

# MTR, MTRE, SPK, MTH, MTA

Immersible pumps

50/60 Hz



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## 1. Introduction

### MTR, SPK and MTH



TM02 8540 0404\*

**Fig. 1** MTR, SPK and MTH pumps

MTR, SPK and MTH pumps are vertical multistage centrifugal pumps designed for pumping of cooling lubricants for machine tools, condensate transfer and similar applications.

The pumps are designed to be mounted on top of tanks with the chamber stack immersed in the pumped liquid.

The pumps come in various pump sizes and have various numbers of stages to provide the flow, the pressure and the installation length required. To meet specific depths of tanks or containers, the immersible length of the pump can be varied using empty chambers.

The pumps consist of two main components:  
The motor and the pump unit. The motor is a Grundfos standard MG motor designed to EN standards.  
The pump unit consists of optimised hydraulics, various types of connections, a motor stool, a given number of chambers and various other parts.

The pumps are available in two material versions

- standard range (A-version) with wetted parts of cast iron and stainless steel
- stainless steel version (I-version) with all wetted parts of stainless steel EN/DIN 1.4301 or better.

The mounting flange dimensions are according to DIN 5440. The mechanical shaft seal is according to EN 12 756.

### MTA



TM05 1132 2211

**Fig. 2** MTA and MTA-H

The MTA range of single-stage immersible pumps has been designed especially for filtering systems in the machine tool industry.

The MTA pumps efficiently transport liquid containing chips, fibres and abrasive particles to the filtering unit. The semi-open impellers allow the passing of chips up to 10 mm.

These low-pressure pumps are available in 9 different hydraulic variants and come with a choice between top suction or bottom suction.

The pumps are designed to be mounted on top of tanks with the pump part immersed into the pumped liquid.

The pump is designed to be maintenance free, and therefore does not contain shaft seals or other wear parts.

## 2. Applications

Application	MTR(E)	SPK	MTH	MTA
Boring	•	•	•	•
Sawing	-	-	-	•
Milling	•	•	•	•
Grinding	•	•	•	•
Spark erosion	•	•	•	-
Wire cutting	•	•	•	-
Turning	•	•	•	•
Chilling	•	•	•	•
Part washing	•	•	•	-
Filtration	-	•	•	•
Condensate systems	•	•	•	-
Wash and clean	•	•	•	-

- The pump is suitable for this application.

### Machine tool applications

Grundfos' range of high-pressure pumps offers unsurpassed accuracy and stability to make sure that nothing interferes with the delicate machining process. Equally important, high efficiency ensures a remarkably low heat input into the cooling lubricant. Integrated frequency converters can be optionally supplied for increased system efficiency and flexibility. Pumps suitable for machine tool applications are the immersible MTR, SPK, MTH, MTA and MTS, offering a tank mounted design. For MTS data, see section separate MTS data booklet.

### Machine tool sub applications

#### Boring

Grundfos is capable of providing the exact pressure and flow required for different materials, bore diameters and tool speeds in both through boring and blind boring. Our flexible range includes pumps supplying a pressure of up to 130 bar (MTS pumps), required for the deep blind-hole boring.

#### Milling/turning

The Grundfos range easily meets the individual cooling requirements of different materials in milling and turning - from low flow and low pressure to high flow and high pressure. The pumps are available in different lengths and customised to fit specific tank sizes. In fact, the modular construction of our pumps allows for more than 1,000,000 individual configurable variants.

#### Wire cutting

In wire cutting it is essential that the liquids are clean. This results in a more accurate process and extends the life of the filter. As a steady temperature is required for wire cutting operation, the process will benefit from a Grundfos E-solution.

#### Filtration

Reliable filtration is crucial in top quality machine tool applications, as it prolongs the life of the tool as well as prevents chips from damaging surfaces or tolerances. With semi-open impellers, MTA and MTB are ideal for transporting liquids containing chips, fibres and abrasive particles to the filtration system.

For MTB data, see section separate MTB data booklet.

#### Part washing

The Grundfos range includes pumps suitable for corrosive liquids and liquids with a high content of particles. Our frequency-converter operated pumps with high-efficiency motors ensure that systems operate under the best possible conditions with low-energy consumption. Pumps suitable for this application are MTB and all immersible pumps.

#### Chilling

The reliable and thoroughly-tested range of pumps for chillers offers a particularly diverse application spectrum. It covers cooling water circuits, washing plants, industrial circulation systems as well as general pressure boosting applications. All pumps are available with an E-motor to increase efficiency and perfectly control any process. Pumps suitable for this application are all immersible pumps.

#### Condensate systems

As condensate is normally pumped from a tank, an immersible pump will be a perfect choice. Compact solution as half the pump will be in the tank. Optimum suction as no pipes or valves are needed in front of inlet. For temperatures above 90 °C, a 120 °C version is available.

#### Wash & clean

As for condensate systems, wash and clean applications are typically based around a tank. So also here the immersible pumps can save space and secure optimum suction. A version in all stainless steel is available for aggressive liquids.

**MTRE - pumps with built-in frequency-converter**

TM05 8202 2113 - TM05 8203 2113

**Fig. 3** MTRE pumps

MTRE pumps are MTR pumps with an E-motor, i.e. a motor with built-in frequency control. Frequency control enables continuously variable control of motor speed, which makes it possible to set the pump to operate in any duty point. The motors of the MTRE pumps are Grundfos MGЕ motors designed to EN standards.

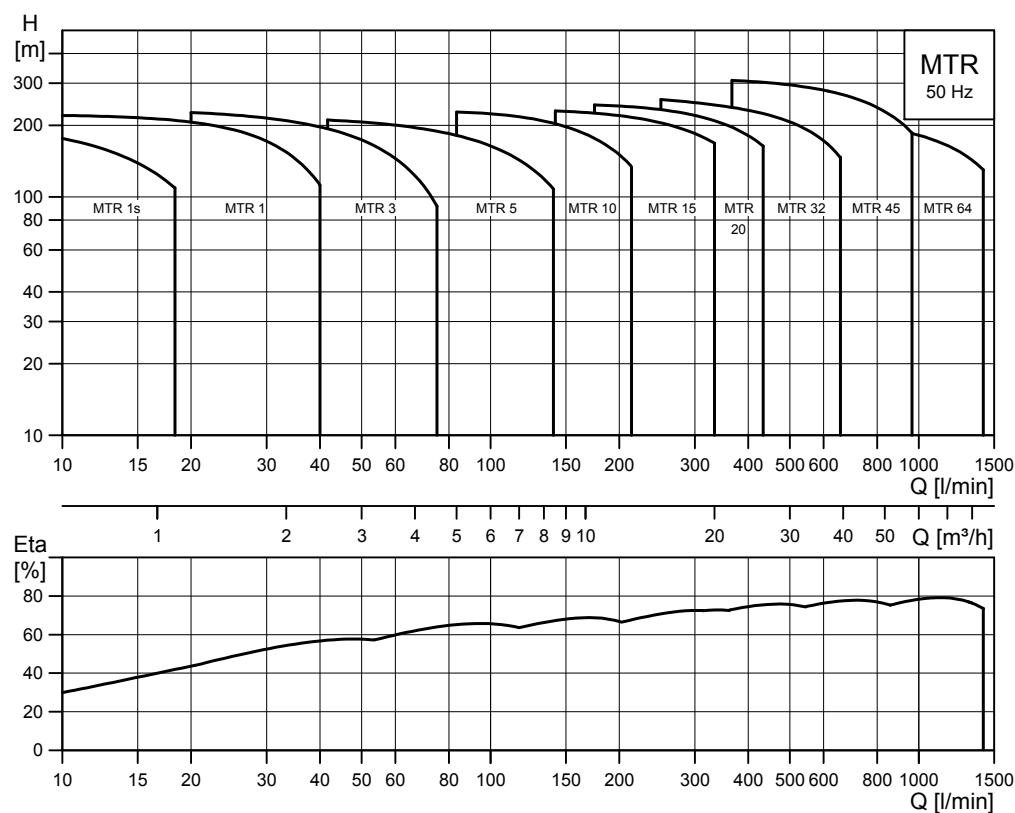
MTRE pumps are ideal for machining centres which operate with different machining processes and tools, as this will often result in different needs for flow and pressure.

The following features and benefits are typical for choosing an MTRE pump:

- energy savings
- low heat input into the cooling lubricant
- increased cooling efficiency
- better performance of the machining centre
- simple integration with the machining centre.

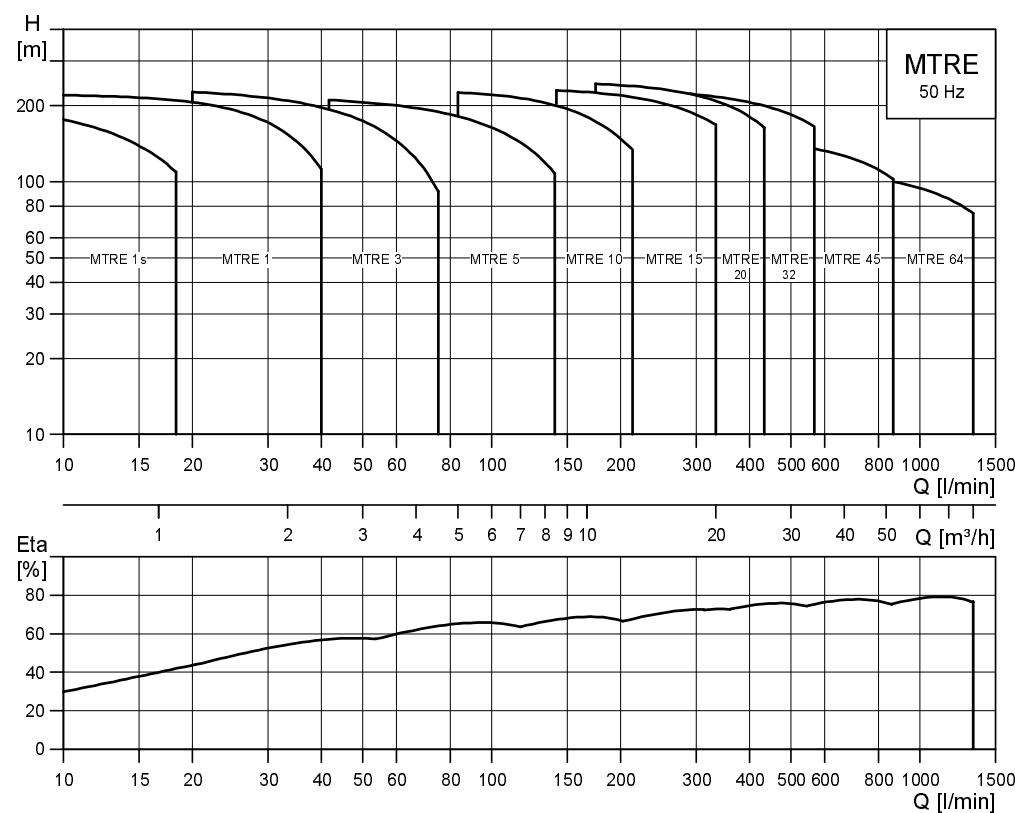
### 3. Performance range

#### MTR, 50 Hz

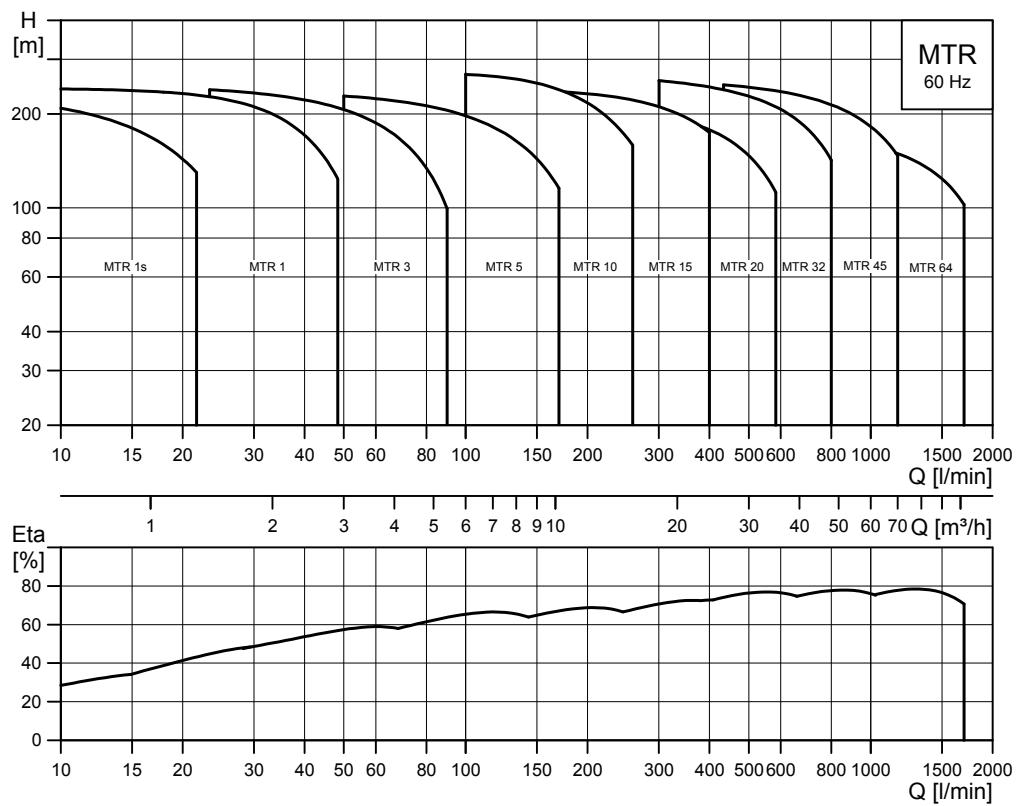


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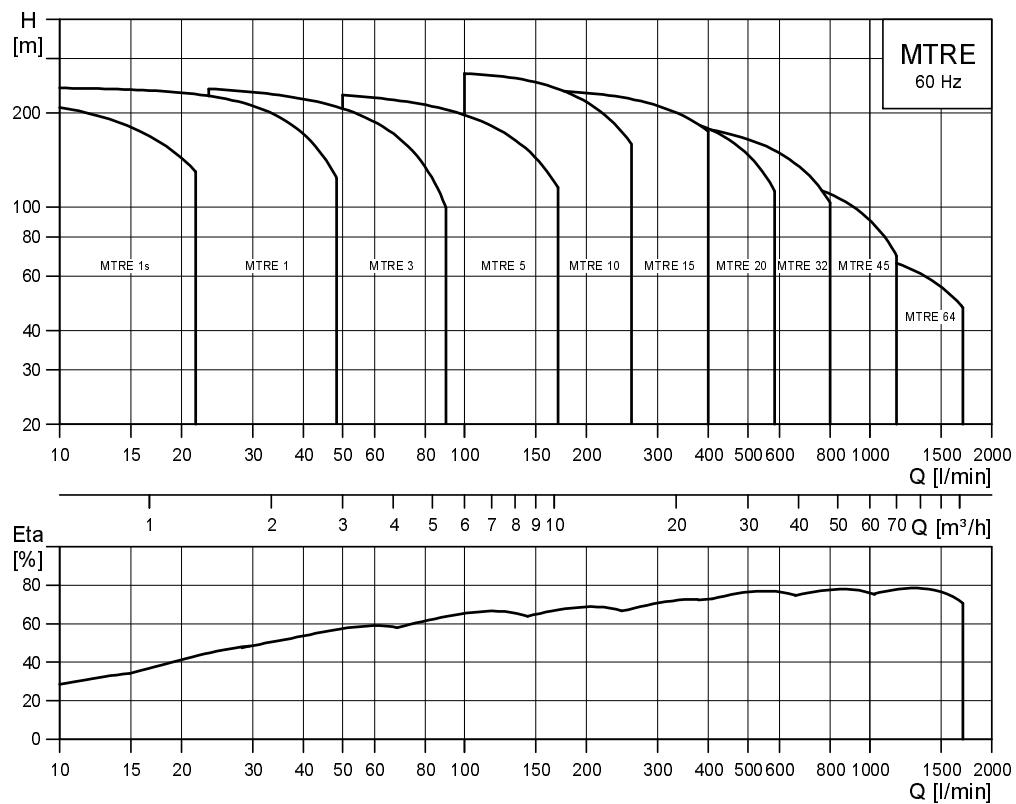
#### MTRE, 50 Hz



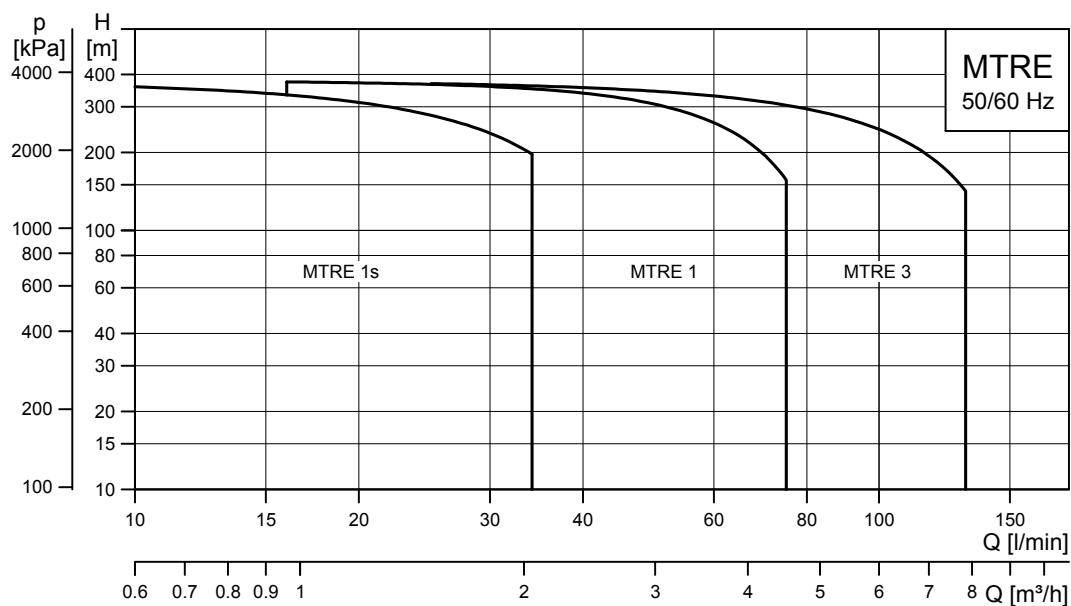
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**MTR, 60 Hz**

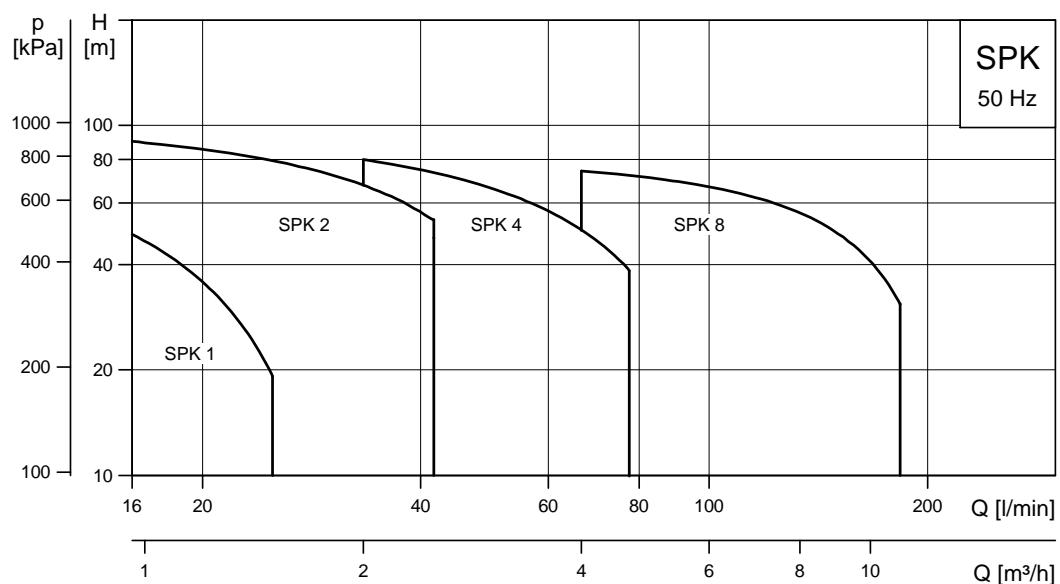
TM02 8105 2213

**MTRE, 60 Hz**

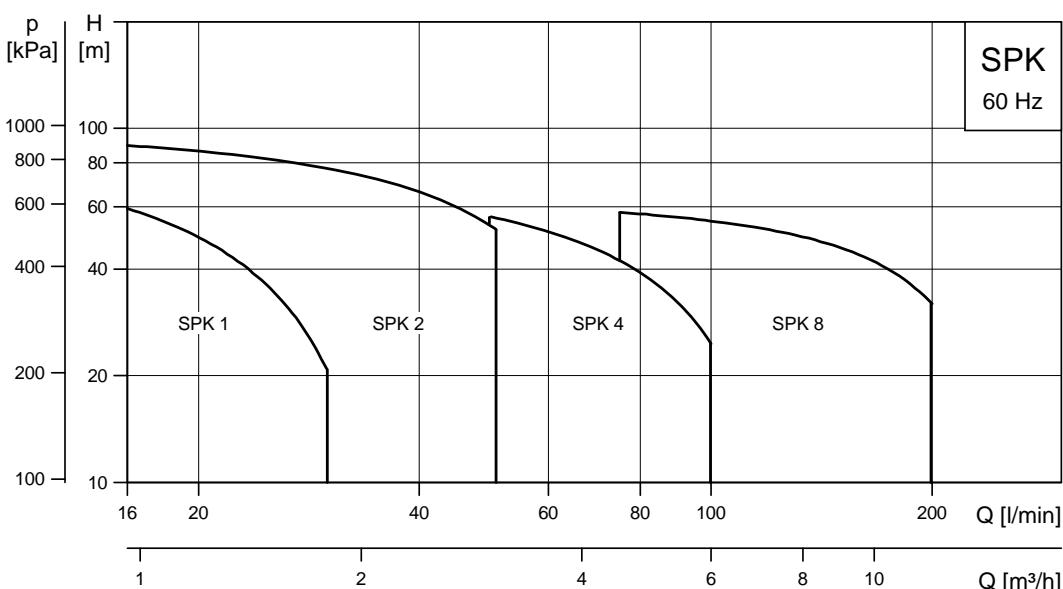
TM02 8554 2213

**MTRE high pressure, 50/60 Hz**

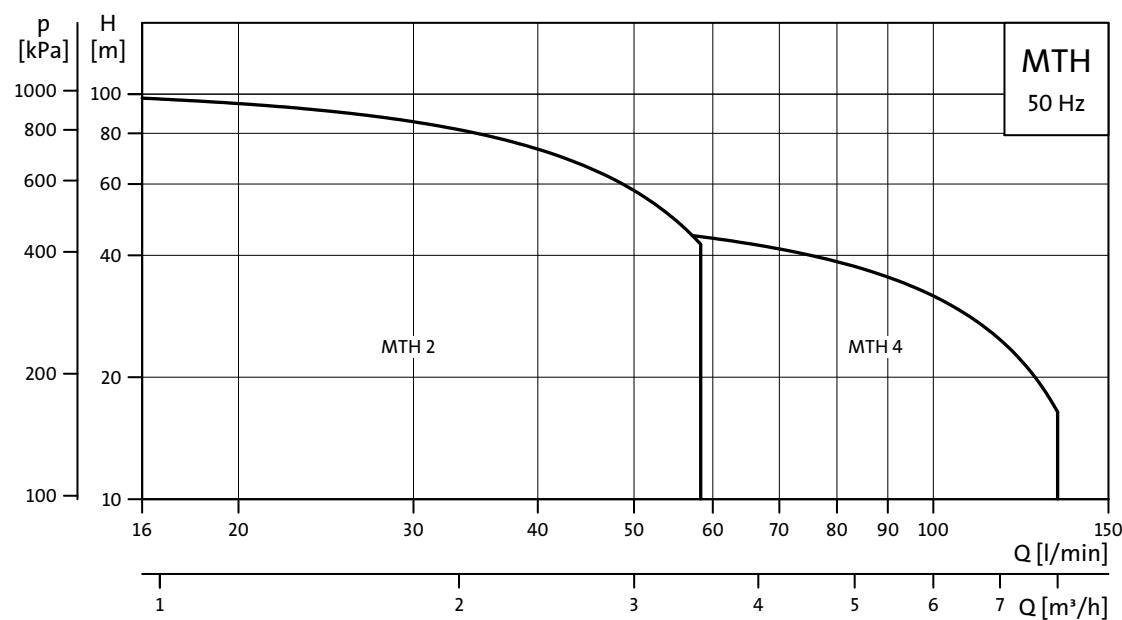
TM051565 3111

**SPK, 50 Hz**

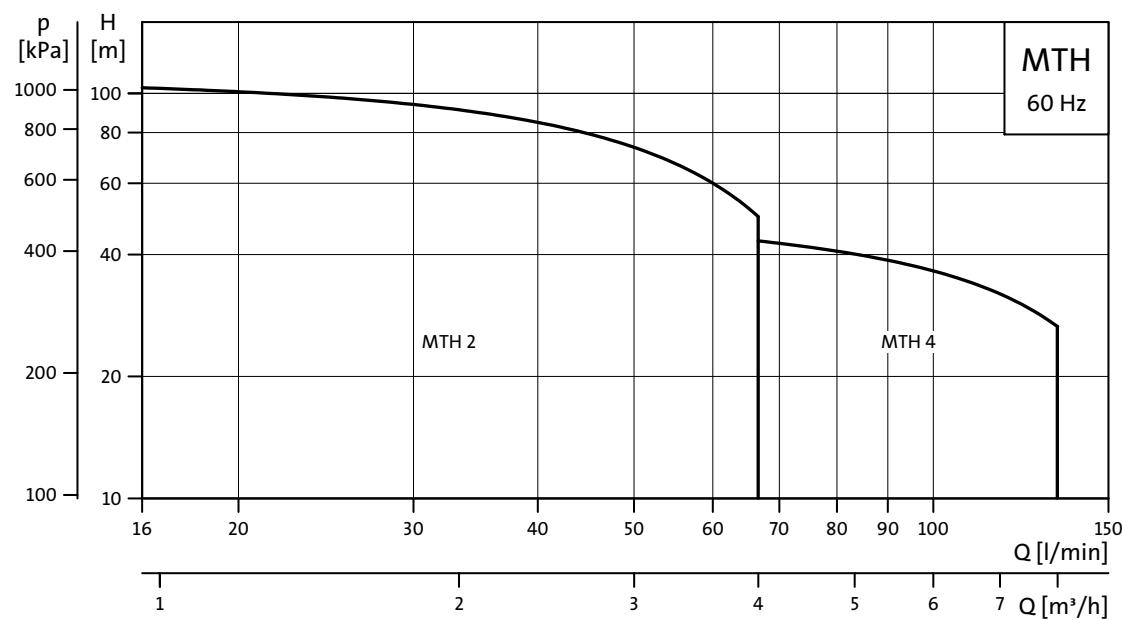
TM00 8398 0599

**SPK, 60 Hz**

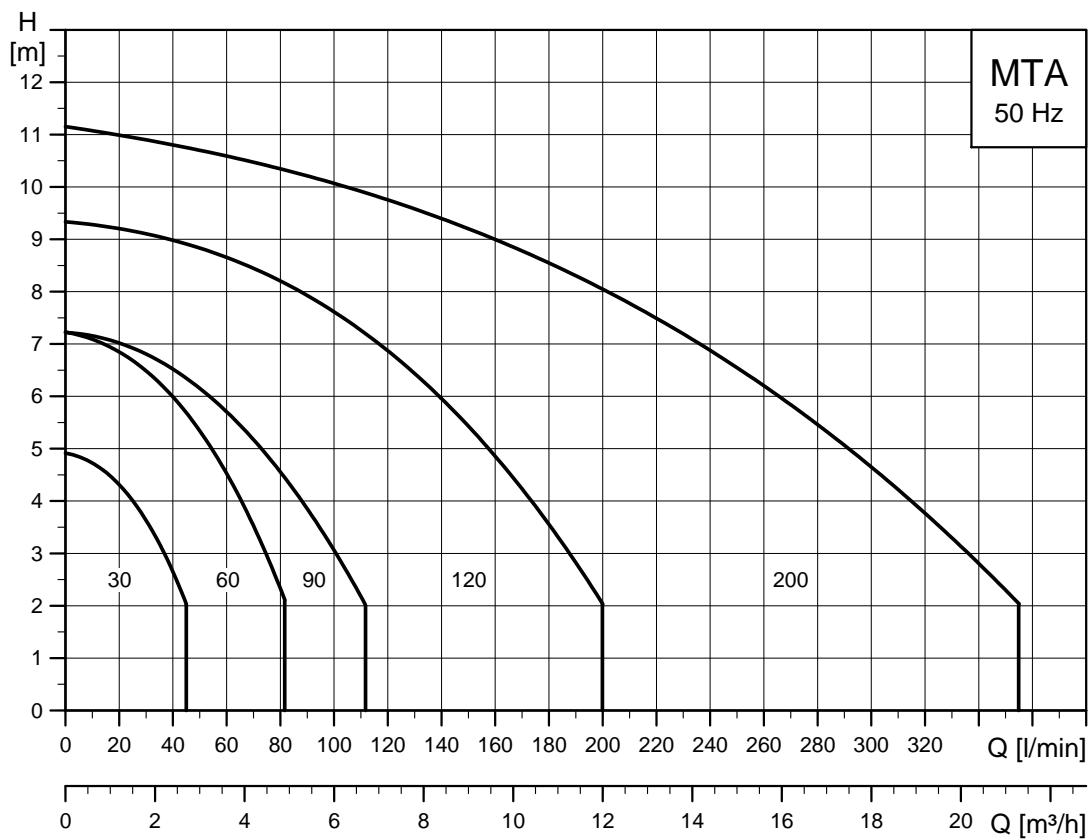
TM00 8397 0599

**MTH, 50 Hz**

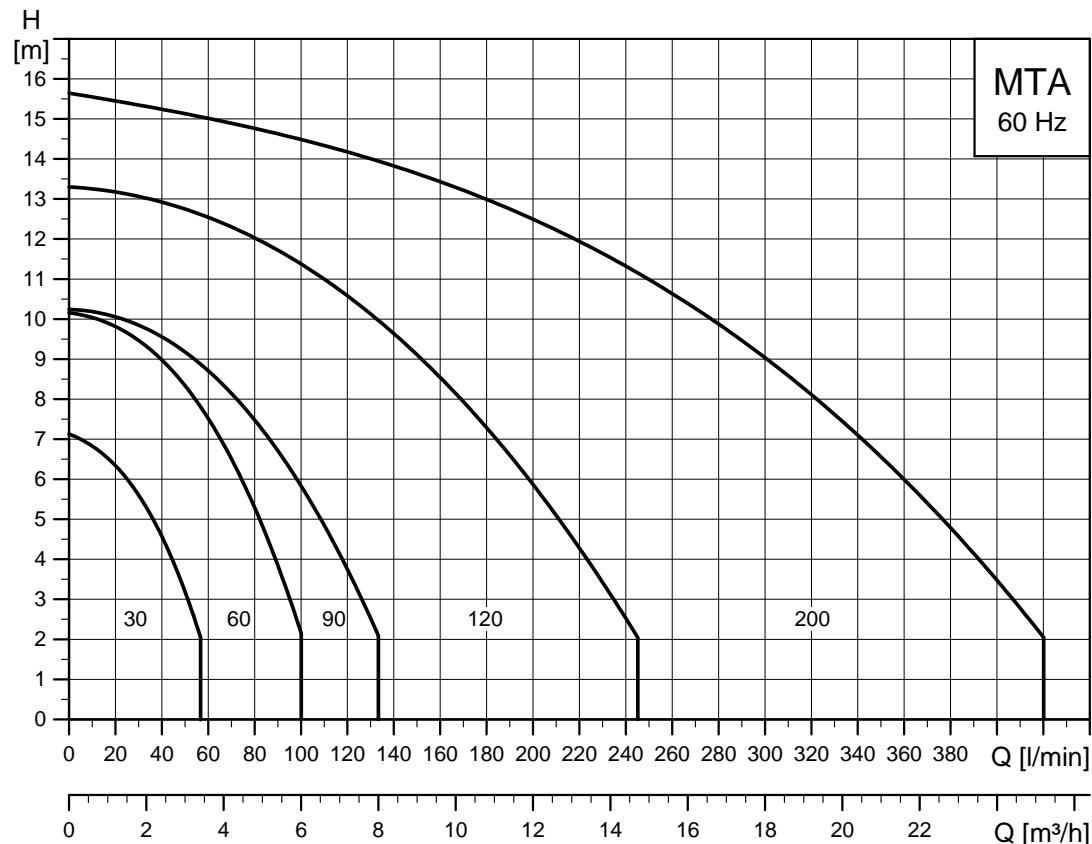
TM02 7828 4103

**MTH, 60 Hz**

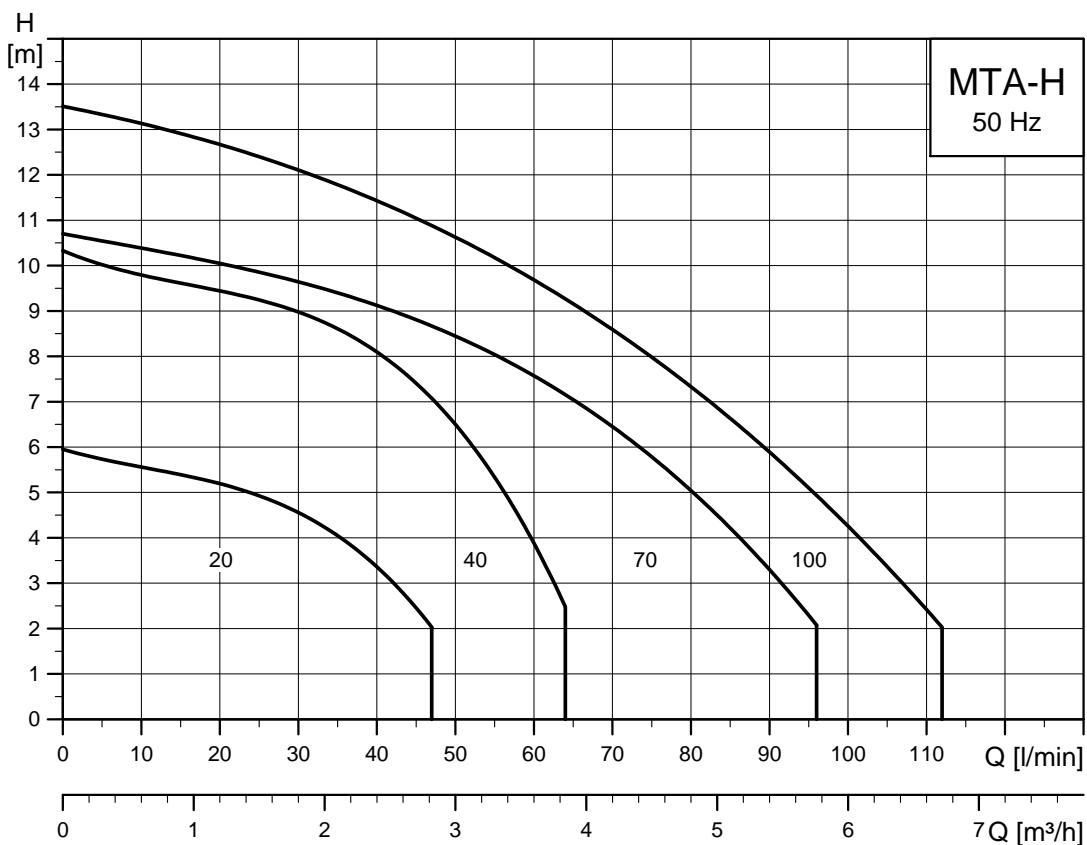
TM02 7829 4103

**MTA, 50 Hz**

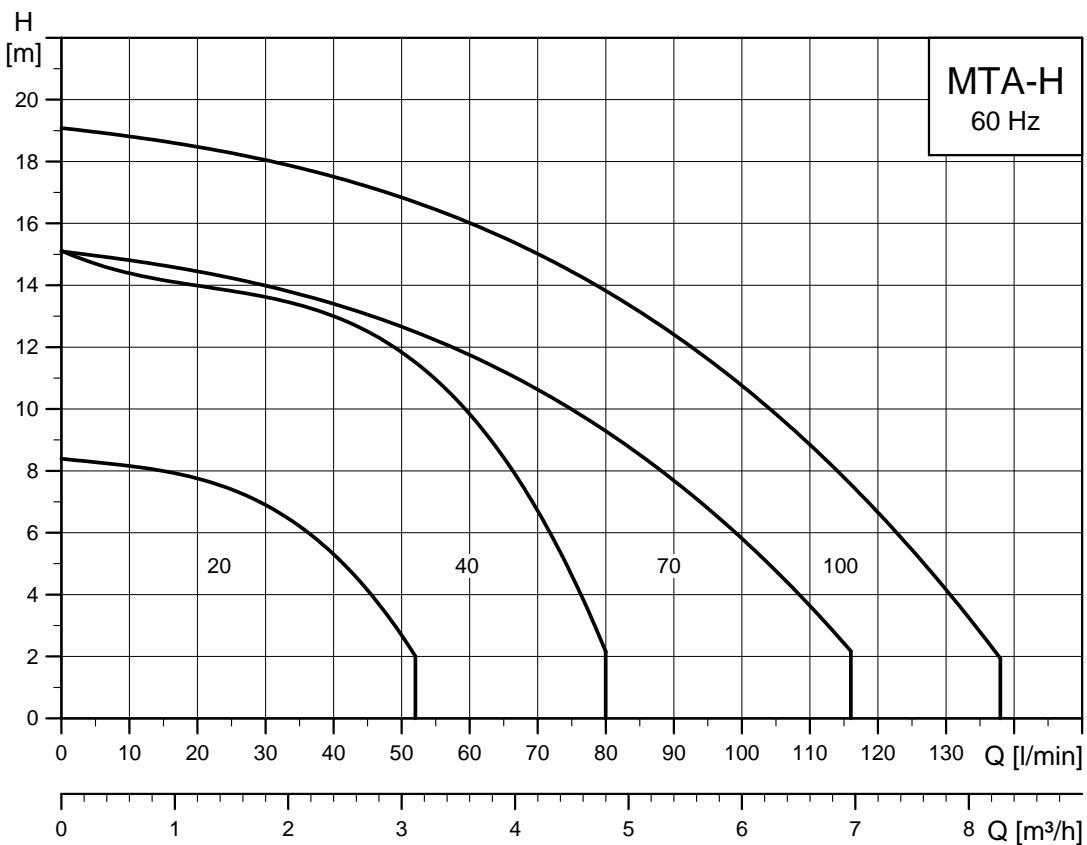
TM04 9437 1711

**MTA, 60 Hz**

TM04 9439 1711

**MTA-H, 50 Hz**

TM04 9438 171

**MTA-H, 60 Hz**

TM04 9440 171

## EuP ready

The MTR, MTRE, SPK and MTH pumps are energy-optimised and comply with the EuP Directive (Commission Regulation (EC) No 547/2012) which has been effective since 1 January 2013. As from this date, all pumps will be classified/graduated in the new minimum efficiency index (MEI).

## Minimum efficiency index

Minimum efficiency index (MEI) means the dimensionless scale unit for hydraulic pump efficiency at best efficiency point (BEP), part load (PL) and overload (OL). The Commission regulation (EU) sets efficiency requirements to  $MEI \geq 0.10$  as from 1 January 2013 and  $MEI \geq 0.40$  as from 1 January 2015. An indicative benchmark for best-performing water pump available on the market as from 1 January 2013 is determined in the regulation.

- The benchmark for most efficient water pumps is  $MEI \geq 0.70$ .
- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. The trimming of the impeller will adapt the pump to a fixed duty point, thus leading to reduced energy consumption. MEI is based on the full impeller diameter.
- The operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by using a variable-speed drive that matches the pump duty to the system requirement.
- Information on benchmark efficiency is available at <http://europump.eu/efficiencycharts>.

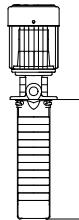
### Minimum efficiency index (MEI)

Pump type	MEI
MTR1s-3/3	0.67
MTR1-3/3	> 0.70
MTR3-3/3	> 0.70
MTR5-3/3	0.57
MTR10-3/3	> 0.70
MTR15-3/3	> 0.70
MTR20-3/3	> 0.70
MTR323/3	> 0.70
MTR45-3/3	> 0.70
MTR64-3/3	> 0.70
SPK1-3/3	0.56
SPK2-3/3	> 0.70
SPK4-3/3	0.14
SPK8-3/3	0.16
MTH2-30/3	> 0.70
MTH4-30/3	> 0.70

## 4. Product range

### MTR, MTRE

Pump	MTR, MTRE 1s	MTR, MTRE 1	MTR, MTRE 3	MTR, MTRE 5	MTR, MTRE 10	MTR, MTRE 15	MTR, MTRE 20	MTR, MTRE 32	MTR, MTRE 45	MTR, MTRE 64
<b>50 Hz</b>										
Rated flow rate [m³/h]	0.8	1	3	5	10	15	20	32	45	64
Rated flow rate [l/min]	13	17	50	83	167	250	333	533	750	1067
Temperature range [°C]					-10 - +90					
Maximum efficiency [%]	35	48	58	66	70	72	72	76	78	80
<b>MTR pumps</b>										
Flow range [m³/h]	0.3-1.3	0.7-2.4	1.2-4.5	2.5-8.5	5-13	8.5-23.5	10.5-29	15-40	22-58	30-85
Flow range [l/min]	5-22	12-40	20-75	42-142	83-217	142-392	175-483	250-667	367-967	500-1417
Maximum head [bar]	20	22	23	21	22	23	24	27	32	22
Motor power [kW]	0.37-1.1	0.37-2.2	0.37-3.0	0.37-5.5	0.37-7.5	1.1-15.0	1.1-18.5	1.5-30	3.0-45	4.0-45
<b>MTRE pumps</b>										
Flow range [m³/h]	0.3-1.3	0.7-2.4	1.2-4.5	2.5-8.5	5-13	8.5-23.5	10.5-29	15-40	22-58	30-85
Flow range [l/min]	5-22	12-40	20-75	42-142	83-217	142-392	175-483	250-667	367-967	500-1417
Maximum head [bar]	20	22	23	21	22	23	24	22	15	11
Motor power [kW]	0.37-1.1	0.37-2.2	0.37-3.0	0.37-5.5	0.37-7.5	1.1-15.0	1.1-18.5	1.5-22	3.0-22	4.0-22
<b>60 Hz</b>										
Rated flow rate [m³/h]	1	1.2	3.6	6	12	18	24	38	54	77
Rated flow rate [l/min]	17	20	60	100	200	300	400	633	900	1283
Temperature range [°C]					-10 - +90					
Maximum efficiency [%]	35	49	59	67	70	72	72	76	78	79
<b>MTR pumps</b>										
Flow range [m³/h]	0.4-1.6	0.8-2.9	1.4-5.4	3-10	6-15.5	10-28.5	13-35	18-48	26-70	36-102
Flow range [l/min]	7-27	13-23	48-90	50-167	100-258	167-475	217-583	300-800	433-1167	600-1700
Maximum head [bar]	22	24	23	23	26	23	21	27	26	18
Motor power [kW]	0.37-1.5	0.37-2.2	0.37-4.0	0.55-7.5	0.75-11	1.5-11.0	2.2-18.5	2.2-30	5.5-45	7.5-45
<b>MTRE pumps</b>										
Flow range [m³/h]	0.4-1.6	0.8-2.9	1.4-5.4	3-10	6-15.5	10-28.5	13-35	18-48	26-70	36-102
Flow range [l/min]	7-27	13-23	48-90	50-167	100-258	167-475	217-583	300-800	433-1167	600-1700
Maximum head [bar]	22	24	23	23	26	23	21	18	13	9
Motor power [kW]	0.37-1.5	0.37-2.2	0.37-4.0	0.55-7.5	0.75-11.0	1.5-11.0	2.2-11.0	2.2-22	5.5-22	7.5-22
<b>Material variants</b>										
Pump head (A-version): cast iron, EN-GJL-200	•	•	•	•	•	•	•	•	•	•
Pump head (I-version): stainless steel, EN 1.4408	•	•	•	•	•	•	•	•	•	•
<b>Pipe connection</b>										
<b>A-version</b>										
Internal thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 2	G 2	G 2	-	-	-
	-	-	-	-	Rp 2	Rp 2	Rp 2	-	-	-
Square flange with internal thread	Rp 1 1/4	Rp 1 1/4	Rp 1 1/4	Rp 1 1/4	-	-	-	-	-	-
Flange	-	-	-	-	-	-	-	DN 65	DN 80	DN 80
<b>I-version</b>										
Internal thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 2	G 2	G 2	-	-	-
	Rp 1 1/4	Rp 1 1/4	Rp 1 1/4	Rp 1 1/4	Rp 2	Rp 2	Rp 2	-	-	-
Flange	-	-	-	-	-	-	-	DN 65	DN 80	DN 80
<b>Installation length [mm]</b>										



160-1006 160-1006 160-1006 169-1006 148-1018 178-1033 178-1033 223-1343 244-1444 249-1487

#### Shaft seal \*

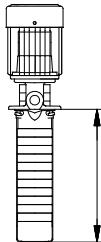
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\* Other shaft seals on request

**SPK**

Pump	SPK 1	SPK 2	SPK 4	SPK 8
<b>50 Hz</b>				
Rated flow rate [m³/h]	1	2	4	8
Rated flow rate [l/min]	16.7	33.3	67	133
Flow range [m³/h]	0.2-1.5	0.5-2.5	2.0-5.0	4.0-11
Flow range [l/min]	3.3-25	8.3-41.7	33.3-83	67-180
Maximum head [bar]	8.6	10.5	9.8	8.5
Motor power [kW]	0.06-0.55	0.06-0.75	0.06-1.1	0.25-2.2
Liquid temperature range [°C]	-10 - +90	-10 - +90	-10 - +90	-10 - +90
Maximum efficiency [%]	40	55	50	58
<b>Range 60 Hz</b>				
Rated flow rate [m³/h]	1	2	4	8
Rated flow rate [l/min]	16.7	33.3	67	133
Flow range [m³/h]	0.2-1.8	0.6-3.0	2.0-6.0	4.5-12
Flow range [l/min]	3.3-30	10.0-50	33.3-100	75-200
Maximum head [bar]	8.5	10.0	7.5	6.5
Motor power [kW]	0.06-0.55	0.06-1.1	0.12-1.1	0.37-2.2
Liquid temperature range [°C]	-10 - +90	-10 - +90	-10 - +90	-10 - +90
Maximum efficiency [%]	40	55	50	58
<b>Material variants</b>				
Pump head (A-version): cast iron, EN-GJL-200	•	•	•	•
Pump head (I-version): stainless steel, EN 1.4408	•	•	•	•
<b>Pipe connection</b>				
<b>A-version</b>				
Internal thread	G 3/4	G 3/4	G 3/4	G 1 1/4
Square flange with internal thread	Rp 3/4	Rp 3/4	Rp 3/4	Rp 1 1/4
<b>I-version</b>				
Internal thread	Rp 3/4 G 3/4	Rp 3/4 G 3/4	Rp 3/4 G 3/4	Rp 1 1/4 G 1 1/4
<b>Installation length [mm]</b>				



140-1005

140-1005

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140-1005

**Shaft seal \***

AUUV

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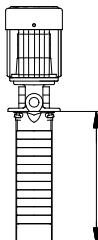
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\* Other shaft seals on request

**MTH**

Pump	MTH 2	MTH 4
<b>50 Hz</b>		
Rated flow rate [m <sup>3</sup> /h]	2.5	4
Rated flow rate [l/min]	42	67
Temperature range [°C]	-10 - +90	
Maximum efficiency [%]	68	66
Flow range [m <sup>3</sup> /h]	1 - 3.5	1-8
Flow range [l/min]	17-58	17-133
Maximum head [bar]	10	5
Motor power P1 [W]	255-1371	340-1340
<b>60 Hz</b>		
Rated flow rate [m <sup>3</sup> /h]	3	4.8
Rated flow rate [l/min]	50	80
Temperature range [°C]	-10 - +90	
Maximum efficiency [%]	45	45
Flow range [m <sup>3</sup> /h]	1-4	1-8
Flow range [l/min]	17-67	17-133
Maximum head [bar]	10	5
Motor power P1 [W]	315-1666	475-1600
<b>Material variants</b>		
Pump head (A-version): cast iron, EN-GJL-200	•	•
Pump head (I-version): stainless steel, EN 1.4408	•	•
<b>Pipe connection</b>		
<b>A-version</b>		
Internal thread	Rp 3/4	Rp 3/4
<b>I-version</b>		
Internal thread	Rp 3/4	Rp 3/4
<b>Installation length [mm]</b>		



145-289

145-307

**Shaft seal \***

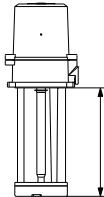
AQKV

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\* Other shaft seals on request

**MTA**

Pump	MTA 30	MTA 60	MTA 90	MTA 120	MTA 200	MTA 20H	MTA 40H	MTA 70H	MTA 100H
<b>Range</b>									
<b>50 Hz</b>									
Rated flow rate [l/min]	30	50	80	100	200	20	35	60	90
Temperature range [°C]					0-60				
Flow range [l/min]	0-45	0-82	0-111	0-200	0-355	0-47	0-67	0-95	0-112
Maximum head [m]	4.9	7.2	7.2	9.3	11.1	5.9	10.2	10.2	13.5
<b>60 Hz</b>									
Rated flow rate [l/min]	35	60	96	120	250	24	42	72	108
Temperature range [°C]					0-60				
Flow range [l/min]	0-56	0-100	0-134	0-245	0-420	0-52	0-81	0-114	0-138
Maximum head [m]	7.1	10.1	10.2	13.3	15.6	8.4	14.2	14.6	19.1
<b>Pipe connection</b>									
	Rp 3/8	Rp 1/2	Rp 3/4	Rp 1	Rp 2	Rp 3/8	Rp 1/2	Rp 3/4	Rp 1
Internal thread	G 1/2	G 3/4	G 3/4	G 1 1/4	G 1 1/2	G 1/2	G 3/4	G 3/4	G 1
	1/2" NPT	3/4" NPT	3/4" NPT	1 1/4" NPT	1 1/2" NPT	1/2" NPT	3/4" NPT	3/4" NPT	1" NPT
<b>Material</b>									
Pump housing	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron	Cast iron
Impeller	PAA GF50	PAA GF50	PAA GF50	Bronze	Bronze	Bronze	Bronze	Bronze	Bronze
<b>Installation length [mm]</b>									



150      130-350      130-350      180-350      250-350      150      180      250      280

**Suction**

Top suction	•	•	•	•	-	•	•	•	•
Bottom suction	•	•	•	•	•	-	-	•	-

\* Impeller material: PAA GF50

## 5. Motors

### Motors for MTR and SPK pumps

MTR and SPK pumps are fitted with a totally enclosed, fan-cooled, 2-pole Grundfos standard MG motor with principal dimensions according to IEC, DIN and British standards.

Electrical tolerances according to EN 60034.

<b>Mounting designation</b>	Up to 4 kW	V 18/B 14
	From 5.5 kW	V 1/B 5
<b>Efficiency class</b>	0.06 - 0.55 kW	-
	0.75 - 45 kW	IE2
<b>Enclosure class</b>	IP55	
<b>Insulation class</b>	F	
<b>Supply voltage, 50 Hz</b> (- 10 %/+ 10 %)	0.06 - 45 kW: 0.37 - 5.5 kW 7.5 - 45 kW	3 x 220-240/380-415 V 3 x 380-415 V Δ 3 x 380-415/660-690 V
	0.06 - 0.18 kW 0.25 - 1.1 kW 1.5 - 45 kW 0.37 - 5.5 kW 7.5 - 45 kW	3 x 220-277/380-480 V 3 x 220-255/380-440 V 3 x 220-277/380-480 V 3 x 380-440 V Δ 3 x 380-480/660-690 V
<b>MTR pumps are also available for these supply voltages</b>		
<b>Supply voltage, 50 Hz</b>	0.06 - 45 kW	3 x 200-220/346-380 V
<b>Supply voltage, 60 Hz</b>	0.06 - 45 kW 0.25 - 45 kW	3 x 200-230/346-400 V 3 x 208-230/460-480 V

For detailed electrical data see section "Motor data" on page 144.

On request, Grundfos MG motors are available with cURus approvals carried out by the Underwriters Laboratories Inc. according to UL 1004 Electric motor standard.

### Motors for MTH pumps

MTH motors are totally enclosed, fan-cooled, 2-pole Grundfos standard motors with principal dimensions according to IEC, DIN and British standards.

<b>Enclosure class</b>	IP55
<b>Insulation class</b>	F
<b>Supply voltage, 50 Hz</b> (- 10 %/+ 10 %)	3 x 220-240/380-415 V 3 x 200-220/346-380 V
<b>Supply voltage, 60 Hz</b> (- 10 %/+ 10 %)	3 x 220-255/380-440 V 3 x 200-230/346-400 V 3 x 208-230/460 V

### Motors for MTA pumps

<b>Efficiency class (only MTA 200, 750 W)</b>	IE3
<b>Enclosure class</b>	IP54
<b>Insulation class</b>	F
<b>Supply voltage, 50 Hz</b> (- 10 %/+ 10 %)	3 x 220-240/380-415 V 3 x 200 V
<b>Supply voltage, 60 Hz</b> (- 10 %/+ 10 %)	3 x 220-240/380-440 V 3 x 200-220 V 3 x 208-230/460 V

We do not recommend operation via frequency converter.

### Grundfos standard motors

#### Motor protection

Single-phase Grundfos motors have a built-in thermal overload switch (IEC 34-11:TP 211).

Three-phase motors must be connected to a motor-protective circuit breaker in accordance with local regulations.

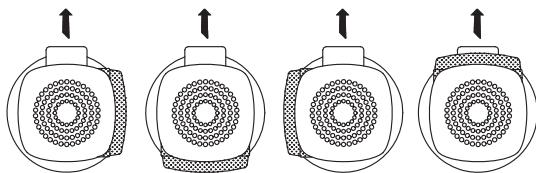
Three-phase Grundfos motors from 3 kW and upwards have a built-in thermistor (PTC) according to DIN 44082 (IEC 34-11:TP 211).

## Terminal box positions

MTR, MTRE, SPK and MTH

Pump	Terminal box positions			
	3 o'clock	6 o'clock (standard)	9 o'clock	12 o'clock
MTR	•	•	•	•
MTRE	•	•	•	•
SPK	•	•	•	•
MTH	•	•	•	-
MTA				
Pump	Terminal box positions			
	3 o'clock	6 o'clock	9 o'clock (standard)	12 o'clock
MTA 30	•	-	•	-
MTA 60	•	(•)	•	(•)
MTA 90	•	(•)	•	(•)
MTA 120	(•)	(•)	•	(•)
MTA 200	(•)	(•)	•	(•)
MTA 20H	•	-	•	-
MTA 40H	•	(•)	•	(•)
MTA 70H	•	(•)	•	(•)
MTA 100H	(•)	(•)	•	(•)

- This position is possible. The pump can be ordered with the terminal box in this position or the terminal box can be turned to this position after delivery.
- (•) This position is possible, but the terminal box cannot be turned to this position after delivery. Therefore the pump must be ordered with the terminal box in this position.
- This position is not possible.



Position 3 o'clock      Position 6 o'clock      Position 9 o'clock      Position 12 o'clock

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Fig. 4 Terminal box positions, top view

## Maximum number of starts

Pump	Motor [kW]	Recommended maximum number of starts per hour
MTR	0.06 - 0.18	100
	0.25 - 2.2	250
	3 - 4	100
	5.5 - 11	50
	15 - 22	40
	30 - 45	8
MTA	All	250

## Sound pressure level

Pump	Motor [kW]	$\bar{L}_{pA}$ [dB(A)]	
		50 Hz	60 Hz
MTR	0.06	41	41
	0.12	41	41
	0.18	41	41
	0.25	56	62
	0.37	53	58
	0.55	53	56
	0.75	53	57
	1.1	60	65
	1.5	59	65
	2.2	61	66
SPK	3.0	59	64
	4.0	65	69
	5.5	63	68
	7.5	60	65
	11	60	65
	15	60	65
	18.5	60	65
	22	64	69
	30	71	75
	37	71	75
	45	71	75
MTH	< 70	< 70	< 70
MTA 30	< 45	< 45	< 45
MTA 60	< 45	< 45	< 45
MTA 90	< 45	< 45	< 45
MTA 120	< 62	< 62	< 62
MTA 200	< 62	< 62	< 62
MTA 20H	< 45	< 45	< 45
MTA 40H	< 45	< 45	< 45
MTA 70H	< 45	< 45	< 45
MTA 100H	< 62	< 62	< 62

The values have been measured according to EN ISO 4871.

## Viscosity and density

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption. In such situations, the pump should be fitted with a larger motor. If in doubt, contact Grundfos.

## Ambient temperature

### MTR, SPK

Motor power [kW]	Motor make	Motor efficiency class	Maximum ambient temperature at full load [°C]	Maximum altitude above sea level [m]
0.06-0.18	Siemens	-	40	1000
0.25-0.55	Grundfos MG	-	40	1000
0.75-22	Grundfos MG	IE2	60	3500
30-45	Siemens	IE2	55	2750

If the ambient temperature exceeds the above temperature values, or the pump is installed at an altitude exceeding the above altitude values, the motor must not be fully loaded due to the risk of overheating. Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air.

In such cases, it may be necessary to use a motor with a higher rated output.

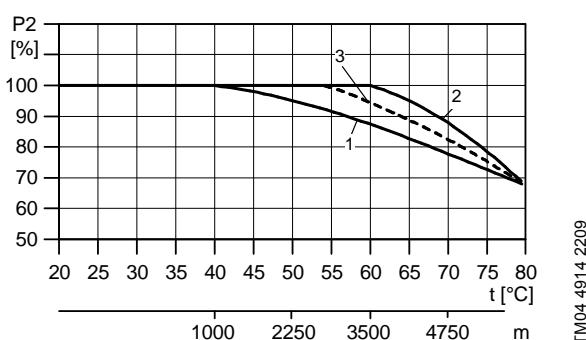


Fig. 5 The maximum motor output depends on the ambient temperature/altitude.

### Legend

Pos.	Description
1	0.06-0.18 kW motors (Siemens): 0.37-0.55 kW motors (MG):
2	0.75-22 kW motors (MG, IE2):
3	30-45 kW motors (Siemens, IE2)

**Example:** A pump with a 1.1 kW IE2 MG motor: If this pump is installed 4750 m above sea level, the motor must not be loaded more than 88 % of rated output. At an ambient temperature of 75 °C, the motor must not be loaded more than 78 % of rated output. If the pump is installed 4750 m above sea level at an ambient temperature of 75 °C, the motor must not be loaded more than 88 % x 78 % = 68.6 % of rated output.

### MTH

The motor used on an MTH pump is not shown in the list above, but the maximum ambient temperature at full load is the same as for MG motors.

### MTA

Max. permissible ambient temperature [°C]	40
---	----

### Optional motors

The Grundfos standard range of motors meets a wide variety of system requirements.

For special applications or operating conditions, we offer custom-built motors, such as:

- ATEX-approved motors
- MG motors with anti-condensation heating unit
- motors with thermal protection.

### Grundfos blueflux®

Grundfos blueflux® technology represents the best from Grundfos within energy-efficient motors and frequency converters. Grundfos blueflux® solutions either meet or exceed legislative requirements, such as the EuP IE3 and IE4 grades.



Fig. 6 Grundfos blueflux® label

To read more about the energy challenge and Grundfos blueflux®, please visit [grundfos.com/energy](http://grundfos.com/energy).

### Motors for MTRE pumps

MTRE is an MTR pump with frequency-controlled motors, type MGE.

### MGE motors

The MGE motor is a totally enclosed, fan-cooled, 2-pole Grundfos frequency-controlled motor with principal dimensions in accordance with the EN standards.

Electrical tolerances comply with EN 60034.

MTRE pumps from 0.37 to 22 kW are fitted with three-phase MGE motors as standard.

0.37 to 1.5 kW single-phase MGE motors are available on request.

See WinCAPS or WebCAPS on [www.grundfos.com](http://www.grundfos.com).

## Motor data for MGE

MGE motor size (MTRE)		
Mounting designation	Up to 4 kW	V18
	5.5 kW and up	V1
	0.75 to 2.2 kW	Above IE4 level *
Efficiency class	3 to 22 kW:	IE3
	0.37 and 0.55 kW	The IE classification does not apply for these sizes
Enclosure class	0.37 to 2.2 kW	IP55 (IP66 optional)
	3 to 22 kW	IP55
Insulation class		F
	0.37 to 1.5 kW	1 x 200-240 V
Supply voltage (- 10 %/+ 10 %)	0.37 to 2.2 kW	3 x 380-500 V
	3 to 22 kW	3 x 380-480 V
	1.1, 1.5, 2.2, 4.0, 5.5 kW	3 x 200-230 V, 60 Hz
Supply frequency	50/60 Hz	50/60 Hz

\* Even though the MGE motor (0.37 to 2.2 kW) has no defined efficiency class, the efficiency is still above the IE4 level including both motor and electronics.

## MGE motors, motor protection

MGE motors incorporate thermal protection against slow overload and blocking (IEC 34-11:TP 211).

MTRE pumps require no external motor protection.

## MGE motors, ambient temperature

Motor power [kW]	Motor make	Phases	Maximum ambient temperature [°C]	Maximum altitude above sea level [m]
0.37-1.5	MGE	1	50	
0.37-2.2	MGE	3	50	1000
3-22	MGE	3	40	

If the ambient temperature exceeds the above maximum ambient temperatures or the pump is installed at an altitude exceeding 1000 metres, the motor must not be fully loaded due to the risk of overheating. Overheating may result from excessive ambient temperatures or the low density and consequently low cooling effect of the air.

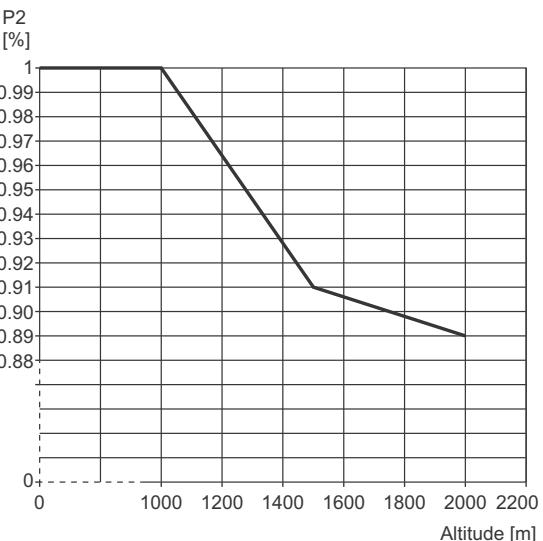
In such cases, it may be necessary to use a motor with a higher rated output.

## Installation altitude

Installation altitude is the height above sea level of the installation site. Motors installed up to 1000 metres above sea level can be loaded 100 %.

Motors installed more than 1000 metres above sea level must not be fully loaded due to the low density and consequently low cooling effect of the air.

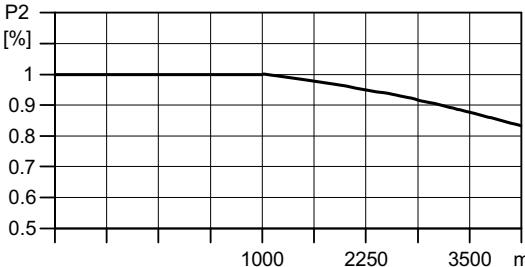
### MGE 0.37 to 2.2 kW



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Fig. 7 Derating of motor output (P2) in relation to altitude above sea level

### MGE 3 to 22 kW



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Fig. 8 Derating of motor output (P2) in relation to altitude above sea level

## 6. Control of MTRE pumps

### Control options

It is possible to communicate with MTRE pumps via the following control devices/systems:

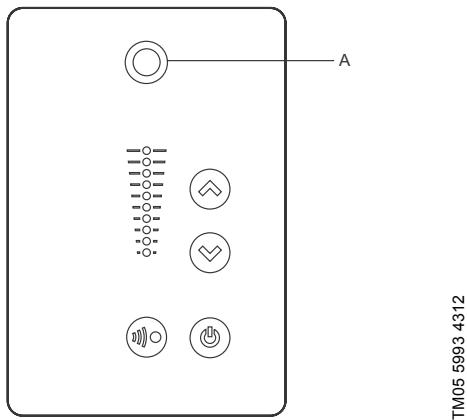
- operating panel on the pump
- Grundfos GO Remote
- central management system.

### Operating panel on pump

The operating panel on the E-pump terminal box makes it possible to change the setpoint settings manually.

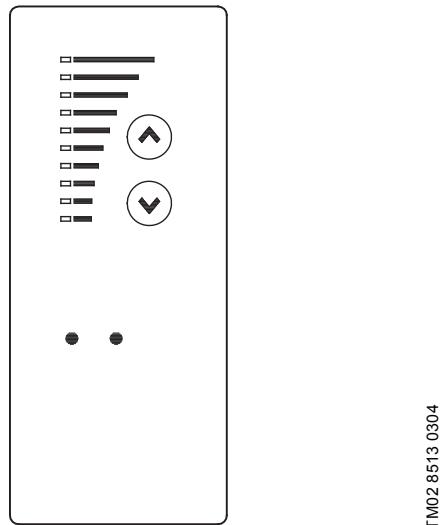
#### MGE 0.37 to 2.2 kW

The operating condition of the pump is indicated by the Grundfos Eye on the operating panel. See fig. 9, pos. A.



**Fig. 9** Operating panel on MTRE pump, 0.37 to 2.2 kW

#### MGE 3 to 22 kW

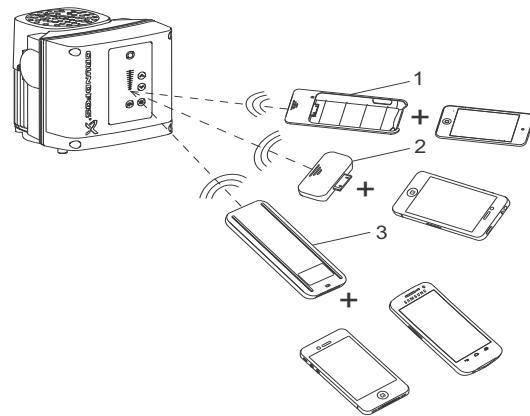


**Fig. 10** Operating panel on MTRE pump, 3 to 22 kW

### Grundfos GO Remote

The pump is designed for wireless radio or infrared communication with the Grundfos GO Remote.

The Grundfos GO Remote enables setting of functions and gives access to status overviews, technical product information and actual operating parameters. The Grundfos GO Remote offers three different mobile interfaces (MI). See fig. 11.



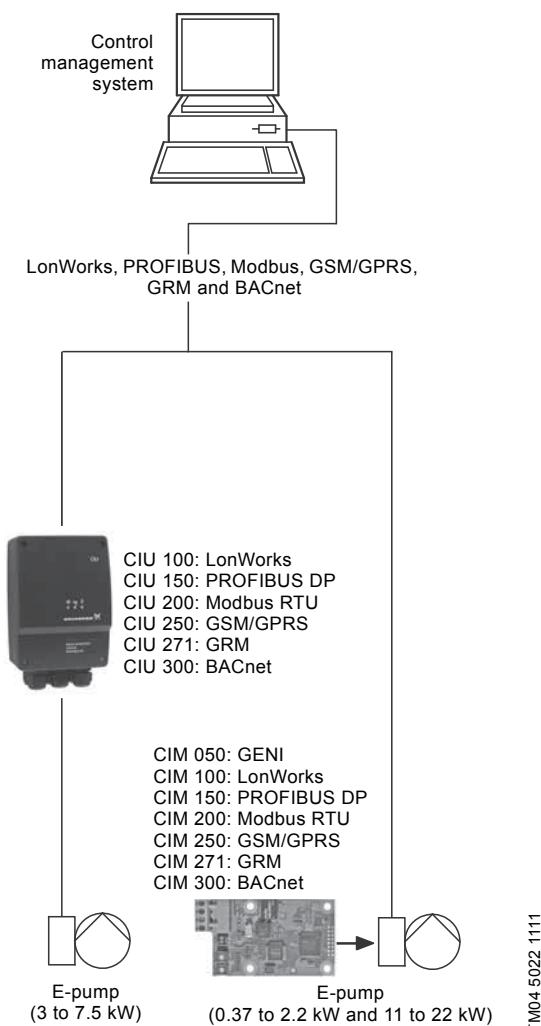
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**Fig. 11** Grundfos GO Remote communicating with the pump via radio or infrared light

Pos.	Description
1	Grundfos MI 201: Consists of an Apple iPod touch 4G and a Grundfos cover.
2	Grundfos MI 202: Add-on module which can be used in conjunction with Apple iPod touch 4G, iPhone 4G or 4GS.
2	Grundfos MI 204: Add-on module which can be used in conjunction with Apple iPod touch 5G or iPhone 5.
3	Grundfos MI 301: Separate module enabling radio or infrared communication. The module can be used in conjunction with an Android or iOS-based Smartphone with Bluetooth connection.

## Central management system

Communication with the E-pump is possible even if the operator is not present near the E-pump. Communication is enabled by connecting the E-pump to a central management system. This allows the operator to monitor the pump and to change control modes and setpoint settings.



**Fig. 12** Structure of a central management system

## Control modes for E-pumps

Grundfos MTRE pumps are only available without pressure sensor.

### MTRE without sensor

MTRE pumps without sensor are suitable in these situations:

- Uncontrolled operation is required.
- You want to retrofit another sensor in order to control the flow, temperature, differential temperature, liquid level, pH value, etc. at some arbitrary point in the system.

### MGE 0.37 to 2.2 kW

These MTRE pumps without sensor can be set to either of these control modes:

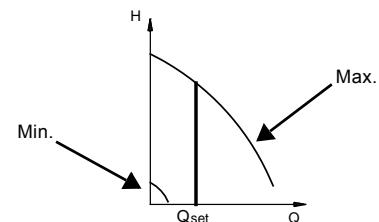
- constant pressure
- constant differential pressure
- constant temperature
- constant differential temperature
- constant flow rate
- constant level
- constant curve
- constant other value.

### MGE 3 to 22 kW

These MTRE pumps without sensor can be set to either of these control modes:

- controlled operation
- uncontrolled operation (factory setting).

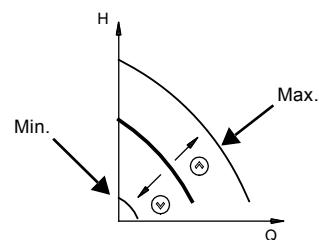
In controlled-operation mode, the pump adjusts its performance to the desired setpoint. See fig. 13.



**Fig. 13** Constant-flow mode

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In uncontrolled-operation mode, the pump operates according to the constant curve set. See fig. 14.



**Fig. 14** Constant-curve mode

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## Functional module for MGE 0.37 to 2.2 kW

### Advanced functional module (FM 300)

The FM 300 is the standard functional module in all MGE motors from 0.37 to 2.2 kW.

The module has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required.

The FM 300 has these connections:

- three analog inputs
- one analog output
- two dedicated digital inputs
- two configurable digital inputs or open-collector outputs
- Grundfos Digital Sensor input and output
- two Pt100/1000 inputs
- two LiqTec sensor inputs
- two signal relay outputs
- GENibus connection.

### Connection terminals

MTRE pumps have a number of inputs and outputs enabling the pumps to be used in advanced applications where many inputs and outputs are required.

The number of available inputs and outputs depends on the selected functional module.

Functional module 300 has been selected as standard for MTRE pumps.

See fig. 15.

As a precaution, the wires to be connected to the following connection groups must be separated from each other by reinforced insulation in their entire lengths.

#### • Inputs and outputs

All inputs and outputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits.

All control terminals are supplied by safety extra-low voltage (SELV), thus ensuring protection against electric shock.

#### • Signal relay outputs

##### – Signal relay 1:

LIVE:

Mains supply voltages up to 250 VAC can be connected to this output.

SELV:

The output is galvanically separated from other circuits. Therefore, the supply voltage or safety extra-low voltage can be connected to the output as desired.

##### – Signal relay 2:

SELV:

The output is galvanically separated from other circuits. Therefore, the supply voltage or safety extra-low voltage can be connected to the output as desired.

#### • Mains supply (terminals N, PE, L or L1, L2, L3, PE)

A galvanically safe separation must fulfil the requirements for reinforced insulation including creepage distances and clearances specified in EN 61800-5-1.

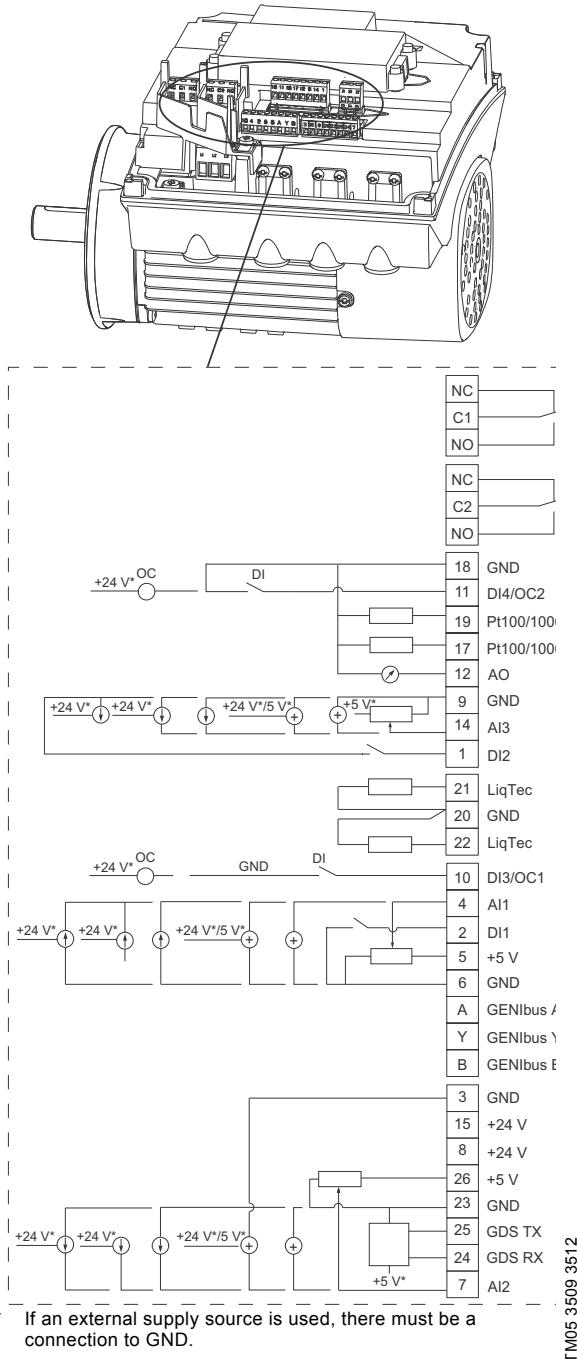


Fig. 15 Connection terminals, FM 300 functional module

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## Functional module for MGE 3 to 7.5 kW

### Advanced I/O module

The Advanced I/O module is the standard functional module in all MGE motors from 3 to 7.5 kW.

The module has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required.

The Advanced I/O module has these connections:

- start/stop terminals
- three digital inputs
- one setpoint input
- one sensor input
- one analog output
- GENibus connection.

### Connection terminals

As a precaution, the wires to be connected to the following connection groups must be separated from each other by reinforced insulation in their entire lengths.

#### Inputs

- Start/stop (terminals 2 and 3)
- digital inputs (terminals 1 and 9, 10 and 9, 11 and 9)
- setpoint input (terminals 4, 5 and 6)
- sensor input (terminals 7 and 8)
- GENibus (terminals B, Y and A).

All inputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits.

All control terminals are supplied with protective extra-low voltage (PELV), thus ensuring protection against electric shock.

### Output (relay signal, terminals NC, C, NO)

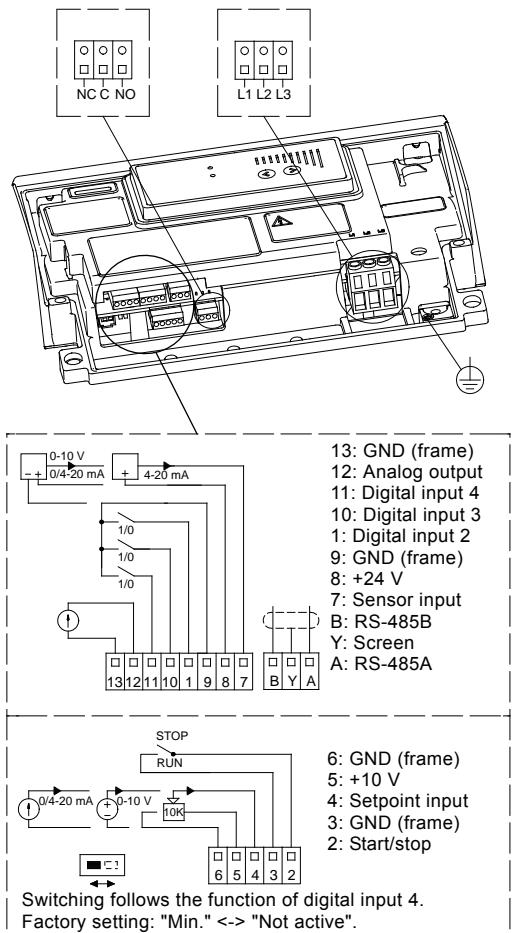
The output is galvanically separated from other circuits.

Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.

- Analog output (terminal 12 and 13).

### Mains supply (terminals L1, L2, L3)

A galvanic separation must fulfil the requirements for reinforced insulation including creepage distances and clearances specified in EN 60335.



**Fig. 16** Connection terminals, Advanced I/O module

TMO2 9032 0904

## Functional module for MGE 11 to 22 kW

### Advanced I/O module

The advanced I/O module is the standard functional module in all MGE motors from 11 to 22 kW.

The module has a number of inputs and outputs enabling the motor to be used in advanced applications where many inputs and outputs are required.

The Advanced I/O module has these connections:

- start/stop terminals
- three digital inputs
- one setpoint input
- one sensor input (feedback sensor)
- one sensor 2 input
- one analog output
- two Pt100 inputs
- two signal relay outputs
- GENibus connection.

### Connection terminals

As a precaution, the wires to be connected to the following connection groups must be separated from each other by reinforced insulation in their entire lengths.

#### Inputs

- Start/stop (terminals 2 and 3)
- digital inputs (terminals 1 and 9, 10 and 9, 11 and 9)
- sensor input 2 (terminals 14 and 15)
- Pt100 sensor inputs (terminals 17, 18, 19 and 20)
- setpoint input (terminals 4, 5 and 6)
- sensor input (terminals 7 and 8)
- GENibus (terminals B, Y and A).

All inputs are internally separated from the mains-conducting parts by reinforced insulation and galvanically separated from other circuits.

All control terminals are supplied with protective extra-low voltage (PELV), thus ensuring protection against electric shock.

#### Output (relay signal, terminals NC, C, NO)

The output is galvanically separated from other circuits.

Therefore, the supply voltage or protective extra-low voltage can be connected to the output as desired.

- Analog output (terminal 12 and 13).

#### Mains supply (terminals L1, L2, L3)

A galvanic separation must fulfil the requirements for reinforced insulation including creepage distances and clearances specified in EN 61800-5-1.

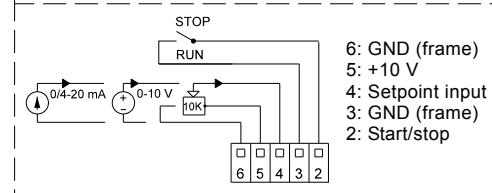
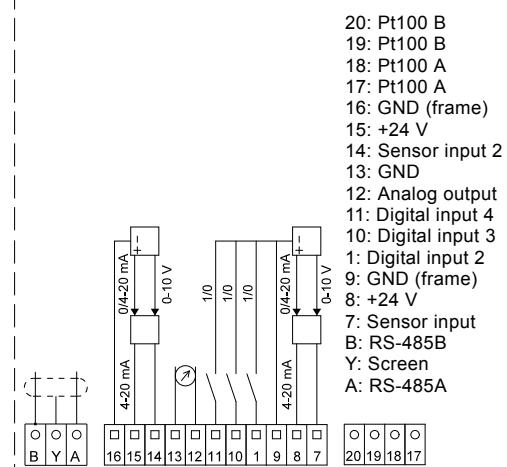
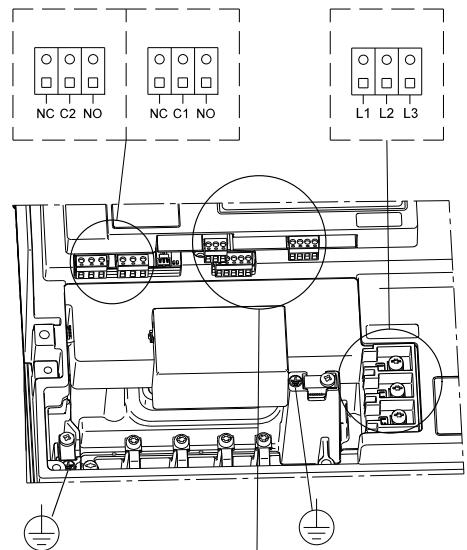


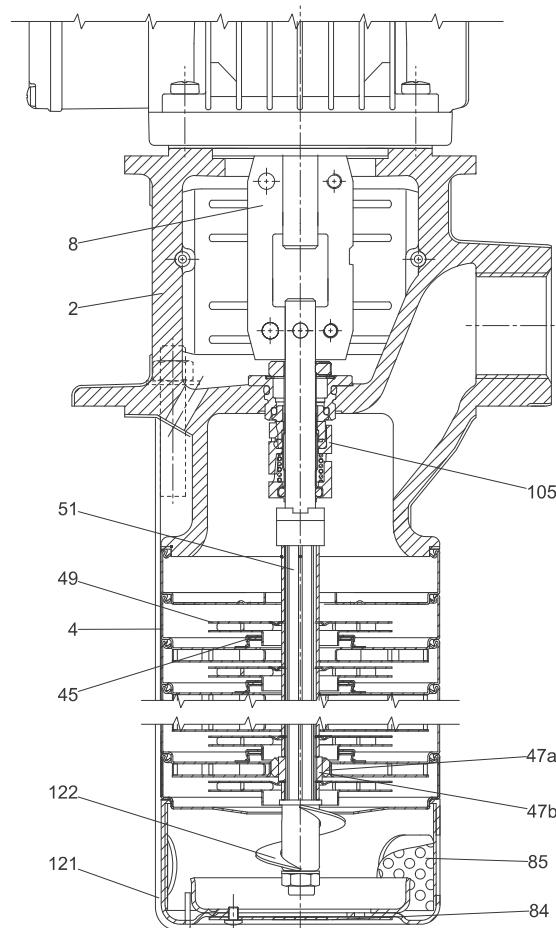
Fig. 17 Connection terminals, Advanced I/O module

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## 7. Construction

### MTR, MTRE 1s, 1, 3 and 5

#### Sectional drawing



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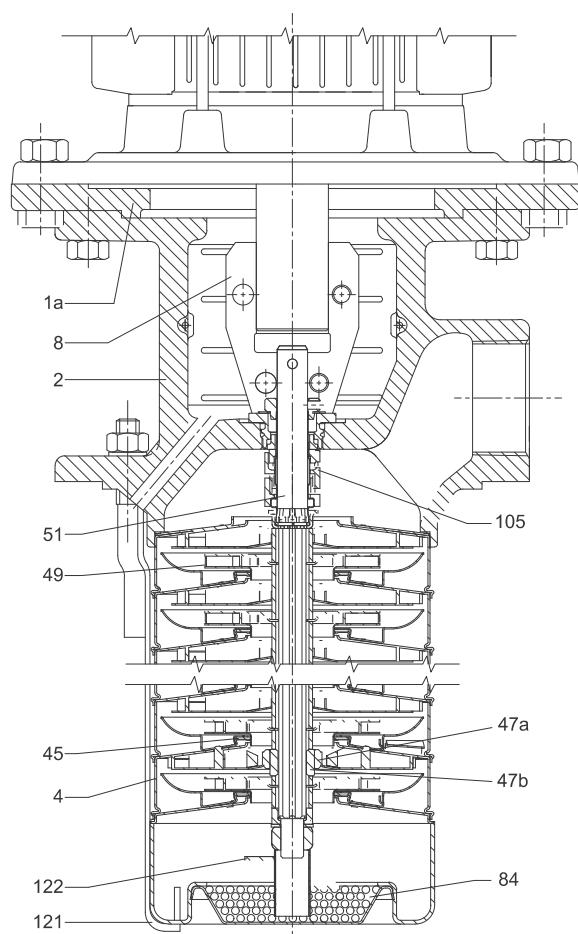
**Fig. 18** MTR, MTRE 1s, 1, 3 and 5

#### Materials

Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	A-version: cast iron	EN-GJL-200	ASTM 25B
		I-version: stainless steel		
4	Chamber	Stainless steel	1.4301	AISI 304
8	Coupling	Sintered metal		
45	Neck ring	PTFE		
47a	Bearing ring, stationary	Silicium carbide		
47b	Bearing ring, rotating	Silicium carbide		
49	Impeller	Stainless steel	1.4301	AISI 304
51	Pump shaft	Stainless steel	1.4401	AISI 316
84	Suction strainer	Stainless steel	1.4301	AISI 304
85	Strainer internal	Stainless steel	1.4301	AISI 304
105	Shaft seal	HUUV/HUUE		
121	Strap	Stainless steel	1.4301	AISI 304
122	Priming screw	Stainless steel	1.4301	AISI 304

**MTR, MTRE 10, 15 and 20**

## Sectional drawing



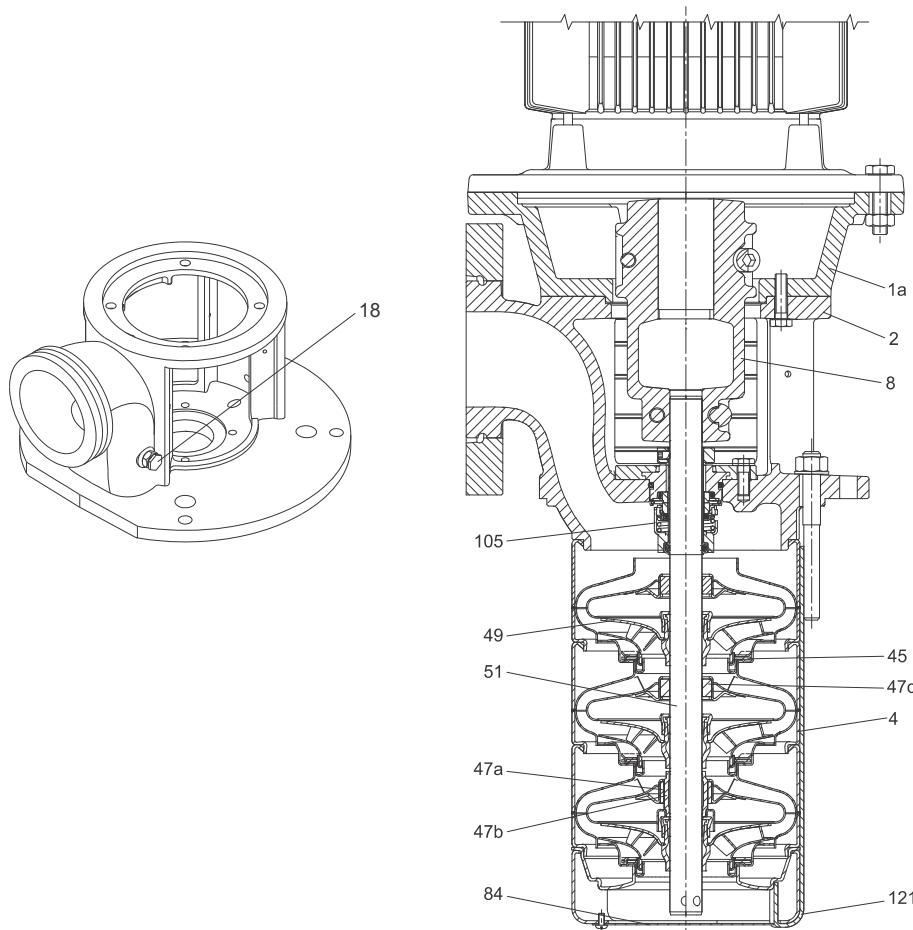
TM02 86688 2813

**Fig. 19** MTR, MTRE 10, 15 and 20**Materials**

Pos.	Description	Materials	EN/DIN	AISI/ASTM
1a	Motor stool	Cast iron	EN-GJL-200	ASTM 25B
2	Pump head	A-version: cast iron I-version: stainless steel	EN-GJL-200 1.4408	ASTM 25B AISI 316LN
4	Chamber	Stainless steel	1.4301	AISI 304
8	Coupling	Sintered metal		
45	Neck ring	PTFE		
47a	Bearing ring, stationary	Silicium carbide		
47b	Bearing ring, rotating	Silicium carbide		
49	Impeller	Stainless steel	1.4301	AISI 304
51	Pump shaft	A-version: stainless steel I-version: stainless steel	1.4057 1.4460	AISI 431
84	Suction strainer	Stainless steel	1.4301	AISI 304
105	Shaft seal	HUUV/HUUE		
121	Strap	Stainless steel	1.4301	AISI 304
122	Priming screw	Stainless steel	1.4301	AISI 304

**MTR, MTRE 32, 45 and 64**

## Sectional drawing



TM02 8689 2813 - TM05 8831 2713

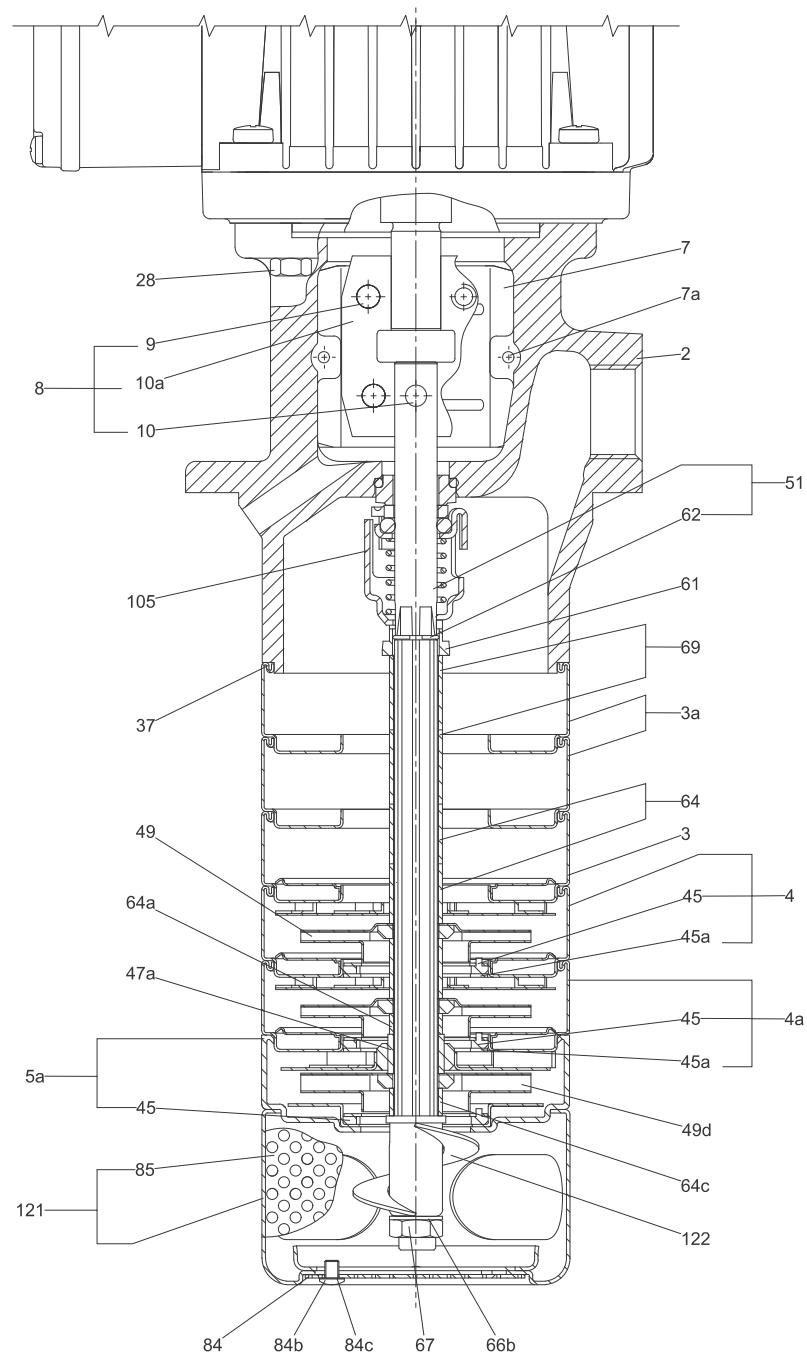
**Fig. 20** MTR, MTRE 32, 45 and 64**Materials**

Pos.	Description	Materials	EN/DIN	AISI/ASTM
1a	Motor stool	Cast iron	EN-GJL-200	ASTM 25B
2	Pump head	A-version: cast iron I-version: stainless steel	EN-GJL-200 1.4408	ASTM 25B AISI 316LN
4	Chamber	Stainless steel	1.4301	AISI 304
8	Coupling	Nodular iron	EN-GJS-500-7	ASTM 80-55-06
18	Air vent screw	Stainless steel	1.4301	AISI 304
45	Neck ring	PTFE		
47a	Bearing ring, stationary	Silicium carbide		
47b	Bearing ring, rotating	Stainless steel	1.4539	AISI 904L
47c	Bush	Graflon® <sup>®</sup> , HY49		
49	Impeller	Stainless steel	1.4301	AISI 304
51	Pump shaft	A-version: stainless steel I-version: stainless steel	1.4057 1.4462	AISI 431
O-ring*		A-version: NBR I-version: depending on rubber material in shaft seal		
84	Suction strainer	Stainless steel	1.4301	AISI 304
105	Shaft seal	HUUU/HUUE		
121	Strap	Stainless steel	1.4301	AISI 304

\* Only used in pumps with empty chambers

**SPK 1, SPK 2**

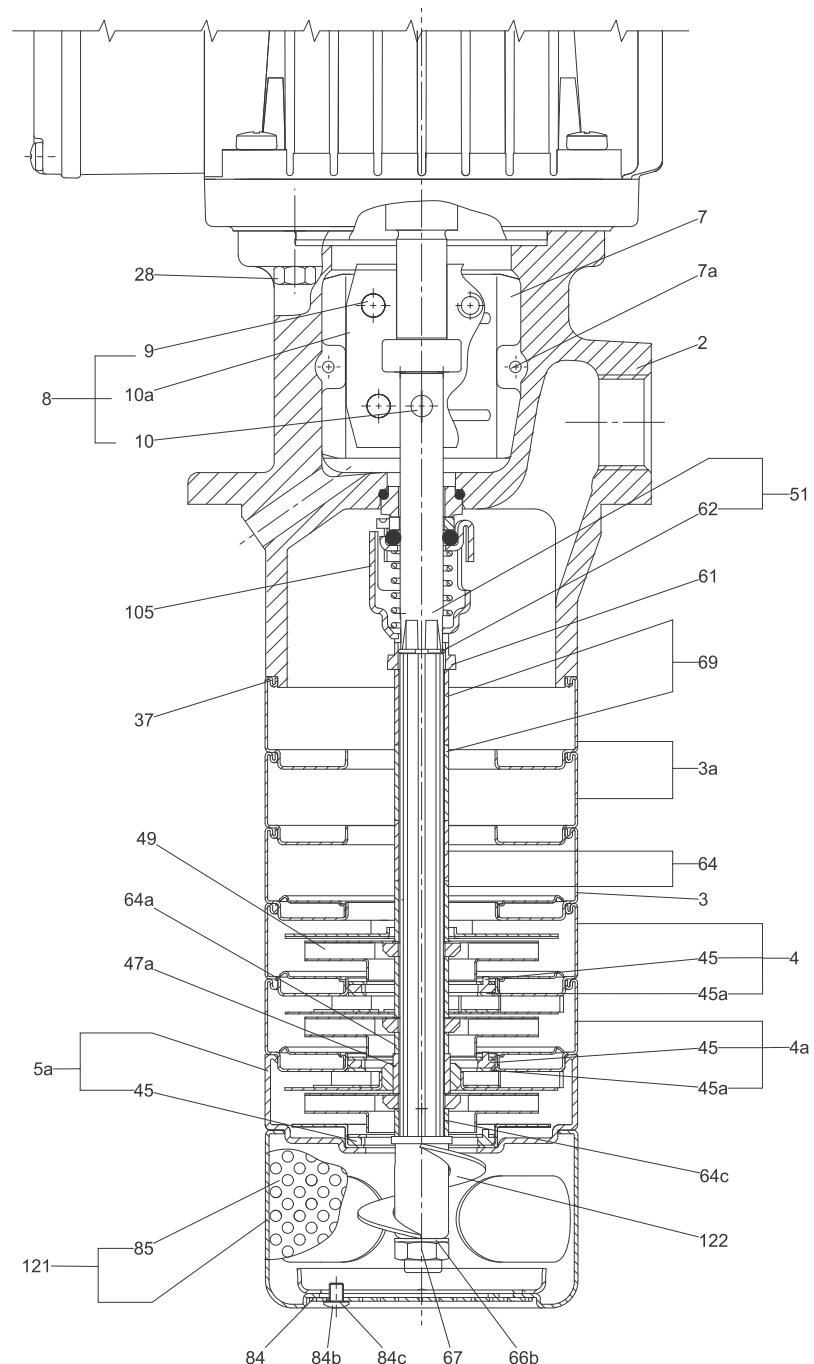
## Sectional drawing



TM01 9281 2813

**Fig. 21** SPK 1, SPK 2

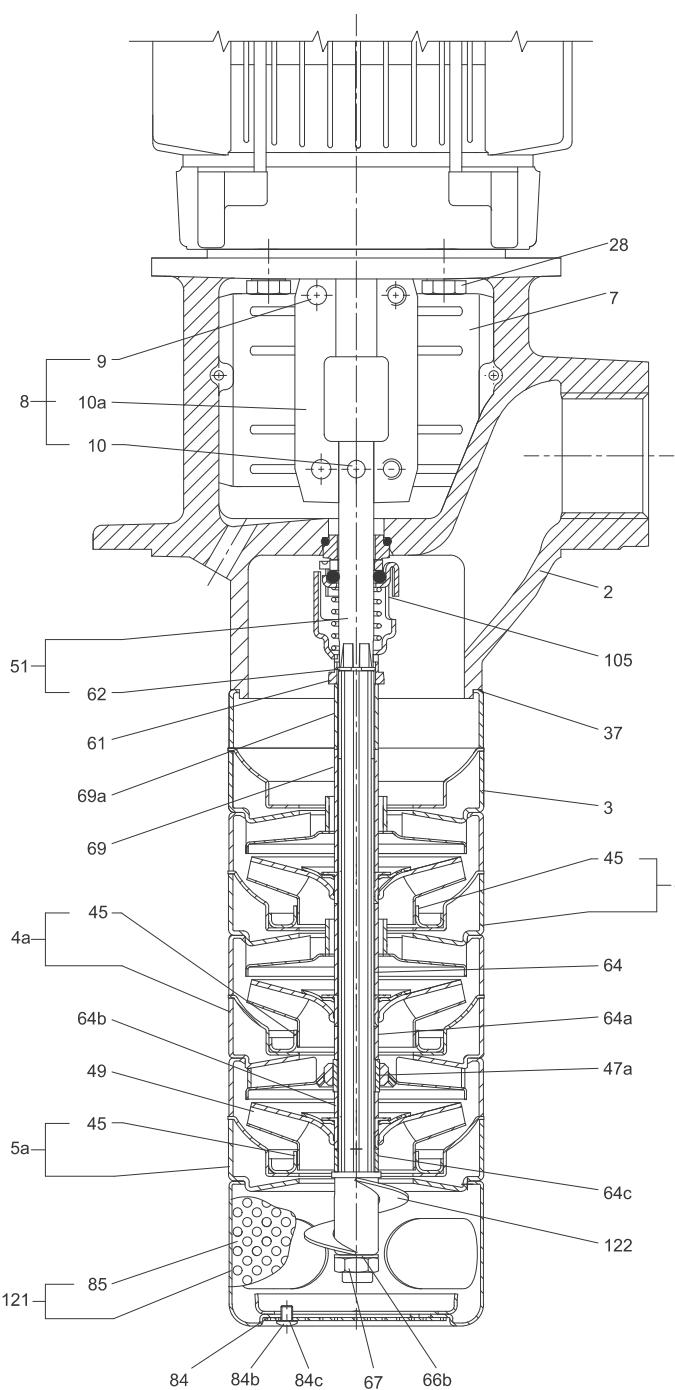
For information on the materials please see page 33.

**SPK 4****Sectional drawing**

TM02 0111 1901

**Fig. 22** SPK 4

For information on the materials please see page 33.

**SPK 8****Sectional drawing**

TM02 0112 1901

**Fig. 23 SPK 8**

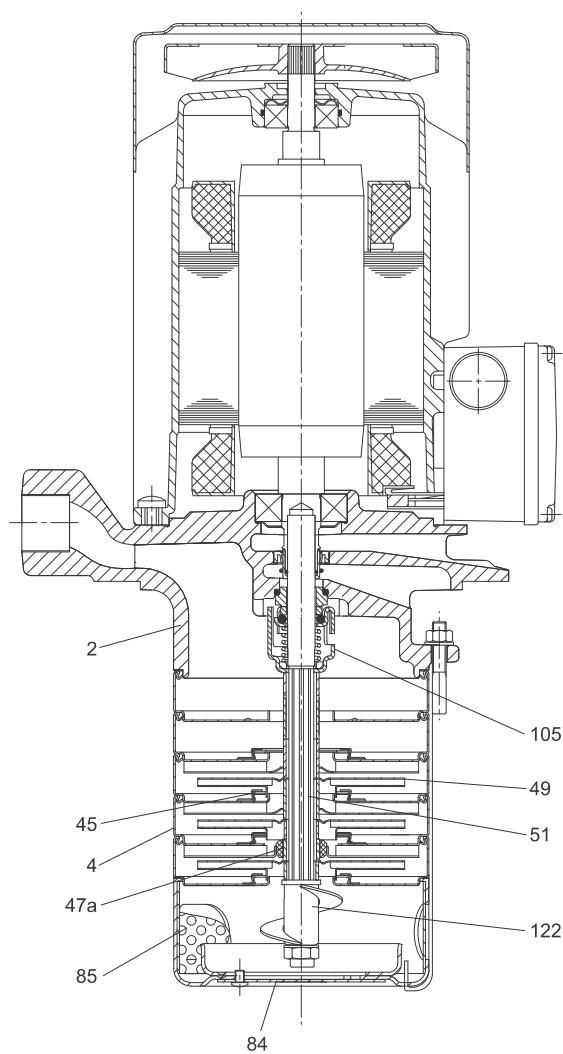
For information on the materials, please see page 33.

**SPK materials**

Pos.	Description	Materials	EN/DIN	AISI/ASTM
<b>Pump head</b>				
2	Pump head	A-version: cast iron I-version: stainless steel	EN-GJL-200 1.4408	ASTM 25B AISI 316LN
7	Coupling guard	Stainless steel	1.4301	AISI 304
7a	Screw	Stainless steel		
28	Set screw	Stainless steel		
	Extension pipe	Stainless steel	1.4301	AISI 304
<b>Chamber without bearing</b>				
3	Chamber, empty	Stainless steel	1.4301	AISI 304
3a	Chamber, empty	Stainless steel	1.4301	AISI 304
4	Chamber	Stainless steel	1.4301	AISI 304
45	Neck ring	SPK 1, 2 and 4: PPS with 40 % glass fibre SPK 8: Tin/bronze	2.1020.10	
45a	Disc for neck ring	PTFE		
64	Spacing pipe	Stainless steel	1.4401	AISI 316
69	Spacing pipe	Stainless steel	1.4401	AISI 316
<b>Chamber with bearing</b>				
4a	Chamber	Stainless steel	1.4301	AISI 304
	Bearing in chamber	Ceramic Al <sub>2</sub> O <sub>3</sub> 95-100 % Hilox™		
45	Neck ring	SPK 1, 2 and 4: PPS with 40 % glass fibre SPK 8: Tin/bronze	2.1020.10	
45a	Disc for neck ring	PTFE		
47a	Bearing ring	Tungsten carbide		
64a	Spacing pipe	Stainless steel	1.4401	AISI 316
64b	Spacing pipe	Stainless steel	1.4401	AISI 316
<b>Bottom chamber</b>				
5a	Chamber	Stainless steel	1.4301	AISI 304
45	Neck ring	SPK 1, 2 and 4: PPS with 40 % glass fibre SPK 8: Tin/bronze	2.1020.10	
45a	Disc for neck ring	PTFE		
64c	Spacing pipe	Stainless steel	1.4401	AISI 316
<b>Inlet part</b>				
84	Suction strainer	Stainless steel	1.4301	AISI 304
121	Inlet part	Stainless steel	1.4301	AISI 304
84b	Set screw	Stainless steel		
<b>Shaft</b>				
51	Spline shaft	Stainless steel	1.4057	AISI 431
61	Neck ring	Stainless steel	1.4301	AISI 304
62	Stop ring	Stainless steel	1.4436	AISI 316
64c	Neck ring	Stainless steel	1.4401	AISI 316
66	Washer	Stainless steel	1.4301	AISI 304
67	Locking nut	Stainless steel	1.4401	AISI 316
69a	Spacing pipe	Stainless steel	1.4301	AISI 304
112	Spacing pipe	Stainless steel	1.4301	AISI 304
122	Priming screw	Stainless steel	1.4401	AISI 316
<b>Impeller</b>				
49	Impeller	Stainless steel	1.4301	AISI 304
49d	Impeller, lower	Stainless steel	1.4301	AISI 304
<b>Strap</b>				
26	Strap	Stainless steel	1.4301	AISI 304
36	Nut	Stainless steel		
66a	Washer	Stainless steel		
<b>Coupling</b>				
8	Coupling	Sintered metal		
9	Hexagon socket head screw	Steel		
10	Shaft pin	Stainless steel	1.4301	AISI 304

**MTH 2**

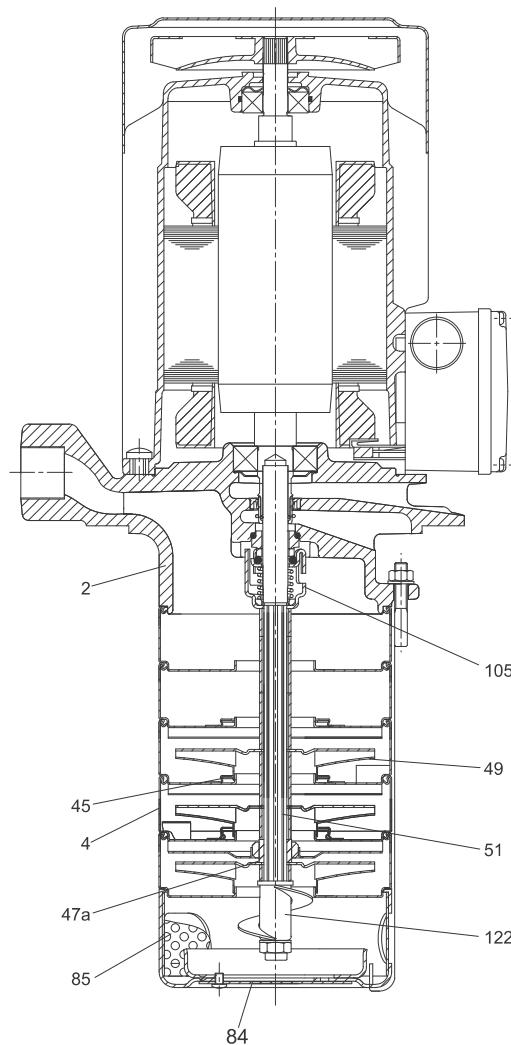
## Sectional drawing



TM02 8690 0704

**Fig. 24 MTH 2****Material specification**

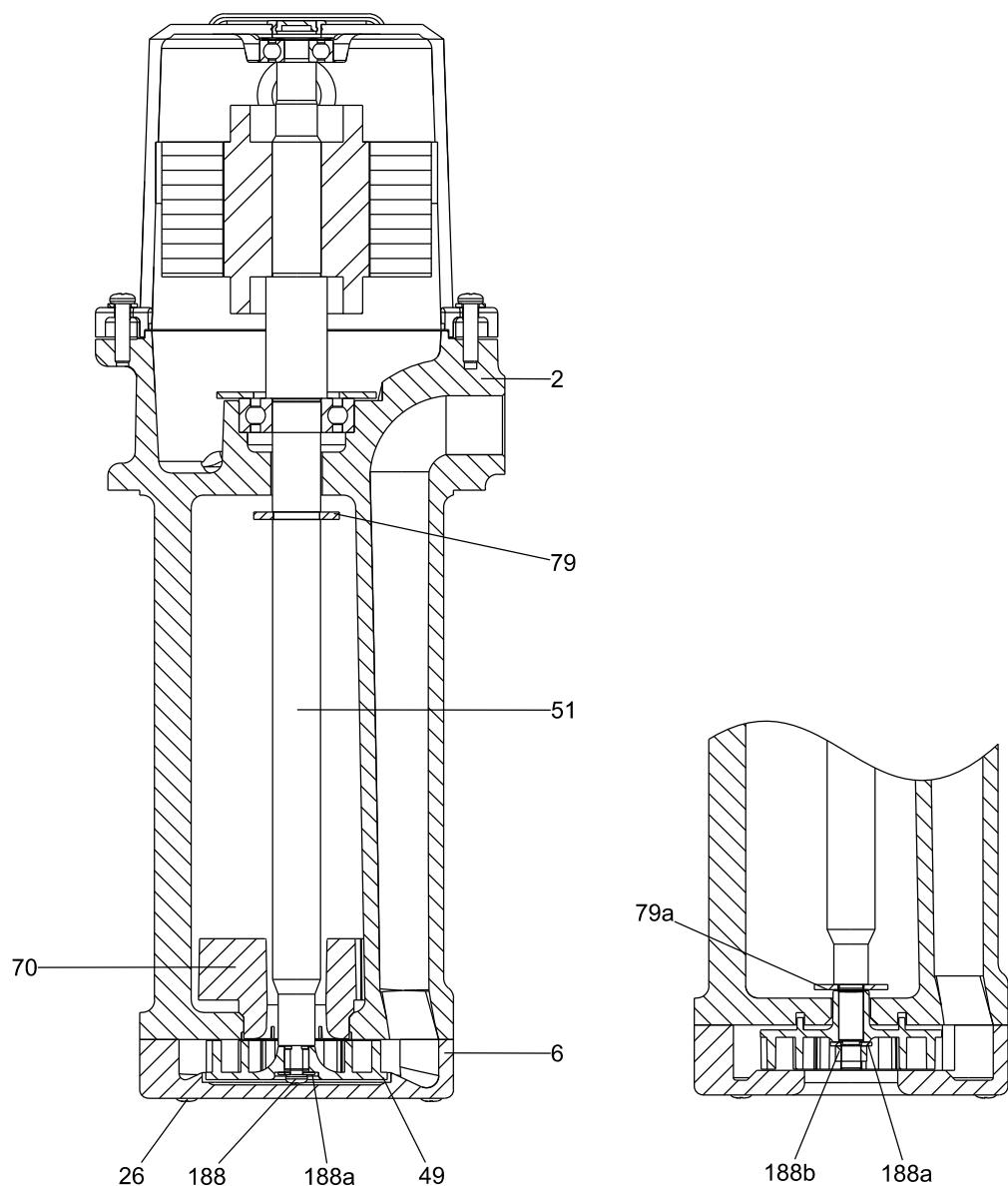
Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	A-version: cast iron	EN-GJL-200	ASTM 25B
		I-version: stainless steel		
4	Chamber	I-version: stainless steel	1.4408	AISI 316LN
45	Neck ring	PTFE	1.4301	AISI 304
47a	Bearing ring	Tungsten carbide		
49	Impeller	Stainless steel	1.4301	AISI 316
51	Pump shaft	Stainless steel	1.4057	AISI 431
84	Suction strainer, Ø2 mm holes	Stainless steel	1.4301	AISI 304
85	Strainer, internal	Stainless steel	1.4301	AISI 304
105	Shaft seal	AQQV		
122	Priming screw	Stainless steel	1.4301	AISI 304

**MTH 4****Sectional drawing**

TM02 8691 0704

**Fig. 25 MTH 4****Material specification**

Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	A-version: cast iron	EN-GJL-200	ASTM 25B
		I-version: stainless steel		
4	Chamber	Stainless steel	1.4301	AISI 304
45	Neck ring	PTFE		
47a	Bearing ring	Tungsten carbide		
49	Impeller	Stainless steel	1.4301	AISI 316
51	Pump shaft	Stainless steel	1.4057	AISI 431
84	Suction strainer, Ø2 mm holes	Stainless steel	1.4301	AISI 304
85	Strainer, internal	Stainless steel	1.4301	AISI 304
105	Shaft seal	AQQV		
122	Priming screw	Stainless steel	1.4301	AISI 304

**MTA 30, 60, 90, 20H, 40H, 70H**

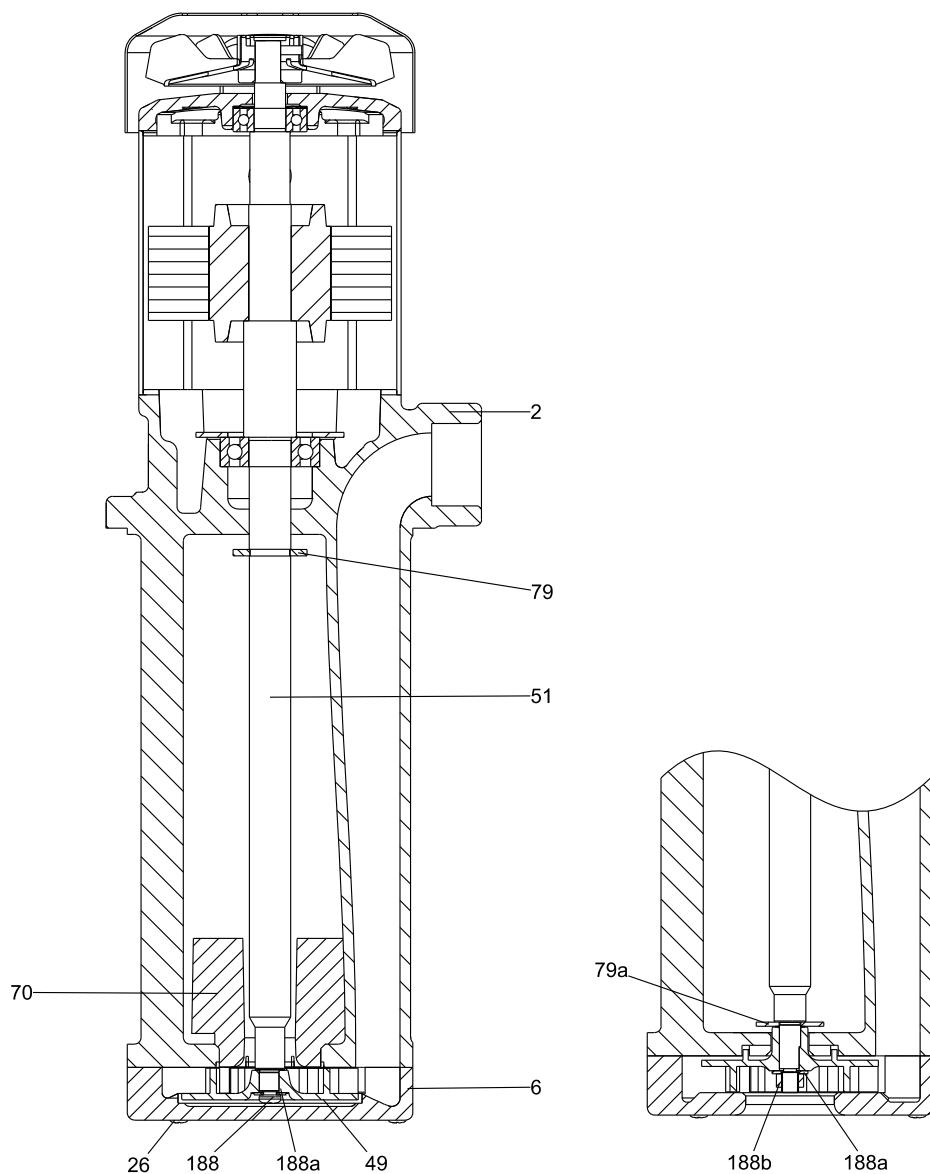
TM05 0894 211

Pos.	Description	Materials	EN/DIN	AISI/ASTM	JIS
2	Pump head	Cast iron	GG20	A48-CL30	FC200
6	Pump housing	Cast iron	GG20	A48-CL30	FC200
26	Screw	Stainless steel	1.4301	A276-304	SUS304
49	Impeller	MTA 30, 60, 90, 70H* MTA 20H, 40H, 70H**	PAA GF50 Bronze casting	G-CuZn-5ZnPb	C92200 BC7
51	Shaft with rotor	Steel	C45	A108-1045	S45C
70	Vortex preventer	MTA 90	PP		
79	Thrower	NBR			
79a	Splash ring	Steel	1623 ST 12	A366	SPCC
188	Cross-head screw	Stainless steel	1.4301	A276-304	SUS304
188a	Washer	Stainless steel	1.4301	A276-304	SUS304
188b	Hexagon nut	Stainless steel	1.4301	A276-304	SUS304
	Terminal box	Aluminium			

\* MTA 70H, bottom suction

\*\* MTA 70H, top suction

## MTA 120, 200, 100H



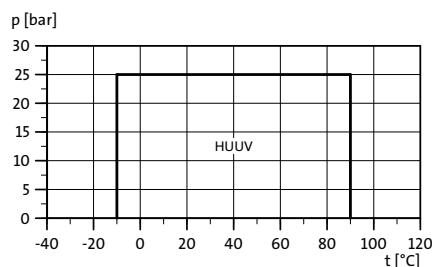
TM05 0895 2111

Pos.	Description	Materials	EN/DIN	AISI/ASTM	JIS
2	Pump head	Cast iron	GG20	A48-CL30	FC200
6	Pump housing	Cast iron	GG20	A48-CL30	FC200
26	Screw	Stainless steel	1.4301	A276-304	SUS304
49	Impeller MTA 120	Bronze casting PAA GF 50	G-CuZn-5ZnPb	C92200	BC7
51	Shaft with rotor	Steel	C45	A108-1045	S45C
70	Vortex preventer MTA 120	PP			
79	Thrower	NBR			
79a	Splash ring	Steel	1623 ST 12	A366	SPCC
188	Cross-head screw	Stainless steel	1.4301	A276-304	SUS304
188a	Washer	Stainless steel	1.4301	A276-304	SUS304
188b	Hexagon nut	Stainless steel	1.4301	A276-304	SUS304
	Terminal box	Aluminium			

## Shaft seals

The operating range of the shaft seal depends on operating pressure, pump type, type of shaft seal and liquid temperature.

### Shaft seal, MTR, MTRE

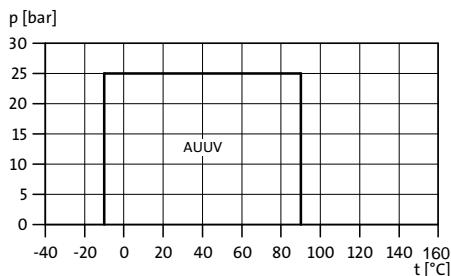


TM02 87988 0904

Shaft seal*	Description	Temperature range [°C]
HUUV	O-ring seal (cartridge type), balanced, tungsten carbide/tungsten carbide, FKM	-10 - +90

\* Other shaft seals on request

### Shaft seal, SPK

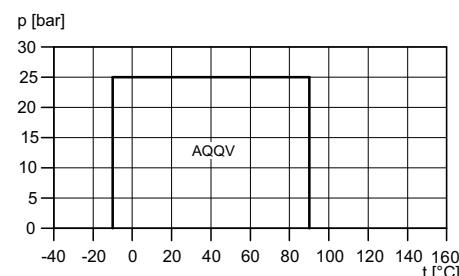


TM03 00234604

Shaft seal*	Description	Temperature range [°C]
AUUV	O-ring seal with fixed seal driver, tungsten carbide/tungsten carbide, FKM	-10 - +90

\* Other shaft seals on request

### Shaft seal, MTH



TM05 8897 3213

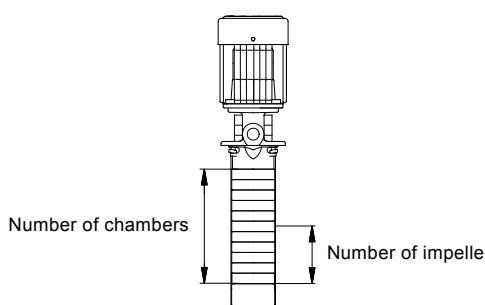
Shaft seal*	Description	Temperature range [°C]
AQQV	O-ring seal with fixed seal driver, silicon carbide, silicon carbide, FKM	-10 - +90

\* Other shaft seals on request

## 8. Identification

### MTR, MTRE type key

Example	MTR	E	32	(s)	-2	/1	-1	-A	-F	-A	-H	UU	V
Pump type													
Pump with integrated frequency control													
Rated flow rate [m <sup>3</sup> /h]													
All impellers with reduced diameter (only MTR 1s)													
Number of chambers, see fig. 26													
Number of impellers, see fig. 26													
Number of impellers with reduced diameter													
Pump version													
A Basic version													
B Oversize motor													
C Suction pipe													
E Pump with certificate/approval													
F 120 °C version													
H Horizontal version													
HS High pressure													
J Pump with different max. speed													
P Undersize motor													
T Double oversize													
X Special version													
Pipe connection													
F DIN flange													
G ANSI flange													
J JIS flange													
M Square flange with internal thread													
W Internal thread													
WB NPT internal thread													
X Special version													
Materials													
A Basic version													
I Wetted parts EN/DIN 1.4301/AISI 304													
X Special version													
Shaft seal													
H Balanced cartridge seal													
Q Silicon carbide													
U Tungsten carbide													
B Carbon													
E EPDM													
F FXM													
K FFKM													
V FKM													

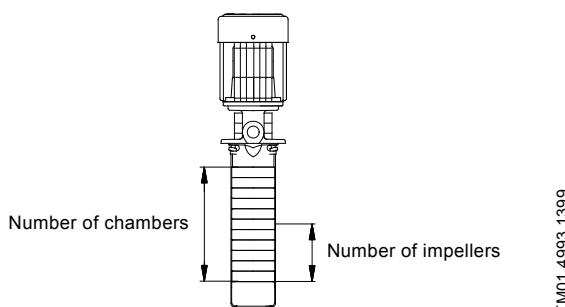


TM01 4993 1399

Fig. 26 MTR pump

## SPK type key

Example	SPK	E	2	-15	/8	A	-W	-A	A	UU	V
Pump type											
Pump with integrated frequency control											
Rated flow rate [m <sup>3</sup> /h]											
Number of chambers, see fig. 27											
Number of impellers, see fig. 27											
Pump version											
A Basic version											
B Oversize motor											
C Suction pipe											
E Pump with certificate/approval											
F 120 °C version											
H Horizontal version											
L With extension pipe											
P Undersize motor											
T Double oversize											
X Special version											
Pipe connection											
M Square flange with internal thread											
W Internal thread											
WB NPT internal thread											
Materials											
A Basic version											
I Pump head of stainless steel											
Shaft seal											
A O-ring seal with fixed seal driver											
B Bellows seal, rubber											
C O-ring seal with spring as seal driver											
R O-ring seal, type A, with reduced seal faces											
A Carbon metal-impregnated											
B Carbon resin-impregnated											
Q Silicon carbide											
U Tungsten carbide											
V Metal oxides, ceramic											
E EPDM											
K FFKM											
P NBR											
V FKM											

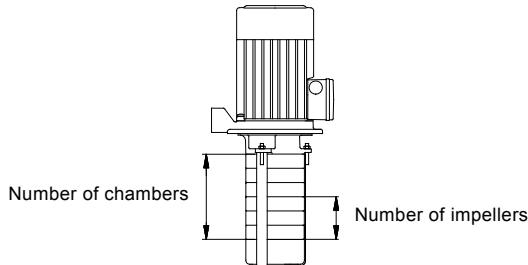


TM0149931399

Fig. 27 SPK pump

**MTH type key**

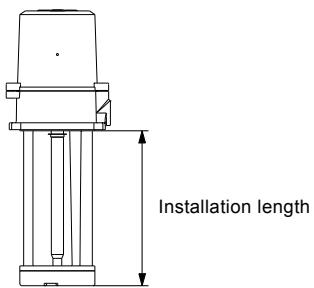
Example	MTH 2 -6 /3 -A -W -A -A UU V
Pump type	
Rated flow rate [m <sup>3</sup> /h]	
Number of chambers, see fig. 28	
Number of impellers, see fig. 28	
Pump version	
A Basic version	
C Suction pipe	
X Special version	
Pipe connection	
W Internal thread	
WB NPT internal thread	
Materials	
A Basic version	
I Pump head of stainless steel	
Shaft seal	
A O-ring seal with fixed seal driver	
B Bellows seal, rubber	
C O-ring seal with spring as seal driver	
R O-ring seal, type A, with reduced seal faces	
A Carbon, metal-impregnated	
B Carbon, resin-impregnated	
Q Silicon carbide	
U Tungsten carbide	
V Metal oxides, ceramic	
E EPDM	
K FFKM	
P NBR	
V FKM	

**Fig. 28** MTH pump

TM01 4992 1299

**MTA type key**

Example	MTA 30 H -150 -A -W -A -T
Pump type	
Pump size	
Pressure type	
Installation length [mm]	
Pump version	
A = standard version	
Thread type	
W = internal thread	
WB = internal NPT thread	
Impeller material	
A = PAA GF50	
B = bronze	
Suction	
T = top	
B = bottom	

**Fig. 29** MTA pump

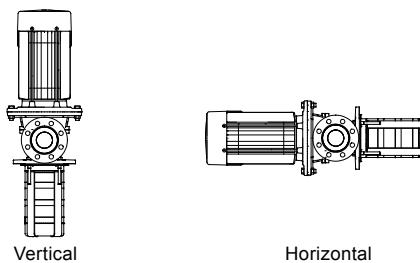
TM05 1021 2011

## 9. Installation

### Installation of MTR, MTRE pumps

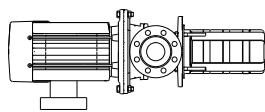
MTR, MTRE 1s, 1, 3, 5, 10, 15 and 20 pumps can be installed both vertically and horizontally.

MTR, MTRE 32, 45, 64 pumps must be installed in a vertical position.



TM01 4990 1399

Fig. 30 Installation of a MTR, MTRE pump



TM04 5755 3809

Fig. 31 On horizontally installed MTR, MTRE pumps with motors from 5.5 kW and up, the motors have feet and must be supported.

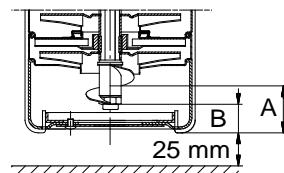
The pumps are designed to provide full performance down to a level of A mm above the bottom of the suction strainer.

At a liquid level between A and B mm above the bottom of the suction strainer, the built-in priming screw will protect the pump against dry running.

**Note:** MTR, MTRE 32, 45 and 64 pumps have no priming screw.

Pump type	A [mm]	B [mm]
MTR, MTRE 1s, 1, 3, 5	41	28
MTR, MTRE 10, 15, 20	50	25
MTR, MTRE 32, 45, 64	70	-

The distance between the pump and the tank bottom must be minimum 25 mm.



TM05 9086 3213

Fig. 32 MTR, MTRE 1s, 1, 3 and 5

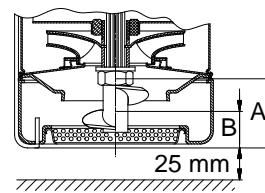


Fig. 33 MTR, MTRE 10, 15 and 20

TM05 9087 3213

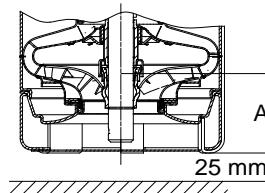
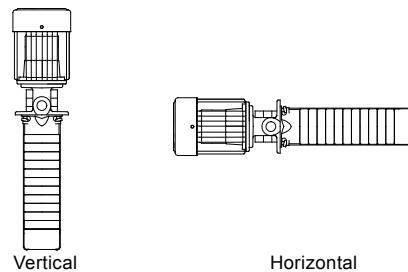


Fig. 34 MTR, MTRE 32, 45 and 64

TM05 9085 3213

### Installation of SPK pumps

SPK pumps can be installed both vertically and horizontally. If the SPK pump is installed horizontally, the drain hole in the pump head must be closed.



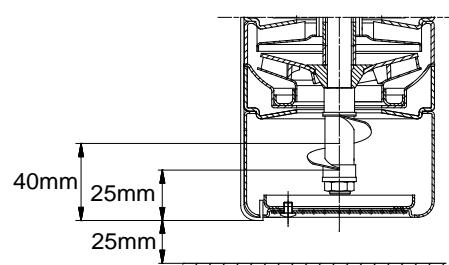
TM00 1922 3297

Fig. 35 Installation of a SPK pump

To enable a very low liquid level of 40 mm above the bottom of the suction strainer, a priming screw is fitted below the bottom chamber.

This protects the pump against dry running down to 25 mm above the bottom of the suction strainer.

The distance between pump and tank bottom must be minimum 25 mm.

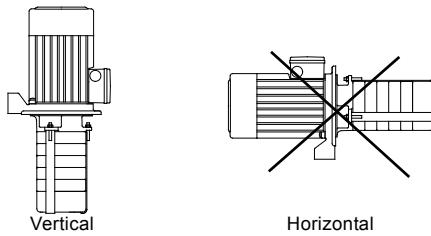


TM01 1204 4899

Fig. 36 SPK

## Installation of MTH pumps

MTH pumps must be installed vertically.

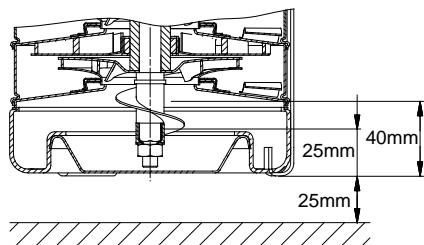


TM00 1923 3297

**Fig. 37** Installation of an MTH pump

To enable a low liquid level of 40 mm above the bottom of the suction strainer, a priming screw is fitted below the bottom chamber. This protects the pump against dry running down to 25 mm above the bottom of the suction strainer.

The distance between pump and tank bottom must be minimum 25 mm.

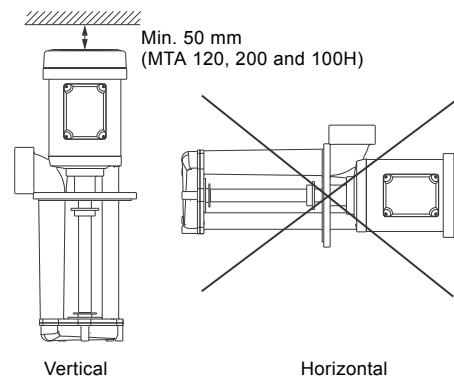


TM01 7809 4899

**Fig. 38** Minimum distance between pump and tank

## Installation of MTA pumps

MTA pumps are designed for vertical mounting in a tank.



TM05 1690 4411

**Fig. 39** Mounting position

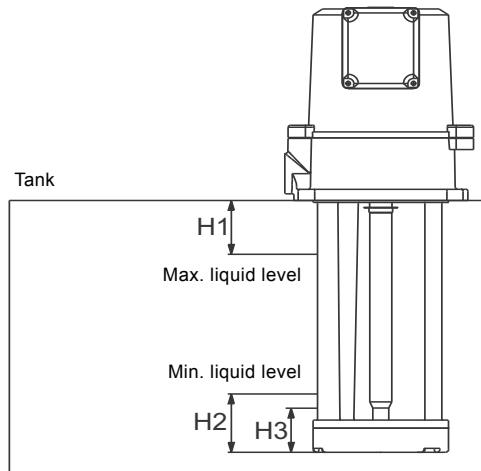
Provide a clearance of minimum 50 mm above the motor to ensure cooling of fan-cooled motors (MTA 120, 200 and 100H).

The pump is designed for indoor operation only.

**Note:** The motor must not be exposed to direct water/liquid sprays.

## Liquid level

### MTA with top suction



TM04 7992 4211

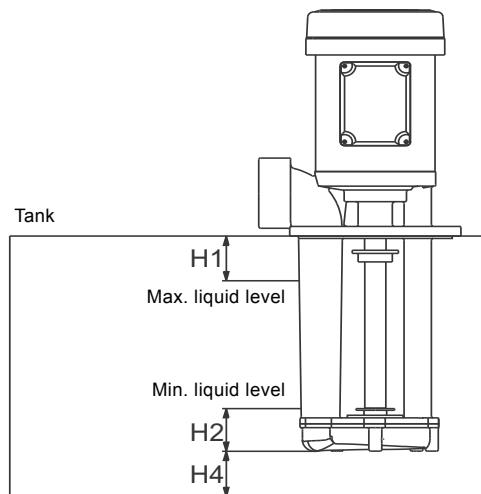
**Fig. 40** MTA with top suction

Pump	H1 [mm]	H2* [mm]	H3** [mm]
MTA 30	15	60	50
MTA 60	20	70	45
MTA 90	20	85	58
MTA 120	20	110	70
MTA 20H	15	50	40
MTA 40H	20	70	40
MTA 70H	20	80	50
MTA 100H	20	110	60

\* Min. liquid level (full performance).

\*\* Min. permissible liquid level (reduced performance).

### MTA with bottom suction



TM04 7993 4211

**Fig. 41** MTA with bottom suction

Pump	H1 [mm]	H2* [mm]	H4 [mm]
MTA 30	15	20	10
MTA 60	20	20	10
MTA 90	20	25	15
MTA 120	20	25	20
MTA 200	25	50	30

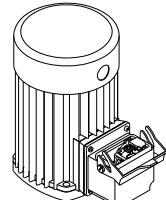
\* Min. liquid level (full performance).

## Electrical installation

MTR, SPK and MTH pumps can be fitted with a 10-pin multi-plug connection, type Han® 10 ES.

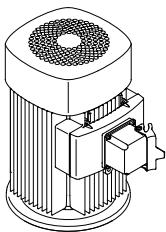
The purpose of a multi-plug connection is to make the electrical installation and the service of the pump easier. The multi-plug functions as a plug-and-pump device.

The following drawings show where the multi-plug is positioned on the motor.



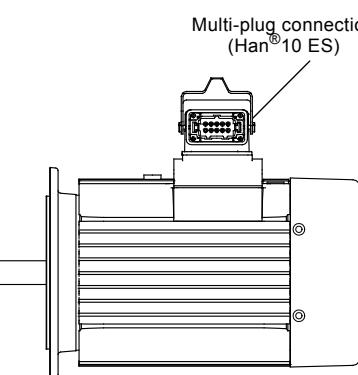
Multi-plug connection  
(Han® 10 ES)

TM05 8900 2813



Multi-plug connection  
(Han® 10 ES)

TM01 8713 1700



Multi-plug connection  
(Han® 10 ES)

TM02 8518 0304

**Fig. 42** Multi-plug on a Grundfos MG motor

On request, the following motors can be supplied with a multi-plug connection (type Han® 10 ES):

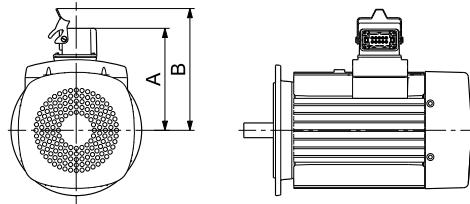
- motors for MTR/SPK up to 7.5 kW
- all MTH motors.

## Technical data for multi-plug

### Material description

Material	Description
Material	GD-Al Si 8 Cu 3
Surface	Powder paint
Clip for locking	Stainless steel
Housing gasket	NBR rubber
Temperature range [°C]	-40 - +125
Enclosure class	IP65 at DIN 40050 in closed position
Type	Han® 10E

## Dimensions

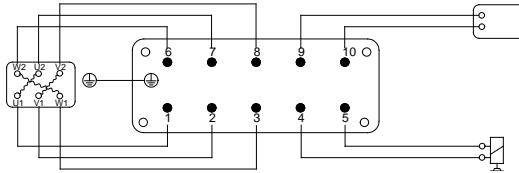


TM04 5756 3809

**Fig. 44** Motor with multi-plug

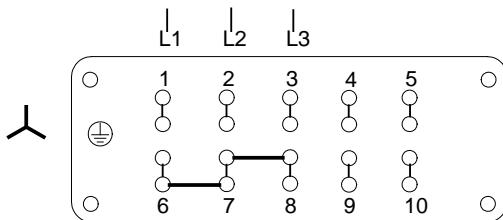
Motor	Frame size	A [mm]	B [mm]
MG	71	131	162
MG	80	131	162
MG	90	173	204
MG	100	183	214
MG	112	197	228
MG (5.5 kW)	132	197	228
MG (7.5 kW)	132	222	253

## Plug connections



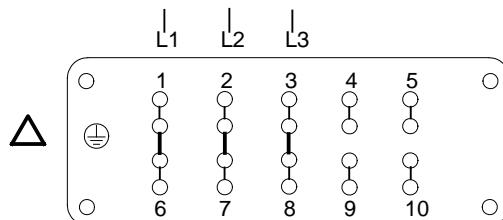
TM01 8702 0700

**Fig. 45** From motor



TM01 8703 0700

**Fig. 46** Plug connections for star connection



TM01 8704 0700

**Fig. 47** Plug connections for delta connection. Fishplates for connections are located in the plug.

## 10. Selection and sizing

### Selection of pumps

Selection of pumps should be based on the following parameters:

- the duty point of the pump
- dimensional data such as pressure loss as a result of height differences, friction loss in the pipework, pump efficiency etc.
- minimum inlet pressure - NPSH.

### Duty point of the pump

From a duty point it is possible to select a pump on the basis of the curve charts shown in the chapter of *11. Performance curves and technical data* starting on page 51.

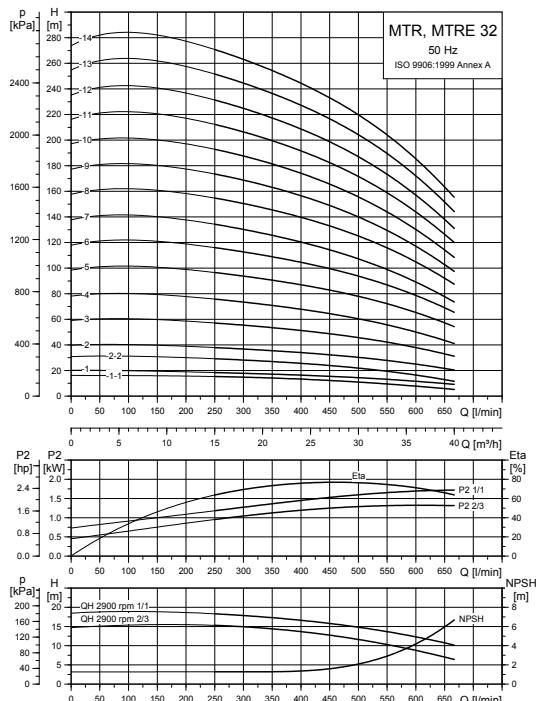


Fig. 48 Example of a curve chart

TM01 4302 0404

### Dimensional data

When sizing a pump the following aspects must be taken into account:

- required flow rate and pressure at the draw-off point
- pressure loss as a result of height differences ( $H_{geo}$ )
- friction loss in the pipework ( $H_f$ ). It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- best efficiency at the estimated duty point
- NPSH value for calculation of the NPSH value, see "Minimum inlet pressure - NPSH" on page 50.

### Efficiency

Before determining the point of best efficiency, the operating pattern of the pump needs to be identified.

Is the pump expected always to operate in the same duty point, select an MTR, MTH, MTA pump which is operating at a duty point corresponding to the best efficiency of the pump.

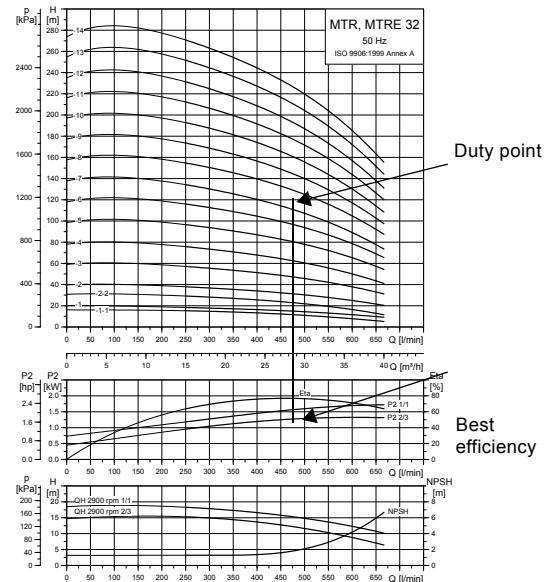


Fig. 49 Example of an MTR pump's duty point

TM01 4302 0404

As the pump is sized on the basis of the highest possible flow, it is important always to have the duty point to the right on the efficiency curve ( $\eta$ ) in order to keep efficiency high when the flow drops.

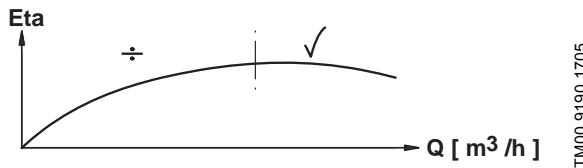


Fig. 50 Best efficiency

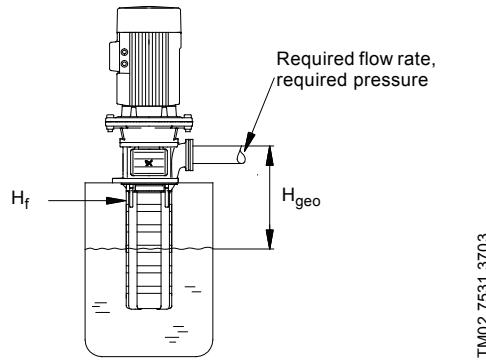


Fig. 51 Dimensional data

Normally, MTRE pumps are used in applications characterized by a variable flow rate. Consequently, it is not possible to select a pump that is operating constantly at optimum efficiency. In order to achieve optimum operating economy, the pump should be selected on the basis of the following criteria:

- The maximum duty point should be as close as possible to the QH curve of the pump.
- The required duty point should be positioned so that  $P_2$  is close to the max. point of the QH curve.

Between the minimum and maximum performance curves, MTRE pumps have an infinite number of performance curves each representing a specific speed. Therefore it may not be possible to select a duty point close to the max. curve.

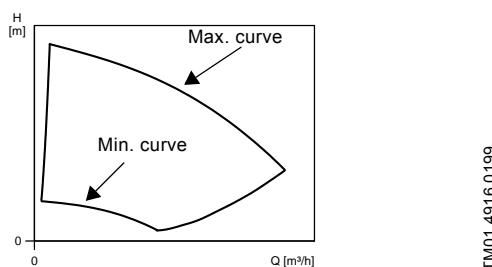


Fig. 52 Min. and max. performance curves

In situations where it is not possible to select a duty point close to the max. curve, the affinity equations below can be used. The head ( $H$ ), the flow rate ( $Q$ ) and the input power ( $P$ ) are all the appropriate variables you need to be able to calculate the motor speed ( $n$ ).

#### Note:

The approximated formulas apply on condition that the system characteristic remains unchanged for  $n_n$  and  $n_x$  and that it is based on the formula  $H = k \times Q^2$  where  $k$  is a constant.

The power equation implies that the pump efficiency is unchanged at the two speeds. In practice this is not quite correct.

Finally, it is worth noting that the efficiencies of the frequency converter and the motor must be taken into account if a precise calculation of the power saving resulting from a reduction of the pump speed is wanted.

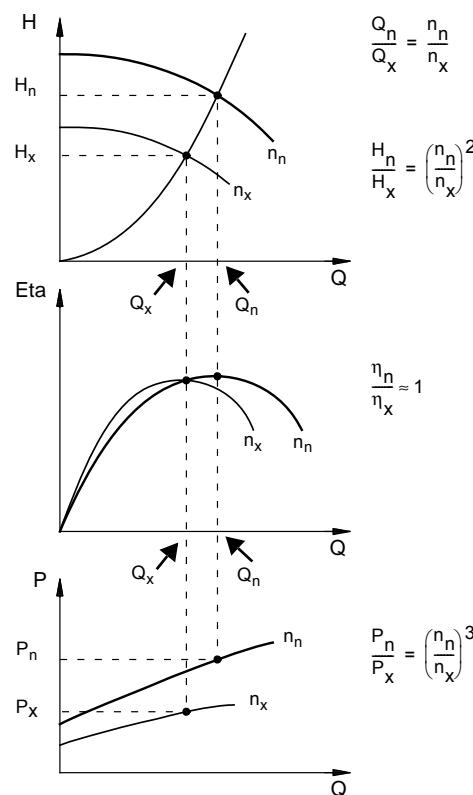


Fig. 53 Affinity equations

#### Legend

$H_n$	Rated head [m]
$H_x$	Current head [m]
$Q_n$	Flow rate [ $m^3/h$ ]
$Q_x$	Current flow rate [ $m^3/h$ ]
$n_n$	Rated motor speed [ $min^{-1}$ ]
$n_x$	Current motor speed [ $min^{-1}$ ]
$\eta_n$	Rated efficiency [%]
$\eta_x$	Current efficiency [%]

### WinCAPS and WebCAPS

WinCAPS and WebCAPS are both selection tools offered by Grundfos.

The two tools make it possible to calculate an MTRE pump's specific duty point and energy consumption.

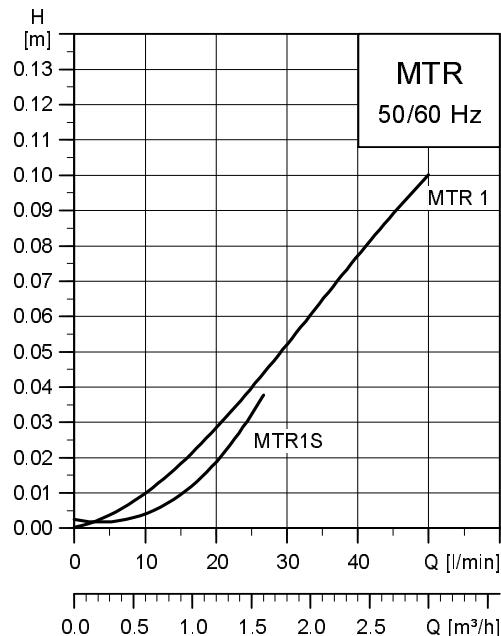
By entering the sizing data of the pump, WinCAPS and WebCAPS can calculate the exact duty point and energy consumption.

For further information see page 159.

### Pressure loss

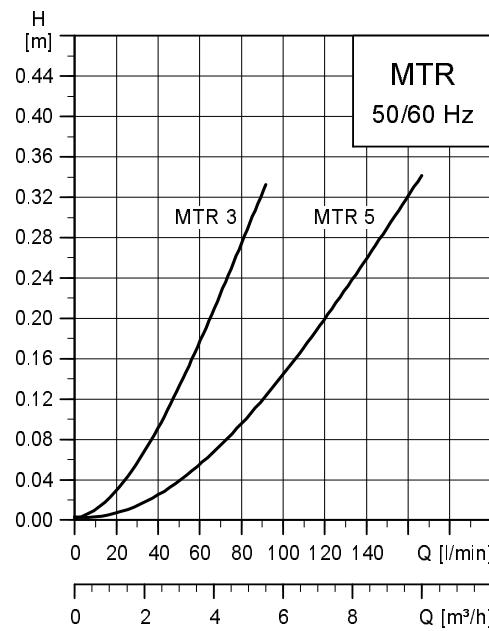
During operation pressure losses occur in all centrifugal pumps.

The below curves illustrate the pressure losses for pumped liquid passing through one empty chamber. An empty chamber is a chamber without an impeller.



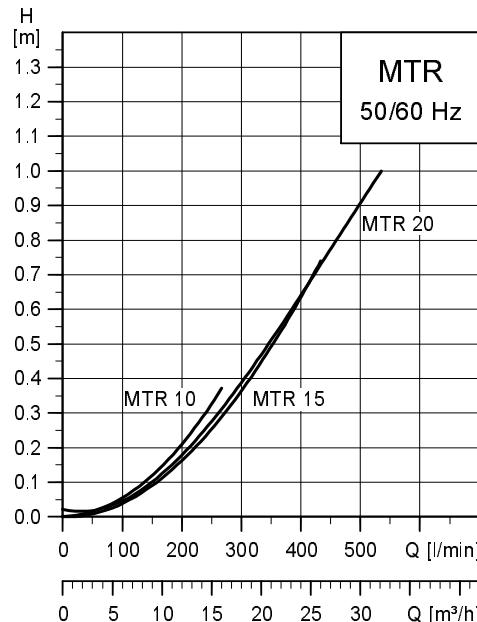
TM02 8546 1010

**Fig. 54** Pressure losses of pumped liquid passing through an empty chamber for MTR 1s and MTR 1 pumps



TM02 8547 1010

**Fig. 55** Pressure losses of pumped liquid passing through an empty chamber for MTR 3 and MTR 5 pumps



TM02 8581 1010

**Fig. 56** Pressure losses of pumped liquid passing through an empty chamber for MTR 10, MTR 15 and MTR 20 pumps

As MTR, MTRE 32, 45 and 64 pumps have holes in the guide vanes, no pressure losses occur in the empty chambers of these pumps.

**Calculation of the reduced head of a pump with empty chambers****Calculation of pressure loss in empty chambers**

From the above curves and the curve charts of each pump type starting on page 45, it is possible to calculate the reduced head of a pump with empty chambers.

The calculation can be made as shown below.

**Example:**

Pump type	MTR 5-18/7
Flow Q (duty point)	6 [m <sup>3</sup> /h]
Head (duty point)	90 [m]

The selected pump is an MTR 5-18/18 with 11 empty chambers, see type keys on page 39.

From the above pressure loss curve of MTR 5, it appears that the pressure loss of each empty chamber at 6 m<sup>3</sup>/h is 0.14 [m]. This results in a total pressure loss of:

$$(\text{Total pressure loss}) = 0.14 \times 11 = 1.54 \text{ [m]}$$

The reduced head of the MTR 5-18/7 pump including pressure losses caused by empty chambers is:

$$\text{Head} = 33 - 1.54 = 31.46 \text{ [m]}$$

The head 33 metres is read from the performance curve for an MTR 5-18/7, see page 58.

## Viscosity

Pump	Maximum kinematic viscosity of pumped liquid [cSt] = [mm <sup>2</sup> /s]
MTR 1s, 1, 3, 5	50
MTR 10, 15, 20, 32, 45, 64	100
SPK	50
MTH	50
MTA	75

The pumping of liquids with densities or kinematic viscosities higher than those of water will cause a considerable pressure drop, a drop in the hydraulic performance and a rise in the power consumption.

In such situations the pump should be equipped with a larger motor. If in doubt, contact Grundfos.

The following examples show the drop in the hydraulic performance of MTR, MTRE pumps pumping oil with a density of 872 kg/m<sup>3</sup> but with three different kinematic viscosities.

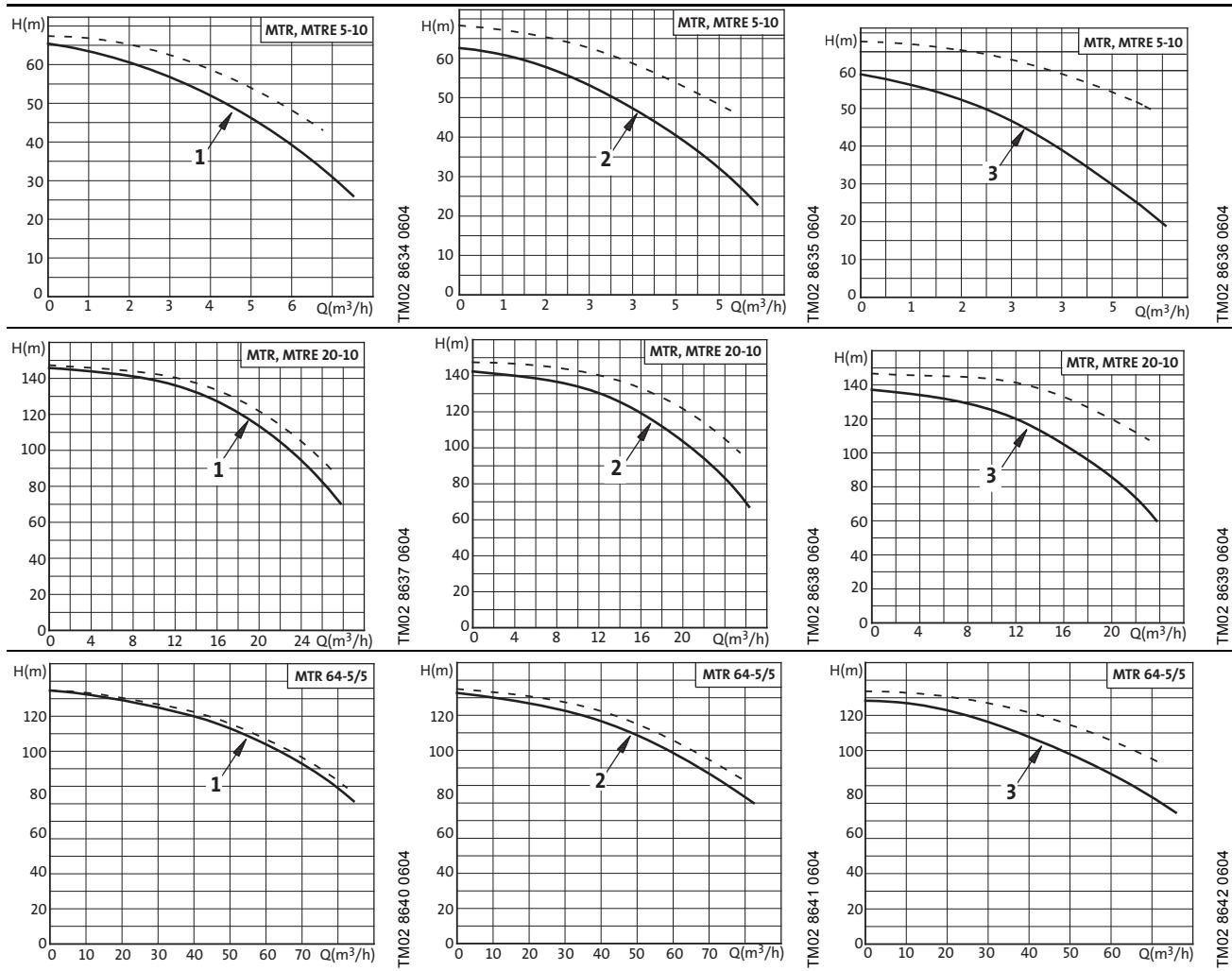


Fig. 57 Drop in the hydraulic performance of MTR, MTRE pumps pumping oil with three different kinematic viscosities.

