

Close Coupled Centrifugal Pumps

NMM SERIES (60 Hz.)



TECHNICAL MANUAL



Mas Grup



NMM Series

Close Coupled Centrifugal Pump

General Information



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Fields of Application

- Water supply and booster stations.
- Irrigation, overhead irrigation and draining.
- Filling and emptying of tanks and containers.
- Circulating of hot and cold water in central heating and air-conditioning installations.
- Pumping of condensate.
- Water circulating for swimming pools.
- Sanitary and cleaning installations.
- For industrial applications and public services.
- Fresh water supply on ships.

Pumped Liquids

Thin, clean, non-aggressive and non-explosive liquids free from large solid particles or fibres.

For special applications, please consult to MAS DAF MAKINA SAN. A.Ş.

Design

- NMM series pumps are volute casing, single stage, end suction, close-coupled centrifugal pumps with closed impeller and mechanical seal.
- Main dimensions and the nominal flow rates of the pumps comply with the DIN 24 255 and EN 733 standards.
- Pump flanges sizes according to ISO 7005-2, DIN 2533 and PN 16.
- Single entry, closed impeller is hydraulically thrust compensated and dynamically balanced.
- A drain plug is fitted in the bottom of pump housing.
- Pump and motor are separate components. Motor shaft is passed into the pump shaft for coupling. After a certain motor power, a coupling system is used between the motor shaft and pump shaft.
- Maintenance is very much easier, the impeller shaft and other rotating parts being removable with no need to disconnect the suction and delivery pipes, due to back pull-out design.
- Maximum interchangeability of components, identical parts can be used along various pumps of the NMM series, which greatly simplifies and reduces stock of spare parts in addition to reduced delivery times.
- Single-stage centrifugal pump coupled by means of a support, to a standard asynchronous motor, closed type, with external ventilation.
- NMM series are fitted with mechanical shaft seal and pump shaft is supported by motor bearings.

Shaft Seal

Single mechanical seal, flushed by pumped liquid, uncooled, unbalanced, heavy duty and rubber bellows mechanical seals are used for sealing.

On the series production, BURGMANN MG1 type mech. seals are used for operation pressures up to 10 bar and for clean, non-aggressive liquids. Different types are available for harder operation conditions. Please refer to MAS DAF MAKINA SAN. A.Ş.

Technical Data

- Suction Flange : DN 50... DN 150
- Discharge Flange : DN 32...DN 125
- Operating Pressure : 10 Bar
- Casing Test Pressure : 13 Bar
- Operating Temperature : -25 – 120°C
- Impeller Diameter \varnothing : 123...428 mm \varnothing
- Speed Range : 1450 – 3600 RPM
- Capacity Range : 5 – 400 m³ / h
- Head Range : 4 - 110 m

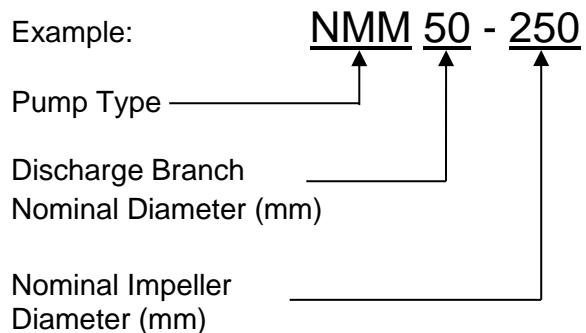
Flanges

- Discharge Flanges : DIN 2533 – PN 16
- Suction Flanges : DIN 2533 – PN 16

Driver

B5 flanged, IP 55 and according to IEC electric motors are used for NMM series pumps. 50 Hz and 60 Hz can be used.

Identification Code



NMM Series

Close Coupled Centrifugal Pump

ATEX Description



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ATEX Codification

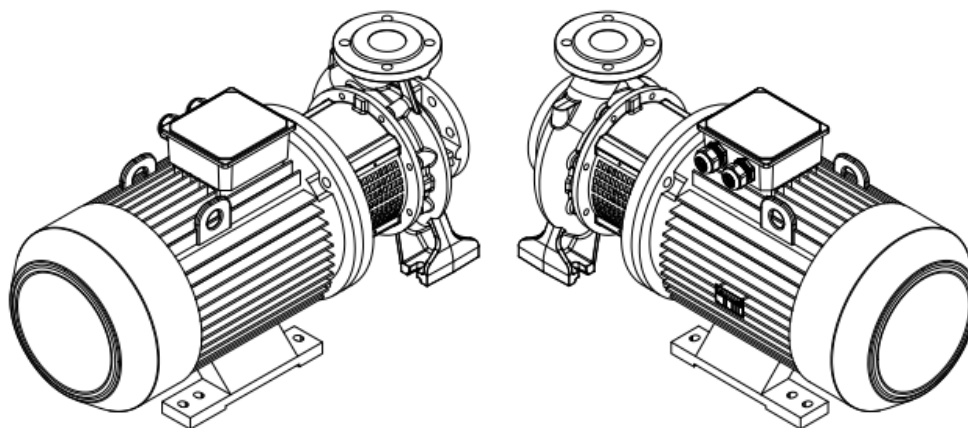
ATEX -95

Ex /D c Tx (85 °C – 200 °C)

Equipment Groups (Annex I of Directive 94/9/EC)							
Group I (mines, mine gas and dust)		Group II (other explosive atmospheres gas/dust)					
Category M 1	Category M 2	Category 1		Category 2		Category 3	
		G (gas) (Zone 0)	D (dust) (Zone 20)	G (gas) (Zone 1)	D (dust) (Zone 21)	G (gas) (Zone 2)	D (dust) (Zone 22)
For equipment providing a very high level of protection when endangered by an explosive atmosphere	For equipment providing a high level of protection when likely to be endangered by an explosive atmosphere	For equipment providing a very high level of protection when used in areas where an explosive atmosphere is very likely to occur		For equipment providing a high level of protection when used in areas where an explosive atmosphere is likely to occur		For equipment providing a normal level of protection when used in areas where an explosive atmosphere is less likely to occur	

TEMPERATURE CLASS		
Temperature class required by the area classification	Ignition temperature of gas or vapor	Allowable temperature classes of equipment
T1	> 450 °C	T1 - T6
T2	> 300 °C	T2 - T6
T3	> 200 °C	T3 - T6
T4	> 135 °C	T4 - T6
T5	> 100 °C	T5 - T6
T6	> 85 °C	T6

Code	Description
II	The Usage in other non-mining explosive atmospheres
2	2. Category: High level of protection
G	For potentially explosive environments due to gases or vapors
T	Temperature class
X	ATEX Marking of the motor manufacturer



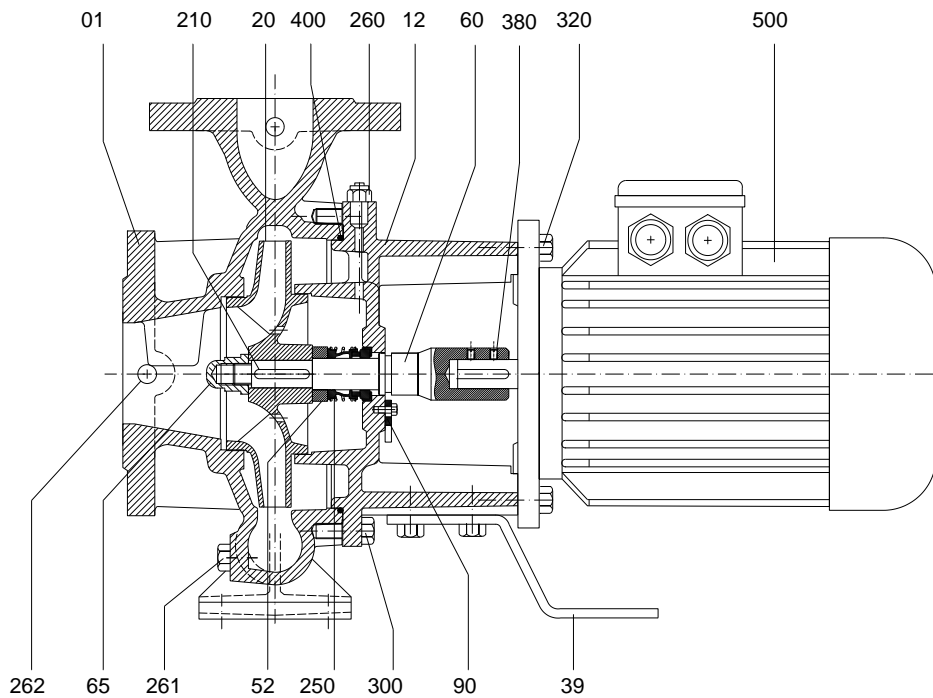
NMM Series

Close Coupled Centrifugal Pump

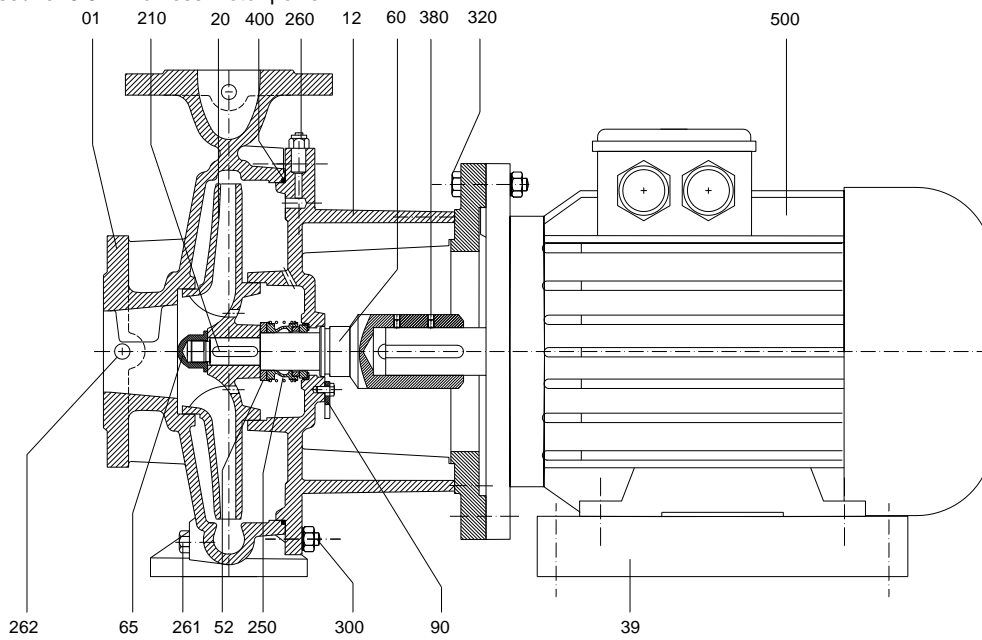
Cross-Sectional View and Part List (Without Coupling)



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Note: This system is used for 5.5 kW or less motor power.



Note: This system is used for motor power above 5.5 kW.

PART NO	PART NAME	PART NO	PART NAME
01	Pump Casing	250	Mechanical Seal
12	Adapter	260	Plug
20	Impeller	261	Drain Plug
39	Supporting Foot	262	Plug (Casing)
52	Mechanical Seal Sleeve	300	Stud, Casing
60	Pump Shaft	320	Hexagonal Bolt
65	Impeller Nut	380	Setscrew
90	Shaft Fixing Device	400	O-Ring
210	Impeller Key	500	Motor

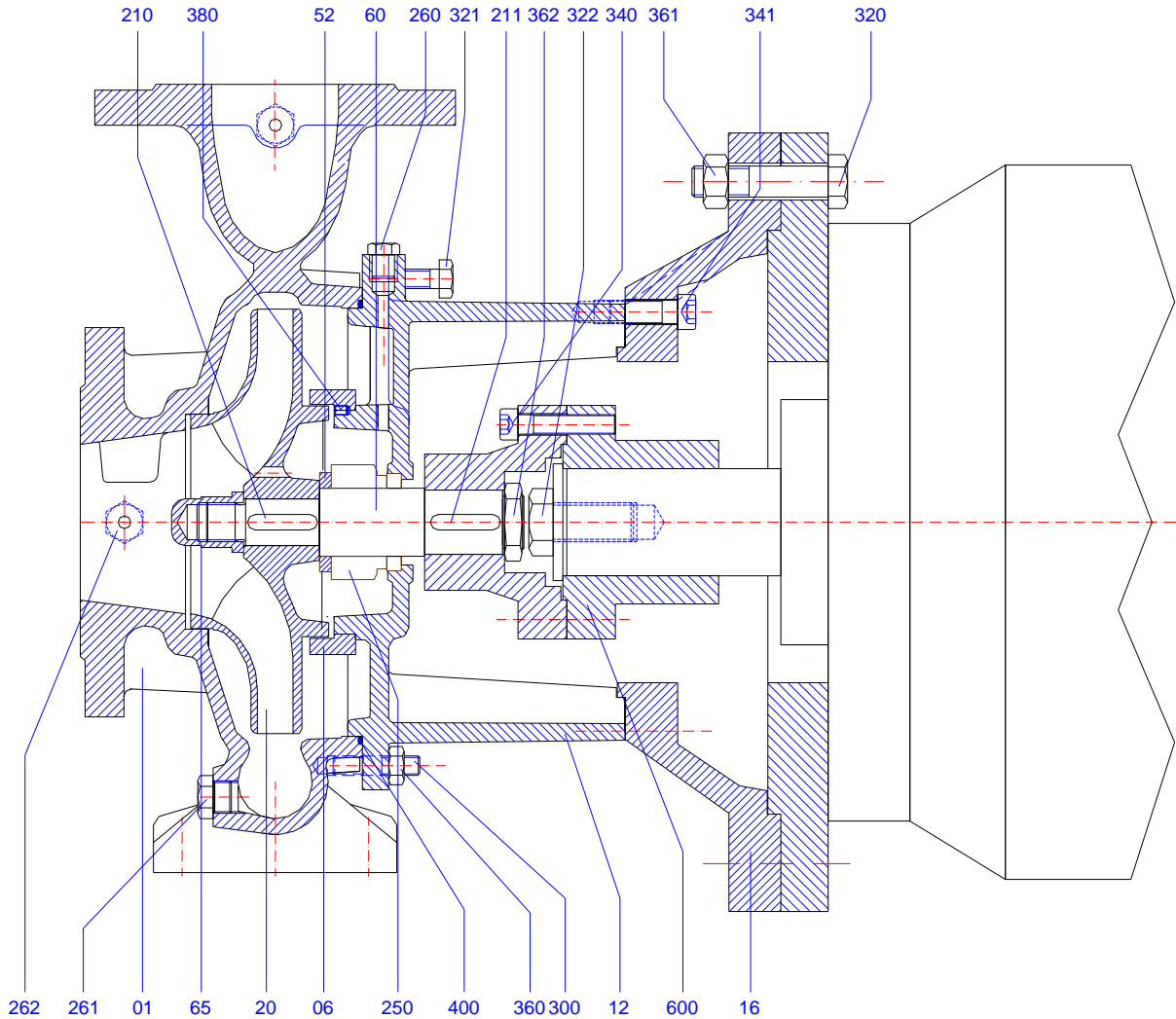
NMM Series

Close Coupled Centrifugal Pump

Cross-Sectional View and Part List (With Coupling)



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PART NO	PART NAME	PART NO	PART NAME
01	Pump Casing	262	Plug, Pump Casing
06	Wearing Ring	300	Stud, Pump Casing
12	Adapter	320	Hexagonal Bolt
16	Motor Flange	321	Hexagonal Bolt
20	Impeller	322	Hexagonal Bolt
52	Mech. Seal Ring	340	Imbus Bolt
60	Pump Shaft	341	Imbus Bolt
65	Impeller Nut	360	Nut
210	Impeller Key	361	Nut
211	Coupling Key	362	Nut
250	Mechanical Seal	380	Setscrew
260	Plug	400	O-Ring
261	Drain Plug	600	Coupling

Note: This coupling system is applied with a motor power 37 KW and over.

NMM Series

Close Coupled Centrifugal Pump

Technical Data



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Material Options

Components	Material. No						
		0.6025	0.7040	2.1050.01	1.4021	1.4301	1.4401
Pump Casing		●	○	○		○	○
Impeller		●	○	○		○	○
Wearing Ring		○	●	○		○	○
Shaft					●	○	○
Adapter		●	○	○		○	○
Adapter (Motor)		●	○				

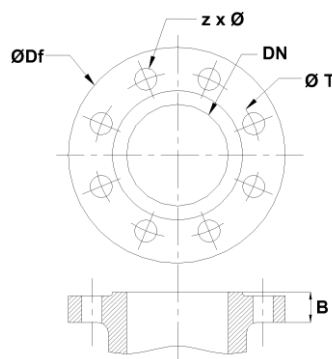
● - Standard Manufacturing
○ - Optional

Material Equivalent

Description	DIN 17007	EN-DIN	ASTM
Cast Iron	0.6025	GJL-250 (GG25)	A 48 Class 40-B
Nodular Cast Iron	0.7040	GJS-400-15 (GGG40)	A 536 Gr.60-40-18
Cast Bronze	2.1050.01	G-Cu Sn 10	B 584 C 90700
Chrome Steel	1.4021	X20 Cr 13	A 276 Type 420
Chrome Nickel Steel	1.4301	X5 Cr Ni 18.9	A 276 Type 304
Chrome Nickel Molybdenum Steel	1.4401	X5 Cr Ni Mo 18.10	A 276 Type 316

Flange Dimensions

Suction and Discharge Flange Dimensions								
DNs DNd	PN	ØD	Øk	Ød4	Ød2	b	f	Number of holes
32	16	140	100	78	18	18	2	4
40		150	110	88	18	18	3	4
50		165	125	102	18	20	3	4
65		185	145	122	18	20	3	4
80		200	160	138	18	22	3	8
100		220	180	158	18	24	3	8
125		250	210	188	18	26	3	8
150		285	240	212	22	26	3	8



No	Pump Type	Flange			
		DNs (mm) Suction		DNs (mm) Discharge	
1	32-160	50	PN 16	32	PN 16
2	32-200				
3	32-250				
4	40-160	65	PN 16	40	PN 16
5	40-200				
6	40-250				
7	50-160	65	PN 16	50	PN 16
8	50-200				
9	50-250				
10	50-315	80	PN 16	65	PN 16
11	65-160				
12	65-200				
13	65-250				
14	65-315				
15	65-400	100			

No	Pump Type	Flange			
		DNs (mm) Suction		DNs (mm) Discharge	
16	80-160	100	PN 16	80	PN 16
17	80-200				
18	80-250				
19	80-315				
20	80-400				
21	100-160	125	PN 16	100	PN 16
22	100-200				
23	100-250				
24	100-315				
25	100-400				
26	125-200	150	PN 16	125	PN 16
27	125-250				
28	125-315				
29	125-400				

NMM Series

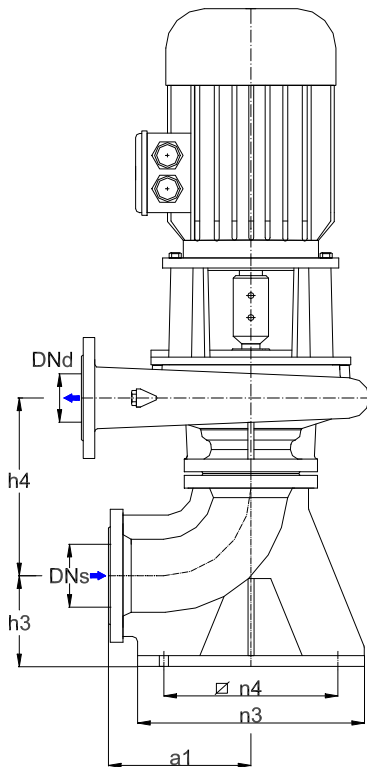
Close Coupled Centrifugal Pump

Technical Data



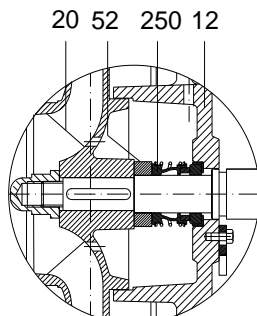
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Elbow Flange Dimensions for Vertical NMM Pumps



Pump Type	DNs	DNd	a1	n3	n4	h3	h4
NMM 32-160	50	32	140	200	150	90	170
NMM 32-200			140	200	150	90	170
NMM 32-250			140	200	150	90	190
NMM 40-160	65	40	160	235	180	105	185
NMM 40-200			160	235	180	105	205
NMM 40-250			160	235	180	105	205
NMM 50-160	65	50	160	235	180	105	205
NMM 50-200			160	235	180	105	205
NMM 50-250			160	235	180	105	185
NMM 50-315	80		190	290	215	115	230
NMM 65-160	80	65	190	290	215	115	230
NMM 65-200			190	290	215	115	230
NMM 65-250			190	290	215	115	230
NMM 65-315			190	290	215	115	255
NMM 65-400	100		225	360	375	145	285
NMM 80-160	100	80	225	360	275	145	285
NMM 80-200			225	360	275	145	285
NMM 80-250			225	360	275	145	285
NMM 80-315			225	360	275	145	285
NMM 80-400			225	360	275	145	285
NMM 100-160	125	100					
NMM 100-200			280	450	350	180	325
NMM 100-250			280	450	350	180	340
NMM 100-315			280	450	350	180	340
NMM 100-400	280	450	350	180	340		
NMM 125-200	150	125	315	500	400	200	380
NMM 125-250			315	500	400	200	380
NMM 125-315			315	500	400	200	380
NMM 125-400			315	500	400	200	380

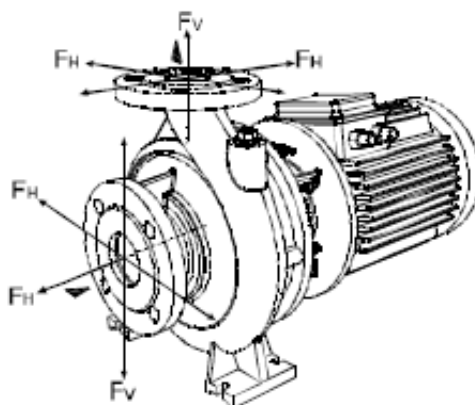
Mechanical Seal Application



Part No	PartName
12	Adapter
20	Impeller
52	Mech. Seal Sleeve
250	Mechanical Seal

Burgmann MG1-G60 – Up to 12 Bar
(Independent of direction of rotation)

Permissible Forces and Moments at the Pump Flanges



The following condition must be satisfied;

$$\left[\frac{\sum(F_V)}{F_{V \max}} \right]^2 + \left[\frac{\sum(F_H)}{F_{H \max}} \right]^2 + \left[\frac{\sum(M_t)}{M_{t \max}} \right]^2 \leq 1$$

$\sum(F_V)$, $\sum(F_H)$ and $\sum(M_t)$ are the sums of the absolute amounts of the corresponding loads applied to the supports.

