Kolmeks

Технические характеристики (eng)

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KM-centrifugal pumps

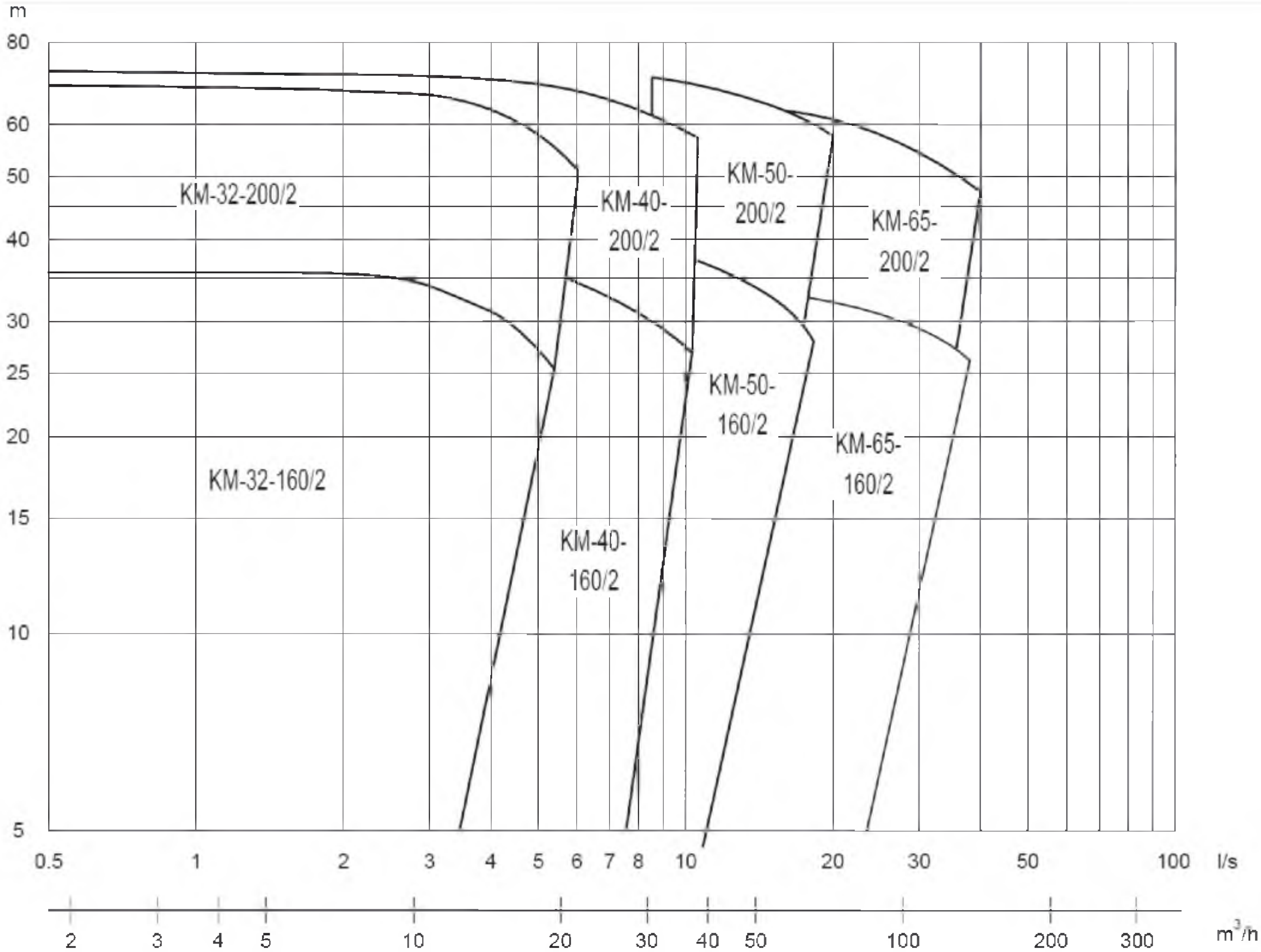
General technical data

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.

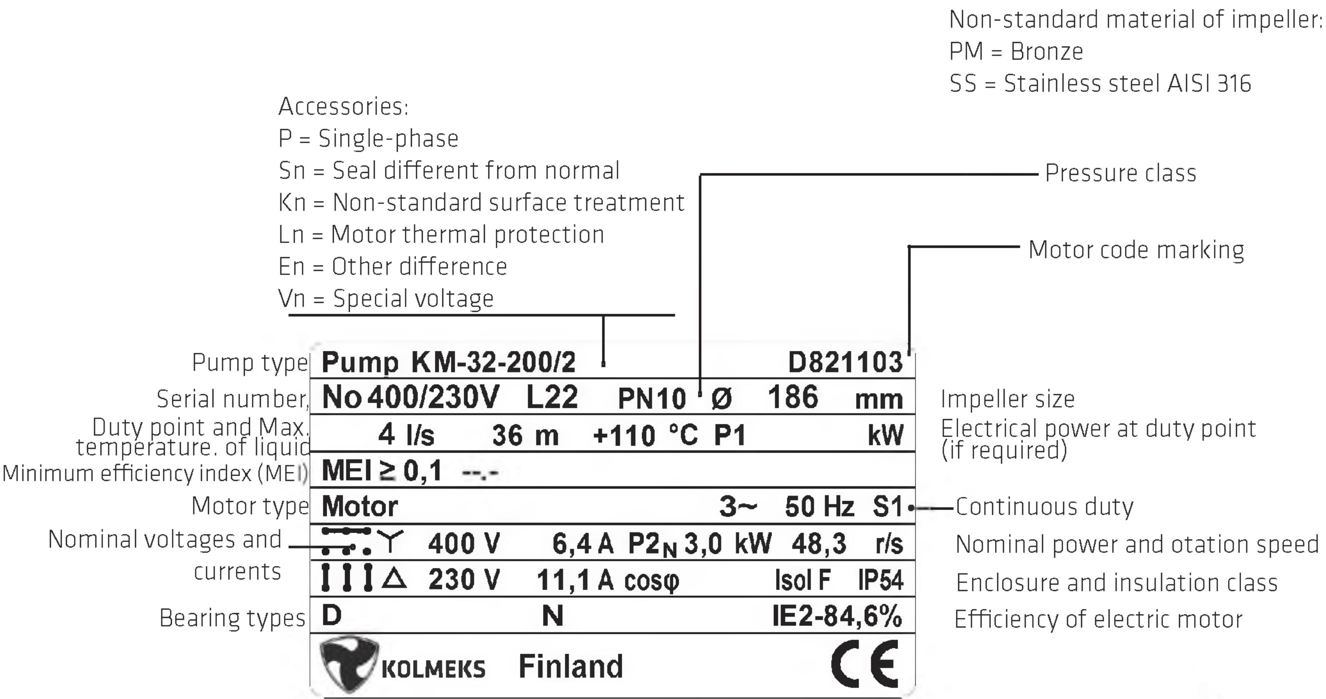
Seals
The shaft seal of a KM pump is a single mechanical seal. The seal in the pump housing is an O-ring.

