

## Customer

## Supplier

Company name  
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**Fields of Application**

The in-line pumps are designed for:

Water supply and boosting,  
Watering, sprinkling and dewatering,  
Filling and discharging of tanks,  
Circulating of hot and cold water,  
In central heating and air-conditioning installations,  
Circulating in swimming pools,  
Liquid transfer applications in industry, agriculture, etc.  
Pumping of clean and sea water in ships.

**Design Specification**

The INM 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 EN 1092, 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.

**Bearings**

For INM 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.

**Technical Data**

|                       |                             |
|-----------------------|-----------------------------|
| Suction Flange        | : DN 40 - DN 200            |
| Discharge Flange      | : DN 40 - DN 200            |
| Operating Pressure    | : 10 bar                    |
| Operating Temperature | : -25 – 120 °C              |
| Flow Range            | : 2 – 520 m <sup>3</sup> /h |
| Head Range            | : 2 - 105 m                 |
| Speed Range           | : 900-3600 rpm              |

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**Operating data specification**

|                             |                          |                          |                   |
|-----------------------------|--------------------------|--------------------------|-------------------|
| Pumped fluid                | Water                    | Rated flow               | m <sup>3</sup> /h |
| Solids                      |                          | Rated head               | m                 |
| Kind                        |                          | Geodetic head            | m                 |
| Percentage of solid content | 0                        | Available system NPSH    | m                 |
| pH value                    |                          | Inlet pressure (pin)     | 0 kPa             |
| Temperature                 | 20 °C                    | Altitude above sea level | 100 m             |
| Density                     | 998.3 kg/m <sup>3</sup>  | Max. operating pressure  | 441 kPa           |
| Kin. viscosity              | 1.005 mm <sup>2</sup> /s | Max. diff. pressure      | 441 kPa           |
| Vapour pressure             | 2.34 kPa                 |                          |                   |

**Pump**

|                        |  |                       |                        |
|------------------------|--|-----------------------|------------------------|
| Make                   | MAS DAF                                | Impeller type         |                        |
| Pump type              | INM 65-160                             | Impeller construction |                        |
| Frame size             |  | Impeller Ø            |                        |
| Design                 |  | Max.                  | 184 mm                 |
| Self priming           | <input checked="" type="checkbox"/> No | designed              | 172 mm                 |
| Speed                  | 2900 1/min                             | Min.                  | 138 mm                 |
| Stages                 | 1                                      | Flow                  |                        |
| Suction port           |  | Nominal               | 53.6 m <sup>3</sup> /h |
| Pressure rating        | PN16                                   | Max.                  | 81.6 m <sup>3</sup> /h |
| Nominal pipe size      | DN65                                   | Min.                  | 0 m <sup>3</sup> /h    |
| Standard               | DIN                                    | Head                  |                        |
| Discharge port         |  | Nominal               | 36.9 m                 |
| Pressure rating        | PN16                                   | Min.                  | 22.6 m                 |
| Nominal pipe size      | DN65                                   | Max.                  | 45 m                   |
| Standard               | DIN                                    | Shut off head         | 45 m                   |
| Shaft power            |  | NPSH3                 | m                      |
| Shaft power P2(Q=max.) | 9.54 kW                                | Efficiency            | %                      |

**Motor**

|                      |                            |
|----------------------|----------------------------|
| Make/Type            | 7.5 KW-2900 RPM / 132S     |
| Specific design      | IE3 / 50 Hz / Pole pairs 1 |
| Rated power          | 7.5 kW                     |
| Electric voltage     | 3~ 400 V                   |
| Speed                | 2910 1/min                 |
| Electric current     | 13.3 A                     |
| Frame size           | 132S                       |
| Degree of protection | IP 55                      |
| Type of protection   |                            |
| Explosion protection |                            |

**Coupling**

|               |    |
|---------------|----|
| Make/Type     |    |
| Series        |    |
| Spacer length | mm |
| Frame size    |    |

