

PUMP CATALOGUE



AE-, L-, AL- and AKN-SERIES
INLINE PUMPS WITH FIXED-SPEED MOTOR

Kolmeks is a Finnish manufacturing company and part of the family-owned Brandt Group Oy Ltd. The group has factories in Finland, Estonia, China and India, providing customers with expertise in two business areas: pumps and components (production and supply chain solutions). Kolmeks Pumps specializes in state-of-the-art pumps, HVAC products and dedicated maintenance services.

The pump specialist

We have been engineering pumps for over 75 years and striving to develop a portfolio of state-of-the-art pumping equipment. Pump technology and application know-how are our core competencies. We provide our customers with high-quality pumping and HVAC solutions as well as versatile maintenance services.

The main industries we work with

include building services, industrial, marine and mobility operators. Kolmeks pumps are typically used in the pulp, paper and chemical industries as well as in other process industries.

Now and in the future, the human infrastructure depends on pumps that improve the quality of lives through sustainable means.

Planet, people and continuity are the cornerstones of our sustainability strategy.





The pumps and their motors are designed and manufactured with the highest craftsmanship and they meet the demands of the European EcoDesign directive. Kolmeks was also among the first Finnish companies to receive the ISO 9001 Quality certificate and the ISO 14001 Environmental certificate.

We strive to be a solutions provider helping our customers to succeed by offering the most efficient, reliable and sustainable products and services.

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.

Global reach, local presence

We have been operating in the Finnish pump market since 1945. Today, a large part of the pumps we manufacture are delivered, to all major European countries, Russia and China. Increasingly, Kolmeks products are also exported to several countries in the Middle East, Asia and Africa.

Turenki and Chuzhou are key sites for Kolmeks's own pumps manufacturing and motor assembly.

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

www.kolmeks.com



Pump ranges

Kolmeks has three ranges of pumps with integrated frequency control; the SC-, VS- and NC -ranges. The smallest pump with integrated frequency control is 0,08 kW, the largest 45 kW. In addition, all of the pumps are suited for control by external frequency control.





INLINE PUMPS WITH FIXED-SPEED MOTORS

TECHNICAL INFORMATION

p. 7 – 19

DATA SHEETS

p. 21 – 61

AE_-series

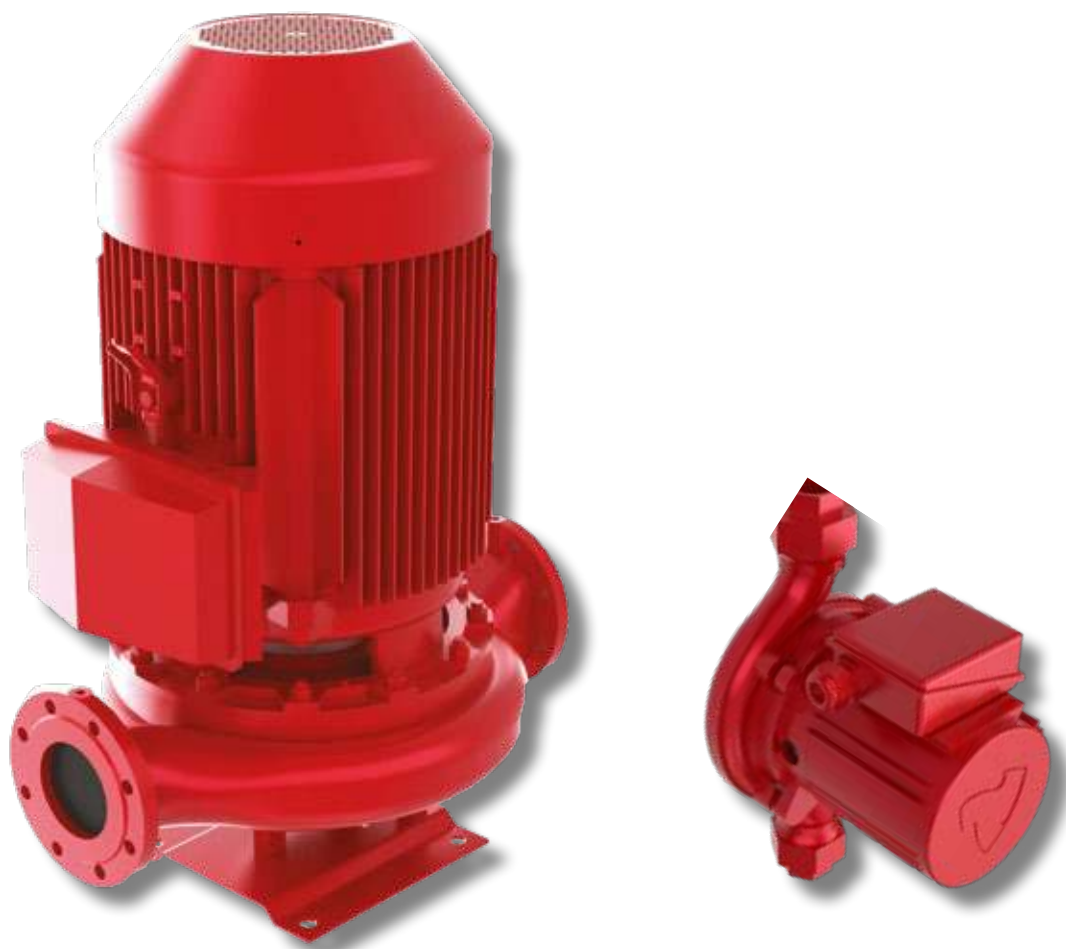
Threaded G1 – G1 1/4

L_-, AL_- and AKN_-series

Flanged DN32-DN300

TECHNICAL INFORMATION

INLINE PUMPS WITH FIXED-SPEED MOTOR



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:

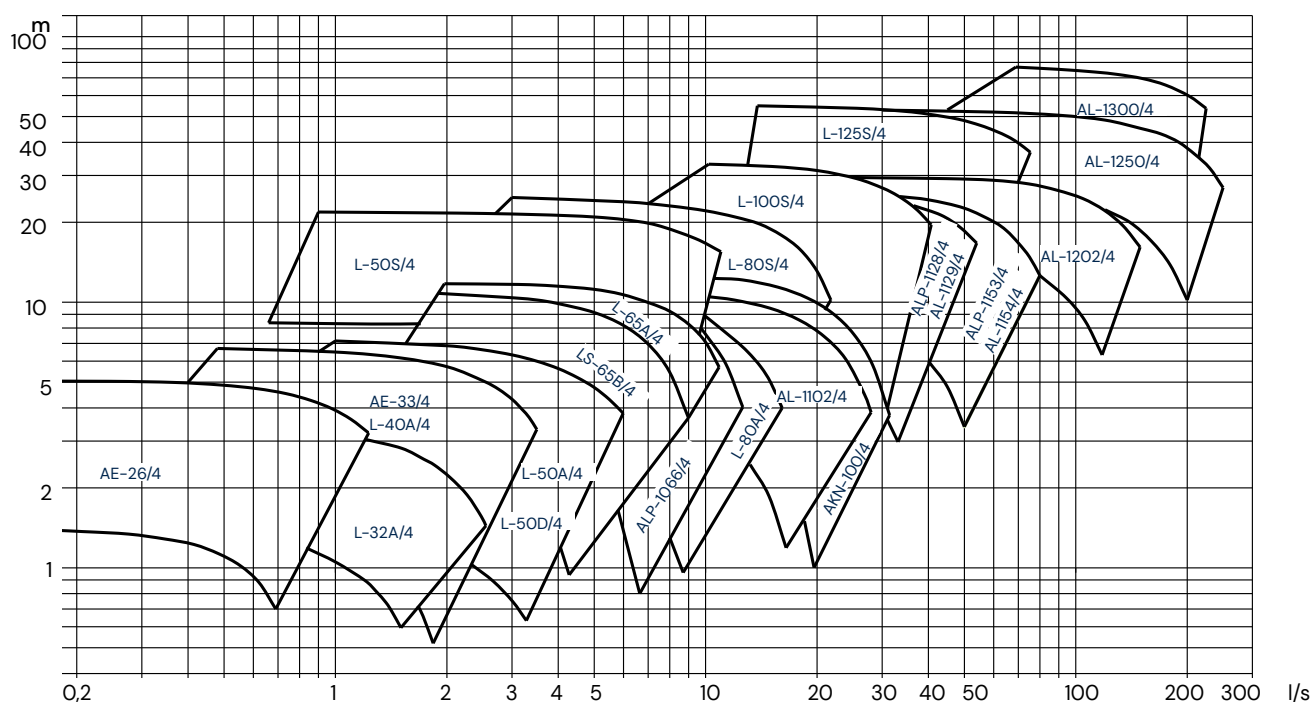
- Inline centrifugal pumps equipped with flange connections.

Applications:

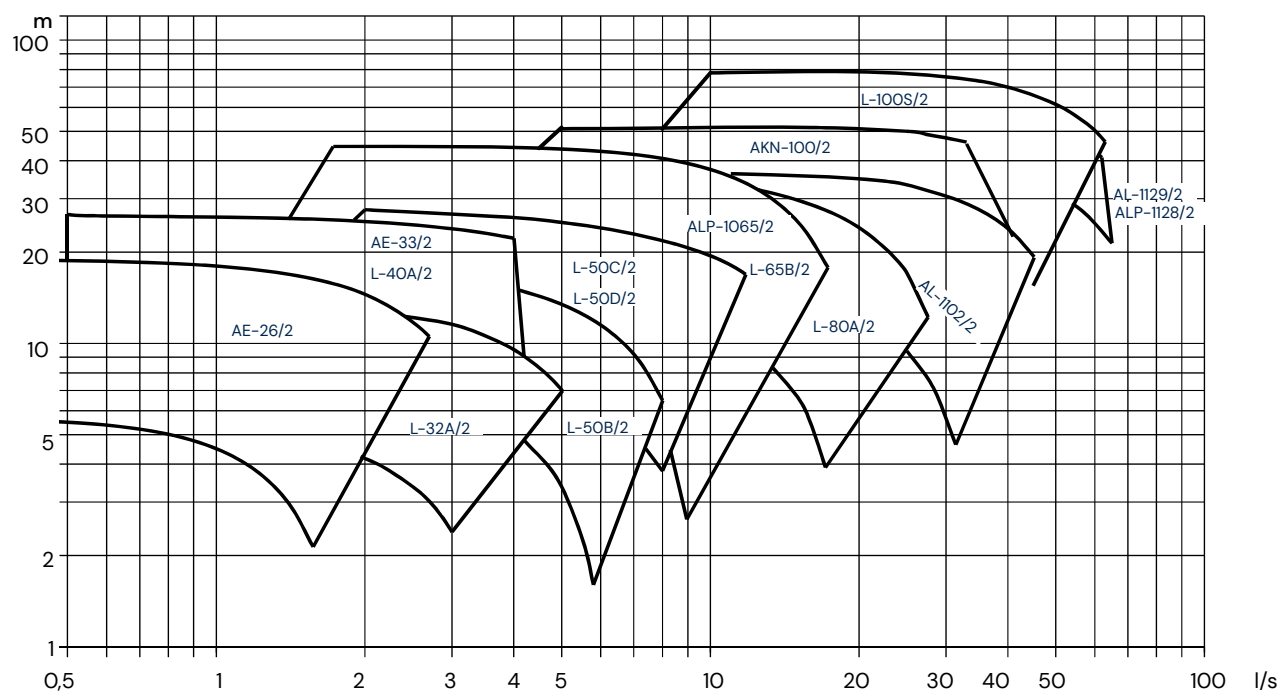
- Grey cast iron (L, AL and AKN) pumps can be used as circulation, pressure boosting and transfer pumps for clean liquids.
- Nodular cast iron (LH, ALH and AKNH) pumps can be used in power plants and as pressure boosting pumps for primary district heating.
- Bronze (LP and ALP) pumps can be used as domestic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

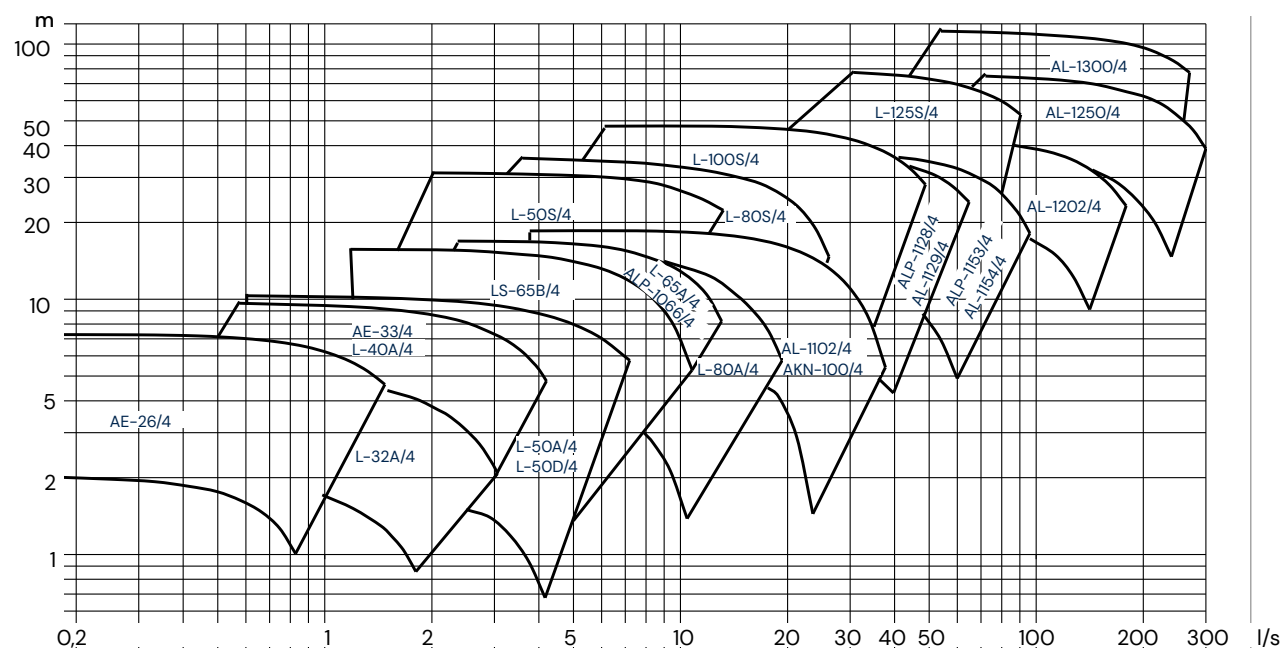
Quick selection chart AE-, L- AL-, and AKN-series 4-poles, 50Hz



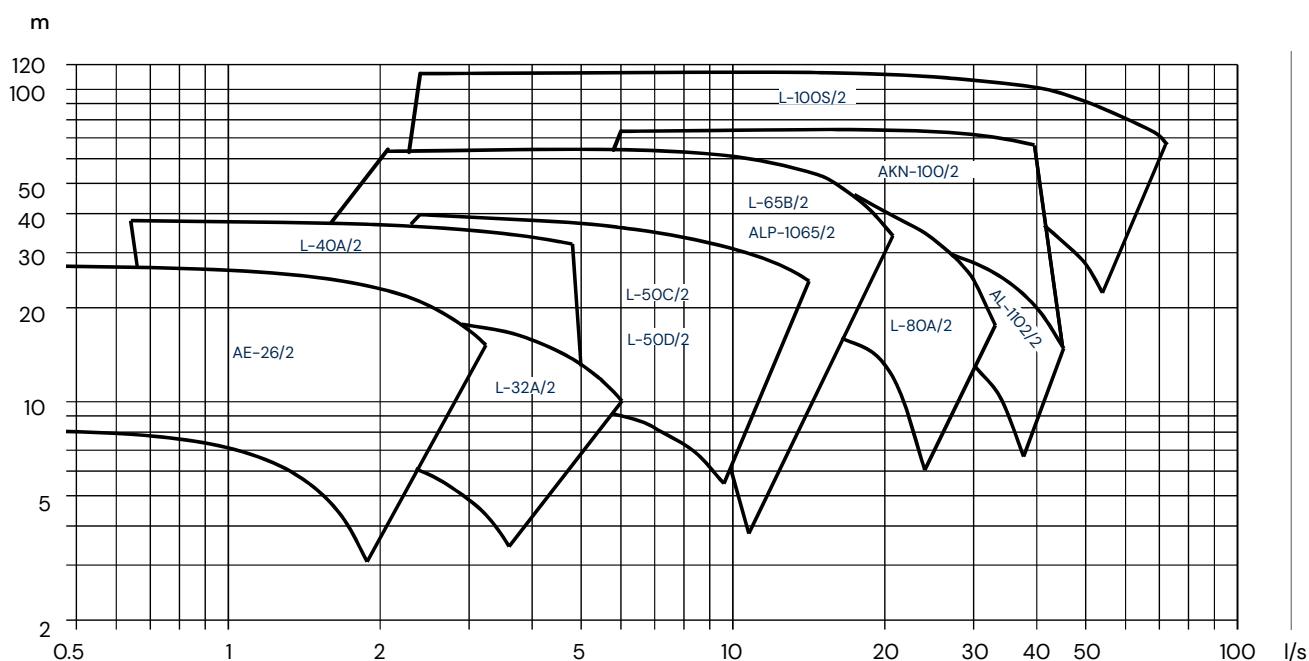
Quick selection chart AE-, L-, AL- and AKN-series 2-poles, 50Hz



Quick selection chart AE-, L-, AL- and AKN-series 4-poles, 60Hz



Quick selection chart AE-, L-, AL- and AKN-series 2-poles, 60Hz



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

Connection	Grey cast iron	Nodular cast iron	Bronze	Stainless steel	Stainless steel Duplex A890	Stainless steel SS 2378	Shaft seal, PN10	O-ring	O-ring	Motor
G or DN	EN-GJL-200, PN10	EN-GJS-400, PN16	CuSn10Zn2, PN10	AlSi 316, PN16	Grade 3A	254 SMO	Ø [mm], materials	Size [mm]	Material	[kW]
G 1	AE-26/4	-	AEP-26/4	-	-	-	12, carbon/SiC Viton	123 X 2,5	NBR	0,05 and 0,08
	AE-26/2	-	AEP-26/2	-	-	-	12, carbon/SiC Viton	123 X 2,5	NBR	0,25, 0,65 and 1,1
G 1 1/4	AE-33/4	-	AEP-33/4	-	-	-	12, carbon/SiC Viton	145 X 2,5	NBR	0,2 and 0,37
	AE-33/2	-	AEP-33/2	-	-	-	12, carbon/SiC Viton	145 X 2,5	NBR	1,1 and 1,5
DN 32	L-32A/4	-	-	-	-	-	12, carbon/SiC EPDM	100 X 2,5	NBR	0,05, 0,08 and 0,2
	L-32A/2	-	-	-	-	-	12, carbon/SiC EPDM	100 X 2,5	NBR	0,25, 0,65 and 1,1
DN 40	L-40A/4	-	-	-	-	-	12, carbon/SiC EPDM	145 X 2,5	NBR	0,2 and 0,37
	L-40A/2	-	-	-	-	-	12, carbon/SiC EPDM	145 X 2,5	NBR	1,1 and 1,5
DN 50	L-50A/4	LH-50A/4	LP-50A/4	-	-	-	12, carbon/SiC EPDM	150 X 3	NBR	0,2, 0,25, 0,37 and 0,55
	L-50B/2	-	LP-50B/2	-	-	-	12, carbon/SiC EPDM	150 X 3	NBR	1,1
	L-50D/4	LH-50D/4	LP-50D/4	-	-	-	18, carbon/SiC EPDM	150 X3	NBR	0,37 and 0,55
	L-50D/2	LH-50D/2	LP-50D/2	-	-	-	18, carbon/SiC EPDM	150 X 3	NBR	1,5, 2,2, 3 and 4
	L-50C/2	LH-50C/2	LP-50C/2	-	-	-	18, carbon/SiC EPDM	150 X 3	NBR	1,5, 2,2, 3 and 4
	L-50S/4	LH-50S/4	-	-	-	-	28, carbon/SiC EPDM	265 X 4	EPDM	1,1, 1,5, 2,2, 3, 4 and 5,5
DN 65	L-65A/4	LH-65A/4	-	-	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,2, 0,37, 0,55, 0,75, 1,1, 1,5, 2,2 and 3
	-	-	-	LS-65B/4	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,2, 0,37, 0,55, 0,75, 1,1, 1,5, 2,2 and 3
	L-65B/2	LH-65B/2	-	LS-65B/2	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,5, 2,2, 3, 4, 5,5 and 7,5
	-	-	ALP-1066/4	-	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37, 0,55, 0,75, 1,1, 1,5, 2,2 and 3
	-	-	ALP-1065/2	-	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	1,5, 2,2, 3, 4, 5,5 and 7,5
DN 80	-	-	-	ALS-1081/4	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37, 0,55, 0,75, 1,1, 1,5, 2,2 and 3
	-	-	-	ALS-1081/2	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	2,2, 3, 4, 5,5 and 7,5
	L-80A/4	LH-80A/4	-	LS-80A/4	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,37, 0,55, 0,75, 1,1, 2,2 and 3
	L-80A/2	LH-80A/2	-	LS-80A/2	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	2,2, 3, 4, 5,5 and 7,5
	L-80S/4	LH-80S/4	-	-	-	-	28, carbon/SiC EPDM	265 X 4	EPDM	1,1, 1,5, 2,2, 3, 4, 5,5 and 7,5
DN 100	AL-1102/4	ALH-1102/4	ALP-1102/4	ALS-1102/4	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	0,55, 0,75, 1,1, 1,5, 2,2 and 3
	AL-1102/2	ALH-1102/2	ALP-1102/2	ALS-1102/2	-	-	18, carbon/SiC EPDM	179,3 X 5,7	EPDM	4, 5,5 and 7,5
	AL-1102/2	ALH-1102/2	ALP-1102/2	ALS-1102/2	-	-	25, carbon/SiC EPDM	179,3 X 5,7	EPDM	11 and 13
	AKN-100/4	AKNH-100/4	-	-	-	-	25, carbon/SiC EPDM	240 X 3	NBR	1,5, 2,2 and 3
	AKN-100/2	AKNH-100/2	-	-	-	-	25, carbon/SiC EPDM	240 X 3	NBR	7,5, 11, 15, 18,5 and 22
	L-100S/4	LH-100S/4	LP-100S/4	-	-	-	32, carbon/SiC EPDM	315 x 6,3	EPDM	3, 4, 5,5, 7,5, 11, 15, 18,5 and 22
	L-100S/2	LH-100S/2	LP-100S/2	-	-	-	32, carbon/SiC EPDM	315 x 6,3	EPDM	15, 18,5, 22, 30 and 37
	L-100S/2	LH-100S/2	LP-100S/2	-	-	-	40, carbon/SiC EPDM	315 x 6,3	EPDM	45
DN 125	AL-1129/4	ALH-1129/4	-	ALS-1129/4	ALX-1129/4 *)	ALM-1129/4 *)	32, carbon/SiC EPDM	309/295X1	gasket	3, 4, 5,5, 7,5, 11, 15, 18,5 and 22
	AL-1129/2	ALH-1129/2	-	ALS-1129/2	ALX-1129/2 *)	ALM-1129/2 *)	32, carbon/SiC EPDM	309/295X1	gasket	30 and 37
	-	-	ALP-1128/4	-	-	-	32, carbon/SiC EPDM	309/295X1	gasket	3, 4, 5,5, 7,5, 11, 15, 18,5 and 22
	-	-	ALP-1128/2	-	-	-	32, carbon/SiC EPDM	309/295X1	gasket	30 and 37
	L-125S/4	LH-125S/4	-	LS-125S/4	-	-	40, carbon/SiC EPDM	405 X 7	EPDM	18,5, 22, 30 and 37
	L-125S/4	LH-125S/4	-	LS-125S/4	-	-	50, carbon/SiC EPDM	405 X 7	EPDM	45 and 55
DN 150	-	-	ALP-1153/4	-	-	-	32, carbon/SiC EPDM	309/295X1	gasket	4, 5,5, 7,5, 11, 15, 18,5, 22 and 30
	AL-1154/4	ALH-1154/4	-	ALS-1154/4	ALX-1154/4 *)	ALM-1154/4 *)	32, carbon/SiC EPDM	309/295X1	gasket	4, 5,5, 7,5, 11, 15, 18,5, 22 and 30
	L-150S/4	LH-150S/4	-	-	-	-	40, carbon/SiC EPDM	375 x 7	EPDM	22, 30, 37, 45 and 55
DN 200	AL-1202/4	ALH-1202/4	ALP-1202/4	ALS-1202/4	ALX-1202/4 *)	ALM-1202/4 *)	32, carbon/SiC EPDM	315 x 6,3	EPDM	15 and 18,5
	AL-1202/4	ALH-1202/4	ALP-1202/4	ALS-1202/4	ALX-1202/4 *)	ALM-1202/4 *)	40, carbon/SiC EPDM	315 x 6,3	EPDM	22, 30 and 37
	AL-1202/4	ALH-1202/4	ALP-1202/4	ALS-1202/4	ALX-1202/4 *)	ALM-1202/4 *)	50, carbon/SiC EPDM	315 x 6,3	EPDM	45
DN 250	AL-1250/4	ALH-1250/4	-	ALS-1250/4	ALX-1250/4 *)	-	40, carbon/SiC EPDM	405 X 7	EPDM	37
	AL-1250/4	ALH-1250/4	-	ALS-1250/4	ALX-1250/4 *)	-	50, carbon/SiC EPDM	405 X 7	EPDM	45 and 55
	AL-1250/4	ALH-1250/4	-	ALS-1250/4	ALX-1250/4 *)	-	65, carbon/SiC EPDM	405 X 7	EPDM	75, 90 and 110
DN 300	AL-1300/4	ALH-1300/4	-	ALS-1300/4	-	-	75, carbon/ceramic. EPDM	475 X 8	EPDM	110, 132 and 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-26 / L-32 impeller Noryl GFN2 (max temperature +100) AL_-1300 impeller EN-GJS-400 ALH-1300 impeller EN-GJS-400
LH / ALH / AKNH	PN16 / -15...+180 (depending on seal construction)	nodular cast iron	EN-GJS-400	EN-GJS-400	EN-GJL-200	AISI329	
AEP / LP / ALP	PN10 / -15...+120	bronze	CuSn10Zn2	CuSn10Zn2	CuSn10Zn2	AISI329	
LS / ALS	PN16 / -15...+180 (depending on seal construction)	stainless steel	AISI316	AISI316	AISI316	AISI329	On special request also Duplex A890 Grade 3A (ALX-pumps) and SS 2378/254 SMO (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 motor designed specially 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 4–190 kW
 (Exception: motor KP-112-2: L_-100S/4 3 kW and AL_-/AT-1129/4 3kW are equipped 690/400V motor)

Enclosure classes: IP 54 0,03–3kW 4-poles motor: 1500 r/min 50Hz and 1800 r/min 60Hz
 2-poles motor: 3000 r/min 50Hz and 3600 r/min 60Hz
 IP55 5,5–160 kW 4-poles motor: 1500 r/min 50Hz and 1800 r/min 60Hz
 2-poles motor: 3000 r/min 50Hz and 3600 r/min 60Hz

Insulation class: F
 Duty type: S1 (continuous duty)
 Ambient temperature: max. +45°C

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

Connections

The AE series pumps are 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 by 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 flat gasket.

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

Standard surface treatment

All parts of the pumps are painted according to Standard SFS-EN ISO 12944-5, AY100/1-FeSa2½. The colour is RAL3020 Kolmeks red. By request, standard surface colour blue RAL5010 available free of charge. Epoxy surface treatment and colour alternatives are available by request.

Rating plate

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

Flange DN-size

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

Pump type
Serial number,
Duty point and max. temperature of liquid
Minimum efficiency index (MEI)
Motor type
Nominal voltages and currents
Bearing types,

Pump LH-65B/2KT V1		O502103	
L65B222H-00011KT V1			
No 222740.100 2021 PN16 Ø 125 mm			
5,5 l/s 13 m +180 °C MEI ≥ 0,4 --			
Motor KP-90-1 F19		Isol F IP54 IE3-86,1%	
	U_n	I_n	I_{max}
3~	690 V	2,49 A	2,9 A
Δ	400 V	4,29 A	5,1 A
		cos φ 0,86	
D 6305-VVC3E N 6205-VVC3E			

Motor code
Pressure class and impeller diameter
Electrical power at duty point (if required)
Continuous duty
Nominal power and rotation speed
Enclosure and insulation class
Efficiency class of electric motor
Manufacturer, Country and CE marking

Kolmeks Finland **CE**

Seal structure alternatives

Standard structure

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

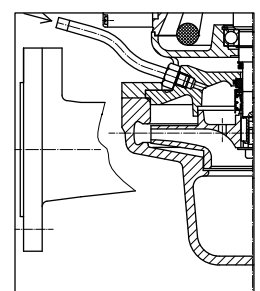
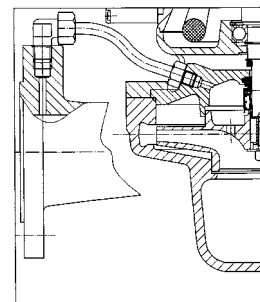
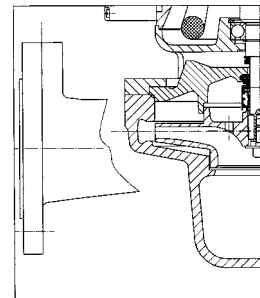
The standard-construction shaft seal can also be used for water-glycol mixtures and most other indirect refrigeration systems. The recommended glycol is propylene glycol with a concentration of up to 50%. Most often, a concentration of 30–40% is adequate.

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.