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 (*

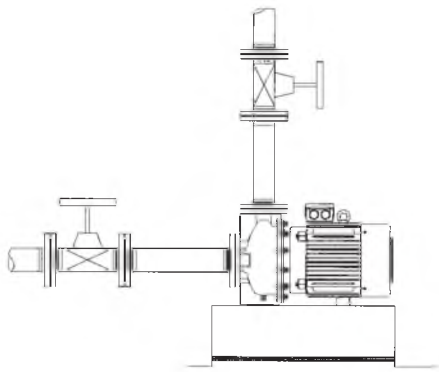
NOTE! The shaft seal in a KM pump is available in several material alternatives depending on the requirements of the liquid to be pumped. (*The operating temperature range of the pump is dependent on the liquid to be pumped. With water, the range is 0 ... +110°C

Rating plate



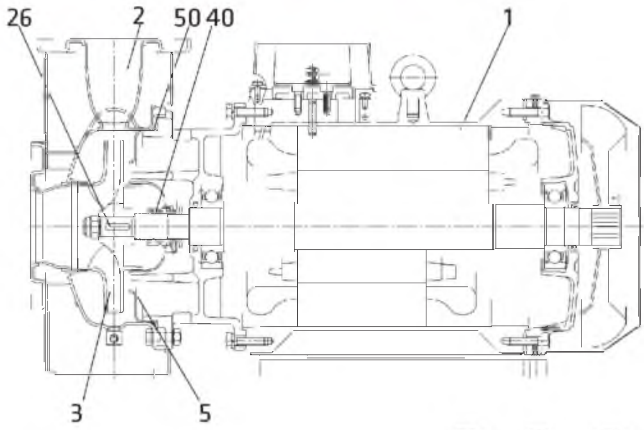
Installation
The KM pump must be installed onto the motor in a horizontal position.

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

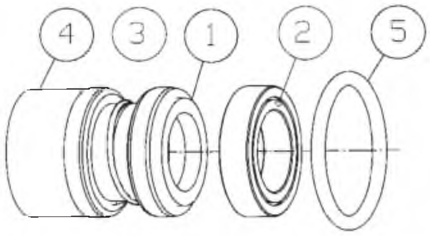


Small pumps (less than 2.2 kW) can be installed in the piping without support. Large pumps (> 2.2 kW) are fastened by their foot onto a freely moving concrete plinth which is separated from the floor, e.g. by a 20 mm thick rubber or cork mat. The weight of the concrete plinth must be about 1.5 times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



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

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

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?

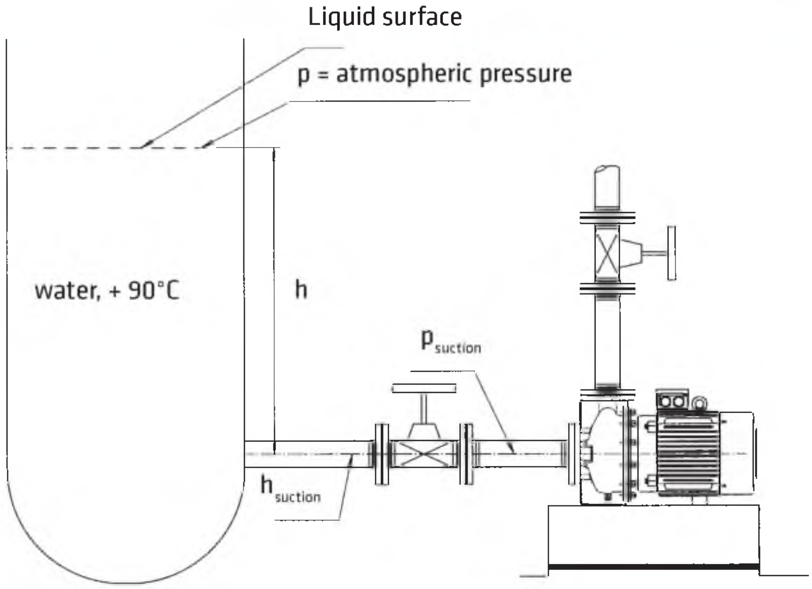
Pump type: KM-50-200/2/ Ø200 11 kW
$NPSH_{re} < p + h - h_{suction} - p_h$
$NPSH_{re} < 10\ m + 2\ m - 1\ m - 7\ m$
$NPSH_{re} < 4\ m$
Observing the safety margin 0.5 m, the $NPSH_{re}$ value of the pump must be smaller than 3.5 m for the pump not to cavitate.

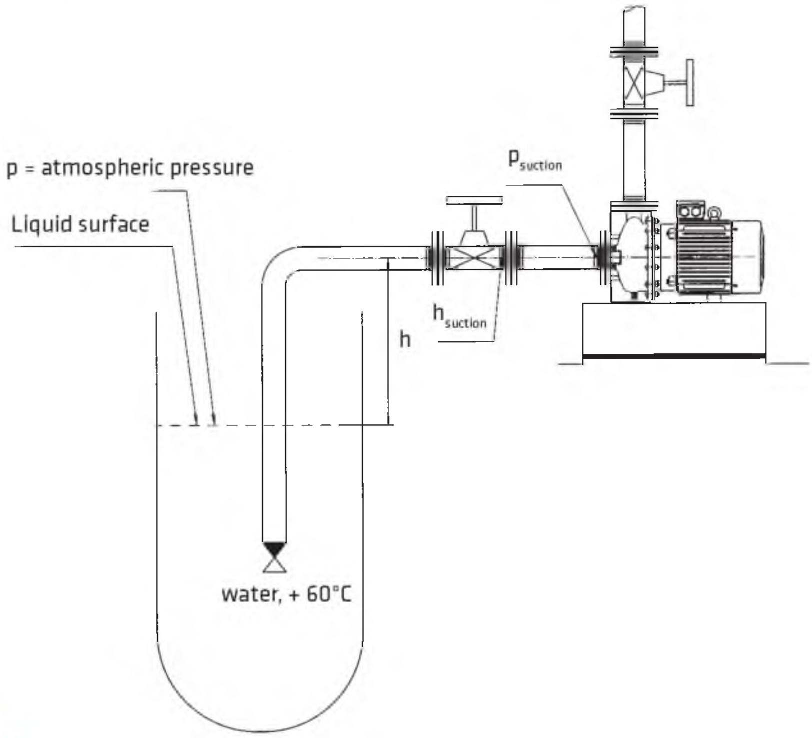
ANSWER: $NPSH_{re}$ of pump KM-50-200/2/Ø200 = 3.1 m (with 14 l/s output), whereby it will not cavitate.

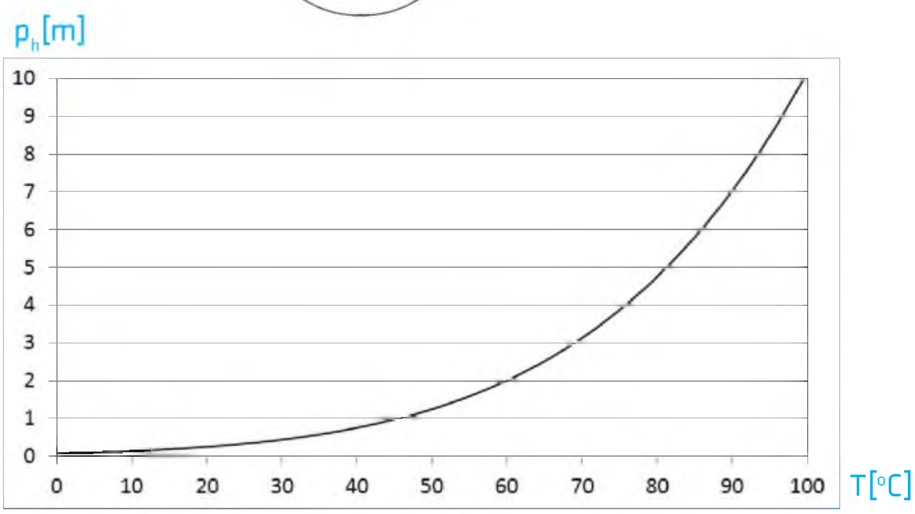
Example 2: Open tank (p = atmospheric pressure = 10 m) where water temperature is at the maximum + 60°C (p_h = 2 m), suction pipe pressure losses 1 m. Pump duty point 14 l/s, 50 m. Pump $NPSH_{re}$ = 3.1 m. QUESTION: At which level in relation to the surface of the liquid should the pump be installed?

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.

