

MTR, MTRE, SPK, SPKE, MTH, MTA

Immersible pumps
50/60 Hz



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Introduction

This data booklet deals with MTR, MTRE, SPK, SPKE, MTH and MTA pumps.



TM02 8540 0404

Fig. 1 MTR, SPK, MTH and MTA pumps

MTR, SPK, MTH, MTA 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.

MTR, SPK, MTH and MTA pumps come in various pump sizes and have various numbers of stages to provide the flow, the pressure and the installation length required.

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.

MTRE and SPKE - pumps with built-in frequency-converter



TM02 8537 0408

Fig. 2 MTRE and SPKE pumps

MTRE and SPKE pumps are built on the basis of standard pumps.

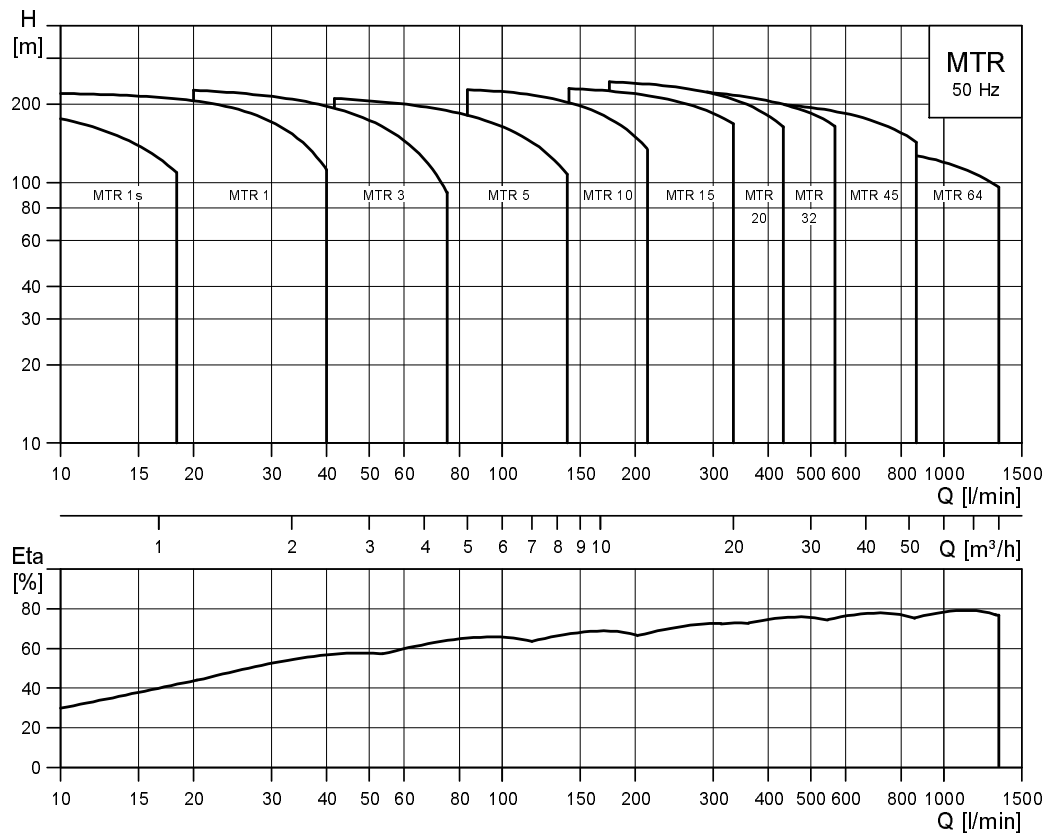
The difference between the standard pumps and the MTRE and SPKE pump ranges is the motor. MTRE and SPKE pumps are fitted with an E-motor, i.e. a motor with built-in frequency control.

The motors of the MTRE and SPKE pumps are Grundfos MGE motors designed to EN standards.

Frequency control enables continuously variable control of motor speed, which makes it possible to set the pump to operate in any duty point. Continuously variable control of the motor speed enables adjustment of the performance to a given requirement.

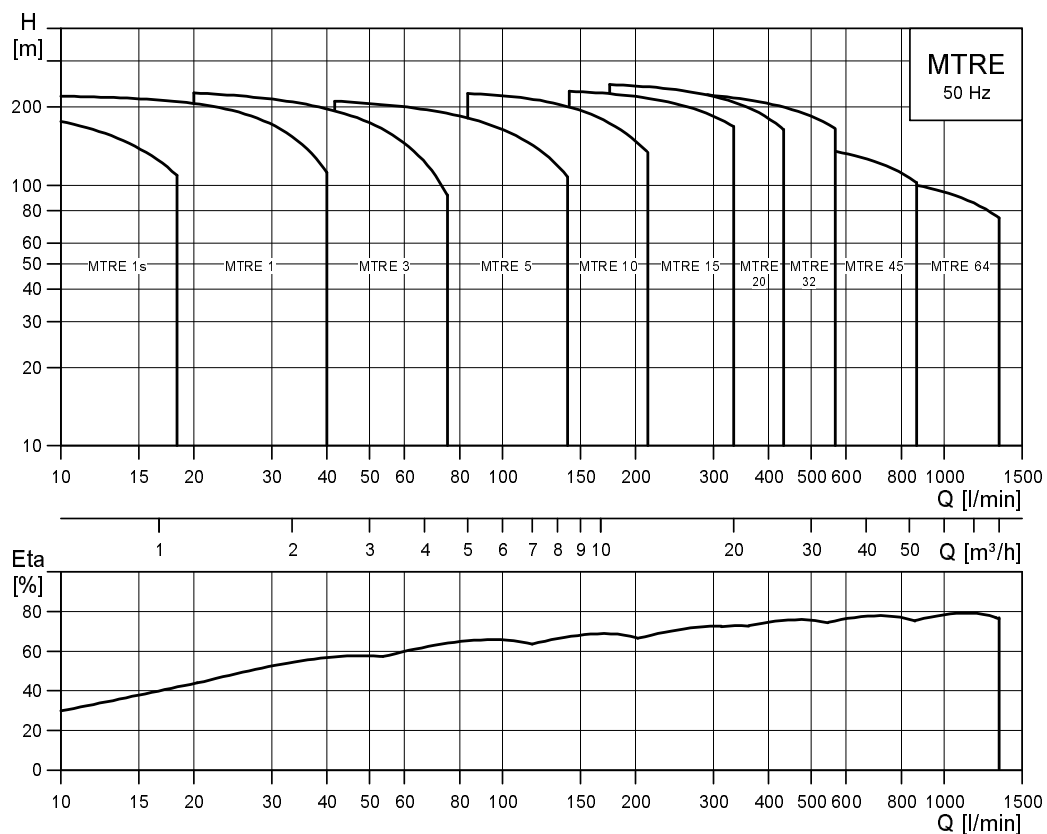
The pump materials are the same as those of the MTR and SPK pump ranges.

Performance range, MTR, 50 Hz



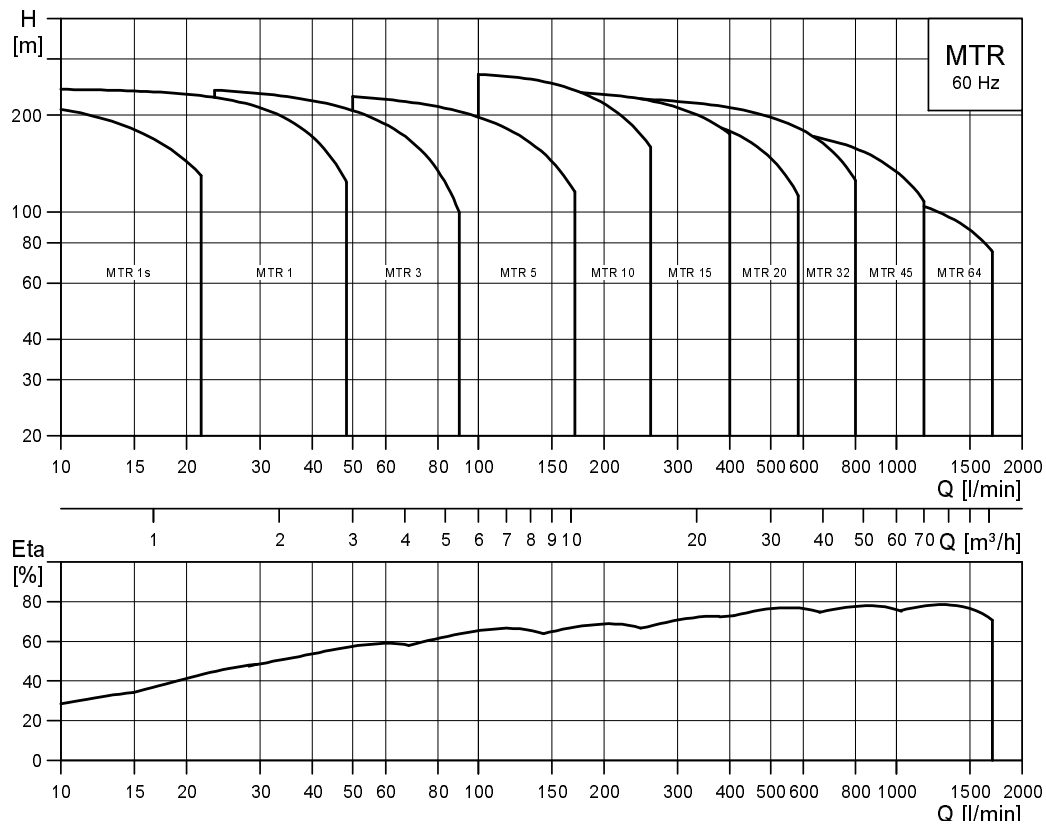
TM02 7818 1010

Performance range, MTRE, 50 Hz



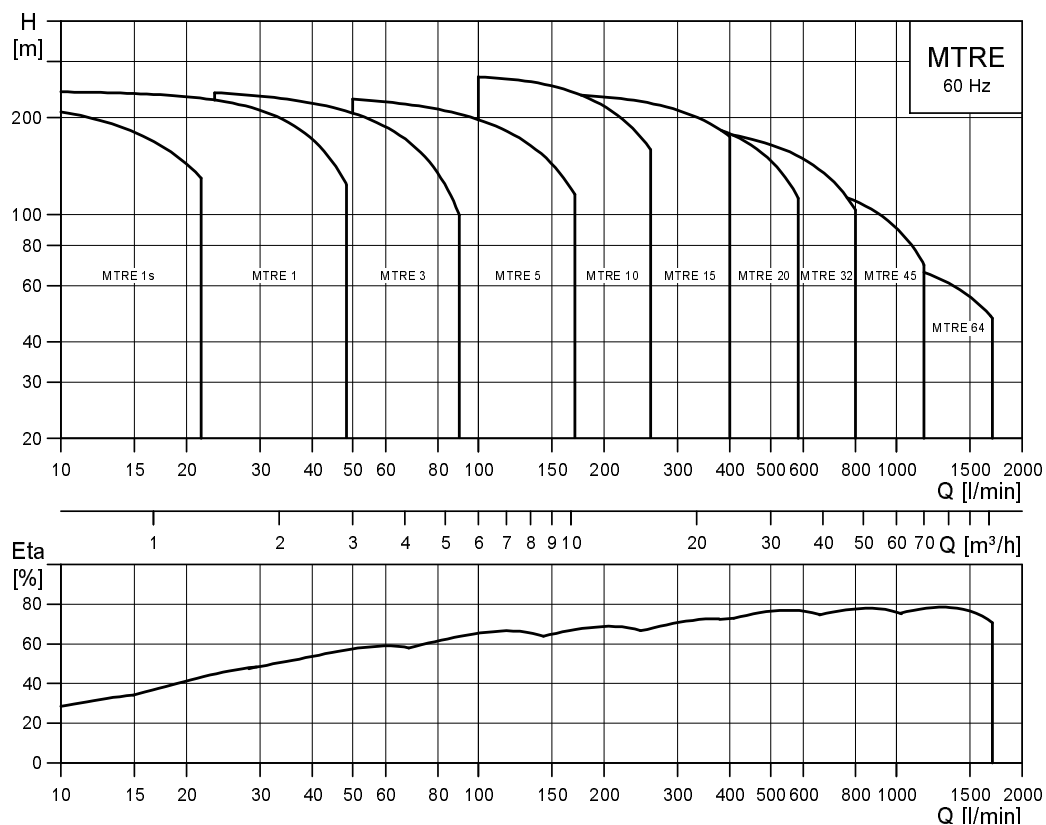
TM02 8553 1010

Performance range, MTR, 60 Hz



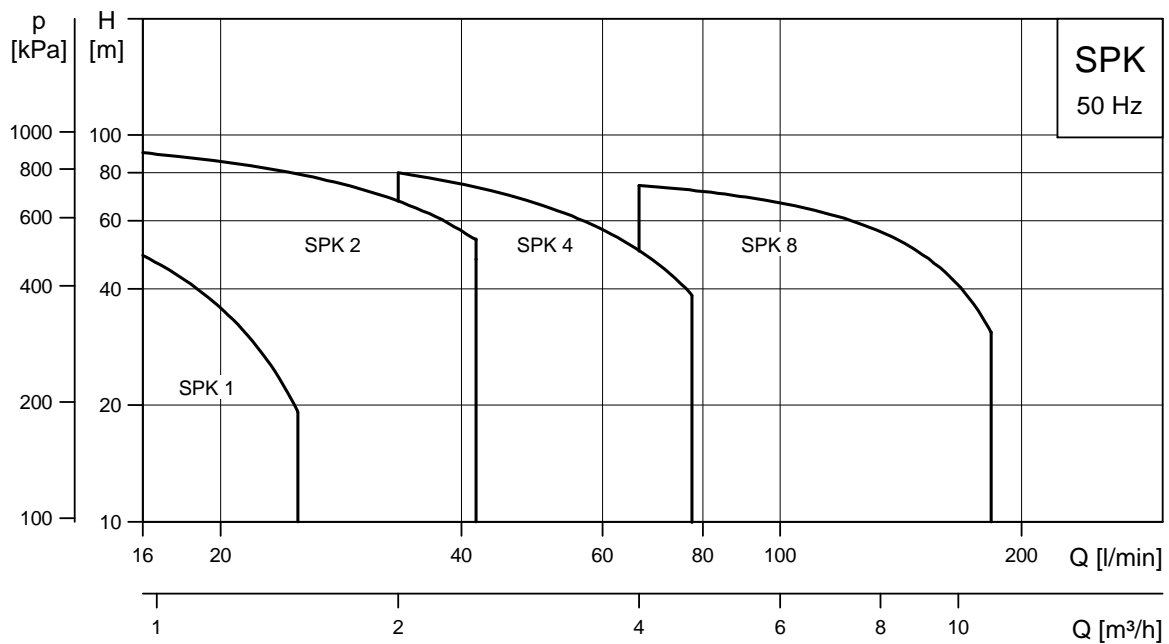
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Performance range, MTRE, 60 Hz



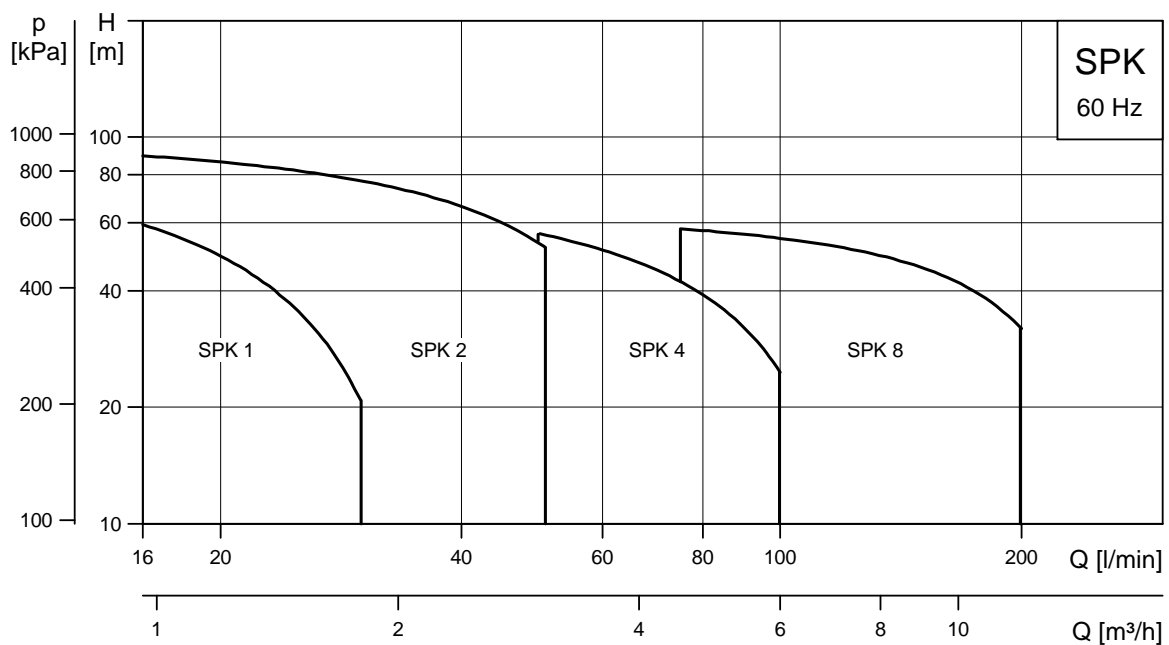
TM02 8554 1010

Performance range, SPK and SPKE, 50 Hz



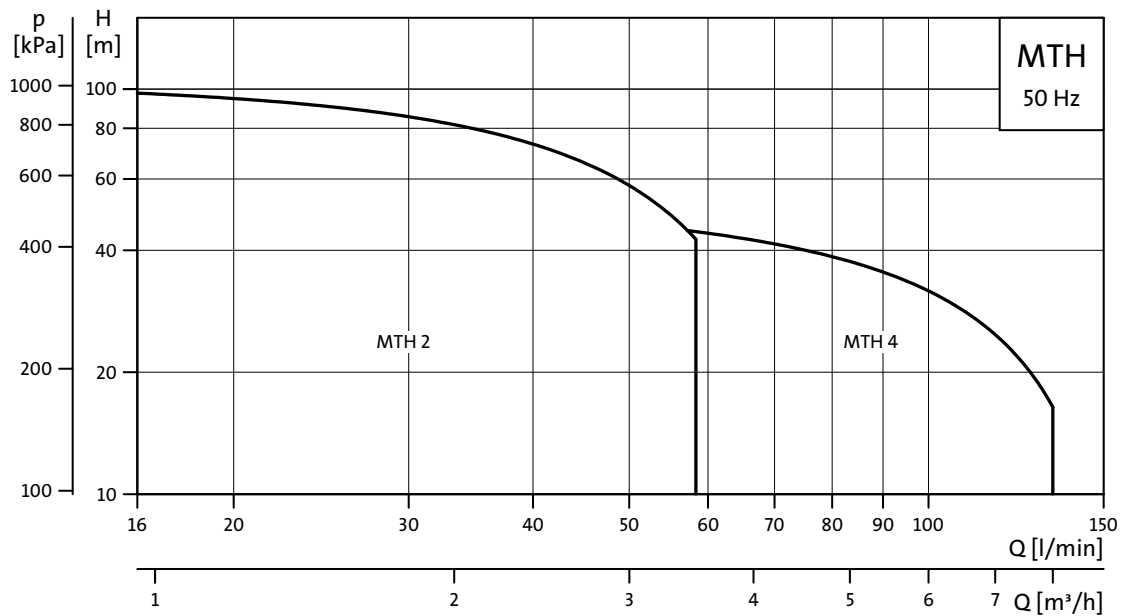
TM00 8398 0599

Performance range, SPK and SPKE, 60 Hz



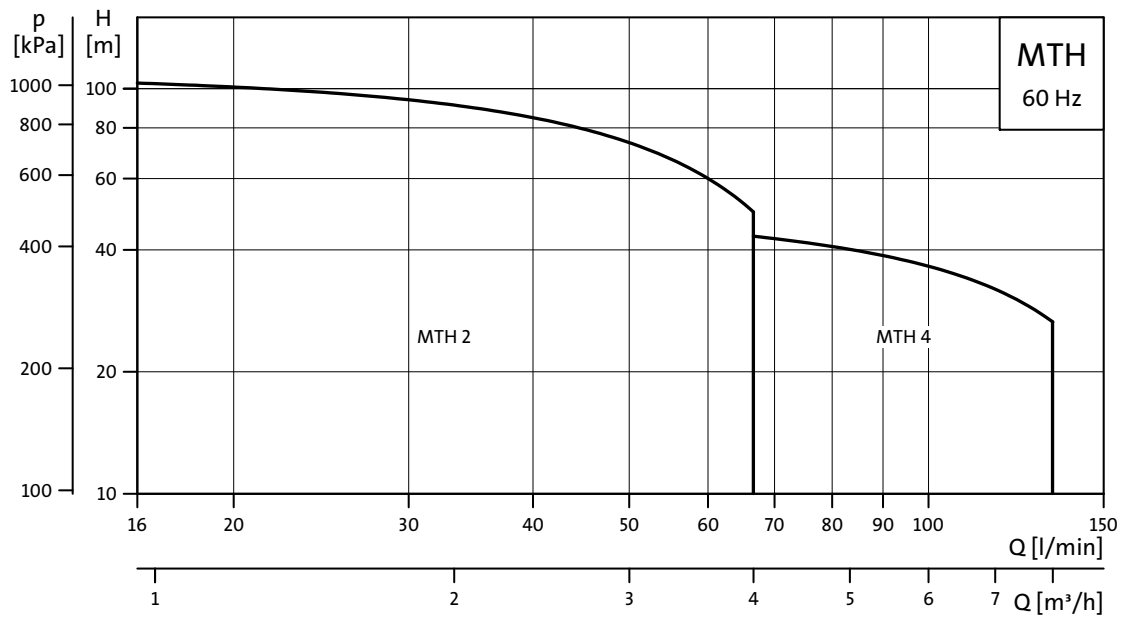
TM00 8397 0599

Performance range, MTH, 50 Hz



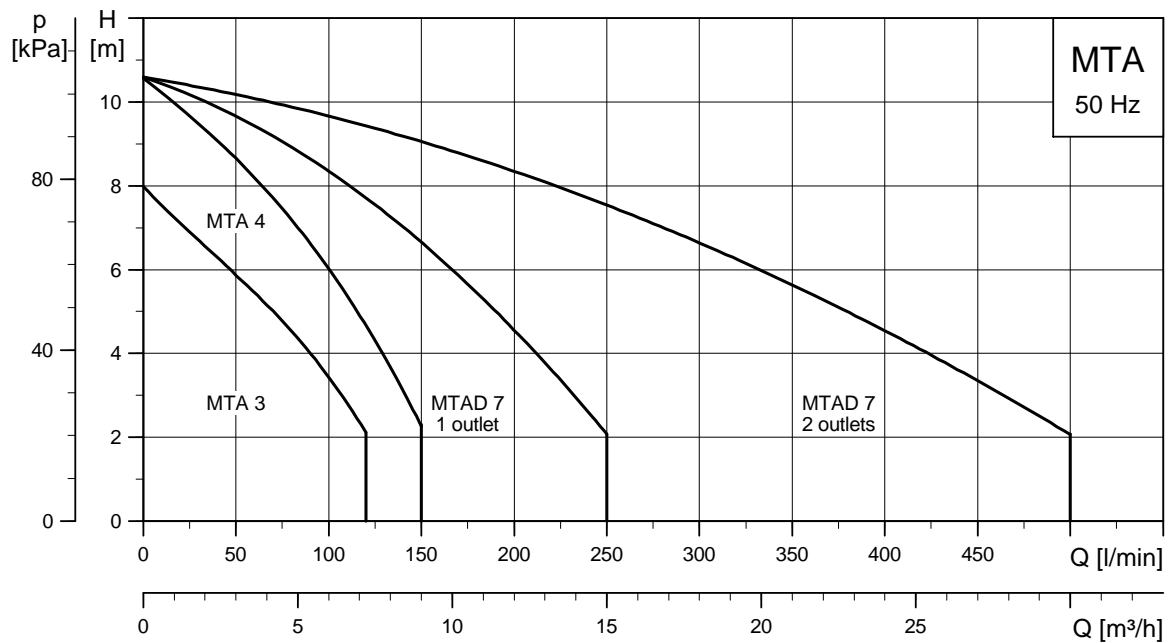
TM02 7828 4103

Performance range, MTH, 60 Hz



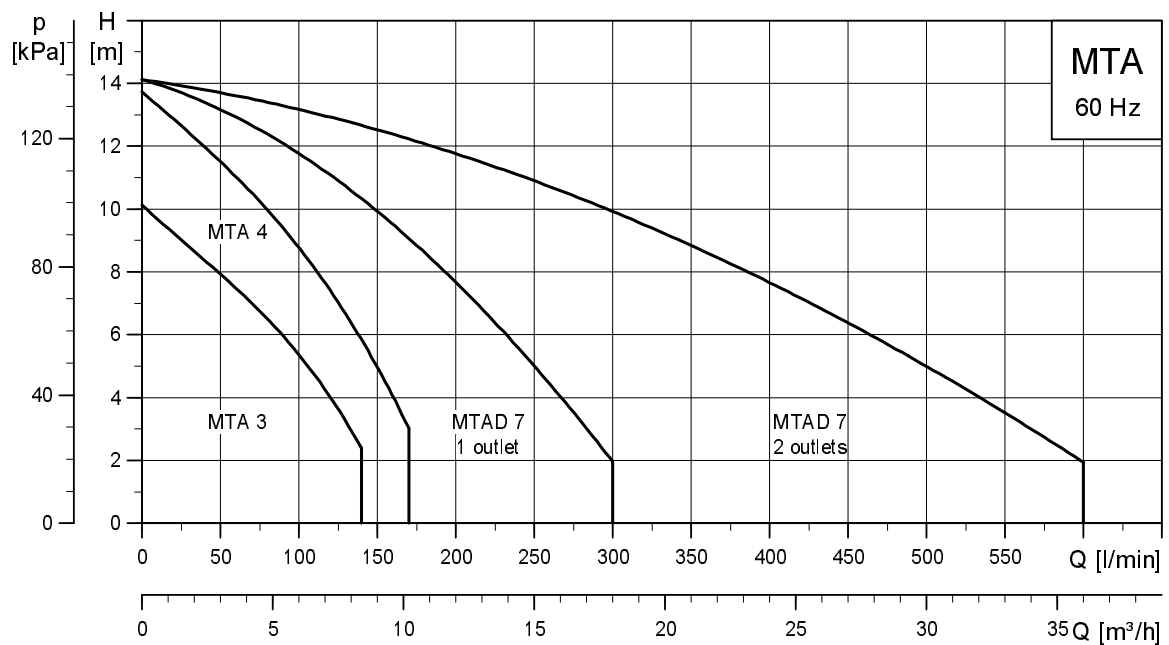
TM02 7829 4103

Performance range, MTA, 50 Hz



TM01 8552 0400

Performance range, MTA, 60 Hz



TM01 8553 3309

Applications

Application	MTR(E)	SPK(E)	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 MTH, MTR, SPK and MTS, offering a tank mounted design. For MTS data, see 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 media 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. MTA and MTB with open impellers are ideal for chip conveying into the filtration system. For MTB data, see separate MTB data booklet.

Part washing

The Grundfos range includes pumps suitable for corrosive media and media 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

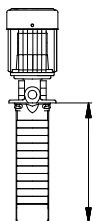
As condensate is normally pumped from a tank, an immersible pump will be a perfect choice. Compact solution as half the pump will be in the tank. Optimum suction as no pipes or valves are needed in front of inlet. For temperatures above 90 °C, a 120 °C version is available.

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 media.

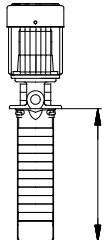
Product range, MTR, MTRE

Pump	MTR 1s	MTR, MTRE 1	MTR, MTRE 3	MTR, MTRE 5	MTR, MTRE 10	MTR, MTRE 15	MTR, MTRE 20	MTR 32	MTR 45	MTR 64
50 Hz										
Rated flow rate [m ³ /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 to +90									
Maximum efficiency [%]	35	48	58	66	70	72	72	76	78	80
MTR pumps										
Flow range [m ³ /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	19	14
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	3.0-30	4.0-30
MTRE pumps										
Flow range [m ³ /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
60 Hz										
Rated flow rate [m ³ /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 to +90									
Maximum efficiency [%]	35	49	59	67	70	72	72	76	78	79
MTR pumps										
Flow range [m ³ /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	21	18	12
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	2.2-18.5	2.2-30	5.5-30	7.5-30
MTRE pumps										
Flow range [m ³ /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	8
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
Material variants										
Pump head (A version): Cast iron, EN-GJL-200	•	•	•	•	•	•	•	•	•	•
Pump head (I version): Stainless steel, EN 1.4408	•	•	•	•	•	•	•	•*	•*	•*
Pipe connection										
A-version										
Internal thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 2	G 2	G 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
I-version										
Internal thread	G 1 1/4	G 1 1/4	G 1 1/4	G 1 1/4	G 2	G 2	G 2	-	-	-
Flange	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*
Installation length [mm]										
	160-1006	160-1006	160-1006	169-1006	148-1018	178-1033	178-1033	223-1343	244-1444	249-1487
Shaft seal										
HUVV **	•	•	•	•	•	•	•	•	•	•



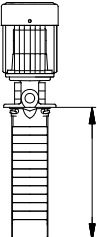
* Available from mid 2010
** Other shaft seals on request

Product range, SPK, SPKE

Pump	SPK 1	SPK 2	SPK 4	SPK 8
50 Hz				
Rated flow rate [m ³ /h]	1	2	4	8
Rated flow rate [l/min]	16.7	33.3	67	133
Flow range [m ³ /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 to +90	-10 to +90	-10 to +90	-10 to +90
Maximum efficiency [%]	40	55	50	58
Range 60 Hz				
Rated flow rate [m ³ /h]	1	2	4	8
Rated flow rate [l/min]	16.7	33.3	67	133
Flow range [m ³ /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 to +90	-10 to +90	-10 to +90	-10 to +90
Maximum efficiency [%]	40	55	50	58
Material variants				
Pump head (A version): Cast iron, EN-GJL-200	•	•	•	•
Pump head (I version): Stainless steel, EN 1.4408	•	•	•	•
Pipe connection				
A-version				
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
I-version				
Internal thread	Rp 3/4	Rp 3/4	Rp 3/4	Rp 1 1/4
Internal thread	G 3/4	G 3/4	G 3/4	G 1 1/4
Installation length [mm]				
	140-1005	140-1005	140-1005	140-1005
Shaft seal				
AUUV *	•	•	•	•

* Other shaft seals on request.

Product range, MTH

Pump	MTH 2	MTH 4
50 Hz		
Rated flow rate [m ³ /h]	2.5	4
Rated flow rate [l/min]	42	67
Temperature range [°C]	-10 to +90	
Maximum efficiency [%]	68	66
Flow range [m ³ /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
60 Hz		
Rated flow rate [m ³ /h]	3	4.8
Rated flow rate [l/min]	50	80
Temperature range [°C]	-10 to +90	
Maximum efficiency [%]	45	45
Flow range [m ³ /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
Material variants		
Pump head (A version): Cast iron, EN-GJL-200	•	•
Pump head (I version): Stainless steel, EN 1.4408	•	•
Pipe connection		
A-version		
Internal thread	Rp 3/4	Rp 3/4
I-version		
Internal thread	Rp 3/4	Rp 3/4
Installation length [mm]		
	145-289	145-307
Shaft seal		
AUUV	•	•
AUUE*	•	•

* Other shaft seals on request.

Product range, MTA

Pump	MTA 3	MTA 4	MTAD 7 - 1 outlet	MTAD 7 - 2 outlets
50 Hz				
Rated flow rate [m ³ /h]	3	4	7	7
Rated flow rate [l/min]	50	67	117	117
Temperature range [°C]	-10 to +90			
Maximum efficiency [%]	29	31	36	36
Flow range [m ³ /h]	0-7.2	0-9	0-15	0-30
Flow range [l/min]	0-120	0-150	0-250	0-500
Maximum head [bar]	0.8	1	1	1
Motor power [W]	220-320	360-560	1050-1600	1050-1600
60 Hz				
Rated flow rate [m ³ /h]	3.6	5	8	8
Rated flow rate [l/min]	60	83	133	133
Temperature range [°C]	-10 to +90			
Maximum efficiency [%]	30	31		
Flow range [m ³ /h]	0-8.4	0-10	0-18	0-36
Flow range [l/min]	0-140	0-170	0-300	0-600
Maximum head [bar]	1	1.3	1.4	1.4
Motor power [W]	220-320	360-560	1600	1600
Material				
Pump head/pump body (A version) Cast iron, EN-GJL-200	●	●	●	●
Pipe connection				
Internal thread	Rp 3/4	Rp 3/4	Rp 1 1/4	Rp 1 1/4
Installation length [mm]	180	250	250	250

Description of the pumps

MTR pumps

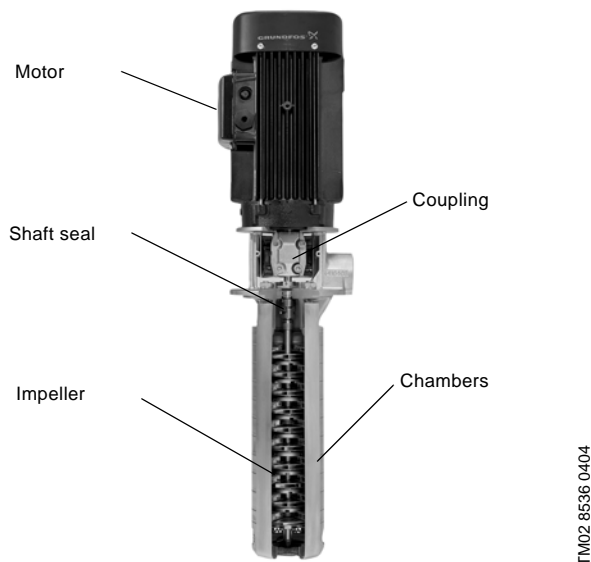


Fig. 3 MTR pump

The pump is a vertical multistage centrifugal pump with mechanical shaft seal according to EN 12 756.

Mounting flange dimensions are according to DIN 5440.

The pumps are available in two 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.

Grundfos offers the following types of pipework connection for MTR pumps:

Version	Connection	Code
A version	Internal thread	G/Rp/NPT
	Square flange	Rp
	Flange	DIN/JIS/ANSI
I version	Internal thread	G/Rp/NPT
	Flange	DIN/JIS/ANSI

The pump is fitted with closed impellers offering optimum hydraulic efficiency and minimum power consumption.

To meet specific depths of tanks or containers, the immersible length of the pump can be varied using empty chambers.

SPK pumps

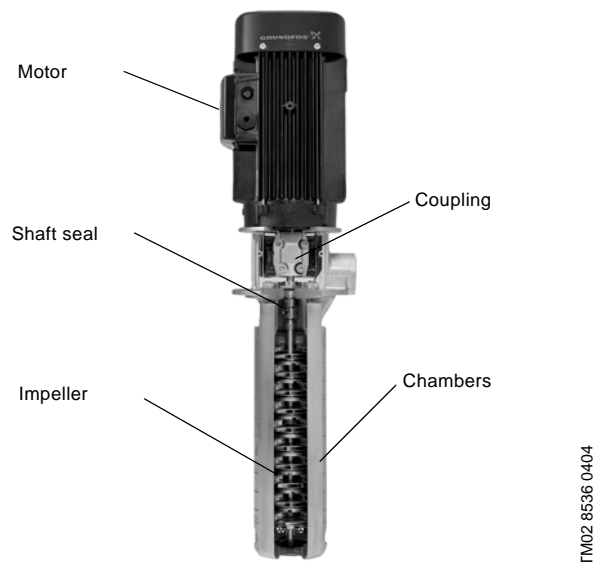


Fig. 4 SPK pump

The pump is a vertical multistage centrifugal pump with mechanical shaft seal according to EN 12 756.

Mounting flange dimensions are according to DIN 5440.

The pumps are available in two 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.

Grundfos offers the following types of pipework connection for SPK pumps:

Version	Connection	Code
A version	Internal thread	G/NPT
	Square flange	Rp
I version	Internal thread	G/Rp/NPT

The pump is fitted with closed impellers offering optimum hydraulic efficiency and minimum power consumption.

To meet specific depths of tanks or containers, the immersible length of the pump can be varied using empty chambers.

MTH pumps



G12774

Fig. 5 MTH pump

The pump is a vertical multistage centrifugal pump with mechanical shaft seal according to EN 12 756.

Mounting flange dimensions are according to DIN 5440.

The pumps are available in two 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.

Grundfos offers the following types of pipework connection for MTH pumps:

Version	Connection	Code
A version	Internal thread	Rp/NPT
I version	Internal thread	Rp/NPT

The pump is fitted with closed impellers offering optimum hydraulic efficiency and minimum power consumption.

MTH pumps are fitted with an integrated Grundfos motor where the rotor shaft is used as pump shaft.

To meet specific depths of tanks or containers, the immersible length of the pump can be varied using empty chambers.

MTA pumps



TMD4 5978 4509

Fig. 6 MTA pump

The MTA pumps are single-chamber or two-chamber vertical centrifugal pumps (MTAD). MTAD has two separate outlets.

MTA pumps are fitted with open impellers for use in unfiltered coolants.

From factory, a 4 mm strainer is fitted on the retainer to meet the requirements of the CE marking. The strainer can be removed by the user if needed.

Mounting flange dimensions are according to DIN 5440/JEM 1242.

Grundfos offers the following types of pipework connection for MTH pumps:

Version	Connection	Code
A version	Internal thread	Rp/NPT

The MTA pump has no shaft seal.

Motors

Motors for MTR, MTRE and SPK, SPKE 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.

Electrical data, MTR/SPK pumps

Mounting designation	Up to 4 kW	V 18/B 14
	From 5.5 kW	V 1/B 5
Insulation class	F	
Enclosure class	IP55	
Efficiency class	0.06-0.55 kW	-
	0.75-30 kW	IE2
	1.1-30 kW	EFF1
Supply voltage, 50 Hz (Tolerance ± 10 %)	0.06-30 kW:	3 x 220-240/380-415 V
	0.37-5.5 kW	3 x 380-415 V Δ
	7.5-30 kW	3 x 380-415/660-690 V
Supply voltage, 60 Hz (Tolerance ± 10 %)	0.06-0.18 kW	3 x 220-277/380-480 V
	0.25-1.1 kW	3 x 220-255/380-440 V
	1.5-30 kW	3 x 220-277/380-480 V
	0.37-5.5 kW	3 x 380-440 V Δ
	7.5-30 kW	3 x 380-480/660-690 V

MTR pumps are also available for

Supply voltage, 50 Hz	0.06-30 kW	3 x 200-220/346-380 V
Supply voltage, 60 Hz	0.06-30 kW	3 x 200-230/346-400 V
	0.25-30 kW	3 x 208-230/460-480 V

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

Electrical data, MTRE/SPKE pumps

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

Mounting designation	Up to 4 kW	V 18/B 14
	From 5.5 kW	V 1/B 5
Insulation class	F	
Efficiency class	0.75-22 kW	IE2
	1.1-22 kW	EFF1
Enclosure class	IP55	
Standard supply voltages, 50/60 Hz (Tolerance ± 10 %)	0.37-1.5 kW	1 x 200-240 V
	0.75-22 kW	3 x 380-480 V
Other supply voltages, 60 Hz	1.5-5.5 kW	3 x 208-230 V*

* Available on request

Note: For information about the electrical data of each MTR, MTRE, SPK, SPKE pump, see "Motor data" on page 132-135.

Electrical data, MTH pumps

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

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

Electrical data, MTA pumps

The pump is fitted with a totally enclosed, fan-cooled motor.

Insulation class	F
Enclosure class	IP54
50 Hz Standard voltages	3 x 220-240/380-415 V
	3 x 200-220/346-380 V
60 Hz Standard voltages	3 x 220-277/380-480 V
	3 x 200-230/346-400 V
	3 x 208-277/360-480 V
	3 x 200-230/346-400 V
	3 x 208-266/360-460 V

Other voltages are available on request.

Motor protection

MG motors

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).

MGE motors

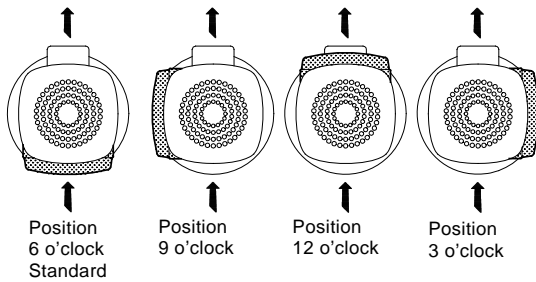
MTRE/SPKE pumps require no external motor protection. The MGE motor incorporates thermal protection against slow overloading and blocking (IEC 11: TP 211).

Terminal box positions

As standard MTR, MTR, SPK, SPKE and MTH pumps have their terminal box mounted in position 6 o'clock of the pump; however, other positions are possible.

Note: On MTH pumps the terminal box cannot be mounted in position 12 as the terminal box does not fit in that position.

On MTA pumps it is only possible to mount the terminal box in position 6 o'clock.



TM02 7777 4003

Fig. 7 Terminal box positions

Maximum number of starts

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

Sound pressure level

MT, MTRE and SPK, SPKE pumps

Motor [kW]	\bar{L}_{pA} [dB(A)]	
	50 Hz	60 Hz
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
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	70	84

The values have been measured according to EN ISO 4871.

MTH and MTA pumps

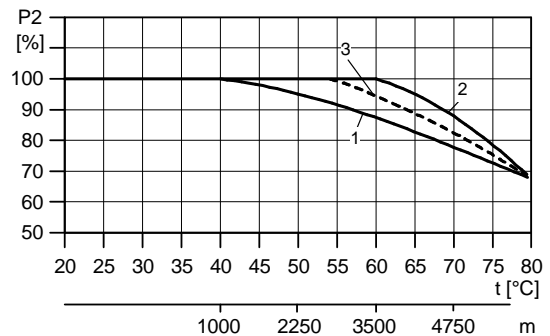
All MTH and MTA pumps have a sound pressure level below 70 dB(A).

Ambient temperature

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	Grundfos MG	IE2	+60	3500
1.1-22	Grundfos MG	IE2/EFF1	+60	3500
30	Siemens	IE2/EFF1	+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.



TM04 4914 2209

Fig. 8 The maximum motor output depends on the ambient temperature/altitude.

Legend

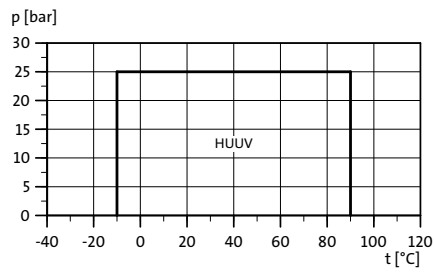
Pos.	Description
1	0.06-0.18 kW motors (Siemens): 0.37-0.55 kW motors (MG):
2	0.75 kW motors (MG, IE2): 1.1-22 kW motors (MG, IE2/EFF1):
3	30 kW motors (Siemens, IE2/EFF1)

Example: A pump with a 1.1 kW IE2/EFF1 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.

Shaft seal

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

Shaft seal, MTR, MTRE

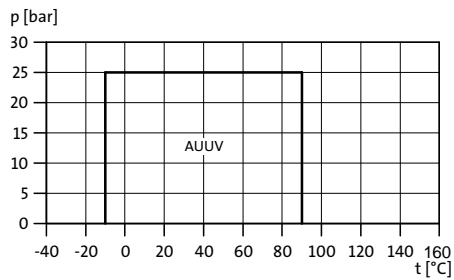


TM02 8798 0904

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

*Other shaft seals on request

Shaft seal, MTH/SPK



TM030023 4604

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

*Other shaft seals on request

MTR, MTRE 1s, 1, 3 and 5

Sectional drawing

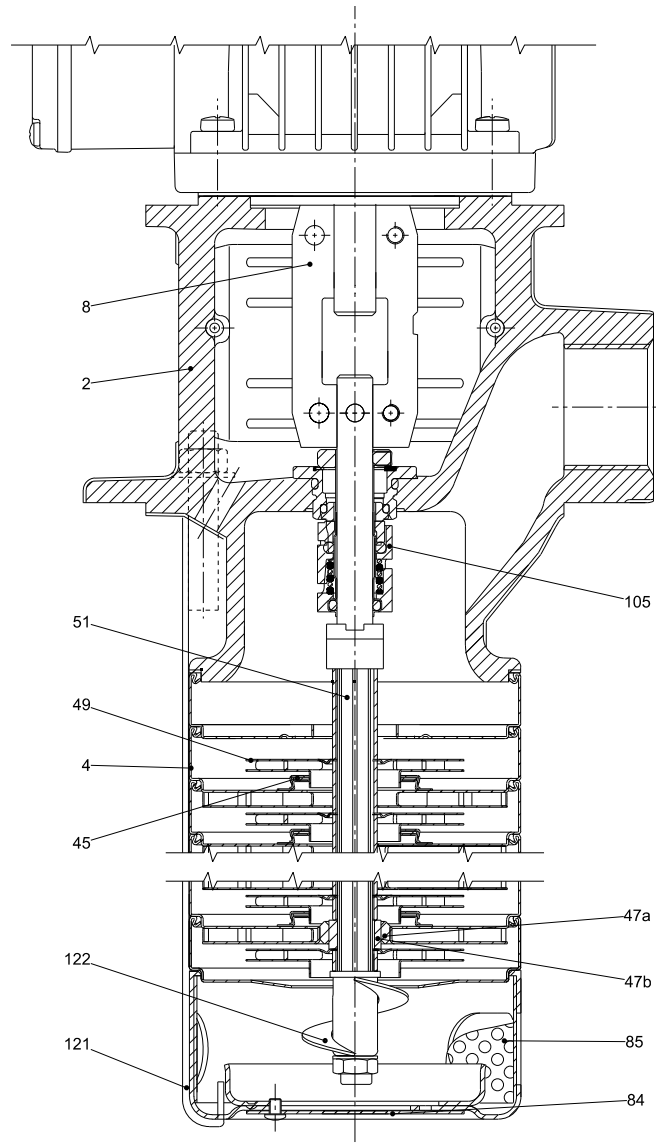


Fig. 9 MTR, MTRE 1s, 1, 3 and 5

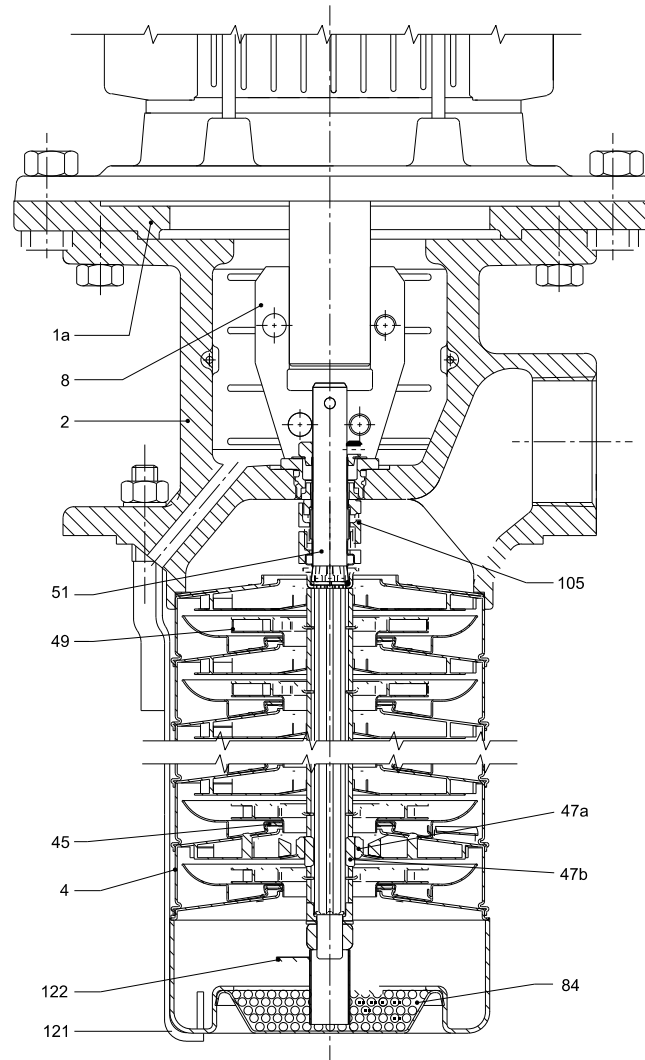
Materials

Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	A version: Cast iron	EN-GJL-200	ASTM 25B
		I version: Stainless steel	1.4408	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	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

TM02 8687 3409

MTR, MTRE 10, 15 and 20

Sectional drawing



TM02 8688 3409

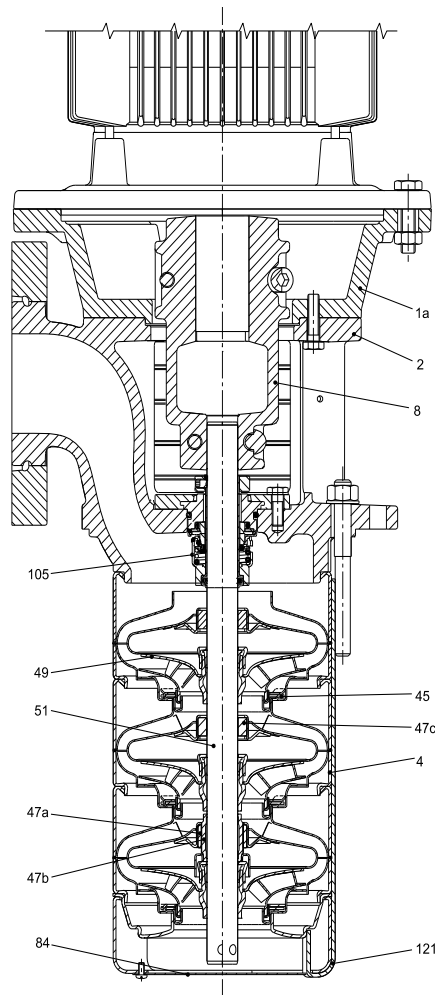
Fig. 10 MTR, MTRE 10, 15 and 20

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	EN-GJL-200	ASTM 25B
		I version: Stainless steel	1.4408	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	1.4057	AISI 431
		I version: Stainless steel	1.4460	
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



TM02.8689.3409

Fig. 11 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	EN-GJL-200	ASTM 25B
		I version: Stainless steel	1.4408	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 [®] , HY49		
49	Impeller	Stainless steel	1.4301	AISI 304
		A version: Stainless steel	1.4057	AISI 431
51	Pump shaft	I version: Stainless steel	1,4462	
		A version: NBR		
	O-ring*	I version: Depending on rubber material in shaft		
84	Suction strainer	Stainless steel	1.4301	AISI 304
105	Shaft seal	HUUUV/HUUE		
121	Strap	Stainless steel	1.4301	AISI 304

* Only used in pumps with empty chambers

SPK 1, SPK 2

Sectional drawing

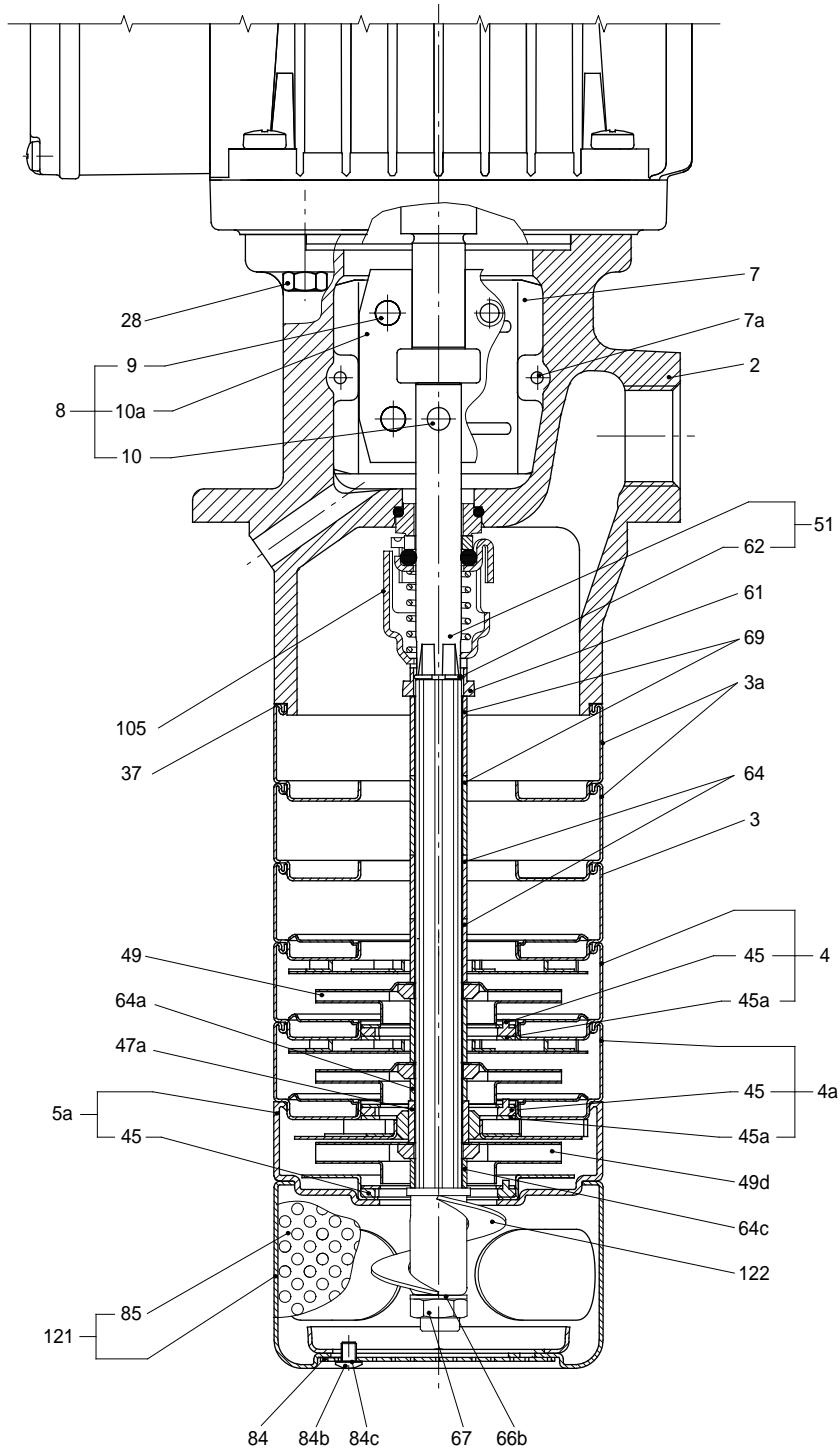


Fig. 12 SPK 1, SPK 2

For information on the materials please see page 26.

