

In-Line Centrifugal Pumps

# **INM/INL SERIES (60 Hz.)**

---



## TECHNICAL MANUAL



## 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

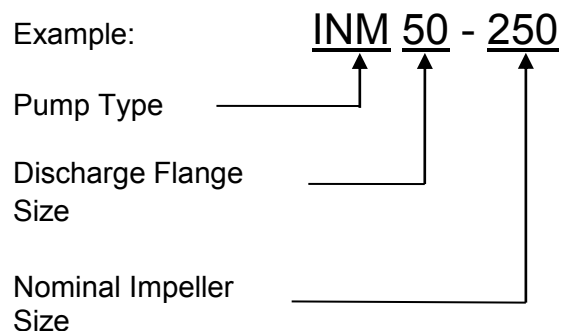
- Suction Flange : DN 40 - DN 250
- Discharge Flange : DN 40 - DN 250
- Operating Pressure : 10 Bar
- Test Pressure : 13 Bar
- Operating Temperature : -25 – 120°C
- Capacity Range : 2 – 700 m<sup>3</sup> / h
- Head Range : 2 - 70 m
- Speed: : 900-3600 RPM

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



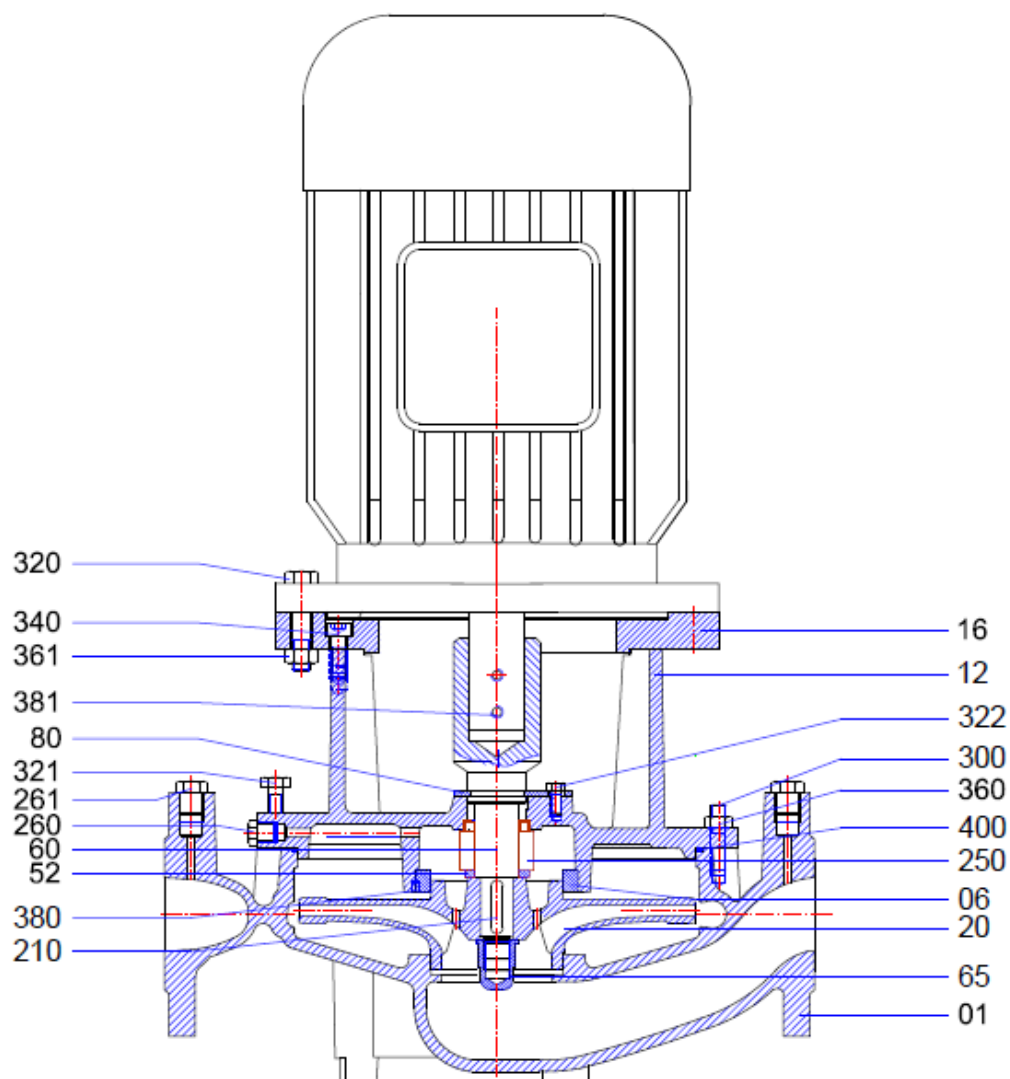
# INM/INL Series

In-Line Centrifugal Pumps

## INM Sectional Drawing and Part List (Without Coupling)



Mas Grup



| 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   |         |                           |

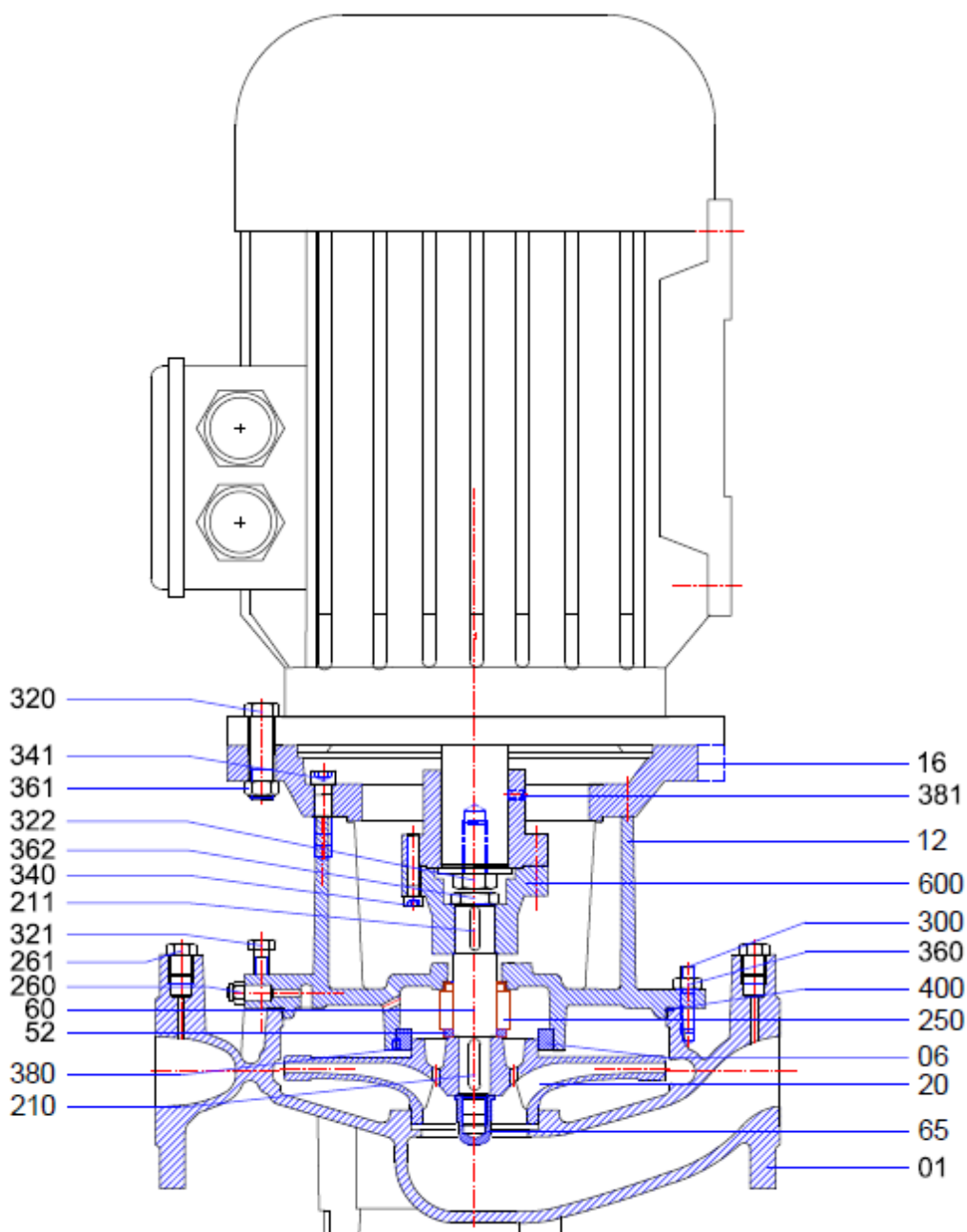
# INM/INL Series

In-Line Centrifugal Pumps

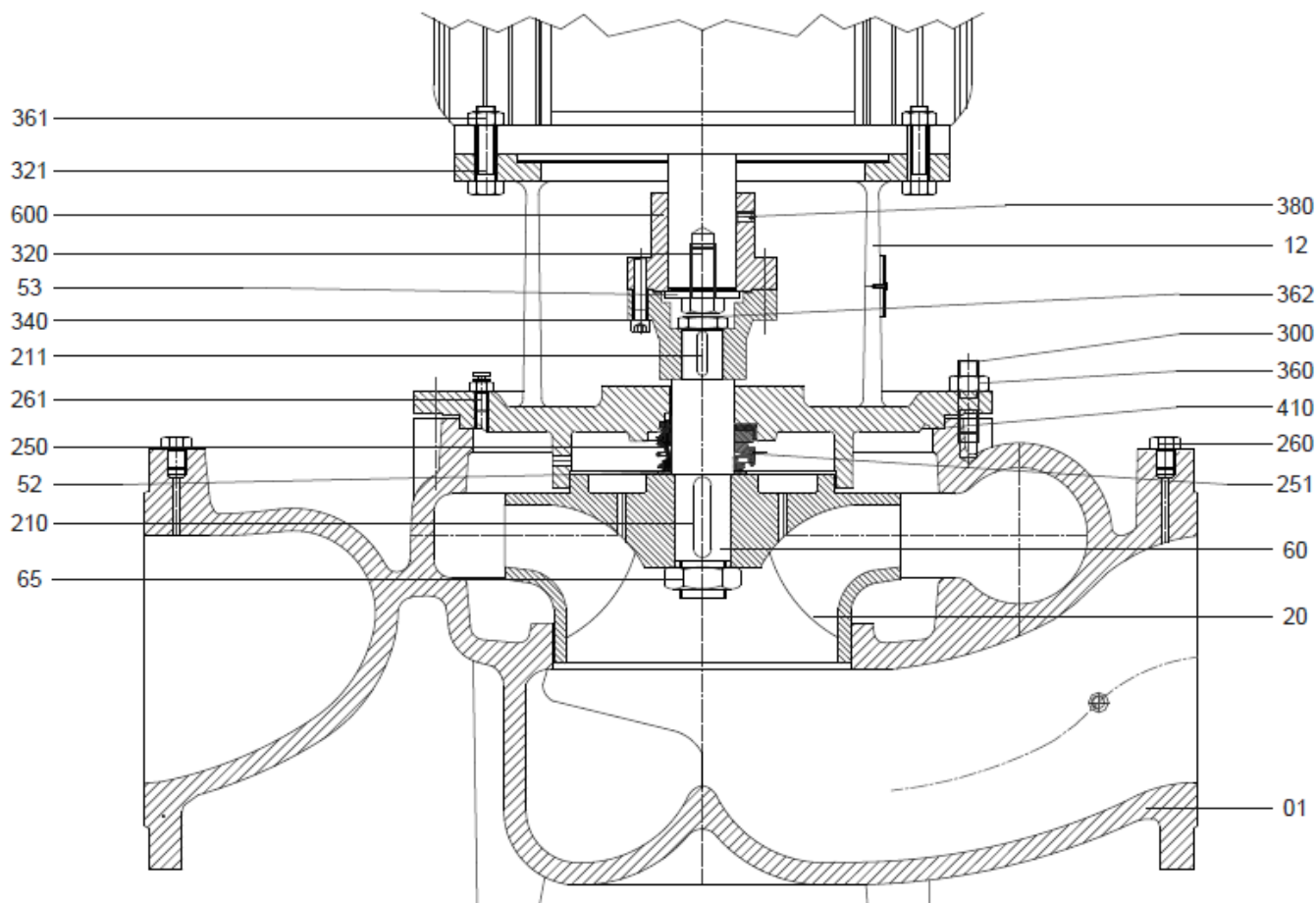
## INM Sectional Drawing and Part List (Without Coupling)



Mas Grup



| 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)        |         |                       |

**INM/INL Series**  
In-Line Centrifugal Pumps  
**Technical Data**



**Mas Grup**

**Material Options**

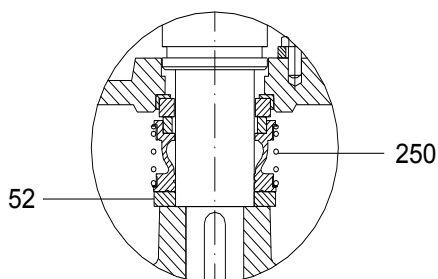
| Components      | Material. No |        |        |           |        |        |        |
|-----------------|--------------|--------|--------|-----------|--------|--------|--------|
|                 |              | 0.6025 | 0.7040 | 2.1050.01 | 1.4021 | 1.4301 | 1.4401 |
| Pump Casing     |              | ●      | ○      | ○         |        | ○      | ○      |
| 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**



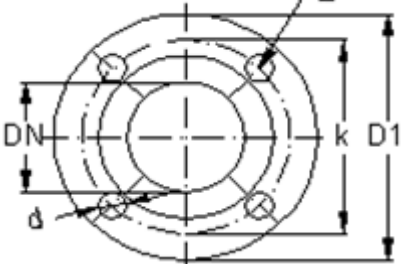
| No  | Part Name            |
|-----|----------------------|
| 52  | Mechanical Seal Ring |
| 250 | Mechanical Seal      |

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

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

**Flange Sizes**

| Suction and Discharge Flanges Sizes |     |     |    |    |
|-------------------------------------|-----|-----|----|----|
| DNs<br>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 |

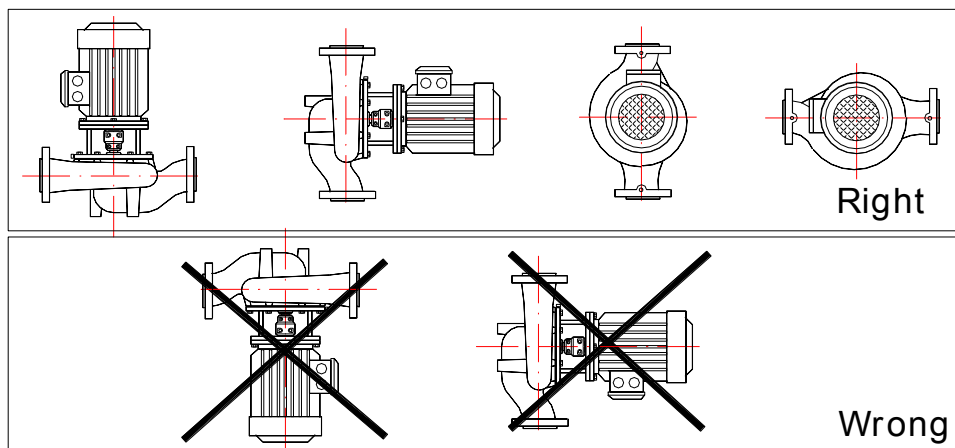


| No | PumpType   | Flanges          |                    |
|----|------------|------------------|--------------------|
|    |            | DNs (mm) Suction | DNd (mm) Discharge |
| 1  | INM 40-125 | 40               | 40                 |
| 2  | INM 40-160 |                  |                    |
| 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 |                  |                    |

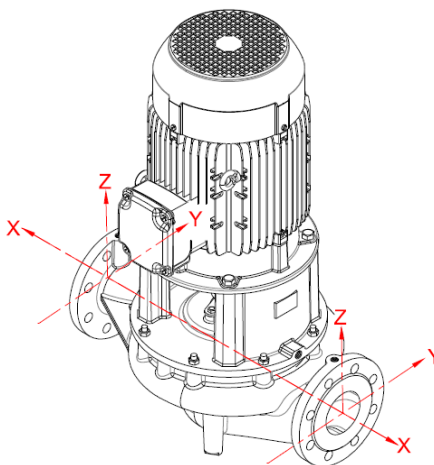
| No | PumpType    | Flanges          |                    |
|----|-------------|------------------|--------------------|
|    |             | DNs (mm) Suction | DNd (mm) Discharge |
| 17 | INM 100-160 | 100              | 100                |
| 18 | INM 100-200 |                  |                    |
| 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.

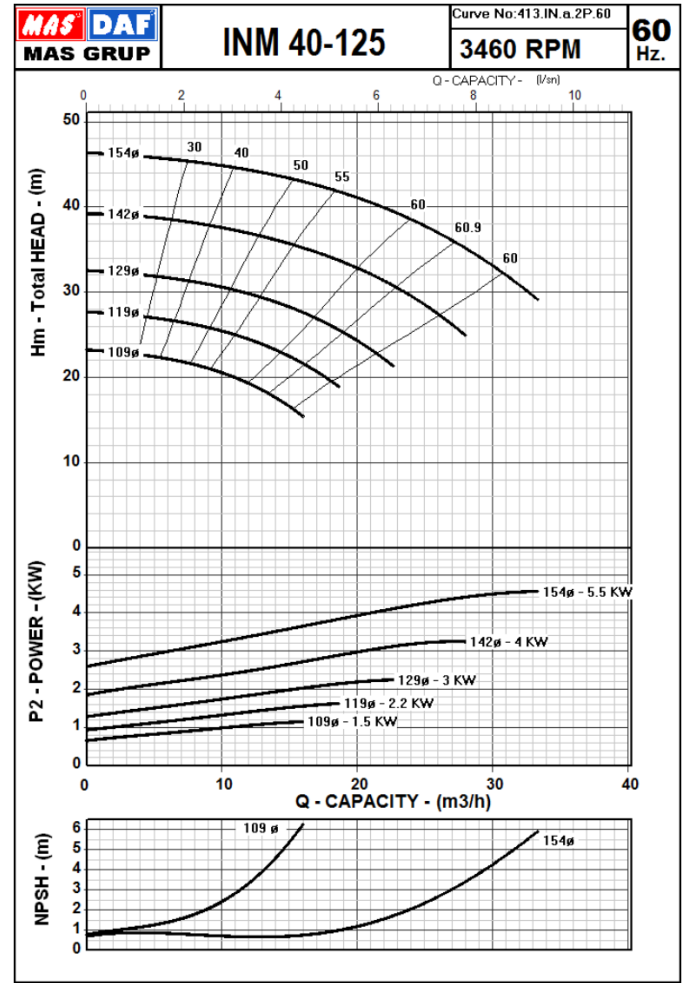
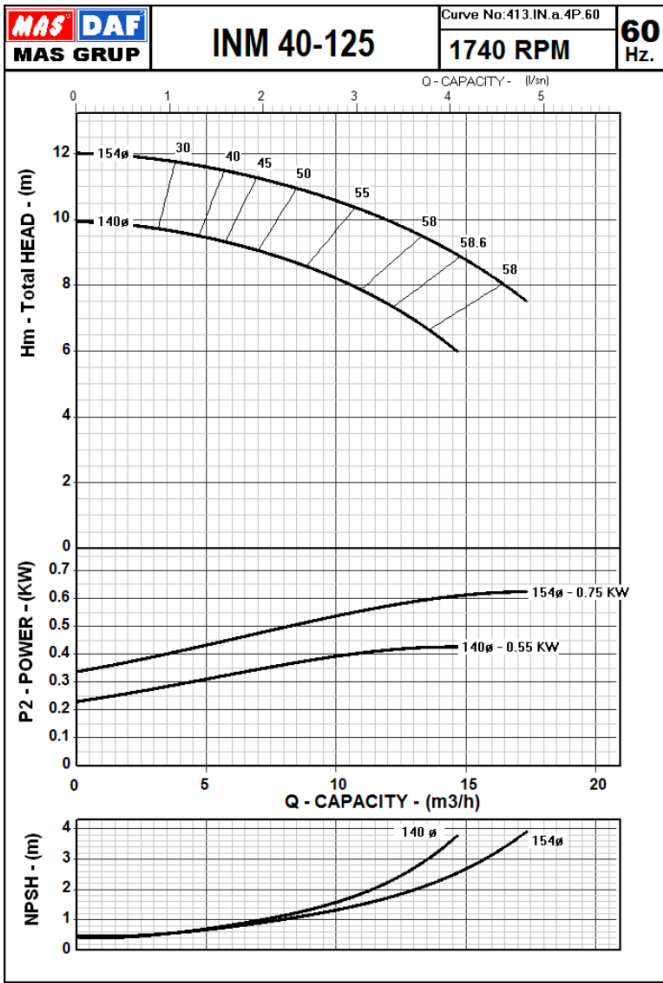
| PUMP TYPE   | FORCES AND MOMENTS |                              |                |                |                              |                |                |
|-------------|--------------------|------------------------------|----------------|----------------|------------------------------|----------------|----------------|
|             | DN FLANGE          | SUCTION AND DISCHARGE FLANGE |                |                | SUCTION AND DISCHARGE FLANGE |                |                |
|             | mm                 | N                            |                |                | Nm                           |                |                |
|             |                    | F <sub>y</sub>               | F <sub>z</sub> | F <sub>x</sub> | M <sub>y</sub>               | M <sub>z</sub> | M <sub>x</sub> |
| 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**