Neither the direction of the loads nor their distributions across the supports are taken into account in these sums.

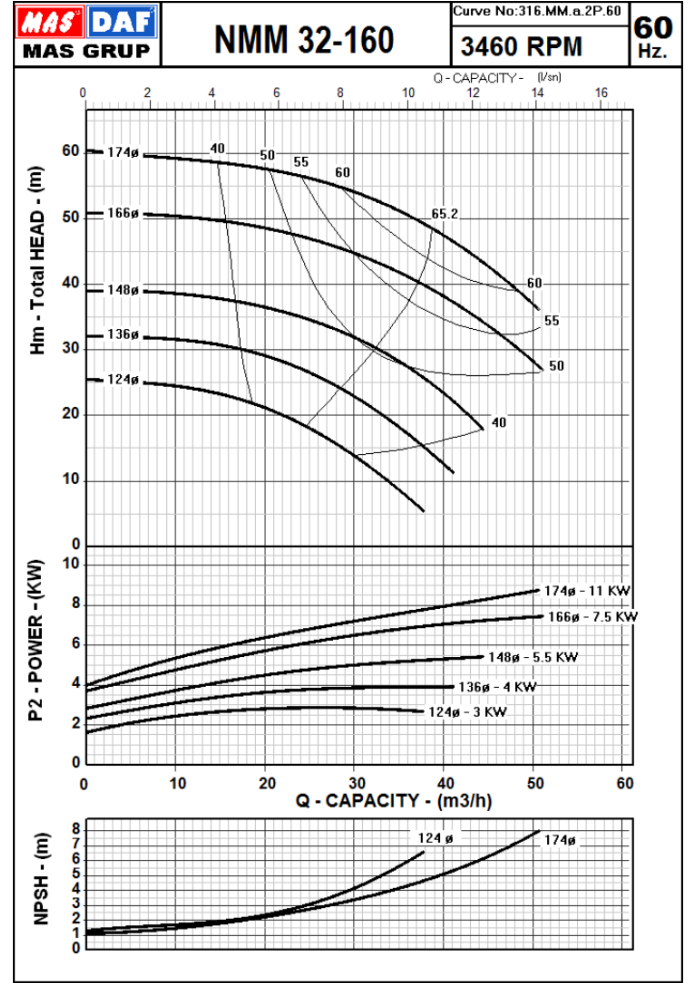
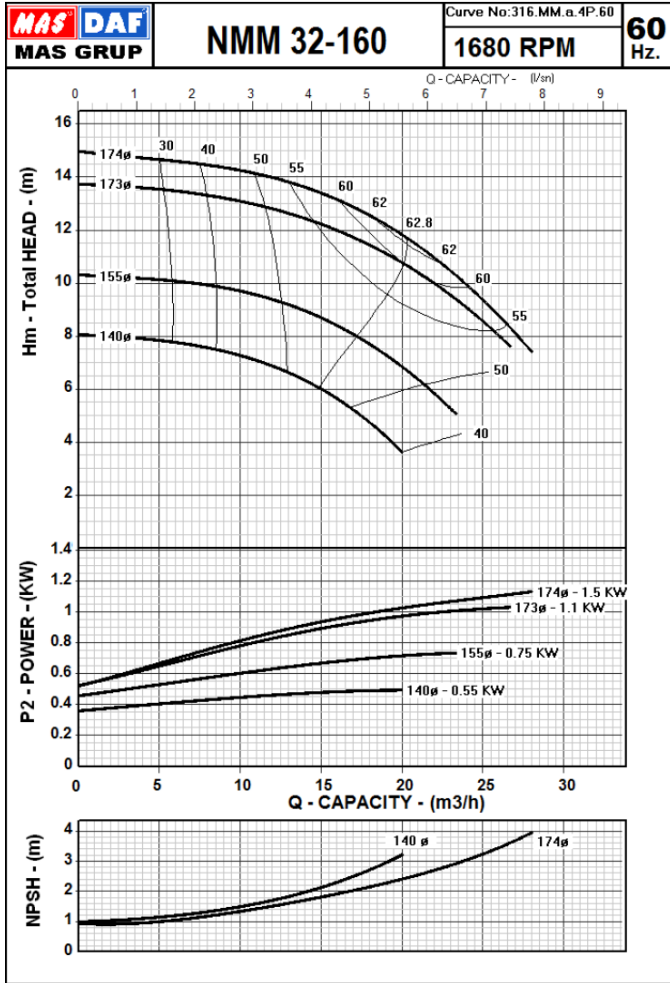
No	Pump Type	Flanges		Forces		Moments
		DNs (mm) Suction	DNd (mm) Discharge	F _v (N)	F _H (N)	M _t (Nm)
1	32-160	50	32	2255	1485	385
2	32-200					
3	32-250					
4	40-160	65	40	2420	1620	440
5	40-200					
6	40-250					
7	50-160	65	50	2490	1700	530
8	50-200					
9	50-200					
10	50-315	80	65	2550	1900	650
11	65-160	80				
12	65-200					
13	65-250					
14	65-315	100	80	3170	2400	1060
15	65-400					
16	80-160					
17	80-200	100	80	3170	2400	1060
18	80-250					
19	80-315					
20	80-400	125	100	4400	3480	1740
21	100-160					
22	100-200					
23	100-250	125	100	4400	3480	1740
24	100-315					
25	100-400					
26	125-200	150	125	5580	4620	2565
27	125-250					
28	125-315					
29	125-400					

NMM Series
Close Coupled Centrifugal Pump
Performance Curves

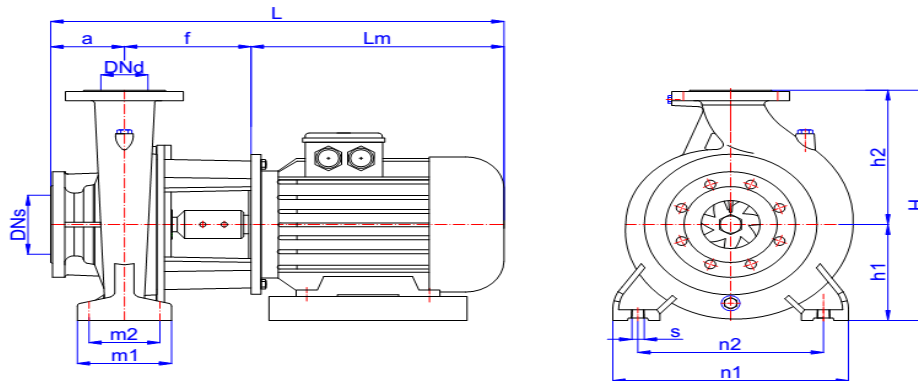


NMM 32-160

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal		
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter		
																	mm	mm
32-160	4 poles	0,55	80	239	32	50	479	80	160	132	160	240	190	100	70	12	20	
		0,75	80	239														479
		1,1	90S	259														499
		1,5	90L	284														524
	2 poles	3	100L	316	32	50	576	80	180	132	160	240	190	100	70	12	20	
		4	112M	336														596
		5,5	132S	418														698
		7,5	132S	418														698
		11	160M	490			800		230							30		

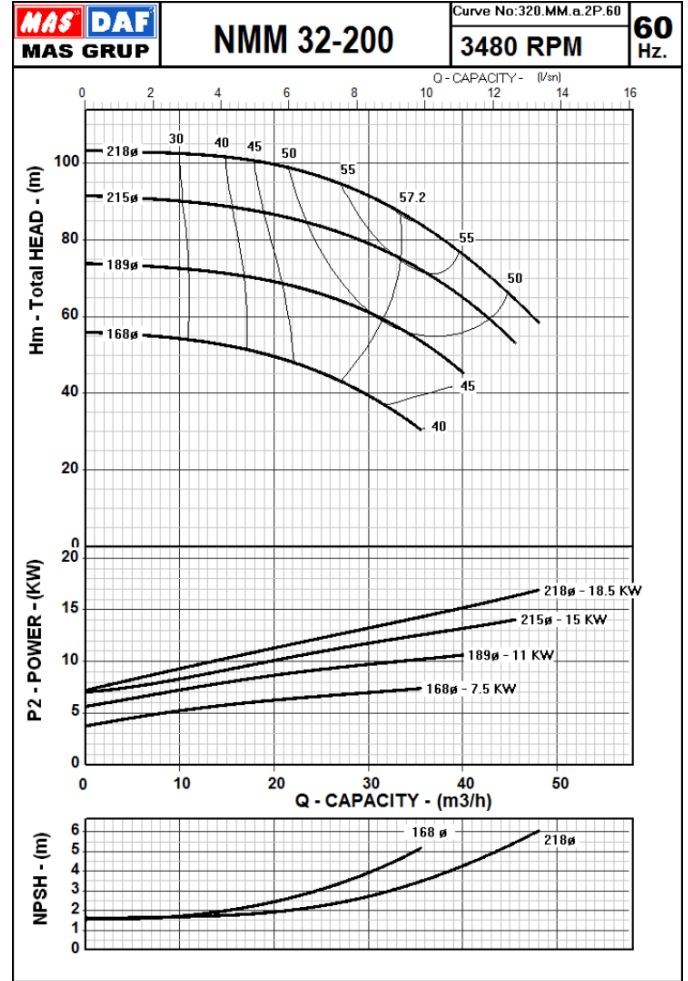
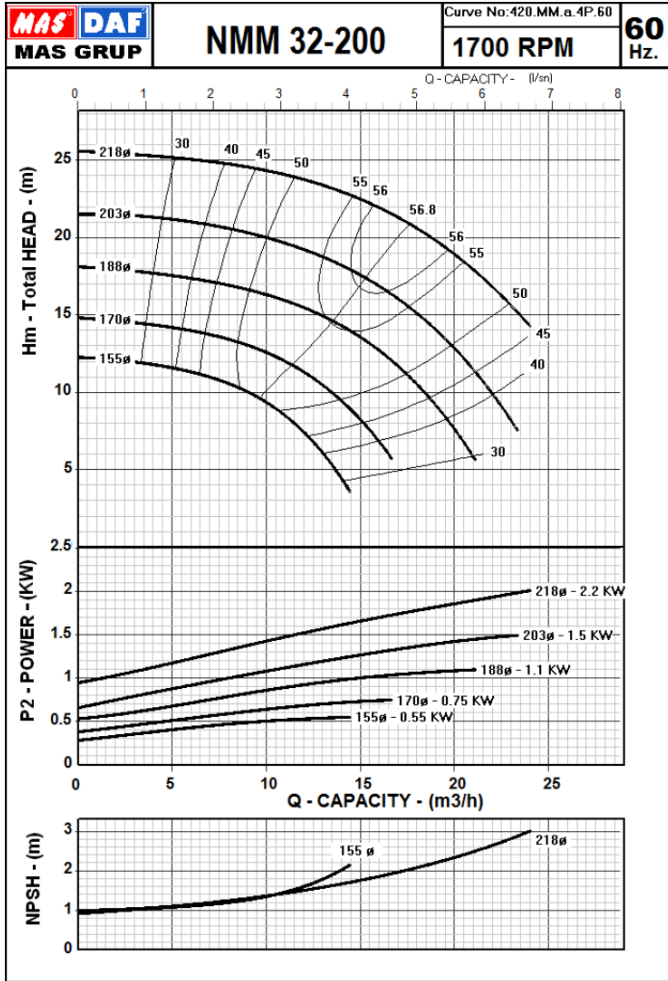
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

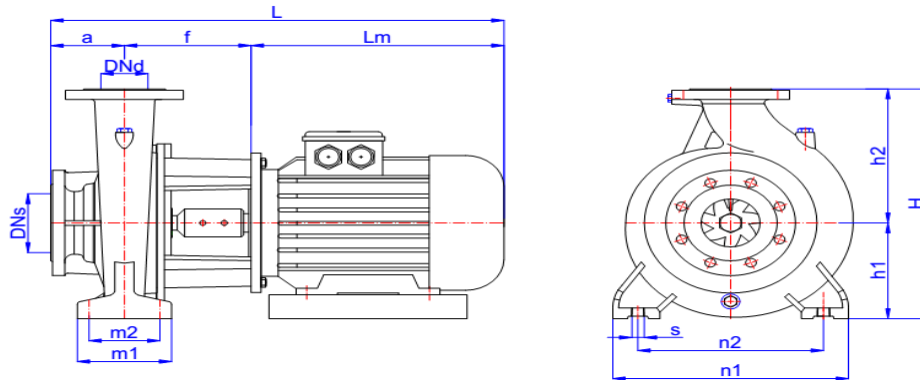


NMM 32-200

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



		MOTOR		FLANGES		GENERAL	PUMP									Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
32-200	4 poles	0,55	80	239	32	50	479	80	160	160	180	240	190	100	70	12	20
		0,75	80	239			479		160								
		1,1	90S	259			499		160								
		1,5	90L	284			524		160								
		2,2	100L	316			556		180								
	2 poles	7,5	132S	418	32	50	703	80	205	160	180	240	190	100	70	12	20
		11	160M	490			800		230								30
		15	160M	490			800		230								
		18,5	160L	534			844		230								

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NMM Series

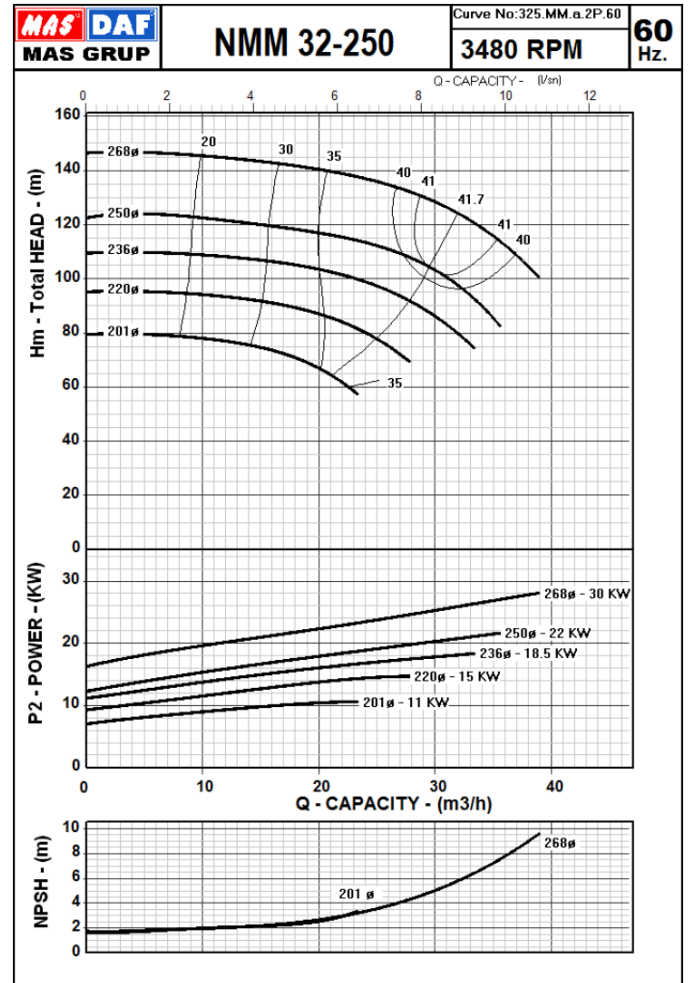
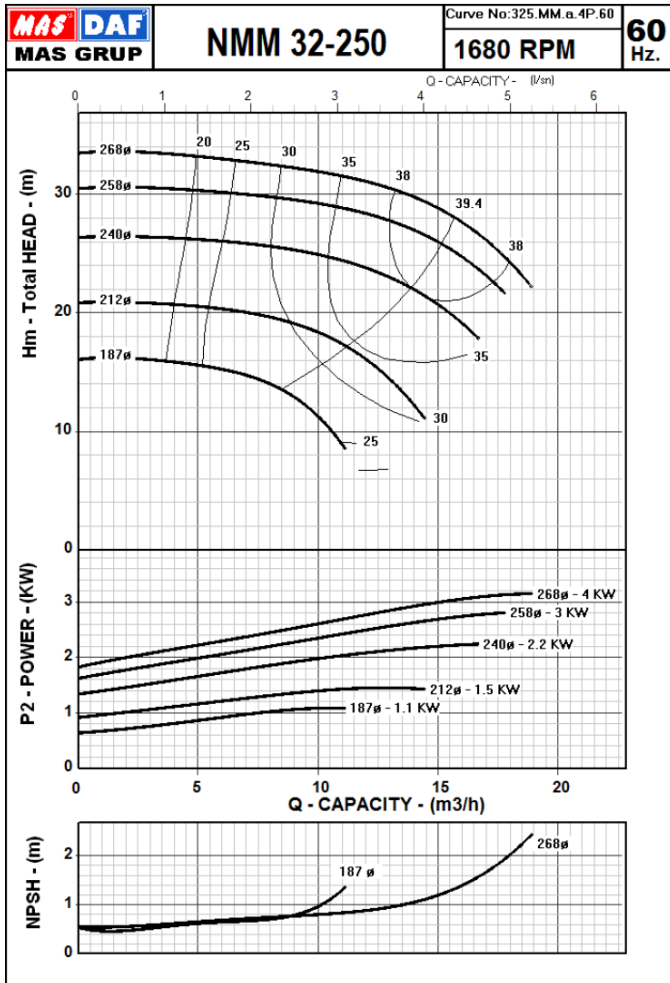
Close Coupled Centrifugal Pump

Performance Curves

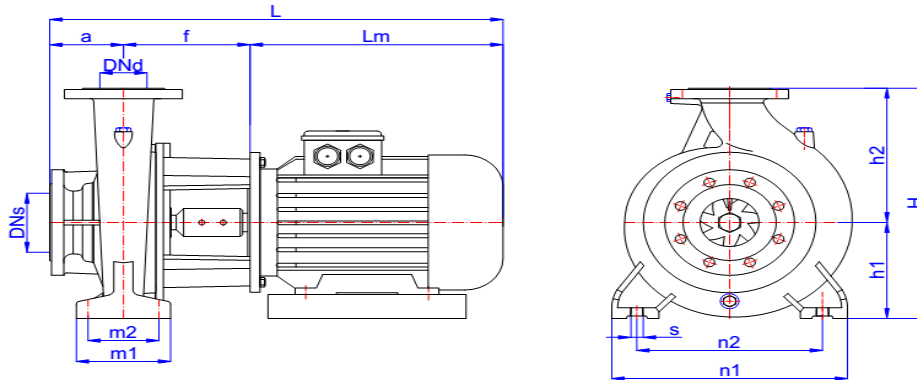


NMM 32-250

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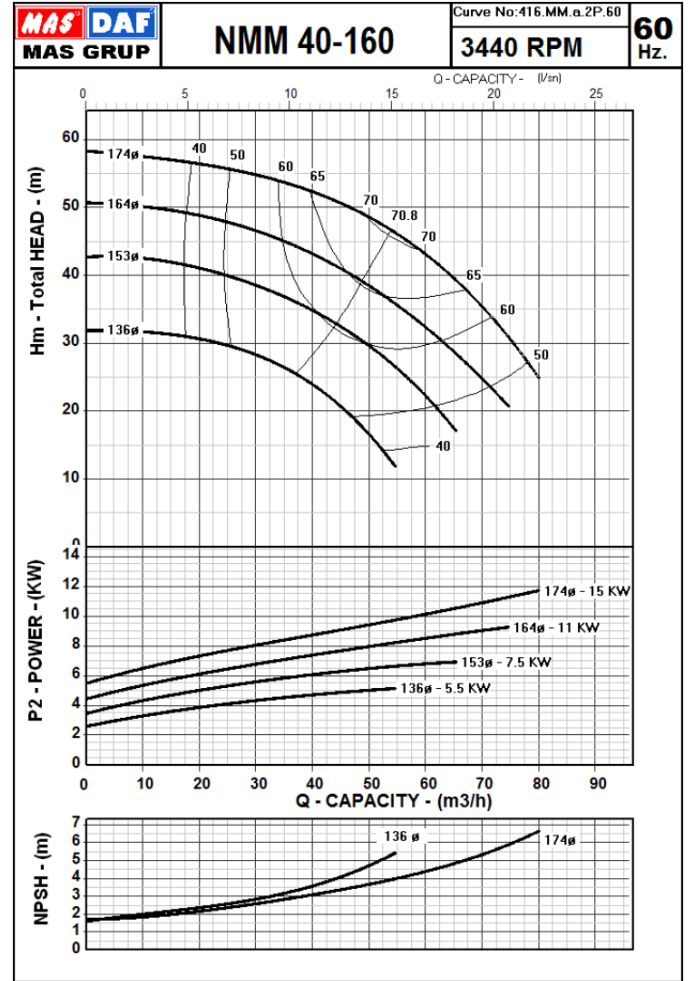
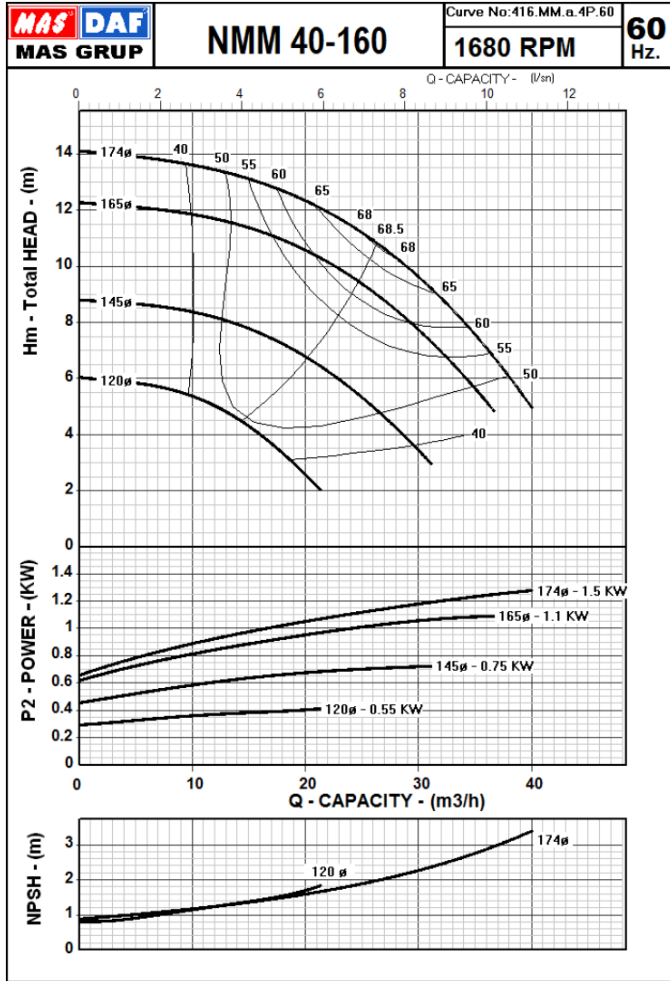


