



# EM DTm SERIES

VERTICAL CLOSE-COUPLED MULTISTAGE PUMPS WITH DRIVE-TECH MINI





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NOTE: Franklin Electric S.r.l. reserves the right to amend specification without prior notice

# EM SERIES - VERTICAL CLOSE-COUPLE MULTISTAGE PUMPS

## APPLICATIONS

- Small domestic and industrial systems / Domestic water supply
- Water distribution / pressure boosting
- Irrigation / Gardening / Sprinklers / Rainwater collection
- Industrial plants / Wash down unit
- Cooling and chilling / Heating and conditioning / Air conditioning systems
- Other various installations

## FEATURES

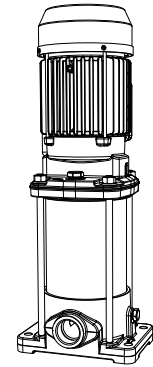
- Compact close-coupled design, robust and corrosion resistant / Superior efficiency and performance
- Floating neck ring in PPS
- Heavy duty oversize motor shaft
- Impellers and diffusers are made of stainless steel in order to achieve durability
- Easy maintenance
- Strong motor ball bearing fitted in the motor
- Pumping of clear non-loaded fluids
- Mechanical seal carbon/ceramic/EPDM Type E0

## PUMP SPECIFICATIONS

- Flow: up to 17 m<sup>3</sup>/h
- Head: up to 101 m
- Discharge and Suction port: Threaded or Oval connections
- Maximum working pressure 10 Bar
- Direction of rotation: clockwise looking at the pump from the top down.
- Maximum altitude at rated current: 1000 m
- Maximum ambient temperature 40 °C
- Liquid temperature range: Minimum: 0 °C
  - Maximum: +80 °C for domestic use (uses covered by CEI EN standard 60335-2-41);
- The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B

## MOTOR SPECIFICATIONS

- Three-phase with IE3 motors
- Asynchronous, TEFC (Totally Enclosed, Fan-Cooled)
- 2 pole, 60 Hz
- IP55 protection motor
- Insulation class F

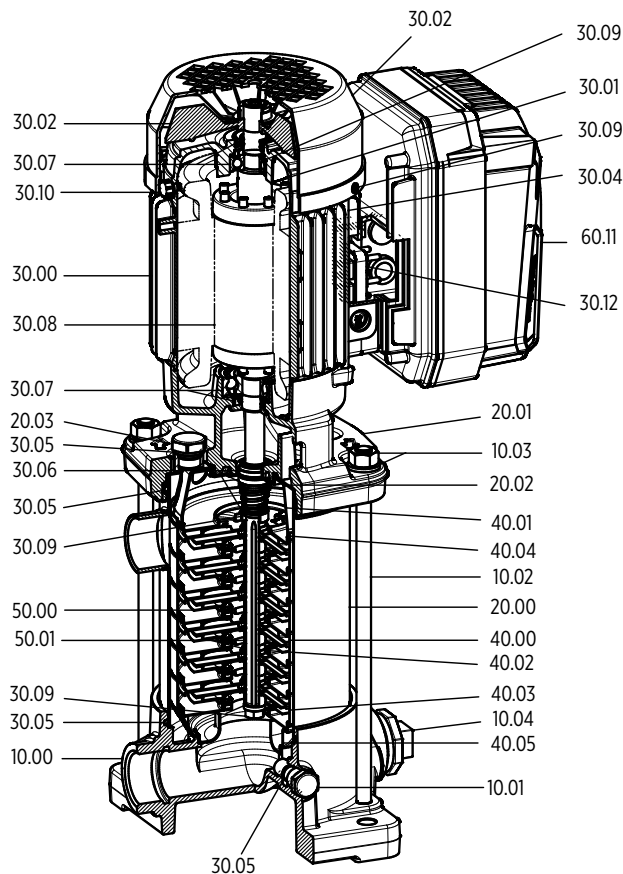




## MATERIALS/FLUIDS COMPATIBILITY

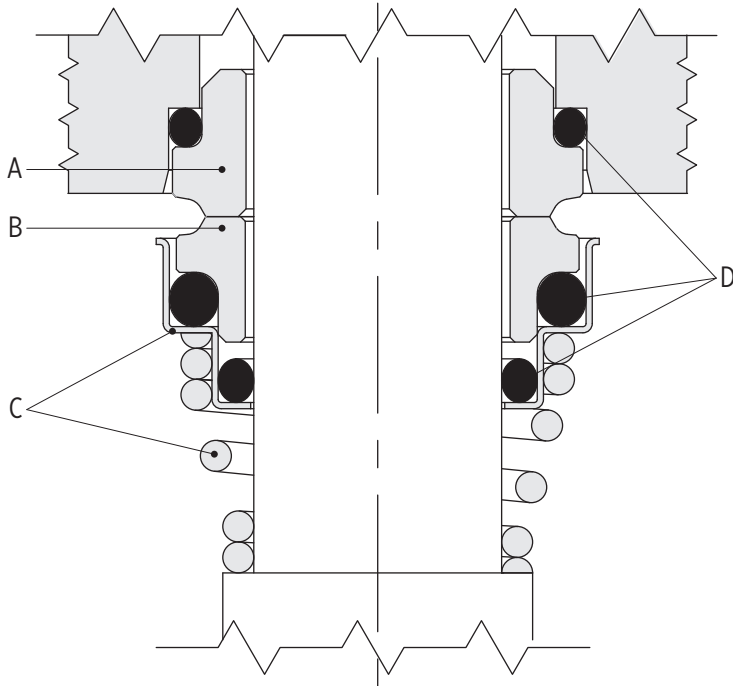
| Pos.  | Parts description          | Type  | Material     |         |
|-------|----------------------------|---|--------------|---------|
|       |                            |   | ASTM/AISI    | DIN/EN  |
| 10.00 | Pump casing                | Cast iron                                       | A48 Class 35 | GJL-250 |
| 10.01 | Draining plug              | Stainless Steel                                 | AISI 304     | 1.4301  |
| 10.04 | Outlet plug*               | Zinc coated steel                               | -            | -       |
| 20.00 | Outer case                 | Stainless Steel                                 | AISI 304     | 1.4301  |
| 20.02 | Mechanical seal housing    | Stainless Steel                                 | AISI 304     | 1.4301  |
| 20.03 | Filling plug               | Stainless Steel                                 | AISI 304     | 1.4301  |
| 30.05 | O-Rings                    | EPDM  | -            | -       |
| 30.06 | Mechanical seal            | Ceramic, Carbon graphite, EPDM, Stainless steel | -            | -       |
| 30.08 | Rotor and pump shaft       | Stainless Steel                                 | AISI 304     | 1.4301  |
| 30.09 | Screws, nuts and washers   | Stainless Steel                                 | AISI 304     | 1.4301  |
| 40.00 | Stage housing and diffuser | Stainless Steel                                 | AISI 304     | 1.4301  |
| 40.01 | Stage centering outlet     | Stainless Steel                                 | AISI 304     | 1.4301  |
| 40.02 | Floating neck ring         | PPS   | -            | -       |
| 40.03 | Initial stage housing      | Stainless Steel                                 | AISI 304     | 1.4301  |
| 40.04 | Last stage with diffuser   | Stainless Steel                                 | AISI 304     | 1.4301  |
| 40.05 | Stage centering inlet      | Stainless Steel                                 | AISI 304     | 1.4301  |
| 50.00 | Impeller                   | Stainless Steel                                 | AISI 304     | 1.4301  |
| 50.01 | Impeller spacer            | Stainless Steel                                 | AISI 304     | 1.4301  |
|       | Pressure trasducer         | Stainless steel                                 | AISI 304     | 1.4301  |

\* only for R version



00130098 02/2018

# MECHANICAL SEAL SPECIFICATIONS



001310012 05/2017

## STANDARD VERSION

| Model               | Type    | Position             |                    |                       |                 | Temperature [°C] |
|---------------------|---------|----------------------|--------------------|-----------------------|-----------------|------------------|
|                     |         | A<br>Stationary part | B<br>Rotating part | C<br>Other components | D<br>Elastomers |                  |
| <b>EM 3 - 5 - 9</b> |         |                      |                    |                       |                 |                  |
| E0                  | V B G E | Ceramic              | Graphite           | AISI 316              | EPDM            | -15 °C +110 °C   |

