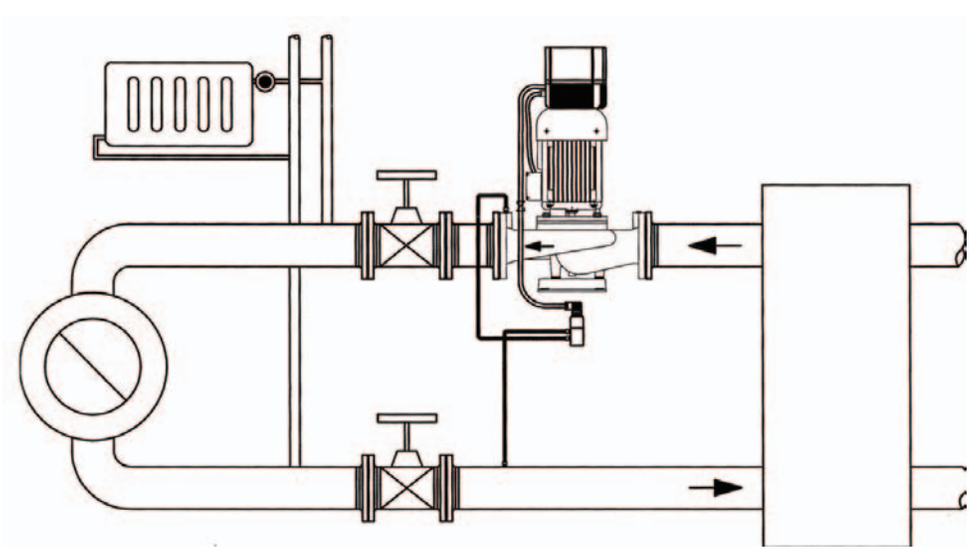


TCC –pump

In systems with variations in flow and where pressure losses are generated mainly of the source of heat equipment. Heating and cooling circulations and pressure boosting of parallel circulations. Differential pressure transducer's one pipe to be installed on the suction or pressure flange of the pump and the other one in the system, inlet or outlet pipe. The level of the constant pressure difference between the inlet- and outlet-line of the system can be adjusted as a reference value for the frequency converter. The pump will run with variable speed.
QH-curve of the pump is controlled to a quadratic. The relation of pressure loss in the source of heat (cold) to the loss in the system defines the shape of the curve. When the losses in the heat exchanger are main part of the whole losses in the system the curve is steeper.



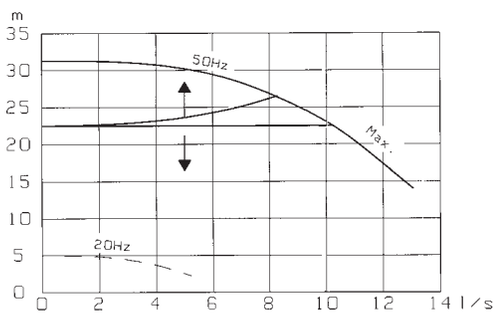


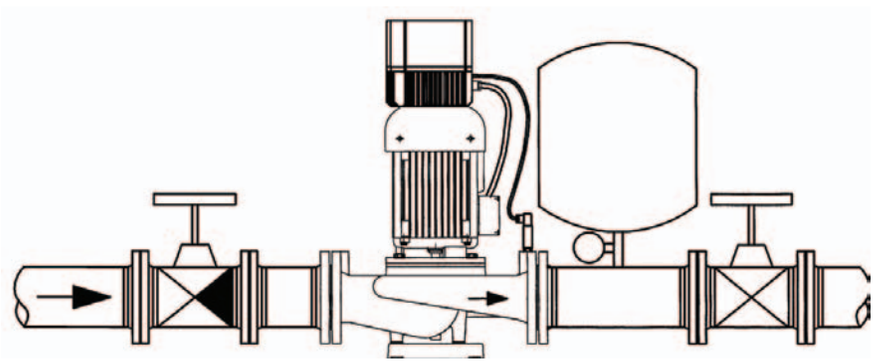


Technical information

TCD –pump

Pressure boosting or other open systems, where constant pressure is required.
The pressure transmitter is installed to the pressure flange of the pump or near to the consumption point in the pipeline. The level of the constant pressure on the pressure flange of the pump or on the outlet-line of the system can be adjusted as a reference value for frequency converter. The pump will run with variable speed. When pressure transmitter is located on pressure flange of the pump and suction head remains constant the QH-curve of the pump is a horizontal line. If the pressure transmitter locates close to the consumption point the QH-curve will be quadratic. When pressure losses in the pipeline are high compared to the total head of the pump the QH-curve is steeper. The main reason for the control is the variation of the suction head, which further effects to the pump head available.





TCG –pump

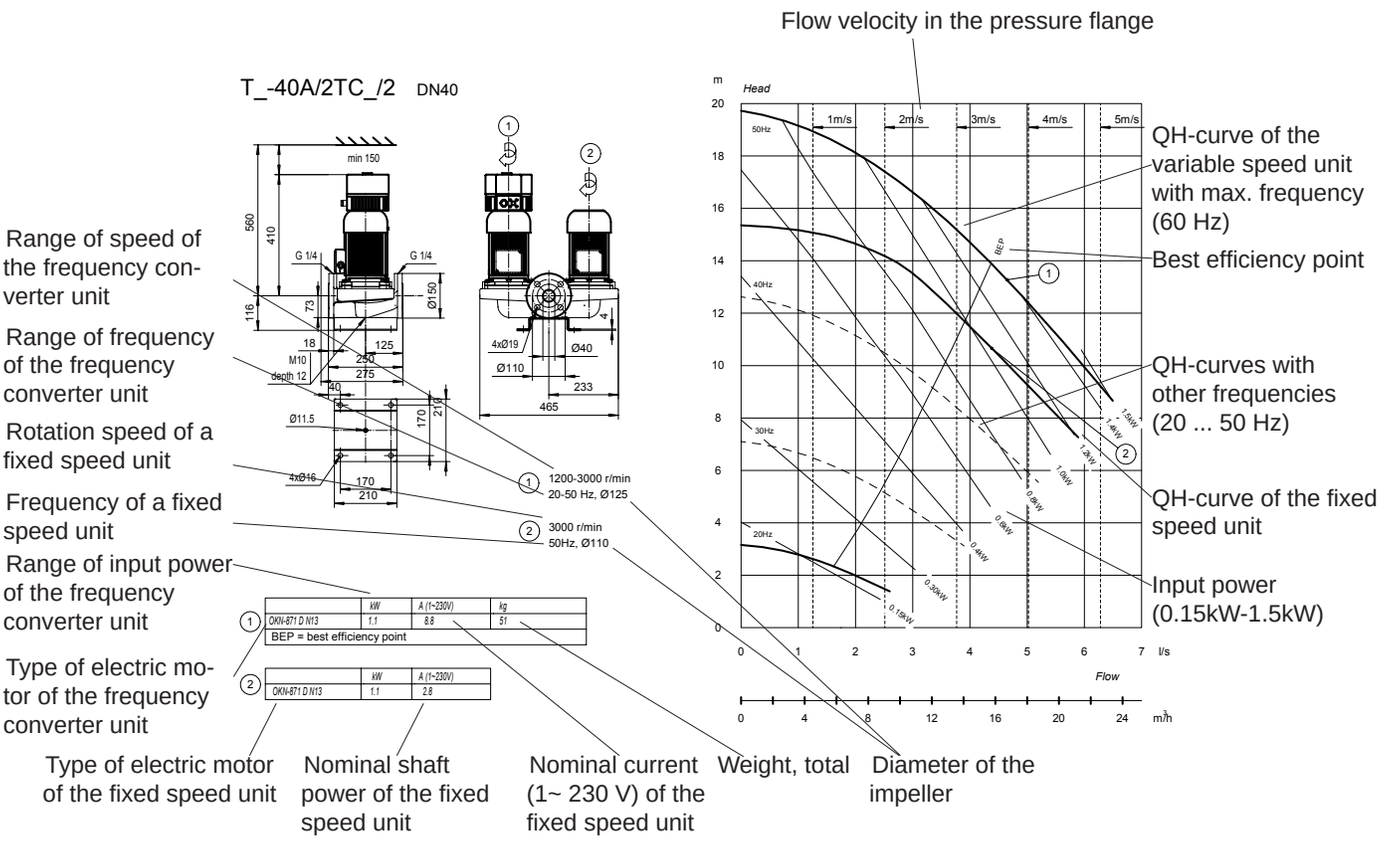
To open or circulation systems, which has the external controller in ADP. The speed reference (0-10V or 4-20 mA), alternation and other automatic operation for the pump from ADP.

Technical information

How to read performance curves

Curves are valid for pumps with water +20°C. For other liquids please contact Kolmeks.

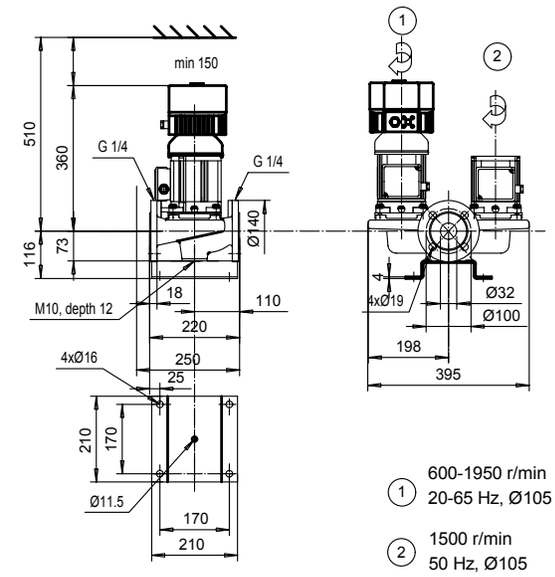
Dimensional drawing



Note! The density of the liquid correlates to the power required. In case the liquid is heavier than water please check the power output of the motor.