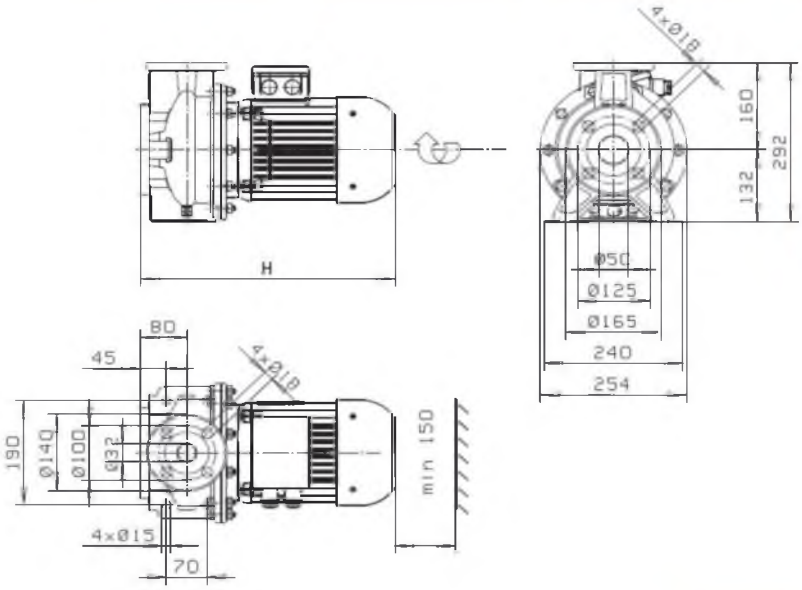




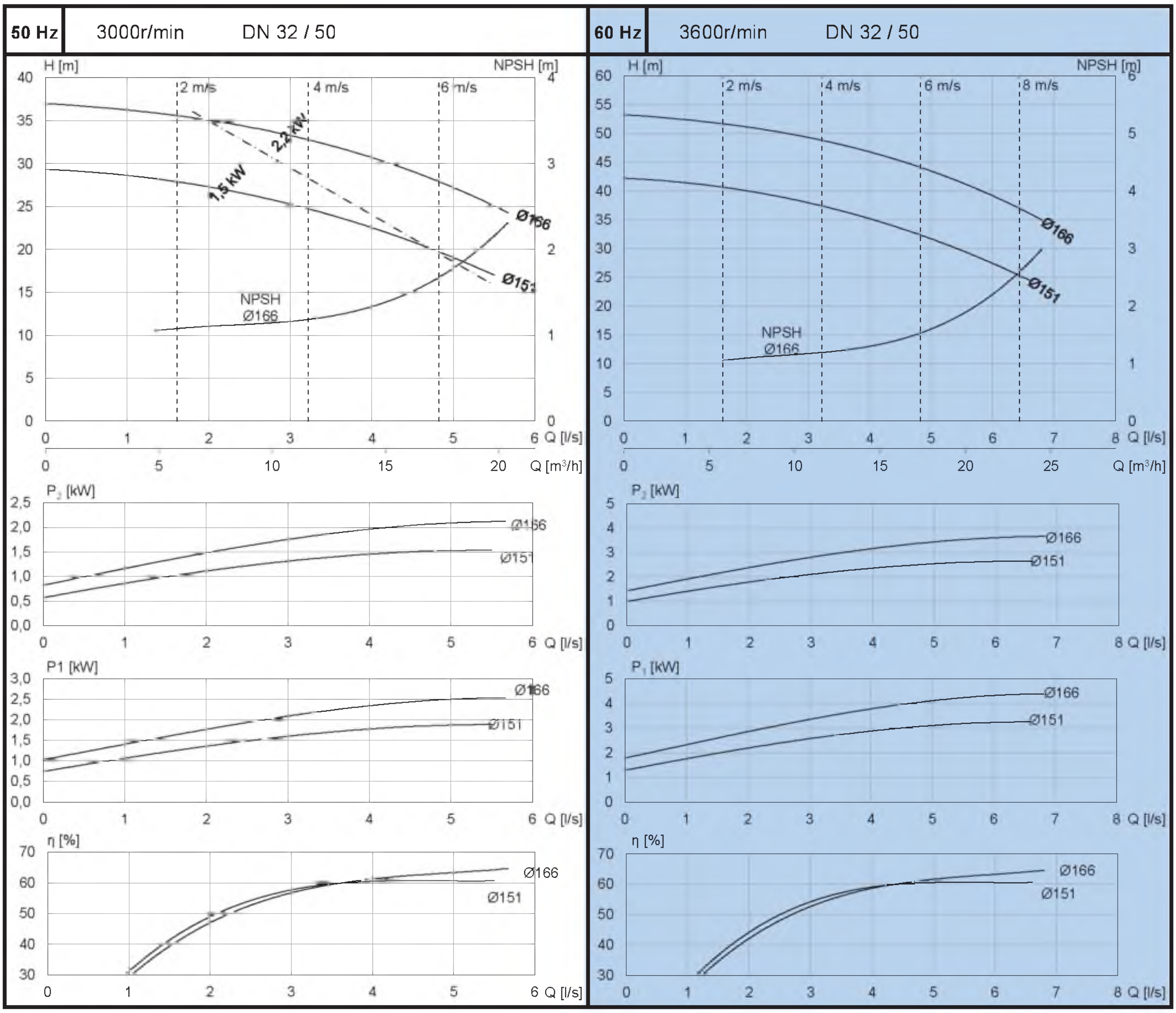


Vapour pressure (water)