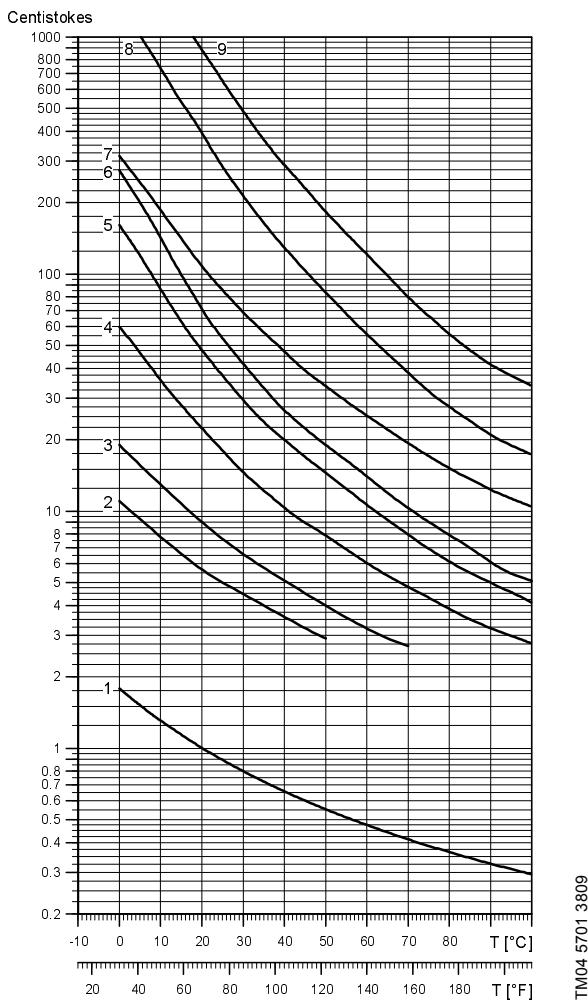
## Key

Position	Density [kg/m <sup>3</sup> ]	Kinematic viscosity [cSt] = [mm <sup>2</sup> /s]
1	872	16
2	872	32
3	872	75

For further information about pump performance when pumping liquids with densities or kinematic viscosities higher than those of water, see WinCAPS or WebCAPS. WinCAPS and WebCAPS are product selection systems offered by Grundfos, see page 159.

## Kinematic viscosity of different oils

The curves below show the kinematic viscosity of different oils in relation to oil temperature.



**Fig. 58** Kinematic viscosity of different oils in relation to oil temperature

## Key to kinematic viscosities of different oils

Curve number	Liquid
1	Water
2	Honing oil
3	Grinding oil
4	Hydraulic oil (ISO VG10)
5	Thermal oil
6	Cutting oil
7	Hydraulic oil (ISO VG46)
8	Motor oil (20W-50)
9	Gear oil

## Minimum inlet pressure - NPSH

We recommend calculating the inlet pressure "H" when the following aspects apply:

- the liquid temperature is high
- the flow is significantly higher than the flow rate
- water is drawn from depths
- water is drawn through long pipes
- inlet conditions are poor.

To avoid cavitation, make sure that there is a minimum pressure on the suction side of the pump. The maximum suction lift "H" in metres head can be calculated as follows:

$$H = p_b \times 10.2 - NPSH - H_f - H_v - H_s$$

$p_b$  = Barometric pressure in bar. Barometric pressure can be set to 1 bar). In closed systems,  $p_b$  indicates the system pressure in bar.

NPSH = Net Positive Suction Head in metres head. (To be read from the NPSH curve at the highest flow rate the pump will be delivering).

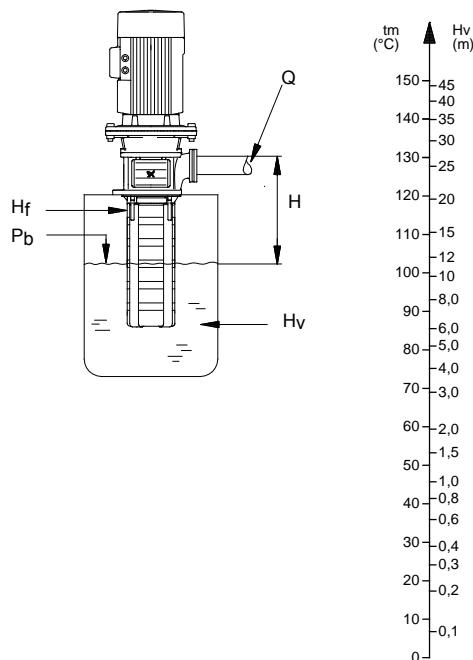
$H_f$  = Friction loss in suction pipe in metres head. (At the highest flow rate the pump will be delivering).

$H_v$  = Vapour pressure in metres head.

$H_s$  = Safety margin = minimum 0.5 metre head.

If the "H" calculated is positive, the pump can operate at a suction lift of maximum "H" metres head.

If the "H" calculated is negative, an inlet pressure of minimum "H" metres head is required.



**Fig. 59** Minimum inlet pressure - NPSH

**Note:** In order to avoid cavitation, never select a pump whose duty point is too far to the right on the NPSH curve.

Always check the NPSH value of the pump at the highest possible flow rate.

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## 11. Performance curves and technical data

### Introduction to performance curves

#### How to read the curve charts

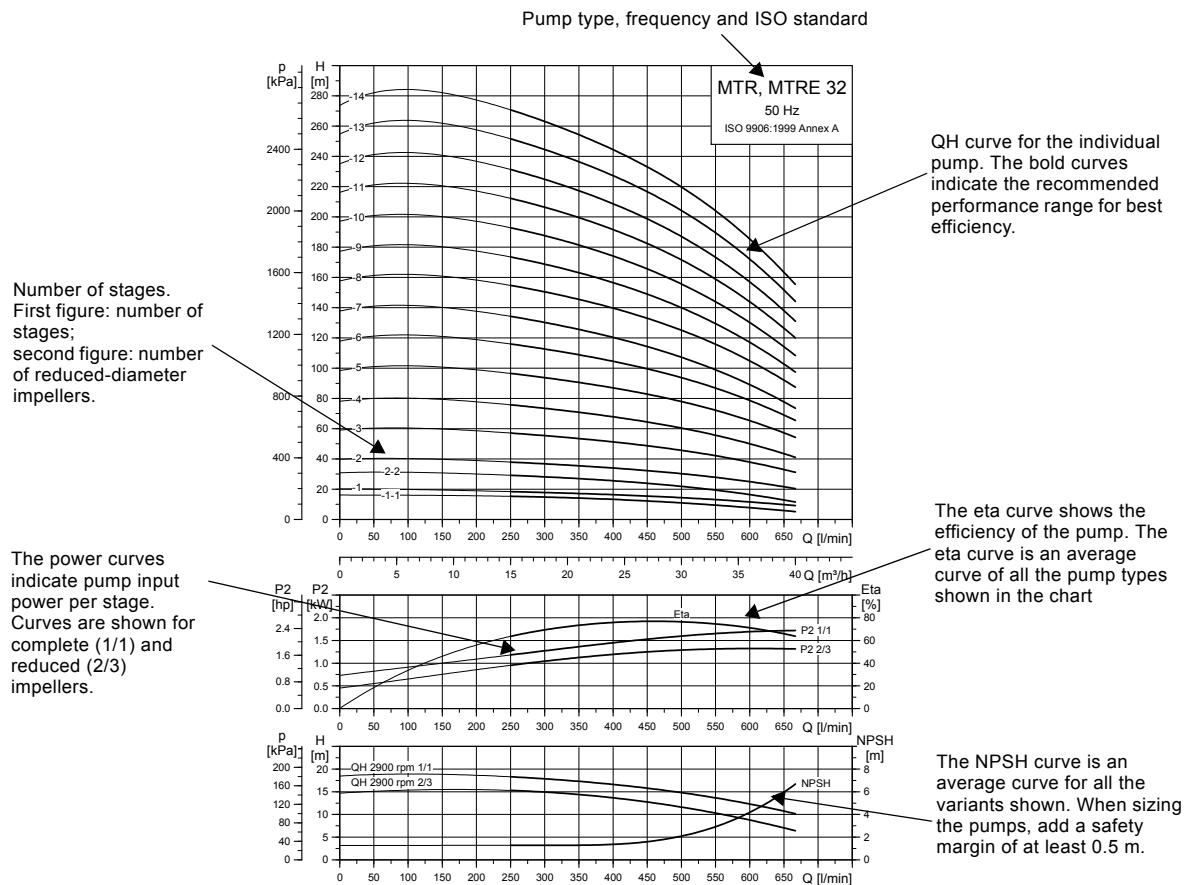


Fig. 60 Example of an MTR, MTRE, curve chart

#### Guidelines to performance curves

The guidelines below apply to the curves shown on the following pages:

1. Tolerances to ISO 9906, Annex A, if indicated.
2. The motors used for the measurements are standard Grundfos motors (MG or MGE).
3. Measurements have been made with airless water at a temperature of 20 °C.
4. The curves apply to a kinematic viscosity of  $\nu = 1 \text{ mm}^2/\text{s}$  (1 cSt).
5. Due to the risk of overheating, the pumps should not be used at a flow below the minimum flow rate.
6. QH curves of the individual pumps are based on current motor speeds.

The curve below shows the minimum flow rate as a percentage of the nominal flow rate in relation to the liquid temperature.

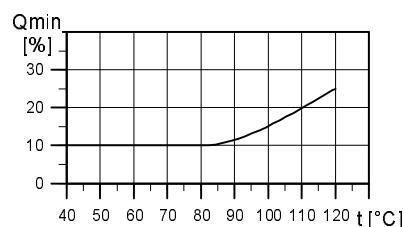
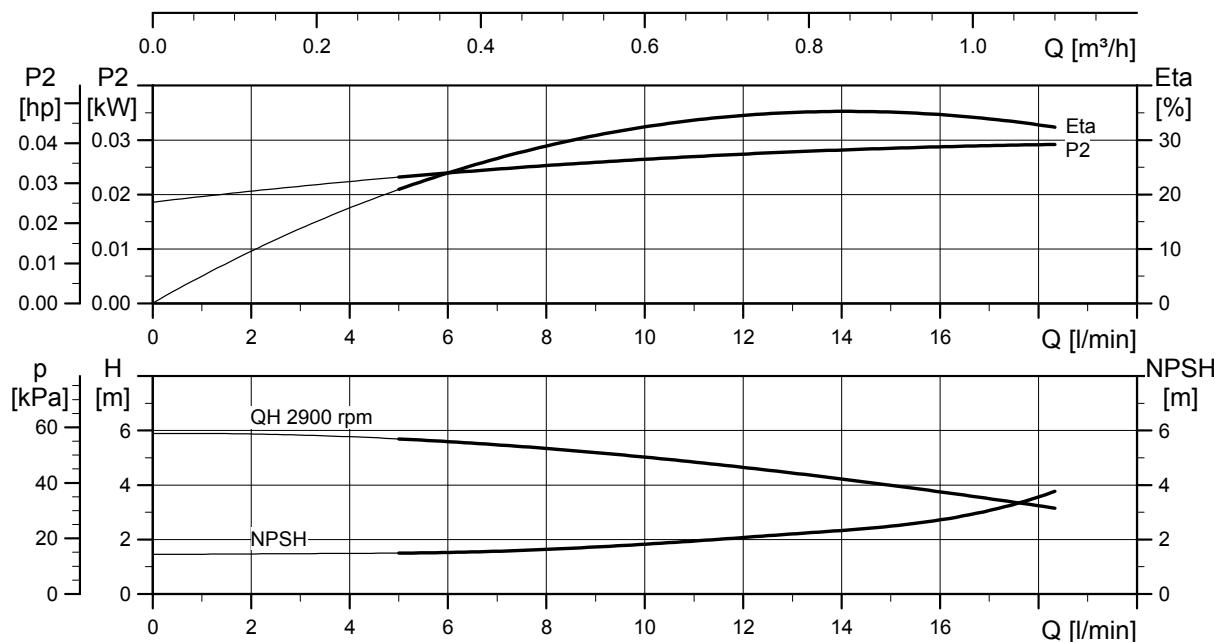
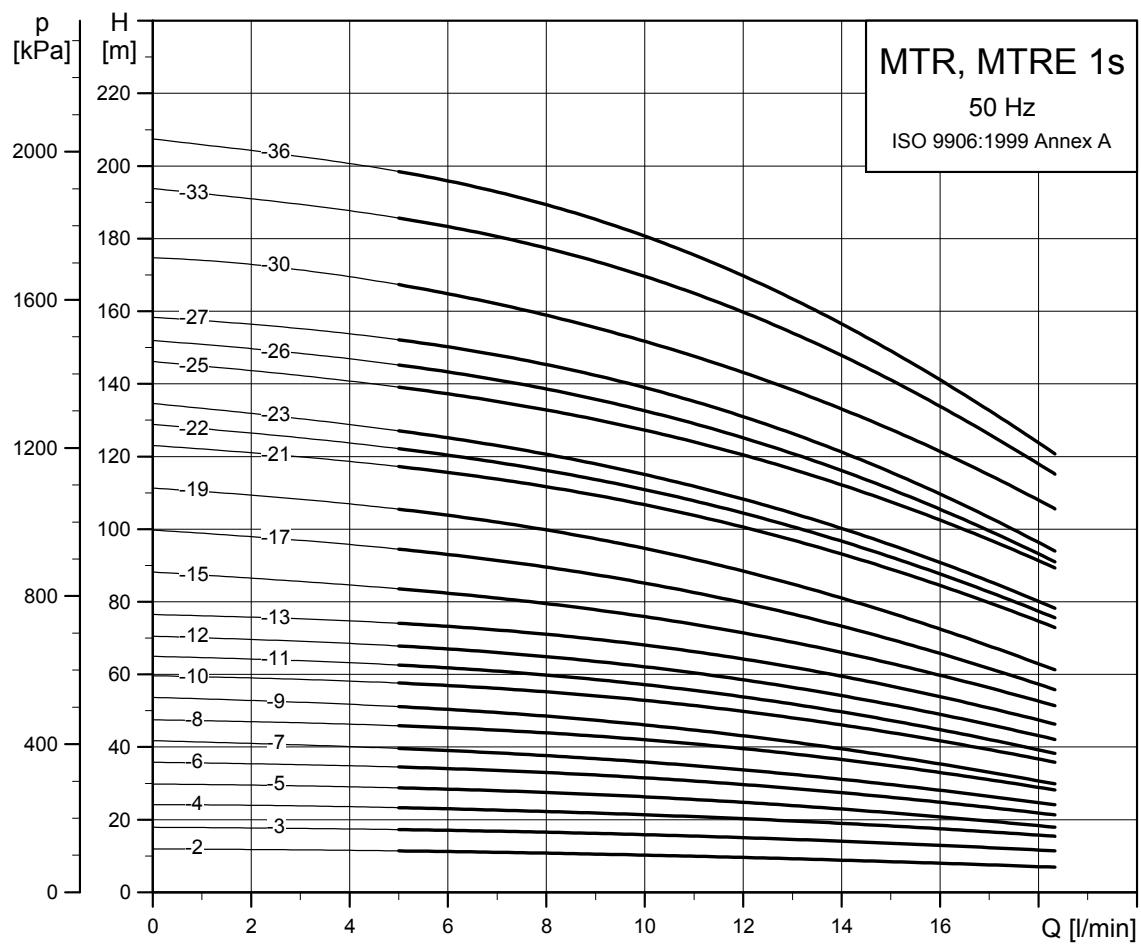
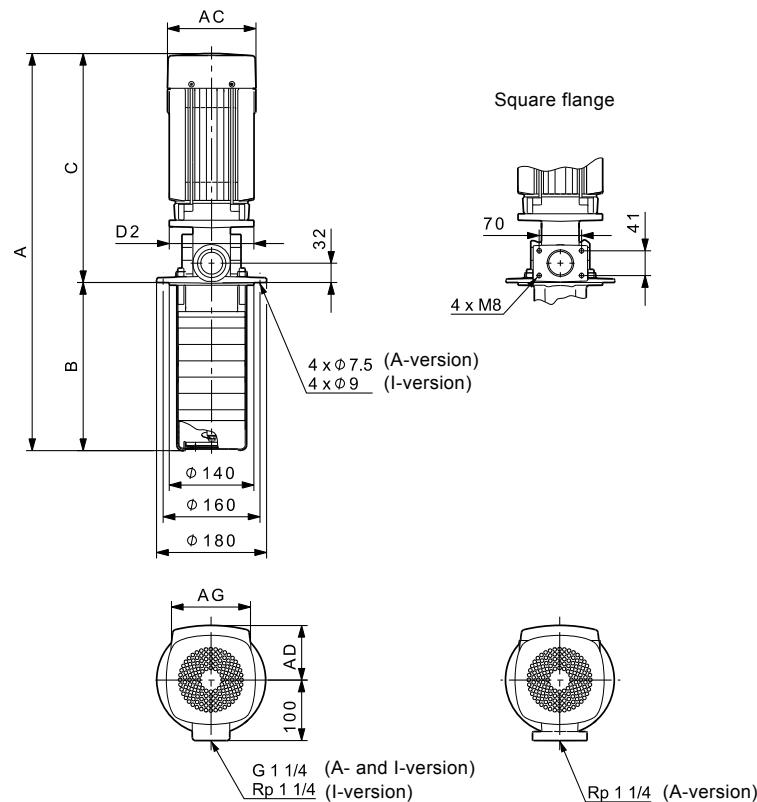


Fig. 61 Minimum flow rate

**MTR, MTRE, 50 Hz****MTR, MTRE 1s, 50 Hz**

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## Dimensional sketches



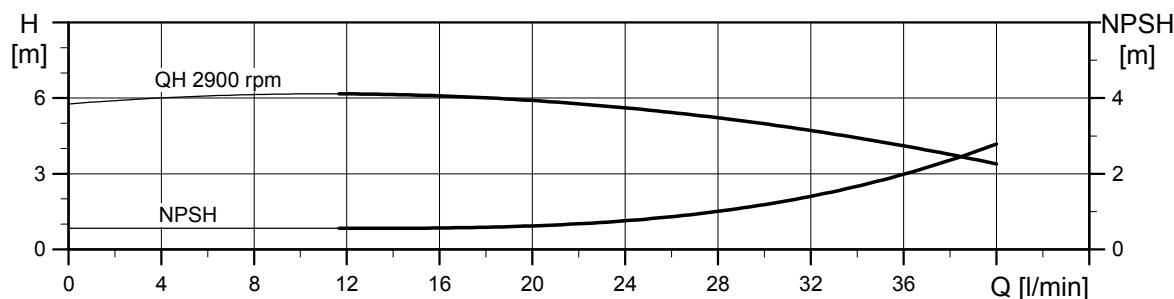
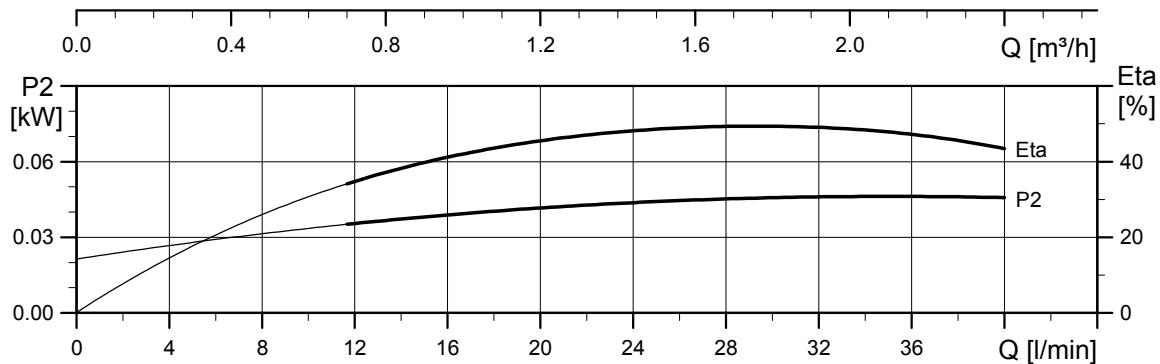
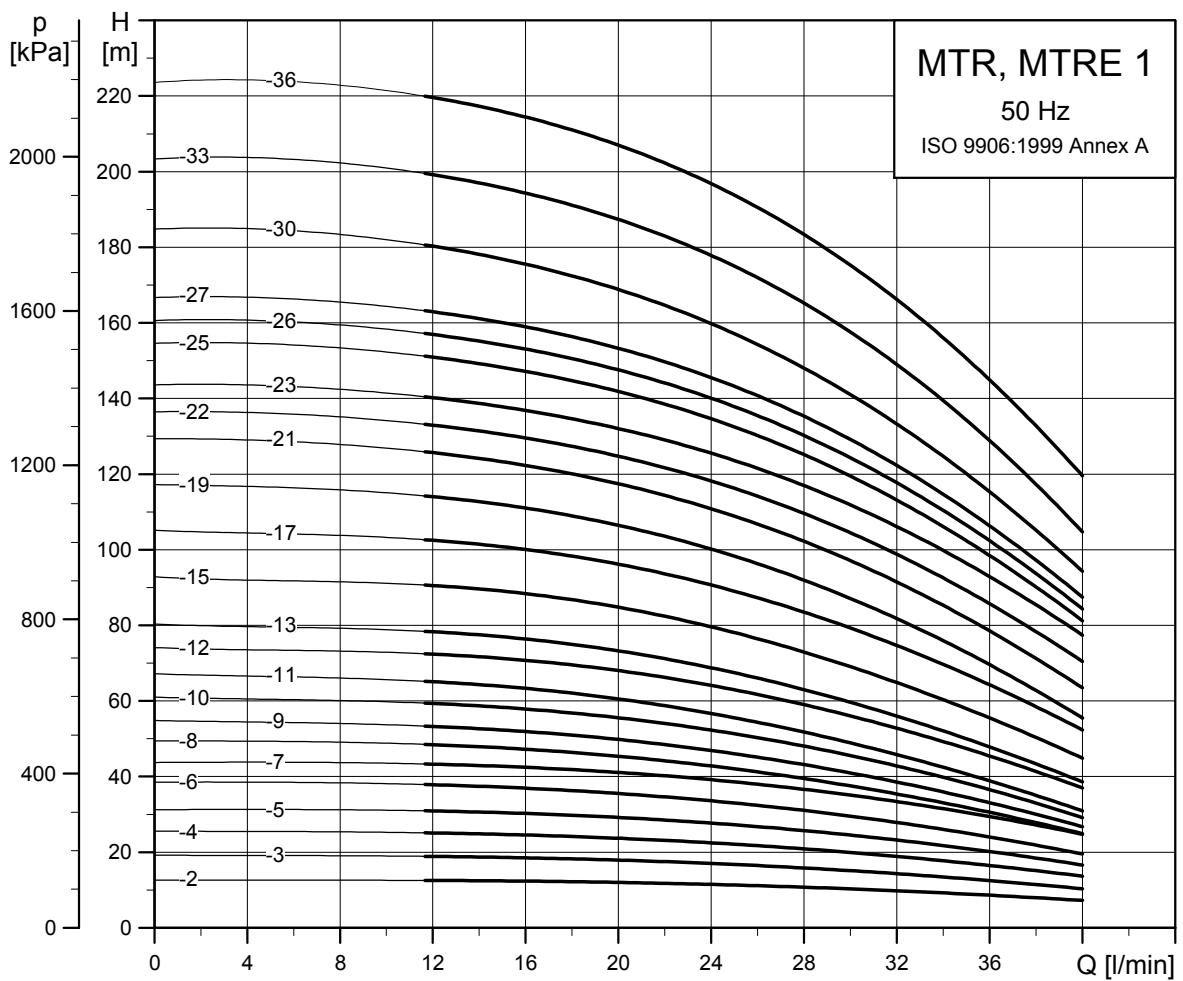
TM03 2677 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE								
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]							
		A	B	C	AC	D2	AD	AG		A	B	C	AC	D2	AD	AG	
MTR 1s-2/2	0.37	464	160	304	140	140	109	82	12.2	-	-	-	-	-	-	-	
MTR 1s-3/3	0.37	482	178	304	140	140	109	82	12.5	-	-	-	-	-	-	-	
MTR 1s-4/4	0.37	500	196	304	140	140	109	82	12.8	-	-	-	-	-	-	-	
MTR, MTRE 1s-5/5	0.37	518	214	304	140	140	109	82	13.1	518	214	304	141	140	140	268	15.8
MTR 1s-6/6	0.37	536	232	304	140	140	109	82	13.4	-	-	-	-	-	-	-	-
MTR 1s-7/7	0.37	554	250	304	140	140	109	82	13.7	-	-	-	-	-	-	-	-
MTR, MTRE 1s-8/8	0.37	572	268	304	140	140	109	82	14.0	572	268	304	141	140	140	268	16.7
MTR 1s-9/9	0.37	590	286	304	140	140	109	82	14.3	-	-	-	-	-	-	-	-
MTR 1s-10/10	0.37	608	304	304	140	140	109	82	14.6	-	-	-	-	-	-	-	-
MTR 1s-11/11	0.37	626	322	304	140	140	109	82	14.9	-	-	-	-	-	-	-	-
MTR, MTRE 1s-12/12	0.37	644	340	304	140	140	109	82	15.2	644	340	304	141	140	140	268	17.9
MTR 1s-13/13	0.37	662	358	304	140	140	109	82	16.0	-	-	-	-	-	-	-	-
MTR 1s-15/15	0.55	698	394	304	140	140	109	82	16.6	-	-	-	-	-	-	-	-
MTR 1s-17/17	0.55	734	430	304	140	140	109	82	17.2	-	-	-	-	-	-	-	-
MTR, MTRE 1s-19/19	0.55	770	466	304	140	140	109	82	17.8	770	466	304	141	140	140	268	19.6
MTR 1s-21/21	0.75	846	502	344	140	140	109	82	19.2	-	-	-	-	-	-	-	-
MTR 1s-22/22	0.75	864	520	344	140	140	109	82	19.8	-	-	-	-	-	-	-	-
MTR 1s-23/23	0.75	882	538	344	140	140	109	82	20.1	-	-	-	-	-	-	-	-
MTR, MTRE 1s-25/25	0.75	918	574	344	140	140	109	82	20.4	918	574	344	178	140	167	268	22.0
MTR 1s-26/26	0.75	936	592	344	140	140	109	82	22.1	-	-	-	-	-	-	-	-
MTR 1s-27/27	1.1	954	610	344	140	140	109	82	22.4	-	-	-	-	-	-	-	-
MTR, MTRE 1s-30/30	1.1	1008	664	344	140	140	109	82	23.3	1008	664	344	178	140	167	268	26.0
MTR 1s-33/33	1.1	1062	718	344	140	140	109	82	24.2	-	-	-	-	-	-	-	-
MTR, MTRE 1s-36/36	1.1	1116	772	344	140	140	109	82	25.1	1116	772	344	178	140	167	268	27.8

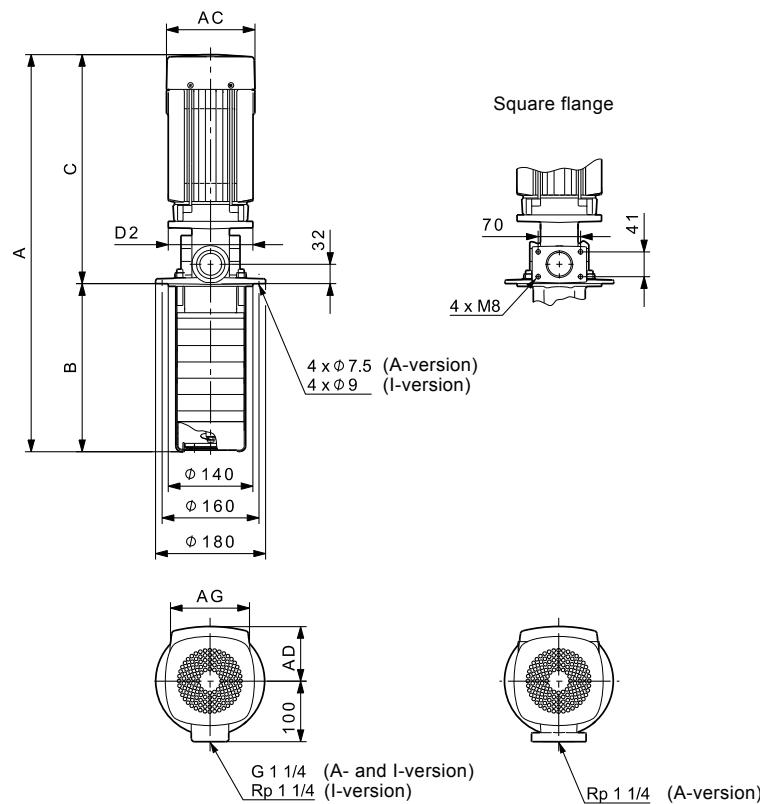
The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 1, 50 Hz**

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## Dimensional sketches



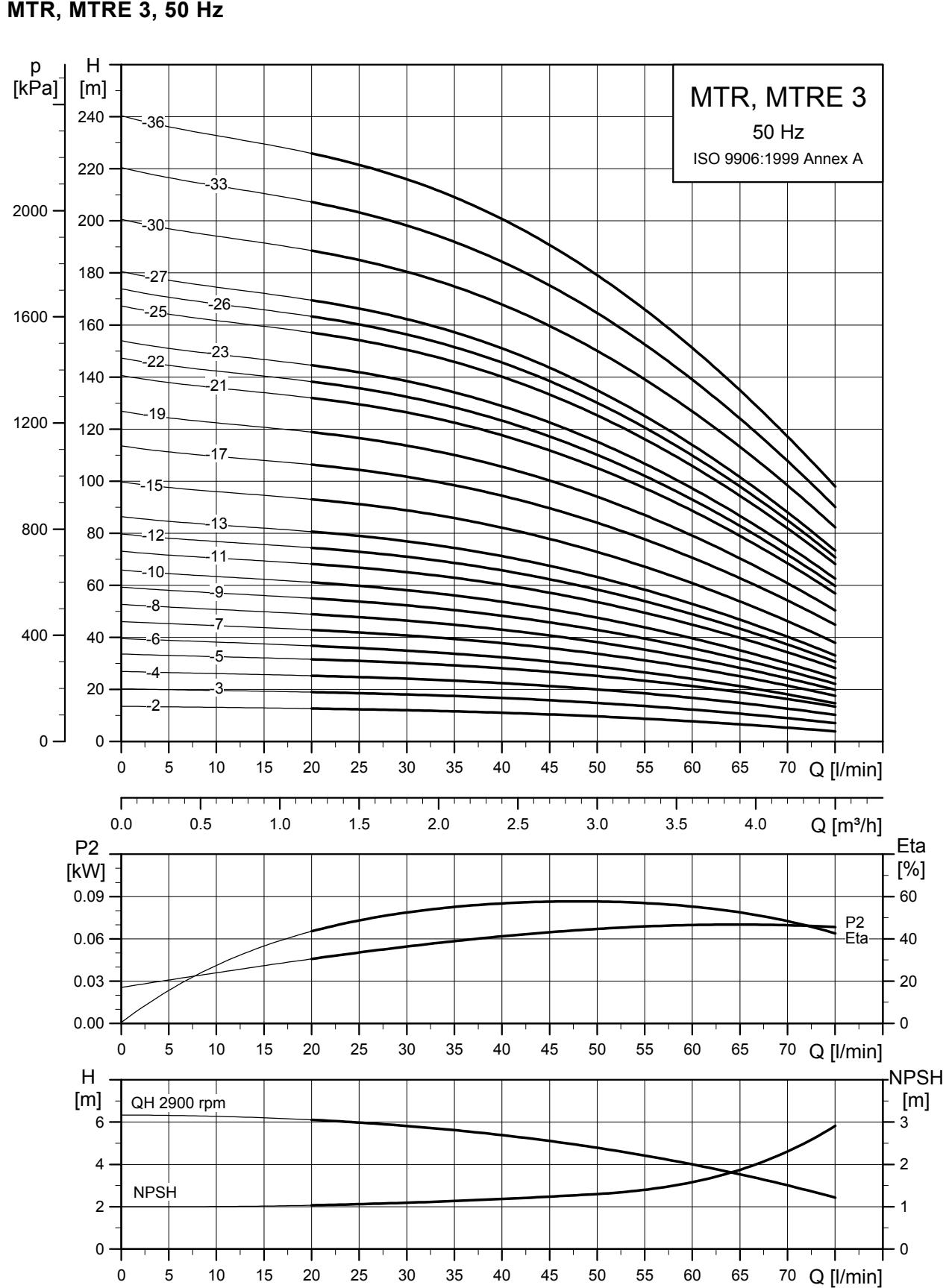
TM03 2677 2413

## Dimensions and weights

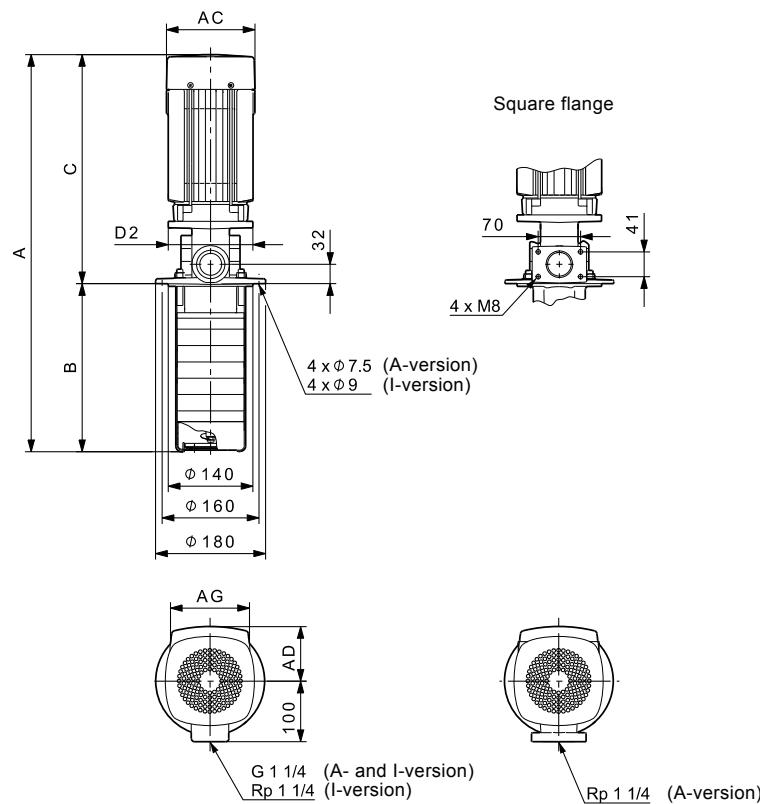
Pump type	P2 [kW]	MTR							MTRE								
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]							
		A	B	C	AC	D2	AD	AG		A	B	C	AC	D2	AD	AG	
MTR 1-2/2	0.37	464	160	304	140	140	109	82	12.2	-	-	-	-	-	-	-	
MTR 1-3/3	0.37	482	178	304	140	140	109	82	12.5	-	-	-	-	-	-	-	
MTR 1-4/4	0.37	500	196	304	140	140	109	82	12.8	-	-	-	-	-	-	-	
MTR, MTRE 1-5/5	0.37	518	214	304	140	140	109	82	13.1	518	214	304	141	140	140	268	15.8
MTR 1-6/6	0.37	536	232	304	140	140	109	82	13.4	-	-	-	-	-	-	-	-
MTR 1-7/7	0.37	554	250	304	140	140	109	82	13.7	-	-	-	-	-	-	-	-
MTR, MTRE 1-8/8	0.55	572	268	304	140	140	109	82	14.0	572	268	304	141	140	140	268	16.7
MTR 1-9/9	0.55	590	286	304	140	140	109	82	14.8	-	-	-	-	-	-	-	-
MTR 1-10/10	0.55	608	304	304	140	140	109	82	15.1	-	-	-	-	-	-	-	-
MTR 1-11/11	0.55	626	322	304	140	140	109	82	15.4	-	-	-	-	-	-	-	-
MTR, MTRE 1-12/12	0.75	684	340	344	140	140	109	82	16.5	684	340	344	141	140	140	268	17.5
MTR 1-13/13	0.75	702	358	344	140	140	109	82	16.8	-	-	-	-	-	-	-	-
MTR, MTRE 1-15/15	0.75	738	394	344	140	140	109	82	17.1	738	394	344	178	140	167	268	18.7
MTR 1-17/17	1.1	774	430	344	140	140	109	82	19.4	-	-	-	-	-	-	-	-
MTR 1-19/19	1.1	810	466	344	140	140	109	82	20.0	-	-	-	-	-	-	-	-
MTR 1-21/21	1.1	846	502	344	140	140	109	82	20.6	-	-	-	-	-	-	-	-
MTR 1-22/22	1.1	864	520	344	140	140	109	82	20.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-23/23	1.1	882	538	344	140	140	109	82	21.2	882	538	344	178	140	167	268	23.9
MTR 1-25/25	1.5	968	574	394	178	140	110	162	28.3	-	-	-	-	-	-	-	-
MTR 1-26/26	1.5	986	592	394	178	140	110	162	28.6	-	-	-	-	-	-	-	-
MTR 1-27/27	1.5	1004	610	394	178	140	110	162	28.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-30/30	1.5	1058	664	394	178	140	110	162	29.8	1058	664	394	178	140	167	268	37.6
MTR 1-33/33	2.2	1152	718	434	178	140	110	162	34.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-36/36	2.2	1206	772	434	178	140	110	162	35.8	1206	772	434	178	140	167	268	41.6

The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.



## Dimensional sketches



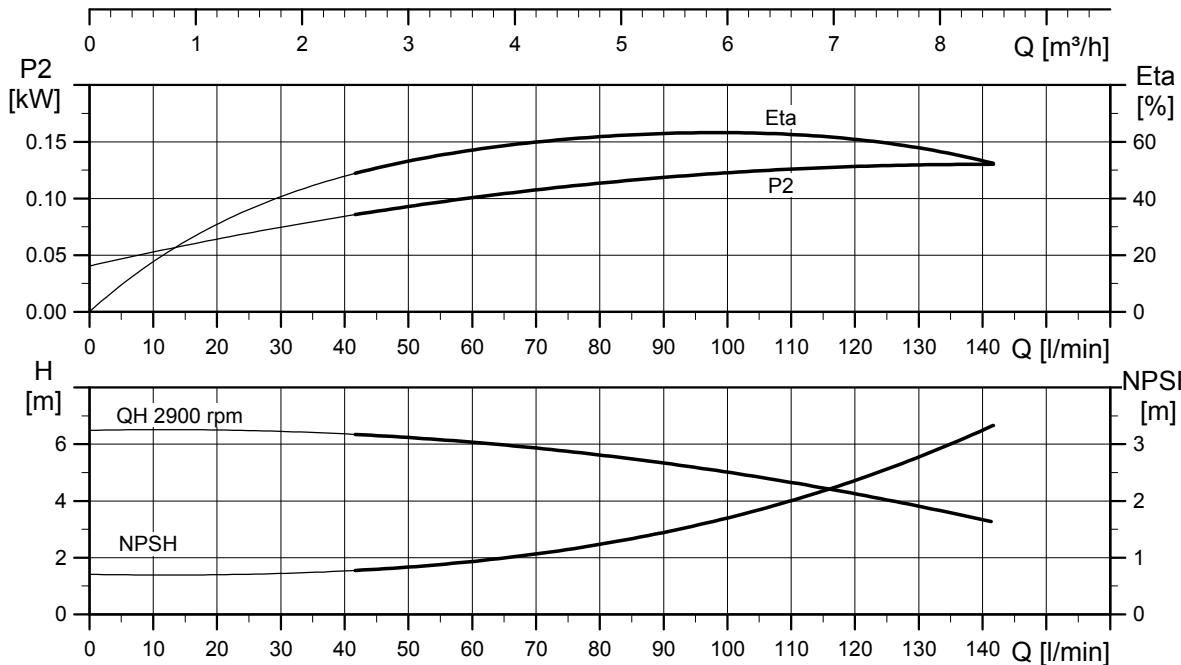
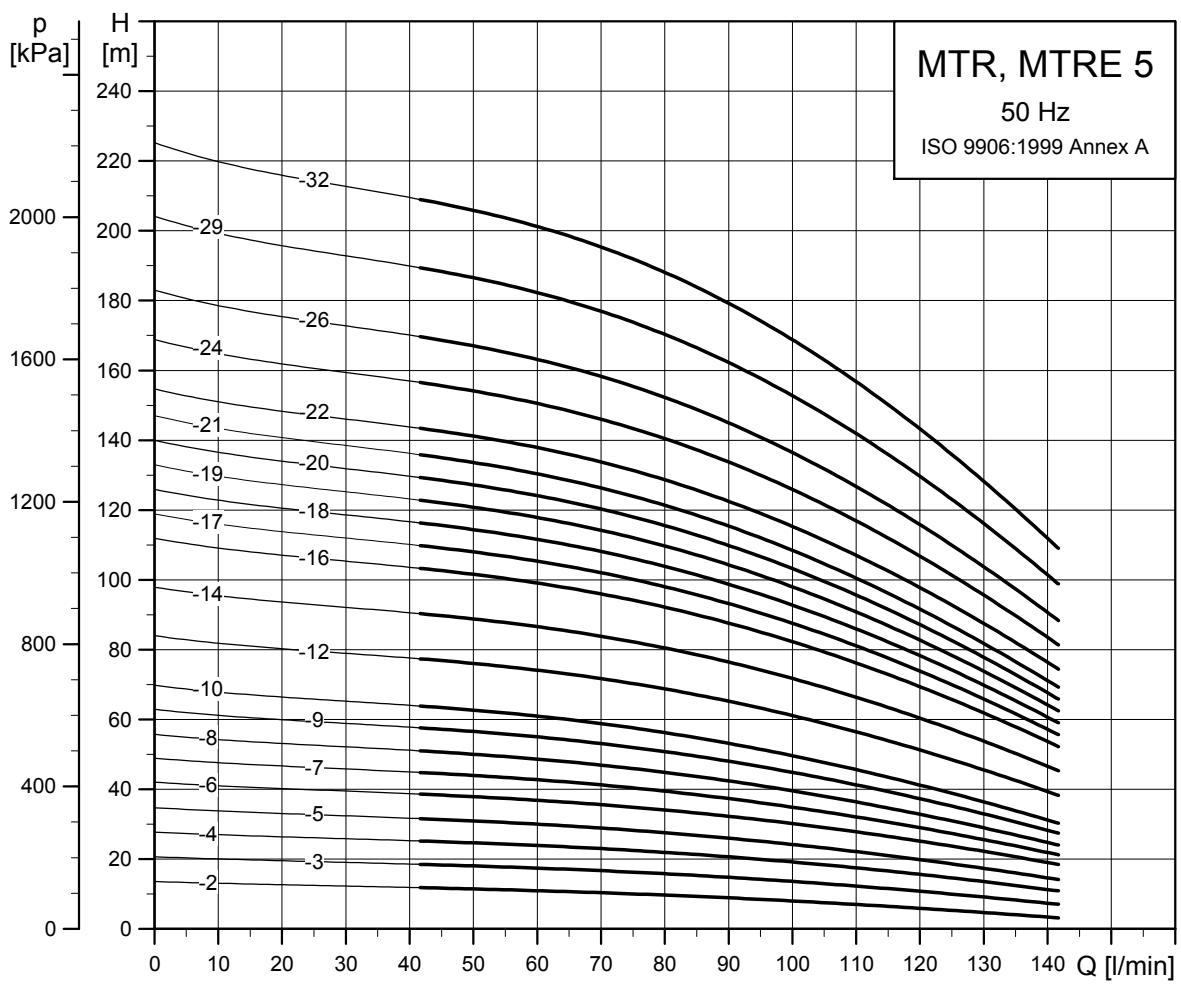
TM03 2677 2413

## Dimensions and weights

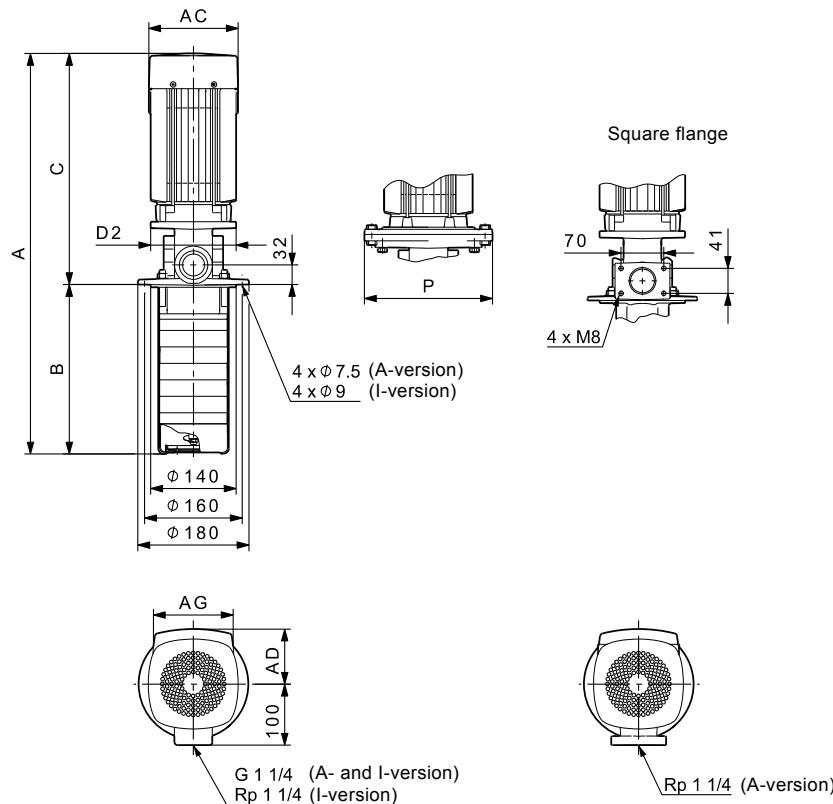
Pump type	P2 [kW]	MTR							MTRE								
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]							
		A	B	C	AC	D2	AD	AG		A	B	C	AC	D2	AD	AG	
MTR 3-2/2	0.37	464	160	304	140	140	109	82	12.2	-	-	-	-	-	-	-	
MTR 3-3/3	0.37	482	178	304	140	140	109	82	12.5	-	-	-	-	-	-	-	
MTR 3-4/4	0.37	500	196	304	140	140	109	82	12.8	-	-	-	-	-	-	-	
MTR, MTRE 3-5/5	0.37	518	214	304	140	140	109	82	13.1	518	214	304	141	140	140	268	15.8
MTR 3-6/6	0.55	536	232	304	140	140	109	82	13.9	-	-	-	-	-	-	-	-
MTR 3-7/7	0.55	554	250	304	140	140	109	82	14.2	-	-	-	-	-	-	-	-
MTR, MTRE 3-8/8	0.75	612	268	344	140	140	109	82	15.2	612	268	344	178	140	140	268	16.6
MTR 3-9/9	0.75	630	286	344	140	140	109	82	15.6	-	-	-	-	-	-	-	-
MTR 3-10/10	0.75	648	304	344	140	140	109	82	15.9	-	-	-	-	-	-	-	-
MTR, MTRE 3-11/11	0.75	666	322	344	140	140	109	82	16.2	666	322	344	178	140	167	268	17.8
MTR 3-12/12	1.1	684	340	344	140	140	109	82	17.9	-	-	-	-	-	-	-	-
MTR 3-13/13	1.1	702	358	344	140	140	109	82	18.2	-	-	-	-	-	-	-	-
MTR, MTRE 3-15/15	1.1	738	394	344	140	140	109	82	18.5	738	394	344	178	140	167	268	21.2
MTR 3-17/17	1.5	824	430	394	178	140	110	162	25.9	-	-	-	-	-	-	-	-
MTR, MTRE 3-19/19	1.5	860	466	394	178	140	110	162	26.5	860	466	394	178	140	167	268	34.0
MTR 3-21/21	2.2	936	502	434	178	140	110	162	31.3	-	-	-	-	-	-	-	-
MTR 3-22/22	2.2	954	520	434	178	140	110	162	31.6	-	-	-	-	-	-	-	-
MTR 3-23/23	2.2	972	538	434	178	140	110	162	31.9	-	-	-	-	-	-	-	-
MTR, MTRE 3-25/25	2.2	1008	574	434	178	140	110	162	32.5	1008	574	434	178	140	167	268	38.3
MTR 3-26/26	2.2	1026	592	434	178	140	110	162	32.8	-	-	-	-	-	-	-	-
MTR 3-27/27	2.2	1044	610	434	178	140	110	162	33.1	-	-	-	-	-	-	-	-
MTR, MTRE 3-30/30	3	1112	664	448	198	140	110	162	38.2	1112	664	448	198	140	167	264	39.8
MTR 3-33/33	3	1166	718	448	198	160	110	162	39.1	-	-	-	-	-	-	-	-
MTR, MTRE 3-36/36	3	1220	772	448	198	160	110	162	40.0	1220	772	448	198	160	177	264	46.8

The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 5, 50 Hz**

## Dimensional sketches



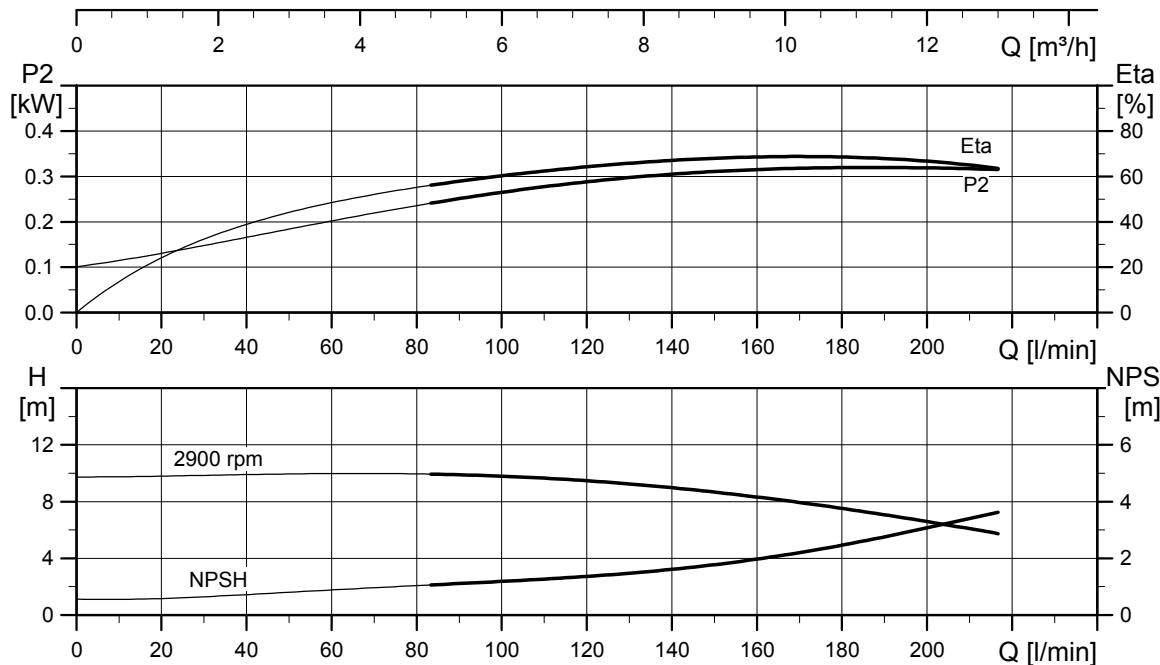
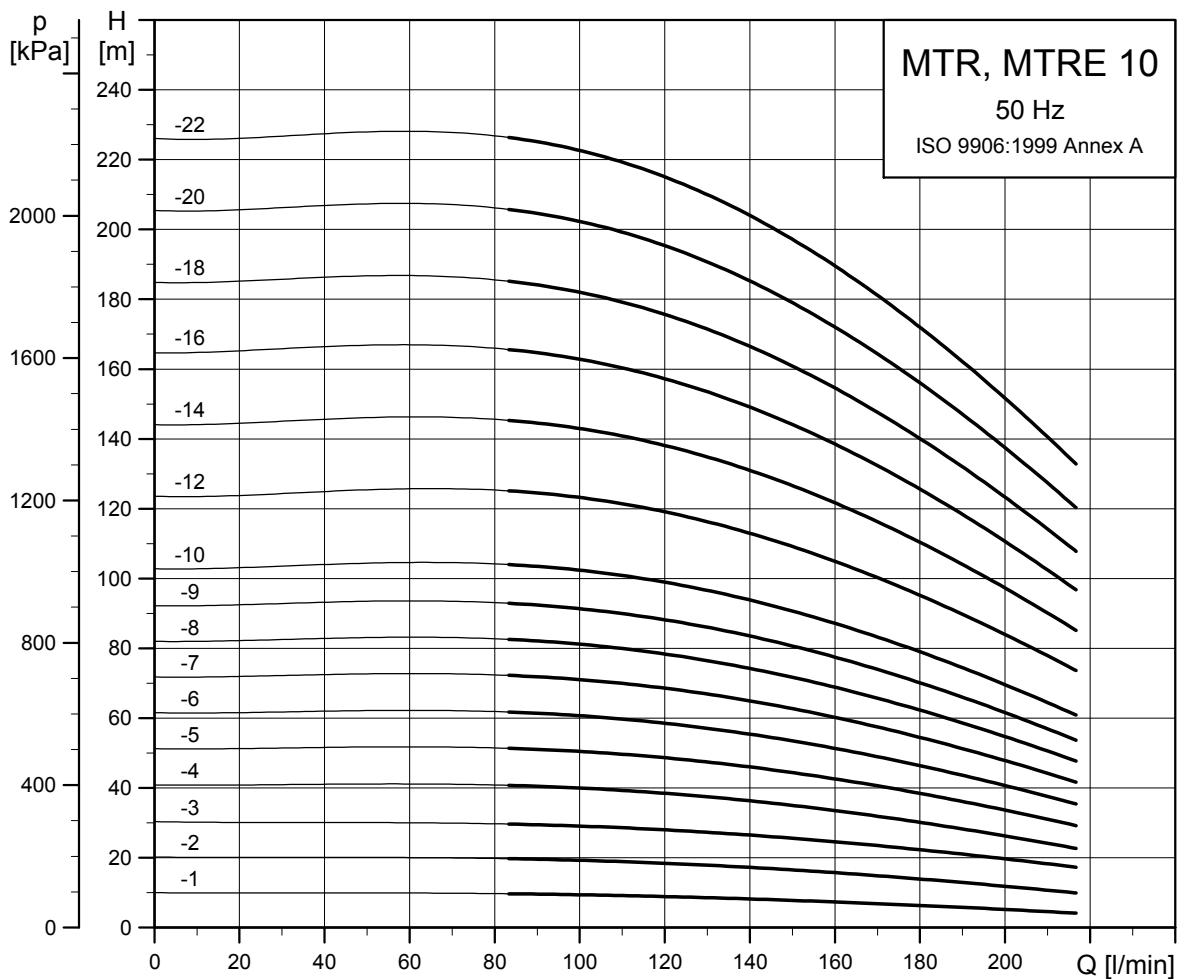
TM04 2789 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE										
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]									
		A	B	C	AC	D2	P	AD		A	B	C	AC	D2	P	AD	AG		
MTR, MTRE 5-2/2	0.37	473	169	304	140	140	-	109	82	12.2	473	169	304	141	140	-	140	268	14.9
MTR 5-3/3	0.55	500	196	304	140	140	-	109	82	13.0	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-4/4	0.55	527	223	304	140	140	-	109	82	13.4	527	223	304	141	140	-	140	268	15.2
MTR, MTRE 5-5/5	0.75	594	250	344	140	140	-	109	82	14.7	594	250	344	178	140	-	167	268	16.3
MTR 5-6/6	1.1	621	277	344	140	140	-	109	82	16.5	-	-	-	-	-	-	-	-	-
MTR 5-7/7	1.1	648	304	344	140	140	-	109	82	16.9	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-8/8	1.1	675	331	344	140	140	-	109	82	17.3	675	331	344	178	140	-	167	268	20.0
MTR 5-9/9	1.5	752	358	394	178	140	-	110	162	26.6	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-10/10	1.5	779	385	394	178	140	-	110	162	27.0	779	385	394	178	140	-	167	268	34.8
MTR 5-12/12	2.2	873	439	434	178	140	-	110	162	32.0	-	-	-	-	-	-	-	-	-
MTR 5-14/14	2.2	927	493	434	178	140	-	110	162	32.8	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-16/16	2.2	981	547	434	178	140	-	110	162	33.6	981	547	434	178	140	-	167	268	37.9
MTR 5-17/17	3	1031	583	448	198	160	-	110	162	35.7	-	-	-	-	-	-	-	-	-
MTR 5-18/18	3	1049	601	448	198	160	-	110	162	36.1	-	-	-	-	-	-	-	-	-
MTR 5-19/19	3	1076	628	448	198	160	-	110	162	36.5	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-20/20	3	1103	655	448	198	160	-	110	162	36.9	1103	655	448	198	160	-	177	264	43.7
MTR 5-21/21	3	1130	682	448	198	160	-	110	162	37.3	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-22/22	4	1194	709	485	220	160	-	134	202	39.5	1194	709	485	220	160	-	188	290	49.2
MTR 5-24/24	4	1248	763	485	220	160	-	134	202	39.9	-	-	-	-	-	-	-	-	-
MTR 5-26/26	4	1302	817	485	220	160	-	134	202	40.3	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-29/29	4	1383	898	485	220	160	-	134	202	40.7	1383	898	485	220	160	-	188	290	50.4
MTR, MTRE 5-32/32	5.5	1464	979	485	220	-	300	134	202	49.3	1464	979	485	220	-	300	188	290	55.9

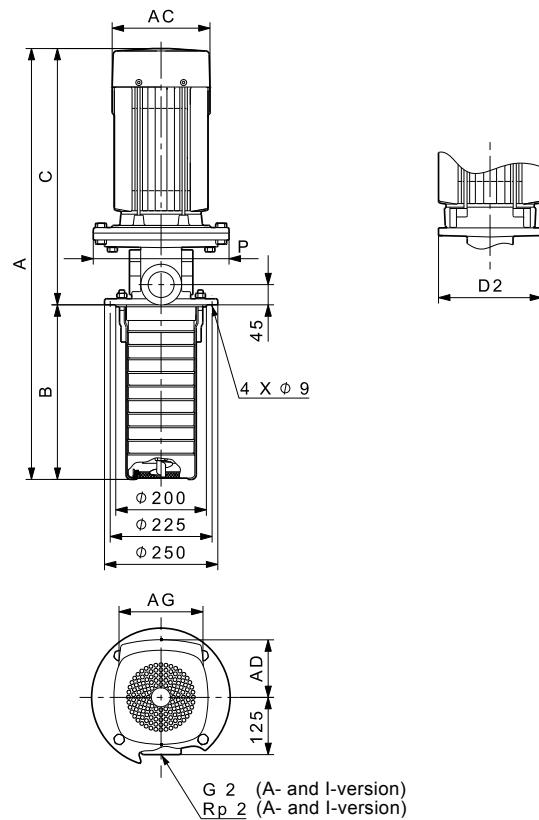
The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 10, 50 Hz**

TM02 7843 4303

## Dimensional sketches



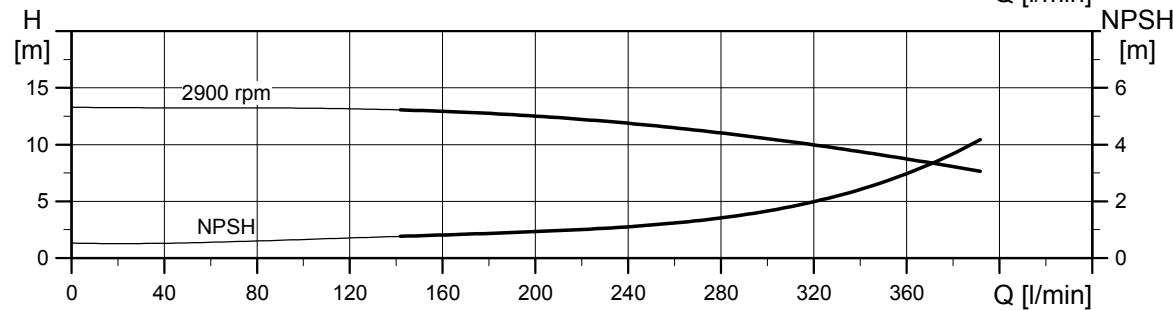
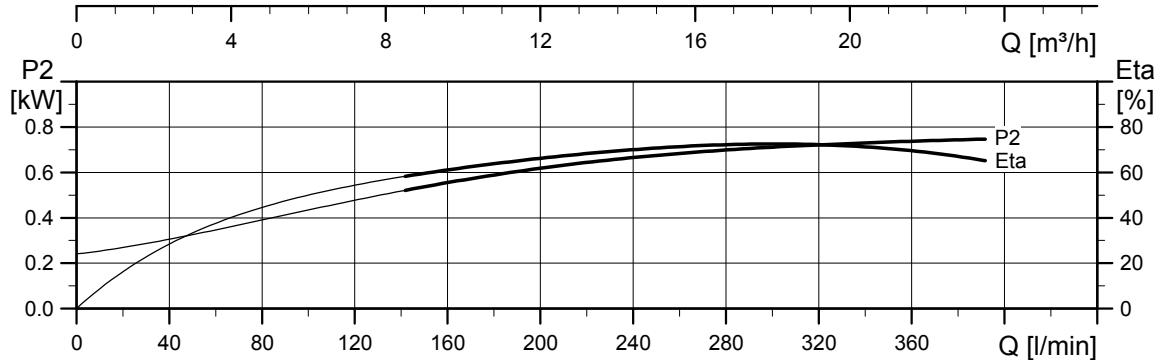
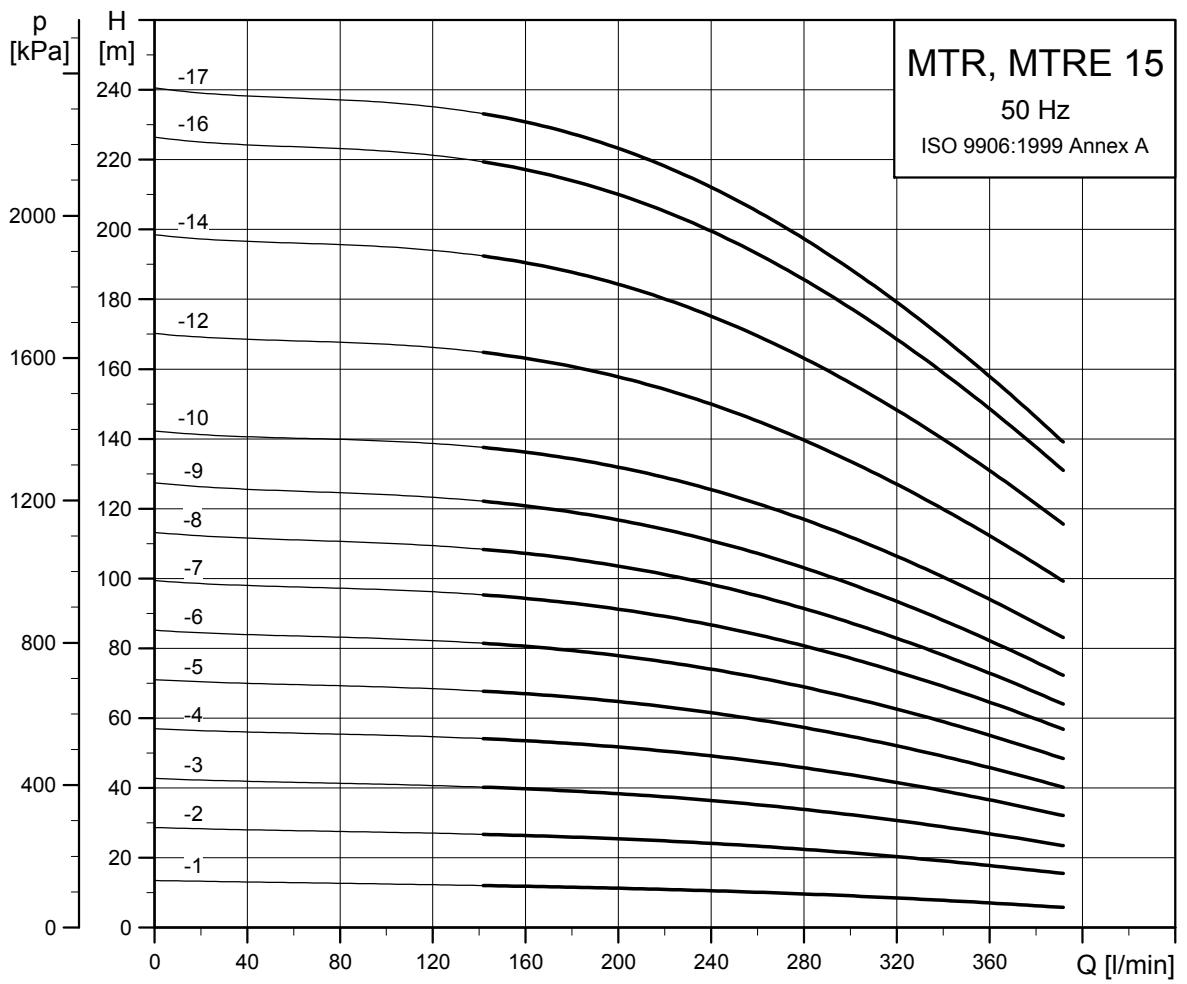
TM04 2790 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							Net weight [kg]			
		A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD	AG		
MTR, MTRE 10-2/1	0.75	523	148	375	140	140	-	109	82	21	523	148	375	141	140	-	140	268	24
MTR, MTRE 10-2/2	0.75	523	148	375	140	140	-	109	82	22	523	148	375	178	140	-	167	268	24
MTR, MTRE 10-3/3	1.1	553	178	375	140	140	-	109	82	24	553	178	375	178	140	-	167	268	27
MTR, MTRE 10-4/4	1.5	633	208	425	178	140	-	110	162	31	633	208	425	178	140	-	167	268	39
MTR 10-5/5	2.2	703	238	465	178	140	-	110	162	37	-	-	-	-	-	-	-	-	-
MTR, MTRE 10-6/6	2.2	733	268	465	178	140	-	110	162	38	733	268	465	178	140	-	167	268	43
MTR 10-7/7	3	777	298	479	198	160	-	110	162	39	-	-	-	-	-	-	-	-	-
MTR 10-8/8	3	807	328	479	198	160	-	110	162	40	-	-	-	-	-	-	-	-	-
MTR, MTRE 10-9/9	3	837	358	479	198	160	-	110	162	41	837	358	479	198	160	-	177	264	48
MTR 10-10/10	4	904	388	516	220	160	-	134	202	43	-	-	-	-	-	-	-	-	-
MTR, MTRE 10-12/12	4	964	448	516	220	160	-	134	202	44	964	448	516	220	160	-	188	290	54
MTR 10-14/14	5.5	1063	508	555	220	-	300	134	202	68	-	-	-	-	-	-	-	-	-
MTR, MTRE 10-16/16	5.5	1123	568	555	220	-	300	134	202	69	1123	568	555	220	-	300	188	290	76
MTR 10-18/18	7.5	1171	628	543	260	-	300	159	203	87	-	-	-	-	-	-	-	-	-
MTR 10-20/20	7.5	1231	688	543	260	-	300	159	203	88	-	-	-	-	-	-	-	-	-
MTR, MTRE 10-22/22	7.5	1291	748	543	260	-	300	159	203	89	1291	748	543	260	-	300	213	290	95

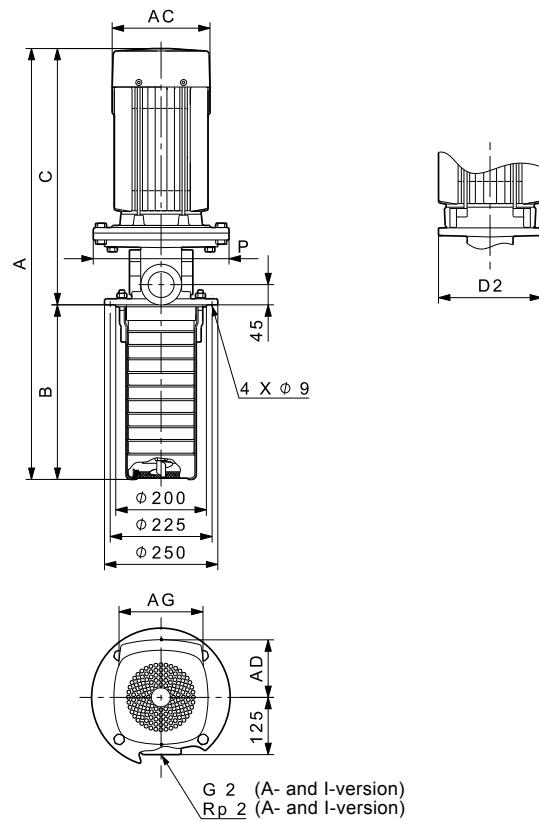
The maximum immersion depth is 1018 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 15, 50 Hz**

TM02 7844 4303

## Dimensional sketches



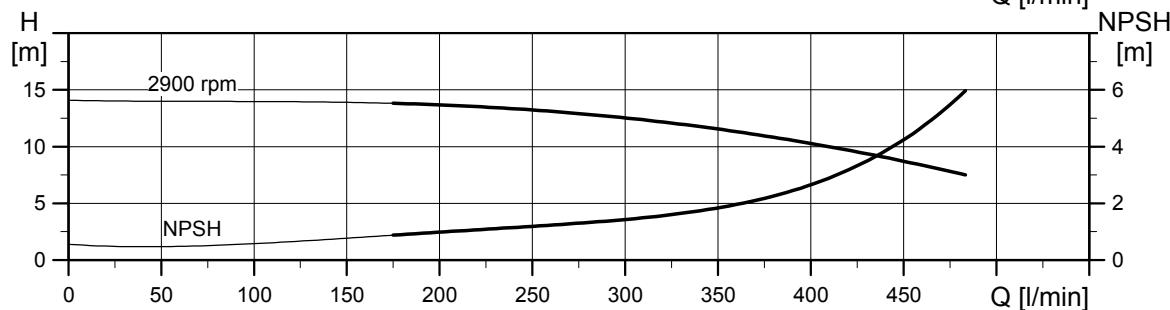
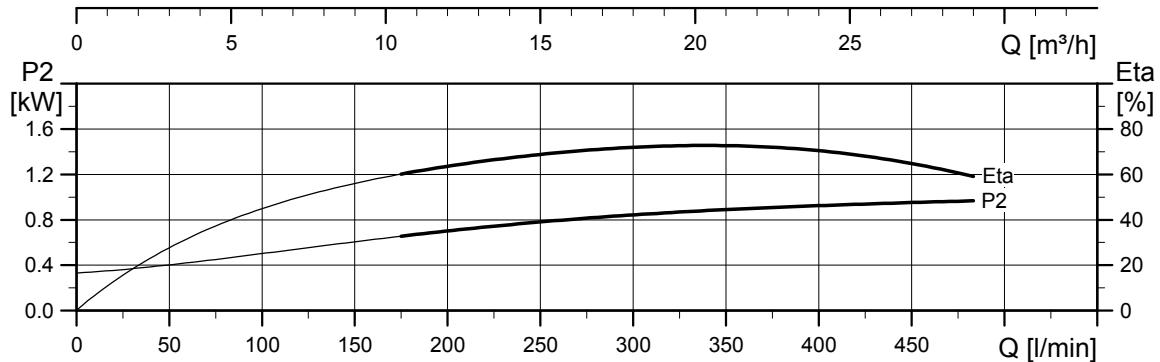
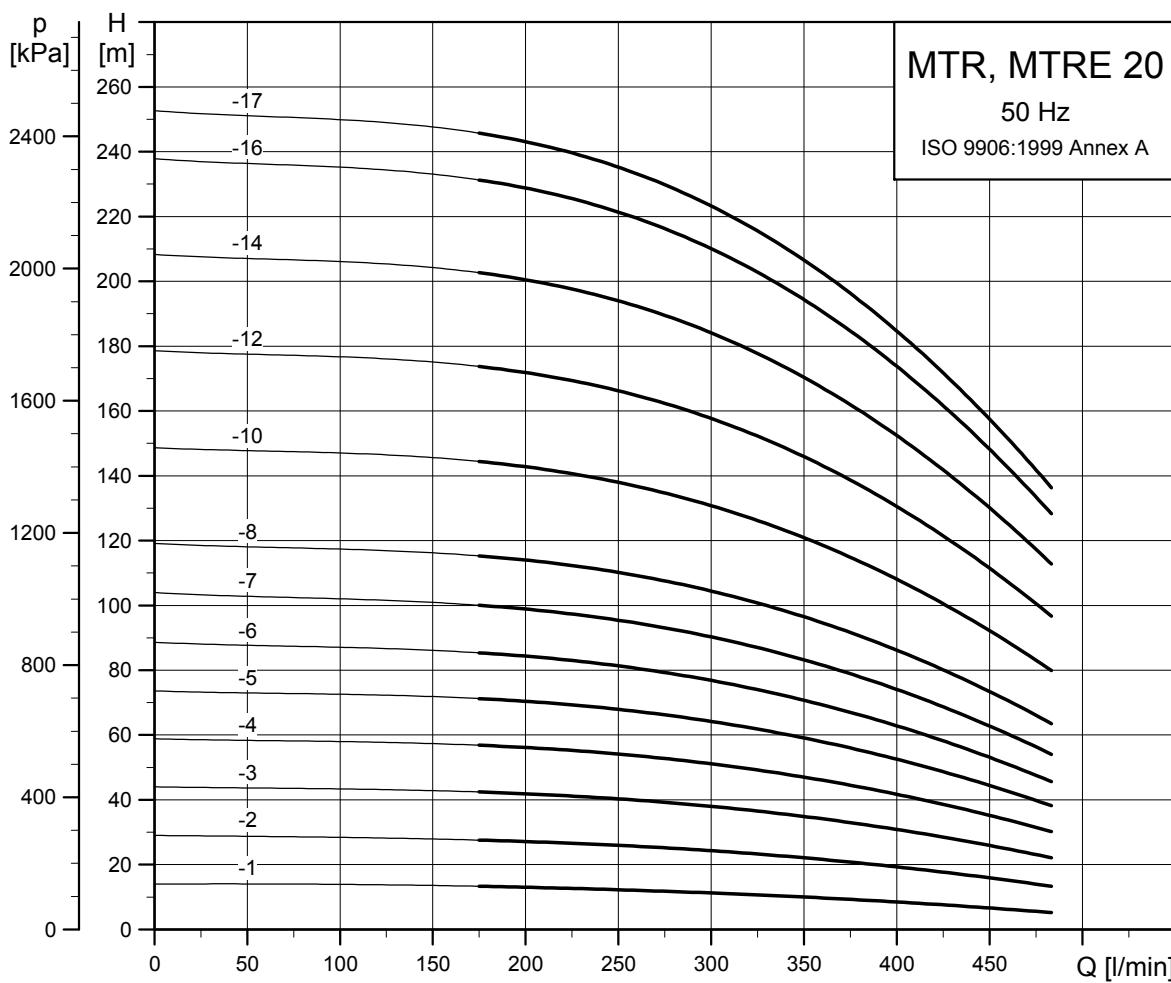
TM04 2790 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE								Net weight [kg]	
		Dimensions [mm]								Dimensions [mm]									
		A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD	AG		
MTR, MTRE 15-2/1	1.1	553	178	375	178	140	-	110	82	553	178	375	178	140	-	167	268	26	
MTR, MTRE 15-2/2	2.2	643	178	465	178	140	-	110	162	643	178	465	178	140	-	167	268	41	
MTR, MTRE 15-3/3	3	702	223	479	198	160	-	110	162	702	223	479	198	160	-	177	264	45	
MTR 15-4/4	4	784	268	516	220	160	-	134	202	40	-	-	-	-	-	-	-	-	
MTR, MTRE 15-5/5	4	829	313	516	220	160	-	134	202	41	829	313	516	220	160	-	188	290	51
MTR 15-6/6	5.5	913	358	555	220	-	300	134	202	64	-	-	-	-	-	-	-	-	
MTR, MTRE 15-7/7	5.5	958	403	555	220	-	300	134	202	65	958	403	555	220	-	300	188	290	72
MTR 15-8/8	7.5	991	448	543	260	-	300	159	203	83	-	-	-	-	-	-	-	-	
MTR, MTRE 15-9/9	7.5	1036	493	543	260	-	300	159	203	84	1036	493	543	260	-	300	213	290	93
MTR 15-10/10	11	1203	538	665	315	-	350	204	243	123	-	-	-	-	-	-	-	-	
MTR 15-12/12	11	1293	628	665	315	-	350	204	243	125	-	-	-	-	-	-	-	-	
MTR, MTRE 15-14/14	11	1383	718	665	315	-	350	204	243	127	1383	718	665	314	-	350	308	420	155
MTR 15-16/16	15	1473	808	665	314	-	350	204	243	141	-	-	-	-	-	-	-	-	
MTR, MTRE 15-17/17	15	1518	853	665	314	-	350	204	243	142	1518	853	665	314	-	350	308	420	173