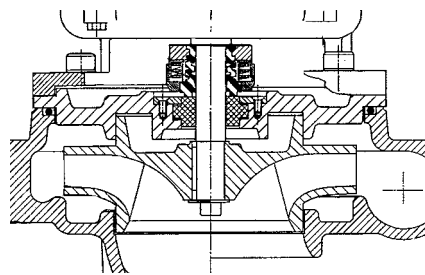
External flushing

- Single mechanical seal
- A pipe from an external source plugged to the seal chamber, which makes it possible to flush the seal with external pressure if required
- Available for pumps in flange sizes DN 50–300
- Crystallising and accumulative liquids



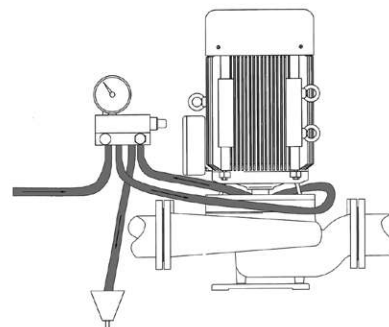
External seal

- Externally-mounted single mechanical Teflon bellows
- Available for flange sizes DN 65–300 ALS- and LS-pumps
- Extremely corrosive liquids, e.g. sulfuric acid
- Marking 'T' in the pump type e.g. LS-65B/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, crystallizing and accumulative liquids



Installation

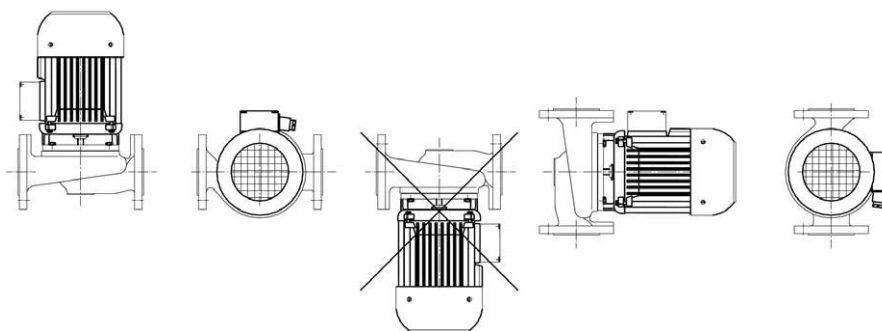
Ensure the following when installing the pump:

- 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 drive unit and the electrical terminal connection box to be changed by removing the drive 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:

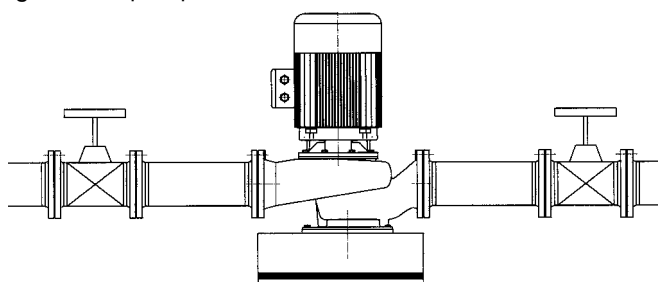
- Enough room for installation and service
- Strength, rigidity and support of the piping
- Vibration and noise level requirements



Recommended general limits without the base:

Size	Power
G1 ... DN 50	max. 2,2 kW
DN 65	4 kW
DN 80	4 kW
DN 100	7,5 kW
DN 125	7,5 kW

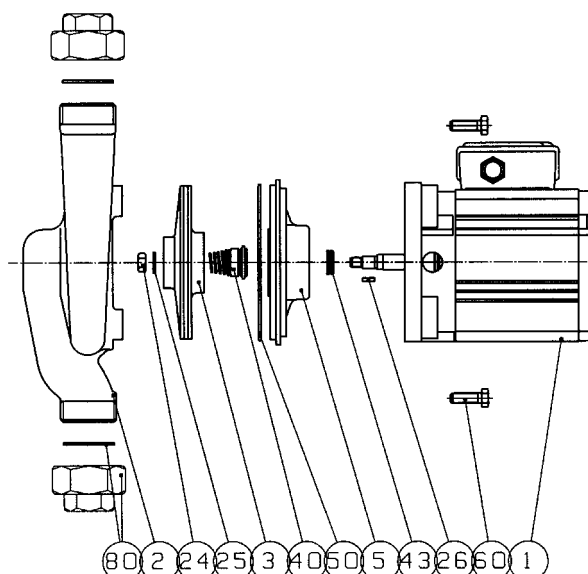
Large pumps are fastened by their base plate onto a freely moving concrete plinth, which is separated from the floor by a 20-mm thick rubber or cork mat for example. The weight of the concrete base must be about 1.5 times the weight of the pump.



Pump service

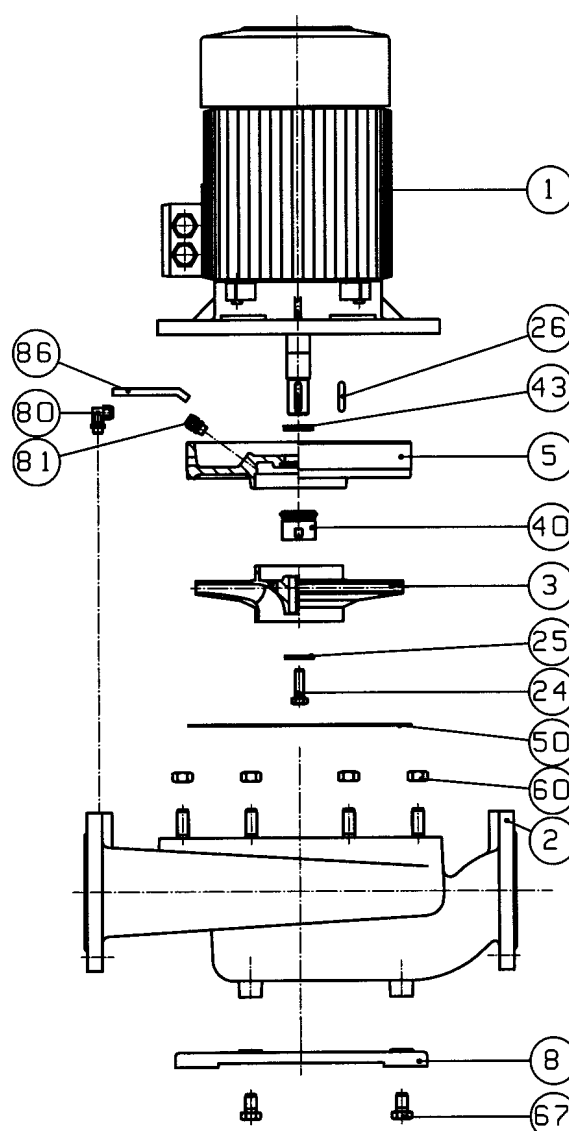
Parts for AE_-pumps

- 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-series)
- 81 Pipe joint (ALH-series)
- 86 Pipe (ALH-series)



Drive unit

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

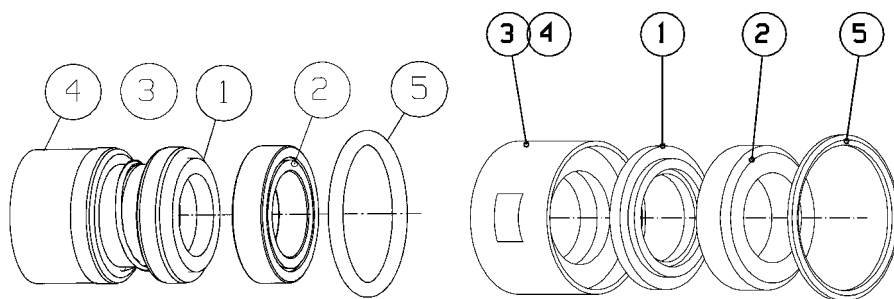
- 1) Motor
- 2) Sealing flange
- 3) Impeller
- 4) Seals

If a motor malfunction or a seal leak occurs, replacing the drive 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

ALH-1250/4

ALS-1250/4

ALX-1250/4

AL_-1250/4 DN250

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 ($\eta = 80\%$).

2. Select the impeller size [$\varnothing$ mm] from the QH curve by drawing a vertical line through the point of 160 l/s flow and, equivalently, a horizontal line through the point of 35 m 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 $P_2 N = 75$ kW.
According to the shaft power P_2 , $P_2 = 71$ kW, the motor nominal power becomes $P_2 N = 75$ 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

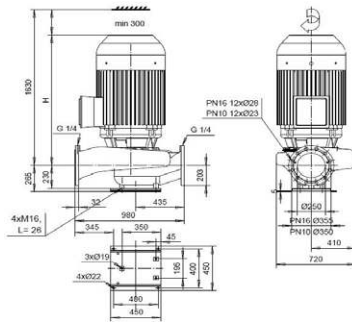
column in the table, $I_N = 133.9$ A. Select an overload protection for the motor according to nominal current.

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

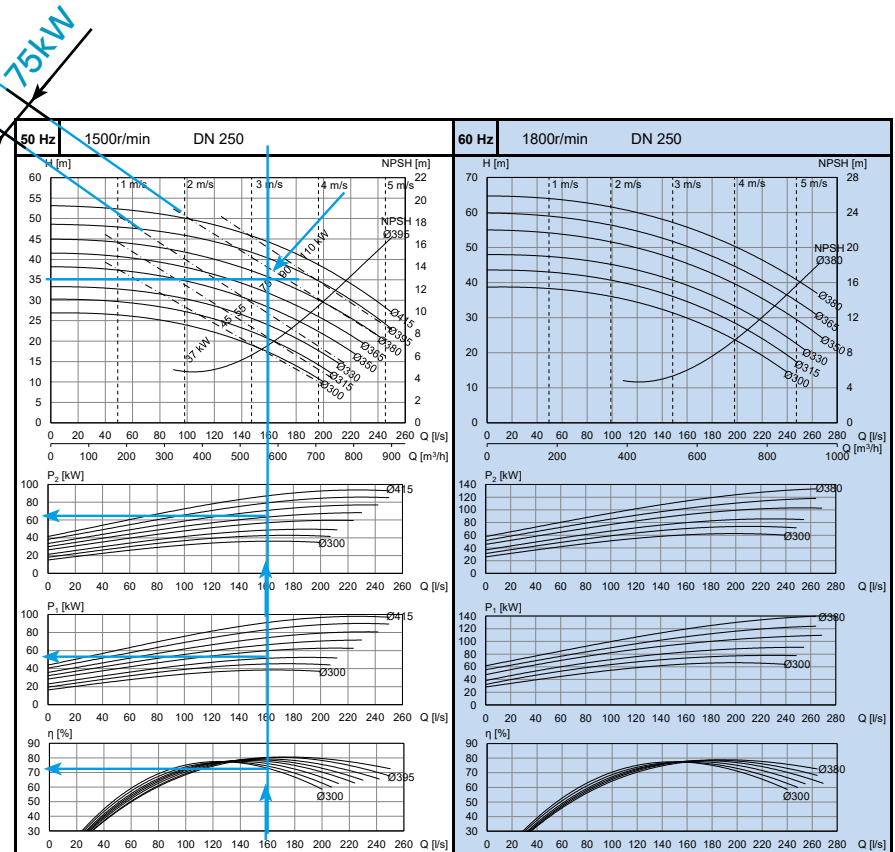
7. For energy calculation, read the electrical power of the device = P_1 [kW], from the P_1 curve with a required flow of $Q = 160$ l/s and at the point of the selected impeller size, $\varnothing = 380$ mm.
In this example, the device electrical power is $P_1 = 74$ kW.

8. Energy cost = Electrical power P_1 [kW] x energy price [€/ kWh] x operating time [h].

Characteristic curves apply to +20°C water.



Motor 400V	$P_2 N$ [kW]	I_N [A]	[kg]	H [mm]
KP-225 K2 F41	37	67,1	625	900
KP-225 K2 F42	45	81,1	630	900
KP-256 J2 F42	55	98,6	755	950
KP-288 K2 F43	75	133,8	920	1070
KP-288 K2 F43	90	156,9	935	1070
KPR-314 H2 F43	110	189,2	1265	1330
Motor 380-400V(460-480V)	$P_2 N$ [kW]	I_N [A]	[kg]	H [mm]
KP-225 K2 F42	45 (54)	80,4 (84,6)	630	900
KP-256 J2 F42	55 (66)	96,8 (101,0)	755	950
KP-288 K2 F43	75 (90)	135,1 (137,7)	920	1070
KP-288 K2 F43	90 (105)	162,8 (158,2)	935	1070
KPR-314 H2 F43	110 (132)	190,6 (195,8)	1265	1330



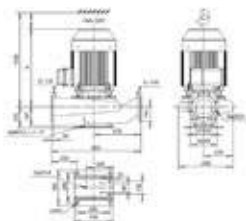
Note! Please contact Kolmeks for additional information on the following issues!

- When pumping liquids whose viscosity differs from that of water, the effect of viscosity must be considered in pump selection.
- 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

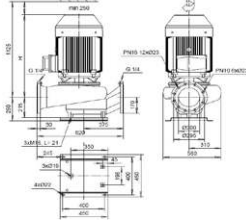
AL-1154/4 ALH-1154/4 ALS-1154/4 ALX-1154/4 ALM-1154/4



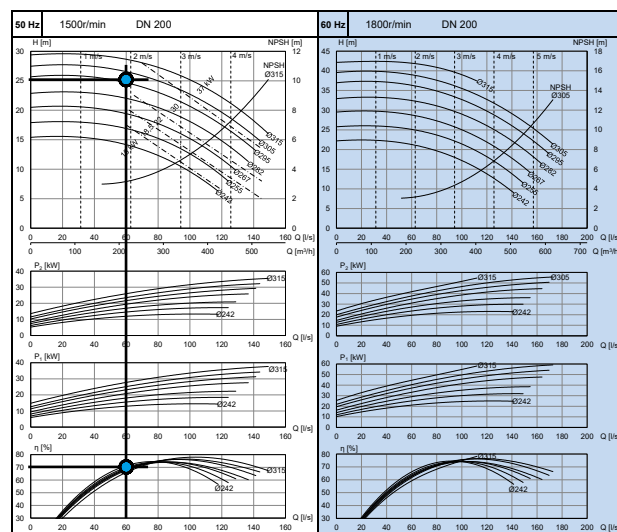
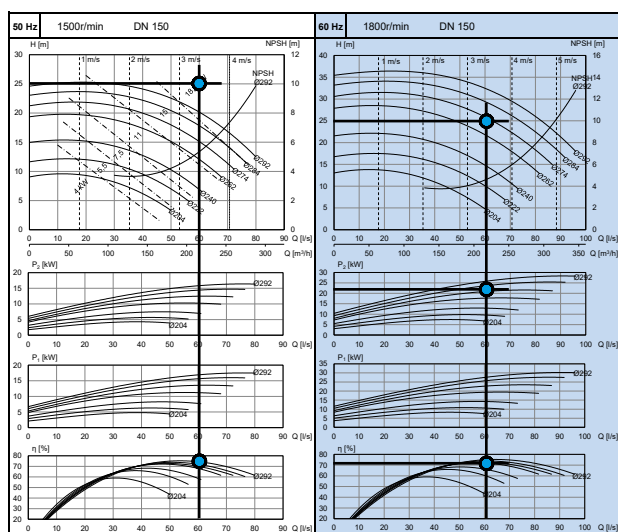
Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
KP-112 2 F31	4	8,29	168	480
KP-133 G2 F31	5,5	10,44	203	545
KP-134 H2 F31	7,5	14,58	214	600
KP-166 G2 F31	11	22,51	270	690
KP-180 2 BF31	15	28,86	275	690
KP-180 2 BF31	18,5	32,90	335	770
Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
KP-112 2 F31	4 (4,9)	8,49 (8,54)	165	480
KP-133 G2 F31	5,5 (6,6)	10,72 (11,29)	203	545
KP-134 H2 F31	7,5 (9)	14,23 (15,21)	214	600
KP-166 G2 F31	11 (13)	22,32 (22,78)	270	690
KP-180 2 BF31	15 (18)	28,06 (29,43)	275	690
KP-180 2 BF31	18,5 (22)	33,60 (35,90)	335	770
KP-180 2 BF31	22 (26)	38,60 (39,40)	340	770
KP-205 K2 F32	30 (36)	54,20 (56,50)	400	780

OVERSIZED PUMP

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



Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
KP-166 G2 F31	15	28,86	330	720
KP-180 2 BF31	18,5	32,9	405	830
KP-180 2 BF31	22	38,7	410	830
KP-205 K2 F32	30	55,0	465	830
KP-225 K2 F32	37	67,1	530	865
Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
KP-180 2 BF31	18,5 (22)	33,6 (33,9)	405	830
KP-180 2 BF31	22 (26)	38,6 (39,4)	410	830
KP-205 K2 F32	30 (36)	54,2 (56,5)	465	830
KP-225 K2 F32	37 (44)	67,0 (70,1)	530	865
KP-225 K2 F32	45 (54)	80,4 (84,6)	525	880



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

- Use the quick selection chart at the beginning of the catalogue or check the data sheets 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 $\eta = 75\%$.
- The duty point is outside the operating range of the AL-1154/4 50 Hz pump.
- Usually when selecting the pump from the 50 Hz curve to the required higher duty point ($Q = 60$ l/s, 25 m), the next largest pump is selected.
In the above example, we choose AL-1202/4, $\varnothing 300$ mm, $P_2N = 30$ kW, $\eta = 67\%$. This is an oversized pump whose best flow range is within 100–120 l/s, where its efficiency is the highest $\eta = 80\%$.
- Select the pump AL-1154/4 from the 60 Hz curve, whereby the impeller is $\varnothing 274$ mm. The nominal motor shaft power P_2N is selected according to the shaft power curve P_2 .
Shaft power $P_2 = 21$ kW and the next higher nominal power is $P_2N = 22$ kW.
In this example, we choose AL-1154/4, $\varnothing 274$ mm, $P_2N = 22$ kW, $\eta = 75\%$.

QH curves are available for 50 Hz and 60 Hz on the same data sheet 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?

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

NPSH and cavitation

$$\text{NPSH}_{re} < \text{NPSH}_{av}$$

$$\text{NPSH}_{re} < p + h - h_{suction} - p_h$$

$$\text{NPSH}_{re} < p_{suction} - p_h$$

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

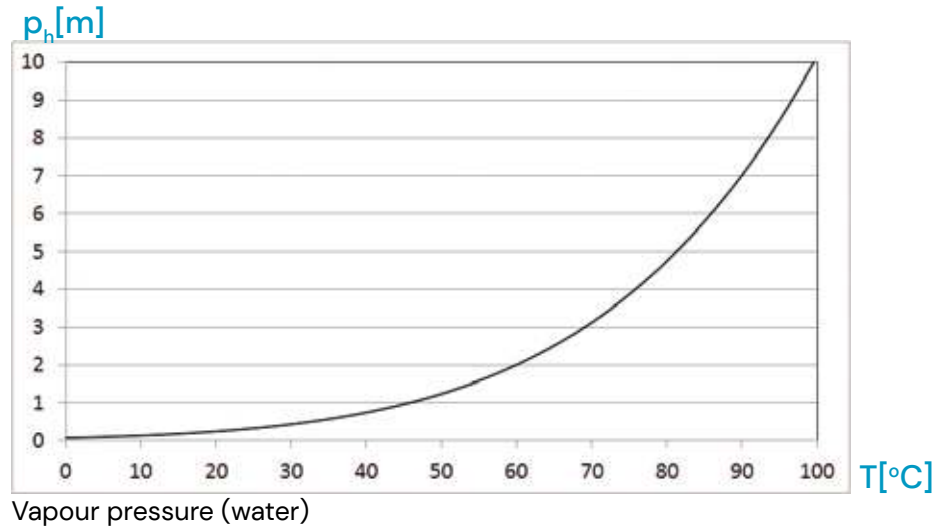
p_h = Absolute liquid vapour pressure at the operating temperature

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.



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 (p_h = 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:

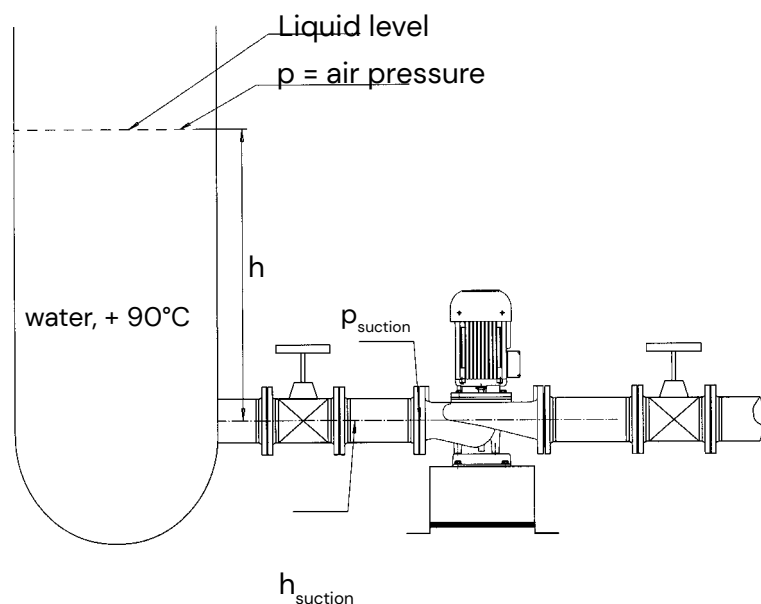
Pump type: AL_-1102/4/Ø188 2,2 kW

$$\text{NPSH}_{re} < p + h - h_{suction} - p_h$$

$$\text{NPSH}_{re} < 10 \text{ m} + 2 \text{ m} - 1 \text{ m} - 7 \text{ m}$$

$$\text{NPSH}_{re} < 4 \text{ m}$$

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.



DATA SHEETS

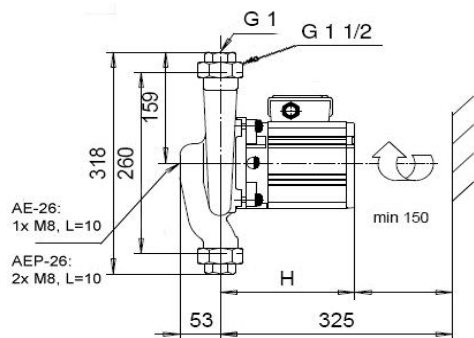
AE_-series, threaded G1-G1¼

L_- , AL_- and AKN_-series, flanged DN32-DN300

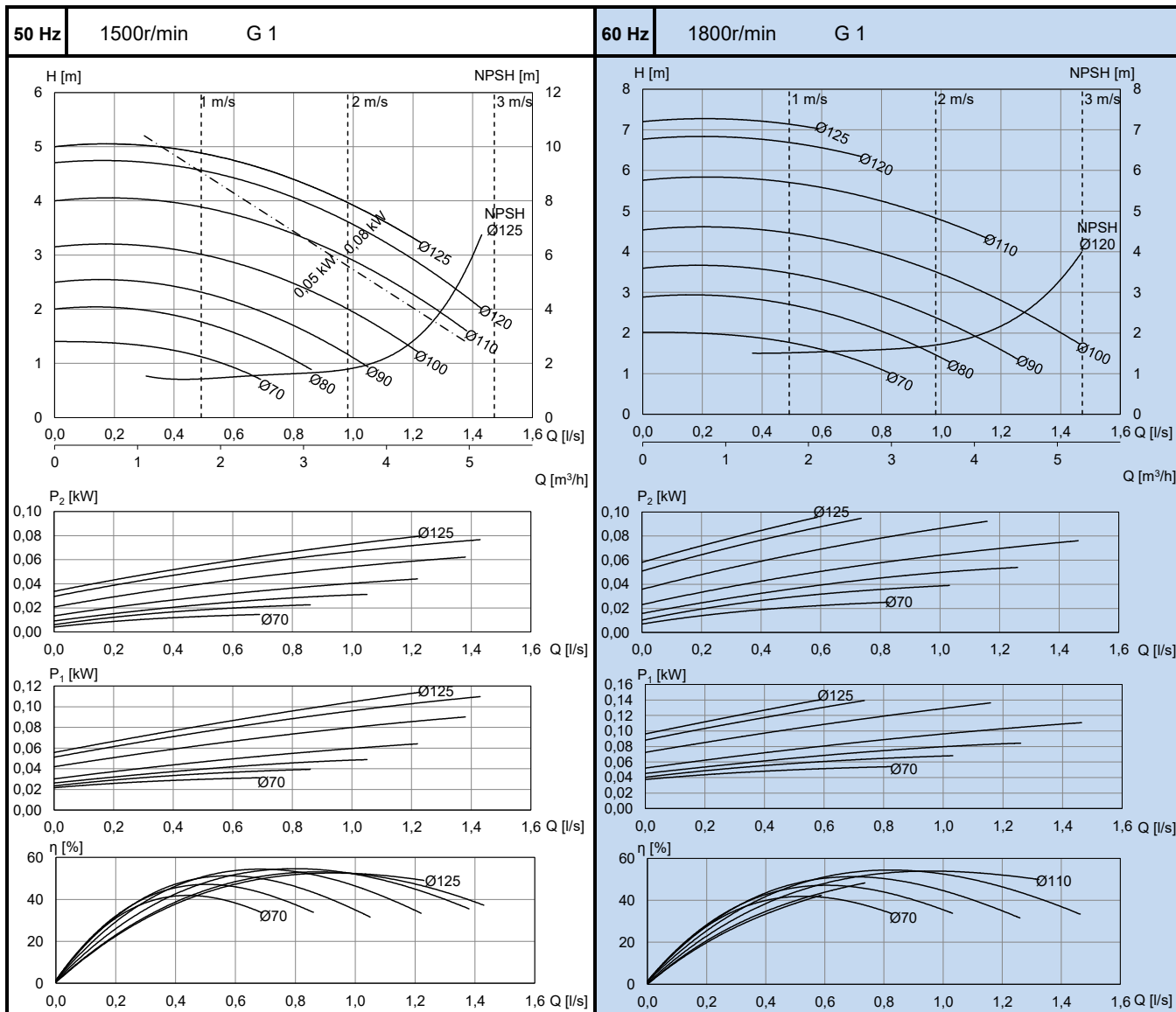
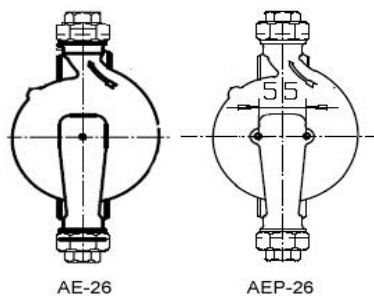


AE-26/4

AEP-26/4

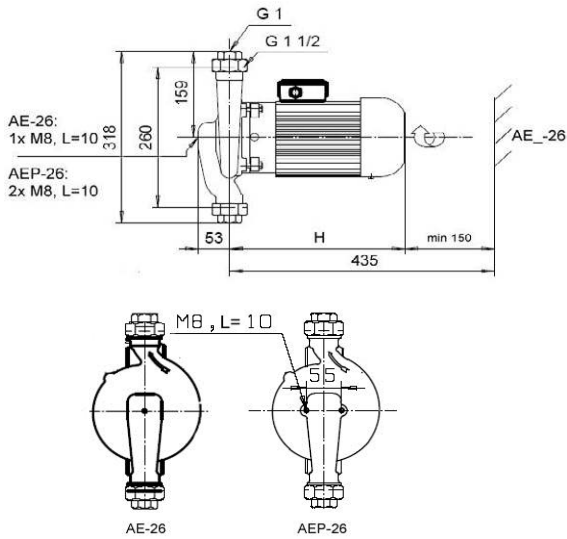


ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-732 B N12	0,05	0,17	9,5	175
	OP-742 N12	0,08	0,23	10,5	175
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-732 B N12	0,05 (0,06)	0,18 (0,18)	9,5	175
	OP-742 N12	0,08 (0,09)	0,23 (0,24)	10,5	175

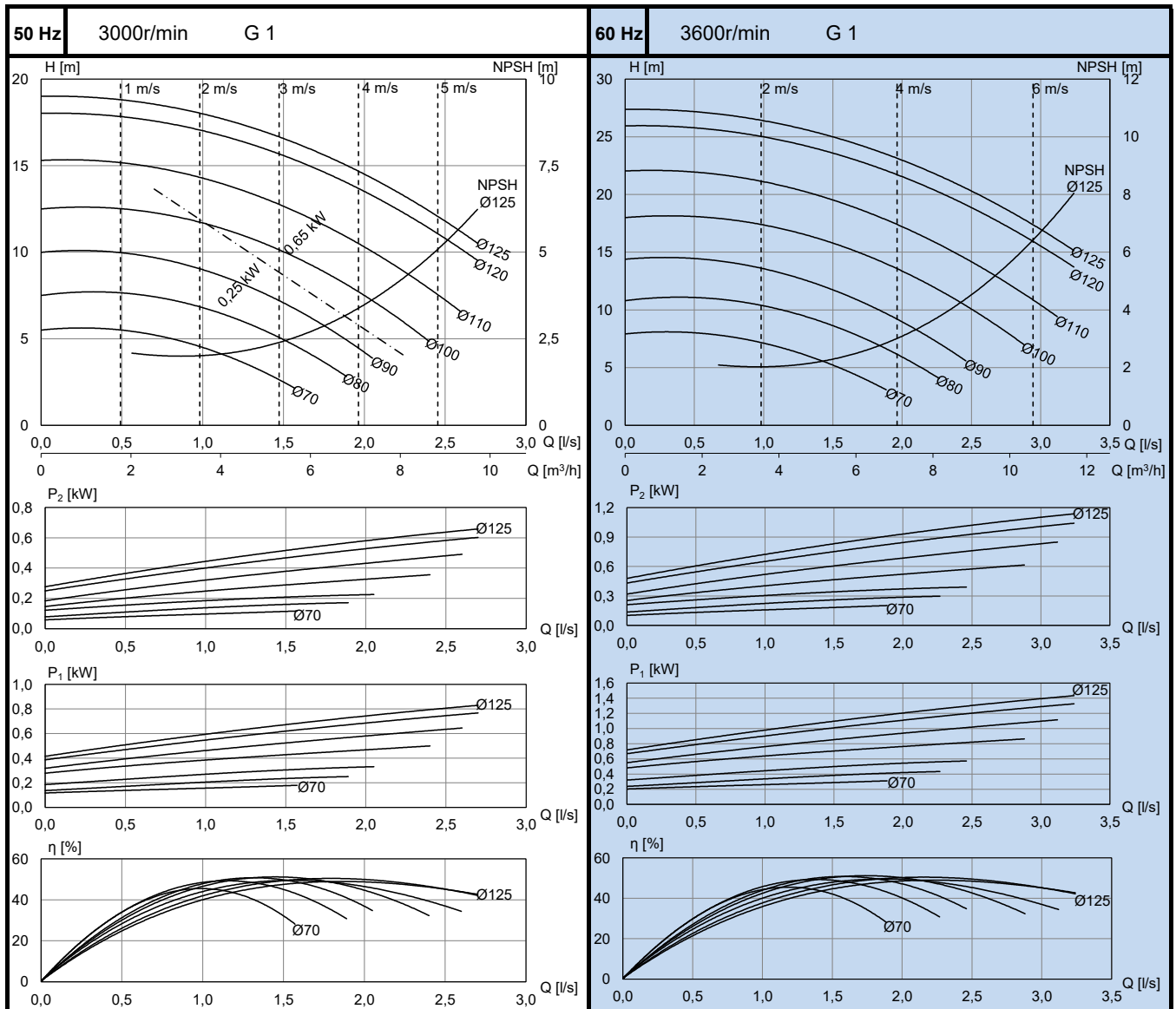


AE-26/2

AEP-26/2

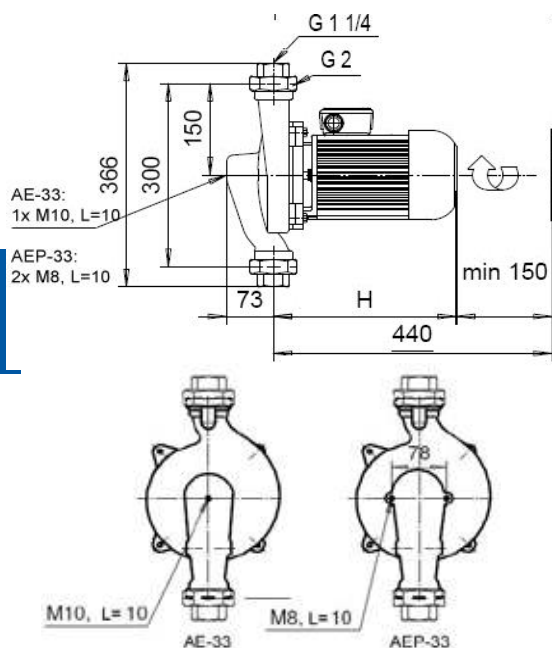


50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-741 N12	0,25	0,66	10,5	215
	KP-80-1 N12	0,65	1,39	18	315
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-741 N12	0,25 (0,3)	0,67 (0,70)	10,5	215
	KP-80-1 N12	0,65 (0,75)	1,45 (1,40)	18	315
	KP-80-1 N12	1,1 (1,3)	2,25 (2,22)	18	315