**Materials**

|             |                          |               |  |
|-------------|--------------------------|---------------|--|
| Pump        |                          | Shaft seal    | AQ1EGG                                   |
| Pump Casing | GJL-250 (GG25)           | Material code | AQ1EGG                                   |
| Impeller    | GJL-250 (GG25)           | Seal face     | Carbon graphite antimony impregnated (A) |
| Shaft       | A 276 Type 420 (X20Cr13) | Seat          | Silicon carbide (Q1, eSiC-Q7)            |
|             |                          | Elastomer     | EPDM (E)                                 |
|             |                          | Metal parts   | CrNiMo steel (G)                         |

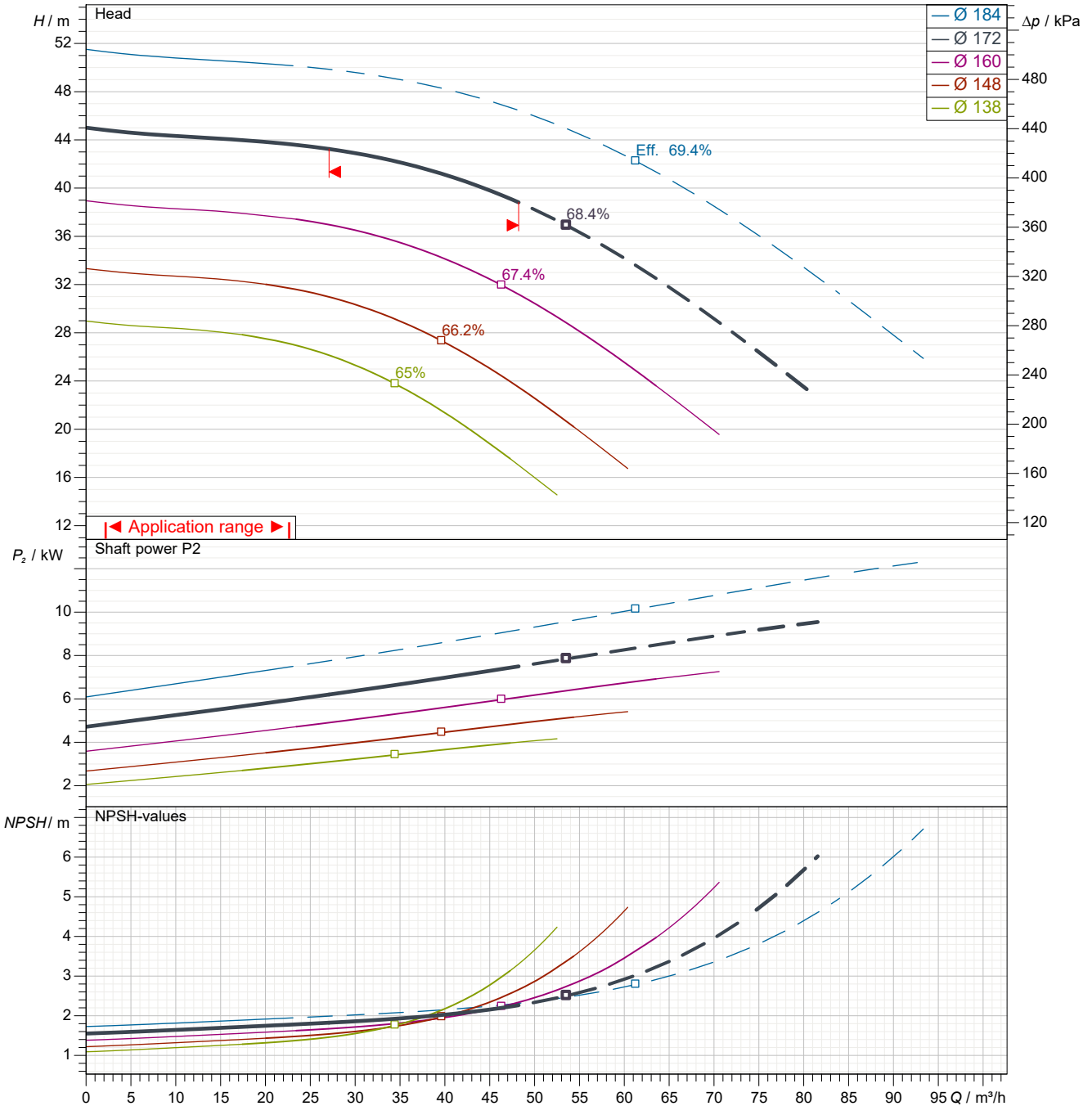
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Power data referred to: Water; 20°C; 998.3kg/m<sup>3</sup>; 1.005mm<sup>2</sup>/s Sense of rotation Clockwise from the drive end