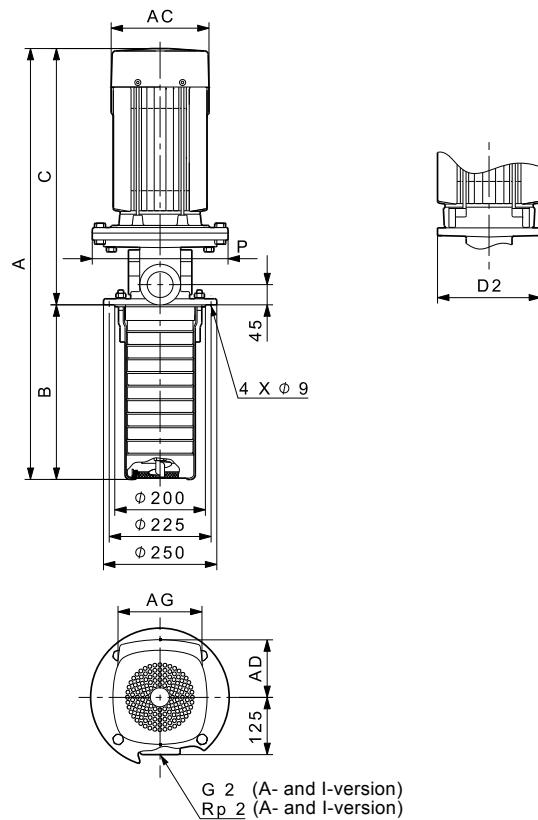
The maximum immersion depth is 1033 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 20, 50 Hz**

TM02 7845 4303

## Dimensional sketches



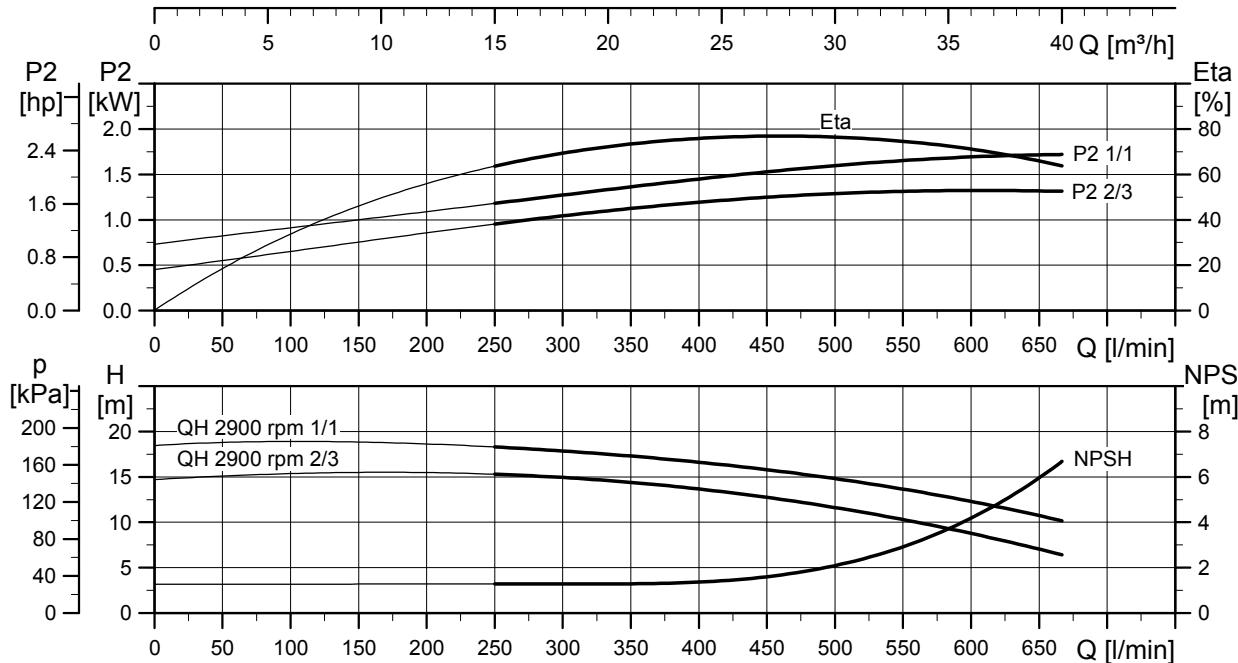
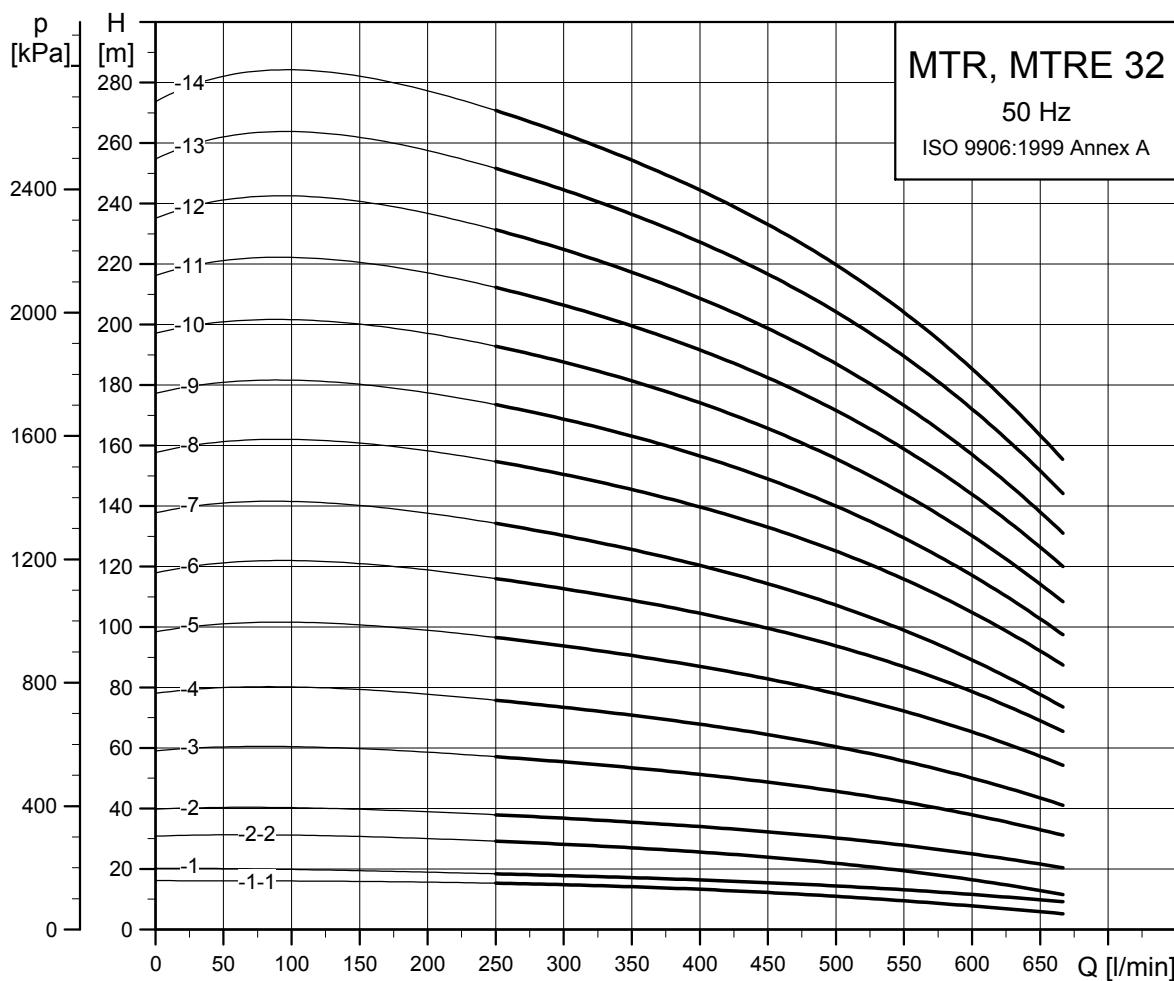
TM04 2790 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							Net weight [kg]			
		A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD			
MTR, MTRE 20-2/1	1.1	553	178	375	140	140	-	109	82	553	178	375	178	140	-	167	268	26	
MTR, MTRE 20-2/2	2.2	643	178	465	178	140	-	110	162	643	178	465	178	140	-	167	268	41	
MTR, MTRE 20-3/3	4	739	223	516	220	160	-	134	202	739	223	516	220	160	-	188	290	49	
MTR 20-4/4	5.5	823	268	555	220	-	300	134	202	62	-	-	-	-	-	-	-	-	
MTR, MTRE 20-5/5	5.5	868	313	555	220	-	300	134	202	63	868	313	555	220	-	300	188	290	70
MTR 20-6/6	7.5	901	358	543	260	-	300	159	203	81	-	-	-	-	-	-	-	-	
MTR, MTRE 20-7/7	7.5	946	403	543	260	-	300	159	203	82	946	403	543	260	-	300	213	290	91
MTR 20-8/8	11	1113	448	665	315	-	350	204	243	121	-	-	-	-	-	-	-	-	
MTR, MTRE 20-10/10	11	1203	538	665	315	-	350	204	243	123	1203	538	665	314	-	350	308	420	151
MTR 20-12/12	15	1293	628	665	314	-	350	204	243	137	-	-	-	-	-	-	-	-	
MTR, MTRE 20-14/14	15	1383	718	665	314	-	350	204	243	139	1383	718	665	314	-	350	308	420	170
MTR 20-16/16	18.5	1517	808	709	314	-	350	204	243	153	-	-	-	-	-	-	-	-	
MTR, MTRE 20-17/17	18.5	1562	853	709	314	-	350	204	243	154	1562	853	709	314	-	350	308	420	185

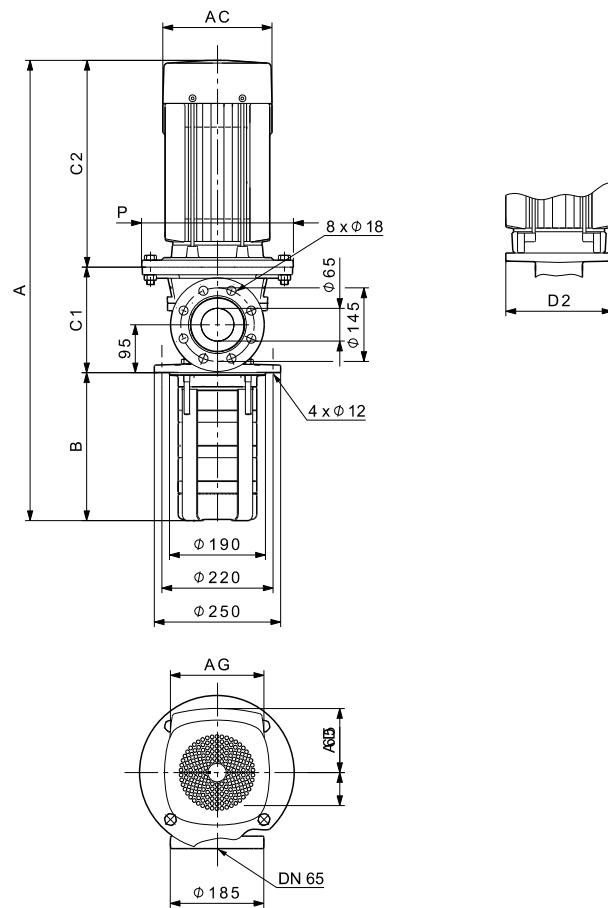
The maximum immersion depth is 1033 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 32, 50 Hz**

TM0143022213

## Dimensional sketches



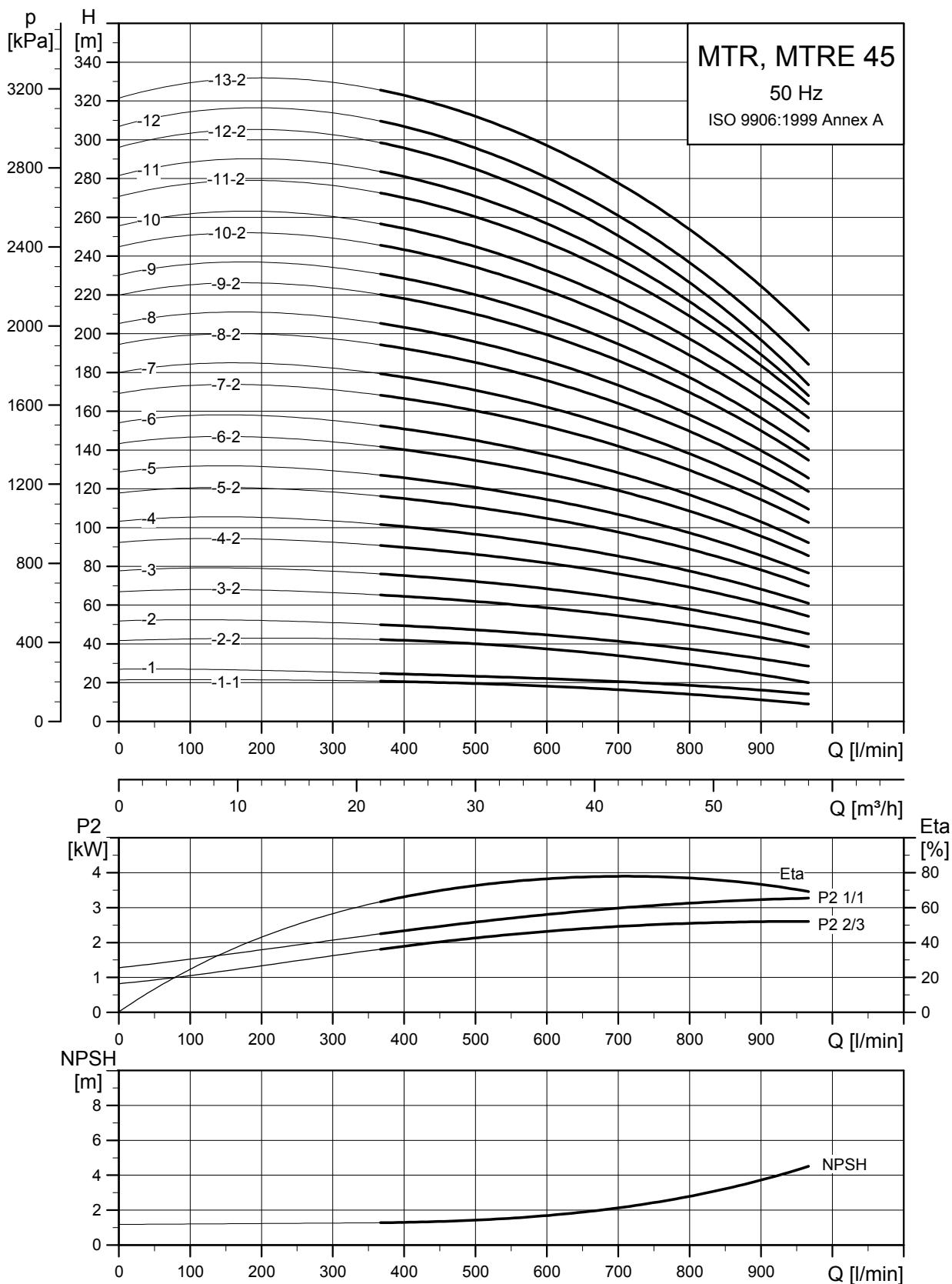
TM04 2791 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							Net weight [kg]					
		A	B	C1	C2	AC	D2	P	AD	AG	A	B	C1	C2	AC	D2	P	AD	AG		
MTR, MTRE 32-2/1-1	1.5	642	223	138	281	178	-	200	110	162	64	635	223	138	274	122	-	200	158	268	63
MTR, MTRE 32-2/1	2.2	682	223	138	321	178	-	200	110	162	70	635	223	138	274	122	-	200	158	268	64
MTR, MTRE 32-2/2-2	3	696	223	138	335	198	198	-	120	162	71	696	223	138	335	198	198	-	177	264	94
MTR, MTRE 32-2/2	4	733	223	138	372	220	198	-	134	202	83	733	223	138	372	220	198	-	188	290	105
MTR, MTRE 32-3/3	5.5	893	293	209	391	220	-	300	134	202	110	893	293	209	391	220	-	298	188	290	122
MTR, MTRE 32-4/4	7.5	951	363	209	379	260	-	300	159	203	121	963	363	209	379	260	-	300	213	290	123
MTR 32-5/5	11	1113	433	209	471	314	-	350	204	243	162	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 32-6/6	11	1183	503	209	471	314	-	350	204	243	163	1183	503	209	471	314	-	350	308	420	197
MTR 32-7/7	15	1253	573	209	471	314	-	350	204	243	175	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 32-8/8	15	1323	643	209	471	314	-	350	204	243	175	1323	643	209	471	314	-	350	308	420	213
MTR 32-9/9	18.5	1437	713	209	515	314	-	350	204	243	188	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 32-10/10	18.5	1507	783	209	515	314	-	350	204	243	189	1507	783	209	566	314	-	350	308	420	225
MTR 32-11/11	22	1603	853	209	541	314	-	350	204	243	208	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 32-12/12	22	1673	923	209	541	314	-	350	204	243	209	1673	923	209	541	314	-	350	308	420	239
MTR 32-13/13	30	1812	993	209	610	402	-	400	300	260	325	-	-	-	-	-	-	-	-	-	-
MTR 32-14/14	30	1882	1063	209	610	402	-	400	300	260	325	-	-	-	-	-	-	-	-	-	-

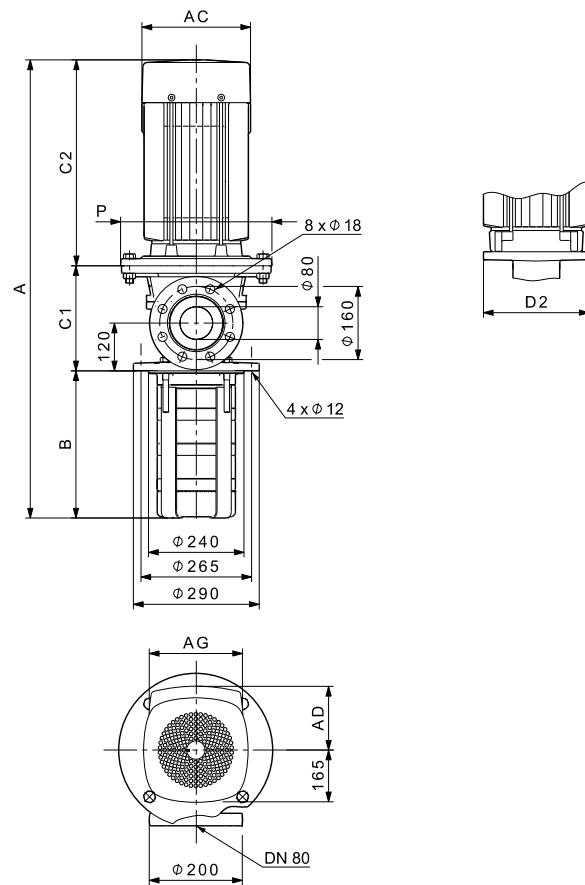
The maximum immersion depth is 1343 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 45, 50 Hz**

TM014303 2213

## Dimensional sketches



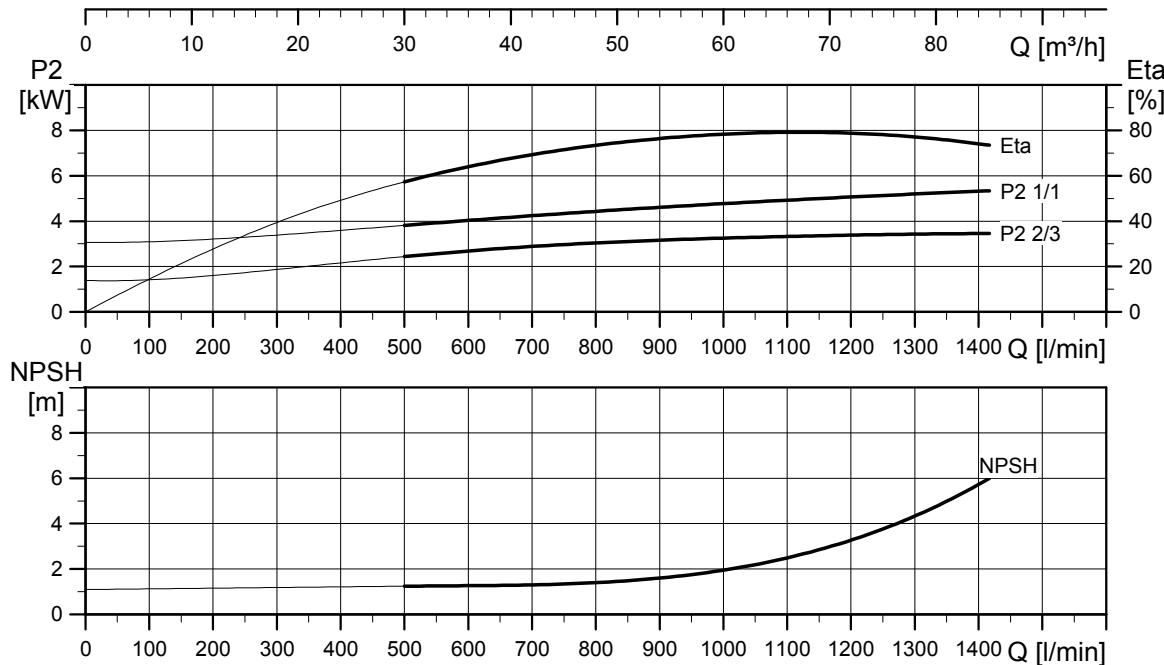
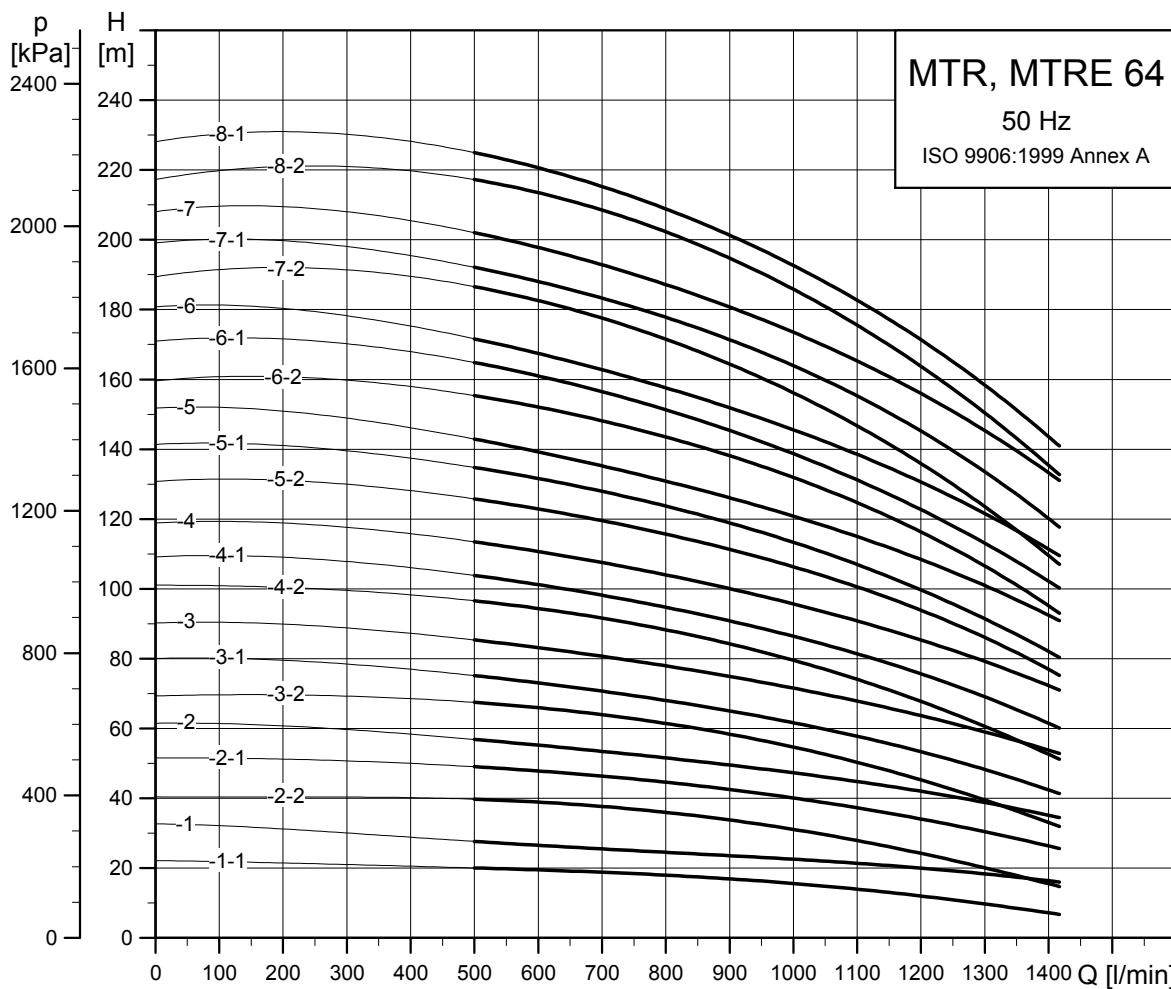
TM04 2791 2413

## Dimensions and weights

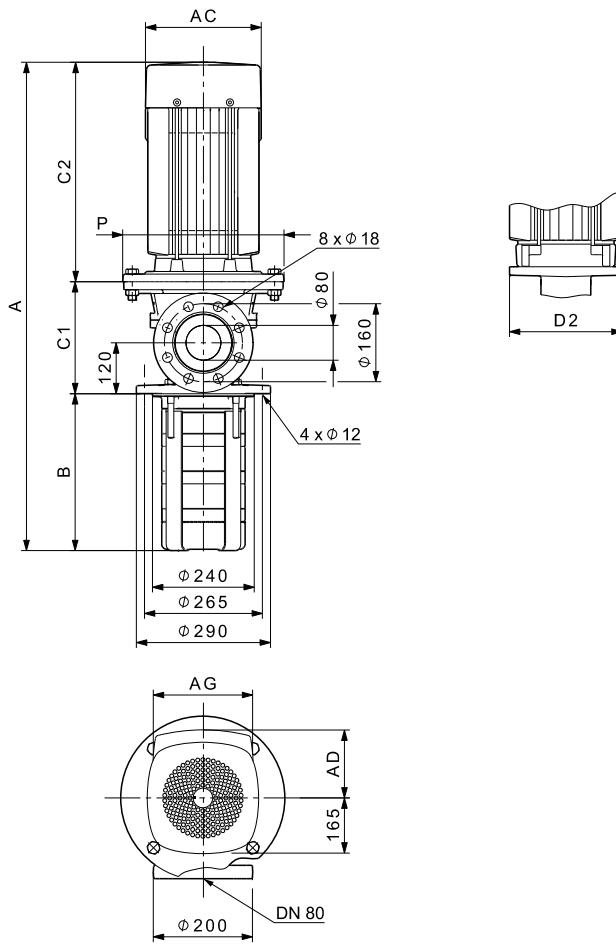
Pump type	P2 [kW]	MTR							MTRE							Net weight [kg]					
		Dimensions [mm]							Dimensions [mm]												
		A	B	C1	C2	AC	D2	P	AD	AG	A	B	C1	C2	AC	D2	P	AD	AG		
MTR, MTRE 45-2/1-1	3	748	244	169	335	198	198	-	120	162	80	748	244	169	335	198	198	-	177	264	102
MTR, MTRE 45-2/1	4	785	244	169	372	220	198	-	134	202	102	785	244	169	372	220	198	-	188	290	114
MTR, MTRE 45-2/2-2	5.5	875	244	240	391	220	-	300	134	202	118	875	244	240	391	220	-	298	188	290	129
MTR, MTRE 45-2/2	7.5	863	244	240	379	260	-	300	159	203	128	875	244	240	379	260	-	300	213	290	131
MTR 45-3/3-2	11	1035	324	240	471	314	-	350	204	243	171	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 45-3/3	11	1035	324	240	471	314	-	350	204	243	171	1035	324	240	471	314	-	350	308	420	213
MTR 45-4/4-2	15	1115	404	240	471	314	-	350	204	243	183	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 45-4/4	15	1115	404	240	471	314	-	350	204	243	183	1115	404	240	471	314	-	350	308	420	229
MTR 45-5/5-2	18.5	1239	484	240	515	314	-	350	204	243	196	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 45-5/5	18.5	1239	484	240	515	314	-	350	204	243	196	1239	484	240	566	314	-	350	308	420	241
MTR 45-6/6-2	22	1345	564	240	541	314	-	350	204	243	211	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 45-6/6	22	1345	564	240	541	314	-	350	204	243	211	1345	564	240	541	314	-	350	308	420	254
MTR 45-7/7-2	30	1494	644	240	610	402	-	400	300	260	332	-	-	-	-	-	-	-	-	-	-
MTR 45-7/7	30	1494	644	240	610	402	-	400	300	260	332	-	-	-	-	-	-	-	-	-	-
MTR 45-8/8-2	30	1574	724	240	610	402	-	400	300	260	332	-	-	-	-	-	-	-	-	-	-
MTR 45-8/8	30	1574	724	240	610	402	-	400	300	260	332	-	-	-	-	-	-	-	-	-	-
MTR 45-9/9-2	30	1654	804	240	610	402	-	400	300	260	333	-	-	-	-	-	-	-	-	-	-
MTR 45-9/9	37	1711	804	240	667	402	-	400	300	260	355	-	-	-	-	-	-	-	-	-	-
MTR 45-10/10-2	37	1791	884	240	667	402	-	400	300	260	355	-	-	-	-	-	-	-	-	-	-
MTR 45-10/10	37	1791	884	240	667	402	-	400	300	260	355	-	-	-	-	-	-	-	-	-	-
MTR 45-11/11-2	45	1932	964	259	709	442	-	450	325	260	507	-	-	-	-	-	-	-	-	-	-
MTR 45-11/11	45	1932	964	259	709	442	-	450	325	260	507	-	-	-	-	-	-	-	-	-	-
MTR 45-12/12-2	45	2012	1044	259	709	442	-	450	325	260	507	-	-	-	-	-	-	-	-	-	-
MTR 45-12/12	45	2012	1044	259	709	442	-	450	325	260	507	-	-	-	-	-	-	-	-	-	-
MTR 45-13/13-2	45	2092	1124	259	709	442	-	450	325	260	507	-	-	-	-	-	-	-	-	-	-

The maximum immersion depth is 1444 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 64, 50 Hz**

## Dimensional sketches



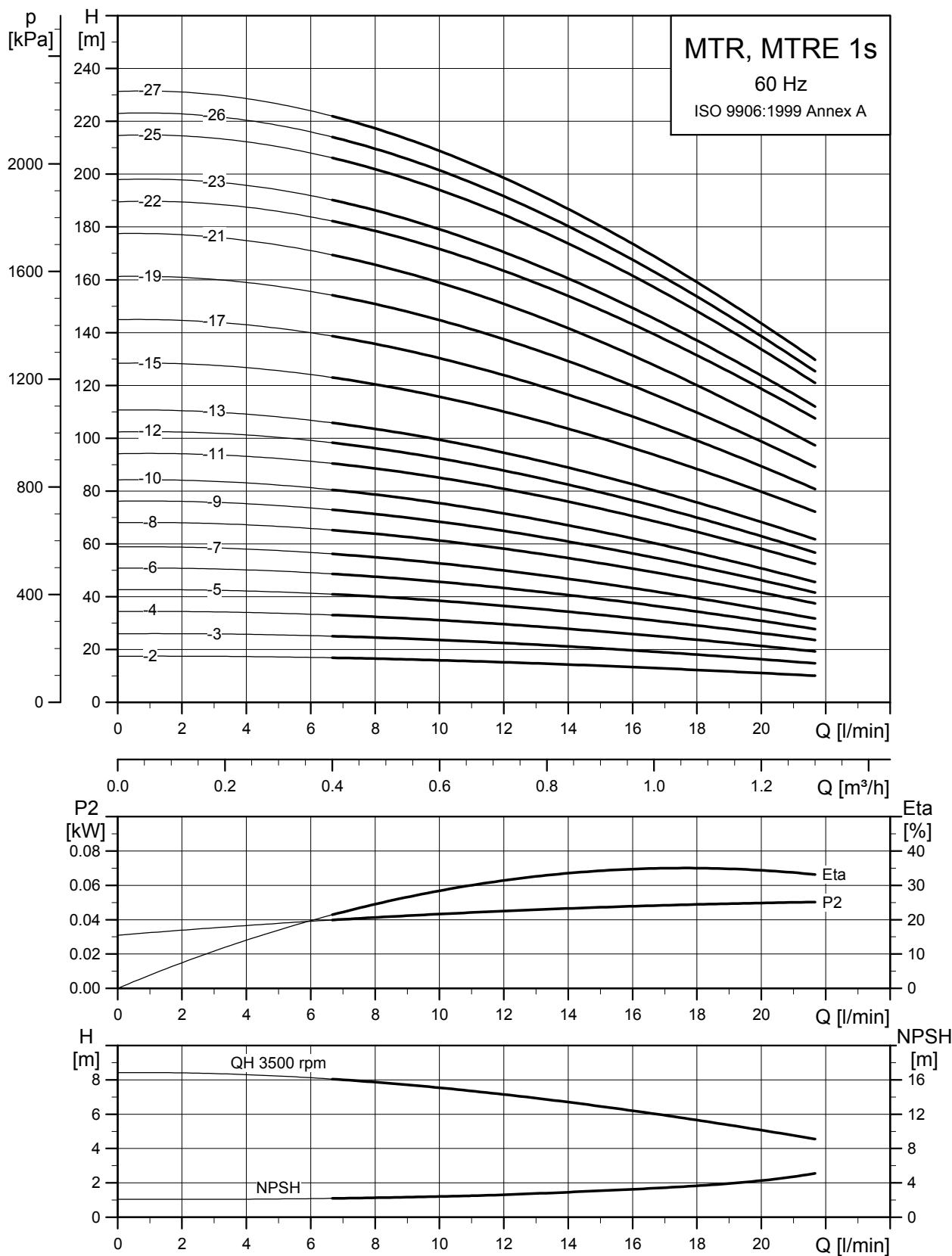
TM04 2791 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE								Net weight [kg]			
		Dimensions [mm]								Dimensions [mm]											
		A	B	C1	C2	AC	D2	P	AD	A	B	C1	C2	AC	D2	P	AD				
MTR, MTRE 64-2/1-1	4	790	249	169	372	220	198	-	134	202	105	790	249	169	372	220	198	-	188	290	116
MTR, MTRE 64-2/1	5.5	880	249	240	391	220	-	300	134	202	120	880	249	240	391	220	-	298	188	290	132
MTR, MTRE 64-2/2-2	7.5	868	249	240	379	260	-	300	159	203	131	880	249	240	379	260	-	300	213	290	133
MTR 64-2/2-1	11	960	249	240	471	314	-	350	204	243	173	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 64-2/2	11	960	249	240	471	314	-	350	204	243	173	960	249	240	471	314	-	350	308	420	216
MTR 64-3/3-2	15	1043	332	240	471	314	-	350	204	243	185	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 64-3/3-1	15	1043	332	240	471	314	-	350	204	243	185	1043	332	240	471	314	-	350	308	420	231
MTR, MTRE 64-3/3	18.5	1087	332	240	515	314	-	350	204	243	198	1087	332	240	566	314	-	350	308	420	243
MTR 64-4/4-2	18.5	1169	414	240	515	314	-	350	204	243	199	-	-	-	-	-	-	-	-	-	-
MTR 64-4/4-1	22	1195	414	240	541	314	-	350	204	243	213	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 64-4/4	22	1195	414	240	541	314	-	350	204	243	213	1195	414	240	541	314	-	350	308	420	256
MTR 64-5/5-2	30	1347	497	240	610	402	-	400	300	260	334	-	-	-	-	-	-	-	-	-	-
MTR 64-5/5-1	30	1347	497	240	610	402	-	400	300	260	334	-	-	-	-	-	-	-	-	-	-
MTR 64-5/5	30	1347	497	240	610	402	-	400	300	260	334	-	-	-	-	-	-	-	-	-	-
MTR 64-6/6-2	30	1429	579	240	610	402	-	400	300	260	334	-	-	-	-	-	-	-	-	-	-
MTR 64-6/6-1	37	1486	579	240	667	402	-	400	300	260	356	-	-	-	-	-	-	-	-	-	-
MTR 64-6/6	37	1486	579	240	667	402	-	400	300	260	356	-	-	-	-	-	-	-	-	-	-
MTR 64-7/7-2	37	1569	662	240	667	402	-	400	300	260	357	-	-	-	-	-	-	-	-	-	-
MTR 64-7/7-1	37	1569	662	240	667	402	-	400	300	260	357	-	-	-	-	-	-	-	-	-	-
MTR 64-7/7	45	1630	662	259	709	442	-	450	325	260	446	-	-	-	-	-	-	-	-	-	-
MTR 64-8/8-2	45	1712	744	259	709	442	-	450	325	260	446	-	-	-	-	-	-	-	-	-	-
MTR 64-8/8-1	45	1712	744	259	709	442	-	450	325	260	446	-	-	-	-	-	-	-	-	-	-

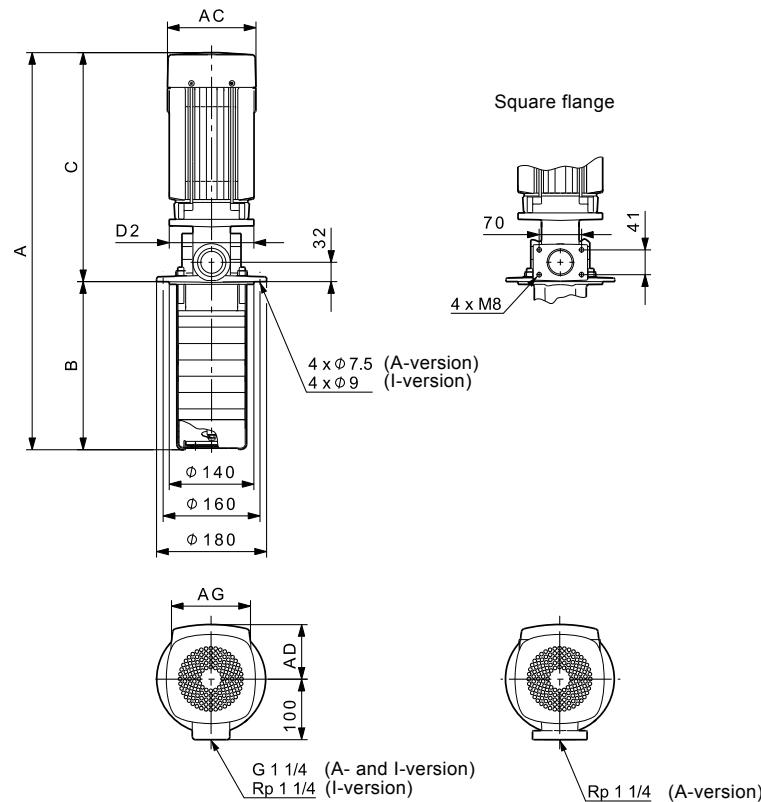
The maximum immersion depth is 1487 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE, 60 Hz****MTR, MTRE 1s, 60 Hz**

TM0278464103

## Dimensional sketches



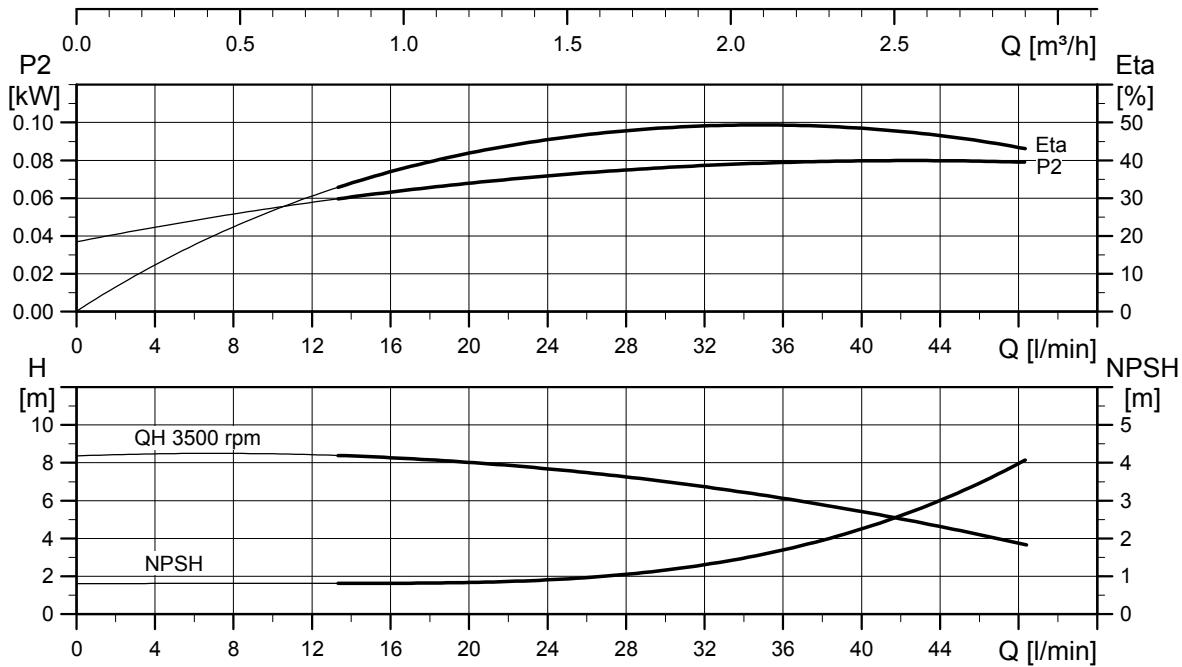
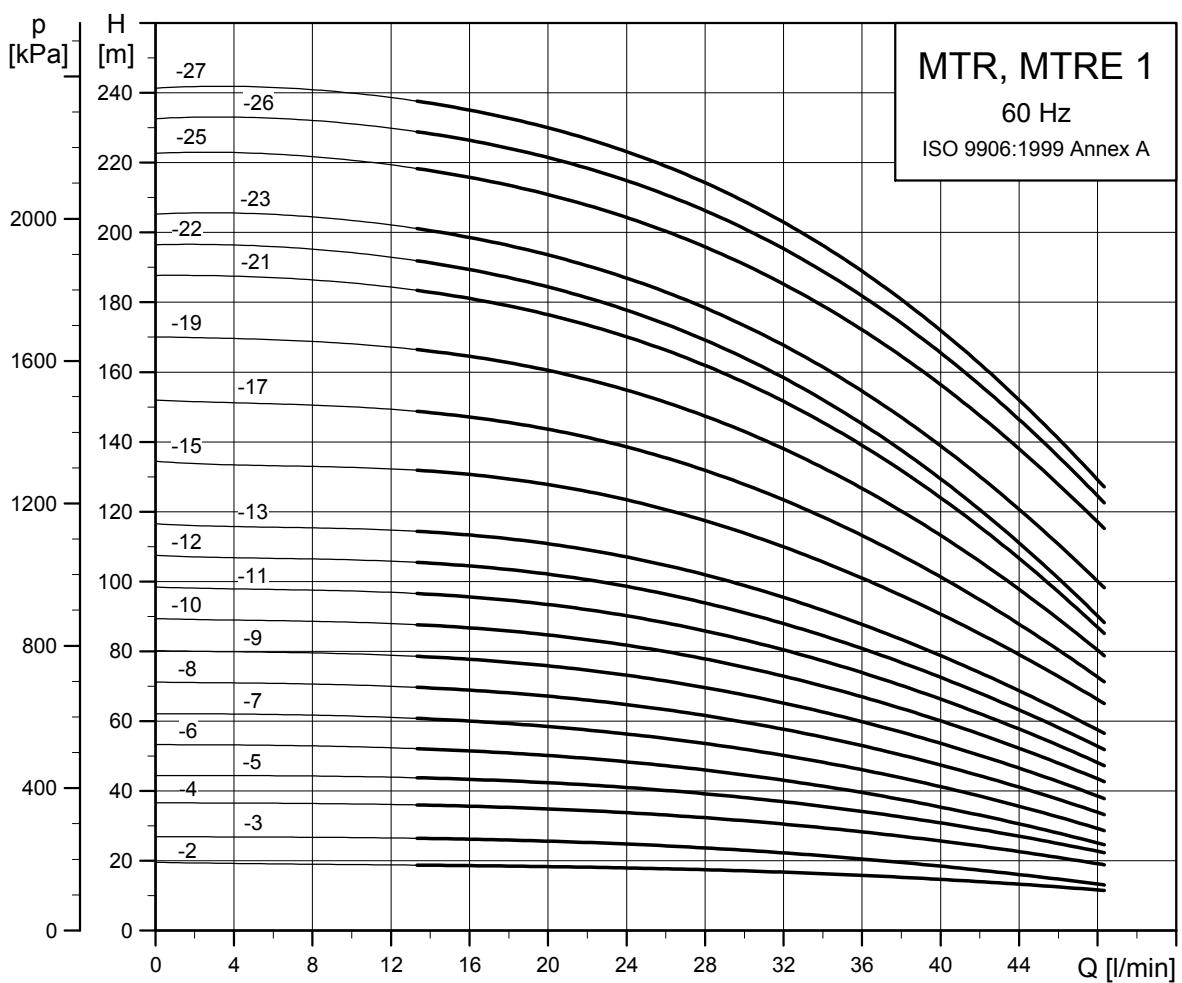
TM03 2677 2413

## Dimensions and weights

Pump type	P <sub>2</sub> [kW]	MTR							MTRE								
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]							
		A	B	C	AC	D2	AD	AG		A	B	C	AC	D2	AD	AG	
MTR 1s-2/2	0.37	464	160	304	140	140	109	82	12.2	-	-	-	-	-	-	-	
MTR 1s-3/3	0.37	482	178	304	140	140	109	82	12.5	-	-	-	-	-	-	-	
MTR, MTRE 1s-4/4	0.37	500	196	304	140	140	109	82	12.8	500	196	304	141	140	140	268	15.5
MTR 1s-5/5	0.37	518	214	304	140	140	109	82	13.1	-	-	-	-	-	-	-	-
MTR 1s-6/6	0.37	536	232	304	140	140	109	82	13.4	-	-	-	-	-	-	-	-
MTR, MTRE 1s-7/7	0.37	554	250	304	140	140	109	82	13.7	554	250	304	141	140	140	268	16.4
MTR 1s-8/8	0.55	572	268	304	140	140	109	82	14.5	-	-	-	-	-	-	-	-
MTR 1s-9/9	0.55	590	286	304	140	140	109	82	14.8	-	-	-	-	-	-	-	-
MTR, MTRE 1s-10/10	0.55	608	304	304	140	140	109	82	15.1	608	304	304	141	140	140	268	16.9
MTR 1s-11/11	0.75	666	322	344	140	140	109	82	16.2	-	-	-	-	-	-	-	-
MTR 1s-12/12	0.75	684	340	344	140	140	109	82	16.5	-	-	-	-	-	-	-	-
MTR, MTRE 1s-13/13	0.75	702	358	344	140	140	109	82	16.0	702	358	344	178	140	167	268	17.6
MTR 1s-15/15	1.1	738	394	344	140	140	109	82	18.8	-	-	-	-	-	-	-	-
MTR 1s-17/17	1.1	774	430	344	140	140	109	82	19.4	-	-	-	-	-	-	-	-
MTR 1s-19/19	1.1	810	466	344	140	140	109	82	20.0	-	-	-	-	-	-	-	-
MTR, MTRE 1s-21/21	1.1	846	502	344	140	140	109	82	20.6	846	502	344	178	140	167	268	23.3
MTR 1s-22/22	1.5	914	520	394	178	140	110	162	27.4	-	-	-	-	-	-	-	-
MTR, MTRE 1s-23/23	1.5	932	538	394	178	140	110	162	27.7	932	538	394	178	140	167	268	35.5
MTR 1s-25/25	1.5	968	574	394	178	140	110	162	28.3	-	-	-	-	-	-	-	-
MTR 1s-26/26	1.5	986	592	394	178	140	110	162	28.6	-	-	-	-	-	-	-	-
MTR, MTRE 1s-27/27	1.5	1004	610	394	178	140	110	162	28.9	1004	610	394	178	140	167	268	36.7

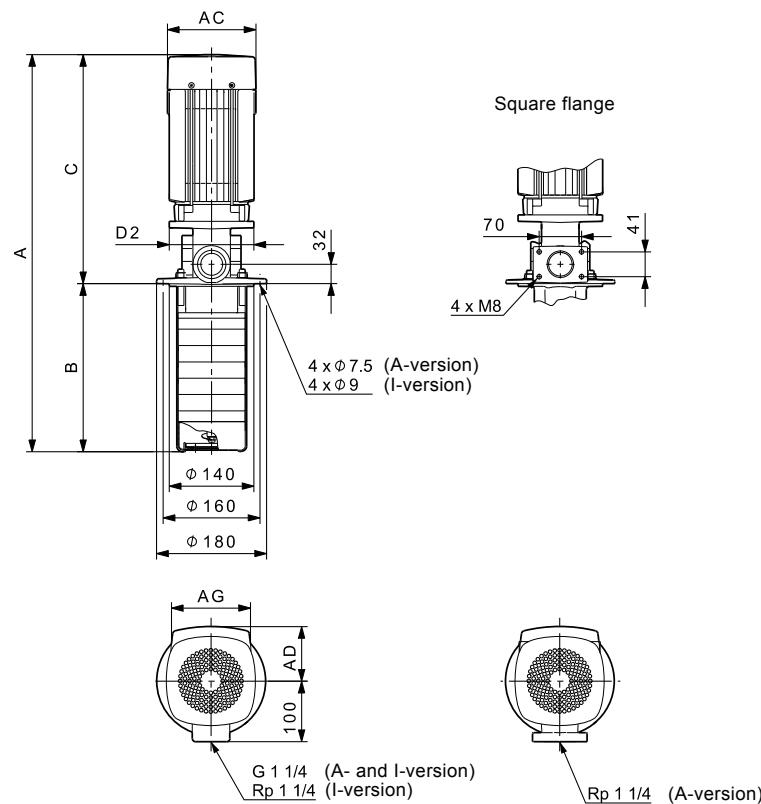
The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 1, 60 Hz**

TM02 7847 4303

## Dimensional sketches



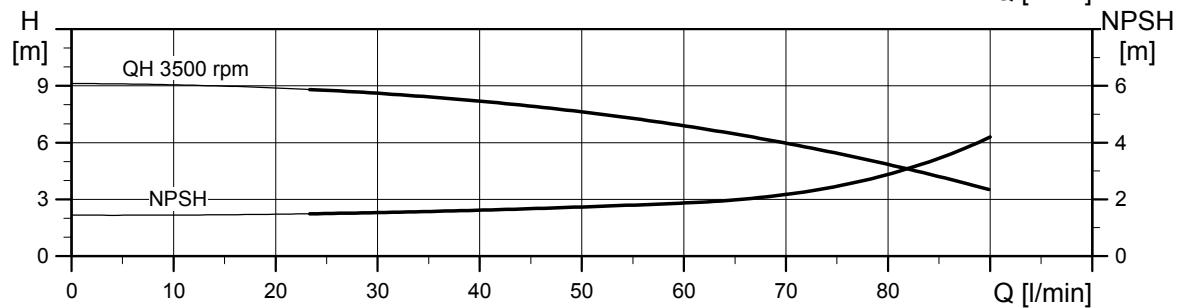
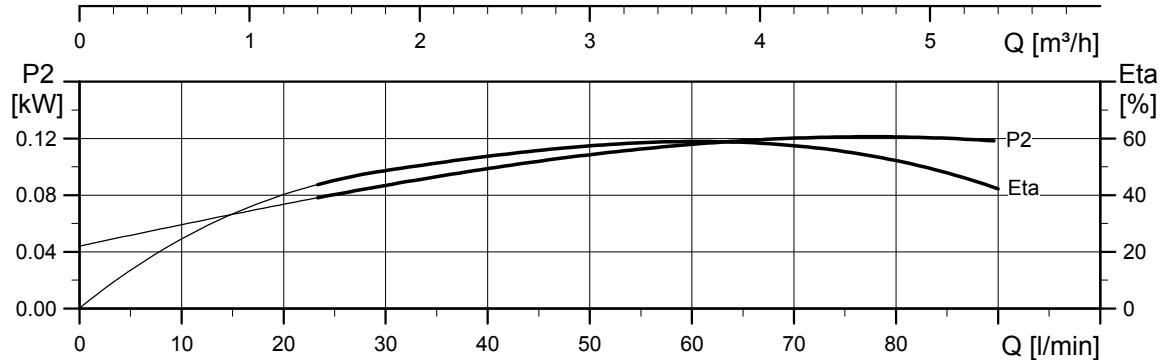
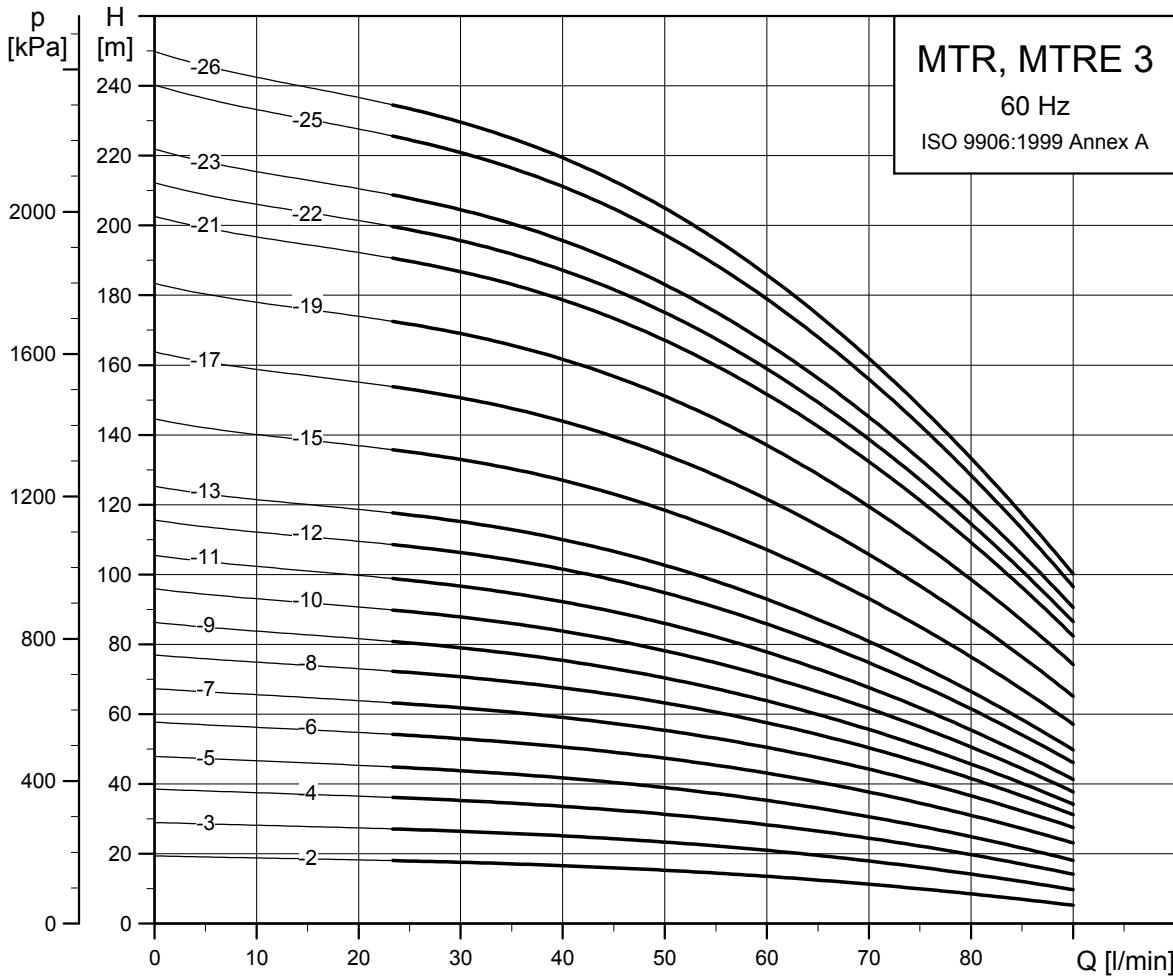
TM03 2677 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE								
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]							
		A	B	C	AC	D2	AD	AG		A	B	C	AC	D2	AD	AG	
MTR 1-2/2	0.37	464	160	304	140	140	109	82	12.2	-	-	-	-	-	-	-	
MTR 1-3/3	0.37	482	178	304	140	140	109	82	12.5	-	-	-	-	-	-	-	
MTR, MTRE 1-4/4	0.37	500	196	304	140	140	109	82	12.8	500	196	304	141	140	140	268	15.5
MTR 1-5/5	0.55	518	214	304	140	140	109	82	13.6	-	-	-	-	-	-	-	-
MTR 1-6/6	0.55	536	232	304	140	140	109	82	13.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-7/7	0.75	594	250	344	140	140	109	82	15.0	594	250	344	141	140	140	268	16.0
MTR 1-8/8	0.75	612	268	344	140	140	109	82	15.3	-	-	-	-	-	-	-	-
MTR, MTRE 1-9/9	0.75	630	286	344	140	140	109	82	15.6	630	286	344	178	140	167	268	17.2
MTR 1-10/10	1.1	648	304	344	140	140	109	82	17.3	-	-	-	-	-	-	-	-
MTR 1-11/11	1.1	666	322	344	140	140	109	82	17.6	-	-	-	-	-	-	-	-
MTR 1-12/12	1.1	684	340	344	140	140	109	82	17.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-13/13	1.1	702	358	344	140	140	109	82	18.2	702	358	344	178	140	167	268	20.9
MTR 1-15/15	1.5	788	394	394	178	140	110	162	25.3	-	-	-	-	-	-	-	-
MTR, MTRE 1-17/17	1.5	824	430	394	178	140	110	162	25.9	824	430	394	178	140	167	268	33.7
MTR 1-19/19	2.2	900	466	434	178	140	110	162	29.7	-	-	-	-	-	-	-	-
MTR 1-21/21	2.2	936	502	434	178	140	110	162	30.3	-	-	-	-	-	-	-	-
MTR, MTRE 1-22/22	2.2	954	520	434	178	140	110	162	30.6	954	520	434	178	140	167	268	37.4
MTR 1-23/23	2.2	972	538	434	178	140	110	162	30.9	-	-	-	-	-	-	-	-
MTR 1-25/25	2.2	1008	574	434	178	140	110	162	31.5	-	-	-	-	-	-	-	-
MTR 1-26/26	3	1040	592	448	198	160	110	162	34.8	-	-	-	-	-	-	-	-
MTR, MTRE 1-27/27	3	1058	610	448	198	160	110	162	35.1	1058	610	448	198	160	177	264	41.9

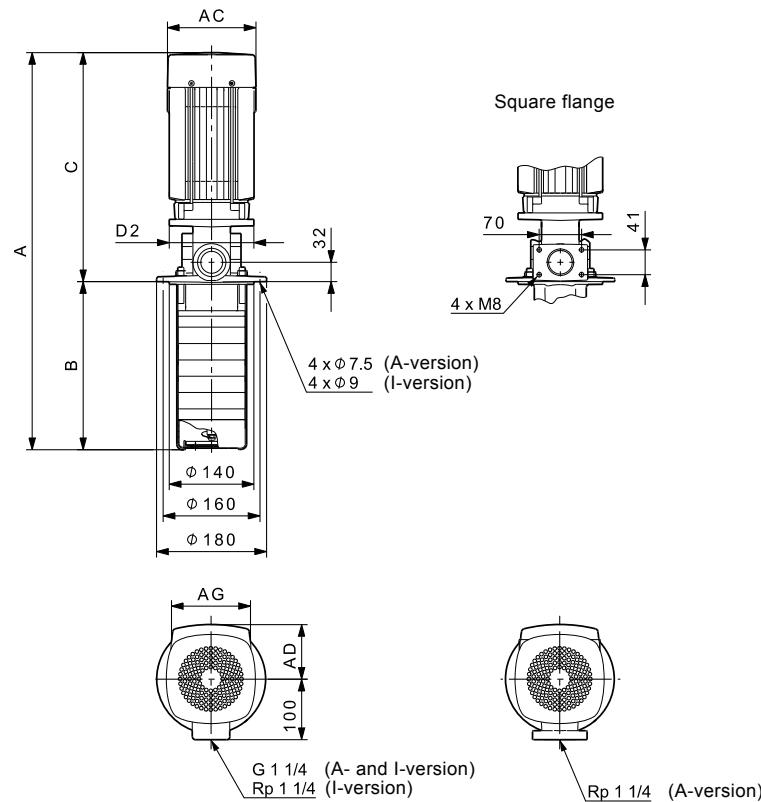
The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 3, 60 Hz**

TM02 78484303

## Dimensional sketches



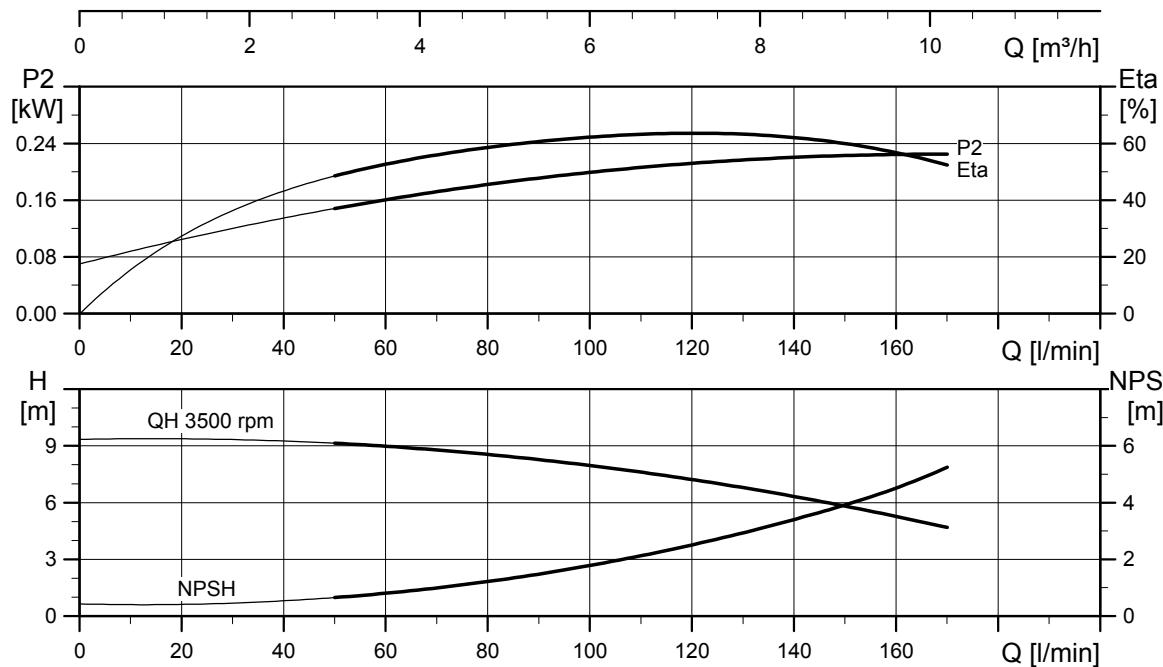
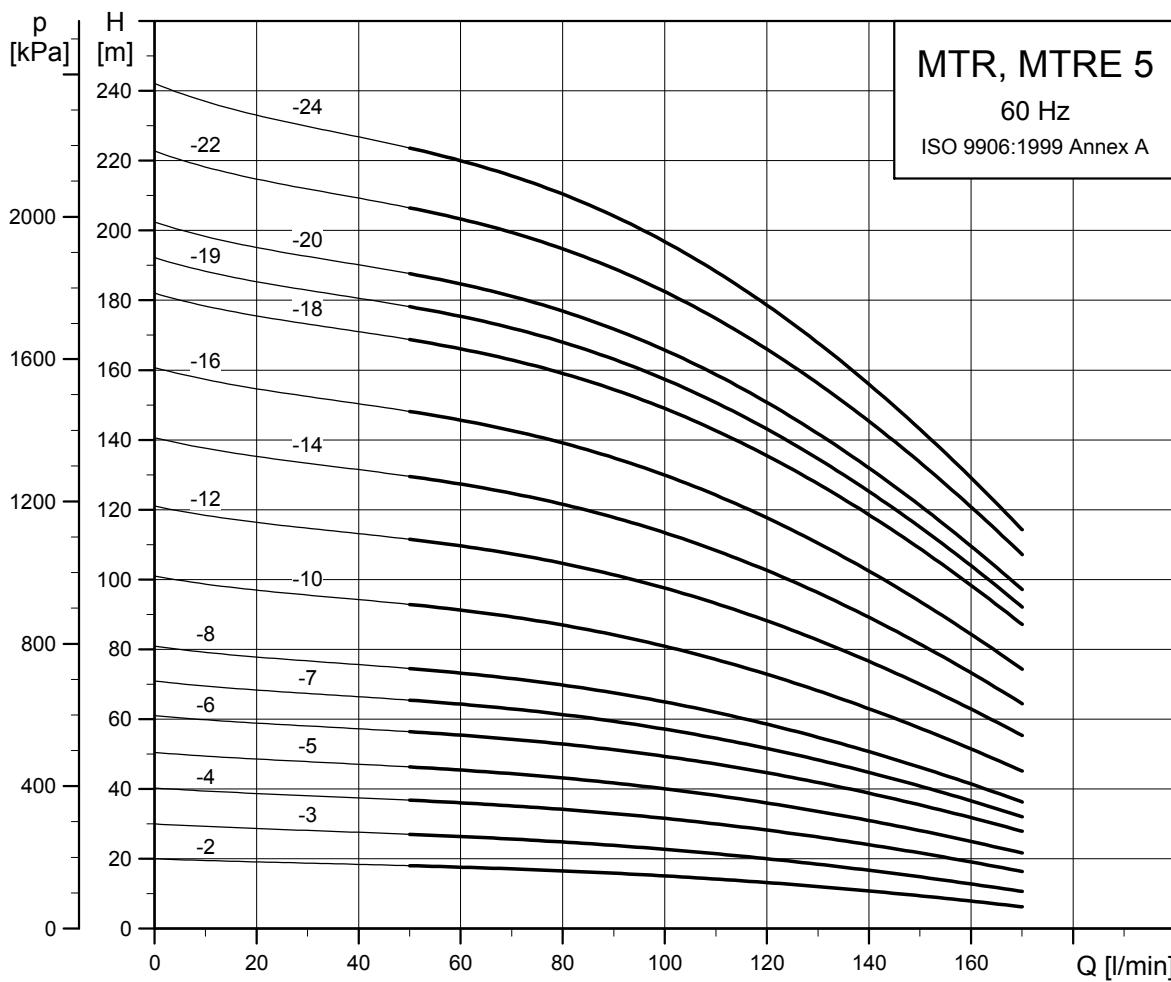
TM03 2677 2413

## Dimensions and weights

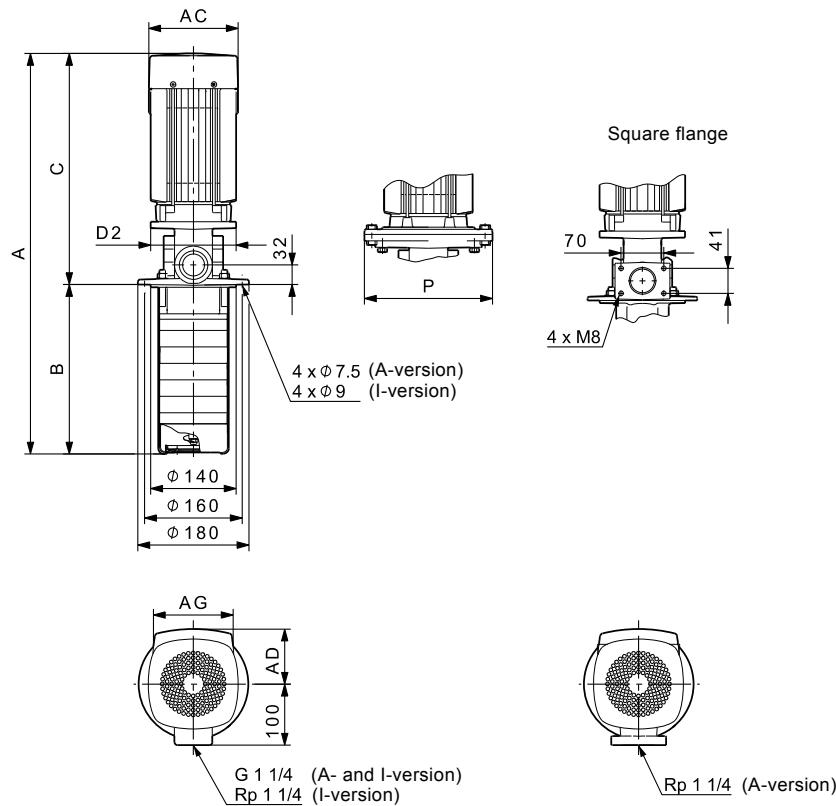
Pump type	P2 [kW]	MTR							MTRE								
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]							
		A	B	C	AC	D2	AD	AG		A	B	C	AC	D2	AD	AG	
MTR 3-2/2	0.37	464	160	304	140	140	109	82	12.2	-	-	-	-	-	-	-	
MTR, MTRE 3-3/3	0.55	482	178	304	140	140	109	82	13.0	482	178	304	141	140	140	268	15.2
MTR, MTRE 3-4/4	0.55	500	196	304	140	140	109	82	13.3	500	196	304	141	140	140	268	15.1
MTR 3-5/5	0.75	558	214	344	140	140	109	82	14.4	-	-	-	-	-	-	-	-
MTR, MTRE 3-6/6	1.1	576	232	344	140	140	109	82	16.1	576	232	344	178	140	167	268	16.3
MTR 3-7/7	1.1	594	250	344	140	140	109	82	16.4	-	-	-	-	-	-	-	-
MTR 3-8/8	1.1	612	268	344	140	140	109	82	16.7	-	-	-	-	-	-	-	-
MTR 3-9/9	1.5	680	286	394	140	140	109	162	24.1	-	-	-	-	-	-	-	-
MTR 3-10/10	1.5	698	304	394	140	140	109	162	24.4	-	-	-	-	-	-	-	-
MTR, MTRE 3-11/11	1.5	716	322	394	140	140	109	162	24.7	716	322	394	178	140	167	268	20.3
MTR 3-12/12	2.2	774	340	434	178	140	110	162	27.6	-	-	-	-	-	-	-	-
MTR 3-13/13	2.2	792	358	434	178	140	110	162	27.9	-	-	-	-	-	-	-	-
MTR 3-15/15	2.2	828	394	434	178	140	110	162	28.5	-	-	-	-	-	-	-	-
MTR, MTRE 3-17/17	2.2	864	430	434	178	140	110	162	29.1	864	430	434	178	140	167	268	35.9
MTR 3-19/19	3	914	466	448	198	160	110	162	36.4	-	-	-	-	-	-	-	-
MTR 3-21/21	3	950	502	448	198	160	110	162	37.0	-	-	-	-	-	-	-	-
MTR 3-22/22	3	968	520	448	198	160	110	162	37.3	-	-	-	-	-	-	-	-
MTR, MTRE 3-23/23	3	986	538	448	198	160	110	162	37.6	986	538	448	198	160	177	264	44.4
MTR 3-25/25	4	1059	574	485	220	160	134	202	40.9	-	-	-	-	-	-	-	-
MTR, MTRE 3-26/26	4	1077	592	485	220	160	134	202	41.2	1077	592	485	220	160	188	290	50.9

The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 5, 60 Hz**

## Dimensional sketches



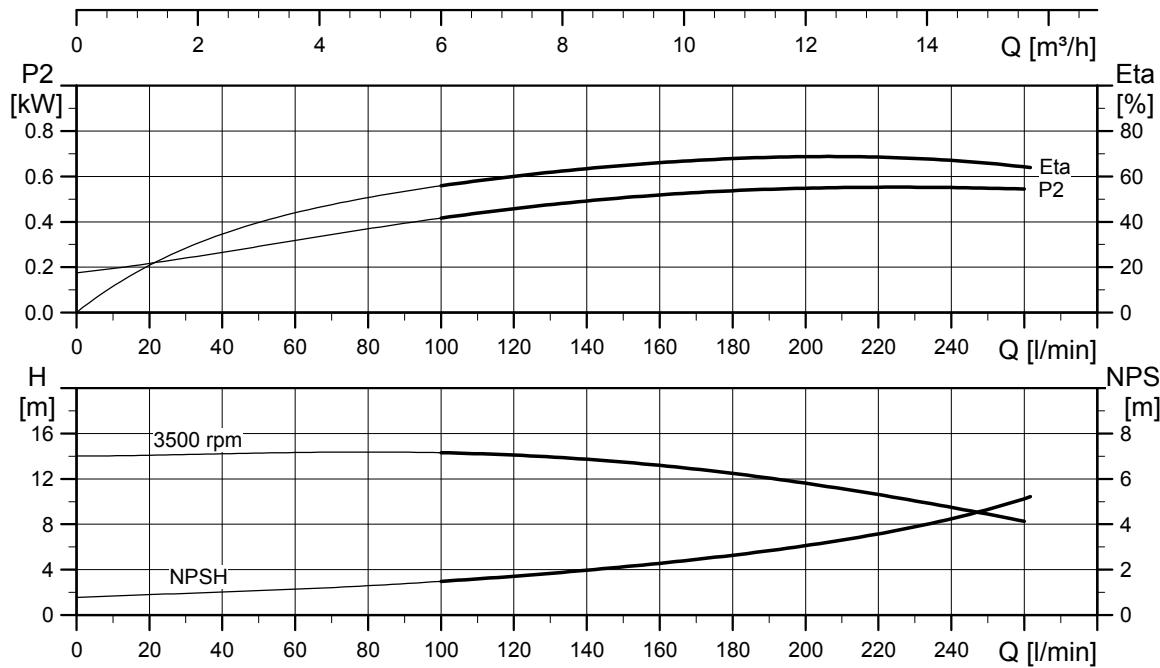
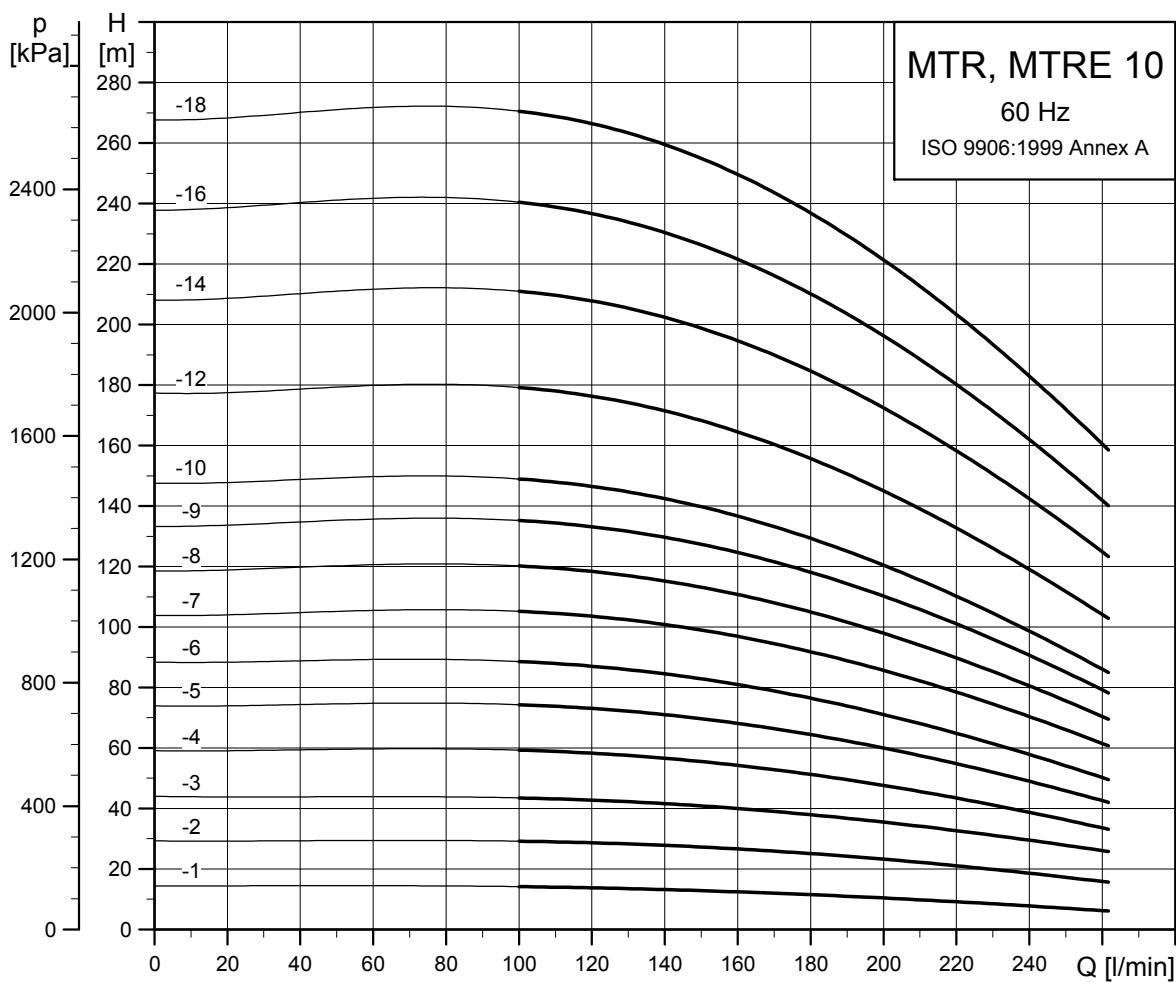
TM04 2789 2413

