

In-Line Centrifugal Pumps

INM/INL SERIES (60 Hz.)



TECHNICAL MANUAL



Revision No: 02

February/2018

INM/INL Series In-Line Centrifugal Pumps

General Information



Mas Grup

Fields of Application

The MAS in-line pumps are designed for,

- Water supply,
- Boosting,
- Circulating of hot and cold water,
- In central heating and air-conditioning installations,
- Liquid transfer applications in industry, agriculture, etc.

Pumped Liquids

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

Cooling liquids, not containing mineral oil. (Oil-resistant O-rings are available on request.)

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

Design

- The INM/INL pumps are single-stage centrifugal pumps of non-self-priming type fitted with standard motors and mechanical shaft seals.
- The nominal flow rates of the pumps comply with the DIN 24 255 standards.
- Pump flanges sizes according to DIN 2533, PN 16. The dimensions of the suction and discharge ports are identical. Both pump flanges have pressure gage tapings.
- Single entry, closed impeller is hydraulically thrust compensated and dynamically balanced.
- A drain plug is fitted in the bottom of pump housing.
- The motor shaft is passed into the pump shaft for coupling and no need to use any coupling for the system.

Shaft

Chromium steel (AISI 420) fine grained shafts are used on INM/INL pumps. Motor shaft is passed into the pump shaft for coupling. For high powers, a coupling system is used between the motor shaft and pump shaft.

Bearings

For INM/INL series pumps, the motor shaft and pump shaft are passed into each other. The axial and the radial loads are carried by the bearing inside the motor. There is no need to use extra bearing for the pump. For high powers, a coupling system is used between the motor shaft and pump shaft.

Shaft Seal

- INM/INL pumps are fitted with a single, uncooled and unbalanced rubber bellow mechanical seal.
- Mechanical seal flushed from internal source.
- The circulation of liquid in the duct of the air vent screw ensures lubrication and cooling of the shaft seal.

For a medium different than water, please consult to MAS for selection of appropriate O-Ring and Mechanical Seal type.

Technical Data

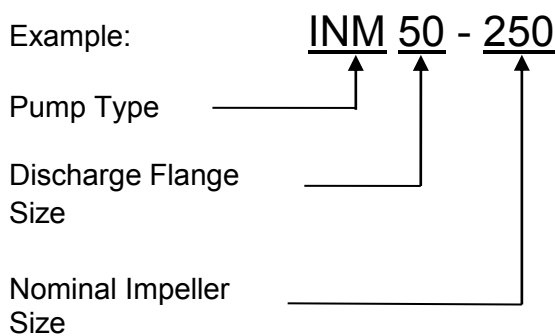
• Suction Flange	: DN 40 - DN 250
• Discharge Flange	: DN 40 - DN 250
• Operating Pressure	: 10 Bar
• Test Pressure	: 13 Bar
• Operating Temperature	: -25 – 120°C
• Capacity Range	: 2 – 700 m ³ / h
• Head Range	: 2 - 70 m
• Speed:	: 900-3600 RPM

Inform us in your orders, for suction pressure above 7 Bar.

Driver

B5, B14 flanged, IP 55 and according to IEC electric motors are used for INM/INL series pumps. 50 Hz and 60 Hz can be used.

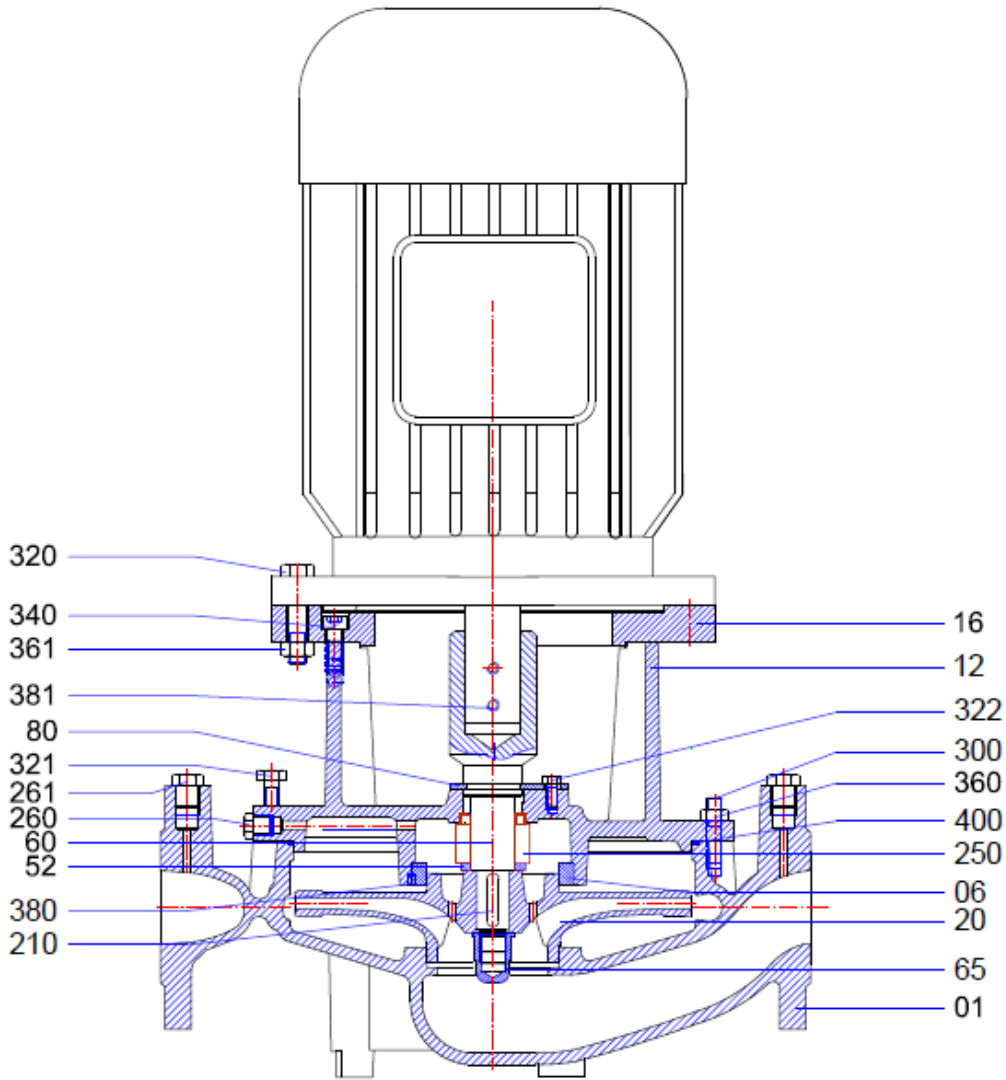
Identification Code



INM/INL Series
In-Line Centrifugal Pumps
INM Sectional Drawing and Part List (Without Coupling)



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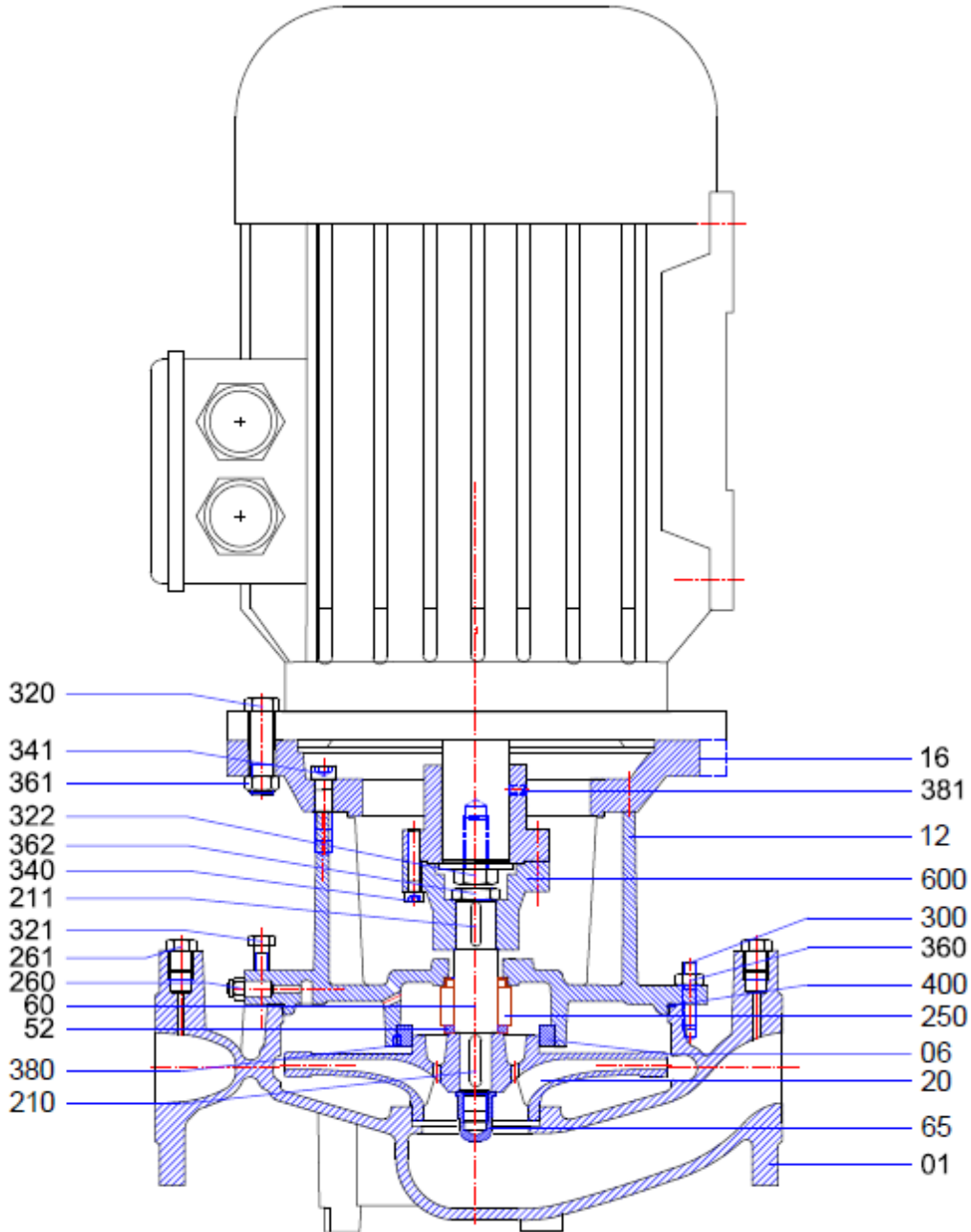


Part No	Part Name	Part No	Part Name
01	Pump Casing	261	Pipe Plug, Pressure Gauge
06	Wearing Ring	300	Stud, Pump Casing
12	Adapter	320	Hex Bolt
16	Motor Flange	321	Hex Bolt
20	Impeller	322	Hex Bolt
52	Mechanical Seal Ring	340	Cap Screw
60	Pump Shaft	360	Nut
65	Impeller Nut	361	Nut
80	Shackle	380	Set-Screw
210	Key, Impeller	381	Set-Screw
250	Mechanical Seal	400	O-Ring
260	Pipe Plug, Adapter		

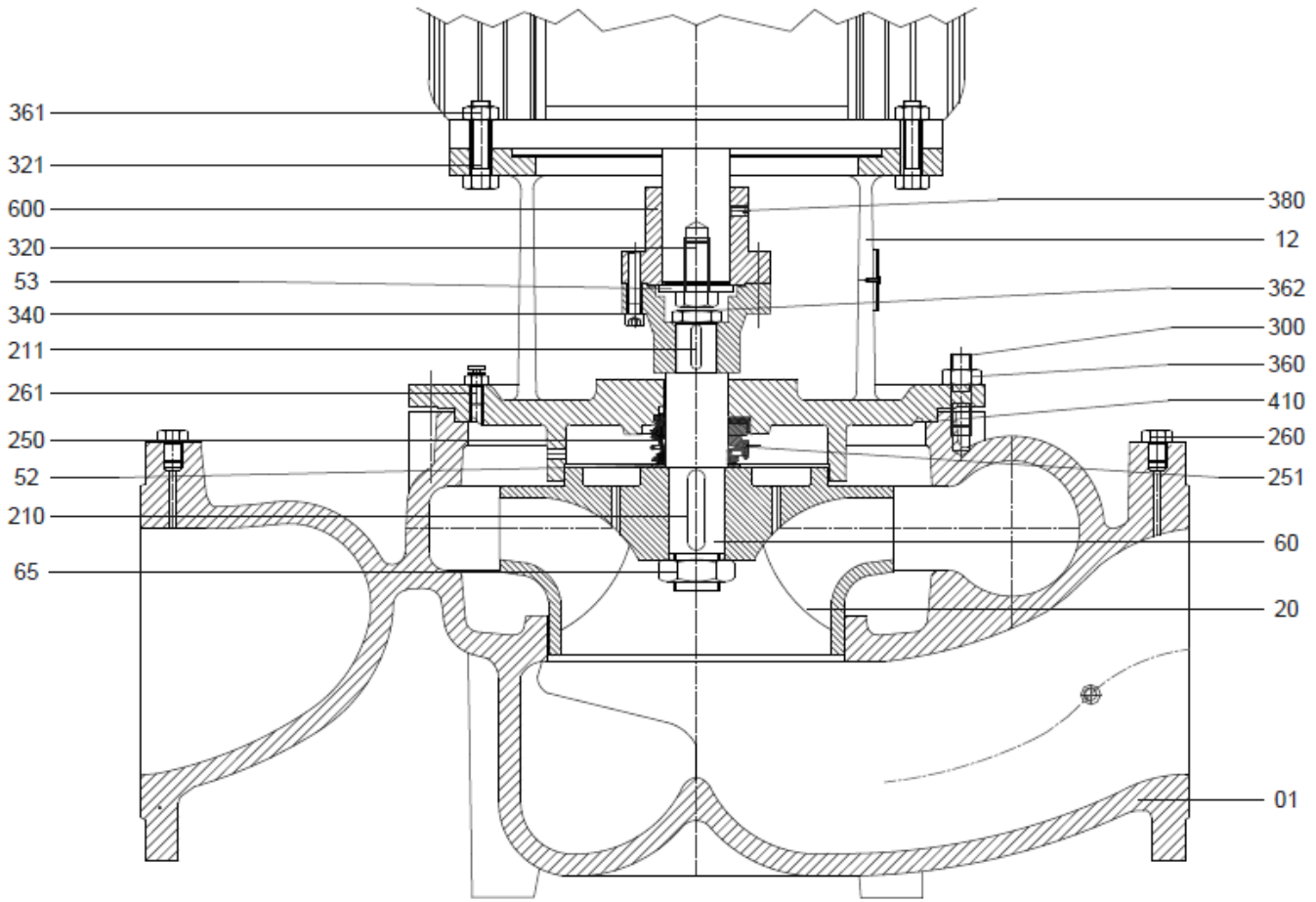
INM/INL Series
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Part No	Part Name	Part No	Part Name
01	Volute casing	300	Casing stud
06	Wear Ring	320	Hex Bolt
12	Adapter	321	Hex Bolt
16	Motor Flange	322	Hex Bolt
20	Impeller	340	Imbues Bolt
52	Mechanical Seal Ring	341	Imbues Bolt
60	Shaft	360	Nut
65	Impeller nut	361	Nut
210	Key, Impeller	362	Nut
211	Kama, coupling	380	Setscrew
250	Mechanical Seal	381	Setscrew
260	Solid plug	400	O-Ring
261	Drain plug	600	Rigid coupling



Part No	Part Name	Part No	Part Name
01	Volute casing	261	Stud (Adapter)
12	Adapter	300	Casing stud
20	Impeller	320	Hex Bolt (Coupling)
52	Mechanical Seal Ring	321	Hex Bolt (Adapter)
53	Coupling Front Bush	340	Imbus Bolt (Coupling)
60	Shaft	360	Nut(Casing)
65	Impeller nut	361	Nut(Adapter)
210	Key, Impeller	362	Nut(Coupling)
211	Key, Coupling	380	Setscrew
250	Mechanical Seal	410	Cylinder Head Gasket
251	Mechanical Seal	600	Rigid Coupling
260	Stud (casing)		

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Technical Data



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Material Options

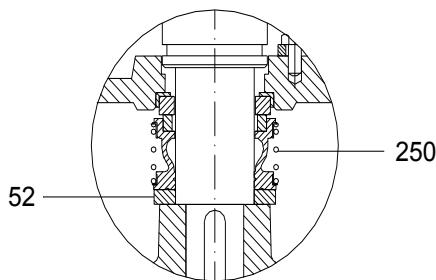
Components	Material. No						
		0.6025	0.7040	2.1050.01	1.4021	1.4301	1.4401
Pump Casing		●	○	○		○	○
Adapter		●	○	○		○	○
Impeller		●	○	○		○	○
Wear Ring		●	○	○		○	○
Shaft					●	○	○
Adapter (Motor)		●	○	○		○	○

● - 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 Ni18.9	A 276 Type 304
Chrome Nickel Molybdenum Steel	1.4401	X5 Cr NiMo 18.10	A 276 Type 316

Mechanical Seal Application



No	Part Name
52	Mechanical Seal Ring
250	Mechanical Seal

For different type of mechanical seal, please consult MAS representative.

Burgmann MG1-G60- up to 12 Bar
(Independent on direction of rotation)

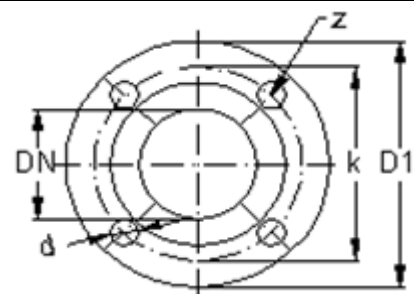
INM/INL Series
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Flange Sizes

Suction and Discharge Flanges Sizes				
DNs DNd	ØD1	Øk	Ød	Z
40	150	110	18	4
50	165	125	18	4
65	185	145	18	4
80	200	160	18	8
100	220	180	18	8
125	250	210	18	8
150	285	240	23	8
200	340	295	23	12

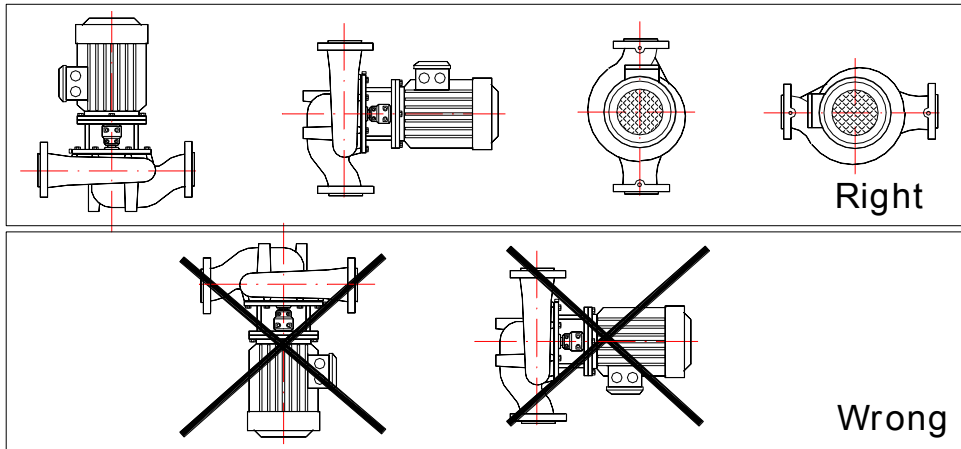


No	PumpType	Flanges	
		DNs (mm) Suction	DNd (mm) Discharge
1	INM 40-125	40	40
2	INM 40-160		
3	INM 40-200		
4	INM 40-250		
5	INM 50-125	50	50
6	INM 50-160		
7	INM 50-200		
8	INM 50-250		
9	INM 65-125	65	65
10	INM 65-160		
11	INM 65-200		
12	INM 65-250		
13	INM 80-160	80	80
14	INM 80-200		
15	INM 80-250		
16	INM 80-315		

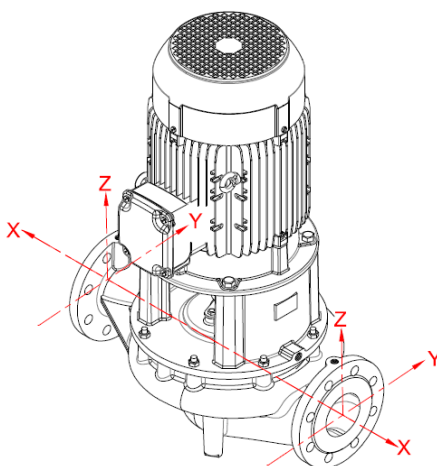
No	PumpType	Flanges	
		DNs (mm) Suction	DNd (mm) Discharge
17	INM 100-160	100	100
18	INM 100-200		
19	INM 100-250		
20	INM 100-315		
21	INM 125-200	125	125
22	INM 125-250		
23	INM 125-315		
24	INM 150-200	150	150
25	INM 150-250		
26	INM 150-315		
27	INL 150-360		
28	INL 200-315	200	200

Mounting Arrangement

INM/INL Pumps can be installed with the motor (Motor Centre Line) in all positions between vertical and horizontal. To avoid that the water penetrates motor and bearings, the motor (terminal box) must never fall below the horizontal.



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.