## THREE-PHASE MOTORS SPECIFICATIONS

- Asynchronous, TEFC (Totally Enclosed, Fan-Cooled)
- 2 pole, 60 Hz
- IP55
- Insulation class F
- IE3 Motors Efficiency according to IEC 60034-30-1:2014
- Electrical performance according to IEC 60034-2-1:2007
- Standard voltage: 220-230 V  $\pm$  5 % up to 3 kW

| $P_N$<br>[kW] | Rendimento / Efficiency<br>$\eta_N$ % |      |      | IE |
|---------------|---------------------------------------|------|------|----|
|               | $\Delta$ 230 V<br>Y 400 V             |      |      |    |
|               | 4/4                                   | 3/4  | 2/4  |    |
| 0.75          | 82.5                                  | 82.6 | 80.4 | 3  |
| 1.1           | 84                                    | 84.5 | 82.8 |    |
| 1.5           | 85.5                                  | 85.7 | 83.7 |    |
| 2.2           | 86.9                                  | 87.6 | 86.8 |    |

| $P_N$<br>[kW] | MOTOR SIZE | N. of poles | $f_N$<br>[Hz] | 230 V 60 Hz |             |               |             |             |
|---------------|------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|
|               |            |             |               | $\cos \phi$ | $I_s / I_N$ | $T_N$<br>[Nm] | $T_s / T_N$ | $T_M / T_N$ |
| 0.75          | 71         | 2           | 60            | 0.85        | 7.9         | 2.1           | 3.9         | 4           |
| 1.1           | 71         |             |               | 0.85        | 6.6         | 3.1           | 3           | 3.1         |
| 1.5           | 80         |             |               | 0.85        | 8.2         | 4.1           | 3.1         | 3.2         |
| 2.2           | 90         |             |               | 0.89        | 9.8         | 6.0           | 4           | 4.1         |

| $P_N$<br>[kW] | VOLTAGE $U_N$  |         | $n_N$<br>[min <sup>-1</sup> ] | Motor operating conditions      |                        |      |
|---------------|----------------|---------|-------------------------------|---------------------------------|------------------------|------|
|               | $\Delta$ 230 V | Y 400 V |                               | Altitude Above<br>Sea Level [m] | T. amb<br>min/max [°C] | ATEX |
|               | $I_N$ [A]      |         |                               |                                 |                        |      |
| 0.75          | 2.8            | 1.6     | 3440                          | $\leq$ 1000                     | -15 / 40               | NO   |
| 1.1           | 4.0            | 2.3     | 3440                          |                                 |                        |      |
| 1.5           | 5.4            | 3.1     | 3480                          |                                 |                        |      |
| 2.2           | 7.5            | 4.3     | 3490                          |                                 |                        |      |

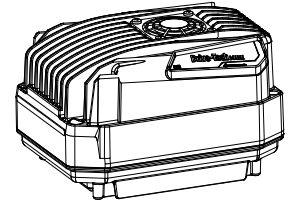
## DRIVE-TECH MINI

### APPLICATIONS

- Water booster sets
- HVAC systems with circulating pumps
- Control of submersible pumps (when installed on wall)

### FEATURES

- Energy saving due to variable speed control
- Soft start and soft stop
- Extended system life and reliability
- Simplified installation on motor or wall
- Easy and fast commissioning thanks to initial configuration wizard
- Installation on humid and dusty environment made possible by IP55 (NEMA 4) protection degree
- High thermal and mechanical performance thanks to aluminum case and independent ventilation



### SPECIFICATIONS

#### Advanced functionalities:

- Monitoring and programming with smartphone and FE Connect App, available for Android and iOS mobile devices
- Remote control using a smartphone nearby as a modem
- Copy and paste of programming recipes
- Ability to send reports via email
- Multilingual support

#### Control modes:

- Constant pressure control
- Constant or proportional differential pressure control
- Constant temperature control
- Constant differential temperature control
- Constant flow control
- External frequency control (trimmer) or 1 or 2 preset frequencies control

#### Built-in protection against:

- Overvoltage and undervoltage
- Overcurrent and no load
- Dry running
- Overtemperature

#### EMC compatibility for residential environment:

- Integrated PFC (P.F. 1) to meet EN61000-3-2
- Integrated input filter for Category C1 (EN61800-3), Class B (EN55011)

#### Multi-pump operation (COMBO):

- Up to 8 units
- Working alternation for uniform pumps wearing
- Master or slave replacement in case of failure to ensure continuity of operation

#### Advanced motor controls:

- Next generation control of asynchronous motors
- Sensorless control of permanent magnet synchronous motors

**Inputs and outputs:**

- 2 programmable digital inputs for motor start & stop
- Modbus RTU
- 2 output relays for alarm and run indication
- 2 analog inputs 4-20 mA
- 2 analog inputs 0-10 V

**SYSTEM PERFORMANCE**

- P.F. line side: 1
- Power frequency: 50-60 Hz ( $\pm 2\%$ )
- Storing temperature: from  $-30\text{ }^{\circ}\text{C}$  to  $+70\text{ }^{\circ}\text{C}$
- Minimum ambient temperature at rated current:  $-10\text{ }^{\circ}\text{C}$
- Maximum ambient temperature at rated current:  $+40\text{ }^{\circ}\text{C}$
- Maximum altitude at rated current: 1000 m
- Maximum relative humidity: 95% without condensation
- Grade of protection: IP55 (NEMA 4) or motor IP when connected to motor terminal box (protect the device from exposure to sunlight and atmospheric agents)
- Connetivity: serial RS 485 for COMBO operation (up to 8 units) + Bluetooth SMART for motoring programming + MODBUS RTU

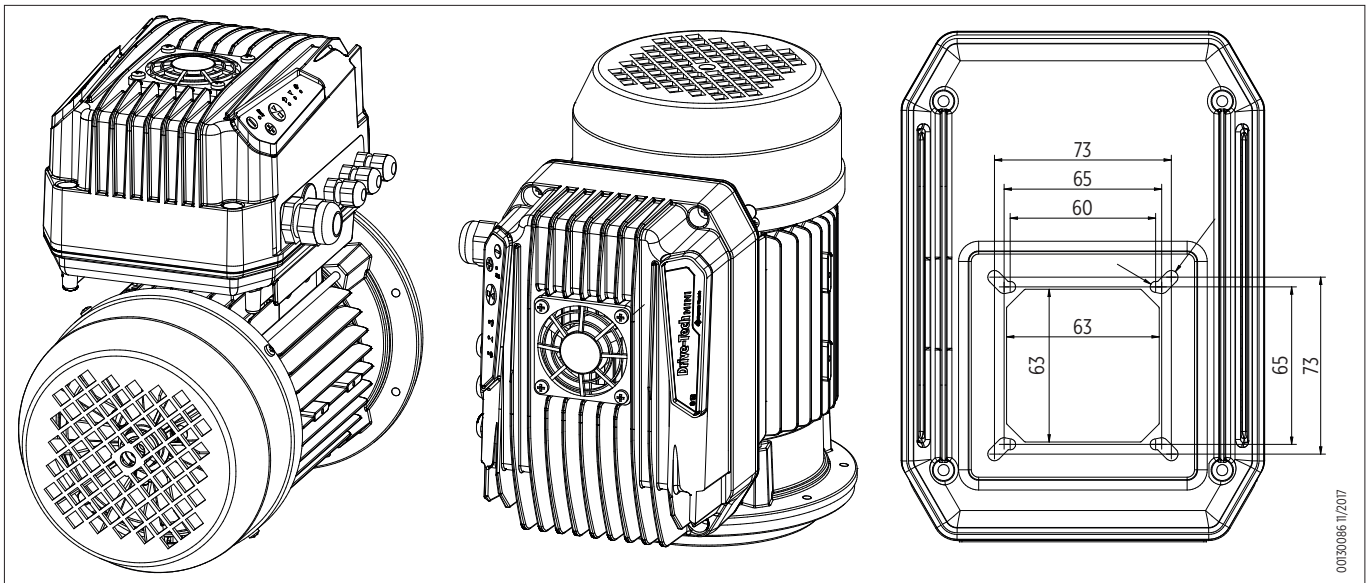
**TRASDUCER SPECIFICATION**

- Nominal output signal (protected against shortcut):  $4 \div 20\text{ mA}$
- Power voltage [ $U_B$ ], protection antipolarity:  $9 \div 28\text{ V}$
- Sensor temperature range:  $0\text{ }^{\circ}\text{C} \div +80\text{ }^{\circ}\text{C}$
- Environment temperature range (based on electric connection):  $-20\text{ }^{\circ}\text{C} \div +80\text{ }^{\circ}\text{C}$
- Shielded cable: 2 m
- Protection degree achived with connector coupled: IP67

## DIMENSIONAL DATA

| Model              | Vin [Vac]      | Max Vout [V] | Max I input [A] | Max I out [A] | Typical motor power P <sub>2</sub> [kW] | Drawing |
|--------------------|----------------|--------------|-----------------|---------------|---|---------|
| DTm 2.005 M/T 3A   | 1 x 230 ± 15 % | 3 x 230      | 4.5             | 3             | 0.55                                    |         |
| DTm 2.011 M/T 5A   | 1 x 230 ± 15 % | 3 x 230      | 7.5             | 5             | 1.1                                     |         |
| DTm 2.015 M/T 7.5A | 1 x 230 ± 15 % | 3 x 230      | 11              | 7.5           | 1.5                                     |         |