## Dimensions and weights

Pump type	P <sub>2</sub> [kW]	MTR								MTRE									
		Dimensions [mm]				Net weight [kg]				Dimensions [mm]				Net weight [kg]					
A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD	AG				
MTR, MTRE 5-2/2	0.55	473	169	304	140	140	-	109	82	12.7	473	169	304	141	140	-	140	268	14.5
MTR 5-3/3	1.1	540	196	344	140	140	-	109	82	15.6	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-4/4	1.1	567	223	344	140	140	-	109	82	16.0	567	223	344	178	140	-	167	268	18.7
MTR, MTRE 5-5/5	1.5	644	250	394	178	140	-	110	162	25.0	644	250	394	178	140	-	167	268	32.8
MTR 5-6/6	2.2	711	277	434	178	140	-	110	162	27.9	-	-	-	-	-	-	-	-	-
MTR 5-7/7	2.2	738	304	434	178	140	-	110	162	28.3	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-8/8	2.2	765	331	434	178	140	-	110	162	28.7	765	331	434	178	140	-	167	268	35.5
MTR 5-10/10	3	833	385	448	198	160	-	110	162	32.9	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-12/12	3	887	439	448	198	160	-	110	162	33.7	887	439	448	198	160	-	177	264	40.5
MTR 5-14/14	4	978	493	485	220	160	-	134	202	36.3	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-16/16	4	1032	547	485	220	160	-	134	202	37.1	1032	547	485	220	160	-	188	290	46.8
MTR 5-18/18	5.5	1130	601	529	220	-	300	134	202	43.7	-	-	-	-	-	-	-	-	-
MTR 5-19/19	5.5	1157	628	529	220	-	300	134	202	44.1	-	-	-	-	-	-	-	-	-
MTR 5-20/20	5.5	1184	655	529	220	-	300	134	202	44.5	-	-	-	-	-	-	-	-	-
MTR, MTRE 5-22/22	5.5	1238	709	529	220	-	300	134	202	45.3	1238	709	529	220	-	300	188	290	51.9
MTR, MTRE 5-24/24	7.5	1280	763	517	260	-	300	159	203	58.1	1280	763	517	260	-	300	213	290	63.9

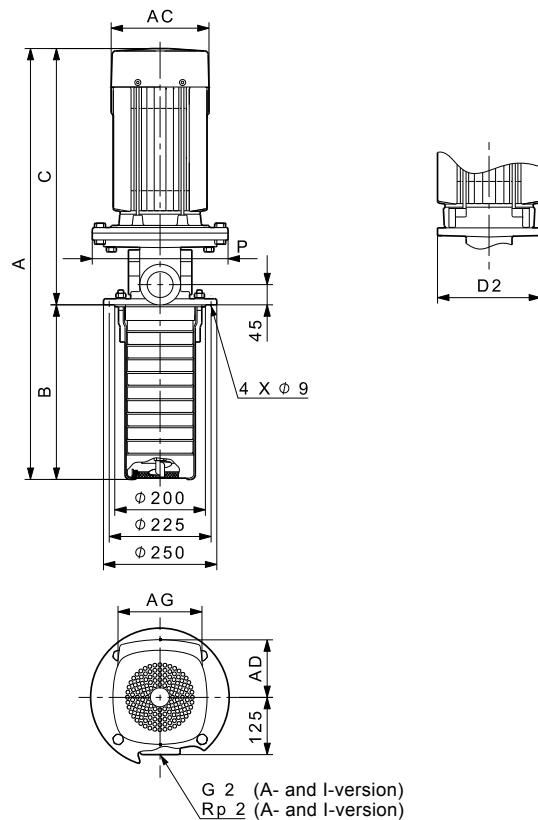
The maximum immersion depth is 1006 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 10, 60 Hz**

TM02 7850 4303

## Dimensional sketches



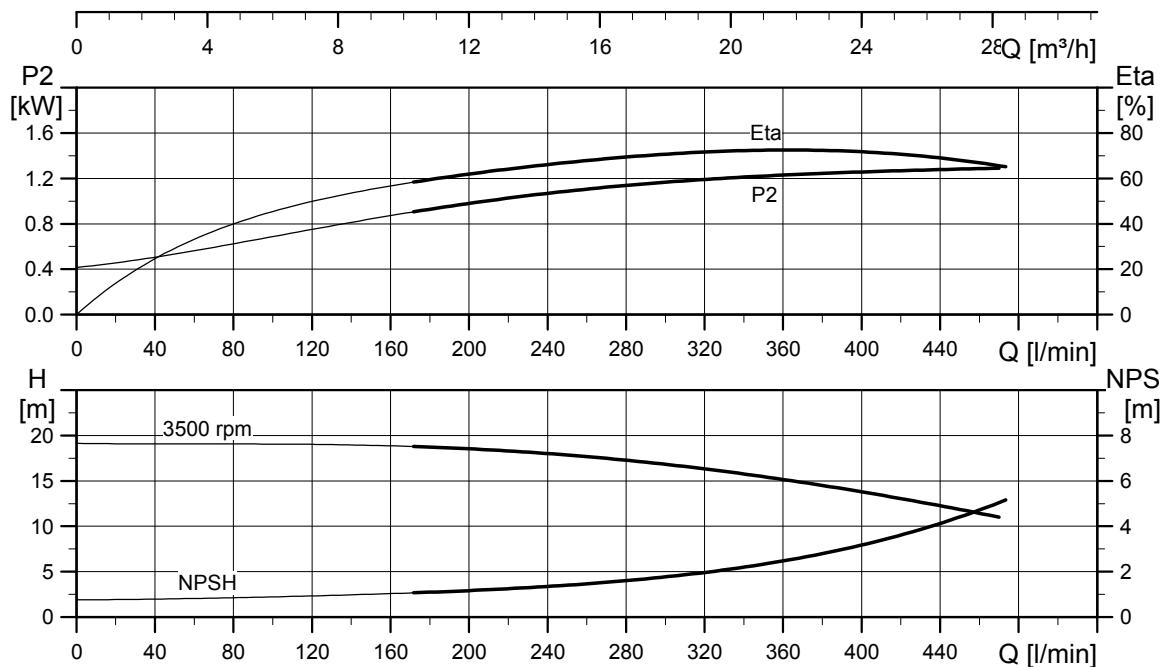
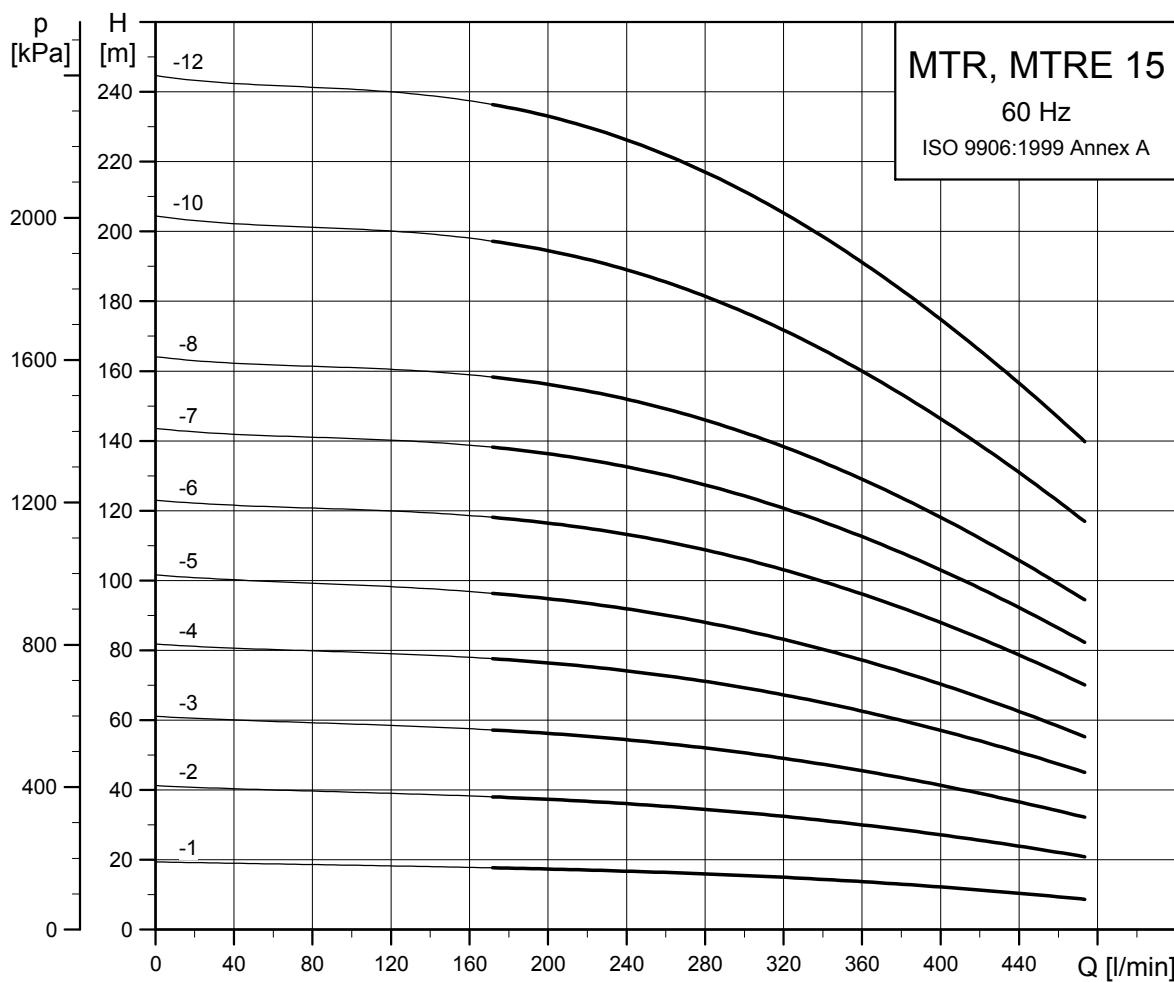
TM04 2790 2413

## Dimensions and weights

Pump type	P <sub>2</sub> [kW]	MTR							MTRE							Net weight [kg]			
		Dimensions [mm]							Dimensions [mm]										
		A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD	AG		
MTR 10-2/1	0.75	523	148	375	178	140	-	110	82	28	-	-	-	-	-	-	-		
MTR, MTRE 10-2/2	1.5	573	148	425	178	140	-	110	162	31	573	148	425	178	140	-	167	268	39
MTR, MTRE 10-3/3	2.2	643	178	465	178	140	-	110	162	34	643	178	465	178	140	-	167	268	41
MTR 10-4/4	3	687	208	479	198	160	-	110	162	38	-	-	-	-	-	-	-	-	
MTR, MTRE 10-5/5	3	717	238	479	198	160	-	110	162	39	717	238	479	198	160	-	177	264	46
MTR, MTRE 10-6/6	4	784	268	516	220	160	-	134	202	40	784	268	516	220	160	-	188	290	50
MTR 10-7/7	5.5	853	298	555	220	-	300	134	202	63	-	-	-	-	-	-	-	-	
MTR, MTRE 10-8/8	5.5	883	328	555	220	-	300	134	202	64	883	328	555	220	-	300	188	290	71
MTR 10-9/9	5.5	913	358	555	220	-	300	134	202	69	-	-	-	-	-	-	-	-	
MTR, MTRE 10-10/10	7.5	931	388	543	260	-	300	159	203	82	931	388	543	260	-	300	213	290	91
MTR, MTRE 10-12/12	7.5	991	448	543	260	-	300	159	203	84	991	448	543	260	-	300	213	290	93
MTR 10-14/14	11	1173	508	665	315	-	350	204	243	124	-	-	-	-	-	-	-	-	
MTR 10-16/16	11	1233	568	665	315	-	350	204	243	126	-	-	-	-	-	-	-	-	
MTR, MTRE 10-18/18	11	1293	628	665	315	-	350	204	243	128	1293	628	665	314	-	350	308	420	156
MTR 10-20/18	11	1353	688	665	315	-	350	204	243	130	-	-	-	-	-	-	-	-	
MTR 10-22/18	11	1413	748	665	315	-	350	204	243	132	-	-	-	-	-	-	-	-	

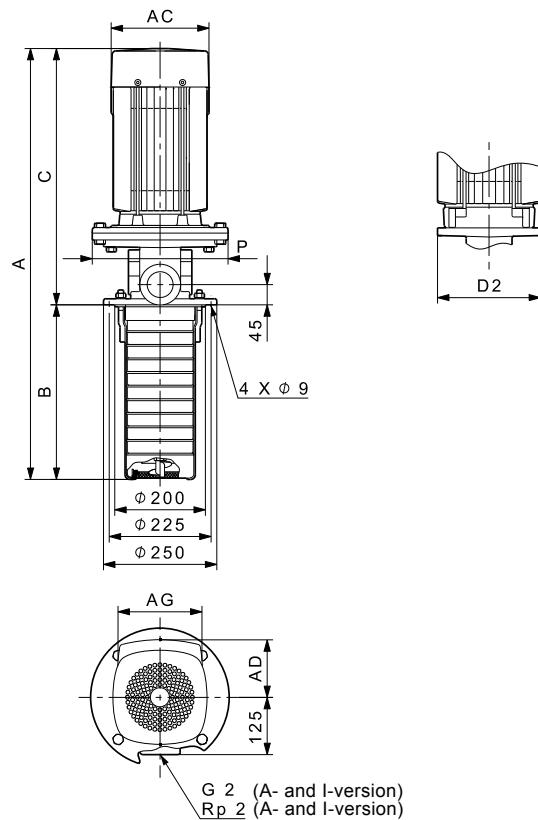
The maximum immersion depth is 1018 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 15, 60 Hz**

TM02 78514303

## Dimensional sketches



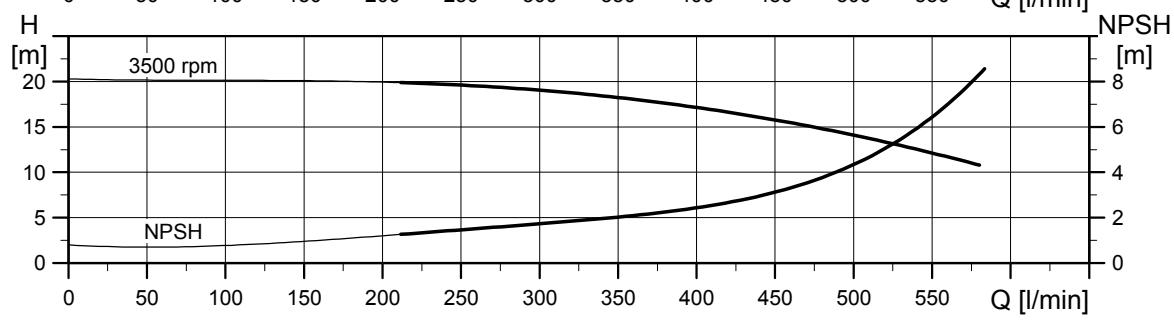
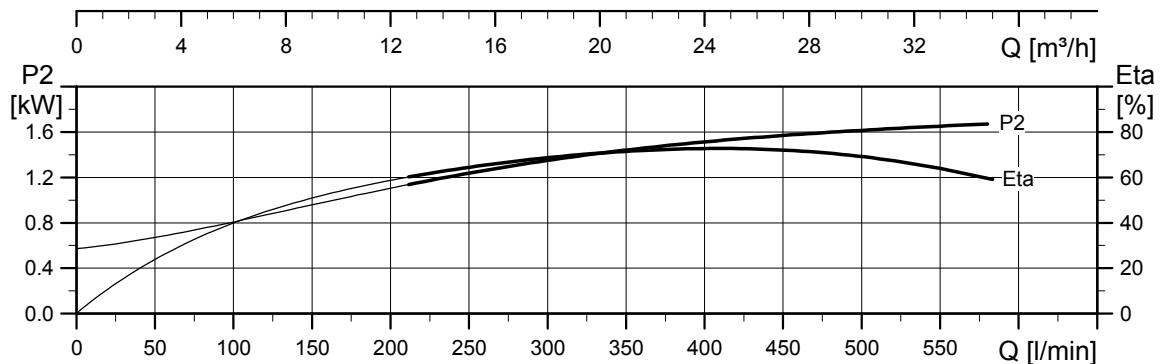
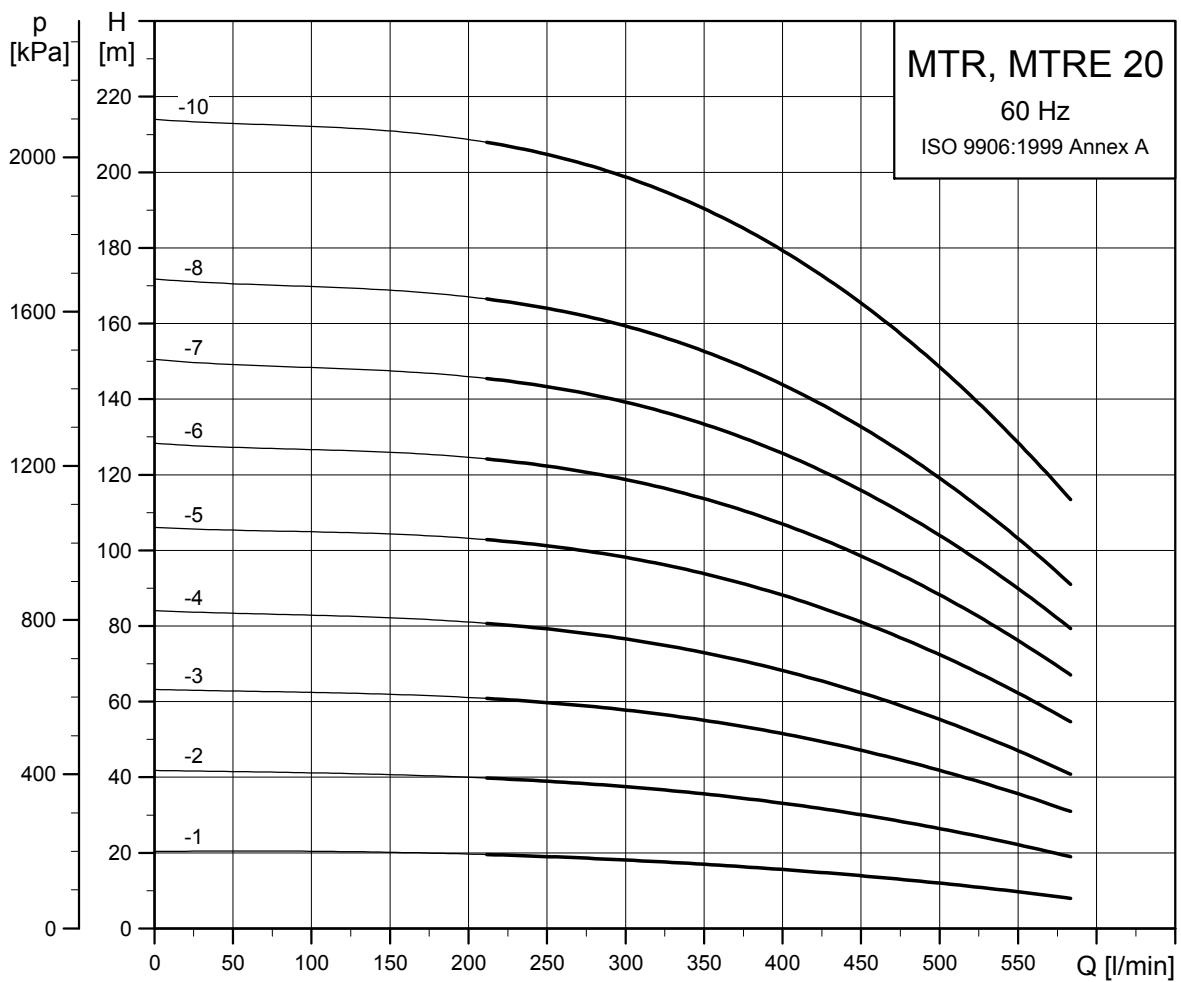
TM04 2790 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE								Net weight [kg]		
		Dimensions [mm]								Dimensions [mm]										
		A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD	AG			
MTR, MTRE 15-2/1	1.5	603	178	425	178	140	-	110	162	28	603	178	425	178	140	-	167	268	35	
MTR, MTRE 15-2/2	3	657	178	479	198	160	-	110	162	45	657	178	479	198	160	-	177	264	52	
MTR, MTRE 15-3/3	4	739	223	516	220	160	-	134	202	47	739	223	516	220	160	-	188	290	57	
MTR, MTRE 15-4/4	5.5	823	268	555	220	-	300	134	202	63	823	268	555	220	-	300	188	290	70	
MTR, MTRE 15-5/5	7.5	856	313	543	260	-	300	159	203	80	856	313	543	260	-	300	213	290	89	
MTR 15-6/6	11	1023	358	665	315	-	350	204	243	119	-	-	-	-	-	-	-	-	-	
MTR 15-7/7	11	1068	403	665	315	-	350	204	243	120	-	-	-	-	-	-	-	-	-	
MTR, MTRE 15-8/8	11	1113	448	665	315	-	350	204	243	121	1113	448	665	314	-	350	308	420	149	
MTR, MTRE 15-10/10	15	1203	538	665	314	-	350	204	243	135	1203	538	665	314	-	350	308	420	166	
MTR, MTRE 15-12/12	18.5	1337	628	709	314	-	350	204	243	149	1337	628	709	314	-	350	308	420	180	
MTR 15-14/12	18.5	1427	718	709	314	-	350	204	243	151	-	-	-	-	-	-	-	-	-	
MTR 15-16/12	18.5	1517	808	709	314	-	350	204	243	153	-	-	-	-	-	-	-	-	-	
MTR 15-17/12	18.5	1562	853	709	314	-	350	204	243	154	-	-	-	-	-	-	-	-	-	

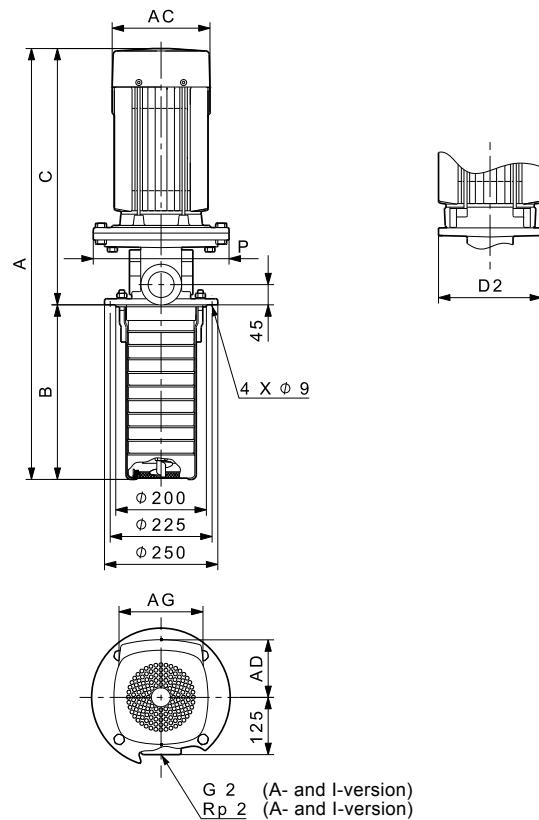
The maximum immersion depth is 1033 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 20, 60 Hz**

TM02 7852 4303

## Dimensional sketches



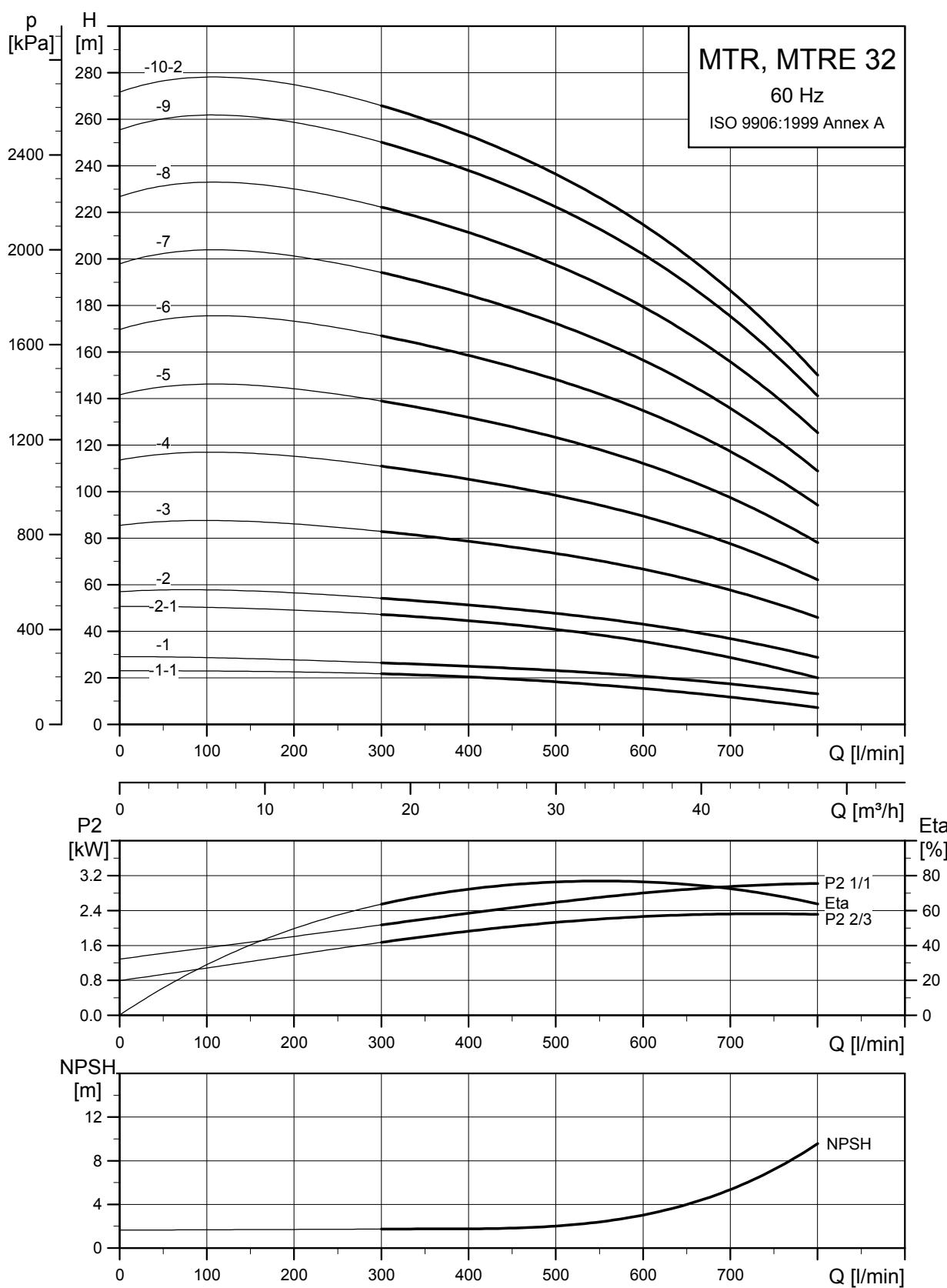
TM04 2790 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							Net weight [kg]			
		A	B	C	AC	D2	P	AD	AG	A	B	C	AC	D2	P	AD			
MTR, MTRE 20-2/1	2.2	643	178	465	178	160	-	110	162	44	643	178	465	198	160	-	177	268	51
MTR, MTRE 20-2/2	4	694	178	516	220	160	-	134	202	46	694	178	516	220	160	-	188	290	56
MTR, MTRE 20-3/3	5.5	778	223	555	220	-	300	134	202	62	778	223	555	220	-	300	188	290	69
MTR, MTRE 20-4/4	7.5	811	268	543	260	-	300	159	203	79	811	268	543	260	-	300	213	290	88
MTR 20-5/5	11	978	313	665	315	-	350	204	243	117	-	-	-	-	-	-	-	-	-
MTR, MTRE 20-6/6	11	1023	358	665	315	-	350	204	243	118	1023	358	665	314	-	350	308	420	146
MTR 20-7/7	15	1068	403	665	314	-	350	204	243	131	-	-	-	-	-	-	-	-	-
MTR, MTRE 20-8/8	15	1113	448	665	314	-	350	204	243	132	1113	448	665	314	-	350	308	420	163
MTR, MTRE 20-10/10	18.5	1247	538	709	314	-	350	204	243	146	1247	538	709	314	-	350	308	420	177
MTR 20-12/10	18.5	1337	628	709	314	-	350	204	243	148	-	-	-	-	-	-	-	-	-
MTR 20-14/10	18.5	1427	718	709	314	-	350	204	243	150	-	-	-	-	-	-	-	-	-
MTR 20-16/10	18.5	1517	808	709	314	-	350	204	243	152	-	-	-	-	-	-	-	-	-
MTR 20-17/10	18.5	1562	853	709	314	-	350	204	243	153	-	-	-	-	-	-	-	-	-

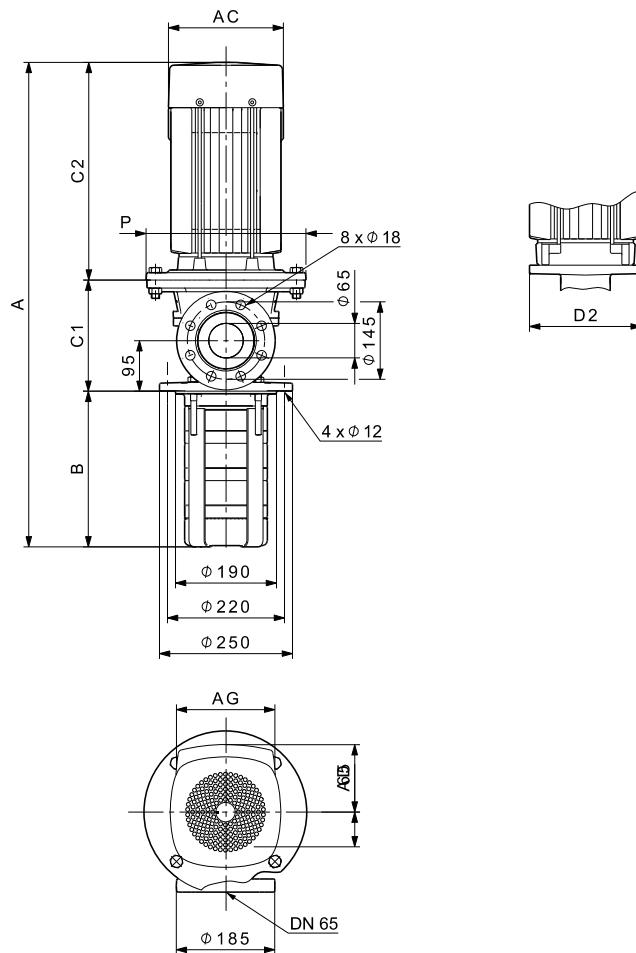
The maximum immersion depth is 1033 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 32, 60 Hz**

TM01 4305 2213

## Dimensional sketches



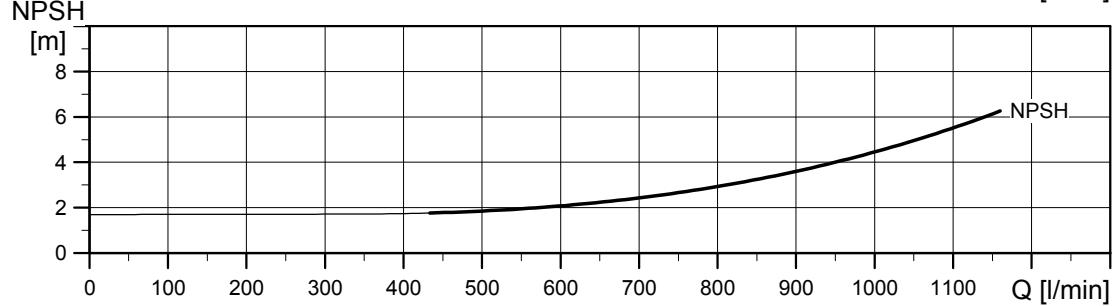
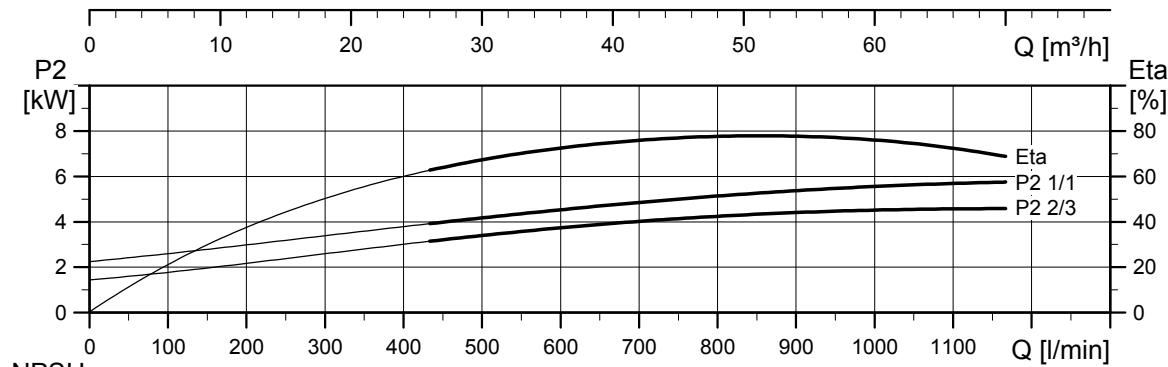
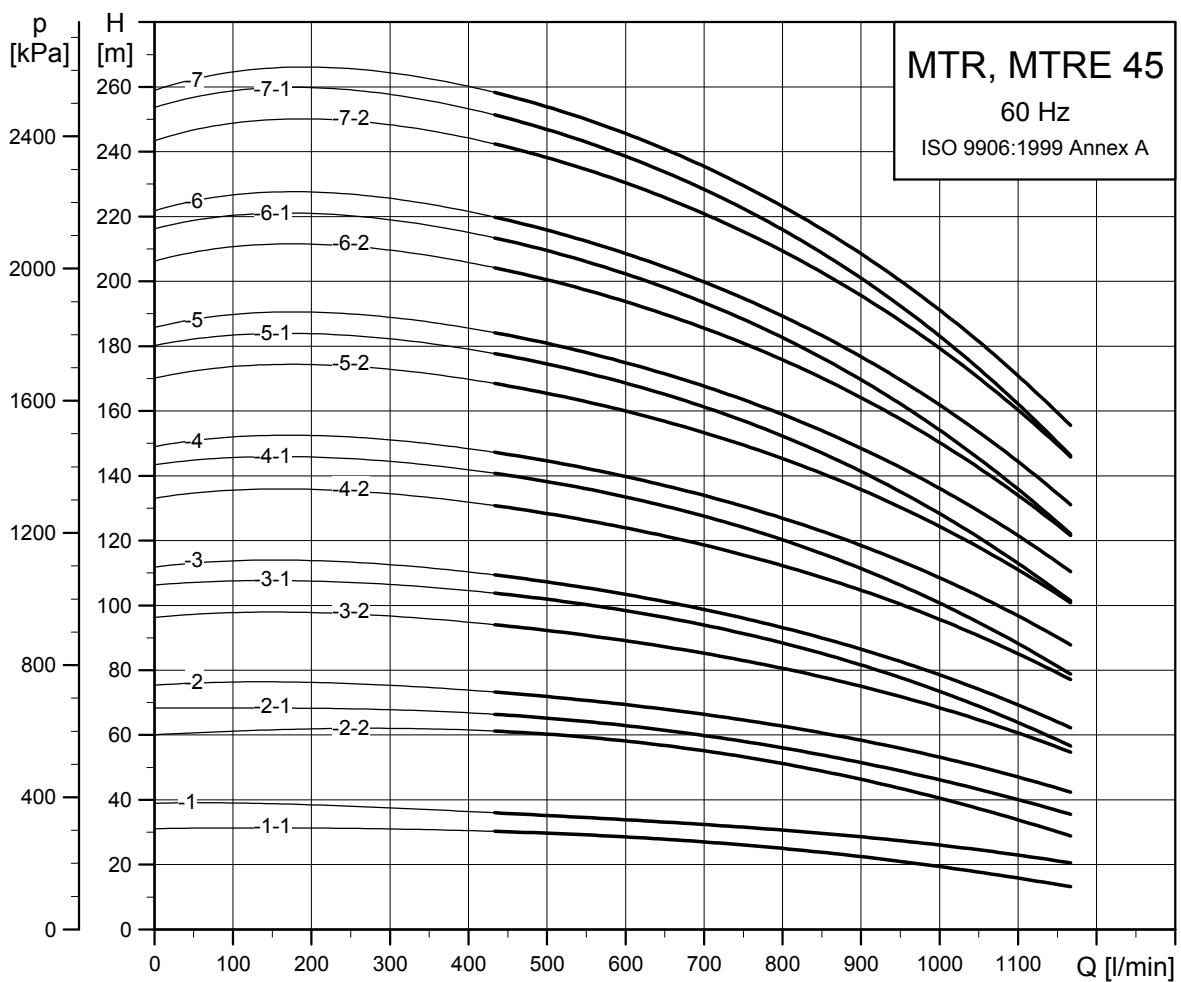
TM04 2791 2413

## Dimensions and weights

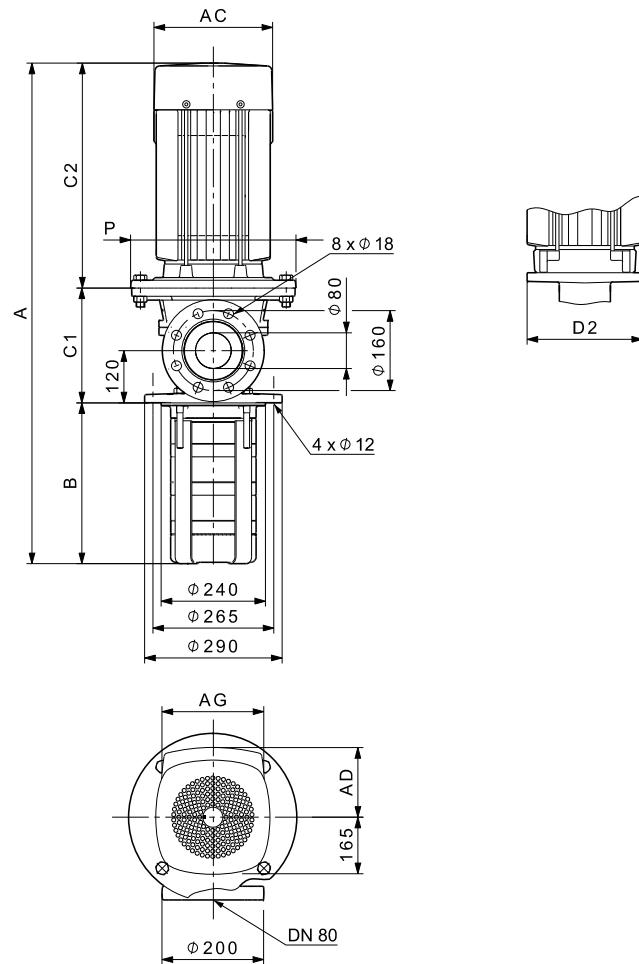
Pump type	P <sub>2</sub> [kW]	MTR								MTRE								Net weight [kg]			
		A	B	C1	C2	AC	D2	P	AD	AG	A	B	C1	C2	AC	D2	P	AD	AG		
MTR, MTRE 32-2/1-1	2.2	682	223	138	321	178	-	200	110	162	70	635	223	138	274	122	-	200	158	268	64
MTR, MTRE 32-2/1	3	696	223	138	335	198	198	-	120	162	71	696	223	138	335	198	198	-	177	264	94
MTR, MTRE 32-2/2-1	5.5	823	223	209	391	220	-	300	134	202	110	823	223	209	391	220	-	298	188	290	121
MTR, MTRE 32-2/2	7.5	811	223	209	379	260	-	300	159	203	121	811	223	209	379	260	-	300	213	290	134
MTR, MTRE 32-3/3	11	973	293	209	471	314	-	350	204	243	162	973	293	209	471	314	-	350	308	420	196
MTR, MTRE 32-4/4	15	1043	363	209	471	314	-	350	204	243	174	1043	363	209	471	314	-	350	308	420	212
MTR 32-5/5	18.5	1157	433	209	515	314	-	350	204	243	187	-	-	-	-	-	-	-	-	-	-
MTR, MTRE 32-6/6	18.5	1227	503	209	515	314	-	350	204	243	188	1278	503	209	566	314	-	350	308	420	224
MTR, MTRE 32-7/7	22	1323	573	209	541	314	-	350	204	243	202	1323	573	209	541	314	-	350	308	420	237
MTR 32-8/8	30	1462	643	209	610	402	-	400	300	260	307	-	-	-	-	-	-	-	-	-	-
MTR 32-9/9	30	1532	713	209	610	402	-	400	300	260	307	-	-	-	-	-	-	-	-	-	-
MTR 32-10/10-2	30	1602	783	209	610	402	-	400	300	260	308	-	-	-	-	-	-	-	-	-	-

The maximum immersion depth is 1343 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 45, 60 Hz**

## Dimensional sketches



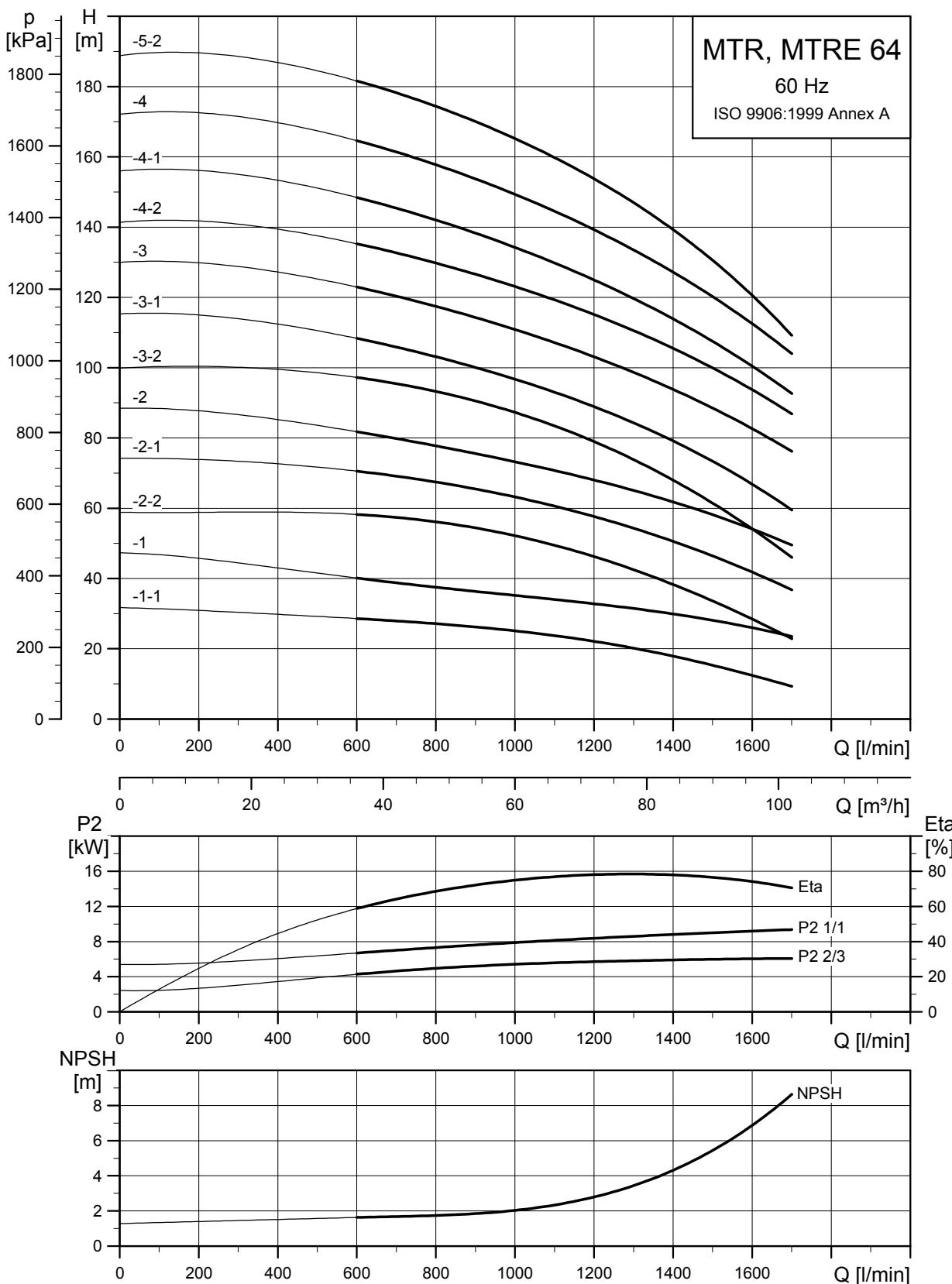
TM04 2791 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE								Net weight [kg]	
		A	B	C1	C2	AC	P	AD	AG	A	B	C1	C2	AC	P	AD	AG		
MTR, MTRE 45-2/1-1	5.5	875	244	240	391	220	300	134	202	118	875	244	240	391	220	298	188	290	129
MTR, MTRE 45-2/1	7.5	863	244	240	379	260	300	159	203	128	863	244	240	379	260	300	213	290	142
MTR 45-2/2-2	11	955	244	240	471	314	350	204	243	170	-	-	-	-	-	-	-	-	-
MTR, MTRE 45-2/2-1	11	955	244	240	471	314	350	204	243	170	955	244	240	471	314	350	308	420	213
MTR, MTRE 45-2/2	15	955	244	240	471	314	350	204	243	182	955	244	240	471	314	350	308	420	228
MTR 45-3/3-2	18.5	1079	324	240	515	314	350	204	243	196	-	-	-	-	-	-	-	-	-
MTR 45-3/3-1	18.5	1079	324	240	515	314	350	204	243	196	-	-	-	-	-	-	-	-	-
MTR, MTRE 45-3/3	18.5	1079	324	240	515	314	350	204	243	196	1130	324	240	566	314	350	308	420	240
MTR, MTRE 45-4/4-2	22	1185	404	240	541	314	350	204	243	210	1185	404	240	541	314	350	308	420	254
MTR 45-4/4-1	30	1254	404	240	610	402	400	300	260	331	-	-	-	-	-	-	-	-	-
MTR 45-4/4	30	1254	404	240	610	402	400	300	260	331	-	-	-	-	-	-	-	-	-
MTR 45-5/5-2	30	1334	484	240	610	402	400	300	260	331	-	-	-	-	-	-	-	-	-
MTR 45-5/5-1	30	1334	484	240	610	402	400	300	260	331	-	-	-	-	-	-	-	-	-
MTR 45-5/5	30	1334	484	240	610	402	400	300	260	331	-	-	-	-	-	-	-	-	-
MTR 45-6/6-2	37	1471	564	240	667	402	400	300	260	354	-	-	-	-	-	-	-	-	-
MTR 45-6/6-1	37	1471	564	240	667	402	400	300	260	354	-	-	-	-	-	-	-	-	-
MTR 45-6/6	37	1471	564	240	667	402	400	300	260	354	-	-	-	-	-	-	-	-	-
MTR 45-7/7-2	45	1612	644	259	709	442	450	325	260	444	-	-	-	-	-	-	-	-	-
MTR 45-7/7-1	45	1612	644	259	709	442	450	325	260	444	-	-	-	-	-	-	-	-	-
MTR 45-7/7	45	1612	644	259	709	442	450	325	260	444	-	-	-	-	-	-	-	-	-

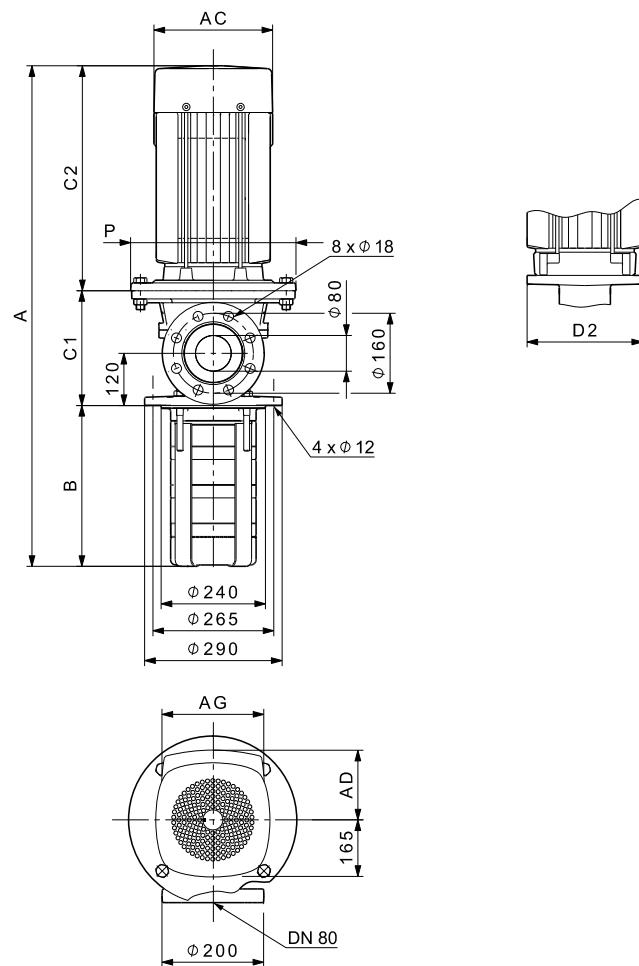
The maximum immersion depth is 1444 mm. See page 156.

For information about electrical data, see section 12. Motor data on page 144.

**MTR, MTRE 64, 60 Hz**

TM01 4307 2213

## Dimensional sketches



TM04 2791 2413

## Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE								Net weight [kg]	
		A	B	C1	C2	AC	P	AD	AG	A	B	C1	C2	AC	P	AD	AG		
MTR MTRE 64-2/1-1	7.5	868	249	240	379	260	300	159	203	131	868	249	240	379	260	300	213	290	144
MTR MTRE 64-2/1	11	960	249	240	471	314	350	204	243	173	960	249	240	471	314	350	308	420	216
MTR MTRE 64-2/2-2	15	960	249	240	471	314	350	204	243	185	960	249	240	471	314	350	308	420	231
MTR MTRE 64-2/2-1	18.5	1004	249	240	515	314	350	204	243	198	1055	249	240	566	314	350	308	420	243
MTR MTRE 64-2/2	22	1030	249	240	541	314	350	204	243	212	1030	249	240	541	314	350	308	420	256
MTR 64-3/3-2	22	1113	332	240	541	314	350	204	243	212	-	-	-	-	-	-	-	-	
MTR 64-3/3-1	30	1182	332	240	610	402	400	300	260	333	-	-	-	-	-	-	-	-	
MTR 64-3/3	30	1182	332	240	610	402	400	300	260	333	-	-	-	-	-	-	-	-	
MTR 64-4/4-2	37	1321	414	240	667	402	400	300	260	356	-	-	-	-	-	-	-	-	
MTR 64-4/4-1	37	1321	414	240	667	402	400	300	260	356	-	-	-	-	-	-	-	-	
MTR 64-4/4	45	1382	414	259	709	442	450	325	260	445	-	-	-	-	-	-	-	-	
MTR 64-5/5-2	45	1465	497	259	709	442	450	325	260	446	-	-	-	-	-	-	-	-	

The maximum immersion depth is 1487 mm. See page 156.

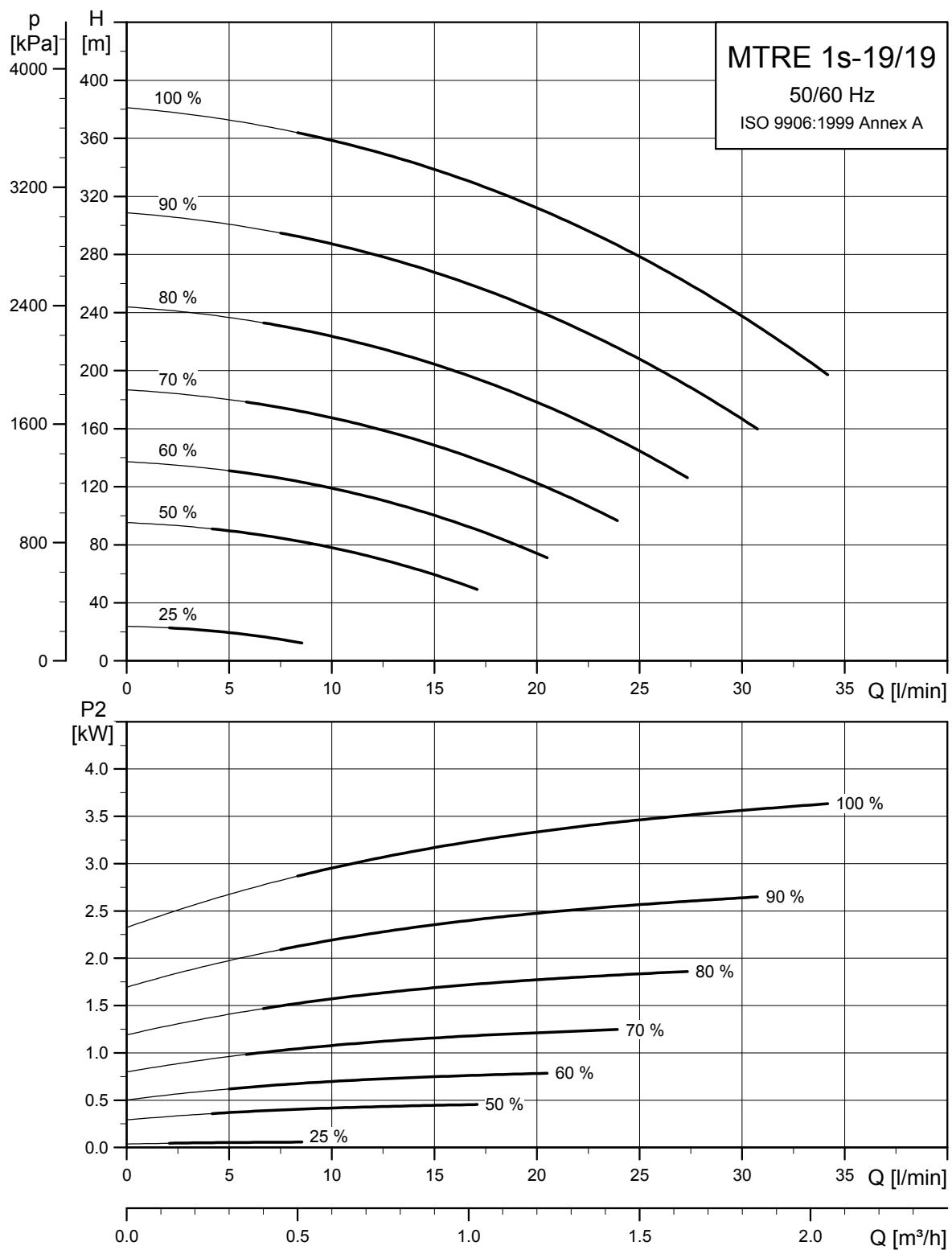
For information about electrical data, see section 12. Motor data on page 144.

## MTRE for high pressure applications

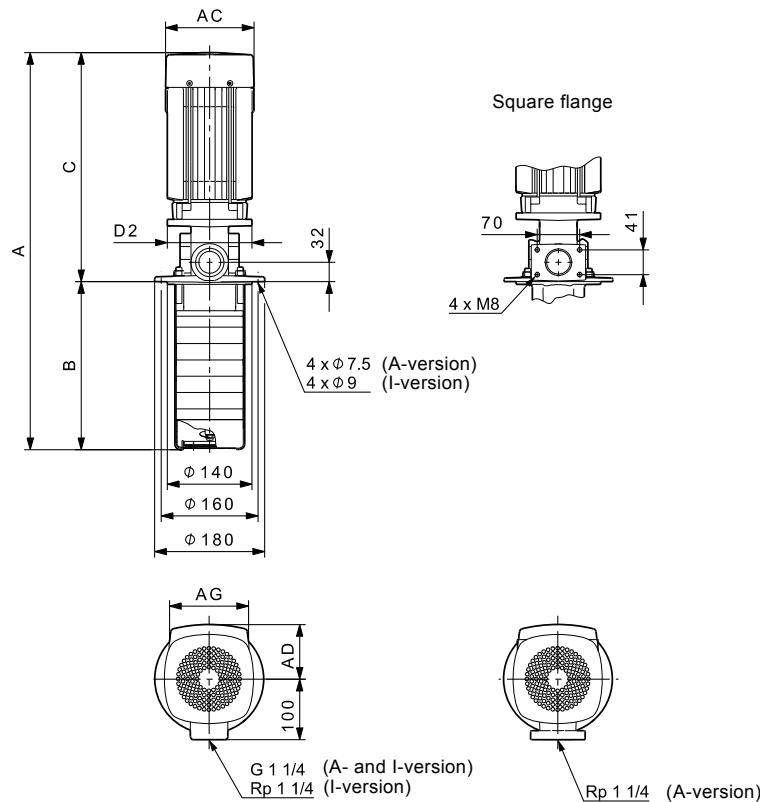
For high-pressure applications, Grundfos offers a unique MTR pump capable of generating up to 38 bar.

These pumps are equipped with a high-speed motor, type MGE

### MTRE 1s high-pressure pump



TM05 156633111

**Dimensional sketches**

TM03 2677 2413

**Dimensions and weight**

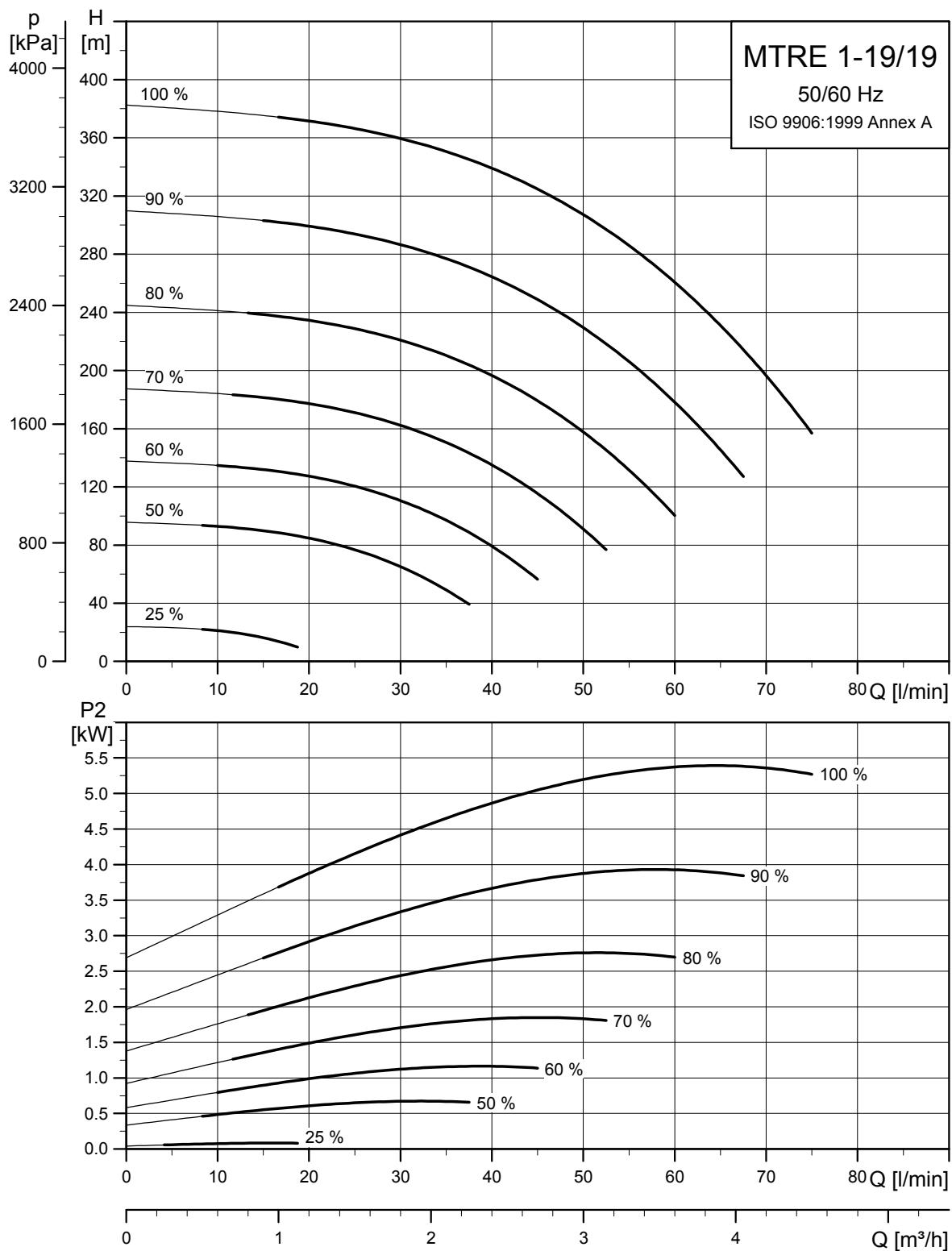
Pump type	Dimensions [mm]						Weight [kg]	
	A	B	C	AC	D2	AD		
MTRE1s-19/19 HS	951	466	485	220	160	188	290	49.8

The maximum immersion depth is 1006 mm. For further details about the available immersion depths for MTR, MTRE pumps, see page 156.

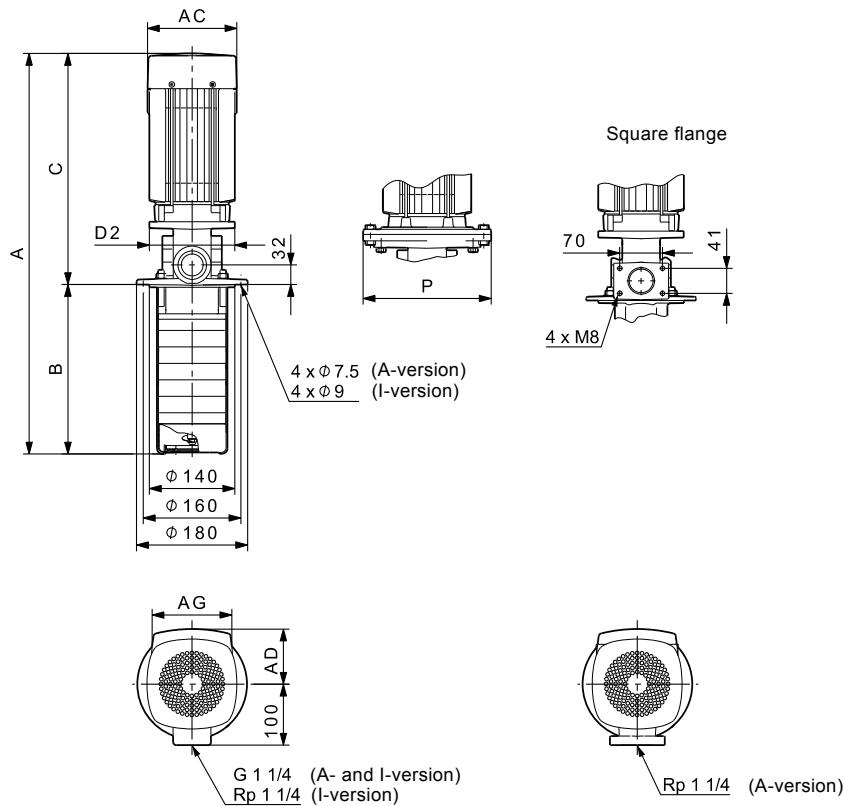
**Electrical data**

Voltage	P <sub>2</sub> [kW]	Type	I <sub>1/1</sub> [A]	I <sub>start</sub> [A]	Power factor cos Φ <sub>1/1</sub>	Motor efficiency		Maximum motor speed [min <sup>-1</sup> ]
						η [%]	Class	
3 x 380-480V 50/60Hz	4	MGE112MC	8.1-6.6	8.1-6.6	0.94-0.92	88.1	IE3	5425
3 x 200-230V 50/60Hz	4	MGE112MC	13.4-12.8	13.4-12.8	0.94	88.1	IE3	5425

## MTRE 1 high-pressure pump



TM04 5677 0010

**Dimensional sketches**

TM04 2789 2413

**Dimensions and weight**

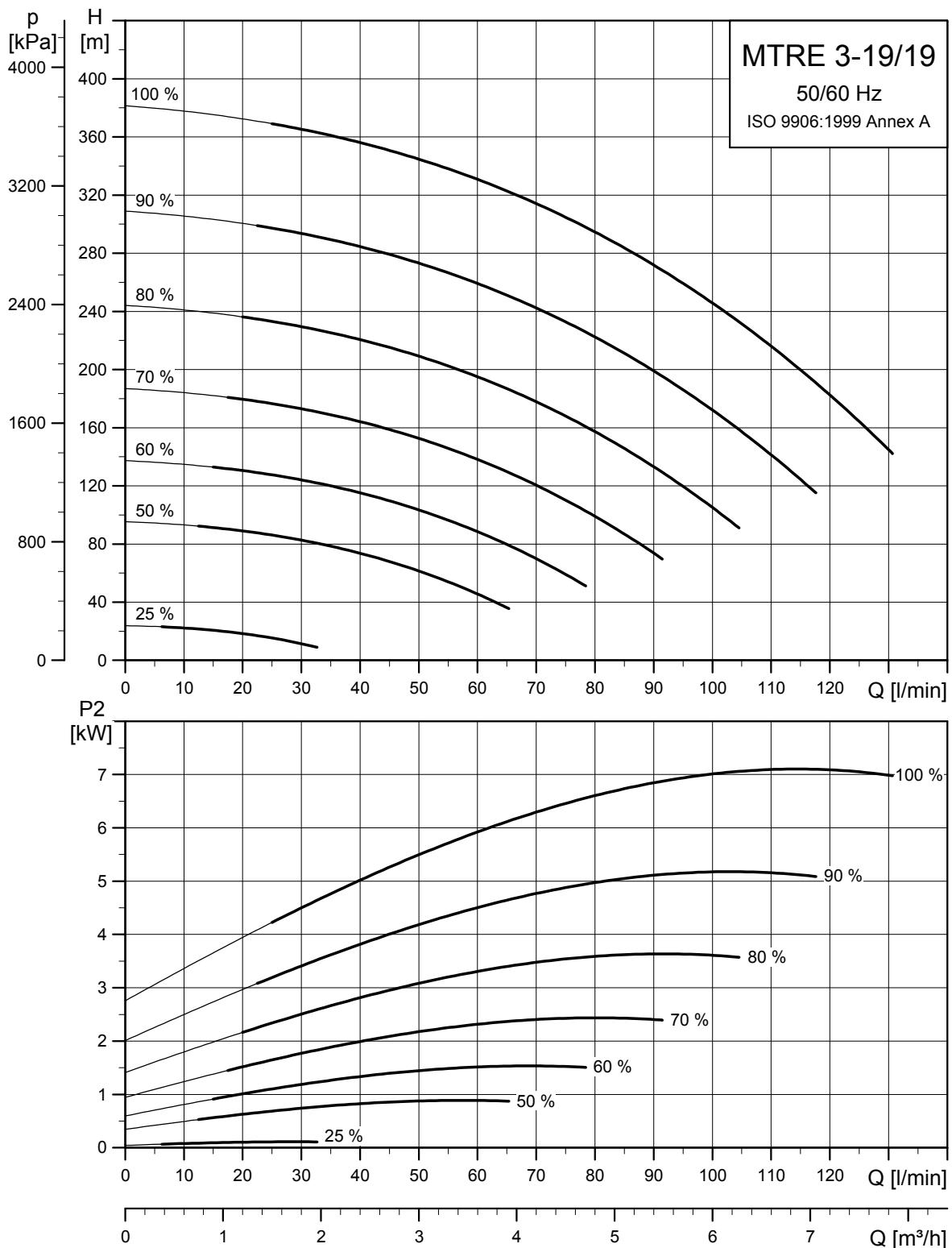
Pump type	Dimensions [mm]						Weight [kg]	
	A	B	C	AC	P	AD	AG	
MTRE1-19/19 HS	994	466	528	220	300	188	290	61

The maximum immersion depth is 1006 mm. For further details about the available immersion depths for MTR, MTRE pumps, see page 156.

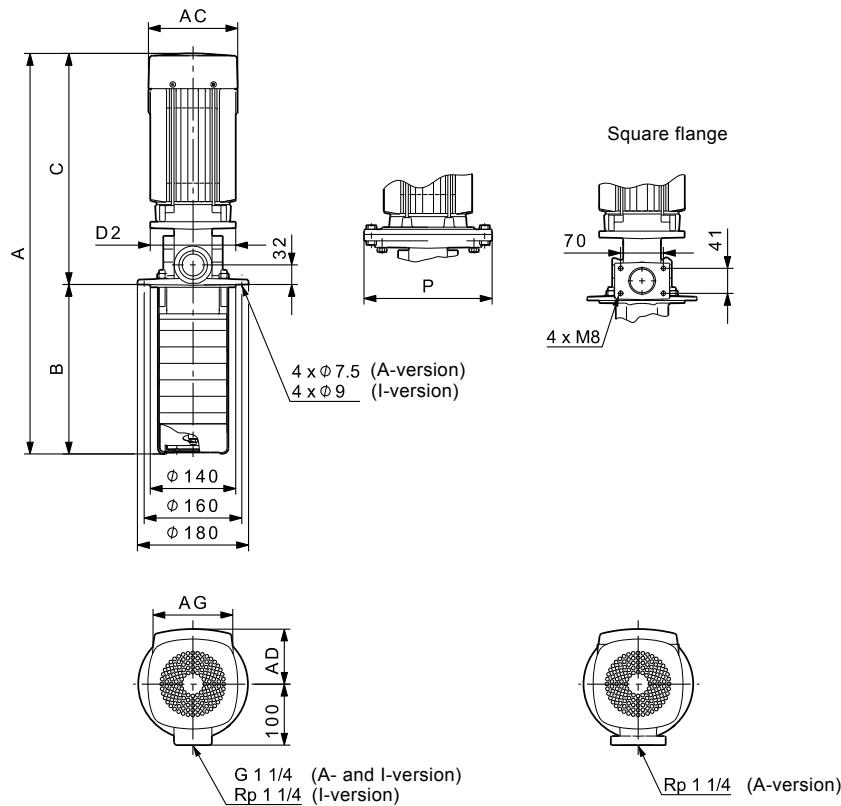
**Electrical data**

Voltage	P <sub>2</sub> [kW]	Type	I <sub>1/1</sub> [A]	I <sub>start</sub> [A]	Power factor cos Φ <sub>1/1</sub>	Motor efficiency		Maximum motor speed [min <sup>-1</sup> ]
						η [%]	Class	
3 x 380-480V 50/60Hz	5.5	MGE132SC	11-8.8	11-8.8	0.94-0.93	85.5	IE2	5400
3 x 200-230V 50/60Hz	5.5	MGE132SC	19.7-18.1	19.7-18.1	0.94	88.5	IE2	5400

## MTRE 3 high-pressure pump



TM05 1564 3111

**Dimensional sketches**

TM04 2789 2413

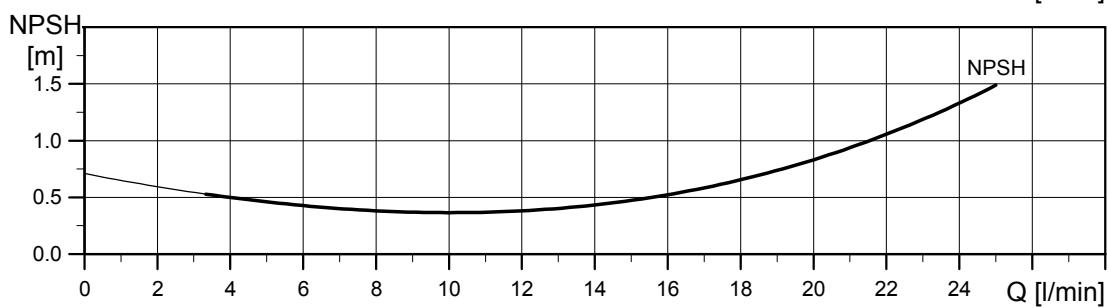
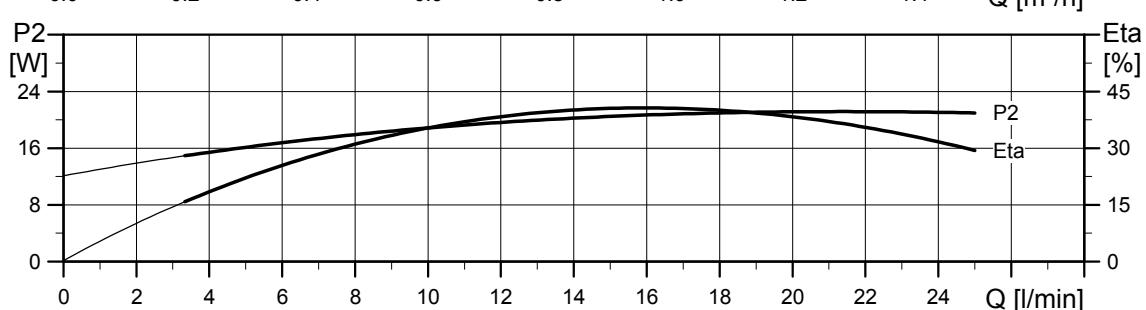
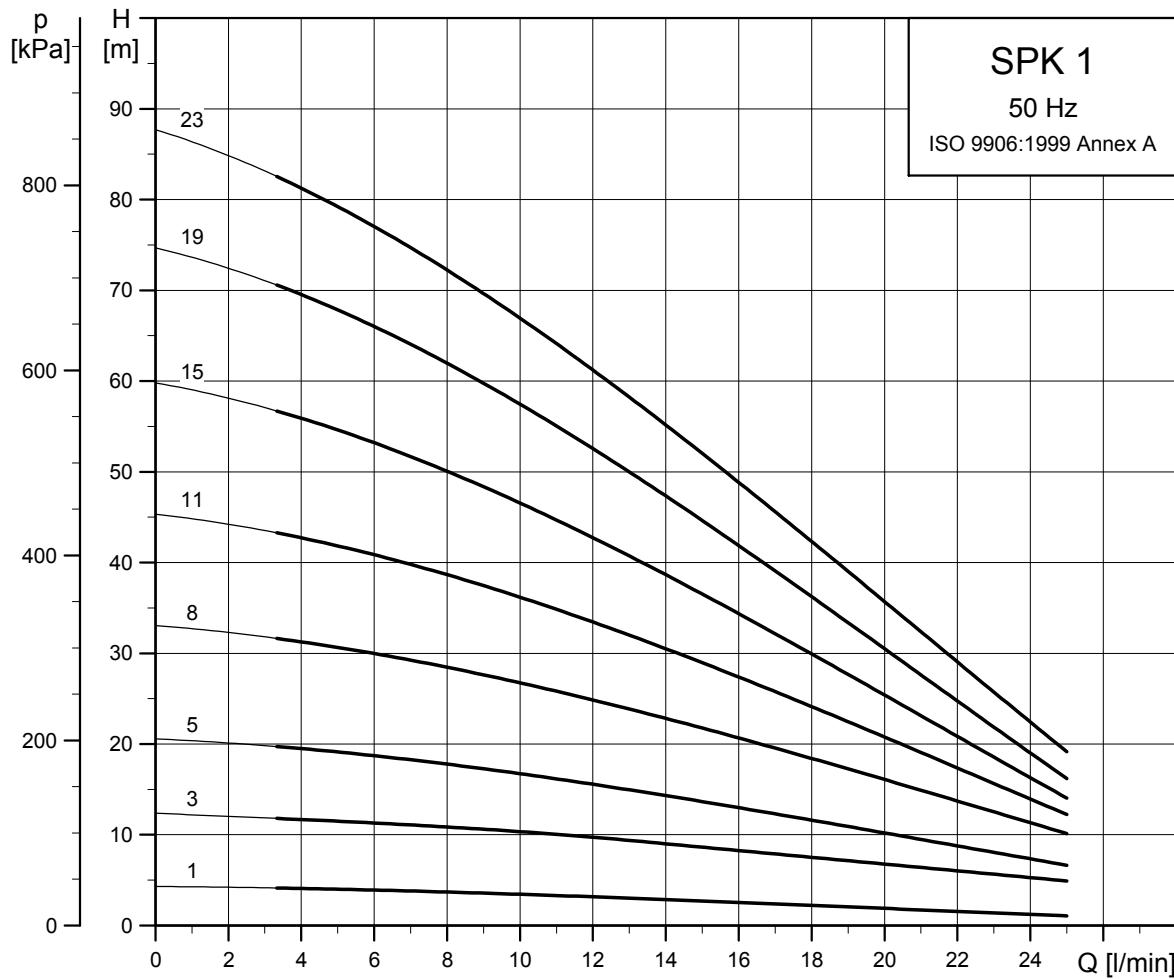
**Dimensions and weight**

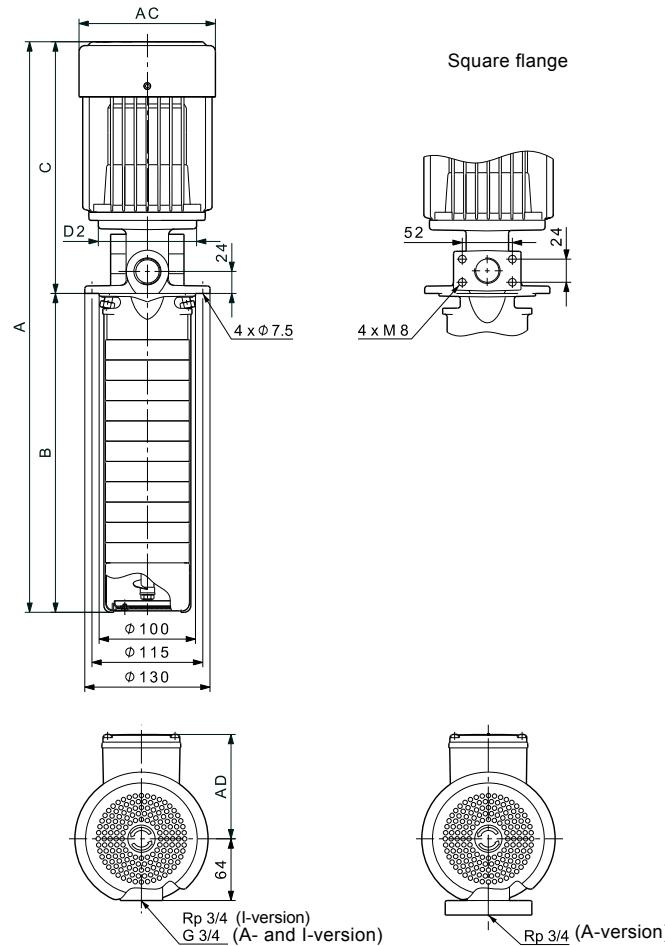
Pump type	Dimensions [mm]						Weight [kg]	
	A	B	C	AC	P	AD	AG	
MTRE3-19/19 HS	982	466	516	260	300	213	290	64.2

The maximum immersion depth is 1006 mm. For further details about the available immersion depths for MTR, MTRE pumps, see page 156.