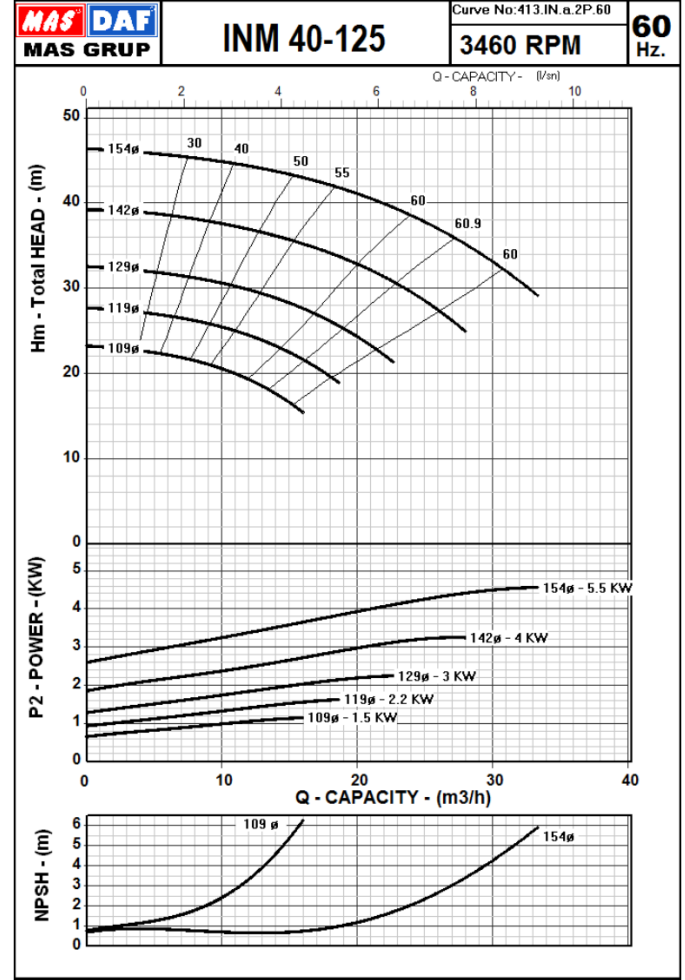
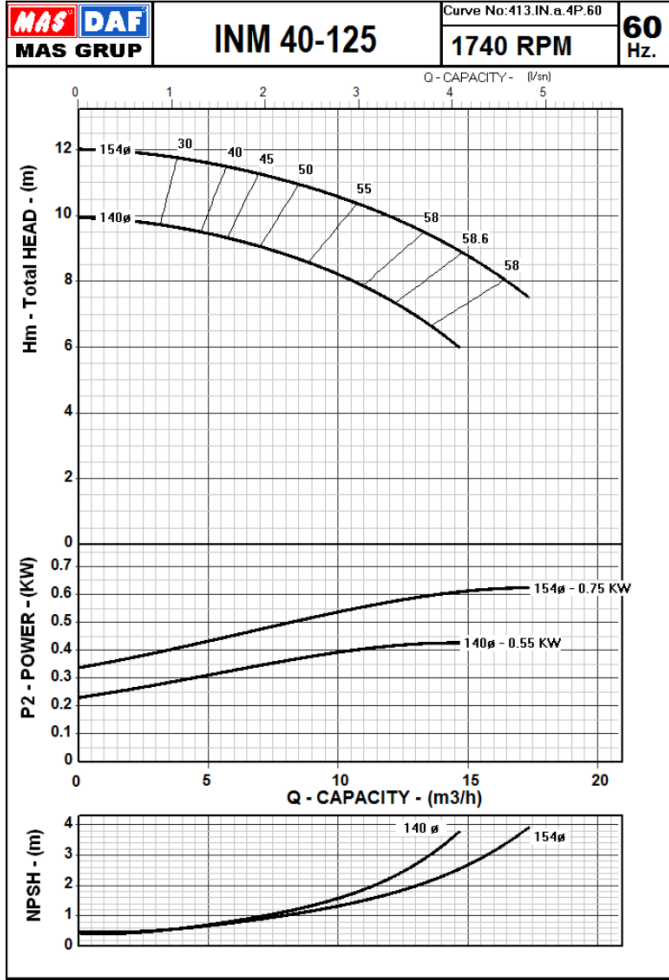
PUMP TYPE	FORCES AND MOMENTS						
	DN FLANGE	SUCTION AND DISCHARGE FLANGE			SUCTION AND DISCHARGE FLANGE		
	mm	N			Nm		
		F _y	F _z	F _x	M _y	M _z	M _x
INM 40-125	40	595,3	476,2	523,82	428,58	500,01	619,06
INM 40-160							
INM 40-200							
INM 40-250							
INM 50-125	50	785,7	642,9	714,3	476,2	547,63	666,68
INM 50-160							
INM 50-200							
INM 50-250							
INM 65-125	65	1000	809,5	880,97	523,82	571,44	714,3
INM 65-160							
INM 65-200							
INM 65-250							
INM 80-160	80	1191	976,2	1071,45	547,63	619,06	761,92
INM 80-200							
INM 80-250							
INM 80-315							
INM 100-160	100	1595	1286	1428,6	595,25	690,49	833,35
INM 100-200							
INM 100-250							
INM 100-315							
INM 125-200	125	1881	1524	1690,51	714,3	904,78	1000
INM 125-250							
INM 125-315							
INM 150-200	150	2381	1929	2142,9	833,35	976,21	1190,5
INM 150-250							
INM 150-315							
INL 150-360							
INL 200-315	200	3040,2	2440,5	2713,8	1065	1223,2	1612,4

INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

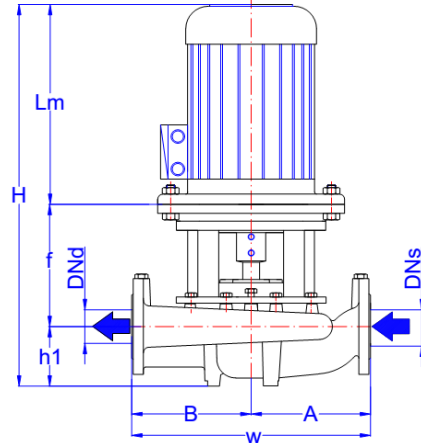


INM 40-125

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	DNs - DNd	H	h1	W	A	B	Nominal Impeller Diameter
40-125	4 Poles	0.55	80	239	40	496	117	300	160	140	20
		0.75	80	239		496	117	300	160	140	20
	2 Poles	1.5	90S	259	40	516	117	300	160	140	20
		2.2	90L	284		541	117	300	160	140	20
		3	100L	316		603	117	300	160	140	20
		4	112M	336		623	117	300	160	140	20
		5.5	132S	375		662	117	300	160	140	20

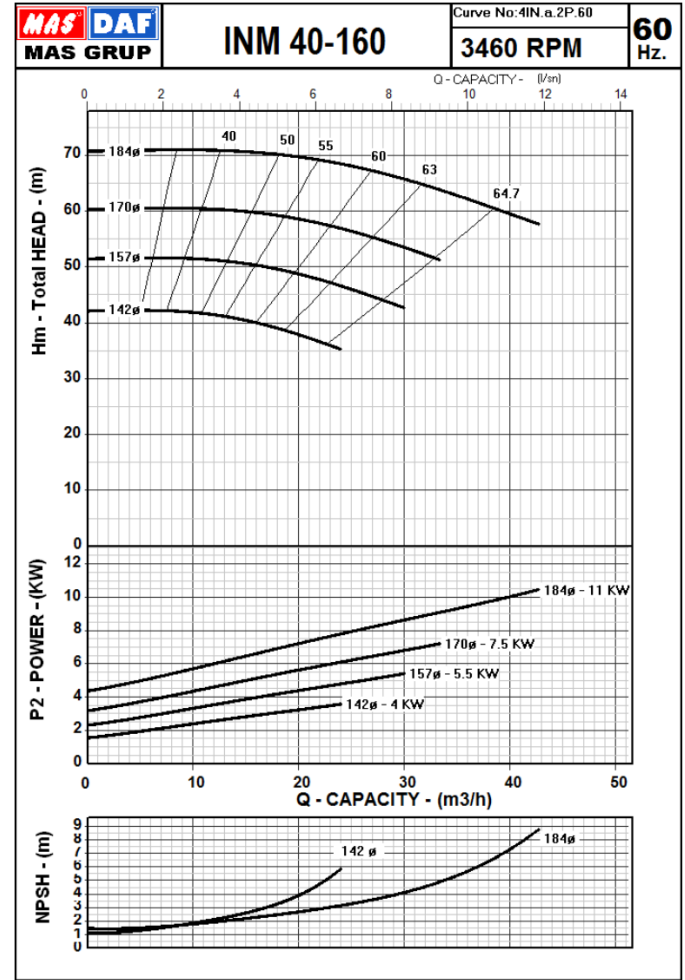
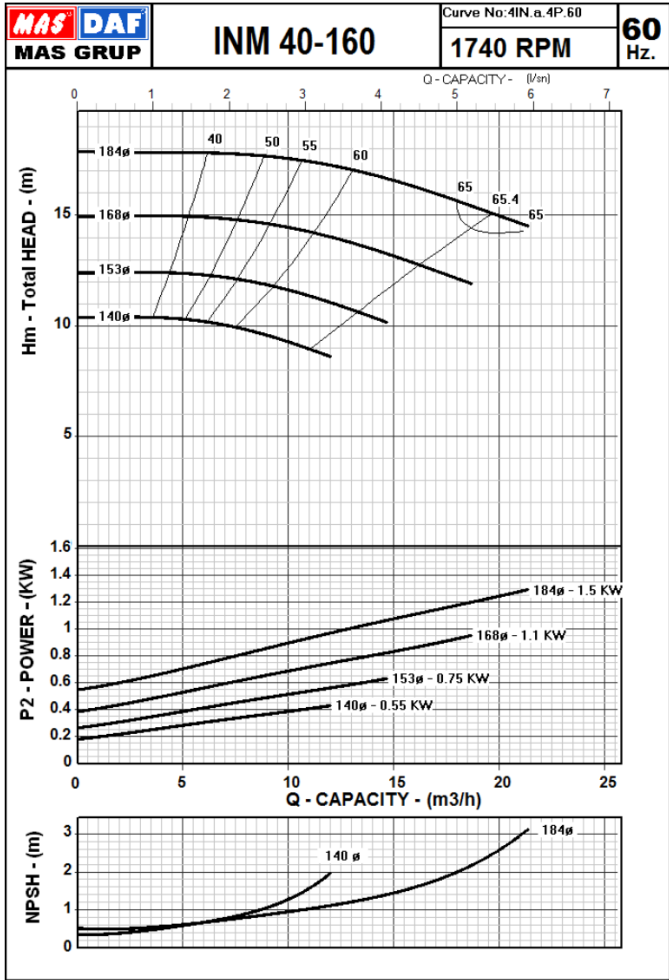
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

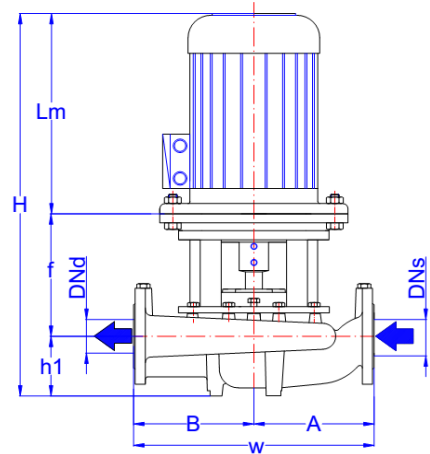


INM 40-160

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	DNs - DNd	H	h1	W	A	B	Nominal Impeller Diameter
40-160	4 Poles	0.55	80	239	40	484	105	340	180	160	20
		0.75	80	239		484	105	340	180	160	20
		1.1	90S	259		504	105	340	180	160	20
		1.5	90L	284		529	105	340	180	160	20
	2 Poles	4	112M	336	40	611	105	340	180	160	20
		5.5	132S	375		650	105	340	180	160	20
		7.5	132S	375		650	105	340	180	160	20
		11	160M	490		795	105	340	180	160	20

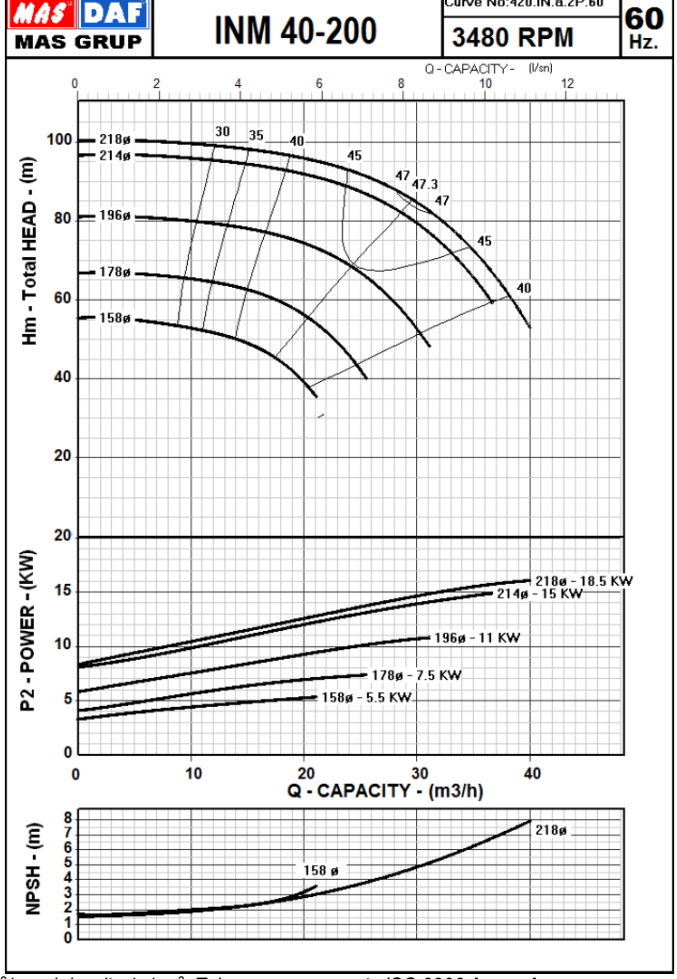
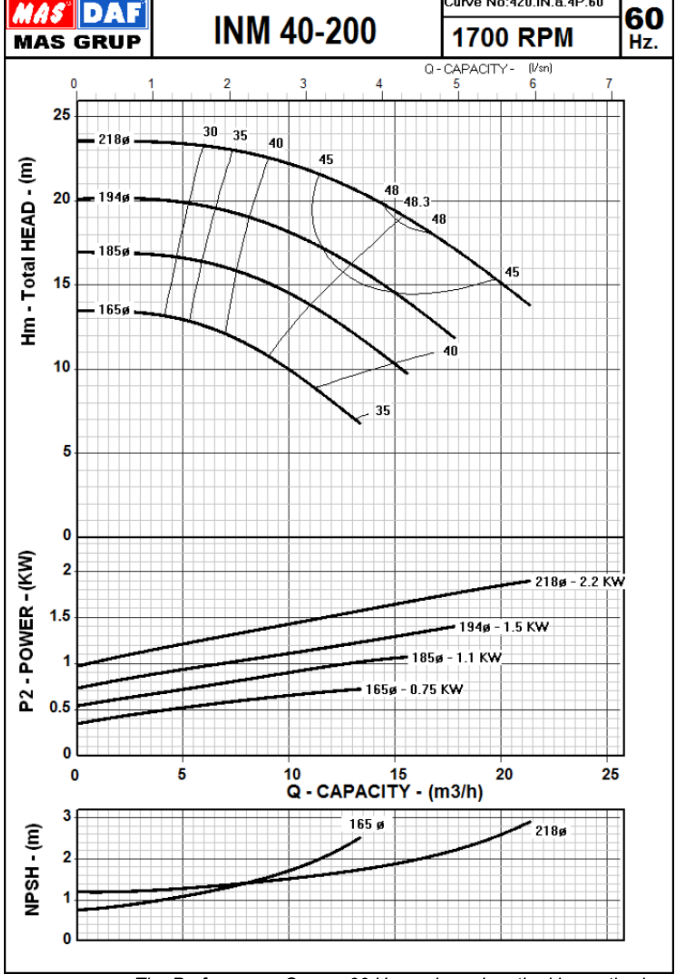
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

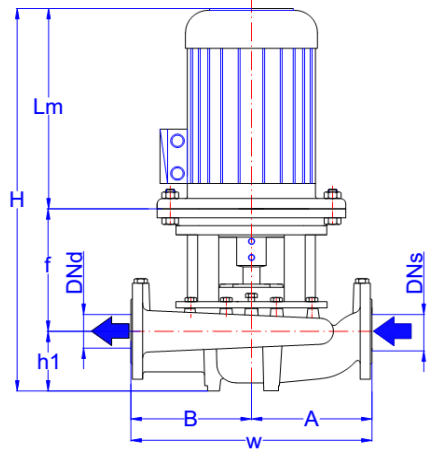


INM 40-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
40-200	4 poles	0.75	80M	284	40	538.5	95	160	380	190	190	Ø 20
		1.1	90L	317		571.5	95	160	380	190	190	Ø 20
		1.5	90L	345		599.5	95	160	380	190	190	Ø 20
		2.2	100L	352		627	95	180	380	190	190	Ø 20
	2 poles	5.5	132S	441	40	748.5	95	213	380	190	190	Ø 20
		7.5	132M	476		770.5	95	200	380	190	190	Ø 20
		11	160L	576		901	95	230	380	190	190	Ø 30
		15	160L	576		901	95	230	380	190	190	Ø 30
					901	95	230	380	190	190	Ø 30	

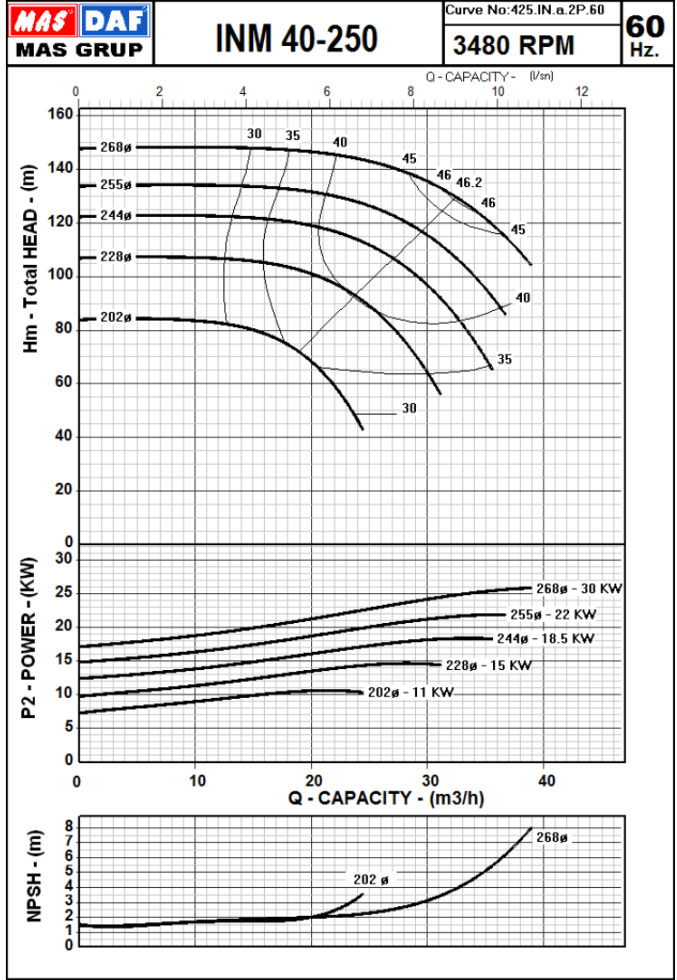
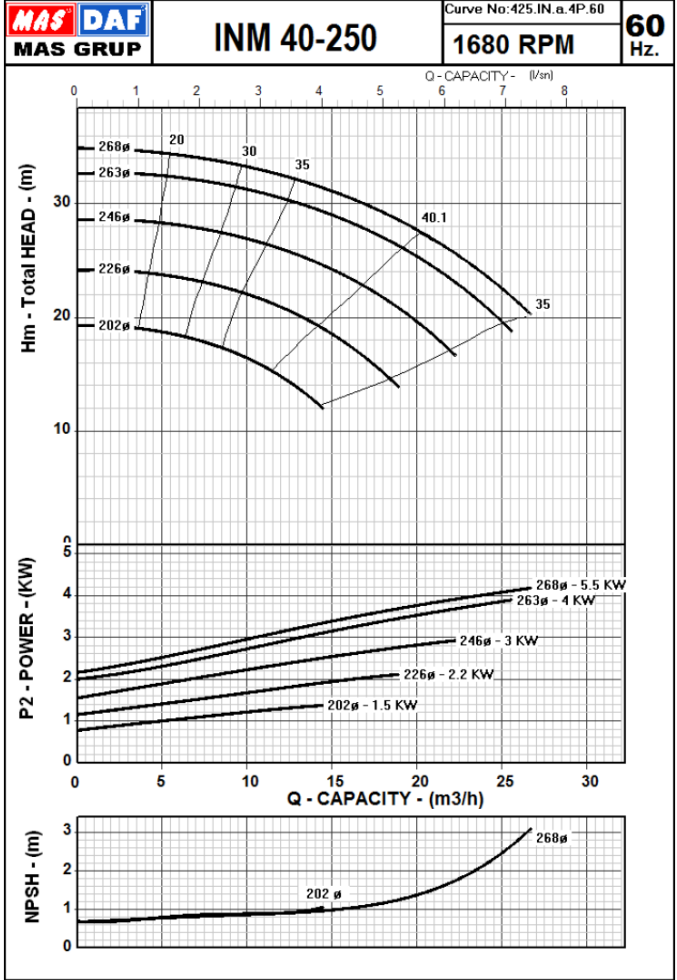
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

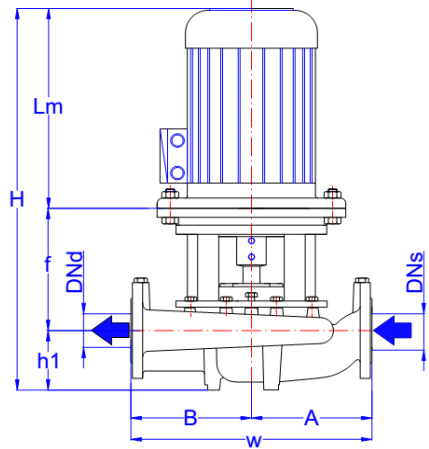


INM 40-250

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
40-250	4 poles	1.5	90L	345	40	604.5	100	160	440	215	225	Ø 20
		2.2	100L	352		632	100	180	440	215	225	Ø 20
		3	100L	377		657	100	180	440	215	225	Ø 20
		4	112M	396		675.5	100	180	440	215	225	Ø 20
		5.5	132M	476		775.5	100	200	440	215	225	Ø 20
	2 poles	11	160L	576	40	906	100	230	440	215	225	Ø 30
		15	160L	576		906	100	230	440	215	225	Ø 30
		18.5	160L	576		906	100	230	440	215	225	Ø 30
		22	180M	629		959	100	230	440	215	225	Ø 30
		30	200L	665		995	100	230	440	215	225	Ø 35