TM01 9281 1901

SPK 8

Sectional drawing

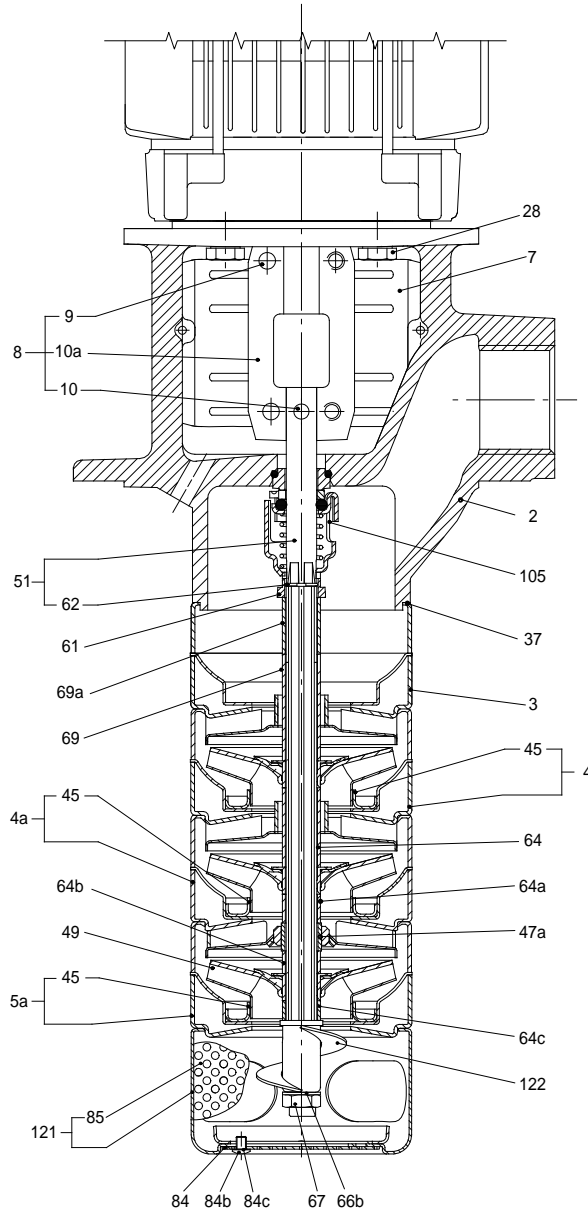


Fig. 14 SPK 8

For information on the materials please see page 26.

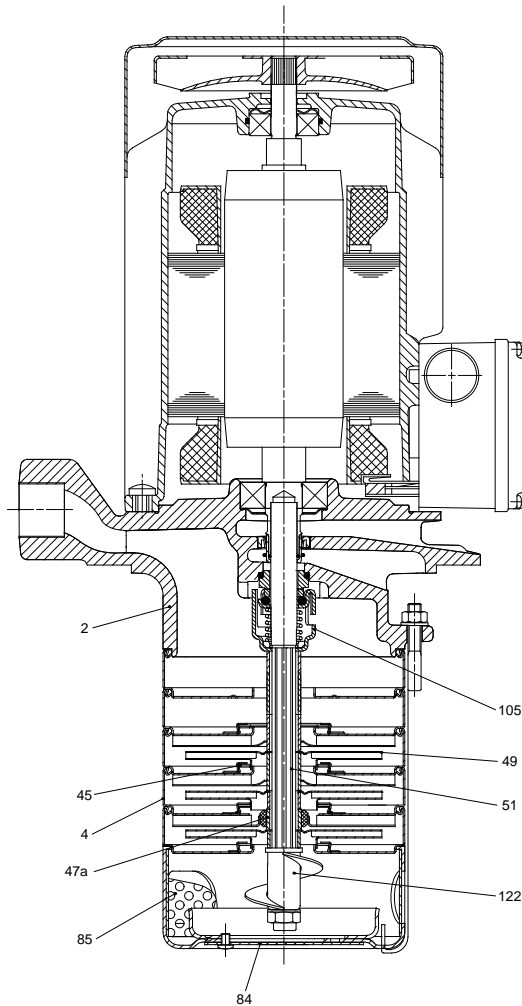
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SPK materials

Pos.	Description	Materials	EN/DIN	AISI/ASTM
Pump head				
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
Chamber without bearing				
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
Chamber with bearing				
4a	Chamber Bearing in chamber	Stainless steel Ceramic Al ₂ O ₃ 95-100 % Hilox™	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		
47a	Bearing ring	Tungsten carbide		
64a	Spacing pipe	Stainless steel	1.4401	AISI 316
64b	Spacing pipe	Stainless steel	1.4401	AISI 316
Bottom chamber				
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
Inlet part				
84	Suction strainer	Stainless steel	1.4301	AISI 304
121	Inlet part	Stainless steel	1.4301	AISI 304
84b	Set screw	Stainless steel		
Shaft				
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	Lock 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
Impeller				
49	Impeller	Stainless steel	1.4301	AISI 304
49d	Impeller, lower	Stainless steel	1.4301	AISI 304
Strap				
26	Strap	Stainless steel	1.4301	AISI 304
36	Nut	Stainless steel		
66a	Washer	Stainless steel		
Coupling				
8	Coupling	Sinter metal		
9	Hexagon socket head screw	Steel		
10	Shaft pin	Stainless steel	1.4301	AISI 304

MTH 2

Sectional drawing



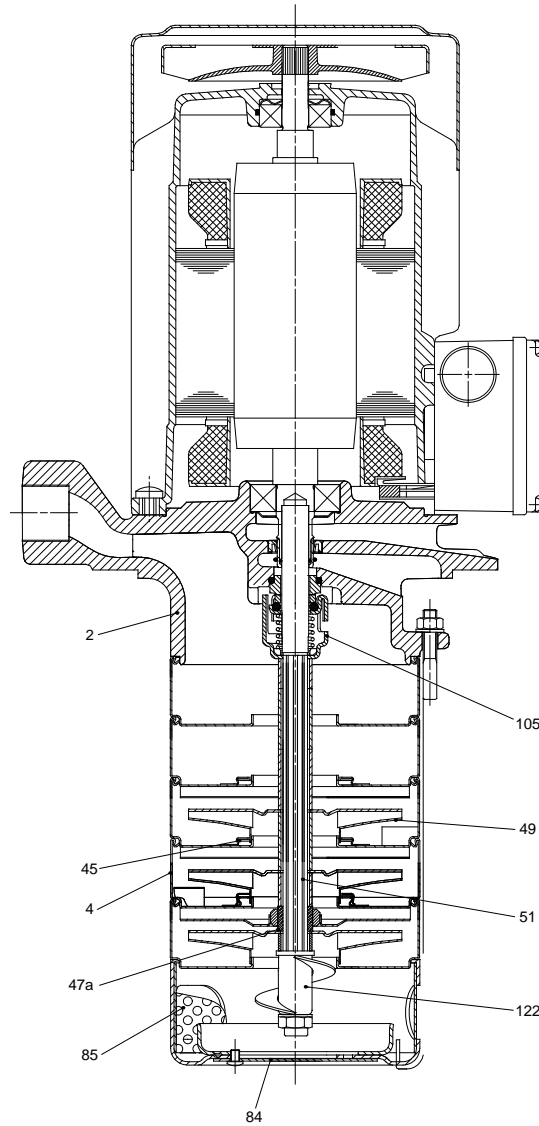
TM02 8690 0704

Material specification

Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	A version: Cast iron I version: Stainless steel	EN-GJL-200 1.4408	ASTM 25B AISI 316LN
4	Chamber	I version: Stainless steel	1.4301	AISI 304
45	Neck ring	PTFE (only MTH 2)		
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, $\varnothing 2$ mm holes	Stainless steel	1.4301	AISI 304
85	Strainer, internal	Stainless steel	1.4301	AISI 304
105	Shaft seal	AUUV		
122	Priming screw	Stainless steel	1.4301	AISI 304

MTH 4

Sectional drawing



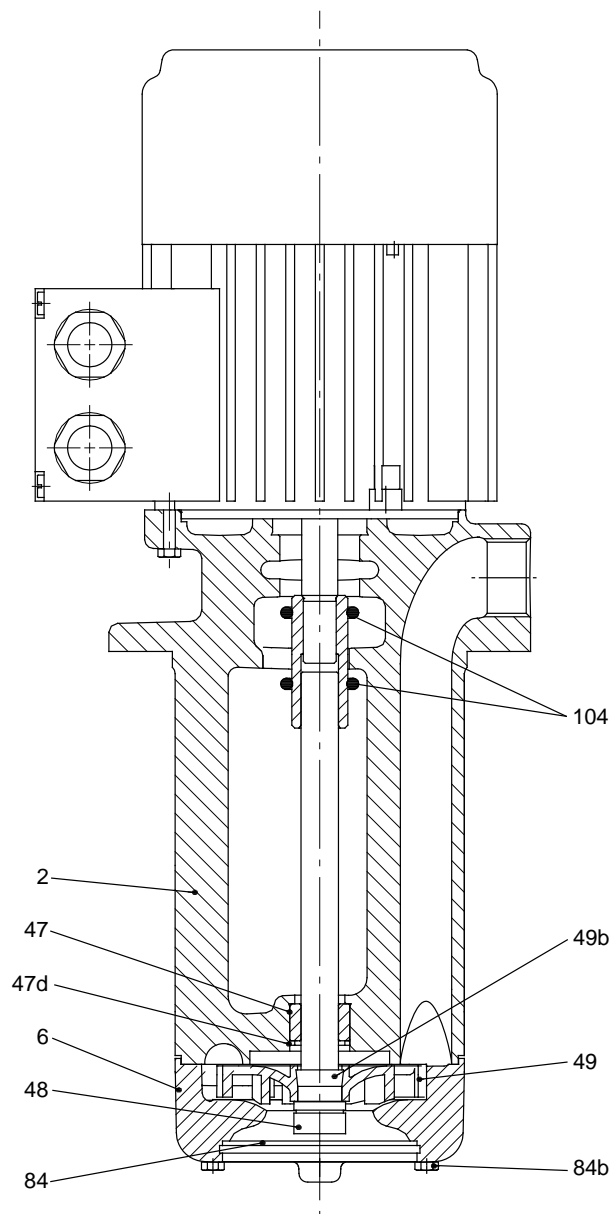
TM02 8691 0704

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	1.4408	AISI 316LN
4	Chamber	Stainless steel	1.4301	AISI 304
45	Neck ring	PTFE (only MTH 2)		
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, $\varnothing 2$ mm holes	Stainless steel	1.4301	AISI 304
85	Strainer, internal	Stainless steel	1.4301	AISI 304
105	Shaft seal	AUUV		
122	Priming screw	Stainless steel	1.4301	AISI 304

MTA 3, MTA 4

Sectional drawing



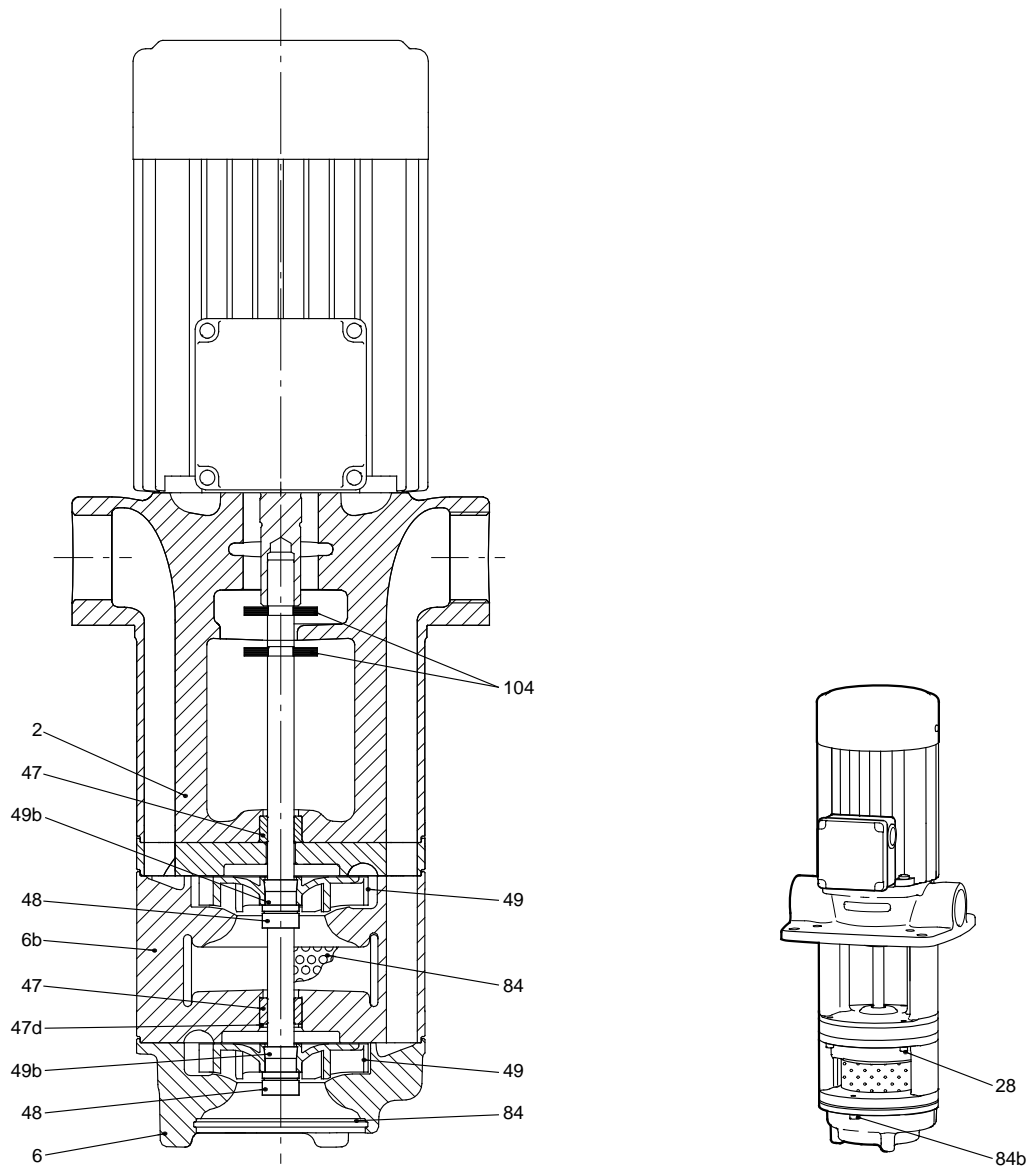
TM02 9074 1804

Material specification

Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	Cast iron	EN-GJL-150	ASTM 30B
6	Pump housing	Cast iron	EN-GJL-150	ASTM 30B
47	Bearing ring	Filled PTFE		
47d	Retaining ring	Stainless steel	1.4305	AISI 304
48	Split cone nut	Stainless steel	1.4401	AISI 316
49	Impeller	Stainless steel	1.4408	AISI 316
49b	Split cone	Stainless steel	1.4301	AISI 304
84	Suction strainer, $\varnothing 4$ mm holes	Stainless steel	1.4301	AISI 304
84b	Hexagon socket head screw	Stainless steel	1.4301	AISI 304
104	O-ring	NBR		

MTAD 7/7

Sectional drawing



TM01 9676 2506

Material specification

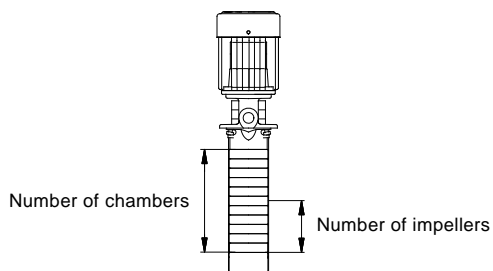
Pos.	Description	Materials	EN/DIN	AISI/ASTM
2	Pump head	Cast iron	EN-GJL-150	ASTM 30B
6	Pump housing lower	Cast iron	EN-GJL-150	ASTM 30B
6b	Pump housing upper	Cast iron	EN-GJL-150	ASTM 30B
28	Hexagon socket head screw	Stainless steel	1.4301	AISI 304
47	Bearing ring	Filled PTFE		
47d	Retaining ring	Stainless steel	1.4305	
48	Split cone nut	Stainless steel	1.4401	AISI 316
49	Impeller	Stainless steel	1.4408	AISI 316
49b	Split cone	Stainless steel	1.4301	AISI 304
84	Suction strainer, $\varnothing 4$ holes	Stainless steel	1.4301	AISI 304
84b	Hexagon socket head screw	Stainless steel	1.4301	AISI 304
104	Diverting disc	NBR		

Type keys

Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

MTR, MTRE

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 ³ /h]													
All impellers with reduced diameter (applies only to MTR 1s)													
Number of chambers, see fig. 15													
Number of impellers, see fig. 15													
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												
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 4991 1299

Fig. 15 MTR pump

SPK, SPKE

Example	SPK E 2 -15 /8 A -W -A A UU V
Pump type	
Pump with integrated frequency control	
Rated flow rate [m ³ /h]	
Number of chambers, see fig. 16	
Number of impellers, see fig. 16	
Pump version	
A Basic	
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	
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	

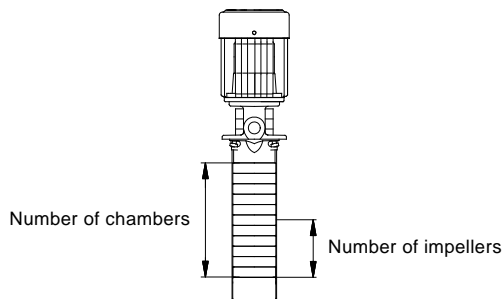


Fig. 16 SPK pump

TM01 4993 1399

MTH

Example	MTH 2 -6 /3 -A -W -A -A UU V
Pump type	
Rated flow rate [m ³ /h]	
Number of chambers, see fig. 17	
Number of impellers, see fig. 17	
Pump version	
A Basic	
C Suction pipe	
X Special version	
Pipe connection	
W Internal thread	
WB NPT internal thread	
Materials	
A Basic	
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	

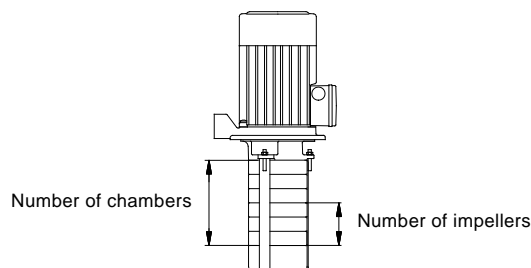


Fig. 17 MTH pump

TM01 4992 1299

Type keys

Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

MTA

Example	MTA	D	77	-250
Pump type				
Two-chamber pump				
Rated flow rate [m ³ /h]				
Installation length [mm], see fig. 18				

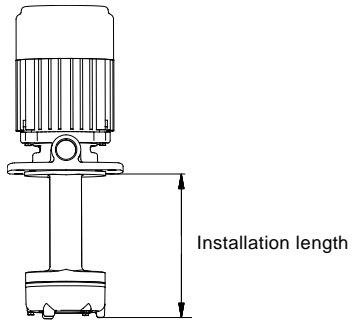


Fig. 18 MTA pump

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.

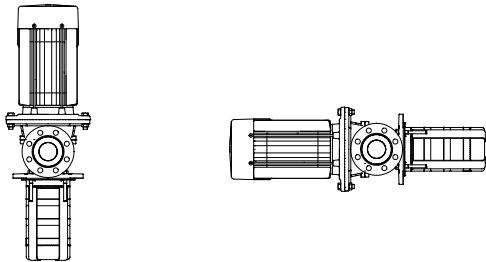


Fig. 19 Installation of a MTR, MTRE pump

TM01 4990 1399

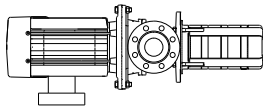


Fig. 20 On vertically installed MTR, MTRE pumps with motors from 5.5 kW and up the motors have feet and must be supported.

TM04 5755 3809

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.

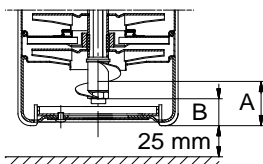


Fig. 21 MTR, MTRE 1s, 1, 3 and 5

TM00 4841 4702

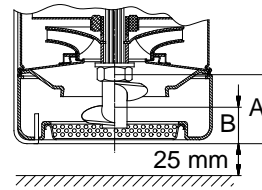


Fig. 22 MTR, MTRE 10, 15 and 20

TM00 4842 3897

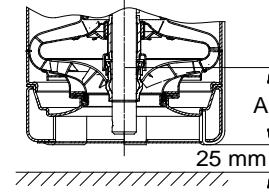
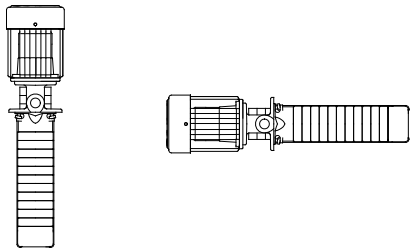


Fig. 23 MTR, MTRE 32, 45 and 64

TM01 4335 5298

Installation of SPK, SPKE pumps

SPK, SPKE 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.



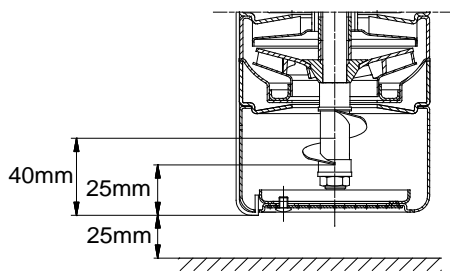
TM00 1922 3297

Fig. 24 Installation of a SPK, SPKE 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.

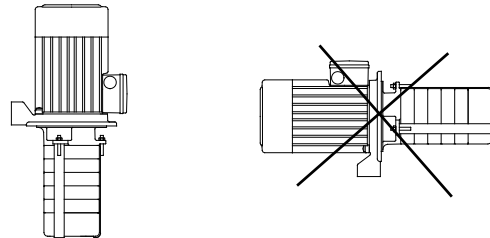


TM01 1204 4899

Fig. 25 SPK, SPKE

Installation of MTH pumps

MTH pumps must be installed vertically.

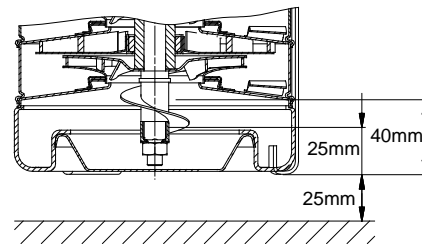


TM00 1923 3297

Fig. 26 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.

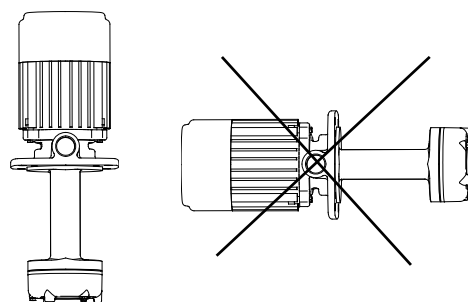


TM01 7809 4899

Fig. 27 Minimum distance between pump and tank

Installation of MTA pumps

MTA pumps are designed for vertical mounting in a tank.



TM01 8522 2203

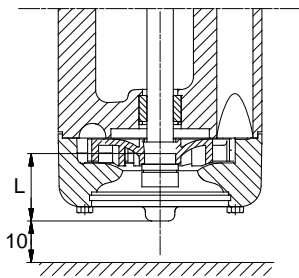
Fig. 28 Installation of MTA pump

The distance between the bottom of the pump and the bottom of the tank must be at least 10 mm.

The pumps are designed to provide full performance down to a level of L mm above the bottom of the pump, see below.

	MTA 3	MTA 4	MTAD 7/7
L [mm]	35	45	45

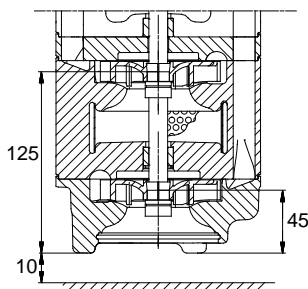
MTA 3, MTA 4



TM01 8657 2203

Fig. 29 Minimum distance between pump and tank

MTAD 7/7

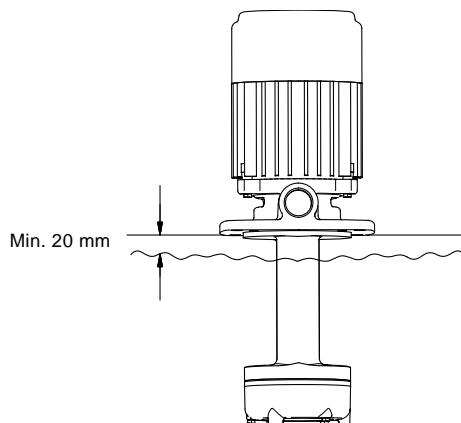


TM01 8658 2203

Fig. 30 Minimum distance between pump and tank

Maximum liquid level

To protect the motor of the MTA pump from the pumped liquid, the maximum liquid level in the installation tank must be 20 mm below the top of the tank.



TM01 9076 1000

Fig. 31 Maximum liquid level

Installation

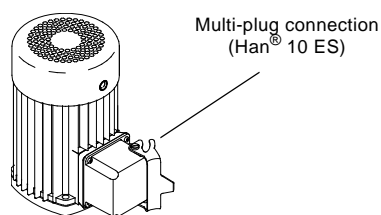
Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

Electrical installation

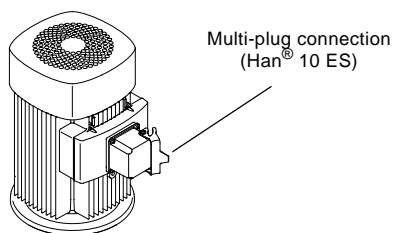
MTR, SPK, MTH and MTAD 7/7 pumps can be fitted with a 10-pin multi-plug connection, type Han[®] 10 ES.

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.

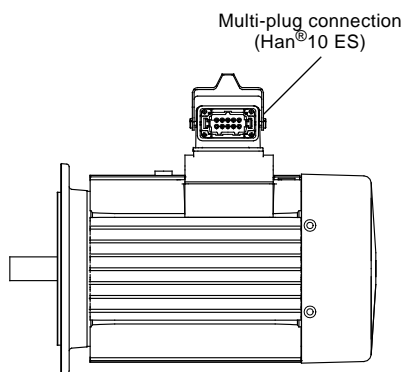


TM01 8715 1700



TM01 8713 1700

Fig. 32 Multi-plug on a Grundfos MG motor



TM02 8518 0304

Fig. 33 Multi-plug type Han[®] 10 ES

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 and
- motors for MTAD 7/7.

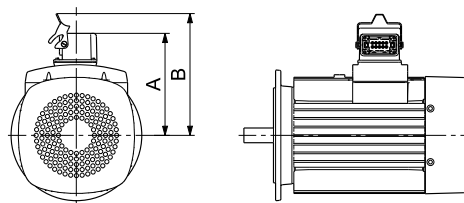
Technical data for multi-plug

Material description

Material	Description
Material	GD-Al Si 8 Cu 3
Surface	Powder paint
Clip for locking	Stainless steel

Material	Description
Housing gasket	NBR rubber
Temperature range [°C]	-40 to +125
Enclosure class	IP65 at DIN 40050 in closed position
Type	Han [®] 10E

Dimensions

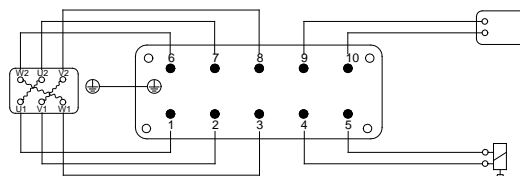


TM04 5756 3809

Fig. 34 Motor with multi-plug

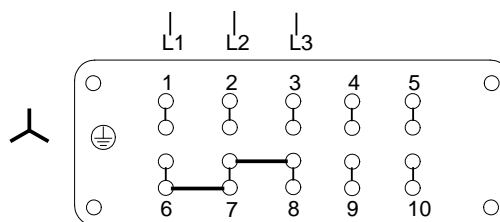
Motor	Frame size	A [mm]	B [mm]
MG	71	131	162
MG	80	131	162
MG	90	173	204
MG	100	183	214
MG	112	197	228
MG (5.5 kW)	132	197	228
MG (7.5 kW)	132	222	253

Plug connections



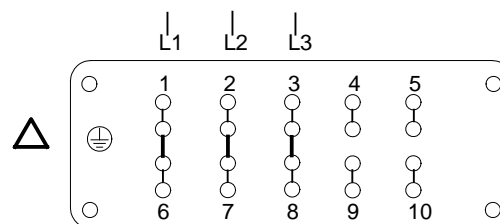
TM01 8702 0700

Fig. 35 From motor



TM01 8703 0700

Fig. 36 Plug connections for star connection



TM01 8704 0700

Fig. 37 Plug connections for delta connection.
Fishplates for connections are located in the plug.

Selection of pumps

Selection of pumps should be based on

- 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.

1. 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 "Performance curves/Technical data" starting on page 48.

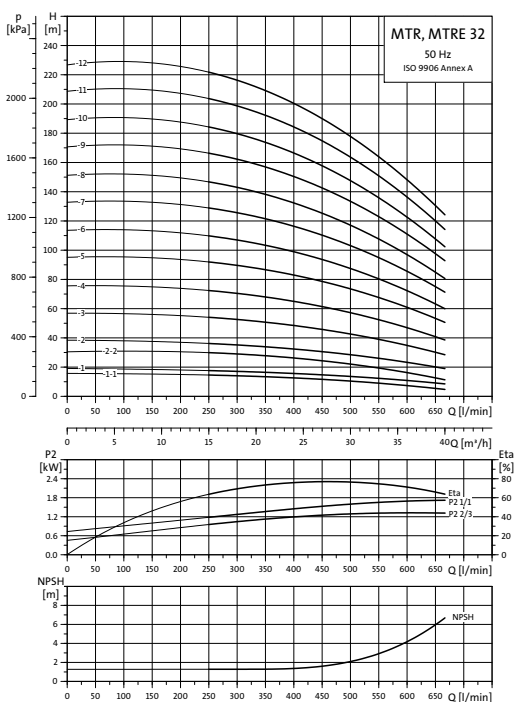


Fig. 38 Example of a curve chart

2. Dimensional data

When sizing a pump the following 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 43.

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.

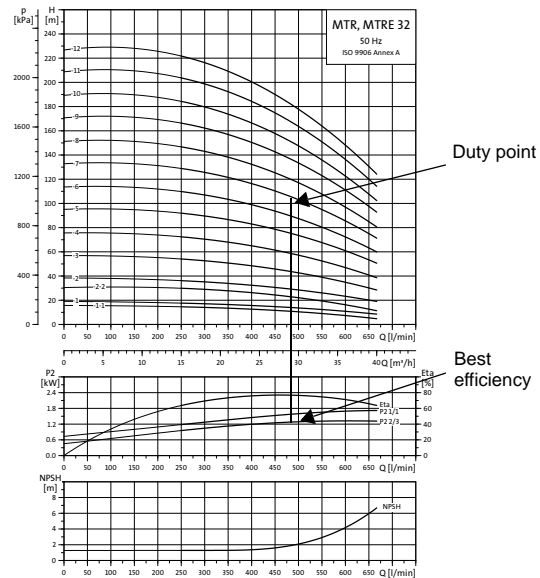


Fig. 39 Example of an MTR pump's duty point

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.

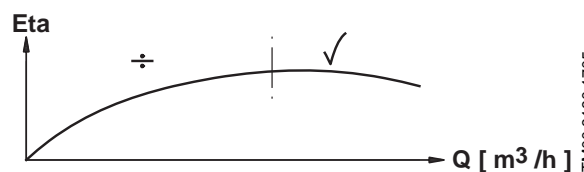


Fig. 40 Best efficiency

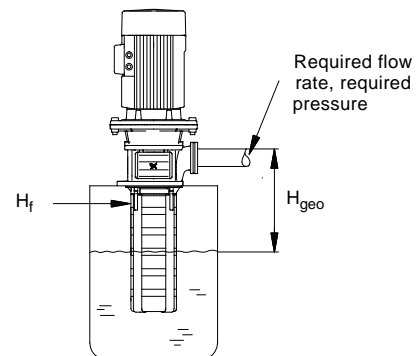


Fig. 41 Dimensional data

Selection and sizing

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 P2 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.

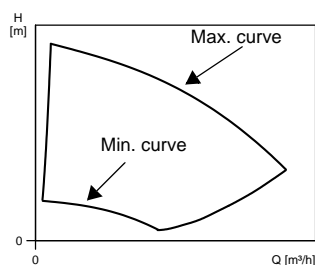


Fig. 42 Min. and max. performance curves

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.

TM01 49116 0199

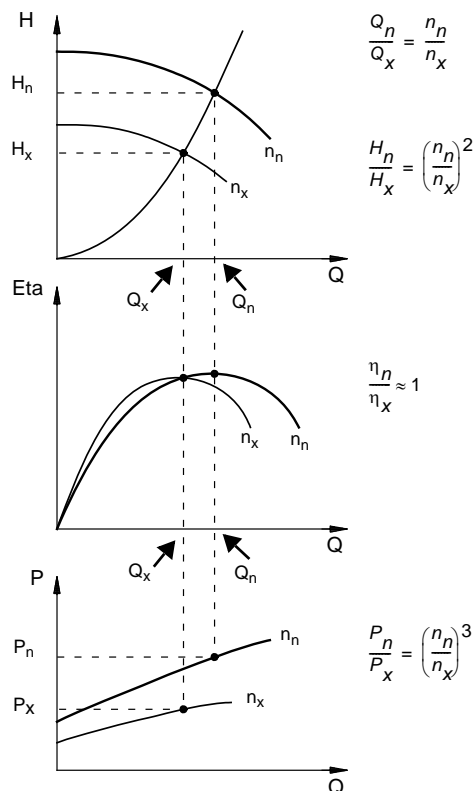


Fig. 43 Affinity equations

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}]
- η_n Rated efficiency [%]
- η_x Current efficiency [%]

WinCAPS and WebCAPS

WinCAPS and WebCAPS are both selection programmes offered by Grundfos.

The two programmes 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 pages 148 and 149.

TM00 8720 3496

3. 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.

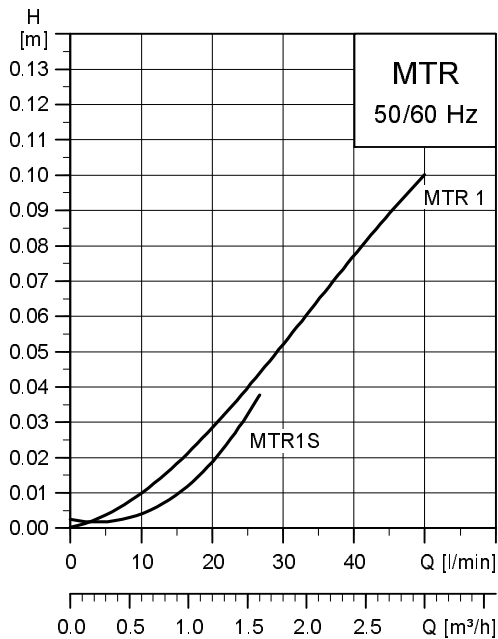


Fig. 44 Pressure losses of pumped liquid passing through an empty chamber for MTR 1s and MTR 1 pumps

TM02 8546 1010

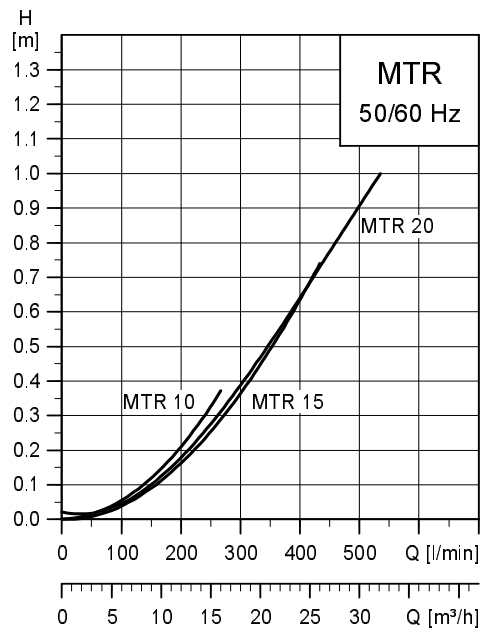


Fig. 46 Pressure losses of pumped liquid passing through an empty chamber for MTR 10, MTR 15 and MTR 20 pumps

TM02 8561 1010

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.

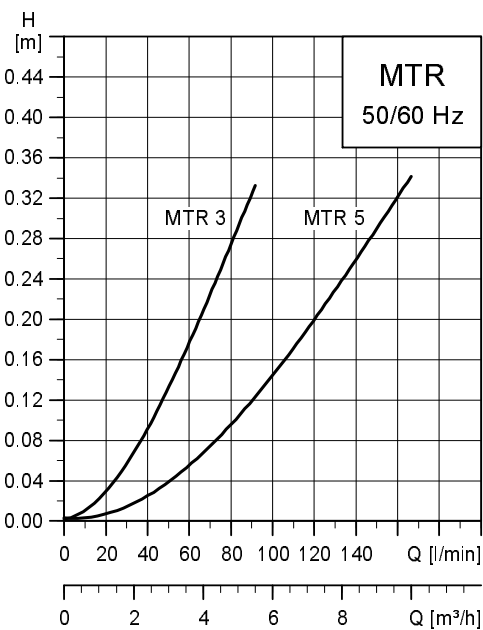


Fig. 45 Pressure losses of pumped liquid passing through an empty chamber for MTR 3 and MTR 5 pumps

TM02 8547 1010

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 38, 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 ³ /h]
Head (duty point)	90 [m]

The selected pump is an MTR 5-18/18 with 11 empty chambers, see type keys on page 31.

From the above pressure loss curve of MTR 5, it appears that the pressure loss of each empty chamber at 6 m³/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 48.

Pressure loss in chambers with impeller

The pressure loss in chambers with impeller can be calculated by means of the following formula:

$$\Delta H = k \times Q^2 \times n$$

Key:

Factor	Description
ΔH	Difference in head [m]
k	A constant
Q	Flow through the pump [m ³ /h]
n	Number of stages with impellers

Calculation of pressure loss in chambers with impeller

MTR 5-18/7 has a flow of 6 m³/h through the pump and a constant (k) of 0.11.

$$\Delta H = 0.11 \times 6^2 \times 7$$

$$\Delta H = 27.72 \text{ [m]}$$

By adding the two pressure losses you get the following total pressure loss through the idle pump:

$$\Delta H_{\text{total}} = \Delta H_{\text{empty chambers}} + \Delta H_{\text{chambers with impeller}}$$

$$\Delta H_{\text{total}} = 1.54 + 27.72$$

$$\Delta H_{\text{total}} = 29.26 \text{ [m]}$$

Selection and sizing

Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

4. Viscosity

Pump	Maximum kinematic viscosity of pumped liquid [cSt] = [mm ² /s]
MTR 1s, 1, 3, 5	50
MTR 10, 15, 20, 32, 45, 64	100
SPK	50
MTH	50
MTA	70

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/m³ but with three different kinematic viscosities.

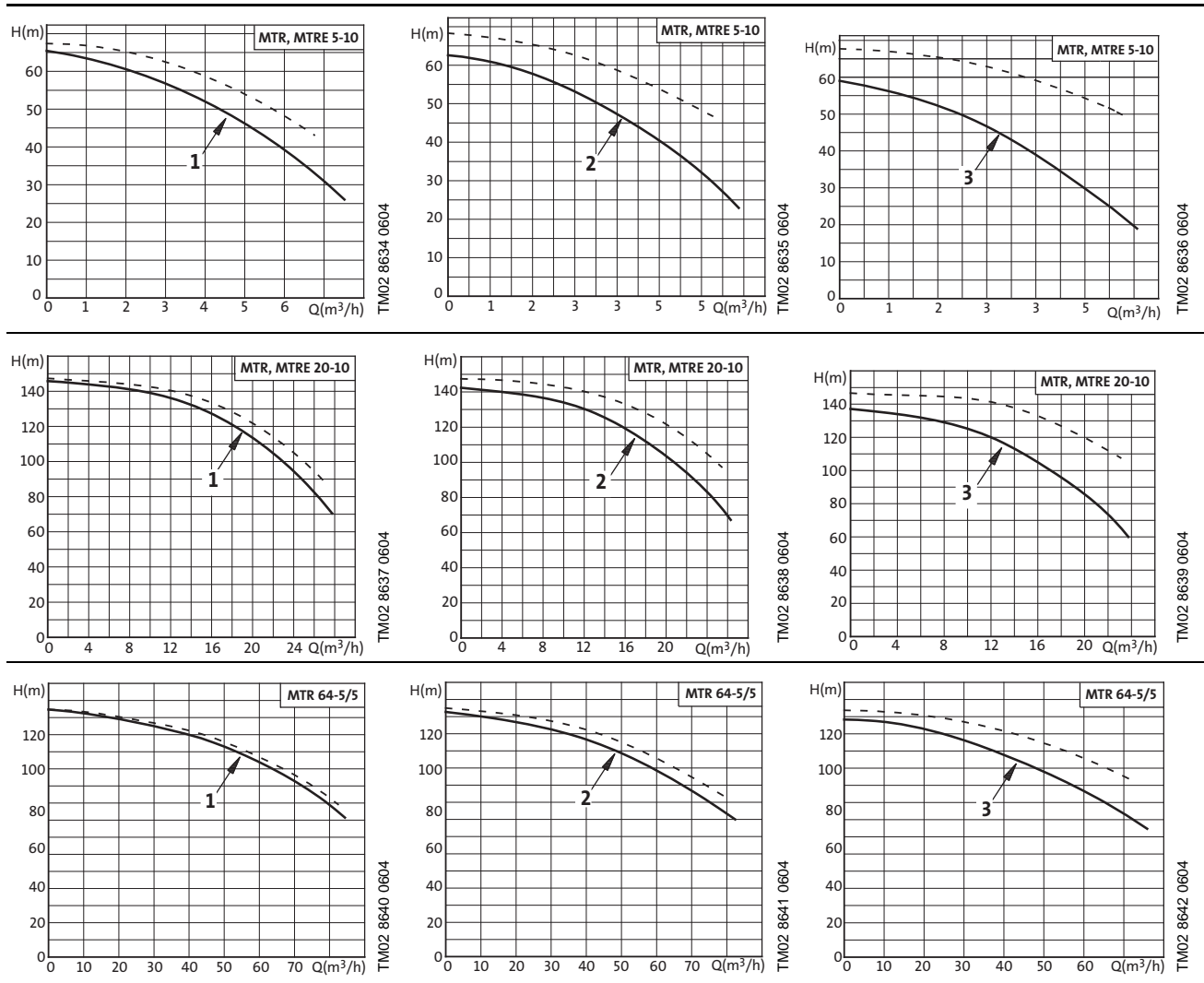


Fig. 47 Drop in the hydraulic performance of MTR(E) pumps pumping oil with three different kinematic viscosities.

Key

Position	Density [kg/m ³]	Kinematic viscosity [cSt] = [mm ² /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 149.

Selection and sizing

Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

Kinematic viscosity of different oils

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

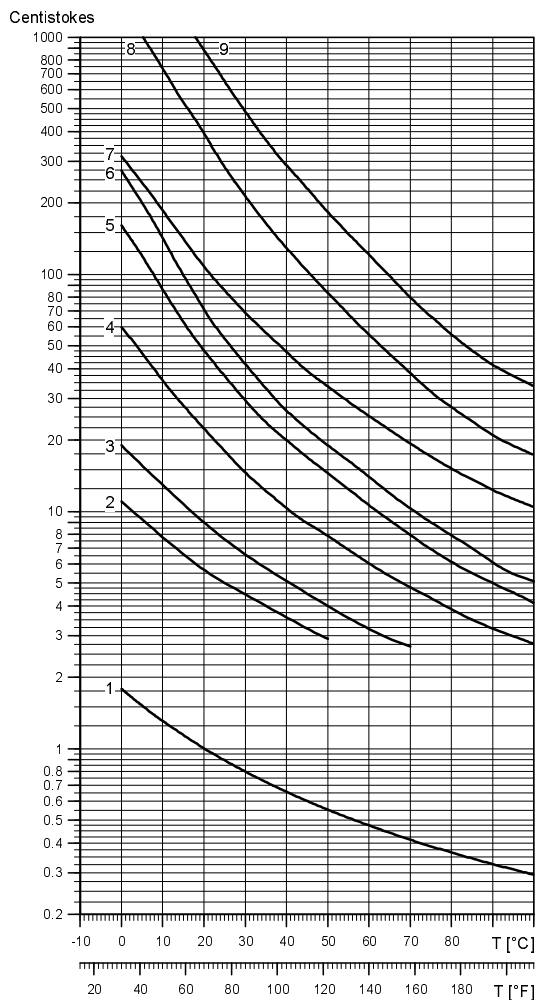


Fig. 48 Kinematic viscosity of different oils in relation to oil temperature

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

Calculation of the inlet pressure "H" is recommended when

- 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.

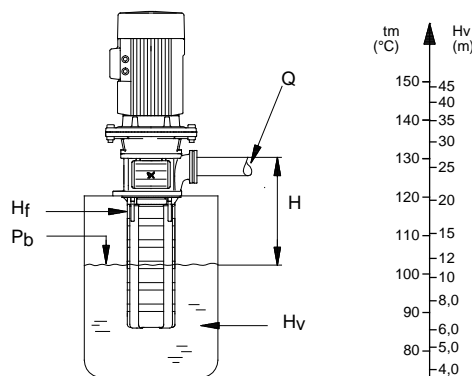


Fig. 49 Minimum inlet pressure - NPSH

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.

Control options for MTRE, SPKE pumps

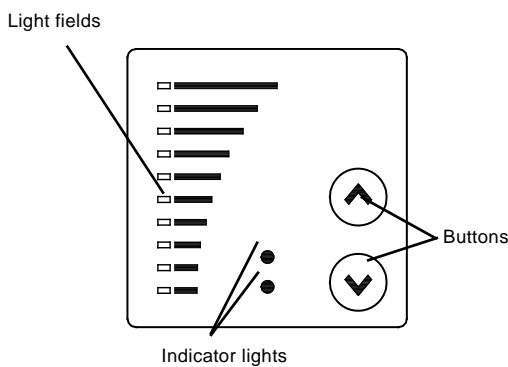
Communication with MTRE, SPKE pumps is possible by means of

- a control panel,
- remote control (Grundfos R100),
- external digital or analog control signals,
- an RS485 bus interface.

The purpose of controlling a MTRE, SPKE pump is to monitor and control the pressure, temperature, flow or liquid level of the system.

Control panel

The control panel of the MTRE, SPKE pump terminal box makes it possible to change the setpoint settings manually.



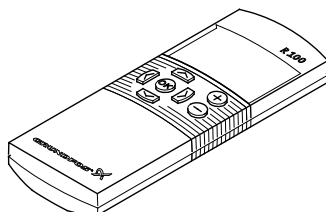
TM00 7600 0404

Fig. 50 Control panel on MTRE, SPKE pump

Remote control

The R100 remote control produced by Grundfos is available as an accessory.

The operator communicates with the MTRE, SPKE pump by pointing the IR-signal transmitter at the control panel of the MTRE, SPKE pump terminal box.



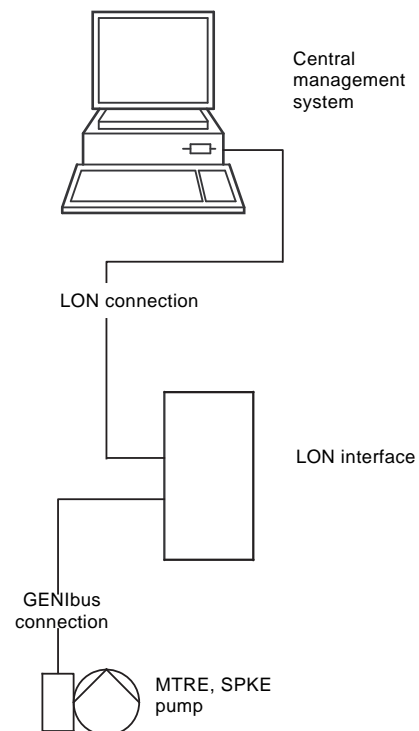
TM00 4498 2802

Fig. 51 R100 remote control

On the R100 display it is possible to monitor and change control modes and settings of the MTRE, SPKE pump.

External control signals

Communication with the MTRE, SPKE pump is possible even though the operator is not present near the MTRE, SPKE pump. Communication is enabled by connecting the MTRE, SPKE pump to an external control or monitoring system allowing the operator to monitor and change control modes and setpoint settings of the MTRE, SPKE pump.



TM02 6592 1103

Fig. 52 Example of a central management system with LON interface

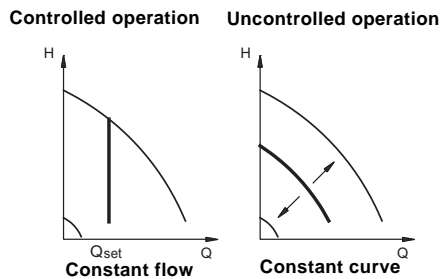
Control modes of MTRE, SPKE pumps

MTRE, SPKE pumps can be connected to an external sensor enabling control of pressure, differential pressure, temperature, differential temperature or flow.