Missing or invalid parameter (REFDIAM)



Pump curves in accordance with ISO 9906 2B

|                 |       |                    |             |                   |
|-----------------|-------|--------------------|-------------|-------------------|
| Pumped fluid    | Water |                    | Rated flow  | m <sup>3</sup> /h |
| Temperature     | 20    | °C                 | Rated head  | m                 |
| Density         | 998.3 | kg/m <sup>3</sup>  | Shaft power | kW                |
| Kin. viscosity  | 1.005 | mm <sup>2</sup> /s | Speed       | 2900<br>1/min     |
| Vapour pressure | 2.34  | kPa                | NPSH3       | m                 |
| Impeller Ø      | 172   | mm                 | Efficiency  | %                 |

Subject to change

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Issue date  
2022-04-06

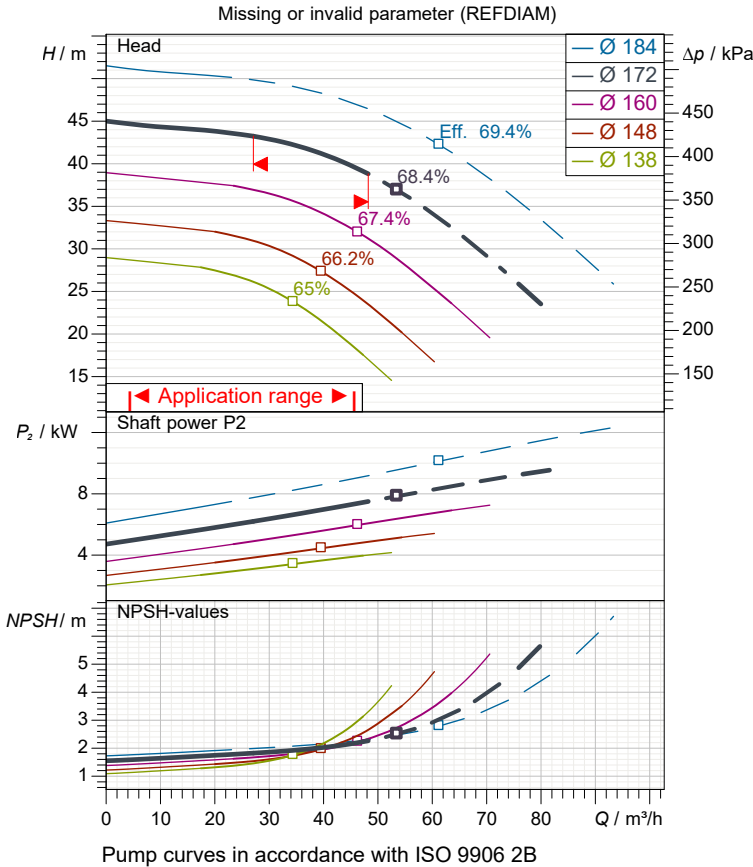
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**Performance curves**