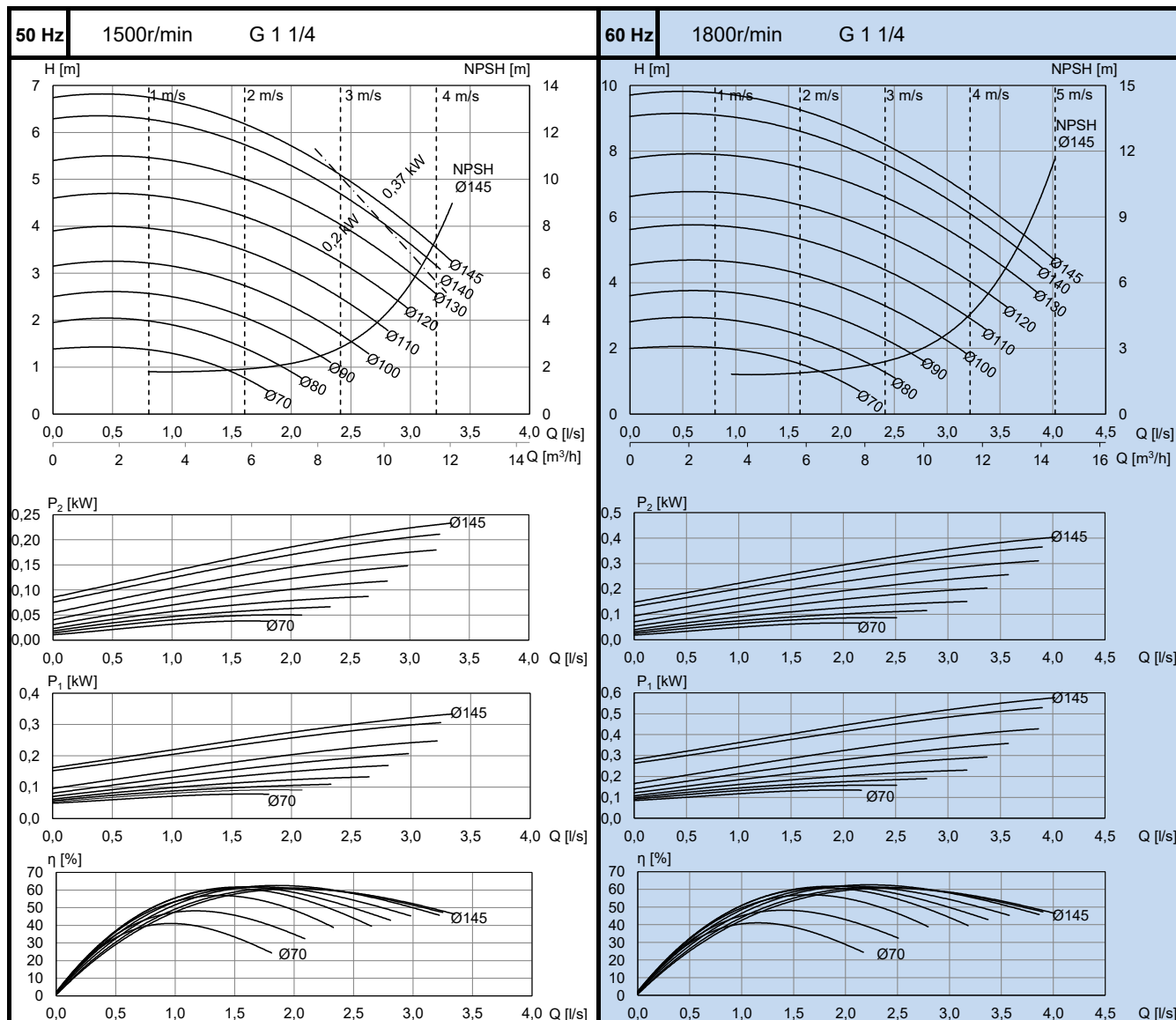


AE-33/4

AEP-33/4

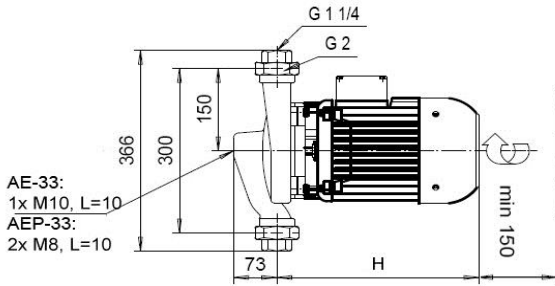


Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
OP-752 N13	0,2	0,57	16	240
OP-772 N13	0,37	1,11	19	280
Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
OP-752 N13	0,2 (0,24)	0,57 (0,60)	16	240
OP-772 N13	0,37 (0,44)	1,11 (1,10)	19	280

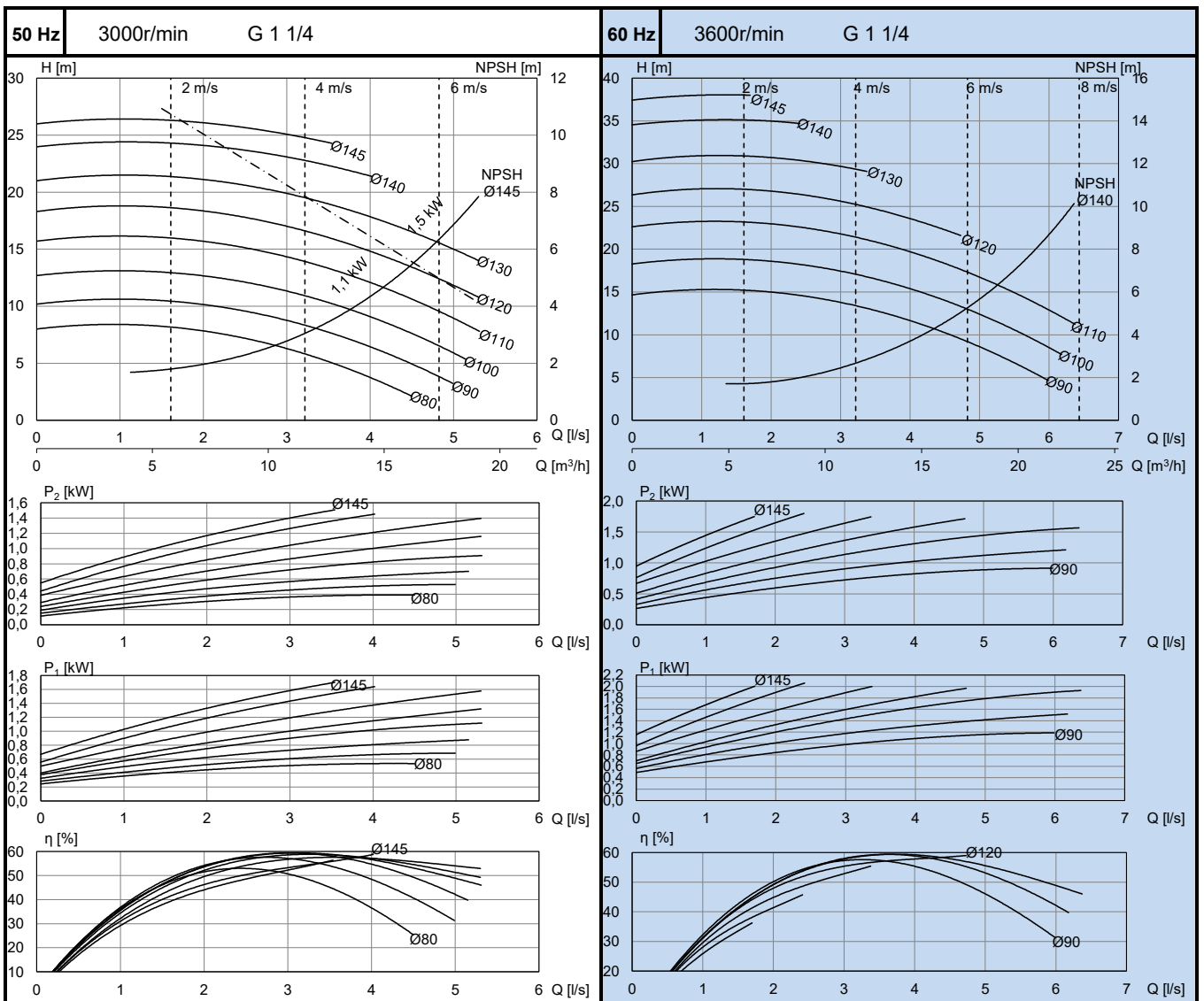
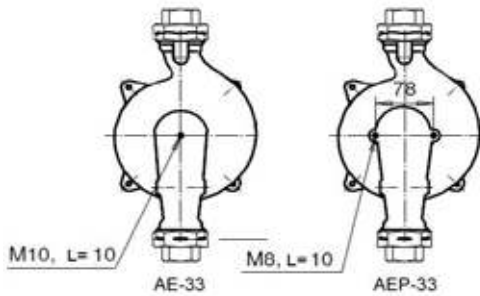


AE-33/2

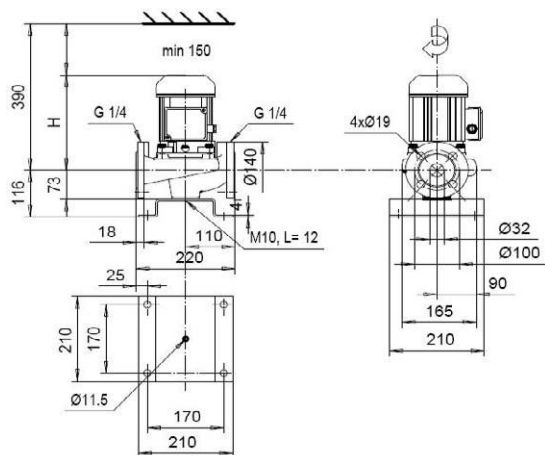
AEP-33/2



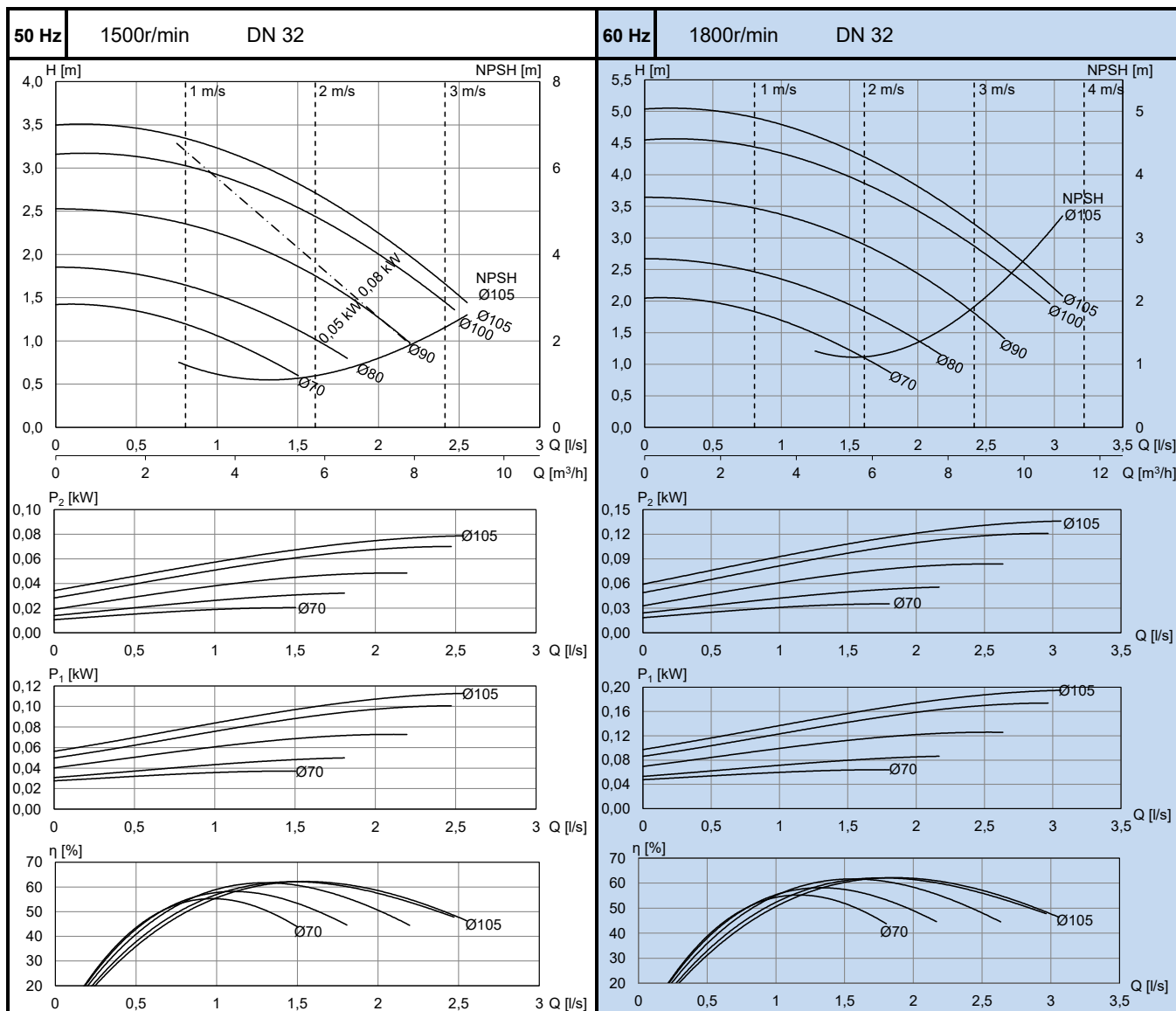
50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-1 N13	1,1	2,16	22	310
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-1 N13	1,1 (1,3)	2,25 (2,22)	22	310
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 N13	1,5 (1,8)	3,22 (3,41)	29	390



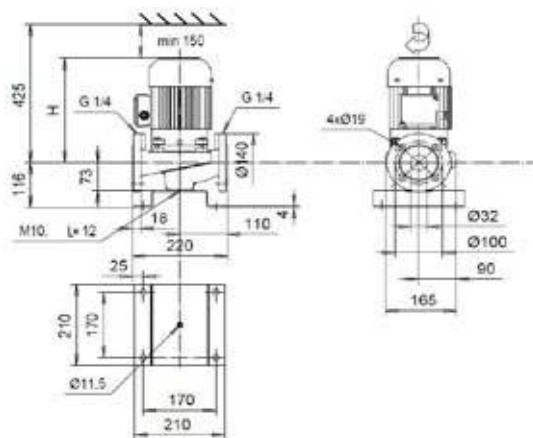
L-32A/4



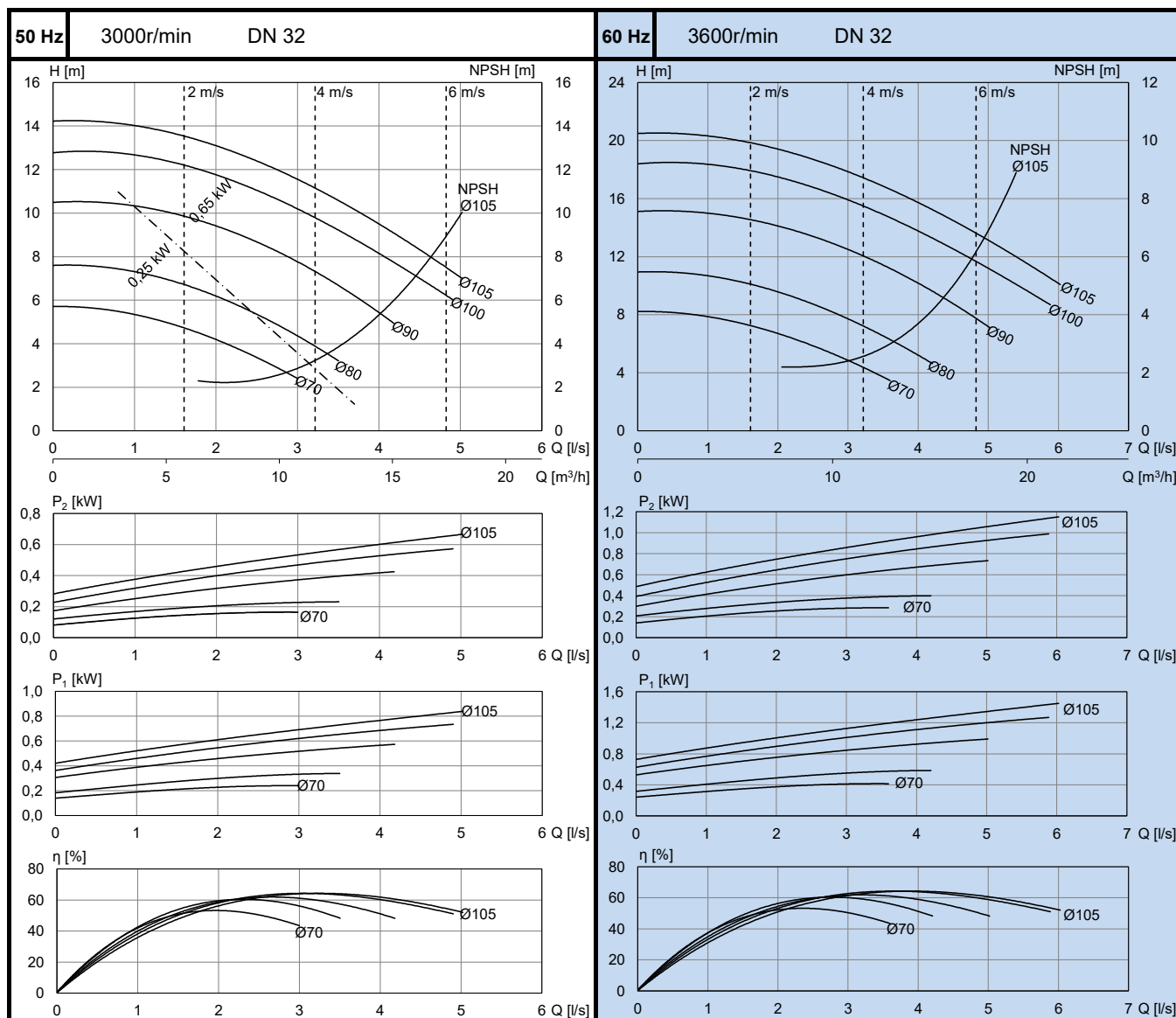
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-732 B N12	0,05	0,17	16	185
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-732 B N12	0,05 (0,06)	0,18 (0,18)	16	185
	OP-742 N12	0,08 (0,09)	0,23 (0,24)	16,5	185
	OP-752 N12	0,2 (0,24)	0,65 (0,65)	19	240



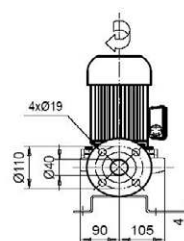
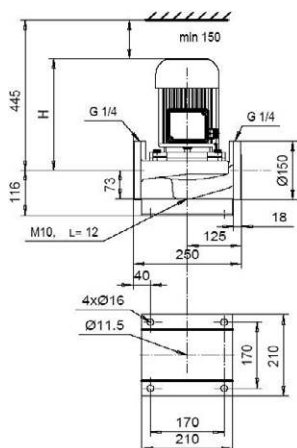
L-32A/2



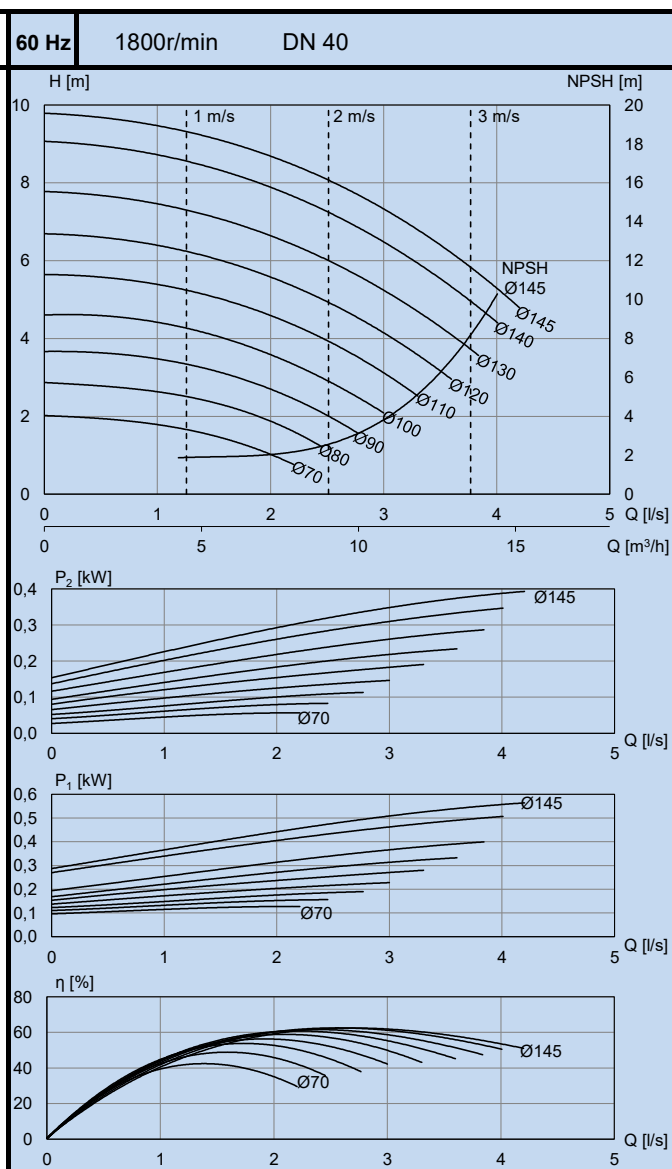
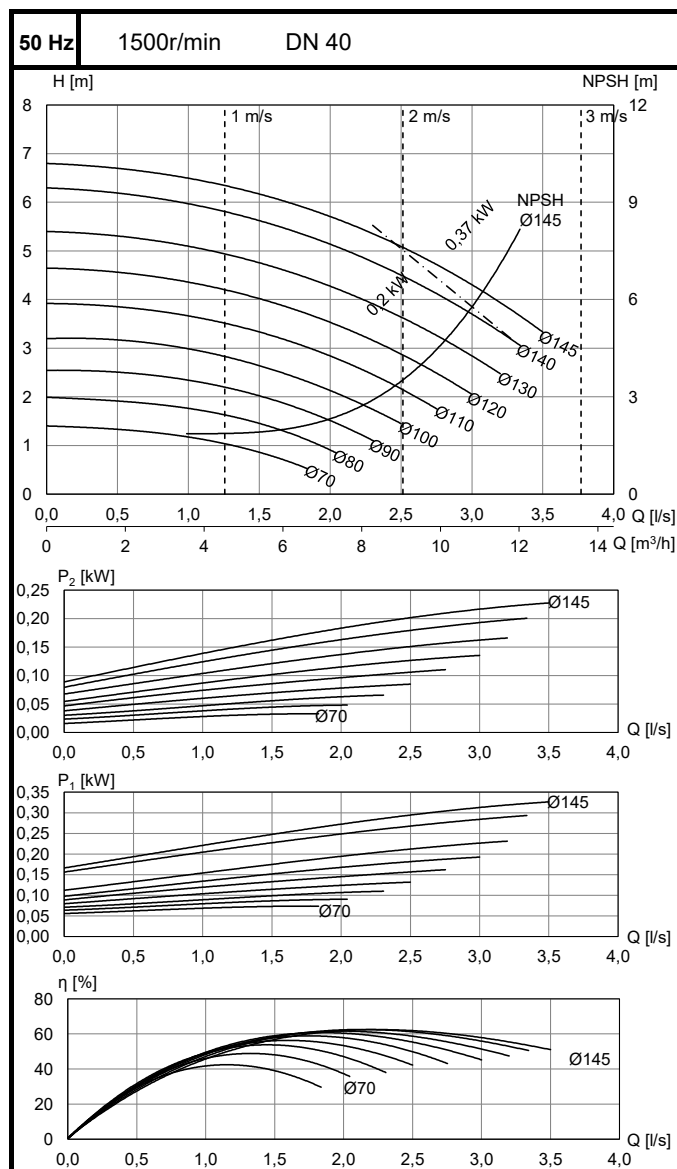
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-741 N12	0,25	0,66	17	225
	KP-80-1 N12	0,65	1,39	21	330
ZH05	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-741 N12	0,25 (0,3)	0,67 (0,70)	17	225
	KP-80-1 N12	0,65 (0,75)	1,45 (1,40)	21	330
	KP-80-1 N12	1,1 (1,3)	2,25 (2,22)	24	330



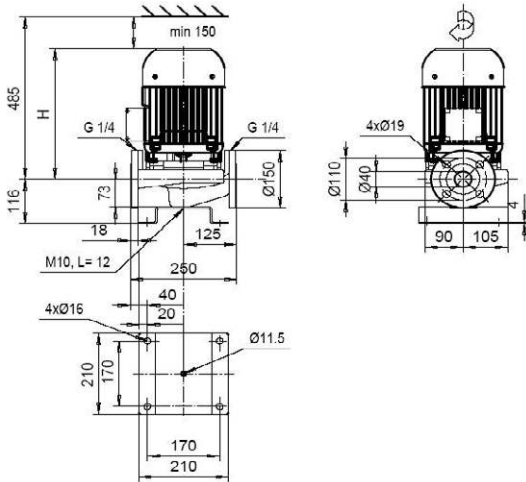
L-40A/4



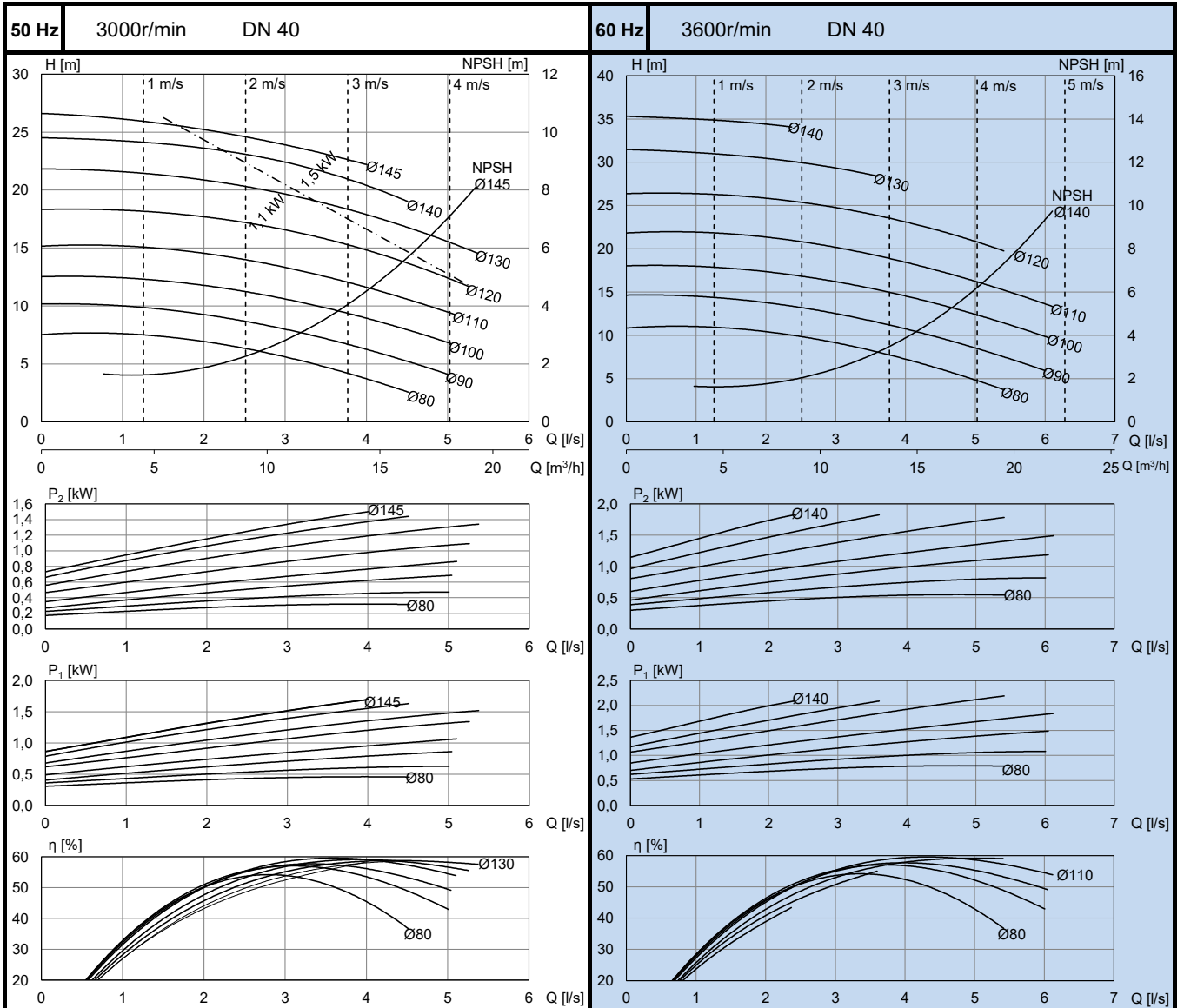
50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 N13	0,2	0,57	21	240
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 N13	0,2 (0,24)	0,57 (0,60)	21	240
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-772 N13	0,37 (0,44)	1,11 (1,10)	24	305



L-40A/2



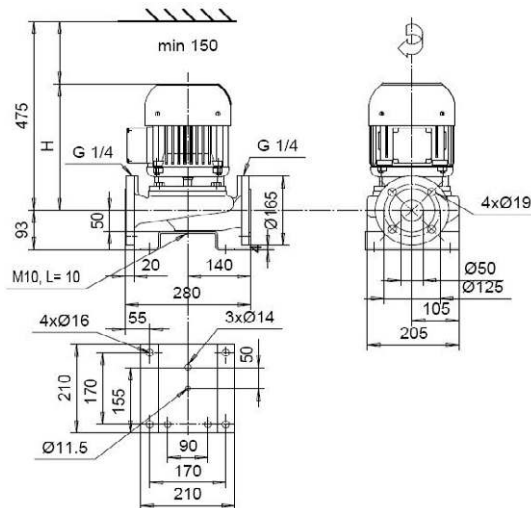
ZHO5	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-1 N13	1,1	2,16	27	310
ZHO9	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-1 N13	1,1 (1,3)	2,25 (2,22)	27	310
ZHO9	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 N13	1,5 (1,8)	3,22 (3,41)	34	390



