KOLMEKS

PUMP CATALOGUE

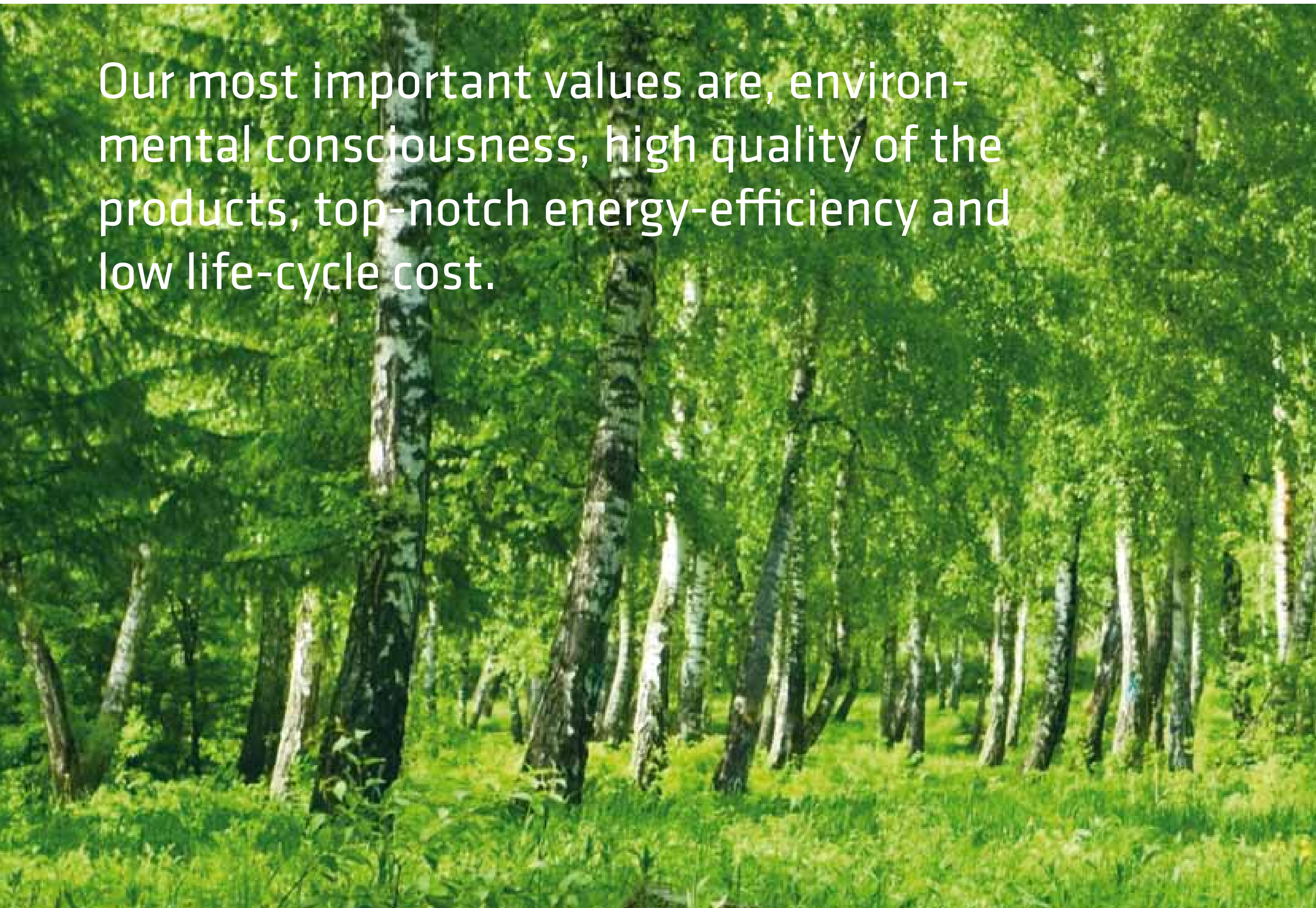
Kolmeks Ltd is a Finnish pump and electric motor manufacturer and part of the privately owned Brandt Group. It is one of the most successful companies in the pump business in Finland, operating in three main business areas; pumps, electric motors and HVAC systems. Kolmeks specializes in centrifugal pumps for application in heating and air-conditioning. In addition, Kolmeks' products are used in district heating plants as well as in district heating primary circulation systems.

Kolmeks – Efficient reliability

In industry, the pumps are typically used in the pulp, paper and chemical industries as well as in other process industries. Notably, the major part of Finnish spas and swimming halls are equipped with Kolmeks' bronze pumps suitable for chlorinated water.

The pumps and their motors are designed and manufactured in Finland and they meet the demands of the Eco Design directive in force as from 2013.

Kolmeks was also among the first Finnish companies to have received the ISO 9001 quality certificate and the ISO 14001 environmental certificate.



Our most important values are, environmental consciousness, high quality of the products, top-notch energy-efficiency and low life-cycle cost.

Pump ranges

Kolmeks has two ranges of pumps with integrated frequency control; the SC- and TC-ranges. The smallest pump with integrated frequency control is 0,08 kW, the largest 22 kW. In addition all of the pumps are suited for control by external frequency control.

Kolmeks pumps are available in four different materials; grey cast iron, nodular cast iron, bronze and stainless steel casting. The pumps are also available with several different shaft sealing solutions – which makes them suitable for numerous pumping applications.

Finnish internationalism

In Finland, the market share of Kolmeks is, obviously, very large. A large part, however, of Kolmeks' pumps end up to be exported, to all major European countries, including Russia. More and more Kolmeks products are also being exported to Middle-Eastern, Asian and African countries.

Ask us about our products and services! We will be more than happy to provide you with solutions

www.kolmeks.com

KOLMEKS
EFFICIENT RELIABILITY

DOMESTIC HOT WATER PUMPS, INLINE CENTRIFUGAL PUMPS WITH INTEGRATED SC FREQUENCY CONVERTER, 1x230V

AEP-series, threaded G1-G1 ¼

LP-, ALP-series, flanged DN50-DN100

www.kolmeks.com

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General technical data

AEP, LP and ALP pumps are bronze domestic hot water pumps equipped with an integrated frequency converter according to the SCA version.

Other versions are also available if needed, see Frequency converter pumps SC series in this product catalogue.

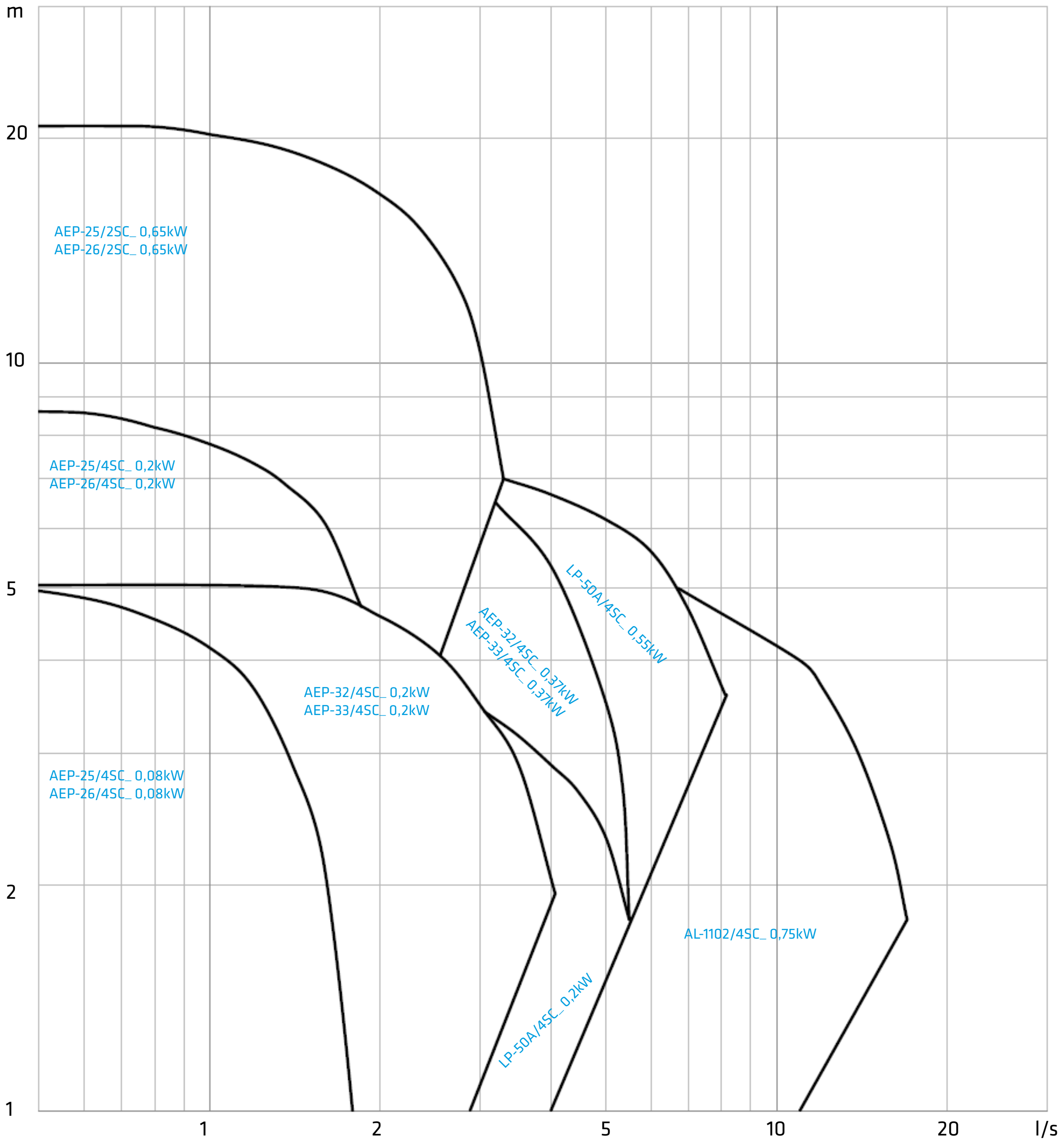
•AEP pumps are equipped with threads – G 1 ¼
•LP and ALP pumps are equipped flanges DN50 ... DN100

Applications

These bronze pumps are mainly used for the circulation of domestic hot water.

They can also be used in standard circulation systems, as pressure boosters and as transfer pumps for various clean oxygen-rich liquids.

Quick Selection Chart



Structure

Pump
SCA domestic hot water pumps are centrifugal pumps equipped with a dry motor suitable for horizontal or vertical pipe installation. The impeller is installed directly onto the shaft of the electric motor (no separate couplings). A frequency converter is integrated into the pump motor.

Electric motor
The electric motor is a three-phase Kolmeks asynchronous motor designed for pump and frequency converter operation, which guarantees high starting torque and low energy consumption. The electric motor is highly efficient and has low noise levels.

Supply voltage:	1 x 230 V, 50 Hz
Enclosure class:	IP 54
Insulating class:	F
Duty type:	Continuous duty (S1)
Ambient temperature:	0 ... +40°C (max. +35°C diurnal average)

Connection types

Threaded:
The SC_ pump threads are dimensioned according to Standard ISO 228/1.

Flanged:
The flanges of an SC_ pump fit counter-flanges dimensioned according to ISO 7005.

Seals:
The standard shaft seal of an SC_ series pump is a single mechanical seal. The pump housing seal is an O-ring or a gasket. Other seal options are available by request.

AEP domestic hot water pumps with SCA frequency converters
Standard materials

Connection G or DN	Bronze CuSn10Zn2, PN10	Shaft seal, PN10 Ø [mm], materials	Housing size [mm]	O-ring material	Motor [kW]
G 1	AEP-25/4-26/4 SCA	12, carbon/SiC Viton	123 X 2,5	NBR	0,08 - 0,2
	AEP-25/2-26/2 SCA	12, carbon/SiC Viton	123 X 2,5	NBR	0,65
G 1 1/4	AEP-32/4-33/4 SCA	12, carbon/SiC Viton	145 X 2,5	NBR	0,2 - 0,37
DN50	LP-50A/4 SCA	12, carbon/SiC EPDM	150 X 3	NBR	0,2 and 0,55
DN100	ALP-1102/4 SCA	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	0,75

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Kolmeks recommendation for pumps in district heating circulation systems

SCA-version bronze domestic hot water pump equipped with an integrated frequency converter.

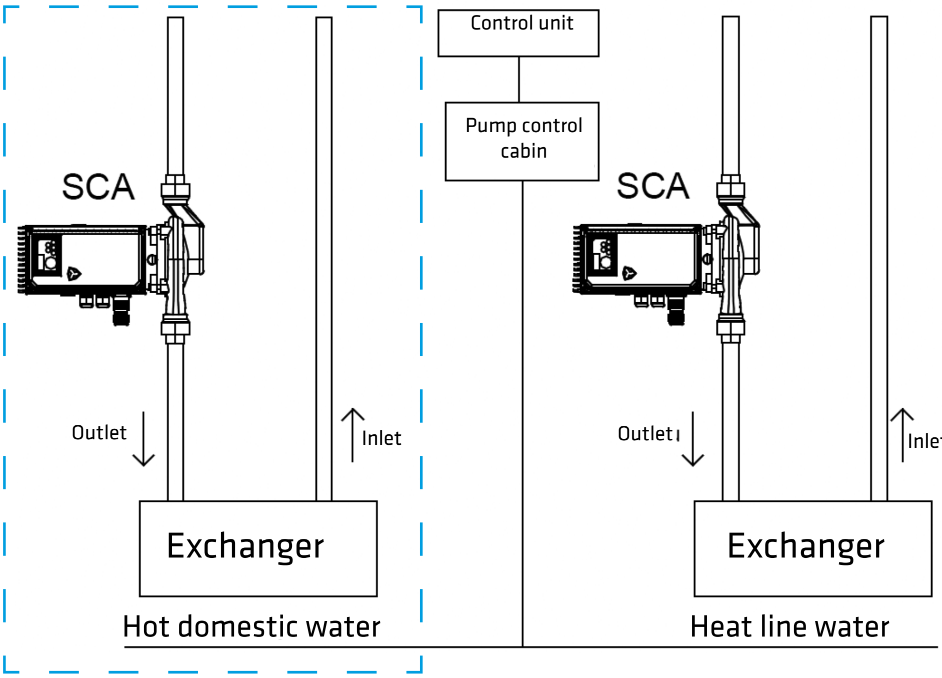
Supply voltage 1 x 230 V

Advantages of SC pump

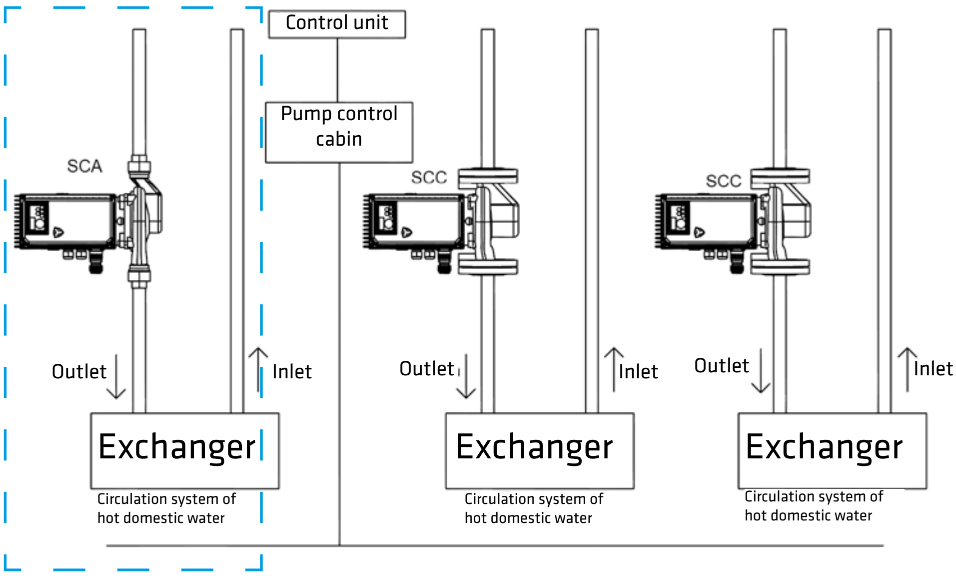
- Alarms to BMS
- Duty point can be adjusted in one step
- Automatically adapts to system heat/cooling requirements (radiator and air heating circulation)
- Energy savings
- Reliable operation
- Reduced wear in pipework and system valves leading to proponged life. - Smoother system operation
- Replacement motor unit service

Domestic hot water

District heating system with two secondary circuits



District heating system with three secondary circuits



Rating plate information

Accessories:
T = External mechanical seal for aggressive liquids
H = Flushing
KT = Double mechanical seal
Sn = Non-standard mechanical seal
Kn = Non-standard surface treatment

Special impeller material:
PM = Bronze
SS = Stainless steel AISI316

1	2		3		4	5
AL		**-**	**110**	**2 /**	**4**	**SC B**
L	**P**	**-**	**50**	**A /**	**4**	**SC C**

1) Pump series:
AE-, L-, AL-

2) Housing, sealing flange and impeller material:
no letter = Grey cast iron EN-GJL-200
H = Nodular cast iron EN-GJS-400
P = Bronze CuSn10Zn2
S = Stainless steel AISI 316

3) Connection sizes:
20 = 3/4”
25 = 1”
32 = 1 1/4” or DN 32
40 = DN 40
50 = DN 50
65 = DN 65
80 = DN 80
110 = DN 100

4) Electric motor pole number:
2 = rotation speed 50 r/s (50 Hz)
4 = rotation speed 25 r/s (50 Hz)
rotation speed 30 r/s (60 Hz)
rotation speed 32.5 r/s (65 Hz)

5) SC = SC frequency converter integrated in pump:
Pump adjustment method SCA, SCB, SCC, SCD, SCF, SCG, SCM

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Installation:

The pump can be installed directly in the pipework without additional support.

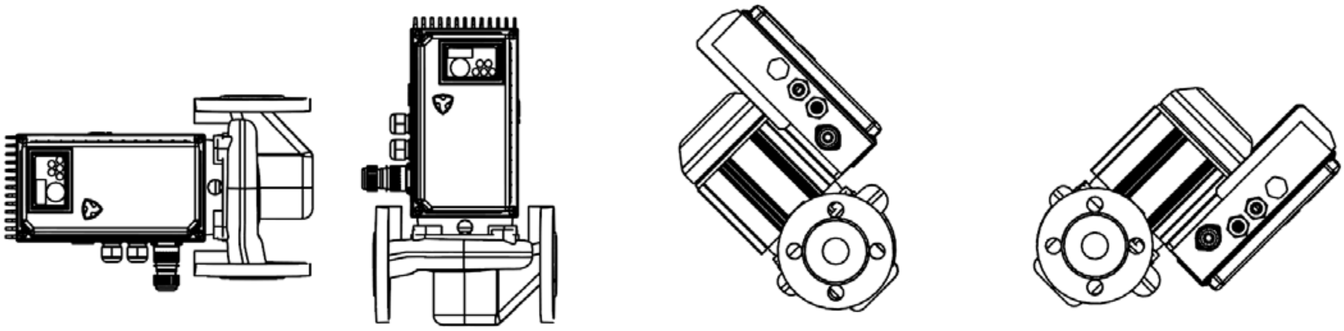
The position of the motor unit and therefore the location of the frequency converter box can be changed by detaching the motor unit from the pump housing and rotating it to the required position, with certain limitations.

Ensure the following when installing the pump:

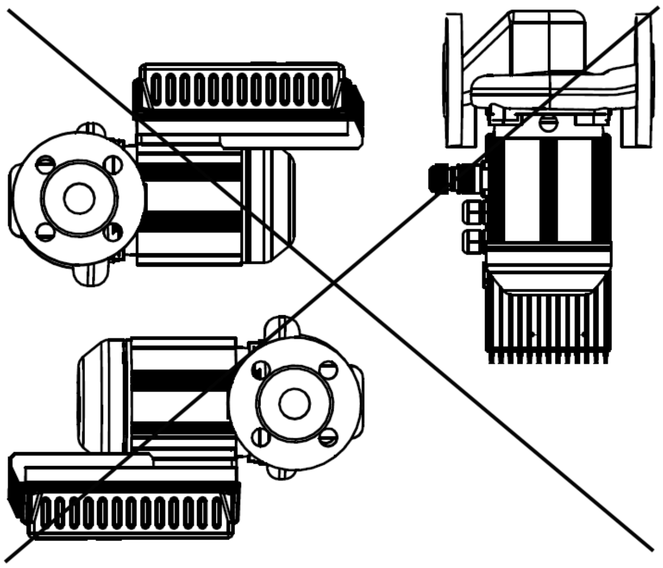
- Enough room for control, service and inspections
- The installation position should be chosen such that the display is readable; a separate control panel can also be used if required.
- Possibility to use lifting and transfer devices if needed
- Shut-off valves on both sides of the pump
- Pump must be installed in such a position that the integrated frequency converter is not in the immediate vicinity of a hot pipes and is fully accessable.

Operating positions

Permitted operating positions

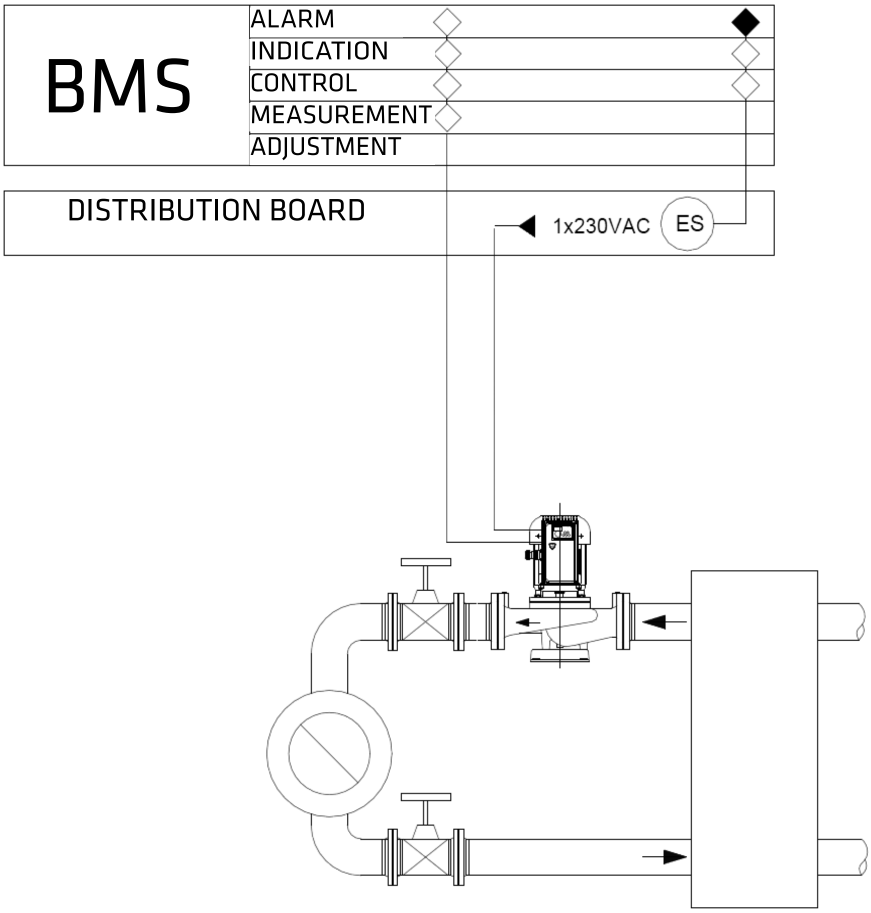


Prohibited operating positions



SCA pump: Direct speed reference using a potentiometer

Applications
For systems with no continuous automatic adjustment requirement and a constant duty point, such as domestic hot water circulation systems, for example.



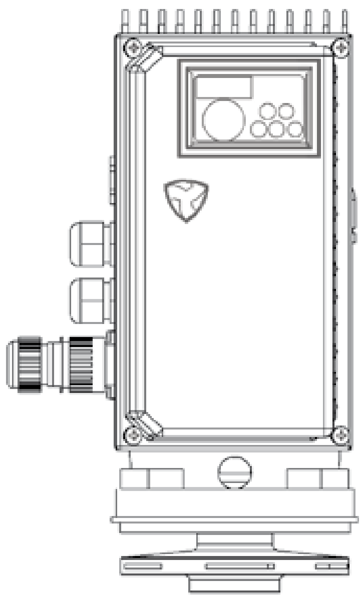
Accessories
Pump and frequency converter.

Operating principle
The rotation speed of the pump is set in one step during commissioning using the buttons on the frequency converter. The desired frequency is selected using the control panel potentiometer and saved by pushing the SET button. The pump rotates at a fixed speed. As the pump rotates, it is possible to select the motor current (A) or frequency (Hz) on the display by pushing the SET button. Panel use can be locked by pushing the MODE button for 2 seconds. The panel can be unlocked in the same way.

Pump curve
The pump QH curve equals the QH curve of a standard speed pump.

Motor unit:

Motor unit (SCA, SCG)
The pump motor unit without the transmitter includes an electric motor, a frequency converter, a sealing flange, an impeller, and seals. When replacing the motor unit, no procedures need to be carried out on the piping or electricity, because there is no need to detach the pump housing and the power supply is connected using a quick connection plug.



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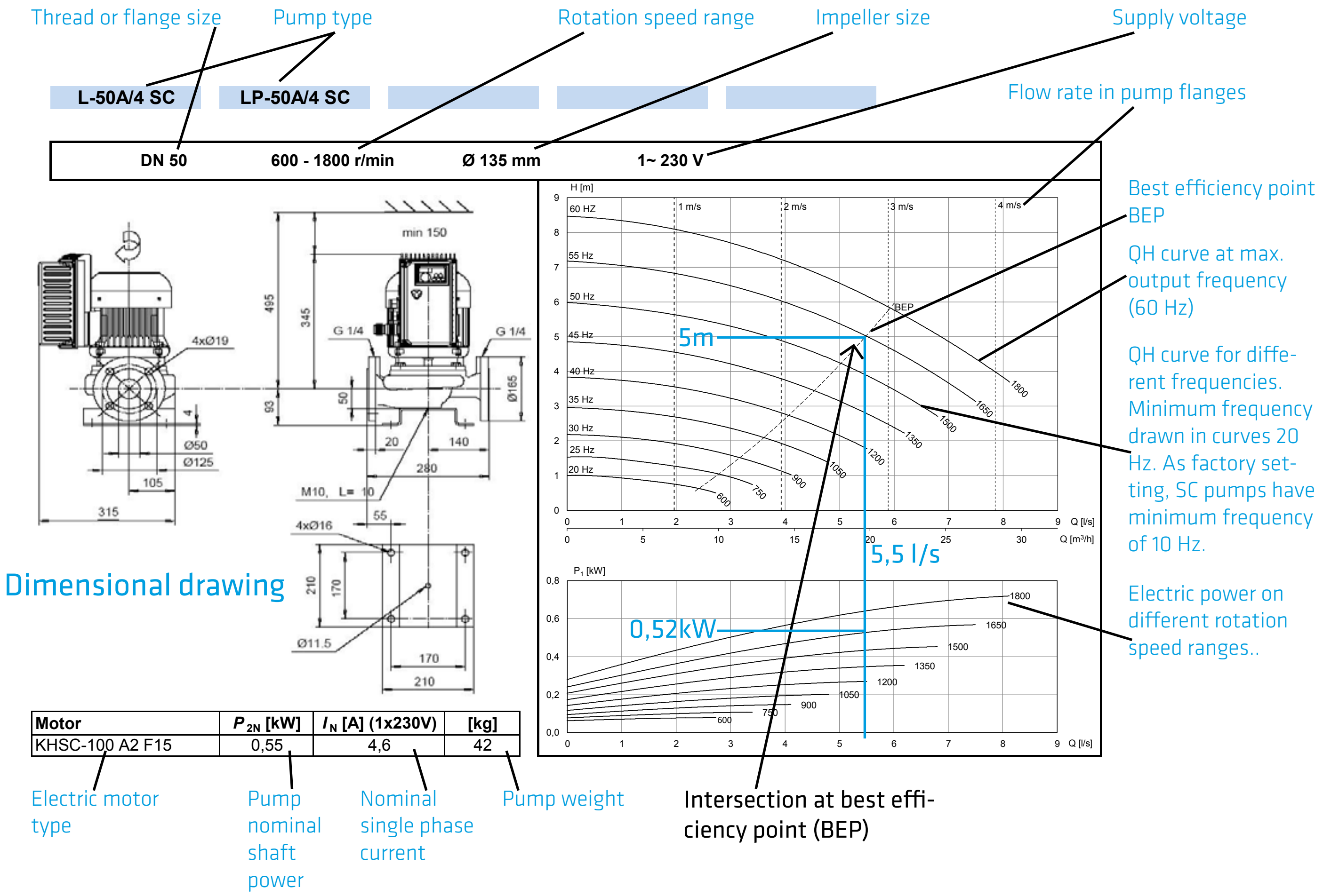
Reading curves:

Characteristic curves apply to +20°C water.



Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 F15	0,55	4,6	42

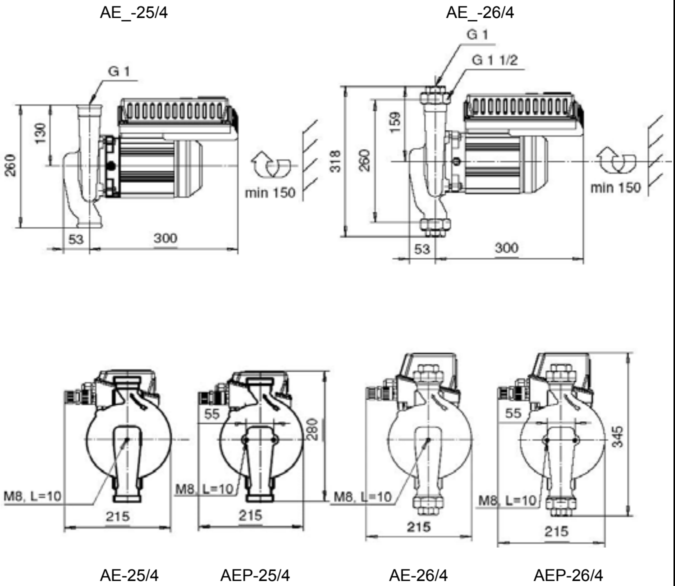
NOTE! Liquid density and viscosity affect the amount of power required. Please check that the motor power is sufficient for liquids with a higher density and viscosity than water. Please contact Kolmeks for further information.

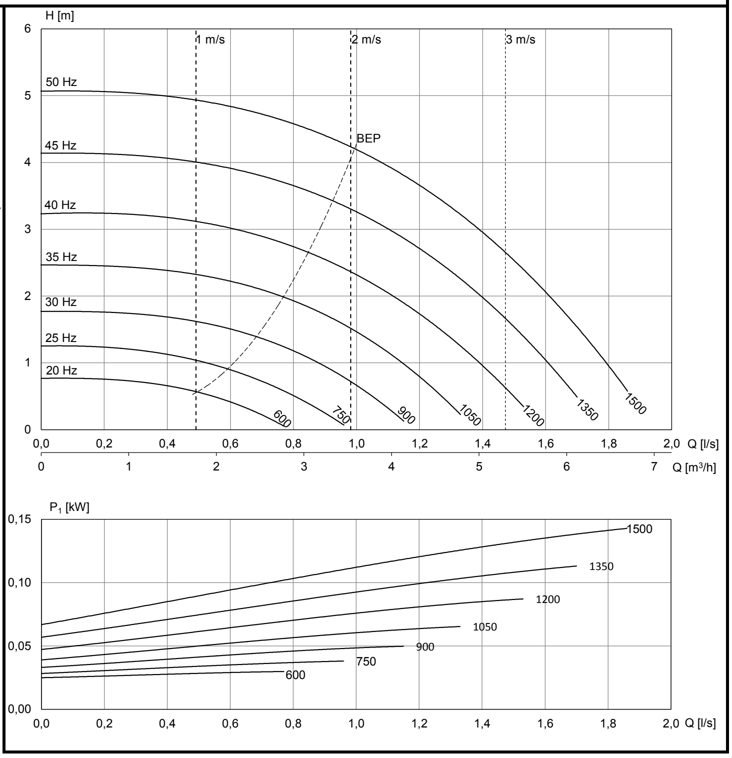
An example of selecting a pump:
Duty point 5.5 l/s, 50kPa (5m)

1. Find a pump size with a BEP (best efficiency point) which is as close as possible to the required duty point.
2. Ensure that the output 5.5 l/s and head 5m intersect at the best efficiency point.
3. The best energy efficiency and lowest energy consumption are obtained by following the above steps.
4. If needed, it is possible to read the input power of the device on the P1 curve. In this case, the input power is 0.52 kW at the desired duty point.

AEP-25/4 SC **AEP-26/4 SC**

G 1	600 - 1500 r/min	Ø 125 mm	1~ 230 V

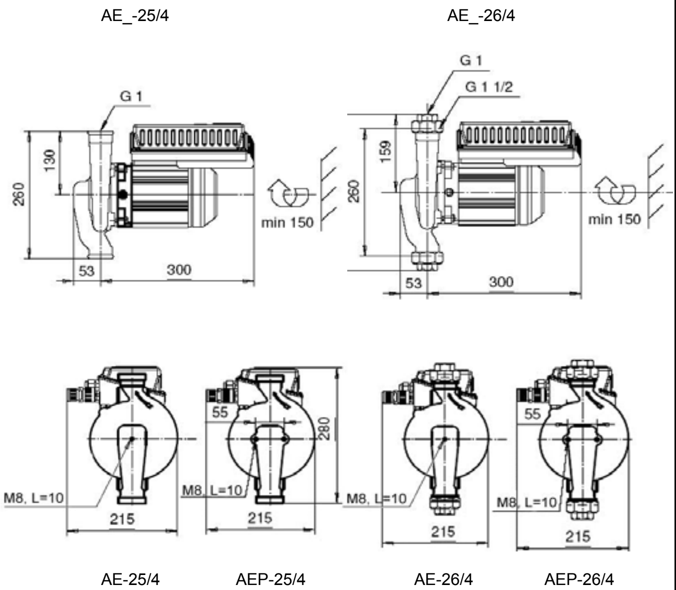


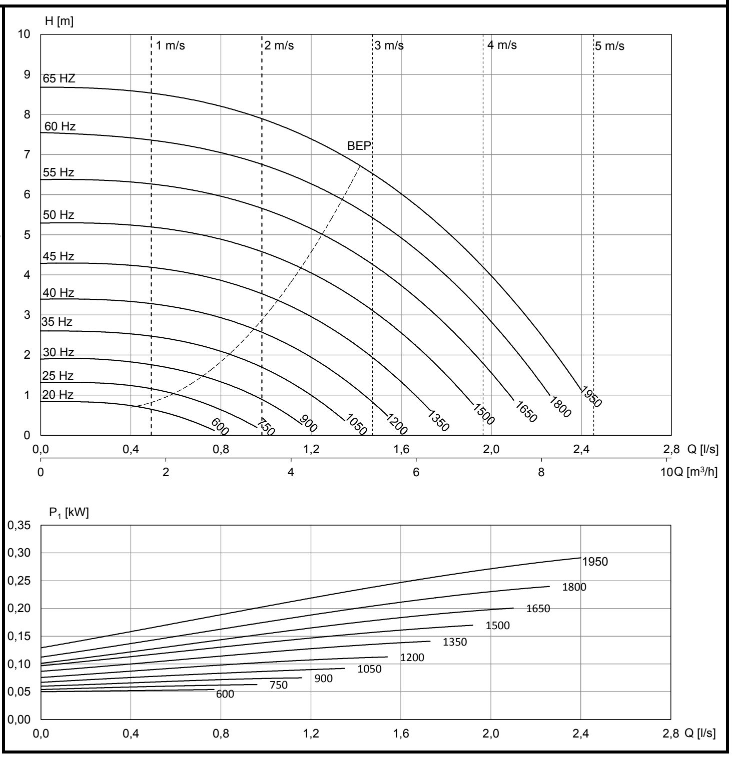


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-742 N12	0,08	1,1	14

AEP-25/4 SC **AEP-26/4 SC**

G 1	600 - 1950 r/min	Ø 125 mm	1~ 230 V



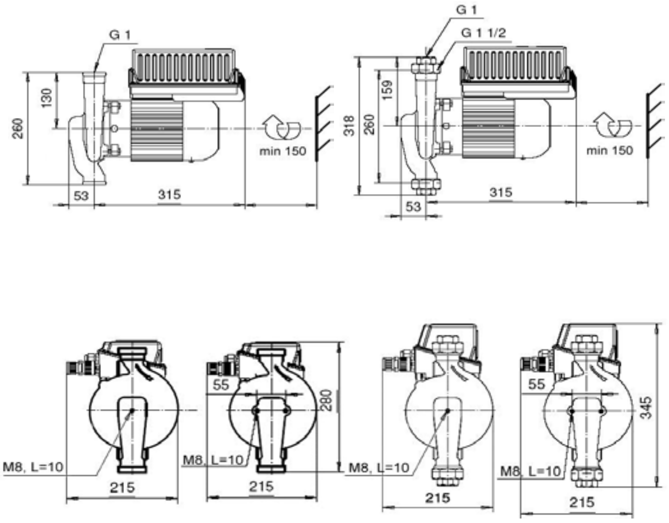


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N12	0,2	2,1	15

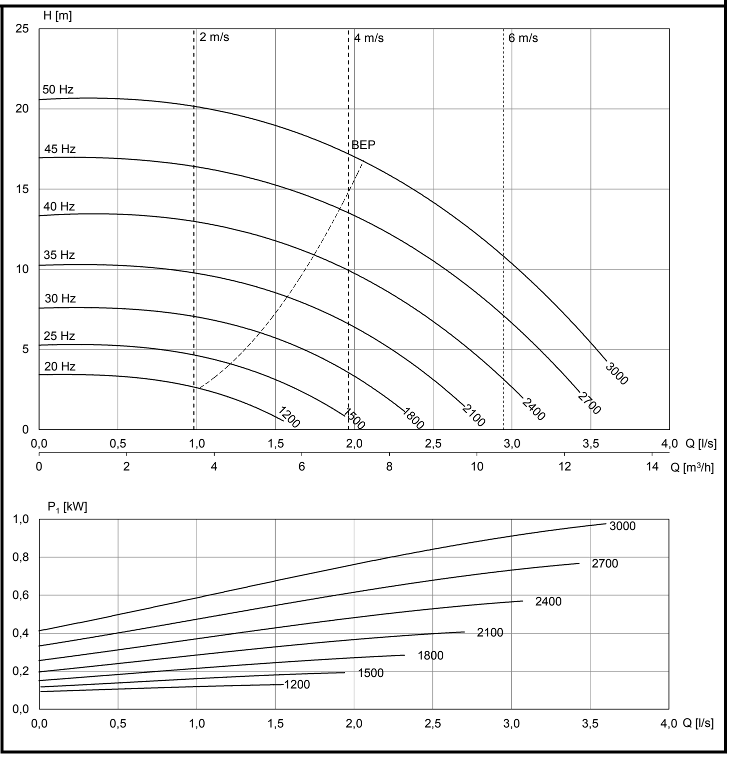
AEP-25/2 SC | AEP-26/2 SC

G 1	1200 - 3000 r/min	Ø 125 mm	1~ 230 V

AE_-25/2 AE_-26/2



AE-25/2 AEP-25/2 AE-26/2 AEP-26/2

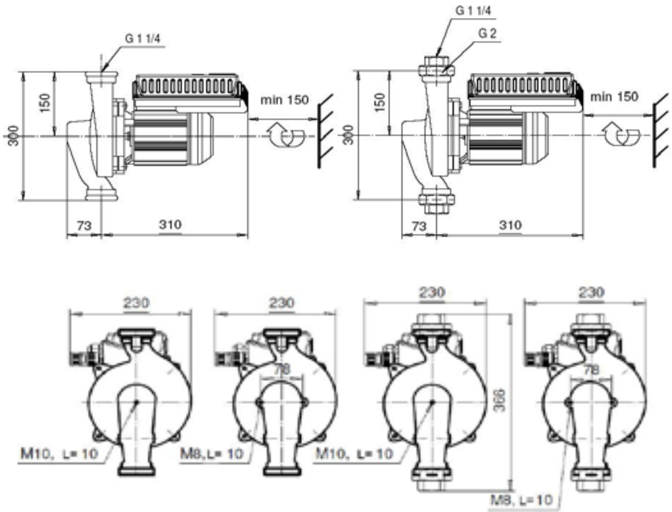


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-841 N12	0,65	6,0	19

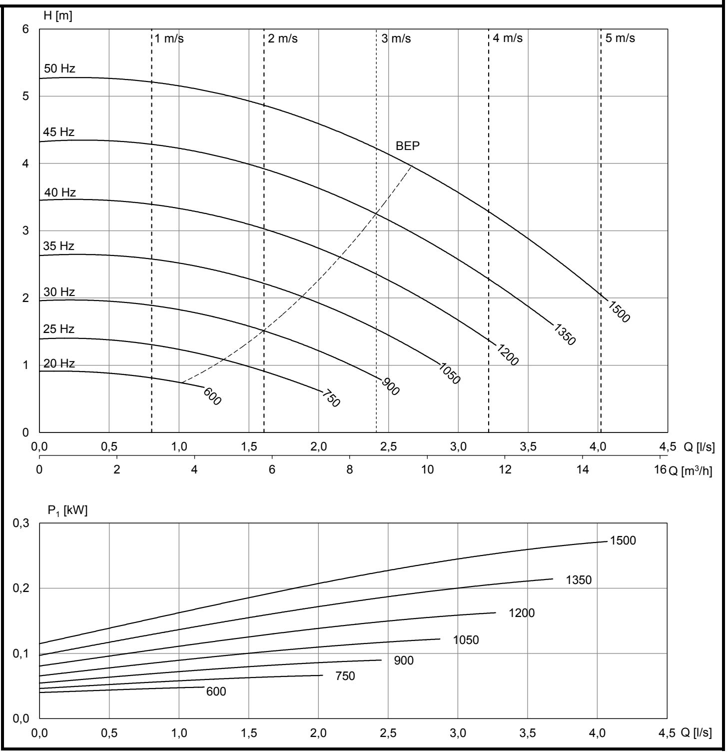
AEP-32/4 SC | AEP-33/4 SC

G 1 1/4	600 - 1500 r/min	Ø 130 mm	1~ 230 V

AE_-32/4 AE_-33/4



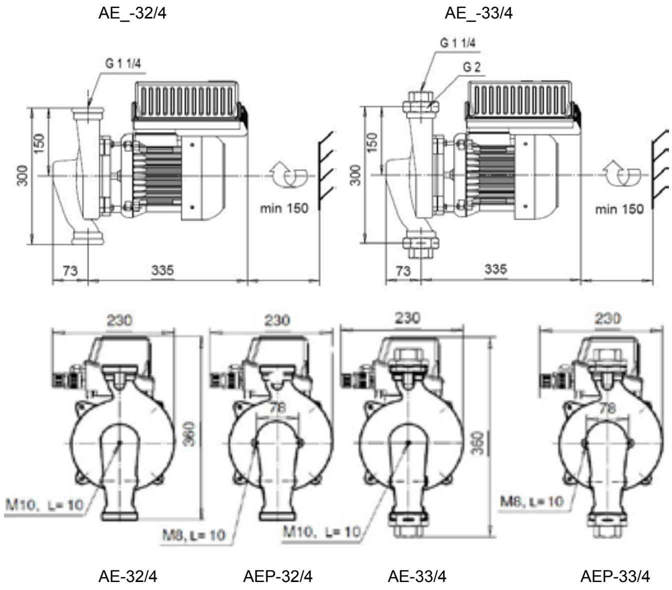
AE-32/4 AEP-32/4 AE-33/4 AEP-33/4

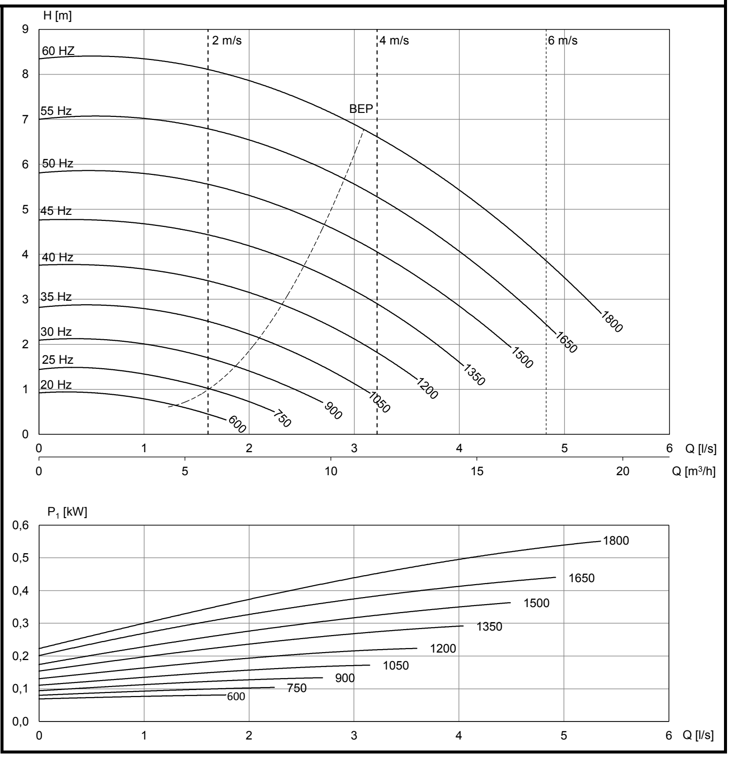


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N13	0,2	2,1	20

AEP-32/4 SC | AEP-33/4 SC

G 1 1/4 | **600 - 1800 r/min** | **Ø 135 mm** | **1~ 230 V**

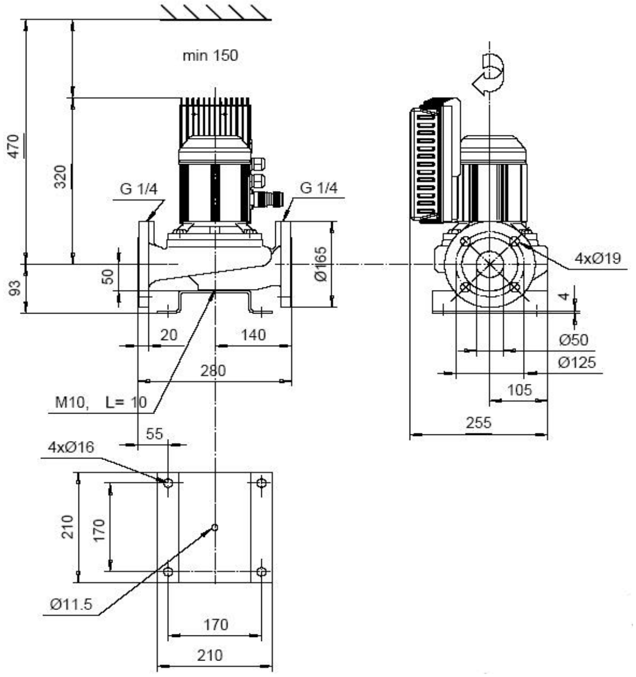


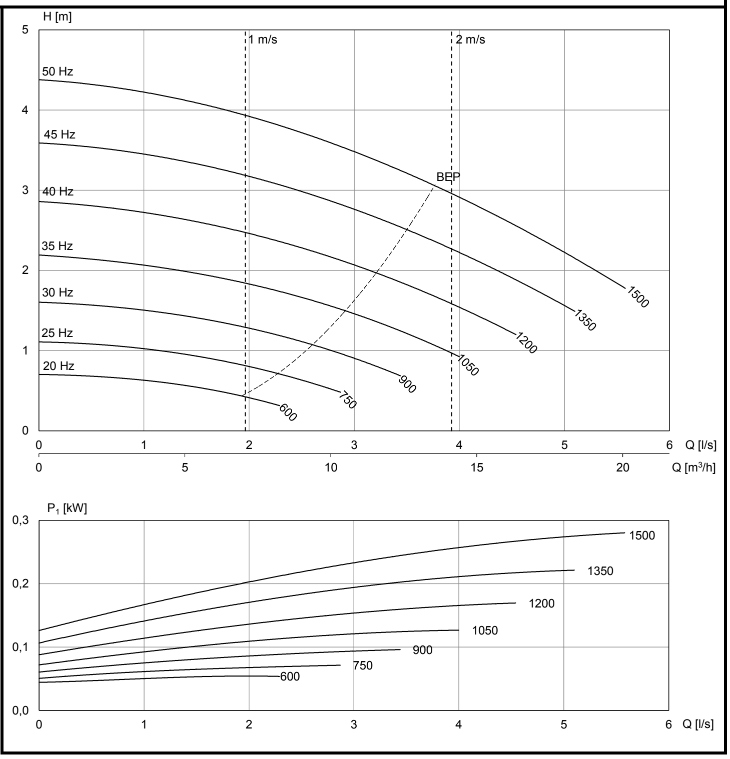


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 N13	0,37	3,6	35

LP-50A/4 SC

DN 50 | **600 - 1500 r/min** | **Ø 120 mm** | **1~ 230 V**

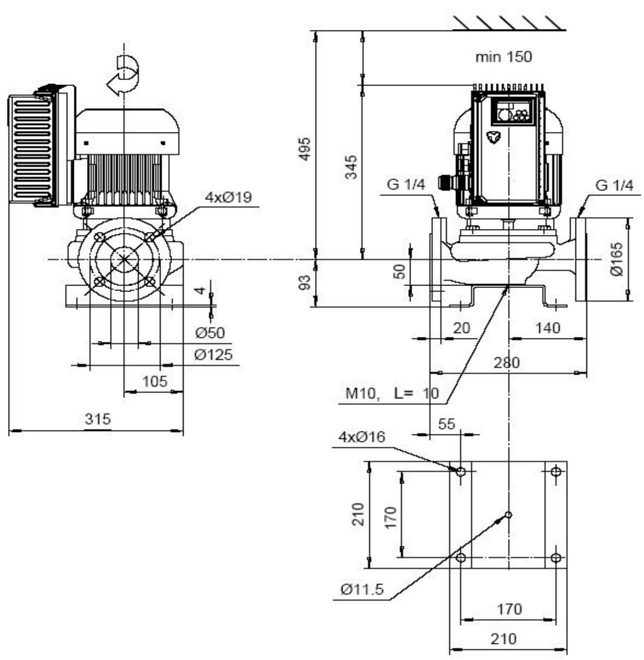


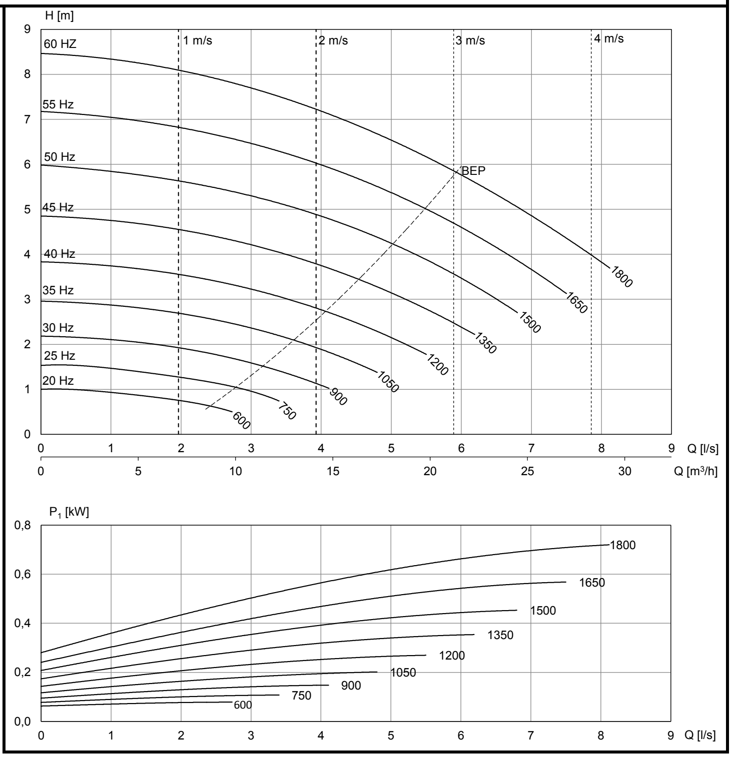


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 F15	0,2	2,1	26

LP-50A/4 SC

DN 50	600 - 1800 r/min	Ø 135 mm	1~ 230 V

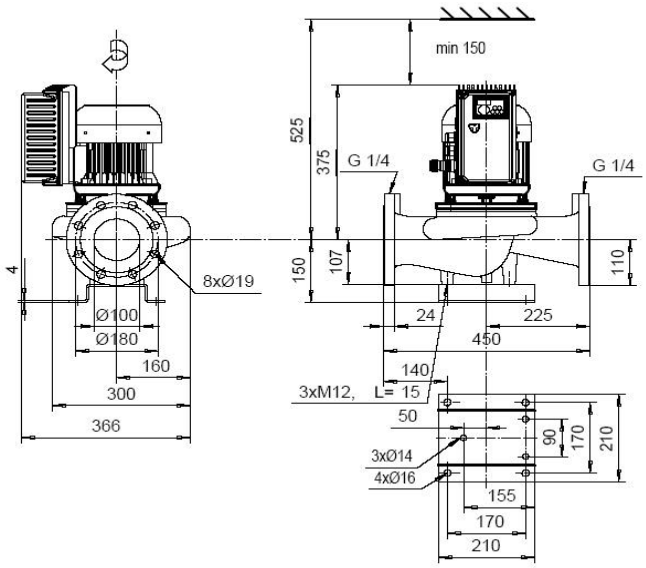


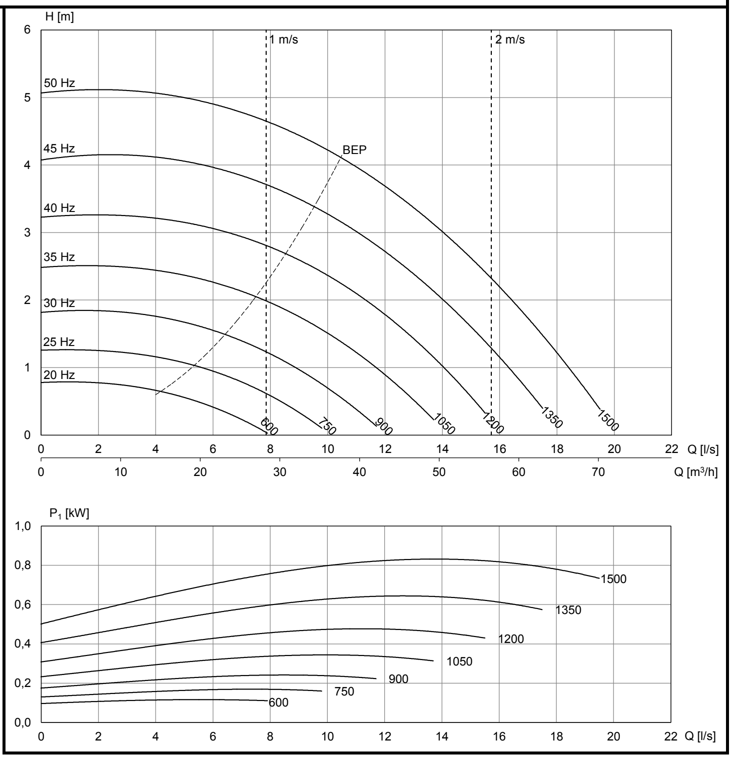


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 F15	0,55	4,6	42

ALP-1102/4 SC

DN 100	600 - 1500 r/min	Ø 142 mm	1~ 230 V





Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 B2 F19	0,75	6,1	59

KOLMEKS
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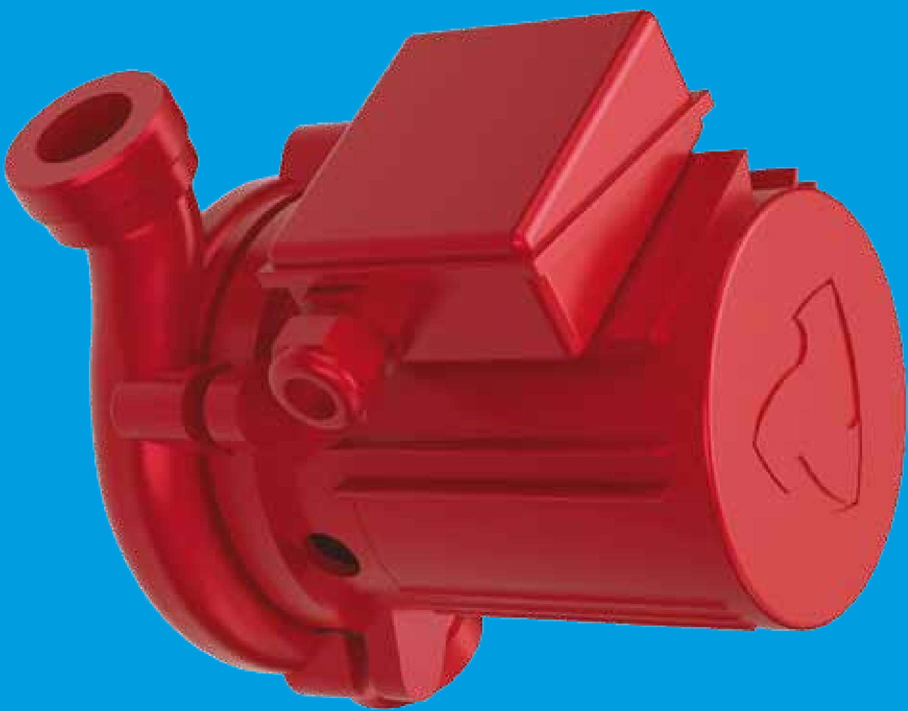


DOMESTIC HOT WATER PUMPS WITH FIXED-SPEED MOTOR, 3x400V

AP-, AKP- and AEP- series, threaded G1/2 – G1 ¼

General Technical Information

AKP, AP and AEP series pumps are bronze centrifugal pumps equipped with threaded connections.

Application

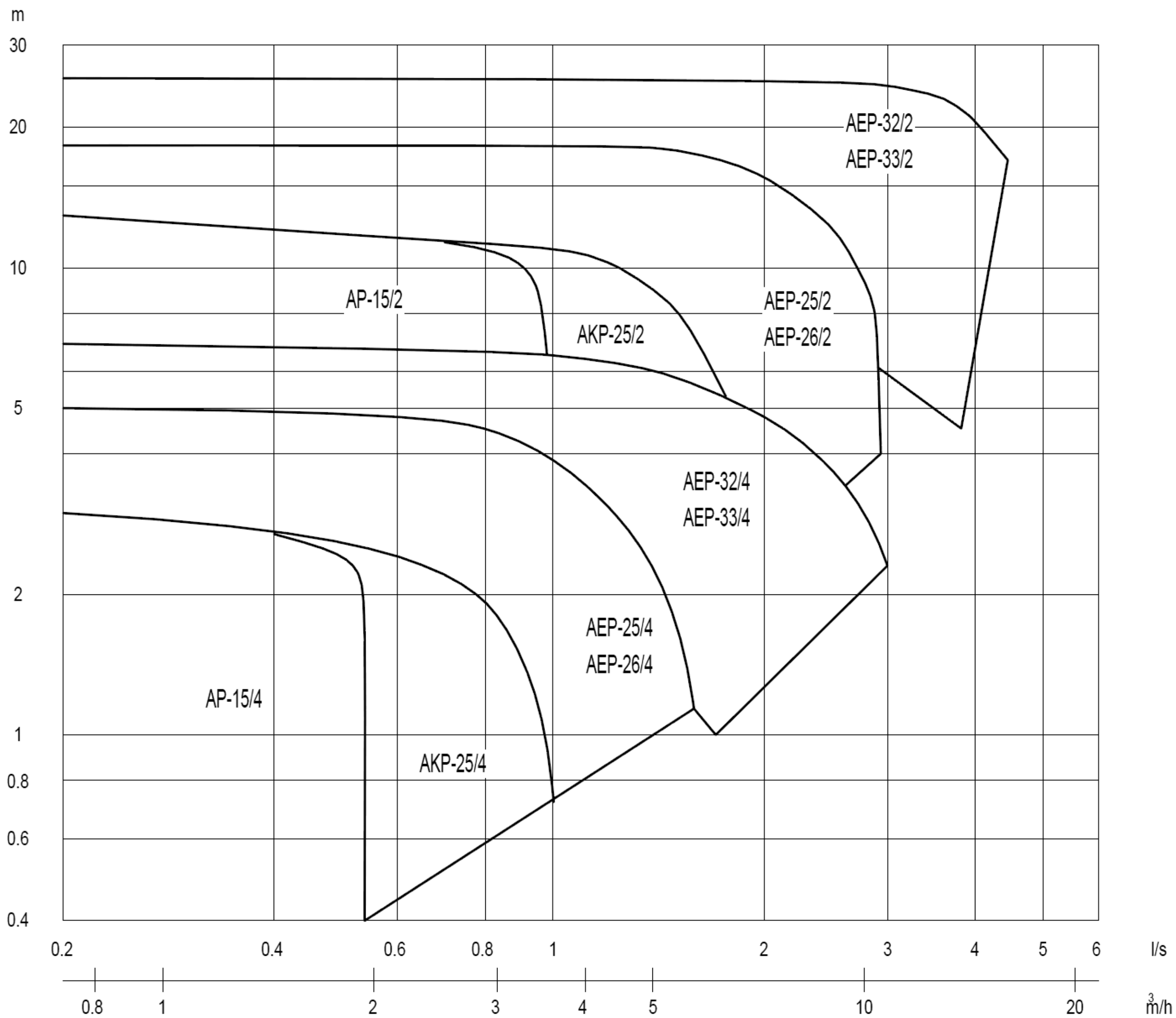
AKP, AP and AEP series pumps can be used in circulation, pressure booster and transfer pumps for various clean, oxygen-rich liquids.

Structure

Pump

AKP, AP and AEP series pumps are monoblock centrifugal pumps equipped with a dry motor which comply with the requirements of the EcoDesign Directive. The pump impeller is installed directly onto the shaft of the electric motor (no separate couplings).

Quick Selection Chart



Electric motor

The electric motor of the AKP, AP and AEP series pump is a Kolmeks asynchronous motor designed for pump use and which complies with the requirements of the EcoDesign Directive. The electric motor is highly efficient, has low noise levels, and can be used for operation with a frequency converter.

Standard voltages:	3~ 400/230 V, 50 Hz
Enclosure classes:	IP 54
Insulating class:	F

NOTE!

Kolmeks electric motors with other ratings are available by request.

Connections

AKP, AP and AEP pumps are equipped with G thread connections (ISO 228/1).

Seals

The shaft seal of the AKP, AP and AEP series pump is a single mechanical seal. The pump housing seal is an O-ring.

Standard materials and fields of application

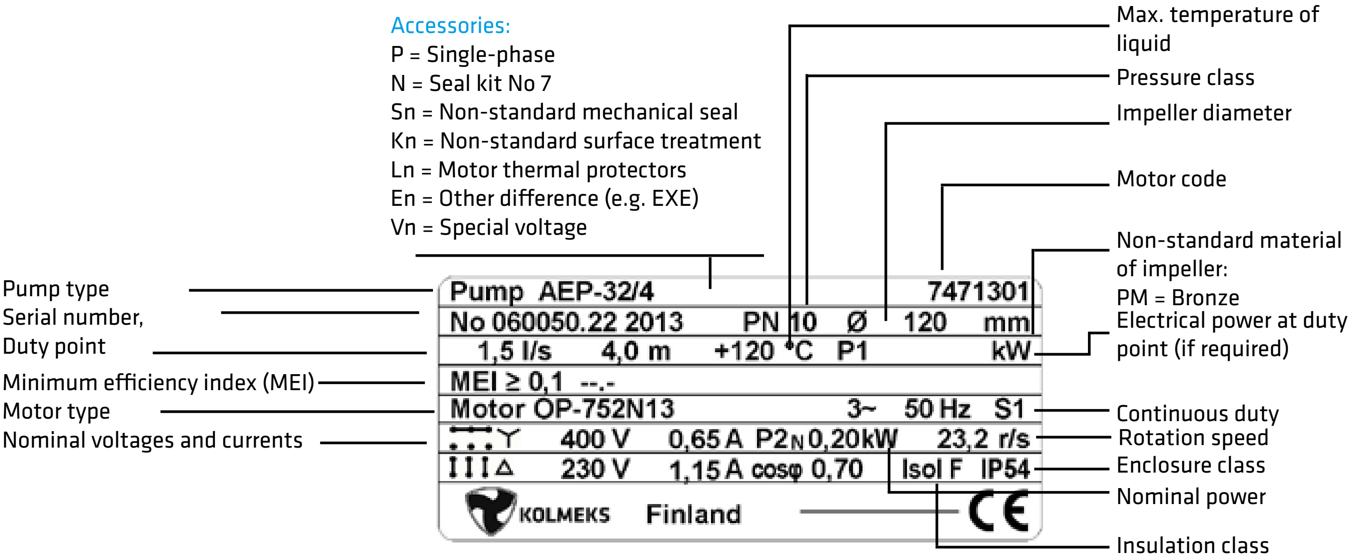
AKP-, AP and AEP-pumps

Pump:	Pump housing	bronze CuSn10Zn2
	Impeller	plastic Noryl GFN2 (bronze CuSn10Zn2 by special order)
	Shaft	stainless steel AISI 329 (SIS 2324)
Seal:	Shaft seal	carbon/silicon carbide, Viton elastomer
	Metal parts	AISI 316
	Housing O-ring	nitrile elastomer
Technical information:	Max. operating pressure	10 bar
	Käyttölämpötila	-15 ... +100°C (*

NOTE!

The shaft seal in the AKP, AP and AEP series pump is available in several alternative materials depending on the properties of the liquid to be pumped. (* The operating temperature range of the pump is dependent on the liquid to be pumped. For water, the operating temperature range is 0°C ... +100°C (0°C ... +120°C with a bronze impeller and EPDM elastomer shaft seal).

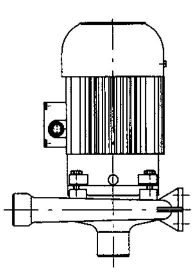
Rating plate information

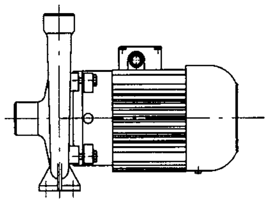


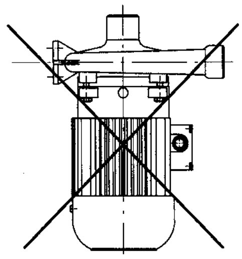
Installation

Please consider the following when installing the pump:
- Enough room for service and inspections
- Shut-off valves on both sides of the pump

The position of the motor unit and therefore the location of the terminal box can be changed by detaching the motor unit from the pump housing and turning it to the desired position.

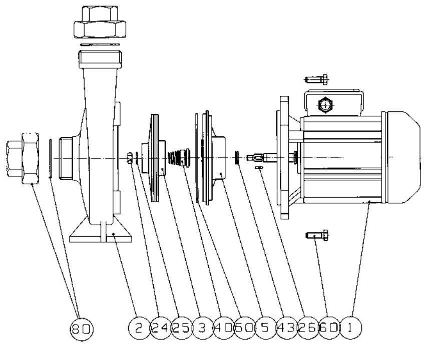






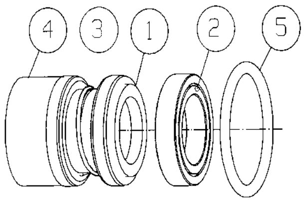
Spare parts and service

Part catalogue:
1 Electric motor
2 Pump housing
3 Impeller
5 Sealing flange
24 Nut
25 Washer
26 Key
40 Shaft seal
43 V-ring
50 Housing O-ring
60 Screw
80 Pipe union and seal
(AEP-26 and 33)
(not included in the delivery)



Seal kits

1 Rotating ring
2 Stationary ring
3 Body/bellows
4 Spring
5 O-ring



Connection G	Bronze CuSn10Zn2, PN10	Shaft seal, PN10 Ø [mm], materials	Housing size [mm]	O-ring material	Motor [kW]
G 1/2	AP-15/4	12, carbon/SiC Viton	100 X 2,5	NBR	0,03 - 0,05
	AP-15/2	12, carbon/SiC Viton	100 X 2,5	NBR	0,25
G 1	AKP-25/4	12, carbon/SiC Viton	100 X 2,5	NBR	0,05
	AKP-25/2	12, carbon/SiC Viton	100 X 2,5	NBR	0,25 - 0,65
G 1	AEP-25/4-26/4	12, carbon/SiC Viton	123 X 2,5	NBR	0,05 - 0,08
	AEP-25/2-26/2	12, carbon/SiC Viton	123 X 2,5	NBR	0,25 - 1,1
G 1 1/4	AEP-32/4-33/4	12, carbon/SiC Viton	145 X 2,5	NBR	0,2 - 0,37
	AEP-32/2-33/2	12, carbon/SiC Viton	145 X 2,5	NBR	1,1 - 1,5

Motor unit

The pump motor unit is a new stand-by operation unit which includes: motor, sealing flange, impeller and seals.

In case of a motor malfunction or a seal leak, replacing the motor unit is simple and quick, it does not require long stand-by periods in operation or any procedures to be carried out on the piping, because there is no need to detach the pump housing.

Reading curves and selecting a pump

Selecting a fixed speed pump from 50 Hz pump curve (the curves on the left)

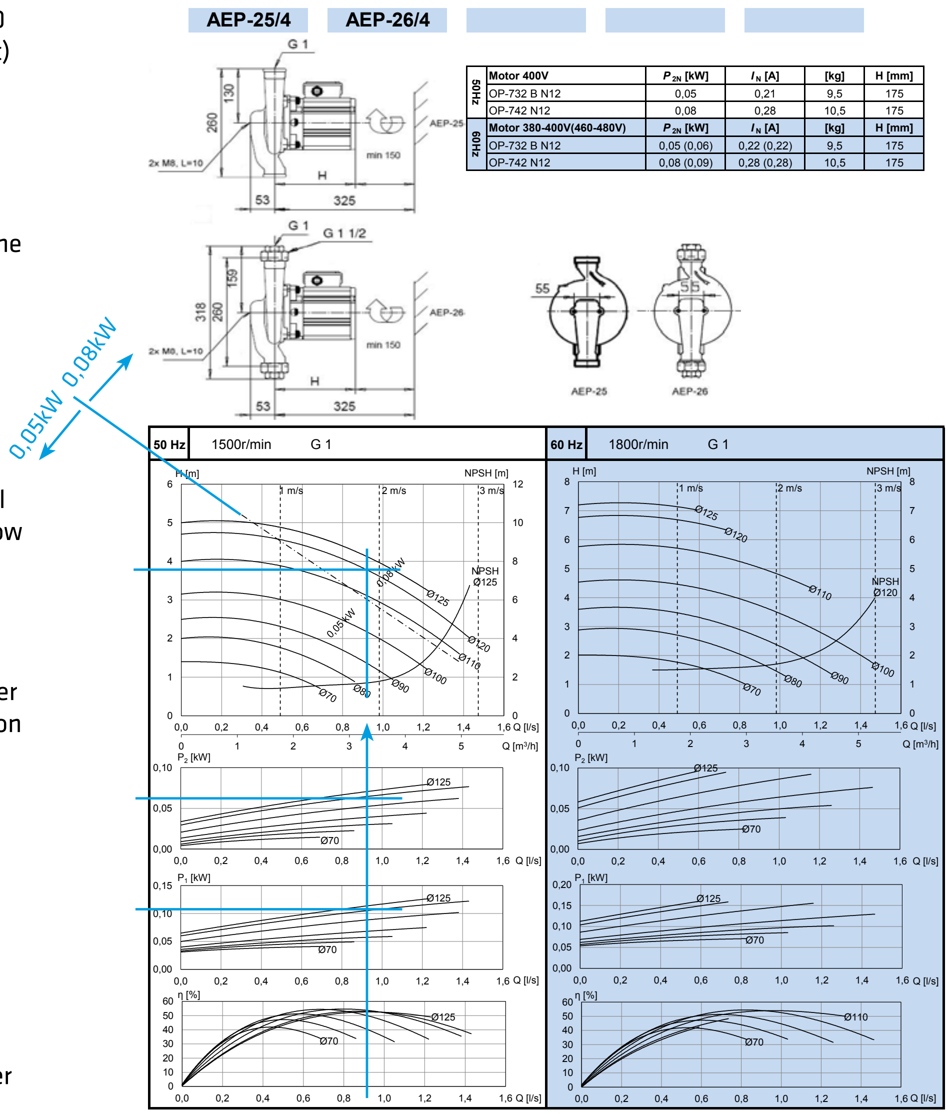
E.g. duty point: flow =0.9 l/s, head = 3.8 m, liquid: water +20°C.

1. Use the quick selection chart at the beginning of the catalogue or check the datasheets in the product catalogue in order and search for a pump with the correct size range such that the required flow 0.9 l/s is at the best efficiency point.

2. Select the impeller size [Ø= mm] from the QH curve such that a vertical line is drawn at the point of 0.9 l/s flow through all curves and, equivalently, a horizontal line at the point of 3.8m head.

3. At the intersection, find the impeller size = 120 mm. Note! If the intersection falls between two impeller sizes, the impeller size is selected halfway between the two sizes.

4. The nominal shaft power of the motor is read from the section where the QH curve and the duty point are. In this example, the motor nominal shaft power is P2N = 0.08 kW. According to the shaft power P2, P2 = 0.062 kW -> the motor nominal power becomes P2N = 0.08 kW (the closest highest motor nominal power).



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 B N12	0,05	0,21	9,5	175
	OP-742 N12	0,08	0,28	10,5	175
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	9,5	175
	OP-742 N12	0,08 (0,09)	0,28 (0,28)	10,5	175

5. Check the nominal current of the electric motor from the column on the right-hand side of the nominal power column in the table, IN = 0.28 A, and select overload protection for the motor based on nominal current.

6. The pump weight is read from the same table [kg] = 10.5 kg.

7. For energy calculation, read the electrical power of the device = P1 [kW], from the P1 curve with desired flow Q = 0.9 l/s and at the point of the selected impeller size, Ø = 120 mm. In this example, the electrical power is P1= 0.11 kW.

8. Energy costs = Electrical power P1 [kW] x energy price [€/ kWh] x operating time [h].

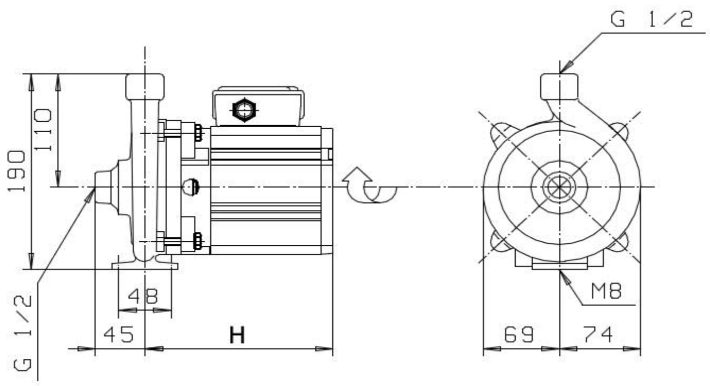
Characteristic curves apply to +20°C water.

Please contact Kolmeks for support if the following applies!

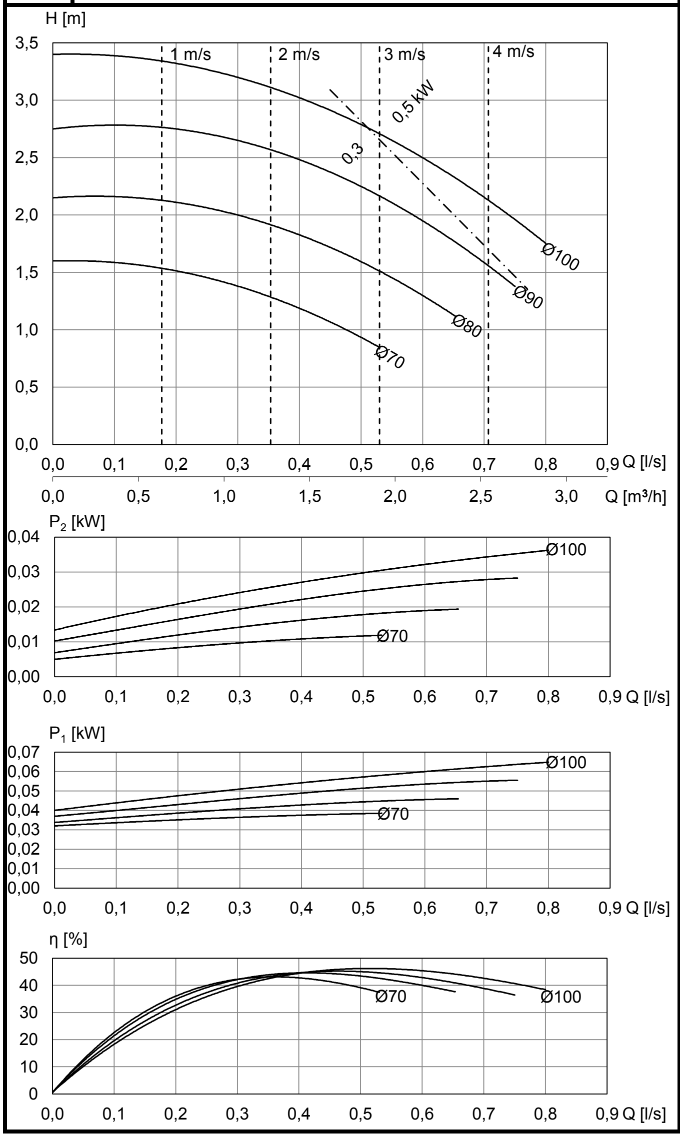
1. When pumping liquids different from water in their viscosity or density, these must be taken into consideration when selecting the pump
2. Liquid density and viscosity are directly proportional to the power requirement. Please check that the motor power is sufficient for liquids with a higher density or viscosity than water.

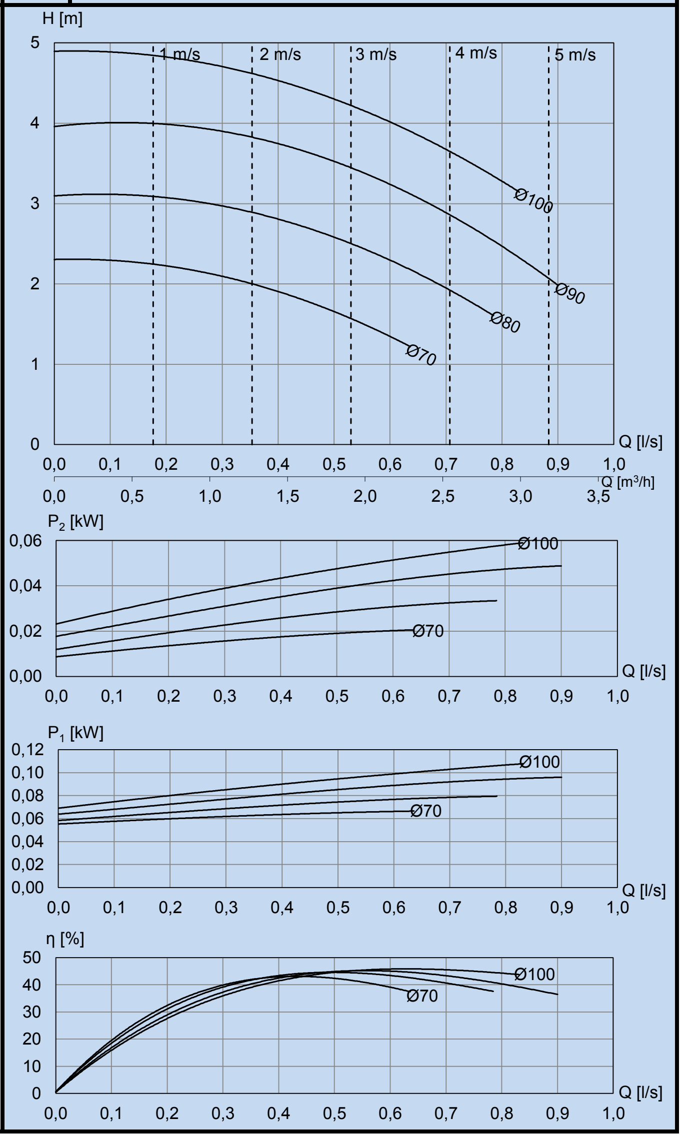
AP-15/4

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 N12	0,03	0,18	9	175
50Hz	OP-732 B N12	0,05	0,21	9	175
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	9	175



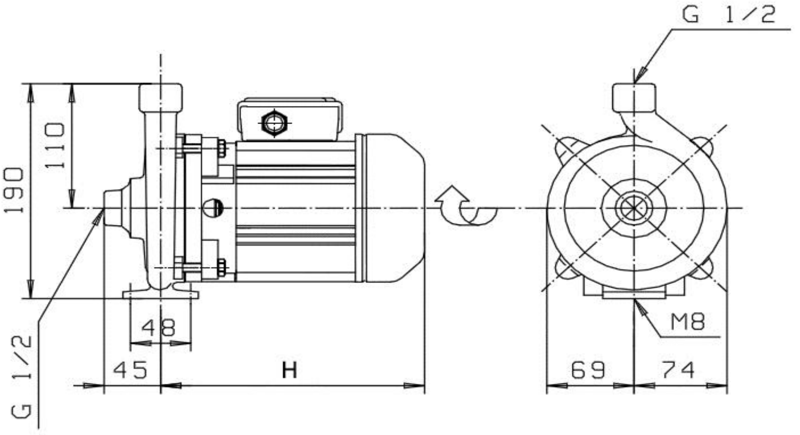
50 Hz	1500r/min G ½	60 Hz	1800r/min G ½



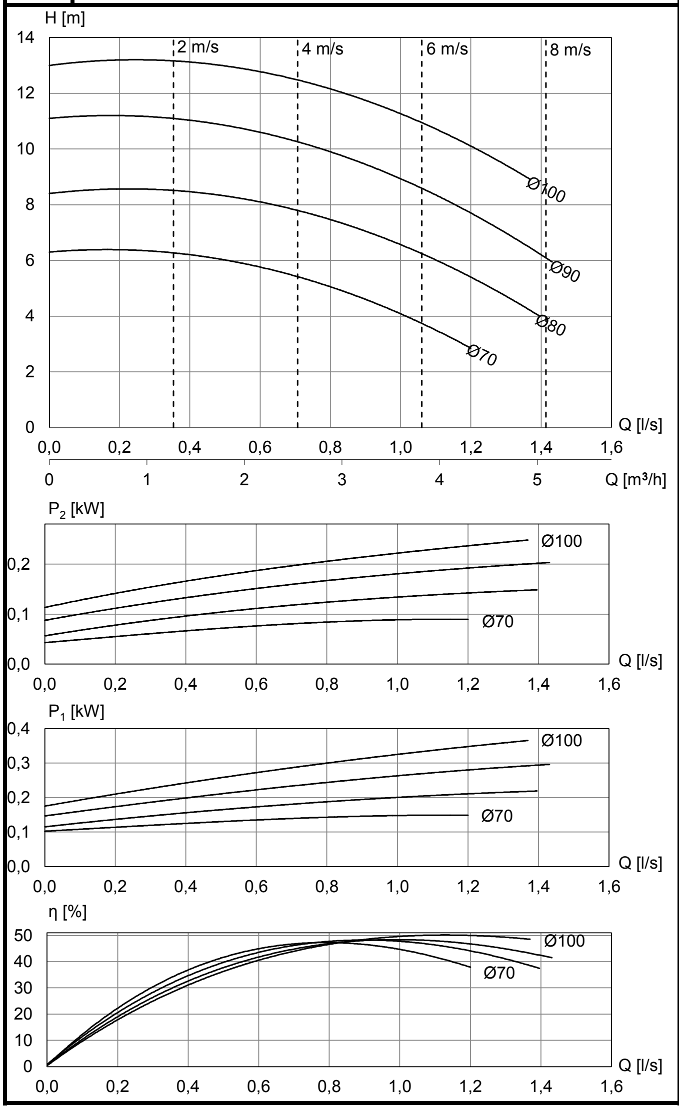


AP-15/2

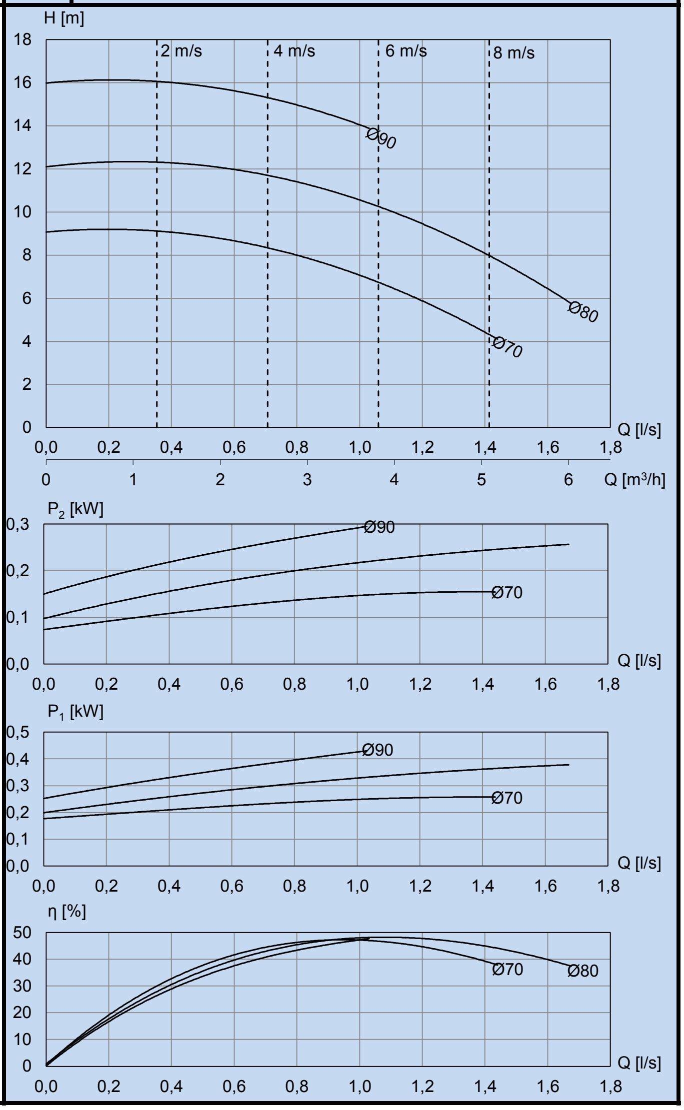
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-741 N12	0,25	0,70	9,5	210
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-741 N12	0,25 (0,3)	0,70 (0,70)	9,5	210



50 Hz	3000r/min	G ½



60 Hz	3600r/min	G ½



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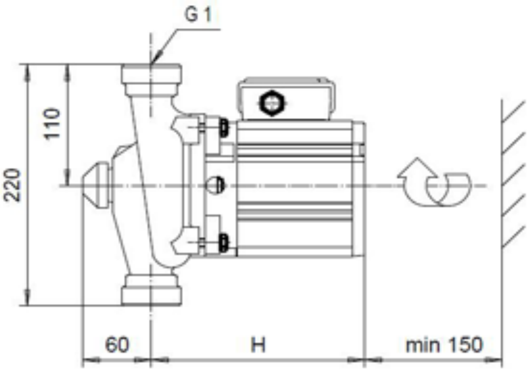
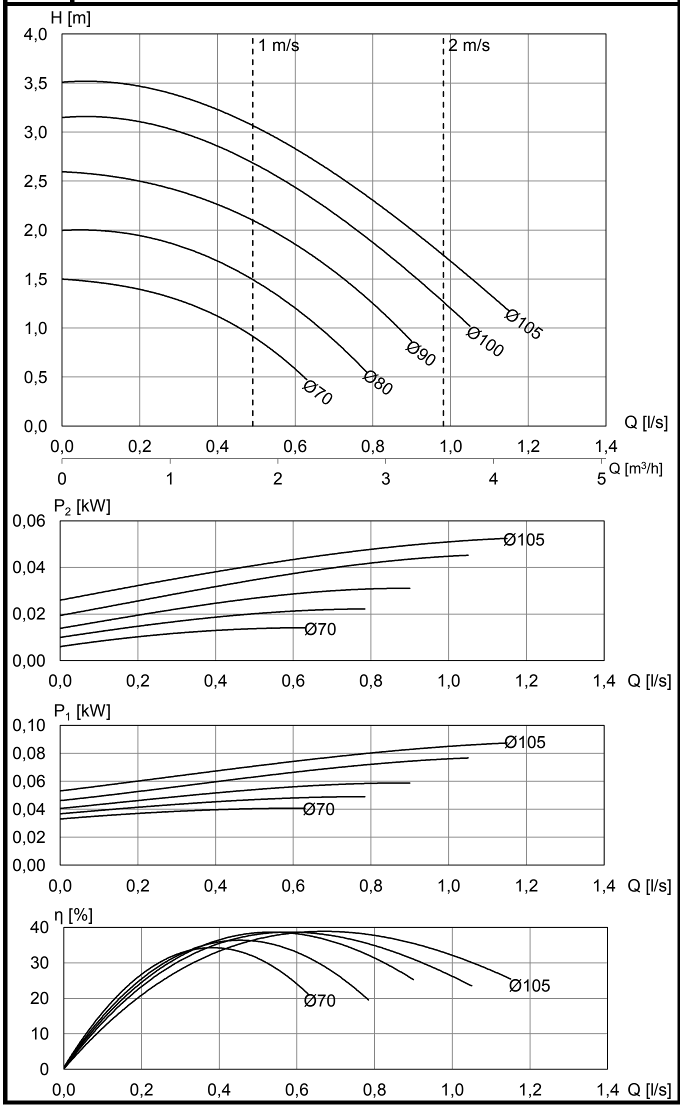
AKP-25/4

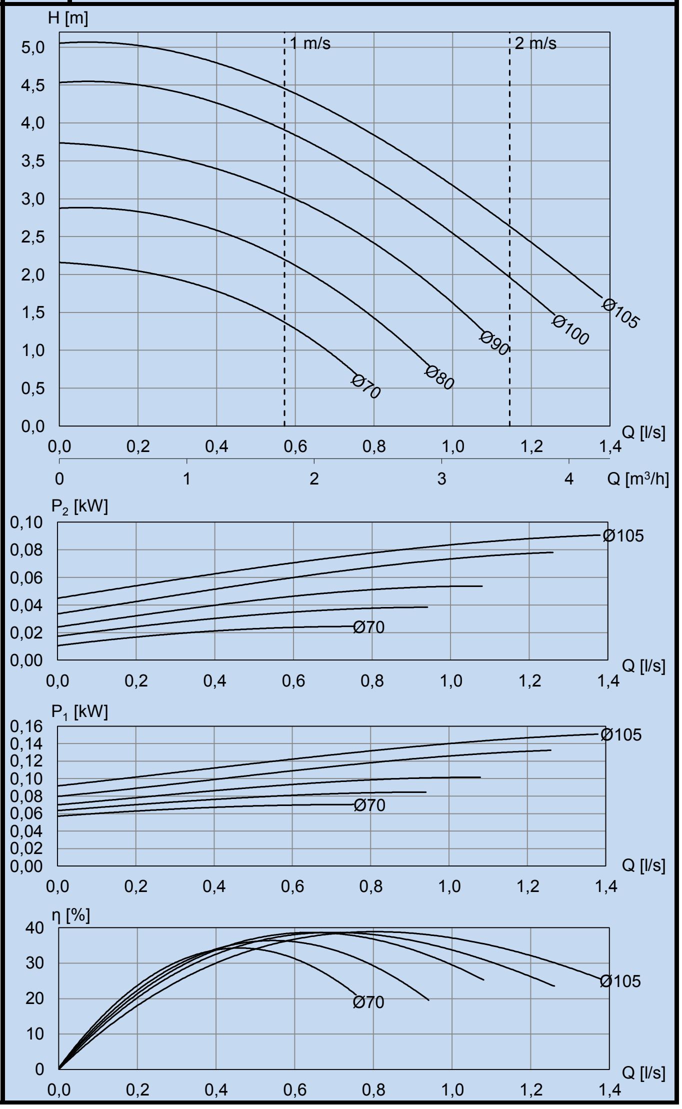


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 B N12	0,05	0,21	10	185
	OP-742 N12	0,08	0,28	11	185
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	10	185
	OP-742 N12	0,08 (0,09)	0,28 (0,28)	11	185

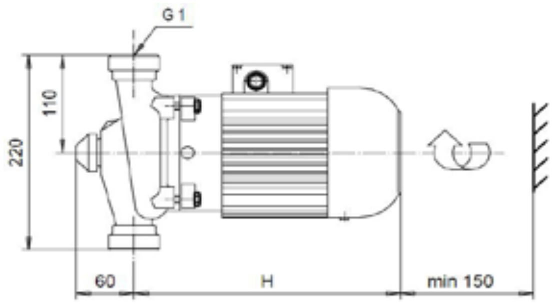
50 Hz	1500r/min	G 1



60 Hz	1800r/min	G 1

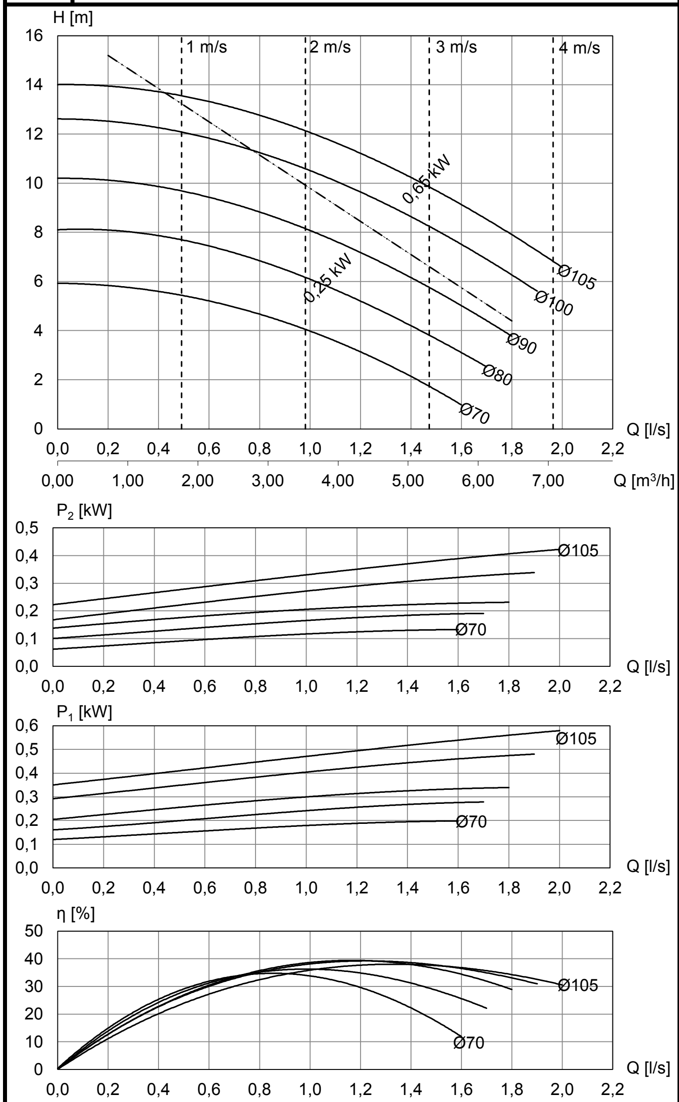


AKP-25/2

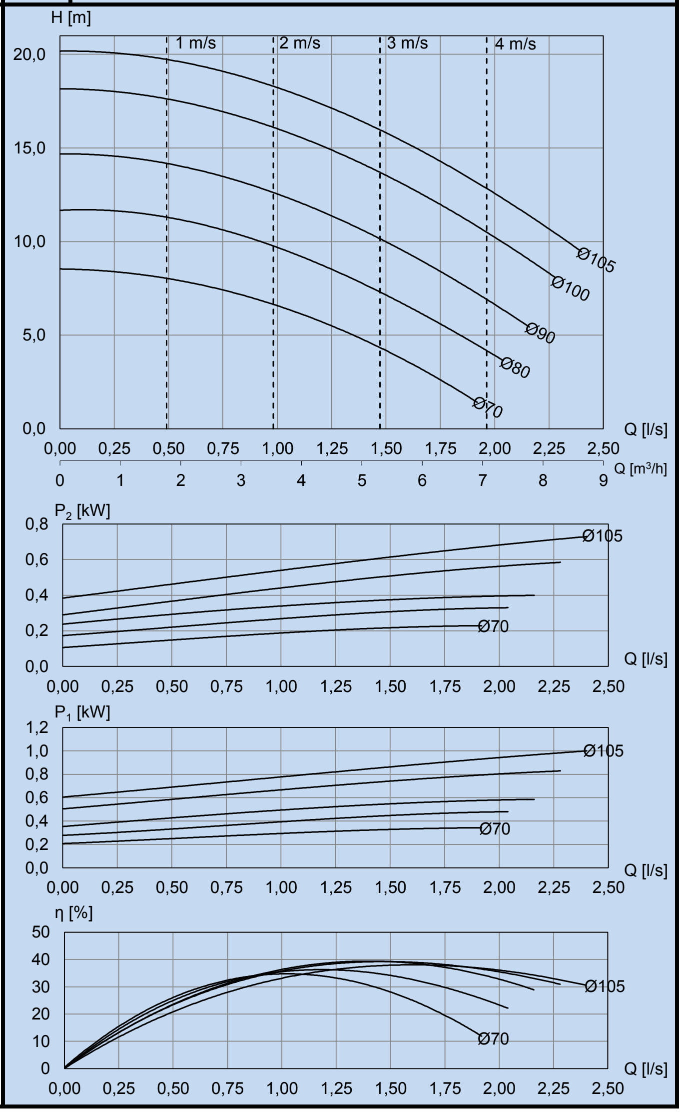


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-741 N12	0,25	0,70	10,5	225
	OKN-841 D N12	0,65	1,75	15	275
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-741 N12	0,25 (0,3)	0,70 (0,70)	10,5	225
	OKN-841 D N12	0,65 (0,75)	1,60 (1,60)	15	275

50 Hz 3000r/min G 1



60 Hz 3600r/min G 1



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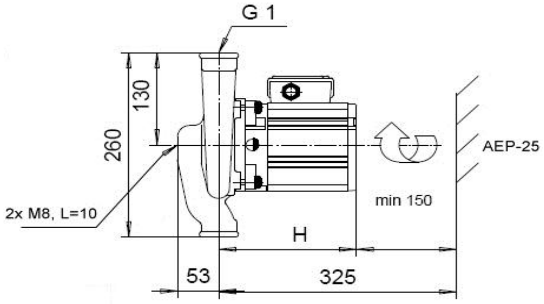
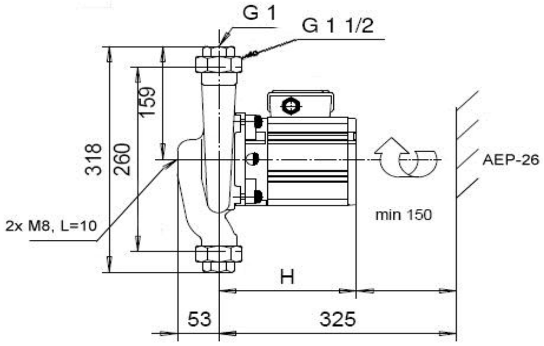
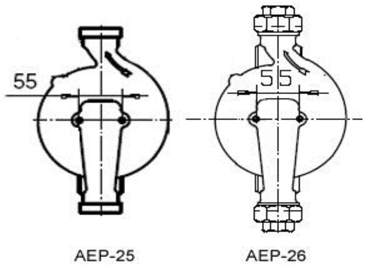
AEP-25/4 AEP-26/4

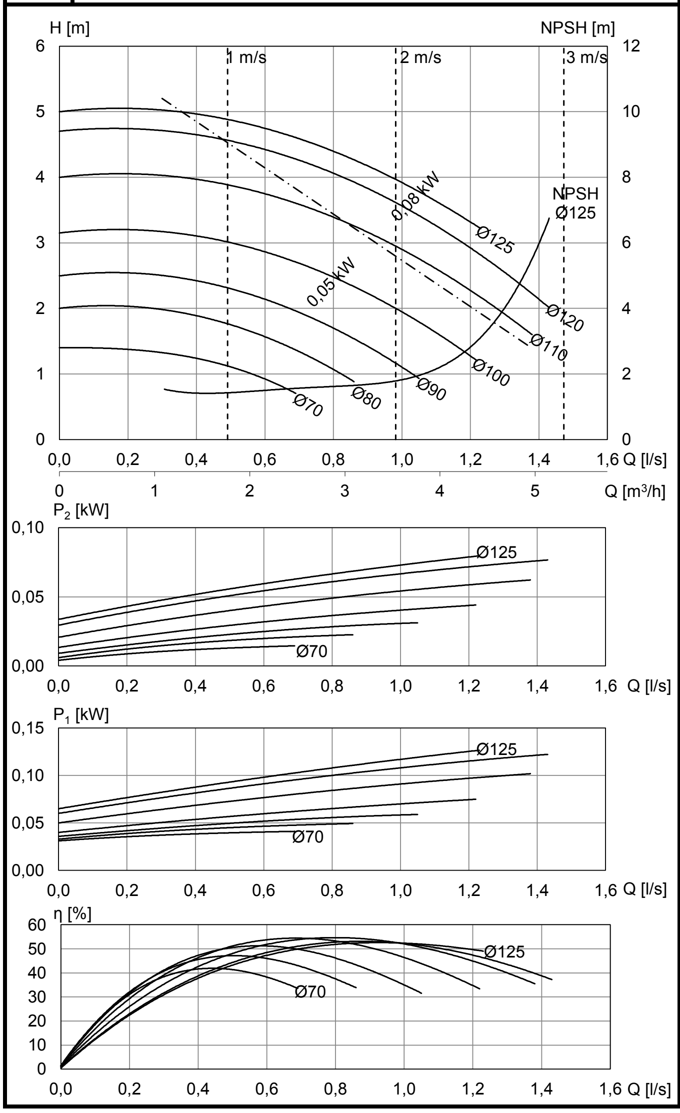


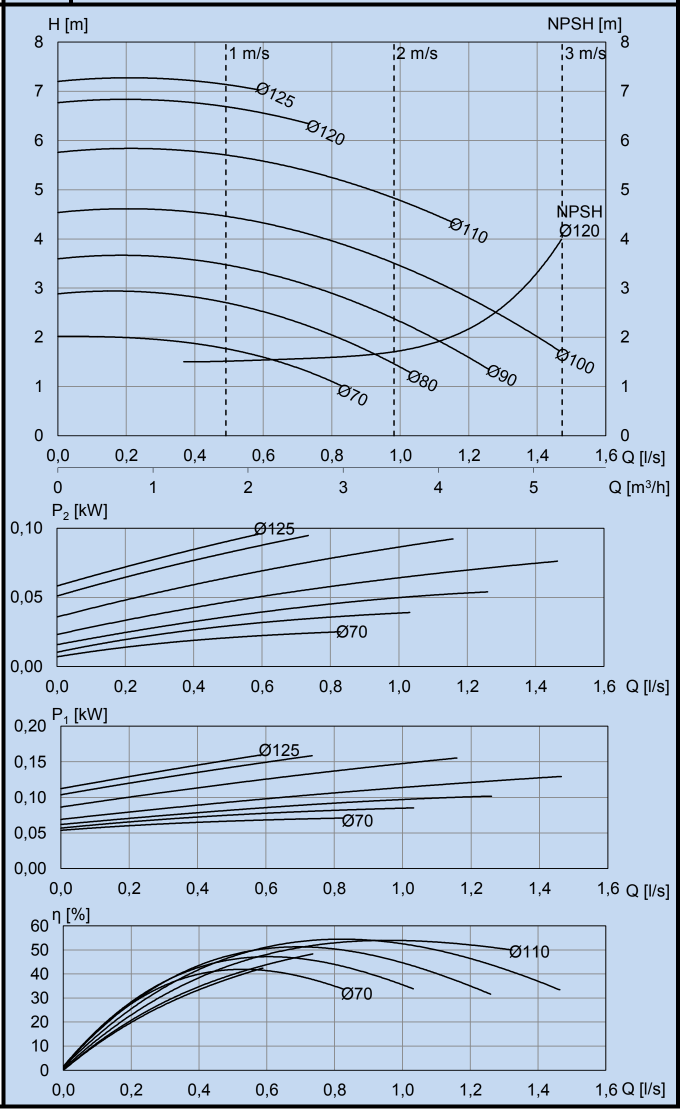


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 B N12	0,05	0,21	9,5	175
	OP-742 N12	0,08	0,28	10,5	175
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	9,5	175
	OP-742 N12	0,08 (0,09)	0,28 (0,28)	10,5	175

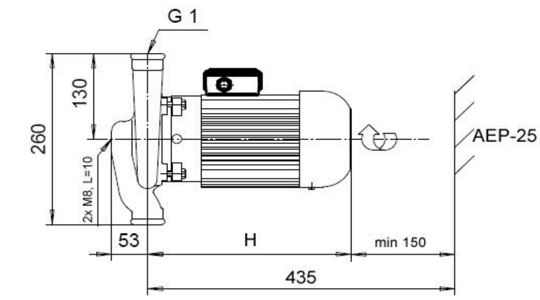


50 Hz	1500r/min	G 1	60 Hz	1800r/min	G 1

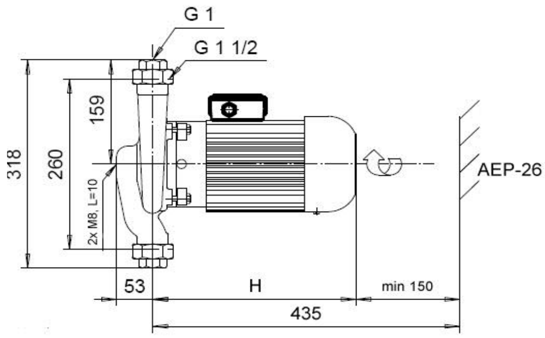


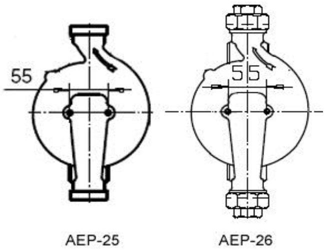


AEP-25/2 | AEP-26/2

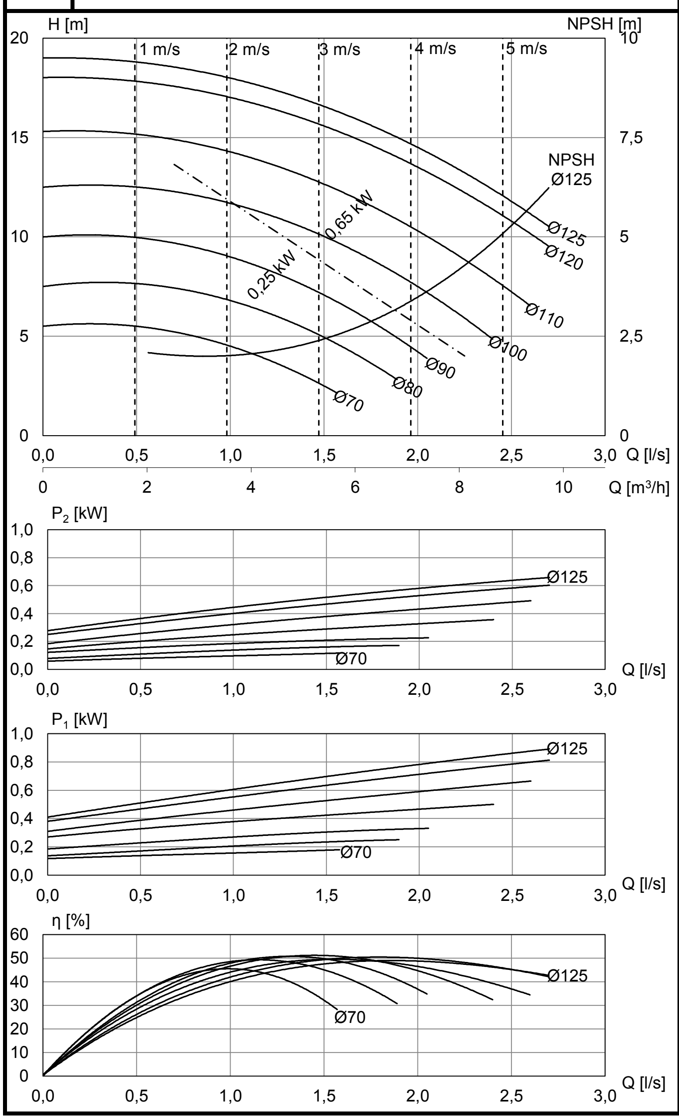


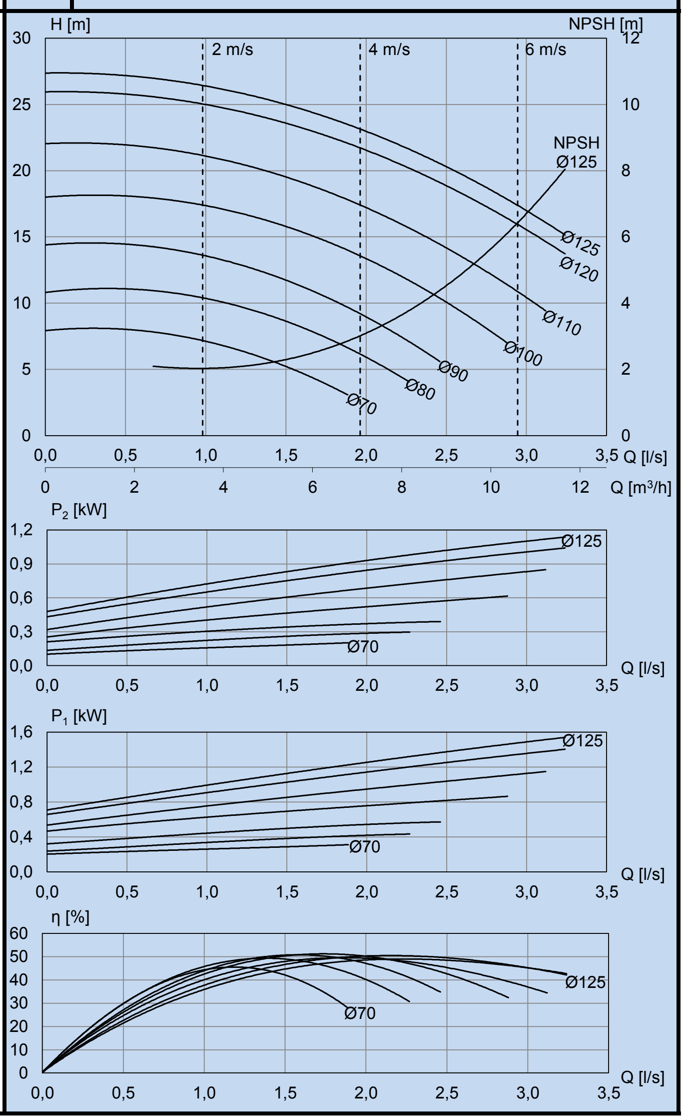
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-741 N12	0,25	0,70	10,5	215
50Hz	OKN-841 D N12	0,65	1,75	14,5	260
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-741 N12	0,25 (0,3)	0,70 (0,70)	10,5	215
60Hz	OKN-841 D N12	0,65 (0,75)	1,60 (1,60)	15	260
60Hz	KH-871 N12	1,1 (1,3)	2,35 (2,50)	17	295





50 Hz	3000r/min	G 1	60 Hz	3600r/min	G 1





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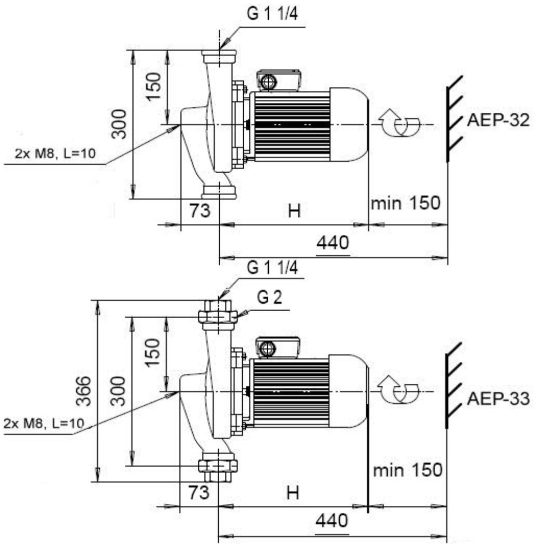
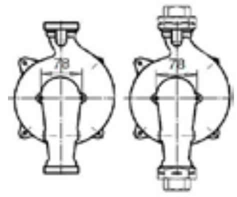
AEP-32/4 | AEP-33/4

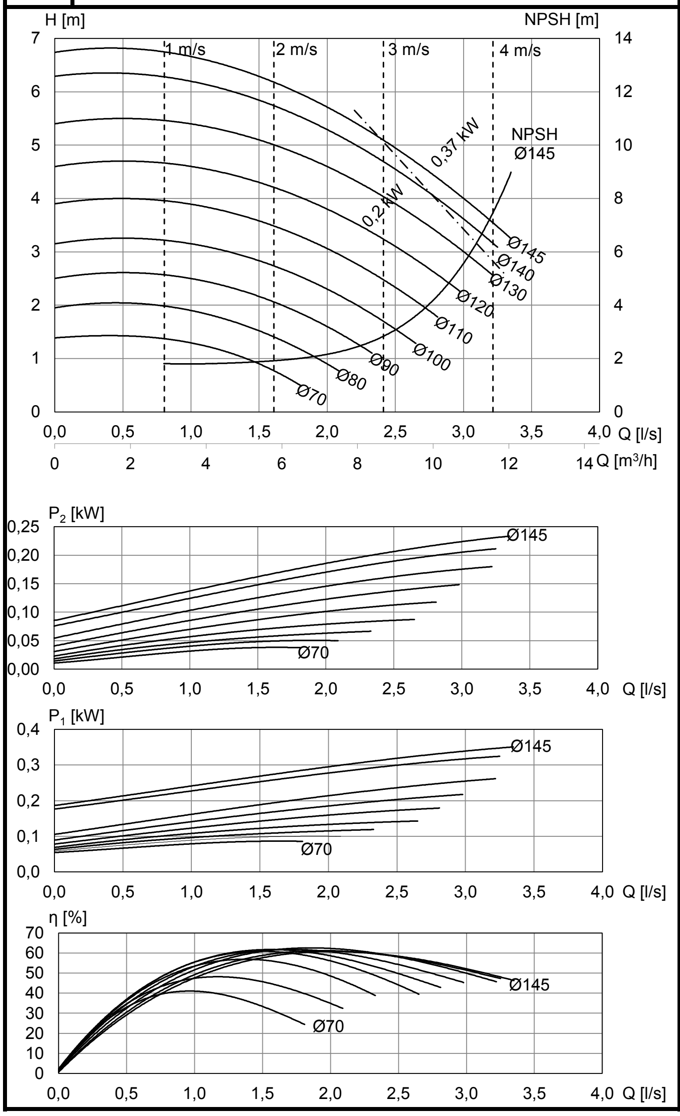


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-752 N13	0,2	0,65	16	240
	OKN-862L D N13	0,37	1,15	20	290
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-752 N13	0,2 (0,24)	0,65 (0,65)	16	240
	OKN-862L D N13	0,37 (0,44)	1,15 (1,15)	20	290

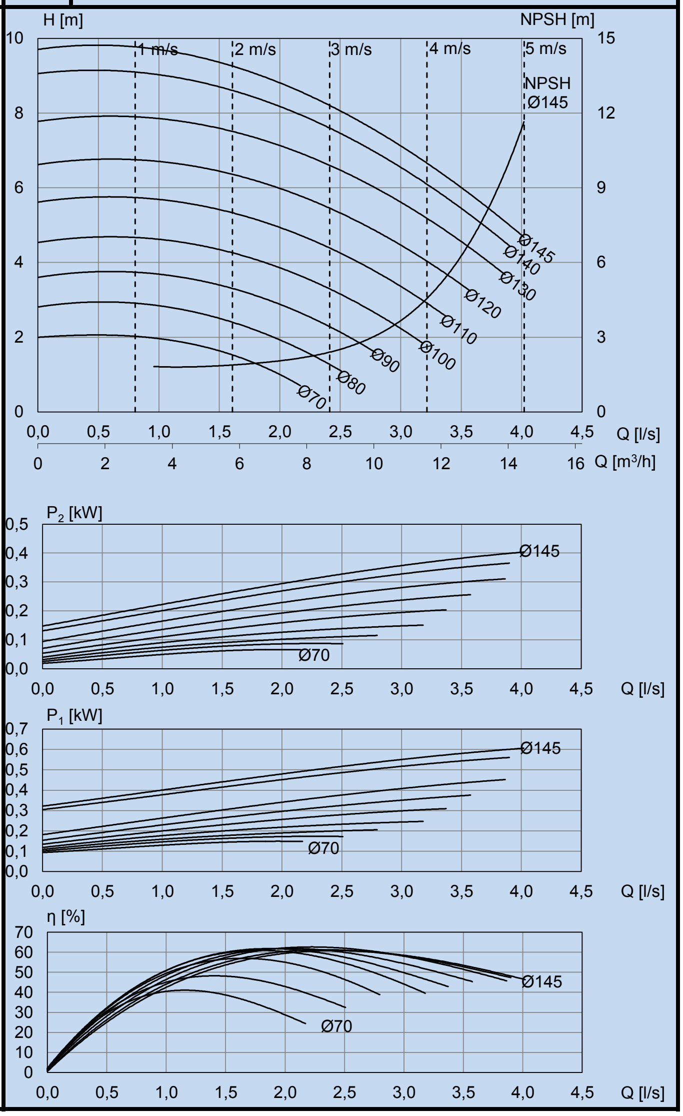


AEP-32 AEP-33

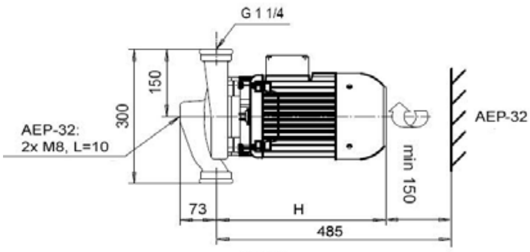
50 Hz 1500r/min G 1 1/4



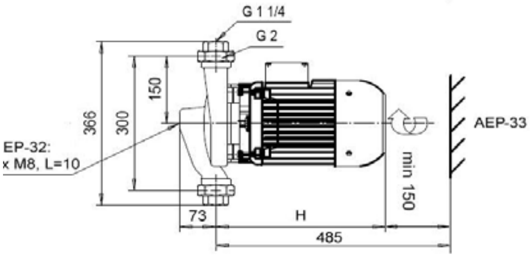
60 Hz 1800r/min G 1 1/4

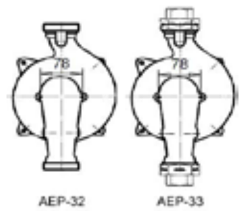


AEP-32/2 AEP-33/2

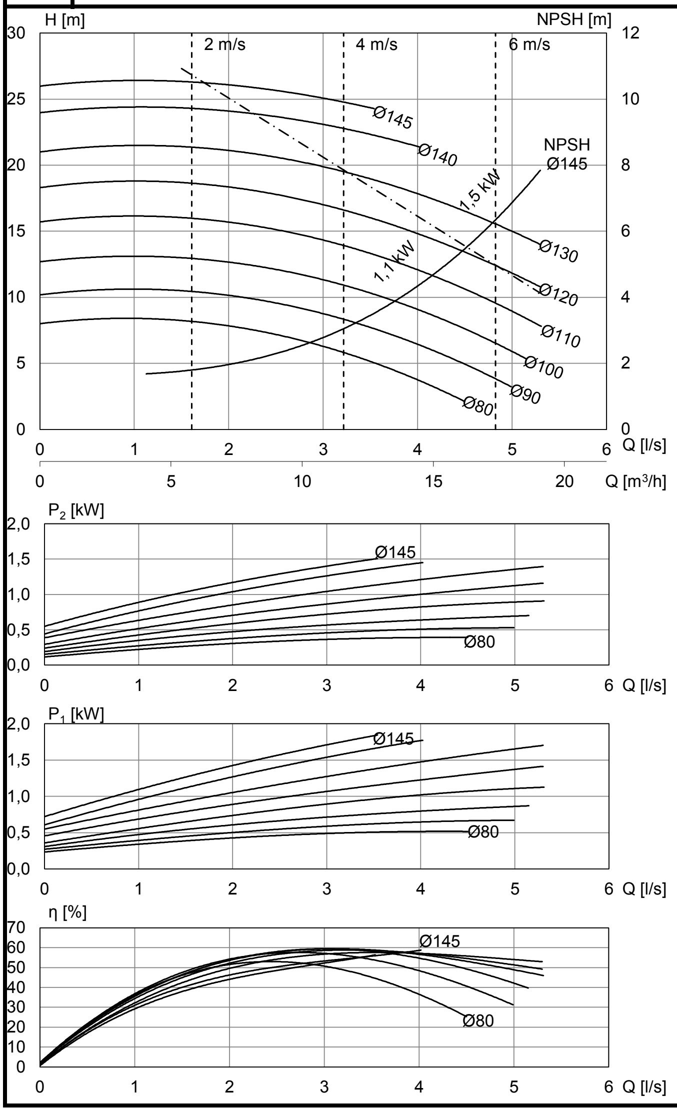


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-871 N13	1,1	2,55	21	295
50Hz	KH-101 C1 N13	1,5	2,95	32	335
	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-871 N13	1,1 (1,3)	2,35 (2,50)	21	295
60Hz	KH-101 C1 N13	1,5 (1,8)	2,98 (3,02)	32	335

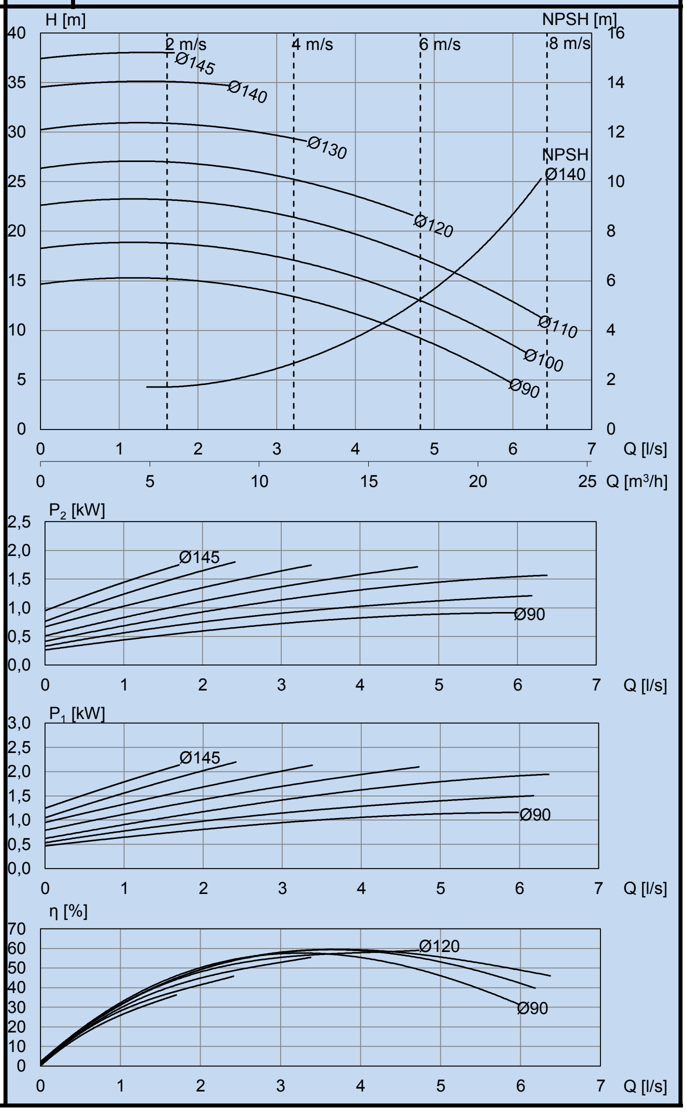




50 Hz	3000r/min	G 1 1/4



60 Hz	3600r/min	G 1 1/4



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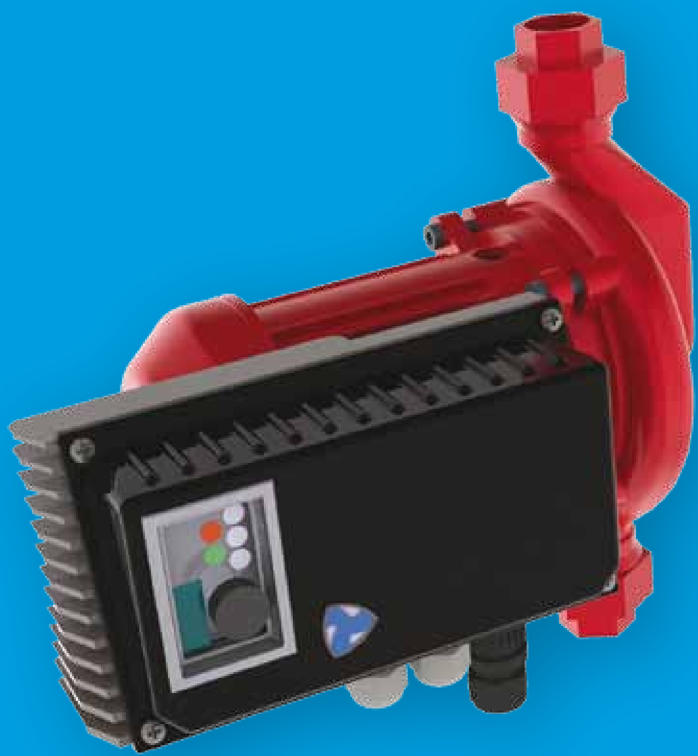


INLINE PUMPS WITH INTEGRATED SC FREQUENCY CONVERTER, 1x230V

AE- series, threaded G3/4 – G1 ¼

L- and AL- series, flanged DN32 – DN100

General technical data

SC Series of Kolmeks circulation pumps and variable speed controlled centrifugal pumps with integrated frequency converter.

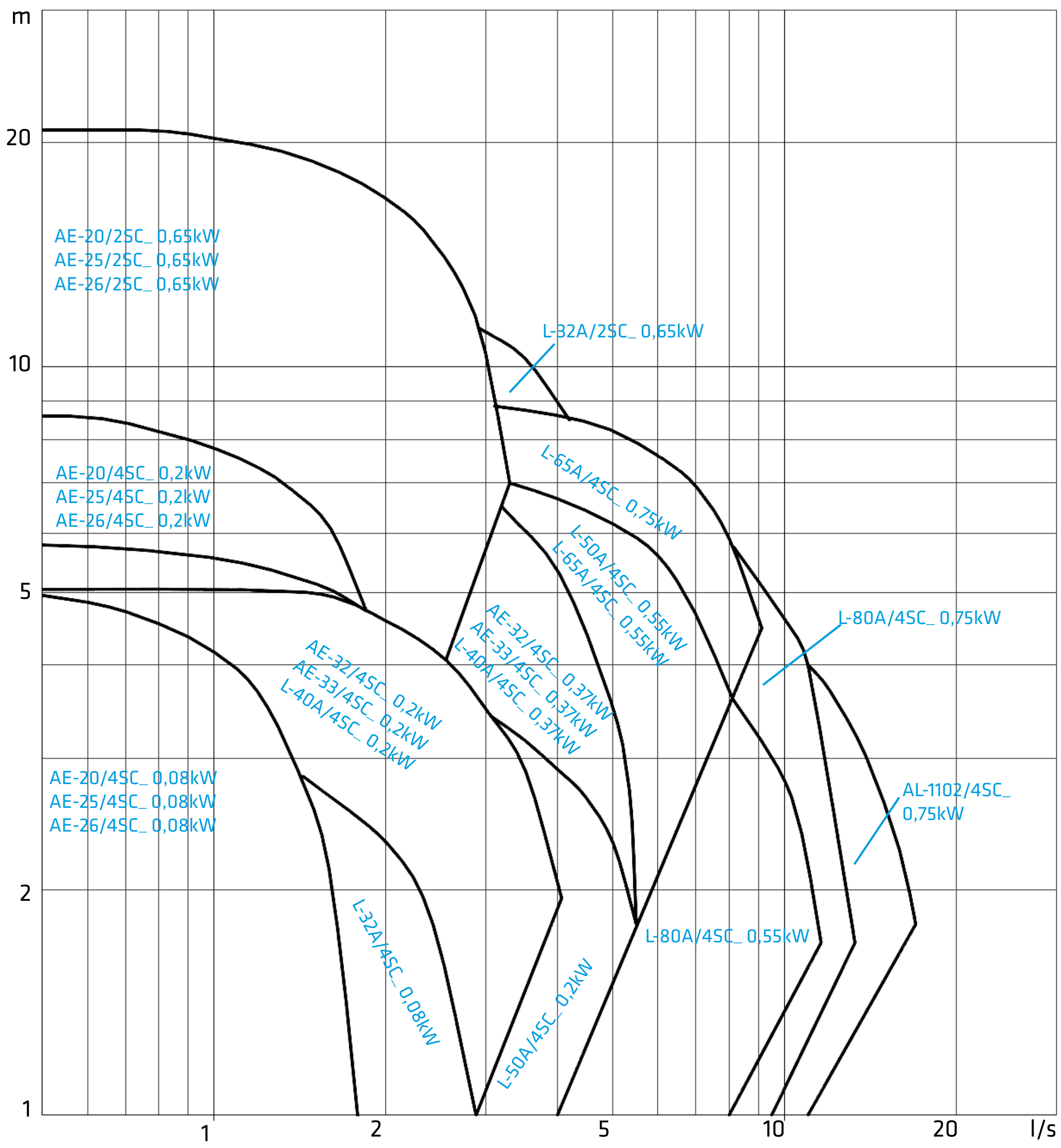
Applications

Cast iron SC series pumps can be used as circulation, pressure boosting and transfer pumps for clean liquids.

- Bronze SC pumps can be used as domestic hot water, circulation, pressure boosting and transfer pumps for clean , oxygen-rich and some slightly aggressive liquids.
- Stainless steel AISI316 SC pumps can be used as circulation, pressure boosting and transfer pumps for clean and aggressive liquids.

The most common applications of the SC pump series are heating, ventilation, cooling and heat recovery systems, heat exchangers, pressure boosting, district heating plants, ice rinks, swimming pools, spas and industrial processes.

Quick Selection Chart



Structure

Pump

SC series pumps are monoblock-structured centrifugal pumps with a dry asynchronous motor. A frequency converter is integrated into the motor. The pump impeller is installed directly onto the shaft of the electric motor (no separate couplings).

Electric motor

The electric motor of an SC pump is a three-phase Kolmeks asynchronous motor designed for pump and frequency converter operation, which guarantees high starting torque and low energy consumption. The electric motor is highly efficient and has low noise levels.

Supply voltage:	1 x 230 V, 50 Hz
Enclosure class:	IP 54
Insulation class:	F
Duty type:	Continuous duty (S1)
Ambient temperature:	0°C ... +40°C (max. +35°C diurnal average)

Connections

Flanged:

The flanges of SC pump fit counter-flanges dimensioned according to ISO 7005.

Threaded:

The SC pump threads are dimensioned according to Standard ISO 228/1.

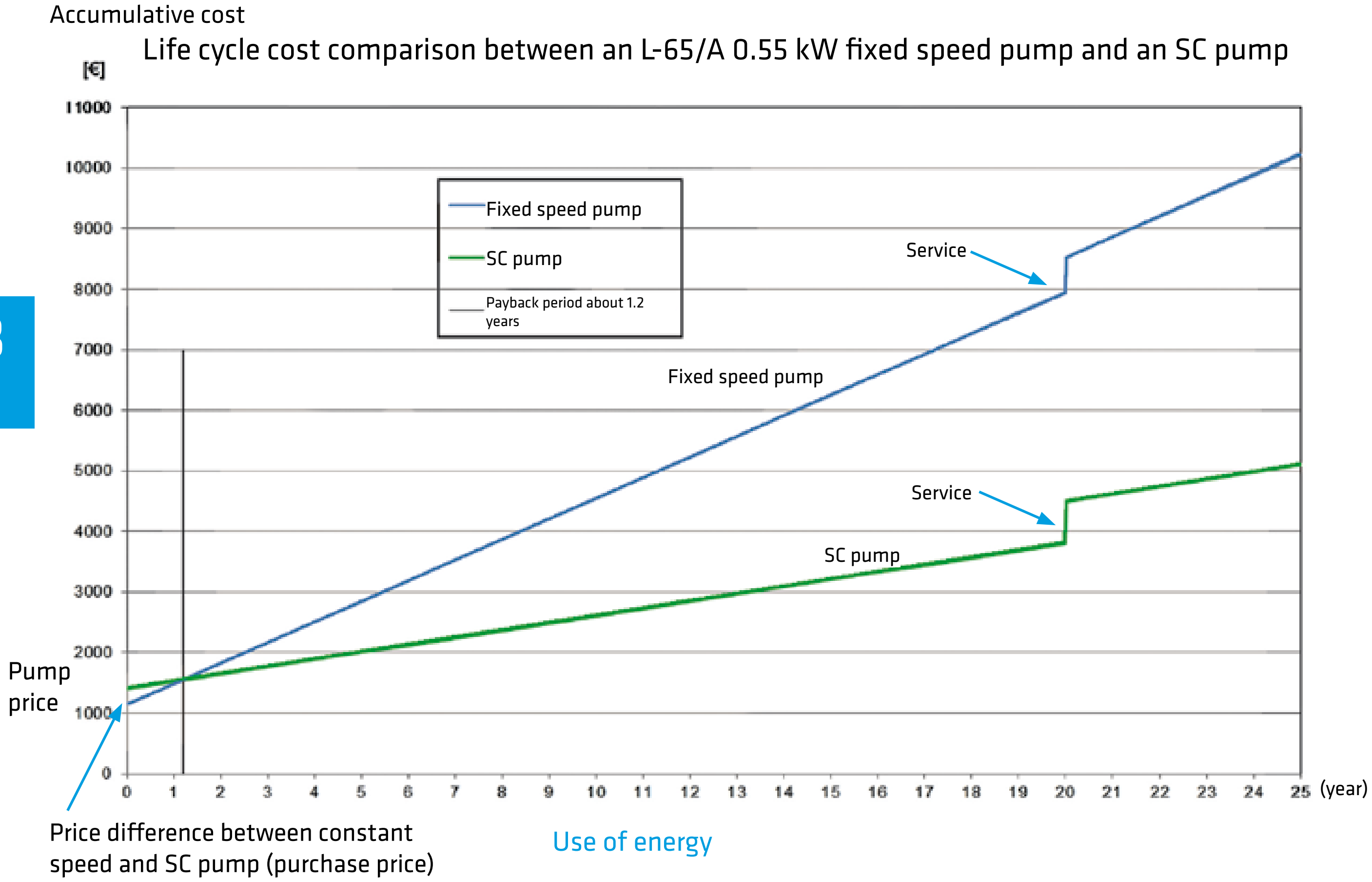
Seals

The standard shaft seal of an SC series pump is a single mechanical seal. The pump housing seal is O-ring or a gasket. Other seal options are available by request.

Advantages of selecting an SC pump

- The pump is adjusted manually / automatically adjusts its duty to match the requirements of the system
- The duty point, and therefore the electric power consumption, is determined by actual flow requirements, resulting in reduced running and life cycle costs.
- Depending on pump size, the payback period compared to a fixed speed pump is 0.5–2.5 years (see example).

L-65A/4 0.55kW constant speed
L-65A/4SCG 0.55kW with integrated frequency converter



Cost-benefit analysis, Q=6l/s, H=35kPa

3

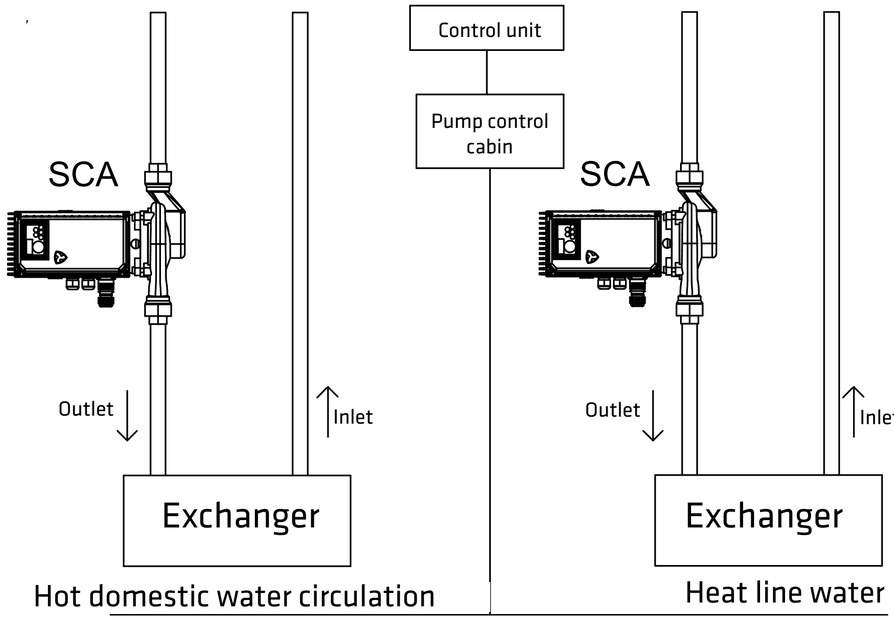
Kolmeks recommendation for pumps in district heating circulation systems

As the payback period for installing a Kolmeks SC variable speed pump is short, Kolmeks recommends the use of variable speed pumps in new systems and the replacement of fixed speed pumps with variable speed pumps in existing systems.

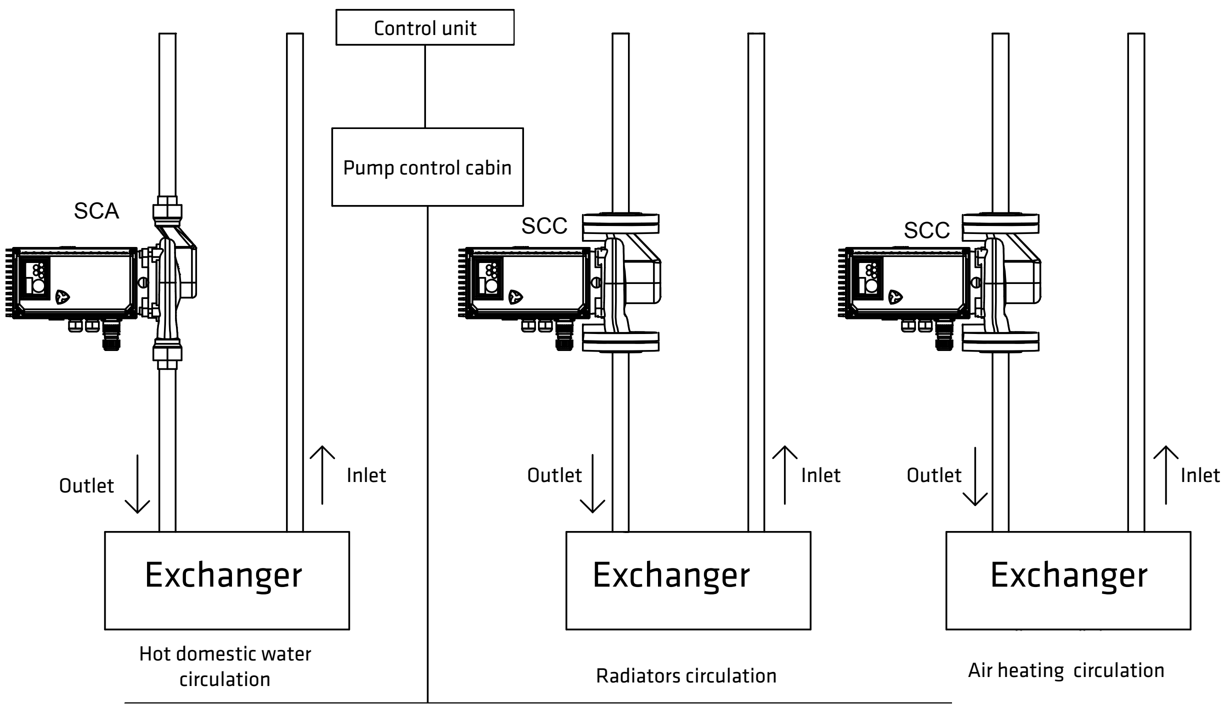
District heating system with two secondary circuits

Supply for all pumps
1 x 230 V

Advantages of an SC pump
- Alarms to BMS
- Duty point can be adjusted in one step
- Operates according to system requirements (radiator and air heating circulation)
- Energy savings
- Reliable operation



District heating system with three secondary circuits



Examples of Kolmeks recommendations for pumps in district heating circulation systems

Standard materials and fields of application for SC pumps

Connection size G or DN	Grey cast iron EN-GJL-200 PN10	Nodular cast iron EN-GJS-400 PN16	Bronze CuSn10Zn2 PN10	Stainless steel AISI 316 PN 16	Shaft seal PN10 Ø [mm] materials	O-ring size [mm]	O-ring material	Motor [kW]
G 3/4	AE-20/4 SC_	no	no	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-20/2 SC_	no	no	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,65
G 1	AE-25/4 SC_	no	AEP-25/4 SC_	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-26/4 SC_	no	AEP-26/4 SC_	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-25/2 SC_	no	AEP-25/2 SC_	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,65
	AE-26/2 SC_	no	AEP-26/2 SC_	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,65
G 1 1/4	AE-32/4 SC_	no	AEP-32/4 SC_	no	12, carbon/SiC Viton	145 X 2,5	NBR	0,2-0,37
	AE-33/4 SC_	no	AEP-33/4 SC_	no	12, carbon/SiC Viton	145 X 2,5	NBR	0,2-0,37
DN 32	L-32/4 SC_	no	no	no	12, carbon/SiC EPDM	100 X 2,5	NBR	0,08 and 0,2
	L-32/2 SC_	no	no	no	12, carbon/SiC EPDM	100 X 2,5	NBR	0,65
DN 40	L-40A/4 SC_	no	no	no	12, carbon/SiC EPDM	145 X 2,5	NBR	0,2-0,37
DN 50	L-50A/4 SC_	no	LP-50A/4 SC_	no	12, carbon/SiC EPDM	150 X 3	NBR	0,2 and 0,55
DN 65	L-65A/4 SC_	LH-65A/4 SC_	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN 80	L-80A/4 SC_	LH-80A/4 SC_	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN 100	AL-1102/4 SC_	ALH-1102/4 SC_	ALP-1102/4 SC_	ALS-1102/4 SC_	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,75

Operating temperature -15...+95 °C
PN10 = Max. working pressure 10bar, grey cast iron and bronze
PN16 = Max. working pressure 16bar, nodular cast iron and stainless steel

Rating plate information

Additional accessories:
T = Seal for aggressive liquids (external)
H = Flushing
KT = Double mechanical seal
Sn = Non-standard mechanical seal
Kn = Non-standard surface treatment

Special impeller material:
PM = Bronze
SS = stainless steel AISI316

Pump type
Serial number, Pressure class
Duty point, Max liquid temperature
Motor type
Nominal voltage and current
Rotation speed, insulating and enclosure class
Manufacturer, Country of origin

Motor code marking
Impeller size
Electrical power at duty point
Supply voltage phase number, frequency and duty type
Nominal shaft power
Minimum efficiency index (MEI)
Bearing types, CE marking

1 2 3 4 5

AL - 110 2 / 4 SC B

L P - 50 A / 4 SC C

1) Pump series:
AE-, L-, AL-

2) Material of housing, sealing flange and impeller:
no letter = Grey cast iron EN-GJL-200
H = Nodular cast iron EN-GJS-400
P = Bronze CuSn10Zn2
S = Stainless steel AISI 316

3) Flange DN size:

20 =	3/4"
25 =	1"
32 =	DN 32
40 =	DN 40
50 =	DN 50
65 =	DN 65
80 =	DN 80
110 =	DN 100

4) Electric motor pole number:
2 = rotation speed 50 r/s (50 Hz)
4 = rotation speed 25 r/s (50 Hz)
rotation speed 30 r/s (60 Hz)
rotation speed 32.5 r/s (65 Hz)

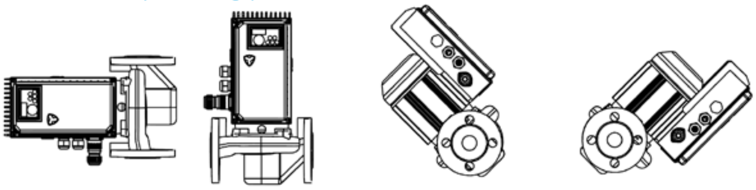
5) SC = SC frequency converter integrated into pump Pump adjustment method:
SCA, SCB, SCC, SCD, SCF, SCG, SCM
(see Adjustment and connections)

Pump installation
The pump can be installed in the piping without additional support. The position of the motor unit and therefore the location of the frequency converter box can be changed by detaching the motor unit from the pump housing and turning it to the required position, within certain limitations.

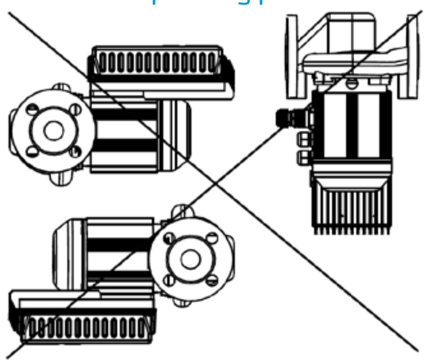
Ensure the following when installing the pump:
- Enough room for control, service and inspections
- The installation position should be chosen such that the display is readable; a separate control panel can be used if required.
- Possibility to use lifting and transfer devices if required
- Shut-off valves on both sides of the pump
- The pump must be installed in such a position that the frequency converter of the pump is not in the immediate vicinity of a hot pipe.

Operating positions

Permitted operating positions

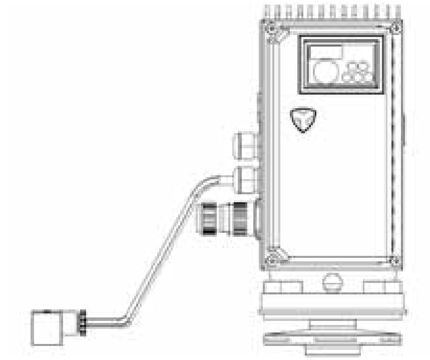


Prohibited operating positions



3

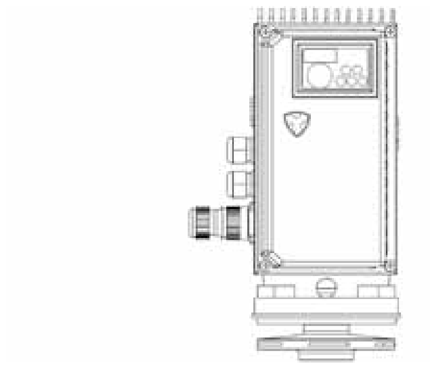
Motor units:



SCB, SCC, SCD and SCF pumps

The complete pump motor unit is a new spare motor unit which includes:
- Electric motor
- Frequency converter
- Transmitter quick connection plug with wires
- Sealing flange
- Impeller
- Seals

When replacing the motor unit, no piping or electrical work is required, as there is no need to detach the pump housing, and the power supply is connected using a quick connection plug. There is also no need to detach the transmitter or its tubes. Only the cap screw of the plug connector at the top of the transmitter is opened, which enables the plug connector and its wiring to be pulled out. In the new motor unit, the connection plug is pre-wired, which allows quick replacement of the transmitter electrical connection.



SCA and SCG pumps

The complete pump motor unit is a new spare motor unit which includes:
- Electric motor
- Frequency converter
- Sealing flange
- Impeller
- Seals

Control methods and control connections

SC pump I/Os (inputs and outputs)

Terminal 4	Programmable 4-20 mA, 0–5 VDC, 0–10 VDC analog input (voltage/current selection switch)
Terminal 2	Programmable 0–10 VDC, 0–5 VDC analog input
Terminals STF, STR, RH, RM, RL	Programmable digital inputs
Terminal PC	24 VDC voltage supply for digital inputs and feedback transmitter (max. 100 mA)
Terminal 10	5 VDC voltage supply for potentiometer
Terminal 5	Signal ground
AM / 5	Programmable analog output
Relay output, Terminals A,B, C	Fault indication (programmable relay output), potential free change-over contacts max. 230 VAC / 0.3 A, cos fii 0.4, max. 30 VAC / 0.3 A
Transistor output, Terminals RUN, SE	Load 27 V / 0.1 A, voltage loss 3.4 V

Terminal factory settings

Terminal 4	Programmed as feedback input 4–20 mA or not in use depending on the pump control method
Terminal 2:	0–10 VDC direct speed reference or controller reference depending on control method used, or not in use.
Terminal STF:	Jumper between terminals PC–STF open/closed = pump off/on
Terminal STR:	Not in use
Terminal RH:	Dry running protection in the SCD version
Terminal RM:	Jogging operation. PC – RM open/closed = normal operation / runs forced at 40 Hz frequency.
AM / 5:	Analog output 0–10 VDC. SCCVAK (direct speed reference from automation) and in SCG versions programmed as frequency. SCB, SCC, SCCVAK (differential pressure reference from automation), in SCD and SCF version programmed as feedback.
Relay output, Terminals A,B ja C:	The relay output is programmed with fault information. The relay draws: Terminals A and C connected, when the pump runs or voltage is connected to it. Terminals B and C connected, when the device is in fault mode or dead.

SCA pump: Direct speed reference by potentiometer

Applications
For systems with no continuous automatic adjustment requirement and a constant duty point, such as domestic hot water circulation systems, for example.

Accessories
Pump and frequency converter.

Operating principle
The rotation speed of the pump is set in one step using the buttons on the frequency converter when commissioning the pump. The desired frequency is selected using the control panel potentiometer, and is saved by pushing the SET button. The pump rotates at a constant set rotation speed. As the pump is running, it is possible to select the motor current (A) or start frequency (Hz) on the display by pushing the SET button. Panel use can be locked by pushing the MODE button for 2 seconds. The panel can be unlocked in the same way.