**Pump**

|                   |            |
|-------------------|------------|
| Make              | MAS DAF    |
| Pump type         | INM 65-160 |
| Design            |            |
| Suction port      |            |
| Pressure rating   | PN16       |
| Nominal pipe size | DN65       |
| Standard          | DIN        |
| Discharge port    |            |
| Pressure rating   | PN16       |
| Nominal pipe size | DN65       |
| Standard          | DIN        |

**Operating data specification**

|                 |       |       |
|-----------------|-------|-------|
| Pumped fluid    | Water |       |
| Temperature     | 20    | °C    |
| Density         | 998.3 | kg/m³ |
| Kin. viscosity  | 1.005 | mm²/s |
| Vapour pressure | 2.34  | kPa   |
| Rated flow      |       | m³/h  |
| Rated head      |       | m     |
| Shaft power     |       | kW    |
| Speed           | 2900  | 1/min |
| NPSH3           |       | m     |
| Efficiency      |       | %     |
| Impeller Ø      | 172   | mm    |

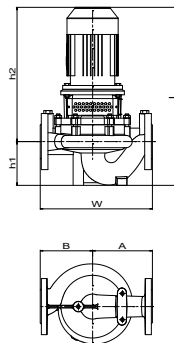
**Motor**

|                      |                            |
|----------------------|----------------------------|
| Make/Type            | 7.5 KW-2900 RPM / 132S     |
| Specific design      | IE3 / 50 Hz / Pole pairs 1 |
| Rated power          | 7.5 kW                     |
| Speed                | 2910 1/min                 |
| Electric voltage     | 3~ 400 V                   |
| Electric current     | 13.3 A                     |
| Degree of protection | IP 55                      |

**Materials**

|               |  |
|---------------|--|
| Shaft seal    | AQ1EGG                                   |
| Material code | AQ1EGG                                   |
| Seal face     | Carbon graphite antimony impregnated (A) |
| Seat          | Silicon carbide (Q1, eSiC-Q7)            |
| Elastomer     | EPDM (E)                                 |
| Metal parts   | CrNiMo steel (G)                         |

|             |                          |
|-------------|--------------------------|
| Pump Casing | GJL-250 (GG25)           |
| Impeller    | GJL-250 (GG25)           |
| Shaft       | A 276 Type 420 (X20Cr13) |



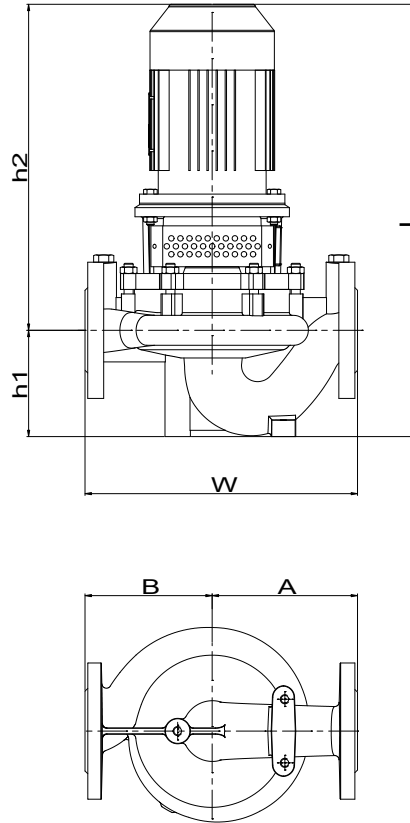
**Dimensions**

|    | mm  |
|----|-----|
| A  | 210 |
| B  | 180 |
| h1 | 130 |
| h2 | 545 |
| L  | 675 |
| w  | 390 |