Technical data

T-32A/4TC_/4 DN32

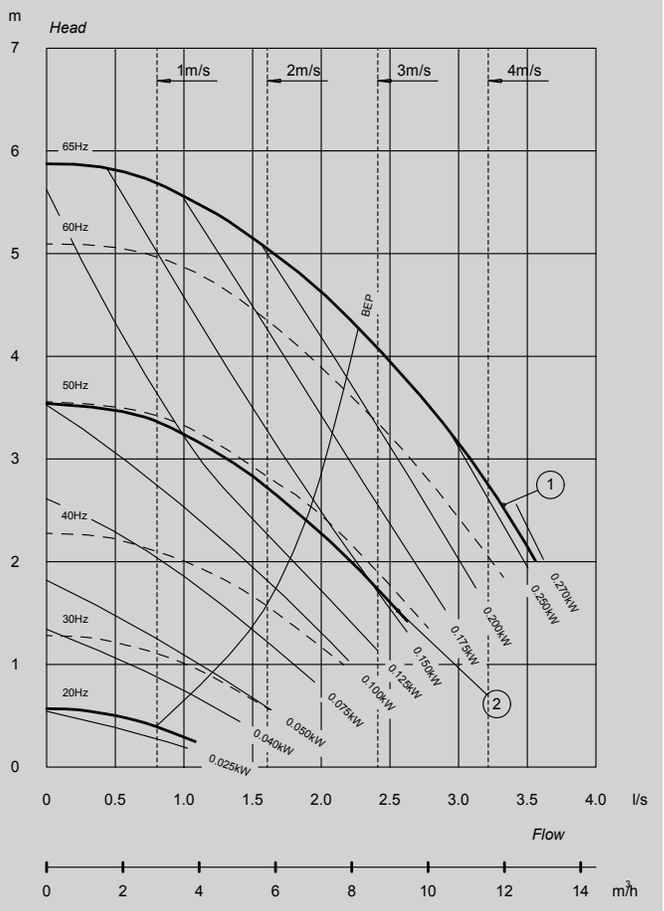


1 600-1950 r/min
20-65 Hz, Ø105

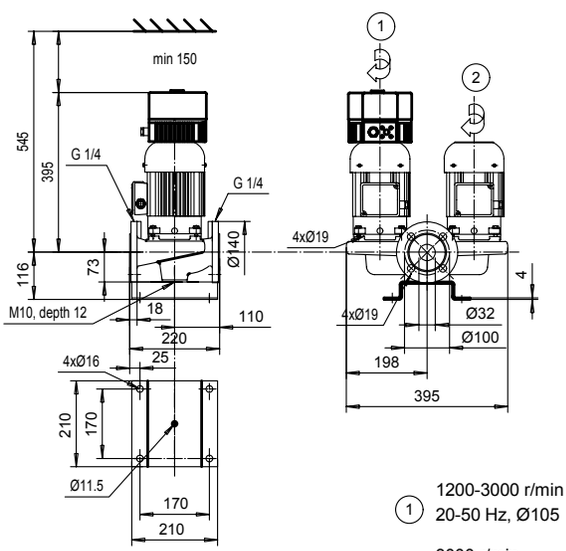
2 1500 r/min
50 Hz, Ø105

		kW	A (1~230V)	kg
1	OP-752 N12	0.2	2.1	32
	BEP = best efficiency point			

		kW	A (1~230V)
2	OP-742 N12	0.08	0.28



T_-32A/2TC_/2 DN32

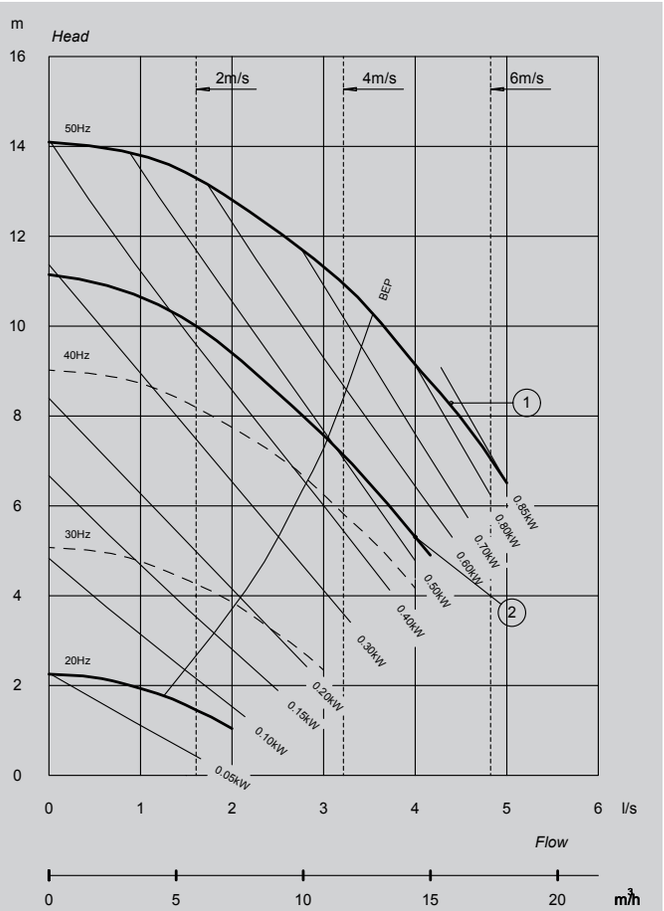


1 1200-3000 r/min
20-50 Hz, Ø105

2 3000 r/min
50 Hz, Ø90

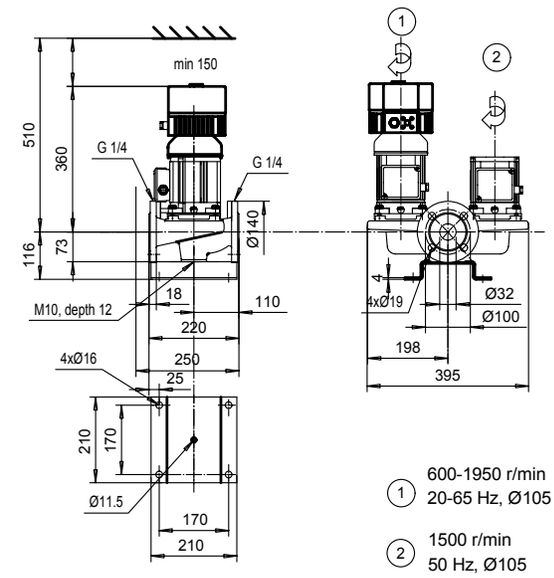
		kW	A (1~230V)	kg
1	OKN-841 D N12	0.65	5.7	40
	BEP = best efficiency point			

		kW	A (1~230V)
2	OKN-841 D N12	0.65	1.8



Technical data

T-32A/4TC_/4 DN32

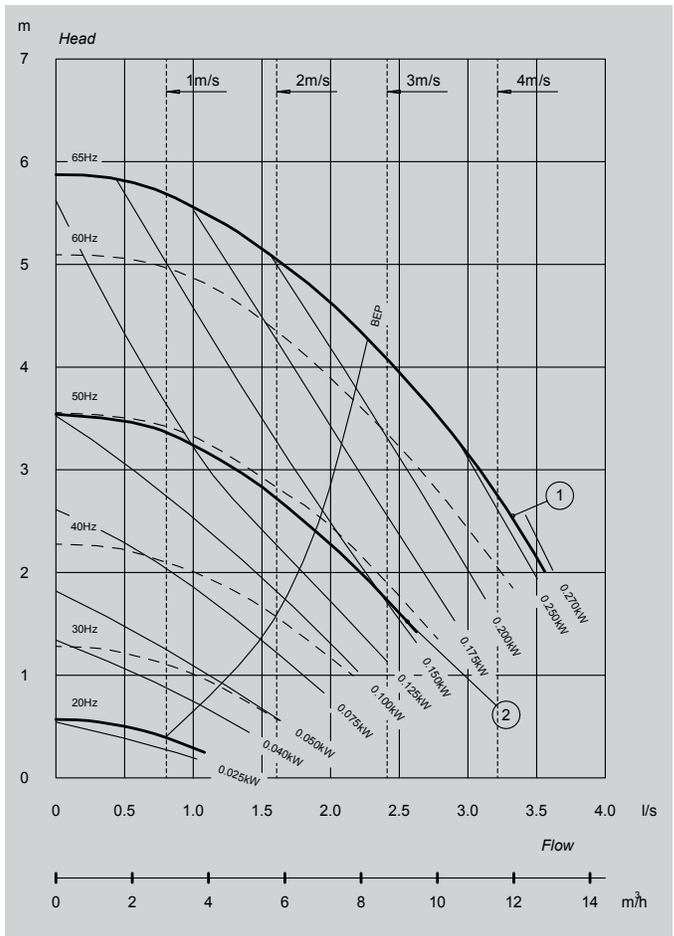


1 600-1950 r/min
20-65 Hz, Ø105

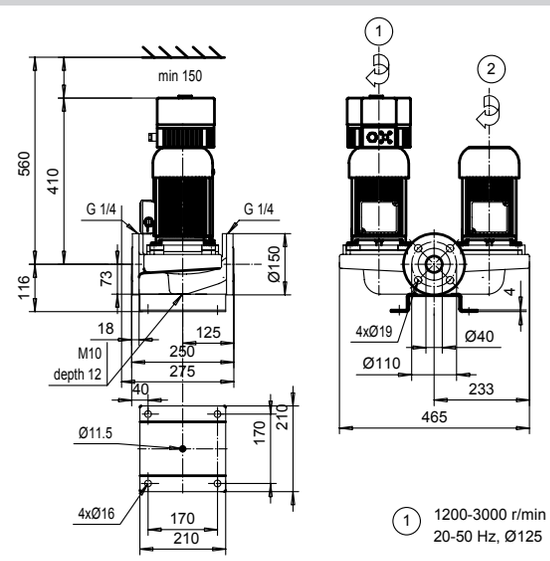
2 1500 r/min
50 Hz, Ø105

		kW	A (1~230V)	kg
1	OP-752 N12	0.2	2.1	32
BEP = best efficiency point				

		kW	A (1~230V)
2	OP-742 N12	0.08	0.28



T_-40A/2TC_/2 DN40

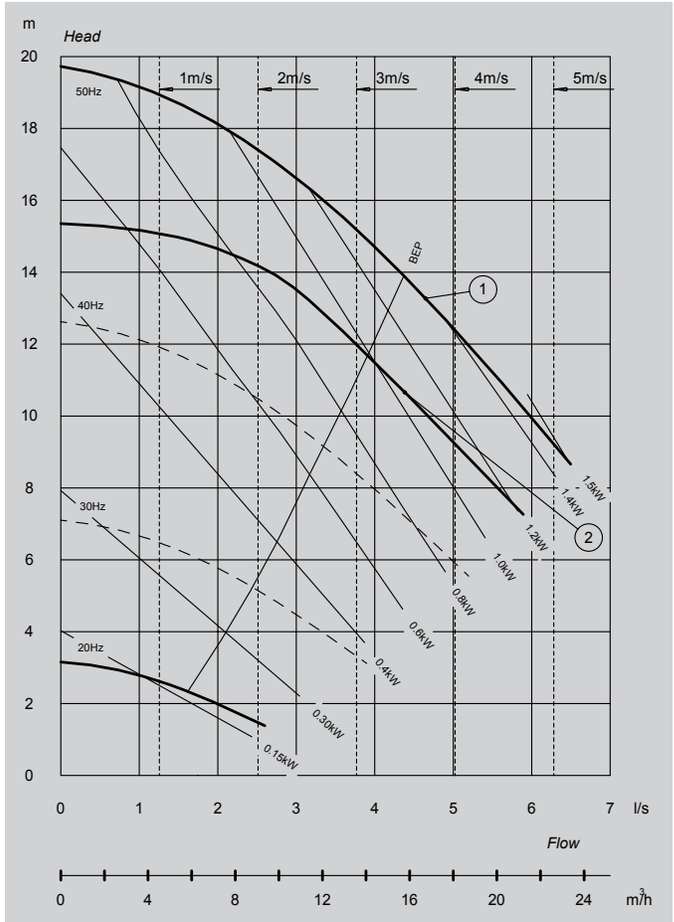


1 1200-3000 r/min
20-50 Hz, Ø125

2 3000 r/min
50Hz, Ø110

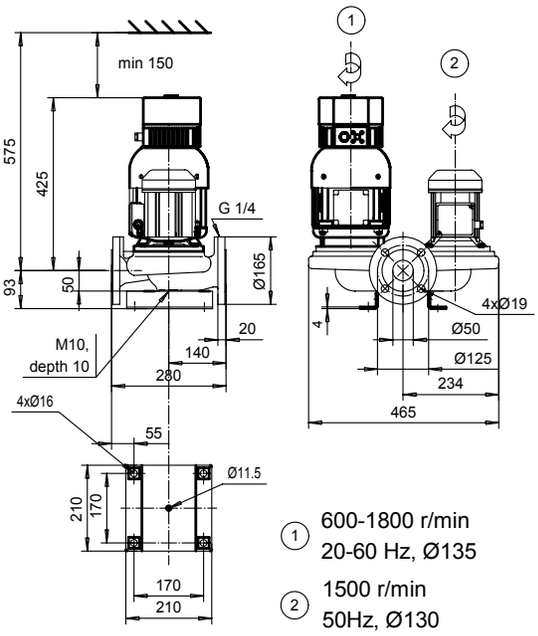
		kW	A (1~230V)	kg
1	OKN-871 D N13	1.1	8.8	51
BEP = best efficiency point				

		kW	A (1~230V)
2	OKN-871 D N13	1.1	2.8



Technical data

T_-50A/4TC4 DN50

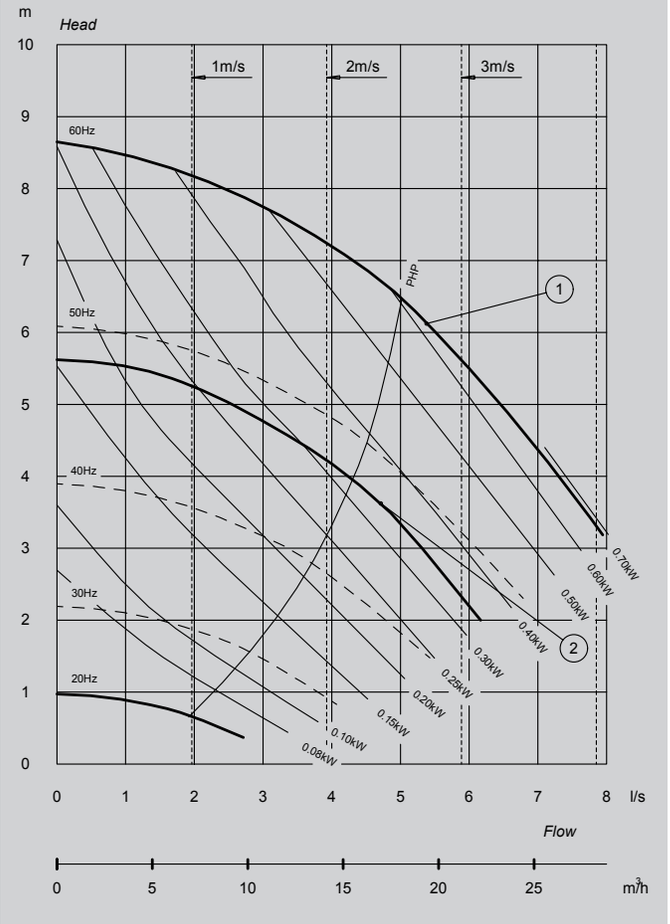


1 600-1800 r/min
20-60 Hz, Ø135

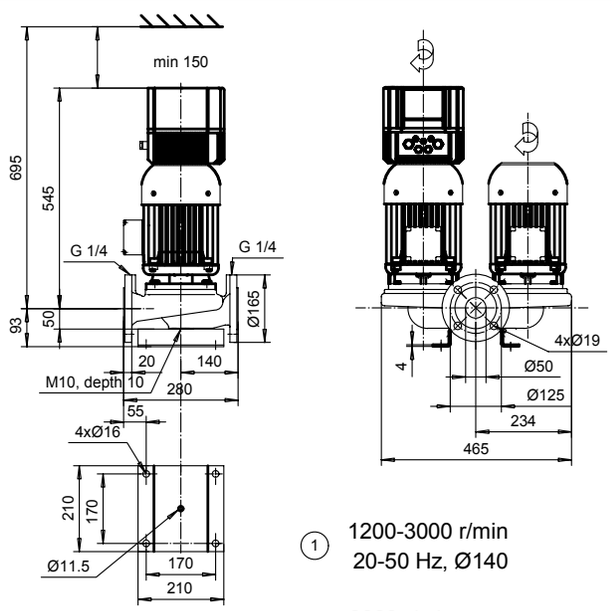
2 1500 r/min
50Hz, Ø130

		P2n kW	P1 kW	A 1~230V	kg
1	OKN-100 B2 F15	0.55	0.08 - 0.70	0.6 - 4.3	53
	PEP = best efficiency point				