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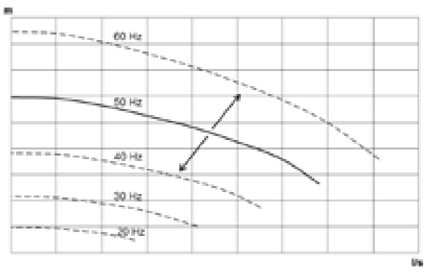
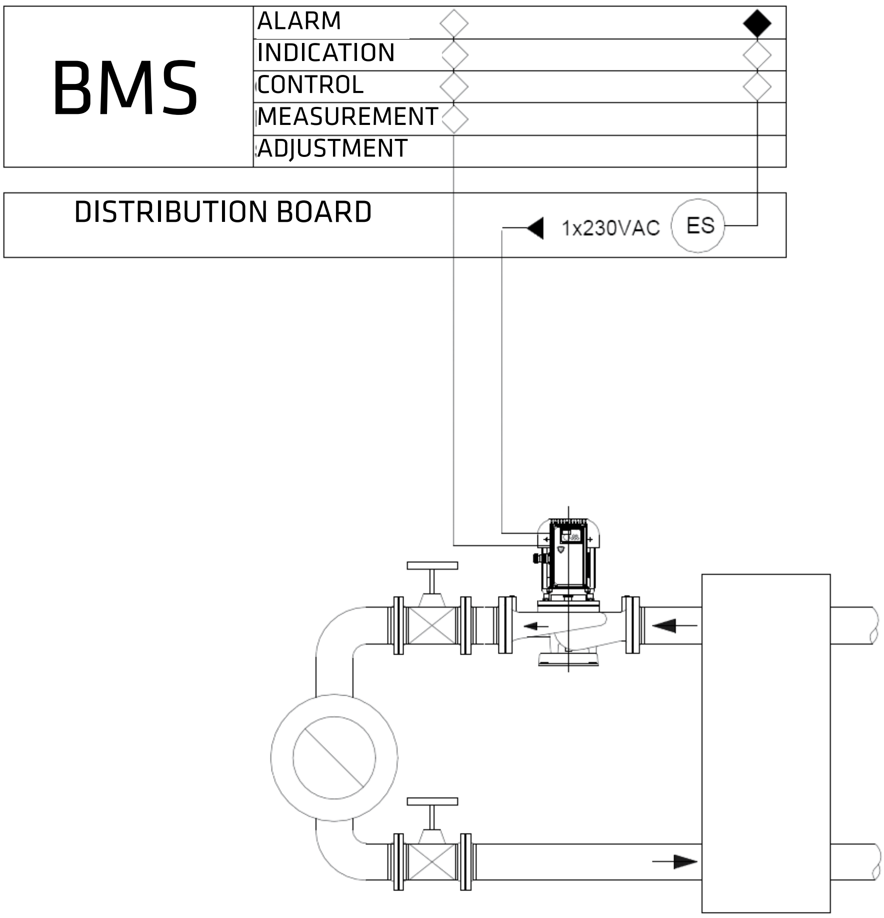
Pump curve
The pump QH curve equals the QH curve of a standard speed pump.

Standard control connections, PU / EXT COMBINED OPERATION MODE





SCB pump: Constant differential pressure across pump

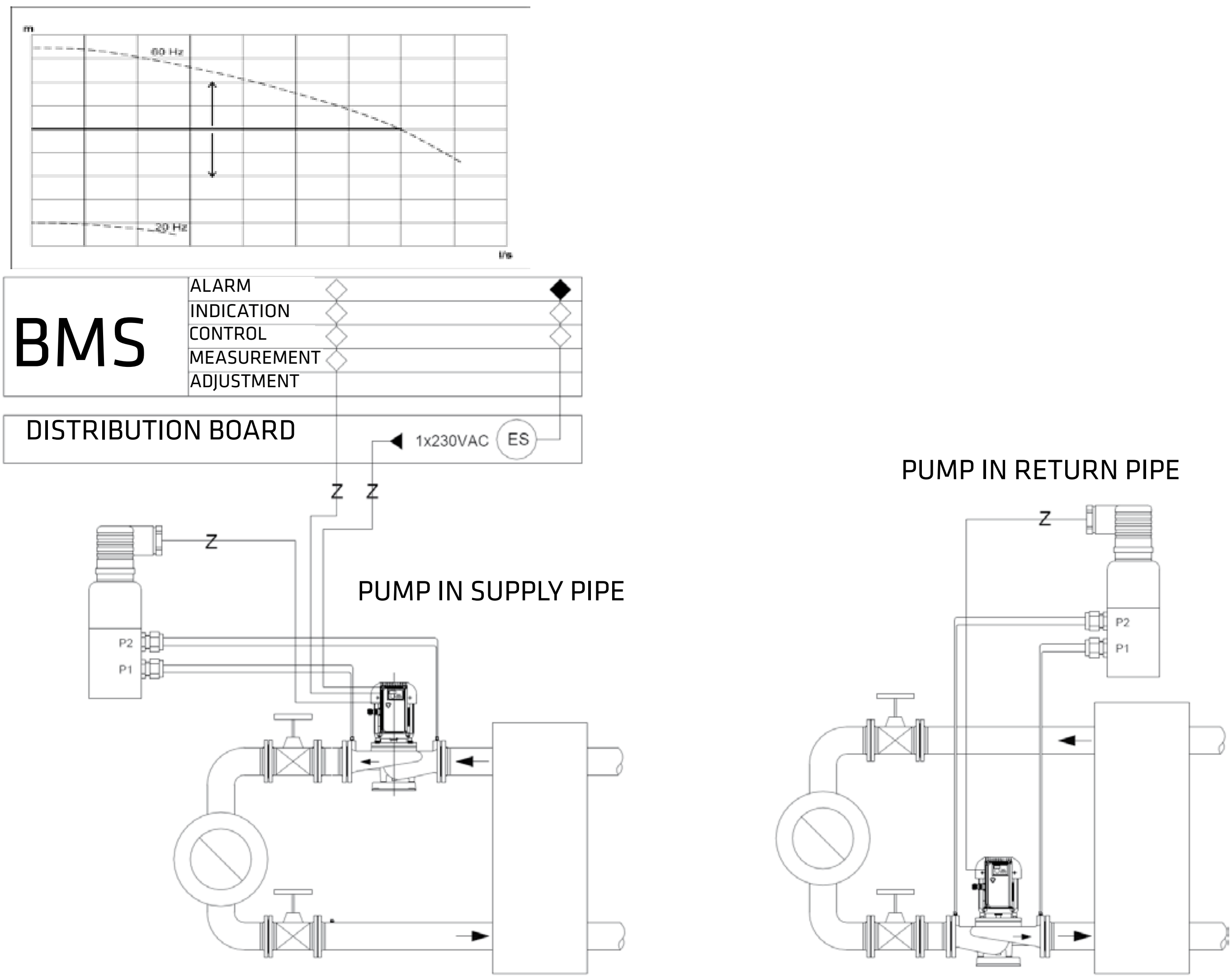
Applications
For circulation systems where flow rates vary and the majority of pressure loss is created at consumption targets. For example, heating and cooling systems and pressure boosting in parallel circulation systems.

Accessories
Pump, frequency converter, differential pressure transmitter and measurement pipes installed in the suction and discharge flanges of the pump.

Operating principle and system adjustment
Constant differential pressure is maintained between the pump flanges, and is set to Parameter 133 of the frequency converter as percentages of the maximum measurement value of the differential pressure transmitter (mentioned in the differential pressure transmitter). As the pump rotates, it is possible to select the start frequency (Hz), motor current (A) or differential pressure feedback (% of the maximum measurement value of the differential pressure transmitter) on the display by pushing the SET button. Panel use can be locked by pushing the MODE button for 2 seconds. The panel can be unlocked in the same way.

Pump curve
The QH curve of the pump is horizontal, which is applicable for circulation systems where the pressure loss of the heat source is low in relation to the total pressure loss.

Standard control connections, PU / EXT COMBINED OPERATION MODE



SCC pump: Constant differential pressure in piping

Applications

For circulation systems where flow rates vary significantly and the majority of pressure loss is created at consumption targets. For example, heating and cooling systems and pressure boosting in parallel circulation systems.

Accessories

Pump, frequency converter, differential pressure transmitter with pipes, one of which is installed in the suction or pressure flange in the pump and the other in the system's inlet or outlet pipe.

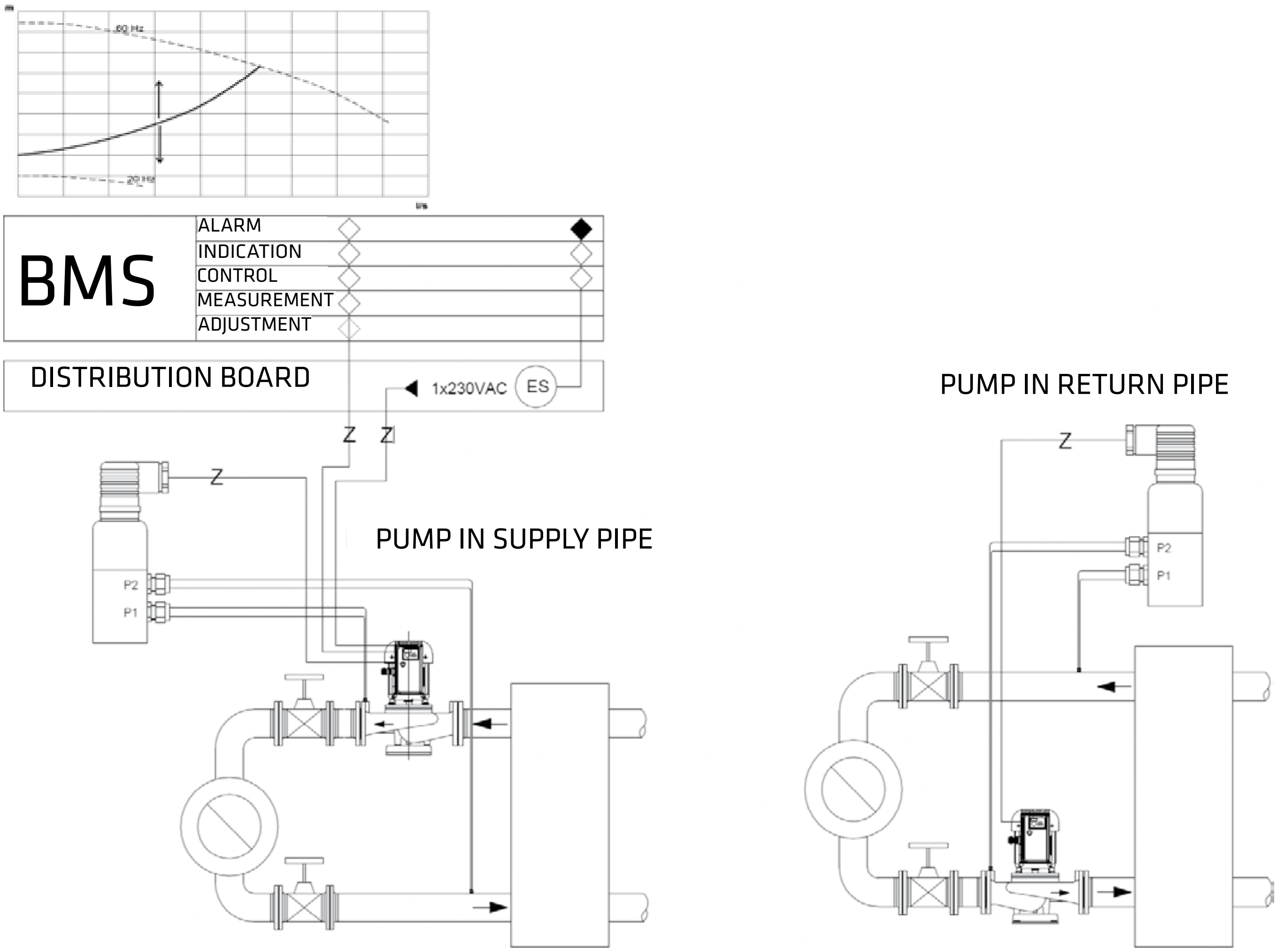
Operating principle and system adjustment

Constant differential pressure is maintained over the inlet and outlet lines of the system, and is set to Parameter 133 of the frequency converter as percentages of the maximum measurement value of the differential pressure transmitter (mentioned in the transmitter). As the pump rotates, it is possible to select the frequency (Hz), motor current (A) or differential pressure feedback (% of the maximum measurement value of the differential pressure transmitter) on the display by pushing the SET button. Panel use can be locked by pushing the MODE button for 2 seconds. The panel can be unlocked in the same way.

Pump curve

The pump QH curve is automatically square. The shape of the QH curve depends on the relation of the heat source pressure loss to the total pressure loss of the circulation system. The larger the share of the heat exchanger pressure loss is in relation to the circulation system's total pressure loss, the steeper the QH curve is.

Standard control connections, PU / EXT COMBINED OPERATION MODE



SCCVAK pump: Constant differential pressure in piping by BMS PI-controller

Operating principle (speed reference to pump as voltage signal 0–10 V)

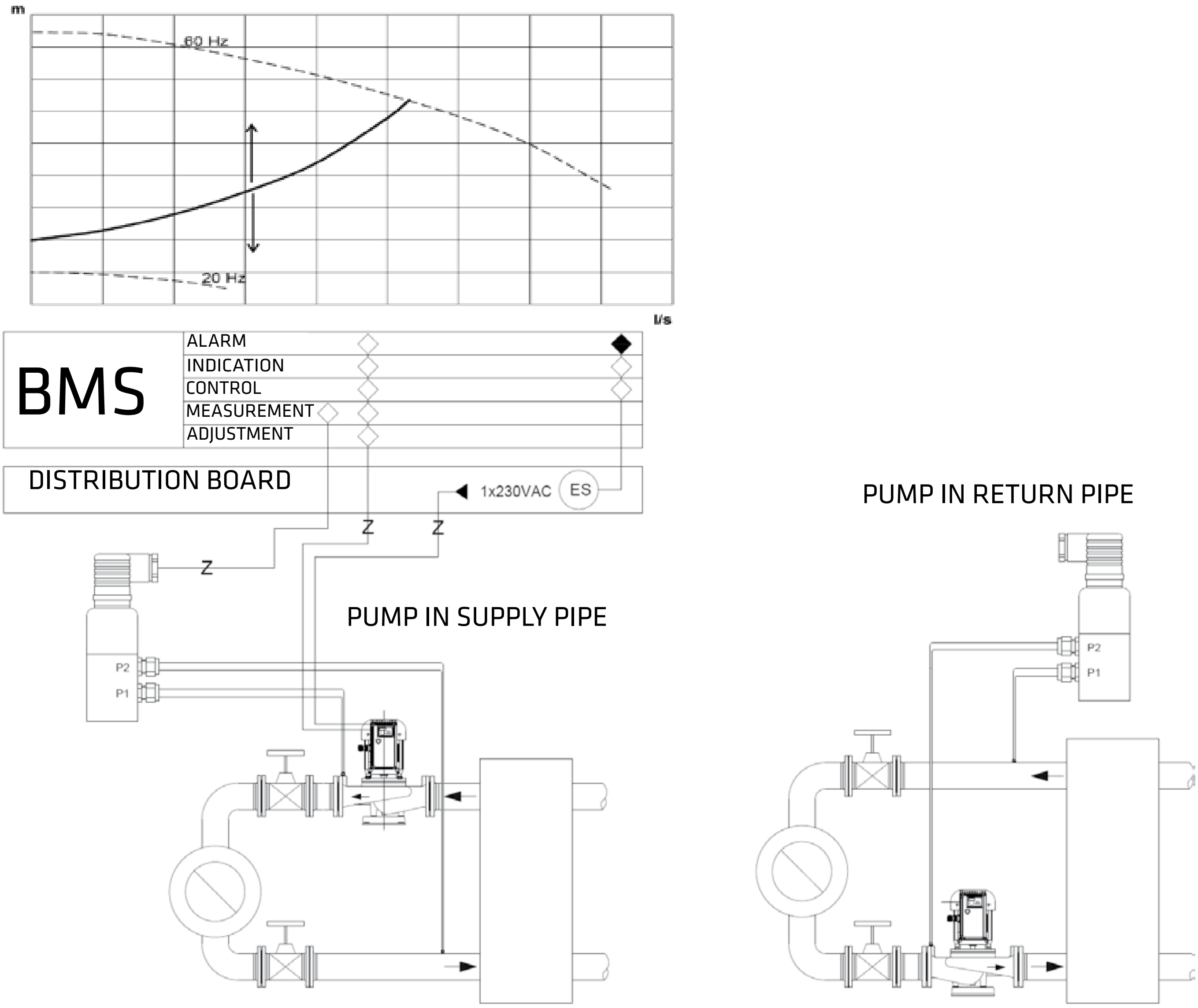
Constant differential pressure is maintained over the return and supply pipe of the system by setting it in the BMS (direct speed reference to pump as voltage or current signal). The differential pressure feedback measurement is connected to the BMS.

System adjustment/balancing

When adjusting and balancing the system, the differential pressure transmitter is connected to the BMS. The main control valve is fully opened and the flow is adjusted using the frequency converter display by entering the correct frequency. When the system is balanced and the desired flow is obtained, the differential pressure value of the differential pressure transmitter is read in the BMS and programmed into the BMS as a reference value.

Alternatively, the accurate constant differential pressure value can be accessed when the pump is SCC connected (see previous section). A wire loop must be installed between Terminals PC and RL (control run). When the system is balanced and the correct flow is obtained, the reference value of differential pressure (m) can be read (Parameter 133). It is programmed into the BMS as a reference value.

Standard control connections, EXT OPERATION MODE



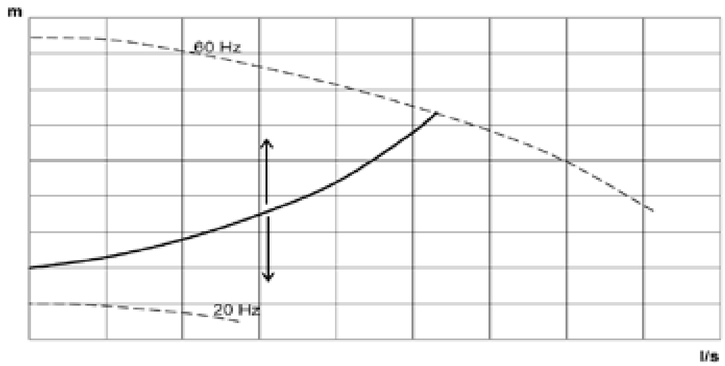
SCCVAK pump: Constant differential pressure in piping by frequency converter PI-controller

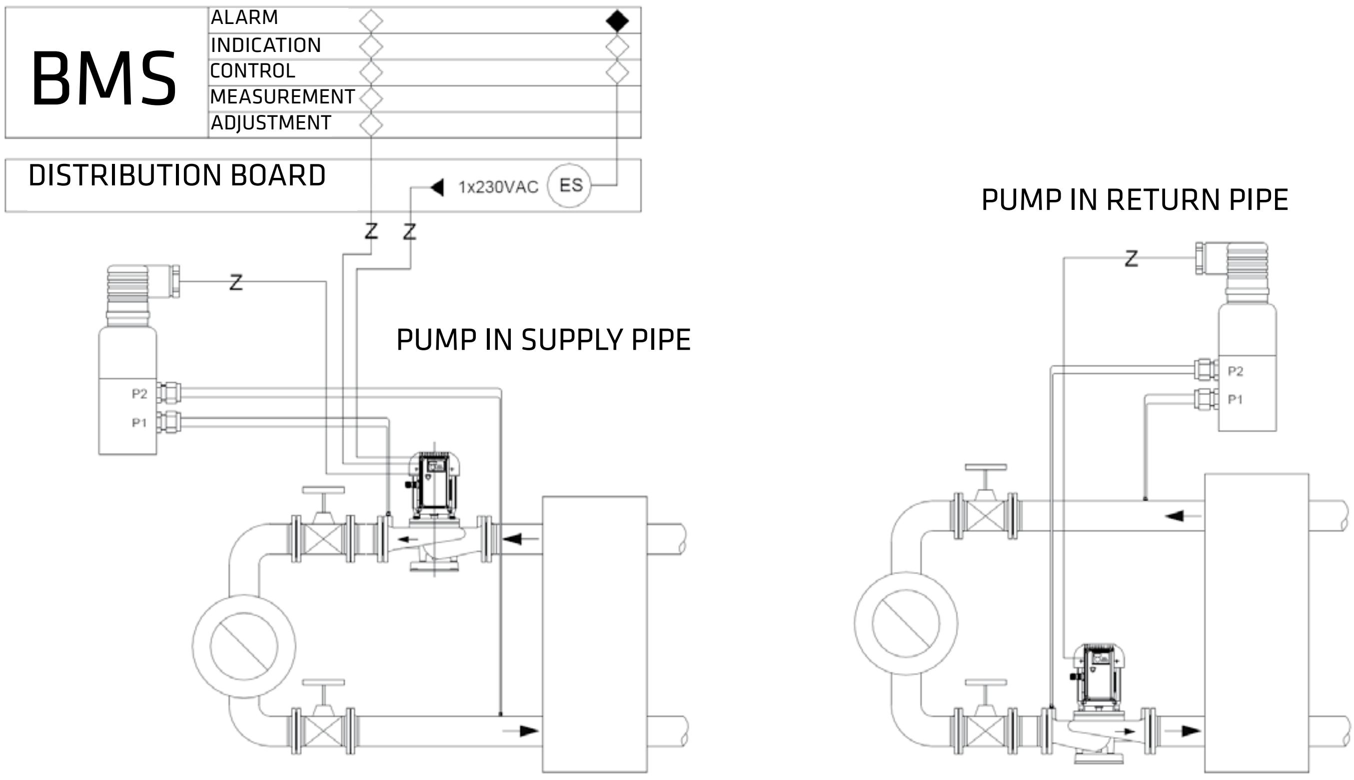
Operating principle

Constant differential pressure is maintained over the inlet and outlet line of the system by setting it in the BMS (differential pressure reference value as voltage current signal 0–10 V). These connections and operation are the same as for the SCC pump: Constant differential pressure in piping, but here, instead of using the keyboard, the differential pressure reference value is set externally from the BMS between terminals 2 and 5 (Parameter 133 = 9999).

NOTE! If the BMS is not operational when pumping is required, set the differential pressure using Parameter 133 (see SCC pump).

Standard control connections, PU / EXT COMBINED OPERATION MODE





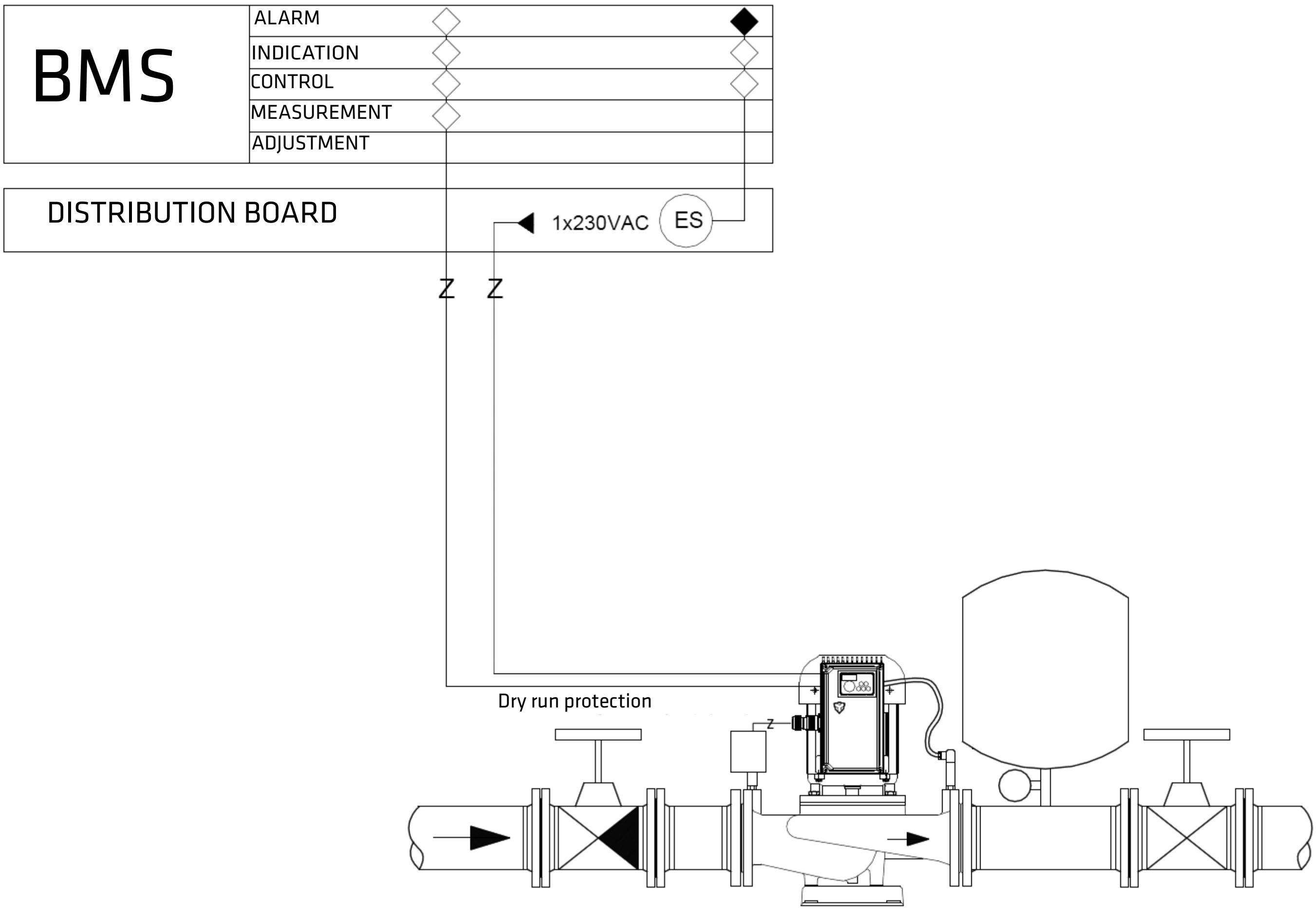
SCD pump: Constant pressure in discharge flange (pressure boosting)

Applications
For pressure boosting and other open systems which require a constant pressure.

Accessories
Pump, frequency converter and pressure transmitter which is installed either on the pump discharge flange or consumption point.

Operating principle
The pump maintains constant pressure at the installation point of the pressure transmitter. The pressure is set to Parameter 133 of the frequency converter as percentages of the maximum measurement value of the differential pressure transmitter (found in the pressure transmitter). As the pump rotates, it is possible to select the frequency (Hz), motor current (A) or pressure feedback (% of the maximum measurement value of the pressure transmitter) on the display by pushing the SET button. Panel use can be locked by pushing the MODE button for 2 seconds. The panel can be unlocked in the same way.

Standard control connections, PU / EXT COMBINED OPERATION MODE



SCF pump: Constant temperature

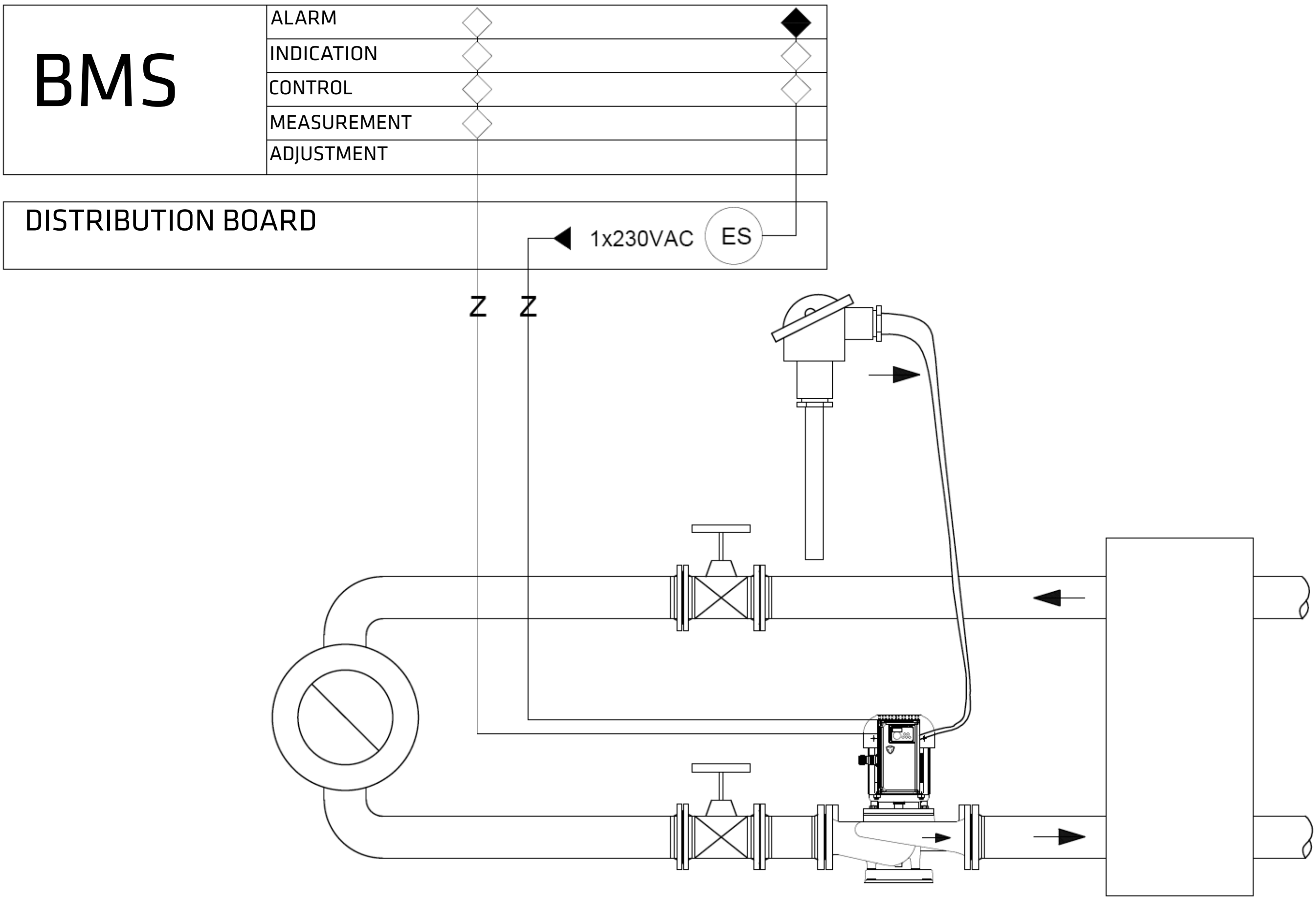
Applications
For heating or cooling systems which maintain constant temperature by adjusting the flow rate.

Accessories
Pump, frequency converter and temperature transmitter.

Operating principle
The system maintains a constant temperature which is set to Parameter 133 as percentages of the maximum measurement value of the temperature transmitter (found in the temperature transmitter). As the pump rotates, it is possible to select the frequency (Hz), motor current (A) or temperature feedback (% of the maximum measurement value of the temperature transmitter) on the display by pushing the SET button. Panel use can be locked by pushing the MODE button for two seconds. The panel can be opened in the same way.

NOTE! Please state the adjustment direction when ordering the pump. Normal when pumping is decreased as the temperature (feedback) increases, inverse when pumping is increased as the temperature increases. 128 => normal = 20, inverse = 21).

Standard control connections, PU / EXT COMBINED OPERATION MODE



SCG pump: Pump speed controlled by external automation

For systems with varying flow rates and/or in which the flow rate is adjusted using the pump. The pump is controlled centrally or by a separate controller.

Accessories

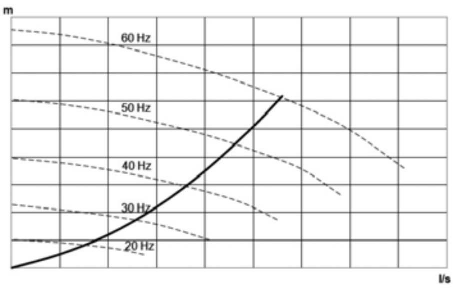
Pump and frequency converter.

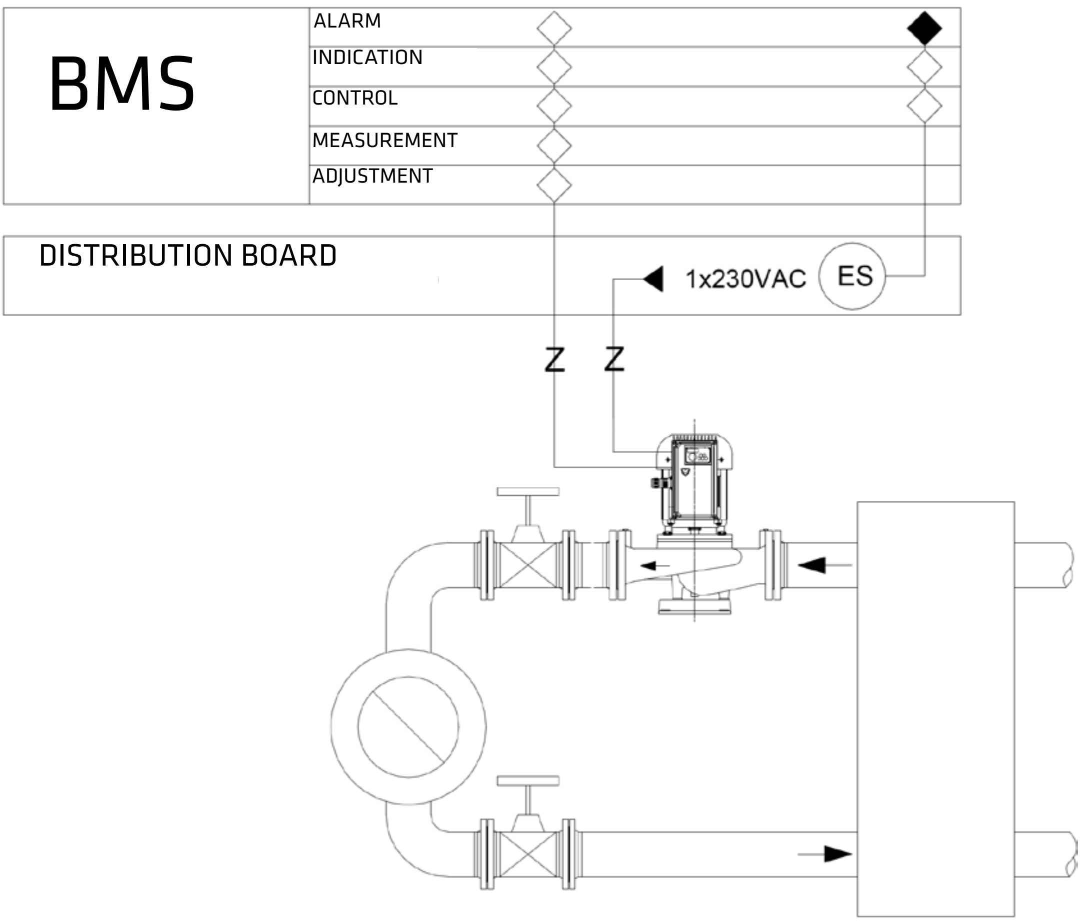
Operating principle

The pump is given a direct speed reference externally e.g. from the BMS, a separate controller, process control, etc.

NOTE! If the BMS is not operational when pumping is required, use Parameter 79 to select PU/EXT combined operation (Par 79: 0=>3). After this, the standard speed of the pump can be set in the same way as for an SCA pump.

Standard control connections, EXT OPERATION MODE





SCM pump: Automation controlled pump with MODBUS RTU bus

For systems with varying flow rates and/or in which the flow rate is adjusted by the pump. The pump is controlled centrally or by a separate controller.

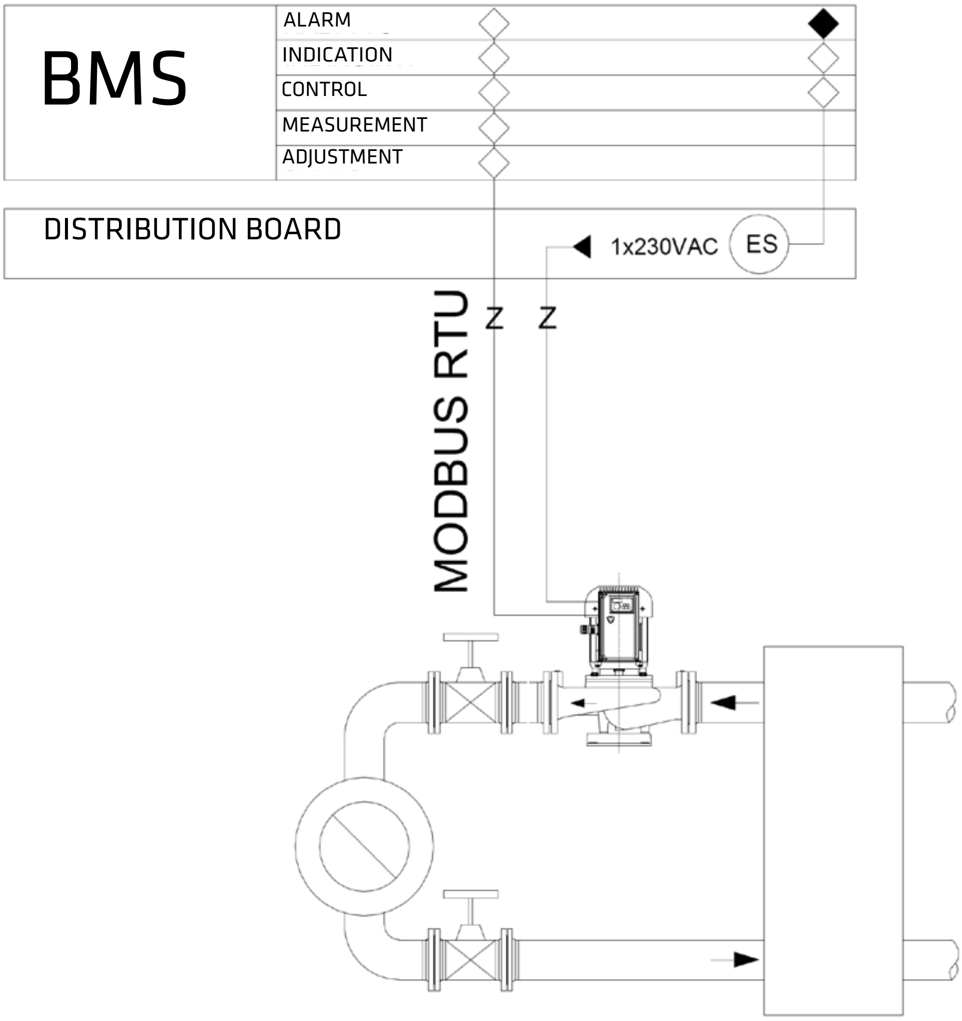
Accessories

Pump and frequency converter.

Operating principle

The adjustment, control, measurement, indication and alarms of the pump frequency converter is carried out externally using building automation, process control, or by means of MODBUS RTU bus functions.

Standard control connections, NET COMBINED OPERATION MODE



Local control panel

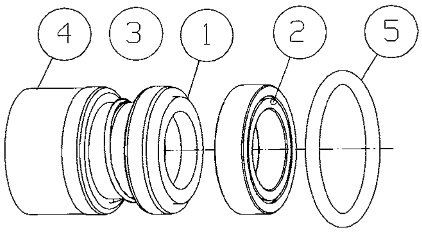
A separate local control panel is available as an accessory for the SC pump. The control panel is equipped with cables which can control and monitor all operations of the SC pump. It makes it easier to set frequency converter parameters if the positioning of the pump makes it difficult to see the keyboard, for example.

Service and spare parts

The pump does not require regular service. The shaft seal is a mechanical seal. It is a part which undergoes wear and which must be replaced if it starts to leak. Please note that the leakage of a few drops per hour can be quite normal, especially when pumping water-glycol mixtures.

Seal kits

Pump type	Seal mm	Housing O-ring / gasket mm
AE_-25/-26 SC_	12	123x2,5
L_-32A SC_	12	100x2,5
L_-40A SC_, AE_-32/-33 SC_	12	145x2,5
L_-50A SC_	12	150x3
L_-65A SC_, L_-80A SC_, AL_-1102 SC_	18	179,3x5,7

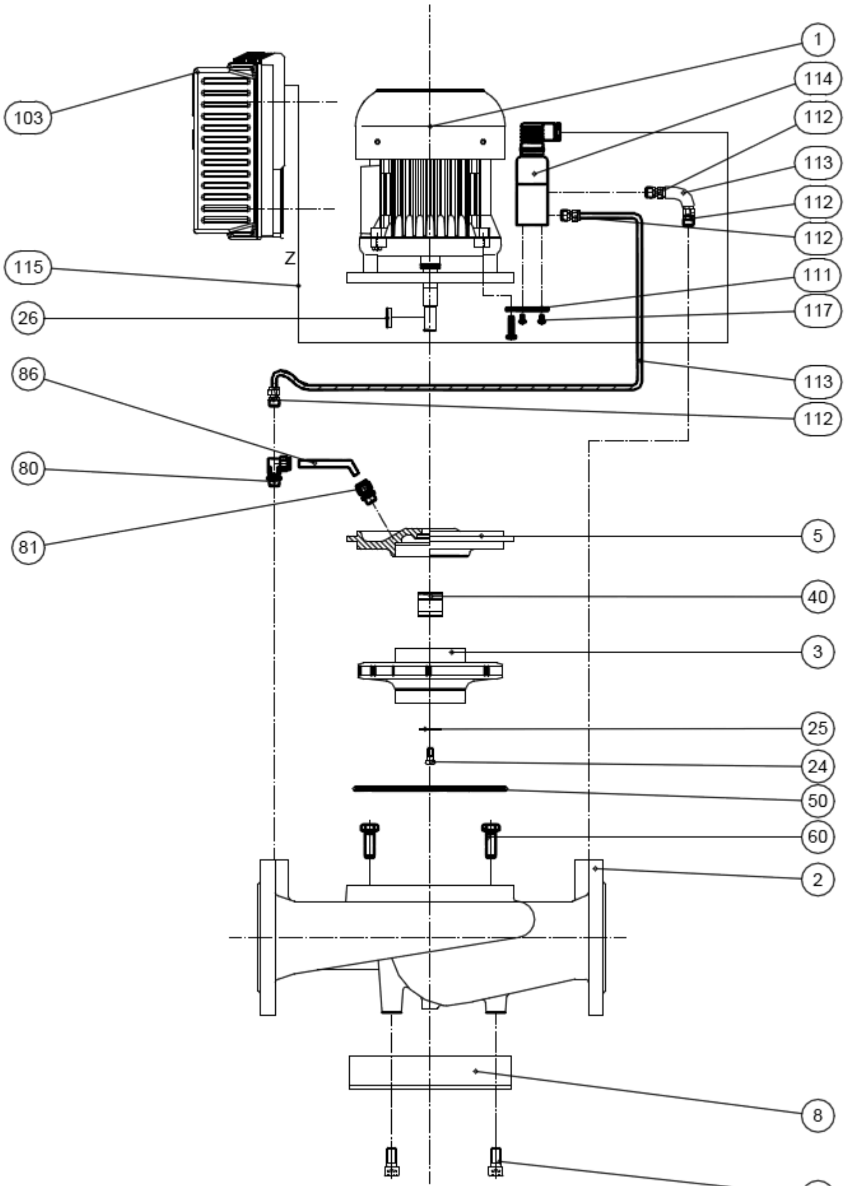


1 Rotating ring
2 Stationary ring
3 Body/bellows
4 Spring
5 O-ring

Bearings in pump motors are pre-lubricated and can withstand several years of continuous use. If a motor malfunction occurs, we recommend replacing the whole motor unit.

3

Other parts

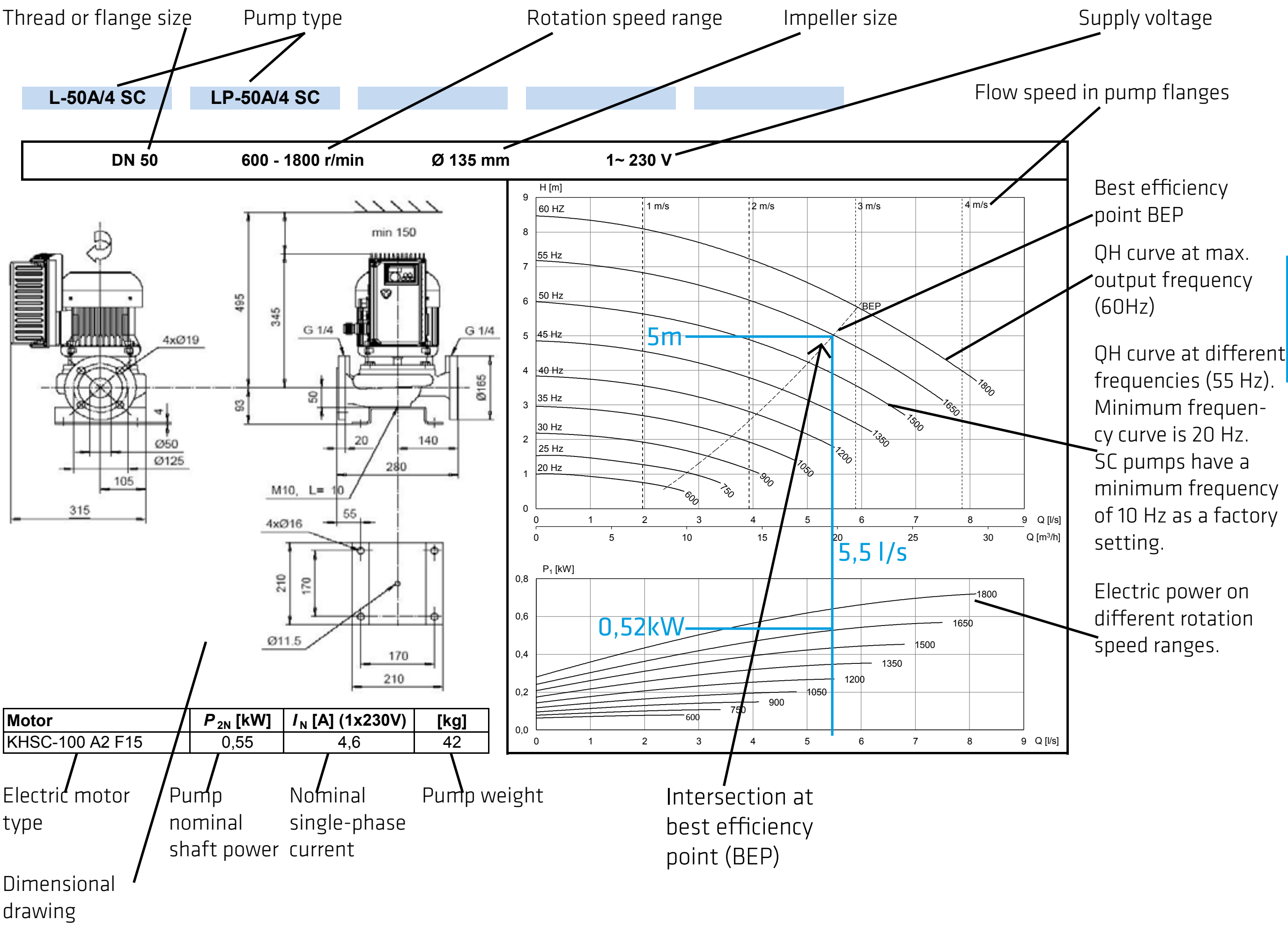


1 Electric motor
2 Pump housing
3 Impeller
5 Sealing flange
8 Foot
24 Screw or nut
25 Washer
26 Key
40 Shaft seal
50 Housing O-ring
60 Nut / Screw
67 Screw
80 Pipe union (LH and ALH series)
81 Pipe union (LH and ALH series)
86 Pipe (LH and ALH series)
103 Frequency converter
111 Fixing plate (SCB, SCC)
112 Pipe joints (SCB, SCC)
113 Pipes (SCB, SCC)
114 Transmitter for differential pressure (SCB, SCC), pressure (SCD) or temperature (SCF)
115 Cable (SCB, SCC, SCD, SCF)
117 Screws (SCB, SCC)

WHEN ORDERING SPARE PARTS, PLEASE STATE THE PUMP TYPE, SERIAL NUMBER, DUTY POINT, IMPELLER SIZE, ELECTRIC MOTOR TYPE AND POWER. THESE CAN BE FOUND ON THE RATING PLATE.

Reading curves:

Characteristic curves apply to +20°C water. Liquids whose viscosity differs from that of water must be taken into account when dimensioning the pump. Please contact Kolmeks for further information.



Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 F15	0,55	4,6	42

An example of selecting a pump:

Duty point 5.5 l/s, 50kPa (5m)

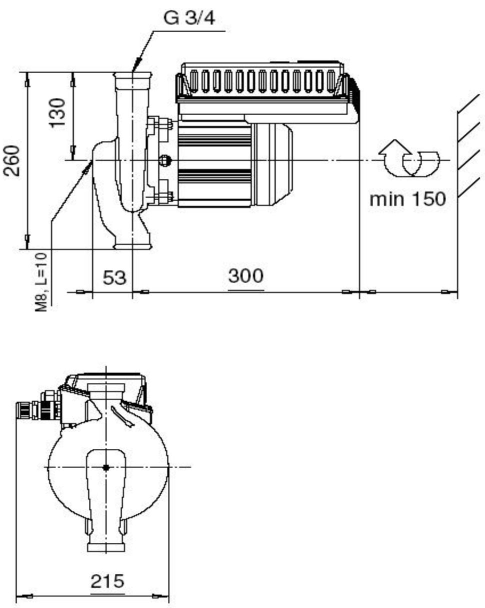
1. Find a pump size with a BEP (best efficiency point) which is as close as possible to the required duty point.
2. Ensure that the output 5.5 l/s and head 5m intersect at the best efficiency point.
3. The best energy efficiency and lowest energy consumption are obtained by following the above steps.
4. If needed, it is possible to read the input power of the device on the P1 curve. In this case, the input power is 0.52 kW at the desired duty point.

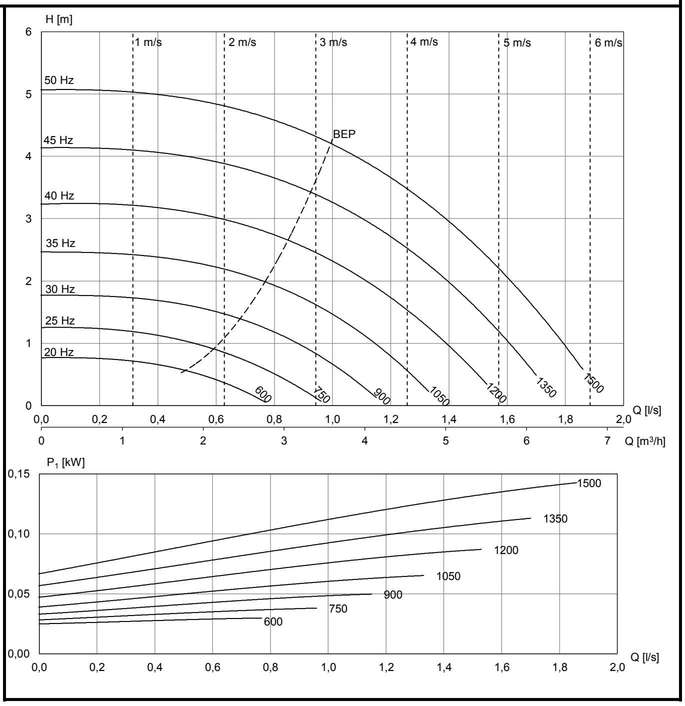
NOTE! Liquid density and viscosity affect the amount of power required. Please check that the motor power is sufficient for liquids with a higher density and viscosity than water.

3

AE-20/4 SC

G 3/4	600-1500 r/min	Ø 125 mm	1~ 230 V

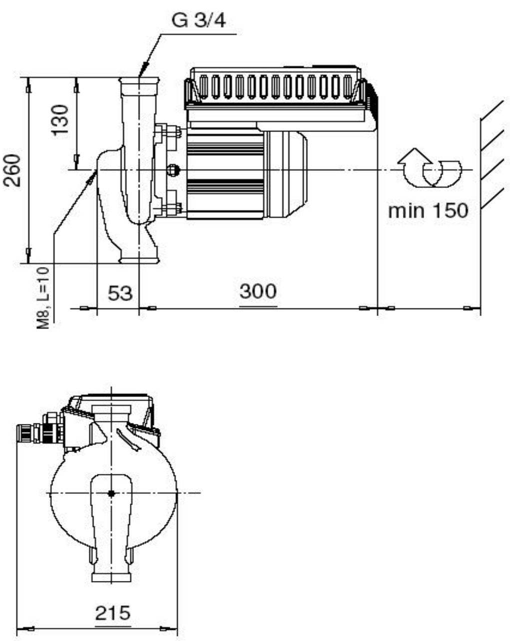


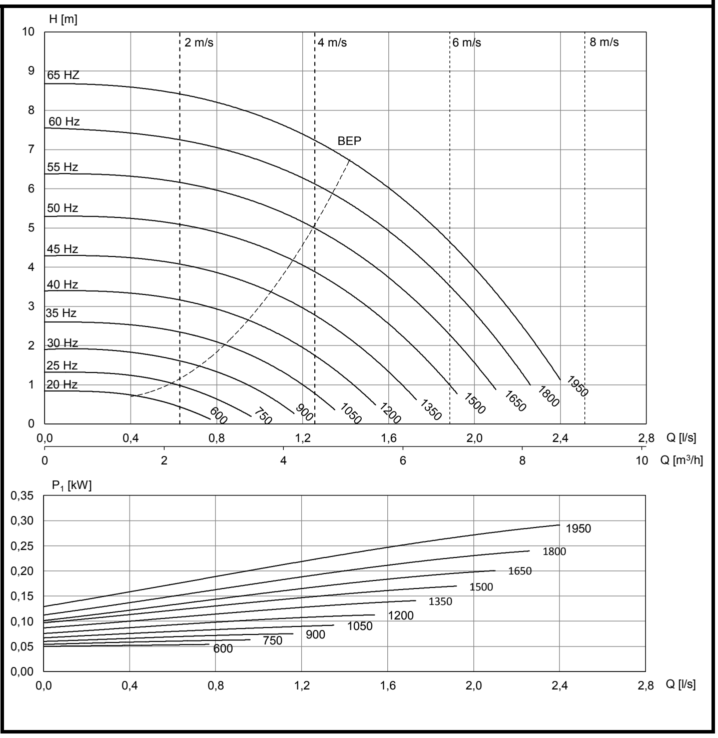


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-742 N12	0,08	1,1	15

AE-20/4 SC

G 3/4	600 - 1950 r/min	Ø 125 mm	1~ 230 V

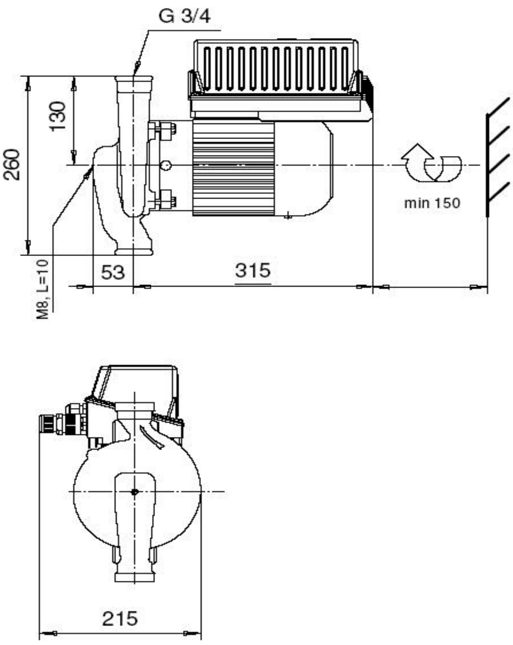


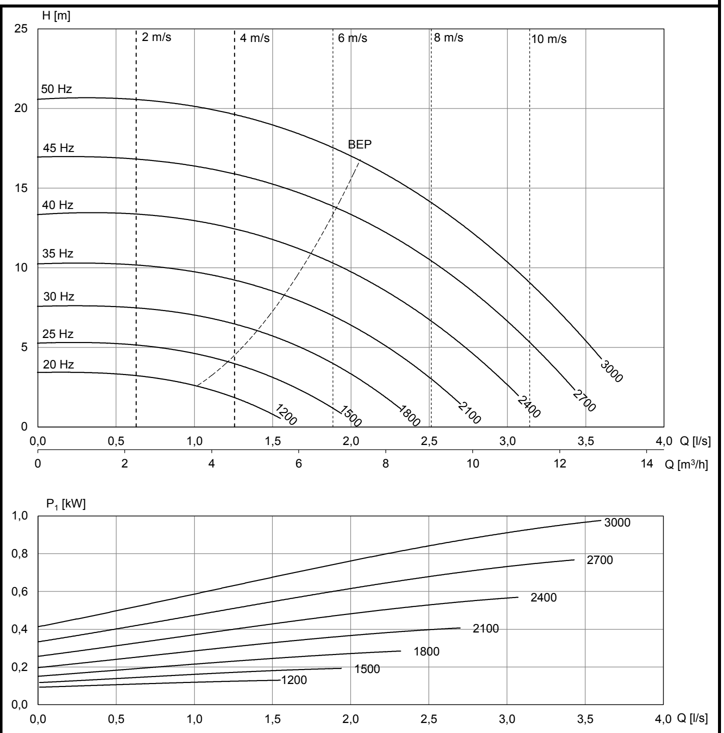


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N12	0,2	2,1	15

AE-20/2 SC

G 3/4	1200 - 3000 r/min	Ø 125 mm	1~ 230 V

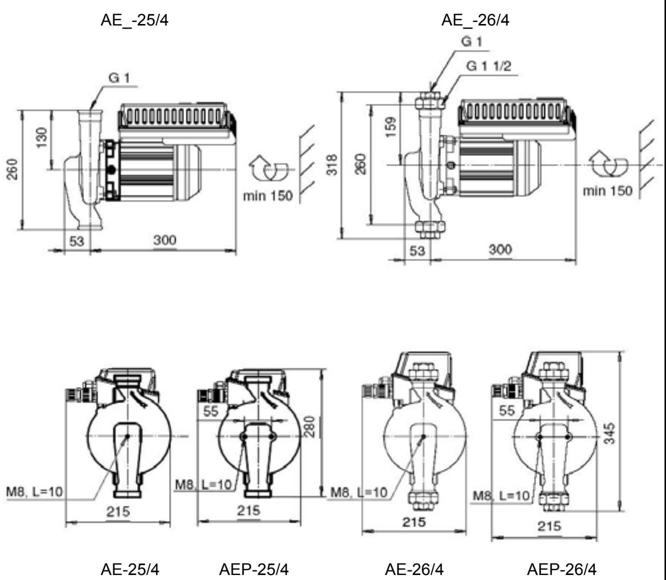


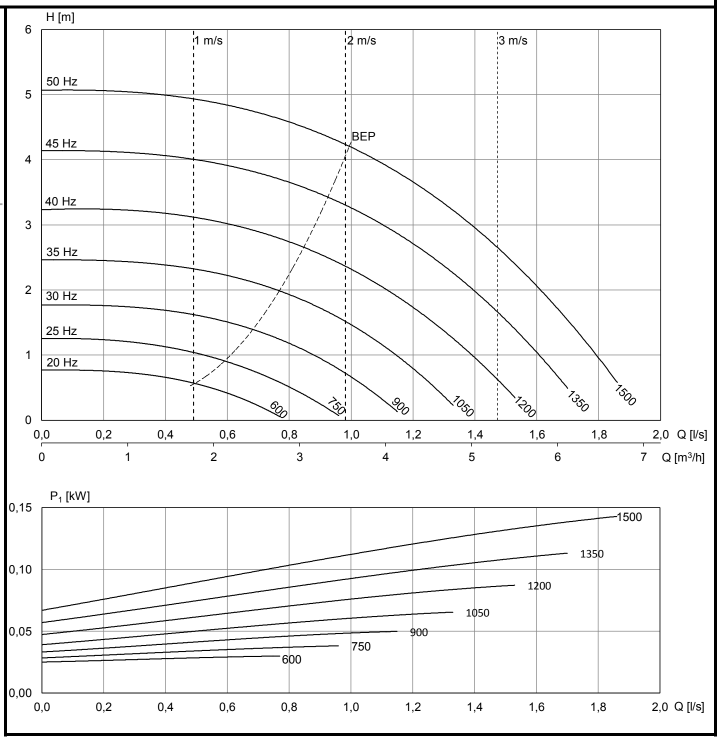


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-841 N12	0,65	6,0	19

AE-25/4 SC | AEP-25/4 SC | AE-26/4 SC | AEP-26/4 SC

G 1	600 - 1500 r/min	Ø 125 mm	1~ 230 V





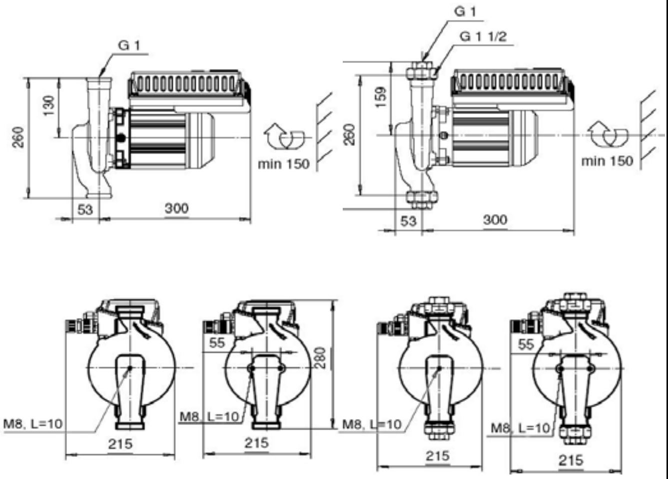
Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-742 N12	0,08	1,1	14

3

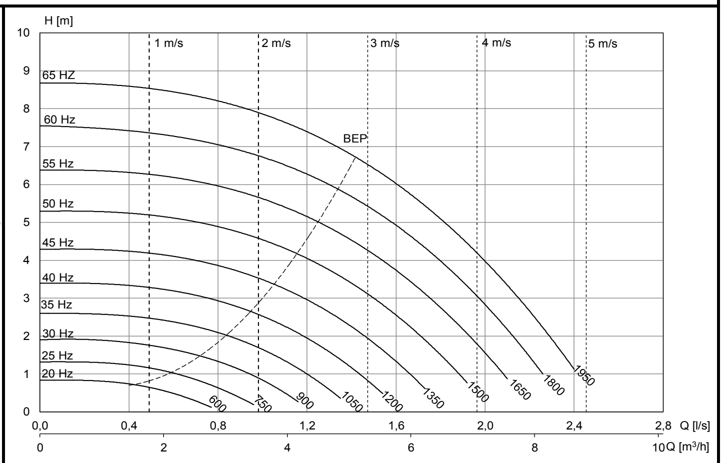
AE-25/4 SC | AEP-25/4 SC | AE-26/4 SC | AEP-26/4 SC

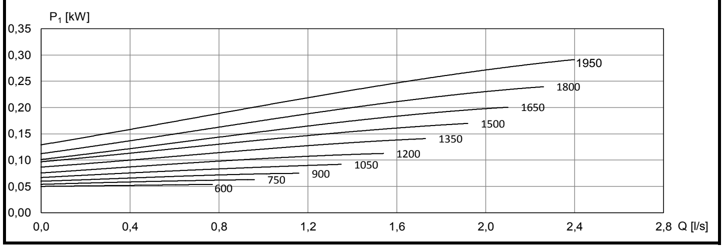
G 1 | 600 - 1950 r/min | Ø 125 mm | 1~ 230 V

AE_-25/4 AE_-26/4



AE-25/4 AEP-25/4 AE-26/4 AEP-26/4



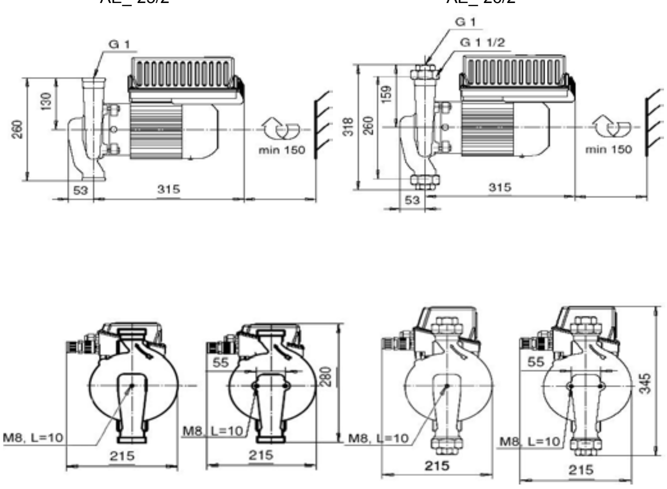


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N12	0,2	2,1	15

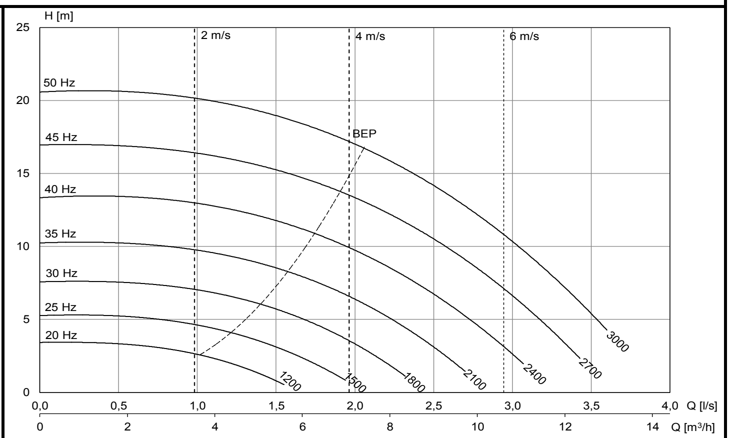
AE-25/2 SC | AEP-25/2 SC | AE-26/2 SC | AEP-26/2 SC

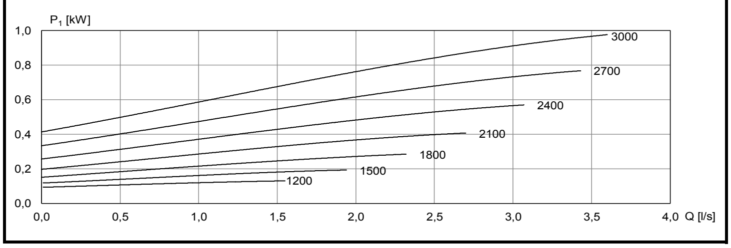
G 1 | 1200 - 3000 r/min | Ø 125 mm | 1~ 230 V

AE_-25/2 AE_-26/2



AE-25/2 AEP-25/2 AE-26/2 AEP-26/2



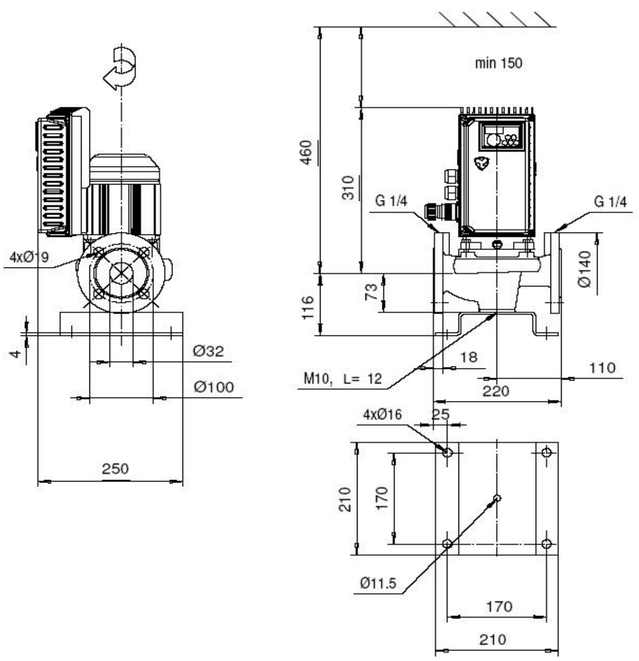


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-841 N12	0,65	6,0	19

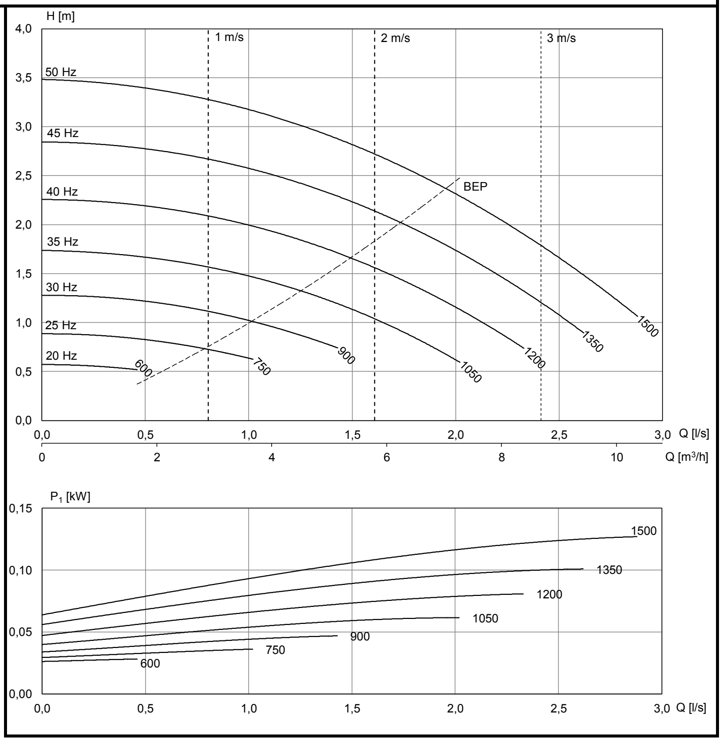
KOLMEKS
www.kolmeks..com

L-32A/4 SC

DN 32	600 - 1500 r/min	Ø 105 mm	1~ 230 V

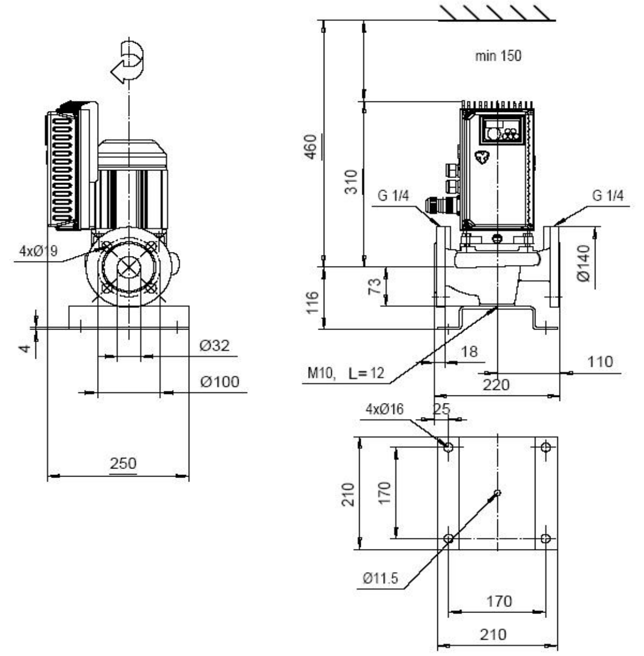


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-742 N12	0,08	1,1	14

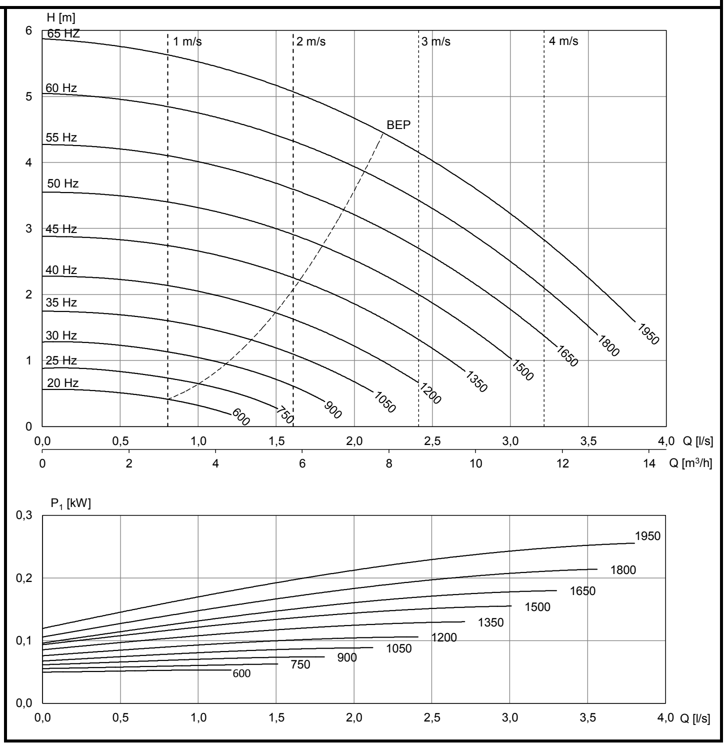


L-32A/4 SC

DN 32	600 - 1950 r/min	Ø 105 mm	1~ 230 V



Motor 230V	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N12	0,2	2,1	19



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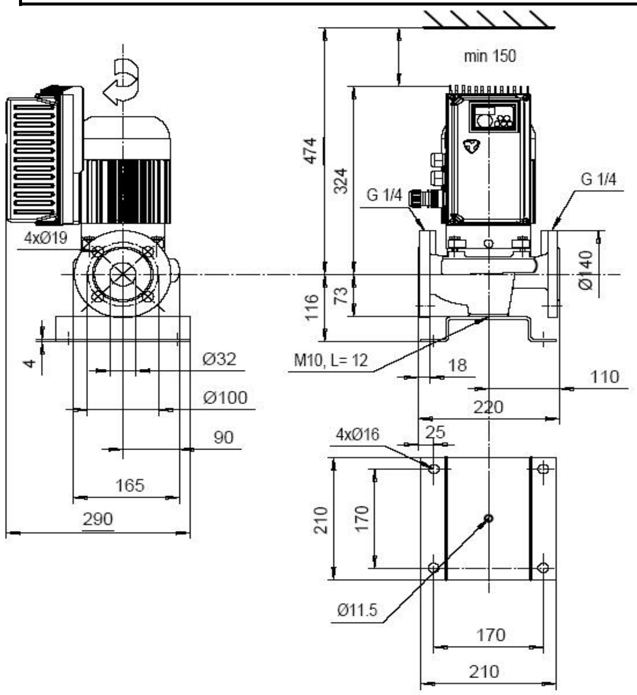
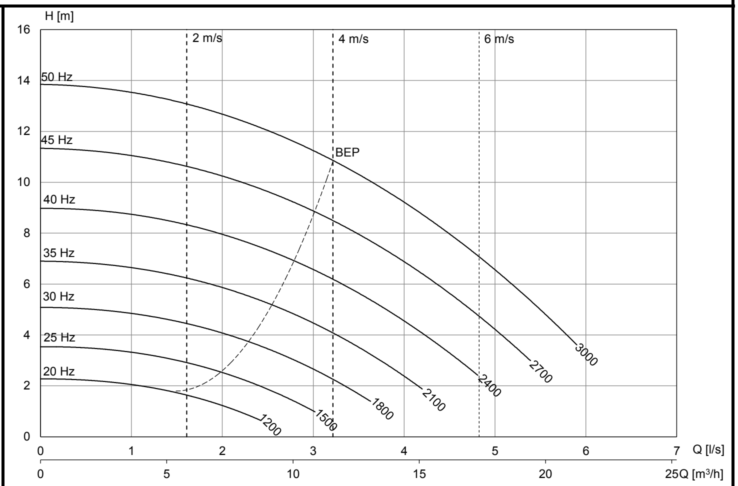
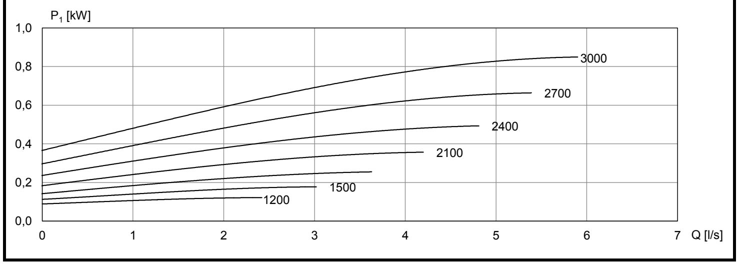
L-32A/2 SC

DN 32	1200 - 3000 r/min	Ø 105 mm	1~ 230 V





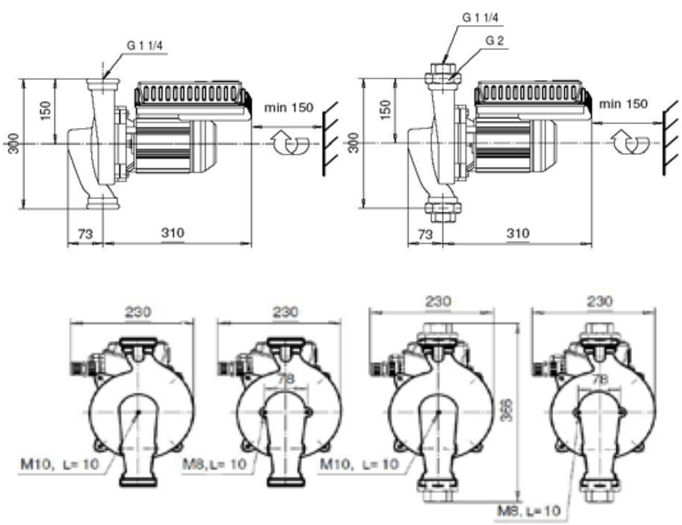


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-841 N12	0,65	6,0	24

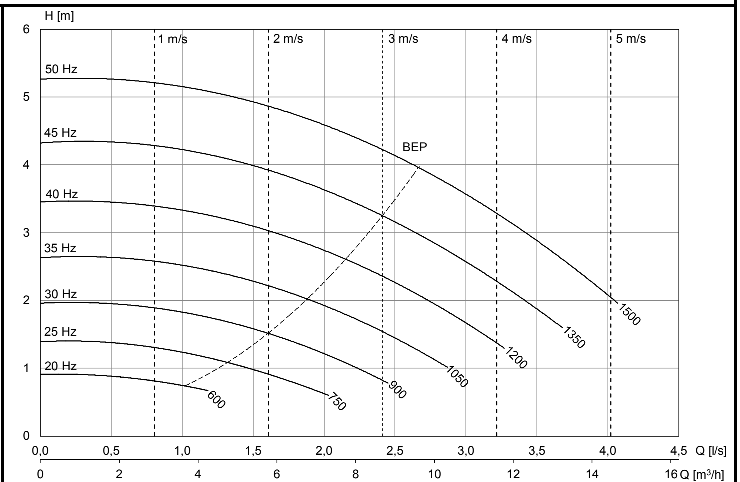
AE-32/4 SC | AEP-32/4 SC | AE-33/4 SC | AEP-33/4 SC

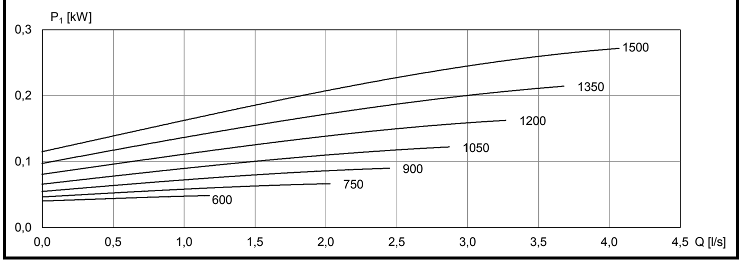
G 1 1/4	600 - 1500 r/min	Ø 130 mm	1~ 230 V

AE_-32/4 AE_-33/4



AE-32/4 AEP-32/4 AE-33/4 AEP-33/4





Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N13	0,2	2,1	20

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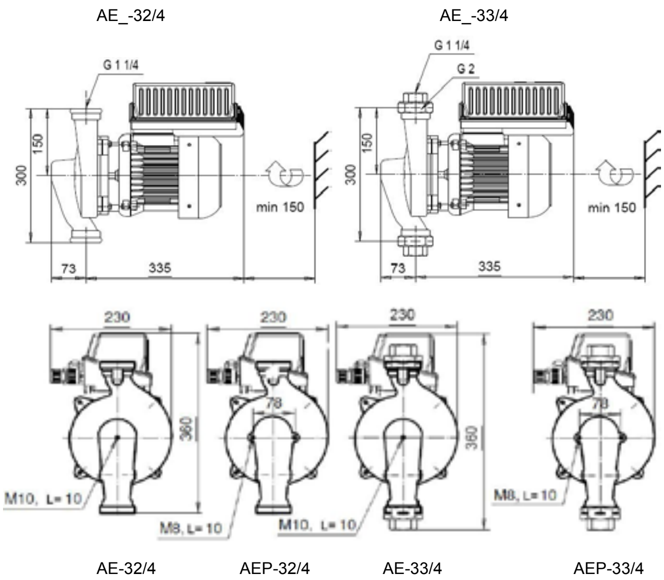
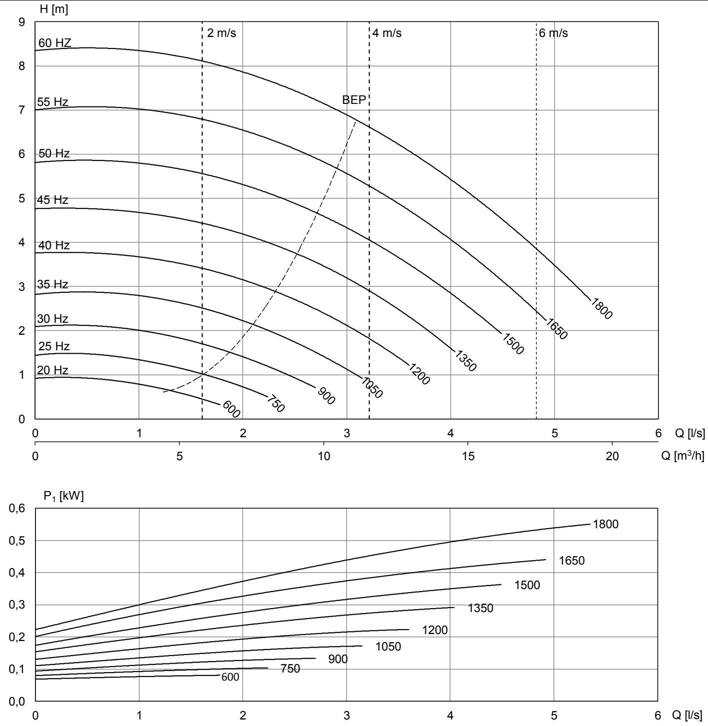
AE-32/4 SC	AEP-32/4 SC	AE-33/4 SC	AEP-33/4 SC	

G 1 1/4	600 - 1800 r/min	Ø 135 mm	1~ 230 V

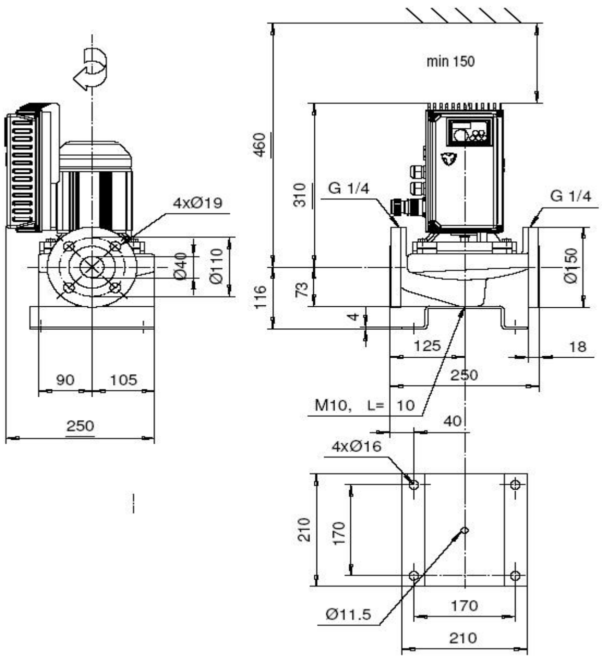


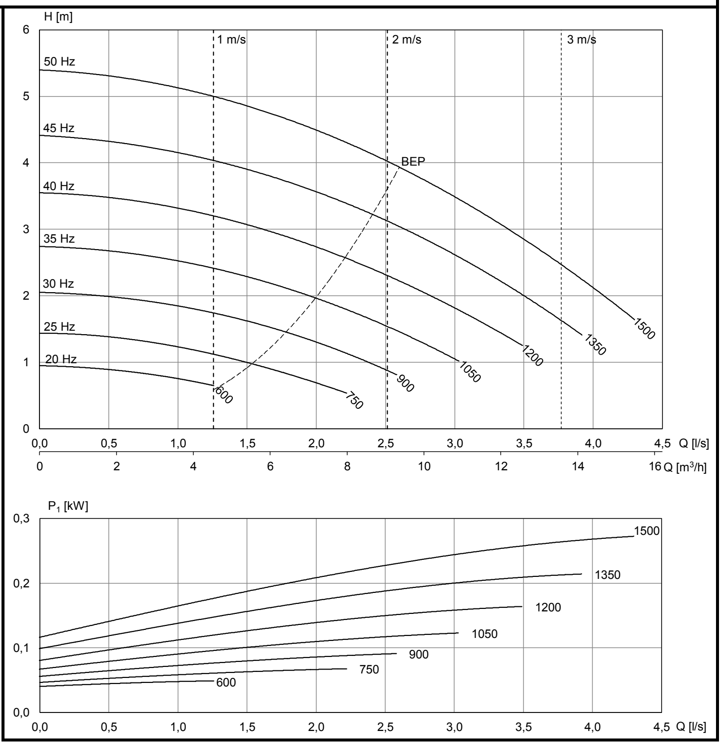


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 N13	0,37	3,6	35

L-40A/4 SC				

DN 40	600 - 1500 r/min	Ø 130 mm	1~ 230 V





Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 N13	0,2	2,1	24

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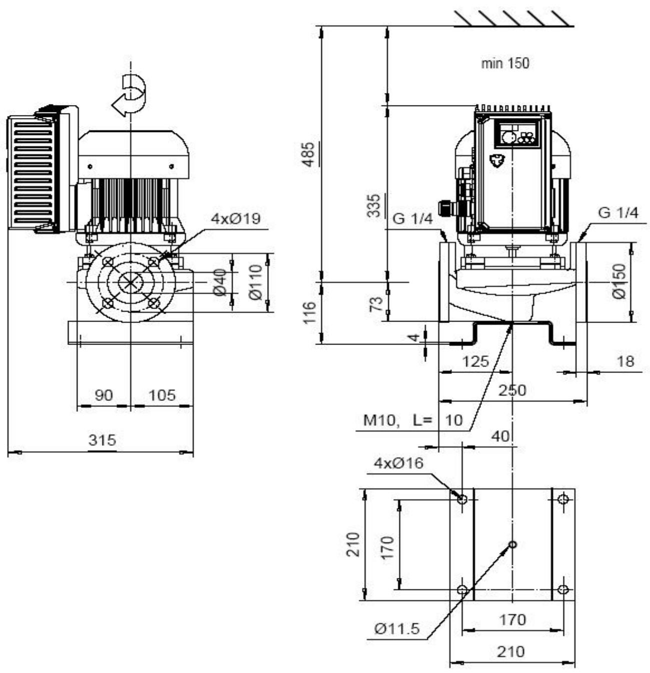
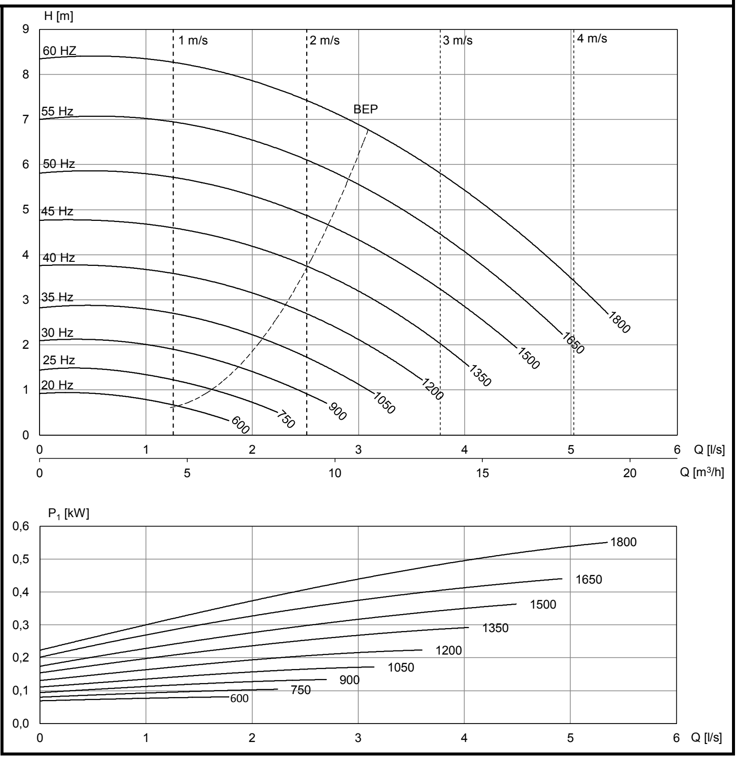
L-40A/4 SC

DN 40	600 - 1800 r/min	Ø 135 mm	1~ 230 V

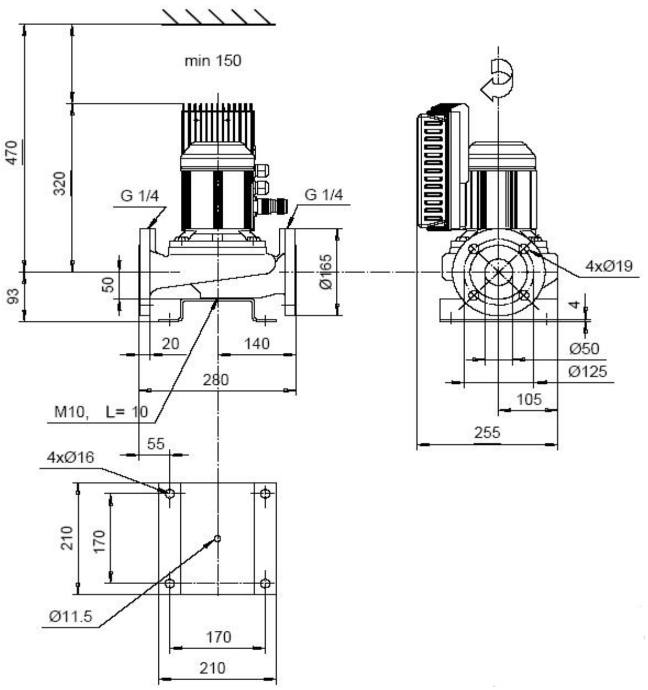


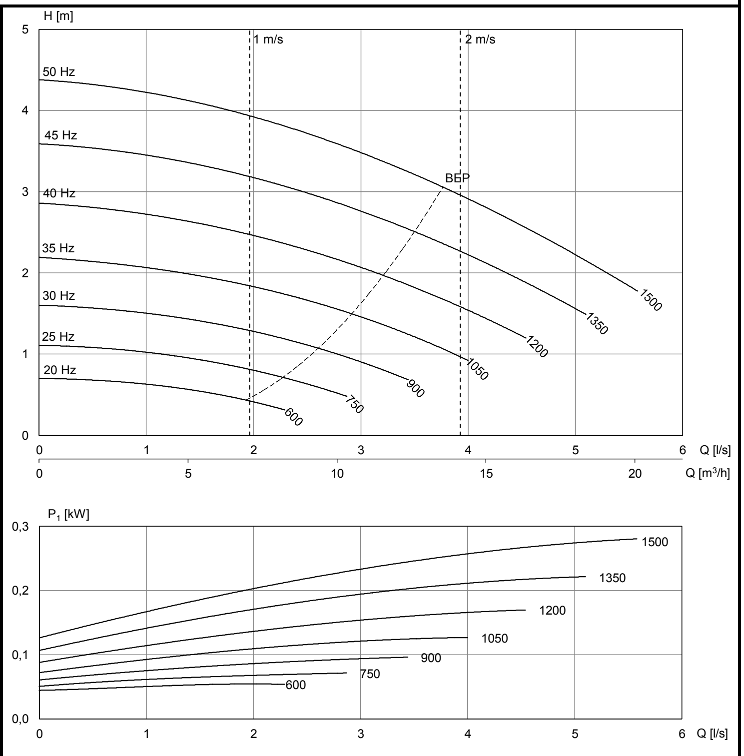


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 N13	0,37	3,6	40

L-50A/4 SC   LP-50A/4 SC

DN 50	600 - 1500 r/min	Ø 120 mm	1~ 230 V

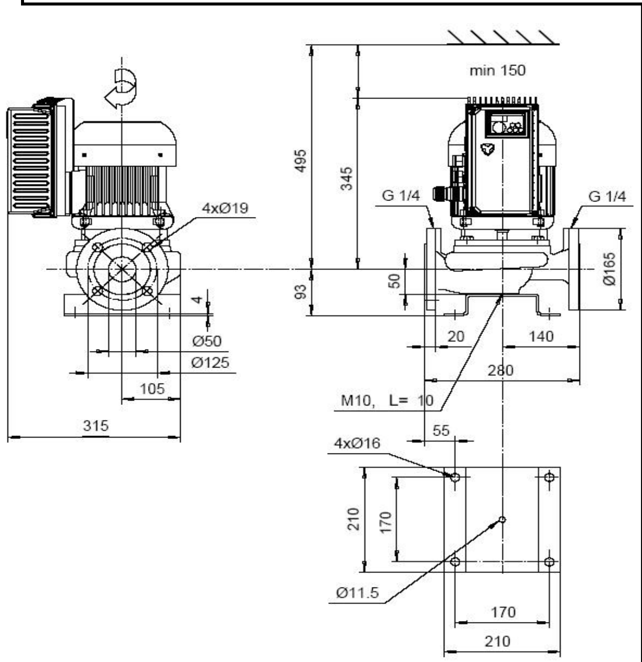


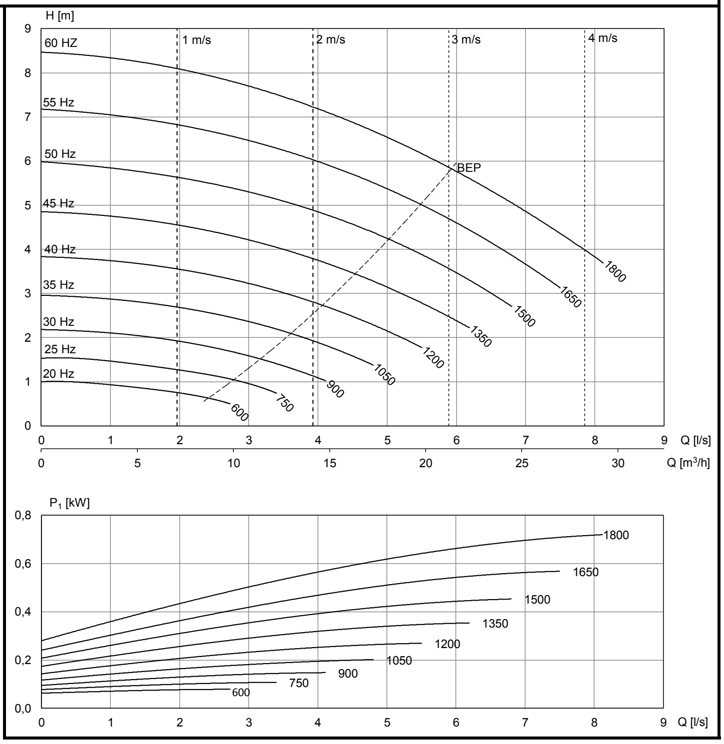


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
OPSC-752 F15	0,2	2,1	26

L-50A/4 SC | **LP-50A/4 SC**

DN 50	600 - 1800 r/min	Ø 135 mm	1~ 230 V

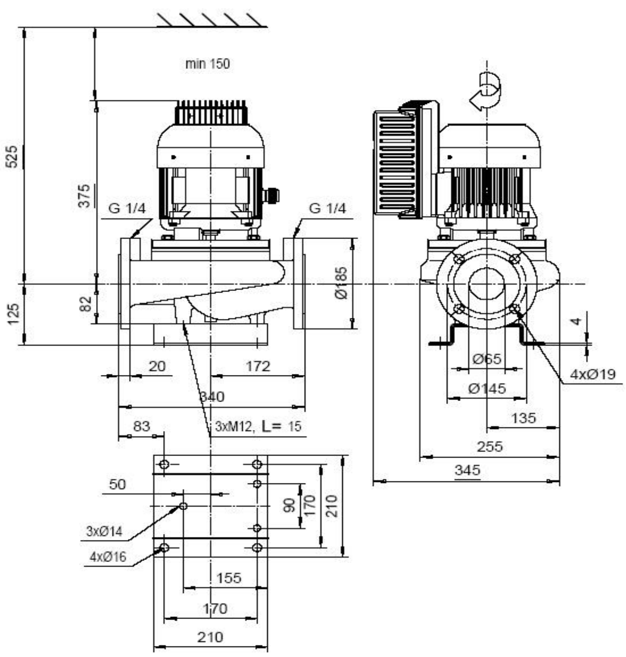


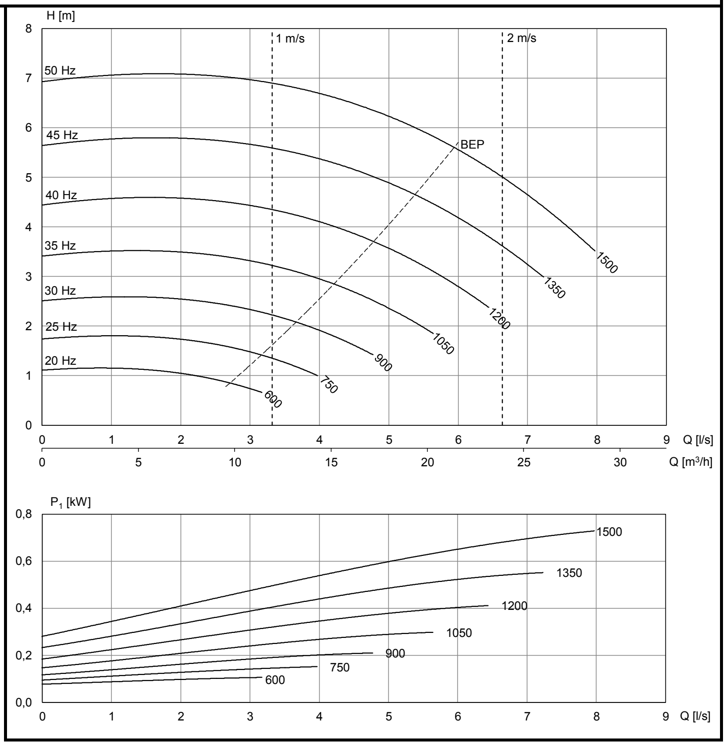


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 F15	0,55	4,6	42

L-65A/4 SC | **LH-65A/4 SC**

DN 65	600 - 1500 r/min	Ø 148 mm	1~ 230 V

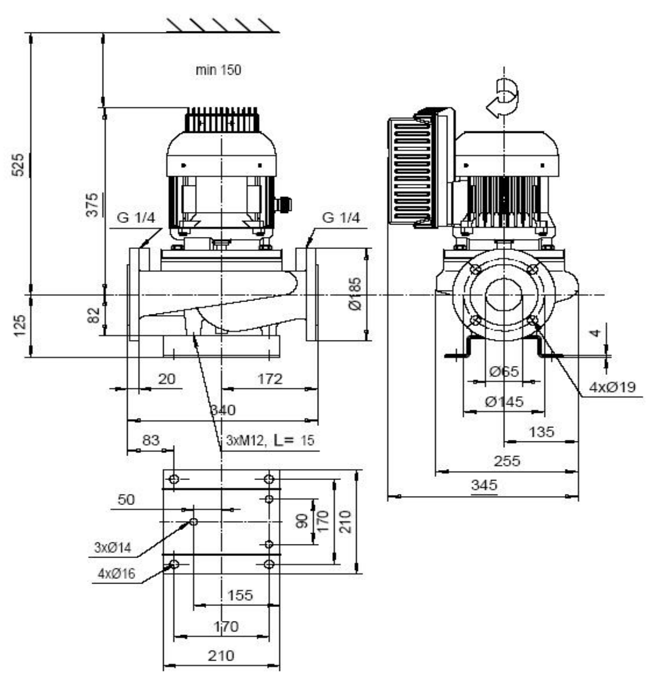


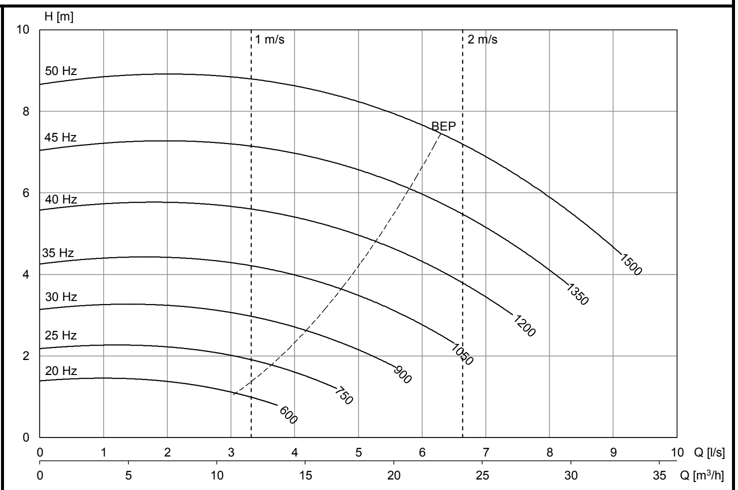


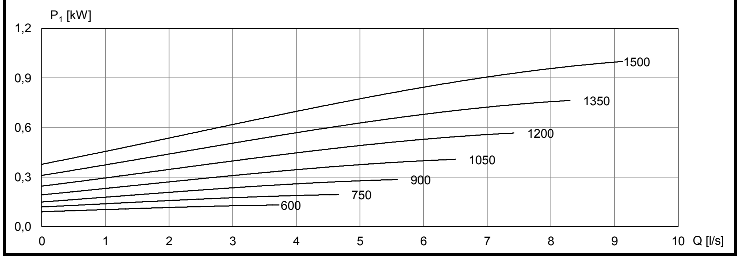
Motor	P_{2N} [kW]	I_N [A]	[kg]
KHSC-100 A2 F19	0,55	4,6	47

L-65A/4 SC **LH-65A/4 SC**

DN 65	600 - 1500 r/min	Ø 164 mm	1~ 230 V



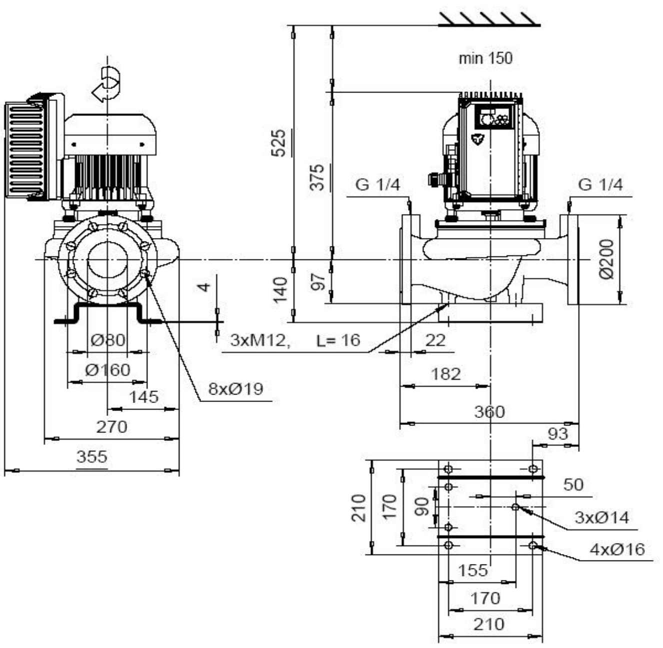


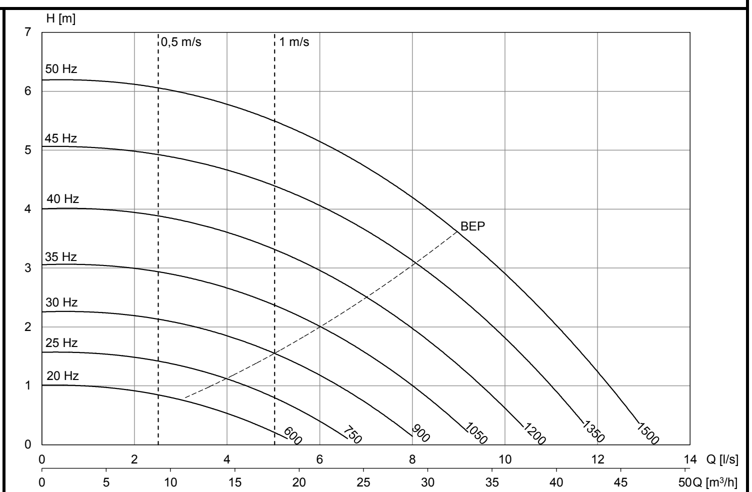


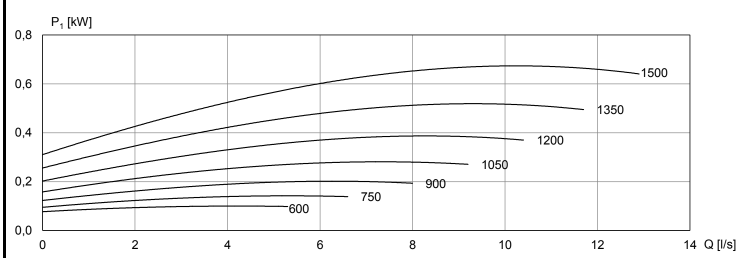
Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 B2 F19	0,75	6,1	47

L-80A/4 SC **LH-80A/4 SC**

DN 80	600 - 1500 r/min	Ø 147 mm	1~ 230 V



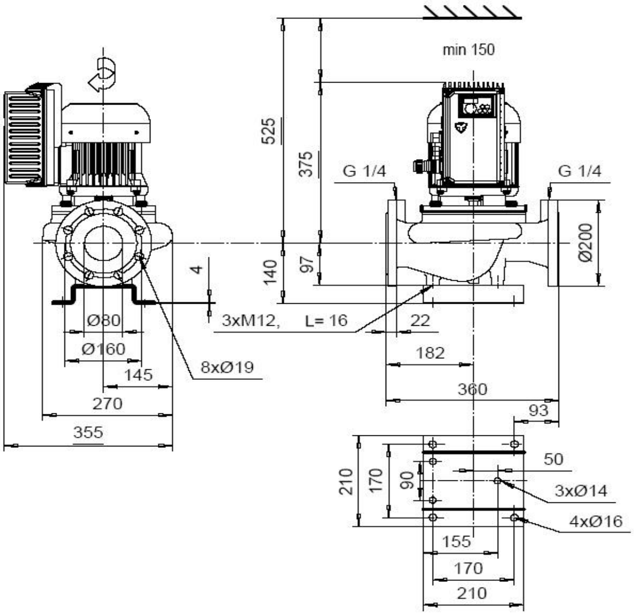


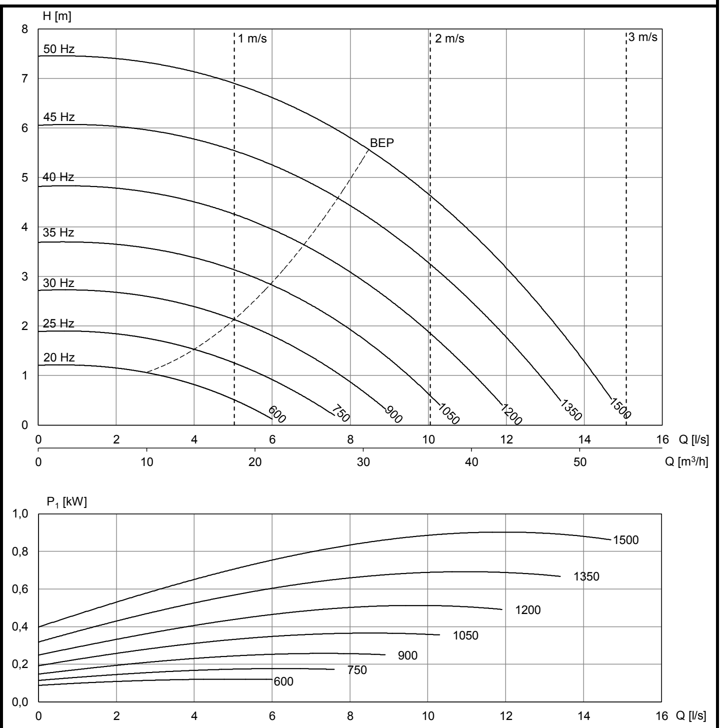


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 A2 F19	0,55	4,6	48

L-80A/4 SC **LH-80A/4 SC**

DN 80	600 - 1500 r/min	Ø 158 mm	1~ 230 V

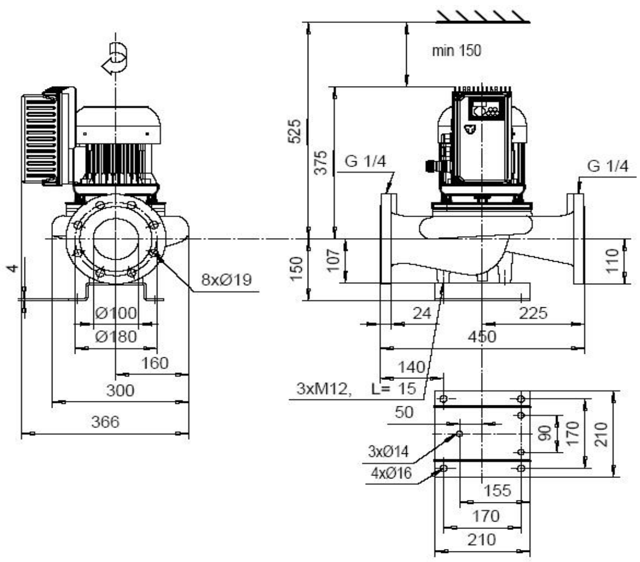


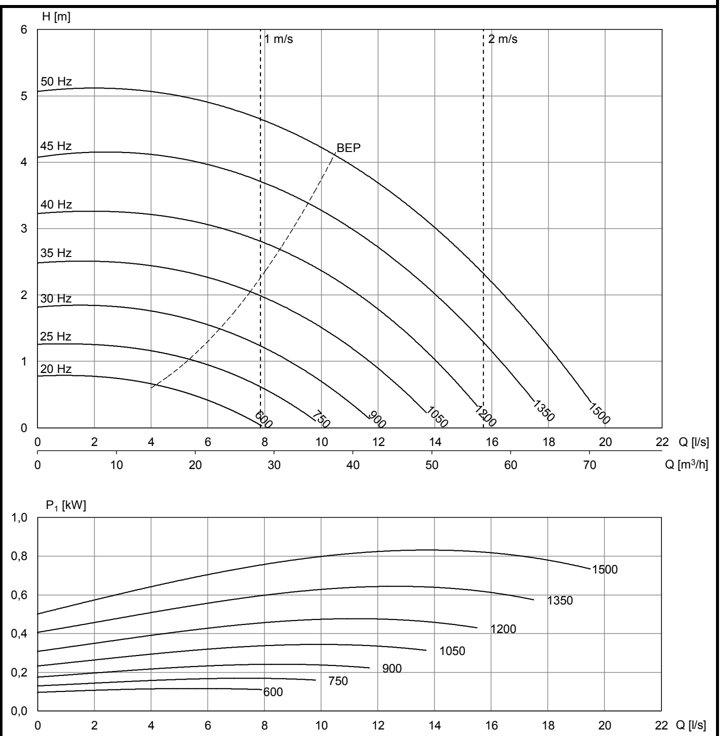


Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 B2 F19	0,75	6,1	48

AL-1102/4 SC **ALH-1102/4 SC** **ALP-1102/4 SC** **ALS-1102/4 SC**

DN 100	600 - 1500 r/min	Ø 142 mm	1~ 230 V





Motor	P_{2N} [kW]	I_N [A] (1x230V)	[kg]
KHSC-100 B2 F19	0,75	6,1	59

KOLMEKS
EFFICIENT RELIABILITY

INLINE PUMPS WITH FIXED-SPEED MOTOR, 3x400V
AE-series, threaded G3/4 - G$1^{1}/_{4}$
L_-, AL_- and AKN-series, flanged DN32 - DN300

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General technical data

AE series pumps:

- Centrifugal pumps equipped with thread connections.
- Pumps can be used as circulation, pressure boosting and transfer pumps for clean liquids.

L, AL and AKN series pumps:

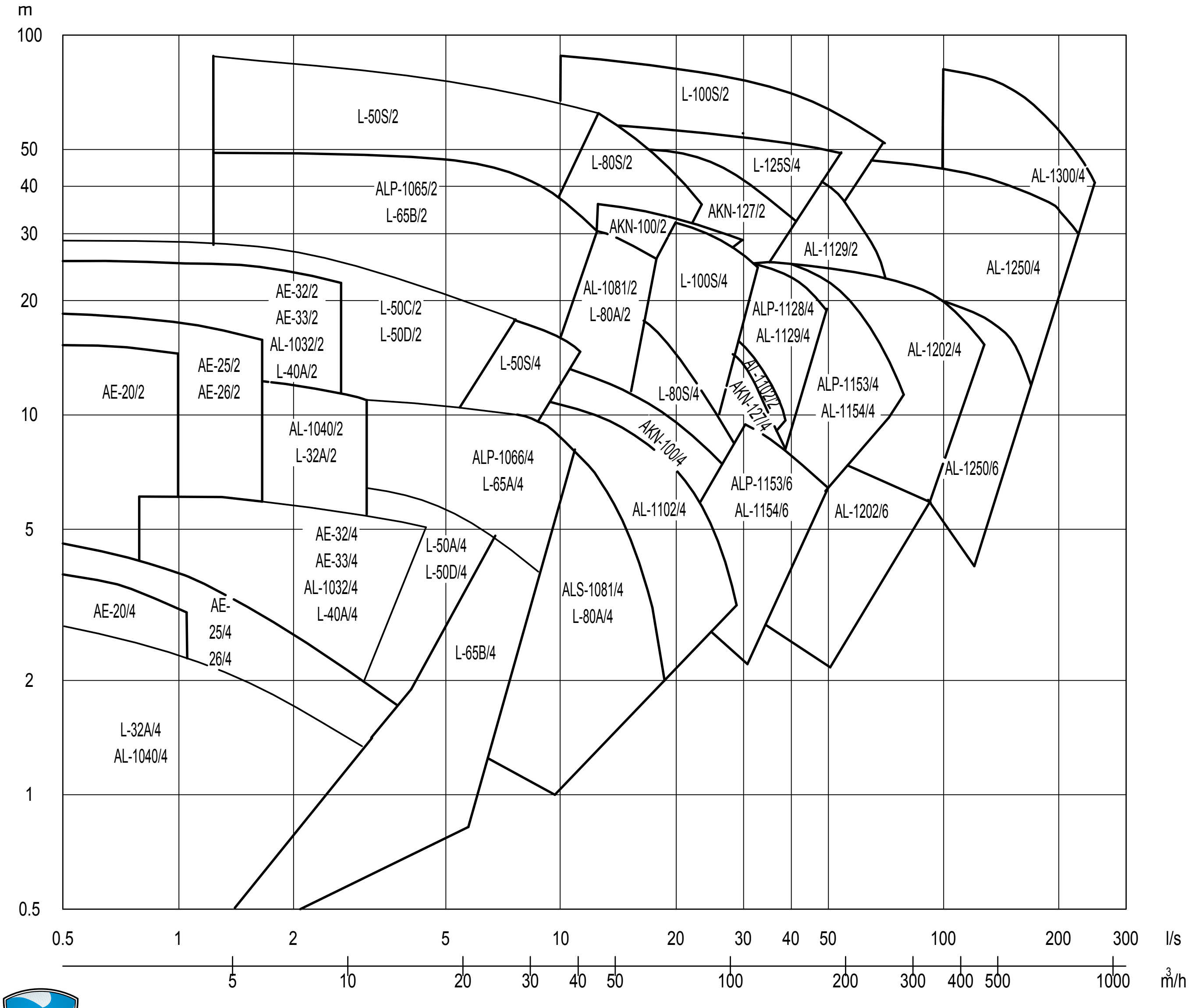
- Inline centrifugal pumps equipped with flange connections.

Applications:

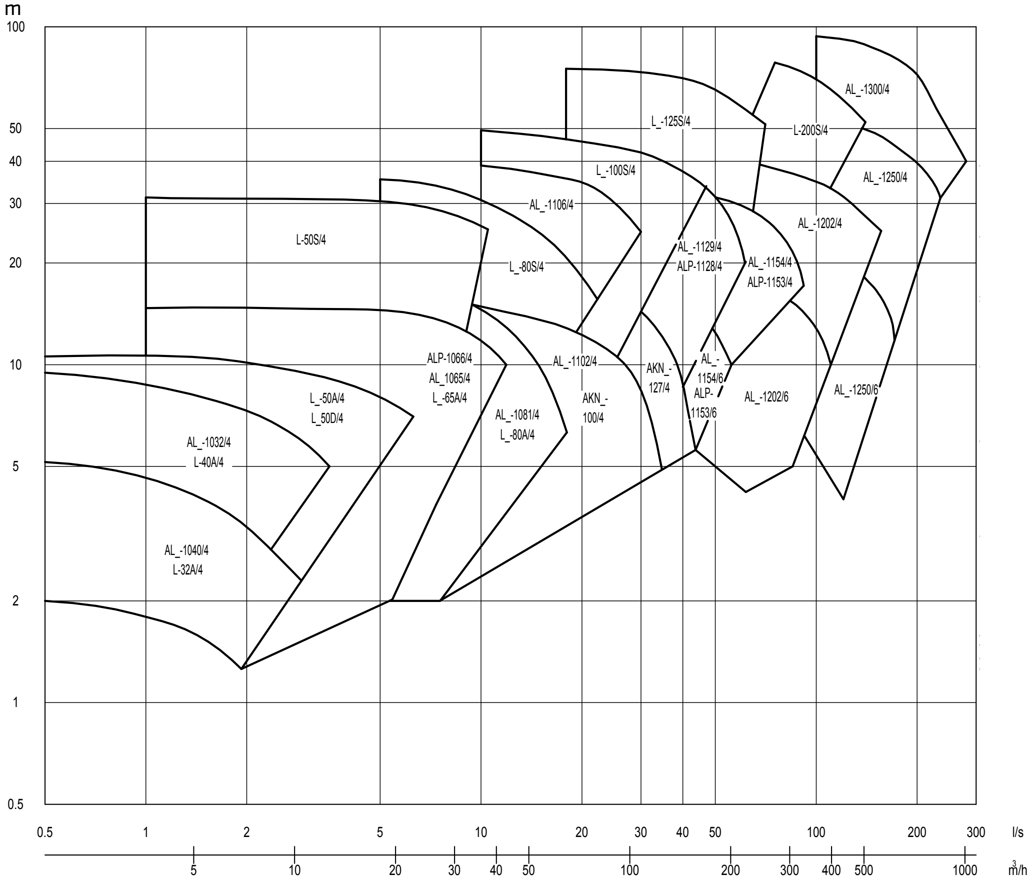
- Grey cast iron (L, AL and AKN) pumps can be used as circulation, pressure boosting and transfer pumps for clean liquids.
- Nodular cast iron (LH, ALH and AKNH) pumps can be used in power plants and as pressure boosting pumps for primary district heating.
- Bronze (LP and ALP) pumps can be used as domestic hot water, circulation, pressure boosting and transfer pumps for clean oxygen-rich and some slightly aggressive liquids.
- Stainless steel AISI316 (LS and ALS) pumps can be used as circulation, pressure boosting and transfer pumps for acid and alkaline liquids.

Note! The suitability of materials and seals for the liquid to be pumped must always be confirmed when selecting a pump.

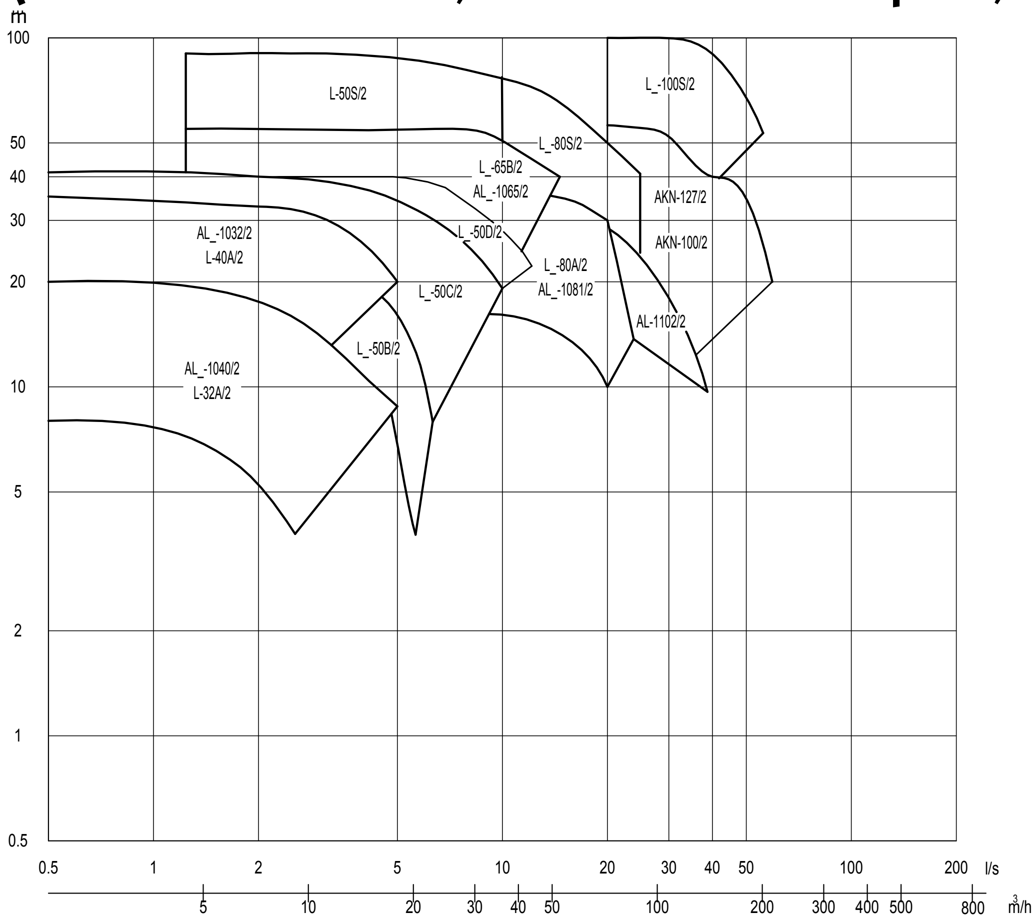
Quick Selection Chart AE-, L- and AKN-series, 50Hz



Quick Selection Chart L-, AL- and AKN-series 4- ja 6-poles, 60Hz



Quick Selection Chart L-, AL- and AKN-series 2-poles, 60Hz



04/2013 Subject to change without prior notice.

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Standard materials and fields of application AE_- / L_- / AL_- / AKN_-pumps

Connection G or DN	Grey cast iron EN-GJL-200, PN10	Nodular cast iron EN-GJS-400, PN16	Bronze CuSn10Zn2, PN10	Stainless steel AISI 316, PN 16	Stainless steel SS 2378-254 SMO	Shaft seal, PN10 Ø [mm], materials	O-ring Size [mm]	O-ring Material	Motor [kW]
G 3/4	AE-20/4	no	no	no	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,03-0,08
- " -	AE-20/2	no	no	no	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,25-1,1
G 1	AE-25/4, -26/4	no	AEP-25/4, -26/4	no	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,05-0,08
- " -	AE-25/2, -26/2	no	AEP-25/2, -26/2	no	no	12, carbon/SiC Viton	123 X 2,5	NBR	0,25-1,1
G 1 1/4	AE-32/4, -33/4	no	AEP-32/4, -33/4	no	no	12, carbon/SiC Viton	145 X 2,5	NBR	0,2-0,37
- " -	AE-32/2, -33/2	no	AEP-32/2, -33/2	no	no	12, carbon/SiC Viton	145 X 2,5	NBR	1,1-1,5
DN 32	L-32/4	no	no	no	no	12, carbon/SiC EPDM	100 X 2,5	NBR	0,05-0,2
	L-32/2	no	no	no	no	12, carbon/SiC EPDM	100 X 2,5	NBR	0,25-1,1
	no	no	no	ALS-1032/4	no	12, carbon/SiC EPDM	145 X 2,5	NBR	0,2-0,37
	no	no	no	ALS-1032/2	no	12, carbon/SiC EPDM	145 X 2,5	NBR	1,1-1,5
DN 40	no	no	no	ALS-1040/4	no	12, carbon/SiC EPDM	100 X 2,5	NBR	0,05-0,2
	no	no	no	ALS-1040/2	no	12, carbon/SiC EPDM	100 X 2,5	NBR	0,25-1,1
	L-40A/4	no	no	no	no	12, carbon/SiC EPDM	145 X 2,5	NBR	0,2-0,37
	L-40A/2	no	no	no	no	12, carbon/SiC EPDM	145 X 2,5	NBR	1,1-1,5
DN 50	L-50A/4	no	LP-50A/4	no	no	12, carbon/SiC EPDM	150 X 3	NBR	0,2-0,55
	L-50B/2	no	LP-50B/2	no	no	12, carbon/SiC EPDM	150 X 3	NBR	1,1
	no	LH-50D/4	no	no	no	18, carbon/SiC EPDM	150 X3	NBR	0,37-0,55
	L-50D/2	LH-50D/2	LP-50D/2	no	no	18, carbon/SiC EPDM	150 X 3	NBR	1,5-4
	L-50C/2	LH-50C/2	LP-50C/2	no	no	18, carbon/SiC EPDM	150 X 3	NBR	1,5-4
	L-50S/4	LH-50S/4	no	no	no	28, carbon/SiC EPDM	265 X 4	EPDM	1,1-5,5
	L-50S/2	LH-50S/2	no	no	no	28, carbon/SiC EPDM	265 X 4	EPDM	5,5-18,5
DN 65	L-65A/4	LH-65A/4	no	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,2-3
	no	no	no	LS-65B/4	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,2-3
	L-65B/2	LH-65B/2	no	LS-65B/2	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,5-7,5
	no	no	ALP-1066/4	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37-3
	no	no	ALP-1065/2	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,5-7,5
DN 80	L-80A/4	LH-80A/4	no	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37-3
	L-80A/2	LH-80A/2	no	no	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	2,2-7,5
	no	no	no	ALS-1081/4	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37-3
	no	no	no	ALS-1081/2	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	2,2-7,5
	L-80S/4	LH-80S/4	no	no	no	28, carbon/SiC EPDM	265 X 4	EPDM	1,1-7,5
	L-80S/2	LH-80S/2	no	no	no	28, carbon/SiC EPDM	265 X 4	EPDM	7,5-18,5
DN 100	AL-1102/4	ALH-1102/4	ALP-1102/4	ALS-1102/4	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55-3
	AL-1102/2	ALH-1102/2	ALP-1102/2	ALS-1102/2	no	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	4-7,5
	AKN-100/4	AKNH-100/4	no	no	no	25, carbon/SiC EPDM	240 X 3	NBR	1,5-3
	AKN-100/2	AKNH-100/2	no	no	no	25, carbon/SiC EPDM	240 X 3	NBR	7,5-22
	AL-1106/4	ALH-1106/4	no	ALS-1106/4	no	32, carbon/SiC EPDM	309/295X1	gasket	3-18,5
	L-100S/4	LH-100S/4	LP-100S/4	no	no	32, carbon/SiC EPDM	315 x 6,3	EPDM	3-22
	L-100S/2	LH-100S/2	LP-100S/2	no	no	32, carbon/SiC EPDM	315 x 6,3	EPDM	15-37
	L-100S/2	LH-100S/2	LP-100S/2	no	no	40, carbon/SiC EPDM	315 x 6,3	EPDM	45
DN 125	AKN-127/4	AKNH-127/4	no	no	no	32, carbon/SiC EPDM	240 X 3	NBR	4-11
	AKN-127/2	AKNH-127/2	no	no	no	32, carbon/SiC EPDM	240 X 3	NBR	11-22
	AL-1129/4	ALH-1129/4	no	ALS-1129/4	ALM-1129/4	32, carbon/SiC EPDM	309/295X1	gasket	3-22
	AL-1129/2	ALH-1129/2	no	ALS-1129/2	ALM-1129/2	32, carbon/SiC EPDM	309/295X1	gasket	30-37
	no	no	ALP-1128/4	no	no	32, carbon/SiC EPDM	309/295X1	gasket	3-22
	no	no	ALP-1128/2	no	no	32, carbon/SiC EPDM	309/295X1	gasket	30-37
	L-125S/4	LH-125S/4	no	LS-125S/4	no	40, carbon/SiC EPDM	405 X 7	EPDM	18,5-37
	L-125S/4	LH-125S/4	no	LS-125S/4	no	50, carbon/SiC EPDM	405 X 7	EPDM	45-55
DN 150	no	no	ALP-1153/6	no	no	32, carbon/SiC EPDM	309/295X1	gasket	5,5-11
	no	no	ALP-1153/4	no	no	32, carbon/SiC EPDM	309/295X1	gasket	4-30
	AL-1154/6	ALH-1154/6	no	ALS-1154/6	ALM-1154/6	32, carbon/SiC EPDM	309/295X1	gasket	5,5-11
	AL-1154/4	ALH-1154/4	no	ALS-1154/4	ALM-1154/4	32, carbon/SiC EPDM	309/295X1	gasket	4-30
DN 200	AL-1202/6	ALH-1202/6	ALP-1202/6	ALS-1202/6	ALM-1202/6	32, carbon/SiC EPDM	315 x 6,3	EPDM	4-11
	AL-1202/6	ALH-1202/6	ALP-1202/6	ALS-1202/6	ALM-1202/6	40, carbon/SiC EPDM	315 x 6,3	EPDM	15-18,5
	AL-1202/4	ALH-1202/4	ALP-1202/4	ALS-1202/4	ALM-1202/4	32, carbon/SiC EPDM	315 x 6,3	EPDM	15-18,5
	AL-1202/4	ALH-1202/4	ALP-1202/4	ALS-1202/4	ALM-1202/4	40, carbon/SiC EPDM	315 x 6,3	EPDM	22-37
	AL-1202/4	ALH-1202/4	ALP-1202/4	ALS-1202/4	ALM-1202/4	50, carbon/SiC EPDM	315 x 6,3	EPDM	45
DN 250	AL-1250/6	ALH-1250/6	ALP-1250/6	ALS-1250/6	no	40, carbon/SiC EPDM	405 X 7	EPDM	15-22
	AL-1250/6	ALH-1250/6	ALP-1250/6	ALS-1250/6	no	50, carbon/SiC EPDM	405 X 7	EPDM	30
	AL-1250/4	ALH-1250/4	ALP-1250/4	ALS-1250/4	no	40, carbon/SiC EPDM	405 X 7	EPDM	37
	AL-1250/4	ALH-1250/4	ALP-1250/4	ALS-1250/4	no	50, carbon/SiC EPDM	405 X 7	EPDM	45-55
	AL-1250/4	ALH-1250/4	ALP-1250/4	ALS-1250/4	no	65, carbon/SiC EPDM	405 X 7	EPDM	75-110
DN 300	AL-1300/4	ALH-1300/4	no	ALS-1300/4	no	75, carbon/ceramic. EPDM	475 X 8	EPDM	110-160

Series	Pressure class / temperature [°C]	Housing material Name	Marking	Sealing flange	Impeller	Pump shaft	Difference in materials
AE / L / AL / AKN	PN10 / -15...+120	grey cast iron	EN-GJL-200	EN-GJL-200	EN-GJL-200	AISI329	AE / L_-32 impeller Noryl GFN2 AL_-1300 impeller EN-GJS-400
LH / ALH / AKNH	PN16 / -15...+180 (depending on seal constrution)	nodular cast iron	EN-GJS-400	EN-GJS-400	EN-GJL-200	AISI329	ALH-1300 impeller EN-GJS-400
AEP / LP / ALP	PN10 / -15...+120	bronze	CuSn10Zn2	CuSn10Zn2	CuSn10Zn2	AISI329	Bronze impeller available to all pumps
LS / ALS	PN16 / -15...+180 (depending on seal construction)	stainless steel	AISI316	AISI316	AISI316	AISI329	On special request also SS2324 (AISI 329) ja SS2378 "SMO" (LM / ALM-pumps)

Standard shaft material is Stainless steel AISI 329. In LM / ALM-pumps shaft material is Stainless steel SMO, SS2378.

Structure

Pump

AE, L and AL series pumps are monoblock centrifugal pumps equipped with a dry asynchronous motor. The pump impeller is installed directly onto the shaft of the electric motor (no separate couplings).

Electric motor

The electric motor of AE, L and AL series pump is a Kolmeks asynchronous designed for pump use. The electric motor is highly efficient and has low noise levels. The electric motor is suitable for frequency converter use.

Standard voltages:	400/230 V, 50 Hz	0,03–3 kW	
	690/400 V, 50 Hz	4–160 kW	
Enclosure classes:	IP 54	0,03–3 kW	1000, 1500r/min
		0,25–4 kW	3000r/min
	IP55	4–160 kW	1000, 1500r/min
		5,5–55 kW	3000r/min
Insulation class:	F		
Duty type:	S1 (continuous duty)		
Ambient temperature:	max. +45°C		

NOTE! **Kolmeks electric motors are available with other enclosure classes and voltages by request.**

Connections

The AE series pump is equipped with G thread connections according to ISO 228/1.
The L, AL and AKN series pump is equipped with flanged connections (PN10 or PN16) according to ISO 7005 Flanges to ANSI/JIS standards are available on request.

Seals

The shaft seal of an AE series pump is a single mechanical seal. The pump housing seal is an O-ring

The standard shaft seal on L, AL and AKN series pumps is a single mechanical seal. The pump housing seal is an O-ring or gasket.

By request, there are several seal materials and structure alternatives available depending on the properties and temperature of the liquid.

Standard surface treatment

The pumps are painted according to Standard SFS-EN ISO 12944-5, AY100/1-FeSa2½. The colour is RAL3020. Epoxy surface treatment and colour alternatives are available by request.

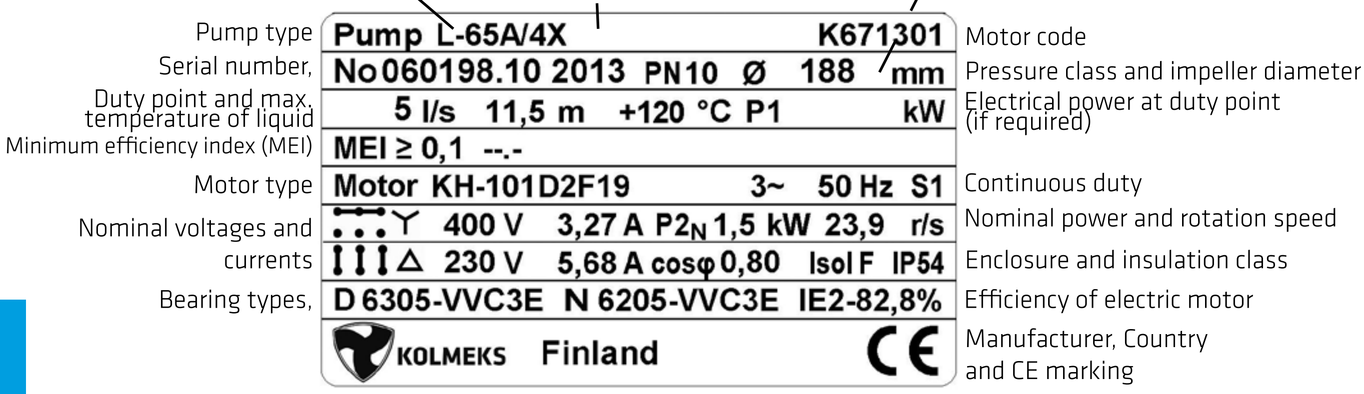
4

Rating plate

Material:
P = Bronze
H = Nodular Cast Iron
S = Stainless steel

Accessories:
X = Pump without baseplate
P = Single phase motor
N = Seal kit no.7
T = External shaft seal
H = Recirculation
KT = Double shaft seal
Sn = Non-standard shaft seal
Kn = Non-standard surface treatment
Ln = Motor thermal protectors
En = Other difference (e.g. EXE)
Vn = Special voltage

Non-standard material of impeller:
PM = Bronze
SS = Stainless steel AISI316



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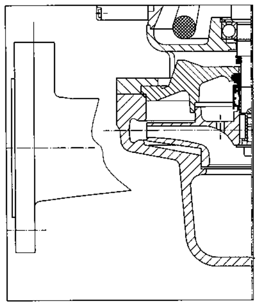
Seal structure alternatives

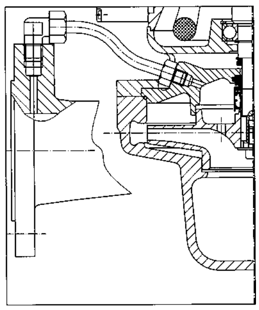
Standard structure



- Single mechanical seal
- Max. operating temperature +120°C.

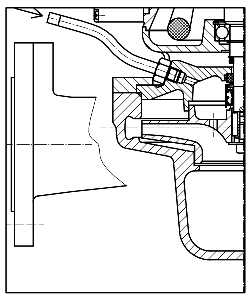
The standard-constructed shaft seal can also be used for water-glycol mixtures and most other indirect refrigeration systems. The recommended glycol is propylene glycol and the concentration can be up to 50%. Most often, a concentration of 30–40% is adequate.

Internal flushing



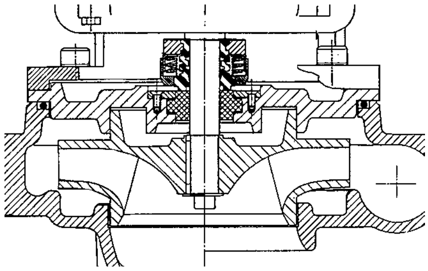
- Single mechanical seal
- Recirculation from the discharge flange of the pump to the seal chamber which flushes the seal
- Max. +150°C water
- Available for flange sizes DN50 ... DN300. . This is indicated with an additional marking ‘H’ in the pump type e.g. LS-65B/4H.

External flushing



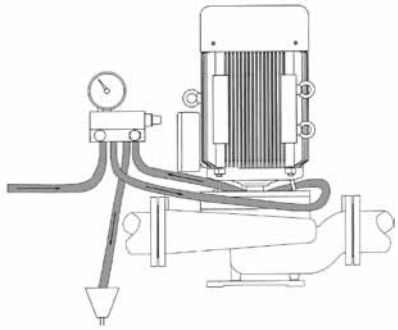
- Single mechanical seal
- Plugged pipe to the seal chamber using which, it is possible to flush the seal with external pressure if required
- Available for flange sizes DN 50–300 pumps
- Crystallising and accumulative liquids

External seal



- Externally-mounted single mechanical Teflon bellows
- Available for flange sizes DN 65–300 ALS pumps
- Extremely corrosive liquids, e.g. sulphuric acid
- Marking 'T' in the pump type e.g. ALS-1065/4T
- NOTE! Maximum working pressure 10 bar

Double mechanical seal system (cartridge)

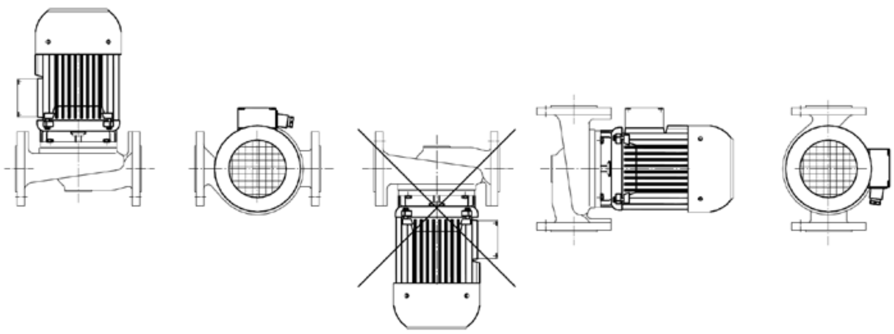


- Two opposing seals with sealing liquid brought from outside (circulation). The pressure of the liquid can be lower or higher than that of the liquid being pumped
- Available for flange sizes DN 65–300 pumps
- Max. operating temperature +180°C for water
- Requires a separate seal water monitoring unit (available from Kolmeks)
- Marking 'KT' in the pump type e.g. ALS-1154/4KT
- Hot, crystallising and accumulative liquids

Installation

Ensure the following when installing the pump:
- Enough room for service and inspection
- Possibility to use lifting and transfer devices if required
- Shut-off valves on both sides of the pump, allowing the position of the motor unit and the electrical terminal connection box to be changed by removing the motor unit from the pump housing and by installing it in the required position ---(not applicable when using internal seal flushing, marking 'H' which is standard in the LH/ALH series)

Kolmeks inline pumps are suitable for both vertical and horizontal pipe mounted positions. Small pumps are usually installed without a base in a vertical or horizontal position. Large pumps are installed with the base in a vertical position.

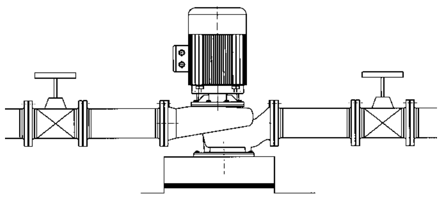


When selecting a method of installation, please consider at least the following:
- Enough room for installation and service
- Piping strength, rigidity and support
- Vibration and noise level requirements
- Pump installability
- Pump serviceability
  - number of service personnel and availability of lifting equipment
  - pump weight

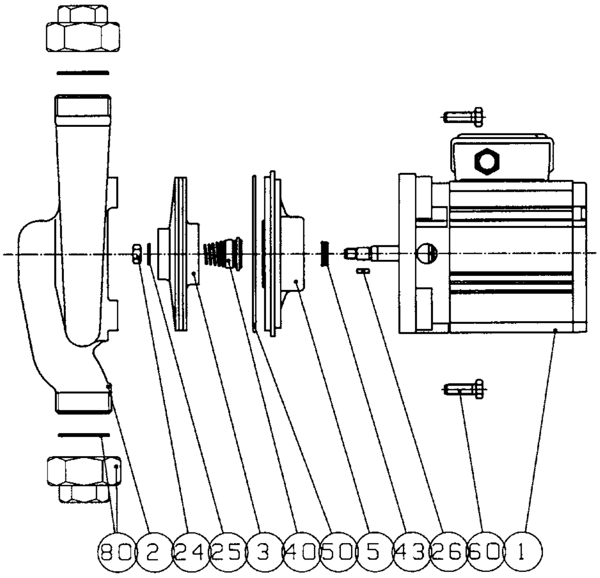
Size	Power
DN 15 ... 50	max. 2,2 kW
DN 65	4 kW
DN 80	4 kW
DN 100	7,5 kW
DN 125	7,5 kW

Recommended general limits without the base:

Large pumps are fastened by their foot onto a freely moving concrete plinth, which is separated from the floor.by a 20-mm thick rubber or cork mat for example. The weight of the concrete base must be about 1.5 times the weight of the pump.

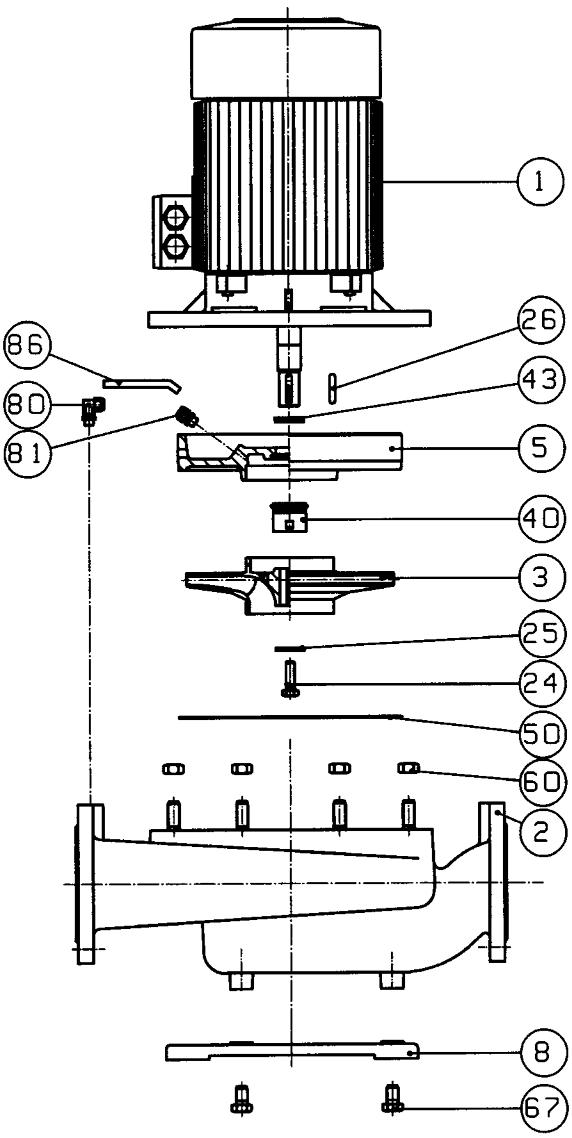


Pump service



Parts for AE-pumps

1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
24	Nut / Screw
25	Washer
26	Key
40	Mechanical seal
43	V-ring
50	O-ring / gasket
60	Nut / Screw
80	Pipe joint (AE-26, AE-33)



Parts for L_-, AL_-, ja AKN- pumps

1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
8	Base plate (not always)
24	Nut / Screw
25	Washer
26	Key
40	Mechanical seal
43	V-ring (not always)
50	O-ring / gasket
60	Nut / screw
67	Screw
80	Pipe joint (ALH-serie)
81	Pipe joint (ALH-serie)
86	Pipe (ALH-serie)

Motor unit

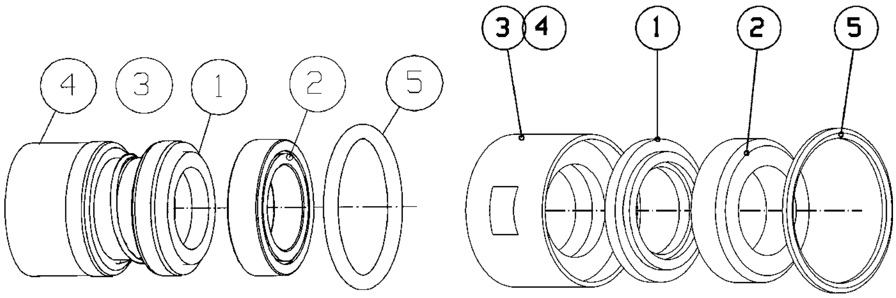
The pump motor unit is a new stand-by operation unit which includes:

1) Motor
2) Sealing flange
3) Impeller
4) Seals

If a motor malfunction or a seal leak occurs, replacing the motor unit is simple and quick and does not require long periods of stoppage. No procedures need to be carried out on the piping, because there is no need to detach the pump housing.

Shaft seal

If a seal leak occurs in a new pump, e.g. during commissioning , it is possible to replace only the shaft seal with a new one.



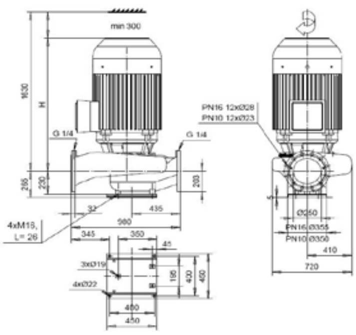
Parts of single mechanical shaft seal

1	Rotating ring
2	Stationary ring
3	Body/bellows
4	Spring
5	O-ring

Reading curves and selecting a pump

AL_-1250/4 DN250

AL-1250/4 **ALH-1250/4** **ALP-1250/4** **ALS-1250/4** **ALM-1250/4**



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-224 J2 F41	37	67,0	580	880
	KZ-225 K2 F42	45	81,1	610	900
	KZ-256 J2 F42	55	98,7	690	950
	KZ-287 J2 F43	75	133,9	850	1020
	KZ-288 K2 F43	90	158,5	920	1070
	KZR-314 H2 F43	110	193,2	1210	1330
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KZ-225 K2 F42	45 (54)	84,0 (83,8)	610	900
	KZ-256 J2 F42	55 (66)	102,1 (100,9)	690	950
	KZ-287 J2 F43	75 (90)	138,6 (139,0)	850	1020
	KZ-288 K2 F43	90 (105)	156,2 (159,6)	920	1070
	KZR-314 H2 F43	110 (132)	199,9 (198,2)	1210	1330

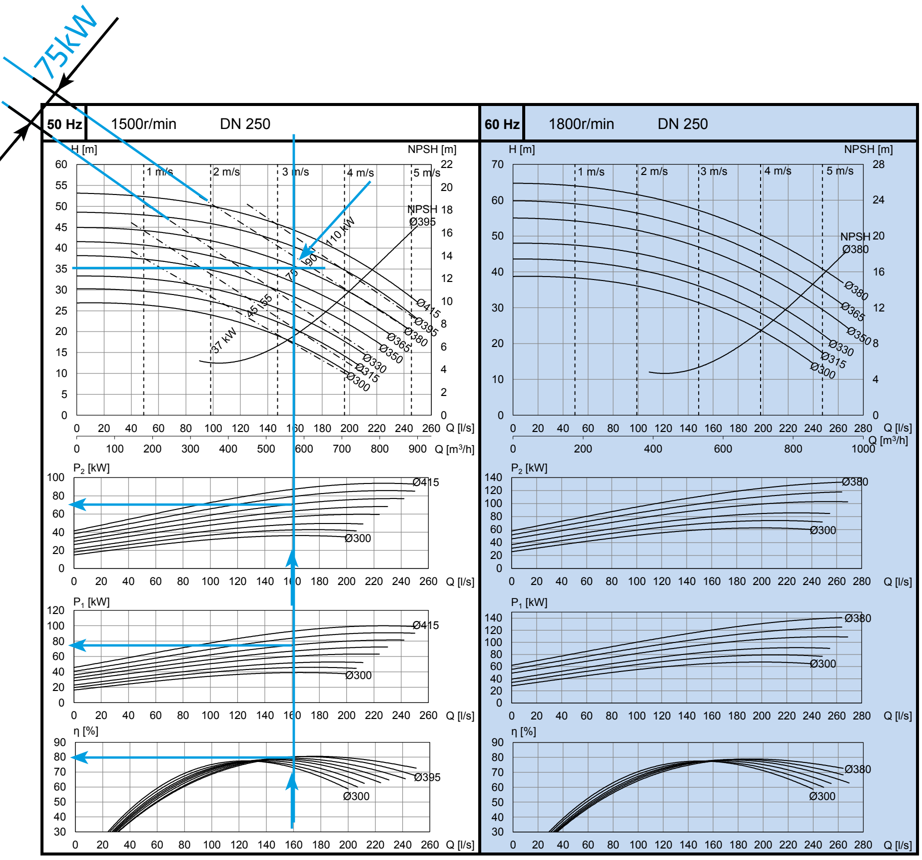
Selecting a fixed speed pump from 50 Hz pump curve (curves on the left)
E.g. duty point: flow =160 l/s, head = 35 m, liquid: water +20°C.

