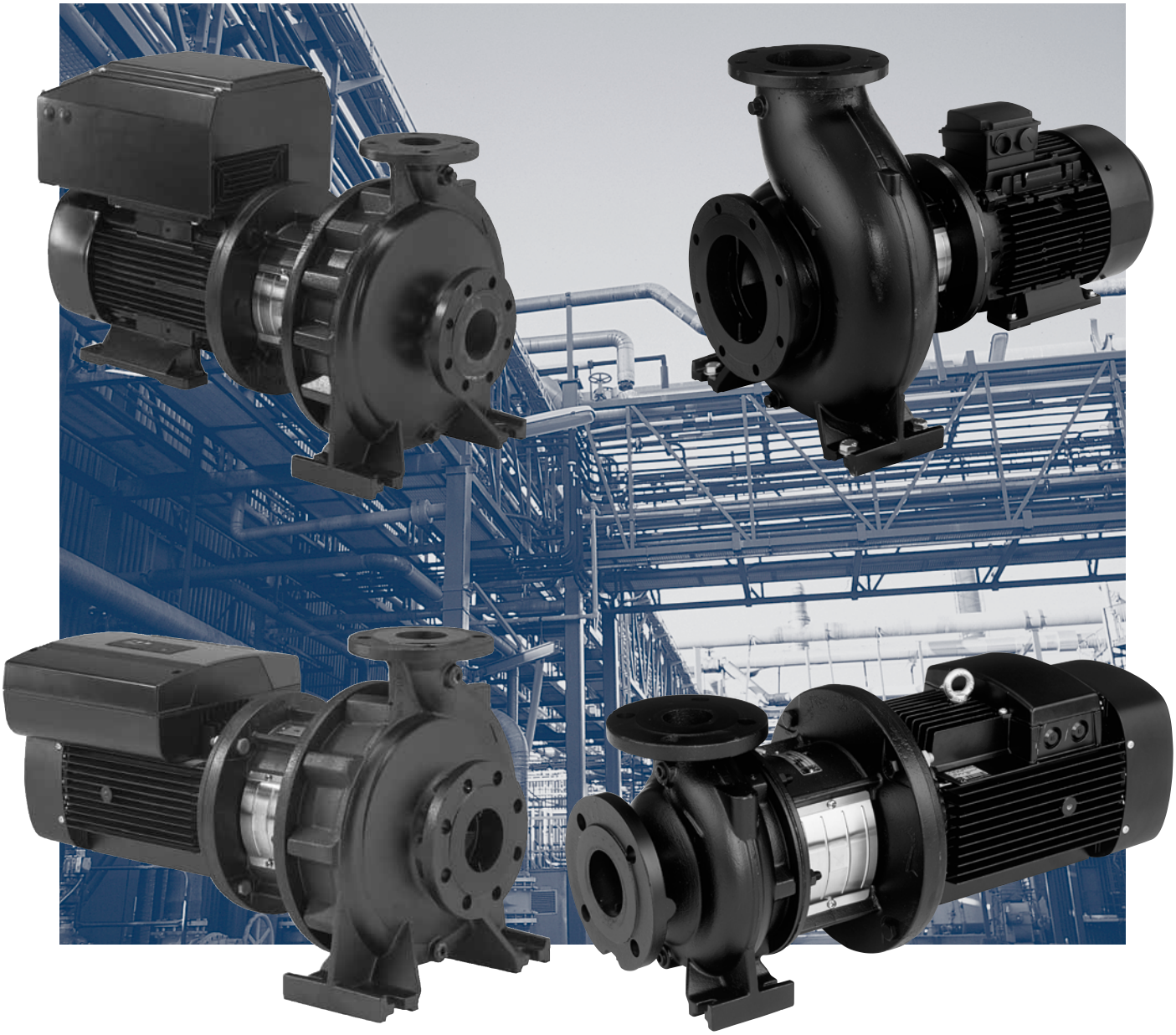
GRUNDFOS **DATA BOOKLET**

NB, NBE

Single-stage end-suction pumps
50 Hz



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Contents

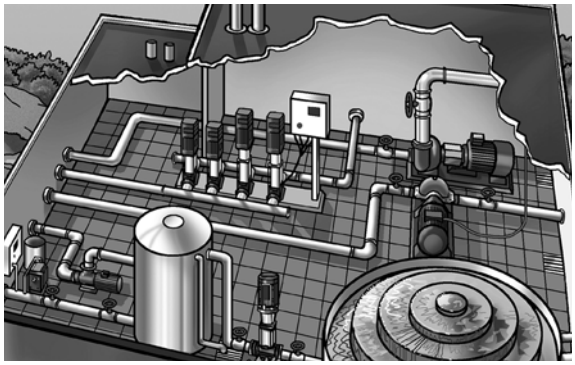
Applications

Introduction

The NB series is a multi-purpose pump range suitable for a variety of different applications demanding reliable and cost-efficient supply.

NB, NBE pumps are used in four main fields of application:

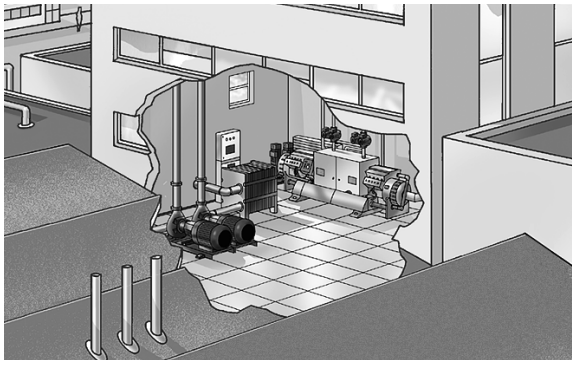
- water supply
- industrial pressure boosting
- industrial liquid transfer
- irrigation.



Water supply

Besides general water supply in municipal and industrial waterworks, the NB, NBE pumps are used for these specific applications:

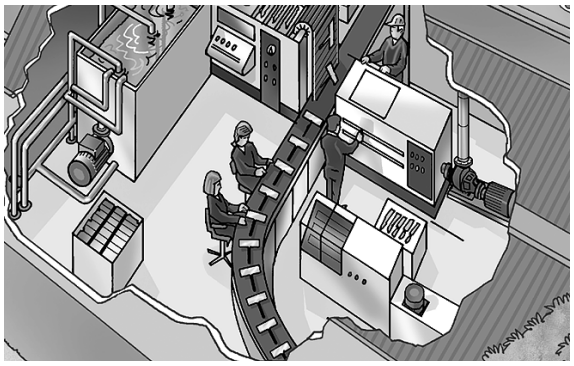
- filtration and transfer at waterworks
- pressure boosting in mains
- pressure boosting in high-rise buildings, hotels, etc.
- pressure boosting in industrial buildings
- various swimming bath applications.



Industrial pressure boosting

Pressure boosting in

- industrial washing and cleaning systems
- industrial washdown systems
- vehicle washing tunnels
- fire protection systems.



Industrial liquid transfer

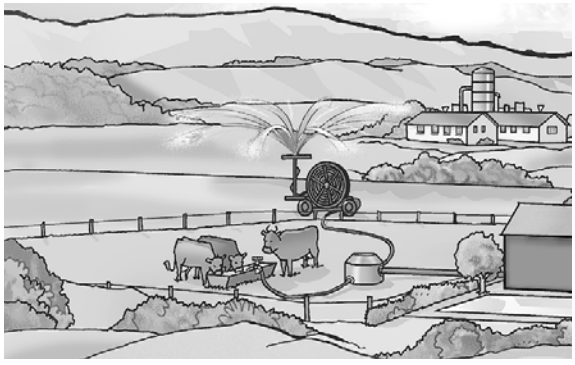
Liquid transfer in

- cooling and air-conditioning systems (refrigerants)
- boiler feed and condensate systems
- aquafarming
- industrial heating systems
- district heating plants.

Irrigation

Irrigation covers these applications:

- field irrigation (flooding)
- sprinkler irrigation
- drip-feed irrigation.



Features and benefits

NB, NBE pumps present these features and benefits:

- The pumps are non-self-priming, single-stage, centrifugal volute pumps with axial suction port, radial discharge port and horizontal shaft.
- Suction and discharge flanges are PN 10 or PN 16 according to EN 1092-2.
- Dimensions and rated performance are according to EN 733 (10 bar).
  However, pumps with flange dimensions up to and including DN 150 are marked PN 16 and thus suitable for 16 bar operation.
- The pump is close-coupled with a totally enclosed fan-cooled standard motor with main dimensions to IEC and DIN standards
- The mechanical shaft seal has dimensions according to EN 12756.
- NB, NBE pumps cover the performance range from 3 to 500 m^3/h and heads from 3 to 110 m.
  Motor sizes fall in the 0.25 to 45 kW range.
- Pumps with power requirement 1.1 to 22 kW are available with motors with built-in frequency converter. These pumps are called NBE.
- All pumps are dynamically balanced according to ISO 1940 class 6.3.
  Impellers are hydraulically balanced.
- The NB product range is available in two product series, "Standard range" and "Premium range". Premium range products have EFF 1 motors, standard range products have EFF 2 motors.
- The pumps are of the back pull-out design enabling removal and dismantling of the motor and impeller without disturbing the pump housing or pipework. Consequently, even the largest pumps can be serviced by a single person with a crane, see Fig. 1.

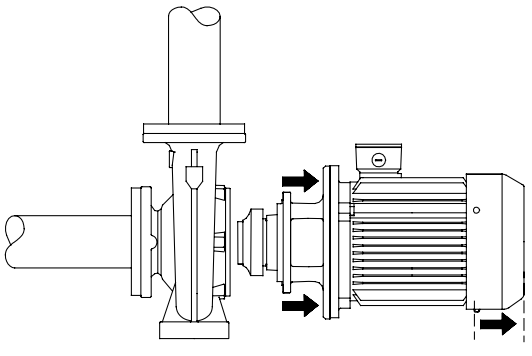


Fig. 1 Back pull-out design

High-efficiency motors

NB pumps with motors ranging from 1.1 to 45 kW are available with high-efficiency motors (EFF 1). These pumps are called premium range. EFF 1 is the highest efficiency class defined by CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics).

Pumps with electronic speed control

NB pumps equipped with a motor with built-in frequency converter and the necessary application software to achieve an all-in-one solution enable electronic speed control. These pumps are called NBE.

Electronic speed control enables continuously variable control of motor speed which again enables adaptation of the performance to a given requirement.

The pump materials of NBE pumps are the same as those of the NB pump range.

If a sensor is installed, NBE pumps allow for any of these configurations and control methods:

- constant pressure
- temperature control
- constant flow.

Why select an NBE pump?

Select an NBE pump if

- controlled operation is required
- constant pressure is required
- communication with the pump is required.

This furthermore gives these obvious advantages:

- energy savings
- increased comfort.

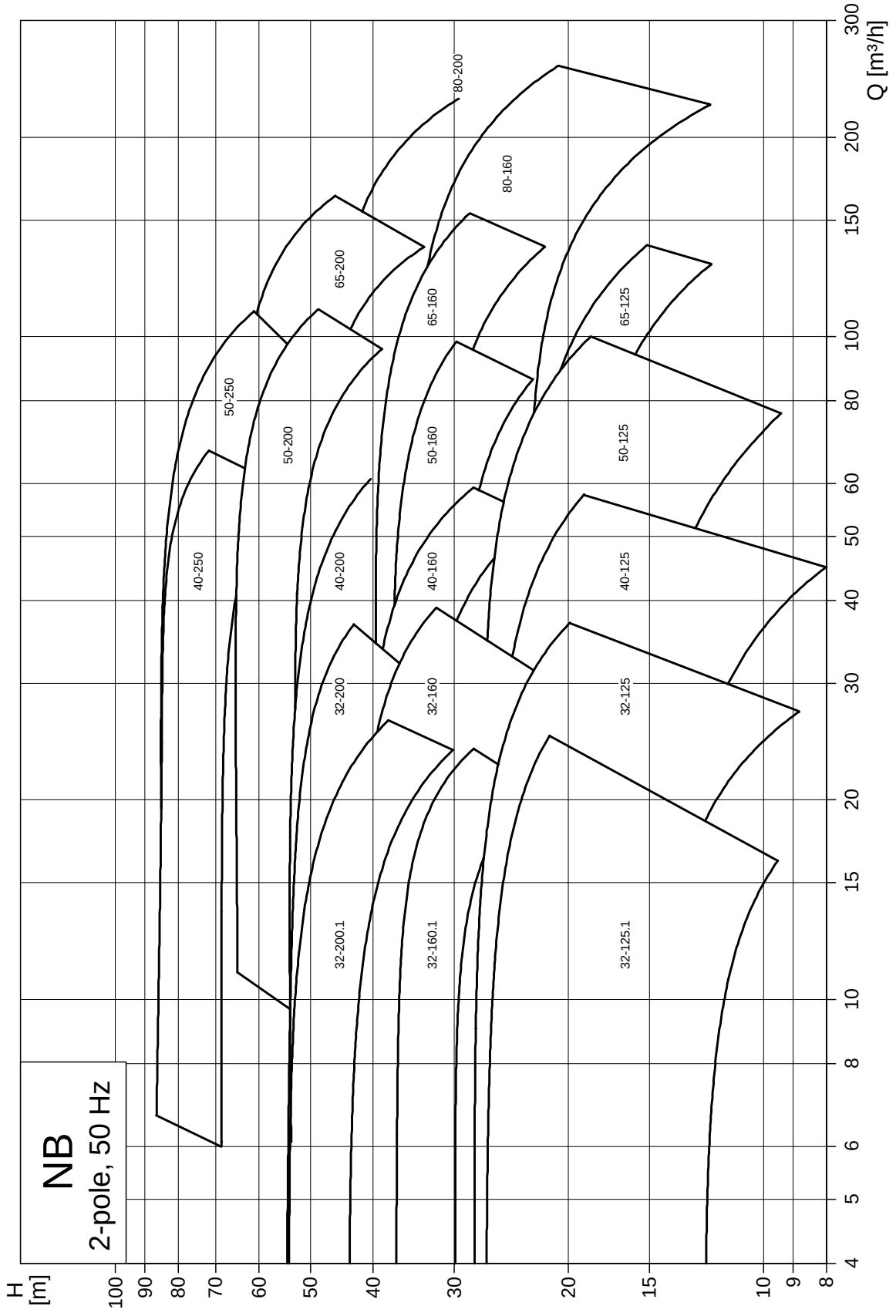
For further information on electronic speed control, see section "Speed controlled NB pumps" page #.

ATEX-approved NB pumps

On request, Grundfos offers NB pumps with ATEX-approval in accordance with Directive 94/9/EC (Group II, category 3G and 3D). If an ATEX-approved dry-running protection is installed, the pump can be upgraded to category 2 G.

Performance range

NB, NBE 2-pole



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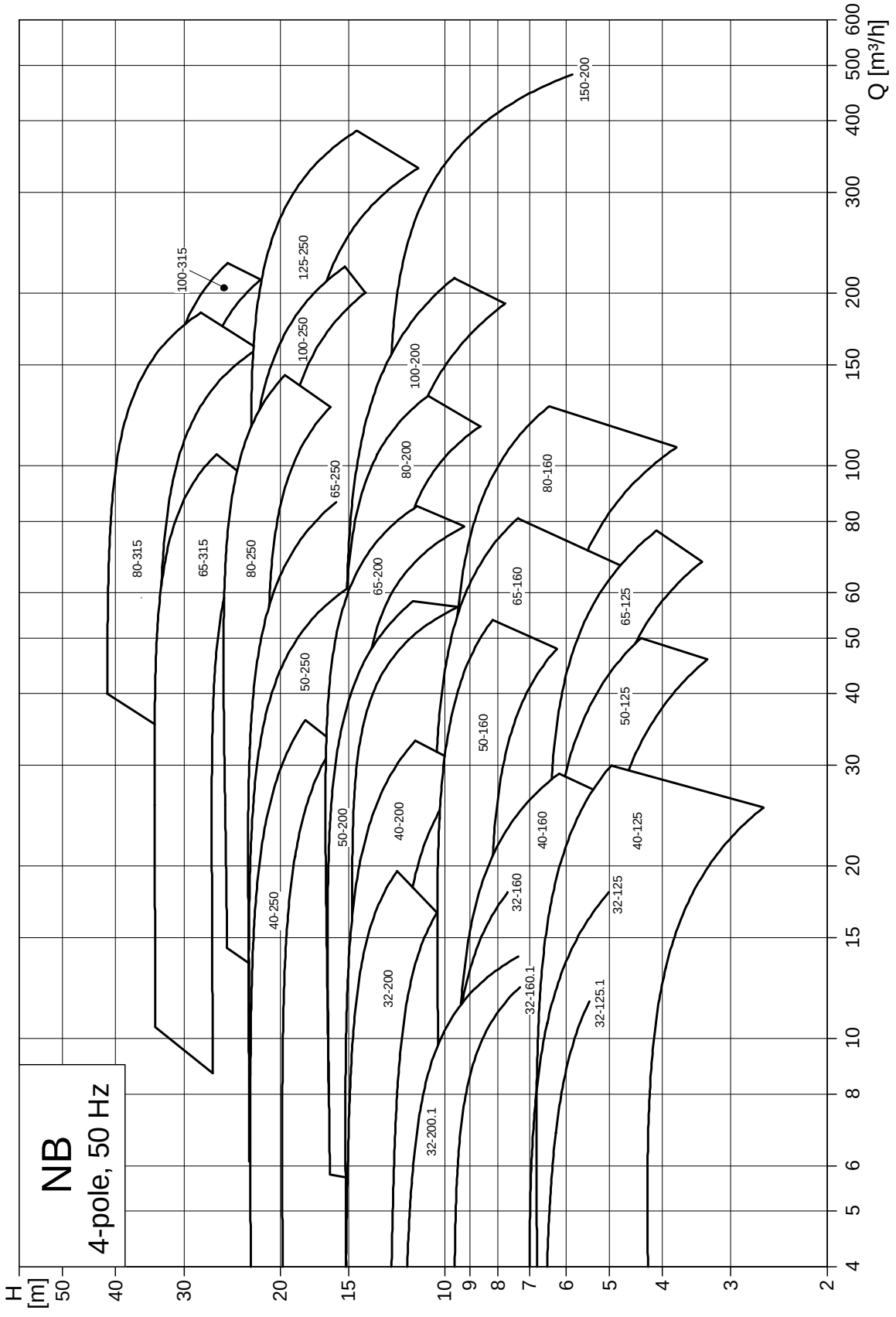
Performance range

NB, NBE 4-pole



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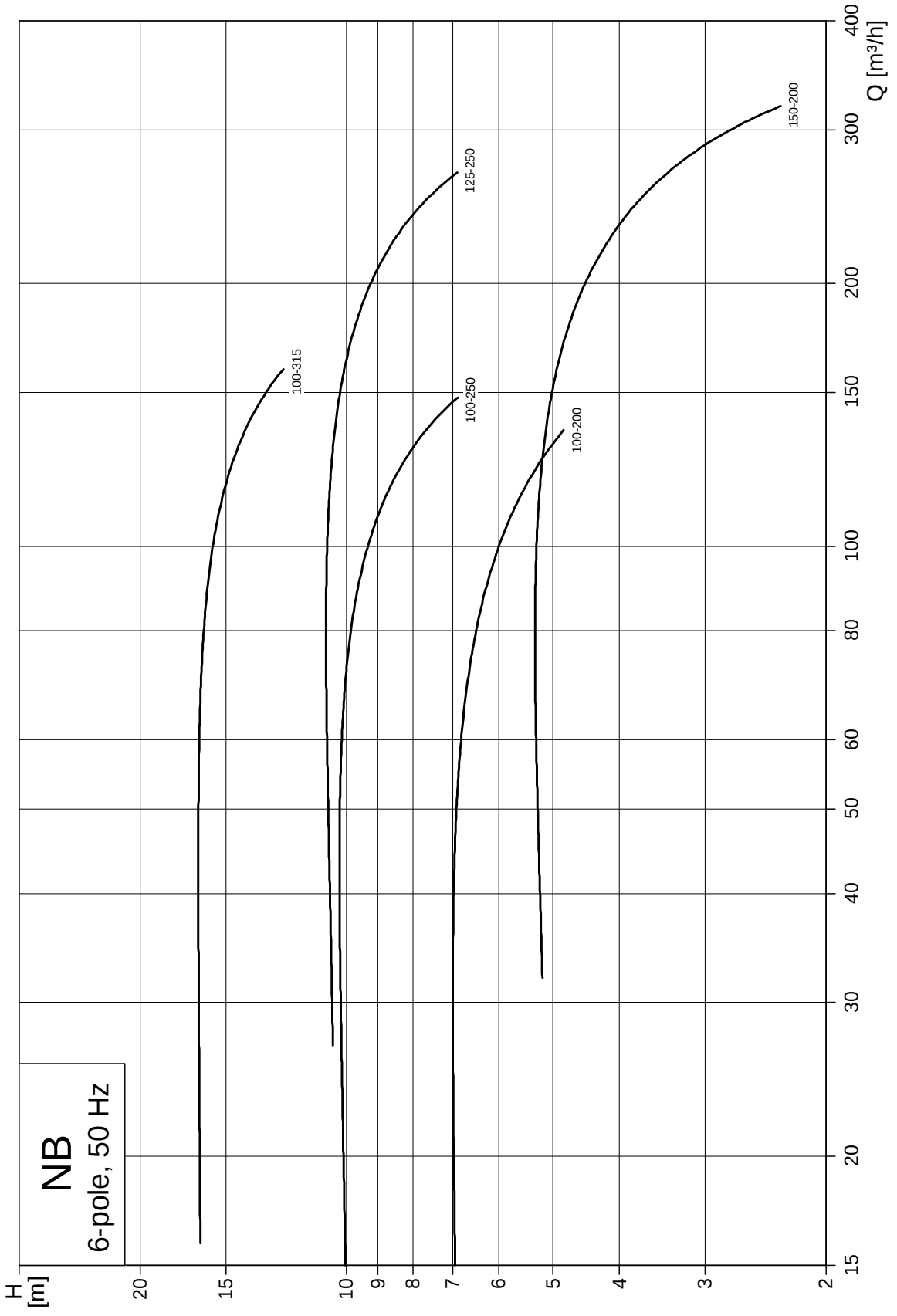
Performance range

NB 6-pole



Product range

The tables on the following pages show the complete NB, NBE product range.

The product range includes the pumps existing in WinCAPS.

The standard range has been combined on the basis of the following parameters:

- Pump housings have discharge flanges from DN 32 to DN 150.
- Pump housings and motor stools are made of electro-coated cast iron.
- Impellers are made of cast iron or bronze.
- Wear rings are made of bronze.
- Shaft seals are BAQE and GQQE.
- Motors are 50 Hz.
- NB pumps are available with 2-, 4- and 6-pole motors, NBE pumps with 2- and 4-pole motors.
- NB pumps are available with Premium range and Standard range motors.
- Motors with power rating up to and including 4 kW are available for "low voltage"; as from 2.2 kW motors are availabe for "high voltage".

To a great extent the pumps can be adapted to the requirements of the individual customer. For customized solutions, please contact Grundfos.

Product range

NB, NBE 50 Hz, 2-pole

Pump type 50 Hz, 2-pole	Design	P_2 [kW]	Available as E-pump	Pressure stage PN 10	Pressure stage PN 16
NB 32-125.1/100	A	0.75			●
NB 32-125.1/110	A	1.1			●
NB 32-125.1/121	A	1.5	●		●
NB 32-125.1/140	A	2.2	●		●
NB 32-125/106	A	1.1			●
NB 32-125/115	A	1.5	●		●
NB 32-125/130	A	2.2	●		●
NB 32-125/142	A	3.0	●		●
NB 32-160.1/155	A	2.2	●		●
NB 32-160.1/169	A	3.0	●		●
NB 32-160/151	A	3.0	●		●
NB 32-160/163	A	4.0	●		●
NB 32-160/177	A	5.5	●		●
NB 32-200.1/188	A	4.0	●		●
NB 32-200.1/205	A	5.5	●		●
NB 32-200/190	A	5.5	●		●
NB 32-200/206	A	7.5	●		●
NB 40-125/105	A	1.5	●		●
NB 40-125/116	A	2.2	●		●
NB 40-125/127	A	3.0	●		●
NB 40-125/139	A	4.0	●		●
NB 40-160/158	A	5.5	●		●
NB 40-160/172	A	7.5	●		●
NB 40-200/206	B	11.0	●		●
NB 40-250/230	B	15.0	●		●
NB 40-250/245	B	18.5	●		●
NB 40-250/255	B	22.0	●		●
NB 50-125/111	A	3.0	●		●
NB 50-125/121	A	4.0	●		●
NB 50-125/135	A	5.5	●		●
NB 50-125/144	A	7.5	●		●
NB 50-160/150	A	7.5	●		●
NB 50-160/167	B	11.0	●		●
NB 50-200/198	B	15.0	●		●
NB 50-200/210	B	18.5	●		●
NB 50-200/219	B	22.0	●		●
NB 50-250/233	B	22.0	●		●
NB 50-250/254	B	30.0			●
NB 65-125/120-110	A	4.0	●		●
NB 65-125/127	A	5.5	●		●
NB 65-125/137	A	7.5	●		●
NB 65-160/157	B	11.0	●		●
NB 65-160/173	B	15.0	●		●
NB 65-200/190	B	18.5	●		●
NB 65-200/198	B	22.0	●		●
NB 65-200/217	B	30.0			●
NB 80-160/147-127	B	11.0	●		●
NB 80-160/151	B	15.0	●		●
NB 80-160/161	B	18.5	●		●
NB 80-160/167	B	22.0	●		●
NB 80-200/188	C	30.0			●

Product range

NB, NBE 50 Hz, 4-pole

Pump type 50 Hz, 4-pole	Design	P_2 [kW]	Available as E-pump	Pressure stage PN 10	Pressure stage PN 16
NB 32-125.1/139	A	0.25			●
NB 32-125/142	A	0.37			●
NB 32-160.1/172	A	0.37			●
NB 32-160/172	A	0.55			●
NB 32-200.1/196	A	0.55			●
NB 32-200/200	A	0.75	●		●
NB 32-200/216	A	1.1	●		●
NB 40-125/116	A	0.25			●
NB 40-125/130	A	0.37			●
NB 40-125/142	A	0.55			●
NB 40-160/151	A	0.55			●
NB 40-160/166	A	0.75	●		●
NB 40-200/198	A	1.1	●		●
NB 40-200/217	A	1.5	●		●
NB 40-250/245	A	2.2	●		●
NB 40-250/260	A	3.0	●		●
NB 50-125/129	A	0.55			●
NB 50-125/142	A	0.75	●		●
NB 50-160/158	A	1.1	●		●
NB 50-160/175	A	1.5	●		●
NB 50-200/210	A	2.2	●		●
NB 50-200/219	A	3.0	●		●
NB 50-250/263	A	4.0	●		●
NB 65-125/133	A	0.75	●		●
NB 65-125/144	A	1.1	●		●
NB 65-160/149	A	1.1	●		●
NB 65-160/165	A	1.5	●		●
NB 65-160/177	A	2.2	●		●
NB 65-200/205	A	3.0	●		●
NB 65-200/219	A	4.0	●		●
NB 65-250/259	A	5.5	●		●
NB 65-315/282	A[1)]	7.5	●		●
NB 65-315/314	C	11.0	●		●
NB 80-160/146	A	1.5	●		●
NB 80-160/161	A	2.2	●		●
NB 80-160/175	A	3.0	●		●
NB 80-200/196	A	4.0	●		●
NB 80-200/214	A	5.5	●		●
NB 80-250/247	A[1)]	7.5	●		●
NB 80-250/270	C	11.0	●		●
NB 80-315/305	C	15.0	●		●
NB 80-315/320	C	18.5	●		●
NB 80-315/334	C	22.0	●		●

Pump type 50 Hz, 4-pole	Design	P_2 [kW]	Available as E-pump	Pressure stage PN 10	Pressure stage PN 16
NB 100-200/196	A	5.5	●		●
NB 100-200/214	A[1)]	7.5	●		●
NB 100-250/245	C	11.0	●		●
NB 100-250/266	C	15.0	●		●
NB 100-315/295	C	18.5	●		●
NB 100-315/312	C	22.0	●		●
NB 125-250/236	C	15.0	●		●
NB 125-250/249	C	18.5	●		●
NB 125-250/262	C	22.0	●		●
NB 150-200/220	C	11.0	●	●	

[1)] NBE pumps are design C

NB 50 Hz, 6-pole

Pump type 50 Hz, 6-pole	Design	P_2 [kW]	Available as E-pump	Pressure stage PN 10	Pressure stage PN 16
NB 100-200/214	A	2.2			●
NB 100-250/259	A	4.0			●
NB 100-315/326	C	7.5			●
NB 125-250/269	C	7.5			●
NB 150-200/215	A	3.0		●	

Identification

Type key

NB, NBE

Example	NB	32	-125	.1	/142	A	-F	-A	-BAQE

Type range

Nominal diameter of discharge port (DN)

Nominal impeller diameter [mm]

Reduced performance = .1

Actual impeller diameter [mm]

Code for pump version (the codes may be combined[1)]):

A = Basic version
B = Oversize or double-oversize motor
C = Without motor
D = Pump housing with feet
E = With ATEX approval, certificate or test report
X = Special version

Code for pipework connection:

F = DIN flange

Code for materials:

A = Basic version
B = Bronze impeller
S = Stainless steel impeller

Code for mechanical shaft seal and rubber pump parts

[1)] Examples of combined pump version codes:

AE = Basic version with ATEX-approval, certificate or test report

BD = Oversize motor with pump housing with feet

CE = Without motor and with certificate

Mechanical shaft seals

NB, NBE pumps are available as standard with BAQE and GQQE shaft seals. Other shaft seal variants are available on request.

Codes for mechanical shaft seal

The positions (1) - (4) cover four pieces of information about the mechanical shaft seal:

Example	(1)	(2)	(3)	(4)

Grundfos type designation

Material, rotating seal face

Material, stationary seat

Material, secondary seal and other rubber and composite parts, except the wear ring

The following table explains the positions (1), (2), (3) and (4).

Position	Type	Short description of seal
(1)	A	O-ring seal with fixed driver
	B	Rubber bellows seal
	G	Bellows seal, type B, with reduced seal faces
	D	O-ring seal, balanced
Position	**Type**	**Material**
(2) and (3)		Synthetic carbons:
	A	Carbon, metal-impregnated (antimony (not approved for potable water))
	B	Carbon, synthetic resin-impregnated
		Carbides:
	Q	Silicon carbide
Position	**Type**	**Material**
(4)	E	EPDM
	V	FKM
	F	FXM

The mechanical shaft seal variant codes are used when stamping the nameplates for identification.

General information

Mounting

The pumps are made in three different designs:

- design A: pump housing with feet
- design B: motor with feet
- design C: pump housing and motor with feet.

See the figures below.

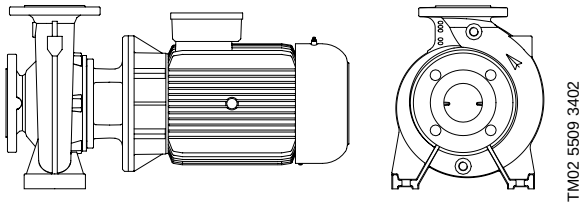


Fig. 2 NB pump design A

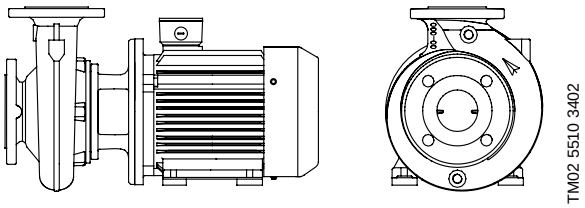


Fig. 3 NB pump design B

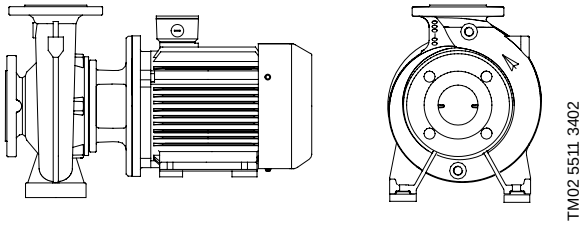


Fig. 4 NB pump design C

Sectional drawing

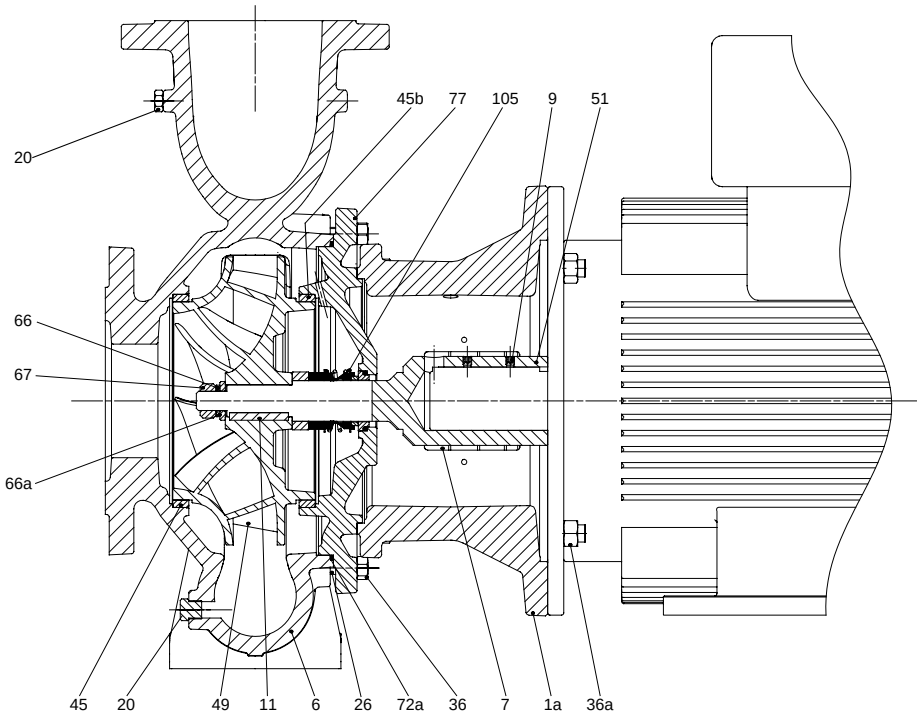


Fig. 5 Sectional drawing NB pump

Material specification

Pos.	Component	Materials	DIN W.-Nr.	AISI/ASTM
1a	Motor stool	Cast iron EN-GJL-250	EN-JL1040	A48-40B
6	Pump housing	Cast iron EN-GJL-250	EN-JL1040	A48-40B
7	Coupling guard	Stainless steel	1.4301	AISI 304
9	Set screw	Steel		
11	Parallel key	Steel		
20*	Pipe plug	Steel		
26	Staybolt	Steel		
36, 36a	Nut	Steel		
45	Wear ring	Bronze	2.1096.01	B584 - C83600
45b	Wear ring, upper	Bronze	2.1096.01	B584 - C83600
49	Impeller	Cast iron EN-GJL-200	EN-JL 1030	A48-30B
		Bronze CuSn5Zn5Pb	2.1096.01	B584 - C83600
		Stainless steel **	1.4408	
51	Shaft	Stainless steel/steel	1.4301/1.0301	
		Stainless steel/steel **	1.4401/1.0301	
66	Washer	Stainless steel	100-250	
66a	Spring washer	Stainless steel		
67	Nut	Stainless steel		
72 a	O-ring	EPDM rubber		
77	Cover	Cast iron EN-GJL-250	EN-JL1040	A48-40B
105	Shaft seal	Stainless steel	1.4301	AISI 304

*** NB, NBE:**
32-125.1 →80-315: R 3/8"
100-200 →150-200: R 1/2"

** A stainless steel impeller is combined with a stainless steel shaft, material 1.4401/1.0301.

Mechanical construction

Pump housing

The volute type pump housing is made of cast iron and has axial suction port and radial discharge port.

Flange connection dimensions are in accordance with EN 1092-2.

The bottom of the pump housing incorporates a drain plug. The discharge port has a pressure gauge tapping.

Motor stool and cover

The cover is provided with a manual air vent screw for the venting of the pump housing and the shaft seal chamber. An O-ring forms the seal between cover and pump housing.

Coupling guards are fitted to the motor stool.

The mounting designations of motors for NB, NBE are as follows:

- IM B5: Up to and including frame size 132.
- IM B 35: As from frame size 160 and upwards.

The flange size of the motor stool is according to IEC 60034.

Shaft/coupling

The stainless steel shaft is ø28 or ø38 mm.

The coupling end of the shaft is cylindrical and has two drilled holes for the set screws of the coupling.

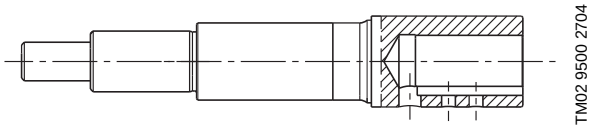


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Fig. 6 Shaft and coupling NB and NBE pump

Impeller

The impeller is made of cast iron, bronze or stainless steel. The impeller is closed and has double-curved blades with smooth surfaces ensuring high efficiency.

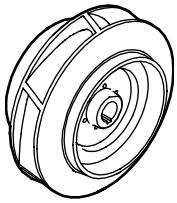

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Fig. 7 Impeller for a NB, NBE pump

All impellers are dynamically and hydraulically balanced. The hydraulical balancing compensates for axial thrust.

The direction of rotation of the impeller is clockwise when viewed from the motor fan.

If a certain duty point is required, pumps with reduced impeller diameter are available on request.

Shaft seal

The shaft seal is an unbalanced, mechanical shaft seal with dimensions according to EN 12756. The seal faces are of carbon/silicon carbide. The code of the standard version is BAQE or GQQE.

We recommend BAQE for high-temperature applications. The BAQE seal is not suitable for liquids containing abrasive particles as this will wear down the carbon face of the seal.

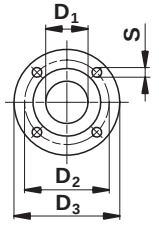
We recommend GQQE for cooling applications involving the risk of precipitation on the seal faces.

Construction

Flanges

The suction and discharge flanges of NB, NBE pumps are according to EN 1092-2, PN 10 or PN 16. For size and number of holes, see the table below:

PN 16 and PN 10 flanges:



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	Nominal diameter (DN)								
	PN 16 (1.6 MPa)								PN 10 (1.0 MPa)
	32	**40**	**50**	**65**	**80**	**100**	**125**	**150**	**200**
D1	32	40	50	65	80	100	125	150	200
D2	100	110	125	145	160	180	210	240	295
D3	140	150	165	185	200	220	250	285	340
s	4x19	4x19	4x19	4x19	8x19	8x19	8x19	8x23	8x23

Surface treatment

The cast iron parts of NB, NBE pumps are electro-coated.

Electro-coating includes:

1. Alkaline cleaning
2. Pre-treatment with zinc phosphate coating
3. Cathodic electro-coating (epoxy)
4. Curing of paint film at 200-250°C.

The colour code of the finished product is NCS 9000/ RAL 9005.

For low-temperature applications with a high humidity Grundfos offers NB, NBE pumps with extra surface treatment to avoid corrosion. These pumps are available on request.

Test pressure

Pressure testing of the pump housing was made with +20°C (~ +68°F) water containing corrosion inhibitor.

Pressure stage	Operating pressure		Test pressure	
	bar	MPa	bar	MPa
PN 10	10	1.0	13	1.3
PN 16	16	1.6	24	2.4

Motor

The motor is a totally enclosed, fan-cooled standard motor with main dimensions according to IEC and DIN standards.

The tables on the following pages show the motors used for NB, NBE.

As appears from the tables you can choose between

- standard range with EFF 2 (efficiency 2) motors
- premium range with EFF 1 (efficiency 1) motors for NB
- E-motor range for NBE.

Standard motor range

Standard range - including EFF 2 motors

Output P_2 [kW]	2-pole	4-pole	6-pole
0.25		MG model C	
0.37			MMG model E
0.55			
0.75	MG model C		
1.1	MG model C EFF 2	MG model C EFF 2	
1.5			
2.2			
3.0			
4.0			
5.5			
7.5		MMG model E EFF2	
11.0	MMG model E EFF 2		
15.0			
18.5			
22.0			
30.0			
37.0			
45.0			

Grey squares = these motors are not further described.
EFF 1 is the highest efficiency class according to the CEMEP efficiency classes.
Note: The CEMEP list of minimum requirements for high-efficiency motors covers the range from 1.1 kW to 90.0 kW, 2-pole and 4-pole motors, see the bold frames in the tables. Consequently, only the motors within this range may be designated EFF 1 and EFF 2.

Premium range

Premium range - including EFF 1 motors

Output P_2 [kW]	2-pole	4-pole	6-pole
0.25		MG model C	
0.37			MMG model D
0.55			
0.75	MG model C		
1.1	MG model D EFF 1	MG model D EFF 1	
1.5			
2.2			
3.0			
4.0			
5.5		MMG model D EFF 1	
7.5			
11.0	MMG model D EFF 1		
15.0			
18.5			
22.0			
30.0			
37.0			
45.0			

Grey squares = these motors are not further described.

E-motor range

Electronically speed controlled motors

Output P_2 [kW]	2-pole	4-pole
0.75		MGE
1.1		
1.5	MGE	
2.2		
3.0		
4.0		
5.5		
7.5		MMGE
11.0	MMGE	
15.0		
18.5		
22.0		

Grey squares = these motors are not further described.

Operating conditions

Pump location

The pump is designed for installation in a non-aggressive and non-explosive atmosphere.

The relative air humidity must not exceed 95%.

Ambient temperature and altitude

The ambient temperature and the installation altitude are important factors for the motor life, as they affect the life of the bearings and the insulation system.

Ambient temperature must not exceed:

- +40°C for EFF 2 motors
- +60°C for EFF 1 motors.

If the ambient temperature exceeds +40°C (+60°C) or if the motor is installed more than 1000 m (3500 m) above sea level, the motor must not be fully loaded due to the low density and consequently low cooling effect of the air. In such cases, it may be necessary to use a motor with a higher output.

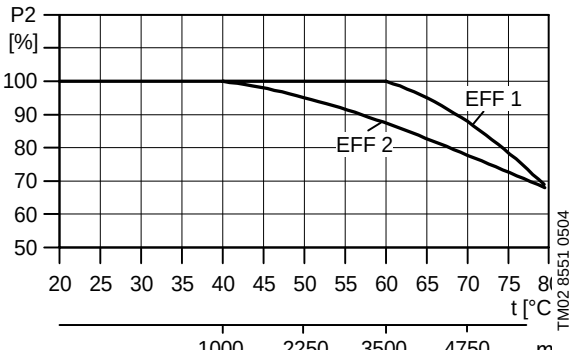


Fig. 8 Motor P2 depends on temperature/altitude

Example:

Fig. 8 shows that the load of an EFF 2-motor must be reduced to 88% when installed 3500 m above sea level.

At an ambient temperature of 70°C the load of an EFF 2-motor must be reduced to 78% of the rated output.

In such situations an oversize motor can be used.

Pumped liquids

NB pumps are suitable for pumping clean, thin, non-aggressive and non-explosive liquids, not containing any solid particles

The effect of viscosity on centrifugal pump performance

A viscous liquid affects a centrifugal pump in several ways.

- The power consumption will be increased, i. e. a larger motor is required.
- Head, flow rate and pump efficiency will be reduced.

The effect of high density on centrifugal pump performance

A high density liquid only affects the power consumption of a centrifugal pump.

- The head, flow rate and pump efficiency will remain unchanged.
- The power consumption will increase at a ratio corresponding to the increase in density. A liquid with a specific gravity of 1.2 will thus require a 20% larger power input.
- An oversize motor will often be required.

WinCAPS can help you select the right pump for liquids with viscosity/density different from those of water.

Liquid temperatures

The NB, NBE pump range covers the temperature range from –25°C (~ –13°F) to +140°C (~+284°F). The permissible liquid temperature depends on the mechanical shaft seal type and pump type. See also table below.

Be aware that the maximum liquid temperature limits stated by Grundfos may be overruled by local regulations and various laws.

The maximum liquid temperature is stamped on the nameplate.

Relationship between mechanical shaft seals and temperature

Mechanical shaft seal	Operating temperature	Maximum operating pressure [bar]
BAQE	0°C to +120°C	16 bar
GQQE	–25°C to +90°C	16 bar
BQBE	0°C to +140°C	16 bar
DAQF	0°C to +140°C	16 bar
BQQV[1)]	0°C to +90°C	16 bar
BBQE	0°C to +120°C	16 bar
BAQV[1)]	0°C to +90°C	16 bar
GQQV[1)]	–20°C to +90°C	16 bar
BQQE	–25°C to +90°C	16 bar
AQQE	0°C to +90°C	16 bar
AQQV[1)]	0°C to +90°C	16 bar
AQAE	0°C to +120°C	16 bar
AQAV[1)]	0°C to +90°C	16 bar

BAQE and GQQE are standard shaft seals.
The remaining shaft seal combinations in the list are available for custom built pumps.
1) The maximum temperature for FKM rubber is 80°C (~176°F) in liquids containing water. For liquids not containing water, such as pure oil, the seal faces of the mechanical shaft seal are the temperature limiting factor.

EPDM

Mechanical shaft seals with EPDM are primarily suitable for water.

If the water contains oil or if chemicals or other liquids than water are pumped, you may have to replace the rubber parts of the mechanical shaft seal.

FKM

Mechanical shaft seals with FKM (xxxV) rubber have excellent resistance against oil and a range of chemicals.

Carbon/silicon carbide

Mechanical shaft seals with carbon/silicon carbide (xAQx) seal faces have a wide range of applications and are especially suitable if there is risk of dry running and/or if the temperature is high. These mechanical shaft seals are not suitable for liquids containing abrasive particles as the carbon parts will be worn. At temperatures below 0°C (~+32°F) corrosion inhibitors containing abrasive particles will usually be added to the pumped liquid, and xAQx seals will thus not be suitable.

Silicon carbide/silicon carbide

Mechanical shaft seals with silicon carbide/silicon carbide (xQQx) seal faces also have a very wide range of applications. These seals are very resistant to abrasive particles and well suited at liquid temperatures up to +90°C (~+194°F). At higher temperatures the reduced lubricating properties of the pumped liquid may cause noise problems and limit the life of the seal faces.

Inlet pressure

Maximum inlet pressure

The actual inlet pressure + pressure when the pump is running against a closed valve must always be lower than the maximum permissible operating pressure.

Minimum inlet pressure

The minimum inlet pressure must be according to the NPSH curve + a safety margin of at least 0.5 m ~ 1.65 feet + correction for vapour pressure. It is, however, advisable to calculate the inlet pressure if:

- the liquid temperature is high
- the flow rate is considerably higher than the pump's rated flow rate
- the pump is operating in an open system with suction lift
- the liquid is sucked through long pipes
- the inlet conditions are poor
- the operating pressure is low.

Calculation of maximum suction lift for water in open systems

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift "H" in metres head can be calculated as follows:

$H = p_b \times 10.2 - NPSH - H_f - H_v - H_s$

p_b	=	Barometric pressure in bar. (Barometric pressure can be set to 1 bar). In closed systems, p_b indicates the system pressure in bar.
NPSH	=	Net Positive Suction Head in metres head. (To be read from the NPSH curve at the highest flow the pump will be delivering).
H_f	=	Friction loss in suction pipe in metres head. (At the highest flow the pump will be delivering.)
H_v	=	Vapour pressure in metres head. (To be read from the vapour pressure scale."H_v" depends on the liquid temperature "T_m").
H_s	=	Safety margin = minimum 0.5 metres head.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" metres head.

If the "H" calculated is negative, an inlet pressure of minimum "H" metres head is required.

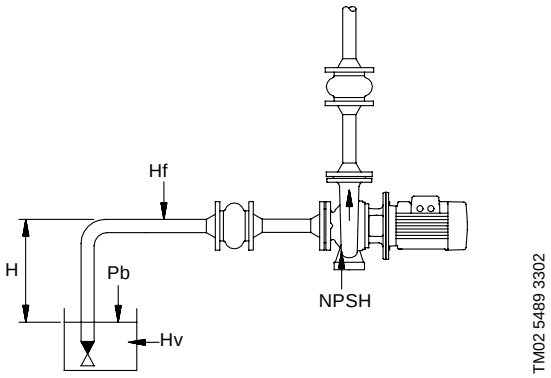


Fig. 9 Schematic view of open system with NB pump

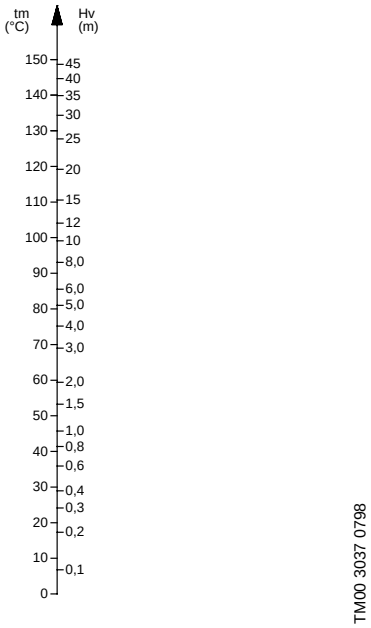


Fig. 10 Relation between liquid temperature and vapour pressure

Speed controlled NB pumps

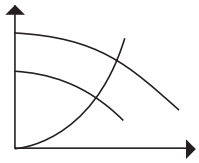
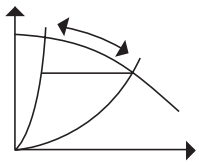
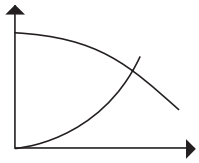
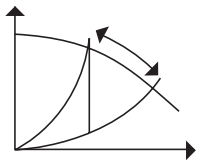
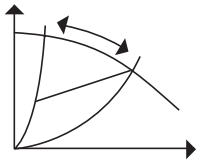
Most NB pumps are available as “E-pumps” meaning that they are fitted with Grundfos standard motors with integrated frequency converter. These pumps are called NBE. Alternatively, all NB pumps with three-phase motors can be connected to an external frequency converter.

NBE pump applications

NBE pumps with integrated speed control enable automatic adaptation of performance to current conditions. This keeps the energy consumption at a minimum.

Depending on the nature of the application, NBE pumps offer energy-savings, increased comfort or improved processing.

The charts below show possible control modes of NBE pumps in different applications.

Control mode	Applications
Constant curve	
	Single-pipe heating systems. Systems with three-way valves. Heating and cooling surfaces. Chiller pumps. (Sensor not required)
Constant pressure	
	Pressure boosting systems. (Sensor required)
Temperature control	
	Single-pipe heating systems. Systems with three-way valves. Cooling towers. Chiller pumps. Domestic hot water recirculation systems. (Sensor required)
Constant flow	
	Heating and cooling surfaces. Cooling towers. Flow filters. (Sensor required)
Proportional differential pressure (measured)	
	System with two-way valves. (Differential pressure sensor is located in the system)

Constant curve

In constant curve control mode, the pump will adjust its speed to meet the required flow without using throttle valves.

In this control mode the pump can be set to operate within 12 - 100% of the maximum performance range.