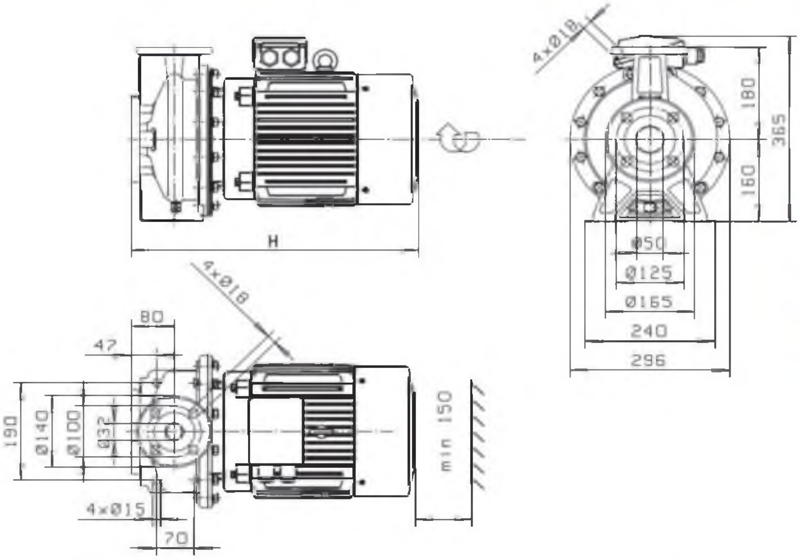
KM-32-160/2



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



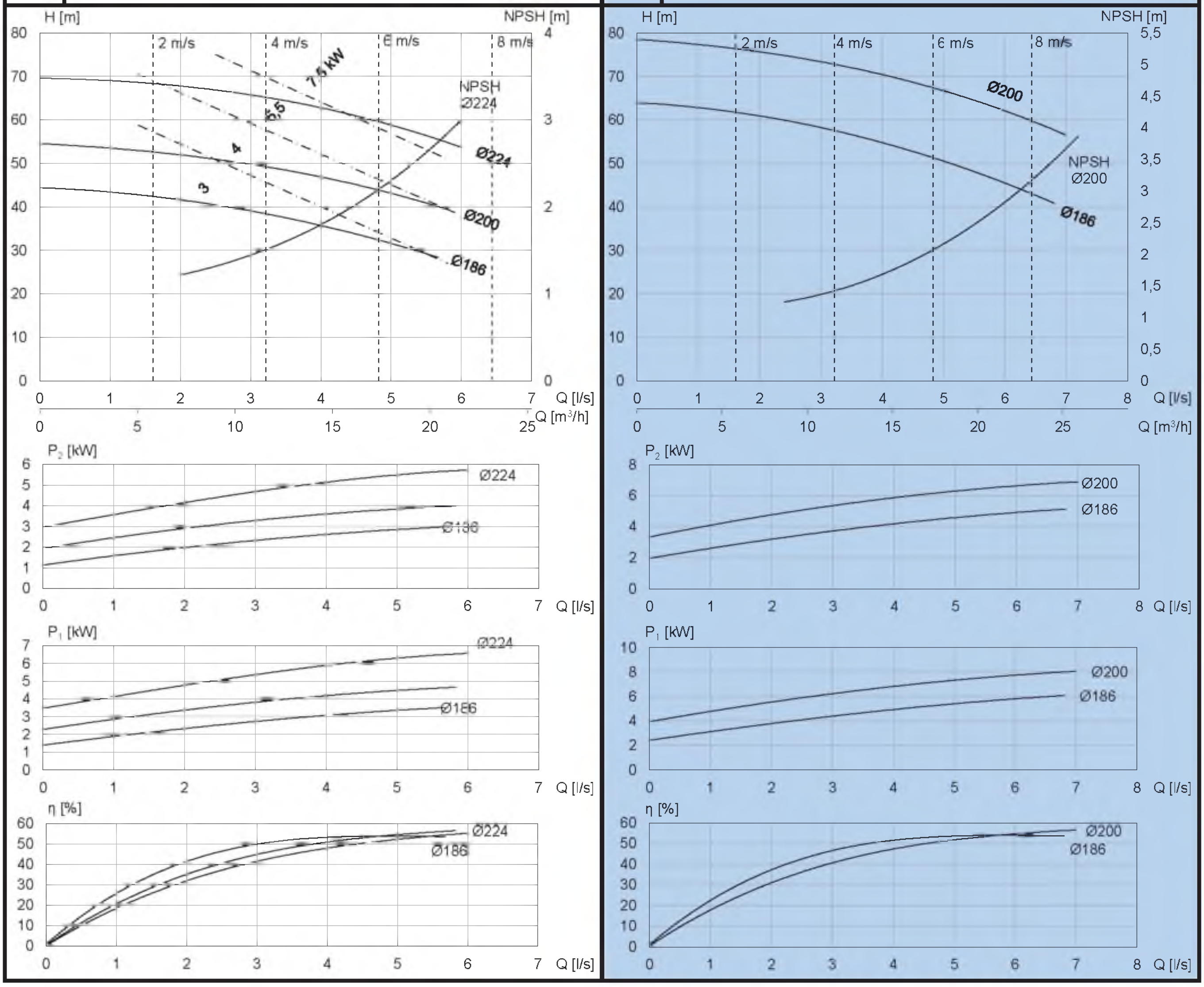
KM-32-200/2



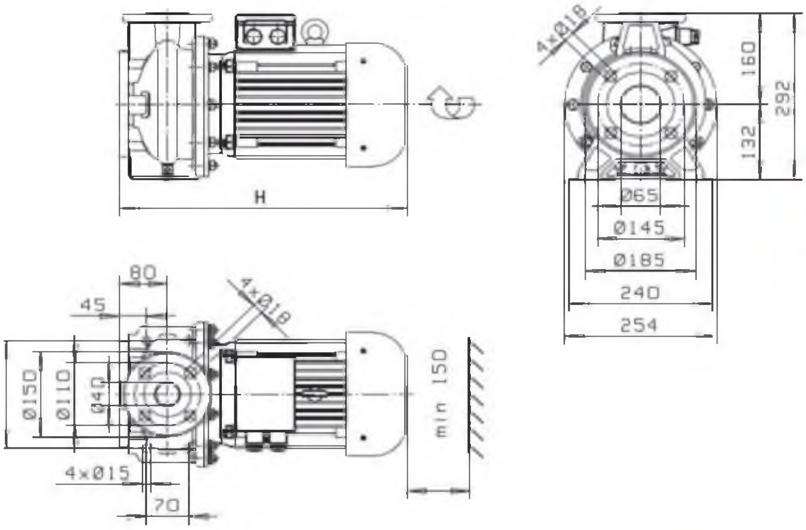
	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	3,0	6,4	33	433
	4,0	8,3	40	454
	5,5	10,5	49	475
	7,5	14,6	58	517
60Hz	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
	5,5	12,3	49	477
	7,5	15,2	58	520