1. Use the quick selection chart at the beginning of the catalogue or browse through the product catalogue in order to find a pump of the correct size range such that the required flow 160 l/s is at the best efficiency point (η = 80%).

2. Select the impeller size [Ø= mm] from the QH curve such that a vertical line is drawn at the point of 160 l/s flow through all curves and, equivalently, a horizontal line at the point of 35m head.

3. Find the impeller size at the intersection= 380 mm. Note! If the intersection falls between two impeller sizes, the impeller diameter is selected halfway between the two sizes.

4. Read the nominal shaft power of the motor from the section in which the QH curve is.
In this example, the motor nominal shaft power is P2N = 75 kW.
According to the shaft power P2, P2 = 71 kW, the motor nominal power becomes P2N = 75 kW (the closest highest motor nominal power).



5. Check the nominal current of the electric motor from the column on the right-hand side of the nominal power column in the table, IN = 133.9 A. Select an overload protection for the motor according to nominal current.

6. Read the pump weight from the same table [kg] = 850 kg.

7. For energy calculation, read the electrical power of the device = P1 [kW], from the P1 curve with a required flow of Q = 160 l/s and at the point of the selected impeller size, Ø = 380 mm.
In this example, the device electrical power is P1= 74 kW.

8. Energy costs = Electrical power P1 [kW] x energy price [€/ kWh] x operating time [h].

Characteristic curves apply to +20°C water.

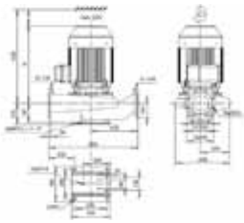
Note! Please contact Kolmeks for additional information on the following issues!

1. When pumping liquids whose viscosity differs from that of water, the effect of viscosity must be considered in pump selection.
2. Liquid density is directly proportional to the power requirement. The sufficiency of motor power must be checked for liquids denser than water.

Selecting an optimal pump for frequency converter operation from a 60Hz curve

CORRECTLY-SIZED PUMP

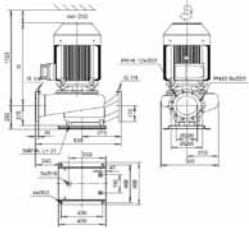
AL-1154/4 ALH-1154/4 ALS-1154/4 ALM-1154/4



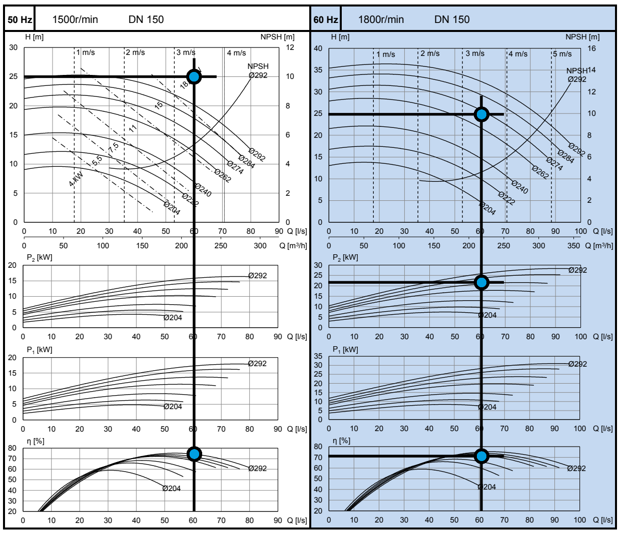
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C2 F31	4	8,13	177	500
	KH-132 E2 F31	5,5	10,95	184	500
	KH-133 G2 F31	7,5	14,88	196	550
	KZ-165 F2 F31	11	20,75	250	660
	KZ-165 G2 F31	15	28,10	255	660
	KZ-186 G2 BF31	18,5	34,40	295	720
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	177	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	184	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	196	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	250	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	255	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	295	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	310	720
	KZ-205 K2 F31	30 (30)	57,60 (57,10)	370	780

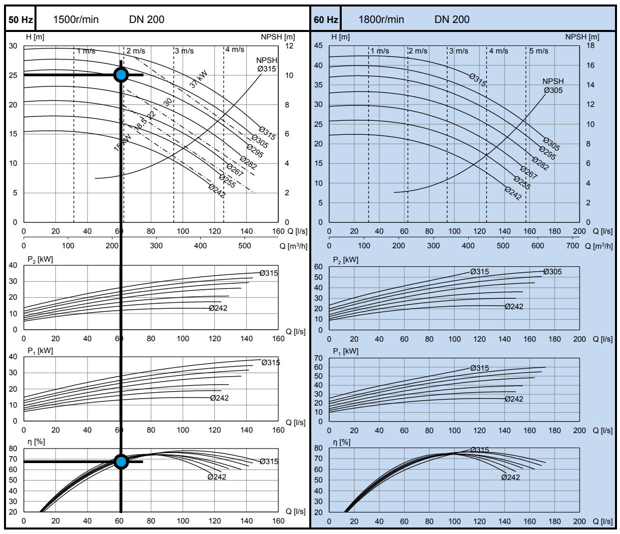
OVERSIZED PUMP

AL-1202/4 ALH-1202/4 ALP-1202/4 ALS-1202/4 ALM-1202/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-165 G2 F31	15	28,1	325	720
	KZ-186 G2 BF31	18,5	34,4	365	780
	KZ-186 K2 BF32	22	40,3	380	780
	KZ-205 K2 F32	30	55,2	435	830
	KZ-224 J2 F32	37	67,0	485	840
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	365	780
	KZ-186 K2 BF32	22 (26)	41,60 (41,00)	380	780
	KZ-205 K2 F32	30 (36)	57,60 (57,10)	435	830
	KZ-224 J2 F32	37 (44)	69,50 (68,60)	485	840
	KZ-225 K2 F33	45 (54)	84,00 (83,80)	510	880





E.g. duty point: flow = 60 l/s, head = 25 m, pumped liquid being water +20°C.

1. Use the quick selection chart at the beginning of the catalogue or check the datasheets in the product catalogue to find a pump in the correct size range such that the required flow is in the best efficiency point. The AL-1154/4 pump is selected because its efficiency is the best in the required duty point η = 75%.
2. The duty point is outside the operating range of the AL-1154/4 50 Hz pump.
3. Usually when selecting the pump from the 50 Hz curve to the required duty point (Q = 60 l/s, 25 m), the next largest pump is selected.
   In the above example, we choose AL-1202/4, Ø300mm, P2N = 30 kW, η = 67%. This is an oversized pump whose best flow range is within 100–120 l/s, where its efficiency is the highest η = 80 %.
4. Select the pump AL-1154/4 from the 60 Hz curve, whereby the impeller is Ø274mm.The nominal motor shaft power P2N is selected according to the shaft power curve P2.
   Shaft power P2 = 21 kW and the next higher nominal power is P2N = 22 kW.
   In this example, we choose AL-1154/4, Ø274mm, P2N = 22 kW, η = 75%.

QH curves are available for 50 Hz and 60 Hz on the same datasheet in order to facilitate the customer's selection of the most energy efficient pump for frequency converter operation.

How does careful pump selection benefit the customer?

1. The pump saves energy, because it has been selected from the range of the best efficiency.
2. The total purchase cost is lower, because the pump, the electric motor and the frequency converter are one size smaller.
3. The pumps are designed to operate at the best efficiency where they run with low noise and vibration and have a long service life.
4. A smaller pump saves energy in partial flows, because its efficiency is better for the entire operating range.

4

KOLMEKS
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NPSH and cavitation

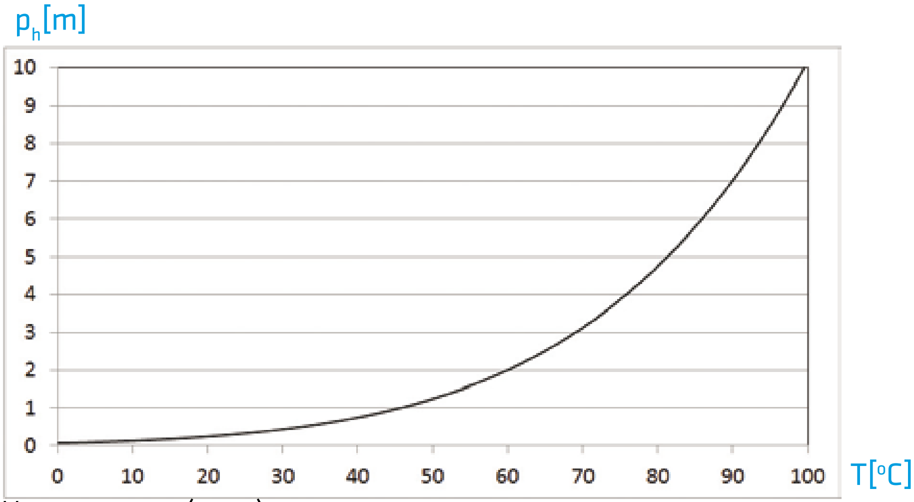
$NPSH_{re} < NPSH_{av}$

$NPSH_{re} < p + h - h_{suction} - p_h$

$NPSH_{re} < p_{suction} - p_h$

$NPSH_{av}$ = difference between available inlet pressure (in suction flange) and vapour pressure of liquid being pumped
$NPSH_{re}$ = NPSH value required by the pump
p = Absolute air pressure
p_h = Absolute liquid vapour pressure at the operating temperature
h = Liquid geodetic suction head
$h_{suction}$ = Pressure losses in suction pipes
$p_{suction}$ = Absolute suction pressure

The $NPSH_{av}$ value of a system refers to the actual difference between inlet pressure (in the suction flange) and vapour pressure of the liquid being pumped. The $NPSH_{re}$ value required of the pump must be smaller than the $NPSH_{av}$ value in order to prevent cavitation from occurring. A safety margin of 0.5 m must be added to the measurement value.



Vapour pressure (water)

At normal air pressure levels (10 m water column, 1,013 mbar = 760 mm Hg), clean water boils at 100°C. It can be seen from the curve that water boils at 60°C when the absolute pressure is 2 m wc (i.e. 8 m wc below atmospheric pressure). The boiling point of water at less than 40°C can be achieved at a very low pressure. Vice versa, at the top of Mount Everest, where air pressure is about 0.6 bar (6 m), water boils at +85°C.

Example:

Open tank (p = air pressure = 10 m) where the water temperature is + 90°C (ph = 7 m), suction pipe losses 1 m and liquid suction head flange +2 m. The pump duty point 20 l/s, 7.8 m.

Is the selected pump suitable for the use in question? An example of calculation:

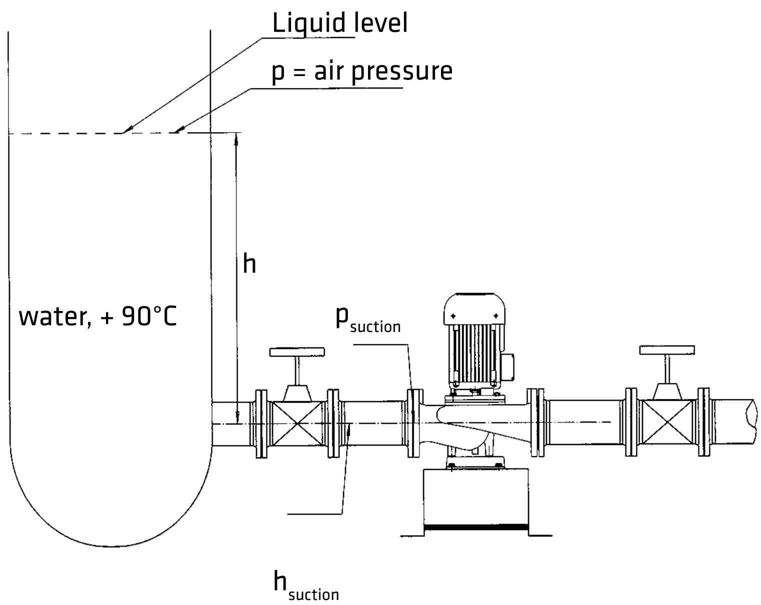
Pump type: AL_-1102/4/Ø188 2,2 kW

$NPSH_{re} < p + h - h_{suction} - p_h$

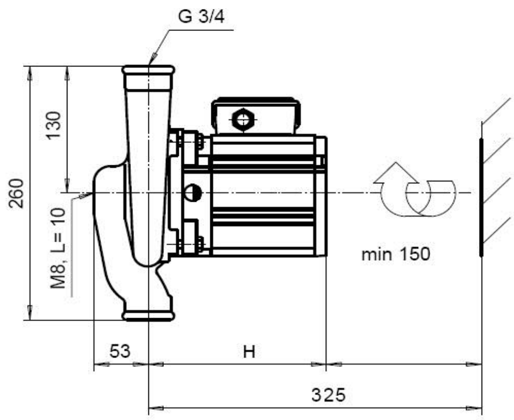
$NPSH_{re} < 10\ m + 2\ m - 1\ m - 7\ m$

$NPSH_{re} < 4\ m$

When observing the safety margin 0.5 m, the $NPSH_{re}$ value of the pump must be smaller than 3.5 m in order to prevent the pump from cavitating. $NPSH_{re}$ of pump AL_-1102/4/Ø188 = 2.7 m, whereby it will not cavitate.

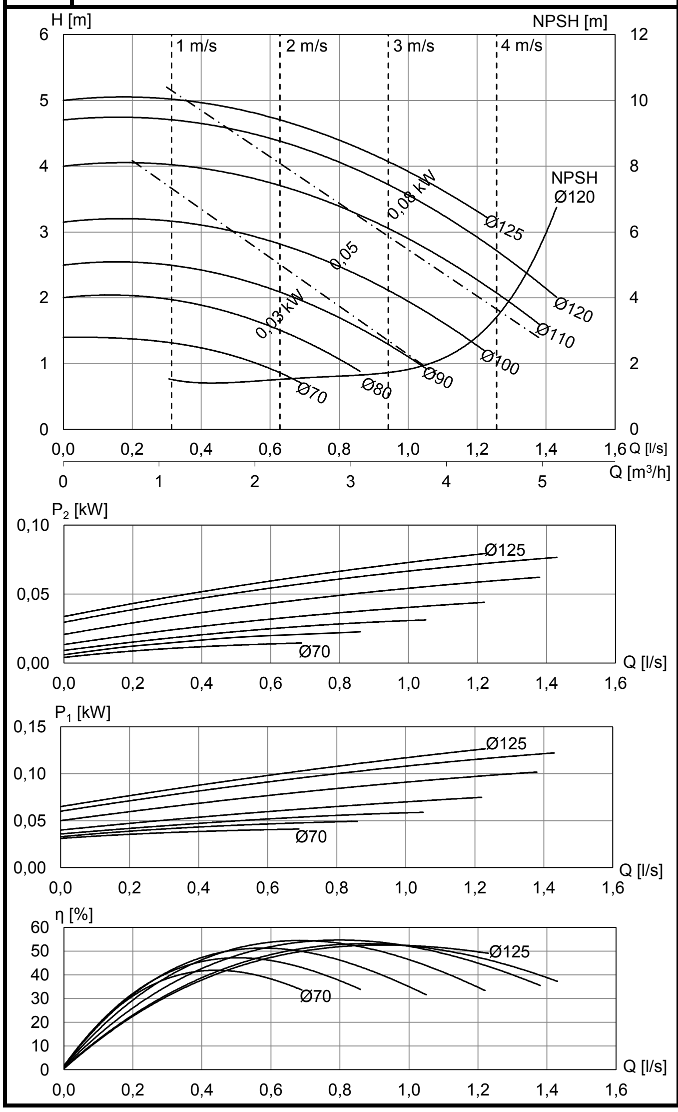


AE-20/4

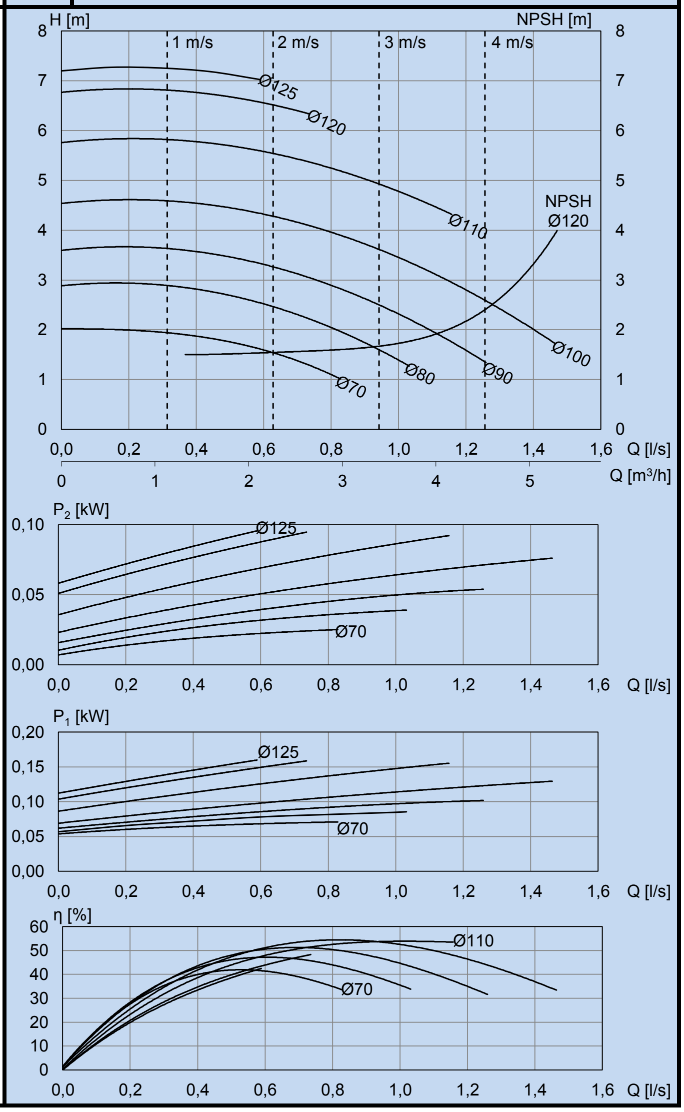


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 N12	0,03	0,18	10	175
50Hz	OP-732 B N12	0,05	0,21	10	175
50Hz	OP-742 N12	0,08	0,28	10,5	175
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	10	175
60Hz	OP-742 N12	0,08 (0,09)	0,28 (0,28)	10,5	175

50 Hz 1500r/min G 3/4

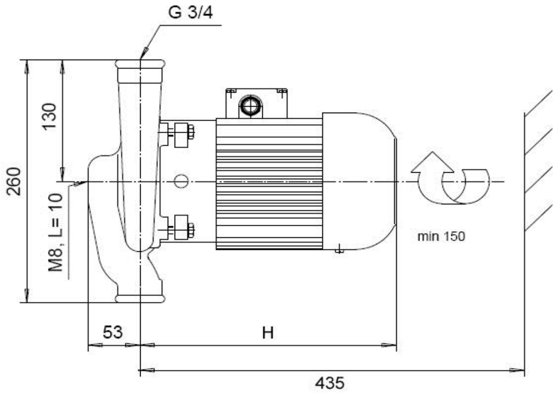


60 Hz 1800r/min G 3/4



AE-20/2

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-741 N12	0,25	0,7	10,5	215
50Hz	OKN-841 D N12	0,65	1,75	14,5	260
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-741 N12	0,25 (0,3)	0,7 (0,7)	10,5	215
60Hz	OKN-841 D N12	0,65 (0,75)	1,6 (1,6)	14,5	260
60Hz	KH-871 N12	1,1 (1,3)	2,35 (2,50)	20	295



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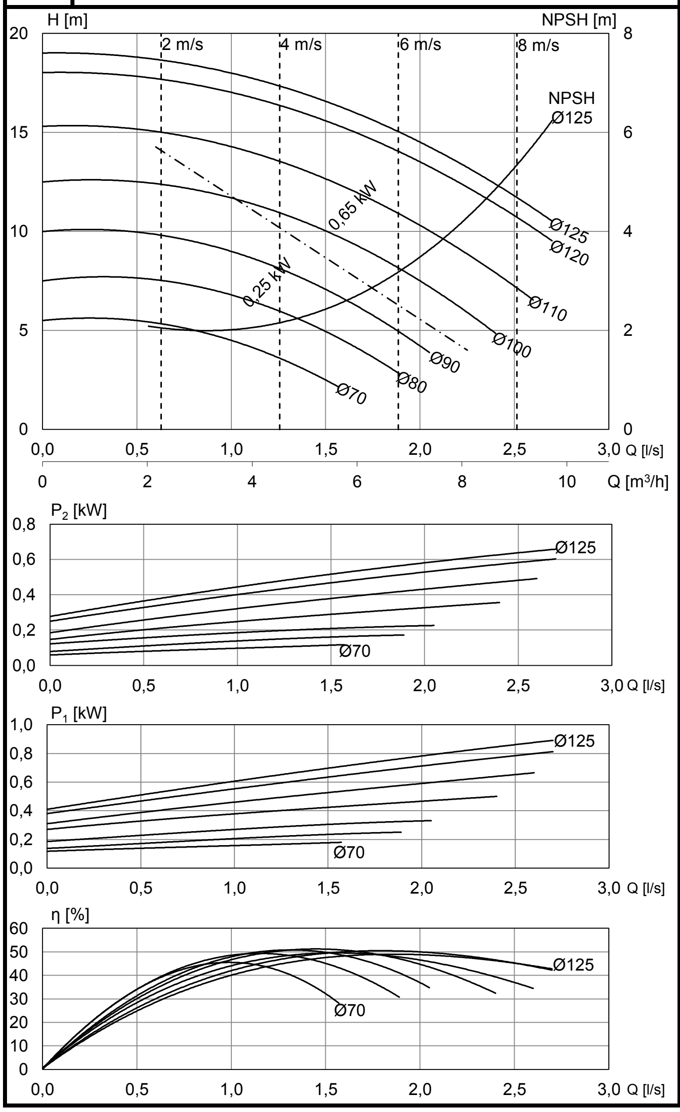
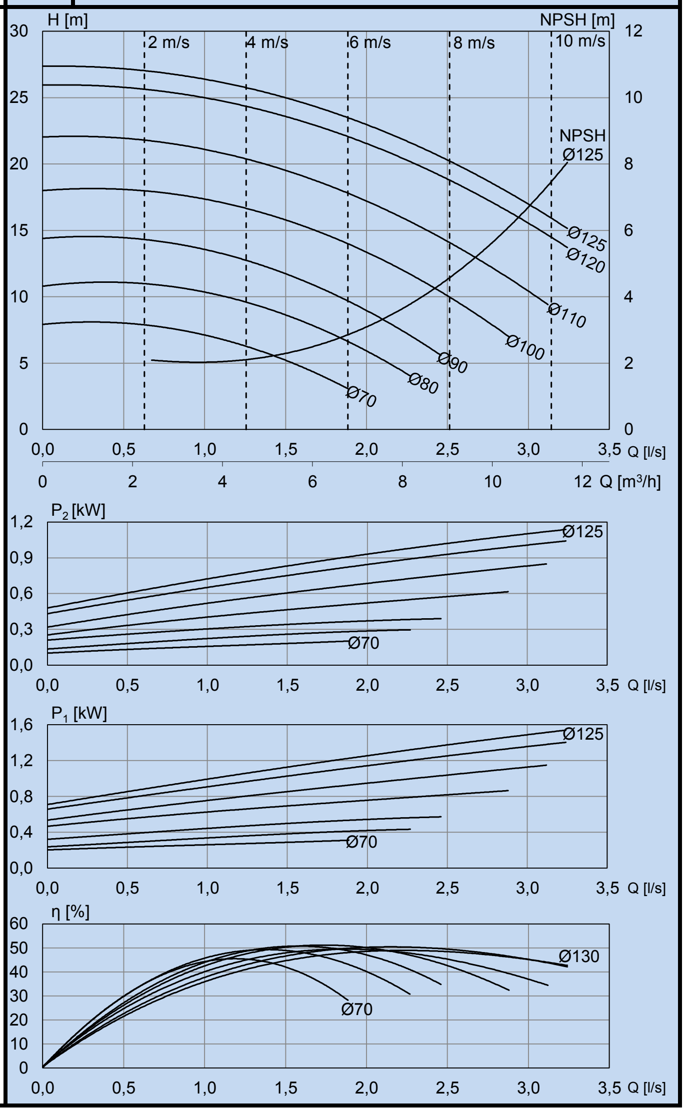
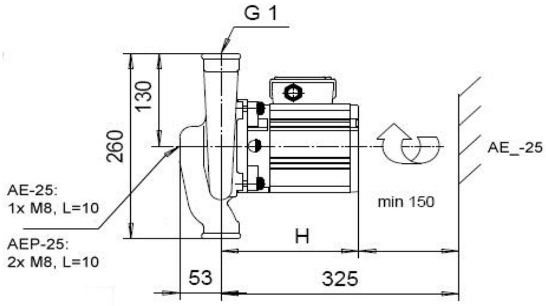
50 Hz	3000r/min	G 3/4



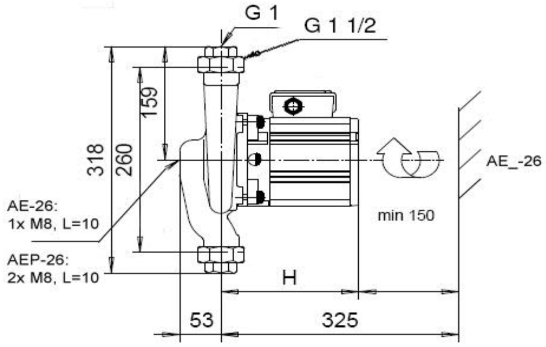
60 Hz	3600r/min	G 3/4

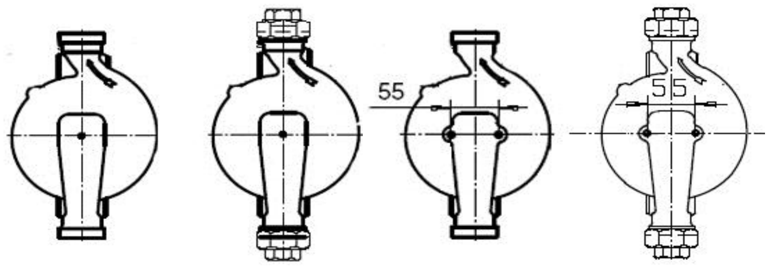


AE-25/4 | AE-26/4 | AEP-25/4 | AEP-26/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 B N12	0,05	0,21	9,5	175
	OP-742 N12	0,08	0,28	10,5	175
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	9,5	175
	OP-742 N12	0,08 (0,09)	0,28 (0,28)	10,5	175

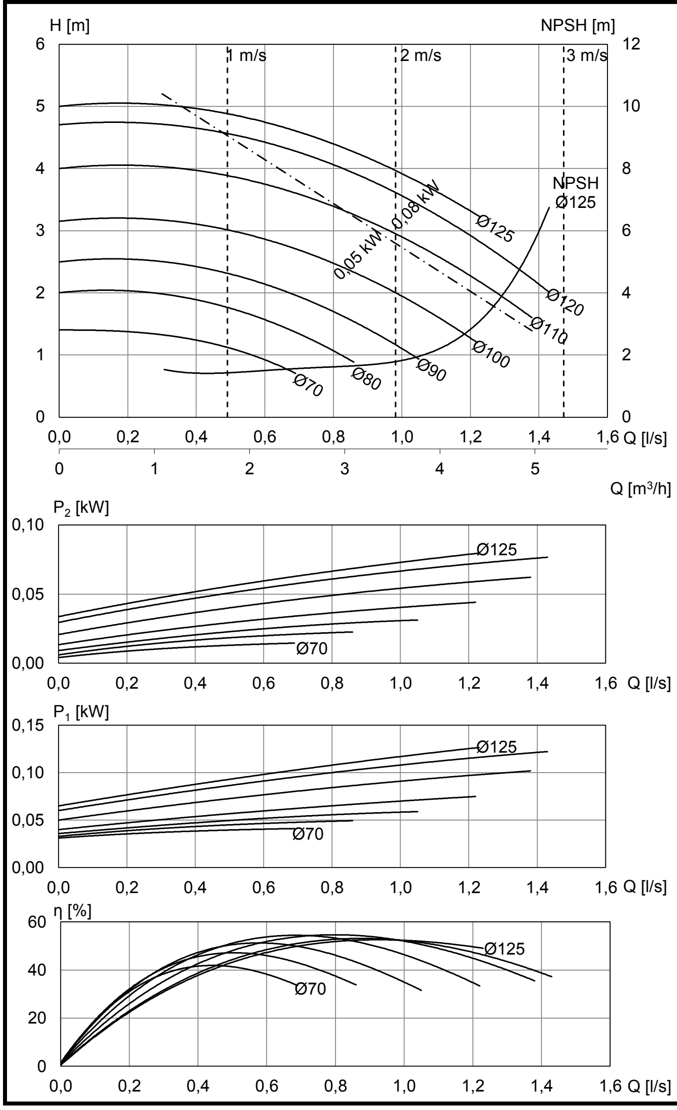


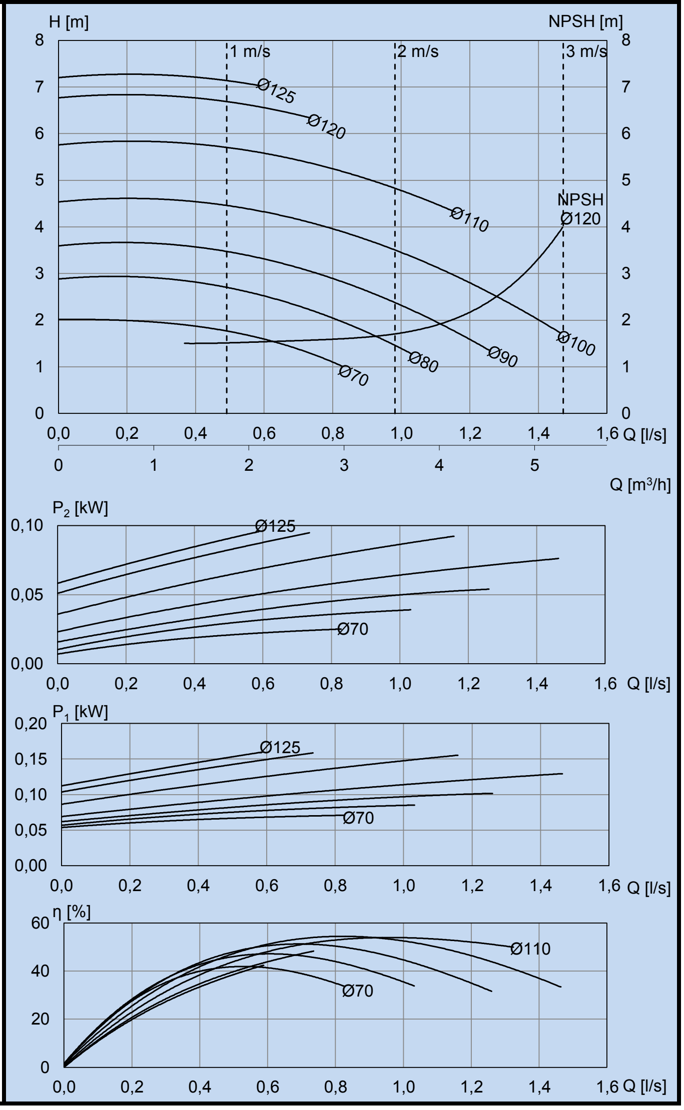


AE-25 | AE-26 | AEP-25 | AEP-26

4

50 Hz	1500r/min	G 1	60 Hz	1800r/min	G 1





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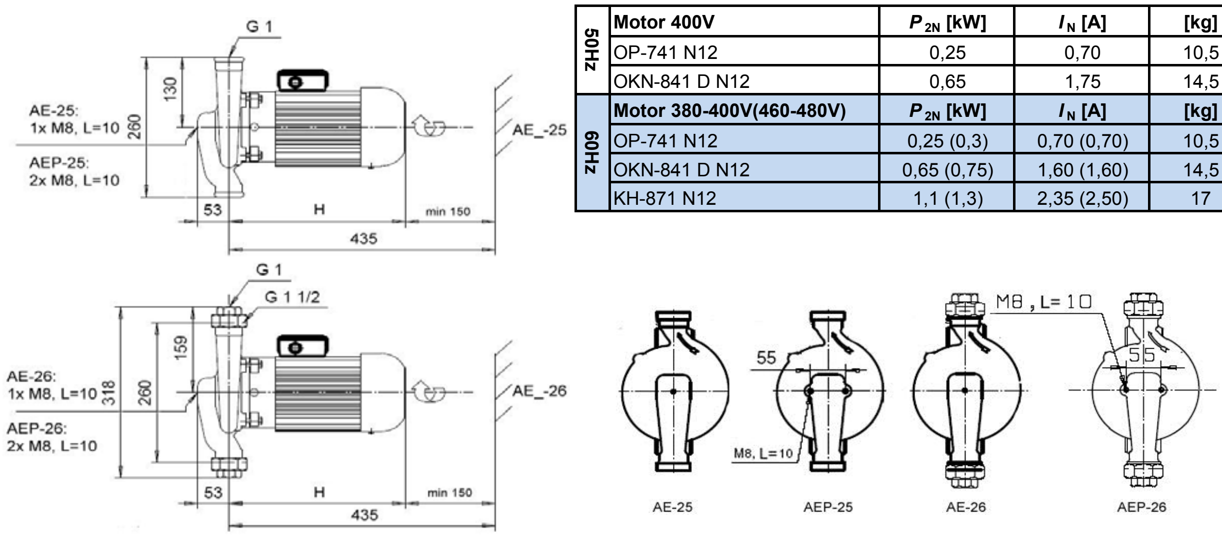
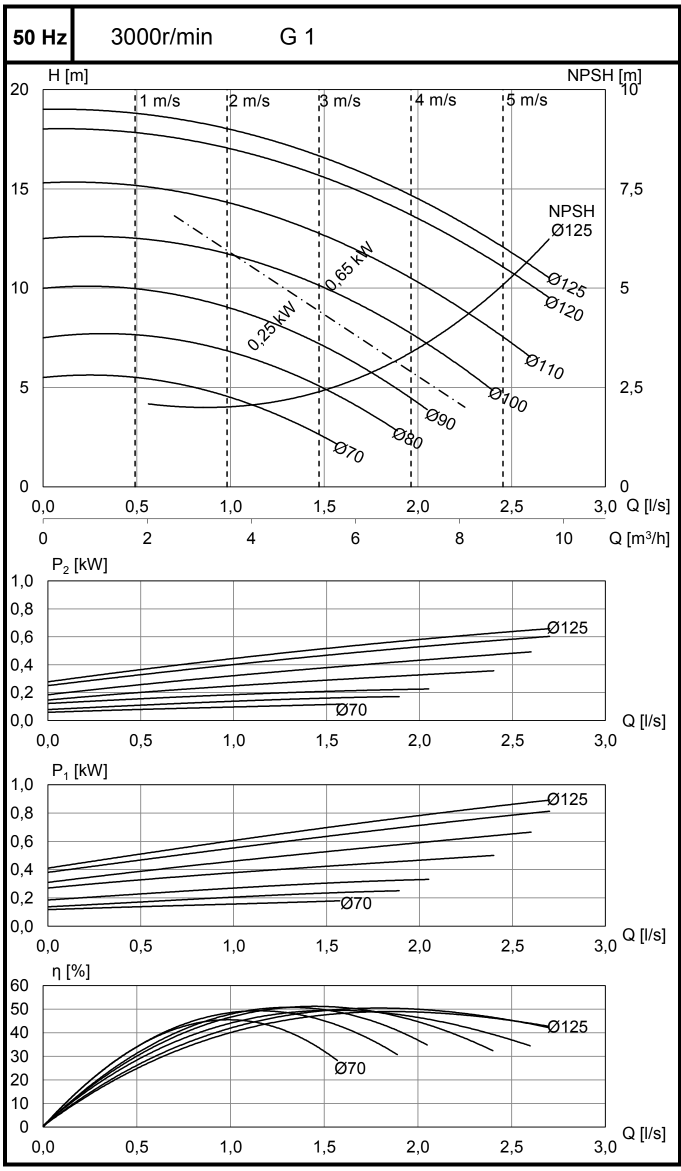
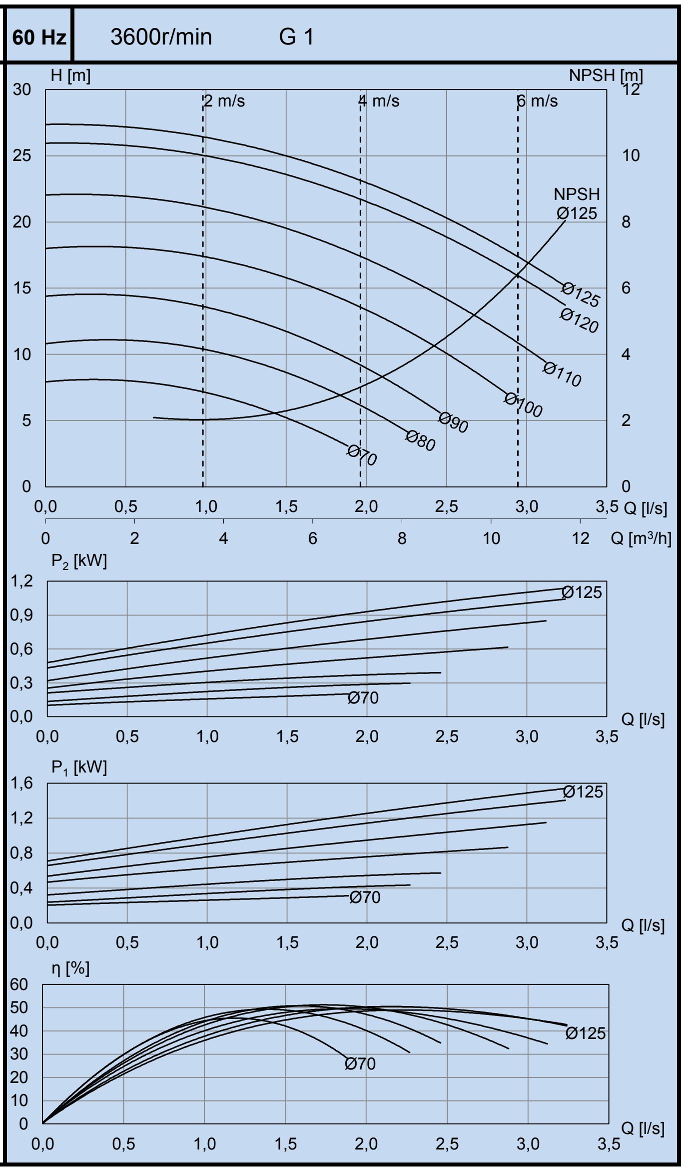
AE-25/2 | AE-26/2 | AEP-25/2 | AEP-26/2



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-741 N12	0,25	0,70	10,5	215
	OKN-841 D N12	0,65	1,75	14,5	260
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-741 N12	0,25 (0,3)	0,70 (0,70)	10,5	215
	OKN-841 D N12	0,65 (0,75)	1,60 (1,60)	14,5	260
	KH-871 N12	1,1 (1,3)	2,35 (2,50)	17	295

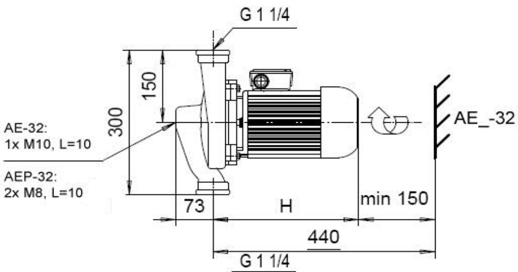
4

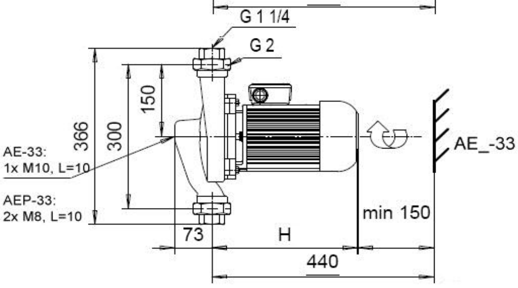


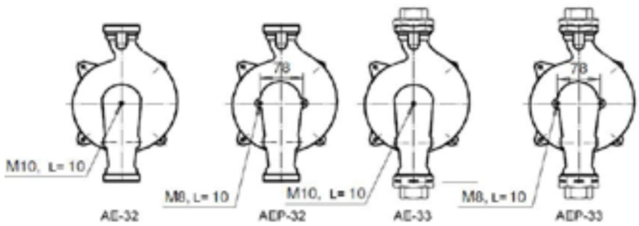


AE-32/4 | AE-33/4 | AEP-32/4 | AEP-33/4

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-752 N13	0,2	0,65	16	240
	OKN-862L D N13	0,37	1,15	20	290
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-752 N13	0,2 (0,24)	0,65 (0,65)	16	240
	OKN-862L D N13	0,37 (0,44)	1,15 (1,15)	20	290







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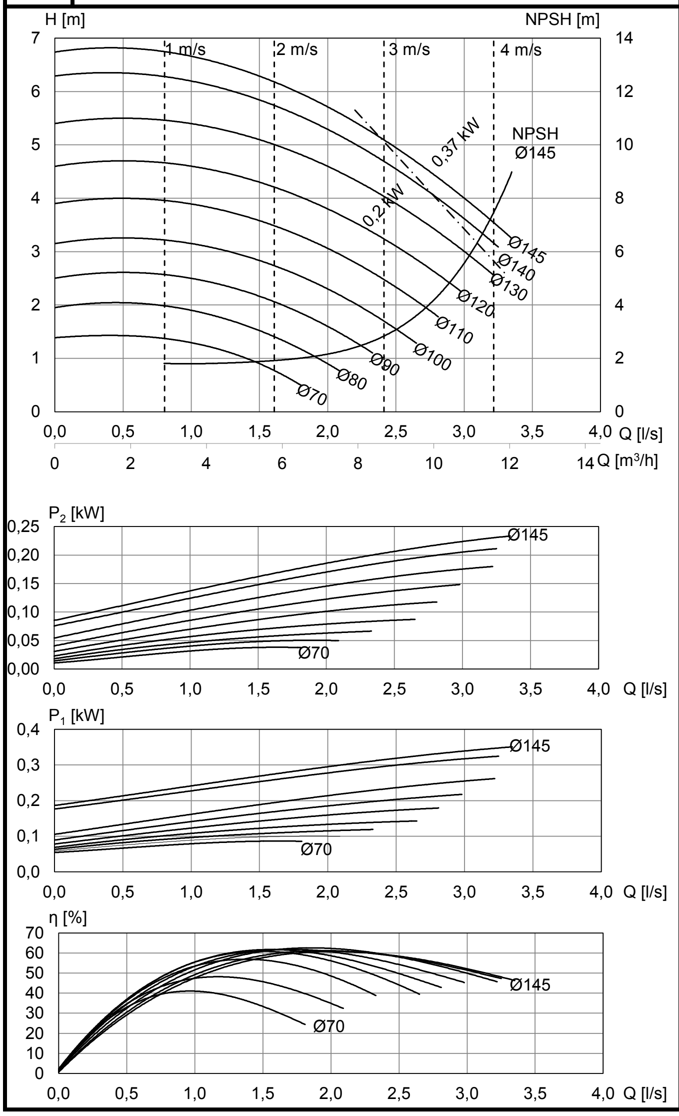
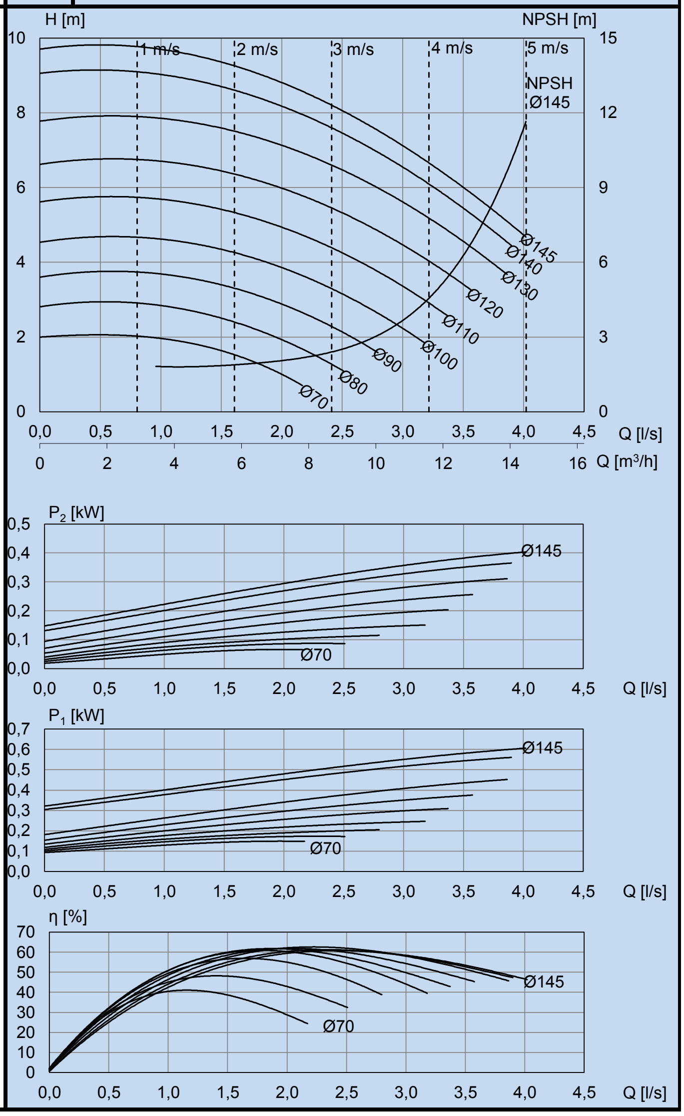
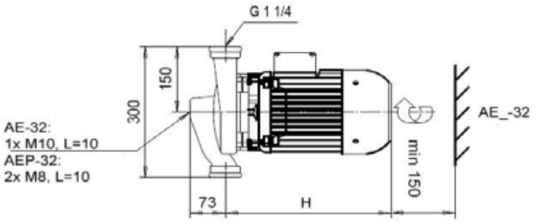
50 Hz	1500r/min G 1 1/4	60 Hz	1800r/min G 1 1/4

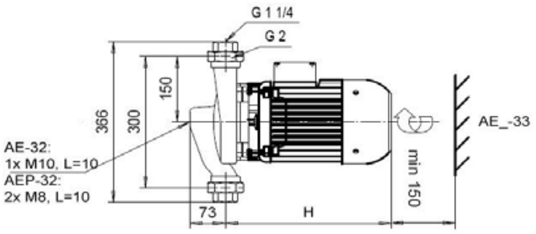


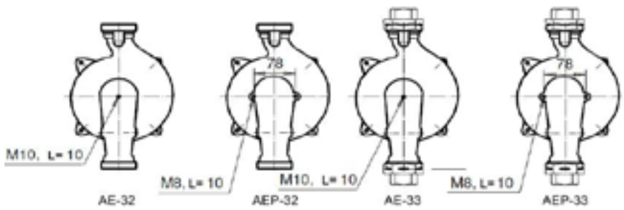


AE-32/2 | AE-33/2 | AEP-32/2 | AEP-33/2

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-871 N13	1,1	2,55	21	295
	KH-101 C1 N13	1,5	2,95	32	335
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-871 N13	1,1 (1,3)	2,35 (2,50)	21	295
	KH-101 C1 N13	1,5 (1,8)	2,98 (3,02)	32	335







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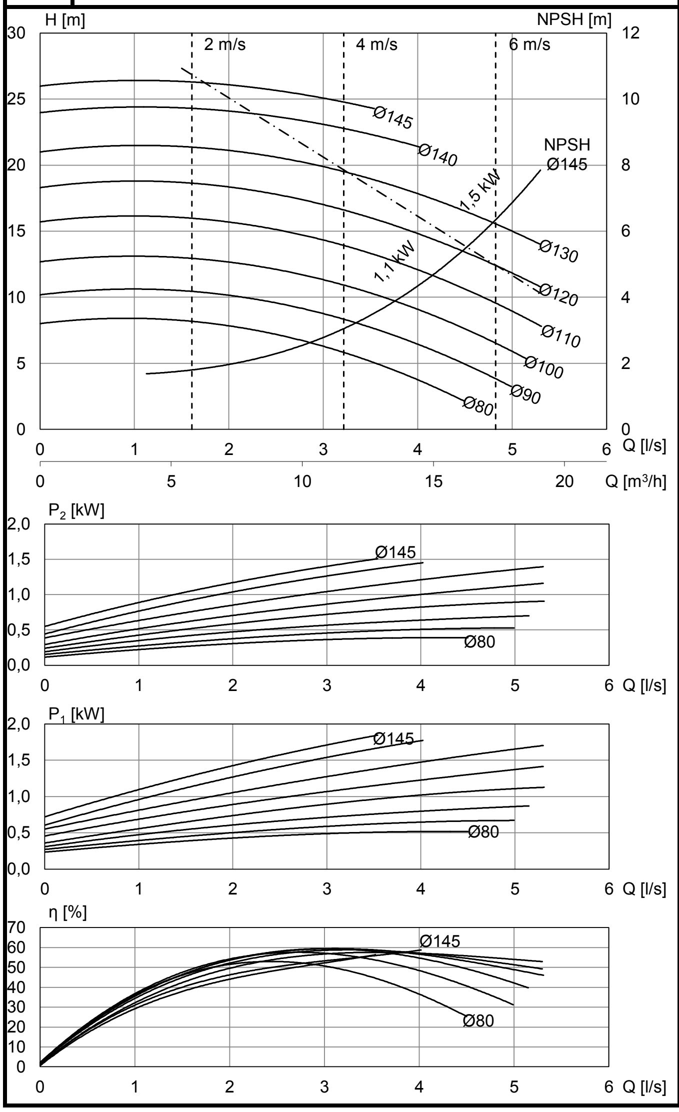
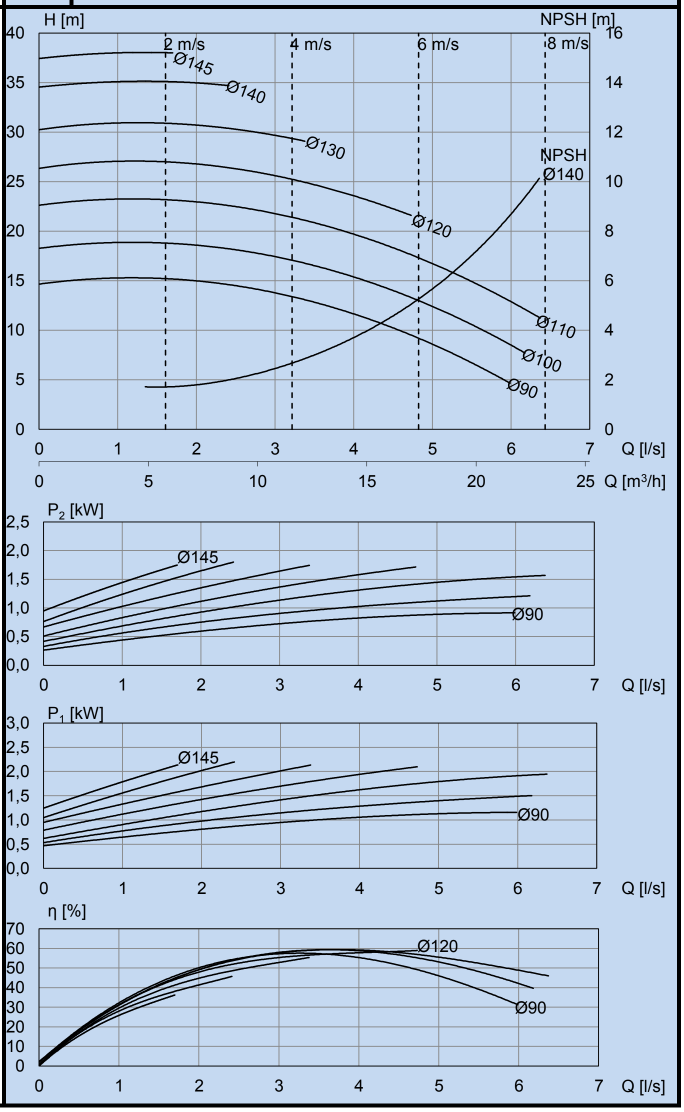
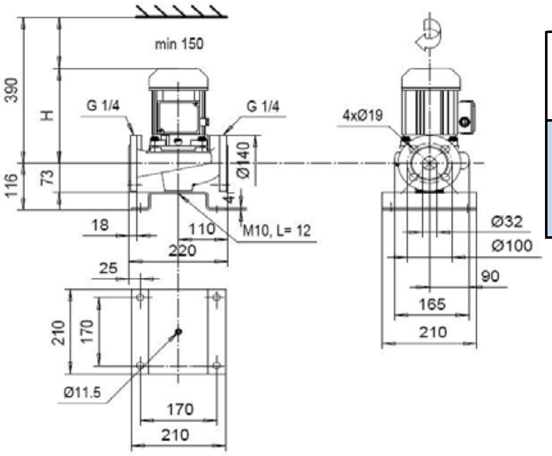
50 Hz	3000r/min	G 1 1/4	60 Hz	3600r/min	G 1 1/4



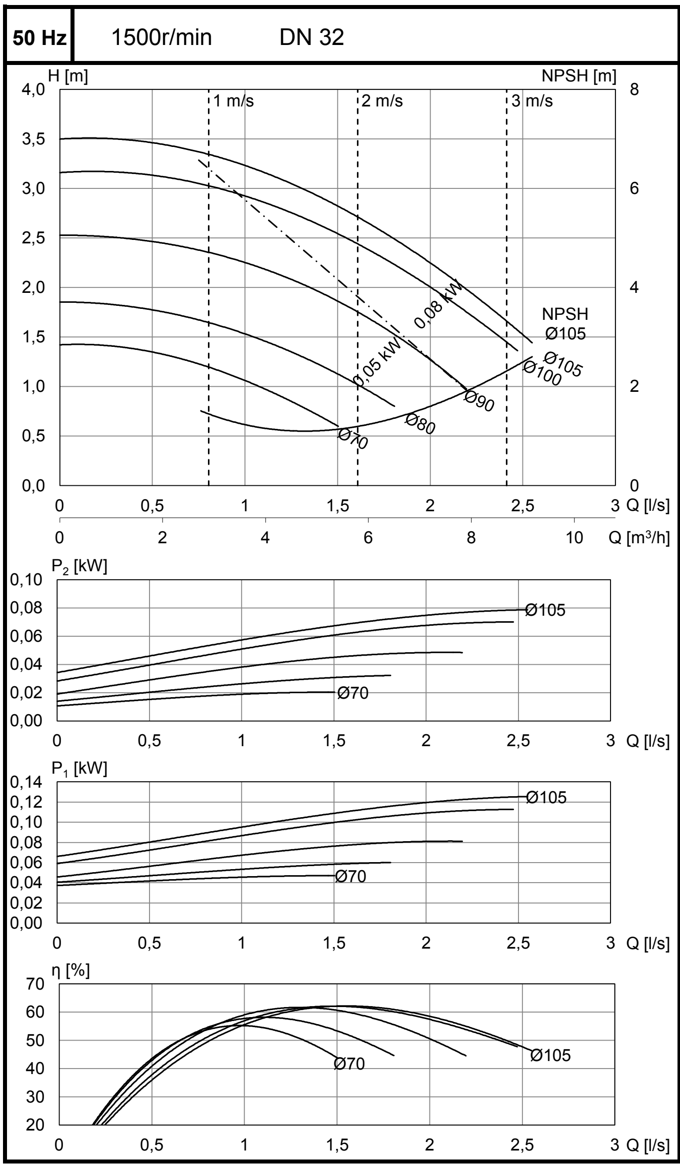


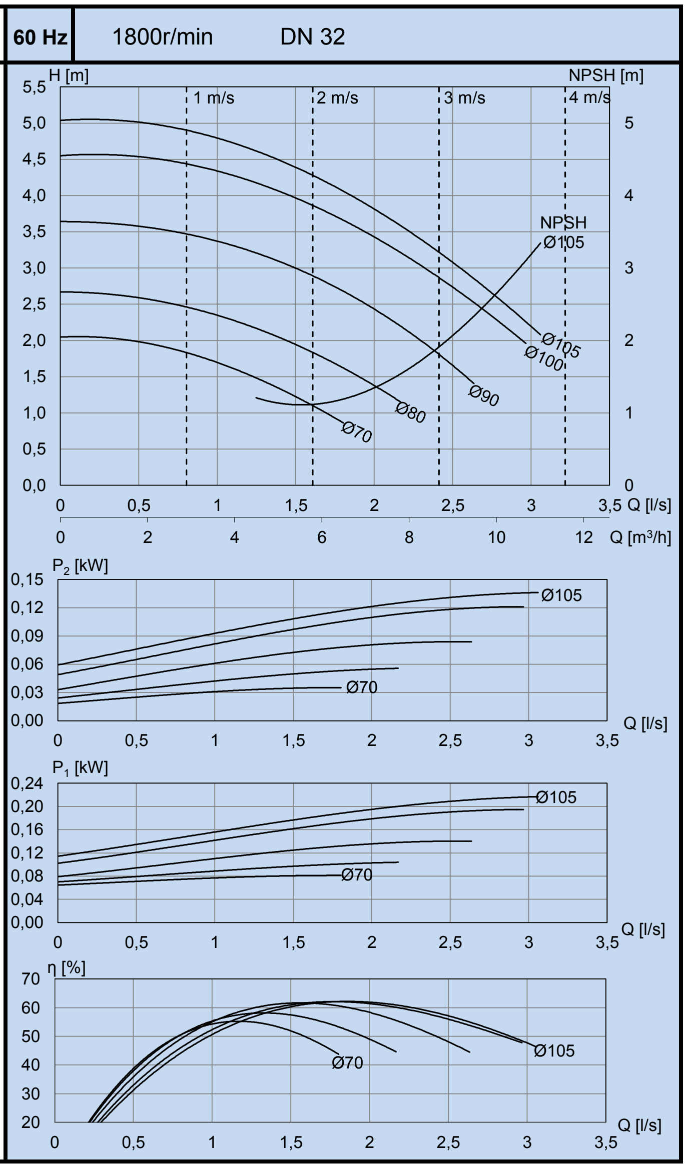
L-32A/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 B N12	0,05	0,21	16	185
50Hz	OP-742 N12	0,08	0,28	16,5	185
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	16	185
60Hz	OP-742 N12	0,08 (0,09)	0,28 (0,28)	16,5	185
60Hz	OP-752 N12	0,2 (0,24)	0,65 (0,65)	19	240

4





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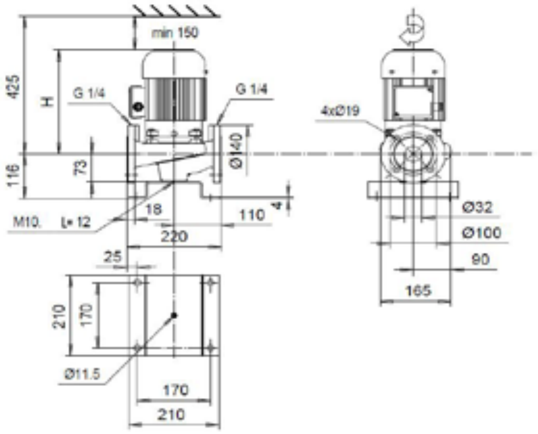
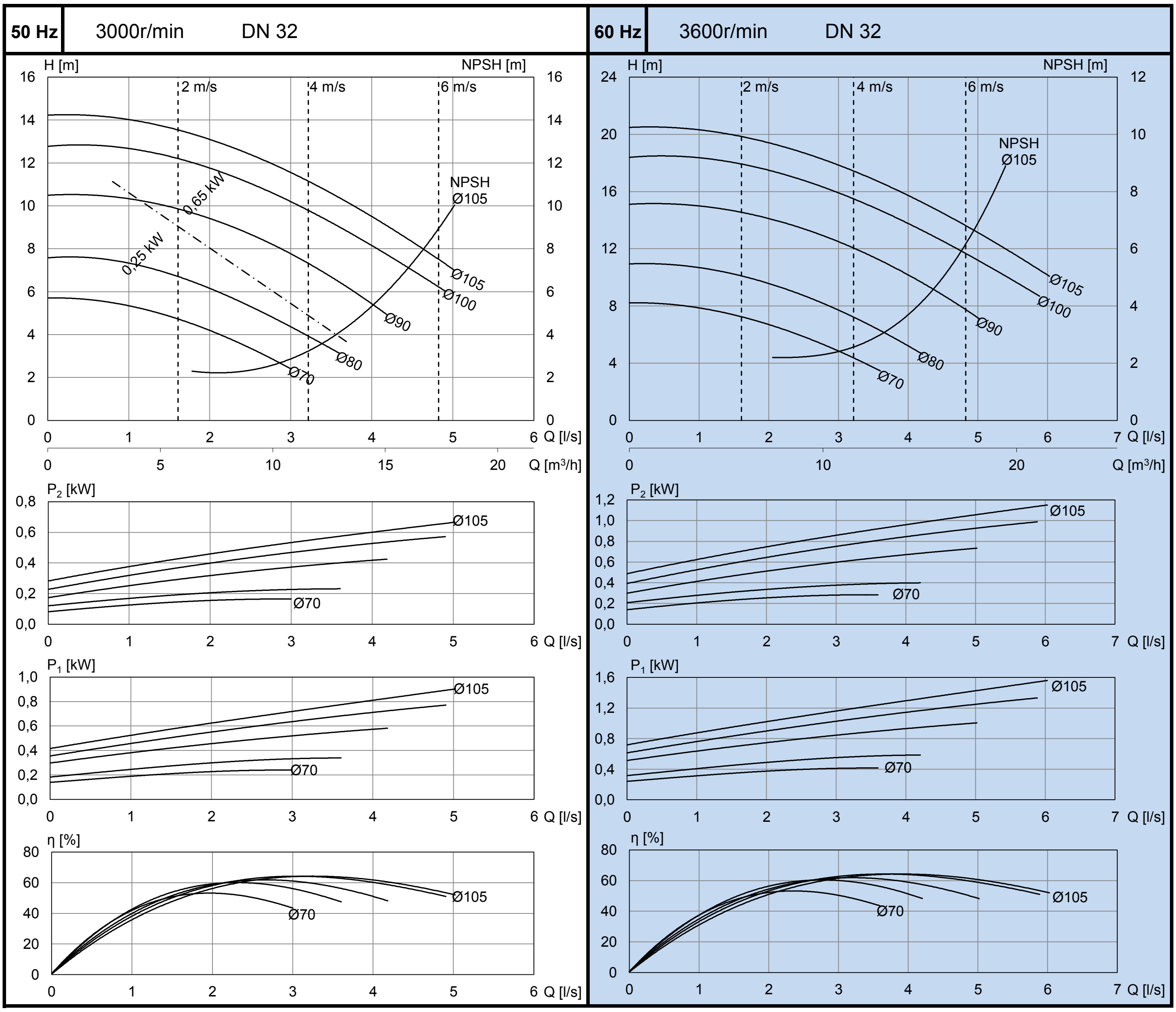
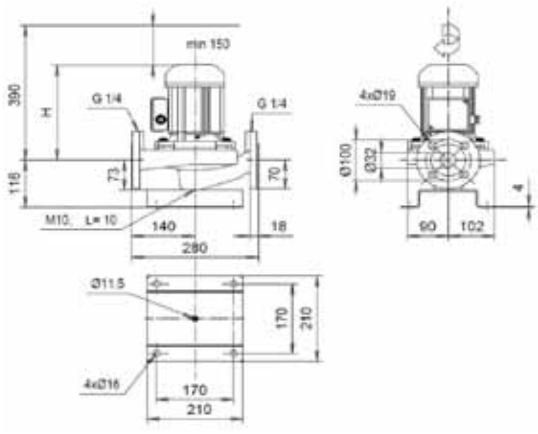


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50HZ	OP-741 N12	0,25	0,7	17	225
50HZ	OKN-841 D N12	0,65	1,75	21	275
60HZ	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60HZ	OP-741 N12	0,25 (0,3)	0,7 (0,7)	17	225
60HZ	OKN-841 D N12	0,65 (0,75)	1,6 (1,6)	21	275
60HZ	KH-871 N12	1,1 (1,3)	2,35 (2,5)	24	295

4

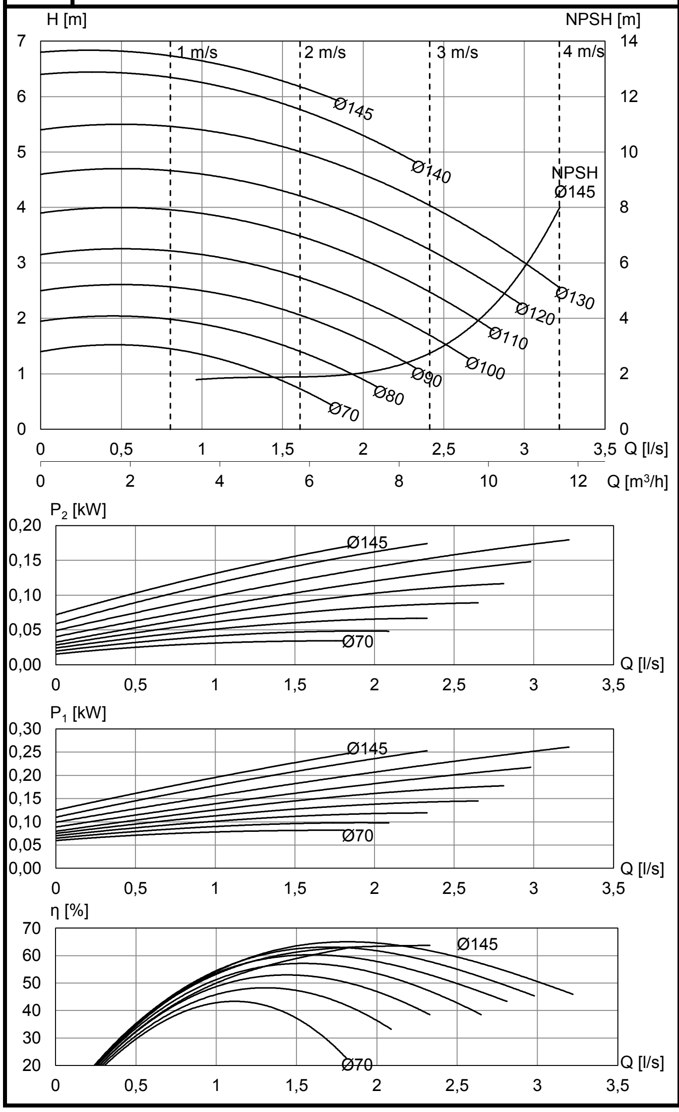


ALS-1032/4

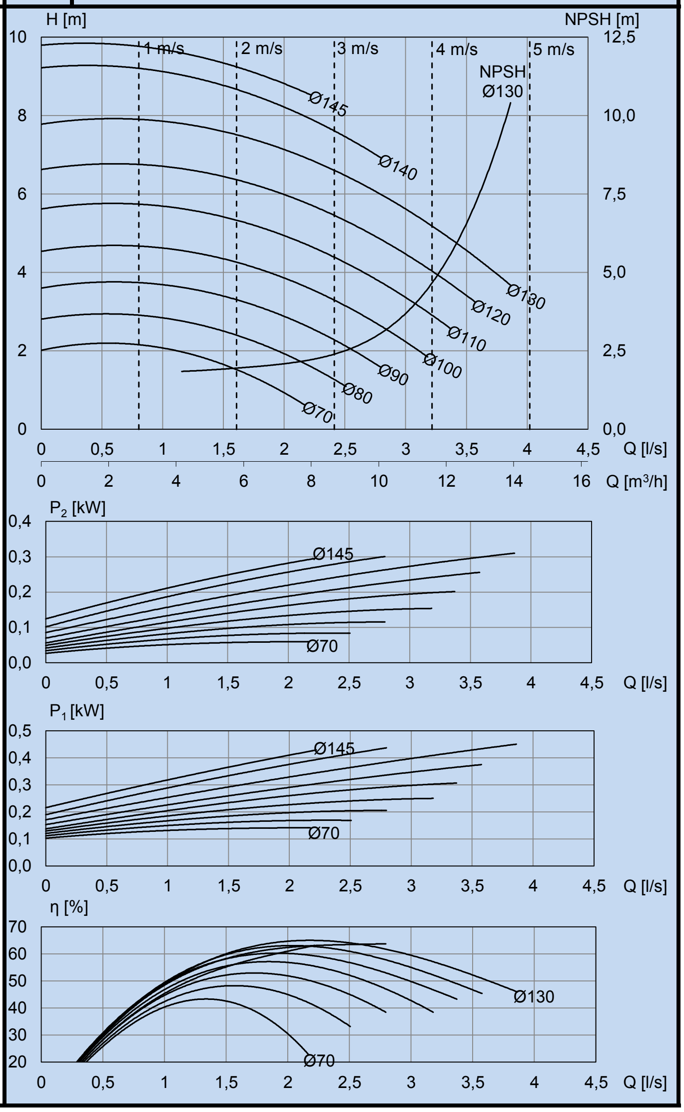


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-752 N13	0,2	0,65	22	240
	OKN-862L D N13	0,37	1,15	26	290
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-752 N13	0,2 (0,24)	0,65 (0,65)	22	240
	OKN-862L D N13	0,37 (0,44)	1,15 (1,15)	26	290

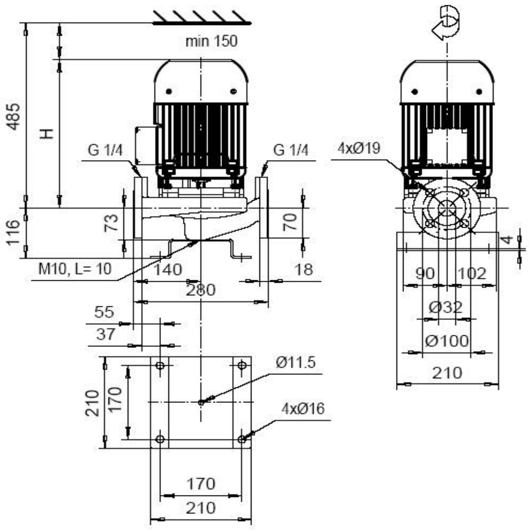
50 Hz 1500r/min DN 32



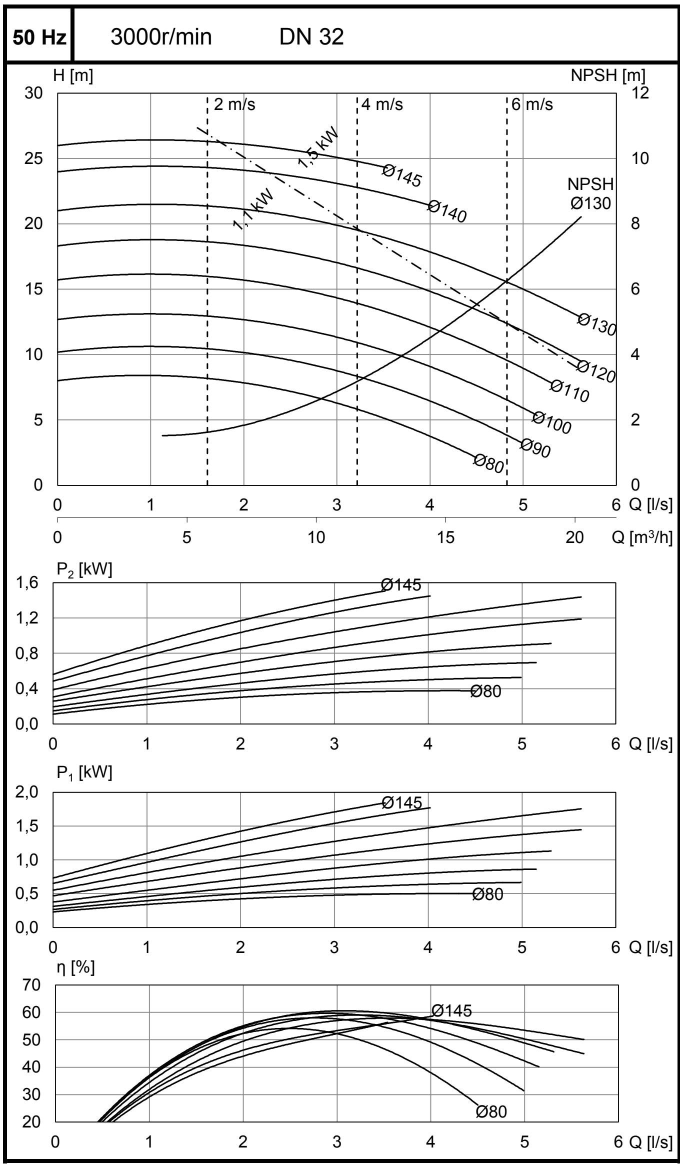
60 Hz 1800r/min DN 32

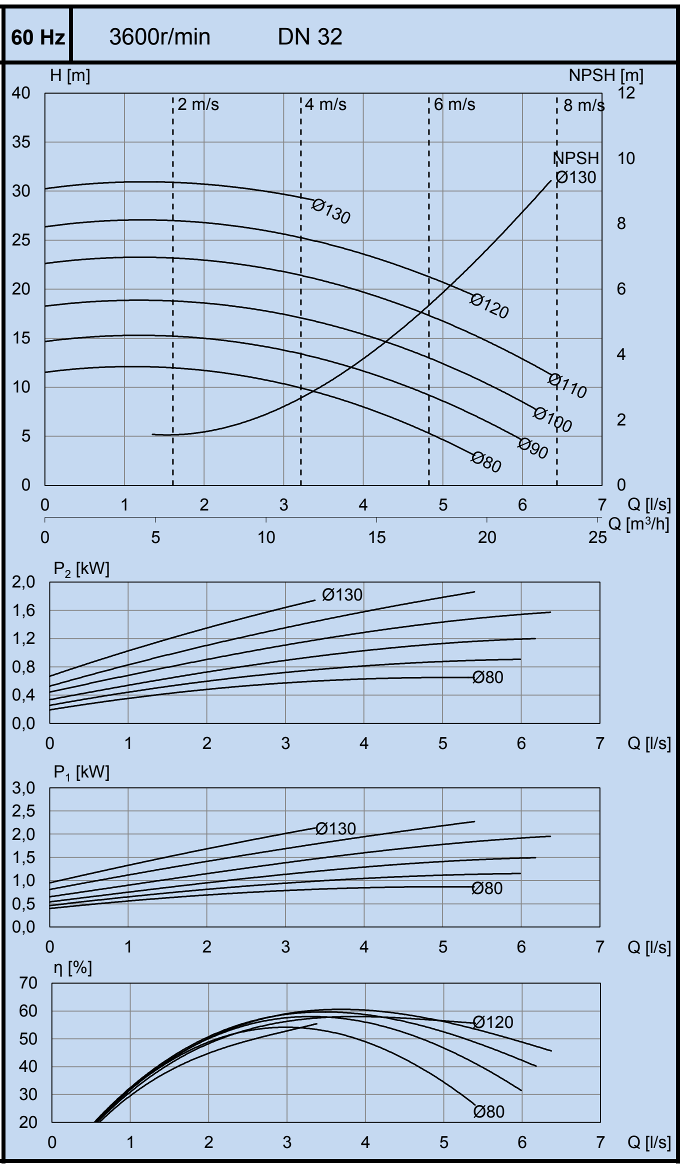


ALS-1032/2



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-871 N13	1,1	2,55	27	295
	KH-101 C1 N13	1,5	2,95	39	335
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-871 N13	1,1 (1,3)	2,35 (2,50)	27	295
	KH-101 C1 N13	1,5 (1,8)	2,98 (3,02)	39	335





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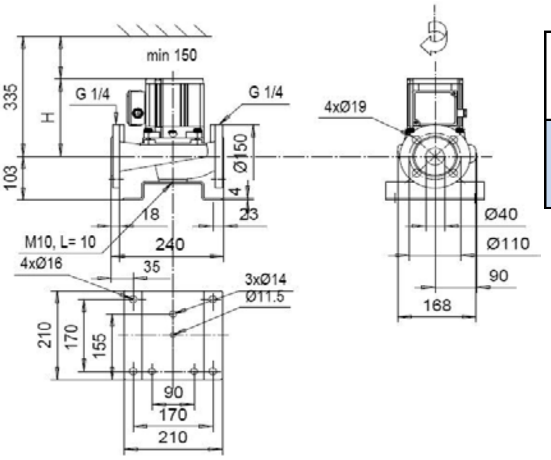
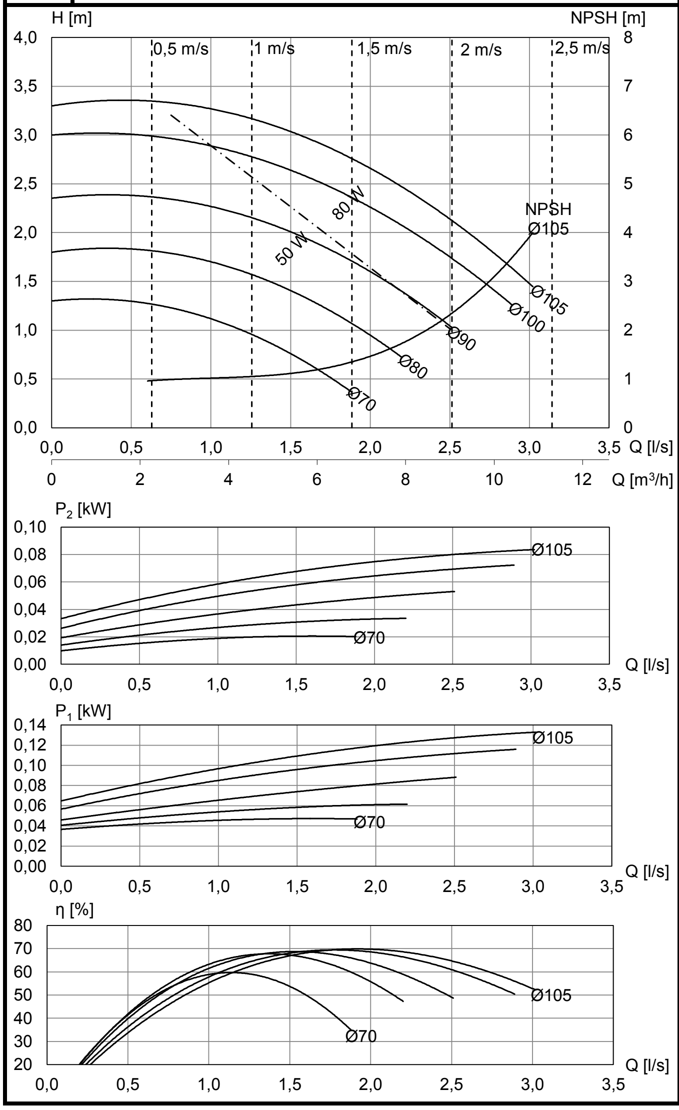
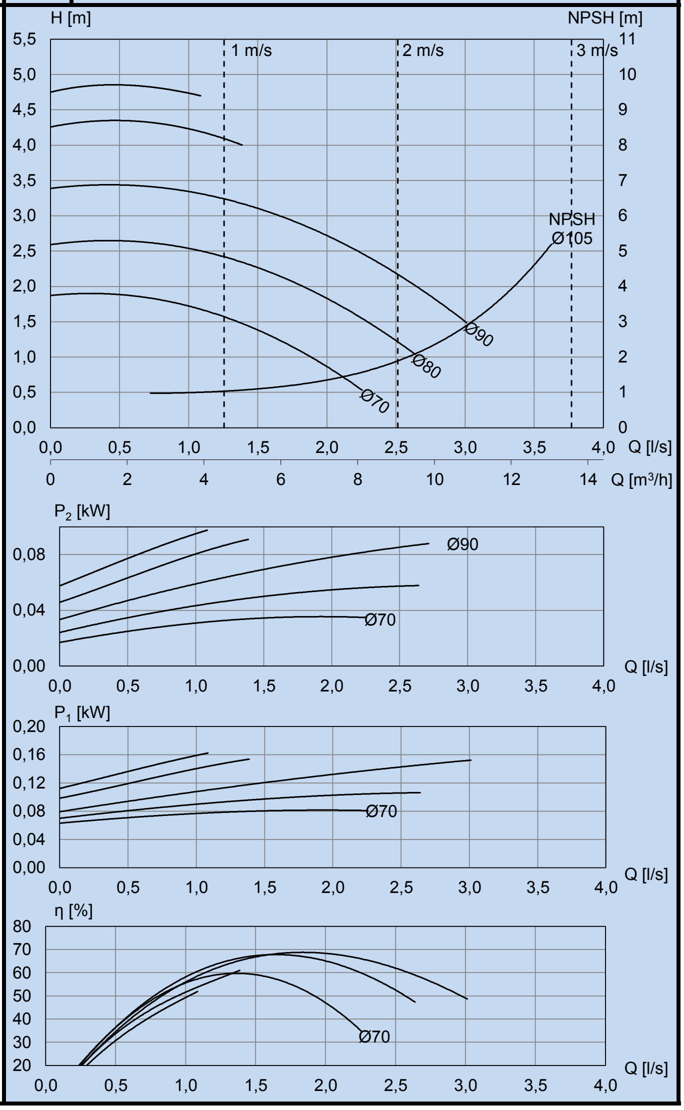


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-732 B N12	0,05	0,21	17	185
	OP-742 N12	0,08	0,28	18	185
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	17	185
	OP-742 N12	0,08 (0,09)	0,28 (0,28)	18	185

4

50 Hz	1500r/min	DN 40	60 Hz	1800r/min	DN 40





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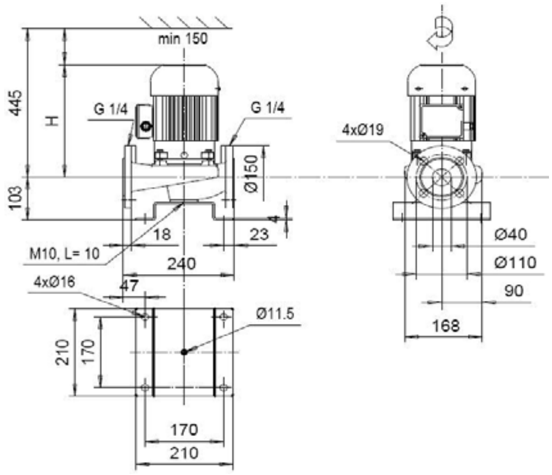
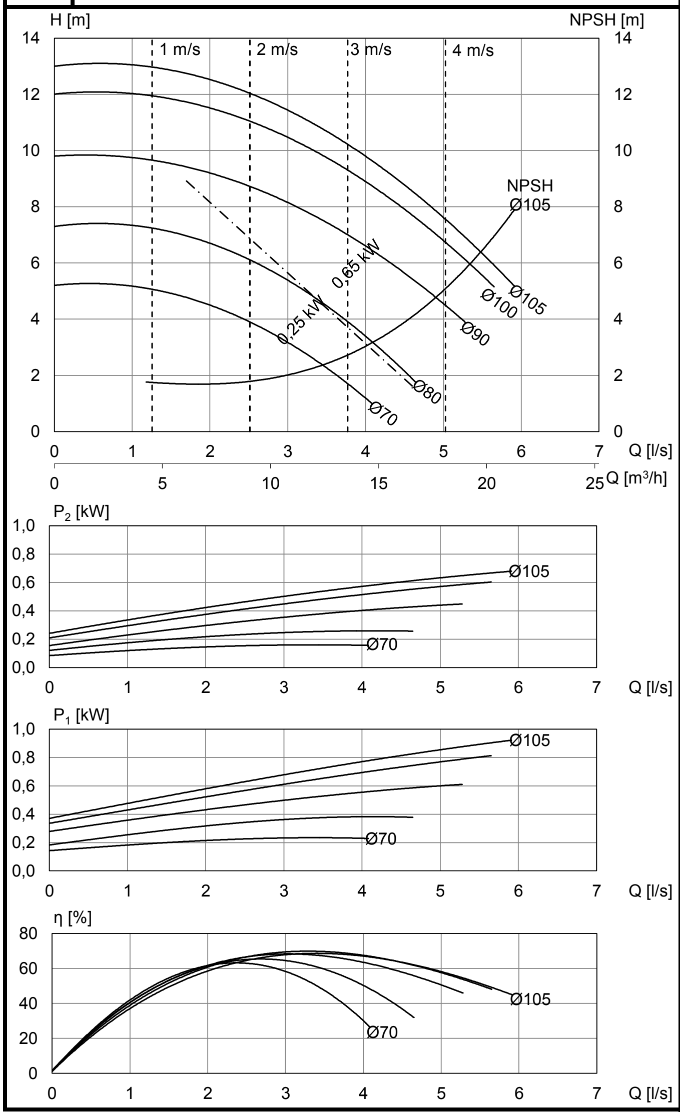
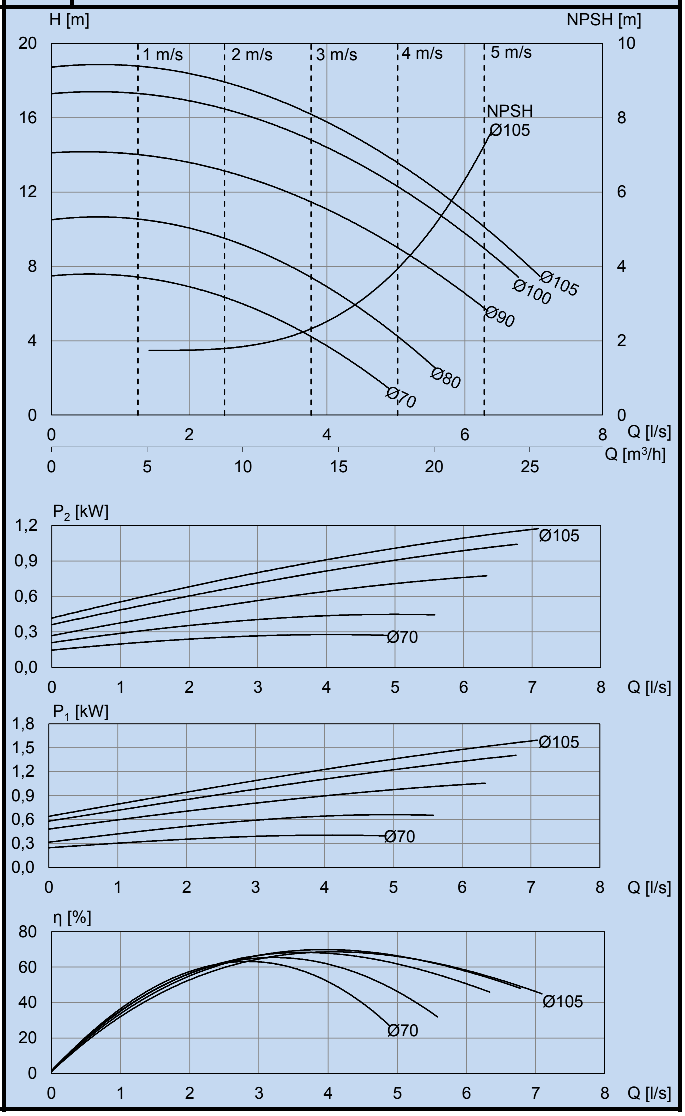


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-741 N12	0,25	0,7	18	225
50Hz	OKN-841 D N12	0,65	1,75	22	275
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OP-741 N12	0,25 (0,3)	0,7 (0,7)	18	225
60Hz	OKN-841 D N12	0,65 (0,75)	1,6 (1,6)	22	275
60Hz	KH-871 N12	1,1 (1,3)	2,4 (2,5)	24	295

50 Hz 3000r/min DN 40



60 Hz 3600r/min DN 40



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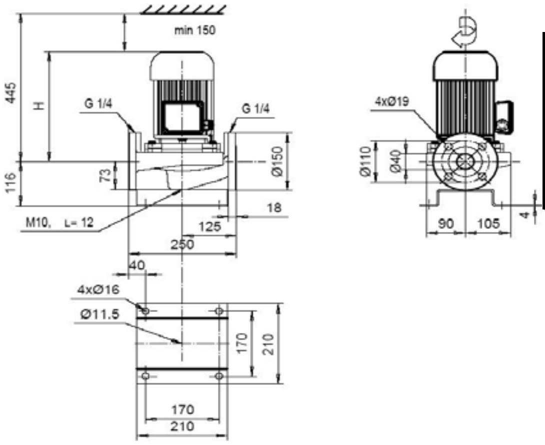
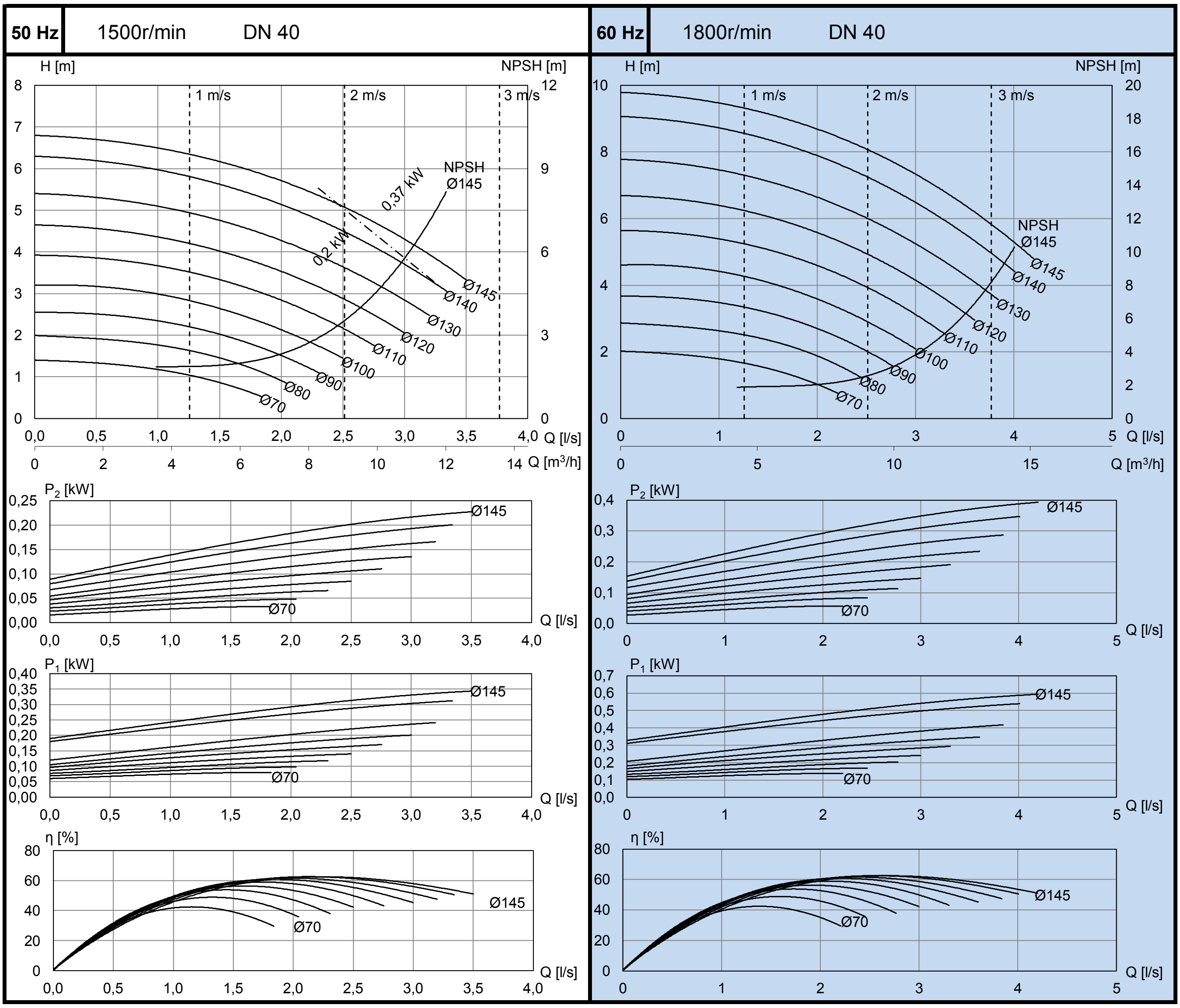
L-40A/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-752 N13	0,2	0,65	21	240
	OKN-862L D N13	0,37	1,15	25	295
60Hz	**Motor 380-400V(460-480V)**	P_{2N} **[kW]**	I_N **[A]**	**[kg]**	**H [mm]**
	OP-752 N13	0,2 (0,24)	0,65 (0,65)	21	240
	OKN-862L D N13	0,37 (0,44)	1,15 (1,15)	25	295

4



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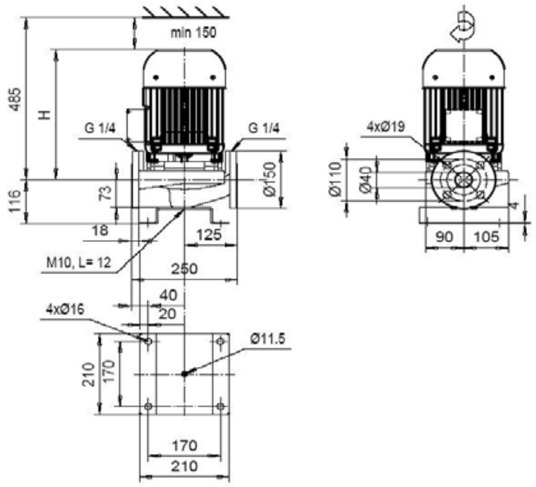
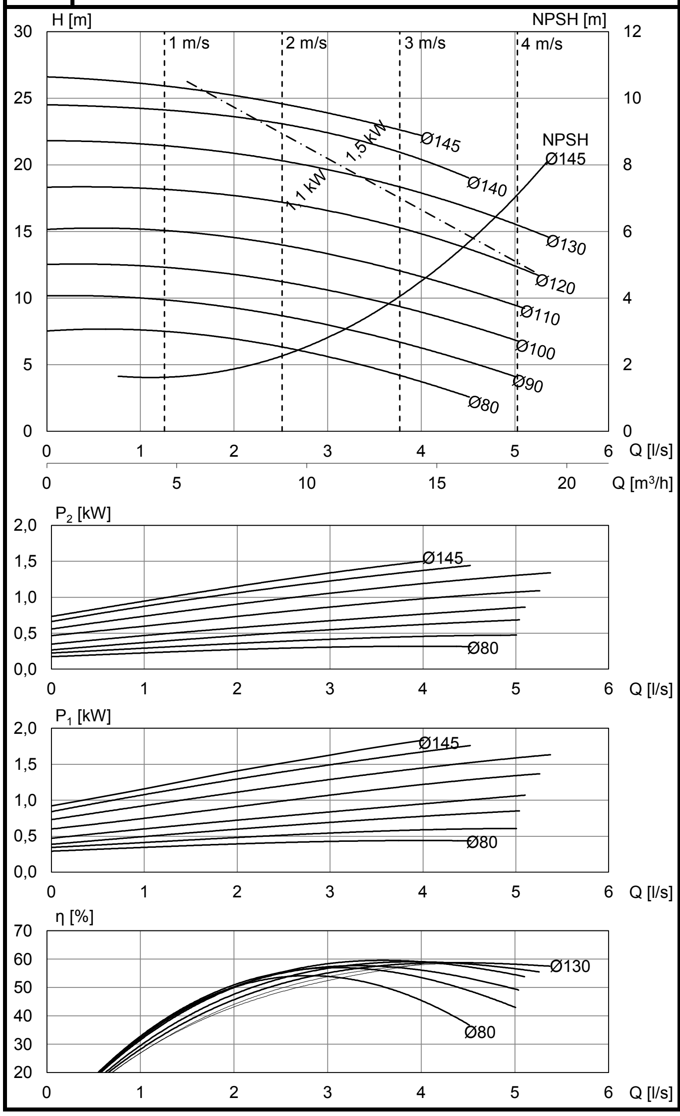
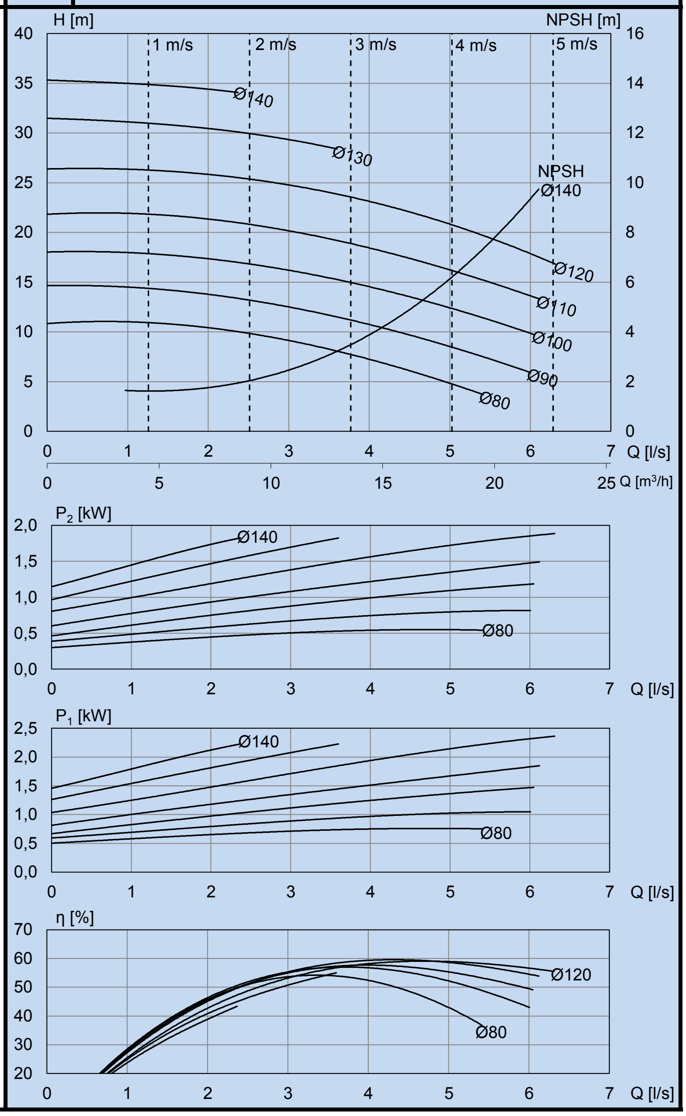
L-40A/2



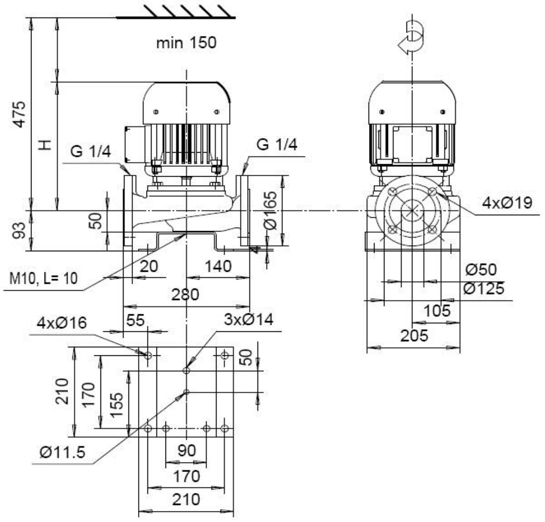
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-871 N13	1,1	2,55	26	295
	KH-101 C1 N13	1,5	2,95	37	335
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-871 N13	1,1 (1,3)	2,35 (2,50)	26	295
	KH-101 C1 N13	1,5 (1,8)	2,98 (3,02)	37	335

50 Hz	3000r/min	DN 40	60 Hz	3600r/min	DN 40

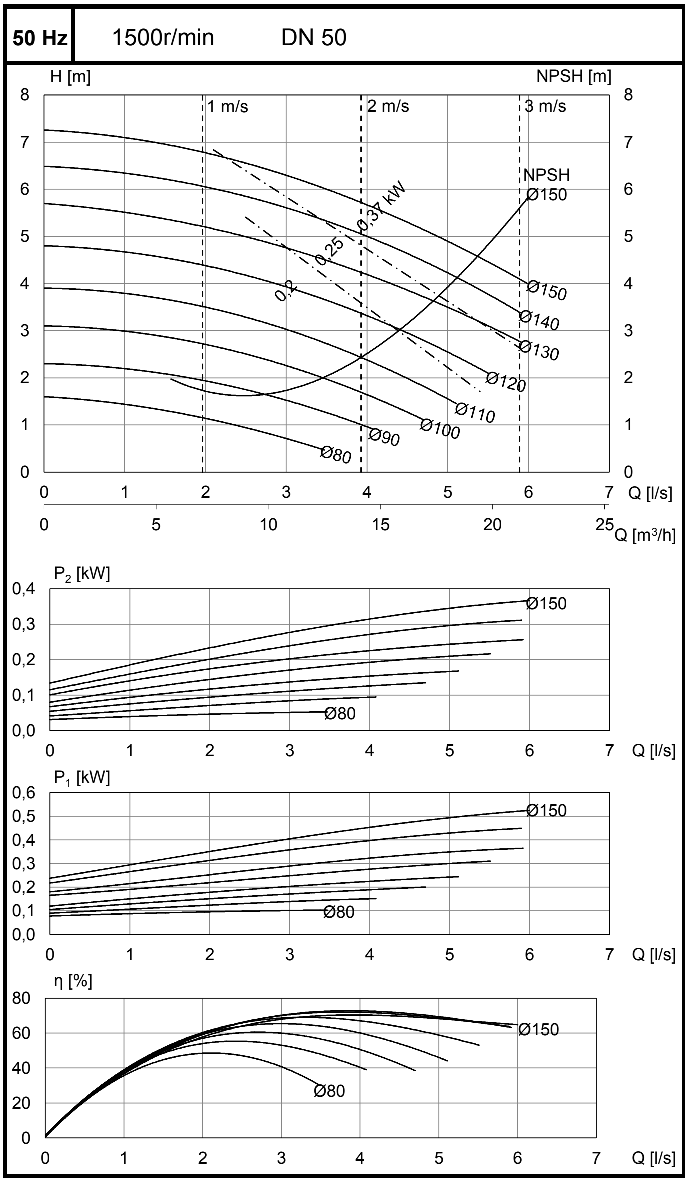


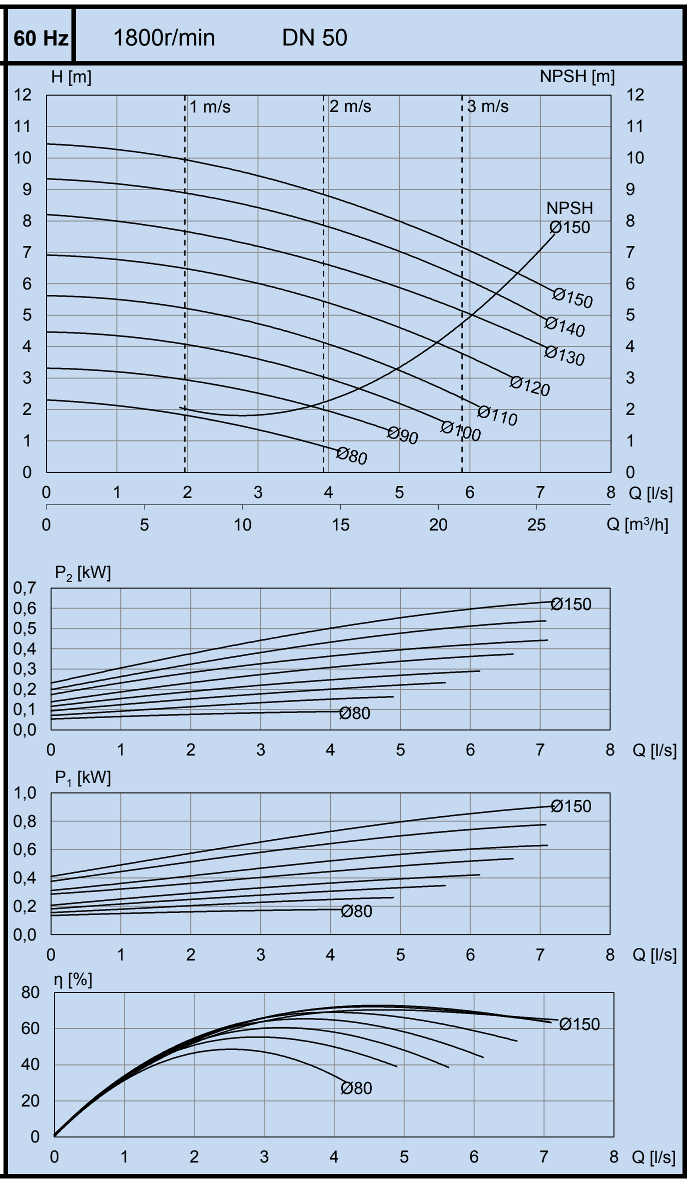


L-50A/4 **LP-50A/4**



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OP-752 F15	0,2	0,65	23	250
	OP-762 F15	0,25	0,82	24	250
	OKN-862 D F15	0,37	1,15	27	280
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	OP-752 F15	0,2 (0,24)	0,65 (0,65)	23	250
	OP-762 F15	0,25 (0,3)	0,82 (0,82)	24	250
	OKN-862 D F15	0,37 (0,44)	1,15 (1,15)	27	280
	KH-100 A2 F15	0,55 (0,66)	1,28 (1,30)	35	325





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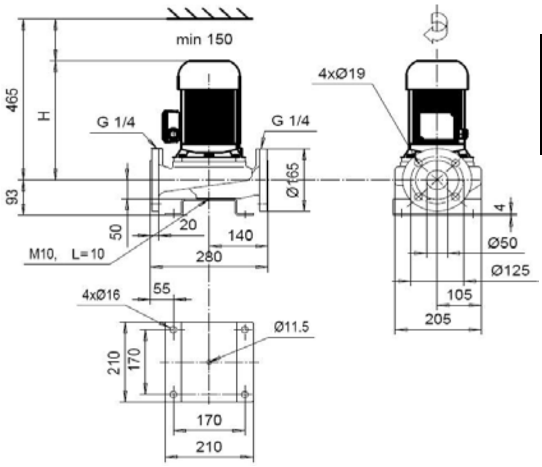
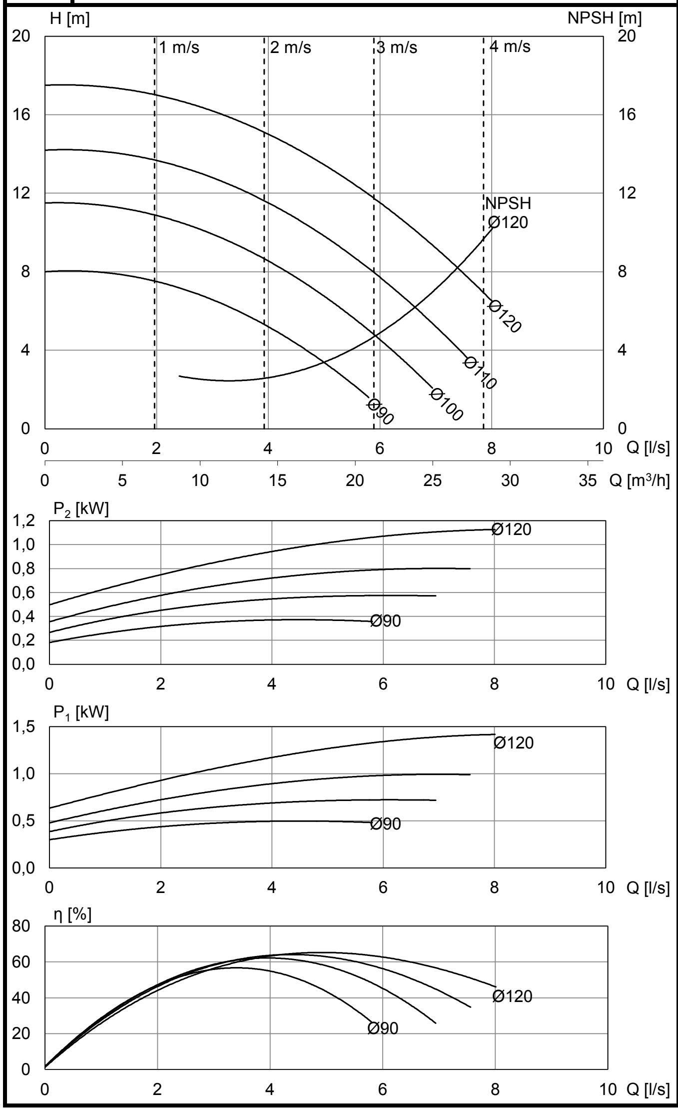
L-50B/2 | LH-50B/2 | LP-50B/2

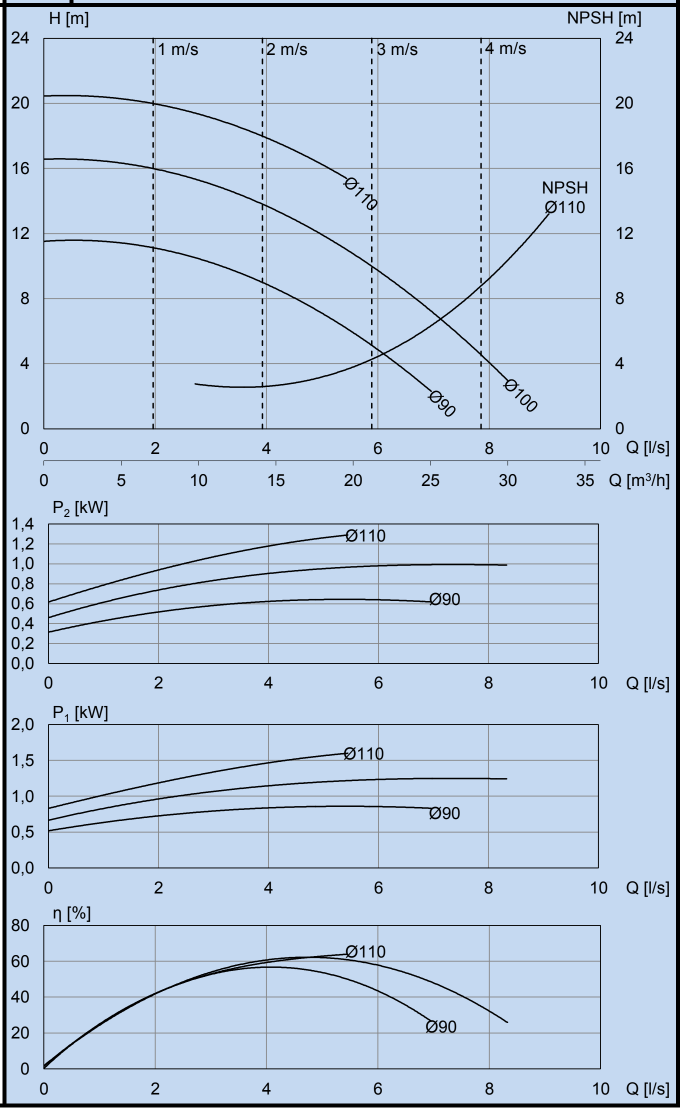


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-871 F15	1,1	2,55	30	315
	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-871 F15	1,1 (1,3)	2,35 (2,50)	30	315

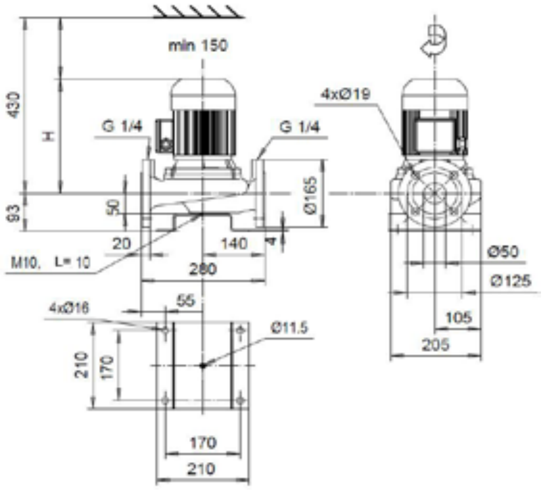
50 Hz 3000r/min DN 50



60 Hz 3600r/min DN 50

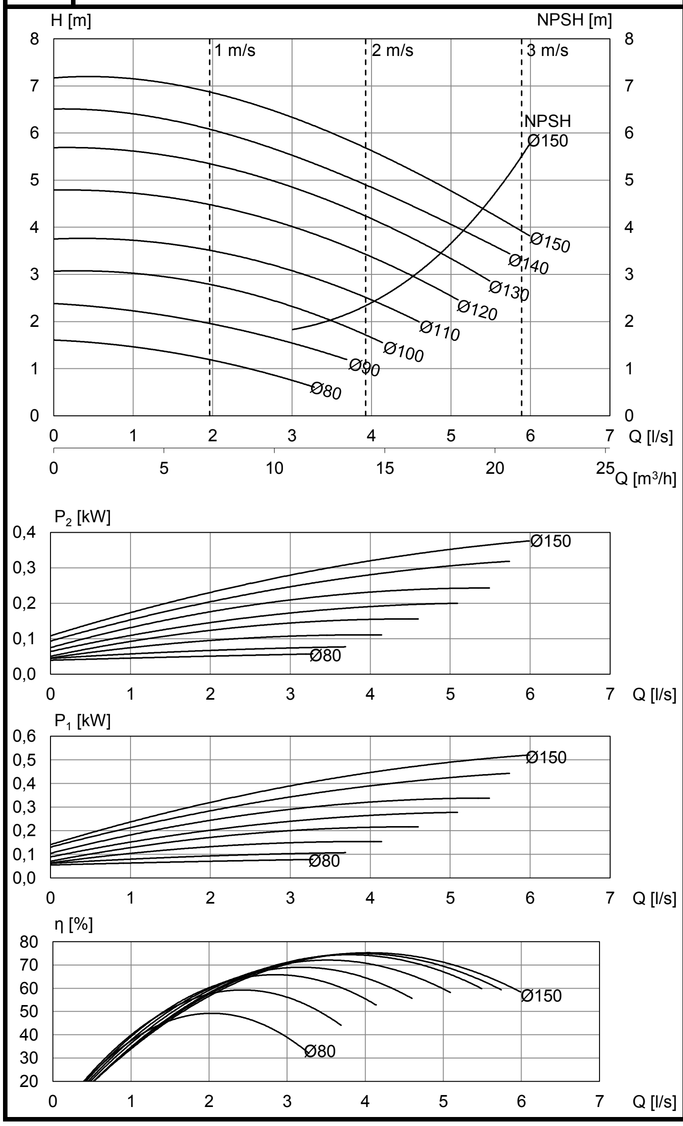


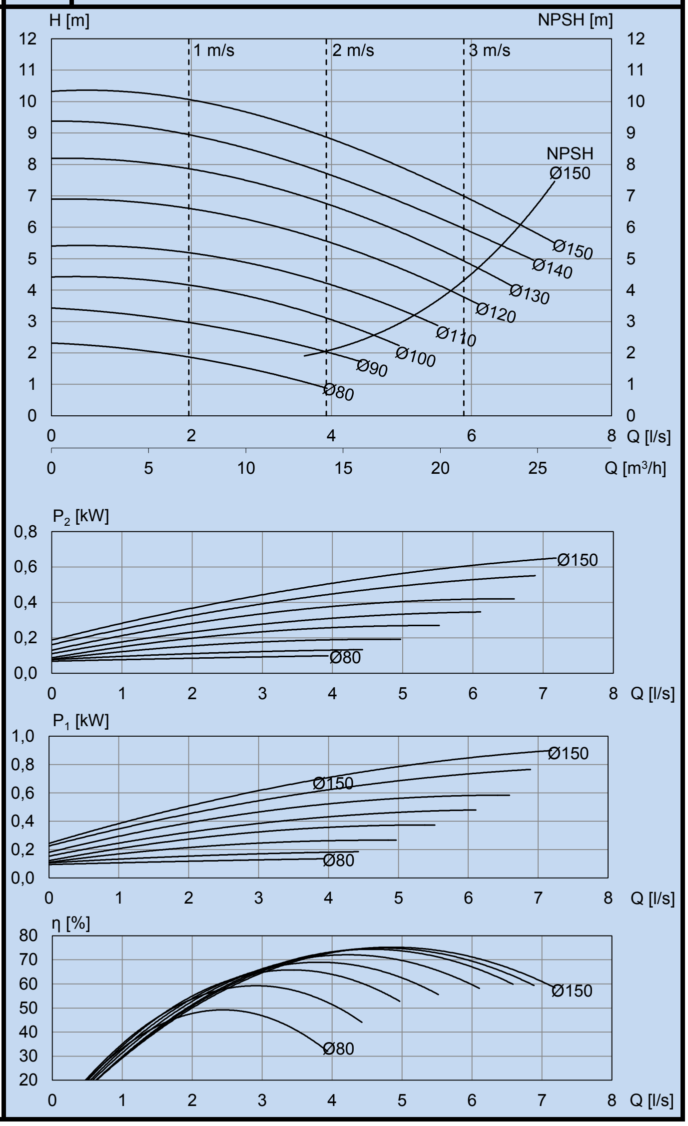
L-50D/4 | LH-50D/4 | LP-50D/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50HZ	OKN-862L D F16	0,37	1,15	30	280
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60HZ	OKN-862L D F16	0,37 (0,44)	1,15 (1,15)	30	280
	KH-100 A2 F15	0,55 (0,66)	1,28 (1,30)	35	325

50 Hz	1500r/min	DN 50	60 Hz	1800r/min	DN 50





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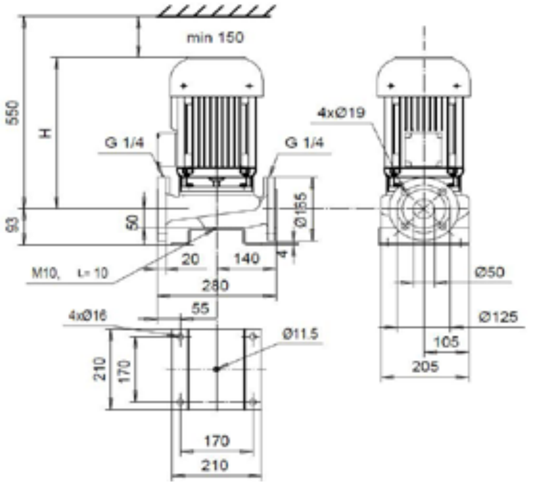
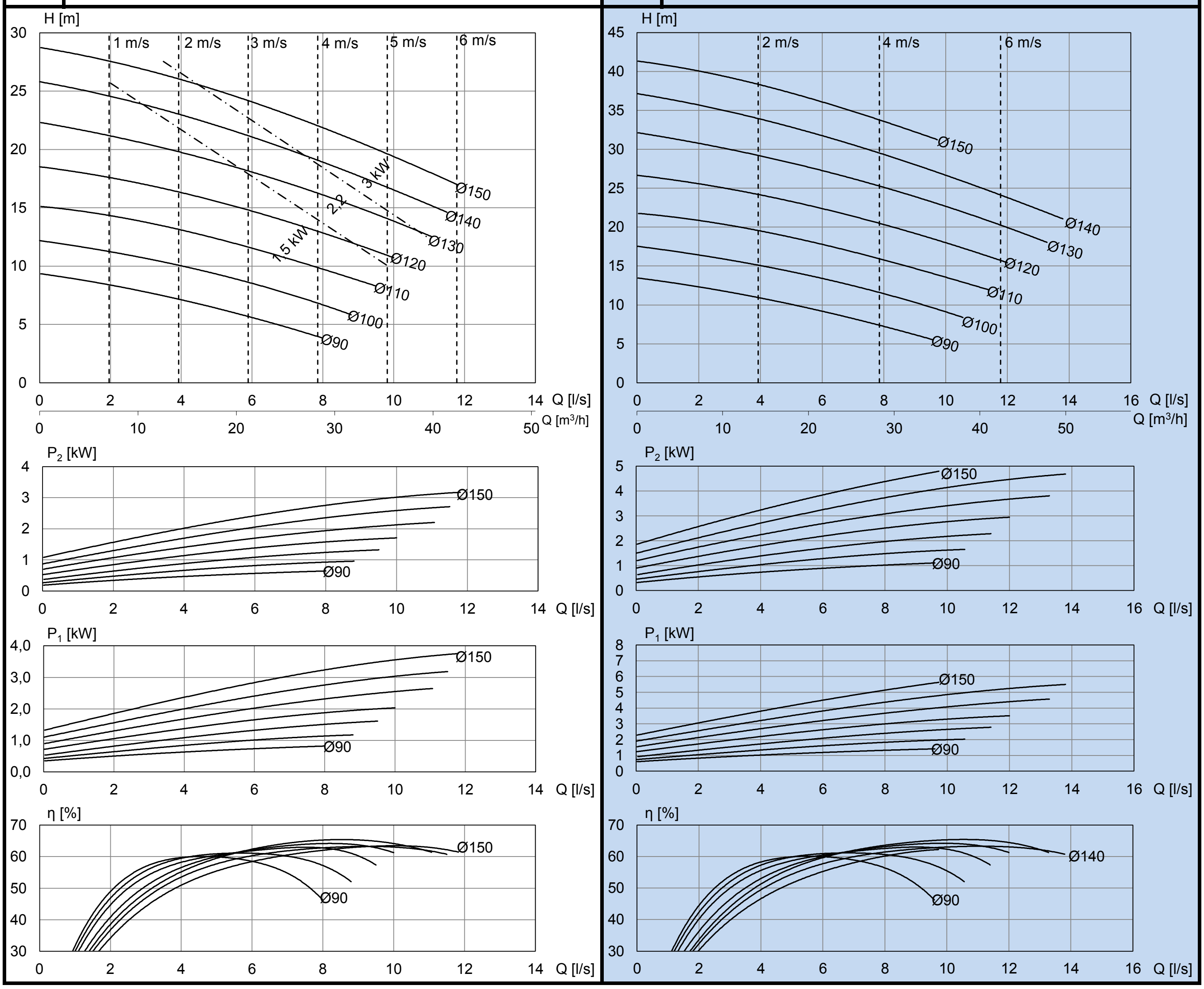
L-50D/2 | LH-50D/2 | LP-50D/2

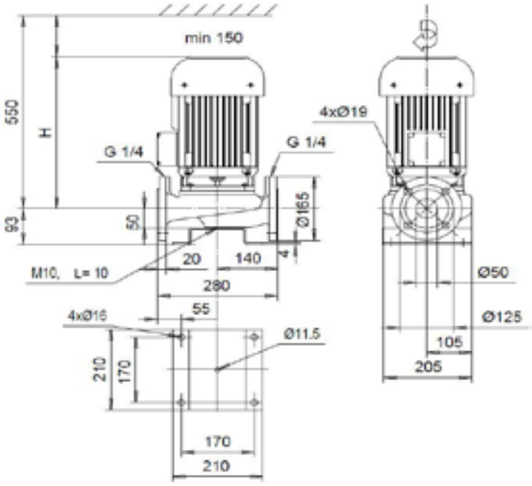


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 C1 F16	1,5	2,95	40	355
	KH-101 D1 F16	2,2	4,28	43	355
	KH-112 C1 F16	3	6,05	49	400
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-101 C1 F16	1,5 (1,8)	2,98 (3,02)	40	355
	KH-101 D1 F16	2,2 (2,6)	4,35 (4,33)	43	355
	KH-112 C1 F16	3 (3,6)	6,0 (6,05)	49	400
	KH-112 E1 F16	4 (4,8)	7,9 (8,0)	54	400

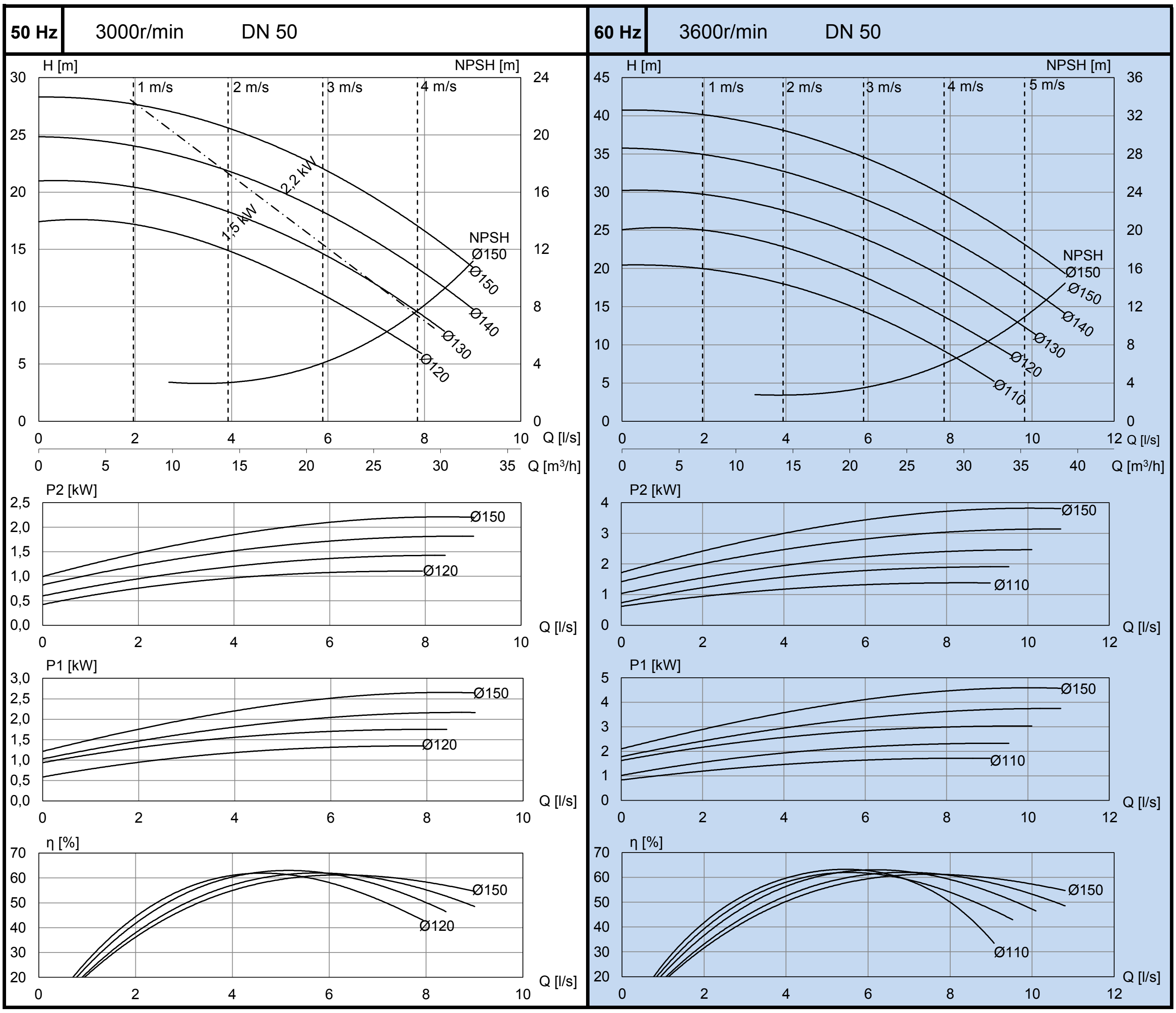
50 Hz	3000r/min DN 50	60 Hz	3600r/min DN 50



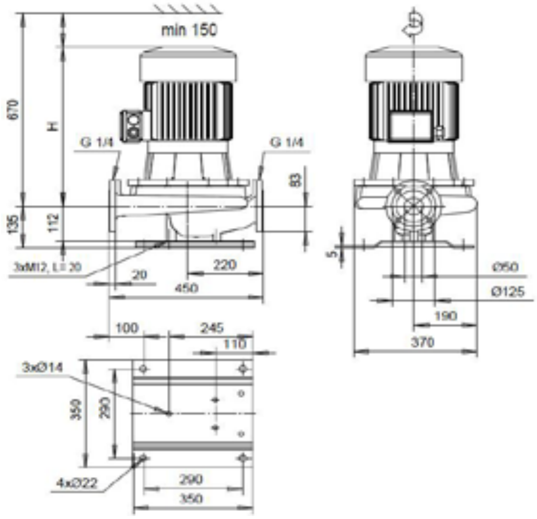
L-50C/2 | LH-50C/2 | LP-50C/2



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 C1 F16	1,5	2,95	40	355
	KH-101 D1 F16	2,2	4,28	43	355
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C1 F16	1,5 (1,8)	2,98 (3,02)	40	355
	KH-101 D1 F16	2,2 (2,6)	4,35 (4,33)	43	355
	KH-112 C1 F16	3 (3,6)	6,00 (6,05)	49	400
	KH-112 E1 F16	4 (4,8)	7,9 (8,0)	54	400



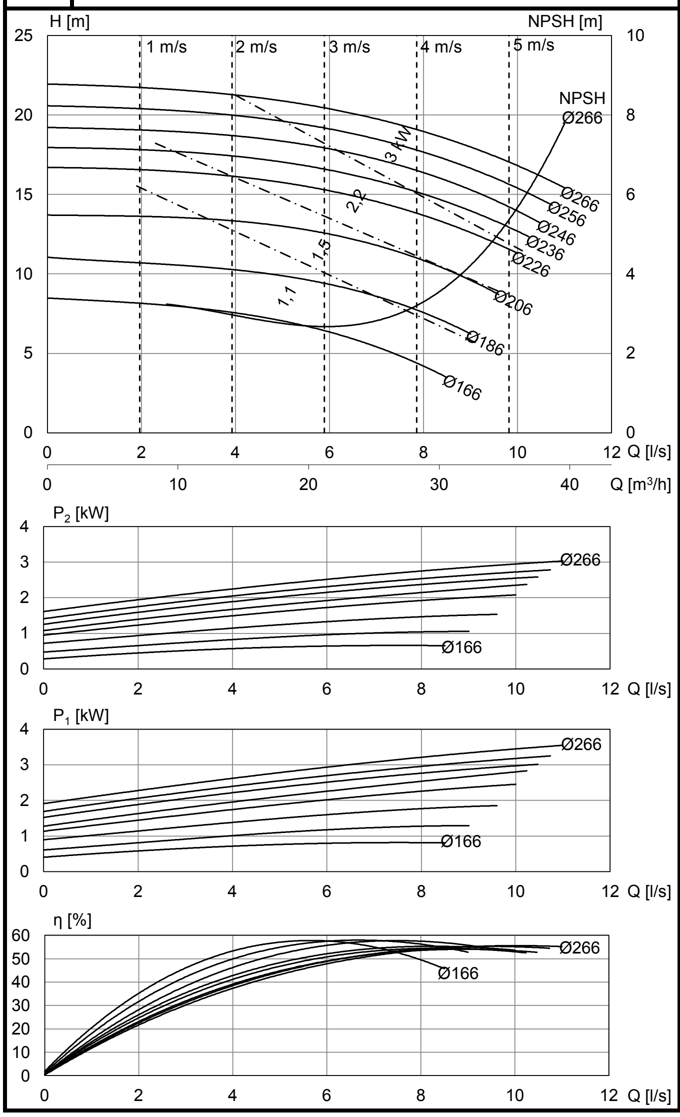
L-50S/4 | LH-50S/4



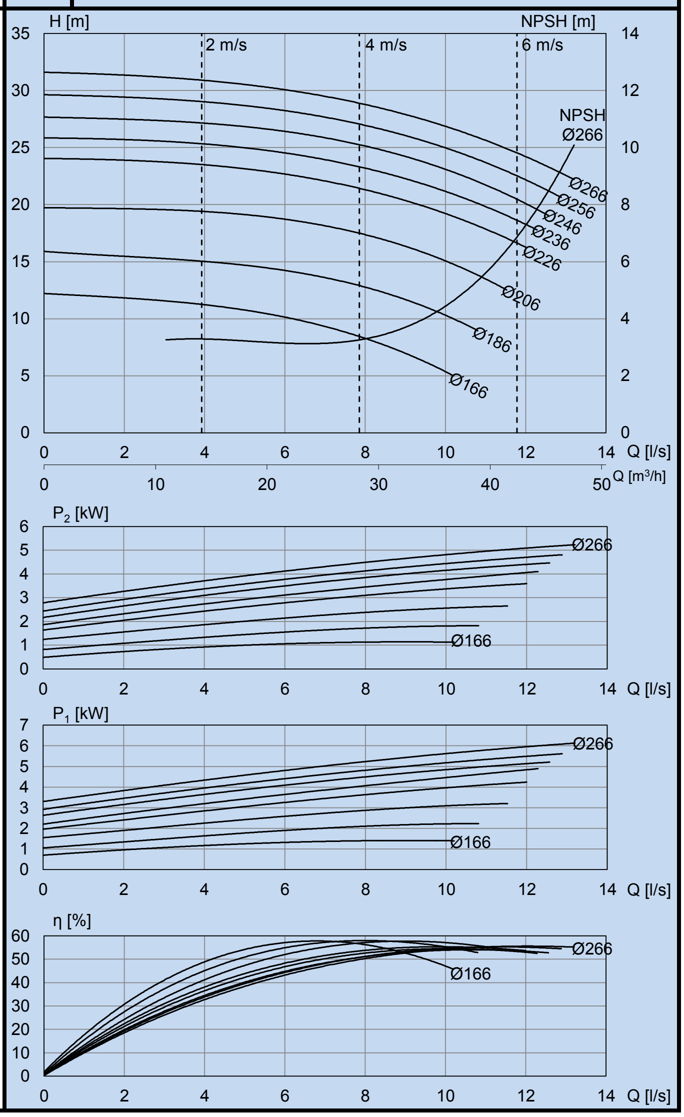
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 C2 F29	1,1	2,44	85	430
	KH-101 D2 F29	1,5	3,27	88	430
	KH-112 C2 F29	2,2	4,60	93	475
	KH-112 E2 F29	3	6,25	98	475
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-101 C2 F29	1,1 (1,3)	2,43 (2,43)	85	430
	KH-101 D2 F29	1,5 (1,8)	3,23 (3,32)	88	430
	KH-112 C2 F29	2,2 (2,6)	4,55 (4,60)	93	475
	KH-112 E2 F29	3 (3,6)	6,15 (6,25)	98	475
	KH-132 C2 F29	4 (4,8)	8,17 (8,30)	125	520
	KH-132 E2 F29	5,5 (6,6)	11,00 (11,15)	130	520

4

50 Hz 1500r/min DN 50



60 Hz 1800r/min DN 50



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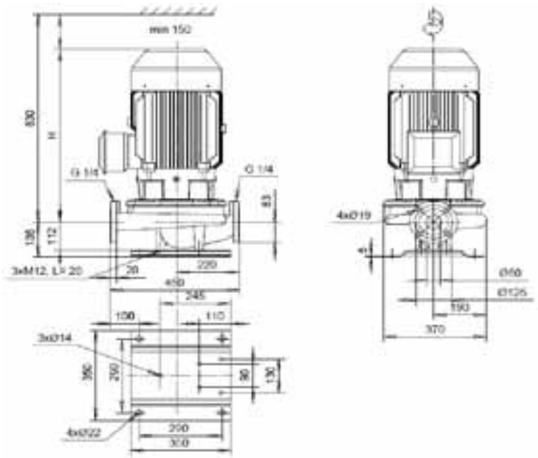
L-50S/2 | **LH-50S/2**



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C1 F29	5,5	10,20	125	520
	KH-132 E1 F29	7,5	13,75	135	520
	KZ-165 E1 F29	11	20,20	185	680
	KZ-165 F1 F29	15	26,95	190	680
	KZ-165A H1 F29	18,5	32,60	195	680
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-132 C1 F29	5,5 (6,6)	10,25 (10,40)	125	520
	KH-132 E1 F29	7,5 (9)	13,80 (14,05)	135	520
	KZ-165 E1 F29	11 (13)	20,60 (20,30)	185	680
	KZ-165 F1 F29	15 (18)	28,05 (27,90)	190	680
	KZ-165A H1 F29	18,5 (22)	33,90 (33,60)	195	680

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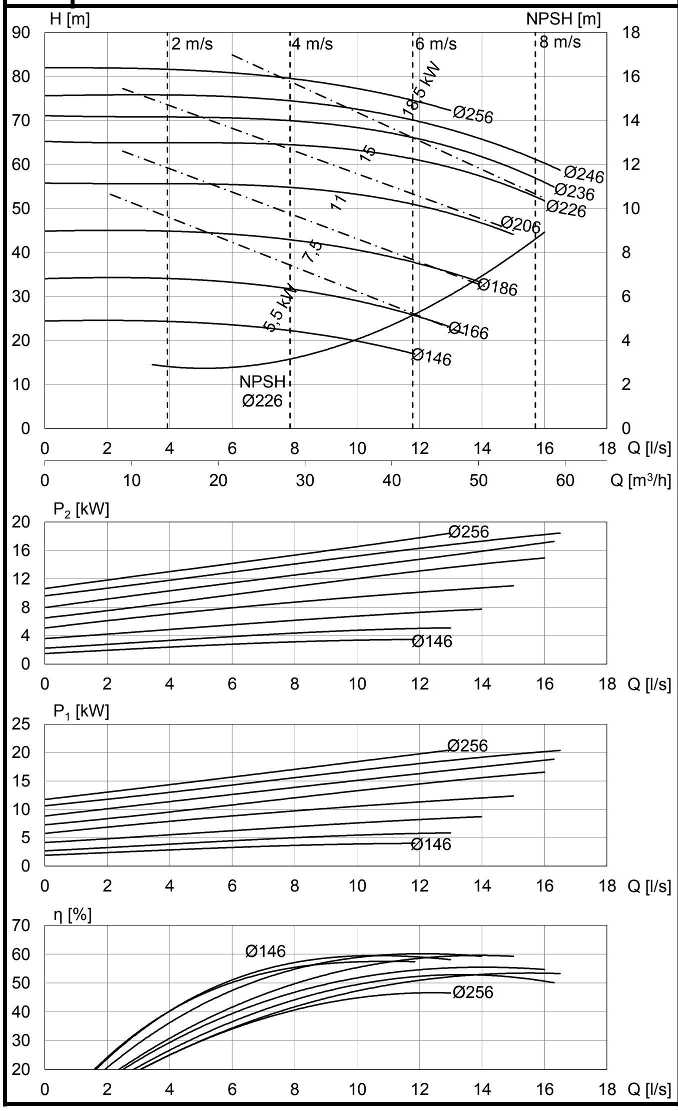
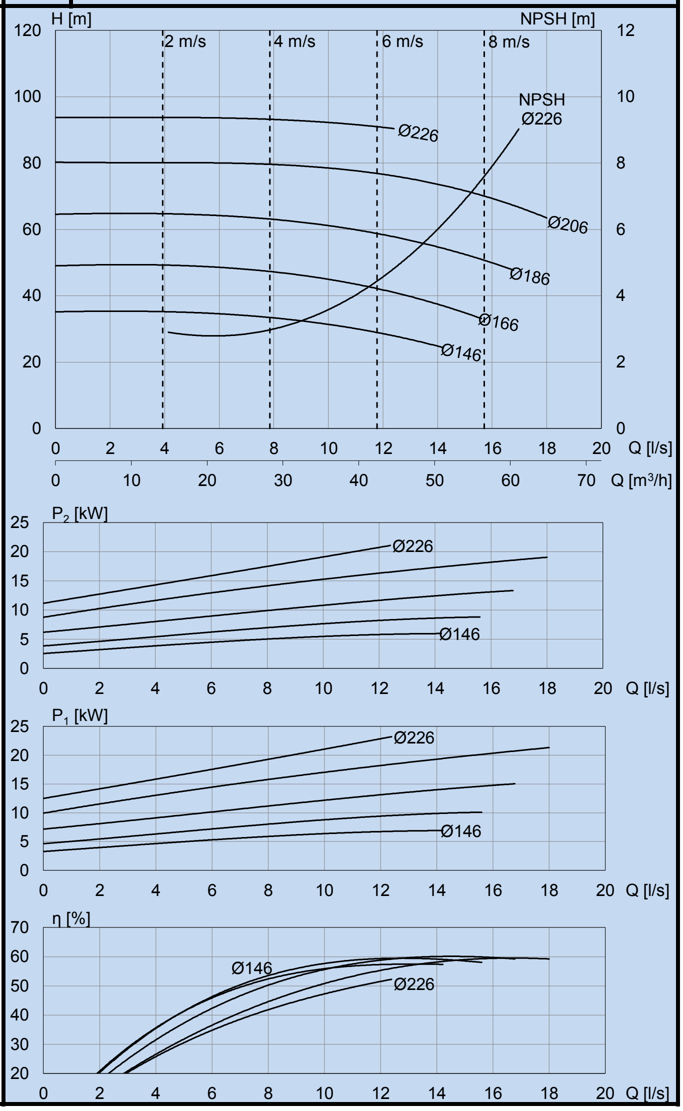
50 Hz	3000r/min	DN 50	60 Hz	3600r/min	DN 50





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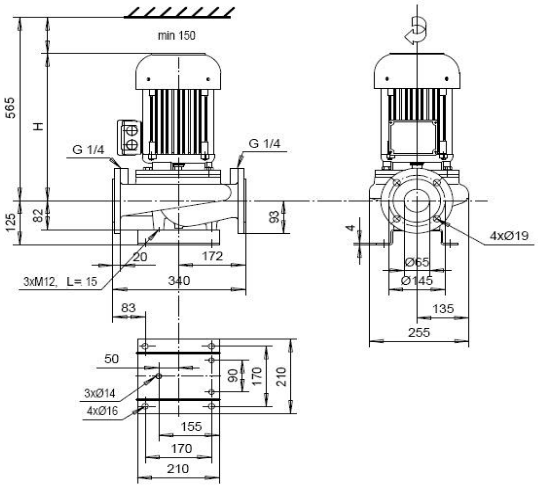
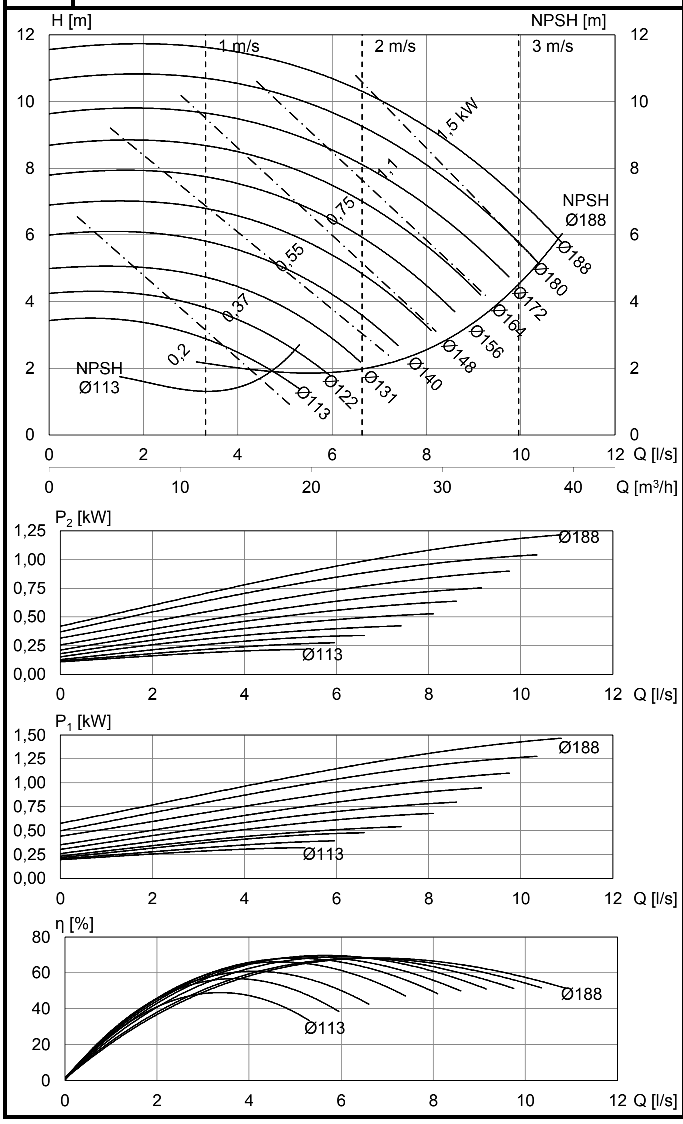
L-65A/4 | LH-65A/4

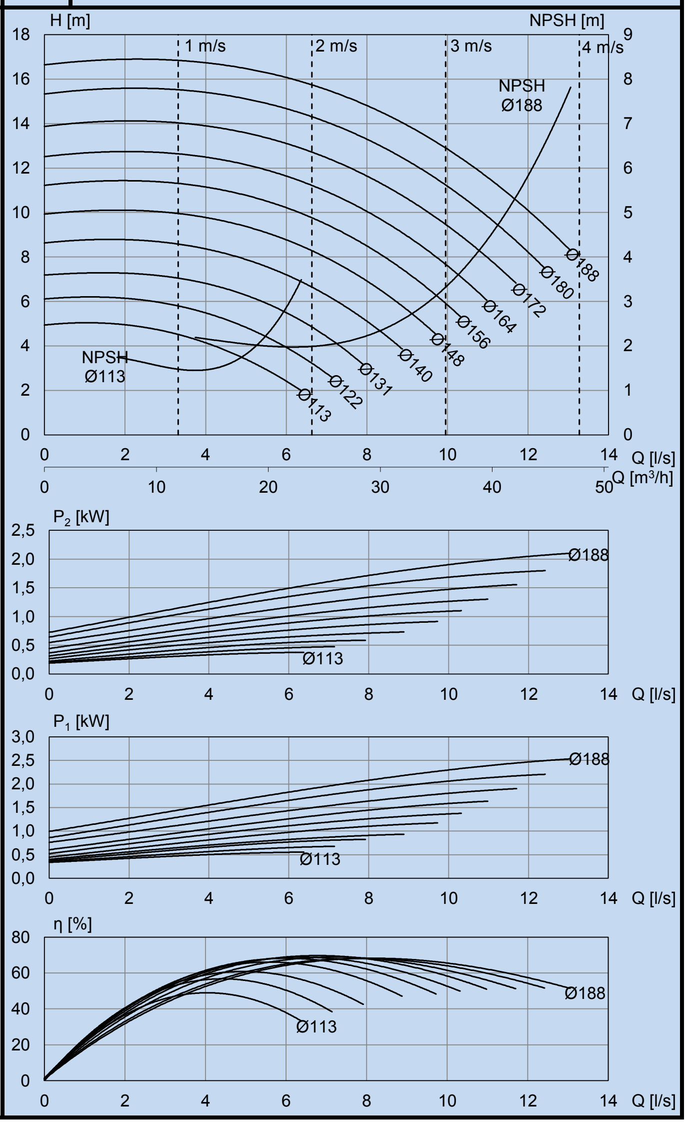


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OKN-852 D F19	0,2	0,75	37	310
	OKN-852 D F19	0,37	1	37	310
	KH-100 A2 F19	0,55	1,27	45	320
	KH-100 B2 F19	0,75	1,74	45	320
	KH-101 C2 F19	1,1	2,44	50	370
	KH-101 D2 F19	1,5	3,27	52	370
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OKN-852 D F19	0,37 (0,44)	1 (1)	37	310
	KH-100 A2 F19	0,55 (0,66)	1,28 (1,30)	45	320
	KH-100 B2 F19	0,75 (0,9)	1,70 (1,74)	45	320
	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	50	370
	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	52	370
	KH-112 C2 F19	2,2 (2,6)	4,55 (4,60)	58	415
	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	62	415

50 Hz 1500r/min DN 65



60 Hz 1800r/min DN 65



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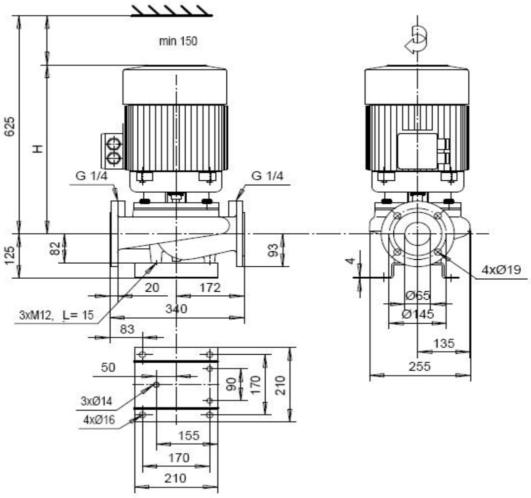
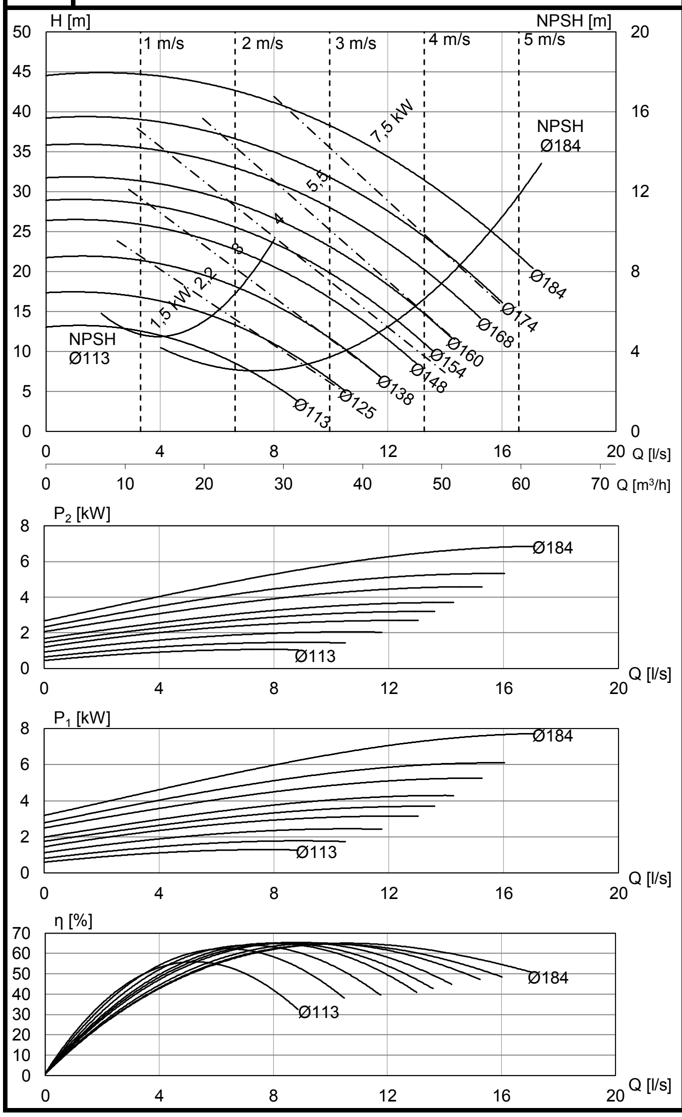
L-65B/2 LH-65B/2 LS-65B/2