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

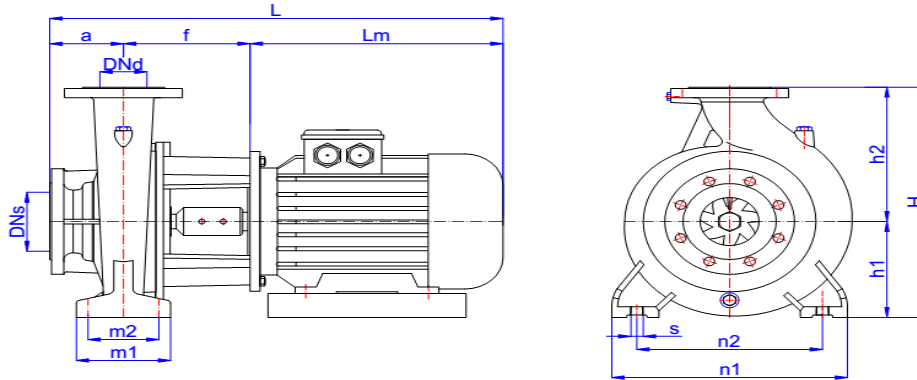


	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal		
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter		
			mm														mm	mm
32-250	4 poles	1,1	90S	259	32	50	100	168	180	225	320	250	125	95	12	20		
		1,5	90L	284													527	168
		2,2	100L	316													604	188
		3	100L	316													604	188
		4	112M	336													624	188
	2 poles	11	160M	490	32	50	100	238	180	225	320	250	125	95	12	30		
		15	160M	490													828	238
		18,5	160L	534													872	238
		22	180M	547													885	238
		30	200L	637													997	260

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
																	mm
40-160	4 poles	0,55	80	239	40	65	479	80	160	132	160	240	190	100	70	12	20
		0,75	80	239			479		160								
		1,1	90S	259			499		160								
		1,5	90L	284			524		160								
	2 poles	5,5	132S	418	40	65	698	80	200	132	160	240	190	100	70	12	20
		7,5	132S	418			698		200								
		11	160M	490			800		230								
		15	160M	490			800		230								

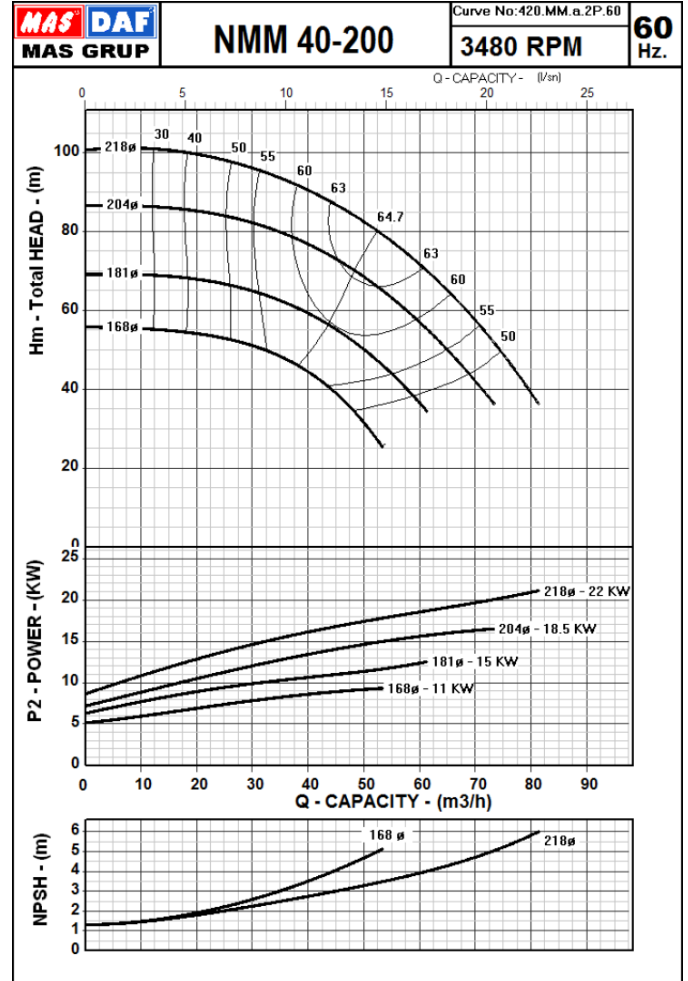
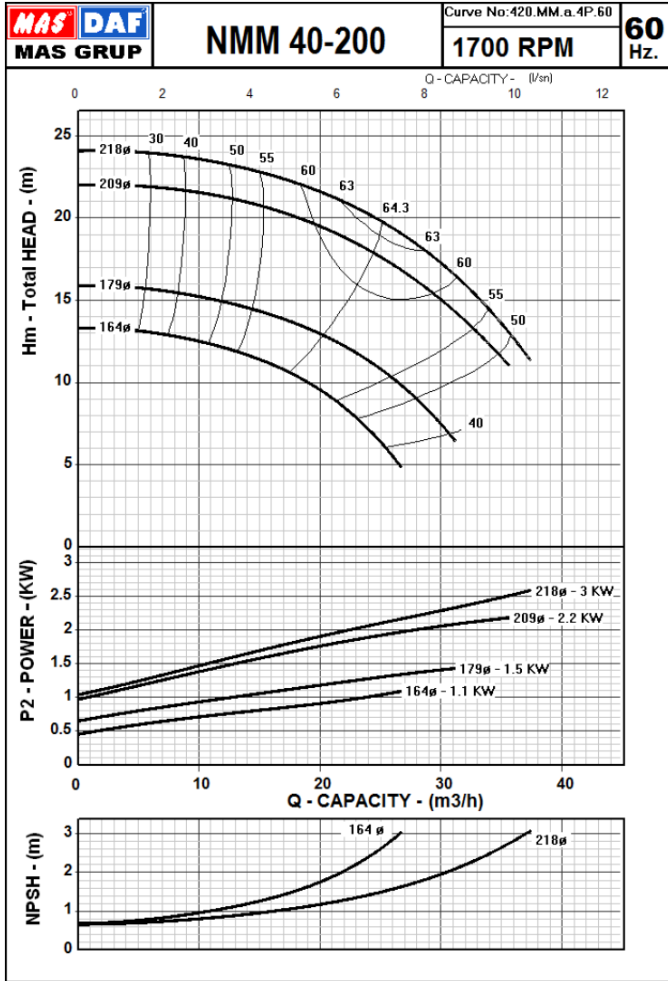
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Close Coupled Centrifugal Pump
Performance Curves

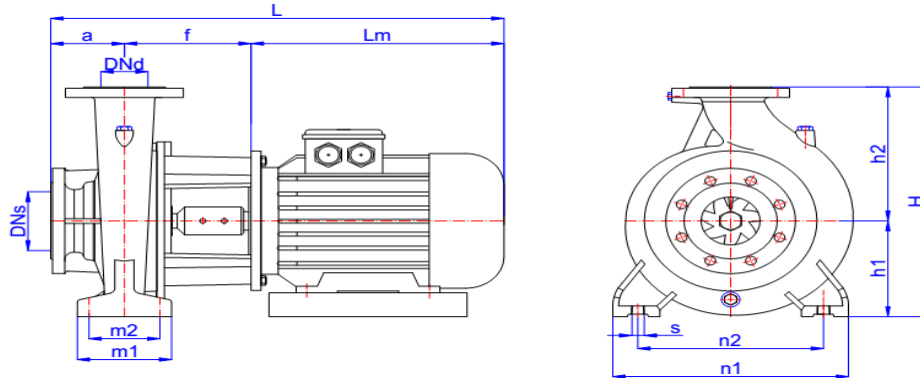


NMM 40-200

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
			mm														mm
40-200	4 poles	1,1	90S	259	40	65	518	100	159	160	180	265	212	100	70	12	20
		1,5	90L	284					159								
		2,2	100L	316					180								
		3	100L	316					180								
	2 poles	11	160M	490	40	65	820	100	230	160	180	265	212	100	70	12	30
		15	160M	490			820		230								
		18,5	160L	534			864		230								
		22	180M	547			877		230								

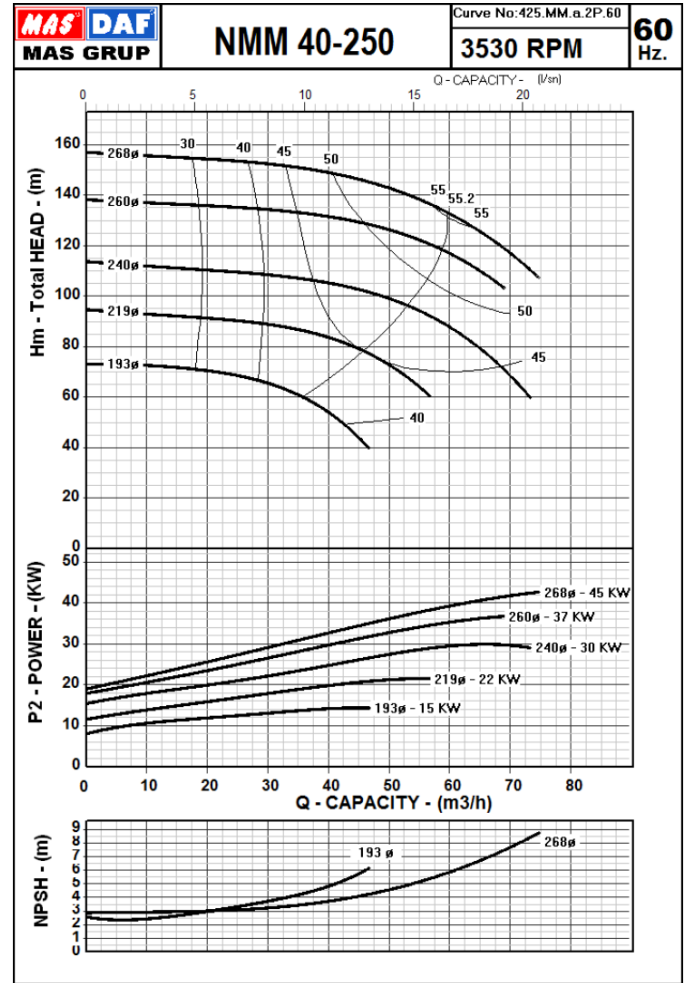
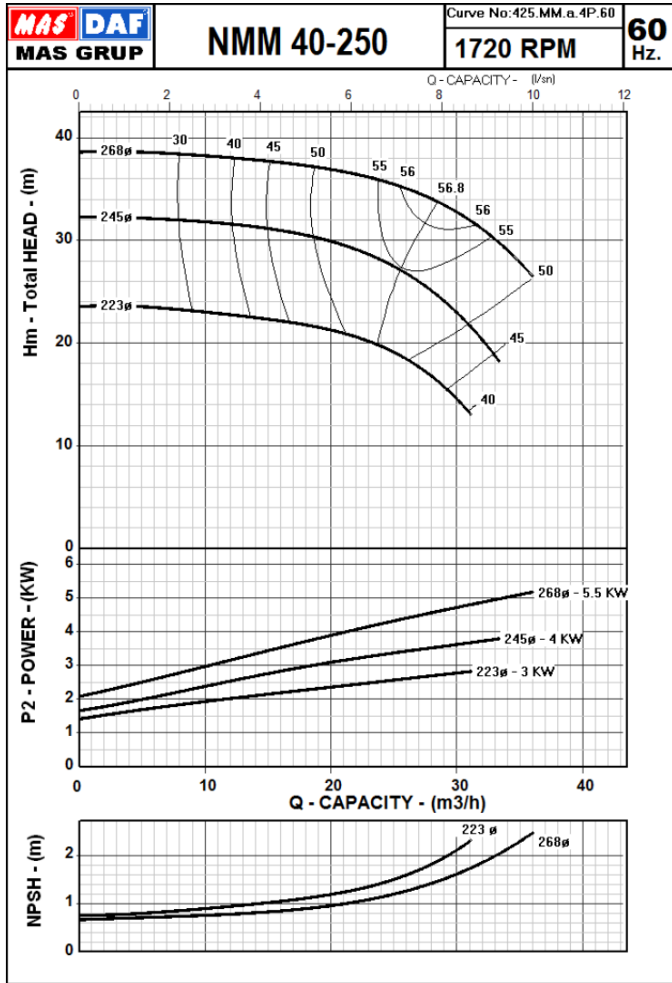
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

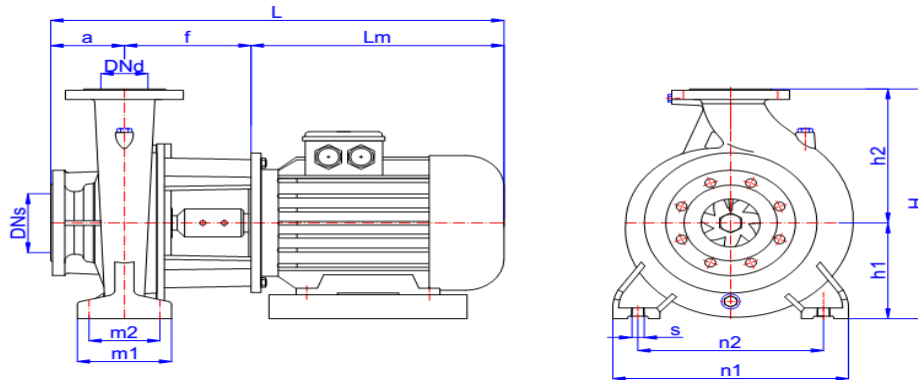


NMM 40-250

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



		MOTOR		FLANGES		GENERAL	PUMP									Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
40-250	4 poles	3	100L	316	40	65	596	100	180	180	225	320	250	125	95	12	20
		4	112M	336			616		180								
		5,5	132S	418			723		205								
	2 poles	15	160M	490	40	65	820	100	230	180	225	320	250	125	95	12	30
		18,5	160M	490			820		230								
		22	180M	547			877		230								
		30	200L	637			997		260								
		37	200L	637			997		260								
		45	225M	680			1040		260								

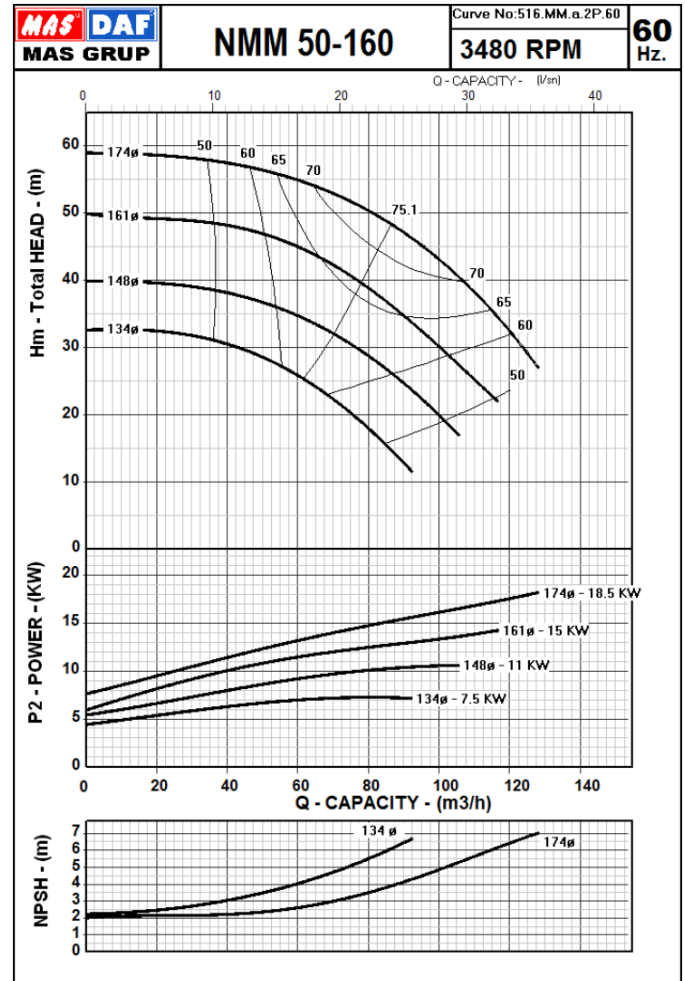
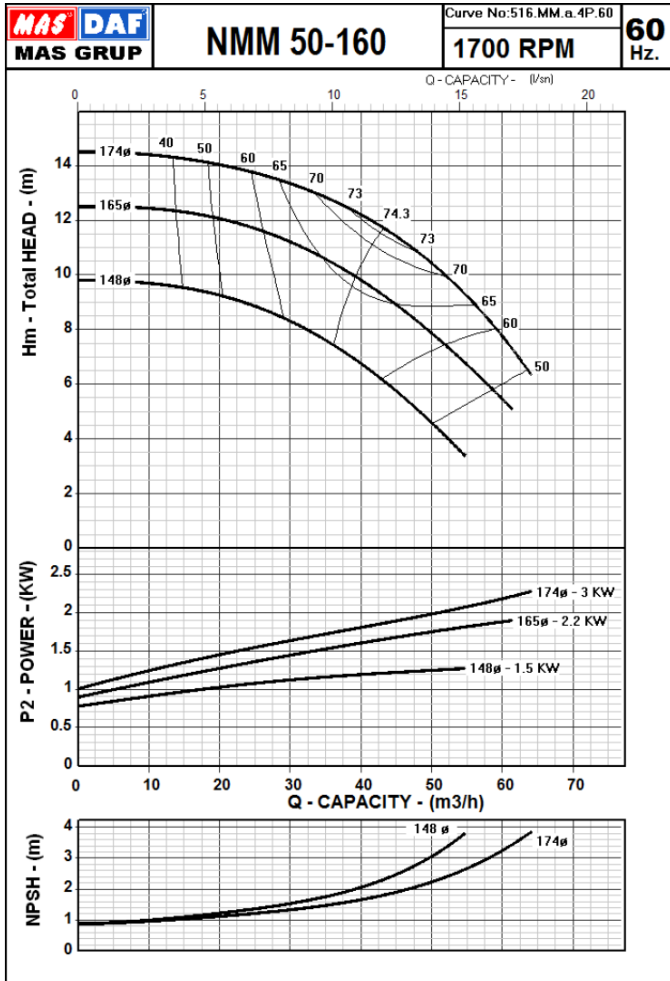
MAS DAF MAKINA SAN. A.Ş. reserves the right to change specifications without prior notice.