50 Hz 3000r/min DN 32 / 50

60 Hz 3600r/min DN 32 / 50

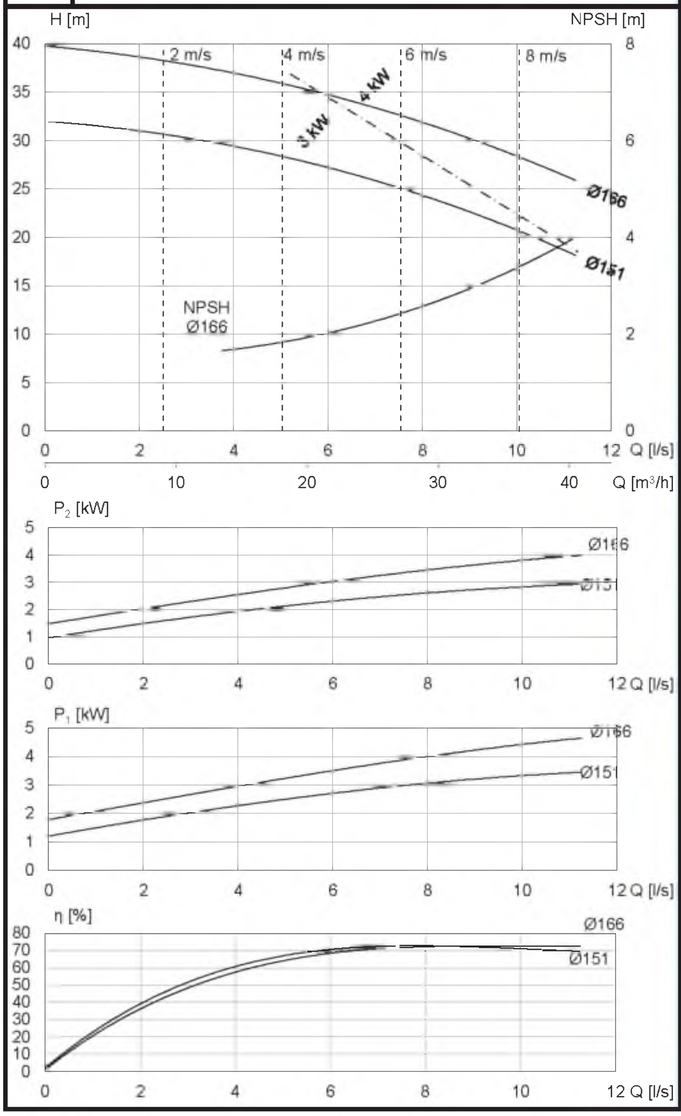


KM-40-160/2

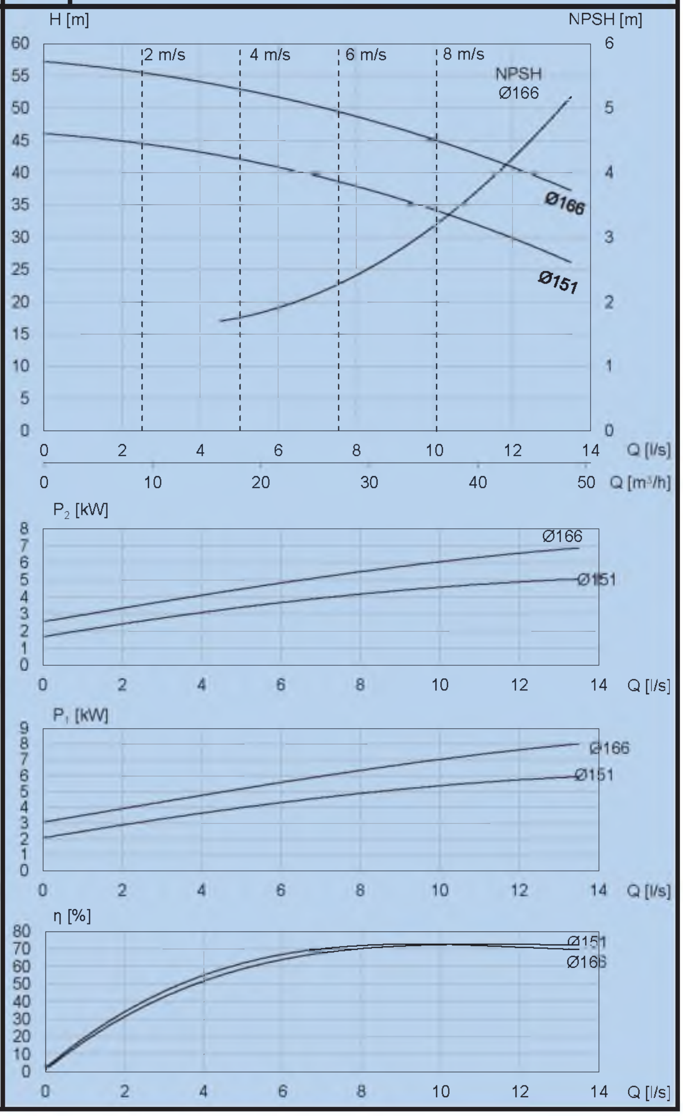


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	3,0	6,4	53	433
50Hz	4,0	8,3	57	454
60Hz	5,5	12,0	43	475
60Hz	7,5	15,4	51	498

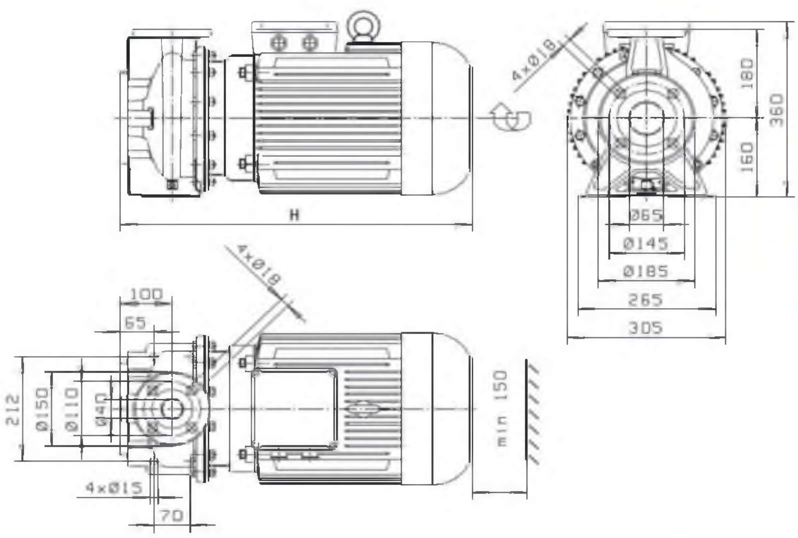
50 Hz	3000r/min	DN 40 / 65



60 Hz	3600r/min	DN 40 / 65

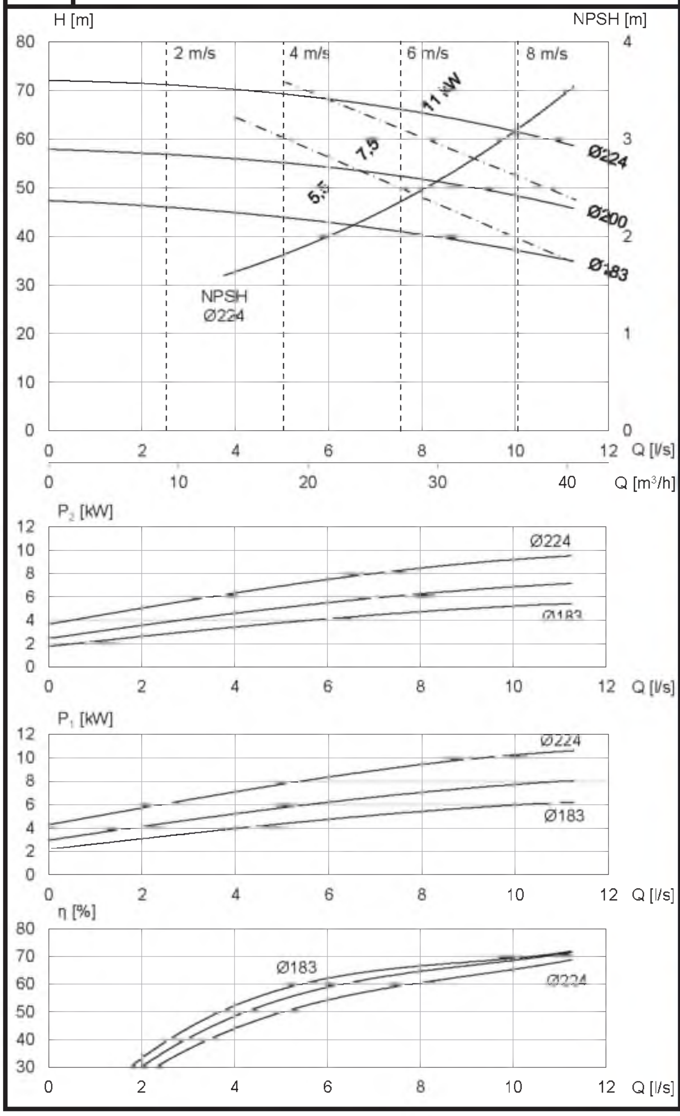


KM-40-200/2

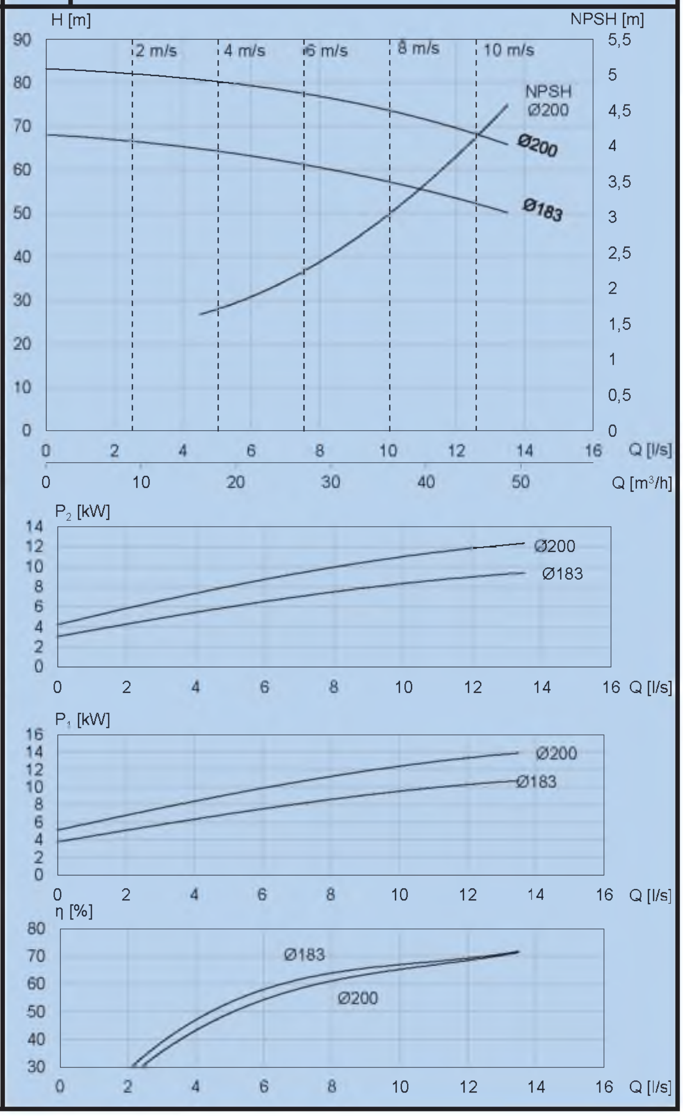


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	5,5	10,5	49	495
	7,5	14,6	57	537
	11,0	21,7	68	594
60Hz	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
	11,0	22,2	68	498
	15,0	27,0	74	724