**Electrical data**

Voltage	P <sub>2</sub> [kW]	Type	I <sub>1/1</sub> [A]	I <sub>start</sub> [A]	Power factor cos Φ <sub>1/1</sub>	Motor efficiency		Maximum motor speed [min <sup>-1</sup> ]
						η [%]	Class	
3 x 380-480V 50/60Hz	7.5	MGE132SC	14.6-11.6	14.6-11.6	0.94	88.1	IE2	5050

**SPK, 50 Hz****SPK 1, 50 Hz**

**Dimensional sketches**

TM04-5801 3313

**Dimensions and weights**

Pump type	P <sub>2</sub> [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 1-1/1	0.06	395	140	255	124	90	101	9.3
SPK 1-3/3	0.12	437	182	255	124	90	101	9.0
SPK 1-5/5	0.12	479	224	255	124	90	101	9.5
SPK 1-8/8	0.18	542	287	255	124	90	101	10.5
SPK 1-11/11	0.25	596	350	246	141	102	109	12.6
SPK 1-15/15	0.37	701	434	267	141	102	109	14.0
SPK 1-19/19	0.37	785	518	267	141	102	109	15.1
SPK 1-23/23	0.55	869	602	267	141	102	109	15.7

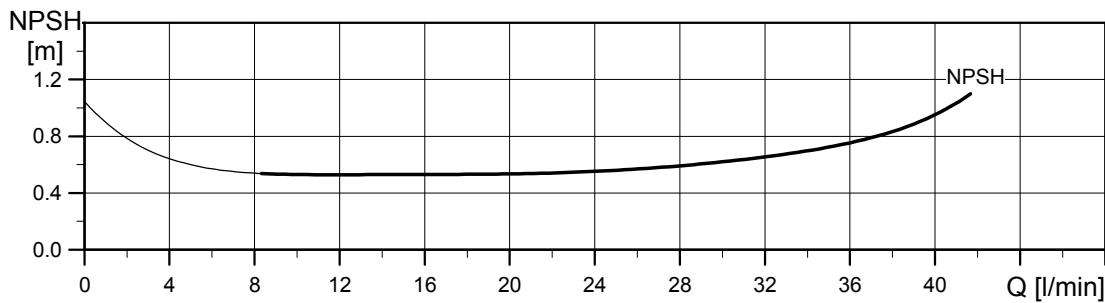
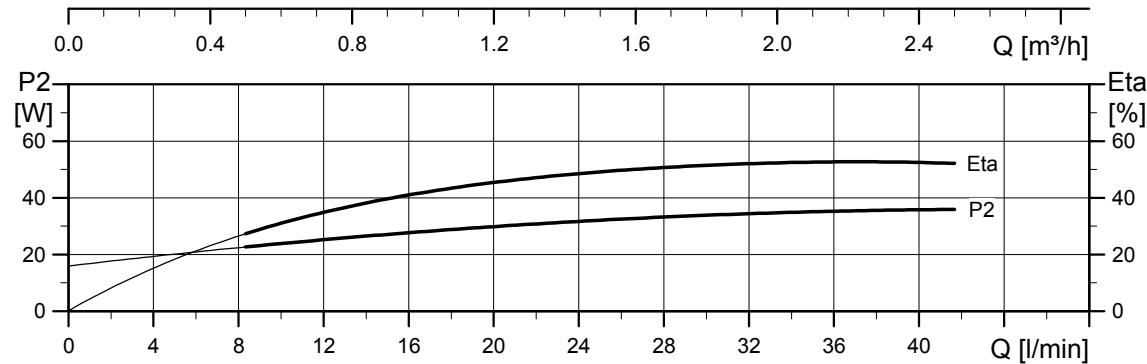
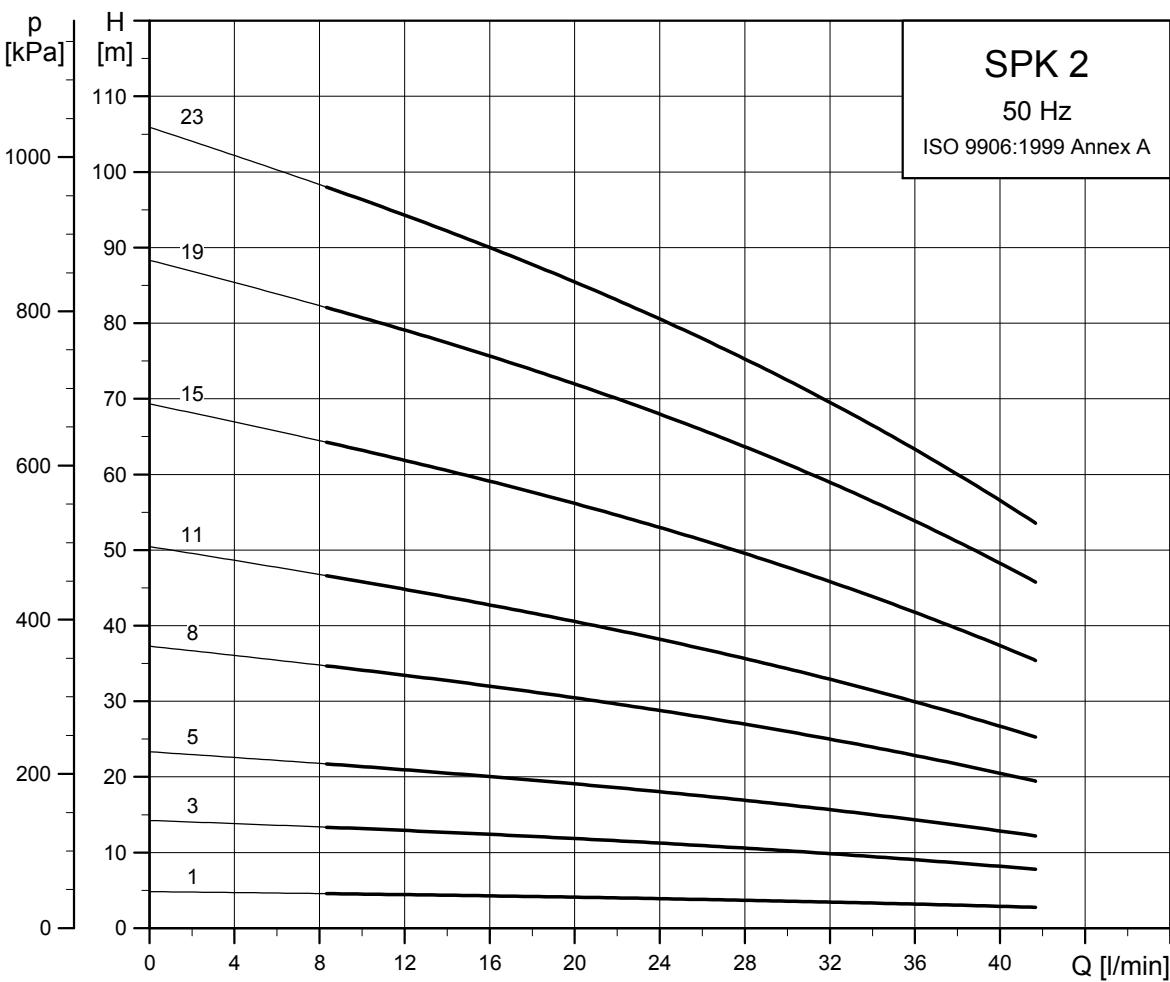
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

**SPK with extension pipe**

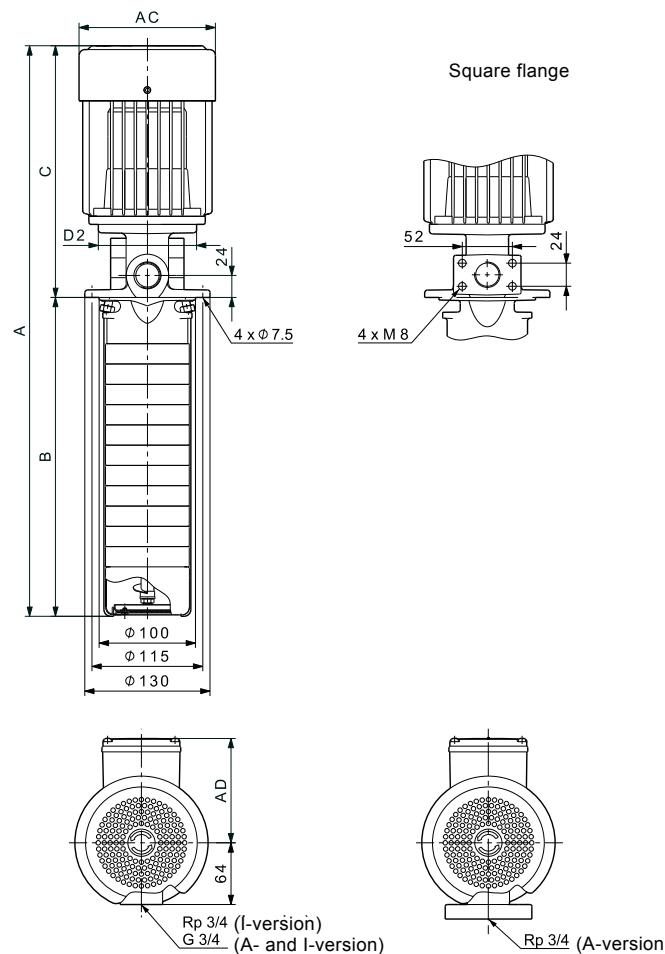
Pump type	P <sub>2</sub> [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 1-23/23	0.55	1272	1005	267	141	102	109	20.3

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

For information about electrical data, see section 12. Motor data on page 144.

**SPK 2, 50 Hz**

TM00 1932 3700

**Dimensional sketches**

TM04 5801 3313

**Dimensions and weights**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 2-1/1	0.06	395	140	255	124	90	101	9.3
SPK 2-3/3	0.12	437	182	255	124	90	101	9.0
SPK 2-5/5	0.18	479	224	255	124	90	101	9.7
SPK 2-8/8	0.37	554	287	267	141	102	109	12.1
SPK 2-11/11	0.37	617	350	267	141	102	109	12.9
SPK 2-15/15	0.55	701	434	267	141	102	109	13.6
SPK 2-19/19	0.75	825	518	307	141	120	109	17.2
SPK 2-23/23	0.75	909	602	307	141	120	109	18.4

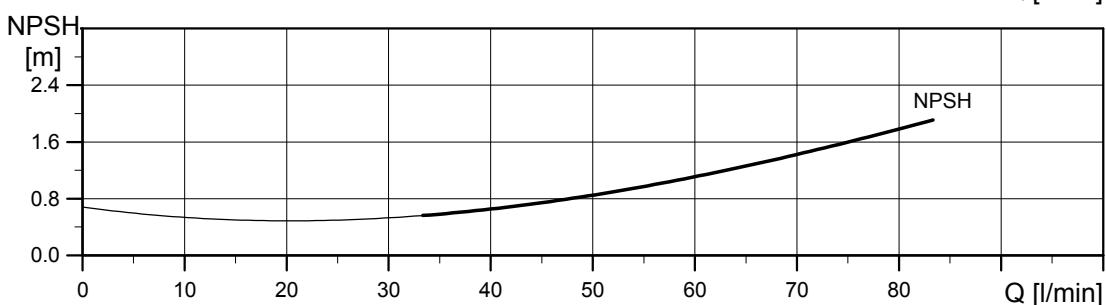
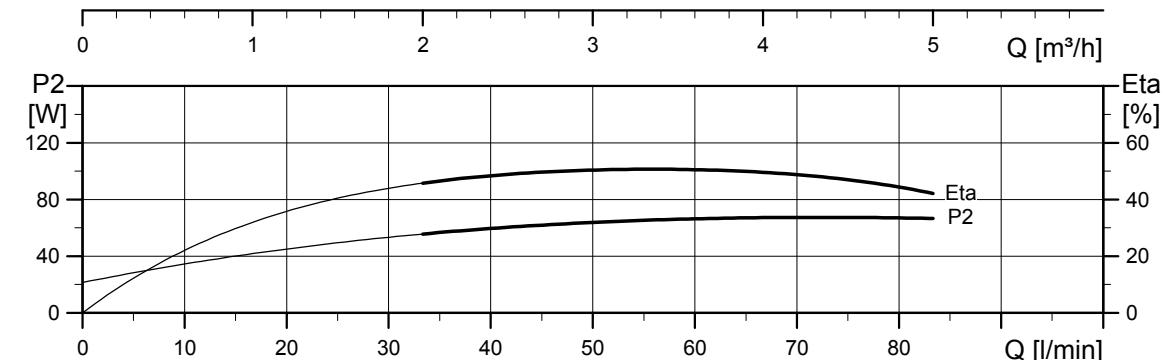
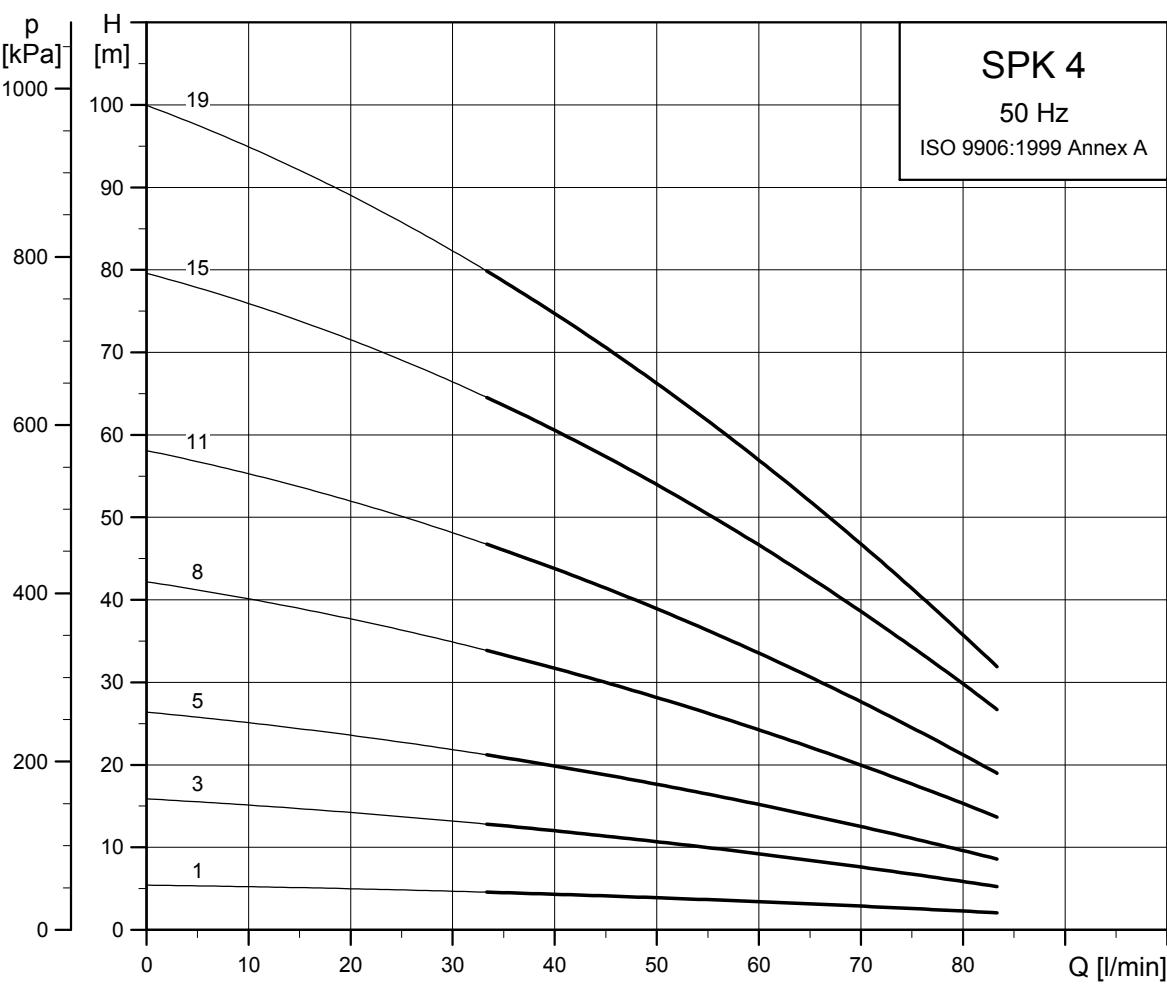
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

**SPK with extension pipe**

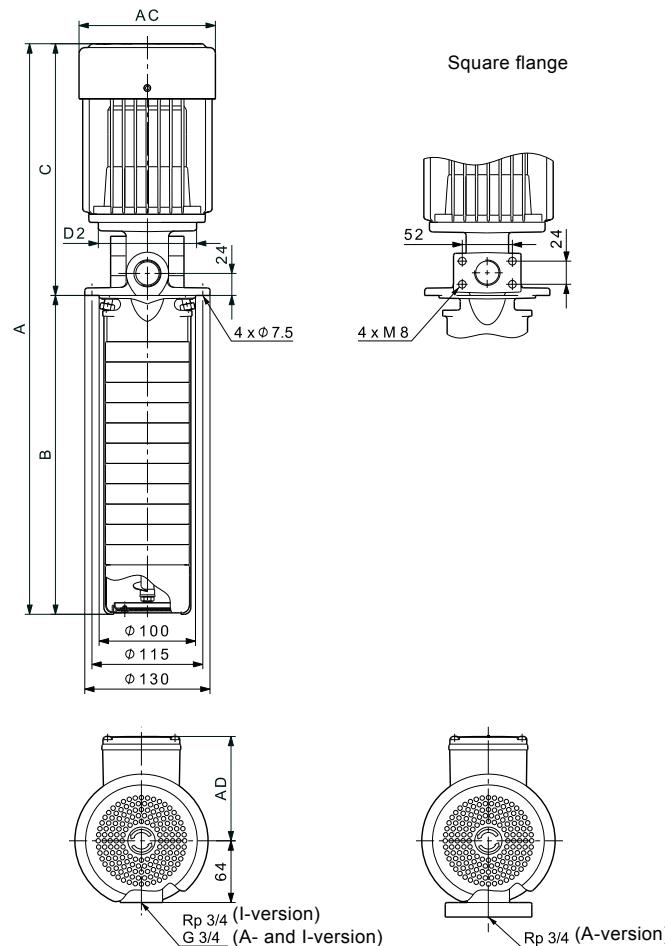
Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 2-23/23	0.75	1312	1005	307	141	120	109	23.0

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

For information about electrical data, see section 12. Motor data on page 144.

**SPK 4, 50 Hz**

TM00 1934 3700

**Dimensional sketches**

TM04 5801 3313

**Dimensions and weights**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 4-1/1	0.12	395	140	255	124	90	101	8.5
SPK 4-3/3	0.25	428	182	246	141	102	109	10.3
SPK 4-5/5	0.37	491	224	267	141	102	109	10.8
SPK 4-8/8	0.55	554	287	267	141	102	109	10.7
SPK 4-11/11	0.75	657	350	307	141	120	109	13.6
SPK 4-15/15	1.1	741	434	307	141	120	109	17.0
SPK 4-19/19	1.1	825	518	307	141	120	109	16.8

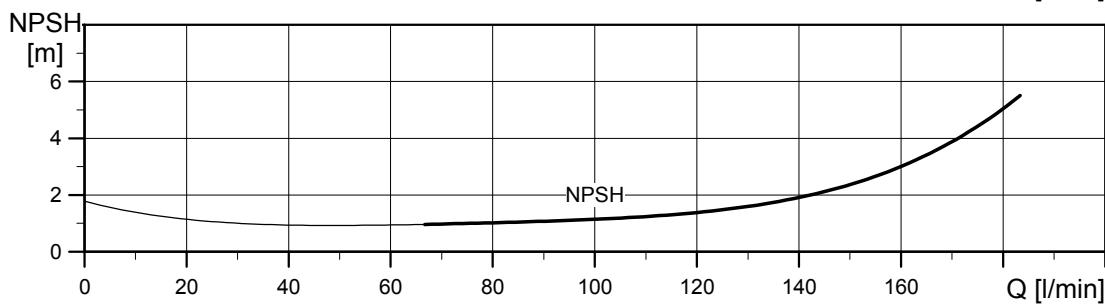
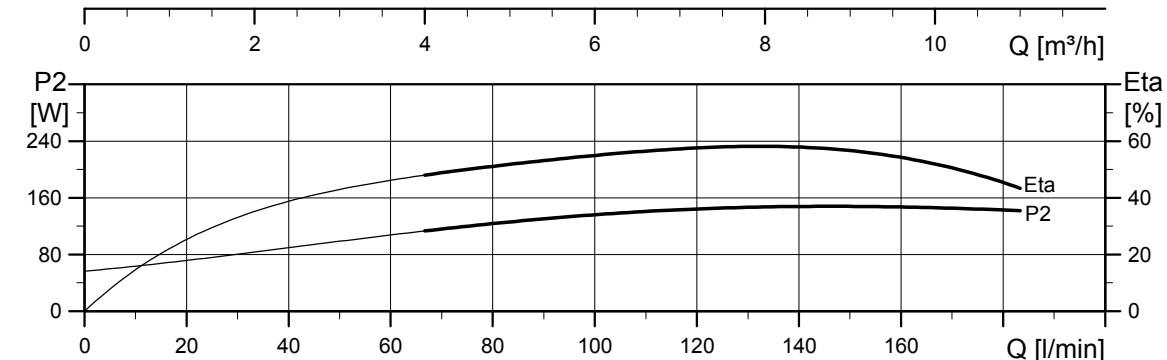
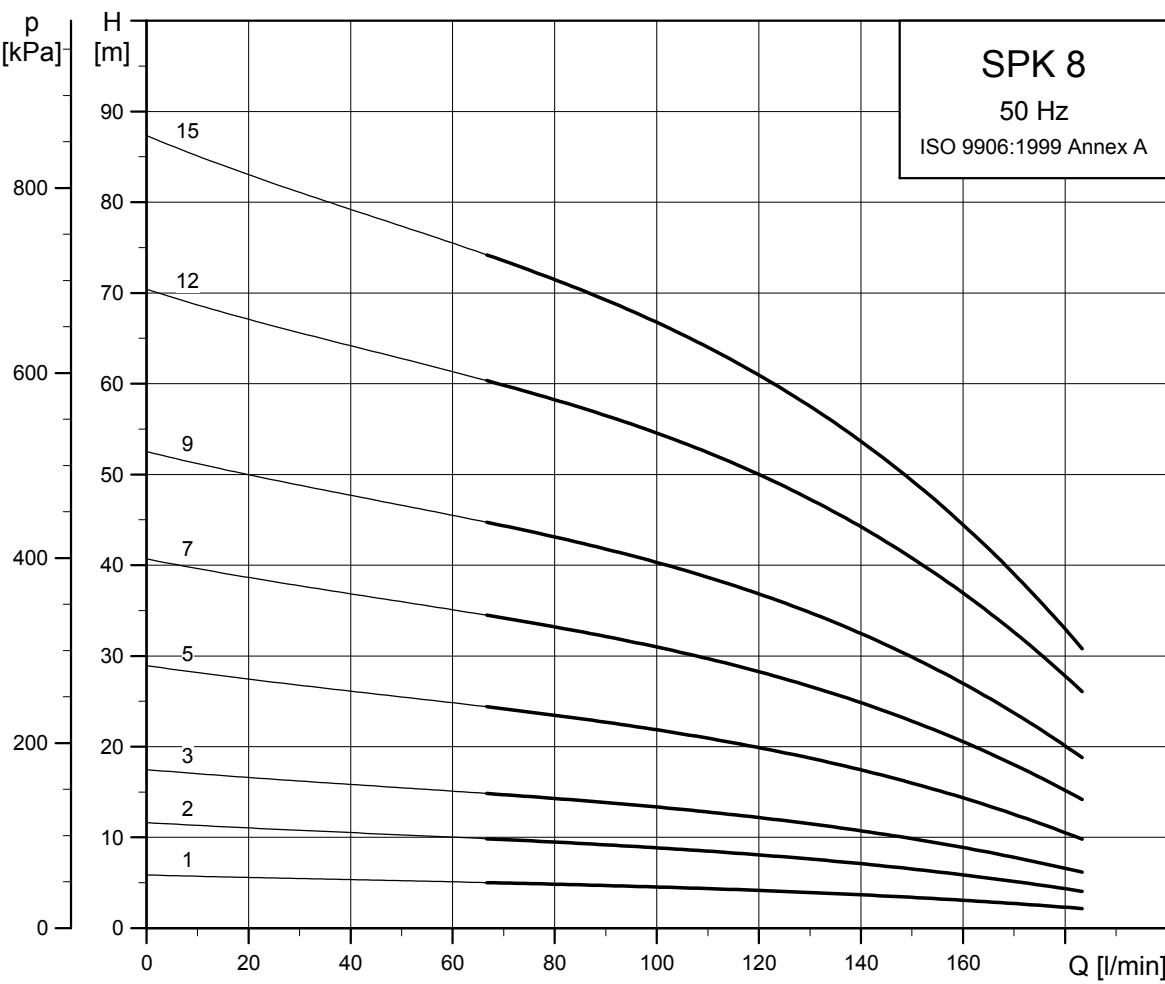
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

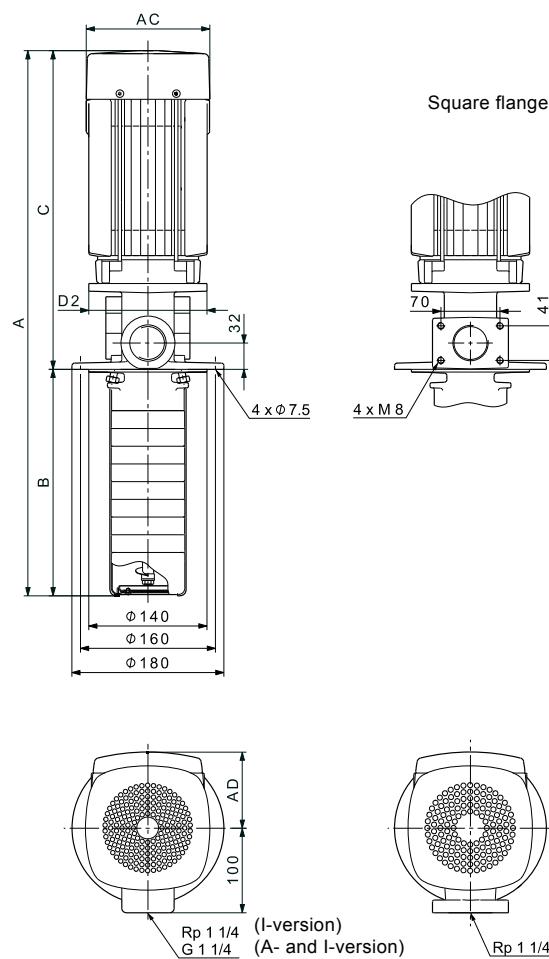
**SPK with extension pipe**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 4-19/19	1.1	1312	1005	307	141	120	109	22.0

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

For information about electrical data, see section 12. Motor data on page 144.

**SPK 8, 50 Hz**

**Dimensional sketches**

TM04 5802 3313

**Dimensions and weights**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 8-1/1	0.25	454	182	272	141	140	109	11.9
SPK 8-2/2	0.37	517	224	293	141	140	109	12.9
SPK 8-3/3	0.55	559	266	293	141	140	109	12.8
SPK 8-5/5	0.75	683	350	333	141	140	109	16.0
SPK 8-7/7	1.1	767	434	333	141	140	109	18.8
SPK 8-9/9	1.5	901	518	383	178	140	110	27.0
SPK 8-12/12	2.2	1067	644	423	178	140	110	32.6
SPK 8-15/15	2.2	1193	770	423	178	140	110	34.0

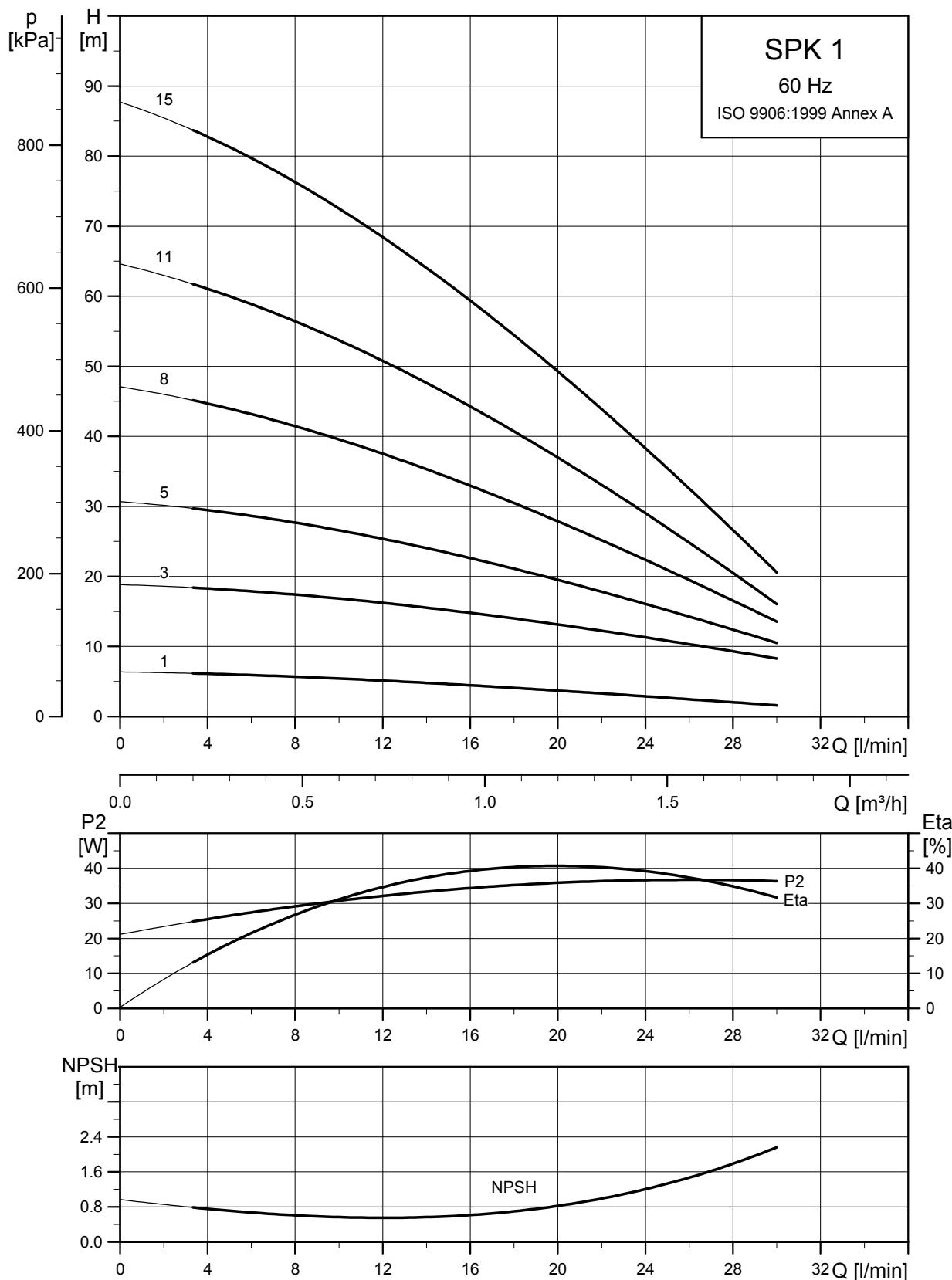
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

**SPK with extension pipe**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 8-15/15	2.2	1428	1005	423	178	140	110	36.7

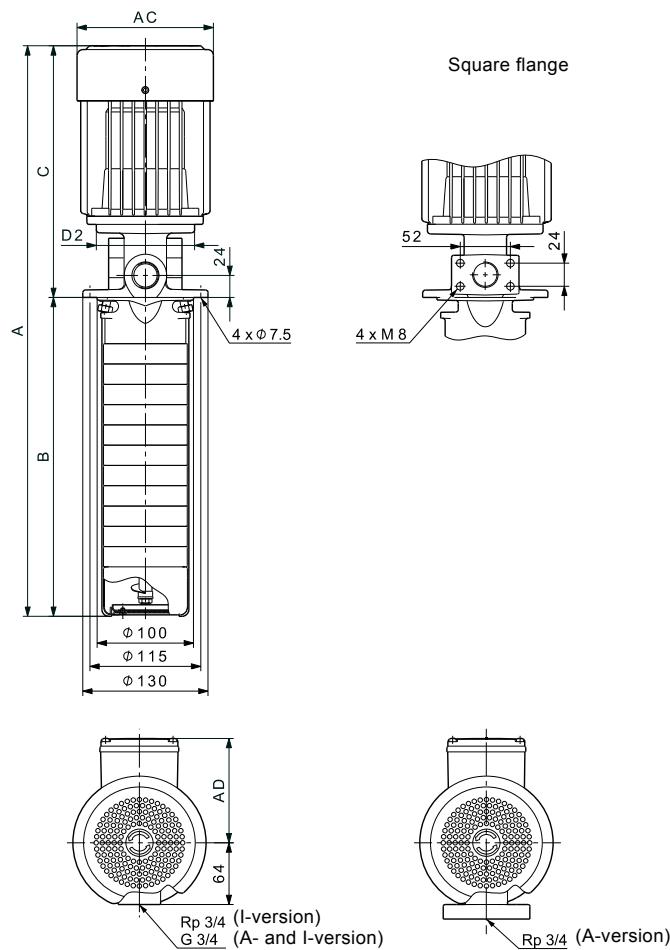
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

For information about electrical data, see section 12. Motor data on page 144.

**SPK, 60 Hz****SPK 1, 60 Hz**

TM00 1931 3700

## Dimensional sketches



TM04 5801 3313

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 1-1/1	0.06	395	140	255	124	90	101	9.3
SPK 1-3/3	0.12	437	182	255	124	90	101	9.0
SPK 1-5/5	0.25	470	224	246	141	102	109	9.0
SPK 1-8/8	0.25	533	287	246	141	102	109	11.8
SPK 1-11/11	0.37	617	350	267	141	102	109	12.8
SPK 1-15/15	0.55	701	434	267	141	102	109	13.4
SPK 1-19/15	0.55	785	518	267	141	102	109	13.8
SPK 1-23/15	0.55	869	602	267	141	102	109	14.3

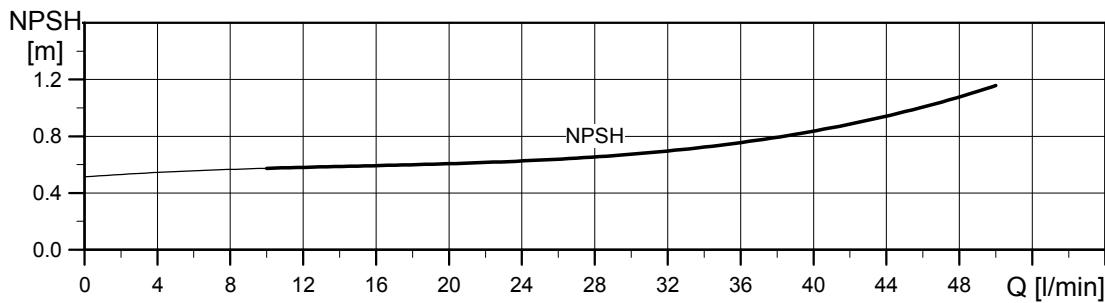
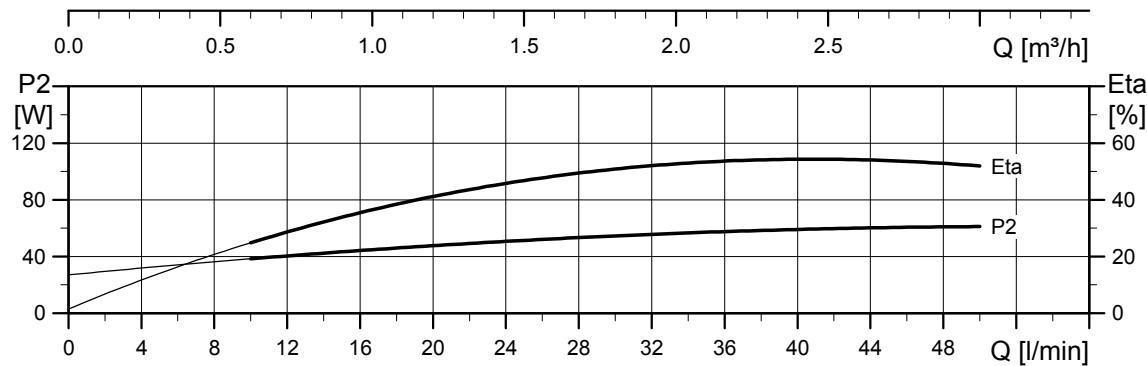
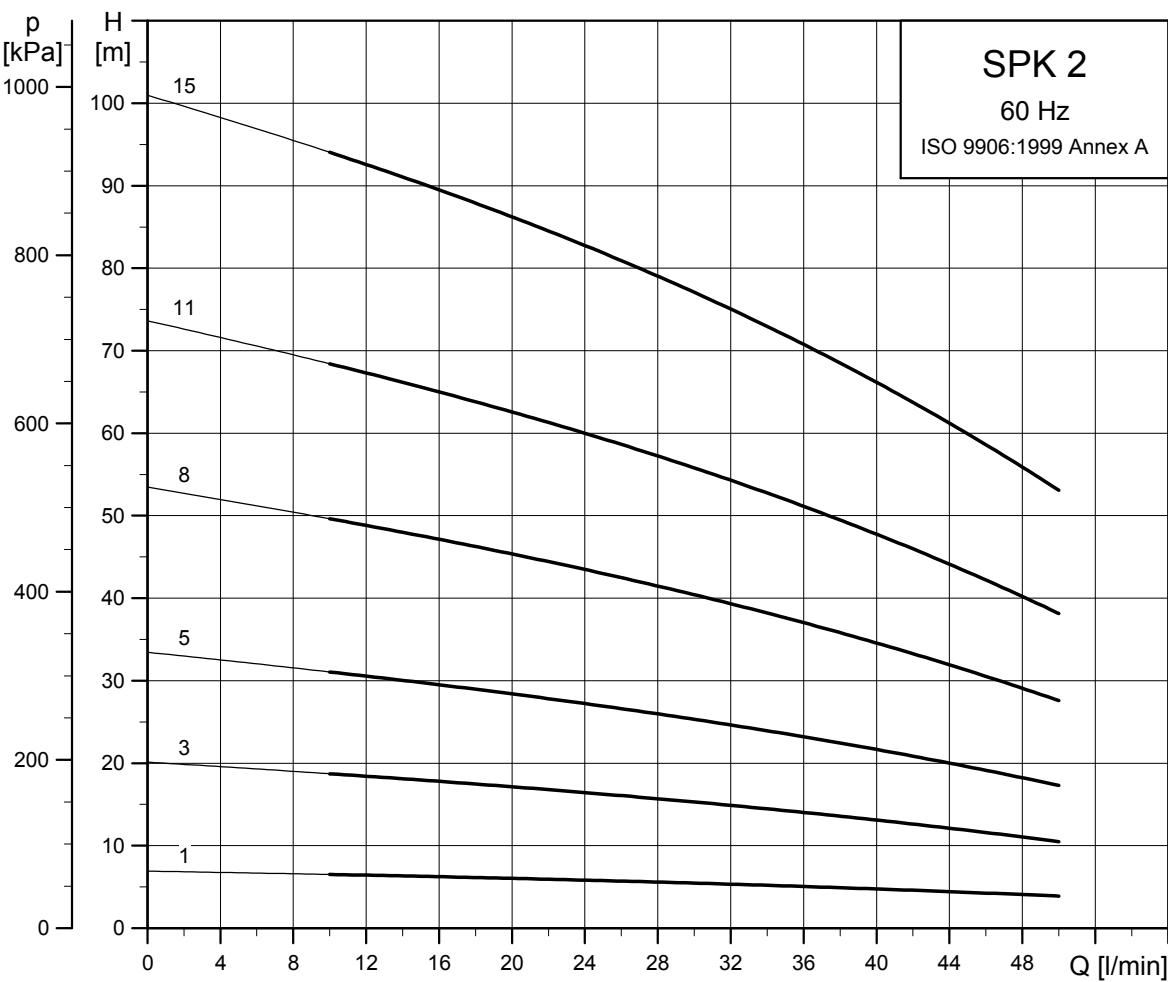
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

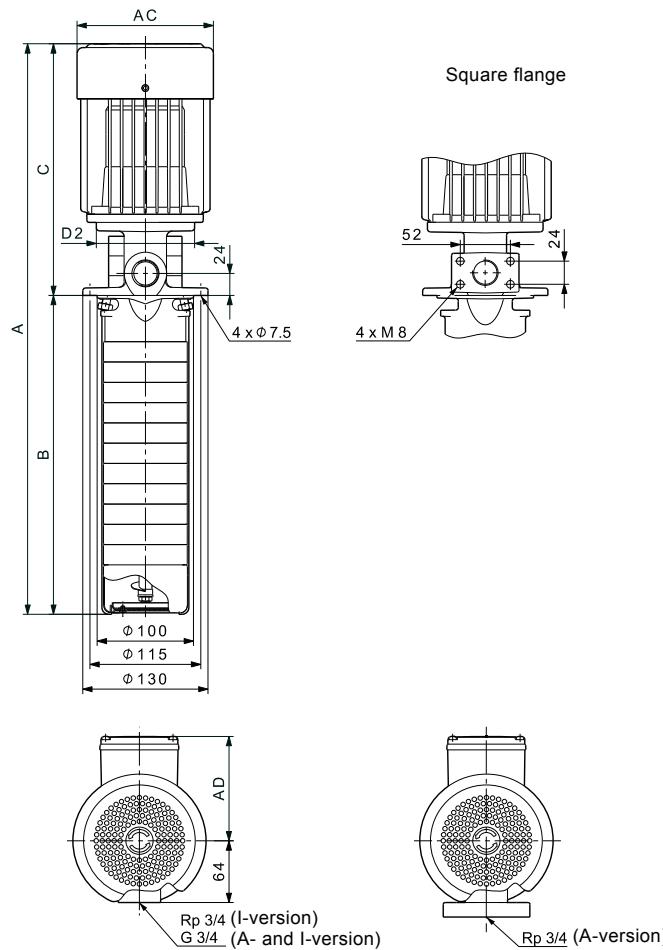
## SPK with extension pipe

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 1-23/15	0.55	1272	1005	267	141	102	109	19.0

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

For information about electrical data, see section 12. Motor data on page 144.

**SPK 2, 60 Hz**

**Dimensional sketches**

TM04 5801 3313

**Dimensions and weights**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 2-1/1	0.06	395	140	255	124	90	101	9.3
SPK 2-3/3	0.25	428	182	246	141	102	109	8.0
SPK 2-5/5	0.37	491	224	267	141	102	109	11.2
SPK 2-8/8	0.55	554	287	267	141	102	109	11.5
SPK 2-11/11	0.75	657	350	307	141	120	109	14.9
SPK 2-15/15	1.1	741	434	307	141	120	109	17.9
SPK 2-19/15	1.1	825	518	307	141	120	109	18.4
SPK 2-23/15	1.1	909	602	307	141	120	109	18.8

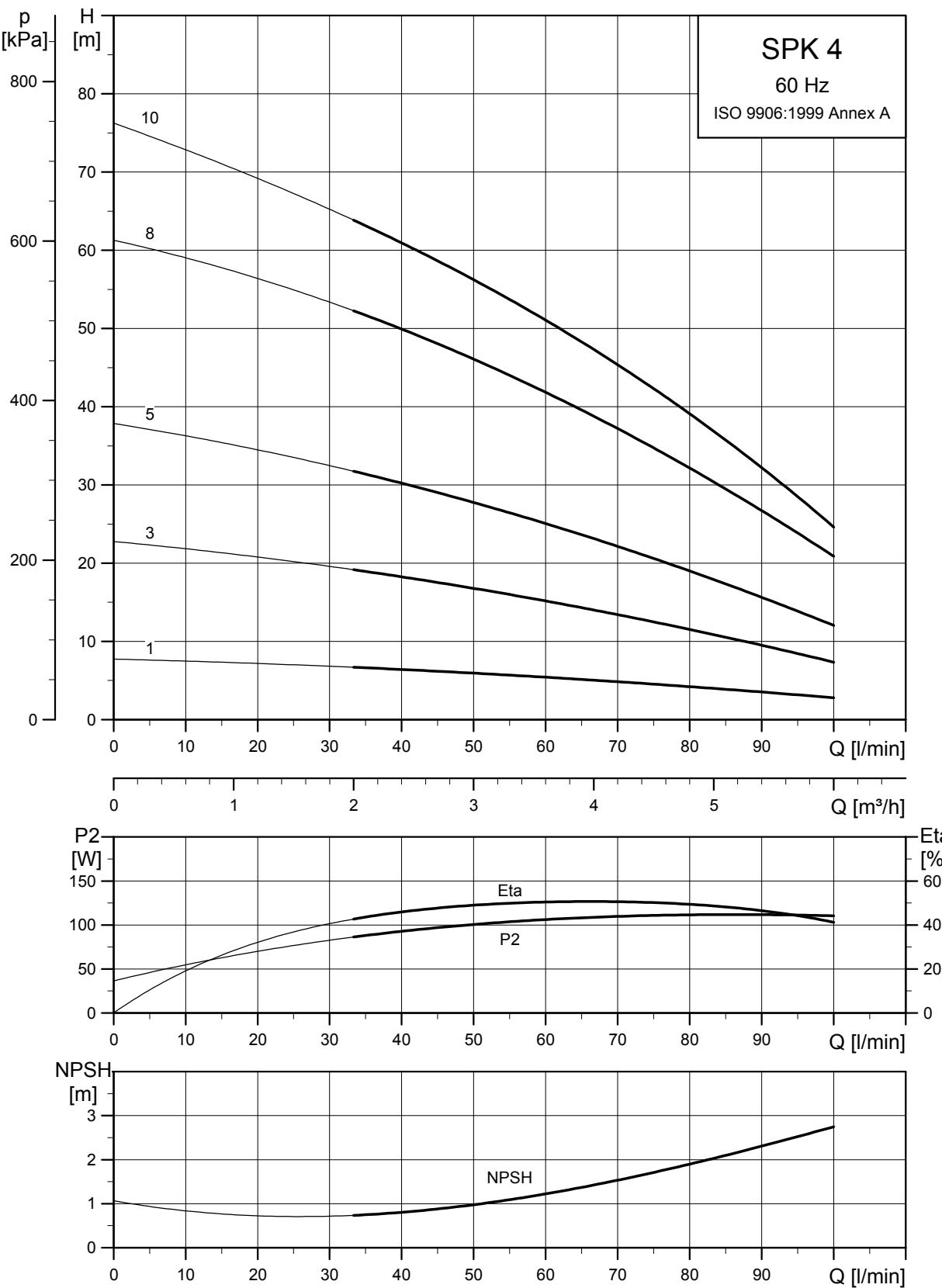
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

**SPK with extension pipe**

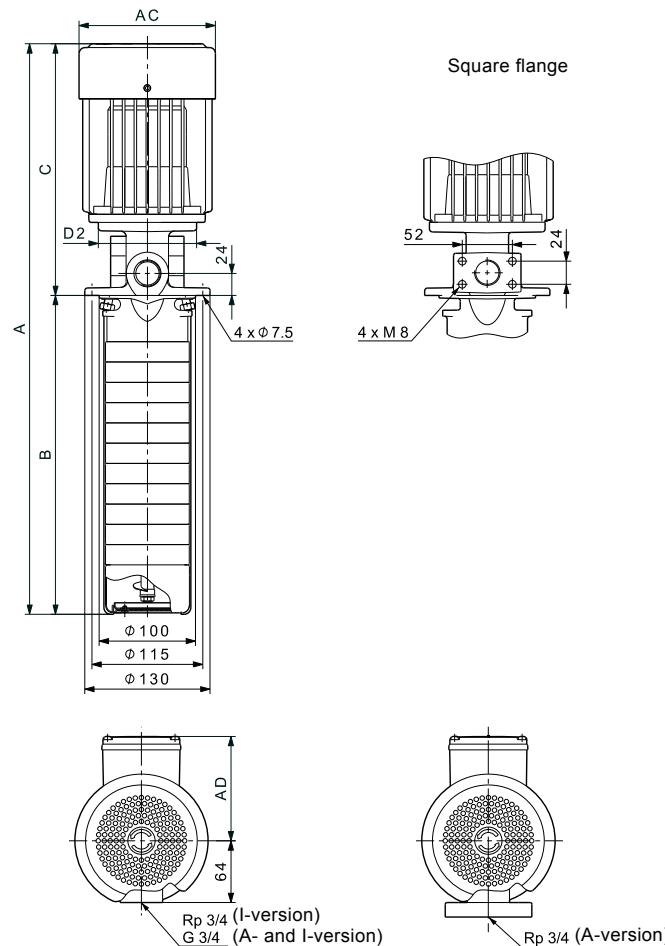
Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 2-23/15	1.1	1312	1005	307	141	120	109	23.5

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1 kg.

For information about electrical data, see section 12. *Motor data* on page 144.

**SPK 4, 60 Hz**

TM00 1935 3700

**Dimensional sketches**

TM04 5801 3313

**Dimensions and weights**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 4-1/1	0.12	395	140	255	124	90	101	8.5
SPK 4-3/3	0.37	449	182	267	141	102	109	10.5
SPK 4-5/5	0.55	491	224	267	141	102	109	10.2
SPK 4-8/8	1.1	594	287	307	141	120	109	15.1
SPK 4-11/10	1.1	657	350	307	141	120	109	15.4
SPK 4-15/10	1.1	741	434	307	141	120	109	16.0
SPK 4-19/10	1.1	825	518	307	141	120	109	16.5

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

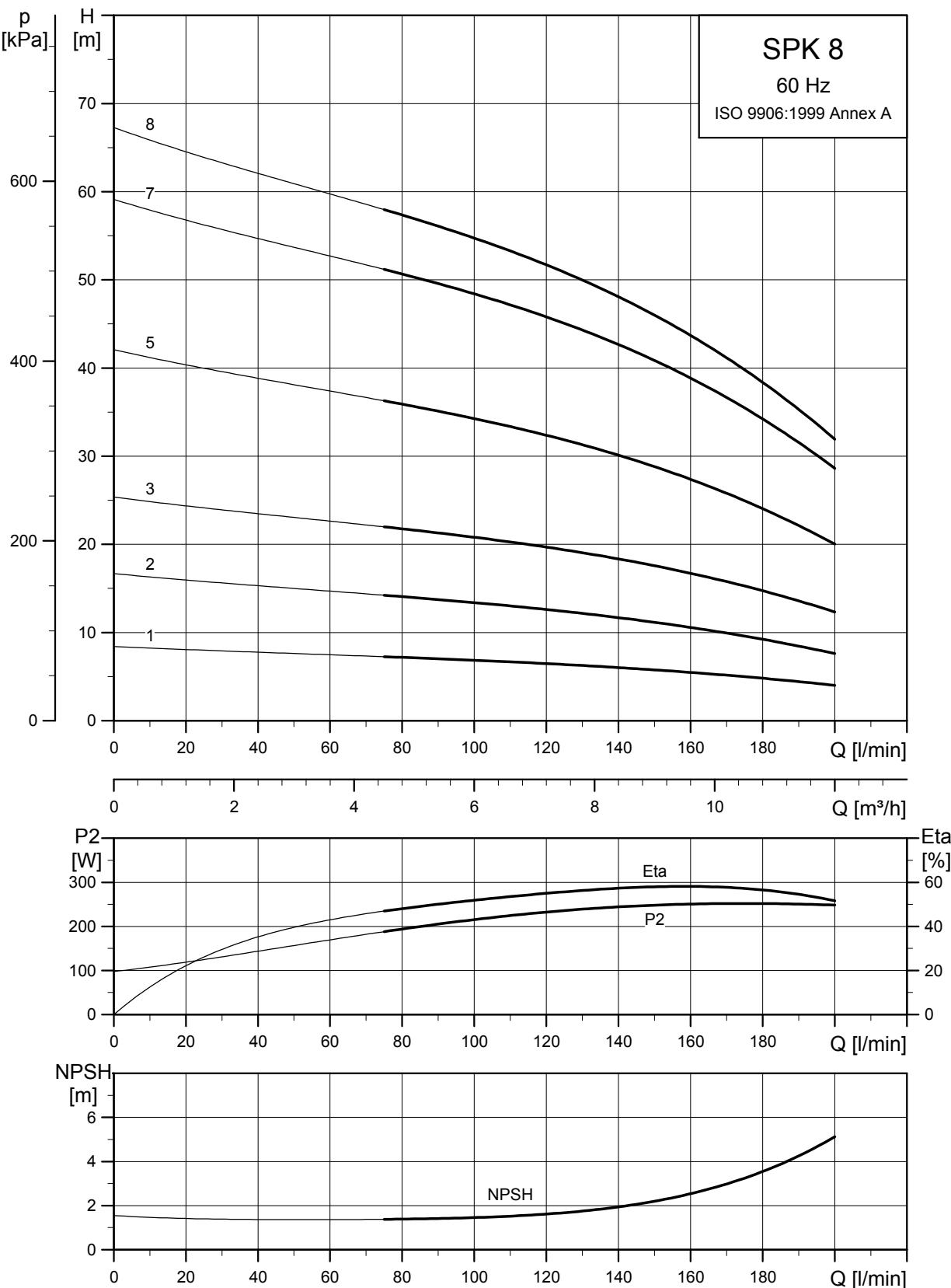
**SPK with extension pipe**

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 4-19/10	1.1	1312	1005	307	141	120	109	21.7

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

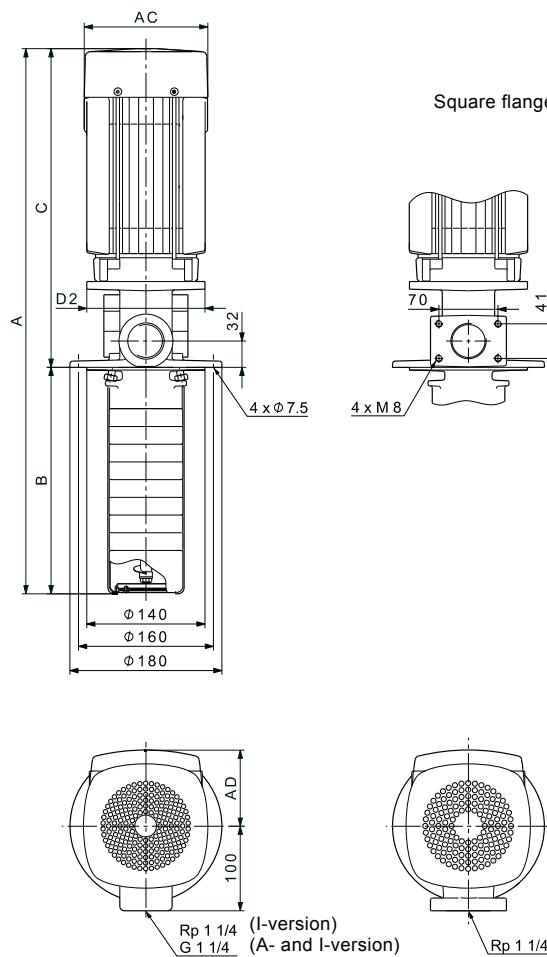
For information about electrical data, see section 12. *Motor data* on page 144.

## SPK 8, 60 Hz



TM00 1937 3700

## Dimensional sketches



TM04 5802 3313

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 8-1/1	0.37	475	182	293	141	140	109	12.1
SPK 8-2/2	0.55	517	224	293	141	140	109	12.4
SPK 8-3/3	1.1	599	266	333	141	140	109	17.0
SPK 8-5/5	1.5	733	350	383	178	140	110	25.2
SPK 8-7/7	2.2	857	434	423	178	140	110	30.3
SPK 8-9/8	2.2	941	518	423	178	140	110	31.0
SPK 8-12/8	2.2	1067	644	423	178	140	110	31.8
SPK 8-15/8	2.2	1193	770	423	178	140	110	32.5

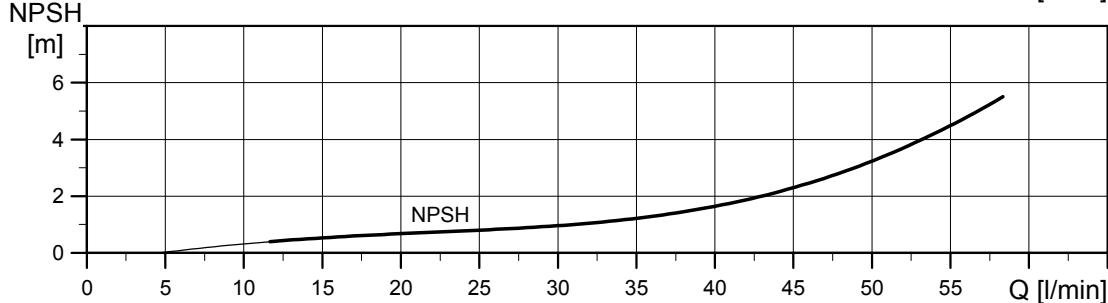
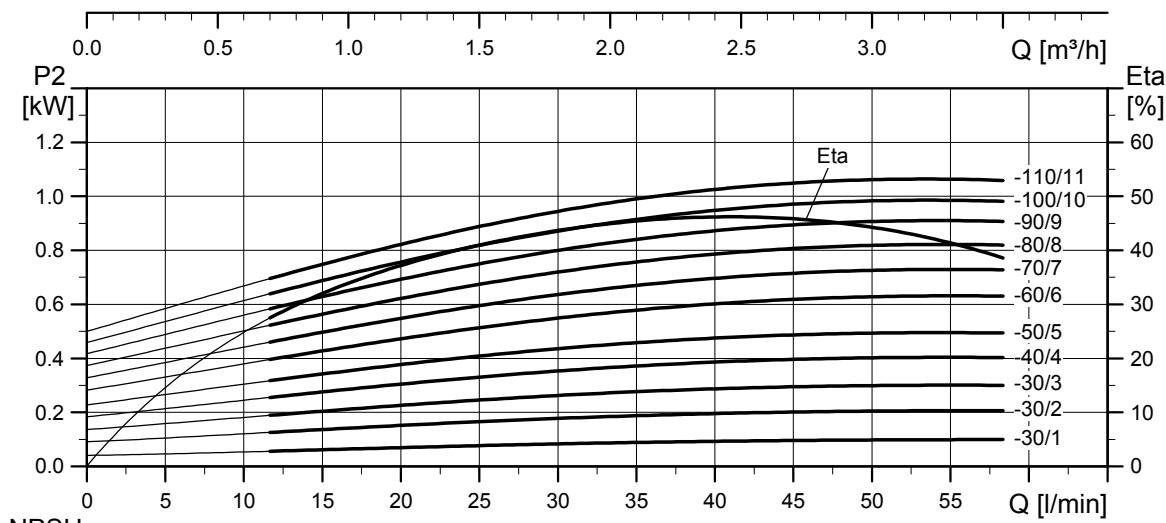
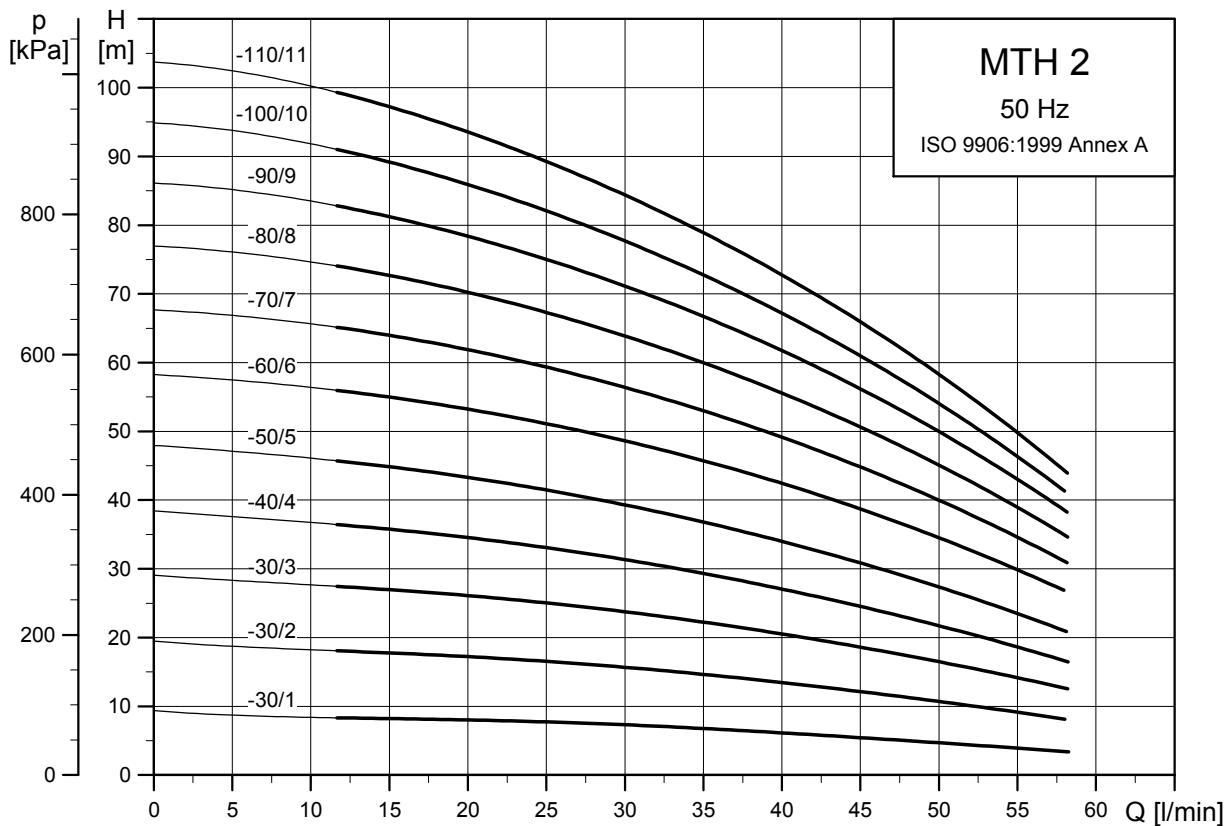
\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

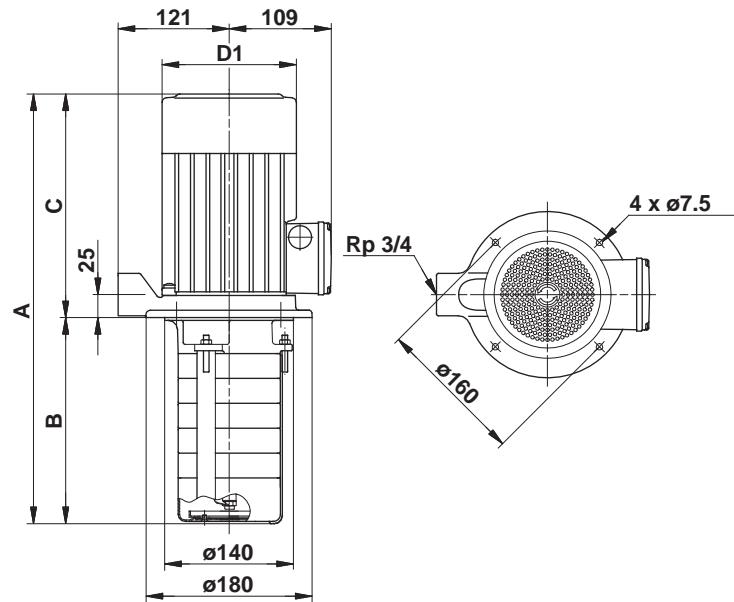
## SPK with extension pipe

Pump type	P2 [kW]	Dimensions [mm]						Weight * [kg]
		A	B	C	AC	D2	AD	
SPK 8-15/8	2.2	1428	1005	423	178	140	110	35.8

\* The weights apply to the standard range (A-version). For the stainless steel versions (I-version), add 1.3 kg.

For information about electrical data, see section 12. Motor data on page 144.