NMM Series
Close Coupled Centrifugal Pump
Performance Curves

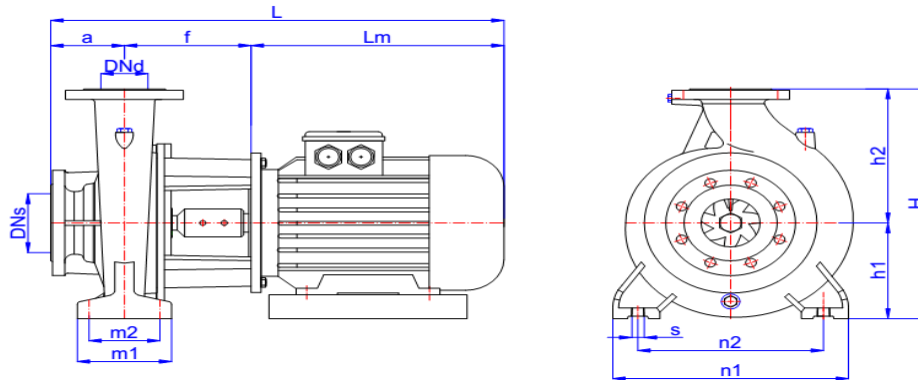


NMM 50-160

Mas Grup

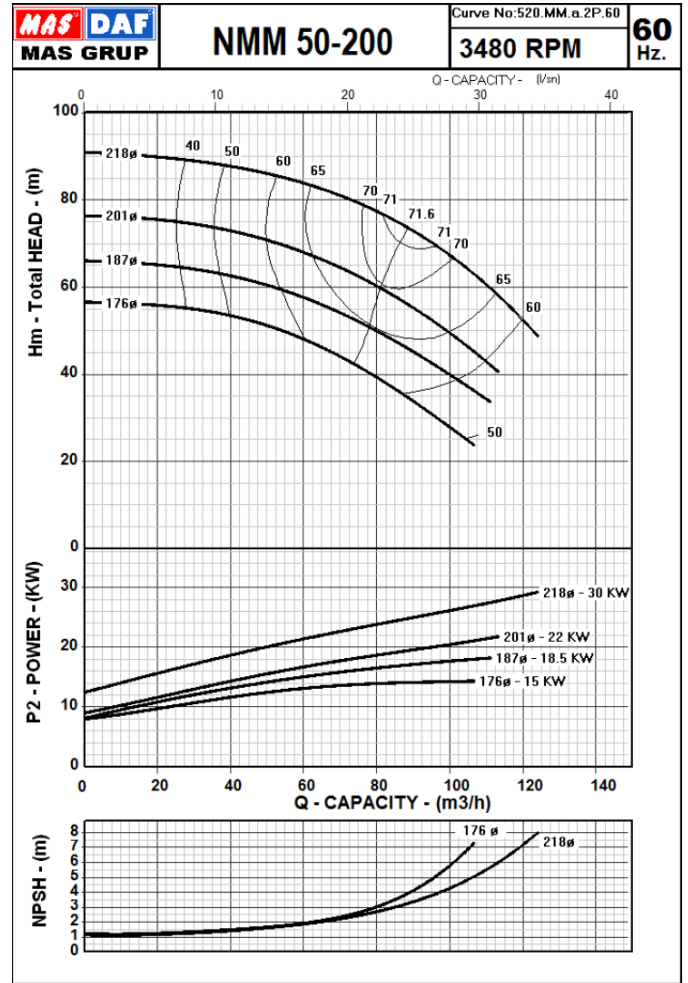
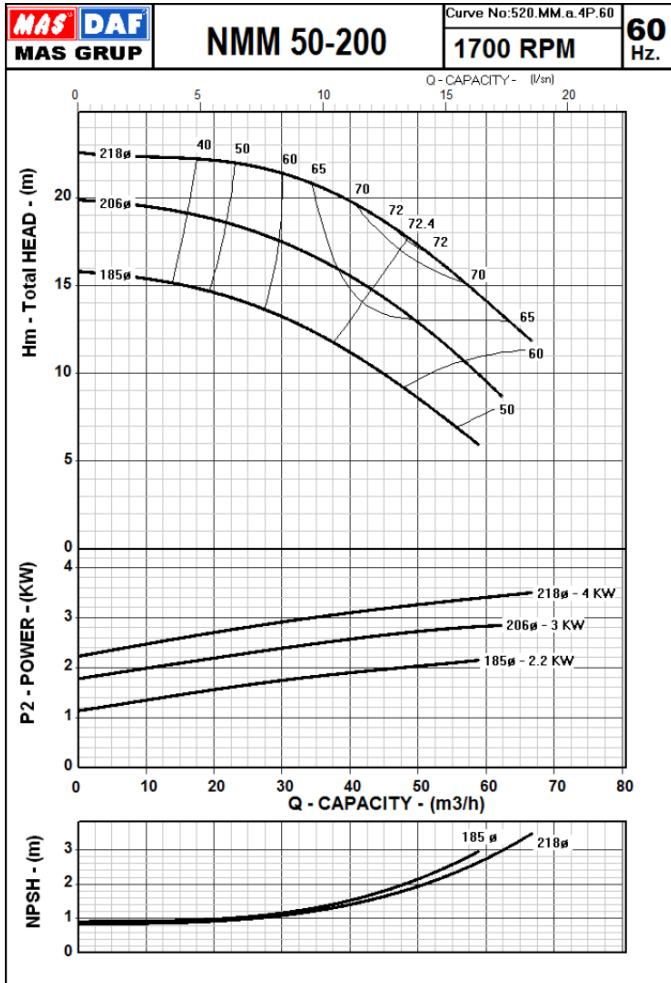


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

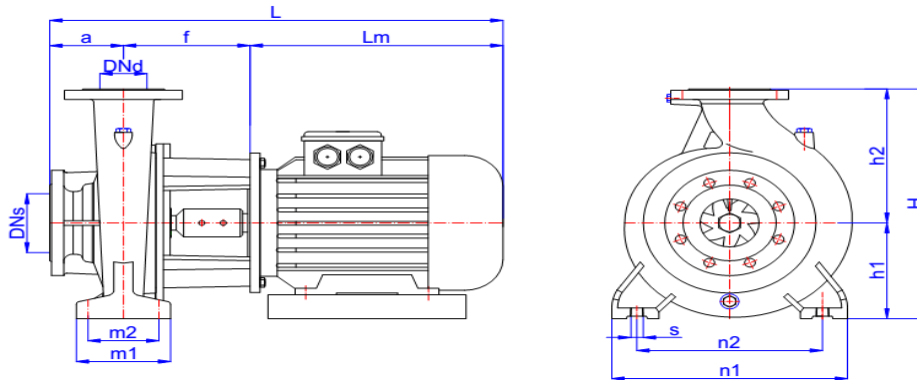


		MOTOR		FLANGES		GENERAL	PUMP									Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
50-160	4 poles	1,5	90L	284	50	65	544	100	160	160	180	265	212	100	70	12	20
		2,2	100L	316			596		180								
		3	100L	316			596		180								
	2 poles	7,5	132S	418	50	65	718	100	200	160	180	265	212	100	70	12	20
		11	160M	490			820		230								
		15	160M	490			820		230								
		18,5	160L	534			864		230								

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
																	mm
50-200	4 poles	2,2	100L	316	50	65	596	100	180	160	200	265	212	100	70	12	20
		3	100L	316		596			180								
		4	112M	336		616			180								
	2 poles	15	160M	490	50	65	820	100	230	160	200	265	212	100	70	12	30
		18,5	160L	534		864	230										
		22	180M	547		877	230										
		30	200L	637		997	260										

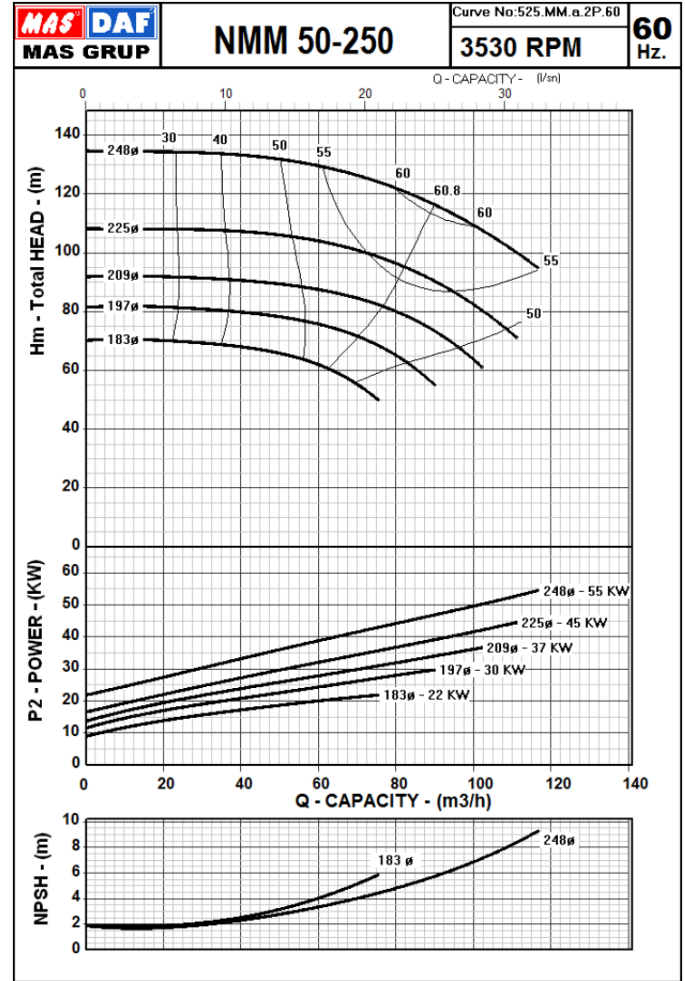
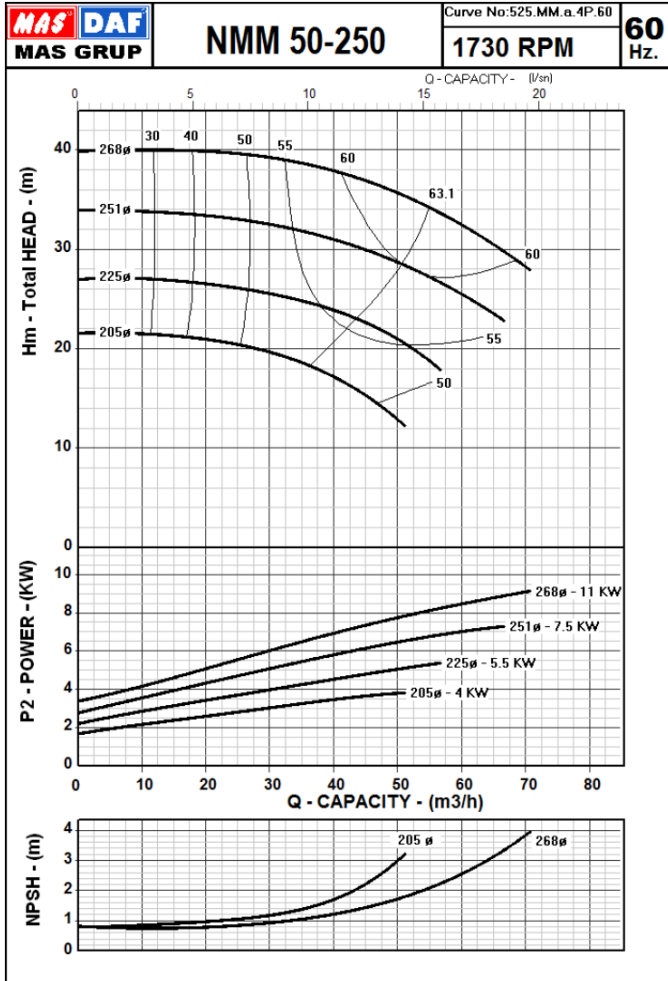
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

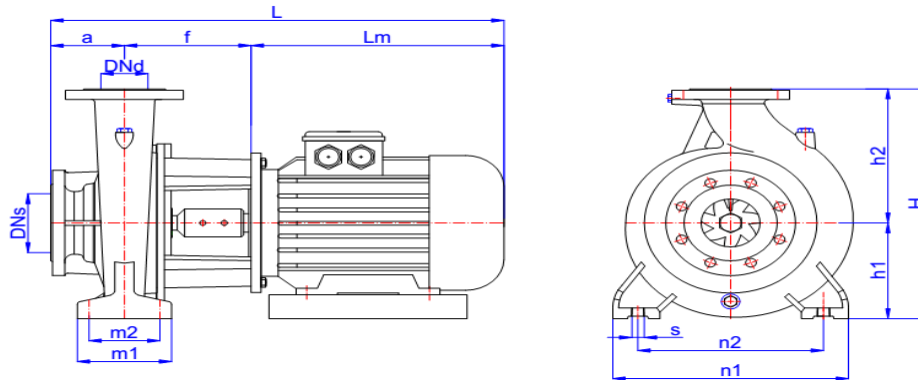


NMM 50-250

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
																	mm
50-250	4 poles	4	112M	336	50	65	616	100	180	180	225	320	250	125	95	12	20
		5,5	132S	418			748		230								30
		7,5	132S	418			748		230								30
		11	160M	490			820		230								30
	2 poles	22	180M	547	50	65	877	100	230	180	225	320	250	125	95	12	30
		30	200L	637			997		260								35
		37	200L	637			997		260								35
		45	225M	680			1040		260								35
		55	250M	756			1146		290								35

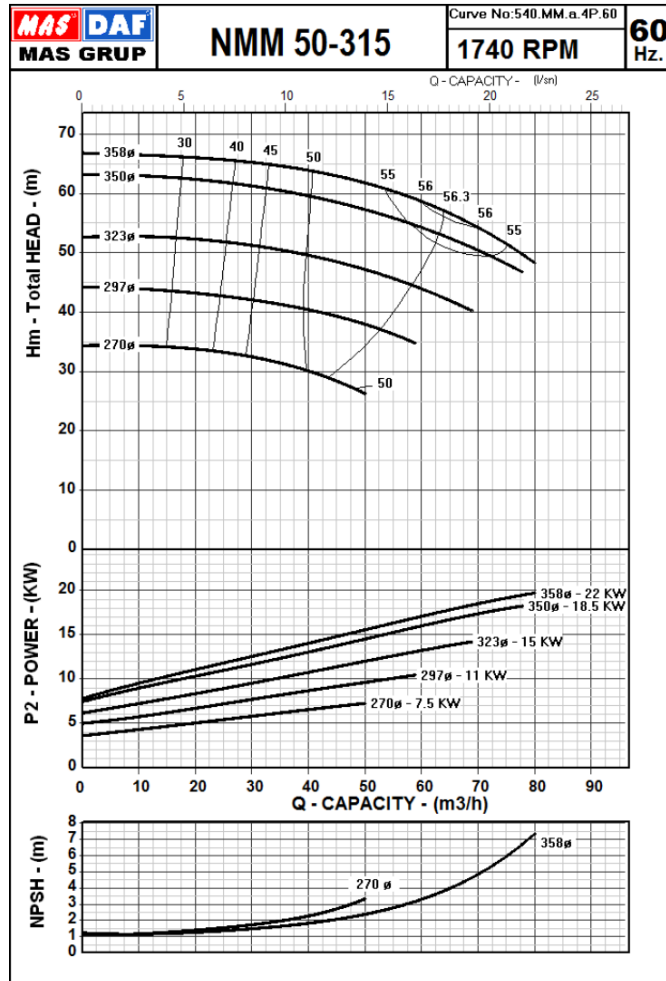
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

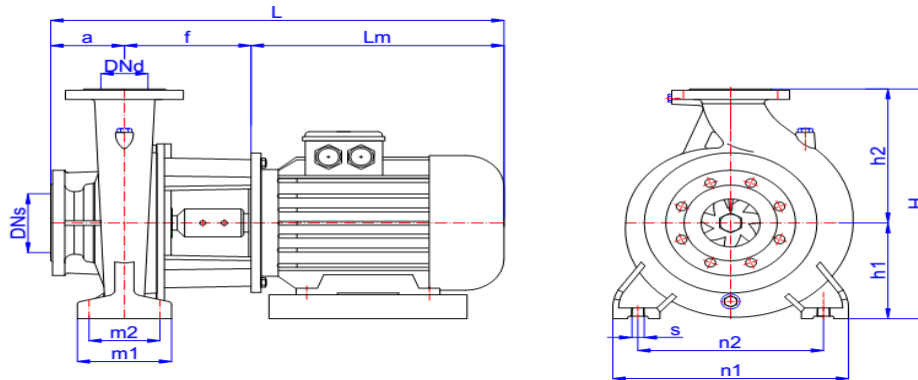
NMM 50-315



Mas Grup

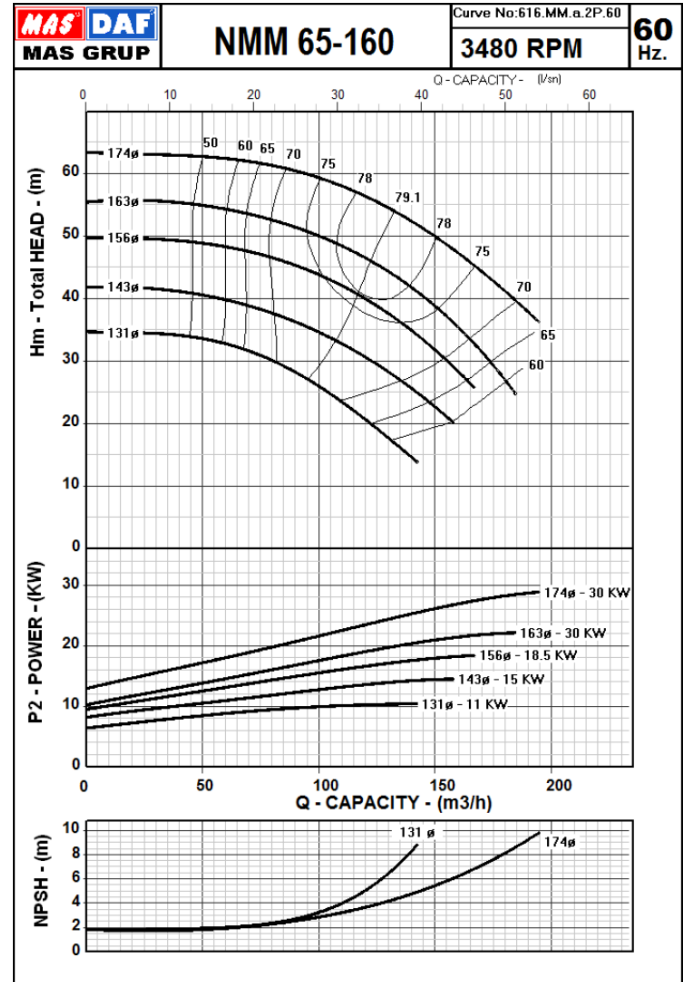
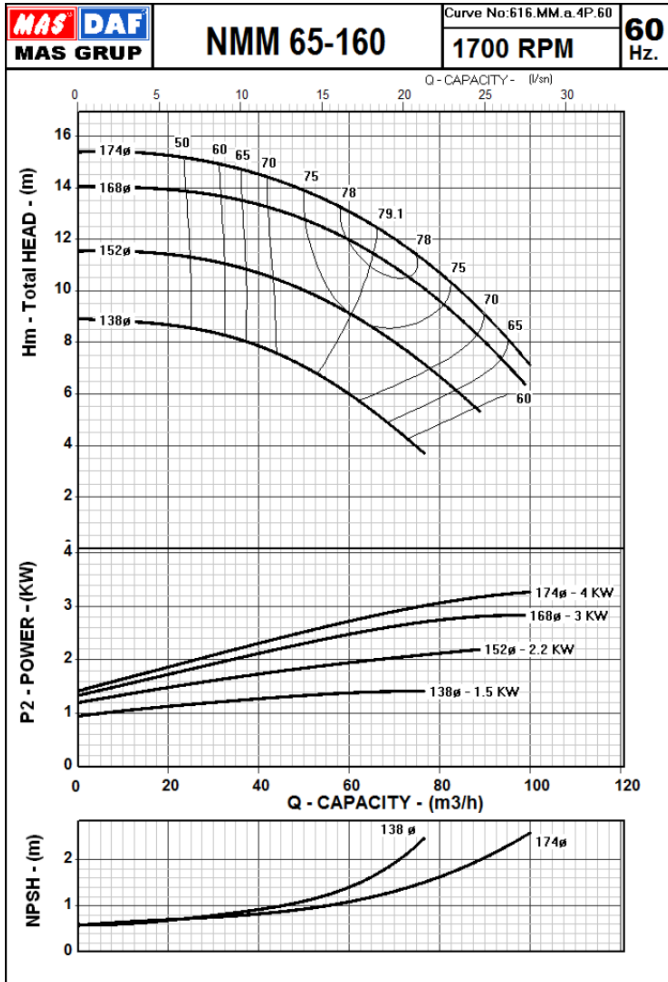


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

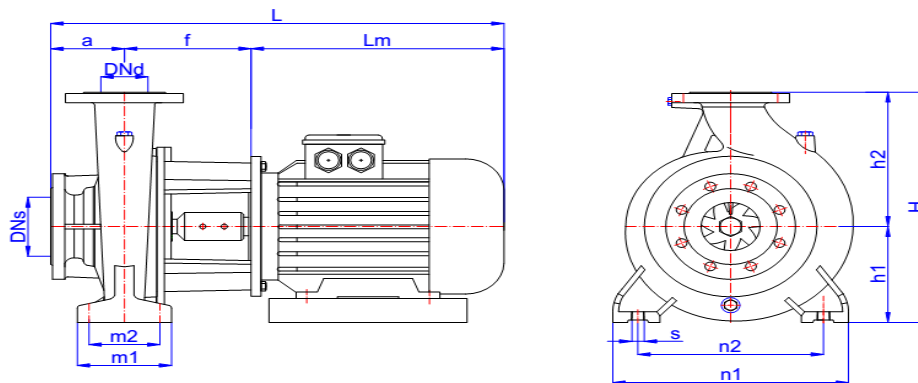


50-315	MOTOR		FLANGES			GENERAL		PUMP							Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
4 poles	7,5	132S	418	50	80	733	100	215	225	280	360	280	160	120	12	30
	11	160M	490			830		240								
	15	160L	534			874		240								
	18,5	180M	547			887		240								
	22	180L	585			925		240								

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
																	mm
65-160	4 poles	1,5	90L	284	65	80	544	100	160	160	200	280	212	125	95	12	20
		2,2	100L	316			596		180								
		3	100L	316			596		180								
		4	112M	336			616		180								
	2 poles	11	160M	490	65	80	830	100	240	160	200	280	212	125	95	12	30
		15	160M	490			830		240								
		18,5	160L	534			874		240								
		22	180M	550			890		240								
		30	200L	637			1007		270								