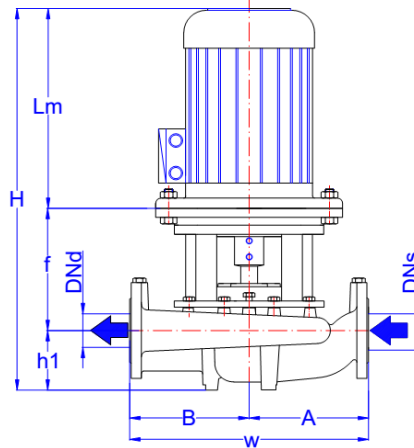


**INM 40-125**

**Mas Grup**

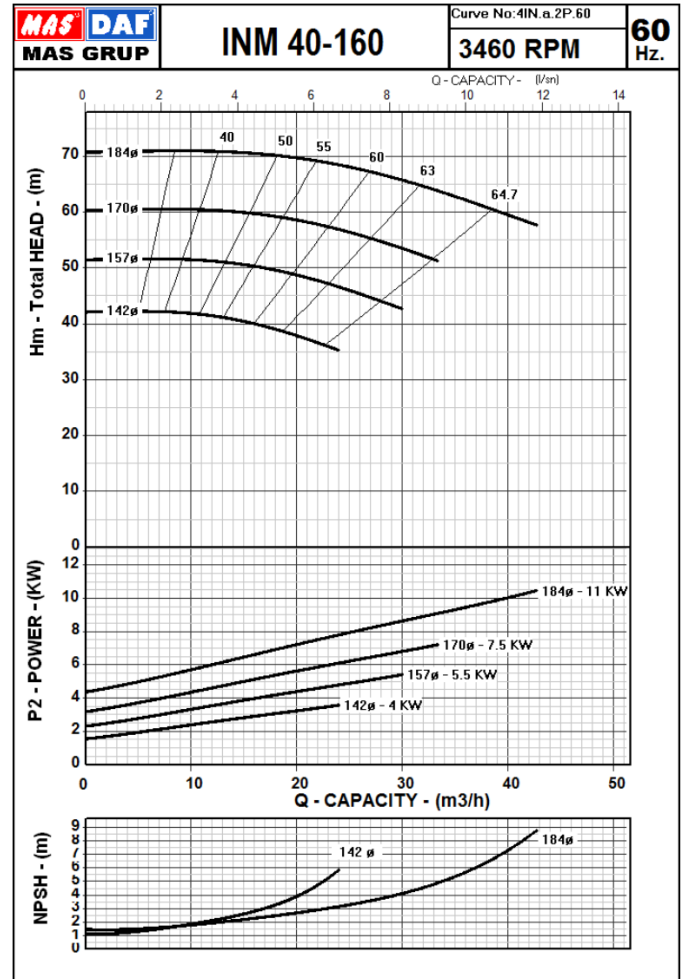
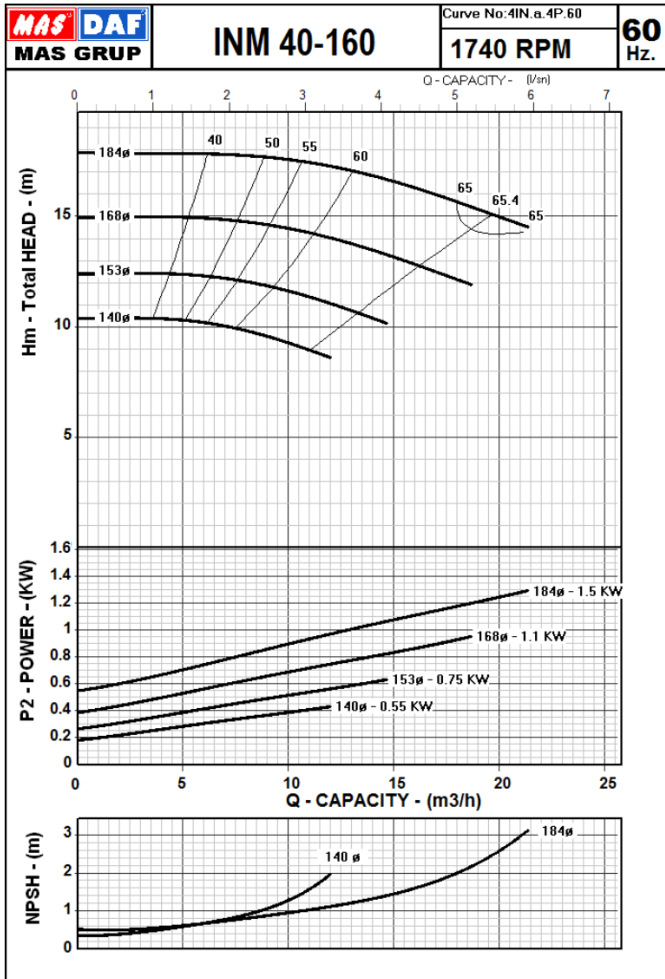


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

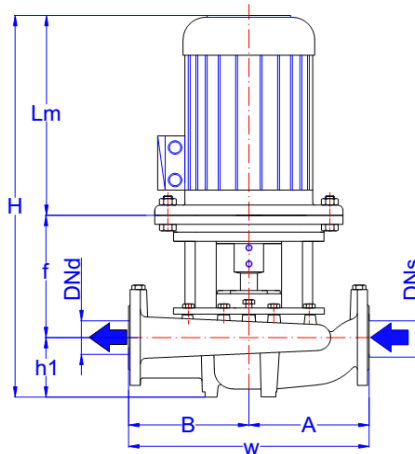


|        |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     |     | Mechanical Seal           |
|--------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----|---------------------------|
|        |         | KW    | IEC  | Lm  | DNs - DNd | H       | h1   | 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                        |

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

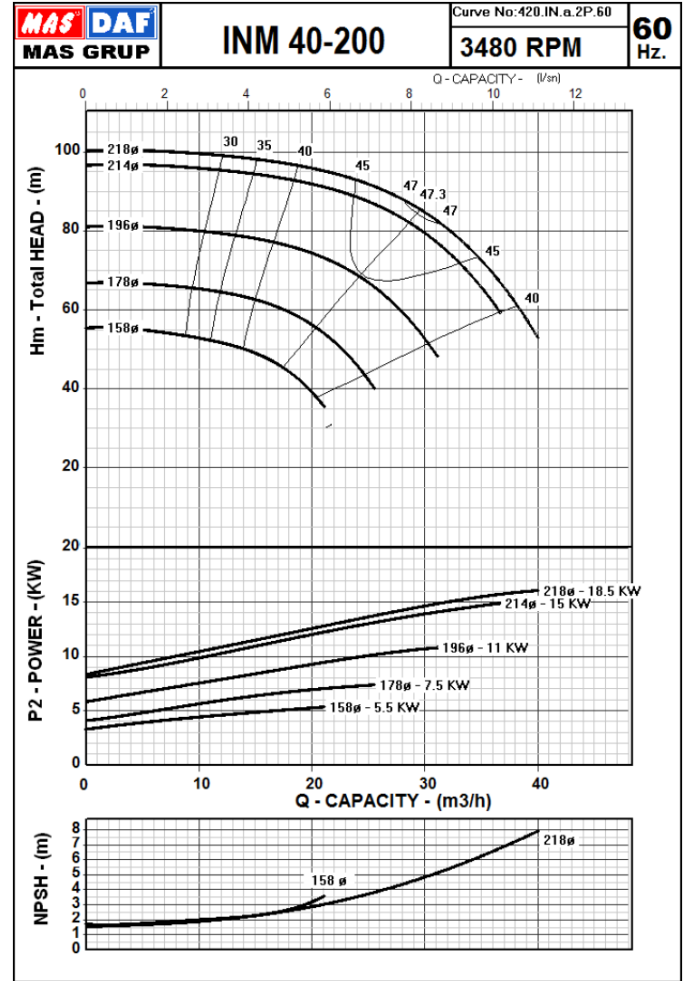
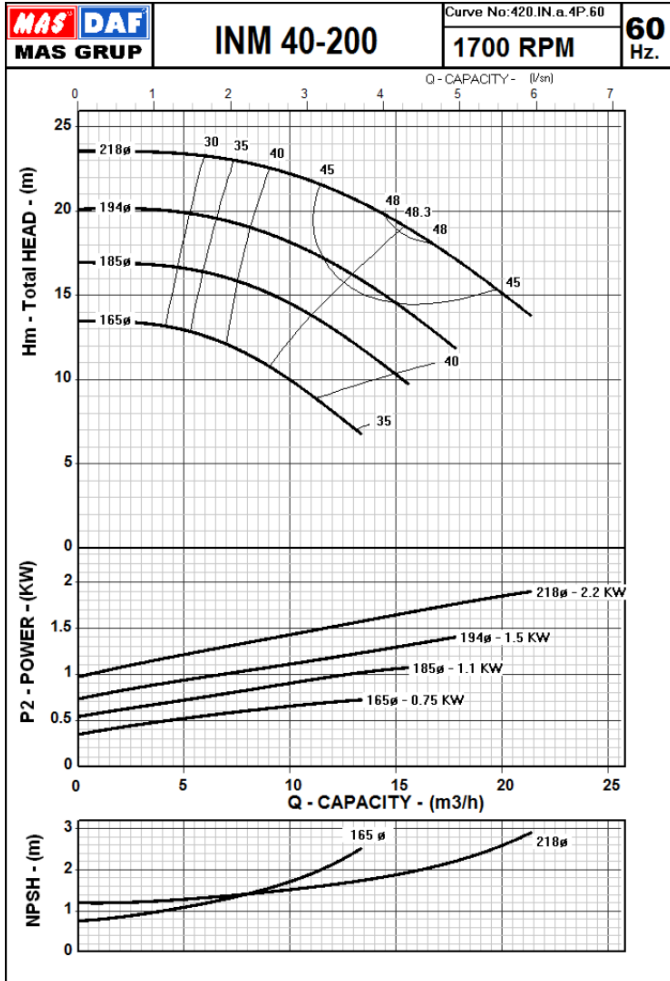


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

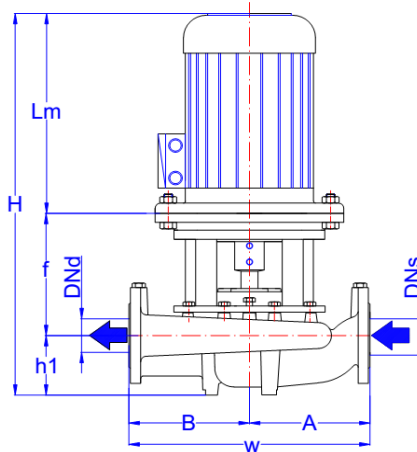


|        |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     | Mechanical Seal |                           |
|--------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----------------|---------------------------|
|        |         | KW    | IEC  | Lm  | DNs - 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                        |

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

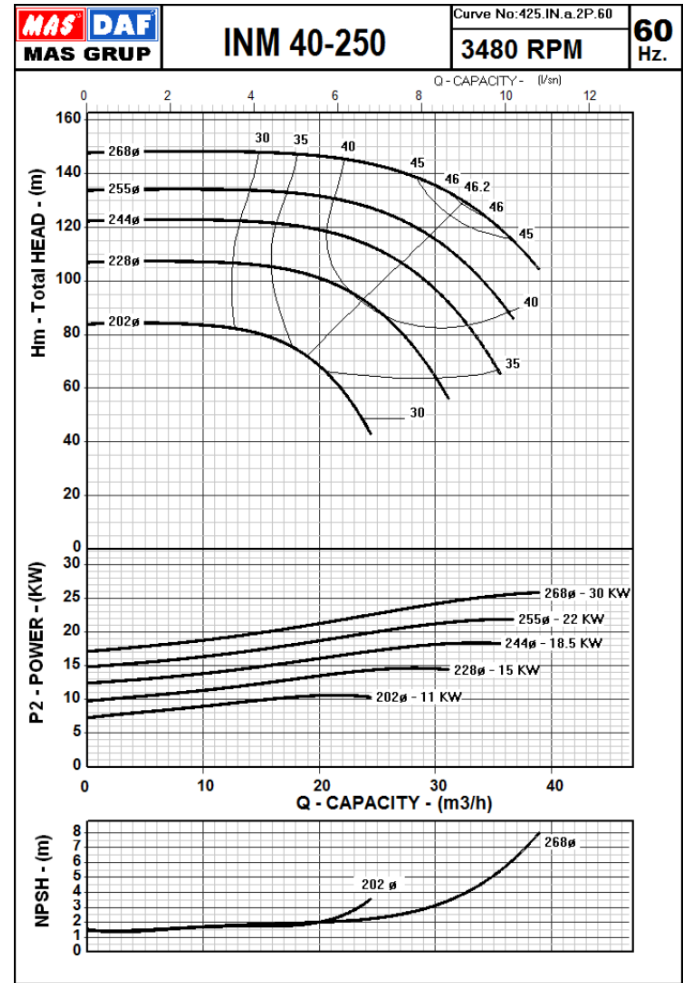
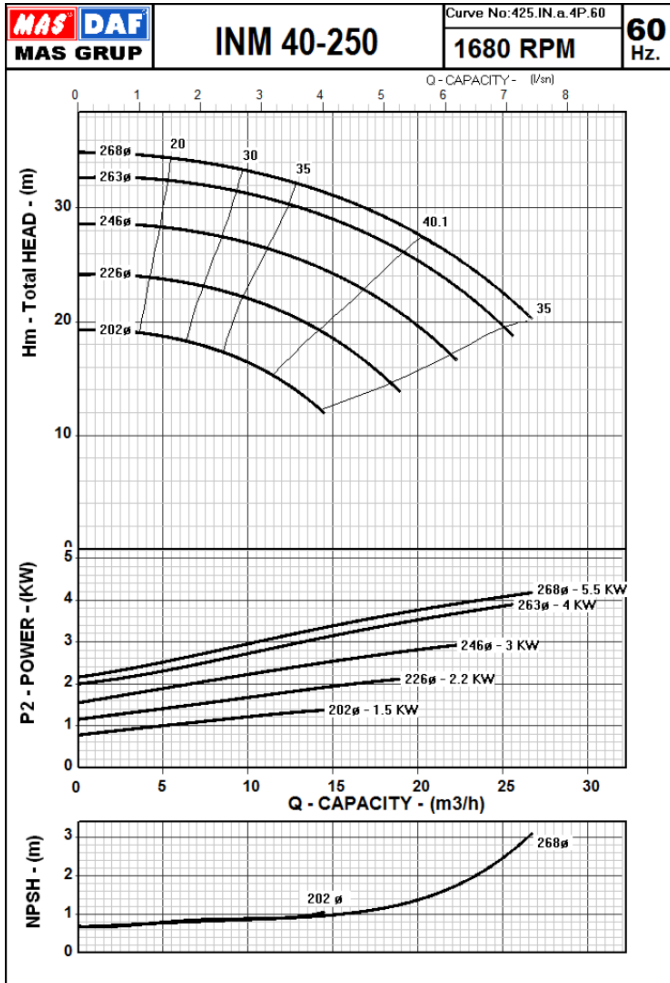


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

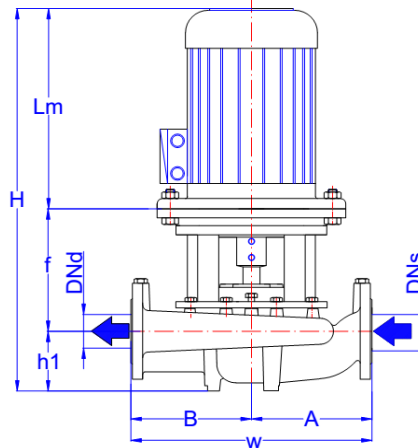


|        | MOTOR   |      |      | FLANGES   | GENERAL | PUMP  |    |     |     |     | Mechanical Seal           |      |
|--------|---------|------|------|-----------|---------|-------|----|-----|-----|-----|---------------------------|------|
|        | KW      | IEC  | Lm   | DNs - DNd | H       | h1    | f  | W   | A   | B   | Nominal Impeller Diameter |      |
|        |         |      | mm   |           |         |       |    |     |     |     |                           | mm   |
| 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 |
|        |         | 18.5 | 160L | 576       |         | 901   | 95 | 230 | 380 | 190 | 190                       | Ø 30 |

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



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. 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  |                           |      |
| 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 |

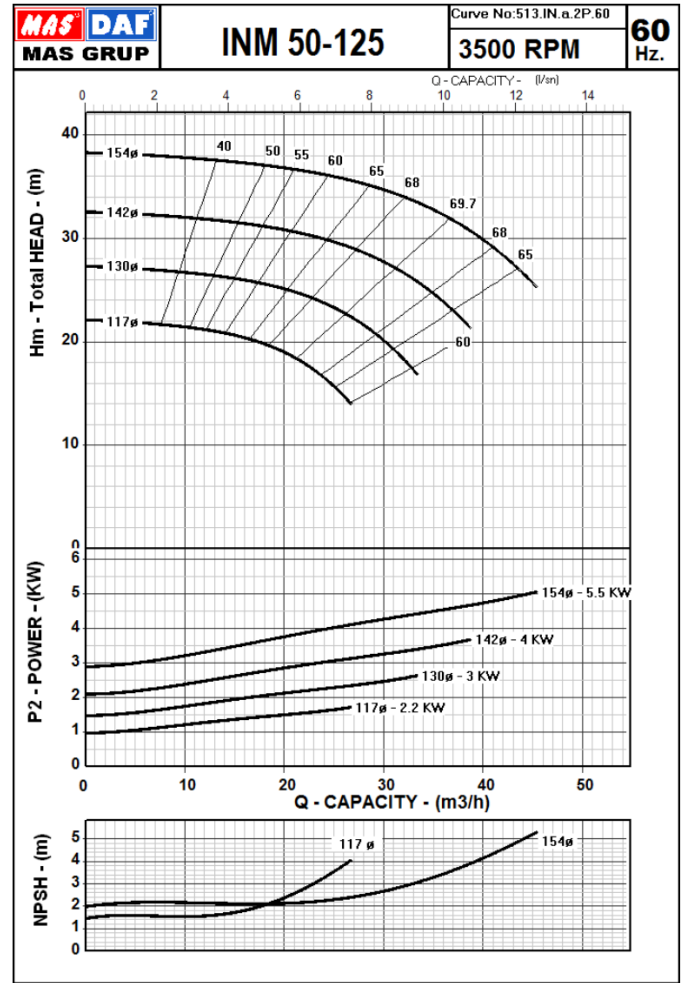
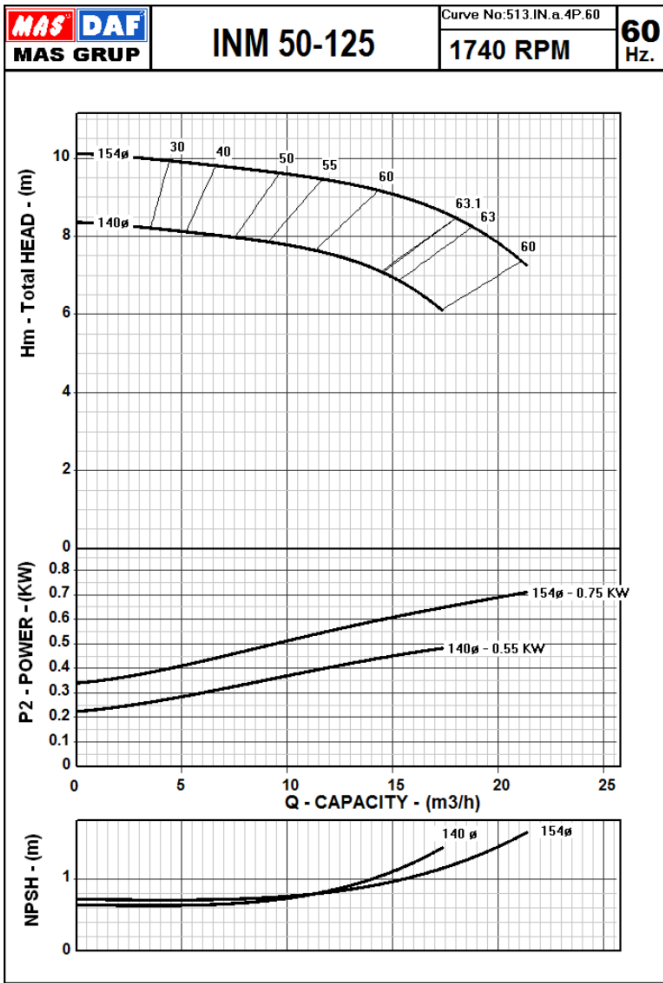
MAS DAF MAKINA SAN. A.Ş. reserves the right to change specifications without prior notice.