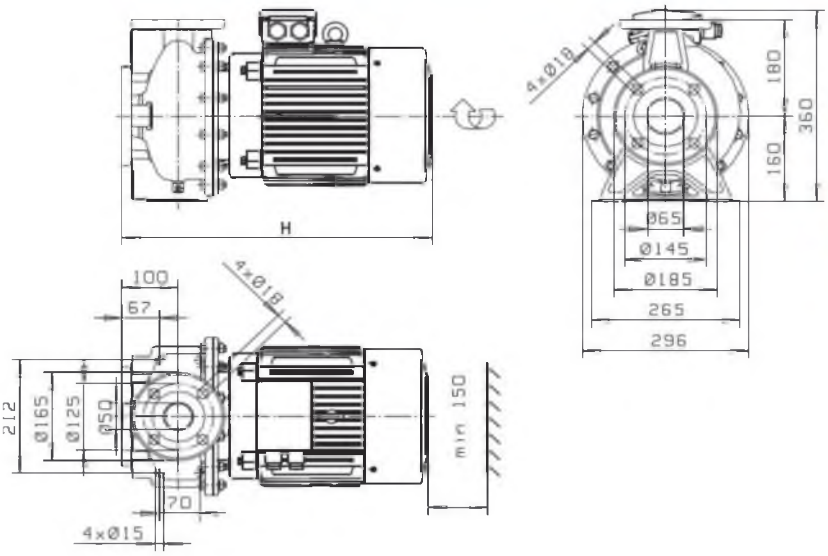
50 Hz 3000r/min DN 40 / 65



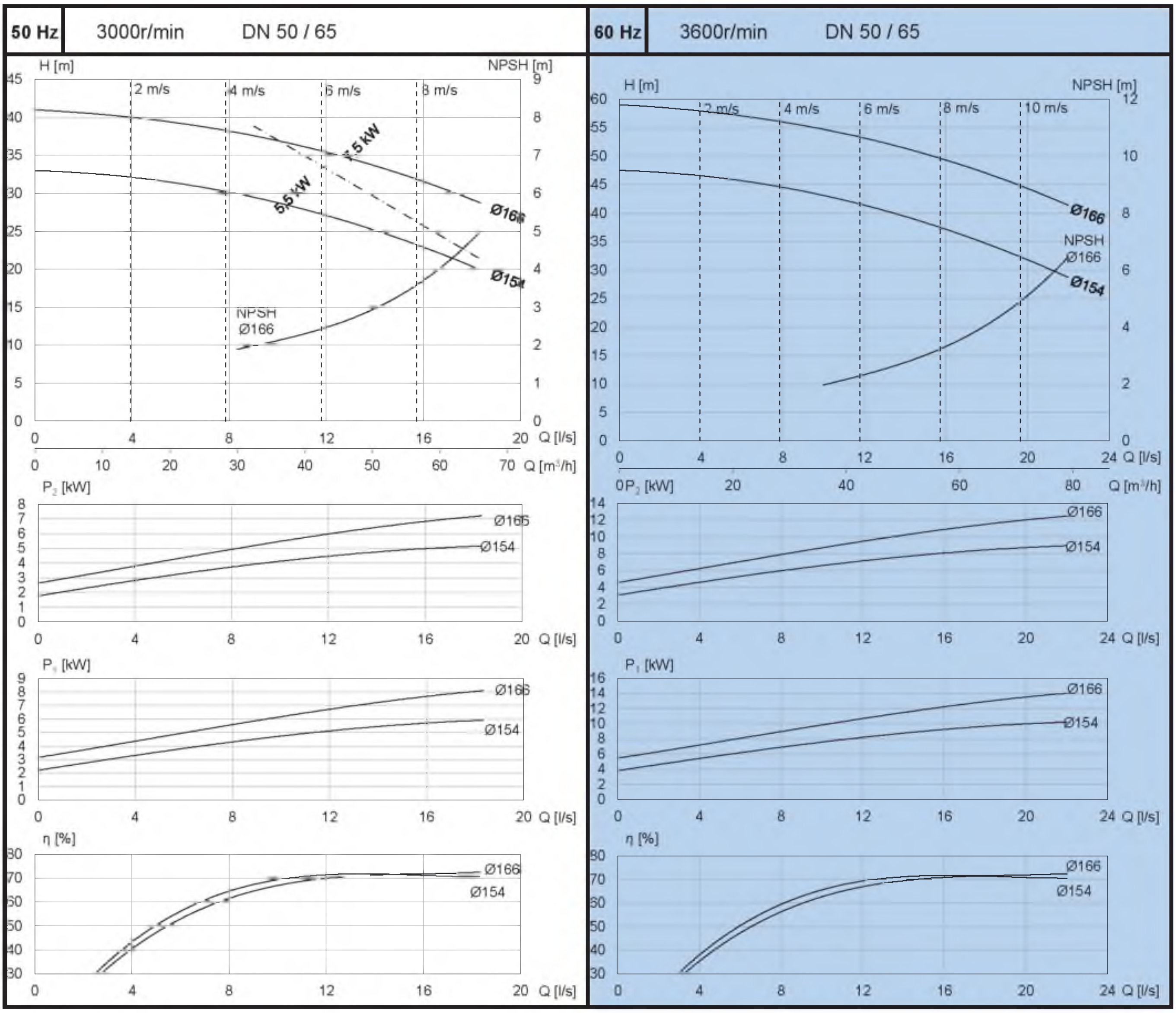
60 Hz 3600r/min DN 40 / 65



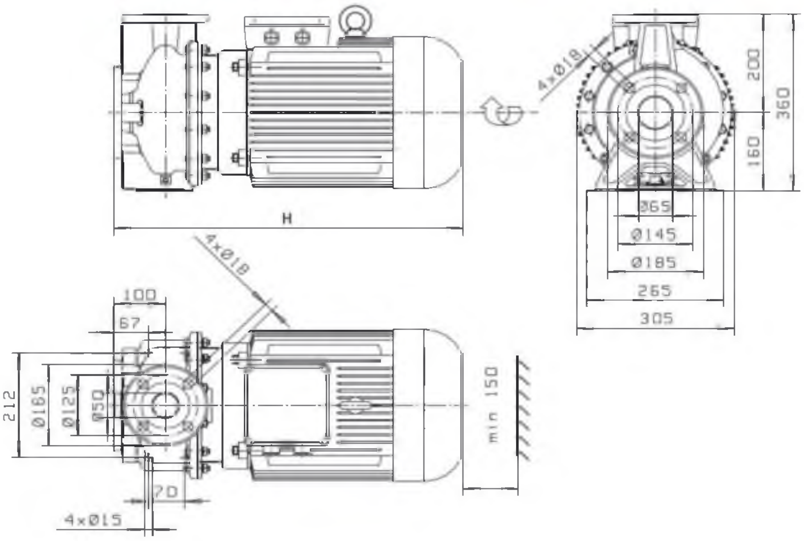
KM-50-160/2



	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

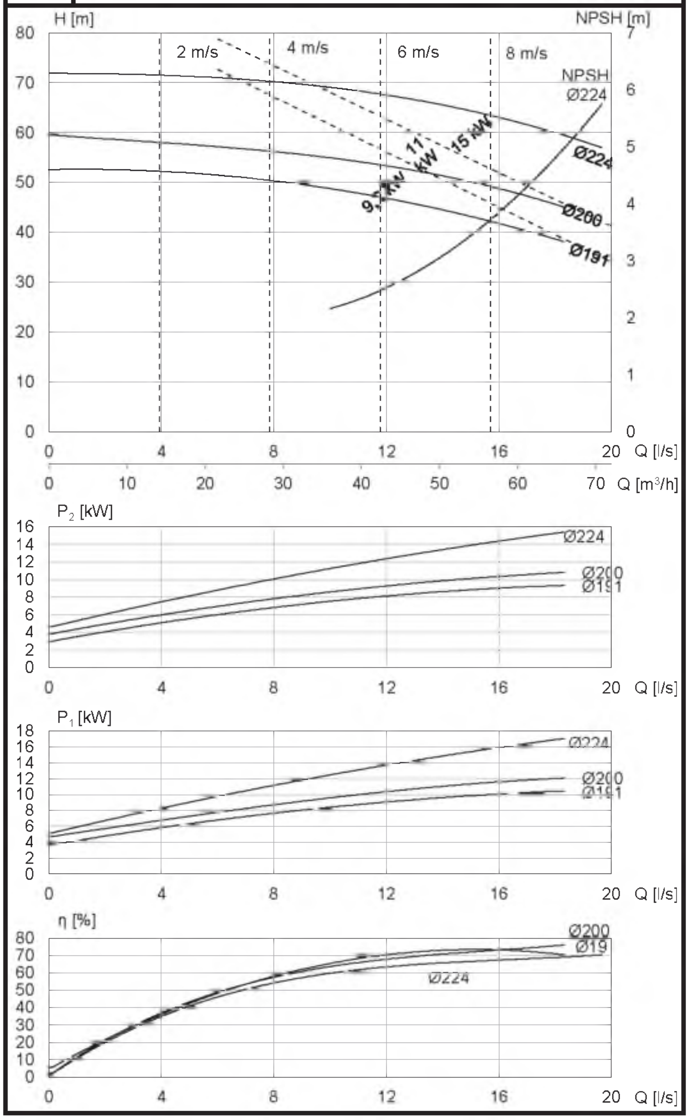


KM-50-200/2



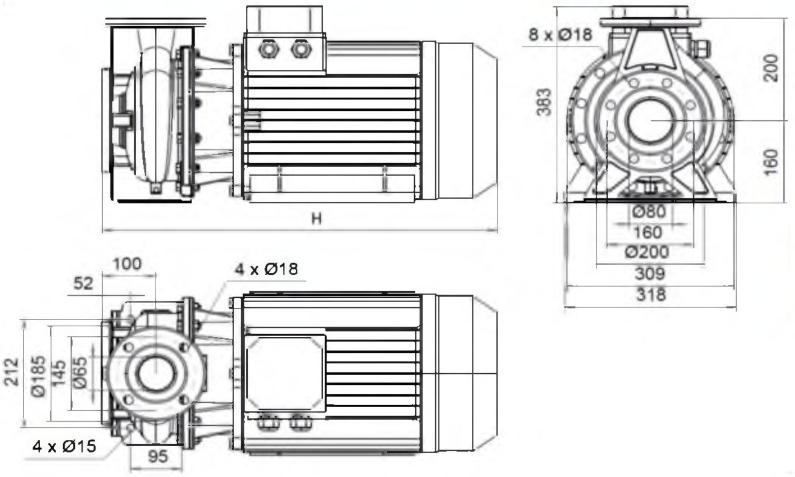
50Hz	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