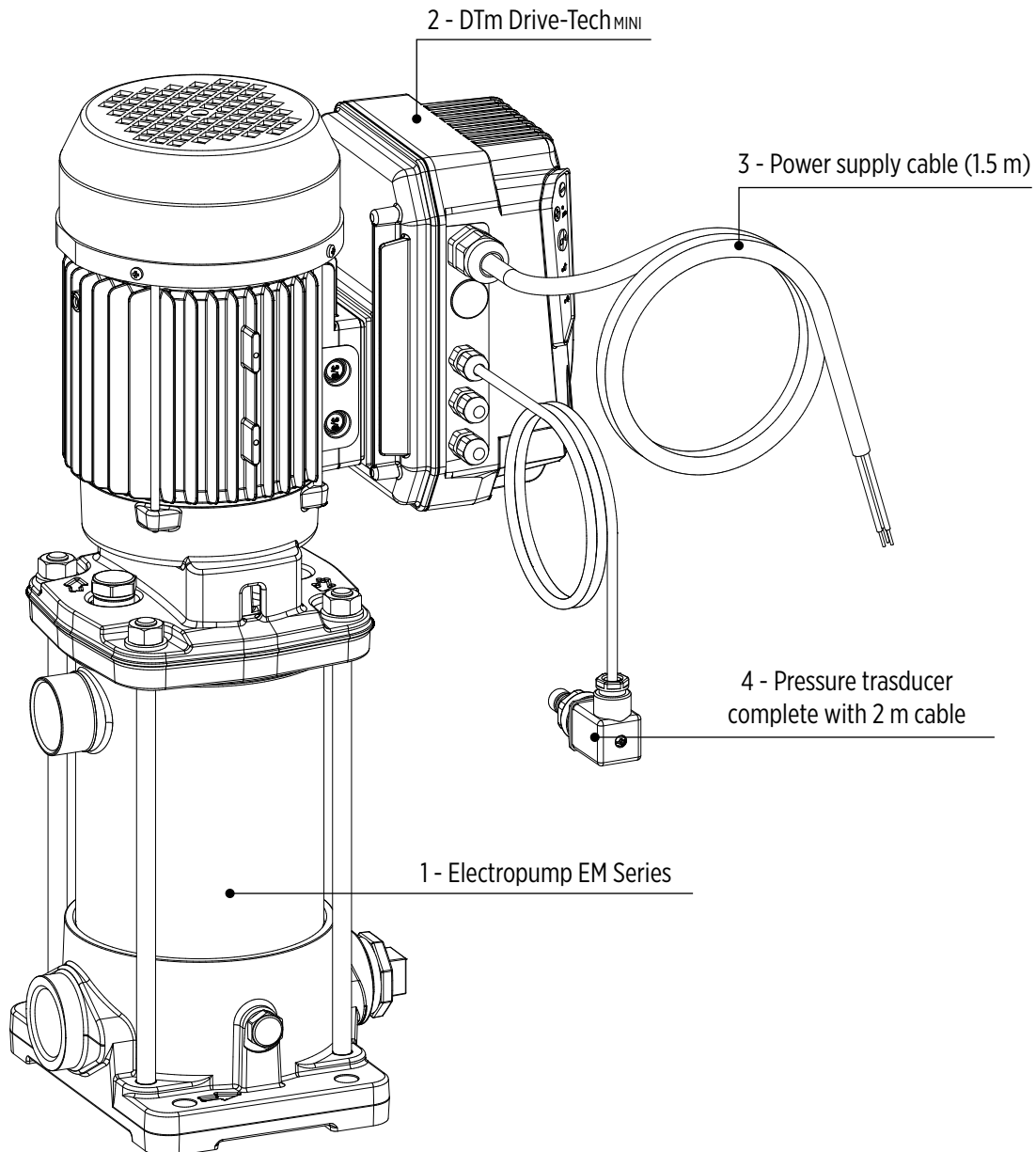
## INSTALLATION DRAWINGS



DTm can be installed directly on motor terminal box of horizontal or vertical axis pumps

## EM DTm 3-5-9

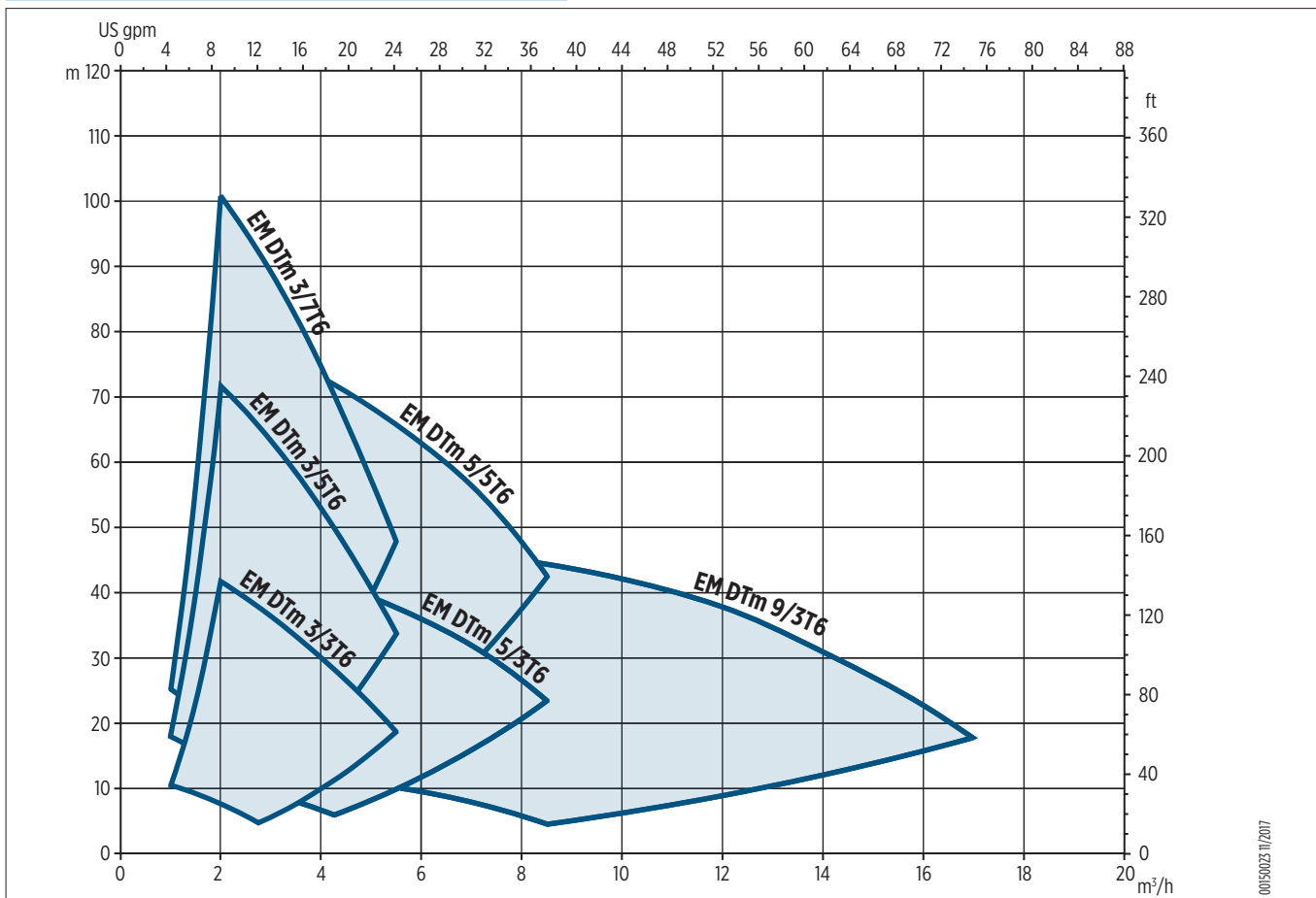
PACKAGE SYSTEM AND MAIN COMPONENTS INCLUDED



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## EM DTm FAMILY CURVES



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## SYSTEM IDENTIFICATION CODE

EM DTm 3 / 03 007 T6 E0 IE3

- EM DTm
  - 3
  - /
  - 03
  - 007
  - T6
  - E0
  - IE3
- System model
  - Nominal flow rate in m³/h
  - Number of stages
  - R (Second threaded delivery port puts on top)
  - T (In-line oval flange);
  - Pump version: D (In-line threaded);
  - Motor power kW x 10
  - Motor type: T (Three phase); 6 (60Hz)
  - Mechanical seal type
  - Three-phase motor efficiency

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# EM DTm 3-5-9

## TABLE OF HYDRAULIC PERFORMANCE AT 60Hz

| Pump model                         | Q = DELIVERY        |       |      |      |      |      |      |       |      |      |      |      |       |       |      |      |       |       |  |
|------------------------------------|---------------------|-------|------|------|------|------|------|-------|------|------|------|------|-------|-------|------|------|-------|-------|--|
|                                    | l/min 0             | 33    | 42   | 50   | 58   | 67   | 75   | 83    | 92   | 100  | 117  | 133  | 141.6 | 167   | 200  | 233  | 266.6 | 283.3 |  |
|                                    | m <sup>3</sup> /h 0 | 2     | 2.5  | 3    | 3.5  | 4    | 4.5  | 5     | 5.5  | 6    | 7    | 8    | 8.5   | 10    | 12   | 14   | 16    | 17    |  |
|                                    | US GPM 0            | 8.8   | 11.0 | 13.2 | 15.4 | 17.6 | 19.8 | 22.01 | 24.2 | 26.4 | 30.8 | 35.2 | 37.4  | 44.02 | 52.8 | 61.6 | 70.4  | 74.8  |  |
| H=TOTAL M.HEAD OF WATER COLUMN [m] |                     |       |      |      |      |      |      |       |      |      |      |      |       |       |      |      |       |       |  |
| EM DTm 3/3T6                       | 48.0                | 41.5  | 39.0 | 36.5 | 33.5 | 30.0 | 26.5 | 23.0  | 19.0 | 14.0 |      |      |       |       |      |      |       |       |  |
| EM DTm 3/5T6                       | 81.5                | 71.5  | 68.0 | 63.0 | 58.0 | 53.0 | 47.0 | 40.5  | 34.0 | 26.0 |      |      |       |       |      |      |       |       |  |
| EM DTm 3/7T6                       | 114.5               | 101.0 | 95.5 | 89.0 | 82.0 | 74.5 | 66.5 | 57.5  | 48.0 | 37.0 |      |      |       |       |      |      |       |       |  |
| EM DTm 5/3T6                       | 49.5                |       | 46.0 | 44.5 | 43.5 | 42.5 | 41.0 | 39.5  | 38.0 | 36.0 | 32.0 | 26.5 | 23.5  |       |      |      |       |       |  |
| EM DTm 5/5T6                       | 83.5                |       | 78.0 | 76.5 | 75.0 | 73.0 | 71.0 | 68.5  | 66.0 | 63.0 | 56.5 | 48.0 | 42.5  |       |      |      |       |       |  |
| EM DTm 9/3T6                       | 52.0                |       |      |      |      |      |      |       |      | 47.0 | 46.0 | 45.0 | 44.5  | 42.0  | 38.0 | 31.0 | 23.0  | 18.0  |  |