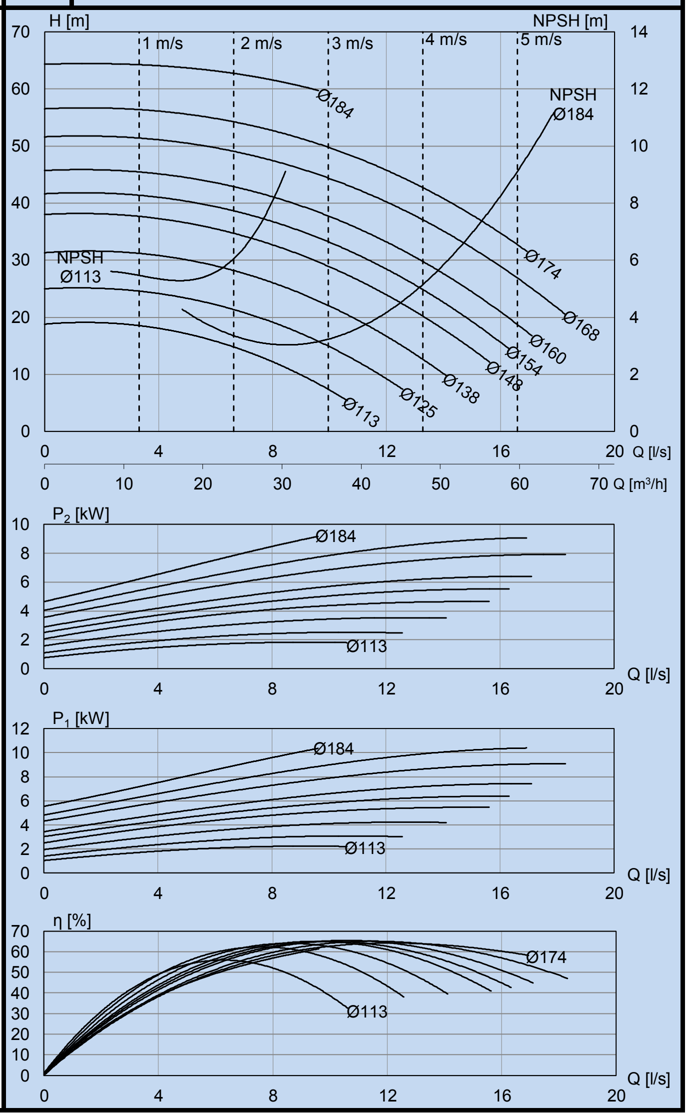


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50HZ	KH-101 C1 F19	1,5	2,95	50	370
	KH-101 D1 F19	2,2	4,28	52	370
	KH-112 C1 F19	3,0	6,05	58	415
	KH-112 E1 F19	4,0	7,95	63	415
	KH-132 C1 F19	5,5	10,20	87	475
	KH-132 E1 F19	7,5	13,75	95	475
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60HZ	KH-101 C1 F19	1,5 (1,8)	2,98 (3,02)	50	370
	KH-101 D1 F19	2,2 (2,6)	4,35 (4,33)	52	370
	KH-112 C1 F19	3 (3,6)	6,00 (6,05)	58	415
	KH-112 E1 F19	4 (4,8)	7,90 (8,00)	63	415
	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	87	475
	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	95	475

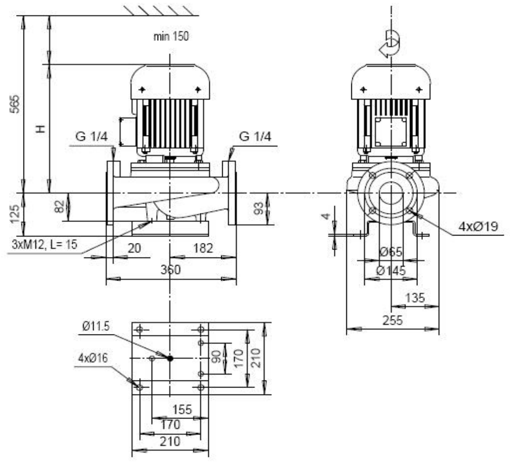
50 Hz 3000r/min DN 65



60 Hz 3600r/min DN 65



ALP-1066/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OKN-852 D F19	0,37	1,0	37	310
50Hz	KH-100 A2 F19	0,55	1,27	44	320
50Hz	KH-100 B2 F19	0,75	1,74	44	320
50Hz	KH-101 C2 F19	1,1	2,44	48	370
50Hz	KH-101 D2 F19	1,5	3,27	52	370
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	OKN-852 D F19	0,37 (0,44)	1 (1)	37	310
60Hz	KH-100 A2 F19	0,55 (0,66)	1,28 (1,3)	44	320
60Hz	KH-100 B2 F19	0,75 (0,9)	1,70 (1,74)	44	320
60Hz	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	48	370
60Hz	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	52	370
60Hz	KH-112 C2 F19	2,2 (2,6)	4,55 (4,6)	58	415
60Hz	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	62	415

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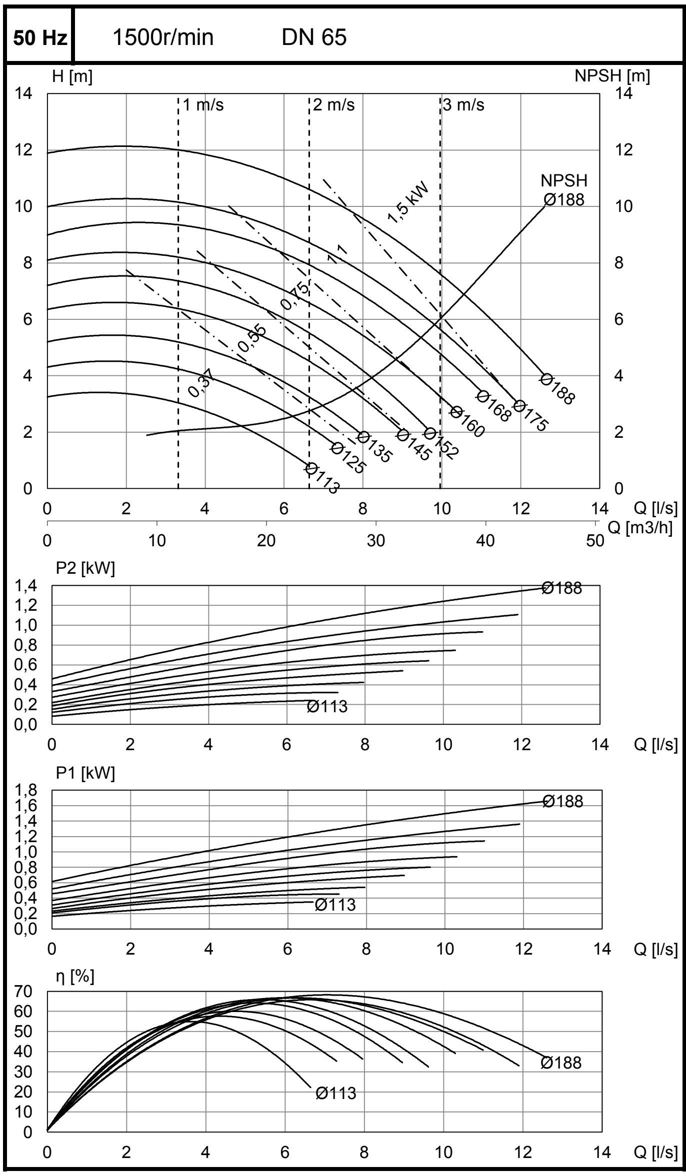
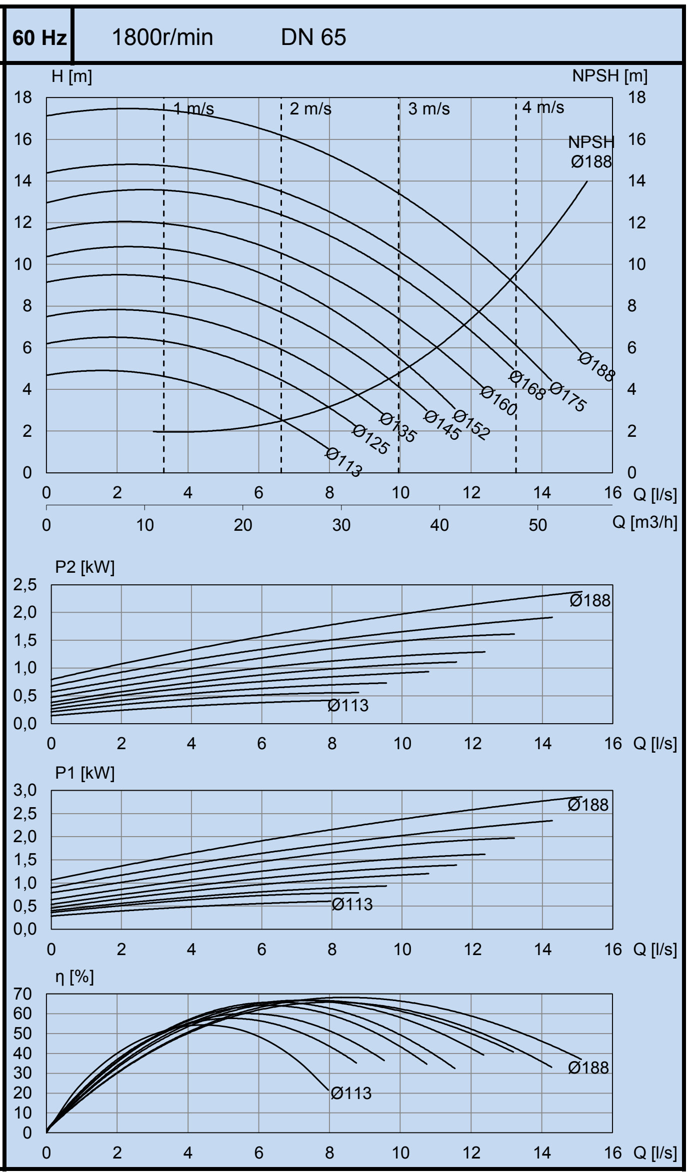
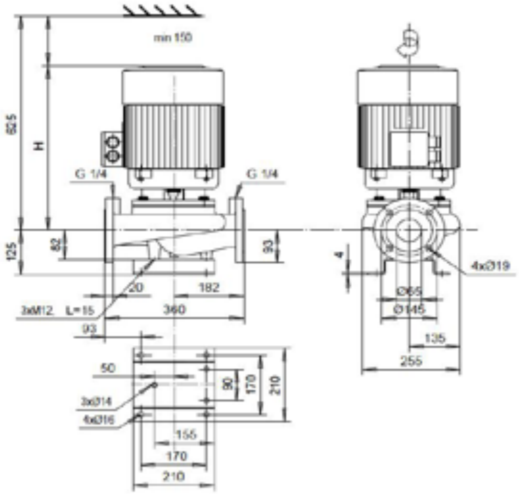


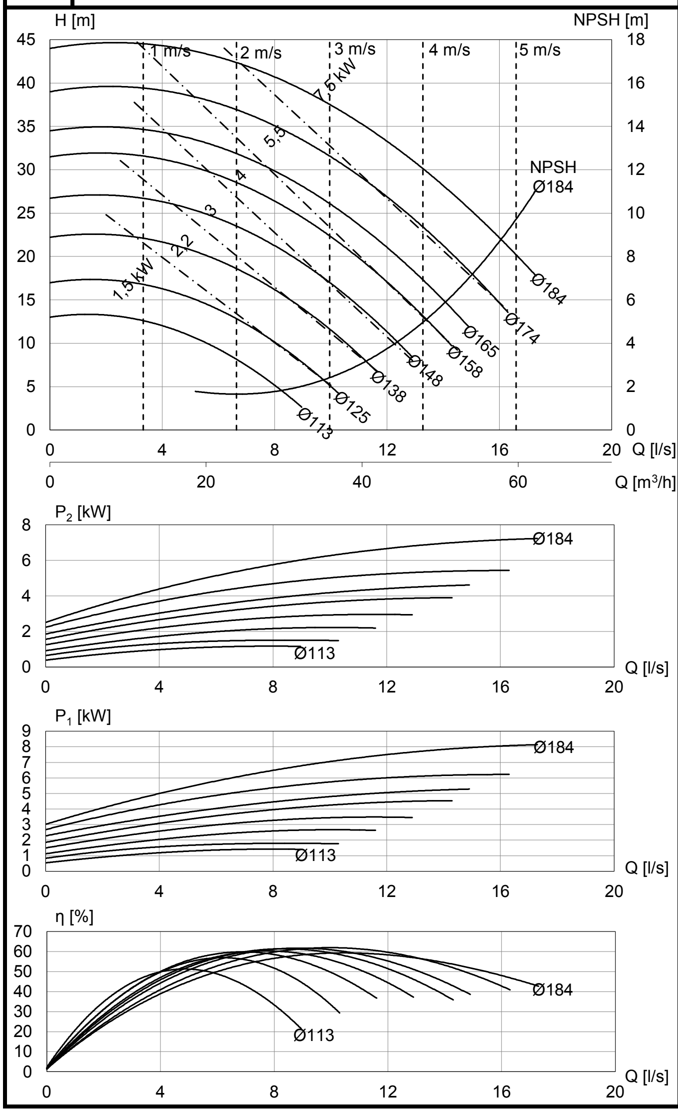


ALP-1065/2

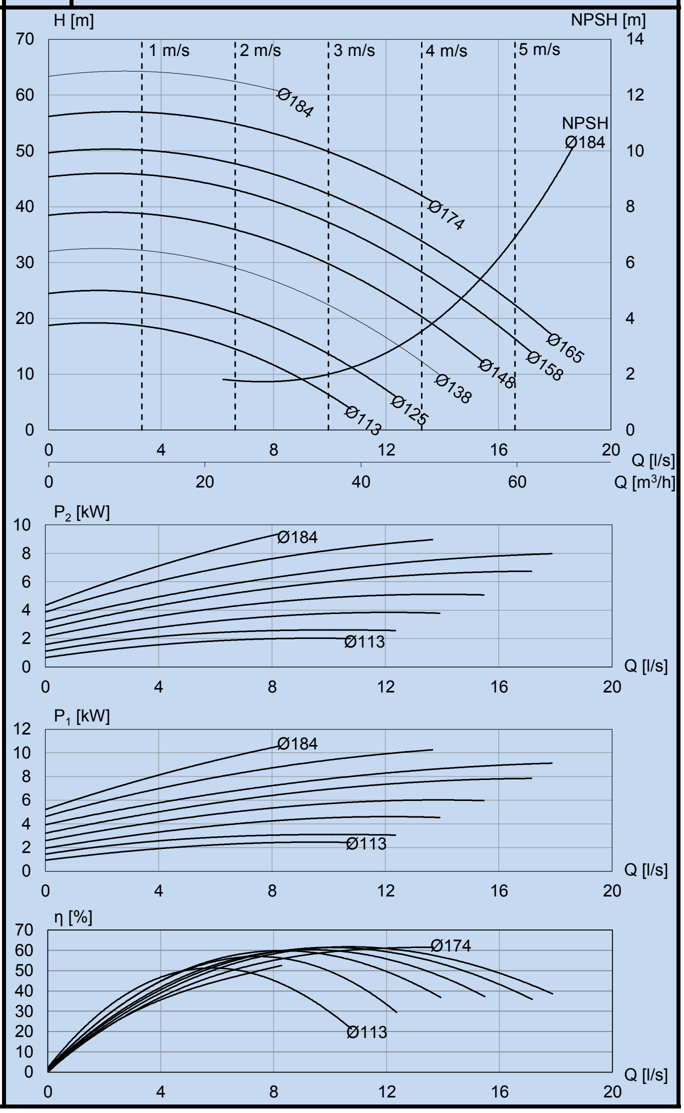


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 C1 F19	1,5	2,95	51	370
	KH-101 D1 F19	2,2	4,28	52	370
	KH-112 C1 F19	3	6,05	58	415
	KH-112 E1 F19	4	7,95	62	415
	KH-132 C1 F19	5,5	10,20	86	475
	KH-132 E1 F19	7,5	13,75	94	475
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 D1 F19	2,2 (2,6)	4,35 (4,33)	52	370
	KH-112 C1 F19	3 (3,6)	6,00 (6,05)	58	415
	KH-112 E1 F19	4 (4,8)	7,90 (8,00)	62	415
	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	86	475
	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	94	475

50 Hz 3000r/min DN 65



60 Hz 3600r/min DN 65



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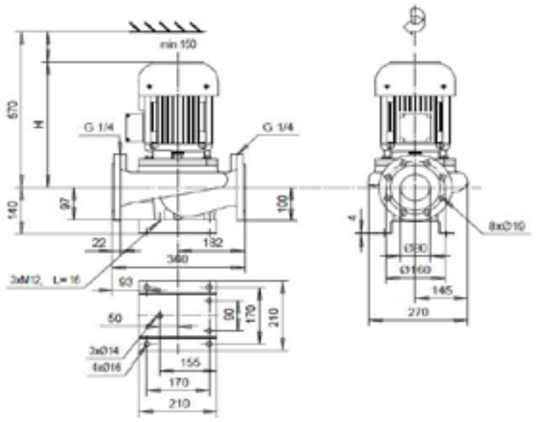
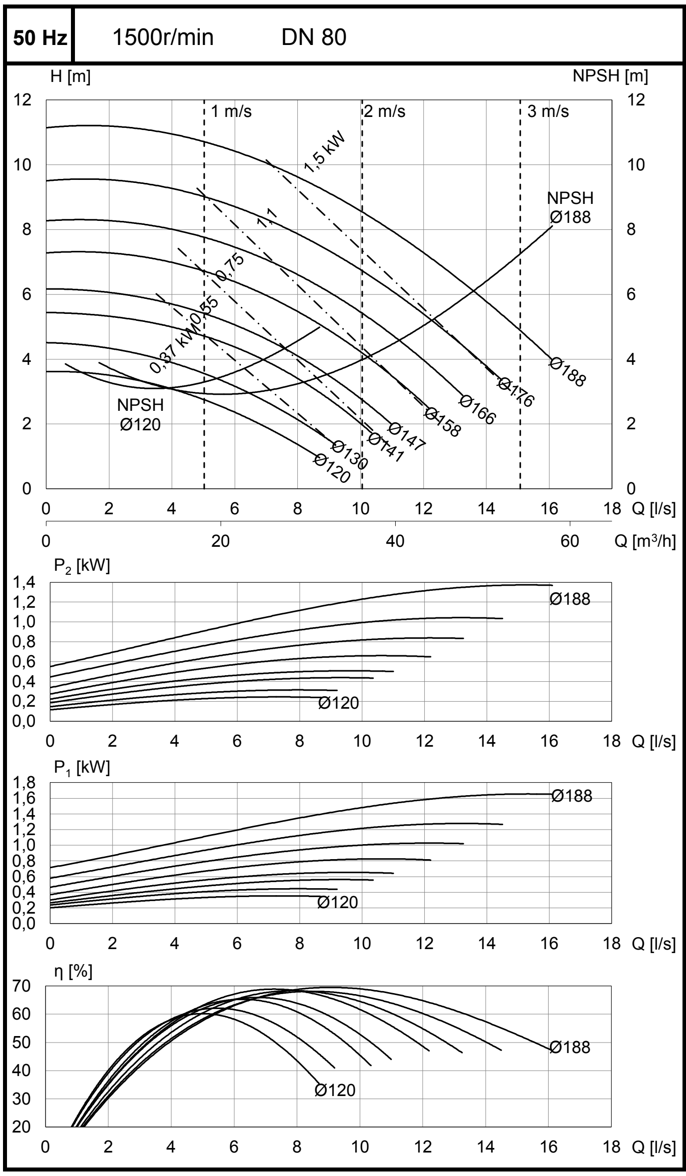
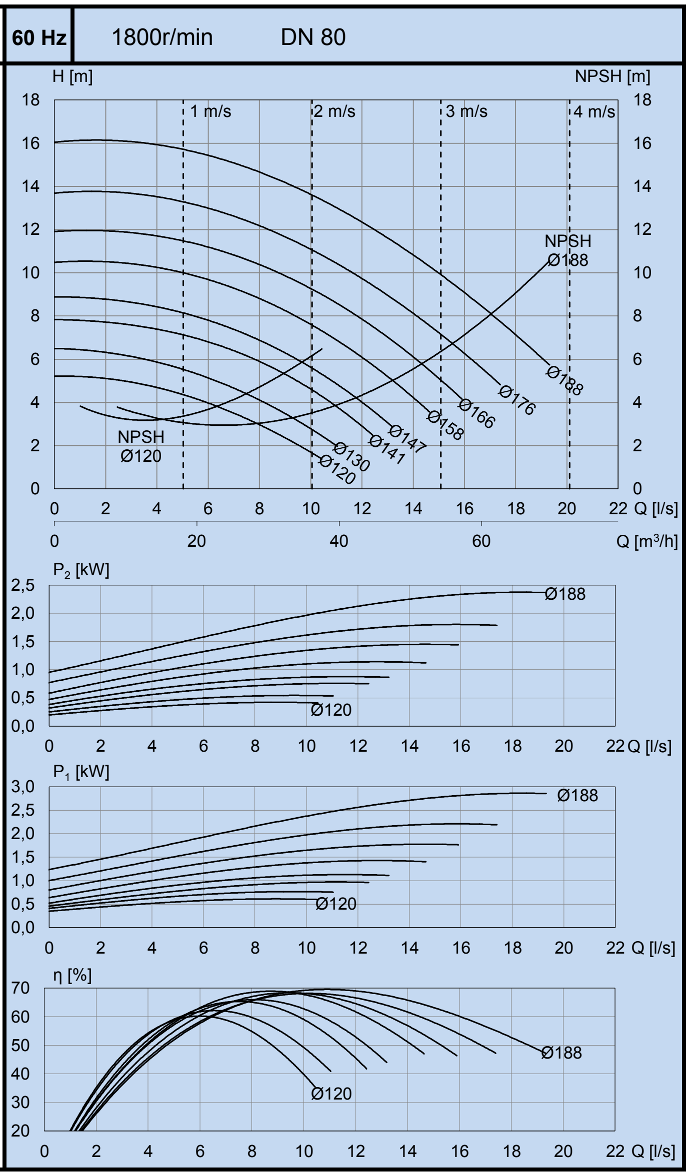
L-80A/4 | LH-80A/4

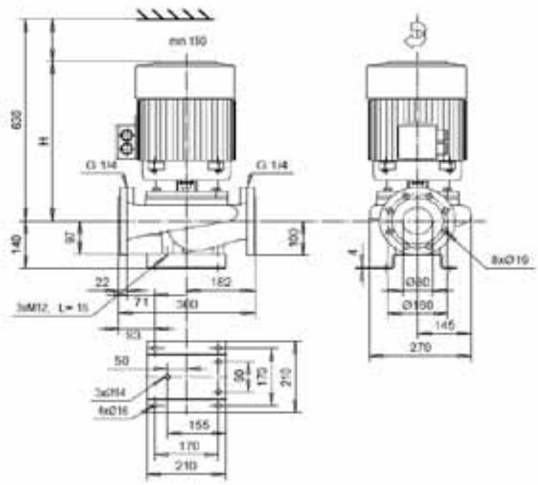


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OKN-852 D F19	0,37	1,0	38	315
50Hz	KH-100 A2 F19	0,55	1,27	46	325
50Hz	KH-100 B2 F19	0,75	1,74	46	325
50Hz	KH-101 C2 F19	1,1	2,44	51	375
50Hz	KH-101 D2 F19	1,5	3,27	54	375
50Hz	KH-112 C2 F19	2,2	4,60	60	420
50Hz	KH-112 E2 F19	3	6,25	64	420
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-100 A2 F19	0,55 (0,66)	1,27 (1,30)	46	325
60Hz	KH-100 B2 F19	0,75 (0,9)	1,74 (1,74)	46	325
60Hz	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	51	375
60Hz	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	54	375
60Hz	KH-112 C2 F19	2,2 (2,6)	4,55 (4,6)	60	420
60Hz	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	64	420



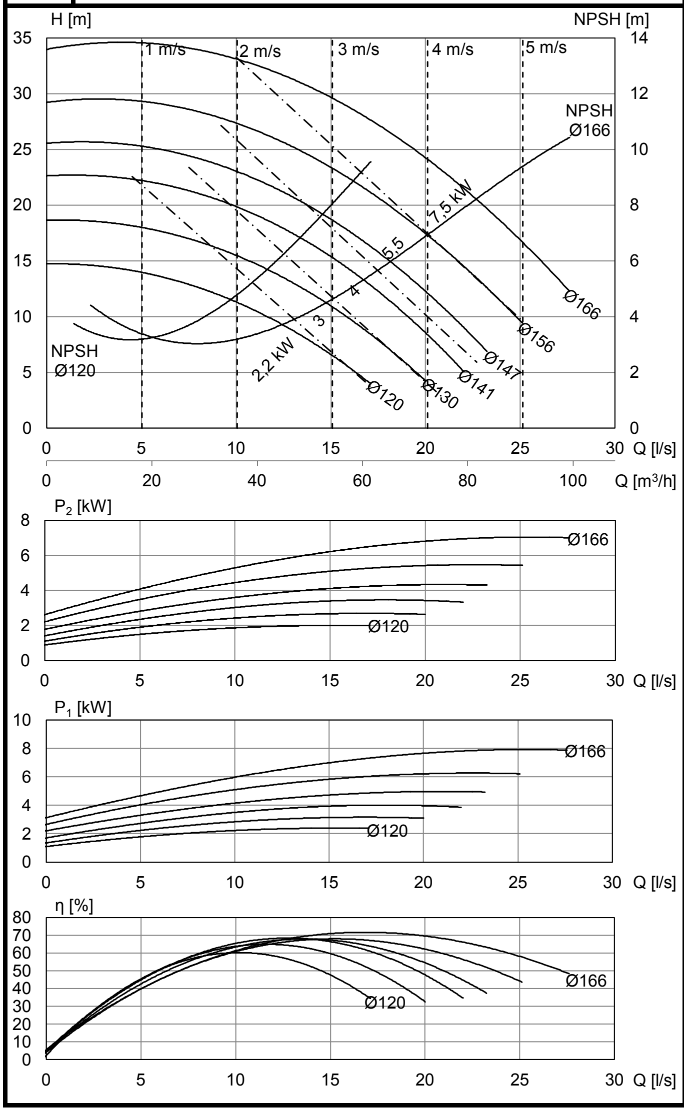


L-80A/2 | LH-80A/2

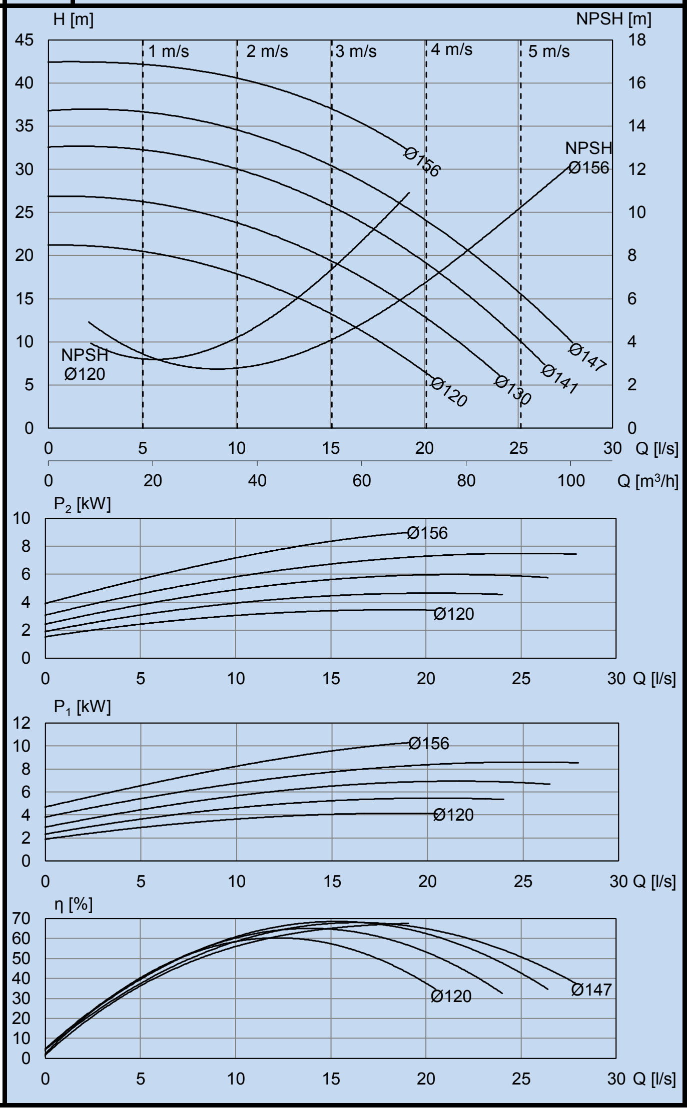


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 D1 F19	2,2	4,28	54	375
50Hz	KH-112 C1 F19	3	6,05	60	420
50Hz	KH-112 E1 F19	4	7,95	64	420
50Hz	KH-132 C1 F19	5,5	10,2	88	480
50Hz	KH-132 E1 F19	7,5	13,75	96	480
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-112 C1 F19	3 (3,6)	6,00 (6,05)	60	420
60Hz	KH-112 E1 F19	4 (4,8)	7,9 (8,0)	64	420
60Hz	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	88	480
60Hz	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	96	480

50 Hz 3000r/min DN 80



60 Hz 3600r/min DN 80



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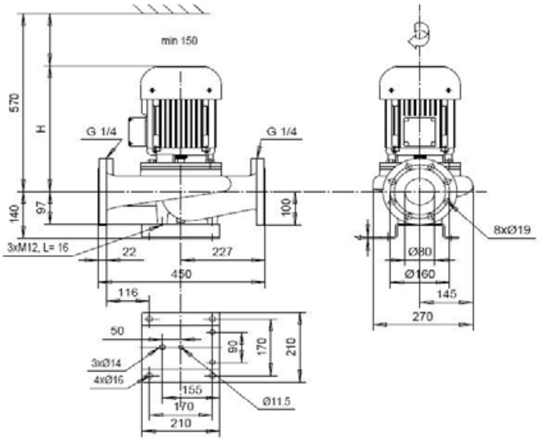
ALS-1081/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OKN-852 D F19	0,37	1,0	43	315
	KH-100 A2 F19	0,55	1,27	50	325
	KH-100 B2 F19	0,75	1,74	50	325
	KH-101 C2 F19	1,1	2,44	54	375
	KH-101 D2 F19	1,5	3,27	58	375
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OKN-852 D F19	0,37 (0,44)	1,0 (1,0)	43	315
	KH-100 A2 F19	0,55 (0,66)	1,28 (1,3)	50	325
	KH-100 B2 F19	0,75 (0,9)	1,7 (1,74)	50	325
	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	54	375
	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	58	375
	KH-112 C2 F19	2,2 (2,6)	4,55 (4,60)	64	420
	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	68	420

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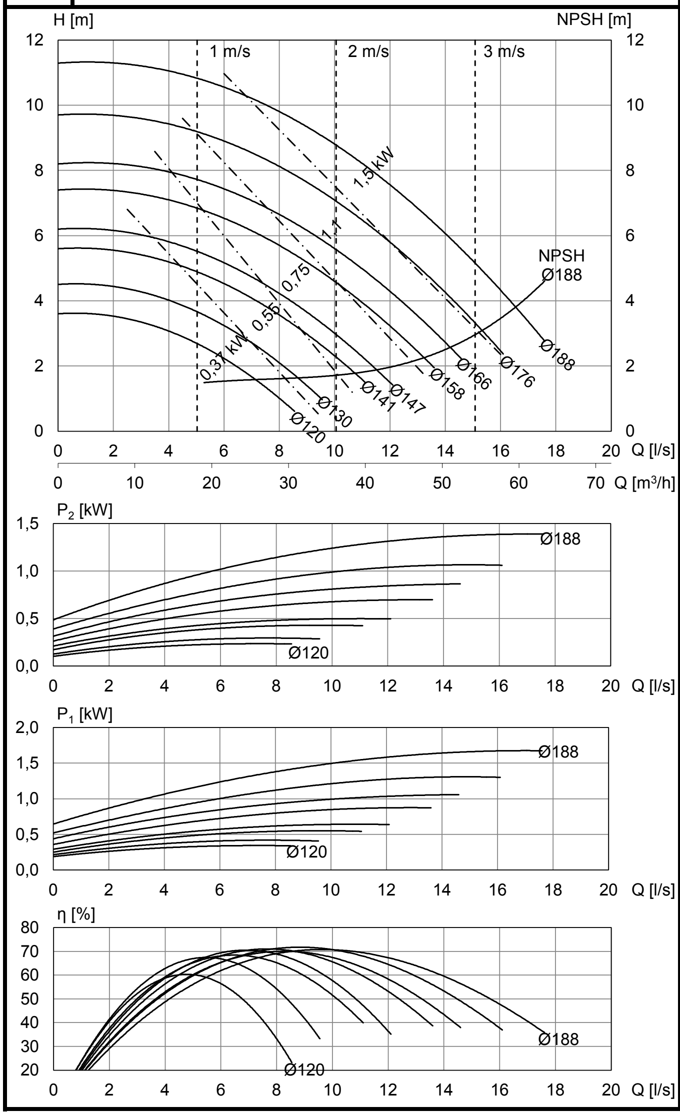
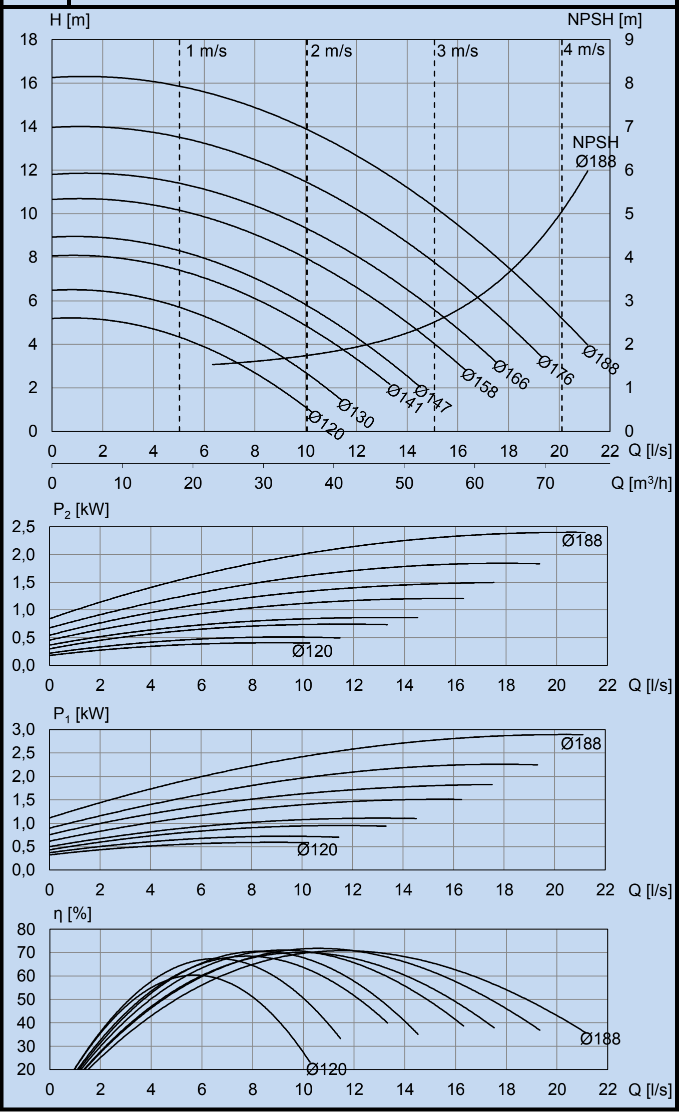
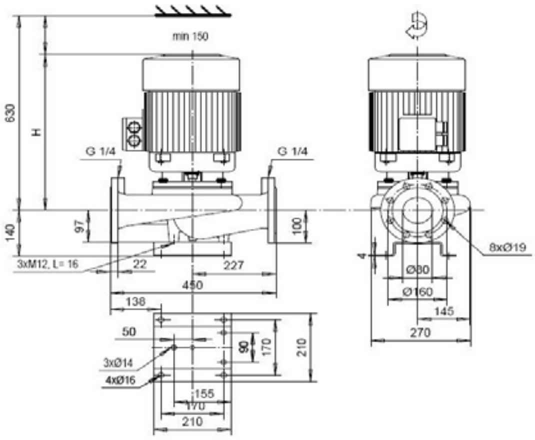
50 Hz 1500r/min DN 80



60 Hz 1800r/min DN 80

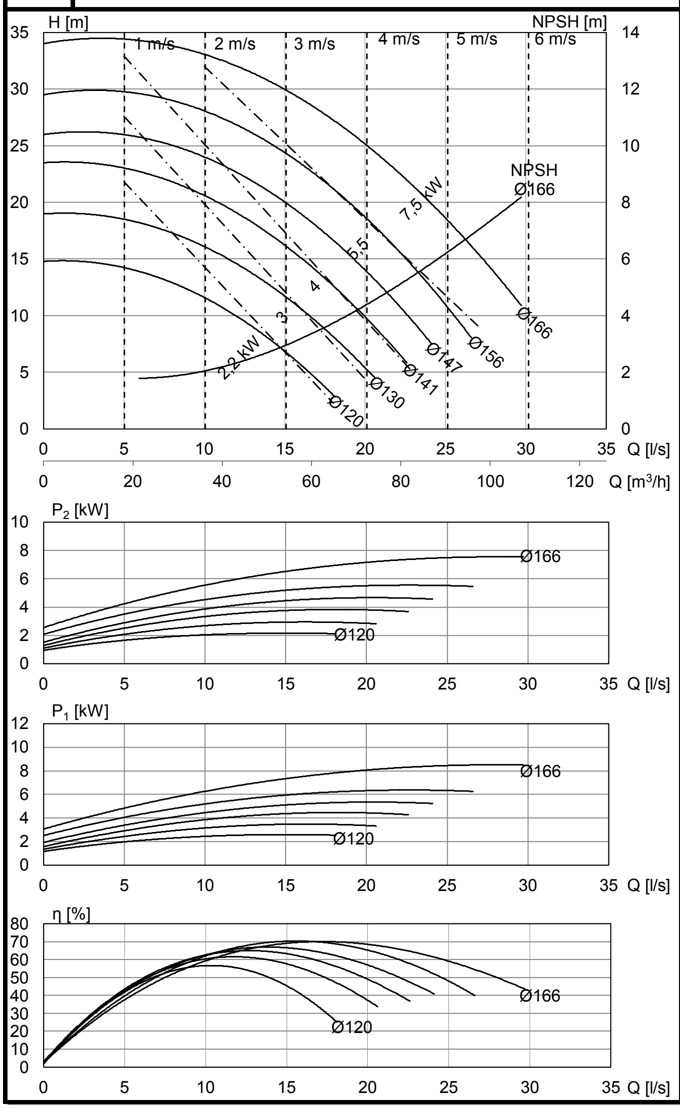


ALS-1081/2

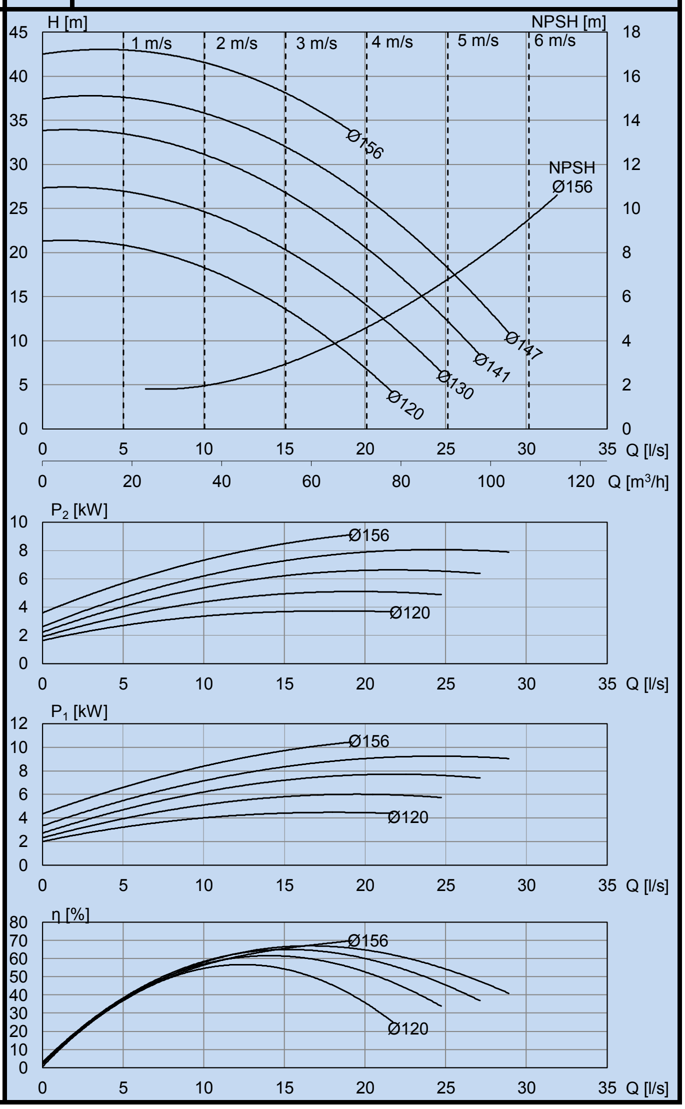


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 D1 F19	2,2	4,28	58	375
50Hz	KH-112 C1 F19	3	6,05	64	420
50Hz	KH-112 E1 F19	4	7,95	68	420
50Hz	KH-132 C1 F19	5,5	10,20	92	480
50Hz	KH-132 E1 F19	7,5	13,75	99	480
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-112 C1 F19	3 (3,6)	6,00 (6,05)	64	420
60Hz	KH-112 E1 F19	4 (4,8)	7,90 (8,00)	68	420
60Hz	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	92	480
60Hz	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	99	480

50 Hz 3000r/min DN 80



60 Hz 3600r/min DN 80



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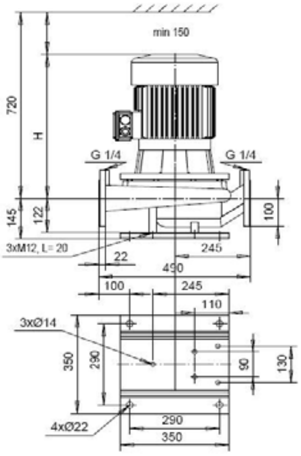
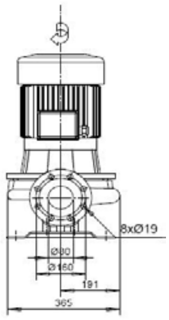
L-80S/4 | LH-80S/4





	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 C2 F29	1,1	2,44	86	430
	KH-101 D2 F29	1,5	3,27	89	430
	KH-112 C2 F29	2,2	4,6	94	475
	KH-112 E2 F29	3	6,25	99	475
	KH-132 C2 F29	4	8,13	125	520
	KH-132 E2 F29	5,5	10,95	135	520
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-101 D2 F29	1,5 (1,8)	3,23 (3,32)	89	430
	KH-112 C2 F29	2,2 (2,6)	4,55 (4,6)	94	475
	KH-112 E2 F29	3 (3,6)	6,15 (6,25)	99	475
	KH-132 C2 F29	4 (4,8)	8,17 (8,3)	125	520
	KH-132 E2 F29	5,5 (6,6)	11,00 (11,15)	135	520
	KH-133 G2 F29	7,5 (9)	14,80 (15,47)	147	570

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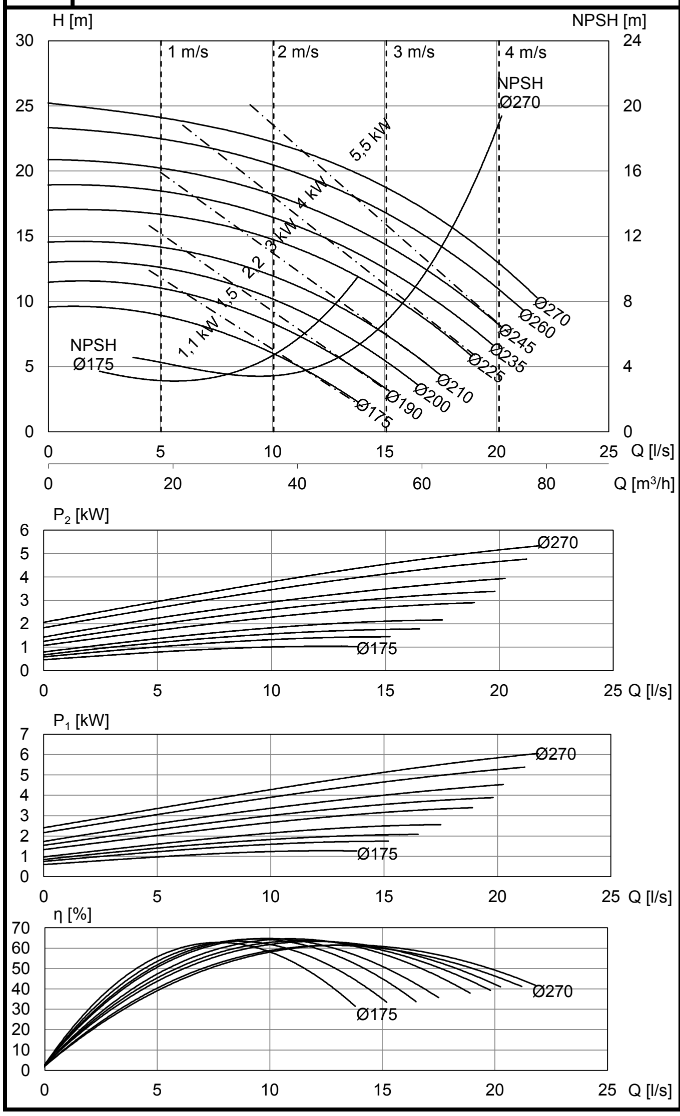
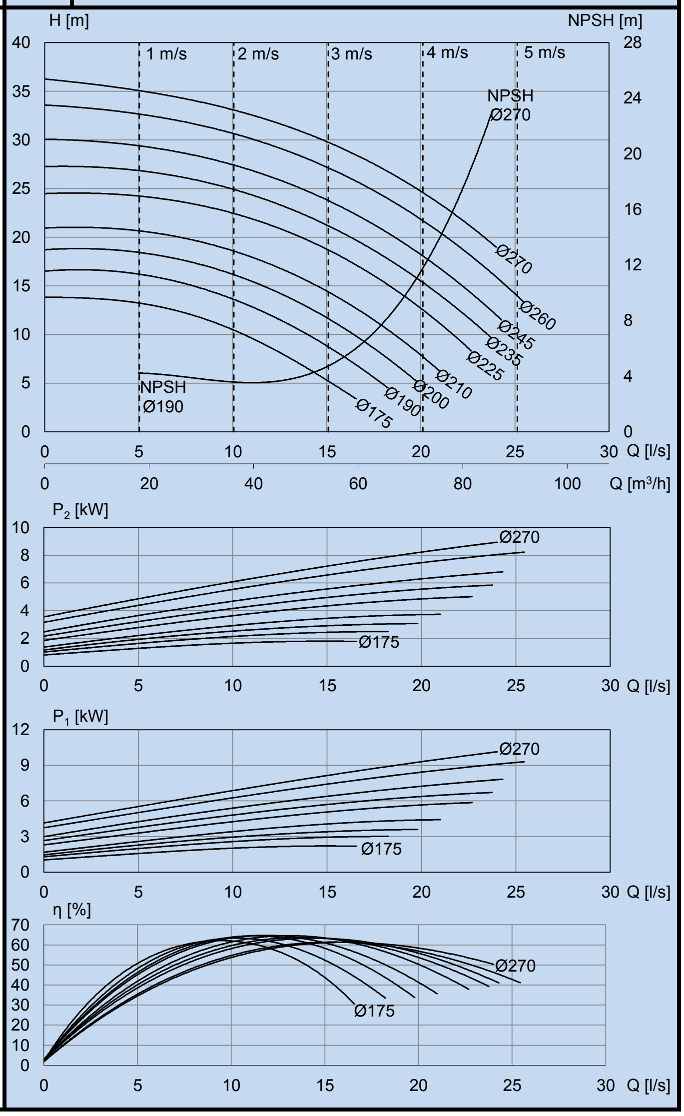
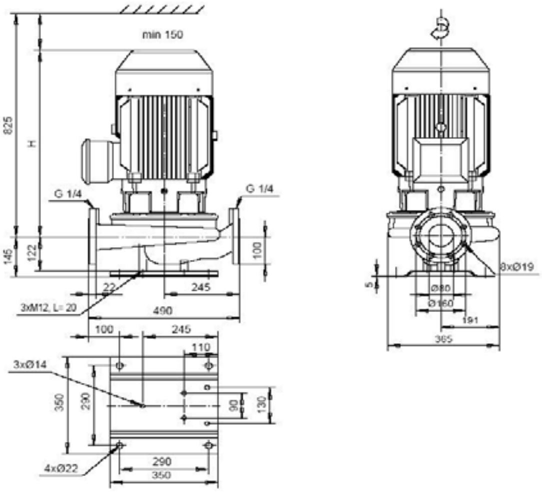
50 Hz 1500r/min DN 80



60 Hz 1800r/min DN 80

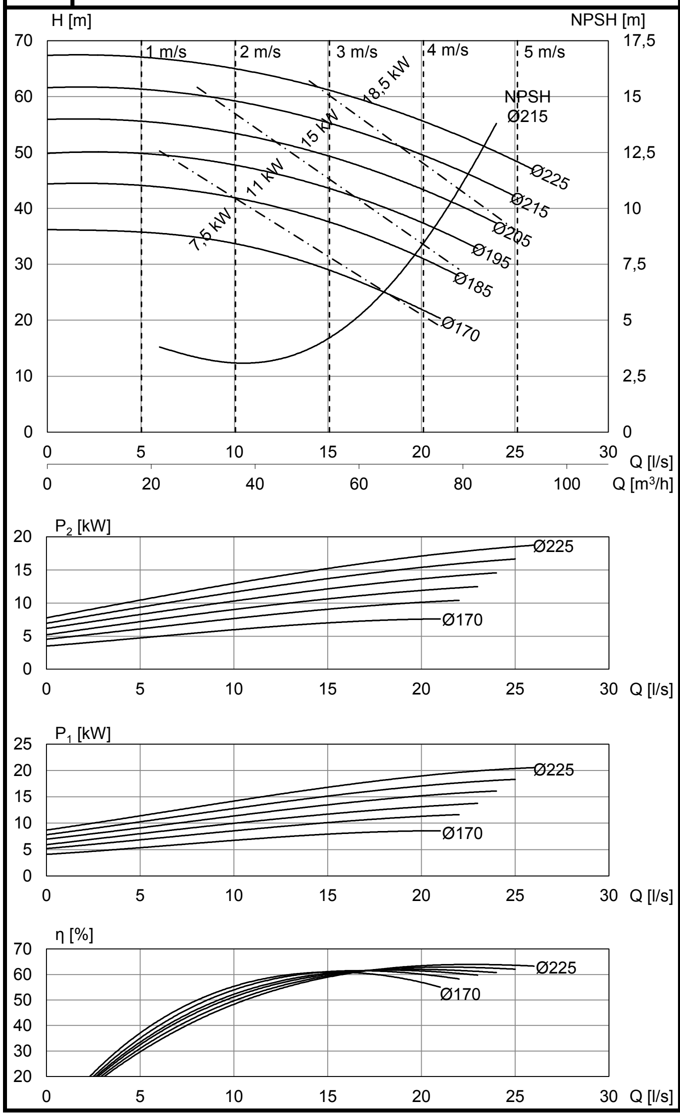


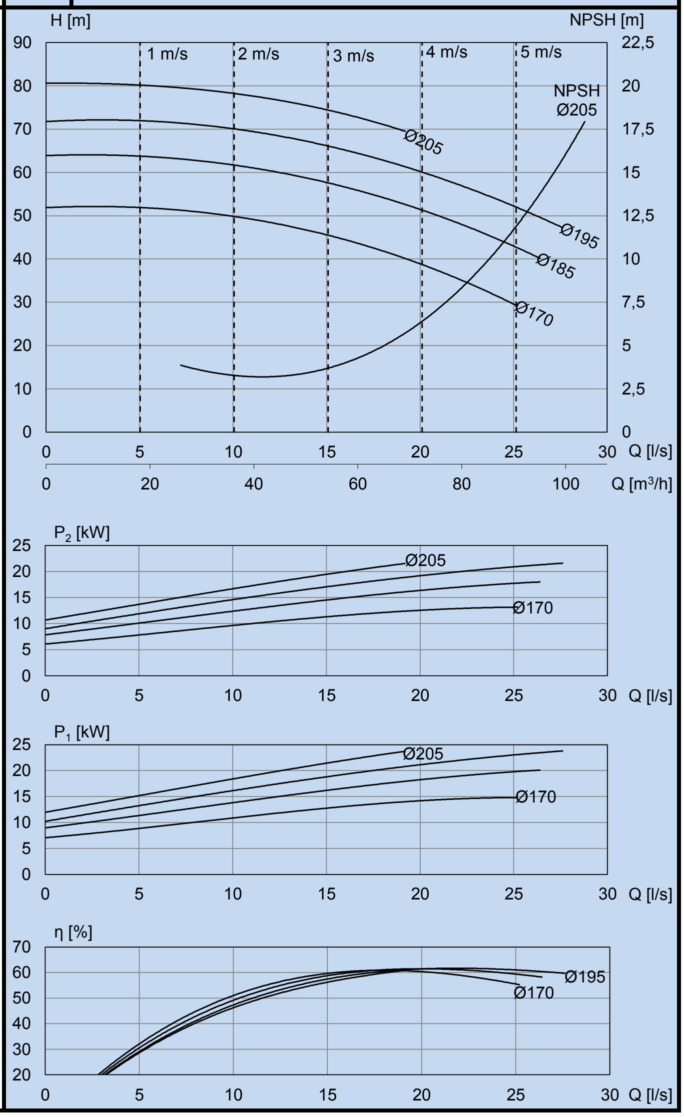
L-80S/2 | LH-80S/2



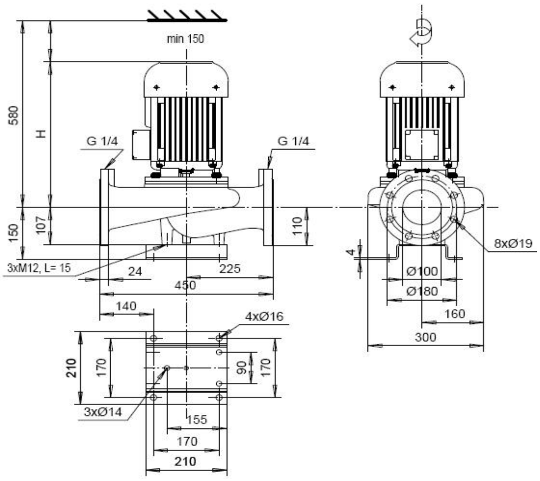
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 E1 F29	7,5	13,75	130	520
50Hz	KZ-165 E1 F29	11	20,2	185	680
50Hz	KZ-165 F1 F29	15	26,95	190	680
50Hz	KZ-165A H1 F29	18,5	32,6	195	680
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-132 E1 F29	7,5 (9)	13,8 (14,05)	130	520
60Hz	KZ-165 E1 F29	11 (13)	20,6 (20,3)	185	680
60Hz	KZ-165 F1 F29	15 (18)	28,05 (27,9)	190	680
60Hz	KZ-165A H1 F29	18,5 (22)	33,9 (33,6)	195	680

50 Hz	3000r/min DN 80	60 Hz	3600r/min DN 80





AL-1102/4 ALH-1102/4 ALP-1102/4 ALS-1102/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-100 A2 F19	0,55	1,27	55	335
	KH-100 B2 F19	0,75	1,74	55	335
	KH-101 C2 F19	1,1	2,44	60	385
	KH-101 D2 F19	1,5	3,27	63	385
	KH-112 C2 F19	2,2	4,60	69	430
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	60	385
	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	63	385
	KH-112 C2 F19	2,2 (2,6)	4,55 (4,60)	69	430
	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	72	430

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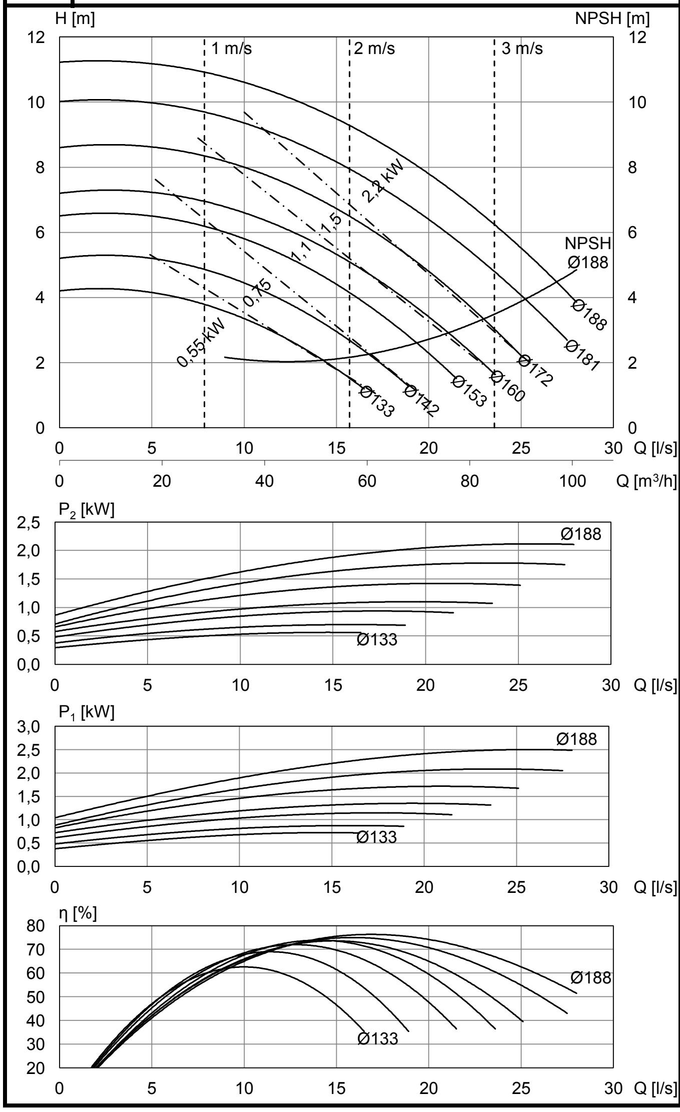
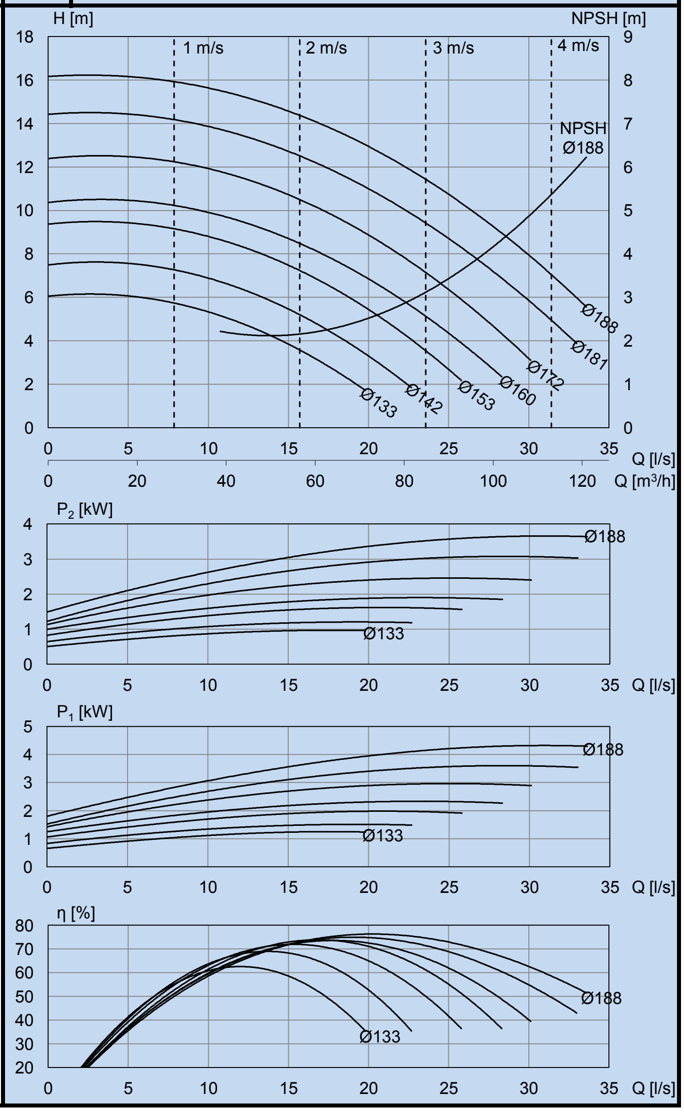
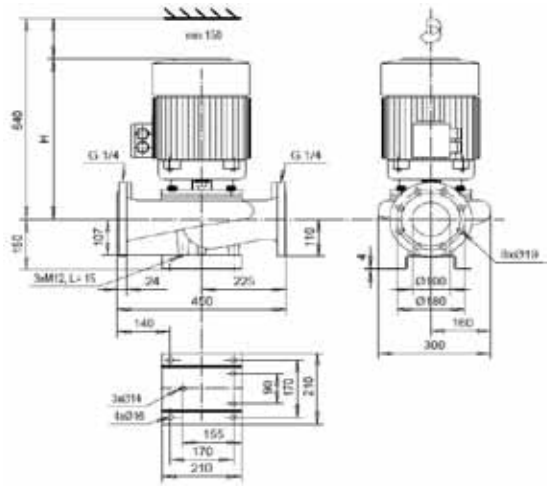
50 Hz	1500r/min	DN 100	60 Hz	1800r/min	DN 100



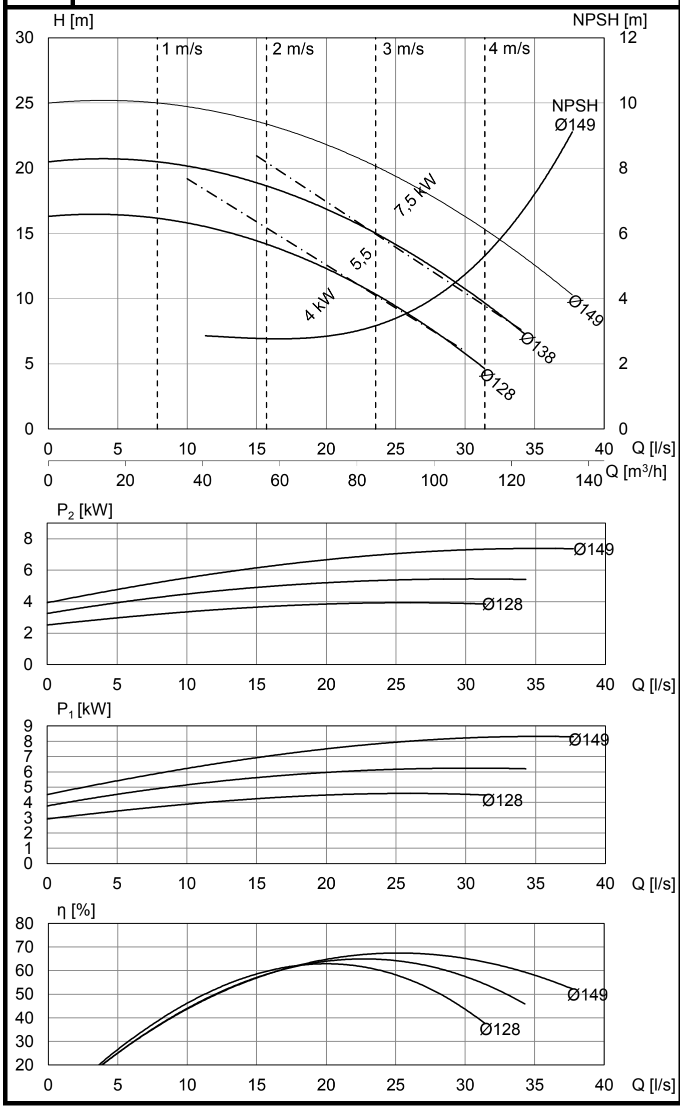


AL-1102/2 | ALH-1102/2 | ALP-1102/2 | ALS-1102/2

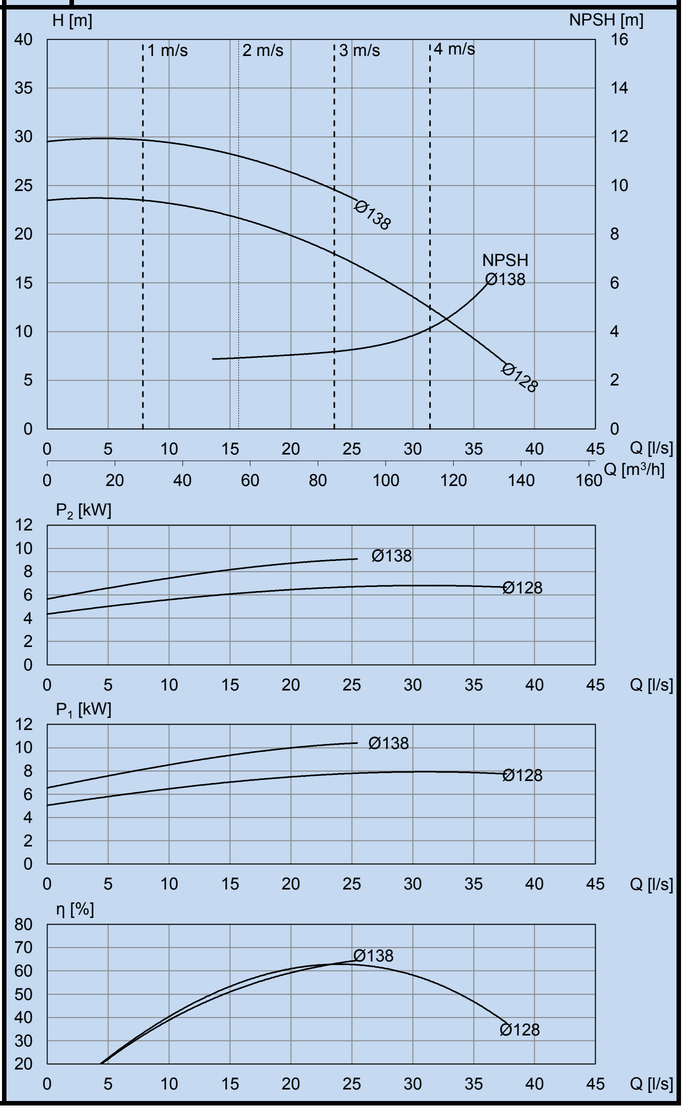


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E1 F19	4	7,95	73	430
	KH-132 C1 F19	5,5	10,2	98	490
	KH-132 E1 F19	7,5	13,75	105	490
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	98	490
	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	105	490

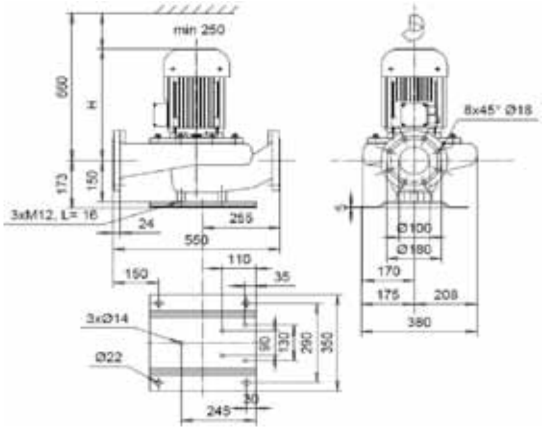
50 Hz 3000r/min DN 100



60 Hz 3600r/min DN 100



AKN-100/4 AKNH-100/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 D2 N26	1,5	3,27	83	365
	KH-112 C2 N26	2,2	4,60	89	410
	KH-112 E2 N26	3	6,25	93	410
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-101 D2 N26	1,5 (1,8)	3,23 (3,32)	83	365
	KH-112 C2 N26	2,2 (2,6)	4,55 (4,60)	89	410
	KH-112 E2 N26	3 (3,6)	6,15 (6,25)	93	410

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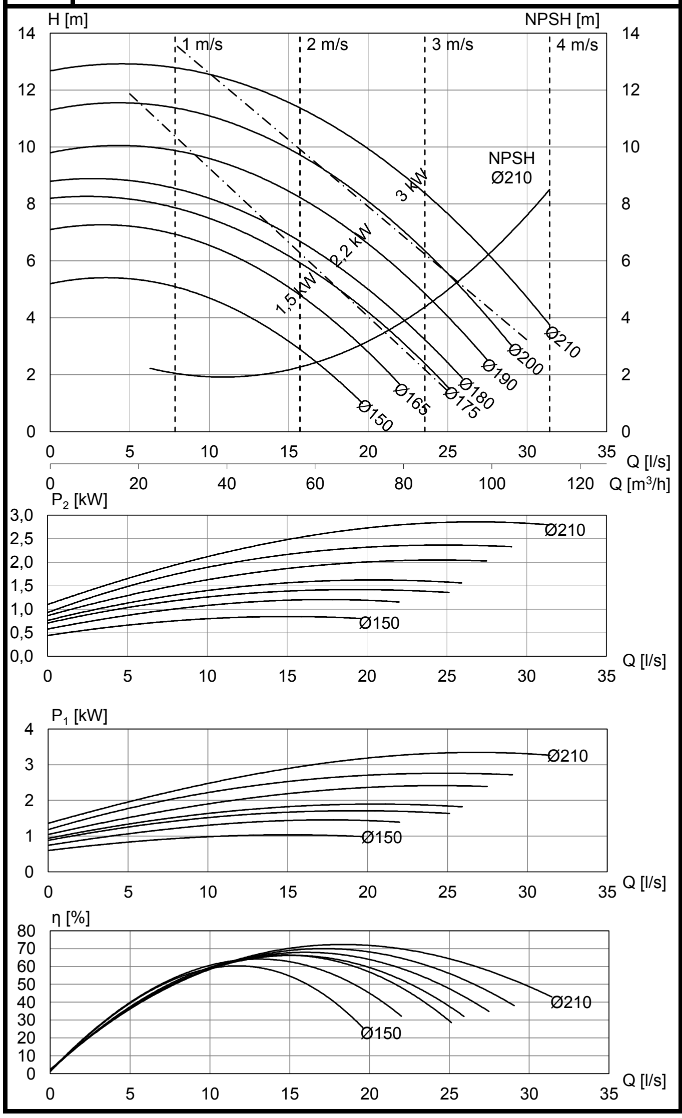
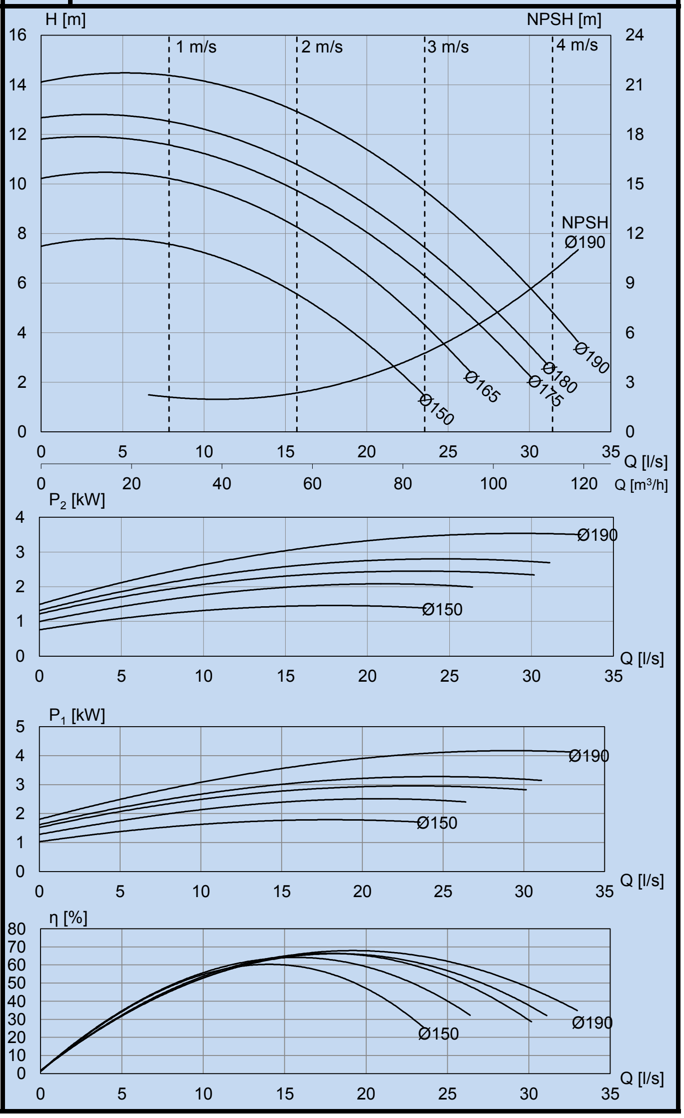
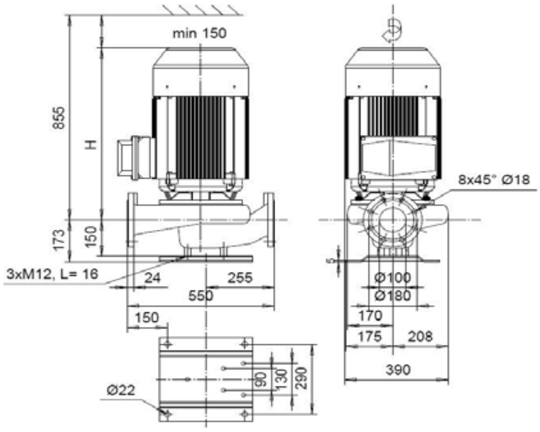
50 Hz 1500r/min DN 100



60 Hz 1800r/min DN 100

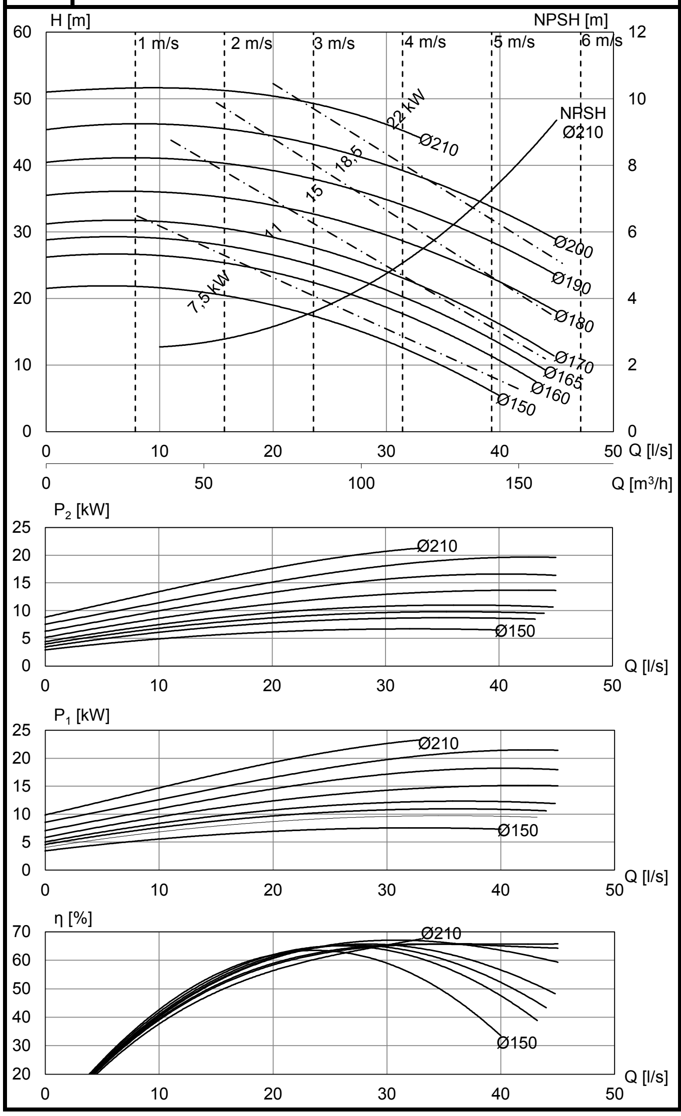


AKN-100/2 **AKNH-100/2**

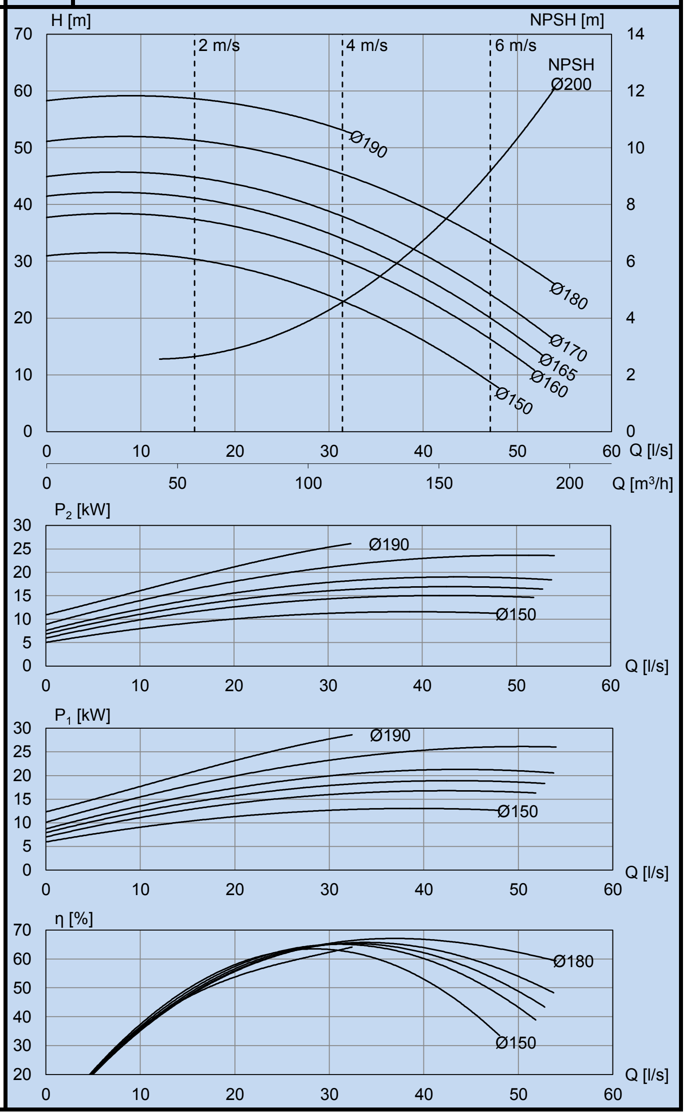


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 E1 N26	7,5	13,75	125	465
	KZ-165 E1 N26	11	20,20	185	640
	KZ-165 F1 N26	15	26,95	190	640
	KZ-165A H1 N26	18,5	32,60	205	640
	KZ-186 J1 N26	22	38,60	250	710
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KZ-165 E1 N26	11 (13)	20,60 (20,30)	185	640
	KZ-165 F1 N26	15 (18)	28,05 (27,90)	190	640
	KZ-165A H1 N26	18,5 (22)	33,90 (33,60)	205	640
	KZ-186 J1 N26	22 (26)	40,30 (39,60)	250	710

50 Hz 3000r/min DN 100



60 Hz 3600r/min DN 100



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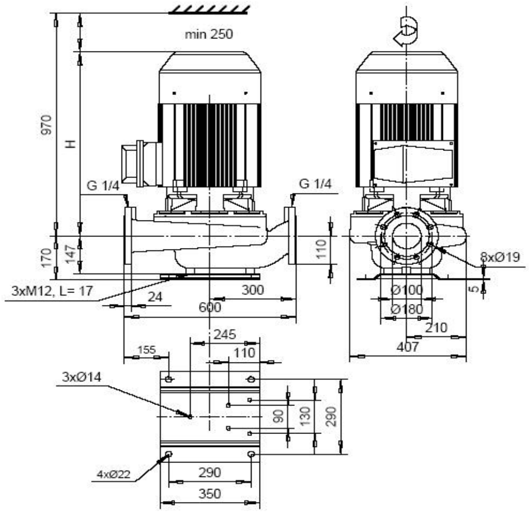
AL-1106/4 **ALH-1106/4** **ALS-1106/4**



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E2 F31	3	6,25	126	430
	KH-132 C2 F31	4	8,13	153	495
	KH-132 E2 F31	5,5	10,95	160	495
	KH-133 G2 F31	7,5	14,88	172	550
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-112 E2 F31	3 (3,6)	6,15 (6,25)	126	430
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	153	495
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	160	495
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	172	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	230	655
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	235	655
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	275	715

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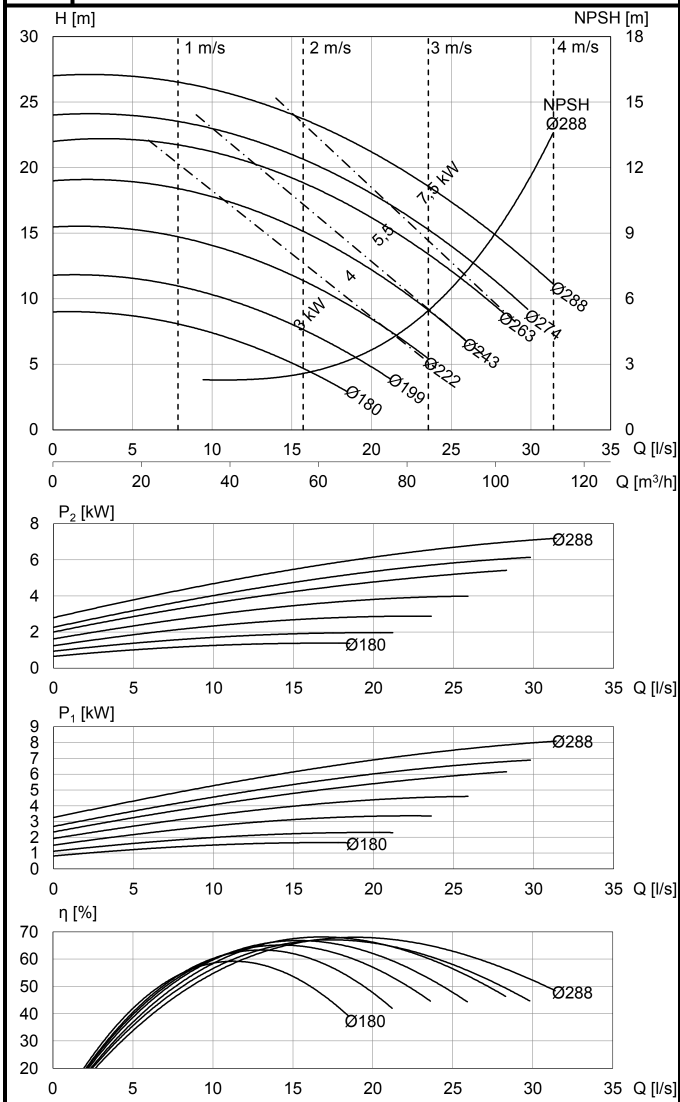
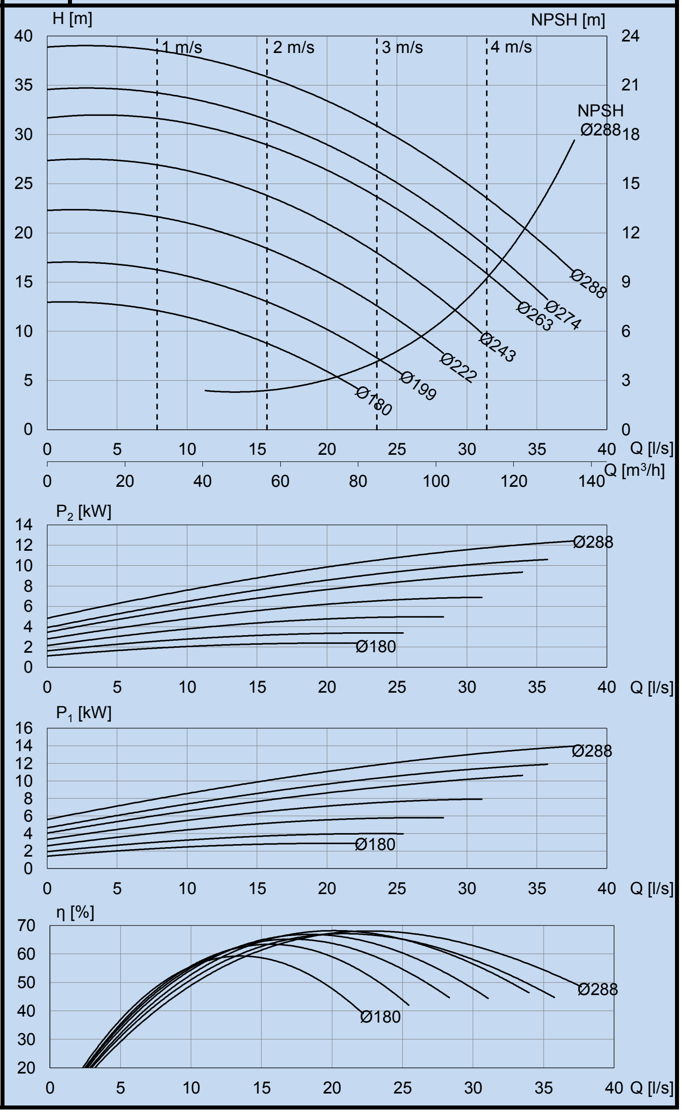
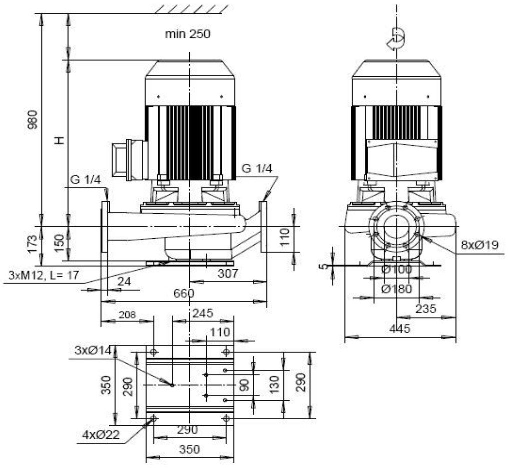
50 Hz	1500r/min	DN 100	60 Hz	1800r/min	DN 100



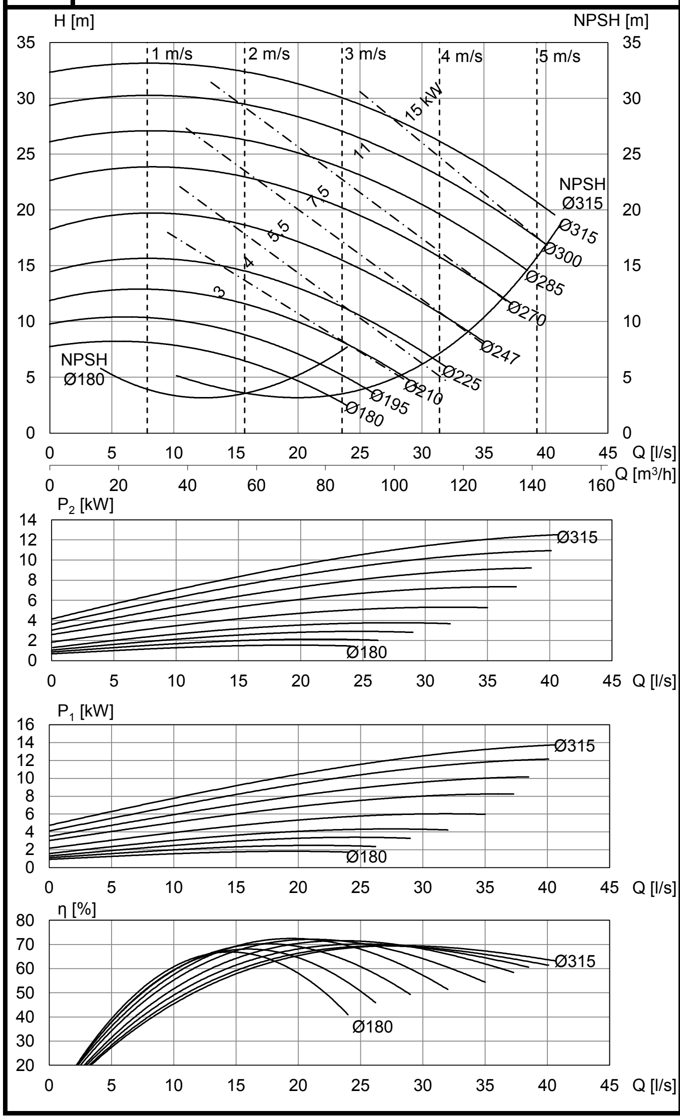


L-100S/4 | LH-100S/4 | LP-100S/4

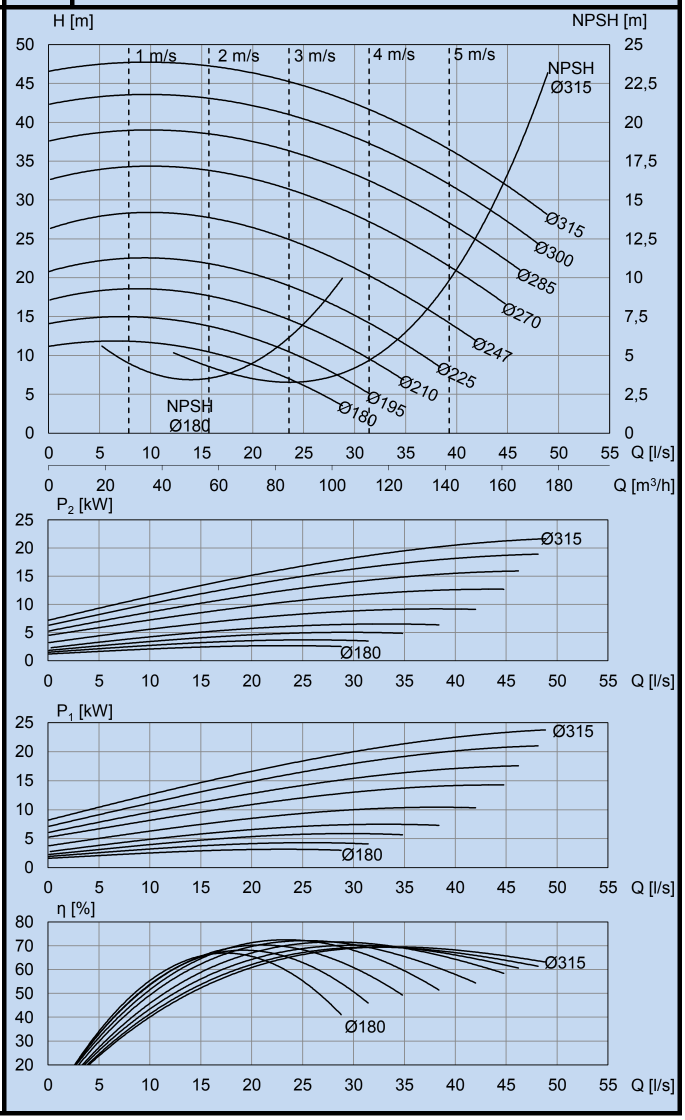


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E2 F31	3	6,25	140	440
50Hz	KH-132 C2 F31	4	8,13	165	510
50Hz	KH-132 E2 F31	5,5	10,95	175	510
50Hz	KH-133 G2 F31	7,5	14,88	185	560
50Hz	KZ-165 F2 F31	11	20,75	240	670
50Hz	KZ-165 G2 F31	15	28,10	245	670
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-112 E2 F31	3 (3,6)	6,15 (6,25)	140	440
60Hz	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	165	510
60Hz	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	175	510
60Hz	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	185	560
60Hz	KZ-165 F2 F31	11 (13)	21,35 (21,35)	240	670
60Hz	KZ-165 G2 F31	15 (18)	29,10 (28,75)	245	670
60Hz	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	290	730
60Hz	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	300	730

50 Hz 1500r/min DN 100



60 Hz 1800r/min DN 100



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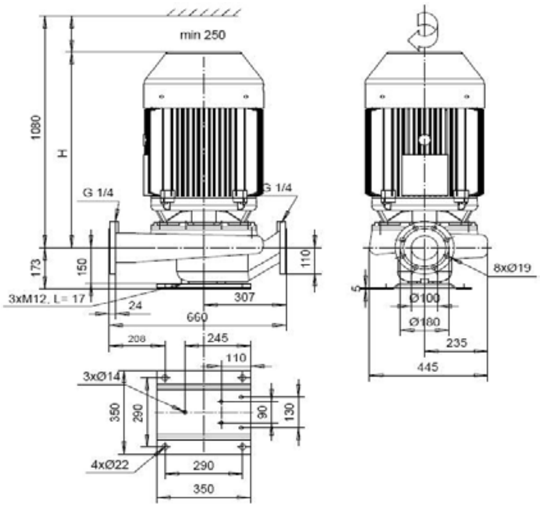
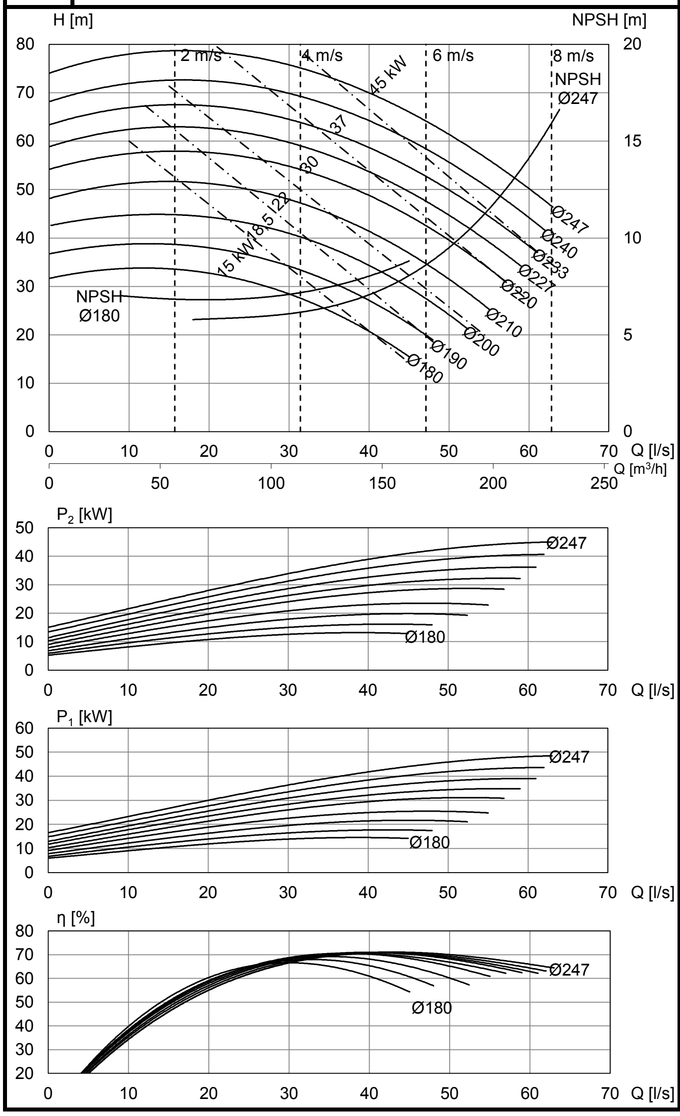
L-100S/2 | LH-100S/2 | LP-100S/2

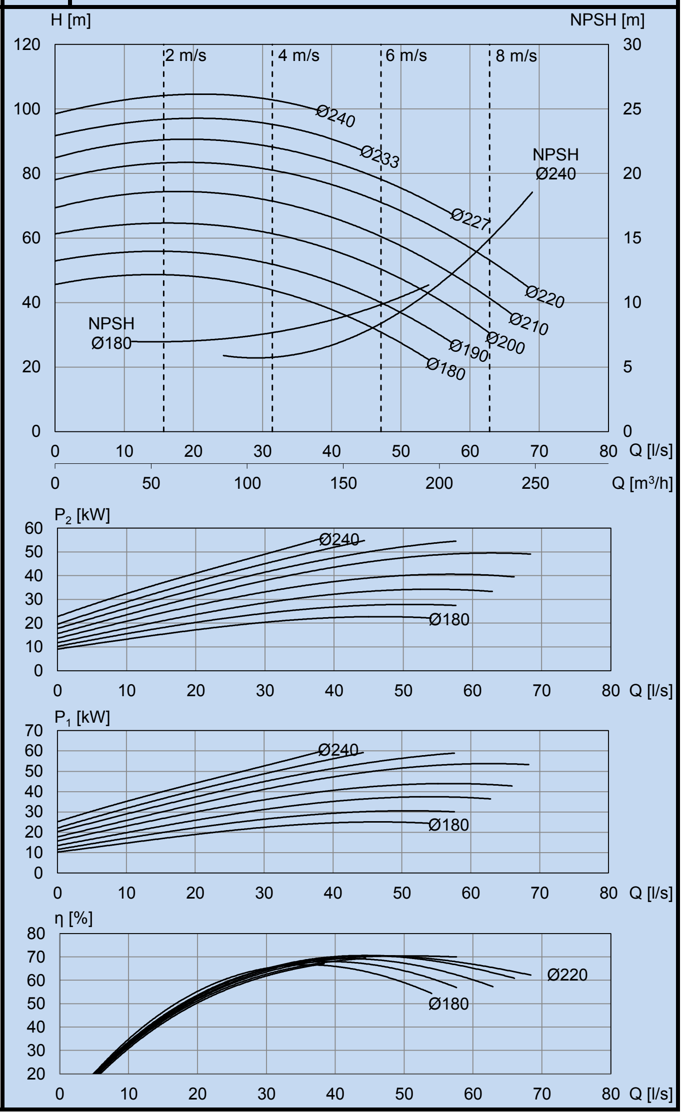


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-165 F1 F31	15	26,95	235	670
	KZ-165A H1 F31	18,5	32,6	240	670
	KZ-186 J1 BF31	22	38,6	295	730
	KZ-205 H1 F31	30	53,5	340	780
	KZ-205 J1 F31	37	65,6	360	780
	KZ-225 H1 F32	45	77,7	430	830
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KZ-165 F1 F31	15 (18)	28,05 (27,9)	235	670
	KZ-165A H1 F31	18,5 (22)	33,9 (33,6)	240	670
	KZ-186 J1 BF31	22 (26)	40,3 (39,6)	295	730
	KZ-205 H1 F31	30 (36)	55,8 (55,6)	340	780
	KZ-205 J1 F31	37 (44)	68,3 (66,8)	360	780
	KZ-225 H1 F32	45 (54)	80,8 (81,0)	430	830

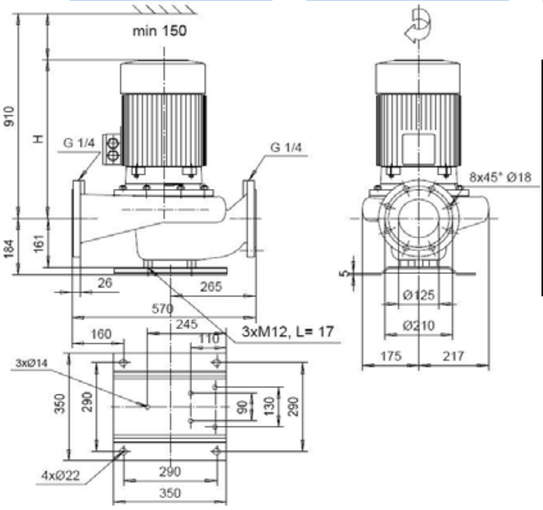
50 Hz 3000r/min DN 100



60 Hz 3600r/min DN 100



AKN-127/4 AKNH-127/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C2 N27	4	8,13	135	470
	KH-132 E2 N27	5,5	10,95	145	470
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-132 C2 N27	4 (4,8)	8,17 (8,30)	135	470
	KH-132 E2 N27	5,5 (6,6)	11,00 (11,15)	145	470
	KH-133 G2 N27	7,5 (9)	14,8 (15,47)	157	520
	KZ-165 F2 N27	11 (13)	21,35 (21,35)	170	660

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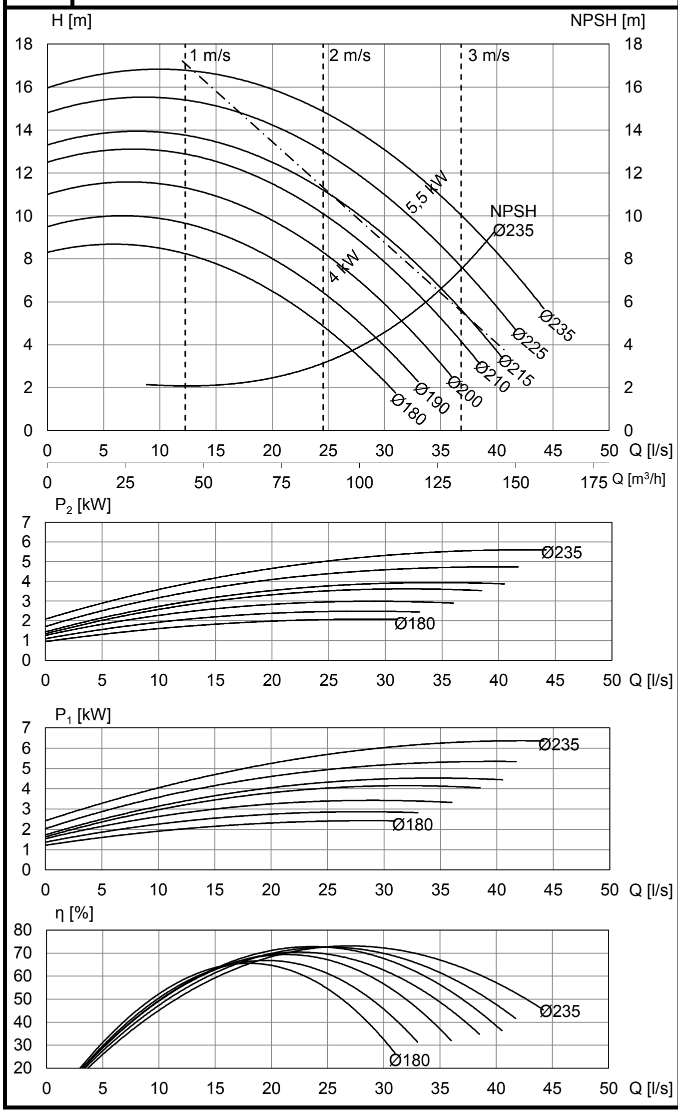
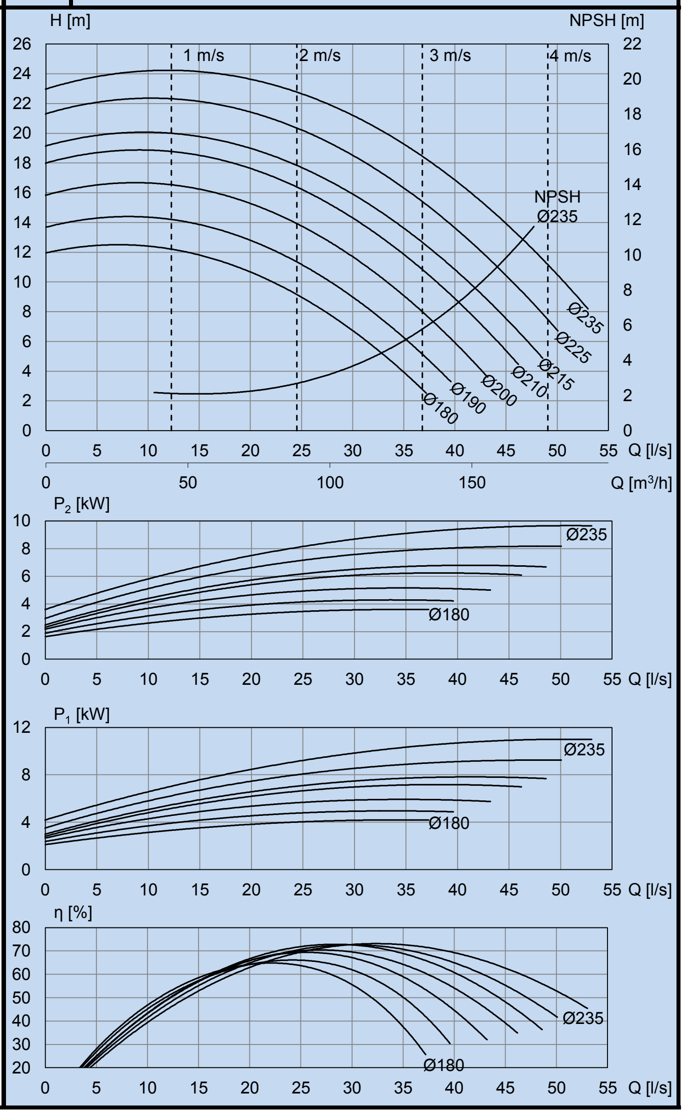
50 Hz 1500r/min DN 125



60 Hz 1800r/min DN 125



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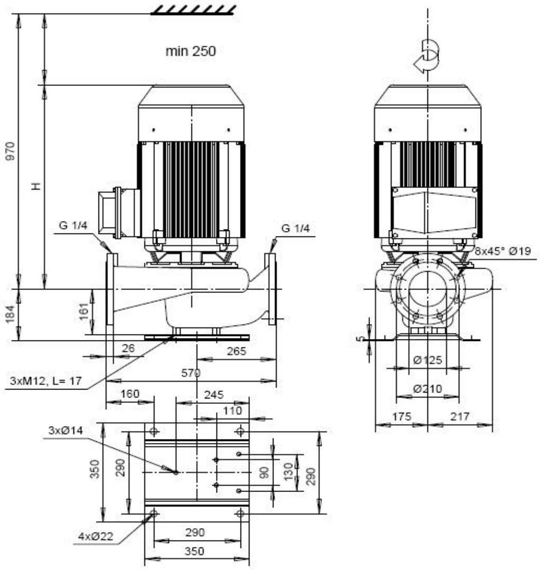
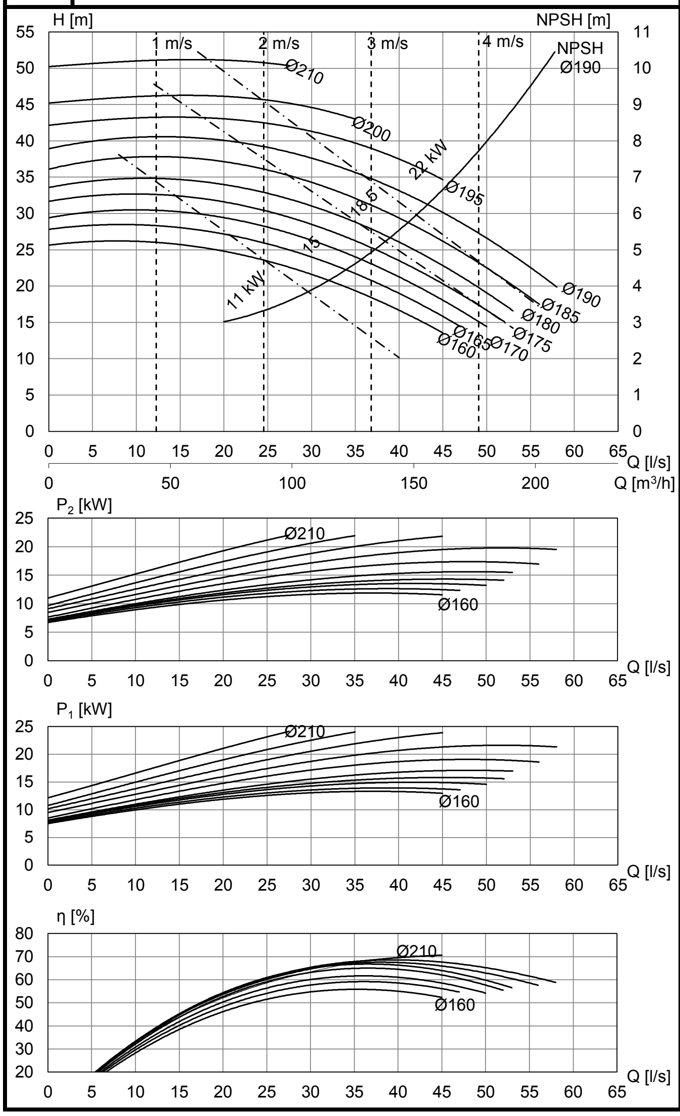
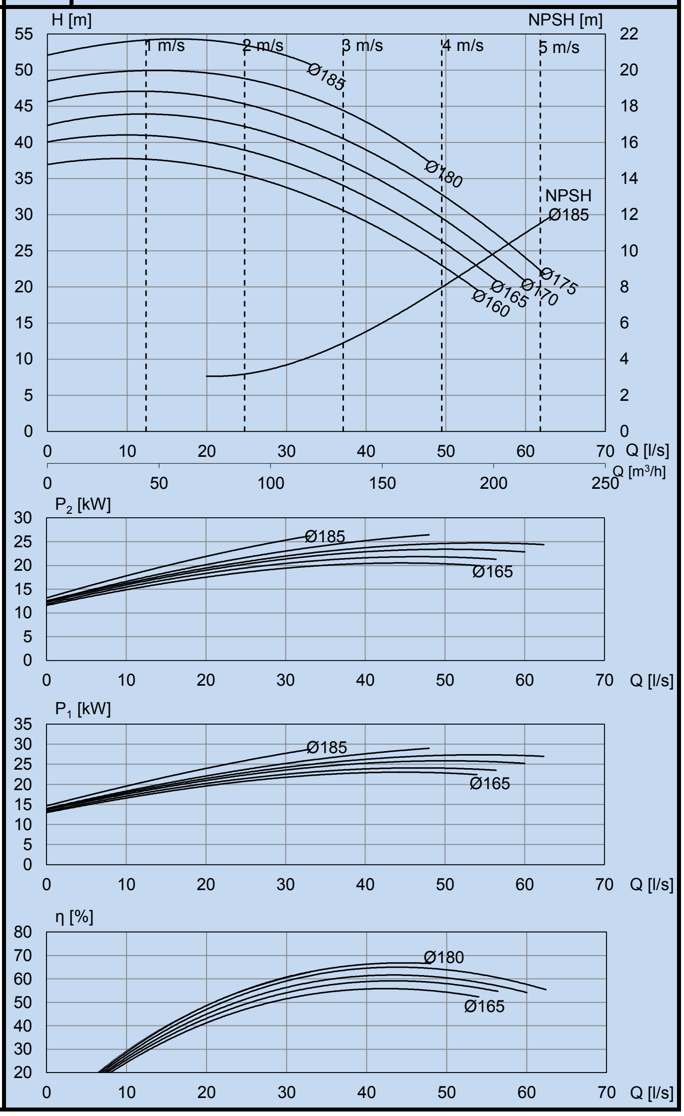
AKN-127/2 AKNH-127/2



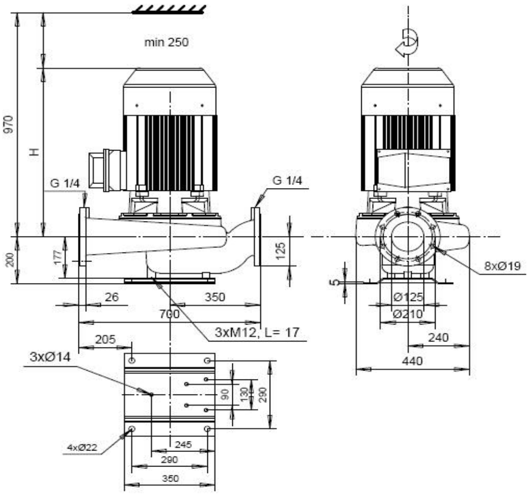
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-165 E1 N27	11	20,2	200	650
	KZ-165 F1 N27	15	26,95	205	650
	KZ-165A H1 N27	18,5	32,6	210	650
	KZ-186 J1 N27	22	38,6	265	720
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KZ-165 F1 N27	15 (18)	28,05 (27,9)	205	650
	KZ-165A H1 N27	18,5 (22)	33,9 (33,6)	210	650
	KZ-186 J1 N27	22 (26)	40,3 (39,6)	265	720

50 Hz	3000r/min	DN 125	60 Hz	3600r/min	DN 125





AL-1129/4 **ALH-1129/4** **ALS-1129/4** **ALM-1129/4**



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E2 F31	3	6,25	136	440
	KH-132 C2 F31	4	8,13	164	500
	KH-132 E2 F31	5,5	10,95	171	500
	KH-133 G2 F31	7,5	14,88	183	550
	KZ-165 F2 F31	11	20,75	240	660
	KZ-165 G2 F31	15	28,10	245	660
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	164	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	171	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	183	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	240	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	245	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	285	720
	KZ-186 K2 BF32	22 (26)	41,60 (41,00)	295	720

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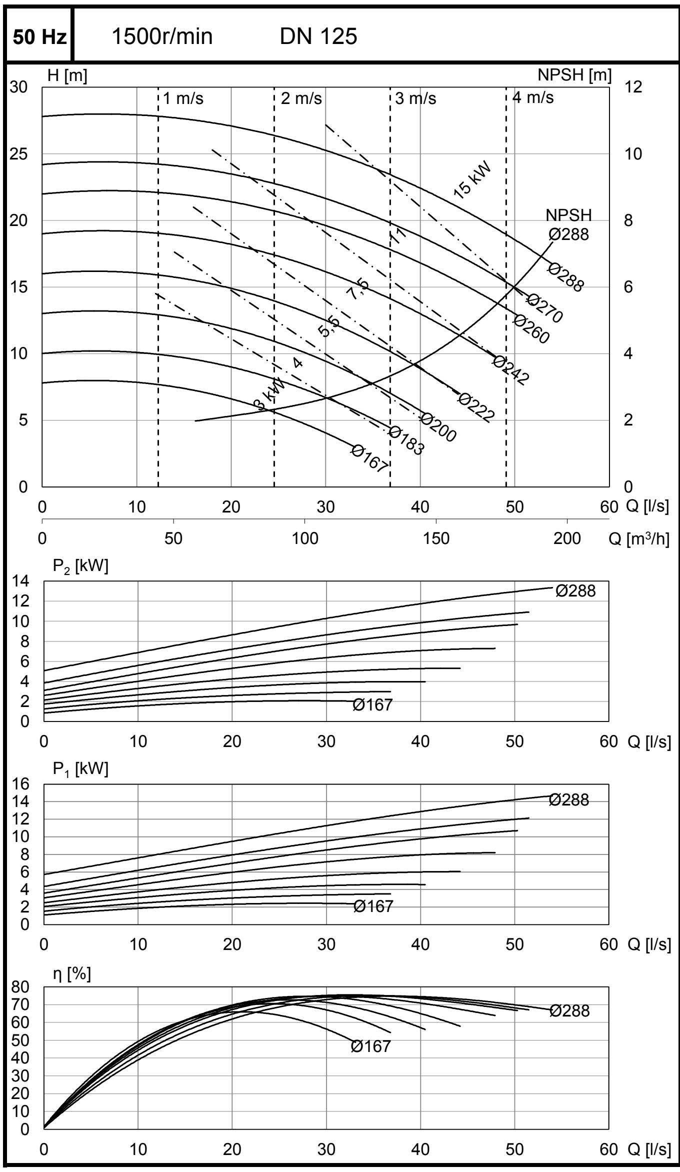

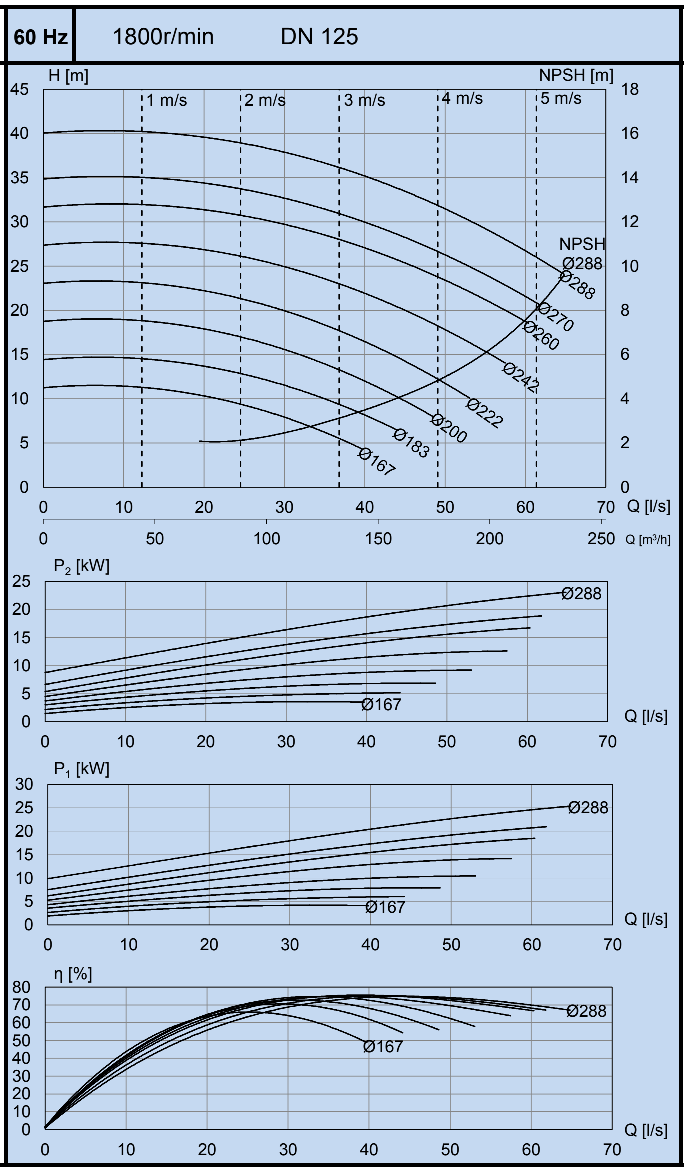

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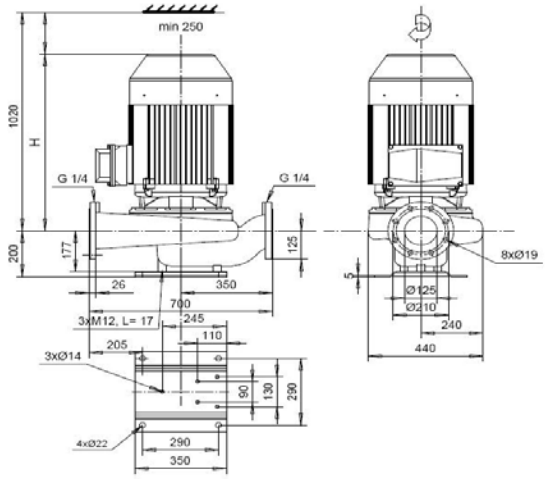
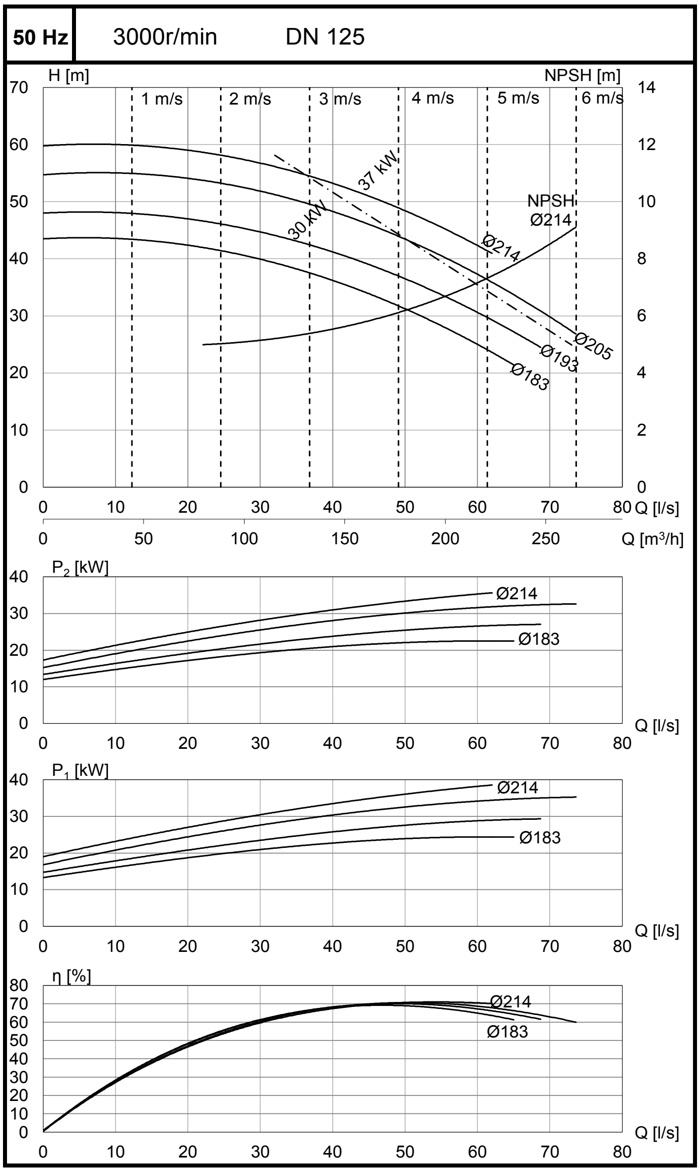
AL-1129/2 | **ALH-1129/2** | **ALS-1129/2** | **ALM-1129/2**



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KZ-205 H1 F31	30	53,5	340	770
	KZ-205 J1 F31	37	65,6	365	770



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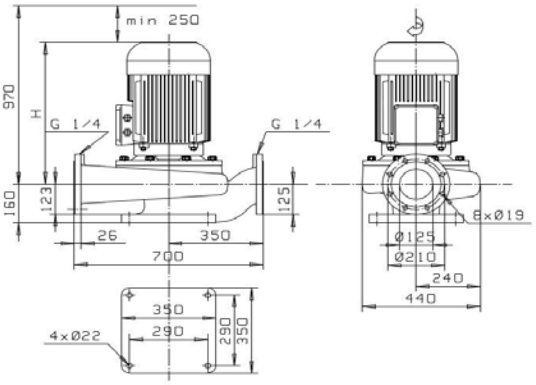
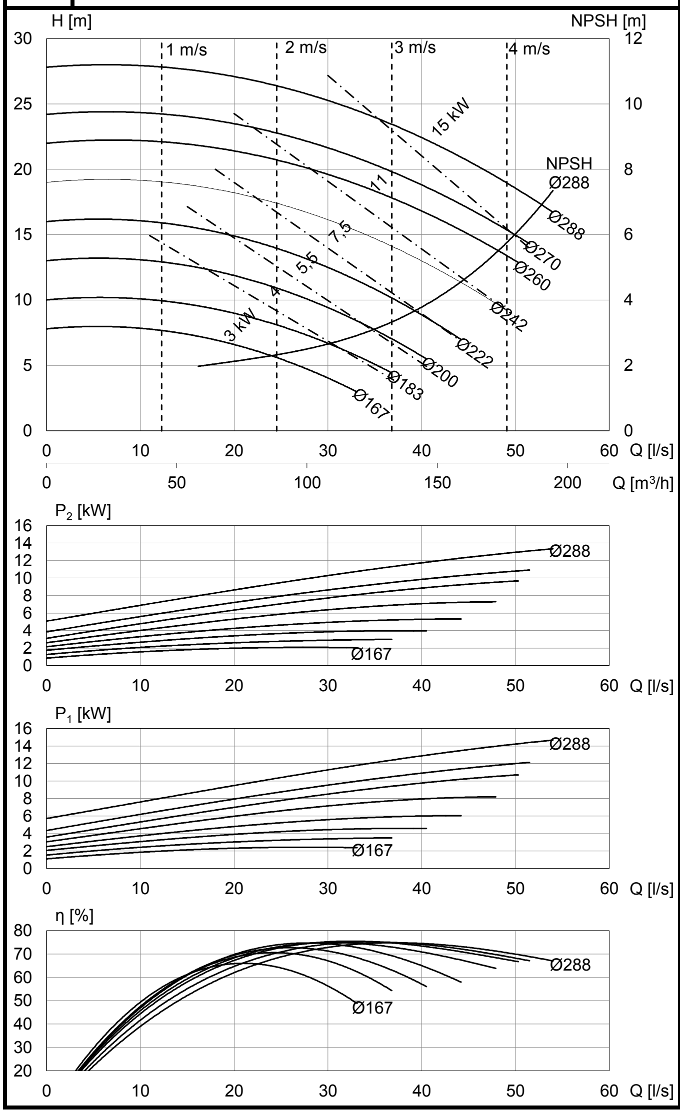
ALP-1128/4

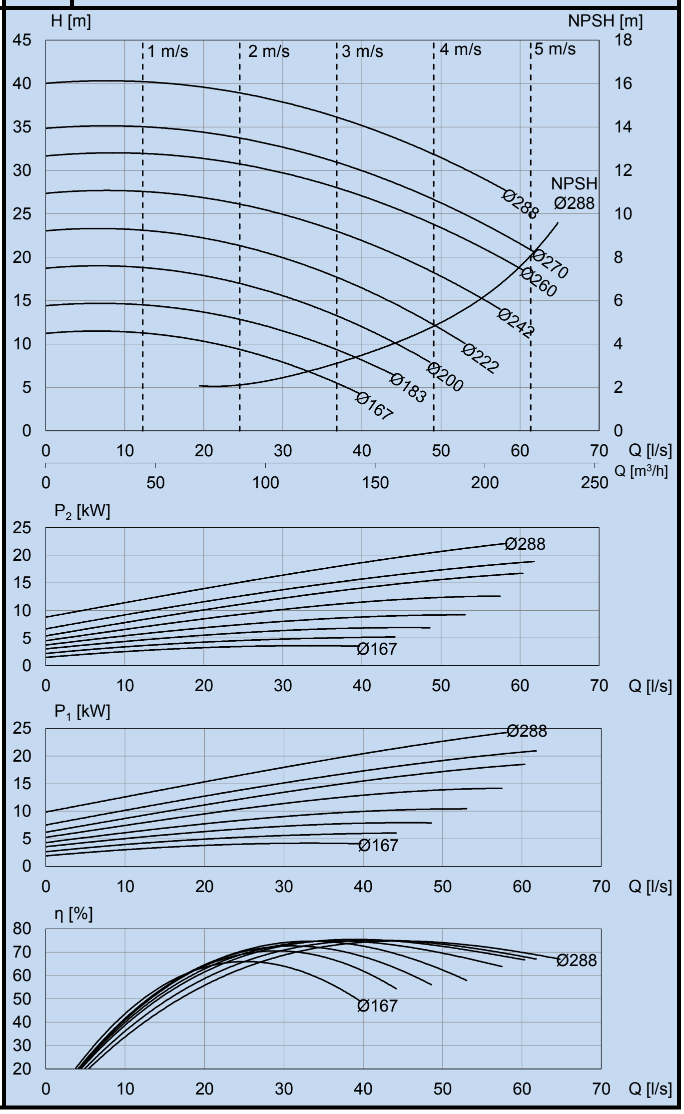


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E2 F31	3	6,25	136	435
	KH-132 C2 F31	4	8,13	164	500
	KH-132 E2 F31	5,5	10,95	171	500
	KH-133 G2 F31	7,5	14,88	183	550
	KZ-165 F2 F31	11	20,75	240	660
	KZ-165 G2 F31	15	28,10	245	660
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-112 E2 F31	3 (3,6)	6,15 (6,25)	136	435
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	164	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	171	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	183	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	240	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	245	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	285	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	295	720

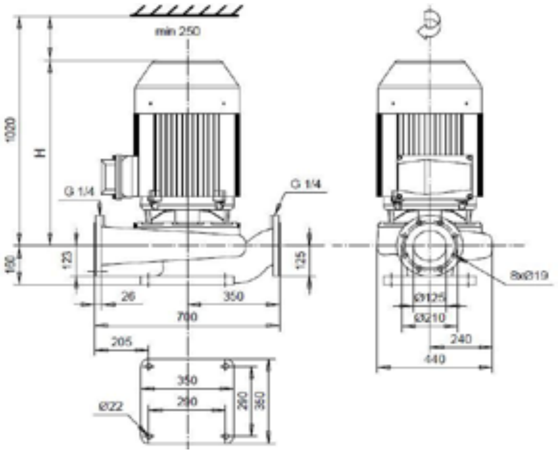
50 Hz 1500r/min DN 125



60 Hz 1800r/min DN 125



ALP-1128/2



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KZ-205 H1 F31	30	53,5	340	770
	KZ-205 J1 F31	37	65,6	360	770

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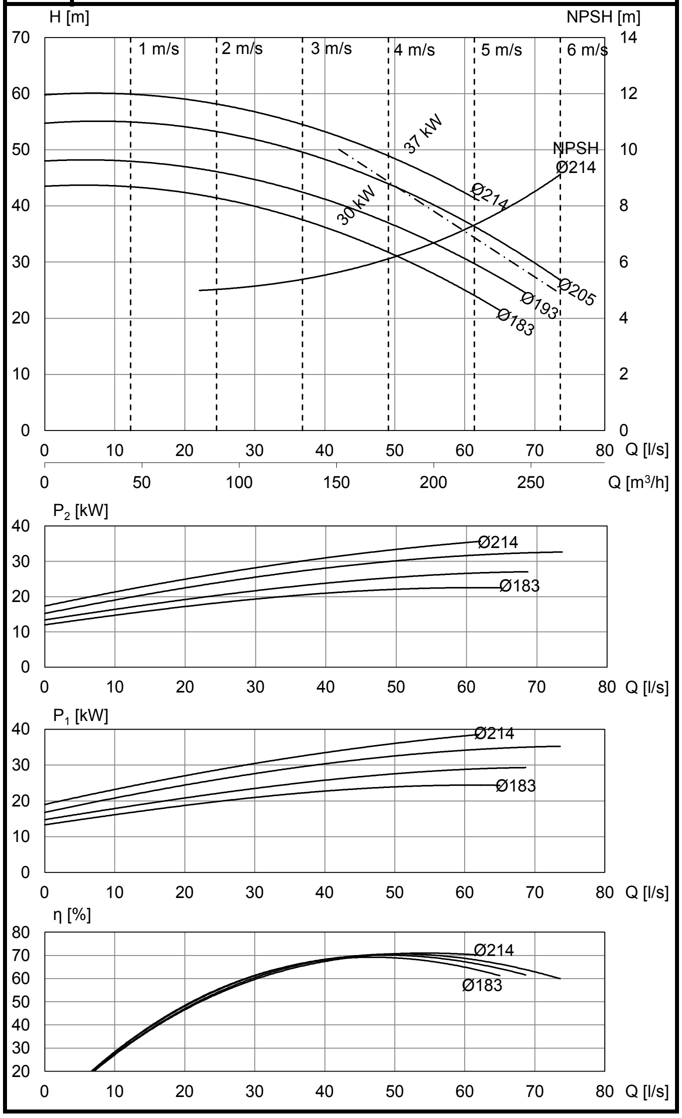
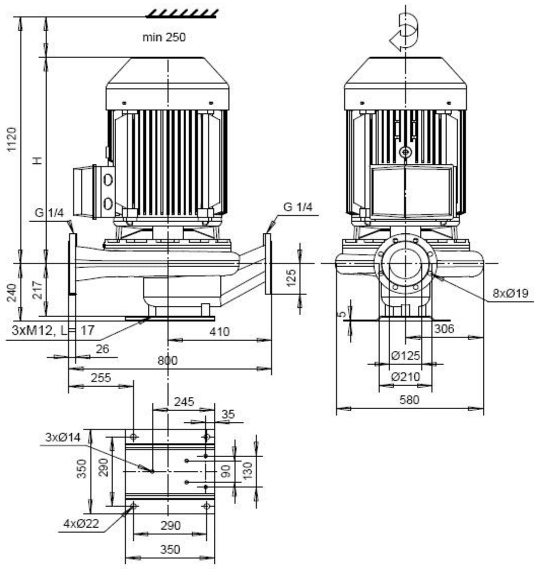
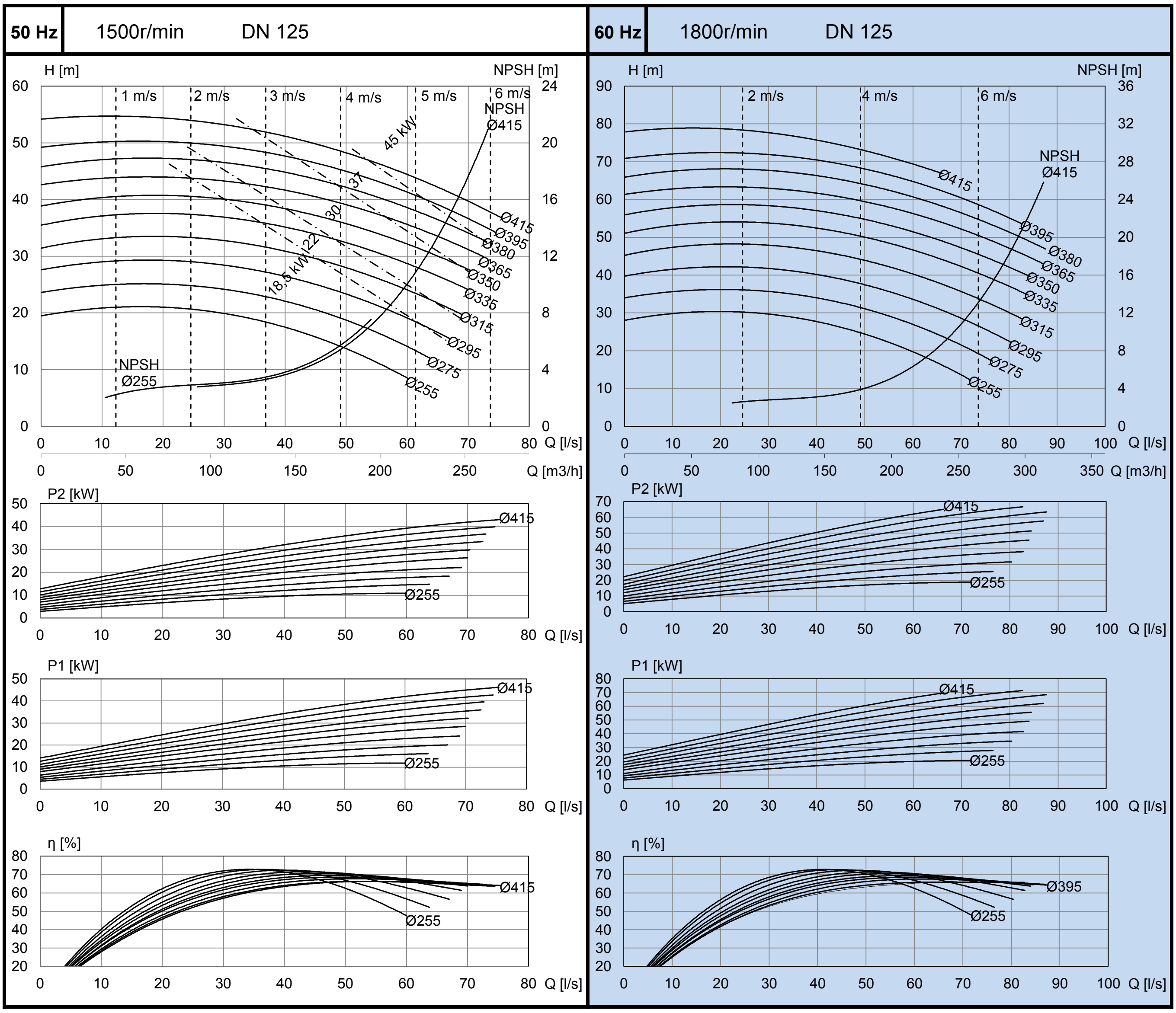
50 Hz	3000r/min DN 125



L-125S/4 | LH-125S/4 | LS-125S/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-186 G2 F41	18,5	34,4	340	730
	KZ-186 K2 F41	22	40,3	350	730
	KZ-205 K2 F41	30	55,2	405	800
	KZ-224 J2 F41	37	67,0	455	800
	KZ-225 K2 F42	45	81,1	485	830
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KZ-186 G2 F41	18,5 (22)	35,3 (35,1)	340	730
	KZ-186 K2 F41	22 (26)	41,6 (41,0)	350	730
	KZ-205 K2 F41	30 (36)	57,6 (57,1)	405	800
	KZ-224 J2 F41	37 (44)	69,5 (68,6)	455	800
	KZ-225 K2 F42	45 (54)	84,0 (83,8)	485	830
	KZ-256 J2 F42	55 (66)	102,1 (100,9)	570	870



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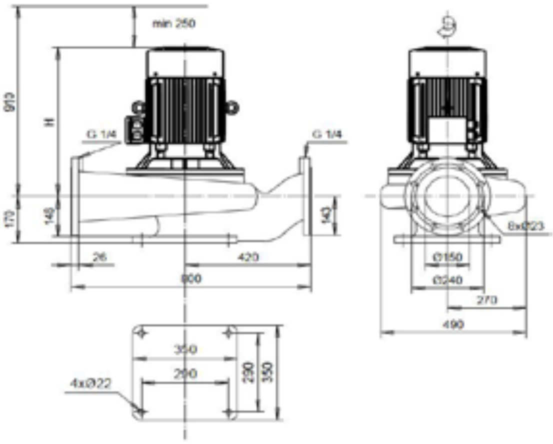
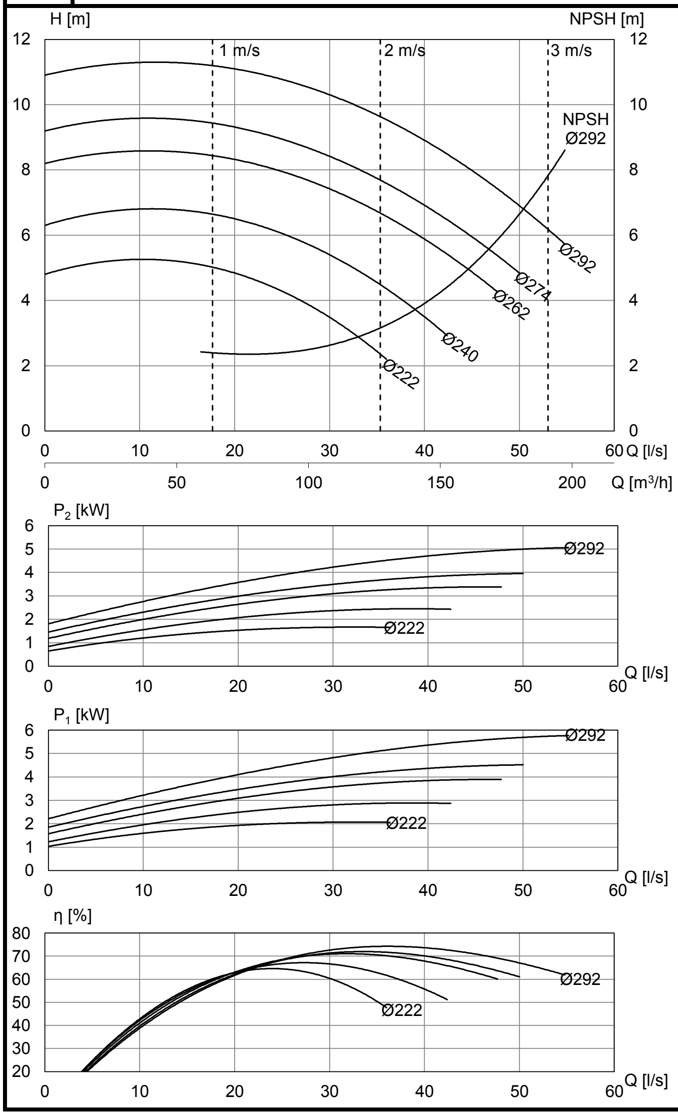
ALP-1153/6

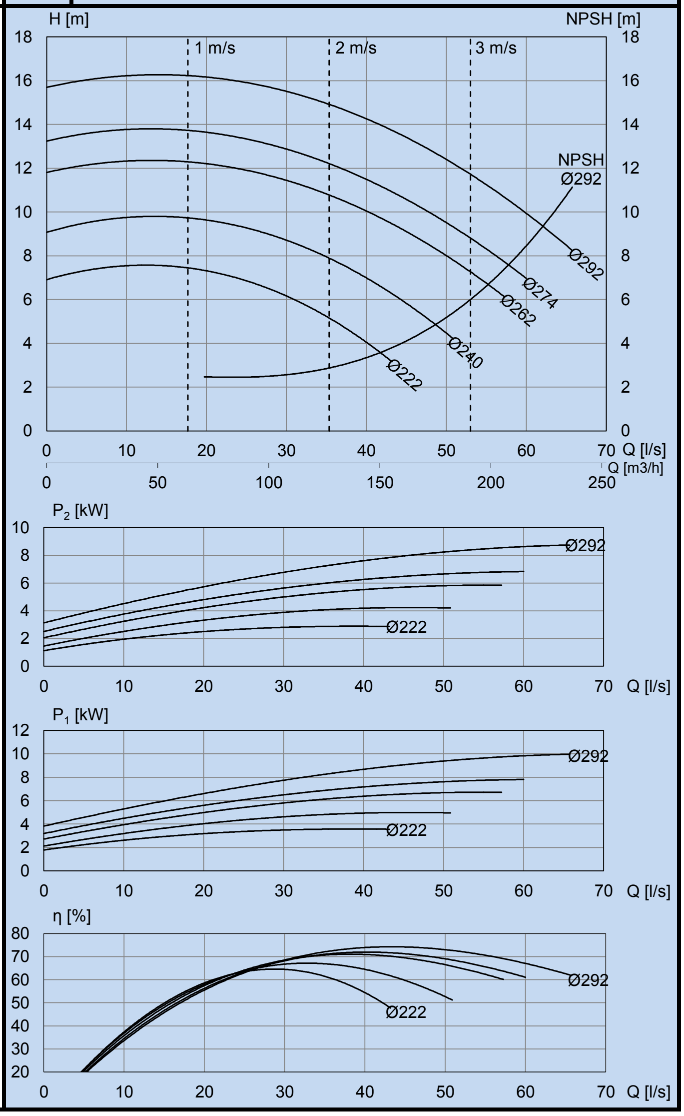


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50HZ	KH-133 G3 F31	5,5	12,30	200	550
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60HZ	KH-133 G3 F31	5,5 (6,6)	11,53 (12,18)	200	550
	KZ-165 G3 F31	7,5 (9)	16,30 (17,40)	250	660
	KZ-165 G3 F31	11 (13)	22,90 (23,20)	250	660

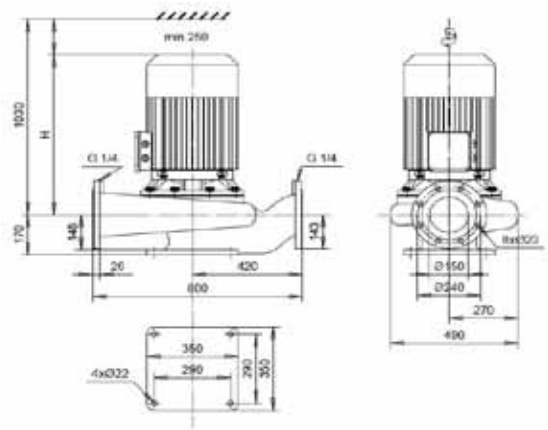
50 Hz 1000r/min DN 150



60 Hz 1200r/min DN 150

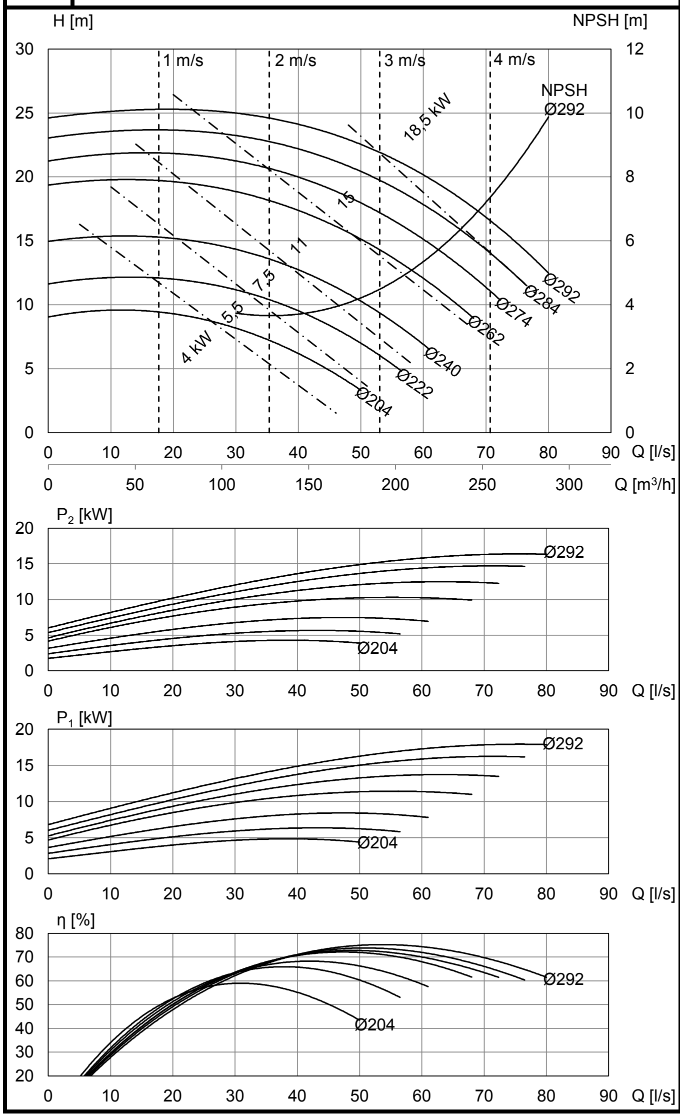


ALP-1153/4

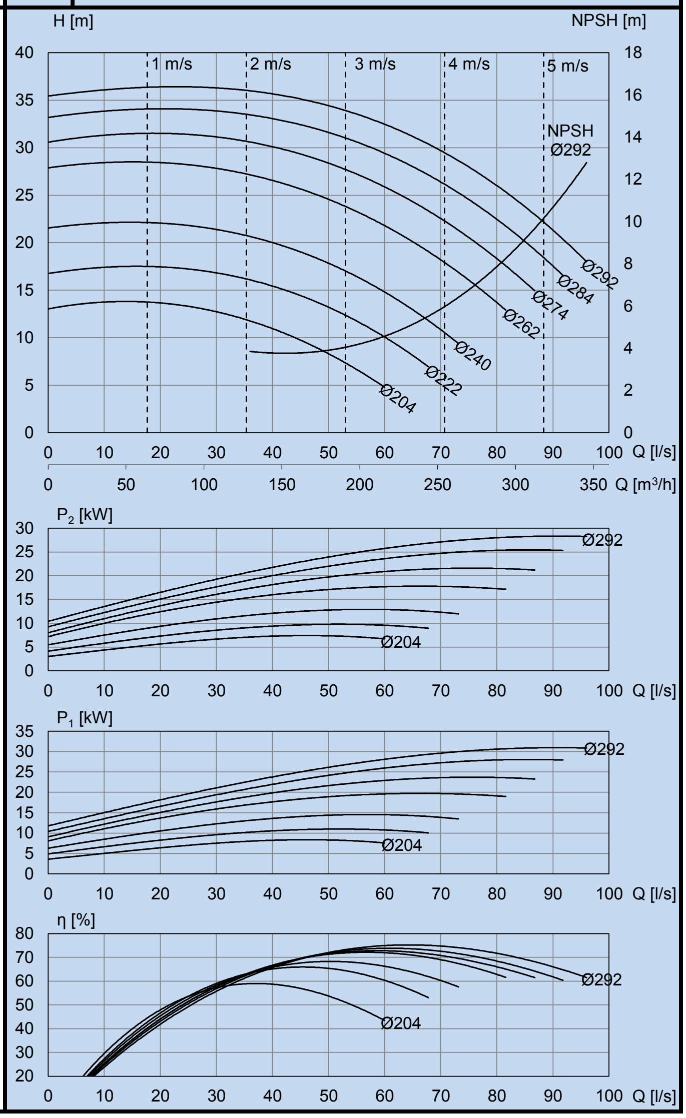


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C2 F31	4	8,13	177	500
50Hz	KH-132 E2 F31	5,5	10,95	184	500
50Hz	KH-133 G2 F31	7,5	14,88	196	550
50Hz	KZ-165 F2 F31	11	20,75	250	660
50Hz	KZ-165 G2 F31	15	28,1	255	660
50Hz	KZ-186 G2 BF31	18,5	34,4	295	720
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	177	500
60Hz	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	184	500
60Hz	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	196	550
60Hz	KZ-165 F2 F31	11 (13)	21,35 (21,35)	250	660
60Hz	KZ-165 G2 F31	15 (18)	29,10 (28,75)	255	660
60Hz	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	295	720
60Hz	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	310	720
60Hz	KZ-205 K2 F31	30 (30)	57,60 (57,60)	370	780

50 Hz 1500r/min DN 150



60 Hz 1800r/min DN 150



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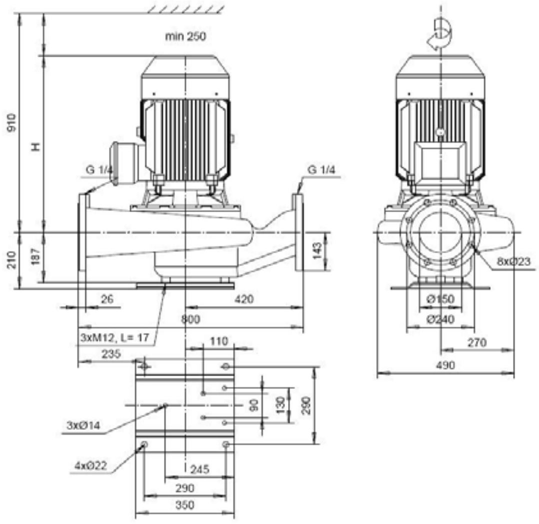
AL-1154/6 ALH-1154/6 ALS-1154/6 ALM-1154/6



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-133 G3 F31	5,5	12,30	200	550
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-133 G3 F31	5,5 (6,6)	11,53 (12,18)	200	550
	KZ-165 G3 F31	7,5 (9)	16,30 (17,40)	250	660
	KZ-165 G3 F31	11 (13)	22,90 (23,20)	250	660