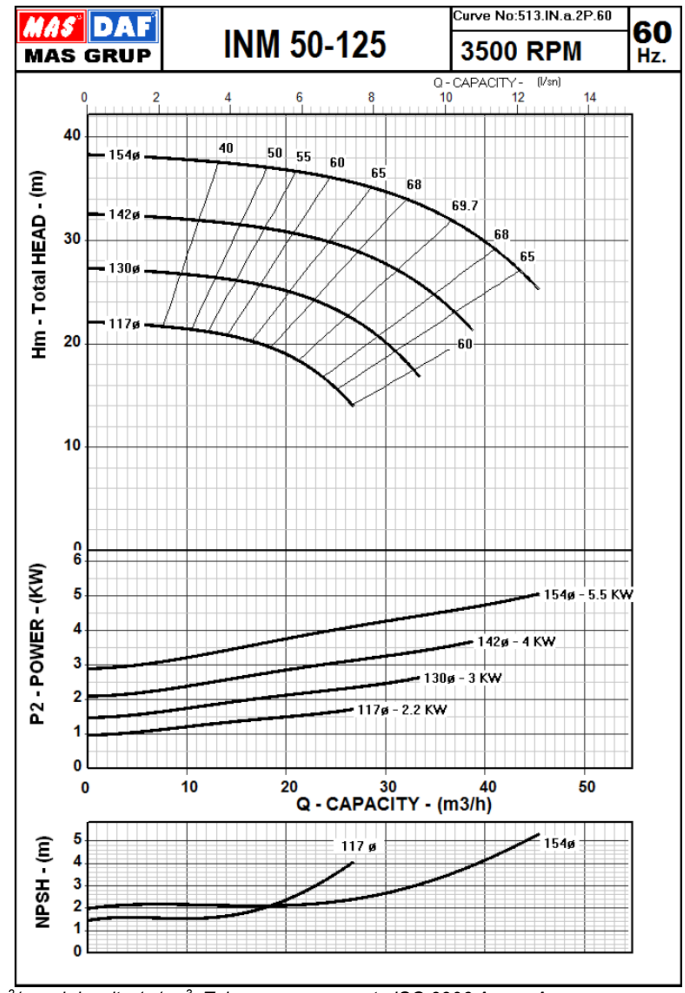
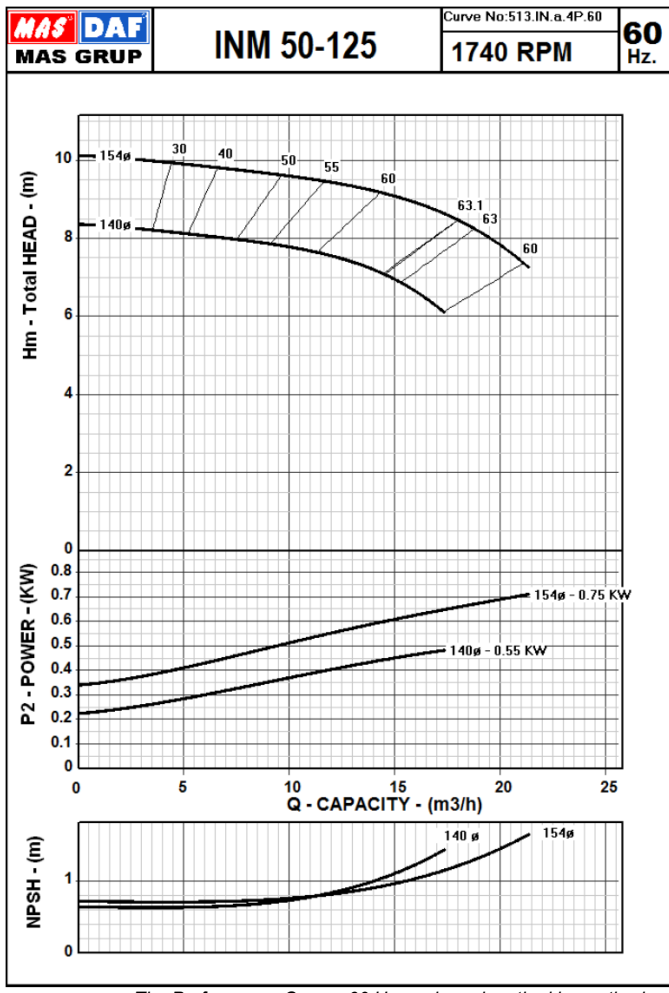
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INM/INL Series
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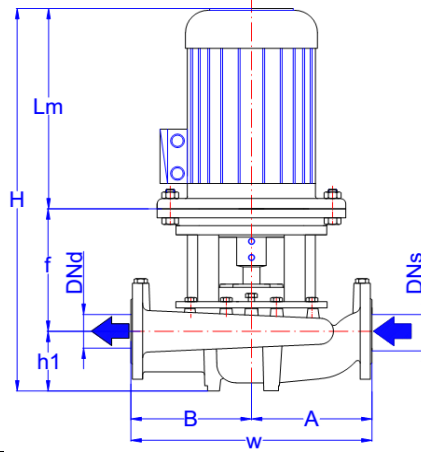


INM 50-125

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	DNs - DNd	H	h1	W	A	B	Nominal Impeller Diameter
50-125	4 Poles	0.55	80	239	50	489	110	320	170	15	20
		0.75	80	239		489	110	320	170	15	20
	2 Poles	2.2	90L	284	50	534	110	320	170	15	20
		3	100L	316		596	110	320	170	15	20
		4	112M	336		616	110	320	170	15	20
		5.5	132S	375		655	110	320	170	15	20

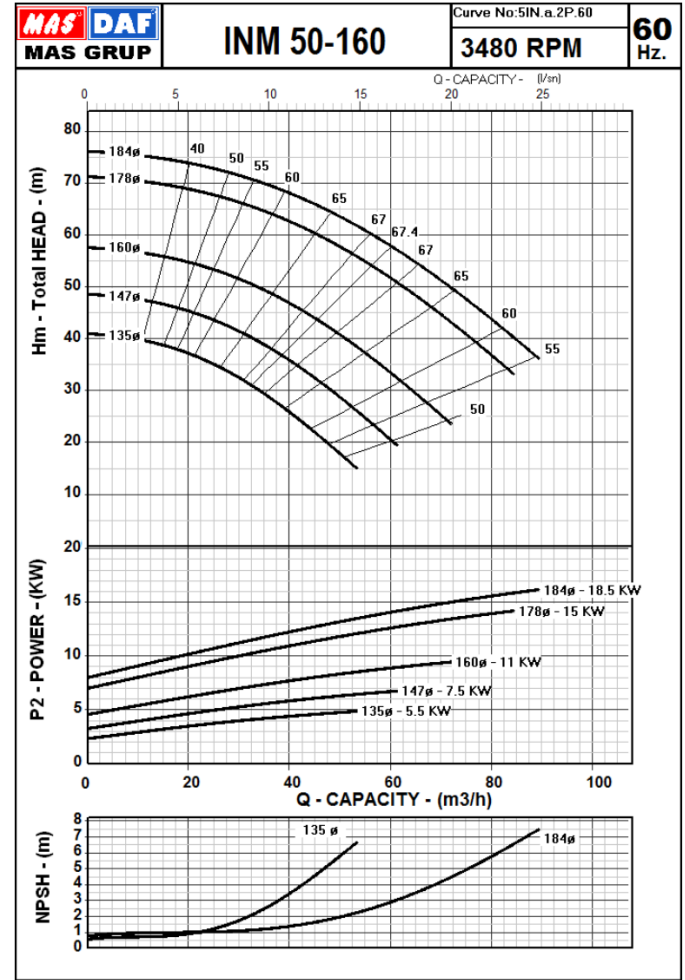
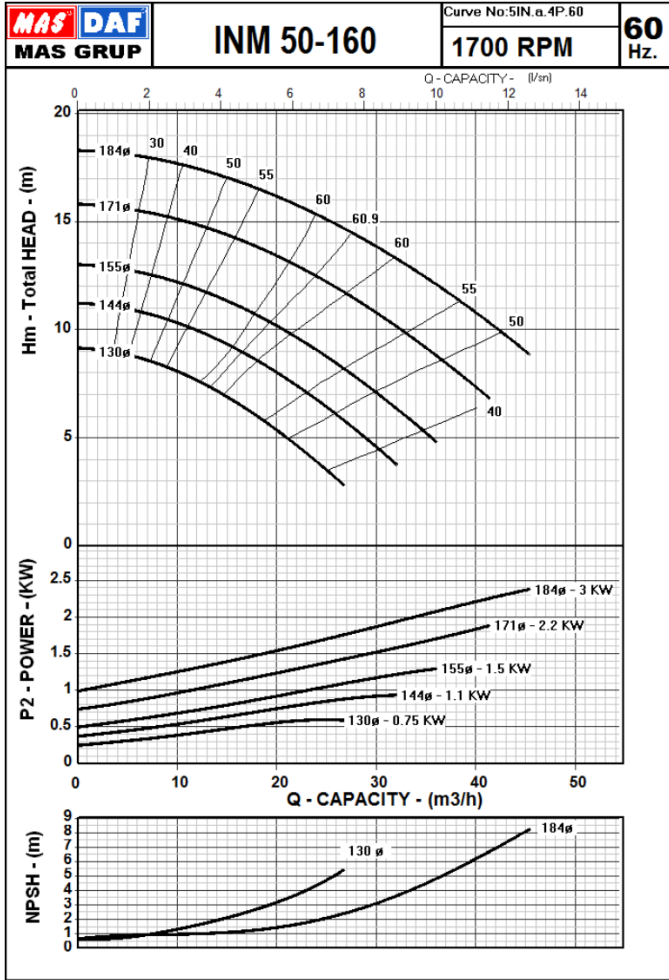
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In-Line Centrifugal Pumps
Performance Curves

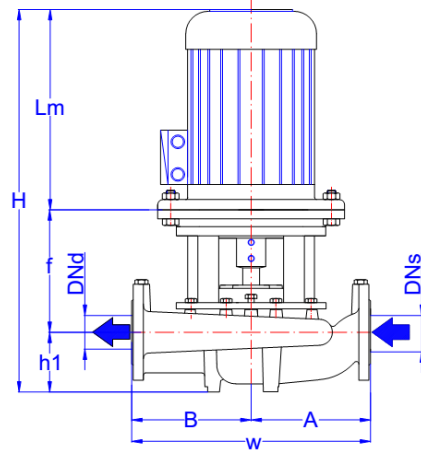


INM 50-160

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	DNs - DNd	H	h1	W	A	B	Nominal Impeller Diameter	
50-160	4 Poles	0.75	80	239	50	504	125	360	190	170	20
		1.1	90S	259		524	125	360	190	170	20
		1.5	90L	284		549	125	360	190	170	20
		2.2	100L	316		611	125	360	190	170	20
		3	100L	316		611	125	360	190	170	20
	2 Poles	5.5	132S	375	50	670	125	360	190	170	20
		7.5	132S	375		670	125	360	190	170	20
		11	160M	490		815	125	360	190	170	20
		15	160M	490		815	125	360	190	170	20
		18.5	160L	490		815	125	360	190	170	20

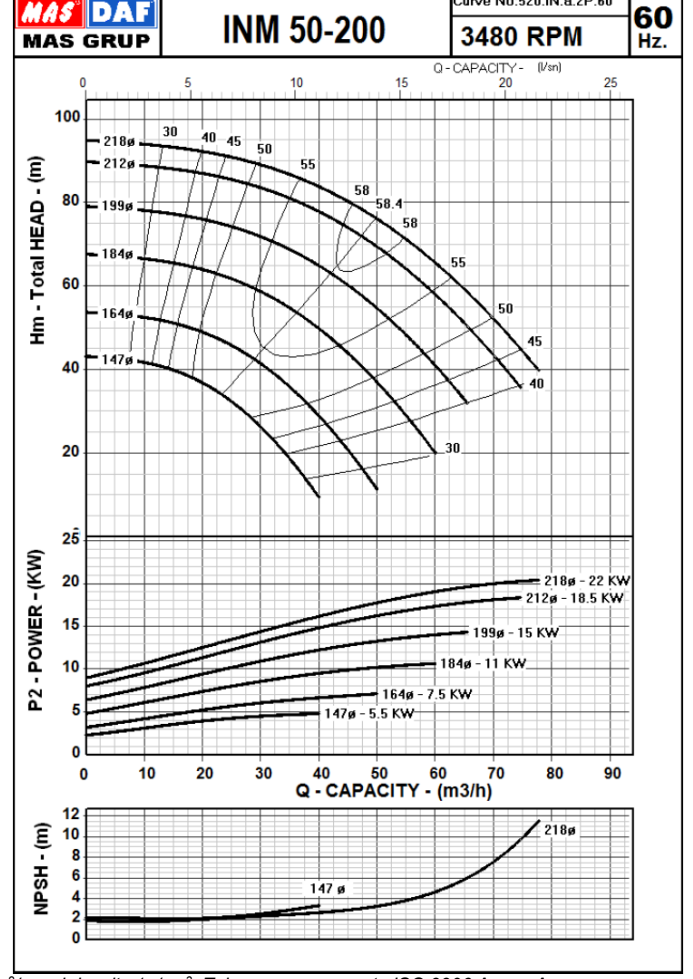
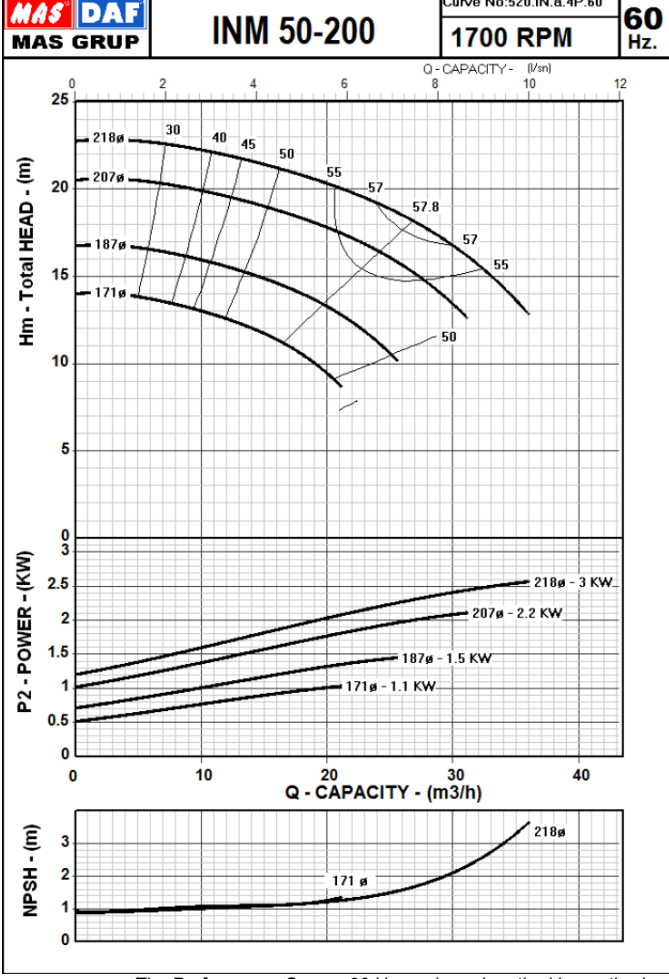
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

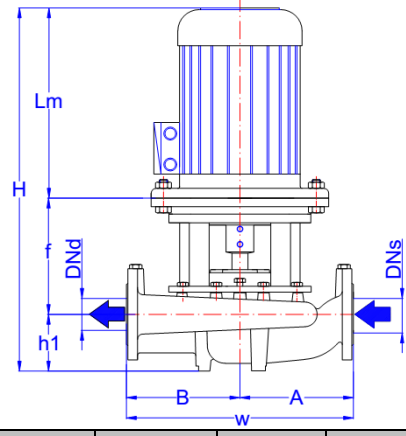


INM 50-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
50-200	4 poles	1.1	90L	317	50	586.5	110	160	400	200	200	Ø 20
		1.5	90L	345		614.5	110	160	400	200	200	Ø 20
		2.2	100L	352		642	110	180	400	200	200	Ø 20
		3	100L	377		667	110	180	400	200	200	Ø 20
	2 poles	5.5	132S	441	50	763.5	110	213	400	200	200	Ø 20
		7.5	132M	476		785.5	110	200	400	200	200	Ø 20
		11	160L	576		916	110	230	400	200	200	Ø 30
		15	160L	576		916	110	230	400	200	200	Ø 30
		18.5	160L	576		916	110	230	400	200	200	Ø 30
		22	180M	629		969	110	230	400	200	200	Ø 30

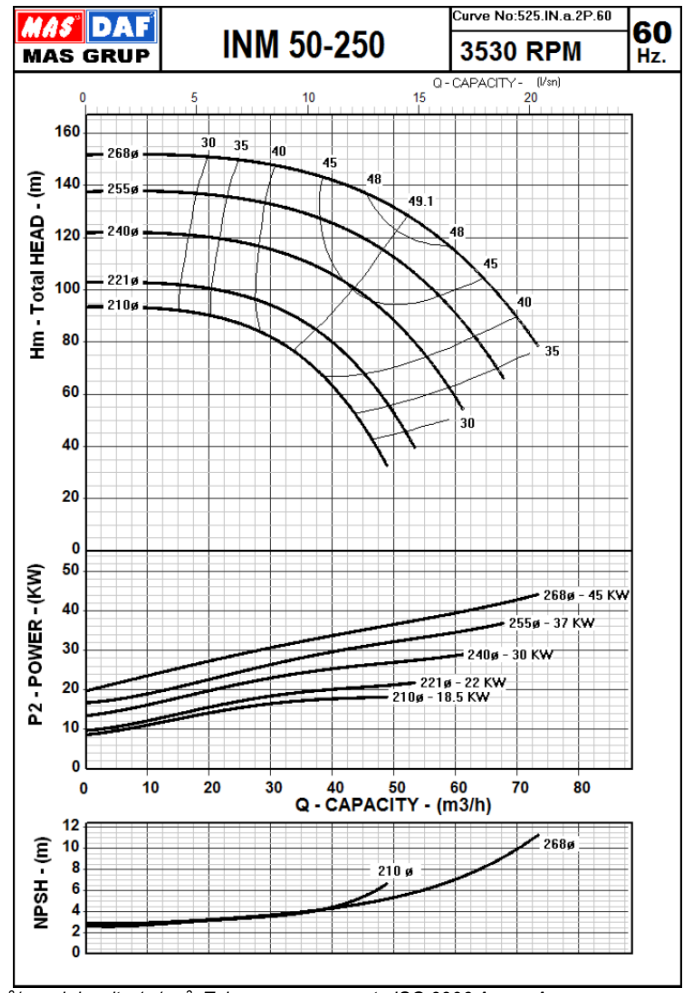
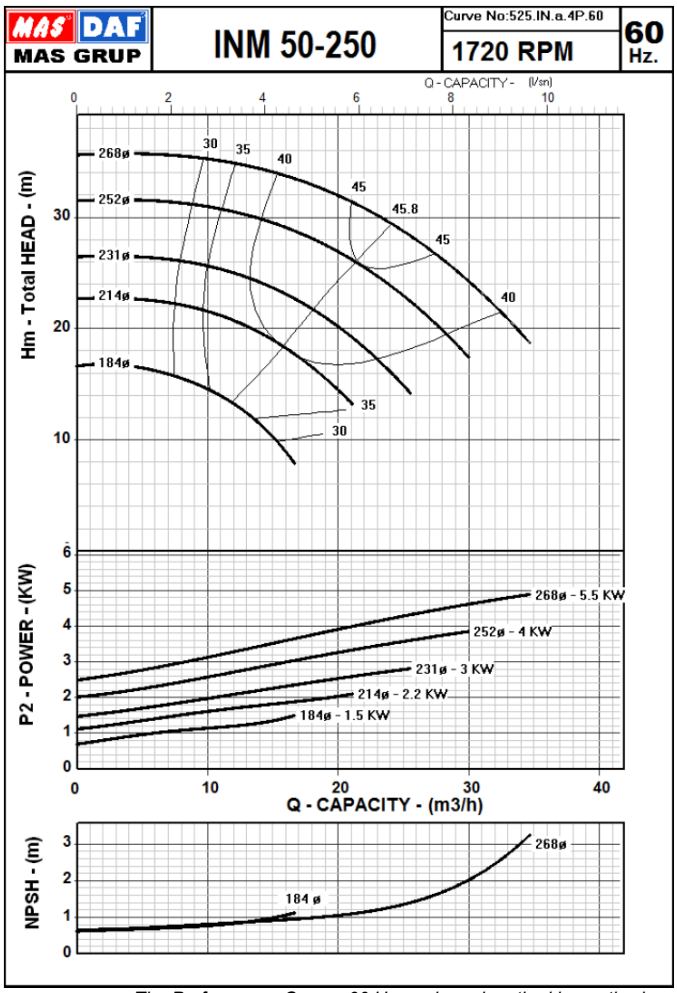
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

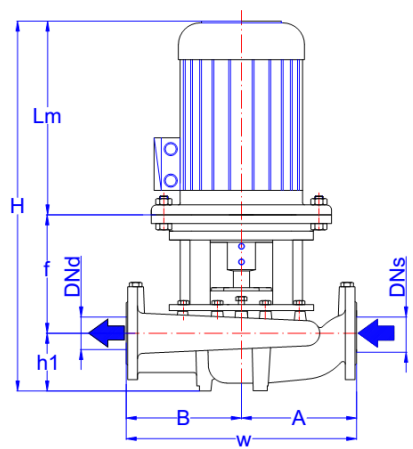


INM 50-250

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
50-250	4 poles	1.5	90L	345	50	619.5	115	160	440	215	225	Ø 20
		2.2	100L	352		647	115	180	440	215	225	Ø 20
		3	100L	377		672	115	180	440	215	225	Ø 20
		4	112M	396		690.5	115	180	440	215	225	Ø 20
		5.5	132M	476		790.5	115	200	440	215	225	Ø 20
	2 poles	18.5	160L	576	50	921	115	230	440	215	225	Ø 30
		22	180M	629		974	115	230	440	215	225	Ø 30
		30	200L	665		1010	115	230	440	215	225	Ø 35
		37	200L	665		1010	115	230	440	215	225	Ø 35
		45	225M	735		1110	115	260	440	215	225	Ø 35

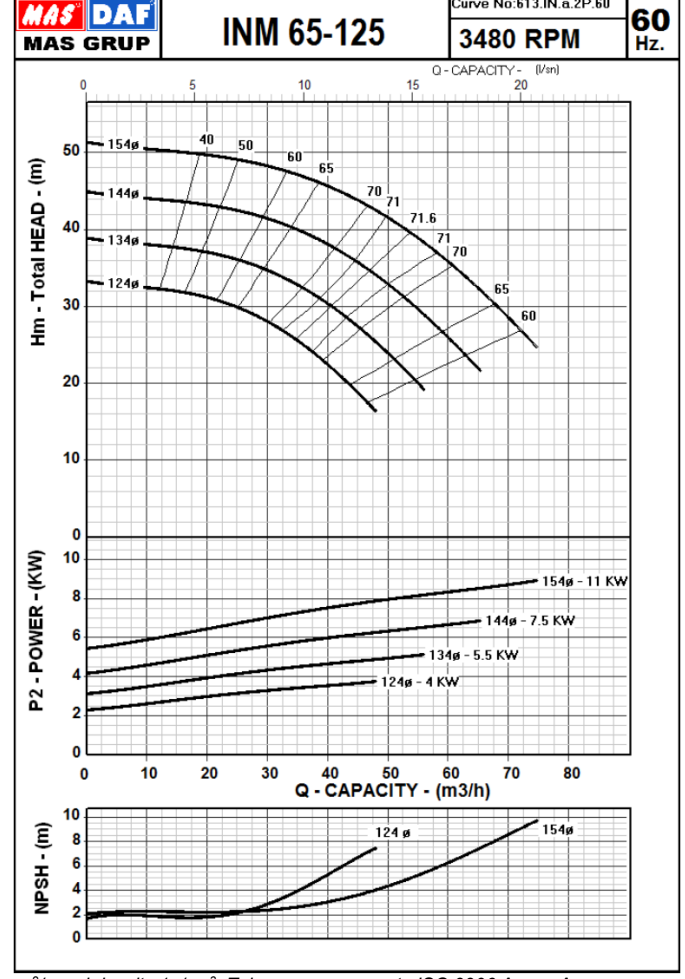
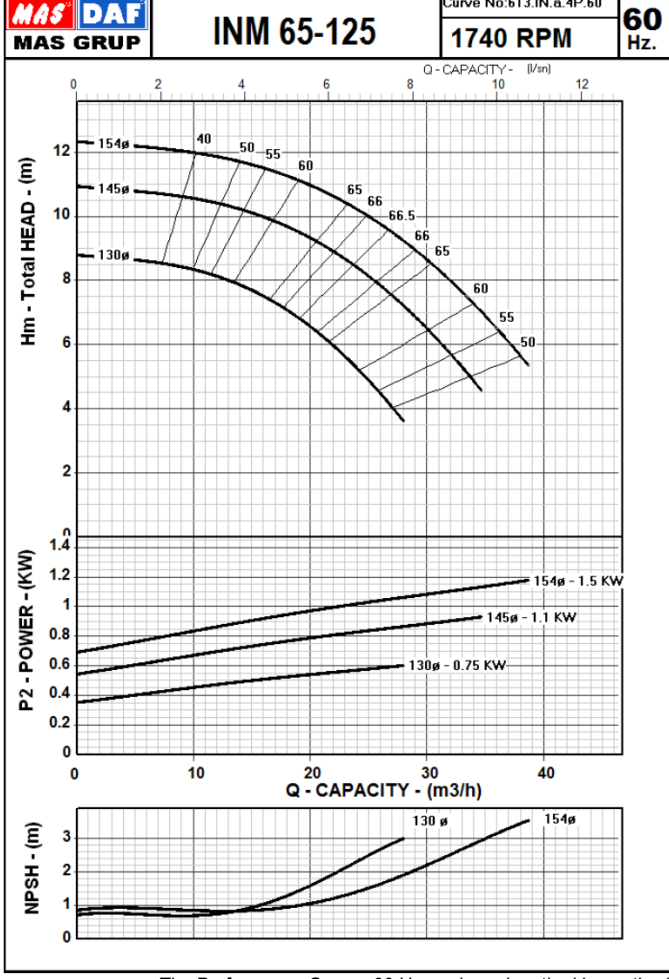
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