	9,2	17,3	62	594
	11,0	21,7	67,5	594
	15	28,5	96,0	723

50 Hz	3000r/min	DN 50 / 65



60 Hz is not available

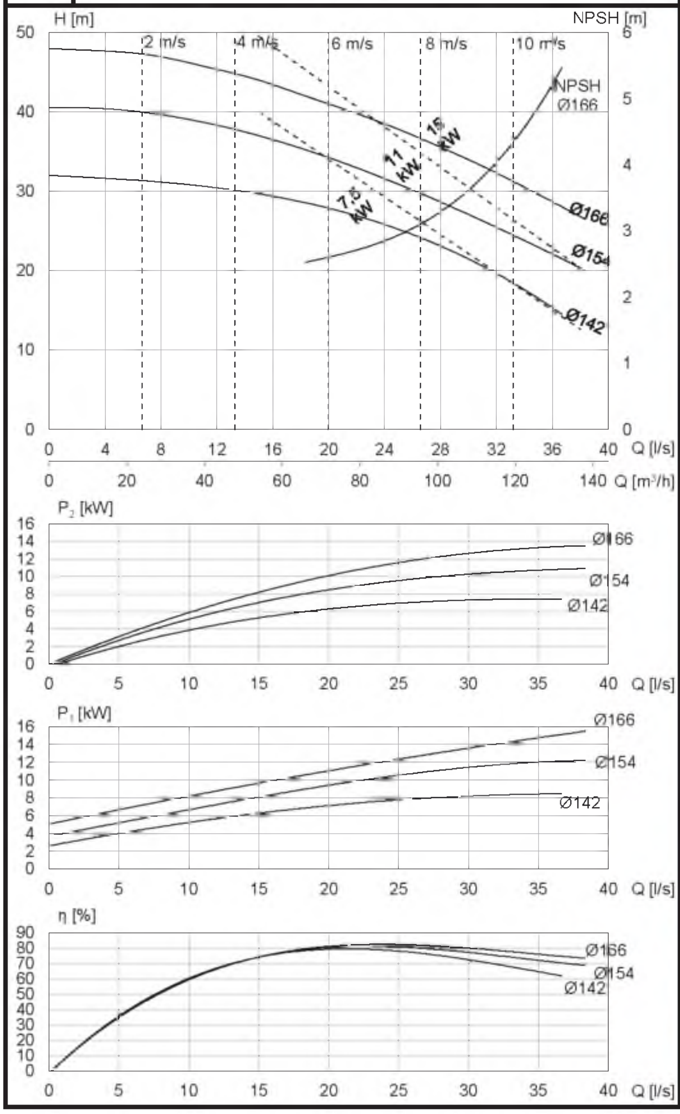
KM-65-160/2



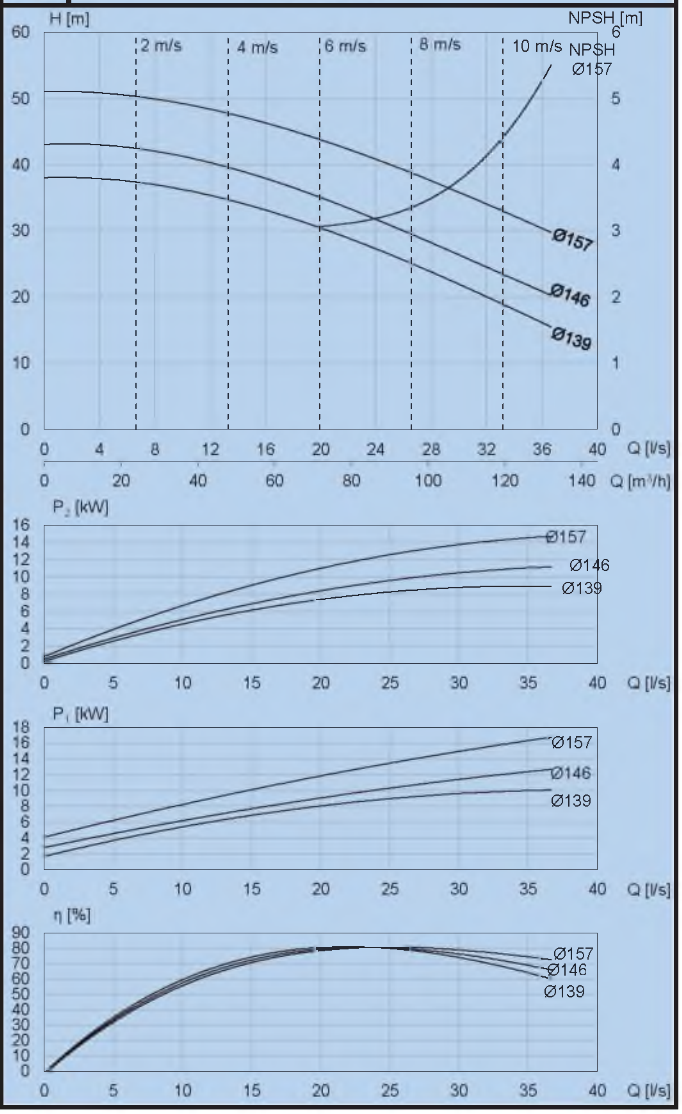
	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	7,5	14,6	62	537
	11	21,7	76	594
	15,0	28,5	93	732
	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
60Hz	9,26	18,4	64	593
	11	21,3	70	593
	15	28,9	103	733