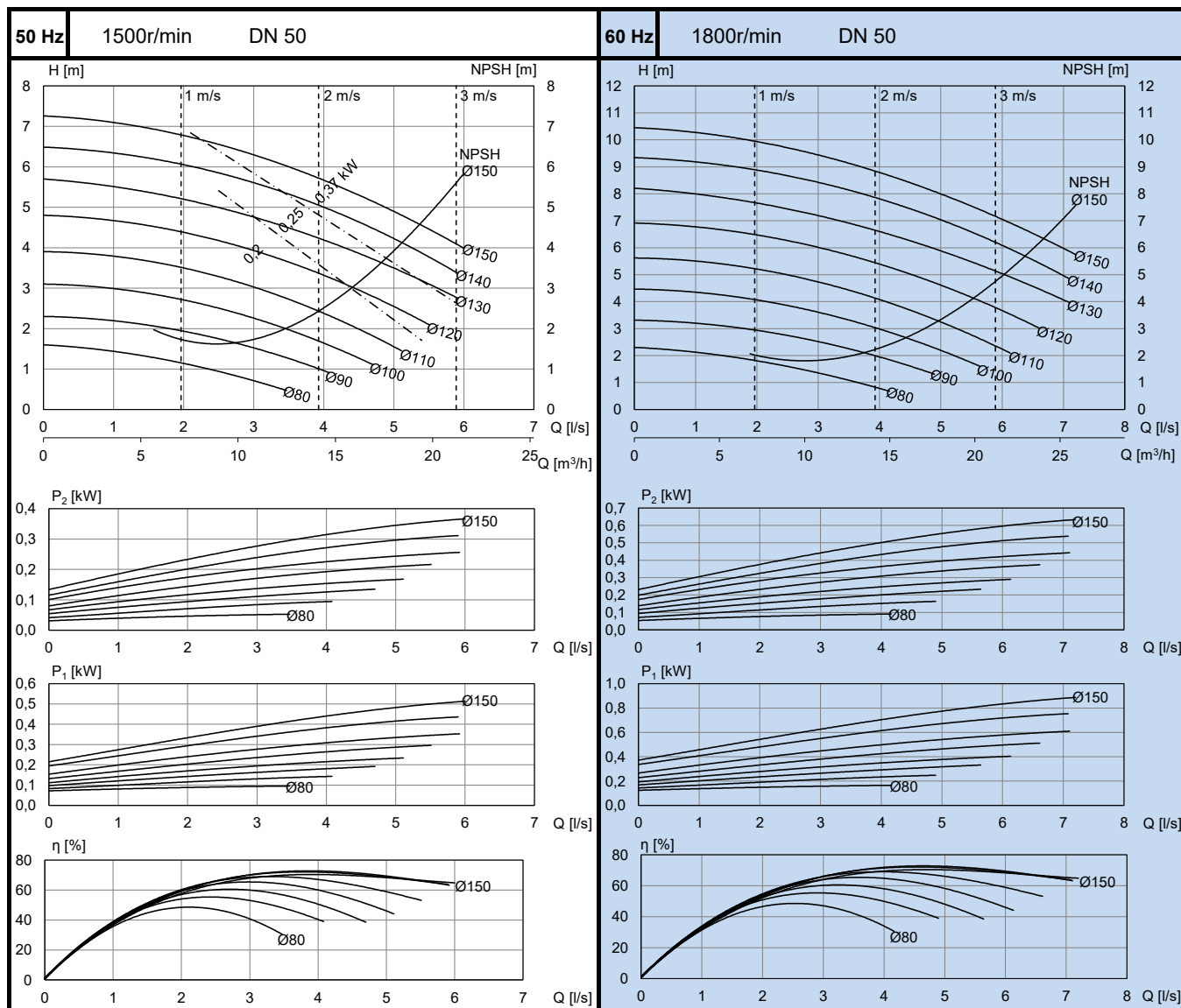
L-50A/4

LH-50A/4

LP-50A/4

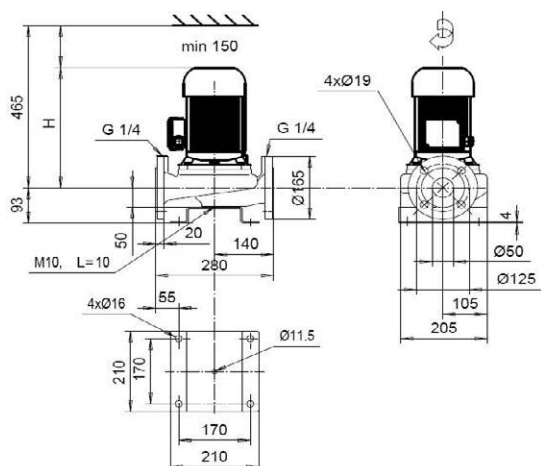


ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 F15	0,2	0,57	23	250
	OP-772 F15	0,25	0,95	25	265
ZH09	OP-772 F15	0,37	1,11	25	265
	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	OP-752 F15	0,2 (0,24)	0,57 (0,60)	23	250
	OP-772 F15	0,25 (0,3)	0,95 (0,94)	25	265
	OP-772 F15	0,37 (0,44)	1,11 (1,10)	25	265
	KP-80-2 F15	0,55 (0,66)	1,42 (1,45)	32	370

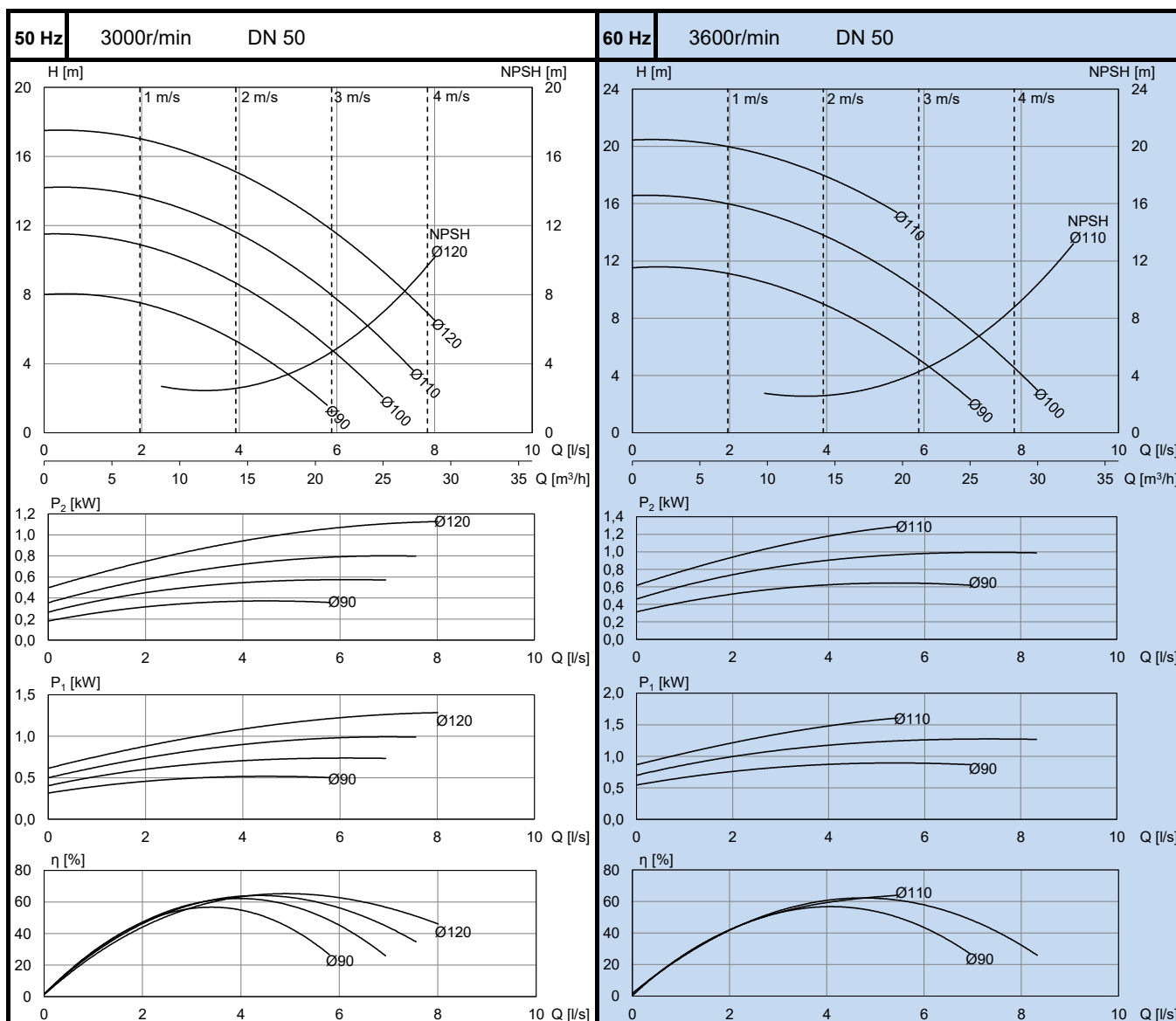


L-50B/2

LP-50B/2



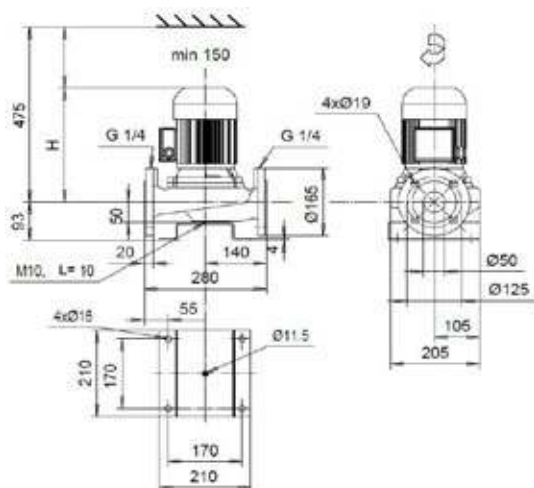
Motor	400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
ZH05	KP-80-1 F15	1,1	2,16	31	330
Motor	380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
ZH09	KP-80-1 F15	1,1 (1,3)	2,25 (2,22)	31	330



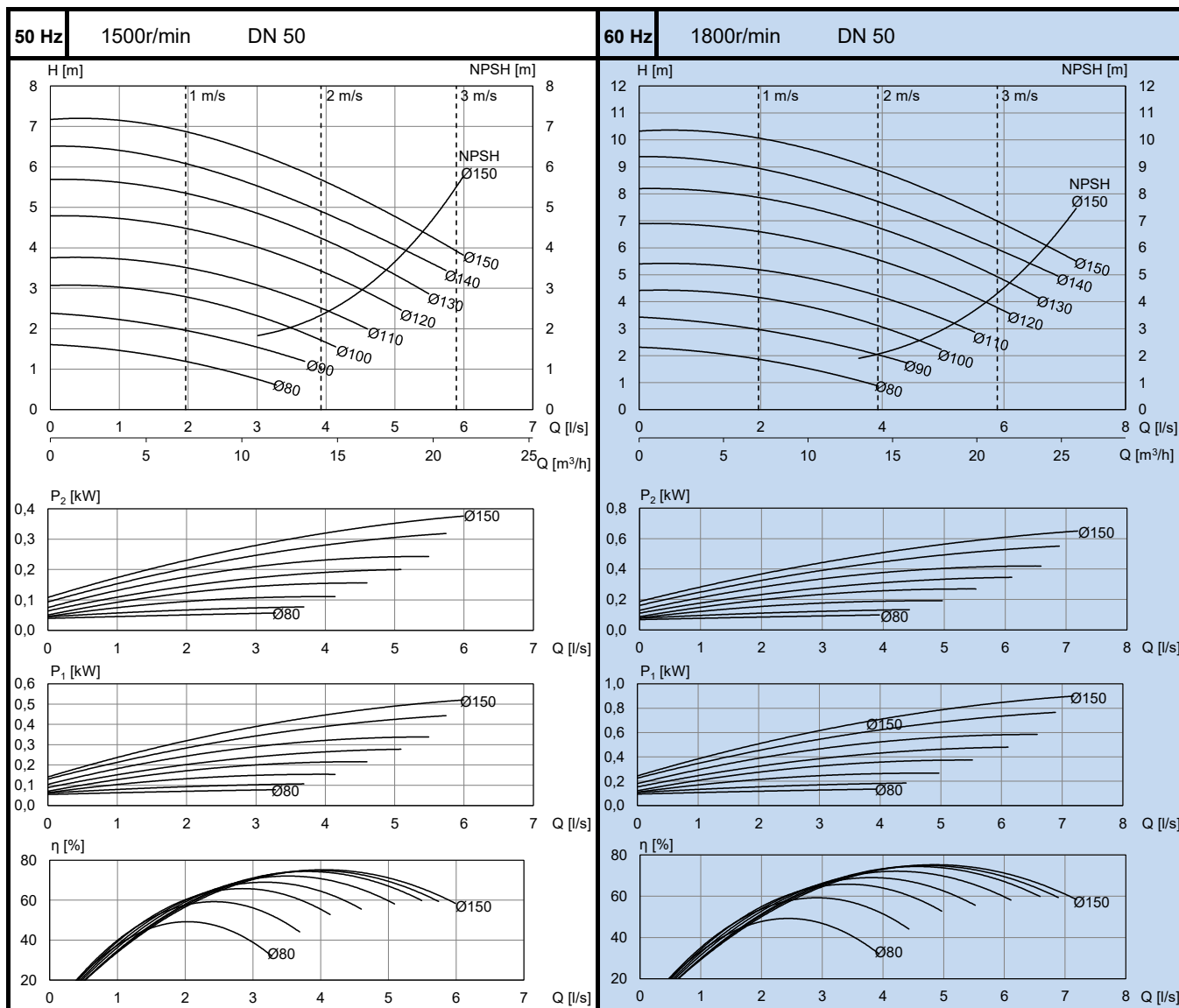
L-50D/4

LH-50D/4

LP-50D/4



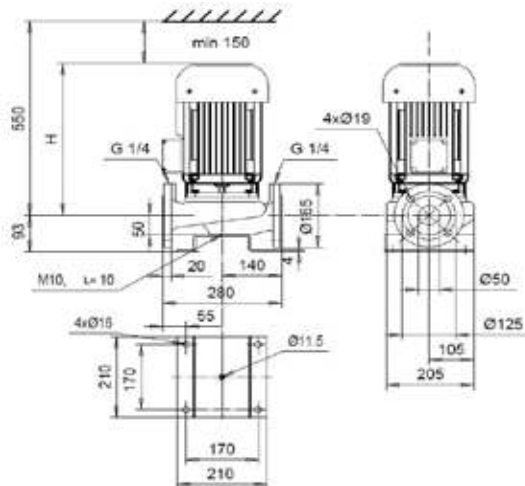
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F16	0,37	1,16	32	370
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F16	0,37 (0,44)	1,15 (1,14)	32	370
	KP-80-2 F16	0,55 (0,66)	1,42 (1,45)	32	370



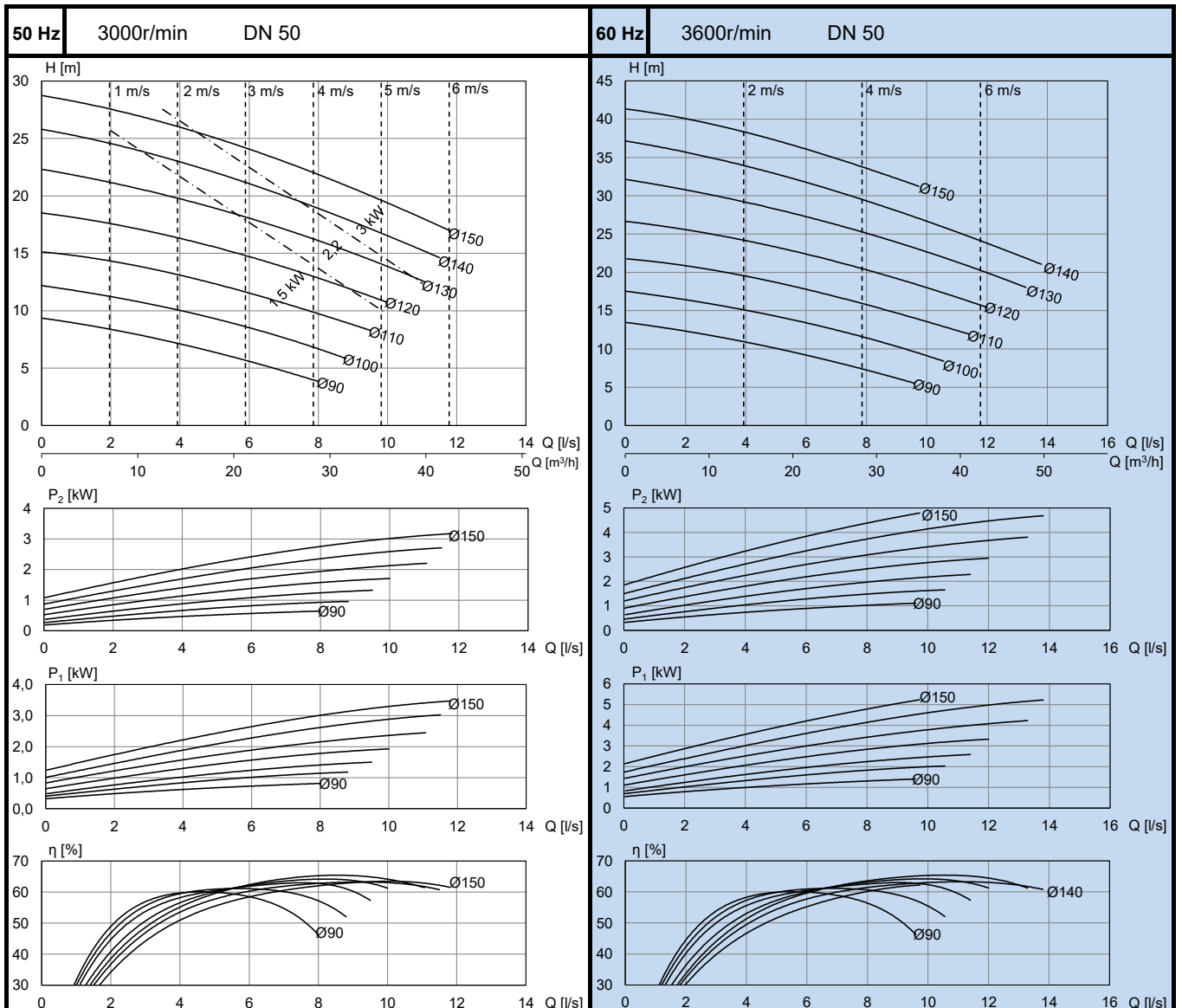
L-50D/2

LH-50D/2

LP-50D/2



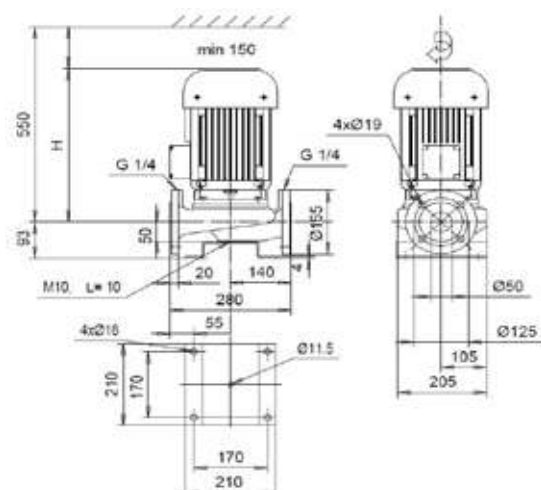
50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F16	1,5	3,22	37	410
	KP-90-1 F16	2,2	4,29	38	410
	KP-100-1 F16	3	5,69	44	460
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F16	1,5 (1,8)	3,22 (3,41)	37	410
	KP-90-1 F16	2,2 (2,6)	4,39 (4,39)	38	410
	KP-100-1 F16	3 (3,6)	5,85 (6,00)	44	460
	KP-112-1 F16	4 (4,8)	7,80 (8,01)	59	460



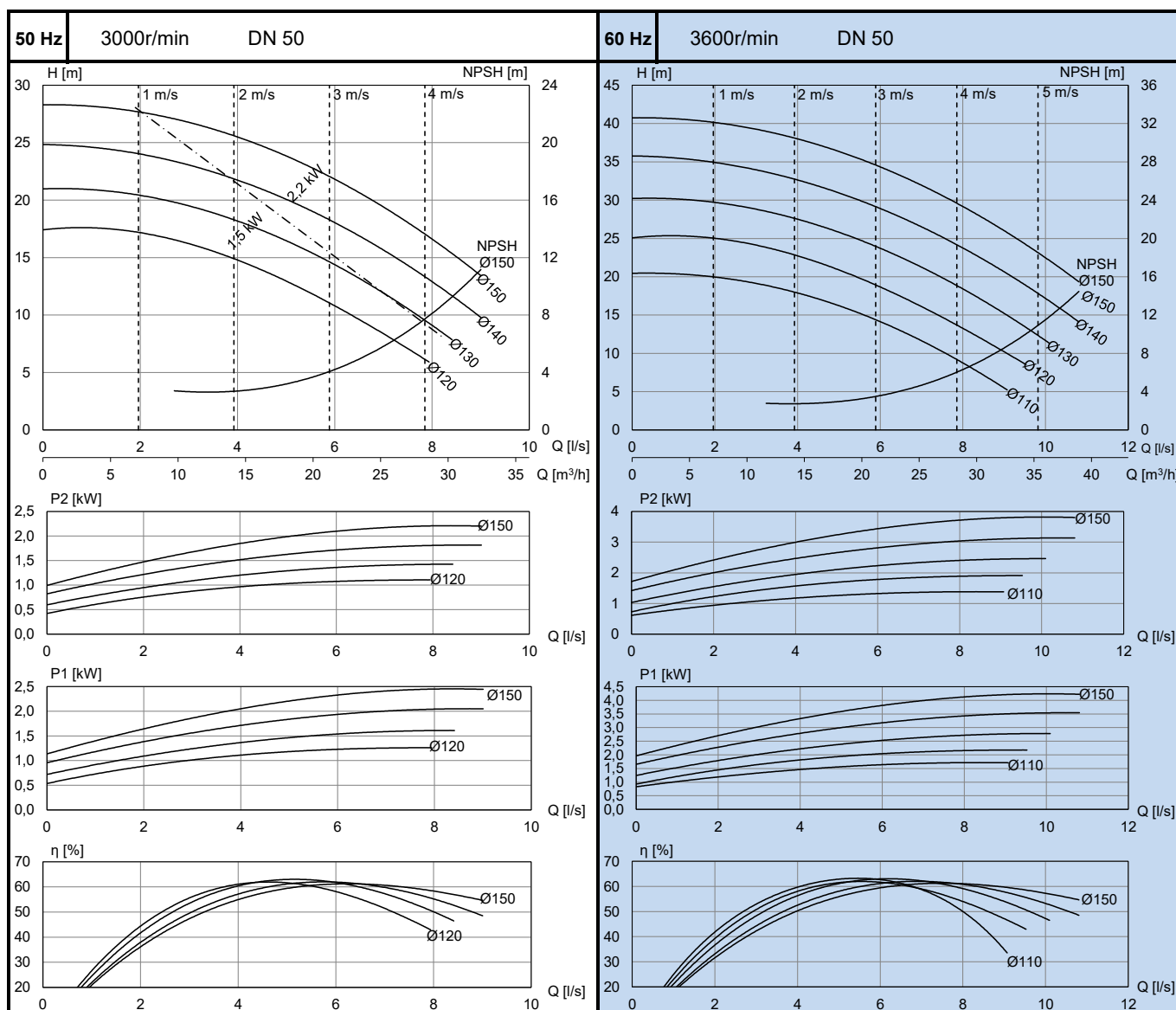
L-50C/2

LH-50C/2

LP-50C/2

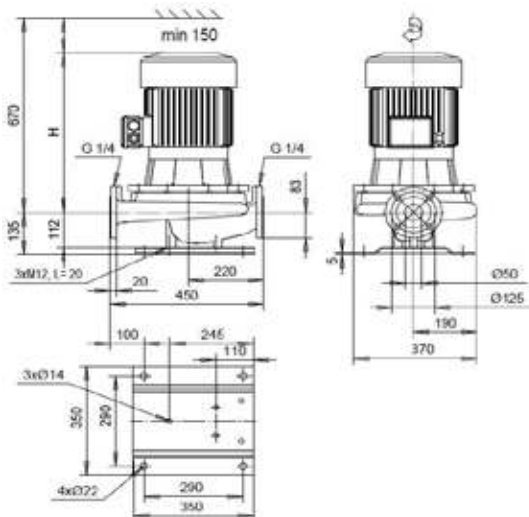


50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F16	1,5	3,22	37	410
400V	KP-90-1 F16	2,2	4,29	38	410
	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F16	1,5 (1,8)	3,22 (3,41)	37	410
	KP-90-1 F16	2,2 (2,6)	4,39 (4,39)	38	410
	KP-100-1 F16	3 (3,6)	5,85 (6,00)	44	460
	KP-112-1 F16	4 (4,8)	7,80 (8,01)	59	450

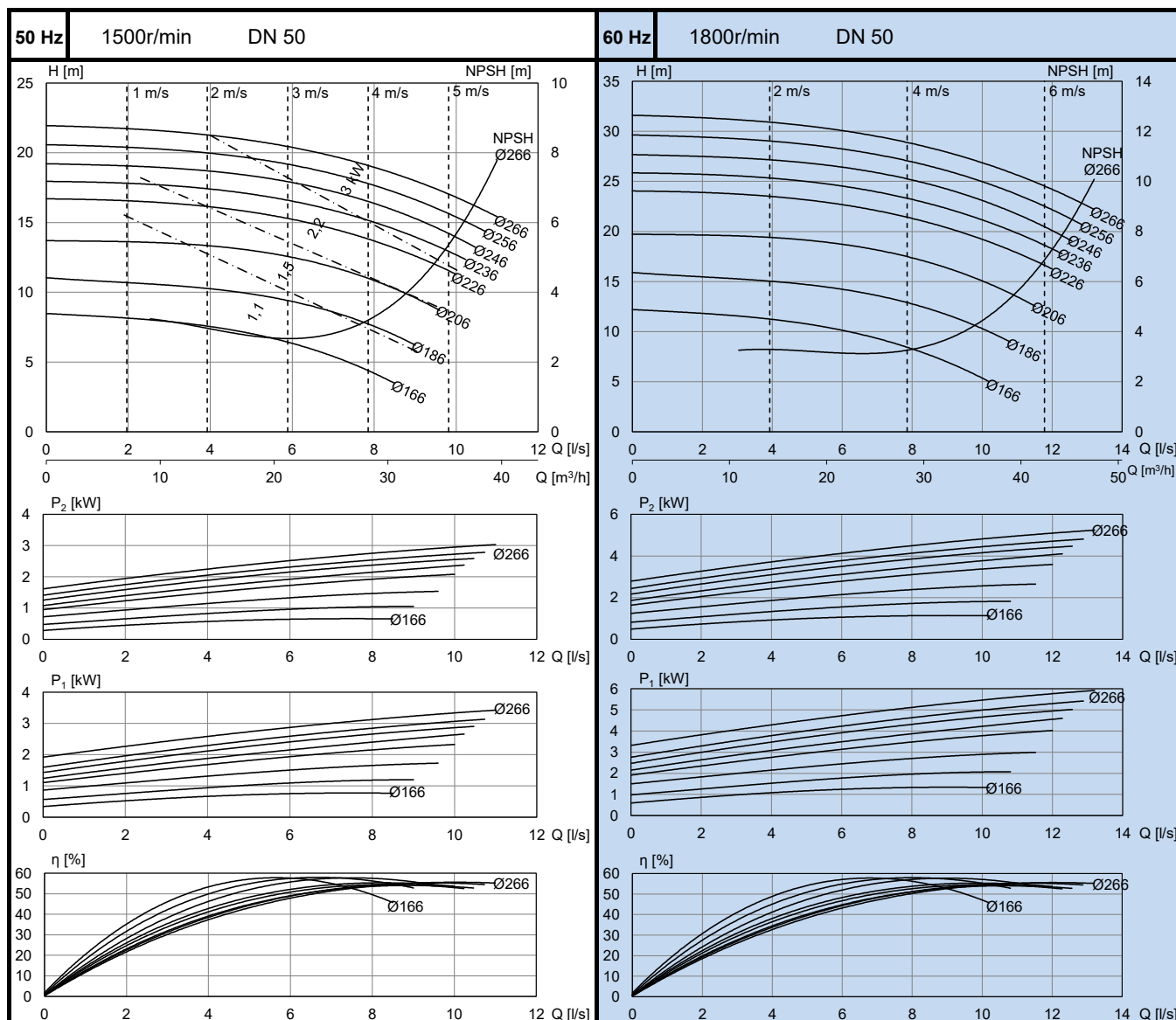


L-50S/4

LH-50S/4

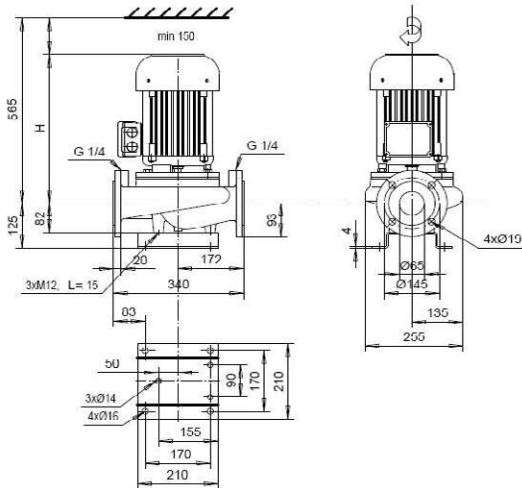


ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 F29	1,1	2,44	84	495
	KP-90-2 F29	1,5	3,19	84	495
	KP-100-2 F29	2,2	4,71	94	535
	KP-100-2 F29	3	5,96	98	535
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 F29	1,1 (1,3)	2,48 (2,53)	84	495
	KP-90-2 F29	1,5 (1,8)	3,29 (3,39)	84	495
	KP-100-2 F29	2,2 (2,6)	4,85 (4,93)	94	535
	KP-100-2 F29	3 (3,6)	6,13 (6,39)	98	535
	KP-112-2 F29	4 (4,8)	8,49 (8,64)	116	500
	KP-133 G2 F29	5,5 (6,6)	10,72 (11,29)	149	565