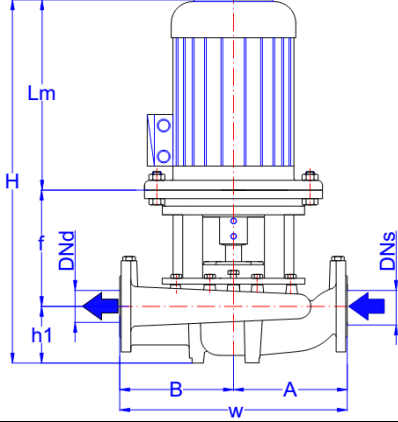


INM 65-125

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	DNs - DNd	H	h1	W	A	B	Nominal Impeller Diameter
65-125	4 Poles	0.75	80	239	65	509	130	340	180	160	20
		1.1	90S	259		529	130	340	180	160	20
		1.5	90L	284		554	130	340	180	160	20
	2 Poles	4	112M	336	65	636	130	340	180	160	20
		5.5	132S	375		675	130	340	180	160	20
		7.5	132S	375		675	130	340	180	160	20
		11	160M	490		820	130	340	180	160	20

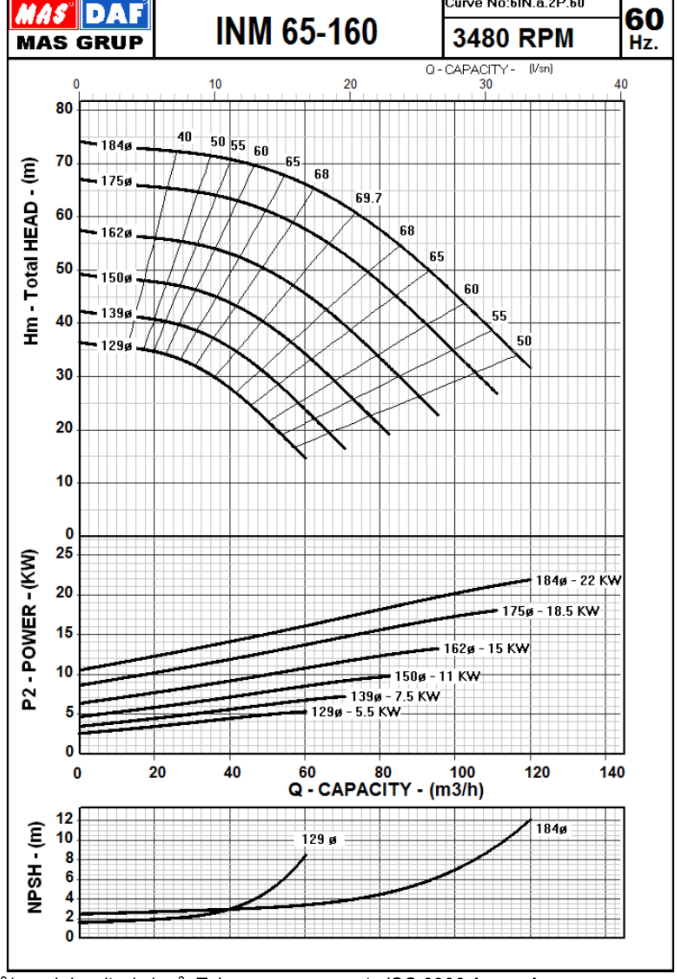
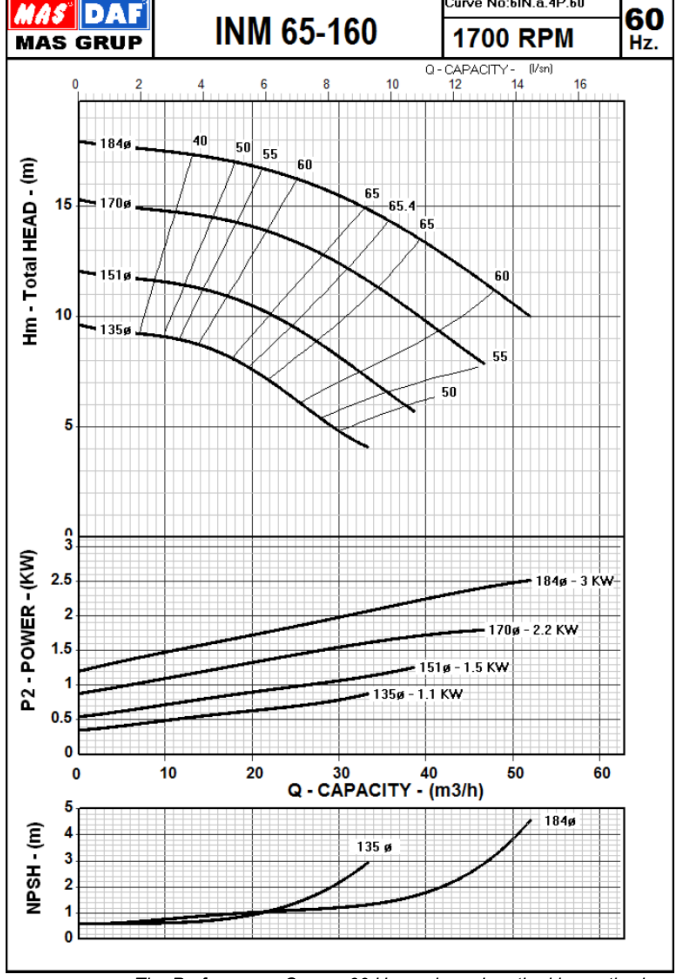
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

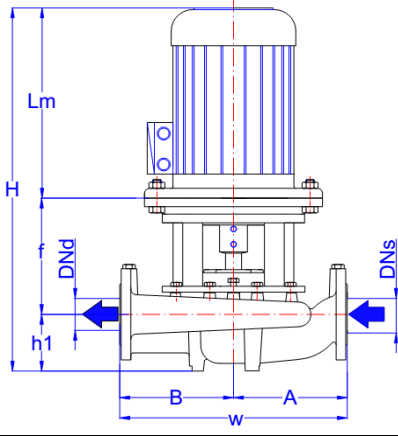


INM 65-160

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	DNs - DNd	H	h1	W	A	B	Nominal Impeller Diameter
65-160	4 Poles	1.1	90S	259	65	531	130	390	210	180	20
		1.5	90L	284		556	130	390	210	180	20
		2.2	100L	316		618	130	390	210	180	20
		3	100L	316		618	130	390	210	180	20
	2 Poles	5.5	132S	375	65	677	130	390	210	180	20
		7.5	132S	375		677	130	390	210	180	20
		11	160M	490		822	130	390	210	180	20
		15	160M	490		822	130	390	210	180	20
		18.5	160L	490		822	130	390	210	180	20

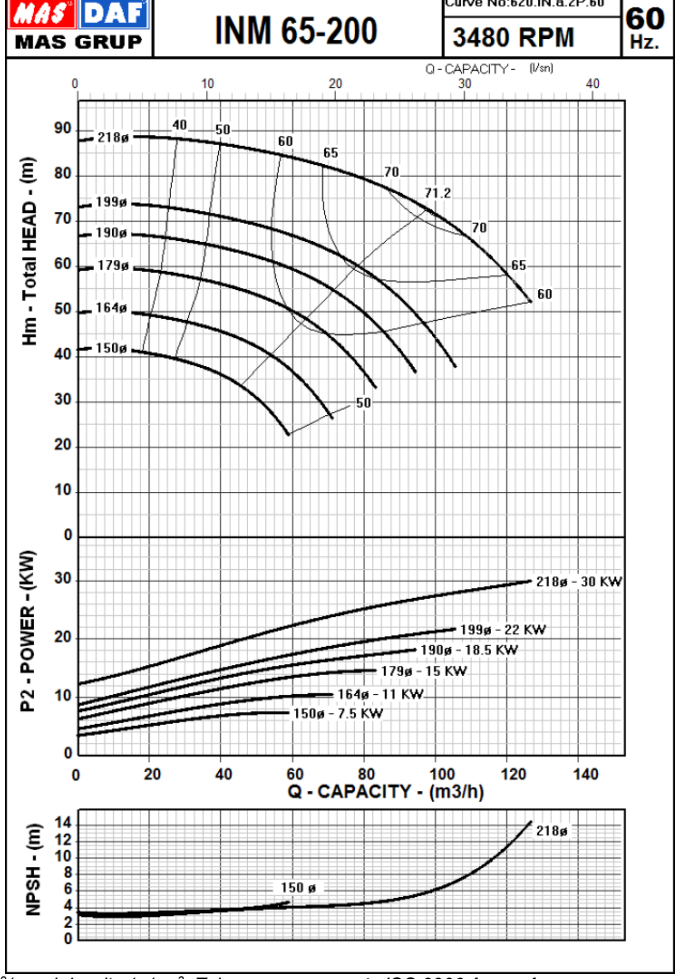
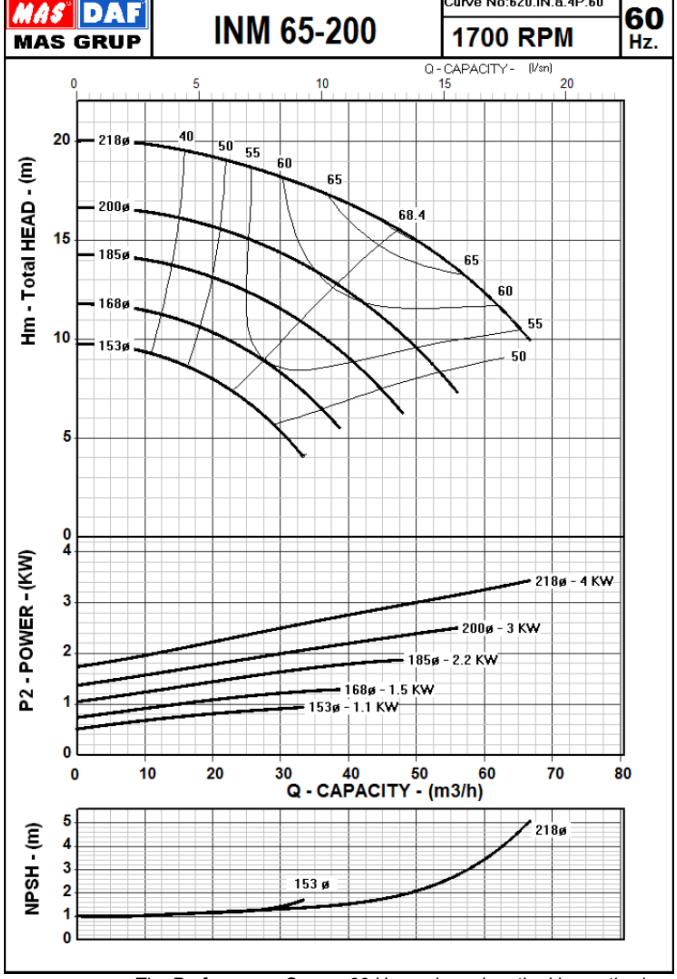
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

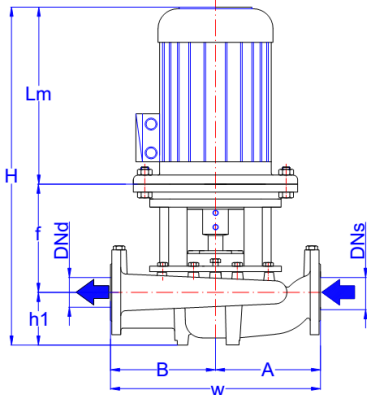


INM 65-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
65-200	4 poles	1.1	90L	317	65	591.5	115	160	460	230	230	Ø 20
		1.5	90L	345		619.5	115	160	460	230	230	Ø 20
		2.2	100L	352		647	115	180	460	230	230	Ø 20
		3	100L	377		672	115	180	460	230	230	Ø 20
		4	112M	396		690.5	115	180	460	230	230	Ø 20
	2 poles	7.5	132M	476	65	803.5	115	213	460	230	230	Ø 20
		11	160L	576		921	115	230	460	230	230	Ø 30
		15	160L	576		921	115	230	460	230	230	Ø 30
		18.5	160L	576		921	115	230	460	230	230	Ø 30
		22	180M	629		974	115	230	460	230	230	Ø 30
	30	200L	665		1010	115	230	460	230	230	Ø 35	

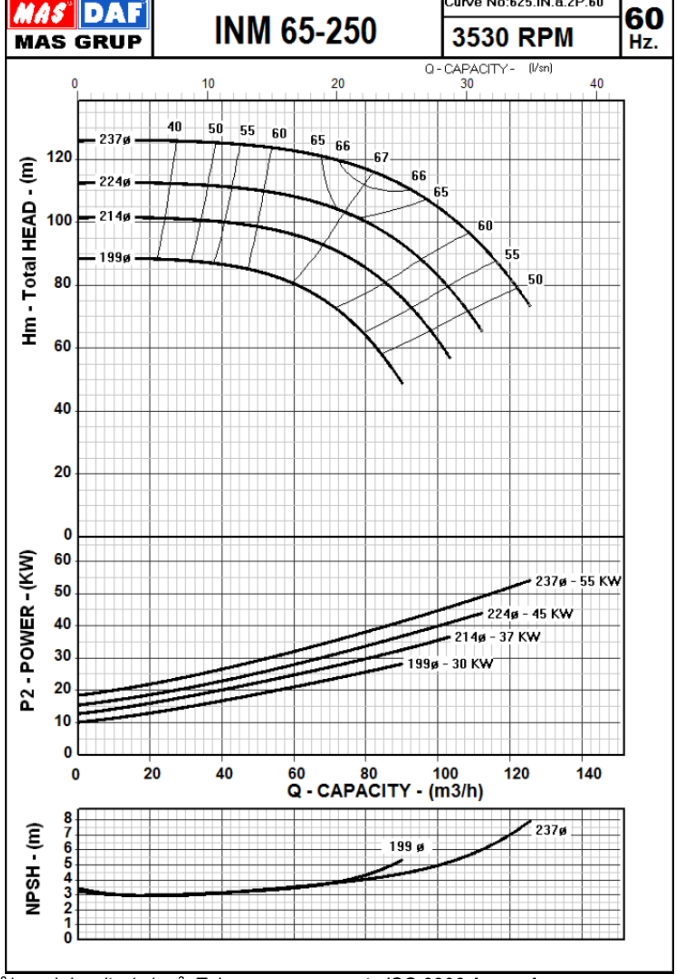
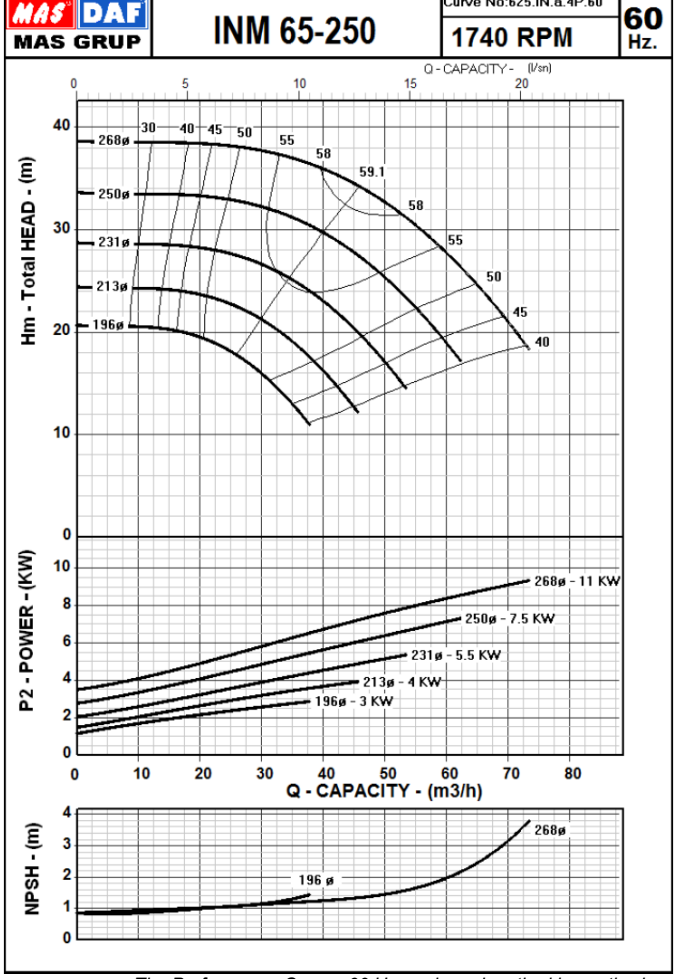
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

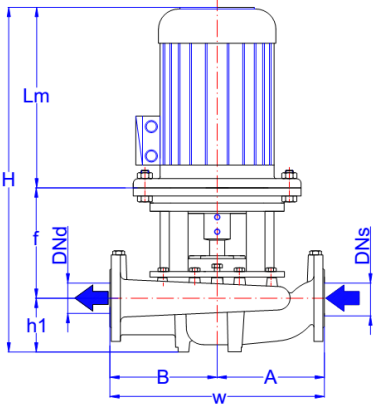


INM 65-250

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
65-250	4 poles	3	100L	377	65	702	135	190	480	245	235	Ø 20
		4	112M	396		710.5	135	180	480	245	235	Ø 20
		5.5	132M	476		810.5	135	200	480	245	235	Ø 20
		7.5	132M	476		810.5	135	200	480	245	235	Ø 20
		11	160L	576		941	135	230	480	245	235	Ø 30
	2 poles	30	200L	665	65	1070	135	270	480	245	235	Ø 35
		37	200L	665		1030	135	230	480	245	235	Ø 35
		45	225M	735		1130	135	260	480	245	235	Ø 35
		55	250M	886		1281	135	260	480	245	235	Ø 35

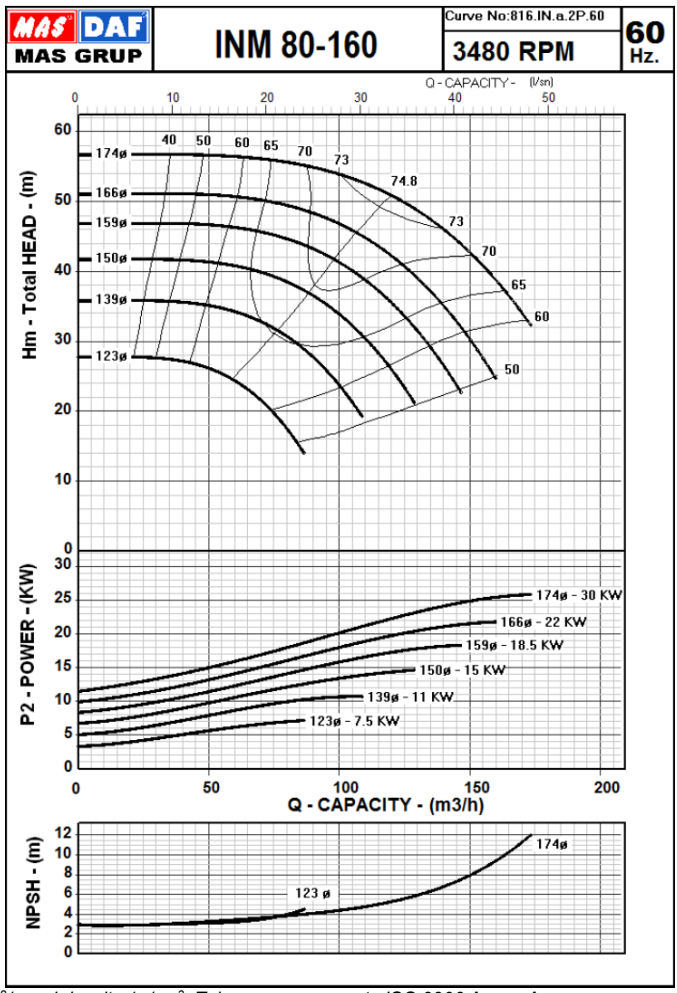
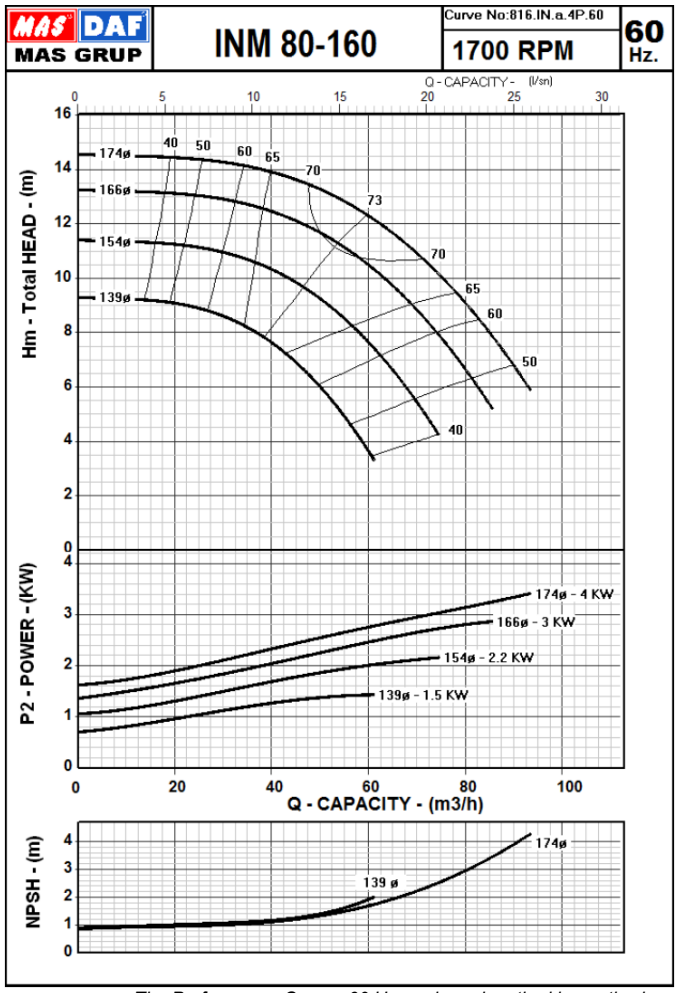
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