**EM DTm**  
**EM Series with Drive-Tech<sub>MINI</sub>**  
**Technical data and**  
**Performance curves**

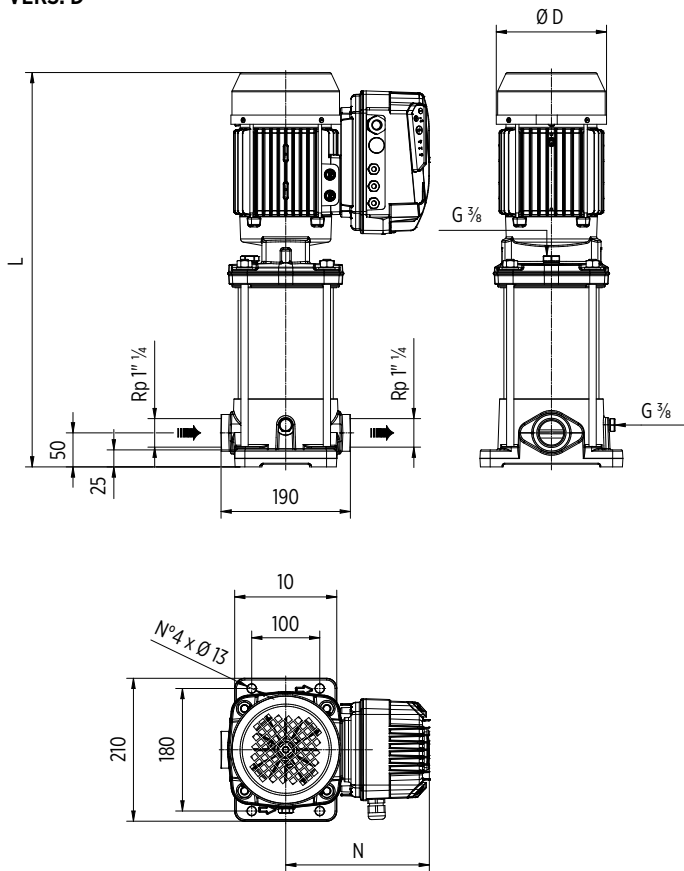
# EM DTm 3

## TECHNICAL DATA

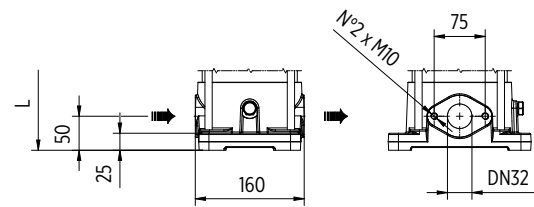
| Pump model   | Motor Size | MOTOR NOMINAL POWER |      | INPUT POWER [kW] | INPUT CURRENT [A] | Dimensions [mm] |     |     |     | Weight [Kg] |
|--------------|------------|---------------------|------|------------------|-------------------|-----------------|-----|-----|-----|-------------|
|              |            | [kW]                | [HP] |                  |                   | L               | L2  | D   | N   |             |
| EM DTm 3/3T6 | 71         | 0.75                | 1    | 1.04             | 4.5               | 465.5           | 111 | 144 | 204 | 22.3        |
| EM DTm 3/5T6 | 80         | 1.5                 | 2    | 1.76             | 7.5               | 555.5           | 159 | 162 | 211 | 27.5        |
| EM DTm 3/7T6 | 90         | 2.2                 | 2.7  | 2.44             | 11.0              | 642.5           | 207 | 179 | 218 | 34.2        |

## DIMENSIONAL DRAWINGS

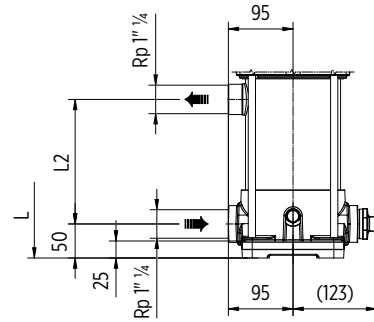
VERS. D



VERS. T



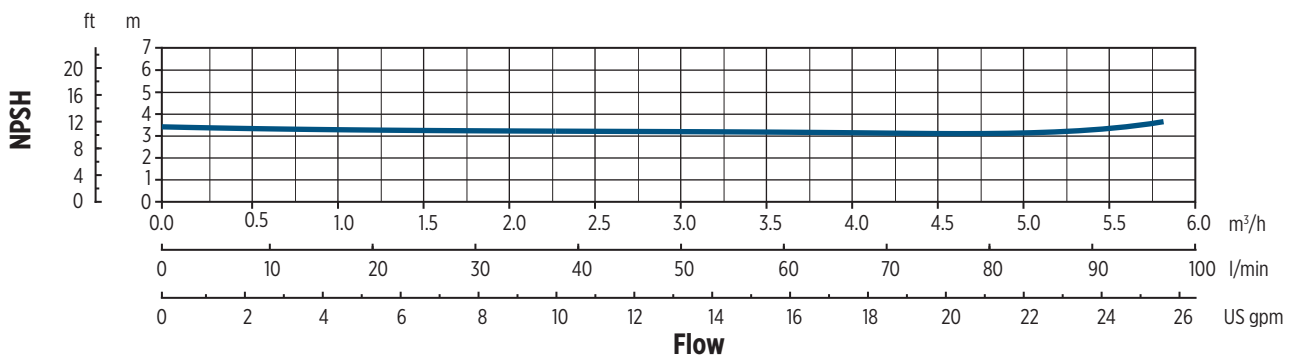
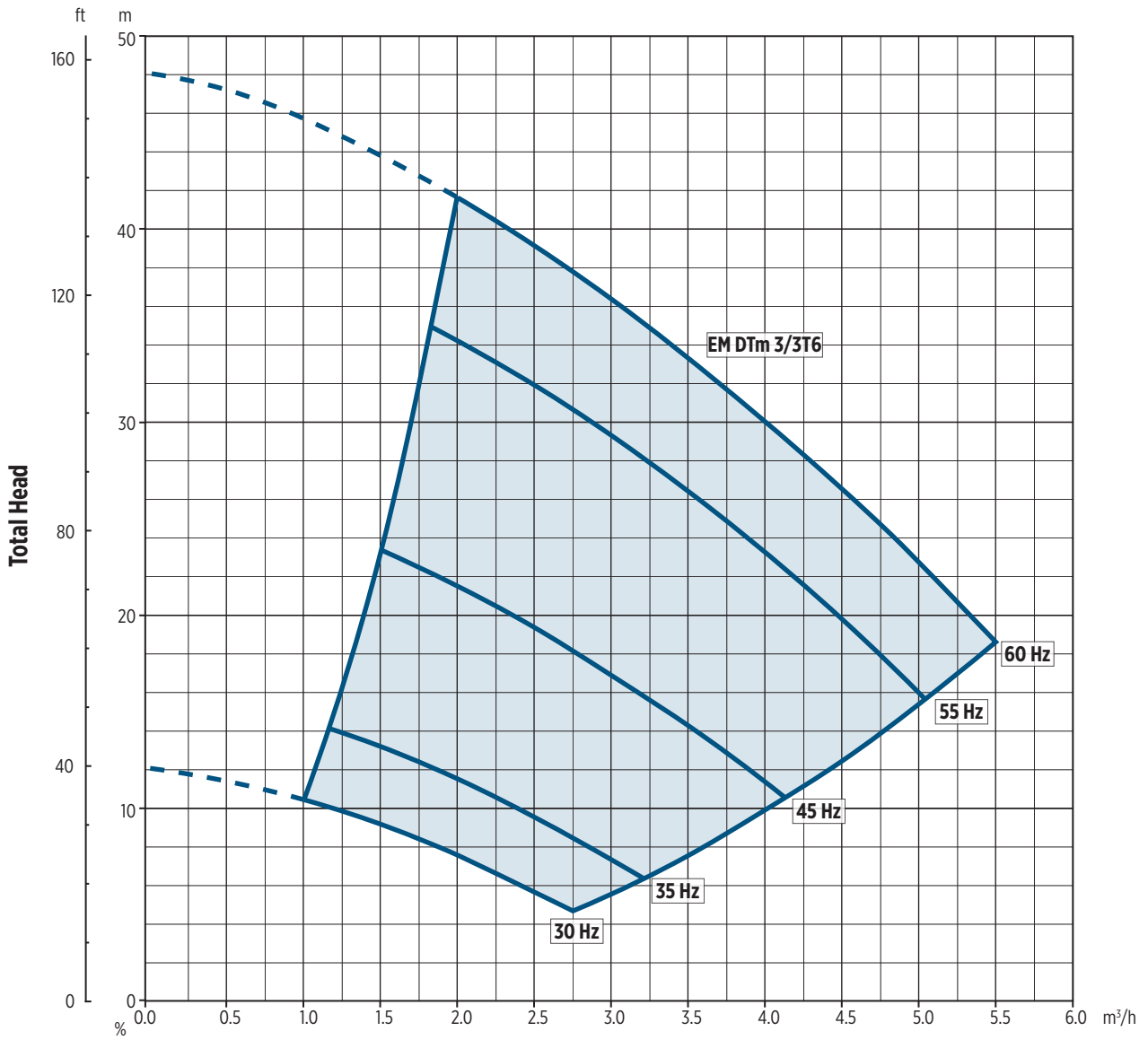
VERS. R