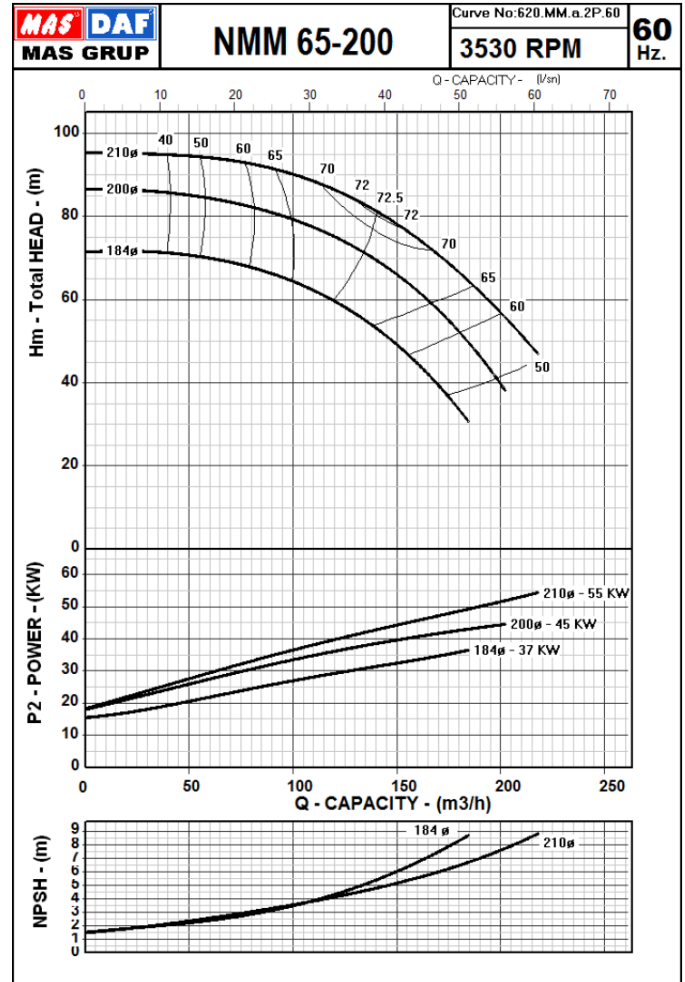
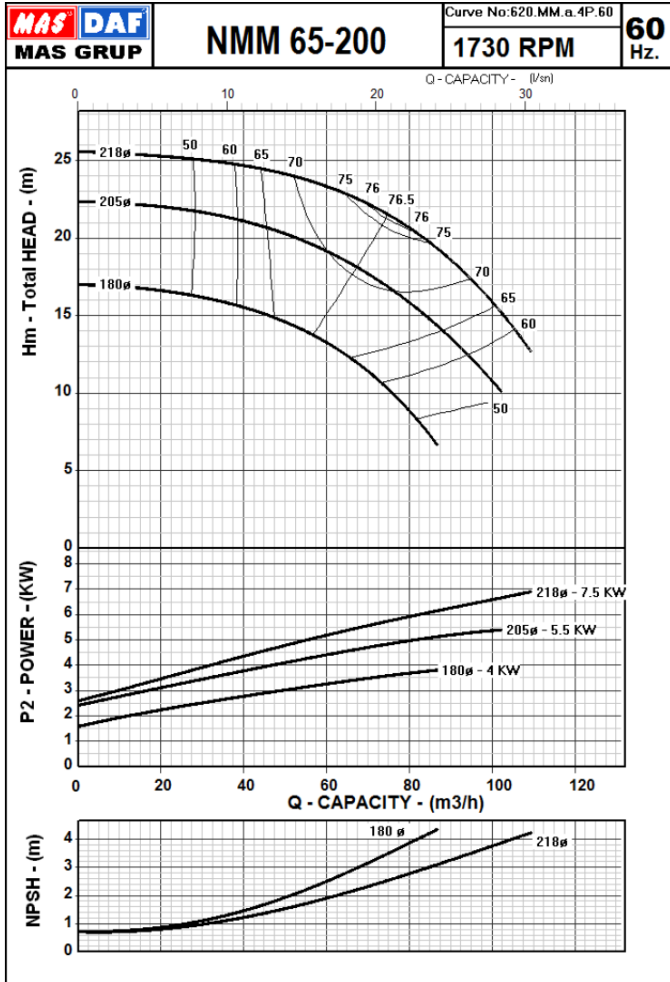
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

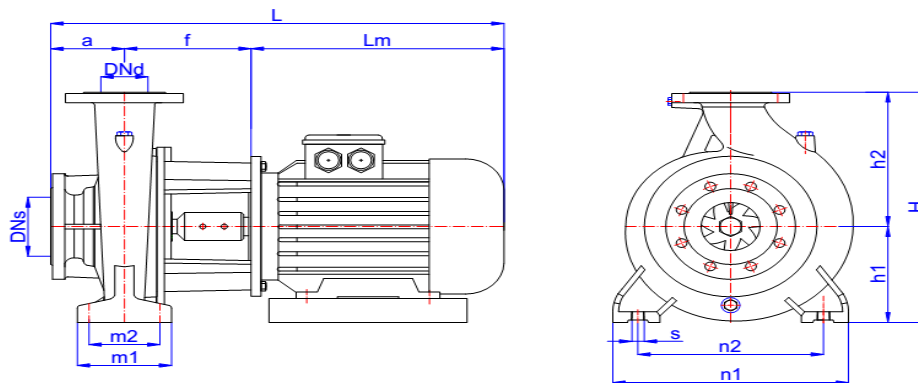


NMM 65-200

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



		MOTOR		FLANGES		GENERAL	PUMP									Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
65-200	4 poles	4	112M	336	65	80	616	100	180	180	225	320	250	125	95	12	20
		5,5	132S	418			723		205								30
		7,5	132M	418			723		205								
	2 poles	37	200L	637	65	80	997	100	260	180	225	320	250	125	95	12	35
		45	225M	680			1090		310								
		55	250M	756			1196		340								

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NMM Series

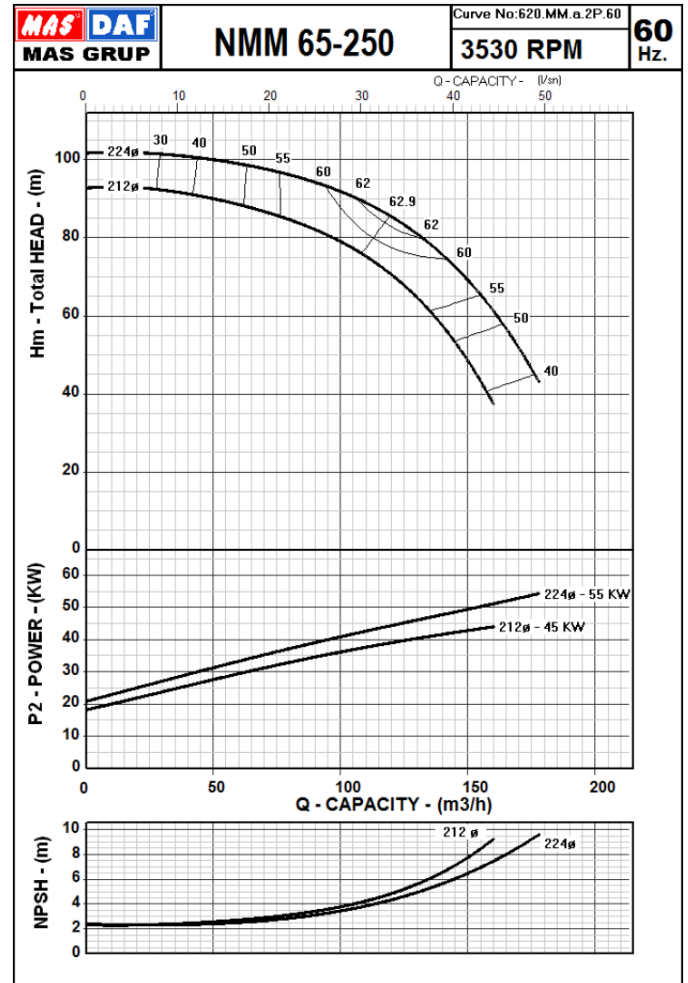
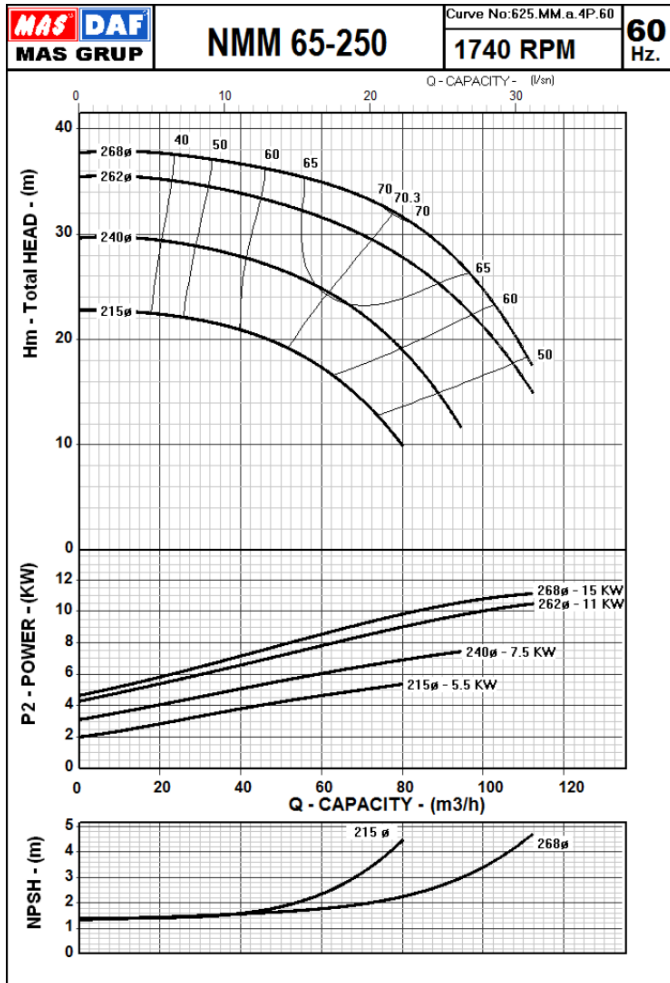
Close Coupled Centrifugal Pump

Performance Curves

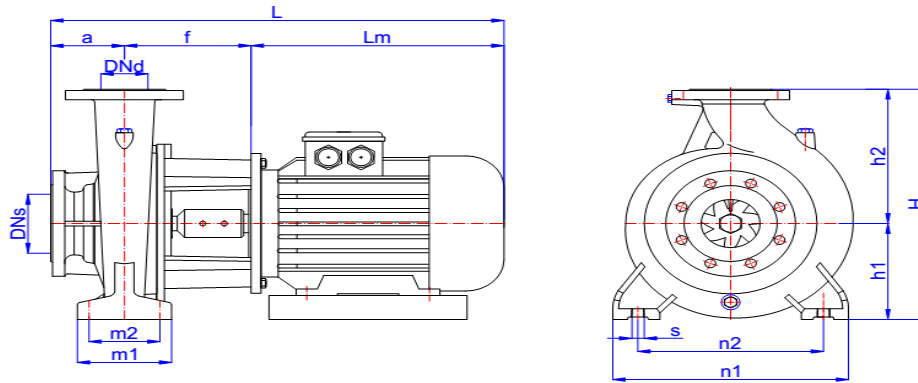


NMM 65-250

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



65-250	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
			mm														mm
4 poles	5,5	132S	418	65	80	733	100	215	200	250	360	280	160	120	16	30	
	7,5	132M	418			733											215
	11	160M	490			830											240
	15	160L	534			874											240
2 poles	45	225M	680	65	80	1070	100	290	200	250	360	280	160	120	16	35	
	55	250M	756			1176											320

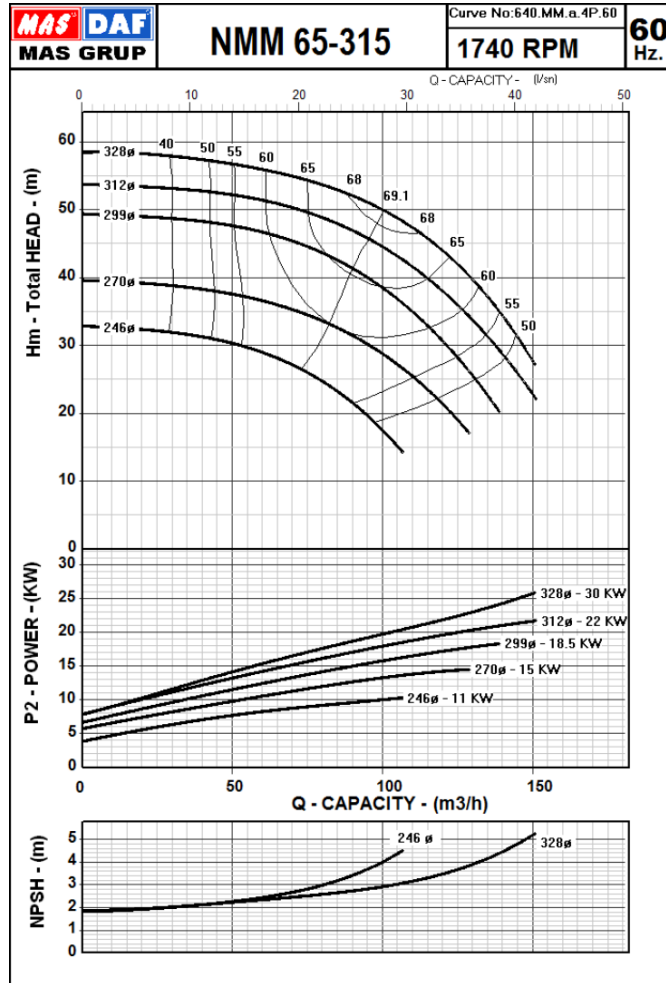
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

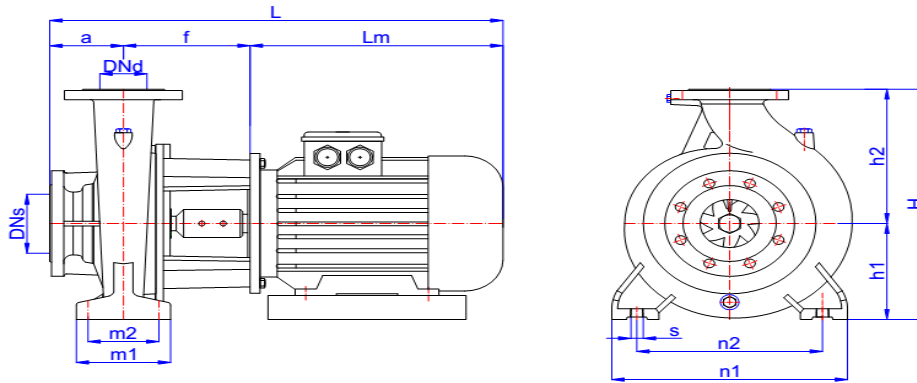


NMM 65-315

Mas Grup

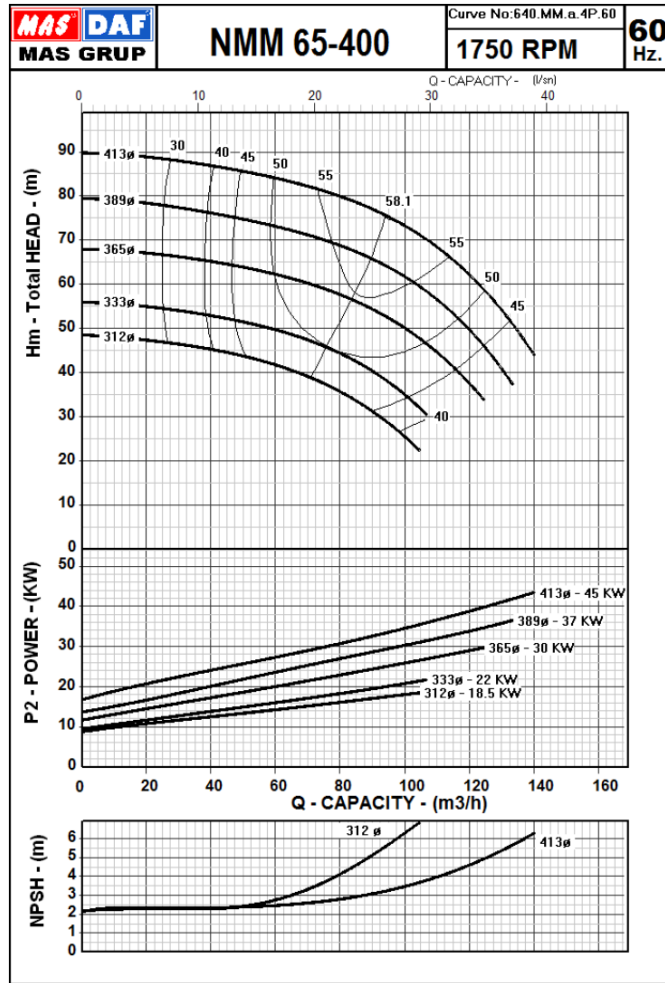


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

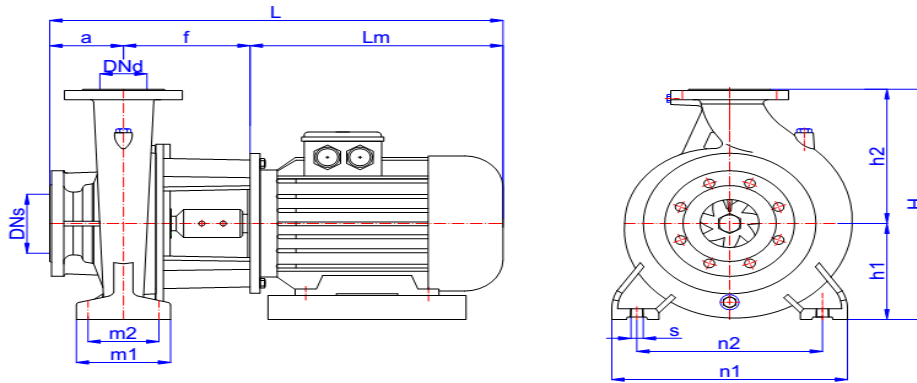


65-315	4 poles	MOTOR		FLANGES		GENERAL		PUMP							Mechanical Seal			
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm
		11	160M	490	65	80	855	125	240	224	280	400	315	160	120	16	30	
		15	160L	534			899											240
		18,5	180M	547			912											240
		22	180L	585			950											240

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



65-400	4 poles	MOTOR		FLANGES		GENERAL	PUMP							Mechanical Seal			
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
18,5	180M	547	65	100	912	125	240	250	355	400	315	160	120	16	30		
22	180L	585			950		240										
30	200L	637			1032		270										
37	225S	680			1126		321										
45	225M	680			1126		321								35		

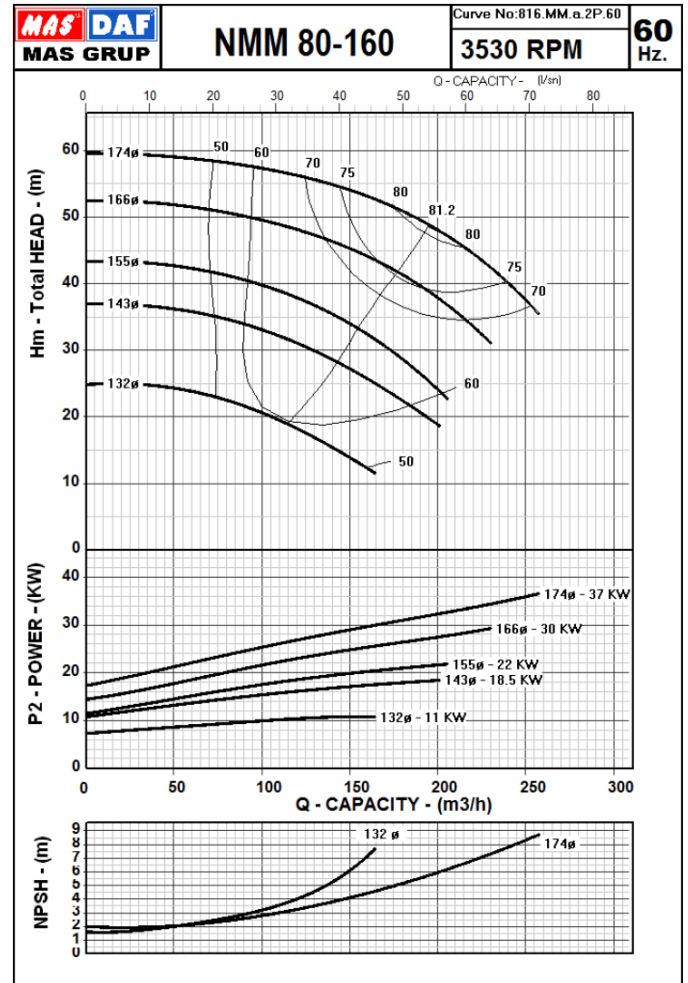
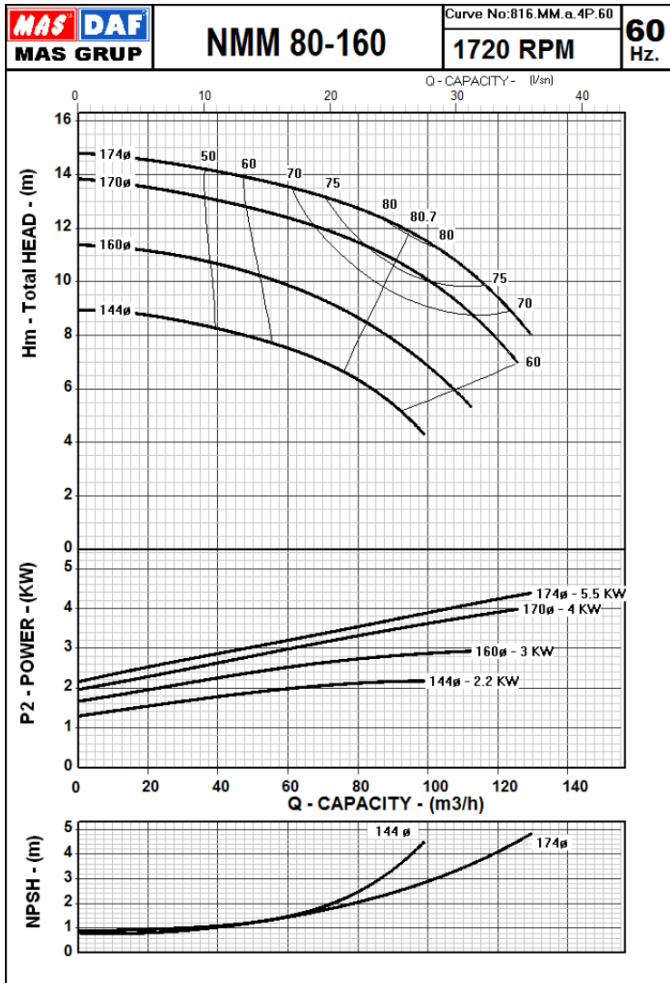
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