A sensor is not required for this control mode.

Constant pressure

In constant pressure control mode, the pump will adjust its speed to keep a constant pressure where the sensor is fitted.

We recommend constant pressure control mode in pressure holding systems.

A pressure sensor with an operating range close to the needed pressure is required.

Temperature control

In the temperature control mode, the pump will adjust its speed to keep a constant temperature or a differential temperature.

We recommend this control mode in systems with three-way valves and systems without control valves.

A temperature sensor or a differential temperature sensor is required for this control mode.

Example

In an industrial cooling system, an NBE pump continuously adapts its performance to the changing demands reflected in the differences in temperature of the liquid circulating in the cooling system. The lower the demand for cooling, the smaller the quantity of liquid circulated in the system and vice versa.

Constant flow

In the constant flow control mode, the pump will adjust its speed to keep a constant flow irrespective of variations of the system characteristics.

We recommend this control mode in systems where a constant flow is required.

In this control mode either an electronic flowmeter or a differential pressure sensor is required.

Proportional differential pressure (measured)

In the proportional differential pressure (measured) mode, the pump will adjust its speed to keep the differential pressure in a reference point in the system.

This control mode is recommended in large circulation systems where the NBE pump functions as a secondary pump.

A differential pressure sensor is required for this control mode.

Example

In a two-pipe heating system or an air-conditioning system with variable flow, the pressure sensor can be fitted in a reference point away from the NBE pump. As the flow increases the NBE pump continuously adapts its speed to maintain the same differential pressure in the reference point.

Affinity equations

Normally, NBE pumps are used in applications characterised by a **variable** flow. Consequently, it is not possible to select a pump that is constantly operating at its optimum efficiency.

In order to achieve optimum operating economy, the pump should be selected on the basis of the following criteria:

- The max. duty point required should be as close as possible to the QH curve of the pump.
- The flow rate at the duty point required should be close to the optimum efficiency (eta) for most operating hours.

Between the min. and max. performance curve NBE pumps have an infinite number of performance curves each representing a specific speed. Therefore, it may not be possible to select a duty point close to the max. curve.

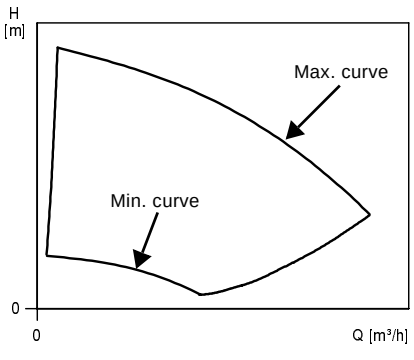


Fig. 11 Min. and max. performance curves

In situations where it is not possible to select a duty point close to the max. curve, use the affinity equations below. The head (H), the flow (Q) and the input power (P) are the appropriate variables you need to be able to calculate the motor speed (n).

Note: The approximated formulas apply on condition that the system characteristic remains unchanged for nn and nx and that it is based on the formula H = k x Q2, where k is a constant.

The power equation implies that the pump efficiency is unchanged at the two speeds. In practice this is **not** quite correct.

Finally, it is worth noting that the efficiencies of the frequency converter and the motor **must** be taken into account if a precise calculation of the power saving resulting from a reduction of the pump speed is wanted.

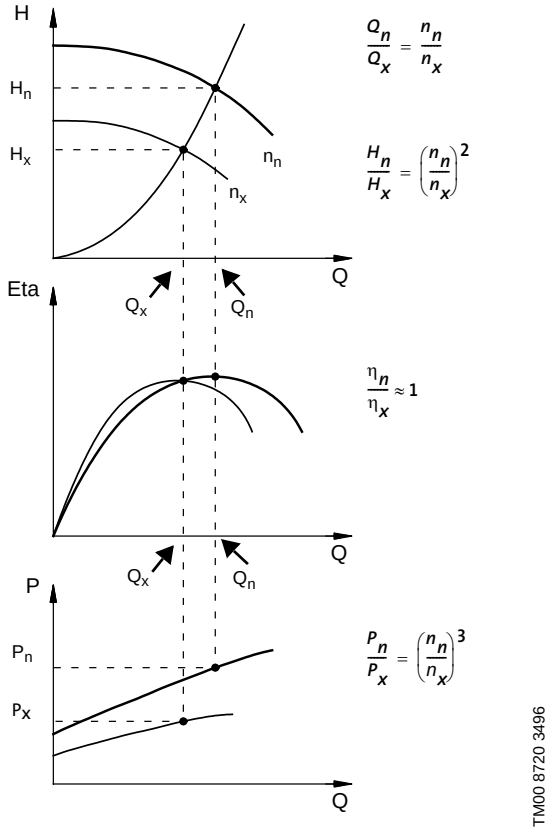


Fig. 12 Affinity equations

Legend

$\mathbf{H_n}$	Rated head in metres
$\mathbf{H_x}$	Current head in metres
$\mathbf{Q_n}$	Rated flow in m^3/h
$\mathbf{Q_x}$	Current flow in m^3/h
$\mathbf{n_n}$	Rated motor speed in min^{-1}
$\mathbf{n_x}$	Current motor speed in min^{-1}
$\eta_\mathbf{n}$	Rated efficiency in %
$\eta_\mathbf{x}$	Current efficiency in %

WinCAPS and WebCAPS

WinCAPS and WebCAPS are both selection programs offered by Grundfos.

The two programs make it possible to calculate a NBE pump's specific duty point and energy consumption.

When you enter the required performance data of the pump, WinCAPS and WebCAPS can calculate the exact duty point and energy comsumption. For further information, see page #.

Communication with NBE pumps

Communication with NBE pumps is possible via a central building management system, remote control (Grundfos R100) or a control panel.

Central building management system

The operator can communicate with an NBE pump even though he is not present near the pump. Communication can take place via a central building management system allowing the operator to monitor and change control modes and setpoint settings.

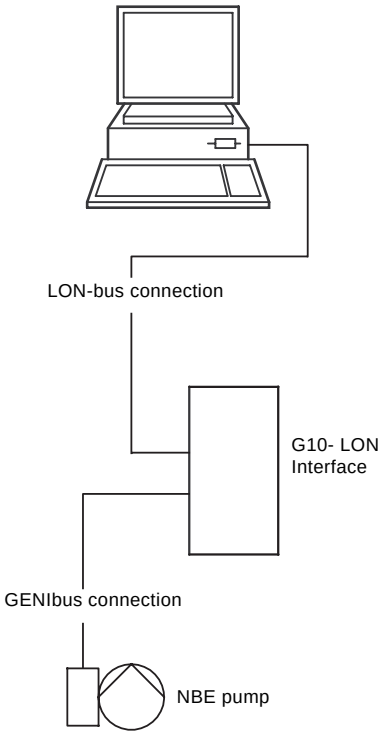


Fig. 13 Structure of a central building management system

Remote control

The R100 remote control produced by Grundfos is available as an accessory.

The operator can communicate with the NBE pump by pointing the IR-signal transmitter at the control panel of the NBE pump terminal box.

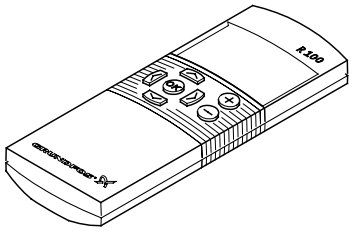


Fig. 14 R100 remote control

The operator can monitor and change control modes and settings of the NBE pump via the R100 display.

Control panel

The operator can change the setpoint settings manually on the control panel of the NBE pump terminal box.

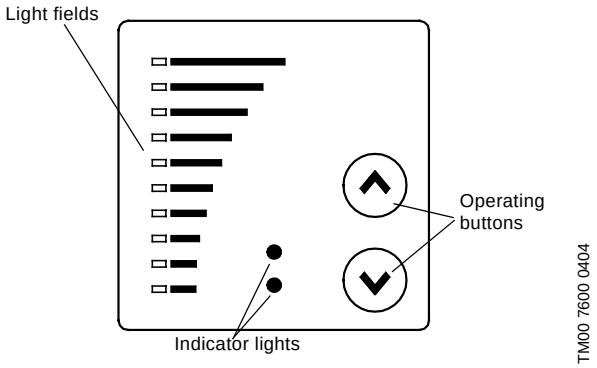


Fig. 15 Control panel of an NBE pump

Pump size

Selection of pump size should be based on:

- required flow and pressure at the draw-off point
- pressure loss as a result of height differences
- friction loss in the pipework
  It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- best efficiency at the estimated duty point.

Efficiency

If you expect the pump to always operate in the same duty point, select a pump which is operating in a duty point corresponding to the best efficiency of the pump.

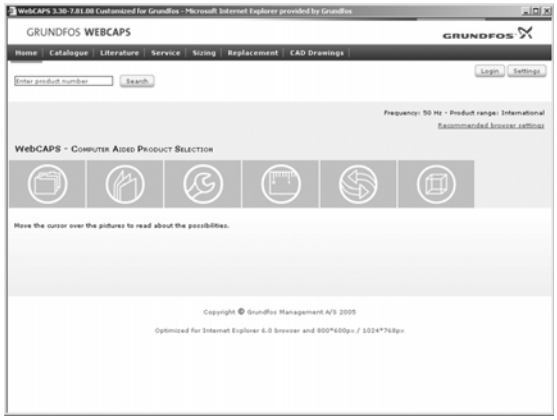
In case of controlled operation or varying consumption, select a pump whose best efficiency falls within the duty range covering the greater part of the duty time.

Material

The material variant should be selected on the basis of the liquid to be pumped, see List of pumped liquids page 26

Further product documentation

WebCAPS

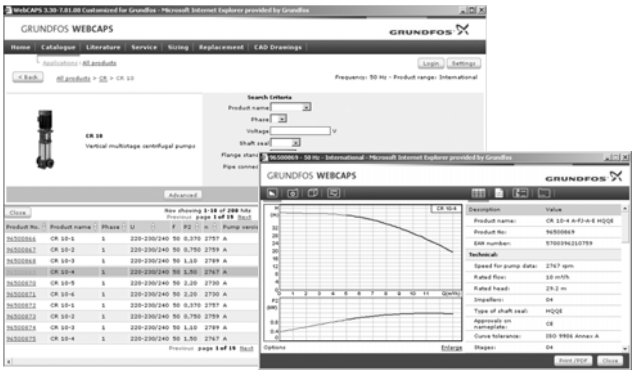


WebCAPS is a **Web**-based **C**omputer **A**ided **P**roduct **S**election program available on www.grundfos.com.

WebCAPS contains detailed information on more than 185,000 Grundfos products in more than 22 languages.

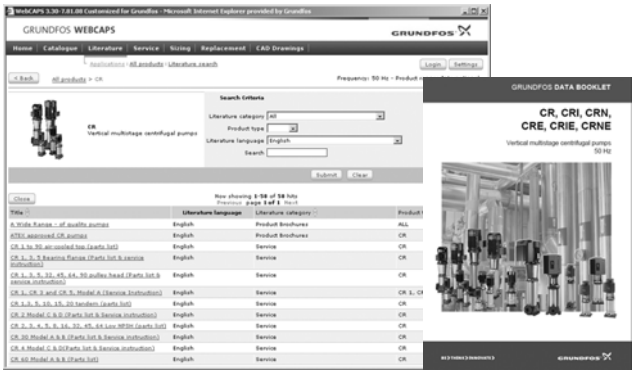
In WebCAPS, all information is divided into 6 sections:

- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



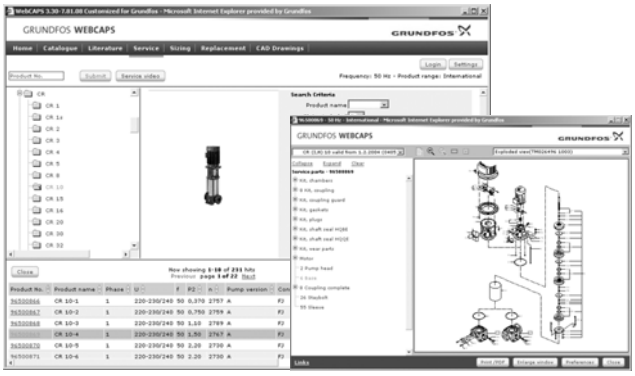
Catalogue

This section is based on fields of application and pump types, and contains
- technical data
- curves (QH, Eta, P1, P2, etc) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

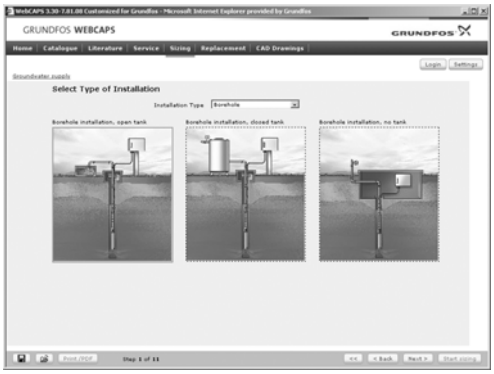
In this section you can access all the lastest documents of a given pump, such as
- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalogue and Service kit instructions
- quick guides
- product brochures, etc.



Service

This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.
Furthermore, this section contains service videos showing you how to replace service parts.

Further product documentation



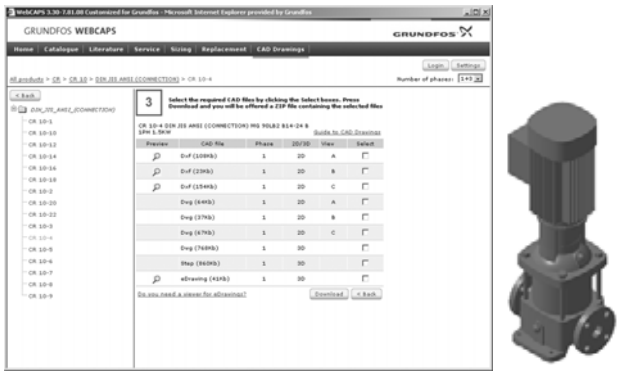
Sizing

This section is based on different fields of application and installation examples, and gives easy step-by-step instructions in how to
- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- analyse your selected pump via the built-in life cycle cost tool
- determine the flow velocity in wastewater applications, etc.

Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.
The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



CAD drawings

In this section it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

2-dimensional drawings:
- .dxf, wireframe drawings
- .dwg, wireframe drawings.

3-dimensional drawings:
- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.

WinCAPS

Fig. 16 WinCAPS CD-ROM

WinCAPS is a **Win**dows-based **C**omputer **A**ided **P**roduct **S**election program containing detailed information on more than 185,000 Grundfos products in more than 22 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no Internet connection is available.

WinCAPS is available on CD-ROM and updated once a year.

Pumped liquids

We recommend NB and NBE pumps for thin, clean and non-aggressive, non-explosive liquids, not containing solid particles or fibres. The liquid must not attack the pump materials chemically or mechanically.

If you pump liquids with a density and/or viscosity higher than that of water, use motors with correspondingly higher outputs, see “Pumped liquids” page 17.

The mechanical shaft seal must be suitable for the liquid.

Water in heating and ventilating systems often contains additives to prevent negative effects such as system corrosion or calcareous deposits. If you want to use the pump for such liquids and if the temperature is above 80°C, use special shaft seals to avoid crystallization/ precipitation between the seal faces.

Liquid temperature: –25°C to +140°C.

For heating systems, the water quality should meet VDI 2035.

List of pumped liquids

The list on the following pages gives an oveview of liquids which may typically be pumped by NB, NBE pumps.

The list states the recommended shaft seals. Other shaft seals may be applicable, but we consider those stated in the list to be the best choices.

The list is intended as a general guide only, and it cannot replace actual testing of pumped liquids and pump materials under specific working conditions.

However, use the list with some caution as factors such as:

- concentration of the pumped liquid
- liquid temperature or
- pressure.

may affect the chemical resistance of a specific pump version.

Legend for notes in the list:

A	May contain additives or impurities that may cause shaft seal problems.
B	The density and/or viscosity differ from that of water. Consider this when calculating motor and pump performance.
C	The liquid must be oxygen-free (anaerobic).
D	Risk of chrystallization/precipitation in shaft seal.
E	Due to the poor lubricating properties of the liquid, dry running should be avoided.
F	The pumped liquid is easily ignited.
G	The pumped liquid is flammable.
H	Insoluble in water.
I	The shaft seal rubber parts must be replaced with FKM rubber.
J	Bronze impeller required.
K	The pump should run continuously to prevent discoloration of pool tiles.
L	Pump life may be reduced.

Pumped liquids

Pumped liquids	Notes	Additional information	Shaft seal
Water			
Groundwater		<+90°C	BQQE
		>+90°C	BAQE[1)] BQBE
Boiler feed water		<+120°C	BAQE
		+120°C - +140°C	BQBE/DAQF
District heating water		<+120°C	BAQE
		+120°C - +140°C	BQBE/DAQF
Condensate		<+90°C	BQQE
		+90°C - +120°C	BAQE
		+120°C - +140°C	BQBE/DAQF
Softened water	C	<+90°C	BQQE
		>+90°C	BAQE
Brackish water	J, L	pH >6.5, +40°C, 1000 ppm Cl^-	BQQE
Sea water	J, L	pH >6.5, +20°C, 20000 ppm Cl^-	BQQE
Swimming pool water	J, K	pH>6.5, 40°C, 150 ppm Cl^-	BQQE
Cooling and cutting lubricant	A, I		BQQV
Coolants			
Ethylene glycol	B, D	+50°C, 50%	BQQE/GQQE
Glycerine (glycerol)	B, D	+50°C, 50%	BQQE/GQQE
Hydrocarbon based antifreeze	B, D, F, G, I	+50°C, 100%	BQQV/GQQV
Potassium acetate	B, D, C	+50°C, 50%	BQQE/GQQE
Potassium formate	B, D, C	+50°C, 50%	BQQE/GQQE
Propylene glycol	B, D		BQQE/GQQE
Brine-sodium chloride	B, D, C	+5°C, 30%	BQQE/GQQE
Brine-calcium chloride	B, D, C	+5°C, 30%	BQQE/GQQE
Ethyl alcohol	B, D, F, I	+70°C	BAQE
Methyl alcohol-cooling	B, D, F, I	+40°C	BAQE
Fuels			
Diesel oil	F, G, H, I	<+20°C, 100%	BAQV
Jet fuel	F, G, H, I	<+20°C, 100%	BAQV
Kerosene	F, G, H, I	<+20°C, 100%	BAQV
Naphta	F, G, H, I	<+20°C, 100%	BAQV
Petrol	F, G, H, I	<+20°C, 100%	BAQV
Mineral oils			
Crude oil	A, B, G, I	<+20°C, 100%	BQQV
Mineral lubricating oil	B, D, G		BAQV/BQQV
Synthetic oils			
Silicone oil	B, H		BAQE/BQQE
Synthetic lubricating oil	B, G, I, H		BAQV/BQQV
Vegetable oils			
Corn oil	B, I, H		BAQV/BQQV
Olive oil	B, I, H	<+80°C	BAQV/BQQV
Peanut oil	B, I, H		BAQV/BQQV
Rape seed oil	D, B, I, H		BAQV/BQQV
Soya oil	B, I, H		BAQV/BQQV
Cleaning			
Soap (salts of fatty acids)	A, H, (I)	<+80°C	BQQE (BQQV)
Alkaline degreasing agent	A, H, (I)	<+80°C	BQQE (BQQV)
Organic solvents			
Isopropyl alcohol	F, G	<+60°C	BAQE
Propyl alcohol	F, G	<+60°C	BAQE
Oxidants			
Hydrogen peroxide		<+40°C, <2%	BQQE

Pumped liquids

Pumped liquids	Notes	Additional information	Shaft seal
Salts			
Ammonium bicarbonate	A	<+20°C, <15%	BQQE
Calcium acetate	A, B	<+20°C, <30%	BQQE
Potassium bicarbonate	A	<+20°C, <20%	BQQE
Potassium carbonate	A	<+20°C, <20%	BQQE
Potassium permanganate	A	<+20°C, <10%	BQQE
Potassium sulfate	A	<+20°C, <20%	BQQE
Sodium acetate	A	<+20°C, <100%	BQQE
Sodium bicarbonate	A	<+20°C, <2%	BQQE
Sodium carbonate	A	<+20°C, <20%	BQQE
Sodium metasilicate	–	max. +30°C, 30%	-
Sodium nitrate	A	<+20°C, <40%	BQQE
Sodium nitrite	A	<+20°C, <40%	BQQE
Sodium phosphate (di)	A	<+100°C, <30%	BQQE
Sodium phosphate (tri)	A	<+90°C, <20%	BQQE
Sodium sulfate	A	<+20°C, <20%	BQQE
Sodium sulfite	A	<+20°C, <1%	BQQE
Alkalies			
Ammonium hydroxide		<+100°C, <30%	BQQE
Calcium hydroxide	A	<+100°C, <10%	BQQE
Potassium hydroxide	A	<+20°C, <20%	BQQE
Sodium hydroxide	A	<+40°C, <20%	BQQE

1) **Do not** use BAQE for potable water. For potable water we recommend you to fit the pump with a BBQE shaft seal. The BBQE shaft seal is available on request.

Note: We recommend the BQBE/DAQF mechanical shaft seal for high-temperature applications.

The BAQE/BAQV mechanical shaft seal is not suited for pumped liquids with abrasive particles as the carbon part of the seal will be worn down. We recommend you to use BQQE/BQQV in stead.

We recommend the GQQE mechanical shaft seal for cooling applications involving risk of precipitation on the seal faces.

Electrical data

Standard range 50 Hz, 2-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]	η [%]	Cos $\varphi_{1/1}$	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MG 80A-C	3x220-240D/ 380-415Y	0.75	3.3/1.9	80-80	0.81-0.71	2840-2870	5.8-6.2
MG 80B-C		1.1	4.5/2.6	81-81	0.81-0.75	2820-2850	5.8-6.3
MG 90SA-C		1.5	5.9/3.4	82-82	0.85-0.79	2860-2890	6.3-6.9
MG 90LA-C		2.2	8.25/4.75	84-84	0.87-0.82	2860-2890	7.0-7.6
MG 100LB-C		3.0	10.8/6.25	85-85	0.88-0.82	2880-2910	7.8-8.5
MG 112MB-C		4.0	13.8/8.0	86-86	0.90-0.87	2900-2910	8.7-9.5
MG 90LA-C	3x380-415D	2.2	4.75	84-84	0.87-0.82	2860-2890	7.0-7.6
MG 100LB-C		3.0	6.25	85-85	0.88-0.82	2880-2910	7.8-8.5
MG 112MB-C		4.0	8.0	86-86	0.90-0.87	2900-2910	8.7-9.5
MG 132SB-C		5.5	11.0	87.5-87.5	0.89-0.86	2890-2910	8.9-9.7
MG 132SC-C		7.5	15.2	88-88	0.87-0.81	2890-2910	9.1-9.9
MMG 160MA-E	3x380-415D/ 660-690Y	11.0	20.2/11.6	89.3	0.89	2930	5.6
MMG 160MB-E		15.0	26.5/15.2	91.0	0.87	2940	5.8
MMG 160L-E		18.5	32.5/18.8	91.6	0.89	2940	6.5
MMG 180M-E		22.0	39.5/22.8	91.0	0.89	2950	7.4
MMG 200LA-E		30.0	53.5/31.0	92.2	0.88	2960	7.0

Standard range 50 Hz, 4-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]	η [%]	Cos $\varphi_{1/1}$	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MG 71A-C	3x220-240D/ 380-415Y	0.25	1.48/0.85	69-69	0.75-0.65	1400-1420	4.0-4.4
MG 71B-C		0.37	1.9/1.1	71-71	0.77-0.67	1400-1420	4.0-4.4
MG 80A-C		0.55	2.6/1.5	77-77	0.79-0.70	1390-1410	4.3-4.7
MG 80B-C		0.75	3.3/1.9	78-78	0.79-0.70	1390-1410	4.3-4.7
MG 90SA-C		1.1	5.0/2.9	78-78	0.78-0.71	1420-1440	4.3-4.7
MG 90LA-C		1.5	6.4/3.7	80-80	0.80-0.74	1420-1430	5.0-5.5
MG 100LB-C		2.2	9.2/5.3	82-82	0.80-0.73	1420-1440	5.2-5.7
MG 112MA-C		3.0	12.0/6.9	85-85	0.80-0.74	1440-1450	6.2-6.7
MG 112MB-C		4.0	15.4/8.9	86.5-87	0.82-0.76	1440-1450	6.6-7.2
MG 100LA-D	3x380-415D	2.2	5.3	83.5-84	0.79-0.76	1430-1440	5.4-5.9
MG 100LB-D		3.0	7.4	85-85	0.79-0.69	1430-1440	5.8-6.3
MG 112MB-C		4.0	8.9	86.5-87	0.82-0.76	1440-1450	6.6-7.2
MG 132SC-C		5.5	12.6	87-87	0.80-0.74	1430-1450	6.3-6.9
MMG 132SB-E	3x380-415D/ 660-690Y	7.5	14.4/8.3	89.1	0.84	1445	7.8
MMG 160MA-E		11.0	21.0/12.2	89.8	0.84	1460	7.4
MMG 160L-E		15.0	28.5/16.4	89.4	0.85	1460	7.8
MMG 180M-E		18.5	33.5/19.4	91.2	0.86	1465	7.6
MMG 180L-E		22.0	39.0/22.6	91.4	0.86	1465	7.8

Standard range 50 Hz, 6-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]	η [%]	Cos $\varphi_{1/1}$	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MMG 80MA-E	3x220-240D /380-415Y	0.37	1.2/0.7	62.7	0.71	890	2.9
MMG 80B-E		0.55	1.7/0.98	66.0	0.72	890	3.0
MMG 90S-E		0.75	2.15/1.24	70.3	0.72	910	3.5
MMG 90L-E		1.1	2.95/1.7	73.0	0.74	910	3.6
MMG 100L-E		1.5	3.7/2.14	76.3	0.77	920	4.3
MMG 112M-E		2.2	5.2/3.0	81.4	0.75	950	5.0
MMG 132S-E		3.0	6.7/3.85	84.1	0.77	960	6.0
MMG 132MA-E		4.0	8.85/5.1	84.7	0.77	960	6.4
MMG 112M-E	3x380-415D/ 660-690Y	2.2	3.0/1.73	81.4	0.75	950	5.0
MMG 132S-E		3.0	3.85/2.2	84.1	0.77	960	6.0
MMG 132MA-E		4.0	5.1/2.94	84.7	0.77	960	6.4
MMG 132MB-E		5.5	11.4/6.65	86.4	0.80	960	5.9
MMG 160M-E		7.5	16.0/9.2	87.1	0.78	960	5.8

Electrical data

Premium range 50 Hz, 2-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]	η [%]	Cos $\varphi_{1/1}$	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MG 80A-C	3x220-240D/ 380-415Y	0.75	3.3/1.9	80-80	0.81-0.71	2840-2870	5.8-6.2
MG 90SA-D		1.1	4.1/2.35	84-84	0.87-0.82	2890-2910	7.4-8.0
MG 90SB-D		1.5	5.45/3.15	85.5-85.5	0.87-0.82	2890-2910	8.5-9.3
MG 90LC-D		2.2	7.7/4.45	87.5-87.5	0.89-0.87	2890-2910	8.5-9.5
MG 100LC-D		3.0	10.9/6.3	87.5-87.5	0.87-0.82	2900-2920	8.4-9.2
MG 112MC-D		4.0	13.9/8.0	89-89	0.88-0.84	2910-2930	11.2-12.3
MG 90LC-D	3x380-415D	2.2	4.45	87.5-87.5	0.89-0.87	2890-2910	8.5-9.5
MG 100LC-D		3.0	6.3	87.5-87.5	0.87-0.82	2900-2920	8.4-9.2
MG 112MC-D		4.0	8.0	89-89	0.88-0.84	2910-2930	11.2-12.3
MG 132SC-D		5.5	11.2	90-90	0.88-0.84	2910-2930	10.7-11.7
MG 132SD-D		7.5	15.2	89.5-89.5	0.87-0.80	2900-2920	10.0-11.1
MMG 160MA-D	3x380-415D/ 660-690Y	11.0	21.0/12.2	90.7	0.86	2930	7.3
MMG 160MB-D		15.0	28.0/16.2	91.6	0.86	2930	7.6
MMG 160L-D		18.5	34.5/20.0	92.0	0.86	2930	7.9
MMG 180M-D		22.0	41.0/23.6	92.5	0.87	2930	7.7
MMG 200LA-D		30.0	55.0/32.0	92.9	0.89	2945	7.8

Premium range 50 Hz, 4-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]	η [%]	Cos $\varphi_{1/1}$	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MG 71A-C	3x220-240D/ 380-415Y	0.25	1.48/0.85	69-69	0.75-0.65	1400-1420	4.0-4.4
MG 71B-C		0.37	1.9/1.1	71-71	0.77-0.67	1400-1420	4.0-4.4
MG 80A-C		0.55	2.6/1.5	77-77	0.79-0.70	1390-1410	4.3-4.7
MG 80B-C		0.75	3.3/1.9	78-78	0.79-0.70	1390-1410	4.3-4.7
MG 90SB-D		1.1	4.7/2.7	83.8	0.78	1440	7.0
MG 90LC-D		1.5	6.2/3.6	85	0.77	1440	6.0
MG 100LB-D		2.2	8.5/4.9	86.4	0.82	1440	6.5
MG 100LC-D		3.0	11.8/6.75	87.4	0.81	1450	6.7
MG 112MC-D		4.0	15.4/8.9	88.3	0.81	1450	7.3
MG 100LB-D	3x380-415D	2.2	4.9	86.4	0.82	1440	6.5
MG 100LC-D		3.0	6.75	87.4	0.81	1450	6.7
MG 112MC-D		4.0	8.9	88.3	0.81	1450	7.3
MMG 132S-D	3x380-415D/ 660-690Y	5.5	11.3/6.5	89.2	0.84	1450	7.4
MMG 132M-D		7.5	15.0/8.7	90.1	0.84	1450	7.4
MMG 160M-D		11.0	22.5/13.0	91.0	0.82	1460	6.9
MMG 160L-D		15.0	29.5/17.0	91.8	0.84	1460	7.4
MMG 180M-D		18.5	36.0/21.0	92.2	0.84	1460	7.5
MMG 180L-D		22.0	42.5/24.5	92.6	0.85	1465	7.8

Electrical data

Premium range 50 Hz, 6-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]	η [%]	Cos $\varphi_{1/1}$	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MMG 80A-D	3x220-240D/ 380-415Y	0.37	2.2/1.3	60	0.72	910	2.7
MMG 80B-D		0.55	3.1/1.8	67	0.67	910	2.9
MMG 90S-D		0.75	4.3/2.5	70	0.67	910	2.9
MMG 90L-D		1.1	5.9/3.4	72	0.66	910	3.0
MMG 100L-D		1.5	7.6/4.4	72	0.71	930	3.7
MMG 112M-D		2.2	9.4/5.4	80	0.72	940	4.4
MMG 132SA-D		3.0	7.1/4.1	83.7	0.75	955	5.8
MMG 132MA-D		4.0	9.2/5.3	84.9	0.76	955	6.2
MMG 112M-D	3x380-415D/ 660-690Y	2.2	9.4/5.4	80	0.72	940	4.4
MMG 132SA-D		3.0	7.1/4.1	83.7	0.75	955	5.8
MMG 132MA-D		4.0	9.2/5.3	84.9	0.76	955	6.2
MMG 132MB-D		5.5	12.5/7.2	85.2	0.77	955	6.2
MMG 160M-D		7.5	15.9/9.2	87.7	0.82	965	5.9

NBE range 50 Hz, 2-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]
MGE 90SB-D	3 x 380-480 V	1.5	3.3 - 2.7
MGE 90LC-D		2.2	4.6 - 3.8
MGE 100LC-D		3.0	6.2 - 5.0
MGE 112MC-D		4.0	8.1 - 6.6
MGE 132SC-D		5.5	11.0 - 8.8
MGE 132SD-D		7.5	15.0 - 12.0
MMGE 160M	3 x 380-415 V	11.0	21.4
MMGE 160MX		15.0	28.0
MMGE 160L		18.5	34.0
MMGE 180M		22.0	42.0

NBE range 50 Hz 4-pole

Frame size	Voltage	P2 [kW]	$I_{1/1}$ [A]
MGE 90SA-D	3 x 380-480 V	0.75	1.8-1.9
MGE 90SB-D		1.1	2.5 - 2.2
MGE 90LC-D		1.5	3.3 - 2.9
MGE 100LB-D		2.2	4.6 - 3.8
MGE 112LC-D		3.0	6.2 - 5.0
MGE 112MC-D		4.0	8.1 - 6.6
MGE 132SC-D	3 x 380-415 V	5.5	11.3 - 10.5
MMGE 160M		7.5	14.7
MMGE 160M		11.0	21.7
MMGE 160L		15.0	28.5
MMGE 180M		18.5	34.7
MMGE 180L		22.0	41.0

Curve charts

The following many pages are divided into sections:

pages 32 - 33	A brief explanation of curve conditions and how to read the curve charts, etc.

Performance curves and technical data:

page 34	NB, NBE 50 Hz 2-pole pumps
page 72	NB, NBE 50 Hz 4-pole pumps
page 128	NB, NBE 50 Hz 6-pole pumps

Curve conditions

Selection of pumps

The guidelines below apply to the curves shown in the performance charts on page 34 to page 172.

- Tolerances according to: ISO 9906, Annex A.
- The curves show pump performance with different impeller diameters at the nominal speed.
- The bold part of the curves show the **recommended** operating range.
- The thin parts are not recommended as possible operating range here might suggest the selection of a smaller/larger pump type.
- Do not use the pumps at minimum flows below 0.1 x Q at an optimum efficiency because of the danger of overheating of the pump.
- The curves apply to the pumping of water at a temperature of +20°C and a kinematic viscosity of 1 mm^2/s (1 cSt).
- **ETA:** The dashed lines show values of the hydraulic efficiency of the pump.
- **NPSH:** The curves show average values measured under the same conditions as the performance curves.
  When dimensioning the pump, add a safety margin of at least 0.5 m.
- In case of other densities than 1000 kg/m^3 the discharge pressure is proportional to the density.
- When pumping liquids with a density higher than 1000 kg/m^3, motors with correspondingly higher outputs must be used.

Calculation of total head

The total pump head consists of the height difference between the measuring points + the differential head + the dynamic head.

$$H_{total} = H_{geo} + H_{start} + H_{dyn}$$

H_{geo} : Height difference between measuring points.

H_{stat} : Differential head between suction and the discharge side of the pump.

H_{dyn} : Calculated values based on the velocity of the pumped liquid on the suction and the discharge side of the pump.

Certificates

Grundfos offers a number of certificates and reports.

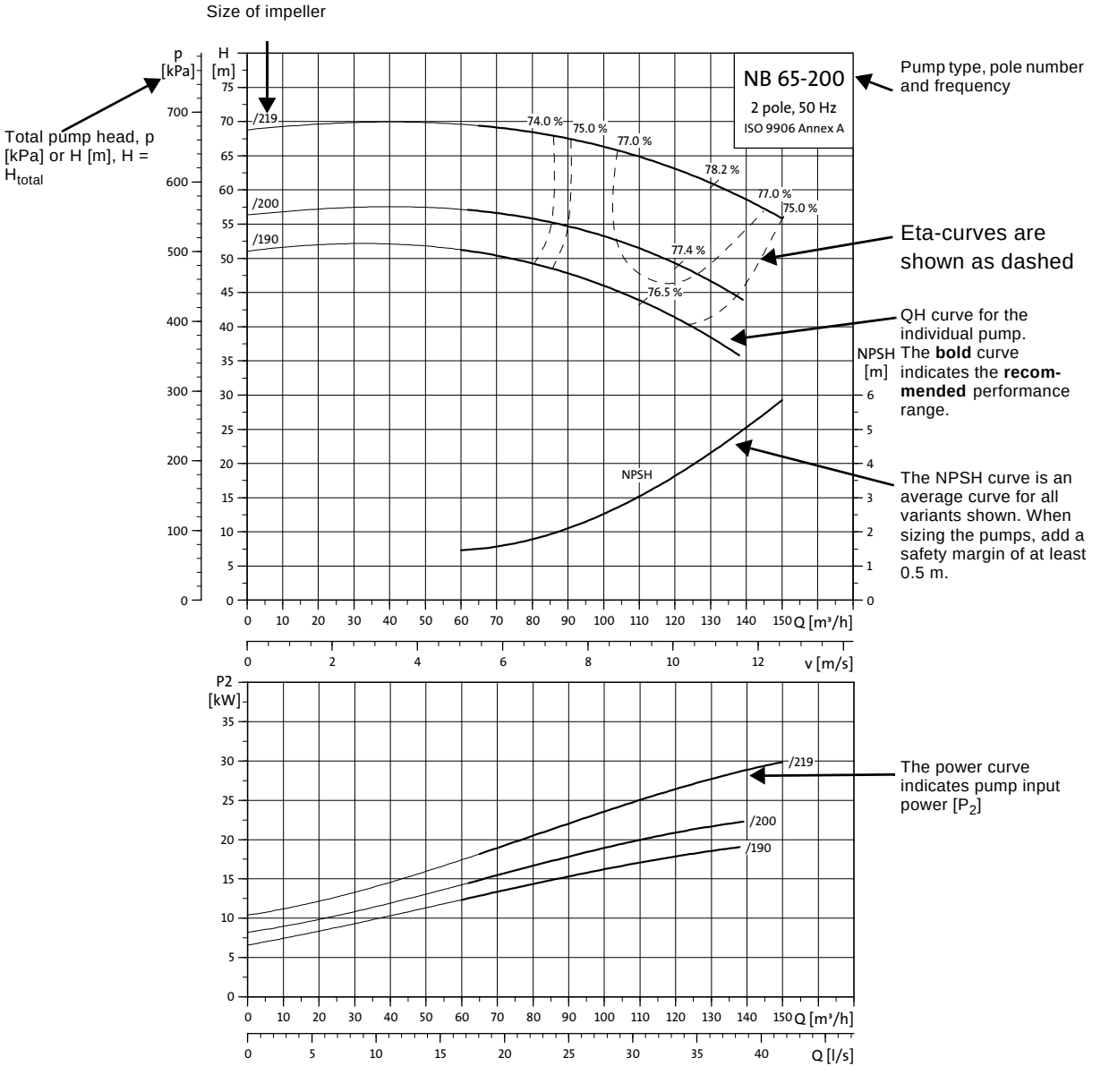
If the customer requires a certificate or a report place the request on the order and the certificate or report will be put onto the bill of materials. This means that the certificate or report will be included in the product number of the pump.

Certificates have to be confirmed for every order and are available on request as follows:

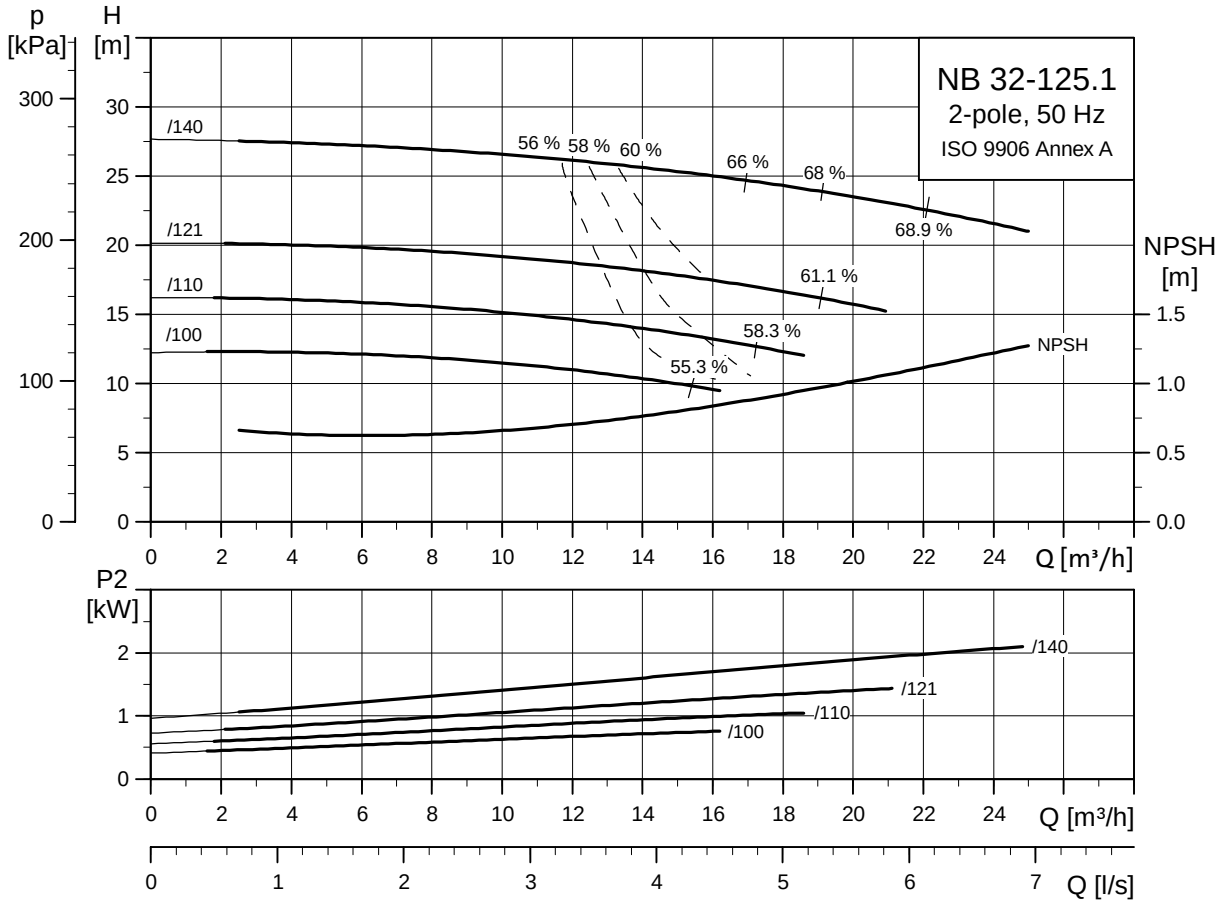
- Certificate for compliance with the order EN 10204 - 2.1
- Pump certificate EN 10204 - 2.2
- Inspection certificate EN 10204 - 3.1.B
- Inspection certificate EN 10204 - 3.1.C

Curve charts

How to read the curve charts



NB, NBE 2-pole



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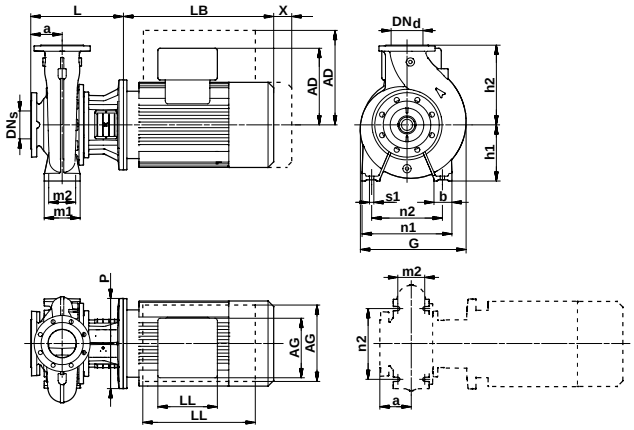
Technical data



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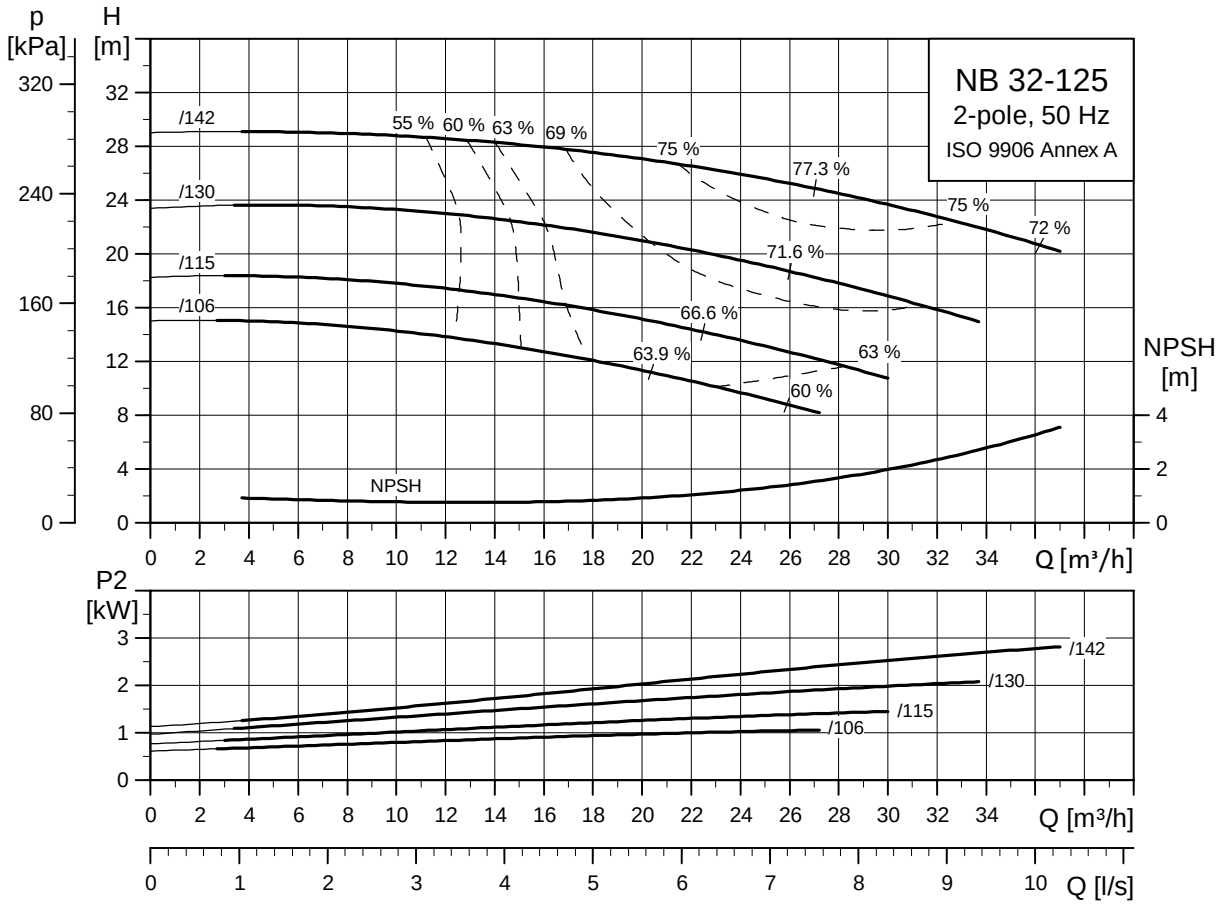
NB			NB 32-125.1/100	NB 32-125.1/110	NB 32-125.1/121	NB 32-125.1/140
NBE			**-**	**-**	**NBE 32-125.1/121**	**NBE 32-125.1/140**
IEC size	NB[1)]		MG 80B-C/MG 80A-C	MG 80B-C/MG 90SA-D	MG 90SA-C/MG 90SB-D	MG 90LA-C/MG 90LC-D
	NBE		-	-	MGE 90SA	MGE 90LA
P2		[kW]	0.75	1.1	1.5	2.2
Design			A	A	A	A
PN		[bar]	PN 16	PN 16	PN 16	PN 16
DN_s		[mm]	50	50	50	50
DN_d		[mm]	32	32	32	32
a		[mm]	80	80	80	80
b		[mm]	50	50	50	50
B[2)]		[mm]	-	-	-	-
LB[2)]		[mm]	231/281/-	231/281/321	281/281/321	281/321/321
P[2)]		[mm]	200/200/-	200/200/198	200/200/198	200/200/198
C[2)]		[mm]	-	-	-	-
G		[mm]	234	234	234	234
H		[mm]	-	-	-	-
h1		[mm]	112	112	112	112
h2		[mm]	140	140	140	140
L		[mm]	226	226	226	226
m1		[mm]	100	100	100	100
m2		[mm]	70	70	70	70
n1		[mm]	190	190	190	190
n2		[mm]	140	140	140	140
s1		[mm]	M12	M12	M12	M12
A		[mm]	-	-	-	-
AA[2)]		[mm]	-	-	-	-
AB[2)]		[mm]	-	-	-	-
K[2)]		[mm]	-	-	-	-
AD[2)]		[mm]	109/110/-	109/110/167	110/110/167	110/110/167
AG[2)]		[mm]	82/81/-	82/81/264	81/81/264	81/81/264
LL[2)]		[mm]	82/81/-	82/81/260	81/81/260	81/81/260
X	Motor only	[mm]	40	40	50	50
	Motor and motor stool	[mm]	100	100	100	100
NB[7)]	Standard motor range		33/39/0.129	35/41/0.129	40/46/0.129	42/48/0.129
	Premium motor range		-	40/46/0.129	41/47/0.129	45/52/0.172
NBE[7)]	E-motor range		-	-	46/53/0.172	48/55/0.172

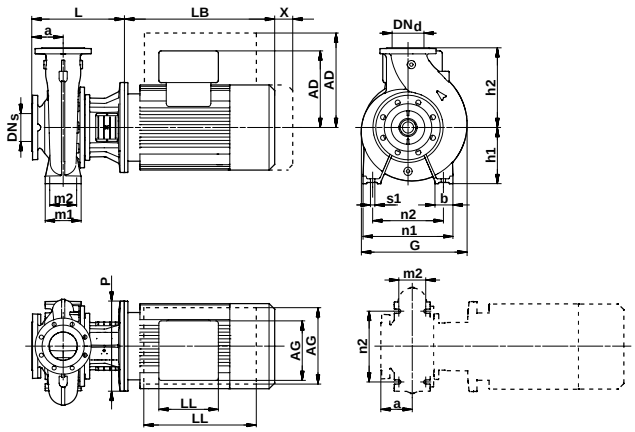
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3221 0606