**MTH, 50 Hz****MTH 2, 50 Hz**

**Dimensional sketches**

TM00 19-19 4899

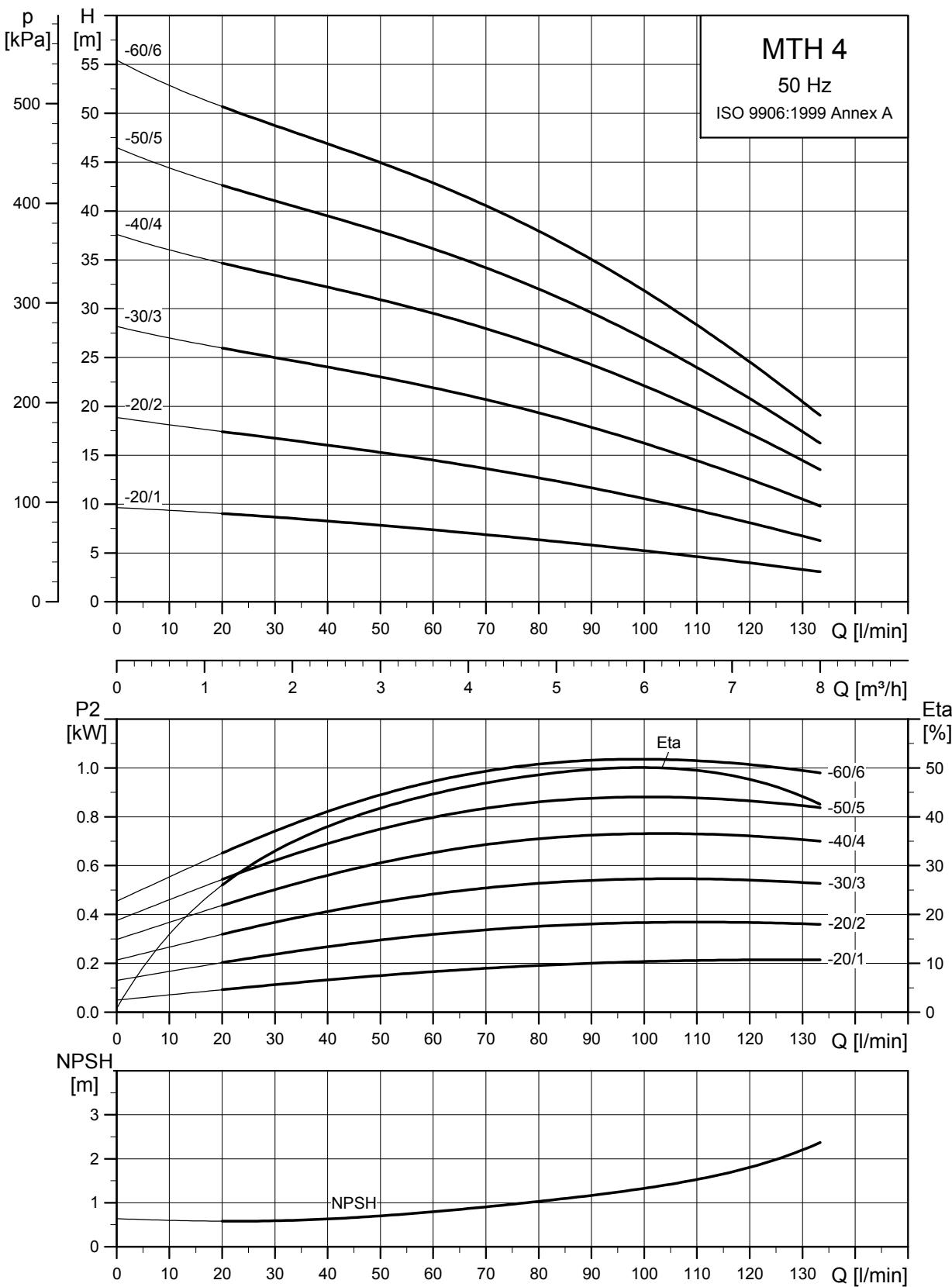
**Dimensions and weights**

Pump type	Motor P2 [kW]	Dimensions [mm]				Weight [kg]
		A	B	C	D1	
MTH 2-30/1	0.55	347	145	202	135	10.2
MTH 2-30/2	0.55	347	145	202	135	10.3
MTH 2-30/3	0.55	347	145	202	135	10.4
MTH 2-40/1	0.55	365	163	202	135	10.4
MTH 2-40/2	0.55	365	163	202	135	10.5
MTH 2-40/3	0.55	365	163	202	135	10.6
MTH 2-40/4	0.75	405	163	242	142	10.8
MTH 2-50/1	0.55	383	181	202	135	10.6
MTH 2-50/2	0.55	383	181	202	135	10.7
MTH 2-50/3	0.55	383	181	202	135	10.8
MTH 2-50/4	0.75	423	181	242	142	11.2
MTH 2-50/5	0.75	423	181	242	142	11.3
MTH 2-60/1	0.55	401	199	202	135	10.8
MTH 2-60/2	0.55	401	199	202	135	10.9
MTH 2-60/3	0.55	401	199	202	135	11.0
MTH 2-60/4	0.75	441	199	242	142	13.6
MTH 2-60/5	0.75	441	199	242	142	13.7
MTH 2-60/6	1.1	441	199	242	142	13.8
MTH 2-70/1	0.55	419	217	202	135	11.0
MTH 2-70/2	0.55	419	217	202	135	11.1
MTH 2-70/3	0.55	419	217	202	135	11.2
MTH 2-70/4	0.75	459	217	242	142	13.8
MTH 2-70/5	0.75	459	217	242	142	13.9
MTH 2-70/6	1.1	459	217	242	142	14.0
MTH 2-70/7	1.1	459	217	242	142	14.1
MTH 2-80/1	0.55	437	235	202	135	11.2
MTH 2-80/2	0.55	437	235	202	135	11.3
MTH 2-80/3	0.55	437	235	202	135	11.4
MTH 2-80/4	0.75	477	235	242	142	14.0
MTH 2-80/5	0.75	477	235	242	142	14.1
MTH 2-80/6	1.1	477	235	242	142	14.2
MTH 2-80/7	1.1	477	235	242	142	14.3
MTH 2-80/8	1.1	477	235	242	142	14.4
MTH 2-90/1	0.55	455	253	202	135	11.4
MTH 2-90/2	0.55	455	253	202	135	11.5
MTH 2-90/3	0.55	455	253	202	135	11.6
MTH 2-90/4	0.75	495	253	242	142	14.4

Pump type	Motor P2 [kW]	Dimensions [mm]				Weight [kg]
		A	B	C	D1	
MTH 2-90/5	0.75	495	253	242	142	14.5
MTH 2-90/6	1.1	495	253	242	142	14.6
MTH 2-90/7	1.1	495	253	242	142	14.7
MTH 2-90/8	1.1	495	253	242	142	14.8
MTH 2-90/9	1.1	495	253	242	142	14.9
MTH 2-100/1	0.55	473	271	202	135	11.6
MTH 2-100/2	0.55	473	271	202	135	11.7
MTH 2-100/3	0.55	473	271	202	135	11.8
MTH 2-100/4	0.75	513	271	242	142	14.7
MTH 2-100/5	0.75	513	271	242	142	14.8
MTH 2-100/6	1.1	513	271	242	142	14.9
MTH 2-100/7	1.1	513	271	242	142	15.0
MTH 2-100/8	1.1	513	271	242	142	15.1
MTH 2-100/9	1.1	513	271	242	142	15.2
MTH 2-100/10	1.1	513	271	242	142	15.3
MTH 2-110/1	0.55	491	289	202	135	11.8
MTH 2-110/2	0.55	491	289	202	135	11.9
MTH 2-110/3	0.55	491	289	202	135	12.0
MTH 2-110/4	0.75	531	289	242	142	14.9
MTH 2-110/5	0.75	531	289	242	142	15.0
MTH 2-110/6	1.1	531	289	242	142	15.1
MTH 2-110/7	1.1	531	289	242	142	15.2
MTH 2-110/8	1.1	531	289	242	142	15.3
MTH 2-110/9	1.1	531	289	242	142	15.4
MTH 2-110/10	1.1	531	289	242	142	15.5
MTH 2-110/11	1.1	531	289	242	142	15.6

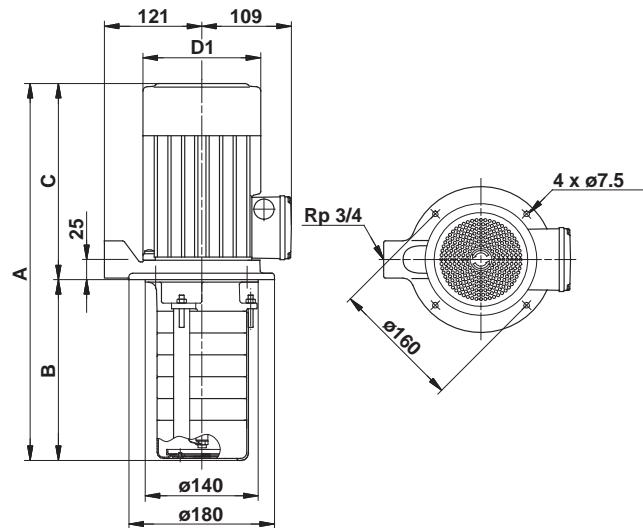
**Electrical data**

P2 [kW]	Electrical data						Speed [min <sup>-1</sup> ]
	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos ϕ <sub>1/1</sub>	h [%]	Motor efficiency class	I <sub>start</sub> [A]	
0.55	220-240Δ/380-415Y	2.44-2.7/1.42-1.54	0.78-0.67	75.5-73.6	-	13.18-13.77/7.67-7.85	2820-2850
0.75	220-240Δ/380-415Y	3.05-3.15/1.76-1.80	0.82-0.74	79.3-79.0	IE2	16.78-18.27/9.68-10.44	2840-2850
1.1	220-240Δ/380-415Y	4.30-4.35/2.48-2.5	0.83-0.75	81.9-82.0	IE2	24.51-26.54/14.14-15.25	2840-2870
0.55	200-220Δ/346-380Y	2.7-2.95/1.56-1.72	0.79-0.66	75.4-73.3	-	14.58-17.7/8.42-10.32	2810-2850
0.75	200-220Δ/220-380Y	3.35-3.45/3.5-2.0	0.83-0.72	79.3-78.7	IE2	20.1-21.74/21-12.6	2830-2870
1.1	200-220Δ/346-380Y	4.75-4.85/2.7-2.75	0.83-0.74	81.3-81.4	IE2	25.65-28.62/14.58-16.23	2830-2870

**MTH 4, 50 Hz**

TM02 7825 4103

## Dimensional sketches



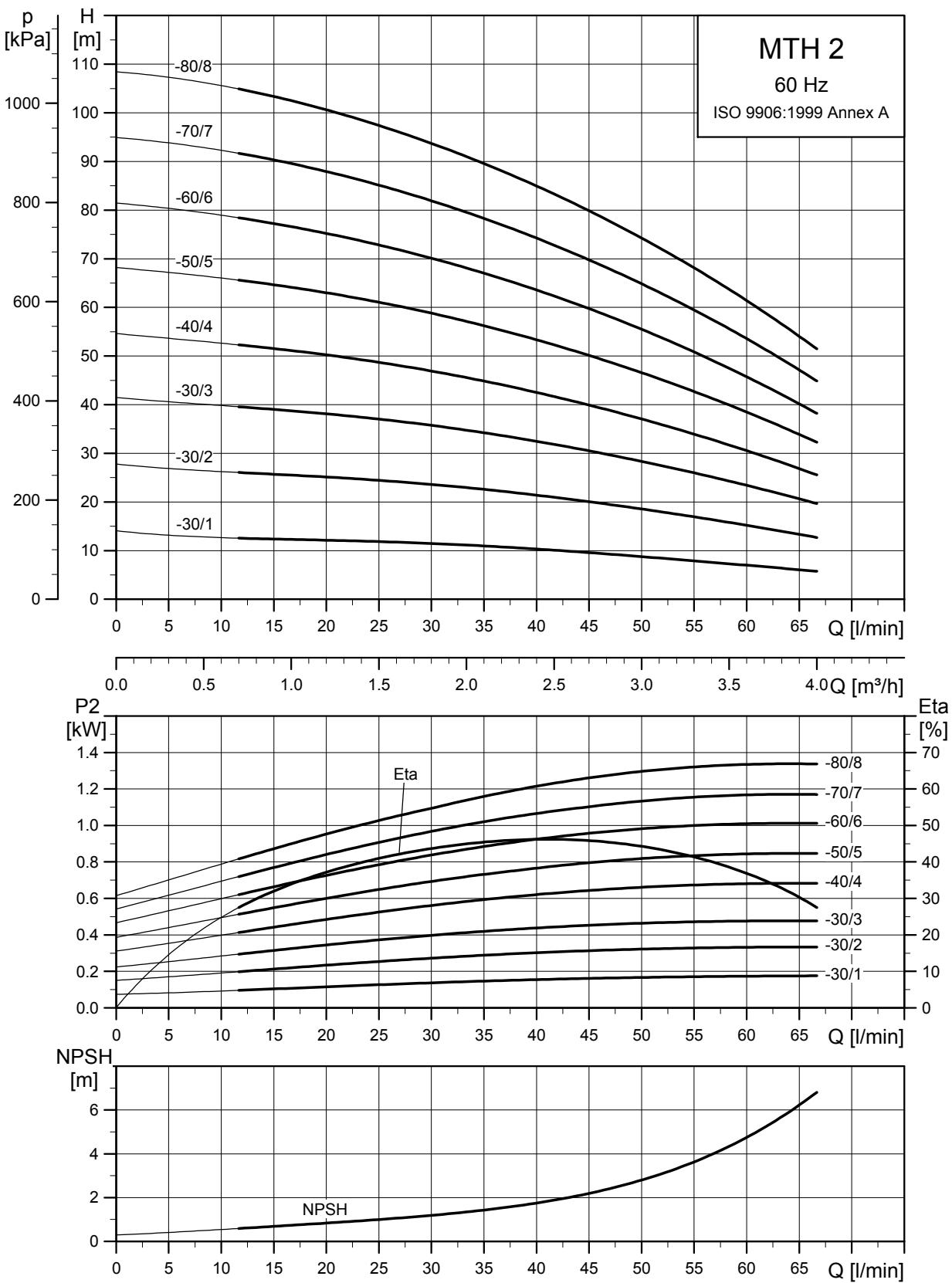
TM00 1919 4899

## Dimensions and weights

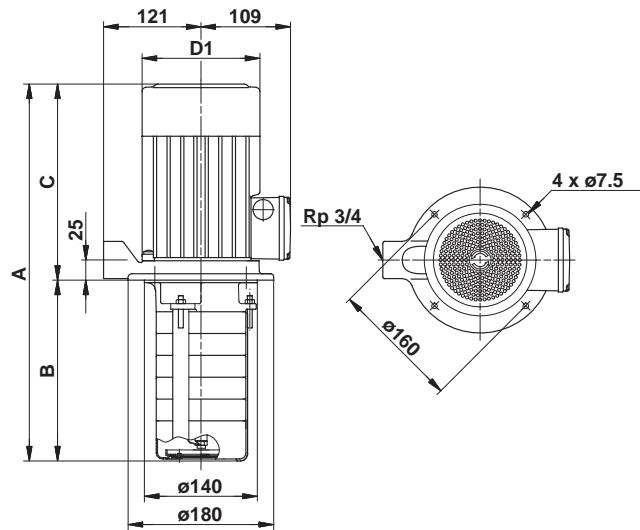
Pump type	Motor P2 [kW]	Dimensions [mm]				Weight [kg]
		A	B	C	D1	
MTH 4-20/1	0.55	347	145	202	135	10.1
MTH 4-20/2	0.55	347	145	202	135	10.2
MTH 4-30/1	0.55	374	172	202	135	10.3
MTH 4-30/2	0.55	374	172	202	135	10.4
MTH 4-30/3	0.75	374	172	242	142	10.9
MTH 4-40/1	0.55	401	199	202	135	10.5
MTH 4-40/2	0.55	401	199	202	135	10.6
MTH 4-40/3	0.75	401	199	242	142	12.4
MTH 4-40/4	1.1	441	199	242	142	12.5
MTH 4-50/1	0.55	428	226	202	135	10.7
MTH 4-50/2	0.55	428	226	202	135	10.8
MTH 4-50/3	0.75	428	226	242	142	14.0
MTH 4-50/4	1.1	468	226	242	142	14.1
MTH 4-50/5	1.1	468	226	242	142	14.2
MTH 4-60/1	0.55	455	253	202	135	10.9
MTH 4-60/2	0.55	455	253	202	135	11.0
MTH 4-60/3	0.75	455	253	242	142	14.5
MTH 4-60/4	1.1	495	253	242	142	14.6
MTH 4-60/5	1.1	495	253	242	142	14.7
MTH 4-60/6	1.1	495	253	242	142	14.8
MTH 4-70/1	0.55	482	280	202	135	11.1
MTH 4-70/2	0.55	482	280	202	135	11.2
MTH 4-70/3	0.75	482	280	242	142	15.6
MTH 4-70/4	1.1	522	280	242	142	15.7
MTH 4-70/5	1.1	522	280	242	142	15.8
MTH 4-70/6	1.1	522	280	242	142	15.9
MTH 4-80/1	0.55	509	307	202	135	11.3
MTH 4-80/2	0.55	509	307	202	135	11.4
MTH 4-80/3	0.75	509	307	242	142	15.9
MTH 4-80/4	1.1	549	307	242	142	16.0
MTH 4-80/5	1.1	549	307	242	142	16.1
MTH 4-80/6	1.1	549	307	242	142	16.2

**Electrical data**

P2 [kW]	Electrical data						Speed [min <sup>-1</sup> ]
	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos Φ <sub>1/1</sub>	η [%]	Motor efficiency class	I <sub>start</sub> [A]	
0.55	220-240Δ/380-415Y	2.44-2.7/1.42-1.54	0.78-0.67	75.5-73.6	-	13.18-13.77/7.67-7.85	2820-2850
0.75	220-240Δ/380-415Y	3.05-3.15/1.76-1.80	0.82-0.74	79.3-79.0	IE2	16.78-18.27/9.68-10.44	2840-2850
1.1	220-240Δ/380-415Y	4.30-4.35/2.48-2.5	0.83-0.75	81.9-82.0	IE2	24.51-26.54/14.14-15.25	2840-2870
0.55	200-220Δ/346-380Y	2.7-2.95/1.56-1.72	0.79-0.66	75.4-73.3	-	14.58-17.7/8.42-10.32	2810-2850
0.75	200-220Δ/220-380Y	3.35-3.45/3.5-2.0	0.83-0.72	79.3-78.7	IE2	20.1-21.74/21-12.6	2830-2870
1.1	200-220Δ/346-380Y	4.75-4.85/2.7-2.75	0.83-0.74	81.3-81.4	IE2	25.65-28.62/14.58-16.23	2830-2870

**MTH, 60 Hz****MTH 2, 60 Hz**

TM0278264103

**Dimensional sketches**

TM00 1919 4889

**Dimensions and weights**

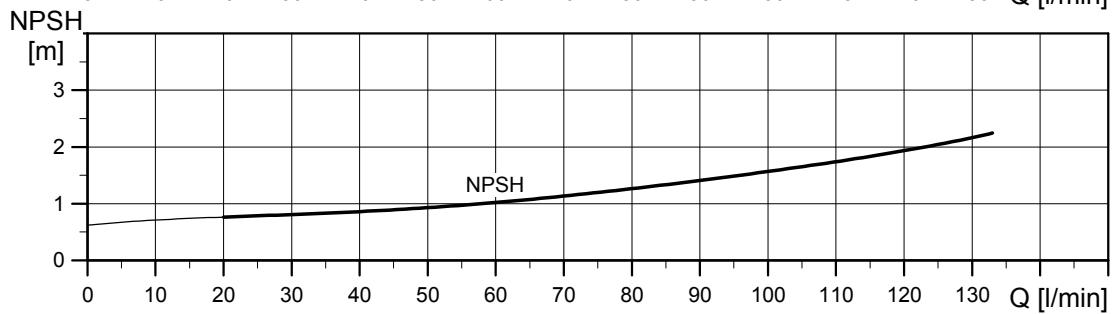
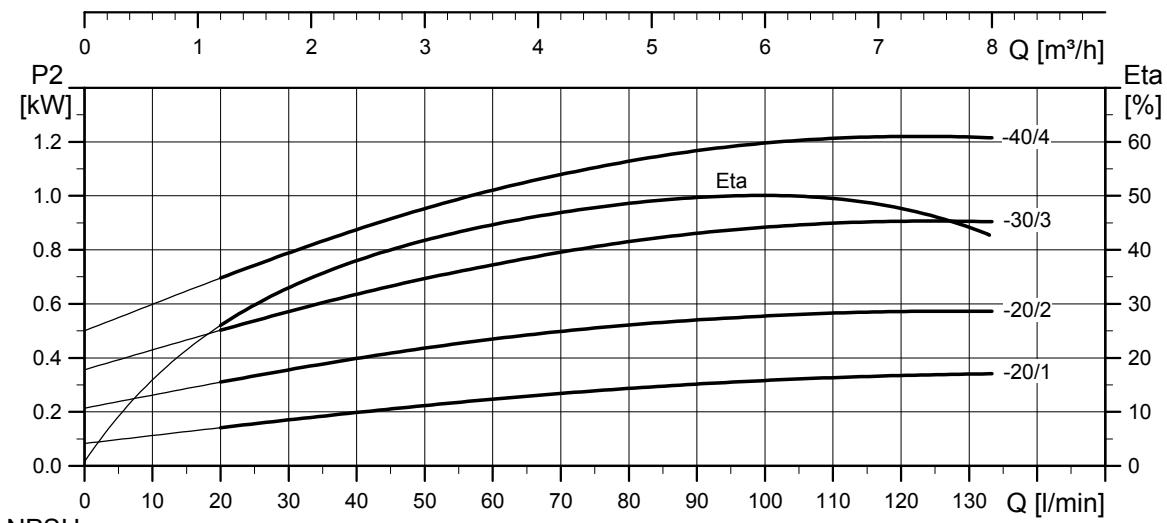
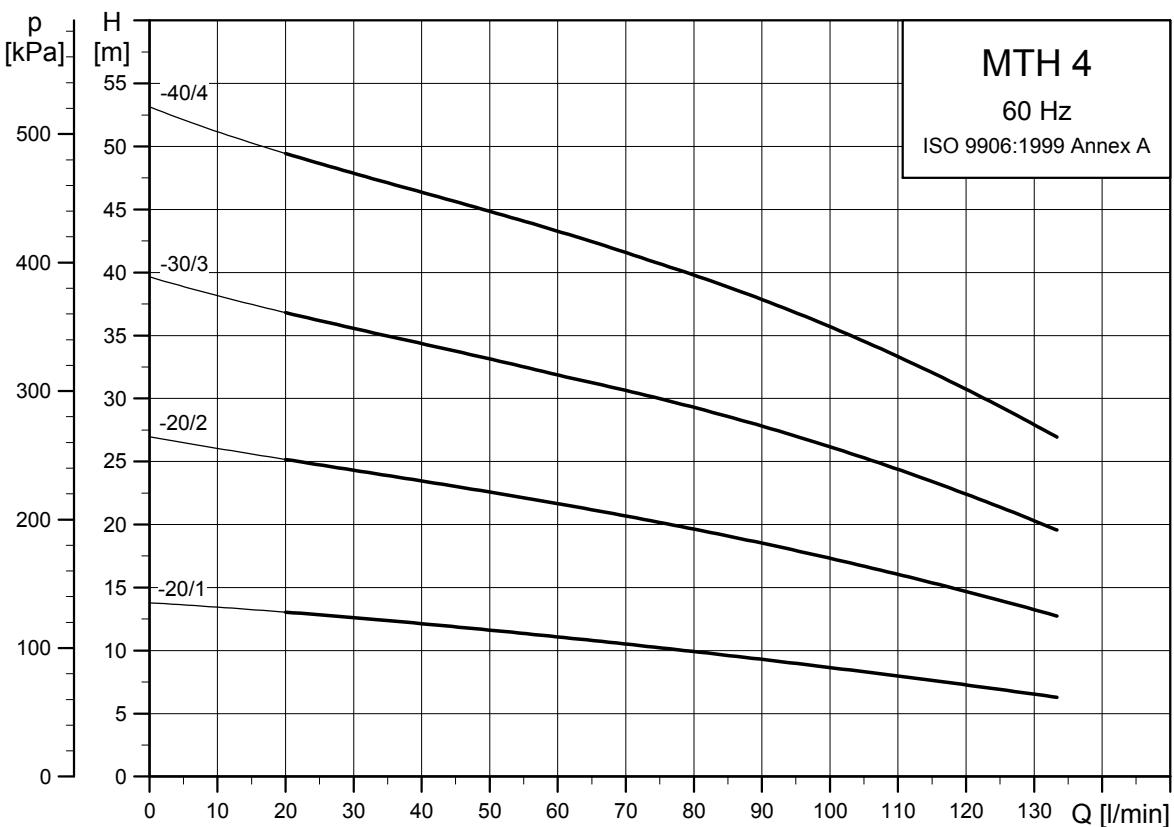
Pump type	Motor P2 [kW]	Dimensions [mm]				Weight [kg]
		A	B	C	D1	
MTH 2-30/1	0.55	347	145	202	135	10.4
MTH 2-30/2	0.55	347	145	202	135	10.5
MTH 2-30/3	0.55	347	145	202	135	10.6
MTH 2-40/1	0.55	365	163	202	135	10.6
MTH 2-40/2	0.55	365	163	202	135	10.7
MTH 2-40/3	0.55	365	163	202	135	10.8
MTH 2-40/4	0.75	405	163	242	142	12.0
MTH 2-50/1	0.55	383	181	202	135	10.8
MTH 2-50/2	0.55	383	181	202	135	10.9
MTH 2-50/3	0.55	383	181	202	135	11.0
MTH 2-50/4	0.75	423	181	242	142	12.2
MTH 2-50/5	0.75	423	181	242	142	12.3
MTH 2-60/1	0.55	401	199	202	135	11.0
MTH 2-60/2	0.55	401	199	202	135	11.1
MTH 2-60/3	0.55	401	199	202	135	11.2
MTH 2-60/4	0.75	441	199	242	142	13.9
MTH 2-60/5	0.75	441	199	242	142	14.0
MTH 2-60/6	1.1	441	199	242	142	14.1
MTH 2-70/1	0.55	419	217	202	135	11.2
MTH 2-70/2	0.55	419	217	202	135	11.3
MTH 2-70/3	0.55	419	217	202	135	11.4
MTH 2-70/4	0.75	459	217	242	142	14.1
MTH 2-70/5	0.75	459	217	242	142	14.2
MTH 2-70/6	1.1	459	217	242	142	14.3
MTH 2-70/7	1.1	459	217	242	142	14.4
MTH 2-80/1	0.55	437	235	202	135	11.4
MTH 2-80/2	0.55	437	235	202	135	11.5
MTH 2-80/3	0.55	437	235	202	135	11.6
MTH 2-80/4	0.75	477	235	242	142	14.3
MTH 2-80/5	0.75	477	235	242	142	14.4
MTH 2-80/6	1.1	477	235	242	142	14.5
MTH 2-80/7	1.1	477	235	242	142	14.6
MTH 2-80/8	1.1	477	235	242	142	14.7
MTH 2-90/1	0.55	455	253	202	135	11.6
MTH 2-90/2	0.55	455	253	202	135	11.7
MTH 2-90/3	0.55	455	253	202	135	11.8
MTH 2-90/4	0.75	495	253	242	142	14.4
MTH 2-90/5	0.75	495	253	242	142	14.5
MTH 2-90/6	1.1	495	253	242	142	14.6
MTH 2-90/7	1.1	495	253	242	142	14.7

Pump type	Motor P2 [kW]	Dimensions [mm]				Weight [kg]
		A	B	C	D1	
MTH 2-90/8	1.1	495	253	242	142	14.8
MTH 2-100/1	0.55	473	271	202	135	11.8
MTH 2-100/2	0.55	473	271	202	135	11.9
MTH 2-100/3	0.55	473	271	202	135	12.0
MTH 2-100/4	0.75	513	271	242	142	14.7
MTH 2-100/5	0.75	513	271	242	142	14.8
MTH 2-100/6	1.1	513	271	242	142	14.9
MTH 2-100/7	1.1	513	271	242	142	15.0
MTH 2-100/8	1.1	513	271	242	142	15.1
MTH 2-110/1	0.55	491	289	202	135	12.0
MTH 2-110/2	0.55	491	289	202	135	12.1
MTH 2-110/3	0.55	491	289	202	135	12.2
MTH 2-110/4	0.75	531	289	242	142	14.9
MTH 2-110/5	0.75	531	289	242	142	15.0
MTH 2-110/6	1.1	531	289	242	142	15.1
MTH 2-110/7	1.1	531	289	242	142	15.2
MTH 2-110/8	1.1	531	289	242	142	15.3

**Electrical data**

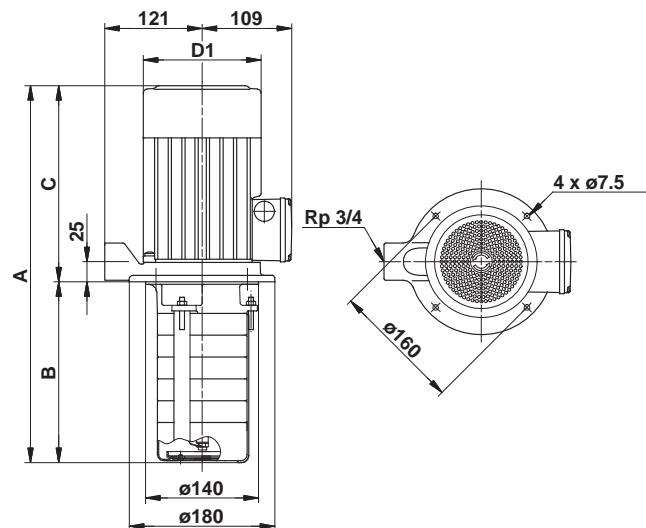
P2 [kW]	Electrical data						Speed [min <sup>-1</sup> ]
	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos ϕ <sub>1/1</sub>	h [%]	Motor efficiency class	I <sub>start</sub> [A]	
0.55	220-255Δ/380-440Y	2.26-2.18/1.30-1.26	0.85-0.76	75.8-76.7	-	12.43-14.39/7.15-8.32	3370-3440
0.75	220-255Δ/380-440Y	2.85-2.65/1.65-1.52	0.87-0.79	79.3-80.8	IE2	15.39-18.02/8.91-10.34	3400-3470
1.1	220-255Δ/380-440Y	4.05-3.75/2.33-2.16	0.88-0.80	77.0-88.6	IE2	23.9-27.75/13.75-15.98	3400-3470
0.55	200-200Δ/346-400Y	2.48-2.48/1.42-1.38	0.85-0.81	75.5-76.8	-	14.38-16.62/8.24-9.25	3370-3400
0.75	200-230Δ/346-400Y	3.15-2.9/1.81-1.68	0.87-0.8	79.2-80.8	IE2	17.96-20.3/10.32-11.76	3400-3460
1.1	200-230Δ/346-400Y	4.5-4.15/2.57-2.38	0.88-0.81	81.5-83.4	IE2	25.2-29.05/14.39-16.66	3400-3460



**MTH 4, 60 Hz**

TM02 7827 4103

## Dimensional sketches



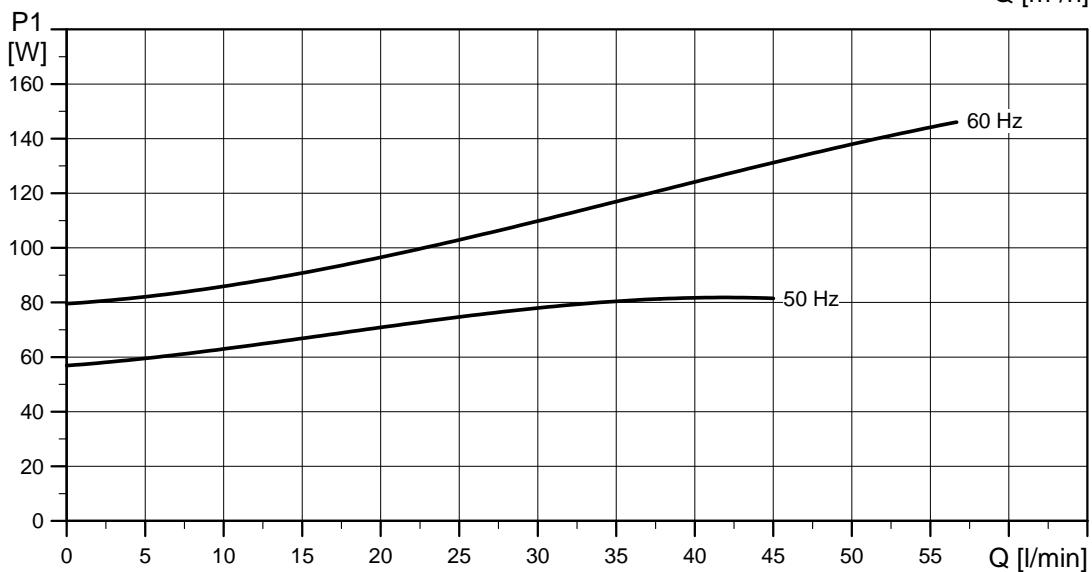
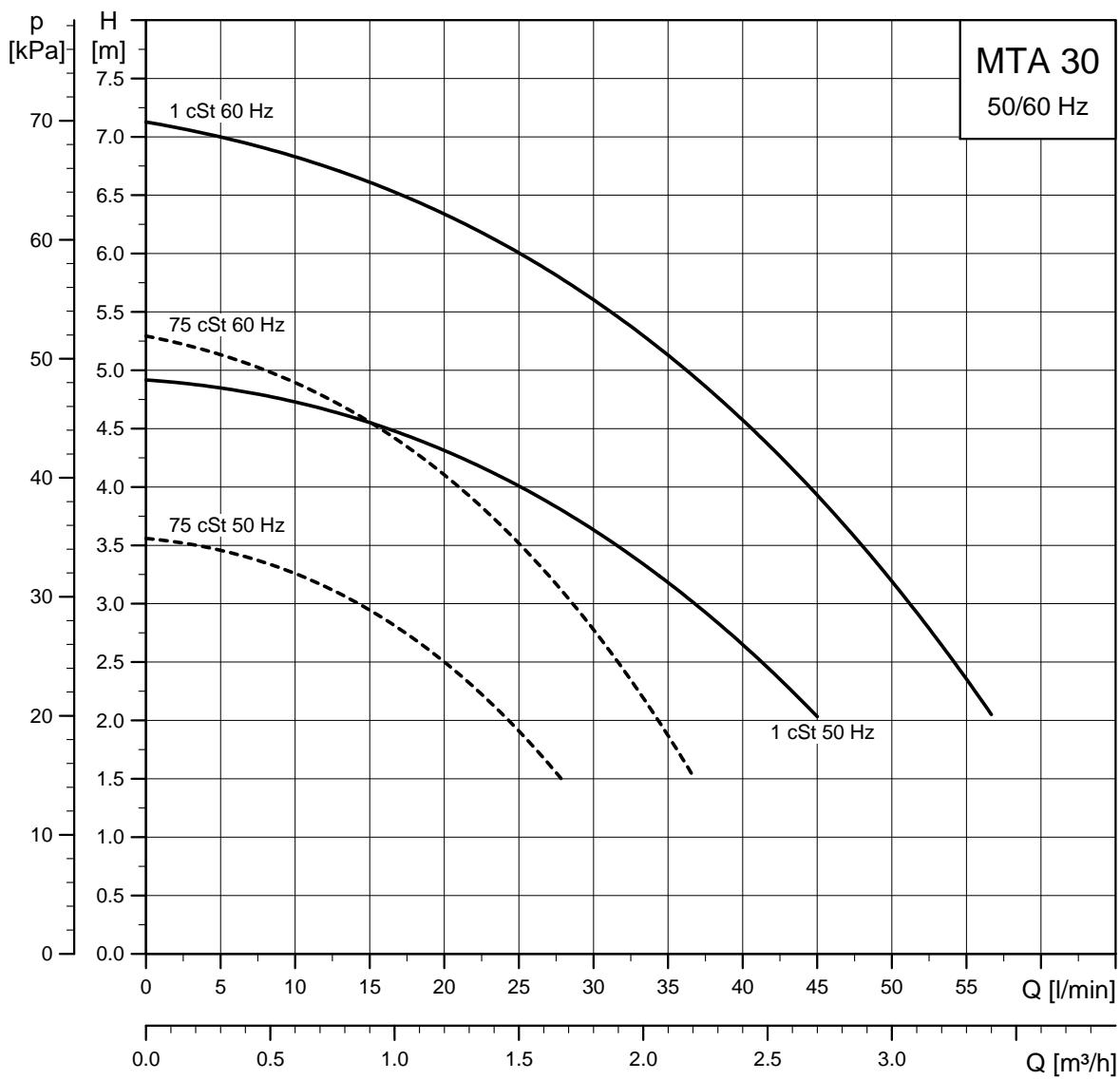
TM00 1919 4899

## Dimensions and weights

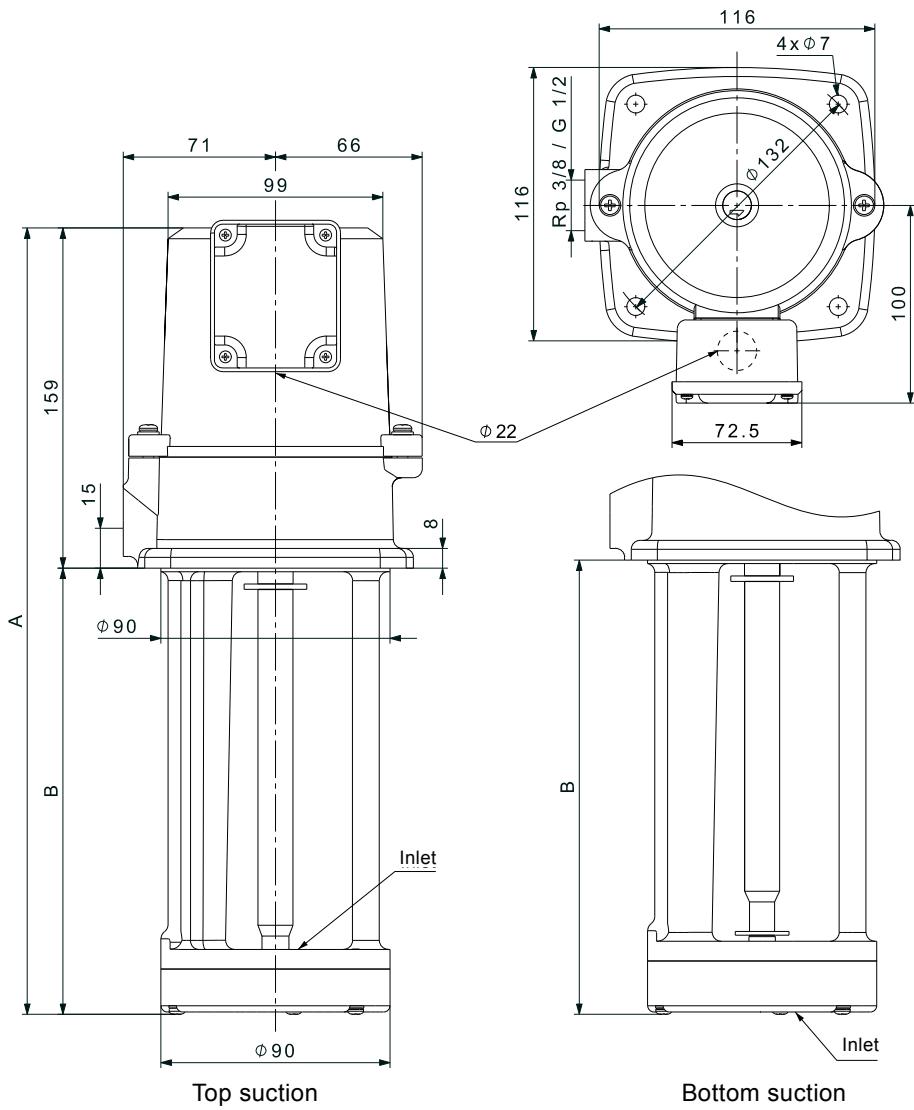
Pump type	Motor P2 [kW]	Dimensions [mm]				Weight [kg]
		A	B	C	D1	
MTH 4-20/1	0.55	347	145	202	135	10.3
MTH 4-20/2	0.55	347	145	202	135	10.4
MTH 4-30/1	0.55	374	172	202	135	10.5
MTH 4-30/2	0.55	374	172	202	135	10.6
MTH 4-30/3	0.75	374	172	202	135	11.9
MTH 4-40/1	0.55	401	199	202	135	10.7
MTH 4-40/2	0.55	401	199	202	135	10.8
MTH 4-40/3	0.75	401	199	202	135	13.7
MTH 4-40/4	1.1	441	199	242	142	13.8
MTH 4-50/1	0.55	428	226	202	135	10.9
MTH 4-50/2	0.55	428	226	202	135	11.0
MTH 4-50/3	0.75	428	226	202	135	14.0
MTH 4-50/4	1.1	468	226	242	142	14.1
MTH 4-60/1	0.55	455	253	202	135	11.1
MTH 4-60/2	0.55	455	253	202	135	11.2
MTH 4-60/3	0.75	455	253	202	135	14.5
MTH 4-60/4	1.1	495	253	242	142	14.6
MTH 4-70/1	0.55	482	280	202	135	11.3
MTH 4-70/2	0.55	482	280	202	135	11.4
MTH 4-70/3	0.75	482	280	202	135	15.8
MTH 4-70/4	1.1	522	280	242	142	15.9
MTH 4-80/1	0.55	509	307	202	135	11.5
MTH 4-80/2	0.55	509	307	202	135	11.6
MTH 4-80/3	0.75	509	307	202	135	16.1
MTH 4-80/4	1.1	549	307	242	142	16.2

## Electrical data

P2 [kW]	Electrical data						Speed [min <sup>-1</sup> ]
	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	h [%]	Motor efficiency class	I <sub>start</sub> [A]	
0.55	220-255Δ/380-440Y	2.26-2.18/1.30-1.26	0.85-0.76	75.8-76.7	-	12.43-14.39/7.15-8.32	3370-3440
0.75	220-255Δ/380-440Y	2.85-2.65/1.65-1.52	0.87-0.79	79.3-80.8	IE2	15.39-18.02/8.91-10.34	3400-3470
1.1	220-255Δ/380-440Y	4.05-3.75/2.33-2.16	0.88-0.80	77.0-88.6	IE2	23.9-27.75/13.75-15.98	3400-3470
0.55	200-200Δ/346-400Y	2.48-2.48/1.42-1.38	0.85-0.81	75.5-76.8	-	14.38-16.62/8.24-9.25	3370-3400
0.75	200-230Δ/346-400Y	3.15-2.9/1.81-1.68	0.87-0.8	79.2-80.8	IE2	17.96-20.3/10.32-11.76	3400-3460
1.1	200-230Δ/346-400Y	4.5-4.15/2.57-2.38	0.88-0.81	81.5-83.4	IE2	25.2-29.05/14.39-16.66	3400-3460

**MTA, 50/60 Hz****MTA 30**

## Dimensional sketches



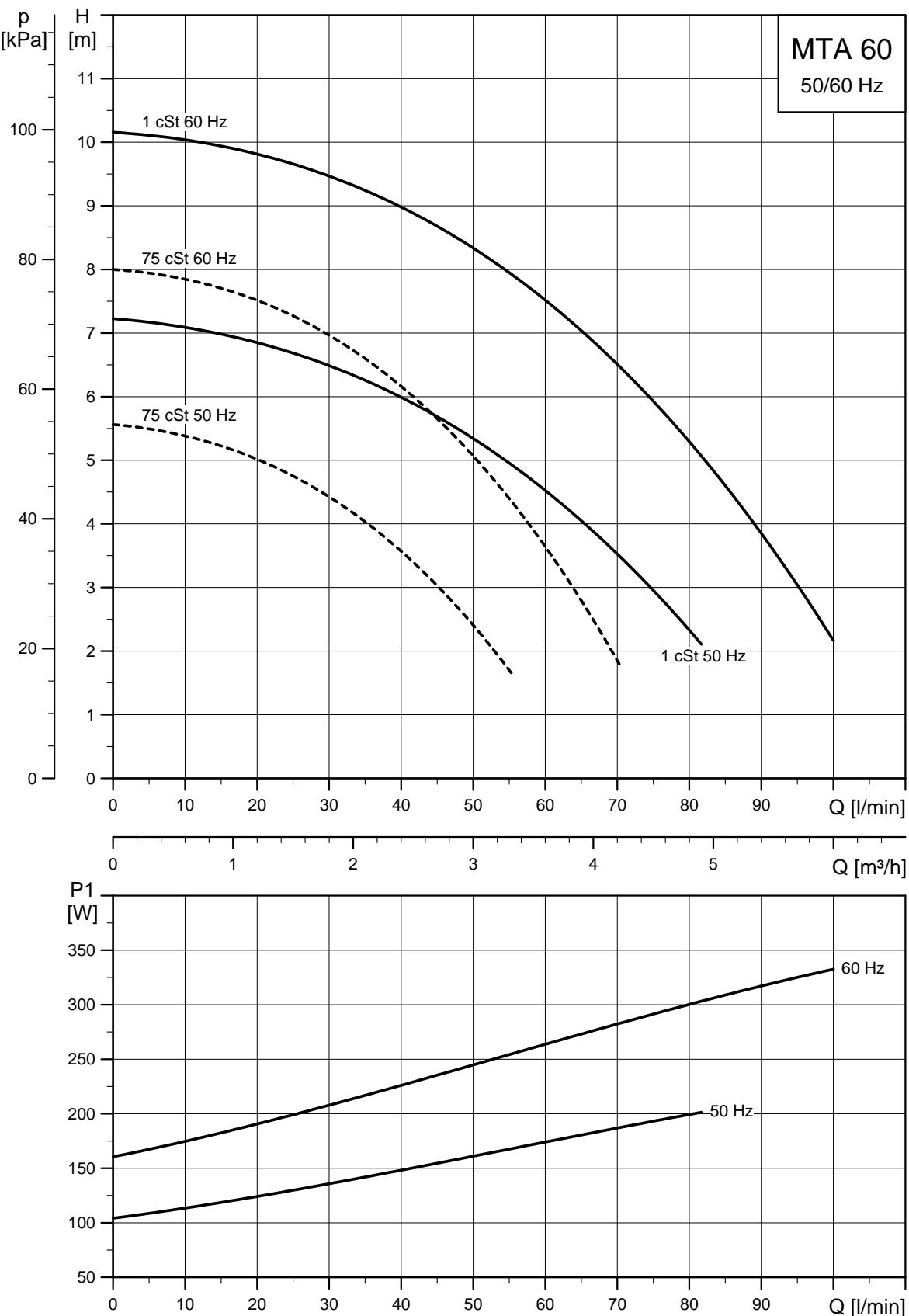
TM05 0879 3313

## Dimensions and weights

Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 30-150	Top	309	150	6.7	7.6	0.012
MTA 30-150	Bottom	312	153	6.7	7.7	0.012

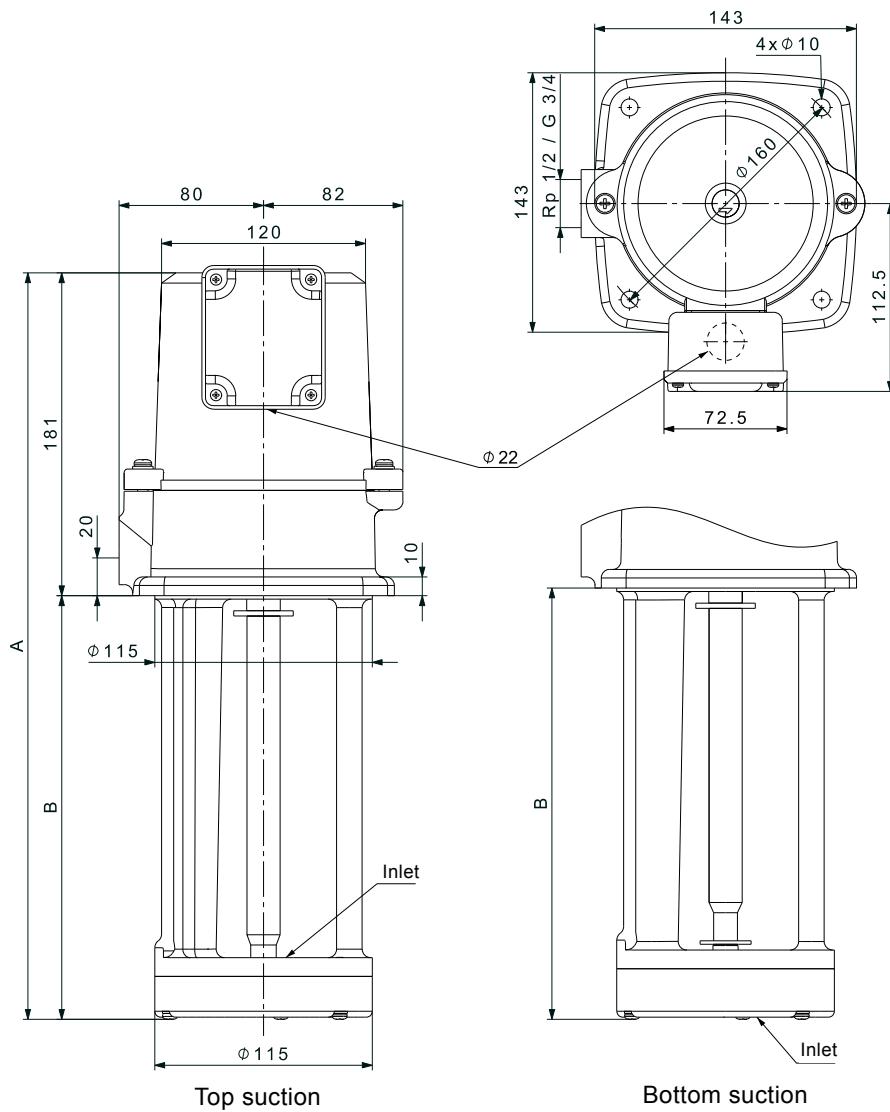
## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	82	0.41	0.47	3.28	0.58
3 x 200-220Δ V	60	145	0.5	0.58-0.58	3.65-3.80	0.84-0.76
3 x 220-240Δ/380-415Y V	50	86	0.33/0.19	0.38/0.22	3.14/1.81	0.68-0.63
3 x 220-240Δ/380-440Y V	60	142	0.41/0.24-0.22	0.47/0.28-0.25	3.36/1.97-1.80	0.91-0.83

**MTA 60**

TM05 0858 1711

## Dimensional sketches



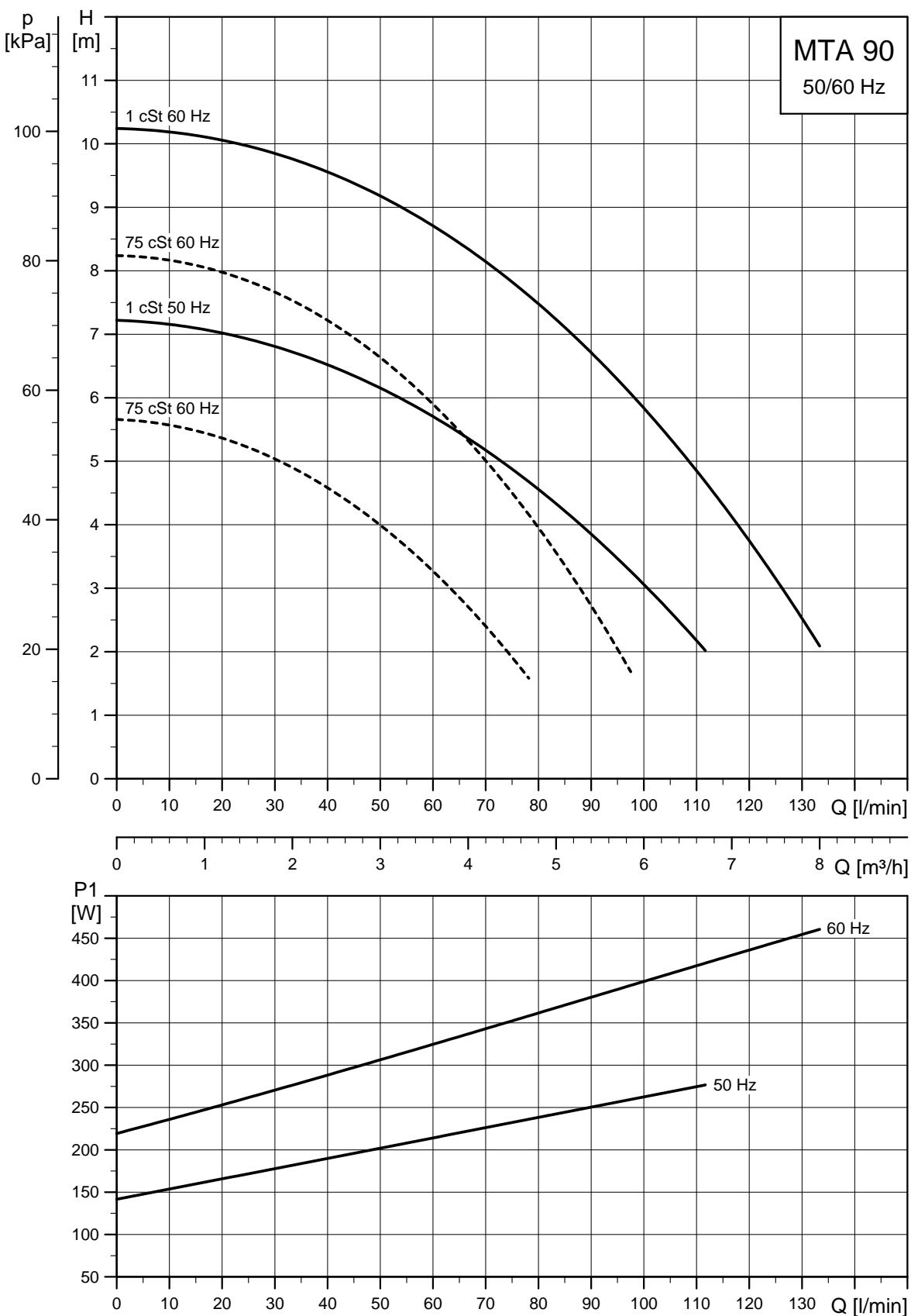
TM05 0880 3313

## Dimensions and weights

Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 60-130		306	125	10.6	11.6	0.017
MTA 60-180		356	175	11.1	12.2	0.020
MTA 60-250		426	245	11.8	12.2	0.023
MTA 60-350		526	345	12.9	14.7	0.027
MTA 60-130	Top	311.5	130.5	10.9	11.8	0.017
MTA 60-180	Top	361.5	180.5	11.4	12.4	0.020
MTA 60-250	Bottom	431.5	250.5	12.2	13.5	0.023
MTA 60-350	Bottom	531.5	350.5	13.2	14.9	0.027

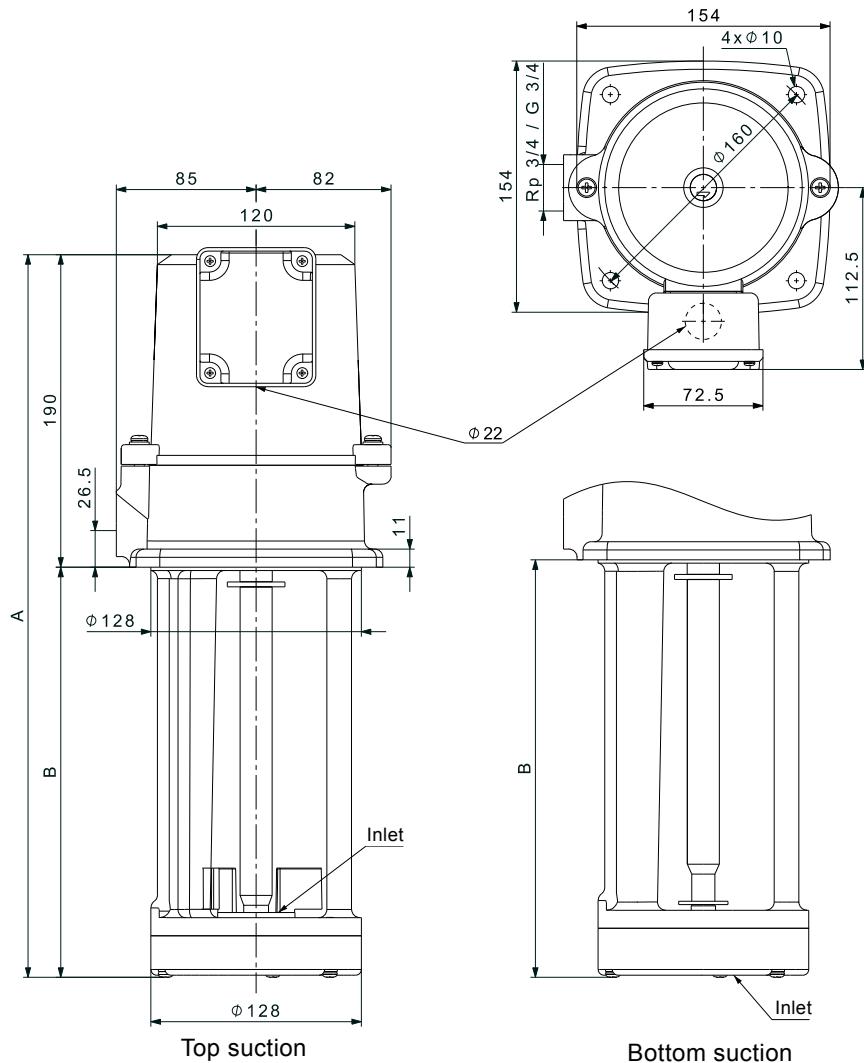
## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	202	0.78	0.90	5.38	0.75
3 x 200-220Δ V	60	333	1.18-1.09	1.36-1.27	6.25-6.43	0.81-0.80
3 x 220-240Δ/380-415Y V	50	200	0.69/0.42	0.79/0.48	5.87/3.57	0.76-0.70
3 x 220-240Δ/380-440Y V	60	330	0.99/0.63-0.57	1.14/0.72-0.66	6.44/4.10-3.71	0.87-0.80

**MTA 90**

TM05 0859 1711

## Dimensional sketches



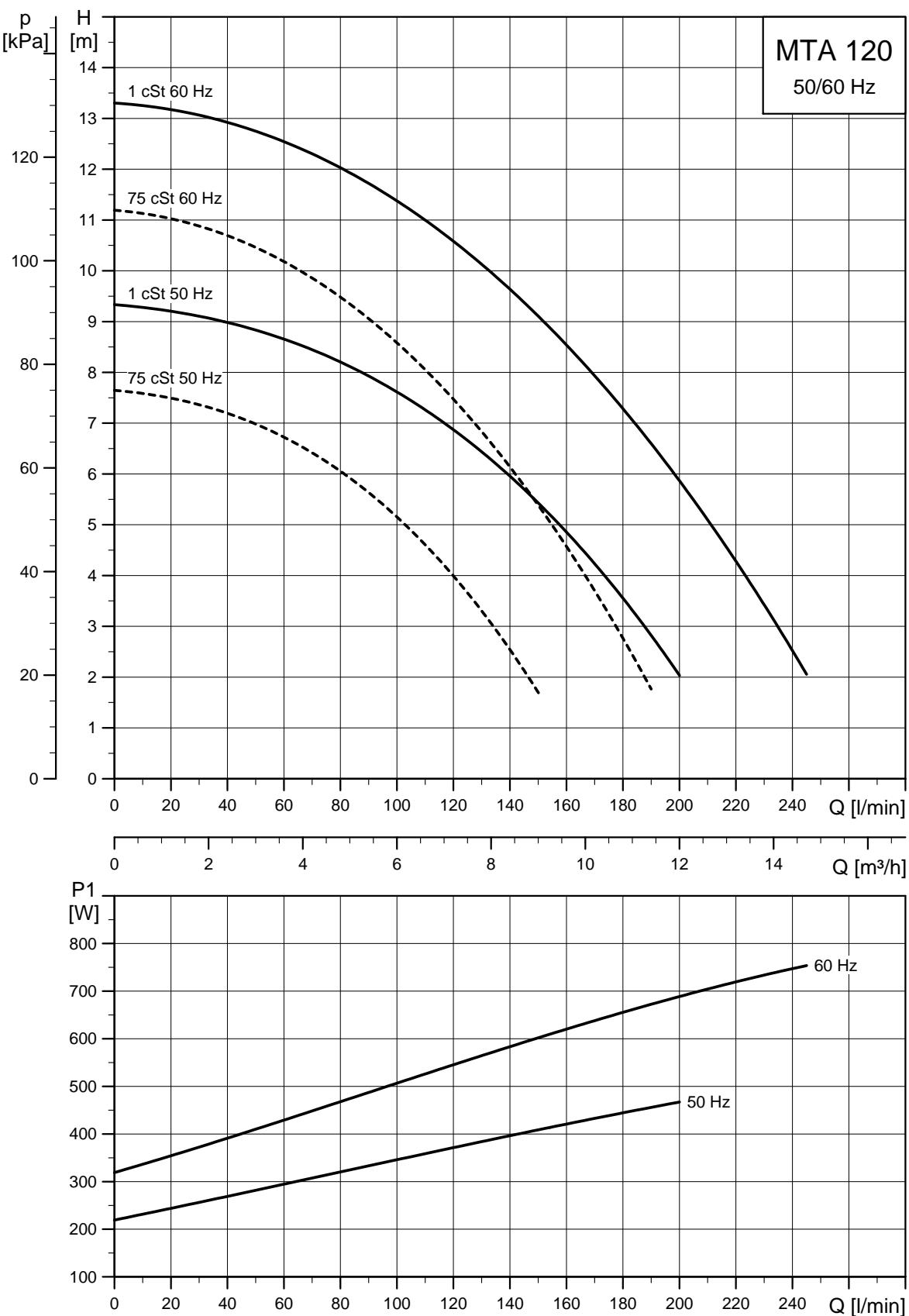
TM05 0881 3313

## Dimensions and weights

Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 90-130		318	128	12.5	14.2	0.017
MTA 90-180		368	178	13.3	15.1	0.020
MTA 90-250		438	248	14.2	16.2	0.023
MTA 90-350		538	348	15.6	17.9	0.027
MTA 90-130	Top	322.5	132.5	12.9	14.3	0.017
MTA 90-180	Top	372.5	182.5	13.6	15.2	0.020
MTA 90-250	Bottom	442.5	252.5	14.5	16.3	0.023
MTA 90-350	Bottom	542.5	352.5	15.9	18.0	0.027

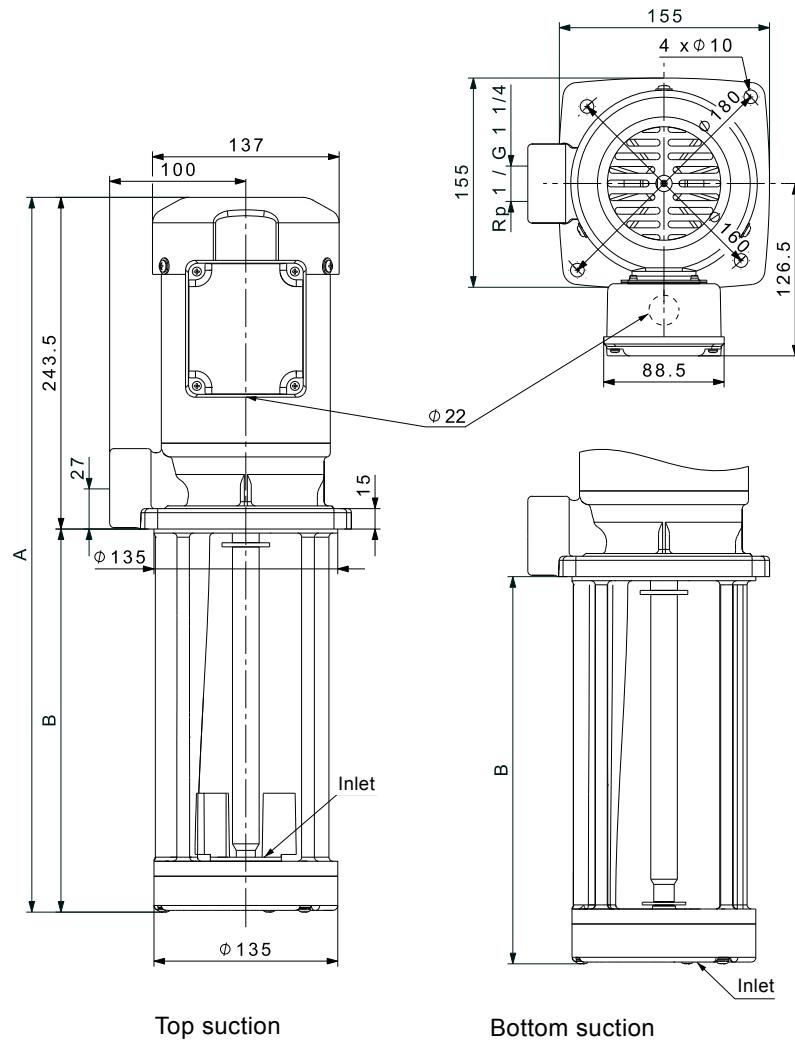
## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	276	1.12	1.29	8.29	0.71
3 x 200-220Δ V	60	460	1.63-1.51	1.87-1.74	9.29-9.51	0.81-0.80
3 x 220-240Δ/380-415Y V	50	270	0.97/0.55	1.12/0.63	7.86/4.46	0.73-0.67
3 x 220-240Δ/380-440Y V	60	440	1.3/0.8-0.72	1.5/0.92-0.83	8.45/5.20-4.68	0.89-0.81

**MTA 120**

TM05 0859 1711

## Dimensional sketches



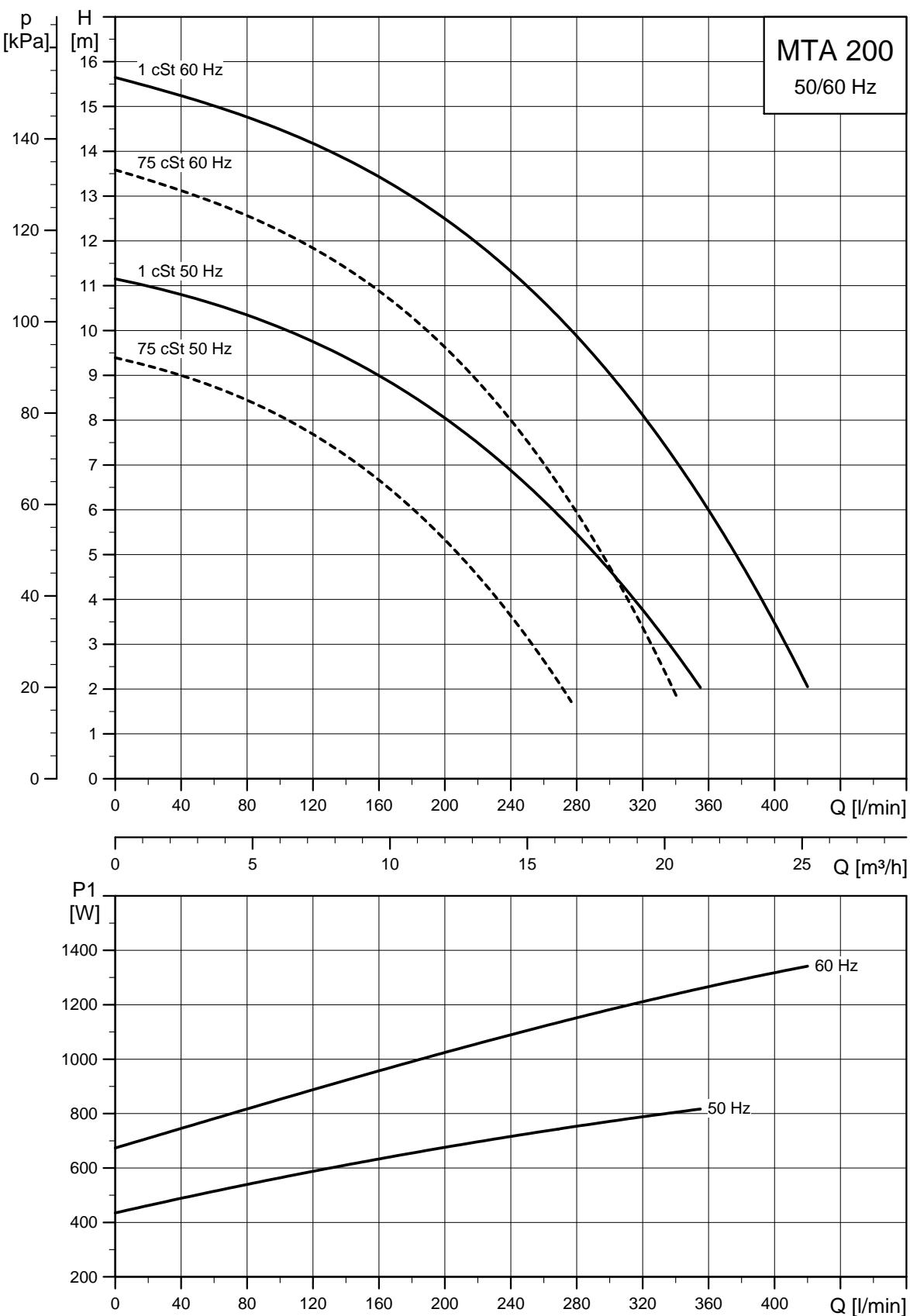
TM05 0882 3313

## Dimensions and weights

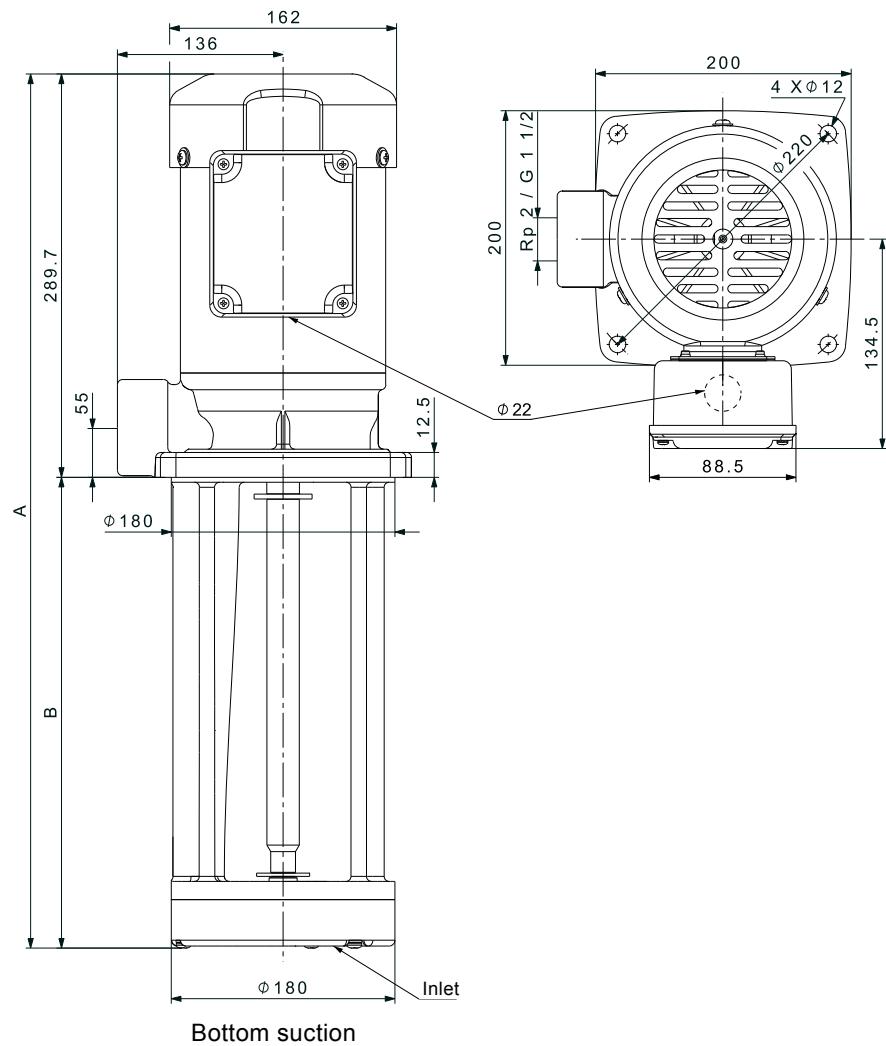
Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 120-180	Top	423.5	180	15.8	17.5	0.026
MTA 120-250		493.5	250	16.9	19.0	0.032
MTA 120-280		523.5	280	17.4	19.4	0.032
MTA 120-350		593.5	350	18.4	21.5	0.036
MTA 120-180	Bottom	426.5	183	16.0	18.1	0.026
MTA 120-250		496.5	253	17.1	19.2	0.032
MTA 120-280		526.5	283	17.6	19.6	0.032
MTA 120-350		596.5	353	18.6	21.7	0.036

## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	468	1.79	2.06	12.2	0.75
3 x 200-220Δ V	60	755	2.47-2.37	2.84-2.73	13.8-14.2	0.88-0.84
3 x 220-240Δ/380-415Y V	50	440	1.47/0.87	1.69/1.00	10.0/5.92	0.79-0.72
3 x 220-240Δ/380-440Y V	60	730	2.1/1.26-1.13	2.42/1.45-1.30	11.34/6.80-6.10	0.91-0.84

**MTA 200**

## Dimensional sketches



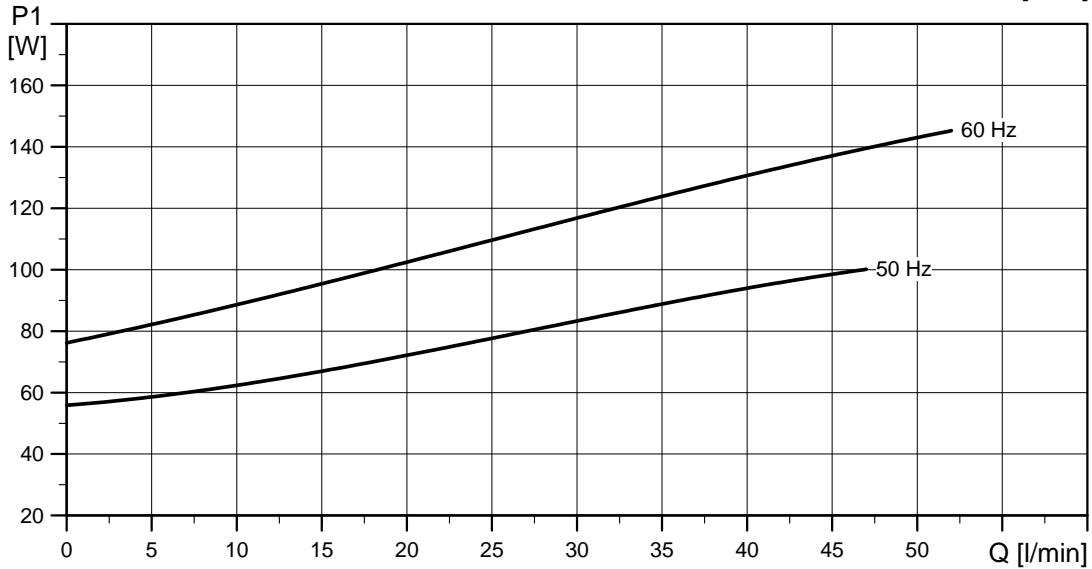
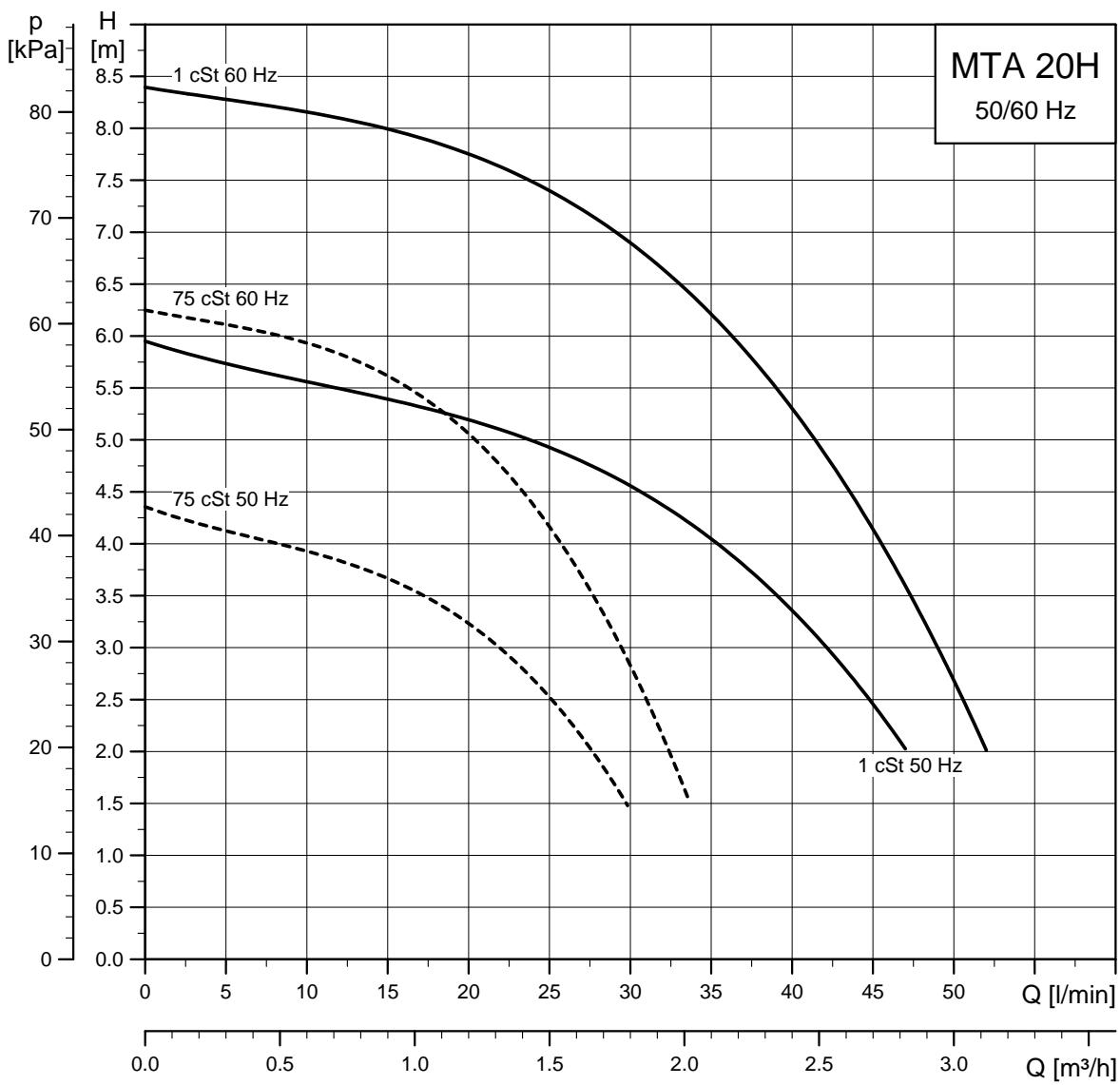
TM05 0883 3313

## Dimensions and weights

Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 200-250		534.7	250	24.3	26.9	0.06
MTA 200-280	Bottom	564.7	280	24.8	27.4	0.06
MTA 200-350		634.7	350	25.8	28.6	0.067

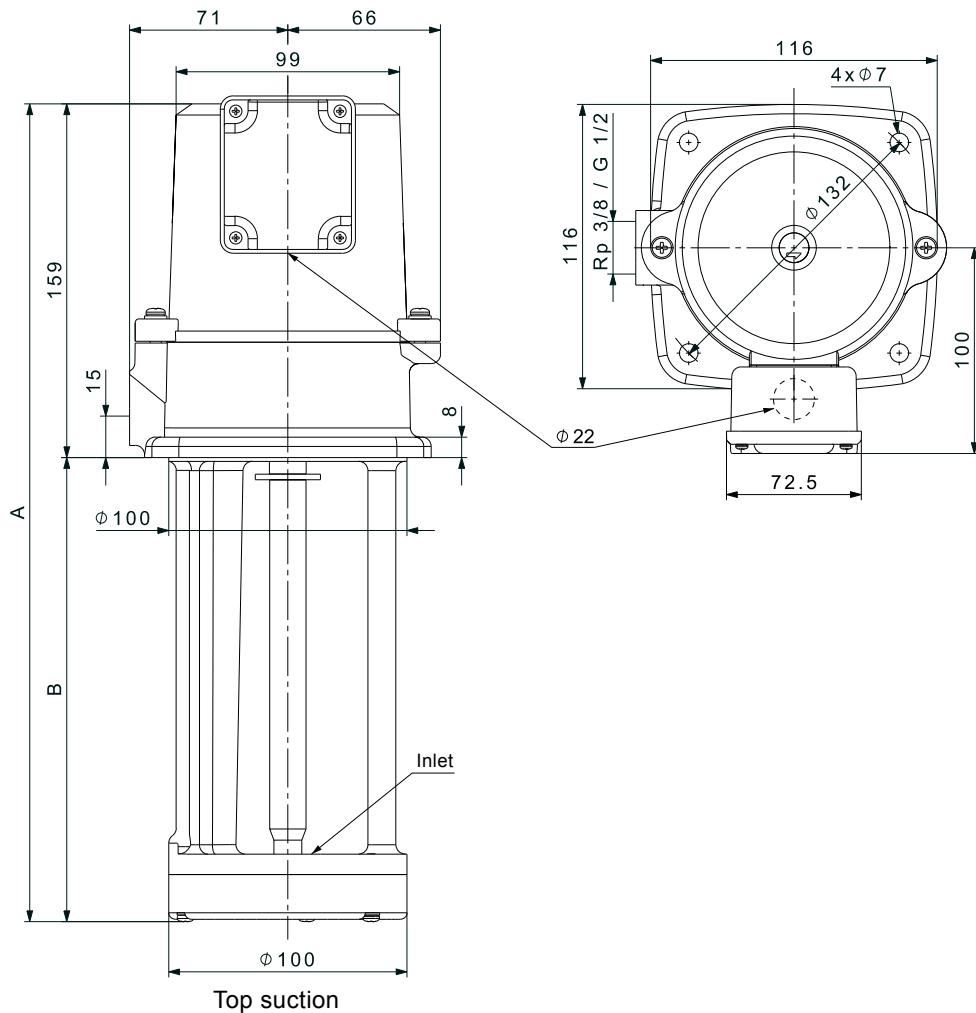
## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	815	2.85	3.28	23.9	0.83
3 x 200-220Δ V	60	1340	4.28-4.28	4.92-4.92	27.8-27.8	0.90-0.82
3 x 220-240Δ/380-415Y V	50	790	2.78/1.64	3.2/1.89	23.9/14.1	0.75-0.68
3 x 220-240Δ/380-440Y V	60	1270	3.48/2.11-1.96	4.0/2.43-2.25	27.5/16.7-15.5	0.96-0.88