**INM/INL Series**  
In-Line Centrifugal Pumps  
**Performance Curves**

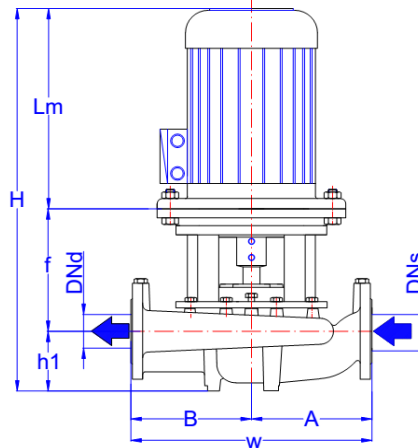


**INM 50-125**

**Mas Grup**

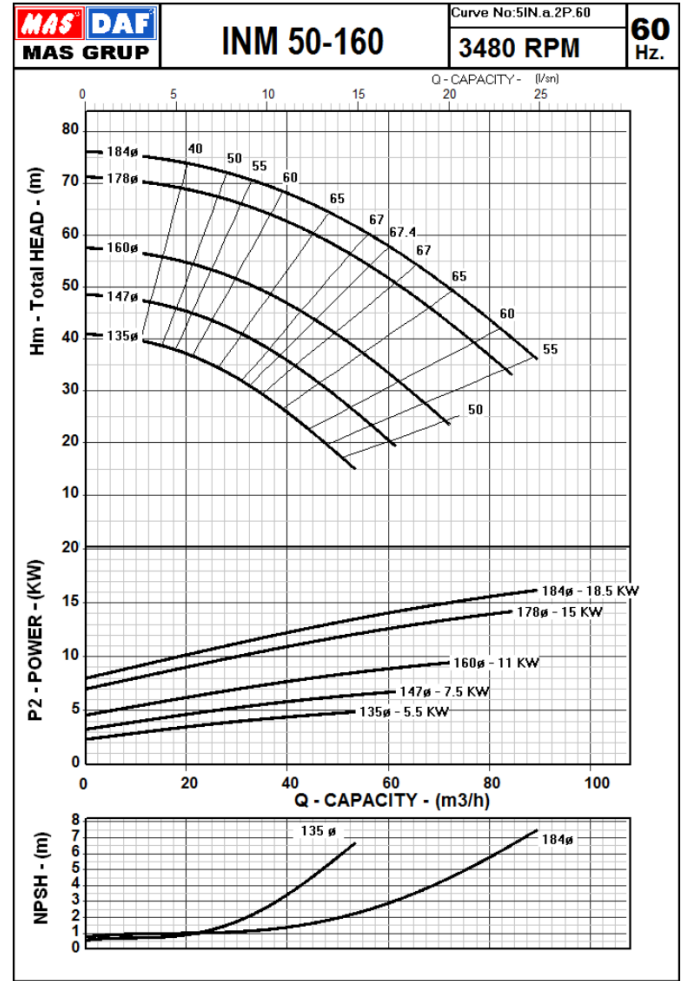
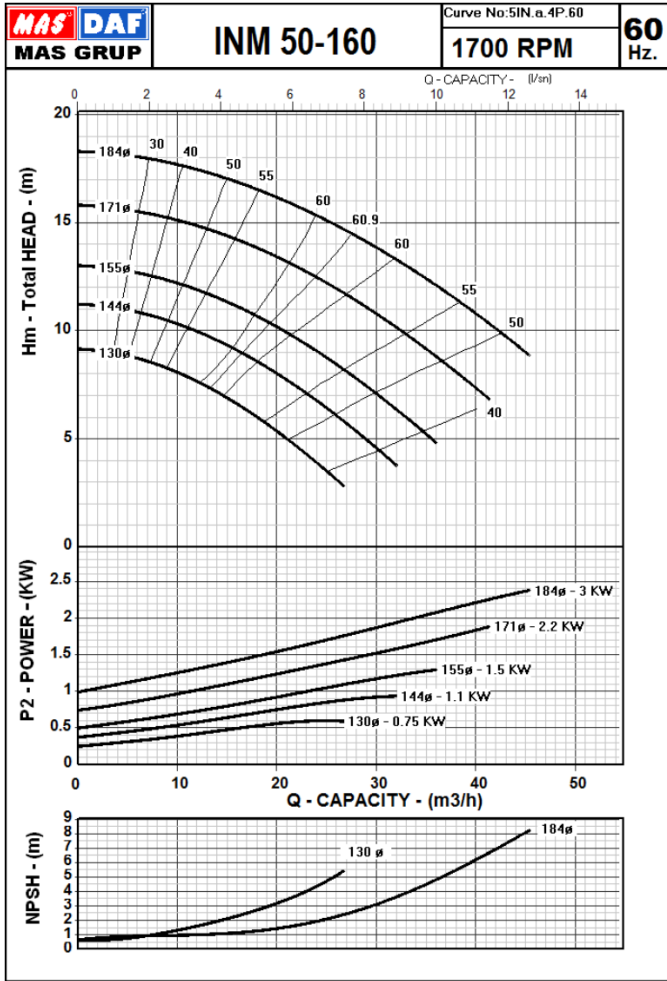


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

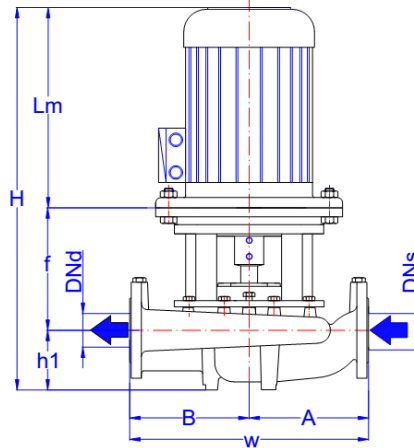


|        |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     | Mechanical Seal |                           |
|--------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----------------|---------------------------|
|        |         | KW    | IEC  | Lm  | DNs - 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                        |

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

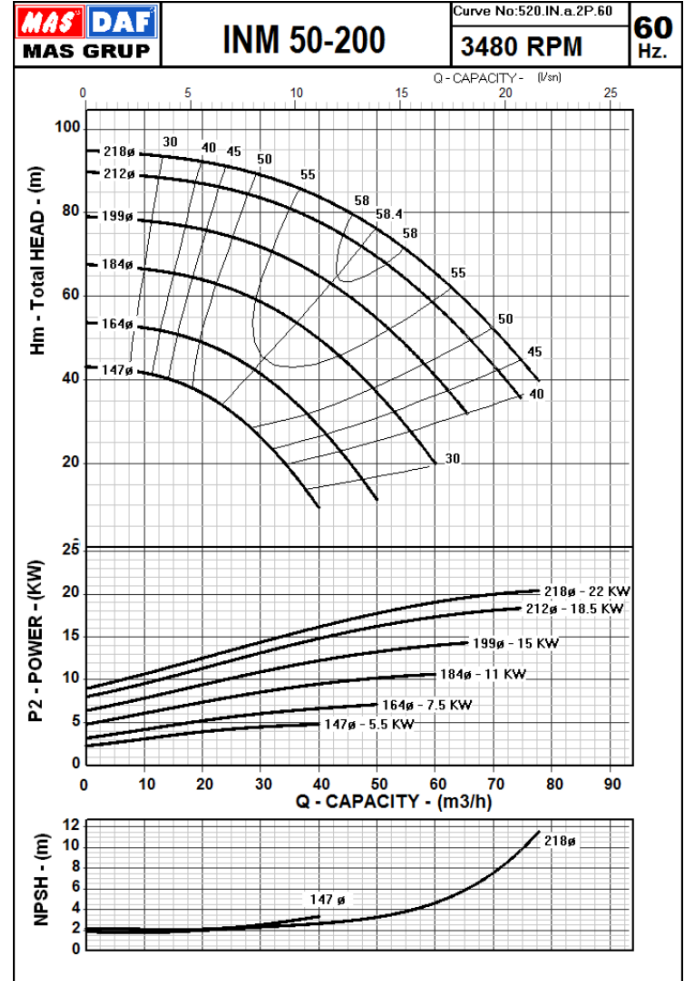
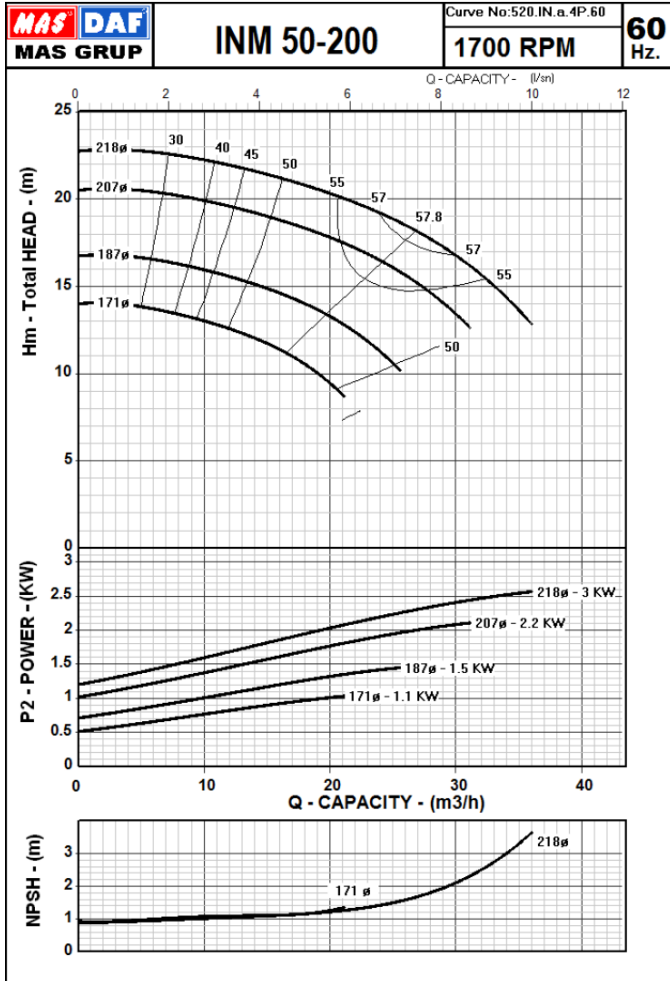


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

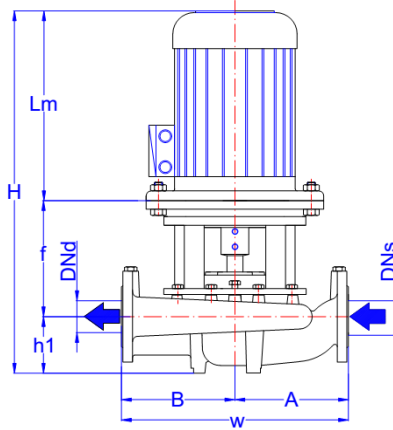


|        |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     | Mechanical Seal |                           |
|--------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----------------|---------------------------|
|        |         | KW    | IEC  | Lm  | DNs - 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                        |

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

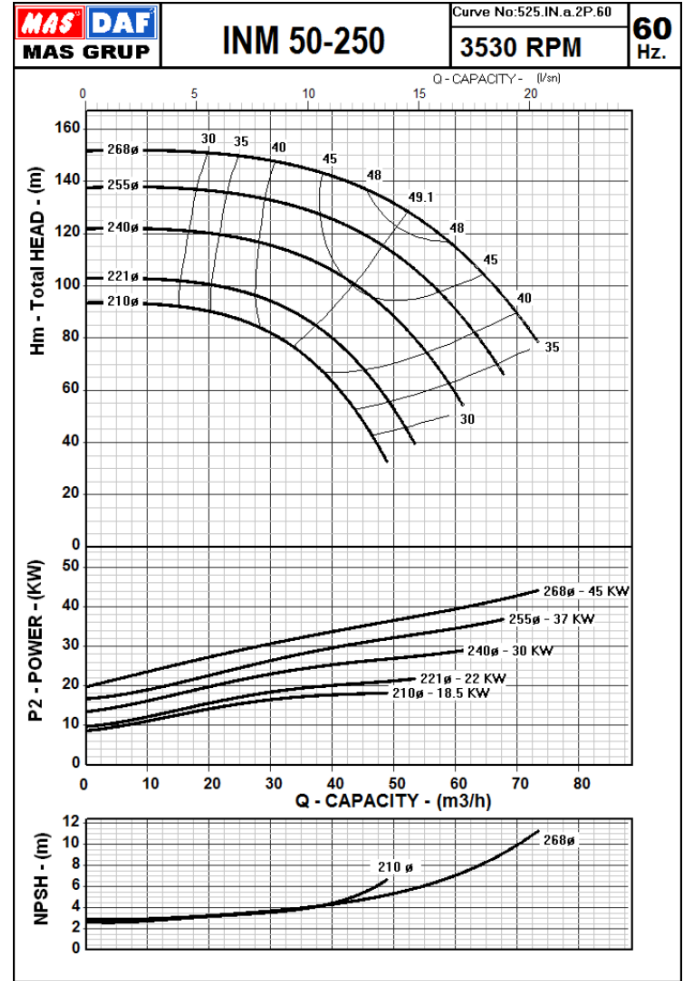
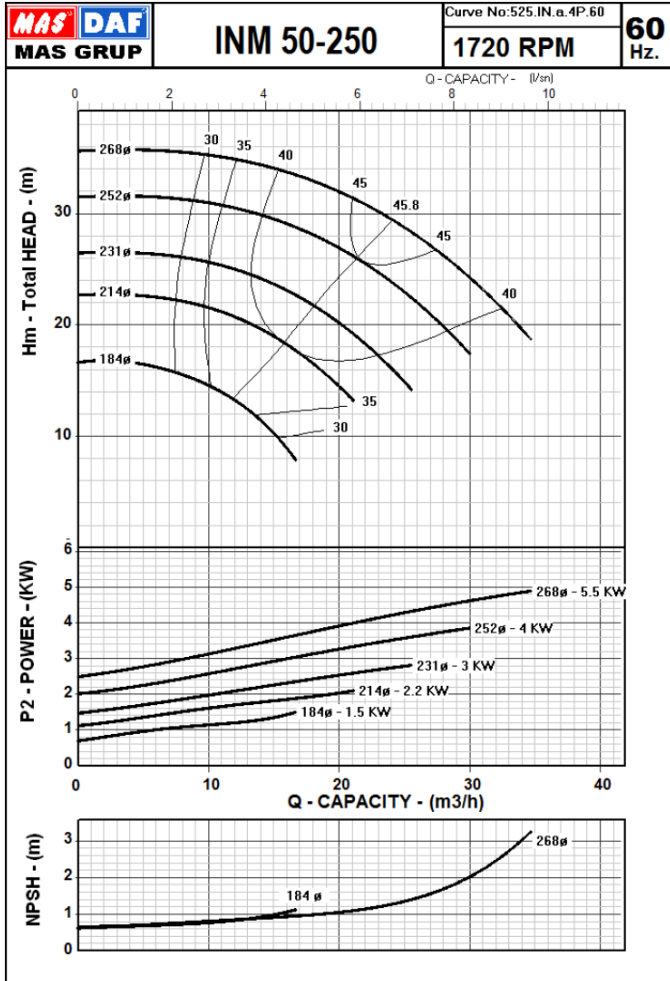


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

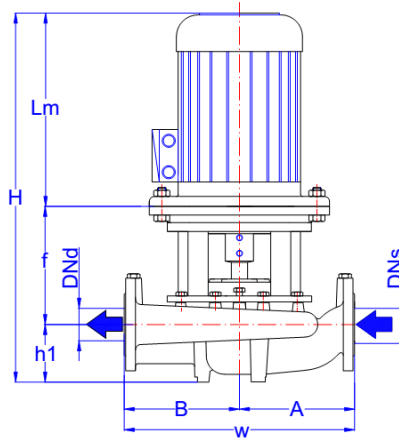


|        | MOTOR   | FLANGES |      | GENERAL | PUMP |           |     |     |     | Mechanical Seal |     |      |   |
|--------|---------|---------|------|---------|------|-----------|-----|-----|-----|-----------------|-----|------|---|
|        |         | KW      | IEC  |         | Lm   | DNs - DNd | H   | h1  | f   |                 | W   | A    | B |
|        |         |         |      |         |      |           |     |     |     |                 |     |      |   |
| 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 |   |

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

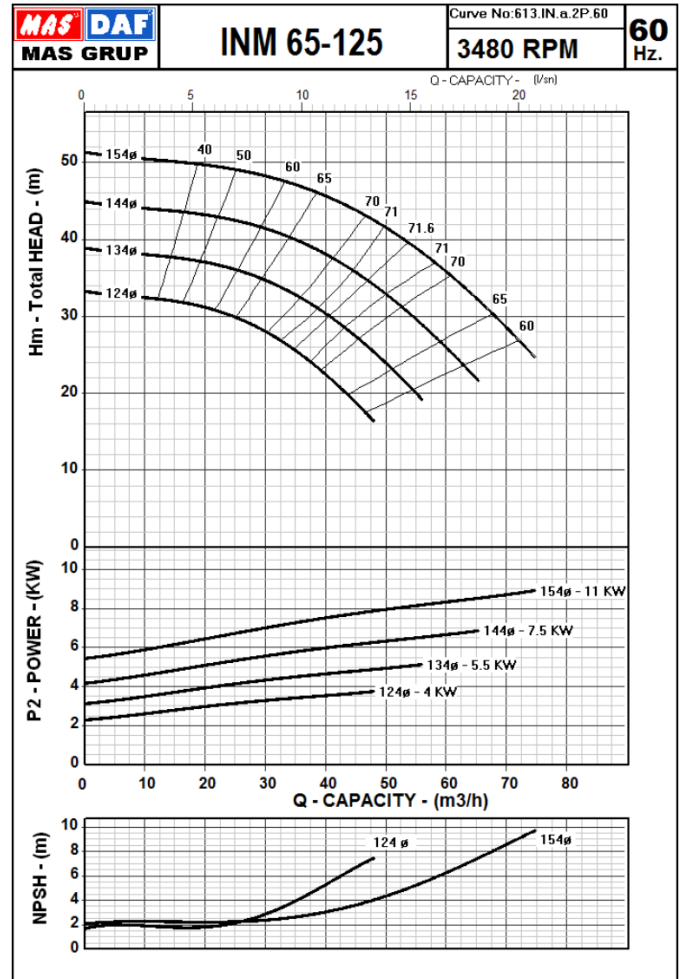
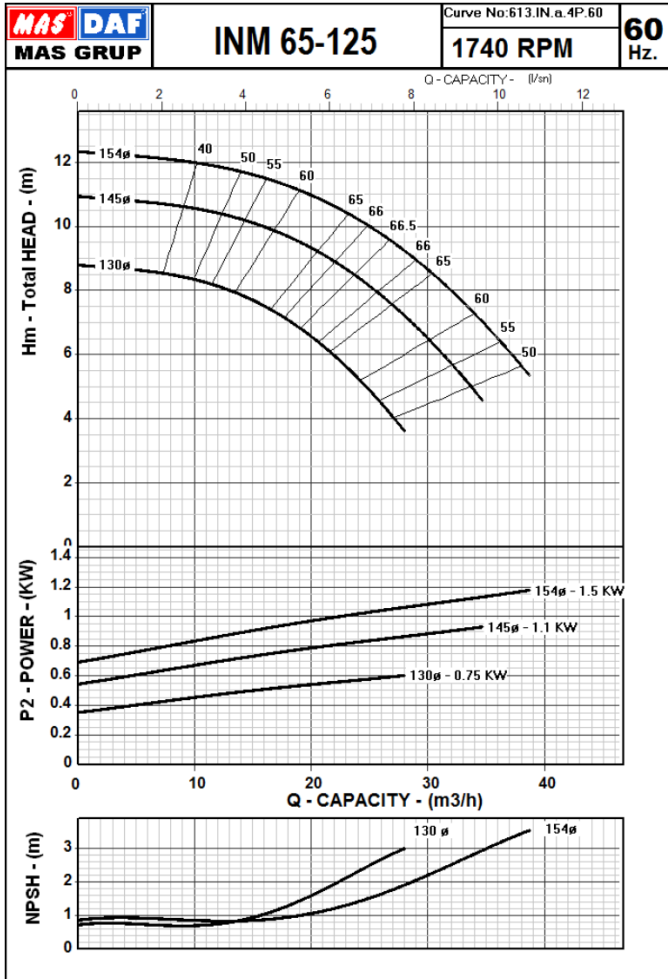


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

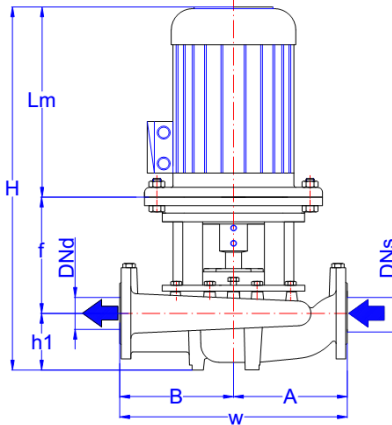


|        | MOTOR   |      |      | FLANGES   | GENERAL | PUMP  |     |     |     |     | Mechanical Seal           |      |
|--------|---------|------|------|-----------|---------|-------|-----|-----|-----|-----|---------------------------|------|
|        | KW      | IEC  | Lm   | DNs - DNd | H       | h1    | f   | W   | A   | B   | Nominal Impeller Diameter |      |
|        |         |      | mm   |           |         |       |     |     |     |     |                           | mm   |
| 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 |