Technical data

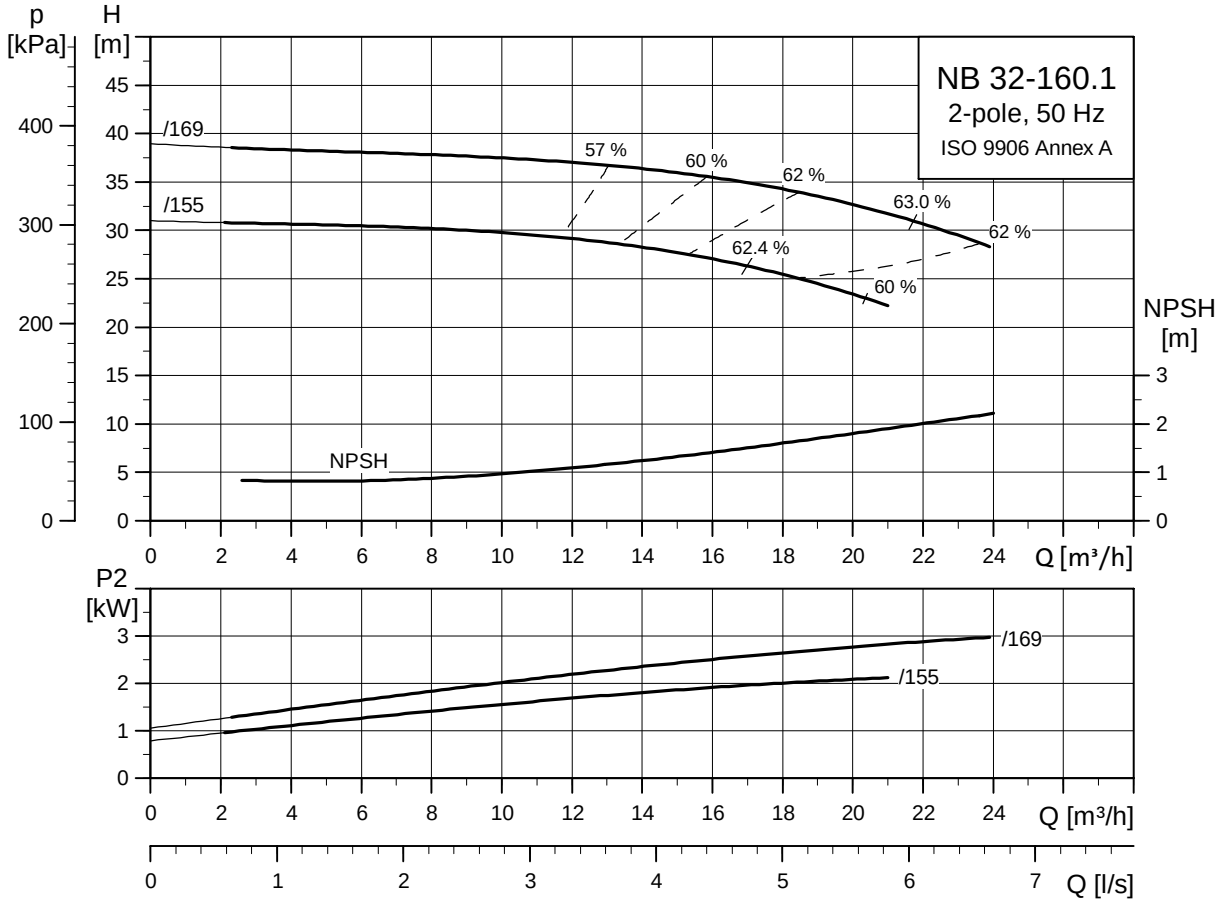


TM02 9206 2104

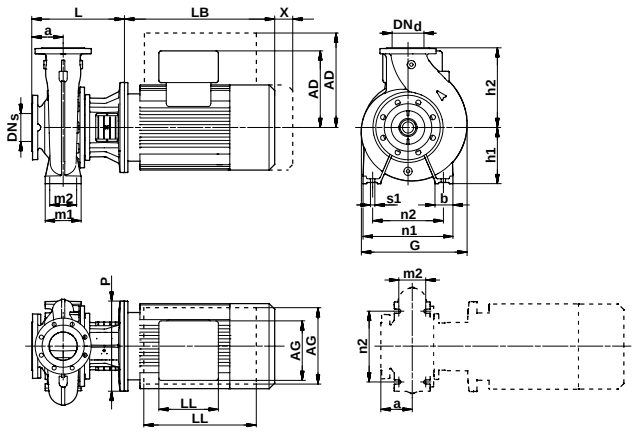
NB			NB 32-125/106	NB 32-125/115	NB 32-125/130	NB 32-125/142
NBE			**-**	**NBE 32-125/115**	**NBE 32-125/130**	**NBE 32-125/142**
IEC size	NB[1)]		MG 80B-C/MG 90SA-D	MG 90SA-C/MG 90SB-D	MG 90LA-C/MG 90LC-D	MG 100LB-C/MG 100LC-D
	NBE		-	MGE 90SA	MGE 90LA	MGE 100LB
P2		[kW]	1.1	1.5	2.2	3.0
Design			A	A	A	A
PN		[bar]	PN 16	PN 16	PN 16	PN 16
DN_s		[mm]	50	50	50	50
DN_d		[mm]	32	32	32	32
a		[mm]	80	80	80	80
b		[mm]	50	50	50	50
B[2)]		[mm]	-	-	-	-
LB[2)]		[mm]	231/281/321	281/281/321	281/321/321	335/335/335
P[2)]		[mm]	200/200/198	200/200/198	200/200/198	250/250/250
C[2)]		[mm]	-	-	-	-
G		[mm]	234	234	234	250
H		[mm]	-	-	-	-
h1		[mm]	112	112	112	112[4)]
h2		[mm]	140	140	140	140
L		[mm]	226	226	226	254
m1		[mm]	100	100	100	100
m2		[mm]	70	70	70	70
n1		[mm]	190	190	190	190
n2		[mm]	140	140	140	140
s1		[mm]	M12	M12	M12	M12
A		[mm]	-	-	-	-
AA[2)]		[mm]	-	-	-	-
AB[2)]		[mm]	-	-	-	-
K[2)]		[mm]	-	-	-	-
AD[2)]		[mm]	109/110/167	110/110/167	110/110/167	120/120/177
AG[2)]		[mm]	82/81/264	81/81/264	81/81/264	162/162/264
LL[2)]		[mm]	82/81/260	81/81/260	81/81/260	103/103/260
X	Motor only	[mm]	40	50	50	60
	Motor and motor stool	[mm]	100	100	100	100
NB[7)]	Standard motor range		35/41/0.129	40/46/0.129	42/48/0.129	49/56/0.172
	Premium motor range		40/46/0.129	41/47/0.129	45/52/0.172	51/58/0.172
NBE[7)]	E-motor range		-	46/53/0.172	48/55/0.172	56/64/0.249

1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
4) Attention: P/2 > h1.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3219 0606

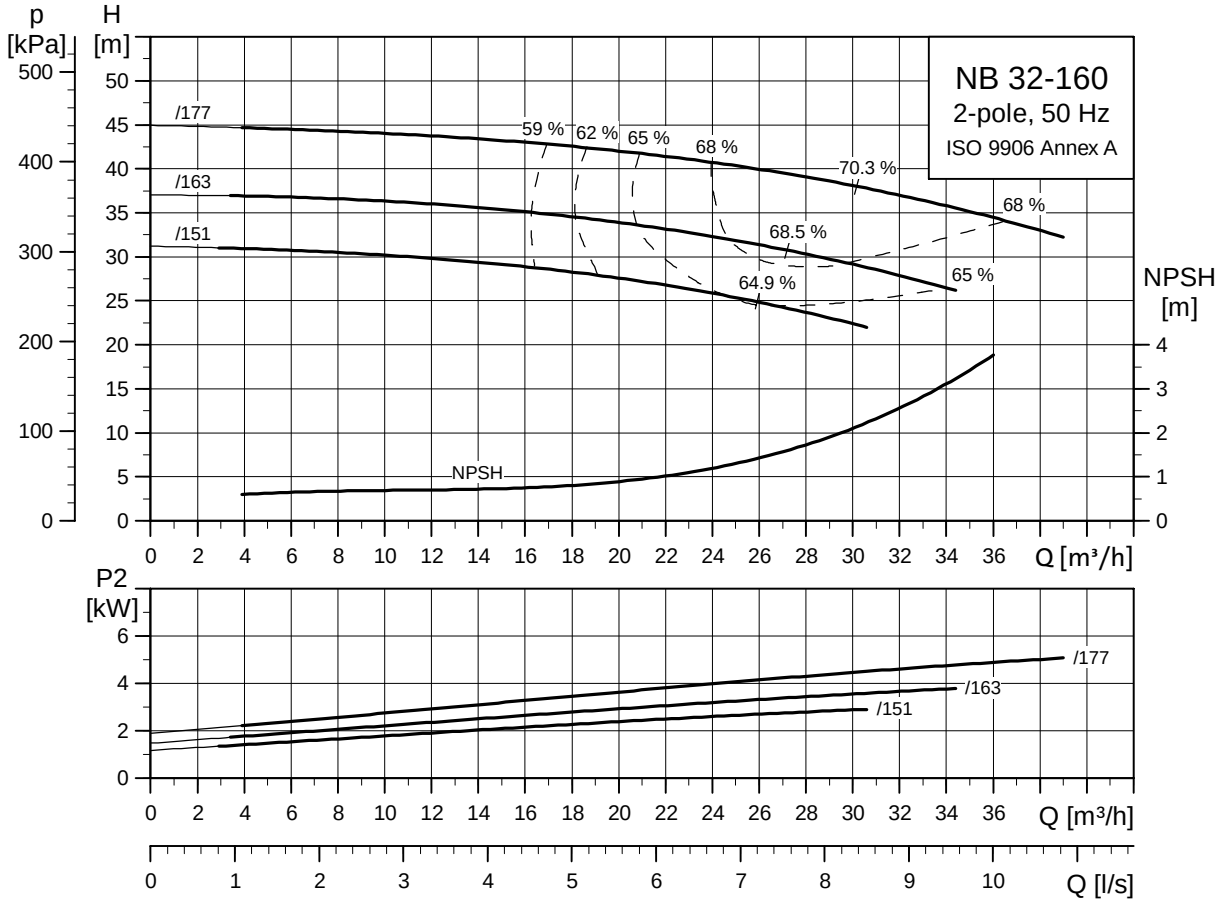


TM02 9206 2104

NB			NB 32-160.1/155	NB 32-160.1/169
NBE			**NBE 32-160.1/155**	**NBE 32-160.1/169**
IEC size	NB[1)]		MG 90LA-C/MG 90LC-D	MG 100LB-C/MG 100LC-D
	NBE		MGE 90LA	MGE 100LB
P2		[kW]	2.2	3.0
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	50	50
DN_d		[mm]	32	32
a		[mm]	80	80
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	281/321/321	335/335/335
P[2)]		[mm]	200/200/198	250/250/250
C[2)]		[mm]	-	-
G		[mm]	245	250
H		[mm]	-	-
h1		[mm]	132	132
h2		[mm]	160	160
L		[mm]	226	254
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	110/110/167	120/120/177
AG[2)]		[mm]	81/81/264	162/162/264
LL[2)]		[mm]	81/81/260	103/103/260
X	Motor only	[mm]	50	60
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		42/49/0.129	50/57/0.172
	Premium motor range		45/53/0.172	52/59/0.172
NBE[7)]	E-motor range		48/56/0.172	57/65/0.249

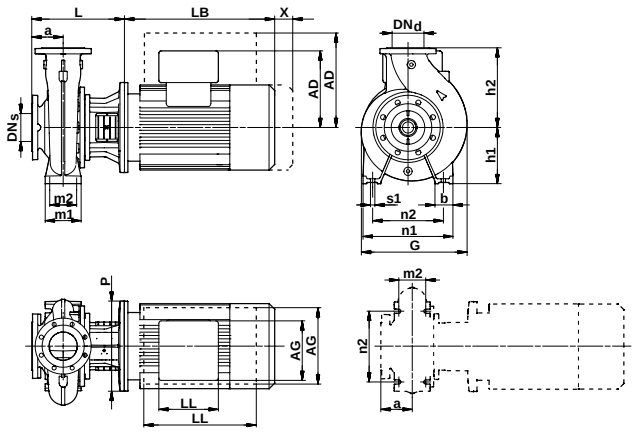
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3222 0606

Technical data

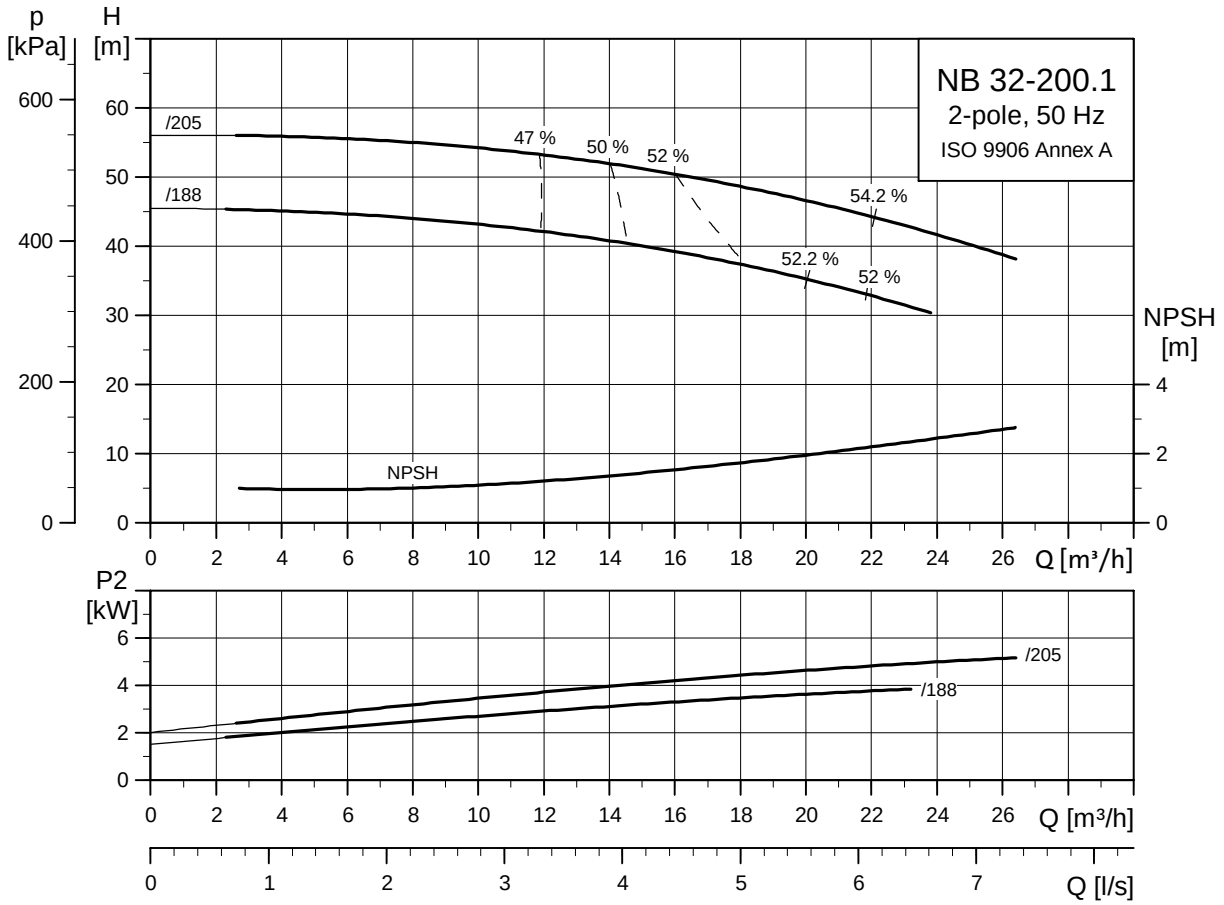


TM02 9206 2104

NB			NB 32-160/151	NB 32-160/163	NB 32-160/177
NBE			**NBE 32-160/151**	**NBE 32-160/163**	**NBE 32-160/177**
IEC size	NB[1)]		MG 100LB-C/MG 100LC-D	MG 112MB-C/MG 112MC-D	MG 132SB-C/MG 132SC-D
	NBE		MGE 100LB	MGE 112MB	MGE 132SB
P2		[kW]	3.0	4.0	5.5
Design			A	A	A
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	50	50	50
DN_d		[mm]	32	32	32
a		[mm]	80	80	80
b		[mm]	50	50	50
B[2)]		[mm]	-	-	-
LB[2)]		[mm]	335/335/335	372/372/372	391/391/391
P[2)]		[mm]	250/250/250	250/250/250	300/300/300
C[2)]		[mm]	-	-	-
G		[mm]	250	250	250
H		[mm]	-	-	-
h1		[mm]	132	132	132[4)]
h2		[mm]	160	160	160
L		[mm]	254	254	254
m1		[mm]	100	100	100
m2		[mm]	70	70	70
n1		[mm]	240	240	240
n2		[mm]	190	190	190
s1		[mm]	M12	M12	M12
A		[mm]	-	-	-
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	-	-	-
AD[2)]		[mm]	120/120/177	134/134/188	134/134/188
AG[2)]		[mm]	162/162/264	201/201/290	201/201/290
LL[2)]		[mm]	103/103/260	103/103/300	103/103/300
X	Motor only	[mm]	60	60	80
	Motor and motor stool	[mm]	100	100	100
NB[7)]	Standard motor range		51/58/0.172	62/69/0.172	76/84/0.172
	Premium motor range		53/60/0.172	71/78/0.172	76/84/0.172
NBE[7)]	E-motor range		58/66/0.249	69/77/0.249	83/92/0.249

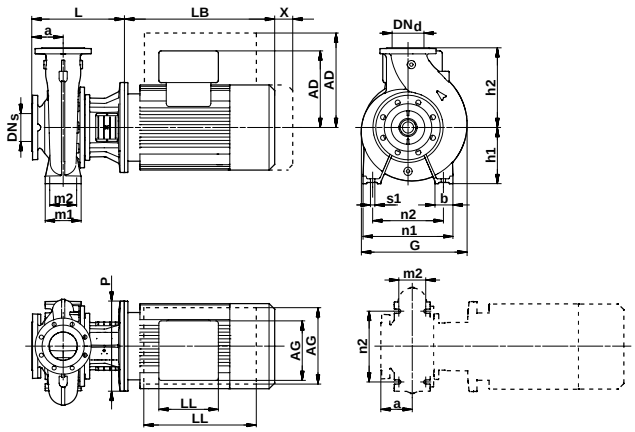
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
4) Attention: P/2 > h1.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3220 0606

Technical data

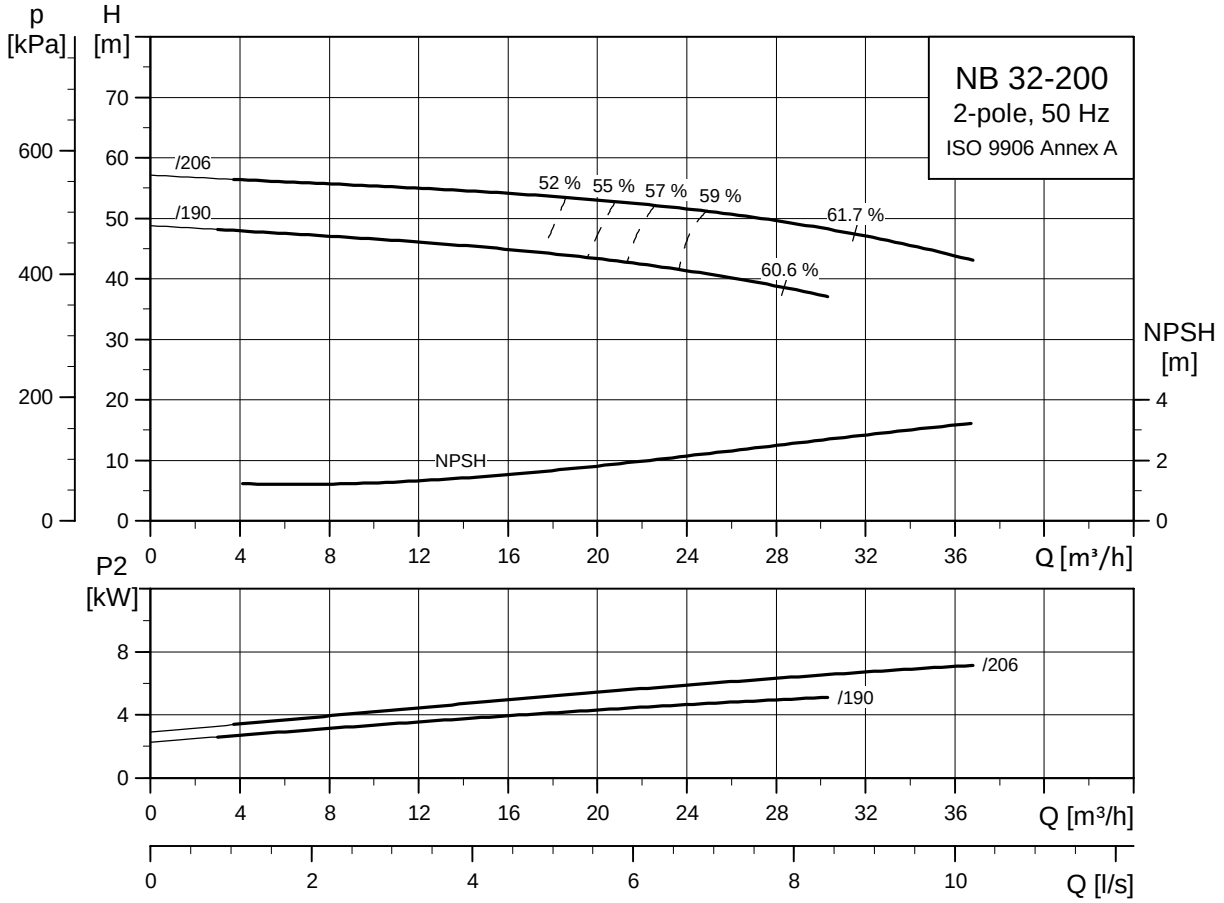


TM02 9206 2104

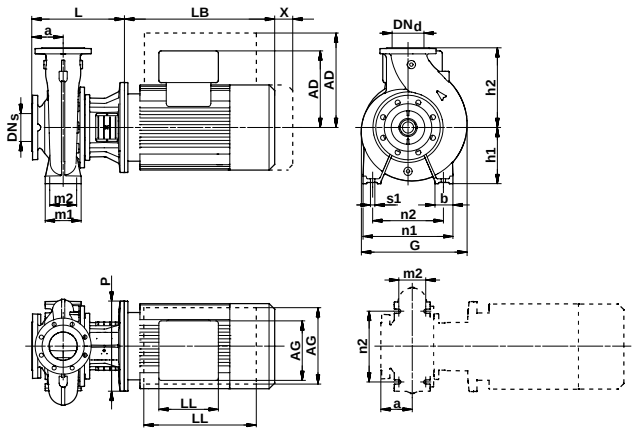
NB			NB 32-200.1/188	NB 32-200.1/205
NBE			**NBE 32-200.1/188**	**NBE 32-200.1/205**
IEC size	NB[1)]		MG 112MB-C/MG 112MC-D	MG 132SB-C/MG 132SC-D
	NBE		MGE 112MB	MGE 132SB
P2		[kW]	4.0	5.5
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	50	50
DN_d		[mm]	32	32
a		[mm]	80	80
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	372/372/372	391/391/391
P[2)]		[mm]	250/250/250	300/300/300
C[2)]		[mm]	-	-
G		[mm]	279	301
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	180	180
L		[mm]	254	293
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	134/134/188	134/134/188
AG[2)]		[mm]	201/201/290	201/201/290
LL[2)]		[mm]	103/103/300	103/103/300
X	Motor only	[mm]	60	80
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		66/73/0.172	81/88/0.172
	Premium motor range		75/82/0.172	81/88/0.172
NBE[7)]	E-motor range		73/81/0.249	88/96/0.249

1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3223 0606

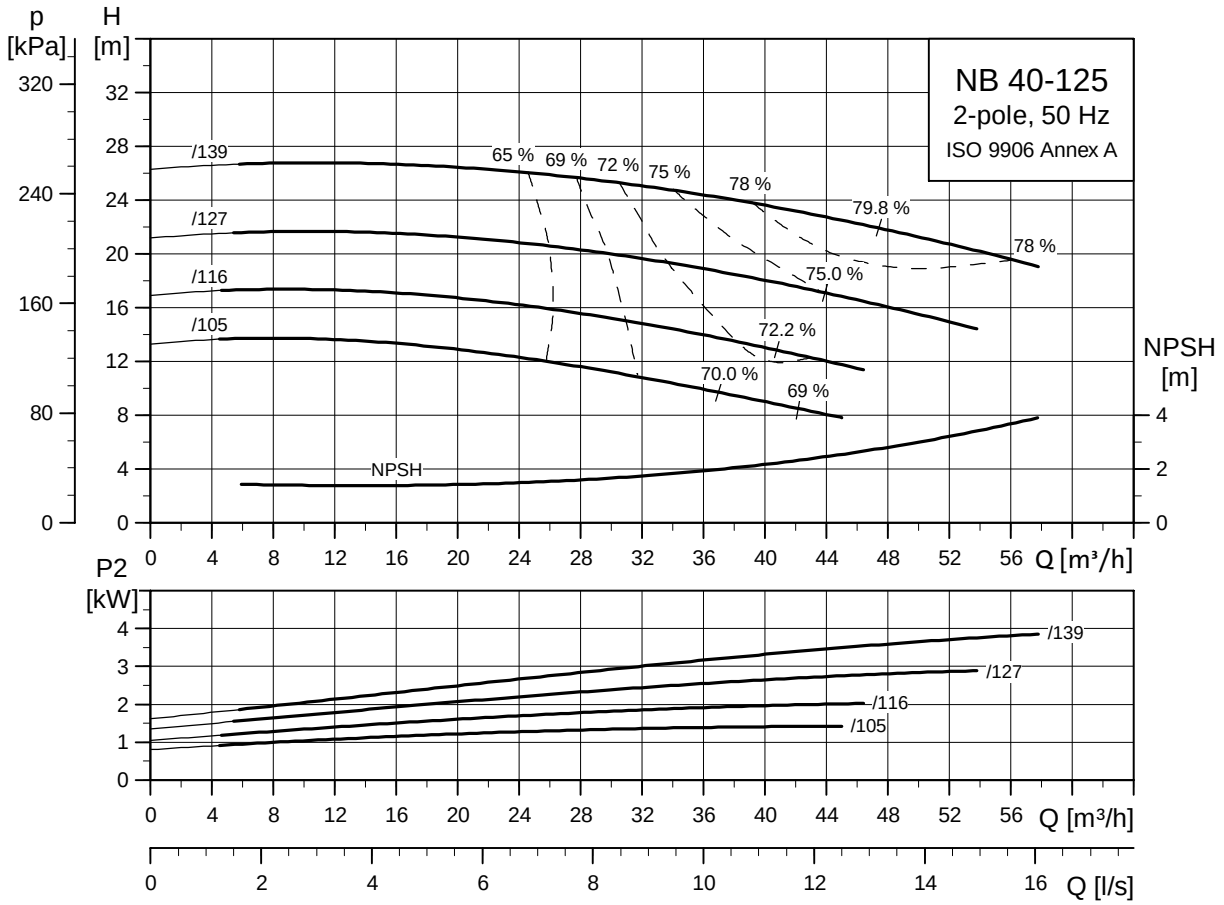


TM02 9206 2104

NB			NB 32-200/190	NB 32-200/206
NBE			**NBE 32-200/190**	**NBE 32-200/206**
IEC size	NB[1)]		MG 132SB-C/MG 132SC-D	MG 132SC-C/MG 132SD-D
	NBE		MGE 132SB	MGE 132SC
P2		[kW]	5.5	7.5
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	50	50
DN_d		[mm]	32	32
a		[mm]	80	80
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	391/391/391	391/391/391
P[2)]		[mm]	300/300/300	300/300/300
C[2)]		[mm]	-	-
G		[mm]	301	301
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	180	180
L		[mm]	293	293
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	134/134/188	134/134/188
AG[2)]		[mm]	201/201/290	201/201/290
LL[2)]		[mm]	103/103/300	103/103/300
X	Motor only	[mm]	80	80
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		82/89/0.172	84/91/0.172
	Premium motor range		82/89/0.172	82/89/0.172
NBE[7)]	E-motor range		89/97/0.249	92/100/0.249

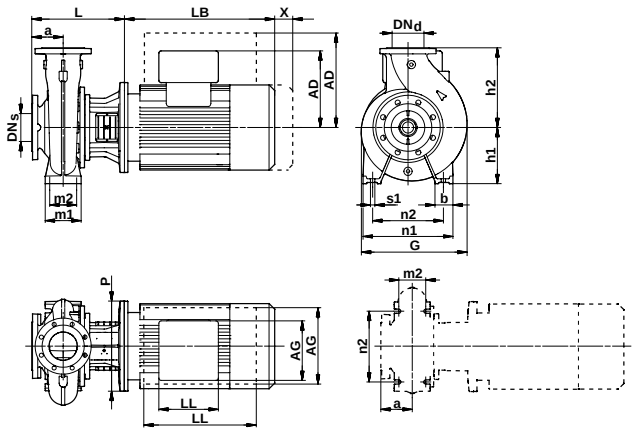
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3224 0606

Technical data



TM02 9206 2104

NB			NB 40-125/105	NB 40-125/116	NB 40-125/127	NB 40-125/139
NBE			**NBE 40-125/105**	**NBE 40-125/116**	**NBE 40-125/127**	**NBE 40-125/139**
IEC size	NB[1)]		MG 90SA-C/MG 90SB-D	MG 90LA-C/MG 90LC-D	MG 100LB-C/MG 100LC-D	MG 112MB-C/MG 112MC-D
	NBE		MGE 90SA	MGE 90LA	MGE 100LB	MGE 112MB
P2		[kW]	1.5	2.2	3.0	4.0
Design			A	A	A	A
PN		[bar]	PN 16	PN 16	PN 16	PN 16
DN_s		[mm]	65	65	65	65
DN_d		[mm]	40	40	40	40
a		[mm]	80	80	80	80
b		[mm]	50	50	50	50
B[2)]		[mm]	-	-	-	-
LB[2)]		[mm]	281/281/321	281/321/321	335/335/335	372/372/372
P[2)]		[mm]	200/200/198	200/200/198	250/250/250	250/250/250
C[2)]		[mm]	-	-	-	-
G		[mm]	235	235	250	250
H		[mm]	-	-	-	-
h1		[mm]	112	112	112[4)]	112[4)]
h2		[mm]	140	140	140	140
L		[mm]	226	226	254	254
m1		[mm]	100	100	100	100
m2		[mm]	70	70	70	70
n1		[mm]	210	210	210	210
n2		[mm]	160	160	160	160
s1		[mm]	M12	M12	M12	M12
A		[mm]	-	-	-	-
AA[2)]		[mm]	-	-	-	-
AB[2)]		[mm]	-	-	-	-
K[2)]		[mm]	-	-	-	-
AD[2)]		[mm]	110/110/167	110/110/167	120/120/177	134/134/188
AG[2)]		[mm]	81/81/264	81/81/264	162/162/264	201/201/290
LL[2)]		[mm]	81/81/260	81/81/260	103/103/260	103/103/300
X	Motor only	[mm]	50	50	60	60
	Motor and motor stool	[mm]	100	100	100	100
NB[7)]	Standard motor range		42/48/0.129	44/50/0.129	51/58/0.172	62/69/0.172
	Premium motor range		43/49/0.129	47/54/0.172	53/60/0.172	71/78/0.172
NBE[7)]	E-motor range		48/55/0.172	50/57/0.172	58/66/0.249	69/77/0.249

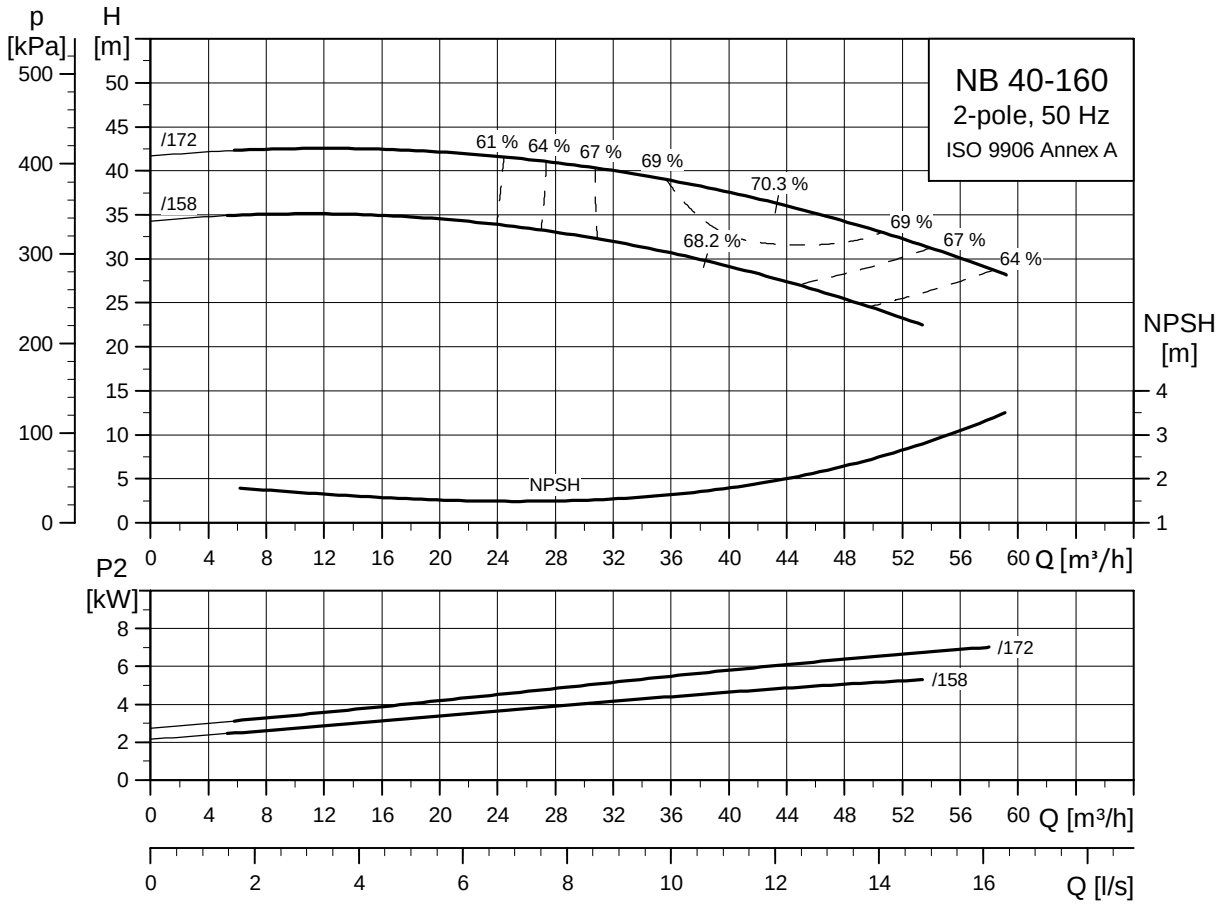
1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

4) Attention: P/2 > h1.

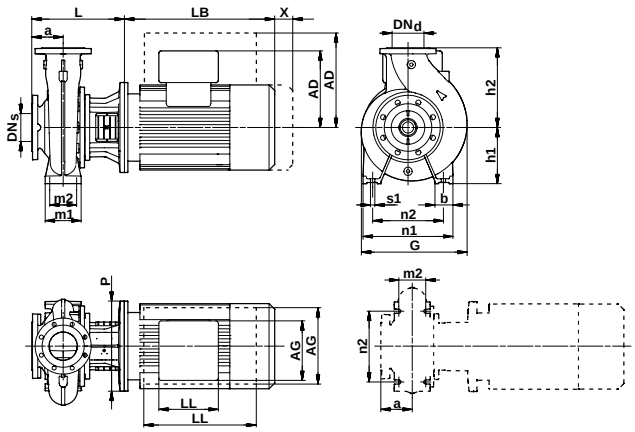
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3225 0606

Technical data

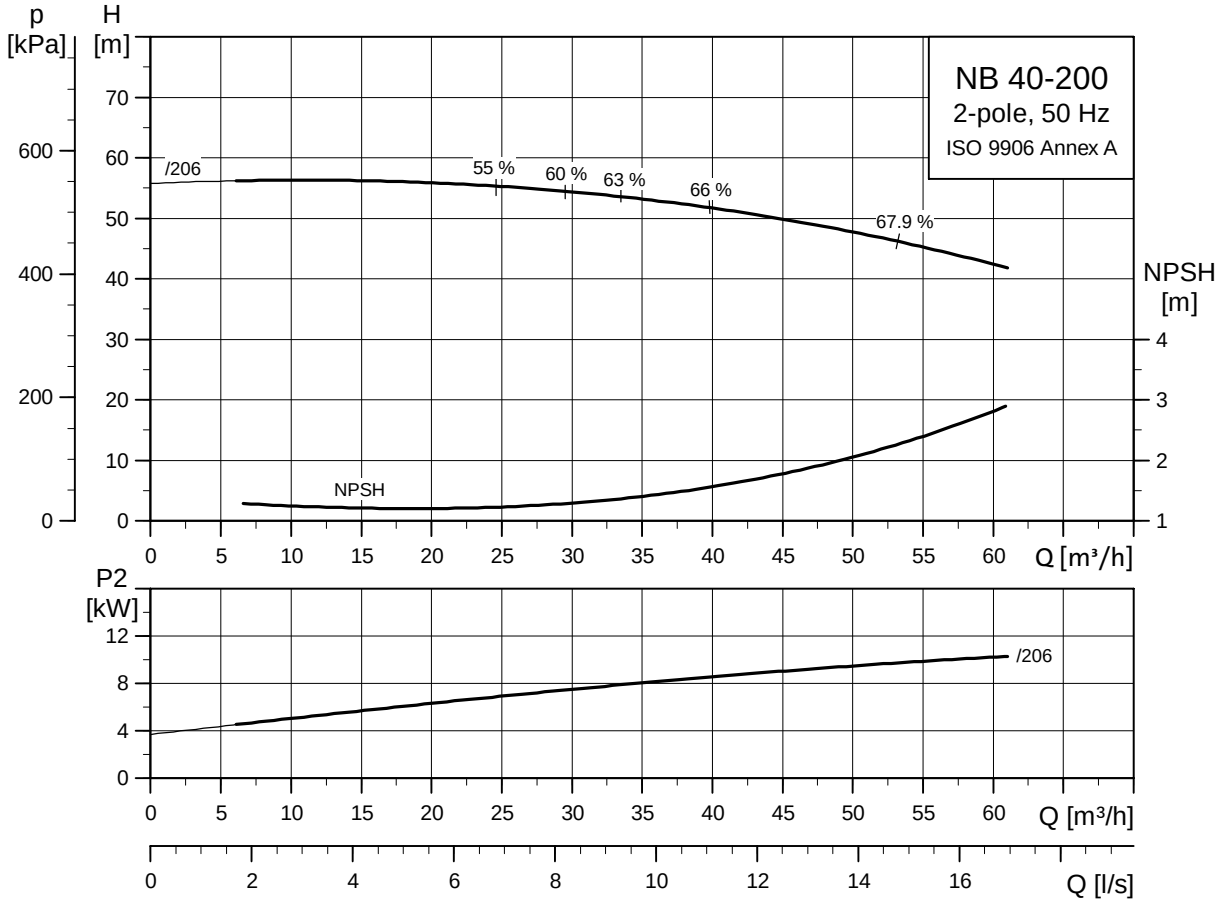


TM02 9206 2104

NB			NB 40-160/158	NB 40-160/172
NBE			**NBE 40-160/158**	**NBE 40-160/172**
IEC size	NB[1)]		MG 132SB-C/MG 132SC-D	MG 132SC-C/MG 132SD-D
	NBE		MGE 132SB	MGE 132SC
P2		[kW]	5.5	7.5
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	40	40
a		[mm]	80	80
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	391/391/391	391/391/391
P[2)]		[mm]	300/300/300	300/300/300
C[2)]		[mm]	-	-
G		[mm]	300	300
H		[mm]	-	-
h1		[mm]	132[4)]	132[4)]
h2		[mm]	160	160
L		[mm]	293	293
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	134/134/188	134/134/188
AG[2)]		[mm]	201/201/290	201/201/290
LL[2)]		[mm]	103/103/300	103/103/300
X	Motor only	[mm]	60	80
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		78/85/0.172	80/87/0.172
	Premium motor range		78/85/0.172	78/85/0.172
NBE[7)]	E-motor range		85/93/0.249	88/96/0.249

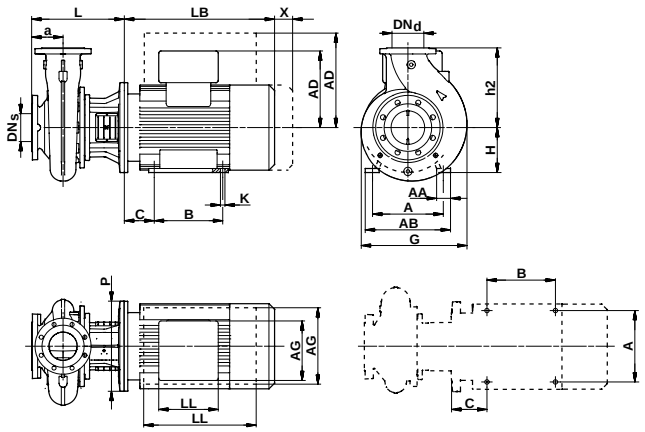
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
4) Attention: P/2 > h1.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3226 0606

Technical data

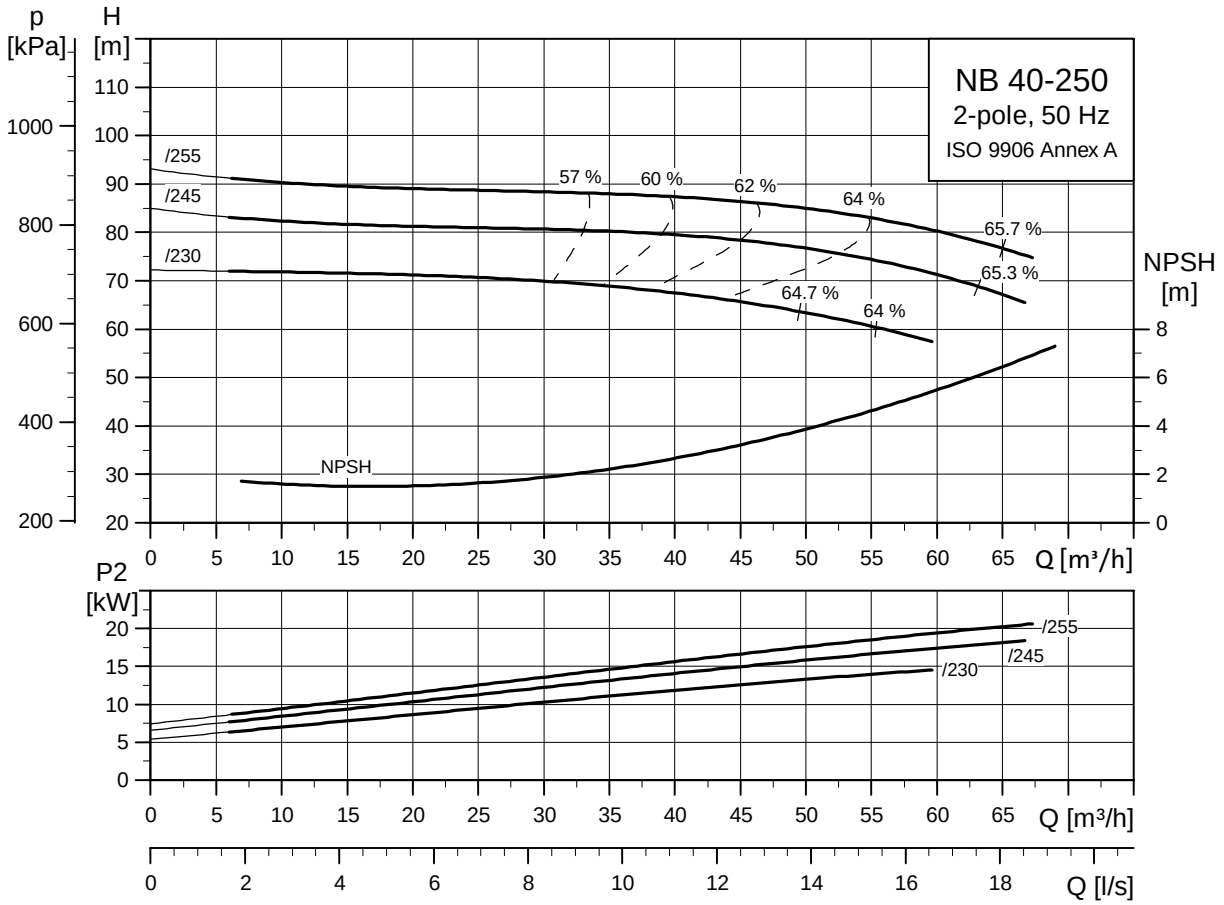


TM01 29207 2104

NB			**NB 40-200/206**
NBE			**NBE 40-200/206**
IEC size	NB[1)]		MMG 160MA-E/MMG 160MA-D
	NBE		MMGE 160M
P2		[kW]	11.0
Design			B
PN		[bar]	PN 16
DN_S		[mm]	65
DN_d		[mm]	40
a		[mm]	100
b		[mm]	-
B[2)]		[mm]	210/210/210
LB[2)]		[mm]	505/503/449
P[2)]		[mm]	350/350/350
C[2)]		[mm]	108/108/108
G		[mm]	350
H		[mm]	160[5)]
h1		[mm]	-
h2		[mm]	180
L		[mm]	343
m1		[mm]	-
m2		[mm]	-
n1		[mm]	-
n2		[mm]	-
s1		[mm]	-
A		[mm]	254
AA[2)]		[mm]	61/64/55
AB[2)]		[mm]	320/292/296
K[2)]		[mm]	15/12/15
AD[2)]		[mm]	244/244/391
AG[2)]		[mm]	178/178/296
LL[2)]		[mm]	162/162/410
X	Motor only	[mm]	110
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		166/175/0.498
	Premium motor range		134/143/0.498
NBE[7)]	E-motor range		170/179/0.498

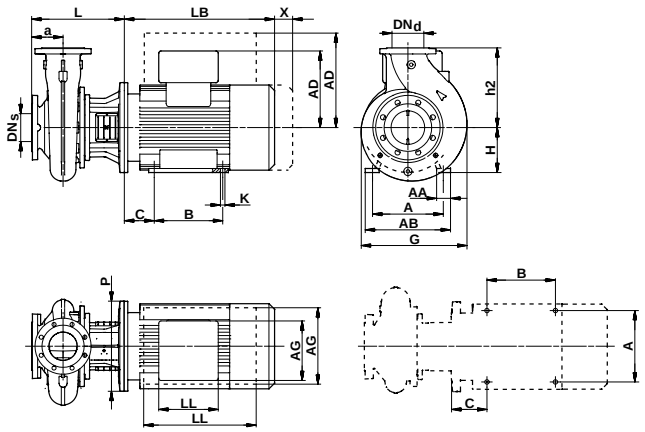
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
5) Attention: P/2 > H.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3227 0606

Technical data

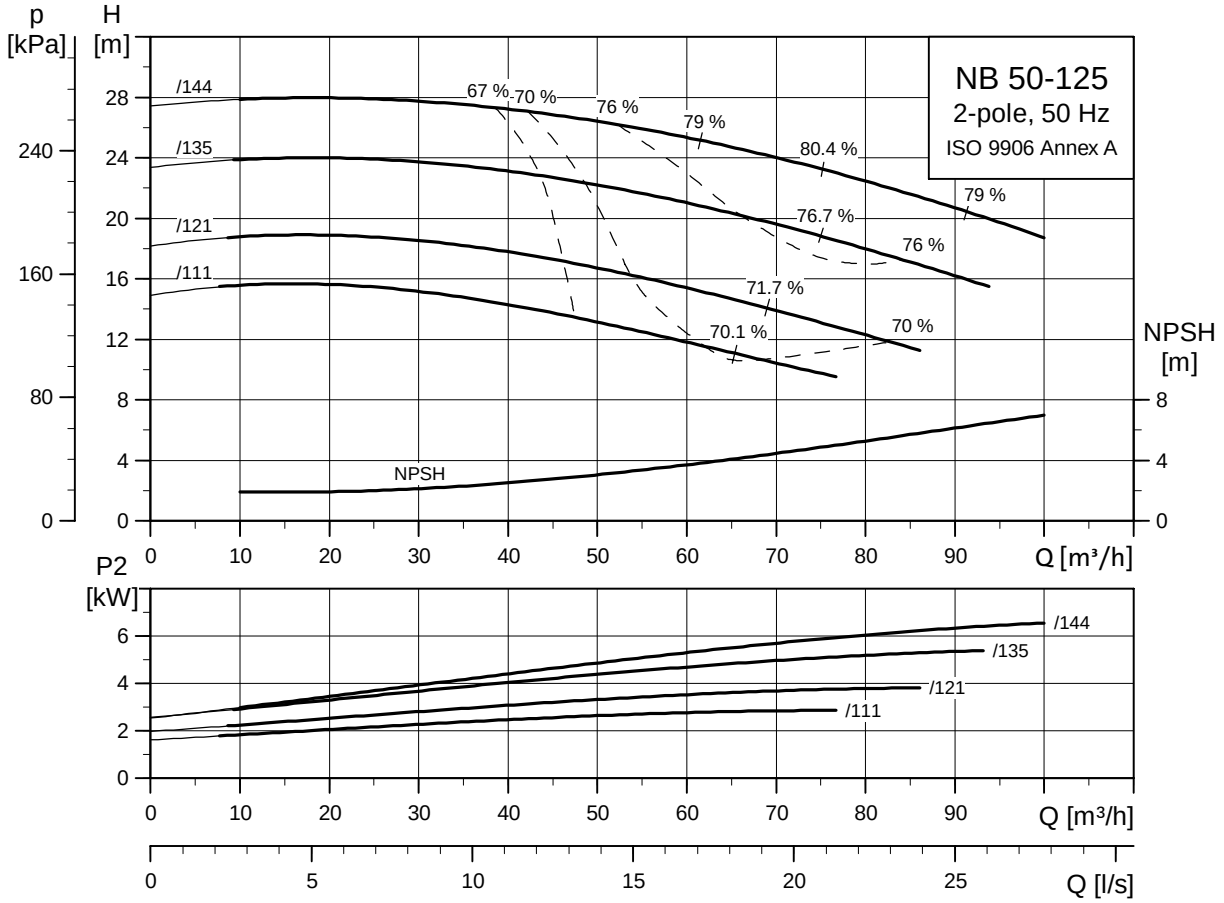


TM01 29207 2104

NB			NB 40-250/230	NB 40-250/245	NB 40-250/255
NBE			**NBE 40-250/230**	**NBE 40-250/245**	**NBE 40-250/255**
IEC size	NB[1)]		MMG 160MB-E/MMG 160MB-D	MMG 160L-E/MMG 160L-D	MMG 180M-E/MMG 180M-D
	NBE		MMGE 160MX	MMGE 160L	MMGE 180M
P2		[kW]	15.0	18.5	22.0
Design			B	B	B
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	65	65	65
DN_d		[mm]	40	40	40
a		[mm]	100	100	100
b		[mm]	-	-	-
B[2)]		[mm]	210/210/210	254/254/254	241/241/241
LB[2)]		[mm]	505/503/461	560/547/499	590/602/525
P[2)]		[mm]	350/350/350	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	108/108/108	121/121/121
G		[mm]	350	350	350
H		[mm]	160[5)]	160[5)]	180
h1		[mm]	-	-	-
h2		[mm]	225	225	225
L		[mm]	343	343	343
m1		[mm]	-	-	-
m2		[mm]	-	-	-
n1		[mm]	-	-	-
n2		[mm]	-	-	-
s1		[mm]	-	-	-
A		[mm]	254	254	279
AA[2)]		[mm]	61/64/55	61/64/55	70/66/62
AB[2)]		[mm]	320/292/296	320/292/296	355/330/328
K[2)]		[mm]	15/12/15	15/12/15	15/12/15
AD[2)]		[mm]	244/244/418	260/241/418	272/285/439
AG[2)]		[mm]	178/178/296	130/163/296	150/178/328
LL[2)]		[mm]	162/162/410	162/162/410	186/178/456
X	Motor only	[mm]	110	110	110
	Motor and motor stool	[mm]	100	100	100
NB[7)]	Standard motor range		181/190/0.498	204/225/0.68	242/263/0.68
	Premium motor range		152/161/0.498	162/183/0.68	192/213/0.68
NBE[7)]	E-motor range		194/203/0.498	237/246/0.498	269/290/0.872

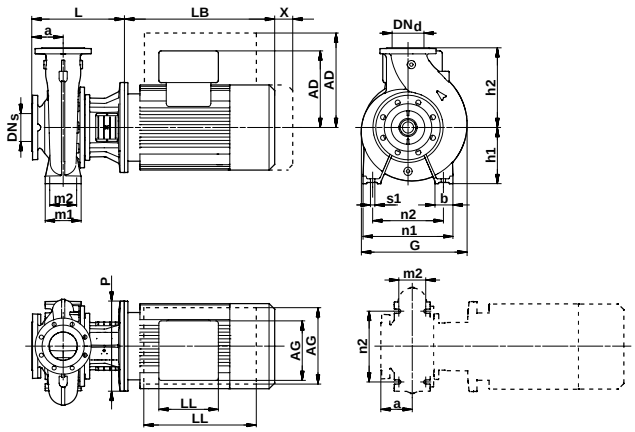
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
5) Attention: P/2 > H.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3228 0606

Technical data



TM02 9206 2104

NB			NB 50-125/111	NB 50-125/121	NB 50-125/135	NB 50-125/144
NBE			**NBE 50-125/111**	**NBE 50-125/121**	**NBE 50-125/135**	**NBE 50-125/144**
IEC size	NB[1)]		MG 100LB-C/MG 100LC-D	MG 112MB-C/MG 112MC-D	MG 132SB-C/MG 132SC-D	MG 132SC-C/MG 132SD-D
	NBE		MGE 100LB	MGE 112MB	MGE 132SB	MGE 132SC
P2		[kW]	3.0	4.0	5.5	7.5
Design			A	A	A	A
PN		[bar]	PN 16	PN 16	PN 16	PN 16
DN_s		[mm]	65	65	65	65
DN_d		[mm]	50	50	50	50
a		[mm]	100	100	100	100
b		[mm]	50	50	50	50
B[2)]		[mm]	-	-	-	-
LB[2)]		[mm]	335/335/335	372/372/372	391/391/391	391/391/391
P[2)]		[mm]	250/250/250	250/250/250	300/300/300	300/300/300
C[2)]		[mm]	-	-	-	-
G		[mm]	250	250	300	300
H		[mm]	-	-	-	-
h1		[mm]	132	132	132[4)]	132[4)]
h2		[mm]	160	160	160	160
L		[mm]	274	274	313	313
m1		[mm]	100	100	100	100
m2		[mm]	70	70	70	70
n1		[mm]	240	240	240	240
n2		[mm]	190	190	190	190
s1		[mm]	M12	M12	M12	M12
A		[mm]	-	-	-	-
AA[2)]		[mm]	-	-	-	-
AB[2)]		[mm]	-	-	-	-
K[2)]		[mm]	-	-	-	-
AD[2)]		[mm]	120/120/177	134/134/188	134/134/188	134/134/188
AG[2)]		[mm]	162/162/264	201/201/290	201/201/290	201/201/290
LL[2)]		[mm]	103/103/260	103/103/300	103/103/300	103/103/300
X	Motor only	[mm]	60	60	80	80
	Motor and motor stool	[mm]	100	100	100	100
NB[7)]	Standard motor range		54/61/0.172	65/72/0.172	79/87/0.172	81/89/0.172
	Premium motor range		56/63/0.172	74/81/0.172	79/87/0.172	79/87/0.172
NBE[7)]	E-motor range		61/69/0.249	72/80/0.249	86/95/0.249	89/98/0.249

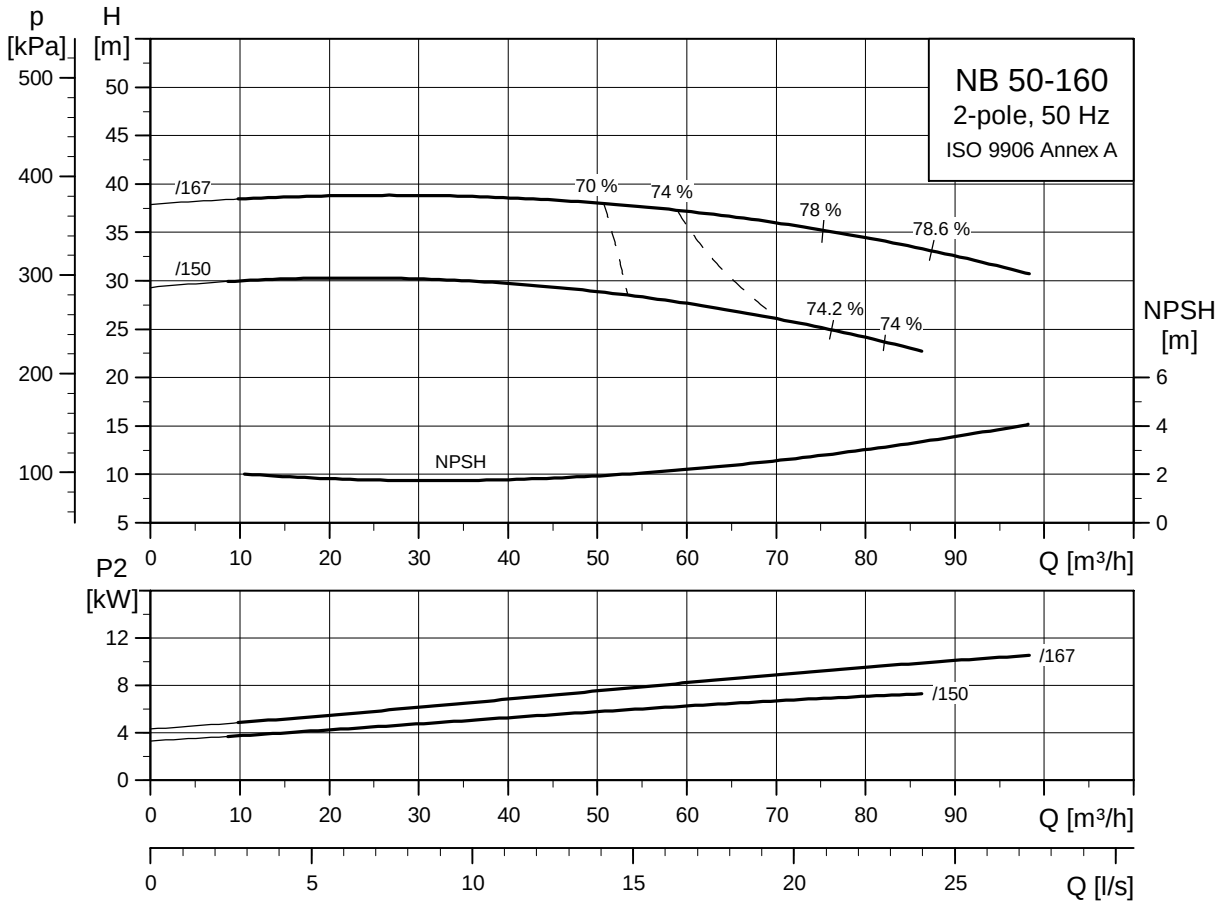
1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

4) Attention: P/2 > h1.