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# PERFORMANCE CURVES

MEI ≥ 0,40

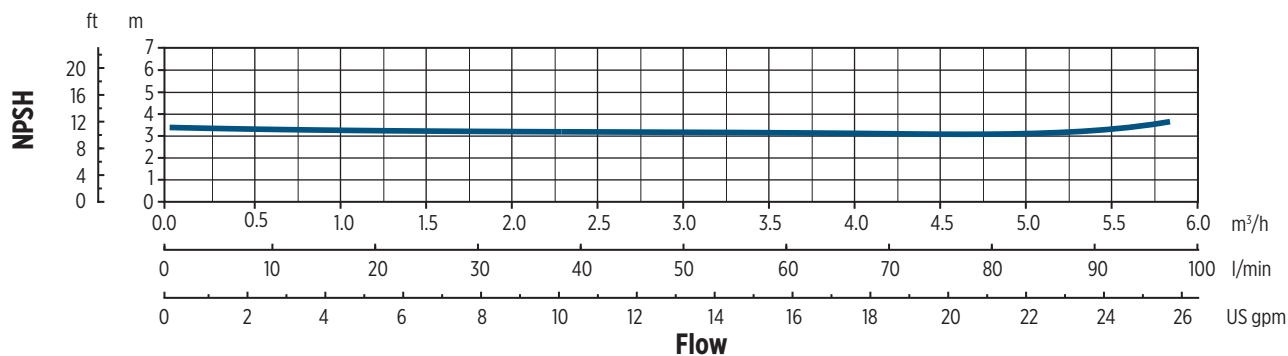
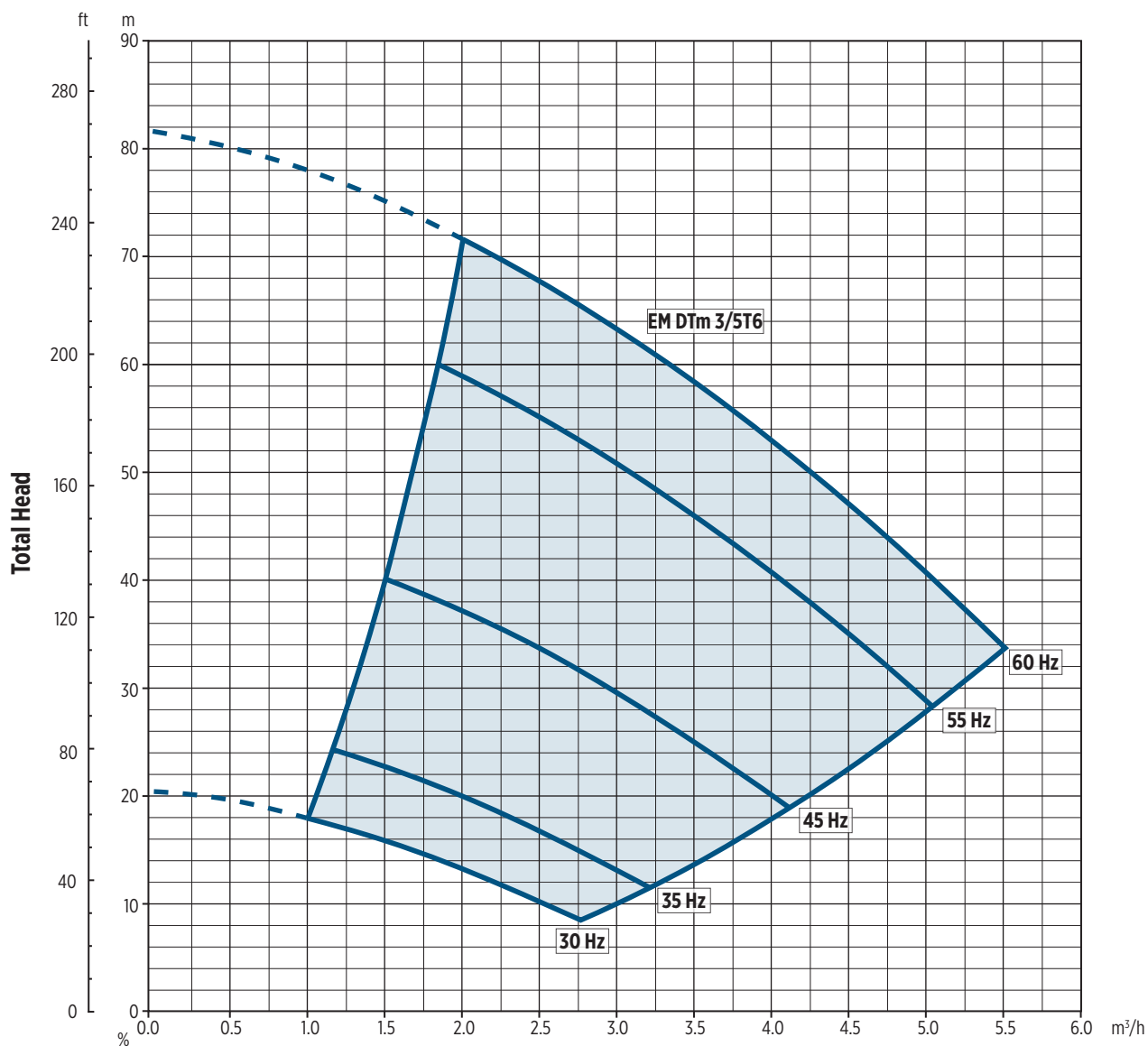


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The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B