MTRE, SPKE pumps can be set to two control modes - controlled or uncontrolled operation.

In **controlled** operating mode the pump is automatically operating according to the desired setpoint of the control parameter. The illustration below shows a pump with flow control as an example of controlled operation.

In **uncontrolled** operating mode the pump operates according to the constant curve set.

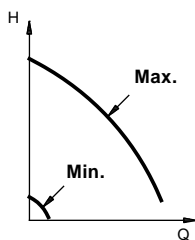


TM01 0684 0808

Fig. 53 Controlled and uncontrolled operating modes

The pumps are set to uncontrolled operation from factory.

Besides normal duty (constant flow and constant curve) the operating modes **Stop**, **Min.** or **Max.** are available.



TM00 5547 0995

Fig. 54 Max. and min. curves

How to read the curve charts

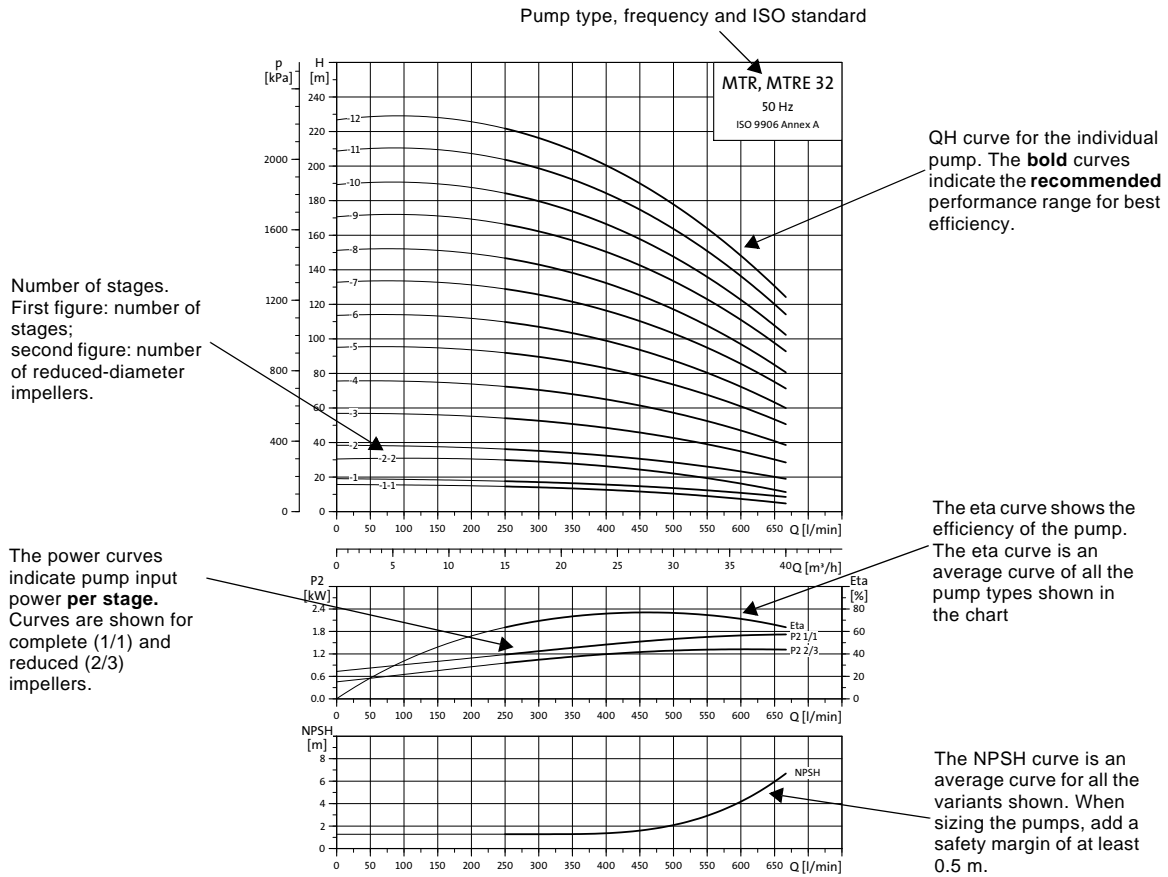


Fig. 55 Example of an MTR, MTRE curve chart

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.

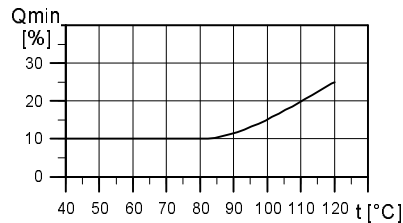


Fig. 56 Minimum flow rate

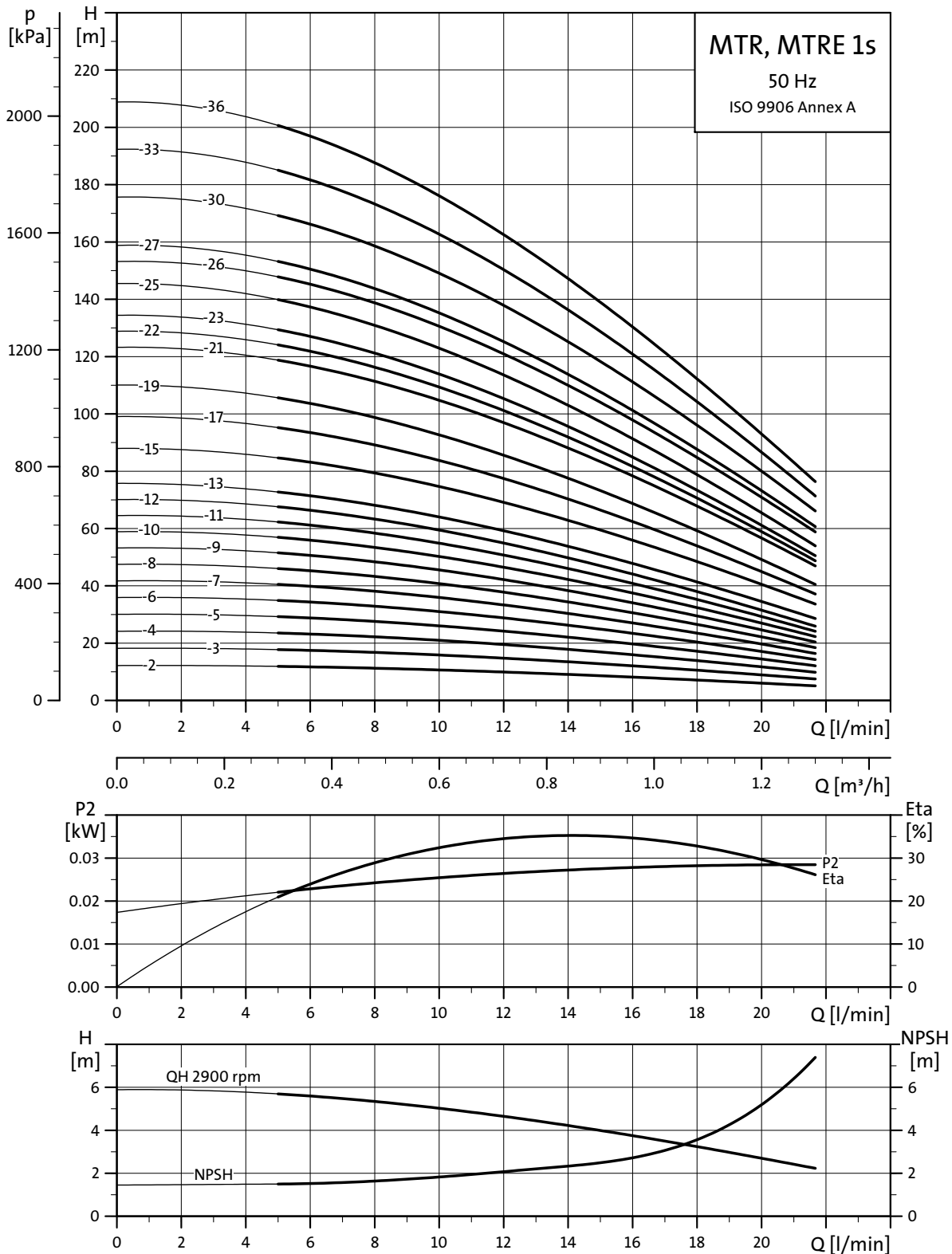
TM01 4302 0404

TM04 5693 3909

Performance curves/ Technical data

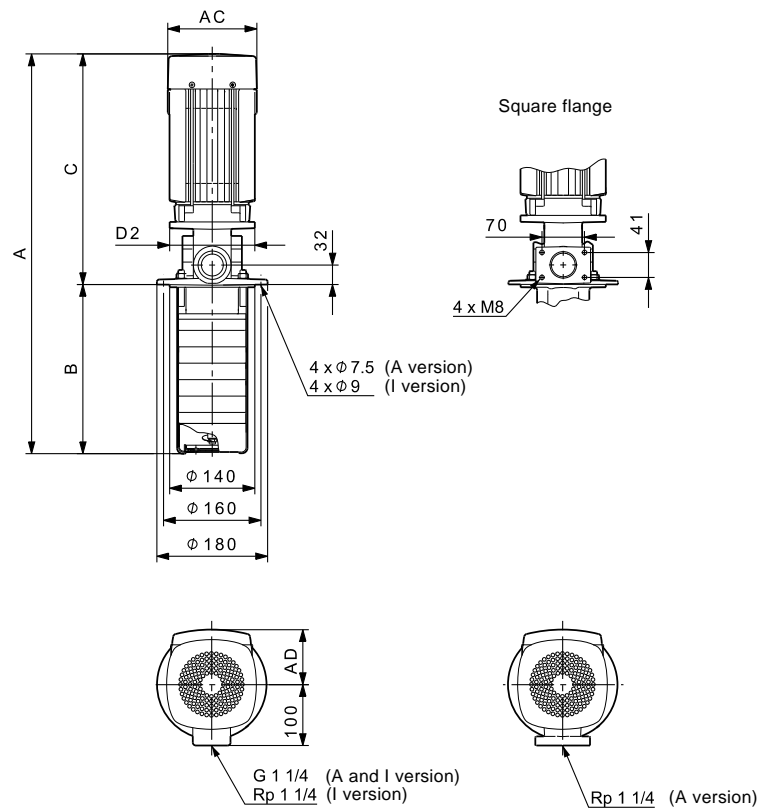
Immersible pumps
MTR, MTRE 1s, 50 Hz

MTR, MTRE 1s, 50 Hz



TM02 7639 4303

Dimensional sketches



TM03 2677 2909

Dimensions and weights

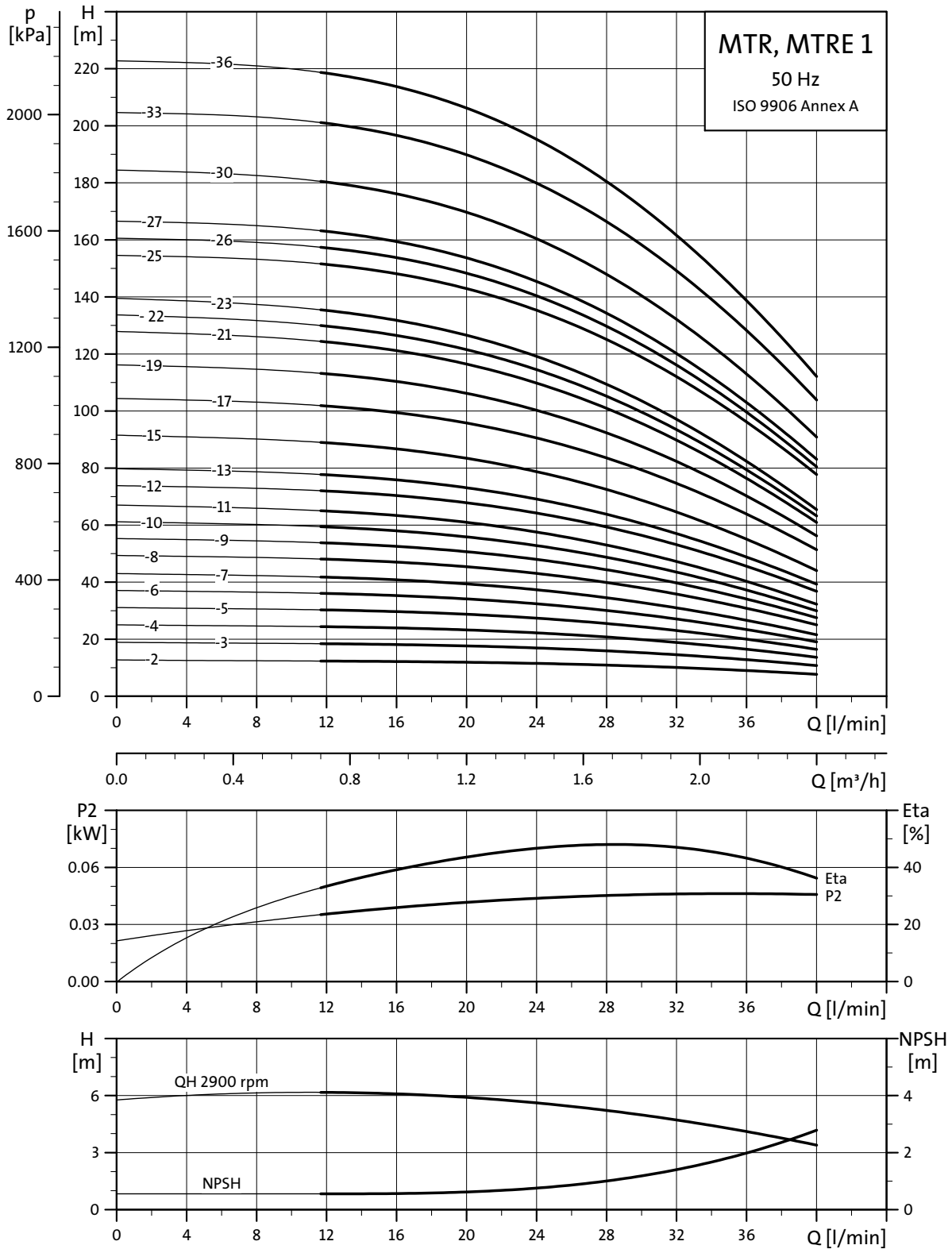
Pump type	P2 [kW]	MTR							MTRE							
		Dimensions [mm]							Net weight [kg]	Dimensions [mm]						Net weight [kg]
		A	B	C	AC	D2	AD	A		B	C	AC	D2	AD		
MTR 1s-2/2	0.37	464	160	304	140	140	109	12.2	-	-	-	-	-	-	-	-
MTR 1s-3/3	0.37	482	178	304	140	140	109	12.5	-	-	-	-	-	-	-	-
MTR 1s-4/4	0.37	500	196	304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

The maximum immersion depth is 1006 mm.
For information about electrical data see "Motor data" on pages 132-135.

Performance curves

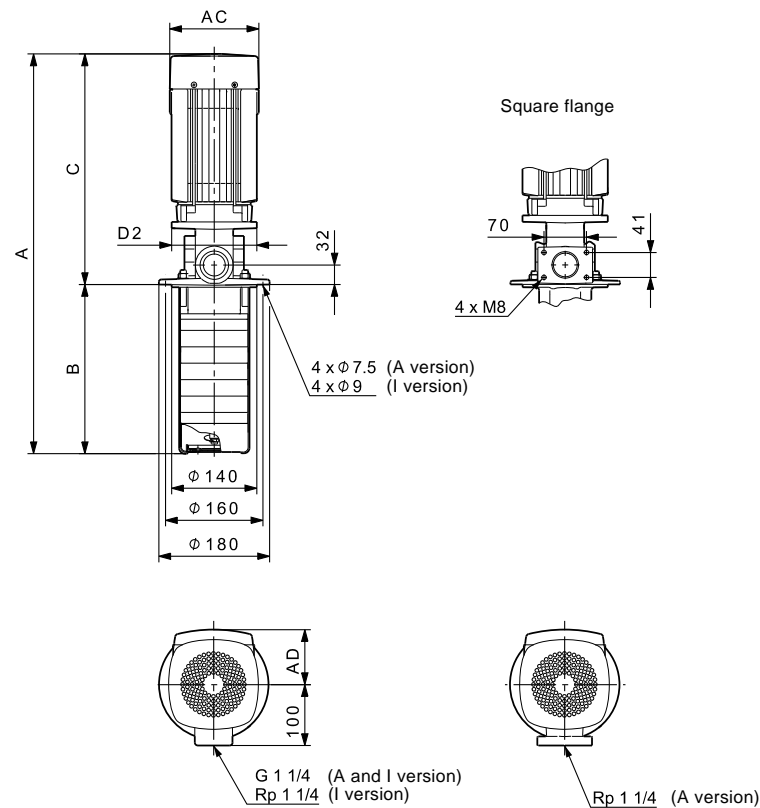
Immersible pumps
MTR, MTRE 1, 50 Hz

MTR, MTRE 1, 50 Hz



TM02 7840 4303

Dimensional sketches



TM03 2677 2908

Dimensions and weights

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

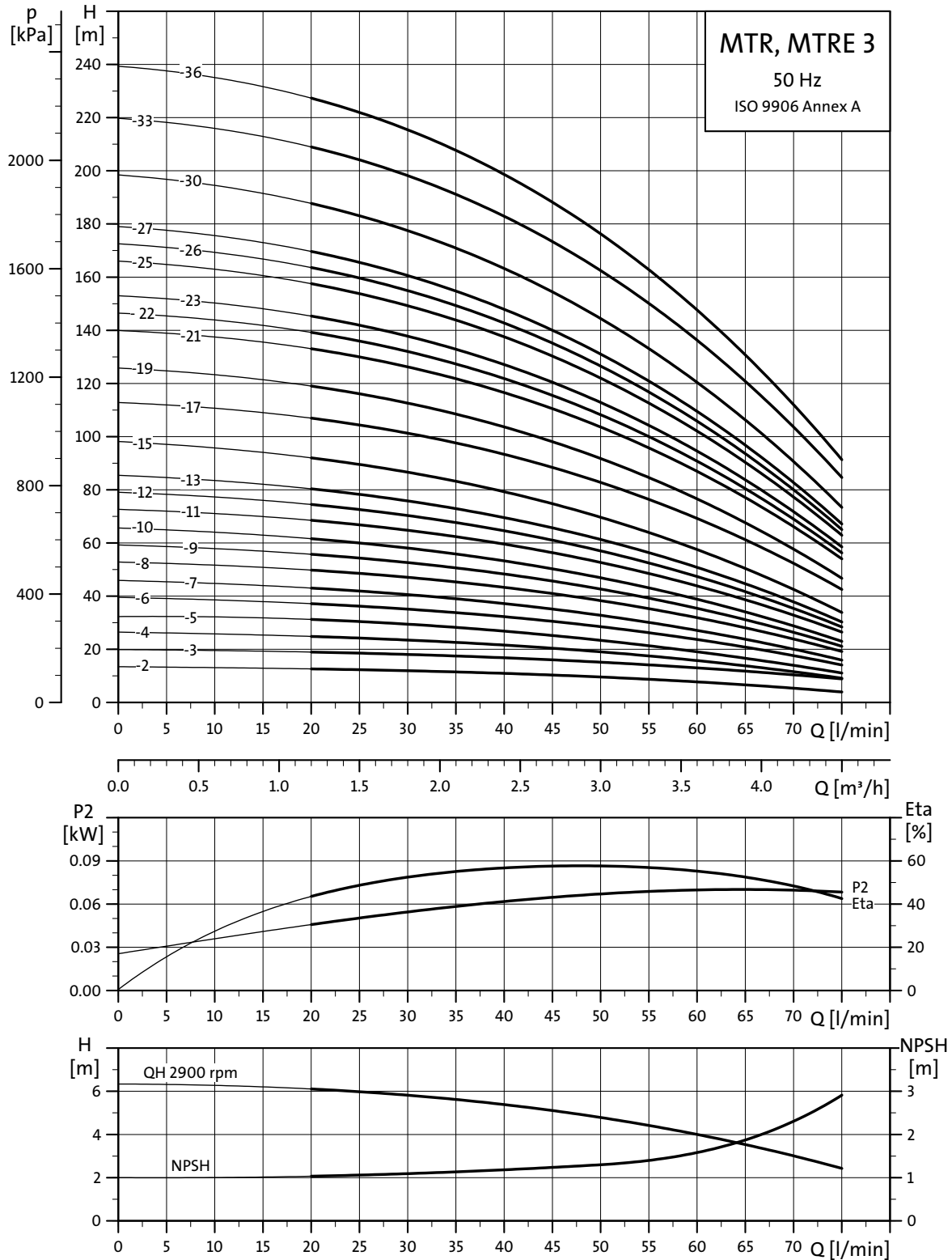
The maximum immersion depth is 1006 mm.

For information about electrical data see "Motor data" on pages 132-135.

Performance curves

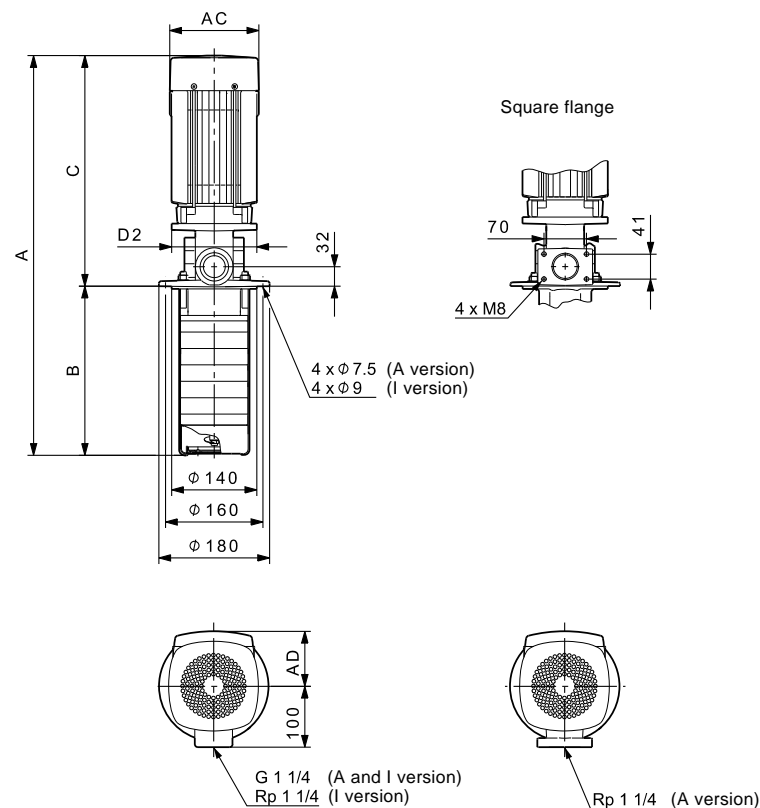
Immersible pumps
MTR, MTRE 3, 50 Hz

MTR, MTRE 3, 50 Hz



TM02 7841 4303

Dimensional sketches



TM03 2677 2909

Dimensions and weights

Pump type	P2 [kW]	MTR							Net weight [kg]	MTRE					
		Dimensions [mm]								Dimensions [mm]					
		A	B	C	AC	D2	AD	A		B	C	AC	D2	AD	
MTR 3-2/2	0.37	464	160	304	140	140	109	12.2	-	-	-	-	-	-	-
MTR 3-3/3	0.37	482	178	304	140	140	109	12.5	-	-	-	-	-	-	-
MTR 3-4/4	0.37	500	196	304	140	140	109	12.8	-	-	-	-	-	-	-
MTR, MTRE 3-5/5	0.37	518	214	304	140	140	109	13.1	518	214	304	141	140	140	15.8
MTR 3-6/6	0.55	536	232	304	140	140	109	13.9	-	-	-	-	-	-	-
MTR 3-7/7	0.55	554	250	304	140	140	109	14.2	-	-	-	-	-	-	-
MTR, MTRE 3-8/8	0.75	612	268	344	140	140	109	15.2	612	268	344	178	140	140	16.6
MTR 3-9/9	0.75	630	286	344	140	140	109	15.6	-	-	-	-	-	-	-
MTR 3-10/10	0.75	648	304	344	140	140	109	15.9	-	-	-	-	-	-	-
MTR, MTRE 3-11/11	0.75	666	322	344	140	140	109	16.2	666	322	344	178	140	167	17.8
MTR 3-12/12	1.1	684	340	344	140	140	109	17.9	-	-	-	-	-	-	-
MTR 3-13/13	1.1	702	358	344	140	140	109	18.2	-	-	-	-	-	-	-
MTR, MTRE 3-15/15	1.1	738	394	344	140	140	109	18.5	738	394	344	178	140	167	21.2
MTR 3-17/17	1.5	824	430	394	178	140	110	25.9	-	-	-	-	-	-	-
MTR, MTRE 3-19/19	1.5	860	466	394	178	140	110	26.5	860	466	394	178	140	167	34.0
MTR 3-21/21	2.2	936	502	434	178	140	110	31.3	-	-	-	-	-	-	-
MTR 3-22/22	2.2	954	520	434	178	140	110	31.6	-	-	-	-	-	-	-
MTR 3-23/23	2.2	972	538	434	178	140	110	31.9	-	-	-	-	-	-	-
MTR, MTRE 3-25/25	2.2	1008	574	434	178	140	110	32.5	1008	574	434	178	140	167	38.3
MTR 3-26/26	2.2	1026	592	434	178	140	110	32.8	-	-	-	-	-	-	-
MTR 3-27/27	2.2	1044	610	434	178	140	110	33.1	-	-	-	-	-	-	-
MTR, MTRE 3-30/30	3.0	1112	664	448	198	140	110	38.2	1112	664	448	198	140	167	39.8
MTR 3-33/33	3.0	1166	718	448	198	160	110	39.1	-	-	-	-	-	-	-
MTR, MTRE 3-36/36	3.0	1220	772	448	198	160	110	40.0	1220	772	448	198	160	177	46.8

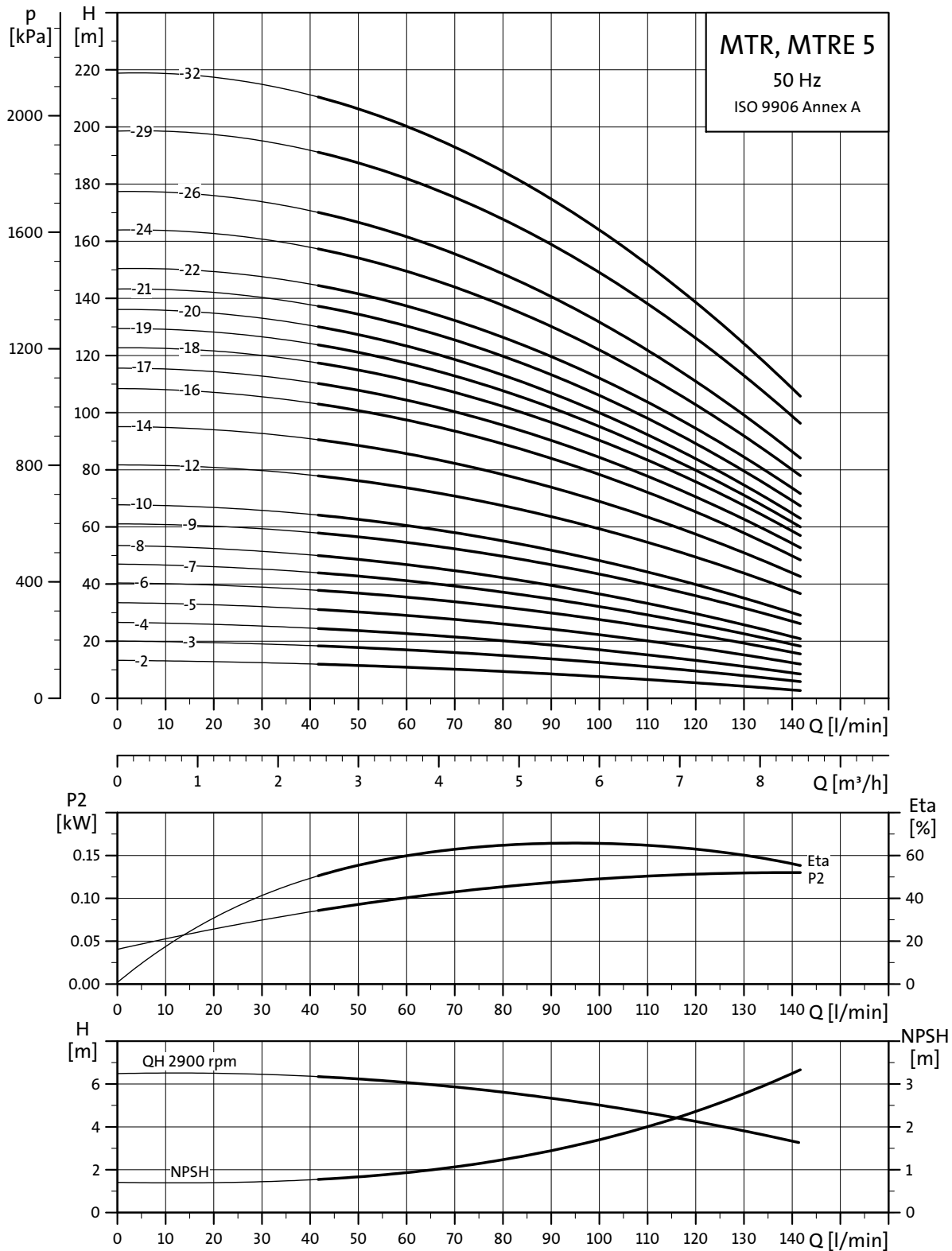
The maximum immersion depth is 1006 mm.

For information about electrical data see "Motor data" on pages 132-135.

Performance curves

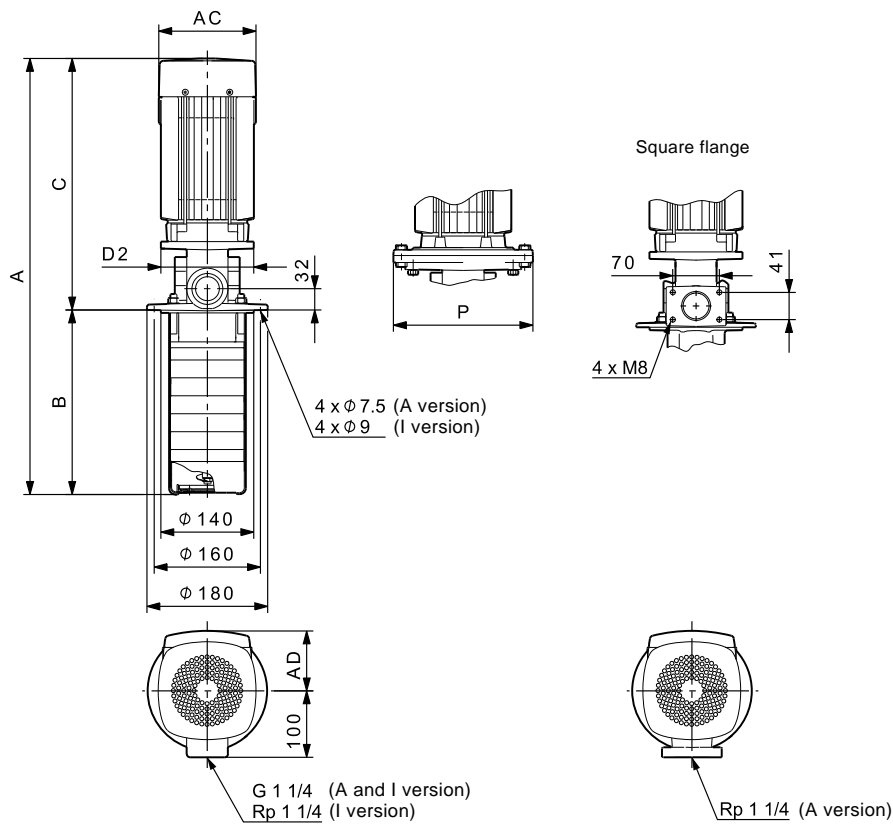
Immersible pumps
MTR, MTRE 5, 50 Hz

MTR, MTRE 5, 50 Hz



TM02 7842 4303

Dimensional sketches



TM04 2789 2909

Dimensions and weights

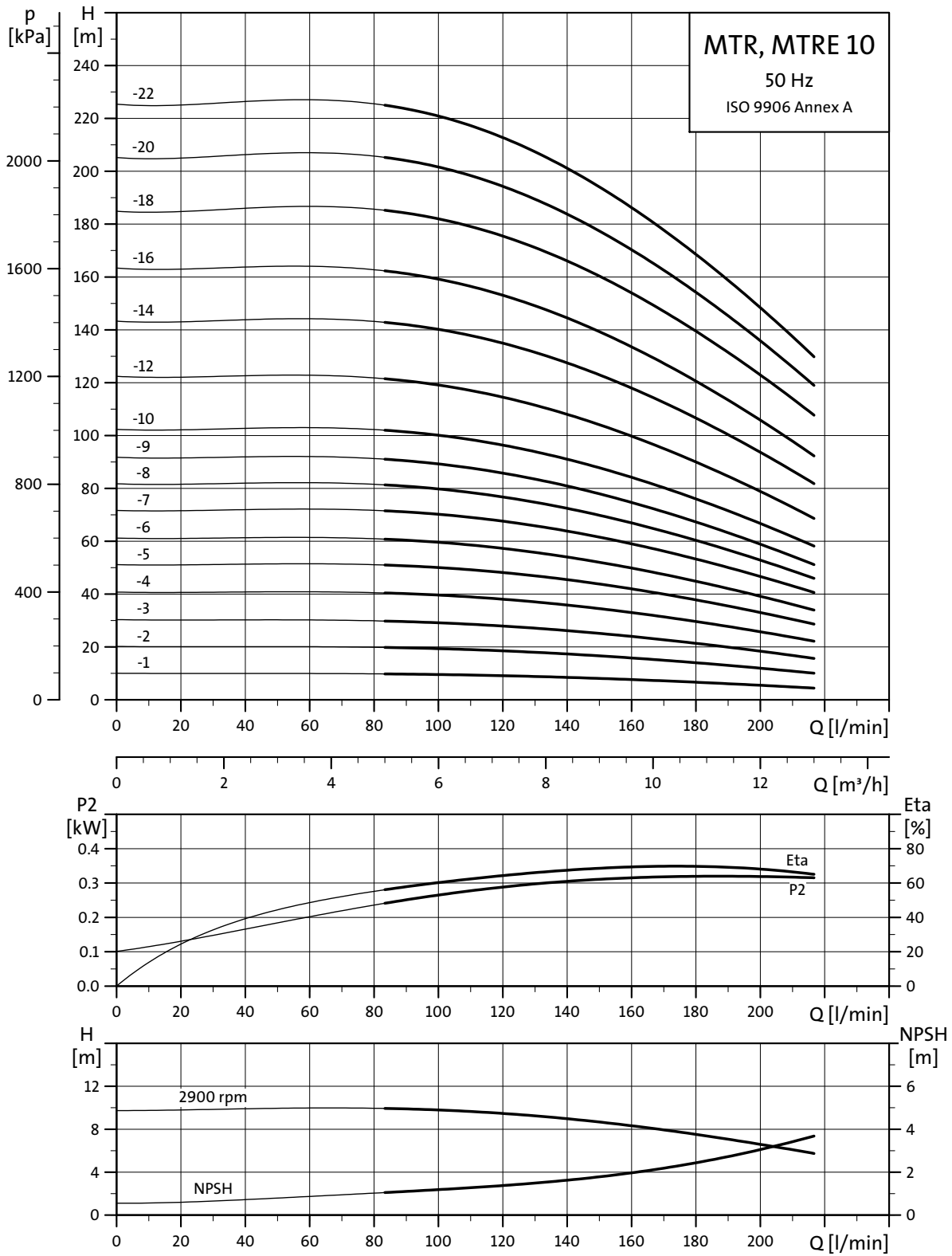
Pump type	P2 [kW]	MTR								MTRE									
		Dimensions [mm]								Net weight [kg]	Dimensions [mm]								Net weight [kg]
		A	B	C	AC	D2	P	AD	A		B	C	AC	D2	P	AD			
MTR, MTRE 5-2/2	0.37	473	169	304	140	140	-	109	12.2	473	169	304	141	140	-	140	14.9		
MTR 5-3/3	0.55	500	196	304	140	140	-	109	13.0	-	-	-	-	-	-	-	-		
MTR, MTRE 5-4/4	0.55	527	223	304	140	140	-	109	13.4	527	223	304	141	140	-	140	15.2		
MTR, MTRE 5-5/5	0.75	594	250	344	140	140	-	109	14.7	594	250	344	178	140	-	167	16.3		
MTR 5-6/6	1.1	621	277	344	140	140	-	109	16.5	-	-	-	-	-	-	-	-		
MTR 5-7/7	1.1	648	304	344	140	140	-	109	16.9	-	-	-	-	-	-	-	-		
MTR, MTRE 5-8/8	1.1	675	331	344	140	140	-	109	17.3	675	331	344	178	140	-	167	20.0		
MTR 5-9/9	1.5	752	358	394	178	140	-	110	26.6	-	-	-	-	-	-	-	-		
MTR, MTRE 5-10/10	1.5	779	385	394	178	140	-	110	27.0	779	385	394	178	140	-	167	34.8		
MTR 5-12/12	2.2	873	439	434	178	140	-	110	32.0	-	-	-	-	-	-	-	-		
MTR 5-14/14	2.2	927	493	434	178	140	-	110	32.8	-	-	-	-	-	-	-	-		
MTR, MTRE 5-16/16	2.2	981	547	434	178	140	-	110	33.6	981	547	434	178	140	-	167	37.9		
MTR 5-17/17	3.0	1031	583	448	198	160	-	110	35.7	-	-	-	-	-	-	-	-		
MTR 5-18/18	3.0	1049	601	448	198	160	-	110	36.1	-	-	-	-	-	-	-	-		
MTR 5-19/19	3.0	1076	628	448	198	160	-	110	36.5	-	-	-	-	-	-	-	-		
MTR, MTRE 5-20/20	3.0	1103	655	448	198	160	-	110	36.9	1103	655	448	198	160	-	177	43.7		
MTR 5-21/21	3.0	1130	682	448	198	160	-	110	37.3	-	-	-	-	-	-	-	-		
MTR, MTRE 5-22/22	4.0	1194	709	485	220	160	-	134	39.5	1194	709	485	220	160	-	188	49.2		
MTR 5-24/24	4.0	1248	763	485	220	160	-	134	39.9	-	-	-	-	-	-	-	-		
MTR 5-26/26	4.0	1302	817	485	220	160	-	134	40.3	-	-	-	-	-	-	-	-		
MTR, MTRE 5-29/29	4.0	1383	898	485	220	160	-	134	40.7	1383	898	485	220	160	-	188	50.4		
MTR, MTRE 5-32/32	5.5	1464	979	485	220	-	160	134	49.3	1464	979	485	220	-	300	188	55.9		

The maximum immersion depth is 1006 mm.
For information about electrical data see "Motor data" on pages 132-135.

Performance curves

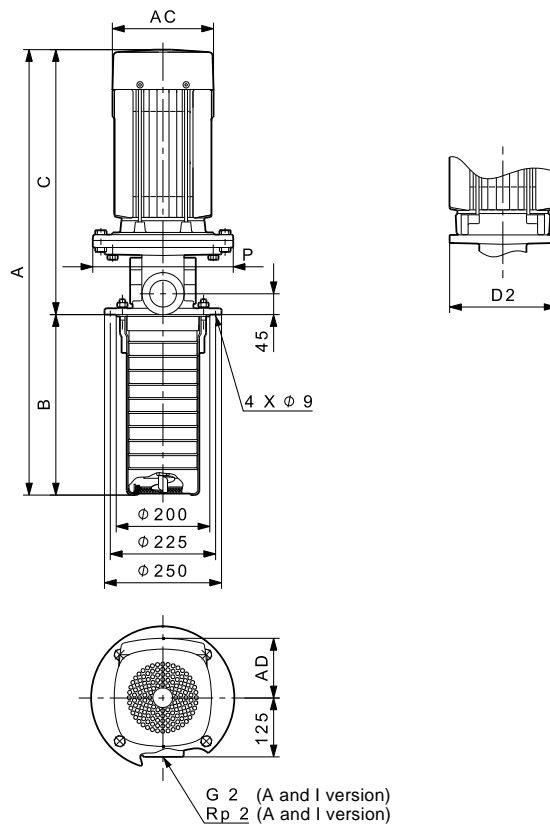
Immersible pumps
MTR, MTRE 10, 50 Hz

MTR, MTRE 10, 50 Hz



TM02 7843 4303

Dimensional sketches



TM04 2790 3308

Dimensions and weights

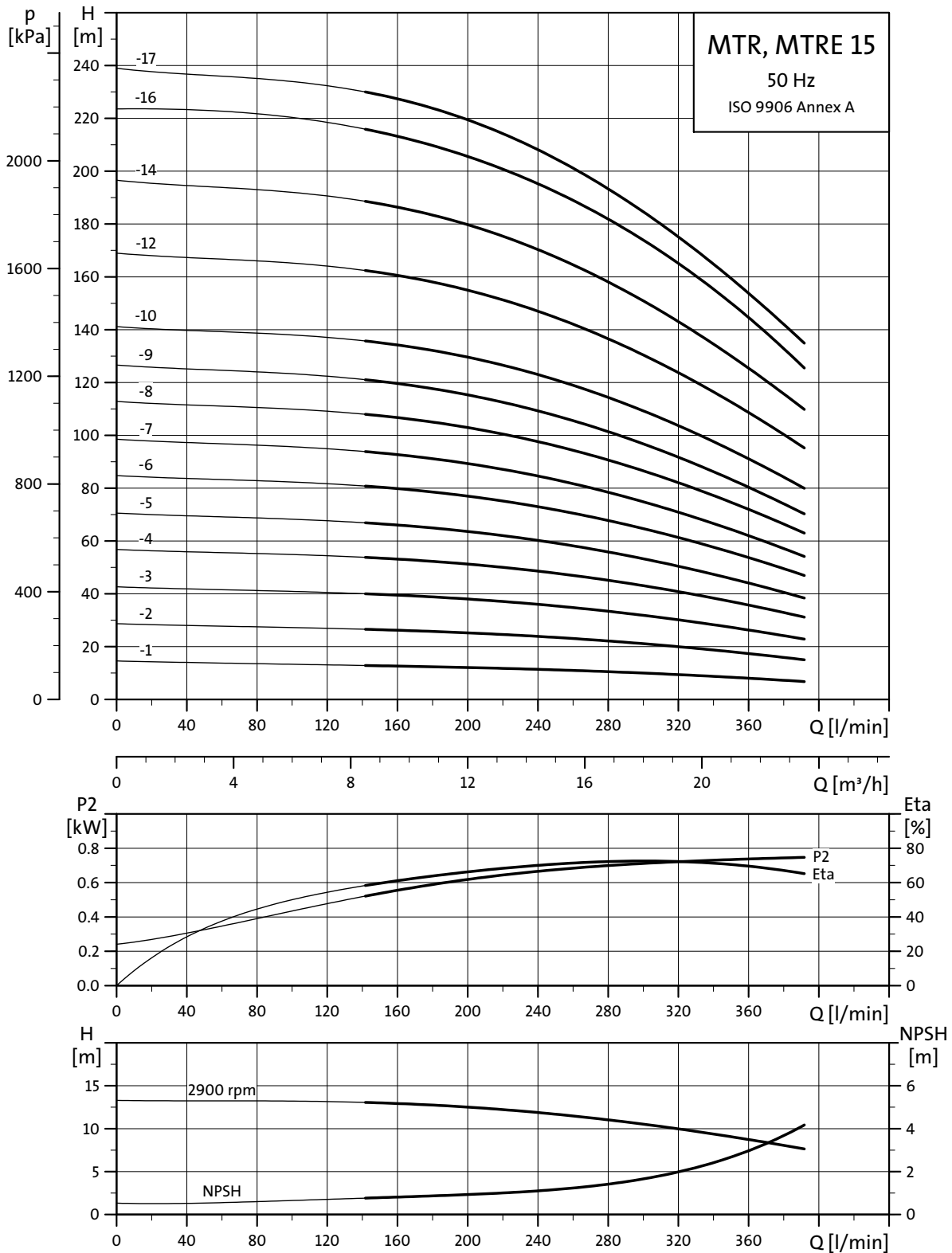
Pump type	P2 [kW]	MTR								Net weight [kg]	MTRE						Net weight [kg]
		Dimensions [mm]									Dimensions [mm]						
		A	B	C	AC	D2	P	AD		A	B	C	AC	D2	P	AD	
MTR, MTRE 10-2/1	0.75	523	148	375	140	140	-	109	21	523	148	375	141	140	-	140	24
MTR, MTRE 10-2/2	0.75	523	148	375	140	140	-	109	22	523	148	375	178	140	-	167	24
MTR, MTRE 10-3/3	1.1	553	178	375	140	140	-	109	24	553	178	375	178	140	-	167	27
MTR, MTRE 10-4/4	1.5	633	208	425	178	140	-	110	31	633	208	425	178	140	-	167	39
MTR 10-5/5	2.2	703	238	465	178	140	-	110	37	-	-	-	-	-	-	-	-
MTR, MTRE 10-6/6	2.2	733	268	465	178	140	-	110	38	733	268	465	178	140	-	167	43
MTR 10-7/7	3.0	777	298	479	198	160	-	110	39	-	-	-	-	-	-	-	-
MTR 10-8/8	3.0	807	328	479	198	160	-	110	40	-	-	-	-	-	-	-	-
MTR, MTRE 10-9/9	3.0	837	358	479	198	160	-	110	41	837	358	479	198	160	-	177	48
MTR 10-10/10	4.0	904	388	516	220	160	-	134	43	-	-	-	-	-	-	-	-
MTR, MTRE 10-12/12	4.0	964	448	516	220	160	-	134	44	964	448	516	220	160	-	188	54
MTR 10-14/14	5.5	1063	508	555	220	-	300	134	68	-	-	-	-	-	-	-	-
MTR, MTRE 10-16/16	5.5	1123	568	555	220	-	300	134	69	1123	568	555	220	-	300	188	76
MTR 10-18/18	7.5	1171	628	543	260	-	300	159	87	-	-	-	-	-	-	-	-
MTR 10-20/20	7.5	1231	688	543	260	-	300	159	88	-	-	-	-	-	-	-	-
MTR, MTRE 10-22/22	7.5	1291	748	543	260	-	300	159	89	1291	748	543	260	-	300	213	95

The maximum immersion depth is 1018 mm.
For information about electrical data see "Motor data" on pages 132-135.

Performance curves

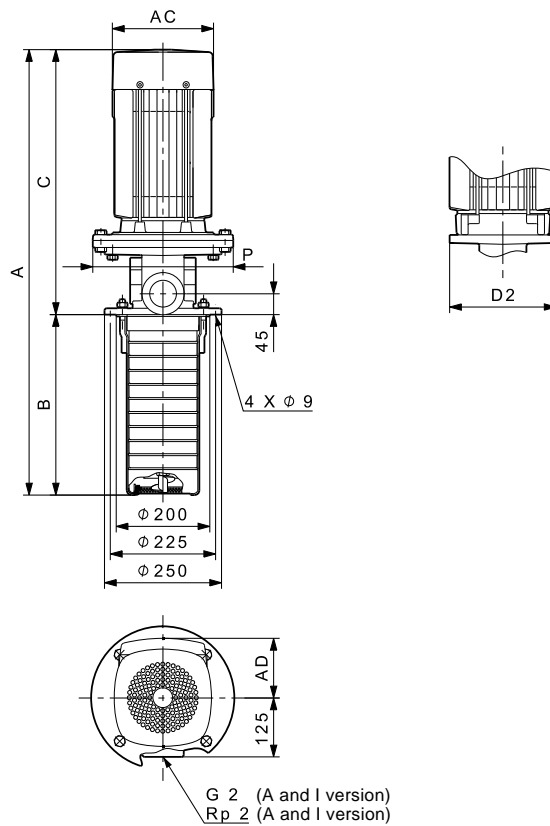
Immersible pumps
MTR, MTRE 15, 50 Hz

MTR, MTRE 15, 50 Hz



TM02 7844 4303

Dimensional sketches



TM04 2790 3308

Dimensions and weights

Pump type	P2 [kW]	MTR								Net weight [kg]	MTRE						Net weight [kg]
		Dimensions [mm]									Dimensions [mm]						
		A	B	C	AC	D2	P	AD		A	B	C	AC	D2	P	AD	
MTR, MTRE 15-2/1	1.1	553	178	375	178	140	-	110	23	553	178	375	178	140	-	167	26
MTR, MTRE 15-2/2	2.2	643	178	465	178	140	-	110	34	643	178	465	178	140	-	167	41
MTR, MTRE 15-3/3	3.0	702	223	479	198	160	-	110	38	702	223	479	198	160	-	177	45
MTR 15-4/4	4.0	784	268	516	220	160	-	134	40	-	-	-	-	-	-	-	-
MTR, MTRE 15-5/5	4.0	829	313	516	220	160	-	134	41	829	313	516	220	160	-	188	51
MTR 15-6/6	5.5	913	358	555	220	-	300	134	64	-	-	-	-	-	-	-	-
MTR, MTRE 15-7/7	5.5	958	403	555	220	-	300	134	65	958	403	555	220	-	300	188	72
MTR 15-8/8	7.5	991	448	543	260	-	300	159	83	-	-	-	-	-	-	-	-
MTR, MTRE 15-9/9	7.5	1036	493	543	260	-	300	159	84	1036	493	543	260	-	300	213	93
MTR 15-10/10	11.0	1203	538	665	315	-	350	204	123	-	-	-	-	-	-	-	-
MTR 15-12/12	11.0	1293	628	665	315	-	350	204	125	-	-	-	-	-	-	-	-
MTR, MTRE 15-14/14	11.0	1383	718	665	315	-	350	204	127	1383	718	665	314	-	350	308	155
MTR 15-16/16	15.0	1473	808	665	314	-	350	204	141	-	-	-	-	-	-	-	-
MTR, MTRE 15-17/17	15.0	1518	853	665	314	-	350	204	142	1518	853	665	314	-	350	308	173

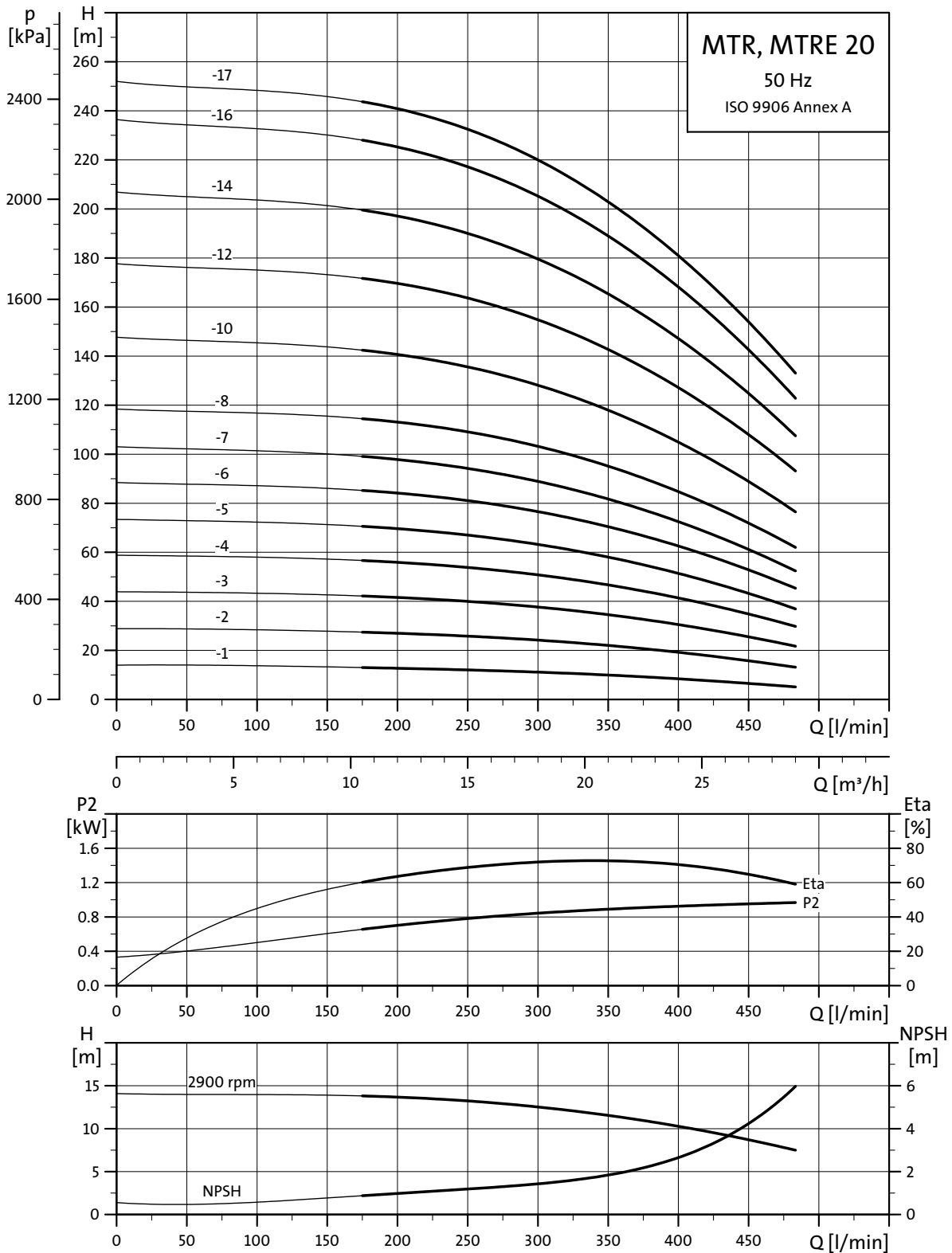
The maximum immersion depth is 1033 mm.