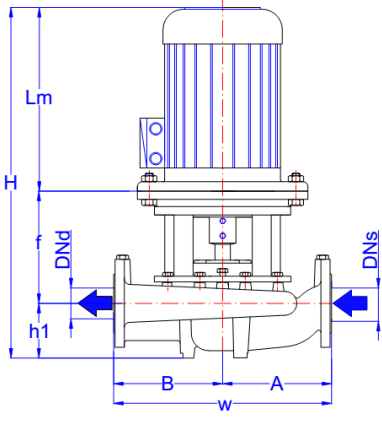
INM 80-160



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 mm	DNs - DNd mm	H mm	h1 mm	f mm	W mm	A mm	B mm	Nominal Impeller Diameter	
80-160	4 poles	1.5	90L	345	80	639.5	135	160	440	220	220	Ø 20
		2.2	100L	352		667	135	180	440	220	220	Ø 20
		3	100L	377		692	135	180	440	220	220	Ø 20
		4	112M	396		710.5	135	180	440	220	220	Ø 20
	2 poles	7.5	132M	476	80	823.5	135	213	440	220	220	Ø 20
		11	160L	576		941	135	230	440	220	220	Ø 30
		15	160L	576		941	135	230	440	220	220	Ø 30
		18.5	160L	576		941	135	230	440	220	220	Ø 30
		22	180M	629		994	135	230	440	220	220	Ø 30
		30	200L	665		1030	135	230	440	220	220	Ø 35

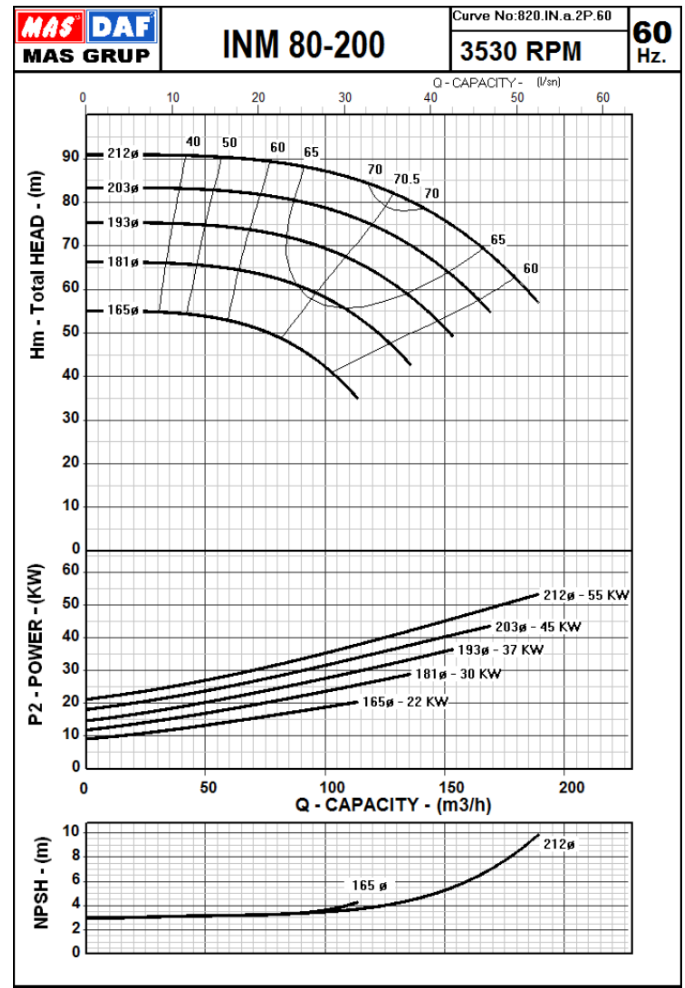
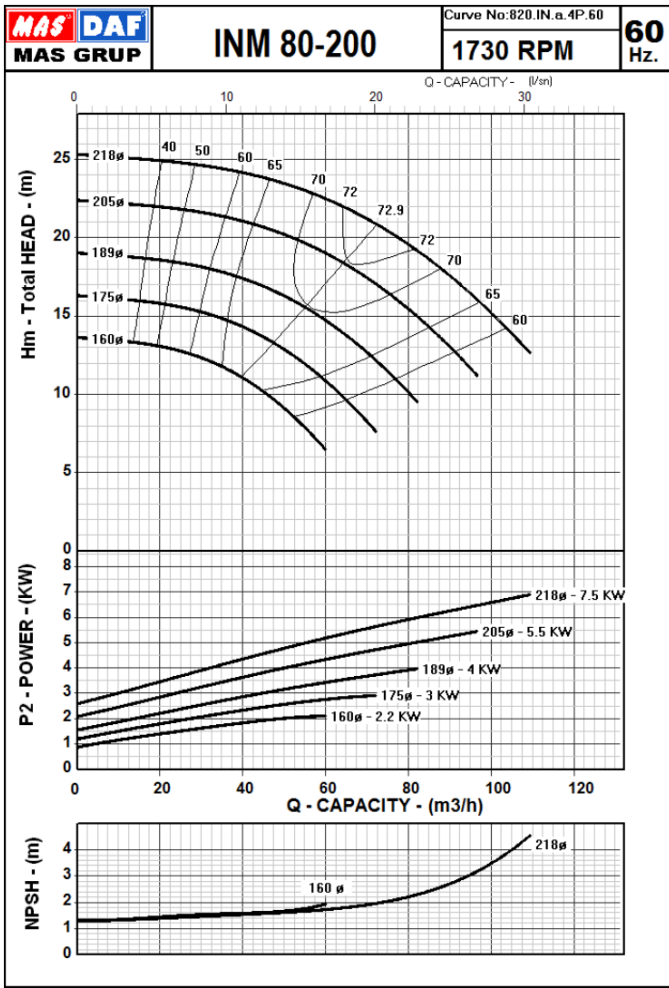
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

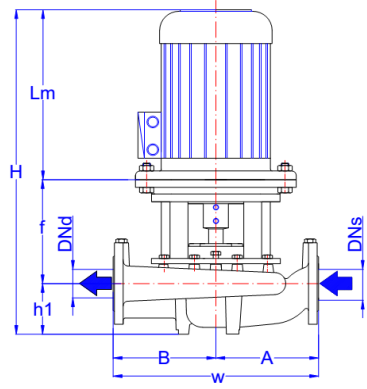


INM 80-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
80-200	4 poles	2.2	100L	352	80	682	140	190	500	250	250	Ø 20
		3	100L	377		697	140	180	500	250	250	Ø 20
		4	112M	396		715.5	140	180	500	250	250	Ø 20
		5.5	132M	476		815.5	140	200	500	250	250	Ø 20
		7.5	132M	476		815.5	140	200	500	250	250	Ø 20
	2 poles	22	180M	629	80	999	140	230	500	250	250	Ø 30
		30	200L	665		1035	140	230	500	250	250	Ø 35
		37	200L	665		1035	140	230	500	250	250	Ø 35
		45	225M	735		1135	140	260	500	250	250	Ø 35
		55	250M	886		1286	140	260	500	250	250	Ø 35

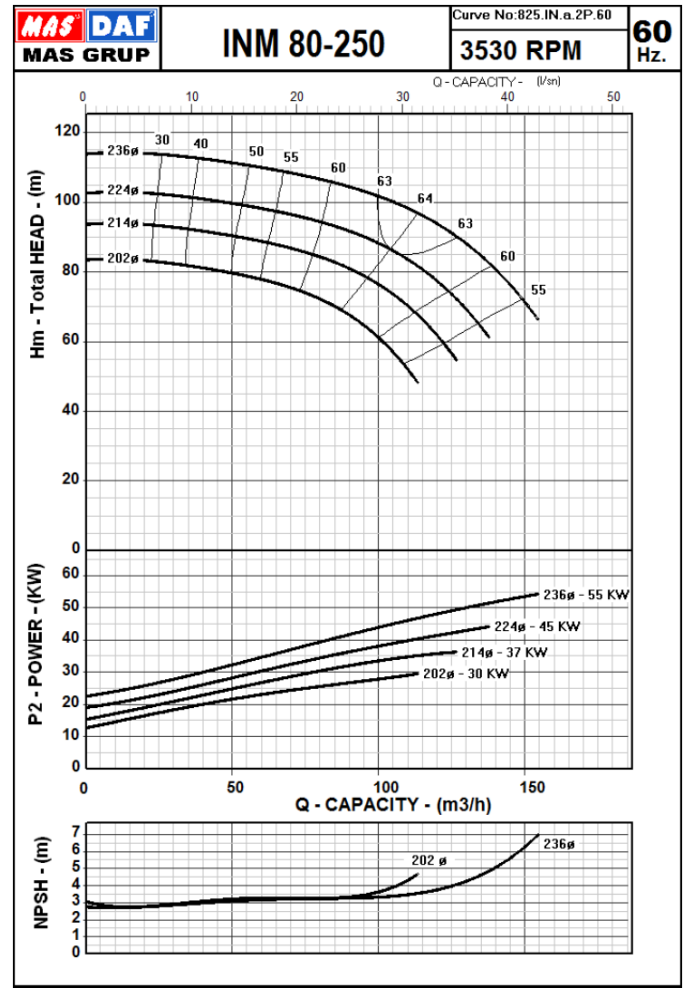
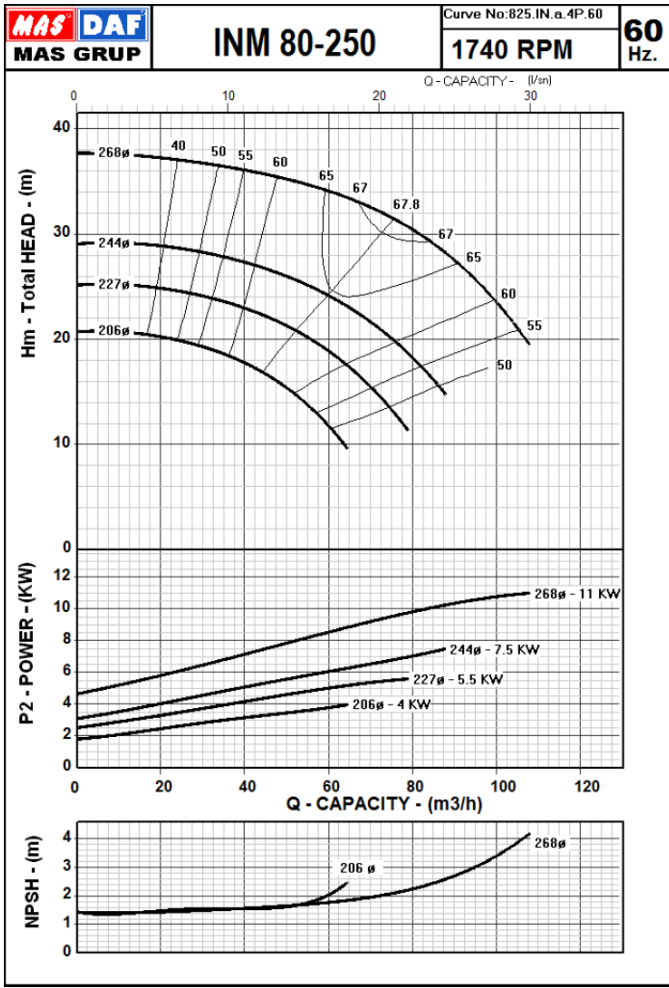
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

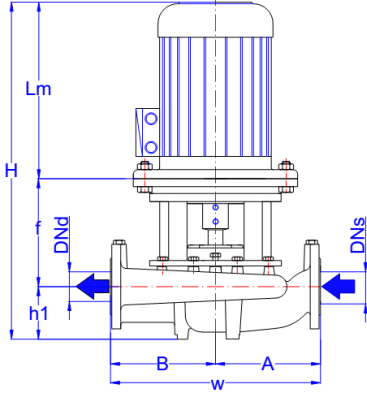


INM 80-250

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
80-250	4 poles	4	112M	396	80	730.5	145	190	550	270	280	Ø 20
		5.5	132M	476		820.5	145	200	550	270	280	Ø 20
		7.5	132M	476		820.5	145	200	550	270	280	Ø 20
		11	160L	576		951	145	230	550	270	280	Ø 30
	2 poles	30	200L	665	80	1080	145	270	550	270	280	Ø 35
		37	200L	665		1040	145	230	550	270	280	Ø 35
		45	225M	735		1140	145	260	550	270	280	Ø 35
		55	250M	886		1301	145	270	550	270	280	Ø 35

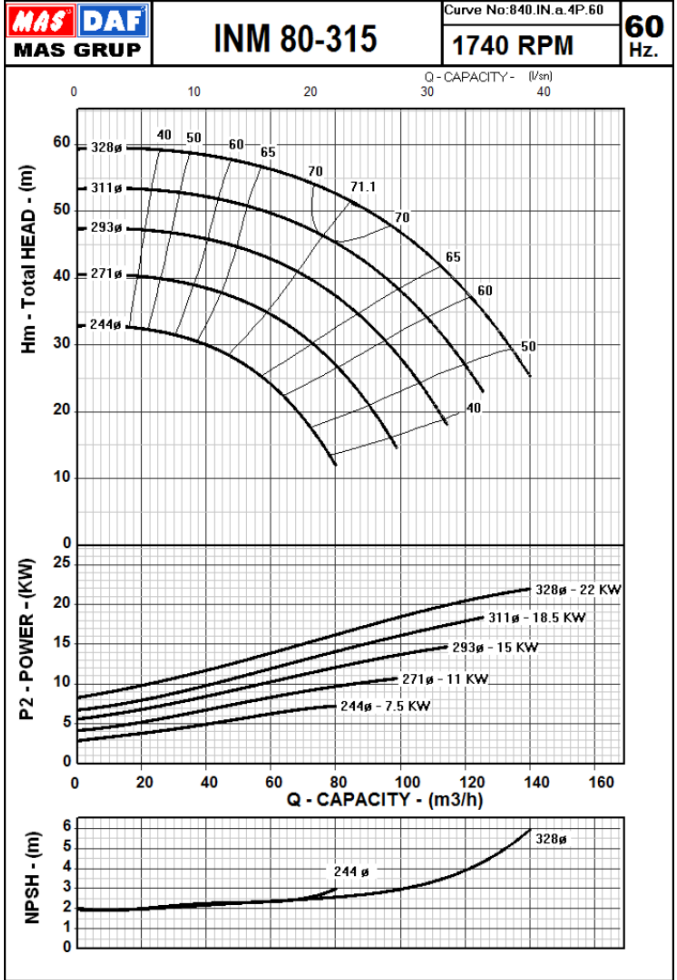
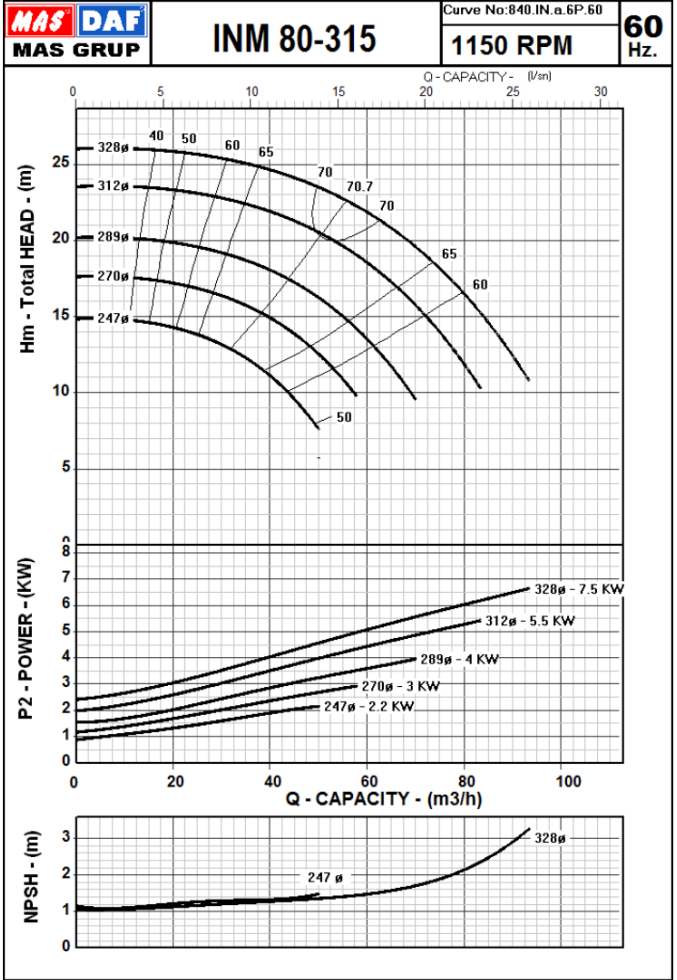
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

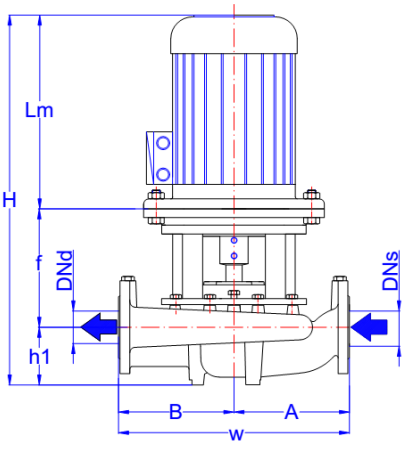


INM 80-315

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm									mm
80-315	6 poles	2.2	112M	396	80	746	160	190	600	300	300	Ø 20
		3	132S	498		858	160	200	600	300	300	Ø 20
		4	132M	498		858	160	200	600	300	300	Ø 20
		5.5	132M	498		858	160	200	600	300	300	Ø 20
		7.5	160M	600		990	160	230	600	300	300	Ø 30
	4 poles	7.5	132M	476	80	850.5	160	215	600	300	300	Ø 30
		11	160L	576		966	160	230	600	300	300	Ø 30
		15	160L	576		966	160	230	600	300	300	Ø 30
		18.5	180M	629		1019	160	230	600	300	300	Ø 30
		22	180L	629		1019	160	230	600	300	300	Ø 30

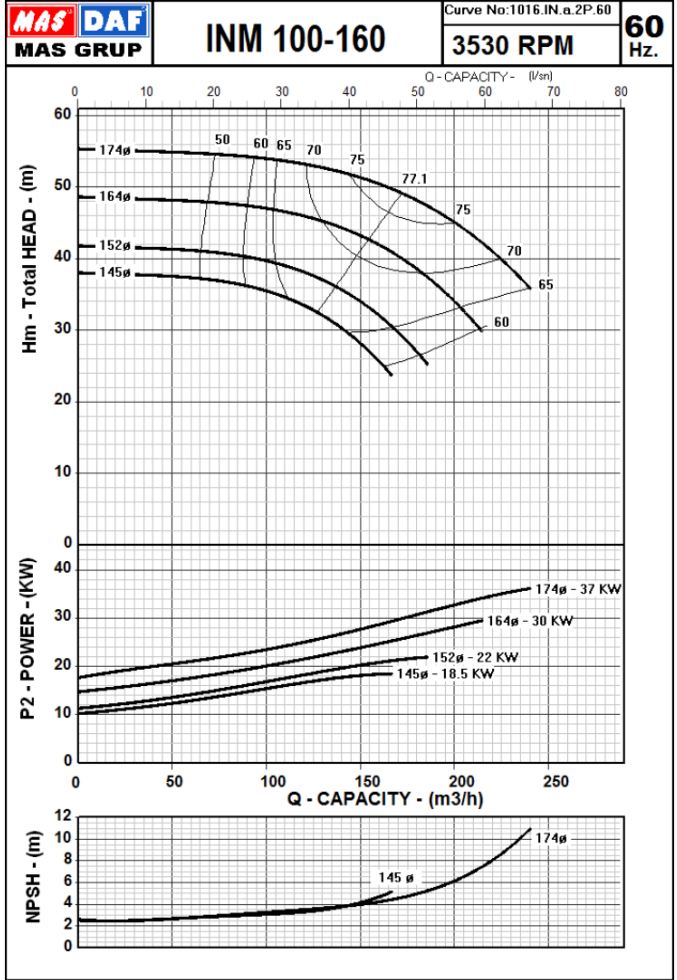
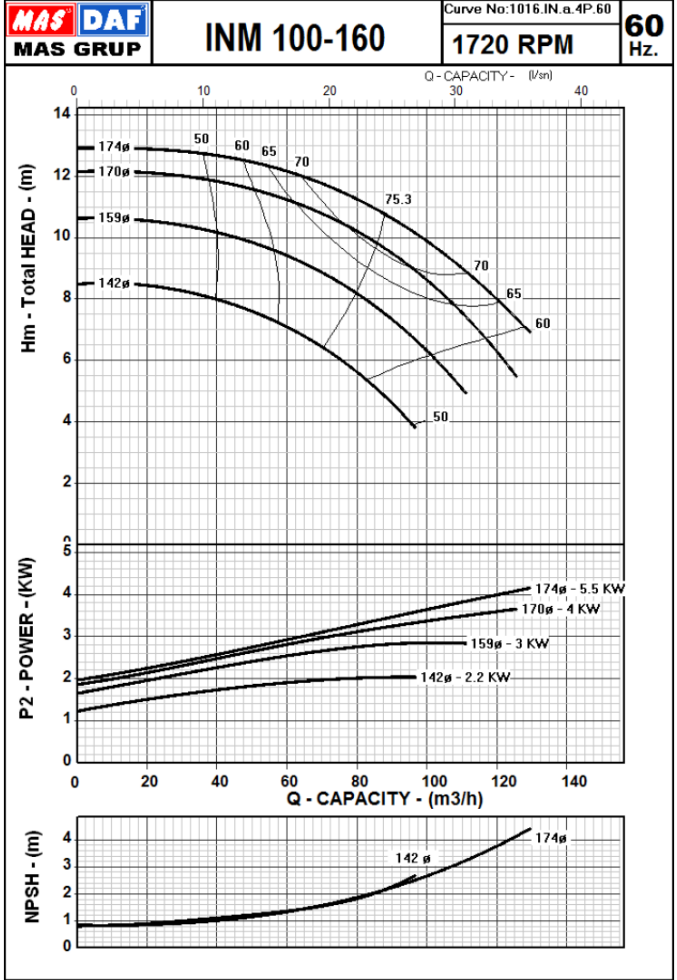
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