		P2n kW	A
2	OP-762 F15	0.25	0.82



T_-50C/2TC_/2 DN50

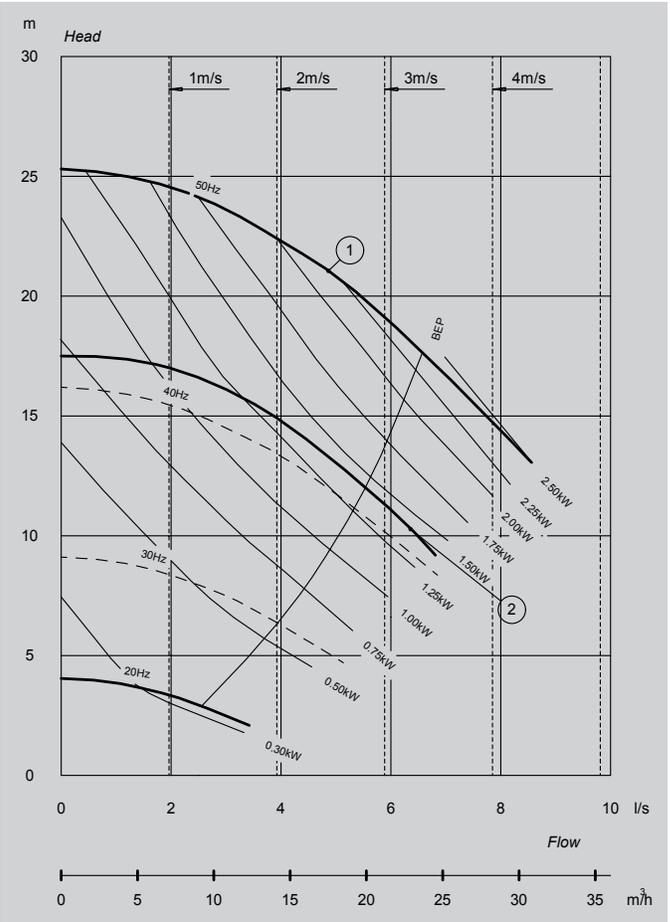


1 1200-3000 r/min
20-50 Hz, Ø140

2 3000 r/min
50 Hz, Ø120

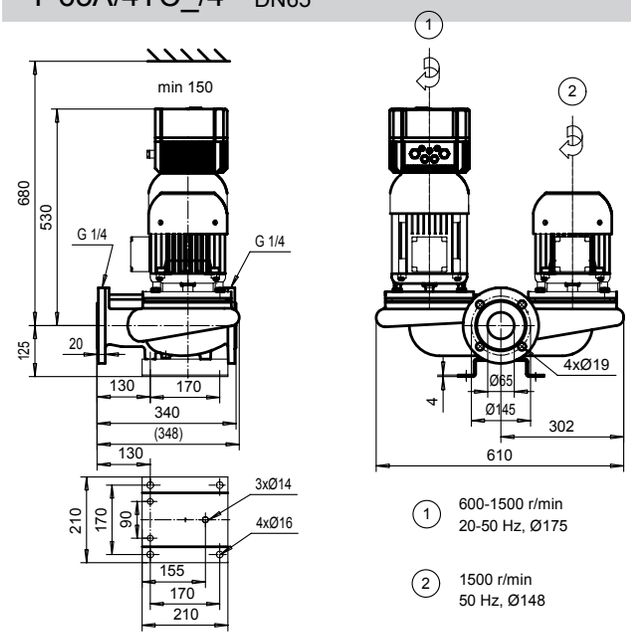
		kW	A (3~400V)	kg
1	OKN-101 D1 F16	2.2	6.0	78
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-101 C1 F16	1.5	3.3



Technical data

T-65A/4TC_/4 DN65

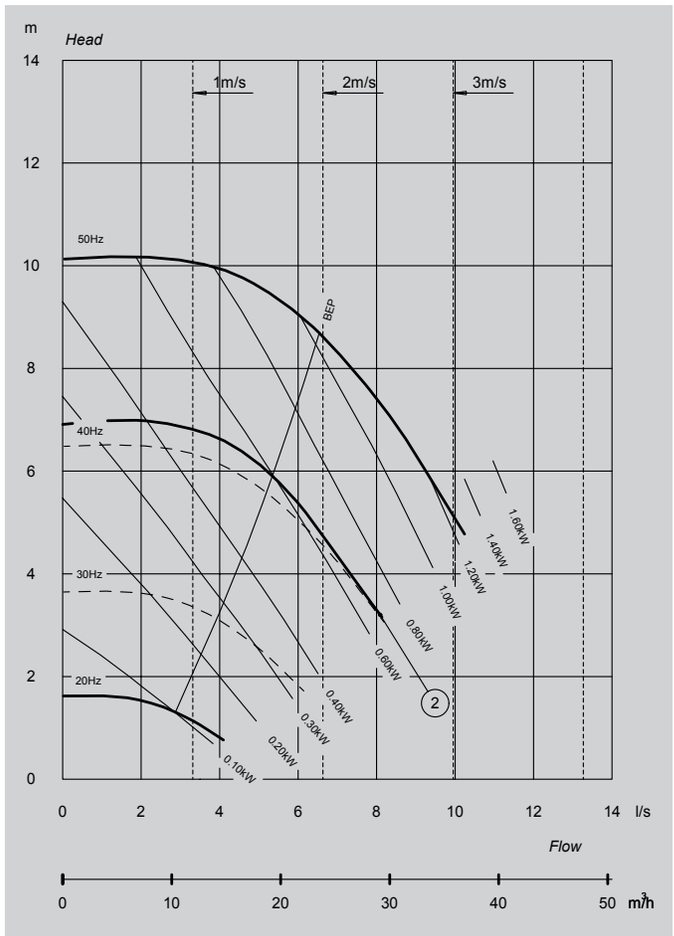


1 600-1500 r/min
20-50 Hz, Ø175

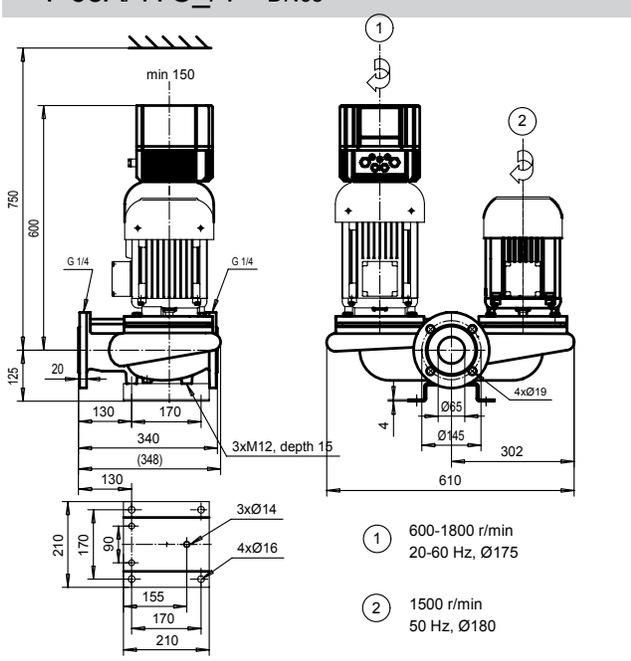
2 1500 r/min
50 Hz, Ø148

	kW	A (1~230V)	kg
1 OKN-101 C2 F19	1.5	7.0	105
BEP = best efficiency point			

	kW	A (1~230V)
2 OKN-100 B2 F19	0.55	1.4



T-65A/4TC_/4 DN65

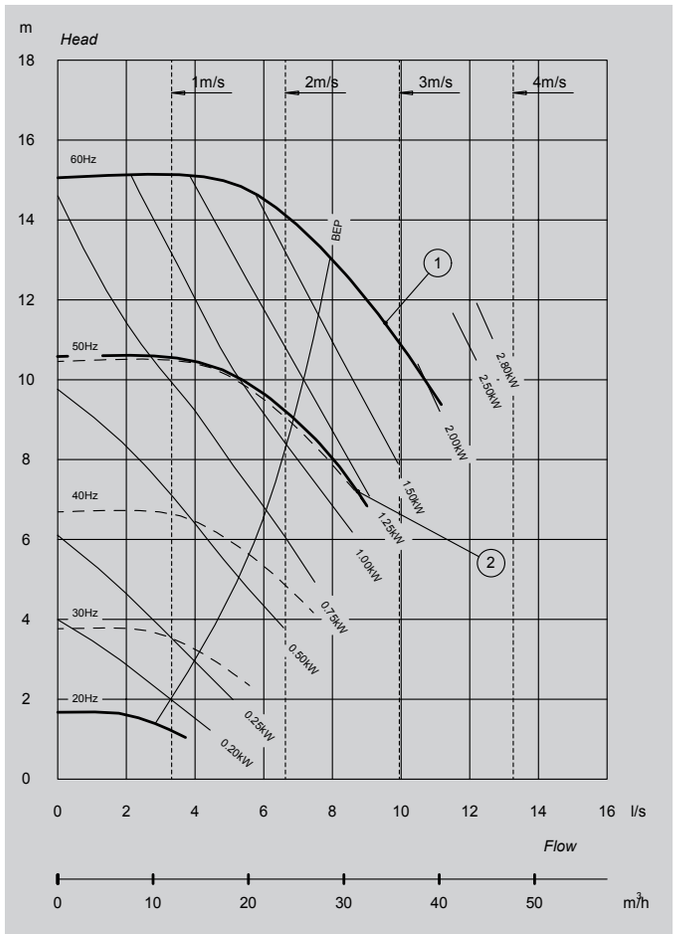


1 600-1800 r/min
20-60 Hz, Ø175

2 1500 r/min
50 Hz, Ø180

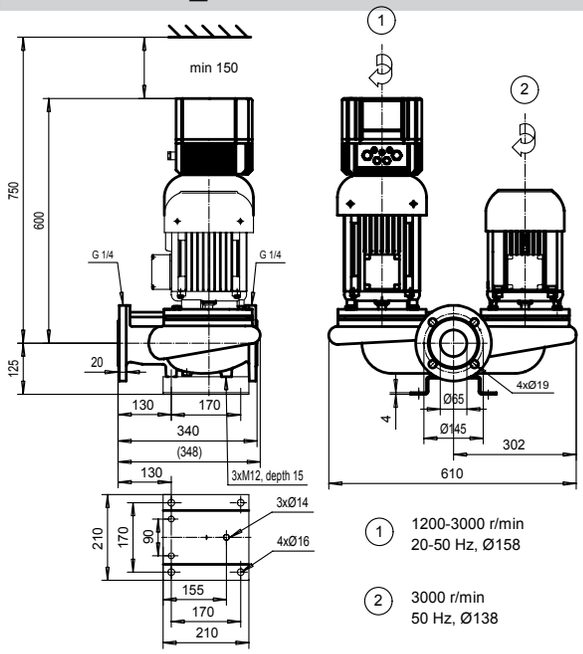
	kW	A (3~400V)	kg
1 OKN-112 C2 F19	2.2	6.0	116
BEP = best efficiency point			