For information about electrical data see "Motor data" on pages 132-135.

Performance curves

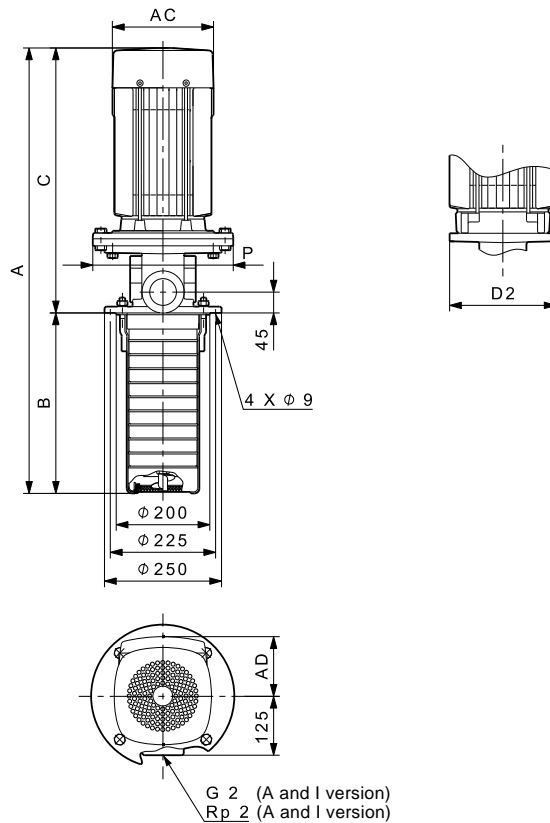
Immersible pumps
MTR, MTRE 20, 50 Hz

MTR, MTRE 20, 50 Hz



TM02 7845 4303

Dimensional sketches



TM04 2790 3308

Dimensions and weights

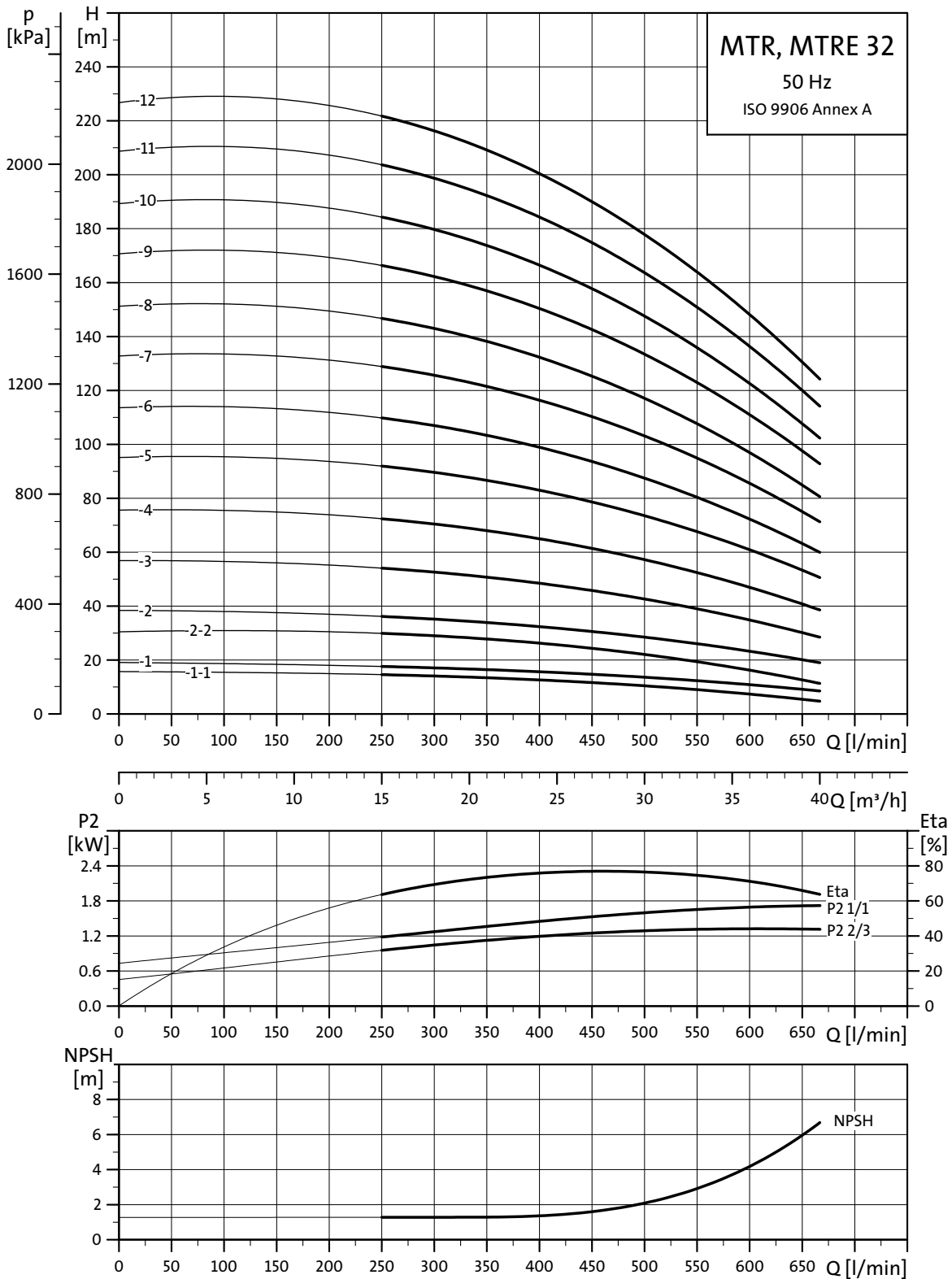
Pump type	P2 [kW]	MTR								MTRE							
		Dimensions [mm]								Net weight [kg]	Dimensions [mm]						
A	B	C	AC	D2	P	AD	A	B	C		AC	D2	P	AD			
MTR, MTRE 20-2/1	1.1	553	178	375	140	140	-	109	23	553	178	375	178	140	-	167	26
MTR, MTRE 20-2/2	2.2	643	178	465	178	140	-	110	34	643	178	465	178	140	-	167	41
MTR, MTRE 20-3/3	4.0	739	223	516	220	160	-	134	39	739	223	516	220	160	-	188	49
MTR 20-4/4	5.5	823	268	555	220	-	300	134	62	-	-	-	-	-	-	-	-
MTR, MTRE 20-5/5	5.5	868	313	555	220	-	300	134	63	868	313	555	220	-	300	188	70
MTR 20-6/6	7.5	901	358	543	260	-	300	159	81	-	-	-	-	-	-	-	-
MTR, MTRE 20-7/7	7.5	946	403	543	260	-	300	159	82	946	403	543	260	-	300	213	91
MTR 20-8/8	11.0	1113	448	665	315	-	350	204	121	-	-	-	-	-	-	-	-
MTR, MTRE 20-10/10	11.0	1203	538	665	315	-	350	204	123	1203	538	665	314	-	350	308	151
MTR 20-12/12	15.0	1293	628	665	314	-	350	204	137	-	-	-	-	-	-	-	-
MTR, MTRE 20-14/14	15.0	1383	718	665	314	-	350	204	139	1383	718	665	314	-	350	308	170
MTR 20-16/16	18.5	1517	808	709	314	-	350	204	153	-	-	-	-	-	-	-	-
MTR, MTRE 20-17/17	18.5	1562	853	709	314	-	350	204	154	1562	853	709	314	-	350	308	185

The maximum immersion depth is 1033 mm.
For information about electrical data see "Motor data" on pages 132-135.

Performance curves

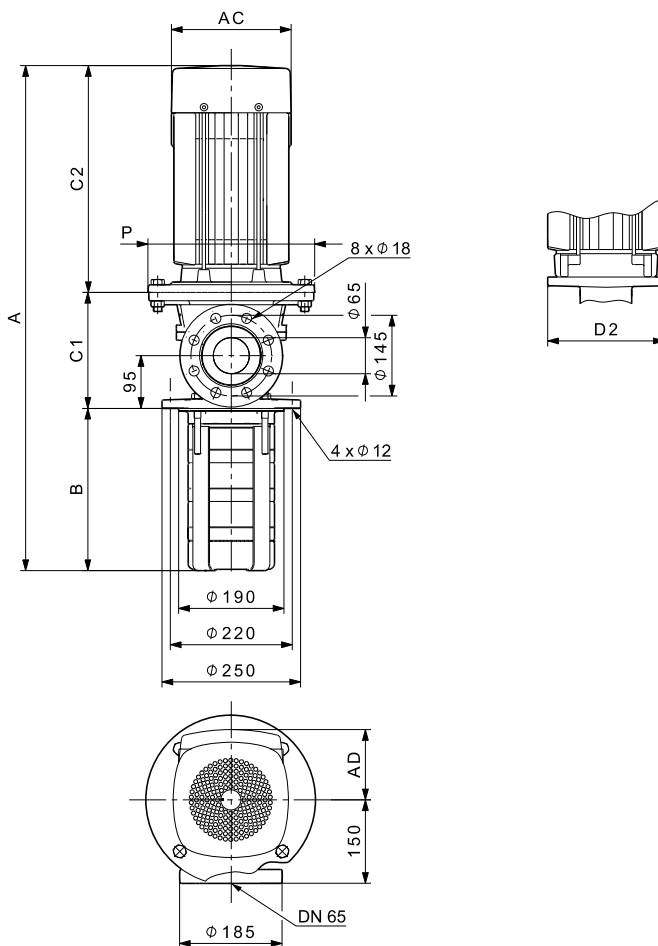
Immersible pumps
MTR, MTRE 32, 50 Hz

MTR, MTRE 32, 50 Hz



TM01 4302 0304

Dimensional sketches



TM04 2791 3308

Dimensions and weights

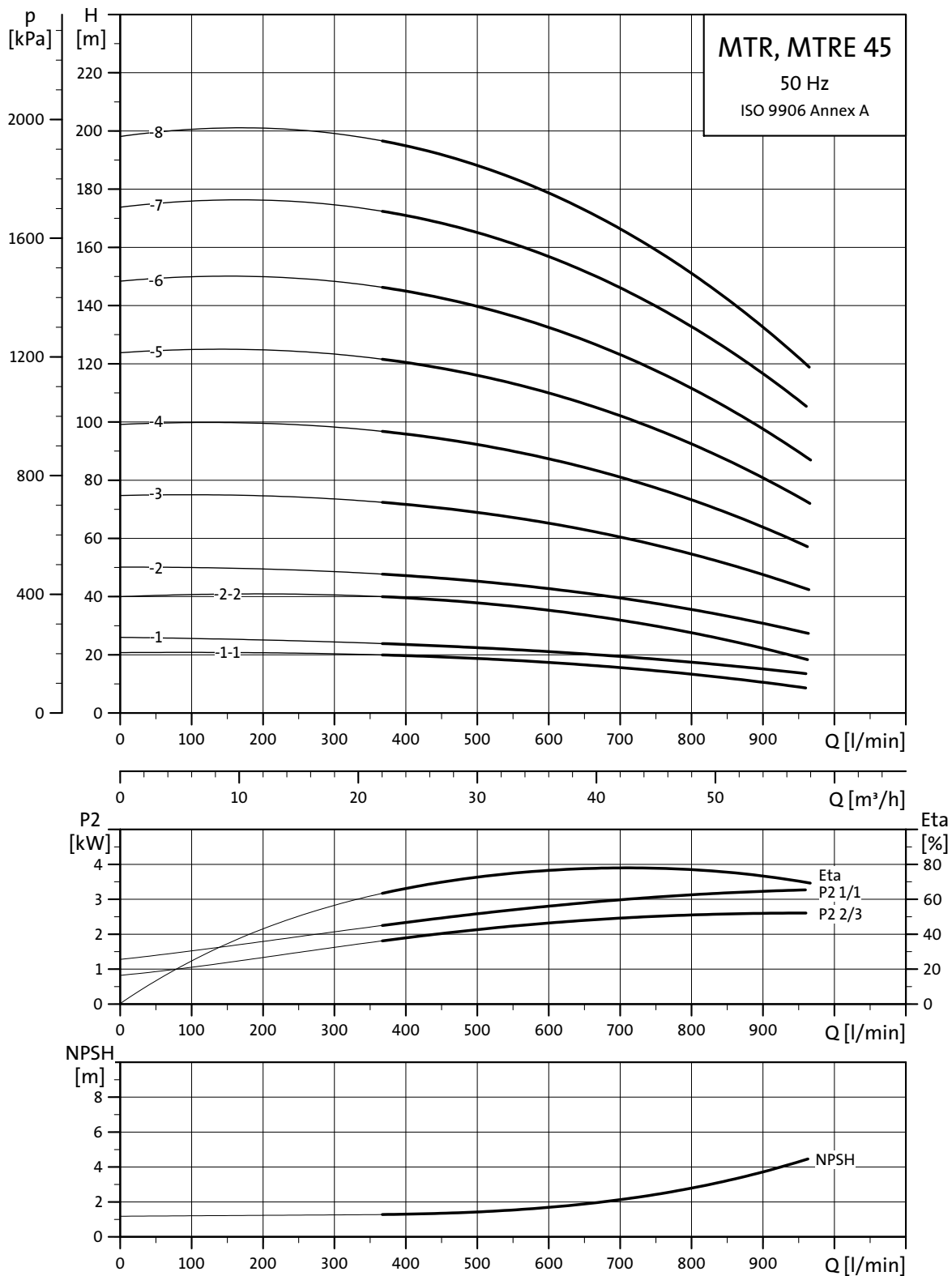
Pump type	P2 [kW]	MTR									MTRE									
		Dimensions [mm]									Net weight [kg]	Dimensions [mm]								Net weight [kg]
		A	B	C1	C2	AC	D2	P	AD	A		B	C1	C2	AC	D2	P	AD		
MTR, MTRE 32-2/1-1	1.5	642	223	138	281	178	-	200	110	39	642	223	138	281	178	-	200	167	47	
MTR, MTRE 32-2/1	2.2	682	223	138	321	178	-	200	110	41	642	223	138	281	178	-	200	167	48	
MTR, MTRE 32-2/2-2	3.0	696	223	138	335	198	143	-	110	47	696	223	138	335	198	143	-	177	54	
MTR, MTRE 32-2/2	4.0	733	223	138	372	220	248	-	134	56	733	223	138	372	220	248	-	188	66	
MTR, MTRE 32-3/3	5.5	893	293	209	391	220	-	300	134	78	893	293	209	391	220	-	300	188	85	
MTR, MTRE 32-4/4	7.5	951	363	209	379	260	-	300	159	94	951	363	209	379	260	-	300	213	103	
MTR 32-5/5	11.0	1078	433	209	436	315	-	350	204	135	-	-	-	-	-	-	-	-	-	
MTR, MTRE 32-6/6	11.0	1148	503	209	436	315	-	350	204	137	1198	503	209	486	314	-	350	308	165	
MTR 32-7/7	15.0	1253	573	209	471	314	-	350	204	151	-	-	-	-	-	-	-	-	-	
MTR, MTRE 32-8/8	15.0	1323	643	209	471	314	-	350	204	153	1340	643	209	488	314	-	350	308	184	
MTR 32-9/9	18.5	1397	713	209	475	314	-	350	204	167	-	-	-	-	-	-	-	-	-	
MTR, MTRE 32-10/10	18.5	1467	783	209	475	314	-	350	204	169	1486	783	209	494	314	-	350	308	200	
MTR 32-11/11	22.0	1594	853	209	532	314	-	350	204	185	-	-	-	-	-	-	-	-	-	
MTR, MTRE 32-12/12	22.0	1664	923	209	532	314	-	350	204	187	1748	923	209	616	314	-	350	308	217	
MTR 32-13/12	22.0	1734	993	209	532	314	-	350	204	189	-	-	-	-	-	-	-	-	-	
MTR 32-14/12	22.0	1804	1063	209	532	314	-	350	204	191	-	-	-	-	-	-	-	-	-	

The maximum immersion depth is 1343 mm.
For information about electrical data see "Motor data" on pages 132-135.

Performance curves

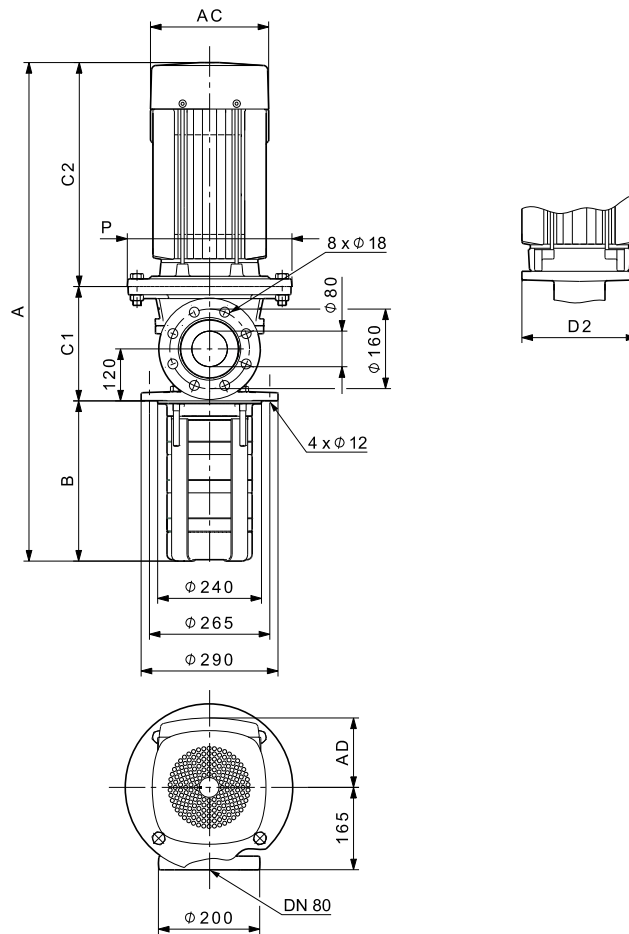
Immersible pumps
MTR, MTRE 45, 50 Hz

MTR, MTRE 45, 50 Hz



TM01 4303 0304

Dimensional sketches



TM04 2792 2909

Dimensions and weights

Pump type	P2 [kW]	MTR									Net weight [kg]	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 45-2/1-1	3.0	785	244	169	372	198	135	-	124	53	748	244	169	335	198	135	-	177	60	
MTR, MTRE 45-2/1	4.0	785	244	169	372	220	248	-	134	61	785	244	169	372	220	248	-	188	71	
MTR, MTRE 45-2/2-2	5.5	875	244	240	391	220	-	300	134	82	875	244	240	391	220	-	300	188	89	
MTR, MTRE 45-2/2	7.5	863	244	240	379	260	-	300	159	97	863	244	240	379	260	-	300	213	106	
MTR, MTRE 45-3/3	11.0	1035	324	240	471	315	-	350	204	138	1050	324	240	486	314	-	350	308	166	
MTR, MTRE 45-4/4	15.0	1115	404	240	471	314	-	350	204	152	1132	404	240	488	314	-	350	308	183	
MTR, MTRE 45-5/5	18.5	1199	484	240	475	314	-	350	204	166	1218	484	240	494	314	-	350	308	197	
MTR, MTRE 45-6/6	22.0	1336	564	240	532	314	-	350	204	182	1420	564	240	616	314	-	350	308	212	
MTR 45-7/7	30.0	1551	644	240	667	404	-	400	306	284	-	-	-	-	-	-	-	-	-	
MTR 45-8/8	30.0	1631	724	240	667	404	-	400	306	286	-	-	-	-	-	-	-	-	-	
MTR 45-9/8	30.0	1711	804	240	667	404	-	400	306	288	-	-	-	-	-	-	-	-	-	
MTR 45-10/8	30.0	1791	884	240	667	404	-	400	306	290	-	-	-	-	-	-	-	-	-	
MTR 45-11/8	30.0	1871	964	240	667	404	-	400	306	292	-	-	-	-	-	-	-	-	-	
MTR 45-12/8	30.0	1951	1044	240	667	404	-	400	306	294	-	-	-	-	-	-	-	-	-	

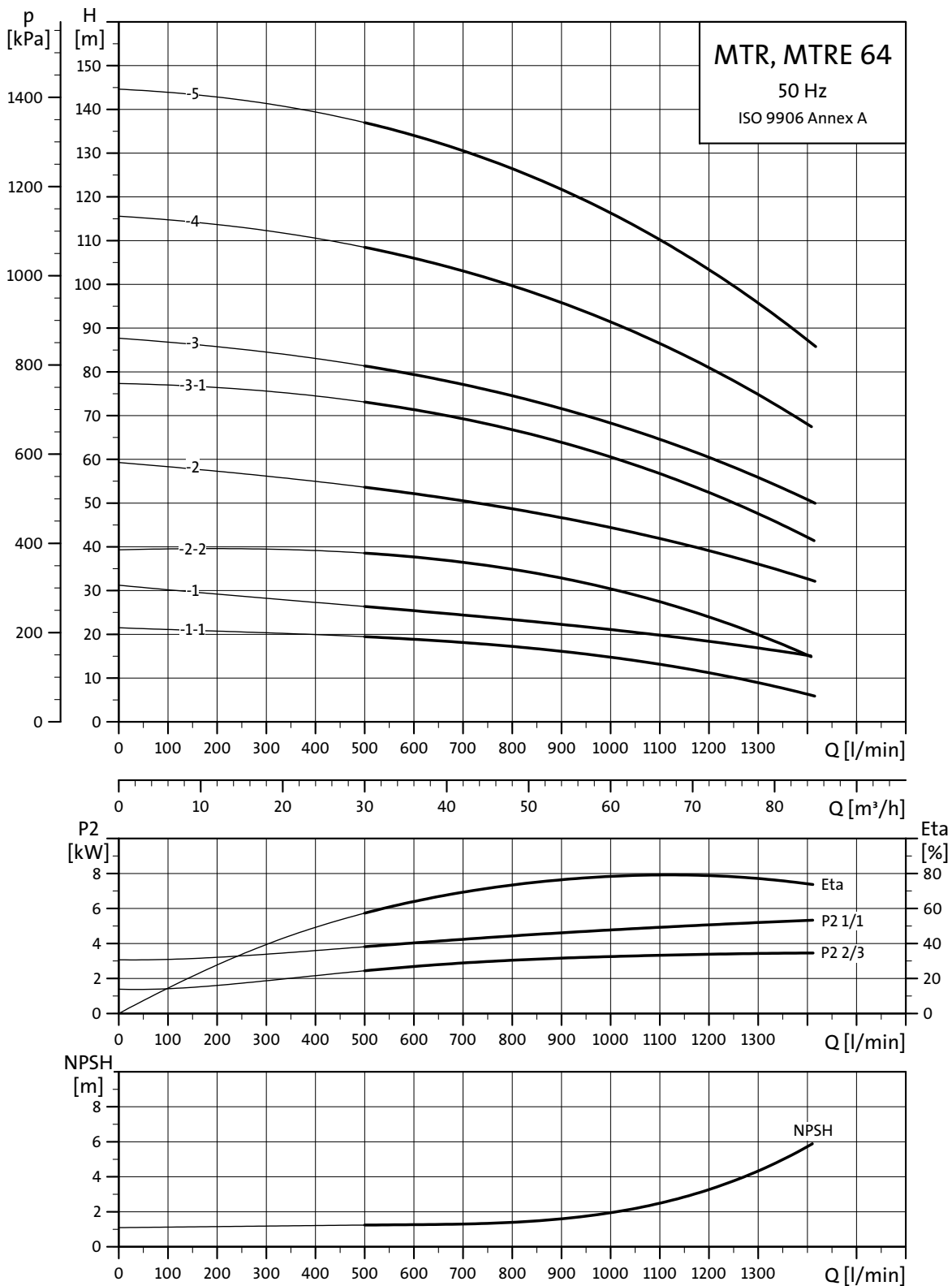
The maximum immersion depth is 1444 mm.

For information about electrical data see "Motor data" on pages 132-135.

Performance curves

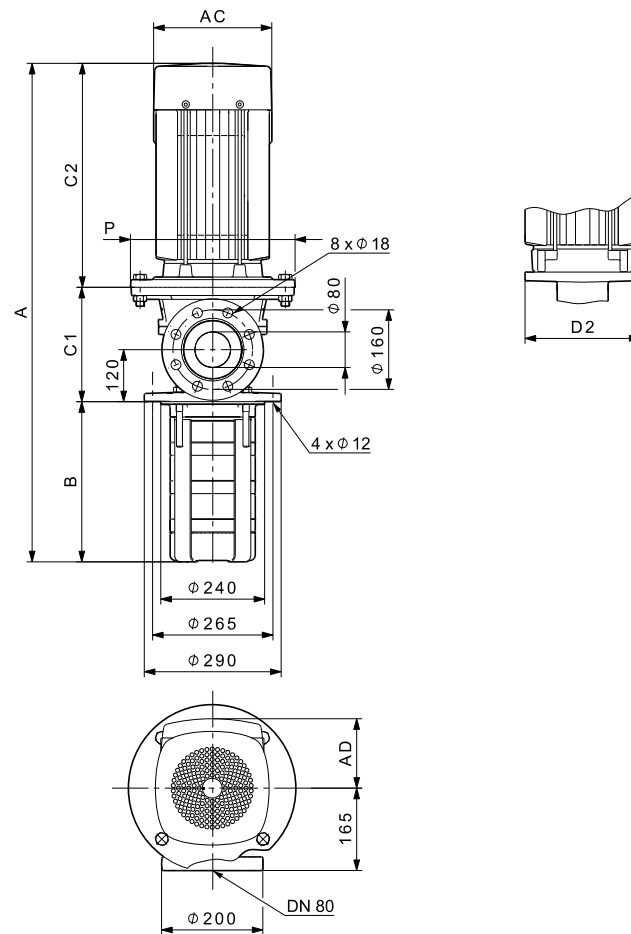
Immersible pumps
MTR, MTRE 64, 50 Hz

MTR, MTRE 64, 50 Hz



TM01 4304 0304

Dimensional sketches



TM04 2792 2909

Dimensions and weights

Pump type	P2 [kW]	MTR									MTRE								
		Dimensions [mm]									Net weight [kg]	Dimensions [mm]							Net weight [kg]
		A	B	C1	C2	AC	D2	P	AD	A		B	C1	C2	AC	D2	P	AD	
MTR, MTRE 64-2/1-1	4.0	790	249	169	372	220	248	-	134	62	790	249	169	372	220	248	-	188	72
MTR, MTRE 64-2/1	5.5	880	249	240	391	220	-	300	134	82	880	249	240	391	220	-	300	188	89
MTR, MTRE 64-2/2-2	7.5	868	249	240	379	260	-	300	159	97	868	249	240	379	260	-	300	213	106
MTR, MTRE 64-2/2	11.0	960	249	240	471	315	-	350	204	136	975	249	240	486	314	-	350	308	164
MTR, MTRE 64-3/3-1	15.0	1043	332	240	471	314	-	350	204	150	1060	332	240	488	314	-	350	308	181
MTR, MTRE 64-3/3	18.5	1047	332	240	475	314	-	350	204	162	1066	332	240	494	314	-	350	308	193
MTR, MTRE 64-4/4	22.0	1186	414	240	532	314	-	350	204	178	1270	414	240	616	314	-	350	308	208
MTR 64-5/5	30.0	1404	497	240	667	404	-	400	306	280	-	-	-	-	-	-	-	-	-
MTR 64-6/5	30.0	1486	579	240	667	404	-	400	306	282	-	-	-	-	-	-	-	-	-
MTR 64-7/5	30.0	1569	662	240	667	404	-	400	306	284	-	-	-	-	-	-	-	-	-
MTR 64-8/5	30.0	1651	744	240	667	404	-	400	306	286	-	-	-	-	-	-	-	-	-
MTR 64-9/5	30.0	1734	827	240	667	404	-	400	306	288	-	-	-	-	-	-	-	-	-
MTR 64-10/5	30.0	1816	909	240	667	404	-	400	306	290	-	-	-	-	-	-	-	-	-
MTR 64-11/5	30.0	1899	992	240	667	404	-	400	306	292	-	-	-	-	-	-	-	-	-
MTR 64-12/5	30.0	1981	1074	240	667	404	-	400	306	294	-	-	-	-	-	-	-	-	-

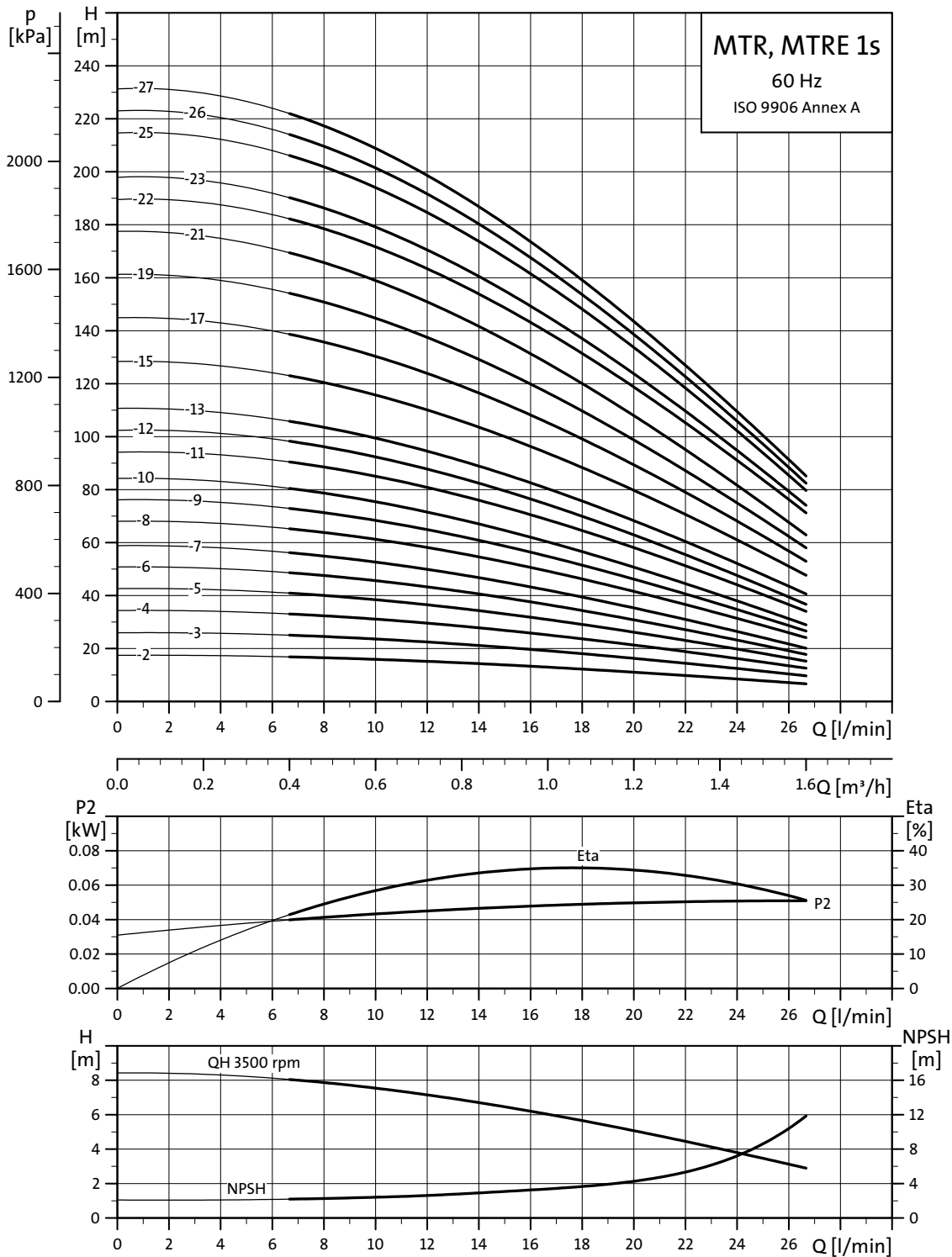
The maximum immersion depth is 1487 mm.

For information about electrical data see "Motor data" on pages 132-135.

Performance curves

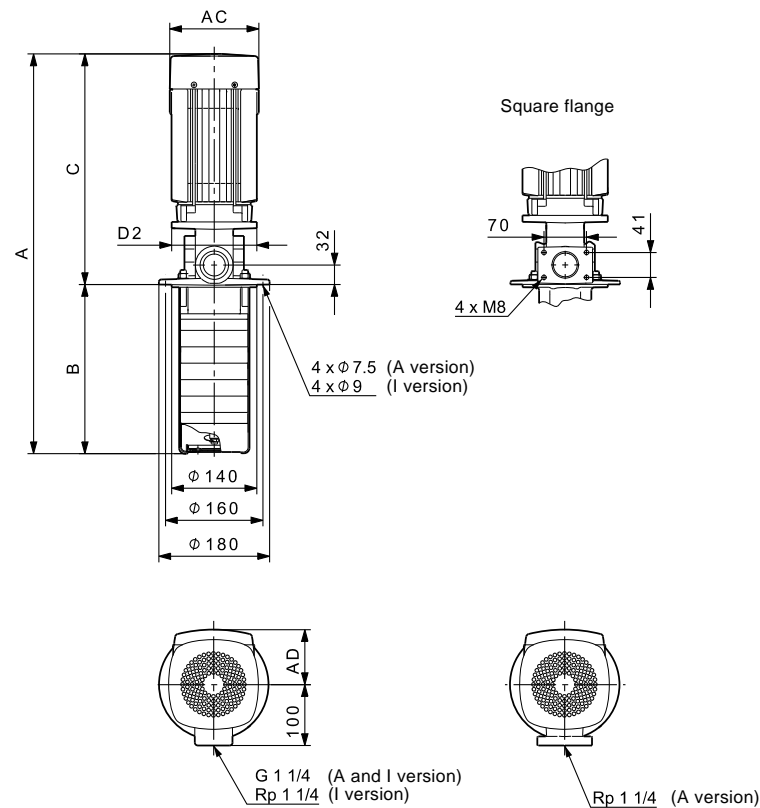
Immersible pumps
MTR, MTRE 1s, 60 Hz

MTR, MTRE 1s, 60 Hz



TM02 7846 4103

Dimensional sketches



TM03 2677 2908

Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							
		Dimensions [mm]						Net weight [kg]	Dimensions [mm]						Net weight [kg]	
		A	B	C	AC	D2	AD		A	B	C	AC	D2	AD		
MTR 1s-2/2	0.37	464	160	304	140	140	109	12.2	-	-	-	-	-	-	-	-
MTR 1s-3/3	0.37	482	178	304	140	140	109	12.5	-	-	-	-	-	-	-	-
MTR, MTRE 1s-4/4	0.37	500	196	304	140	140	109	12.8	500	196	304	141	140	140	15.5	-
MTR 1s-5/5	0.37	518	214	304	140	140	109	13.1	-	-	-	-	-	-	-	-
MTR 1s-6/6	0.37	536	232	304	140	140	109	13.4	-	-	-	-	-	-	-	-
MTR, MTRE 1s-7/7	0.37	554	250	304	140	140	109	13.7	554	250	304	141	140	140	16.4	-
MTR 1s-8/8	0.55	572	268	304	140	140	109	14.5	-	-	-	-	-	-	-	-
MTR 1s-9/9	0.55	590	286	304	140	140	109	14.8	-	-	-	-	-	-	-	-
MTR, MTRE 1s-10/10	0.55	608	304	304	140	140	109	15.1	608	304	304	141	140	140	16.9	-
MTR 1s-11/11	0.75	666	322	344	140	140	109	16.2	-	-	-	-	-	-	-	-
MTR 1s-12/12	0.75	684	340	344	140	140	109	16.5	-	-	-	-	-	-	-	-
MTR, MTRE 1s-13/13	0.75	702	358	344	140	140	109	16.0	702	358	344	178	140	167	17.6	-
MTR 1s-15/15	1.1	738	394	344	140	140	109	18.8	-	-	-	-	-	-	-	-
MTR 1s-17/17	1.1	774	430	344	140	140	109	19.4	-	-	-	-	-	-	-	-
MTR 1s-19/19	1.1	810	466	344	140	140	109	20.0	-	-	-	-	-	-	-	-
MTR, MTRE 1s-21/21	1.1	846	502	344	140	140	109	20.6	846	502	344	178	140	167	23.3	-
MTR 1s-22/22	1.5	914	520	394	178	140	110	27.4	-	-	-	-	-	-	-	-
MTR, MTRE 1s-23/23	1.5	932	538	394	178	140	110	27.7	932	538	394	178	140	167	35.5	-
MTR 1s-25/25	1.5	968	574	394	178	140	110	28.3	-	-	-	-	-	-	-	-
MTR 1s-26/26	1.5	986	592	394	178	140	110	28.6	-	-	-	-	-	-	-	-
MTR, MTRE 1s-27/27	1.5	1004	610	394	178	140	110	28.9	1004	610	394	178	140	167	36.7	-

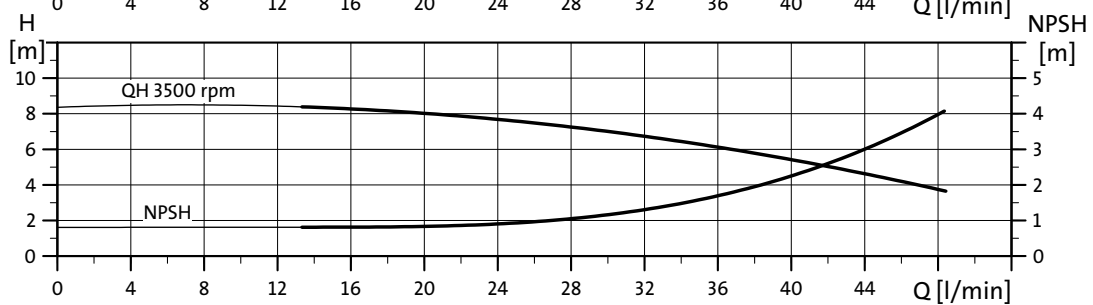
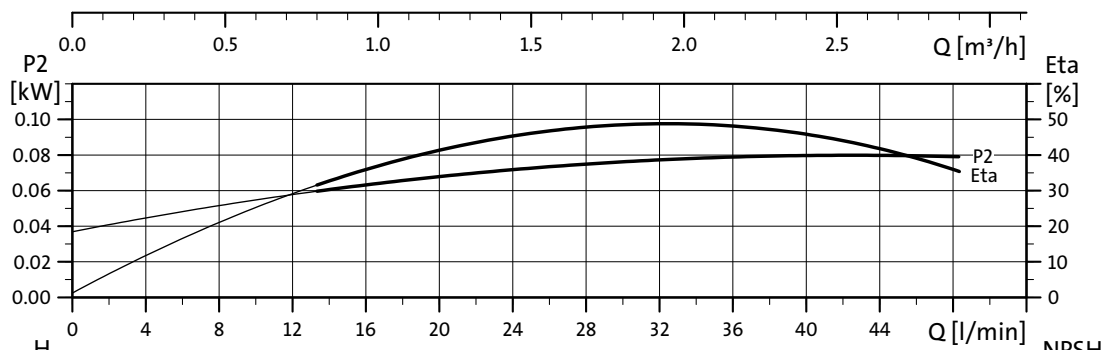
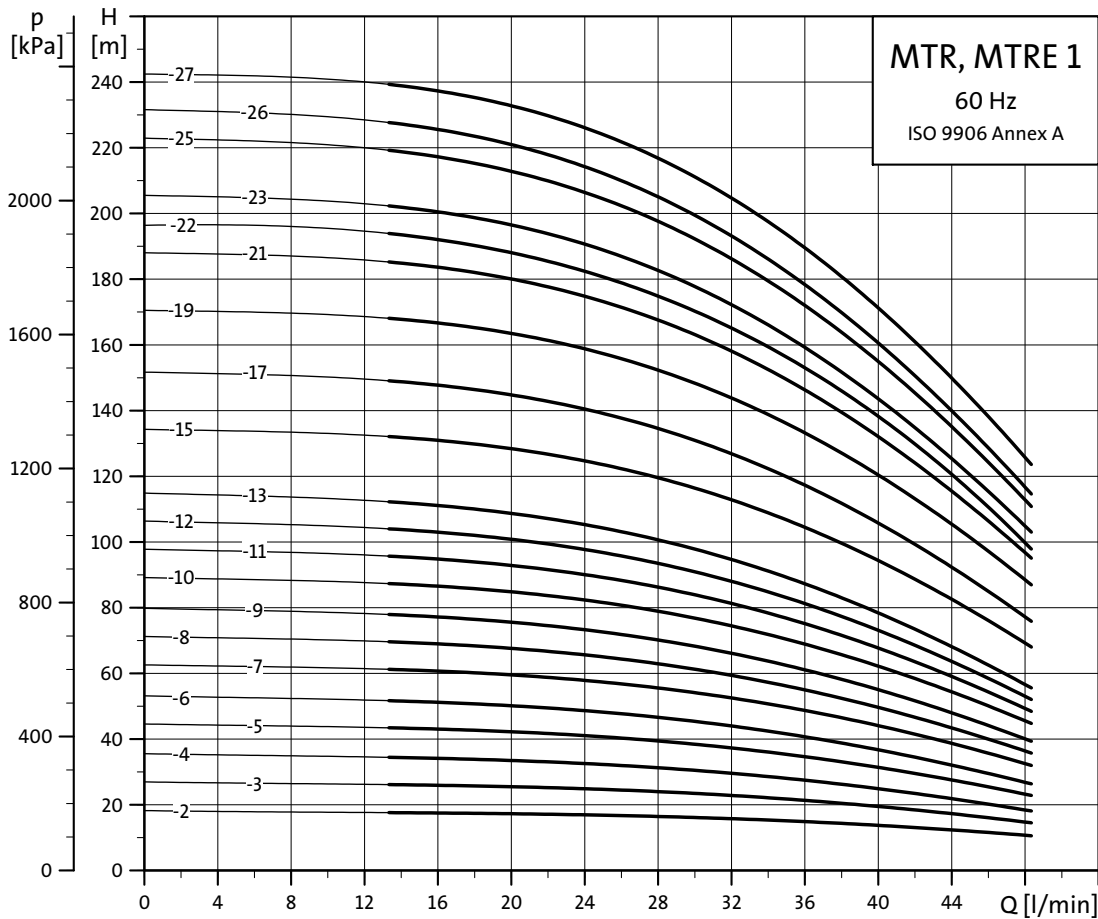
The maximum immersion depth is 1006 mm.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

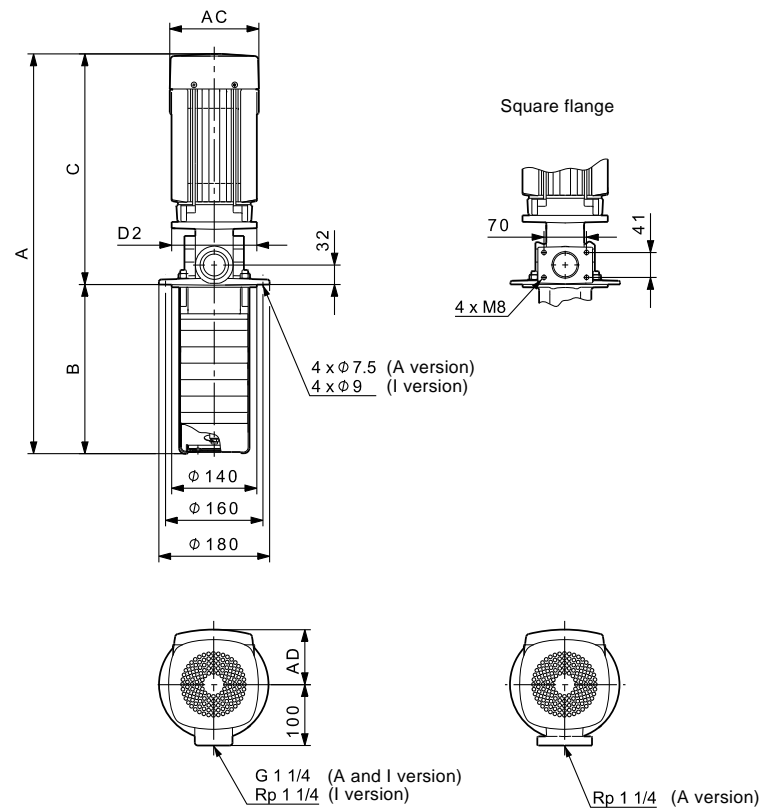
Immersible pumps
MTR, MTRE 1, 60 Hz

MTR, MTRE 1, 60 Hz



TM02 7847 4303

Dimensional sketches



TM03 2677 2908

Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							
		Dimensions [mm]						Net weight [kg]	Dimensions [mm]						Net weight [kg]	
		A	B	C	AC	D2	AD		A	B	C	AC	D2	AD		
MTR 1-2/2	0.37	464	160	304	140	140	109	12.2	-	-	-	-	-	-	-	-
MTR 1-3/3	0.37	482	178	304	140	140	109	12.5	-	-	-	-	-	-	-	-
MTR, MTRE 1-4/4	0.37	500	196	304	140	140	109	12.8	500	196	304	141	140	140	15.5	
MTR 1-5/5	0.55	518	214	304	140	140	109	13.6	-	-	-	-	-	-	-	-
MTR 1-6/6	0.55	536	232	304	140	140	109	13.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-7/7	0.75	594	250	344	140	140	109	15.0	594	250	344	141	140	140	16.0	
MTR 1-8/8	0.75	612	268	344	140	140	109	15.3	-	-	-	-	-	-	-	-
MTR, MTRE 1-9/9	0.75	630	286	344	140	140	109	15.6	630	286	344	178	140	167	17.2	
MTR 1-10/10	1.1	648	304	344	140	140	109	17.3	-	-	-	-	-	-	-	-
MTR 1-11/11	1.1	666	322	344	140	140	109	17.6	-	-	-	-	-	-	-	-
MTR 1-12/12	1.1	684	340	344	140	140	109	17.9	-	-	-	-	-	-	-	-
MTR, MTRE 1-13/13	1.1	702	358	344	140	140	109	18.2	702	358	344	178	140	167	20.9	
MTR 1-15/15	1.5	788	394	394	178	140	110	25.3	-	-	-	-	-	-	-	-
MTR, MTRE 1-17/17	1.5	824	430	394	178	140	110	25.9	824	430	394	178	140	167	33.7	
MTR 1-19/19	2.2	900	466	434	178	140	110	29.7	-	-	-	-	-	-	-	-
MTR 1-21/21	2.2	936	502	434	178	140	110	30.3	-	-	-	-	-	-	-	-
MTR, MTRE 1-22/22	2.2	954	520	434	178	140	110	30.6	954	520	434	178	140	167	37.4	
MTR 1-23/23	2.2	972	538	434	178	140	110	30.9	-	-	-	-	-	-	-	-
MTR 1-25/25	2.2	1008	574	434	178	140	110	31.5	-	-	-	-	-	-	-	-
MTR 1-26/26	3.0	1040	592	448	198	160	110	34.8	-	-	-	-	-	-	-	-
MTR, MTRE 1-27/27	3.0	1058	610	448	198	160	110	35.1	1058	610	448	198	160	177	41.9	

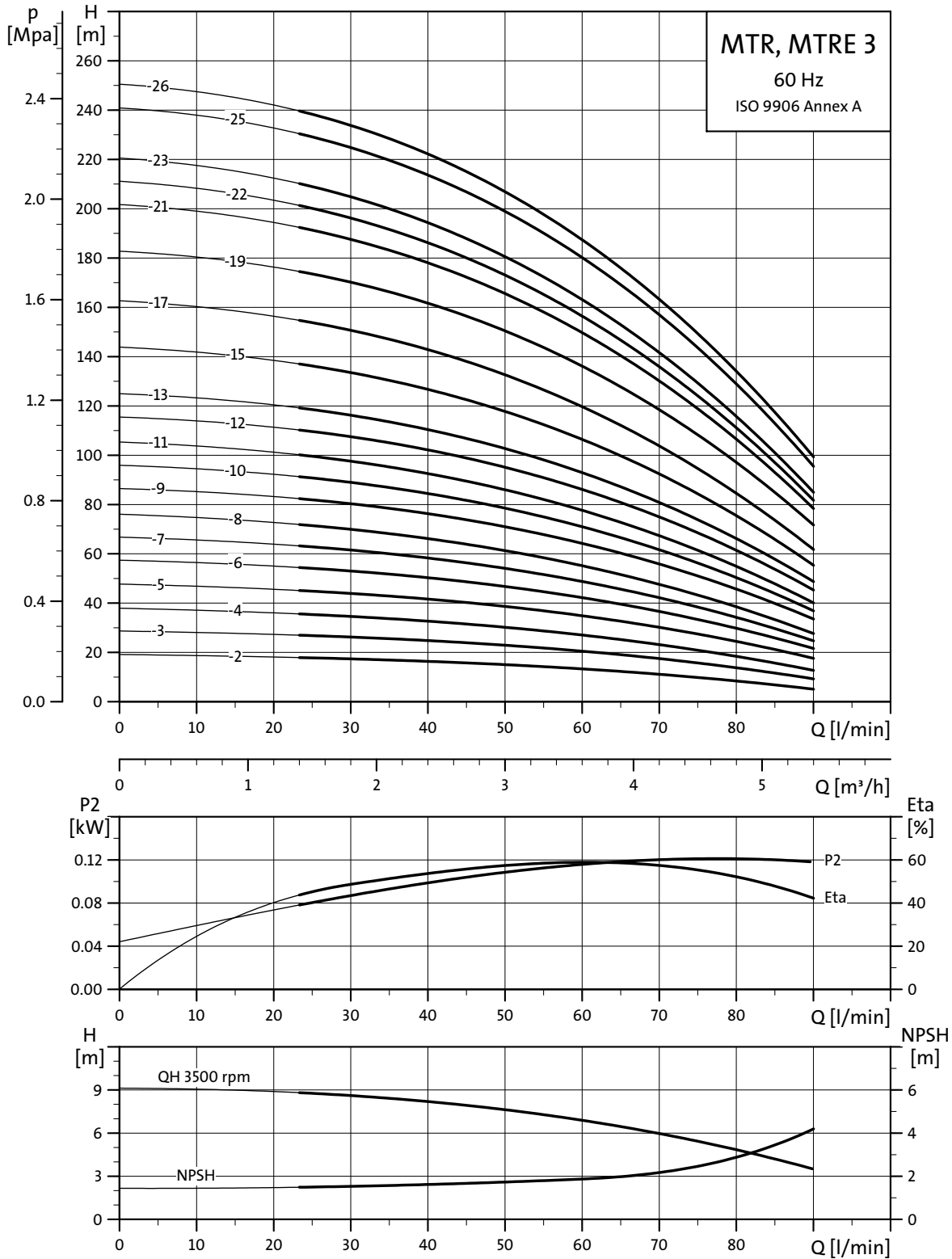
The maximum immersion depth is 1006 mm.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