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

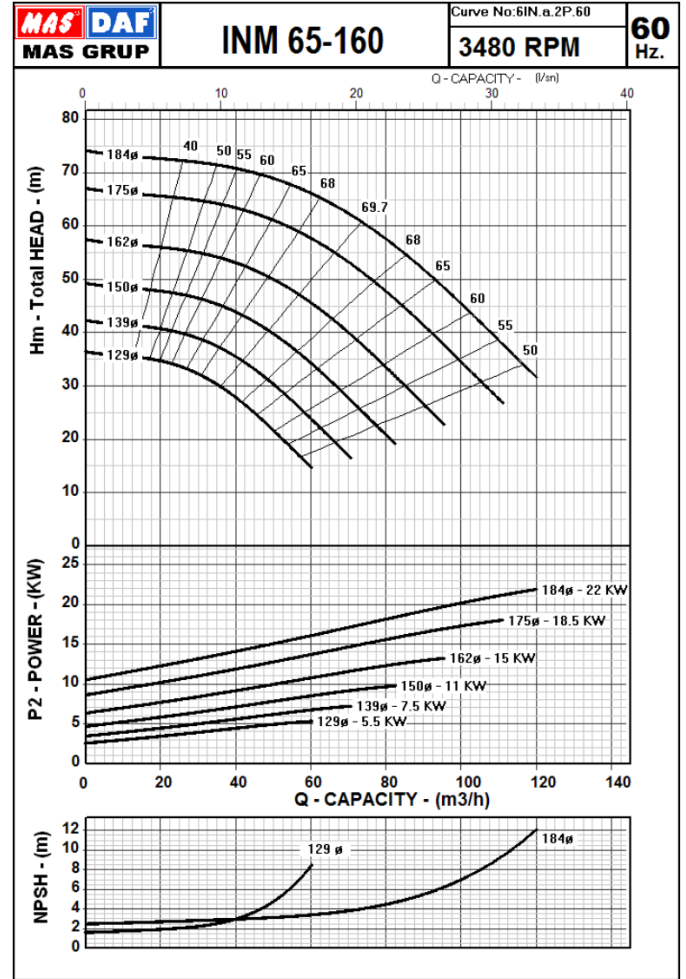
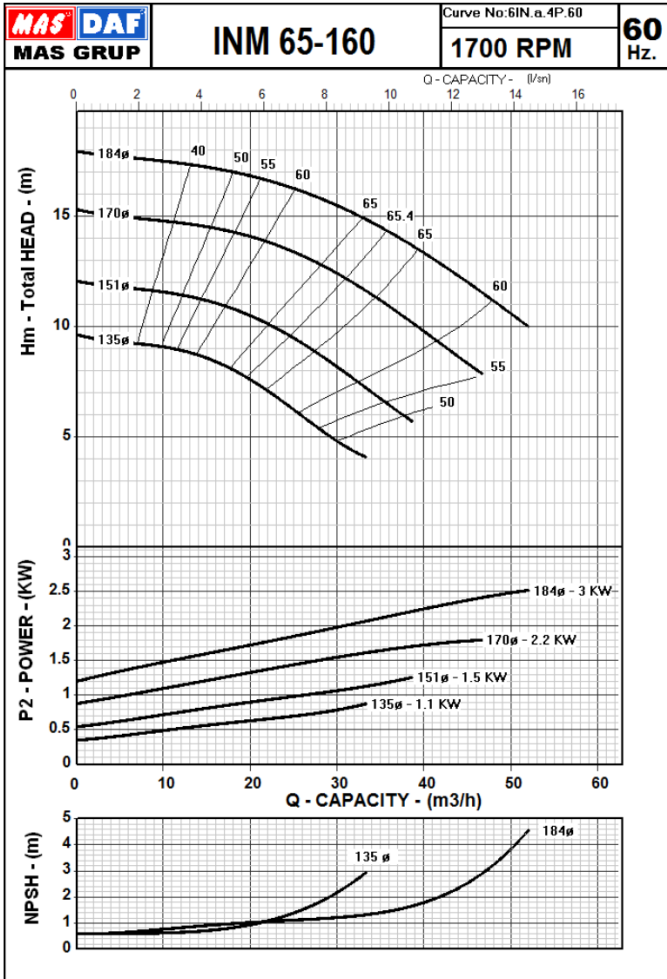


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

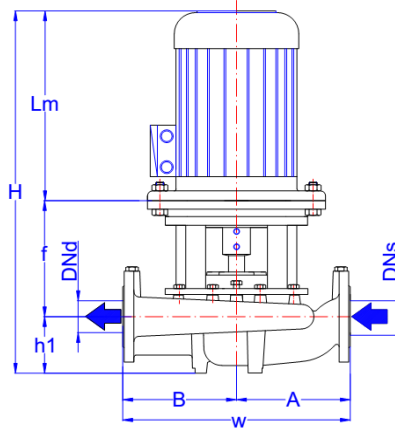


|        |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     |     | Mechanical Seal           |
|--------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----|---------------------------|
|        |         | KW    | IEC  | Lm  | DNs - DNd | H       | h1   | 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                        |

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

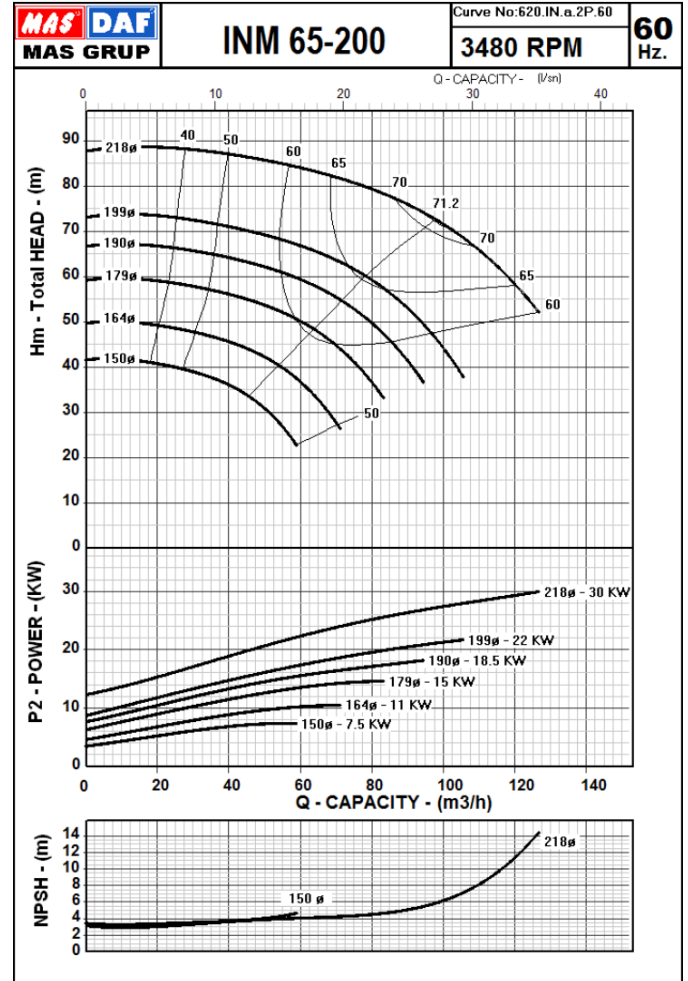
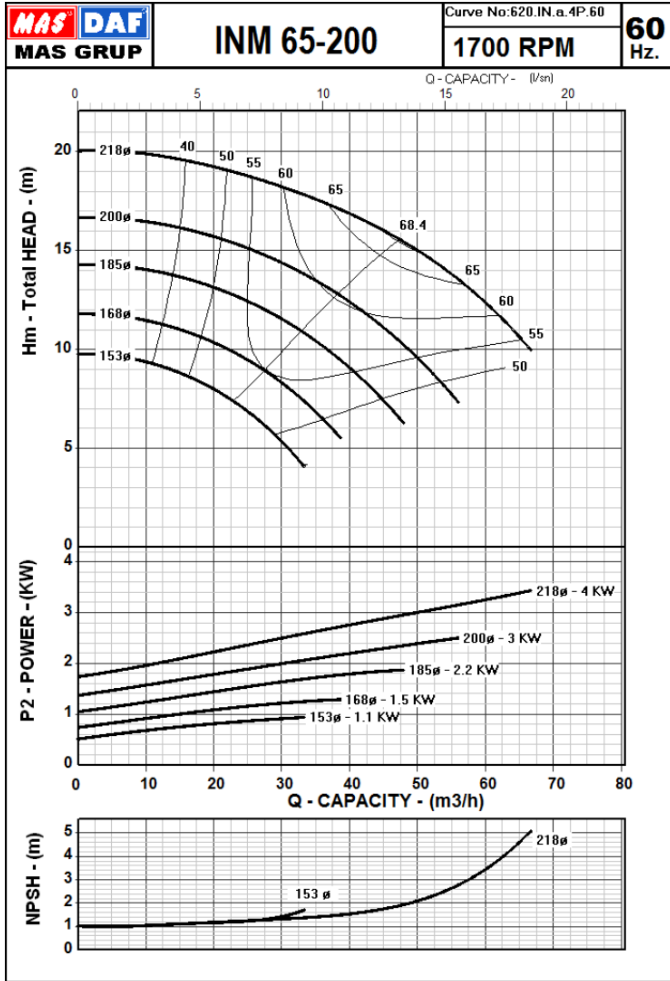


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

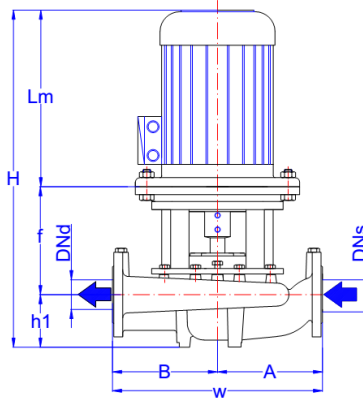


|        |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     | Mechanical Seal |                           |
|--------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----------------|---------------------------|
|        |         | KW    | IEC  | Lm  | DNs - 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                        |

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

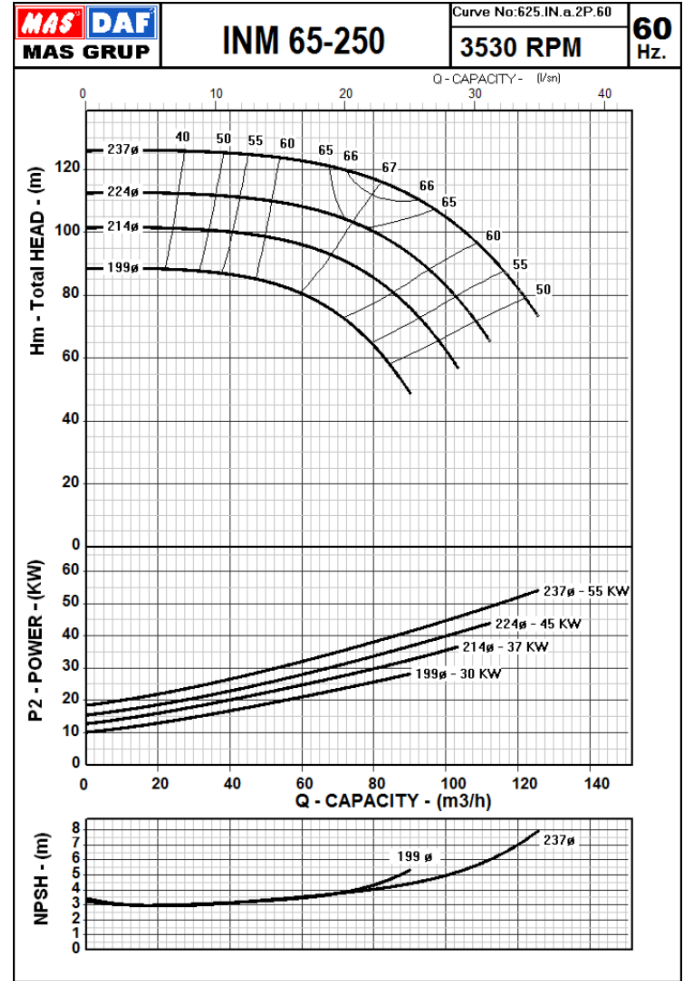
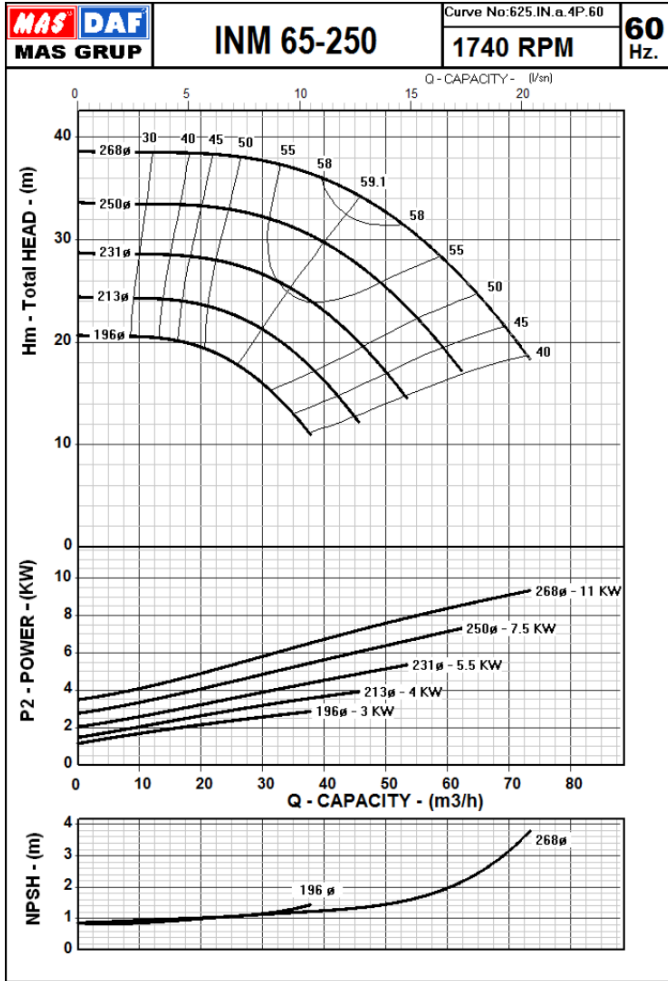


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

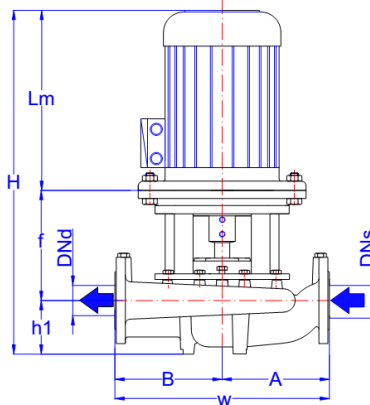


|        |         | MOTOR |      | FLANGES | GENERAL   | PUMP  |     |     |     |     | Mechanical Seal |                           |
|--------|---------|-------|------|---------|-----------|-------|-----|-----|-----|-----|-----------------|---------------------------|
|        |         | KW    | IEC  | Lm      | DNs - DNd | H     | h1  | f   | W   | A   | B               | Nominal Impeller Diameter |
|        |         |       |      | mm      |           |       |     |     |     |     |                 |                           |
| 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            |                           |

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

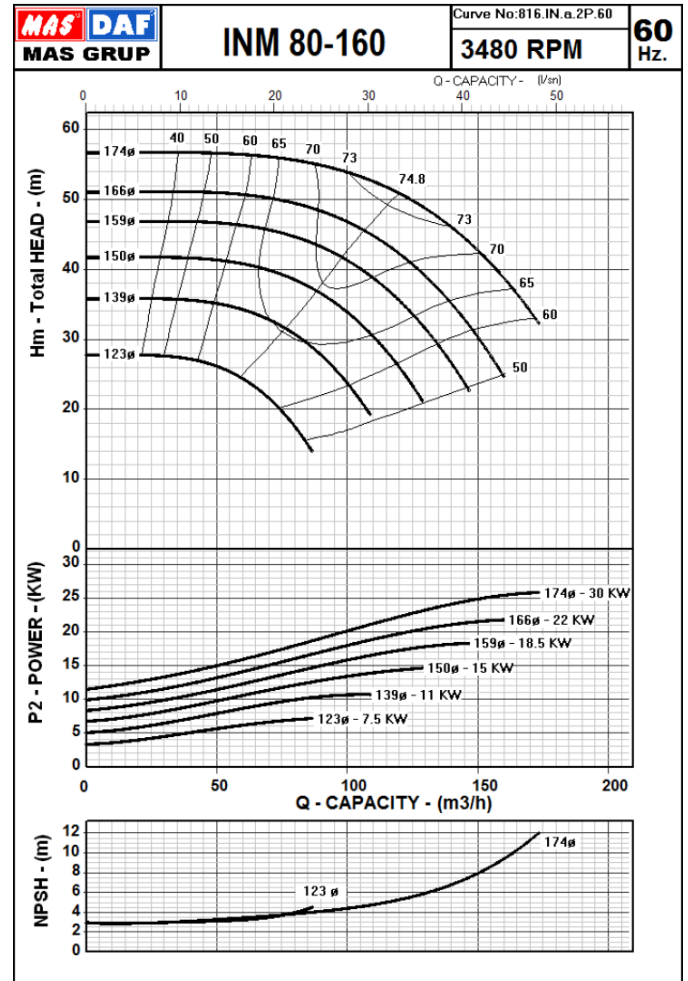
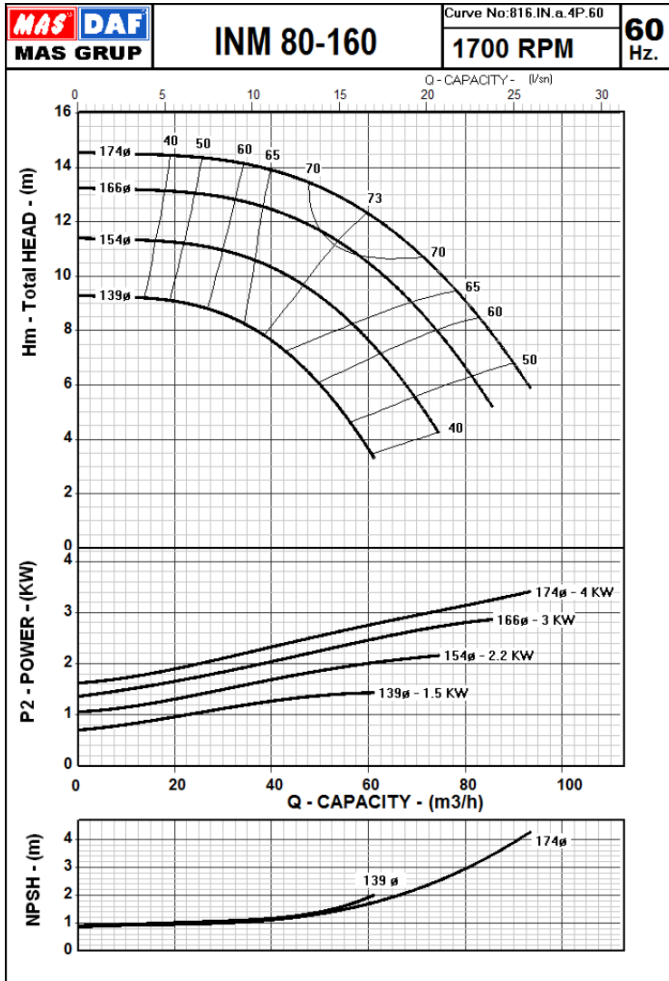


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

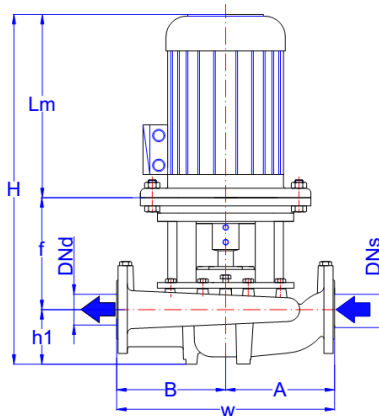


|        | MOTOR   |     | FLANGES | GENERAL   | PUMP |       |     |     |     | Mechanical Seal |                           |      |
|--------|---------|-----|---------|-----------|------|-------|-----|-----|-----|-----------------|---------------------------|------|
|        | KW      | IEC | Lm      | DNs - DNd | H    | h1    | f   | W   | A   | B               | Nominal Impeller Diameter |      |
|        |         |     |         |           |      |       |     |     |     |                 |                           | mm   |
| 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 |