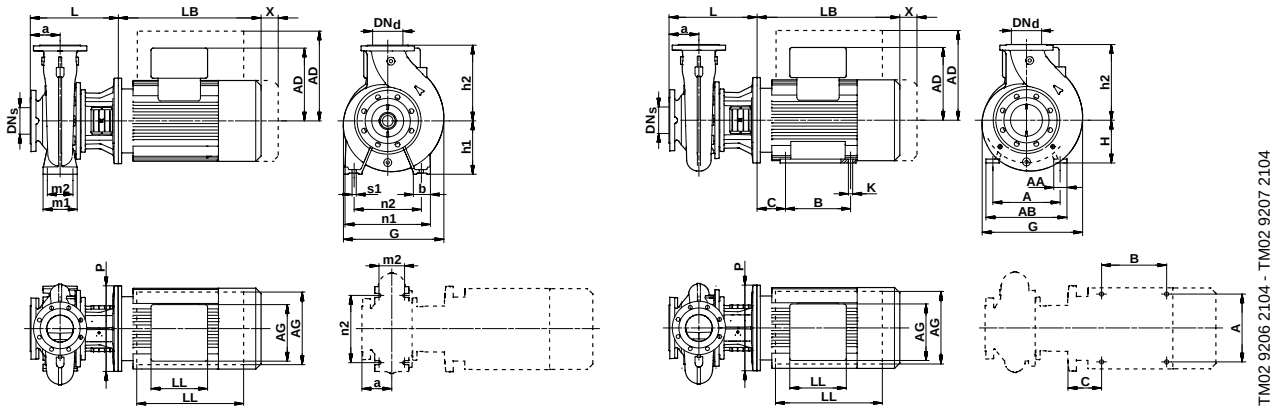
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3229 0606

Technical data

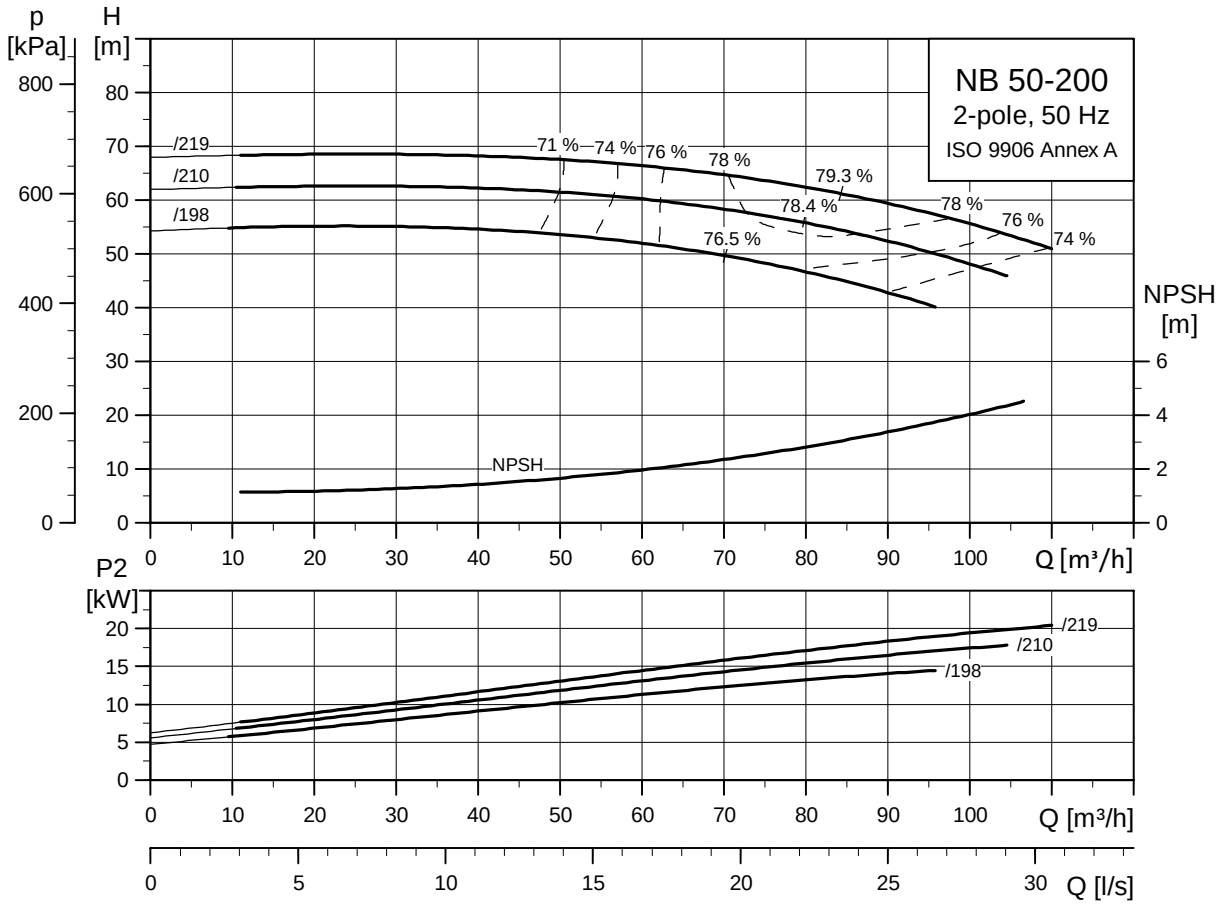


TM02 9206 2104 - TM02 9207 2104

NB			NB 50-160/150	NB 50-160/167
NBE			NBE 50-160/150	NBE 50-160/167
IEC size	NB[1)]		MG 132SC-C/MG 132SD-D	MMG 160MA-E/MMG 160MA-D
	NBE		MGE 132SC	MMGE 160M
P2		[kW]	7.5	11.0
Design			A	B
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	50	50
a		[mm]	100	100
b		[mm]	50	-
B[2)]		[mm]	-	210/210/210
LB[2)]		[mm]	391/391/391	505/503/449
P[2)]		[mm]	300/300/300	350/350/350
C[2)]		[mm]	-	108/108/108
G		[mm]	301	350
H		[mm]	-	160[5)]
h1		[mm]	160	-
h2		[mm]	180	180
L		[mm]	313	343
m1		[mm]	100	-
m2		[mm]	70	-
n1		[mm]	265	-
n2		[mm]	212	-
s1		[mm]	M12	-
A		[mm]	-	254
AA[2)]		[mm]	-	61/64/55
AB[2)]		[mm]	-	320/292/296
K[2)]		[mm]	-	15/12/15
AD[2)]		[mm]	134/134/188	244/244/391
AG[2)]		[mm]	201/201/290	178/178/296
LL[2)]		[mm]	103/103/300	162/162/410
X	Motor only	[mm]	80	110
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		81/88/0.172	163/171/0.498
	Premium motor range		52/59/0,172	131/139/0.498
NBE[7)]	E-motor range		52/59/0.172	167/175/0.498

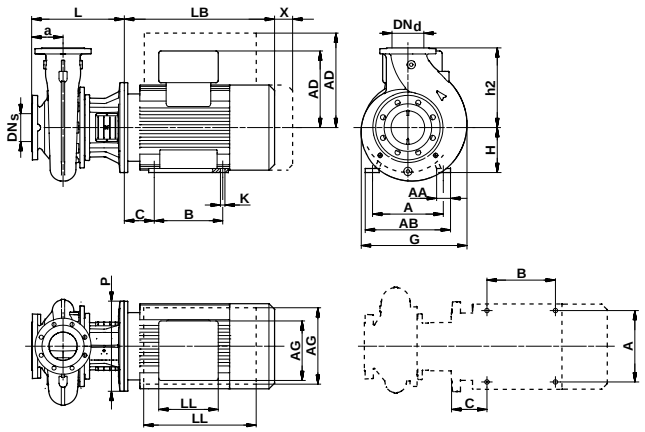
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
5) Attention: P/2 > H.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3230 0606

Technical data



TM01 29207 2104

NB			NB 50-200/198	NB 50-200/210	NB 50-200/219
NBE			**NBE 50-200/198**	**NBE 50-200/210**	**NBE 50-200/219**
IEC size	NB[1)]		MMG 160MB-E/MMG 160MB-D	MMG 160L-E/MMG 160L-D	MMG 180M-E/MMG 180M-D
	NBE		MMGE 160MX	MMGE 160L	MMGE 180M
P2		[kW]	15.0	18.5	22.0
Design			B	B	B
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	65	65	65
DN_d		[mm]	50	50	50
a		[mm]	100	100	100
b		[mm]	-	-	-
B[2)]		[mm]	210/210/210	254/254/254	241/241/241
LB[2)]		[mm]	505/503/461	560/547/499	590/602/525
P[2)]		[mm]	350/350/350	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	108/108/108	121/121/121
G		[mm]	350	350	350
H		[mm]	160[5)]	160[5)]	180
h1		[mm]	-	-	-
h2		[mm]	200	200	200
L		[mm]	343	343	343
m1		[mm]	-	-	-
m2		[mm]	-	-	-
n1		[mm]	-	-	-
n2		[mm]	-	-	-
s1		[mm]	-	-	-
A		[mm]	254	254	279
AA[2)]		[mm]	61/64/55	61/64/55	70/66/62
AB[2)]		[mm]	320/292/296	320/292/296	355/330/328
K[2)]		[mm]	15/12/15	15/12/15	15/12/15
AD[2)]		[mm]	244/244/418	260/241/418	272/285/439
AG[2)]		[mm]	178/178/296	130/163/296	150/178/328
LL[2)]		[mm]	162/162/410	162/162/410	186/178/456
X	Motor only	[mm]	110	110	110
	Motor and motor stool	[mm]	100	100	100
NB[7)]	Standard motor range		175/184/0.498	198/219/0.68	236/256/0.68
	Premium motor range		146/155/0.498	156/177/0.68	186/206/0.68
NBE[7)]	E-motor range		188/197/0.498	231/240/0.498	263/284/0.872

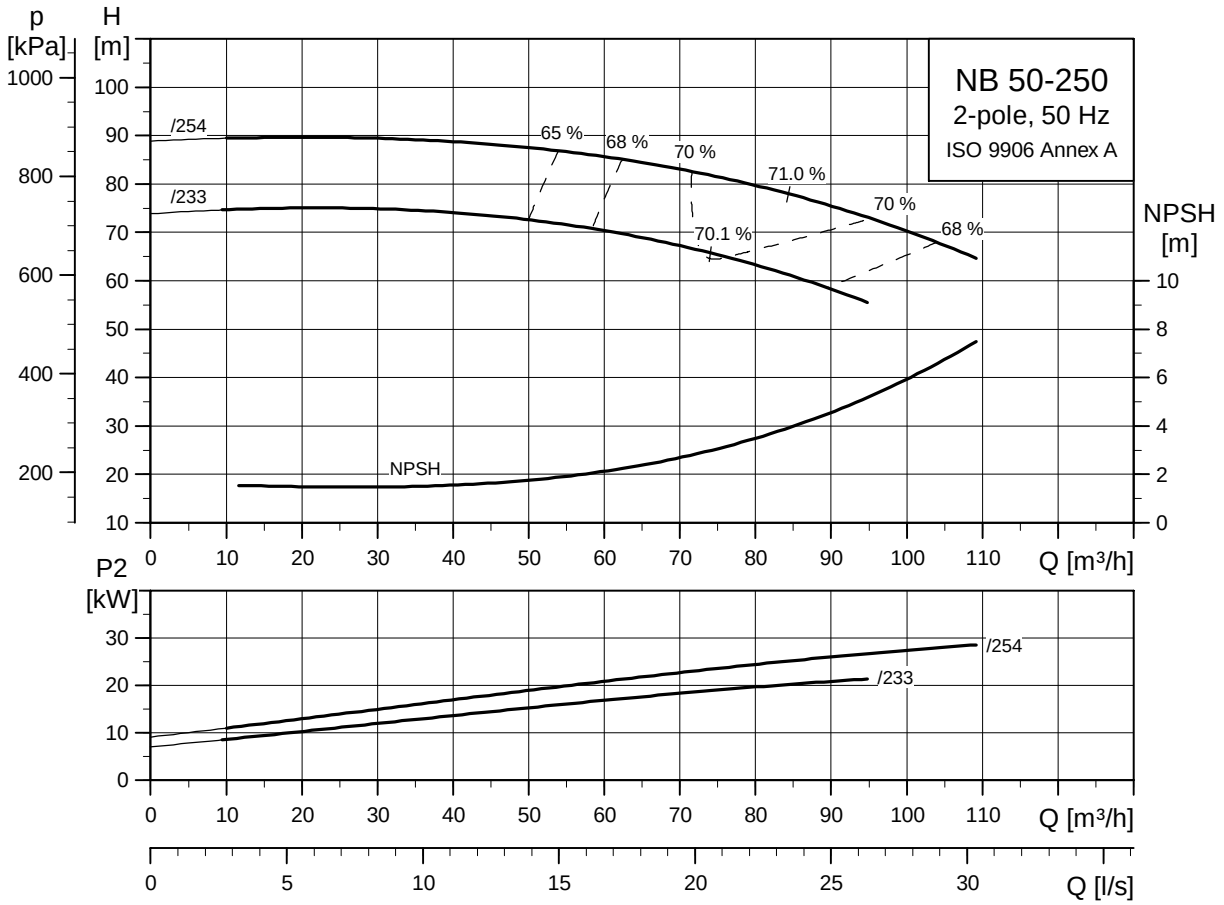
1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

5) Attention: P/2 > H.

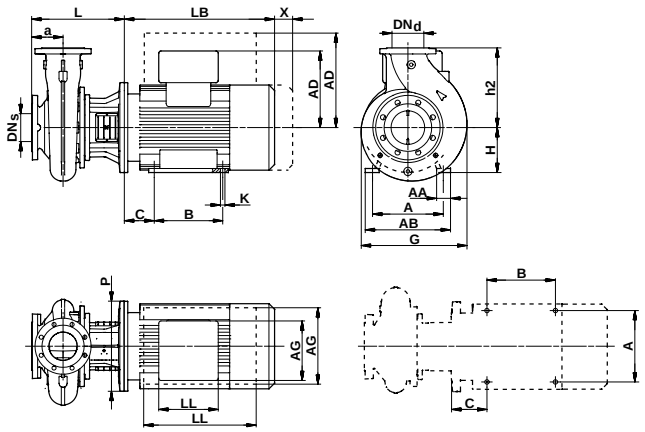
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3231 0606

Technical data

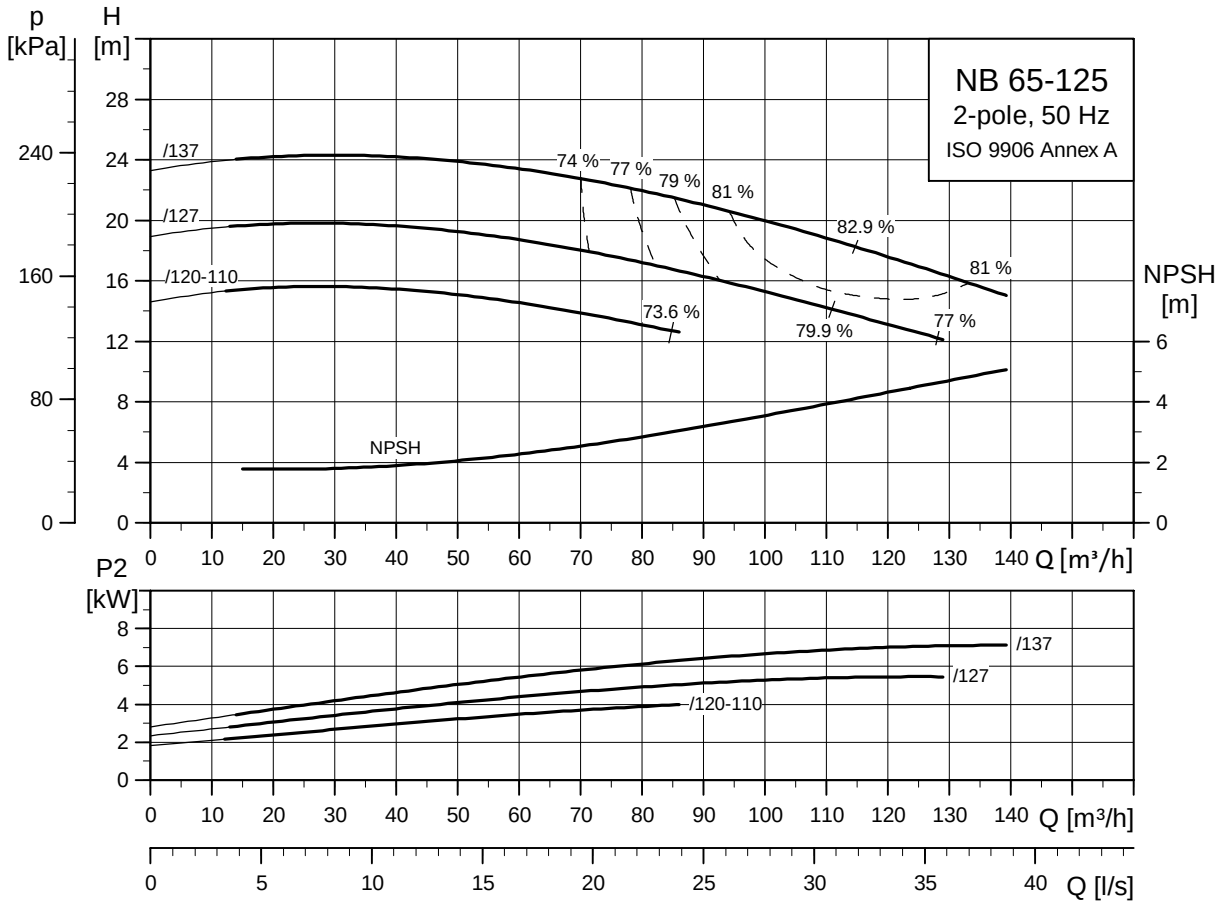


TM01 29207 2104

NB			NB 50-250/233	NB 50-250/254
NBE			**NBE 50-250/233**	**-**
IEC size	NB[1)]		MMG 180M-E/MMG 180M-D	MMG 200LA-E/MMG 200LA-D
	NBE		MMGE 180M	-
P2		[kW]	22.0	30.0
Design			B	B
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	50	50
a		[mm]	100	100
b		[mm]	-	-
B[2)]		[mm]	241/241/241	305/305/-
LB[2)]		[mm]	590/602/525	660/669/-
P[2)]		[mm]	350/350/350	400/400/-
C[2)]		[mm]	121/121/121	133/133/-
G		[mm]	350	400
H		[mm]	180	200
h1		[mm]	-	-
h2		[mm]	225	225
L		[mm]	343	343
m1		[mm]	-	-
m2		[mm]	-	-
n1		[mm]	-	-
n2		[mm]	-	-
s1		[mm]	-	-
A		[mm]	279	318
AA[2)]		[mm]	70/66/62	70/79/-
AB[2)]		[mm]	355/330/328	395/380/-
K[2)]		[mm]	15/12/15	19/16/-
AD[2)]		[mm]	272/285/439	305/327/-
AG[2)]		[mm]	150/178/328	160/265/-
LL[2)]		[mm]	186/178/456	190/265/-
X	Motor only	[mm]	110	110
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		243/264/0.68	311/332/0.68
	Premium motor range		193/214/0.68	283/304/0.68
NBE[7)]	E-motor range		270/291/0.872	-

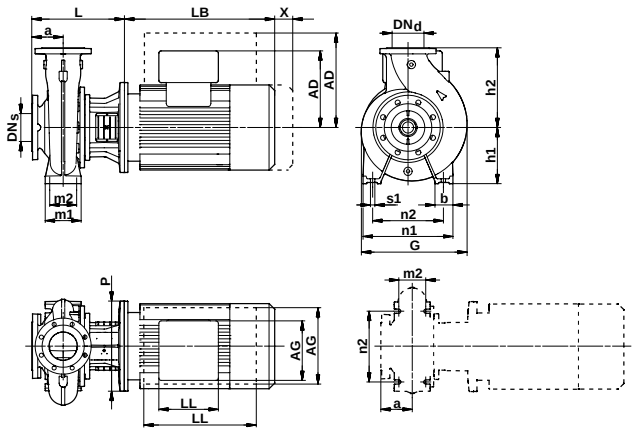
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3232 0606

Technical data

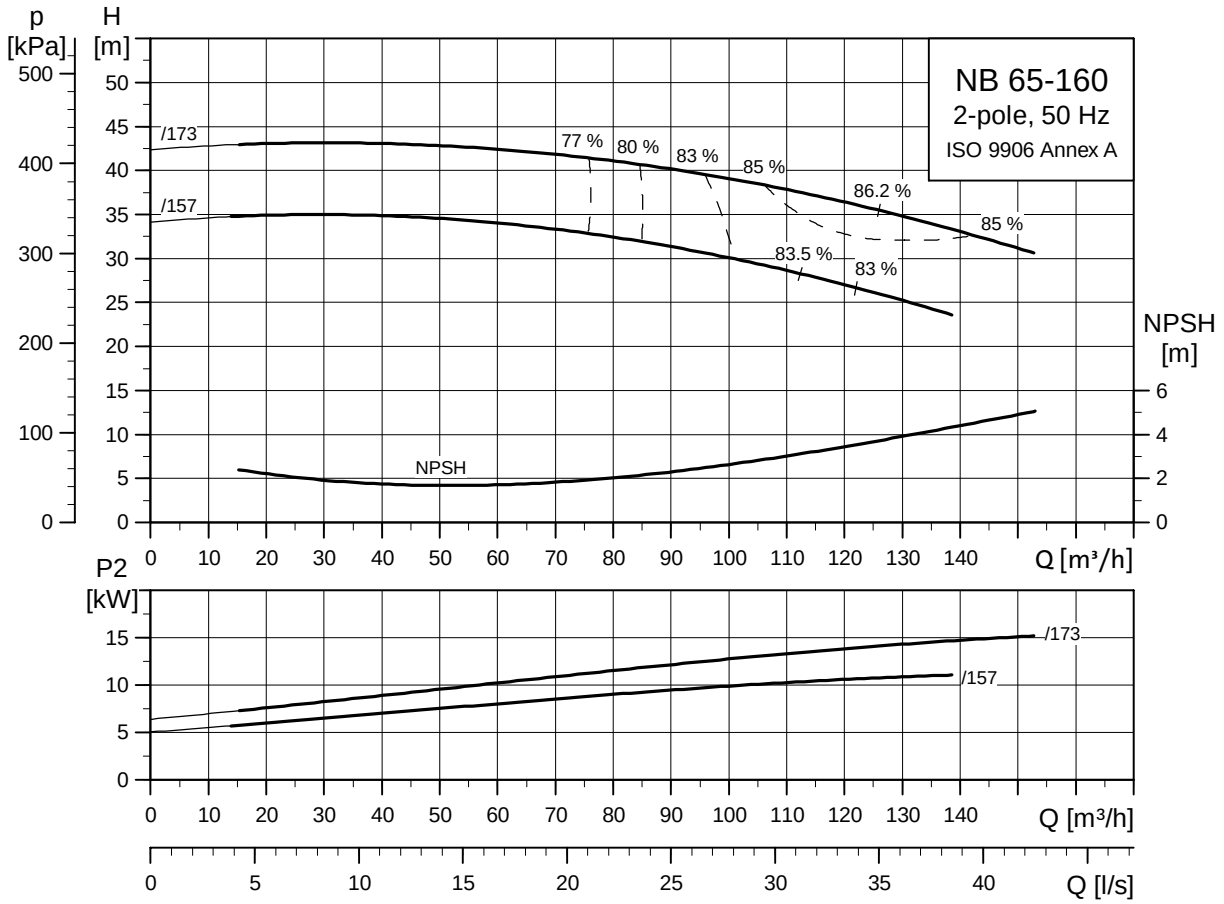


TM02 9206 2104

NB			NB 65-125/120-110	NB 65-125/127	NB 65-125/137
NBE			**NBE 65-125/120-110**	**NBE 65-125/127**	**NBE 65-125/137**
IEC size	NB[1)]		MG 112MB-C/MG 112MC-D	MG 132SB-C/MG 132SC-D	MG 132SC-C/MG 132SD-D
	NBE		MGE 112 MB	MGE 132SB	MGE 132SC
P2		[kW]	4.0	5.5	7.5
Design			A	A	A
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	80	80	80
DN_d		[mm]	65	65	65
a		[mm]	100	100	100
b		[mm]	65	65	65
B[2)]		[mm]	-	-	-
LB[2)]		[mm]	391/372/372	391/391/391	391/391/391
P[2)]		[mm]	250/250/250	300/300/300	300/300/300
C[2)]		[mm]	-	-	-
G		[mm]	286	300	300
H		[mm]	-	-	-
h1		[mm]	160	160	160
h2		[mm]	180	180	180
L		[mm]	274	313	313
m1		[mm]	125	125	125
m2		[mm]	95	95	95
n1		[mm]	280	280	280
n2		[mm]	212	212	212
s1		[mm]	M12	M12	M12
A		[mm]	-	-	-
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	-	-	-
AD[2)]		[mm]	134/134/188	134/134/188	134/134/188
AG[2)]		[mm]	201/201/290	201/201/290	201/201/290
LL[2)]		[mm]	103/103/300	103/103/300	103/103/300
X	Motor only	[mm]	80	80	80
	Motor and motor stool	[mm]	100	100	100
NB[7)]	Standard motor range		83/90/0.172	83/90/0.172	85/92/0.172
	Premium motor range		83/90/0.172	83/90/0.172	83/90/0.172
NBE[7)]	E-motor range		90/98/0.249	90/98/0.249	93/101/0.249

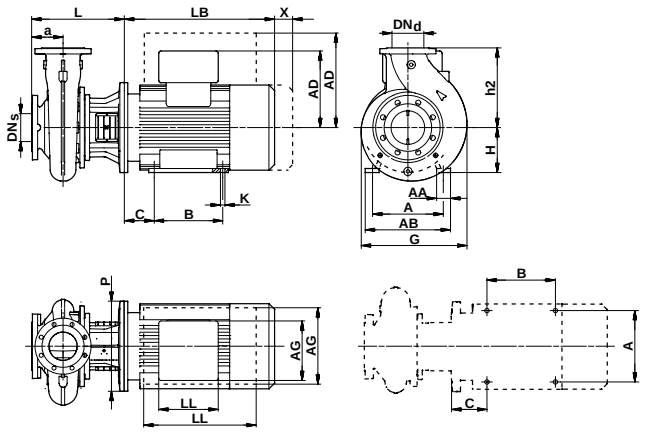
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3233 0606

Technical data

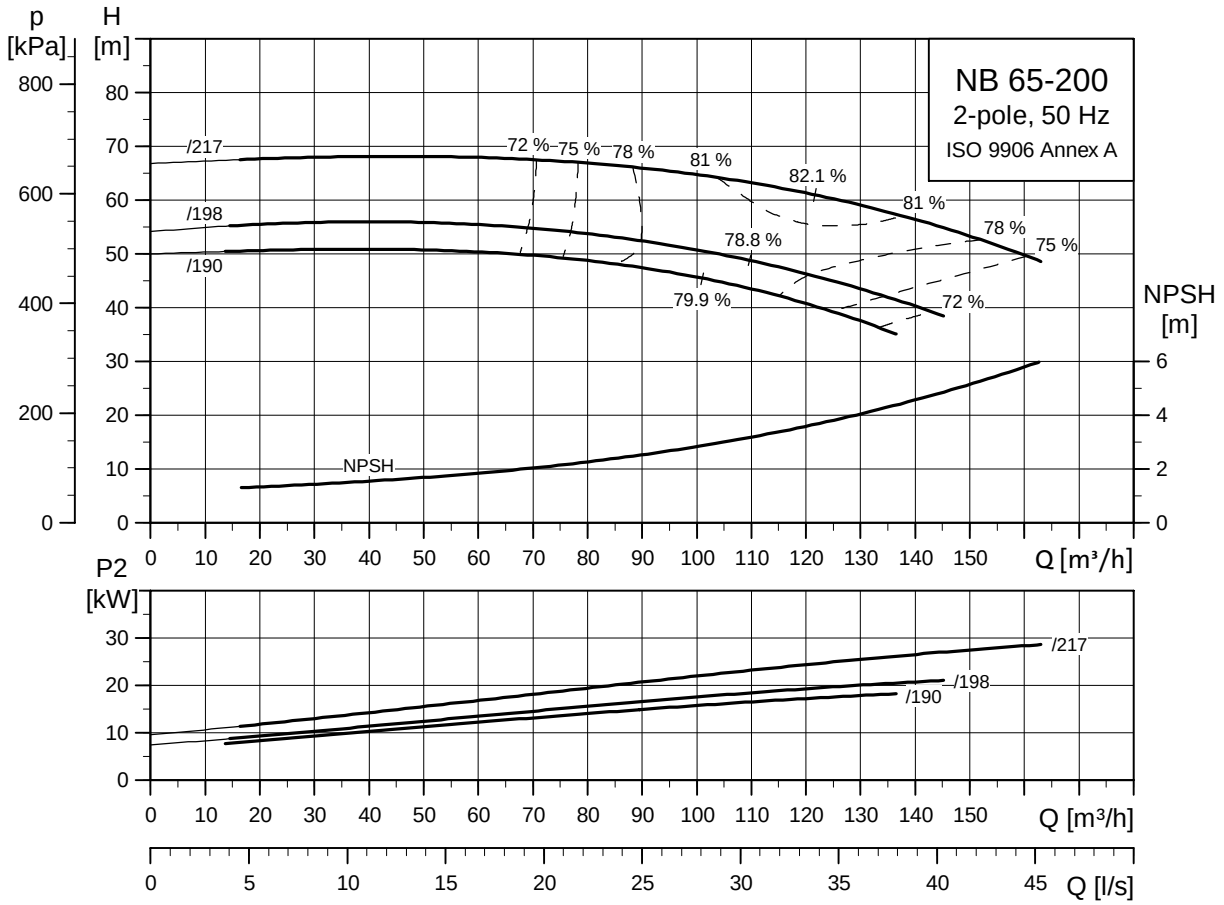


TM01 29207 2104

NB			NB 65-160/157	NB 65-160/173
NBE			**NBE 65-160/157**	**NBE 65-160/173**
IEC size	NB[1)]		MMG 160MA-E/MMG 160MA-D	MMG 160MB-E/MMG 160MB-D
	NBE		MMGE 160M	MMGE 160MX
P2		[kW]	11.0	15.0
Design			B	B
PN		[bar]	PN 16	PN 16
DN_s		[mm]	80	80
DN_d		[mm]	65	65
a		[mm]	100	100
b		[mm]	-	-
B[2)]		[mm]	210/210/210	210/210/210
LB[2)]		[mm]	505/503/449	505/503/461
P[2)]		[mm]	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	108/108/108
G		[mm]	350	350
H		[mm]	160[5)]	160[5)]
h1		[mm]	-	-
h2		[mm]	200	200
L		[mm]	343	343
m1		[mm]	-	-
m2		[mm]	-	-
n1		[mm]	-	-
n2		[mm]	-	-
s1		[mm]	-	-
A		[mm]	254	254
AA[2)]		[mm]	61/64/55	61/64/55
AB[2)]		[mm]	320/292/296	320/292/296
K[2)]		[mm]	15/12/15	15/12/15
AD[2)]		[mm]	244/244/391	244/244/418
AG[2)]		[mm]	178/178/296	178/178/296
LL[2)]		[mm]	162/162/410	162/162/410
X	Motor only	[mm]	110	110
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		166/175/0.498	174/183/0.498
	Premium motor range		134/143/0.498	145/154/0.498
NBE[7)]	E-motor range		170/179/0.498	0

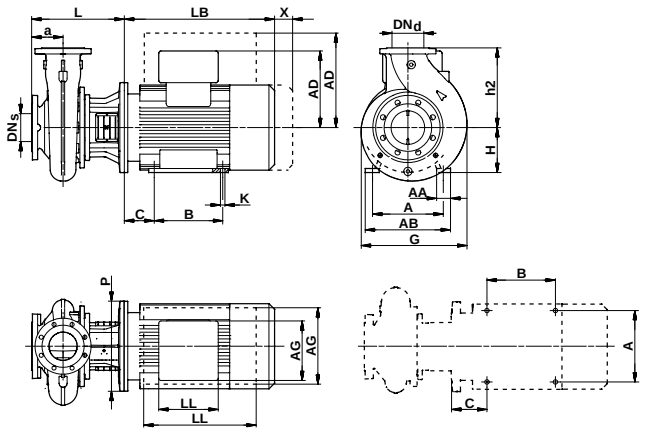
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
5) Attention: P/2 > H.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3234 0606

Technical data



TM01 29207 2104

NB			NB 65-200/190	NB 65-200/198	NB 65-200/217
NBE			**NBE 65-200/190**	**NBE 65-200/198**	**-**
IEC size	NB[1)]		MMG 160L-E/MMG 160L-D	MMG 180M-E/MMG 180M-D	MMG 200LA-E/MMG 200LA-D
	NBE		MMGE 160L	MMGE 180M	-
P2		[kW]	18.5	22.0	30.0
Design			B	B	B
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	80	80	80
DN_d		[mm]	65	65	65
a		[mm]	100	100	100
b		[mm]	-	-	-
B[2)]		[mm]	254/254/254	241/241/241	305/305/-
LB[2)]		[mm]	560/547/499	590/602/525	660/669/-
P[2)]		[mm]	350/350/350	350/350/350	400/400/-
C[2)]		[mm]	108/108/108	121/121/121	133/133/-
G		[mm]	350	350	400
H		[mm]	160[5)]	180	200
h1		[mm]	-	-	-
h2		[mm]	225	225	225
L		[mm]	343	343	343
m1		[mm]	-	-	-
m2		[mm]	-	-	-
n1		[mm]	-	-	-
n2		[mm]	-	-	-
s1		[mm]	-	-	-
A		[mm]	254	279	318
AA[2)]		[mm]	61/64/55	70/66/62	70/79/-
AB[2)]		[mm]	320/292/296	355/330/328	395/380/-
K[2)]		[mm]	15/12/15	15/12/15	19/16/-
AD[2)]		[mm]	260/241/418	272/285/439	305/327/-
AG[2)]		[mm]	130/163/296	150/178/328	166/265/-
LL[2)]		[mm]	162/162/410	186/178/456	190/265/-
X	Motor only	[mm]	110	110	110
	Motor and motor stool	[mm]	140	140	140
NB[7)]	Standard motor range		204/225/0.68	242/263/0.68	310/331/0.68
	Premium motor range		162/183/0.68	192/213/0.68	282/303/0.68
NBE[7)]	E-motor range		90/98/0.249	93/101/0.249	170/179/0.498

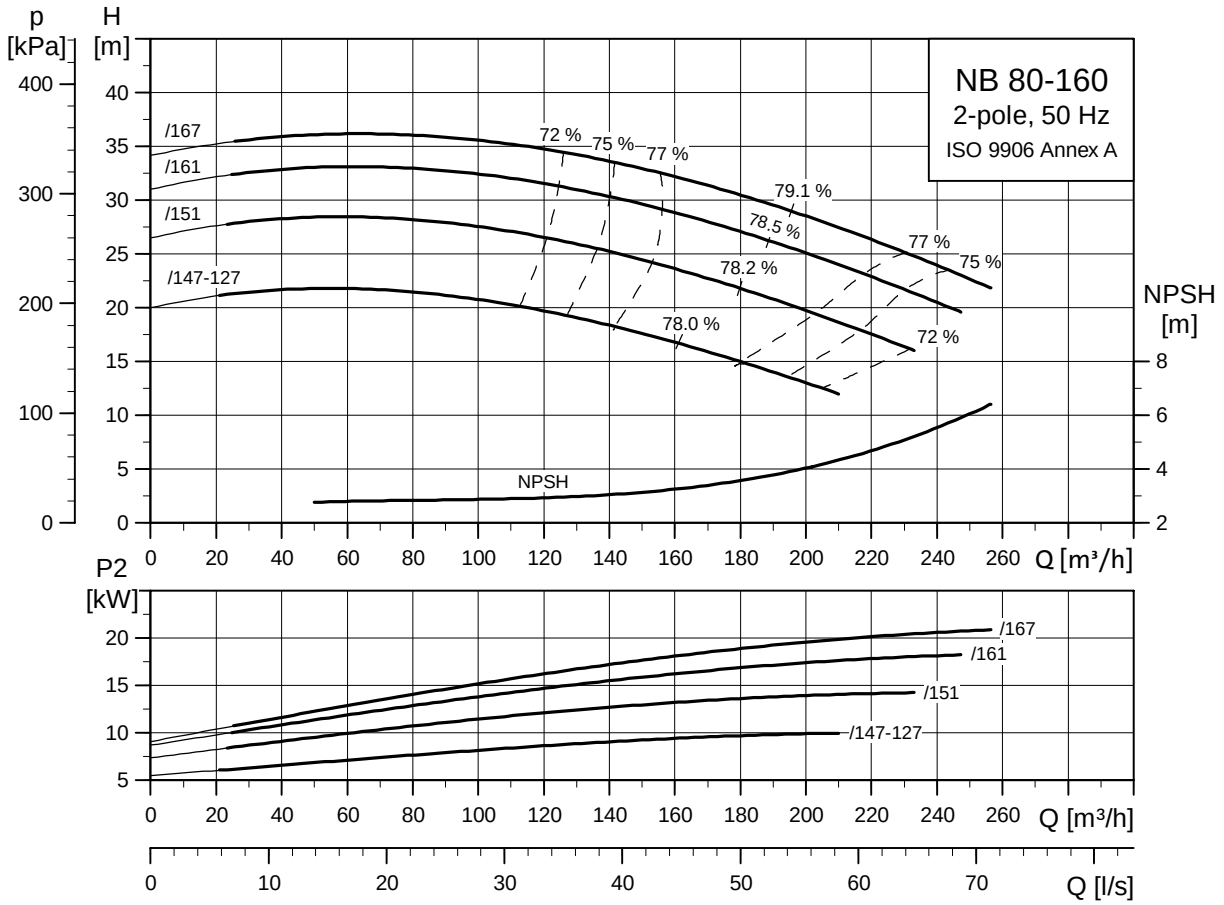
1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

5) Attention: P/2 > H.