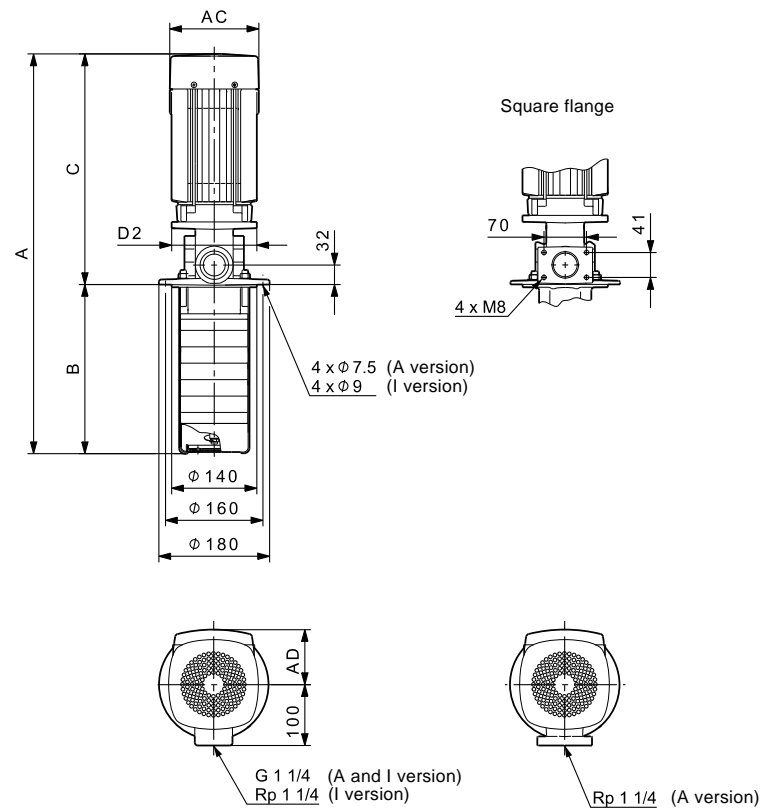
Immersible pumps
MTR, MTRE 3, 60 Hz

MTR, MTRE 3, 60 Hz



TM02 7848 4303

Dimensional sketches



TM03 2677 2908

Dimensions and weights

Pump type	P2 [kW]	MTR							MTRE							
		Dimensions [mm]						Net weight [kg]	Dimensions [mm]						Net weight [kg]	
		A	B	C	AC	D2	AD		A	B	C	AC	D2	AD		
MTR 3-2/2	0.37	464	160	304	140	140	109	12.2	-	-	-	-	-	-	-	-
MTR, MTRE 3-3/3	0.55	482	178	304	140	140	109	13.0	482	178	304	141	140	140	15.2	
MTR, MTRE 3-4/4	0.55	500	196	304	140	140	109	13.3	500	196	304	141	140	140	15.1	
MTR 3-5/5	0.75	558	214	344	140	140	109	14.4	-	-	-	-	-	-	-	
MTR, MTRE 3-6/6	1.1	576	232	344	140	140	109	16.1	576	232	344	178	140	167	16.3	
MTR 3-7/7	1.1	594	250	344	140	140	109	16.4	-	-	-	-	-	-	-	
MTR 3-8/8	1.1	612	268	344	140	140	109	16.7	-	-	-	-	-	-	-	
MTR 3-9/9	1.5	680	286	394	140	140	109	24.1	-	-	-	-	-	-	-	
MTR 3-10/10	1.5	698	304	394	140	140	109	24.4	-	-	-	-	-	-	-	
MTR, MTRE 3-11/11	1.5	716	322	394	140	140	109	24.7	716	322	394	178	140	167	20.3	
MTR 3-12/12	2.2	774	340	434	178	140	110	27.6	-	-	-	-	-	-	-	
MTR 3-13/13	2.2	792	358	434	178	140	110	27.9	-	-	-	-	-	-	-	
MTR 3-15/15	2.2	828	394	434	178	140	110	28.5	-	-	-	-	-	-	-	
MTR, MTRE 3-17/17	2.2	864	430	434	178	140	110	29.1	864	430	434	178	140	167	35.9	
MTR 3-19/19	3.0	914	466	448	198	160	110	36.4	-	-	-	-	-	-	-	
MTR 3-21/21	3.0	950	502	448	198	160	110	37.0	-	-	-	-	-	-	-	
MTR 3-22/22	3.0	968	520	448	198	160	110	37.3	-	-	-	-	-	-	-	
MTR, MTRE 3-23/23	3.0	986	538	448	198	160	110	37.6	986	538	448	198	160	177	44.4	
MTR 3-25/25	4.0	1059	574	485	220	160	134	40.9	-	-	-	-	-	-	-	
MTR, MTRE 3-26/26	4.0	1077	592	485	220	160	134	41.2	1077	592	485	220	160	188	50.9	

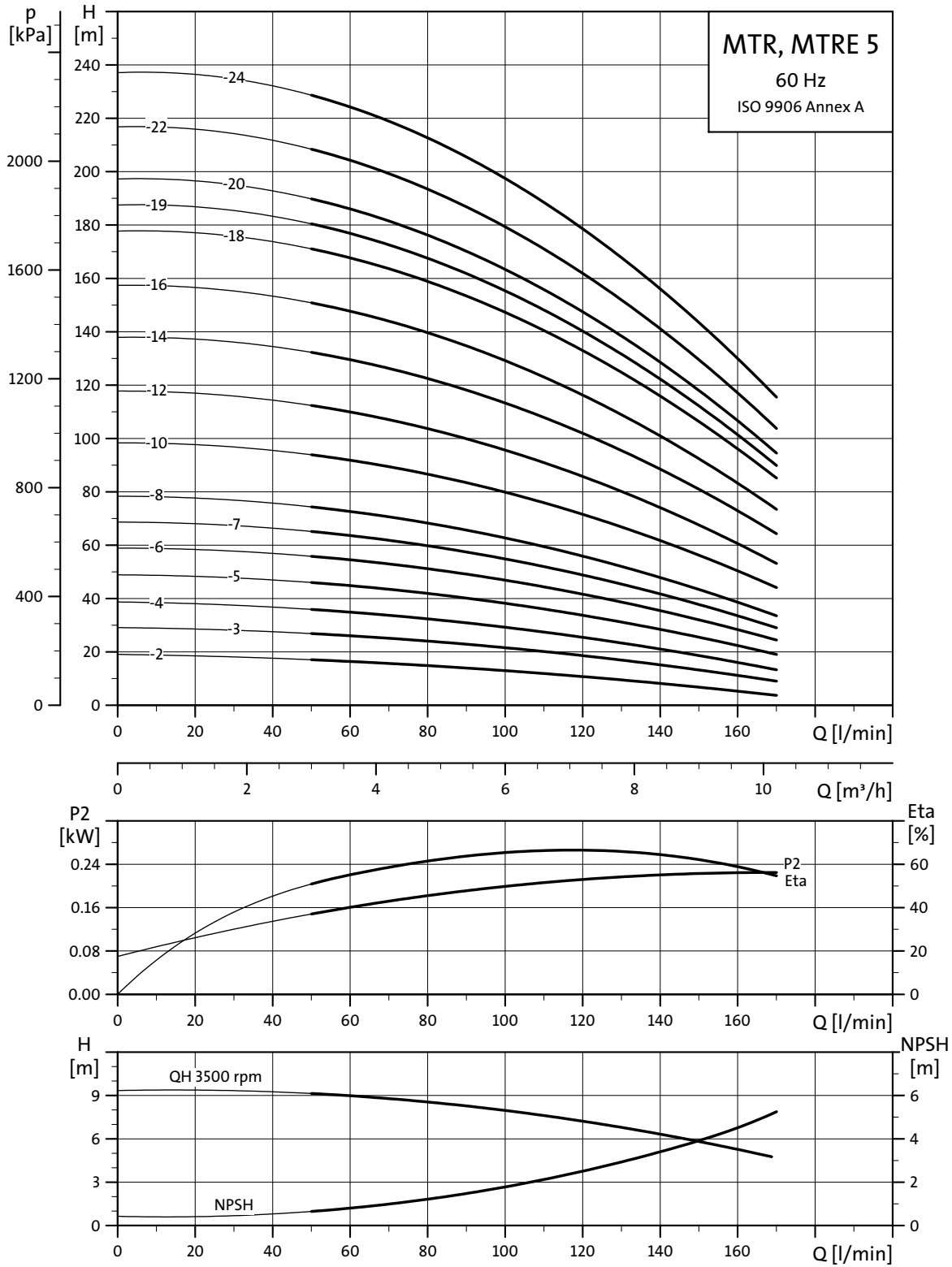
The maximum immersion depth is 1006 mm.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

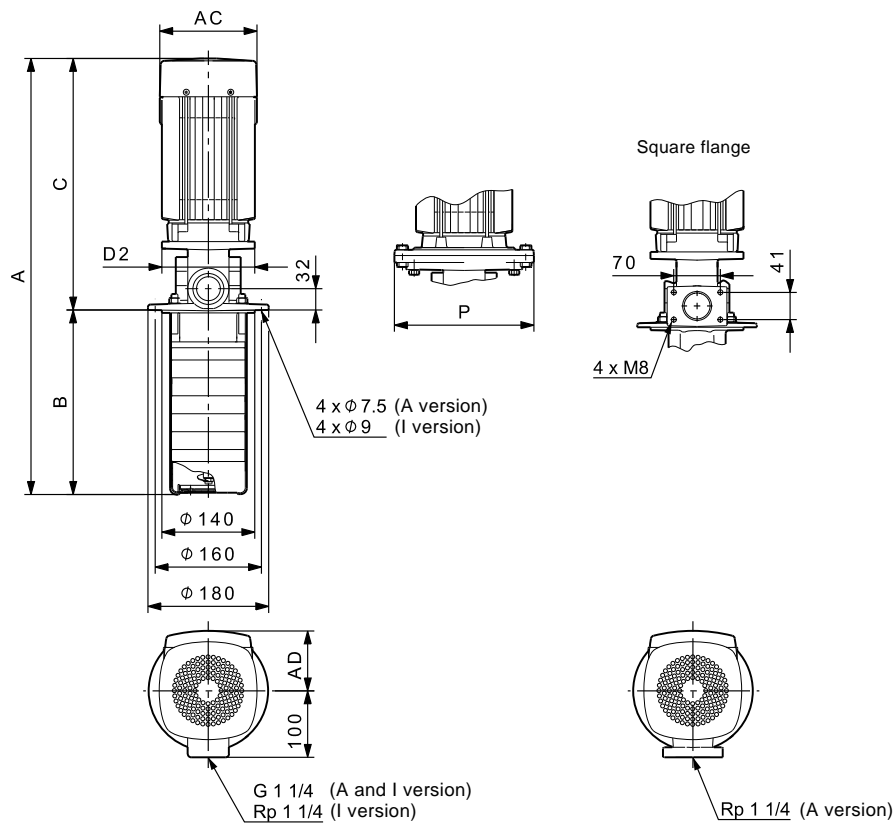
Immersible pumps
MTR, MTRE 5, 60 Hz

MTR, MTRE 5, 60 Hz



TM02 7849 4303

Dimensional sketches



TM04 2789 2909

Dimensions and weights

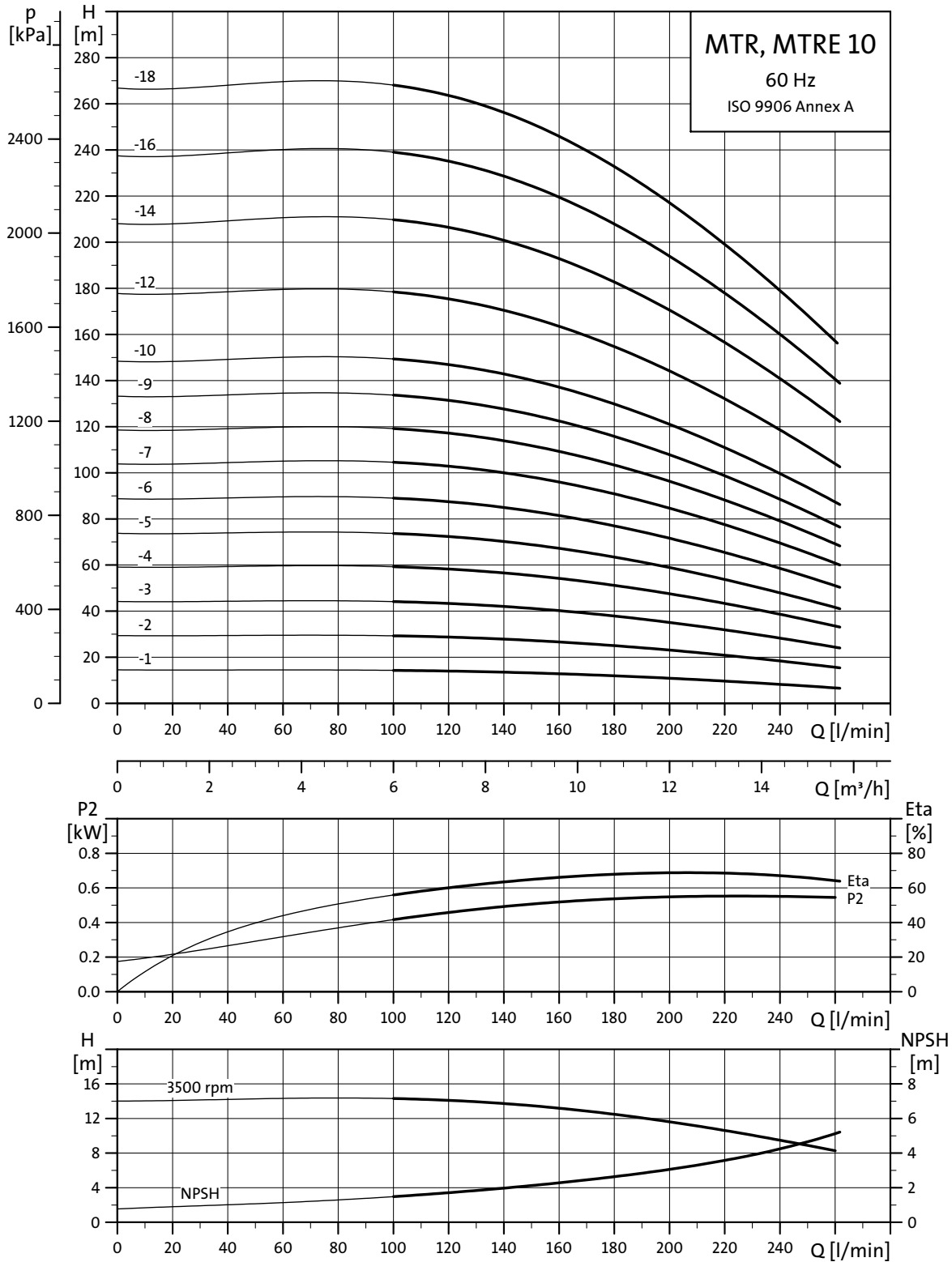
Pump type	P2 [kW]	MTR								MTRE									
		Dimensions [mm]								Net weight [kg]	Dimensions [mm]								Net weight [kg]
		A	B	C	AC	D2	P	AD	A		B	C	AC	D2	P	AD			
MTR, MTRE 5-2/2	0.55	473	169	304	140	140	-	109	12.7	473	169	304	141	140	-	140	14.5		
MTR 5-3/3	1.1	540	196	344	140	140	-	109	15.6	-	-	-	-	-	-	-	-		
MTR, MTRE 5-4/4	1.1	567	223	344	140	140	-	109	16.0	567	223	344	178	140	-	167	18.7		
MTR, MTRE 5-5/5	1.5	644	250	394	178	140	-	110	25.0	644	250	394	178	140	-	167	32.8		
MTR 5-6/6	2.2	711	277	434	178	140	-	110	27.9	-	-	-	-	-	-	-	-		
MTR 5-7/7	2.2	738	304	434	178	140	-	110	28.3	-	-	-	-	-	-	-	-		
MTR, MTRE 5-8/8	2.2	765	331	434	178	140	-	110	28.7	765	331	434	178	140	-	167	35.5		
MTR 5-10/10	3.0	833	385	448	198	160	-	110	32.9	-	-	-	-	-	-	-	-		
MTR, MTRE 5-12/12	3.0	887	439	448	198	160	-	110	33.7	887	439	448	198	160	-	177	40.5		
MTR 5-14/14	4.0	978	493	485	220	160	-	134	36.3	-	-	-	-	-	-	-	-		
MTR, MTRE 5-16/16	4.0	1032	547	485	220	160	-	134	37.1	1032	547	485	220	160	-	188	46.8		
MTR 5-18/18	5.5	1130	601	529	220	-	300	134	43.7	-	-	-	-	-	-	-	-		
MTR 5-19/19	5.5	1157	628	529	220	-	300	134	44.1	-	-	-	-	-	-	-	-		
MTR 5-20/20	5.5	1184	655	529	220	-	300	134	44.5	-	-	-	-	-	-	-	-		
MTR, MTRE 5-22/22	5.5	1238	709	529	220	-	300	134	45.3	1238	709	529	220	-	300	188	51.9		
MTR, MTRE 5-24/24	7.5	1280	763	517	260	-	300	159	58.1	1280	763	517	260	-	300	213	63.9		

The maximum immersion depth is 1006 mm.
For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

Immersible pumps
MTR, MTRE 10, 60 Hz

MTR, MTRE 10, 60 Hz

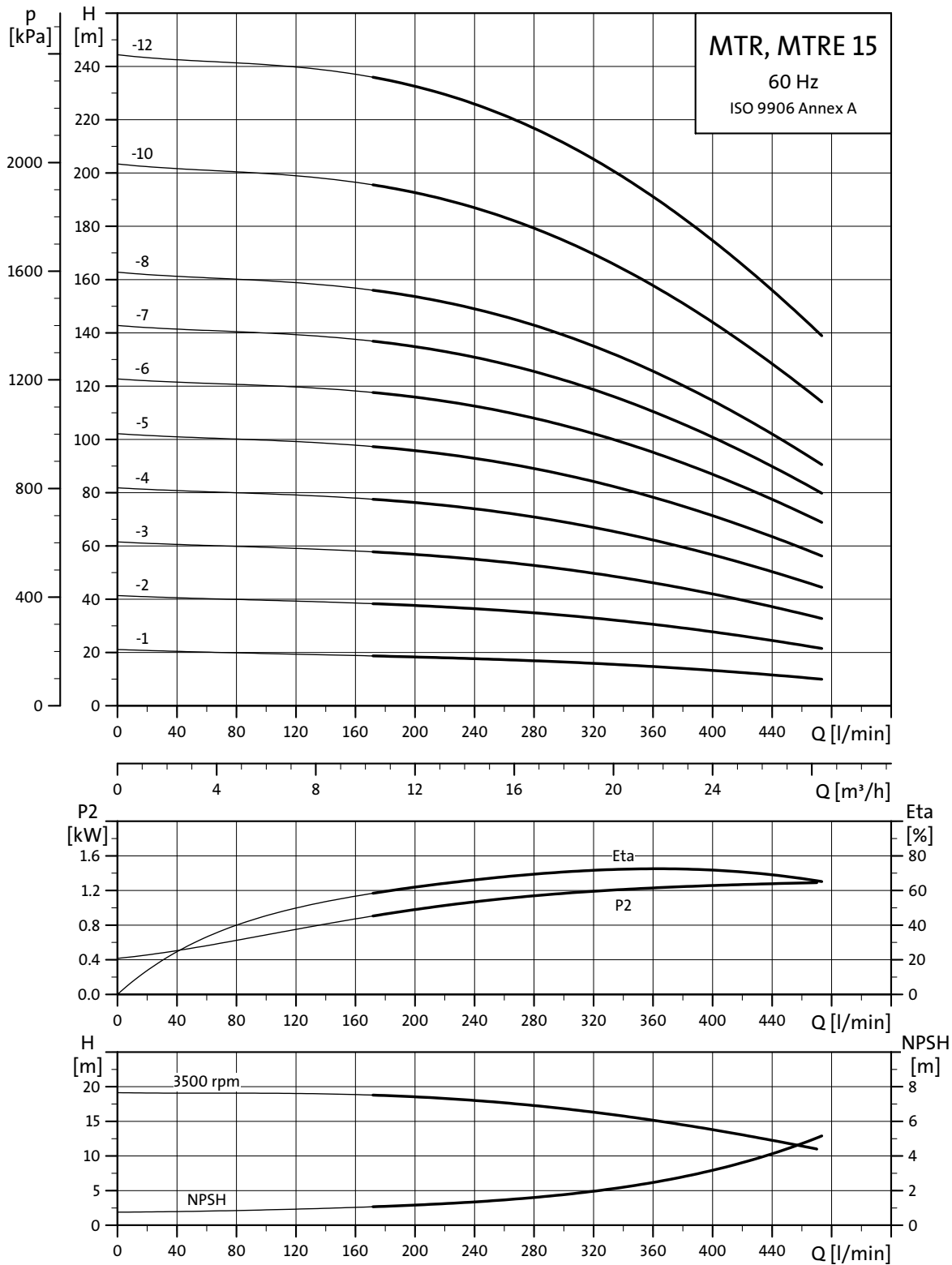


TM02 7850 4303

Performance curves

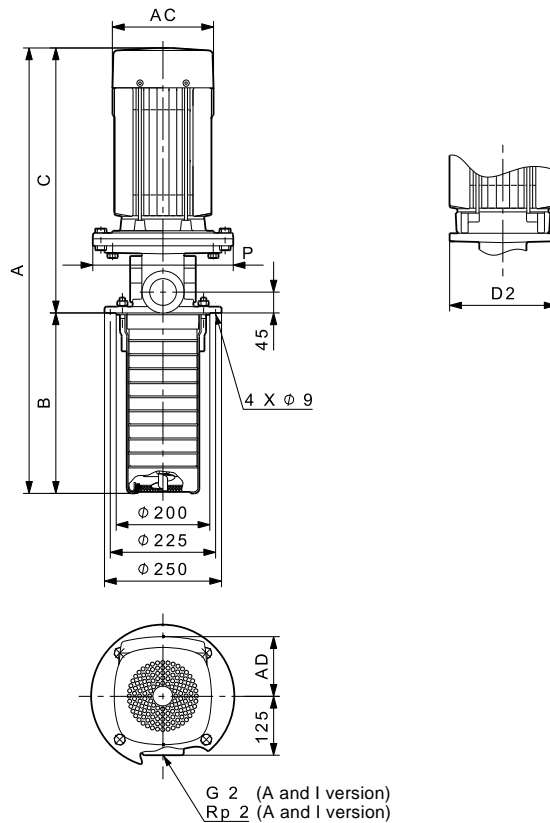
Immersible pumps
MTR, MTRE 15, 60 Hz

MTR, MTRE 15, 60 Hz



TM02 7851 4303

Dimensional sketches



TM04 2790 3308

Dimensions and weights

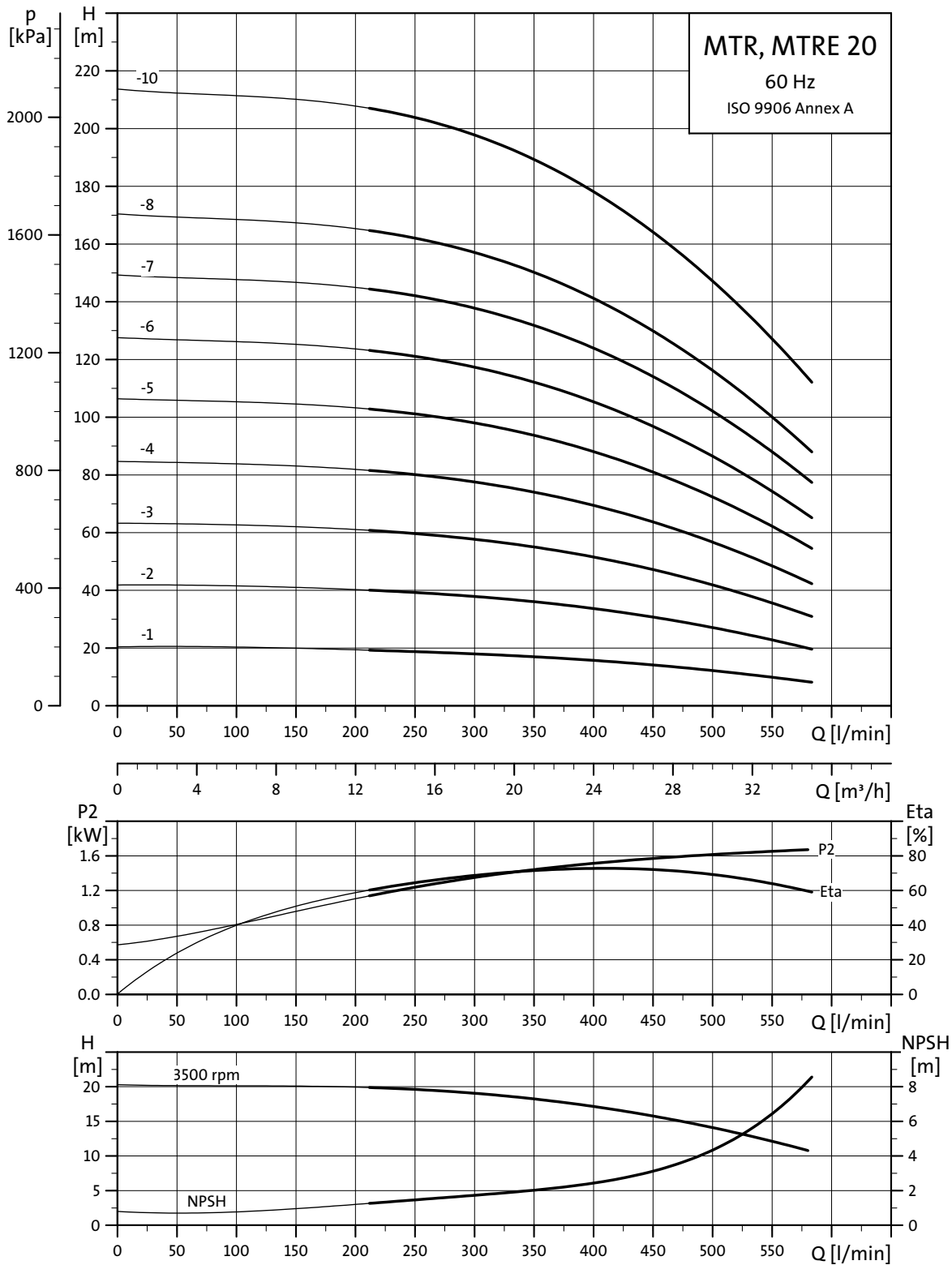
Pump type	P2 [kW]	MTR								MTRE									
		Dimensions [mm]								Net weight [kg]	Dimensions [mm]								Net weight [kg]
		A	B	C	AC	D2	P	AD	A		B	C	AC	D2	P	AD			
MTR, MTRE 15-2/1	1.5	603	178	425	178	140	-	110	28	603	178	425	178	140	-	167	35		
MTR, MTRE 15-2/2	3.0	657	178	479	198	160	-	110	45	657	178	479	198	160	-	177	52		
MTR, MTRE 15-3/3	4.0	739	223	516	220	160	-	134	47	739	223	516	220	160	-	188	57		
MTR, MTRE 15-4/4	5.5	823	268	555	220	-	300	134	63	823	268	555	220	-	300	188	70		
MTR, MTRE 15-5/5	7.5	856	313	543	260	-	300	159	80	856	313	543	260	-	300	213	89		
MTR 15-6/6	11.0	1023	358	665	315	-	350	204	119	-	-	-	-	-	-	-	-		
MTR 15-7/7	11.0	1068	403	665	315	-	350	204	120	-	-	-	-	-	-	-	-		
MTR, MTRE 15-8/8	11.0	1113	448	665	315	-	350	204	121	1113	448	665	314	-	350	308	149		
MTR, MTRE 15-10/10	15.0	1203	538	665	314	-	350	204	135	1203	538	665	314	-	350	308	166		
MTR, MTRE 15-12/12	18.5	1337	628	709	314	-	350	204	149	1337	628	709	314	-	350	308	180		
MTR 15-14/12	18.5	1427	718	709	314	-	350	204	151	-	-	-	-	-	-	-	-		
MTR 15-16/12	18.5	1517	808	709	314	-	350	204	153	-	-	-	-	-	-	-	-		
MTR 15-17/12	18.5	1562	853	709	314	-	350	204	154	-	-	-	-	-	-	-	-		

The maximum immersion depth is 1033 mm.
For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

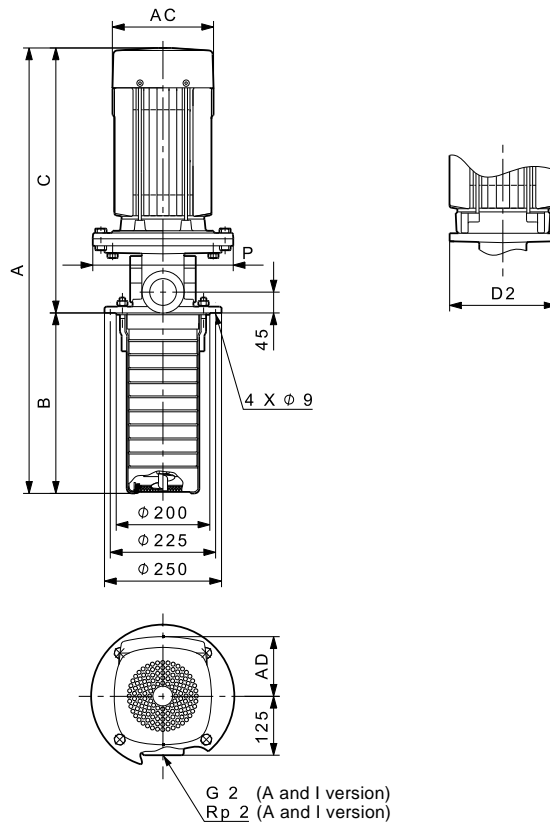
Immersible pumps
MTR, MTRE 20, 60 Hz

MTR, MTRE 20, 60 Hz



TM02 7852 4303

Dimensional sketches



TM04 2790 3308

Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE									
		Dimensions [mm]								Net weight [kg]	Dimensions [mm]								Net weight [kg]
		A	B	C	AC	D2	P	AD	A		B	C	AC	D2	P	AD			
MTR, MTRE 20-2/1	2.2	643	178	465	178	160	-	110	44	643	178	465	198	160	-	177	51		
MTR, MTRE 20-2/2	4.0	694	178	516	220	160	-	134	46	694	178	516	220	160	-	188	56		
MTR, MTRE 20-3/3	5.5	778	223	555	220	-	300	134	62	778	223	555	220	-	300	188	69		
MTR, MTRE 20-4/4	7.5	811	268	543	260	-	300	159	79	811	268	543	260	-	300	213	88		
MTR 20-5/5	11.0	978	313	665	315	-	350	204	117	-	-	-	-	-	-	-	-		
MTR, MTRE 20-6/6	11.0	1023	358	665	314	-	350	204	118	1023	358	665	314	-	350	308	146		
MTR 20-7/7	15.0	1068	403	665	314	-	350	204	131	-	-	-	-	-	-	-	-		
MTR, MTRE 20-8/8	15.0	1113	448	665	314	-	350	204	132	1113	448	665	314	-	350	308	163		
MTR, MTRE 20-10/10	18.5	1247	538	709	314	-	350	204	146	1247	538	709	314	-	350	308	177		
MTR 20-12/10	18.5	1337	628	709	314	-	350	204	148	-	-	-	-	-	-	-	-		
MTR 20-14/10	18.5	1427	718	709	314	-	350	204	150	-	-	-	-	-	-	-	-		
MTR 20-16/10	18.5	1517	808	709	314	-	350	204	152	-	-	-	-	-	-	-	-		
MTR 20-17/10	18.5	1562	853	709	314	-	350	204	153	-	-	-	-	-	-	-	-		

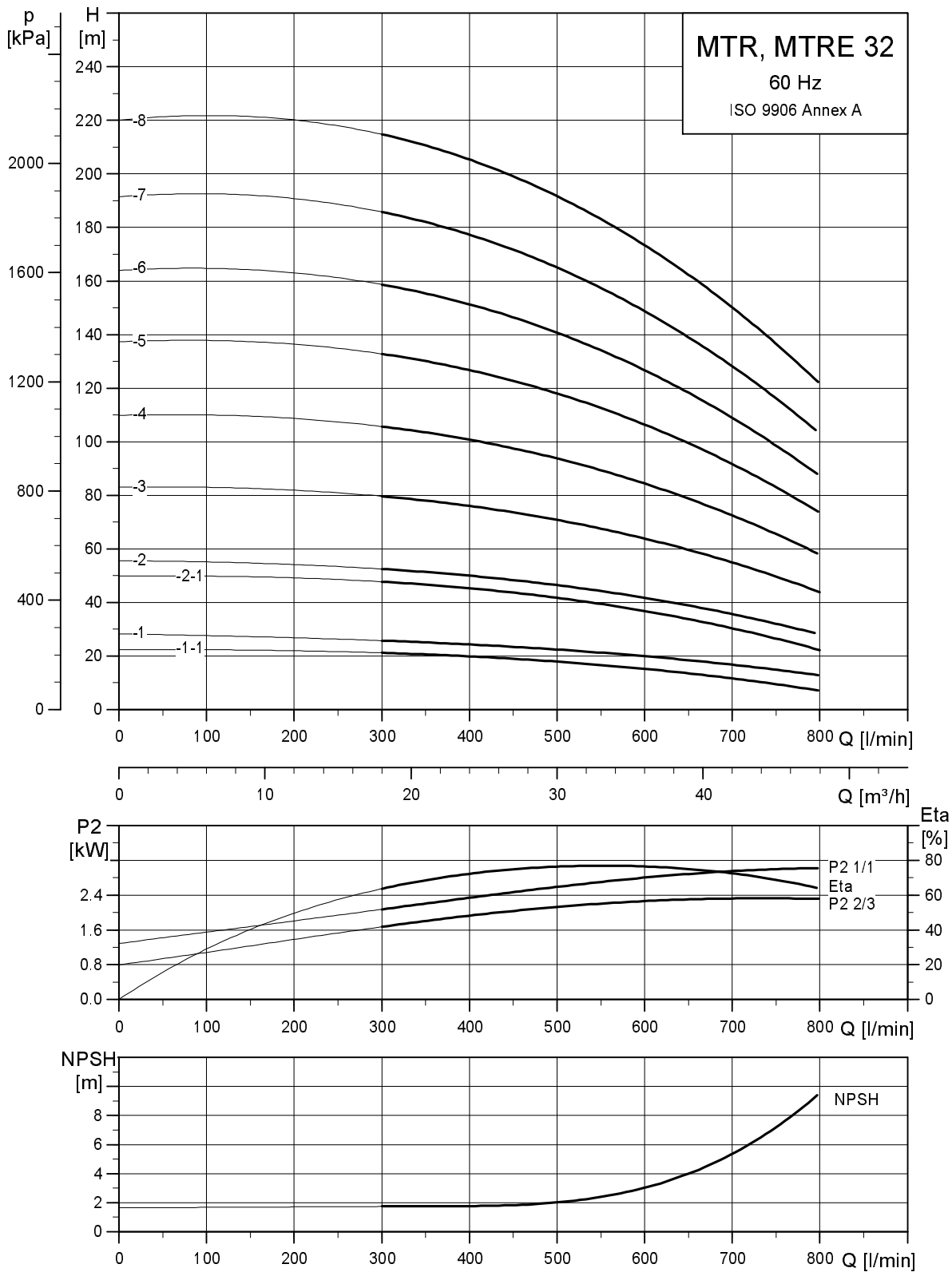
The maximum immersion depth is 1033 mm.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

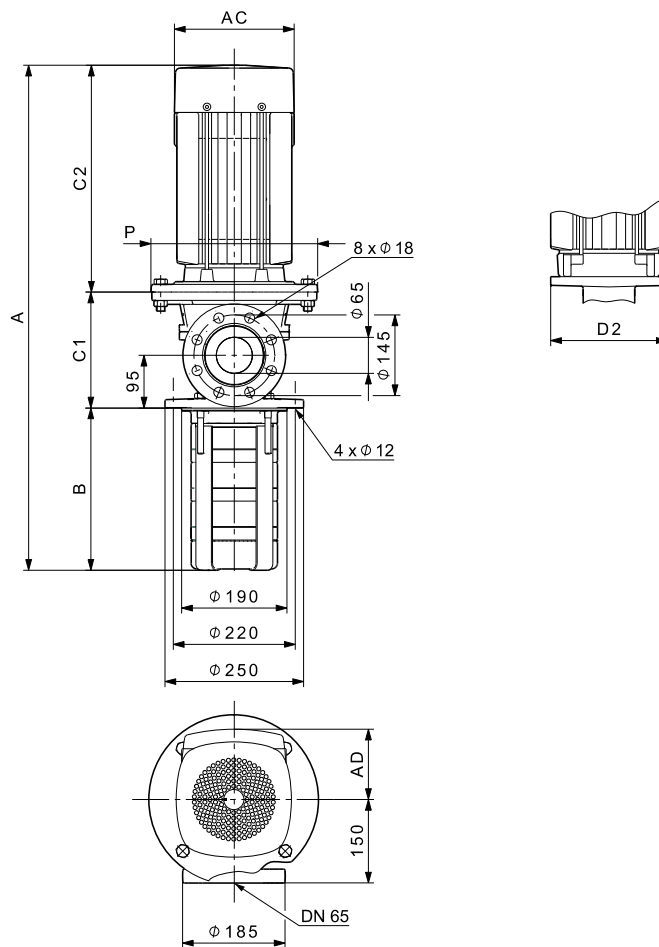
Immersible pumps
MTR, MTRE 32, 60 Hz

MTR, MTRE 32, 60 Hz



TM01 4305 3700

Dimensional sketches



TM04 2791 3308

Dimensions and weights

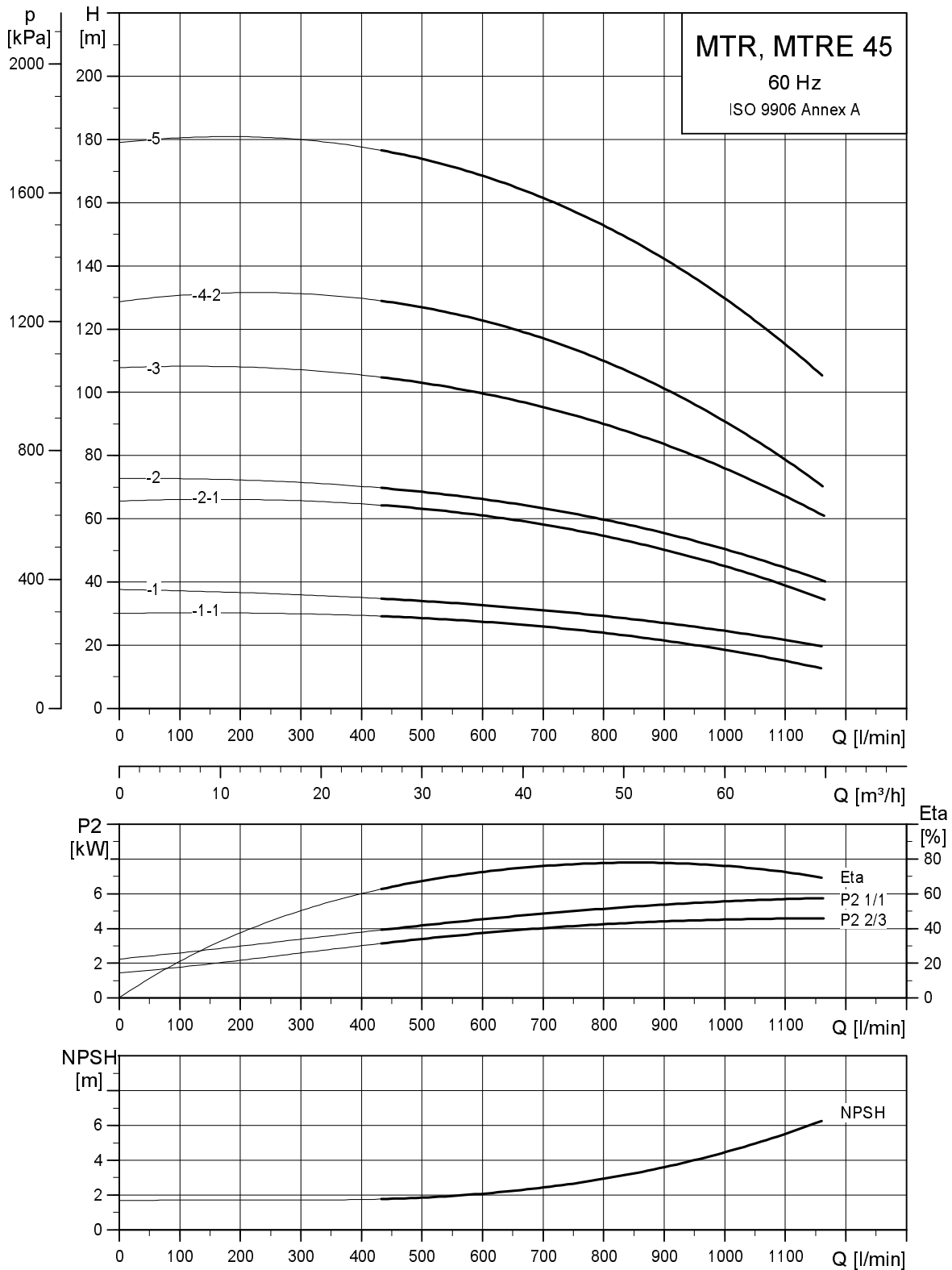
Pump type	P2 [kW]	MTR								Net weight [kg]	MTRE								Net weight [kg]
		Dimensions [mm]									Dimensions [mm]								
		A	B	C1	C2	AC	D2	P	AD		A	B	C1	C2	AC	D2	P	AD	
MTR, MTRE 32-2/1-1	2.2	682	223	138	321	178	-	200	110	41	682	223	138	321	178	-	200	167	48
MTR, MTRE 32-2/1	3.0	696	223	138	335	198	160	-	110	46	696	223	138	335	198	160	-	177	53
MTR, MTRE 32-2/2-1	5.5	823	223	209	391	220	-	300	134	76	823	223	209	391	220	-	300	188	83
MTR, MTRE 32-2/2	7.5	811	223	209	379	260	-	300	159	90	811	223	209	379	260	-	300	213	99
MTR, MTRE 32-3/3	11.0	973	293	209	471	315	-	350	204	131	973	293	209	471	314	-	350	308	159
MTR, MTRE 32-4/4	15.0	1043	363	209	471	314	-	350	204	145	1043	363	209	471	314	-	350	308	176
MTR 32-5/5	18.5	1157	433	209	515	314	-	350	204	159	-	-	-	-	-	-	-	-	-
MTR, MTRE 32-6/6	18.5	1227	503	209	515	314	-	350	204	161	1227	503	209	515	314	-	350	308	192
MTR, MTRE 32-7/7	22.0	1323	573	209	541	314	-	350	204	179	1323	573	209	541	314	-	350	308	209
MTR 32-8/8	30.0	1519	643	209	667	404	-	400	306	281	-	-	-	-	-	-	-	-	-
MTR 32-9/8	30.0	1589	713	209	667	404	-	400	306	283	-	-	-	-	-	-	-	-	-
MTR 32-10/8	30.0	1659	783	209	667	404	-	400	306	285	-	-	-	-	-	-	-	-	-
MTR 32-11/8	30.0	1729	853	209	667	404	-	400	306	287	-	-	-	-	-	-	-	-	-
MTR 32-12/8	30.0	1799	923	209	667	404	-	400	306	289	-	-	-	-	-	-	-	-	-
MTR 32-13/8	30.0	1869	993	209	667	404	-	400	306	291	-	-	-	-	-	-	-	-	-
MTR 32-14/8	30.0	1939	1063	209	667	404	-	400	306	293	-	-	-	-	-	-	-	-	-

The maximum immersion depth is 1343 mm.
For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

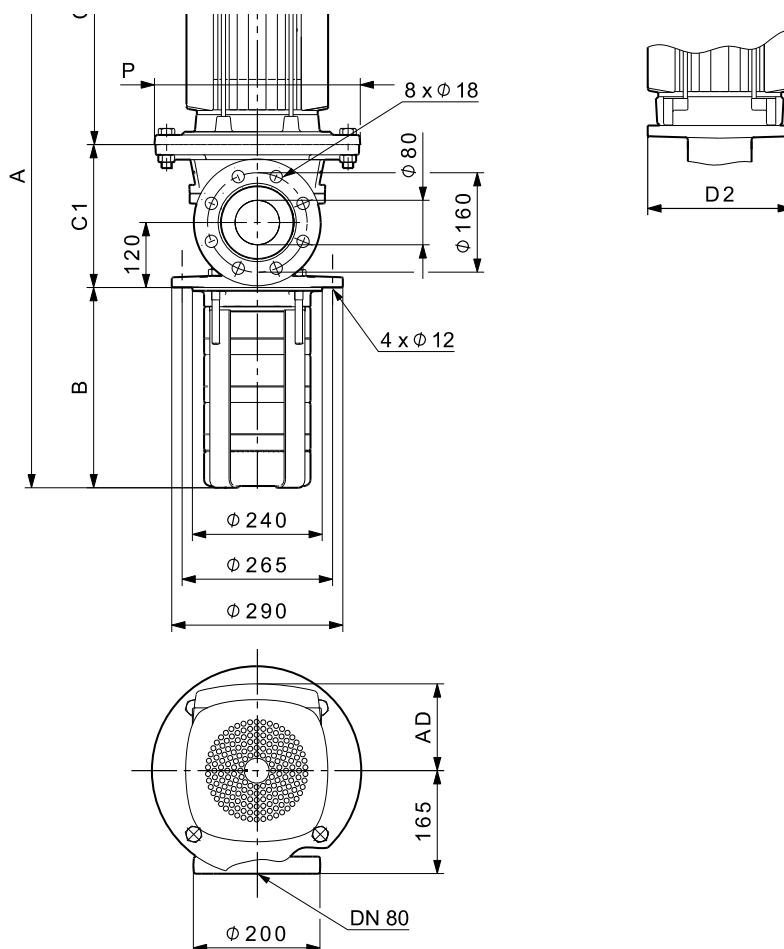
Immersible pumps
MTR, MTRE 45, 60 Hz

MTR, MTRE 45, 60 Hz



TM01 4306 3700

Dimensional sketches



TM04 2792 2909

Dimensions and weights

Pump type	P2 [kW]	MTR								MTRE							
		Dimensions [mm]								Net weight [kg]	Dimensions [mm]						
A	B	C1	C2	AC	P	AD	A	B	C1		C2	AC	P	AD			
MTR, MTRE 45-2/1-1	5.5	875	244	240	391	220	300	134	81	875	244	240	391	220	300	188	88
MTR, MTRE 45-2/1	7.5	863	244	240	379	260	300	159	95	863	244	240	379	260	300	213	104
MTR, MTRE 45-2/2-1	11.0	955	244	240	471	315	350	204	134	955	244	240	471	314	350	308	162
MTR, MTRE 45-2/2	15.0	955	244	240	471	314	350	204	136	955	244	240	471	314	350	308	167
MTR, MTRE 45-3/3	18.5	1079	324	240	515	314	350	204	150	1079	324	240	515	314	350	308	181
MTR, MTRE 45-4/4-2	22.0	1185	404	240	541	314	350	204	166	1185	404	240	541	314	350	308	196
MTR 45-5/5	30.0	1391	484	240	667	404	400	306	268	-	-	-	-	-	-	-	-
MTR 45-6/5	30.0	1471	564	240	667	404	400	306	270	-	-	-	-	-	-	-	-
MTR 45-7/5	30.0	1551	644	240	667	404	400	306	272	-	-	-	-	-	-	-	-
MTR 45-8/5	30.0	1631	724	240	667	404	400	306	274	-	-	-	-	-	-	-	-
MTR 45-9/5	30.0	1711	804	240	667	404	400	306	276	-	-	-	-	-	-	-	-
MTR 45-10/5	30.0	1791	884	240	667	404	400	306	278	-	-	-	-	-	-	-	-
MTR 45-11/5	30.0	1871	964	240	667	404	400	306	280	-	-	-	-	-	-	-	-
MTR 45-12/5	30.0	1951	1044	240	667	404	400	306	282	-	-	-	-	-	-	-	-

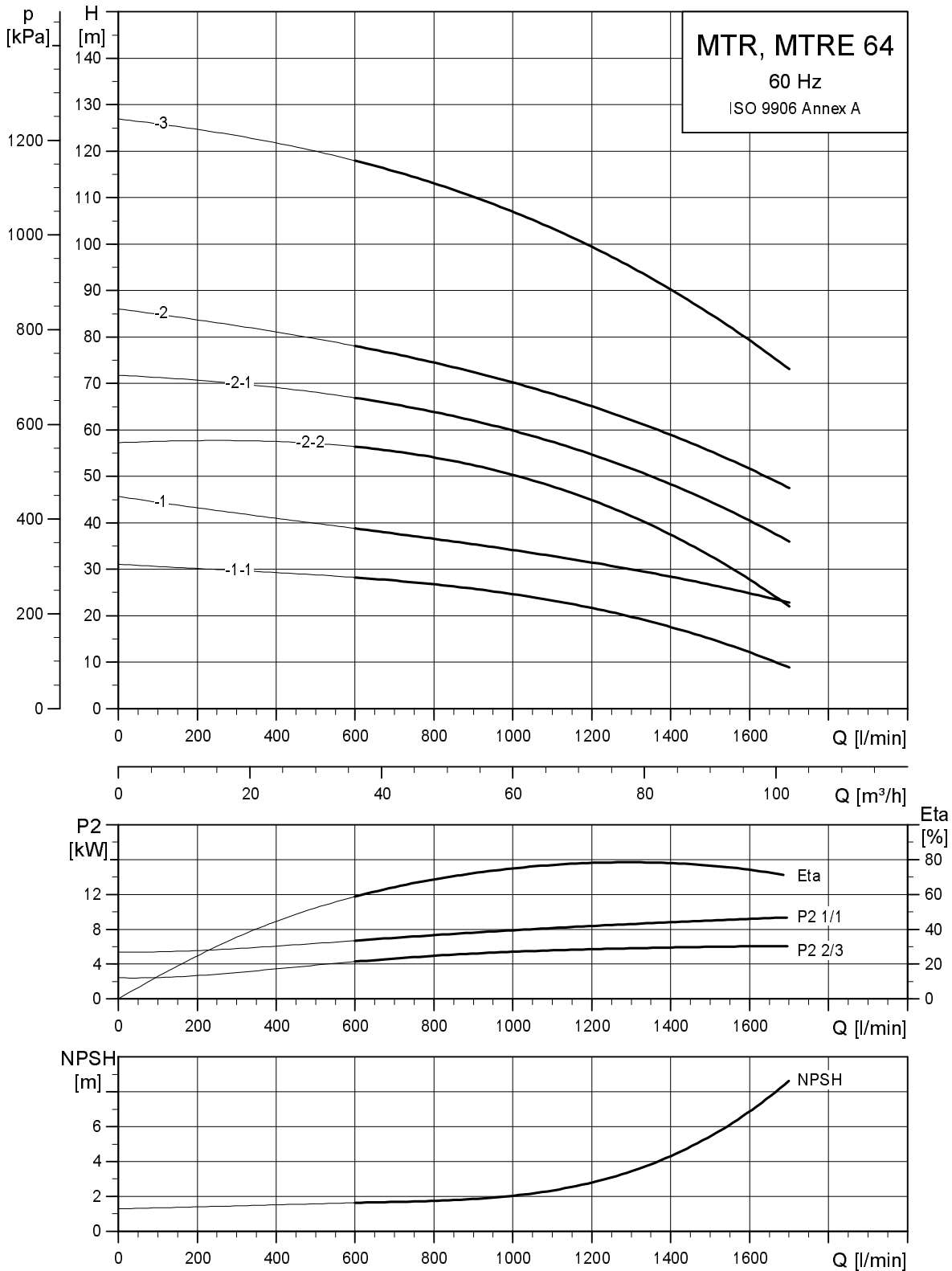
The maximum immersion depth is 1444 mm.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