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

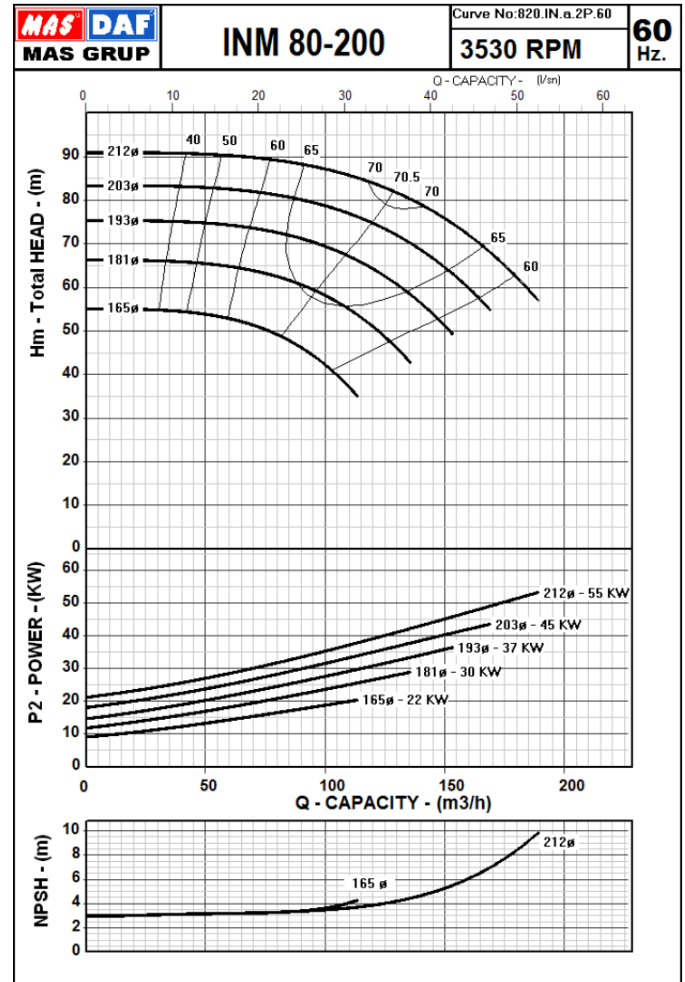
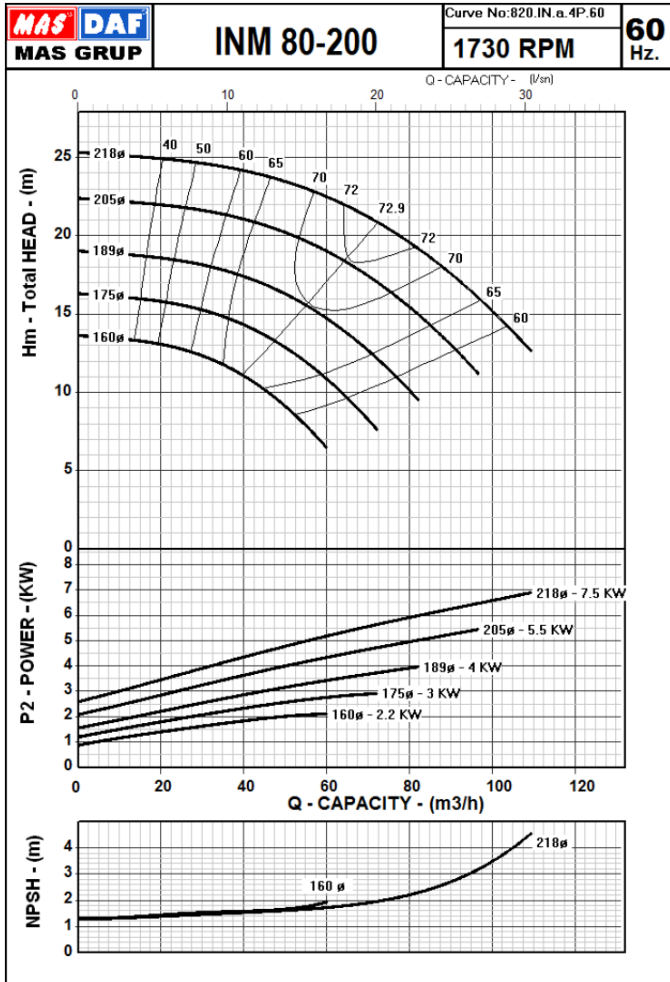


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

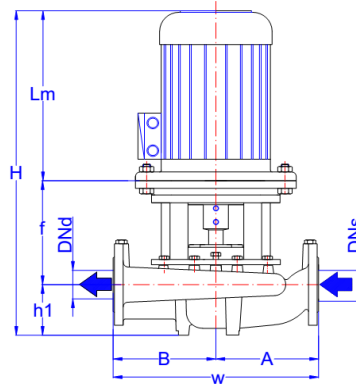


|        | MOTOR   |      |      | FLANGES   | GENERAL | PUMP  |     |     |     |     | Mechanical Seal           |      |
|--------|---------|------|------|-----------|---------|-------|-----|-----|-----|-----|---------------------------|------|
|        | KW      | IEC  | Lm   | DNs - DNd | H       | h1    | f   | W   | A   | B   | Nominal Impeller Diameter |      |
|        |         |      | mm   | mm        | mm      | mm    | mm  | mm  | mm  | mm  |                           |      |
| 80-160 | 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 |

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

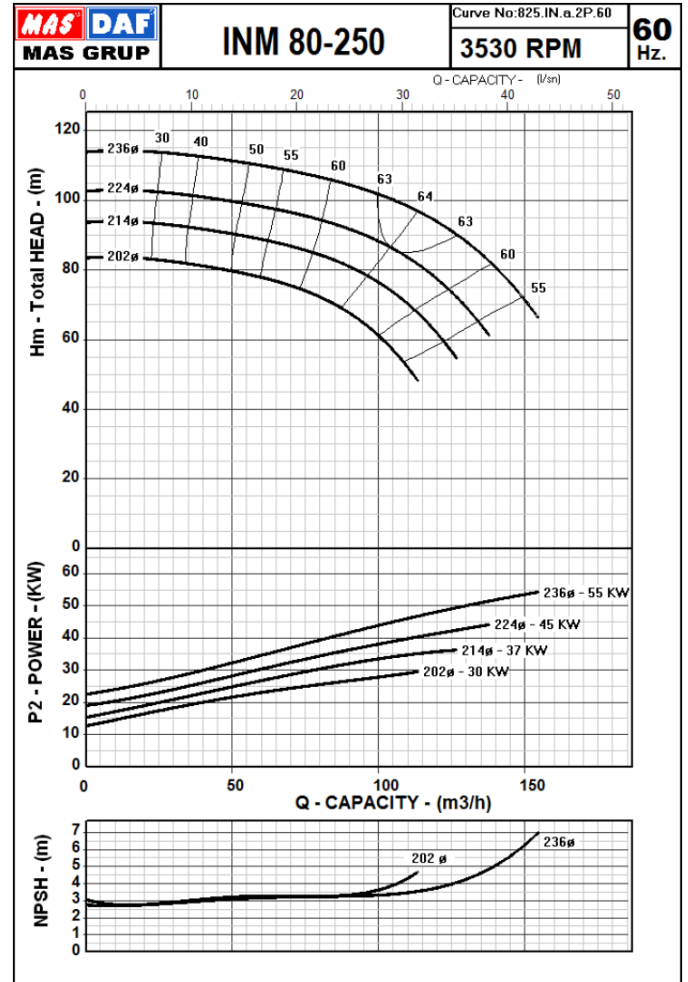
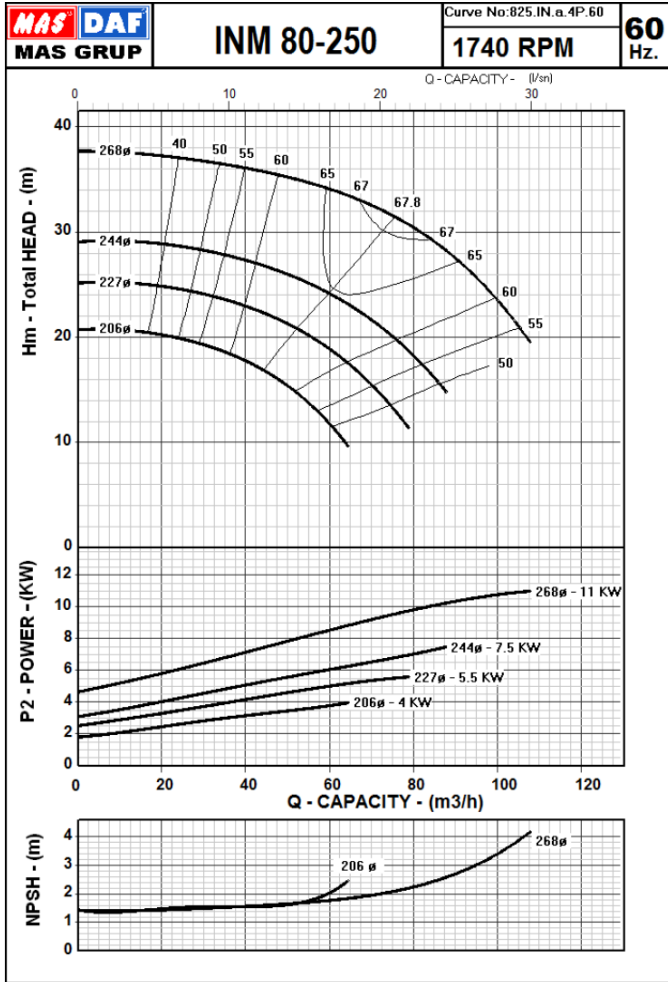


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

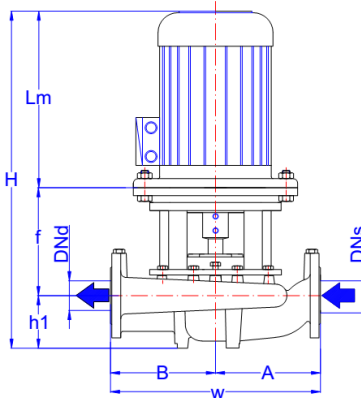


|        | MOTOR   |     |          | FLANGES         | GENERAL | PUMP     |         |         |         |         | Mechanical Seal           |      |
|--------|---------|-----|----------|-----------------|---------|----------|---------|---------|---------|---------|---------------------------|------|
|        | KW      | IEC | Lm<br>mm | DNs - DNd<br>mm | H<br>mm | h1<br>mm | f<br>mm | W<br>mm | A<br>mm | B<br>mm | Nominal Impeller Diameter |      |
| 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 |

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

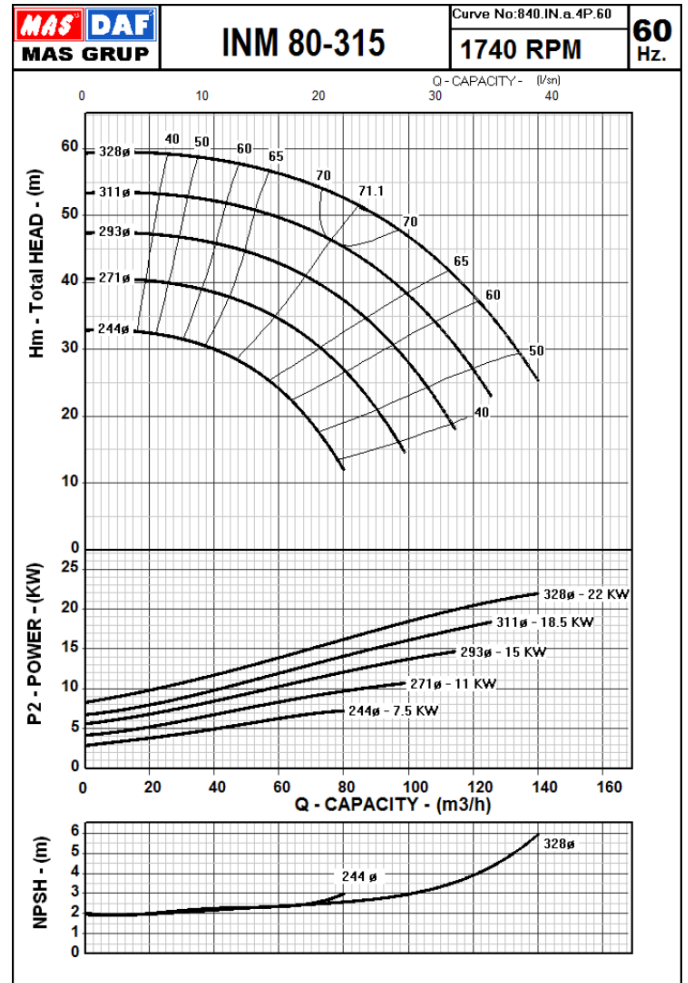
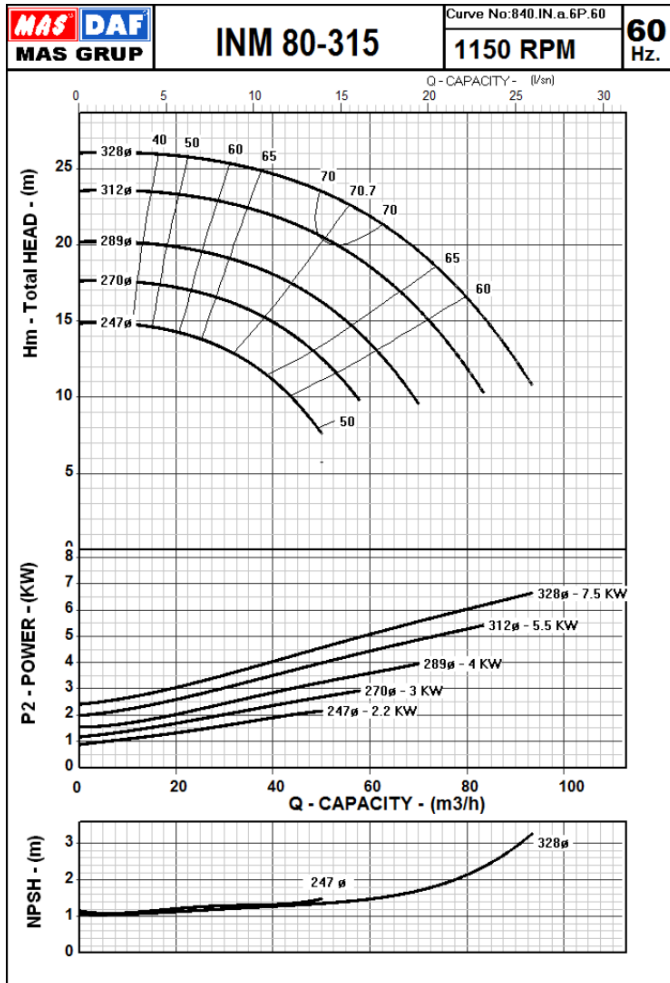


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

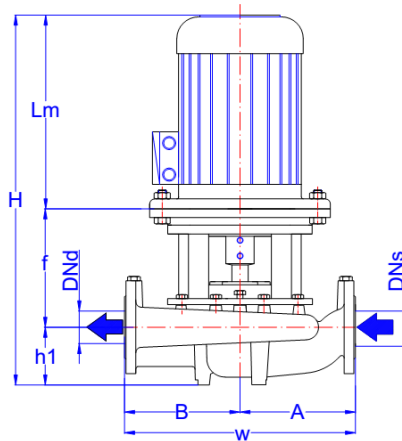


|        | MOTOR   |     |          | FLANGES         | GENERAL | PUMP     |         |         |         |         | Mechanical Seal           |      |
|--------|---------|-----|----------|-----------------|---------|----------|---------|---------|---------|---------|---------------------------|------|
|        | KW      | IEC | Lm<br>mm | DNs - DNd<br>mm | H<br>mm | h1<br>mm | f<br>mm | W<br>mm | A<br>mm | B<br>mm | 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 |

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

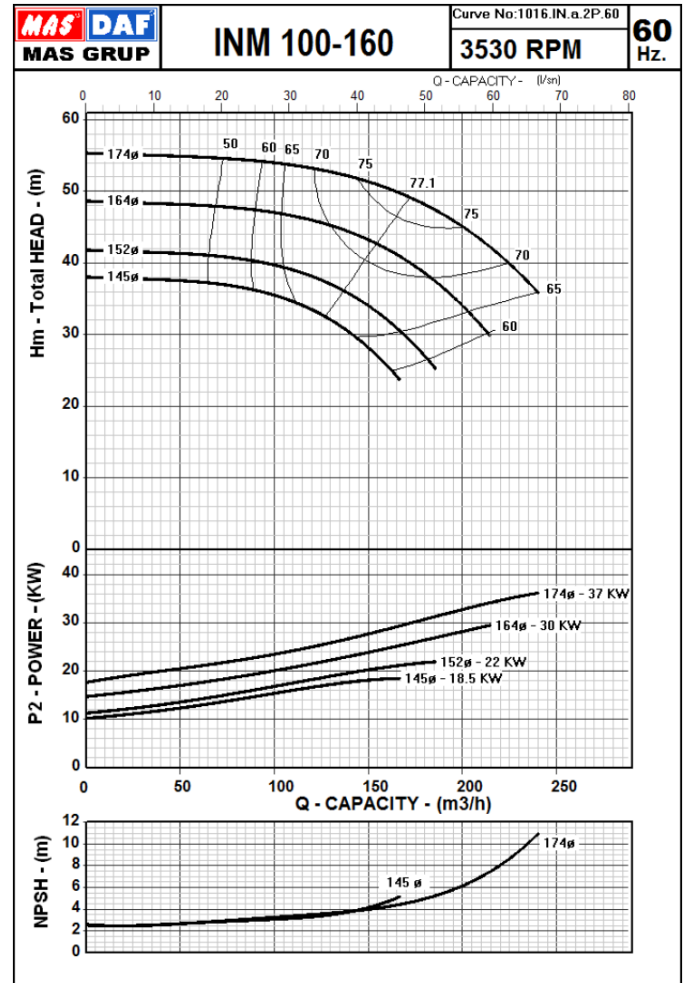
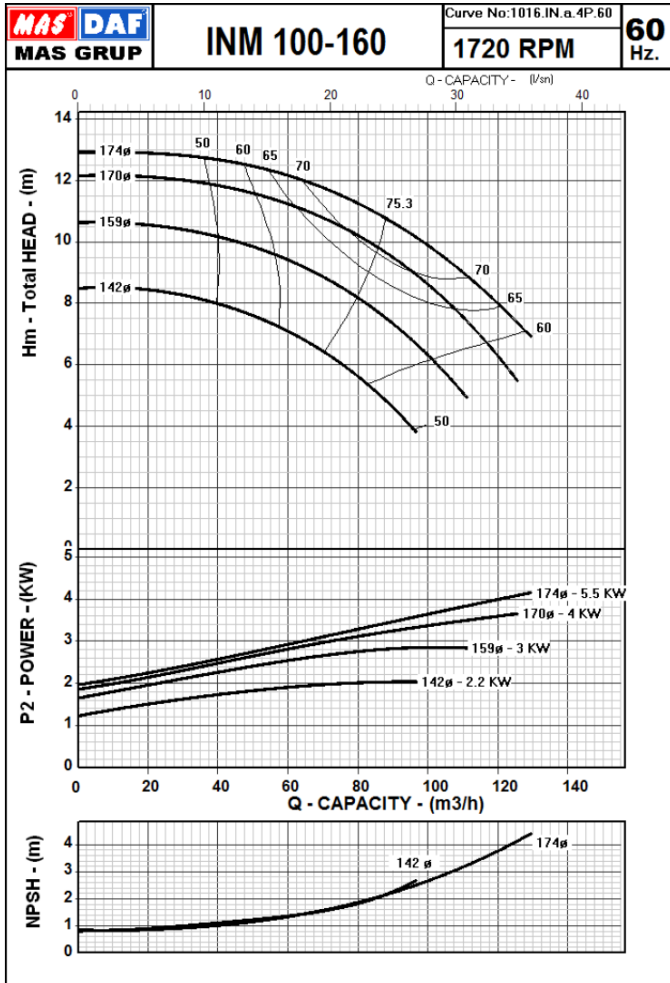


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

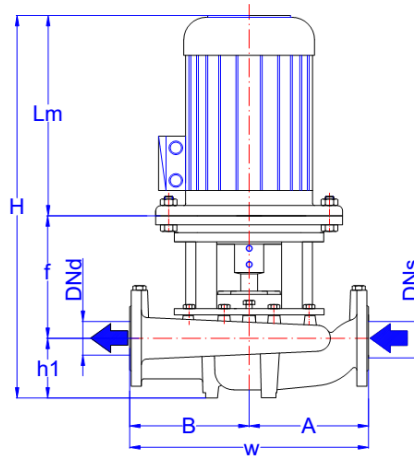


|        | MOTOR   |      | Lm   | FLANGES   |    | GENERAL |     | PUMP |     |     | Mechanical Seal           |      |
|--------|---------|------|------|-----------|----|---------|-----|------|-----|-----|---------------------------|------|
|        | KW      | IEC  |      | DNs - DNd | H  | h1      | f   | W    | A   | B   | Nominal Impeller Diameter |      |
|        |         |      | mm   | mm        | mm | mm      | mm  | mm   | 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 |