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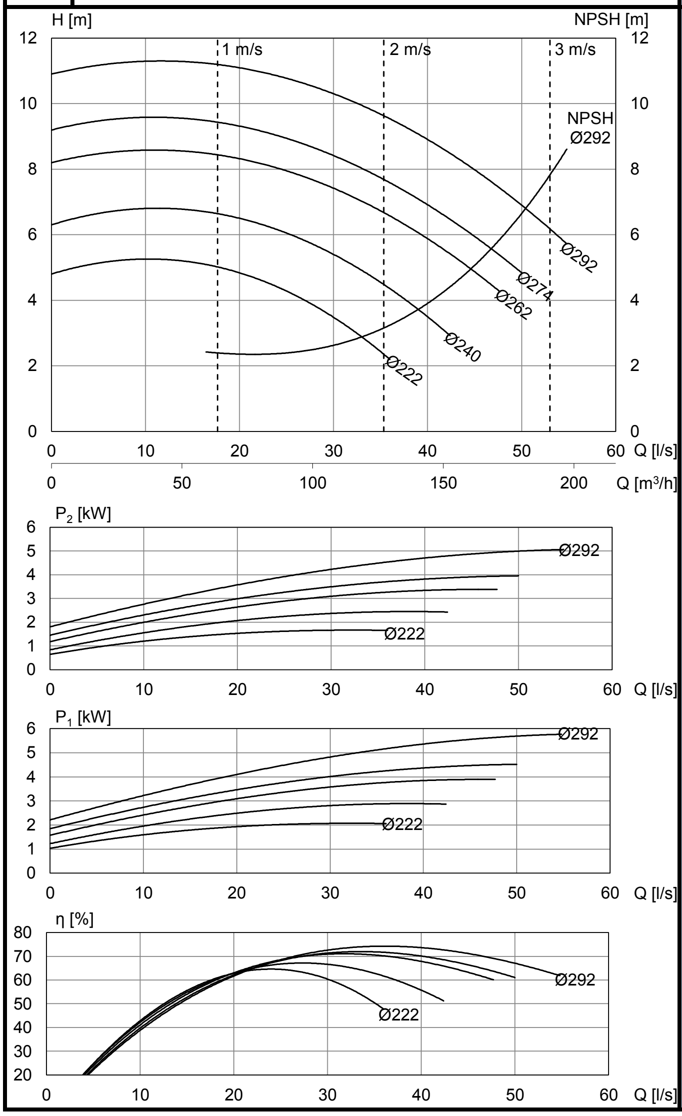
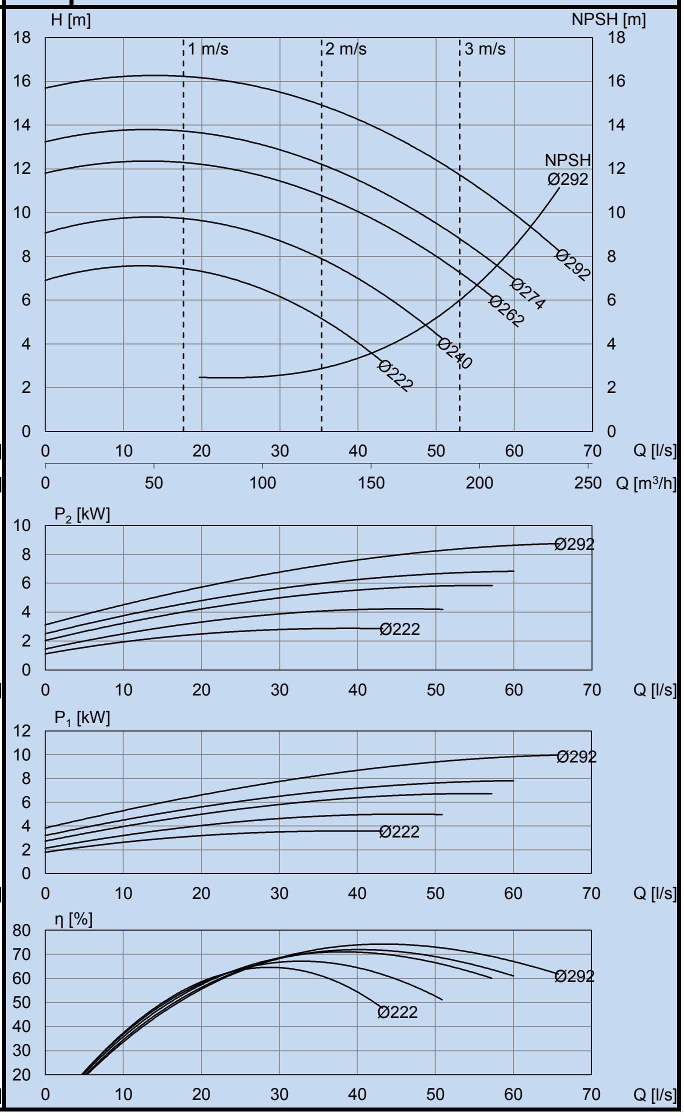
50 Hz 1000r/min DN 150



60 Hz 1200r/min DN 150



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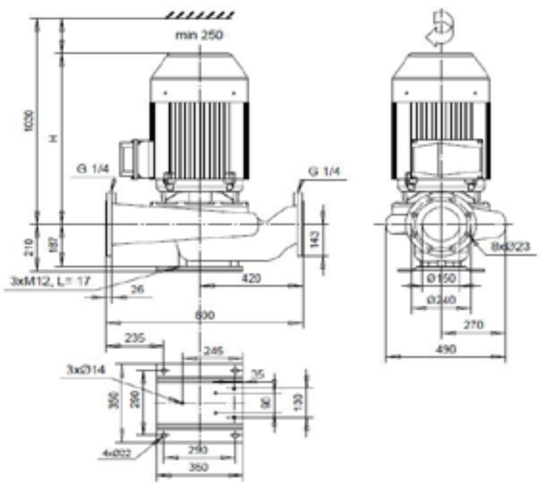
AL-1154/4 ALH-1154/4 ALS-1154/4 ALM-1154/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C2 F31	4	8,13	177	500
	KH-132 E2 F31	5,5	10,95	184	500
	KH-133 G2 F31	7,5	14,88	196	550
	KZ-165 F2 F31	11	20,75	250	660
	KZ-165 G2 F31	15	28,10	255	660
	KZ-186 G2 BF31	18,5	34,40	295	720
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	177	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	184	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	196	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	250	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	255	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	295	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	310	720
	KZ-205 K2 F31	30 (30)	57,60 (57,10)	370	780

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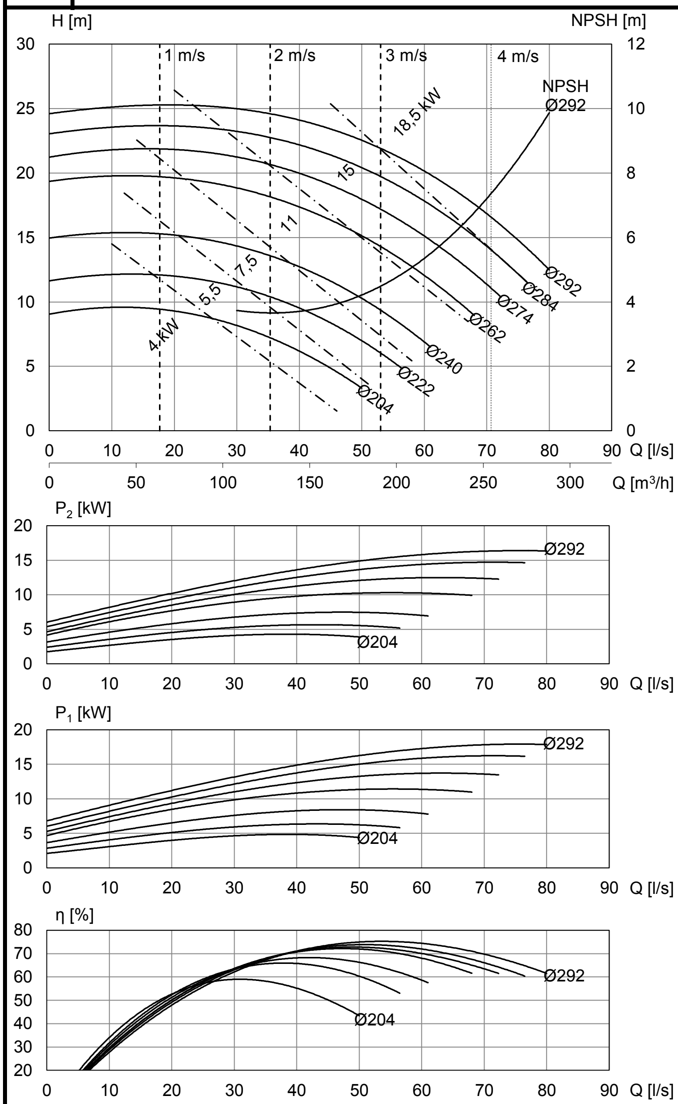
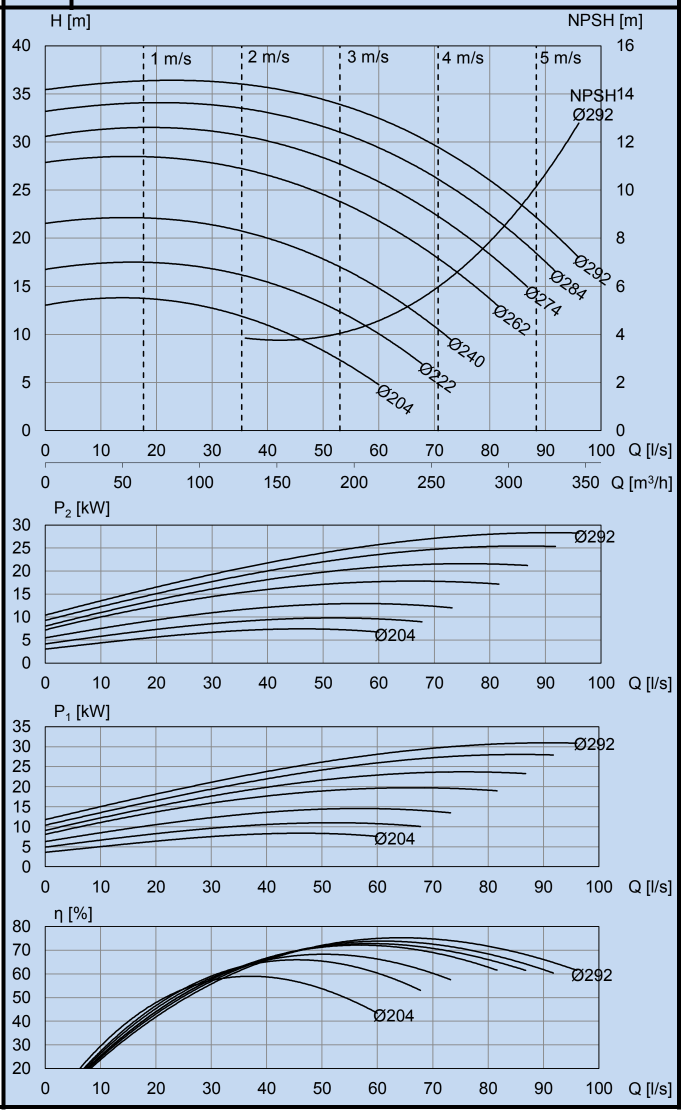
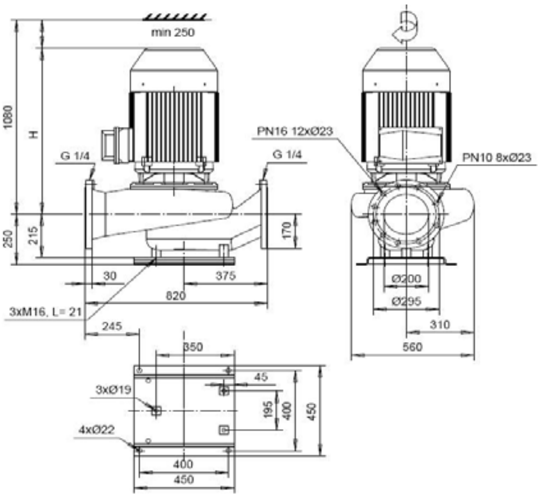
50 Hz	1500r/min	DN 150



60 Hz	1800r/min	DN 150



AL-1202/6 ALH-1202/6 ALP-1202/6 ALS-1202/6 ALM-1202/6



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-133 G3 F31	4	10,2	275	610
	KH-133 G3 F31	5,5	12,3	275	610
	KZ-165 G3 F31	7,5	17,7	320	720
	KZ-165 G3 F31	11	23,3	320	720
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
	KH-133 G3 F31	4 (4,8)	9,89 (10,28)	275	610
	KH-133 G3 F31	5,5 (6,6)	11,53 (12,18)	275	610
	KZ-165 G3 F31	7,5 (9)	16,30 (17,40)	320	720
	KZ-165 G3 F31	11 (13)	22,00 (23,20)	320	720
	KZ-205 G3 F32	15 (18,5)	30,80 (31,30)	440	830
	KZ-205 G3 F32	18,5 (22)	37,40 (36,00)	440	830

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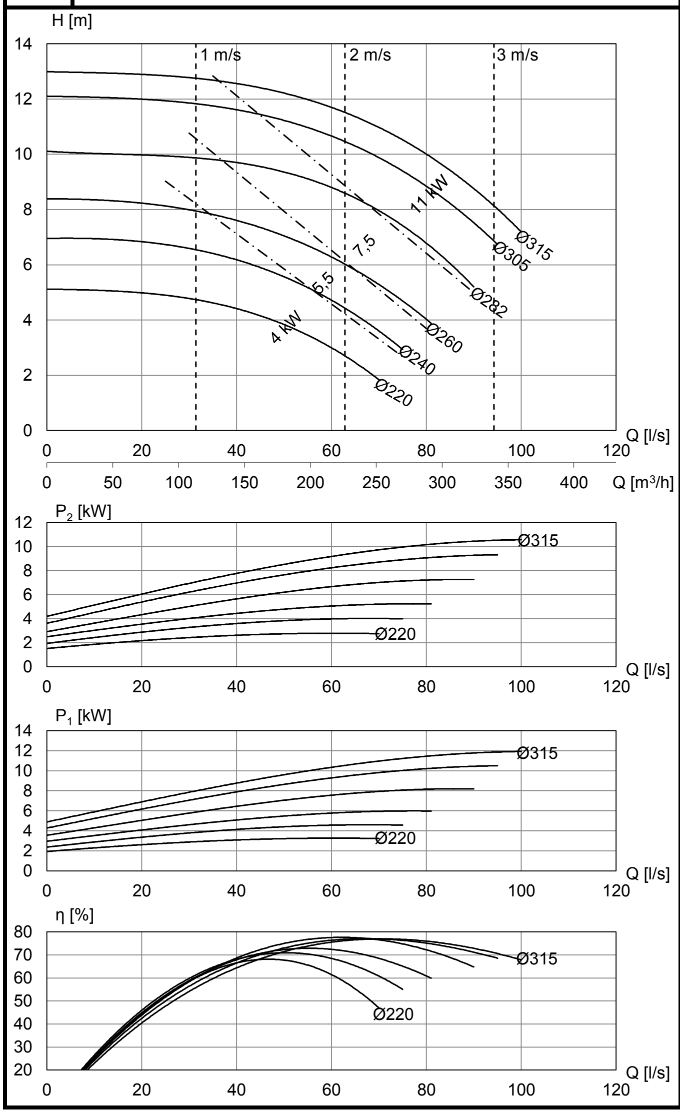
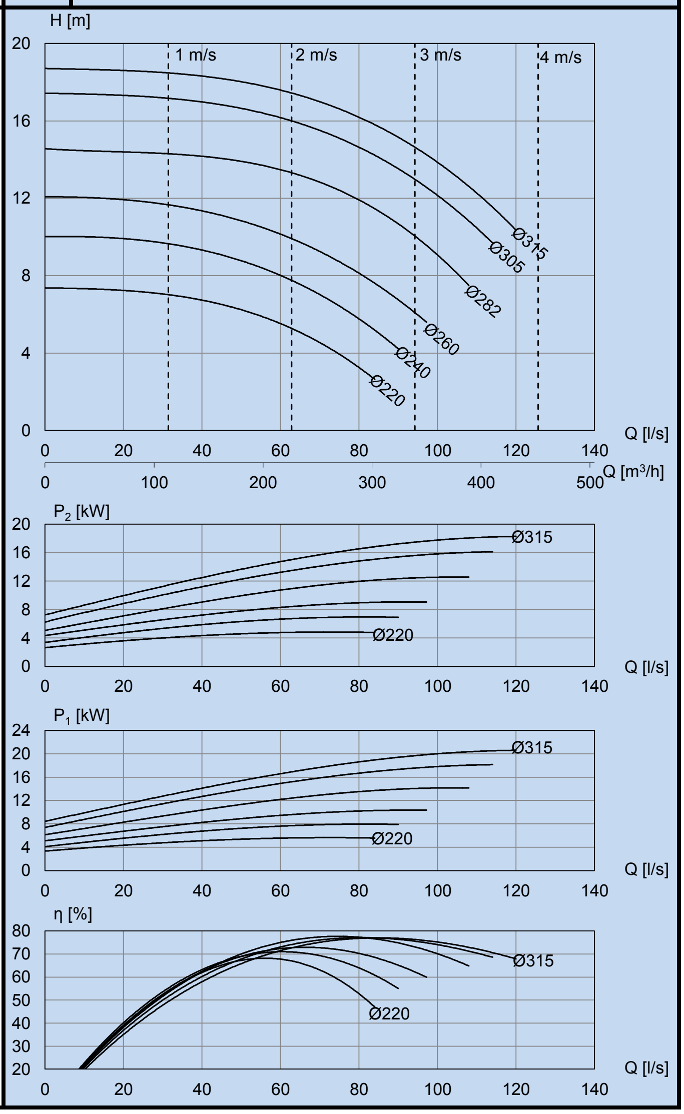
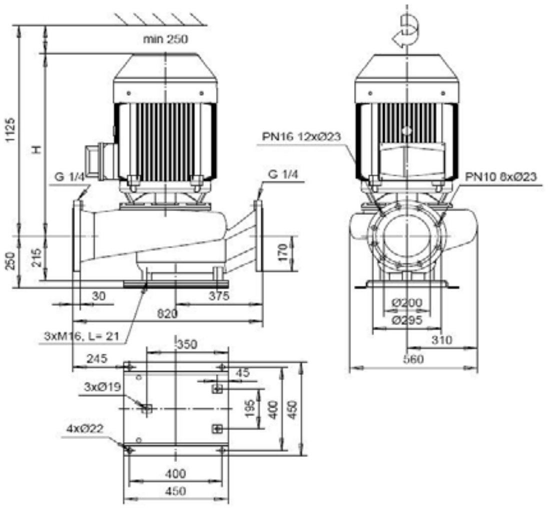
50 Hz	1000r/min	DN 200	60 Hz	1200r/min	DN 200



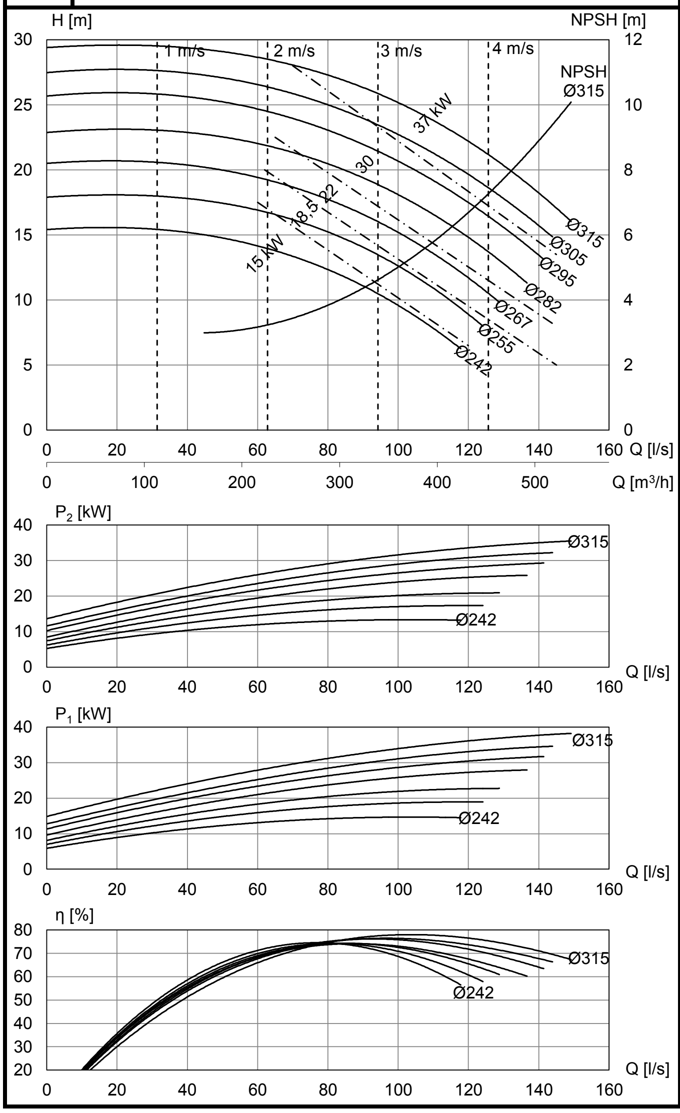


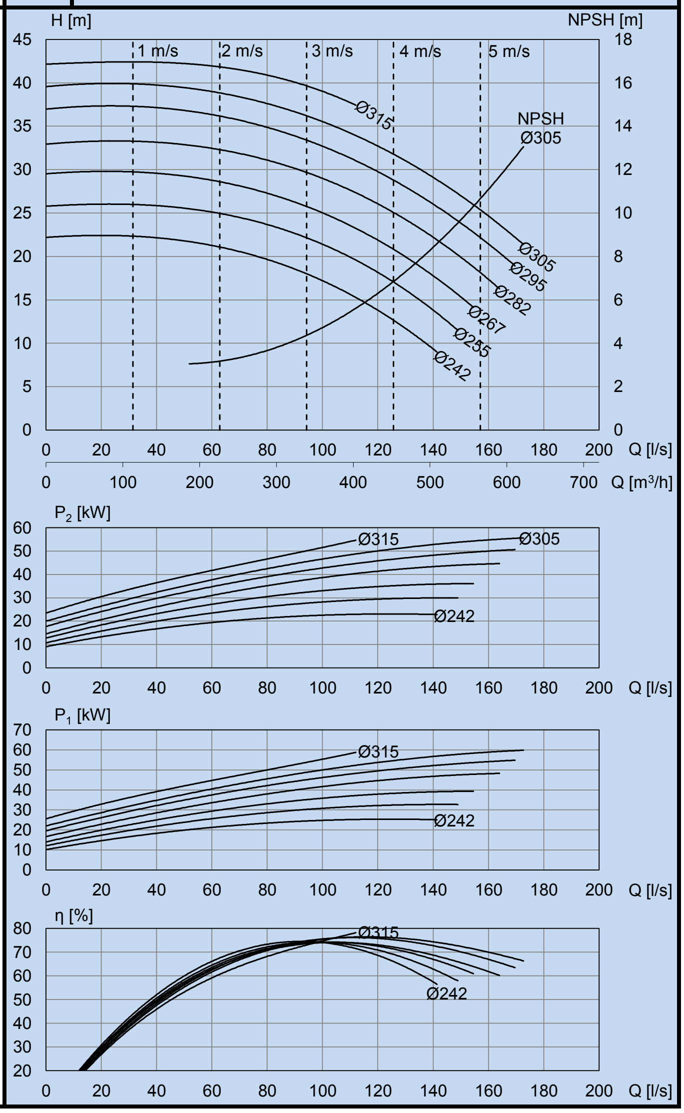
AL-1202/4 ALH-1202/4 ALP-1202/4 ALS-1202/4 ALM-1202/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-165 G2 F31	15	28,1	325	720
	KZ-186 G2 BF31	18,5	34,4	365	780
	KZ-186 K2 BF32	22	40,3	380	780
	KZ-205 K2 F32	30	55,2	435	830
	KZ-224 J2 F32	37	67,0	485	840
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	365	780
	KZ-186 K2 BF32	22 (26)	41,60 (41,00)	380	780
	KZ-205 K2 F32	30 (36)	57,60 (57,10)	435	830
	KZ-224 J2 F32	37 (44)	69,50 (68,60)	485	840
	KZ-225 K2 F33	45 (54)	84,00 (83,80)	510	880

50 Hz	1500r/min DN 200	60 Hz	1800r/min DN 200





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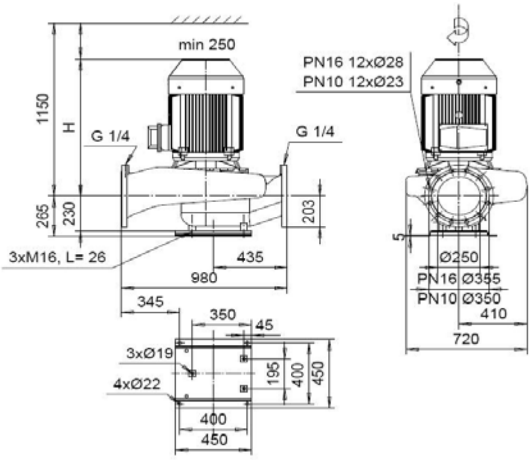
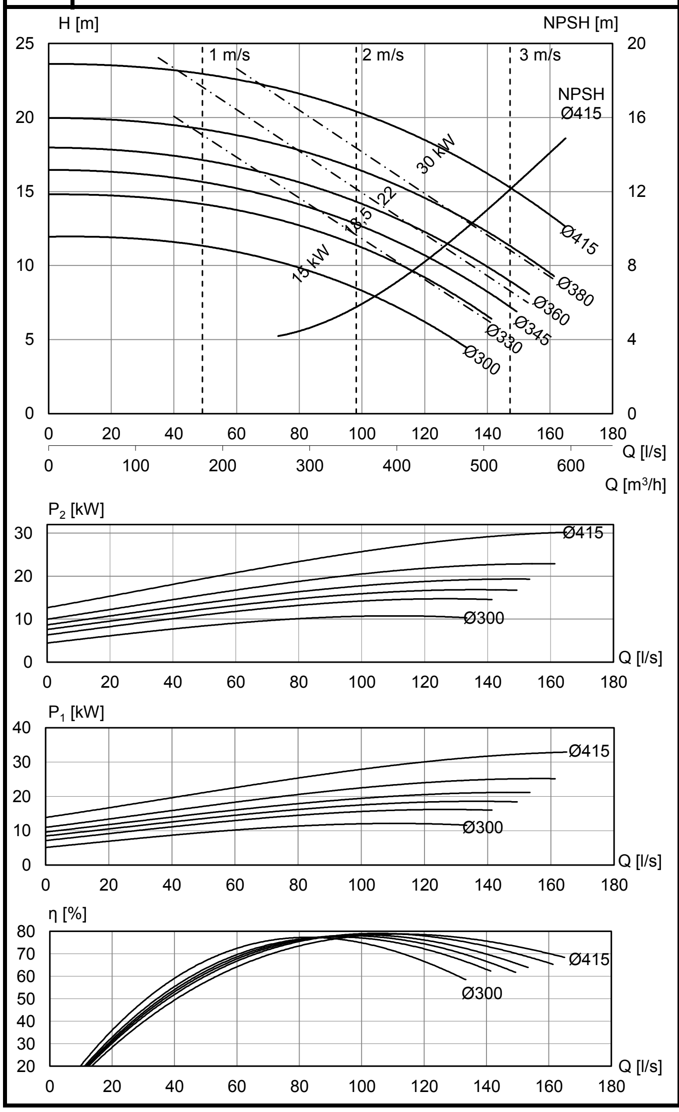
AL-1250/6 ALH-1250/6 ALP-1250/6 ALS-1250/6

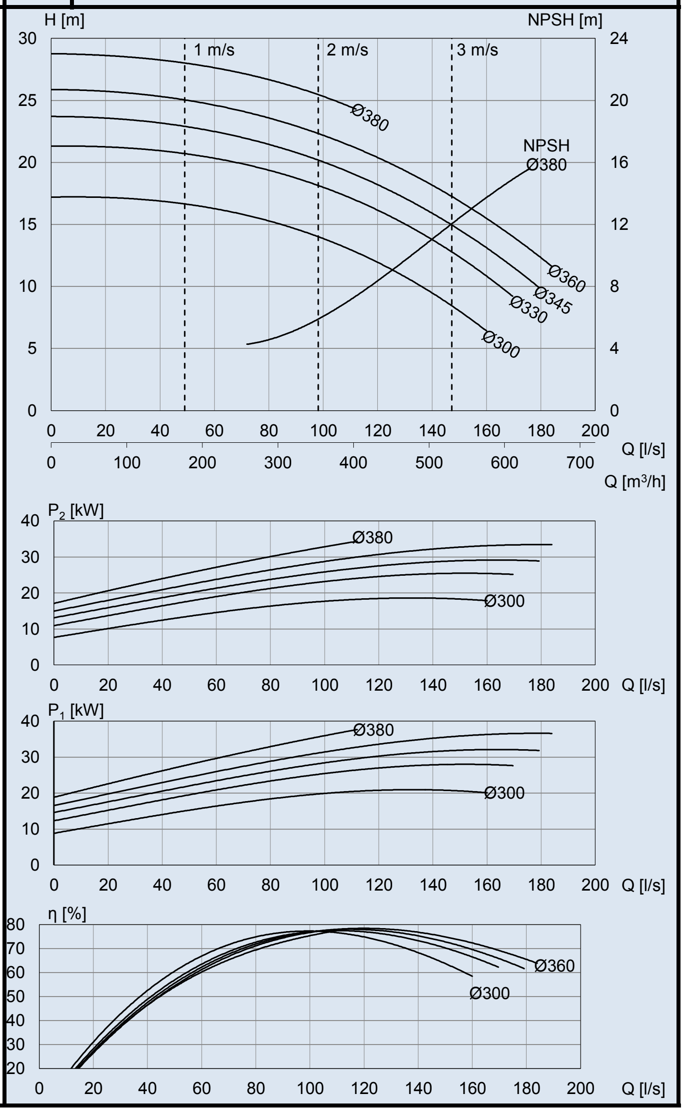


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-205 G3 F41	15	29,7	540	880
50Hz	KZ-205 G3 F41	18,5	36,4	540	880
50Hz	KZ-205 H3 F41	22	42,1	550	880
50Hz	KZ-225 G3 F42	30	56,2	620	900
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KZ-205 G3 F41	18,5 (22)	37,4 (36,0)	540	880
60Hz	KZ-205 H3 F41	22 (26)	43,4 (42,5)	550	880
60Hz	KZ-225 G3 F42	30 (36)	58,3 (57,8)	620	900

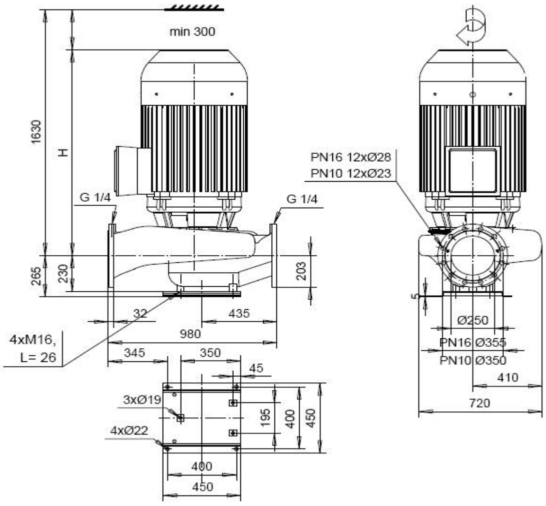
50 Hz 1000r/min DN 250



60 Hz 1200r/min DN250

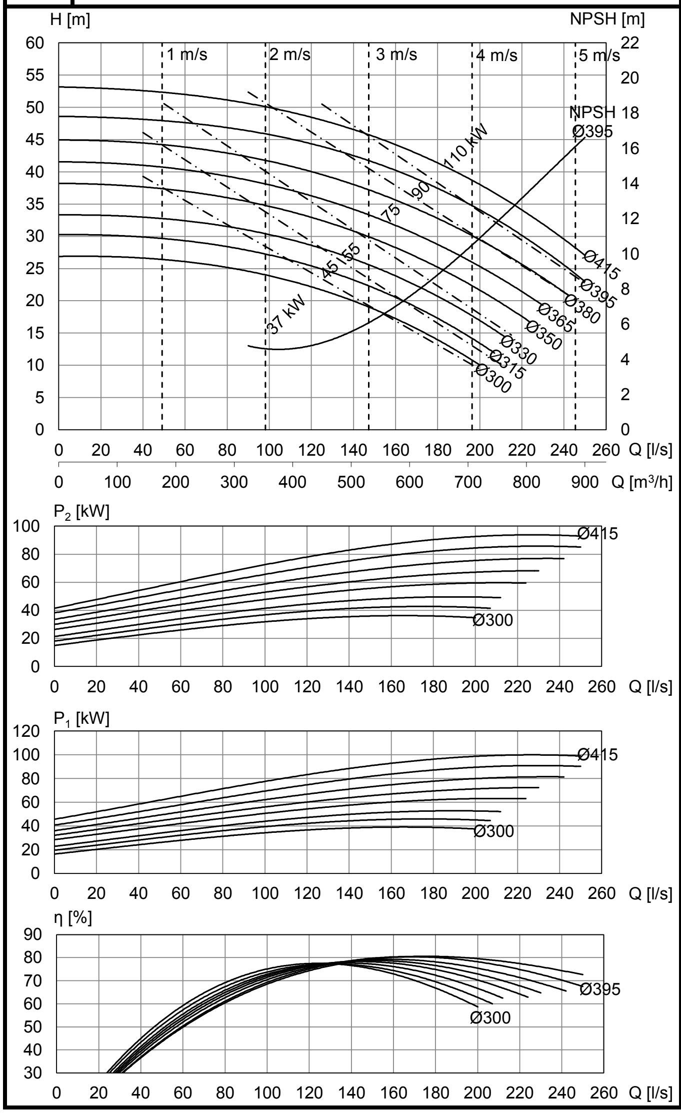


AL-1250/4 ALH-1250/4 ALP-1250/4 ALS-1250/4 ALM-1250/4

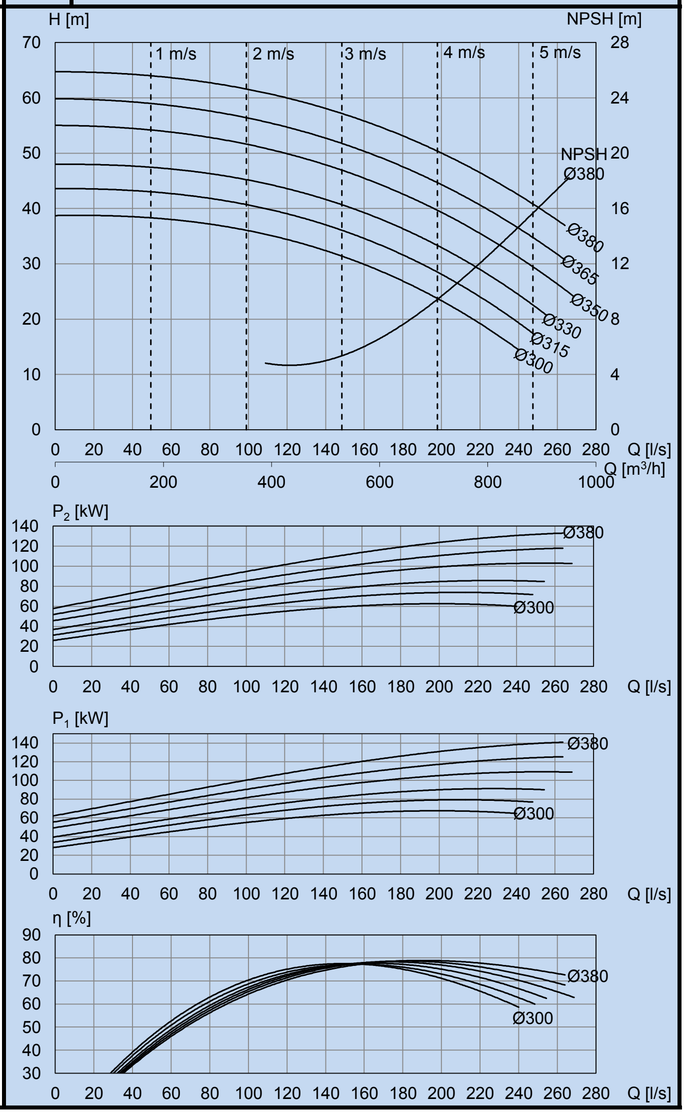


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-224 J2 F41	37	67,0	580	880
	KZ-225 K2 F42	45	81,1	610	900
	KZ-256 J2 F42	55	98,7	690	950
	KZ-287 J2 F43	75	133,9	850	1020
	KZ-288 K2 F43	90	158,5	920	1070
	KZR-314 H2 F43	110	193,2	1210	1330
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KZ-225 K2 F42	45 (54)	84,0 (83,8)	610	900
	KZ-256 J2 F42	55 (66)	102,1 (100,9)	690	950
	KZ-287 J2 F43	75 (90)	138,6 (139,0)	850	1020
	KZ-288 K2 F43	90 (105)	156,2 (159,6)	920	1070
	KZR-314 H2 F43	110 (132)	199,9 (198,2)	1210	1330

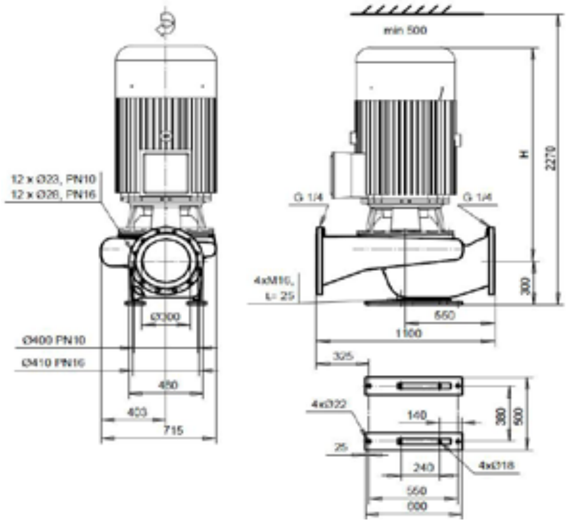
50 Hz 1500r/min DN 250



60 Hz 1800r/min DN 250

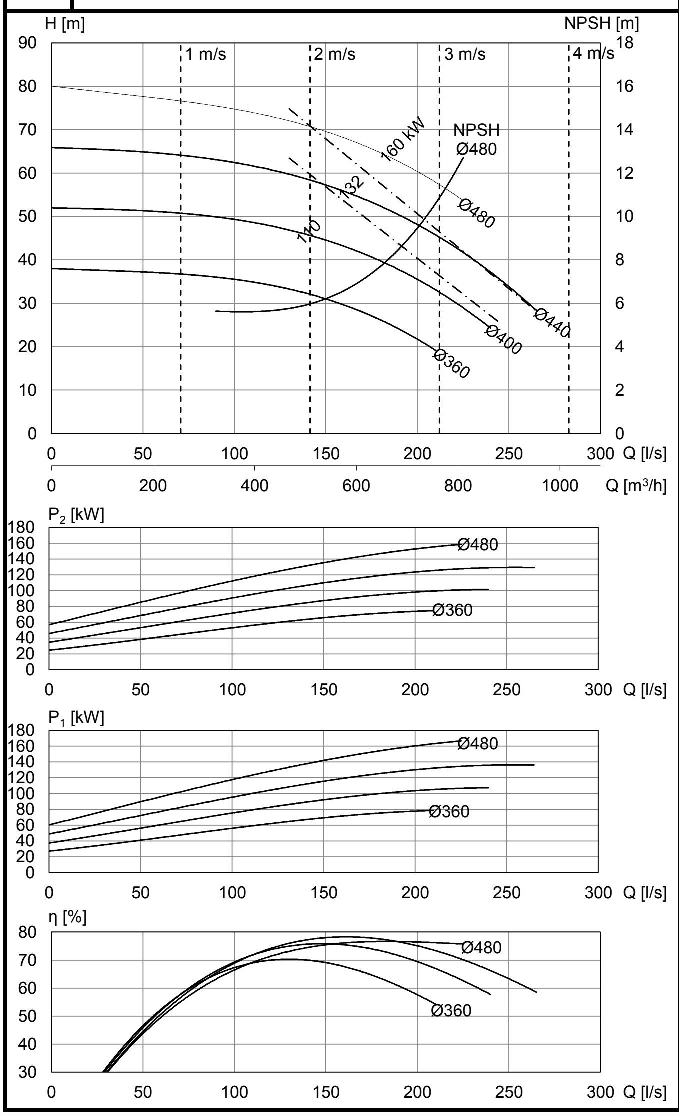


AL-1300/4 **ALH-1300/4** **ALS-1300/4**

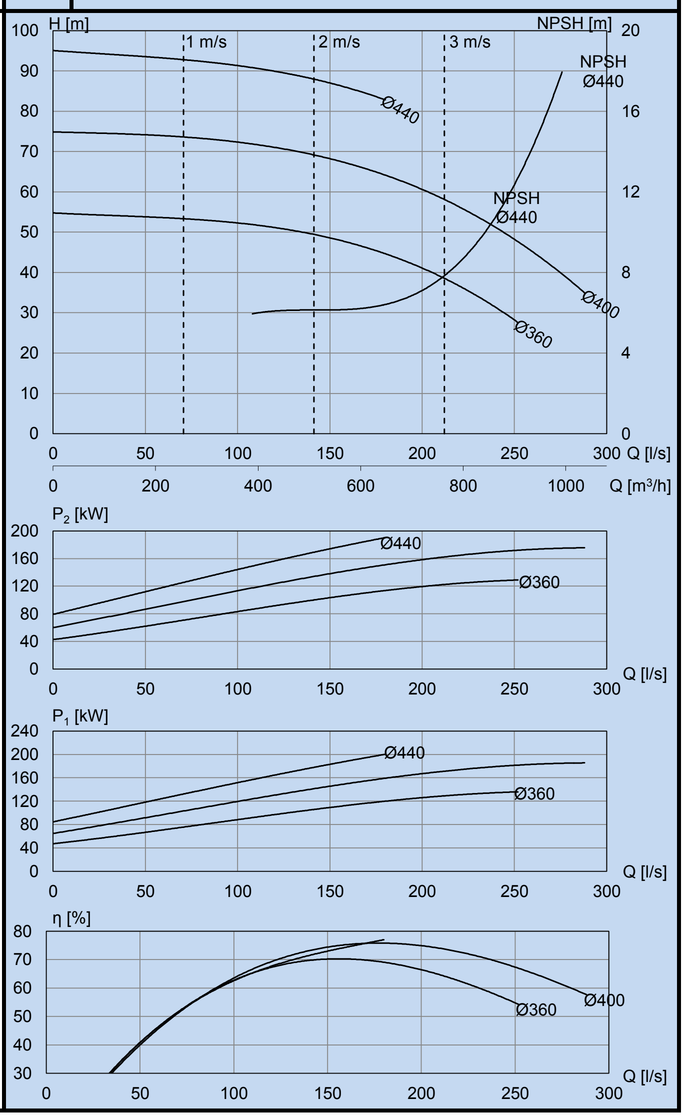


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZR-314 H2 F53	110	193,20	1470	1360
	KZR-316 J2 F53	132	231,20	1590	1470
	KZR-316 K2 F53	160	279,70	1660	1470
60Hz	**Motor 380-400V(460-480V)**	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KZR-314 H2 F53	110 (132)	199,9 (198,2)	1470	1360
	KZR-316 J2 F53	132 (158)	242,6 (242,5)	1590	1470
	KZR-316 K2 F53	160 (190)	290,5 (287,3)	1660	1470

50 Hz 1500r/min DN 300



60 Hz 1800r/min DN 300



KOLMEKS
EFFICIENT RELIABILITY

INLINE TWIN PUMPS WITH FIXED-SPEED MOTOR, 3x400V
T- and AT-series, flanged DN32-DN250

www.kolmeks.com

General technical data

T and AT series twin pumps:

- Vertically installed inline centrifugal pumps

Applications

T and AT series pumps can be used as in circulating , pressure boosting and transfer pump systems for clean liquids in applications which require operational reliability and adjustable pumping.

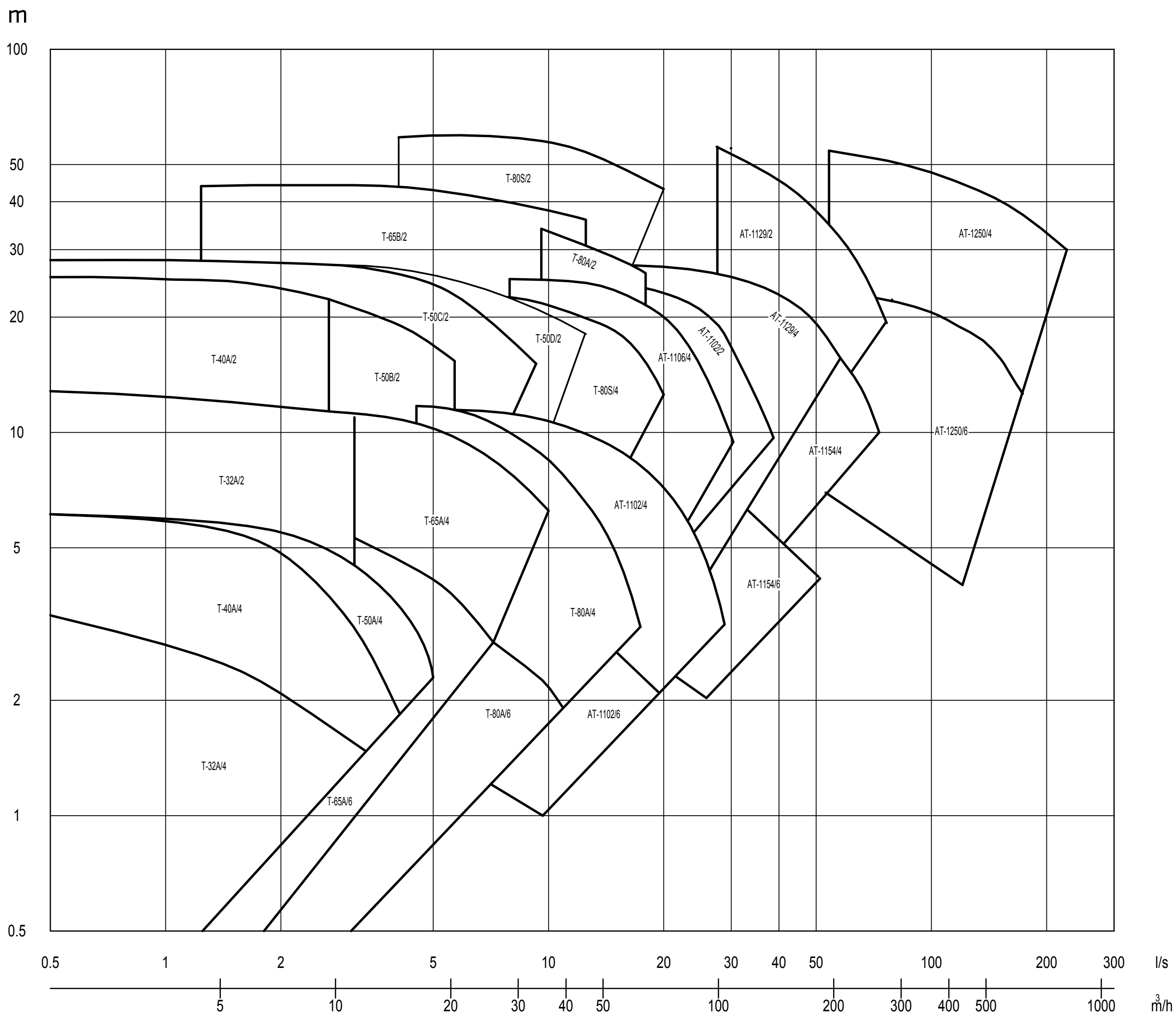
Structure

Pump

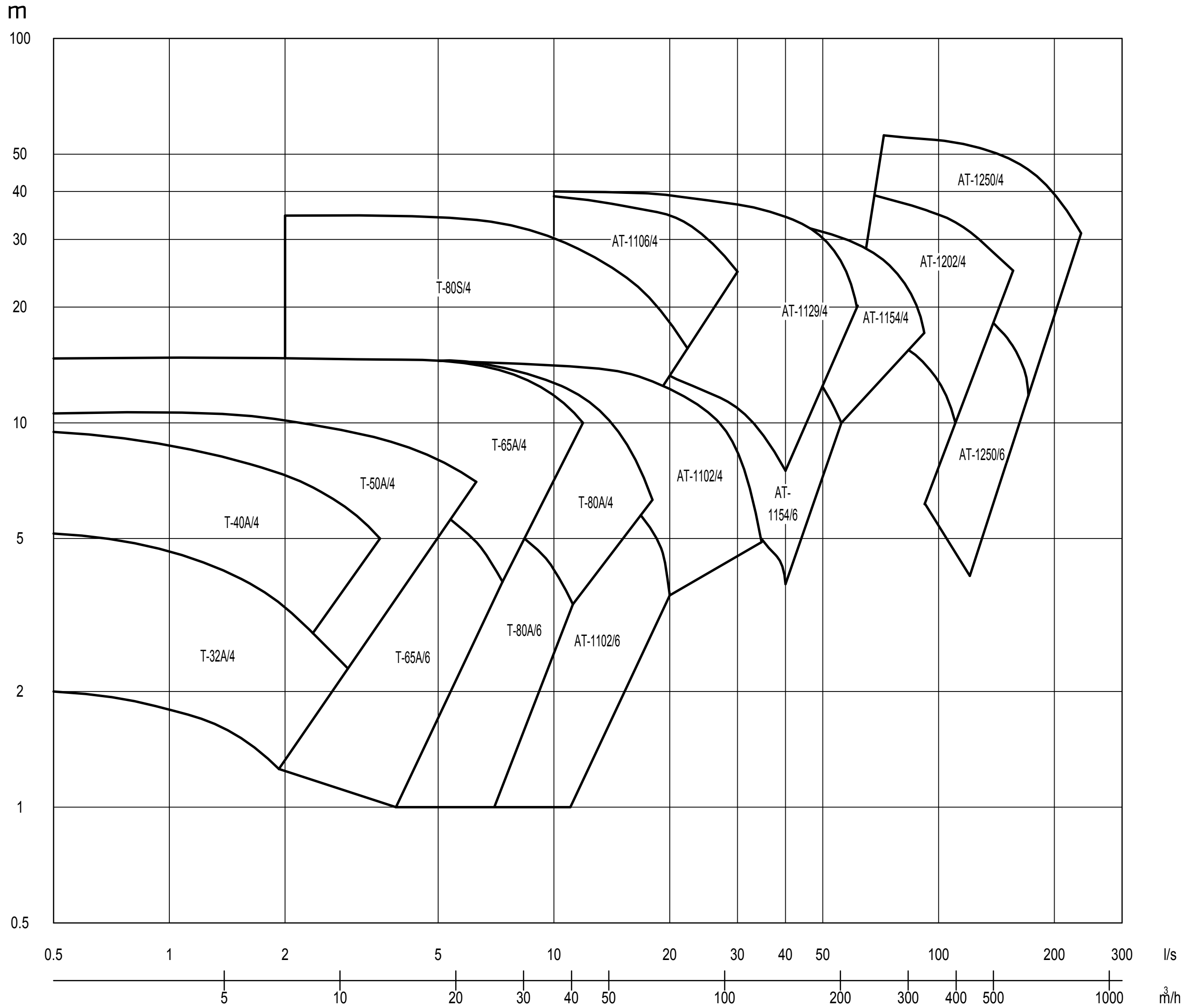
T and AT series twin pumps are vertically installed monoblock-constructed centrifugal pumps equipped with a dry motor. The pump impellers are installed directly onto the shaft of the electric motor (no separate couplings). Both units of the twin pump rotate in the same direction (except AT-1102, -1106, -1129, -1154 and -1202).

The twin pumps include a pump housing with two pump hydraulics which is cast as one piece and is additionally equipped with an automatic relief valve to prevent internal circulation. The relief valve does not operate as a non-return valve required by the system. The change over duty of the pump units can easily be automatised, because there is no need to open or close the valves in the piping when changing the operating unit.

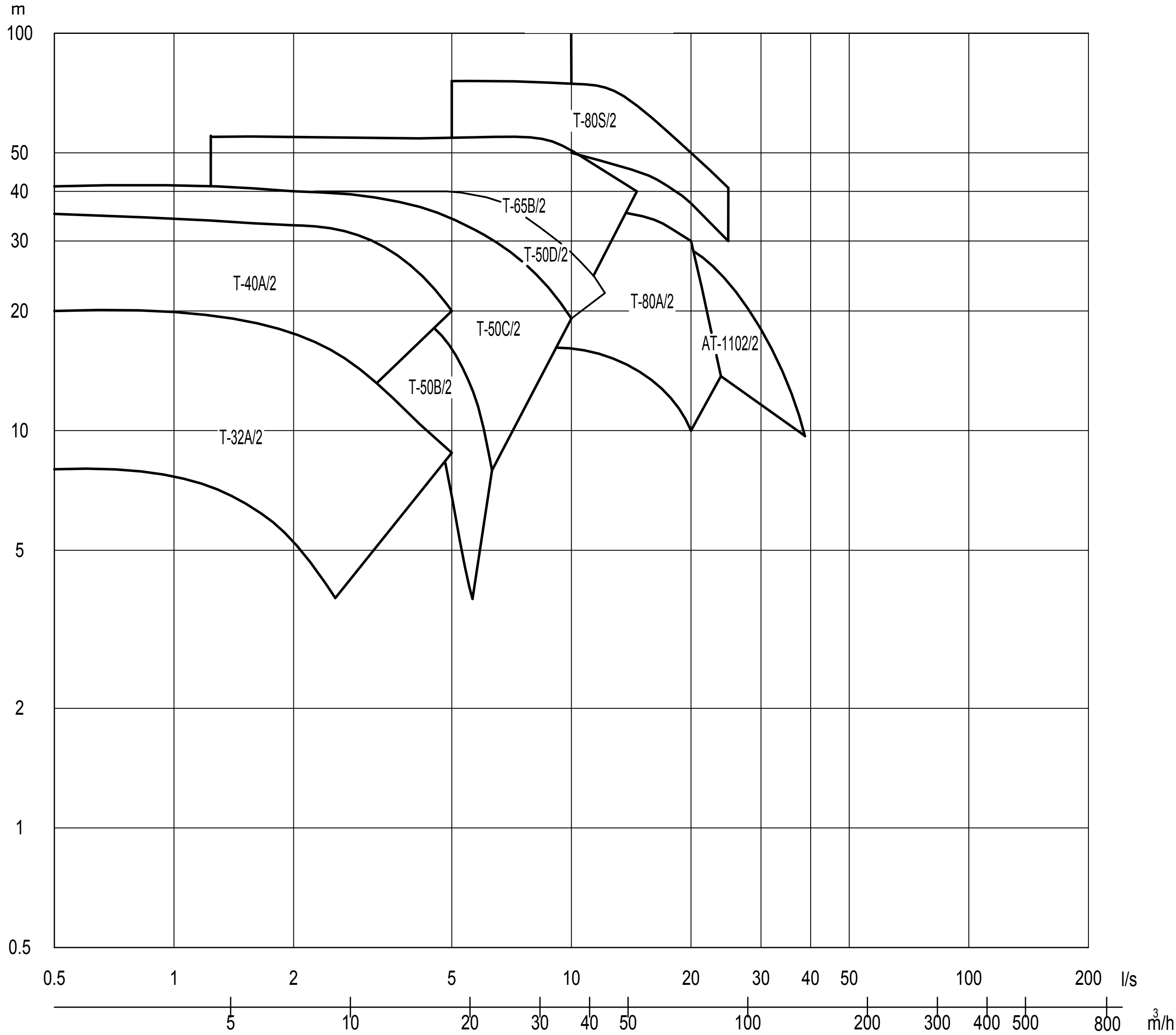
Quick Selection Chart



Quick Selection Chart 4-poles 60Hz



Quick Selection Chart 2-poles 60Hz



Electric motor

The electric motor of the T and AT series pump is a Kolmeks asynchronous motor designed for pump use. The electric motor is highly efficient and has low noise levels. The electric motor is suitable for frequency converter use.

Standard voltages:	400/230 V, 50 Hz		0,03–3 kW
	690/400 V, 50 Hz		4–160 kW
Enclosure classes:	IP 54	0,03–3 kW	1000, 1500r/min
		0,25–4 kW	3000r/min
	IP55	4–160 kW	1000, 1500r/min
		5,5–55 kW	3000r/min
Insulation class:	F		
Duty type:	S1 (continuous duty)		
Ambient temperature:	max. +45°C		

NOTE! Kolmeks electric motors are available with other enclosure classes and special voltages by request.

Flanges

The flanges of the T and AT series pump fit counter-flanges dimensioned according to ISO 7005.

Seals

The standard shaft seal of a T and AT series pump is a single mechanical seal. Several seal constructions are available for the pumps (see seal structures). The seal in the pump housing is an O-ring or a gasket.

Standard paint

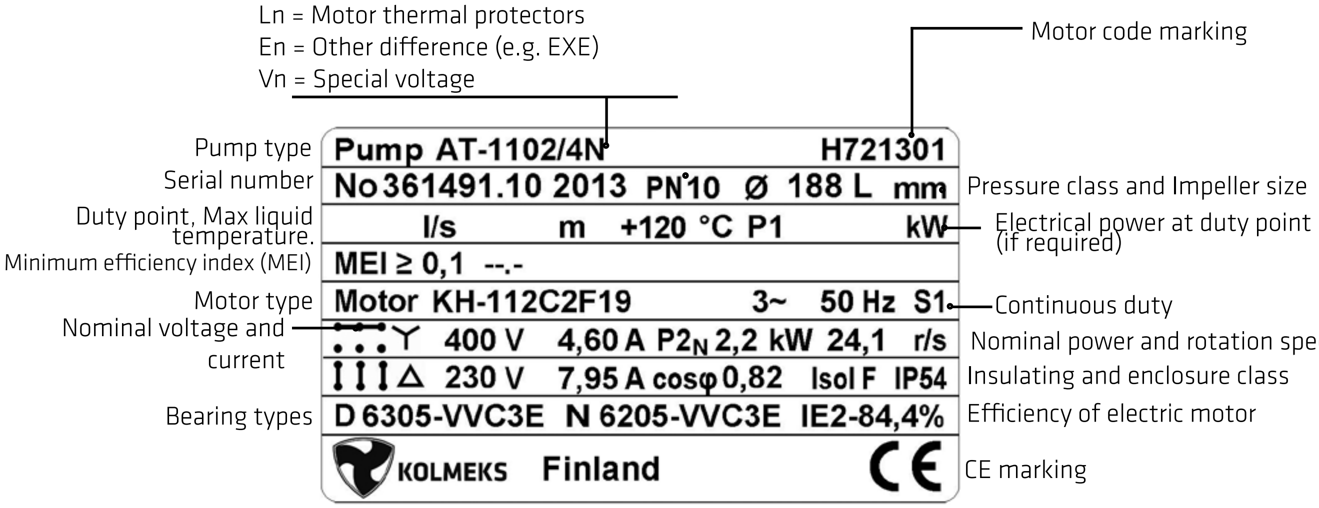
The pumps are painted according to Standard SFS-EN ISO 12944-5, AY100/1-FeSa2½. The surface colour is RAL3020. Epoxy paints and other colour alternatives are available by special order.

Fields of application, standard materials and abbreviations

Rating plate

Accessories:
P = Single-phase
N = Seal kit No 7
T = External shaft seal
H = Flushing
KT = Double shaft seal
Sn = Non-standard shaft seal
Kn = Non-standard surface treatment
Ln = Motor thermal protectors
En = Other difference (e.g. EXE)
Vn = Special voltage

Special impeller material:
PM = Bronze
SS = stainless steel AISI316



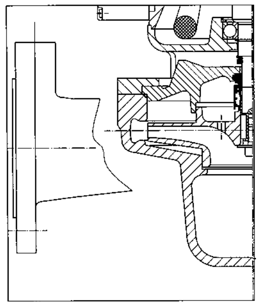
Standard materials and fields of application

Connection DN	Pump type	Pump housing	Sealing flange	Impeller	Shaft	Shaft seal, PN10 Ø [mm], Materials	O-ring size [mm]	O-ring Material	Motor [kW]
DN 32	T-32A/4	EN-GJL-200	EN-GJL-200	Noryl GFN2	SS2324 (AISI 329)	12, carbon/SiC EPDM	100 X 2,5	NBR	0,05-0,2
	T-32A/2	EN-GJL-200	EN-GJL-200	Noryl GFN2	SS2324 (AISI 329)	12, carbon/SiC EPDM	100 X 2,5	NBR	0,25-1,1
DN 40	T-40A/4	EN-GJL-200	EN-GJL-200	EN-GJL-200	SS2324 (AISI 329)	12, carbon/SiC EPDM	145 X 2,5	NBR	0,2-0,37
	T-40A/2	EN-GJL-200	EN-GJL-200	EN-GJL-200	SS2324 (AISI 329)	12, carbon/SiC EPDM	145 X 2,5	NBR	1,1-1,5
DN 50	T-50A/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	12, carbon/SiC EPDM	150 X 3	NBR	0,2-0,55
	T-50B/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	12, carbon/SiC EPDM	150 X 3	NBR	1,1
	T-50C/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	150 X 3	NBR	1,5-4
	T-50D/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	150 X 3	NBR	1,5-4
DN 65	T-65A/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,2-3
	T-65B/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,5-7,5
DN 80	T-80A/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37-3
	T80A/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	2,2-7,5
	T-80S/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	28, carbon/SiC EPDM	265 X 4	EPDM	1,1-7,5
	T-80S/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	28, carbon/SiC EPDM	265 X 4	EPDM	7,5-18,5
DN 100	AT-1102/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55-3
	AT-1102/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	4-7,5
	AT-1106/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	32, carbon/SiC EPDM	309/295X1	gasket	3-18,5
DN 125	AT-1129/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	32, carbon/SiC EPDM	309/295X1	gasket	3-22
	AT-1129/2	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	32, carbon/SiC EPDM	309/295X1	gasket	30-37
DN 150	AT-1154/6	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	32, carbon/SiC EPDM	309/295X1	gasket	5,5-11
	AT-1154/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	32, carbon/SiC EPDM	309/295X1	gasket	4-30
DN 250	AT-1250/6	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	40, carbon/SiC EPDM	405 X 7	EPDM	15-22
	AT-1250/6	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	50, carbon/SiC EPDM	405 X 7	EPDM	30
	AT-1250/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	40, carbon/SiC EPDM	405 X 7	EPDM	37
	AT-1250/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	50, carbon/SiC EPDM	405 X 7	EPDM	45-55
	AT-1250/4	EN-GJS-400	EN-GJS-400	EN-GJL-200	SS2324 (AISI 329)	65, carbon/SiC EPDM	405 X 7	EPDM	75-110

Grey cast iron = EN-GJL-200, PN10
Nodular cast iron = EN-GJS-400, PN16
Shaft, stainless steel = SS2324 (AISI 329)

Max. working pressure 10 bar
Operating temperature -15 ... +120°C (plastic impeller max. +100°C).

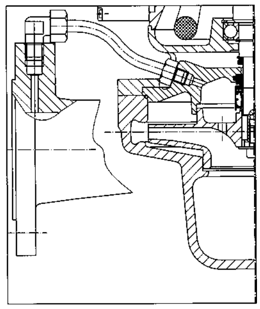
Seal structure alternatives



Standard structure

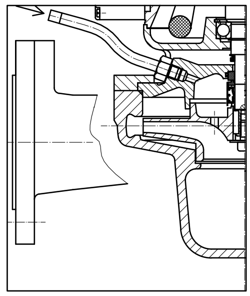
- Single mechanical seal
- Max. operating temperature +120°C.

The standard mechanical shaft seal is also suitable for water-glycol mixtures and most other refrigeration systems. The recommended glycol is propylene glycol and the mixture ratio can be no greater than 50%. Most often, a mixture ratio of 30–40% is adequate.



Internal flushing

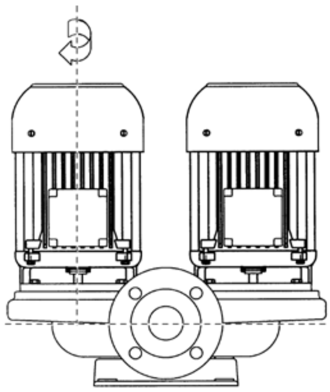
- Single mechanical seal
- Max. operating temperature +120°C.
- Circulation from the discharge side of the pump to the seal chamber which flushes the seal
- Available for pumps DN 50-250, in which case there is an additional marking ‘H’ e.g. T-65B/4H.



External flushing

- Single mechanical seal
- Plugged pipe to the seal body from which it is possible to flush the seal with external pressure if required
- Available for DN 50-250 pumps
- Crystallisable, accumulative liquids

Control automation in a twin pump



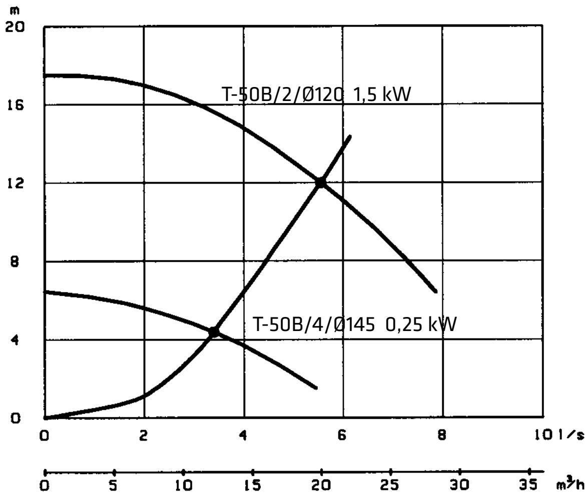
Operating principles:

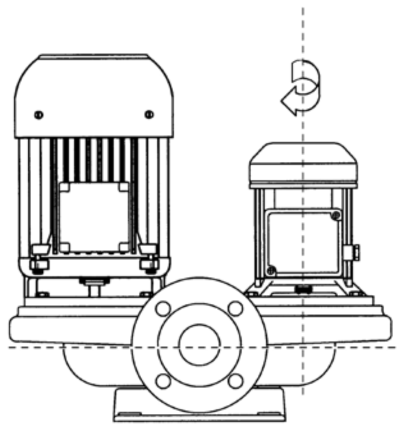
a) Standby pump and change over operation

Here, both units of the twin pump are similar. As one runs, the other operates as an automatic standby unit which starts automatically if the running pump stops e.g. if a thermal relay has tripped. We recommend adding alternate operation to this, allowing for both units to evenly obtain operating hours. This better ensures that they remain in good technical condition. A suitable alternation interval can be achieved e.g. by using a weekly clock.

b) Controlling twin pump according to pumping need

The units of the twin pump are different from each other. The unit of larger flow only runs when there is high demand; otherwise the smaller unit is in use. This arrangement achieves considerable savings in operation costs. Furthermore, the noises in circulating system with the large pump can be avoided when the demand for pumping is low. Most often in these cases, the other unit operates as an adequate automatic standby pump. Control information can be obtained as needed e.g. from temperature, pressure, differential pressure, clock etc.

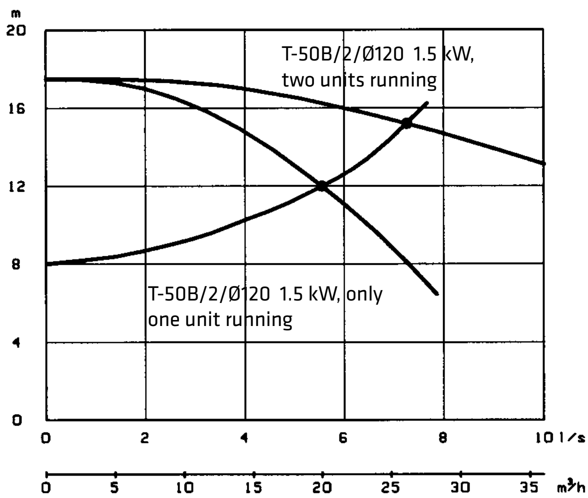


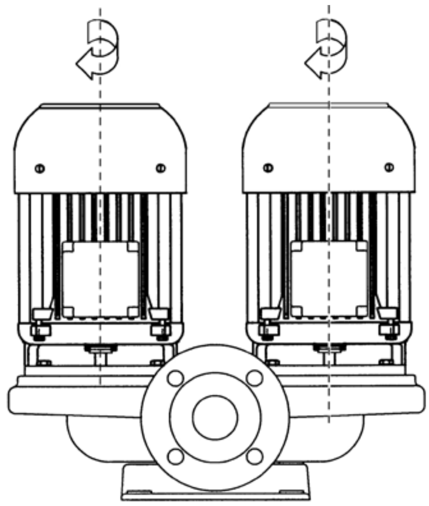


c) Combined operation of twin pump with large flow

The twin pump can also be used such that large flow is pumped by both units in parallel: but when demand is low, only one unit operates. In this case, the units must be similar. When using the pump in this way, the duty points on the pump QH curves and system curves should be very accurately determined. In circulation systems especially, it is often possible that no increase in pumping is obtained even with the parallel use of two similar pumps. This use can be applicable in situations where the system includes static head. For example, when transferring liquid from one tank to another from a lower level to an upper level. We also recommend alternation running in this case, whereby the devices are better maintained in good technical condition.

5





d) Frequency converter integrated alternation automation

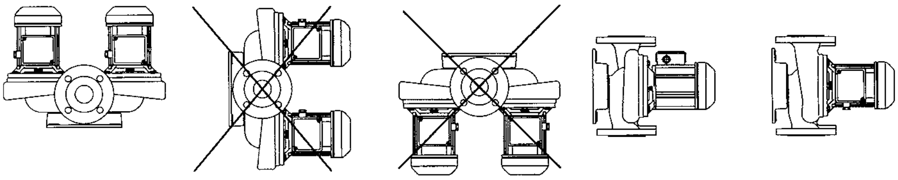
The pump alternation automation can be integrated with frequency converter operation, whereby the frequency converter pump can be alternated as usual. In most fault situations, the other pump automatically switches on to the fixed speed (bypassing the frequency converter).

Installation

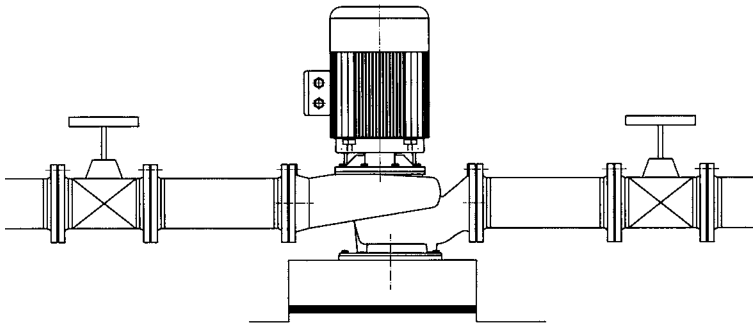
Ensure the following when installing the pump:

- Enough room for service and inspection
- Possibility to use lifting and transfer devices if required
- Check valves on both sides of the pump. The position of the motor unit and therefore the location of the terminal box can be changed by detaching the motor unit from the pump housing and by installing it in the required position.

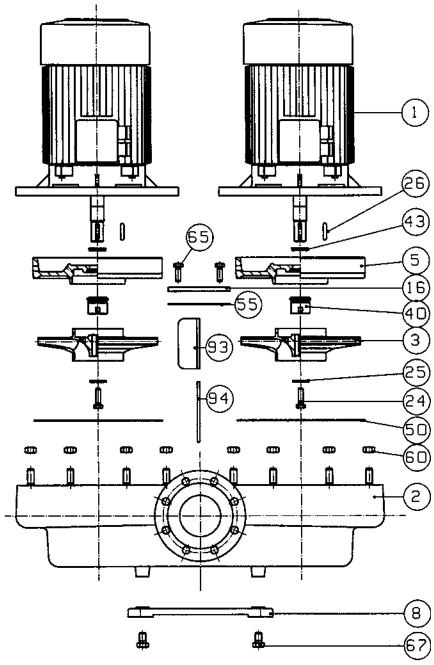
Small pumps (<DN100, less than 1.5 kW motors) can be installed in the piping without support.



Large pumps are fastened by their foot to a freely moving concrete base which is insulated from the floor e.g. by a 20mm thick rubber or cork mat. The weight of the concrete base must be about 1.5 times the weight of the pump.



Spare parts and service

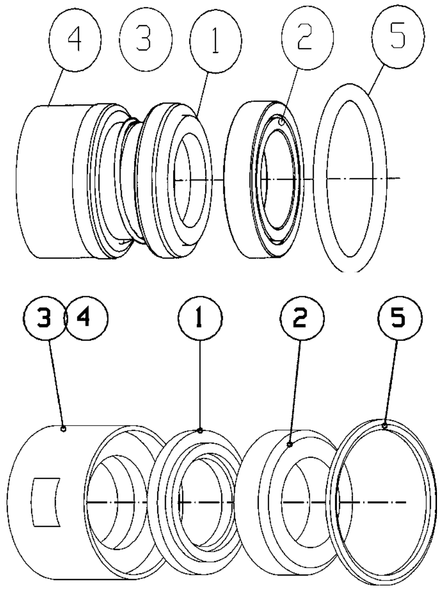


1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
8	Foot (not always)
16	Cover
24	Nut / Screw
25	Washer
26	Key
40	Shaft seal
43	V-ring (not always)
50	Housing O-ring / Gasket
55	Seal
60	Nut / Screw
65	Screw
67	Screw
93	Flap unit
94	Shaft

5

Seal kits

Pump type	Seal mm	Housing O-ring / Gasket mm
T-32A	12	100x2,5
T-40A	12	145x2,5
T-50A, -50B	12	150x3
T-50C	18	150x3
T-65A, -B, T-80A,	18	265x4
AT-1102	18	179,3x5,7
T-80S	28	265x4
AT-1106	32	309/295x1
AT-1129	32	309/295x1
AT-1154	32	309/295x1
AT-1202 5,5 ... 18,5 kW	32	315x6,3
AT-1202 22 ... 37 kW	40	315x6,3
AT-1202 45 kW	50	315x6,3
AT-1250 11 ... 22 kW	40	405x7
AT-1250 30 kW	50	405x7
AT-1250 37 kW	40	405x7
AT-1250 45 ... 55 kW	50	405x7
AT-1250 75 ... 110 kW	65	405x7



1 Rotating ring
2 Stationary ring
3 Body/bellows
4 Spring
5 O-ring

5

Motor unit

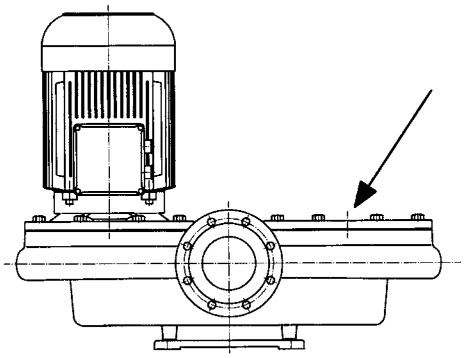
The pump motor unit is a new standby operation unit which includes:

1) Motor
2) Sealing flange
3) Impeller
4) Seals

If a motor malfunction or a seal leak occurs, replacing the motor unit is simple and quick and does not require long periods of downtime. No procedures need to be carried out on in the piping because there is no need to detach the pump housing. Note! The twin pump must be stopped and the check valves closed while replacing the unit.

Service cover

A service cover can be ordered separately for twin pumps and can be installed in place of the disconnected motor unit requiring service. This allows for the other unit to be used as usual during the service.



Reading of twin pump curves and pump selection

Please see below the datasheet for a twin pump which includes four different QH curves of the same pump, allowing for the selection of a pump in four different ways:

Pump selection and operation in the circulating system:

1. One unit in operation 50 Hz: QH curve (1.) on the left -> one unit runs with the maximum frequency 50 Hz. Fixed-speed operation and 50 Hz supply where one unit gives the required flow and the other operates as a 100% stand-by unit. The rotation speed can be controlled using a frequency converter from 50Hz and downwards.

2. Two units in parallel operation 50Hz: QH curve (2.) -second from the left -> when both units run in parallel at the maximum frequency of 50 Hz, whereby the required flow is achieved. When only one unit runs, about 70% of the required flow is achieved. In fixed-speed operation and with a 50Hz power supply, the rotation speed of the pump can be controlled using the frequency converter from 50Hz and downwards, whereby the required flow is
achieved with both units running in parallel at the maximum speed. During low flow, only one unit runs. In order for both to obtain the same operating hours, the units must alternate e.g. at an interval of 2 days.

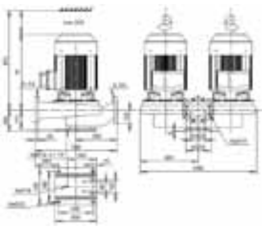
3. One unit operation 60 Hz: QH curve (3.) third from the left -> one unit runs at the maximum frequency of 60 Hz (frequency converter operation or 60 Hz power supplies). One unit achieves the required flow and the other operates as a 100% standby unit. The rotation speed of the pump can be controlled using the frequency converter from 60Hz and downwards.

4. Two units in parallel operation 60Hz: QH curve (4.) on the right -> the required flow is achieved when both units run in parallel with the maximum frequency of 60 Hz. About 70% of the required flow is achieved when only one unit runs. In frequency converter operation or 60Hz power supply, the rotation speed of the pump can be controlled from 60Hz downwards using the frequency converter, whereby the required flow is achieved with both units running at the maximum speed in parallel. During low flow, one unit runs. In order for both to obtain the same operating hours, the units must alternate e.g. at an interval of 2 days.

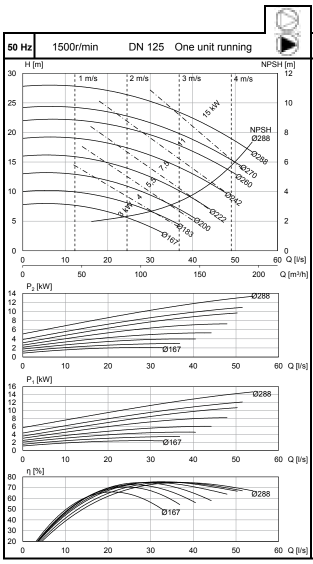
50Hz

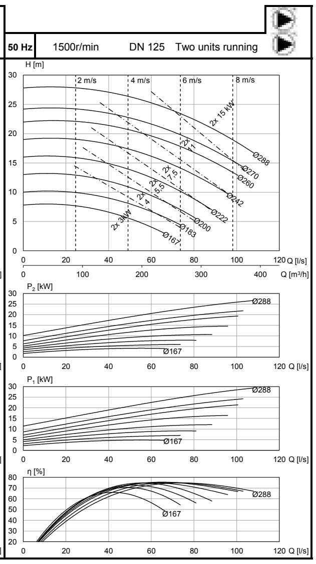
1. **2.**

AT-1129/4



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-112 E2 F31	3	6,25	290	440
	KH-132 C2 F31	4	8,13	345	500
	KH-132 E2 F31	5,5	10,95	360	500
	KH-133 G2 F31	7,5	14,88	385	550
	KZ-165 F2 F31	11	20,75	490	660
	KZ-165 G2 F31	15	28,10	500	660

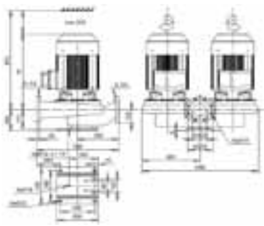




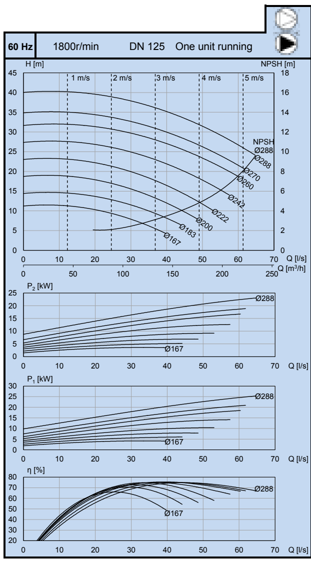
60Hz

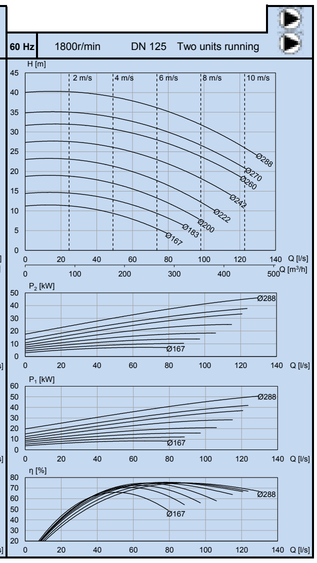
3. **4.**

AT-1129/4



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	345	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	360	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	385	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	490	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	500	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	580	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	610	720





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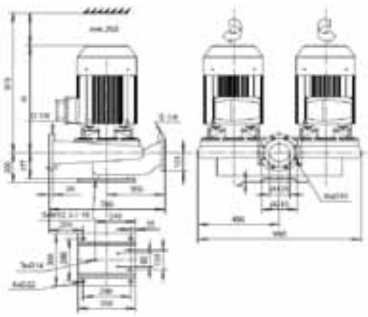
Example 1. Selecting a pump for fixed-speed or frequency converter operation with one unit running with a maximum frequency of 50Hz.

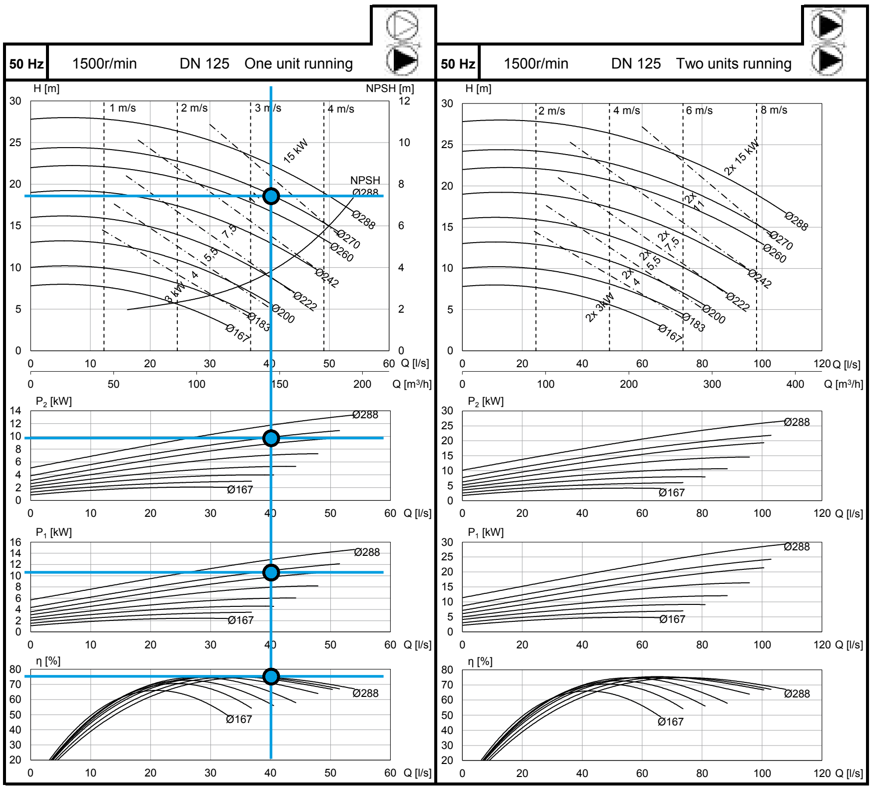
QH curve (1.) on the left.

AT-1129/4



50Hz Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
KH-112 E2 F31	3	6,25	290	440
KH-132 C2 F31	4	8,13	345	500
KH-132 E2 F31	5,5	10,95	360	500
KH-133 G2 F31	7,5	14,88	385	550
KZ-165 F2 F31	11	20,75	490	660
KZ-165 G2 F31	15	28,10	500	660

1. **2.**



E.g. duty point: flow = 40 l/s, head = 18 m, medium: water +20°C

1. The correct pump is selected from the quick selection chart (at the beginning of the catalogue) and datasheets such that the required flow 40 l/s is in the best efficiency point of the pump curve.
The selected pump is AT-1129/4 (pump efficiency η = 75%).

2. The impeller size [Ø= mm], is selected from the QH curves such that a vertical line is drawn at the point of 40 l/s flow through all curves and, equivalently, a horizontal line through the QH curves at the point of 18m head.
3. The impeller size is selected at the intersection of the lines (duty point) -> 270 mm. If the intersection is in between two impeller sizes, the average of the two sizes is selected as the impeller size.

4. The motor is selected from between power limit lines where the QH curve of the selected impeller and the required flow are. In this case, the nominal motor shaft power P2N = 11 kW. The motor can also be selected according to shaft power P2 in the duty point. By drawing a horizontal line from the intersection of the selected impeller and the vertical line to the P2 curves, it is possible to read the duty point shaft power P2 = 9.9 kW. In this case, P2N = 11 kW is selected as the nominal power of the motor (the closest higher motor nominal power).

5. The nominal current of the electric motor is read from the IN column of the table -> IN = 20.75 A, and power supply components (short-circuit protection, switch, cable, overload protection, etc.) are selected based on this value.

6. The pump weight is read from the [kg] column of the table -> 490 kg.

7. To calculate energy costs, a horizontal line is drawn to the P1 curves from the intersection of the selected impeller and the vertical line. The input power of the device according to the reference point P1 = 10.9 kW (motor electrical power) is read from the vertical axis.

8. Energy costs [€] = Electrical power P1 [kW] x energy price [€/ kWh] x operating time [h].

Characteristic curves apply to +20°C water.

Note! When pumping liquids which differ from water with regard to their viscosity, density and temperature, please consider their effect on the motor shaft power and the impeller diameter when dimensioning the pump (e.g. indirect refrigeration systems).

Please contact Kolmeks for further information!

Example 2. Selecting a pump for fixed-speed or frequency converter operation with both units running (parallel operation) with a maximum frequency of 50Hz. In the parallel operation of two units, the flow of the twin pump is double compared to flow using one unit (at the same pump head).

QH curve (2.) second from the left on the spread.

1. The correct pump is selected from the datasheets of twin pumps such that in the parallel operation (both running simultaneously), the required flow 90 l/s is in the best efficiency point at the desired 90 l/s output. The selected pump is AT-1129/4 (pump efficiency η = 75%).

2. The impeller [Ø= mm] is selected from the QH curves such that a vertical line is drawn at the point of 90 l/s flow through all curves and, equivalently, a horizontal line through the QH curves at the point of 18m head.

3. The impeller size is selected at the intersection of the lines (reference point). As the intersection is in between two impeller sizes, their average is selected as the impeller size -> Ø = (288 + 270) / 2 = 279 mm.

4. The motors are selected from between power limits where the QH curve of the selected impeller and the required flow are. In this case, the nominal motor shaft power P2N = 2 x 15 kW. The motors can also be selected according to the common shaft power P2 of the two units in the reference point. By drawing a horizontal line to the P2 curves from where the selected impeller and the vertical line intersect, it is possible to read the combined shaft power of the two motors of the reference point P2 = 22.5 kW. The shaft power of one motor is P2 = 11.25 kW. In this case, P2N = 15 kW is selected as the nominal power of the motor (the closest higher motor nominal power).

5. The nominal current of the electric motor is read from the IN column of the table -> IN = 28.10 A, and the power supply components (short-circuit protection, switch, cable, overload protection, etc.) are selected based on this value.

6. The pump weight is read from the [kg] column of the table -> 500 kg.

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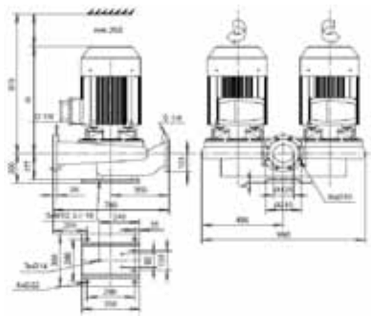
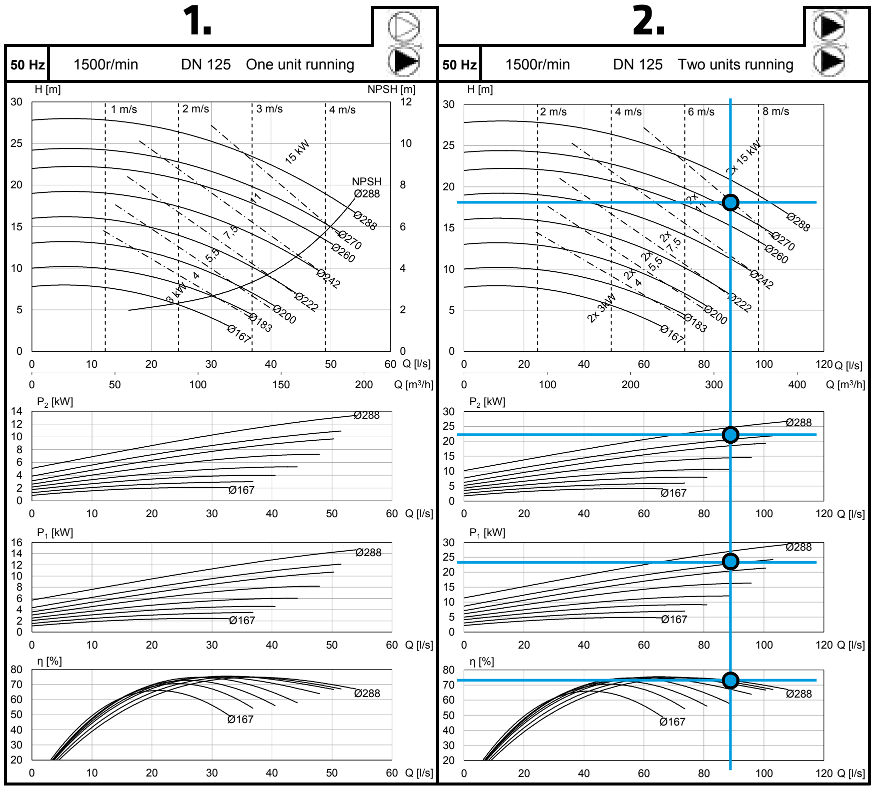


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E2 F31	3	6,25	290	440
	KH-132 C2 F31	4	8,13	345	500
	KH-132 E2 F31	5,5	10,95	360	500
	KH-133 G2 F31	7,5	14,88	385	550
	KZ-165 F2 F31	11	20,75	490	660
	KZ-165 G2 F31	15	28,10	500	660



E.g. duty point: flow = 90 l/s, head = 18 m, medium: water +20°C.

7. To calculate energy costs, a horizontal line is drawn to the P1 curves from the intersection of the selected impeller and the vertical line. From the vertical axis, the electrical power of the combined device with two units according to the reference point P1 = 25 kW (common electrical power of motors) is read.

8. Energy costs [€] = Electrical power P1 [kW] x energy price [€/ kWh] x operating time [h].

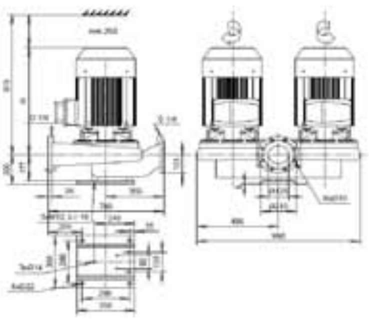
Characteristic curves apply to +20°C water.

Note! When pumping liquids which differ from water with regard to their viscosity, density and temperature, please consider their effect on the motor shaft power and the impeller size when dimensioning the pump (e.g. indirect refrigeration systems).

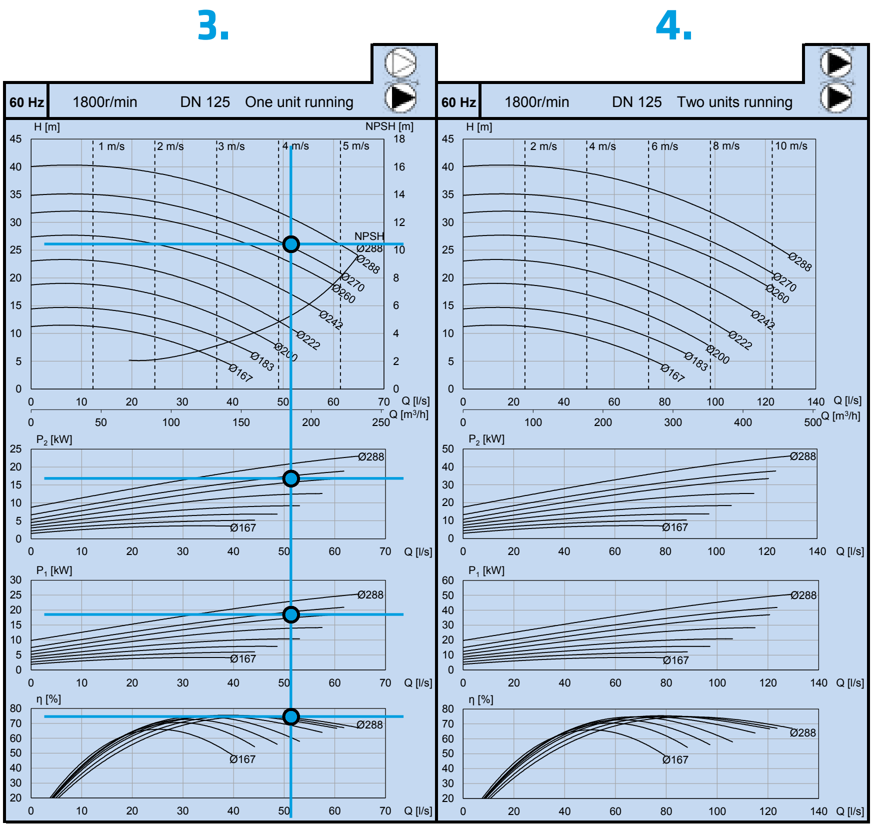
Please contact Kolmeks for further information!

Example 3. Selecting a pump for frequency converter operation with one unit running with a maximum frequency of 50 Hz or 60 Hz. Alternatively, selecting a pump for fixed-speed operation with one unit running with a maximum frequency of 60 Hz. QH curve (3.) third from the left on the spread.

AT-1129/4



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	345	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	360	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	385	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	490	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	500	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	580	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	610	720



E.g. duty point: flow = 48 l/s, head = 26 m, medium: water +20°C. Compare with Example 1: with the same impeller size, the 60Hz pump yields 20% more output and 44% more head -> see Affinity rules.

1. The correct pump is selected from the quick selection chart (at the beginning of the catalogue) and datasheets such that the required flow 48 l/s is in the best efficiency point of the pump QH-curve. The selected pump is AT-1129/4 (pump efficiency η = 75%).

2. The impeller size [Ø= mm] is selected from the QH curves such that a vertical line is drawn at the point of 48 l/s output through all curves and, equivalently, a horizontal line through the QH curves at the point of 26m head.

3. The impeller size is selected from the intersection (duty point) of the lines -> 270 mm. If the intersection is in between two impeller sizes, their average is selected as the impeller size.

4. Alternative 1. Supply voltage 380–400V (50 or 60 Hz), use values not in brackets

The shaft power is in the duty point with one unit running P2 = 16 kW. The nominal shaft power of one motor is P2N = 18.5 kW (22 kW) and the motor type KZ-186 G2 BF31 is selected (closest higher nominal power, according to power not in brackets).

The nominal current of the electric motor is read from the IN column of the table value not in brackets -> IN = 35.30 A, and the power supply components (short-circuit protection, switch, cable, overload protection, etc.) are selected based on this value.

The pump weight is read from the [kg] column of the table -> 580 kg.

Alternative 2. Supply voltage 460–480V (60 Hz), use values in brackets

The shaft power is in the reference point with one unit running P2 = 16 kW. The nominal power of one motor is P2N = 15 kW (18 kW) and the motor type is selected as one frame size smaller compared to Alternative 1 -> KZ-165 G2 F31 15 kW (18 kW) (closest higher nominal power, according to power in brackets).The nominal current of the electric motor is read from the IN column of the table value in brackets -> IN = 28.75 A, and the power supply components (short-circuit protection, switch, cable, overload protection, etc.) are selected based on this value. The pump weight is read from the [kg] column of the table 500 kg.

5. To calculate energy costs, a horizontal line is drawn to the P1 curves from the intersection of the selected impeller and the vertical line. The vertical axis shows that the electrical power of the device according to the flow is P1 = 17.8 kW.

6. Energy costs [€] = Electrical power P1 [kW] x energy price [€/ kWh] x operating time [h].

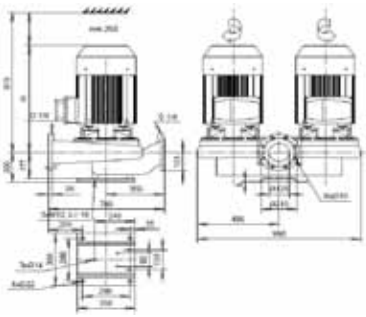
Characteristic curves apply to +20°C water.

Note! When pumping liquids which differ from water with regard to their viscosity, density and temperature, please consider their effect on the motor shaft power and the impeller size when dimensioning the pump (e.g. indirect refrigeration systems).

Please contact Kolmeks for further information!

Example 4. Selecting a pump for frequency converter operation with both units running (parallel operation) at a maximum frequency of 50 Hz or 60 Hz. Alternatively, selecting a pump for fixed- speed operation with one unit running with a maximum frequency of 60 Hz. In the parallel operation of two units, the flow of the twin pump is double compared to the flow when using one unit (at the same pump head). QH curve (4.) on the far right of the spread, both running at the maximum frequency of 60 Hz.

AT-1129/4



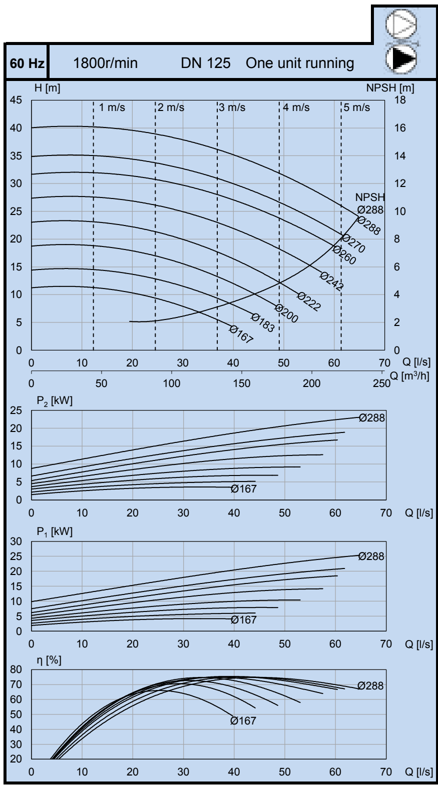
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	345	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	360	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	385	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	490	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	500	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	580	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	610	720

1. The correct pump is selected from the datasheets such that the required flow 96 l/s is in the best efficiency point of the pump QH-curve. The selected pump is AT-1129/4 (pump efficiency η = 75%).

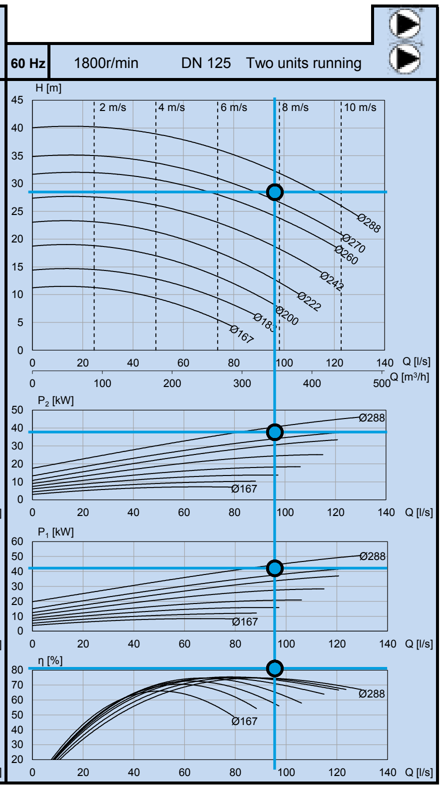
2. The impeller size [Ø= mm] is selected from the QH curves such that a vertical line is drawn at the point of 96 l/s flow through all curves and, equivalently, a horizontal line through the QH curves at the point of 26m head.

3. The impeller size is selected at the intersection of the lines (reference point) -> 270 mm. If the intersection is in between two impeller sizes, their average is selected as the impeller diameter.

3.



4.



E.g. duty point: flow = 96 l/s, head = 26 m, medium: water +20°C.

4. Alternative 1. Supply voltage 380–400V (50 or 60 Hz), use values not in brackets

The combined shaft power of the motors is in the required flow with both units running P2 = 32 kW. The shaft power of one motor is P2 = 16 kW. In this case, the nominal shaft power of the motor selected is P2N = 2 x 18.5 kW and the motor type KZ-186 G2 BF31 is selected (closest higher nominal power, according to power not in brackets). The nominal current of the electric motor is read from the IN column of the table value not in brackets -> IN = 2 x 35.30 A, and power supply components (short-circuit protection, switch, cable, overload protection, etc.) are selected based on this value. The pump weight is read from the [kg] column of the table -> 580 kg.

Alternative 2. Supply voltage 460–480V (60 Hz), use values in brackets The combined shaft power of the motors is in the required flow with both units running P2 = 32 kW. The shaft power of one motor is P2 = 16 kW. The nominal shaft power of one motor is P2N = 15 kW (18 kW) and the motor type is selected as one body size smaller compared to Alternative 1 -> KZ-165 G2 F31 15 kW (18 kW) (closest higher nominal power, according to power in brackets).The nominal current of the electric motor is read from the IN column of the table value in brackets -> IN = 28.75 A, and power supply components (short-circuit protection, switch, cable, overload protection, etc.) are selected based on this value.
The pump weight is read from the [kg] column of the table 500 kg.

5. ETo calculate energy costs, a horizontal line is drawn to the P1 curves from the intersection of the selected impeller and the vertical line. The vertical axis shows the input power of the two unit device according to the reference point P1 = 35.6 kW (motor electric power).

6. Energy costs [€] = Electrical power P1 [kW] x energy price [€/ kWh] x operating time [h].

Characteristic curves apply to +20°C water.

Note! When pumping liquids which differ from water with regard to their viscosity, density and temperature, please consider their effect on the motor power and the impeller diameter when dimensioning the pump (e.g. indirect refrigeration systems).

Please contact Kolmeks for further information!

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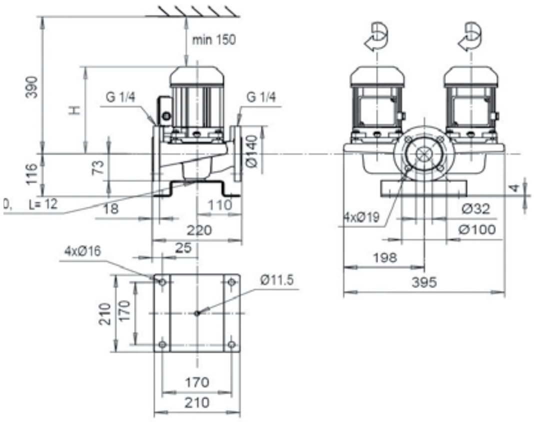
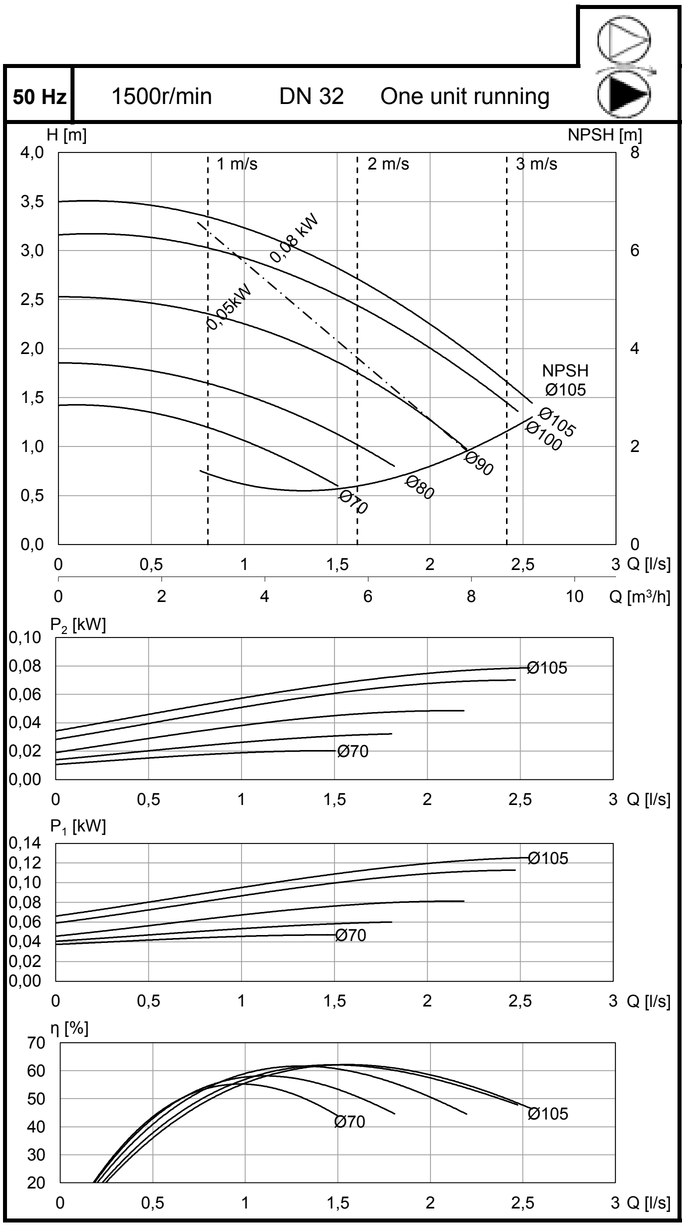
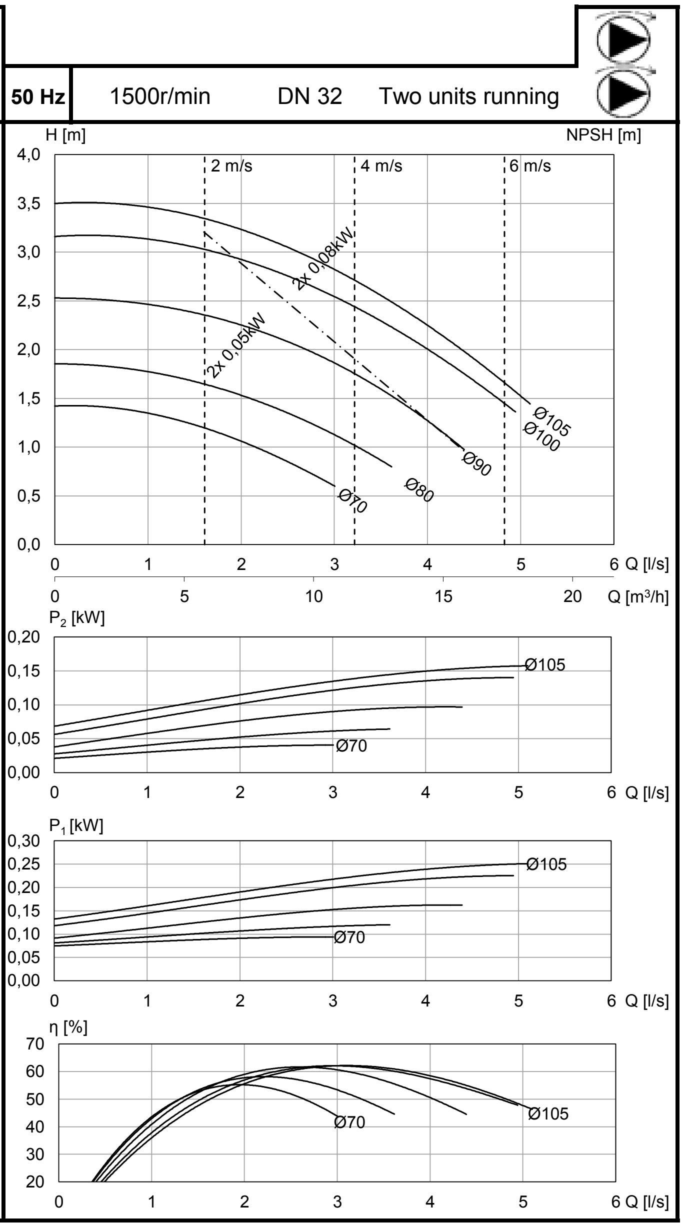
T-32A/4



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-732 B N12	0,05	0,21	28	175
	OP-742 N12	0,08	0,28	28	175





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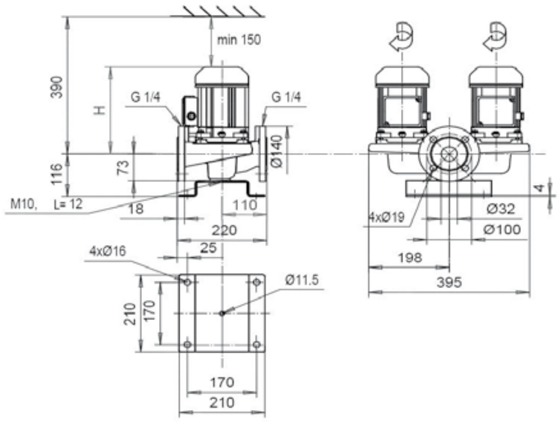
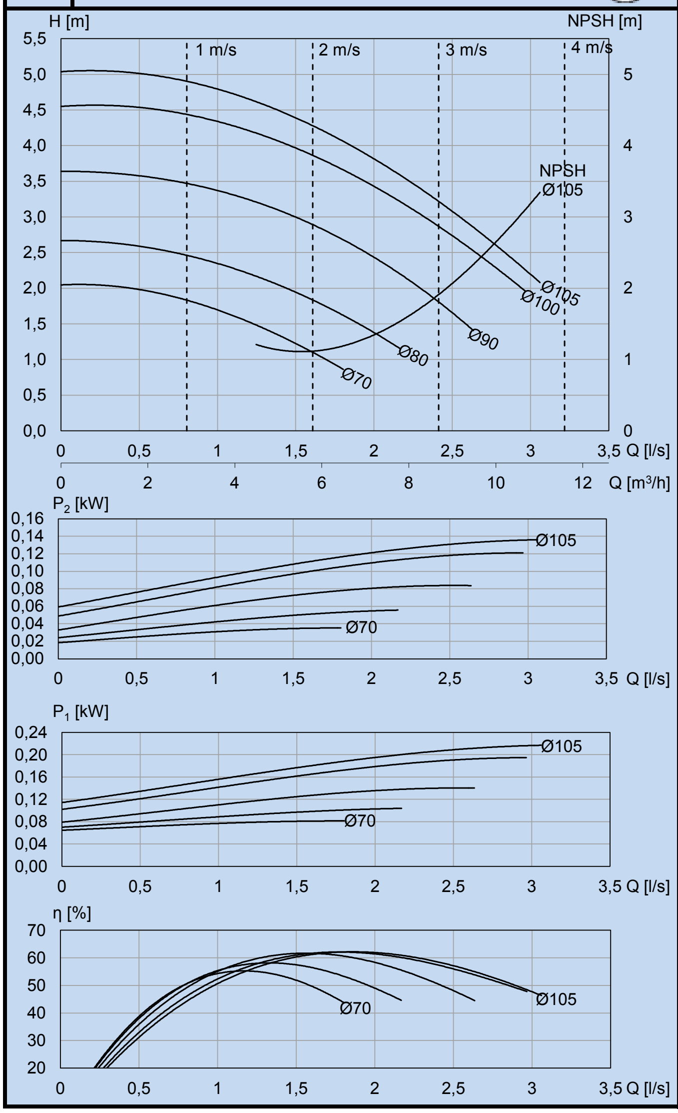
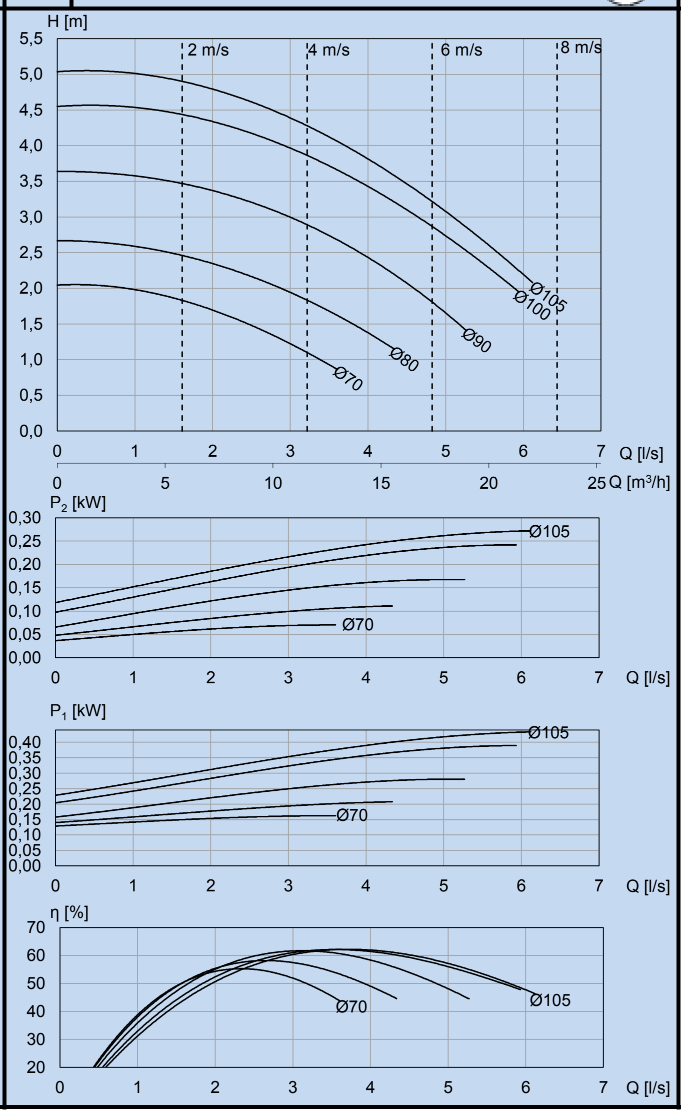


60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-732 B N12	0,05 (0,06)	0,22 (0,22)	28	175
	OP-742 N12	0,08 (0,09)	0,28 (0,28)	28	175
	OP-752 N12	0,2 (0,24)	0,65 (0,65)	33	240

60 Hz	1800r/min	DN 32	One unit running



60 Hz	1800r/min	DN 32	Two units running



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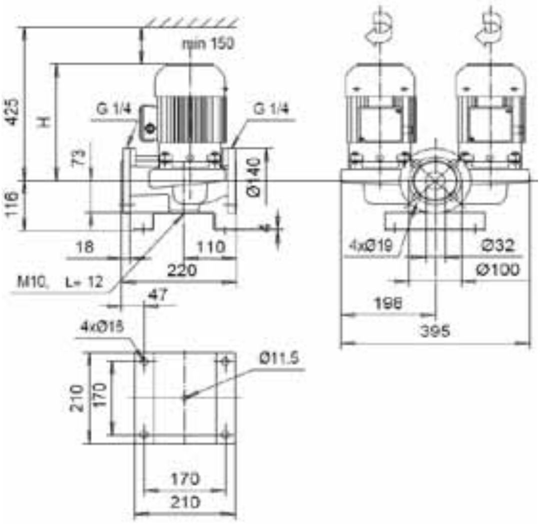
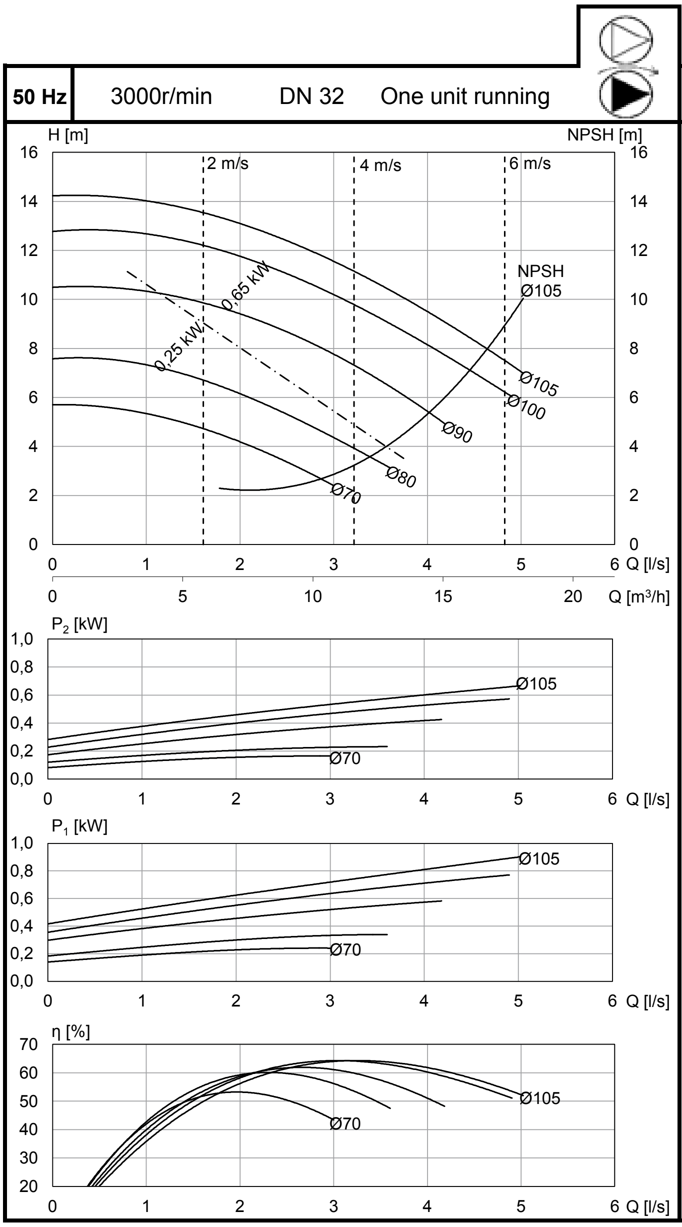
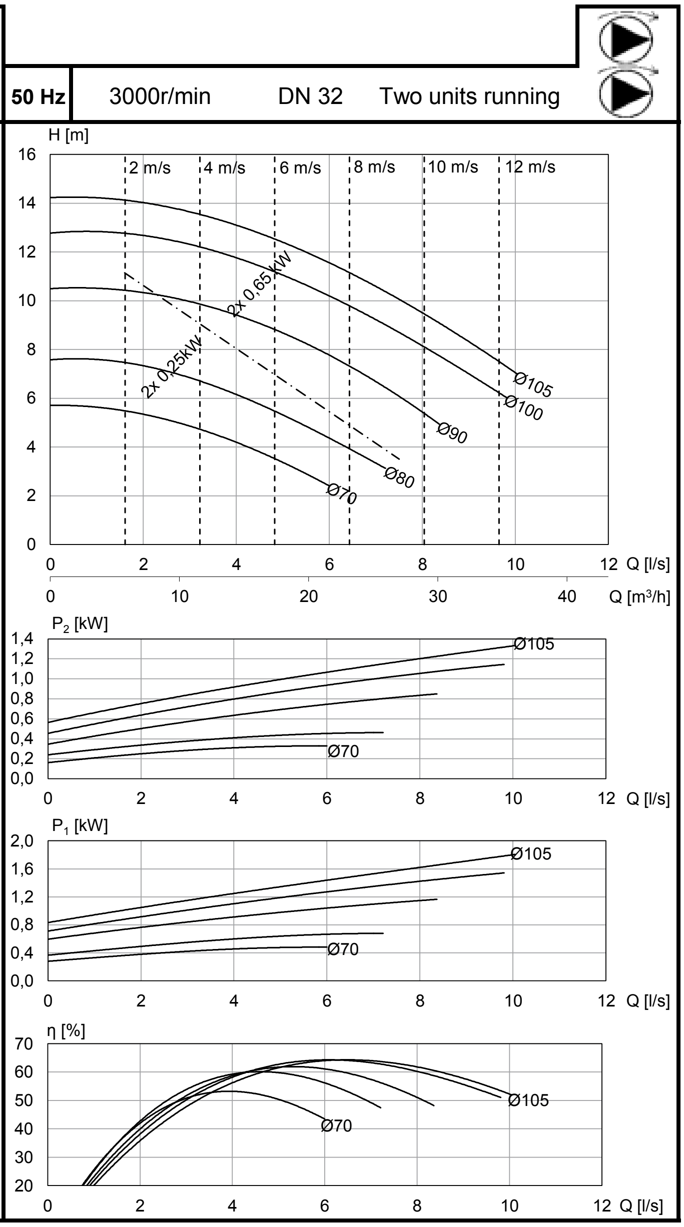


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-741 N12	0,25	0,7	30	225
	OKN-841 D N12	0,65	1,75	36	260





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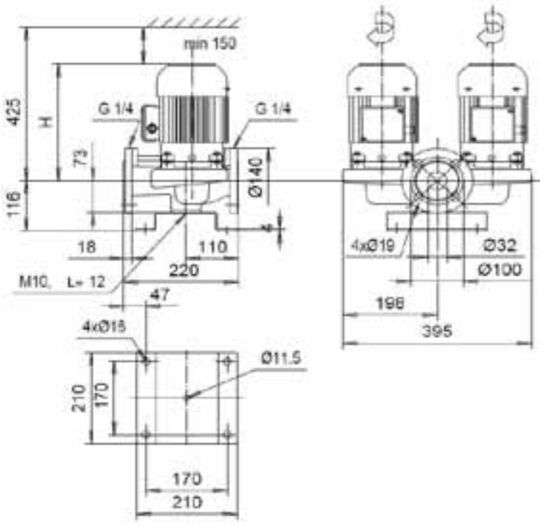
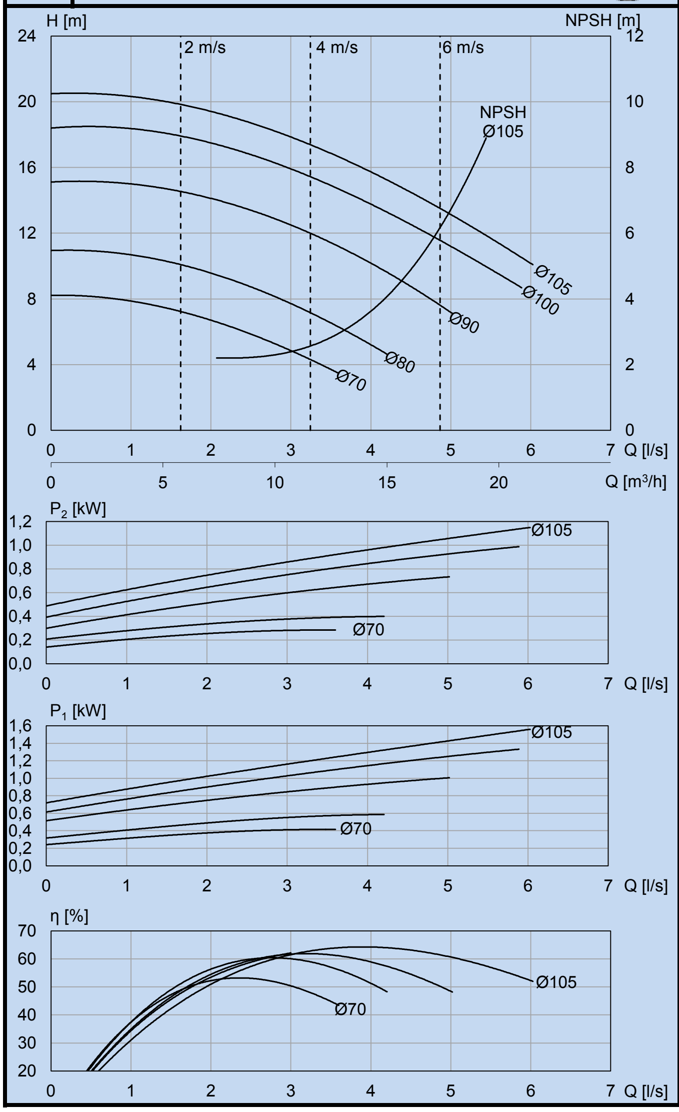
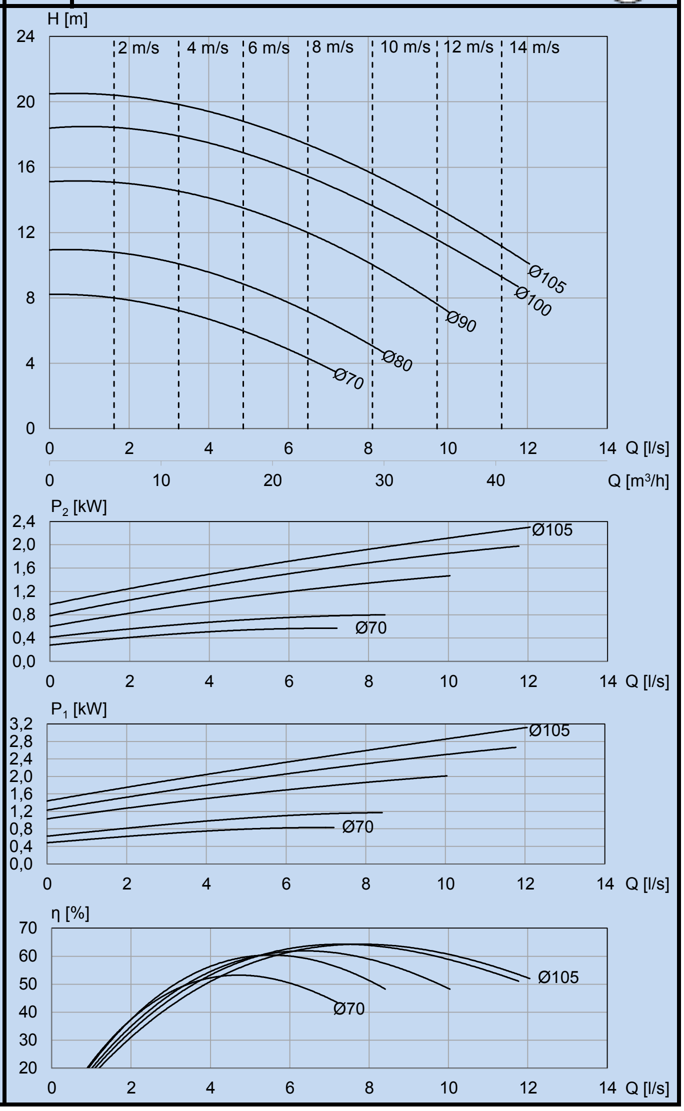


60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-741 N12	0,25 (0,3)	0,70 (0,70)	30	225
	OKN-841 D N12	0,65 (0,75)	1,60 (1,60)	36	275
	KH-871 N12	1,1 (1,3)	2,35 (2,50)	42	295

60 Hz | 3600r/min | DN 32 | One unit running



60 Hz | 3600r/min | DN 32 | Two units running



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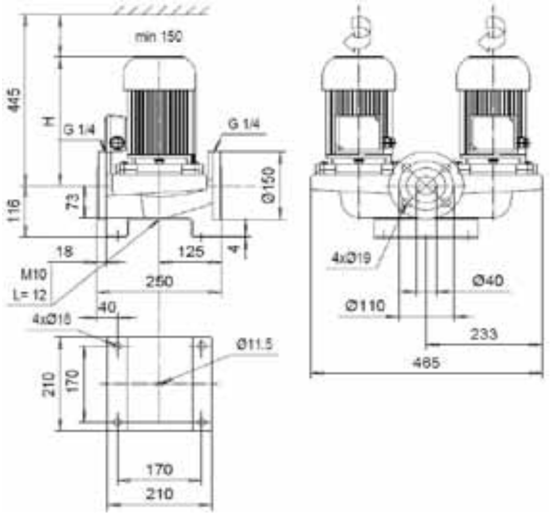
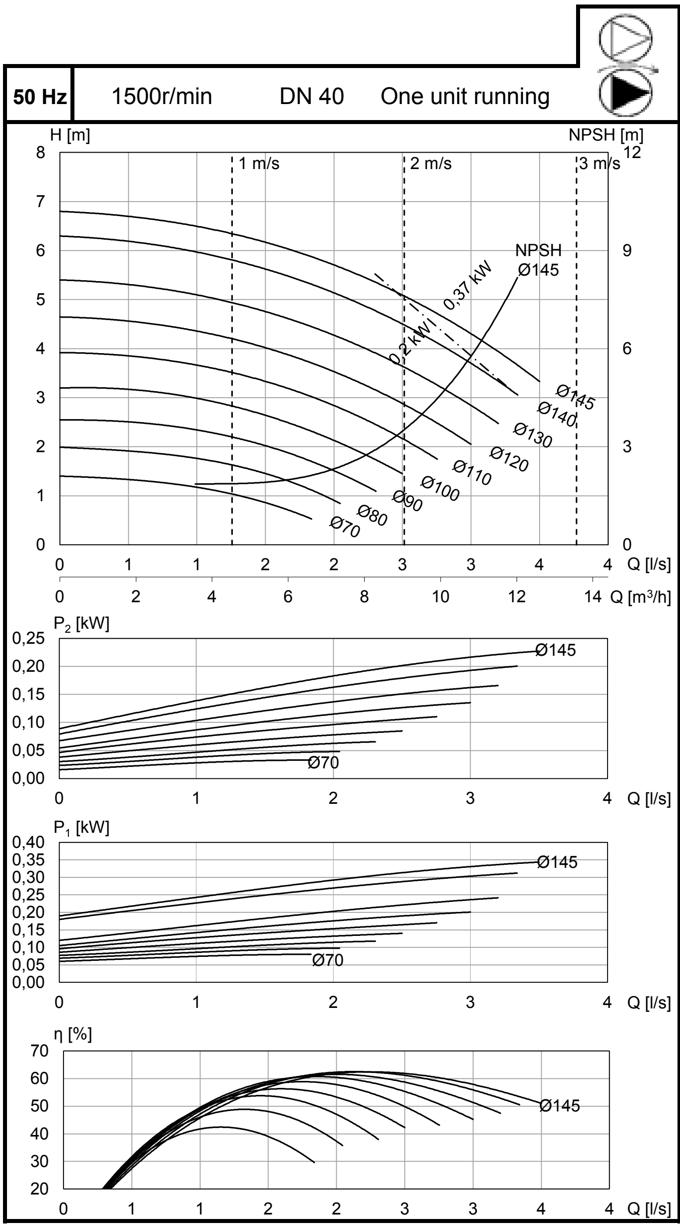
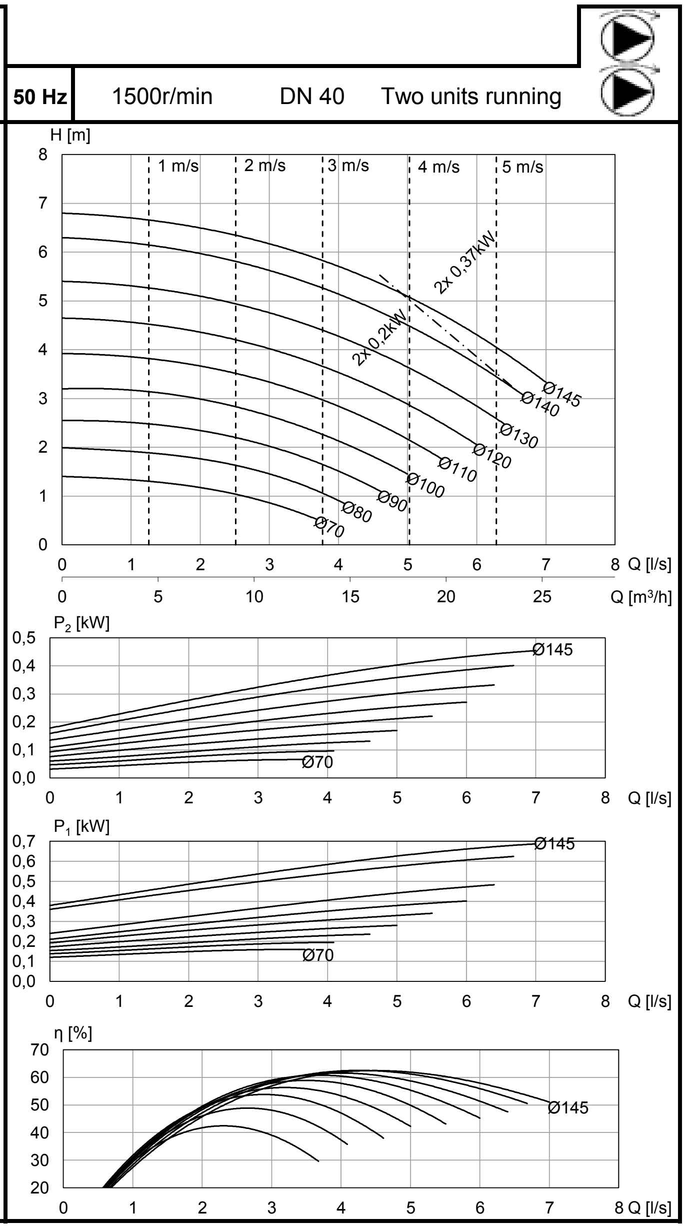
T-40A/4



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 N13	0,2	0,65	38	240
	OKN-862L D N13	0,37	1,15	46	295





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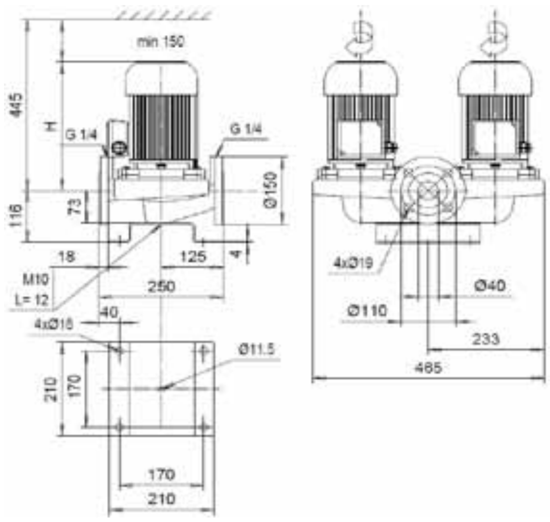
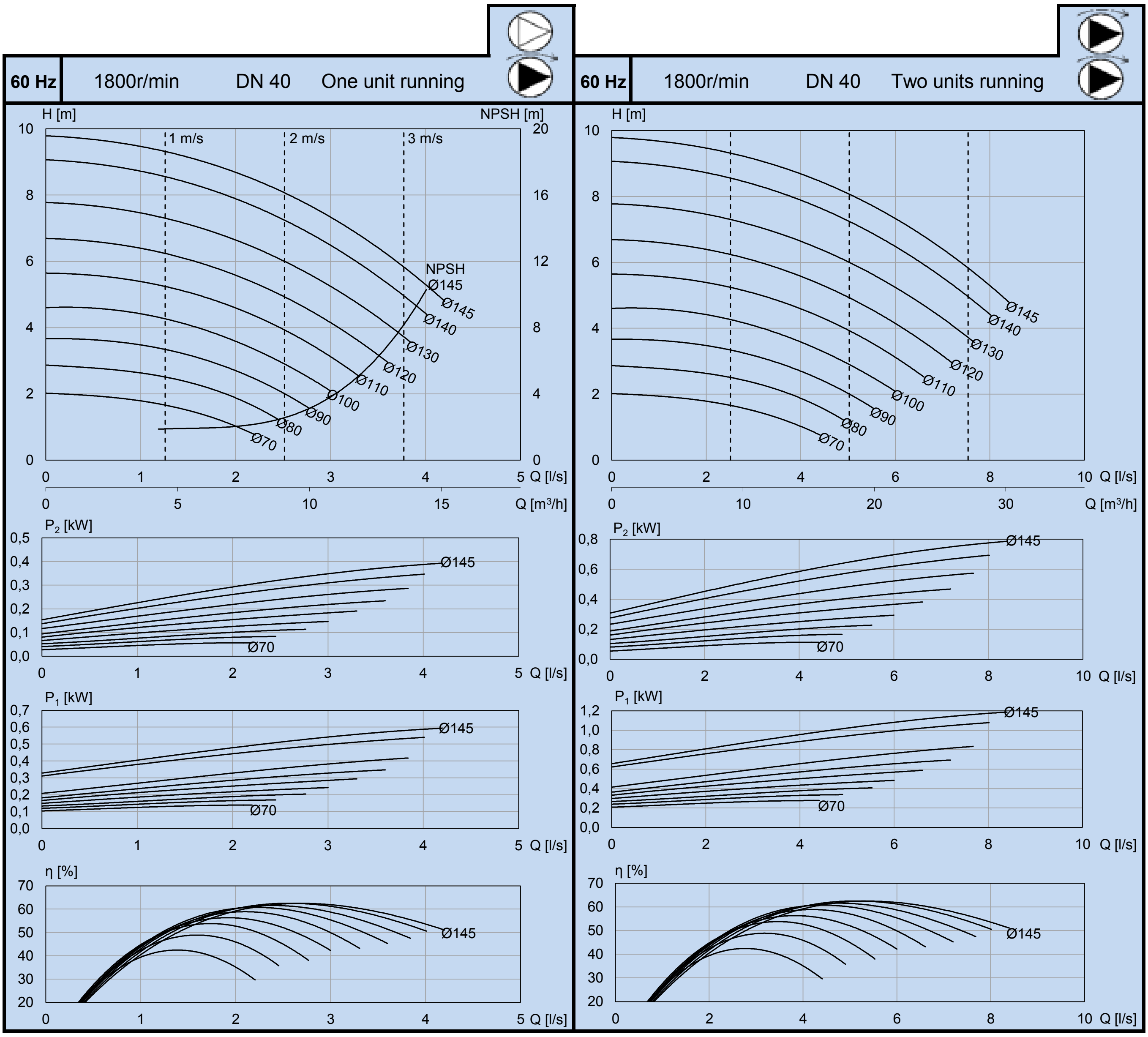
T-40A/4



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 N13	0,2 (0,24)	0,65 (0,65)	38	240
	OKN-862L D N13	0,37 (0,44)	1,15 (1,15)	46	295



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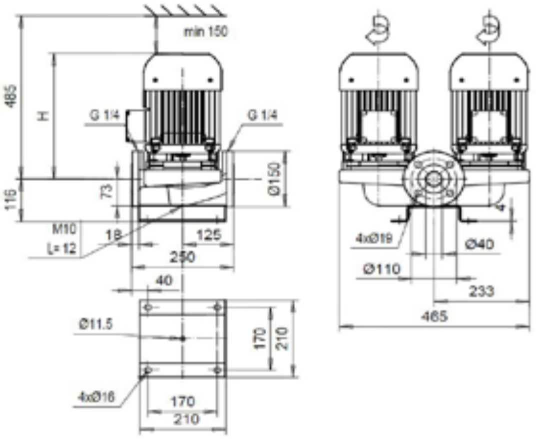
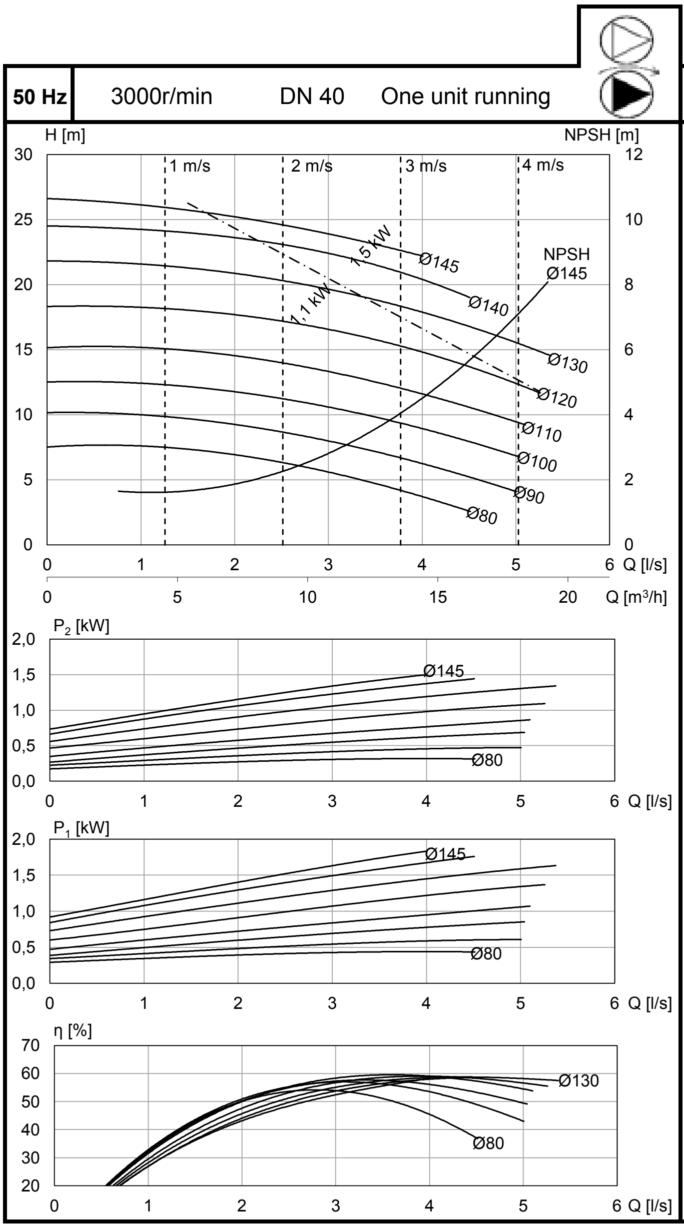
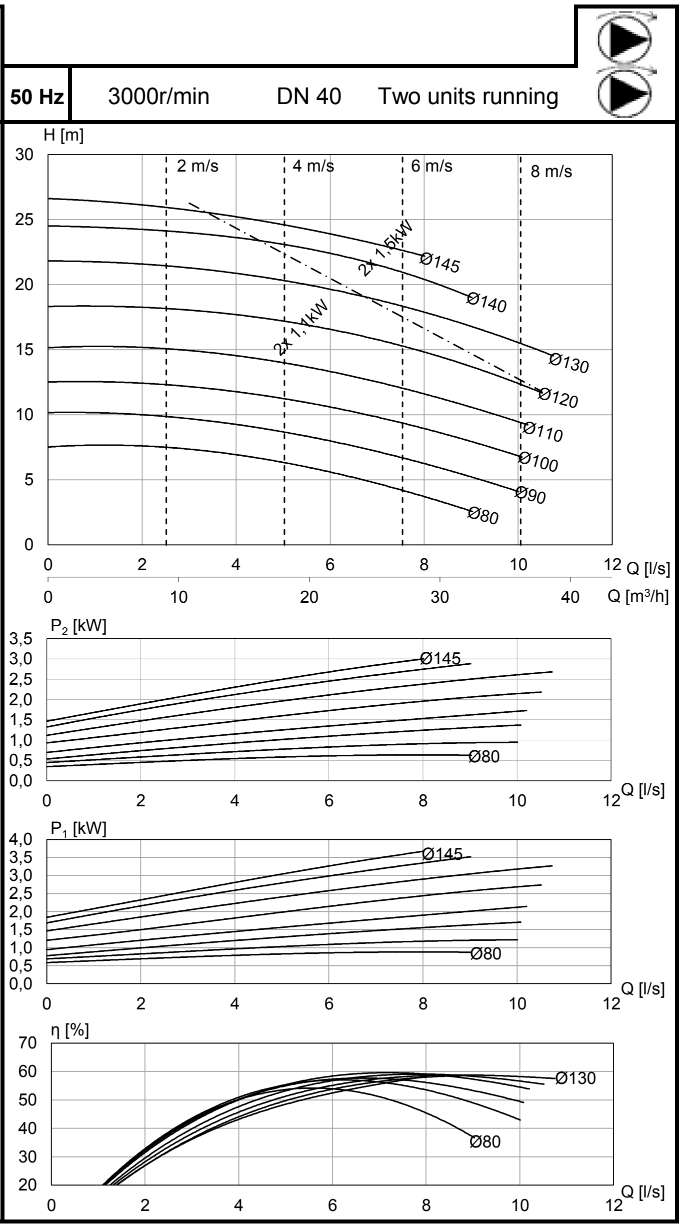
T-40A/2



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-871 N13	1,1	2,55	49	295
	KH-101 C1 N13	1,5	2,95	71	335





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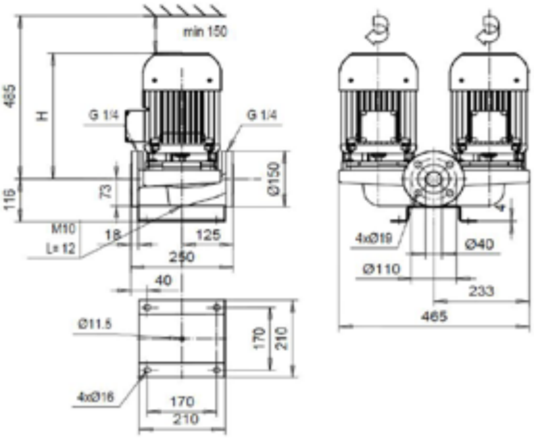
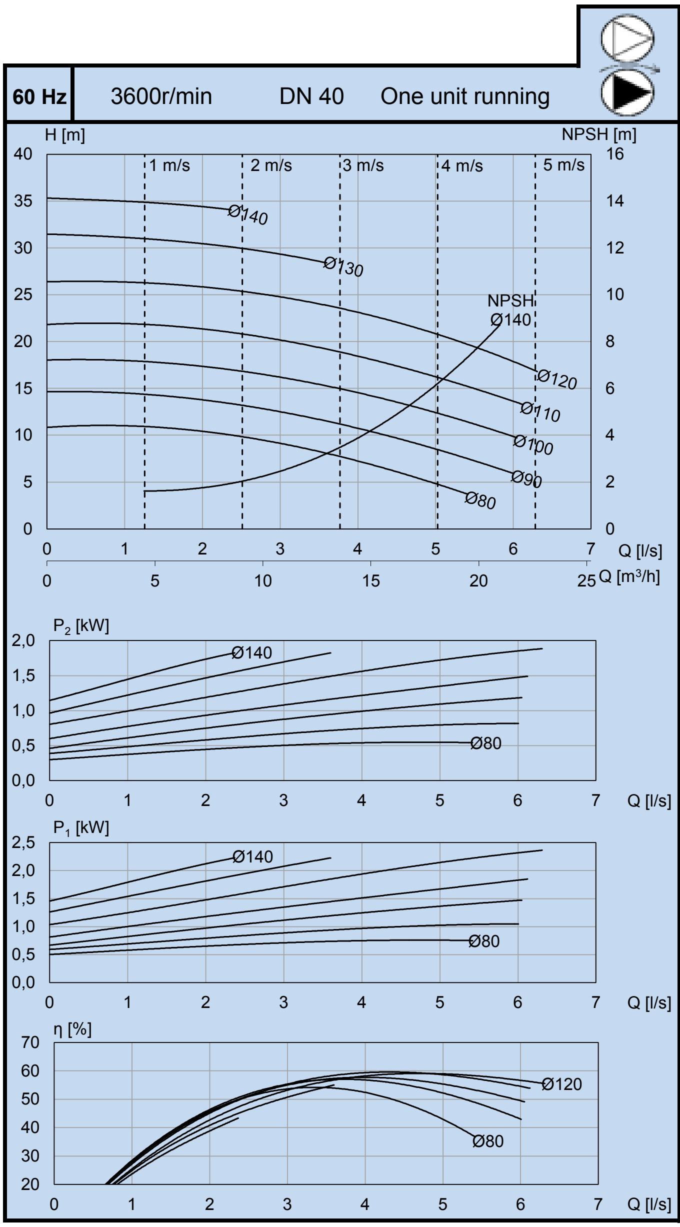
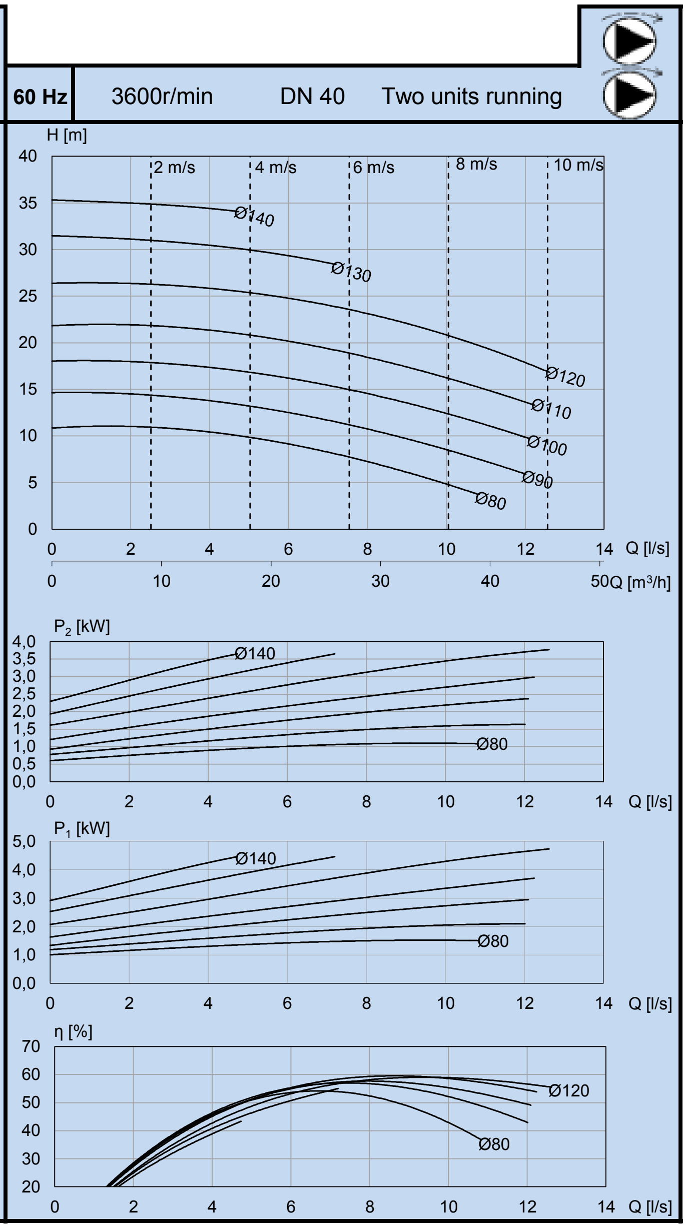


60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-871 N13	1,1 (1,3)	2,35 (2,50)	49	295
	KH-101 C1 N13	1,5 (1,8)	2,98 (3,02)	71	335