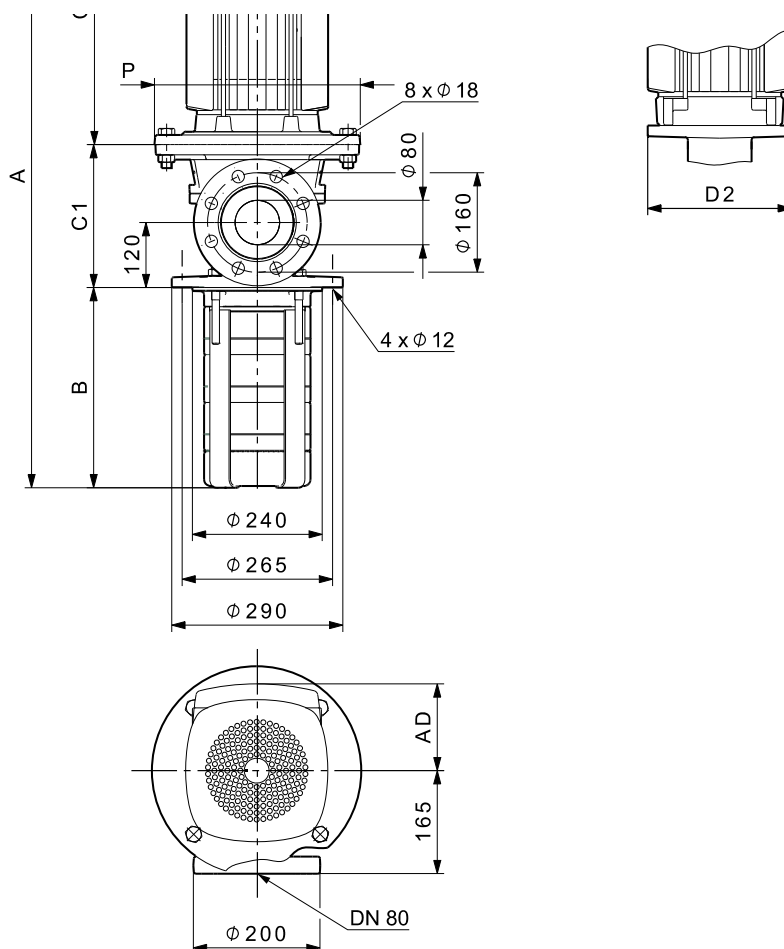
Immersible pumps
MTR, MTRE 64, 60 Hz

MTR, MTRE 64, 60 Hz



TM01 4307 3700

Dimensional sketches



TM04 2792 2909

Dimensions and weights

Pump type	P2 [kW]	MTR								Net weight [kg]	MTRE							
		Dimensions [mm]									Dimensions [mm]							
		A	B	C1	C2	AC	P	AD		A	B	C1	C2	AC	P	AD	Net weight [kg]	
MTR, MTRE 64-2/1-1	7.5	868	249	240	379	260	300	159	96	868	249	240	379	260	300	213	105	
MTR, MTRE 64-2/1	11.0	960	249	240	471	315	350	204	135	960	249	240	471	314	350	308	163	
MTR, MTRE 64-2/2-2	15.0	960	249	240	471	314	350	204	147	960	249	240	471	314	350	308	178	
MTR, MTRE 64-2/2-1	18.5	1004	249	240	515	314	350	204	159	1004	249	240	515	314	350	308	190	
MTR, MTRE 64-2/2	22.0	1030	249	240	541	314	350	204	173	1030	249	240	541	314	350	308	203	
MTR 64-3/3	30.0	1239	332	240	667	404	400	306	275	-	-	-	-	-	-	-	-	
MTR 64-4/3	30.0	1321	414	240	667	404	400	306	277	-	-	-	-	-	-	-	-	
MTR 64-5/3	30.0	1404	497	240	667	404	400	306	279	-	-	-	-	-	-	-	-	
MTR 64-6/3	30.0	1486	579	240	667	404	400	306	281	-	-	-	-	-	-	-	-	
MTR 64-7/3	30.0	1569	662	240	667	404	400	306	283	-	-	-	-	-	-	-	-	
MTR 64-8/3	30.0	1651	744	240	667	404	400	306	285	-	-	-	-	-	-	-	-	
MTR 64-9/3	30.0	1734	827	240	667	404	400	306	287	-	-	-	-	-	-	-	-	
MTR 64-10/3	30.0	1816	909	240	667	404	400	306	289	-	-	-	-	-	-	-	-	
MTR 64-11/3	30.0	1899	992	240	667	404	400	306	291	-	-	-	-	-	-	-	-	
MTR 64-12/3	30.0	1981	1074	240	667	404	400	306	293	-	-	-	-	-	-	-	-	

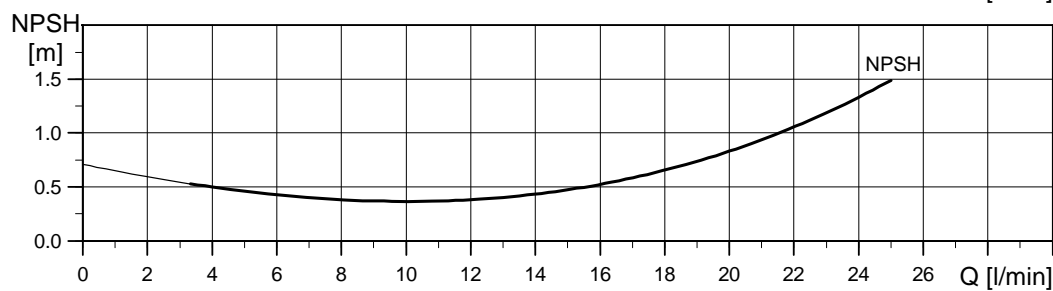
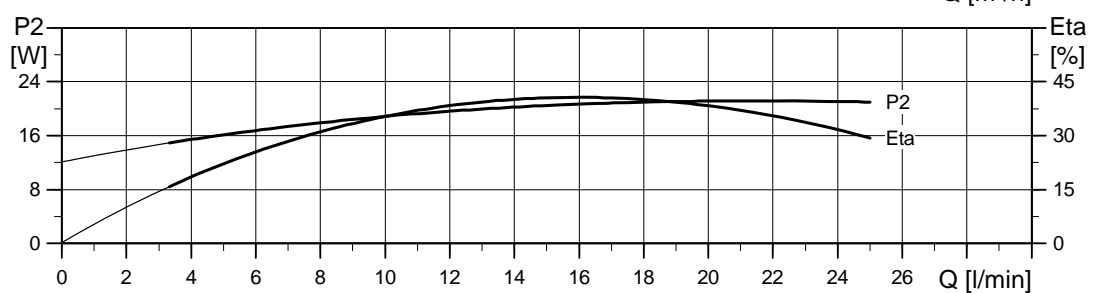
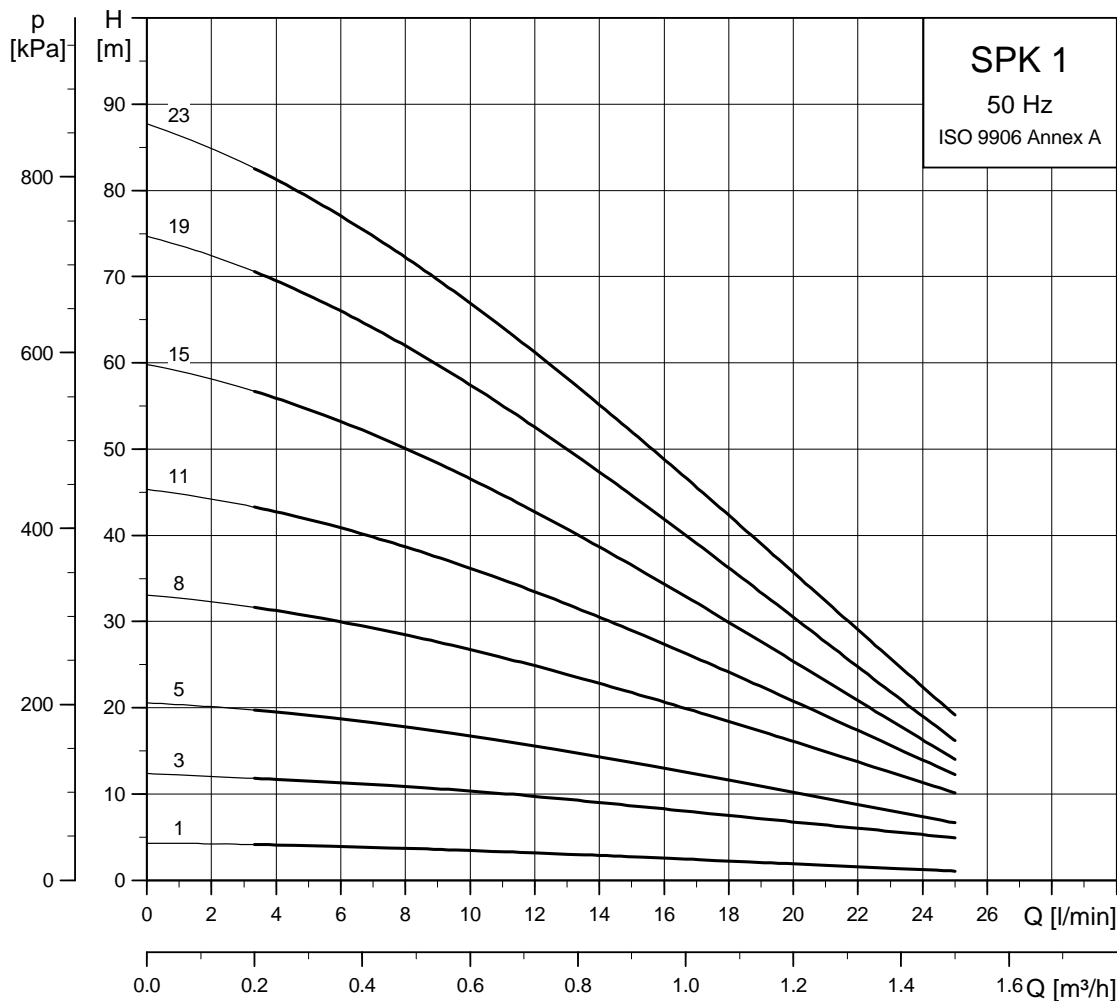
The maximum immersion depth is 1487 mm.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

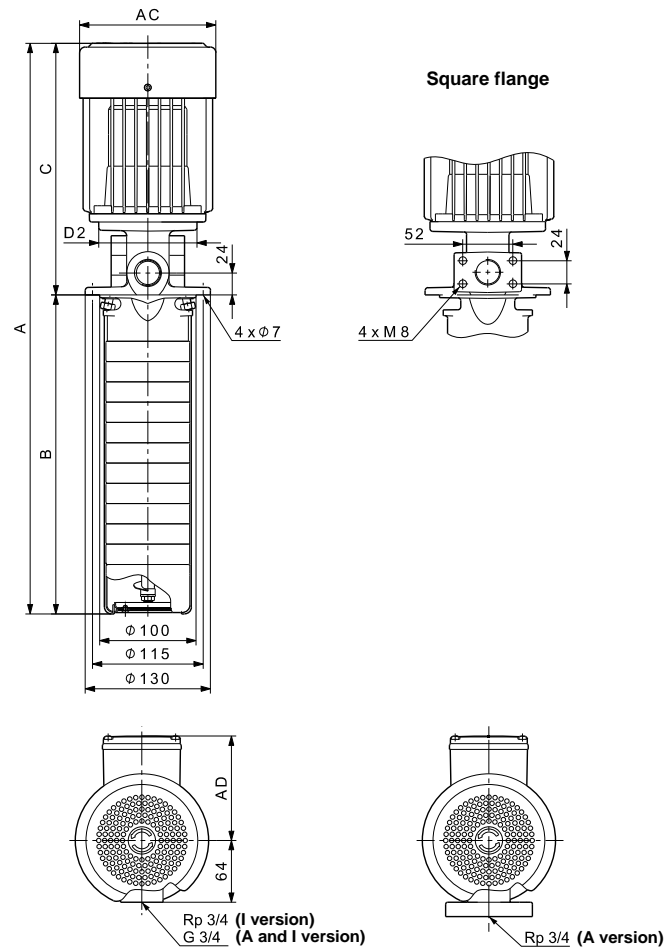
Immersible pumps
SPK 1, 50 Hz

SPK 1, 50 Hz



TM00 1930 3700

Dimensional sketches



TMD4 5801 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 1-1/1	0.06	366	140	226	118	90	95	4.6
SPK 1-3/3	0.12	408	182	226	118	90	95	5.2
SPK 1-5/5	0.12	480	224	256	118	90	95	5.7
SPK 1-8/8	0.18	543	287	256	118	90	95	6.4
SPK 1-11/11	0.25	596	350	246	142	120	109	8.7
SPK 1-15/15	0.37	701	434	267	142	120	109	12.5
SPK 1-19/19	0.37	785	518	267	142	120	109	13.1
SPK 1-23/23	0.55	869	602	267	142	120	109	14.9

* The stated 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 1-23/23	0.55	1272	1005	267	142	120	109	19.5

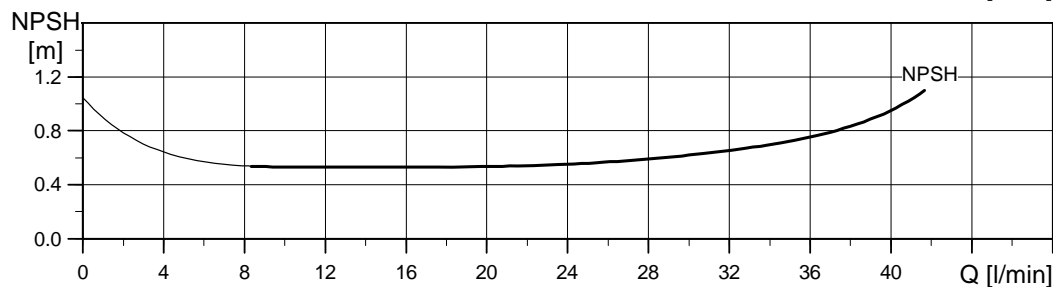
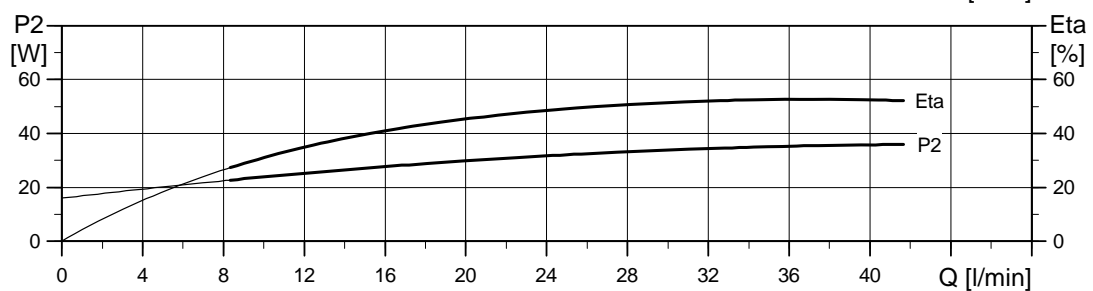
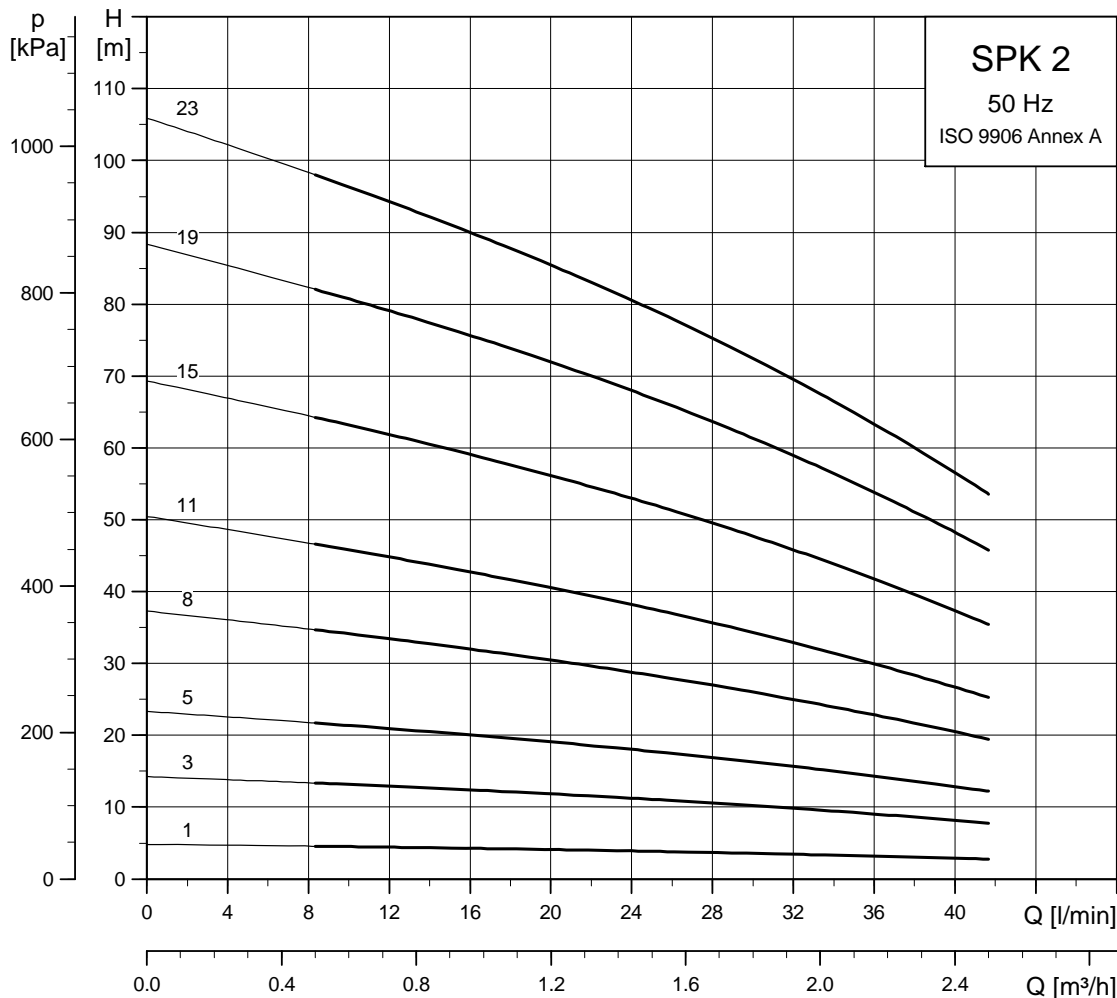
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

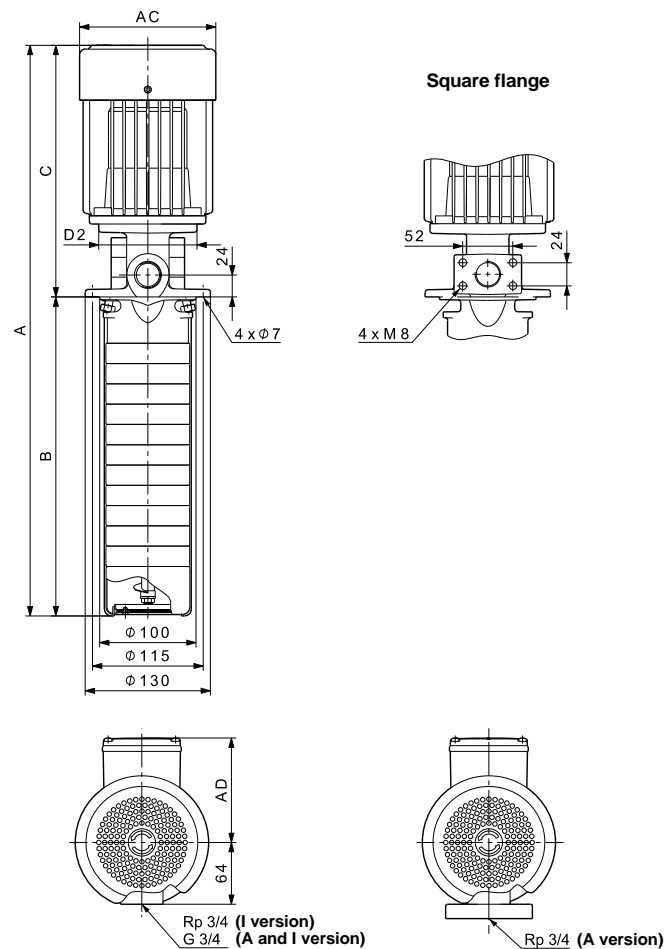
Immersible pumps
SPK 2, 50 Hz

SPK 2, 50 Hz



TM00 1932 3700

Dimensional sketches



TMD4 5801 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 2-1/1	0.06	366	140	226	118	90	95	4.6
SPK 2-3/3	0.12	438	182	256	118	90	95	5.2
SPK 2-5/5	0.18	480	224	256	118	90	95	5.8
SPK 2-8/8	0.37	554	287	267	142	120	109	11.0
SPK 2-11/11	0.37	617	350	267	142	120	109	11.7
SPK 2-15/15	0.55	701	434	267	142	120	109	13.0
SPK 2-19/19	0.75	825	518	307	142	120	109	15.4
SPK 2-23/23	0.75	909	602	307	142	120	109	16.2

* The stated 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	142	120	109	20.8

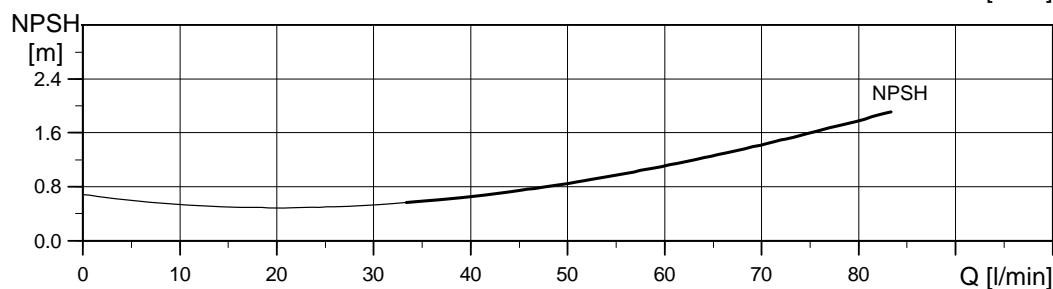
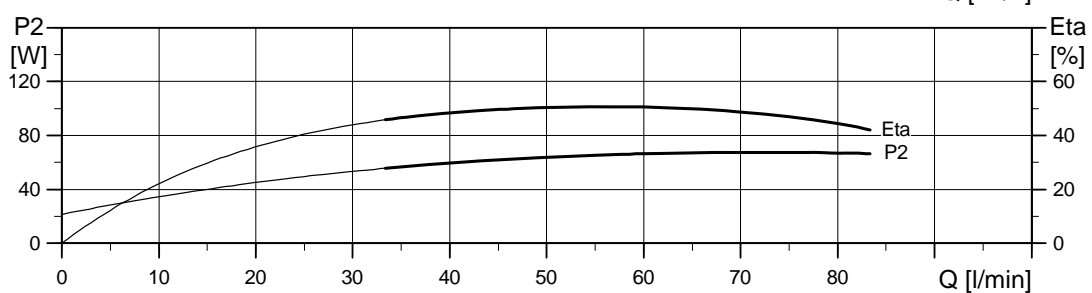
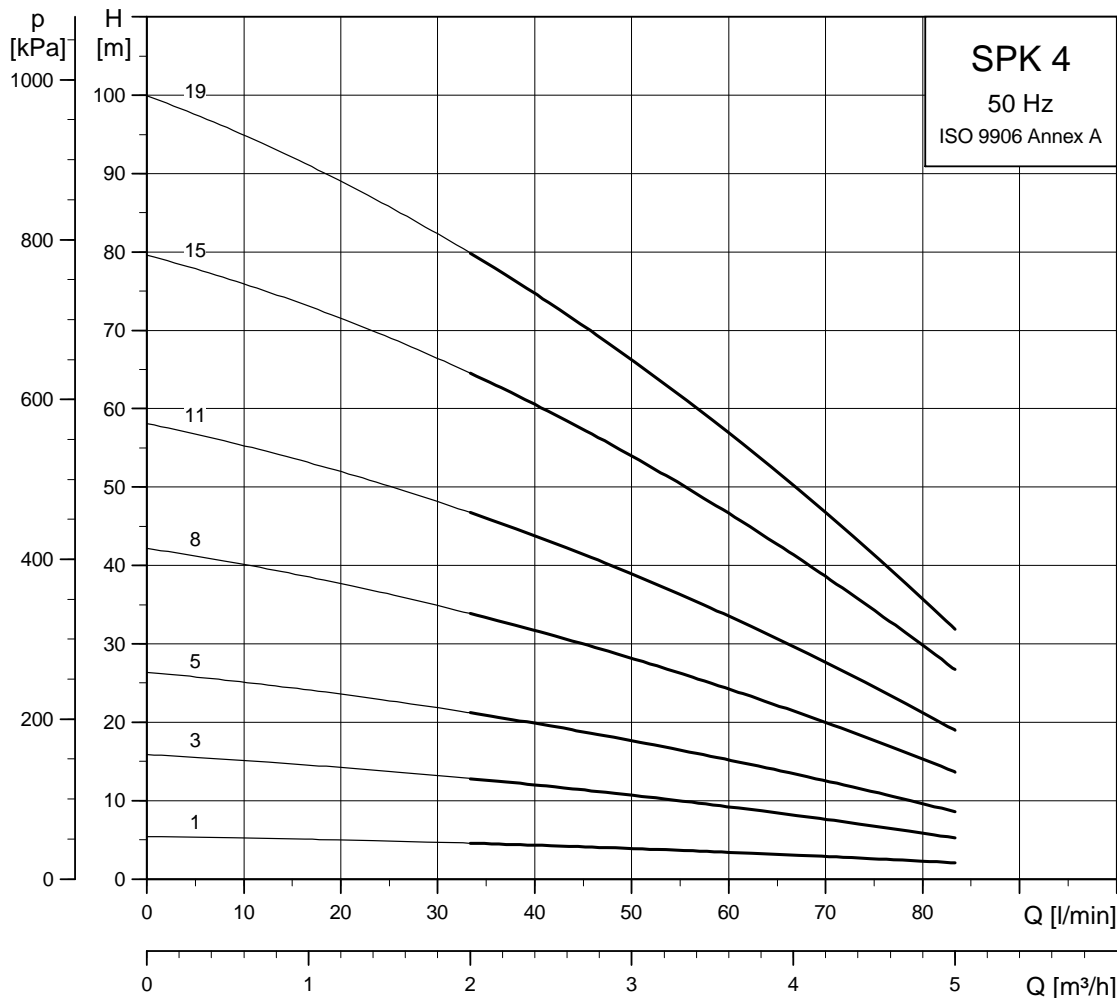
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

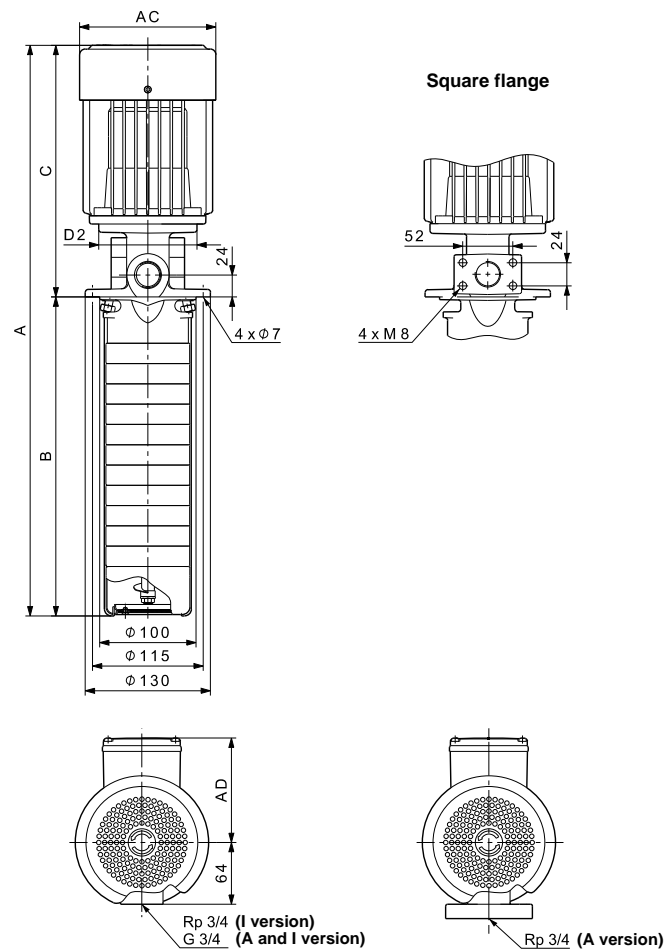
Immersible pumps
SPK 4, 50 Hz

SPK 4, 50 Hz



TM00 1934 3700

Dimensional sketches



TMD4 5801 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 4-1/1	0.12	366	140	226	118	90	95	4.6
SPK 4-3/3	0.25	438	182	256	118	90	95	5.2
SPK 4-5/5	0.37	491	224	267	142	120	109	10.3
SPK 4-8/8	0.55	554	287	267	142	120	109	11.5
SPK 4-11/11	0.75	657	350	307	142	120	109	13.5
SPK 4-15/15	1.1	741	434	307	142	120	109	15.9
SPK 4-19/19	1.1	825	518	307	142	120	109	16.4

* The stated 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	142	120	109	21.8

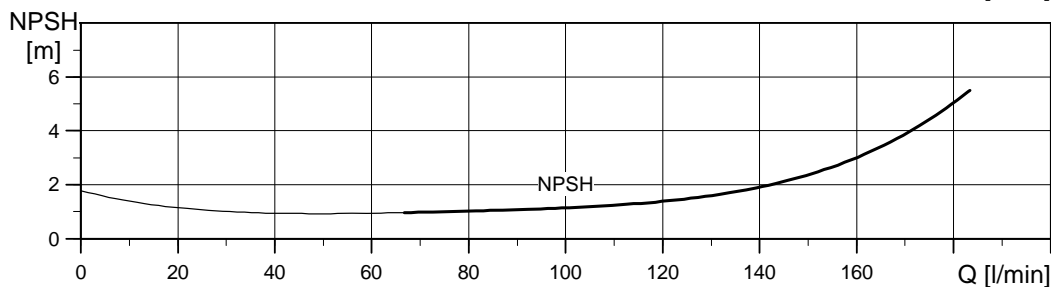
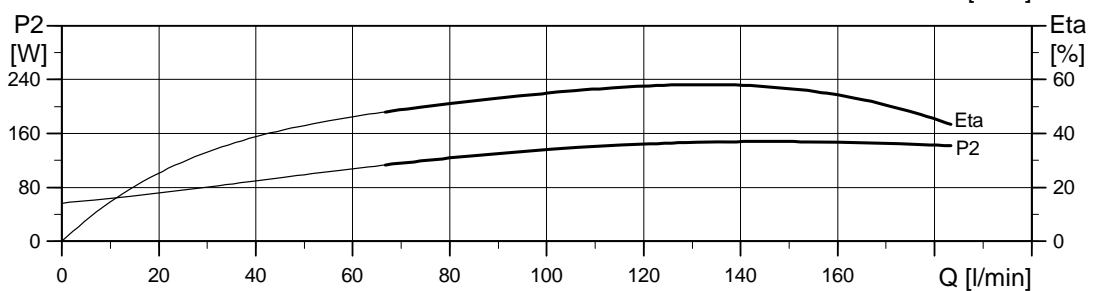
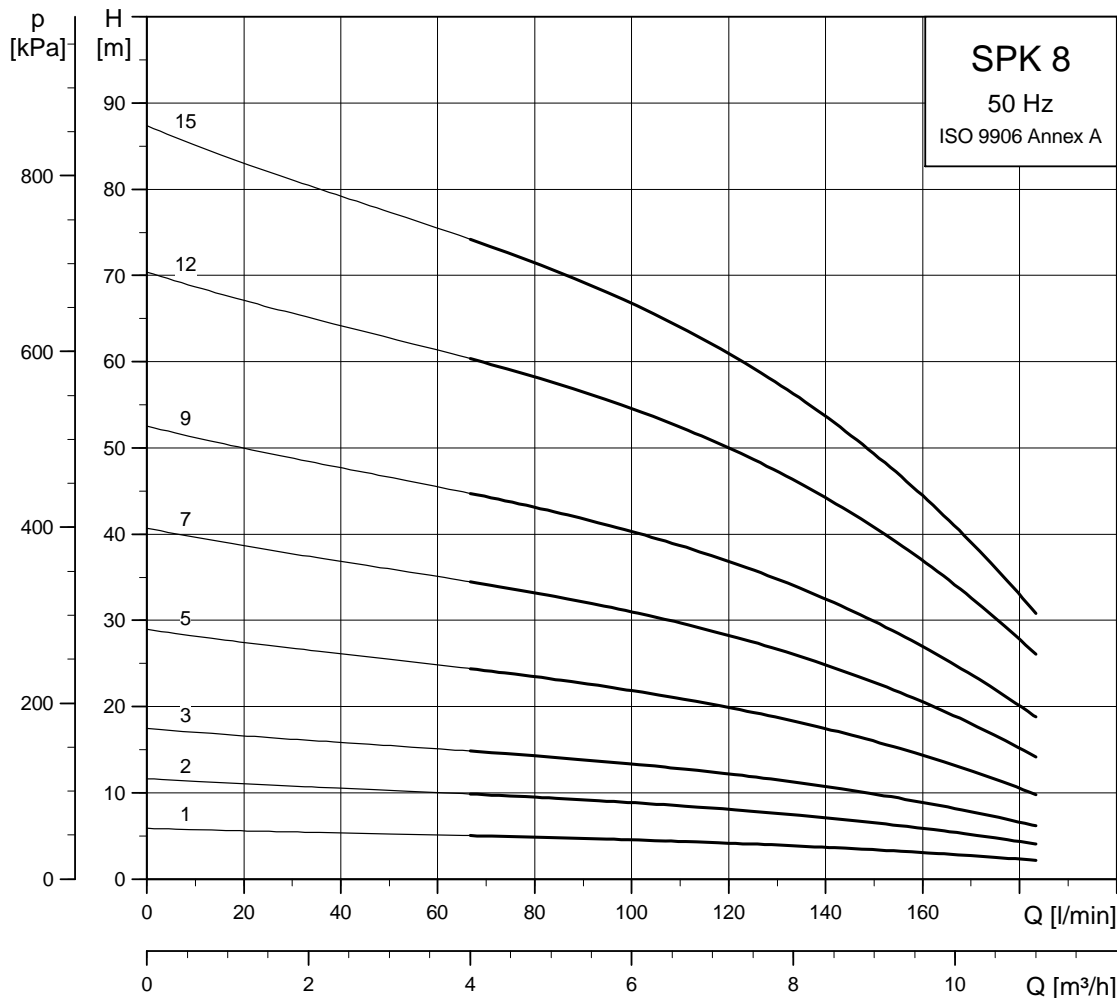
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1.3 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

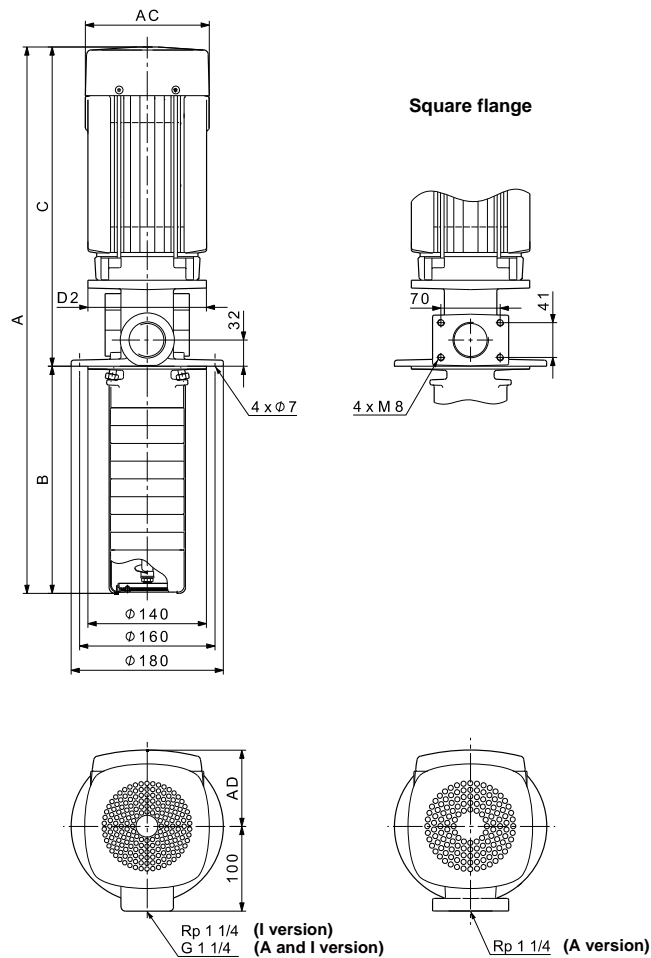
Immersible pumps
SPK 8, 50 Hz

SPK 8, 50 Hz



TM00 1936 3700

Dimensional sketches



TM04 5802 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 8-1/1	0.25	455	182	273	142	140	109	9.4
SPK 8-2/2	0.37	518	224	294	142	140	109	12.6
SPK 8-3/3	0.55	560	266	294	142	140	109	13.6
SPK 8-5/5	0.75	684	350	334	142	140	109	15.9
SPK 8-7/7	1.1	768	434	334	142	140	109	18.3
SPK 8-9/9	1.5	902	518	384	178	140	110	25.6
SPK 8-12/12	2.2	1068	644	424	178	140	110	29.1
SPK 8-15/15	2.2	1194	770	424	178	140	110	30.6

* The stated 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	1429	1005	424	178	140	110	33.6

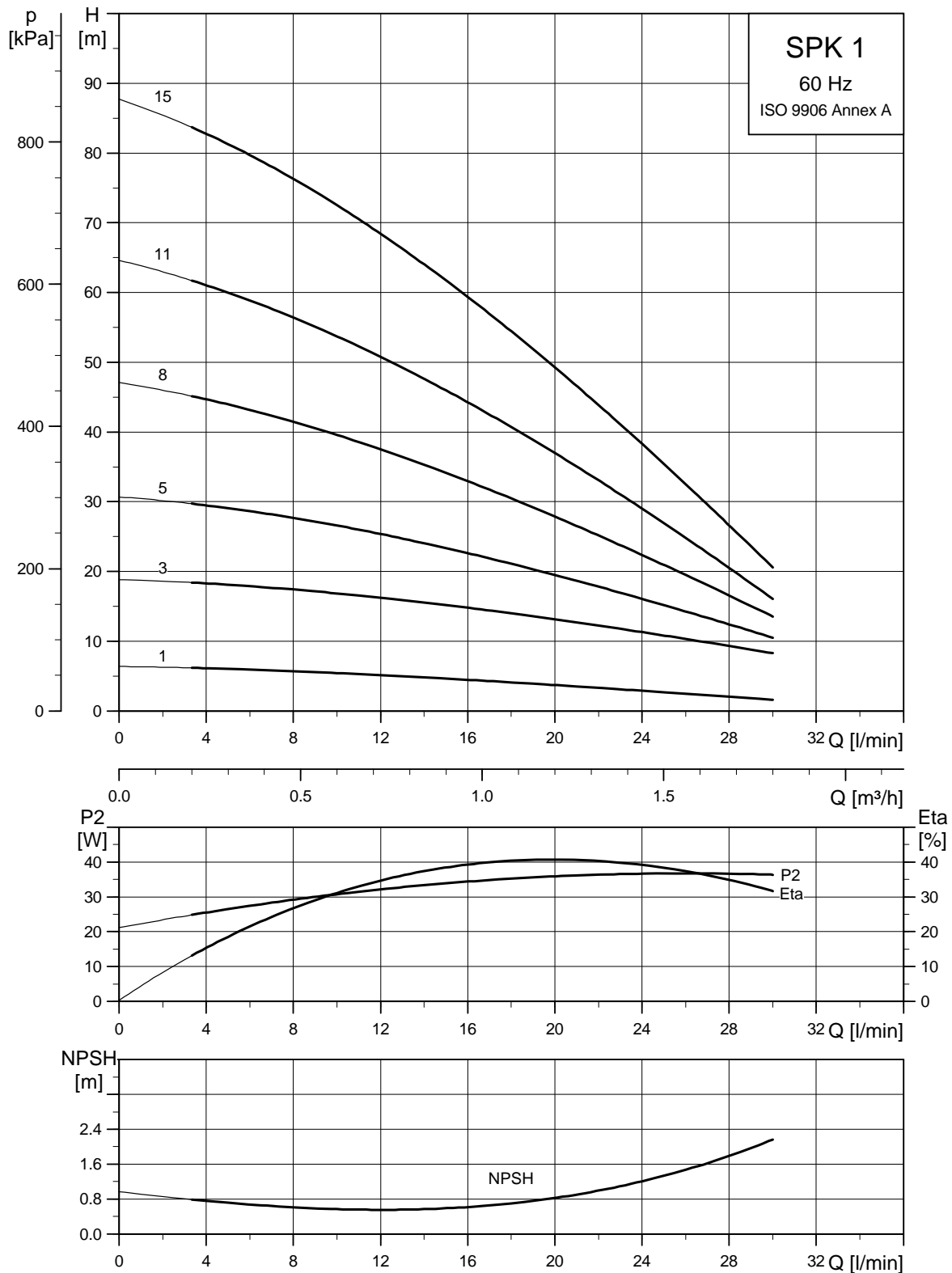
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1.3 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

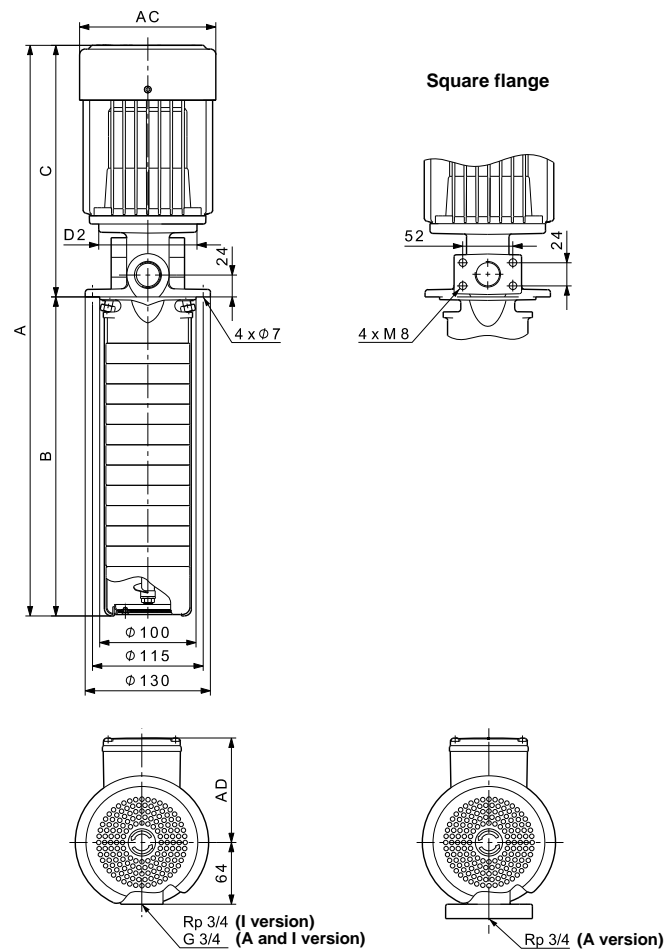
Immersible pumps
SPK 1, 60 Hz

SPK 1, 60 Hz



TM00 1931 3700

Dimensional sketches



TM04 5801 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 1-1/1	0.06	366	140	226	118	90	95	4.6
SPK 1-3/3	0.12	438	182	256	118	90	95	5.2
SPK 1-5/5	0.25	480	224	256	118	90	95	5.7
SPK 1-8/8	0.25	533	287	246	142	120	109	8.1
SPK 1-11/11	0.37	617	350	267	142	120	109	11.5
SPK 1-15/15	0.55	701	434	267	142	120	109	13.0
SPK 1-19/15	0.55	785	518	267	142	120	109	13.3
SPK 1-23/15	0.55	869	602	267	142	120	109	13.6

* The stated 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	142	120	109	18.2

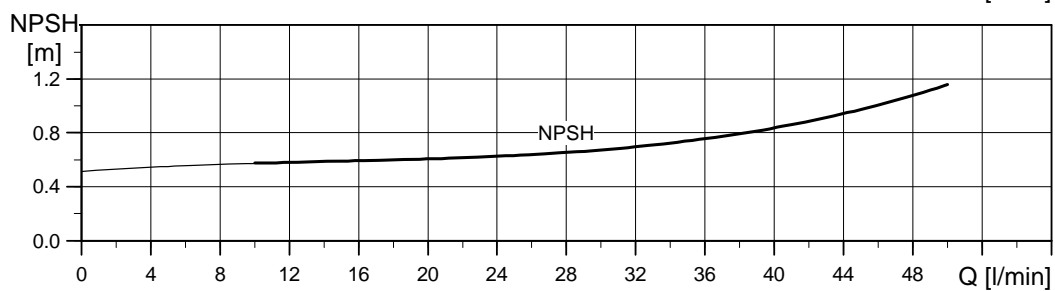
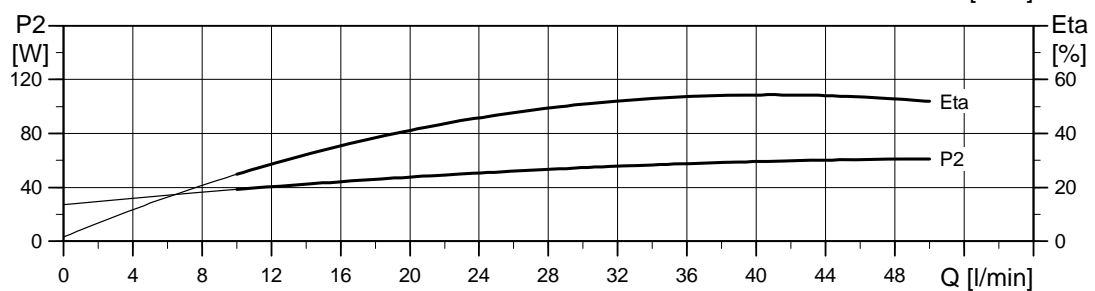
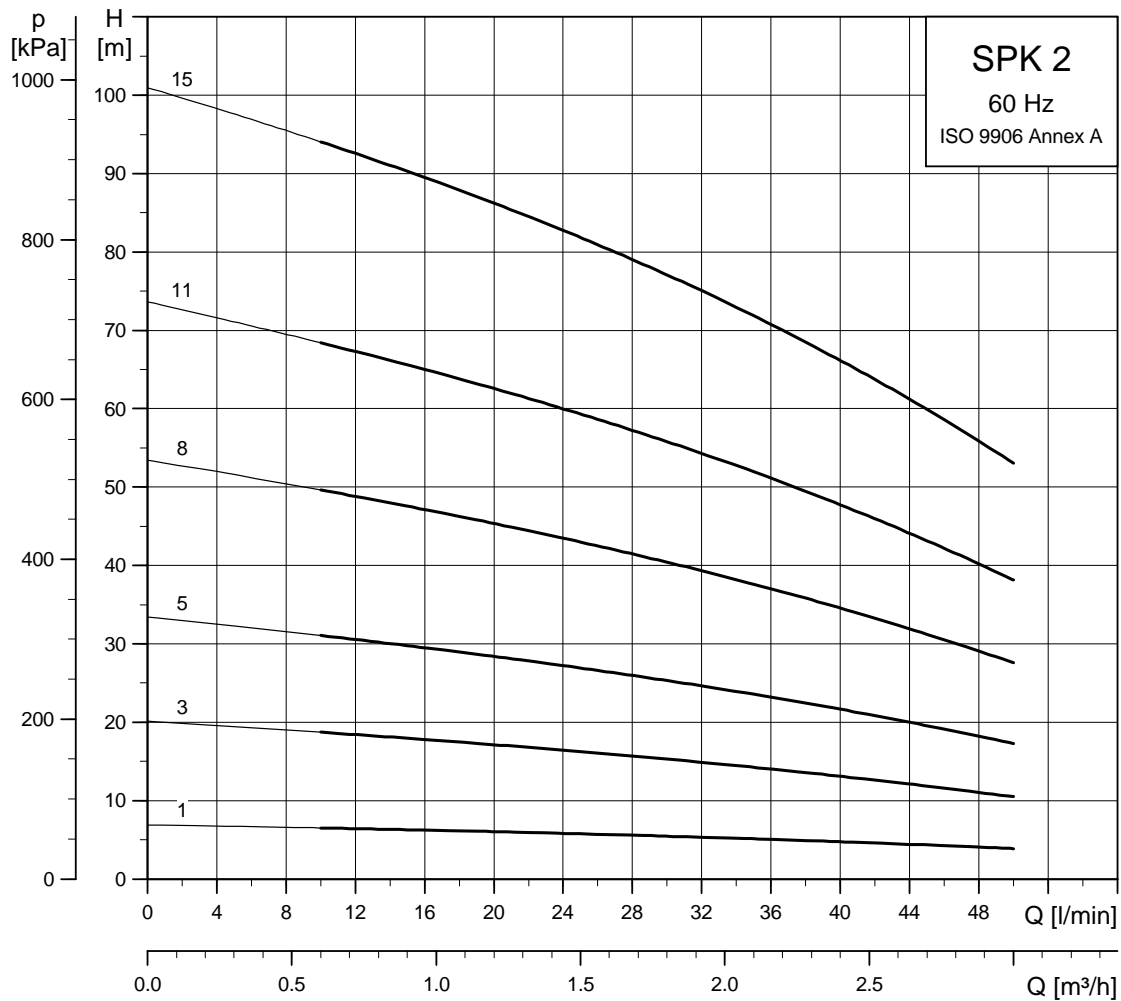
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