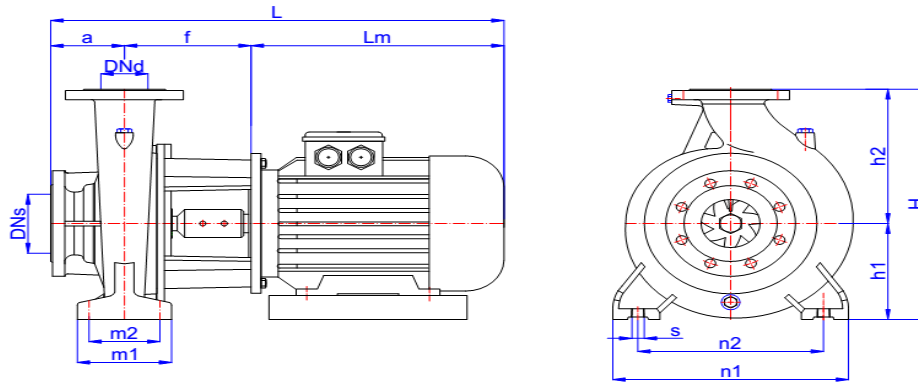


NMM 80-160

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP							Mechanical Seal					
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter		
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm	
80-160	4 poles	2,2	100L	316	80	100	621	125	180	180	225	320	250	125	95	12	20	
		3	100L	316			621											180
		4	112M	336			641											180
		5,5	132S	418			743											200
	2 poles	11	160M	490	80	100	845	125	230	180	225	320	250	125	95	12	30	
		18,5	160L	534			889											230
		22	180M	547			902											230
		30	200L	637			1019											257
		37	200L	637			1019											257

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NMM Series

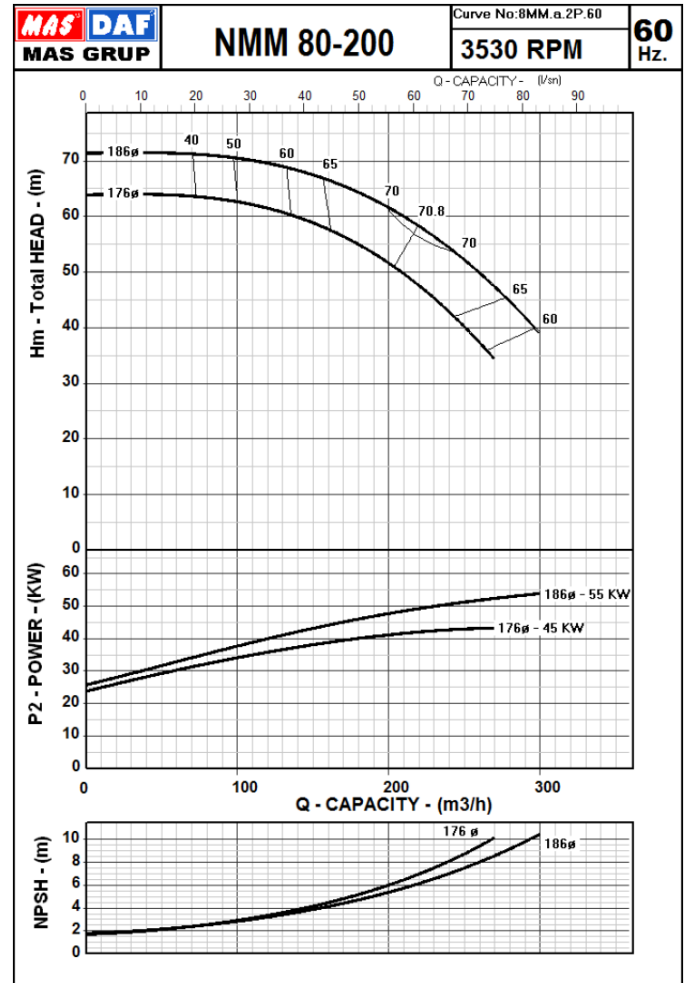
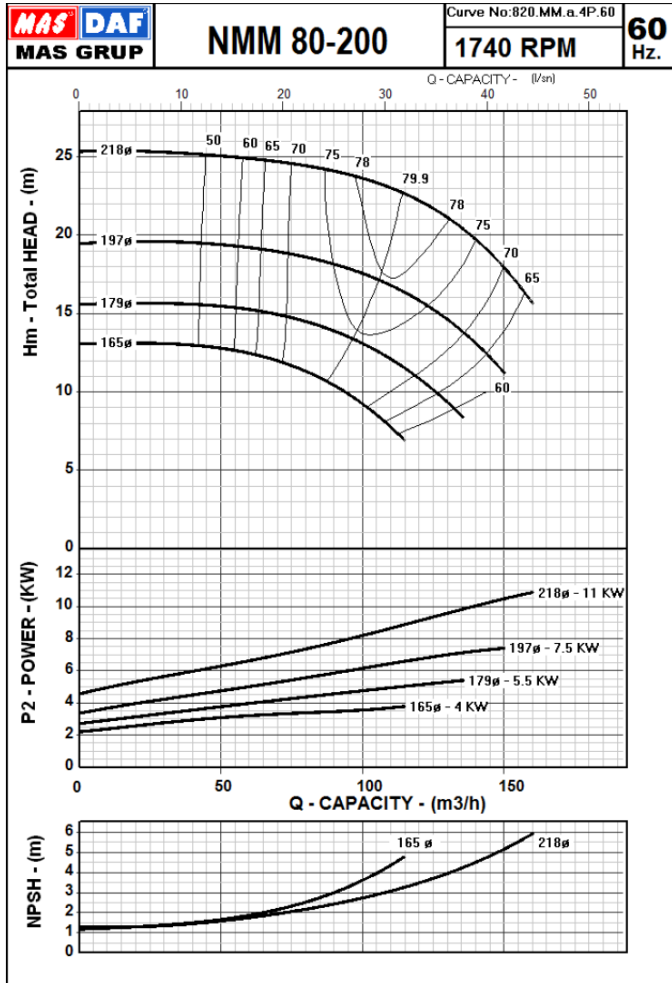
Close Coupled Centrifugal Pump

Performance Curves

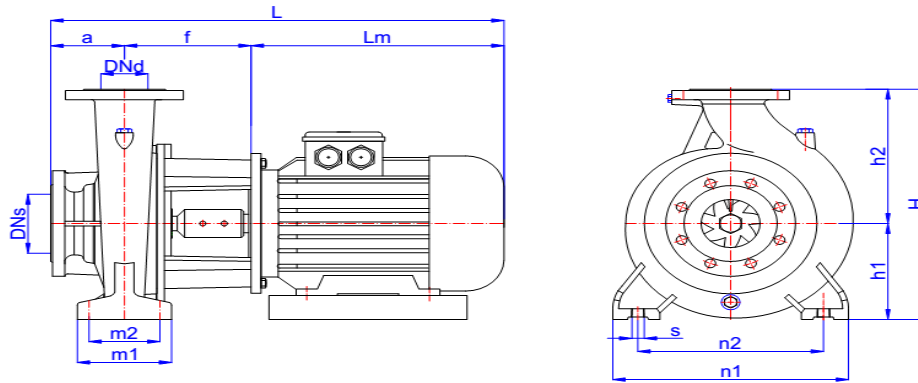


NMM 80-200

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm
80-200	4 poles	4	112M	336	80	100	651	125	190	180	250	345	280	125	95	12	30
		5,5	132S	418			758		215								
		7,5	132M	418			758		215								
		11	160M	490			855		240								
	2 poles	45	225M	680	80	100	1075	125	270	180	250	345	280	125	95	12	35
		55	250M	756			1181		300								

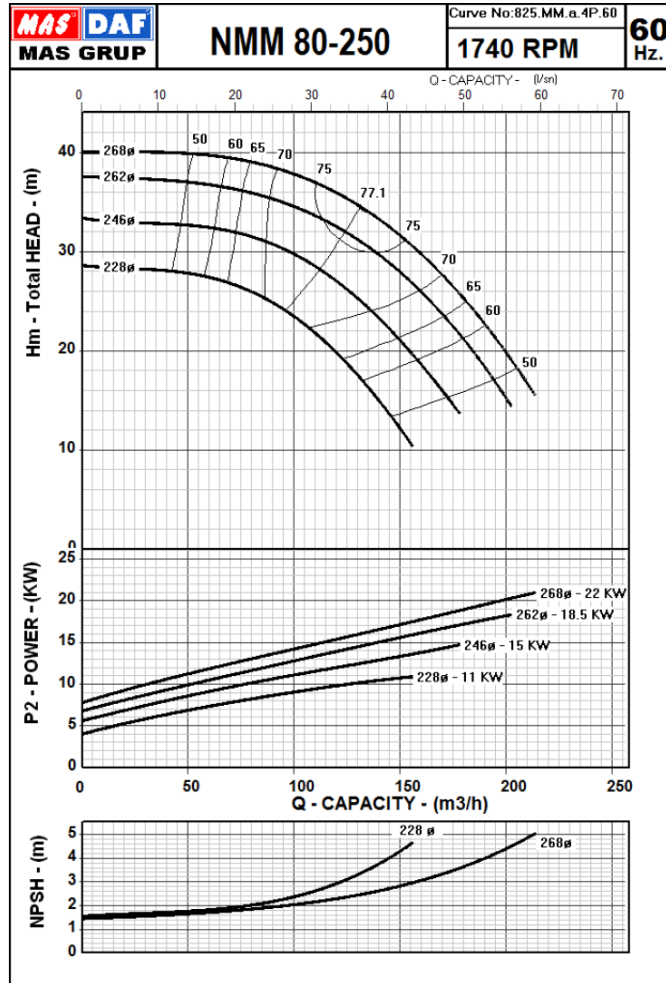
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

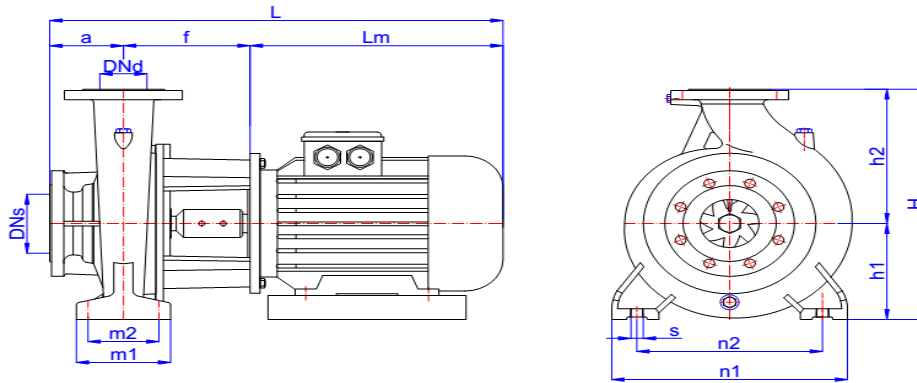
NMM 80-250



Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



80-250	4 poles	MOTOR		FLANGES		GENERAL			PUMP							Mechanical Seal		
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
				mm														mm
		11	160M	490	80	100	855	125	240	200	280	400	315	160	120	16	30	
		15	160L	534			899											240
		18,5	180M	547			912											240
		22	180L	585			950											240

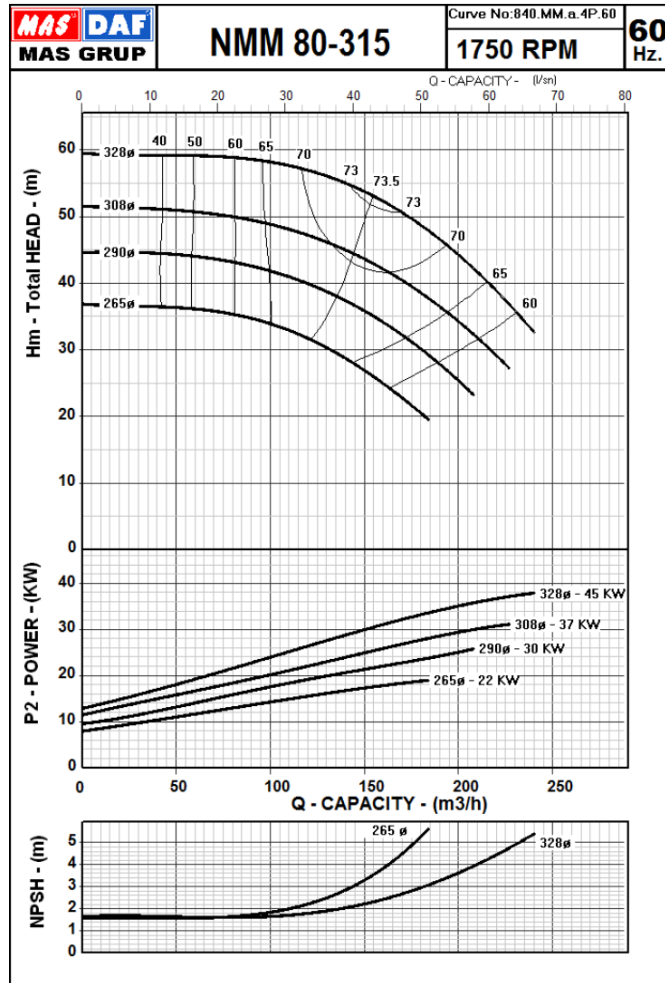
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

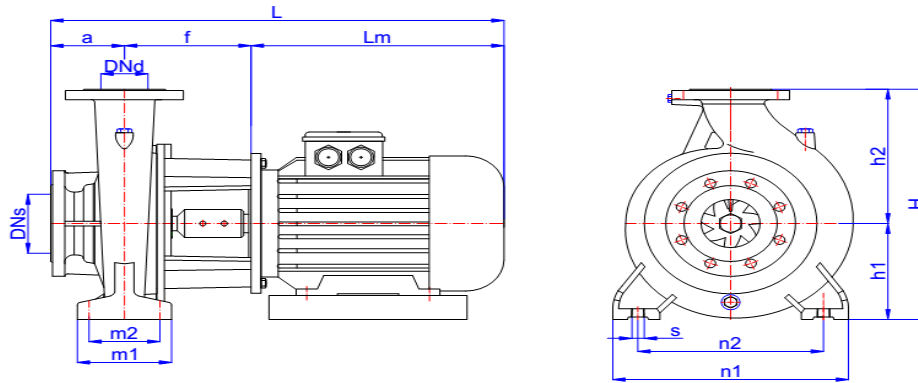
NMM 80-315



Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



80-315	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
4 poles	22	180L	585	80	100	950	125	240	250	315	400	315	160	120	16	30
	30	200L	637			1030		268								
	37	225S	655			1100		320								
	45	225M	680			1125		320								

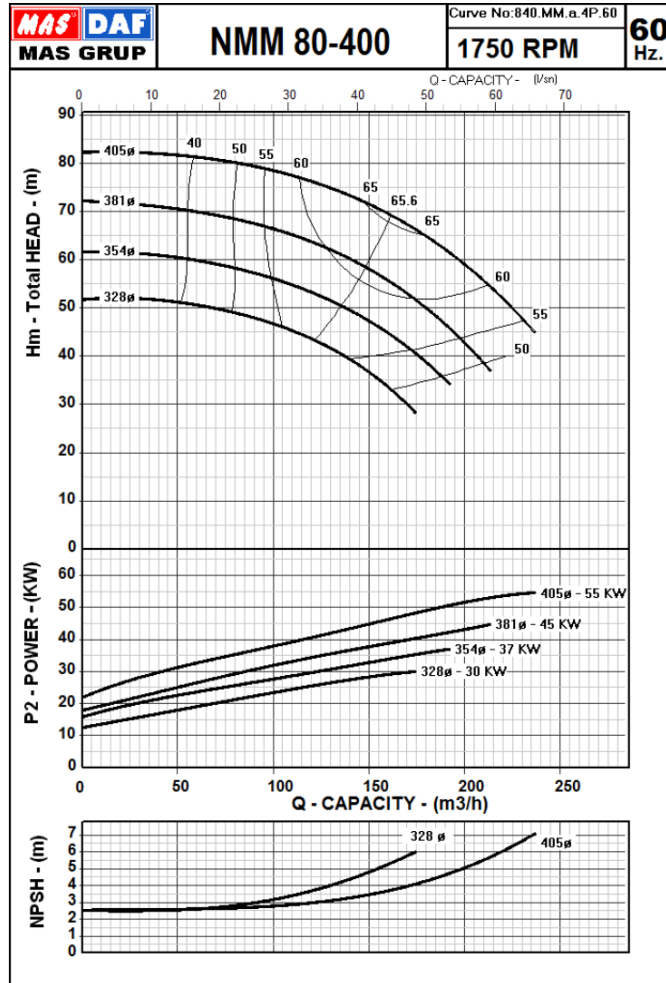
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

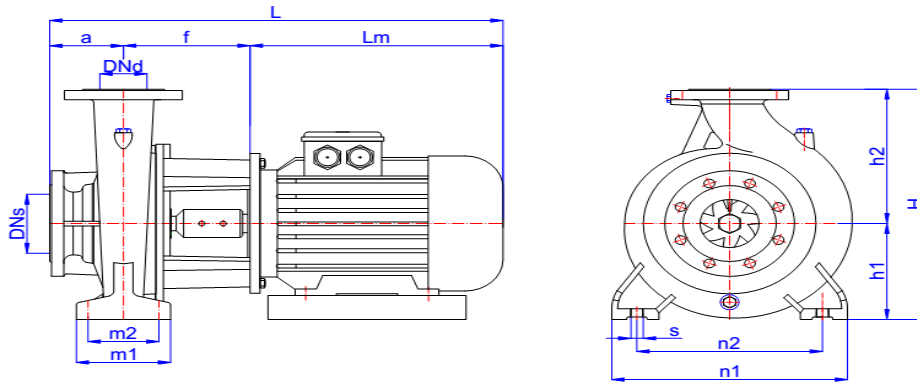


NMM 80-400

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



80-400	MOTOR		FLANGES		GENERAL	PUMP							Mechanical Seal			
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
4 poles	30	200L	637	80	100	1042	125	280	280	355	500	400	200	150	20	45
	37	225S	655			1110		330								
	45	225M	680			1135		330								
	55	250M	756			1241		360								

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NMM Series

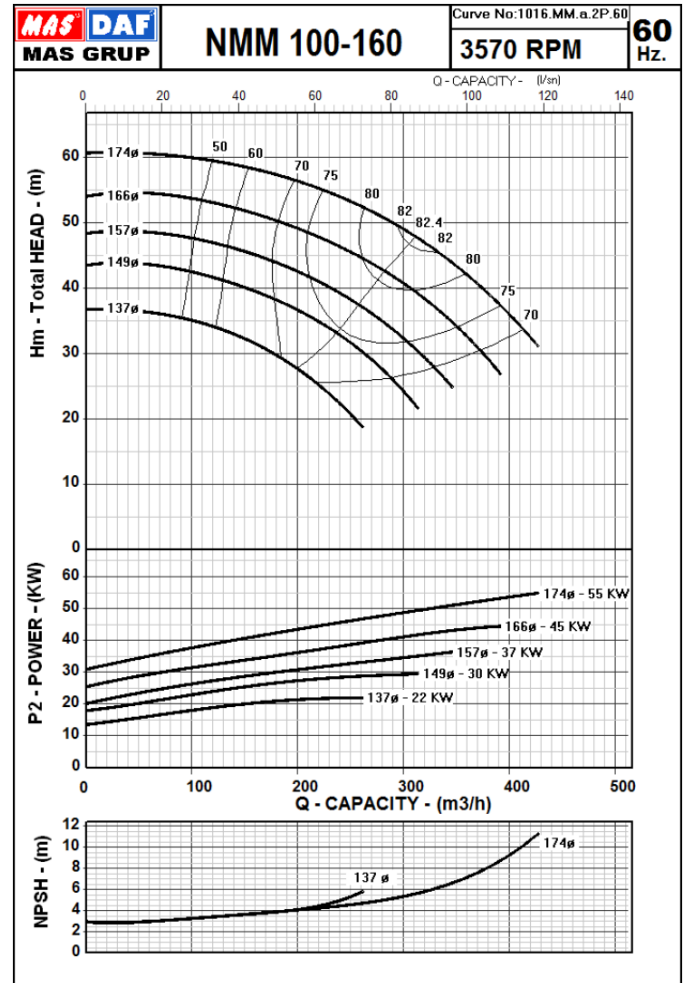
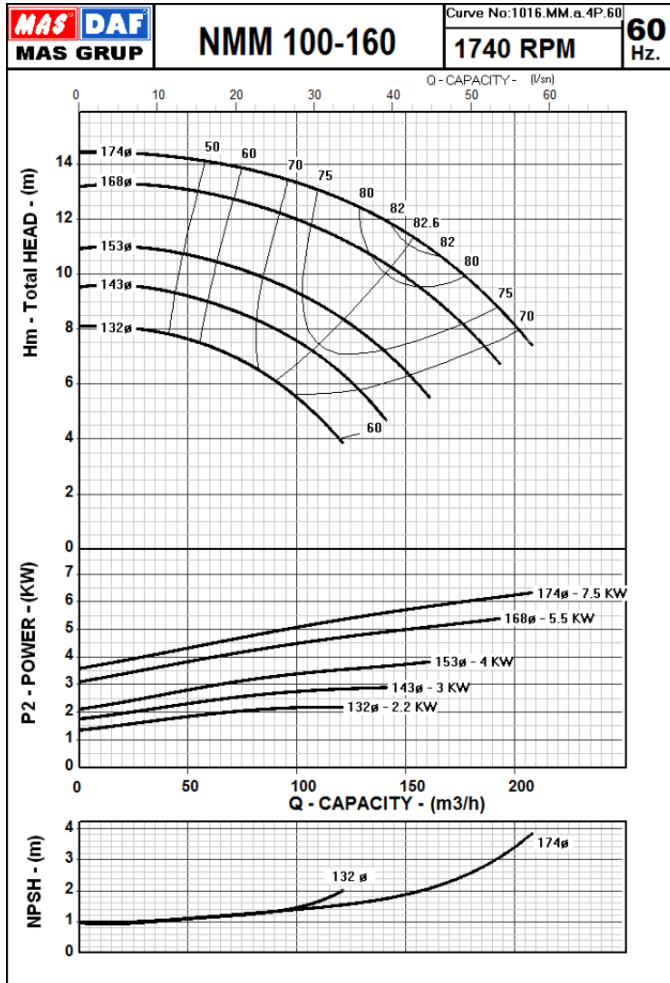
Close Coupled Centrifugal Pump