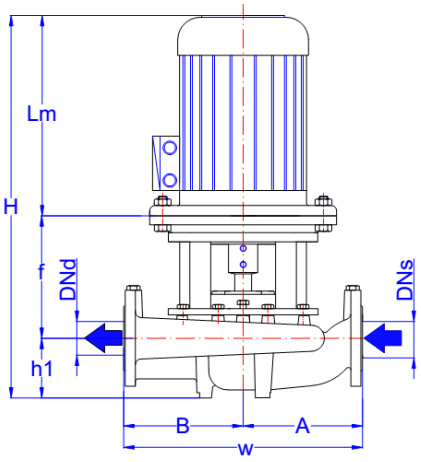


INM 100-160

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
100-160	4 poles	2.2	100L	352	100	697	155	190	500	250	250	Ø 20
		3	100L	377		712	155	180	500	250	250	Ø 20
		4	112M	396		730.5	155	180	500	250	250	Ø 20
		5.5	132M	476		830.5	155	200	500	250	250	Ø 20
	2 poles	18.5	160L	576	100	961	155	230	500	250	250	Ø 30
		22	180M	629		1014	155	230	500	250	250	Ø 30
		30	200L	665		1050	155	230	500	250	250	Ø 35
		37	200L	665		1050	155	230	500	250	250	Ø 35

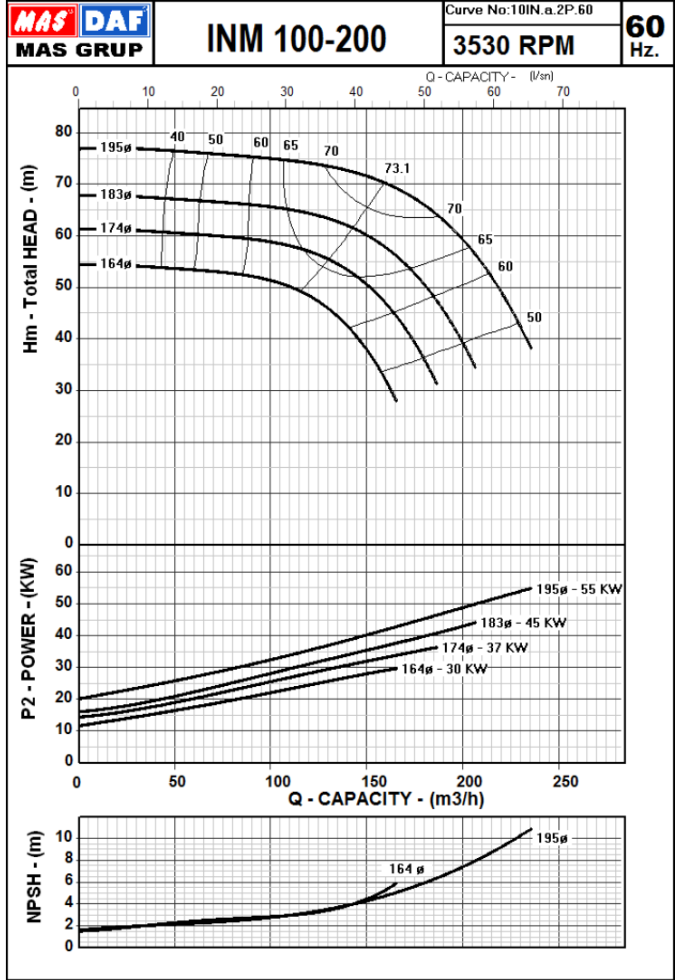
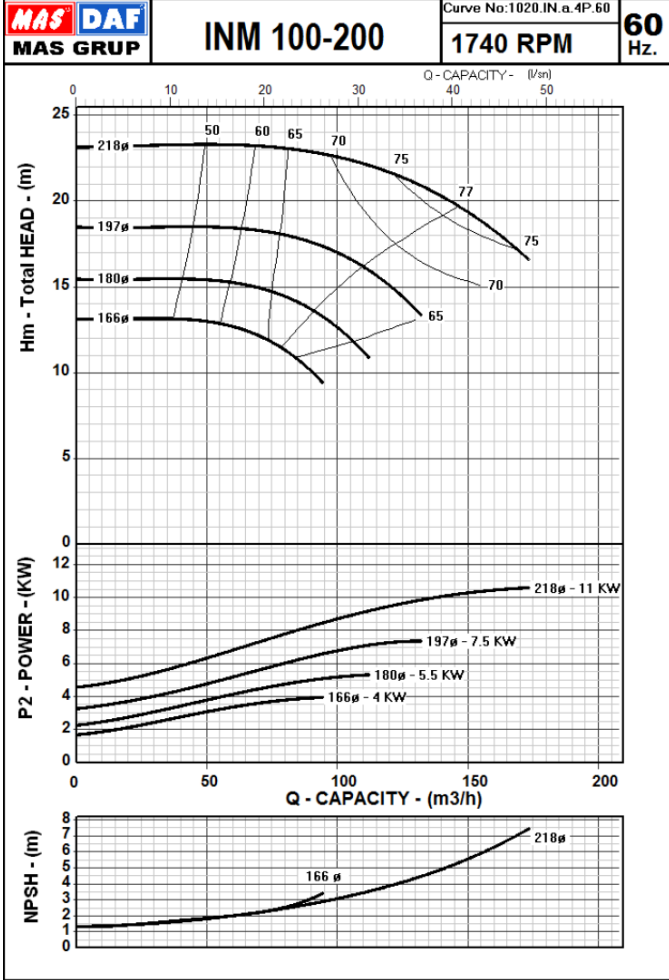
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

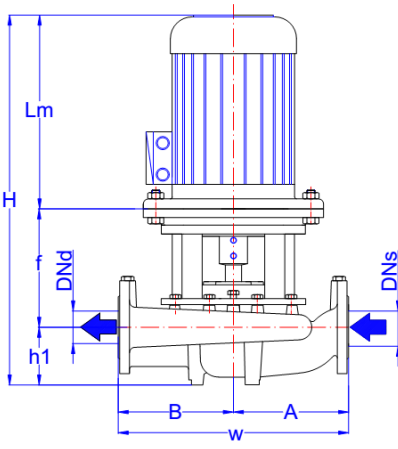


INM 100-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
100-200	4 poles	4	112M	396	100	765.5	180	190	550	275	275	Ø 20
		5.5	132M	476		855.5	180	200	550	275	275	Ø 20
		7.5	132M	476		855.5	180	200	550	275	275	Ø 20
		11	160L	576		986	180	230	550	275	275	Ø 30
	2 poles	30	200L	665	100	1115	180	270	550	275	275	Ø 35
		37	200L	665		1075	180	230	550	275	275	Ø 35
		45	225M	735		1175	180	260	550	275	275	Ø 35
		55	250M	886		1336	180	270	550	275	275	Ø 35

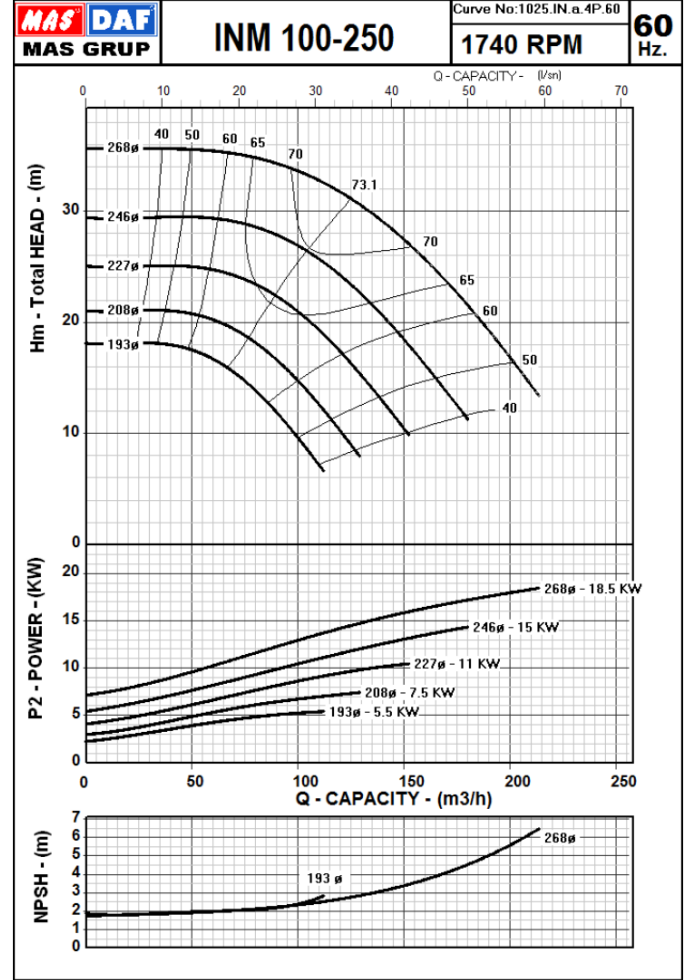
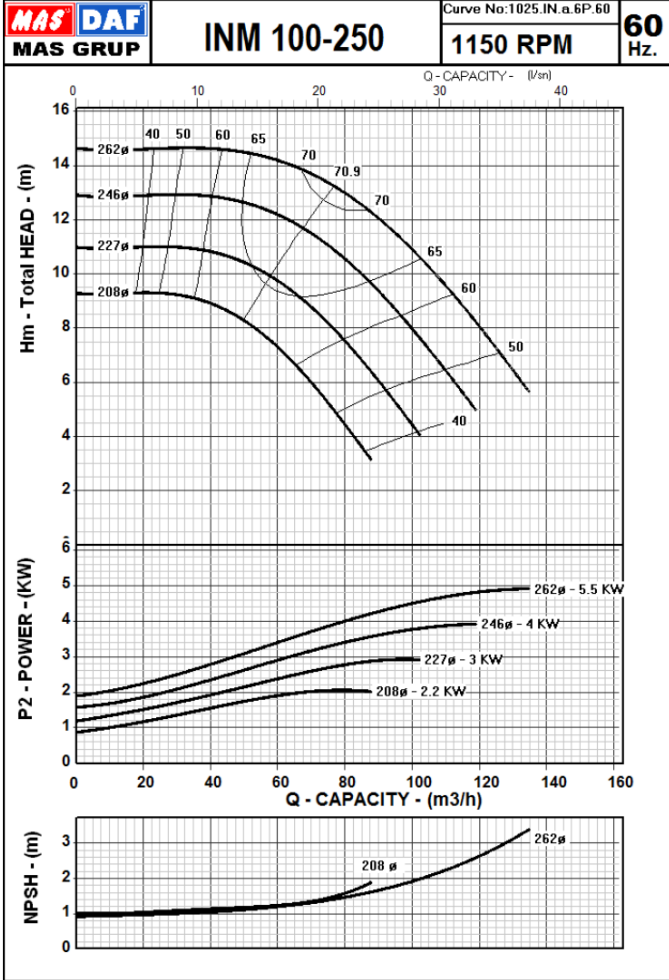
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

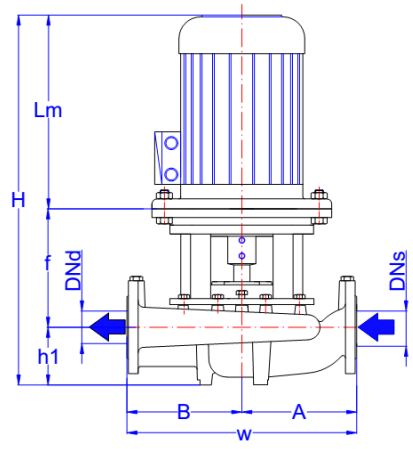


INM 100-315

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
100-250	6 poles	2.2	112M	396	100	776	190	190	600	320	280	Ø 20
		3	132S	498		888	190	200	600	320	280	Ø 20
		4	132M	498		888	190	200	600	320	280	Ø 20
		5.5	132M	498		888	190	200	600	320	280	Ø 20
	4 poles	5.5	132M	476	100	880.5	190	215	600	320	280	Ø 30
		7.5	132M	476		865.5	190	200	600	320	280	Ø 20
		11	160L	576		996	190	230	600	320	280	Ø 30
		15	160L	576		996	190	230	600	320	280	Ø 30
		18.5	180M	629		1049	190	230	600	320	280	Ø 30

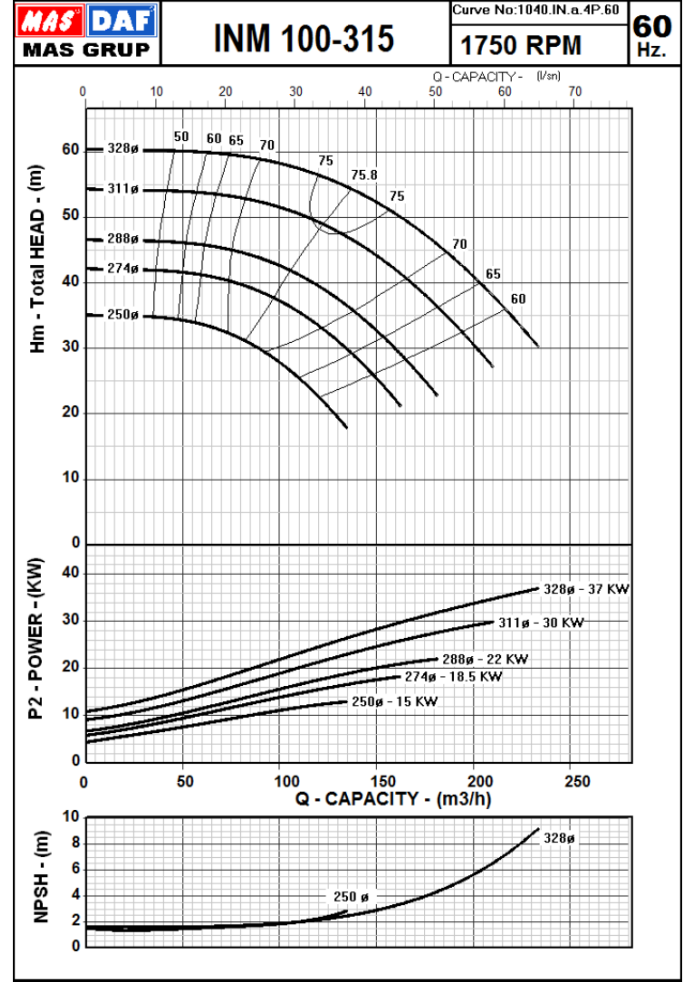
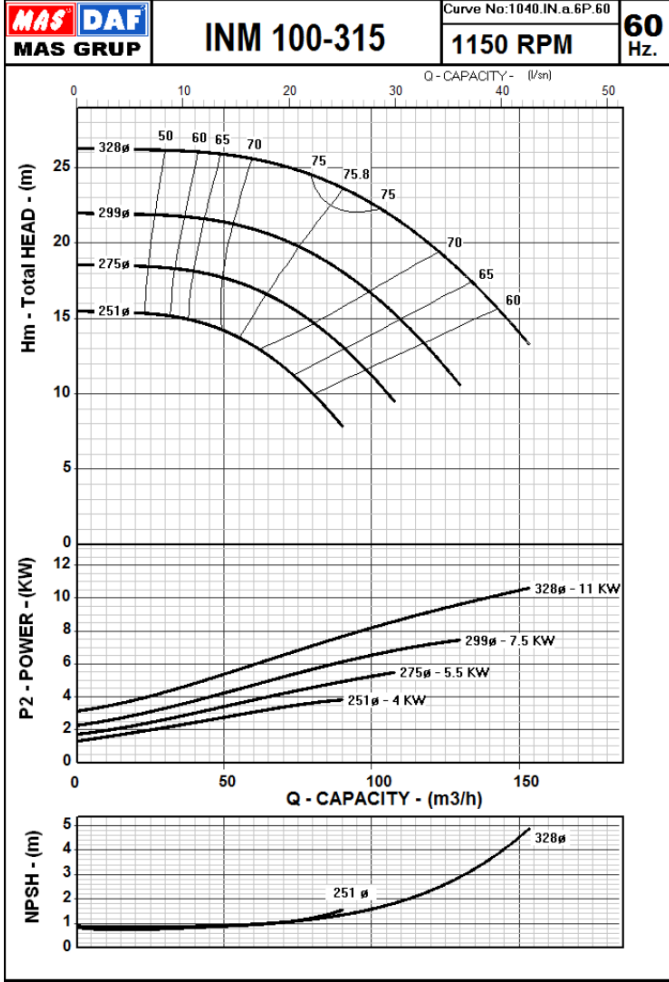
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

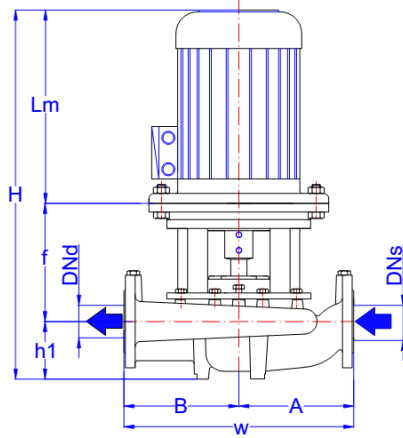


INM 100-315

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
100-315	6 poles	4	132M	498	100	963	190	275	650	335	315	Ø 20
		5.5	132M	498		888	190	200	650	335	315	Ø 20
		7.5	160M	600		1020	190	230	650	335	315	Ø 30
		11	160L	644		1064	190	230	650	335	315	Ø 30
	4 poles	15	160L	576	100	1036	190	270	650	335	315	Ø 30
		18.5	180M	629		1049	190	230	650	335	315	Ø 30
		22	180L	629		1049	190	230	650	335	315	Ø 30
		30	200L	665		1085	190	230	650	335	315	Ø 35
		37	225M	765		1215	190	260	650	335	315	Ø 35

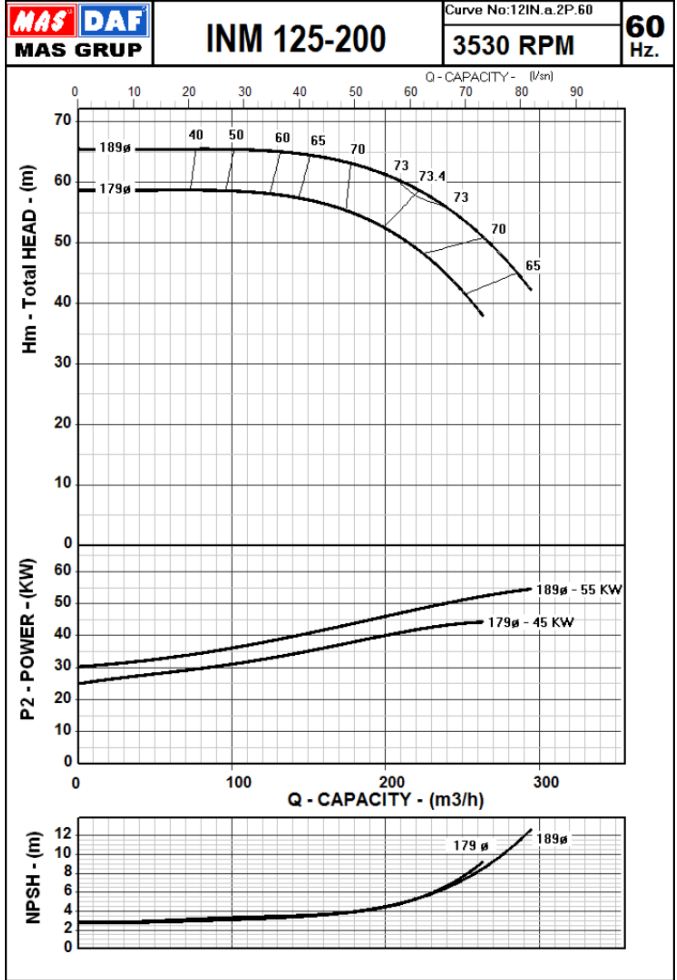
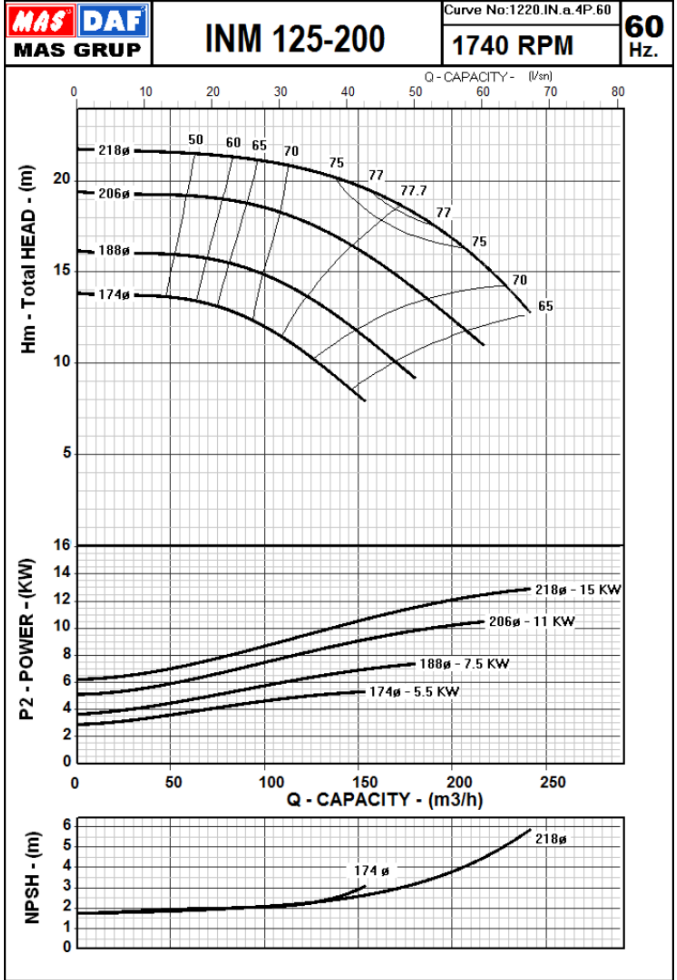
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

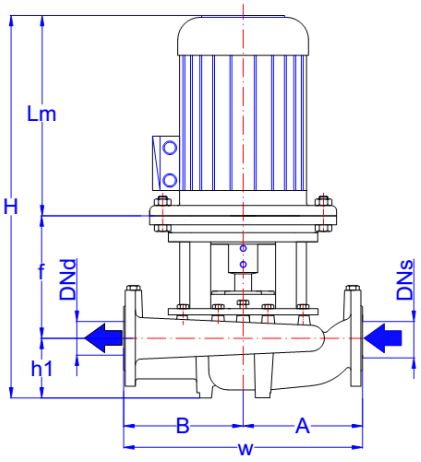


INM 125-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
125-200	4 poles	5.5	132M	476	125	900.5	210	215	600	300	300	Ø 30
		7.5	132M	476		885.5	210	200	600	300	300	Ø 30
		11	160L	576		1016	210	230	600	300	300	Ø 30
		15	160L	576		1016	210	230	600	300	300	Ø 30
	2 poles	45	225M	735	125	1215	210	270	600	300	300	Ø 35
		55	250M	886		1366	210	270	600	300	300	Ø 35