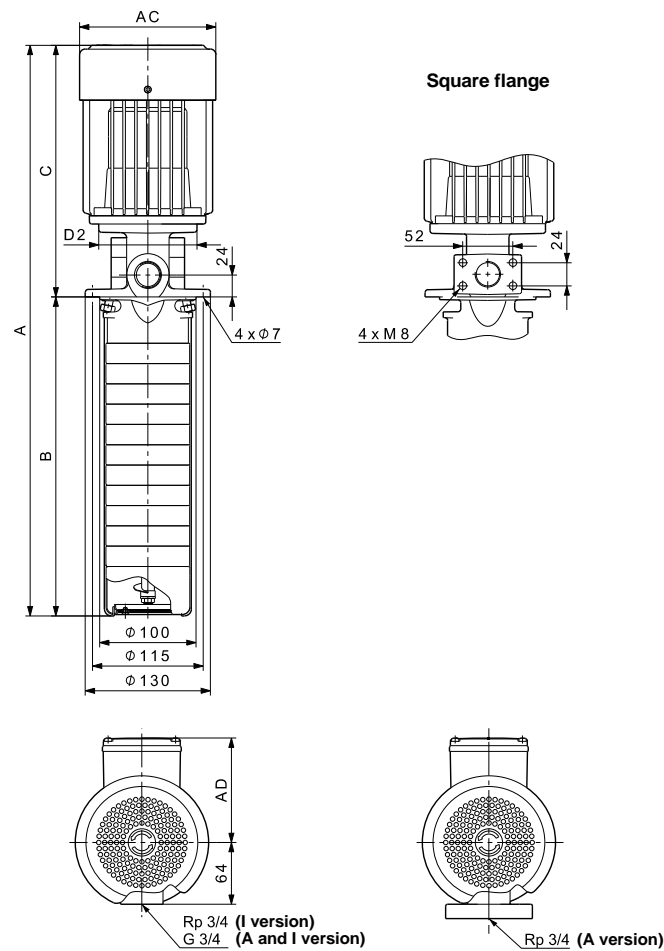
Immersible pumps
SPK 2, 60 Hz

SPK 2, 60 Hz



TM00 1933 3700

Dimensional sketches



TMD4 5801 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 2-1/1	0.06	366	140	226	118	90	95	4.6
SPK 2-3/3	0.25	438	182	256	118	90	95	5.2
SPK 2-5/5	0.37	491	224	267	142	120	109	10.3
SPK 2-8/8	0.55	554	287	267	142	120	109	11.5
SPK 2-11/11	0.75	657	350	307	142	120	109	13.8
SPK 2-15/15	1.1	741	434	307	142	120	109	16.0
SPK 2-19/15	1.1	825	518	307	142	120	109	16.3
SPK 2-23/15	1.1	909	602	307	142	120	109	16.6

* The stated 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	142	120	109	21.2

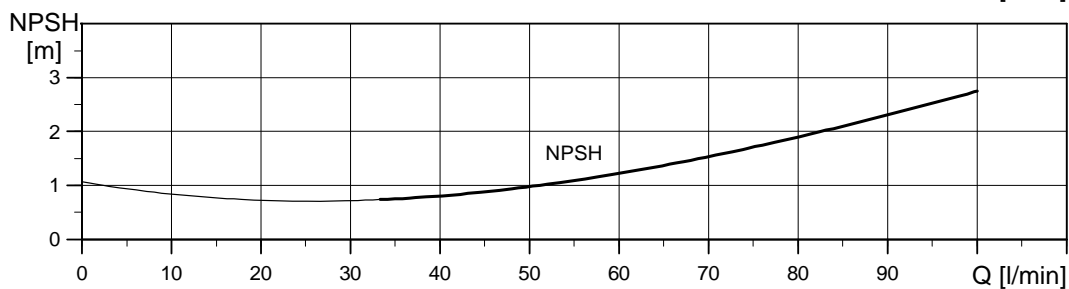
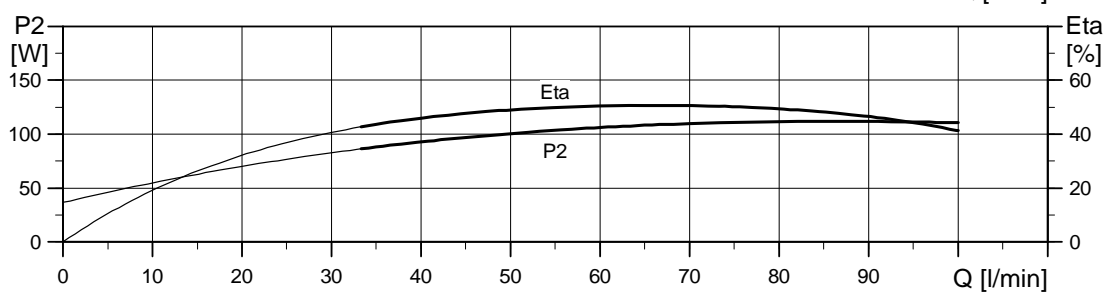
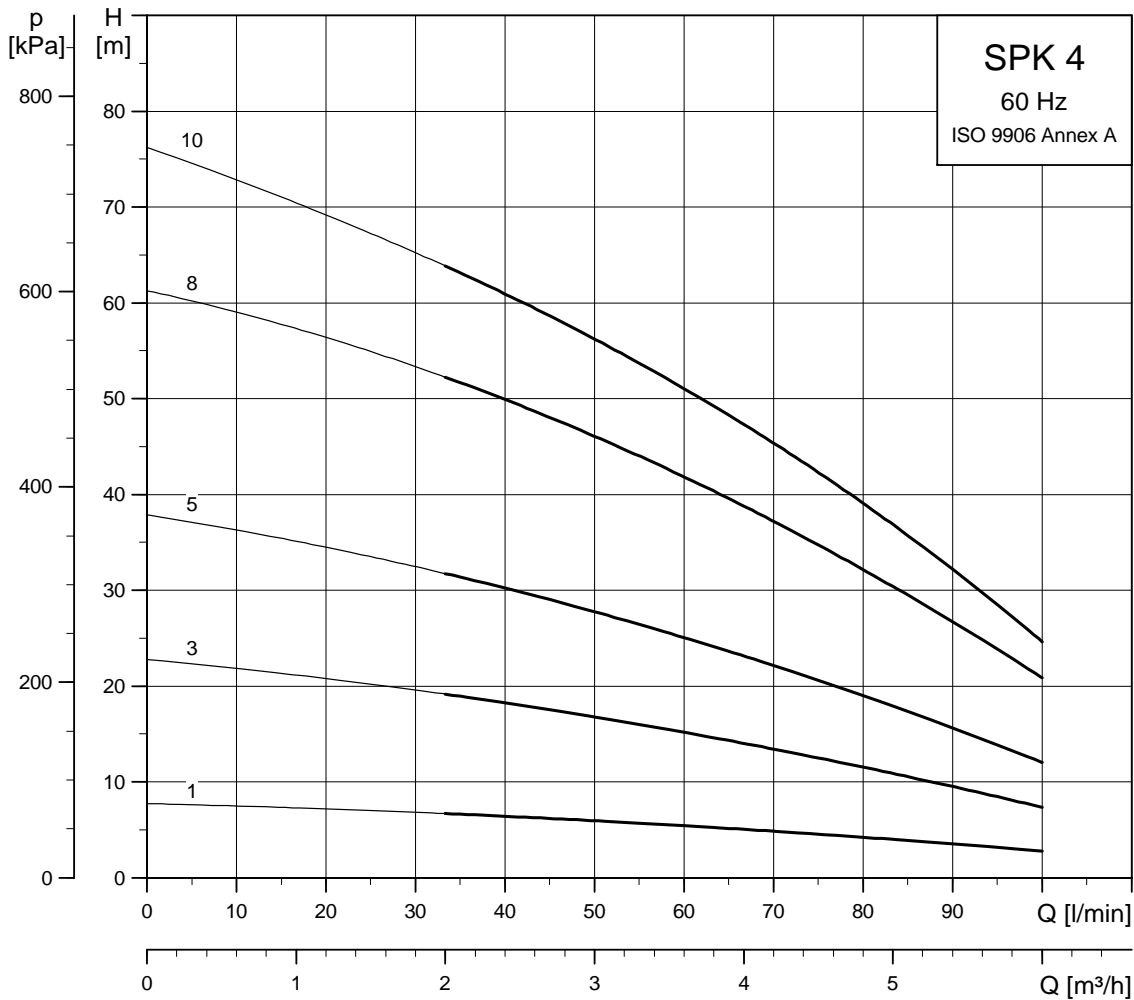
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

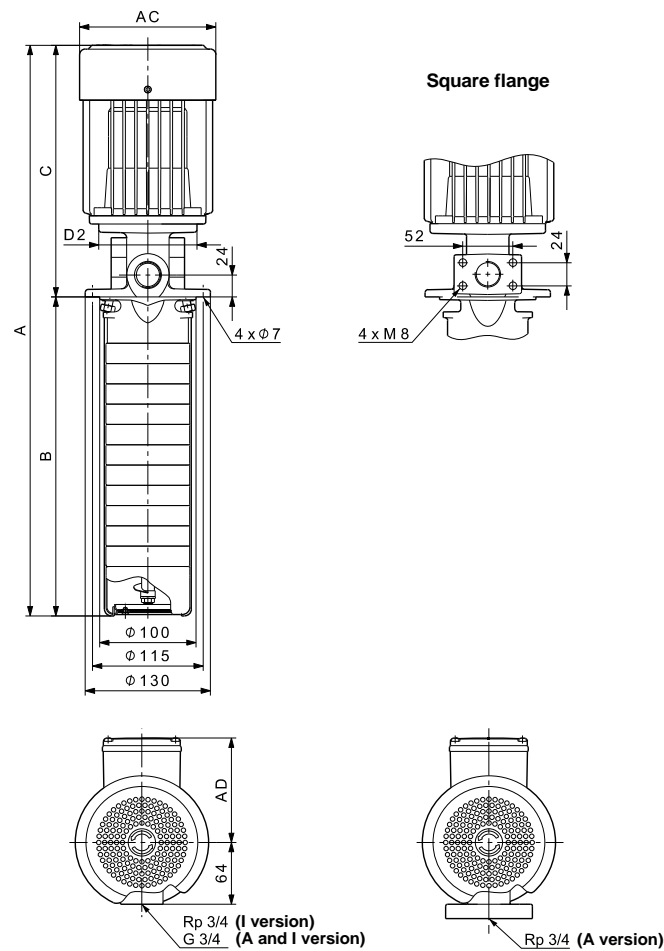
Immersible pumps
SPK 4, 60 Hz

SPK 4, 60 Hz



TM00 1935 3700

Dimensional sketches



TMD4 5801 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 4-1/1	0.12	396	140	256	118	90	95	4.6
SPK 4-3/3	0.37	449	182	267	142	120	109	9.7
SPK 4-5/5	0.55	491	224	267	142	120	109	10.8
SPK 4-8/8	1.1	594	287	307	142	120	109	14.2
SPK 4-11/10	1.1	657	350	307	142	120	109	15.4
SPK 4-15/10	1.1	741	434	307	142	120	109	15.7
SPK 4-19/10	1.1	825	518	307	142	120	109	16.0

* The stated 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	142	120	109	21.4

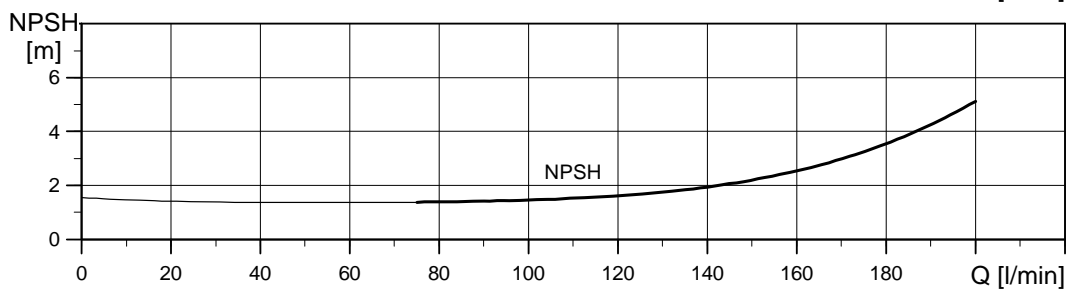
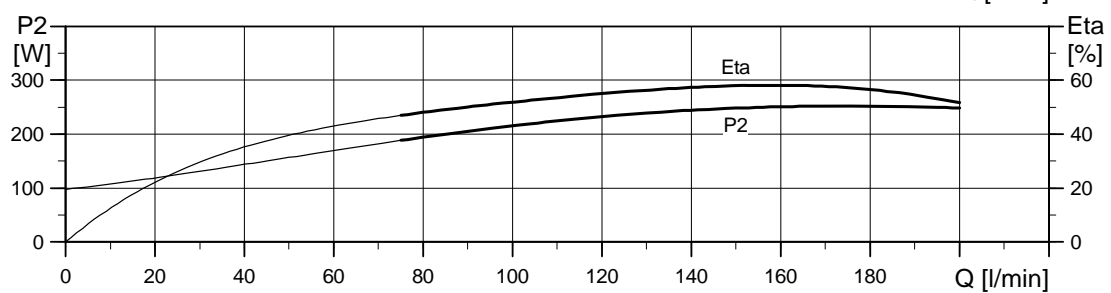
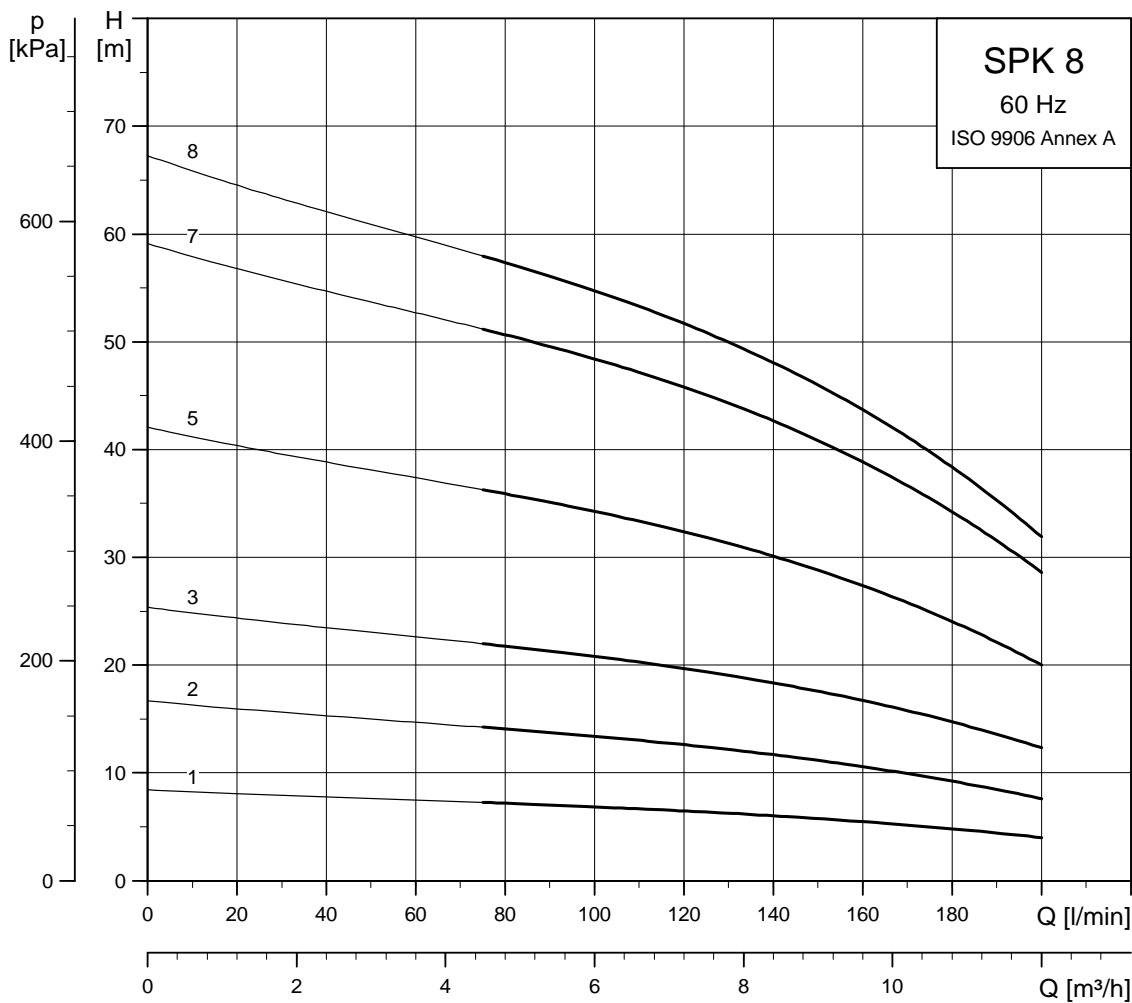
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1.3 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

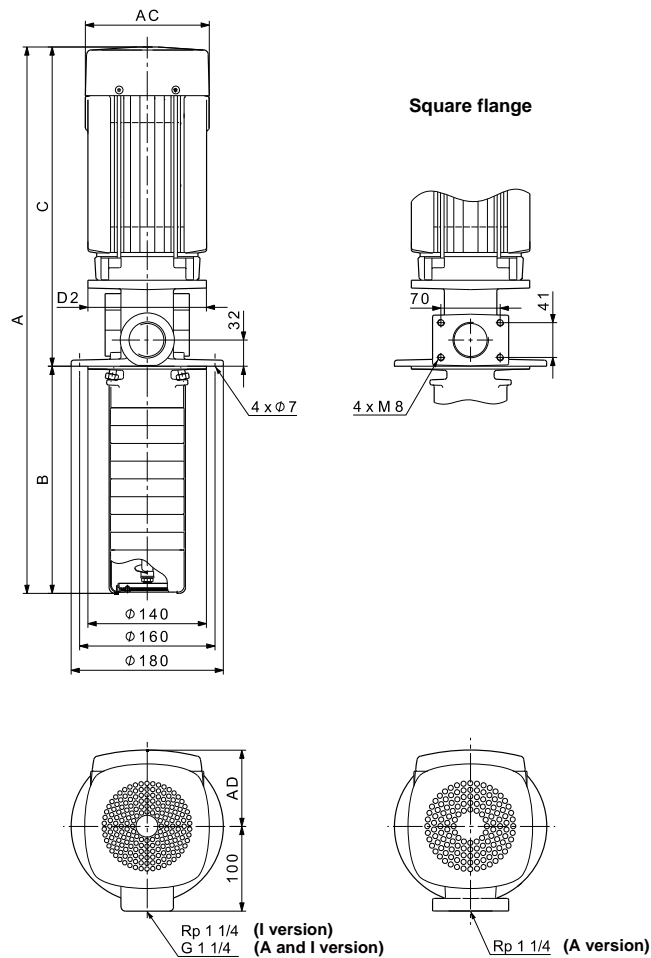
Immersible pumps
SPK 8, 60 Hz

SPK 8, 60 Hz



TM00 1937 3700

Dimensional sketches



TM04 5802 0210

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Weight* [kg]
		A	B	C	AC	D2	AD	
SPK 8-1/1	0.37	476	182	294	142	140	109	12.2
SPK 8-2/2	0.55	518	224	294	142	140	109	13.1
SPK 8-3/3	1.1	600	266	334	142	140	109	16.3
SPK 8-5/5	1.5	734	350	384	178	140	110	23.6
SPK 8-7/7	2.2	858	434	424	178	140	110	26.4
SPK 8-9/8	2.2	942	518	424	178	140	110	28.4
SPK 8-12/8	2.2	1068	644	424	178	140	110	29.0
SPK 8-15/8	2.2	1194	770	424	178	140	110	29.5

* The stated 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	1429	1005	424	178	140	110	32.5

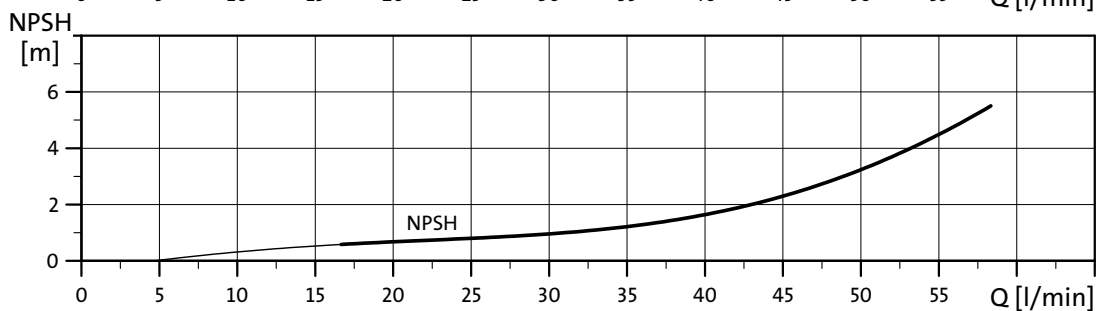
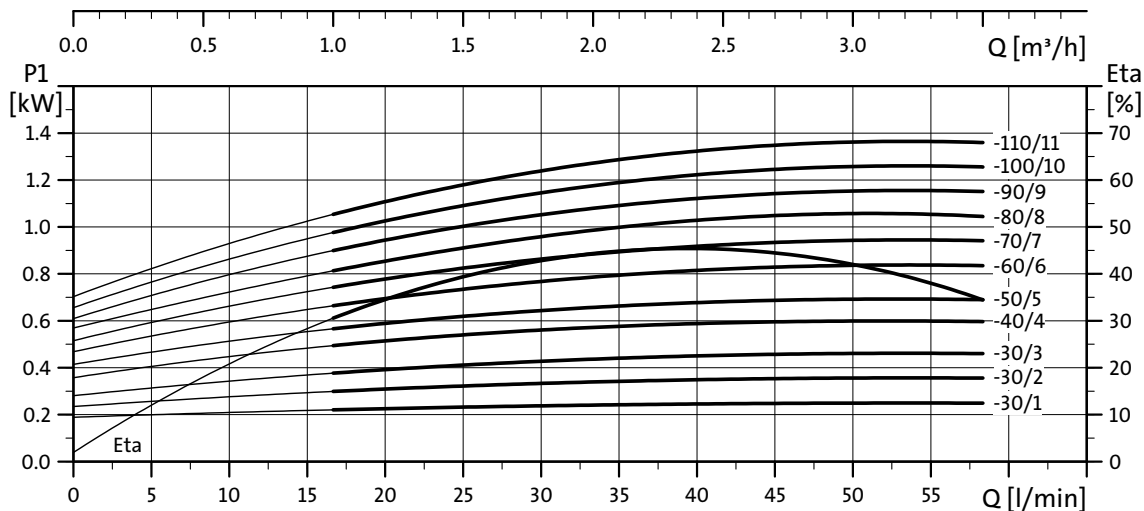
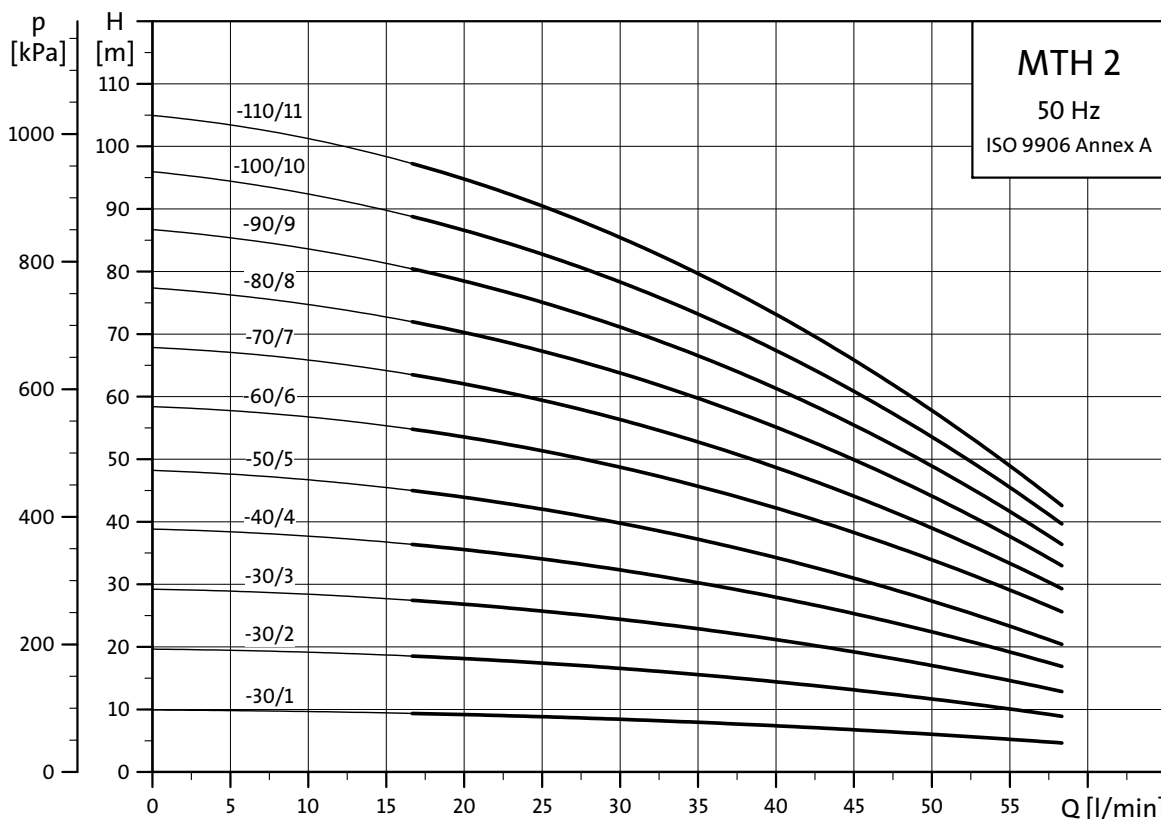
* The stated weights apply to the standard range (A version). For the stainless steel versions (I version), add 1.3 kg.

For information about electrical data, see "Motor data" on pages 132-135.

Performance curves

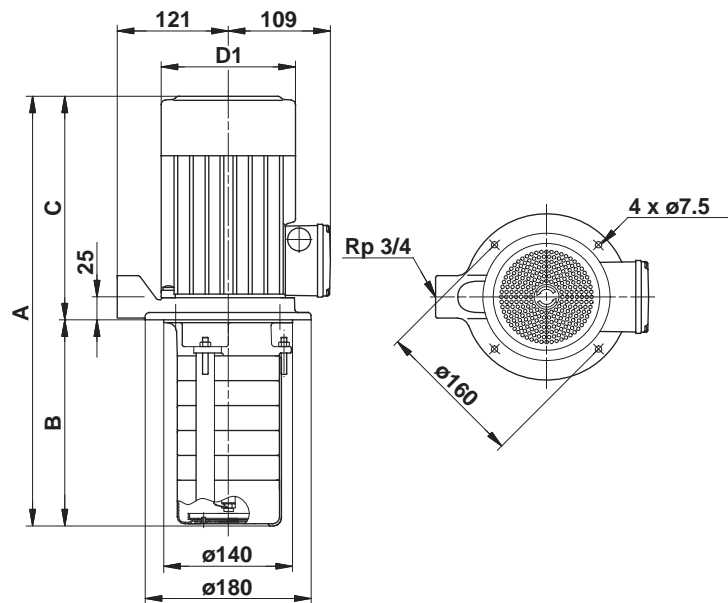
Immersible pumps
MTH 2, 50 Hz

MTH 2, 50 Hz



TM02 7824 4103

Dimensional sketches



TM00 1919 4899

Technical data, 3 x 220-240 ΔV/380-415 YV, 50 Hz, Europe

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I_N [A]	$\cos \varphi_{1/1}$	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-30/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	347	145	202	135	10.2
MTH 2-30/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	347	145	202	135	10.3
MTH 2-30/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	347	145	202	135	10.4
MTH 2-40/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	365	163	202	135	10.4
MTH 2-40/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	365	163	202	135	10.5
MTH 2-40/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	365	163	202	135	10.6
MTH 2-40/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	405	163	242	142	10.8
MTH 2-50/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	383	181	202	135	10.6
MTH 2-50/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	383	181	202	135	10.7
MTH 2-50/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	383	181	202	135	10.8
MTH 2-50/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	423	181	242	142	11.2
MTH 2-50/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	423	181	242	142	11.3
MTH 2-60/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	401	199	202	135	10.8
MTH 2-60/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	401	199	202	135	10.9
MTH 2-60/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	401	199	202	135	11.0
MTH 2-60/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	441	199	242	142	13.6
MTH 2-60/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	441	199	242	142	13.7
MTH 2-60/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	441	199	242	142	13.8
MTH 2-70/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	419	217	202	135	11.0
MTH 2-70/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	419	217	202	135	11.1
MTH 2-70/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	419	217	202	135	11.2
MTH 2-70/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	459	217	242	142	13.8
MTH 2-70/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	459	217	242	142	13.9
MTH 2-70/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	459	217	242	142	14.0
MTH 2-70/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	459	217	242	142	14.1

Performance curves

Immersible pumps
MTH 2, 50 Hz

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I_N [A]	$\cos \varphi_{1/1}$	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-80/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	437	235	202	135	11.2
MTH 2-80/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	437	235	202	135	11.3
MTH 2-80/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	437	235	202	135	11.4
MTH 2-80/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	477	235	242	142	14.0
MTH 2-80/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	477	235	242	142	14.1
MTH 2-80/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	477	235	242	142	14.2
MTH 2-80/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	477	235	242	142	14.3
MTH 2-80/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	477	235	242	142	14.4
MTH 2-90/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	455	253	202	135	11.4
MTH 2-90/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	455	253	202	135	11.5
MTH 2-90/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	455	253	202	135	11.6
MTH 2-90/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	495	253	242	142	14.4
MTH 2-90/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	495	253	242	142	14.5
MTH 2-90/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	495	253	242	142	14.6
MTH 2-90/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	495	253	242	142	14.7
MTH 2-90/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	495	253	242	142	14.8
MTH 2-90/9	1160	4.7	0.75 - 0.68	74	5.0 - 5.5	495	253	242	142	14.9
MTH 2-100/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	473	271	202	135	11.6
MTH 2-100/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	473	271	202	135	11.7
MTH 2-100/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	473	271	202	135	11.8
MTH 2-100/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	513	271	242	142	14.7
MTH 2-100/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	513	271	242	142	14.8
MTH 2-100/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	513	271	242	142	14.9
MTH 2-100/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	513	271	242	142	15.0
MTH 2-100/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	513	271	242	142	15.1
MTH 2-100/9	1160	4.7	0.75 - 0.68	74	5.0 - 5.5	513	271	242	142	15.2
MTH 2-100/10	1266	4.9	0.78 - 0.71	74	5.0 - 5.5	513	271	242	142	15.3
MTH 2-110/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	491	289	202	135	11.8
MTH 2-110/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	491	289	202	135	11.9
MTH 2-110/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	491	289	202	135	12.0
MTH 2-110/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	531	289	242	142	14.9
MTH 2-110/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	531	289	242	142	15.0
MTH 2-110/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	531	289	242	142	15.1
MTH 2-110/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	531	289	242	142	15.2
MTH 2-110/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	531	289	242	142	15.3
MTH 2-110/9	1160	4.7	0.75 - 0.68	74	5.0 - 5.5	531	289	242	142	15.4
MTH 2-110/10	1266	4.9	0.78 - 0.71	74	5.0 - 5.5	531	289	242	142	15.5
MTH 2-110/11	1371	5.0	0.83 - 0.76	74	5.0 - 5.5	531	289	242	142	15.6

Technical data, 3 x 200-220 ΔV/346-380 YV, 50 Hz, Japan

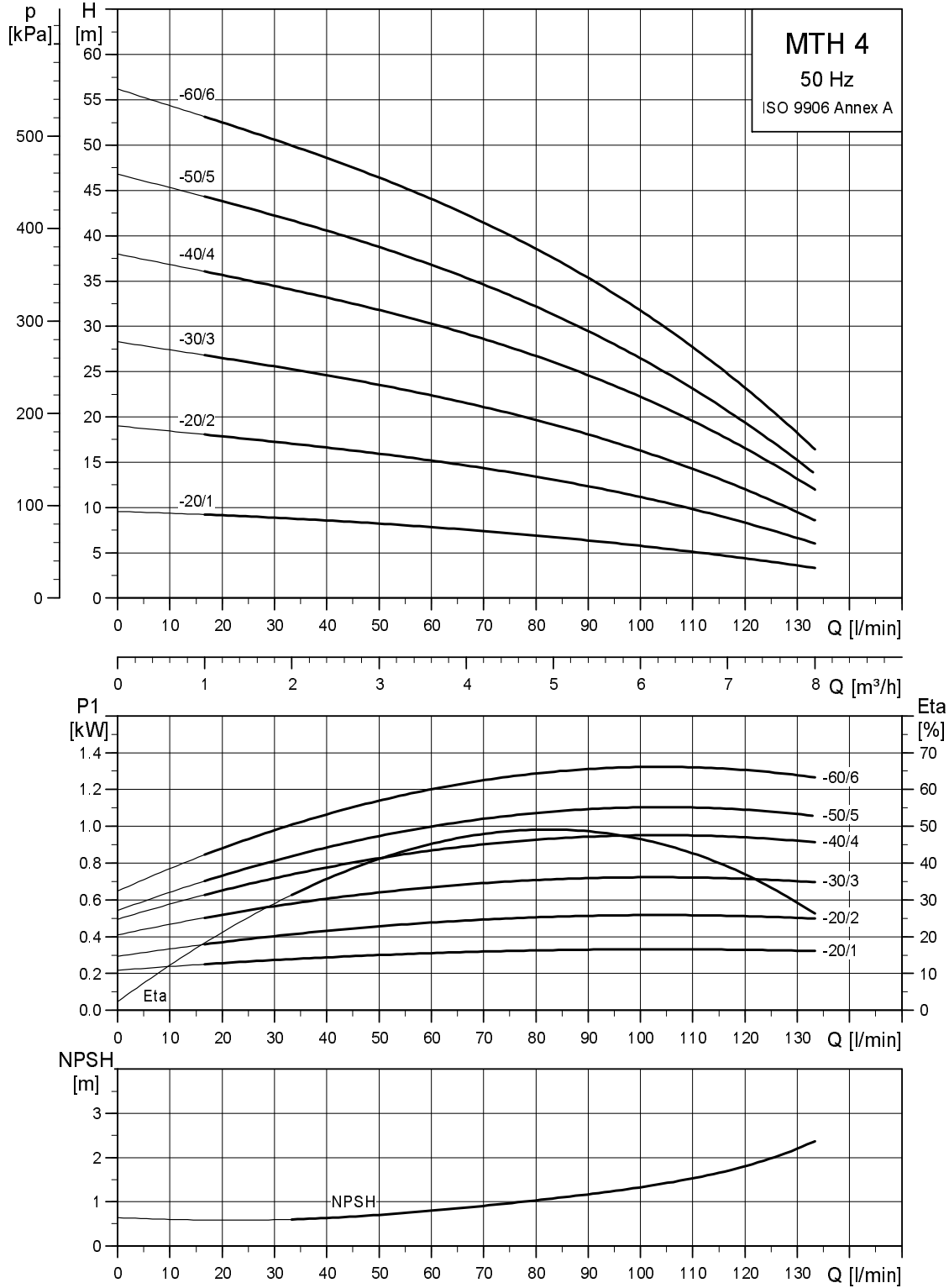
Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I _N [A]	Cos φ _{1/1}	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-30/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	347	145	202	135	10.2
MTH 2-30/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	347	145	202	135	10.3
MTH 2-30/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	347	145	202	135	10.4
MTH 2-40/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	365	163	202	135	10.4
MTH 2-40/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	365	163	202	135	10.5
MTH 2-40/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	365	163	202	135	10.6
MTH 2-40/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	405	163	242	142	10.8
MTH 2-50/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	383	181	202	135	10.6
MTH 2-50/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	383	181	202	135	10.7
MTH 2-50/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	383	181	202	135	10.8
MTH 2-50/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	423	181	242	142	11.2
MTH 2-50/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	423	181	242	142	11.3
MTH 2-60/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	401	199	202	135	10.8
MTH 2-60/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	401	199	202	135	10.9
MTH 2-60/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	401	199	202	135	11.0
MTH 2-60/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	441	199	242	142	13.6
MTH 2-60/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	441	199	242	142	13.7
MTH 2-60/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	441	199	242	142	13.8
MTH 2-70/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	419	217	202	135	11.0
MTH 2-70/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	419	217	202	135	11.1
MTH 2-70/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	419	217	202	135	11.2
MTH 2-70/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	459	217	242	142	13.8
MTH 2-70/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	459	217	242	142	13.9
MTH 2-70/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	459	217	242	142	14.0
MTH 2-70/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	459	217	242	142	14.1
MTH 2-80/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	437	235	202	135	11.2
MTH 2-80/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	437	235	202	135	11.3
MTH 2-80/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	437	235	202	135	11.4
MTH 2-80/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	477	235	242	142	14.0
MTH 2-80/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	477	235	242	142	14.1
MTH 2-80/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	477	235	242	142	14.2
MTH 2-80/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	477	235	242	142	14.3
MTH 2-80/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	477	235	242	142	14.4
MTH 2-90/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	455	253	202	135	11.4
MTH 2-90/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	455	253	202	135	11.5
MTH 2-90/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	455	253	202	135	11.6
MTH 2-90/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	495	253	242	142	14.4
MTH 2-90/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	495	253	242	142	14.5
MTH 2-90/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	495	253	242	142	14.6
MTH 2-90/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	495	253	242	142	14.7
MTH 2-90/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	495	253	242	142	14.8
MTH 2-90/9	1160	4.7	0.75 - 0.68	74	5.0 - 5.5	495	253	242	142	14.9
MTH 2-100/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	473	271	202	135	11.6
MTH 2-100/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	473	271	202	135	11.7
MTH 2-100/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	473	271	202	135	11.8
MTH 2-100/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	513	271	242	142	14.7
MTH 2-100/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	513	271	242	142	14.8
MTH 2-100/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	513	271	242	142	14.9
MTH 2-100/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	513	271	242	142	15.0
MTH 2-100/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	513	271	242	142	15.1
MTH 2-100/9	1160	4.7	0.75 - 0.68	74	5.0 - 5.5	513	271	242	142	15.2
MTH 2-100/10	1266	4.9	0.78 - 0.71	74	5.0 - 5.5	513	271	242	142	15.3

Performance curves

Immersible pumps
MTH 2, 50 Hz

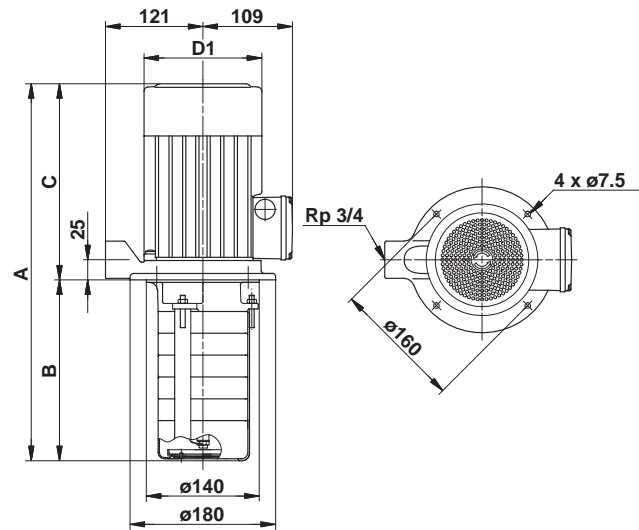
Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I _N [A]	Cos φ _{1/1}	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-110/1	255	2.6	0.30 - 0.27	72	4.8 - 5.2	491	289	202	135	11.8
MTH 2-110/2	370	2.6	0.43 - 0.39	72	4.8 - 5.2	491	289	202	135	11.9
MTH 2-110/3	480	2.6	0.54 - 0.49	72	4.8 - 5.2	491	289	202	135	12.0
MTH 2-110/4	620	3.5	0.54 - 0.49	74	5.0 - 5.5	531	289	242	142	14.9
MTH 2-110/5	715	3.6	0.60 - 0.55	74	5.0 - 5.5	531	289	242	142	15.0
MTH 2-110/6	845	4.2	0.61 - 0.56	74	5.0 - 5.5	531	289	242	142	15.1
MTH 2-110/7	948	4.3	0.67 - 0.61	74	5.0 - 5.5	531	289	242	142	15.2
MTH 2-110/8	1055	4.5	0.71 - 0.65	74	5.0 - 5.5	531	289	242	142	15.3
MTH 2-110/9	1160	4.7	0.75 - 0.68	74	5.0 - 5.5	531	289	242	142	15.4
MTH 2-110/10	1266	4.9	0.78 - 0.71	74	5.0 - 5.5	531	289	242	142	15.5
MTH 2-110/11	1371	5.0	0.83 - 0.76	74	5.0 - 5.5	531	289	242	142	15.6

MTH 4, 50 Hz



TM02 7825 4103

Dimensional sketches



TMO0 1919 4899

Technical data, 3 x 220-240 ΔV/380-415 YV, 50 Hz, Europe

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I_N [A]	$\cos \varphi_{1/1}$	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 4-20/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	347	145	202	135	10.1
MTH 4-20/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	347	145	202	135	10.2
MTH 4-30/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	374	172	202	135	10.3
MTH 4-30/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	374	172	202	135	10.4
MTH 4-30/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	374	172	242	142	10.9
MTH 4-40/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	401	199	202	135	10.5
MTH 4-40/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	401	199	202	135	10.6
MTH 4-40/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	401	199	242	142	12.4
MTH 4-40/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	441	199	242	142	12.5
MTH 4-50/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	428	226	202	135	10.7
MTH 4-50/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	428	226	202	135	10.8
MTH 4-50/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	428	226	242	142	14.0
MTH 4-50/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	468	226	242	142	14.1
MTH 4-50/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	468	226	242	142	14.2
MTH 4-60/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	455	253	202	135	10.9
MTH 4-60/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	455	253	202	135	11.0
MTH 4-60/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	455	253	242	142	14.5
MTH 4-60/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	495	253	242	142	14.6
MTH 4-60/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	495	253	242	142	14.7
MTH 4-60/6	1335	5.0	0.81 - 0.74	74	5.0 - 5.5	495	253	242	142	14.8
MTH 4-70/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	482	280	202	135	11.1
MTH 4-70/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	482	280	202	135	11.2
MTH 4-70/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	482	280	242	142	15.6
MTH 4-70/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	522	280	242	142	15.7
MTH 4-70/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	522	280	242	142	15.8
MTH 4-70/6	1335	5.0	0.81 - 0.74	74	5.0 - 5.5	522	280	242	142	15.9
MTH 4-80/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	509	307	202	135	11.3
MTH 4-80/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	509	307	202	135	11.4
MTH 4-80/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	509	307	242	142	15.9
MTH 4-80/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	549	307	242	142	16.0
MTH 4-80/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	549	307	242	142	16.1
MTH 4-80/6	1335	5.0	0.81 - 0.74	74	5.0 - 5.5	549	307	242	142	16.2

Technical data

Immersible pumps
MTH 4, 50 Hz

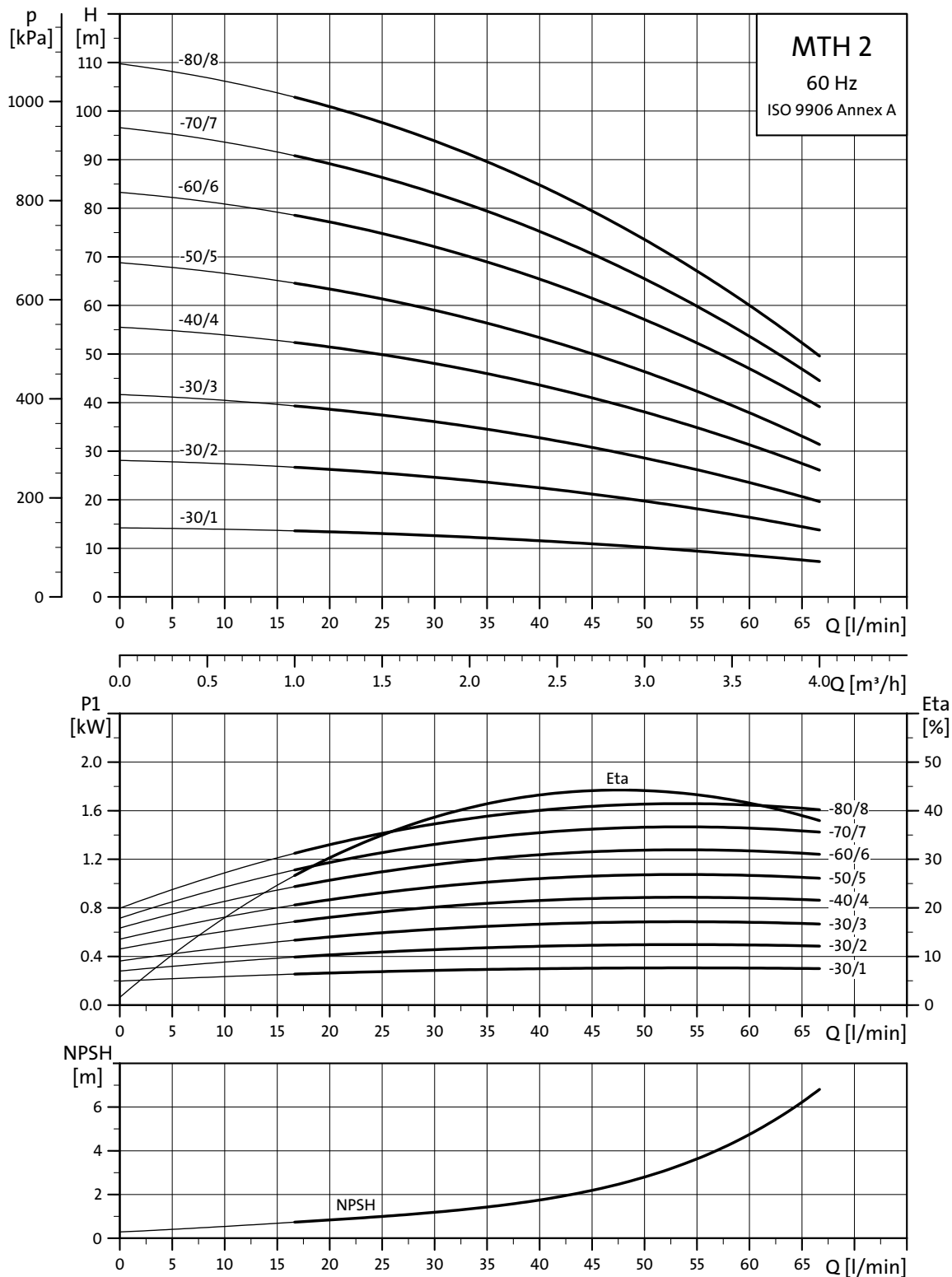
Technical data, 3 x 200-220 ΔV/346-380 YV, 50 Hz, Japan

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I _N [A]	cos φ _{1/1}	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 4-20/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	347	145	202	135	10.1
MTH 4-20/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	347	145	202	135	10.2
MTH 4-30/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	374	172	202	135	10.3
MTH 4-30/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	374	172	202	135	10.4
MTH 4-30/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	374	172	242	142	10.9
MTH 4-40/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	401	199	202	135	10.5
MTH 4-40/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	401	199	202	135	10.6
MTH 4-40/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	401	199	242	142	12.4
MTH 4-40/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	441	199	242	142	12.5
MTH 4-50/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	428	226	202	135	10.7
MTH 4-50/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	428	226	202	135	10.8
MTH 4-50/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	428	226	242	142	14.0
MTH 4-50/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	468	226	242	142	14.1
MTH 4-50/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	468	226	242	142	14.2
MTH 4-60/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	455	253	202	135	10.9
MTH 4-60/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	455	253	202	135	11.0
MTH 4-60/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	455	253	242	142	14.5
MTH 4-60/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	495	253	242	142	14.6
MTH 4-60/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	495	253	242	142	14.7
MTH 4-60/6	1335	5.0	0.81 - 0.74	74	5.0 - 5.5	495	253	242	142	14.8
MTH 4-70/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	482	280	202	135	11.1
MTH 4-70/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	482	280	202	135	11.2
MTH 4-70/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	482	280	242	142	15.6
MTH 4-70/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	522	280	242	142	15.7
MTH 4-70/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	522	280	242	142	15.8
MTH 4-70/6	1335	5.0	0.81 - 0.74	74	5.0 - 5.5	522	280	242	142	15.9
MTH 4-80/1	340	2.0	0.52 - 0.47	72	4.8 - 5.2	509	307	202	135	11.3
MTH 4-80/2	540	2.8	0.59 - 0.53	72	4.8 - 5.2	509	307	202	135	11.4
MTH 4-80/3	760	3.0	0.77 - 0.70	74	5.0 - 5.5	509	307	242	142	15.9
MTH 4-80/4	960	3.7	0.79 - 0.72	74	5.0 - 5.5	549	307	242	142	16.0
MTH 4-80/5	1150	4.2	0.83 - 0.76	74	5.0 - 5.5	549	307	242	142	16.1
MTH 4-80/6	1335	5.0	0.81 - 0.74	74	5.0 - 5.5	549	307	242	142	16.2

Performance curves

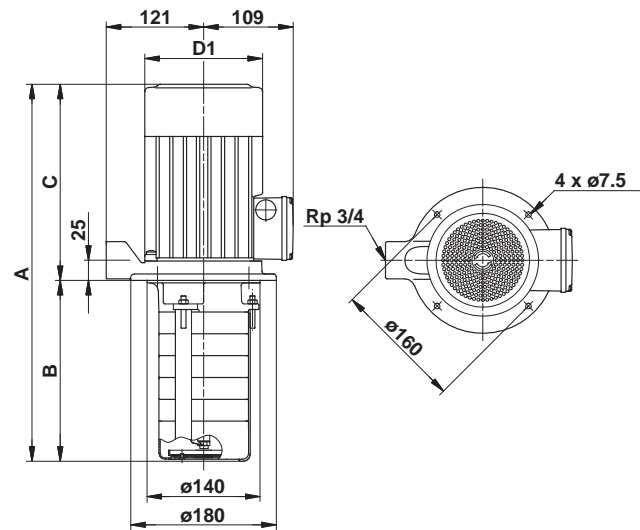
Immersible pumps
MTH 2, 60 Hz

MTH 2, 60 Hz



TM02 7826 4103

Dimensional sketches



TM00 19/19 4899

Technical data, 3 x 220-255 ΔV/380-440 YV, 60 Hz, Europe

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I_N [A]	$\cos \varphi_{1/1}$	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-30/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	347	145	202	135	10.4
MTH 2-30/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	347	145	202	135	10.5
MTH 2-30/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	347	145	202	135	10.6
MTH 2-40/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	365	163	202	135	10.6
MTH 2-40/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	365	163	202	135	10.7
MTH 2-40/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	365	163	202	135	10.8
MTH 2-40/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	405	163	242	142	12.0
MTH 2-50/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	383	181	202	135	10.8
MTH 2-50/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	383	181	202	135	10.9
MTH 2-50/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	383	181	202	135	11.0
MTH 2-50/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	423	181	242	142	12.2
MTH 2-50/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	423	181	242	142	12.3
MTH 2-60/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	401	199	202	135	11.0
MTH 2-60/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	401	199	202	135	11.1
MTH 2-60/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	401	199	202	135	11.2
MTH 2-60/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	441	199	242	142	13.9
MTH 2-60/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	441	199	242	142	14.0
MTH 2-60/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	441	199	242	142	14.1
MTH 2-70/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	419	217	202	135	11.2
MTH 2-70/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	419	217	202	135	11.3
MTH 2-70/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	419	217	202	135	11.4
MTH 2-70/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	459	217	242	142	14.1
MTH 2-70/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	459	217	242	142	14.2
MTH 2-70/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	459	217	242	142	14.3
MTH 2-70/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	459	217	242	142	14.4
MTH 2-80/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	437	235	202	135	11.4
MTH 2-80/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	437	235	202	135	11.5
MTH 2-80/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	437	235	202	135	11.6
MTH 2-80/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	477	235	242	142	14.3
MTH 2-80/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	477	235	242	142	14.4
MTH 2-80/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	477	235	242	142	14.5
MTH 2-80/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	477	235	242	142	14.6
MTH 2-80/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	477	235	242	142	14.7

Performance curves

Immersible pumps
MTH 2, 60 Hz

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I _N [A]	Cos φ _{1/1}	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-90/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	455	253	202	135	11.6
MTH 2-90/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	455	253	202	135	11.7
MTH 2-90/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	455	253	202	135	11.8
MTH 2-90/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	495	253	242	142	14.4
MTH 2-90/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	495	253	242	142	14.5
MTH 2-90/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	495	253	242	142	14.6
MTH 2-90/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	495	253	242	142	14.7
MTH 2-90/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	495	253	242	142	14.8
MTH 2-100/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	473	271	202	135	11.8
MTH 2-100/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	473	271	202	135	11.9
MTH 2-100/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	473	271	202	135	12.0
MTH 2-100/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	513	271	242	142	14.7
MTH 2-100/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	513	271	242	142	14.8
MTH 2-100/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	513	271	242	142	14.9
MTH 2-100/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	513	271	242	142	15.0
MTH 2-100/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	513	271	242	142	15.1
MTH 2-110/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	491	289	202	135	12.0
MTH 2-110/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	491	289	202	135	12.1
MTH 2-110/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	491	289	202	135	12.2
MTH 2-110/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	531	289	242	142	14.9
MTH 2-110/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	531	289	242	142	15.0
MTH 2-110/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	531	289	242	142	15.1
MTH 2-110/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	531	289	242	142	15.2
MTH 2-110/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	531	289	242	142	15.3