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

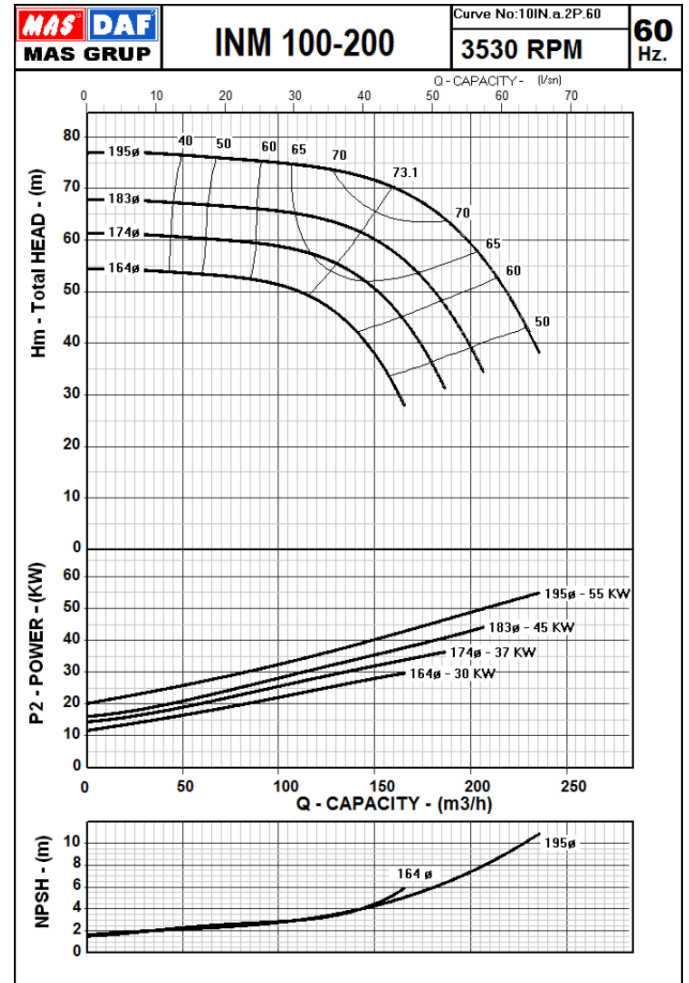
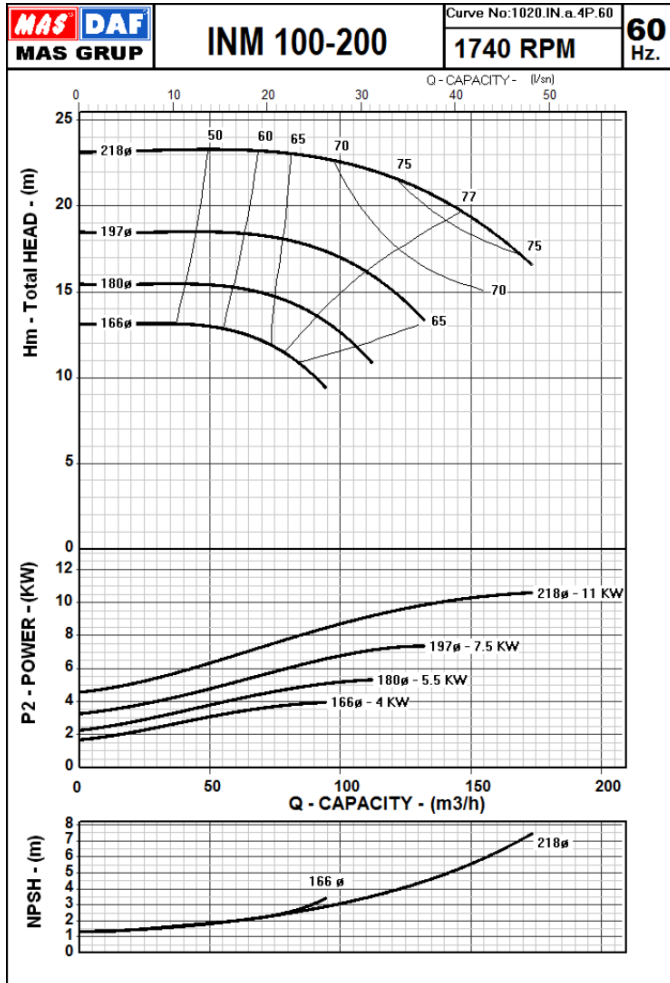


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

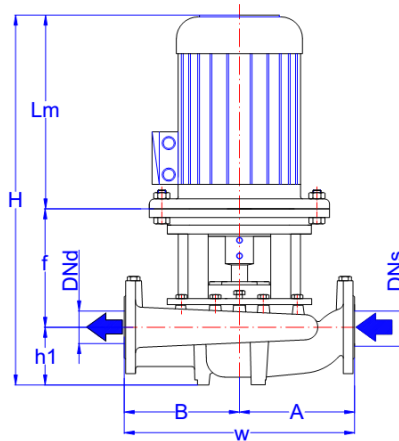


|         |         | MOTOR |      | FLANGES | GENERAL   | PUMP  |     |     |     |     | Mechanical Seal |                           |
|---------|---------|-------|------|---------|-----------|-------|-----|-----|-----|-----|-----------------|---------------------------|
|         |         | KW    | 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                      |

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

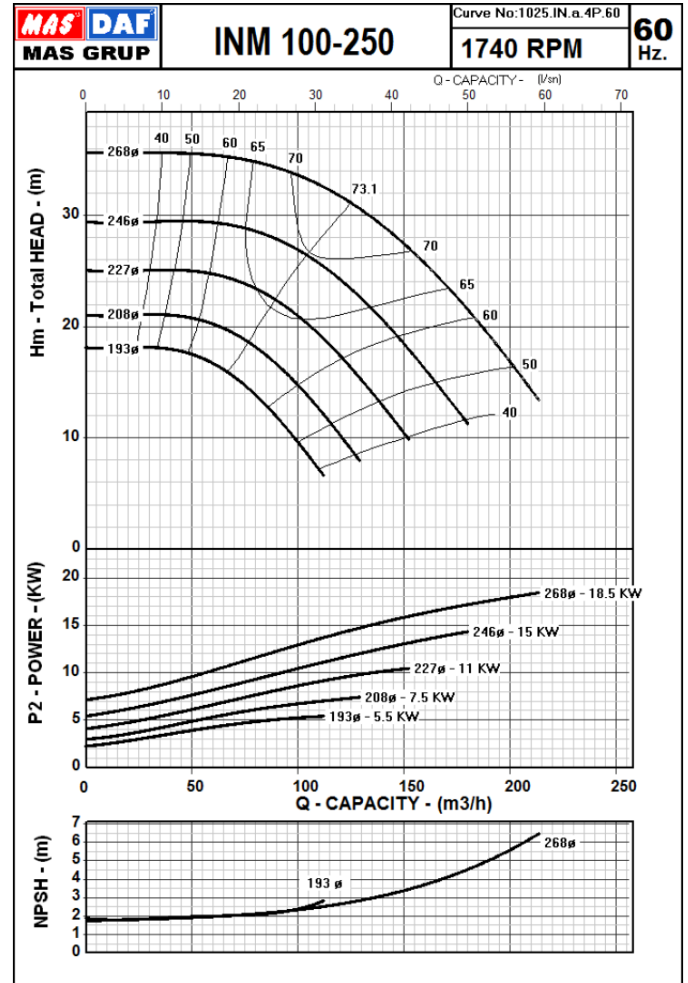
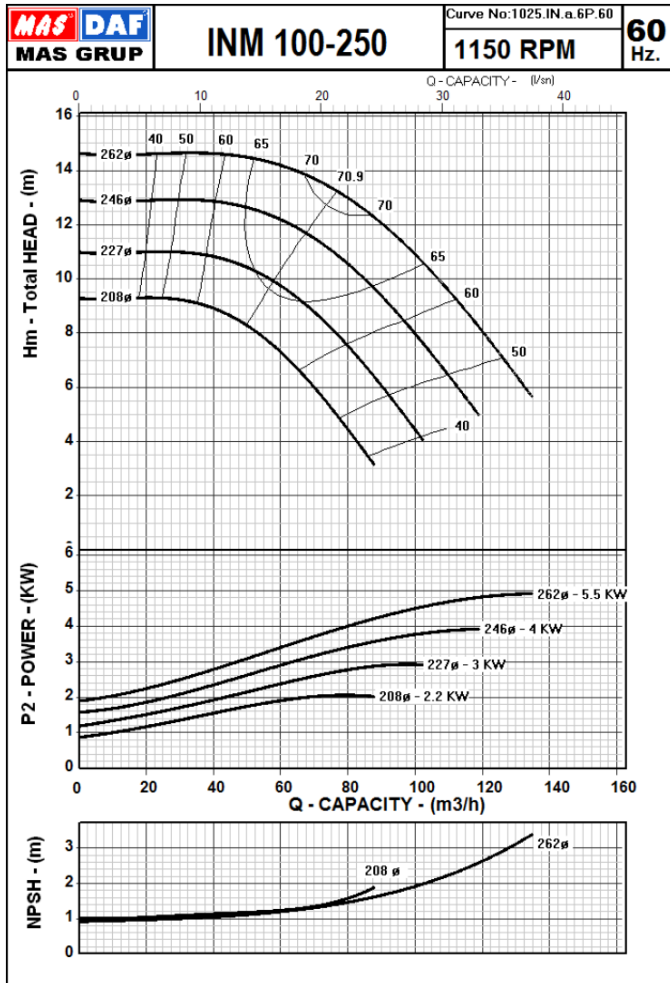


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

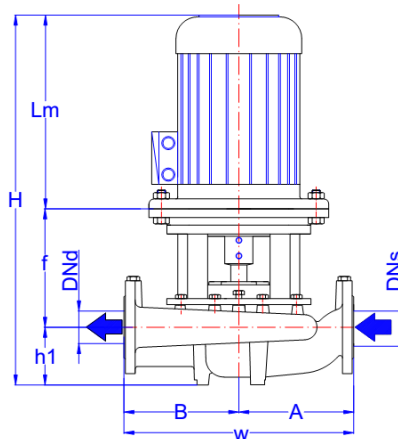


|         | MOTOR   |     |      | FLANGES   | GENERAL | PUMP  |     |     |     |     | Mechanical Seal           |      |
|---------|---------|-----|------|-----------|---------|-------|-----|-----|-----|-----|---------------------------|------|
|         | KW      | IEC | Lm   | DNs - DNd | H       | 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 |

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

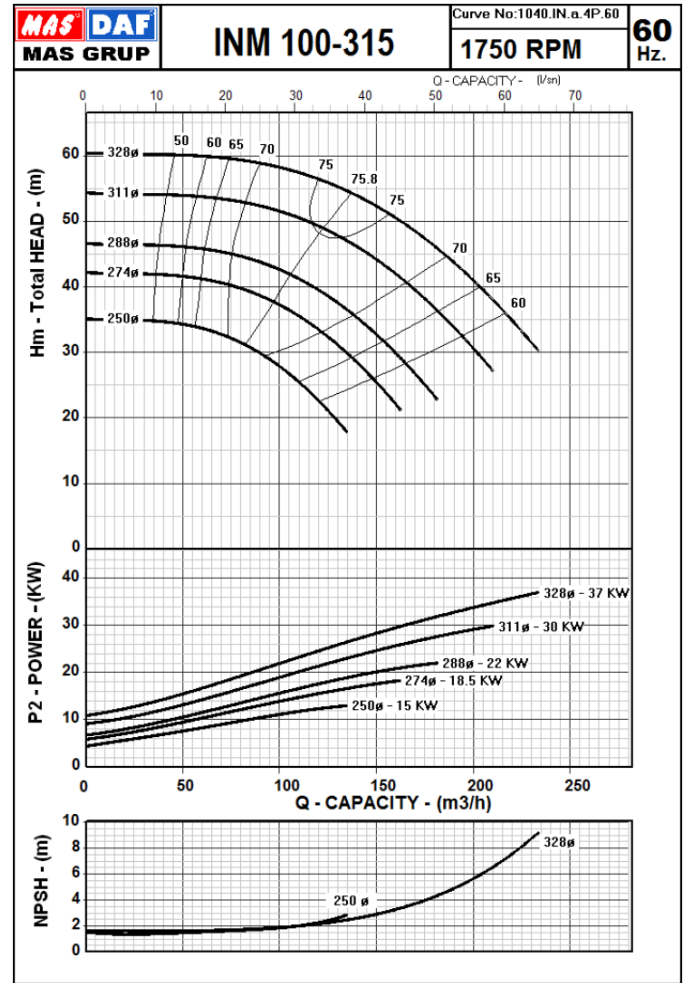
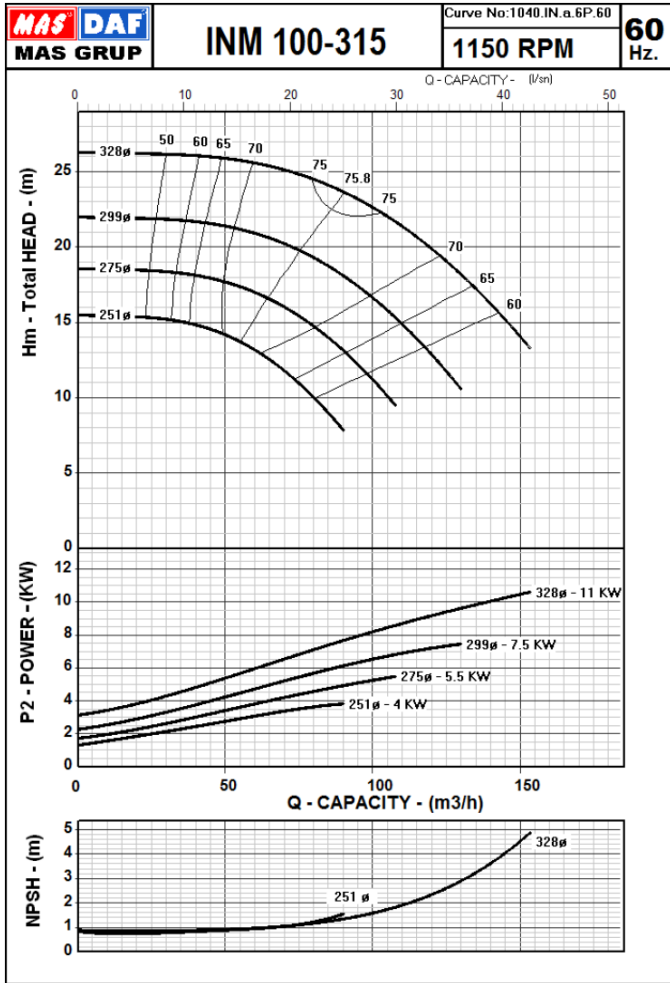


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

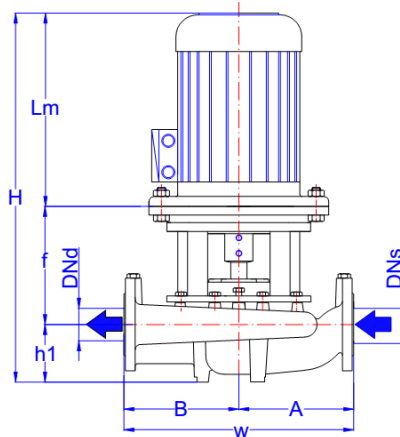


|         | MOTOR   |      | FLANGES | GENERAL   | PUMP |       |     |     |     | Mechanical Seal |                           |      |
|---------|---------|------|---------|-----------|------|-------|-----|-----|-----|-----------------|---------------------------|------|
|         | KW      | IEC  | Lm      | DNs - DNd | H    | h1    | f   | W   | A   | B               | Nominal Impeller Diameter |      |
|         |         |      | mm      | mm        | mm   | mm    | mm  | mm  | mm  | mm              |                           |      |
| 100-250 | 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 |

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

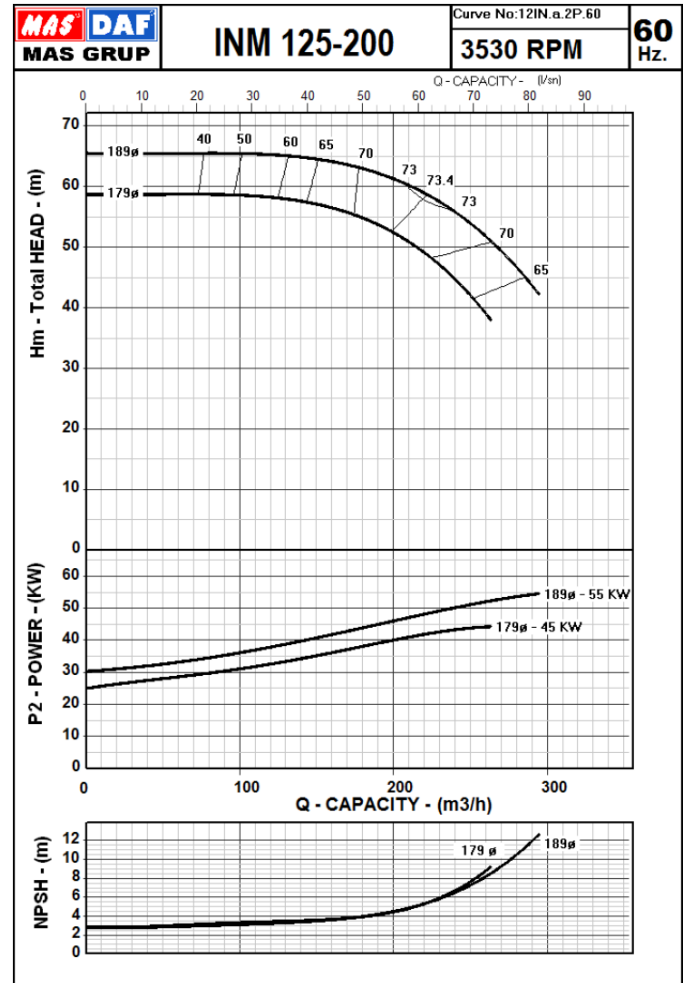
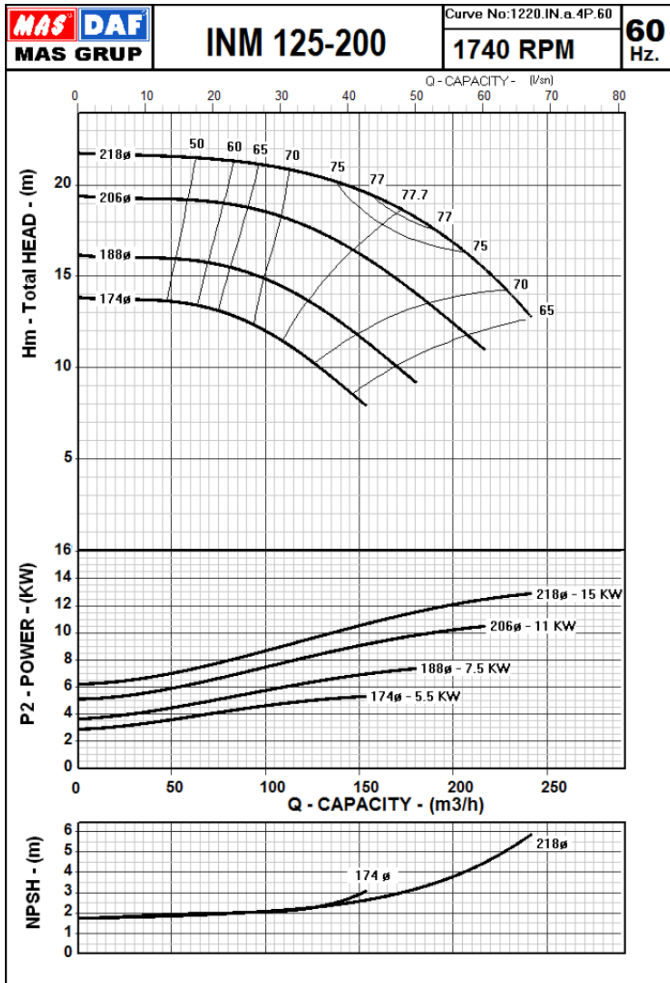


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

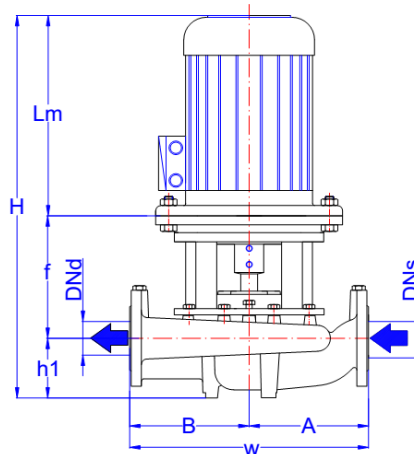


|                | MOTOR   |      |      | FLANGES   | GENERAL | PUMP |     |     |     |     | Mechanical Seal           |      |
|----------------|---------|------|------|-----------|---------|------|-----|-----|-----|-----|---------------------------|------|
|                | KW      | IEC  | Lm   | DNs - DNd | H       | h1   | f   | W   | A   | B   | Nominal Impeller Diameter |      |
|                |         |      | mm   | mm        | mm      | mm   | mm  | mm  | mm  | mm  |                           |      |
| <b>100-315</b> | 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 |

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

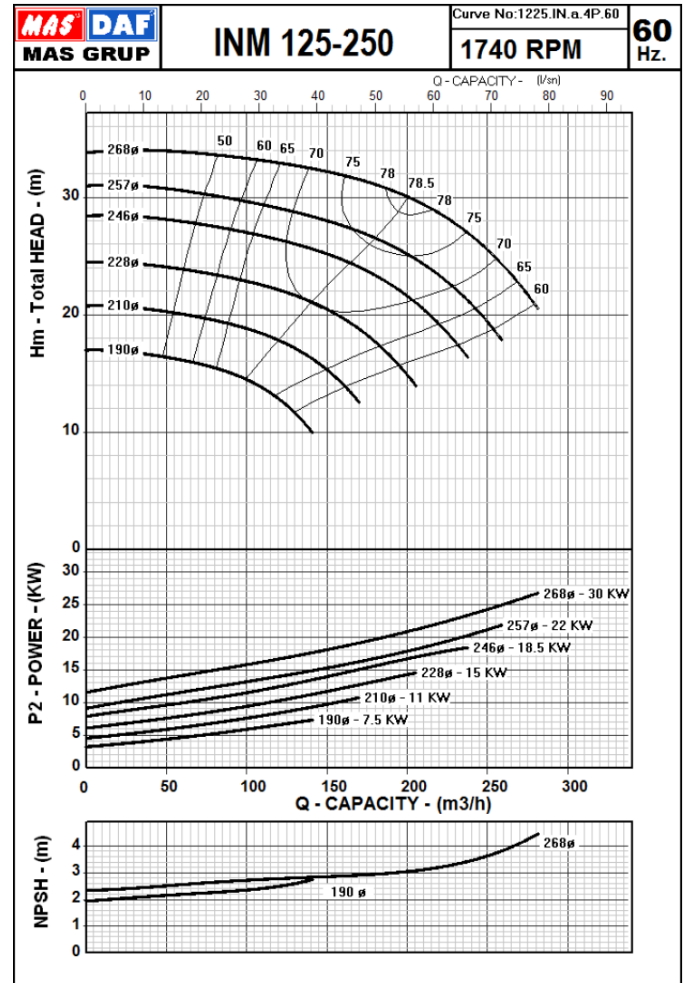
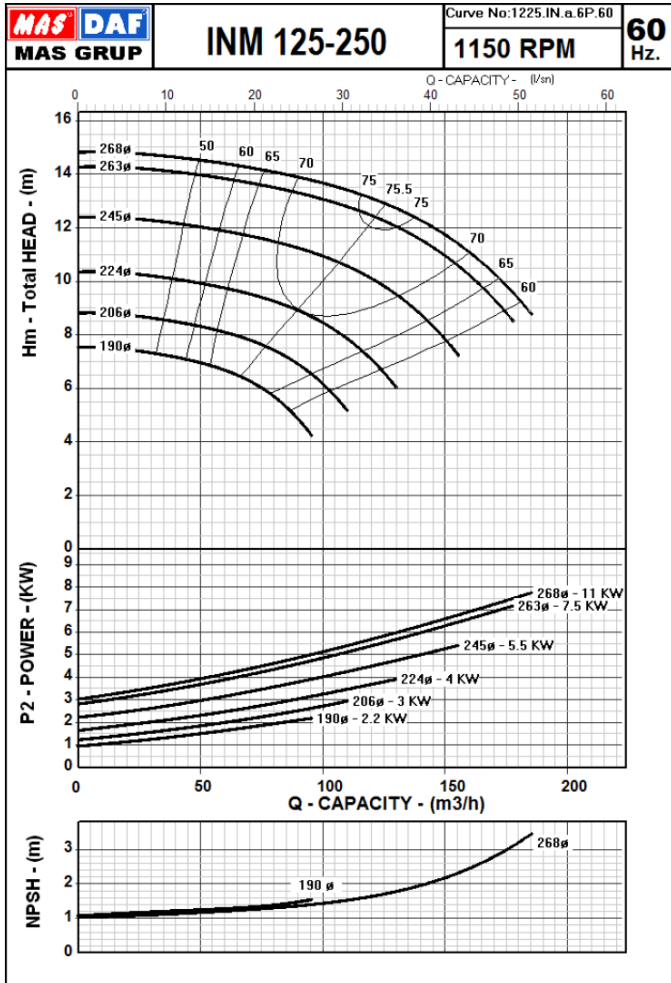