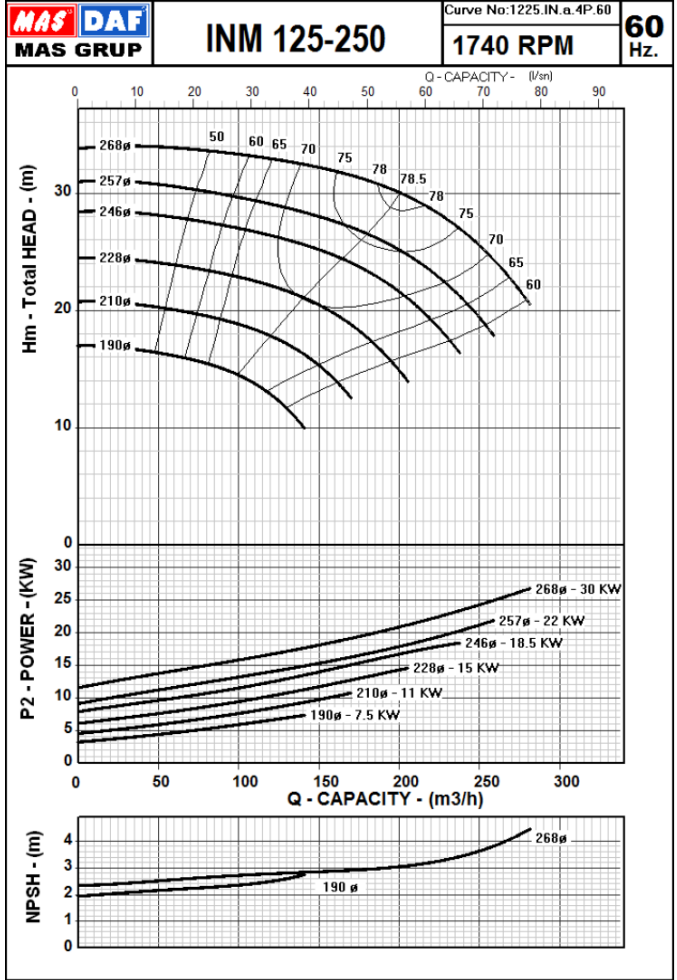
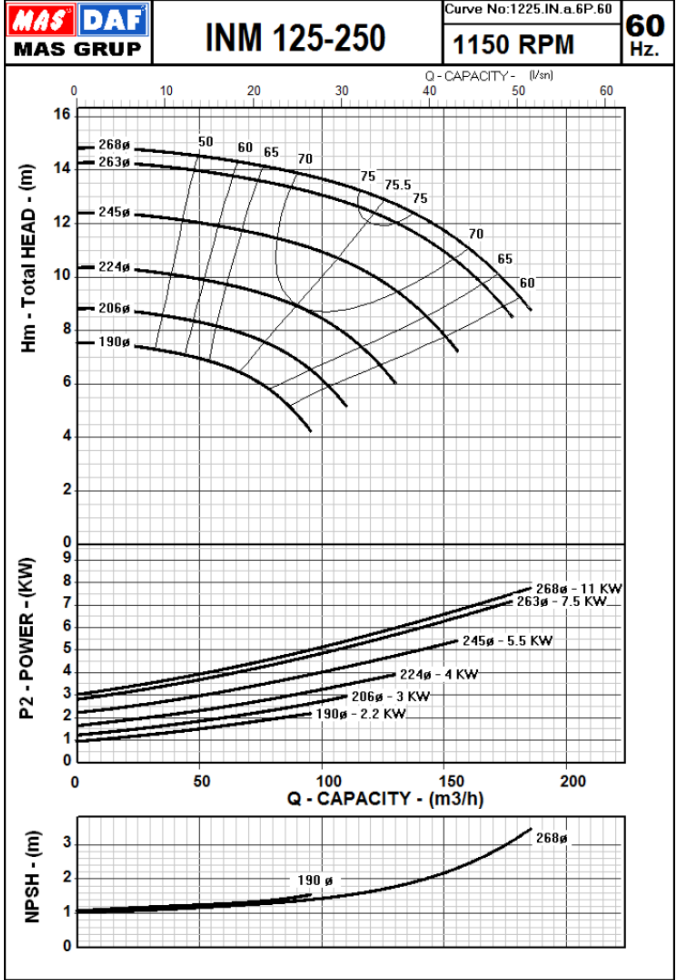
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

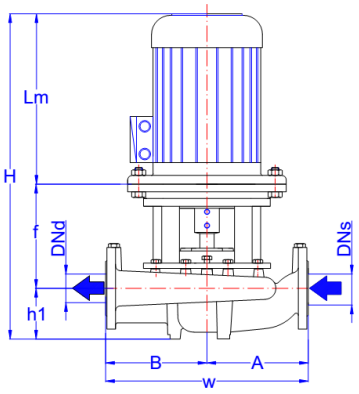


INM 125-250

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm	mm	mm	mm	mm	mm	mm	mm		
125-250	6 poles	2.2	112M	396	125	796	210	190	650	350	300	Ø 20
		3	132S	498		908	210	200	650	350	300	Ø 20
		4	132M	498		908	210	200	650	350	300	Ø 20
		5.5	132M	498		908	210	200	650	350	300	Ø 20
		7.5	160M	600		1040	210	230	650	350	300	Ø 30
		11	160L	644		1084	210	230	650	350	300	Ø 30
	4 poles	7.5	132M	476	125	900.5	210	215	650	350	300	Ø 30
		11	160L	576		1016	210	230	650	350	300	Ø 30
		15	160L	576		1016	210	230	650	350	300	Ø 30
		18.5	180M	629		1069	210	230	650	350	300	Ø 30
		22	180L	629		1069	210	230	650	350	300	Ø 30
30	200L	665	1105	210	230	650	350	300	Ø 35			

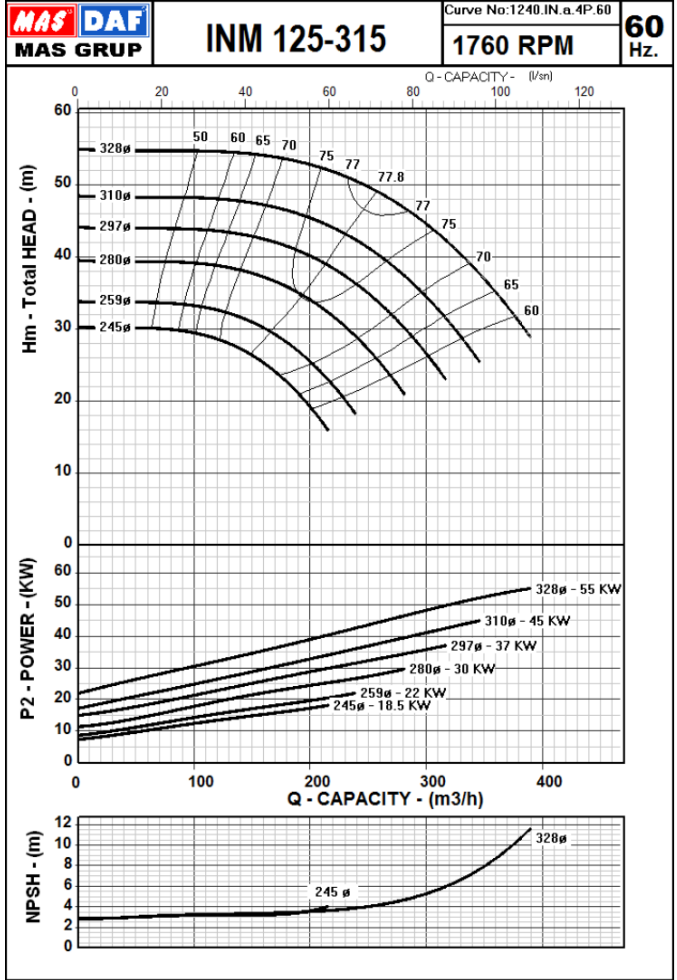
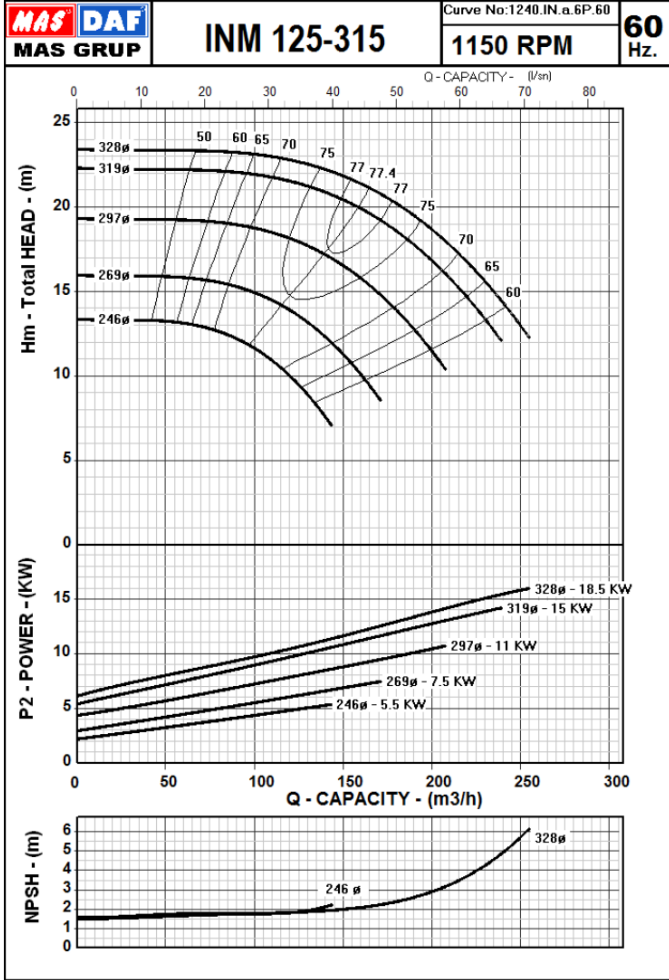
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

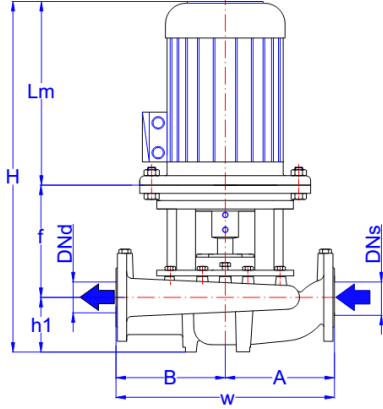


INM 125-315

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
125-315	6 poles	5.5	132M	498	125	983	210	275	700	370	330	Ø 20
		7.5	160M	600		1040	210	230	700	370	330	Ø 30
		11	160L	644		1084	210	230	700	370	330	Ø 30
		15	180L	695		1135	210	230	700	370	330	Ø 30
		18.5	200L	665		1105	210	230	700	370	330	Ø 35
	4 poles	18.5	180M	629	125	1249	210	410	700	370	330	Ø 30
		22	180L	629		1069	210	230	700	370	330	Ø 30
		30	200L	665		1105	210	230	700	370	330	Ø 35
		37	225M	765		1235	210	260	700	370	330	Ø 35
		45	225M	765		1235	210	260	700	370	330	Ø 35
		55	250M	886		1446	210	350	700	370	330	Ø 35

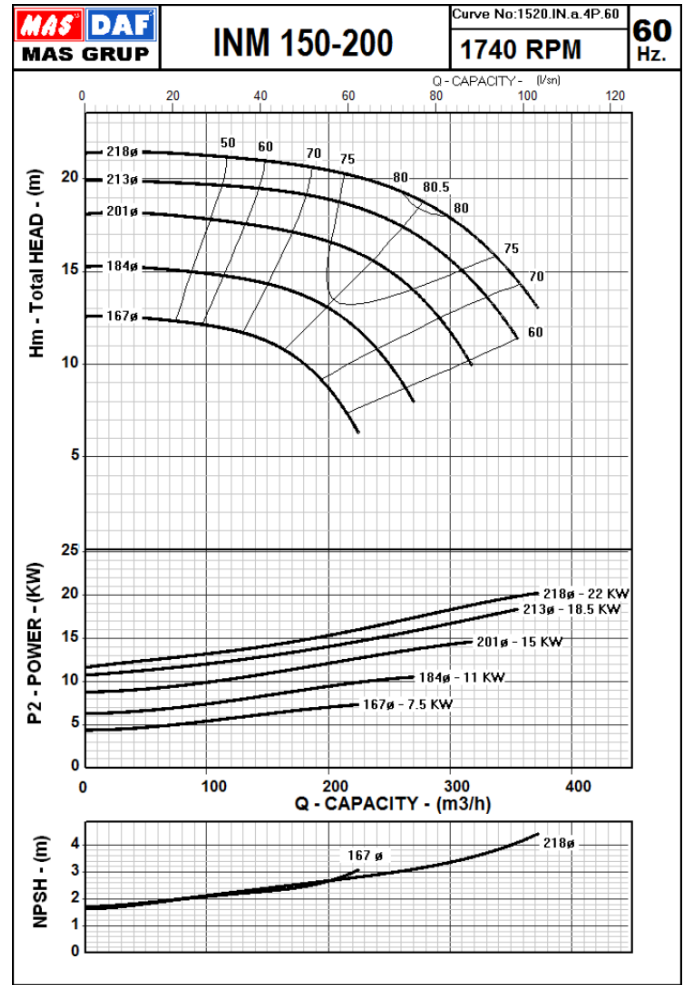
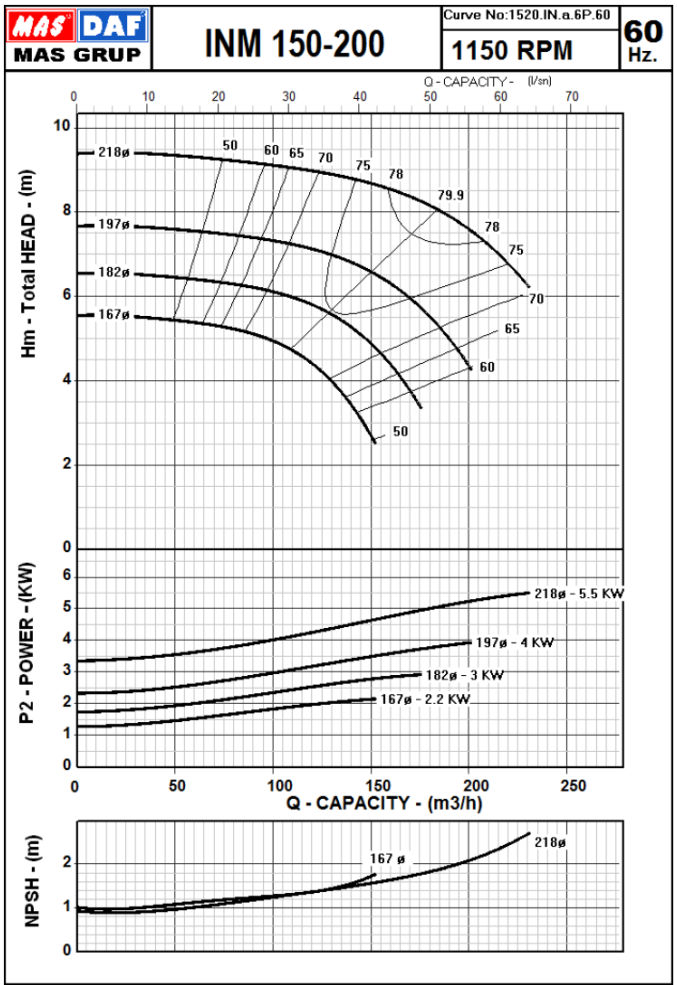
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

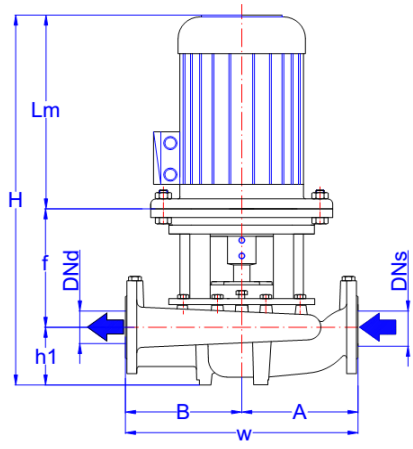


INM 150-200

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
			mm									mm
150-200	6 poles	2.2	112M	396	150	776	190	190	670	315	355	Ø 20
		3	132S	498		888	190	200	670	315	355	Ø 20
		4	132M	498		888	190	200	670	315	355	Ø 20
		5.5	132M	498		888	190	200	670	315	355	Ø 20
	4 poles	7.5	132M	476	150	880.5	190	215	670	315	355	Ø 30
		11	160L	576		996	190	230	670	315	355	Ø 30
		15	160L	576		996	190	230	670	315	355	Ø 30
		18.5	180M	629		1049	190	230	670	315	355	Ø 30
		22	180L	629		1049	190	230	670	315	355	Ø 30

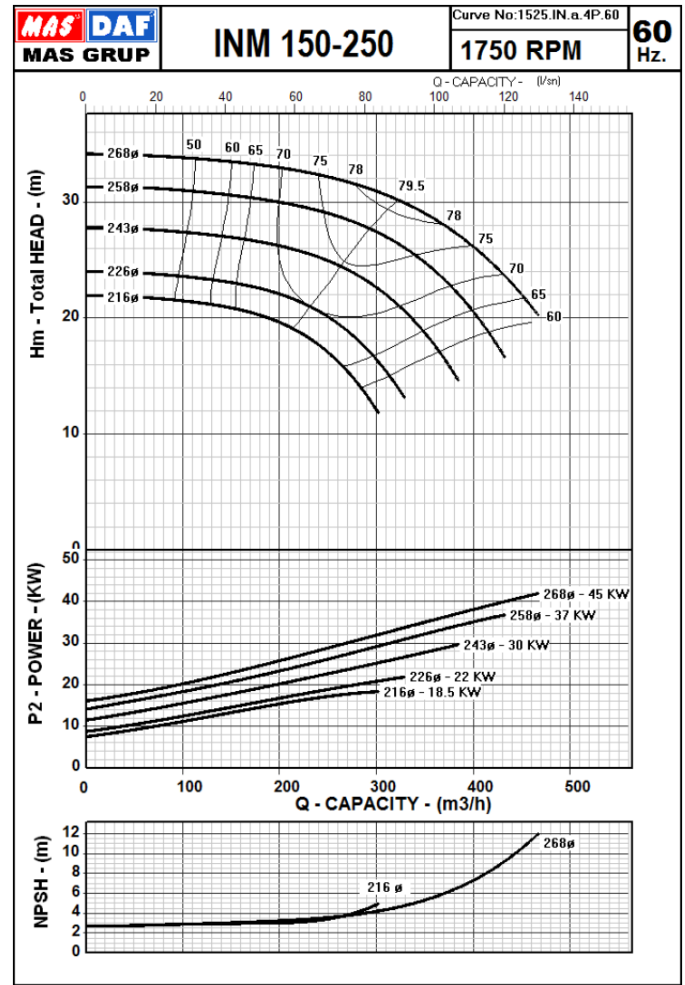
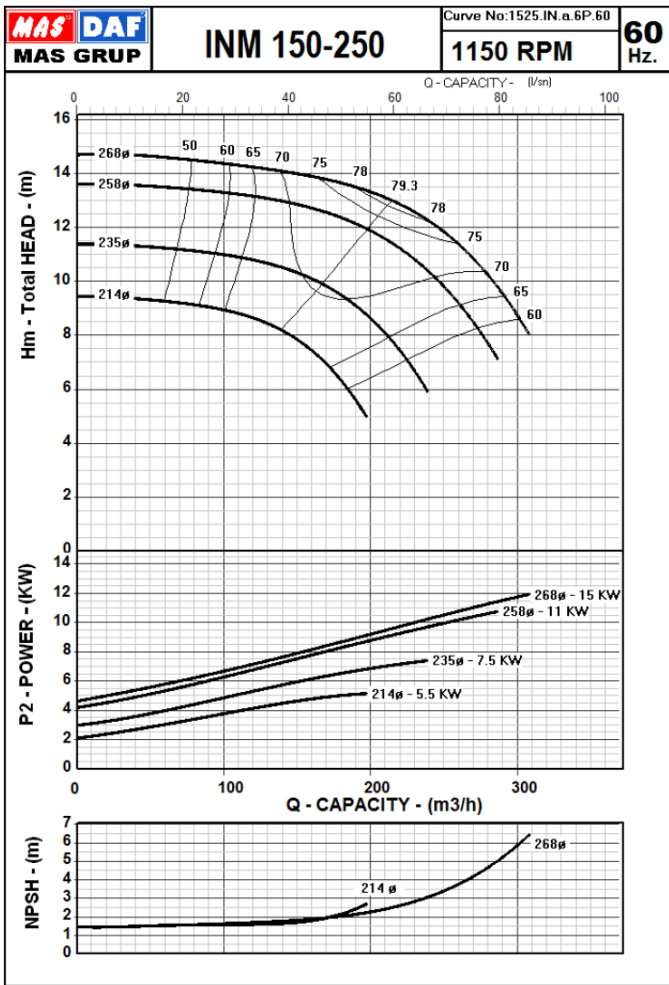
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

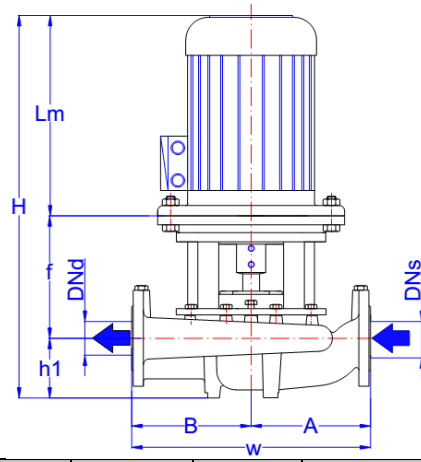


INM 150-250

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 mm	DNs - DNd mm	H mm	h1 mm	f mm	W mm	A mm	B mm	Nominal Impeller Diameter	
150-250	6 poles	5.5	132M	498	150	953	180	275	670	315	355	Ø 20
		7.5	160M	600		1010	180	230	670	315	355	Ø 30
		11	160L	644		1054	180	230	670	315	355	Ø 30
		15	180L	695		1105	180	230	670	315	355	Ø 30
	4 poles	18.5	180M	629	150	1219	180	410	670	315	355	Ø 30
		22	180L	629		1039	180	230	670	315	355	Ø 30
		30	200L	665		1075	180	230	670	315	355	Ø 35
		37	225M	765		1205	180	260	670	315	355	Ø 35
	45	225M	765		1205	180	260	670	315	355	Ø 35	