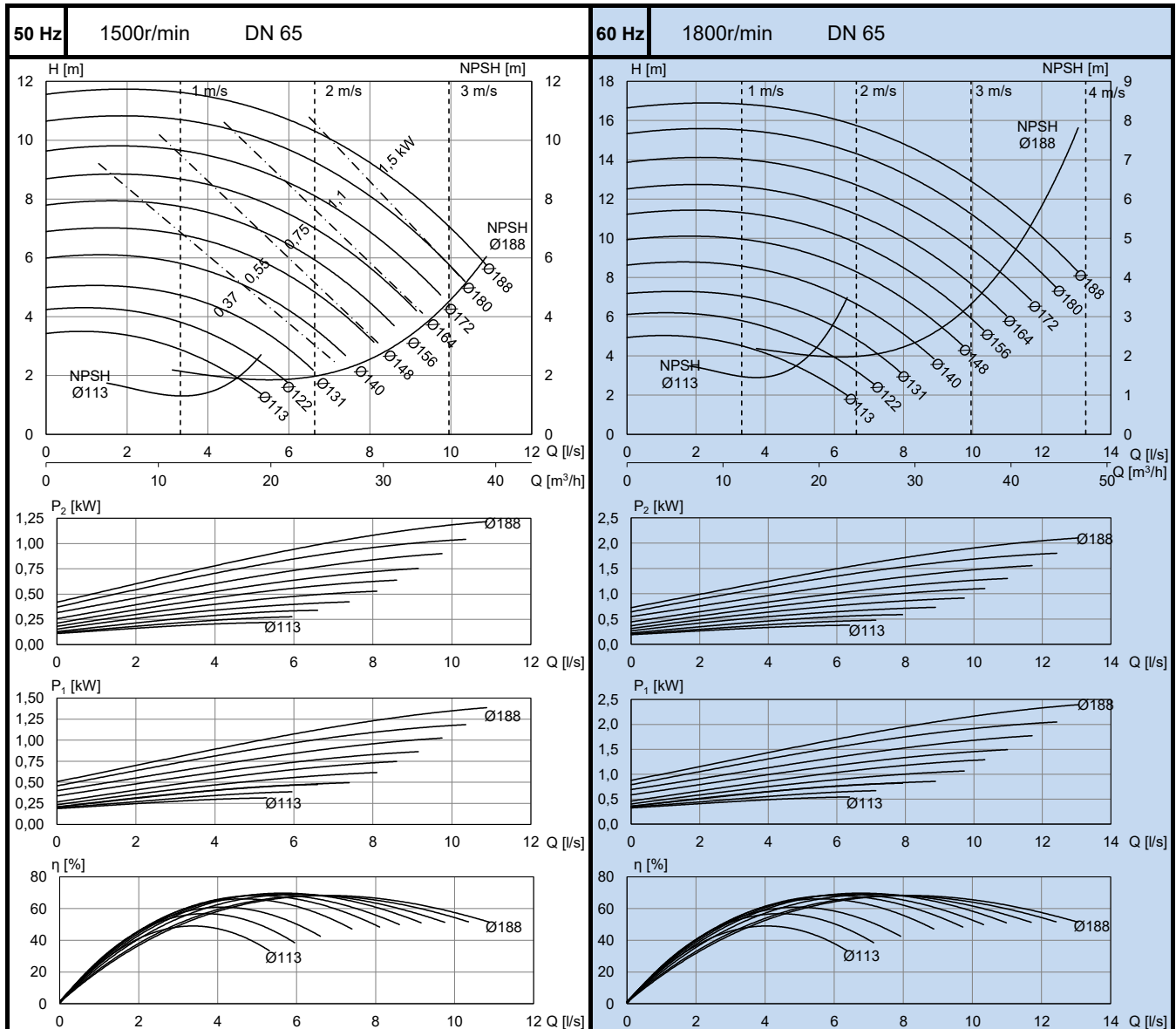


L-65A/4

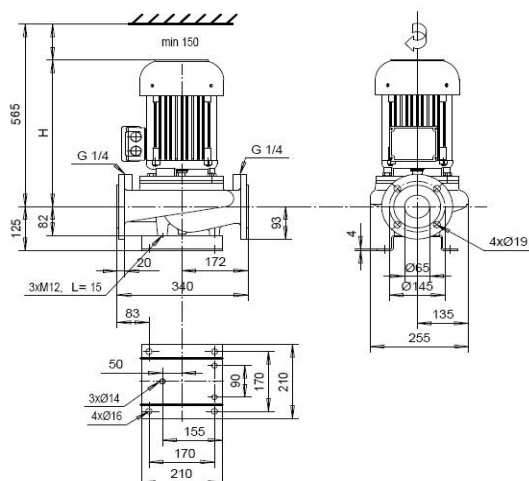
LH-65A/4



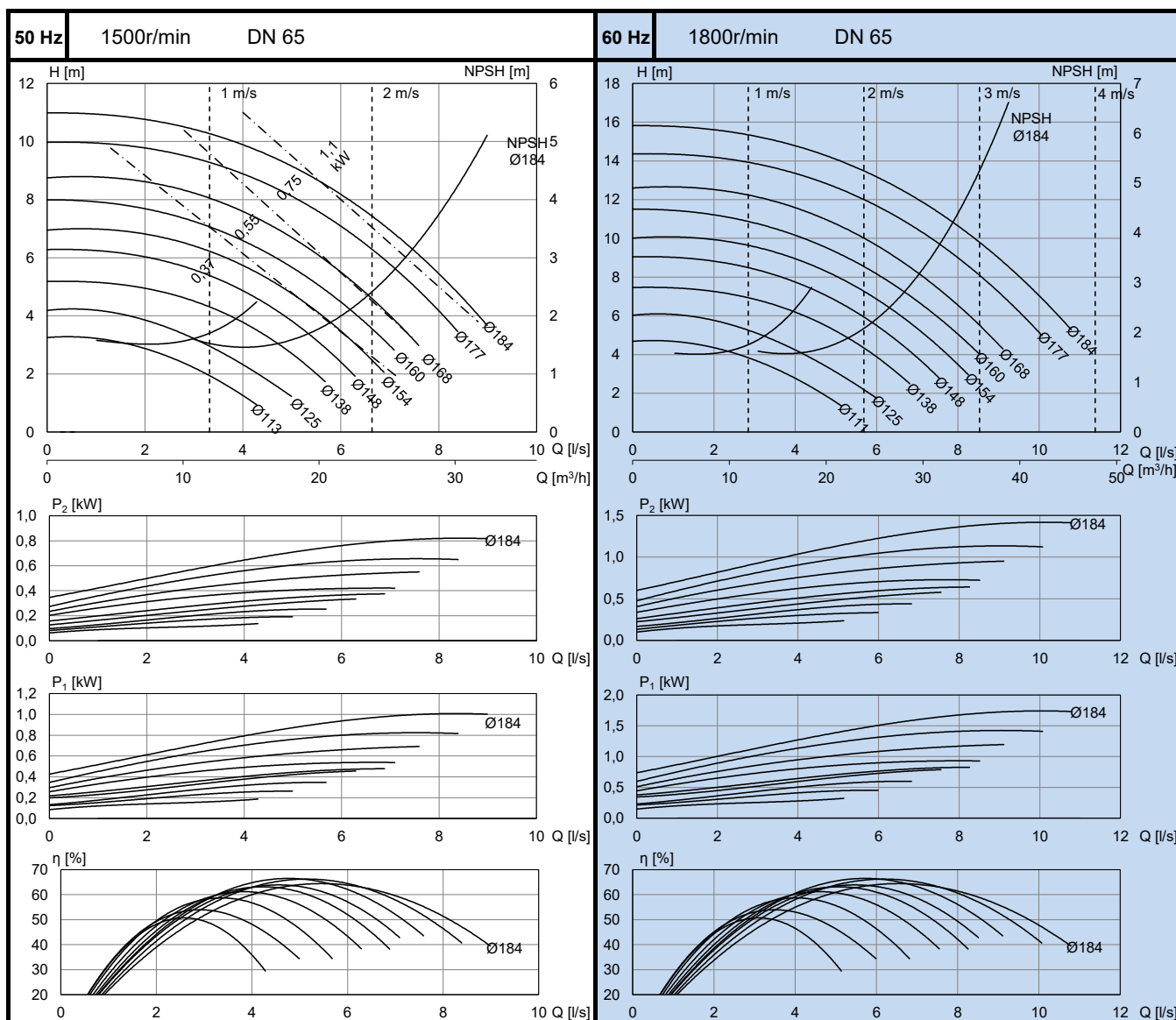
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37	1,16	42	365
	KP-80-2 F19	0,55	1,38	42	365
	KP-80-2 F19	0,75	1,73	42	365
	KP-90-2 F19	1,1	2,44	49	435
	KP-90-2 F19	1,5	3,19	49	435
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,55 (0,66)	1,42 (1,45)	42	365
	KP-80-2 F19	0,75 (0,9)	1,75 (1,80)	42	365
	KP-90-2 F19	1,1 (1,3)	2,48 (2,53)	49	435
	KP-90-2 F19	1,5 (1,8)	3,29 (3,39)	49	435
	KP-100-2 F19	2,2 (2,6)	4,85 (4,93)	59	475
	KP-100-2 F19	3 (3,6)	6,13 (6,39)	62	475



LS-65B/4



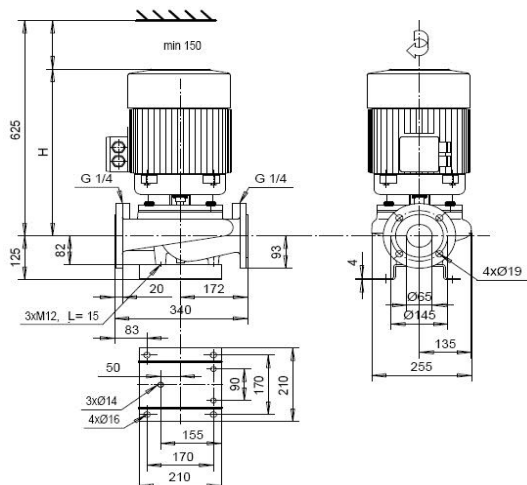
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37	1,16	37	310
	KP-80-2 F19	0,55	1,38	41	365
	KP-80-2 F19	0,75	1,73	41	365
	KP-90-2 F19	1,1	2,44	47	435
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37 (0,44)	1,15 (1,14)	37	310
	KP-80-2 F19	0,55 (0,66)	1,42 (1,45)	41	365
	KP-80-2 F19	0,75 (0,9)	1,75 (1,80)	41	365
	KP-90-2 F19	1,1 (1,3)	2,48 (2,53)	47	435



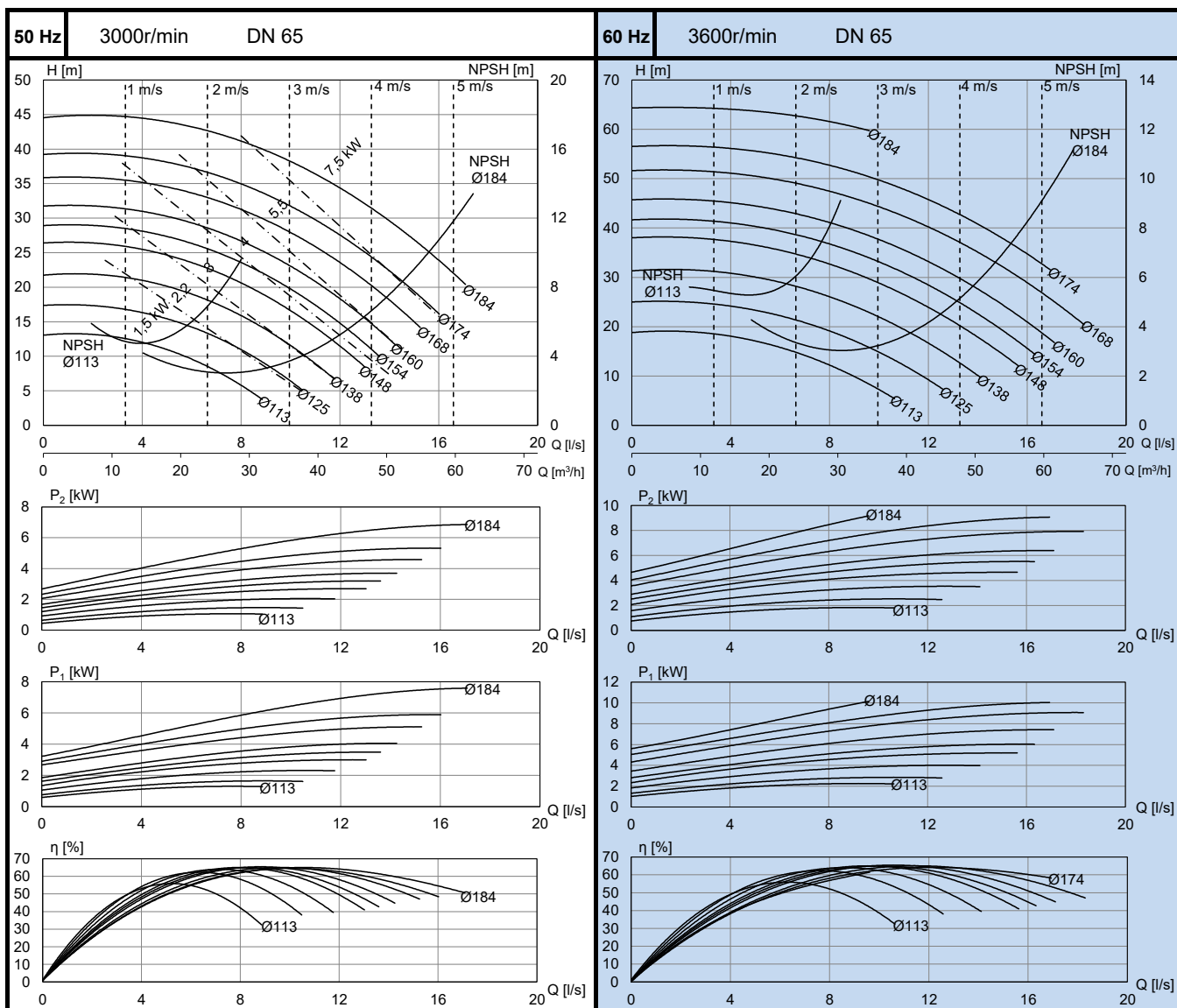
L-65B/2

LH-65B/2

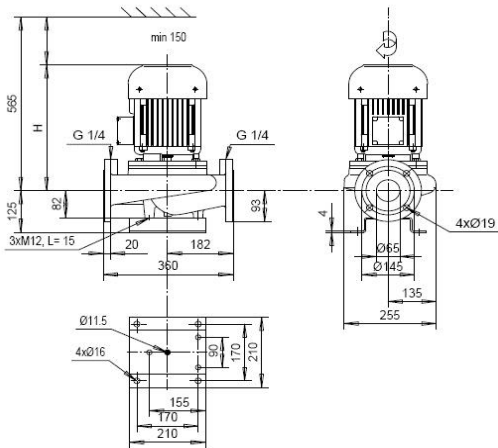
LS-65B/2



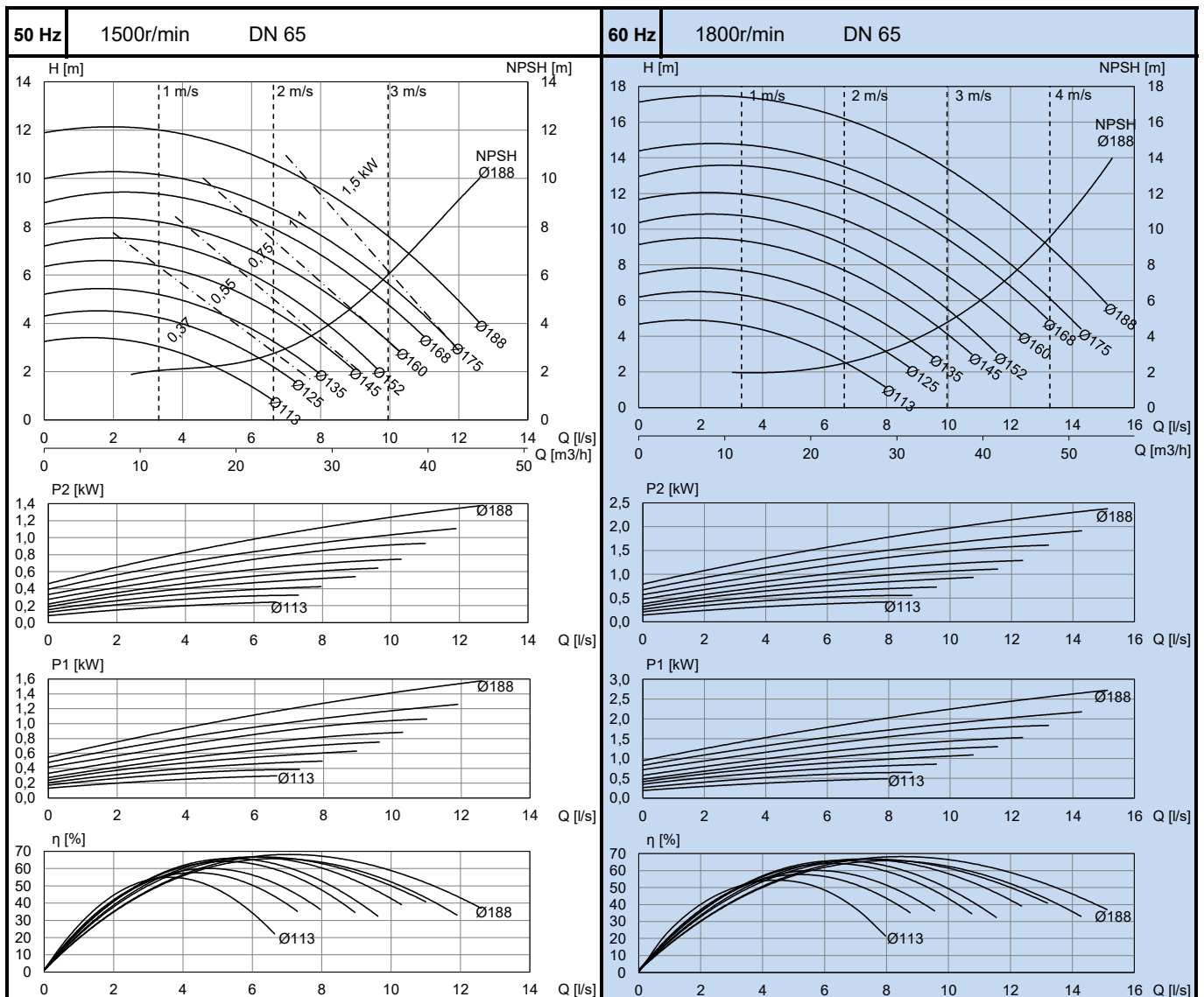
	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F19	1,5	3,22	47	425
ZH09	KP-90-1 F19	2,2	4,29	47	425
	KP-100-1 F19	3,0	5,69	53	475
	KP-112-1 F19	4,0	7,53	68	465
	KP-132 E1 F19	5,5	10,22	94	475
	KP-132 E1 F19	7,5	13,27	94	475
	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F19	1,5 (1,8)	3,22 (3,41)	47	425
ZH09	KP-90-1 F19	2,2 (2,6)	4,39 (4,39)	47	425
	KP-100-1 F19	3 (3,6)	5,85 (6,00)	53	475
	KP-112-1 F19	4 (4,8)	7,80 (8,01)	68	465
	KP-132 E1 F19	5,5 (6,6)	10,38 (10,80)	94	475
	KP-132 E1 F19	7,5 (9)	13,19 (13,91)	94	475



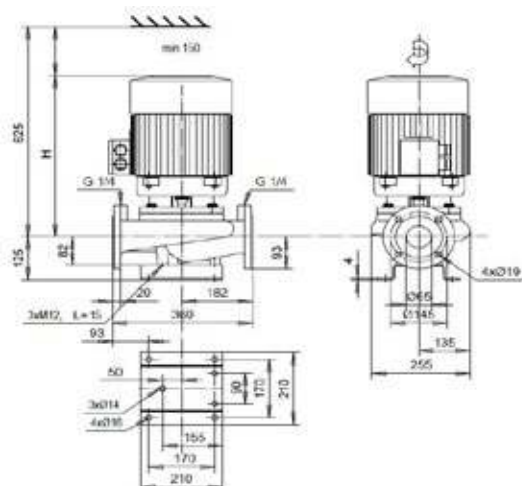
ALP-1066/4



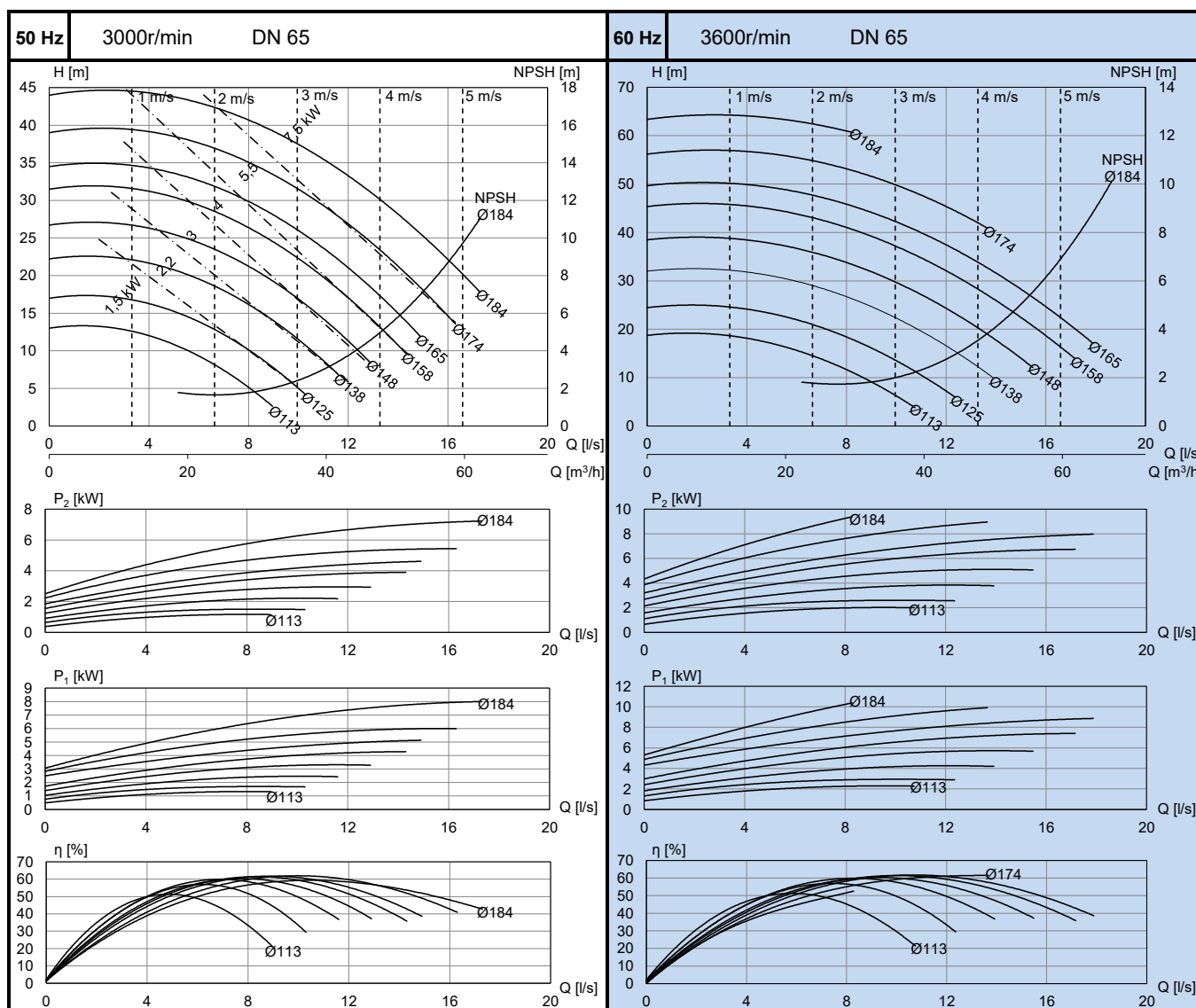
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37	1,16	41	355
	KP-80-2 F19	0,55	1,38	41	365
	KP-80-2 F19	0,75	1,73	41	365
	KP-90-2 F19	1,1	2,44	47	435
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37 (0,44)	1,15 (1,14)	41	355
	KP-80-2 F19	0,55 (0,66)	1,42 (1,45)	41	365
	KP-80-2 F19	0,75 (0,9)	1,75 (1,80)	41	365
	KP-90-2 F19	1,1 (1,3)	2,48 (2,53)	47	435
	KP-90-2 F19	1,5 (1,8)	3,29 (3,39)	47	435
	KP-100-2 F19	2,2 (2,6)	4,85 (4,93)	62	475
	KP-100-2 F19	3 (3,6)	6,13 (6,39)	62	475



ALP-1065/2



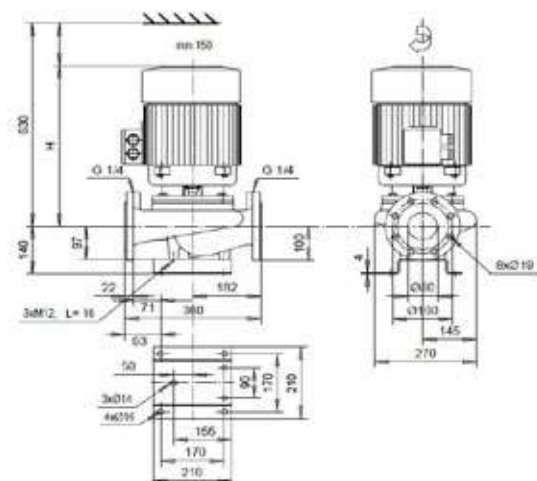
50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F19	1,5	3,22	48	425
	KP-90-1 F19	2,2	4,29	47	425
	KP-100-1 F19	3	5,69	53	475
	KP-112-1 F19	4	7,53	67	465
	KP-132 E1 F19	5,5	10,22	86	475
ZHO9	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F19	2,2 (2,6)	4,39 (4,39)	47	425
	KP-100-1 F19	3 (3,6)	5,85 (6,00)	53	475
	KP-112-1 F19	4 (4,8)	7,80 (8,01)	67	465
	KP-132 E1 F19	5,5 (6,6)	10,38 (10,80)	86	475
	KP-132 E1 F19	7,5 (9)	13,19 (13,91)	94	475



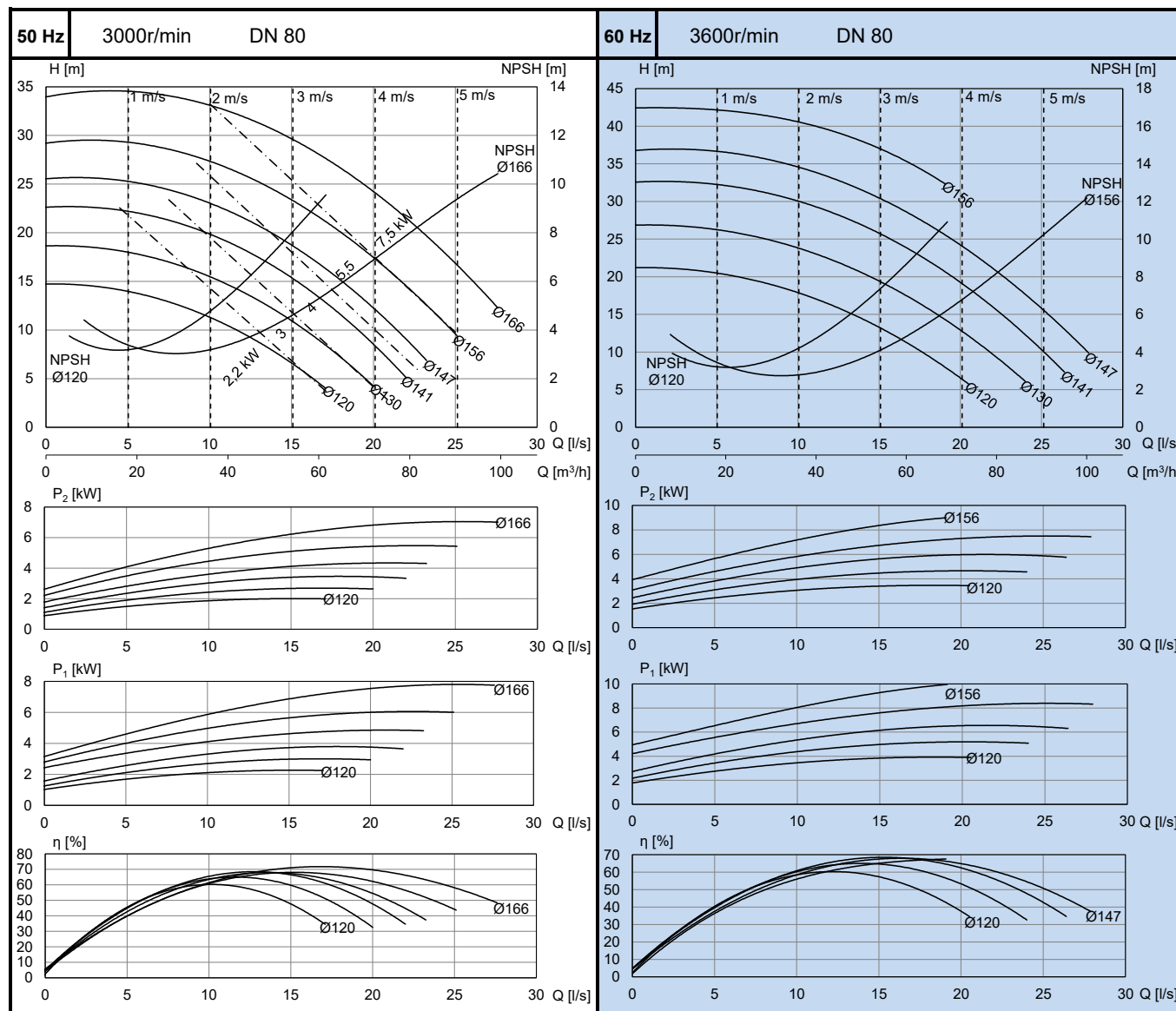
L-80A/2

LH-80A/2

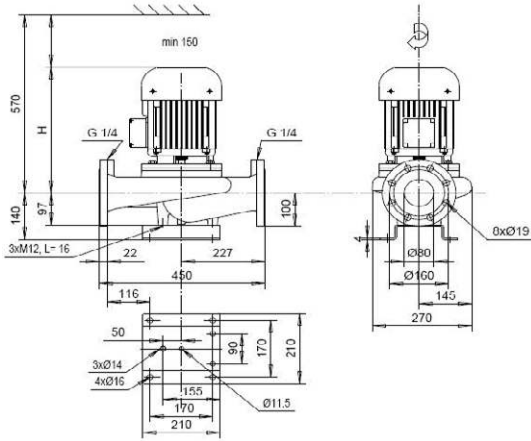
LS-80A/2



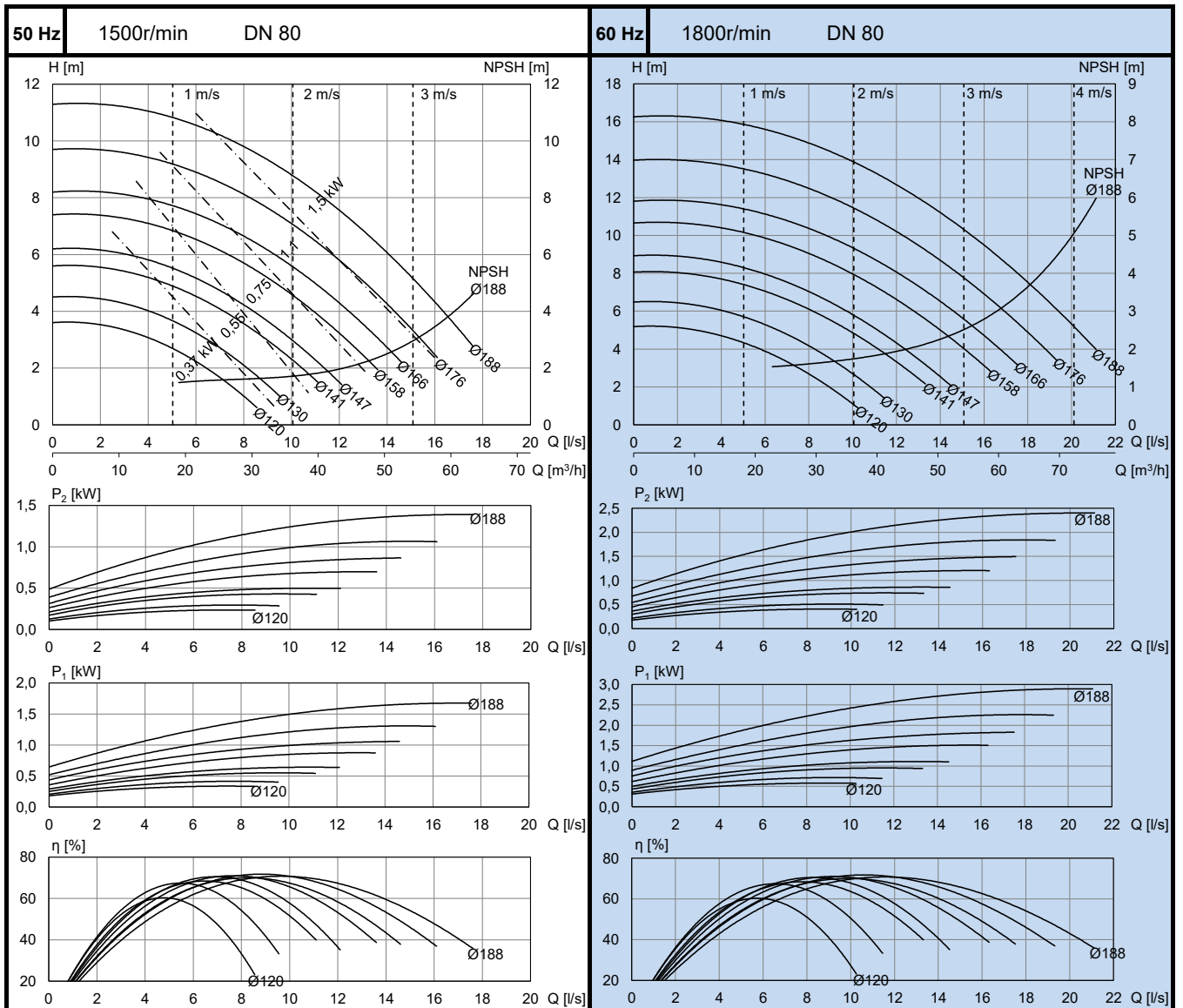
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F19	2,2	4,29	49	430
	KP-100-1 F19	3	5,69	55	480
	KP-112-1 F19	4	7,53	69	470
	KP-132 E1 F19	5,5	10,2	96	480
	KP-132 E1 F19	7,5	13,27	96	480
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-100-1 F19	3 (3,6)	5,85 (6,00)	55	480
	KP-112-1 F19	4 (4,8)	7,8 (8,0)	69	470
	KP-132 E1 F19	5,5 (6,6)	10,38 (10,80)	96	480
	KP-132 E1 F19	7,5 (9)	13,19 (13,91)	96	480