	kW	A (3~400V)
2 OKN-101 C2 F19	1.1	2.6



Technical data

T-65B/2TC_/2 DN65

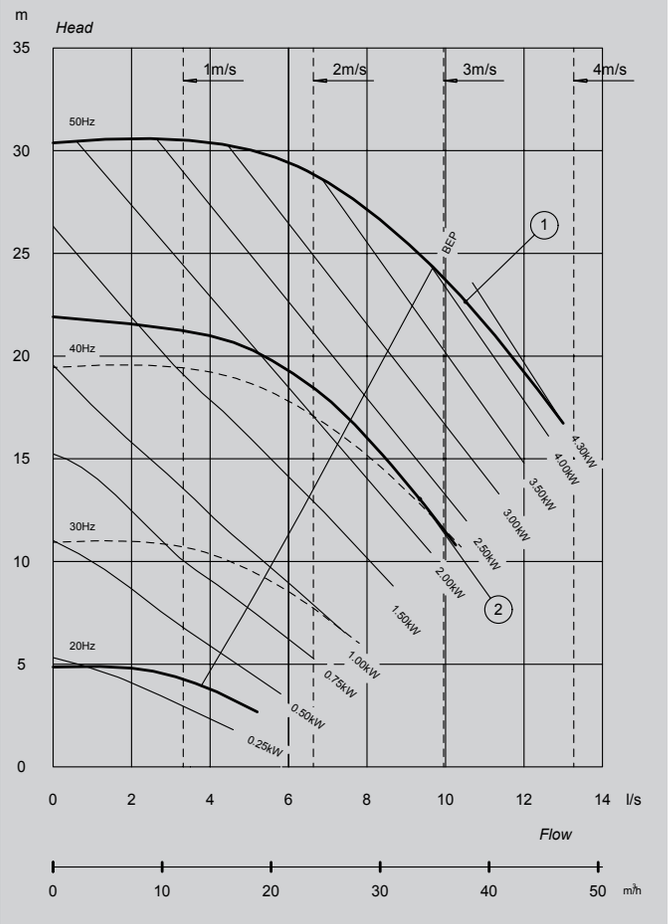


1 1200-3000 r/min
20-50 Hz, Ø158

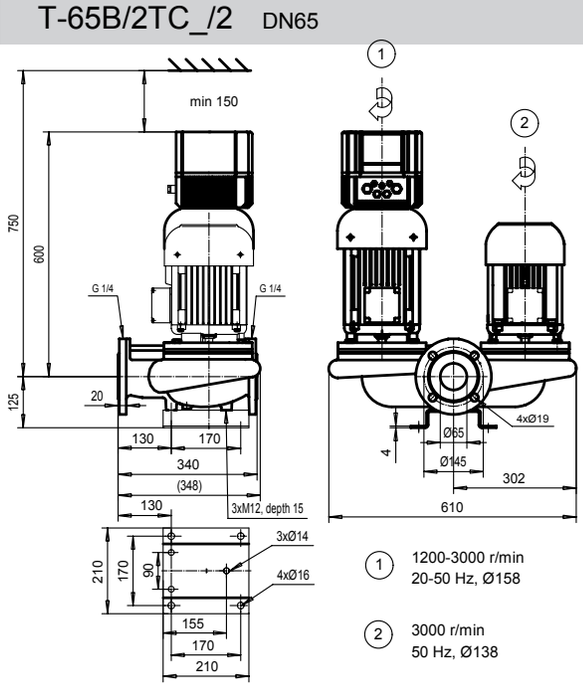
2 3000 r/min
50 Hz, Ø138

	kW	A (3~400V)	kg
1 OKN-112 E1 F19	4.0	9.0	123
BEP = best efficiency point			

	kW	A (3~400V)
2 OKN-101 D1 F19	2.2	4.7



T-65B/2TC_/2 DN65

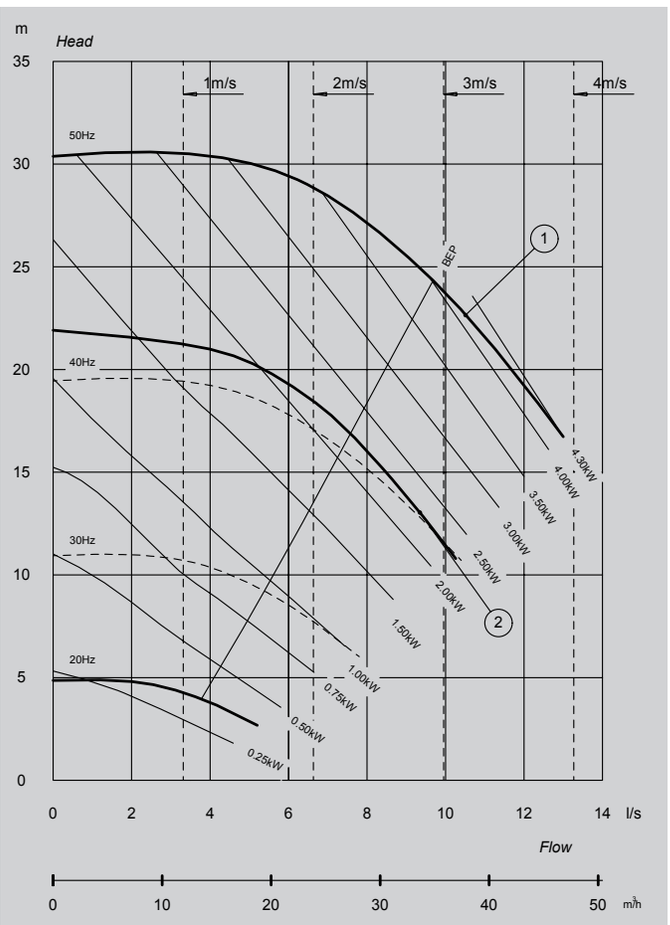


1 1200-3000 r/min
20-50 Hz, Ø158

2 3000 r/min
50 Hz, Ø138

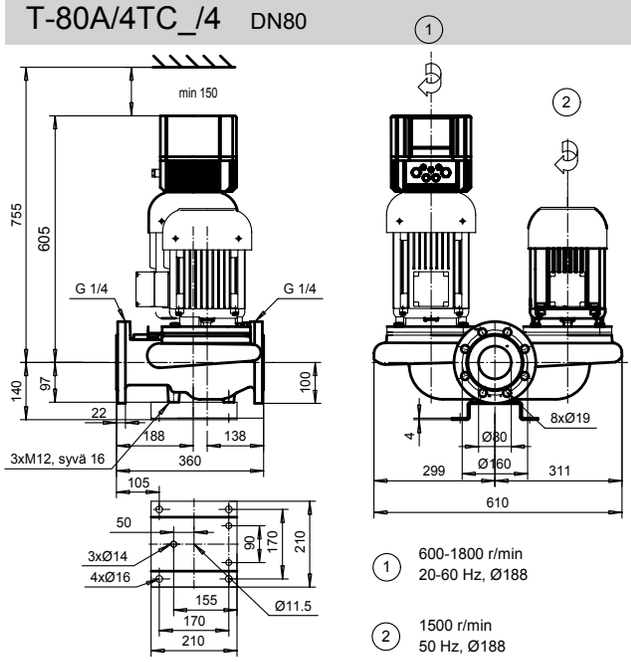
	kW	A (3~400V)	kg
1 OKN-112 E1 F19	4.0	9.0	123
BEP = best efficiency point			

	kW	A (3~400V)
2 OKN-101 D1 F19	2.2	4.7



Technical data

T-80A/4TC_/4 DN80

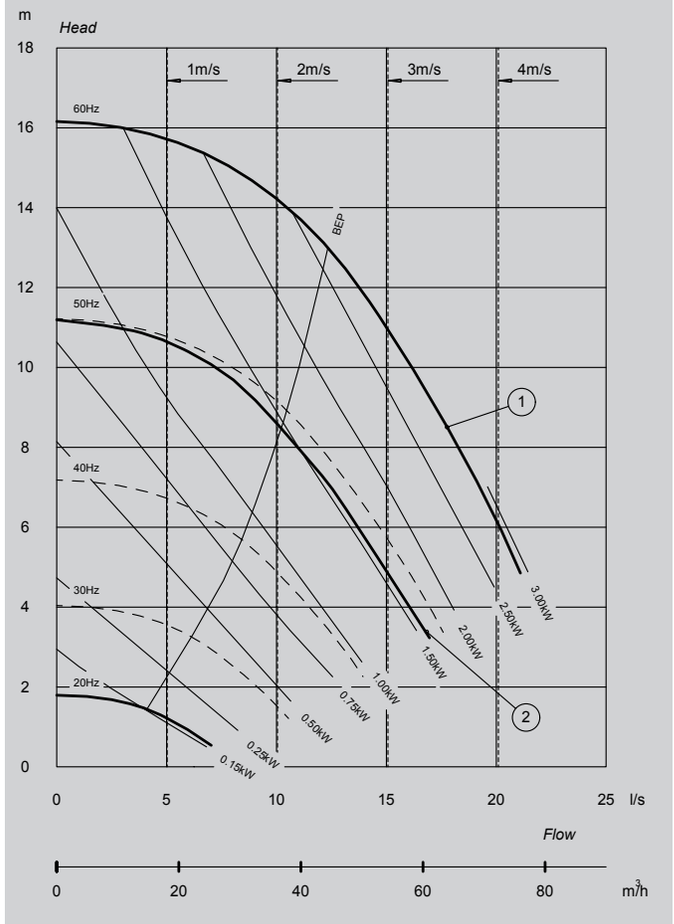


1 600-1800 r/min
20-60 Hz, Ø188

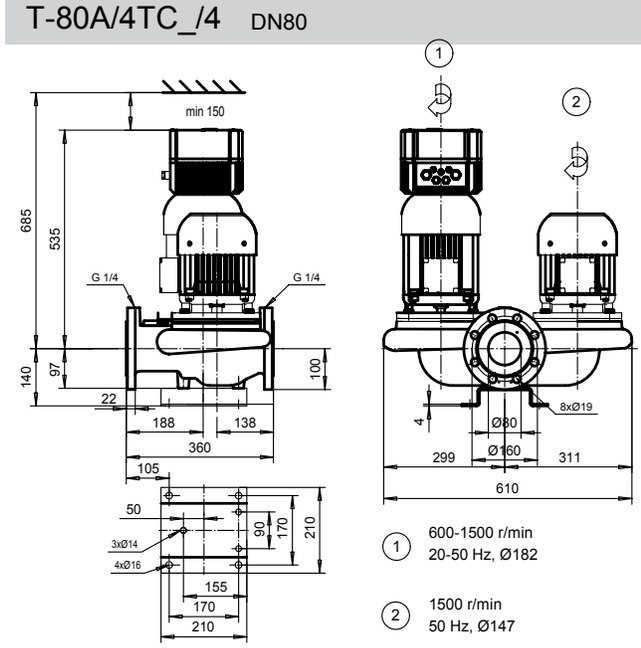
2 1500 r/min
50 Hz, Ø188

		kW	A (3~400V)	kg
1	OKN-112 E2 F19	3.0	7.7	126
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-101 D2 F19	1.5	3.5