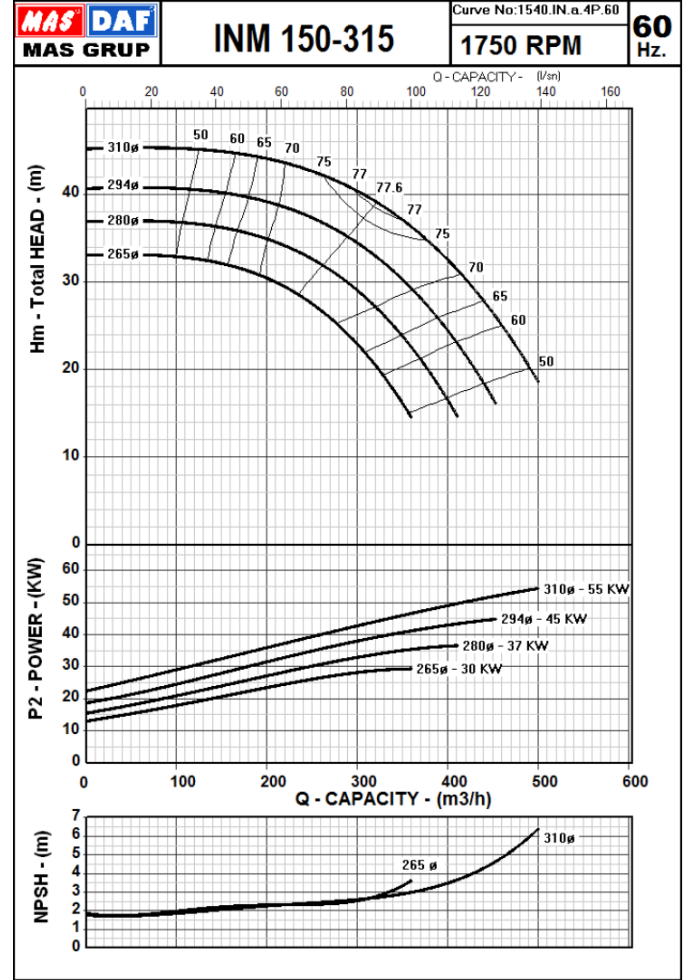
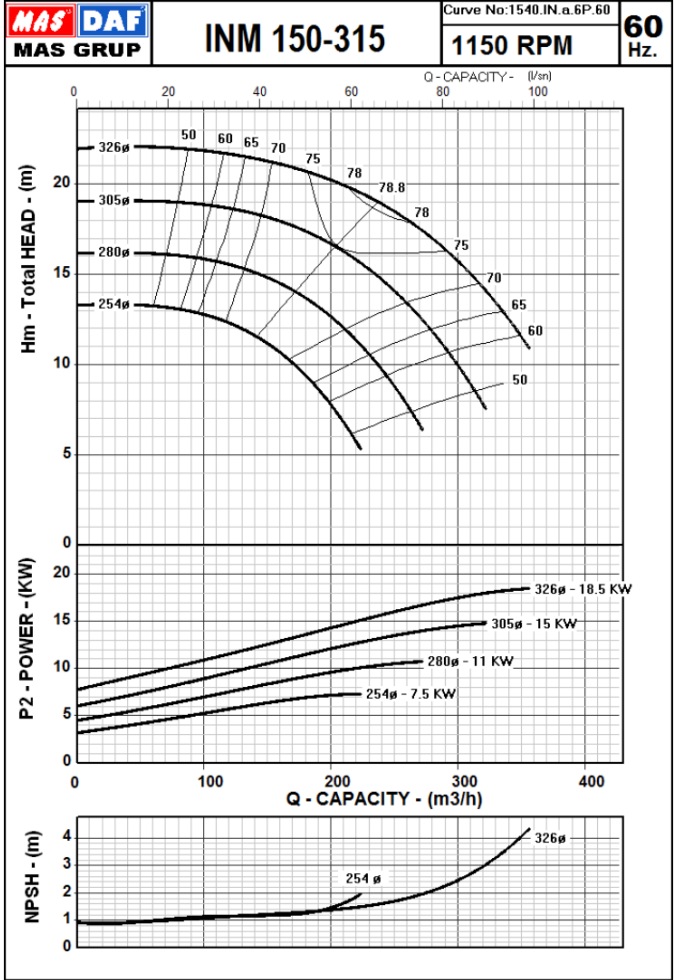
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

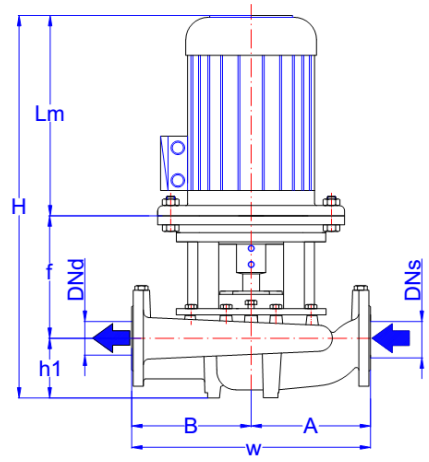


INM 150-315

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.



	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal	
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
150-315	6 poles	7.5	160M	600	150	1255	210	445	770	390	380	Ø 30
		11	160L	644		1084	210	230	770	390	380	Ø 30
		15	180L	695		1135	210	230	770	390	380	Ø 30
		18.5	200L	665		1105	210	230	770	390	380	Ø 35
	4 poles	30	200L	665	150	1320	210	445	770	390	380	Ø 35
		37	225M	765		1235	210	260	770	390	380	Ø 35
		45	225M	765		1235	210	260	770	390	380	Ø 35
		55	250M	886		1481	210	385	770	390	380	Ø 35

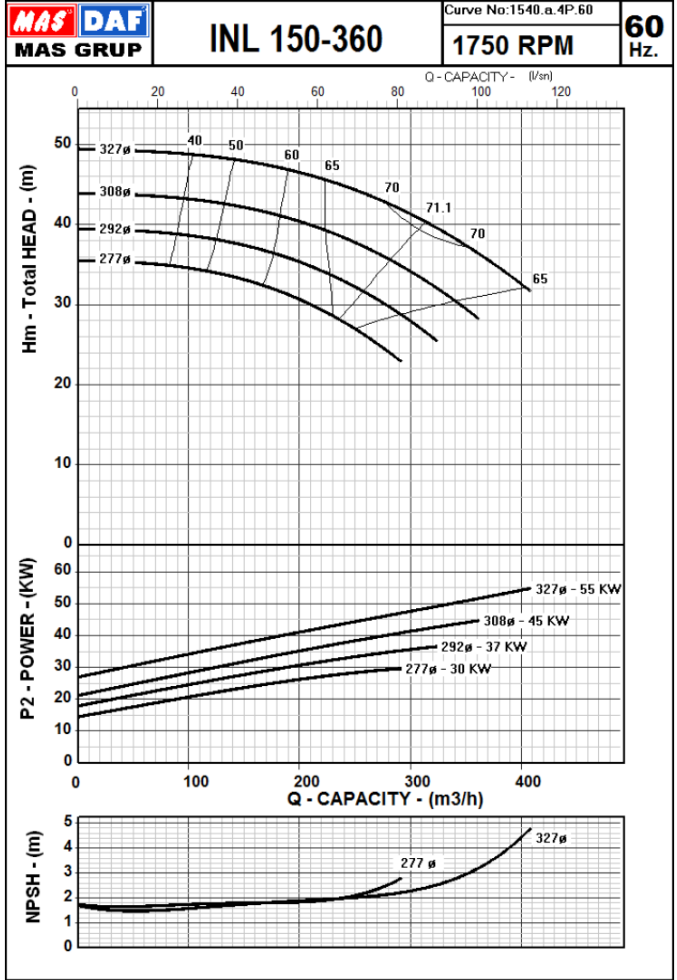
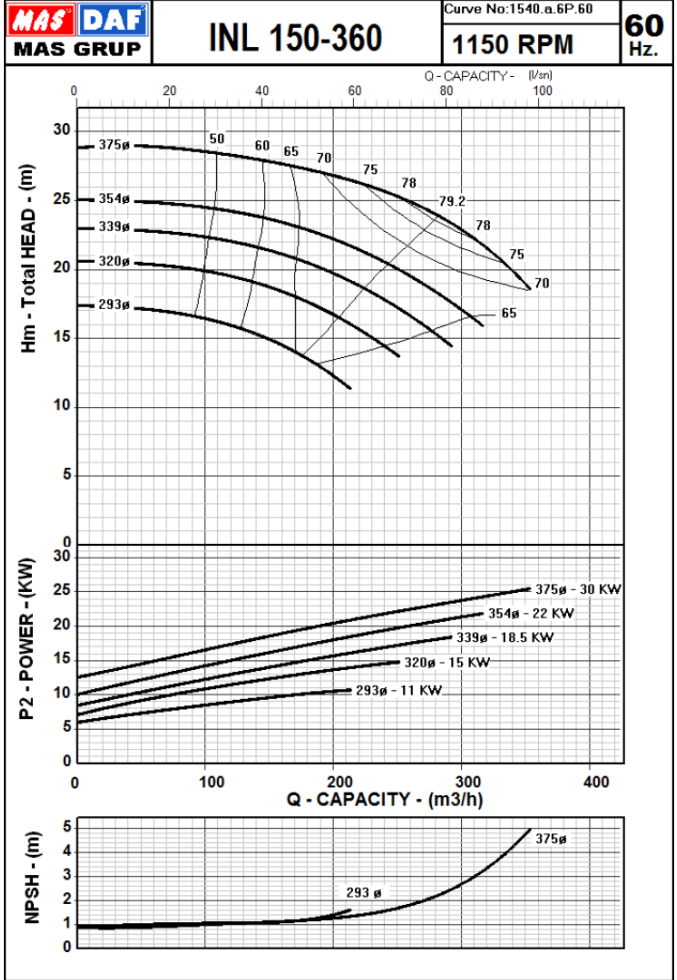
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

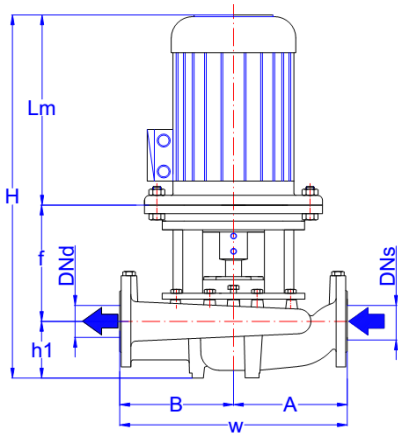


INL 150-360

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	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter	
150-360	6 poles	11	160L	644	150	1279	190	445	800	400	400	Ø 50
		15	180L	695		1115	190	230	800	400	400	Ø 50
		18.5	200L	665		1085	190	230	800	400	400	Ø 50
		22	200L	665		1085	190	230	800	400	400	Ø 50
		30	225M	765		1215	190	260	800	400	400	Ø 50
	4 poles	30	200L	665	150	1300	190	445	800	400	400	Ø 50
		37	225M	765		1215	190	260	800	400	400	Ø 50
		45	225M	765		1215	190	260	800	400	400	Ø 50
		55	250M	886		1486	190	410	800	400	400	Ø 50

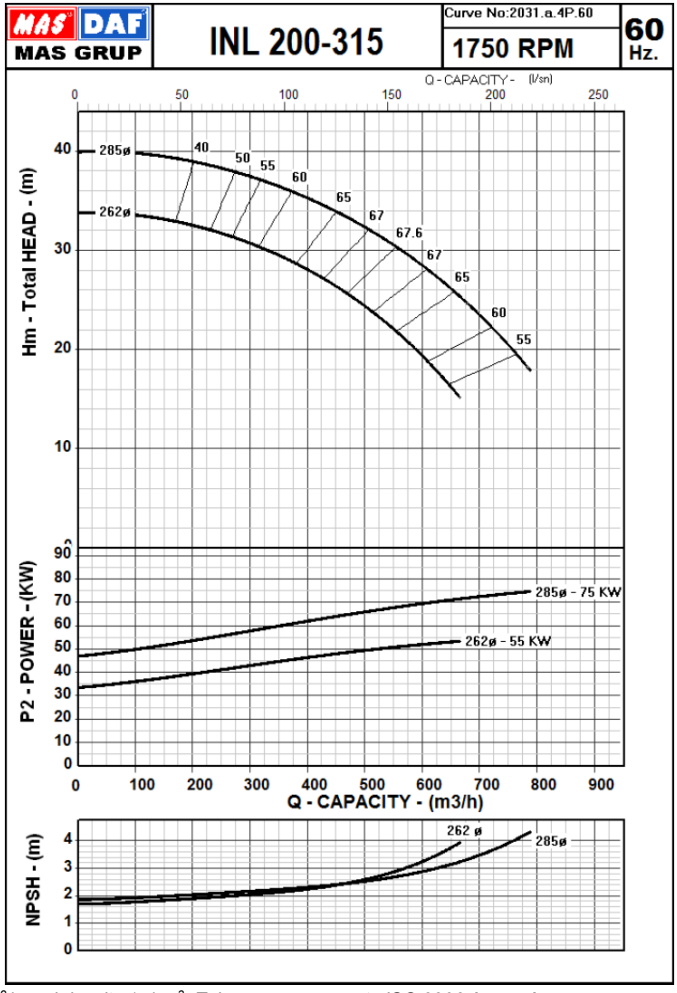
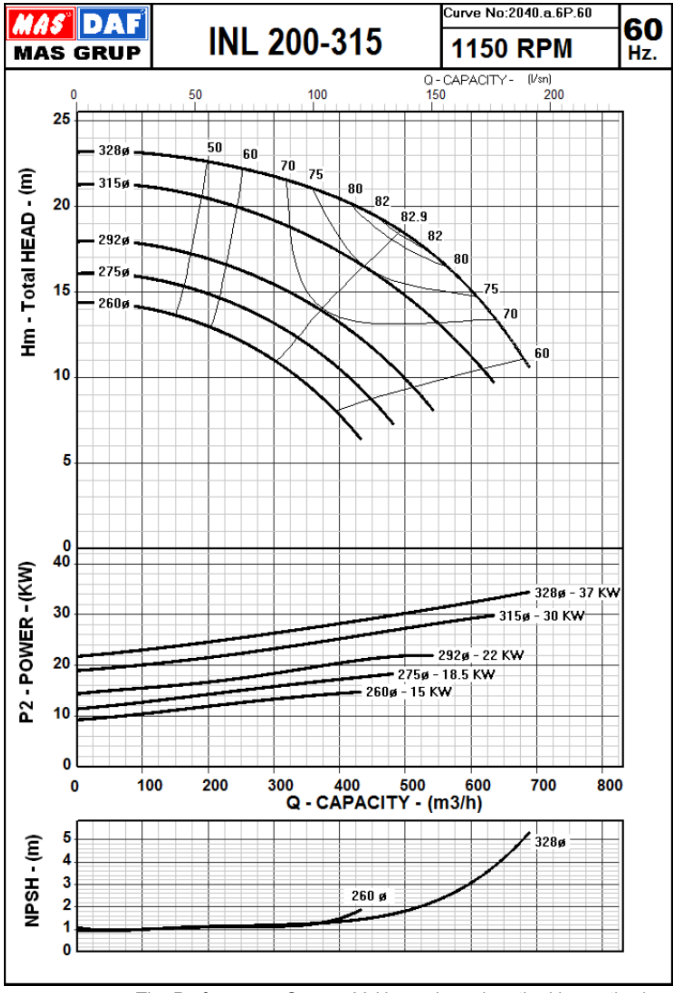
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INM/INL Series
In-Line Centrifugal Pumps
Performance Curves

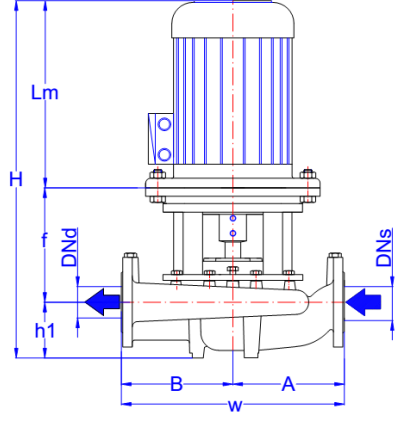


INL 200-315

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.



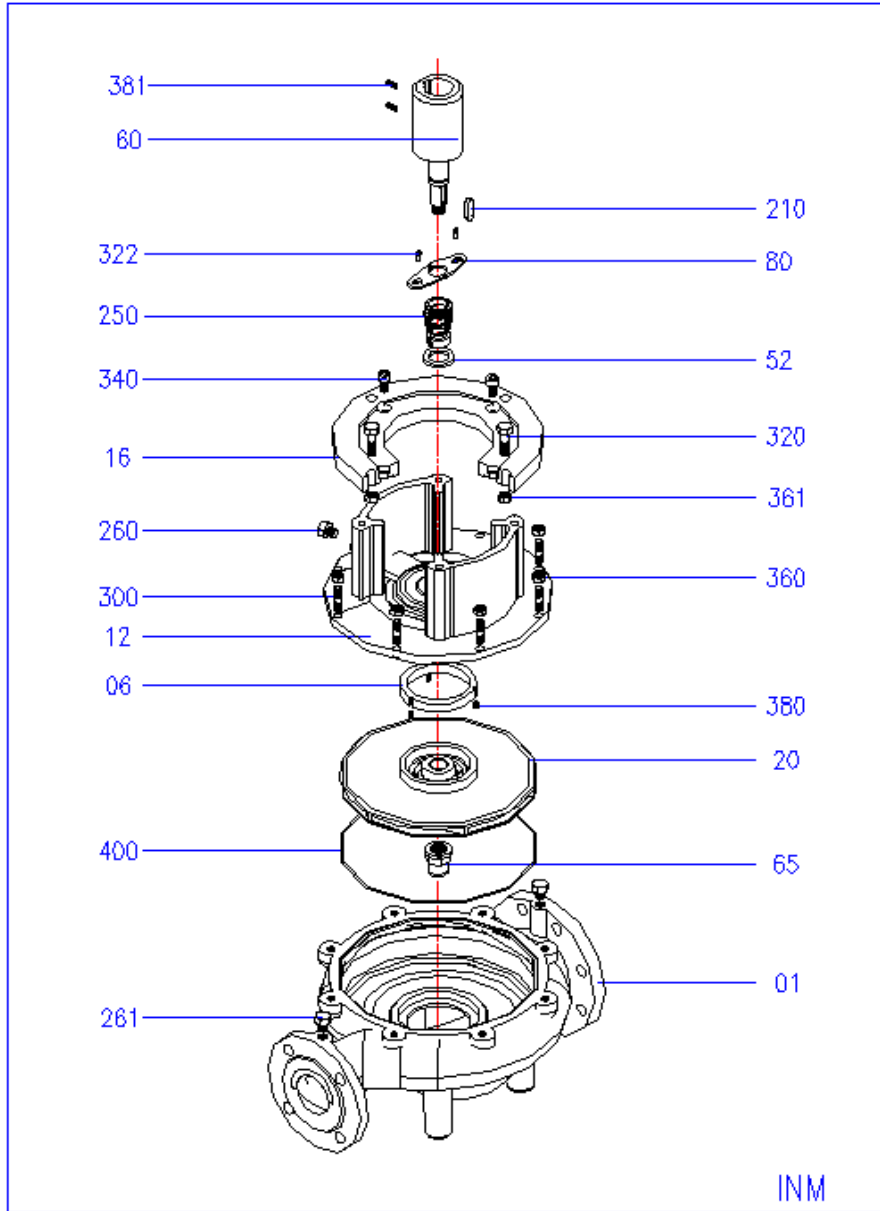
200-315	MOTOR			FLANGES	GENERAL	PUMP					Mechanical Seal
	KW	IEC	Lm	DNs - DNd	H	h1	f	W	A	B	Nominal Impeller Diameter
			mm								
6 poles	15	180L	695	200	1340	200	445	850	400	450	Ø 50
	18.5	200L	665		1095	200	230	850	400	450	Ø 50
	22	200L	665		1095	200	230	850	400	450	Ø 50
	30	225M	765		1225	200	260	850	400	450	Ø 50
	37	250M	896		1541	200	445	850	400	450	Ø 50
4 poles	55	250M	886	200	1531	200	445	850	400	450	Ø 50
	75	280S	958		1603	200	445	850	400	450	Ø 50

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INM/INL Series
In-Line Centrifugal Pumps
Exploded View (Without Coupling)



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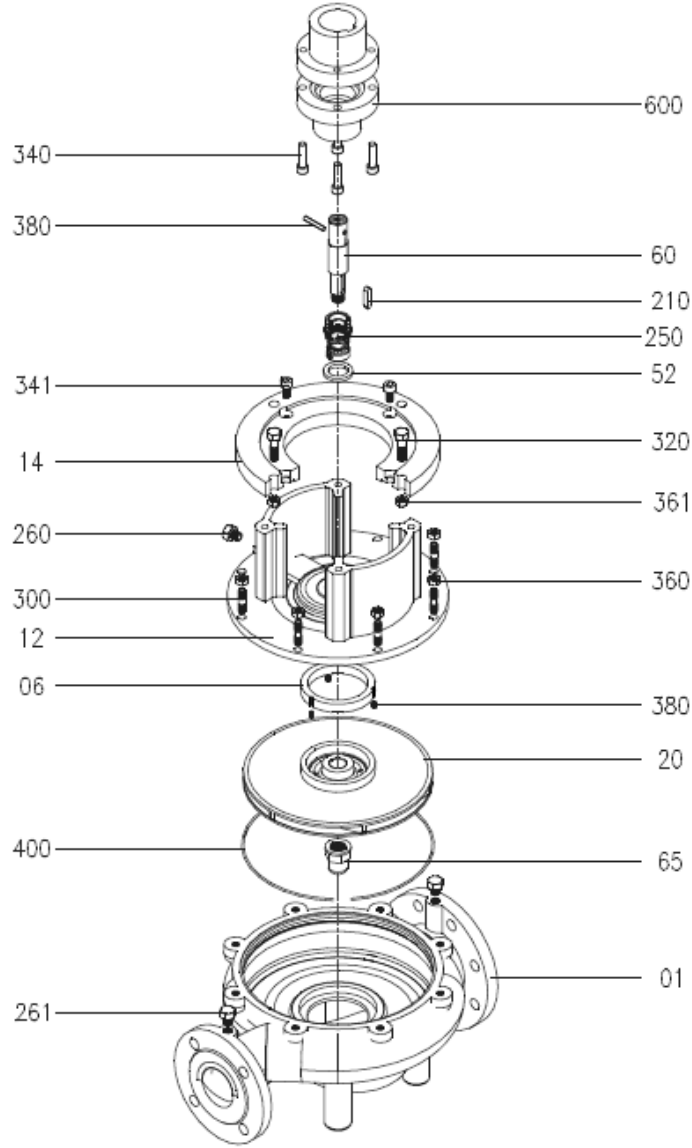


PART NO	PART NAME	PART NO	PART NAME
01	Pump Casing	260	Drain Plug
06	Wearing Ring	261	Plug
12	Adapter	300	Stud for Casing
16	Motor Adapter	320	Hexagonal Bolt
20	Impeller	322	Hexagonal Bolt
52	Mechanical Seal Ring	340	Cap Screw
60	Pump Shaft	360	Nut
65	Impeller Nut	361	Nut
80	Shackle	380	Setscrew
210	Impeller Key	381	Setscrew
250	Mechanical Seal	400	O-Ring

INM/INL Series
In-Line Centrifugal Pumps
Exploded View (With Coupling)



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PART NO	PART NAME	PART NO	PART NAME
01	Pump Casing	261	Plug, Pressure gauge
06	Wearing Ring	300	Stud for Casing
12	Adapter	320	Hexagonal Bolt
14	Motor 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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