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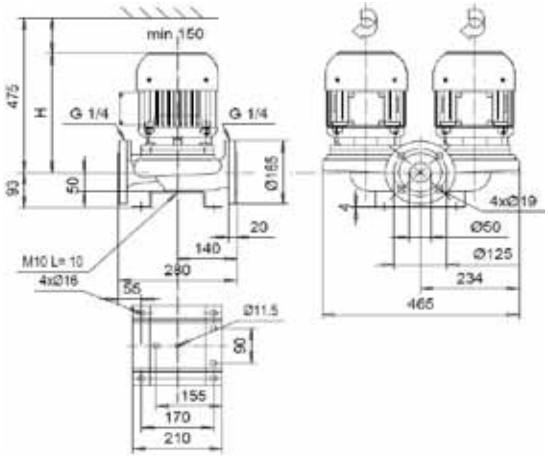
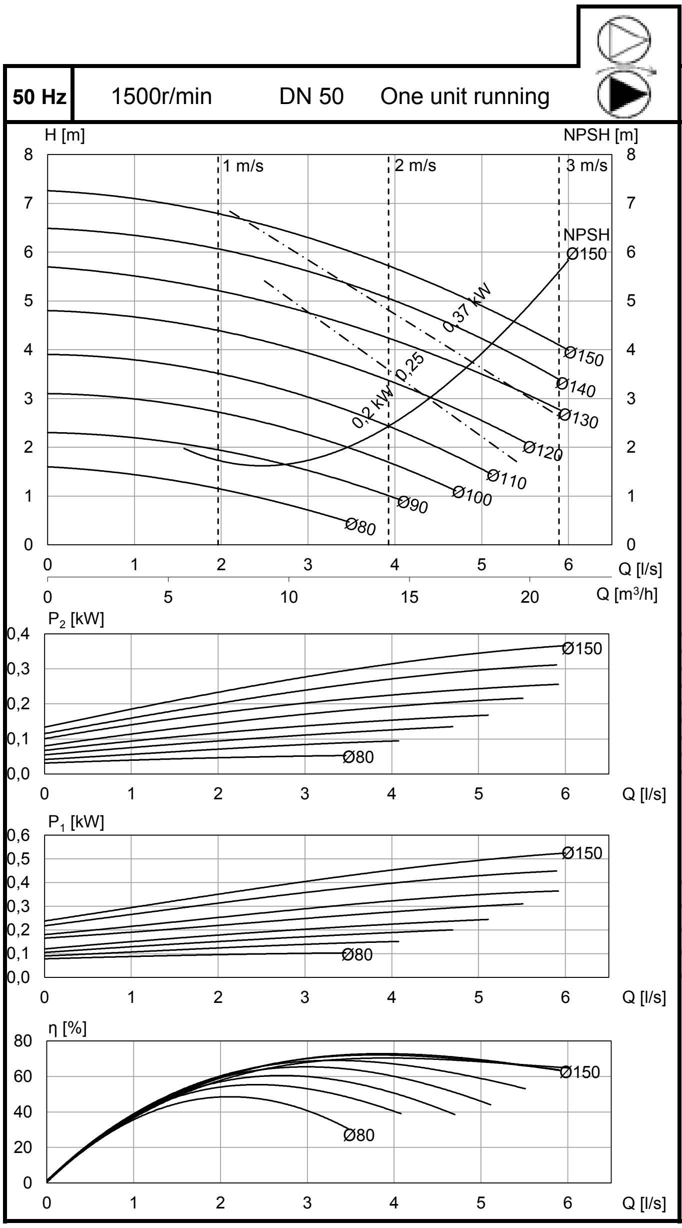
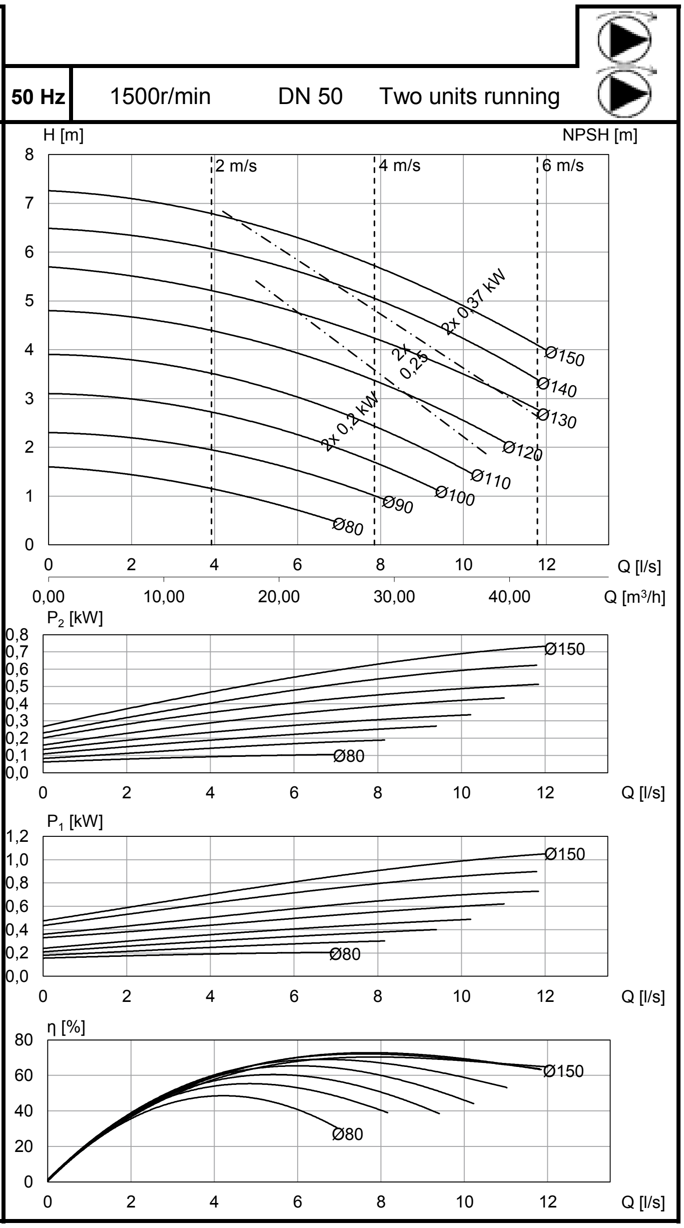
T-50A/4

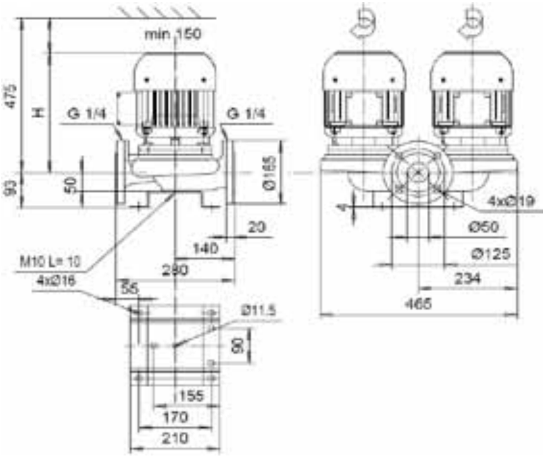


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 F15	0,20	0,65	46	250
	OP-762 F15	0,25	0,82	46	250
	OKN-862 D F15	0,37	1,15	58	280

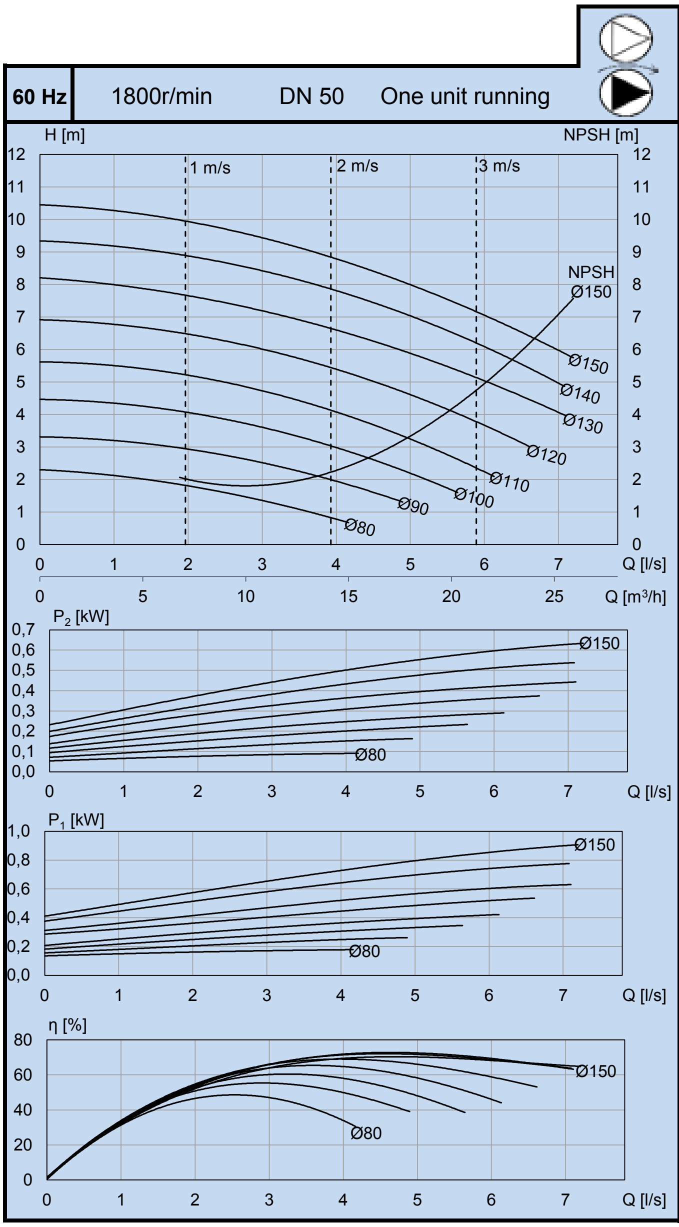


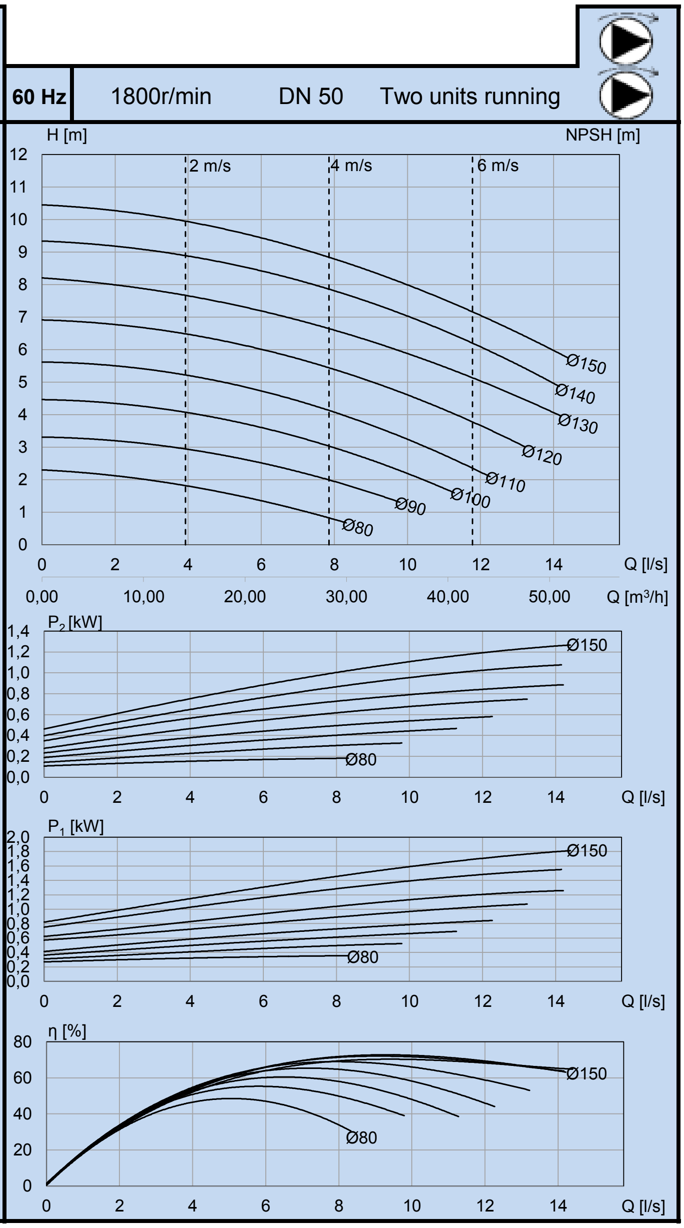


T-50A/4



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 F15	0,2 (0,24)	0,65 (0,65)	46	250
	OP-762 F15	0,25 (0,3)	0,82 (0,82)	46	250
	OKN-862 D F15	0,37 (0,44)	1,15 (1,15)	58	280
	KH-100 A2 F15	0,55 (0,66)	1,28 (1,30)	74	325





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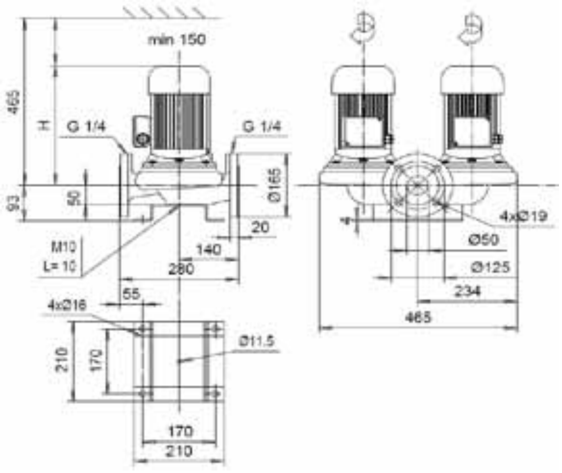
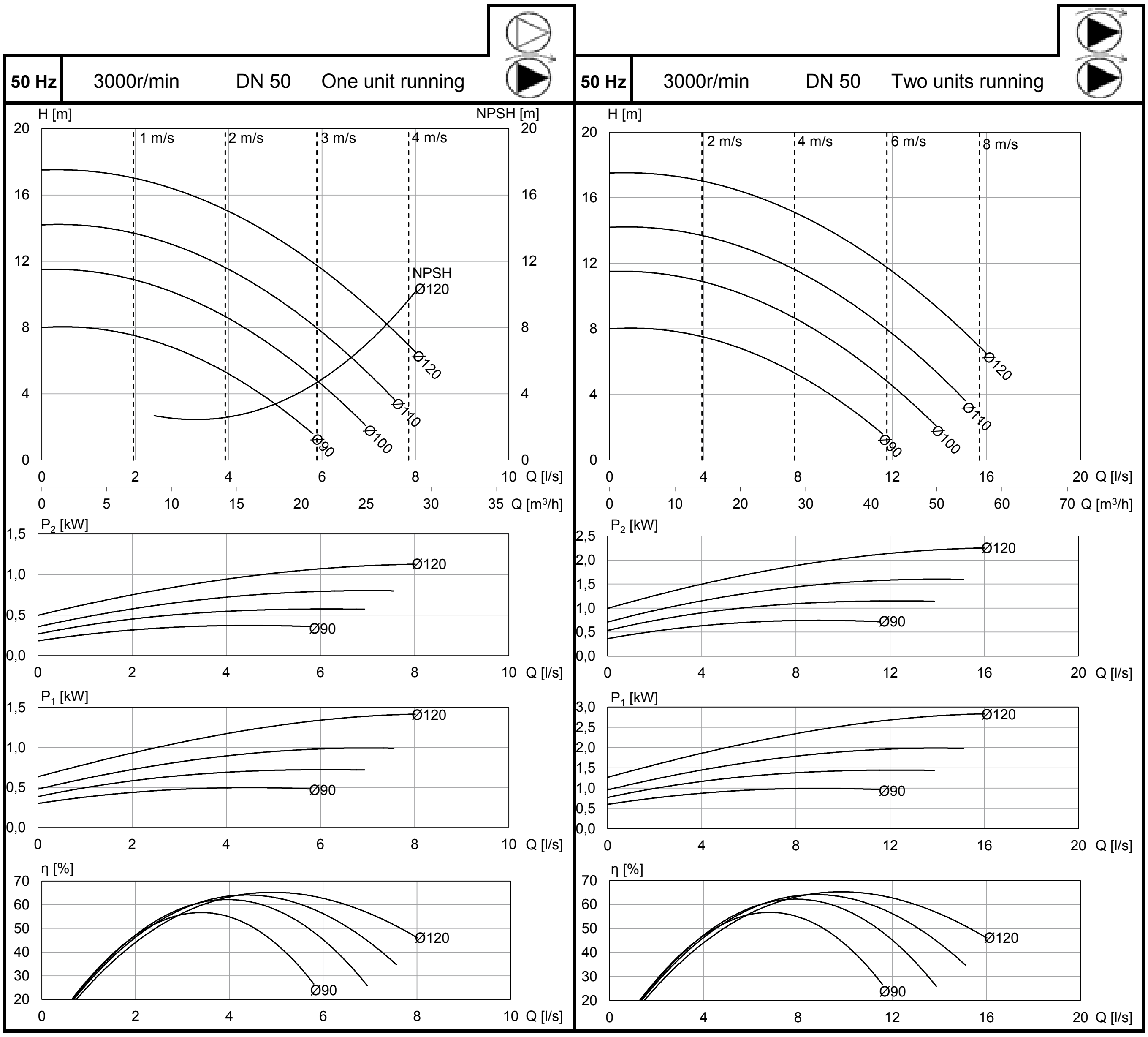
T-50B/2



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-871 F15	1,1	2,55	55	315



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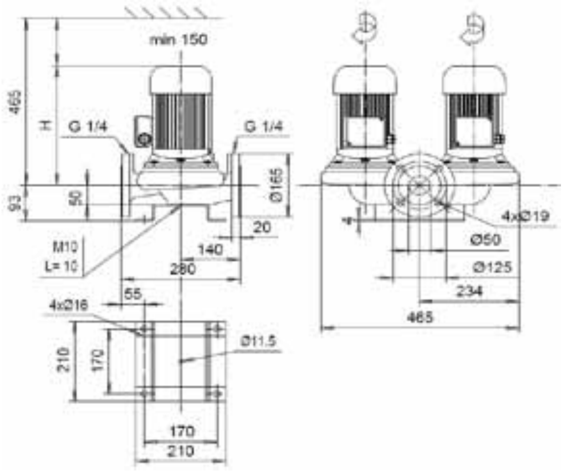
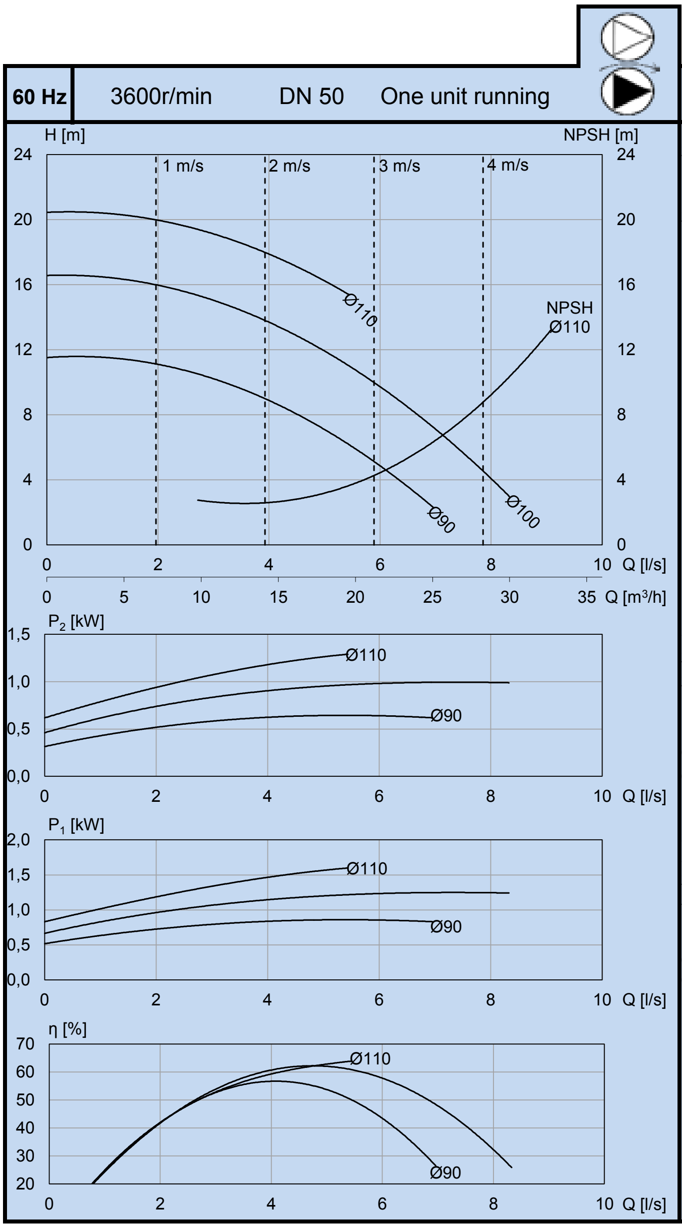
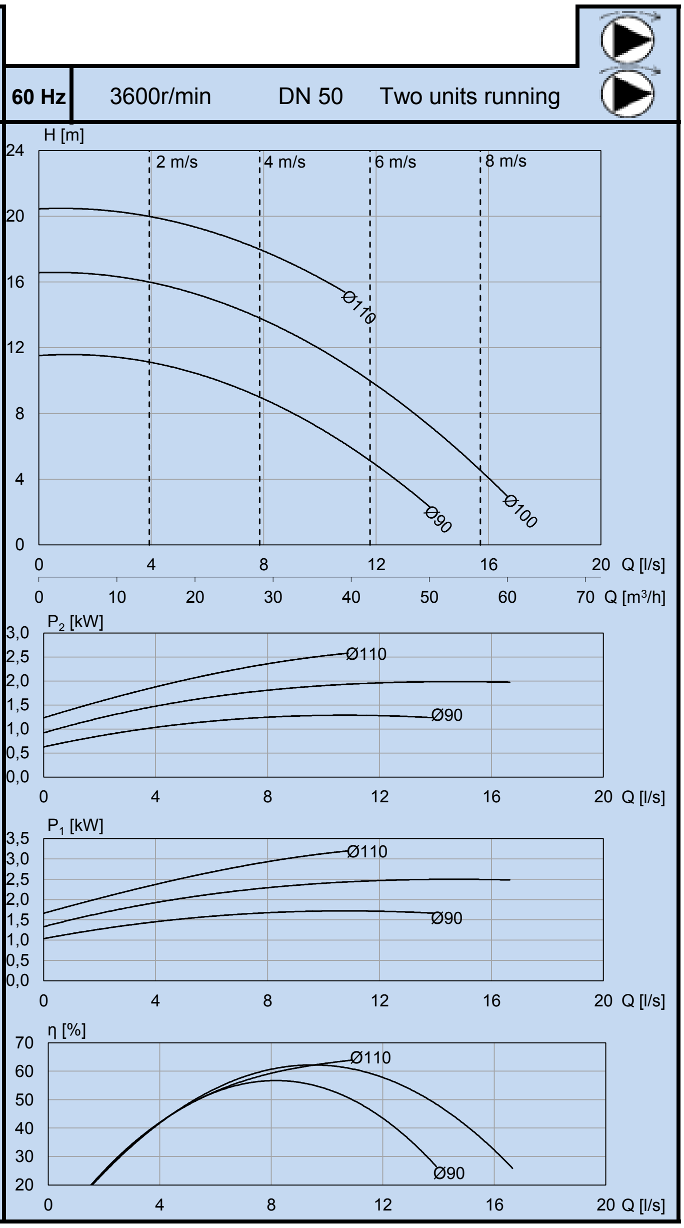
T-50B/2



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-871 F15	1,1 (1,3)	2,35 (2,50)	55	315





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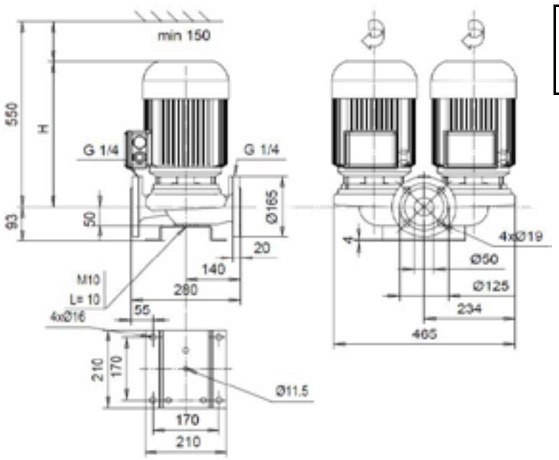
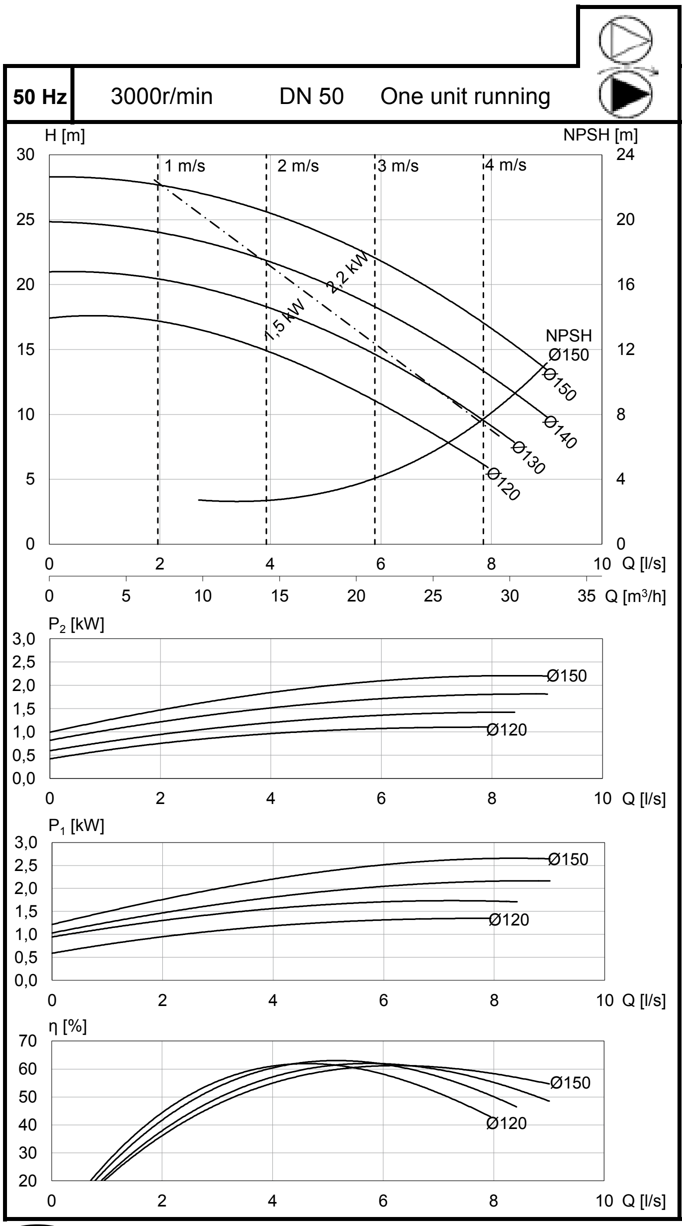
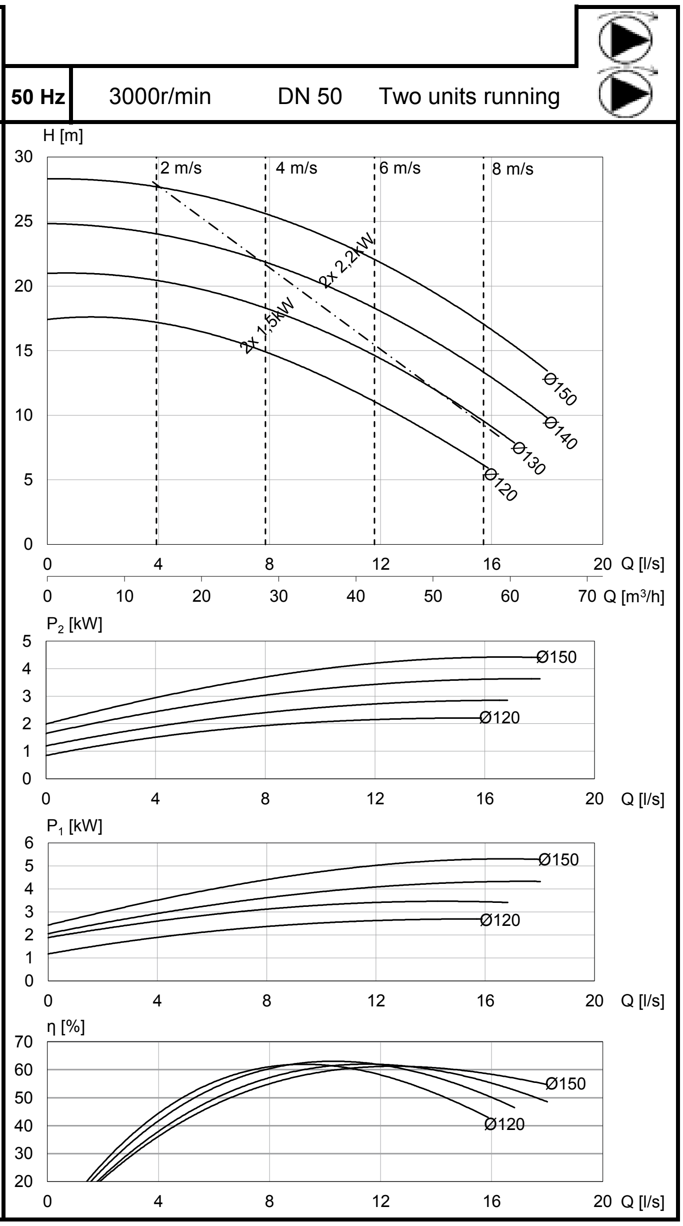
T-50C/2



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C1 F16	1,5	2,95	72	355
	KH-101 D1 F16	2,2	4,28	78	355





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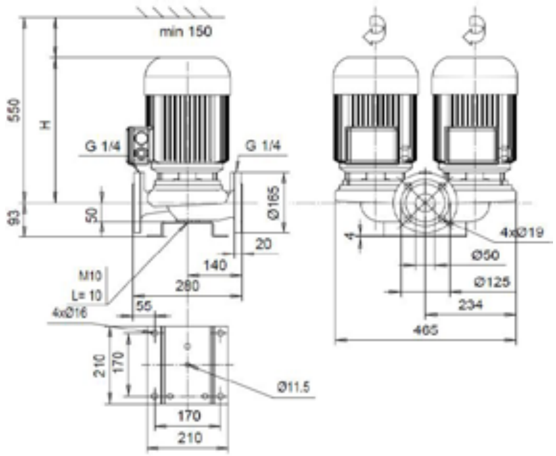
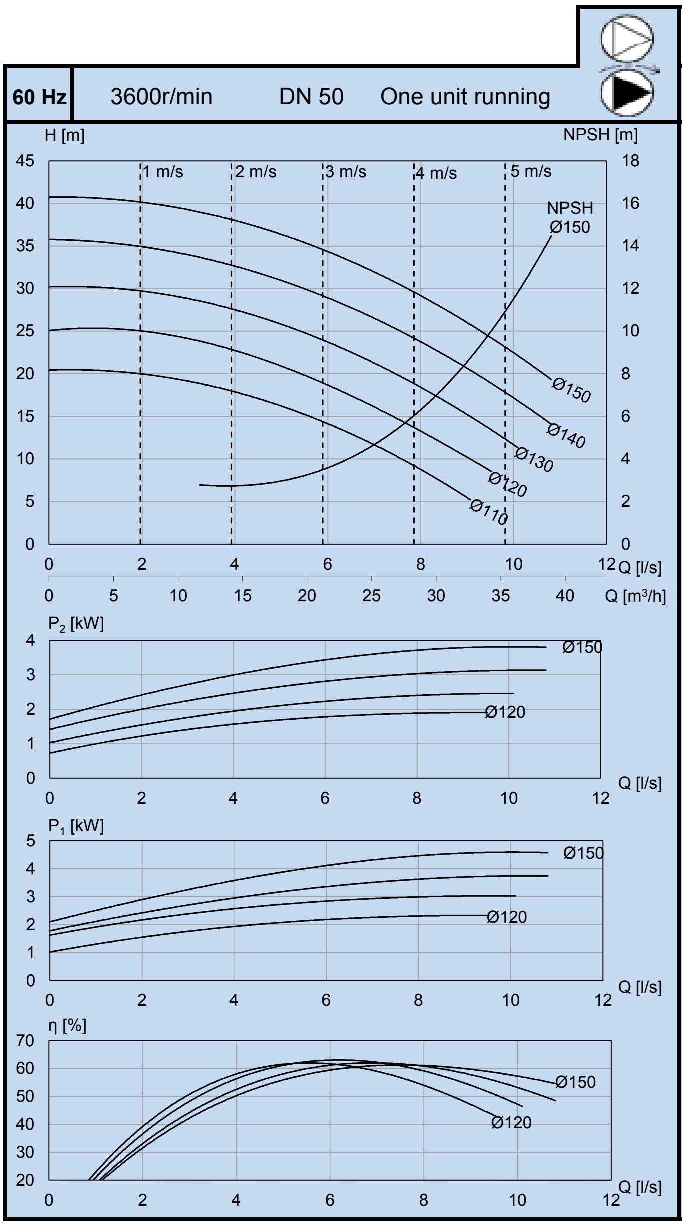
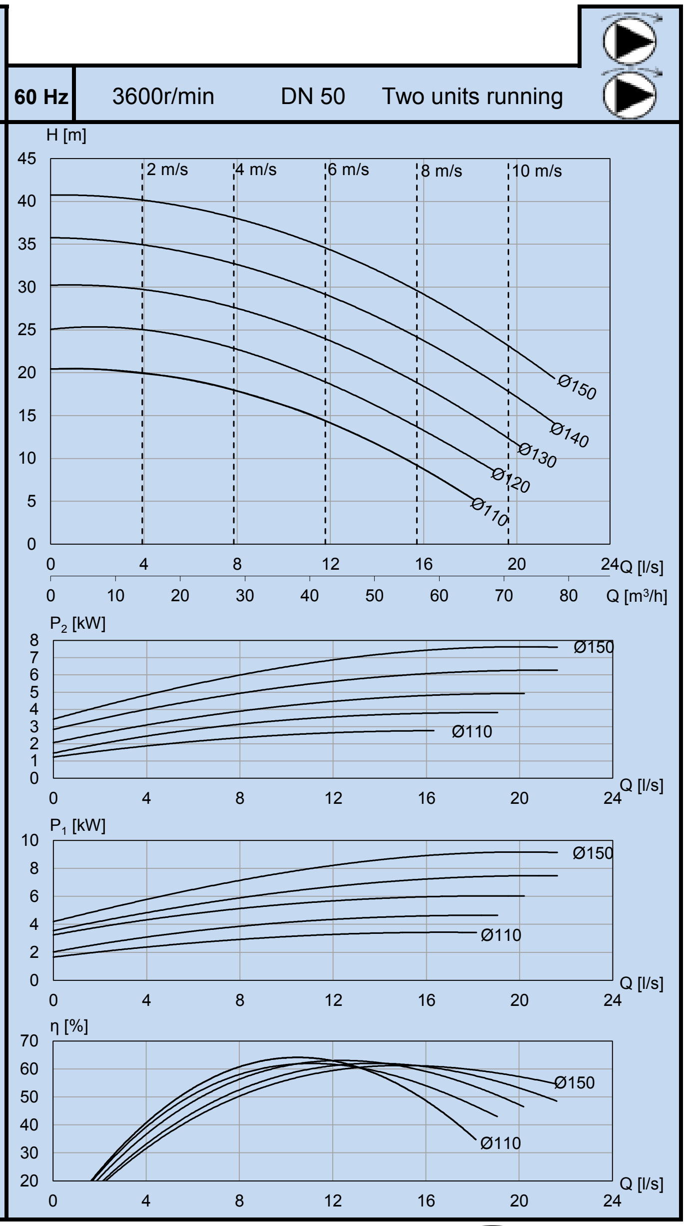
T-50C/2

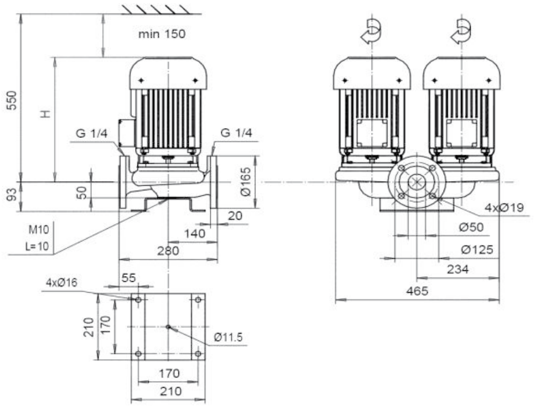


	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-101 C1 F16	1,5 (1,8)	2,98 (3,02)	72	355
	KH-101 D1 F16	2,2 (2,6)	4,35 (4,33)	78	355
	KH-112 C1 F16	3 (3,6)	6,00 (6,05)	86	400
	KH-112 E1 F16	4 (4,8)	7,90 (8,00)	94	400

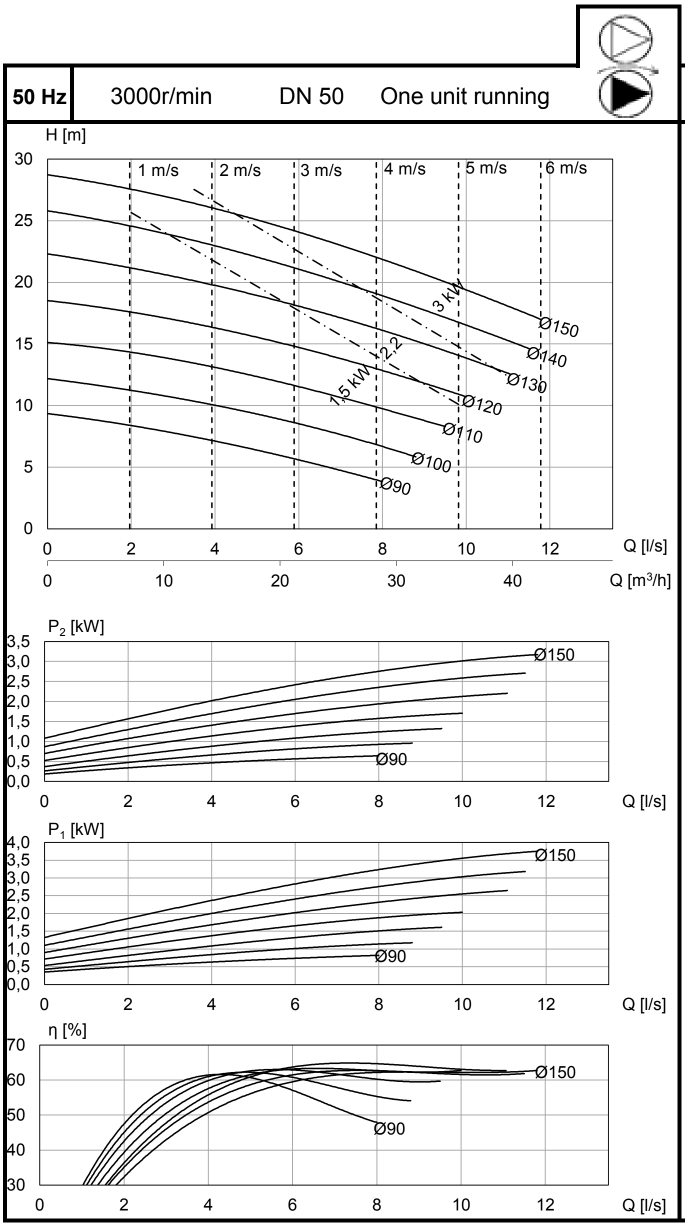


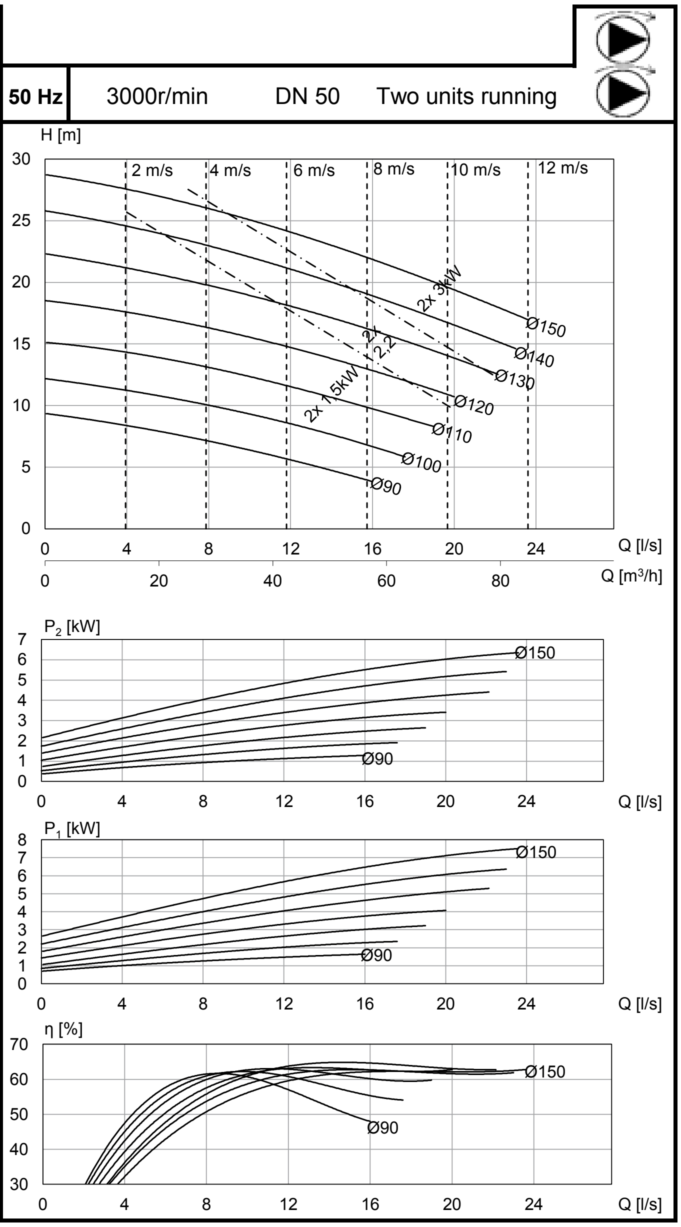


T-50D/2

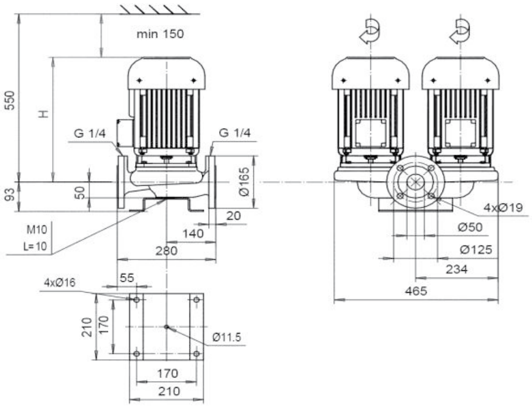


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C1 F16	1,5	2,95	73	355
	KH-101 D1 F16	2,2	4,28	79	355
	KH-112 C1 F16	3	6,05	87	400

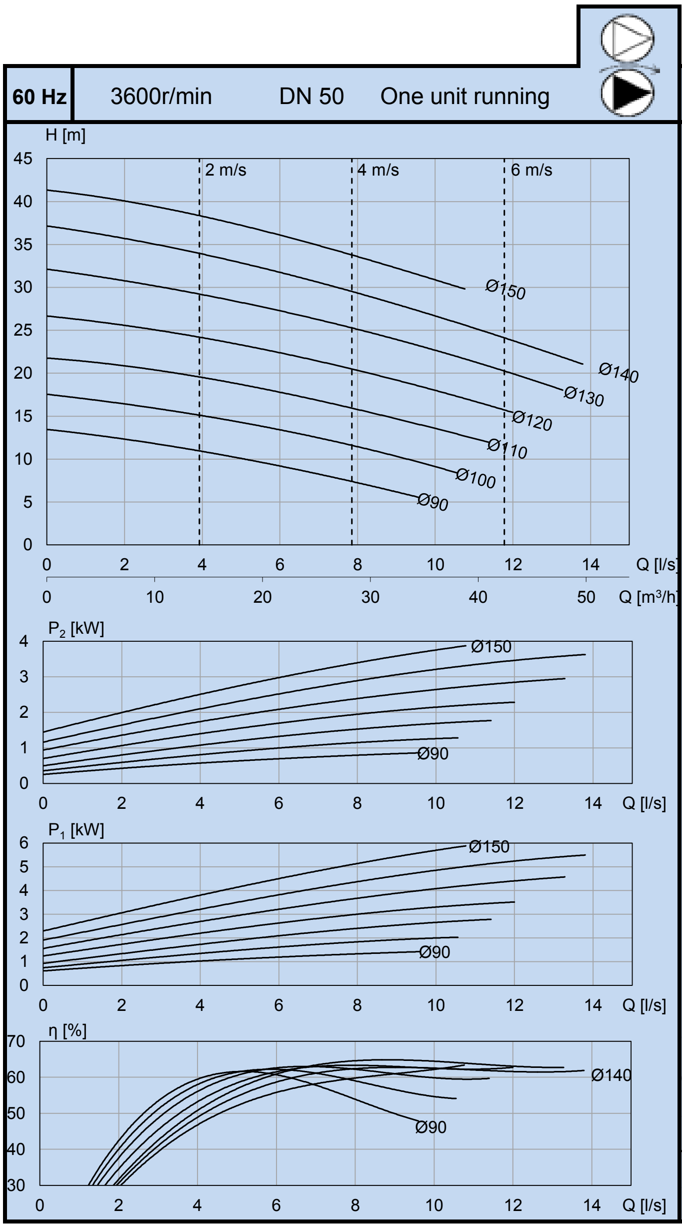


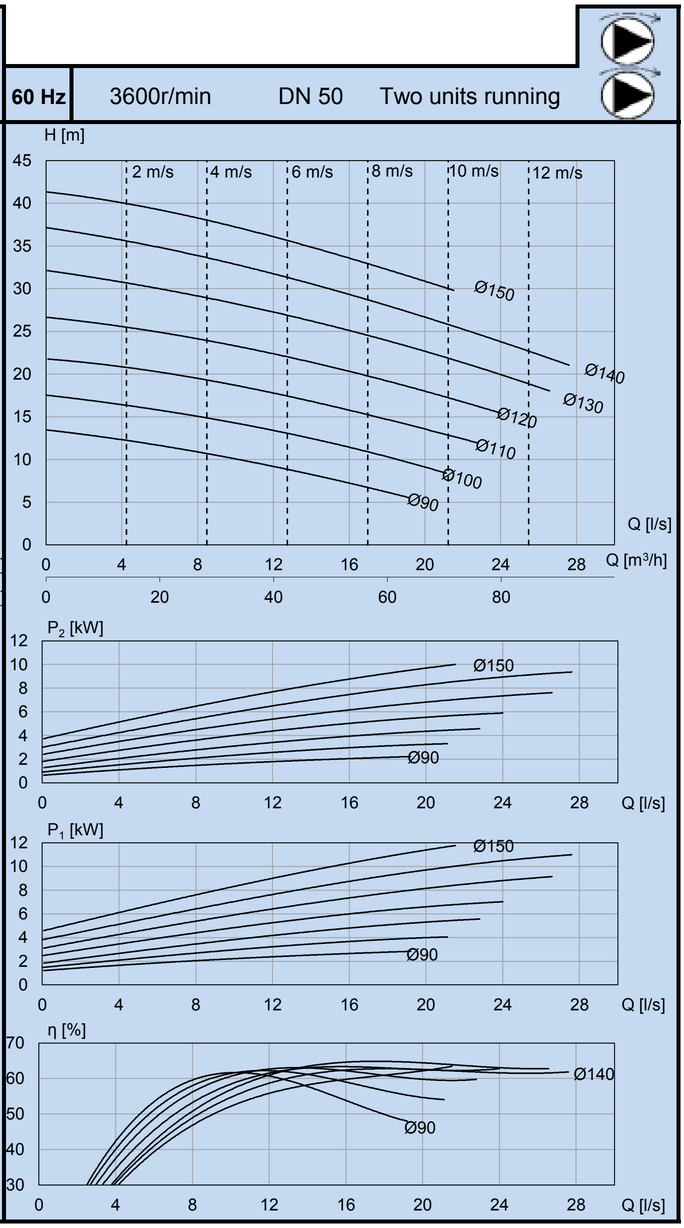


T-50D/2

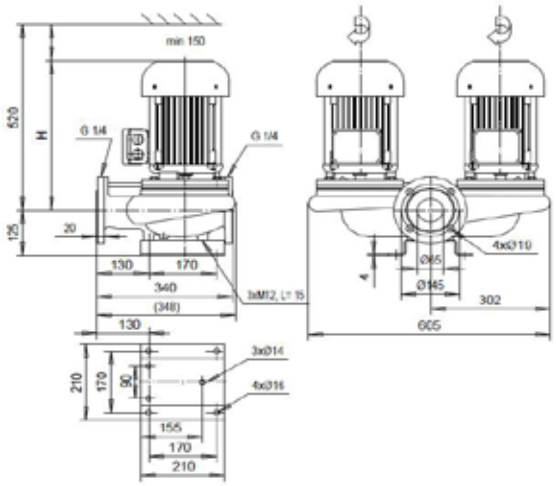


60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C1 F16	1,5 (1,8)	2,98 (3,02)	73	355
	KH-101 D1 F16	2,2 (2,6)	4,35 (4,33)	79	355
	KH-112 C1 F16	3 (3,6)	6,00 (6,05)	87	400
	KH-112 E1 F16	4 (4,8)	7,90 (8,00)	95	400

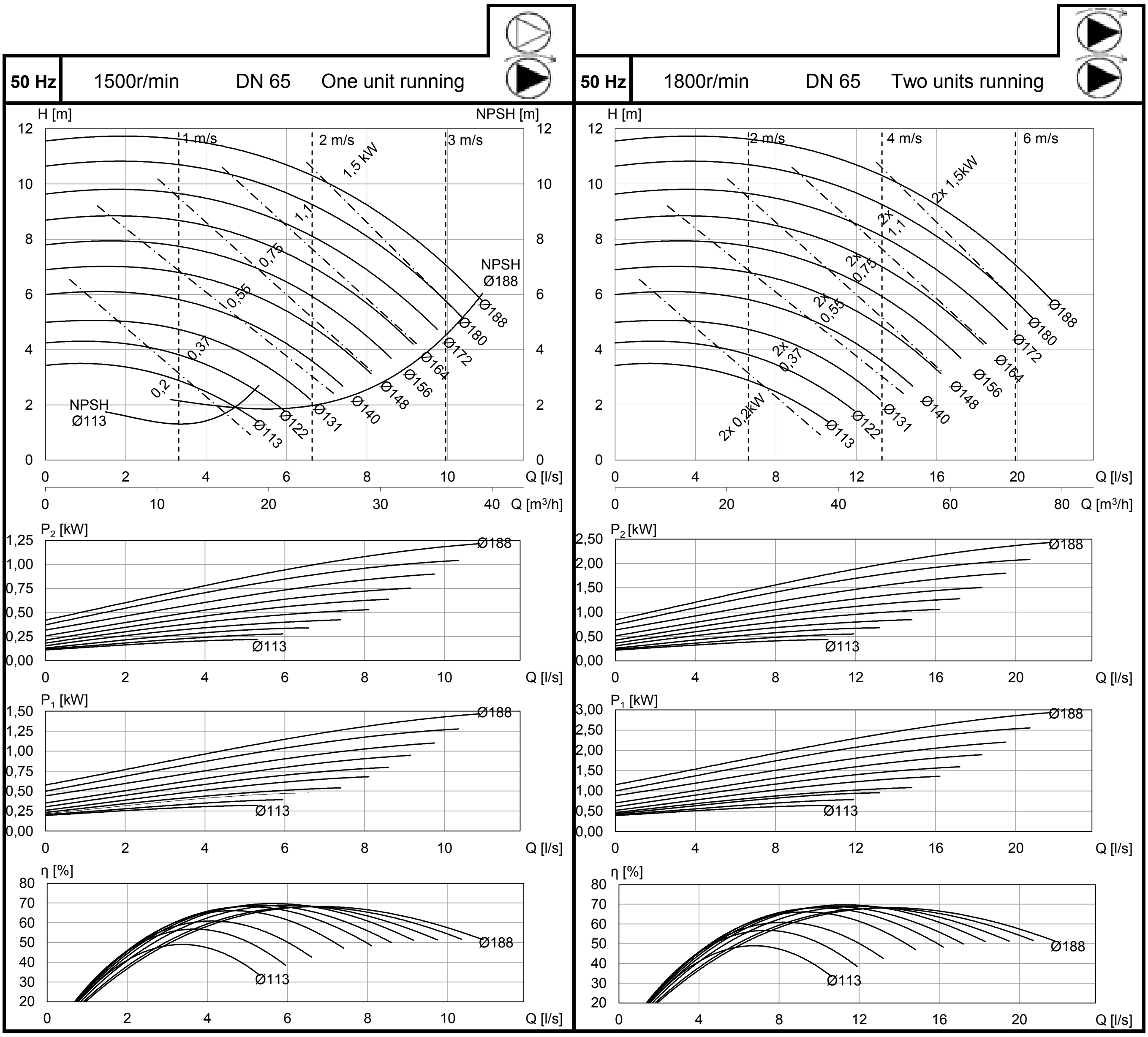




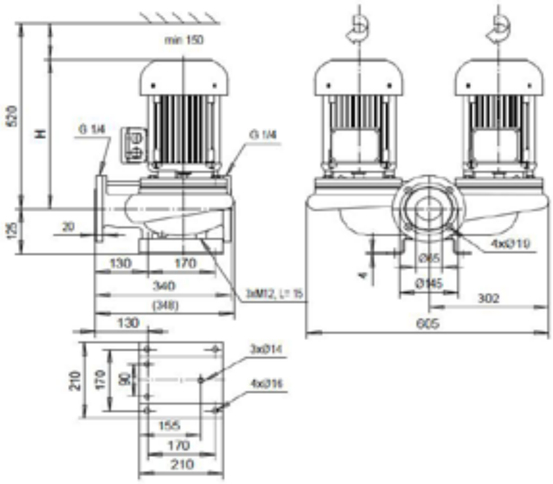
T-65A/4



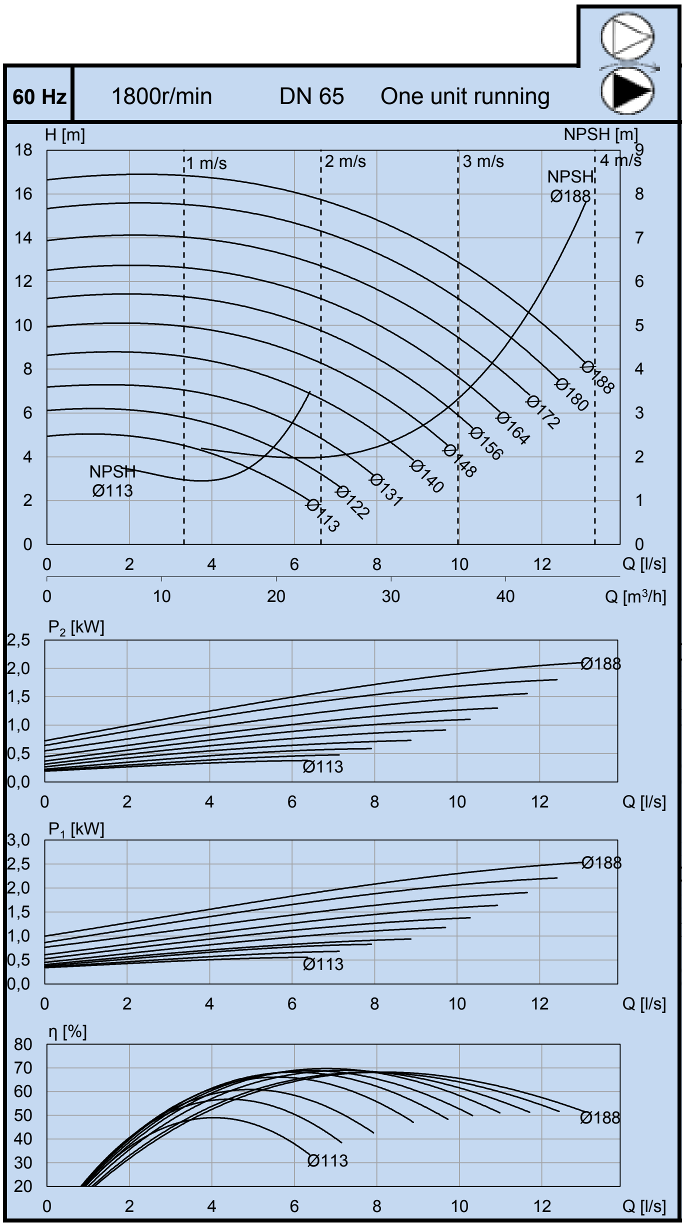
50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OKN-852 D F19	0,2	0,75	76	310
	OKN-852 D F19	0,37	1,00	76	310
	KH-100 A2 F19	0,55	1,28	92	320
	KH-100 B2 F19	0,75	1,70	92	320
	KH-101 C2 F19	1,1	2,44	105	370
	KH-101 D2 F19	1,5	3,27	110	370
	KH-112 C2 F19	2,2	4,60	120	415
	KH-112 E2 F19	3	6,25	130	415

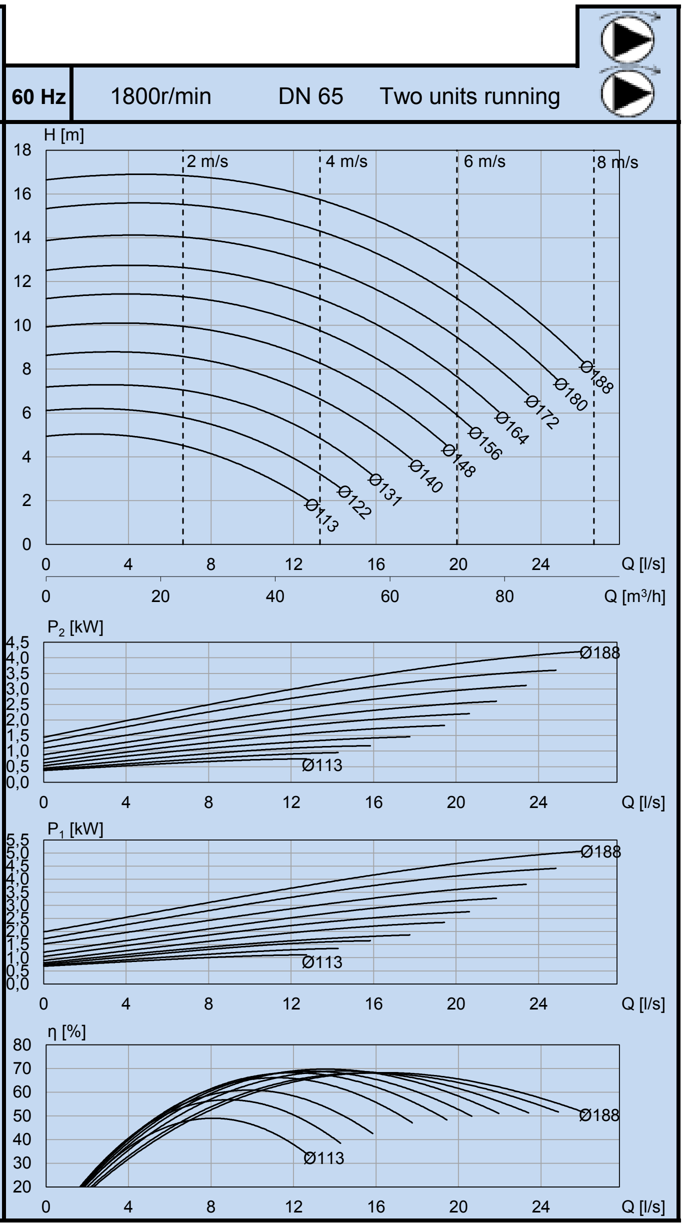


T-65A/4



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OKN-852 D F19	0,37 (0,44)	1,00 (1,00)	76	310
	KH-100 A2 F19	0,55 (0,66)	1,28 (1,30)	92	320
	KH-100 B2 F19	0,75 (0,9)	1,70 (1,74)	92	320
	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	105	370
	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	110	370
	KH-112 C2 F19	2,2 (2,6)	4,55 (4,60)	120	415
	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	130	415





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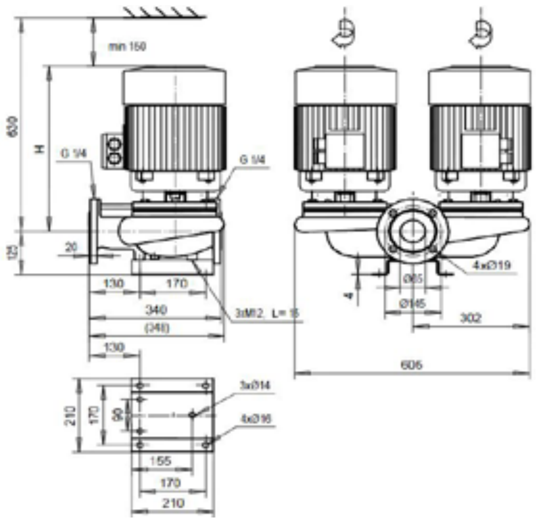
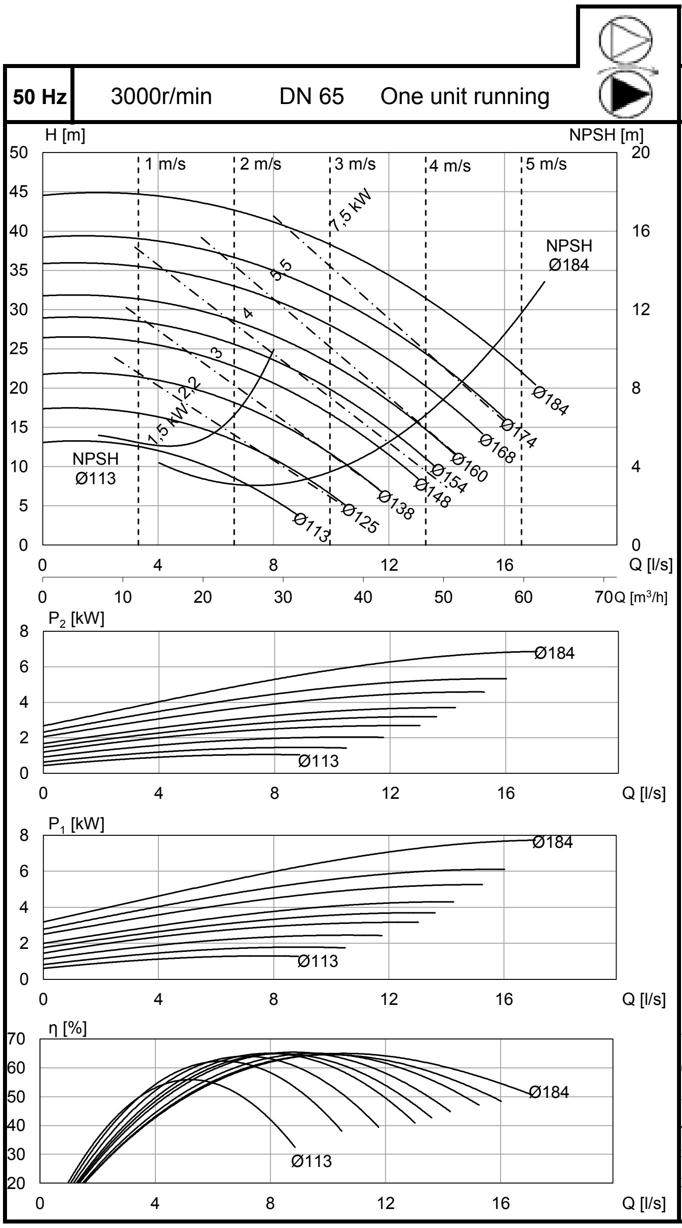
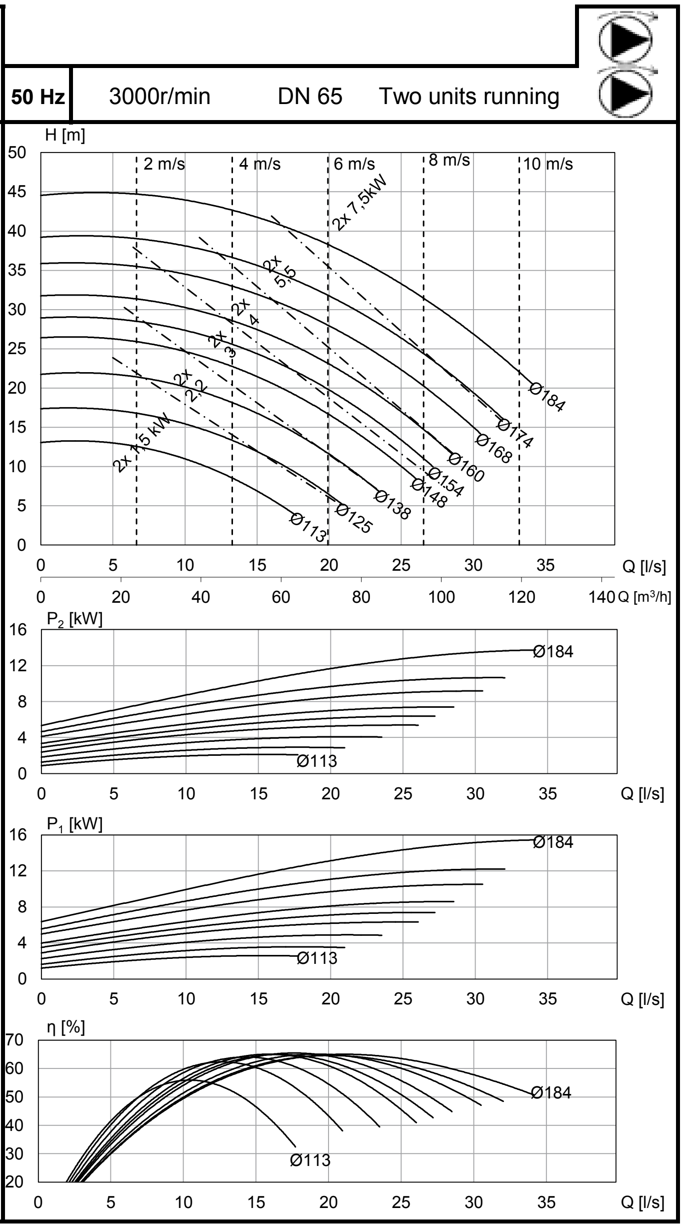
T-65B/2

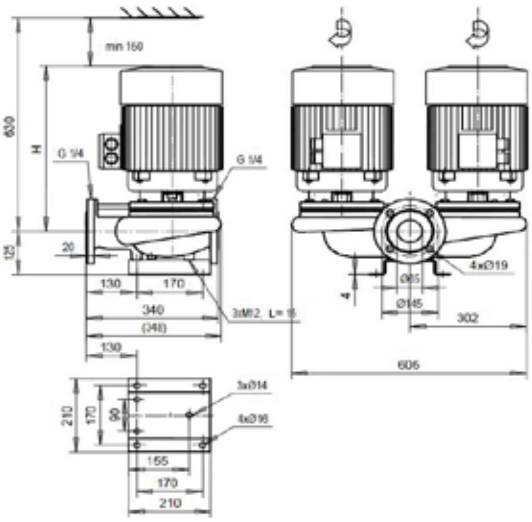


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C1 F19	1,5	2,95	105	370
	KH-101 D1 F19	2,2	4,28	110	370
	KH-112 C1 F19	3	6,05	120	415
	KH-112 E1 F19	4	7,95	130	415
	KH-132 C1 F19	5,5	10,20	180	475
	KH-132 E1 F19	7,5	13,75	195	475

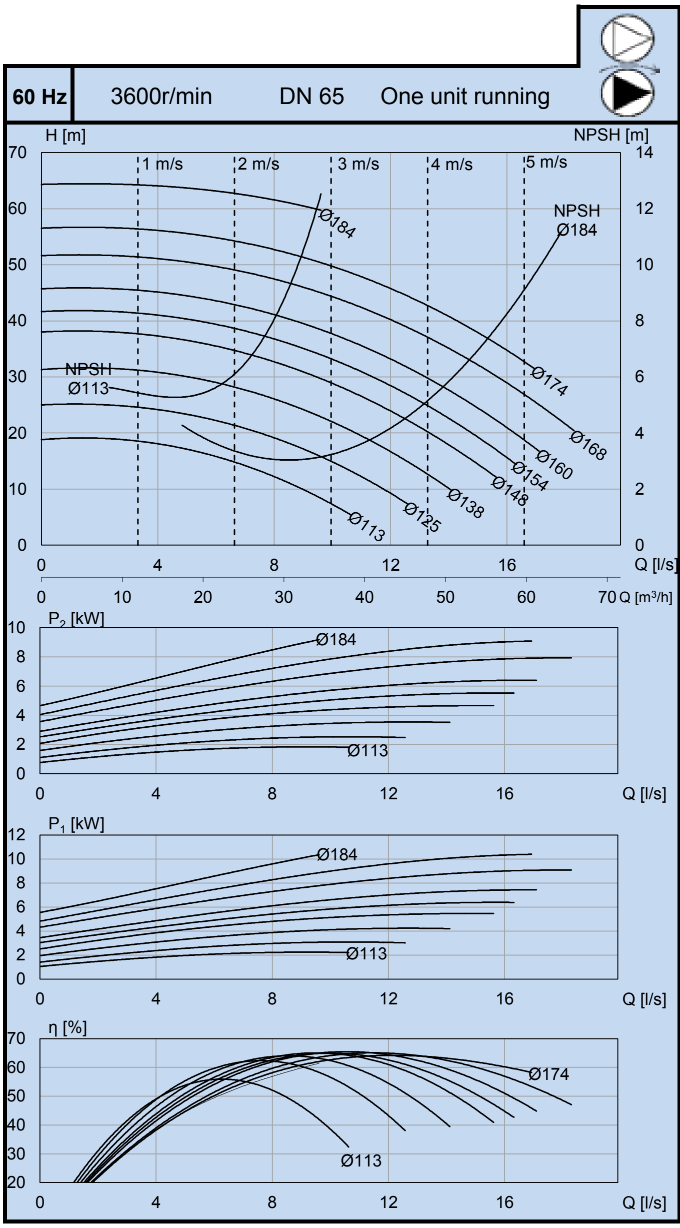


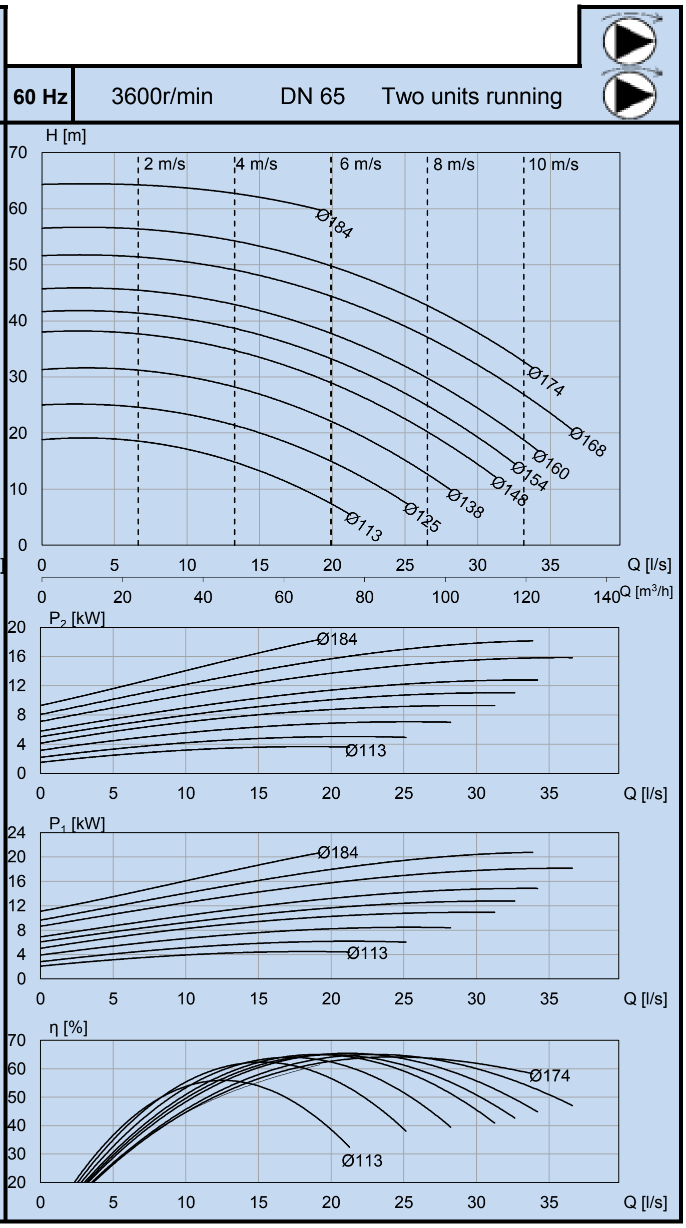


T-65B/2

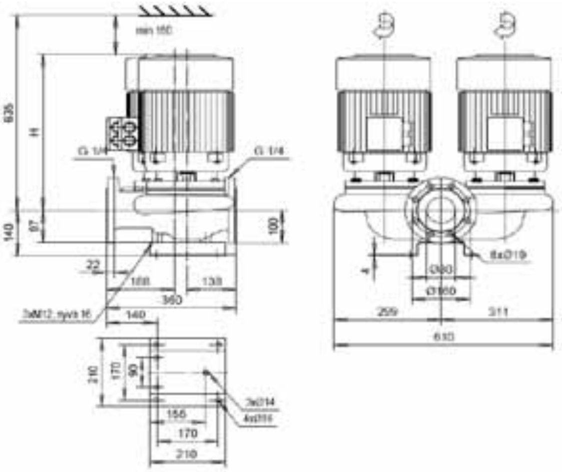


60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C1 F19	1,5 (1,8)	2,98 (3,02)	105	370
	KH-101 D1 F19	2,2 (2,6)	4,35 (4,33)	110	370
	KH-112 C1 F19	3 (3,6)	6,00 (6,05)	120	415
	KH-112 E1 F19	4 (4,8)	7,90 (8,00)	130	415
	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	180	475
	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	195	475

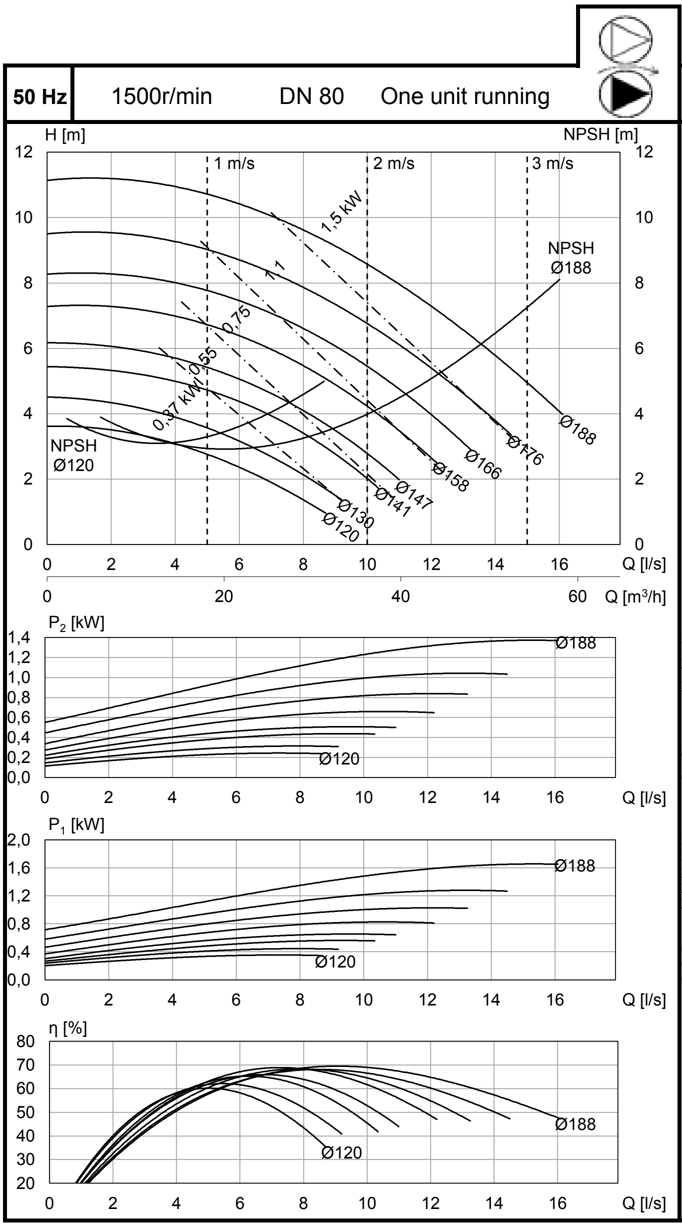


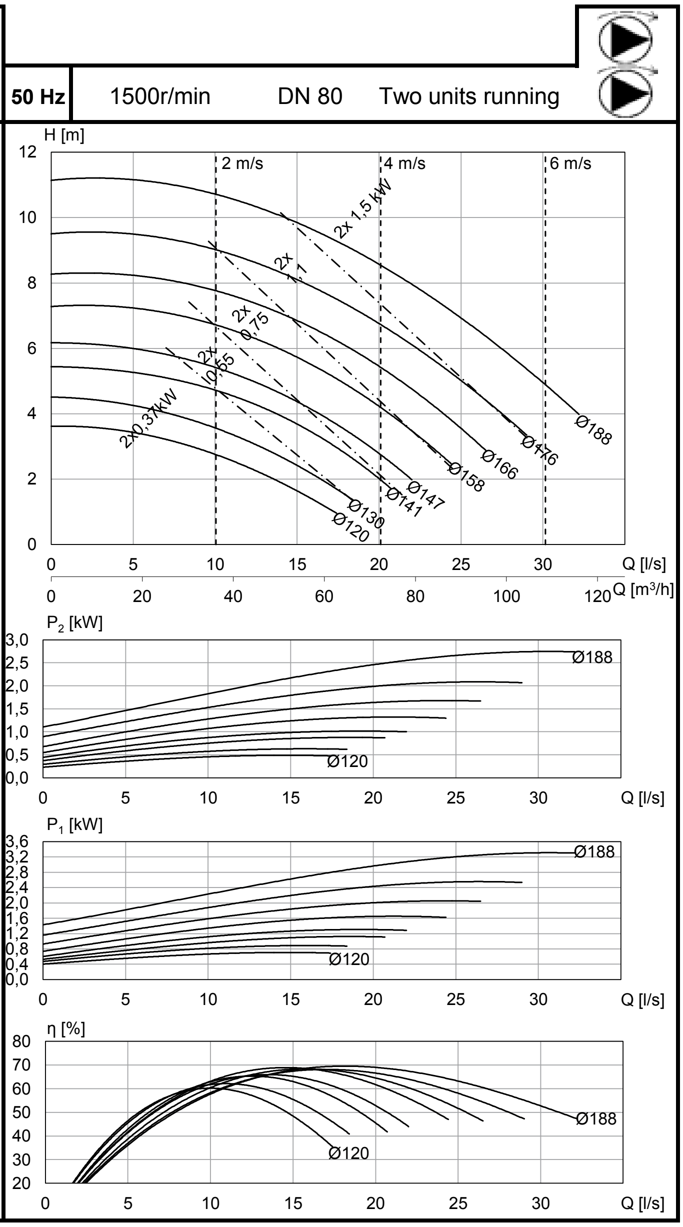


T-80A/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	OKN-852 D F19	0,37	1,00	79	315
	KH-100 A2 F19	0,55	1,27	93	325
	KH-100 B2 F19	0,75	1,74	93	325
	KH-101 C2 F19	1,1	2,44	105	375
	KH-101 D2 F19	1,5	3,27	110	375
	KH-112 C2 F19	2,2	4,60	125	420
	KH-112 E2 F19	3	6,25	130	420





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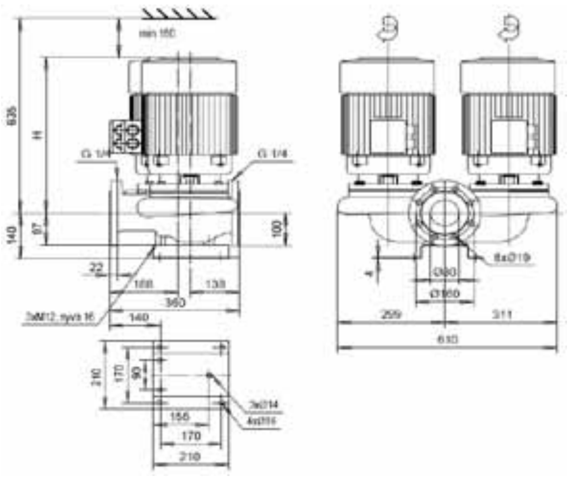
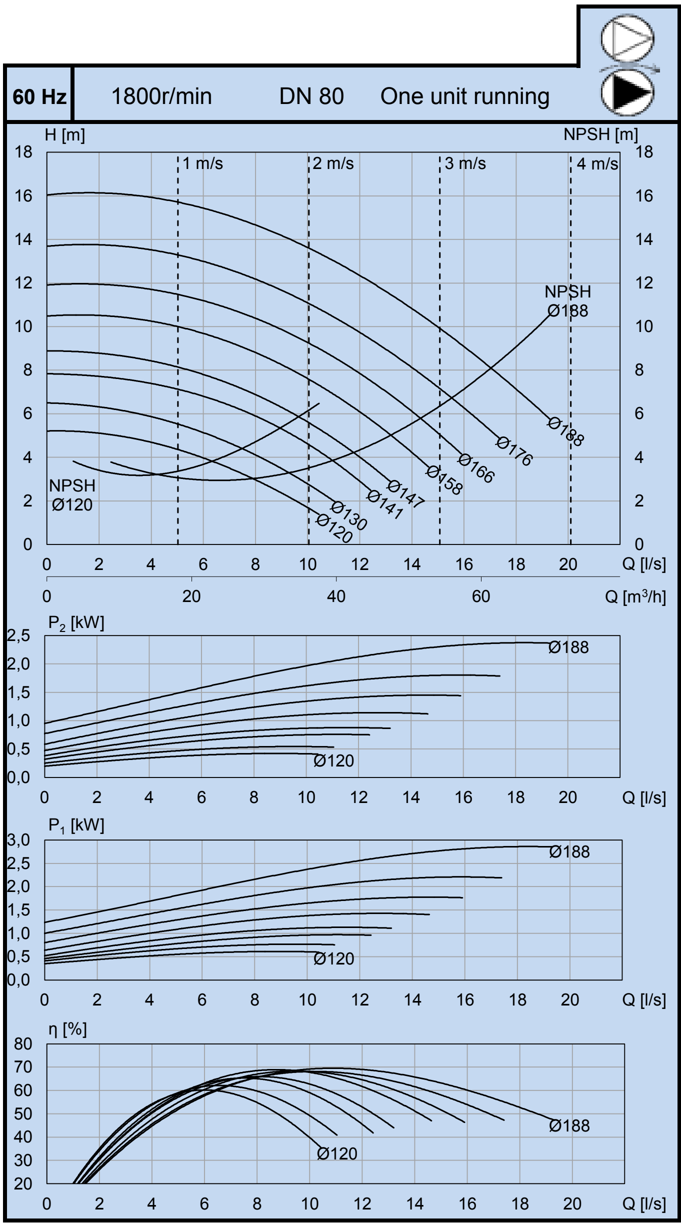
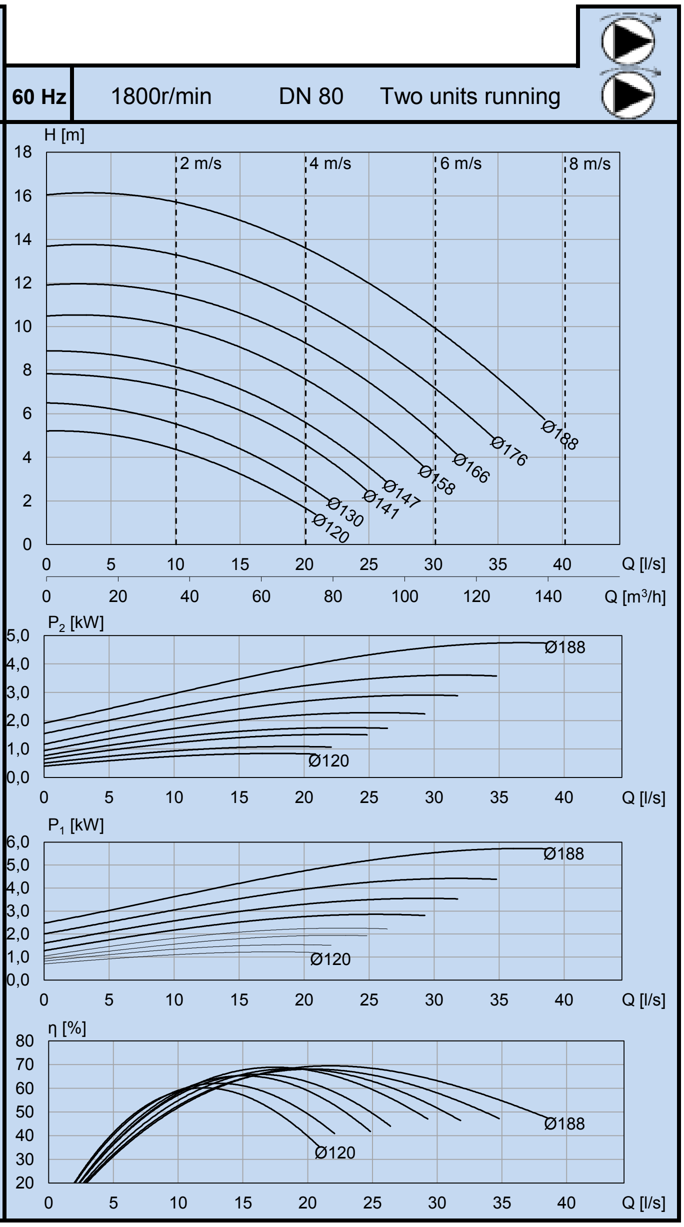
T-80A/4



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-100 A2 F19	0,55 (0,66)	1,28 (1,30)	93	325
	KH-100 B2 F19	0,75 (0,9)	1,70 (1,74)	93	325
	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	105	375
	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	110	375
	KH-112 C2 F19	2,2 (2,6)	4,55 (4,60)	125	420
	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	130	420





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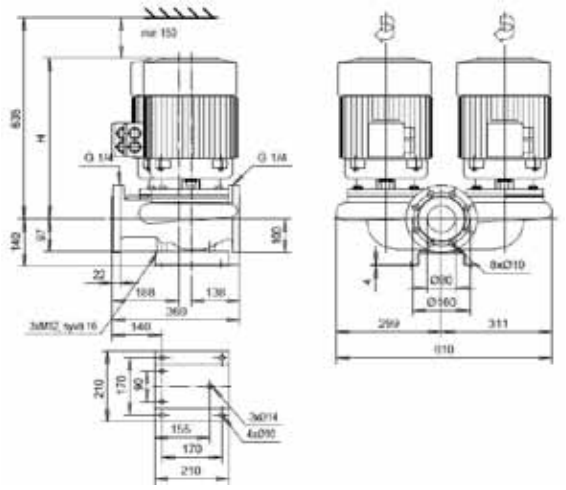
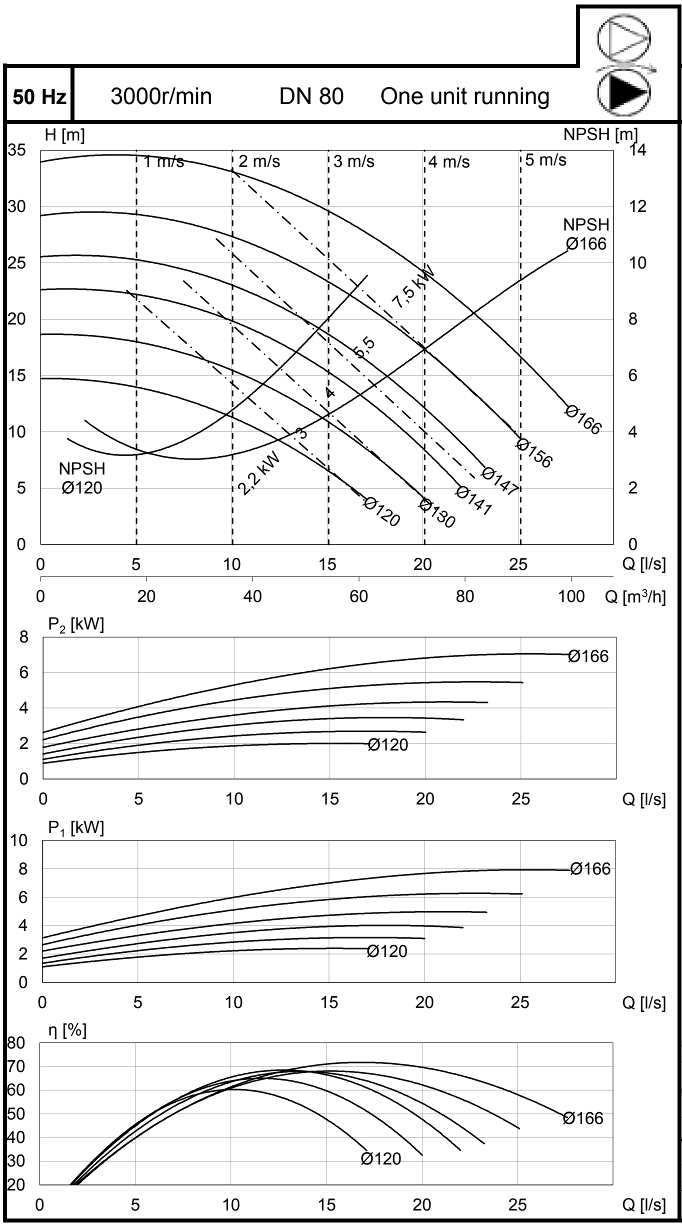
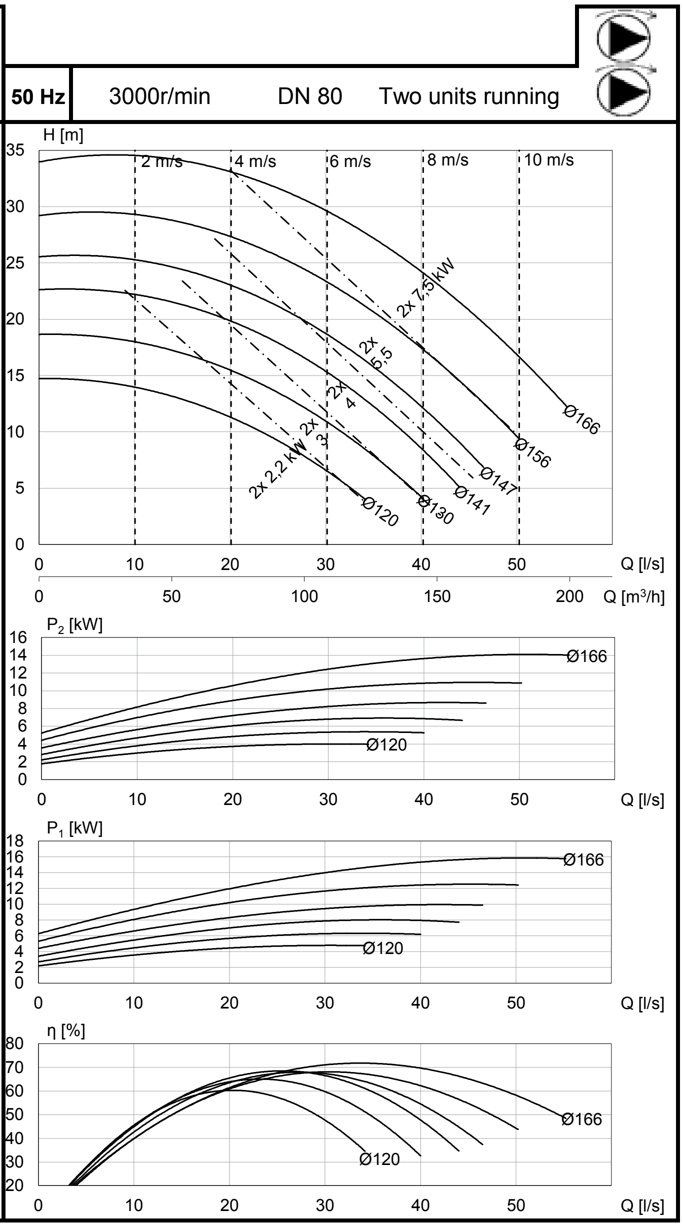
T-80A/2

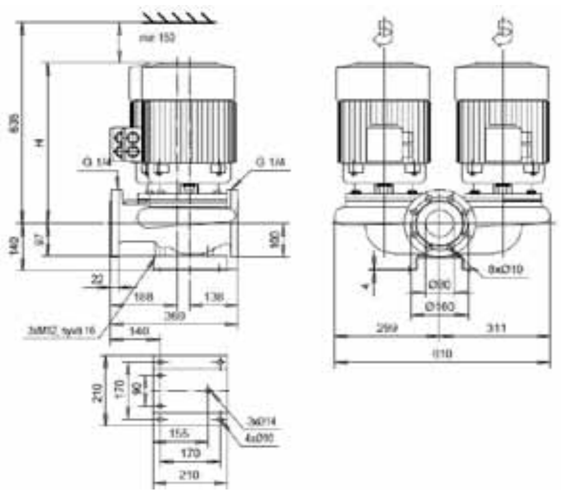


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 D1 F19	2,2	4,28	110	375
	KH-112 C1 F19	3	6,05	125	420
	KH-112 E1 F19	4	7,95	130	420
	KH-132 C1 F19	5,5	10,20	180	480
	KH-132 E1 F19	7,5	13,75	195	480

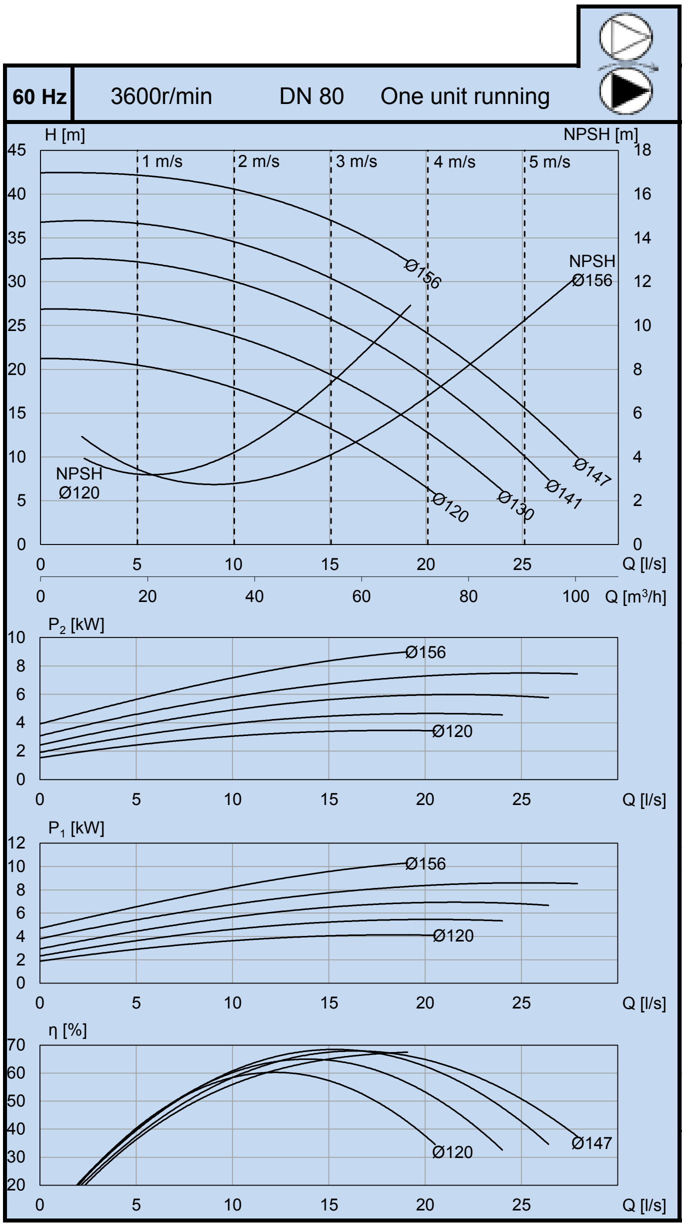


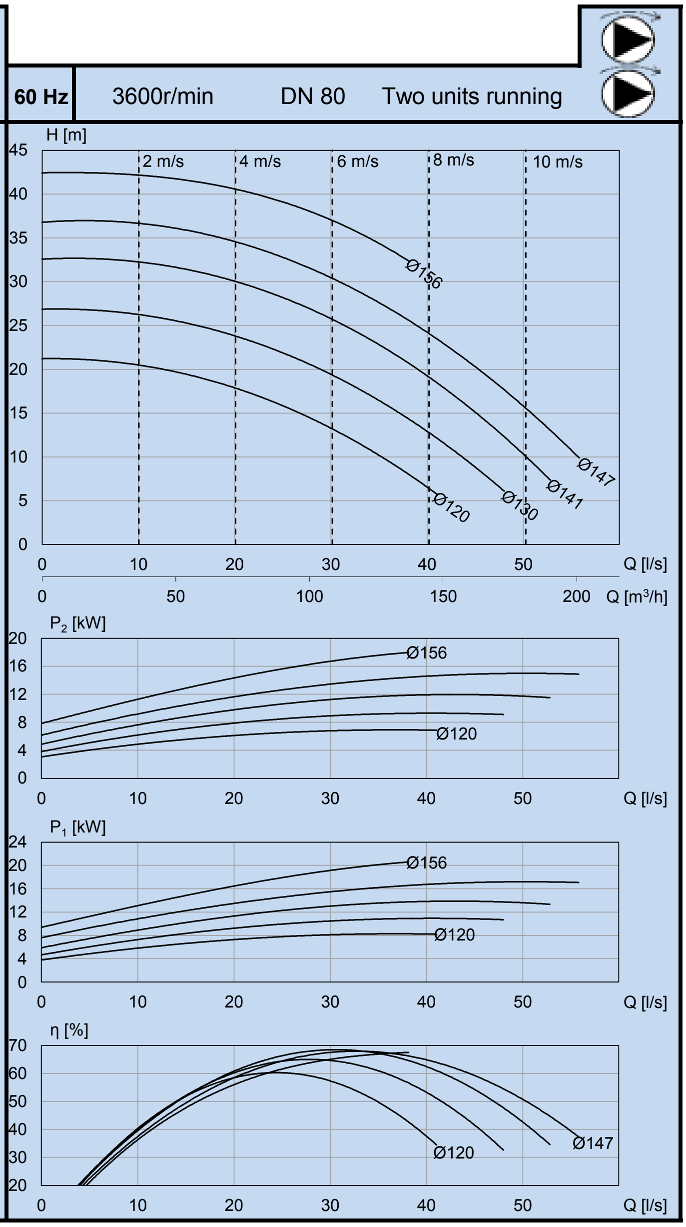


T-80A/2



60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-112 C1 F19	3 (3,6)	6,00 (6,05)	125	420
	KH-112 E1 F19	4 (4,8)	7,90 (8,00)	130	420
	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	180	480
	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	195	480





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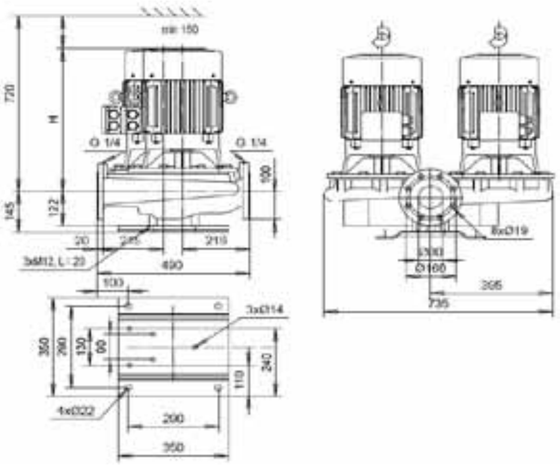
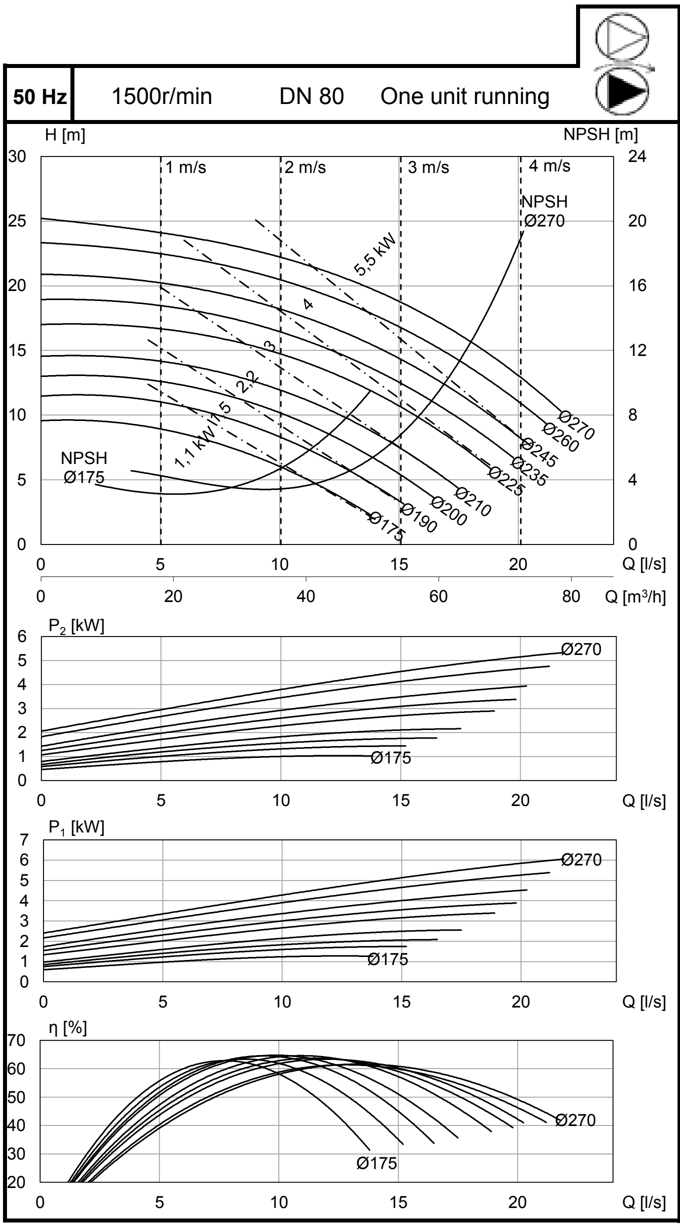
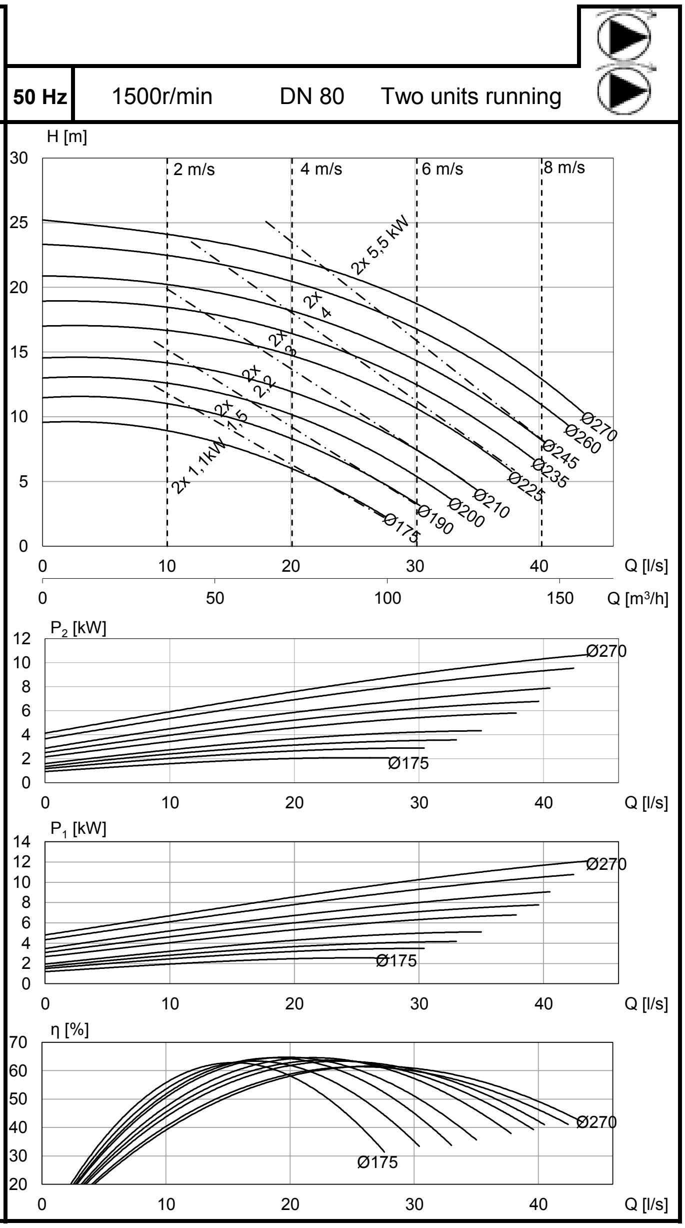
T-80S/4

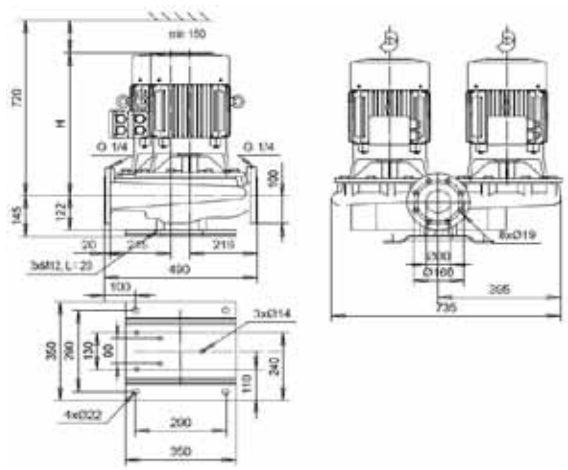


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C2 F29	1,1	2,44	165	430
	KH-101 D2 F29	1,5	3,27	170	430
	KH-112 C2 F29	2,2	4,60	180	475
	KH-112 E2 F29	3	6,25	190	475
	KH-132 C2 F29	4	8,13	245	520
	KH-132 E2 F29	5,5	10,95	255	520

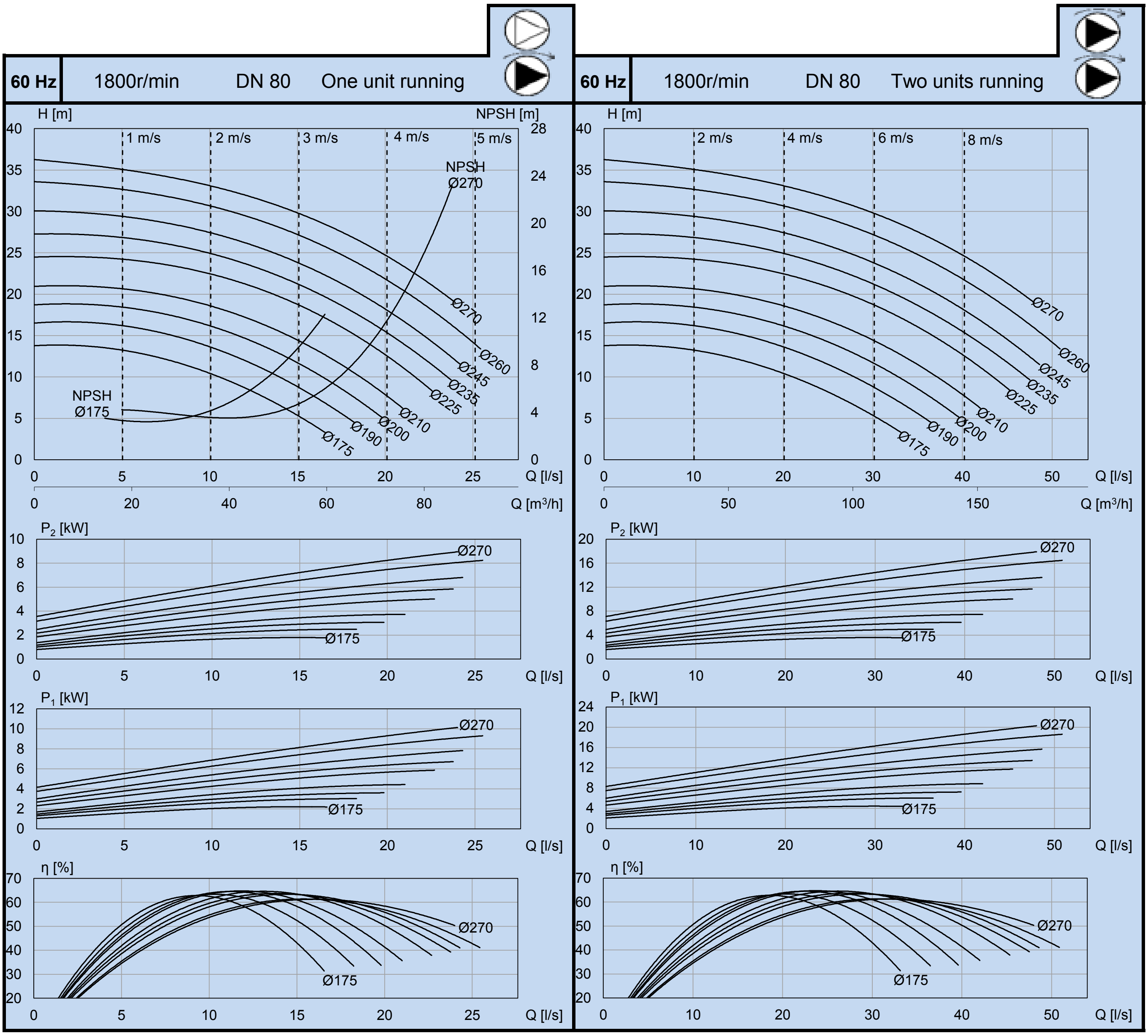




T-80S/4



	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-101 D2 F29	1,5 (1,8)	3,23 (3,32)	170	430
	KH-112 C2 F29	2,2 (2,6)	4,55 (4,60)	180	475
	KH-112 E2 F29	3 (3,6)	6,15 (6,25)	190	475
	KH-132 C2 F29	4 (4,8)	8,17 (8,30)	245	520
	KH-132 E2 F29	5,5 (6,6)	11,00 (11,15)	255	520
	KH-133 G2 F29	7,5 (9)	14,80 (15,47)	280	570



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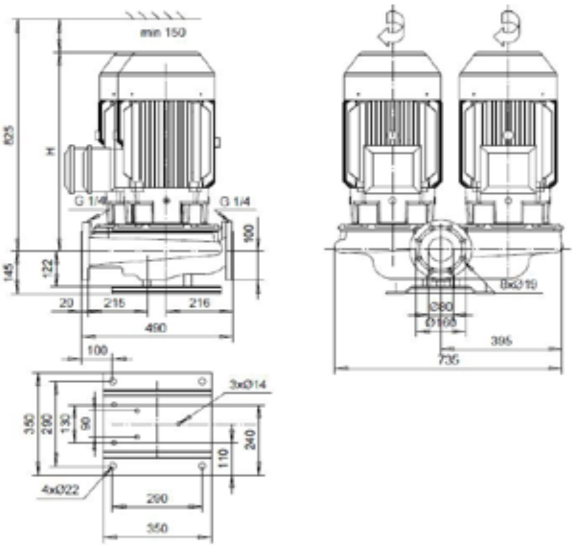
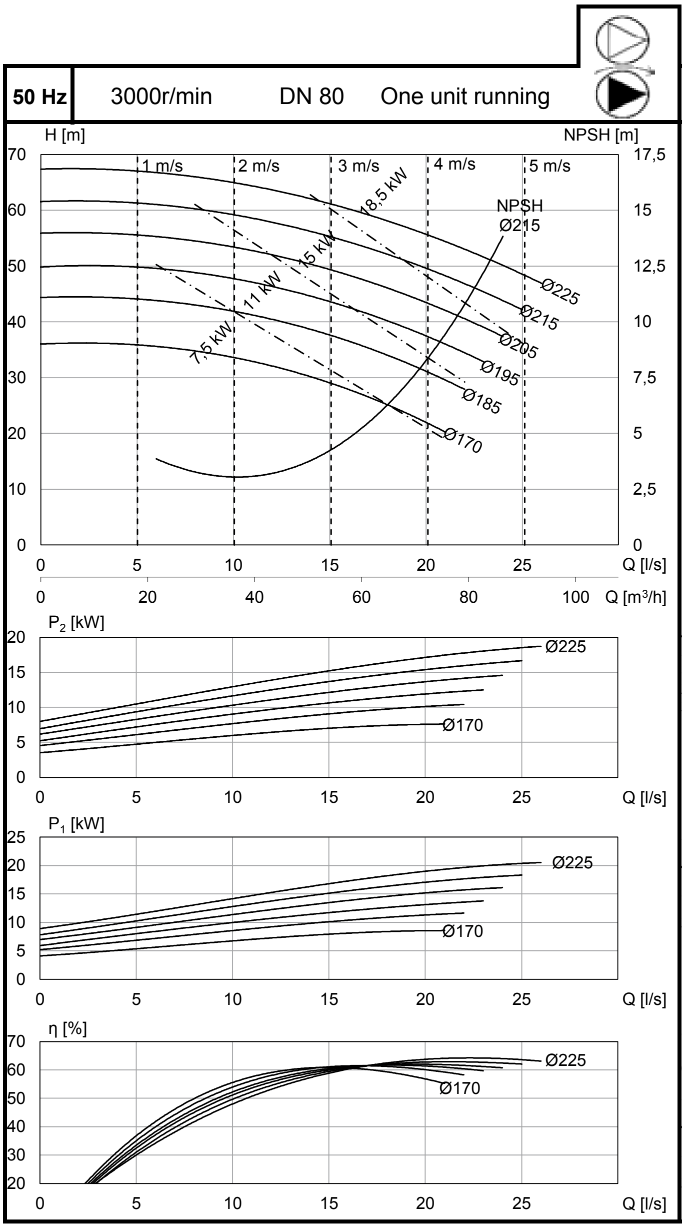
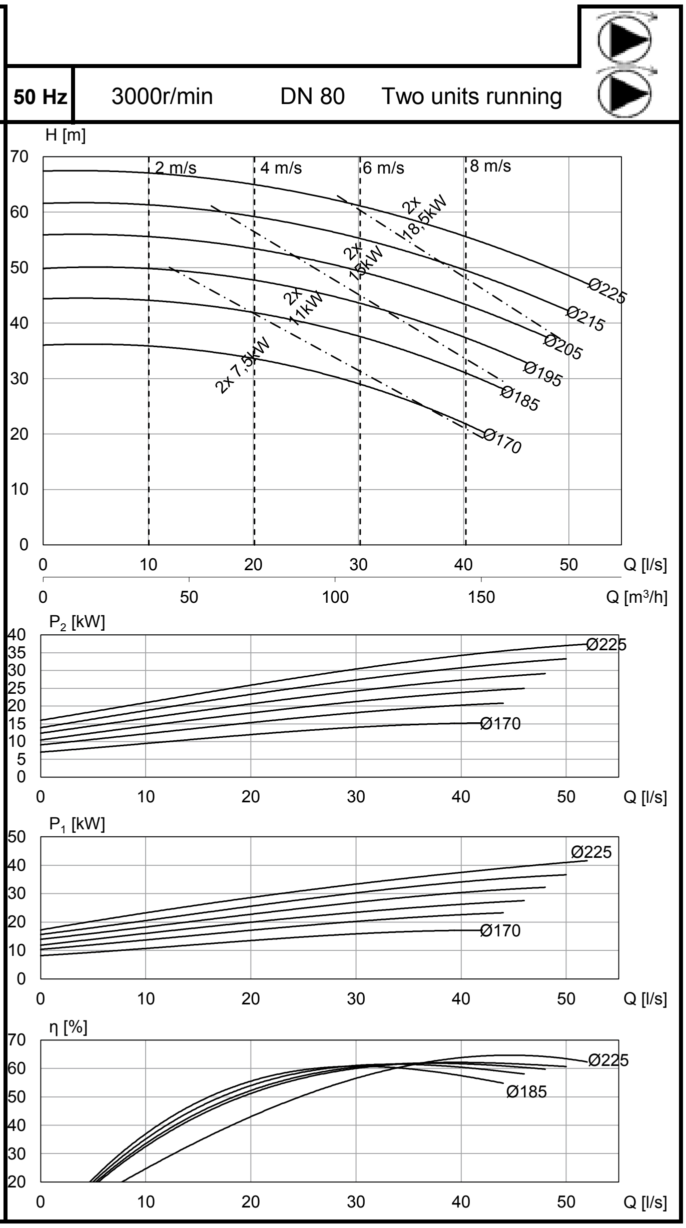
T-80S/2



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 E1 F29	7,5	13,75	255	520
	KZ-165 E1 F29	11	20,20	360	675
	KZ-165 F1 F29	15	26,95	370	675
	KZ-165A H1 F29	18,5	32,60	380	675





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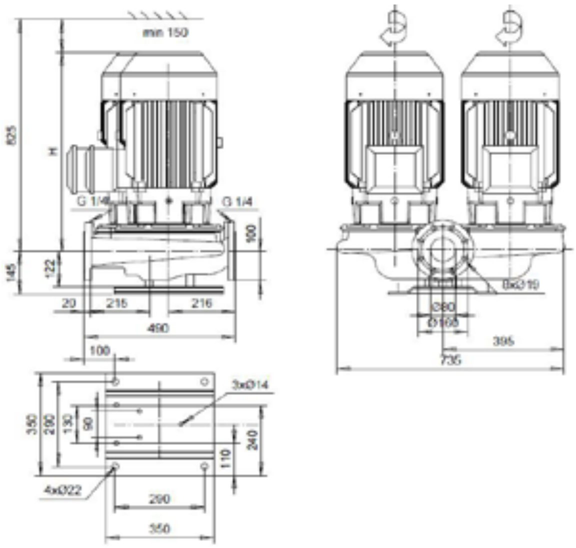
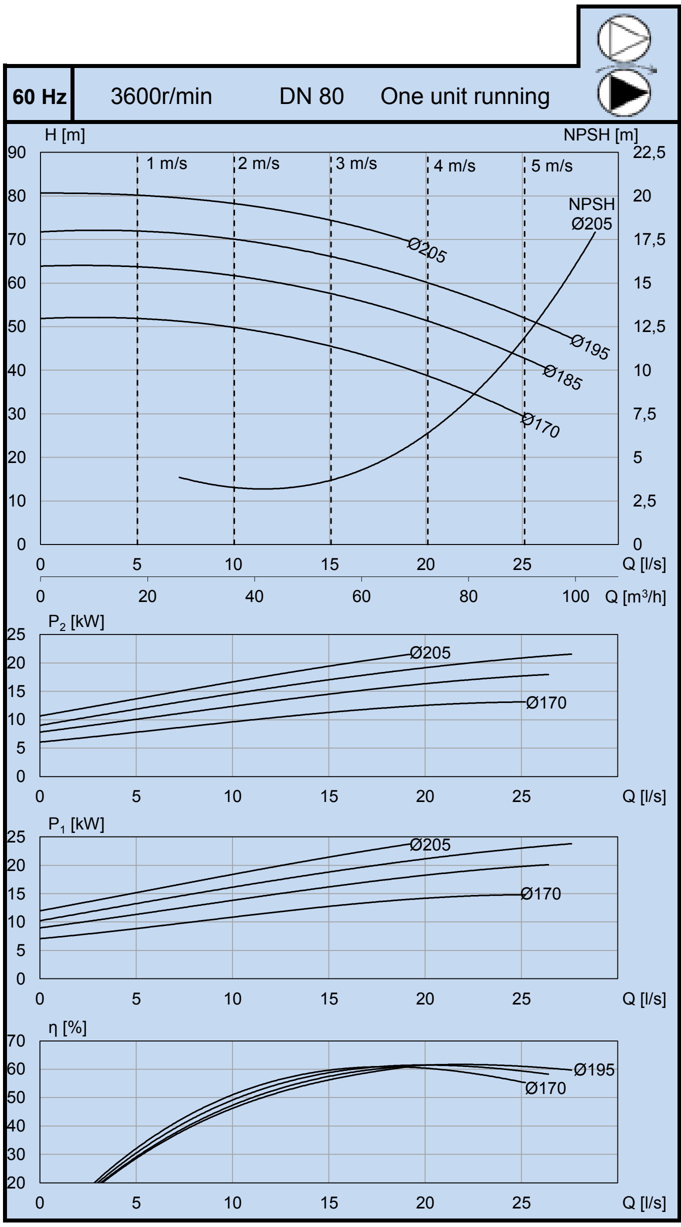
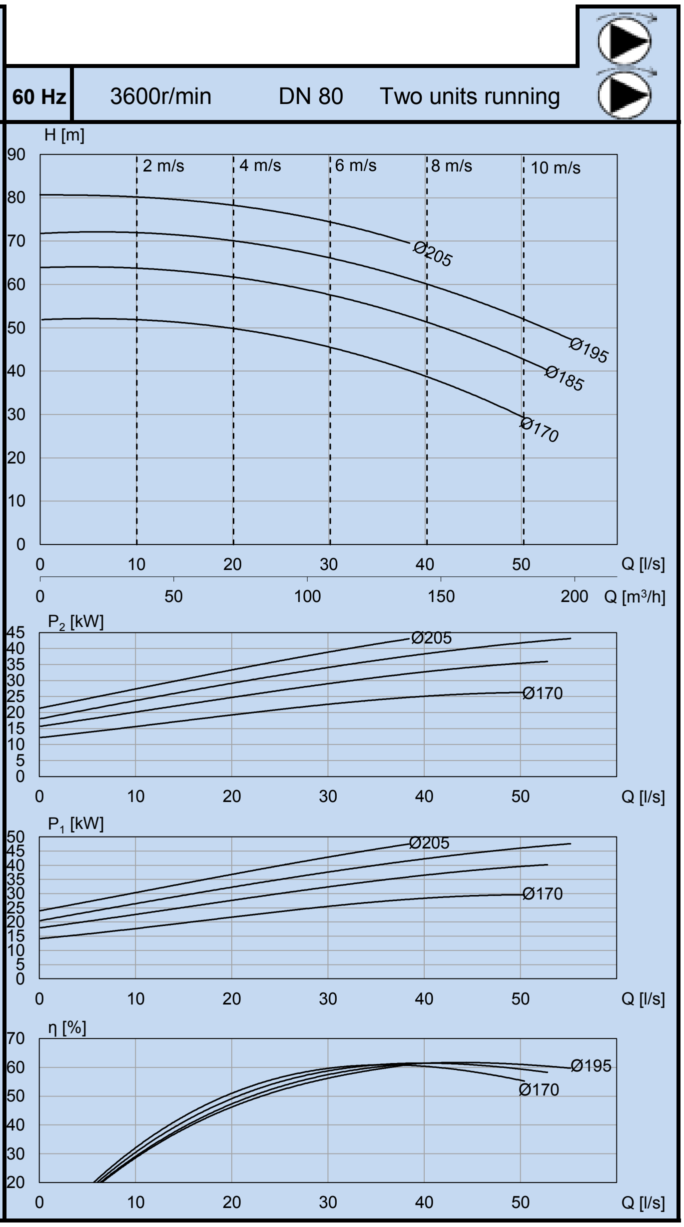
T-80S/2

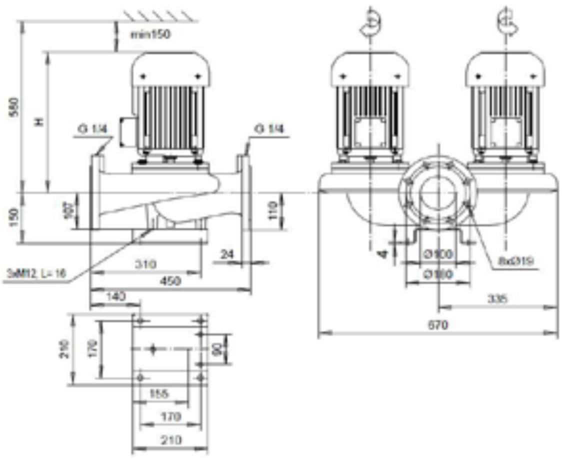


60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-132 E1 F29	7,5 (9)	13,80 (14,05)	255	520
	KZ-165 E1 F29	11 (13)	20,60 (20,30)	360	675
	KZ-165 F1 F29	15 (18)	28,05 (27,90)	370	675
	KZ-165A H1 F29	18,5 (22)	33,90 (33,60)	380	675



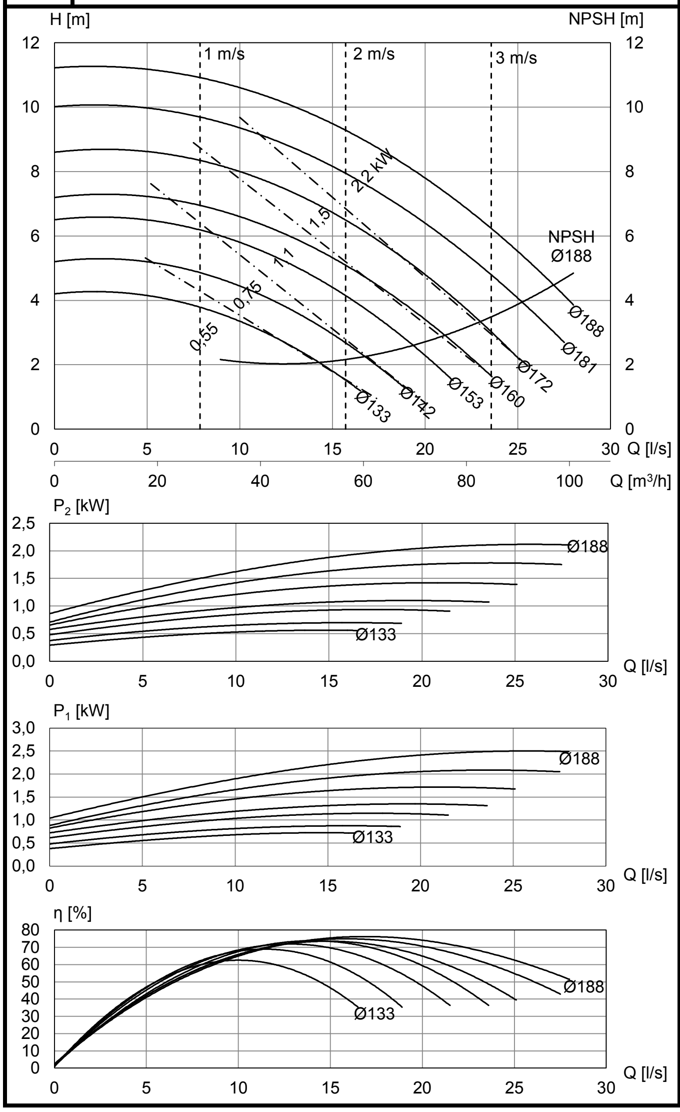


AT-1102/4

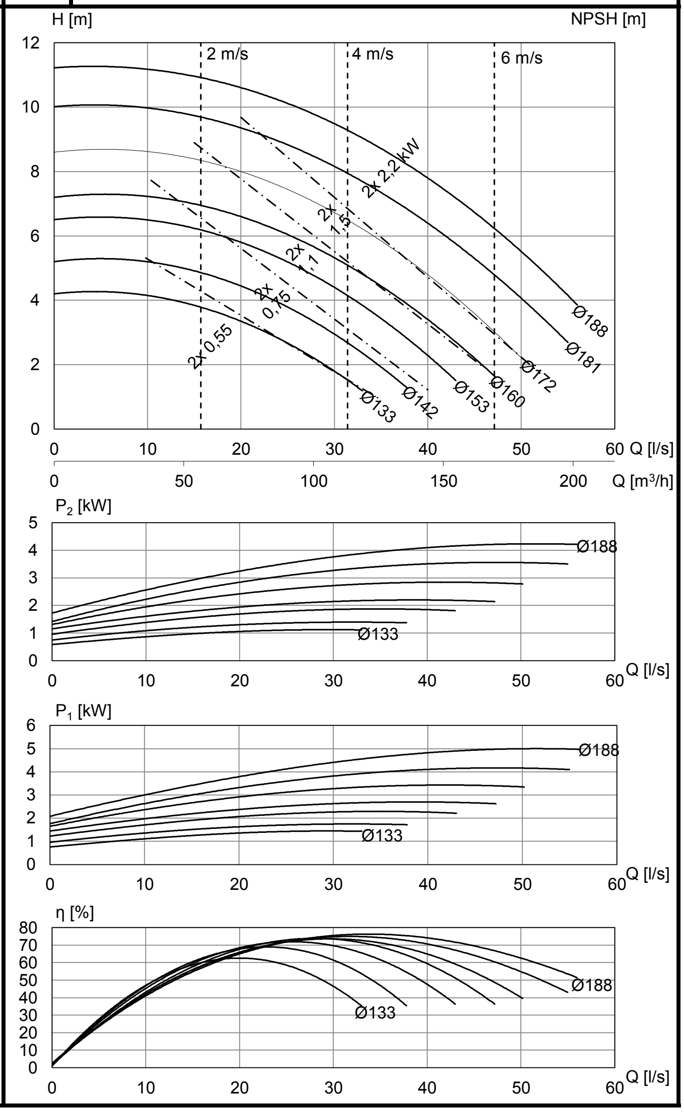


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-100 A2 F19	0,55	1,27	98	335
	KH-100 B2 F19	0,75	1,74	98	335
	KH-101 C2 F19	1,1	2,44	110	385
	KH-101 D2 F19	1,5	3,27	115	385
	KH-112 C2 F19	2,2	4,60	125	430

50 Hz	1500r/min	DN 100	One unit running



50 Hz	1500r/min	DN 100	Two units running



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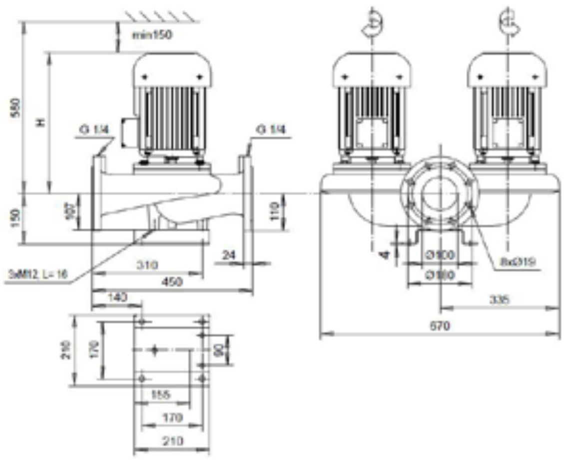
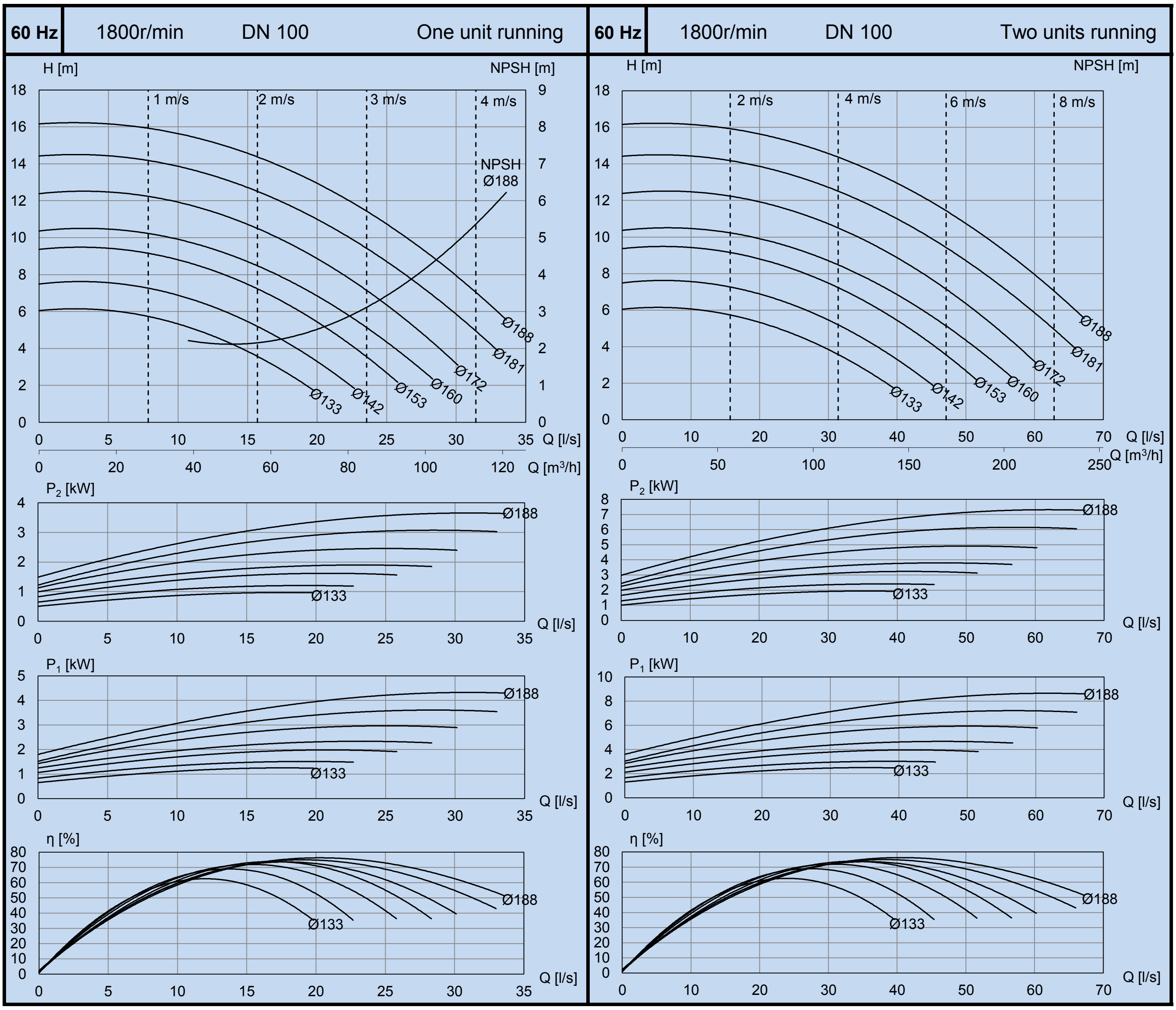
AT-1102/4



ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-101 C2 F19	1,1 (1,3)	2,43 (2,43)	110	385
	KH-101 D2 F19	1,5 (1,8)	3,23 (3,32)	115	385
	KH-112 C2 F19	2,2 (2,6)	4,55 (4,60)	125	430
	KH-112 E2 F19	3 (3,6)	6,15 (6,25)	135	430



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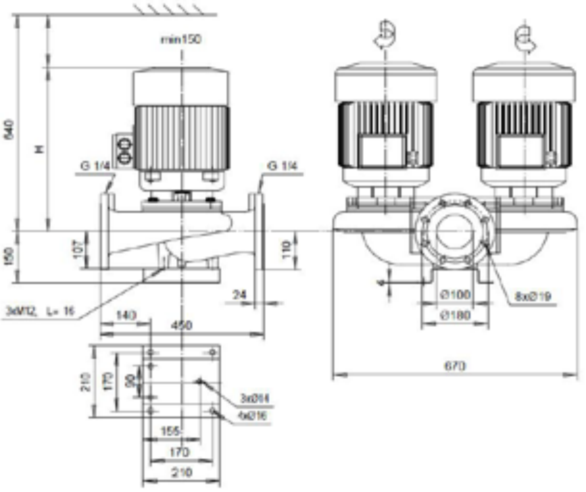
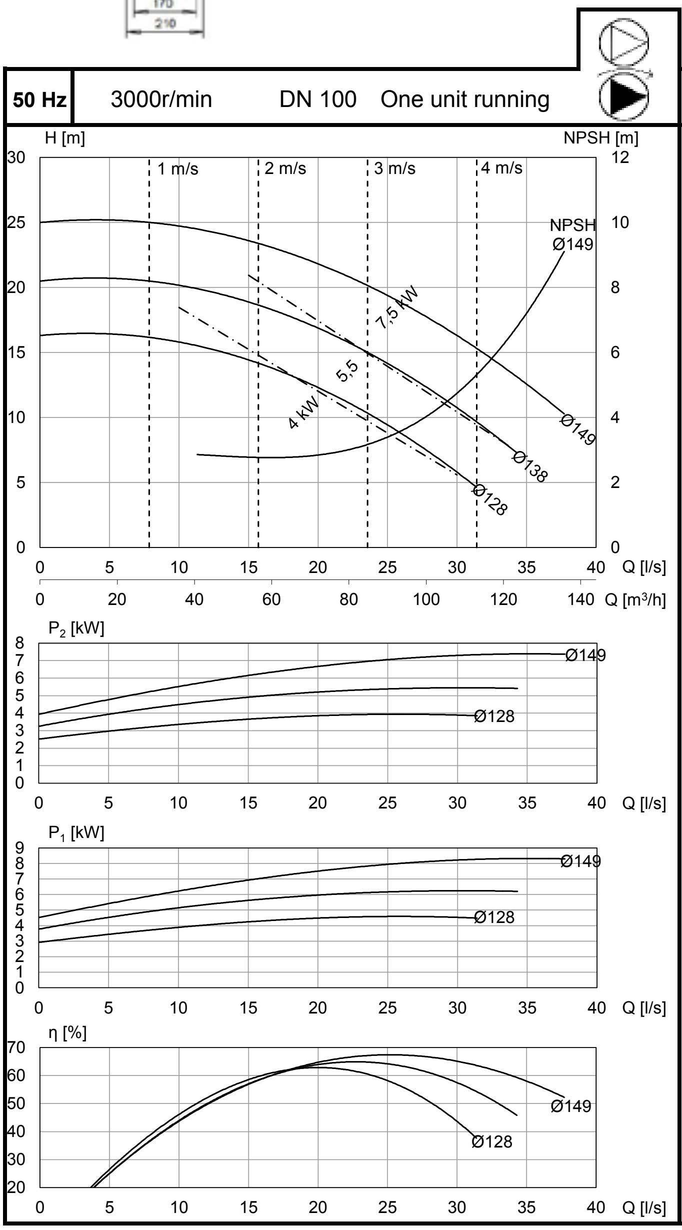
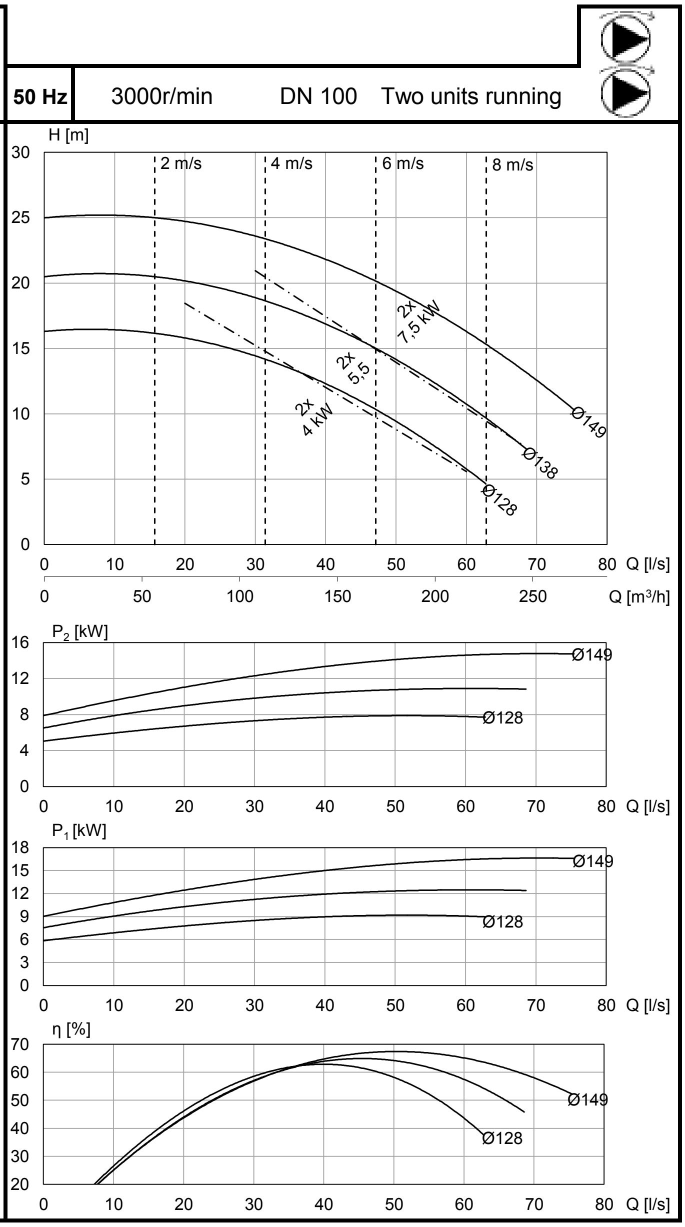
AT-1102/2

50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-112 E1 F19	4	7,95	135	430
	KH-132 C1 F19	5,5	10,20	185	490
	KH-132 E1 F19	7,5	13,75	200	490

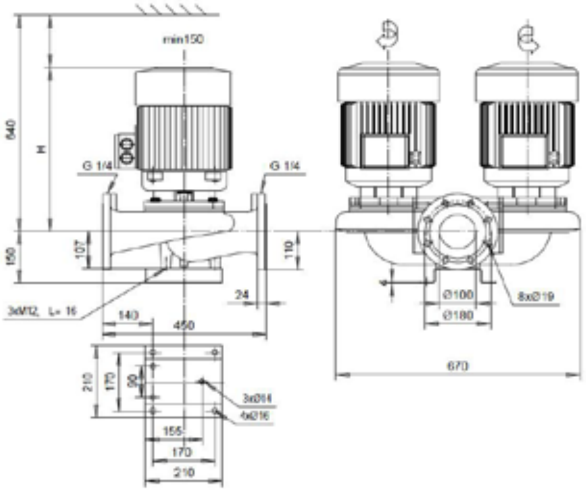


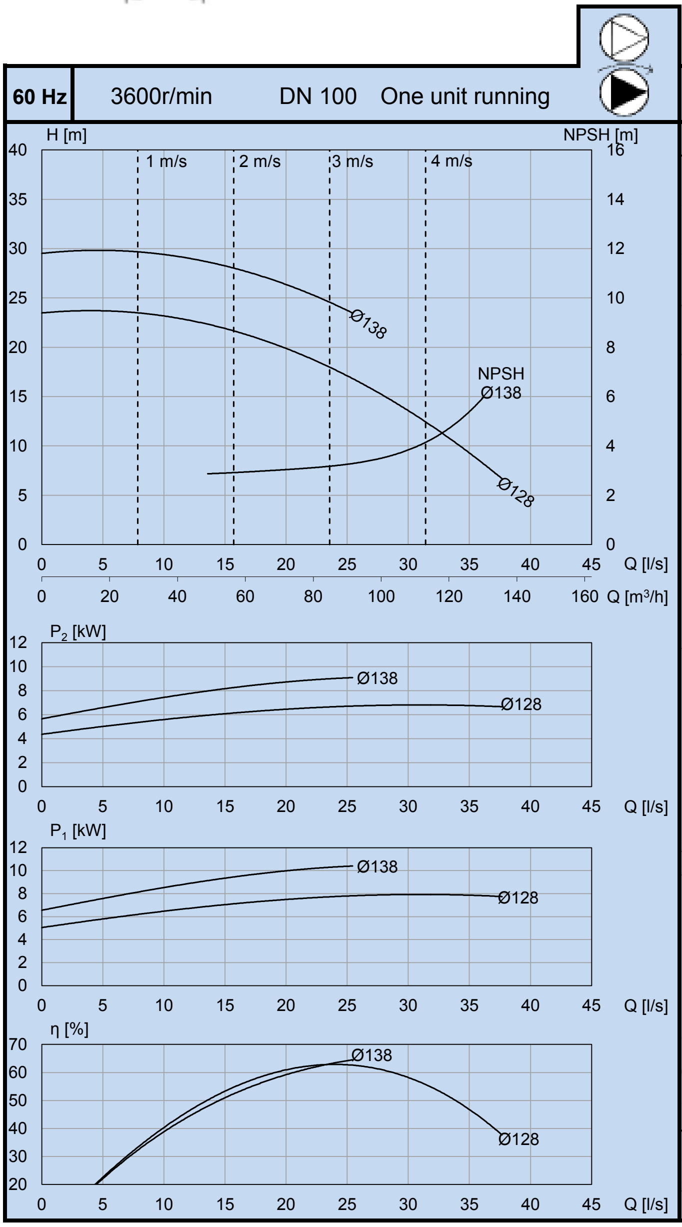


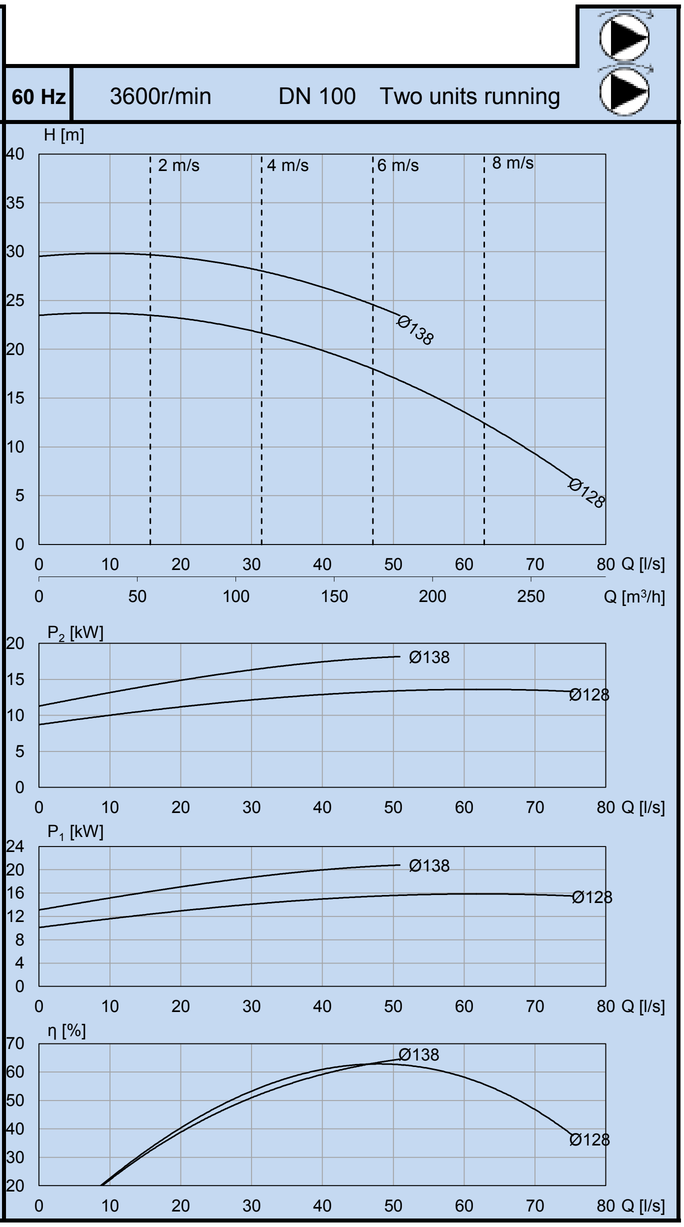


AT-1102/2

60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-132 C1 F19	5,5 (6,6)	10,25 (10,40)	185	490
	KH-132 E1 F19	7,5 (9)	13,80 (14,05)	200	490