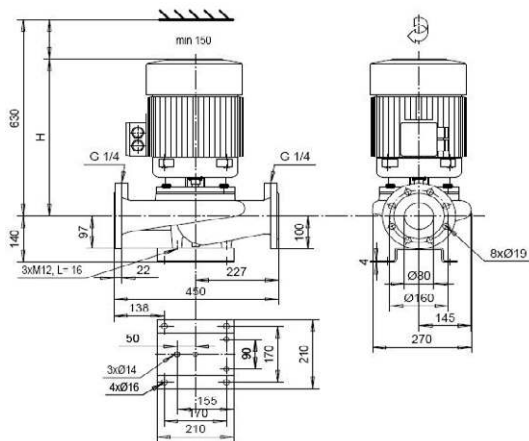
ALS-1081/4



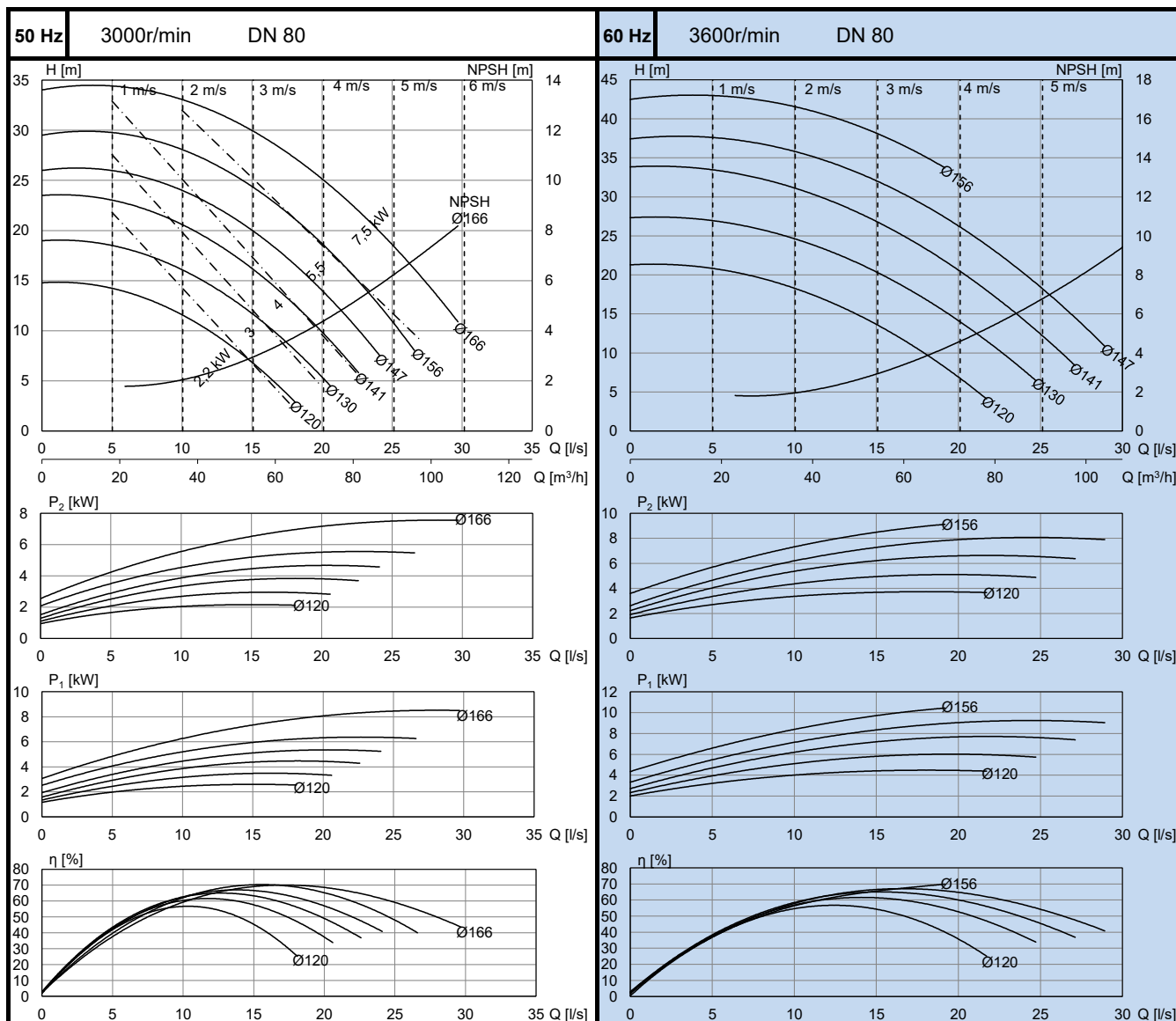
ZH09	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37	1,16	43	355
	KP-80-2 F19	0,55	1,38	47	370
	KP-80-2 F19	0,75	1,73	47	370
	KP-90-2 F19	1,1	2,44	53	440
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,37 (0,44)	1,15 (1,14)	43	355
	KP-80-2 F19	0,55 (0,66)	1,42 (1,45)	47	370
	KP-80-2 F19	0,75 (0,9)	1,75 (1,80)	47	370
	KP-90-2 F19	1,1 (1,3)	2,48 (2,53)	53	440
	KP-90-2 F19	1,5 (1,8)	3,29 (3,39)	58	375
	KP-100-2 F19	2,2 (2,6)	4,85 (4,93)	65	480
	KP-100-2 F19	3 (3,6)	6,13 (6,39)	68	480



ALS-1081/2

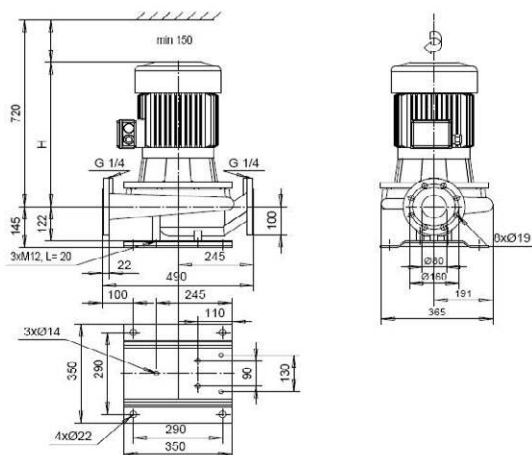


ZH09	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-1 F19	2,2	4,29	53	430
	KP-100-1 F19	3	5,69	59	480
	KP-112-1 F19	4	7,53	73	470
	KP-132 E1 F19	5,5	10,22	92	480
	KP-132 E1 F19	7,5	13,27	99	480
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-100-1 F19	3 (3,6)	5,85 (6,00)	59	480
	KP-112-1 F19	4 (4,8)	7,80 (8,01)	73	470
	KP-132 E1 F19	5,5 (6,6)	10,38 (10,80)	92	480
	KP-132 E1 F19	7,5 (9)	13,19 (13,91)	99	480

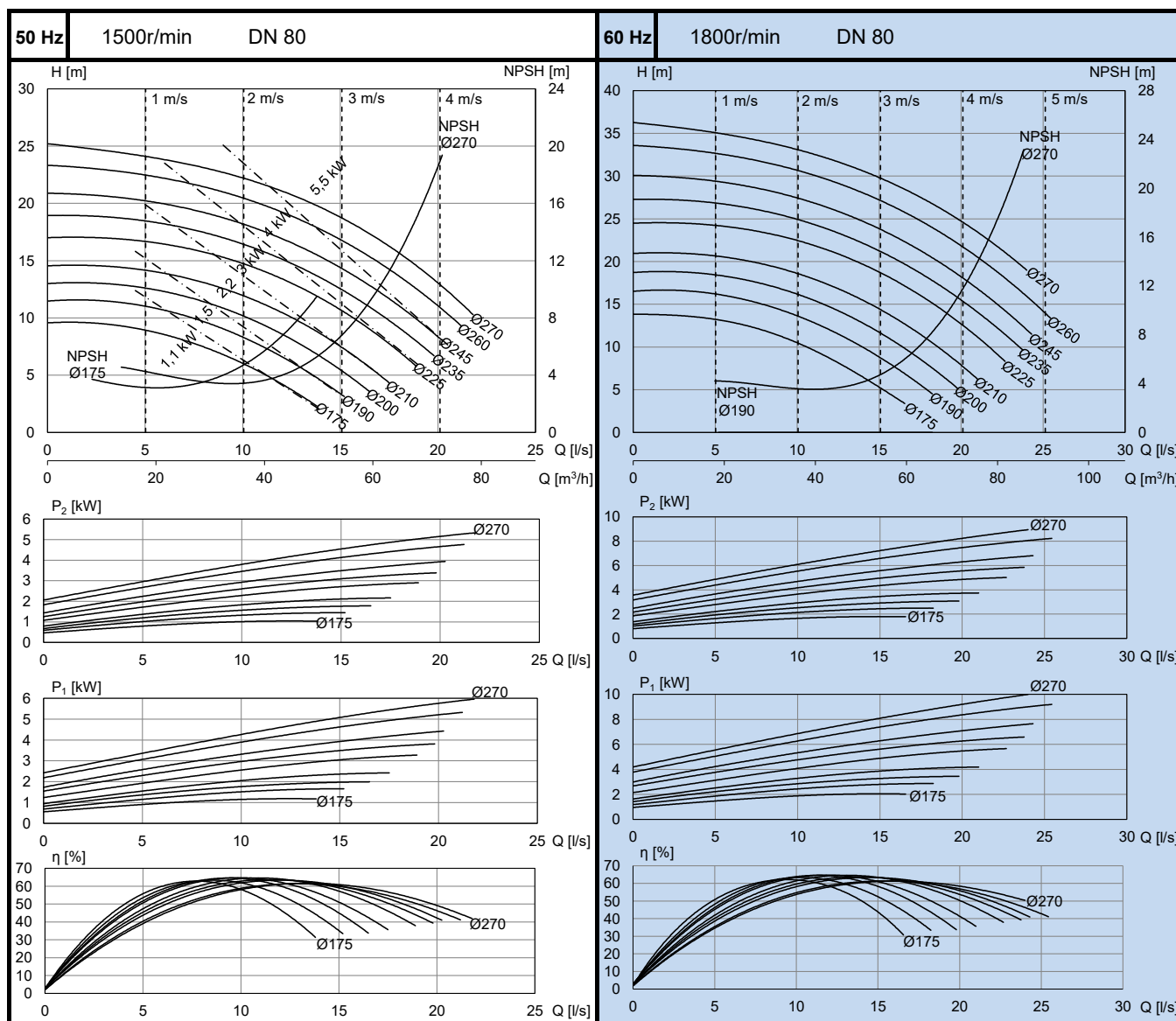


L-80S/4

LH-80S/4



ZH09	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 F29	1,1	2,44	85	495
	KP-90-2 F29	1,5	3,19	85	495
	KP-100-2 F29	2,2	4,7	95	535
	KP-100-2 F29	3	5,96	99	535
	KP-112-2 F29	4	8,29	125	500
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 F29	1,5 (1,8)	3,29 (3,39)	85	495
	KP-100-2 F29	2,2 (2,6)	4,85 (4,9)	95	535
	KP-100-2 F29	3 (3,6)	6,13 (6,39)	99	535
	KP-112-2 F29	4 (4,8)	8,49 (8,6)	125	500
	KP-133 G2 F29	5,5 (6,6)	10,72 (11,29)	135	565
ZH09	KH-133 G2 F29	7,5 (9)	14,80 (15,47)	147	570

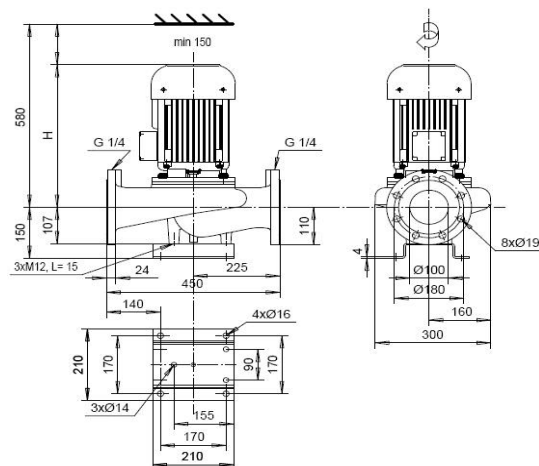


AL-1102/4

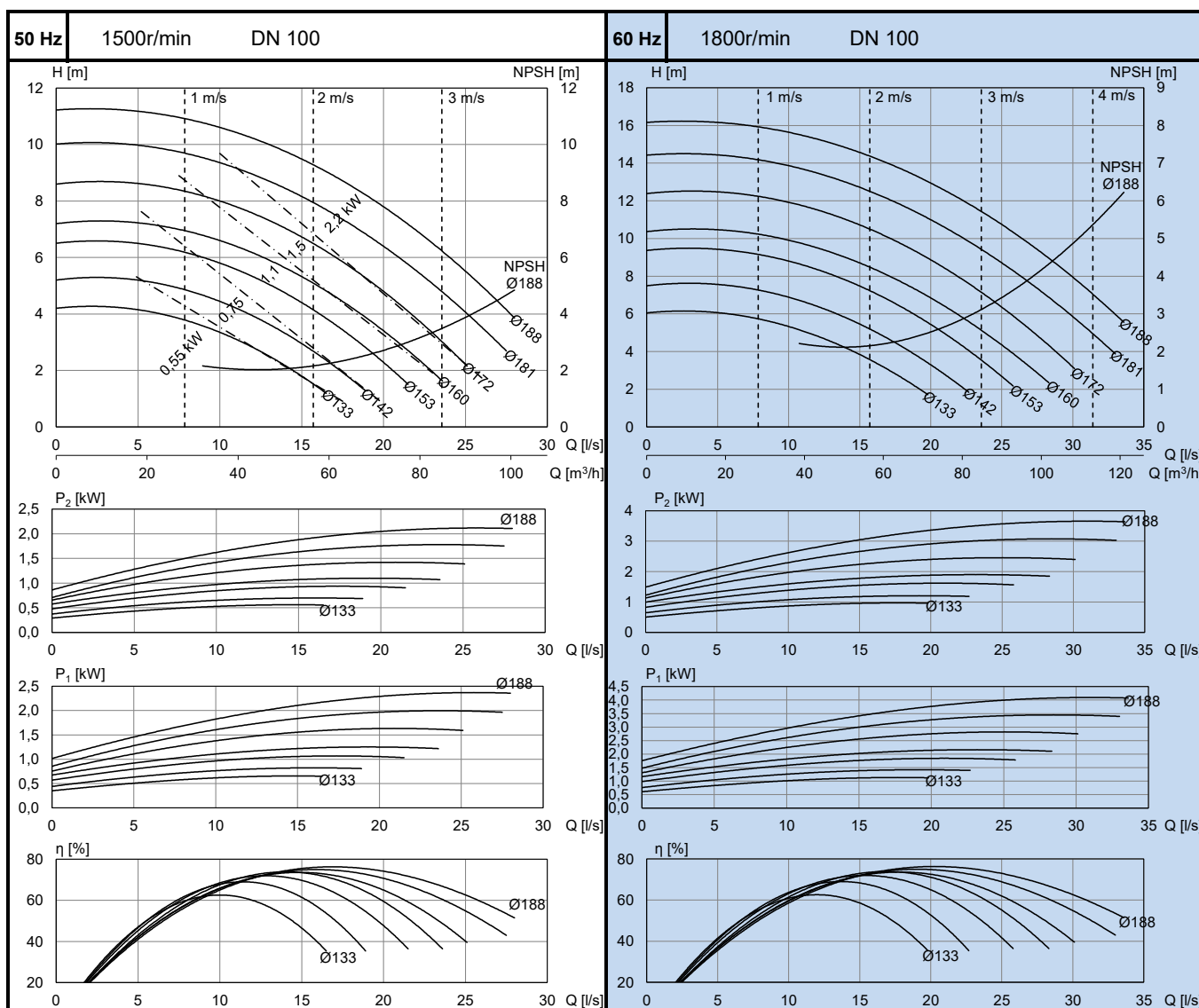
ALH-1102/4

ALP-1102/4

ALS-1102/4



	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-80-2 F19	0,55	1,38	52	380
50Hz	KP-80-2 F19	0,75	1,73	52	380
	KP-90-2 F19	1,1	2,44	59	450
	KP-90-2 F19	1,5	3,19	59	450
	KP-100-2 F19	2,2	4,71	70	490
	KP-100-2 F19	2,2	4,71	70	490
50Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 F19	1,1 (1,3)	2,48 (2,53)	59	450
	KP-90-2 F19	1,5 (1,8)	3,29 (3,39)	59	450
	KP-100-2 F19	2,2 (2,6)	4,85 (4,93)	70	490
	KP-100-2 F19	3 (3,6)	6,13 (6,39)	72	490

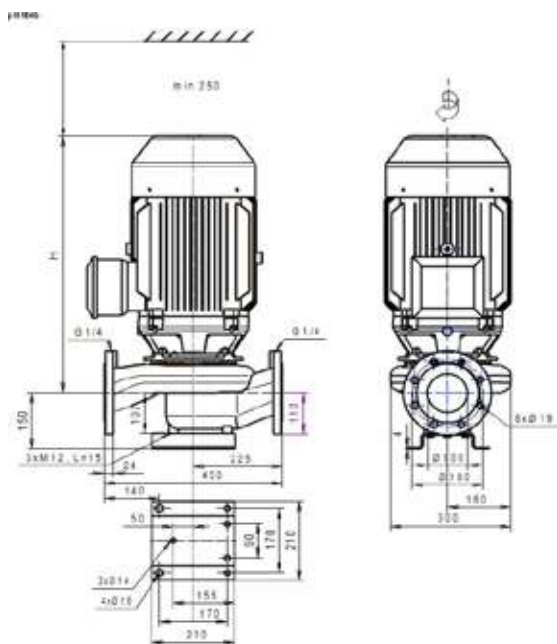


AL-1102/2

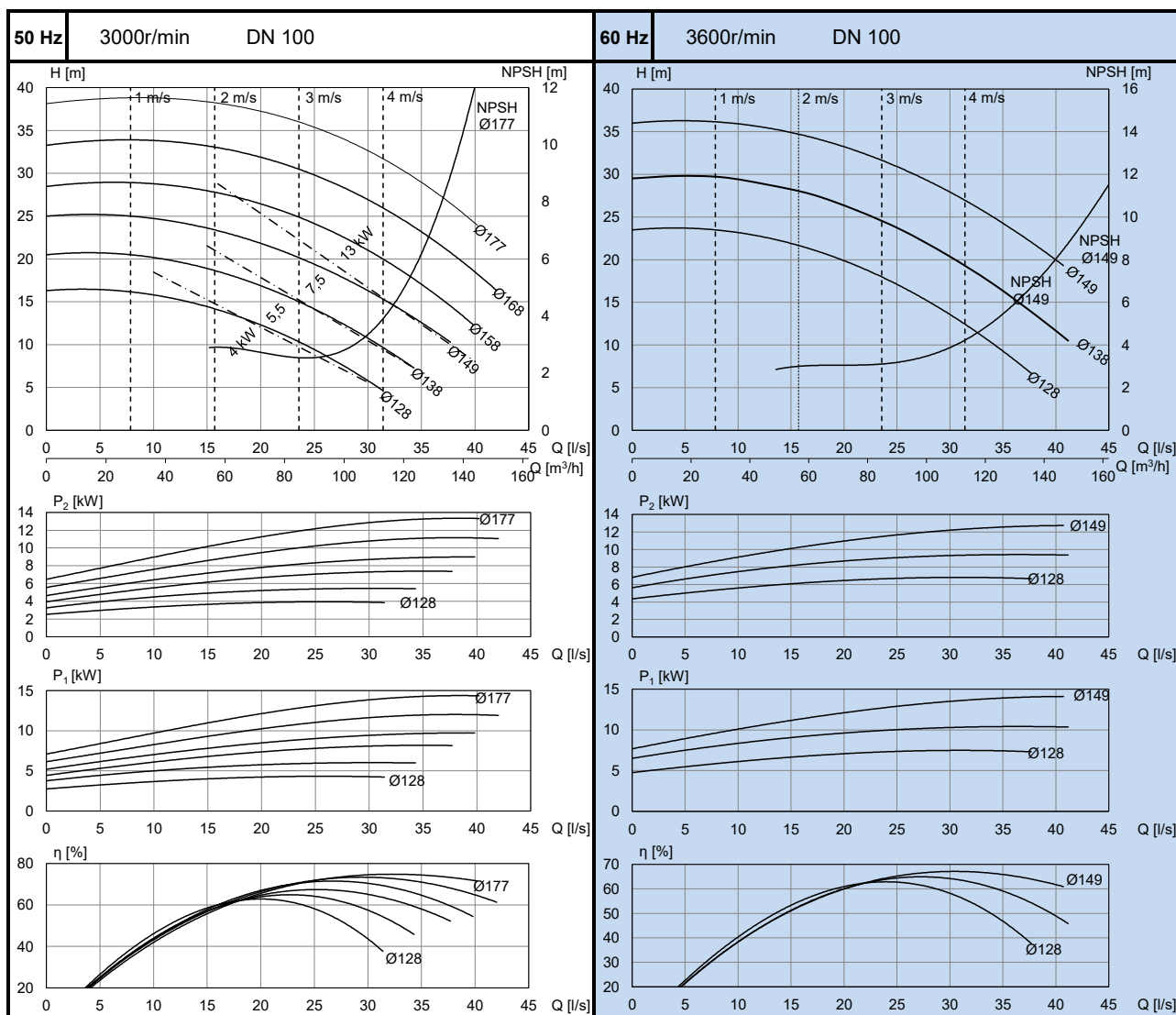
ALH-1102/2

ALP-1102/2

ALS-1102/2

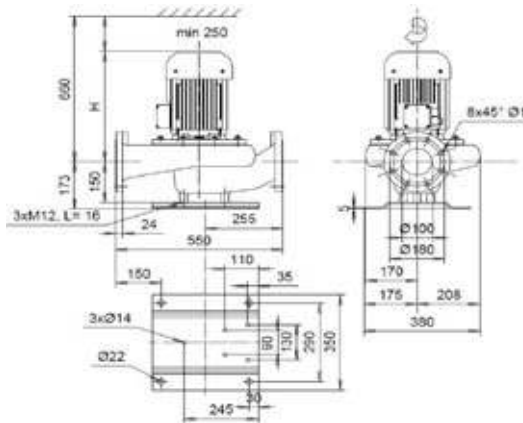


ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-1 F19	4	7,53	78	480
	KP-132 E1 F19	5,5	10,22	99	490
	KP-132 E1 F19	7,5	13,19	105	490
	KP-166 H1 F21	13	23,00	185	680
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-132 E1 F19	5,5 (6,6)	10,38 (10,80)	99	490
	KP-132 E1 F19	7,5 (9)	13,80 (14,05)	105	490

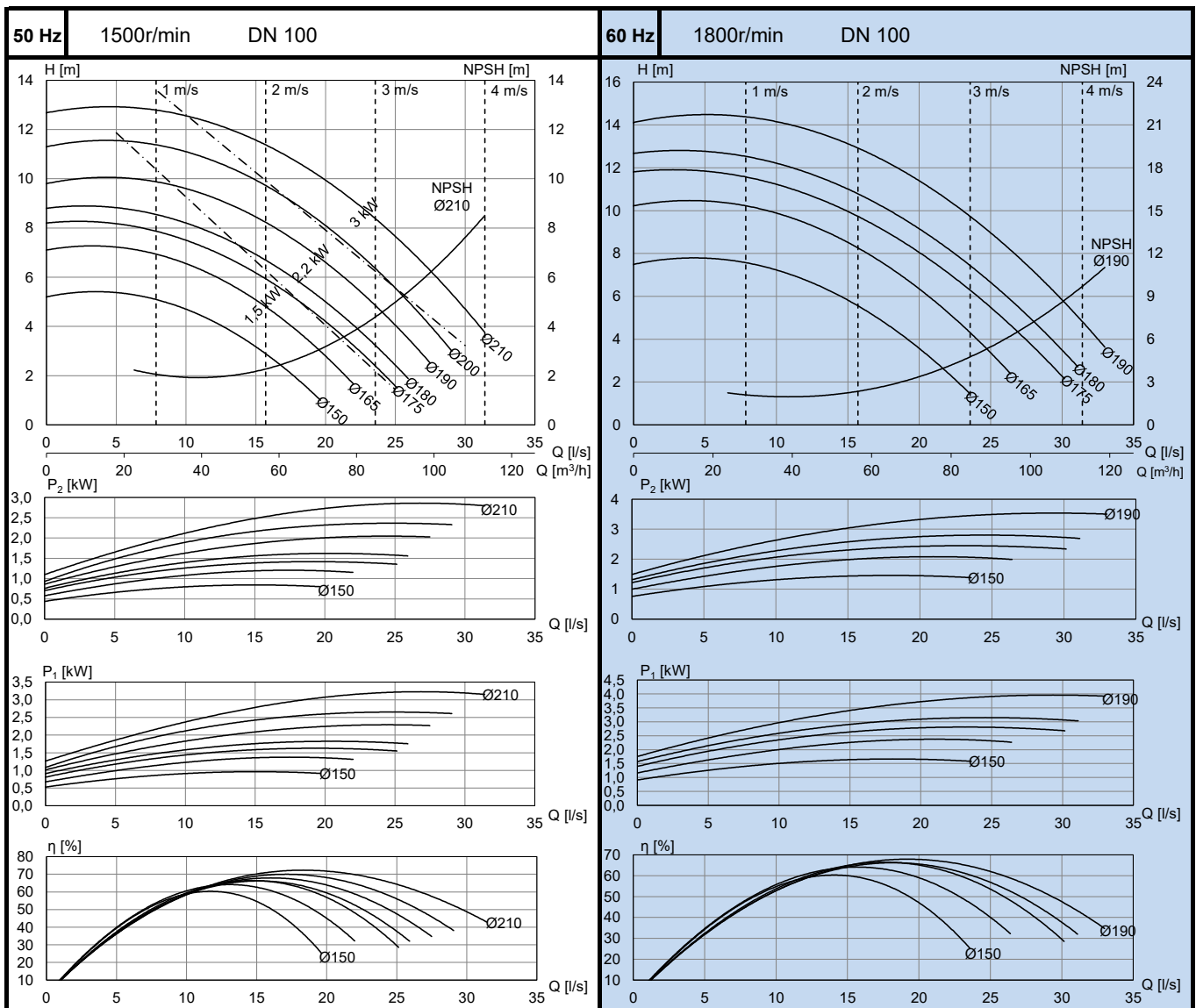


AKN-100/4

AKNH-100/4

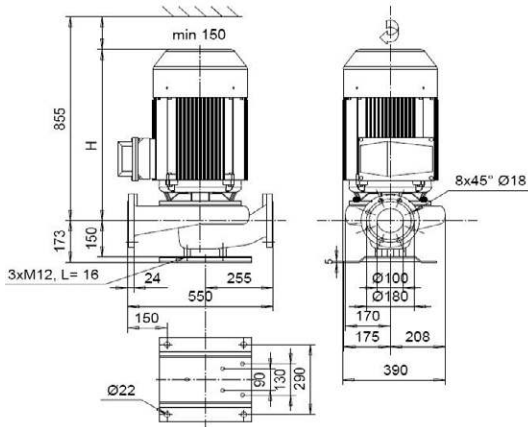


50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 N26	1,5	3,19	79	430
	KP-100-2 N26	2,2	4,71	90	470
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-90-2 N26	1,5 (1,8)	3,29 (3,39)	79	430
	KP-100-2 N26	2,2 (2,6)	4,85 (4,93)	90	470
ZHO9	KP-100-2 N26	3 (3,6)	6,13 (6,39)	93	470