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

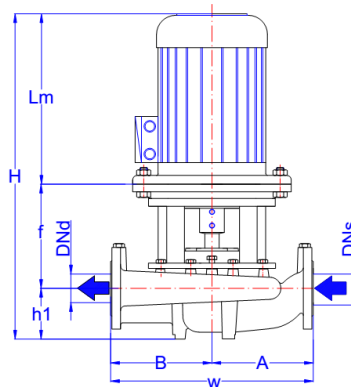


|         |         | MOTOR |      | FLANGES | GENERAL   | PUMP  |     |     |     |     | Mechanical Seal |                           |
|---------|---------|-------|------|---------|-----------|-------|-----|-----|-----|-----|-----------------|---------------------------|
|         |         | KW    | IEC  | Lm      | DNs - DNd | H     | h1  | f   | W   | A   | B               | Nominal Impeller Diameter |
|         |         |       |      | mm      | mm        | mm    | mm  | mm  | mm  | mm  | mm              |                           |
| 125-200 | 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                      |

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

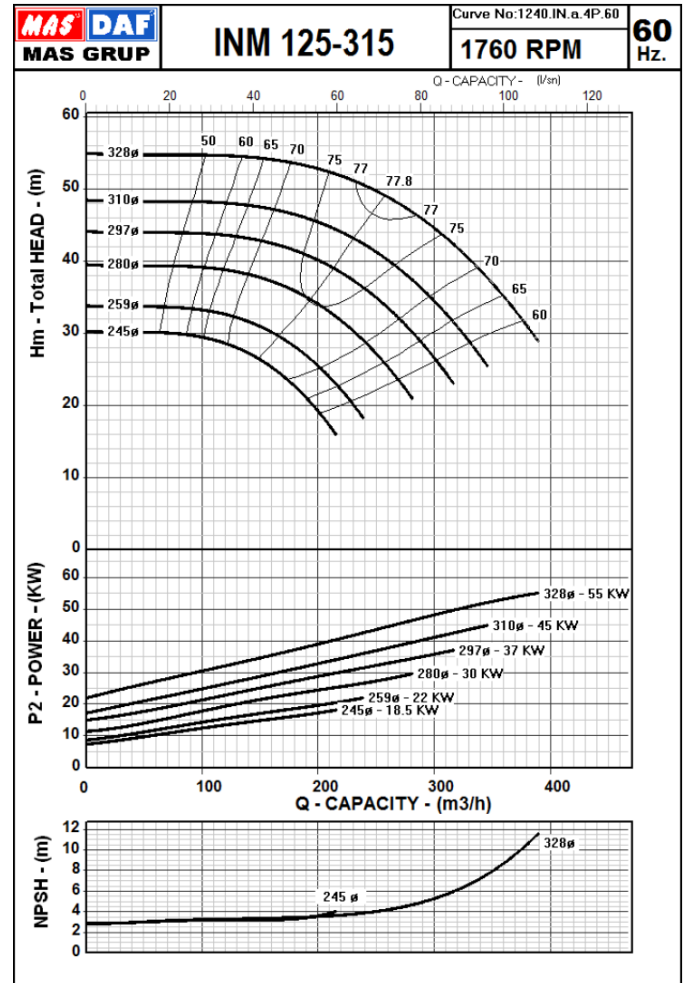
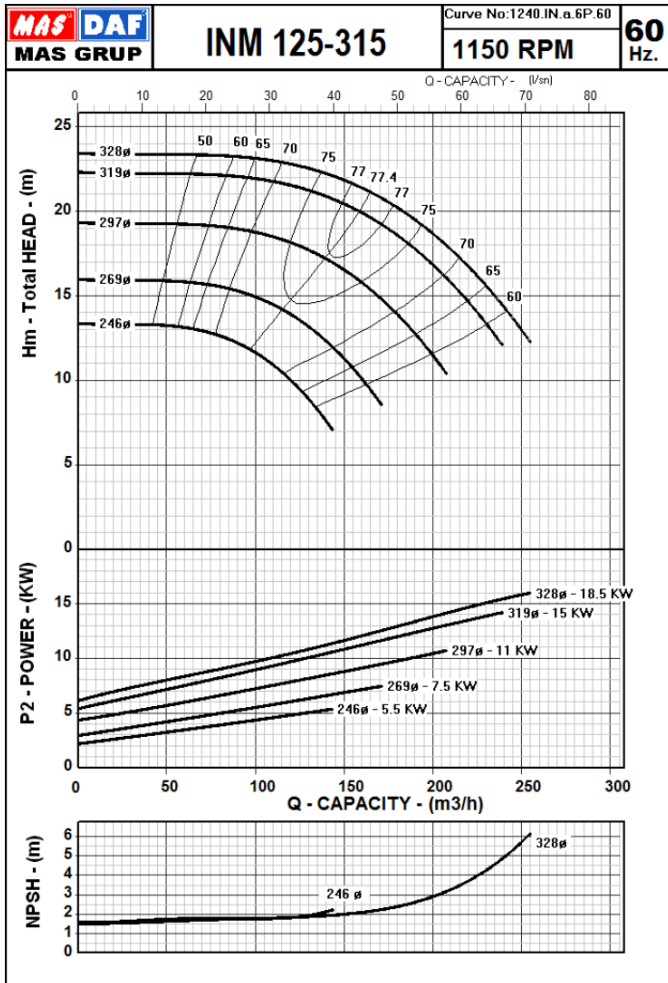


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

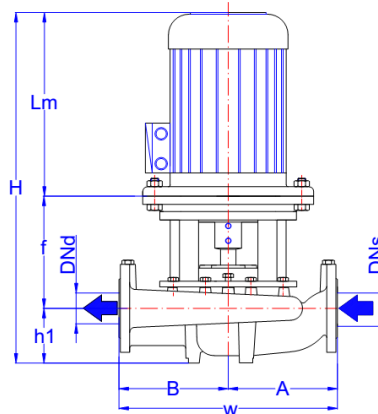


|         | MOTOR   |      |      | FLANGES   | GENERAL | PUMP  |     |     |     |     | Mechanical Seal           |      |
|---------|---------|------|------|-----------|---------|-------|-----|-----|-----|-----|---------------------------|------|
|         | KW      | IEC  | Lm   | DNs - DNd | H       | h1    | f   | W   | A   | B   | Nominal Impeller Diameter |      |
|         |         |      | mm   |           |         |       |     |     |     |     |                           | mm   |
| 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                      |      |

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

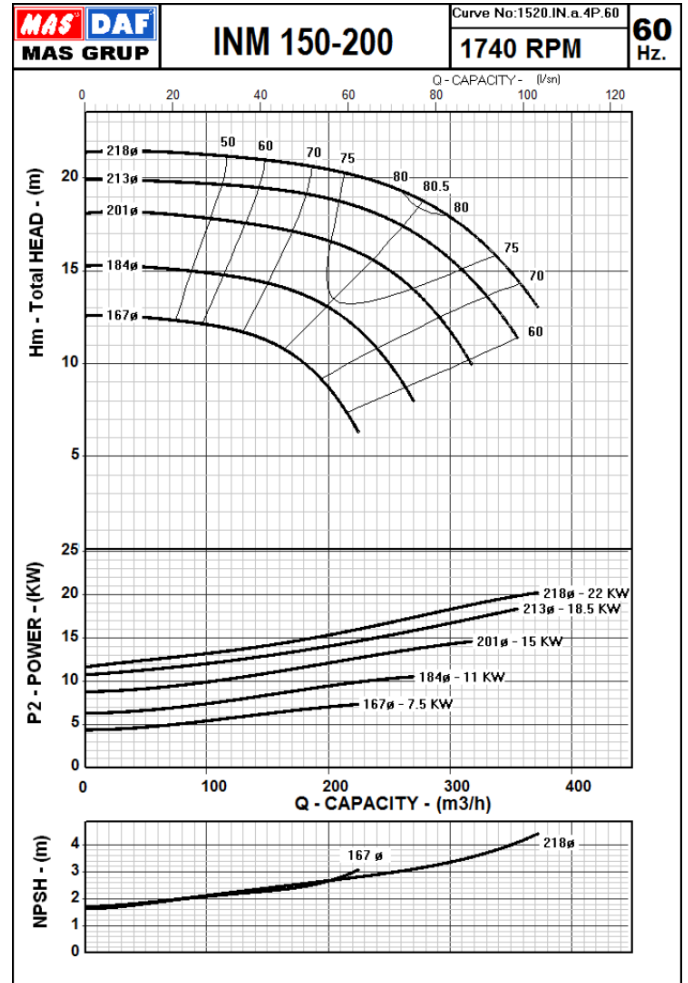
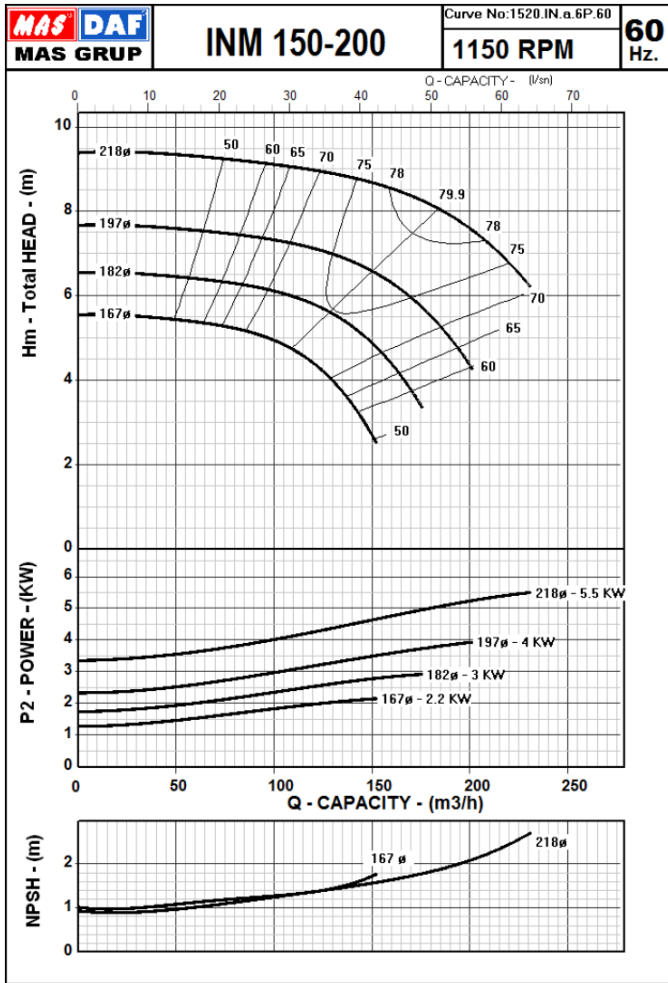


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

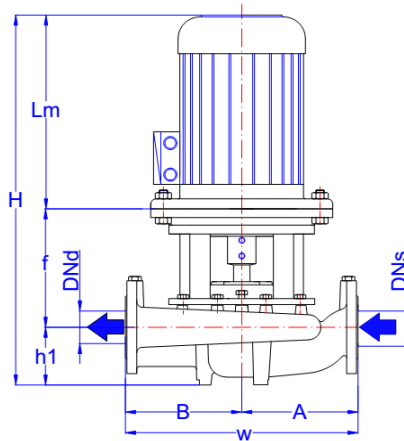


|         |         | MOTOR |      |     | FLANGES   | GENERAL |     |     |     |     | PUMP | Mechanical Seal |   |
|---------|---------|-------|------|-----|-----------|---------|-----|-----|-----|-----|------|-----------------|---|
|         |         | KW    | IEC  | Lm  | DNs - DNd | H       | h1  | f   | W   | A   |      |                 | B |
|         |         |       |      |     |           |         |     |     |     |     |      |                 |   |
| 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            |   |
|         | 4 poles | 18.5  | 200L | 665 | 125       | 1105    | 210 | 230 | 700 | 370 | 330  | Ø 35            |   |
|         |         | 18.5  | 180M | 629 |           | 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 |                 |   |

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

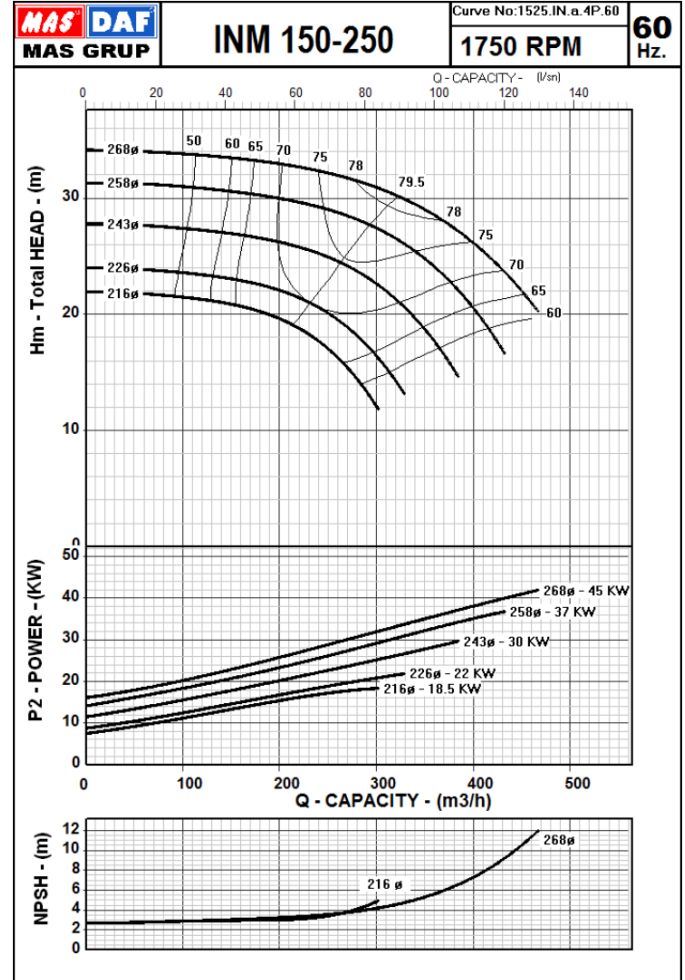
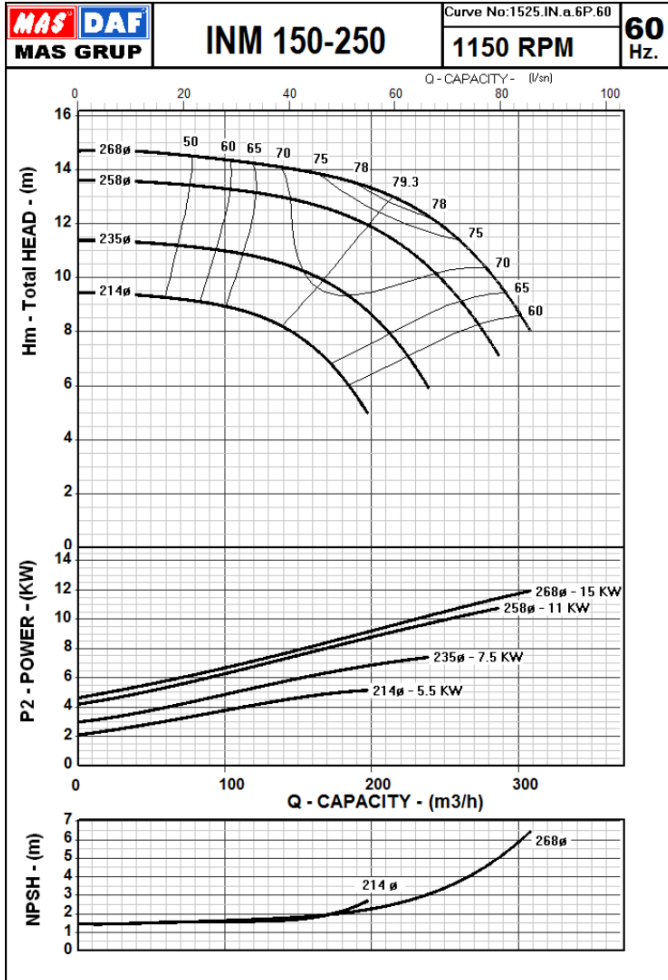


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

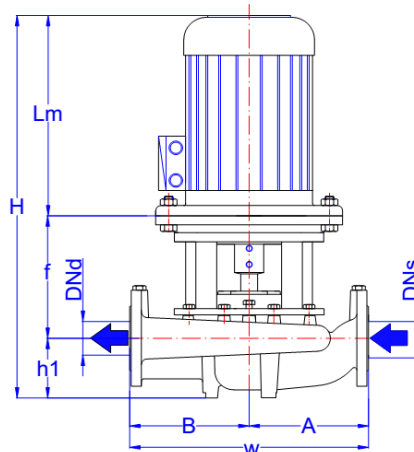


|         | MOTOR   |      |          | FLANGES         | GENERAL | PUMP     |         |         |         |         | Mechanical Seal           |      |
|---------|---------|------|----------|-----------------|---------|----------|---------|---------|---------|---------|---------------------------|------|
|         | KW      | IEC  | Lm<br>mm | DNs - DNd<br>mm | H<br>mm | h1<br>mm | f<br>mm | W<br>mm | A<br>mm | B<br>mm | Nominal Impeller Diameter |      |
| 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 |

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

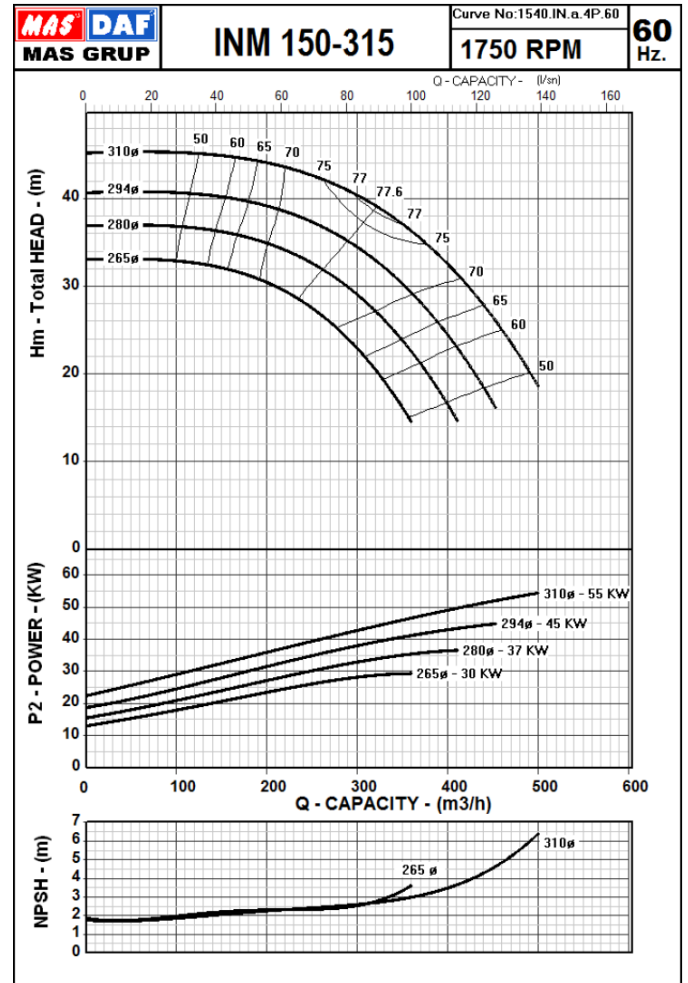
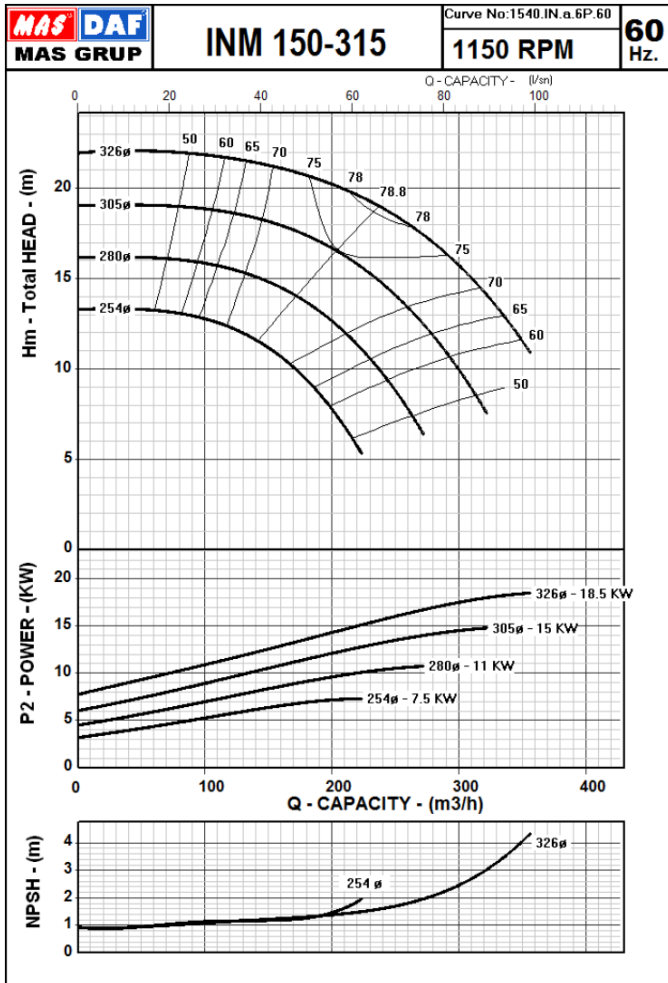