# PERFORMANCE CURVES

MEI ≥ 0,40



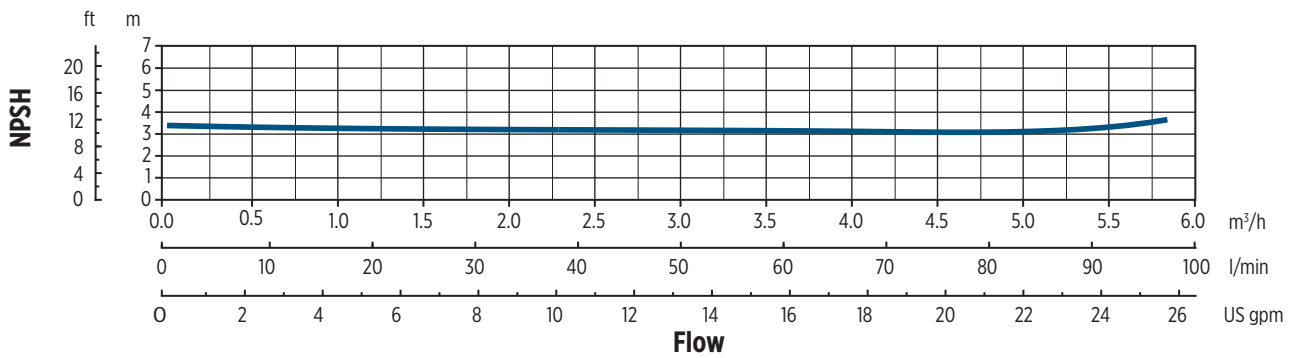
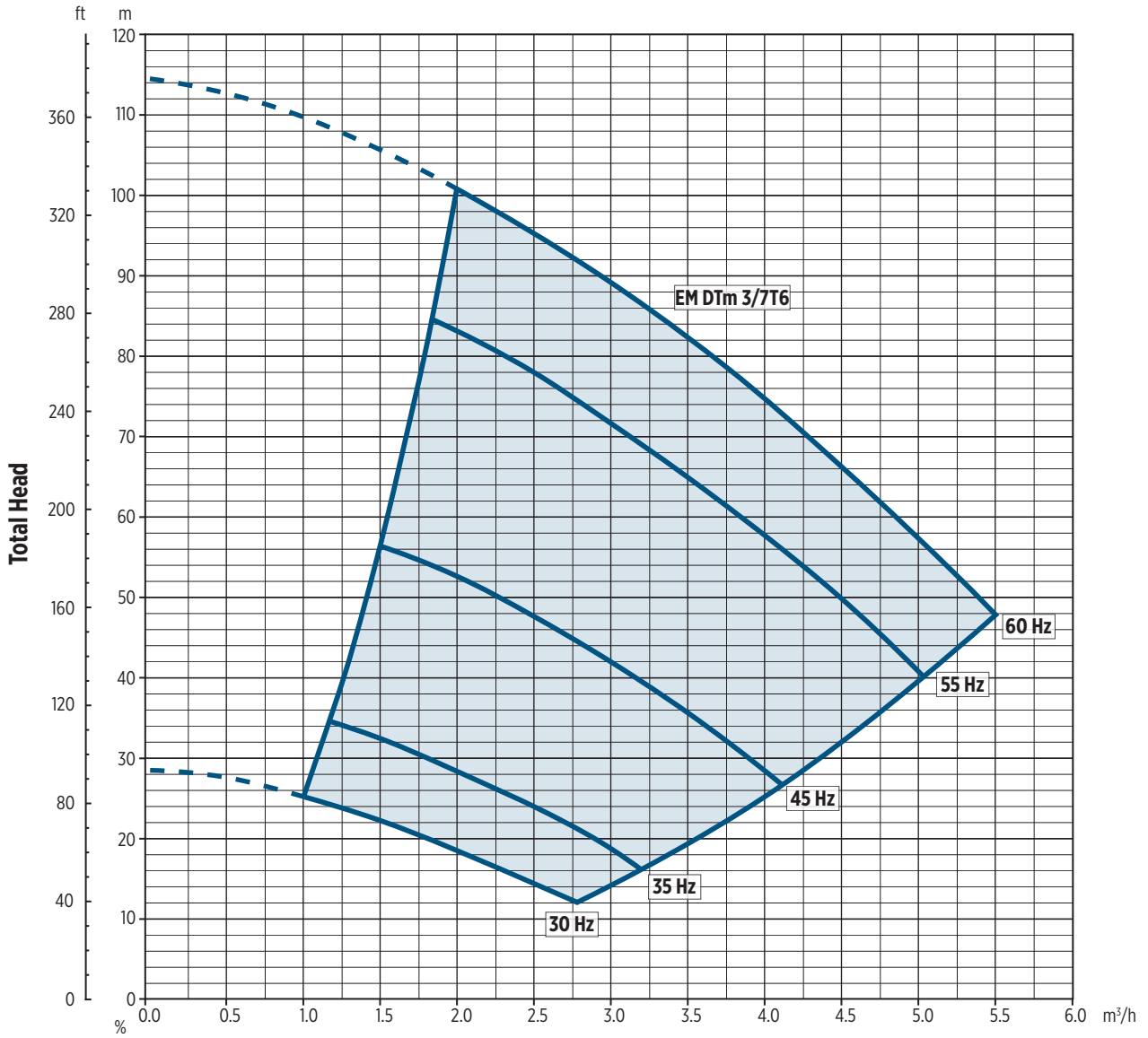
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The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B



# PERFORMANCE CURVES

MEI ≥ 0,40



The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B

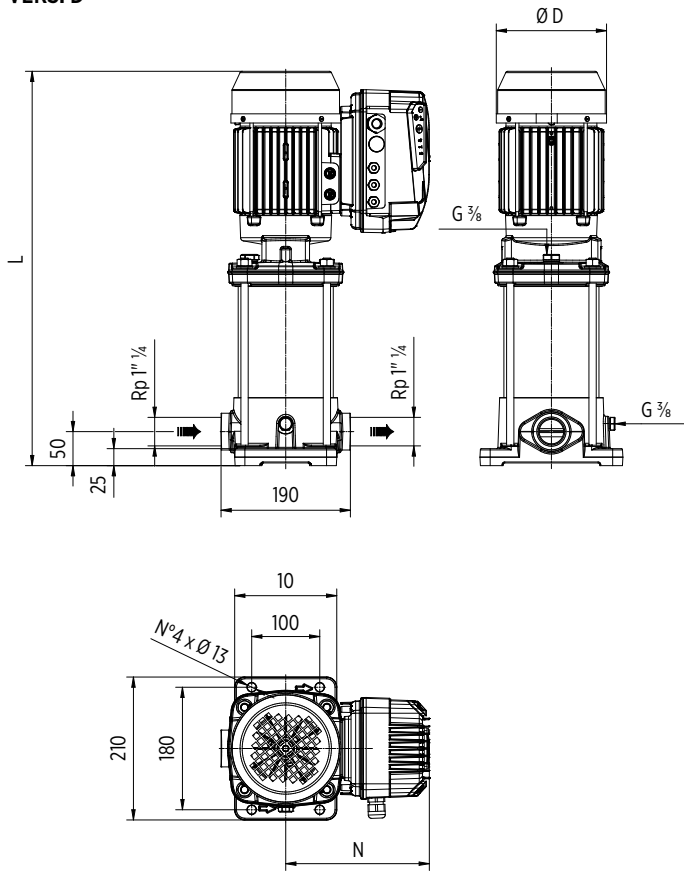
# EM DTm 5

## TECHNICAL DATA

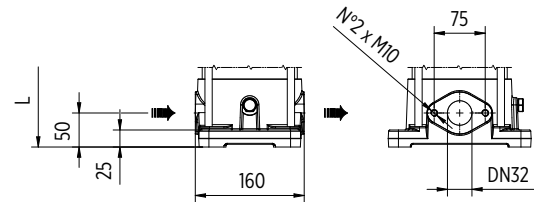
| Pump model   | Motor Size | MOTOR NOMINAL POWER |      | INPUT POWER [kW] | INPUT CURRENT [A] | Dimensions [mm] |     |     |     | Weight [Kg] |
|--------------|------------|---------------------|------|------------------|-------------------|-----------------|-----|-----|-----|-------------|
|              |            | [kW]                | [HP] |                  |                   | L               | L2  | D   | N   |             |
| EM DTm 5/3T6 | 71         | 1.1                 | 1.5  | 1.44             | 7.5               | 465.5           | 111 | 144 | 204 | 22.8        |
| EM DTm 5/5T6 | 90         | 2.2                 | 2.7  | 2.45             | 11.0              | 594.5           | 159 | 179 | 218 | 32.9        |