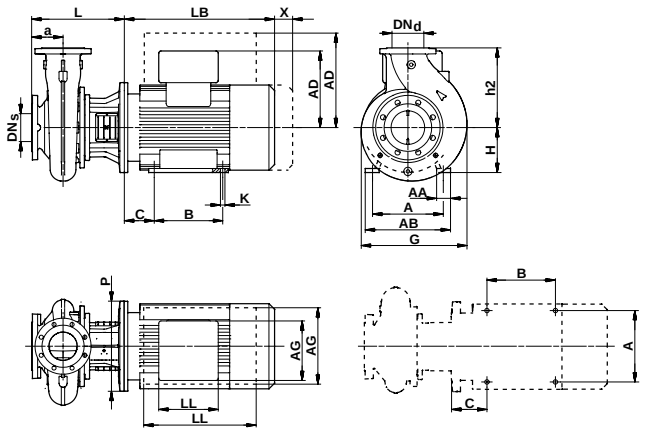
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3235 0606

Technical data

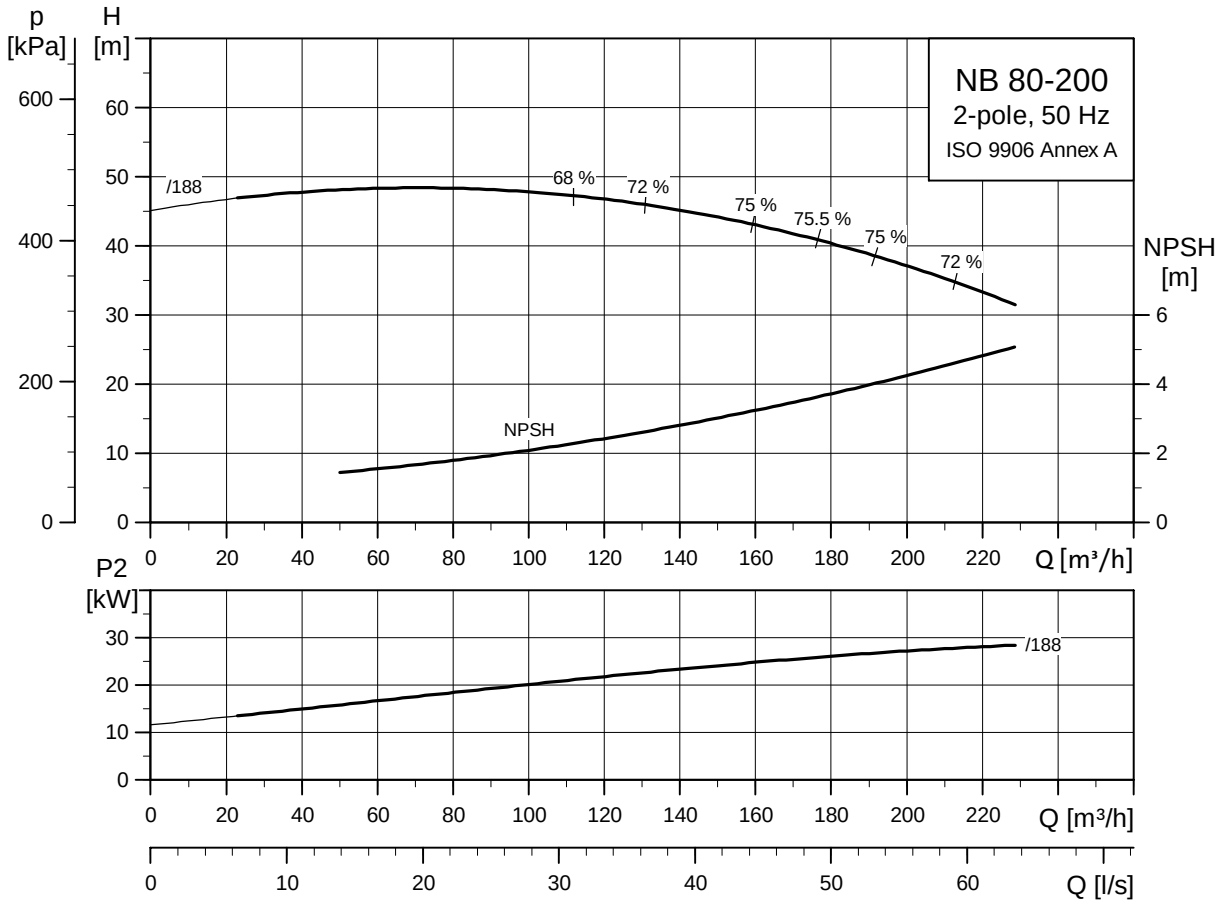


TM01 29207 2104

NB			NB 80-160/147-127	NB 80-160/151	NB 80-160/161	NB 80-160/167
NBE			**NBE 80-160/147-127**	**NBE 80-160/151**	**NBE 80-160/161**	**NBE 80-160/167**
IEC size	NB[1)]		MMG 160MA-E/MMG 160MA-D	MMG 160MB-E/MMG 160MB-D	MMG 160L-E/MMG 160L-D	MMG 180M-E/MMG 180M-D
	NBE		MMGE 160MX	MMGE 160MX	MMGE 160L	MMGE 180M
P2		[kW]	11.0	15.0	18.5	22.0
Design			B	B	B	B
PN		[bar]	PN 16	PN 16	PN 16	PN 16
DN_s		[mm]	100	100	100	100
DN_d		[mm]	80	80	80	80
a		[mm]	125	125	125	125
b		[mm]	-	-	-	-
B[2)]		[mm]	210/210/210	210/210/210	254/254/254	241/241/241
LB[2)]		[mm]	505/503/449	505/503/461	560/547/499	590/602/525
P[2)]		[mm]	350/350/350	350/350/350	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	108/108/108	108/108/108	121/121/121
G		[mm]	350	350	350	350
H		[mm]	160[5)]	160[5)]	160[5)]	180
h1		[mm]	-	-	-	-
h2		[mm]	225	225	225	225
L		[mm]	368	368	368	368
m1		[mm]	-	-	-	-
m2		[mm]	-	-	-	-
n1		[mm]	-	-	-	-
n2		[mm]	-	-	-	-
s1		[mm]	-	-	-	-
A		[mm]	254	254	254	279
AA[2)]		[mm]	61/64/55	61/64/55	61/64/55	70/66/62
AB[2)]		[mm]	320/292/296	320/292/296	320/292/296	355/330/328
K[2)]		[mm]	15/12/15	15/12/15	15/12/15	15/12/15
AD[2)]		[mm]	244/244/391	244/244/418	260/241/418	272/285/439
AG[2)]		[mm]	178/178/296	178/178/296	130/163/296	150/178/328
LL[2)]		[mm]	162/162/410	162/162/410	162/162/410	186/178/456
X	Motor only	[mm]	110	110	110	110
	Motor and motor stool	[mm]	140	140	140	140
NB[7)]	Standard motor range		174/195/0.68	182/203/0.68	205/226/0.68	242/263/0.68
	Premium motor range		142/163/0.68	153/174/0.68	163/184/0.68	192/213/0.68
NBE[7)]	E-motor range		195/204/0.498	269/290/0.872	238/259/0.872	269/291/0.872

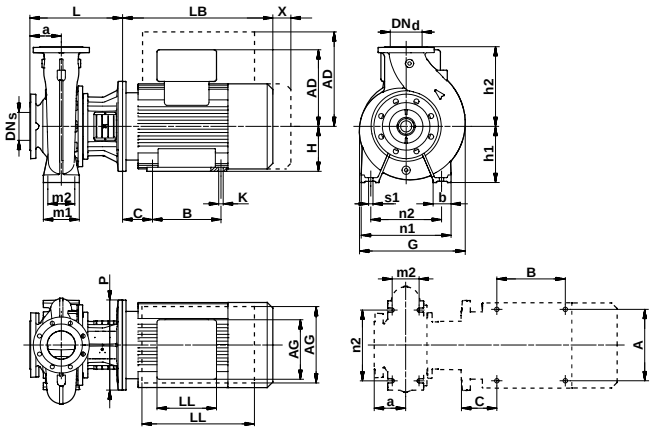
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
5) Attention: P/2 > H.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3236 0606

Technical data

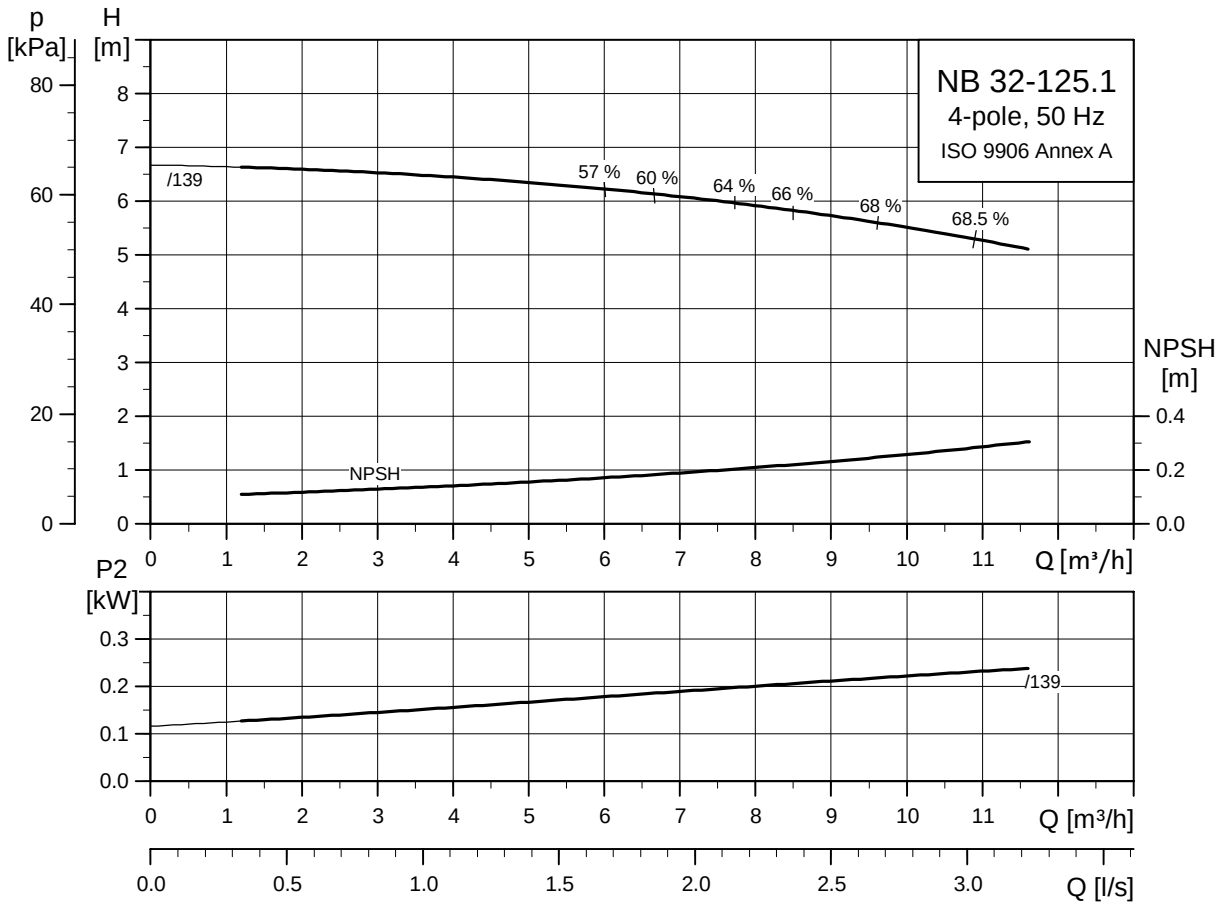


TM02 9208 2104

NB			NB 80-200/188
NBE			-
IEC size	NB[1)]		MMG 200LA-E/MMG 200LA-D
	NBE		-
P2		[kW]	30.0
Design			C
PN		[bar]	PN 16
DN_s		[mm]	100
DN_d		[mm]	80
a		[mm]	125
b		[mm]	-
B[2)]		[mm]	305/305/-
LB[2)]		[mm]	660/669/-
P[2)]		[mm]	400/400/-
C[2)]		[mm]	133/133/-
G		[mm]	400
H		[mm]	200
h1		[mm]	180
h2		[mm]	250
L		[mm]	398
m1		[mm]	125
m2		[mm]	95
n1		[mm]	345
n2		[mm]	280
s1		[mm]	M12
A		[mm]	318
AA[2)]		[mm]	70/79/-
AB[2)]		[mm]	395/380/-
K[2)]		[mm]	19/16/-
AD[2)]		[mm]	305/327/-
AG[2)]		[mm]	166/265/-
LL[2)]		[mm]	190/265/-
X	Motor only	[mm]	110
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		325/346/0.68
	Premium motor range		297/318/0.68
NBE[7)]	E-motor range		0

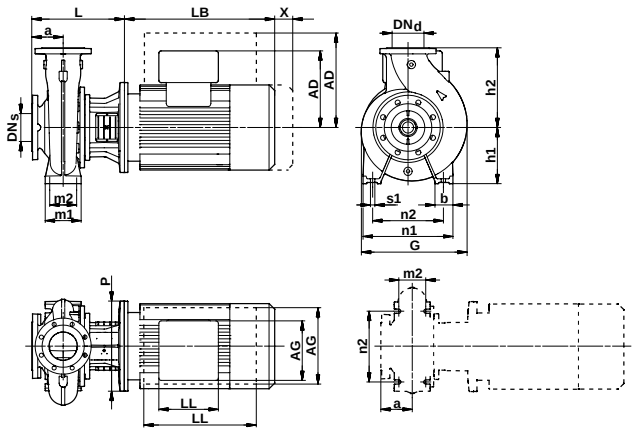
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

NB, NBE 4-pole



TM03 3237 0606

Technical data

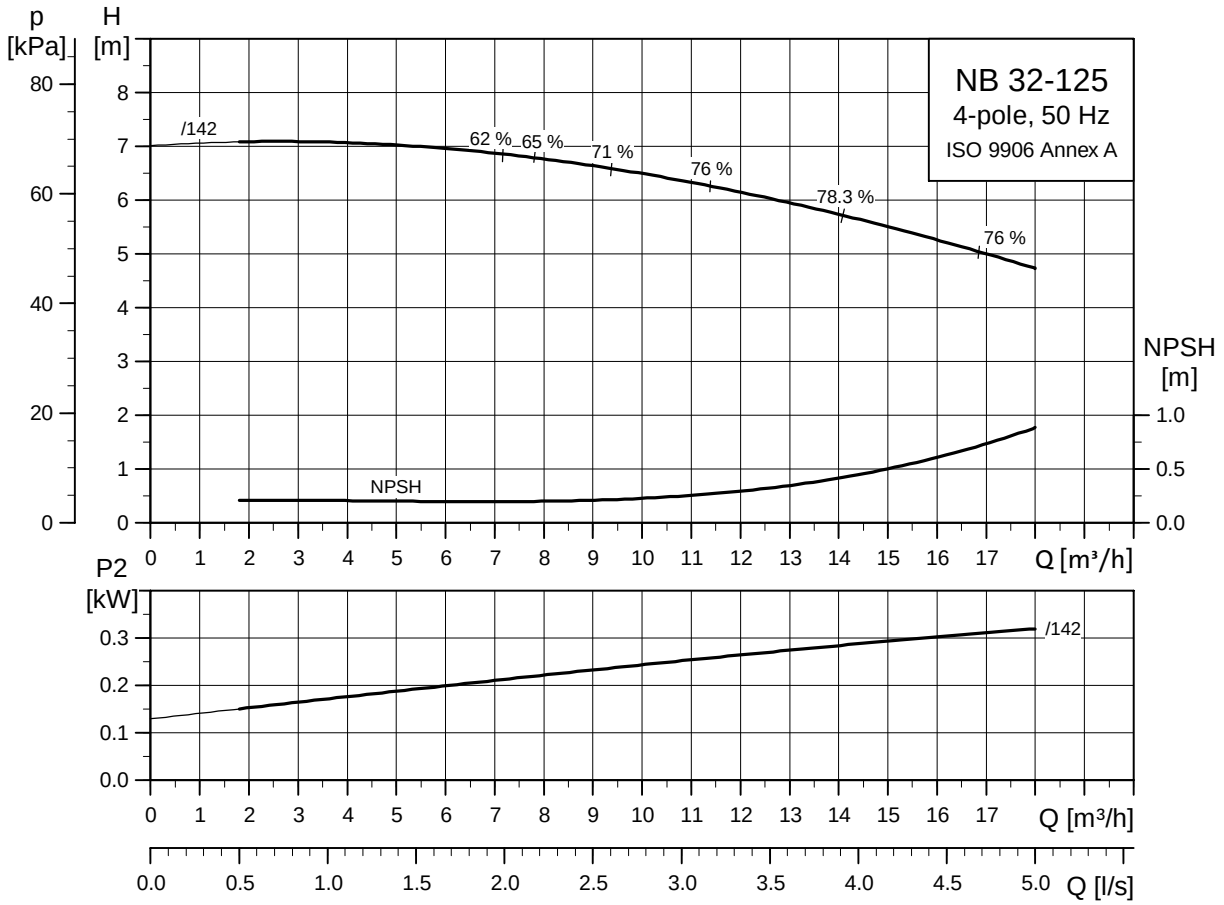


TM02 9206 2104

NB			**NB 32-125.1/139**
NBE			**-**
IEC size	NB[1)]		MG 71A-C/MG 71A-C
	NBE		-
P2		[kW]	0.25
Design			A
PN		[bar]	PN 16
DN_s		[mm]	50
DN_d		[mm]	32
a		[mm]	80
b		[mm]	50
B[2)]		[mm]	-
LB[2)]		[mm]	191/191/-
P[2)]		[mm]	160/160/-
C[2)]		[mm]	-
G		[mm]	234
H		[mm]	-
h1		[mm]	112
h2		[mm]	140
L		[mm]	201
m1		[mm]	100
m2		[mm]	70
n1		[mm]	190
n2		[mm]	140
s1		[mm]	M12
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	109/109/-
AG[2)]		[mm]	82/82/-
LL[2)]		[mm]	82/82/-
X	Motor only	[mm]	30
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		29/35/0.129
	Premium motor range		-
NBE[7)]	E-motor range		-

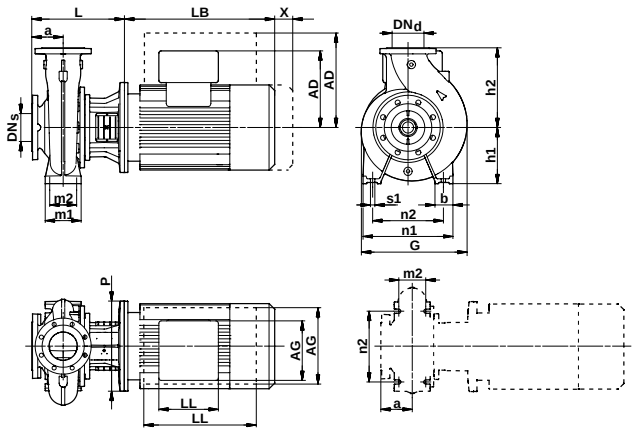
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3240 0606

Technical data

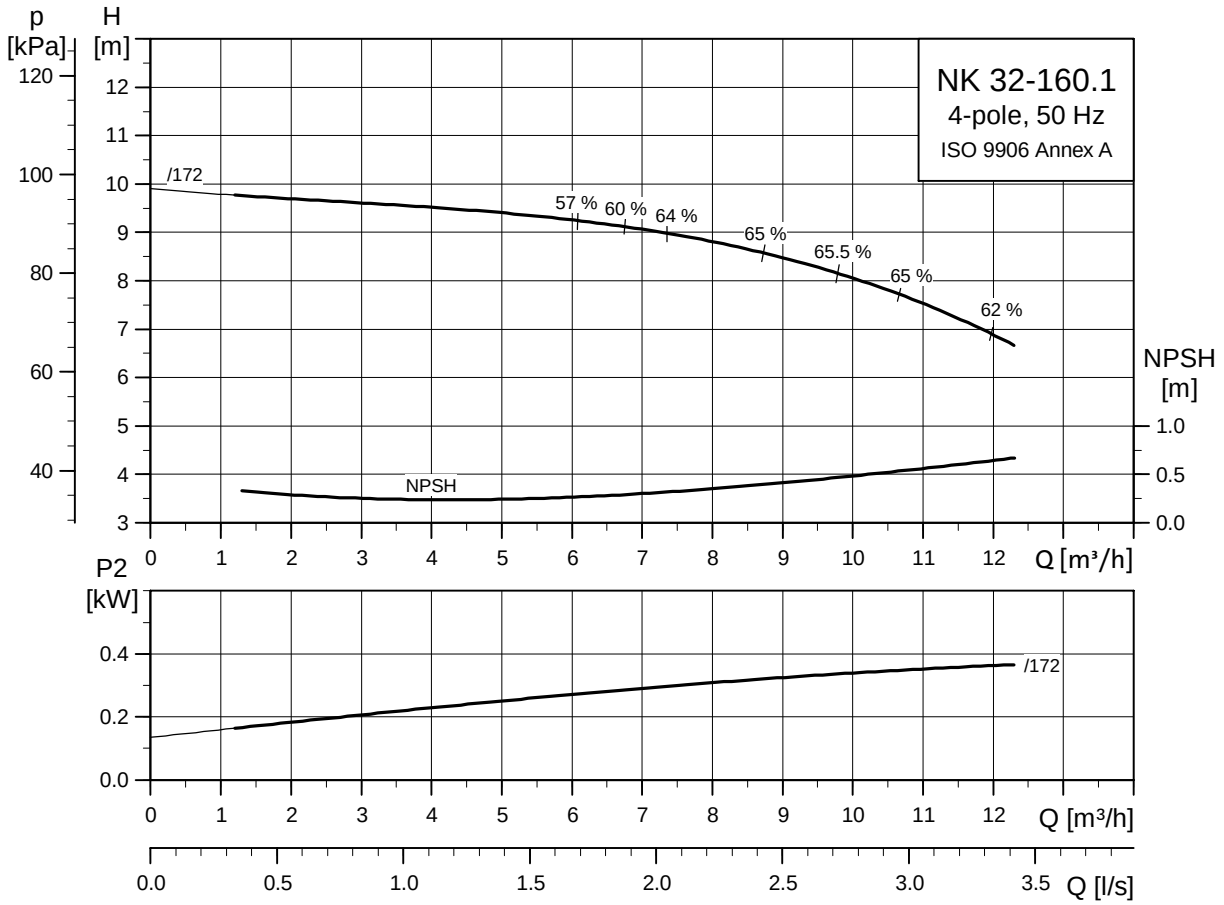


TM02 9206 2104

NB			**NB 32-125/142**
NBE			**NBE 32-125/142**
IEC size	NB[1)]		MG 71B-C/MG 71B-C
	NBE		-
P2		[kW]	0.37
Design			A
PN		[bar]	PN 16
DN_s		[mm]	50
DN_d		[mm]	32
a		[mm]	80
b		[mm]	50
B[2)]		[mm]	-
LB[2)]		[mm]	191/191/-
P[2)]		[mm]	160/160/-
C[2)]		[mm]	-
G		[mm]	234
H		[mm]	-
h1		[mm]	112
h2		[mm]	140
L		[mm]	201
m1		[mm]	100
m2		[mm]	70
n1		[mm]	190
n2		[mm]	140
s1		[mm]	M12
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	109/109/-
AG[2)]		[mm]	82/82/-
LL[2)]		[mm]	82/82/-
X	Motor only	[mm]	30
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		32/39/0.129
	Premium motor range		-
NBE[7)]	E-motor range		-

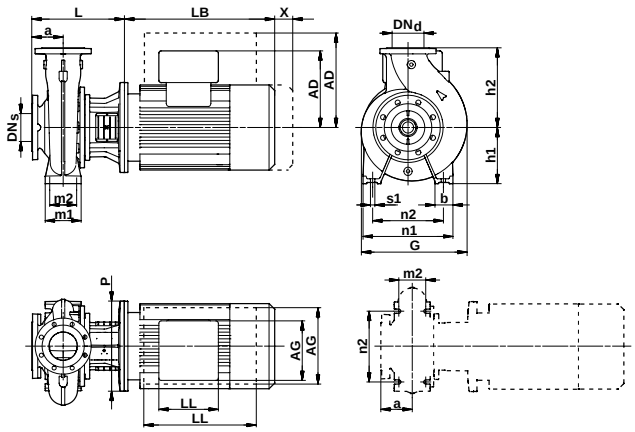
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3238 0606

Technical data

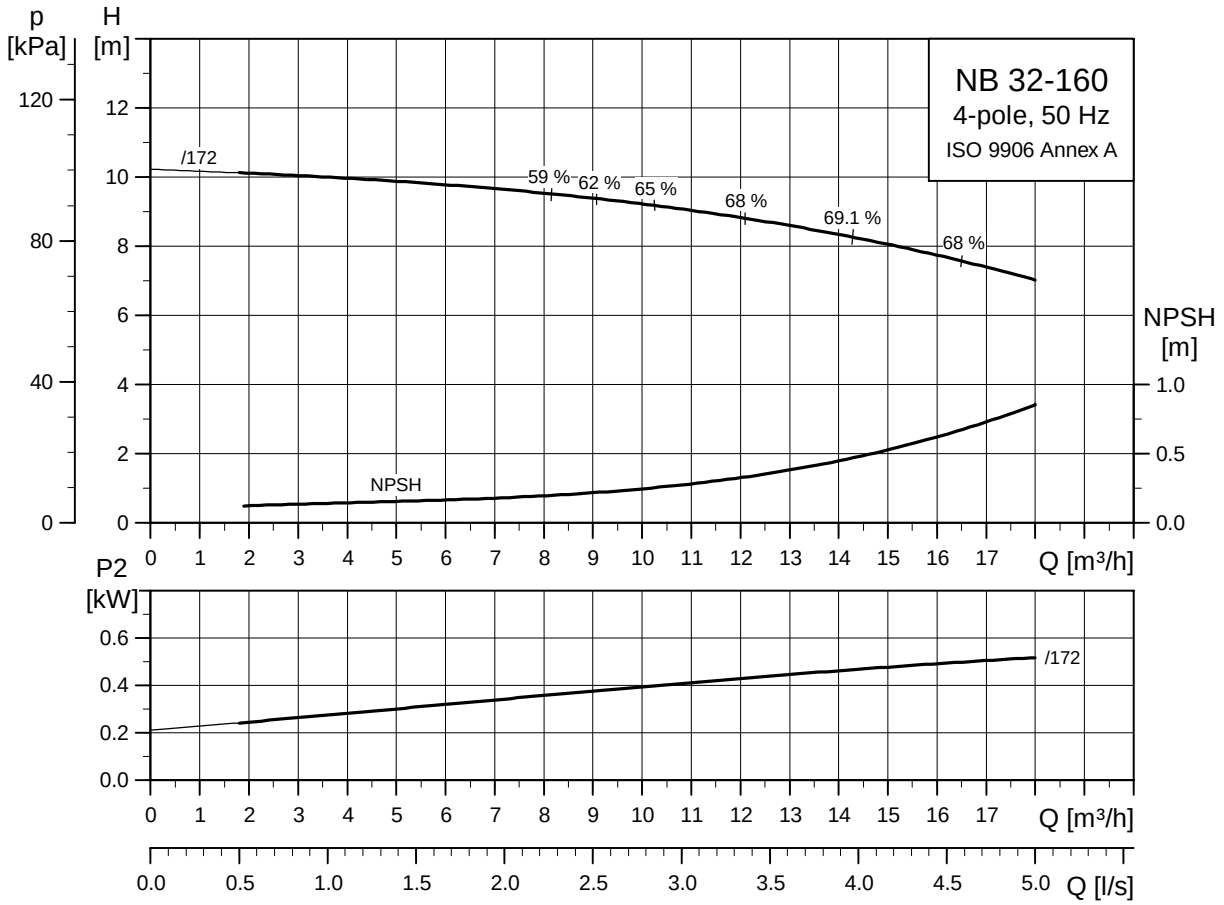


TM02 9206 2104

NB			**NB 32-160.1/172**
NBE			**NBE 32-160.1/172**
IEC size	NB[1)]		MG 71B-C/MG 71B-C
	NBE		-
P2		[kW]	0.37
Design			A
PN		[bar]	PN 16
DN_s		[mm]	50
DN_d		[mm]	32
a		[mm]	80
b		[mm]	50
B[2)]		[mm]	-
LB[2)]		[mm]	191/191/-
P[2)]		[mm]	160/160/-
C[2)]		[mm]	-
G		[mm]	245
H		[mm]	-
h1		[mm]	132
h2		[mm]	160
L		[mm]	201
m1		[mm]	100
m2		[mm]	70
n1		[mm]	240
n2		[mm]	190
s1		[mm]	M12
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	109/109/-
AG[2)]		[mm]	82/82/-
LL[2)]		[mm]	82/82/-
X	Motor only	[mm]	30
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		33/39/0.129
	Premium motor range		-
NBE[7)]	E-motor range		-

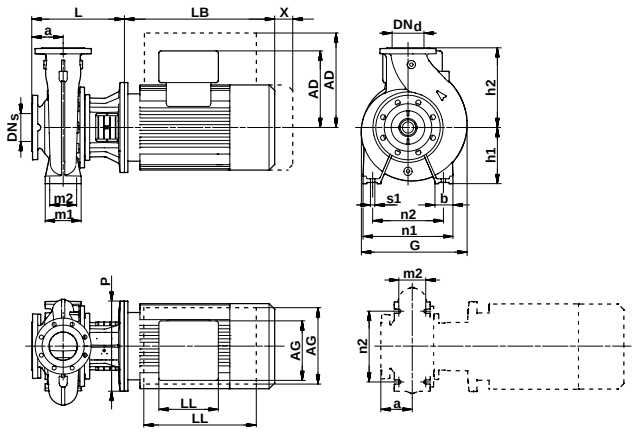
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3241 0606

Technical data

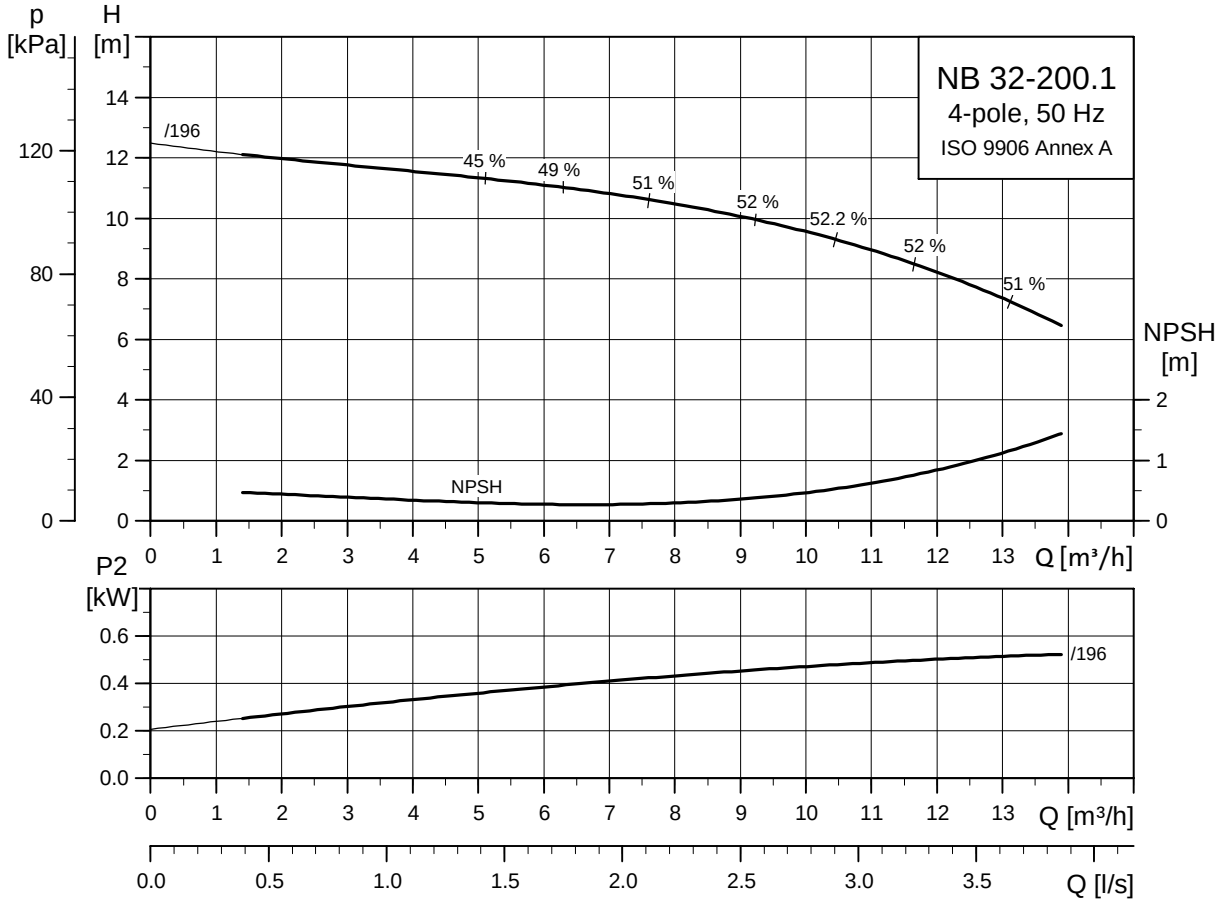


TM02 9206 2104

NB			NB 32-160/172
NBE			NBE 32-160/172
IEC size	NB[1)]		MG 80A-C/MG 80A-C
	NBE		-
P2		[kW]	0.55
Design			A
PN		[bar]	PN 16
DN_s		[mm]	50
DN_d		[mm]	32
a		[mm]	80
b		[mm]	50
B[2)]		[mm]	-
LB[2)]		[mm]	231/231/-
P[2)]		[mm]	200/200/-
C[2)]		[mm]	-
G		[mm]	245
H		[mm]	-
h1		[mm]	132
h2		[mm]	160
L		[mm]	226
m1		[mm]	100
m2		[mm]	70
n1		[mm]	240
n2		[mm]	190
s1		[mm]	M12
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	109/109/-
AG[2)]		[mm]	82/82/-
LL[2)]		[mm]	82/82/-
X	Motor only	[mm]	40
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		34/40/0.129
	Premium motor range		-
NBE[7)]	E-motor range		-

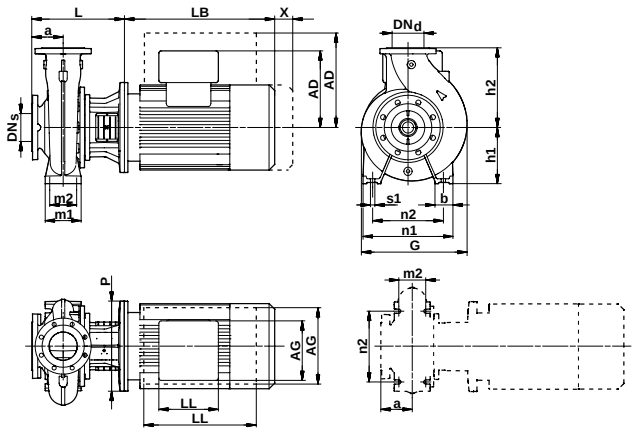
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3239 0606

Technical data

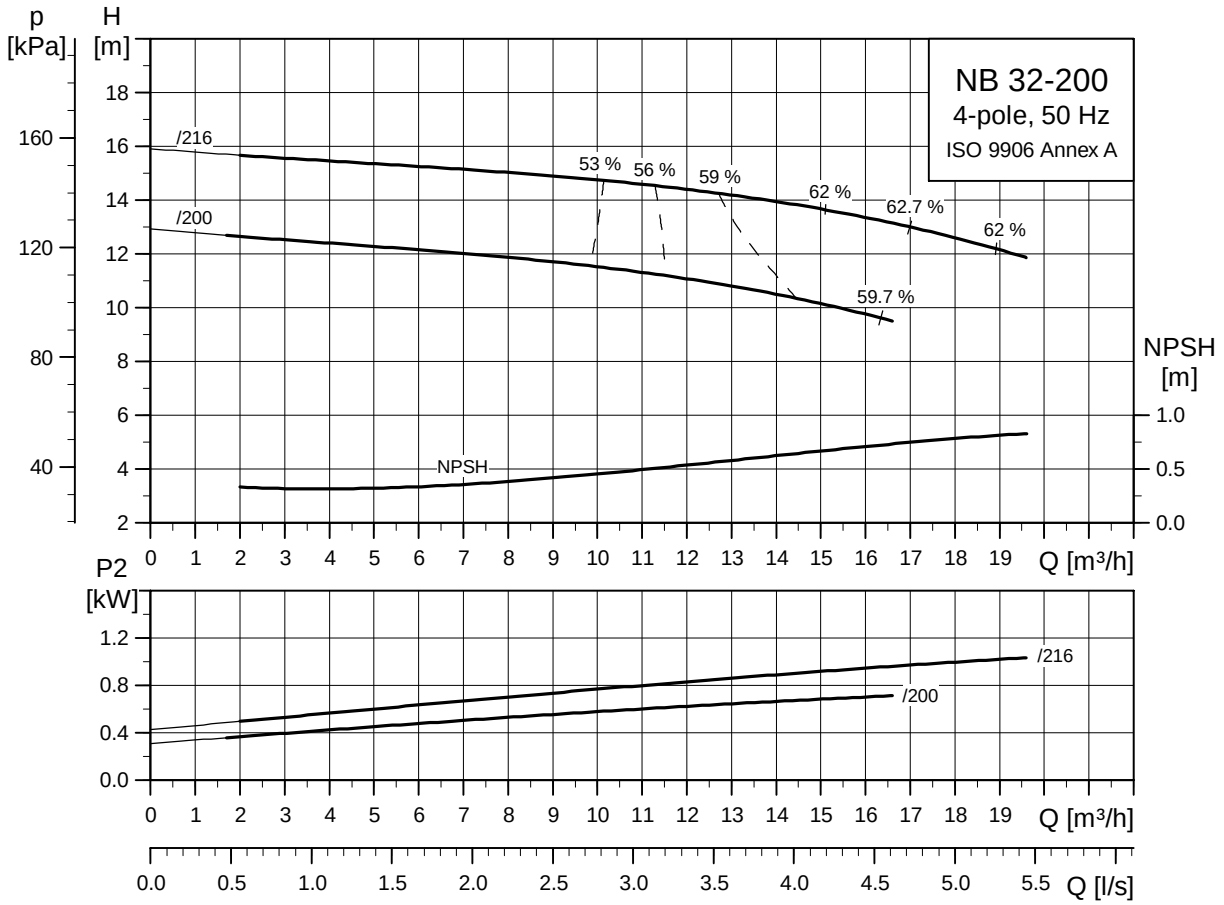


TM02 9206 2104

NB			**NB 32-200.1/196**
NBE			**NBE 32-200.1/196**
IEC size	NB[1)]		MG 80A-C/MG 80A-C
	NBE		-
P2		[kW]	0.55
Design			A
PN		[bar]	PN 16
DN_s		[mm]	50
DN_d		[mm]	32
a		[mm]	80
b		[mm]	50
B[2)]		[mm]	-
LB[2)]		[mm]	231/231/-
P[2)]		[mm]	200/200/-
C[2)]		[mm]	-
G		[mm]	279
H		[mm]	-
h1		[mm]	160
h2		[mm]	180
L		[mm]	226
m1		[mm]	100
m2		[mm]	70
n1		[mm]	240
n2		[mm]	190
s1		[mm]	M12
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	109/109/-
AG[2)]		[mm]	82/82/-
LL[2)]		[mm]	82/82/-
X	Motor only	[mm]	40
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		39/45/0.129
	Premium motor range		-
NBE[7)]	E-motor range		-

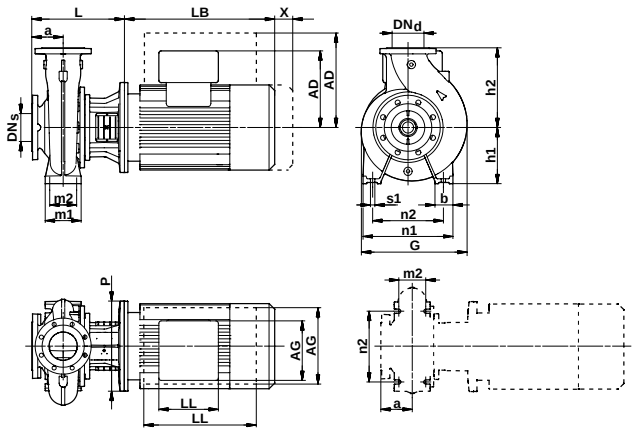
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3242 0606

Technical data

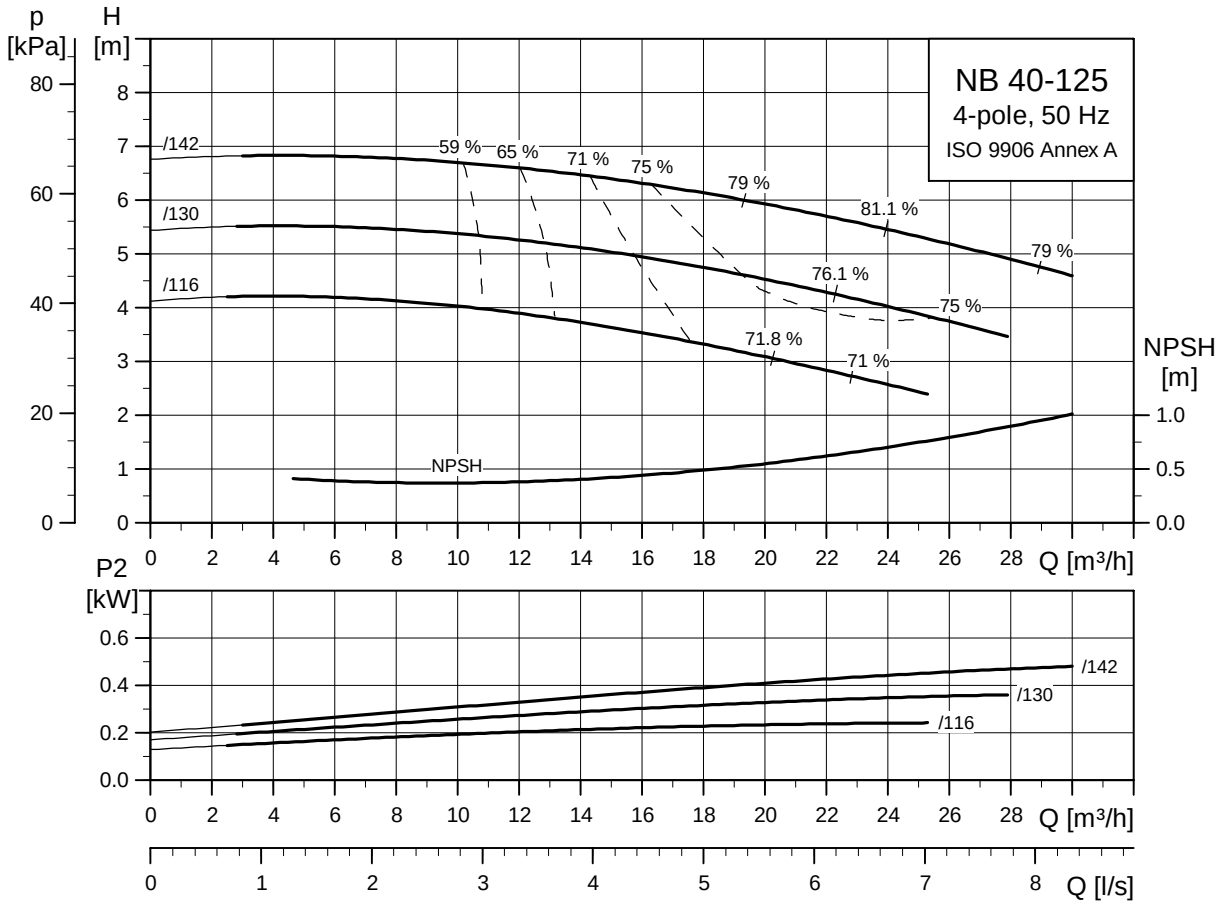


TM02 9206 2104

NB			NB 32-200/200	NB 32-200/216
NBE			**NBE 32-200/200**	**NBE 32-200/216**
IEC size	NB[1)]		MG 80B-C/MG 80B-C	MG 90SA-C/MG 90SB-D
	NBE		-	MGE 90SA
P2		[kW]	0.75	1.1
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	50	50
DN_d		[mm]	32	32
a		[mm]	80	80
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	231/231/321	281/281/321
P[2)]		[mm]	200/200/198	200/200/198
C[2)]		[mm]	-	-
G		[mm]	279	279
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	180	180
L		[mm]	226	226
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	109/109/167	110/110/167
AG[2)]		[mm]	82/82/264	81/162/264
LL[2)]		[mm]	82/82/260	81/103/260
X	Motor only	[mm]	40	50
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		41/47/0.129	46/52/0.129
	Premium motor range		-	52/58/0.129
NBE[7)]	E-motor range		52/59/0.172	52/59/0.172

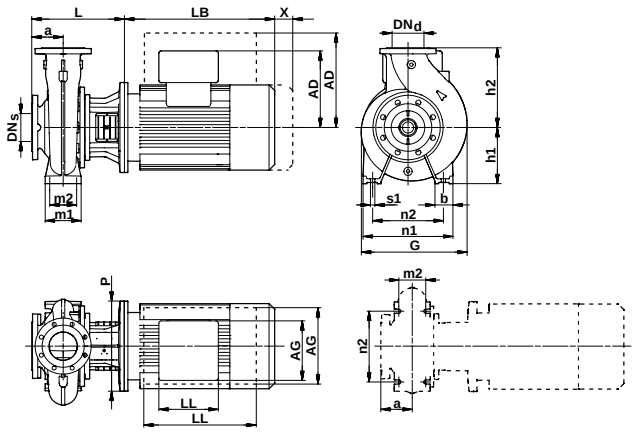
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3243 0606

Technical data



TM02 9206 2104

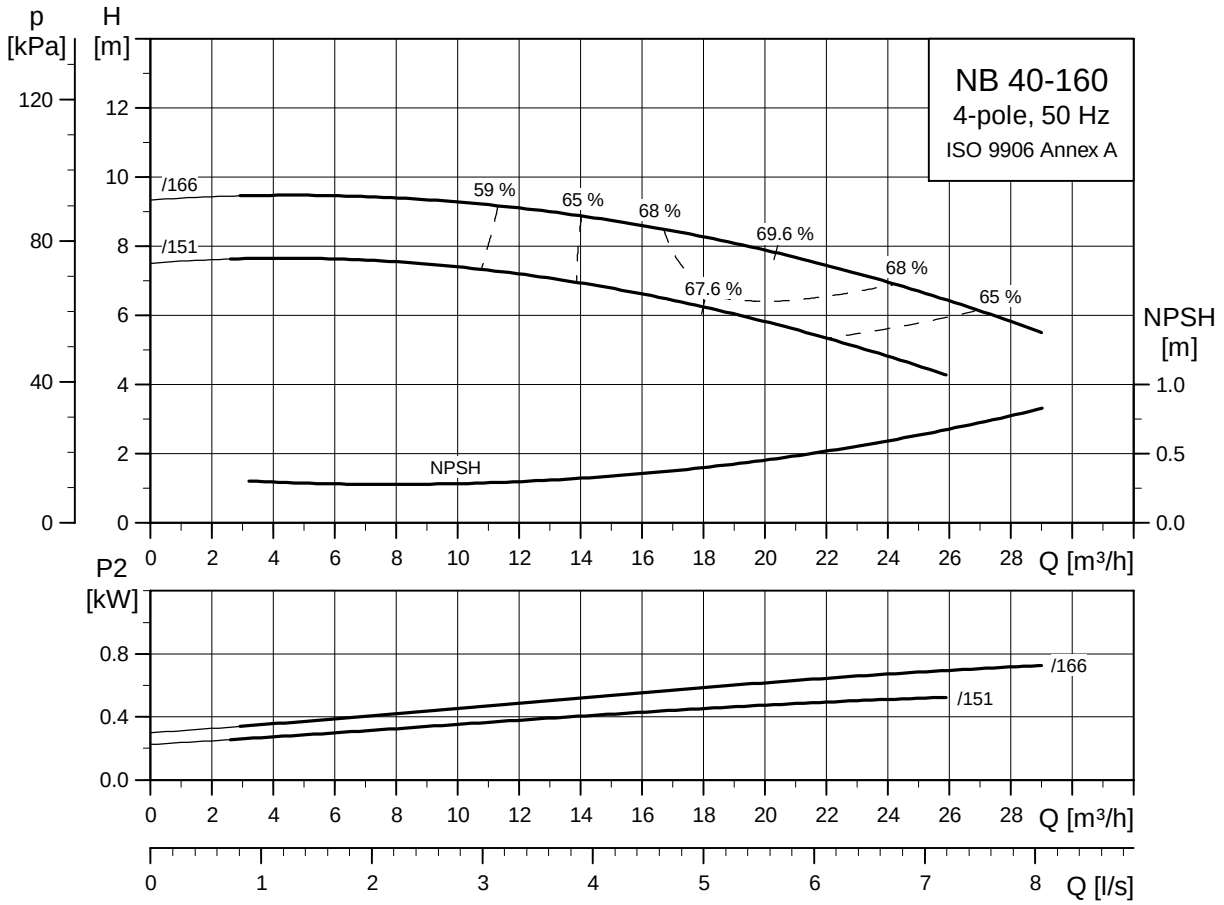
NB			NB 40-125/116	NB 40-125/130	NB 40-125/142
NBE			**-**	**-**	**-**
IEC size	NB[1)]		MG 71A-C/MG 71A-C	MG 71B-C/MG 71B-C	MG 80A-C/MG 80A-C
	NBE		-	-	-
P2		[kW]	0.25	0.37	0.55
Design			A	A	A
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	65	65	65
DN_d		[mm]	40	40	40
a		[mm]	80	80	80
b		[mm]	50	50	50
B[2)]		[mm]	-	-	-
LB[2)]		[mm]	191/191/-	191/191/-	231/231/-
P[2)]		[mm]	160/160/-	160/160/-	200/200/-
C[2)]		[mm]	-	-	-
G		[mm]	235	235	235
H		[mm]	-	-	-
h1		[mm]	112	112	112
h2		[mm]	140	140	140
L		[mm]	201	201	201
m1		[mm]	100	100	100
m2		[mm]	70	70	70
n1		[mm]	210	210	210
n2		[mm]	160	160	160
s1		[mm]	M12	M12	M12
A		[mm]	-	-	-
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	-	-	-
AD[2)]		[mm]	109/109/-	109/109/-	109/109/-
AG[2)]		[mm]	82/82/-	82/82/-	82/82/-
LL[2)]		[mm]	82/82/-	82/82/-	82/82/-
X	Motor only	[mm]	30	30	40
	Motor and motor stool	[mm]	100	100	100
NB[7)]	Standard motor range		32/38/0.129	35/41/0.129	35/41/0.129
	Premium motor range		-	-	-
NBE[7)]	E-motor range		-	-	-

1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

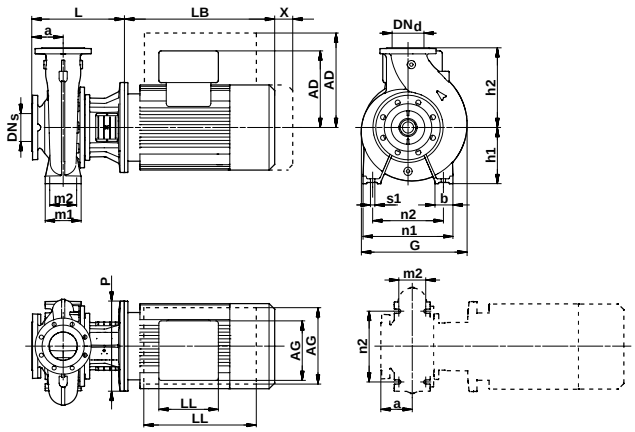
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3244 0606

Technical data

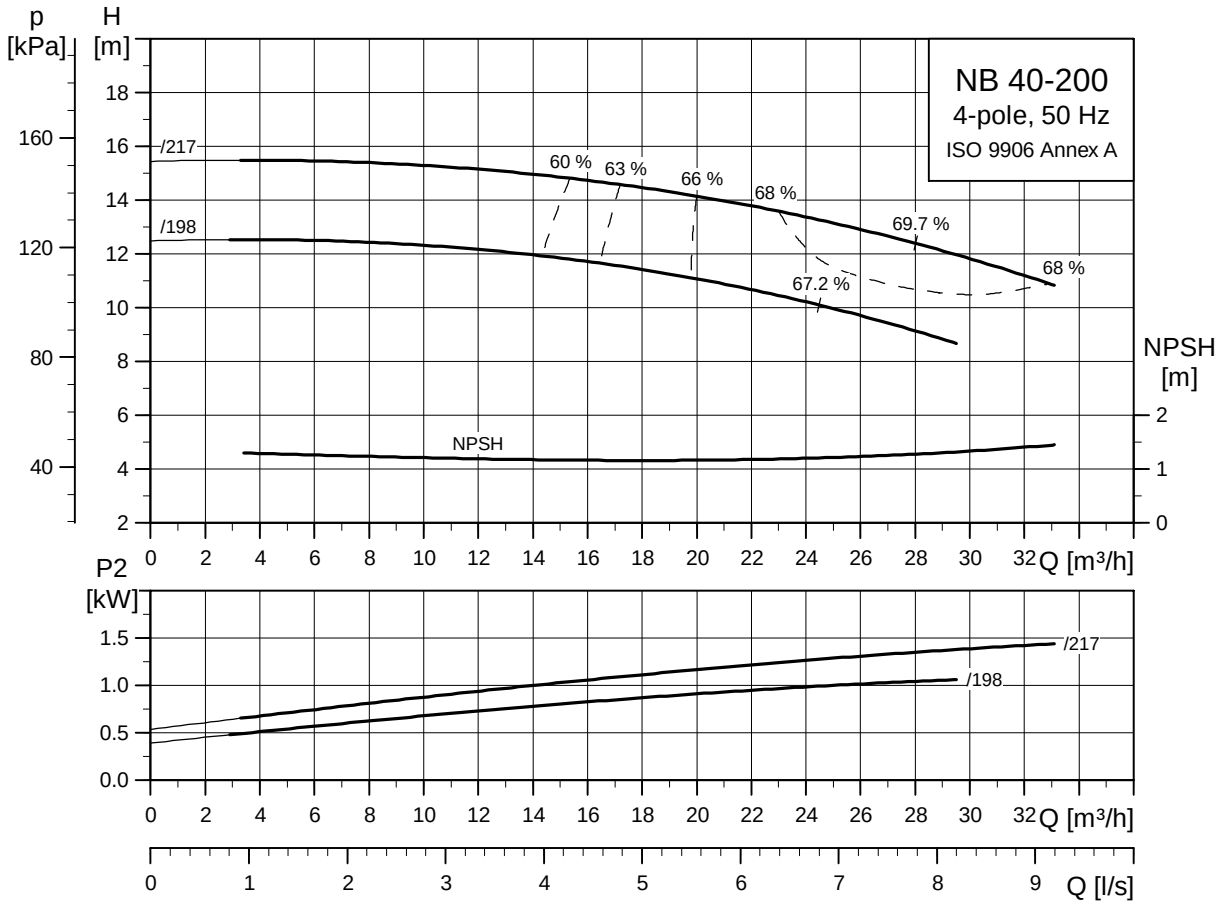


TM02 9206 2104

NB			NB 40-160/151	NB 40-160/166
NBE			**-**	**NBE 40-160/166**
IEC size	NB[1)]		MG 80A-C/MG 80A-C	MG 80B-C/MG 80B-C
	NBE		-	-
P2		[kW]	0.55	0.75
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	40	40
a		[mm]	80	80
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	231/231/-	231/231/321
P[2)]		[mm]	200/200/-	200/200/198
C[2)]		[mm]	-	-
G		[mm]	253	253
H		[mm]	-	-
h1		[mm]	132	132
h2		[mm]	160	160
L		[mm]	226	226
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	109/109/-	109/109/167
AG[2)]		[mm]	82/82/-	82/82/264
LL[2)]		[mm]	82/82/-	82/82/260
X	Motor only	[mm]	40	40
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		36/42/0.129	37/43/0.129
	Premium motor range		-	-
NBE[7)]	E-motor range		-	53/61/0.172