Performance Curves

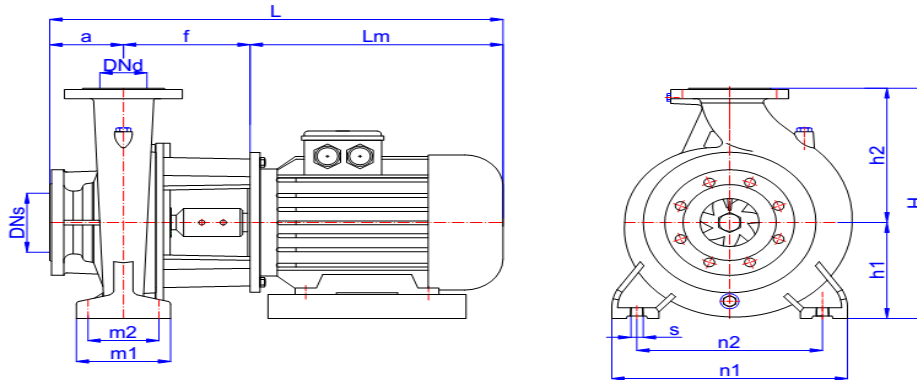


NMM 100-160

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
100-160	4 poles	2,2	100L	316	100	125	621	125	180	200	280	360	280	160	120	16	20
		3	100L	316			621		180								
		4	112M	336			641		180								
		5,5	132S	418			743		200								
		7,5	132M	418			743		200								
	2 poles	22	180M	547	100	125	902	125	230	200	280	360	280	160	120	16	30
		30	200L	637			1022		260								
		37	200L	637			1022		260								
		45	225M	680			1065		260								35
		55	250M	756			1171		290								

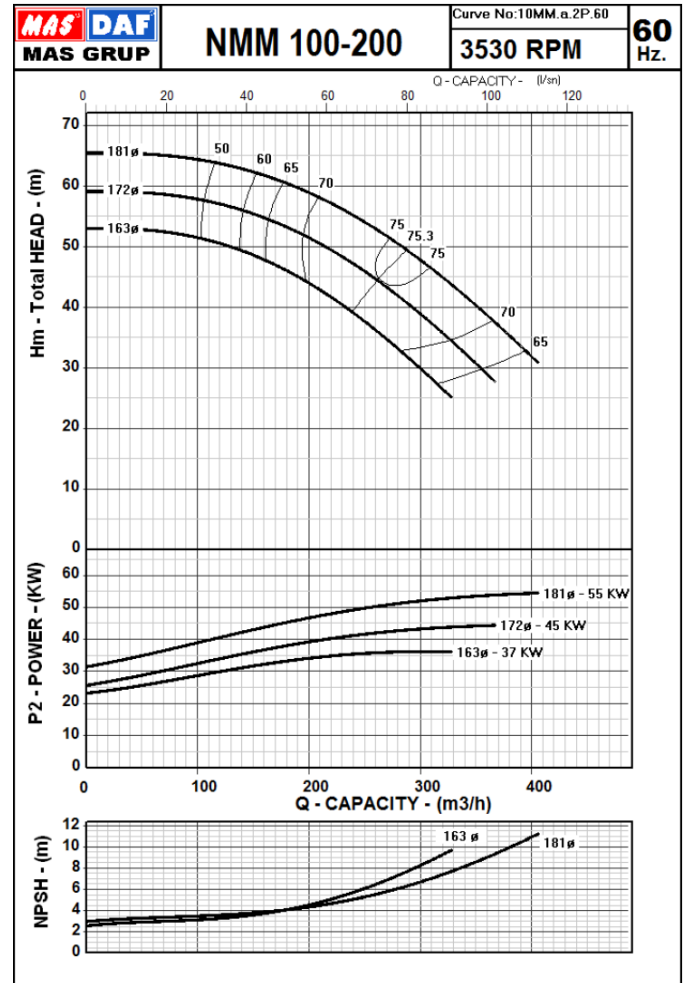
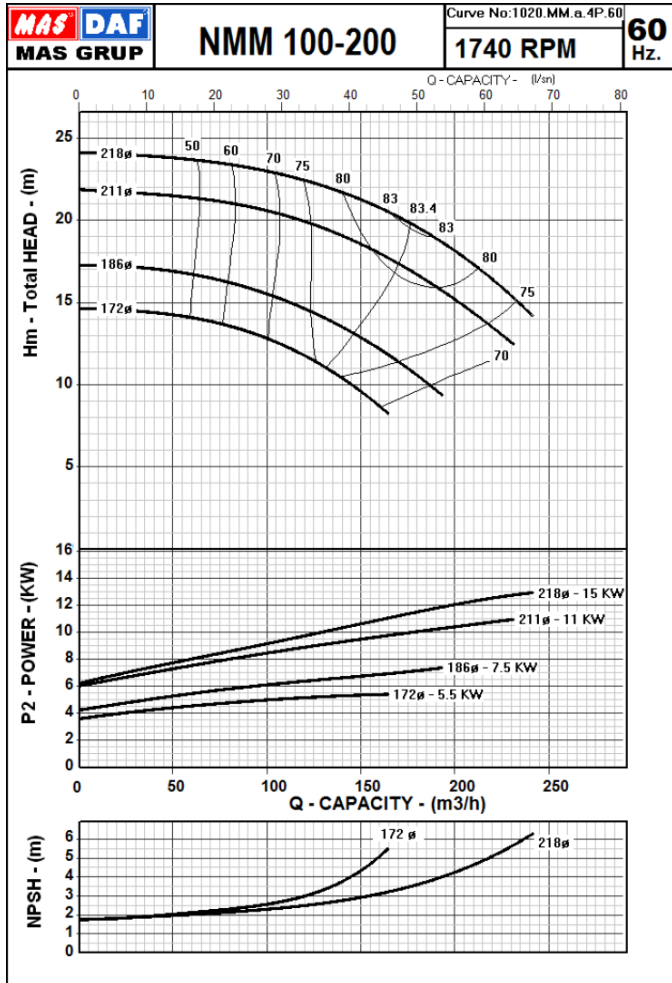
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

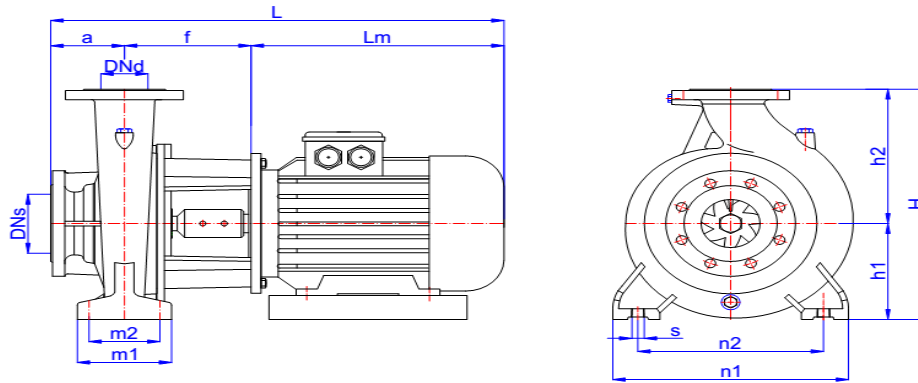


NMM 100-200

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		mm
100-200	4 poles	5,5	132S	418	100	125	758	125	215	200	280	360	280	160	120	16	30
		7,5	132M	418			758		215								
		11	160M	490			855		240								
		15	160L	534			899		240								
	2 poles	37	200L	637	100	125	1032	125	270	200	280	360	280	160	120	16	35
		45	225M	680			1075		270								
		55	250M	756			1181		300								

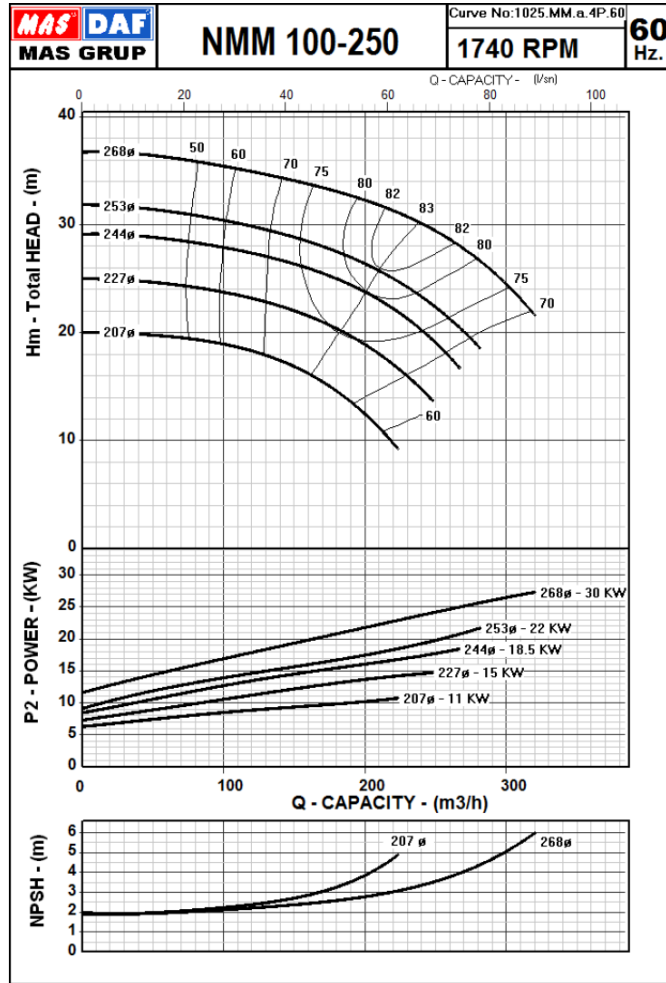
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

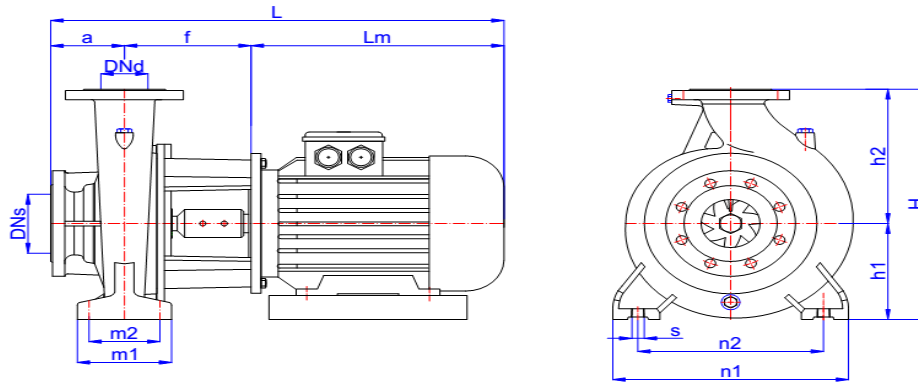


NMM 100-250

Mas Grup



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



100-250	MOTOR		FLANGES		GENERAL	PUMP						Mechanical Seal				
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
4 poles	11	160M	490	100	125	855	125	240	225	280	400	315	160	120	16	30
	15	160L	534			899		240								
	18,5	180M	547			912		240								
	22	180L	586			951		240								
	30	200L	637			1032		270								

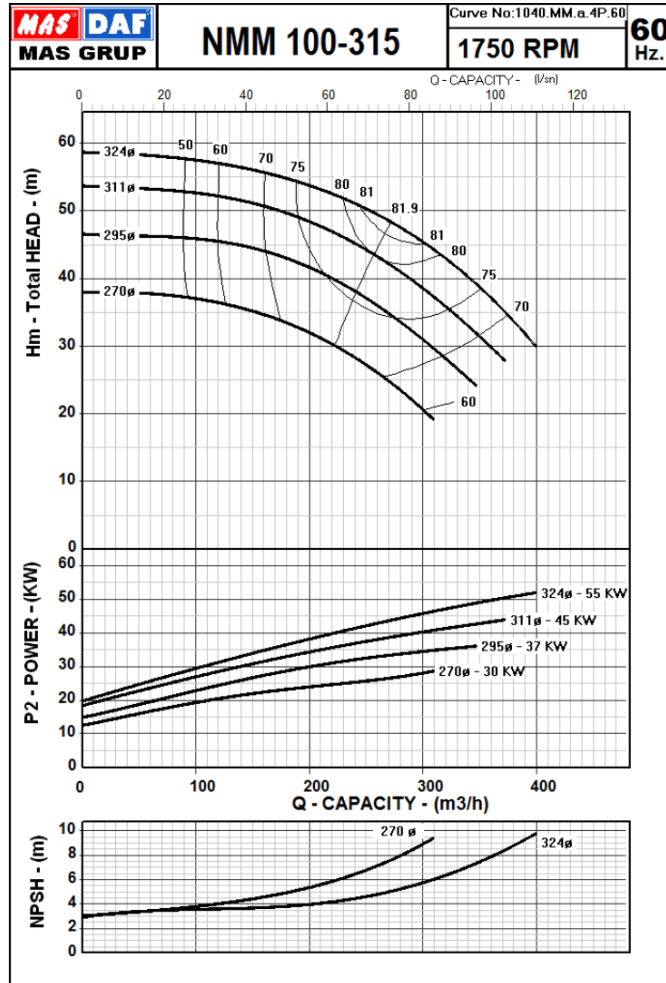
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

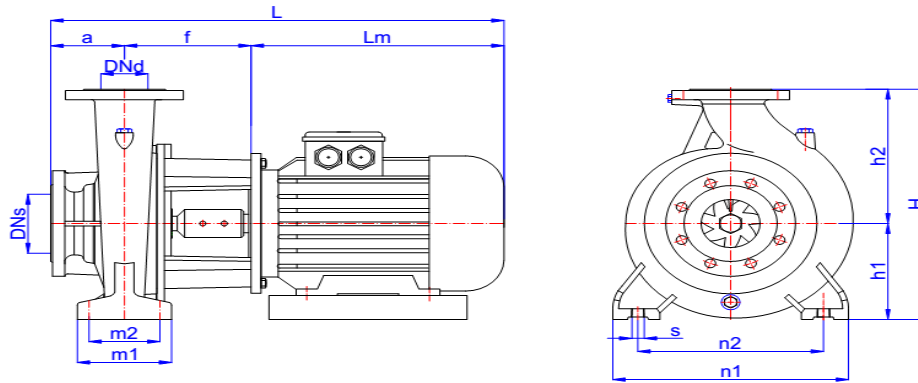


NMM 100-315

Mas Grup

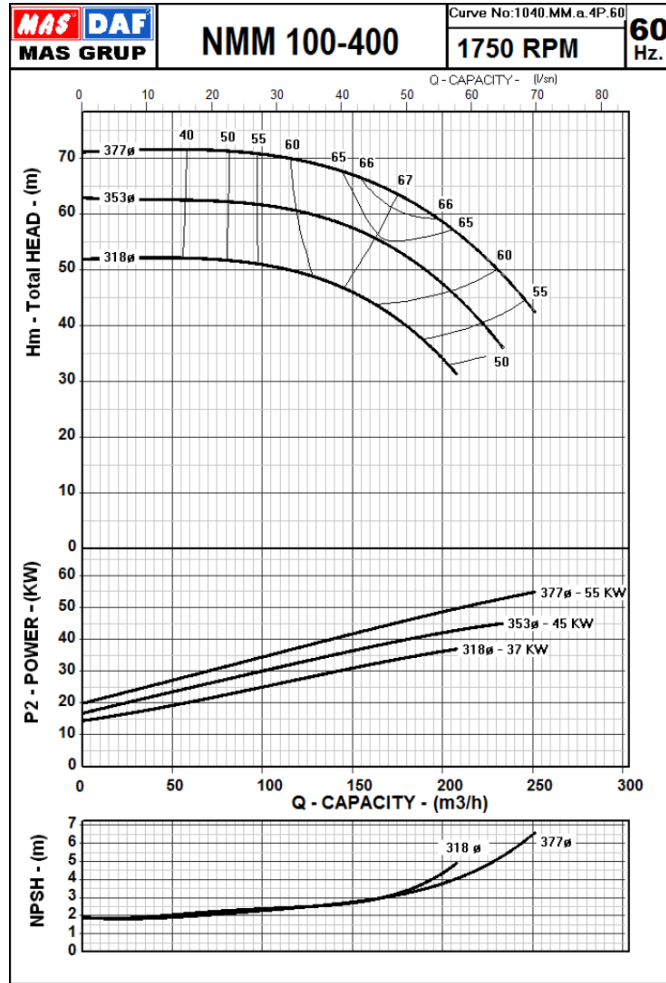


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

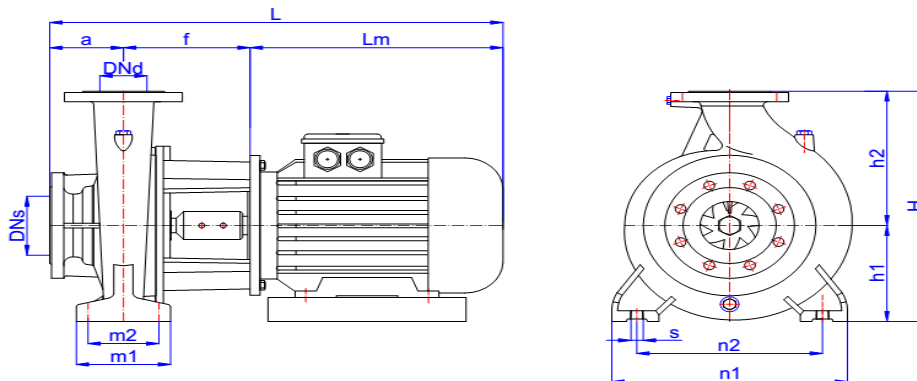


100-315	4 poles	MOTOR		FLANGES		GENERAL	PUMP									Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
		30	200L	637	100	125	1047	270	140	250	315	400	315	160	120	16	30
		37	225S	655			1115	320									35
		45	225M	680			1140	320									
		55	250M	756			1216	320									

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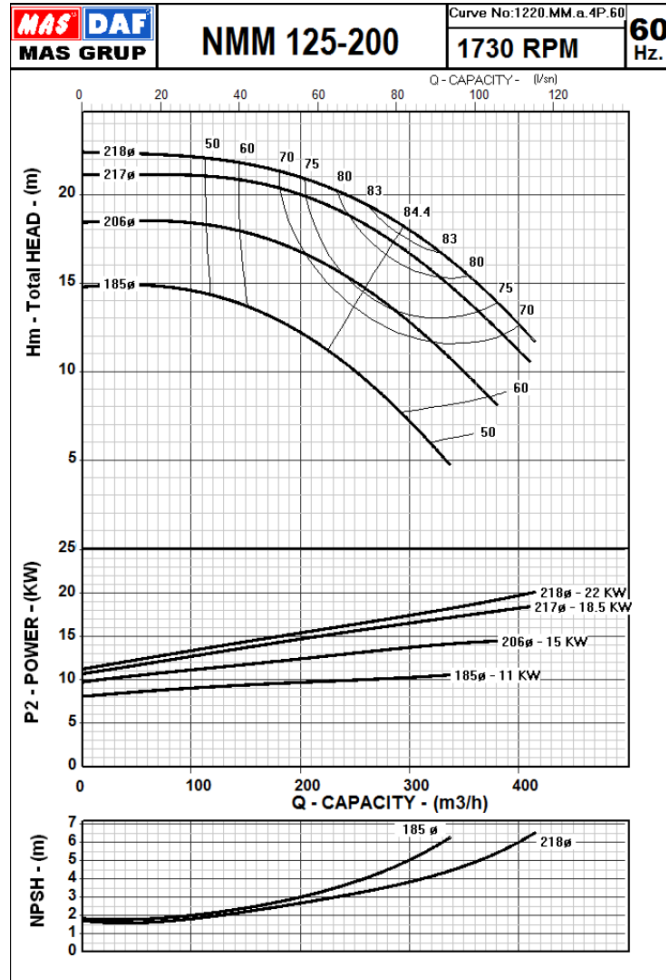


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

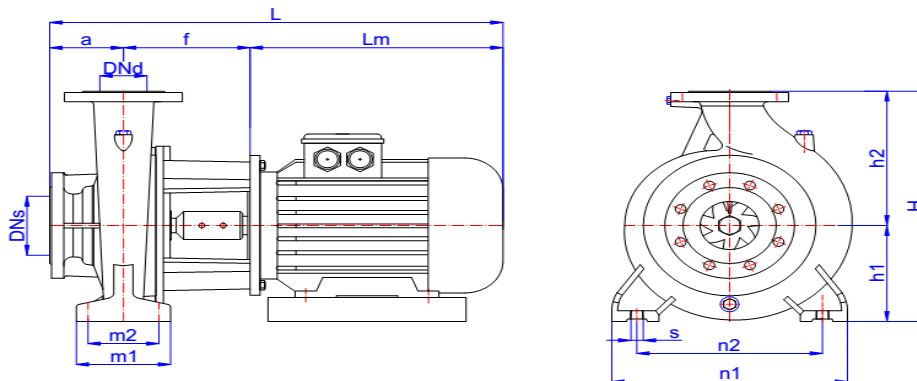


100-400	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
4 poles	37	225S	655	100	125	1125	140	330	280	355	500	400	200	150	20	45
	45	225M	680			1150		330								
	55	250M	756			1226		330								

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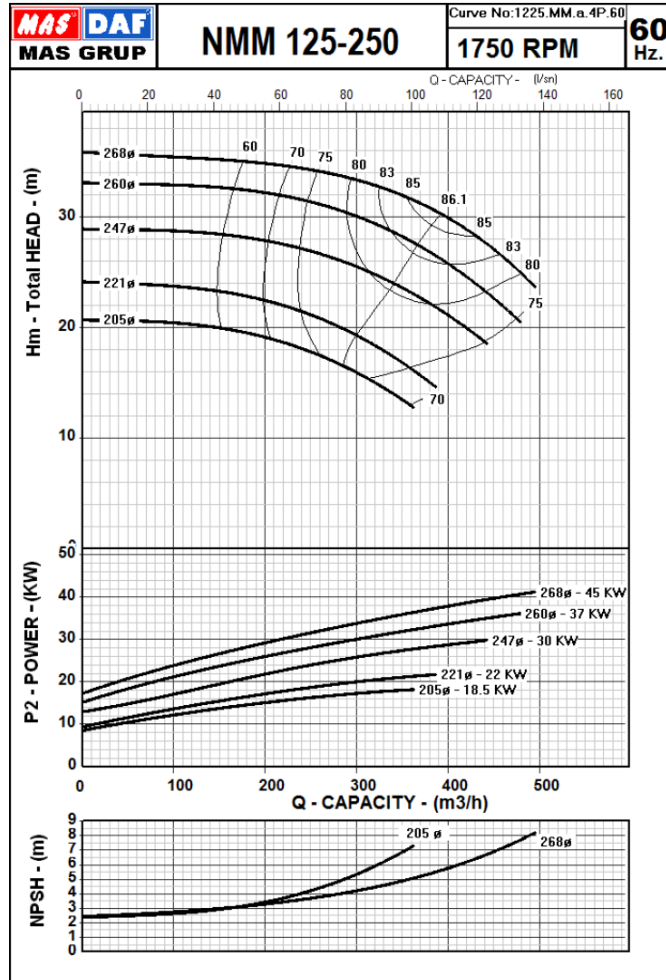


The Performance Curves 60 Hz are based on the kinematic viscosity $1 \text{ mm}^2/\text{s}$ and density $1\text{g}/\text{cm}^3$. Tolerances are acc. to ISO 9906 Annex A.