T-80A/4TC_/4 DN80

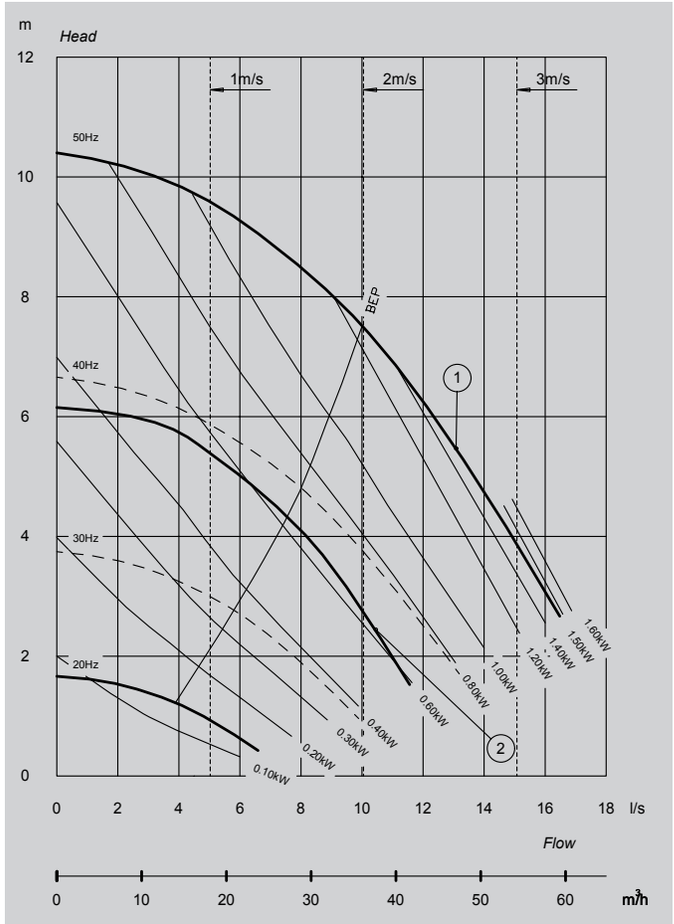


1 600-1500 r/min
20-50 Hz, Ø182

2 1500 r/min
50 Hz, Ø147

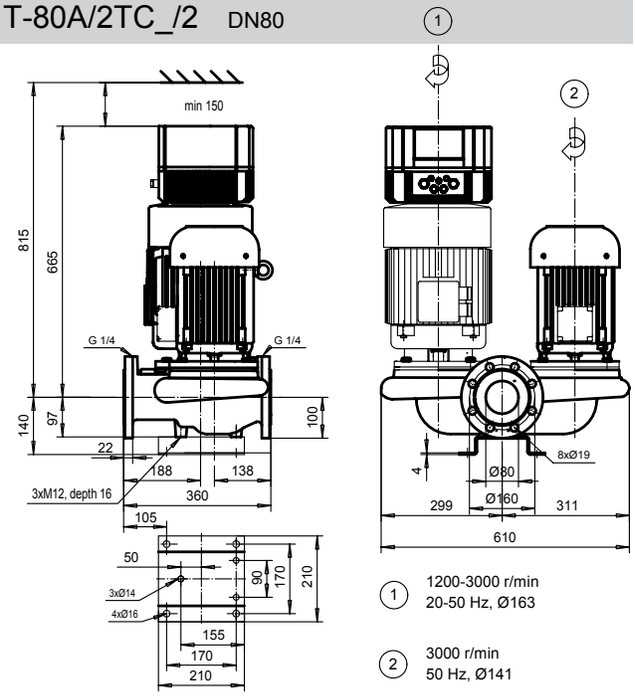
		kW	A (1~230V)	kg
1	OKN-101 C2 F19	1.5	7.0	108
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-100 B2 F19	0.55	1.4



Technical data

T-80A/2TC_/2 DN80

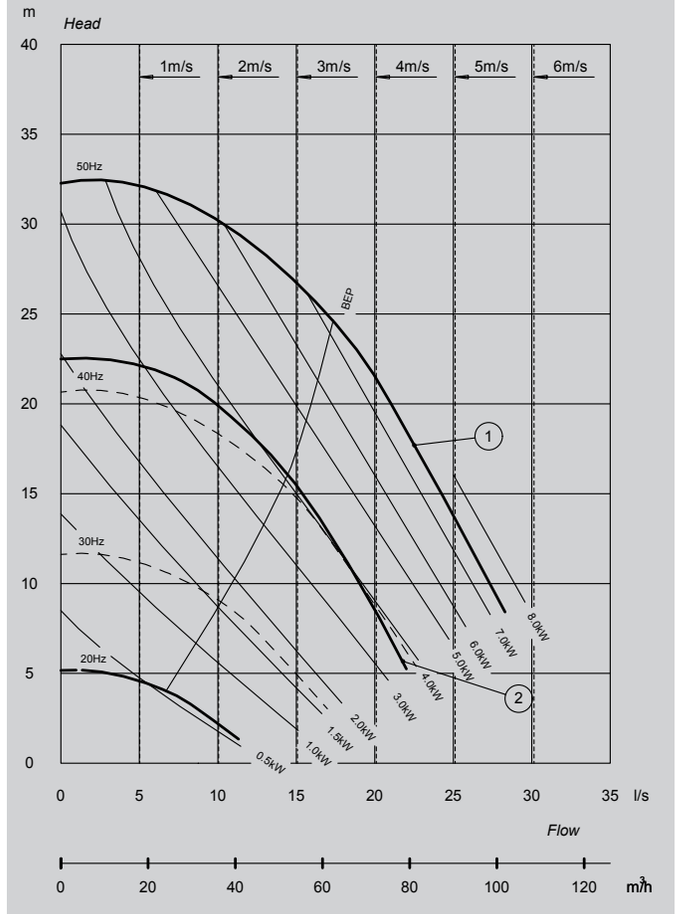


1 1200-3000 r/min
20-50 Hz, Ø163

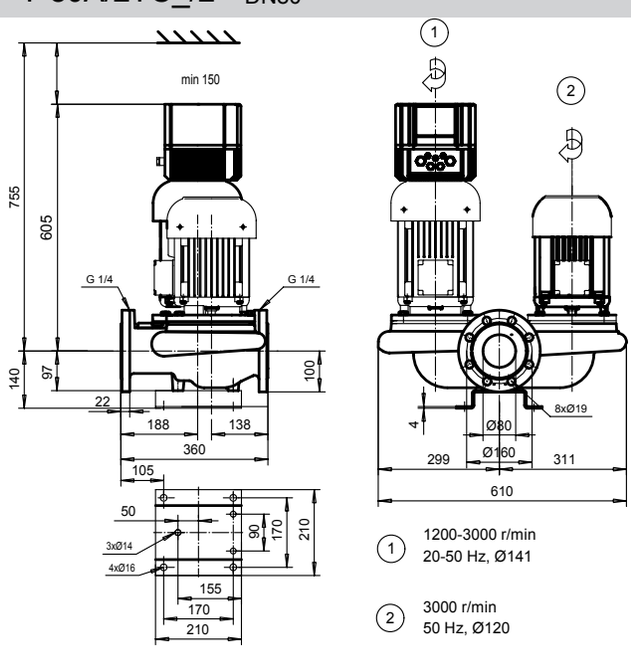
2 3000 r/min
50 Hz, Ø141

	kW	A (3~400V)	kg
1 OKN-132 E1 F19	7.5	15.8	169
BEP = best efficiency point			

	kW	A (3~400V)
2 OKN-112 E1 F19	4	8.2



T-80A/2TC_/2 DN80

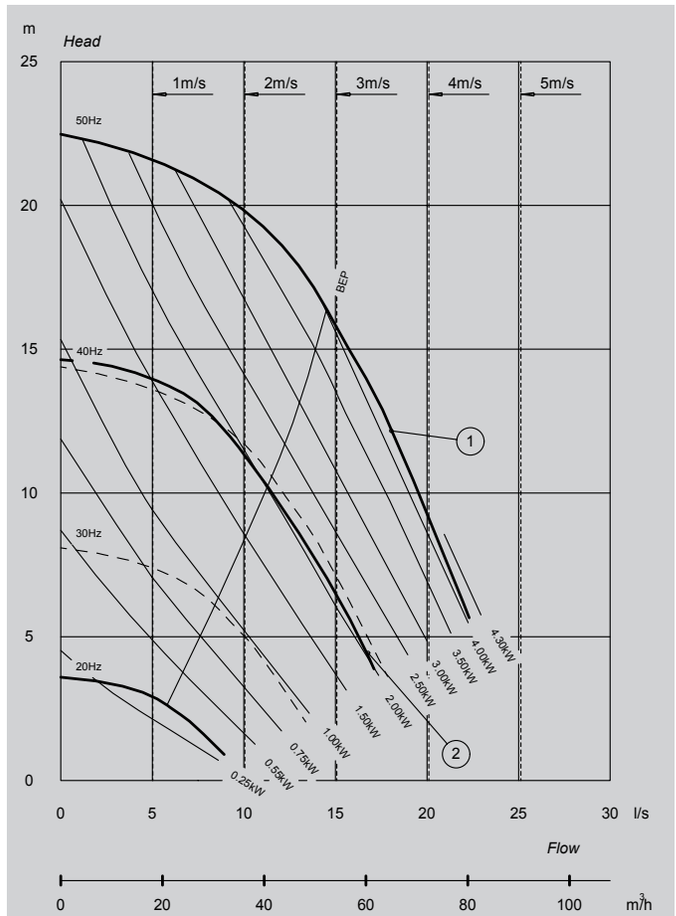


1 1200-3000 r/min
20-50 Hz, Ø141

2 3000 r/min
50 Hz, Ø120

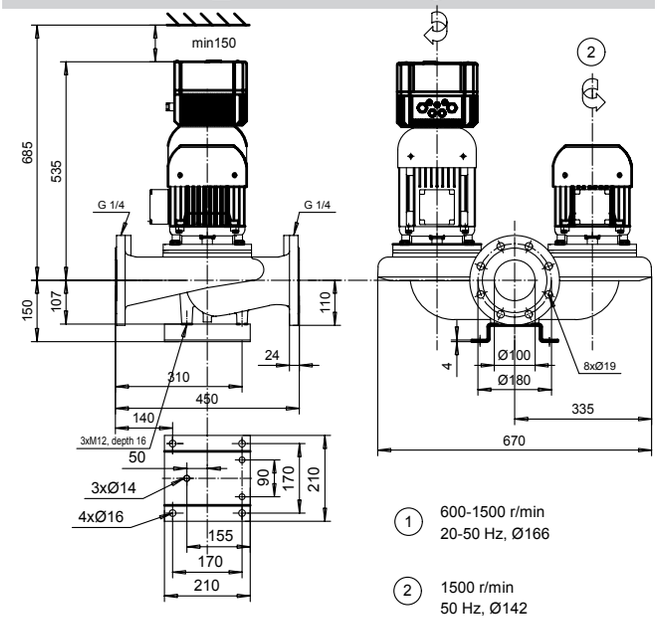
	kW	A (3~400V)	kg
1 OKN-112 E1 F19	4	9.5	126
BEP = best efficiency point			