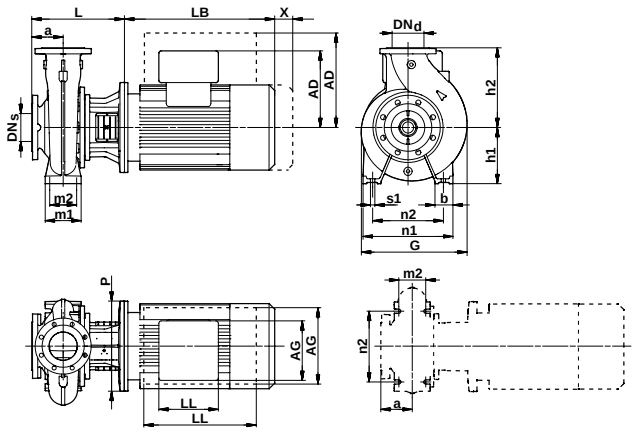
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3245 0606

Technical data

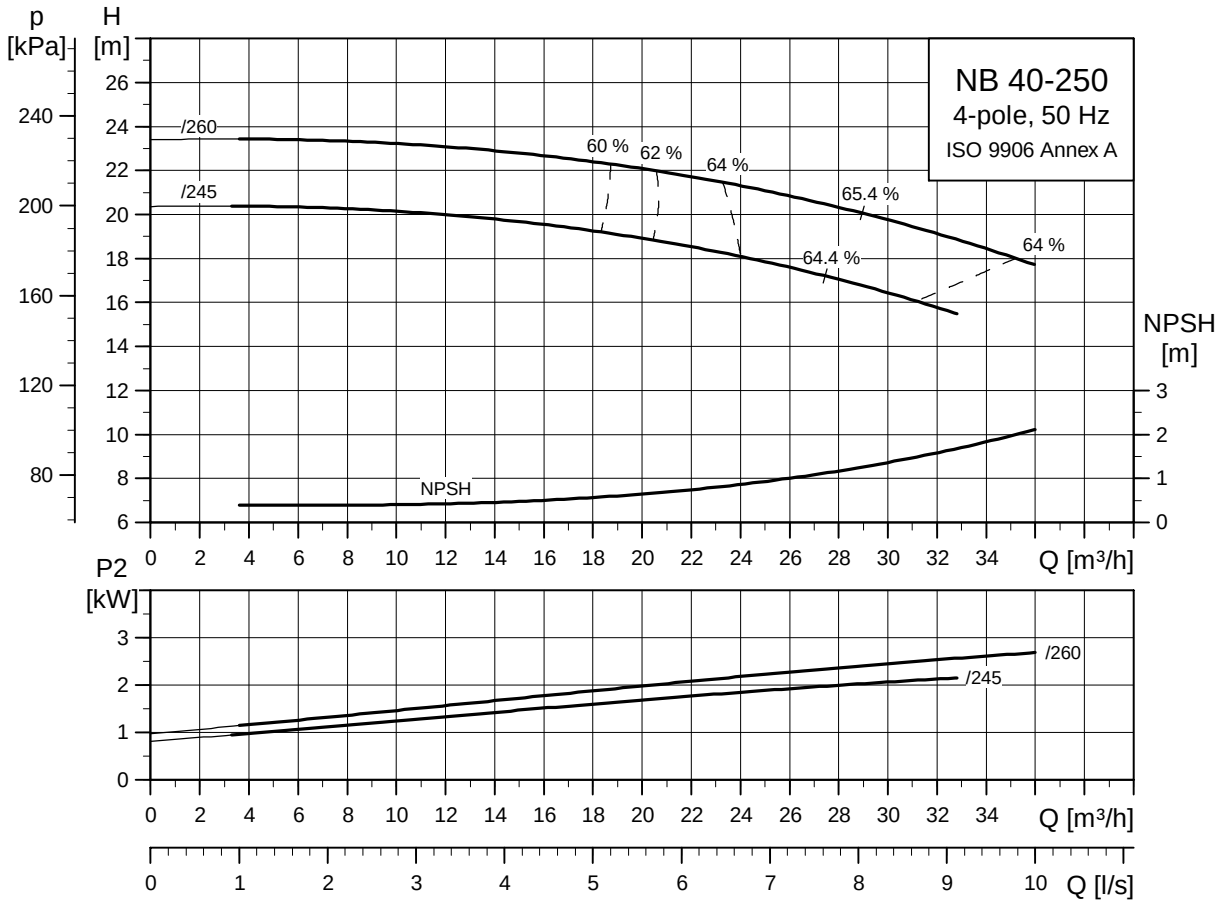


TM02 9206 2104

NB			NB 40-200/198	NB 40-200/217
NBE			**NBE 40-200/198**	**NBE 40-200/217**
IEC size	NB[1)]		MG 90SA-C/MG 90SB-D	MG 90LA-C/MG 90LC-D
	NBE		MGE 90SA	MGE 90LA
P2		[kW]	1.1	1.5
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	40	40
a		[mm]	100	100
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	281/281/321	281/321/321
P[2)]		[mm]	200/200/198	200/200/198
C[2)]		[mm]	-	-
G		[mm]	296	296
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	180	180
L		[mm]	246	246
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	265	265
n2		[mm]	212	212
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	110/110/167	110/110/167
AG[2)]		[mm]	81/162/264	81/81/264
LL[2)]		[mm]	81/103/260	81/81/260
X	Motor only	[mm]	50	50
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		47/53/0.129	49/55/0.129
	Premium motor range		53/59/0.129	54/62/0.172
NBE[7)]	E-motor range		53/61/0.172	55/63/0.172

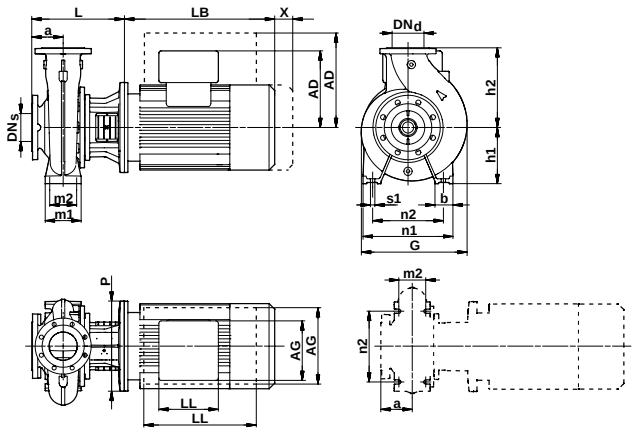
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3246 0606

Technical data

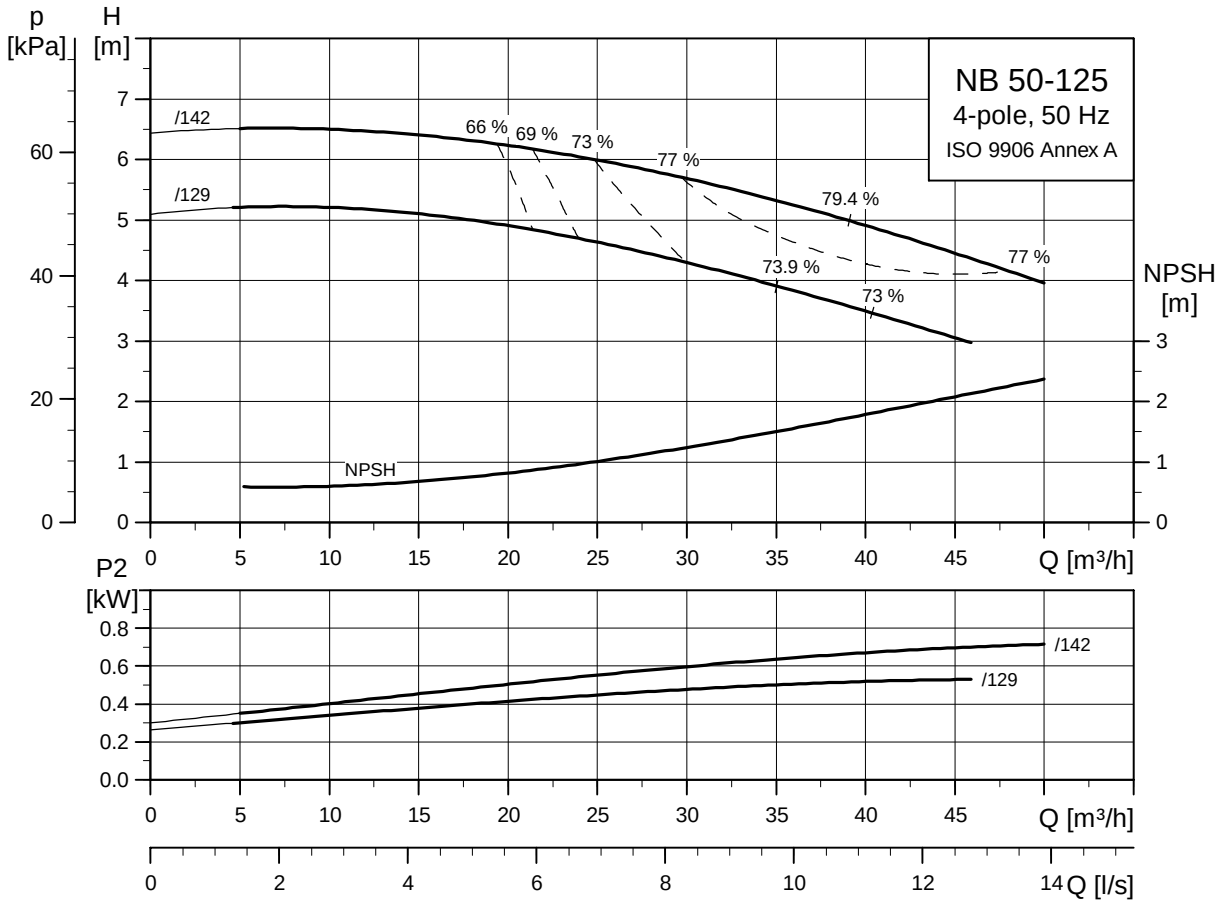


TM02 9206 2104

NB			NB 40-250/245	NB 40-250/260
NBE			**NBE 40-250/245**	**NBE 40-250/260**
IEC size	NB[1)]		MG 100LB-C/MG 100LB-D	MG 112MA-C/MG 100LC-D
	NBE		MGE 100LB	MGE 112MA
P2		[kW]	2.2	3.0
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	40	40
a		[mm]	100	100
b		[mm]	65	65
B[2)]		[mm]	-	-
LB[2)]		[mm]	335/335/335	335/335/335
P[2)]		[mm]	250/250/250	250/250/250
C[2)]		[mm]	-	-
G		[mm]	336	336
H		[mm]	-	-
h1		[mm]	180	180
h2		[mm]	225	225
L		[mm]	274	274
m1		[mm]	125	125
m2		[mm]	95	95
n1		[mm]	320	320
n2		[mm]	250	250
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	120/120/177	120/120/177
AG[2)]		[mm]	162/162/264	162/162/264
LL[2)]		[mm]	103/103/260	103/103/260
X	Motor only	[mm]	60	60
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		63/71/0.306	67/75/0.306
	Premium motor range		67/75/0.306	69/77/0.306
NBE[7)]	E-motor range		68/77/0.498	77/86/0.498

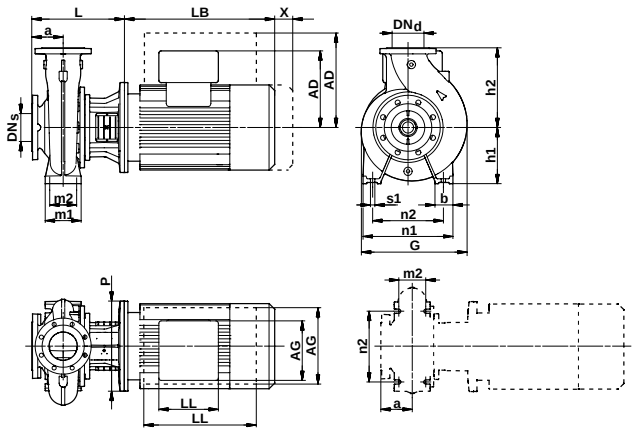
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3247 0606

Technical data

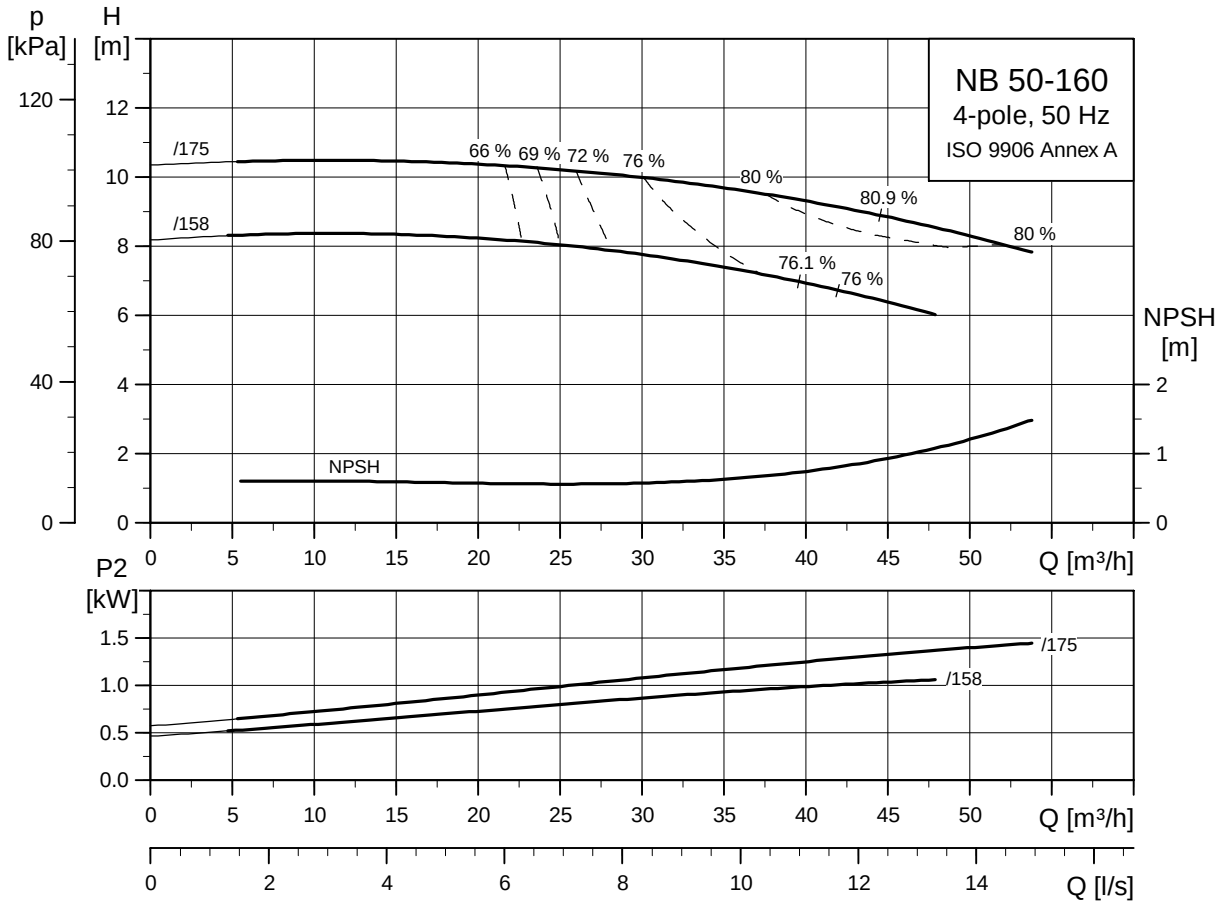


TM02 9206 2104

NB			NB 50-125/129	NB 50-125/142
NBE			**-**	**NBE 50-125/142**
IEC size	NB[1)]		MG 80A-C/MG 80A-C	MG 80B-C/MG 80B-C
	NBE		-	-
P2		[kW]	0.55	0.75
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	50	50
a		[mm]	100	100
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	231/231/-	231/231/321
P[2)]		[mm]	200/200/-	200/200/198
C[2)]		[mm]	-	-
G		[mm]	250	250
H		[mm]	-	-
h1		[mm]	132	132
h2		[mm]	160	160
L		[mm]	246	246
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	240	240
n2		[mm]	190	190
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	109/109/-	109/109/167
AG[2)]		[mm]	82/82/-	82/82/264
LL[2)]		[mm]	82/82/-	82/82/260
X	Motor only	[mm]	40	40
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		37/43/0.129	38/44/0.129
	Premium motor range		-	-
NBE[7)]	E-motor range		-	49/56/0.172

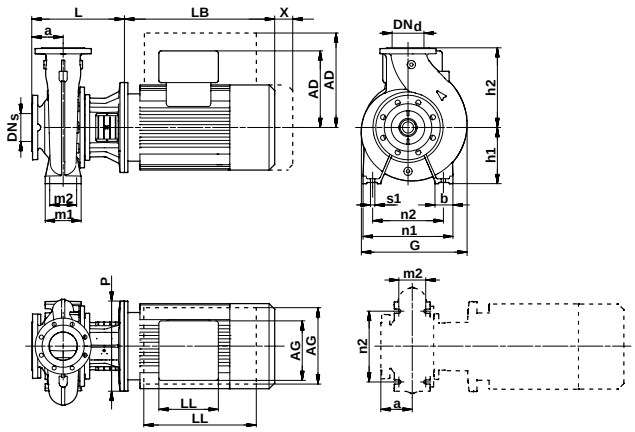
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3248 0606

Technical data

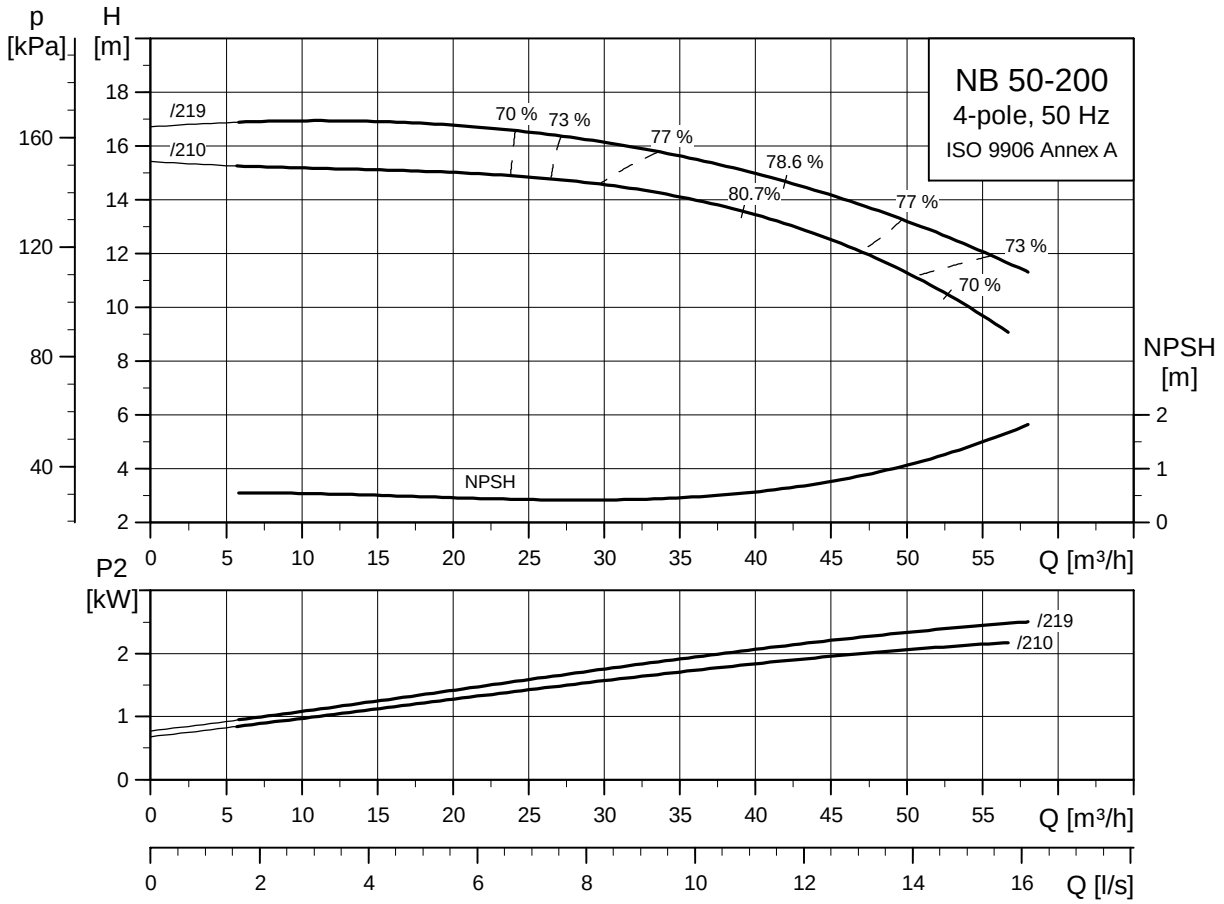


TM02 9206 2104

NB			NB 50-160/158	NB 50-160/175
NBE			**NBE 50-160/158**	**NBE 50-160/175**
IEC size	NB[1)]		MG 90SA-C/MG 90SB-D	MG 90LA-C/MG 90LC-D
	NBE		MGE 90SA	MGE 90LA
P2		[kW]	1.1	1.5
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	50	50
a		[mm]	100	100
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	281/281/321	281/321/321
P[2)]		[mm]	200/200/198	200/200/198
C[2)]		[mm]	-	-
G		[mm]	282	282
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	180	180
L		[mm]	246	246
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	265	265
n2		[mm]	212	212
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	110/110/167	110/110/167
AG[2)]		[mm]	81/162/264	81/81/264
LL[2)]		[mm]	81/103/260	81/81/260
X	Motor only	[mm]	50	50
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		43/49/0.129	45/51/0.129
	Premium motor range		49/55/0.129	50/57/0.172
NBE[7)]	E-motor range		49/56/0.172	51/58/0.172

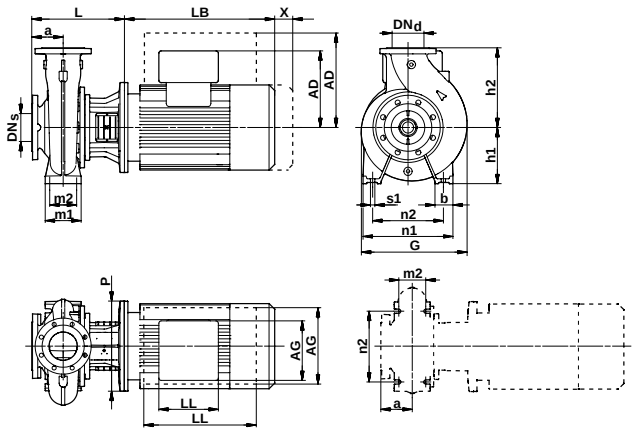
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3249 0606

Technical data

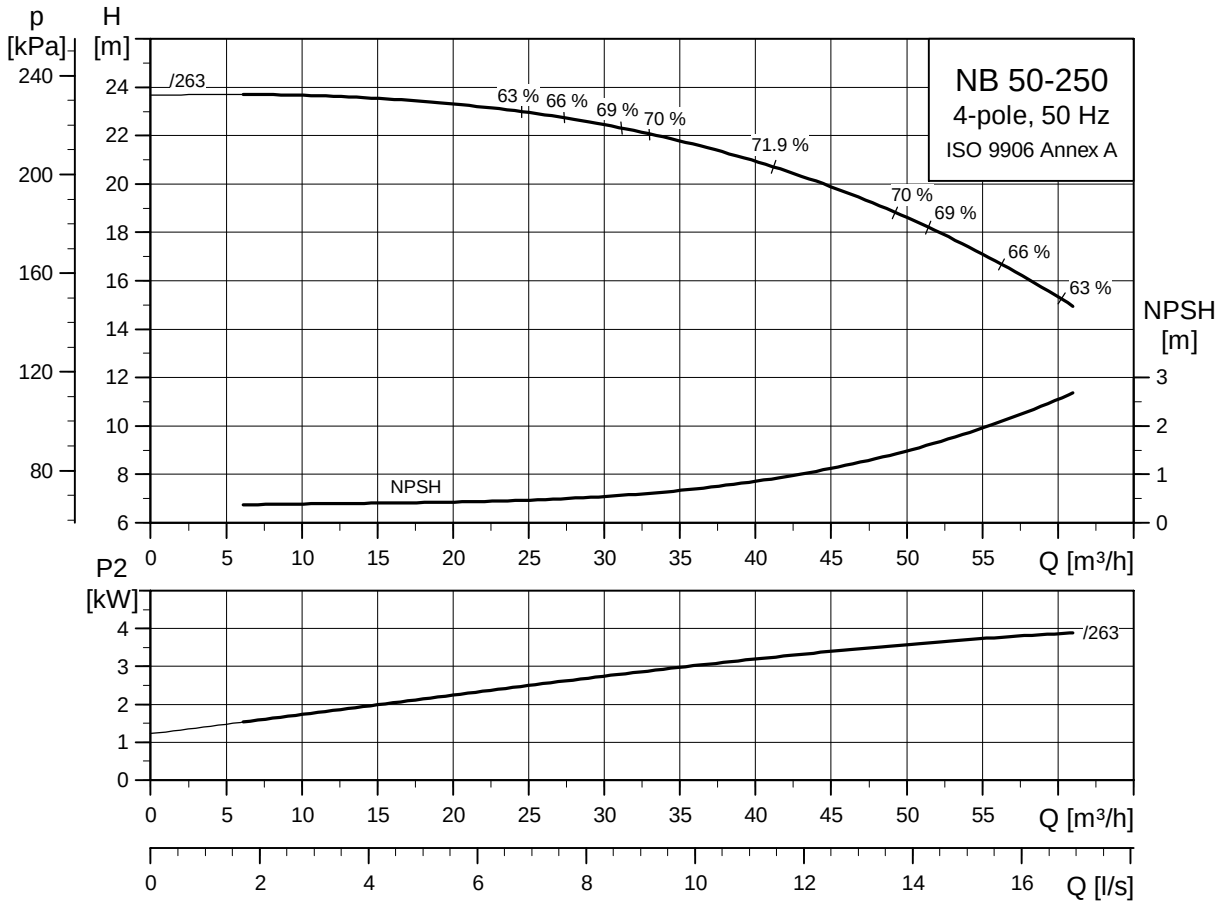


TM02 9206 2104

NB			NB 50-200/210	NB 50-200/219
NBE			**NBE 50-200/210**	**NBE 50-200/219**
IEC size	NB[1)]		MG 100LB-C/MG 100LB-D	MG 112MA-C/MG 100LC-D
	NBE		MGE 100LB	MGE 112MA
P2		[kW]	2.2	3.0
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	65	65
DN_d		[mm]	50	50
a		[mm]	100	100
b		[mm]	50	50
B[2)]		[mm]	-	-
LB[2)]		[mm]	335/335/335	335/335/335
P[2)]		[mm]	250/250/250	250/250/250
C[2)]		[mm]	-	-
G		[mm]	302	302
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	200	200
L		[mm]	274	274
m1		[mm]	100	100
m2		[mm]	70	70
n1		[mm]	265	265
n2		[mm]	212	212
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	120/120/177	120/120/177
AG[2)]		[mm]	162/162/264	162/162/264
LL[2)]		[mm]	103/103/260	103/103/260
X	Motor only	[mm]	60	60
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		55/62/0.172	59/66/0.172
	Premium motor range		59/66/0.172	61/68/0.172
NBE[7)]	E-motor range		60/68/0.249	69/77/0.249

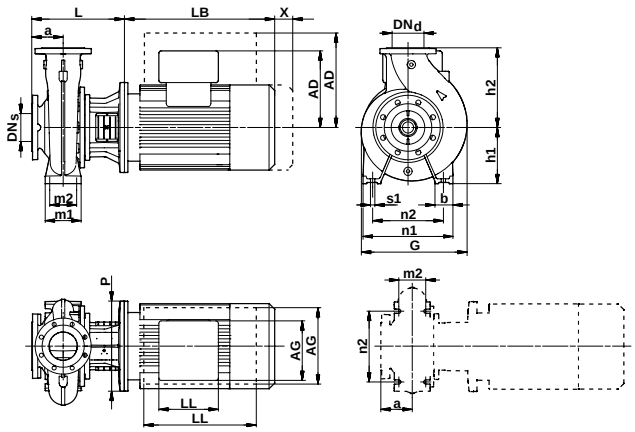
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3250 0606

Technical data

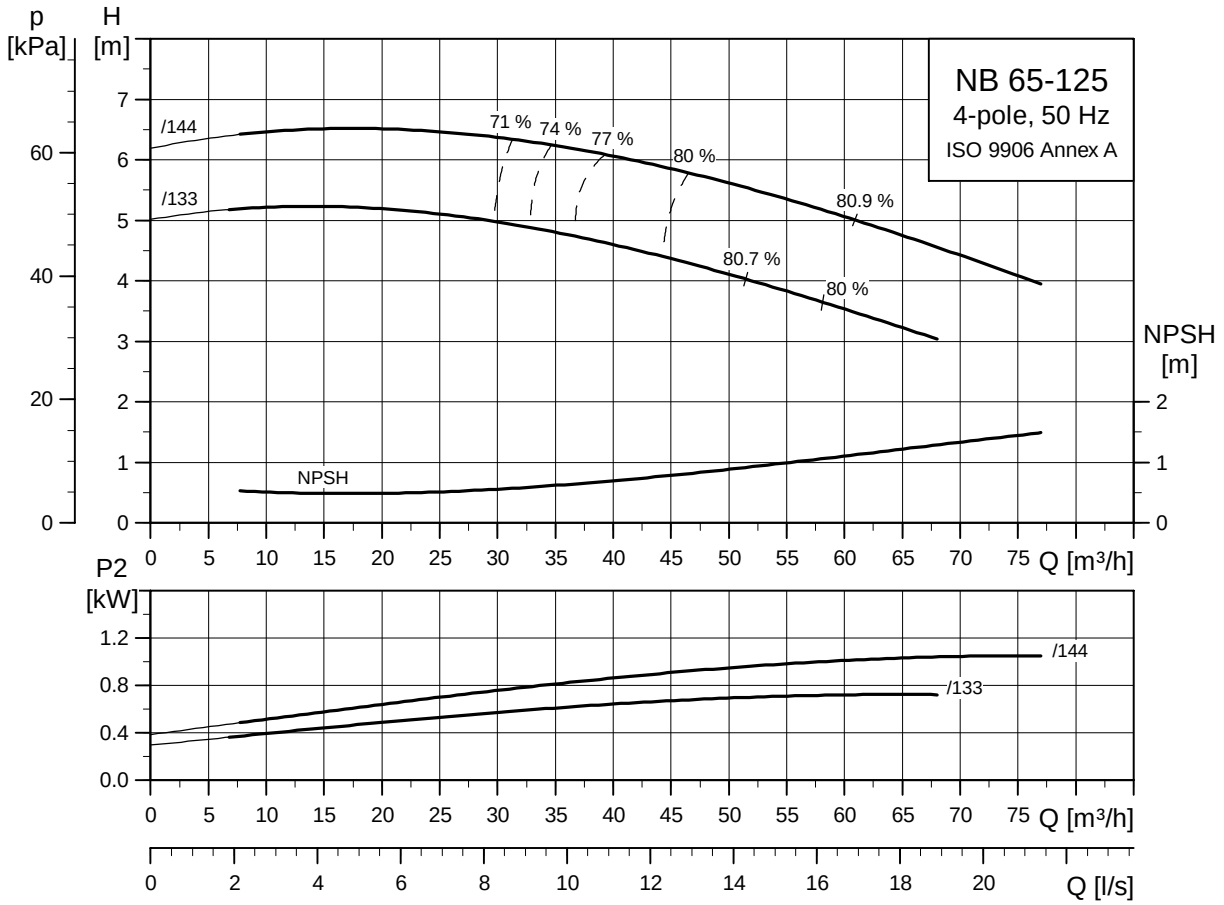


TM02 9206 2104

NB			NB 50-250/263
NBE			NBE 50-250/263
IEC size	NB[1)]		MG 112MB-C/MG 112MC-D
	NBE		MGE 112MB
P2		[kW]	4.0
Design			A
PN		[bar]	PN 16
DN_s		[mm]	65
DN_d		[mm]	50
a		[mm]	100
b		[mm]	65
B[2)]		[mm]	-
LB[2)]		[mm]	372/372/372
P[2)]		[mm]	250/250/250
C[2)]		[mm]	-
G		[mm]	343
H		[mm]	-
h1		[mm]	180
h2		[mm]	225
L		[mm]	274
m1		[mm]	125
m2		[mm]	95
n1		[mm]	320
n2		[mm]	250
s1		[mm]	M12
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	134/134/188
AG[2)]		[mm]	201/201/290
LL[2)]		[mm]	103/103/300
X	Motor only	[mm]	60
	Motor and motor stool	[mm]	100
NB[7)]	Standard motor range		78/86/0.306
	Premium motor range		85/93/0.306
NBE[7)]	E-motor range		83/92/0.498

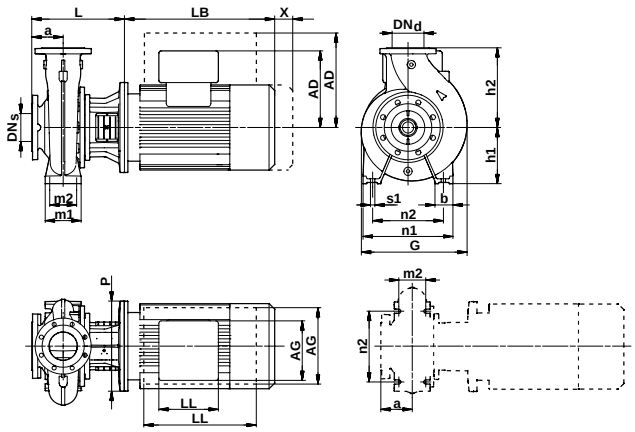
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3251 0606

Technical data

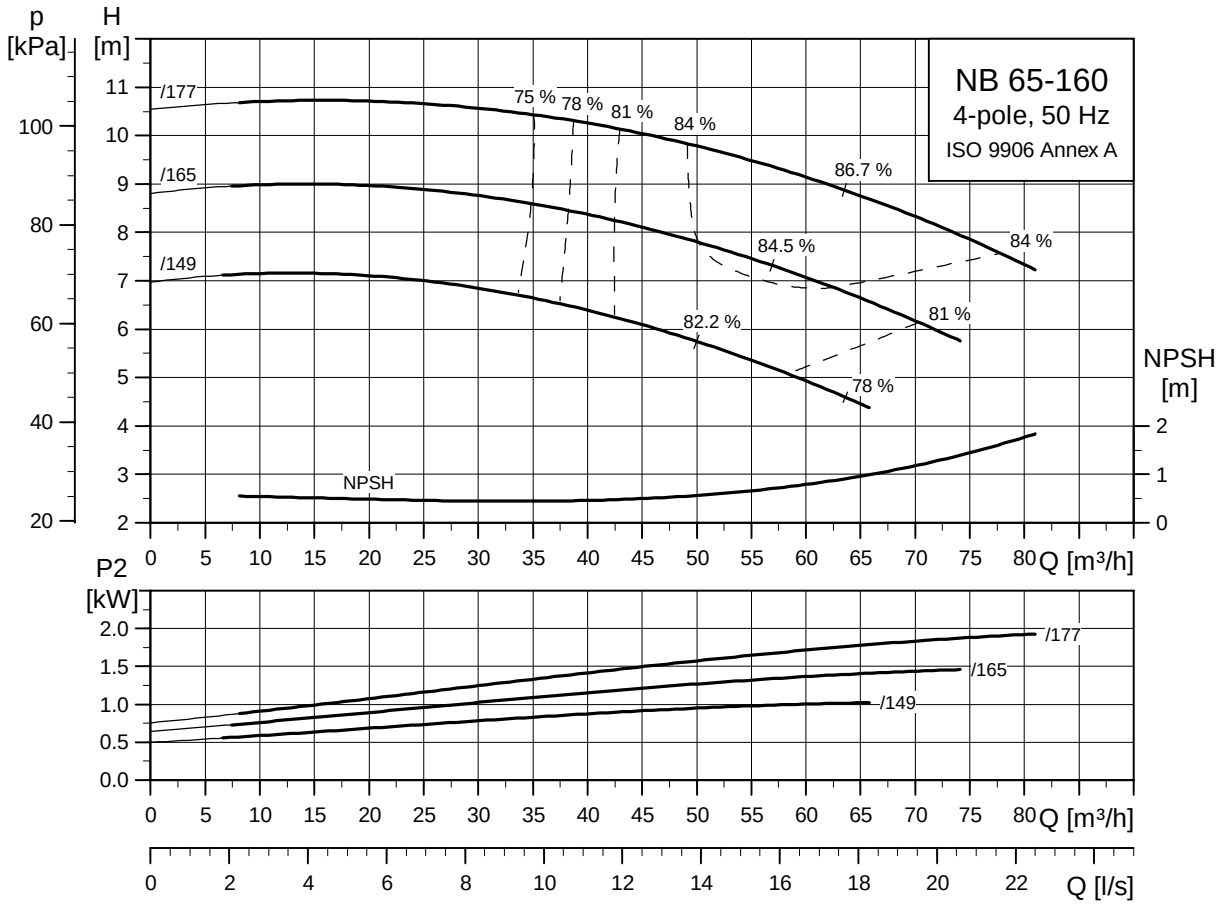


TM02 9206 2104

NB			NB 65-125/133	NB 65-125/144
NBE			**NBE 65-125/133**	**NBE 65-125/144**
IEC size	NB[1)]		MG 80B-C/MG 80B-C	MG 90SA-C/MG 90SB-D
	NBE		-	MGE 90SA
P2		[kW]	0.75	1.1
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	80	80
DN_d		[mm]	65	65
a		[mm]	100	100
b		[mm]	65	65
B[2)]		[mm]	-	-
LB[2)]		[mm]	231/231/321	281/281/321
P[2)]		[mm]	200/200/198	200/200/198
C[2)]		[mm]	-	-
G		[mm]	286	286
H		[mm]	-	-
h1		[mm]	160	160
h2		[mm]	180	180
L		[mm]	246	246
m1		[mm]	125	125
m2		[mm]	95	95
n1		[mm]	280	280
n2		[mm]	212	212
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	109/109/167	110/110/167
AG[2)]		[mm]	82/82/264	81/162/264
LL[2)]		[mm]	82/82/260	81/103/260
X	Motor only	[mm]	40	50
	Motor and motor stool	[mm]	100	100
NB[7)]	Standard motor range		43/49/0.129	48/54/0.129
	Premium motor range		-	54/60/0.129
NBE[7)]	E-motor range		54/61/0.172	54/61/0.172

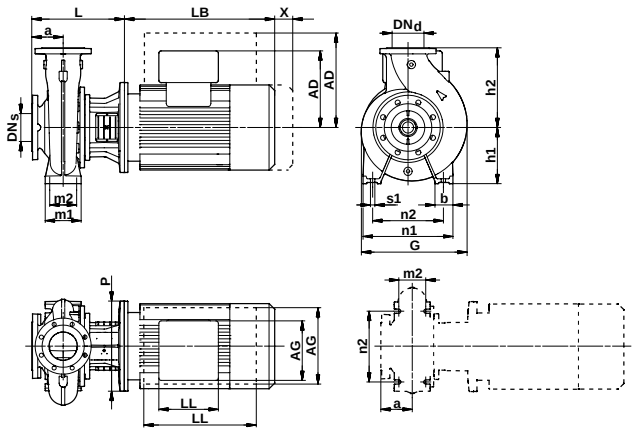
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3252 0606

Technical data



TM02 9206 2104

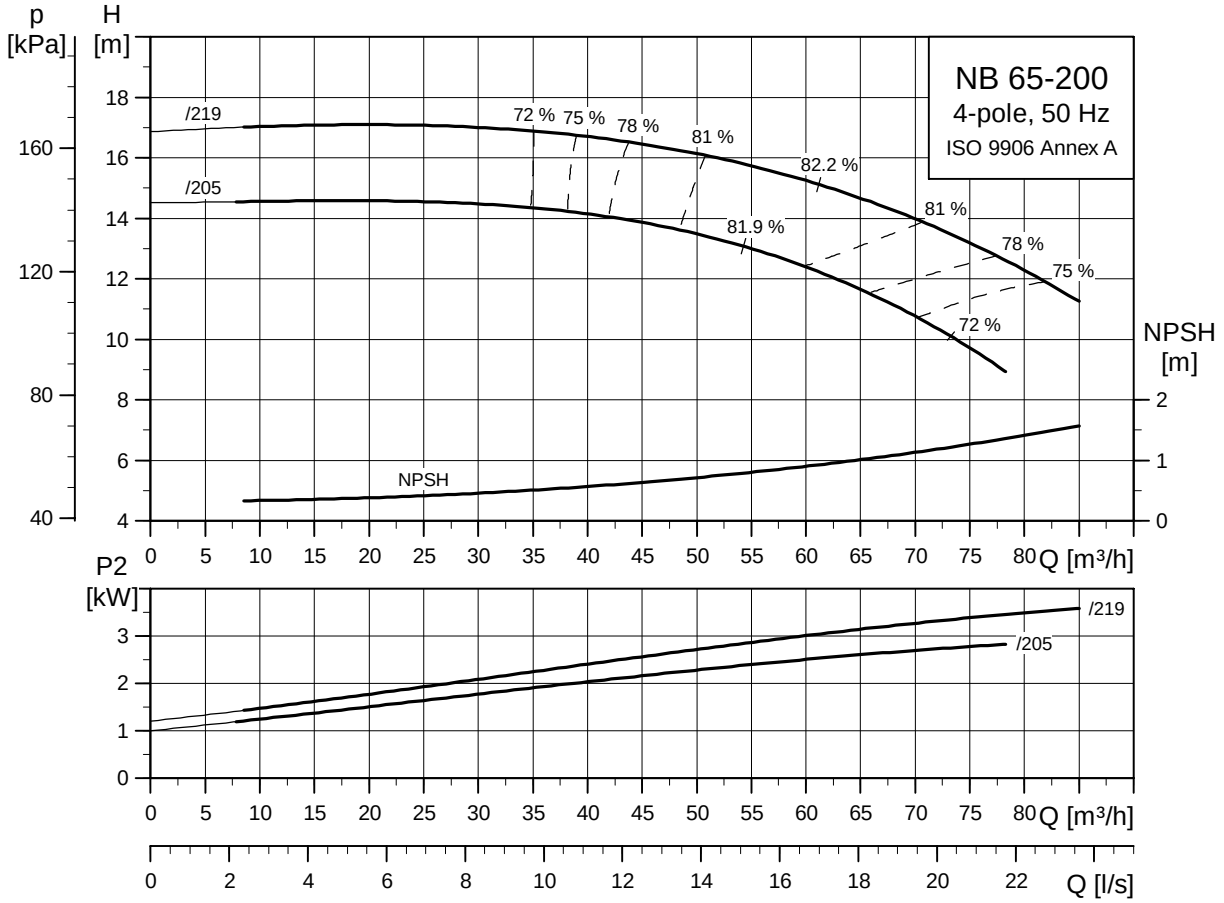
NB			NB 65-160/149	NB 65-160/165	NB 65-160/177
NBE			**NBE 65-160/149**	**NBE 65-160/165**	**NBE 65-160/177**
IEC size	NB[1)]		MG 90SA-C/MG 90SB-D	MG 90LA-C/MG 90LC-D	MG 100LB-C/MG 100LB-D
	NBE		MGE 90SA	MGE 90LA	MGE 100LB
P2		[kW]	1.1	1.5	2.2
Design			A	A	A
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	80	80	80
DN_d		[mm]	65	65	65
a		[mm]	100	100	100
b		[mm]	65	65	65
B[2)]		[mm]	-	-	-
LB[2)]		[mm]	281/281/321	281/321/321	335/335/335
P[2)]		[mm]	200/200/198	200/200/198	250/250/250
C[2)]		[mm]	-	-	-
G		[mm]	302	302	302
H		[mm]	-	-	-
h1		[mm]	160	160	160
h2		[mm]	200	200	200
L		[mm]	246	246	274
m1		[mm]	125	125	125
m2		[mm]	95	95	95
n1		[mm]	280	280	280
n2		[mm]	212	212	212
s1		[mm]	M12	M12	M12
A		[mm]	-	-	-
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	-	-	-
AD[2)]		[mm]	110/110/167	110/110/167	120/120/177
AG[2)]		[mm]	81/162/264	81/81/264	162/162/264
LL[2)]		[mm]	81/103/260	81/81/260	103/103/260
X	Motor only	[mm]	50	50	60
	Motor and motor stool	[mm]	100	100	100
NB[7)]	Standard motor range		46/52/0.129	48/54/0.129	56/64/0.172
	Premium motor range		52/58/0.129	53/60/0.172	60/68/0.172
NBE[7)]	E-motor range		52/59/0.172	54/61/0.172	61/70/0.249

1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

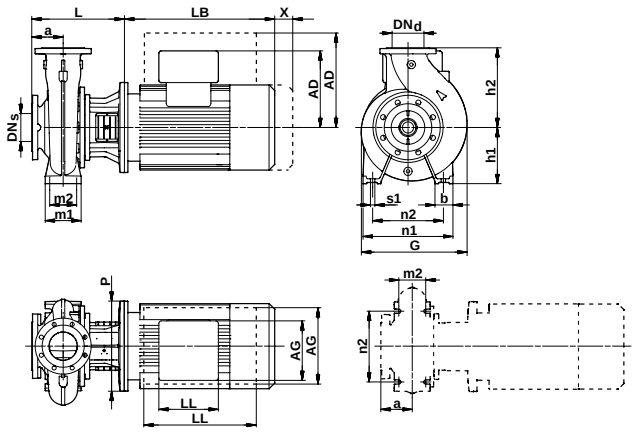
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3253 0606

Technical data

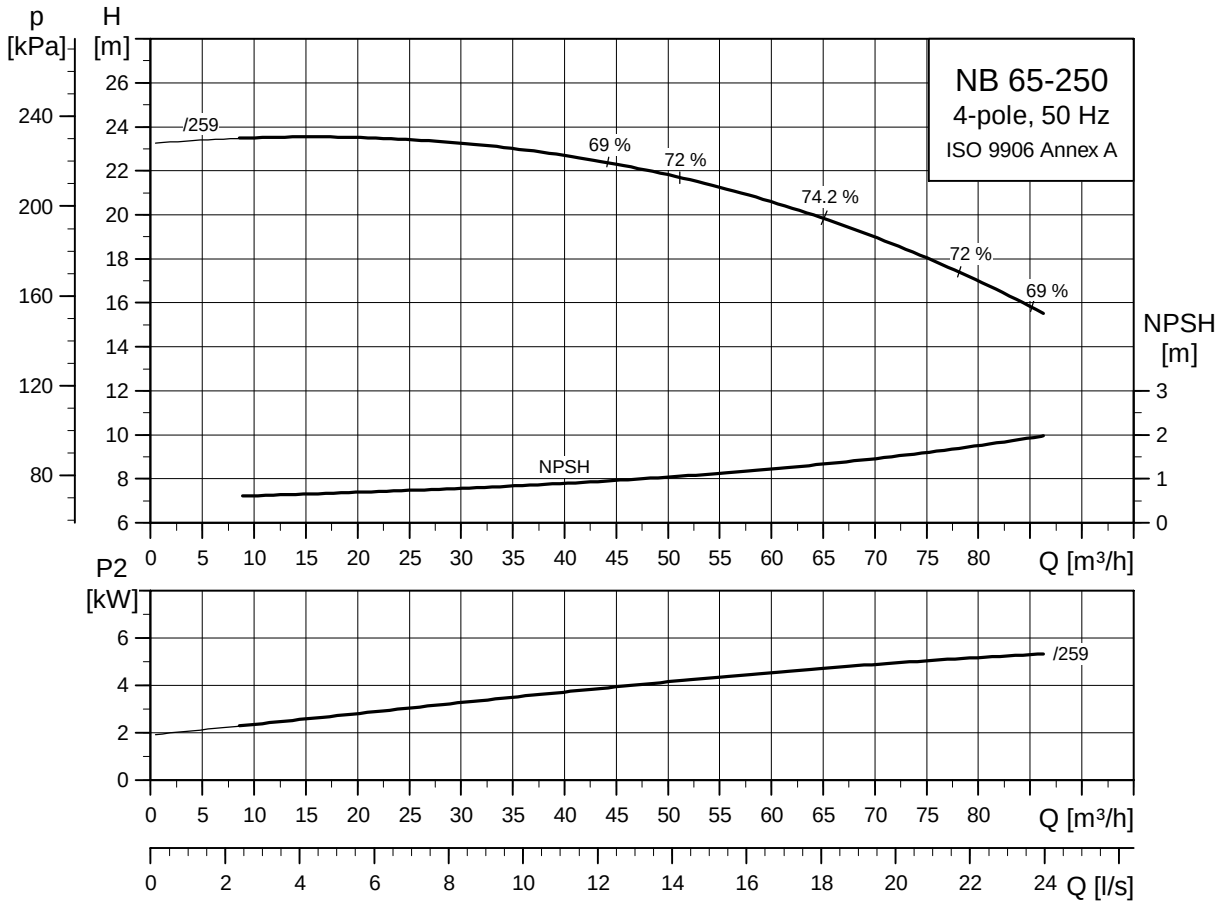


TM02 9206 2104

NB			NB 65-200/205	NB 65-200/219
NBE			**NBE 65-200/205**	**NBE 65-200/219**
IEC size	NB[1)]		MG 112MA-C/MG 100LC-D	MG 112MB-C/MG 112MC-D
	NBE		MGE 112MA	MGE 112MB
P2		[kW]	3.0	4.0
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	80	80
DN_d		[mm]	65	65
a		[mm]	100	100
b		[mm]	65	65
B[2)]		[mm]	-	-
LB[2)]		[mm]	335/335/335	372/372/372
P[2)]		[mm]	250/250/250	250/250/250
C[2)]		[mm]	-	-
G		[mm]	333	333
H		[mm]	-	-
h1		[mm]	180	180
h2		[mm]	225	225
L		[mm]	274	274
m1		[mm]	125	125
m2		[mm]	95	95
n1		[mm]	320	320
n2		[mm]	250	250
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	120/120/177	134/134/188
AG[2)]		[mm]	162/162/264	201/201/290
LL[2)]		[mm]	103/103/260	103/103/300
X	Motor only	[mm]	60	60
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		67/74/0.306	77/84/0.306
	Premium motor range		69/76/0.306	84/91/0.306
NBE[7)]	E-motor range		77/86/0.498	82/91/0.498