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

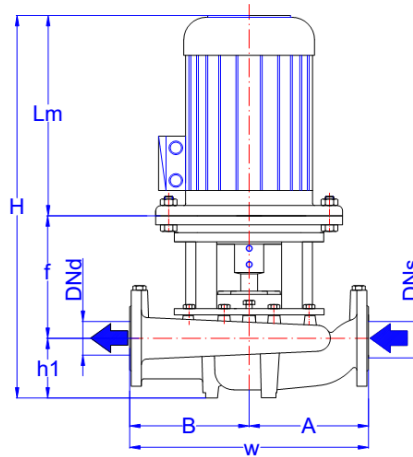


|         |         | MOTOR |      |     | FLANGES   | GENERAL | PUMP |     |     |     |     | Mechanical Seal           |
|---------|---------|-------|------|-----|-----------|---------|------|-----|-----|-----|-----|---------------------------|
|         |         | KW    | IEC  | Lm  | DNs - DNd | H       | h1   | f   | W   | A   | B   | Nominal Impeller Diameter |
|         |         |       |      | mm  |           |         |      |     |     |     |     |                           |
| 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                      |

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

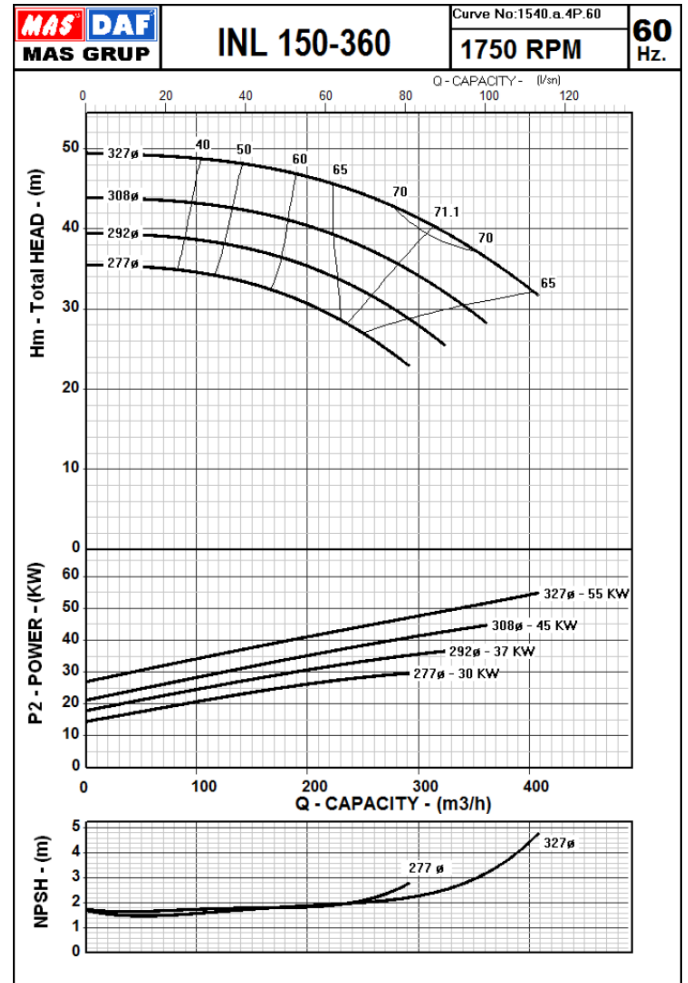
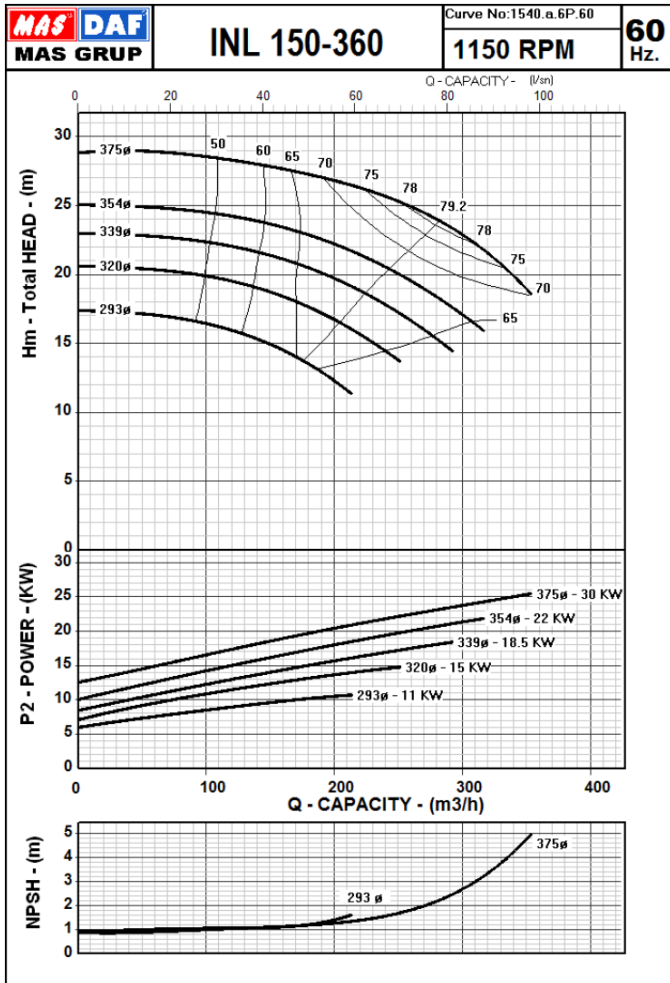


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

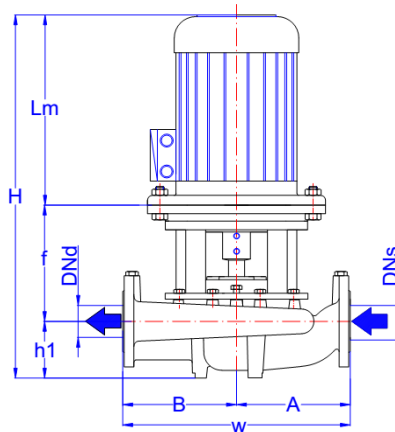


|         |         | MOTOR |      | FLANGES | GENERAL   | PUMP |     |     |     |     | Mechanical Seal |                           |
|---------|---------|-------|------|---------|-----------|------|-----|-----|-----|-----|-----------------|---------------------------|
|         |         | KW    | IEC  | Lm      | DNs - DNd | H    | h1  | f   | W   | A   | B               | Nominal Impeller Diameter |
|         |         |       |      | mm      | mm        | mm   | mm  | mm  | mm  | mm  | mm              |                           |
| 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                      |

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

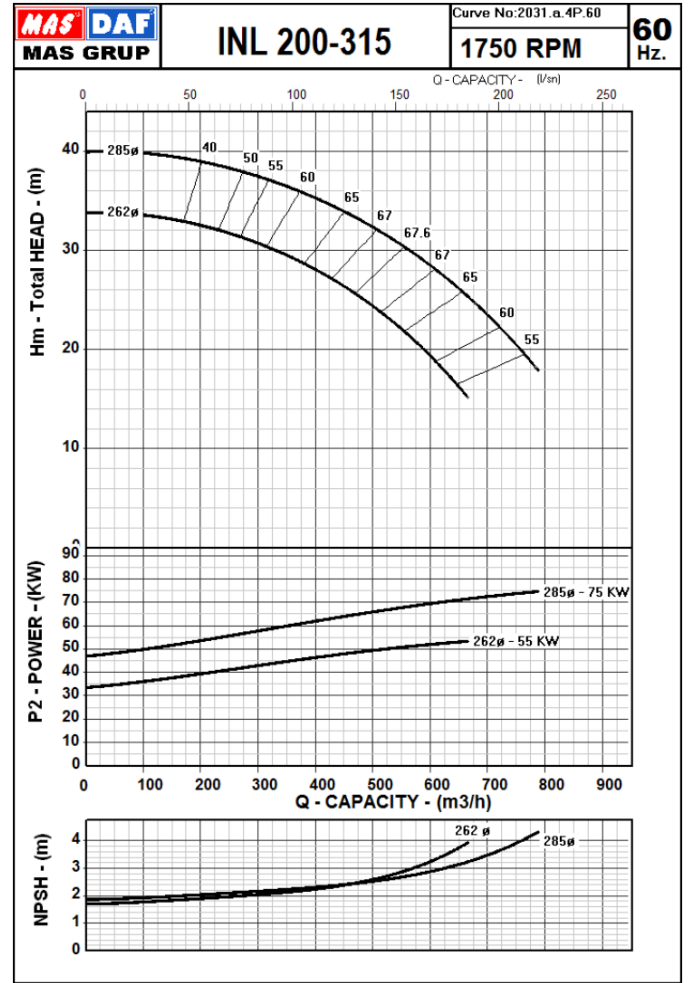
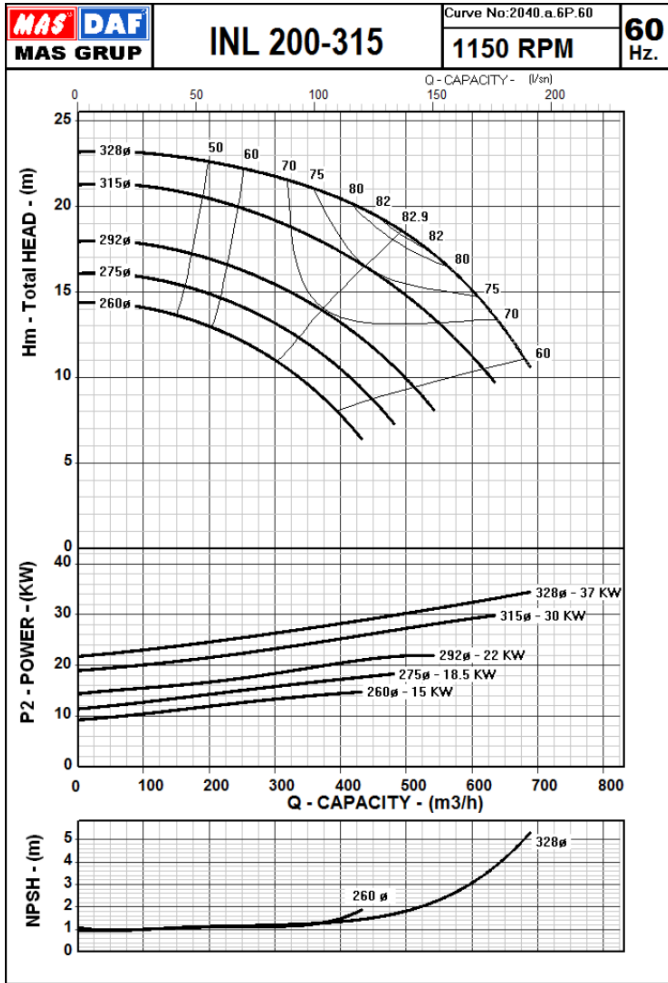


The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. Tolerances are acc. to ISO 9906 Annex A.

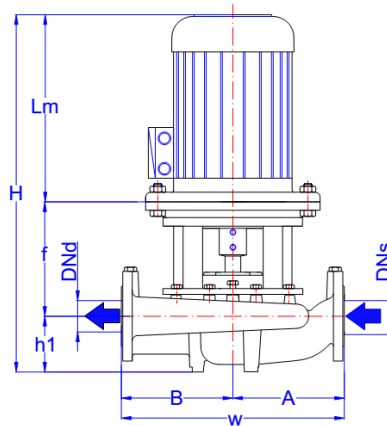


|                | MOTOR   |      |          | FLANGES         | GENERAL | PUMP     |         |         |         |         | Mechanical Seal           |      |
|----------------|---------|------|----------|-----------------|---------|----------|---------|---------|---------|---------|---------------------------|------|
|                | KW      | IEC  | Lm<br>mm | DNs - DNd<br>mm | H<br>mm | h1<br>mm | f<br>mm | W<br>mm | A<br>mm | B<br>mm | Nominal Impeller Diameter |      |
| <b>150-360</b> | 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 |

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



The Performance Curves 60 Hz are based on the kinematic viscosity 1 mm<sup>2</sup>/s and density 1g/cm<sup>3</sup>. 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  |           |         |      |     |     |     |     |                           |
| 200-315 | 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                      |

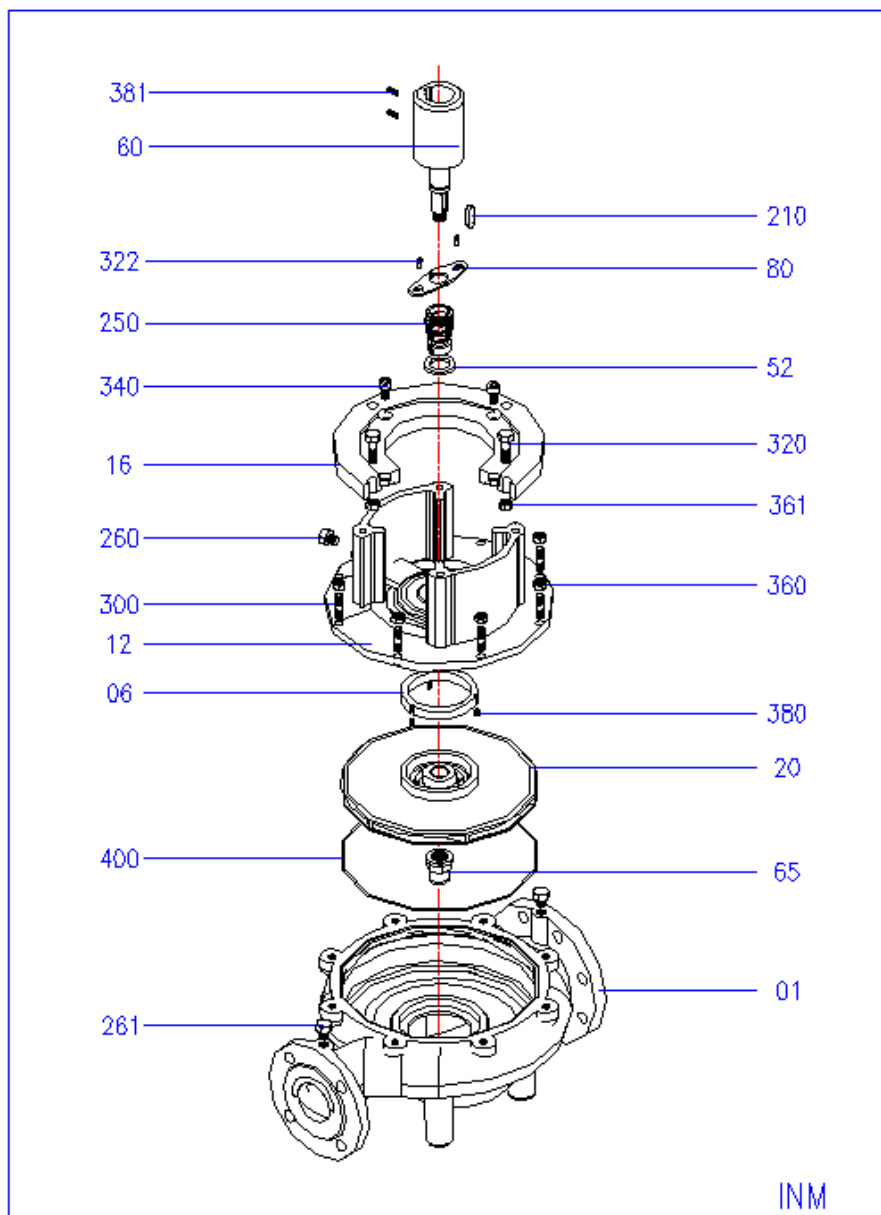
MAS DAF MAKİNA SAN. A.Ş. reserves the right to change specifications without prior notice.

**INM/INL Series**  
In-Line Centrifugal Pumps

**Exploded View (Without Coupling)**



**Mas Grup**



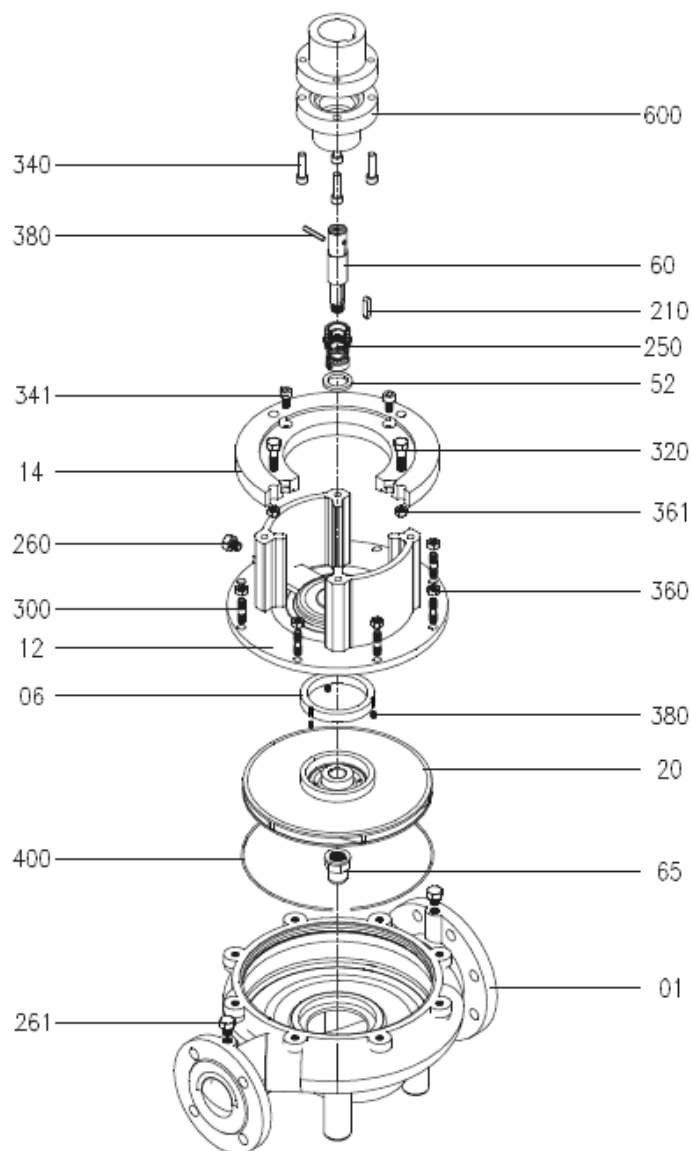
| PART NO | PART NAME            | PART NO | PART NAME       |
|---------|----------------------|---------|-----------------|
| 01      | Pump Casing          | 260     | Drain Plug      |
| 06      | Wearing Ring         | 261     | Plug            |
| 12      | Adapter              | 300     | Stud 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)**



**Mas Grup**



| 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**

### **Head Office / Service Center:**

Aydınlı Mah. Birlik OSB. 1.No'lu Cadde No:17 Tuzla - İSTANBUL / TURKEY  
Tel: +90 (216) 456 47 00 pbx Fax: +90 (216) 455 14 24

### **Ankara Regional Directorate:**

Aşağı Öveçler Mah. 1329 Sok. No:6/9 Öveçler ANKARA / TURKEY  
Tel: +90 (312) 472 81 60-67 Fax:+90 (312) 472 82 51

### **Factory:**

1. Organize Sanayi Bölgesi Parsel 249/5 Beyköy - DÜZCE / TURKEY  
Tel: +90 (380) 553 73 88 Fax: +90 (380) 553 71 29