	kW	A (3~400V)
2 OKN-101 D1 F19	2.2	4.7



Technical data

AT-1102/4TC_/4 DN100

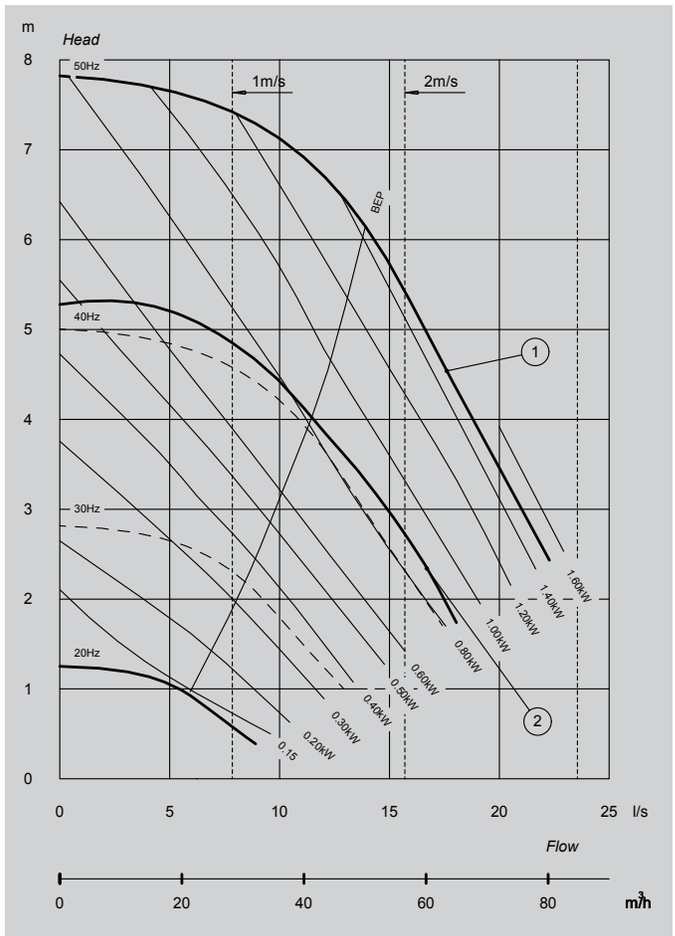


1 600-1500 r/min
20-50 Hz, Ø166

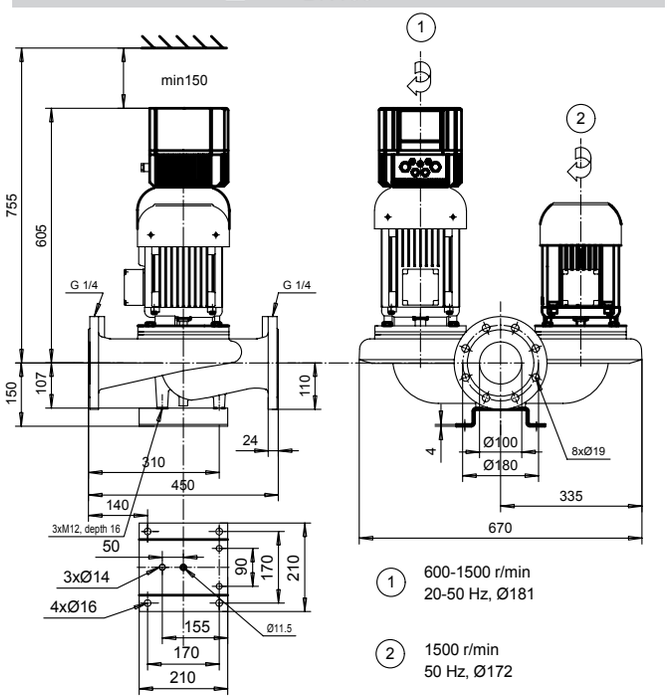
2 1500 r/min
50 Hz, Ø142

		kW	A (1~230V)	kg
1	OKN-101 D2 F19	1.5	7.0	119
	BEP = best efficiency point			

		kW	A (1~230V)
2	OKN-100 B2 F19	0.75	2.0



AT-1102/4TC_/4 DN100

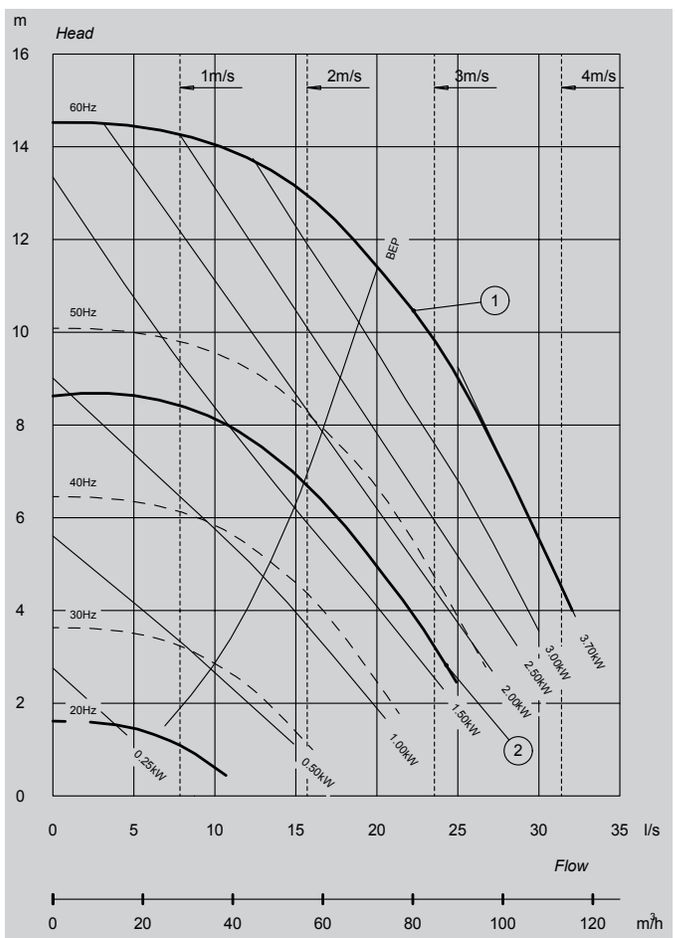


1 600-1500 r/min
20-50 Hz, Ø181

2 1500 r/min
50 Hz, Ø172

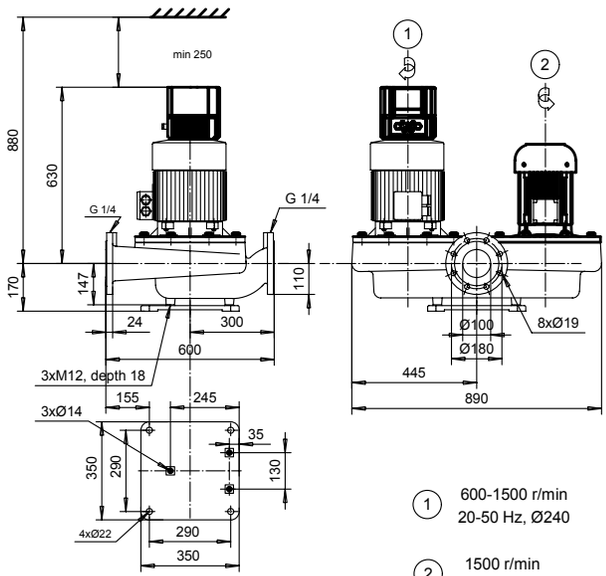
		kW	A (3~400V)	kg
1	OKN-112 E2 F19	3.0	7.7	148
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-101 D2 F19	1.5	3.5



Technical data

AT-1106/4TC_/4 DN100

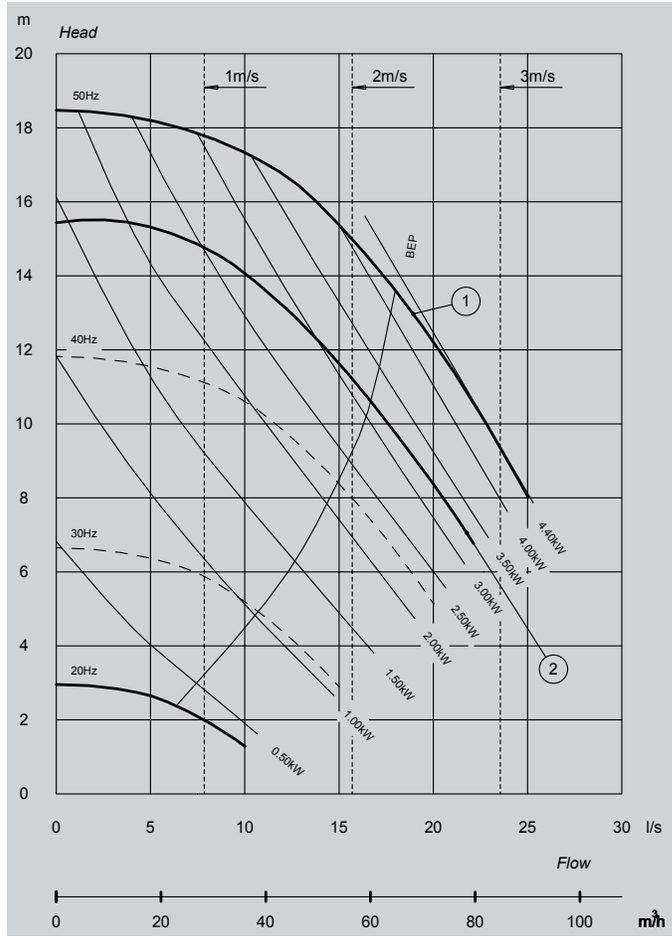


1 600-1500 r/min
20-50 Hz, Ø240

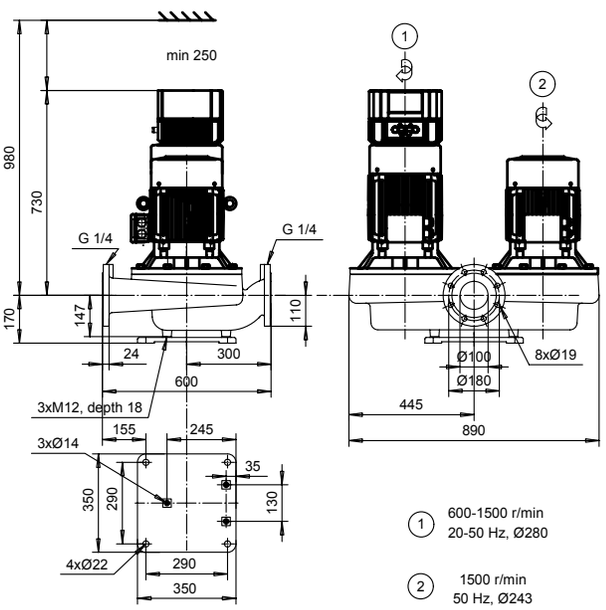
2 1500 r/min
50 Hz, Ø222

		kW	A (3~400V)	kg
1	OKN-132 C2 BF31	4.0	9.5	305
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-112 E2 F31	3	6.6



AT-1106/4TC_/4 DN100

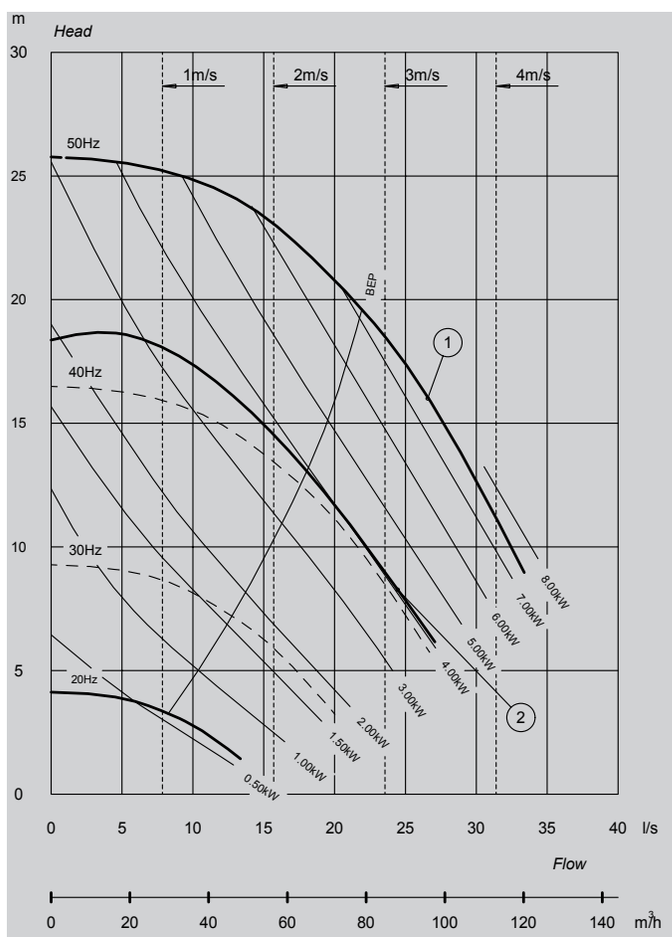


1 600-1500 r/min
20-50 Hz, Ø280

2 1500 r/min
50 Hz, Ø243

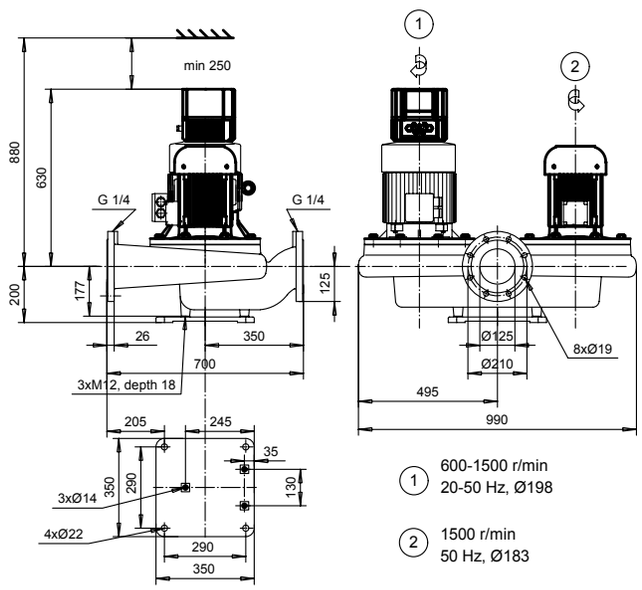
		kW	A (3~400V)	kg
1	OKN-133 G2 BF31	7.5	15.8	345
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-132 C2 BF31	4	8.7