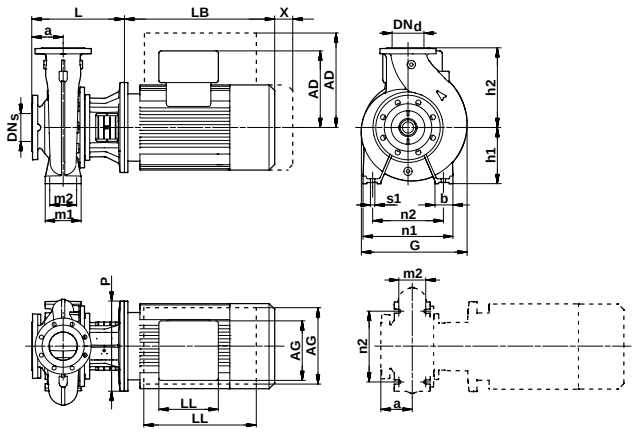
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3254 0606

Technical data

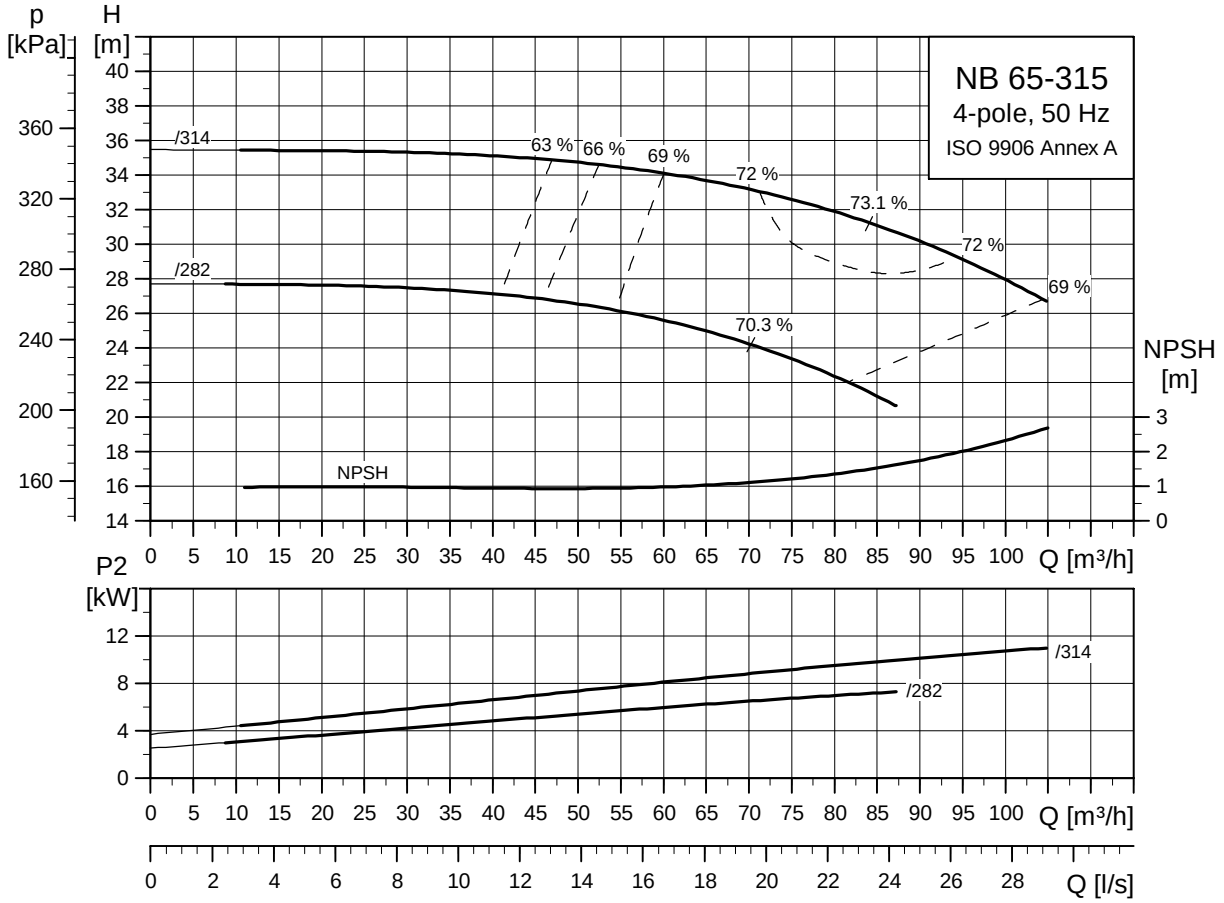


TM02 9206 2104

NB			NB 65-250/259
NBE			NBE 65-250/259
IEC size	NB[1)]		MG 132SC-C/MMG 132S-D
	NBE		MGE 132SA
P2		[kW]	5.5
Design			A
PN		[bar]	PN 16
DN_s		[mm]	80
DN_d		[mm]	65
a		[mm]	100
b		[mm]	80
B[2)]		[mm]	-
LB[2)]		[mm]	391/370/391
P[2)]		[mm]	300/300/300
C[2)]		[mm]	-
G		[mm]	370
H		[mm]	-
h1		[mm]	200
h2		[mm]	250
L		[mm]	343
m1		[mm]	160
m2		[mm]	120
n1		[mm]	360
n2		[mm]	280
s1		[mm]	M16
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	134/197/188
AG[2)]		[mm]	201/110/290
LL[2)]		[mm]	103/110/300
X	Motor only	[mm]	80
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		124/132/0.306
	Premium motor range		135/144/0.498
NBE[7)]	E-motor range		130/151/0.680

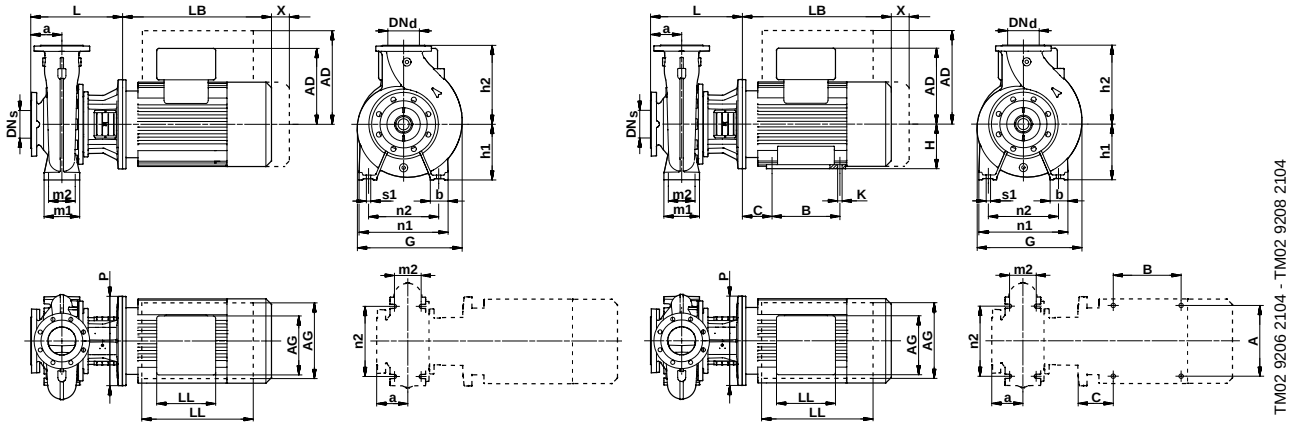
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3255 0606

Technical data

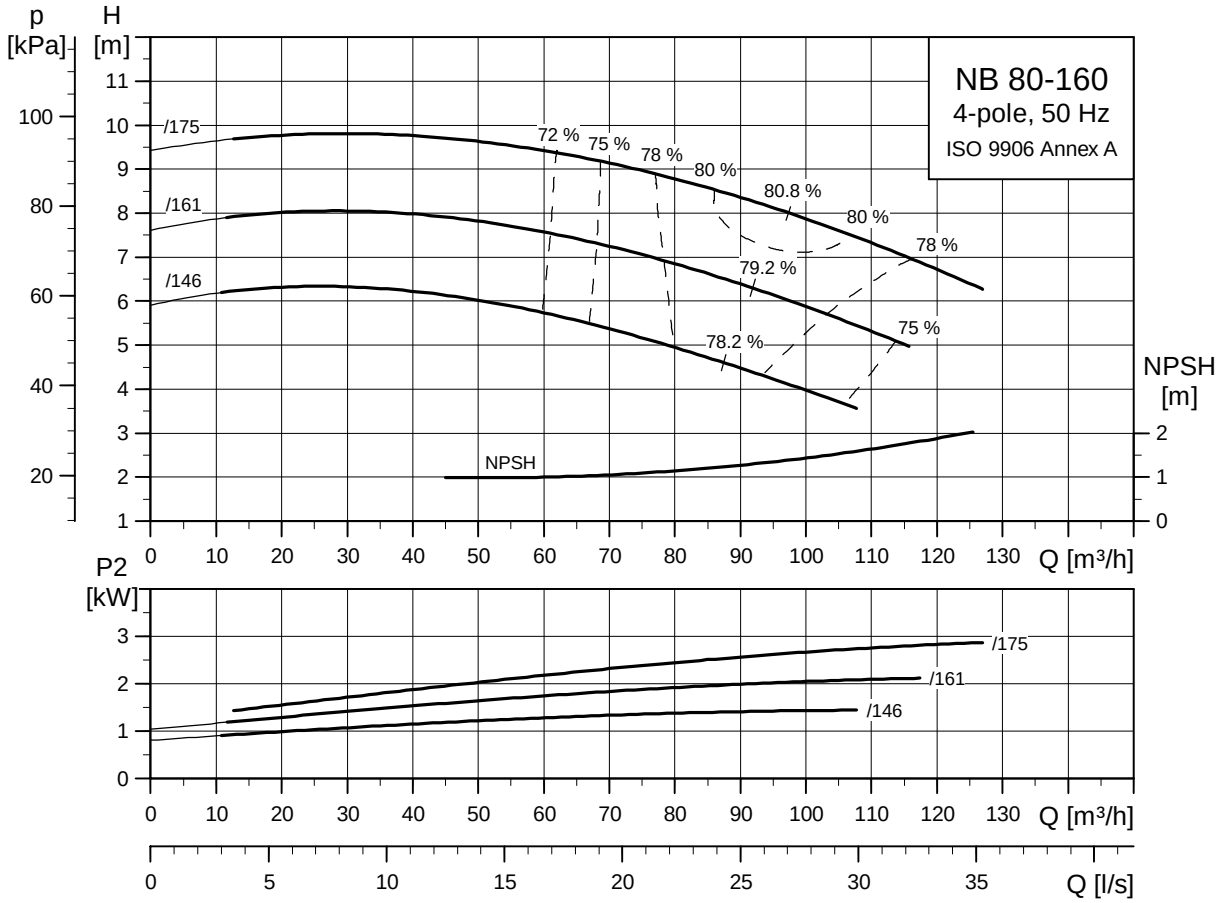


TM02 9206 2104 - TM02 9208 2104

NB			**NB 65-315/282**	**NB 65-315/314**
NBE			**NBE 65-315/282**	**NBE 65-315/314**
IEC size	NB[1)]		MMG 132SB-E/MMG 132M-D	MMG 160MA-E/MMG 160M-D
	NBE		MMGE 160M	MMGE 160M
P2		[kW]	7.5	11.0
Design			A/C[3)]	C
PN		[bar]	PN 16	PN 16
DN_s		[mm]	80	80
DN_d		[mm]	65	65
a		[mm]	125	125
b		[mm]	80	50
B[2)]		[mm]	210/210/210	210/210/210
LB[2)]		[mm]	430/408/449	505/503/449
P[2)]		[mm]	300/300/350	350/350/350
C[2)]		[mm]	108/108/108	108/108/108
G		[mm]	429	429
H		[mm]	160	160
h1		[mm]	225	225
h2		[mm]	280	280
L		[mm]	368	398
m1		[mm]	160	160
m2		[mm]	120	120
n1		[mm]	400	400
n2		[mm]	315	315
s1		[mm]	M16	M16
A		[mm]	254	254
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	15/12/15	15/12/15
AD[2)]		[mm]	213/197/391	244/244/391
AG[2)]		[mm]	160/110/296	178/178/296
LL[2)]		[mm]	126/110/410	162/162/410
X	Motor only	[mm]	80	110
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		173/182/0.498	233/254/0.68
	Premium motor range		157/166/0.498	184/205/0.68
NBE[7)]	E-motor range		193/202/0.498	230/239/0.498

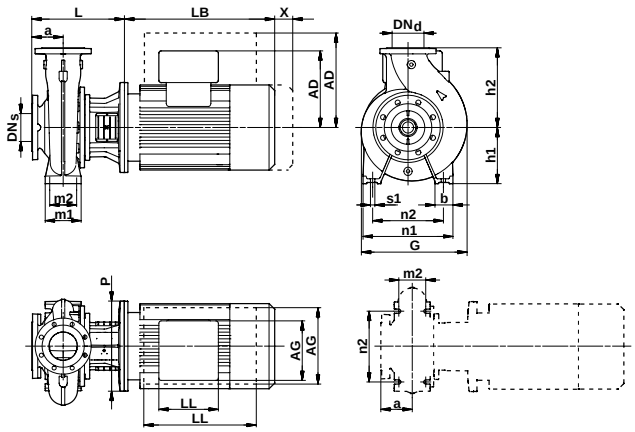
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
3) NB pump is design A; NBE pump is design C.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3292 0606

Technical data



TM02 9206 2104

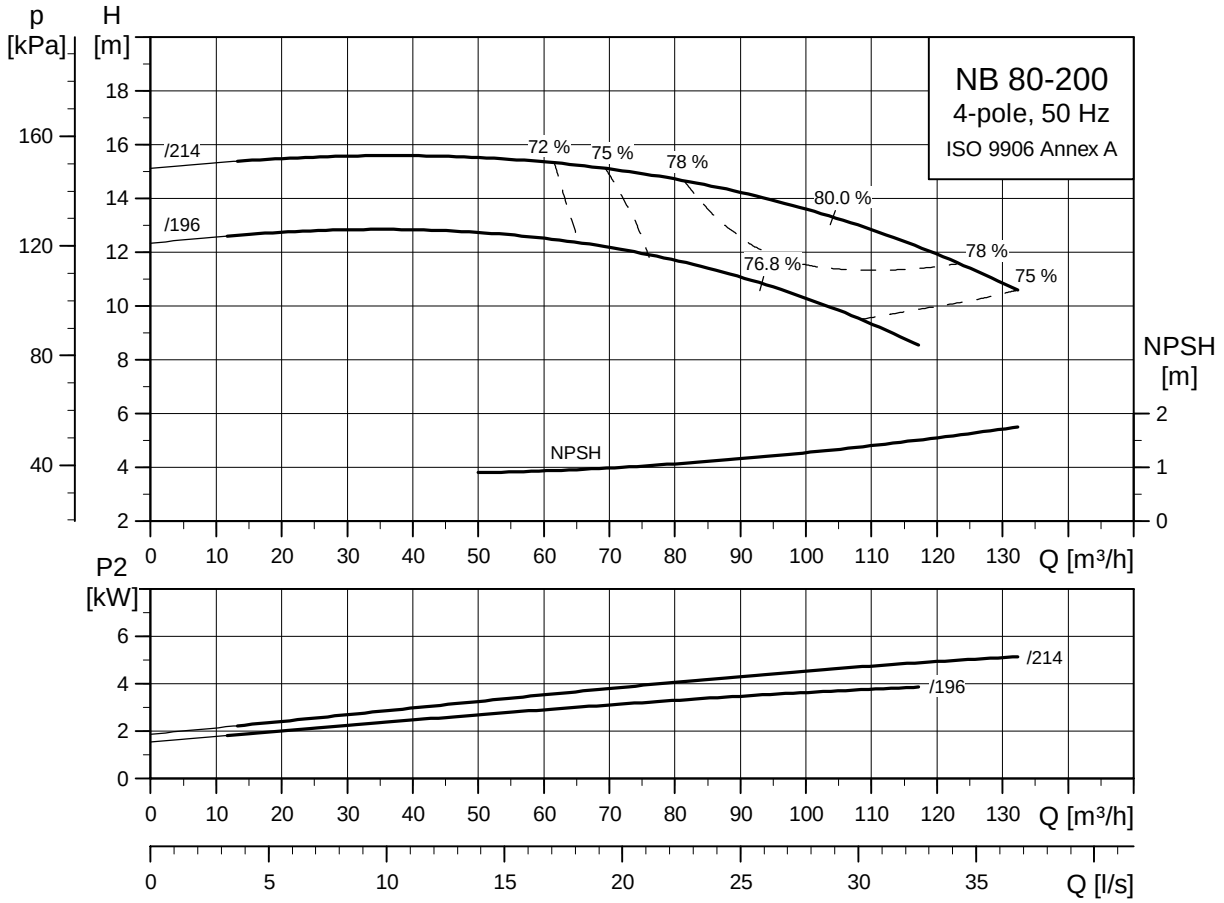
NB			NB 80-160/146	NB 80-160/161	NB 80-160/175
NBE			**NBE 80-160/146**	**NBE 80-160/161**	**NBE 80-160/175**
IEC size	NB[1)]		MG 90LA-C/MG 90LC-D	MG 100LB-C/MG 100LB-D	MG 112MA-C/MG 100LC-D
	NBE		MGE 90LA	MGE 100LB	MGE 112MA
P2		[kW]	1.5	2.2	3.0
Design			A	A	A
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	100	100	100
DN_d		[mm]	80	80	80
a		[mm]	125	125	125
b		[mm]	65	65	65
B[2)]		[mm]	-	-	-
LB[2)]		[mm]	281/321/321	335/335/335	335/335/335
P[2)]		[mm]	200/200/198	250/250/250	250/250/250
C[2)]		[mm]	-	-	-
G		[mm]	342	342	342
H		[mm]	-	-	-
h1		[mm]	180	180	180
h2		[mm]	225	225	225
L		[mm]	271	299	299
m1		[mm]	125	125	125
m2		[mm]	95	95	95
n1		[mm]	320	320	320
n2		[mm]	250	250	250
s1		[mm]	M12	M12	M12
A		[mm]	-	-	-
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	-	-	-
AD[2)]		[mm]	110/110/167	120/120/177	120/120/177
AG[2)]		[mm]	81/81/264	162/162/264	162/162/264
LL[2)]		[mm]	81/81/260	103/103/260	103/103/260
X	Motor only	[mm]	50	60	60
	Motor and motor stool	[mm]	140	140	140
NB[7)]	Standard motor range		56/63/0.306	64/72/0.306	68/76/0.306
	Premium motor range		61/68/0.306	68/76/0.306	70/78/0.306
NBE[7)]	E-motor range		62/69/0.306	69/78/0.498	78/87/0.498

1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

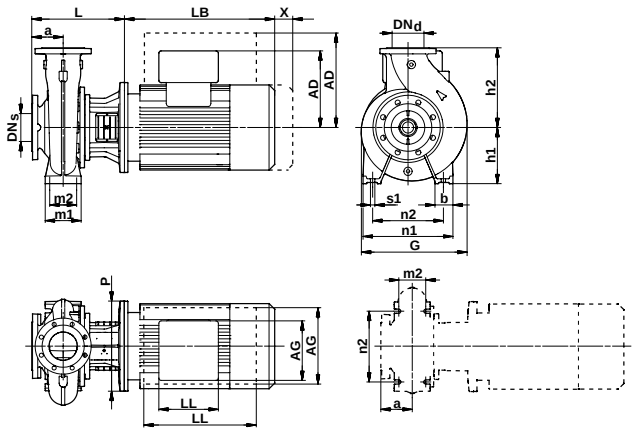
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3293 0606

Technical data

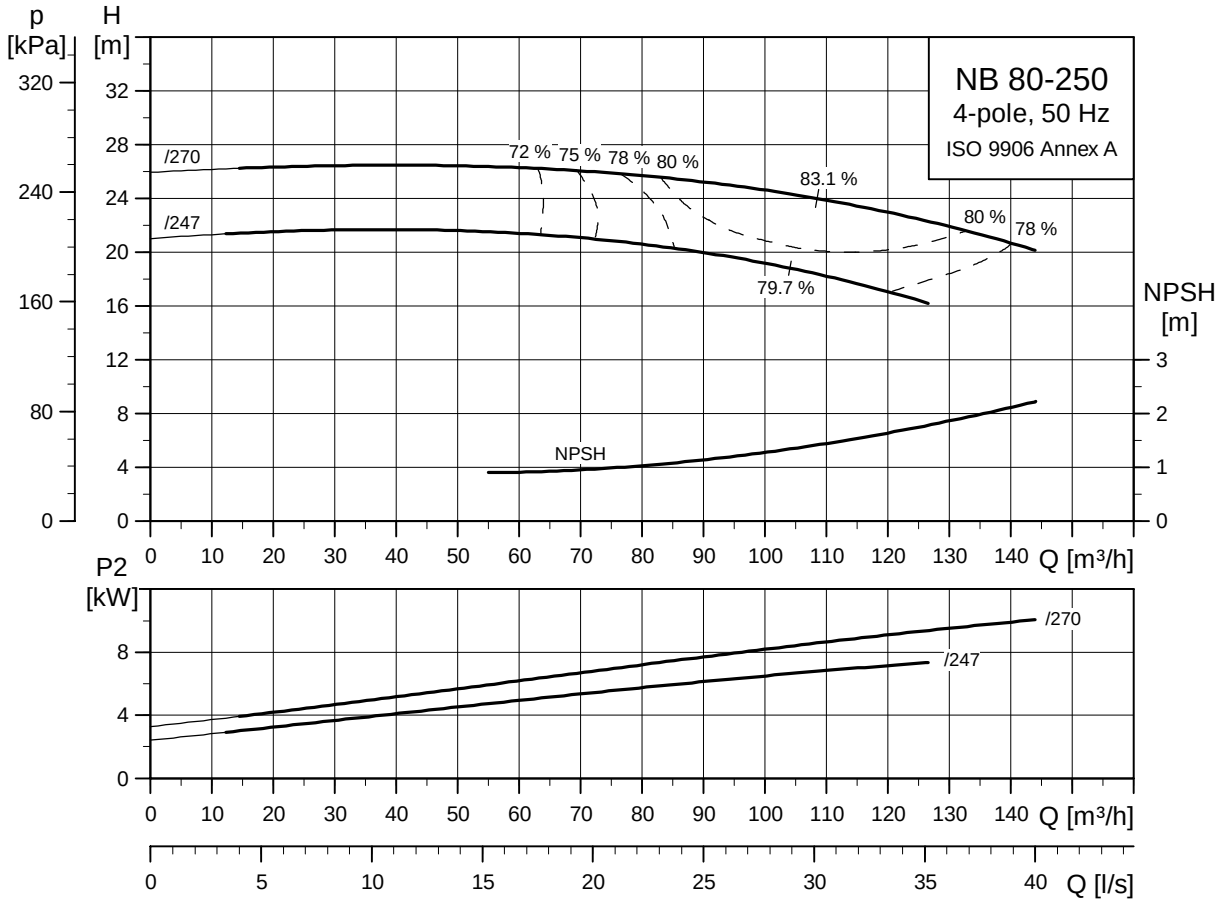


TM02 9206 2104

NB			NB 80-200/196	NB 80-200/214
NBE			**NBE 80-200/196**	**NBE 80-200/214**
IEC size	NB[1)]		MG 112MB-C/MG 112MC-D	MG 132SC-C/MMG 132S-D
	NBE		MGE 112MB	MGE 132SA
P2		[kW]	4.0	5.5
Design			A	A
PN		[bar]	PN 16	PN 16
DN_s		[mm]	100	100
DN_d		[mm]	80	80
a		[mm]	125	125
b		[mm]	65	65
B[2)]		[mm]	-	-
LB[2)]		[mm]	372/372/372	391/370/391
P[2)]		[mm]	250/250/250	300/300/300
C[2)]		[mm]	-	-
G		[mm]	365	365
H		[mm]	-	-
h1		[mm]	180	180
h2		[mm]	250	250
L		[mm]	352	368
m1		[mm]	125	125
m2		[mm]	95	95
n1		[mm]	345	345
n2		[mm]	280	280
s1		[mm]	M12	M12
A		[mm]	-	-
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	-
AD[2)]		[mm]	134/134/188	134/197/188
AG[2)]		[mm]	201/201/290	201/110/290
LL[2)]		[mm]	103/103/300	103/110/300
X	Motor only	[mm]	60	80
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		99/107/0.306	109/118/0.498
	Premium motor range		106/114/0.306	120/129/0.498
NBE[7)]	E-motor range		104/125/0.680	115/136/0.680

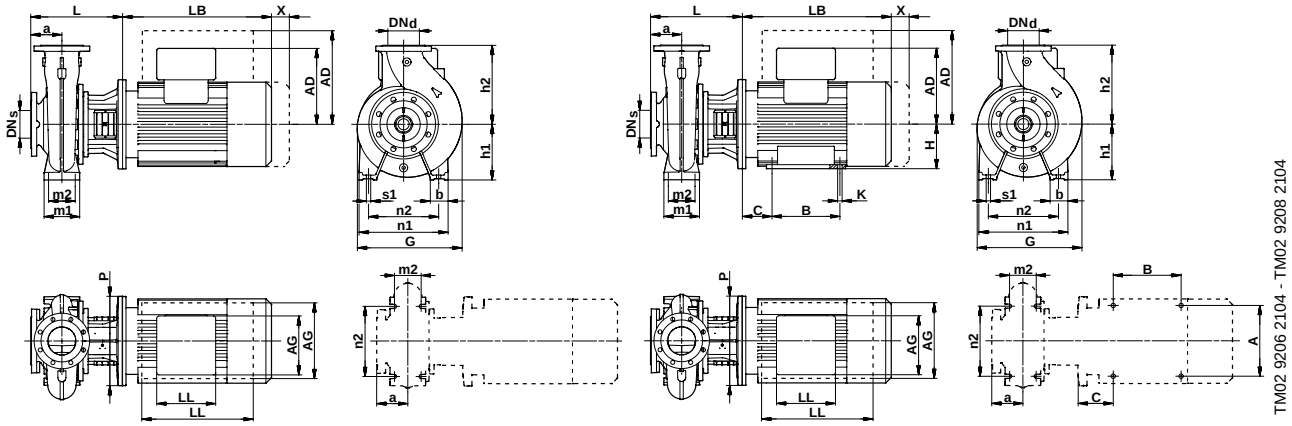
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3294 0606

Technical data

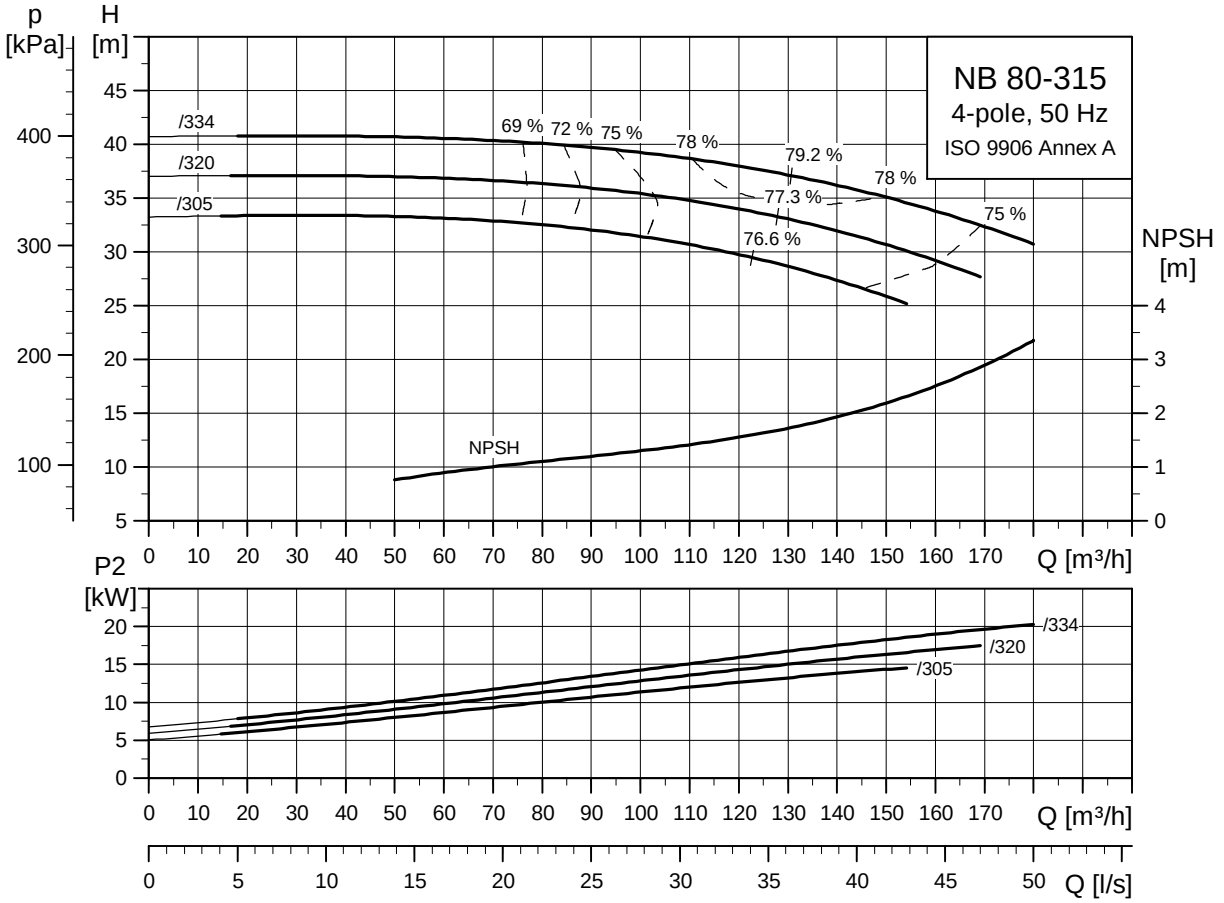


TM02 9206 2104 - TM02 9208 2104

NB			NB 80-250/247	NB 80-250/270
NBE			**NBE 80-250/247**	**NBE 80-250/270**
IEC size	NB[1)]		MMG 132SB-E/MMG 132M-D	MMG 160MA-E/MMG 160M-D
	NBE		MMGE 160M	MMGE 160M
P2		[kW]	7.5	11.0
Design			A/C[3)]	C
PN		[bar]	PN 16	PN 16
DN_s		[mm]	100	100
DN_d		[mm]	80	80
a		[mm]	125	125
b		[mm]	80	80
B[2)]		[mm]	-	210/210/210
LB[2)]		[mm]	430/408/449	505/503/449
P[2)]		[mm]	300/300/350	350/350/350
C[2)]		[mm]	-	108/108/108
G		[mm]	410	410
H		[mm]	-	160
h1		[mm]	200	200
h2		[mm]	280	280
L		[mm]	368	398
m1		[mm]	160	160
m2		[mm]	120	120
n1		[mm]	400	400
n2		[mm]	315	315
s1		[mm]	M16	M16
A		[mm]	-	254
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	15/12/15
AD[2)]		[mm]	213/197/391	244/244/391
AG[2)]		[mm]	160/110/296	178/178/296
LL[2)]		[mm]	126/110/410	162/162/410
X	Motor only	[mm]	80	110
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		168/177/0.498	228/249/0.68
	Premium motor range		152/161/0.498	179/200/0.68
NBE[7)]	E-motor range		188/197/0.498	225/234/0.498

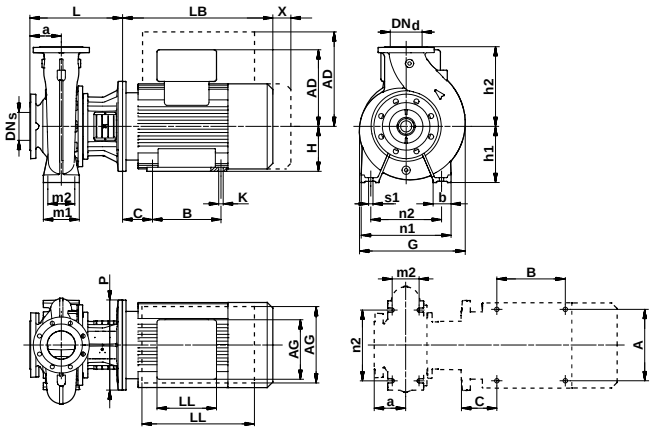
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
3) NB pump is design A; NBE pump is design C.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3295 0606

Technical data

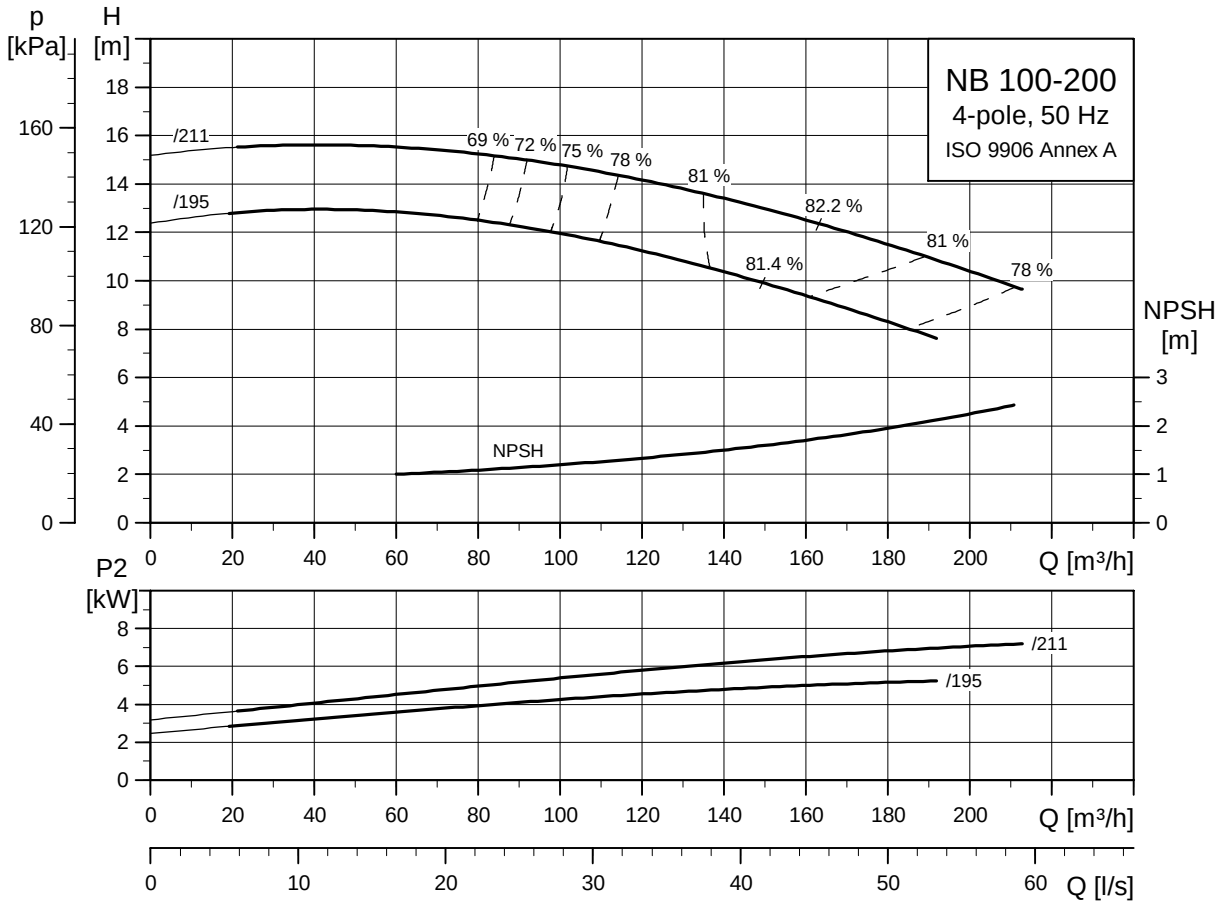


TM02 9208 2104

NB			NB 80-315/305	NB 80-315/320	NB 80-315/334
NBE			**NBE 80-315/305**	**NBE 80-315/320**	**NBE 80-315/334**
IEC size	NB[1)]		MMG 160L-E/MMG 160L-D	MMG 180M-E/MMG 180M-D	MMG 180L-E/MMG 180L-D
	NBE		MMGE 160L	MMGE 180M	MMGE 180L
P2		[kW]	15.0	18.5	22.0
Design			C	C	C
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	100	100	100
DN_d		[mm]	80	80	80
a		[mm]	125	125	125
b		[mm]	80	80	80
B[2)]		[mm]	210/254/254	241/241/241	279/279/241
LB[2)]		[mm]	505/547/499	590/602/499	630/602/575
P[2)]		[mm]	350/350/350	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	121/121/121	121/121/121
G		[mm]	460	460	460
H		[mm]	160	180	180
h1		[mm]	250	250	250
h2		[mm]	315	315	315
L		[mm]	398	398	398
m1		[mm]	160	160	160
m2		[mm]	120	120	120
n1		[mm]	400	400	400
n2		[mm]	315	315	315
s1		[mm]	M16	M16	M16
A		[mm]	254	279	279
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	15/12/15	15/12/15	15/12/15
AD[2)]		[mm]	244/241/418	272/285/414	272/285/439
AG[2)]		[mm]	178/163/296	150/178/328	150/203/328
LL[2)]		[mm]	162/162/410	186/178/456	181/178/456
X	Motor only	[mm]	110	110	110
	Motor and motor stool	[mm]	140	140	140
NB[7)]	Standard motor range		260/281/0.872	294/316/0.872	322/344/0.872
	Premium motor range		214/235/0.872	240/262/0.872	250/272/0.872
NBE[7)]	E-motor range		262/283/0.872	293/315/0.872	327/349/0.872

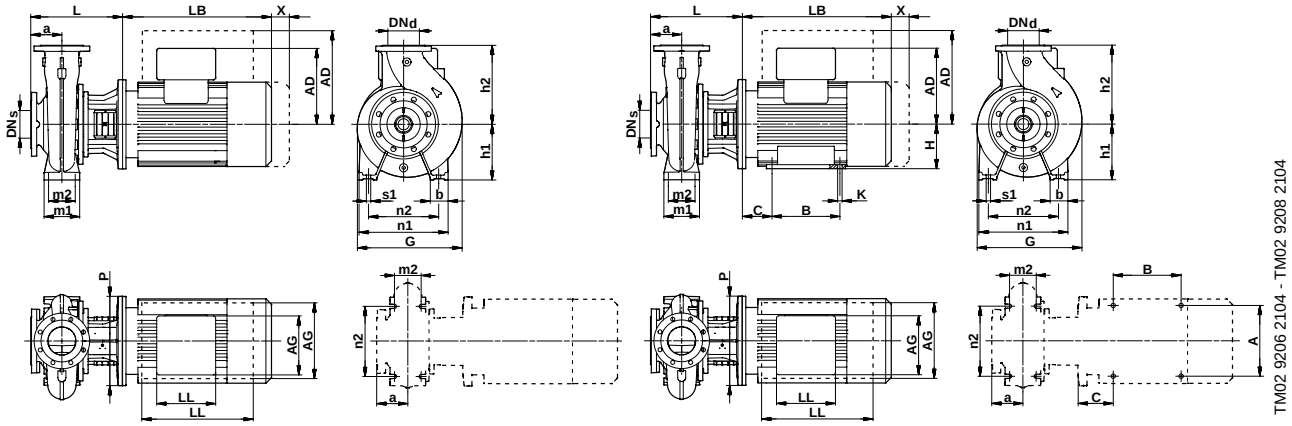
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3296 0606

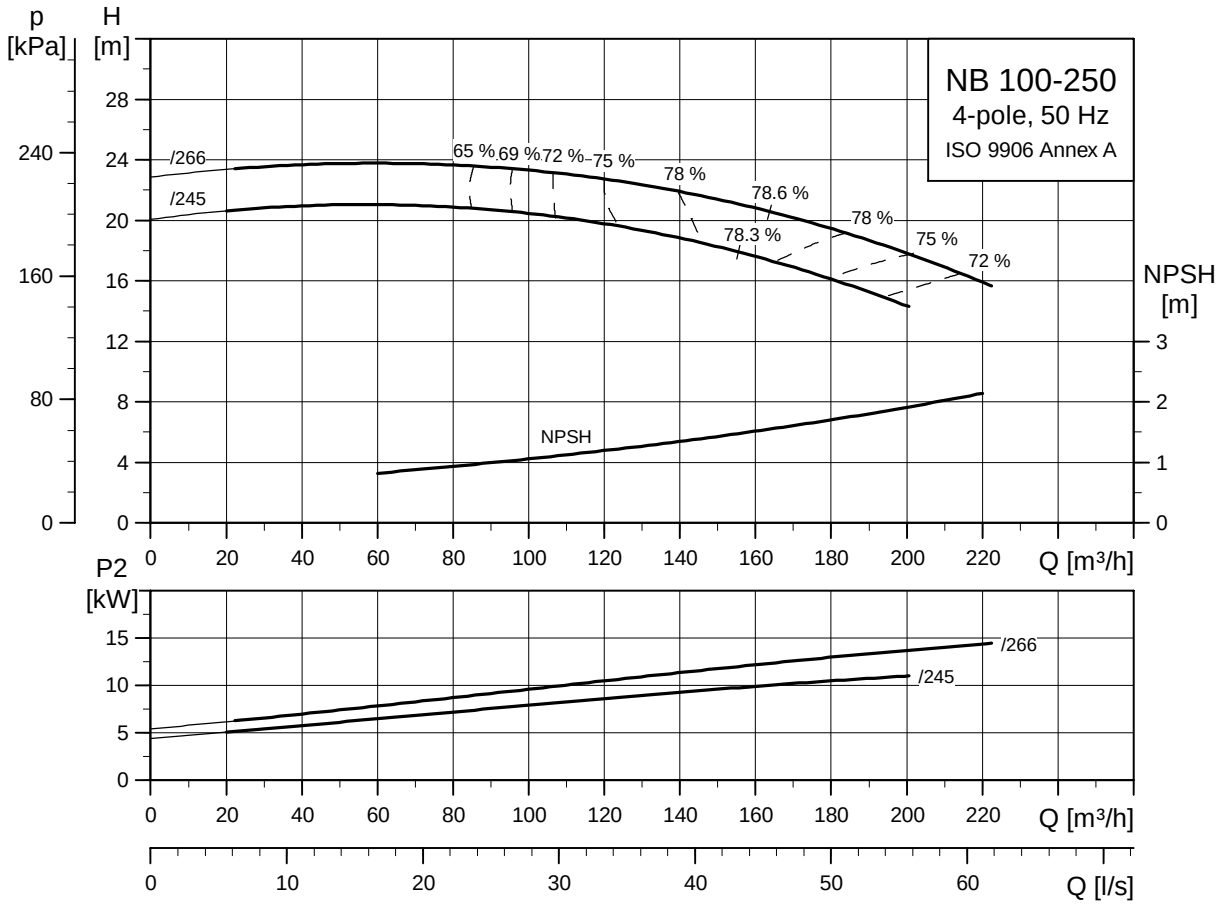
Technical data



NB			NB 100-200/195	NB 100-200/211
NBE			**NBE 100-200/195**	**NBE 100-200/211**
IEC size	NB[1)]		MG 132SC-C/MMG 132S-D	MMG 132SB-E/MMG 132M-D
	NBE		MGE 132SA	MMGE 160M
P2		[kW]	5.5	7.5
Design			A	A/C[3)]
PN		[bar]	PN 16	PN 16
DN_s		[mm]	125	125
DN_d		[mm]	100	100
a		[mm]	125	125
b		[mm]	80	80
B[2)]		[mm]	-	210/210/210
LB[2)]		[mm]	391/370/391	430/408/449
P[2)]		[mm]	300/300/300	300/300/350
C[2)]		[mm]	-	108/108/108
G		[mm]	392	392
H		[mm]	-	160
h1		[mm]	200	200
h2		[mm]	280	280
L		[mm]	368	368
m1		[mm]	160	160
m2		[mm]	120	120
n1		[mm]	360	360
n2		[mm]	280	280
s1		[mm]	M16	M16
A		[mm]	-	254
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	-	15/12/15
AD[2)]		[mm]	134/197/188	213/197/391
AG[2)]		[mm]	201/110/290	160/110/296
LL[2)]		[mm]	103/110/300	126/110/410
X	Motor only	[mm]	80	80
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		122/130/0.498	159/167/0.498
	Premium motor range		133/141/0.498	143/151/0.498
NBE[7)]	E-motor range		128/149/0.680	179/187/0.498

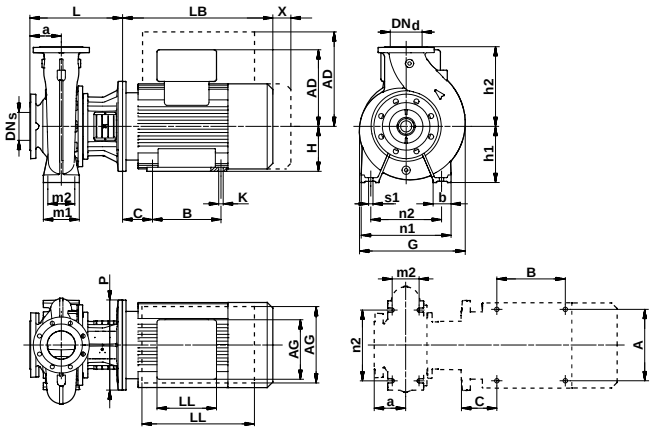
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
3) NB pump is design A; NBE pump is design C.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3297 0606

Technical data

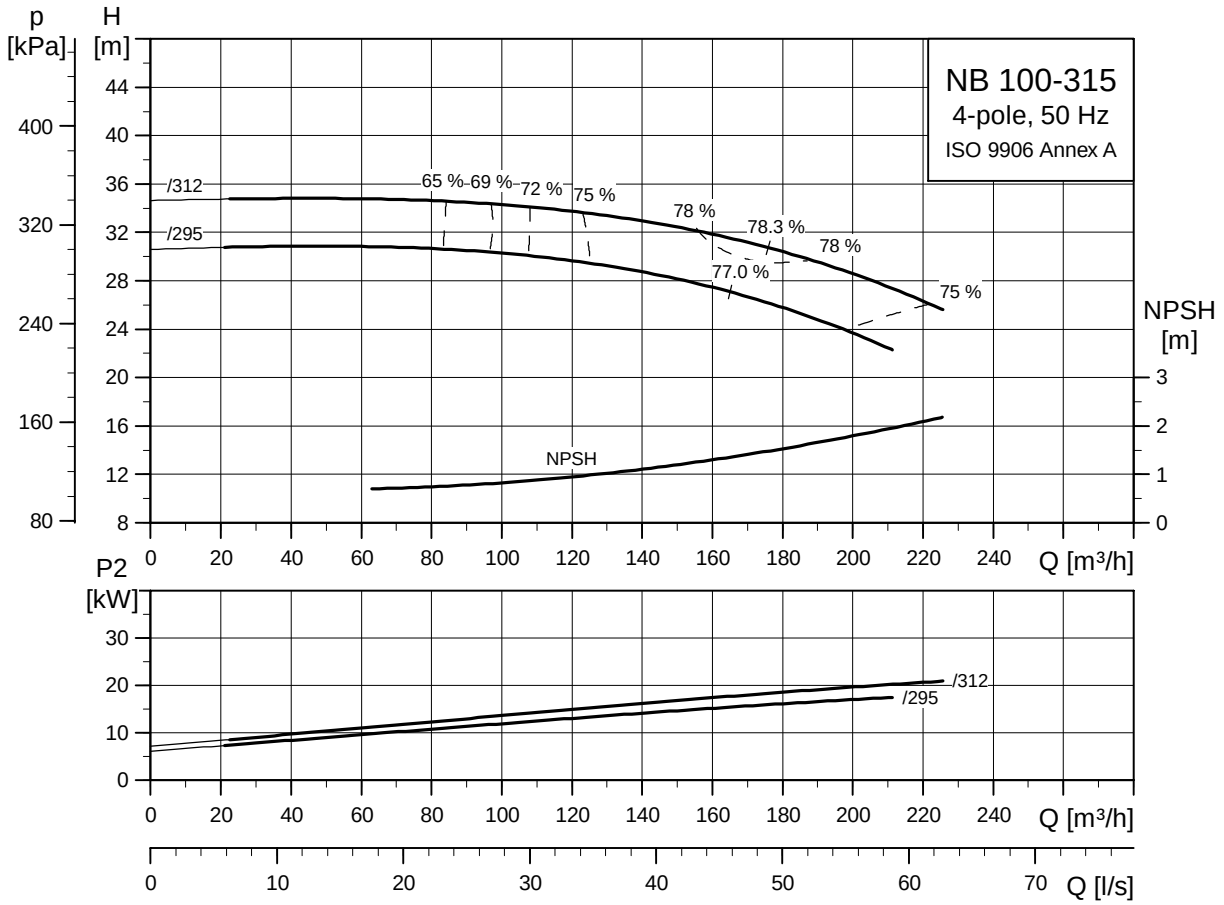


TM02 9208 2104

NB			NB 100-250/245	NB 100-250/266
NBE			**NBE 100-250/245**	**NBE 100-250/266**
IEC size	NB[1)]		MMG 160MA-E/MMG 160M-D	MMG 160L-E/MMG 160L-D
	NBE		MMGE 160M	MMGE 160L
P2		[kW]	11.0	15.0
Design			C	C
PN		[bar]	PN 16	PN 16
DN_s		[mm]	125	125
DN_d		[mm]	100	100
a		[mm]	140	140
b		[mm]	80	80
B[2)]		[mm]	210/210/210	254/254/254
LB[2)]		[mm]	505/503/449	505/547/499
P[2)]		[mm]	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	108/108/108
G		[mm]	424	424
H		[mm]	160	160
h1		[mm]	225	225
h2		[mm]	280	280
L		[mm]	413	413
m1		[mm]	160	160
m2		[mm]	120	120
n1		[mm]	400	400
n2		[mm]	315	315
s1		[mm]	M16	M16
A		[mm]	254	254
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	15/12/15	15/12/15
AD[2)]		[mm]	244/244/391	244/241/418
AG[2)]		[mm]	178/178/296	178/163/296
LL[2)]		[mm]	162/162/410	162/162/410
X	Motor only	[mm]	110	110
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		235/256/0.68	248/269/0.68
	Premium motor range		186/207/0.68	202/223/0.68
NBE[7)]	E-motor range		232/253/0.872	250/271/0.872

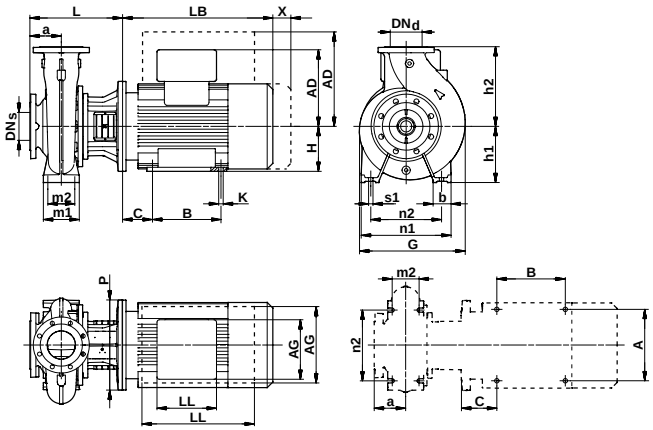
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3298 0606