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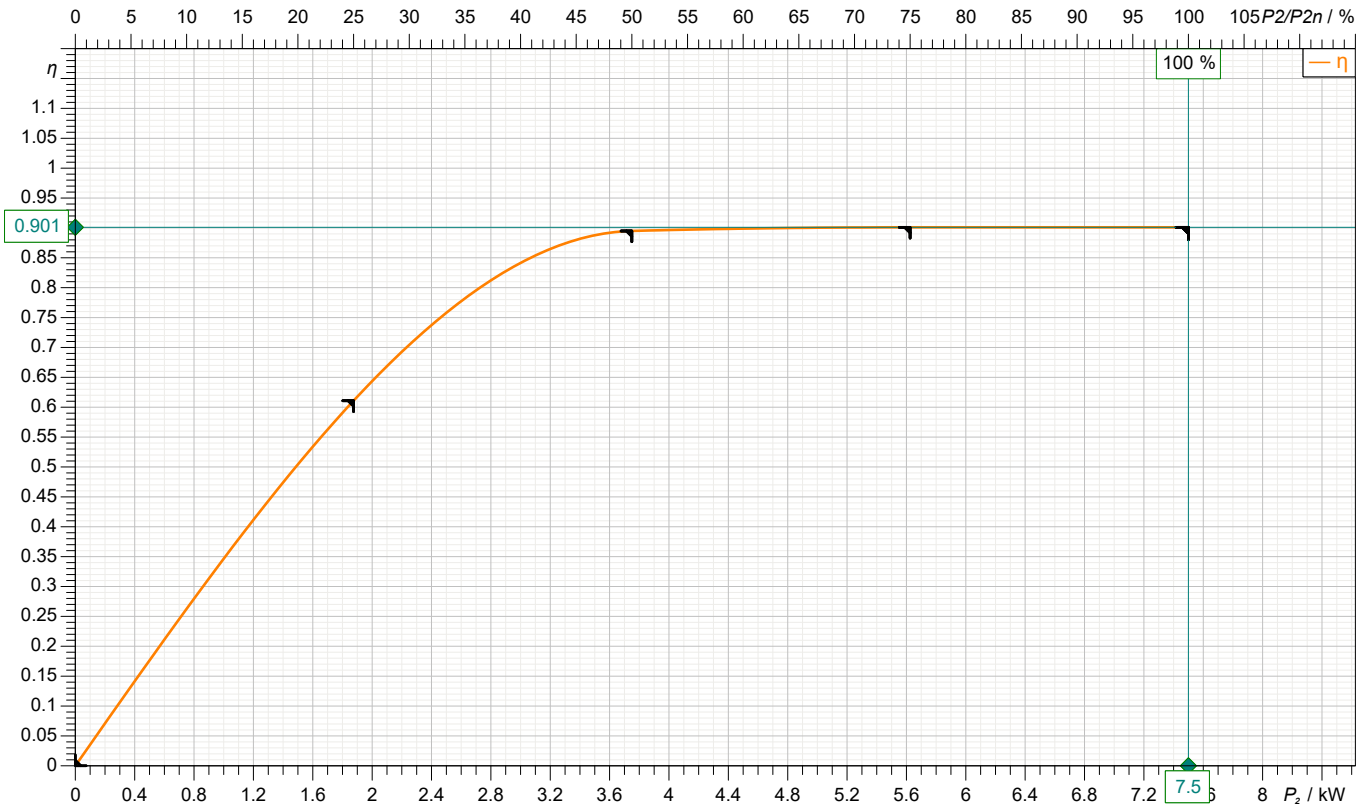
| Dimensions | mm  | Inlet / outlet |                |
|------------|-----|----------------|----------------|
| A          | 210 | Suction port   | Discharge port |
| B          | 180 | DN65           | DN65           |
| h1         | 130 | PN16           | PN16           |
| h2         | 545 |                |                |
| L          | 675 |                |                |
| w          | 390 |                |                |

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**motor data**



| Symbol     | No load | 25 %  | 50 % | 75 %  | 100 % | 125 % |
|------------|---------|-------|------|-------|-------|-------|
| $P_2$ / kW | 0       | 1.875 | 3.75 | 5.625 | 7.5   |       |
| $P_1$ / kW |         | 3.069 | 4.19 | 6.243 | 8.324 |       |
| $\eta$ / % | 0       | 61.09 | 89.5 | 90.1  | 90.1  |       |