Technical data

AT-1129/4TC_/4 DN125

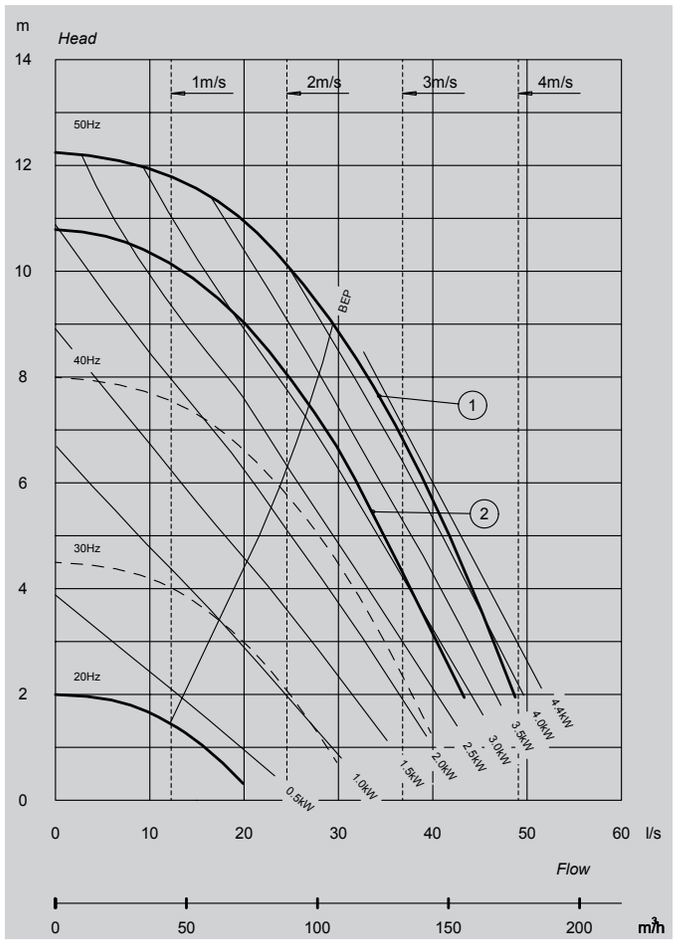


1 600-1500 r/min
20-50 Hz, Ø198

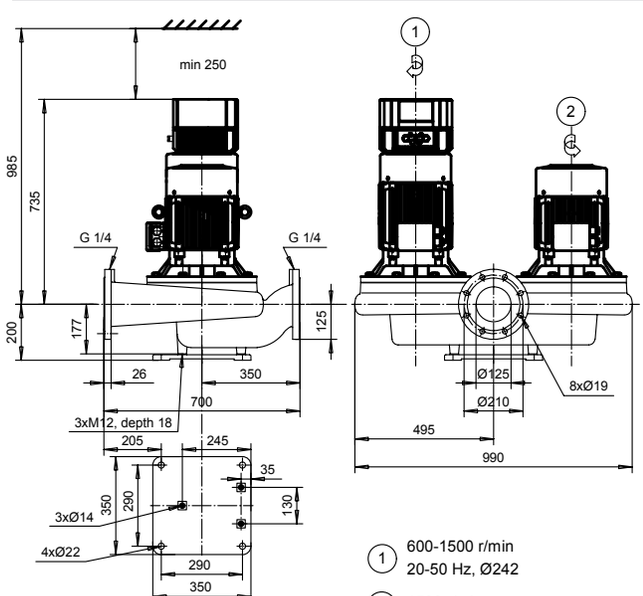
2 1500 r/min
50 Hz, Ø183

		kW	A (3~400V)	kg
1	OKN-132 C2 BF31	4.0	9.5	335
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-112 E2 F31	3	6.6



AT-1129/4TC_/4 DN125

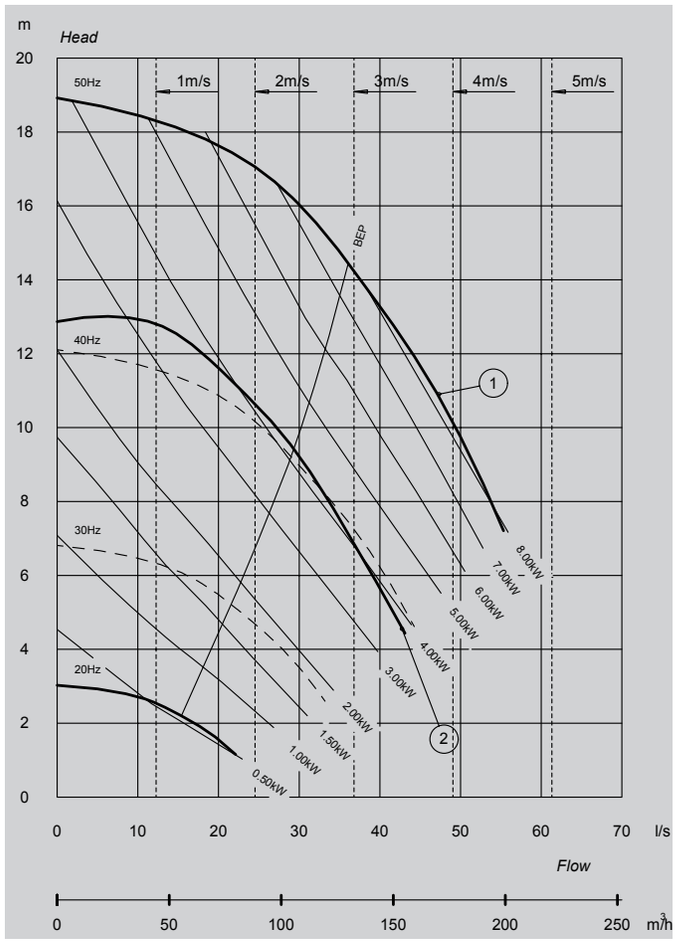


1 600-1500 r/min
20-50 Hz, Ø242

2 1500 r/min
50 Hz, Ø200

		kW	A (3~400V)	kg
1	OKN-133 G2 BF31	7.5	15.8	378
	BEP = best efficiency point			

		kW	A (3~400V)
2	OKN-132 C2 BF31	4	8.7



KOLMEKS

PUMP SERVICE

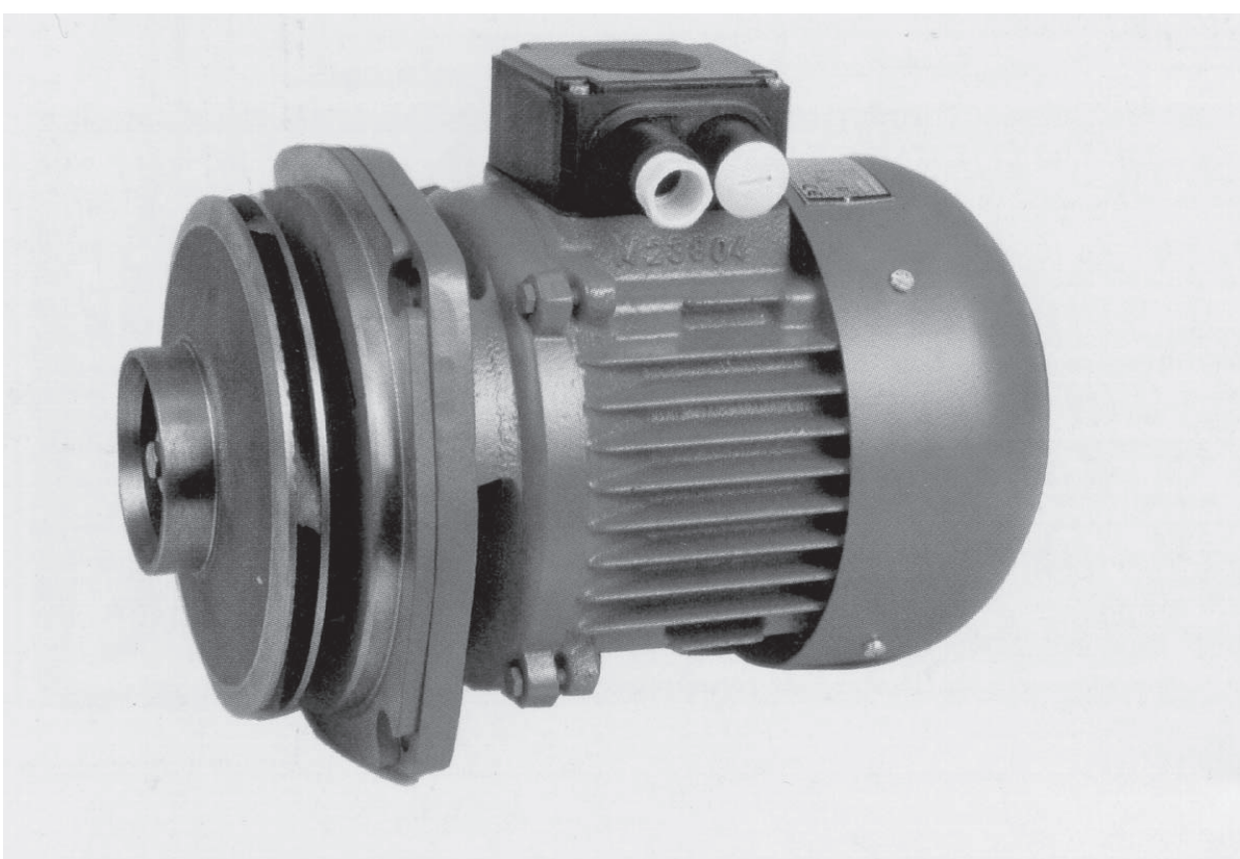
General features

The Kolmeks pumps do not require regular maintenance, nevertheless they need regular operational control. The needed maintenance and repairs depend on the type of application and the cleanness of the pumped medium. The mechanical shaft seal is a wearing part, which can be changed in case of leakage. Small leakage e.g. some drops per hour is allowed, especially when pumping water-clygol mixtures.

The bearings of the motor are lubricated for the whole life-time, which is several years in continuous operation. The change of bearings requires special tools and instructions together with special silent-running bearings. We recommend to change the whole pump head or the electric motor in case of the electrical or mechanical failure of the motor.

Exchange motor unit

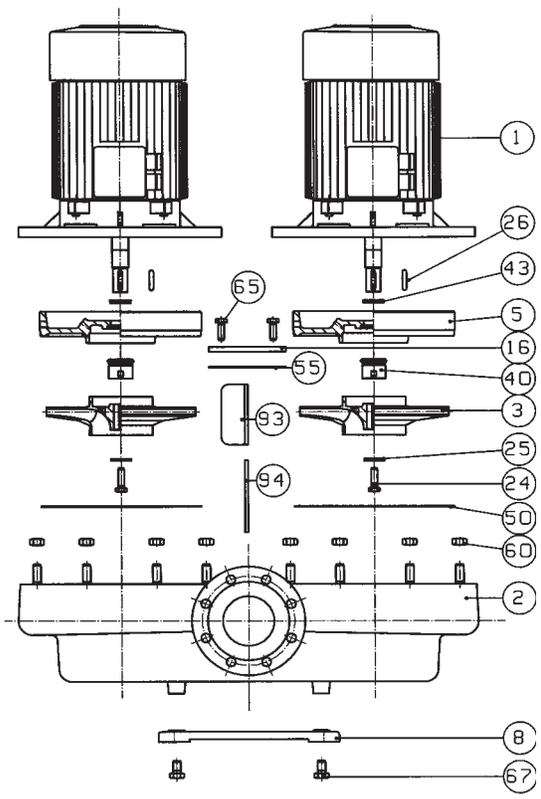
The exchange motor unit (internal, drive unit, rotating parts, exchange pump head) includes the electric motor, sealing flange, impeller and all seals. Please pay attention to the direction of the rotation mentioned in the pump label especially when there is a twin pump in concern.
The failure of electric motor or leakage of mechanical seal can be easily overhauled with the exchange pump head because pump housing remains connected in the pipe line and the shut down time is therefore very short.

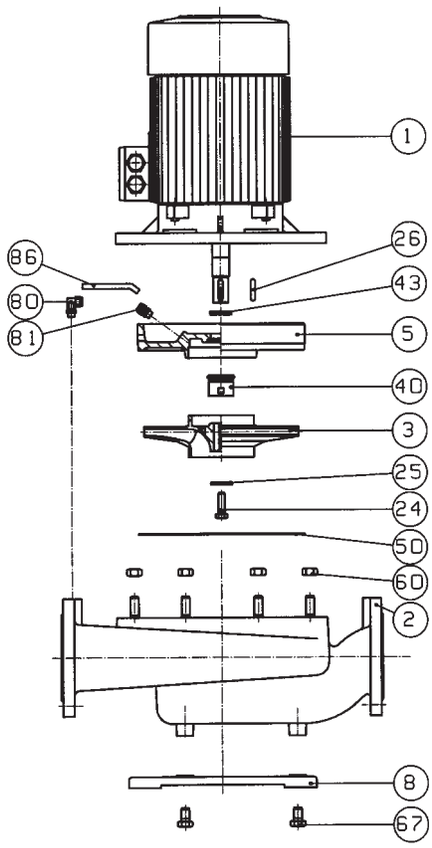


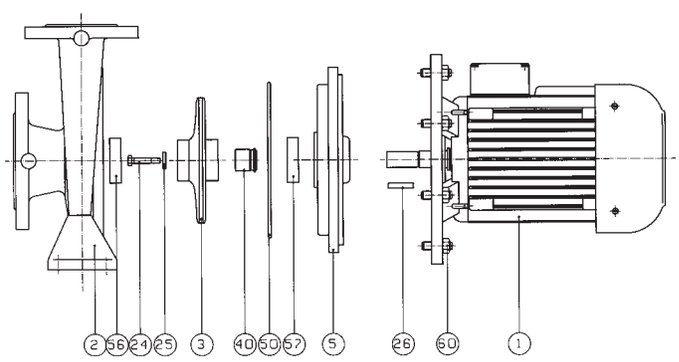
Spares

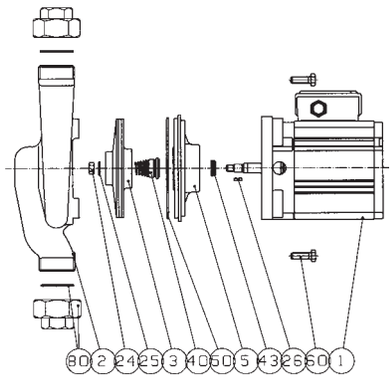
The spares available for KOLMEKS pumps are specified as follows

No.	NAME	No.	NAME
1	Electric motor	**55**	Gasket (AT- ja T-range)
2	Pump housing	**56/57**	Wear ring (N-range)
3	Impeller	**60**	Nut / Screw
5	Sealing flange	**65**	Screw (AT- ja T-range)
8	Base plate	**67**	Screw
16	Cover	**80**	Pipe joint (AMK-25, AHV-25, AE-26, -33, AP -33)
24	Nut / Screw	**81**	Pipe joint (ALH-range)
25	Washer	**86**	Pipe (ALH-range)
26	Key	**93**	Flap device (AT- ja T-range)
40	Mechanical seal	**94**	Pin (AT- ja T-range)
50	O-ring / Gasket	**xx**	Blind service cover









CHANGING THE MOTOR UNIT

Small pumps 1,5 kW or less

1) Stop the pump, open the main switch and take fuses away. Shut the valves.