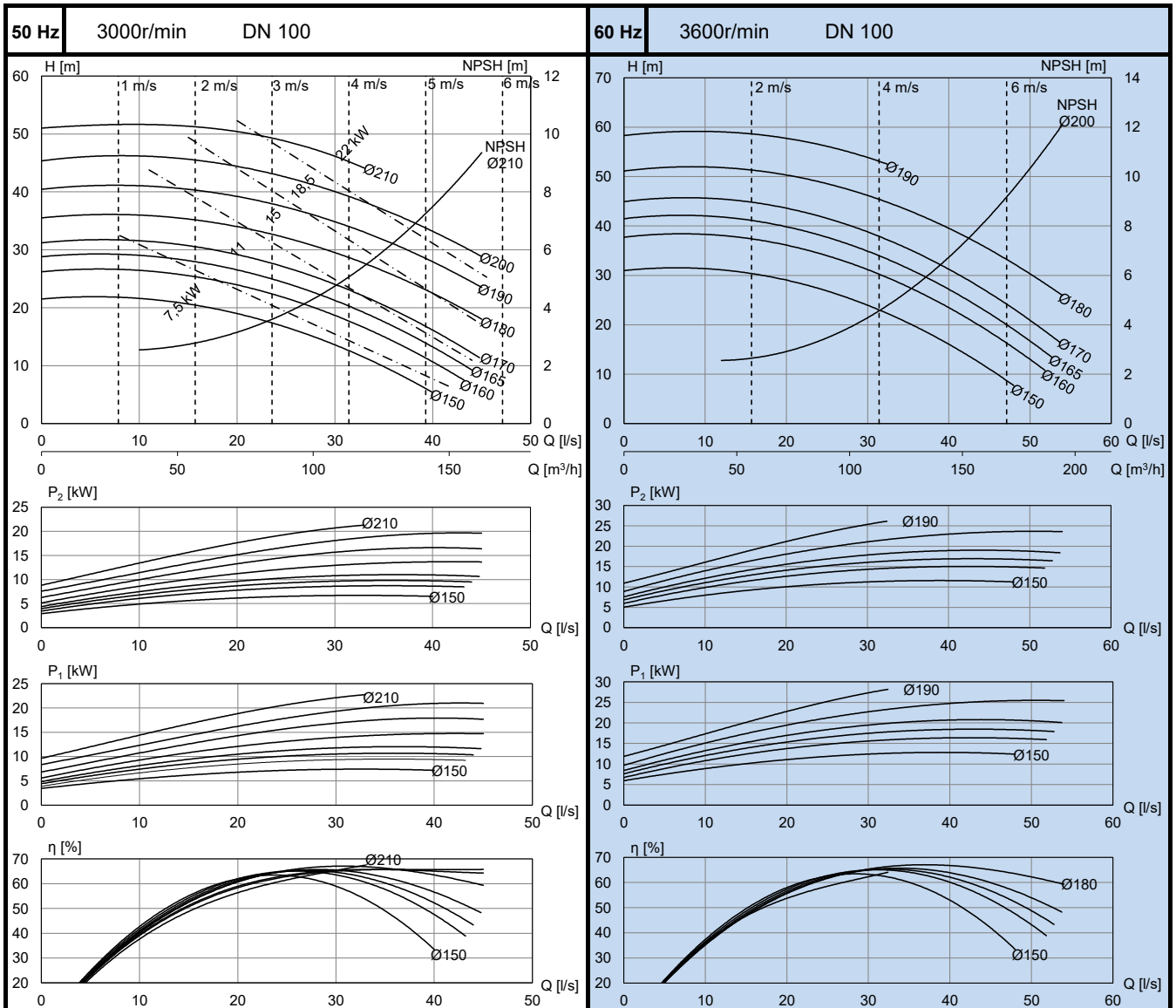


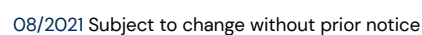
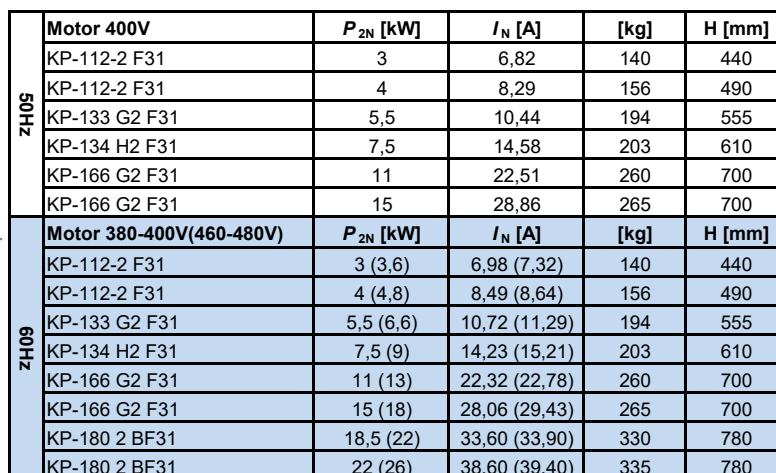
AKN-100/2

AKNH-100/2



ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-132 E1 N26	7,5	13,27	125	465
	KP-165 E1 N26	11	19,58	195	640
	KP-166 H1 N26	15	26,35	215	670
	KP-166 H1 N26	18,5	32,23	220	670
	KP-186 J1 N26	22	37,90	270	710
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-165 E1 N26	11 (13)	19,39 (19,92)	195	640
	KP-166 H1 N26	15 (18)	26,70 (27,37)	215	670
	KP-166 H1 N26	18,5 (22)	32,36 (33,46)	220	670
	KP-186 J1 N26	22 (26)	38,40 (39,20)	270	710

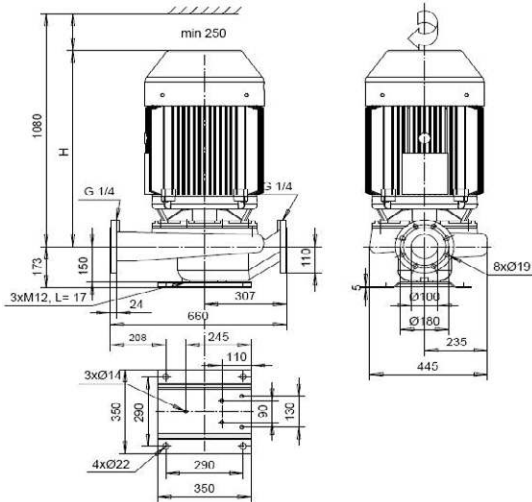




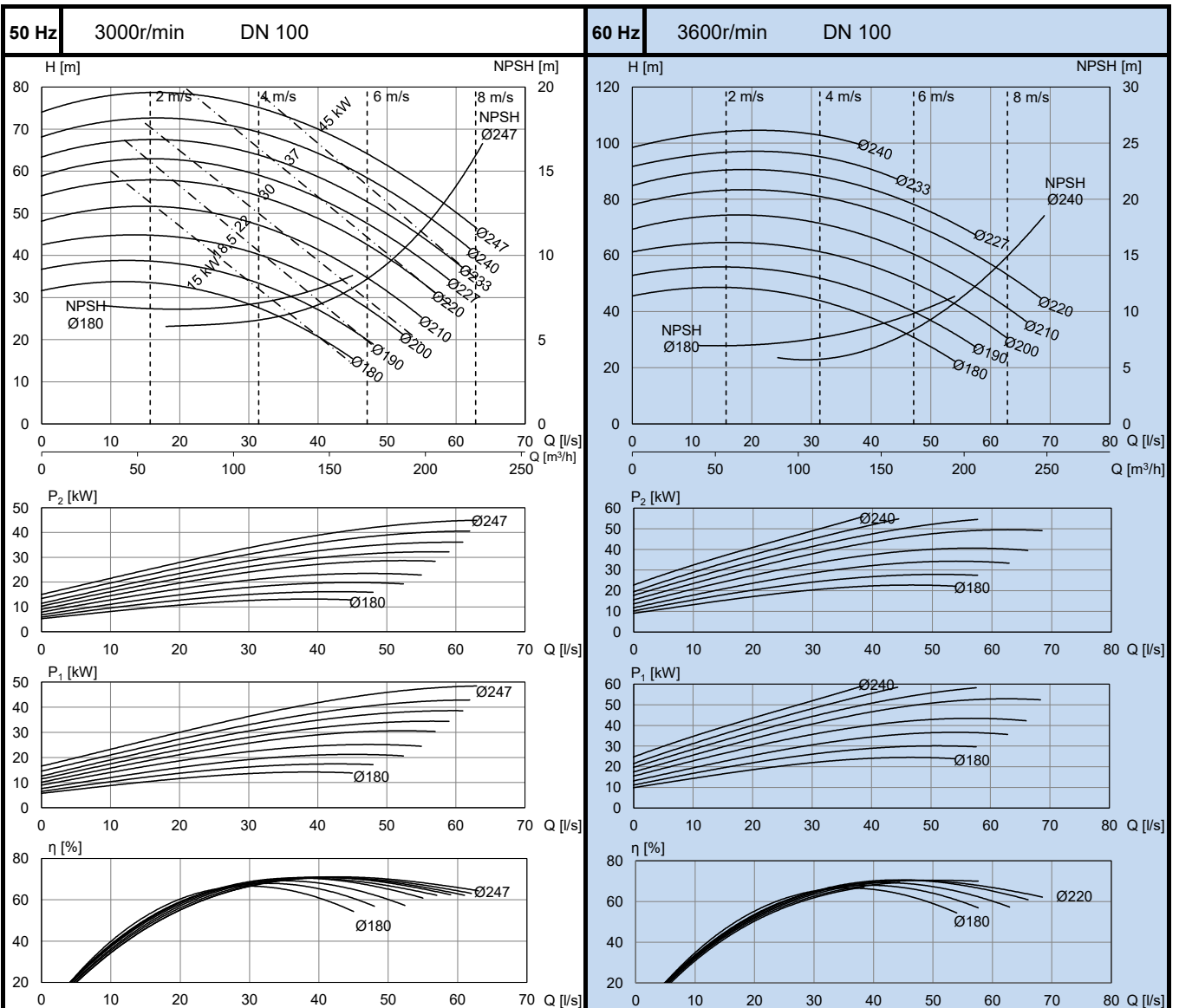
L-100S/2

LH-100S/2

LP-100S/2



50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-166 H1 F31	15	26,35	255	700
	KP-166 H1 F31	18,5	32,23	260	700
	KP-186 J1 BF31	22	37,9	315	730
	KP-205 J1 F31	30	53,8	370	730
	KP-205 J1 F31	37	64,8	375	780
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-166 H1 F31	15 (18)	26,70 (27,37)	255	700
	KP-166 H1 F31	18,5 (22)	32,36 (33,46)	260	700
	KP-186 J1 BF31	22 (26)	38,4 (39,2)	315	730
	KP-205 J1 F31	30 (36)	54,5 (55,9)	370	730
	KP-225 H1 F32	45 (54)	77,0 (81,3)	460	830



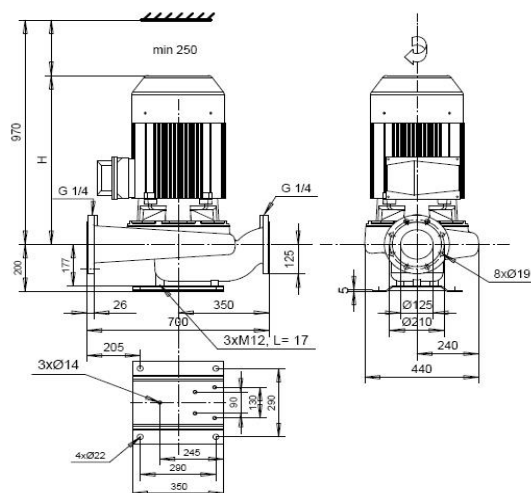
AL-1129/4

ALH-1129/4

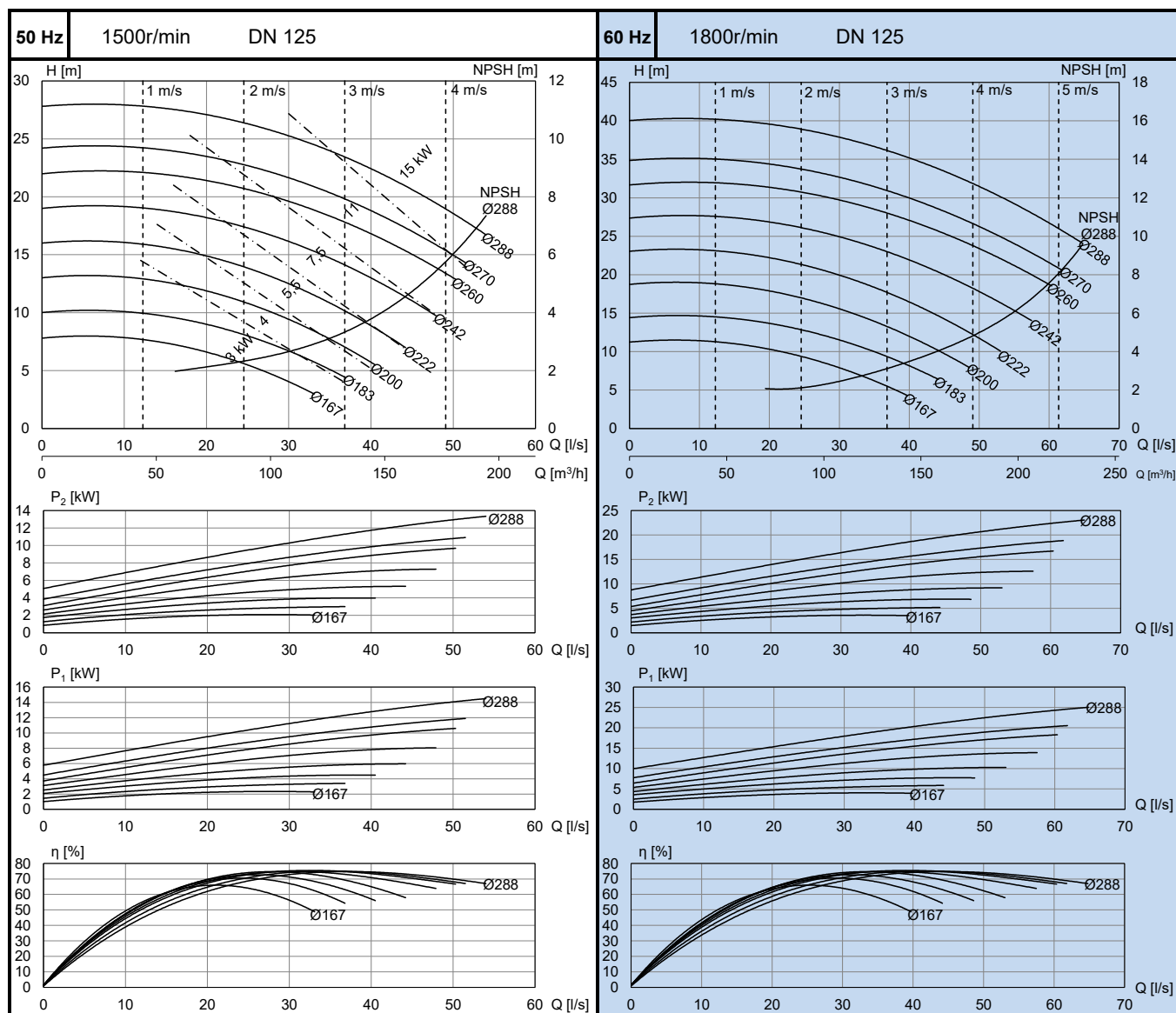
ALS-1129/4

ALX-1129/4

ALM-1129/4



50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	3	6,82	155	480
	KP-112-2 F31	4	8,29	155	480
	KP-133 G2 F31	5,5	10,44	190	545
	KP-134 H2 F31	7,5	14,58	201	600
	KP-166 G2 F31	11	22,51	270	690
ZHO9	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	4 (4,8)	8,49 (8,64)	155	480
	KP-133 G2 F31	5,5 (6,6)	10,72 (11,29)	190	545
	KP-134 H2 F31	7,5 (9)	14,23 (15,21)	201	600
	KP-166 G2 F31	11 (13)	22,32 (22,78)	270	690
	KP-166 G2 F31	15 (18)	28,06 (29,43)	275	690
	KP-180 2 BF31	18,5 (22)	33,60 (33,90)	350	770
	KP-180 2 BF31	22 (26)	38,60 (39,40)	355	770



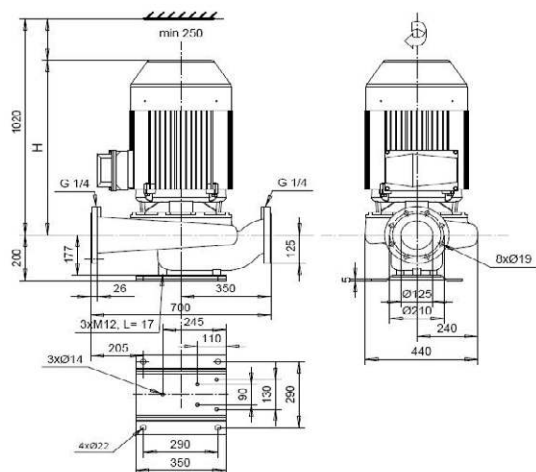
AL-1129/2

ALH-1129/2

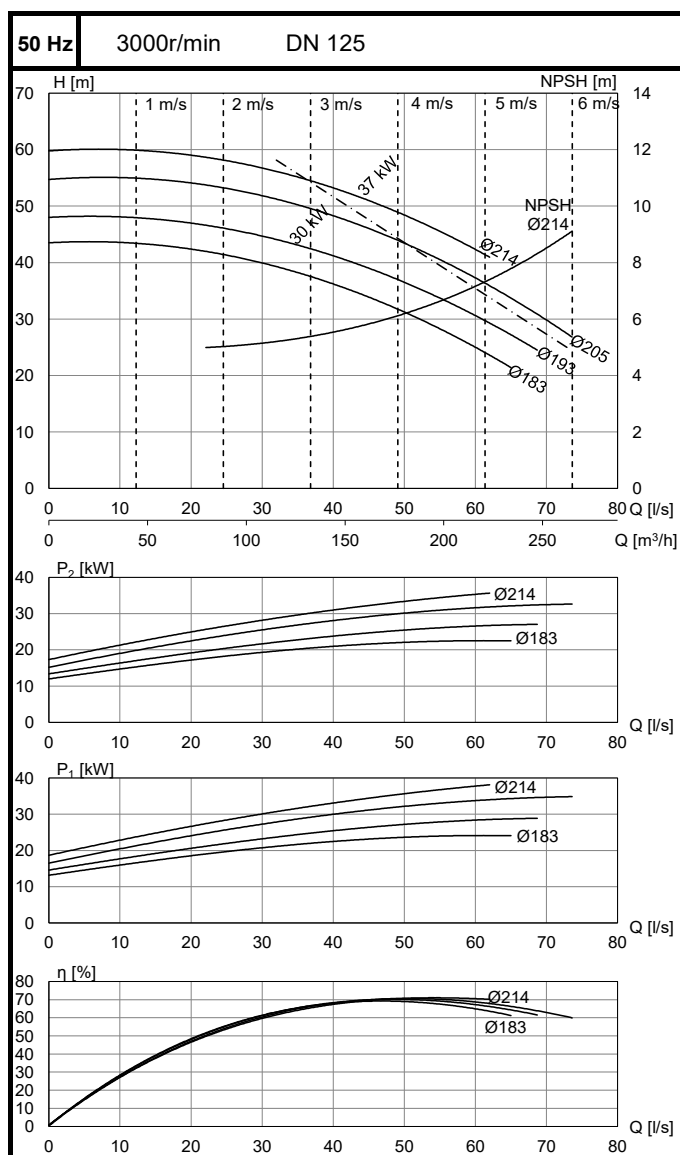
ALS-1129/2

ALX-1129/2

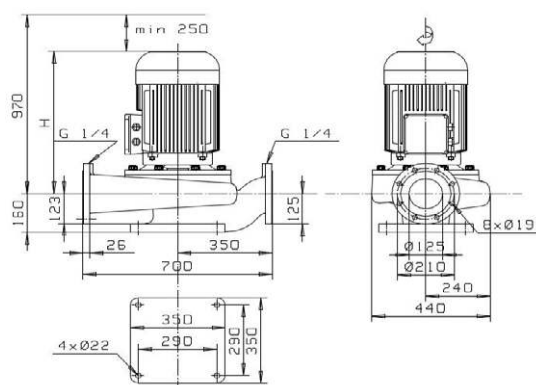
ALM-1129/2



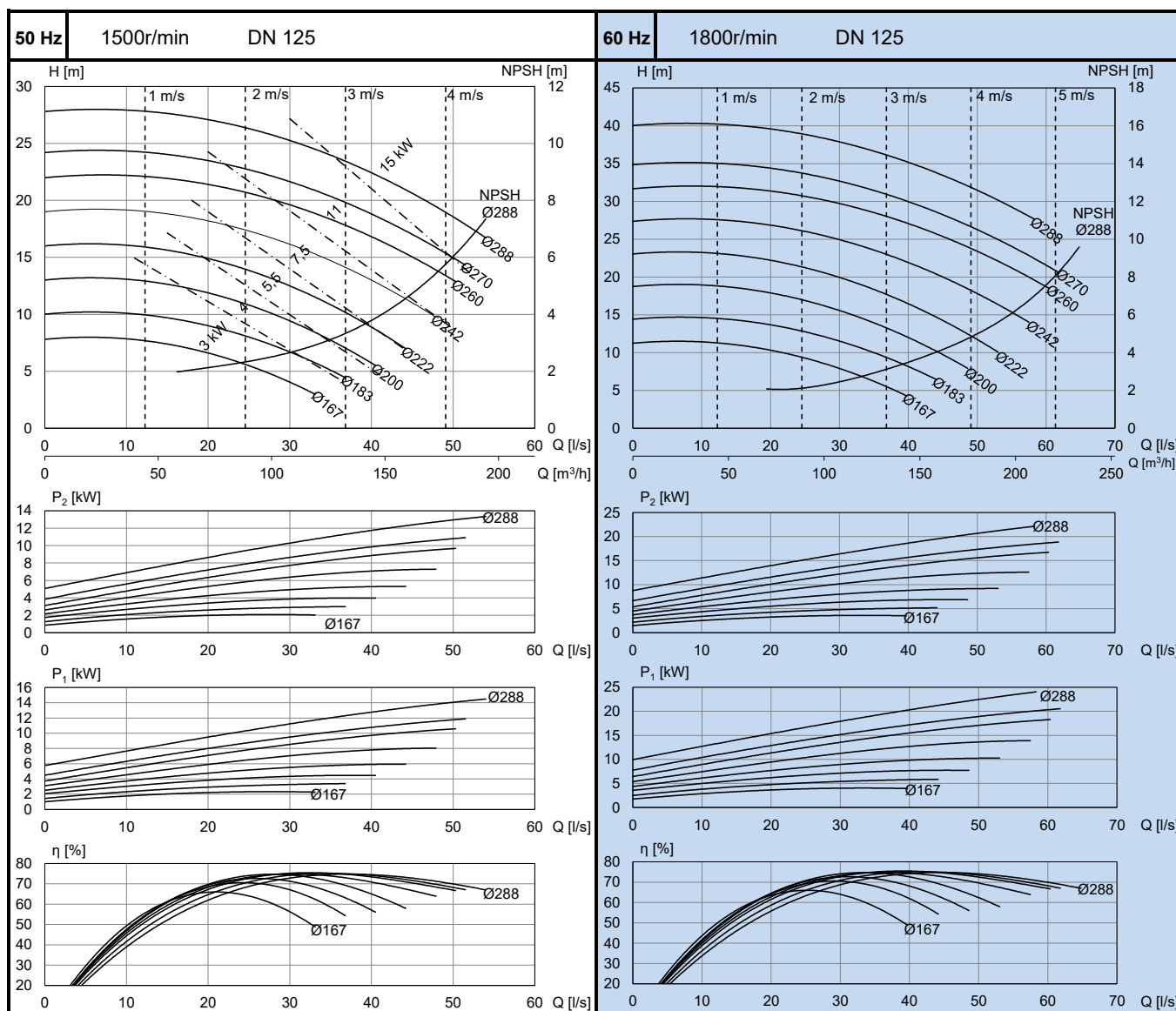
ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-205 J1 F31	30	53,8	370	770
	KP-205 J1 F31	37	64,8	375	770



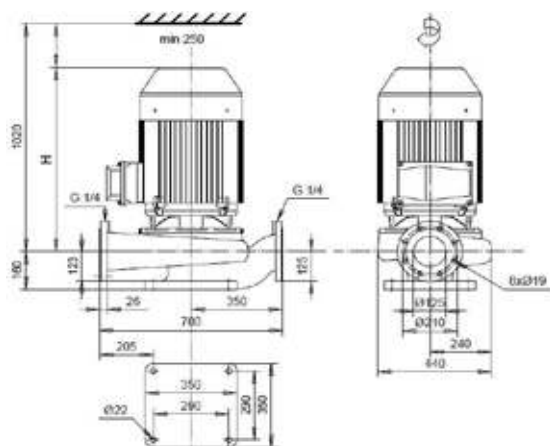
ALP-1128/4



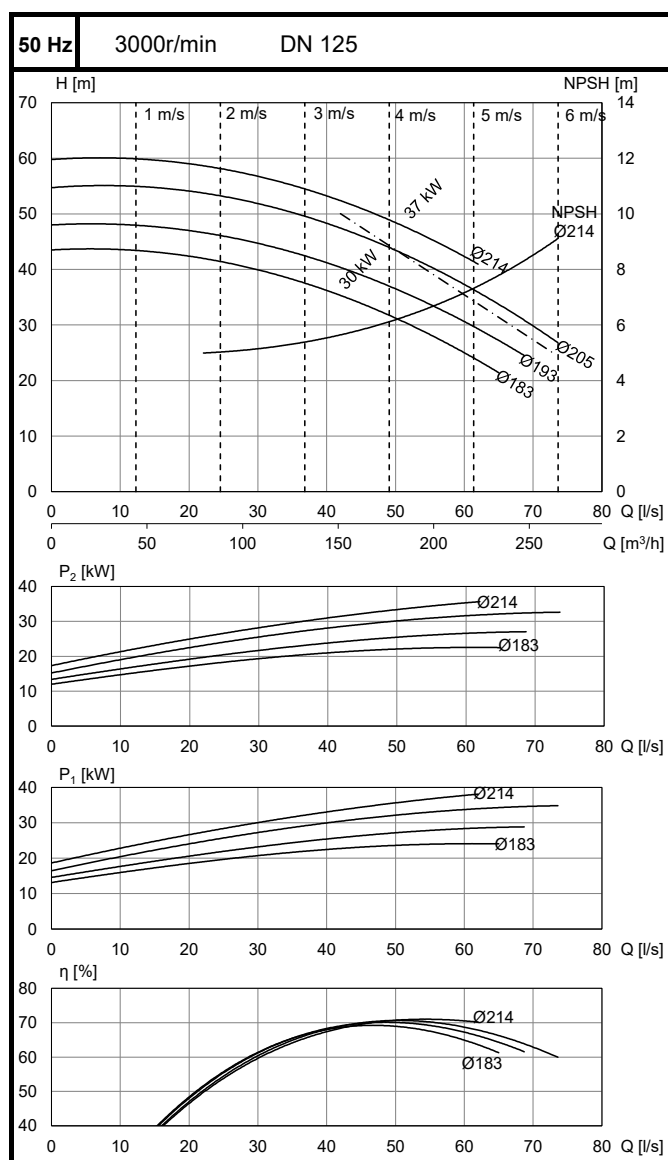
50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	3	6,82	140	480
	KP-112-2 F31	4	8,29	155	480
	KP-133 G2 F31	5,5	10,44	190	545
	KP-134 H2 F31	7,5	14,58	201	600
	KP-166 G2 F31	11	22,51	270	690
400V	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	3 (3,6)	6,98 (7,32)	140	480
	KP-112-2 F31	4 (4,8)	8,49 (8,64)	155	480
	KP-133 G2 F31	5,5 (6,6)	10,72 (11,29)	190	545
	KP-134 H2 F31	7,5 (9)	14,23 (15,21)	201	600
	KP-166 G2 F31	11 (13)	22,32 (22,78)	270	690
	KP-166 G2 F31	15 (18)	28,06 (29,43)	275	690
	KP-180 2 BF31	18,5 (22)	33,6 (33,9)	350	770
	KP-180 2 BF31	22 (26)	38,6 (39,4)	355	770



ALP-1128/2



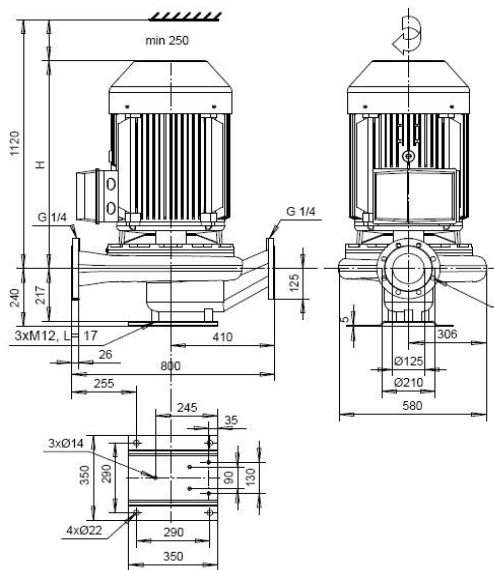
50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-205 J1 F31	30	53,8	370	770
	KP-205 J1 F31	37	64,8	375	770