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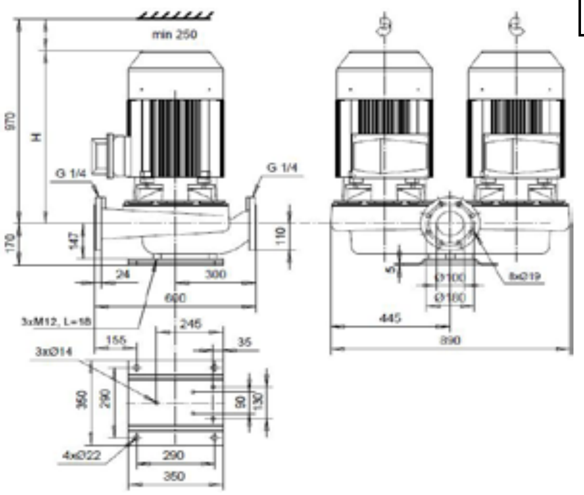
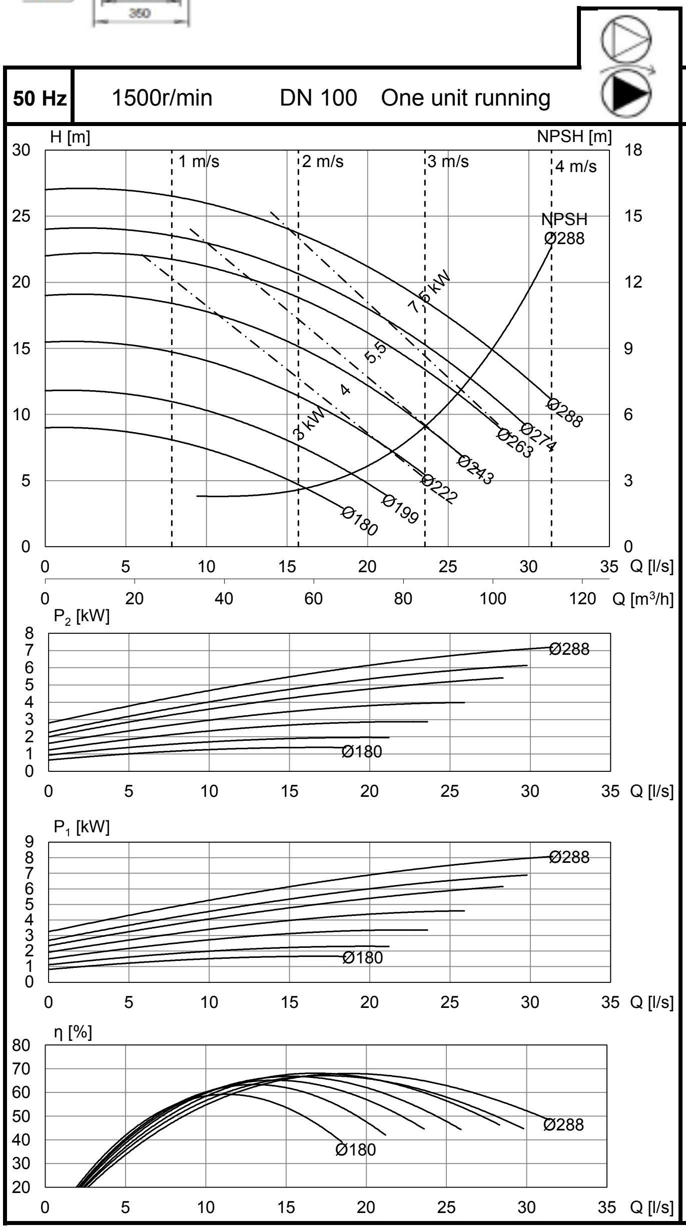
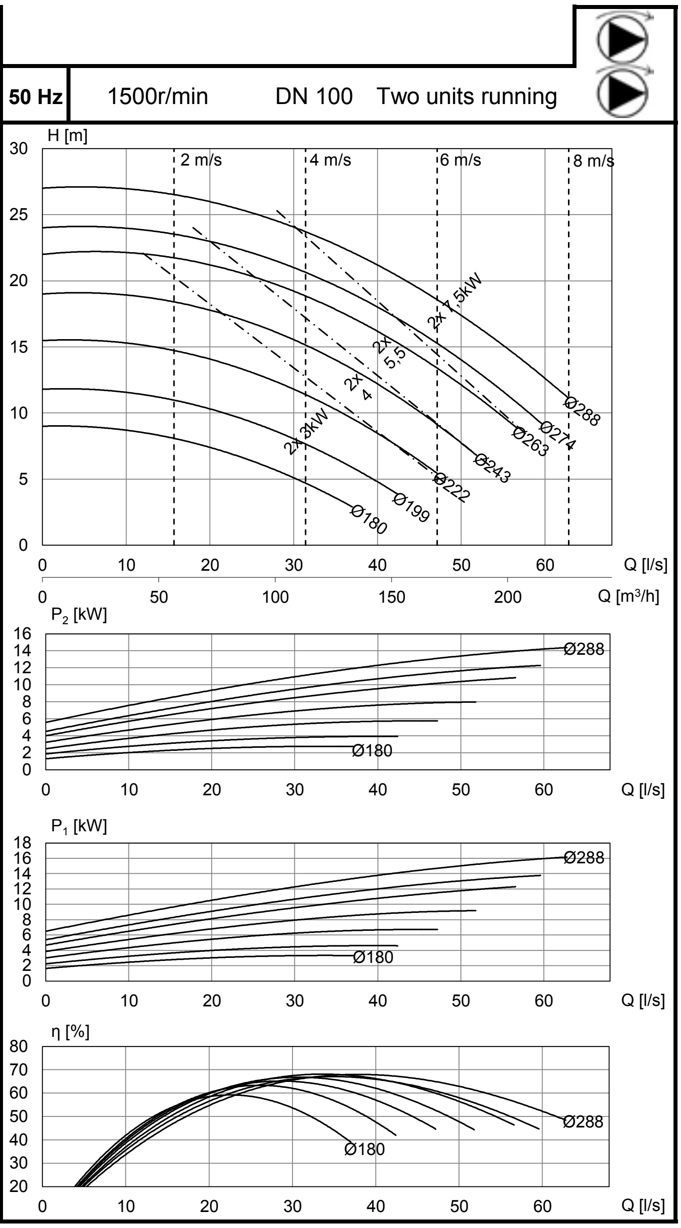
AT-1106/4

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E2 F31	3	6,25	265	430
	KH-132 C2 F31	4	8,13	320	495
	KH-132 E2 F31	5,5	10,95	335	495
	KH-133 G2 F31	7,5	14,88	355	550

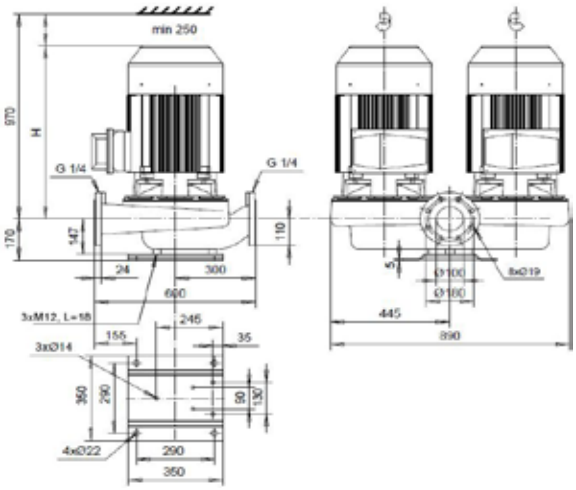


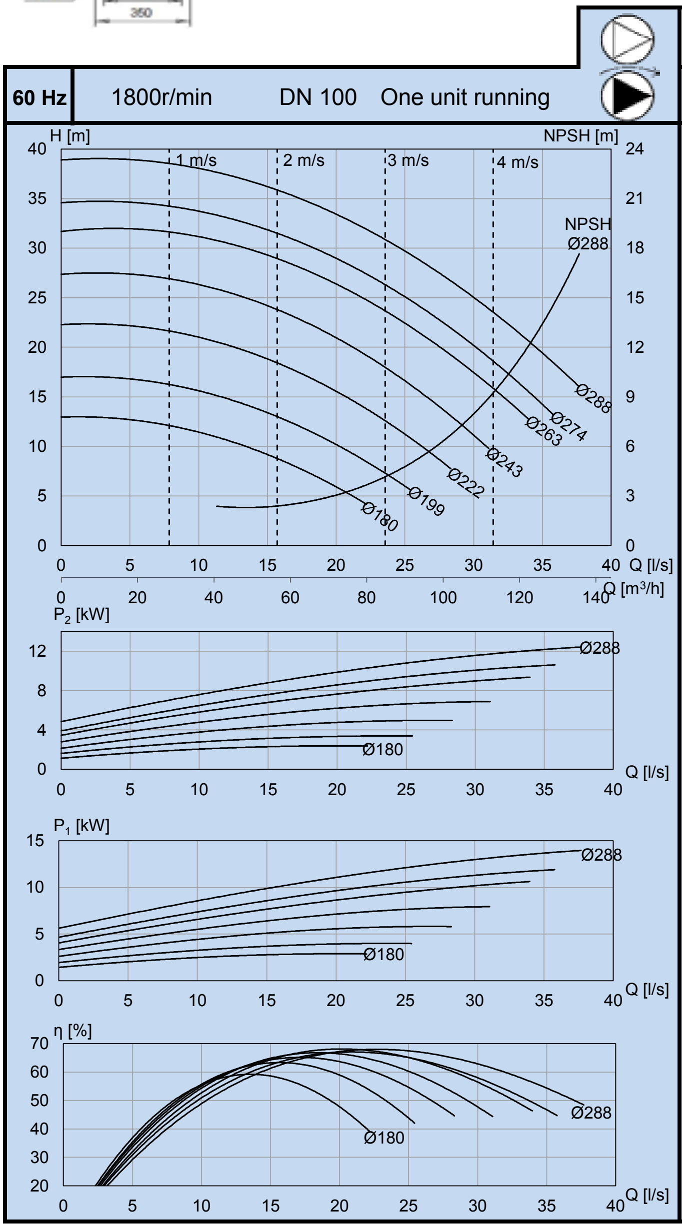


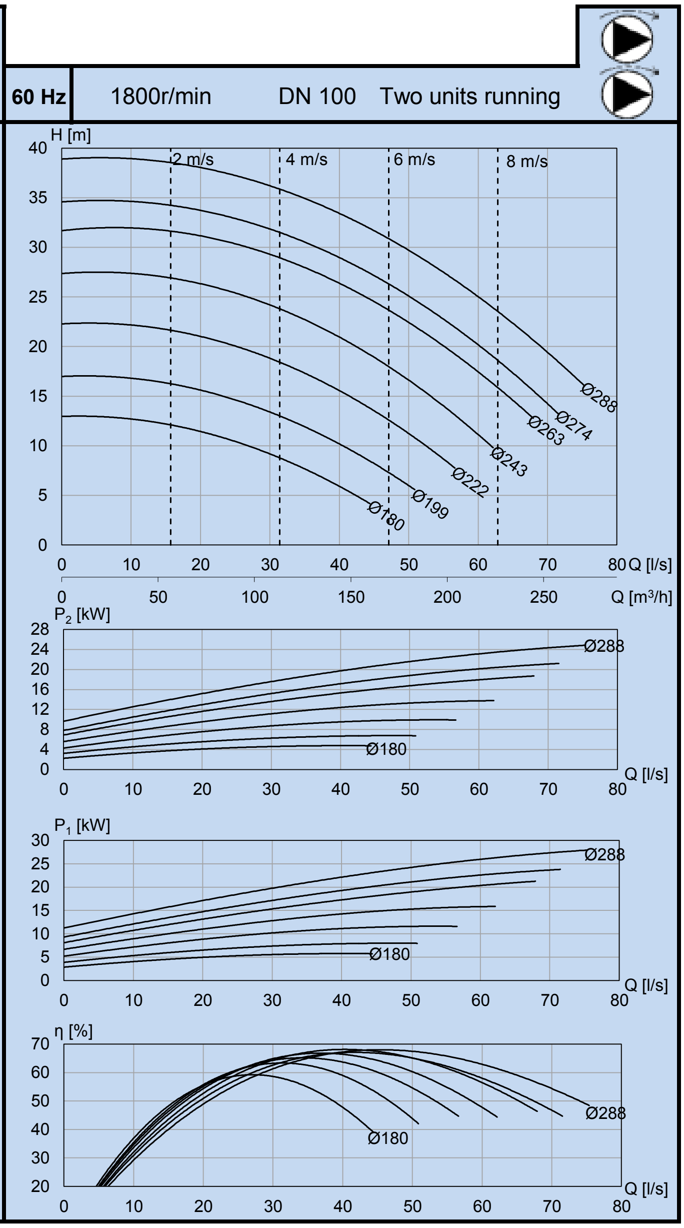


AT-1106/4

	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-112 E2 F31	3 (3,6)	6,15 (6,25)	265	430
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	320	495
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	335	495
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	355	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	465	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	475	660
	KZ-186 G2 F31	18,5 (22)	35,30 (35,10)	560	720







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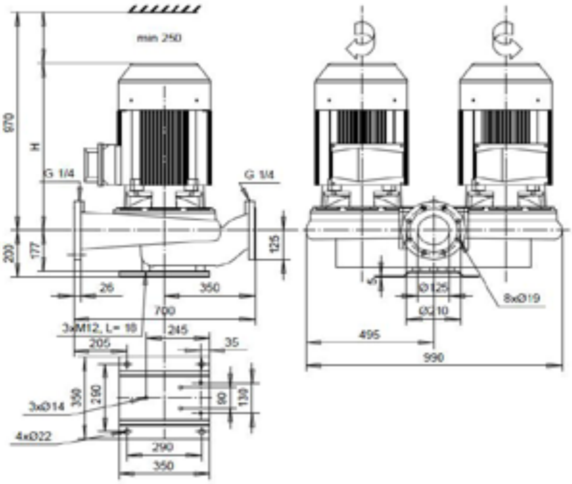
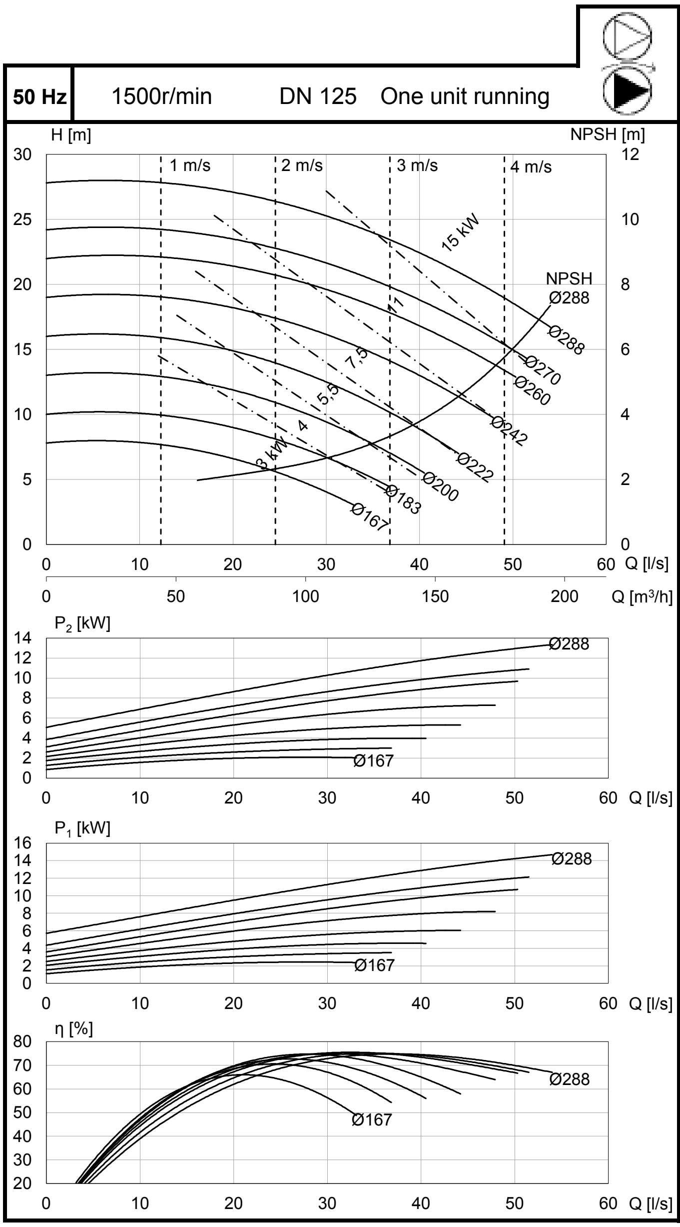
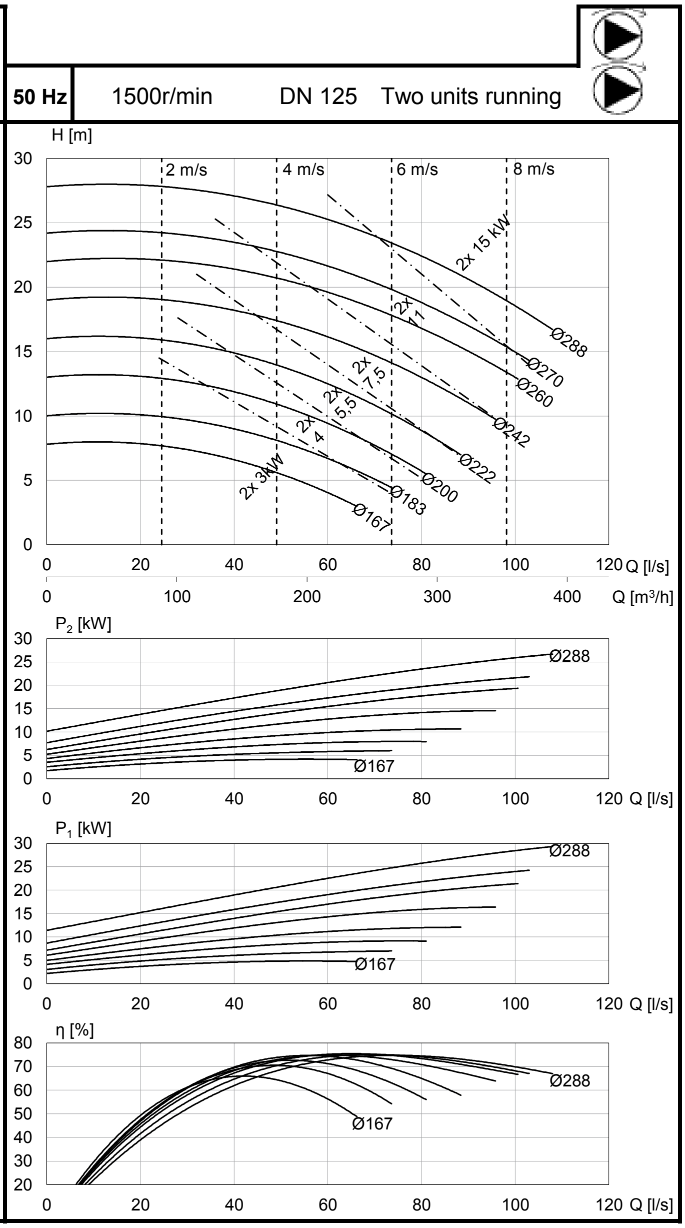
AT-1129/4

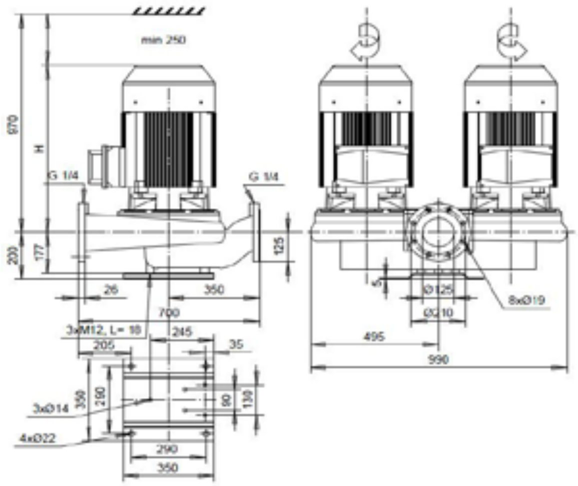


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-112 E2 F31	3	6,25	290	440
	KH-132 C2 F31	4	8,13	345	500
	KH-132 E2 F31	5,5	10,95	360	500
	KH-133 G2 F31	7,5	14,88	385	550
	KZ-165 F2 F31	11	20,75	490	660
	KZ-165 G2 F31	15	28,10	500	660

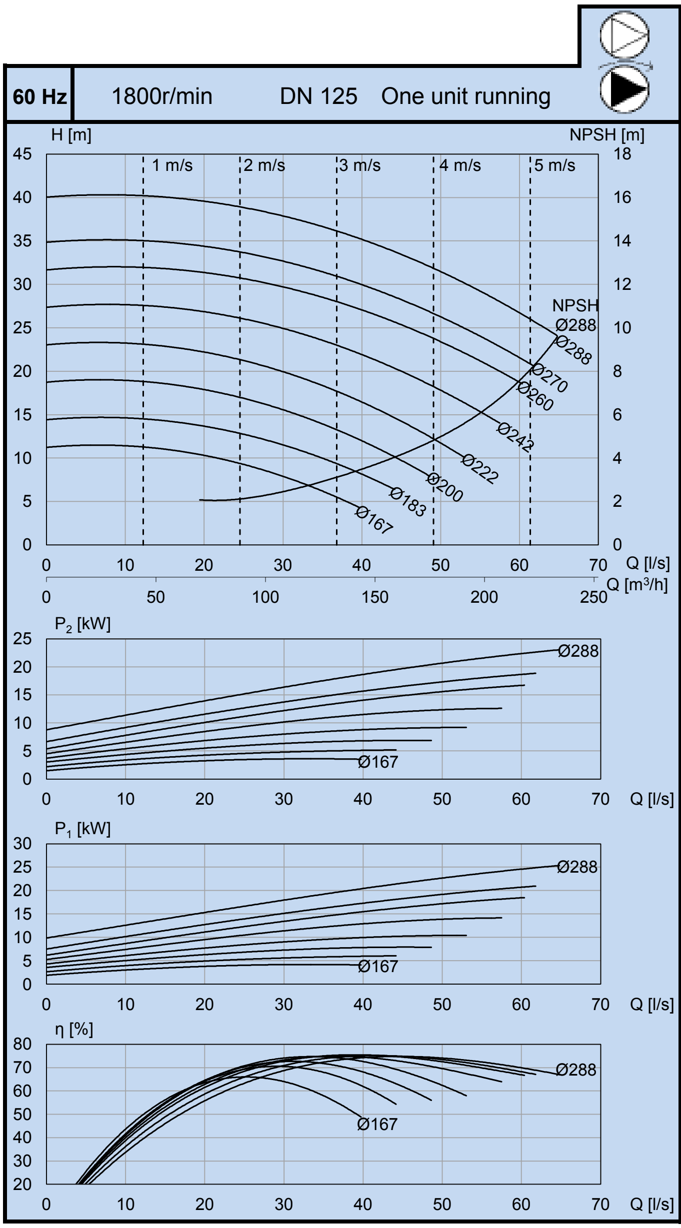


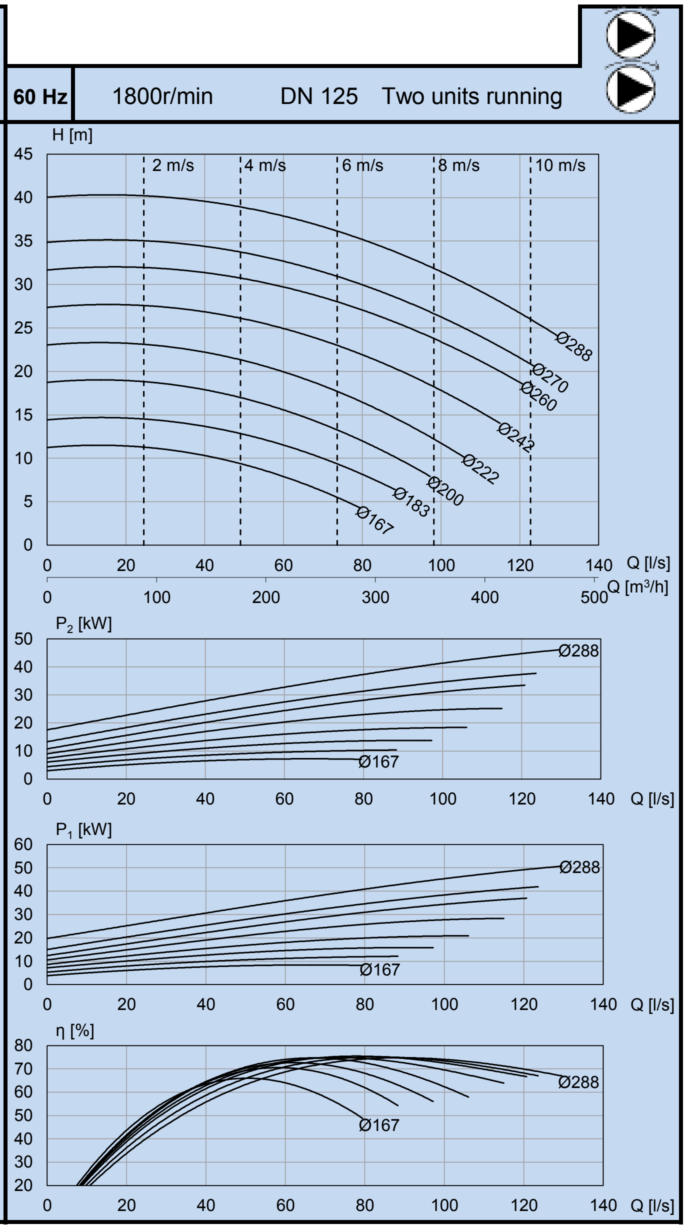


AT-1129/4



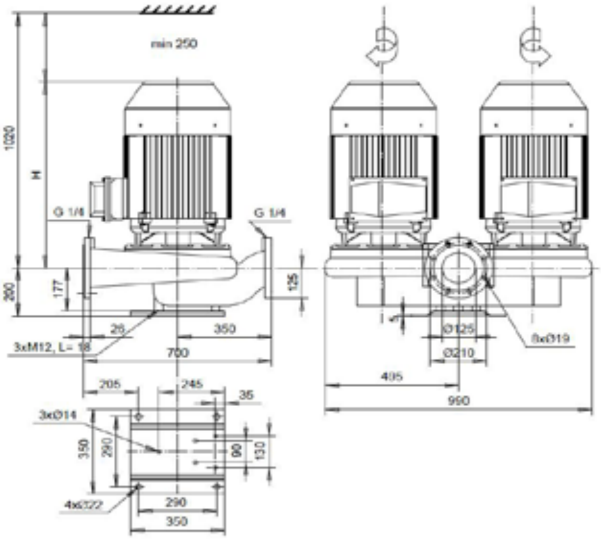
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	345	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	360	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	385	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	490	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	500	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	580	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	610	720



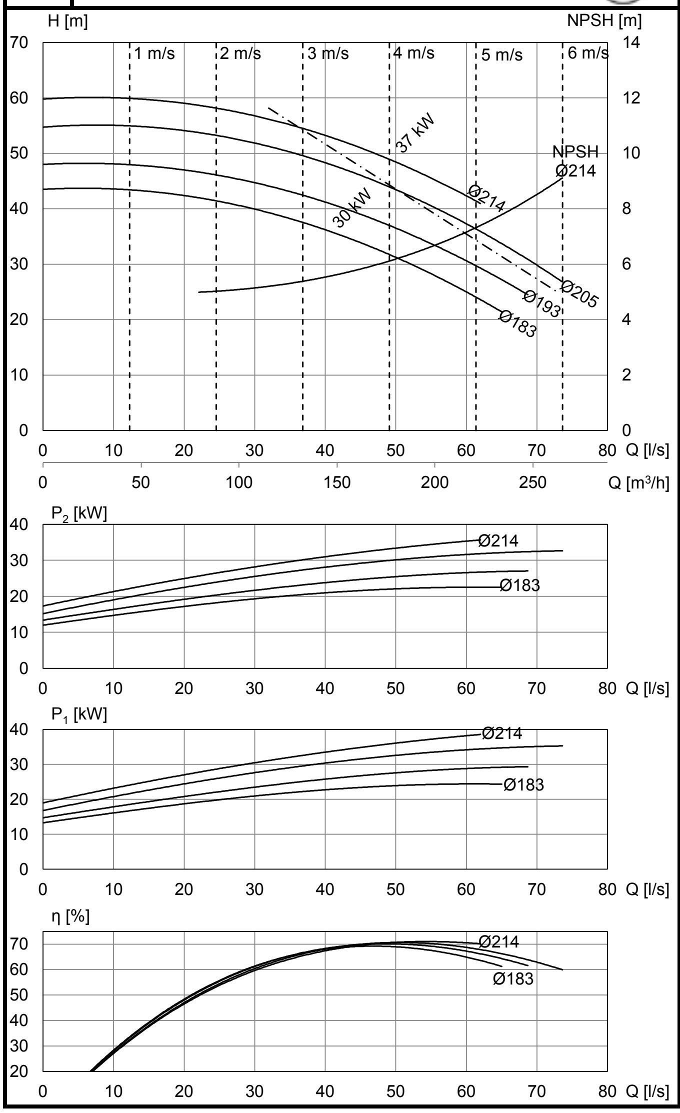


AT-1129/2

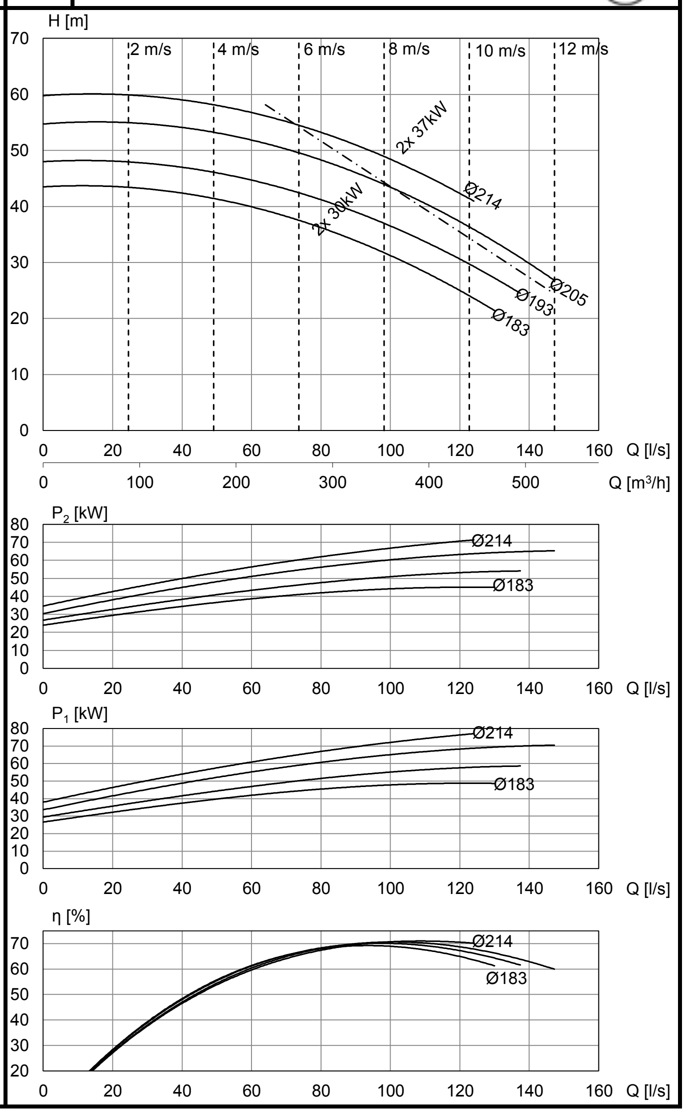
50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KZ-205 H1 F31	30	53,5	690	770
	KZ-205 J1 F31	37	65,6	740	770



50 Hz 3000r/min DN 125 One unit running



50 Hz 3000r/min DN 125 Two units running



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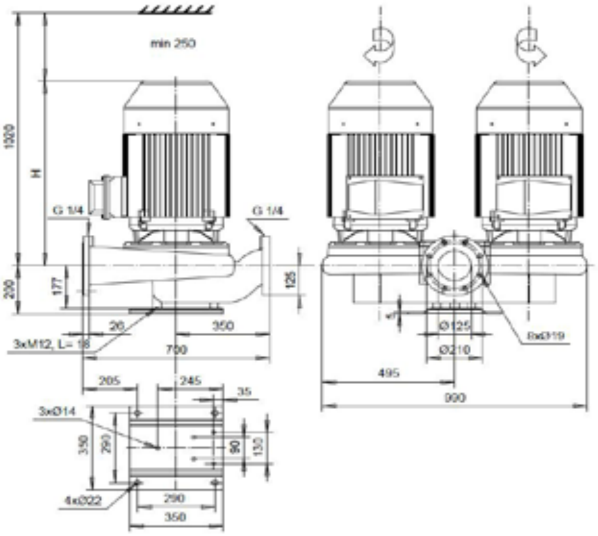
AT-1129/2

60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]



AT-1129/2 not available in 60Hz

60 Hz	3600r/min	DN 125	One unit running

60 Hz	3600r/min	DN 125	Two units running

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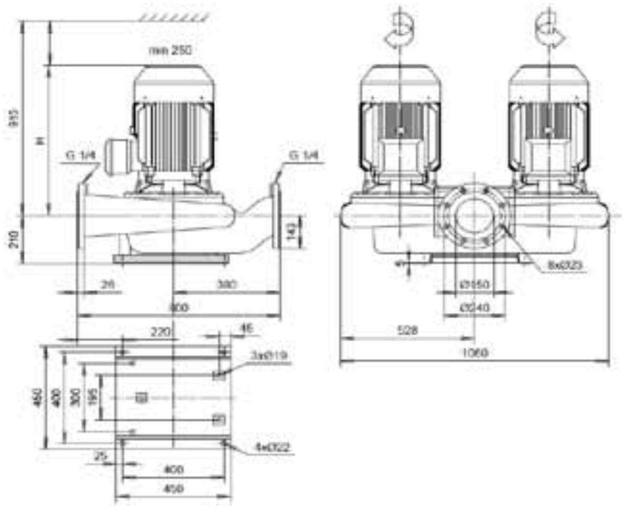
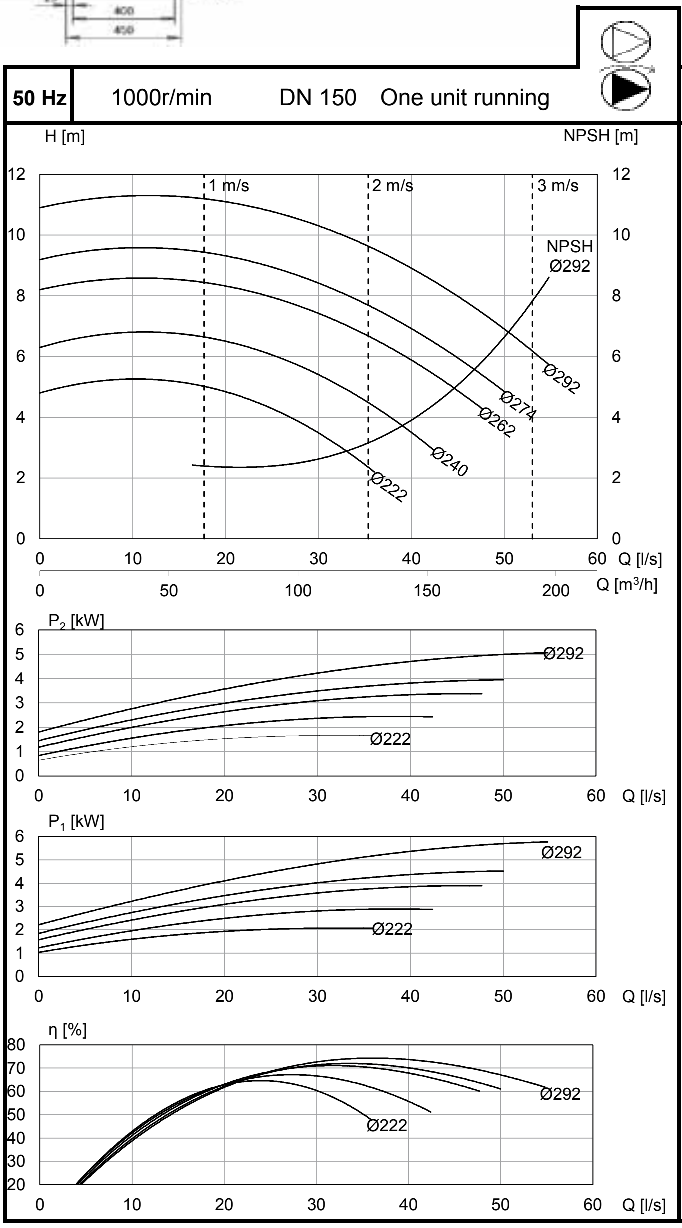
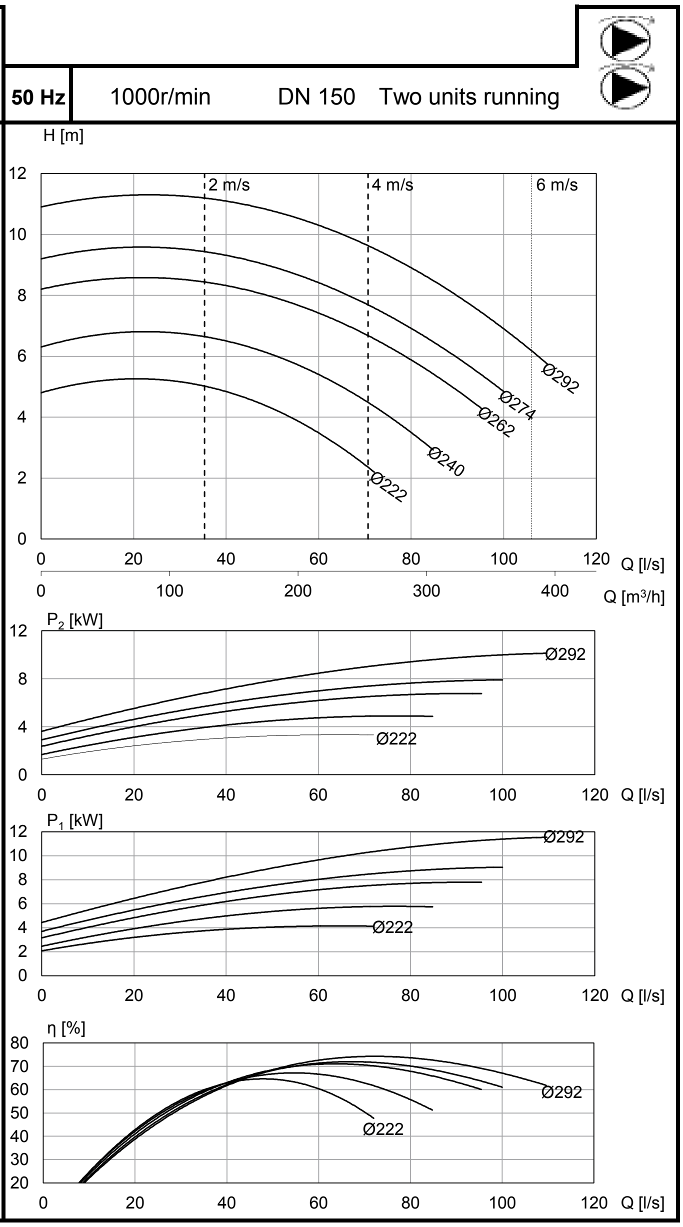
AT-1154/6

50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KH-133 G3 F31	5,5	12,3	405	550







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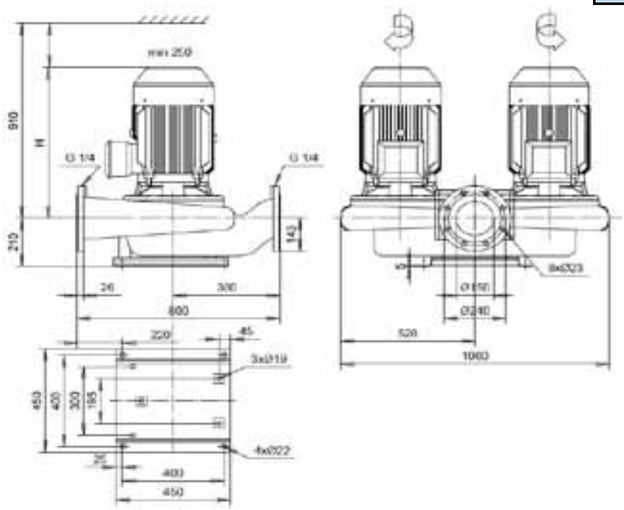
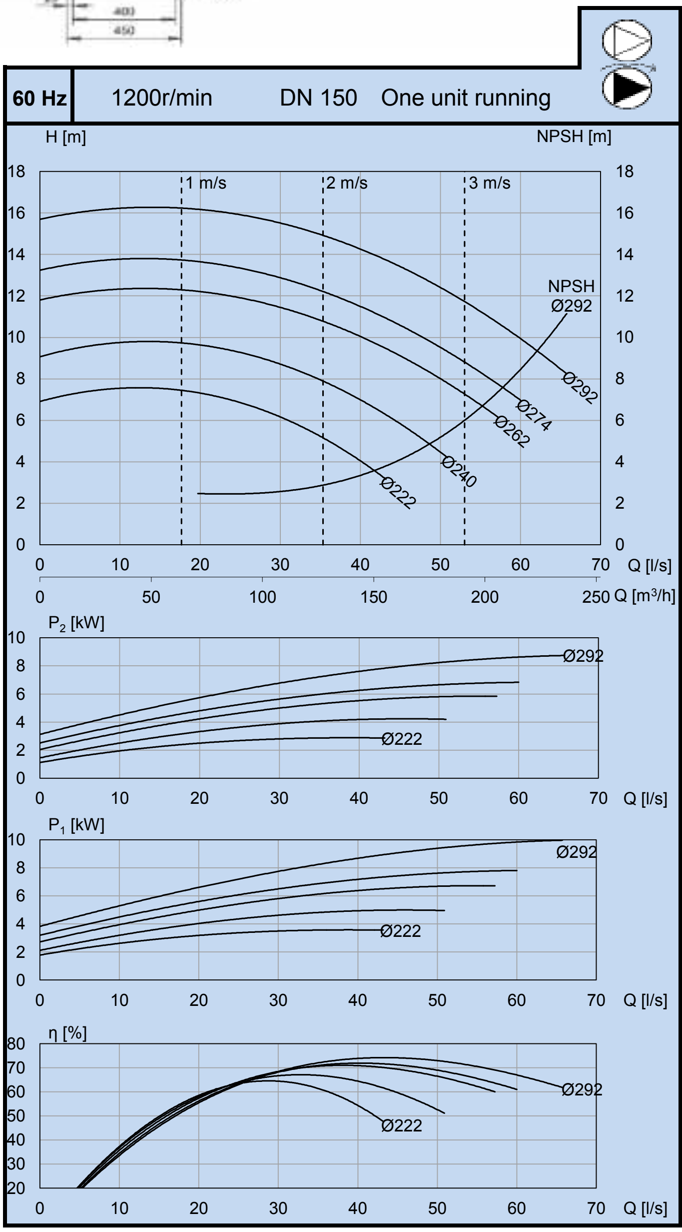
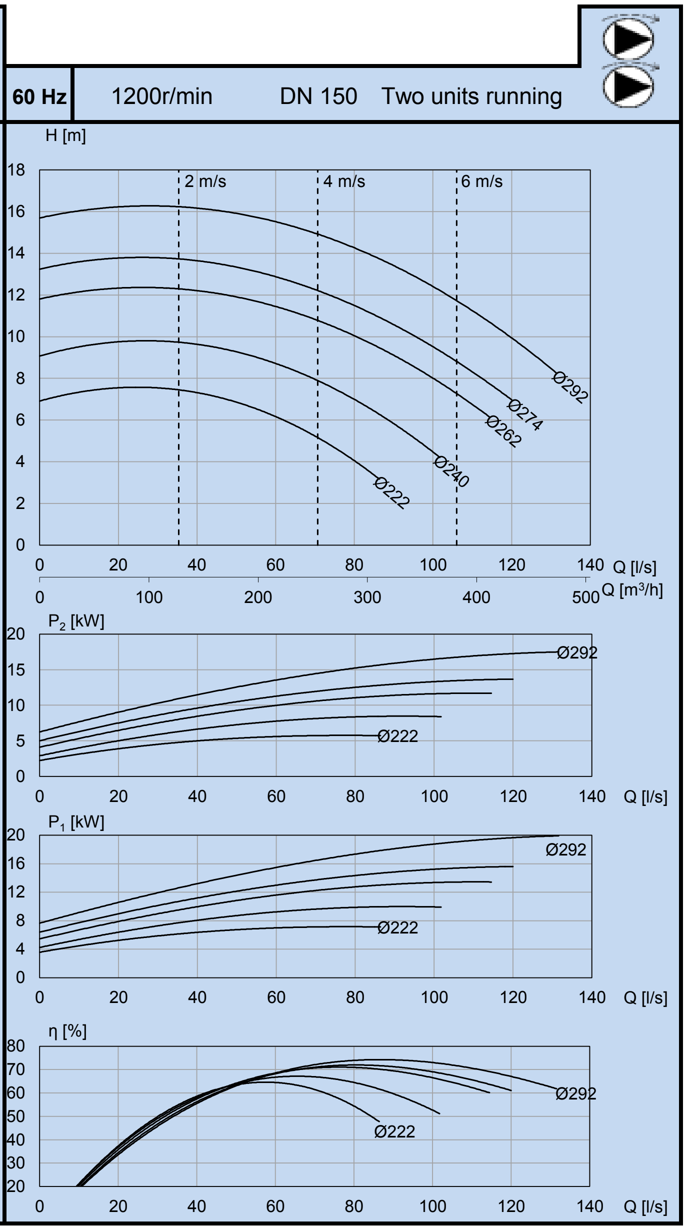
AT-1154/6

	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-133 G3 F31	5,5 (6,6)	11,53 (12,18)	405	550
	KZ-165 G3 F31	7,5 (9)	16,30 (17,40)	510	660
	KZ-165 G3 F31	11 (13)	22,90 (23,20)	510	660







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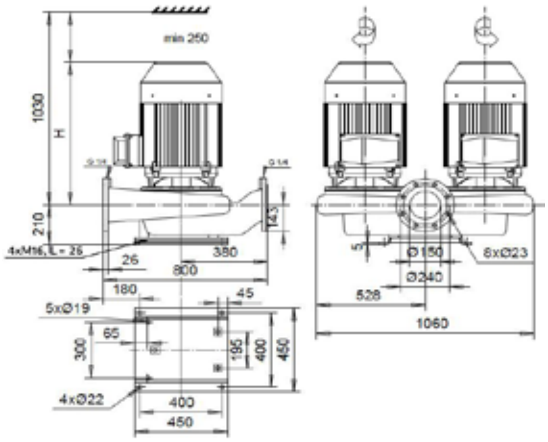
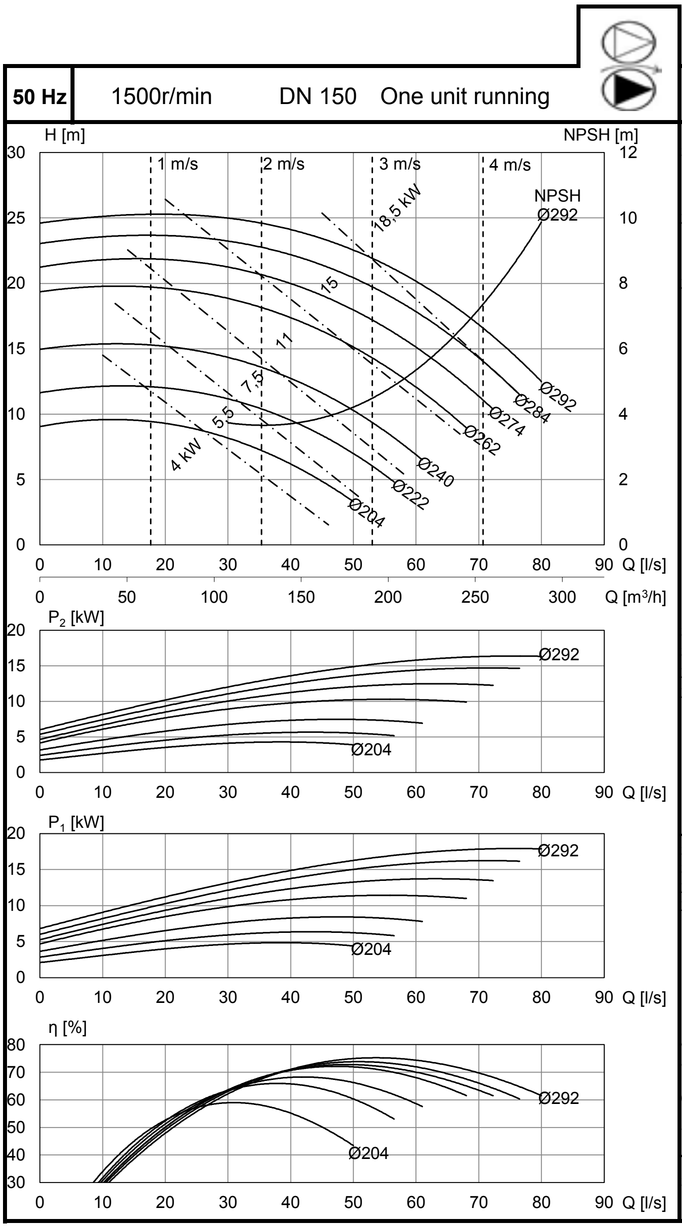
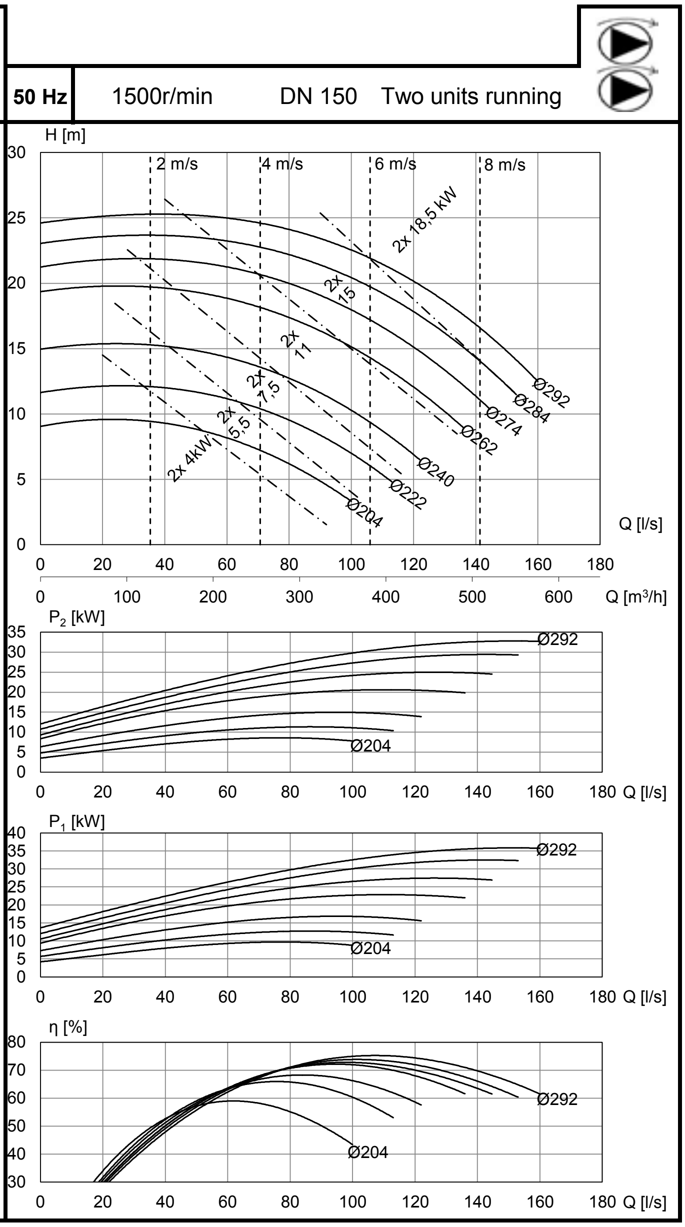
AT-1154/4

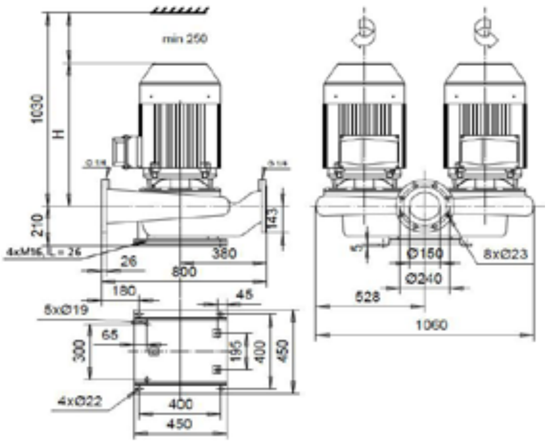


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C2 F31	4	8,13	365	500
	KH-132 E2 F31	5,5	10,95	380	500
	KH-133 G2 F31	7,5	14,88	405	550
	KZ-165 F2 F31	11	20,75	520	660
	KZ-165 G2 F31	15	28,10	530	660
	KZ-186 G2 BF31	18,5	34,40	610	720

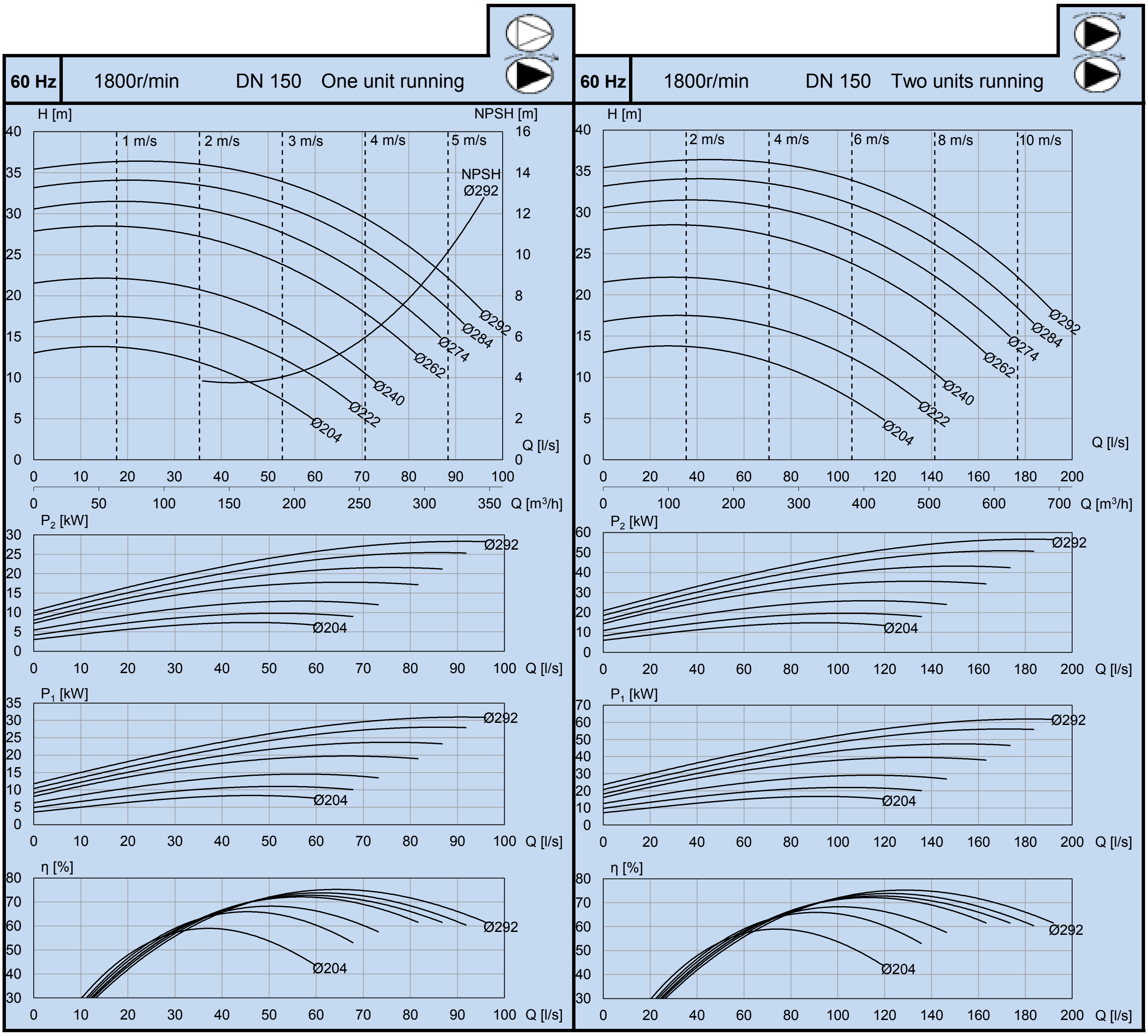




AT-1154/4



	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KH-132 C2 F31	4 (4,8)	8,17 (8,30)	365	500
	KH-132 E2 F31	5,5 (6,6)	11,00 (11,15)	380	500
	KH-133 G2 F31	7,5 (9)	14,80 (15,47)	405	550
	KZ-165 F2 F31	11 (13)	21,35 (21,35)	520	660
	KZ-165 G2 F31	15 (18)	29,10 (28,75)	530	660
	KZ-186 G2 BF31	18,5 (22)	35,30 (35,10)	610	720
	KZ-186 K2 BF31	22 (26)	41,60 (41,00)	630	720
	KZ-205 K2 F31	30 (30)	57,60 (57,10)	740	780



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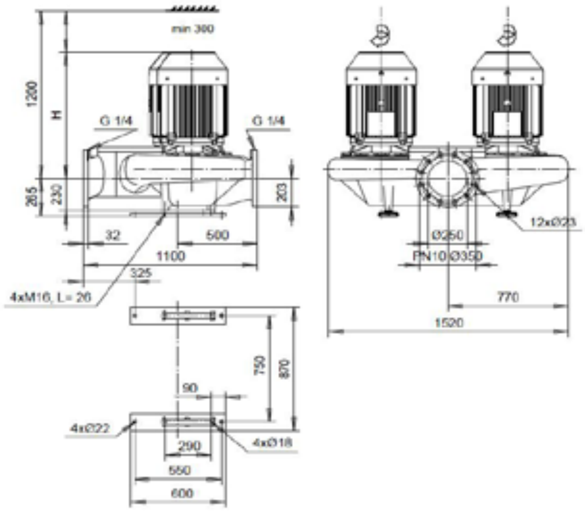
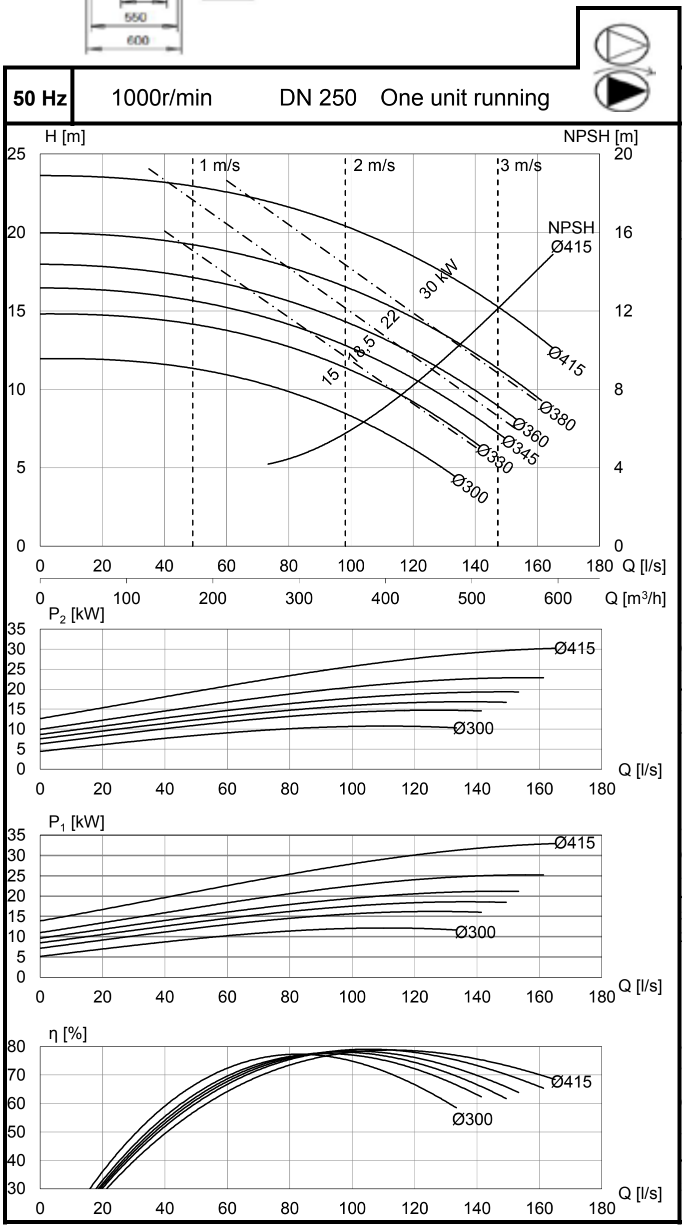
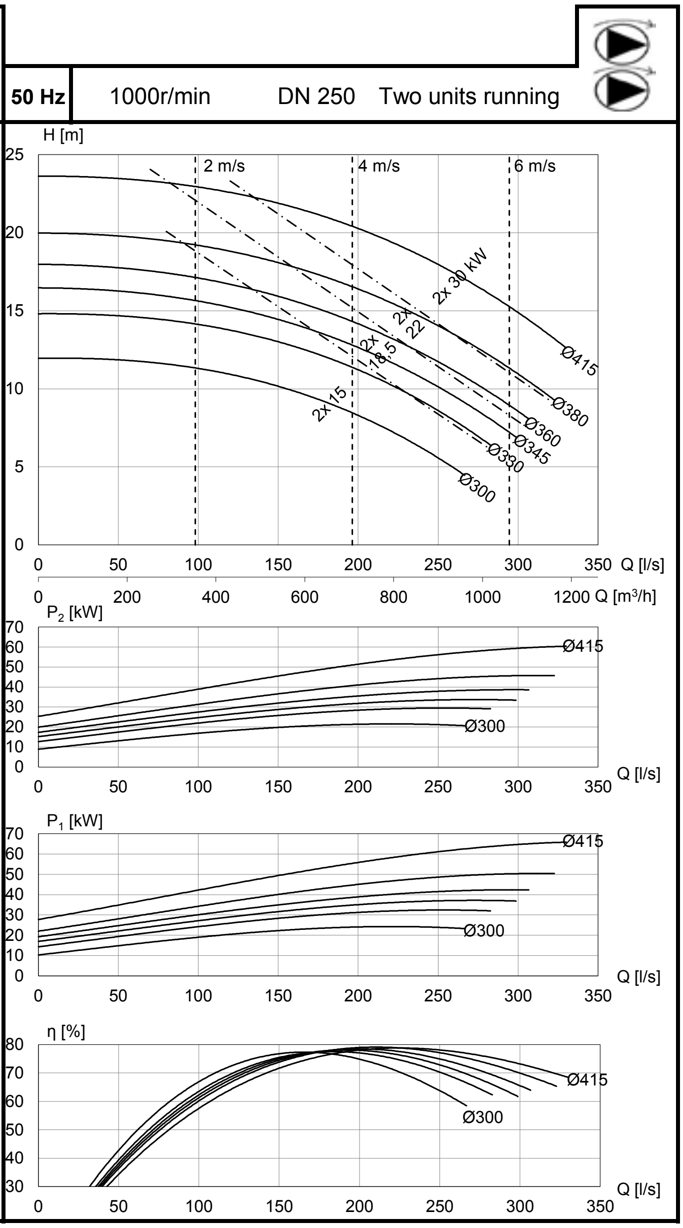
AT-1250/6

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-205 G3 F41	15	29,7	1120	880
	KZ-205 G3 F41	18,5	36,4	1120	880
	KZ-205 H3 F41	22	42,1	1150	880
	KZ-225 G3 F42	30	56,2	1280	900







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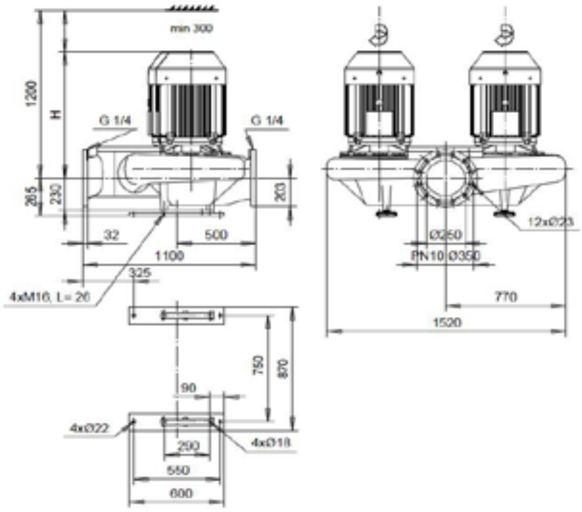
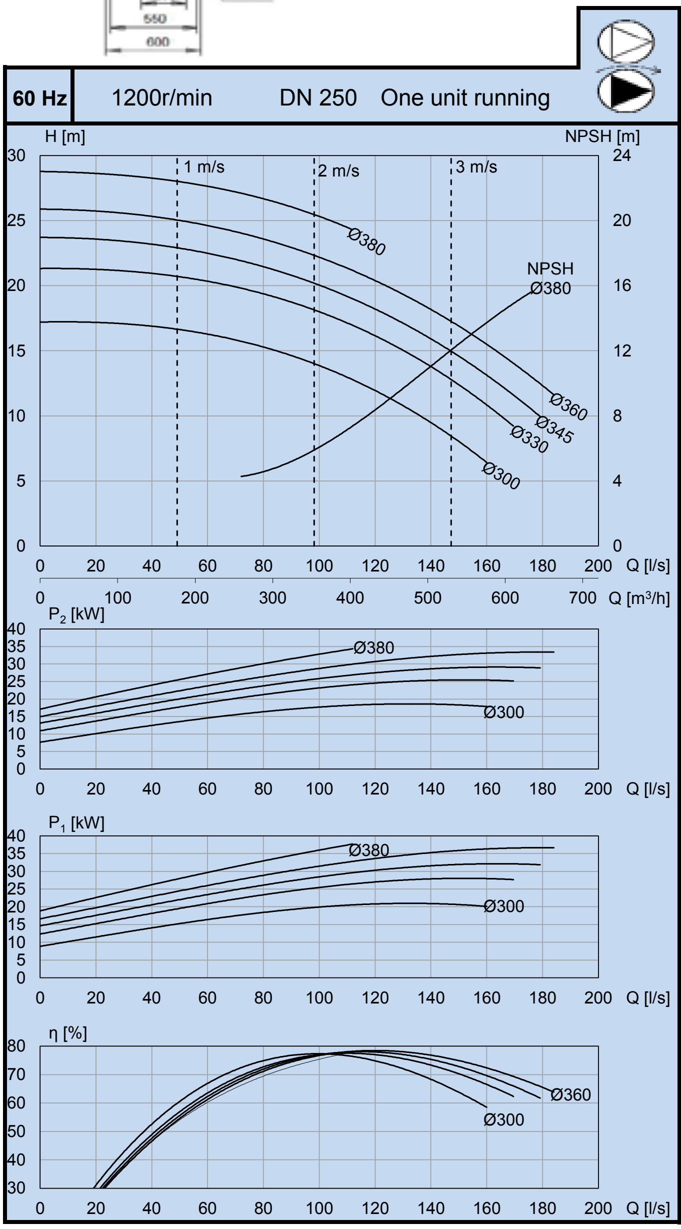
AT-1250/6

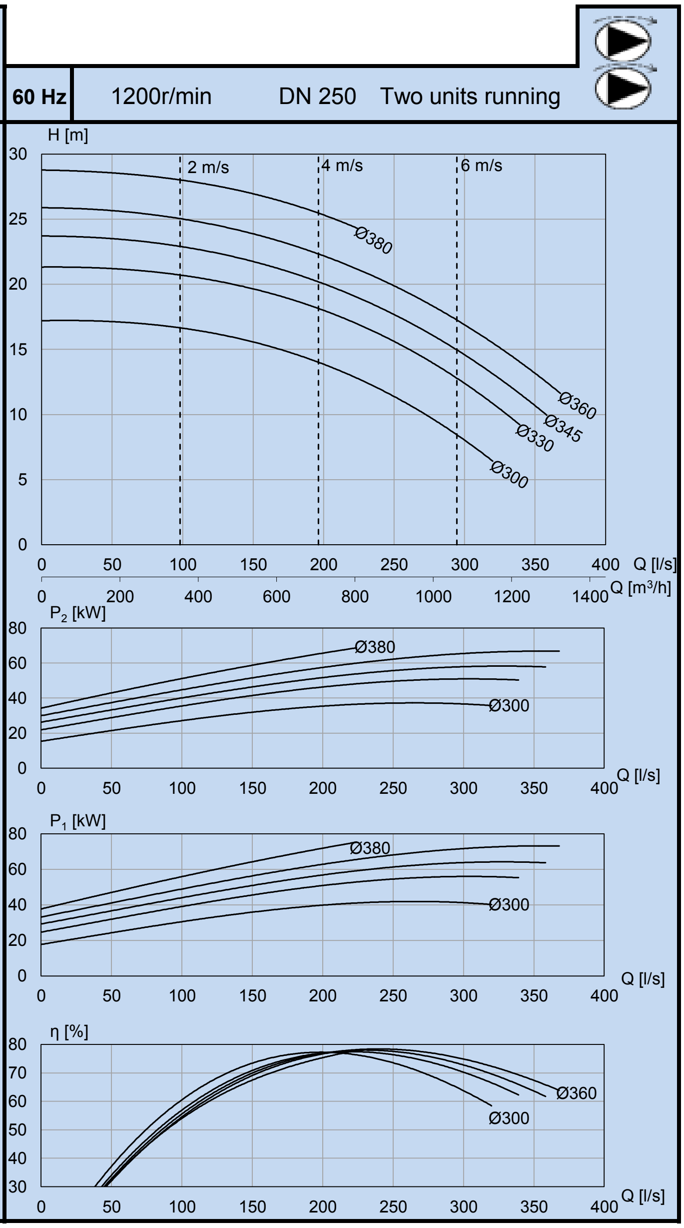
	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
60Hz	KZ-205 G3 F41	18,5 (22)	37,4 (36,0)	1120	880
	KZ-205 H3 F41	22 (26)	43,4 (42,5)	1150	880
	KZ-225 G3 F42	30 (36)	58,3 (57,8)	1280	900



60 Hz | 1200r/min | DN 250 | One unit running



60 Hz | 1200r/min | DN 250 | Two units running



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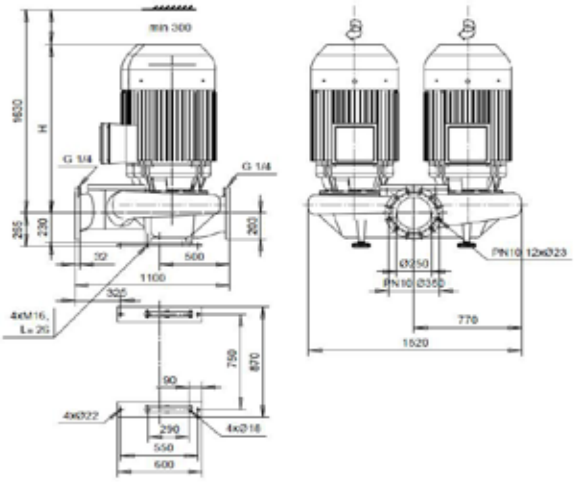
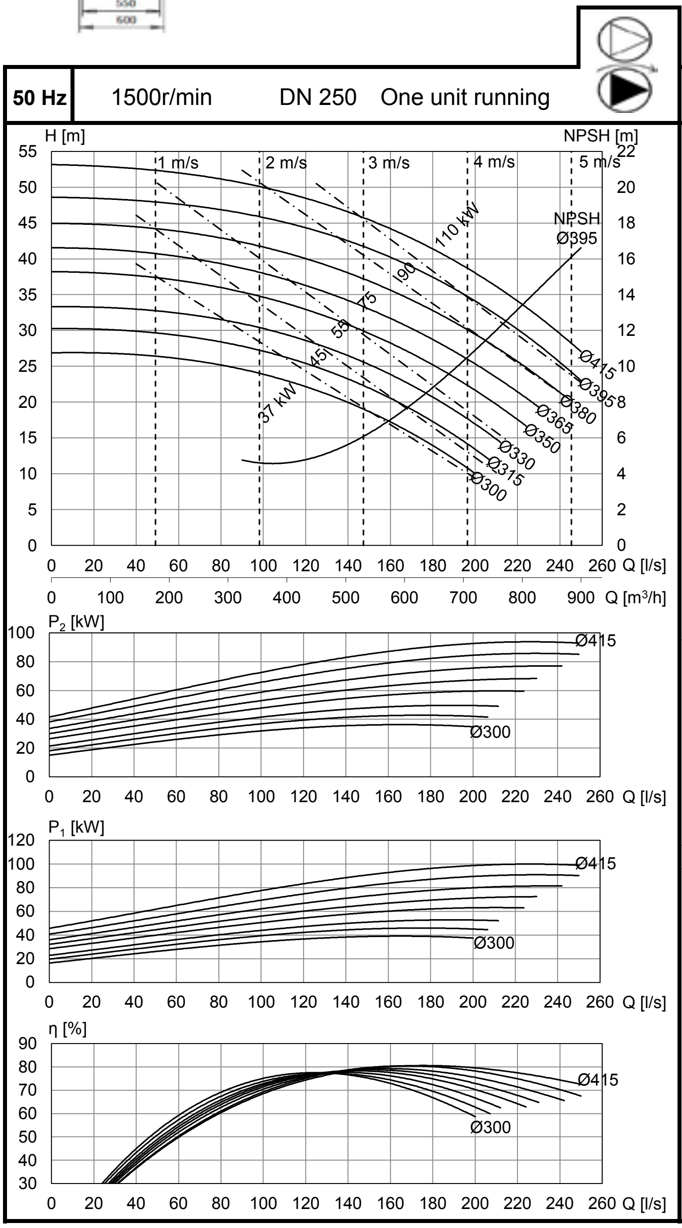
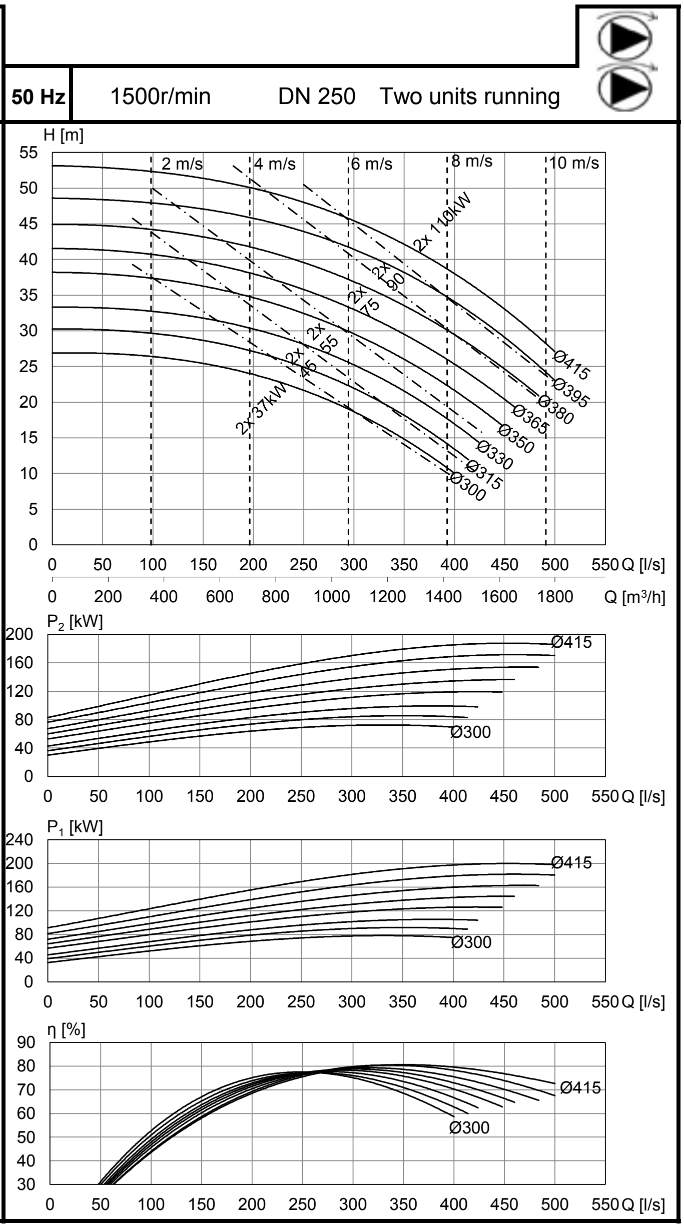
AT-1250/4

	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KZ-224 J2 F41	37	67,0	1160	880
	KZ-225 K2 F42	45	81,1	1220	900
	KZ-256 J2 F42	55	98,7	1430	950
	KZ-287 J2 F43	75	133,9	1740	1020
	KZ-288 K2 F43	90	158,5	1890	1070
	KZR-314 H2 F43	110	193,2	2470	1330

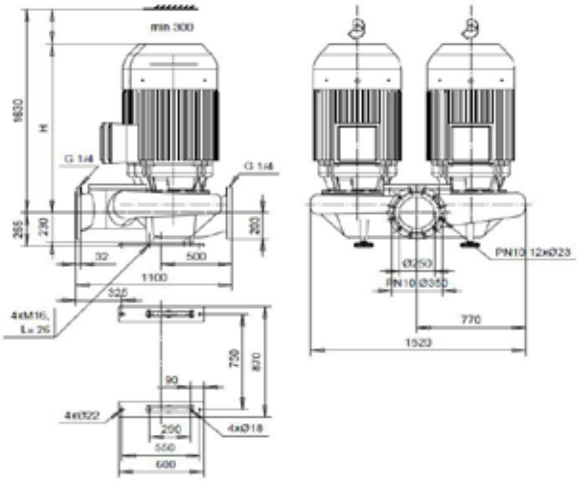


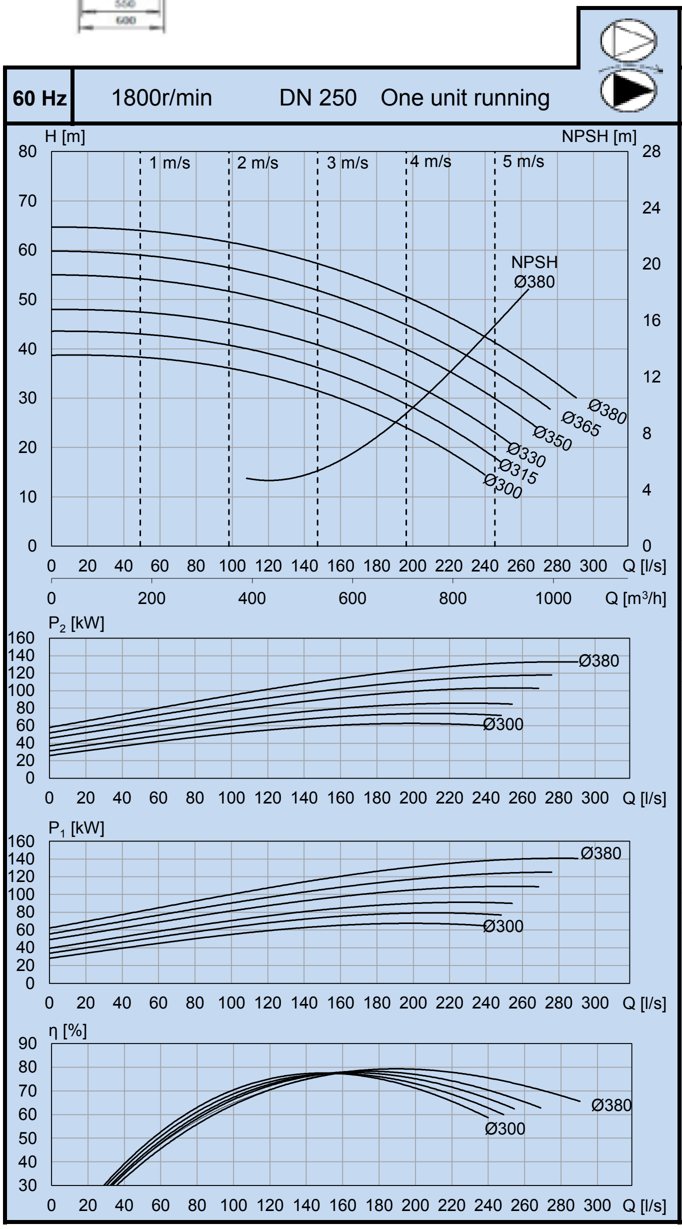


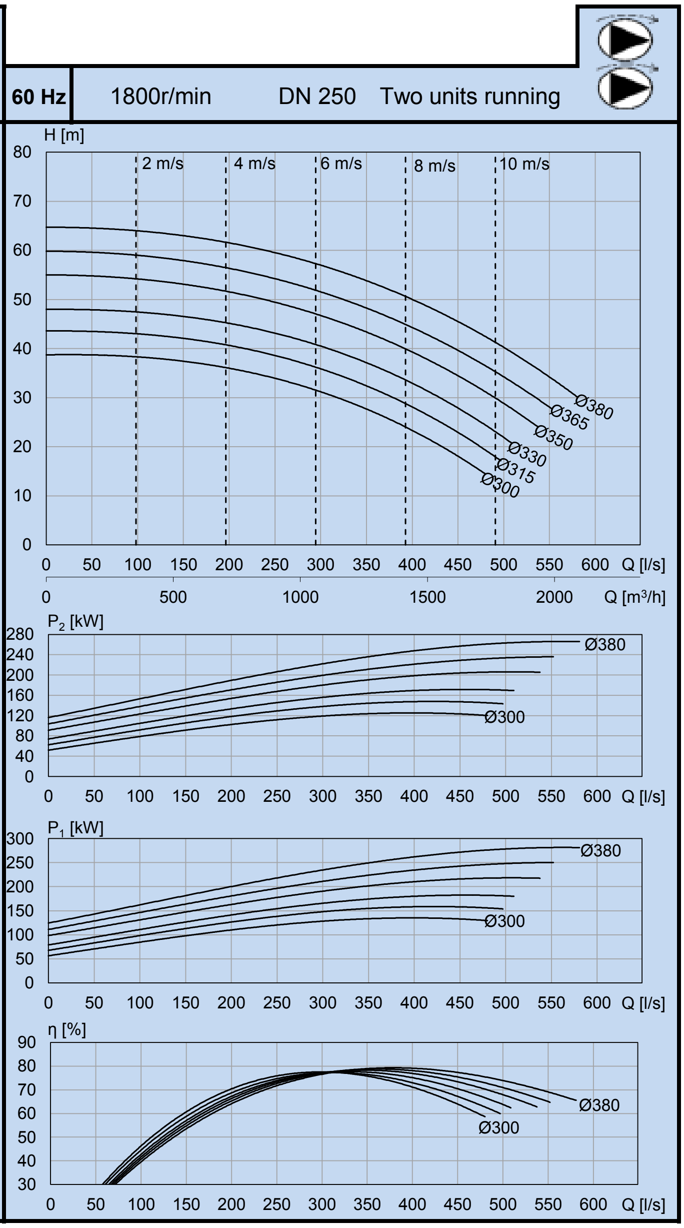


AT-1250/4

60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KZ-225 K2 F42	45 (54)	84,0 (83,8)	1220	900
	KZ-256 J2 F42	55 (66)	102,1 (100,9)	1430	950
	KZ-287 J2 F43	75 (90)	138,6 (139,0)	1740	1020
	KZ-288 K2 F43	90 (105)	156,2 (159,6)	1890	1070
	KZR-314 H2 F43	110 (132)	199,9 (198,2)	2470	1330







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EFFICIENT RELIABILITY

END-SUCTION PUMPS WITH FIXED-SPEED MOTOR, 3x400V
AS-, KN- and KM-series, flanged DN32-DN65

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AS-, KN-series

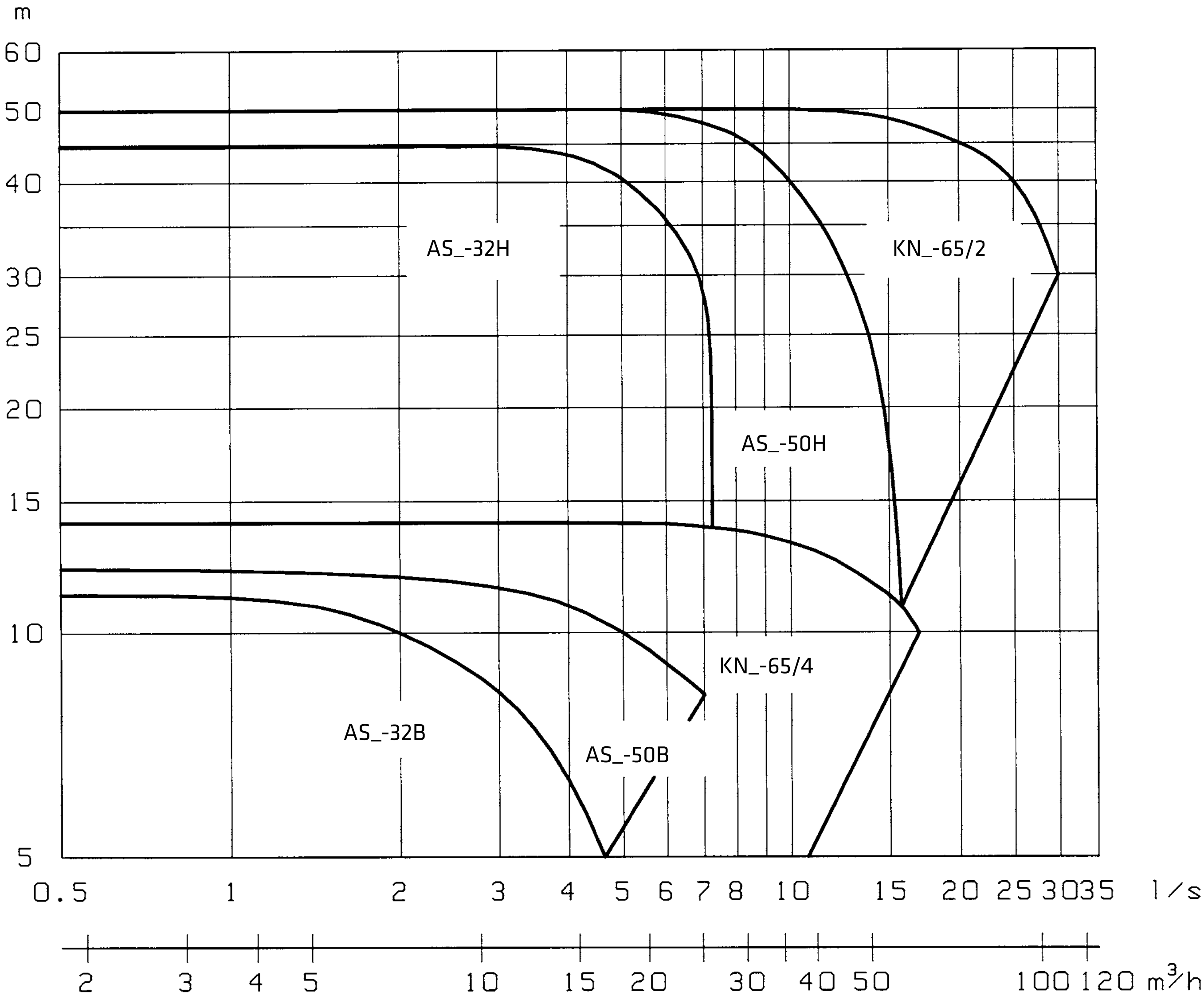
General technical data

AS_ and KN_-ranges consist of single-stage End-suction centrifugal pumps made in compact monobloc design.

Applications

The AS and KN pumps are designed for applications for clean non-aggressive liquids including pressure boosting in heating and primary hot water circulation. ASP and KNP bronze pumps are more suitable for hot water supply, oxygen rich and other applications requiring a construction on corrosion-resistant materials, like Maritime- applications.

Quick Selection Chart



Construction

Pump

The AS and KN range pumps are single stage, monobloc design end-suction centrifugal pumps eguipped with dry type electric motor according to EcoDesing –directive requirements.

Electric motor

The electric motors of AS and KN range are manufactured according to requirements oc EcoDesing –directives. The motor design ensures high efficiency and silent running and is suitable for use with frequency converter.

Voltages:	400/230 V, 50 Hz 3 kW and smaller
	690/400 V, 50 Hz 4 kW and bigger
Enclosure:	IP 54
Insulation class:	F
Max. ambient temperature	+45°C

Flanges

The dimensions of flanges in the AS and KN ranges are according to ISO 7005 standard.

Shaft seals

The shaft seals in the AS and KN ranges are maintenance-free single mechanical seals. The seal of pump housing is an O-ring.

Fields of application and standard materials

AS- and KN-pumps

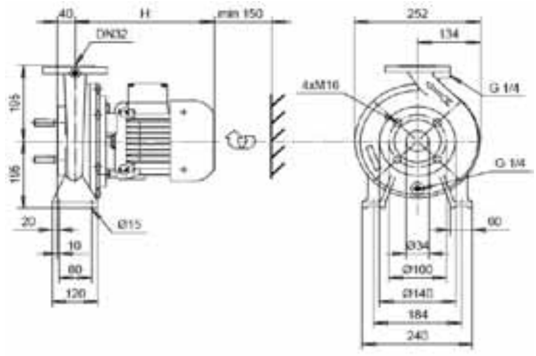
Pump housing and impeller	gray cast iron EN-GJL-200
Shaft	stainless steel AISI 329 (SIS 2324)
Shaft seal	carbon/SiC, EPDM-elastomer (25 mm AS-)
	carbon/Ceram, EPDM-elastomer (28 mm KN-)
	metal parts AISI 316
O-ring for pump housing	EPDM-rubber (Nitril-elastomer)
Max. working pressure	10 bar
Fluid temperature range	-15 ... +120°C (*

ASP- and KNP-pumps

Pump housing and impeller	bronze CuSn10Zn2
Shaft	stainless steel AISI 329 (SIS 2324)
Shaft seal	carbon/SiC, EPDM-elastomer (25 mm ASP-)
	carbon/ceram, EPDM-elastomer (28 mm KNP-)
	metal partsAISI 316
O-ring for pump housing	EPDM-elastomer (Nitrile-elastomer)
Max. working pressure	10 bar
Fluid temperature range	-15 ... +120°C (*

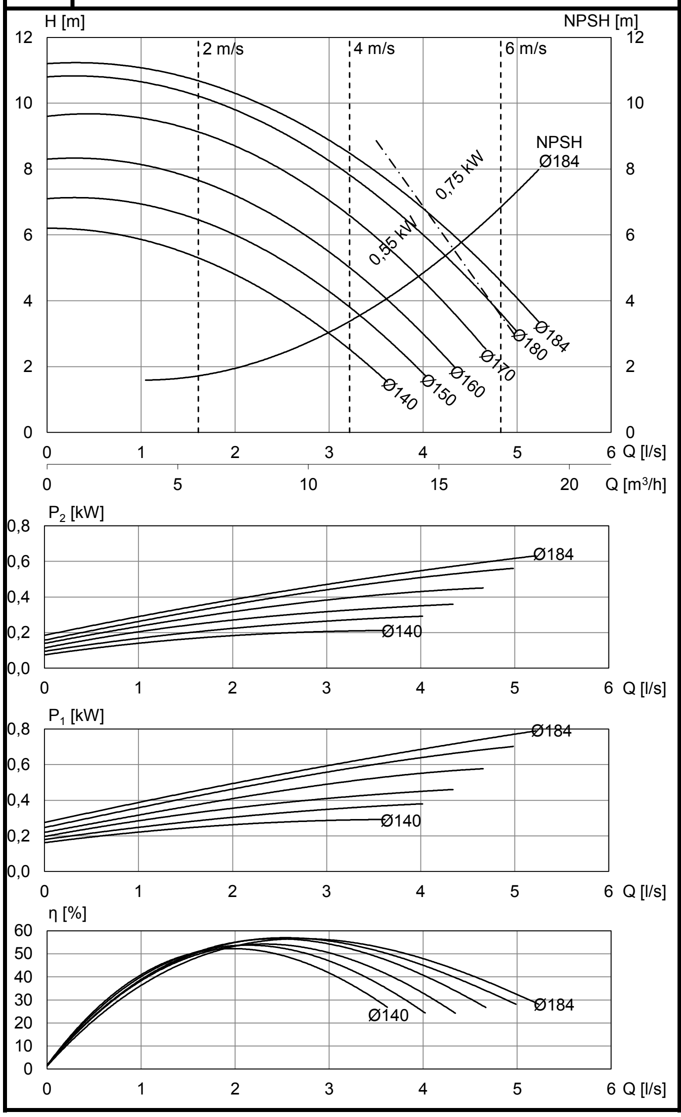
NOTE! Shaft seal for AS and KN range available in different materials.

AS-32B ASP-32B

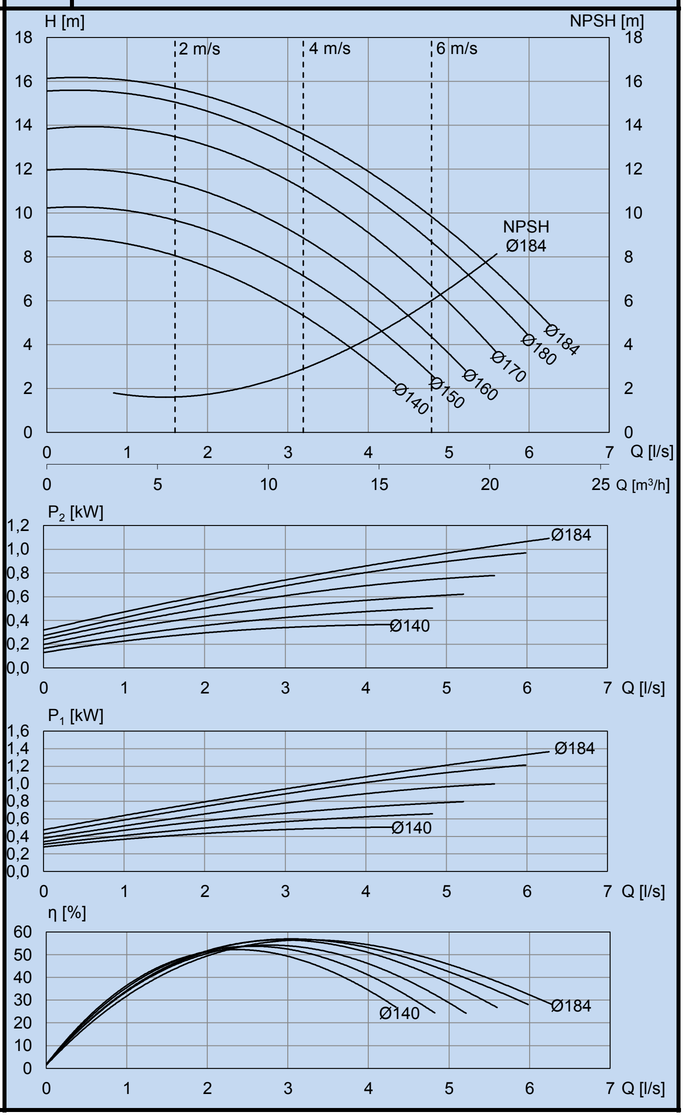


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-100 A2 NE	0,55	1,27	35	280
	KH-100 B2 NE	0,75	1,74	35	280
	KH-101 C2 NE	1,1	2,44	40	330
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-100 A2 NE	0,55 (0,66)	1,28 (1,30)	35	280
	KH-100 B2 NE	0,75 (0,9)	1,70 (1,74)	35	280
	KH-101 C2 NE	1,1 (1,3)	2,43 (2,43)	40	330

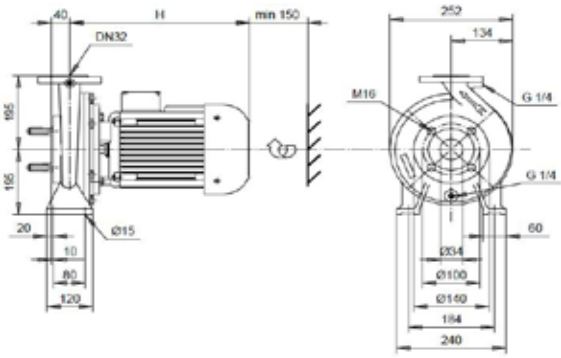
50 Hz 1500r/min DN 32



60 Hz 1800r/min DN 32

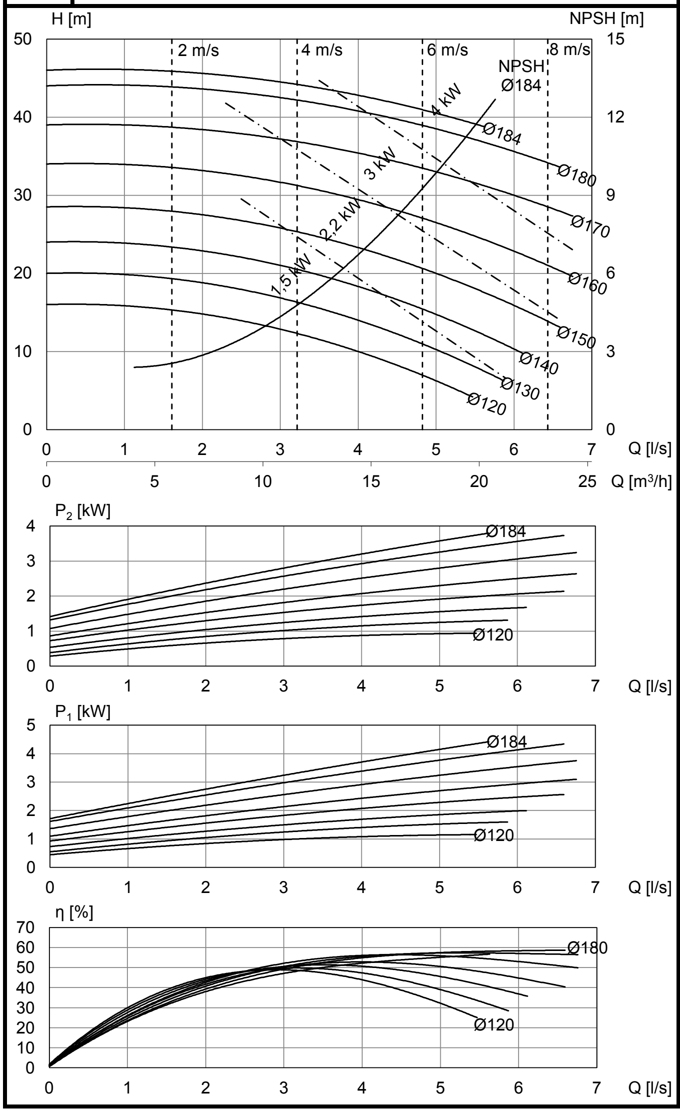


AS-32H ASP-32H

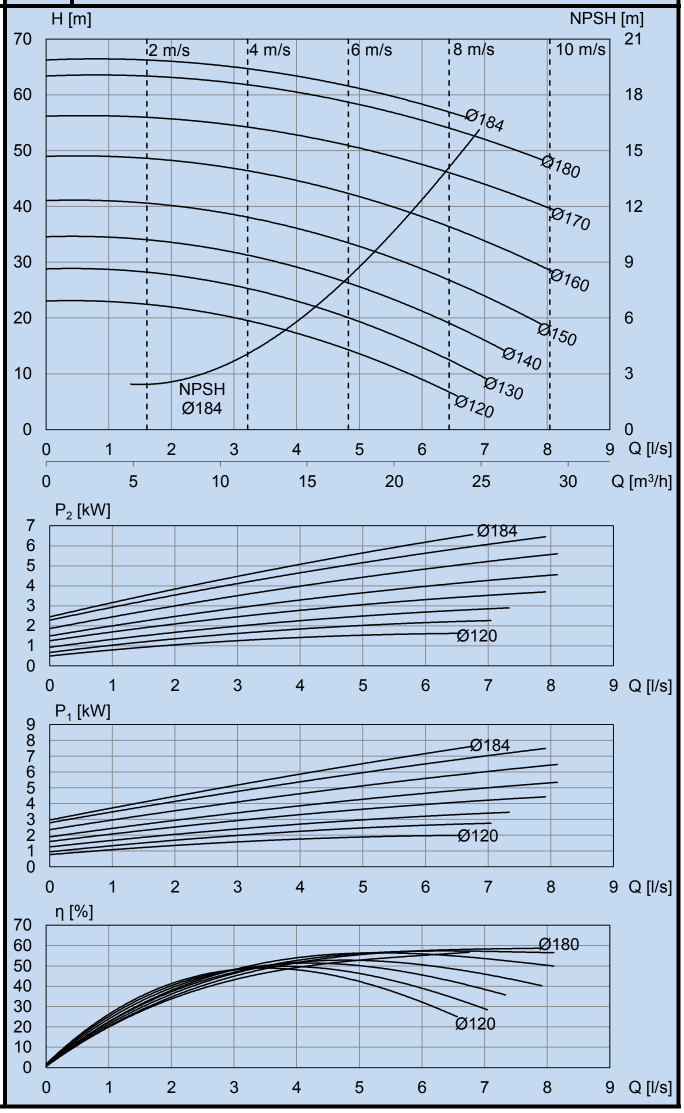


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-101 C1 NE	1,5	2,95	40	330
	KH-101 D1 NE	2,2	4,28	43	330
	KH-112 C1 NE	3	6,05	49	375
	KH-112 E1 NE	4	7,95	53	375
	KH-132 C1 NE	5,5	10,20	76	420
	KH-132 E1 NE	7,5	13,75	84	420
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-101 C1 NE	1,5 (1,8)	2,98 (3,02)	40	330
	KH-101 D1 NE	2,2 (2,6)	4,35 (4,33)	43	330
	KH-112 C1 NE	3 (3,6)	6,00 (6,05)	49	375
	KH-112 E1 NE	4 (4,8)	7,90 (8,00)	53	375
	KH-132 C1 NE	5,5 (6,6)	10,25 (10,40)	76	420
	KH-132 E1 NE	7,5 (9)	13,80 (14,05)	84	420

50 Hz 3000r/min DN 32



60 Hz 3600r/min DN 32



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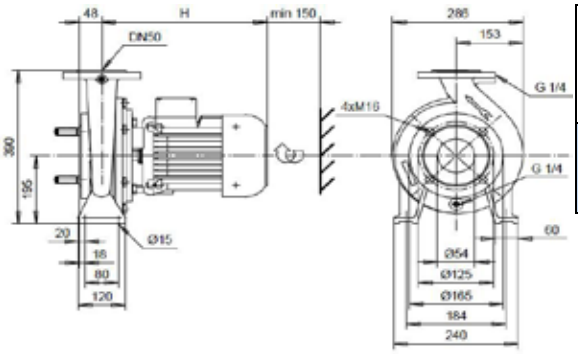
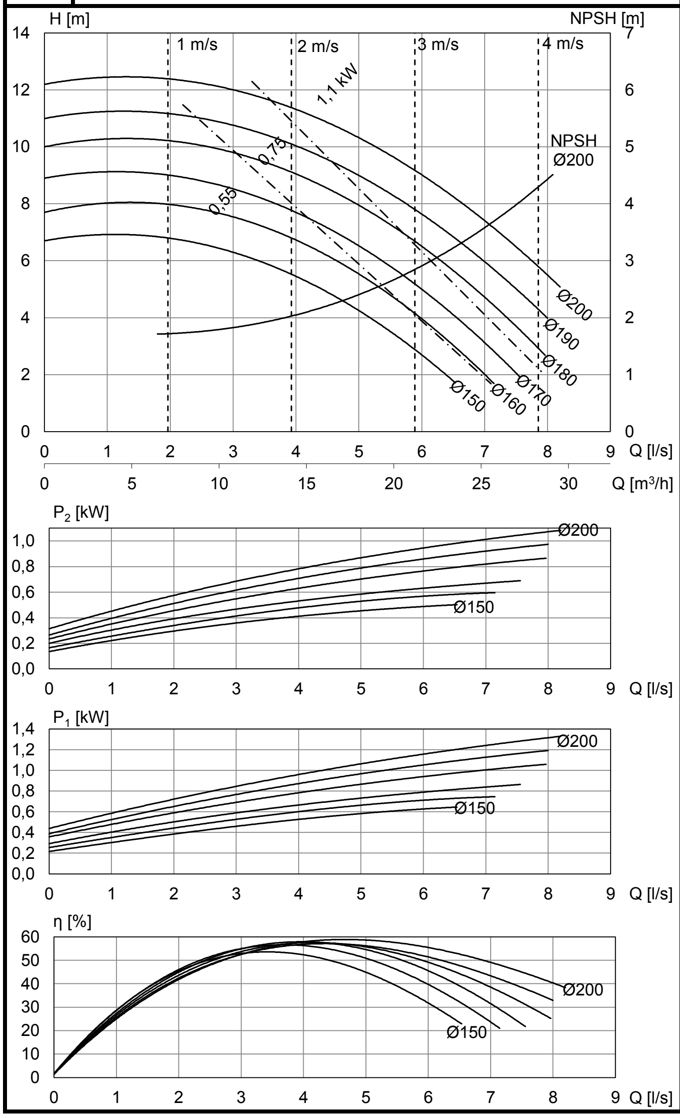
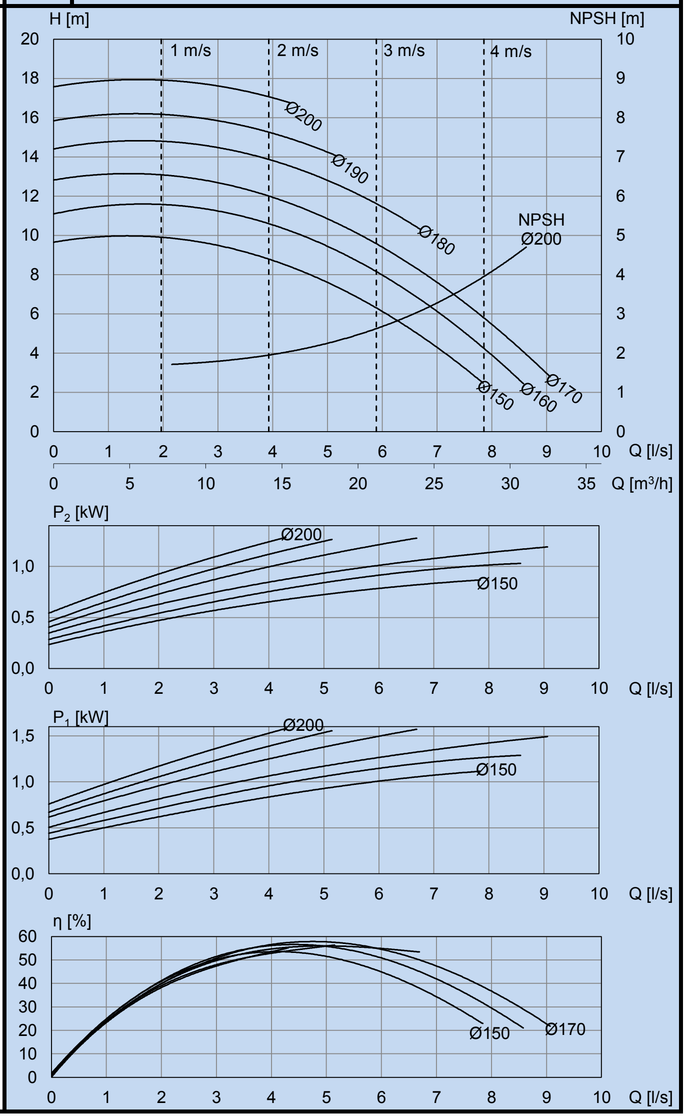
AS-50B | ASP-50B



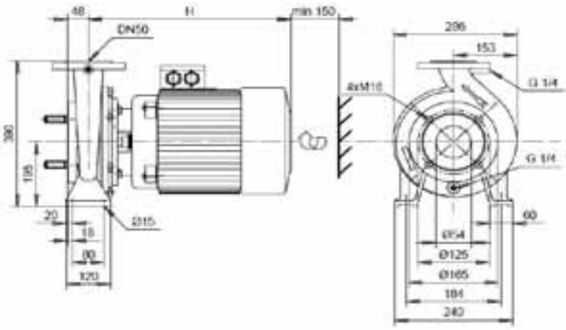
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-100 A2 NE	0,55	1,27	41	290
50Hz	KH-100 B2 NE	0,75	1,74	41	290
50Hz	KH-101 C2 NE	1,1	2,44	45	340
60Hz	**Motor 380-400V(460-480V)**	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-100 B2 NE	0,75 (0,9)	1,70 (1,74)	41	290
60Hz	KH-101 C2 NE	1,1 (1,3)	2,43 (2,43)	45	340

50 Hz	1500r/min	DN 50	60 Hz	1800r/min	DN 50



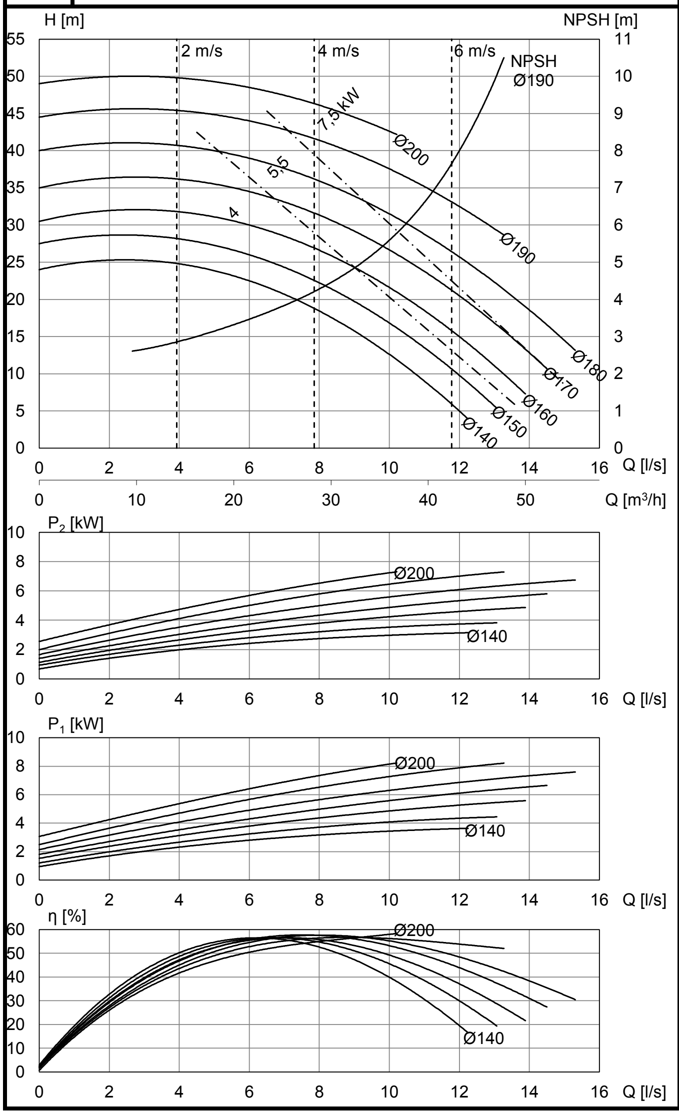


AS-50H | ASP-50H

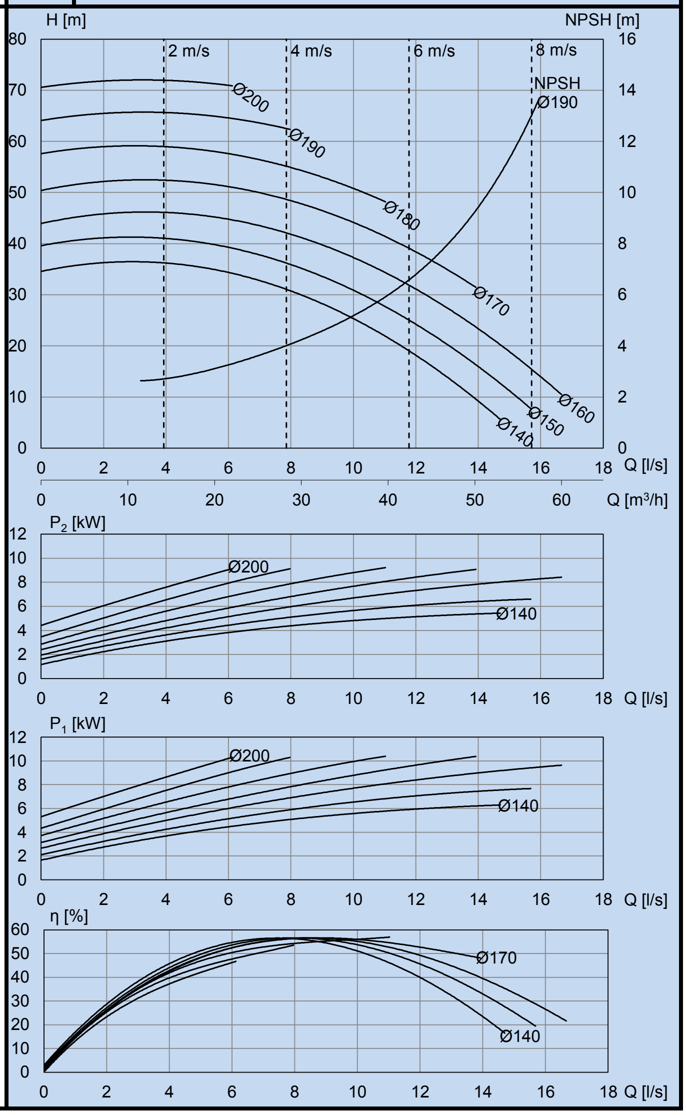


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 E1 NE	4	7,95	58	385
	KH-132 C1 NE	5,5	10,20	83	430
	KH-132 E1 NE	7,5	13,75	91	430
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-112 E1 NE	4 (4,8)	7,90 (8,00)	58	385
	KH-132 C1 NE	5,5 (6,6)	10,25 (10,40)	83	430
	KH-132 E1 NE	7,5 (9)	13,80 (14,05)	91	430

50 Hz 3000r/min DN 50



60 Hz 3600r/min DN 50



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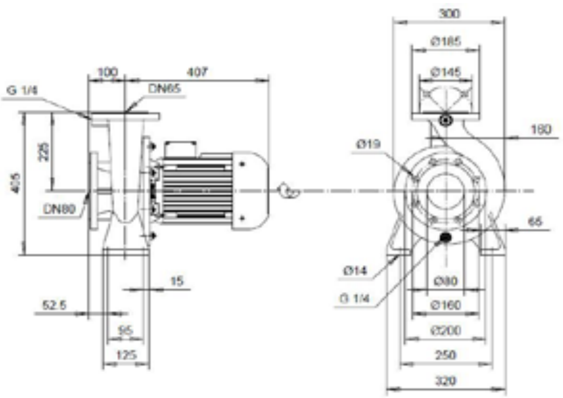
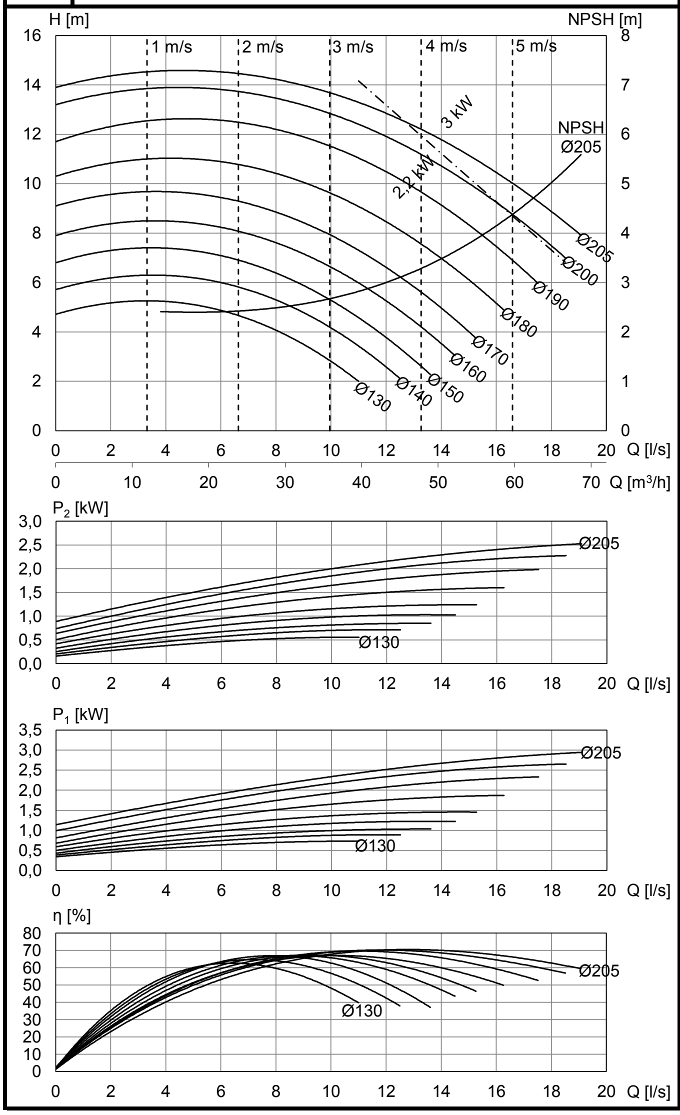
KN-65/4 | KNP-65/4

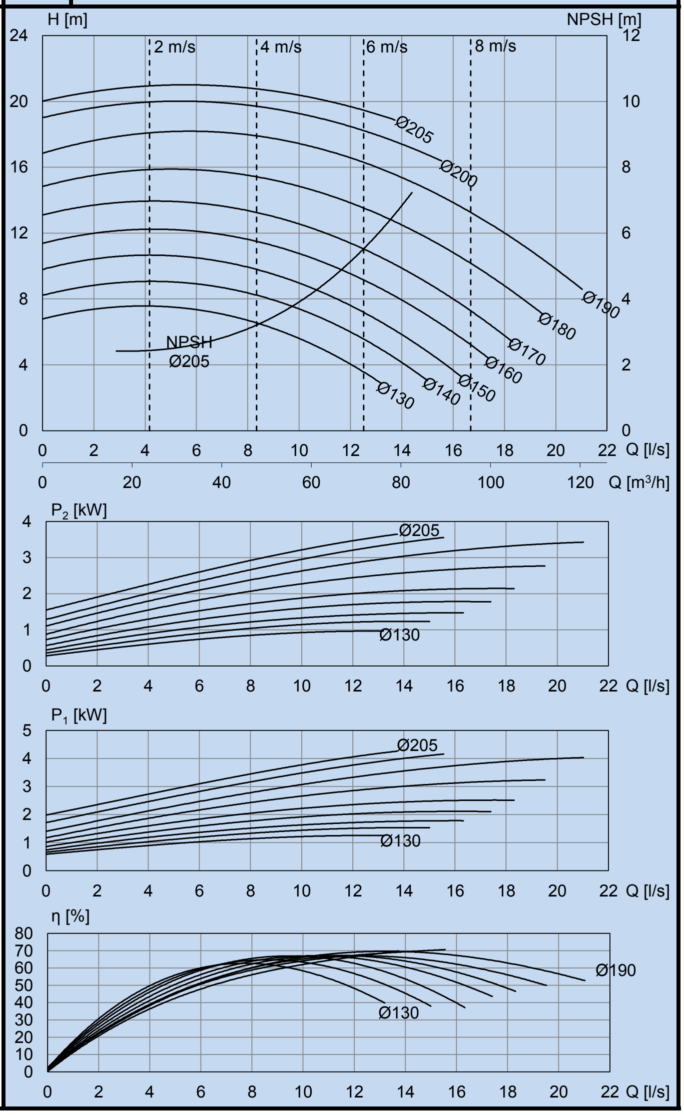


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-112 C2 N22	2,2	4,60	68	410
50Hz	KH-112 E2 N22	3,0	6,25	73	410
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-112 C2 N22	2,2 (2,6)	4,55 (4,60)	68	410
60Hz	KH-112 E2 N22	3 (3,6)	6,15 (6,25)	73	410

50 Hz	1500r/min	DN 80/65



60 Hz	1800r/min	DN 80/65



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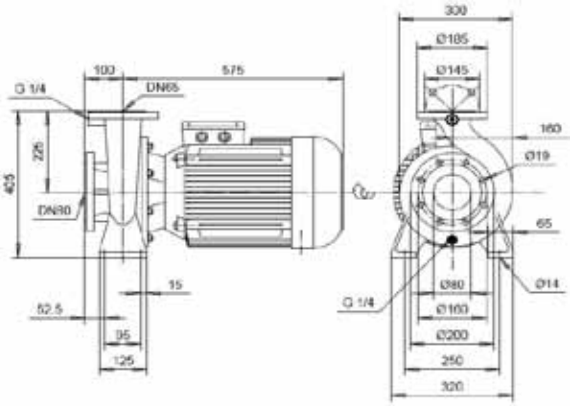
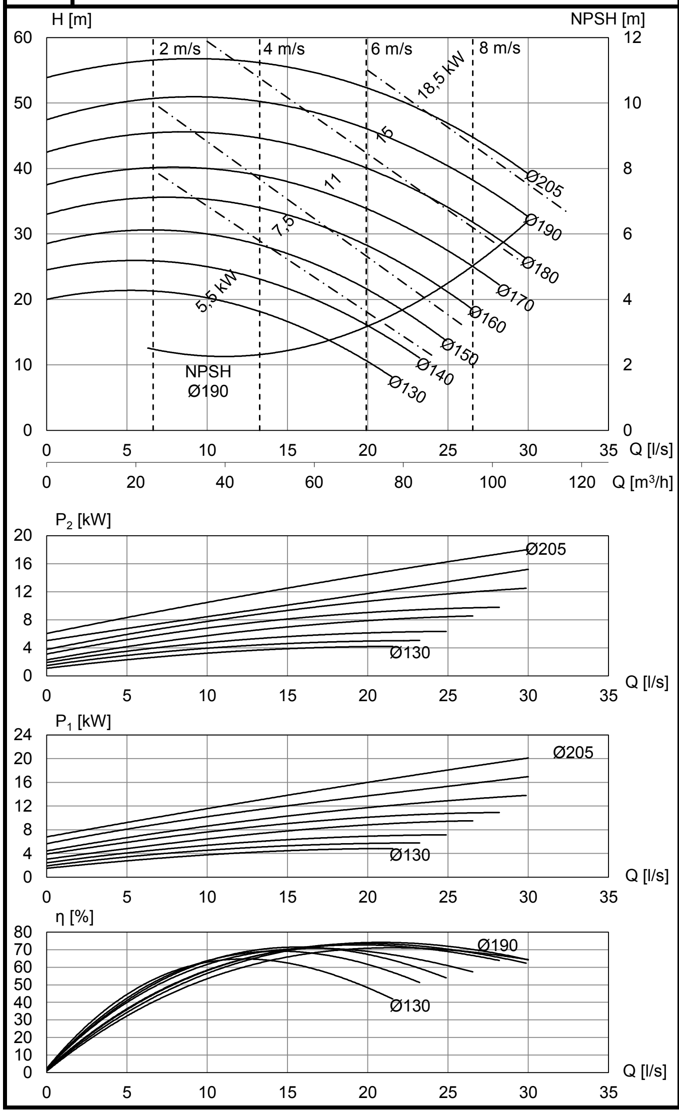
KN-65/2 KNP-65/2

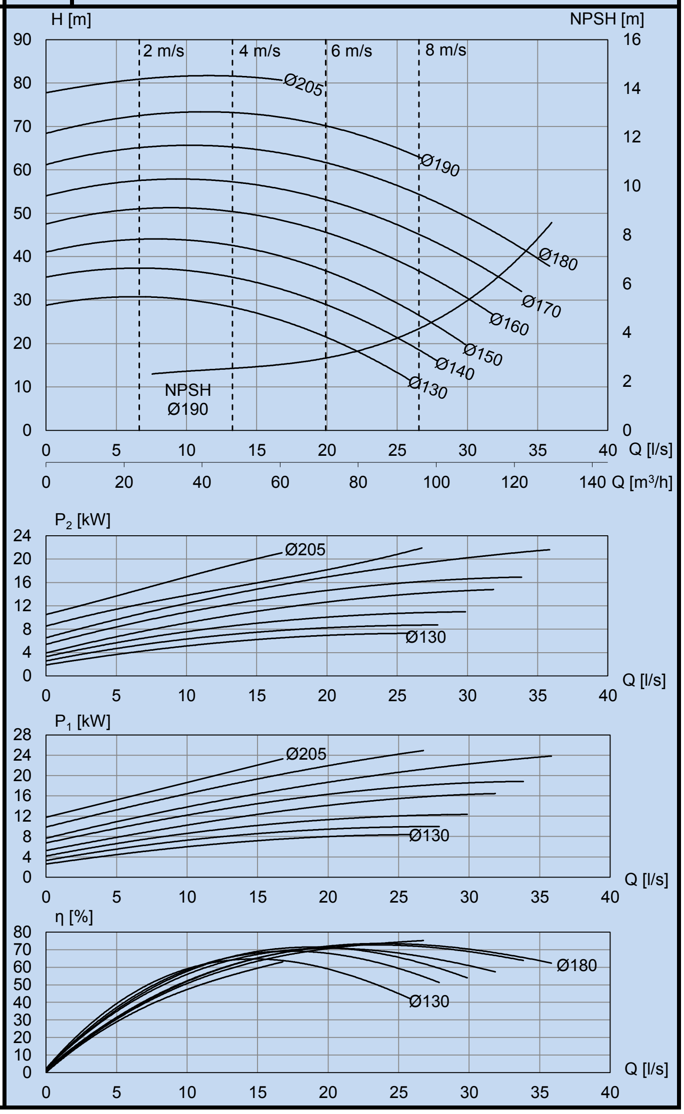


	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
50Hz	KH-132 C1 N22	5,5	10,20	97	470
	KH-132 E1 N22	7,5	13,75	105	470
	KZ-165 E1 N22	11	20,20	165	640
	KZ-165 F1 N22	15	26,95	170	640
	KZ-165A H1 N22	18,5	32,60	173	640
	Motor 380-400V(460-480V)	**P_{2N} [kW]**	**I_N [A]**	**[kg]**	**H [mm]**
60Hz	KH-132 C1 N22	5,5 (6,6)	10,25 (10,40)	97	470
	KH-132 E1 N22	7,5 (9)	13,80 (14,05)	105	470
	KZ-165 E1 N22	11 (13)	20,60 (20,30)	165	640
	KZ-165 F1 N22	15 (18)	28,05 (27,90)	170	640
	KZ-165A H1 N22	18,5 (22)	33,90 (33,60)	173	640

50 Hz 3000r/min DN 80/65



60 Hz 3600r/min DN 80/65



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KM-centrifugal pumps

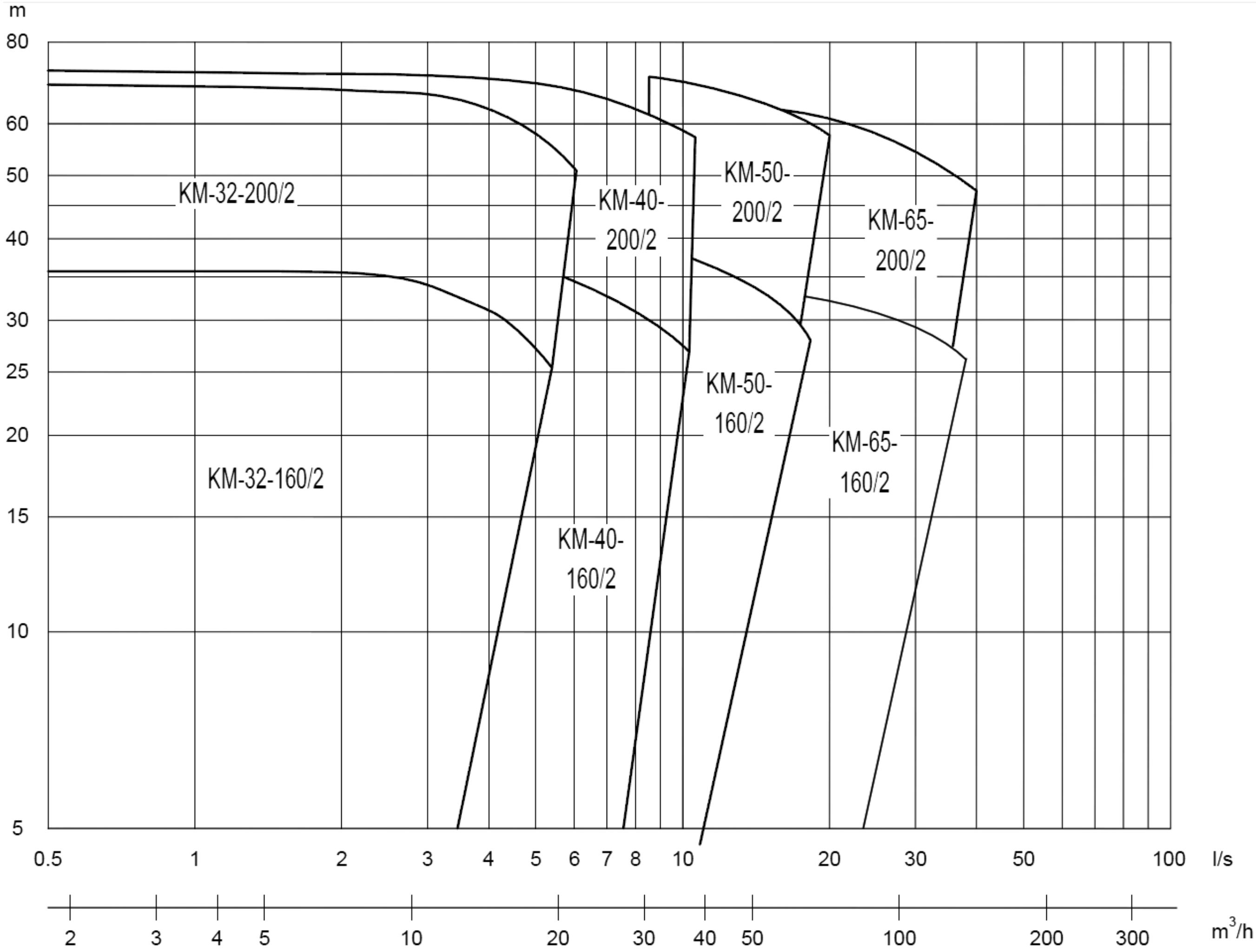
General technical data

Pumps in the KM series are horizontal end-suction centrifugal pumps.

Applications

KM centrifugal pumps can be used as service water, circulation, pressure booster and transfer pumps for clean oxygen-rich or aggressive liquids.

Quick selection chart



Construction

Pump

KM-centrifugal pumps are horizontal end-suction monoblock centrifugal pumps provided with a dry motor which comply with the requirements set by the EcoDesign Directive. The pump impeller is installed directly onto the shaft of the electric motor (no separate couplings).

Electric motor

The electric motor in a KM centrifugal pump is an asynchronous motor complying with the requirements set by the EcoDesign Directive. The electric motor has high efficiency and a low noise level. The electric motor is suitable use with a frequency converter.

Standard voltages:	400/230 V, 50 Hz 4 kW and lower
	690/400 V, 50 Hz 5,5 kW and higher
Enclosure class:	IP 55
Insulating class:	F
Max. ambient temperature	+45°C

Flanges
The flanges of a KM- pump fit counter-flanges dimensioned according to ISO 7005.

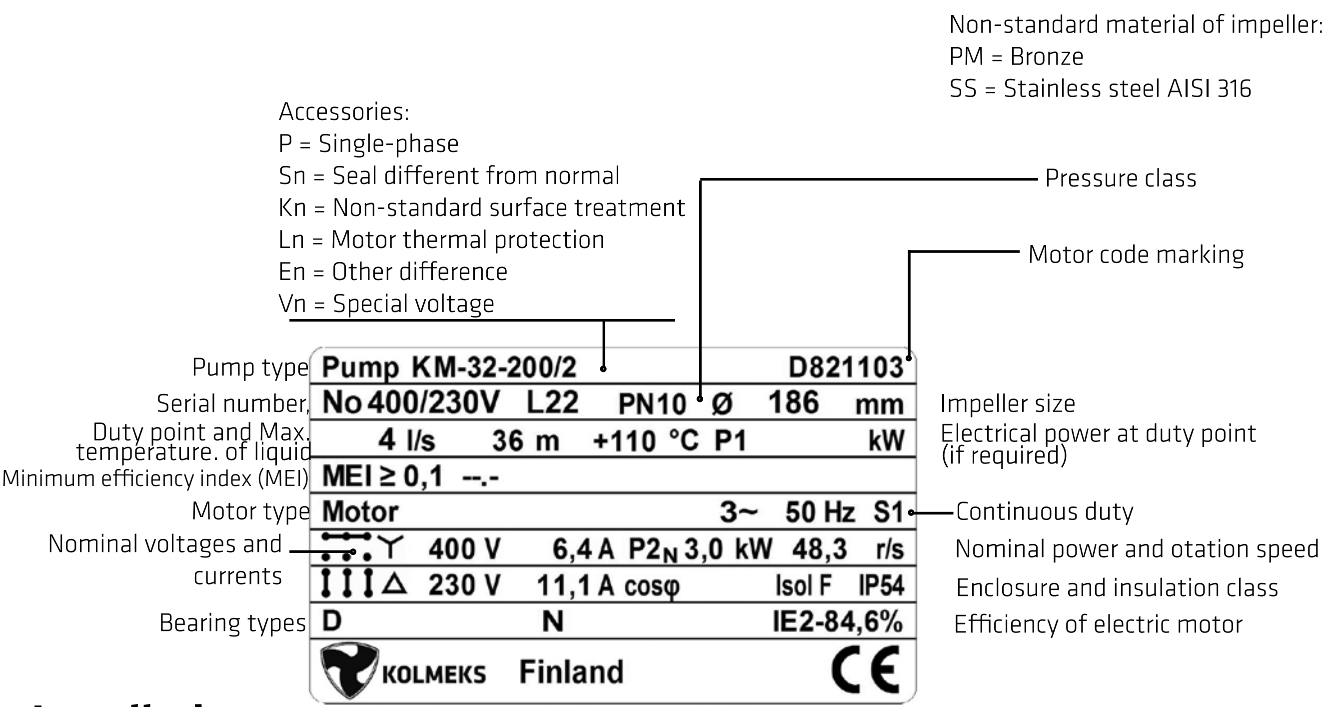
Seals
The shaft seal of a KM pump is a single mechanical seal. The seal in the pump housing is an O-ring.

Standard materials and fields of application

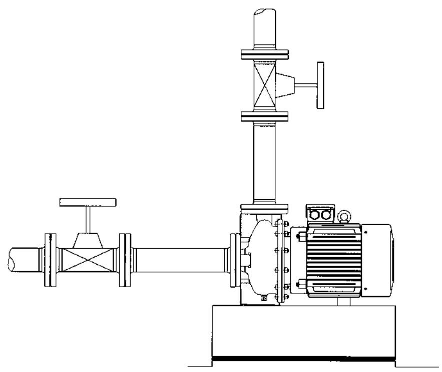
Pump housing and impeller	Acid-proof steel AISI 316L
Shaft	Acid-proof steel AISI 316L
Shaft seal	Ø22 mm silicon carbide/silicon carbide Viton elastomer
Metal parts	AISI 316
Housing O-ring	Nitrile elastomer
Max. operating pressure	10 bar
Operating temperature	-10 ... +110°C (*

NOTE! The shaft seal in a KM pump is available in several material alternatives depending on the requirements of the liquid to be pumped. (*The operating temperature range of the pump is dependent on the liquid to be pumped. With water, the range is 0 ... +110°C

Rating plate



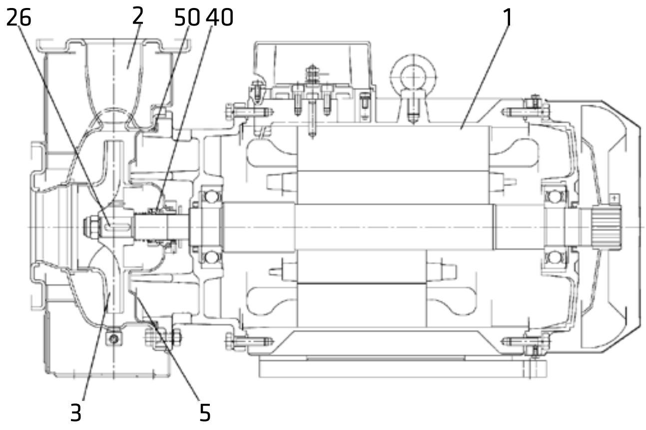
Installation
The KM pump must be installed onto the motor in a horizontal position.



Ensure the following when installing the pump:
- Enough room for service and inspection
- Possibility to use lifting and transfer devices if required
- Shut-off valves on both sides of the pump

Small pumps (less than 2.2 kW) can be installed in the piping without support. Large pumps (> 2.2 kW) are fastened by their foot onto a freely moving concrete plinth which is separated from the floor, e.g. by a 20 mm thick rubber or cork mat. The weight of the concrete plinth must be about 1.5 times the weight of the pump.

Spare parts and service



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

Seal kits

KM-32-160, KM-40-160

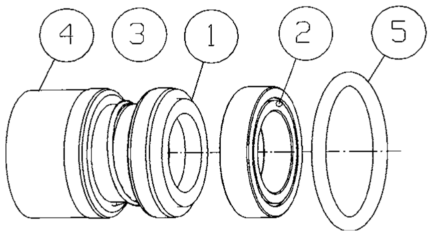
Shaft seal kit No. 7 for 22 mm shaft
Housing O-ring 189.86x5.3

KM-32-200, KM-40-200, KM-50-160, KM-50-200

Shaft seal kit No. 7 for 22 mm shaft
Housing O-ring 227.96x5.34

KM-65-200

Shaft seal kit No. 7 for 30 mm shaft
Housing O-ring 227.96x5.34



1 Rotating ring
2 Stationary ring
3 Body/bellows
4 Spring
5 O-ring

Spare parts

Shaft seal or a complete new pump.

NPSH and cavitation

The $NPSH_{av}$ value of a system refers to the actual difference between the inlet pressure (in the suction flange) and the vapour pressure of the liquid being pumped. The $NPSH_{re}$ value required of the pump must be smaller than the $NPSH_{av}$ value in order to prevent cavitation from occurring. A safety margin of 0.5 m must be added to the measurement value.

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

$$NPSH_{re} < p + h - h_{suction} - p_h$$

$$NPSH_{re} < p_{suction} - p_h$$

$NPSH_{av}$ = difference between available inlet pressure (in suction flange) and vapour pressure of liquid being pumped
$NPSH_{re}$ = NPSH value required of pump
p = Absolute atmospheric pressure
p_h = Absolute liquid vapour pressure in the temperature in question
h = Liquid geodetic suction head
$h_{suction}$ = Pressure losses in suction pipes
$p_{suction}$ = Absolute suction pressure

Example 1: Open tank (p = air pressure = 10 m) where water temperature is + 90°C (ph = 7 m), suction pipe pressure losses 1 m and liquid geodetic suction head +2 m. Pump duty point 14 l/s, 50 m. QUESTION: Is the selected pump suitable for the use in question?

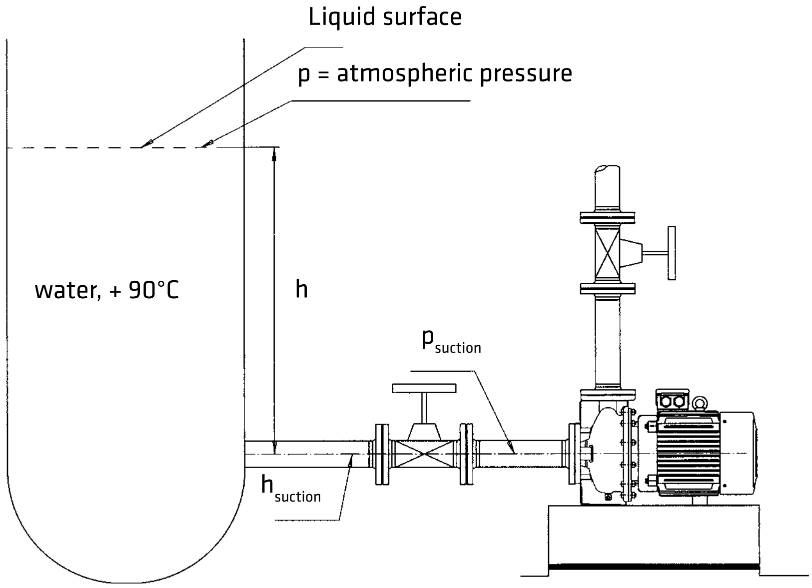
Pump type: KM-50-200/2/ Ø200 11 kW
$NPSH_{re} < p + h - h_{suction} - p_h$
$NPSH_{re} < 10\ m + 2\ m - 1\ m - 7\ m$
$NPSH_{re} < 4\ m$
Observing the safety margin 0.5 m, the $NPSH_{re}$ value of the pump must be smaller than 3.5 m for the pump not to cavitate.

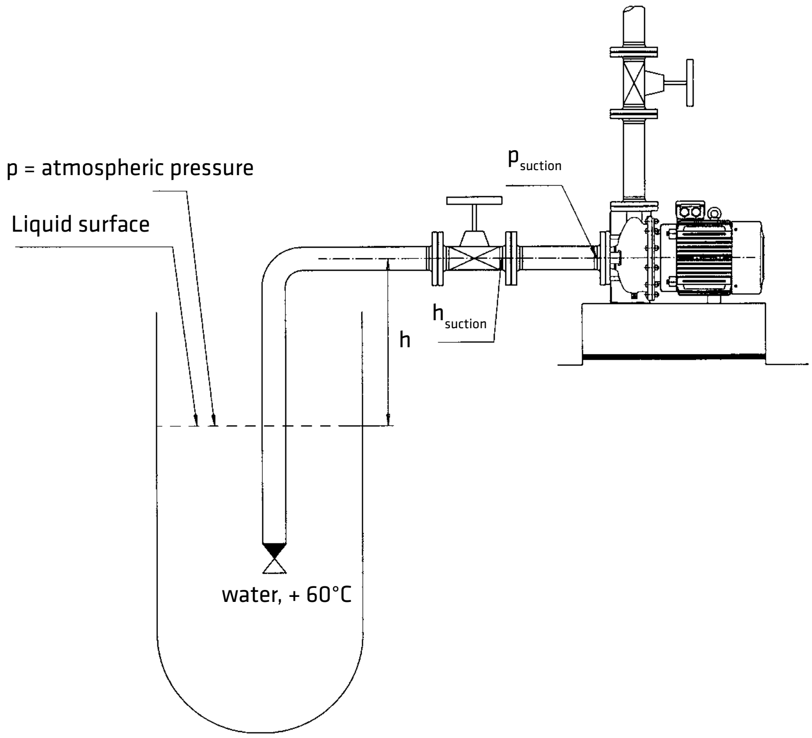
ANSWER: $NPSH_{re}$ of pump KM-50-200/2/Ø200 = 3.1 m (with 14 l/s output), whereby it will not cavitate.

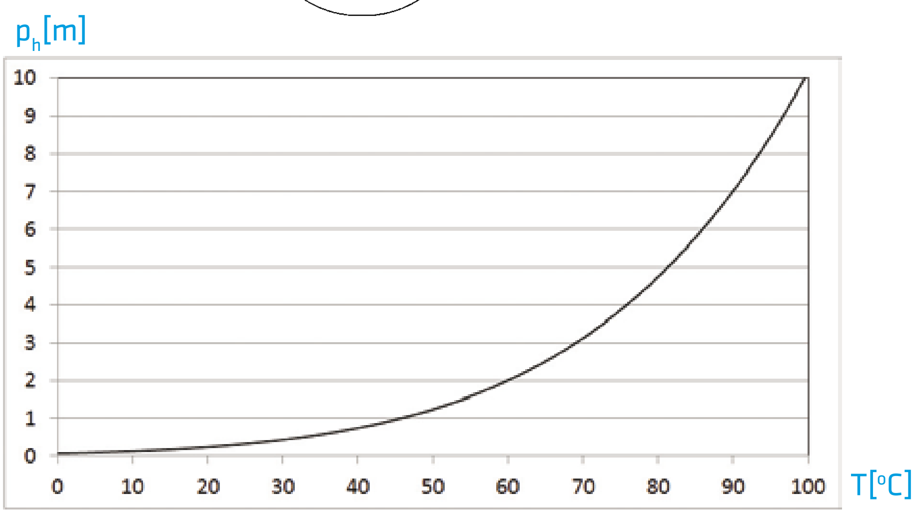
Example 2: Open tank (p = atmospheric pressure = 10 m) where water temperature is at the maximum + 60°C (p_h = 2 m), suction pipe pressure losses 1 m. Pump duty point 14 l/s, 50 m. Pump $NPSH_{re}$ = 3.1 m. QUESTION: At which level in relation to the surface of the liquid should the pump be installed?

Pump type: KM-50-200/2/ Ø200 11 kW
$NPSH_{re} < p + h - h_{suction} - ph$
$h > NPSH_{re} - p + h_{suction} + ph$
$h > 3{,}1\ m - 10\ m + 1\ m + 2\ m$
$h > - 3{,}9\ m$

ANSWER: Observing the safety margin 0.5 m, the pump can be installed 3.4 m above the liquid surface.