## DIMENSIONAL DRAWINGS

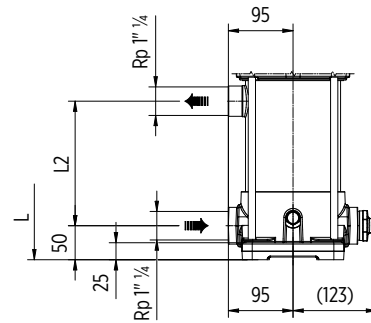
VERS. D



VERS. T



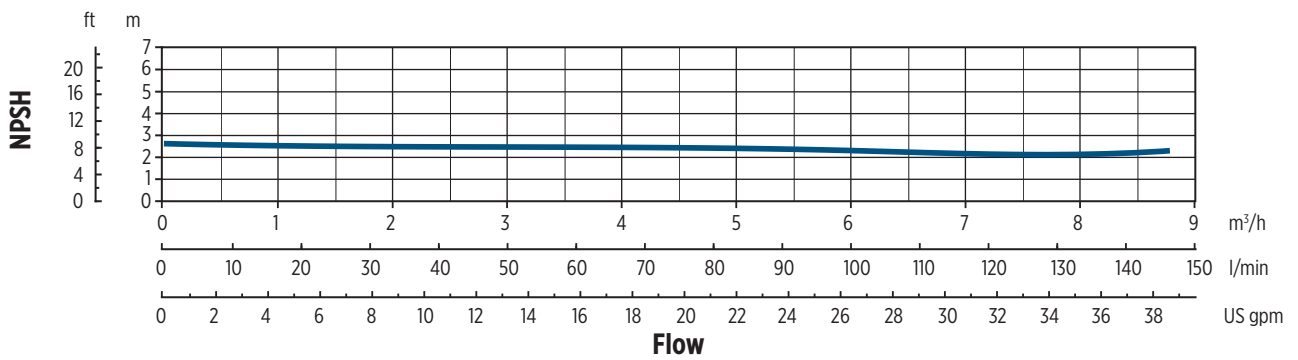
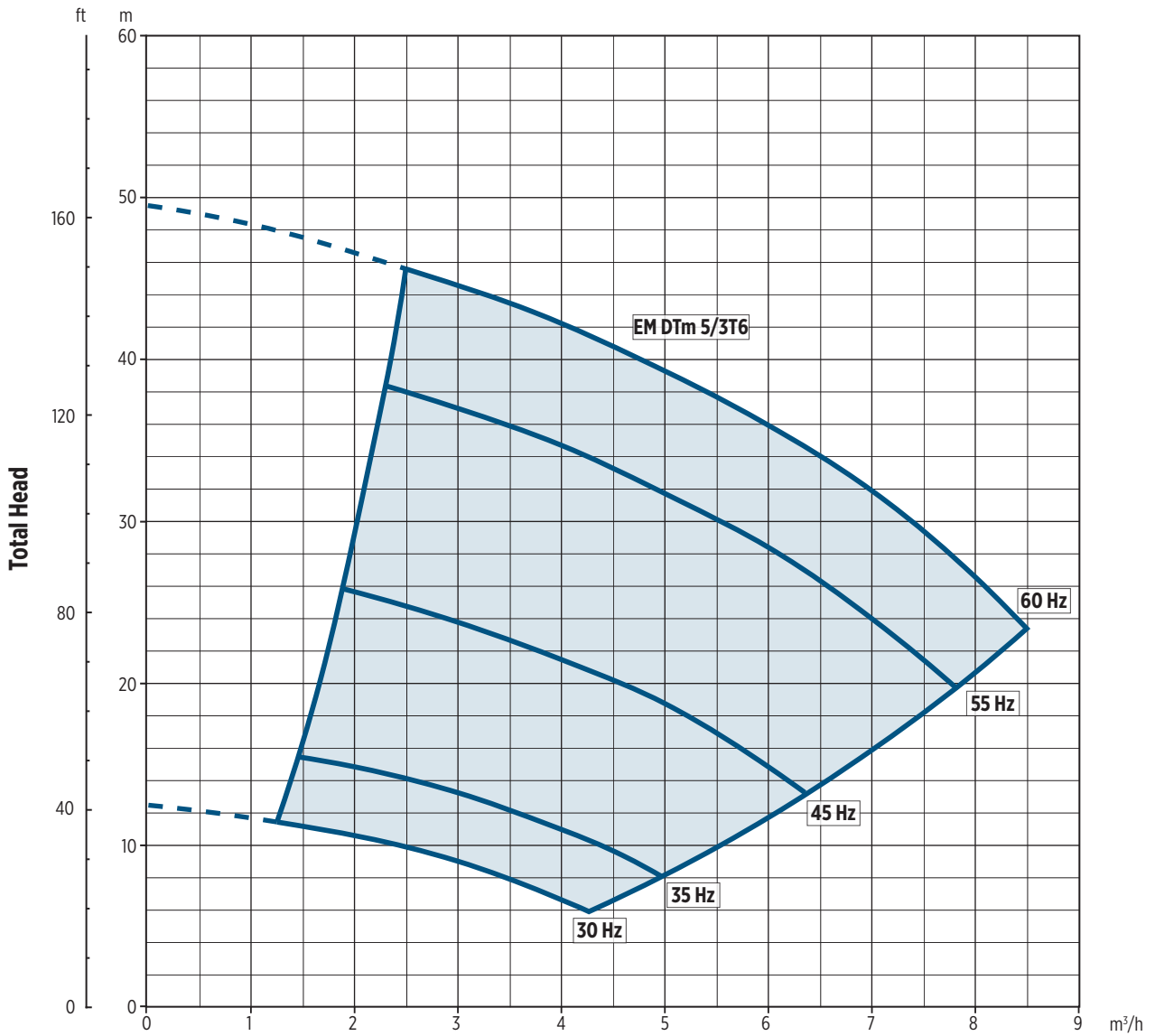
VERS. R



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# PERFORMANCE CURVES

MEI ≥ 0,40

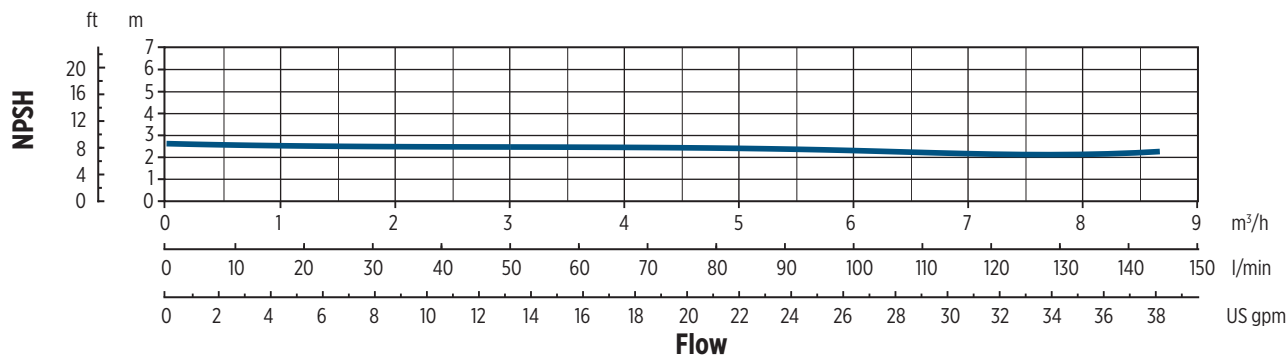
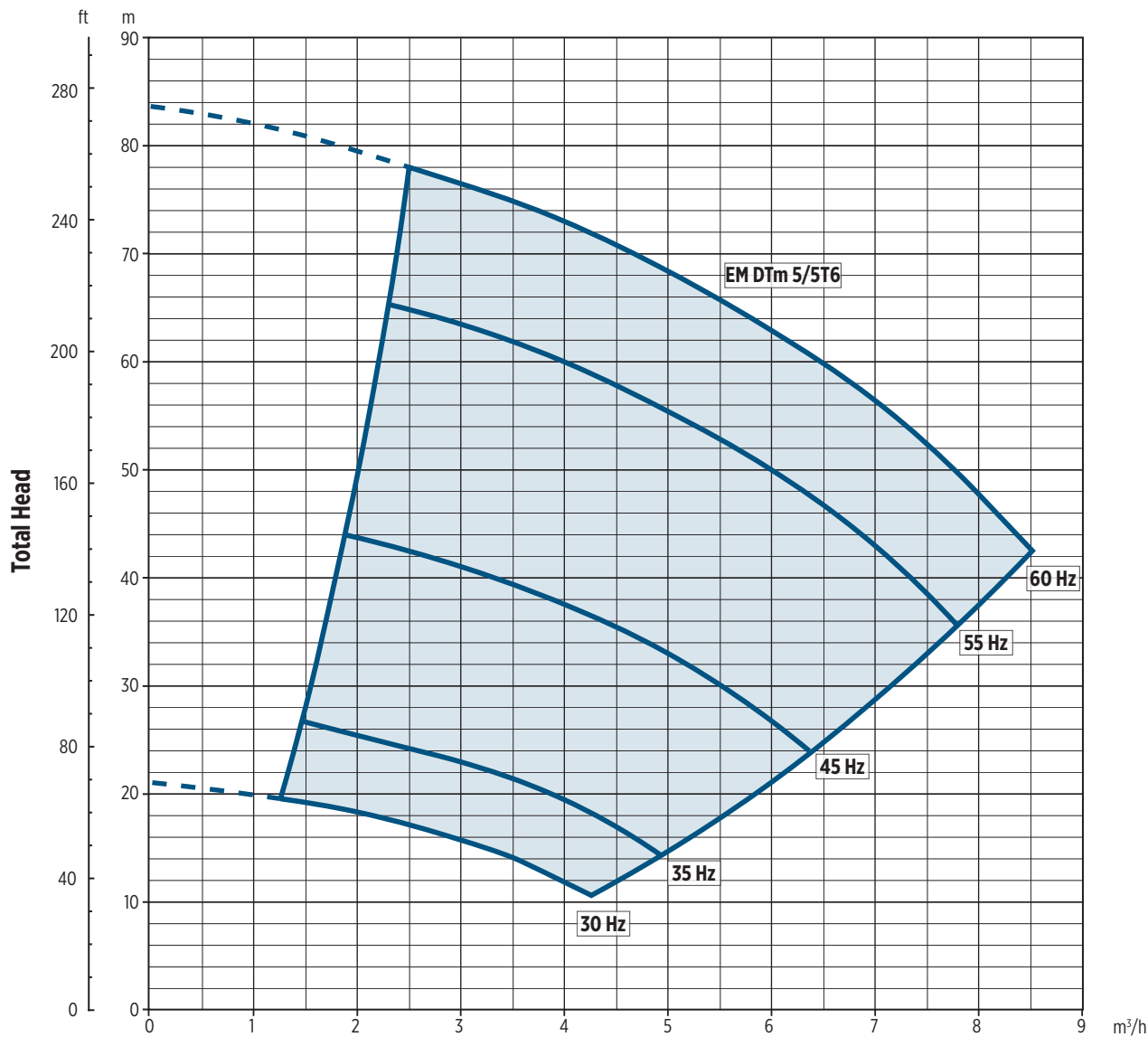


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The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B