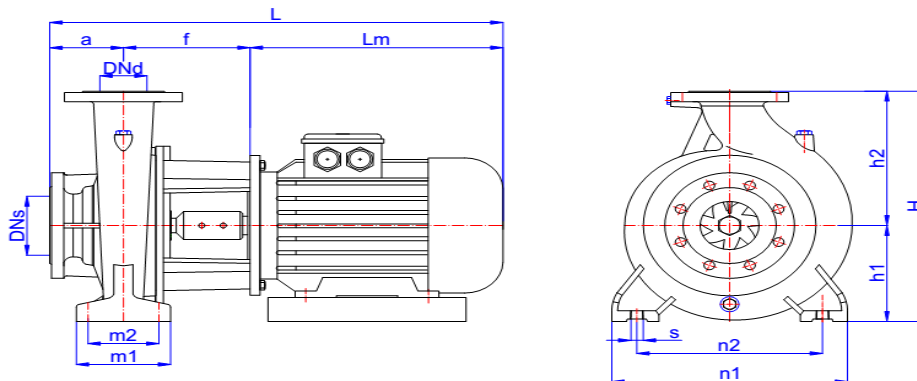


125-200	4 poles	MOTOR		FLANGES			GENERAL		PUMP							Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
11	160M	490	125	150	870	140	240	240	250	315	400	315	160	120	16	30	
15	160L	534			914												
18,5	180M	547			927												
22	180L	586			966												

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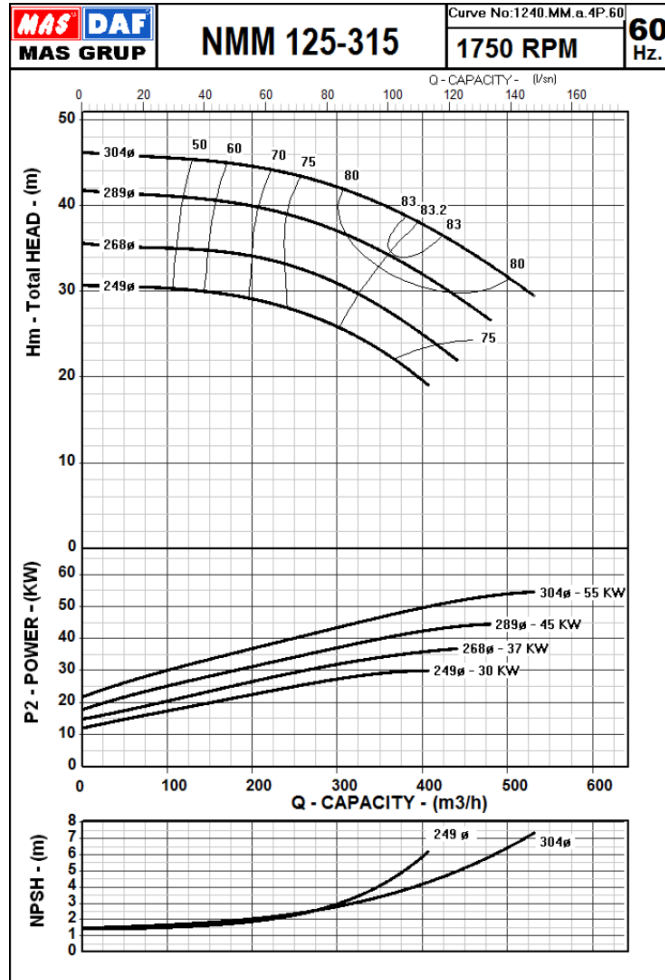


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.

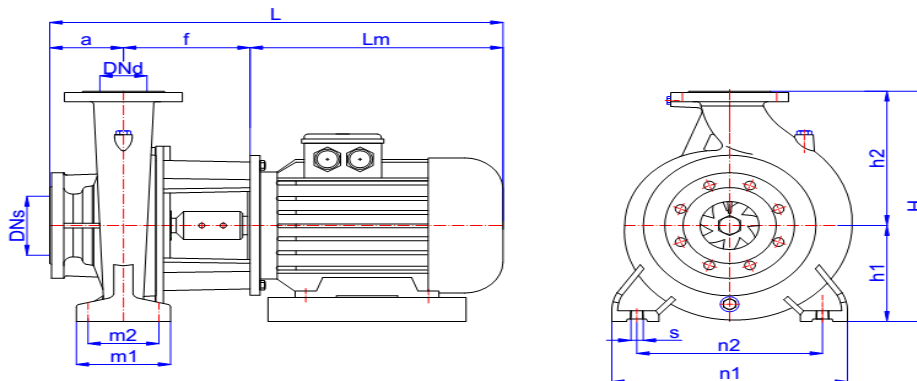


125-250	MOTOR		FLANGES			GENERAL	PUMP									Mechanical Seal
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
			mm													
4 poles	18,5	180M	547	125	150	937	140	250	250	355	400	315	160	120	16	30
	22	180L	586			976		250								
	30	200L	637			1057		280								
	37	225S	655			1075		280								
	45	225M	680			1100		280								35

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The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



125-315	4 poles	MOTOR		FLANGES		GENERAL	PUMP									Mechanical Seal	
		KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter
				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
30	200L	637	125	150	1062	140	285	280	355	500	400	200	150	20	35		
37	225S	655			1110		315										
45	225M	680			1135		315										
55	250M	756			1226		330										

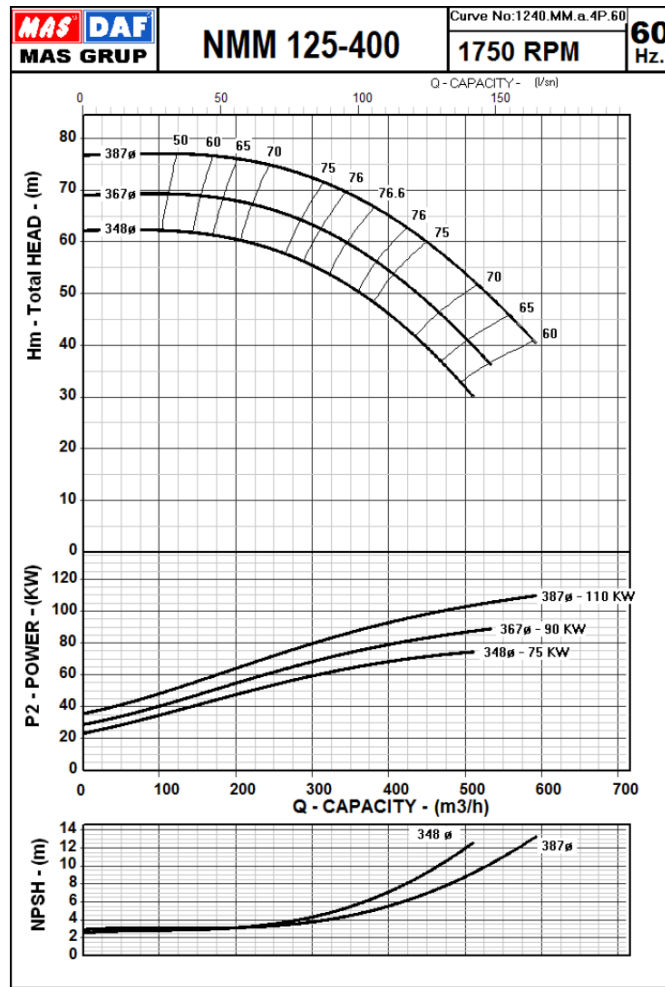
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NMM Series
Close Coupled Centrifugal Pump
Performance Curves

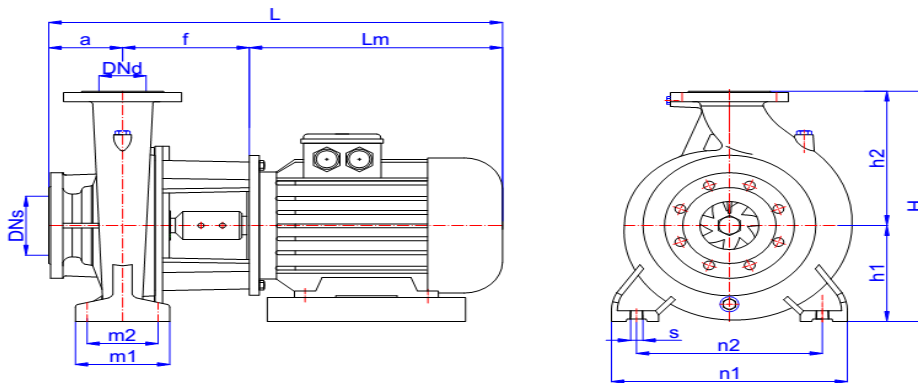


Mas Grup

NMM 125-400



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm²/s and density 1g/cm³. Tolerances are acc. to ISO 9906 Annex A.



	MOTOR		FLANGES		GENERAL	PUMP										Mechanical Seal	
	KW	IEC	Lm	DNd	DNs	L	a	f	h1	h2	n1	n2	m1	m2	s	Nominal Impeller Diameter	
			mm														mm
125-400	4 poles	75	280S	818	125	150	1288	140	330	315	400	500	400	200	150	20	45
		90	280M	818			1288		330								
		110	315S	980			1480		360								

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NMM Series

Close Coupled Centrifugal Pump

Exploded View (Without Coupling)



Mas Grup

PUMP TYPE	MOMENT OF INERTIA I [kgm ²]					
	Impeller GG 25 ($\rho=7,3 \text{ kg/dm}^3$)		Impeller Bronze ($\rho=8,7 \text{ kg/dm}^3$)		Impeller Cast Steel ($\rho=7,8 \text{ kg/dm}^3$)	
	Without Water	With Water	Without Water	With Water	Without Water	With Water
NMM 32-160	0,0062	0,0072	0,0074	0,0084	0,0066	0,0076
NMM 32-200	0,0123	0,0142	0,0147	0,0166	0,0131	0,0150
NMM 32-250	0,0212	0,0272	0,0309	0,0381	0,293	0,345
NMM 40-160	0,0065	0,0072	0,0078	0,0085	0,0070	0,0077
NMM 40-200	0,0124	0,0145	0,0148	0,0169	0,0132	0,0153
NMM 40-250	0,0293	0,0355	0,0349	0,0411	0,0313	0,0375
NMM 50-160	0,0075	0,0087	0,0219	0,0231	0,0080	0,0092
NMM 50-200	0,0136	0,0160	0,0142	0,0186	0,0125	0,0169
NMM 50-250	0,0318	0,0380	0,0379	0,0441	0,0340	0,0402
NMM 50-315	0,0645	0,0800	0,0788	0,0943	0,0696	0,0941
NMM 65-160	0,0077	0,0100	0,0092	0,0115	0,0082	0,0105
NMM 65-200	0,0150	0,0192	0,0179	0,0221	0,0160	0,0202
NMM 65-250	0,0375	0,0465	0,0447	0,0537	0,0401	0,0491
NMM 65-315	0,0745	0,0900	0,0888	0,1043	0,0796	0,0951
NMM 65-400	0,2100	0,2575	0,2522	0,2997	0,2251	0,2726
NMM 80-160	0,0098	0,0127	0,0117	0,0146	0,0105	0,0134
NMM 80-200	0,0195	0,0255	0,0232	0,0292	0,0208	0,0268
NMM 80-250	0,0400	0,0525	0,0477	0,0602	0,0427	0,0552
NMM 80-315	0,0845	0,1077	0,1007	0,1239	0,0903	0,1135
NMM 80-400	0,2200	0,2675	0,2622	0,3097	0,2351	0,2826
NMM 100-160	0,0127	0,0165	0,0145	0,0188	0,0135	0,0175
NMM 100-200	0,0253	0,0327	0,0302	0,0376	0,0270	0,0344
NMM 100-250	0,0448	0,0625	0,0534	0,0711	0,0479	0,0656
NMM 100-315	0,0895	0,1205	0,1067	0,1377	0,0956	0,1266
NMM 100-400	0,2108	0,2650	0,2512	0,3054	0,2252	0,2794
NMM 125-200	0,0375	0,0545	0,0447	0,0617	0,0401	0,0571
NMM 125-250	0,0520	0,0740	0,0556	0,0776	0,0620	0,0840
NMM 125-315	0,1058	0,1480	0,1261	0,1683	0,1130	0,1552
NMM 125-400	0,2358	0,3098	0,2810	0,3550	0,2520	0,3260

For the water filling $\rho=1 \text{ kg/dm}^3$ is used. In case the handled liquid has a different density or the impeller is made of other materials having also a different density, calculate moment of inertia according to the following examples.

Example: Pump Size NMM 100-250

Handled liquid density $\rho=1.25 \text{ kg/dm}^3$, impeller cast iron GG $\rho=7.3 \text{ kg/dm}^3$

$$I = (0.0625 - 0.0448) \times 1.25 + 0.0448 = 0.0669 \text{ kgm}^2$$

Handled liquid density $\rho=1 \text{ kg/dm}^3$, impeller $\rho=8 \text{ kg/dm}^3$ (conversion from GG $\rho=7.3 \text{ kg/dm}^3$)

$$I = 0.0448 \times 8 / 7.3 + (0.0625 - 0.0448) = 0.0668 \text{ kgm}^2$$

Handled liquid density $\rho=1.25 \text{ kg/dm}^3$, impeller $\rho=8 \text{ kg/dm}^3$

(Conversion from GG $\rho=7.3 \text{ kg/dm}^3$ and water $\rho=1 \text{ kg/dm}^3$)

$$I = 0.0448 \times 8 / 7.3 + (0.0625 - 0.0448) \times 1.25 = 0.0712 \text{ kgm}^2$$

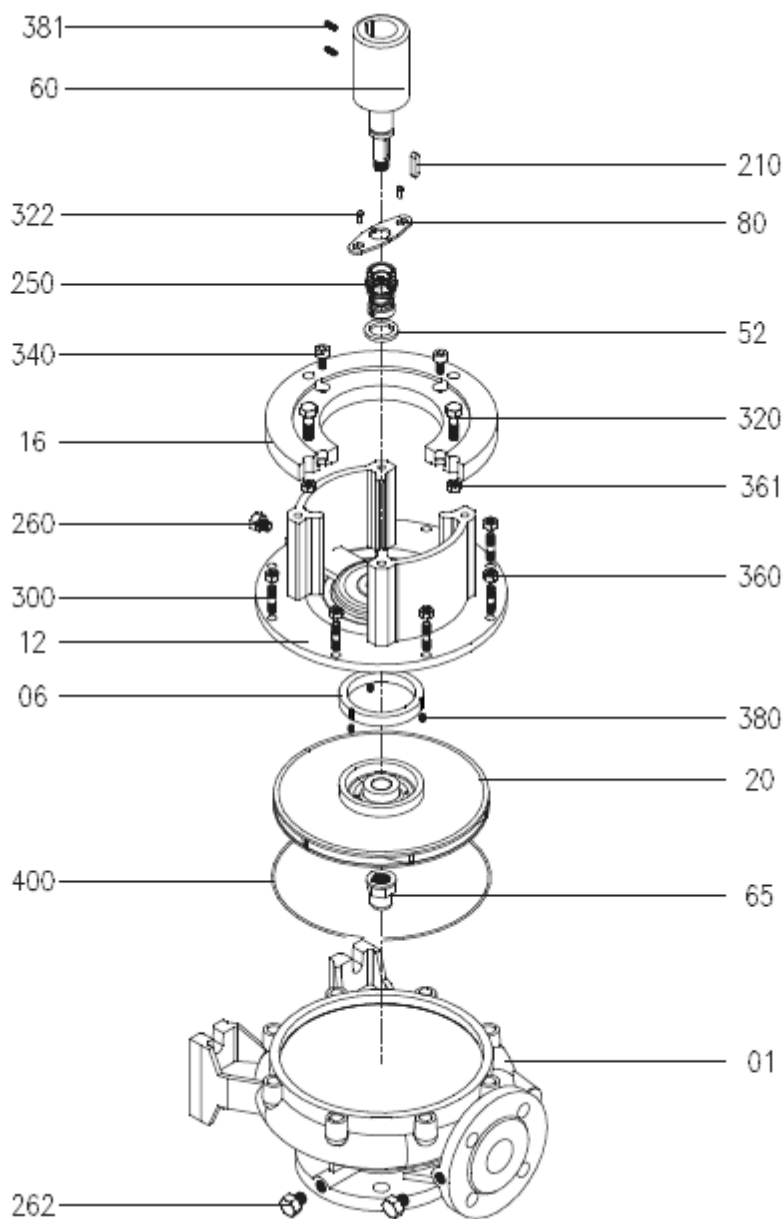
NMM Series

Close Coupled Centrifugal Pump

Exploded View (Without Coupling)



Mas Grup

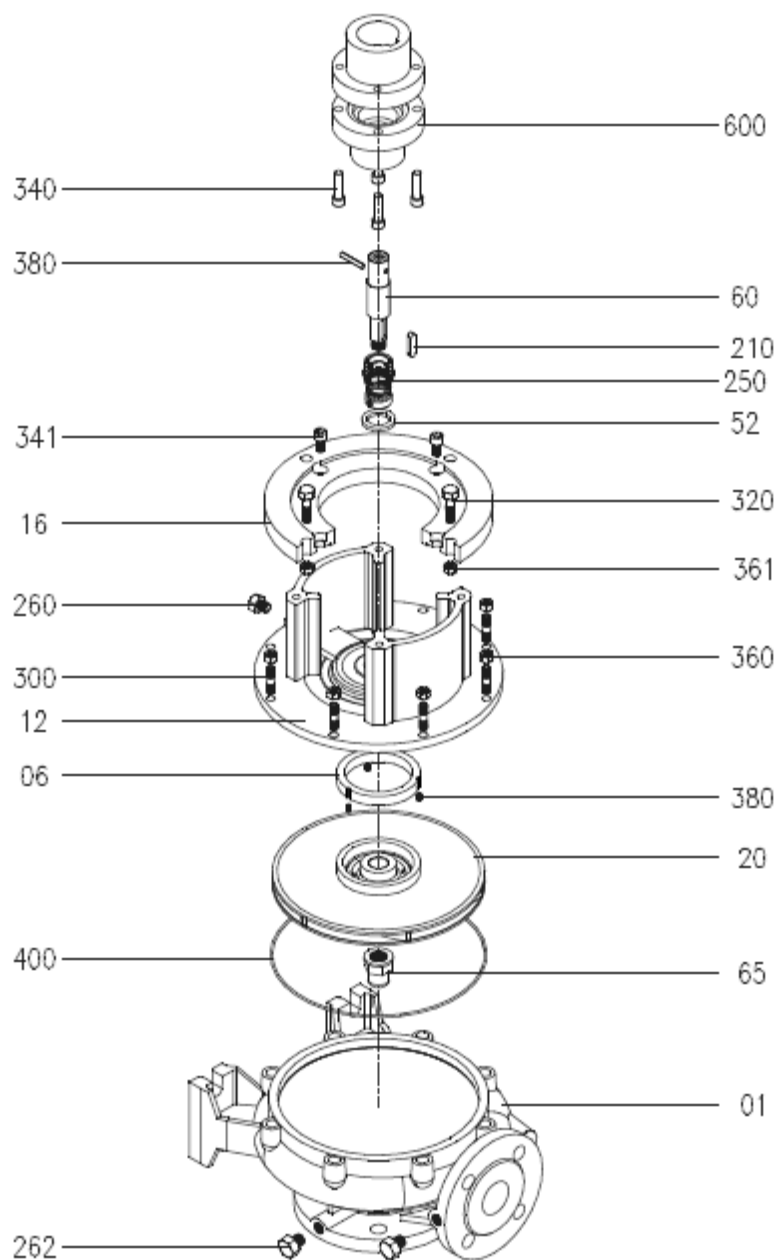


PART NO	PART NAME	PART NO	PART NAME
01	Volute Casing	260	Plug, Adapter
06	Wear Ring	262	Plug, Volute Casing
12	Adapter	300	Stud, Volute Casing
16	Adapter Flange	320	Hex Bolt
20	Impeller	322	Hex Bolt
52	Mechanical Seal Ring	340	Cap Screw
60	Pump Shaft	360	Nut
65	Impeller Nut	361	Nut
80	Shackle	380	Setscrew
210	Impeller Key	381	Setscrew
250	Mechanical Seal	400	O-Ring

NMM Series
Close Coupled Centrifugal Pump
Exploded View (With Coupling)



Mas Grup



PART NO	PART NAME	PART NO	PART NAME
01	Volute Casing	262	Plug, Volute Casing
06	Wear Ring	300	Stud, Volute Casing
12	Adapter	320	Hex Bolt
16	Adapter Flange	340	Cap Screw
20	Impeller	341	Cap Screw
52	Mechanical Seal Ring	360	Nut
60	Pump Shaft	361	Nut
65	Impeller Nut	380	Setscrew
210	Impeller Key	381	Setscrew
250	Mechanical Seal	400	O-Ring
260	Plug, Adapter	600	Rigid Coupling



Mas Grup

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