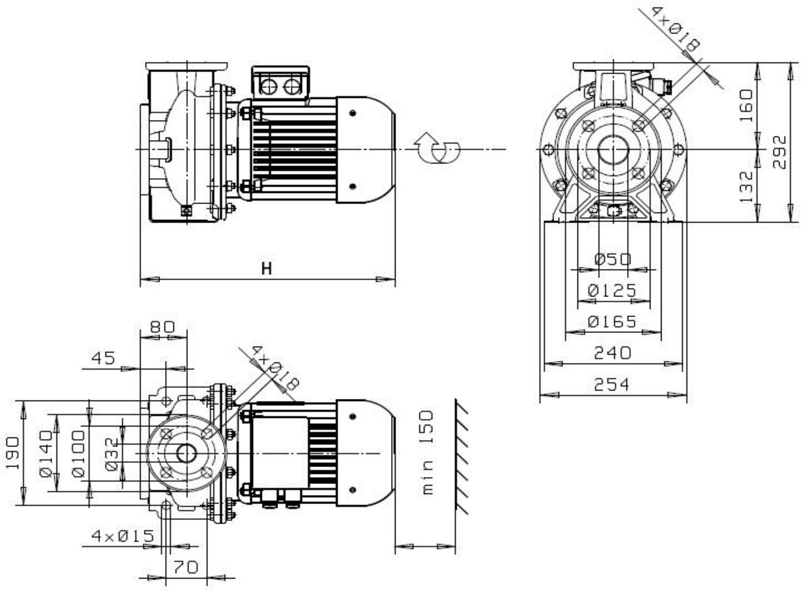




Vapour pressure (water)

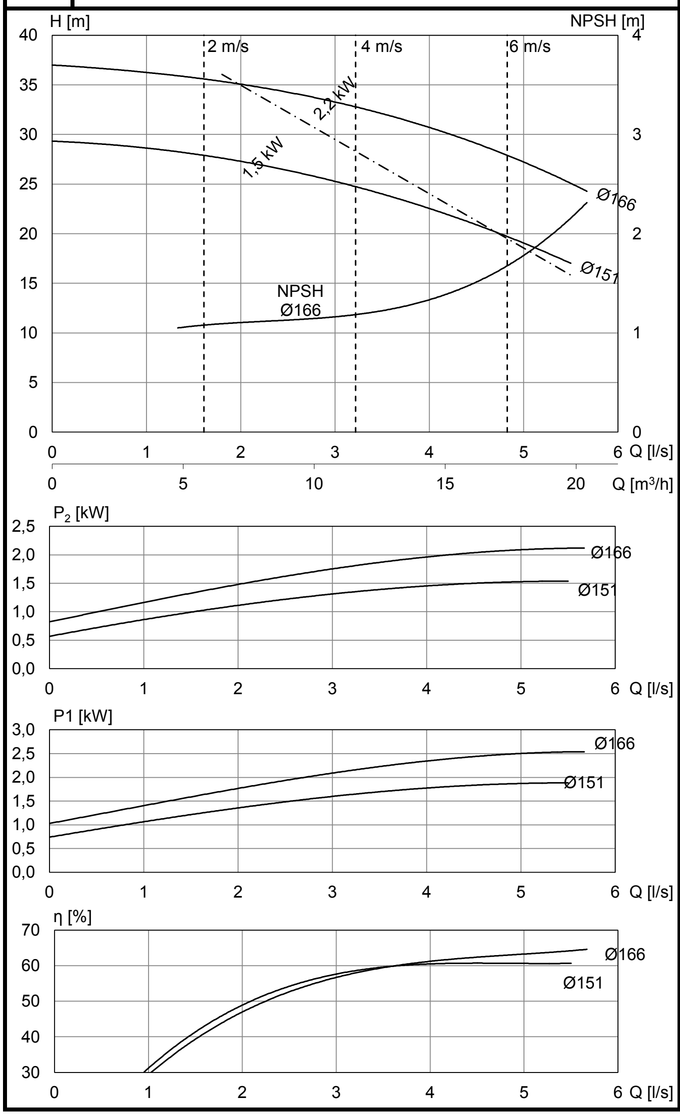
6

KM-32-160/2

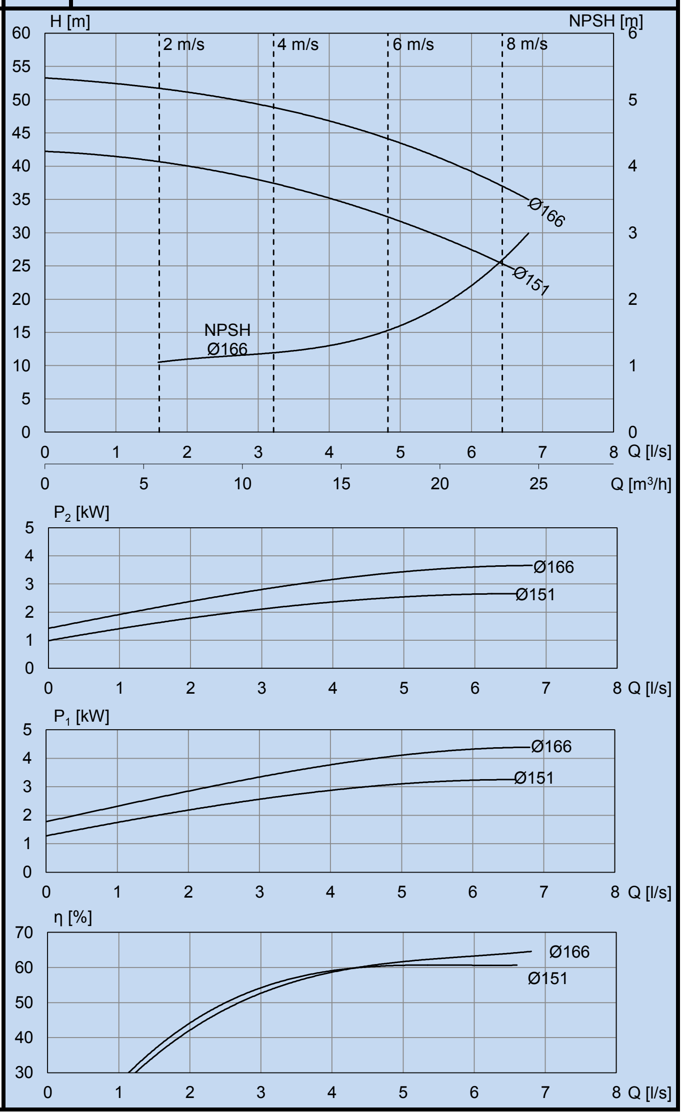


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	1,5	3,4	23	408
	2,2	4,9	25	408
60Hz	**P_{2N} [kW]**	**I_N 400V [A]**	**m [kg]**	**H [mm]**
	3,0	5,6	29	432
	4,0	8,0	35	460

50 Hz 3000r/min DN 32 / 50



60 Hz 3600r/min DN 32 / 50



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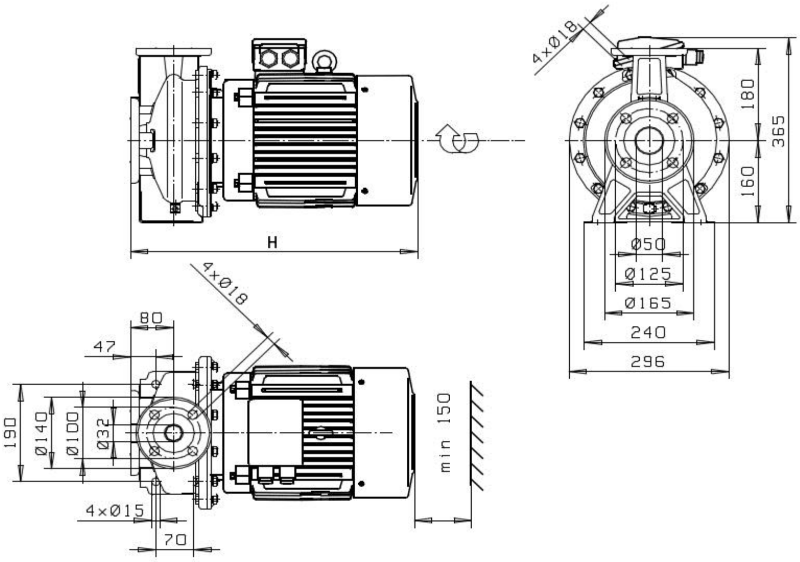
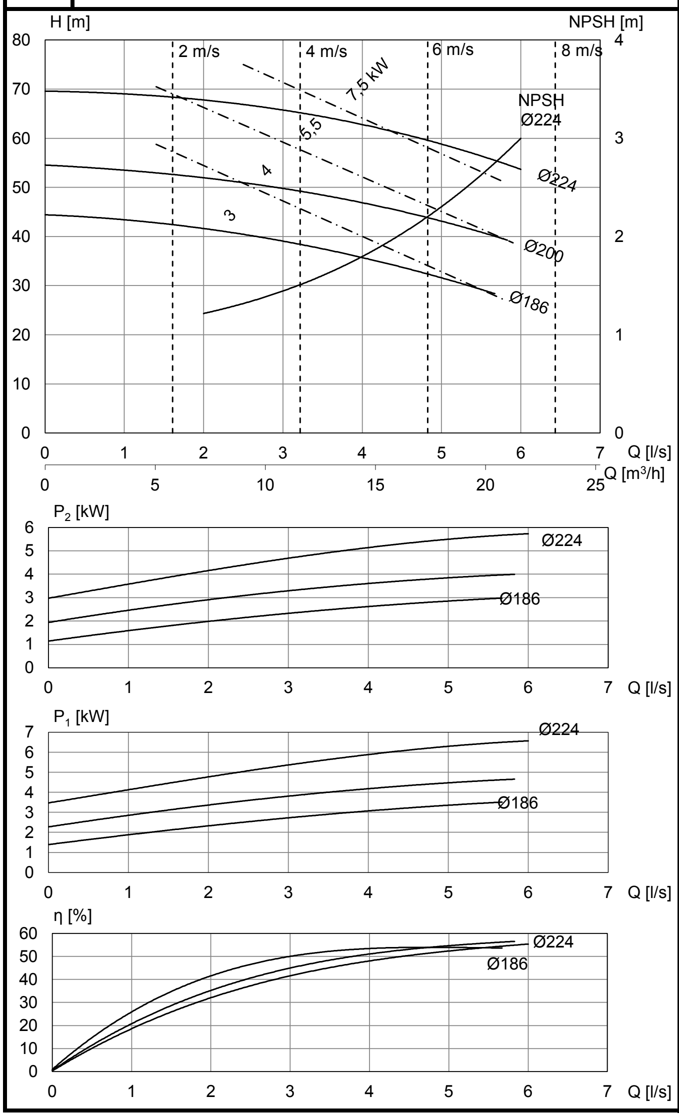
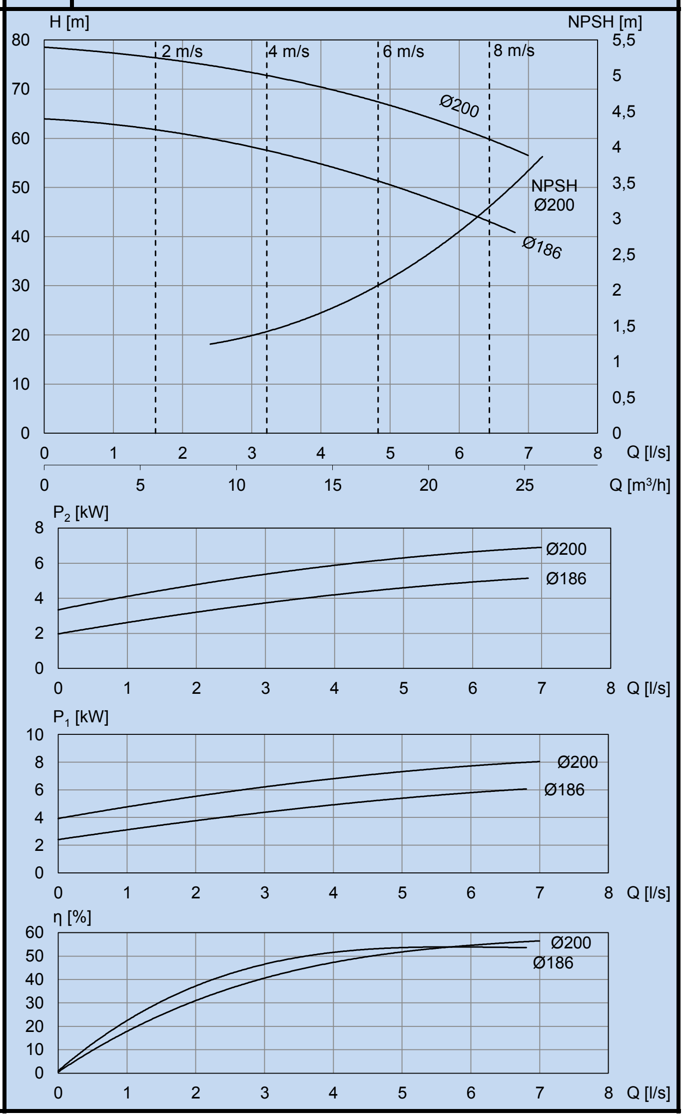
KM-32-200/2



	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	3,0	6,4	33	433
	4,0	8,3	40	454
	5,5	10,5	49	475
	7,5	14,6	58	517
	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
60Hz	5,5	12,3	49	477
	7,5	15,2	58	520

50 Hz	3000r/min	DN 32 / 50	60 Hz	3600r/min	DN 32 / 50





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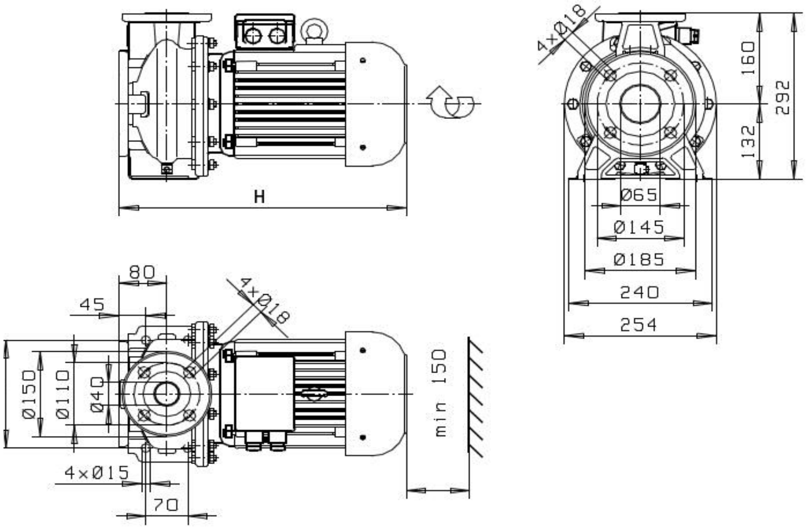
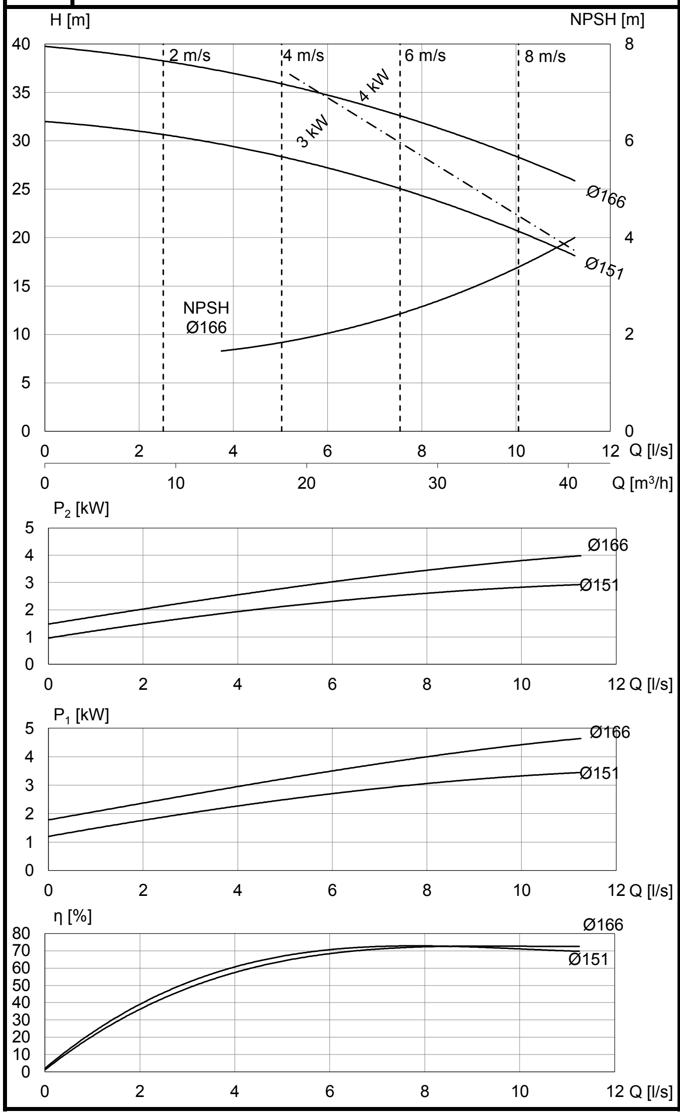
KM-40-160/2

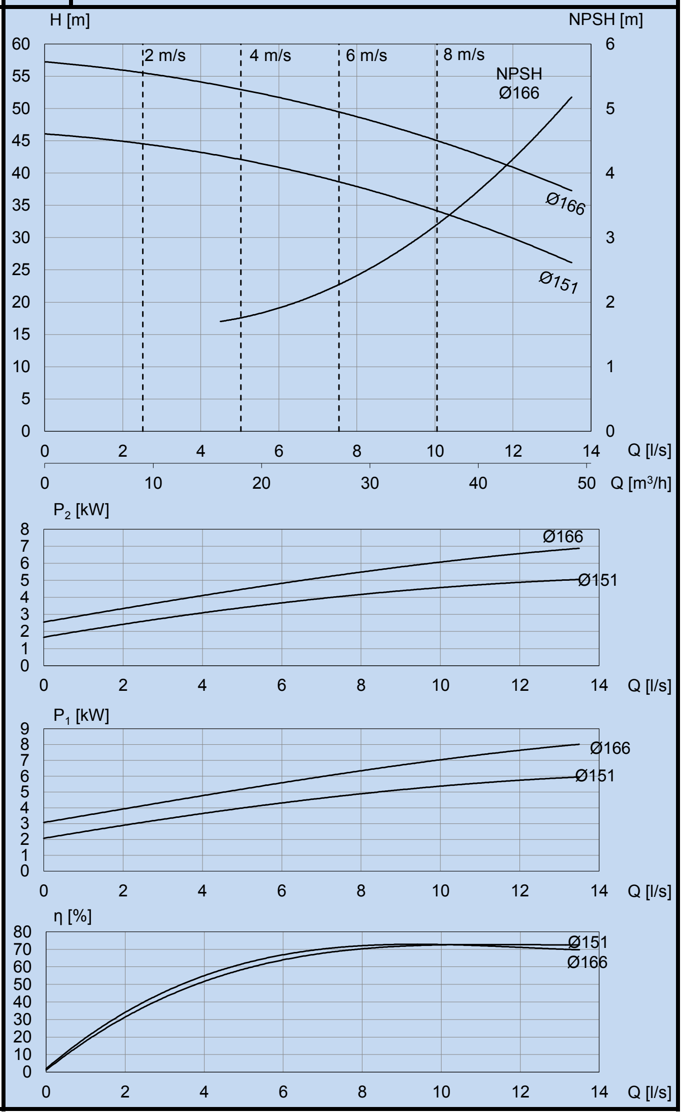


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	3,0	6,4	53	433
	4,0	8,3	57	454
60Hz	**P_{2N} [kW]**	**I_N 400V [A]**	**m [kg]**	**H [mm]**
	5,5	12,0	43	475
	7,5	15,4	51	498

50 Hz	3000r/min	DN 40 / 65



60 Hz	3600r/min	DN 40 / 65



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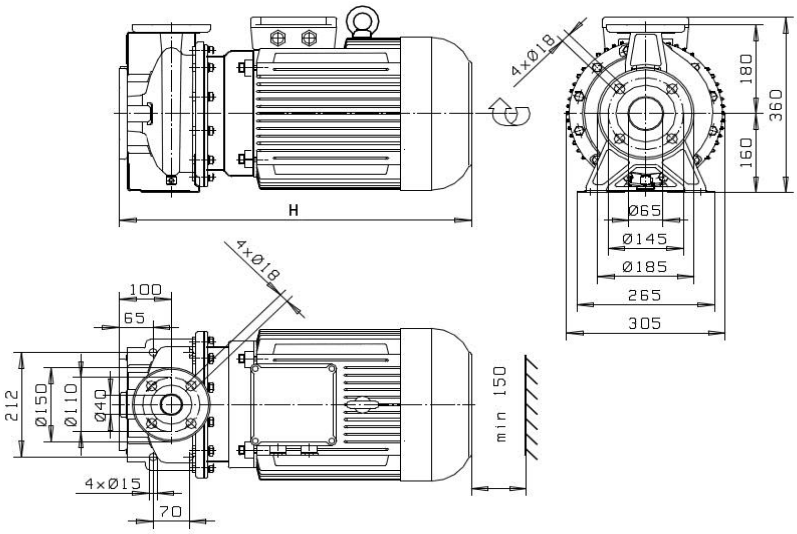
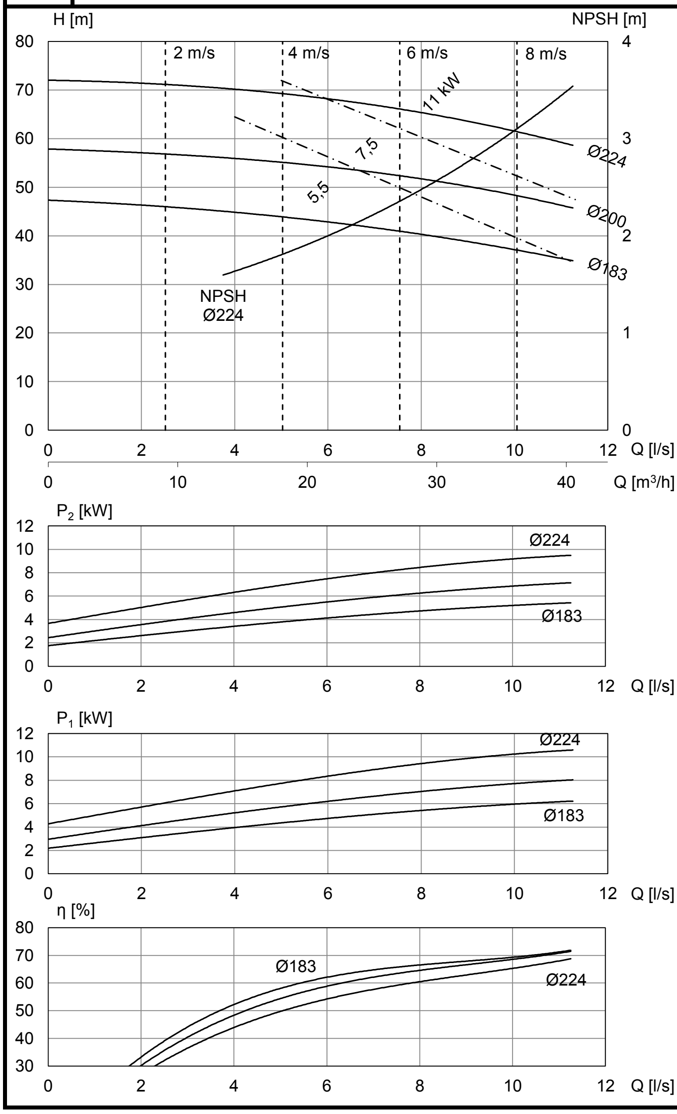
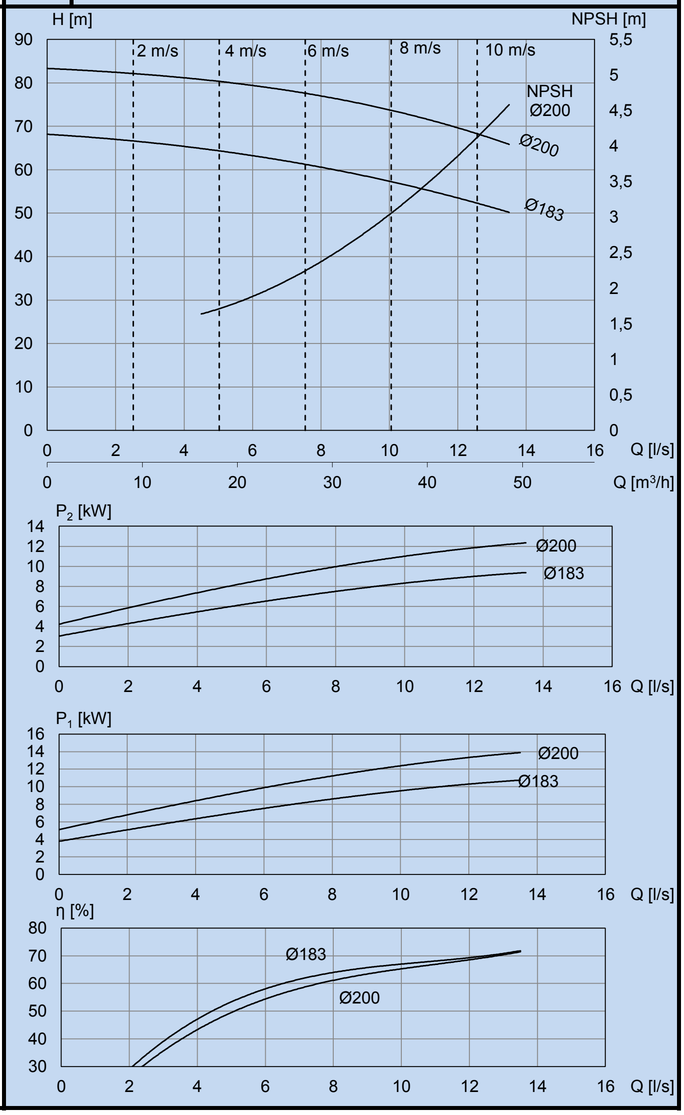
KM-40-200/2



	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	5,5	10,5	49	495
	7,5	14,6	57	537
	11,0	21,7	68	594
60Hz	11,0	22,2	68	498
	15,0	27,0	74	724

50 Hz	3000r/min	DN 40 / 65	60 Hz	3600r/min	DN 40 / 65





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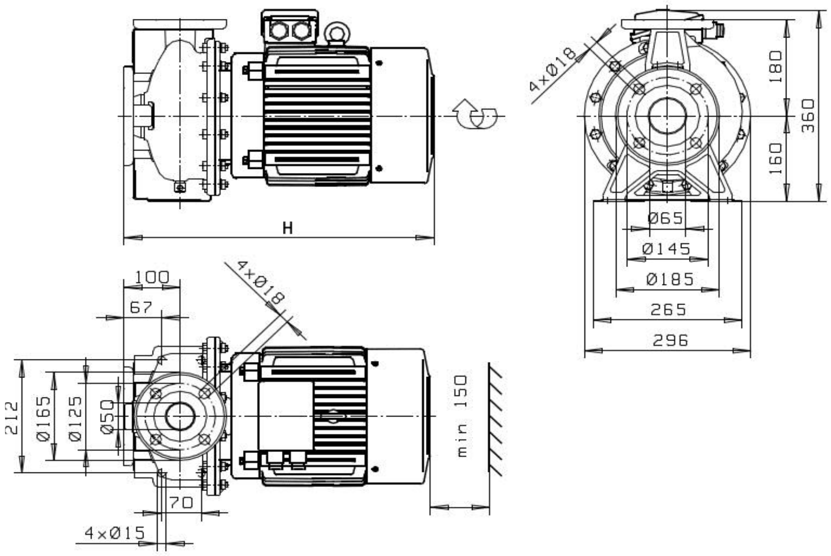
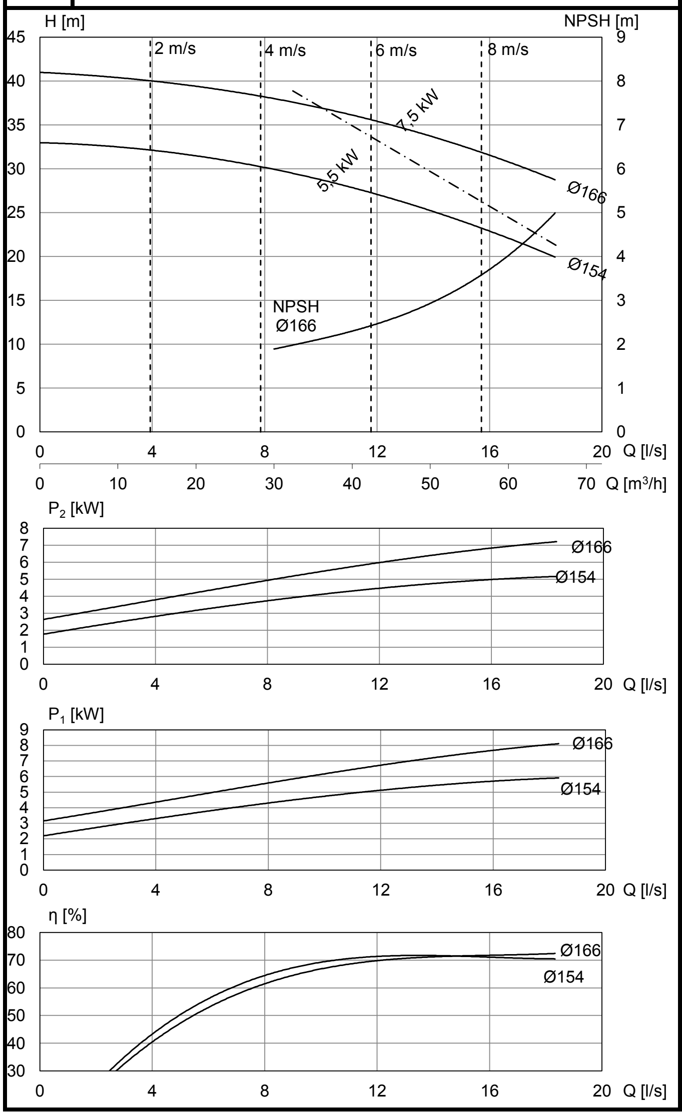
KM-50-160/2

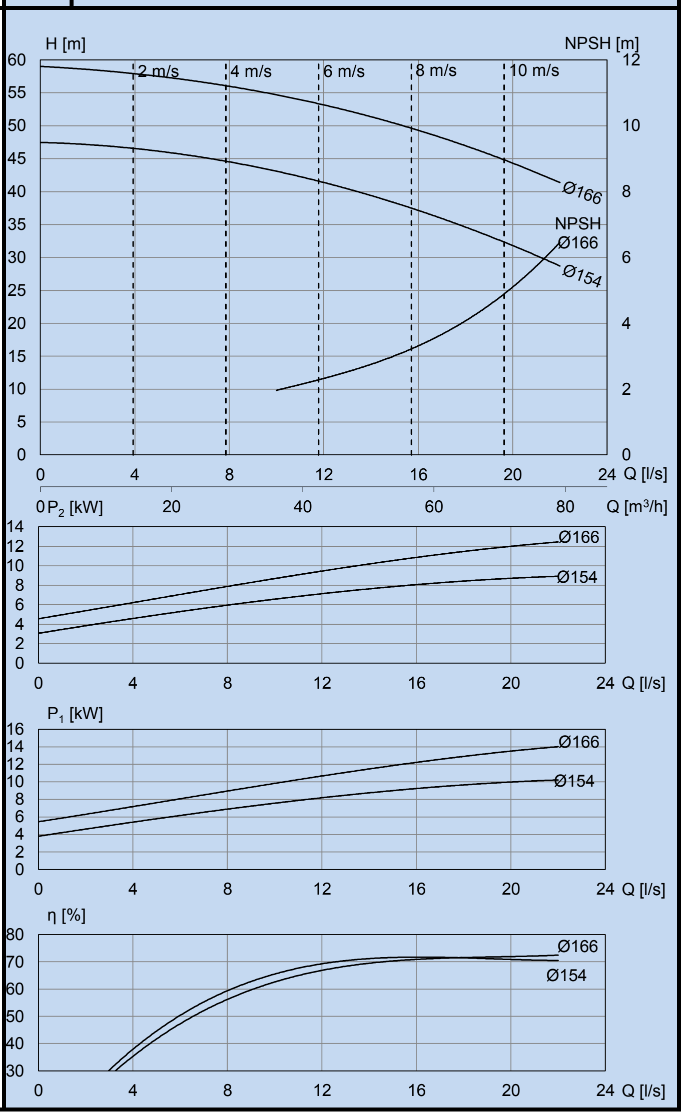


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	5,5	10,5	50	495
50Hz	7,5	14,6	56	537
	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
60Hz	11,0	22,2	62	593
60Hz	15,0	27,0	73	724

50 Hz 3000r/min DN 50 / 65



60 Hz 3600r/min DN 50 / 65



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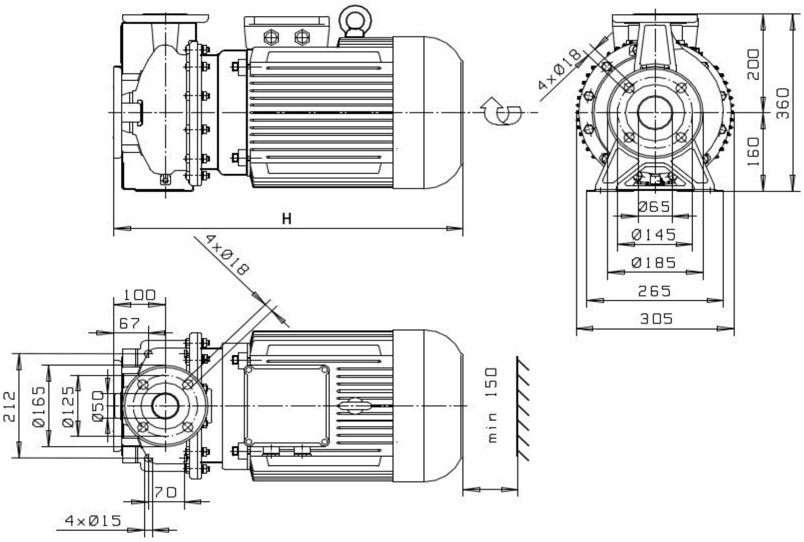
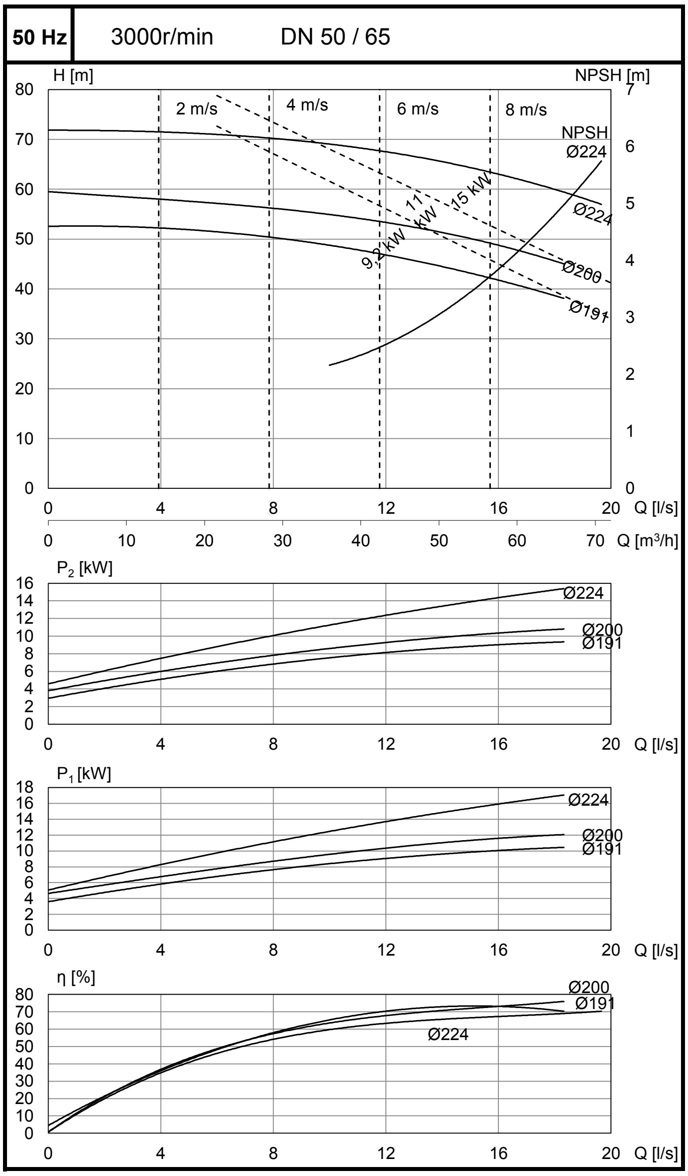
KM-50-200/2

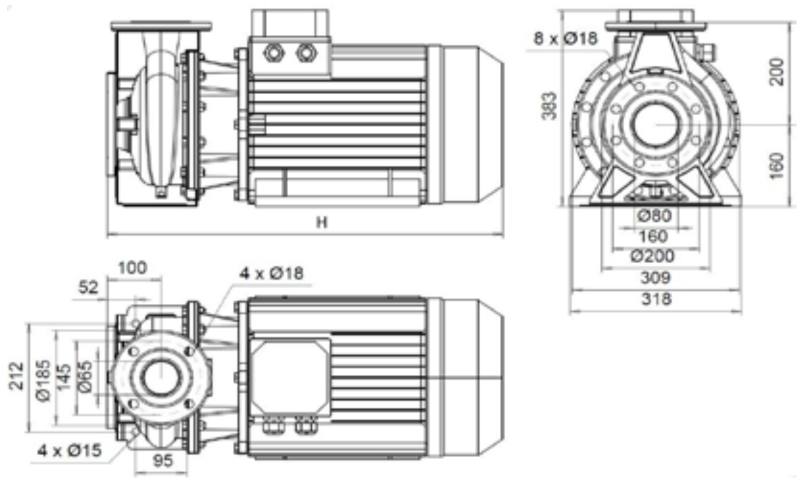


50Hz	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
	9,2	17,3	62	594
	11,0	21,7	67,5	594
	15	28,5	96,0	723



60 Hz is not available

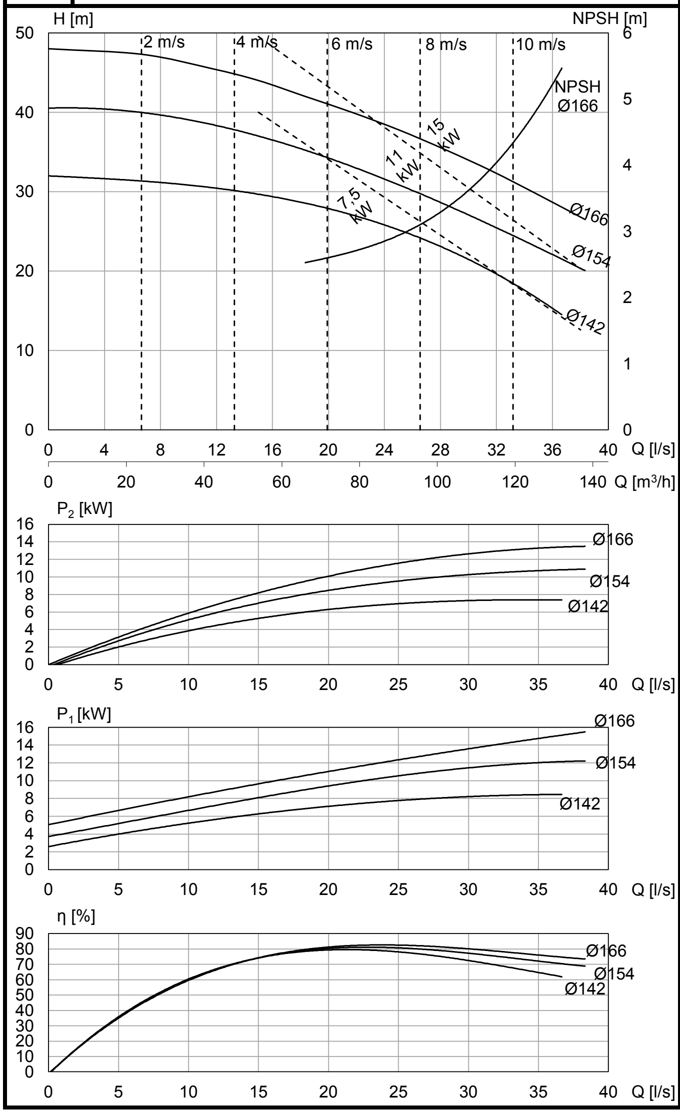
KM-65-160/2



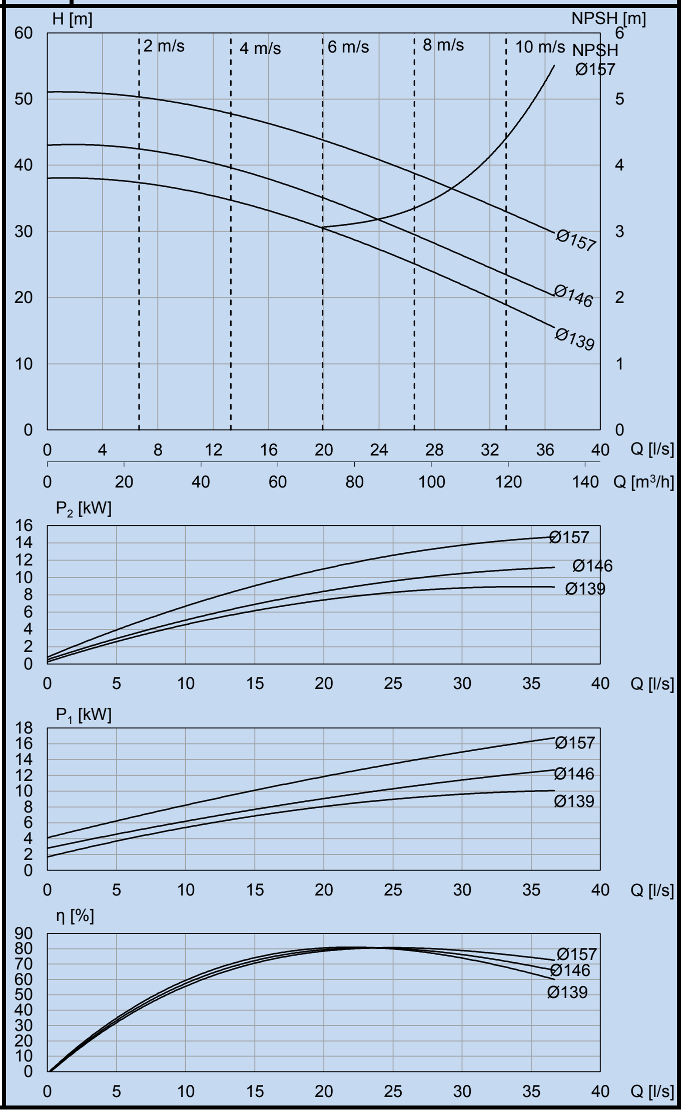
	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	7,5	14,6	62	537
	11	21,7	76	594
	15,0	28,5	93	732
60Hz	9,26	18,4	64	593
	11	21,3	70	593
	15	28,9	103	733

Min 150 mm free space required at the end of the pump

50 Hz	3000r/min	DN 65 / 80



60 Hz	3600r/min	DN 65 / 80



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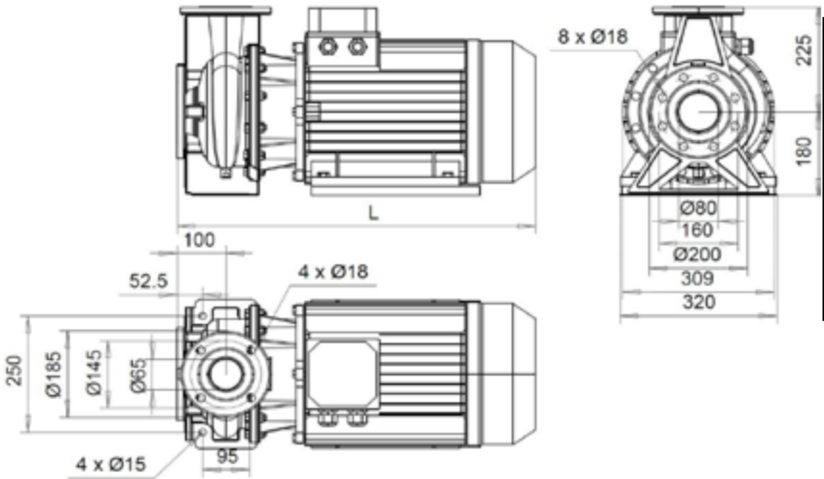
KOLMEKS
www.kolmeks..com

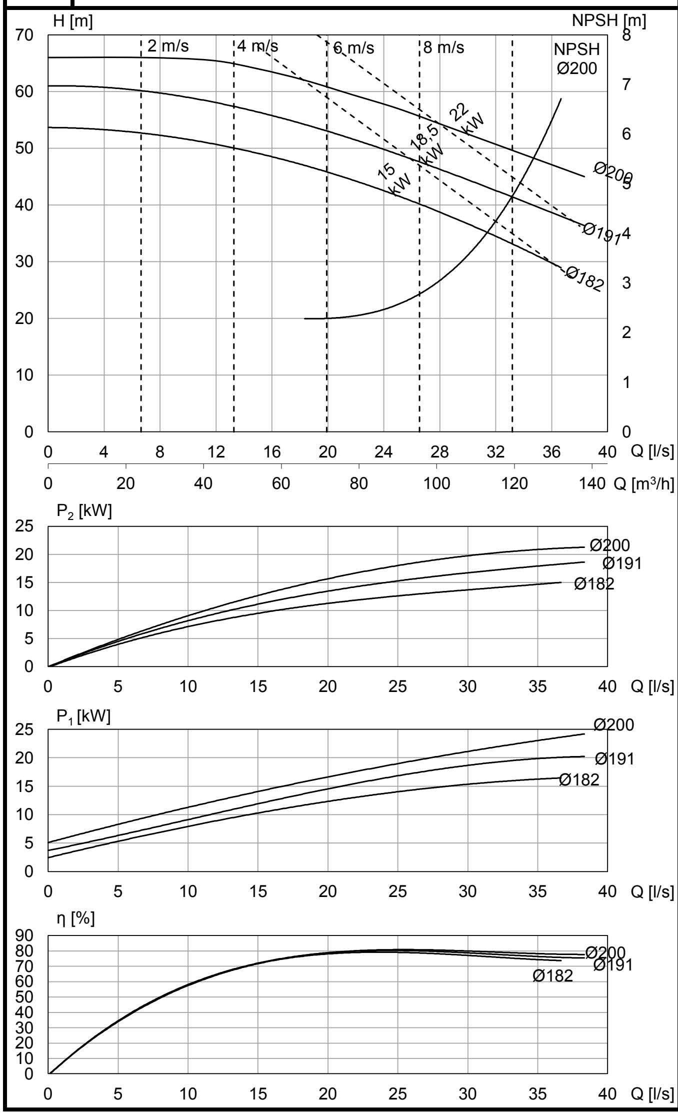
KM-65-200/2

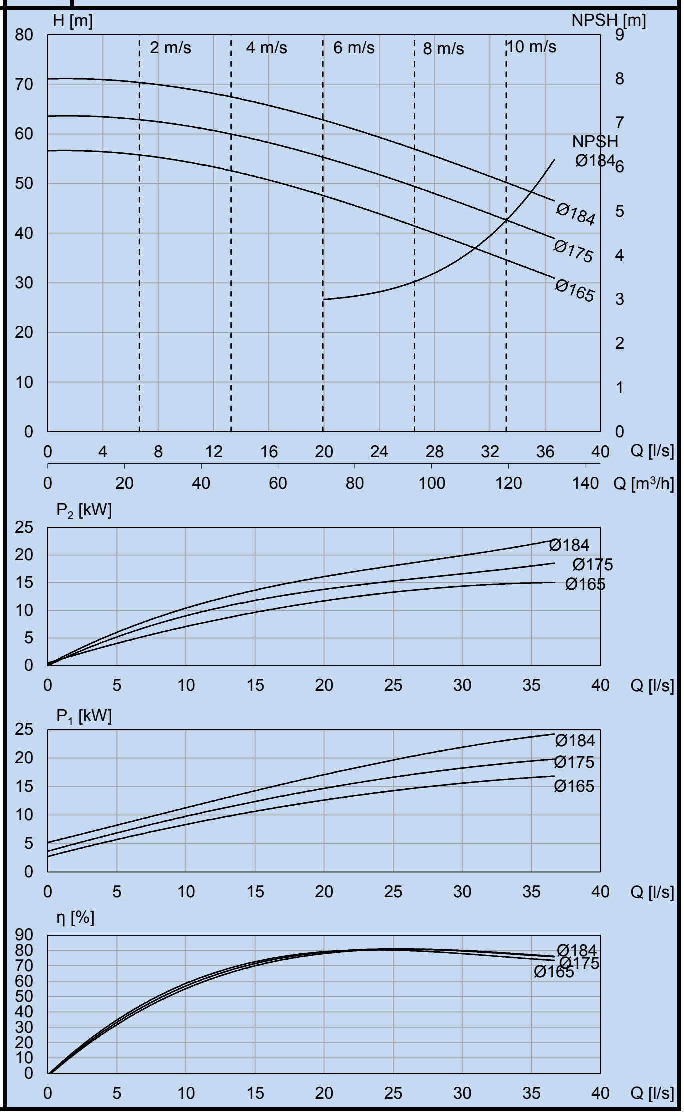


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50HZ	15	28,5	114	732
	18,5	34,1	127	732
	22,0	42,50	136	732
60HZ	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
	15	29,3	106	733
	18,5	35,4	120	733
	22	41,7	128	733

Min 150 mm free space required at the endof the pump

50 Hz	3000r/min DN 65 / 80	60 Hz	3600r/min DN 65 / 80





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KOLMEKS
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KOLMEKS
EFFICIENT RELIABILITY

ATEX PUMPS WITH
FIXED-SPEED MOTOR, 3x400V
AE- L- and T-series, threaded G3/4-G1, flanged DN50

www.kolmeks.com

General technical data

Pumps in the AE and L EXE series are grey cast iron, explosion-proof centrifugal pumps with thread or flange connections.

Pumps in the AEP and LP-EXE series are bronze, explosion-proof centrifugal pumps with threaded or flanged connections.

Pumps in the LH-EXE series are nodular, cast iron, explosion-proof centrifugal pumps with flanged connections.

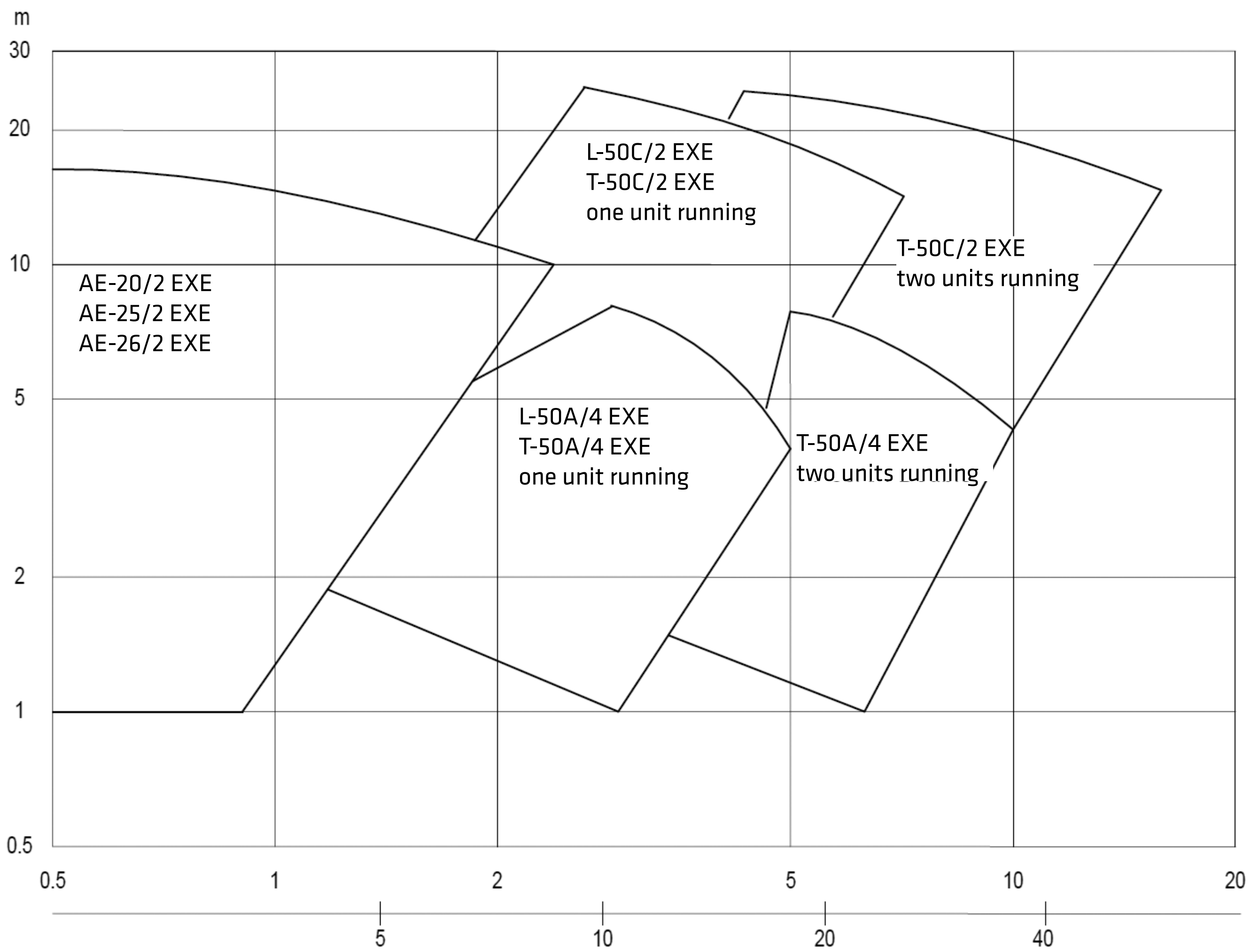
Pumps in T-EXE series are grey cast iron explosion-proof twin centrifugal pumps with flanged connections.

All pumps have type approval according to Directive EY94/9.

Pump applications

Pumps can only be used for non-flammable liquids. The pump cannot be used with a frequency converter.

Quick selection chart for ATEX pumps



7

Construction

Pump

Pumps in the AE_, L_ and T_ EXE series are monoblock centrifugal pumps which are equipped with an explosion-proof motor. The pump impeller is installed directly onto the shaft of the electric motor with no separate couplings.

Electric motor and type markings

The explosion-proof electric motor of a pump in the AE_, L_ and T_ EXE series is a Kolmeks motor designed for pump use. The electric motor is highly efficient and has low noise levels.

Standard voltages:	3~ 400/230 V, 50 Hz 3~ 380/220 V, 50 Hz 3~ 415/240 V, 50 Hz
Enclosure class:	IP 65
Insulating class:	F
Duty type:	S1 (continuous duty)
Maximum ambient temperature:	+40°C

WARNING!
The explosion-proof pump cannot be driven with a frequency converter.

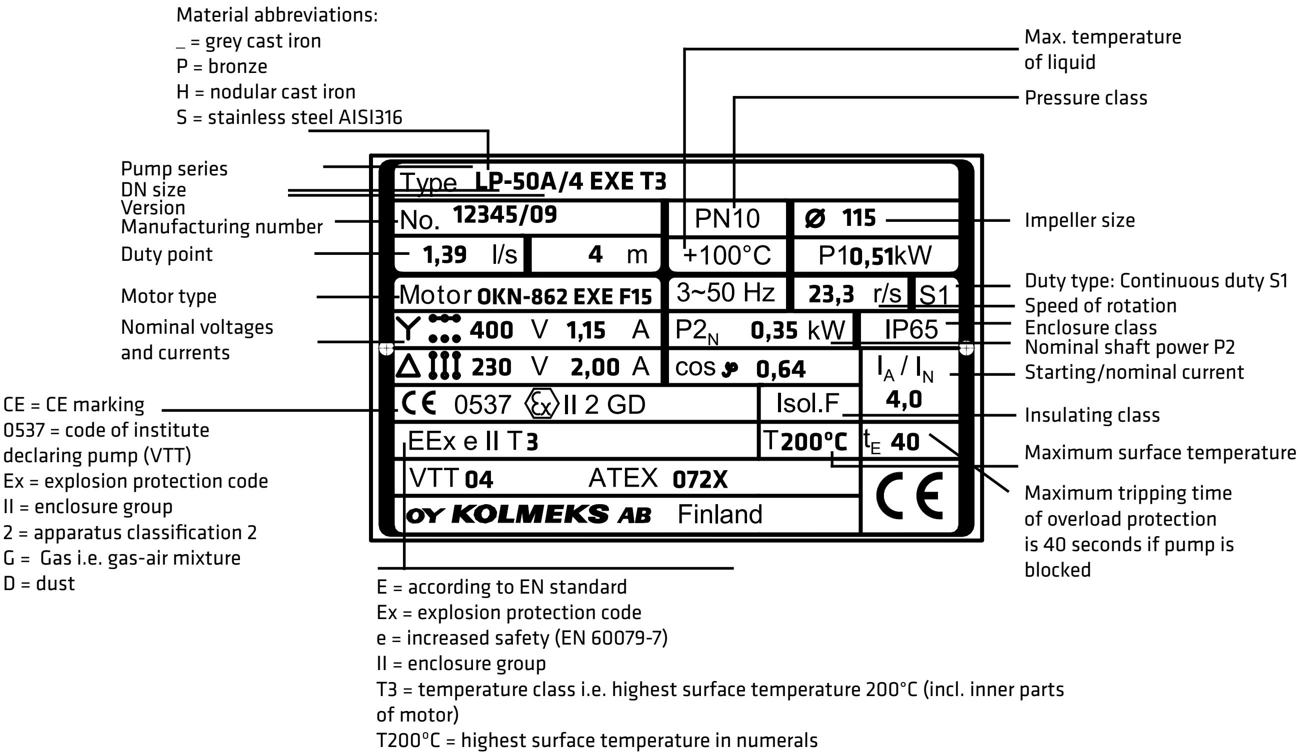
Applicability and markings: **II 2 GD EEx e II T3 IP65 T200°C**

Abbreviations:
II = enclosure group (industrial devices)
2 = apparatus classification 2 (2 GD suitable for space classes 1, 2, 21 and 22)
0537 = code of institute declaring pump (VTT)

CE = CE marking
G = Gas i.e. gas-air mixture
D = Dust i.e. dust-air mixture
E = according to EN standard
e = increased safety (EN 60079-7)
Ex = explosion protection code

T3 = temperature class i.e. highest surface temperature 200°C (incl. inner parts of motor)
T200°C = highest surface temperature in numerals
IP65 = enclosure class

Rating plate



7

Standard materials and fields of application

Technical data of AE_-/L_-/T_-pumps

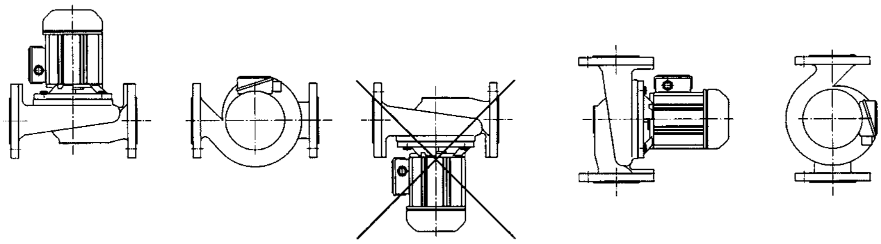
TYPE	Pressure class / liquid temperature °C	MOTOR r/min	P2n kW	Material housing / sealing flange	Material impeller	Pump shaft materials	Shaft seal	Housing O-ring material
AE-20/2EXE	PN10 / -15...+100	3000	0,61	grey cast iron ENG-GJL-200	plastic Noryl GFN2	AISI329 SS2324	12mm, carbon/SiC Viton	123 x 2,5 NBR
AE-25/2EXE, AE-26/2EXE	PN10 / -15...+100	3000	0,61	grey cast iron ENG-GJL-200	plastic Noryl GFN2	AISI329 SS2324	12mm, carbon/SiC Viton	123 x 2,5 NBR
AEP-25/2EXE, AEP-26/2EXE	PN10 / -15...+100	3000	0,61	bronze CuSn10Zn2	Noryl GFN2 or CuSn10Zn2	AISI329 SS2324	12mm, carbon/ SiC Viton	123 x 2,5 NBR
L_-50A/4EXE	PN10 / -15...+100	1500	0,28 or 0,35	grey cast iron ENG-GJL-200	grey cast iron ENG-GJL-200	AISI329 SS2324	12mm, carbon/ SiC EPDM	150 x 3 NBR
LH-50A/4EXE	PN16 / -15...+100	1500	0,28 or 0,35	nodular graphite cast ENG-GJS-400	grey cast iron ENG-GJL-200	AISI329 SS2324	12mm, carbon/ SiC EPDM	150 x 3 NBR
LP-50A/4EXE	PN10 / -15...+100	1500	0,28 or 0,35	bronze CuSn10Zn2	bronze CuSn10Zn2	AISI329 SS2324	12mm, carbon/ SiC EPDM	150 x 3 NBR
L_-50C/2EXE	PN10 / -15...+100	3000	1,9 or 2,0	grey cast iron ENG-GJL-200	grey cast iron ENG-GJL-200	AISI329 SS2324	18mm, carbon/ SiC EPDM	150 x 3 NBR
LH-50C/2EXE	PN16 / -15...+100	3000	1,9 or 2,0	nodular graphite cast ENG-GJS-400	grey cast iron ENG-GJL-200	AISI329 SS2324	18mm, carbon/ SiC EPDM	150 x 3 NBR
LP-50C/2EXE	PN10 / -15...+100	3000	1,9 or 2,0	bronze CuSn10Zn2	bronze CuSn10Zn2	AISI329 SS2324	18mm, carbon/ SiC EPDM	150 x 3 NBR
T_-50A/4EXE	PN10 / -15...+100	1500	0,28 or 0,35	grey cast iron ENG-GJL-200	grey cast iron ENG-GJL-200	AISI329 SS2324	12mm, carbon/ SiC EPDM	150 x 3 NBR
T_-50C/2EXE	PN10 / -15...+100	3000	1,9 or 2,0	grey cast iron ENG-GJL-200	grey cast iron ENG-GJL-200	AISI329 SS2324	18mm, carbon/ SiC EPDM	150 x 3 NBR

Technical data of AE_/L_/T_ -pumps with explosion-proof motors

PUMP	kg	MOTOR					D-end bearing	N-end bearing
AE-20/2EXE	15	OKN-841 EXE N12					6204 DDU	6202 DDU
AE-25/2EXE	15	II 2 GD EEx e II T3 IP65 T200°C					ENS crease	ENS crease
AE-26/2EXE	15	50 Hz	3000r/min	380/220 V	1,65/2,85 A	0,61 kW		
AEP-25/2EXE	15	50 Hz	3000r/min	400/230 V	1,65/2,85 A	0,61 kW		
AEP-26/2EXE	15	50 Hz	3000r/min	415/240 V	1,50/2,60 A	0,61 kW		
		60 Hz	3600r/min	440 V	1,55 A	0,67 kW		
		60 Hz	3600r/min	460 V	1,55 A	0,67 kW		
		60 Hz	3600r/min	480 V	1,42 A	0,67 kW		
L-50A/4EXE	30	OKN-862 EXE F15					6204 DDU	6202 DDU
LH-50A/4EXE	30	II 2 GD EEx e II T3 IP65 T200°C					ENS crease	ENS crease
LP-50A/4EXE	31	50 Hz	1500r/min	380/220 V	1,14/1,97 A	0,35 kW		
T-50A/4EXE	58	50 Hz	1500r/min	400/230 V	1,15/2,00 A	0,35 kW		
		50 Hz	1500r/min	415/240 V	1,21/2,10 A	0,35 kW		
L-50A/4EXE	30	OKN-862 EXE F15					6204 DDU	6202 DDU
LH-50A/4EXE	30	II 2 GD EEx e II T4 IP65 T135°C					ENS crease	ENS crease
LP-50A/4EXE	31	50 Hz	1500r/min	380/220 V	1,08/1,90 A	0,28 kW		
T-50A/4EXE	58	50 Hz	1500r/min	400/230 V	1,08/1,90 A	0,28 kW		
L-50C/2EXE	43	OKN-101 D1 EXE F16					6305 DDU	6205 DDU
LH-50C/2EXE	43	II 2 GD EEx e II T3 IP65 T200°C					ENS crease	ENS crease
LP-50C/2EXE	45	50 Hz	3000r/min	380/220 V	3,85/6,65 A	1,9 kW		
		50 Hz	3000r/min	400/230 V	3,85/6,65 A	2,0 kW		
T-50C/2EXE	78	50 Hz	3000r/min	415/240 V	3,85/6,65 A	2,0 kW		

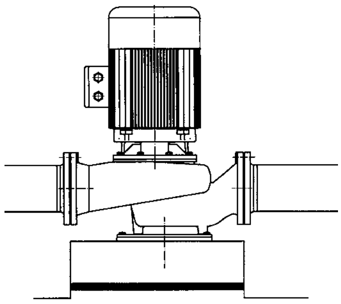
Installation and commissioning

Please ensure the following when installing a pump:
- allow enough room for service and inspection
- possibility to use lifting and transfer devices if required
- shut-off valves on both sides of the pump



Small pumps (less than 15 kW) can be installed in the piping without support.

Large pumps are fastened by their foot onto a freely moving concrete plinth floated on e.g. a 20-mm thick rubber or cork mat The weight of the concrete plinth must be about 1.5 times the weight of the pump.

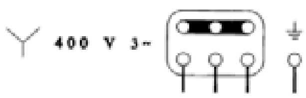


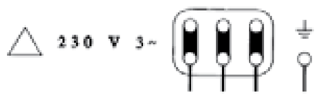
The position of the motor unit and the location of the electrical connection box can be changed by detaching the motor unit from the pump housing and then rotating it to the desired position (does not apply to the LH series).

Electrical connections need to be carried out by a qualified electrician and approved by local authorities.

Check that the motor connections correspond to the local supply voltage.

Standard/factory connections:





NOTE! The motor must always be protected by an overload protection switch which is set at its maximum to a nominal current equivalent to the connection in question. The motors of the twin pump must be connected individually to different supply cables, main switches and fuses/MCB's

The rotational direction of the pump must be checked when starting-up and always after a new connection. The correct direction of rotation is marked with an arrow in the pump housing.

Before start-up, the system must be filled with liquid and vented. Free rotation of the pump can be ensured by rotating the pump by hand e.g. from the motor fan.

NOTE! The pump should not be started or used if it has not been filled with liquid and vented.

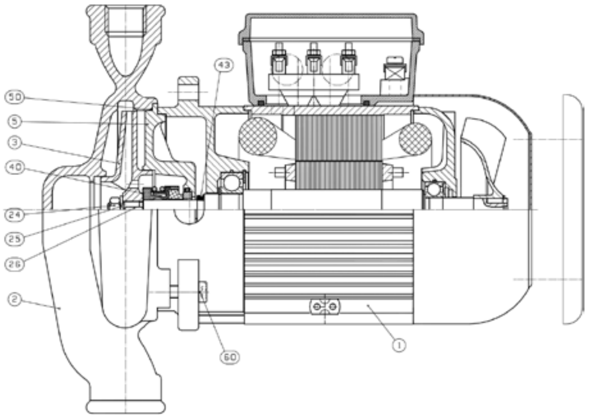
After start-up, please check that there are no extra noises coming from the pump and that no leakages appear.

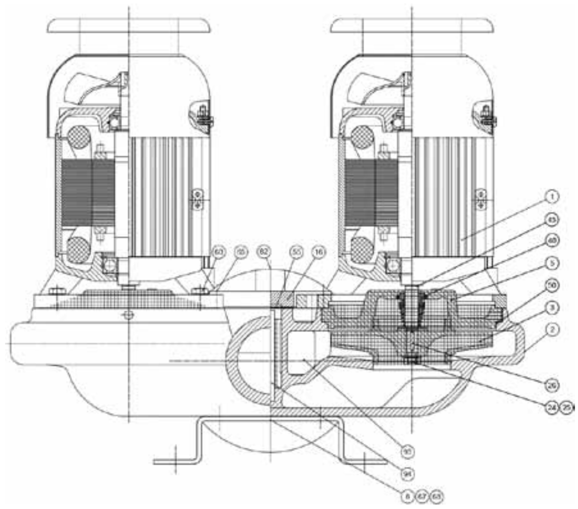
NOTE! The pump cannot be used with a frequency converter.

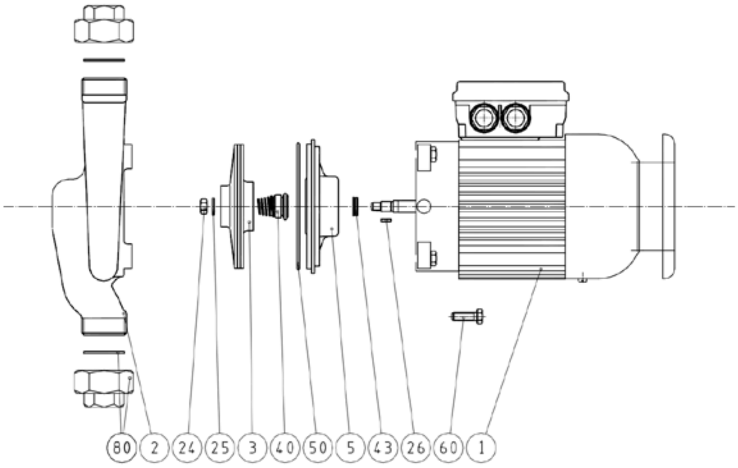
Run both units of the twin pump alternately. A suitable alternating period is about two weeks.

Do not prevent the motor from accessing cooling air. Keep the surfaces of the pump and the motor clean in order to guarantee cooling. Regularly remove dust which gathers on the surfaces.

AE_EXE pump parts

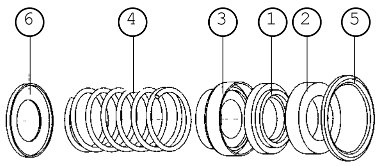


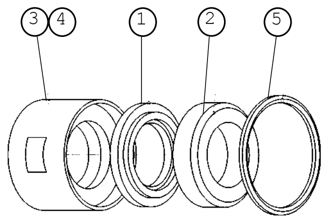


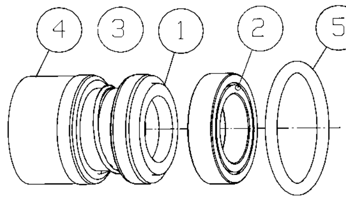


1	Electric motor
2	Pump housing
3	Impeller
5	Sealing flange
24	Nut
25	Washer
26	Key
40	Shaft seal
43	V-ring
50	Housing O-ring
60	Screw
80	Pipe union (AE_ 26/2EXE)

Shaft seal, construction alternatives:







1	Rotating ring
2	Stationary ring
3	Body/bellows
4	Spring
5	O-ring
6	Backing plate (not always present)

Pump service

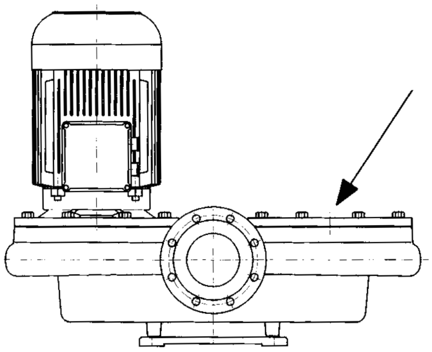
Motor unit The pump motor unit is a new stand-by operation unit which includes motor, sealing flange, impeller and seals. If a motor malfunction or a seal leak occurs, replacing the motor unit is simple and quick. It does not require long periods of downtime or any disconnecting of the pipework , because there is no need to detach the pump housing.

Shaft seal If a seal leak occurs in a new pump (e.g. when commissioning the pump), it is only possible to replace the shaft seal with a new seal. the shaft seal is a wearing part and should be replaced at approx. 5 year intervals.

Motor bearings

The motor bearings are prelubricated and they must be replaced at 5 year intervals at the very least (continuous duty).
If a motor malfunction occurs, we recommend replacing the whole motor unit (motor unit).

When ordering spare parts please inform us: pump type, production number, duty point, impeller size, type of electric motor and power.

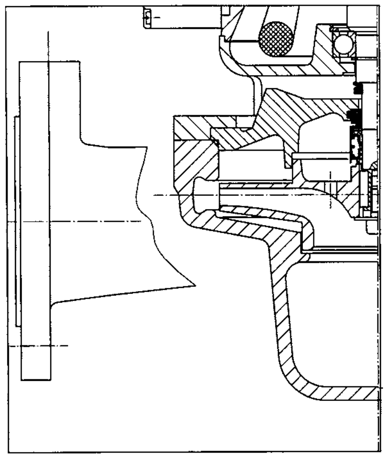


Service cover

In twin pumps, it is possible to install a separately orderable service cover in place of a detached unit. In this way, the standby unit can run as normal.

Seal construction alternatives

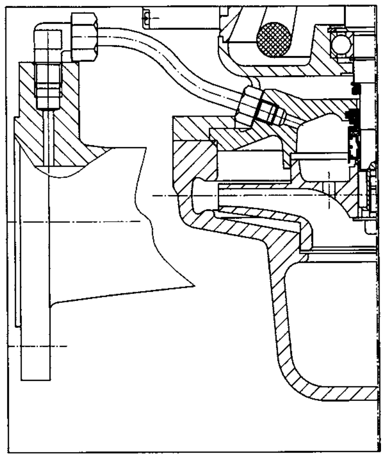
Standard construction



- Single mechanical seal
- Max. operating temperature +100°C

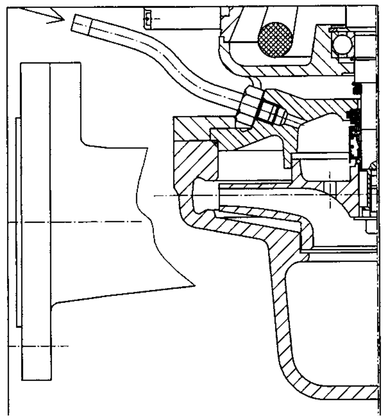
The standard shaft seal is also applicable for water-glycol mixtures and most other cold solutions. The recommended glycol grade is propylene glycol and the mixture ratio can be up to 50%. Most often, a mixture ratio of 30–40% is adequate.

Internal flushing



- Single mechanical seal
- Circulation from the discharge side of the pump to the seal chamber which flushes the seal
- Operating temperature LH-50AEXE, -50CEXE max. +100°C
- Available for pumps DN50, also with other materials, in which case there is an additional marking ‘H’ e.g. LS-50/4HEXE.

External flushing



- Single mechanical seal
- Plugged pipe to the seal chamber making it possible to flush the seal with external pressure if required
- Available for DN 50 ATEX pumps
- Crystallising, accumulative liquids

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KOLMEKS
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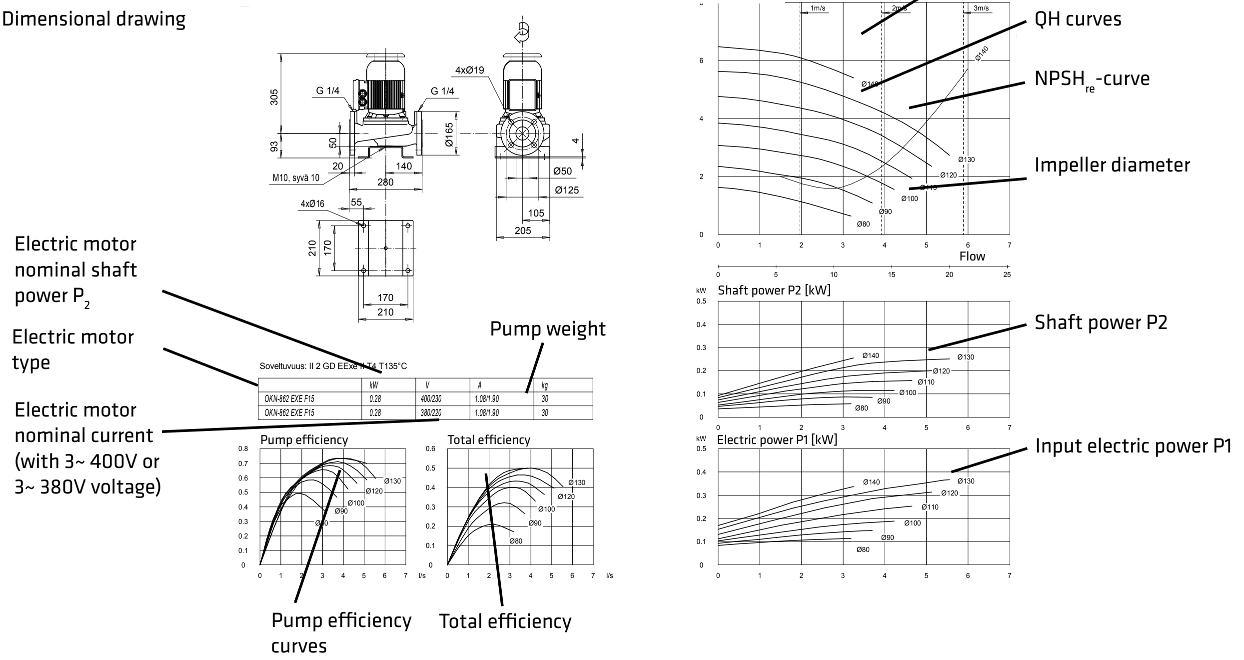
Reading curves and selecting a pump

L_-50A/4EXE DN50 1500r/min



Pump selection 1. First, the correct size of the pump is estimated so that the required flow [l/s] is in the best efficiency point of the pump. 2. Then, the impeller is selected from the QH curve according to the following: at the point of flow [l/s], a vertical line is drawn and, equivalently at the point of head [m], a horizontal line is drawn. The impeller diameter is estimated at the point where these lines intersect. 3. If the intersection falls between two impeller sizes, it is possible to select a so-called fractional-size impeller. In such cases, the impeller diameter is determined from the middle of these two impellers. 4. At the same time, the nominal shaft power2n of the motor is read based on the motor power range into which the QH curve falls. 5.Next, based on the nominal shaft power of the motor, the nominal current value of the electric motor is read. According to this reading, an electrician will adjust the motor overload protection. 6. From the same table, it is also possible to read the pump weight. It is possible to determine the nominal shaft power P2n of the electric motor according to the shaft power curve (P2) of the pump. 7. It is possible to read the input electric power [kW] of the pump from the input power curve (P1) of the device. Each flow [l/s] in question is selected from the point of the impeller diameter, from which it is possible to calculate the actual energy consumption of the pump. Then, the value in question is multiplied by annual energy price [€/kWh] and operating time [h]: e.g. P1 [kW] x X [€/kWh] x 8,760 h.

Performance curves are valid to 50 Hz frequency and +20°C water.

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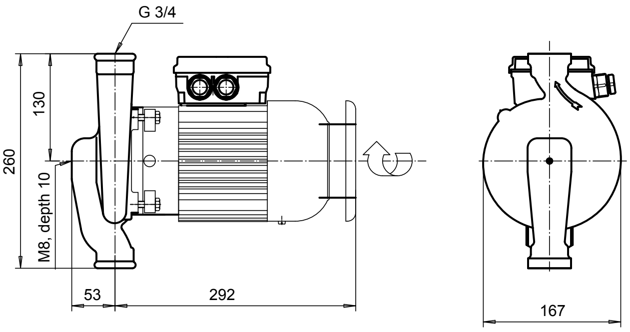
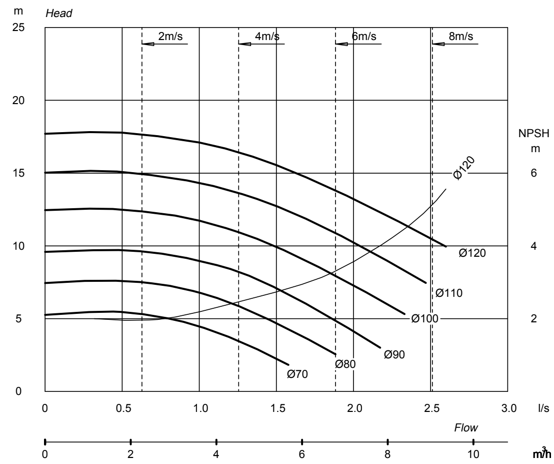
Please contact Kolmeks for additional information on the following issues!

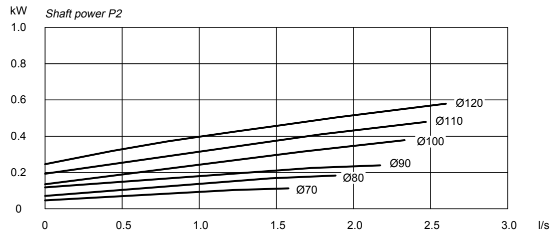
1) When pumping liquids which differ from water in their viscosity and/or density, the effect of viscosity and density needs to be considered when selecting a pump.

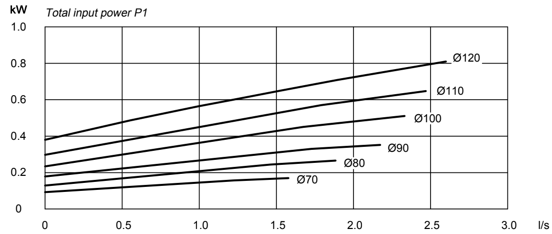
2) The density of the liquid is directly proportional to the power requirement. The sufficiency of motor power must be checked when pumping liquid denser than water.

AE-20/2EXE G3/4 3000r/min 50Hz



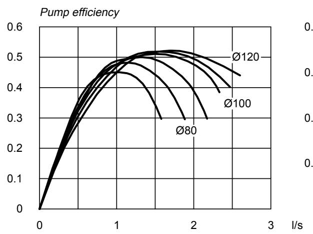


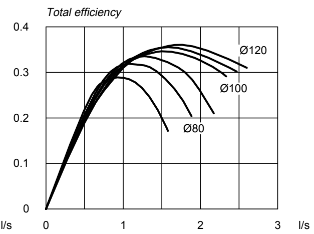




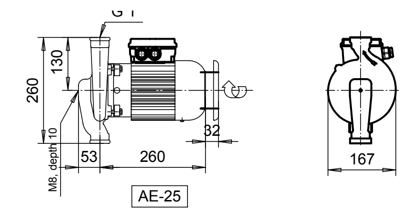
Application: II 2 GD EExe II T3 T200°C

	kW	V	A	kg
OKN-841 EXE N12	0.61	400/230	1.65/2.85	15
OKN-841 EXE N12	0.61	380/220	1.65/2.85	15
OKN-841 EXE N12	0.61	415/240	1.50/2.60	15

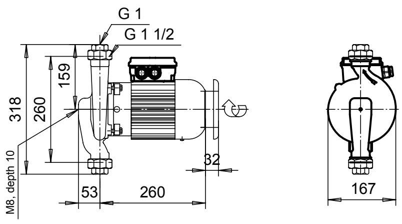




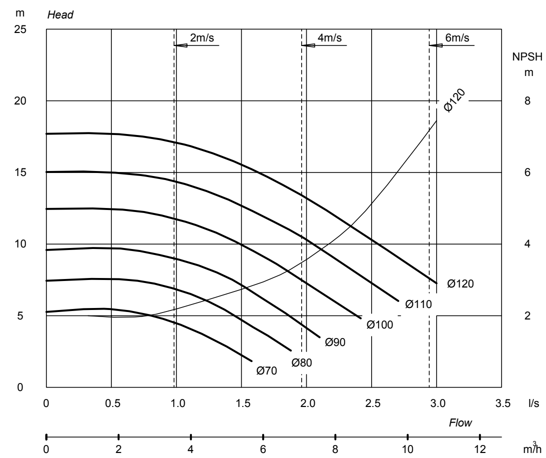
AE$^{P}_{-}$-25/2, -26/2EXE G1 3000r/min 50Hz

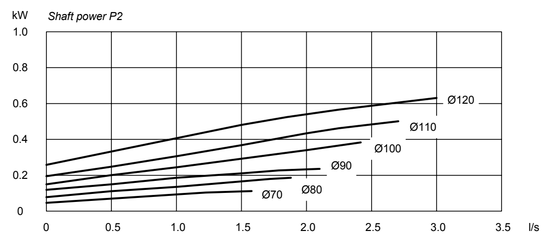


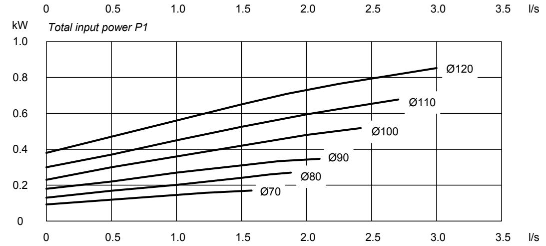
AE-25



AE-26

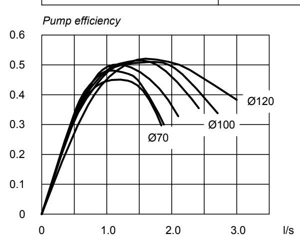


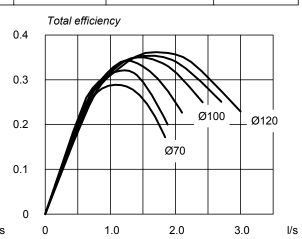




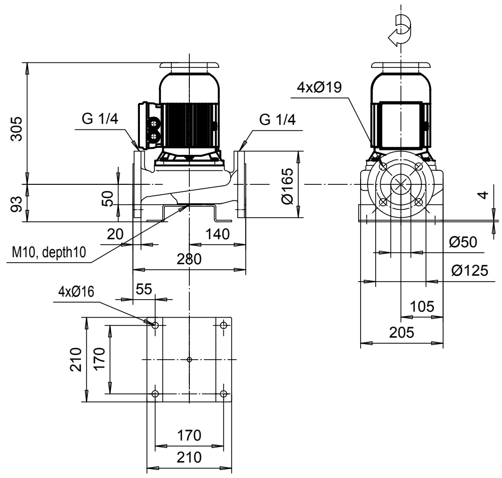
Application: II 2 GD EExe II T3 T200°C

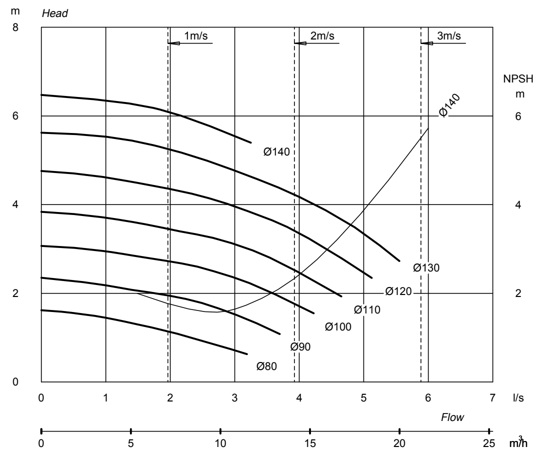
	kW	V	A	kg
OKN-841 EXE N12	0.61	400/230	1.65/2.85	15
OKN-841 EXE N12	0.61	380/220	1.65/2.85	15
OKN-841 EXE N12	0.61	415/240	1.50/2.60	15

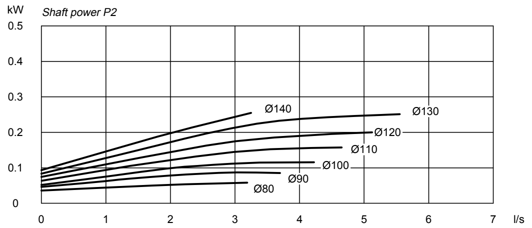




L$_{H}^{P}$-50A/4EXE T4 DN50 1500r/min 50Hz

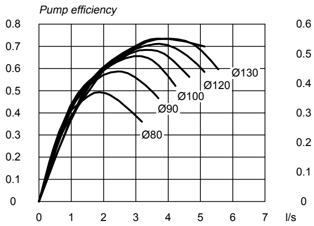


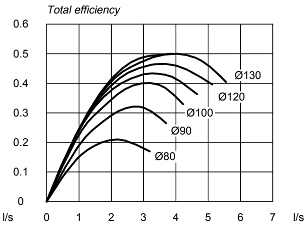


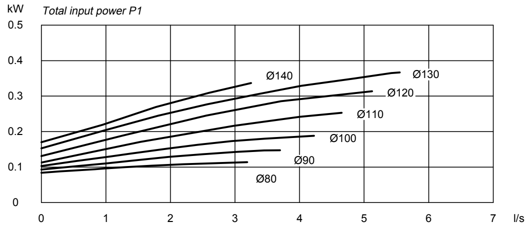


Application: II 2 GD EExe II T4 T135°C

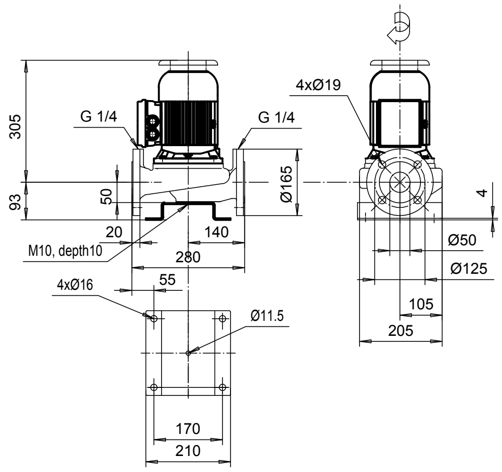
	kW	V	A	kg
OKN-862 EXE F15	0.28	400/230	1.08/1.90	30
OKN-862 EXE F15	0.28	380/220	1.08/1.90	30

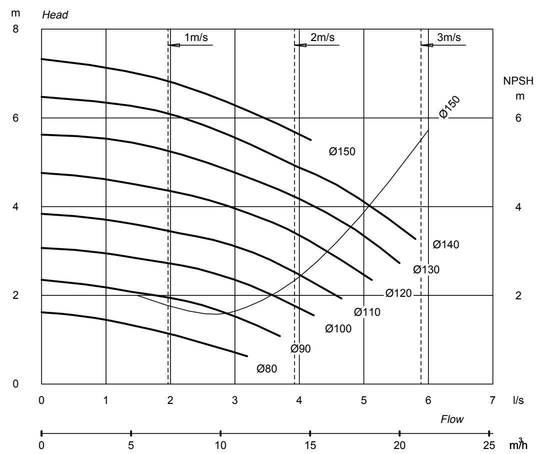


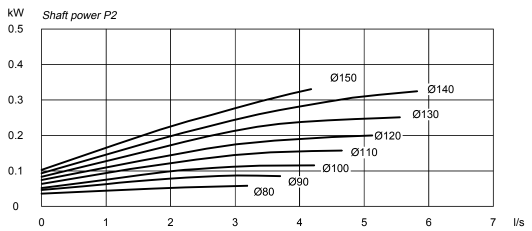




L$_{H}^{P}$-50A/4EXE T3 DN50 1500r/min 50Hz

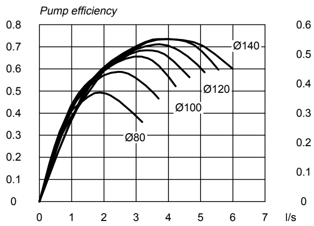


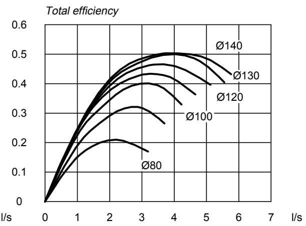


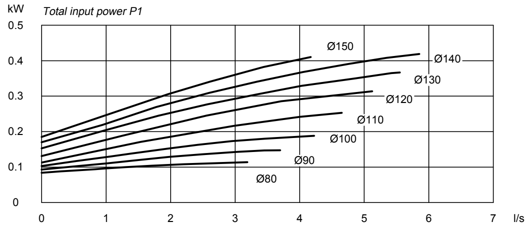


Application: II 2 GD EExe II T3 T200°C

	kW	V	A	kg
OKN-862 EXE F15	0.35	400/230	1.15/2.00	30
OKN-862 EXE F15	0.35	380/220	1.14/1.97	30
OKN-862 EXE F15	0.35	415/240	1.21/2.10	30







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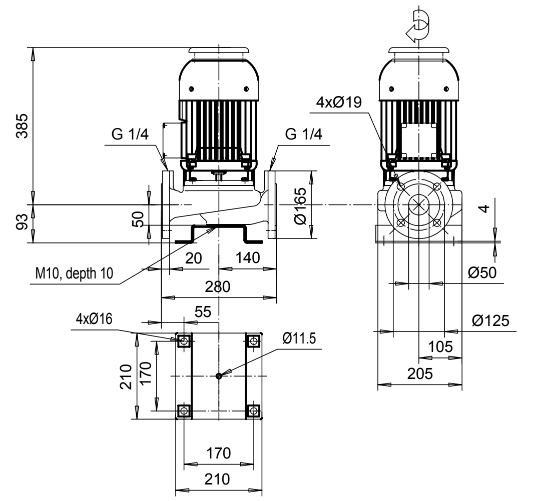
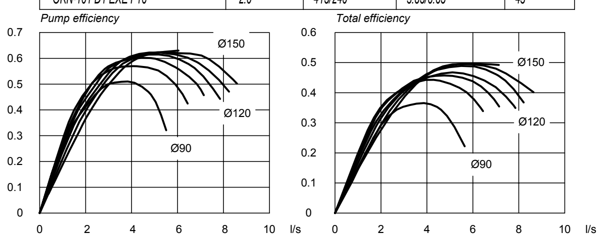
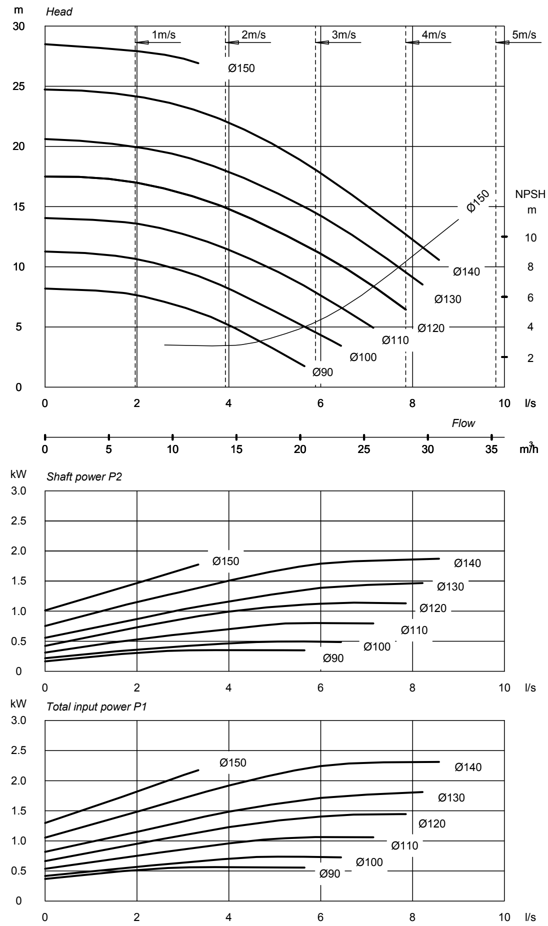
L P/H -50C/2EXE T3 DN 3000r/min 50Hz



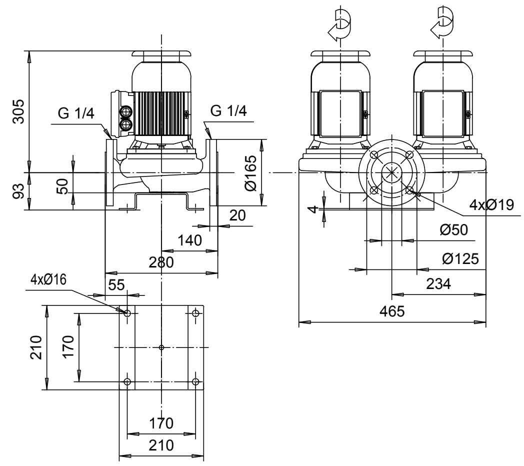
Application: II 2 GD EExe II T3 T200°C

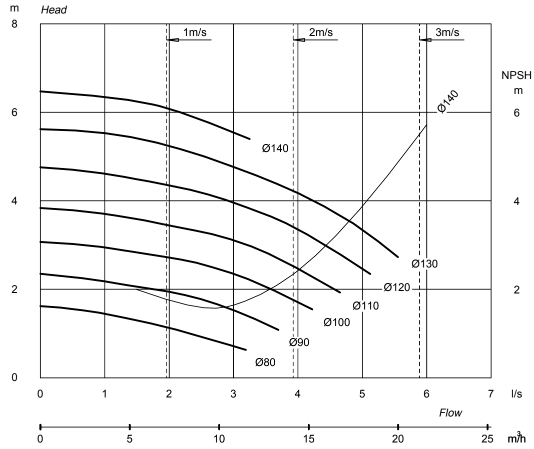
	kW	V	A	kg
OKN-101 D1 EXE F16	2.0	400/230	3.85/6.65	43
OKN-101 D1 EXE F16	1.9	380/220	3.85/6.65	43
OKN-101 D1 EXE F16	2.0	415/240	3.85/6.65	43

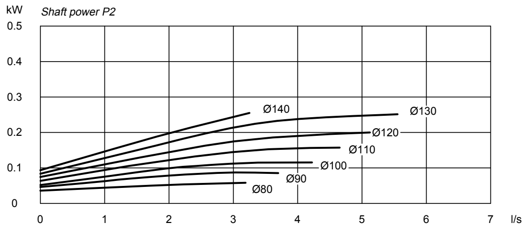




T_-50A/4EXE T4 DN50 1500r/min 50Hz

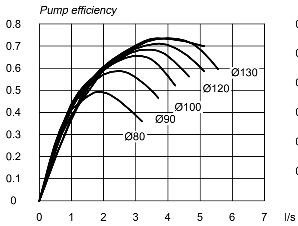


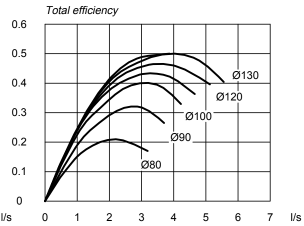


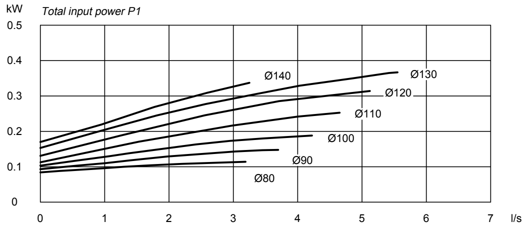


Application: II 2 GD EExe II T4 T135°C

	kW	V	A	kg
OKN-862 EXE F15	0.28	400/230	1.08/1.90	58
OKN-862 EXE F15	0.28	380/220	1.08/1.90	58

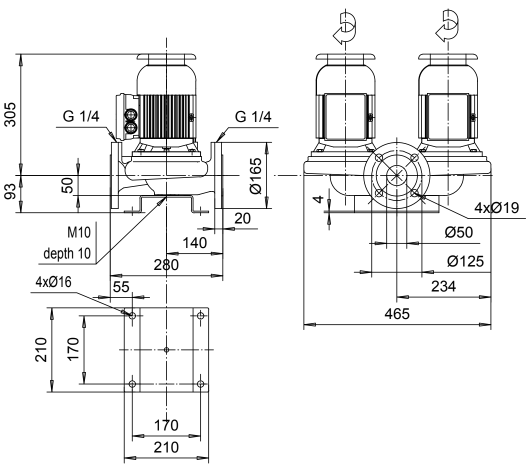


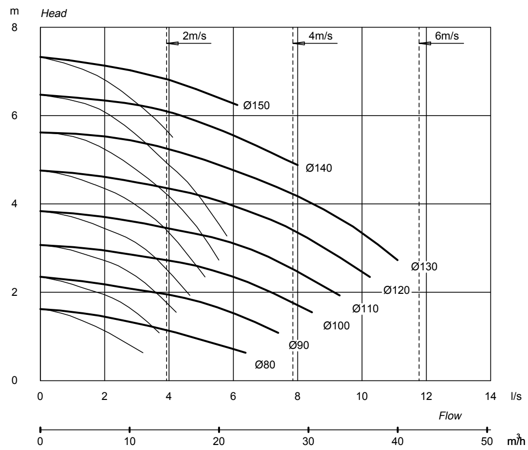


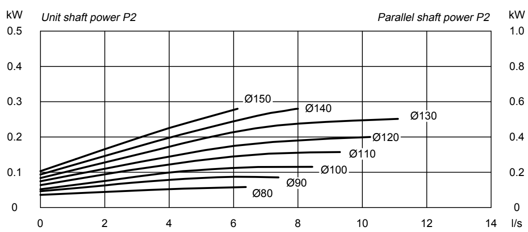


NOTE! Both units are running in parallel

T_-50A/4EXE T4 DN50 1500r/min 50Hz

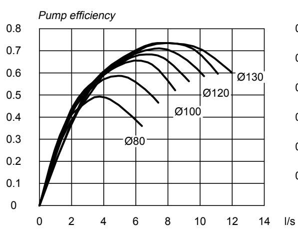


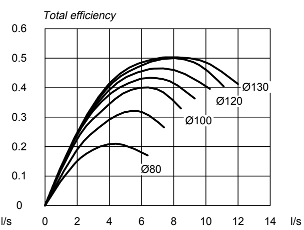


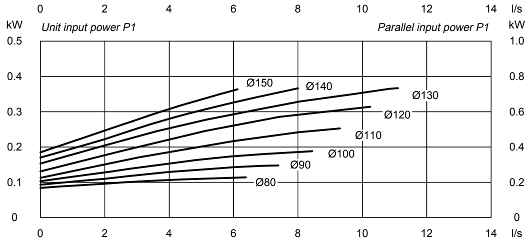


Application: II 2 GD EExe II T4 T135°C

	kW	V	A	kg
OKN-862 EXE F15	0.28	400/230	1.08/1.90	58
OKN-862 EXE F15	0.28	380/220	1.08/1.90	58







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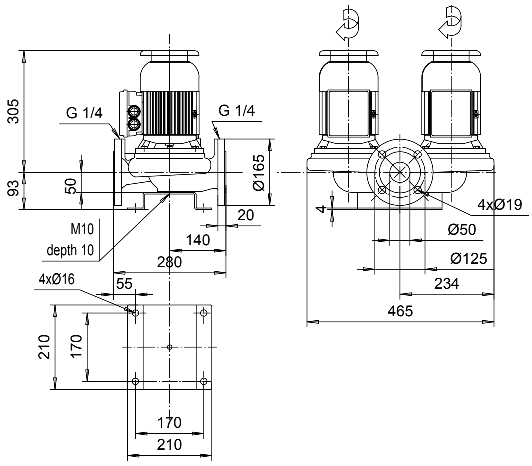
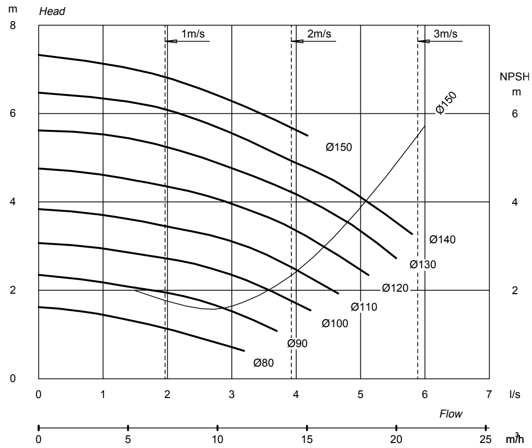
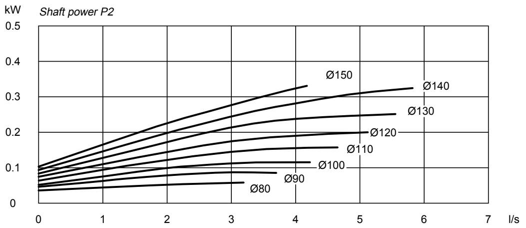
T_-50A/4EXE T3 DN50 1500r/min 50Hz

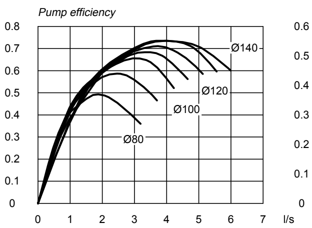


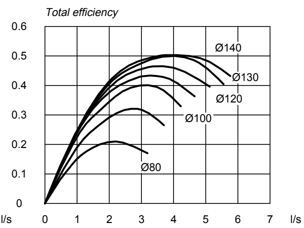


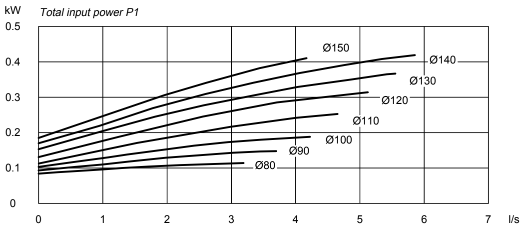


Application: II 2 GD EExe II T3 T200°C

	kW	V	A	kg
OKN-862 EXE F15	0.35	400/230	1.15/2.00	58
OKN-862 EXE F15	0.35	380/220	1.14/1.97	58
OKN-862 EXE F15	0.35	415/240	1.21/2.10	58

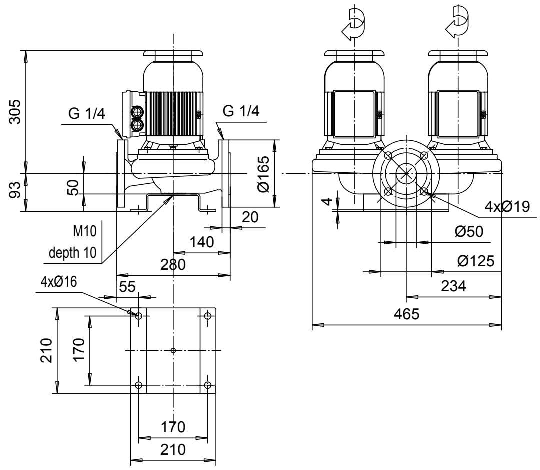


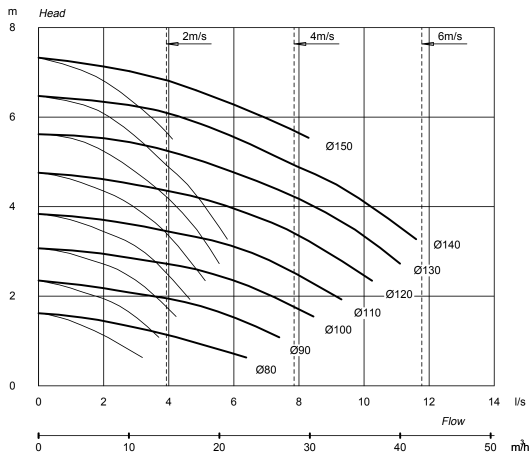


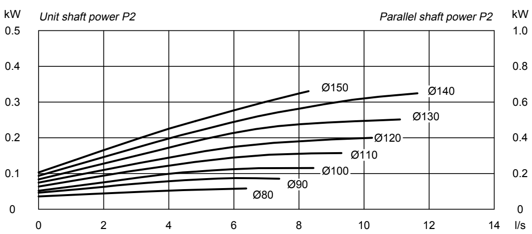


NOTE! Both units are running in parallel

T_-50A/4EXE T3 DN50 1500r/min 50Hz

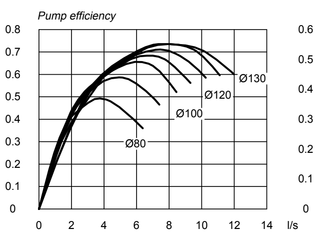


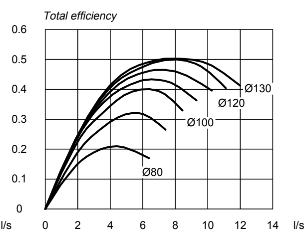


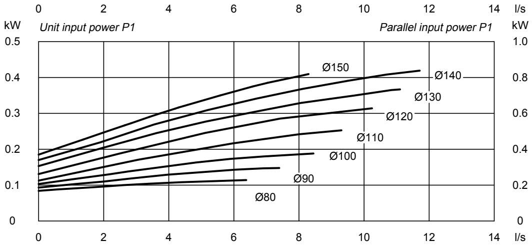


Application: II 2 GD EExe II T3 T200°C

	kW	V	A	kg
OKN-862 EXE F15	0.35	400/230	1.15/2.00	58
OKN-862 EXE F15	0.35	380/220	1.14/1.97	58
OKN-862 EXE F15	0.35	415/240	1.21/2.10	58







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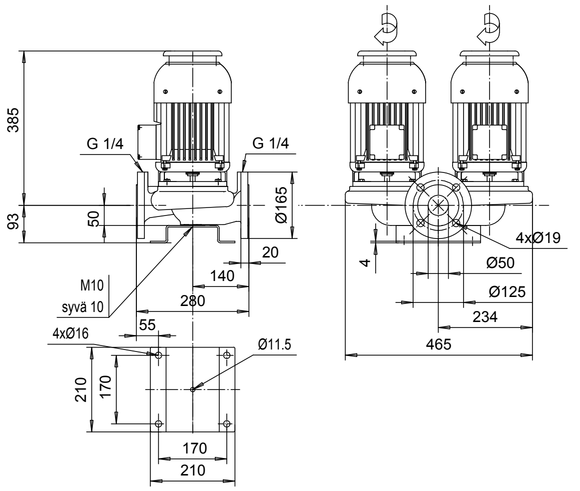
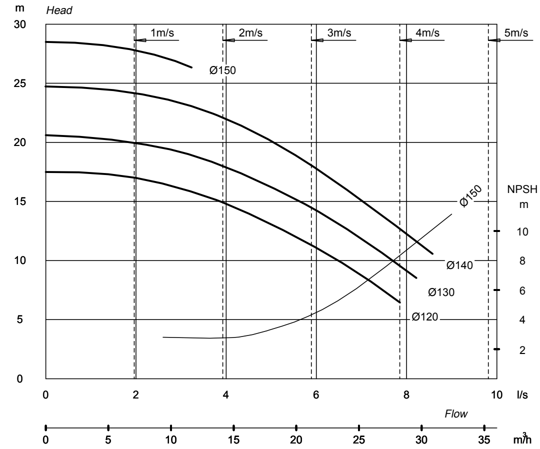
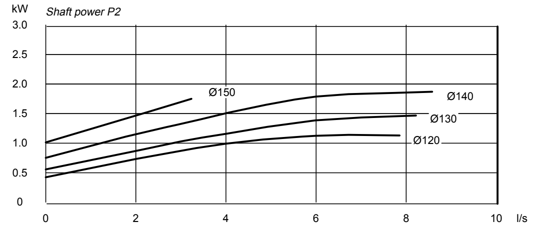
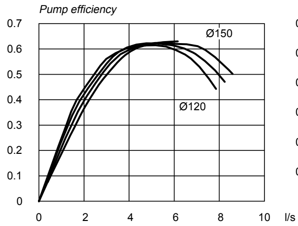
T_-50C/2EXE T3 DN50 3000r/min 50Hz

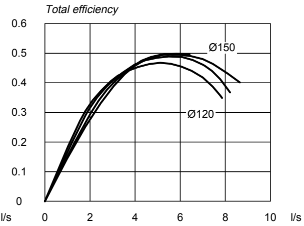


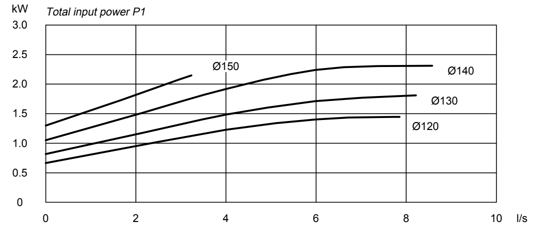




	kW	V	A	kg
OKN-101 D1 EXE F16	2.0	400/230	3.85/6.65	78
OKN-101 D1 EXE F16	1.9	380/220	3.85/6.65	78
OKN-101 D1 EXE F16	2.0	415/240	3.85/6.65	78

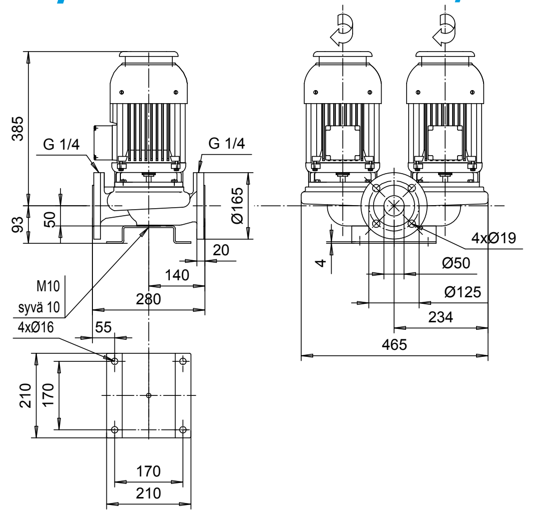


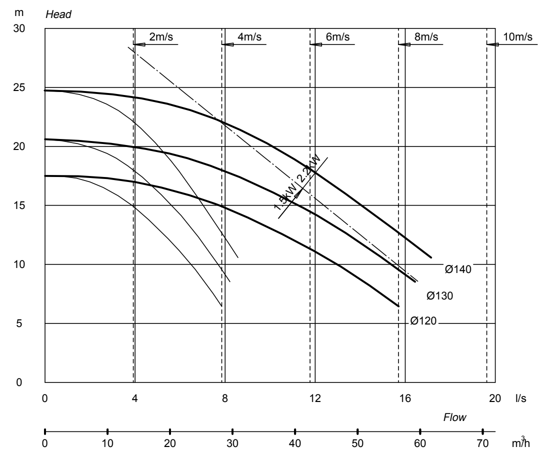


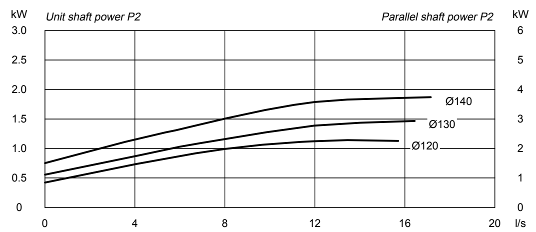


NOTE! Both units are running in parallel

T_-50C/2EXE T3 DN50 3000r/min 50Hz

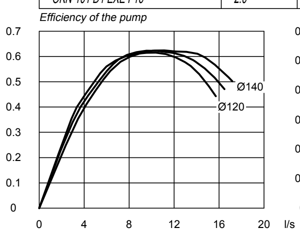


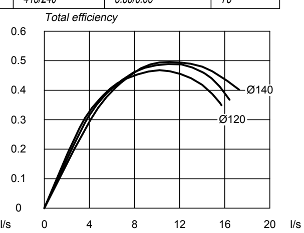


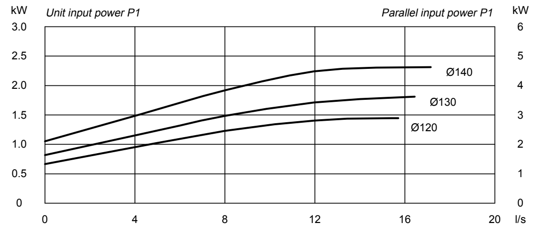


Application: II 2 GD EExe II T3 T200°C

	kW	V	A	kg
OKN-101 D1 EXE F16	2.0	400/230	3.85/6.65	78
OKN-101 D1 EXE F16	1.9	380/220	3.85/6.65	78
OKN-101 D1 EXE F16	2.0	415/240	3.85/6.65	78







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PUMP ACCESSORIES, SPECIAL SURFACE TREATMENTS AND DOCUMENTATION

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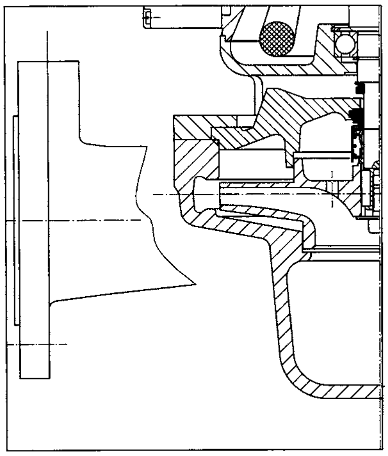
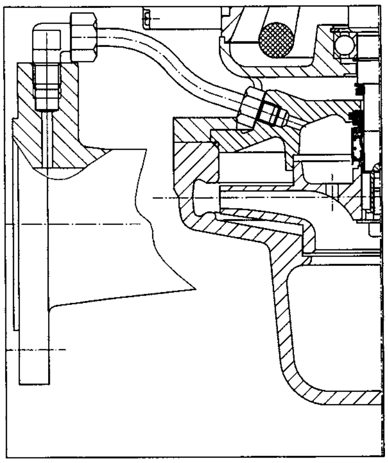
Seal constructions and materials

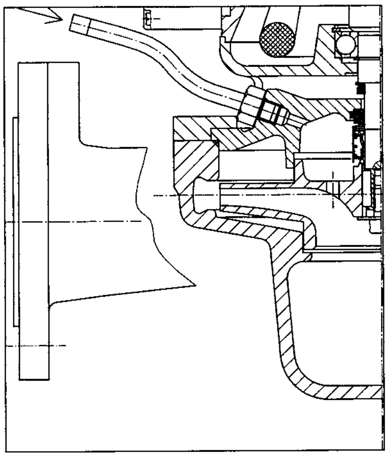
1. Single mechanical seals



Standard construction



Internal flushing



External flushing

Standard materials for single mechanical seal (Series No 7)

Rotating ring	Carbon	
Stationary ring	Silicon carbide or ceramic (depending on seal size / pump type)	
Elastomers	EPDM or Viton (depending on seal size / pump type)	
Metal parts	Stainless steel	AISI 304 (10–12mm seals)
	Stainless steel	AISI 316 (over 12mm seals)

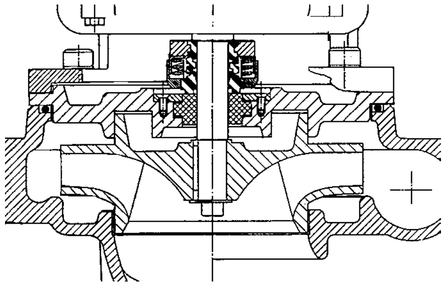
Material suitability for different liquids

Rotating ring/Stationary ring	**Liquid**	**Liquid temperature range**
Carbon/Ceramic	Water	max. +120°C, standard construction
Carbon/Silicon carbide	Water	0 ... +120°C, standard construction
	Water	0 ... +150°C, with internal flushing
	Freezium (refrigeration system)	-15 ... +40°C, standard construction
	Glycol (refrigeration system)	-15 ... +40°C, standard construction
Rotating ring/Stationary ring	**Liquid to be pumped**	**Temperature range of liquid**
Silicon carbide/Silicon carbide	Erosive liquids	-15 ... +120°C, standard construction
		-15 ... +150°C, internal flushing
	Calcium chloride (saline solution)	-15 ... +30°C, standard construction
Antimony carbon/Silicon carbide	Demineralised water	0 ... +120°C, standard construction

Rubber materials: suitability for different liquids

Rubber	EPDM	- mostly used - -40°C-+150°C (+180°C double mech. seal) - water, freezium, glycol, calciumchloride - note! not oil resistant!
	NITRIL	- -40°C-+90°C - oil resistant
	VITON	-20°C-+200°C - note. water max. +100°C - heat transfer oils, dissolvents, special cases - used as standard in pumps with thread connection

2. Single external mechanical seal



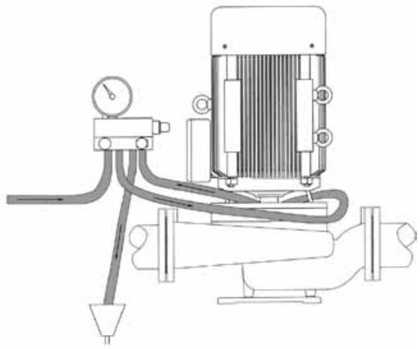
- Single mechanical Teflon seal which is installed outside the pump
- Available DN65-300 acid-proof pumps
- Used for acids and other aggressive liquids (e.g. sulphuric acid 98%)
- Note! The maximum operating pressure is 10 bar (if the maximum operating pressure is exceeded, the seal will open)
- Liquid temperature -15 ... +120°C
- Marking 'T' e.g. ALS-1065/4T

Materials

Rotating ring	Teflon PTFE
Stationary ring	Ceramic

All parts which come into contact with liquid are made of Teflon.

3. Double mechanical seal



Two opposing seals with outside sealing liquid brought from outside (circulation), the pressure of which can be lower or higher than that of the liquid being pumped. If it is desired that no seal water enters the process, the pressure of the seal water is then set lower than that of the liquid being pumped. If the seal water is allowed to enter the process, the pressure of seal water can be higher than that of the liquid being pumped.

- Available for DN 65-300 pumps
- Operating temperature with water max. +180°C (other liquids defined separately)
- Requires a separate seal water monitoring unit, see above (Kolmeks can deliver)
- Marking 'KT' e.g. ALS-1154/4KT
- Hot, crystallising and accumulative liquids
- Momentary dry running of the pump is allowed

Standard materials

Seal size	Liquid side	Atmosphere side	Metal parts
18mm	SiC / SiC / EPDM	Carbon / SiC / EPDM	AISI 316 / 329
25–65mm	SiC / SiC / PTFE	Carbon / SiC / EPDM	AISI 316 / 329

Special materials

18mm	SiC / SiC / VITON	Carbon / SiC / VITON	AISI 316 / 329
32–65mm	SiC / SiC / PTFE	Carbon / SiC / EPDM	254 SMO

Other sizes and materials available by request.

Available colours and special surface treatments

Standard surface treatment:

In Finland, the pumps are delivered in red, colour RAL3020. The painting is carried out according to SFS-EN ISO 12944-5 which includes both primer and finishing. Marking AY100/1-FeSa2½.

The following Kolmeks colours are also available at no extra cost: Grey RAL7030, Black RAL9017 and Blue RAL5010. The painting is carried out according to SFS-EN ISO 12944-5 which includes both primer and finishing.
Marking AY100/1-FeSa2½.

Special surface treatments and special colours:

1. Epoxy paint
Epoxy paint job with required paint thickness, e.g. 160, 240, 280 or 300μm. The painting carried out according to Standard SFS5873 which includes one or more coats of primer and one coat of finishing. Marking EP 240/3FeSt2 (primer 2x80μm + finishing 1x80μm).

Epoxy painting can be carried out on both on the inside and outside if the pump housing. The motor can also be painted from the outside.

2. Customized colour
Standard painting can also be carried out in custom colours. In such cases the painting is carried out according to Standard SFS-EN ISO 12944-5 which includes both primer and finishing. Marking AY100/1-FeSa2½.

Painting system markings:

Painting system markings are described in Standard SFS-EN ISO 12944-5.
Paint type, e.g. AY = Acrylic paint, EP = Epoxy paints, EPZn (R) = Zinc epoxy paint etc.
For example __EP 240/3FeSa 2½ 02
ABBREVIATIONS:
__ = Paint manufacturer code
EP = Epoxy paint
240/3 = Nominal coat thickness / number of paint coats
Fe = Foundation (steel or cast iron surface)
Sa 2½ = Preparation (here spray cleaning)
02 = Quality of mechanical treatment

Accessories, special voltages and non-standard enclosure classes of electric motor

PTC thermistors

Installed 3 pieces/motor (one for each phase). Standard in 75–160kW motors. Operates like a switch, closed below the limiting temperature and open above the limiting temperature.

Can only be connected to a protection system, relay or frequency converter input designed for a PTC thermistor. May not be connected to a 230 V control circuit because its voltage tolerance is only a couple of volts. Quick and accurate indication of limiting temperature, resets once the temperature is slightly below the limiting temperature. Colours indicate the limiting temperature (stock temperatures +130 ... +140°C.) Several temperature alternatives (e.g. 110, 120, 140, 155°C etc.) can be ordered by request. A demanding target requires thermistors for two temperatures in the same motor e.g. 3 pieces for 140°C alarm and 3 pieces for 150°C stoppage.

Thermal protector (thermal contactor)

Coil's internal thermal protector bi-metal switch +140°C. Can be installed 1 piece/motor or 3 pieces/motor (one for each phase).

A small mechanical switch is opened by temperature. Most commonly used for small motors, 1 piece/motor, and for 3 pieces/motor in large motors. The switches are wired to the terminal box where series connections are connected. When a connection malfunctions, the faulty one can be bypassed and the protection is still sufficient. Can also be connected directly to a 230 V control circuit. Can be connected to most PTC thermistor circuits. Reasonably large temperature difference in between switch on and off and therefore not usually used in place of a thermistor. Available for other temperatures by request.

PT100 (PT-1000) or KTY sensors

The pump motors can be delivered either with KTY or PT100 temperature sensors.

Motor anticondesation heater

One-phase resistor/230V. If required, the heating element can be installed on the motor windings if condensation water occurs during their operation. Heating is usually on only when the pump is stopped. Typical applications are pumps in refrigeration systems, pumps installed outdoors and other pumps which occasionally run in conditions where condensation water is formed. The operating voltage is usually 230 V, but other voltages are also available to order. Heating power is determined by motor size. In exceptional circumstances, heating power according to conditions at the site. In some cases, at about -30 °C, solution pumps might require larger power and additional heating, including when the motor is running.

Thermocouple TC

Thermocouples TC i.e. thermoelement. Usually K type. A pair of thermoelements used for temperature measurement, the voltage of which indicates the temperature or, more accurately, the temperature difference between the connection and free ends. Note! The term thermocouple (or thermoelement) must not be confused with the term thermistor and other temperature measuring sensors.

Tropical protection
Includes a rain cap and a protective oil film inside the motor

Curve plate
Quick connection plug R
EMC cable inlets (frequency converter operations)

Drain connection G3/8”
Used if the housing needs to be drained after the pumping session.

Temp Coat - pump external coating
Used in c refrigeration systems when the temperature is below 0°C. Can be applied to the external surfaces of the sealing flange and the pump housing.

Ceramic N-end bearing for frequency converter operations of over 90 kW (standard over 110 kW motors)
Vibration measurement nipples SPM
Standard voltages

1x230V, 50Hz	0,05–1,5kW	3x400/230 V, 50 Hz	0,03–3 kW	3x690/400 V, 50 Hz	4–160 kW

Special voltages
According to request by customer. Maximum 690V. Example 42V, 110V, 120V, 380V, 500V etc. Availale as 1-phase and 3-phase.

Standard enclosure classes

IP 54	0,03–3 kW	1000, 1500r/min	0,25–4 kW	3000r/min
IP55	4–160 kW	1000, 1500r/min	5,5–55 kW	3000r/min

Special enclosure classes
IP 55 also available for small pumps
IP 65
Pressure measurement connections in flanges size 1/4” (standard in inline pumps)

Belzona coating
Used when pumping particularly erosive liquids. The maximum operating temperature is +90°C. If the temperature of the liquid being pumped is higher than +60°C, a double coating is applied. Can be applied inside the pump housing and to the internal surfaces of the sealing flange.

Urethane insulation of sealing flange
Used in refrigeration systems when the temperature is below 0°C. Can only be applied to the outer surfaces of the sealing flange.

Non-standard flanges
If required, the pumps can be delivered with ANSI, NP6 and PN16 borings. PN10 flanges are standard. (DN32-150 flanges are the same PN10 and PN16.)

Pumping without a foot valve when the liquid level is below the pump

- The pump is equipped with an automatic aspirator which fills the suction pipe before the pump starts, making pumping possible without a foot valve.
- After the pumping has stopped, the suction pipe empties. As pumping starts again, the aspirator fills the suction pipe before the pump starts.
- An advantage is smaller energy consumption, because there is no suction loss caused by the foot valve. As the suction pipe empties after the pumping has stopped, there is no risk of freezing in winter. The aspirator can therefore be used in various outdoor applications. The device is commonly used in water supply plants, decking washing water pumps, bilge pumps and various industrial applications.
- The device requires compressed air to operate.
- Several sizes are available. The device size is dependent on the pumping capacity of the system. The device is delivered separately with the pump and the delivery includes all connections and pipes required for installation.

Packaging and documentation

1. Packaging

- As a standard, the pump is delivered in a reinforced cardboard box. If there are several pumps, the packages are fastened onto disposable pallets in order to avoid possible freight damages.
- By request, the pumps can be delivered in export packages or sea export packages.

2. Documentation

Documents delivered free of charge

- Installation and operating instructions are included with the pumps.
- At the order stage and if needed, one set of documentation which includes installation and operating instructions, a datasheet and a product specification is included free of charge.
- Certificate of Compliance '2.1' SFS-EN 10204
- Copies of the ISO 9001 quality certificate, an ISO 14001 environmental certificate, and a Russian TR certificate with Kolmeks stamp can be delivered free-of-charge,
- A spare part list/spare part recommendation for delivered pumps

Documents delivered at extra cost:

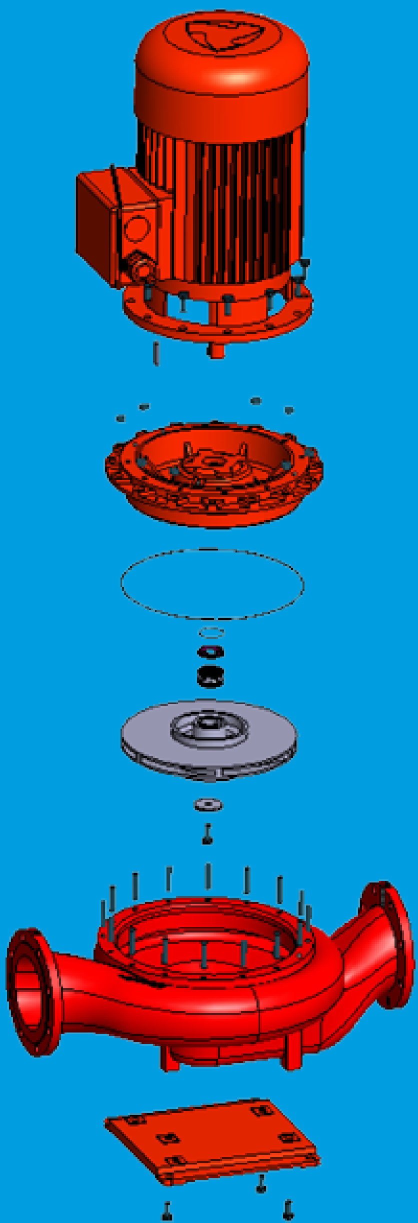
- Detailed datasheet
- Detailed assembly drawing + parts list
- Testing record, see Test runs
- Classification Society Certificate (start costs + testing costs + rating institution costs)
- Notarised Russian TR product certificate
- Copy witnessed by certifier of Russian TR product certificate
- Material Certificate '2.2' SFS-EN 10204
- Material certificate of specific casting batch. NOTE! Material certificate must be ordered in good time.
- Copies: 1 set free of charge, extra sets are charged separately.
- Inspection Certificate '3.1' SFS-EN 10204 i.e. pump-specific test run (start costs + testing costs) specific data sheet
  --> Contents of material certificate:
  Statement on conformity of the order and results of delivery-specific inspection.
  --> Certifier of material certificate:
  Representative authorised by the manufacturer independent of production department.

- Acknowledgement of receipt '3.2' SFS-EN 10204 i.e. pump-specific test run
  --> Contents of material certificate:
  Statement on conformity of the order and results of delivery-specific inspection.
  --> Certifier of material certificate
  Representative authorised by the manufacturer independent of production department and representative authorised by the purchaser or inspector as specified in regulations issued by public authorities.

Note! Documentation must be requested at the order stage, not after the delivery.

3. Test runs and pressure tests

- Test run without pressure test (start costs + cost per test)
- Pressure test (cost per test is charged)



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PUMP SERVICE

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General notes

Kolmeks pumps do not require regular service. The pump shaft seal is a mechanical seal (not used in wet motor pumps). It is a part which undergoes wear and which must be replaced if it starts to leak. Please note that a leakage of a few drops per hour can be quite normal, especially when pumping water-glycol mixtures.
The pump motor bearings are pre-lubricated and can thus withstand several years of continuous use. In case of any motor malfunction, we recommend replacing the whole motor unit.

Motor unit replacement

The pump motor unit includes: motor, sealing flange, impeller and seals.

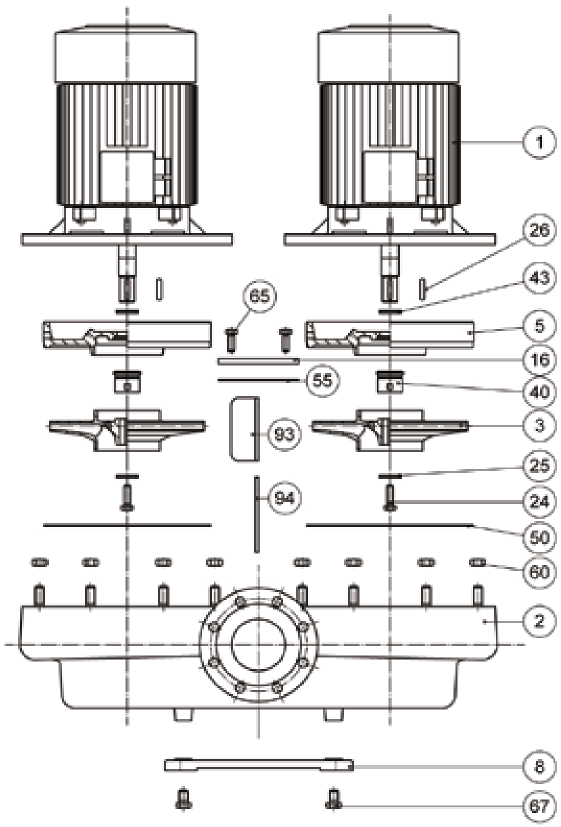
If a motor malfunction or a seal leak occurs, replacing the motor unit is simple and quick and does not require long periods of stand-by or operation downtime. There is no need to carry out procedures on the piping, because there is no need to detach the pump housing.

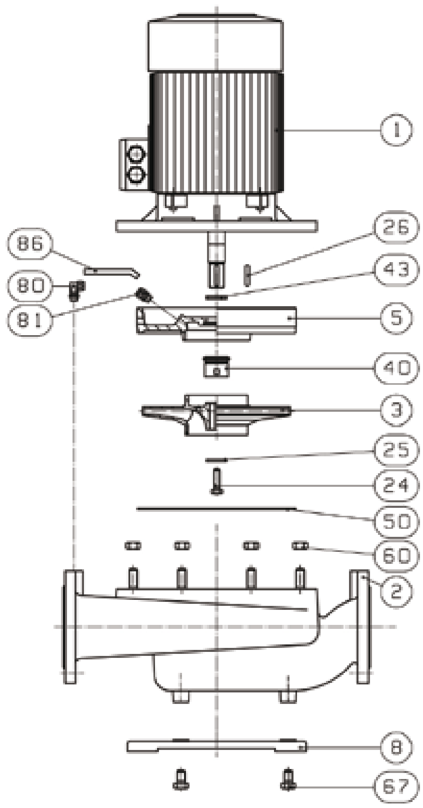
Seal kits and O-rings for SC frequency converter pumps

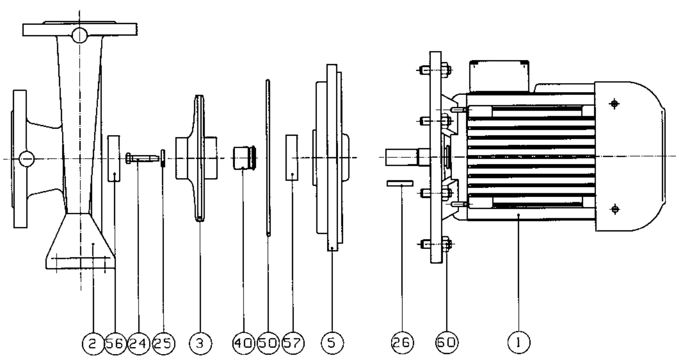
Connection G or DN	Grey cast iron EN-GJL-200 PN10	Nodular cast iron EN-GJS-400 PN16	Bronze CuSn10Zn2 PN10	Stainless steel AISI 316 PN 16	Shaft seal, PN10 Ø [mm] materials	O-ring Size [mm]	O-ring Material	Motor [kW]
G 3/4	AE-20/4 SC_	no	no	no	12, carbon/ SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-20/2 SC_	no	no	no	12, carbon/ SiC Viton	123 X 2,5	NBR	0,65
G 1	AE-25/4 SC_	no	AEP-25/4 SC_	no	12, carbon/ SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-26/4 SC_	no	AEP-26/4 SC_	no	12, carbon/ SiC Viton	123 X 2,5	NBR	0,08 and 0,2
	AE-25/2 SC_	no	AEP-25/2 SC_	no	12, carbon/ SiC Viton	123 X 2,5	NBR	0,65
	AE-26/2 SC_	no	AEP-26/2 SC_	no	12, carbon/ SiC Viton	123 X 2,5	NBR	0,65
G 1 1/4	AE-32/4 SC_	no	AEP-32/4 SC_	no	12, carbon/ SiC Viton	145 X 2,5	NBR	0,2-0,37
	AE-33/4 SC_	no	AEP-33/4 SC_	no	12, carbon/ SiC Viton	145 X 2,5	NBR	0,2-0,37
DN 32	L-32/4 SC_	no	no	no	12, carbon/ SiC EPDM	100 X 2,5	NBR	0,08 and 0,2
	L-32/2 SC_	no	no	no	12, carbon/ SiC EPDM	100 X 2,5	NBR	0,65
DN 40	L-40A/4 SC_	no	no	no	12, carbon/ SiC EPDM	145 X 2,5	NBR	0,2-0,37
DN 50	L-50A/4 SC_	no	LP-50A/4 SC_	no	12, carbon/ SiC EPDM	150 X 3	NBR	0,2 and 0,55
DN 65	L-65A/4 SC_	LH-65A/4 SC_	no	no	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN 80	L-80A/4 SC_	LH-80A/4 SC_	no	no	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	0,55 and 0,75
DN 100	AL-1102/4 SC_	ALH-1102/4 SC_	ALP-1102/4 SC_	ALS-1102/4 SC_	18, carbon/ SiC EPDM	179,3 X 5,7	EPDM	0,75

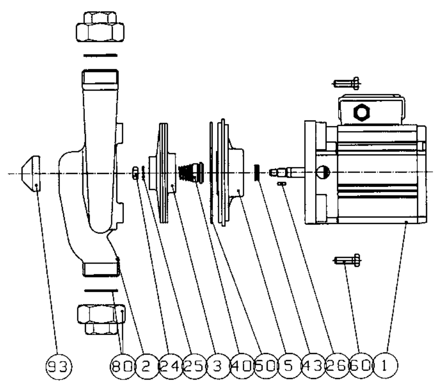
Spare parts

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









KOLMEKS
www.kolmeks.com

Replacing motor unit for pumps less than 1.5 kW

Note! Only an authorized person may carry out the replacement.

Starting situation. The pump is running normally.

1) Stop the pump, open any possible safety switch and remove fuses. Ensure that no one is able to switch the current on, even by accident, during the replacement. Close the valves.

2) Detach the motor cable. Open the screws/bolts of the operating unit.

3) Lift the operation unit from the pump housing. Watch out for hot water!

4) Replace the gasket/O-ring of the housing.

5) Install a new motor unit. Tighten the screws/bolts of the unit evenly.

6) Connect the motor cable and open the valves. Start the pump and check the direction of rotation. Vent the system. Monitor the operation of the pump.

Replacing motor unit for pumps over 1.5 kW

Note! Only an authorized person may carry out the replacement.

Starting situation: The pump is running normally.

1) Stop the pump, open a possible safety switch and remove fuses. Ensure that no one is able to switch the current on, even by accident, during the replacement. Close the valves.

2) Close the valves and detach the connecting cable of the motor. Next, detach the flush pipe (in ALH pumps). Open the screws/bolts of the operation unit.

3) Lift the operation unit by means of a hoist. Watch out for hot water!

4) Replace the gasket/O-ring of the housing.

5) Install a new motor unit. Tighten the screws/bolts of the unit evenly.

6) Connect the motor cable and open the valves. Start the pump and check the direction of rotation. Vent the system. Monitor the operation of the pump.

Replacing impeller

1) Detach the motor unit as usual (see Replacing motor and replacement motor unit).

2) Install the motor unit in a vertical position.

3) Open the screw/bolt of the impeller.

4) Use screwdrivers to detach the impeller.

5) Use an extractor if necessary.

6) The motor unit is without an impeller. Replace the shaft seal when necessary (see Replacing a shaft seal).

7) Install a new impeller. If required, you can lightly tap the impeller with a rubber mallet until flush with the ridge. Tighten the screw/bolt of the impeller.

8) Attach the motor unit as usual.

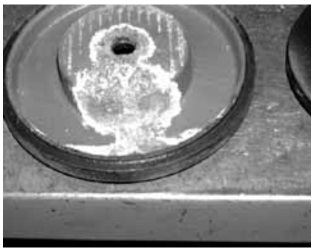
Replacing shaft seal

Detaching seal

Stop the pump and close the shut-off valves. Detach the motor unit from the pump housing. (see replacing motor unit). Detach the impeller of the pump (see Replacing an impeller).

Starting situation. The motor unit with the impeller detached.

1) Detach the shaft seal using two screwdrivers. Do not damage the sealing surface of the shaft.



2) Also detach the sealing flange from the motor front plate using two screwdrivers. If needed, replace the sealing flange with a new one.

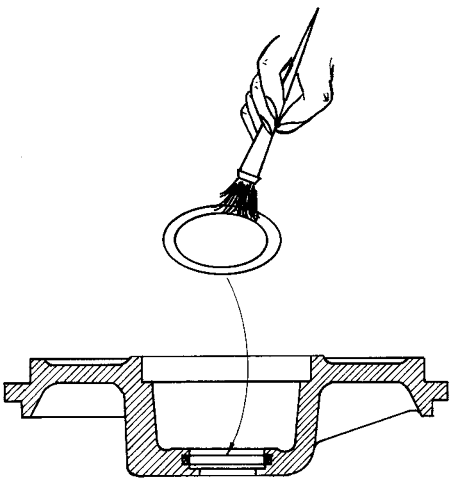
3) The motor unit disassembled, with installation tools.

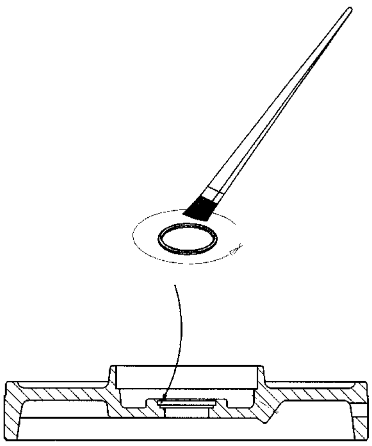
Installing mechanical seal

Lubricating and installing O-ring

NOTE! Touch the seal parts with clean hands only, and as little as possible and with extreme care.

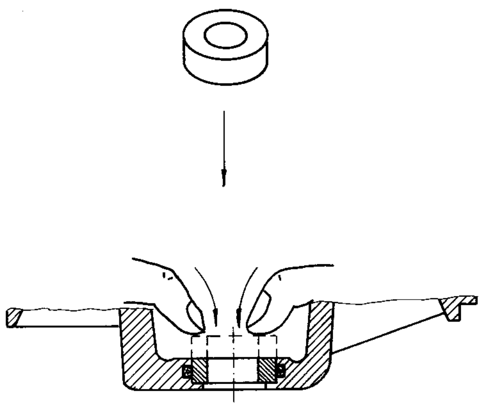
Check the housing and O-ring groove for the stationary ring in the sealing flange are clean. Check the O-ring and lubricate it with soap water, not with oil. Then install the O-ring in the groove of the sealing flange (in the stationary ring for BO- and BP-marked seals).

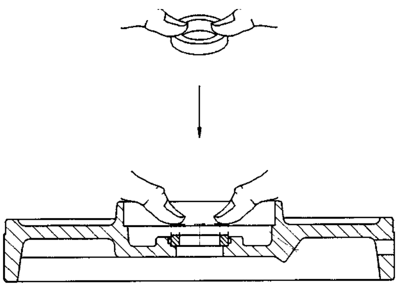




Pressing stationary ring into the sealing flange

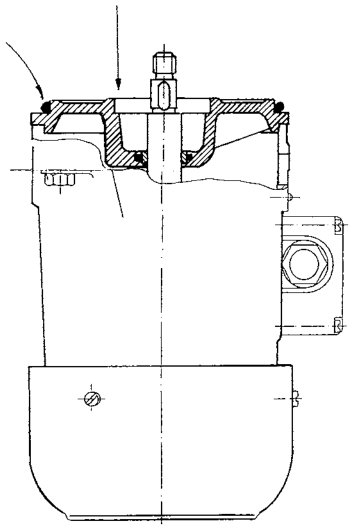
Check that the stationary ring is undamaged, clean, smooth and not scratched. If the stationary ring is packed in protective foil, detach it with a knife, carefully minding the rotating surface. Then, remove the grease with a dry and clean cloth. Press the stationary ring into the sealing flange with the smoother surface facing you (the pump). Ensure that the O-ring does not push the ring out. If this happens, use more lubrication. Finally, clean the rotating surface of the stationary ring with a clean and lint-free cloth or towel which is dampened with a suitable organic solvent, e.g. methyl alcohol or spirit. Alternatively, the stationary ring can be installed with a clean lint-free cloth without fingers touching the rotating surface. Finally, the rotating surface should be blown clean with compressed air.

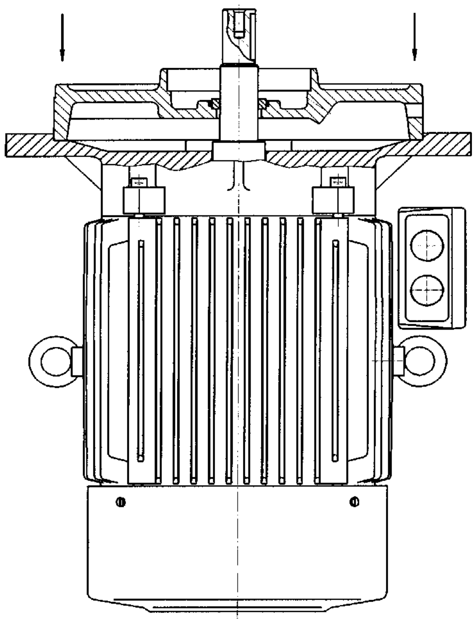




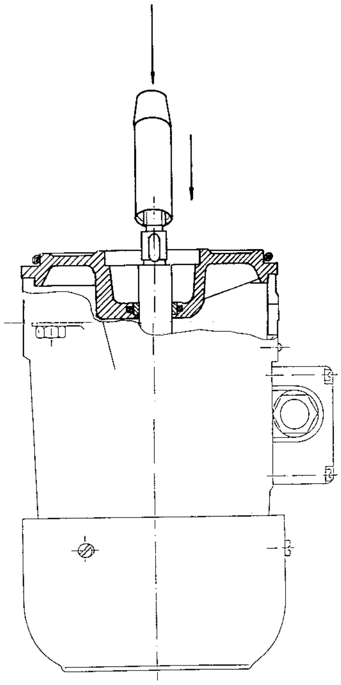
Installing sealing flange onto D-end motor flange

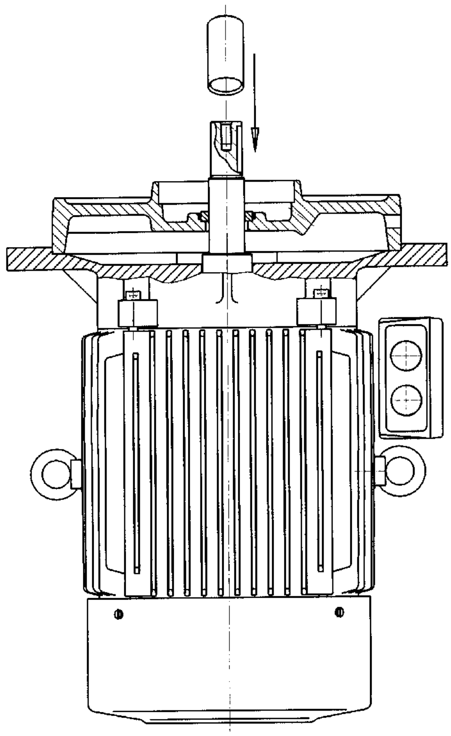
Install the sealing flange onto the motor. Place the assembly sleeve of the installation tool so that it forms a shaft extension. In large pumps, first install the sealing flange onto the motor and then the stationary ring (BO- and BP-marked seals).





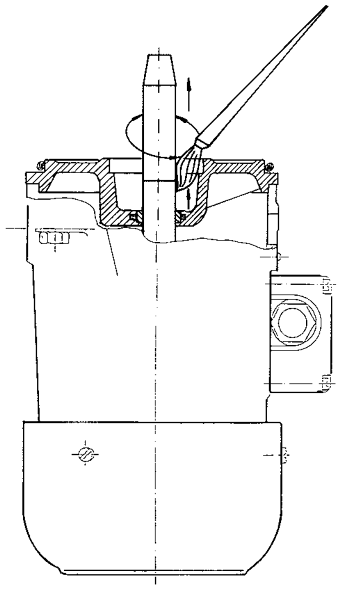
Assembly sleeve as shaft extension

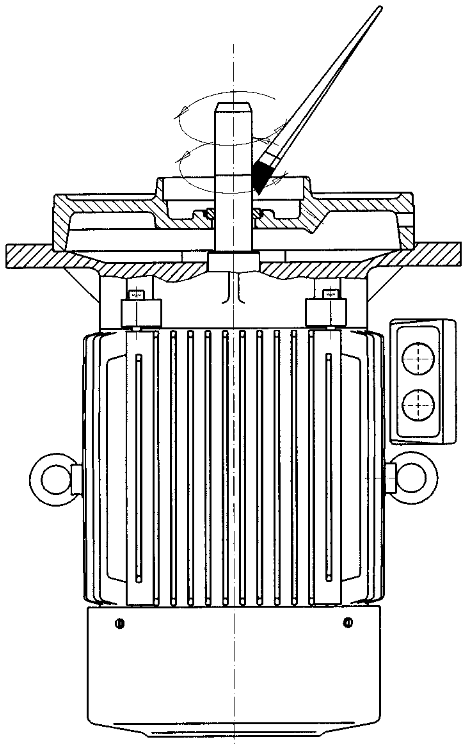




Soaping assembly sleeve

Check that the seal body, bellows and rotating ring are clean and undamaged. If the rotating surface of the rotating ring is dirty, clean it with a clean and lint-free cloth which is dampened with a suitable organic solvent, e.g. methyl alcohol or spirit. Lubricate the shaft and the seal elastomer bellows suitably with soapy water, not with oil.

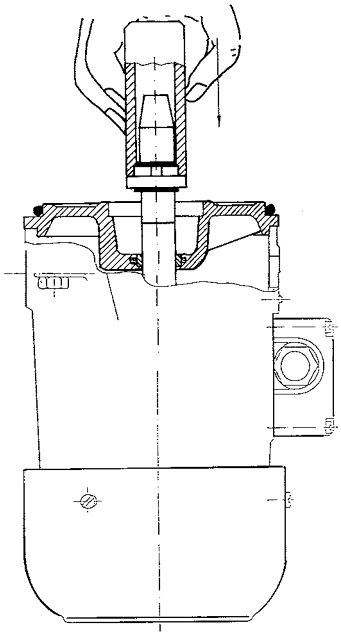


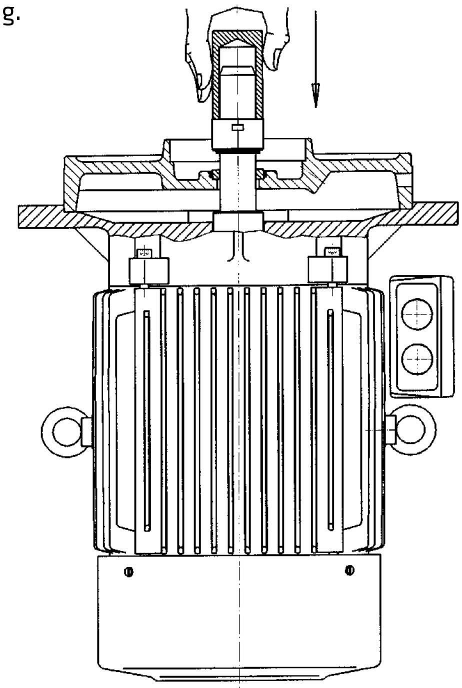


Pushing bellows onto shaft

Detach the spring (if separate) and, using even pressure, push the bellows onto the shaft using the installation mandrel until the rotating surfaces meet. Do not press too hard. If the spring is attached to the frame, install the whole seal onto the shaft from its bellows part (end of seal) by pushing with a suitable sleeve. If the rotating ring of the seal does not stay fast in the seal, install it first and ensure that when installing the seal frame, the frame and the rotating ring are in place correctly.

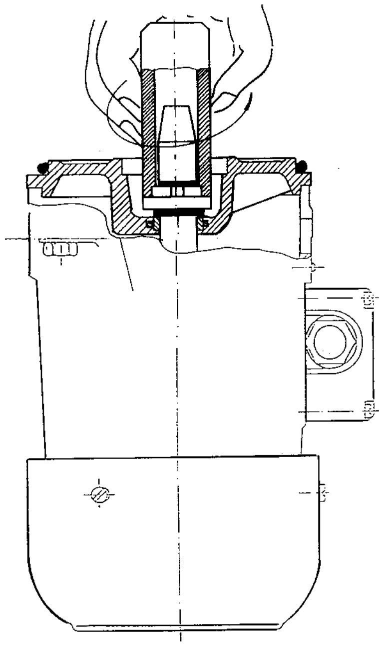
Note! Do not touch the rotating surface of the rotating ring.

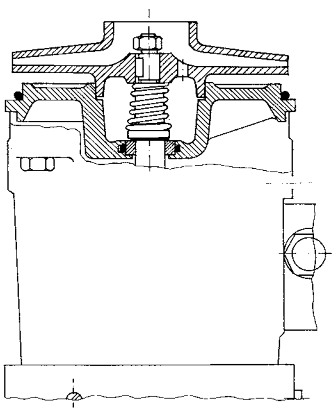


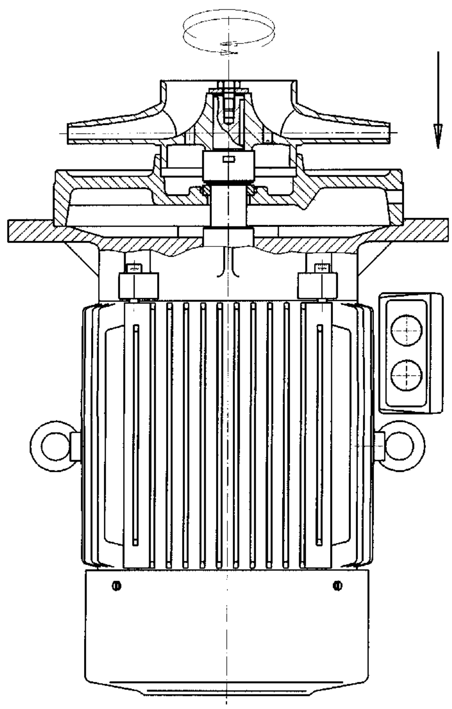


Installing spring, back plate and impeller

Rotate the shaft sligtly and carefully and ensure that the seal fits well. Then, install spring, back plate (if separate) and impeller.







Kolmeks and the new energy efficiency directive

Kolmeks dry motor driven pumps fulfil all energy efficiency requirements in force as from the beginning of 2013. The basis for these requirements is the EcoDesign directive which harmonises the requirements for energy consuming and energy-related products.

The EcoDesign directive - 2009/125/EC October 21st 2009

Establishes a framework for the setting of Community EcoDesign requirements for energy-related products by contributing to sustainable development by increasing energy efficiency and the level of protection of the environment, while at the same time increasing the security of the energy supply.

The Directive provides for the setting of requirements which the energy-related products covered by implementing measures, i.e. measures adopted pursuant to the Directive laying down EcoDesign requirements for defined products or for environmental aspects thereof, must fulfil in order to be placed on the market and / or put into service.

Commission Regulations implementing the Directive with regard to EcoDesign requirements have been issued for water pumps as well as for electric motors.

All Kolmeks' pumps fulfil said energy efficiency requirements.

Kolmeks dry motor driven pumps
Regulation (EU) No 547/2012, June 25th 2012

Regulation 547/2012 sets minimum efficiency requirements (MEI = minimum efficiency index), as well as information requirements for rotodynamic water pumps in Annex II of the Regulation, and shall the requirements apply in accordance with the following timetable. MEI means the dimensionless scale unit for hydraulic pump efficiency at best efficiency point (BEP), part load (PL) and over load (OL)

Requirements are implemented in two phases

From January 1st 2013 water pumps shall have a minimum efficiency of MEI ≥0.1
and shall the information requirements set out be fulfilled

From January 1st 2015 water pumps shall have a minimum efficiency of MEI≥0.4

The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.

The operation of a water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system

The most efficient water pumps have a MEI of ≥ 0.70

More information on the comparative efficiency of pumps can be found at
www.europump.org/efficiencychartsMEI ≥ 0,4

All pumps in this catalogue fulfil the minimum requirements set by the Directive and it's implementing regulations

Kolmeks electric motors
Regulation (EC) No 640/2009, July 22nd 2009

Regulation 640/2009 sets minimum efficiency levels (IE class) for electric motors. The IE class defines directly the minimum efficiency (as a percentage) based on the number of poles and the rated output power of the motor.

The efficiency level of the motor shall be visibly displayed on the motor, for example IE2 – 94,9 %.

Requirements are implemented in phases

Since June 16th 2011 IE2 is required for motors from 0.75kW to 375 kW.

From January 1st 2015 IE3 is required for motors from 7.5 kW to 375 kW and IE2 is allowed only in combination with a variable speed drive.

From January 1st 2017 IE3 is required for all motors from 0.75 kW to 375 kW) and IE2 is allowed only in combination with a variable speed drive.

All Kolmeks manufactured motors meet at least IE2 level requirements.

We will gladly supply You with more information and answer any questions regarding the new energy efficiency requirements

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