# PERFORMANCE CURVES

MEI ≥ 0,40



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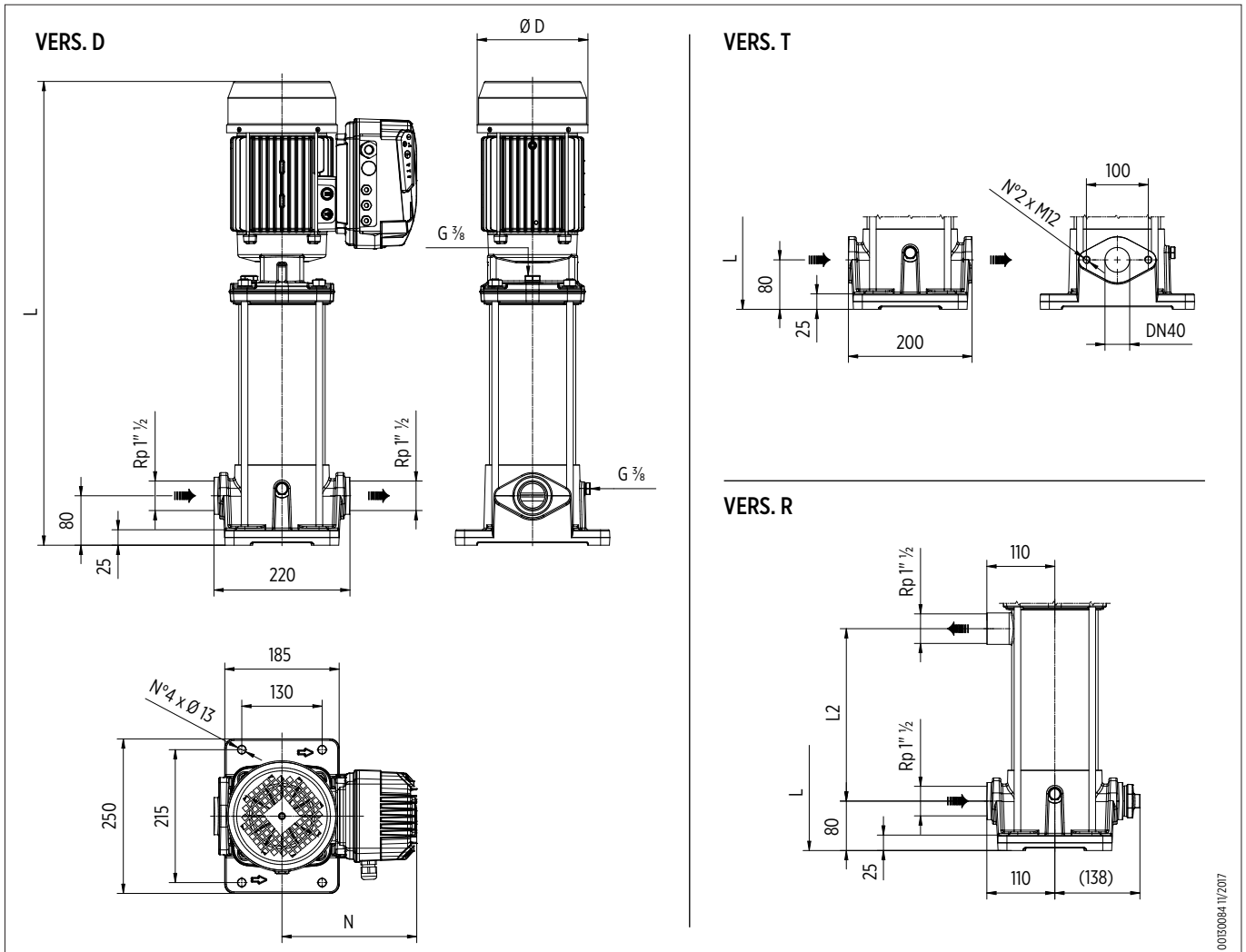
The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B

# EM DTm 9

## TECHNICAL DATA

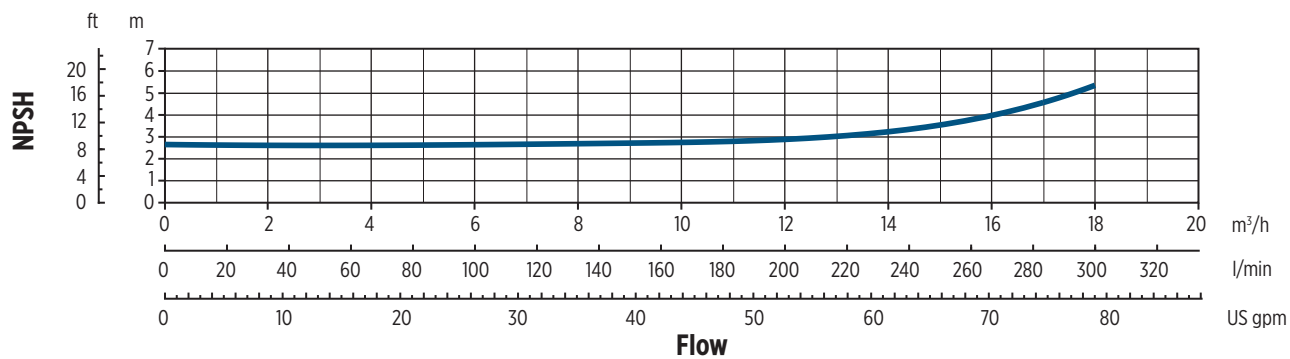
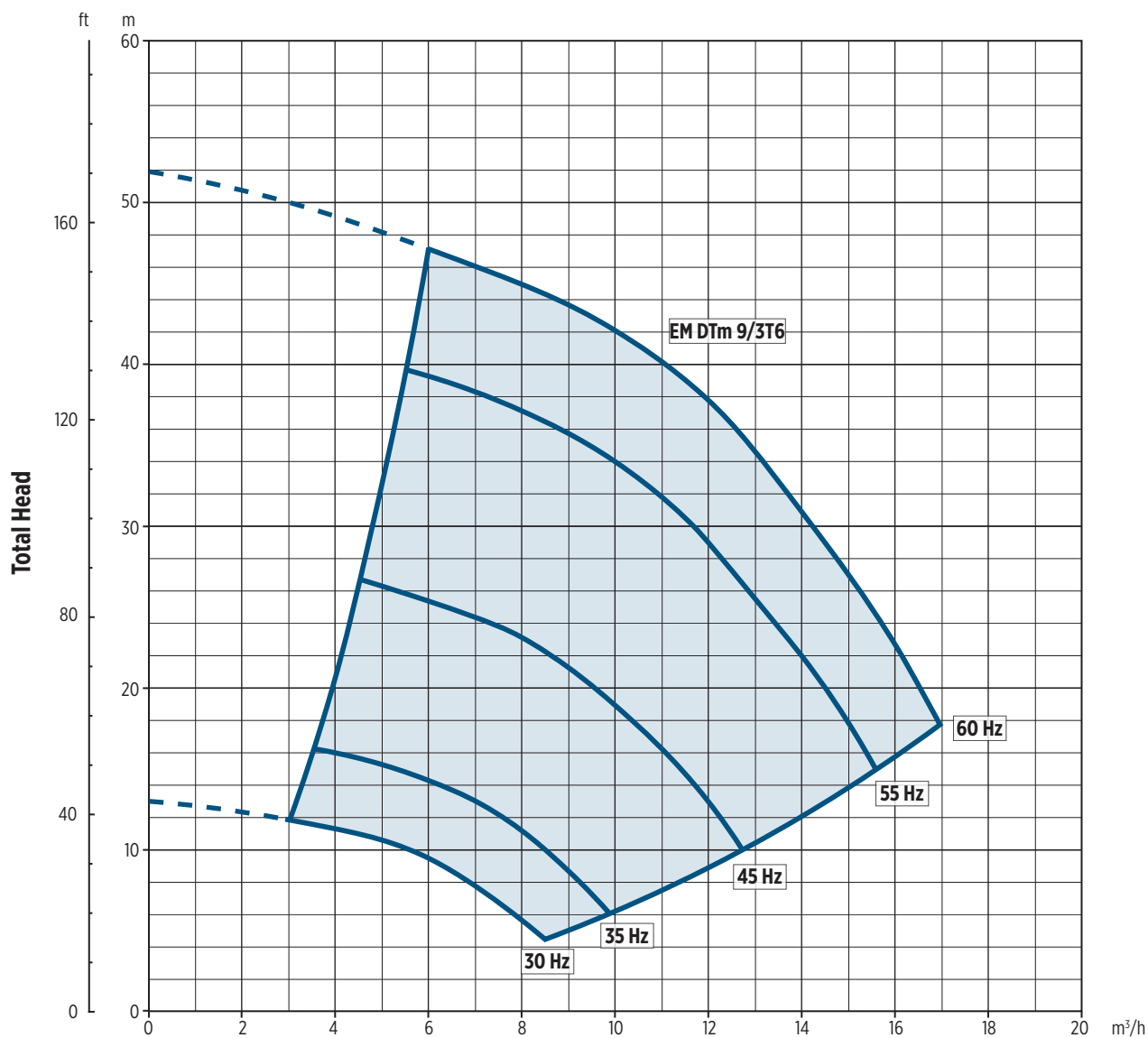
| Pump model   | Motor Size | MOTOR NOMINAL POWER |      | INPUT POWER | INPUT CURRENT [A] | Dimensions [mm] |     |     |     | Weight [Kg] |
|--------------|------------|---------------------|------|-------------|-------------------|-----------------|-----|-----|-----|-------------|
|              |            | [kW]                | [HP] | [kW]        | 220-230 V         | L               | L2  | D   | N   |             |
| EM DTm 9/3T6 | 90         | 2.2                 | 2.7  | 2.57        | 11.0              | 594             | 129 | 179 | 218 | 35.3        |

## DIMENSIONAL DRAWINGS



# PERFORMANCE CURVES

MEI ≥ 0,40



00120060EN/07/2017

The hydraulic characteristics are guaranteed, according to ISO standard 9906:2012, grade 3B











**Franklin Electric**