Technical data

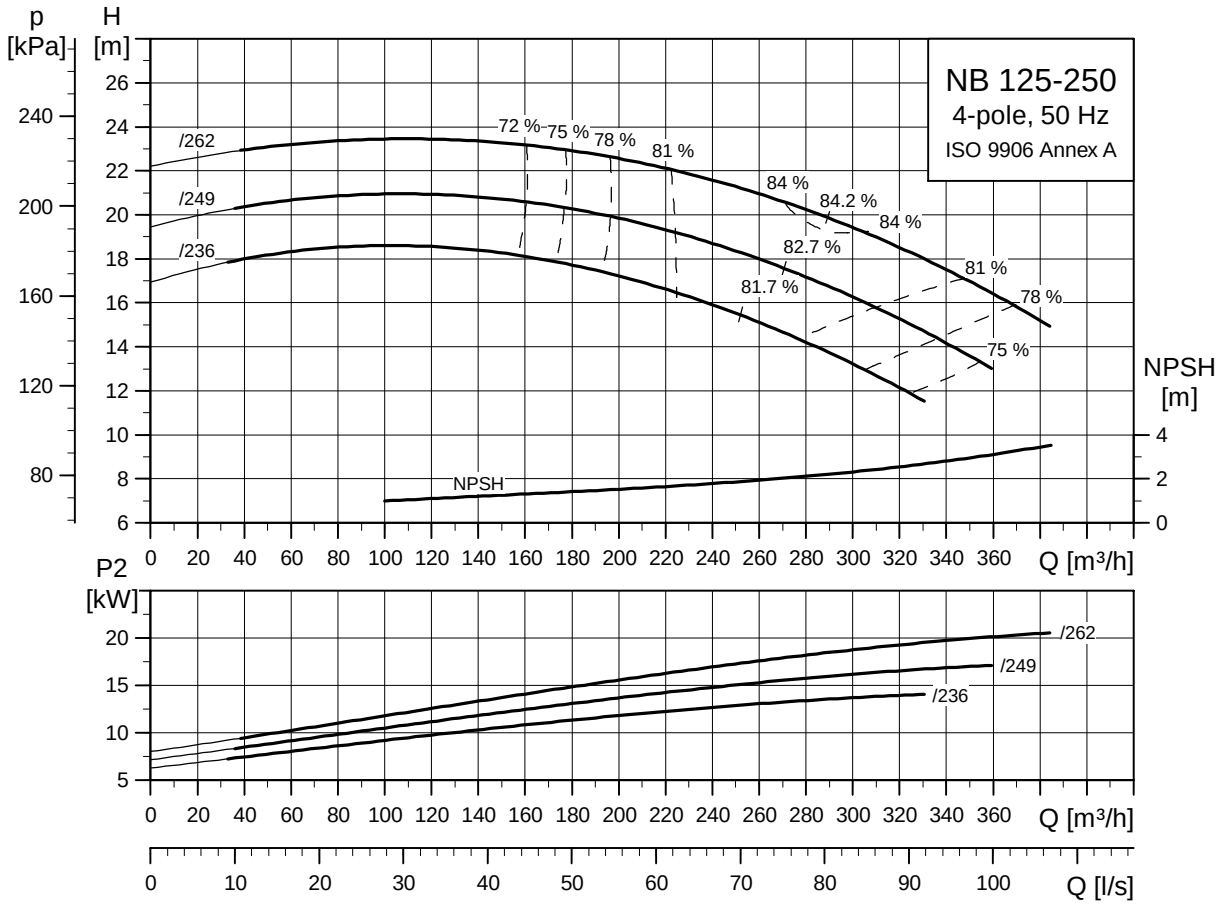


TM02 9208 2104

NB			NB 100-315/295	NB 100-315/312
NBE			**NBE 100-315/295**	**NBE 100-315/312**
IEC size	NB[1)]		MMG 180M-E/MMG 180M-D	MMG 180L-E/MMG 180L-D
	NBE		MMGE 180M	MMGE 180L
P2		[kW]	18.5	22.0
Design			C	C
PN		[bar]	PN 16	PN 16
DN_s		[mm]	125	125
DN_d		[mm]	100	100
a		[mm]	140	140
b		[mm]	80	80
B[2)]		[mm]	241/241/241	279/279/241
LB[2)]		[mm]	590/602/575	630/602/575
P[2)]		[mm]	350/350/350	350/350/350
C[2)]		[mm]	121/121/121	121/121/121
G		[mm]	478	478
H		[mm]	180	180
h1		[mm]	250	250
h2		[mm]	315	315
L		[mm]	413	413
m1		[mm]	160	160
m2		[mm]	120	120
n1		[mm]	400	400
n2		[mm]	315	315
s1		[mm]	M16	M16
A		[mm]	279	279
AA[2)]		[mm]	-	-
AB[2)]		[mm]	-	-
K[2)]		[mm]	15/12/15	15/12/15
AD[2)]		[mm]	272/285/439	272/285/439
AG[2)]		[mm]	150/178/328	150/203/328
LL[2)]		[mm]	186/178/456	181/178/456
X	Motor only	[mm]	110	110
	Motor and motor stool	[mm]	140	140
NB[7)]	Standard motor range		304/325/0.872	332/353/0.872
	Premium motor range		250/271/0.872	260/281/0.872
NBE[7)]	E-motor range		303/324/0.872	337/358/0.872

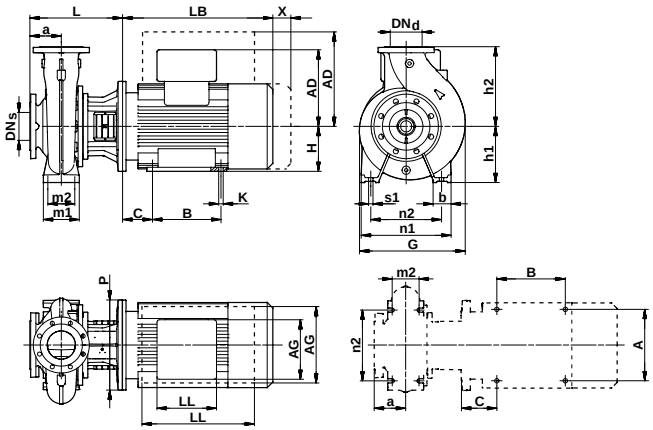
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3299 0606

Technical data



TM02 9208 2104

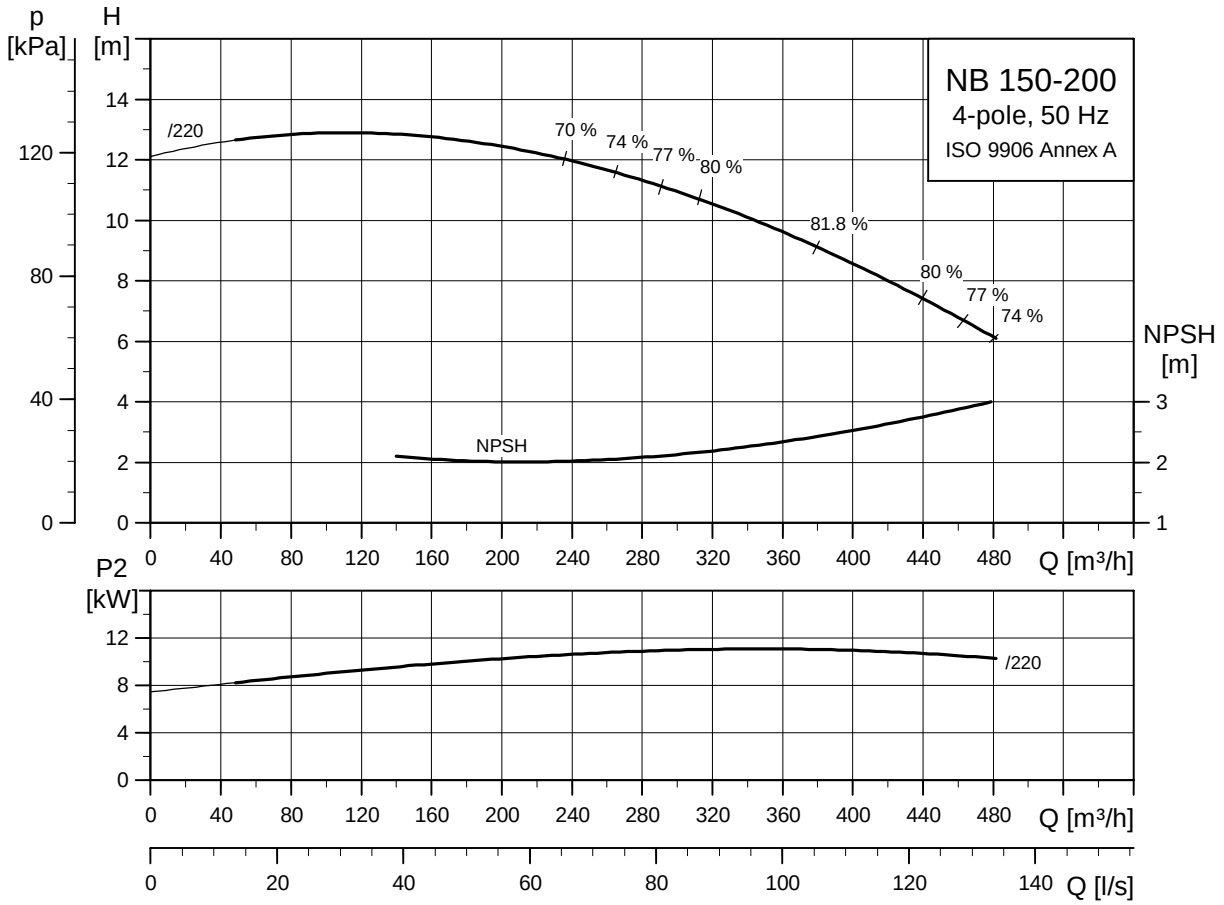
NB			NB 125-250/236	NB 125-250/249	NB 125-250/262
NBE			**NBE 125-250/236**	**NBE 125-250/249**	**NBE 125-250/262**
IEC size	NB[1)]		MMG 160L-E/MMG 160L-D	MMG 180M-E/MMG 180M-D	MMG 180L-E/MMG 180L-D
	NBE		MMGE 160L	MMGE 180M	MMGE 180L
P2		[kW]	15.0	18.5	22.0
Design			C	C	C
PN		[bar]	PN 16	PN 16	PN 16
DN_s		[mm]	150	150	150
DN_d		[mm]	125	125	125
a		[mm]	140	140	140
b		[mm]	80	80	80
B[2)]		[mm]	210/254/254	241/241/241	279/279/241
LB[2)]		[mm]	505/547/499	590/602/499	630/602/575
P[2)]		[mm]	350/350/350	350/350/350	350/350/350
C[2)]		[mm]	108/108/108	121/121/121	121/121/121
G		[mm]	472	472	472
H		[mm]	160	180	180
h1		[mm]	250	250	250
h2		[mm]	355	355	355
L		[mm]	413	413	413
m1		[mm]	160	160	160
m2		[mm]	120	120	120
n1		[mm]	400	400	400
n2		[mm]	315	315	315
s1		[mm]	M16	M16	M16
A		[mm]	254	279	279
AA[2)]		[mm]	-	-	-
AB[2)]		[mm]	-	-	-
K[2)]		[mm]	15/12/15	15/12/15	15/12/15
AD[2)]		[mm]	244/241/418	272/285/414	272/285/439
AG[2)]		[mm]	178/163/296	150/178/328	150/203/328
LL[2)]		[mm]	162/162/410	186/178/456	181/178/456
X	Motor only	[mm]	110	110	110
	Motor and motor stool	[mm]	140	140	140
NB[7)]	Standard motor range		272/293/0.872	308/330/0.872	336/358/0.872
	Premium motor range		226/247/0.872	254/276/0.872	264/286/0.872
NBE[7)]	E-motor range		274/295/0.872	307/329/0.872	341/363/0.872

1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

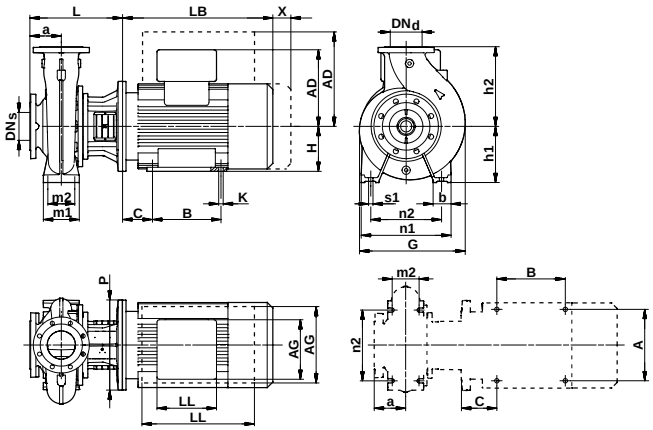
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3300 0606

Technical data

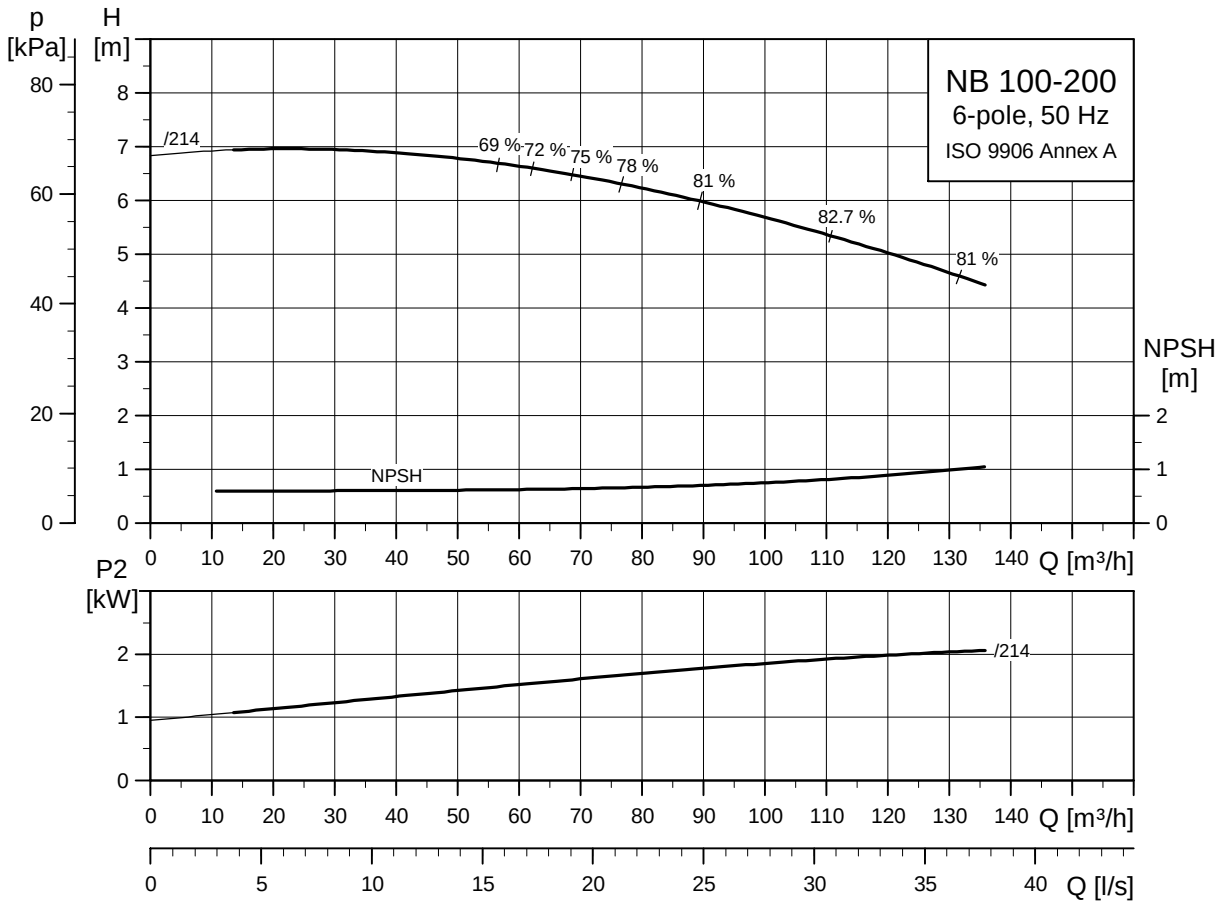


TM02 9208 2104

NB			NB 150-200/220
NBE			NBE 150-200/220
IEC size	NB[1)]		MMG 160MA-E/MMG 160M-D
	NBE		MMGE 160M
P2		[kW]	11.0
Design			C
PN		[bar]	PN 10
DN_s		[mm]	200
DN_d		[mm]	150
a		[mm]	160
b		[mm]	100
B[2)]		[mm]	210/210/210
LB[2)]		[mm]	505/503/449
P[2)]		[mm]	350/350/350
C[2)]		[mm]	108/108/108
G		[mm]	593
H		[mm]	160
h1		[mm]	280
h2		[mm]	400
L		[mm]	433
m1		[mm]	200
m2		[mm]	150
n1		[mm]	550
n2		[mm]	450
s1		[mm]	M20
A		[mm]	254
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	15/12/15
AD[2)]		[mm]	244/244/391
AG[2)]		[mm]	178/178/296
LL[2)]		[mm]	162/162/410
X	Motor only	[mm]	110
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		305/326/0.872
	Premium motor range		256/277/0.872
NBE[7)]	E-motor range		302/323/0.872

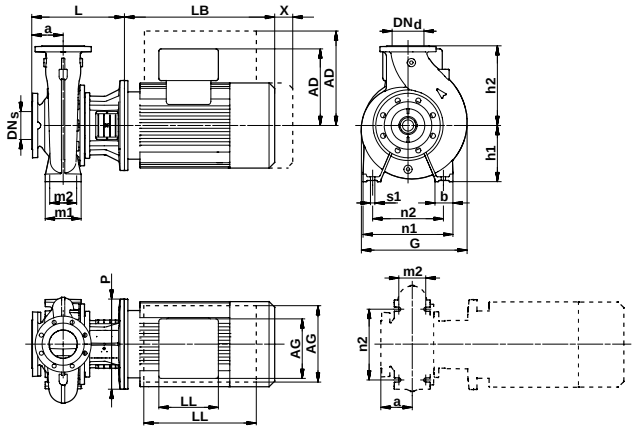
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

NB, NBE 6-pole



TM03 3301 0606

Technical data

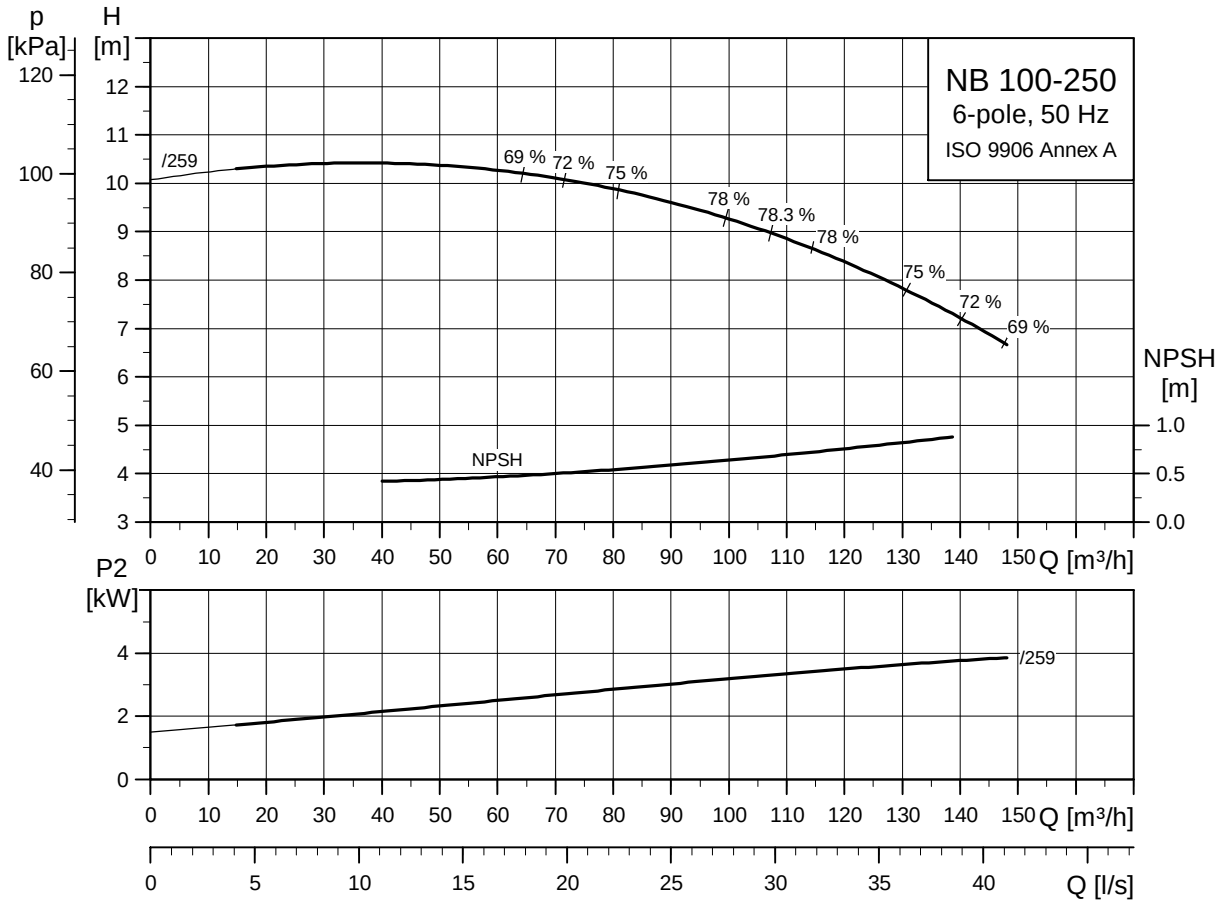


TM02 9206 2104

NB			NB 100-200/214
NBE			**-**
IEC size	NB[1)]		MMG 112M-E/MMG 112M-D
	NBE		-
P2		[kW]	2.2
Design			A
PN		[bar]	PN 16
DN_s		[mm]	125
DN_d		[mm]	100
a		[mm]	125
b		[mm]	80
B[2)]		[mm]	-
LB[2)]		[mm]	340/328/-
P[2)]		[mm]	250/250/-
C[2)]		[mm]	-
G		[mm]	392
H		[mm]	-
h1		[mm]	200
h2		[mm]	280
L		[mm]	352
m1		[mm]	160
m2		[mm]	120
n1		[mm]	360
n2		[mm]	280
s1		[mm]	M16
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	181/145/-
AG[2)]		[mm]	136/110/-
LL[2)]		[mm]	124/108/-
X	Motor only	[mm]	60
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		119/127/0.306
	Premium motor range		100/108/0.306
NBE[7)]	E-motor range		-

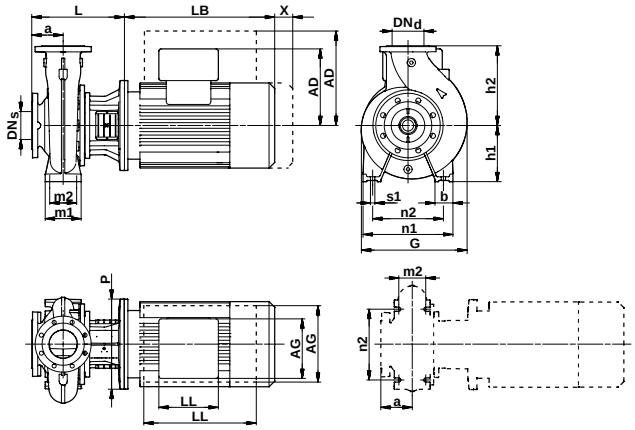
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3302 0606

Technical data

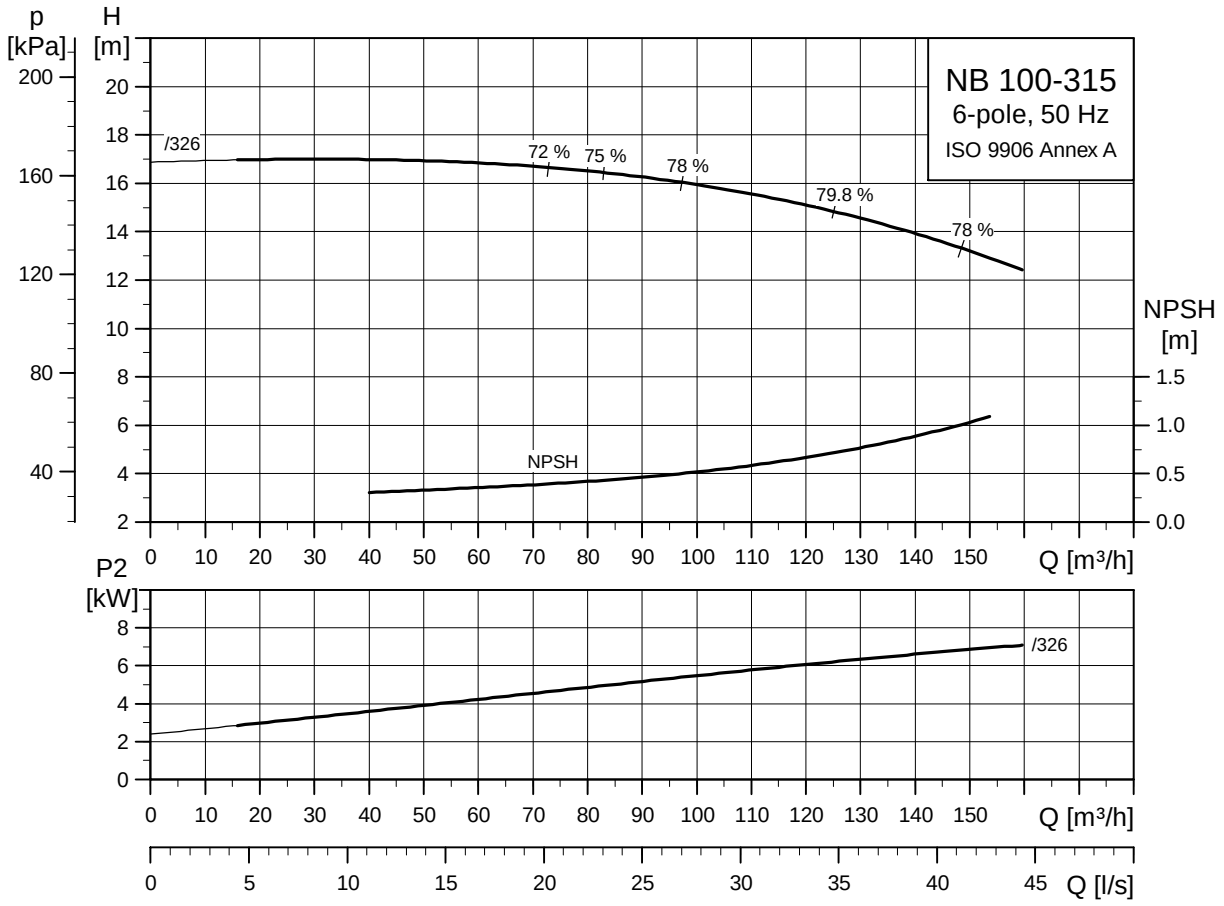


TM02 9206 2104

NB			NB 100-250/259
NBE			-
IEC size	NB[1)]		MMG 132MA-E/MMG132MA-D
	NBE		-
P2		[kW]	4.0
Design			A
PN		[bar]	PN 16
DN_s		[mm]	125
DN_d		[mm]	100
a		[mm]	140
b		[mm]	80
B[2)]		[mm]	-
LB[2)]		[mm]	430/408/-
P[2)]		[mm]	300/300/-
C[2)]		[mm]	-
G		[mm]	424
H		[mm]	-
h1		[mm]	225
h2		[mm]	280
L		[mm]	383
m1		[mm]	160
m2		[mm]	120
n1		[mm]	400
n2		[mm]	315
s1		[mm]	M16
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	213/197/-
AG[2)]		[mm]	160/110/-
LL[2)]		[mm]	126/110/-
X	Motor only	[mm]	80
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		170/179/0.498
	Premium motor range		143/152/0.498
NBE[7)]	E-motor range		-

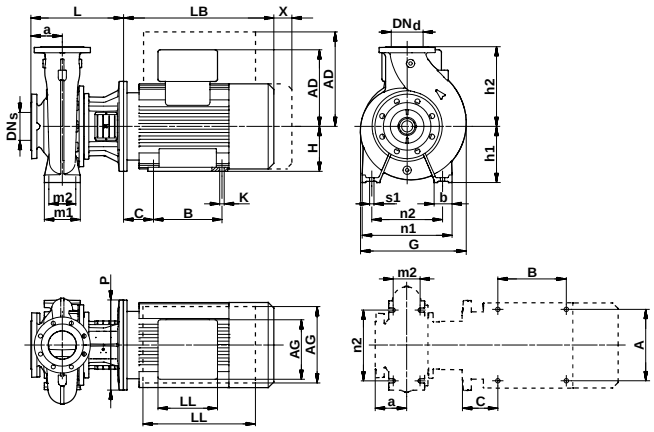
1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3303 0606

Technical data



TM02 9208 2104

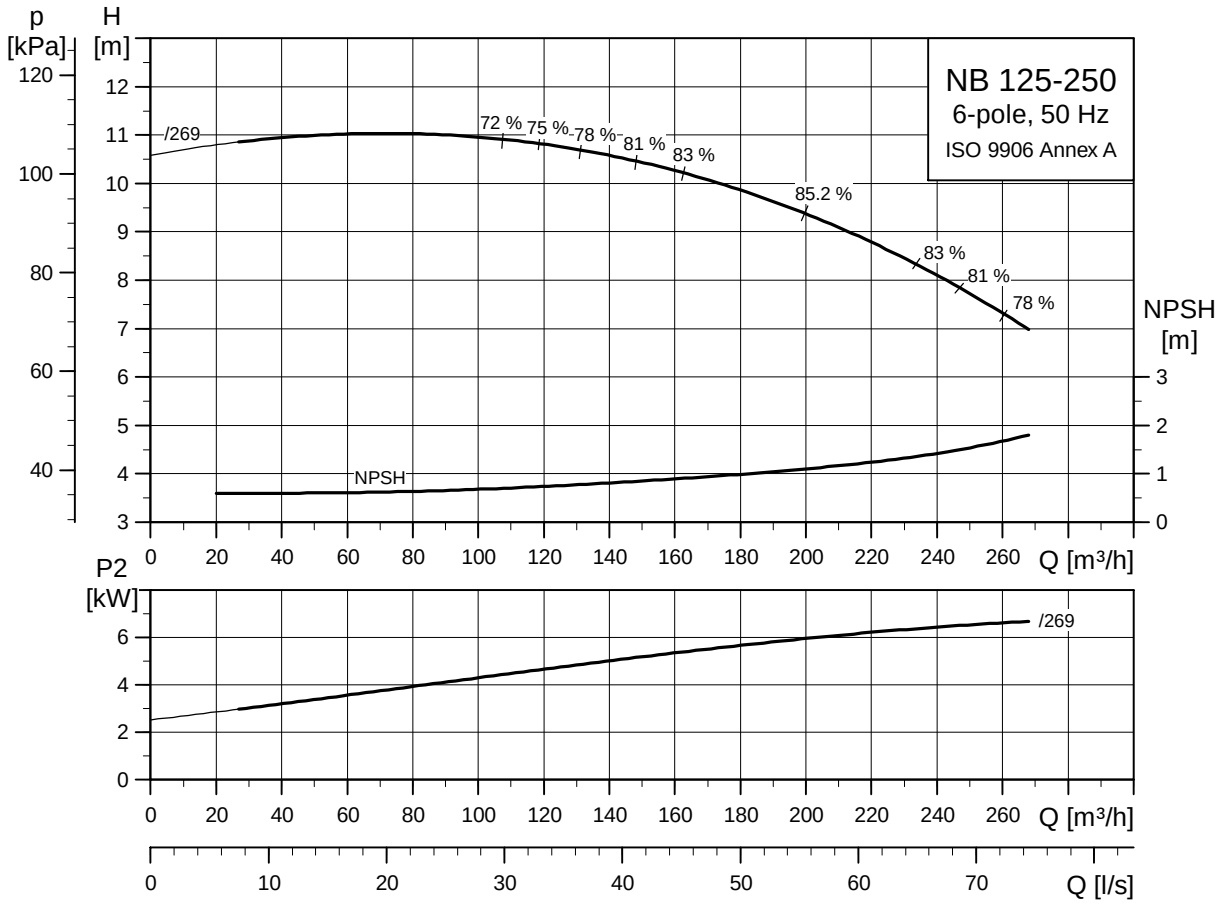
NB			NB 100-315/326
NBE			-
IEC size	NB[1)]		MMG 160M-E/MMG 160M-D
	NBE		-
P2		[kW]	7.5
Design			C
PN		[bar]	PN 16
DN_s		[mm]	125
DN_d		[mm]	100
a		[mm]	140
b		[mm]	80
B[2)]		[mm]	210/210/-
LB[2)]		[mm]	505/503/-
P[2)]		[mm]	350/350/-
C[2)]		[mm]	108/108/-
G		[mm]	478
H		[mm]	160
h1		[mm]	250
h2		[mm]	315
L		[mm]	413
m1		[mm]	160
m2		[mm]	120
n1		[mm]	400
n2		[mm]	315
s1		[mm]	M16
A		[mm]	254
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	15/12/-
AD[2)]		[mm]	244/244/-
AG[2)]		[mm]	178/178/-
LL[2)]		[mm]	162/162/-
X	Motor only	[mm]	110
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		248/269/0.872
	Premium motor range		204/225/0.872
NBE[7)]	E-motor range		-

1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

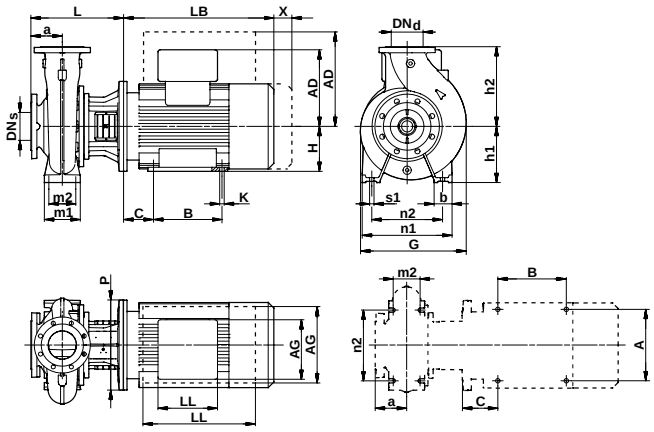
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3304 0606

Technical data



TM02 9208 2104

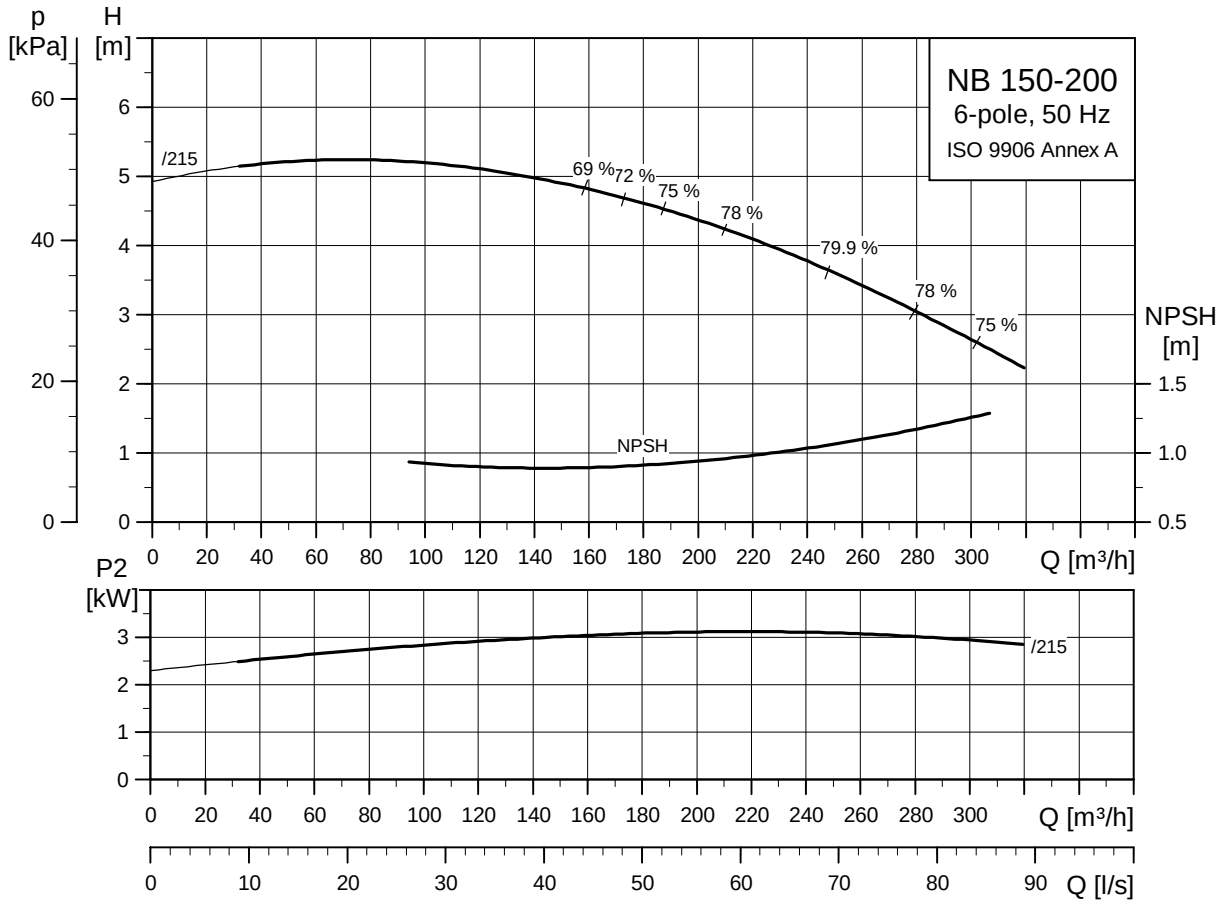
NB			NB 125-250/269
NBE			-
IEC size	NB[1)]		MMG 160M-E/MMG 160M-D
	NBE		-
P2		[kW]	7.5
Design			C
PN		[bar]	PN 16
DN_s		[mm]	150
DN_d		[mm]	125
a		[mm]	140
b		[mm]	80
B[2)]		[mm]	210/210/-
LB[2)]		[mm]	505/503/-
P[2)]		[mm]	350/350/-
C[2)]		[mm]	108/108/-
G		[mm]	473
H		[mm]	160
h1		[mm]	250
h2		[mm]	355
L		[mm]	413
m1		[mm]	160
m2		[mm]	120
n1		[mm]	400
n2		[mm]	315
s1		[mm]	M16
A		[mm]	254
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	15/12/-
AD[2)]		[mm]	244/244/-
AG[2)]		[mm]	178/178/-
LL[2)]		[mm]	162/162/-
X	Motor only	[mm]	110
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		251/272/0.872
	Premium motor range		207/228/0.872
NBE[7)]	E-motor range		-

1) Frame size of standard range motor/premium range motor.

2) Dimension of pump with standard range motor/premium range motor/E-motor range.

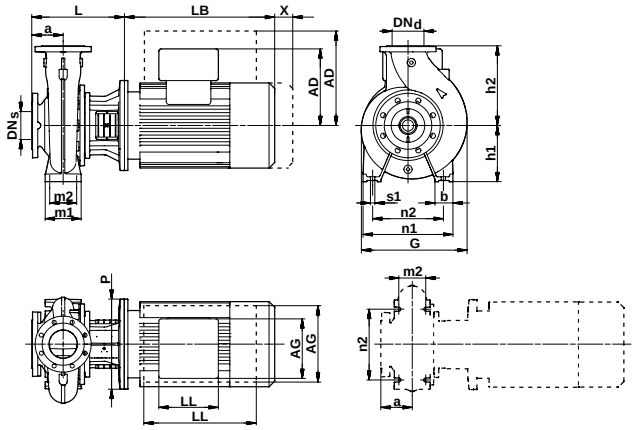
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Performance curves



TM03 3305 0606

Technical data



TM02 9206 2104

NB			NB 150-200/215
NBE			**-**
IEC size	NB[1)]		MMG 132S-E/MMG 132SA-D
	NBE		-
P2		[kW]	3.0
Design			A
PN		[bar]	PN 10
DN_s		[mm]	200
DN_d		[mm]	150
a		[mm]	160
b		[mm]	100
B[2)]		[mm]	-
LB[2)]		[mm]	390/370/-
P[2)]		[mm]	300/300/-
C[2)]		[mm]	-
G		[mm]	593
H		[mm]	-
h1		[mm]	280
h2		[mm]	400
L		[mm]	403
m1		[mm]	200
m2		[mm]	150
n1		[mm]	550
n2		[mm]	450
s1		[mm]	M20
A		[mm]	-
AA[2)]		[mm]	-
AB[2)]		[mm]	-
K[2)]		[mm]	-
AD[2)]		[mm]	213/197/-
AG[2)]		[mm]	160/110/-
LL[2)]		[mm]	126/110/-
X	Motor only	[mm]	80
	Motor and motor stool	[mm]	140
NB[7)]	Standard motor range		230/251/0.872
	Premium motor range		207/228/0.872
NBE[7)]	E-motor range		-

1) Frame size of standard range motor/premium range motor.
2) Dimension of pump with standard range motor/premium range motor/E-motor range.
7) Net weight [kg]/gross weight [kg]/shipping volume [m^3].

Support blocks

Steel support blocks are used to compensate for dimensional differences between pump housing and motor frame sizes. The support blocks can be fitted under the motor or pump housing feet during installation thus enabling horizontal alignment of the pump.

The product numbers in the tables below refer to a set of two support blocks with the dimensions specified.

Hexagon head bolts, washers and nuts are supplied together with support blocks higher than 20 mm.

NB, NBE 50 Hz, 2-pole

Pump type	P_2 [kW]	Dimensions W x L x H [mm]	Support-blocks	Product number
NB(E) 32-125	3.0	50 x 100 x 20	●●	96434610
NB(E) 32-160	5.5			
NB(E) 40-125/130	3.0			
NB(E) 40-125/139	4.0			
NB(E) 40-160/158	5.5			
NB(E) 40-160/172	7.5			
NB(E) 40-200/210	11	70 x 332 x 20	●	96434611
NB(E) 40-250/230	15			
NB(E) 40-250/245	18.5			
NB(E) 50-125/135	5.5	50 x 100 x 20	●●	96434610
NB(E) 50-125/144	7.5			
NB(E) 50-160/169	11	70 x 332 x 20	●	96434611
NB(E) 50-200/200	15			
NB(E) 50-200/210	18.5			
NB(E) 65-160/157	11			
NB(E) 65-160/173	15			
NB(E) 65-200/190	18.5			
NB(E) 80-160/147	11			
NB(E) 80-160/153	15			
NB(E) 80-160/163	18.5			
NB 80-200/190	30	70 x 125 x 20	●●	96434612

● Support blocks to be fitted under motor feet.
●● Support blocks to be fitted under pump housing feet.

NB, NBE 50 Hz, 4-pole

Pump type	P_2 [kW]	Dimensions W x L x H [mm]	Support blocks	Product number
NBE 65-315/279	7.5	90 x 335 x 65	●	96434605
NB(E) 65-315/309	11			
NBE 80-250/240	7.5	80 x 332 x 40	●	96434609
NB(E) 80-250/270	11			
NB(E) 80-315/305	15	90 x 335 x 90	●	96434606
NB(E) 80-315/320	18.5	100 x 320 x 70	●	96434607
NB(E) 80-315/334	22			
NBE 100-200/214	7.5	80 x 332 x 40	●	96434609
NB(E) 100-250/250	11	90 x 335 x 65	●	96434605
NB(E) 100-250/270	15			
NB(E) 100-315/300	18.5	100 x 320 x 70	●	96434607
NB(E) 100-315/316	22			
NB(E) 125-250/243	15	90 x 335 x 90	●	96434606
NB(E) 125-250/256	18.5	100 x 320 x 70	●	96434607
NB(E) 125-250/266	22			
NB(E) 150-200/218	11	80 x 290 x 120	●	96434608

● Support blocks to be fitted under motor feet.
●● Support blocks to be fitted under pump housing feet.

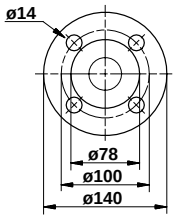
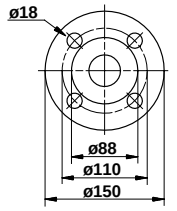
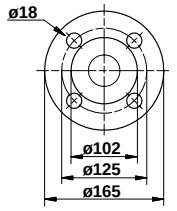
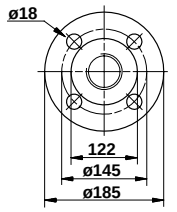
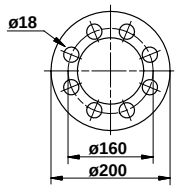
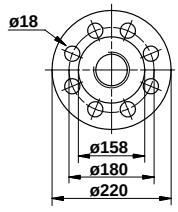
NB 50 Hz, 6-pole

Pump type	P_2 [kW]	Dimensions W x L x H [mm]	Support blocks	Product number
NB 100-315/316	7.5	90 x 335 x 90	●	96434606
NB 125-250/266				

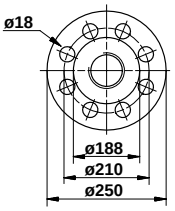
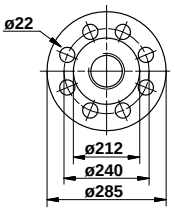
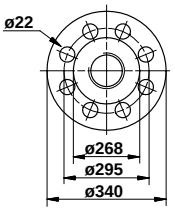
● Support blocks to be fitted under motor feet.
●● Support blocks to be fitted under pump housing feet.

Counter flanges

Counter flange kits consist of one steel flange, one gasket of asbestos-free material, and the requisite number of screws.

Counter flange	Flange size	Description	Rated pressure	Pipework connection	Product number
 TM00 3801 1904	DN 32	Threaded	16 bar, EN 1092-2	Rp 1¼	419901
		For welding	16 bar, EN 1092-2	32 mm	419902
 TM02 7204 2803	DN40	Threaded	16 bar, EN 1092-2	Rp 1½	429902
		For welding	16 bar, EN 1092-2	40 mm	429901
 TM00 3803 1094	DN 50	Threaded	16 bar, EN 1092-2	Rp 2	339903
 TM02 9638 2598	DN 65	Threaded	16 bar, EN 1092-2	Rp 2½	349902
		For welding	16 bar, EN 1092-2	65 mm	349904
 TM01 2162 3498	DN 80	Threaded	16 bar, EN 1092-2	Rp 3	350540
		For welding	16 bar, EN 1092-2	80 mm	350541
 TM02 9639 3604	DN 100	Threaded	16 bar, EN 1092-2	Rp 4	369901
		For welding	16 bar, EN 1092-2	100 mm	369902

Accessories

Counter flange		Flange size	Description	Rated pressure	Pipework connection	Product number
	TM02 9640 3604	DN 125	For welding	16 bar, EN 1092-2	125 mm	96414677
	TM02 9641 3604	DN 150	For welding	16 bar, EN 1092-2	150 mm	96414676
	TM02 9642 3604	DN 200	For welding	10 bar, EN 1092-2	200 mm	96413358

Sensors

Accessory	Type	Supplier	Measuring range	Product number
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	1 - 5 m^3/h (DN 25)	ID8285
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	3 - 10 m^3/h (DN 40)	ID8286
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	6 - 30 m^3/h (DN 65)	ID8287
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	20 - 75 m^3/h (DN 100)	ID8288
Temperature sensor	TTA (0) 25	Carlo Gavazzi	0°C to +25°C	96432591
Temperature sensor	TTA (-25) 25	Carlo Gavazzi	–25°C to +25°C	96430194
Temperature sensor	TTA (50) 100	Carlo Gavazzi	50°C to +100°C	96432592
Temperature sensor	TTA (0) 150	Carlo Gavazzi	0°C to +150°C	96430195
Accessory for temperature sensor. All with ½ RG connection.	Protecting tube ø9 x 50 mm	Carlo Gavazzi		96430201
	Protecting tube ø9 x 100 mm	Carlo Gavazzi		96430202
	Cutting ring bush	Carlo Gavazzi		96430203
Temperature sensor, ambient temperature	WR 52	tmg (DK: Plesner)	–50°C to +50°C	ID8295
Differential temperature sensor	ETSD	Honsberg	0°C to +20°C	96409362
Differential temperature sensor	ETSD	Honsberg	0°C to +50°C	96409363

Note: All sensors have 4-20 mA output signal.

Sensors for boosting applications

Danfoss pressure sensor kit	Pressure range	Product number
• Connection: G ½ A (DIN 16288 - B6kt) • Electrical connection: plug (DIN 43650)	0 - 2.5 bar	96478188
	0 - 4 bar	91072075
	0 - 6 bar	91072076
	0 - 10 bar	91072077
	0 - 16 bar	91072078
• Pressure sensor type MBS 3000, with 2 m screened cable Connection: G ¼ A (DIN 16288 - B6kt) • 5 cable clips (black) • Fitting instructions PT (00400212)	0 - 2.5 bar	405159
	0 - 4 bar	405160
	0 - 6 bar	405161
	0 - 10 bar	405162
	0 - 16 bar	405163

Sensors for circulation applications

Grundfos differential pressure sensor, DPI	Pressure range	Product number
	0 - 0.6 bar	96611522
• 1 sensor incl. 0.9 m screened cable (7/16" connections) • 1 original DPI bracket (for wall mounting) • 1 Grundfos bracket (for mounting on motor) • 2 M4 screws for mounting of sensor on bracket • 1 M6 screw (self-cutting) for mounting on MGE 90/100 • 1 M8 screw (self-cutting) for mounting on MGE 112/132 • 3 capillary tubes (short/long) • 2 fittings (1/4" - 7/16") • 5 cable clips (black) • Installation and operating instructions • Service kit instruction	0 - 1.0 bar	96611523
	0 - 1.6 bar	96611524
	0 - 2.5 bar	96611525
	0 - 4.0 bar	96611526
	0 - 6.0 bar	96611527
	0 - 10 bar	96611550

Select the differential pressure sensor so that the maximum pressure of the sensor is higher than the maximum differential pressure of the pump.

Potentiometer

Potentiometer for setpoint setting and start/stop of the pump.

Product	Product number
External potentiometer with cabinet for wall mounting.	625468

R100

R100 is used for wireless communication.

The communication takes place by means of infrared light.

Product	Product number
R100	625333

G10-LON interface

The G10-LON interface is used for data transmission between a Locally Operating Network (LON) and electronically controlled Grundfos pumps applying the Grundfos bus-protocol GENIbus.

Product	Product number
G10-LON interface	00605726

EMC-filter

EMC-filter is required for installation of pumps of 5.5 kW and higher in residential areas.

Product	Product number
EMC-filter (7.5-22 kW 4 pole, 11-22 kW 2-pole)	96478309

96495310 0406	**GB**
Repl. 96495310 1005	

Subject to alterations.

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