**MTA 20H**

TM05 0862 1711

## Dimensional sketches



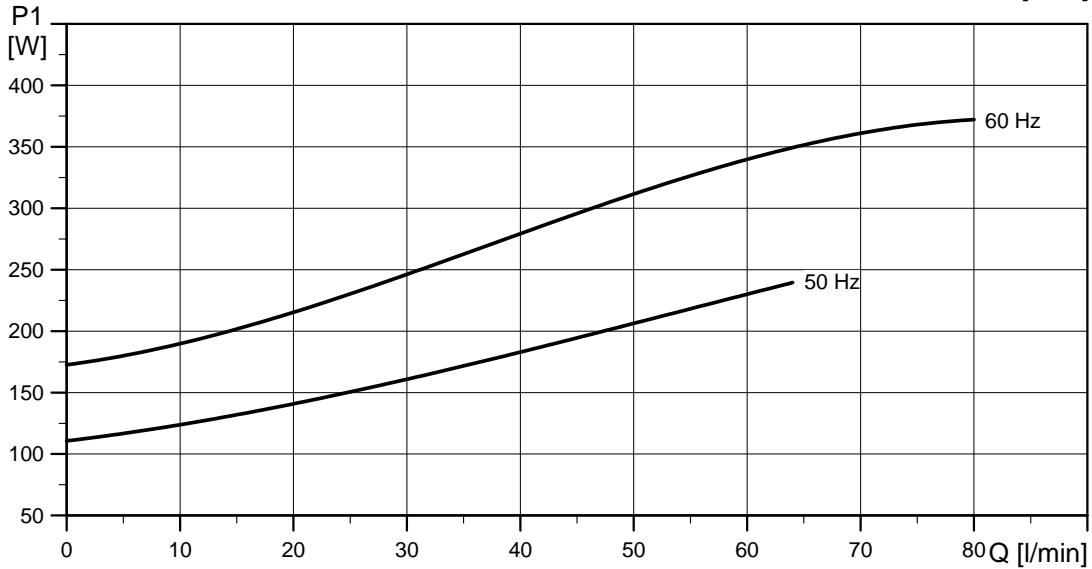
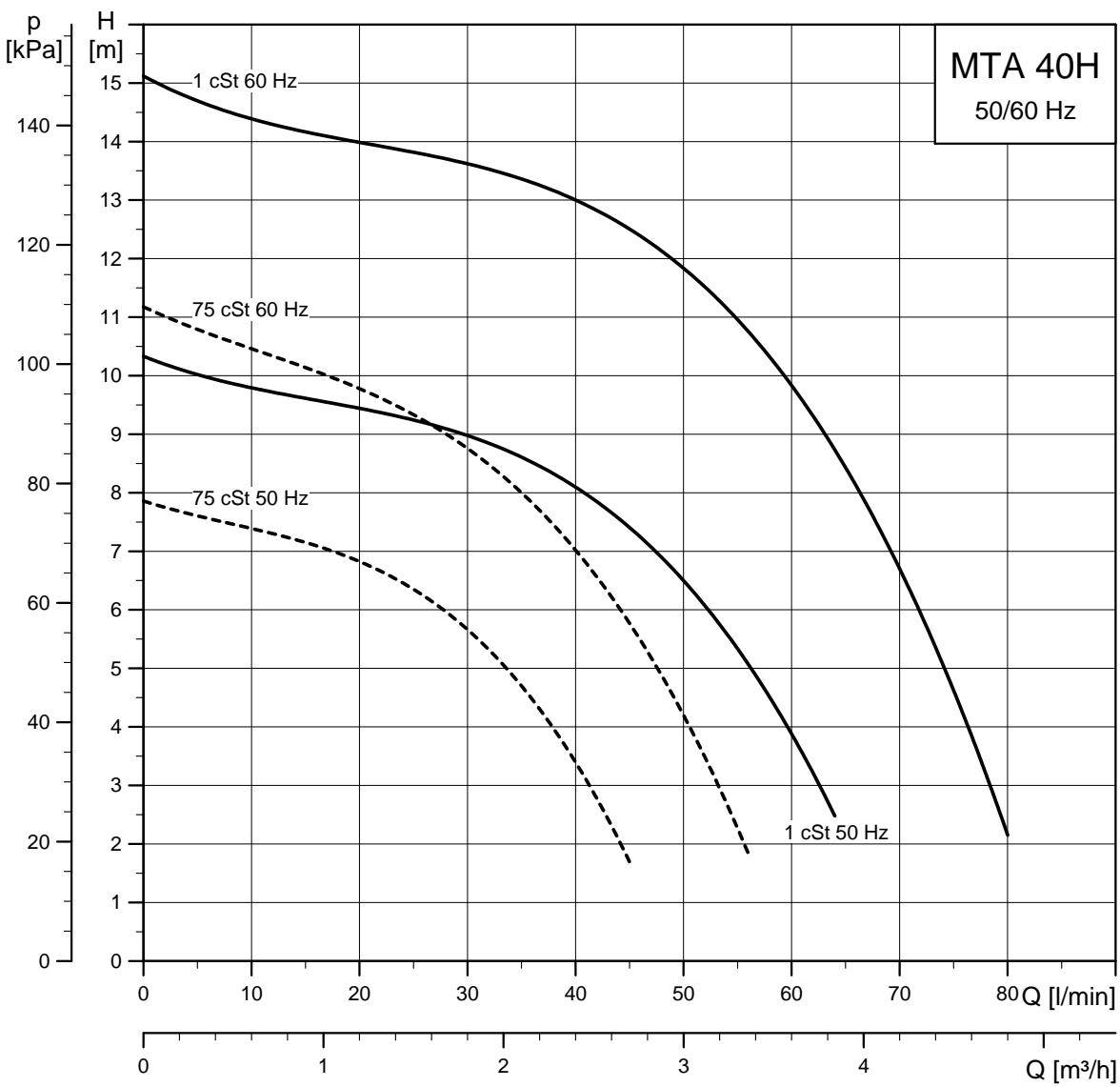
TM05 0884 3313

## Dimensions and weights

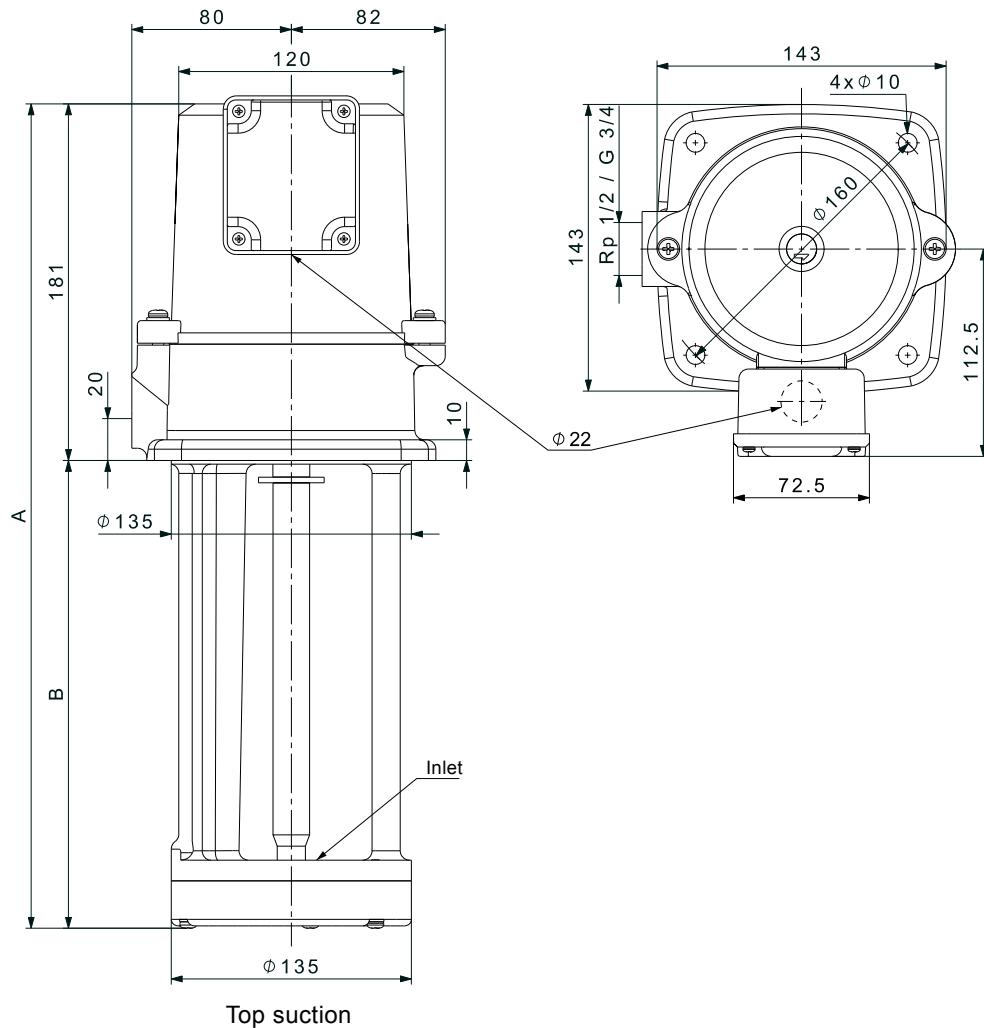
Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 20H-150	Top	309	150	6.8	7.7	0.012

## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	100	0.39	0.45	3.32	0.74
3 x 200-220Δ V	60	145	0.46-0.46	0.53-0.53	3.68-3.82	0.91-0.83
3 x 220-240Δ/380-415Y V	50	95	0.37/0.19	0.43/0.22	3.52/1.81	0.67-0.62
3 x 220-240Δ/380-440Y V	60	140	0.41/0.25-0.22	0.47/0.29-0.25	3.24/1.98-1.74	0.9-0.82

**MTA 40H**

## Dimensional sketches



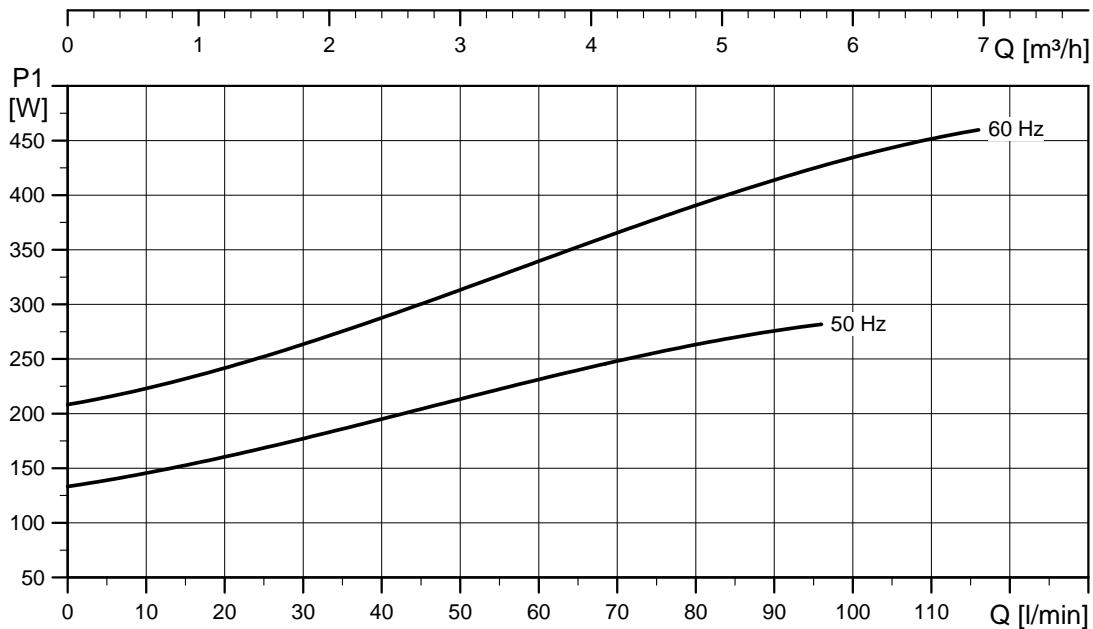
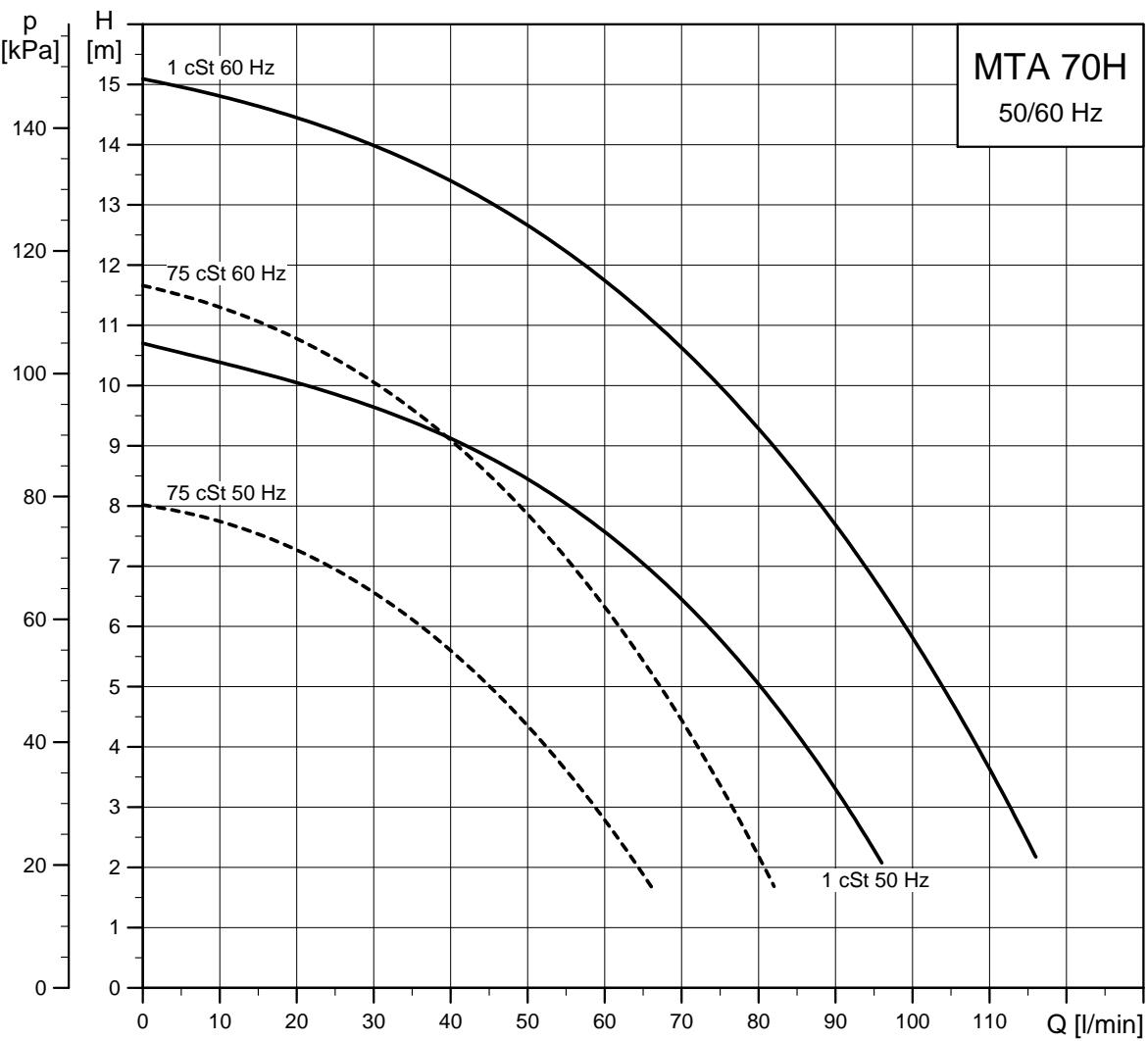
TM05 0885 3313

## Dimensions and weights

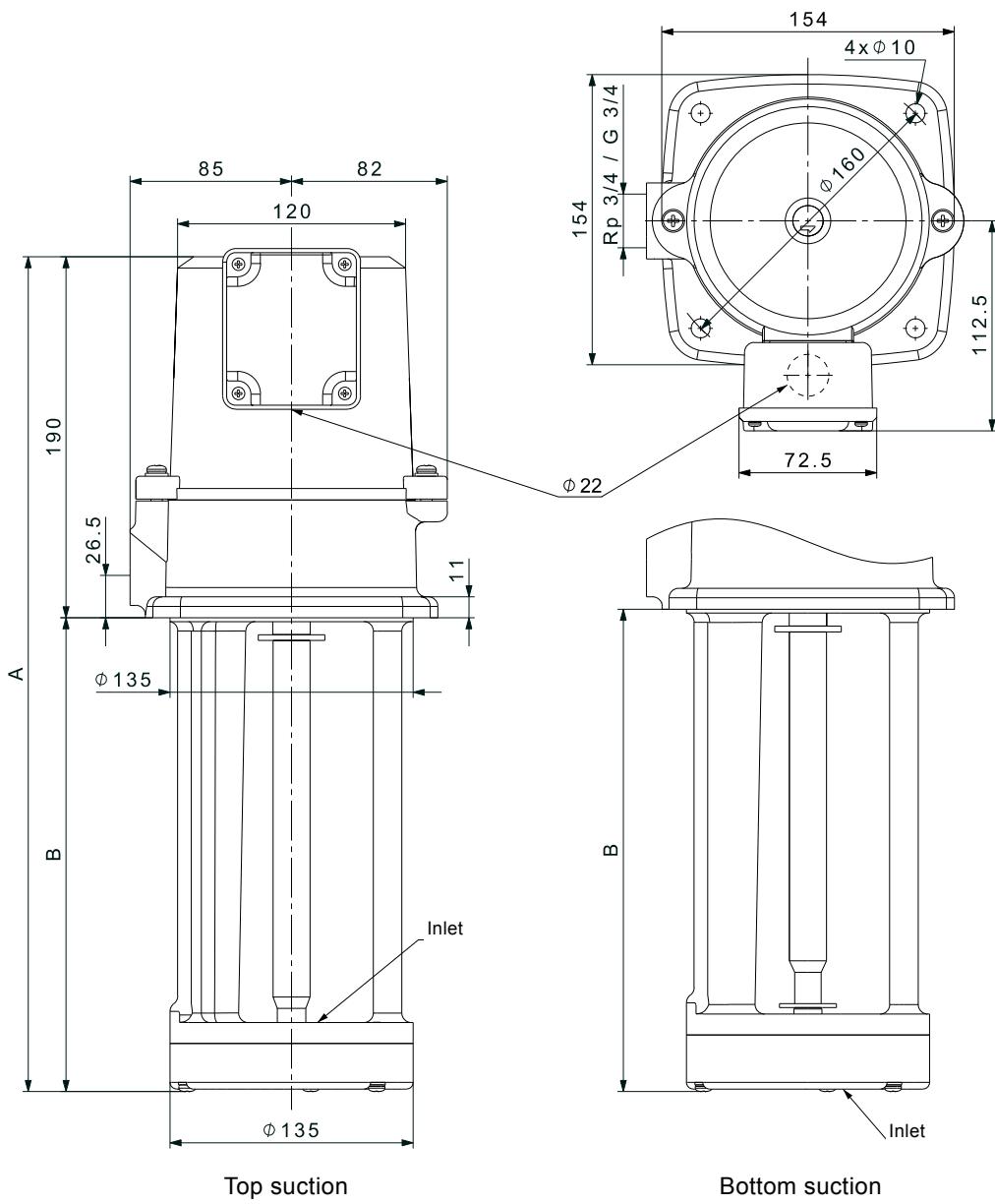
Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 40H-180	Top	361	180	11.3	12.6	0.02

## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	240	0.86	0.99	5.42	0.81
3 x 200-220Δ V	60	375	1.28-1.2	1.47-1.38	6.27-6.36	0.85-0.82
3 x 220-240Δ/380-415Y V	50	230	0.79/0.48	0.91/0.55	5.85/3.55	0.76-0.70
3 x 220-240Δ/380-440Y V	60	365	1.14/0.69-0.63	1.31/0.79-0.72	6.50/3.93-3.59	0.84-0.77

**MTA 70H**

TM05 0864 1711

**Dimensional sketches**

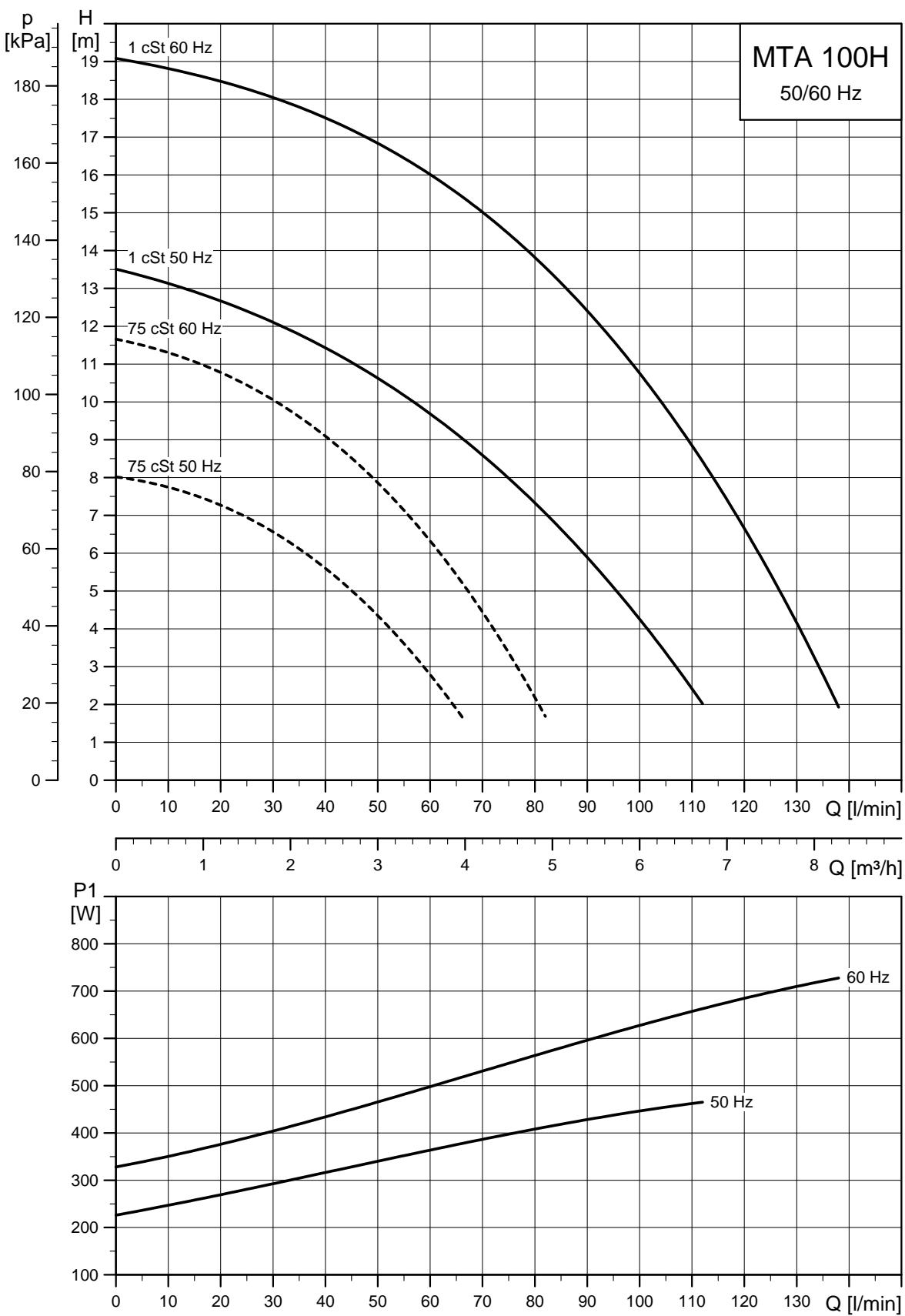
TM05 8318 3313

**Dimensions and weights**

Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 70H-250	Top	440	250	14.3	16.0	0.023
MTA 70H-250	Bottom	440	250	14.8	16.5	0.023

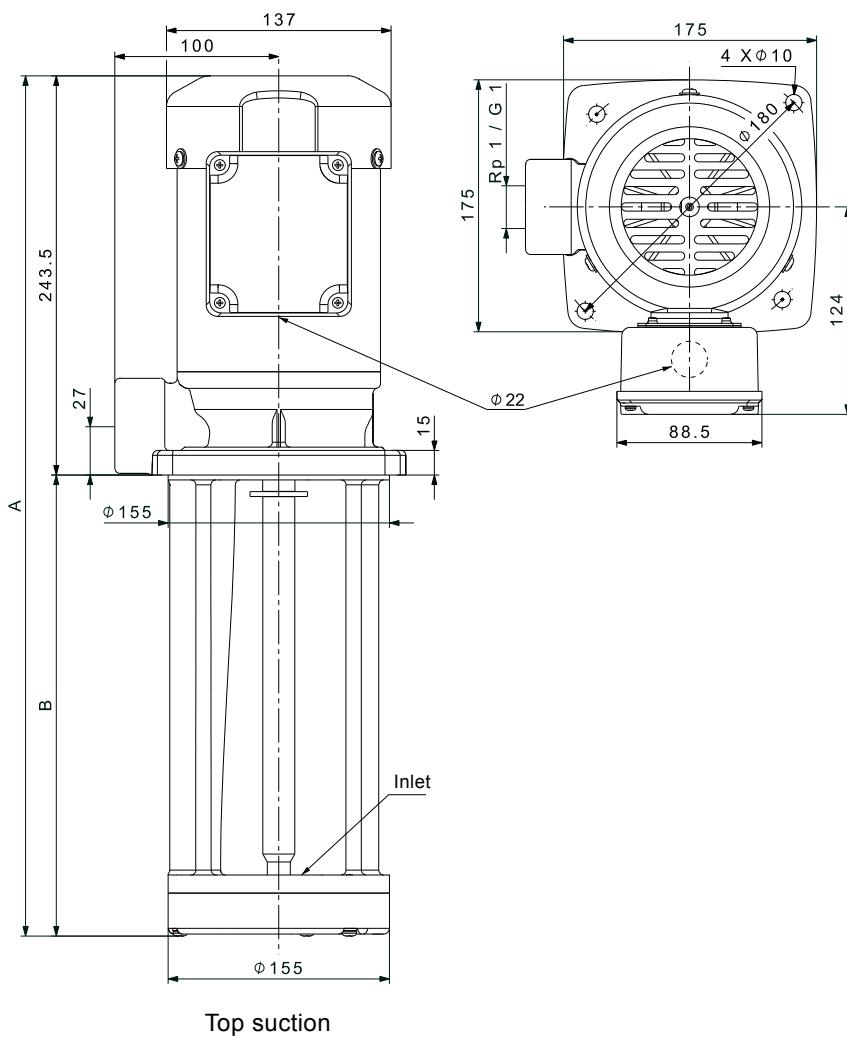
**Electrical data**

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	283	1.18	1.36	8.26	0.69
3 x 200-220Δ V	60	460	1.63-1.54	1.87-1.77	9.29-9.55	0.81-0.78
3 x 220-240Δ/380-415Y V	50	281	1.02/0.59	1.17/0.68	7.65/4.43	0.72-0.66
3 x 220-240Δ/380-440Y V	60	458	1.45/0.86-0.74	1.67/0.99-0.85	8.56/5.07-4.37	0.83-0.76

**MTA 100H**

TM05 0865 1771

## Dimensional sketches



TM05 0887 3313

## Dimensions and weights

Pump type	Suction	A [mm]	B [mm]	Net weight [kg]	Gross weight [kg]	Shipping volume [m³]
MTA 100H-280	Top	523.5	280	18.5	16.1	0.032

## Electrical data

Voltage	Frequency [Hz]	P1 [W]	I <sub>1/1</sub> [A]	I <sub>max</sub> [A]	I <sub>start</sub> [A]	Cos φ
3 x 200Δ V	50	465	1.81	2.08	12.1	0.74
3 x 200-220Δ V	60	725	2.4-2.28	2.76-2.62	13.9-14.1	0.87-0.83
3 x 220-240Δ/380-415Y V	50	445	1.47/0.87	1.69/1.00	10.0/5.92	0.79-0.73
3 x 220-240Δ/380-440Y V	60	715	1.98/1.21-1.05	2.28/1.39 -1.21	11.5/7.02-6.09	0.95-0.87

## 12. Motor data

### Standard motors, MTR and SPK



TM03 1711 2805



TM03 1710 2805

Fig. 62 Grundfos MG motor

Fig. 63 Siemens motor

### Standard motors, MTR and SPK, 50 Hz

Motor make	P <sub>2</sub> [kW]	Frame size	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos Φ <sub>1/1</sub>	η [%]	Motor efficiency class	I <sub>start</sub> [A]	Speed [min <sup>-1</sup> ]
Siemens	0.06	63	220-240Δ/380-415Y	0.31/0.18	0.79-0.72	68.5	-	1.55/0.90	2800-2850
	0.12	63	220-240Δ/380-415Y	0.59/0.34	0.80-0.72	71.0	-	2.71/1.56	2800-2850
	0.18	63	220-240Δ/380-415Y	0.90/0.52	0.79-0.71	71.5	-	3.94/2.28	2800-2850
Grundfos MG	0.25	71	220-255Δ/380-440Y	1.12/0.65	0.83-0.71	73.0	-	6.38/3.71	2840-2880
	0.37	71	220-240Δ/380-415Y	1.7/1.0	0.80-0.70	78.5	-	8.5-9.2/4.9-5.3	2850-2880
	0.55	71	220-240Δ/380-415Y	2.5/1.4	0.80-0.70	80.0	-	12-13/6.9-7.5	2830-2850
	0.75	80	220-240Δ/380-415Y	3.3/1.9	0.81-0.71	81.0	IE2	19.1-20.5/11.0-11.8	2840-2870
	1.1	80	220-240Δ/380-415Y	4.5/2.6	0.84-0.76	82.8	IE2	28.5-31.5/16.3-17.9	2820-2860
	1.5	90	220-240Δ/380-415Y	5.5/3.2	0.87-0.82	85.5	IE2	46.3-50.7/26.8-29.3	2890-2910
	2.2	90	380-415Δ	4.5-4.5	0.89-0.87	87.5	IE2	37.8-42.3	2890-2910
	3.0	100	380-415Δ	6.3-6.3	0.87-0.82	87.5	IE2	52.9-58.0	2900-2920
	4.0	112	380-415Δ	8.0-8.0	0.88-0.84	89.0	IE2	89.6-98.4	2910-2930
	5.5	132	380-415Δ	11.2-11.2	0.88-0.84	90.0	IE2	120-131	2910-2930
	7.5	132	380-415Δ/660-690Y	14.8-13.6/8.5-8.1	0.89-0.88	89.5-90.5	IE2	115-124/66.3-73.7	2920-2930
	11	160	380-415Δ/660-690Y	21.2-19.6/12.2-11.6	0.90-0.88	90.0-88.0	IE2	140-153/80.5-90.5	2920-2940
	15	160	380-415Δ/660-690Y	28.5-26.0/16.2-15.6	0.91-0.90	91.0-92.3	IE2	188-203/107-122	2920-2940
Siemens	18.5	160	380-415Δ/660-690Y	35.0-32.0/20.0-19.2	0.91-0.90	91.6-92.6	IE2	249-272/142-163	2920-2940
	22	180	380-415Δ/660-690Y	41.5-38.5/23.8-22.8	0.91-0.89	91.9-92.8	IE2	311-343/179-203	2930-2940
	30	200L	380-415Δ/660-690Y	55.0-51.0/31.5-30.0	0.88	93.5-93.7	IE2	385-357/221-210	2960
Siemens	37	200L	380-415Δ/660-690Y	67.0-63.0/38.5-36.0	0.89	94.0-94.0	IE2	482-454/277-259	2960
	45	225M	380-415Δ/660-690Y	81.0-73.0/46.5-44.5	0.89	95.0-94.9	IE2	591-533/339-325	2965

### Standard motors, MTR and SPK, 50 Hz, 3 x 200 V

Motor make	P <sub>2</sub> [kW]	Frame size	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos Φ <sub>1/1</sub>	η [%]	Motor efficiency class	I <sub>start</sub> [A]	Speed [min <sup>-1</sup> ]
Siemens	0.06	63	200Δ/346Y	0.35/0.20	0.79	69.3	-	1.70/0.97	2830
	0.12	63	200Δ/346Y	0.66/0.38	0.77	70.5	-	3.38/1.95	2830
	0.18	63	200Δ/346Y	1.00/0.58	0.75	70.3	-	4.61/2.67	2830
Grundfos MG	0.25	71A	200-220Δ/346-380Y	1.32/0.76	0.82-0.77	70.0	-	7.00/4.03	2810-2850
	0.37	71A	200-220Δ/346-380Y	1.90/1.10	0.80-0.70	78.5	-	9.31/5.39	2850-2880
	0.55	71B	200-220Δ/346-380Y	2.75/1.58	0.80-0.70	80.0	-	13.2/7.58	2830-2850
	0.75	80A	200-220Δ/346-380Y	3.60/2.10	0.81-0.71	81.0	IE2	20.9/12.2	2840-2870
	1.1	80B	200-220Δ/346-380Y	4.85/2.80	0.84-0.76	82.8	IE2	31.0/17.9	2820-2860
	1.5	90SB	200-220Δ/346-380Y	5.95/3.45	0.87-0.82	85.5	IE2	50.6/29.3	2890-2910
	2.2	90LC	200-220Δ/346-380Y	8.45/4.90	0.89-0.87	87.5	IE2	71.8/41.7	2890-2910
	3	100LC	200-220Δ/346-380Y	12.0/6.90	0.87-0.82	87.5	IE2	101/58.0	2900-2920
	4	120MC	200-220Δ/346-380Y	15.2/8.75	0.88-0.84	89.0	IE2	170/98.0	2910-2930
	5.5	132SC	200-220Δ/346-380Y	21.2/12.2	0.88-0.84	90.0	IE2	227/131	2910-2930
	7.5	132SD	200-220Δ/346-380Y	29.0/16.6	0.87-0.80	89.5	IE2	290/166	2900-2920
	11	160M	200-220ΔΔ/400-380Δ	39.0-37.0/19.5-21.4	0.90-0.86	91.0-90	IE2	273-303/137-175	2945-2950
	15	160M	200-220ΔΔ/400-380Δ	52.0-49.0/26.0-28.0	0.90-0.88	91.5-91.0	IE2	364-407/182-232	2945-2950
Siemens	18.5	160L	200-220ΔΔ/400-380Δ	63.0-61.0/31.5-35.5	0.92-0.92	92.3-92.0	IE2	441-512/221-298	2940-2950
	22	180M	200-220ΔΔ/400-380Δ	76.0-71.0/38.0-41.0	0.88-0.87	93.9-94.2	IE2	494-554/247-320	2955-2960
	30	200L	200-220ΔΔ/400-380Δ	104-97.0/52.0-57.0	0.87-0.86	93.6-93.6	IE2	666-737/333-433	2960-2965
	37	200L	200-220ΔΔ/400Δ-380YY	128-118/64.0-68.0	0.89-0.88	94.0-94.2	IE2	845-920/422-530	2960-2960
	45	225M	200-220ΔΔ/400Δ-380YY	154-142/77.0-82.0	0.89-0.88	94.6-94.8	IE2	1016-1122/508-648	2965-2965



TM03 1711 2805



TM03 1710 2805

Fig. 64 Grundfos MG motor

Fig. 65 Siemens motor

### Standard motors, MTR and SPK, 60 Hz

Motor make	P2 [kW]	Frame size	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η [%]	Motor efficiency class	I <sub>start</sub> [A]	Speed [min <sup>-1</sup> ]
Siemens	0.06	63	220-277Δ/380-480Y	0.29/0.17	0.83-0.67	69.0	-	1.62/0.95	3360-3460
	0.12	63	220-277Δ/380-480Y	0.55/0.32	0.85-0.67	71.0	-	2.92/1.70	3360-3460
	0.18	63	220-277Δ/380-480Y	0.80/0.46	0.84-0.66	70.5	-	4.08/2.35	3360-3460
Grundfos MG	0.25	71A	220-255Δ/380-440Y	1.10-1.02/0.63-0.59	0.86-0.77	73.0	-	6.05-7.14/3.47-4.13	3400-3450
	0.37	71	220-255Δ/380-440Y	1.50-1.44/0.87-0.83	0.85-0.76	79.0-80.0	-	8.3-9.4/4.8-5.4	3410-3470
	0.55	71	220-255Δ/380-440Y	2.15-2.05/1.25-1.20	0.85-0.76	81.5-83.0	-	10.8-12.3/6.3-7.2	3390-3460
	0.75	80	220-255Δ/380-440Y	2.85-2.70/1.65-1.55	0.86-0.78	83.0-85.0	IE2	17.1-20.0/9.9-11.5	3400-3470
	1.1	80	220-255Δ/380-440Y	4.20-3.85/2.45-2.22	0.88-0.82	82.0-84.5	IE2	25.6-30.4/14.9-17.5	3390-3460
	1.5	90	220-277Δ/380-480Y	5.35-4.70/3.10-2.70	0.90-0.81	84.0-85.0	IE2	41.7-49.4/24.2-28.4	3470-3530
	2.2	90	220-277Δ/380-480Y	7.70-6.35/4.45-3.70	0.91-0.85	85.5-87.0	IE2	60.1-69.9/34.7-40.7	3470-3530
	3.0	100	220-277Δ/380-480Y	10.8-9.80/6.20-5.65	0.89-0.84	84.0-87.5	IE2	86.4-108/49.6-62.2	3450-3550
	4.0	112	220-277Δ/380-480Y	13.6-11.8/7.80-6.80	0.90-0.82	88.0-89.5	IE2	139-177/79.6-102	3510-3540
	5.5	132	220-277Δ/380-480Y	18.8-16.4/10.8-9.45	0.90-0.82	89.0-89.0	IE2	188-239/108-138	3510-3540
	7.5	132	380-480Δ	14.8-13.4	0.90-0.79	89.5-89.5	IE2	138-174	3490-3530
	11	160	380-480Δ/660-690Y	21.2-17.2/12.2-11.6	0.91-0.87	90.0-92.5	IE2	123-153/70.8-103	3500-3550
	15	160	380-480Δ/660-690Y	29.0-22.8/16.6-15.8	0.92-0.89	90.0-92.5	IE2	168-203/96.3-141	3500-3550
	18.5	160	380-480Δ/660-690Y	35.0-28.0/20.2-19.2	0.92-0.89	90.5-93.0	IE2	214-272/123-186	3500-3550
	22	180	380-480Δ/660-690Y	42.0-33.5/24.2-22.8	0.92-0.89	90.0-92.5	IE2	273-348/157-237	3500-3550
Siemens	30	200L	380-480D/660-690Y	55.0-45.0/31.5-30.0	0.90-0.86	92.5-93.5	IE2	358-360/205-240	3540-3565
	37	200L	380-480D/660-690Y	67.0-54.0/38.5-37.0	0.90-0.87	93.0-94.0	IE2	442-448/254-307	3540-3565
	45	225M	380-480D/660-690Y	81.0-65.0/46.5-44.0	0.90-0.87	-	IE2	543-559/312-378	3545-3570

### Standard motors, MTR and SPK, 60 Hz, 3 x 200 V

Motor make	P2 [kW]	Frame size	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η [%]	Motor efficiency class	I <sub>start</sub> [A]	Speed [min <sup>-1</sup> ]
Siemens	0.06	63	200-230Δ/346-400Y	0.33/0.19	0.81-0.72	69.3	IE2	1.60/0.92	3380-3440
	0.12	63	200-230Δ/346-400Y	0.64/0.37	0.84-0.74	70.5	IE2	3.28/1.89	3380-3440
	0.18	63	200-230Δ/346-400Y	0.94/0.54	0.81-0.68	70.3	IE2	4.33/2.49	3380-3440
Grundfos MG	0.25	71A	200-230Δ/346-400Y	1.30/0.75	0.86-0.80	68.0	IE2	6.50/3.75	3380-3450
	0.37	71A	200-230Δ/346-400Y	1.65-1.50/0.96-0.87	0.85-0.76	79.0-80.0	IE2	9.08-9.75/5.28-5.66	3410-3470
	0.55	71B	200-230Δ/346-400Y	2.36-2.14/1.36-1.24	0.85-0.76	81.5-83.0	IE2	11.8-12.8/6.80-7.44	3390-3460
	0.75	80A	200-230Δ/346-400Y	3.15-2.80/1.82-1.62	0.86-0.78	83.0-85.0	IE2	18.9-20.7/10.9-12.0	3400-3470
	1.1	80B	200-230Δ/346-400Y	4.60-4.20/2.70-2.44	0.88-0.82	82.0-84.5	IE2	28.1-33.2/16.5-19.3	3390-3460
	1.5	90SB	200-230Δ/346-400Y	5.85-5.45/3.40-3.15	0.90-0.85	84.0-84.8	IE2	45.6-50.7/26.5-29.3	3470-3530
	2.2	90LC	200-230Δ/346-400Y	8.45-7.65/4.85-4.45	0.91-0.88	85.5-86.3	IE2	65.9-72.7/37.8-42.3	3470-3500
	3	100LC	200-230Δ/346-400Y	11.8-11.2/6.80-6.45	0.89-0.86	84.0-85.9	IE2	94.4-108/54.4-61.9	3430-3480
	4	120MC	200-230Δ/346-400Y	15.0-13.8/8.55-7.95	0.90-0.86	88.0-88.8	IE2	153-177/87.2-102	3510-3530
	5.5	132SC	200-230Δ/346-400Y	20.6-19.2/11.8-11.0	0.90-0.86	89.0	IE2	206-240/118-138	3510-3530
	7.5	132SD	200-230Δ/380-400Y	28.0-26.5/16.2-15.4	0.90-0.84	89.5-89.5	IE2	260-299/151-174	3490-3510
	11	160M	200-220ΔΔ/400-440Δ	39.0-35.6/19.5-17.8	0.92-0.92	90.0-90.0	IE2	265-292/133-146	3535-3535
	15	160M	200-220ΔΔ/400-440Δ	50.0-46.0/25.0-23.0	0.90-0.90	90.0-91.0	IE2	340-377/170-189	3545-3545
	18.5	160L	200-220ΔΔ/400-440Δ	64.0-58.0/32.0-29.0	0.92-0.92	91.0-92.0	IE2	435-476/218-238	3530-3540
	22	180M	200-220ΔΔ/400-440Δ	75.0-69.0/37.5-34.5	0.89-0.89	94.1-94.2	IE2	428-476/214-238	3540-3545
Siemens	30	200L	200-220ΔΔ/400-440Δ	104-95.0/52.0-47.5	0.89-0.89	93.5-93.2	IE2	572-637/286-318	3545-3550
	37	200L	200-220ΔΔ/400-440Δ	128-116/64-58	0.90-0.90	94.0-94.1	IE2	742-1148/371-574	3555-3555
	45	225M	200-220ΔΔ/400-440Δ	152-138/76-69	0.90-0.90	94.7-95.1	IE2	866-1670/433-835	3560-3560

## E-motors, MTRE



TM03 1712 2805

Fig. 66 Grundfos MGE motor

## E-motors, MTRE, 50/60 Hz

Motor make	P <sub>2</sub> [kW]	Frame size	Phase	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η [%]	Motor efficiency class
Grundfos MGE	0.37	71	1	200-240	1.9 - 2.3	0.98	86.3	-
	0.55	71	1	200-240	2.8 - 3.3	0.99	86.7	-
	0.75	80	1	200-240	3.8 - 4.5	0.99	85.8	-
	1.1	80	1	200-240	5.4 - 6.5	0.99	87.2	-
	1.5	90	1	200-240	7.3 - 8.7	1.00	87.6	-
	0.37	71	3	380-500	0.7 - 0.8	0.73 - 0.85	88.2	-
	0.55	71	3	380-500	1.0 - 1.1	0.76 - 0.87	88.5	-
	0.75	90	3	380-500	1.3 - 1.5	0.79 - 0.89	87.7	IE4**
	1.1	90	3	380-500	1.8 - 2.1	0.82 - 0.91	89.5	IE4**
	1.5	90	3	380-500	2.3 - 2.8	0.85 - 0.92	90.0	IE4**
	2.2	90	3	380-480	3.3 - 4.0	0.88 - 0.93	90.7	IE4**
	3	100	3	380-480	6.2 - 5.0	0.94 - 0.92	87.1	IE3
	4	112	3	380-480	8.1 - 6.6	0.94 - 0.92	88.1	IE3
	5.5	132	3	380-480	11.0 - 8.8	0.94 - 0.93	89.2	IE3
	7.5	132	3	380-480	14.8 - 11.6	0.94 - 0.95	90.1	IE3
	11	132	3	380-480	22.5 - 18.8	0.90 - 0.90	91.2	IE3
	15	160	3	380-480	30.0 - 26.0	0.91 - 0.86	91.9	IE3
	18.5	160	3	380-480	37.0 - 31.0	0.91 - 0.88	92.4	IE3
	22	180	3	380-480	43.5 - 35.0	0.91 - 0.90	92.7	IE3

\* Pumps are normally fitted with three-phase MGE motors. Dimension tables in section 11. Performance curves and technical data show pumps with three-phase MGE motors.

\*\* The IE efficiency levels are defined in IEC 60034-30-1 Ed. 1 (CD) draft. Due to the technology used in this motor, it falls outside the scope of IEC 60034-30-1 Ed. 1 (CD). Being the only defined standard at present, this standard is chosen as reference. The efficiency (including both motor and electronics) is above the IE4 level.

## E-motors, MTRE, 60 Hz, 3 x 200V

Motor make	P <sub>2</sub> [kW]	Frame size	Phase	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η [%]	Motor efficiency class
Grundfos MGE	1.5	90	3	200-230	5.6 - 5.1	0.95	84.0	IE2
	2.2	90	3	200-230	8.3 - 7.6	0.95	85.5	IE2
	4	112	3	200-230	13.4 - 12.8	0.94	87.5	IE2
	5.5	132	3	200-230	19.7 - 18.1	0.94 - 0.92	88.5	IE2

## 13. Pumped liquids

### Pumped liquids

MTR, MTRE, MTH and MTA pumps are designed to pump non-explosive liquids that do not chemically attack the pump materials.

When pumping liquids with a density and/or viscosity higher than that of water, oversized motors may be required.

Whether a pump is suitable for a particular liquid depends on a number of factors of which the most important are the chloride content, pH-value, temperature and content of chemicals, oils, etc.

Please note that aggressive liquids may attack or dissolve the protective oxide film of the stainless steel and thus cause corrosion.

### Pumping of solid particles

#### MTR, SPK and MTH pumps

These pumps are fitted with a suction strainer. The strainer prevents large solid particles from entering and damaging the pump. The table below describes the size of the passage in the strainer and the impeller.

Pump	Strainer passage [mm]	Free strainer passage [cm <sup>2</sup> ]	Impeller passage [mm]
MTR(E) 1s	Ø2	23	2.5
MTR(E) 1	Ø2	23	2.5
MTR(E) 3	Ø2	23	3.1
MTR(E) 5	Ø4	28	5.5
MTR(E) 10	Ø4	43	5.5
MTR(E) 15	Ø4	43	6.0
MTR(E) 20	Ø4	43	8.0
MTR(E) 32	Ø4	56	8.0
MTR(E) 45	Ø4	56	9.5
MTR(E) 64	Ø4	56	13.0
SPK 1	Ø2	-	2.5
SPK 2	Ø2	-	2.5
SPK 4	Ø2	-	2.5
SPK 8	Ø4	-	4.0
MTH 2	Ø2	23	2.0
MTH 4	Ø4	28	4.0

If the pumped liquid contains solid particles larger than the size of the holes in the strainer, the passage of the strainer may be blocked. In such situations the performance will drop as a result of a reduced flow through the pump.

**Note:** If the strainer is removed from the suction port, solid particles may enter the pump and cause a seizure or even damage the pump.

In grinding applications Grundfos recommends that the pumped liquid is screened for abrasive particles before entering the pump. When pumped, abrasive particles reduce the life of the pump components.

Wear of the pump components caused by abrasive particles starts when the concentration exceeds 20 ppm.

#### MTA pumps

MTA pumps are not fitted with a suction strainer.

Pump	Max. particle size [mm]
MTA 30	4-5
MTA 60	
MTA 90	
MTA 120	8-10
MTA 200	
MTA 20H	
MTA 40H	
MTA 70H	4-5
MTA 100H	

## List of pumped liquids

A number of typical liquids are listed below.

Other pump versions / shaft seals may be applicable, but those stated in the list are considered to be the best choices.

The table is intended as a general guide only, and it cannot replace actual testing of the pumped liquids and pump materials under specific working conditions.

The list should, however, be applied with some caution as factors such as concentration of the pumped liquid, liquid temperature or pressure may affect the chemical resistance of a specific pump version.

Safety precautions must be taken when pumping hazardous / flammable liquids.

Pumped liquid	Note	Liquid concentration, liquid temperature	Recommended pump version / shaft seal	
			MTR, MTRE	
			A-version (standard range, all wetted parts of cast iron and stainless steel)	I-version (stainless-steel version, all wetted parts of stainless steel EN/DIN 1.4301)
Acetic acid, CH <sub>3</sub> COOH	-	5 %, 20 °C	-	HUUE
Alkaline degreasing agent	D, F	-	HUUE	-
Ammonium bicarbonate, NH <sub>4</sub> HCO <sub>3</sub>	E	20 %, 30 °C	-	HUUE
Ammonium hydroxide, NH <sub>4</sub> OH	-	20 %, 40 °C	HUUE	-
Benzoic acid, C <sub>6</sub> H <sub>5</sub> COOH	H	0.5 %, 20 °C	-	HUUUV
Boiler water	-	< 90 °C	HUUE	-
Calcareous water	-	< 90 °C	HUUE	-
Calcium acetate (as coolant with inhibitor) Ca(CH <sub>3</sub> COO) <sub>2</sub>	D, E	30 %, 50 °C	HUUE	-
Calcium hydroxide, Ca(OH) <sub>2</sub>	E	Saturated solution, 50 °C	HUUE	-
Chloride-containing water	F	< 30 °C, max. 500 ppm	-	HUUE
Citric acid, HOC(CH <sub>2</sub> CO <sub>2</sub> H) <sub>2</sub> COOH	H	5 %, 40 °C	-	HUUE
Completely desalinated water (demineralized water)	-	< 90 °C	-	HUUE
Condensate	-	< 90 °C	HUUE	-
Copper sulfate, CuSO <sub>4</sub>	E	10 %, 30 °C	-	HUUE
Corn oil	D, E, 3	100 %, 80 °C	HUUUV	-
Domestic hot water (potable water)	-	< 120 °C	HUUE	-
Ethylene glycol, HOCH <sub>2</sub> CH <sub>2</sub> OH	D, E	50 %, 50 °C	HUUE	-
Formic acid, HCOOH	-	2 %, 20 °C	-	HUUE
Glycerine (glycerol), OHCH <sub>2</sub> CH(OH)CH <sub>2</sub> OH	D, E	50 %, 50 °C	HUUE	-
Hydraulic oil (mineral)	E, 2, 3	100 %, 100 °C	HUUUV	-
Hydraulic oil (synthetic)	E, 2, 3	100 %, 100 °C	HUUUV	-
Lactic acid, CH <sub>3</sub> CH(OH)COOH	E, H	10 %, 20 °C	-	HUUUV
Linoleic acid, C <sub>17</sub> H <sub>31</sub> COOH	E, 3	100 %, 20 °C	HUUUV	-
Motor oil	E, 2, 3	100 %, 80 °C	HUUUV	-
Cutting oil	E	90 °C	HUUUV	-
Water-based cooling lubricant	E	90 °C	HUUUV	-
Naphthalene, C <sub>10</sub> H <sub>8</sub>	E, H	100 %, 80 °C	HUUUV	-
Nitric acid, HNO <sub>3</sub>	F	1 %, 20 °C	-	HUUE
Oil-containing water	-	< 90 °C	HUUUV	-
Olive oil	D, E, 3	100 %, 80 °C	HUUUV	-
Oxalic acid, (COOH) <sub>2</sub>	H	1 %, 20 °C	-	HUUE
Peanut oil	D, E, 3	100 %, 80 °C	HUUUV	-
Phosphoric acid, H <sub>3</sub> PO <sub>4</sub>	E	20 %, 20 °C	-	HUUE
Propylene glycol, CH <sub>3</sub> CH(OH)CH <sub>2</sub> OH	D, E	50 %, 90 °C	HUUE	-
Potassium carbonate, K <sub>2</sub> CO <sub>3</sub>	E	20 %, 50 °C	HUUE	-
Potassium formate (as coolant with inhibitor), KOOCH	D, E	30 %, 50 °C	HUUE	-
Potassium hydroxide, KOH	E	20 %, 50 °C	-	HUUE
Potassium permanganate, KMnO <sub>4</sub>	-	1 %, 20 °C	-	HUUE
Rape seed oil	D, E, 3	100 %, 80 °C	HUUUV	-
Salicylic acid, C <sub>6</sub> H <sub>4</sub> (OH)COOH	H	0.1 %, 20 °C	-	HUUE
Silicone oil	E, 3	100 %	HUUUV	-
Sodium bicarbonate, NaHCO <sub>3</sub>	E	10 %, 60 °C	-	HUUE
Sodium chloride (as coolant), NaCl	D, E	30 %, < 5 °C, pH > 8	HUUE	-
Sodium hydroxide, NaOH	E	20 %, 50 °C	-	HUUE
Sodium nitrate, NaNO <sub>3</sub>	E	10 %, 60 °C	-	HUUE
Sodium phosphate, Na <sub>3</sub> PO <sub>4</sub>	E, H	10 %, 60 °C	-	HUUE
Sodium sulfate, Na <sub>2</sub> SO <sub>4</sub>	E, H	10 %, 60 °C	-	HUUE
Softened water	-	< 120 °C	-	HUUE
Soya oil	D, E, 3	100 %, 80 °C	HUUUV	-
Unsalted swimming pool water	-	Approx. 2 ppm free chlorine (Cl <sub>2</sub> )	HUUE	-

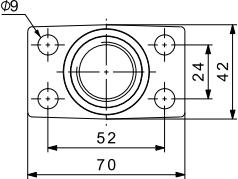
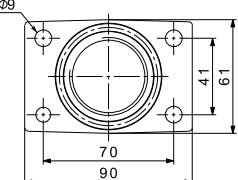
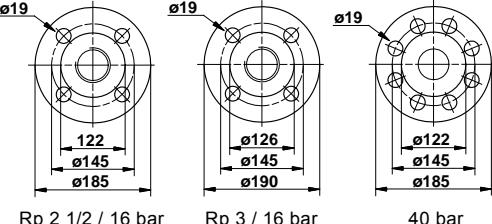
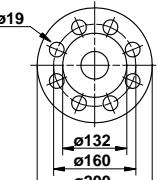
**List of notes**

D	Often with additives.
E	Density and/or viscosity differ from that of water. Allow for this when calculating motor output and pump performance.
F	Pump selection depends on many factors. Contact Grundfos.
H	Risk of crystallisation/precipitation in shaft seal.
1	The pumped liquid is easily ignited.
2	The pumped liquid highly inflammable.
3	Insoluble in water.
4	Low self-ignition point.

## 14. Accessories

### Counter-flanges for MTR, MTRE, SPK

A counter-flange set consists of one counter-flange, one gasket, bolts and nuts.

Counter-flange	Pump type	Description	Rated pressure	Pipe connection	Product number
	SPK 1 SPK 2 SPK 4	Threaded	25 bar	Rp 3/4	395104
	MTR, MTRE 1s MTR, MTRE 1 MTR, MTRE 3 MTR, MTRE 5 SPK 8	Threaded	16 bar	Rp 1 1/4	405178
	Threaded	16 bar, EN 1092-2	Rp 2 1/2	349902	
	Threaded	16 bar, special flange	Rp 3	349901	
	For welding	16 bar, EN 1092-2	65 mm, nominal	349904	
	For welding	40 bar, DIN 2635	65 mm, nominal	349905	
	For welding	16 bar, special flange	80 mm, nominal	349903	
	Threaded	16 bar	Rp 3	350540	
	For welding	16 bar	80 mm, nominal	350541	
	For welding	40 bar	80 mm, nominal	350542	

### Pipe connection

Various sets of counter-flanges and couplings are available for pipe connection.

## Sensors for MTR, MTRE and SPK

Accessory	Type	Flow range [m <sup>3</sup> /h]	Pipe connection	O-ring		Connection type		Product number
				EPDM	FKM	Cast-iron flange	Stainless-steel flange	
Grundfos Vortex Flow sensor, VFI <sup>1)</sup>	VFI 1.3-25 DN32 020 E			•		•		97686141
	VFI 1.3-25 DN32 020 F	1.3-25	DN 32		•	•		97686142
	VFI 1.3-25 DN32 020 E			•			•	97688297
	VFI 1.3-25 DN32 020 F				•		•	97688298
	VFI 2-40 DN40 020 E			•		•		97686143
	VFI 2-40 DN40 020 F	2-40			•	•		97686144
	VFI 2-40 DN40 020 E			•			•	97688299
	VFI 2-40 DN40 020 F				•		•	97688300
	VFI 3.2-64 DN50 020 E			•		•		97686145
	VFI 3.2-64 DN50 020 F	2-64			•	•		97686146
	VFI 3.2-64 DN50 020 E			•			•	97688301
	VFI 3.2-64 DN50 020 F				•		•	97688302
	VFI 5.2-104 DN65 020 E			•		•		97686147
	VFI 5.2-104 DN65 020 F	5.2-104			•	•		97686148
	VFI 5.2-104 DN65 020 E			•			•	97688303
	VFI 5.2-104 DN65 020 F				•		•	97688304
	VFI 8-160 DN80 020 E		DN 80	•		•		97686149
	VFI 8-160 DN80 020 F			•		•		97686150
	VFI 8-160 DN80 020 E				•		•	97688305
	VFI 8-160 DN80 020 F				•		•	97688306
	VFI 12-240 DN100 020 E		DN 100	•		•		97686151
	VFI 12-240 DN100 020 F				•	•		97686152
	VFI 12-240 DN100 020 E			•			•	97688308
	VFI 12-240 DN100 020 F				•		•	97688309

<sup>1)</sup> For more information about the VFI sensor, see the Grundfos Direct Sensors™ data booklet, publication number 97790189, on [www.grundfos.com](http://www.grundfos.com) (WebCAPS).

Accessory	Type	Supplier	Measuring range	Product number
Flowmeter	SITRANS F M MAGFLO MAG 5100 W	Siemens	1-5 m <sup>3</sup> (DN 25)	ID8285
	SITRANS F M MAGFLO MAG 5100 W		3-10 m <sup>3</sup> (DN 40)	ID8286
	SITRANS F M MAGFLO MAG 5100 W		6-30 m <sup>3</sup> (DN 65)	ID8287
	SITRANS F M MAGFLO MAG 5100 W		20-75 m <sup>3</sup> (DN 100)	ID8288
Temperature sensor	TTA (0) 25	Carlo Gavazzi	0 - 25 °C	96432591
	TTA (-25) 25		-25 - +25 °C	96430194
	TTA (50) 100		50 - 100 °C	96432592
	TTA (0) 150		0 - 150 °C	96430195
Accessory for temperature sensor. All with 1/2 RG connection	Protecting tube Ø9 x 50 mm			96430201
	Protecting tube Ø9 x 100 mm			96430202
	Cutting ring bush			96430203
Temperature sensor, ambient temperature	WR 52	tmg (DK: Plesner)	-50 - +50 °C	ID8295
Differential-temperature sensor	ETSD	Honsberg	0 - 20 °C	96409362
			0 - 50 °C	96409363

**Note:** All sensors have 4-20 mA signal output.



**Danfoss pressure sensor kits**

Content	Liquid temperature	Pressure [bar]	Product number
<ul style="list-style-type: none"> <li>Danfoss pressure sensor, type MBS 3000, with 2 m screened cable Connection: G 1/2 A (DIN 16288-B6kt)</li> <li>5 cable clips (black)</li> <li>Instructions PT (400212)</li> </ul>	-40 - +85 °C	0-4	96428014
		0-6	96428015
		0-10	96428016
		0-16	96428017
		0-25	96428018

**DPI differential-pressure sensor kit**

Content	Pressure [bar]	Product number
<ul style="list-style-type: none"> <li>1 sensor incl. 0.9 m screened cable (7/16" connections)</li> <li>1 original DPI bracket for wall mounting</li> <li>1 Grundfos bracket for mounting on motor</li> <li>2 M4 screws for mounting of sensor on bracket</li> <li>1 M6 screw (self-cutting) for mounting on MGE 90/100</li> <li>1 M8 screw (self-cutting) for mounting on MGE 112/132</li> <li>3 capillary tubes (short/long)</li> <li>2 fittings (1/4"-7/16")</li> <li>5 cable clips (black)</li> <li>Installation and operating instructions (00480675)</li> <li>Service kit instructions.</li> </ul>	0 - 0.6	96611522
	0 - 1.0	96611523
	0 - 1.6	96611524
	0 - 2.5	96611525
	0 - 4.0	96611526
	0 - 6.0	96611527
	0 - 10	96611550

**EMC filter for MTRE**

EMC filter required for installation of 7.5 - 22 kW MTRE pumps in residential areas.

Product	Product number
EMC filter (7.5 kW)	96041047
EMC filter (11 kW)	96478309
EMC filter (15 kW)	96478309
EMC filter (18.5 kW)	96478309
EMC filter (22 kW)	96478309

## Remote controls

### Grundfos GO Remote

The Grundfos GO Remote is used for wireless infrared or radio communication with the pumps.

Various Grundfos GO Remote variants are available.

#### MI 201

The MI 201 is a complete solution, consisting of an Apple iPod touch 4G and a Grundfos cover for infrared and radio communication with Grundfos pumps or systems.



TM05 3886 1712

**Fig. 67** MI 201

Supplied with the product:

- Apple iPod touch 4G incl. accessories
- Grundfos MI 201 cover
- battery charger
- quick guide.

#### MI 202 and MI 204

The MI 202 and MI 204 are add-on modules with built-in infrared and radio communication. The MI 202 can be used in conjunction with Apple iPod Touch 4, iPhone 4 and 4S.

The MI 204 can be used in conjunction with Apple iPod Touch 5G, iPhone 5 or later.



TM05 3887 1612 - TM05 7704 1513

**Fig. 68** MI 202 and MI 204

Supplied with the product:

- Grundfos MI 202 or 204
- sleeve
- quick guide
- charger cable.

### MI 301

The MI 301 is a module with built-in infrared and radio communication. The MI 301 must be used in conjunction with an Android or iOS-based Smartphone with a Bluetooth connection. The MI 301 has rechargeable Li-ion battery and must be charged separately.



TM05 3890 1712

**Fig. 69** MI 301

Supplied with the product:

- Grundfos MI 301
- sleeve
- battery charger
- quick guide.

### Product numbers

Grundfos GO Remote variant	Product number
Grundfos MI 201	98140638
Grundfos MI 202	98046376
Grundfos MI 204	98424092
Grundfos MI 301	98046408

### Supported units

Make	Model	Operating system	MI 201	MI 202	MI 204	MI 301
Apple	iPod touch 4G	iOS 5.0 or later	•	•	•	
	iPhone 4, 4S			•	•	
	iPod touch 5G	iOS 6.0 or later		•	•	
	iPhone 5			•	•	
HTC	Desire S	Android 2.3.3 or later			•	
	Sensation	Android 2.3.4 or later			•	
Samsung	Galaxy S II				•	
	Galaxy Nexus	Android 4.0 or later			•	
LG	Google Nexus 4	Android 4.2 or later				•

**Note:** Similar Android and iOS-based devices may work as well, but are not supported by Grundfos.

## CIU communication interface units



GIA 6118

**Fig. 70** Grundfos CIU communication interface unit

The CIU units enable communication of operating data, such as measured values and setpoints, between MTRE pumps and a building management system. The CIU unit incorporates a 24-240 VAC/VDC power supply module and a CIM module. It can either be mounted on a DIN rail or on a wall.

The CIU modules can be used for MTRE pumps with MGE motors from 3.0 to 7.5 kW.

We offer the following CIU units:

Description	Fieldbus protocol	Product number
CIU 100	LonWorks	96753735
CIU 150	PROFIBUS DP	96753081
CIU 200	Modbus RTU	96753082
CIU 250*	GSM/GPRS	96787106
CIU 271*	Grundfos Remote Management (GRM)	96898819
CIU 300	BACnet MS/TP	96893769

\* Aerial not included. See below.

### Aerials for CIU 250 and 270

Description	Product number
Aerial for roof	97631956
Aerial for desk	97631957

For further information about data communication via CIU units and fieldbus protocols, see the CIU documentation available on [www.grundfos.com](http://www.grundfos.com) (WebCAPS).

## CIM communication interface modules



GIA 6121

**Fig. 71** Grundfos CIM communication interface module

The CIM modules enable communication of operating data, such as measured values and setpoints, between MTRE pumps and a building management system. The CIM modules are add-on communication modules which are fitted in the terminal box of CRE, CRIE, CRNE pumps of 11-22 kW.

The CIM modules can be used for MTRE pumps with MGE motors from 0.25 - 2.2 kW and 11-22 kW.

**Note:** CIM modules must be fitted by authorised personnel.

We offer the following CIM modules:

Description	Fieldbus protocol	Product number
CIM 050	GENI	96824631
CIM 100	LonWorks	96824797
CIM 150	PROFIBUS DP	96824793
CIM 200	Modbus RTU	96824796
CIM 250*	GSM/GPRS	96824795
CIM 271*	Grundfos Remote Management (GRM)	96898815
CIM 300	BACnet MS/TP	96893770

\* Aerials not included. See below.

### Aerials for CIM 250 and 270

Description	Product number
Aerial for roof	97631956
Aerial for desk	97631957

For further information about data communication via CIM modules and fieldbus protocols, see the CIM documentation available on [www.grundfos.com](http://www.grundfos.com) (WebCAPS).

## 15. Variants

### List of variants - on request

Below please find the range of options available for customizing the MTR, MTRE, SPK, MTH and MTA pumps to meet special requirements.

Contact Grundfos for further information or for requests other than the ones mentioned below.

#### Pumps

Variant	Applies to	Description
Immersion depth	MTR, MTRE SPK	See page 156 See page 157
Horizontally mounted pump	MTR, MTRE SPK	See page 158
120 ° solution	MTR, MTRE SPK	See page 158
Suction pipe	MTR, MTRE SPK MTH	See page 158

#### Shaft seals

Variant	Applies to	Description
Shaft seal with FFKM, FXM or EDPM O-ring material	MTR, MTRE SPK MTH	We recommend shaft seals with FFKM, FXM or EPDM O-ring material for applications where the pumped liquid may damage the standard O-ring material.

#### Motors

Variant	Applies to	Description
ATEX motor	MTR	For operation in hazardous atmospheres, explosion-proof or dust-ignition-proof motors may be required.
Motor with anti-condensation heating unit	MTR SPK	For operation in humid environments motors with built-in anti-condensation heating unit may be required.
Motor with thermal protection	MTR SPK	Grundfos offers motors with built-in bimetallic thermal switches or temperature-controlled PTC sensors (thermistors) incorporated in the motor windings.
Oversize motor	MTR, MTRE SPK	Ambient temperatures above 40 °C or installation at altitudes of more than 1000 metres above sea level require the use of an oversize motor (i.e. derating).
Multi-plug	MTR SPK MTH	Pumps with motors from 0.25 kW to 7.5 kW can be fitted with a 10-pin multi-plug connection, type Han® 10 ES. The purpose of a multi-plug connection is to make the electrical installation and the service of the pump easier. The multi-plug functions as a plug-and-pump device.
4-pole motor	MTR	Grundfos offers 4-pole standard motors

#### Certificates

Certificate	Description
Certificate of compliance with the order	According to EN 10204, 2.1. Grundfos document certifying that the pump supplied is in compliance with the order specifications.
Test certificate. Non-specific inspection and testing	According to EN 10204, 2.2. Certificate with inspection and test results of a non-specific pump.
Inspection certificate 3.1	Grundfos document certifying that the pump supplied is in compliance with the order specifications. Inspection and test results are mentioned in the certificate.
	Grundfos document certifying that the pump supplied is in compliance with the order specifications. Inspection and test results are mentioned in the certificate. Certificate from the surveyor is included.
	<b>Note:</b> Contact Grundfos if you require a certificate.
Inspection certificate	We offer the following inspection certificates: <ul style="list-style-type: none"> <li>• Lloyds Register of Shipping (LRS)</li> <li>• Det Norske Veritas (DNV)</li> <li>• Germanischer Lloyd (GL)</li> <li>• Bureau Veritas (BV)</li> <li>• American Bureau of Shipping (ABS)</li> <li>• Registro Italiano Navale Agenture (RINA)</li> <li>• China Classification Society (CCS)</li> <li>• Russian maritime register of Shipping (RS)</li> <li>• Biro Klassifikasi Indonesia (BKI)</li> <li>• United States Coast Guard (USCG)</li> <li>• Nippon Kaiji Koykai (NKK)</li> </ul>
Standard test report	Certifies that the main components of the specific pump are manufactured by Grundfos, and that the pump has been QH-tested, inspected and conforms to the full requirements of the appropriate catalogues, drawings and specifications.
Material specification report	Certifies the material used for the main components of the specific pump.
Duty-point verification report	Certifies a test point specified by the customer. Issued according to ISO 9906 concerning "Duty point verification".
ATEX-approved pump (MTR)	Confirms that the specific pump is ATEX-approved according to the EU directive 94/9/EC, the "ATEX directive".

**Note:** Other certificates are available on request.

## Immersion depths, MTR, MTRE

To meet specific depths of tanks and containers, the immersion depth of the pump can be varied using empty chambers.

For the MTR, MTRE range the following immersion depths are available.

The number of impellers depends on the requested head, and can be found on the technical data pages for each product type.

Number of chambers	Immersion depth [mm]									
	MTR1s	MTR1	MTR3	MTR5	MTR10	MTR15	MTR20	MTR32	MTR45	MTR64
2	160	160	160	169	148	178	178	223	244	249
3	178	178	178	196	178	223	223	293	324	332
4	196	196	196	223	208	268	268	363	404	414
5	214	214	214	250	238	313	313	433	484	497
6	232	232	232	277	268	358	358	503	564	579
7	250	250	250	304	298	403	403	573	644	662
8	268	268	268	331	328	448	448	643	724	744
9	286	286	286	358	358	493	493	713	804	827
10	304	304	304	385	388	538	538	783	884	909
11	322	322	322	412	-	583	583	853	964	992
12	340	340	340	439	448	628	628	923	1044	1074
13	358	358	358	466	-	673	673	993	1124	1157
14	376	376	376	493	508	718	718	1063	1204	1239
15	394	394	394	520	-	763	763	1133	1284	1322
16	412	412	412	547	568	808	808	1203	1364	1404
17	430	430	430	574	-	853	853	1273	1444	1487
18	448	448	448	601	628	898	898	1343	-	-
19	466	466	466	628	-	943	943	-	-	-
20	484	484	484	655	688	988	988	-	-	-
21	502	502	502	682	-	1033	1033	-	-	-
22	520	520	520	709	748	-	-	-	-	-
23	538	538	538	736	778	-	-	-	-	-
24	556	556	556	763	808	-	-	-	-	-
25	574	574	574	790	838	-	-	-	-	-
26	592	592	592	817	868	-	-	-	-	-
27	610	610	610	844	898	-	-	-	-	-
28	628	628	628	871	928	-	-	-	-	-
29	646	646	646	898	958	-	-	-	-	-
30	664	664	664	925	988	-	-	-	-	-
31	682	682	682	952	1018	-	-	-	-	-
32	700	700	700	979	-	-	-	-	-	-
33	718	718	718	1006	-	-	-	-	-	-
34	736	736	736	-	-	-	-	-	-	-
35	754	754	754	-	-	-	-	-	-	-
36	772	772	772	-	-	-	-	-	-	-
37	790	790	790	-	-	-	-	-	-	-
38	808	808	808	-	-	-	-	-	-	-
39	826	826	826	-	-	-	-	-	-	-
40	844	844	844	-	-	-	-	-	-	-
41	862	862	862	-	-	-	-	-	-	-
42	880	880	880	-	-	-	-	-	-	-
43	898	898	898	-	-	-	-	-	-	-
44	916	916	916	-	-	-	-	-	-	-
45	934	934	934	-	-	-	-	-	-	-
46	952	952	952	-	-	-	-	-	-	-
47	970	970	970	-	-	-	-	-	-	-
48	988	988	988	-	-	-	-	-	-	-
49	1006	1006	1006	-	-	-	-	-	-	-

## Immersion depths, SPK

To meet specific depths of tanks and containers, the immersion depth of the pump can be varied using empty chambers.

For the SPK range the following immersion depths are available.

The number of impellers depends on the requested head and can be found on the technical data pages for each product type.

Number of chambers	Immersion depth [mm]			
	SPK 1	SPK 2	SPK 4	SPK 8
1	140	140	140	182
2	-	-	-	224
3	182	182	182	266
4	-	-	-	-
5	224	224	224	350
6	-	-	-	392
7	266	266	266	434
8	287	287	287	476
9	-	-	-	518
10	-	-	-	560
11	350	350	350	602
12	-	-	-	644
13	392	392	392	-
14	-	-	-	-
15	434	434	434	770
16	455	455	455	-
17	476	476	476	-
18	-	-	-	896
19	518	518	518	-
20	-	-	-	-
21	560	560	560	-
22	-	-	-	-
23	602	602	602	-
24	-	-	-	-
25	644	644	644	-
26	-	-	-	-
27	-	-	-	-
28	-	-	-	-
29	-	-	-	-
30	-	-	-	-
31	770	770	770	-
32	-	-	-	-
33	-	-	-	-
34	-	-	-	-
35	-	-	-	-
36	-	-	-	-
37	896	896	896	-
15 + extension pipe	-	-	-	1005
19 + extension pipe	-	-	1005	-
23 + extension pipe	1005	1005	-	-

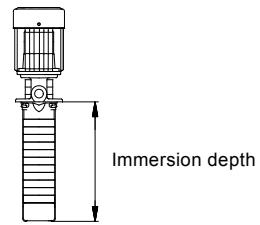


Fig. 72 Immersion depth

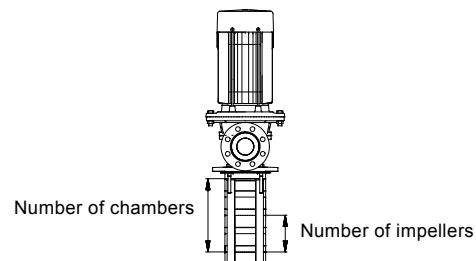


Fig. 73 Number of chambers/impellers

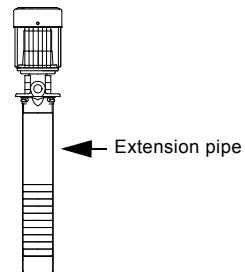
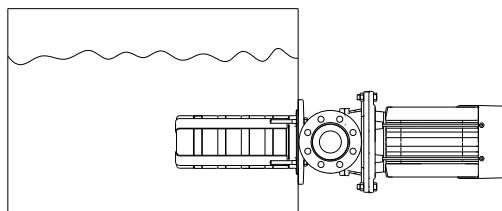


Fig. 74 Extension pipe

## Horizontal mounting

For safety or height reasons, certain applications, for instance on ships, require the pump to be mounted in horizontal position.



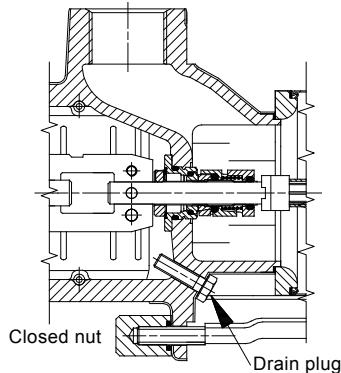
TM04 6542 0610

Fig. 75 Horizontal mounting of an MTR pump

**Note:** If the MTR, MTRE or SPK pump is to be installed horizontally, the drain hole in the pump head must be fitted with a plug, and four closed nuts with O-rings must be fitted to the straps.

For MTR, MTRE pumps horizontal mounting is only available with stainless steel pump heads.

For motors from 5.5 kW and up, motor support is required.



TM02 8043 4503

Fig. 76 Horizontal installation

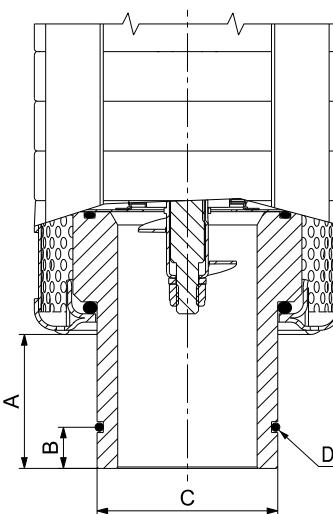
## 120 °C solution

For applications with liquid temperature above 90 °C and up to 120 °C, Grundfos offers a solution for MTR, MTRE and SPK.

## Suction pipe

For compact coolant applications the filter is mounted inside the tank, and the pump sucks directly through this filter.

Pump	A [mm]	B [mm]	C [mm]	D [mm]
MTR, MTRE 1s, 1, 3, 5	48.5	15	Ø64.8	Ø60 x 3
MTR, MTRE 10, 15, 20	48	15	Ø88.8	Ø84 x 3
MTR, MTRE 32	48	15	Ø104.8	Ø100 x 3
MTR, MTRE 45	48	15	Ø124.8	Ø119.5 x 3
MTR, MTRE 64	48	15	Ø133.7	Ø128 x 3
SPK 1, 2, 4	48	15	Ø56	Ø51.2 x 3
SPK 8	48	15	Ø56	Ø51.2 x 3
MTH 2, 4	48	15	Ø64.8	Ø60 x 3

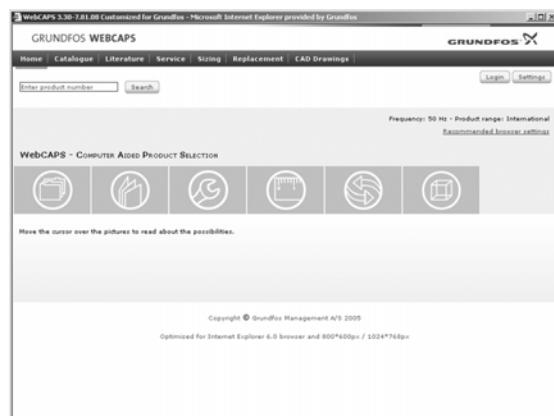


TM04 6335 0210

Fig. 77 Suction pipe

## 16. Further product information

### WebCAPS



WebCAPS is a **Web-based Computer Aided Product Selection** program available on [www.grundfos.com](http://www.grundfos.com).

WebCAPS contains detailed information on more than 220,000 Grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.

#### Catalogue

Based on fields of application and pump types, this section contains the following:

- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.

#### Literature

This section contains all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalogue and Service kit instructions
- quick guides
- product brochures.

#### Service

This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and discontinued Grundfos pumps.

Furthermore, the section contains service videos showing you how to replace service parts.

## WinCAPS



Fig. 78 WinCAPS DVD

### Sizing

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

- Select the most suitable and efficient pump for your installation.
- Carry out advanced calculations based on energy consumption, payback periods, load profiles, life cycle costs, etc.
- Analyse your selected pump via the built-in life cycle cost tool.
- Determine the flow velocity in wastewater applications, etc.

### Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.

The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.

### CAD drawings

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

#### 2-dimensional drawings:

- .dxf, wireframe drawings
- .dwg, wireframe drawings.

#### 3-dimensional drawings:

- .dwg, wireframe drawings (without surfaces)
- .stp, solid drawings (with surfaces)
- .eprt, E-drawings.



WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on DVD and updated once a year.

## GO CAPS

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