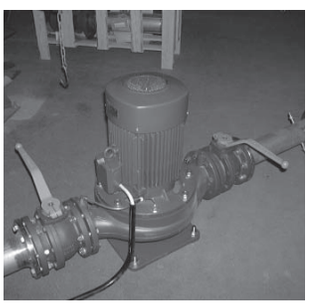
2) Disconnect the electric cable from terminal box. Open the screws/nuts of the connection flange.

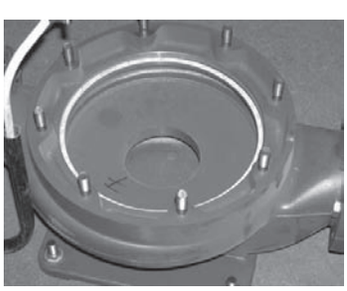
3) Lift the motor unit from the pump housing.

4) Change the O-ring or gasket on the housing.

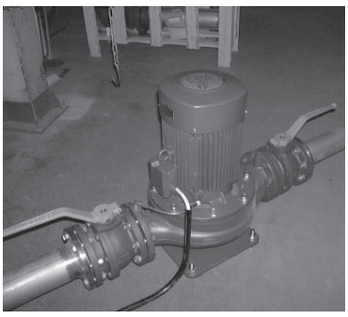
5) Mount the new motor unit. Tighten the screws/nuts

Larger pumps above 1,5 kW



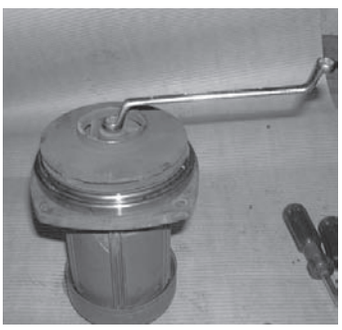


6) Connect the electric cable and open the valves. Start the pump and control the direction of rotation. Note the possible difference on twin pumps. Check the function of the pump.

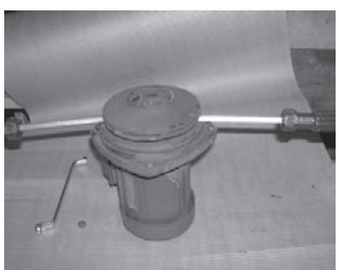


CHANGING THE IMPELLER
when the motor unit is dismounted

1) Put the pump head vertical on it´s fan cover.



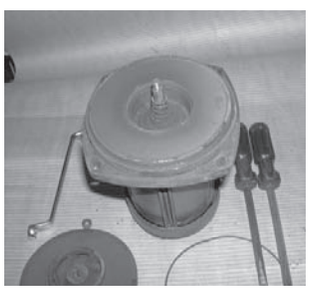
2) Open the nut or screw of the impeller.



3) Use screw drivers to pull the impeller from the shaft.

4) You may have to use special tools to pull out the impeller.

5) Change the shaft seal when needed, see next pages.

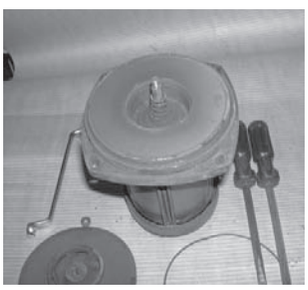


6) Mount the impeller. Use rubber hammer to get the impeller against to the shoulder on the shaft. Tighten the screw/nut.

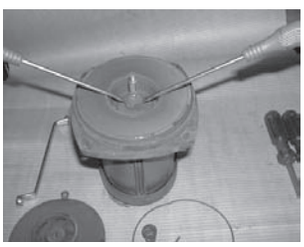
CHANGING THE MECHANICAL SHAFT SEAL

Dismounting the seal

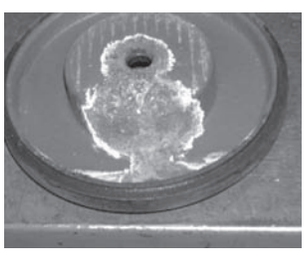
Read the instructions for change the pump head and change the impeller before you follow these instructions.



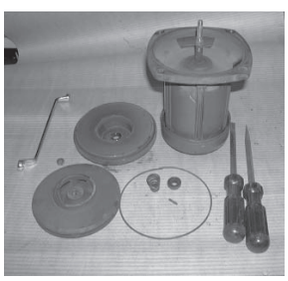
Pump head without impeller as the start position.



1) Dismount the shaft seal with two screw drivers. Do not damage the shaft.



2) Dismantle the sealing flange from the motor bracket. Replace with new when necessary.



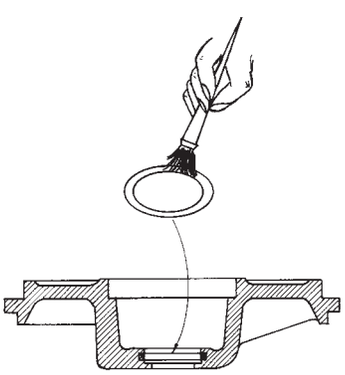
3) The pump head (exchange unit, internal) disassembled together with required tools.

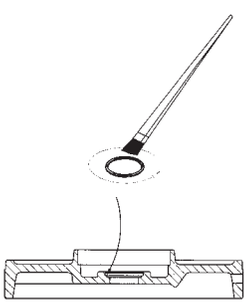
Mounting the seal

Lubrication and mounting of O-ring

N.B.! Please do not touch the parts of the seal if not necessary. Use only clean hands. Check the correct seal size and other information before opening the package.

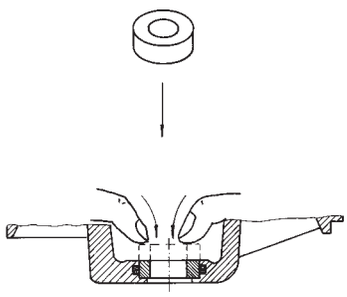
Clean the sealing flange boring and groove for O-ring. Check and lubricate the O-ring, use soft hand soap and water, or clycerine. Set the ring into the groove in the sealing flange (or in the BO and BP types on the counter ring).

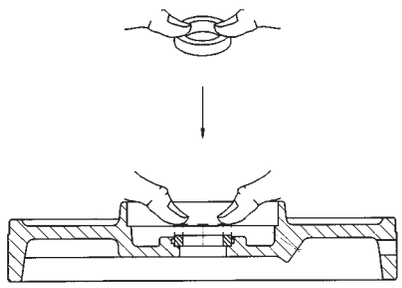




Fitting the seat into the sealing flange

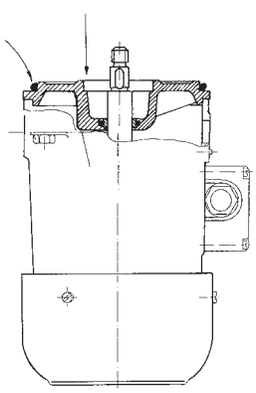
Remove the protective packaging from the seat, check for any damage and wipe clean. Fit the seat into the sealing flange, smoother surface on the top (to the pump). Ensure that the O-ring is in position and will not be displaced during fitting. Using more lubrication on the O-ring it will be easier to fit the seat. Wipe the surface clean again after succesful fitting. Please note that by types BO and BP the sealing flange should be mounted first on the motor.

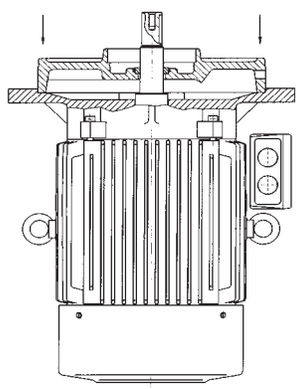




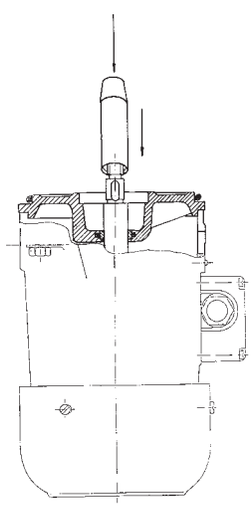
Mounting of the sealing flange

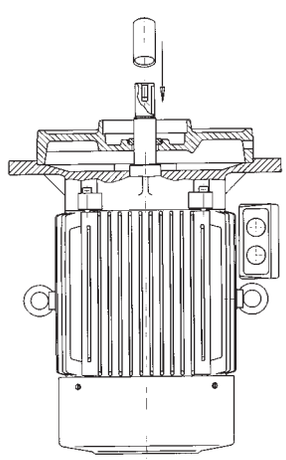
Set the sealing flange on the motor





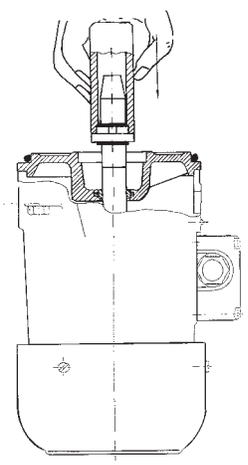
and place the fitting tool on to the shaft.

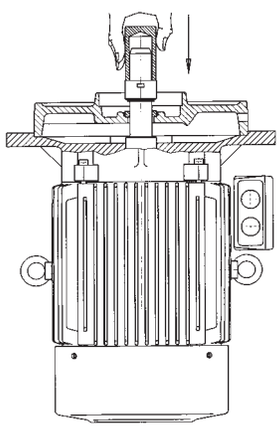




Fitting the seal unit

Check the seal body, bellows and face for any damages, wipe clean. Clean the shaft and lightly lubricate the shaft and the neck of the bellows. Use soft hand soap and water.
Take the separate spring away if needed. Carefully slide using the tool the seal unit along the shaft so that sealing surfaces; the face and the seat are in proper contact. Avoid too heavy forces. Some seal units are to be fitted in parts, first the face and then the seal body and bellows. Wipe the seal clean. Do not touch to the sealing surface!

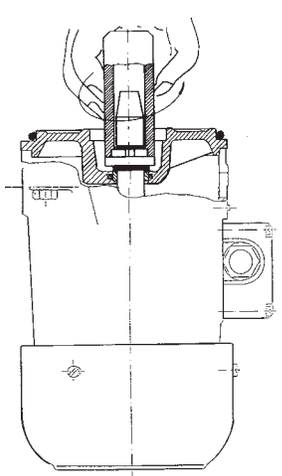


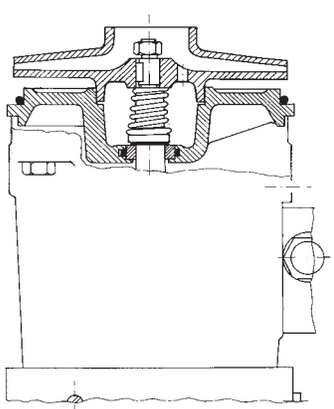


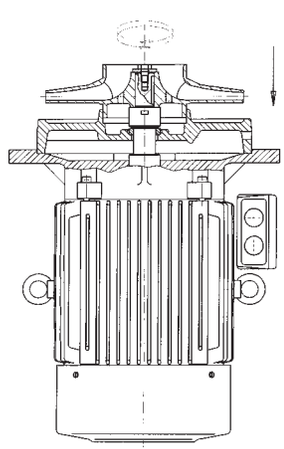
Mounting the impeller

Rotate the shaft lightly and ensure that the seal is perfectly located. Mount the spring and backing plate (if separate) before setting the impeller on the shaft.

DO NOT LET THE PUMP RUN DRY!







Other repairs require more expertice on the electric motors and should be carried out in the workshop with necessary tools and instruments. In the most cases the best solution is to use the electric motor or even the whole pump head as a spare.
Please note: warranty does not cover the damages caused by false connection to the mains.

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