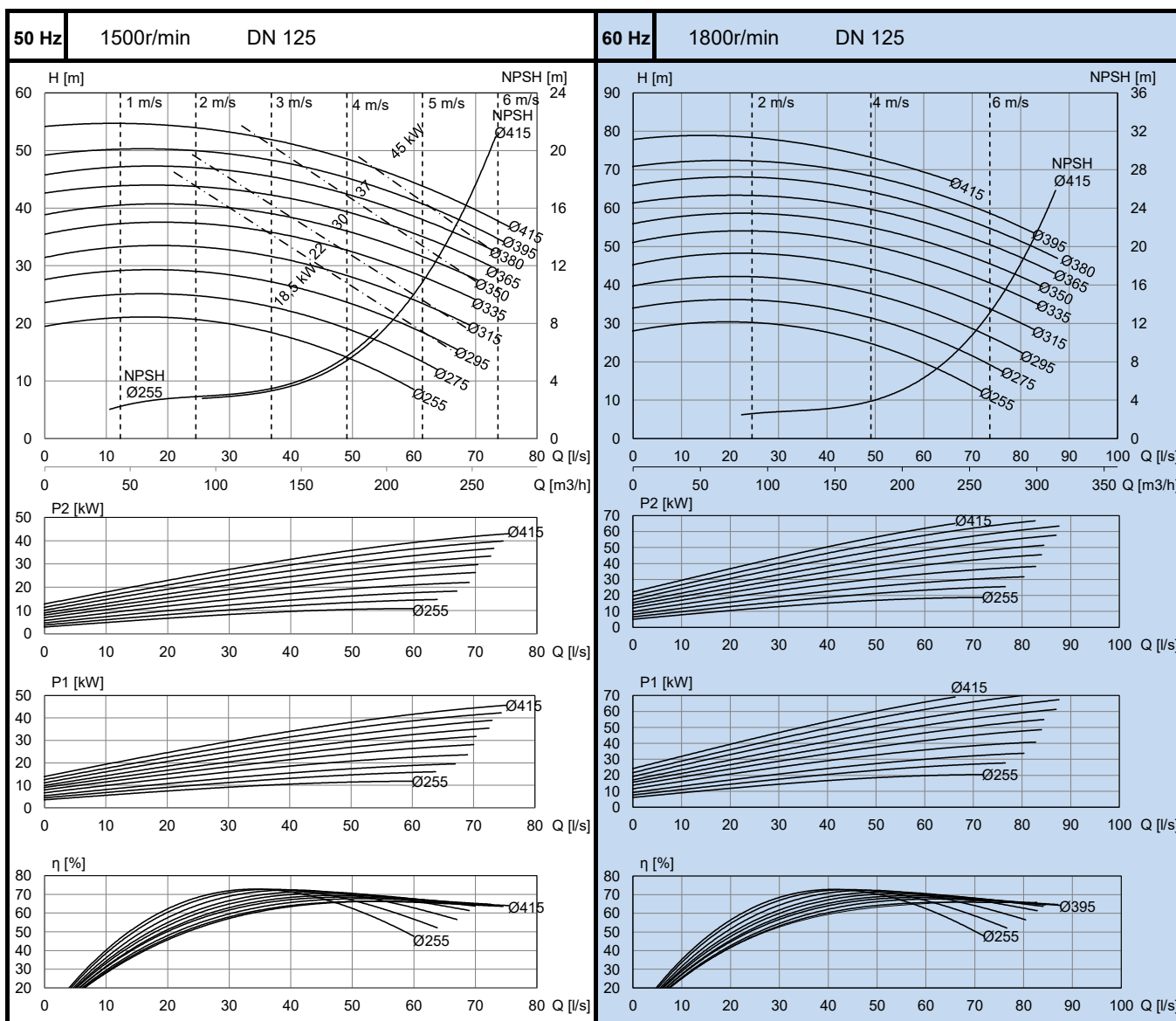
L-125S/4

LH-125S/4

LS-125S/4

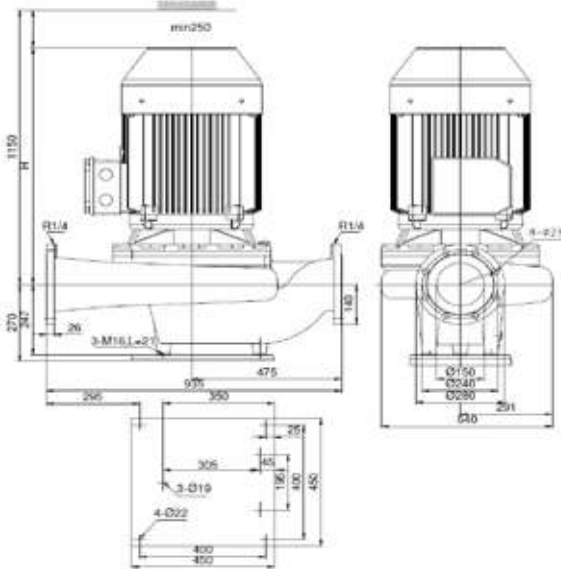


ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-187 K2 F41	18,5	34,4	375	780
	KP-187 K2 F41	22	39,7	380	780
	KP-205 K2 F41	30	55,0	435	800
	KP-225 K2 F41	37	67,1	500	825
	KP-225 K2 F42	45	81,1	510	830
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-187 K2 F41	18,5 (22)	34,2 (34,7)	375	780
	KP-187 K2 F41	22 (26)	39,4 (40,3)	380	780
	KP-205 K2 F41	30 (36)	54,2 (56,5)	435	800
	KP-225 K2 F41	37 (44)	67,0 (70,1)	500	825
	KP-225 K2 F42	45 (54)	80,4 (84,6)	510	830
	KP-256 J2 F42	55 (66)	96,8 (101,0)	605	910

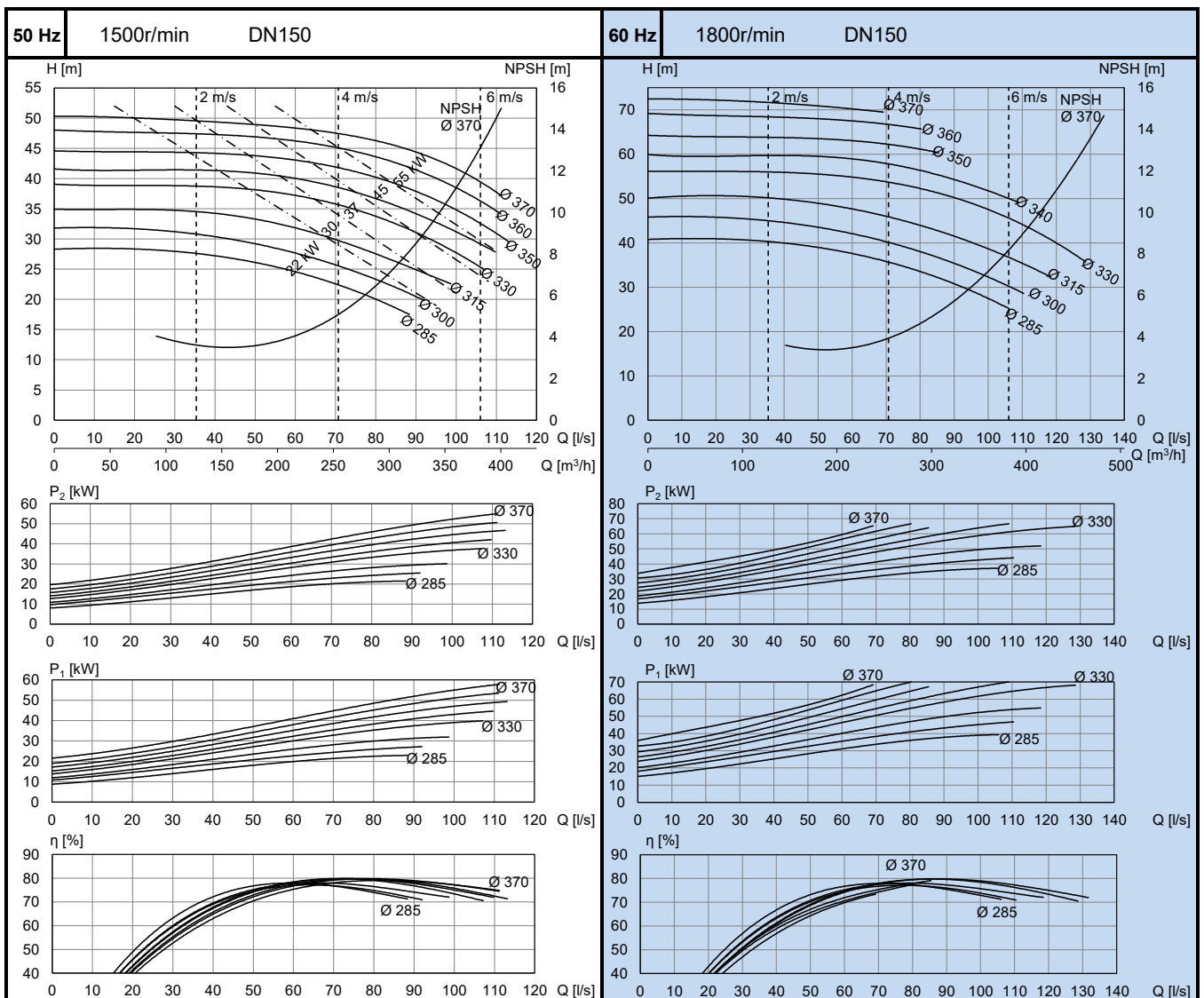


L-150S/4

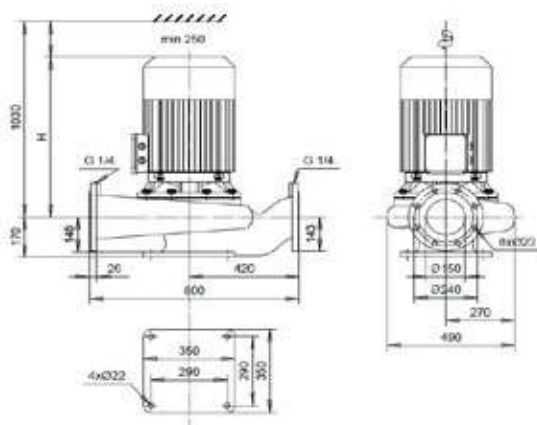
LH-150S/4



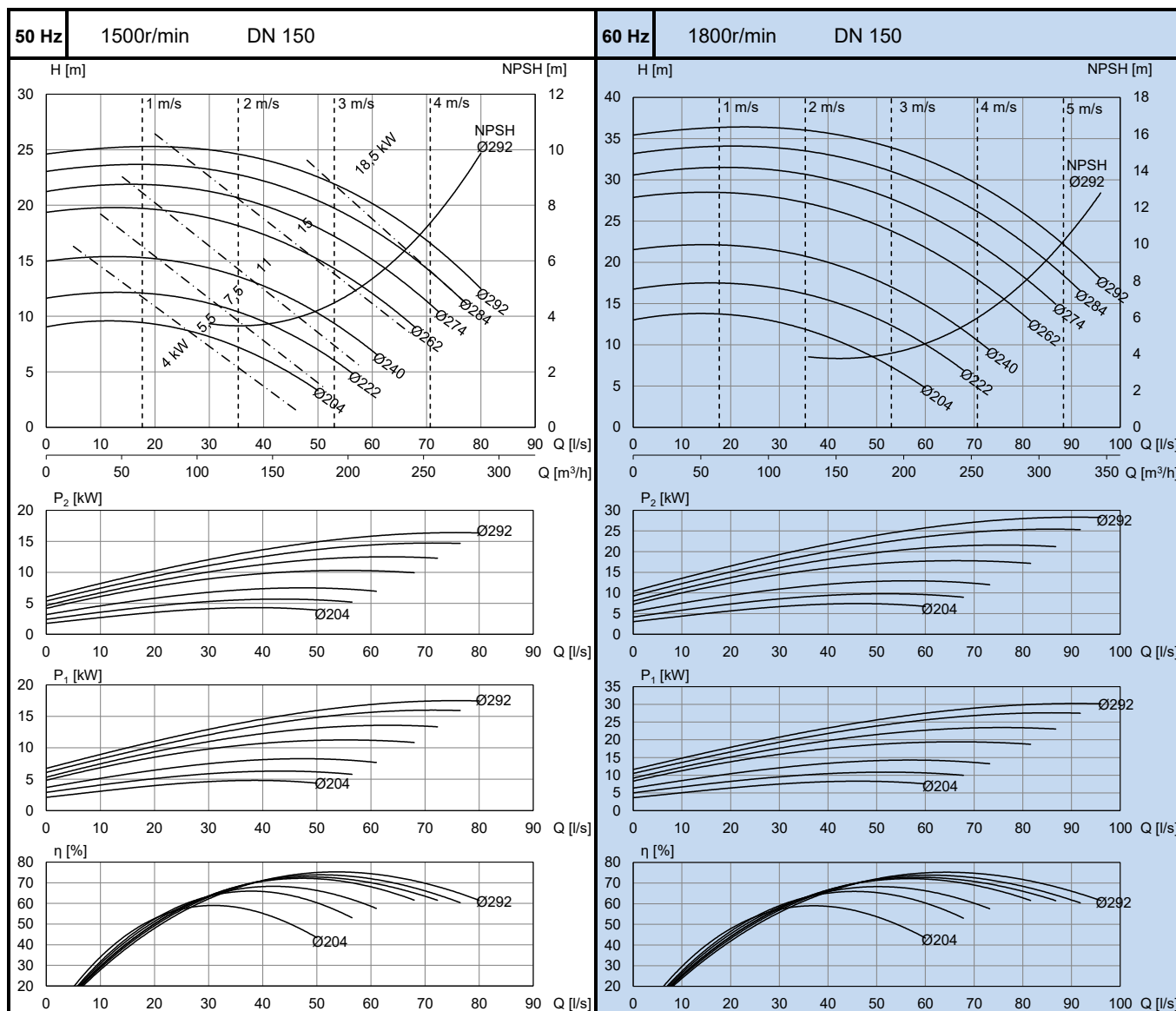
50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-187 K2 F41	22	39,7	385	840
	KP-205 K2 F41	30	55,0	440	840
	KP-225 K2 F41	37	67,1	505	855
	KP-256 K2 F42	45	81,1	510	855
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-205 K2 F41	30 (36)	54,2 (56,5)	440	840
	KP-225 K2 F41	37 (44)	67,0 (70,1)	505	855
	KP-225 K2 F42	45 (54)	80,4 (84,6)	510	855
	KP-256 K2 F42	55 (66)	96,8 (101,0)	635	905



ALP-1153/4



50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	4	8,29	168	480
	KP-133 G2 F31	5,5	10,44	203	545
	KP-134 H2 F31	7,5	14,58	214	600
	KP-166 G2 F31	11	22,51	270	690
	KP-166 G2 F31	15	28,86	275	690
60 Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	4 (4,8)	8,49 (8,64)	168	480
	KP-133 G2 F31	5,5 (6,6)	10,72 (11,29)	203	545
	KP-134 H2 F31	7,5 (9)	14,23 (15,21)	214	600
	KP-166 G2 F31	11 (13)	22,32 (22,78)	270	690
	KP-166 G2 F31	15 (18)	28,06 (29,43)	275	690
	KP-180 2 BF31	18,5 (22)	33,60 (33,90)	335	770
	KP-180 2 BF31	22 (26)	38,60 (39,40)	340	770
	KP-205 K2 F32	30 (36)	54,20 (56,50)	400	780



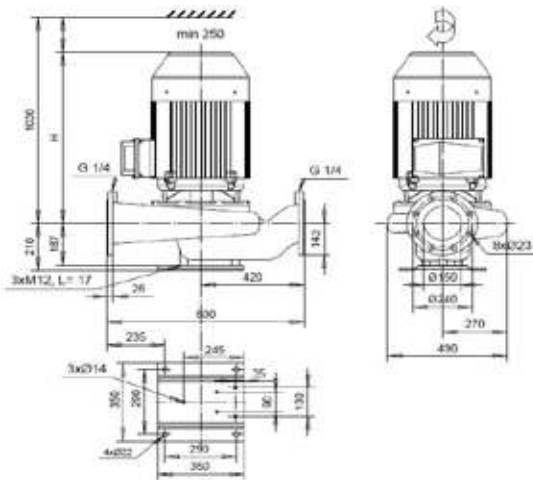
AL-1154/4

ALH-1154/4

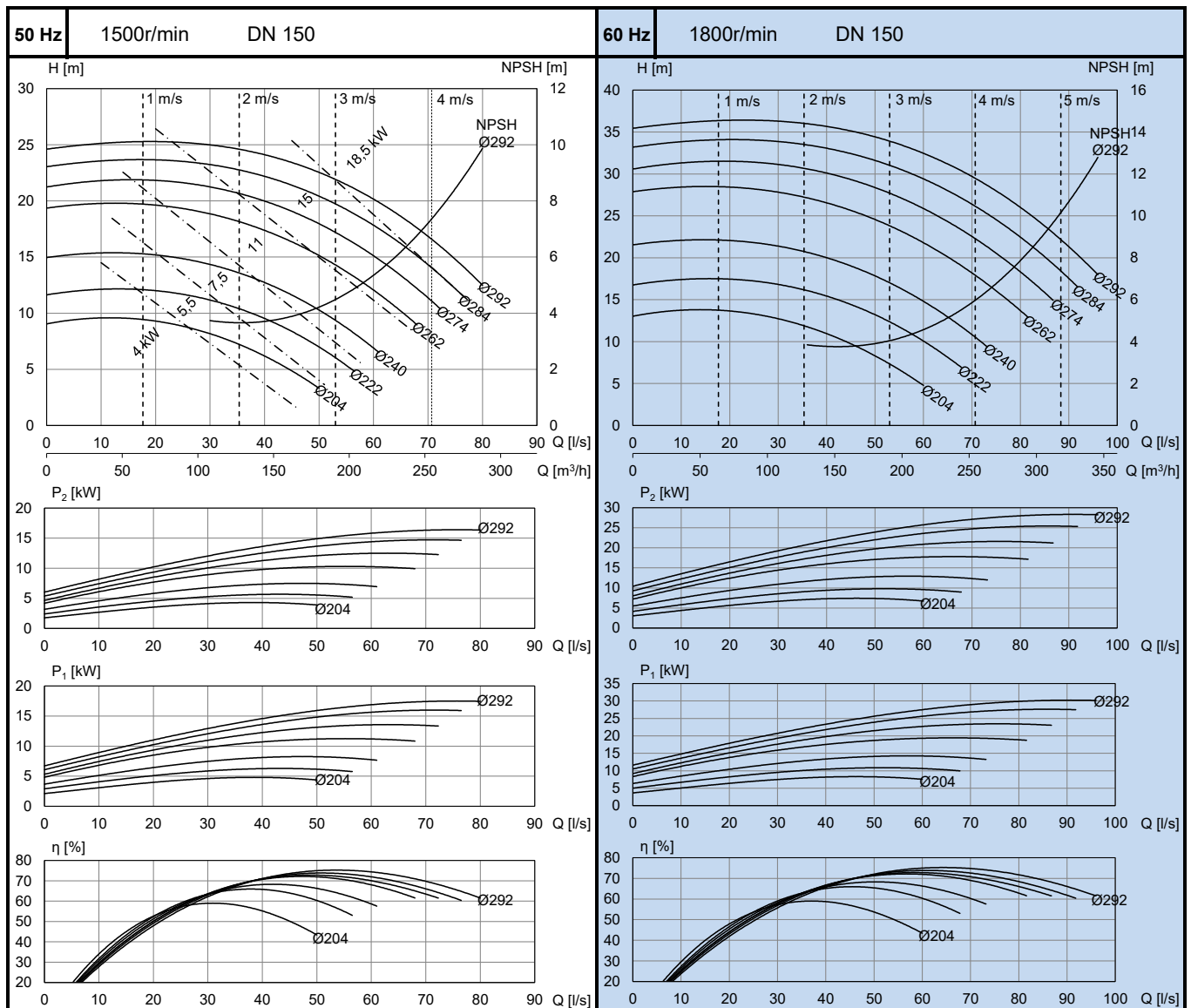
ALS-1154/4

ALX-1154/4

ALM-1154/4



50 Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	4	8,29	168	480
	KP-133 G2 F31	5,5	10,44	203	545
	KP-134 H2 F31	7,5	14,58	214	600
	KP-166 G2 F31	11	22,51	270	690
	KP-180 2 BF31	15	28,86	275	690
ZHO9	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-112-2 F31	4 (4,8)	8,49 (8,64)	168	480
	KP-133 G2 F31	5,5 (6,6)	10,72 (11,29)	203	545
	KP-134 H2 F31	7,5 (9)	14,23 (15,21)	214	600
	KP-166 G2 F31	11 (13)	22,32 (22,78)	270	690
	KP-166 G2 F31	15 (18)	28,06 (29,43)	275	690
	KP-180 2 BF31	18,5 (22)	33,60 (33,90)	335	770
	KP-180 2 BF31	22 (26)	38,60 (39,40)	340	770
	KP-205 K2 F32	30 (36)	54,20 (56,50)	400	780



AL-1202/4

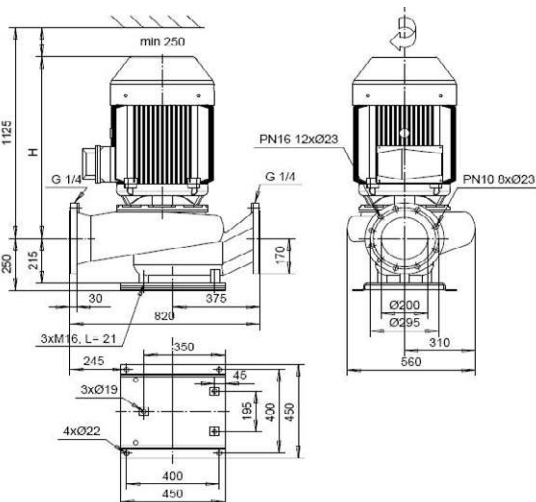
ALH-1202/4

ALP-1202/4

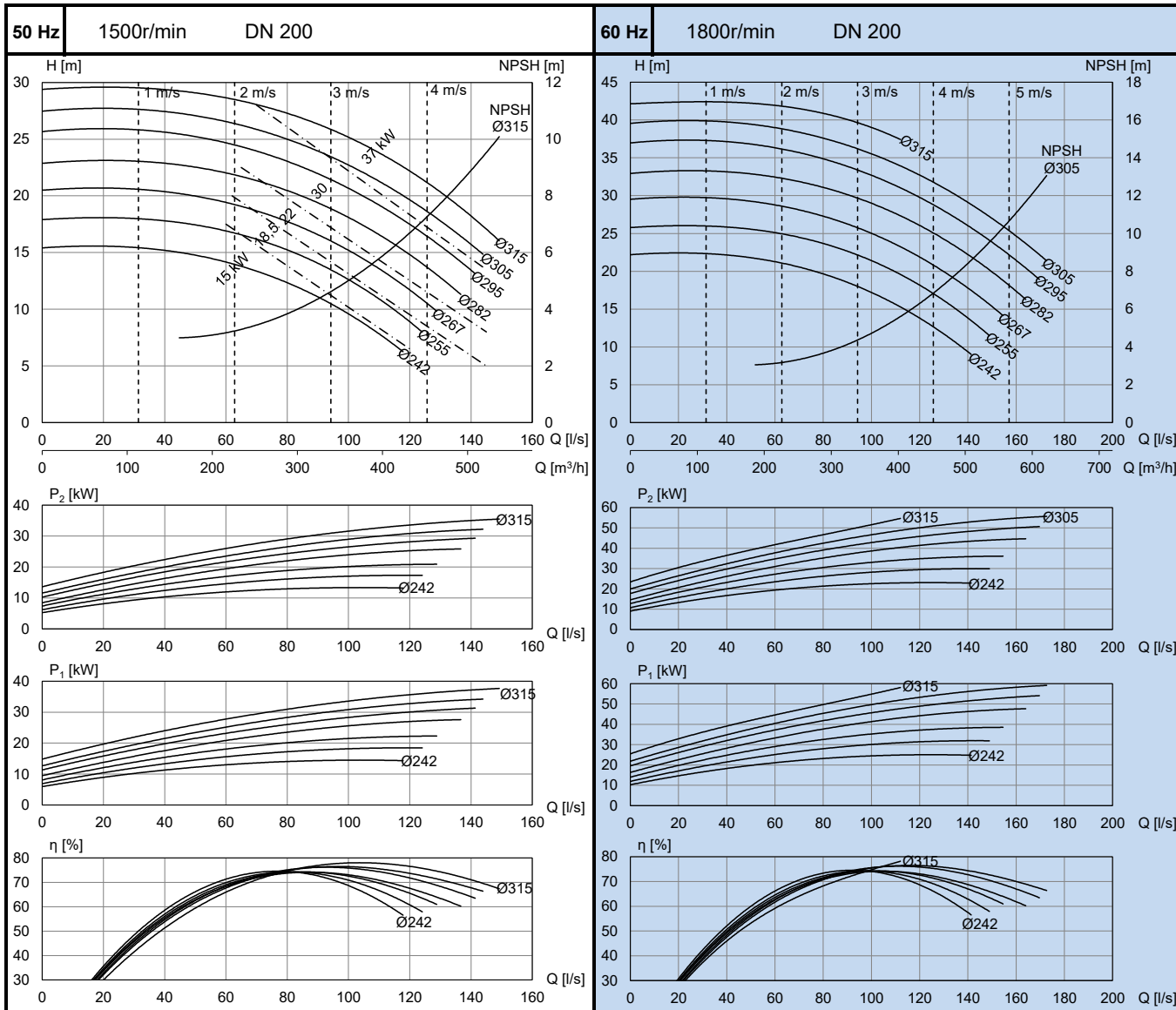
ALS-1202/4

ALX-1202/4

ALM-1202/4



50Hz	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-166 G2 F31	15	28,86	330	720
	KP-180 2 BF31	18,5	32,9	405	830
	KP-180 2 BF31	22	38,7	410	830
	KP-205 K2 F32	30	55,0	465	830
	KP-225 K2 F32	37	67,1	530	865
60Hz	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-180 2 BF31	18,5 (22)	33,6 (33,9)	405	830
	KP-180 2 BF31	22 (26)	38,6 (39,4)	410	830
	KP-205 K2 F32	30 (36)	54,2 (56,5)	465	830
	KP-225 K2 F32	37 (44)	67,0 (70,1)	530	865
	KP-225 K2 F33	45 (54)	80,4 (84,6)	525	880

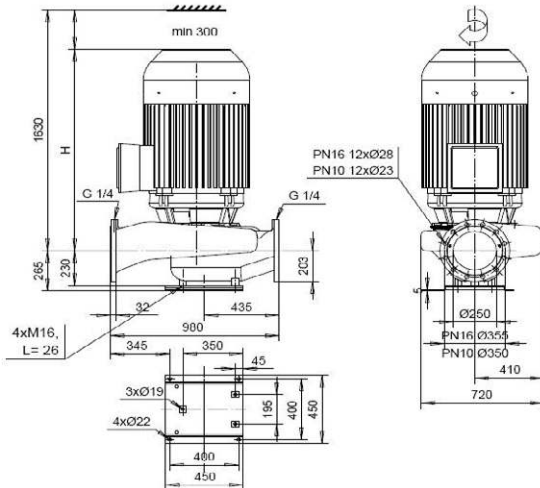


AL-1250/4

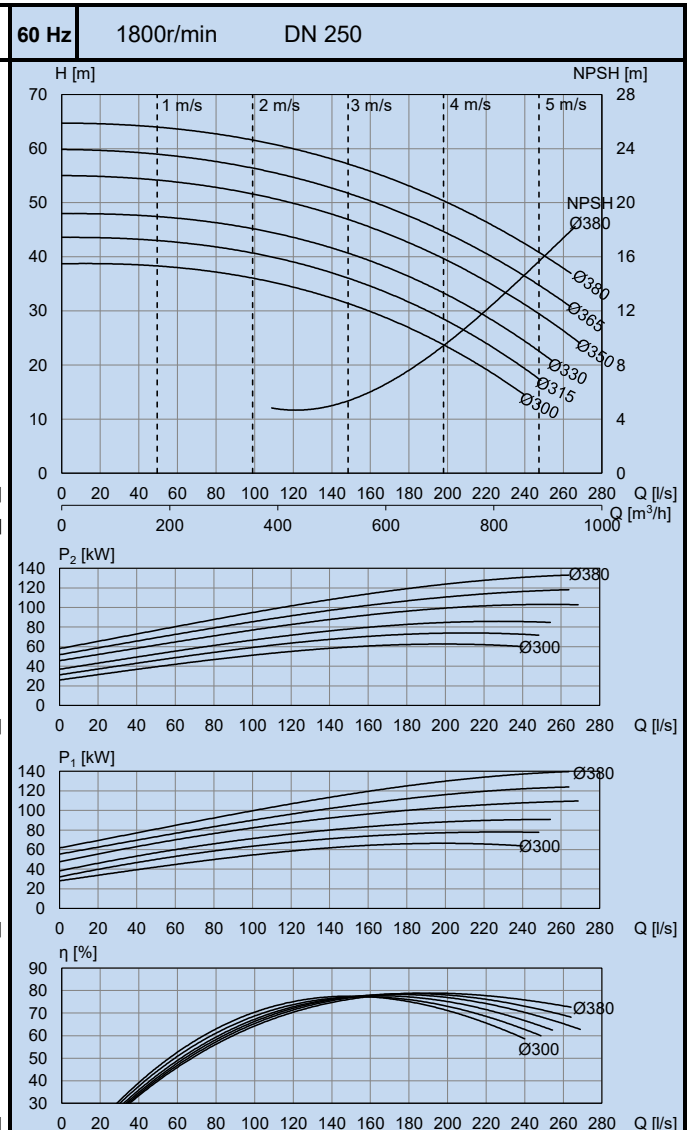
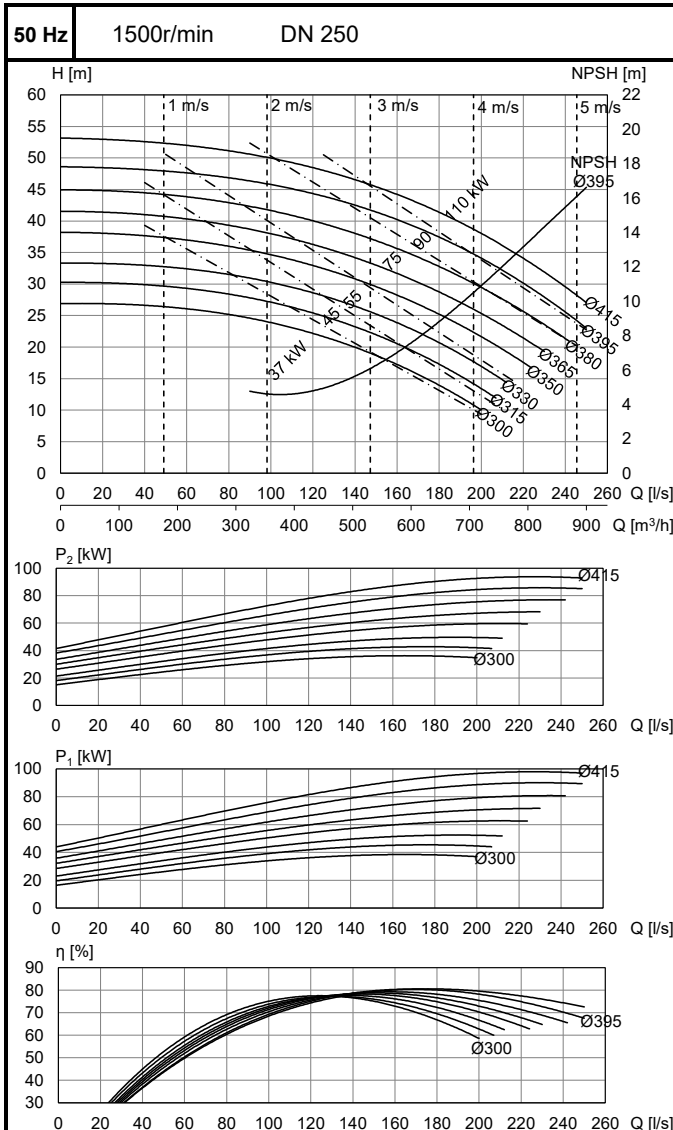
ALH-1250/4

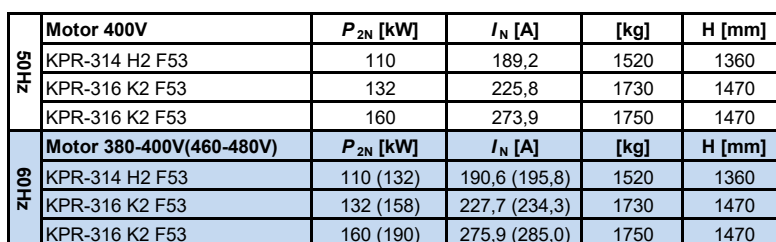
ALS-1250/4

ALX-1250/4



ZH05	Motor 400V	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-225 K2 F41	37	67,1	625	900
	KP-225 K2 F42	45	81,1	630	900
	KP-256 J2 F42	55	98,6	755	950
	KP-288 K2 F43	75	133,8	920	1070
	KP-288 K2 F43	90	156,9	935	1070
ZH09	Motor 380-400V(460-480V)	P_{2N} [kW]	I_N [A]	[kg]	H [mm]
	KP-225 K2 F42	45 (54)	80,4 (84,6)	630	900
	KP-256 J2 F42	55 (66)	96,8 (101,0)	755	950
	KP-288 K2 F43	75 (90)	135,1 (137,7)	920	1070
	KP-288 K2 F43	90 (105)	162,8 (158,2)	935	1070
	KPR-314 H2 F43	110 (132)	190,6 (195,8)	1265	1330







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