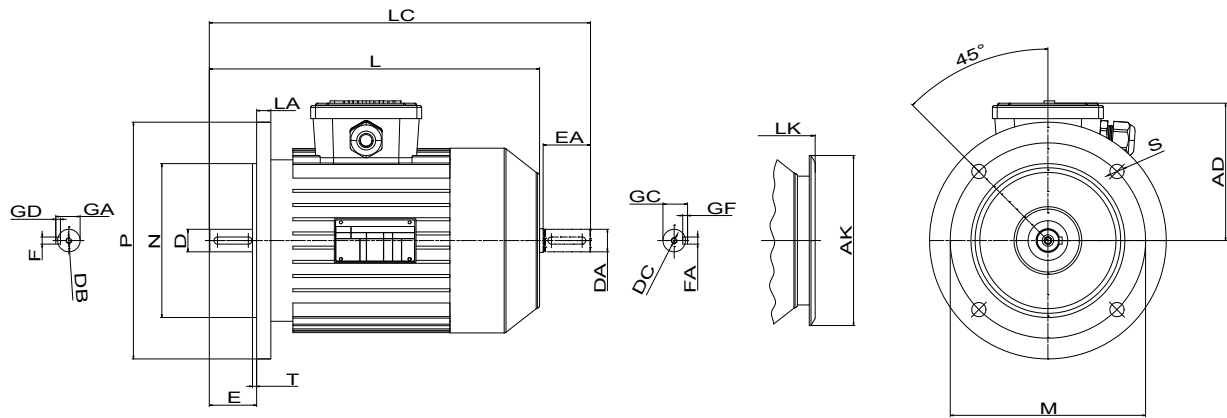
**Motor**

|                  |                            |                      |           |
|------------------|----------------------------|----------------------|-----------|
| Make/Type        | 7.5 KW-2900 RPM / 132S     | Degree of protection | IP 55     |
| Specific design  | IE3 / 50 Hz / Pole pairs 1 | Type of protection   |           |
| Rated power      | 7.5 kW                     | Explosion protection |           |
| Electric voltage | 3~ 400 V                   | Service factor       | 1.15      |
| Number of poles  | 2                          | Starting current     |           |
| Speed            | 2910 1/min                 | Starting torque      |           |
| Electric current | 13.3 A                     | Moment of inertia    |           |
| Power factor     | 0.9                        | No. starts per hour  |           |
| Frame size       | 132S                       | Rated torque         | 24.6 Nm   |
| Efficiency class | IE3                        | Insulation class     | F (155C°) |

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| Dimensions | mm   |    |      |
|------------|------|----|------|
| AD         | 168  | LK | 535  |
| AK         | 239  | M  | 265  |
| D          | 38   | N  | 230  |
| DA         | 38   | NO | 4    |
| DB         | M12  | P  | 300  |
| DC         | M12  | S  | 14.5 |
| E          | 80   | T  | 4    |
| EA         | 80   |    |      |
| FAxGF      | 10X8 |    |      |
| FxGD       | 10X8 |    |      |
| GA         | 41   |    |      |
| GC         | 41   |    |      |
| L          | 498  |    |      |
| LA         | 20   |    |      |
| LC         | 584  |    |      |

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**Suction connection**

DN65  
PN16

**Discharge connection**

DN65  
PN16

| Dimensions | mm   |
|------------|------|
| b          | 20   |
| D          | 185  |
| d2         | 18   |
| d4         | 122  |
| d5         | 77.5 |
| DN         | 65   |
| f          | 2    |
| k          | 145  |
| n          | 8    |

| Dimensions | mm   |
|------------|------|
| b          | 20   |
| D          | 185  |
| d2         | 18   |
| d4         | 122  |
| d5         | 77.5 |
| DN         | 65   |
| f          | 2    |
| k          | 145  |
| n          | 8    |





**Spare part list**  
INM 65-160

Revision number

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**Customer**

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**Subject to change**

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INM 65-160

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