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

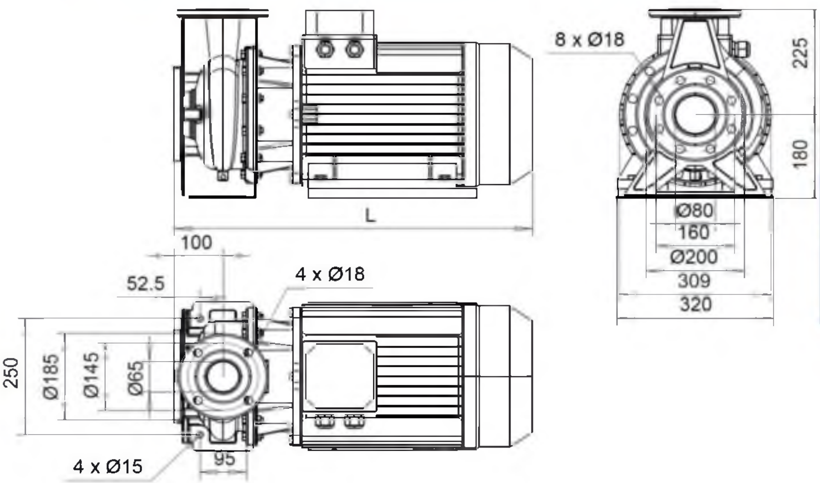
50 Hz 3000r/min DN 65 / 80



60 Hz 3600r/min DN 65 / 80



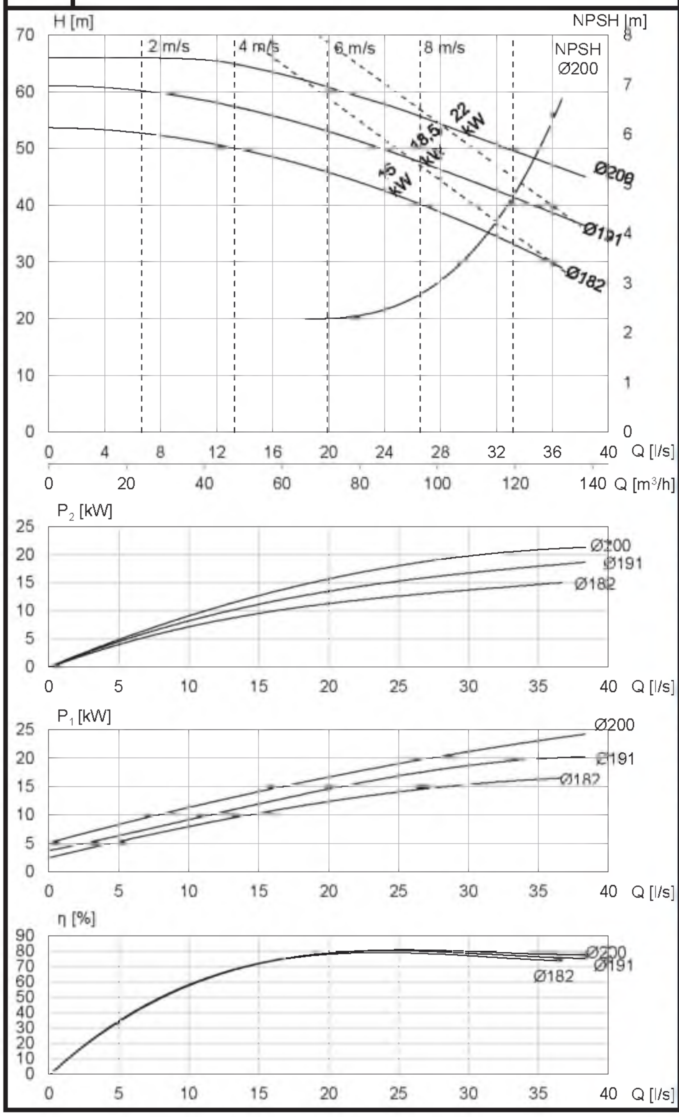
KM-65-200/2

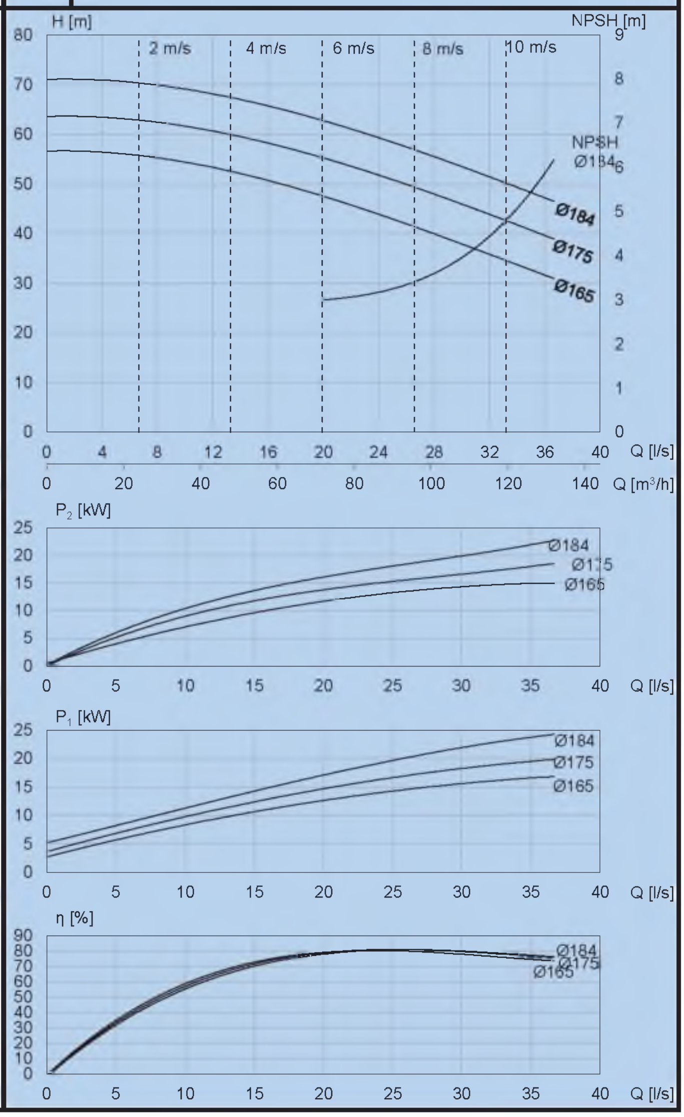


	P_{2N} [kW]	I_N 400V [A]	m [kg]	H [mm]
50Hz	15	28,5	114	732
	18,5	34,1	127	732
	22,0	42,50	136	732
60Hz	15	29,3	106	733
	18,5	35,4	120	733
	22	41,7	128	733

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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