Technical data, 3 x 200-230 ΔV/346-400 YV, 60 Hz, Japan

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I _N [A]	Cos φ _{1/1}	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-30/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	347	145	202	135	10.4
MTH 2-30/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	347	145	202	135	10.5
MTH 2-30/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	347	145	202	135	10.6
MTH 2-40/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	365	163	202	135	10.6
MTH 2-40/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	365	163	202	135	10.7
MTH 2-40/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	365	163	202	135	10.8
MTH 2-40/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	405	163	242	142	12.0
MTH 2-50/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	383	181	202	135	10.8
MTH 2-50/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	383	181	202	135	10.9
MTH 2-50/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	383	181	202	135	11.0
MTH 2-50/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	423	181	242	142	12.2
MTH 2-50/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	423	181	242	142	12.3
MTH 2-60/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	401	199	202	135	11.0
MTH 2-60/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	401	199	202	135	11.1
MTH 2-60/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	401	199	202	135	11.2
MTH 2-60/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	441	199	242	142	13.9
MTH 2-60/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	441	199	242	142	14.0
MTH 2-60/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	441	199	242	142	14.1
MTH 2-70/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	419	217	202	135	11.2
MTH 2-70/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	419	217	202	135	11.3
MTH 2-70/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	419	217	202	135	11.4
MTH 2-70/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	459	217	242	142	14.1
MTH 2-70/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	459	217	242	142	14.2
MTH 2-70/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	459	217	242	142	14.3
MTH 2-70/7	1490	5.2	0.86 - 0.78	74	5.0 - 5.5	459	217	242	142	14.4

Technical data

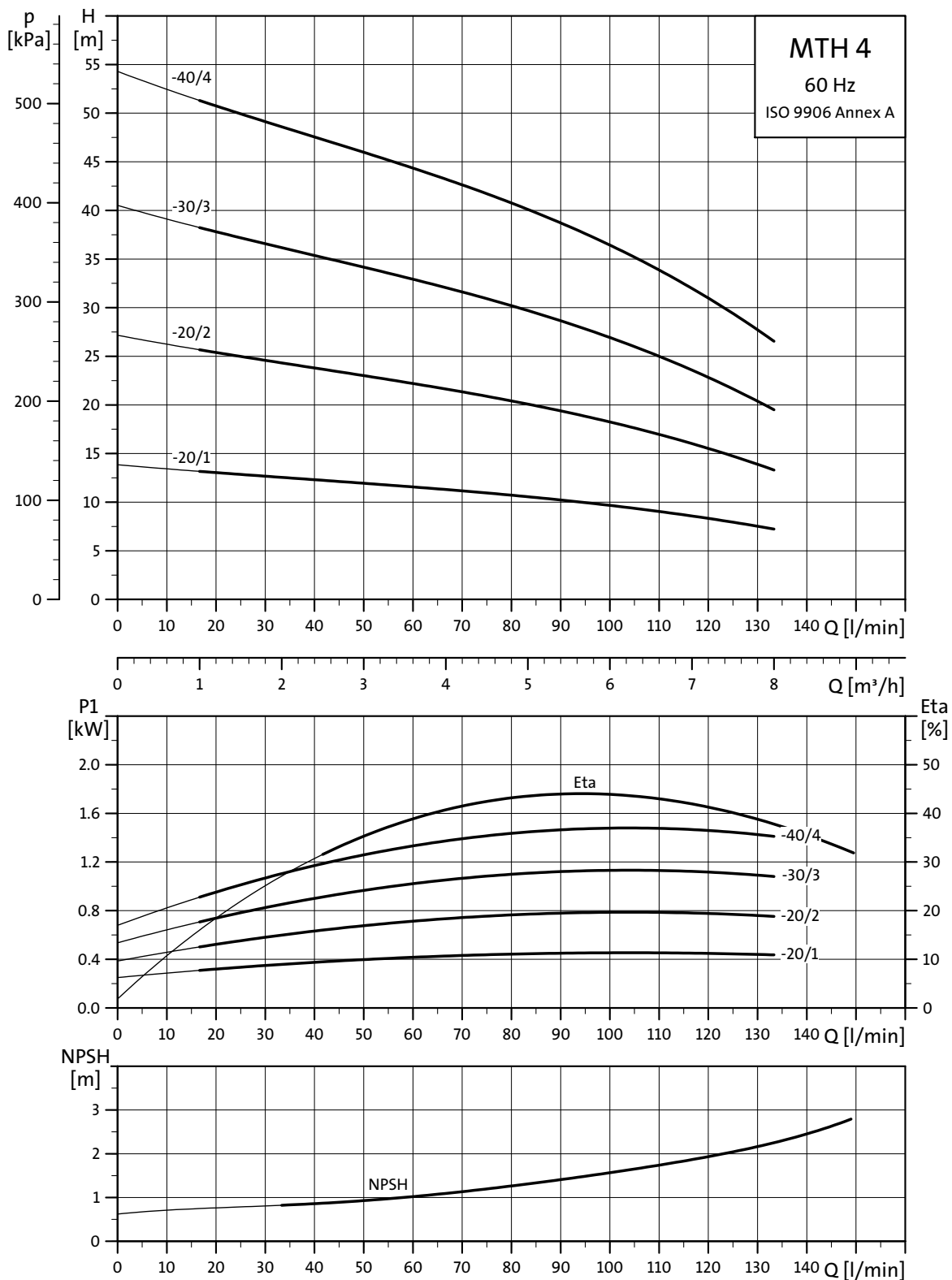
Immersible pumps
MTH 2, 60 Hz

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I_N [A]	$\cos \varphi_{1/1}$	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 2-80/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	437	235	202	135	11.4
MTH 2-80/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	437	235	202	135	11.5
MTH 2-80/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	437	235	202	135	11.6
MTH 2-80/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	477	235	242	142	14.3
MTH 2-80/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	477	235	242	142	14.4
MTH 2-80/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	477	235	242	142	14.5
MTH 2-80/7	1490	5.2	0.86 - 0.78	74	5.0 - 5.5	477	235	242	142	14.6
MTH 2-80/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	477	235	242	142	14.7
MTH 2-90/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	455	253	202	135	11.6
MTH 2-90/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	455	253	202	135	11.7
MTH 2-90/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	455	253	202	135	11.8
MTH 2-90/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	495	253	242	142	14.4
MTH 2-90/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	495	253	242	142	14.5
MTH 2-90/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	495	253	242	142	14.6
MTH 2-90/7	1490	5.2	0.86 - 0.78	74	5.0 - 5.5	495	253	242	142	14.7
MTH 2-90/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	495	253	242	142	14.8
MTH 2-100/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	473	271	202	135	11.8
MTH 2-100/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	473	271	202	135	11.9
MTH 2-100/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	473	271	202	135	12.0
MTH 2-100/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	513	271	242	142	14.7
MTH 2-100/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	513	271	242	142	14.8
MTH 2-100/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	513	271	242	142	14.9
MTH 2-100/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	513	271	242	142	15.0
MTH 2-100/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	513	271	242	142	15.1
MTH 2-110/1	315	1.8	0.53 - 0.48	72	4.8 - 5.2	491	289	202	135	12.0
MTH 2-110/2	505	2.1	0.73 - 0.66	72	4.8 - 5.2	491	289	202	135	12.1
MTH 2-110/3	700	2.4	0.89 - 0.80	74	5.0 - 5.5	491	289	202	135	12.2
MTH 2-110/4	900	3.1	0.88 - 0.80	74	5.0 - 5.5	531	289	242	142	14.9
MTH 2-110/5	1050	3.6	0.89 - 0.80	74	5.0 - 5.5	531	289	242	142	15.0
MTH 2-110/6	1280	4.4	0.88 - 0.80	74	5.0 - 5.5	531	289	242	142	15.1
MTH 2-110/7	1474	5.2	0.86 - 0.78	74	5.0 - 5.5	531	289	242	142	15.2
MTH 2-110/8	1666	5.2	0.97 - 0.88	74	5.0 - 5.5	531	289	242	142	15.3

Performance curves

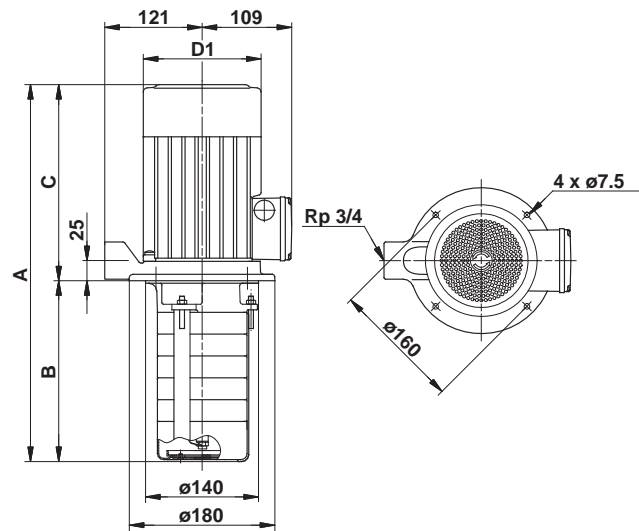
Immersible pumps
MTH 4, 60 Hz

MTH 4, 60 Hz



TM02 7827 4103

Dimensional sketch



TM00 1919 4899

Technical data, 3 x 220-255 ΔV/380-440 YV, 60 Hz, Europe

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I_N [A]	$\cos \varphi_{1/1}$	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 4-20/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	347	145	202	135	10.3
MTH 4-20/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	347	145	202	135	10.4
MTH 4-30/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	374	172	202	135	10.5
MTH 4-30/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	374	172	202	135	10.6
MTH 4-30/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	374	172	202	135	11.9
MTH 4-40/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	401	199	202	135	10.7
MTH 4-40/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	401	199	202	135	10.8
MTH 4-40/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	401	199	202	135	13.7
MTH 4-40/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	441	199	242	142	13.8
MTH 4-50/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	428	226	202	135	10.9
MTH 4-50/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	428	226	202	135	11.0
MTH 4-50/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	428	226	202	135	14.0
MTH 4-50/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	468	226	242	142	14.1
MTH 4-60/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	455	253	202	135	11.1
MTH 4-60/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	455	253	202	135	11.2
MTH 4-60/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	455	253	202	135	14.5
MTH 4-60/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	495	253	242	142	14.6
MTH 4-70/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	482	280	202	135	11.3
MTH 4-70/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	482	280	202	135	11.4
MTH 4-70/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	482	280	202	135	15.8
MTH 4-70/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	522	280	242	142	15.9
MTH 4-80/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	509	307	202	135	11.5
MTH 4-80/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	509	307	202	135	11.6
MTH 4-80/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	509	307	202	135	16.1
MTH 4-80/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	549	307	242	142	16.2

Performance curves

Immersible pumps
MTH 4, 60 Hz

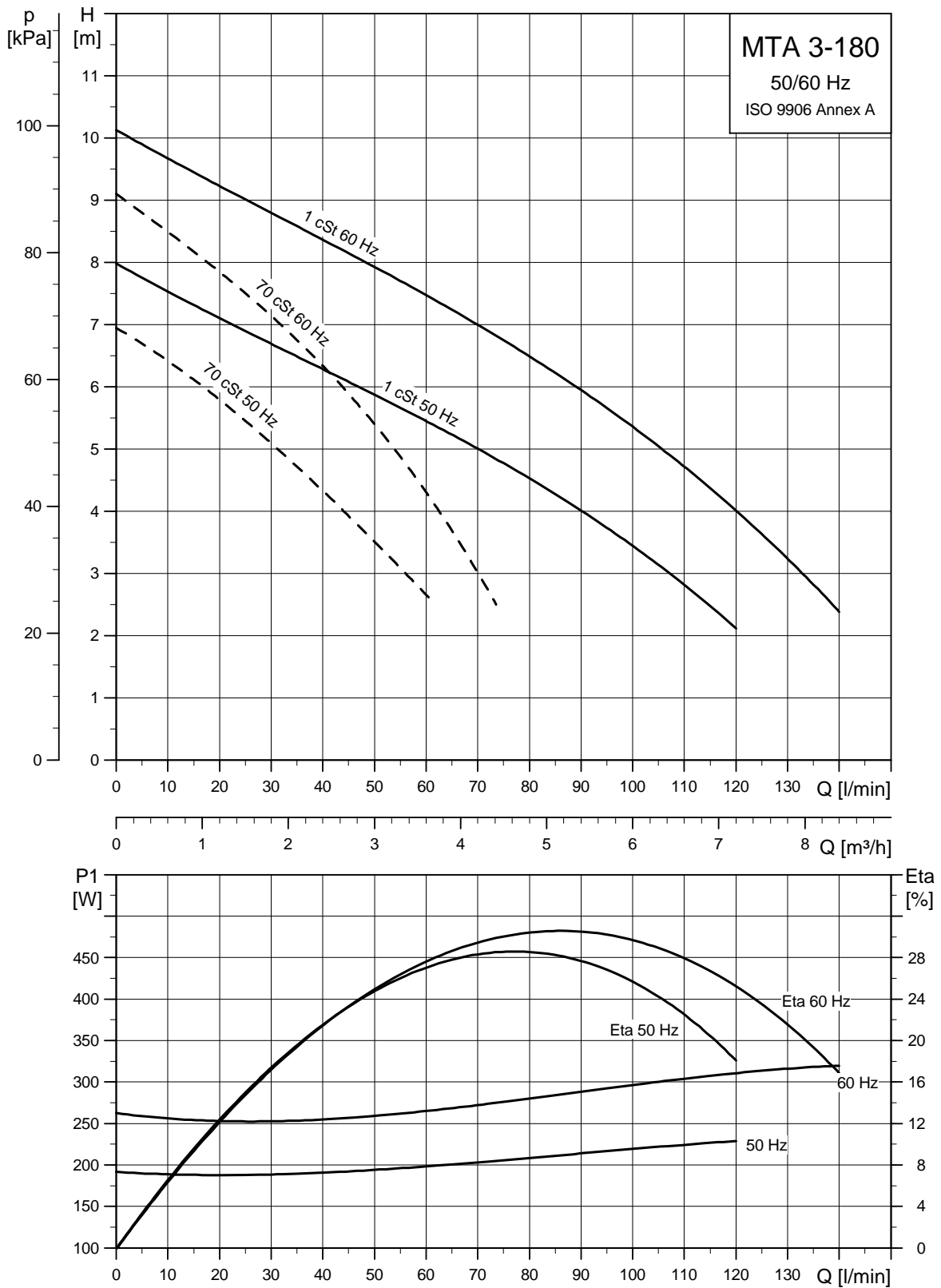
Technical data, 3 x 200-230 ΔV/346-400 YV, 60 Hz, Japan

Pump type	Motor P1 [W]	Electrical data				Dimensions [mm]				Weight [kg]
		I _N [A]	cos φ _{1/1}	η [%]	$\frac{I_{start}}{I_{1/1}}$	A	B	C	D1	
MTH 4-20/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	347	145	202	135	10.3
MTH 4-20/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	347	145	202	135	10.4
MTH 4-30/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	374	172	202	135	10.5
MTH 4-30/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	374	172	202	135	10.6
MTH 4-30/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	374	172	202	135	11.9
MTH 4-40/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	401	199	202	135	10.7
MTH 4-40/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	401	199	202	135	10.8
MTH 4-40/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	401	199	202	135	13.7
MTH 4-40/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	441	199	242	142	13.8
MTH 4-50/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	428	226	202	135	10.9
MTH 4-50/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	428	226	202	135	11.0
MTH 4-50/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	428	226	202	135	14.0
MTH 4-50/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	468	226	242	142	14.1
MTH 4-60/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	455	253	202	135	11.1
MTH 4-60/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	455	253	202	135	11.2
MTH 4-60/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	455	253	202	135	14.5
MTH 4-60/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	495	253	242	142	14.6
MTH 4-70/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	482	280	202	135	11.3
MTH 4-70/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	482	280	202	135	11.4
MTH 4-70/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	482	280	202	135	15.8
MTH 4-70/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	522	280	242	142	15.9
MTH 4-80/1	475	1.8	0.80 - 0.73	72	4.8 - 5.2	509	307	202	135	11.5
MTH 4-80/2	800	2.8	0.87 - 0.79	74	5.0 - 5.5	509	307	202	135	11.6
MTH 4-80/3	1170	3.9	0.91 - 0.83	74	5.0 - 5.5	509	307	202	135	16.1
MTH 4-80/4	1510	5.1	0.90 - 0.82	74	5.0 - 5.5	549	307	242	142	16.2

Performance curves

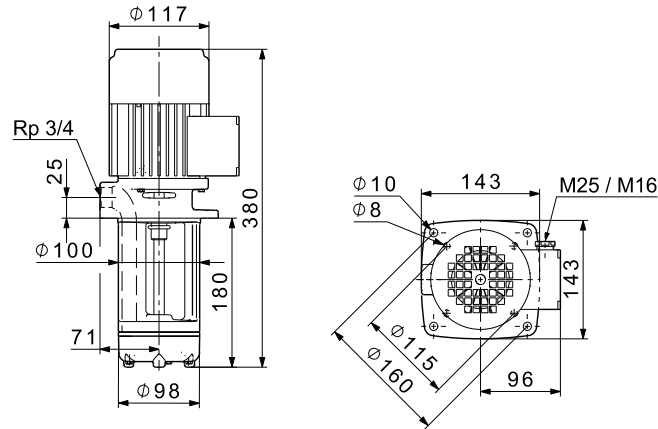
Immersible pumps
MTA 3-180, 50/60 Hz, Europe

MTA 3-180, 50/60 Hz, Europe



TM01 8133 4600

Dimensional sketches



TM04 5887 4409

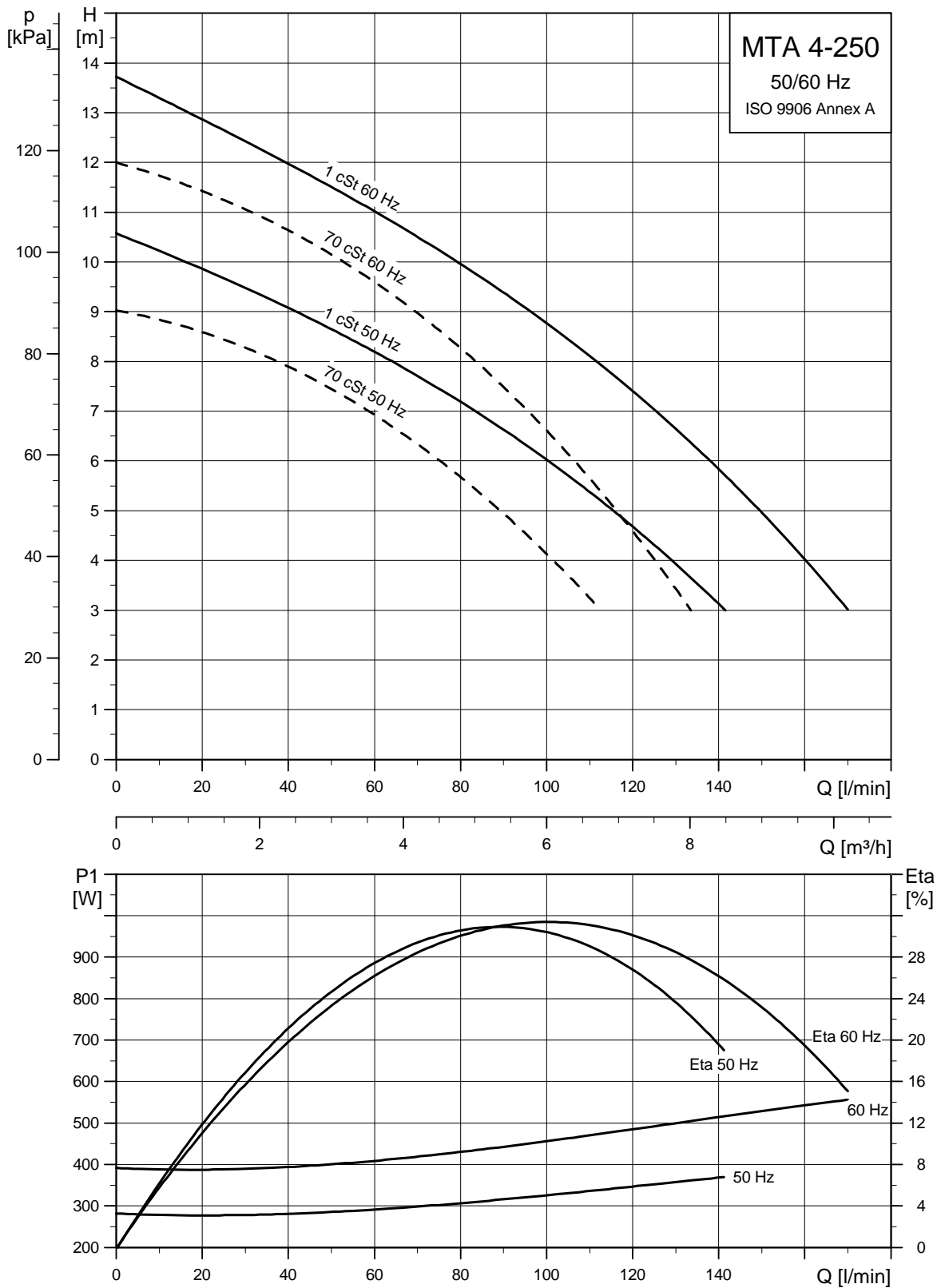
Electrical data

Supply voltage	50 Hz	3 x 220-240 Δ V/380-415 YV, 50 Hz
	60 Hz	3 x 220-277 Δ V/380-480 YV, 60 Hz
Motor P1 [kW]	50 Hz	220
	60 Hz	320
I_{Max} [A]	50 Hz	1.1/0.65
	60 Hz	1.2/0.7
$I_{1/1}$ [A]	50 Hz	0.9/0.5
	60 Hz	1.0/0.6
Weight [kg]		8.7

Performance curves

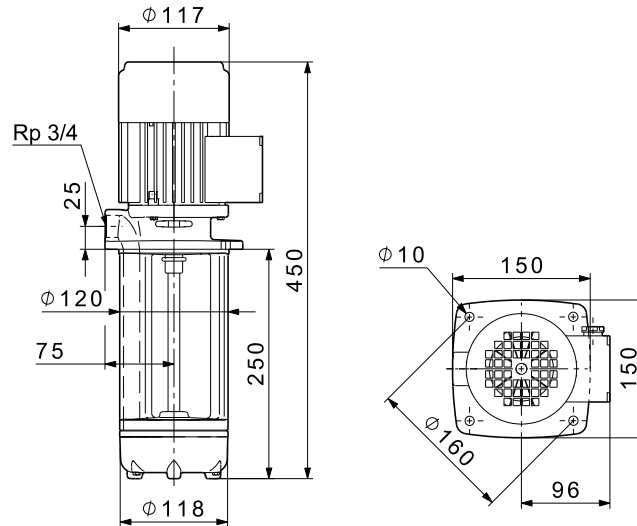
Immersible pumps
MTA 4-250, 50/60 Hz, Europe

MTA 4-250, 50/60 Hz, Europe



TM01 8136 4600

Dimensional sketches



TM04 5688 4409

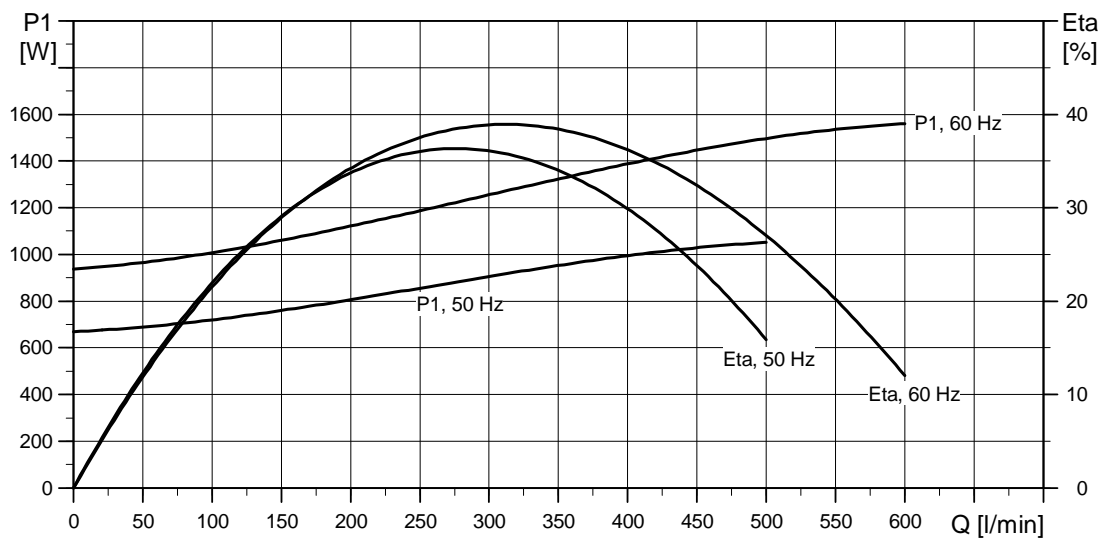
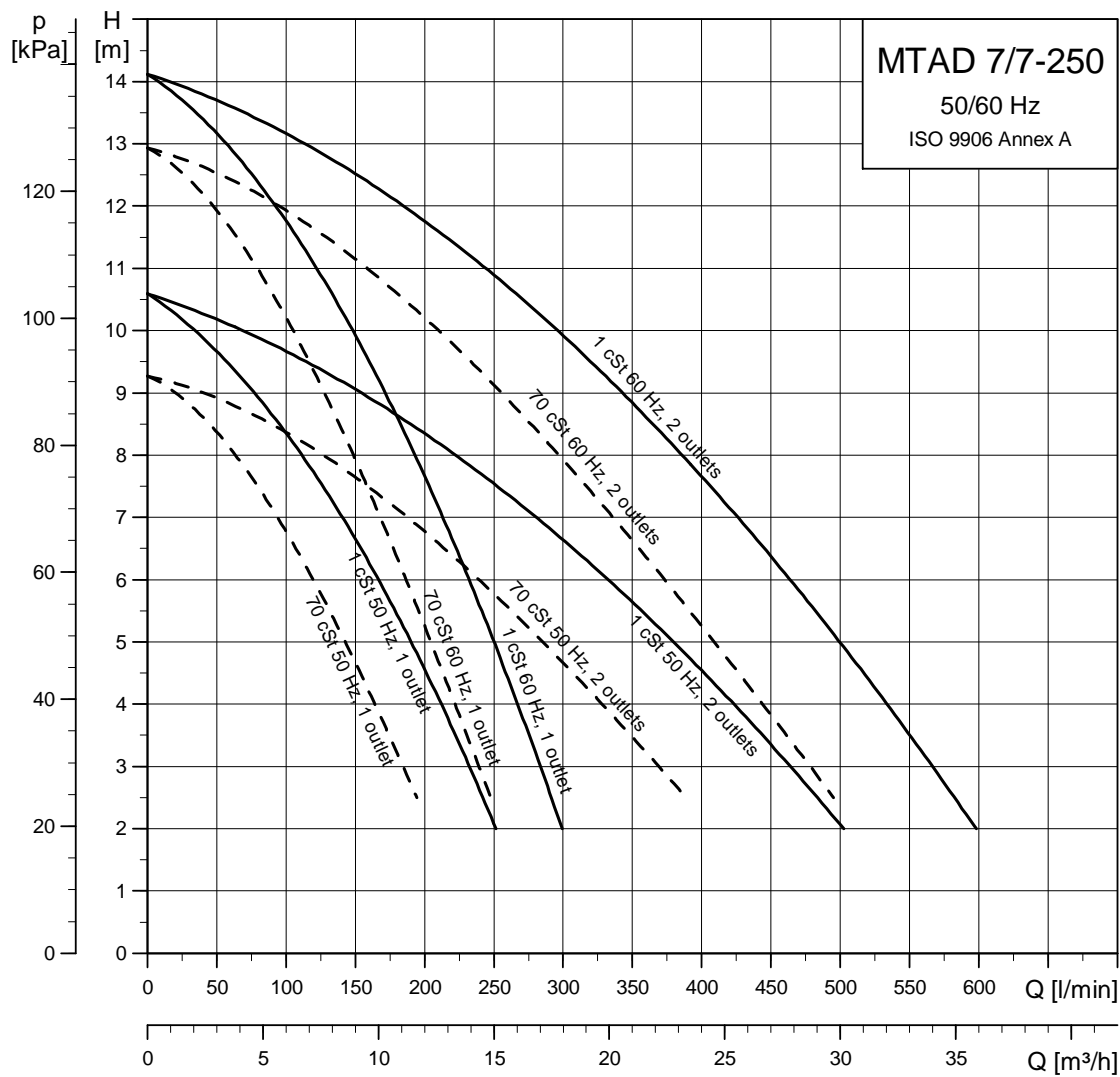
Electrical data

Supply voltage	50 Hz	3 x 220-240 Δ V/380-415 YV, 50 Hz
	60 Hz	3 x 220-277 Δ V/380-480 YV, 60 Hz
Motor P1 [kW]	50 Hz	360
	60 Hz	560
I_{Max} [A]	50 Hz	1.45/0.85
	60 Hz	1.8/1.05
$I_{1/1}$ [A]	50 Hz	1.3/0.75
	60 Hz	1.65/0.95
Weight [kg]	10.5	

Performance curves

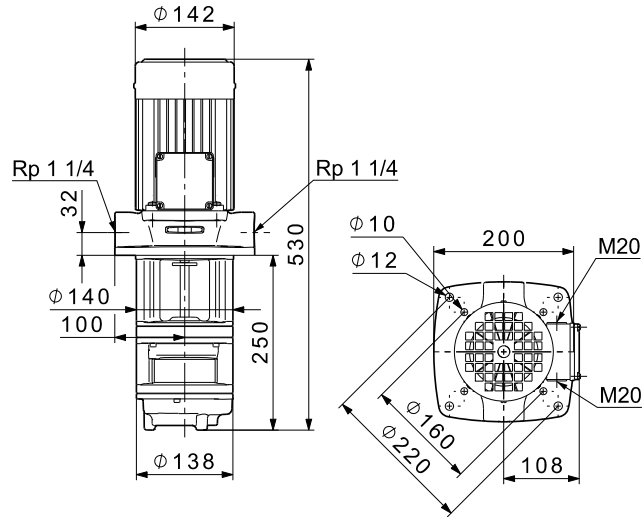
Immersible pumps
MTAD 7/7-250, 50/60 Hz, Europe

MTAD 7/7-250, 50/60 Hz, Europe



TM01 8139 4600

Dimensional sketches



TM04 5689 4409

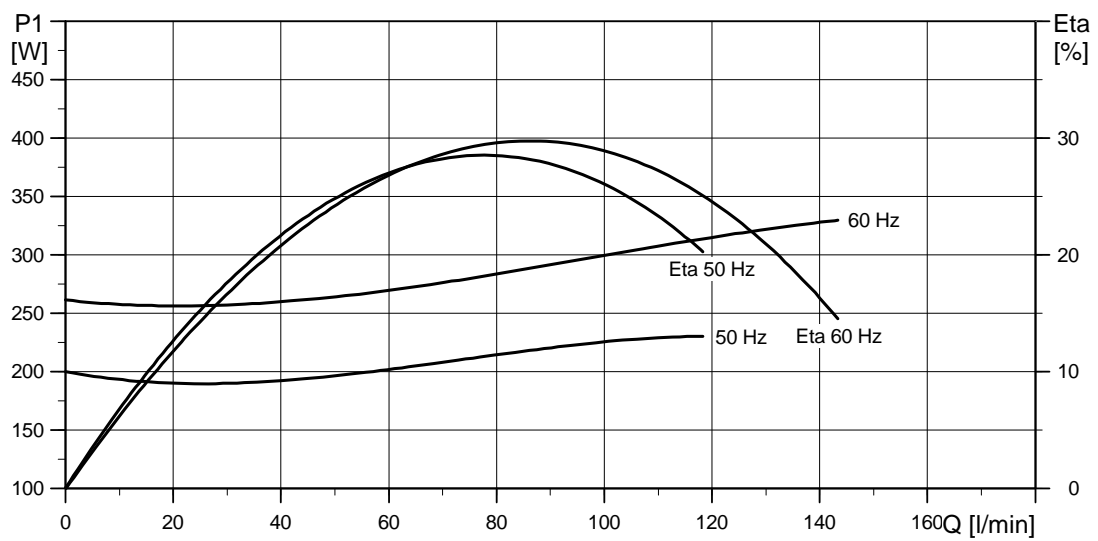
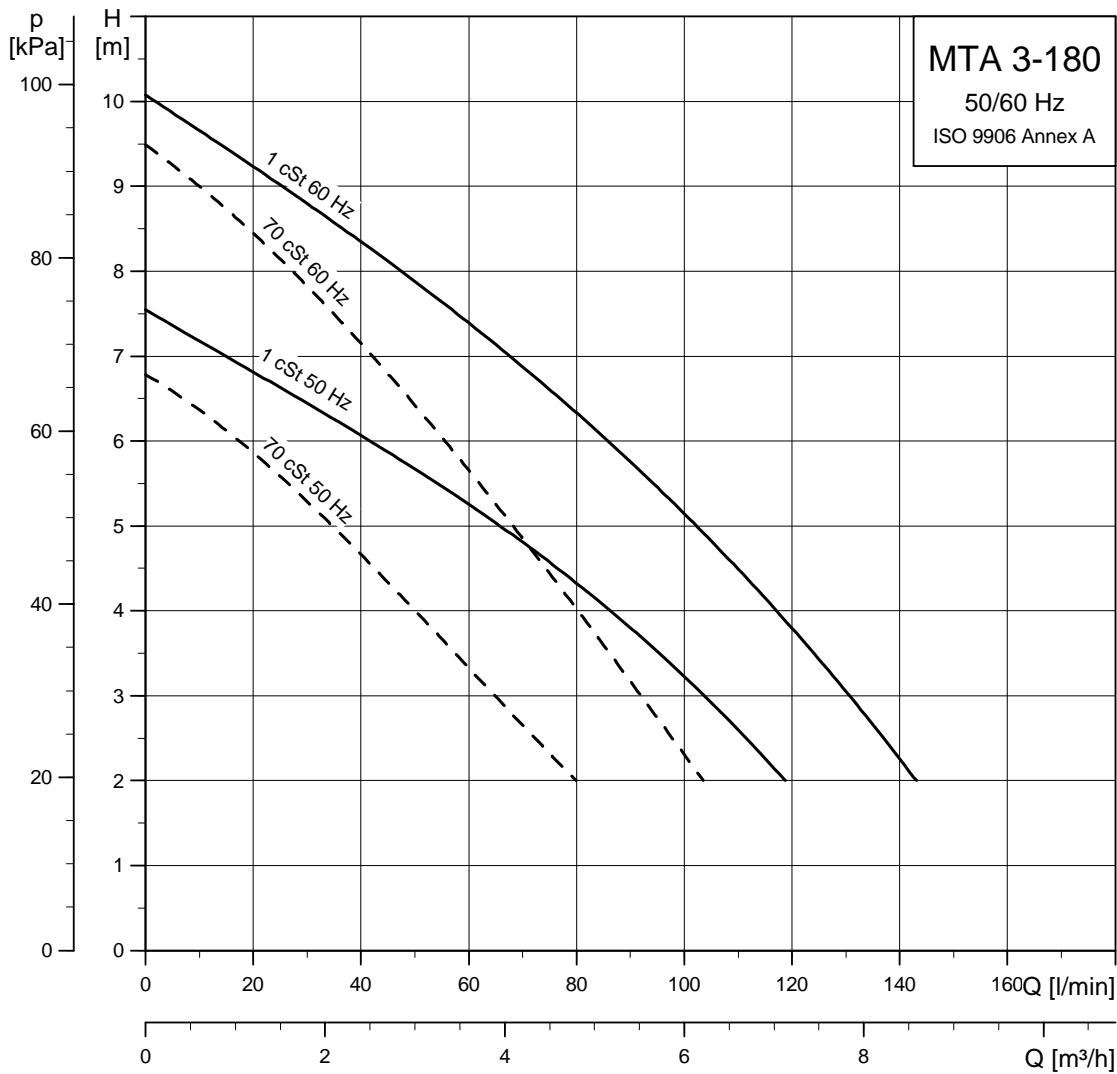
Electrical data

Supply voltage	50 Hz	3 x 220-240 Δ V/380-415 YV, 50 Hz
	60 Hz	3 x 220-277 Δ V/380-480 YV, 60 Hz
Motor P1 [kW]	50 Hz	1050
	60 Hz	1600
I_{Max} [A]	50 Hz	4.0/2.2
	60 Hz	5.7/3.3
$I_{1/1}$ [A]	50 Hz	3.6/2.0
	60 Hz	5.4/3.1
Weight [kg]		24.2

Performance curves

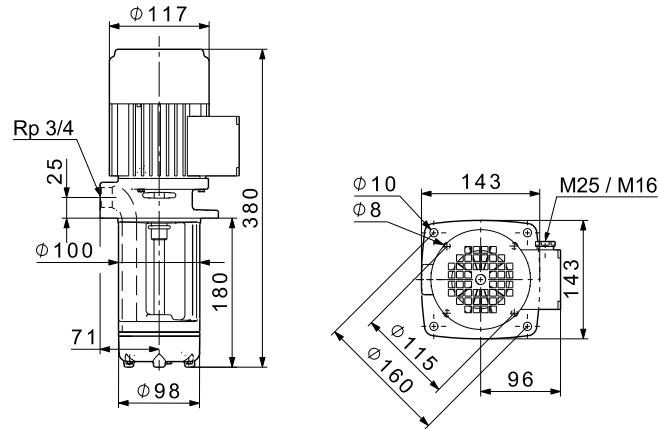
Immersible pumps
MTA 3-180, 50/60 Hz, Japan

MTA 3-180, 50/60 Hz, Japan



TM01 8132 4600

Dimensional sketches



TM04 5887 4409

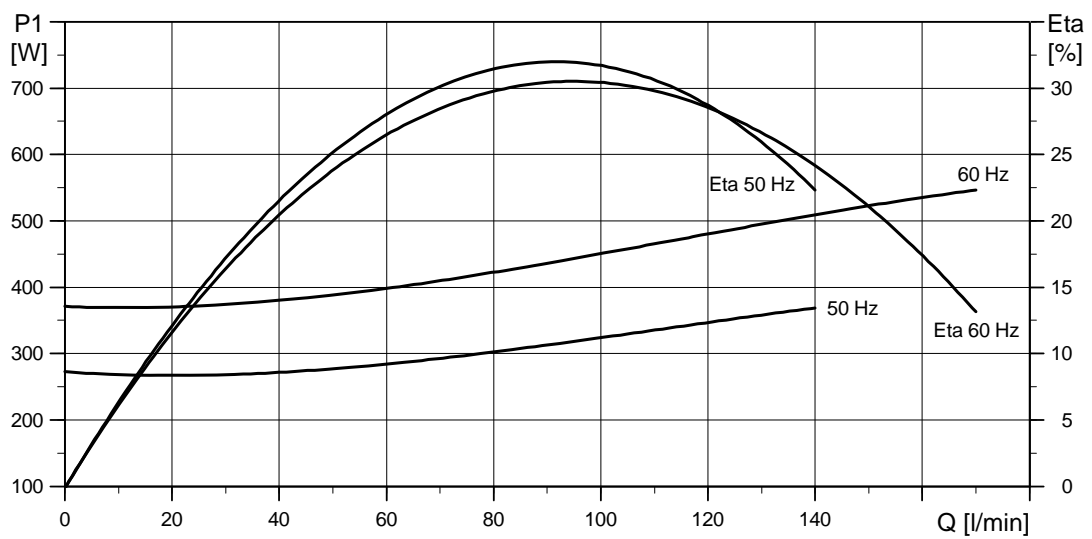
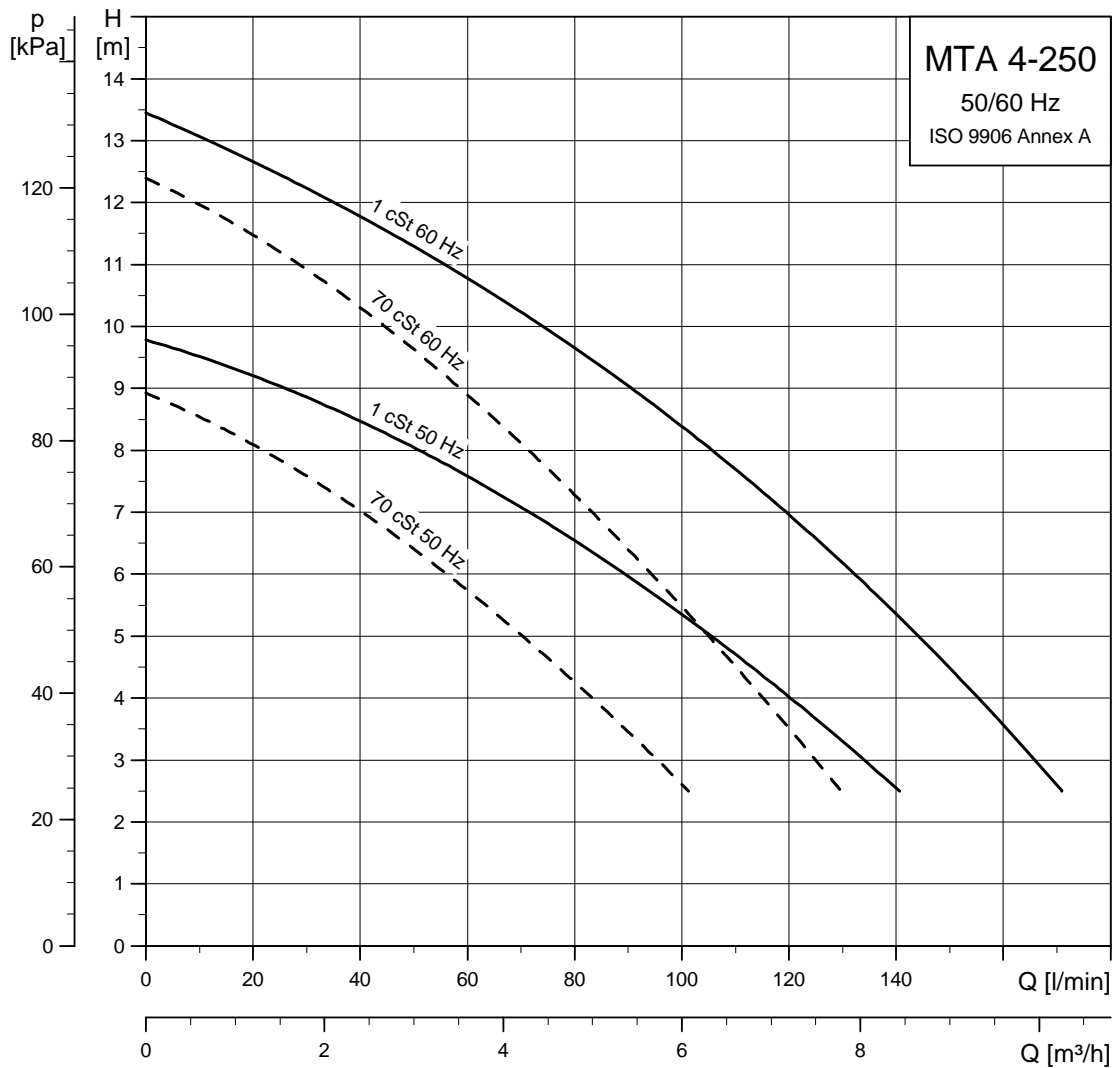
Electrical data

Supply voltage	50 Hz	3 x 200-220 Δ V/346-380 YV, 50 Hz
	60 Hz	3 x 200-230 Δ V/346-400 YV, 60 Hz
Motor P1 [kW]	50 Hz	230
	60 Hz	320
I_{Max} [A]	50 Hz	1.45/0.85
	60 Hz	1.4/0.8
$I_{1/1}$ [A]	50 Hz	1.3/0.75
	60 Hz	1.2/0.7
Weight [kg]	8.7	

Performance curves

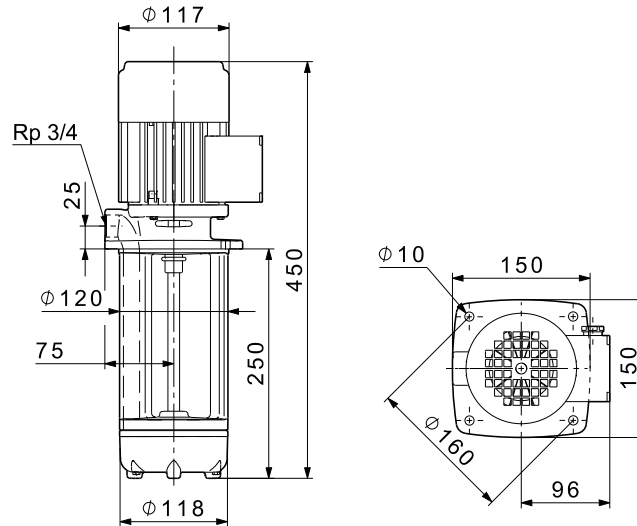
Immersible pumps
MTA 4-250, 50/60 Hz, Japan

MTA 4-250, 50/60 Hz, Japan



TM01 8135 4600

Dimensional sketches



TM04 5888 4409

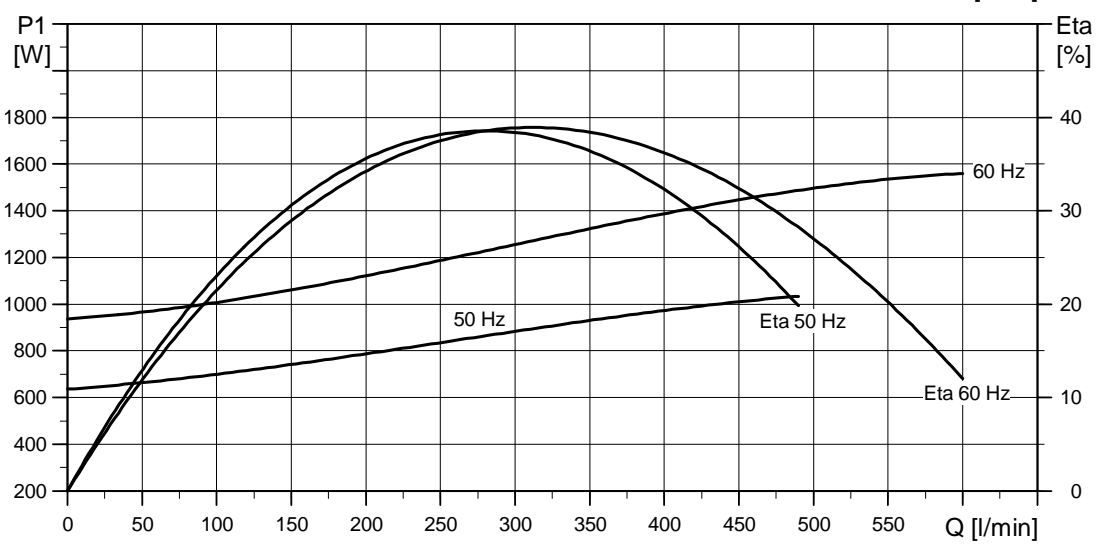
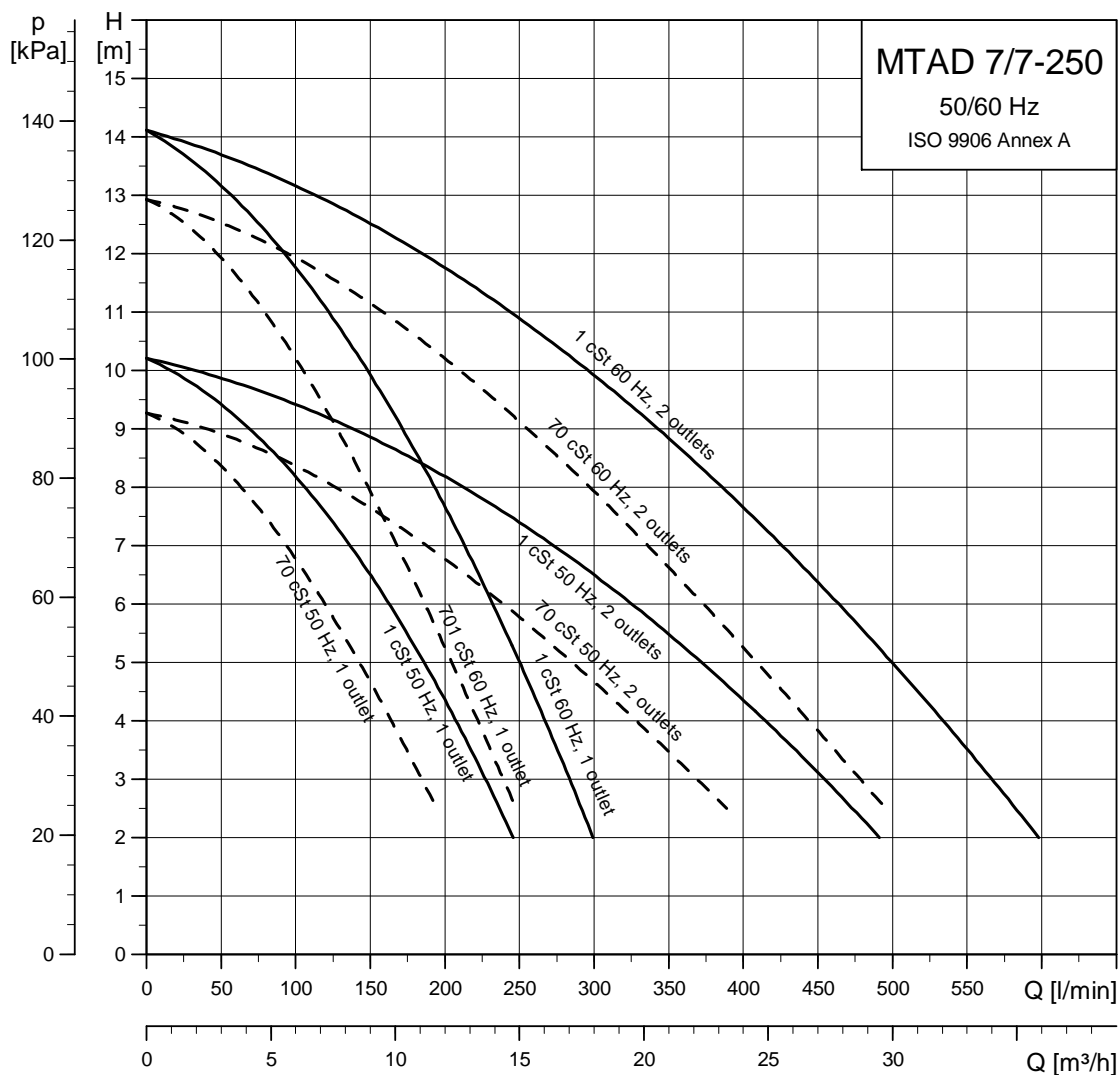
Electrical data

Supply voltage	50 Hz	3 x 200-220 Δ V/346-380 YV, 50 Hz
	60 Hz	3 x 200-230 Δ V/346-400 YV, 60 Hz
Motor P1 [kW]	50 Hz	370
	60 Hz	550
I_{Max} [A]	50 Hz	1.9/1.1
	60 Hz	2.0/1.15
$I_{1/1}$ [A]	50 Hz	1.65/0.95
	60 Hz	1.8/1.05
Weight [kg]	10.5	

Performance curves

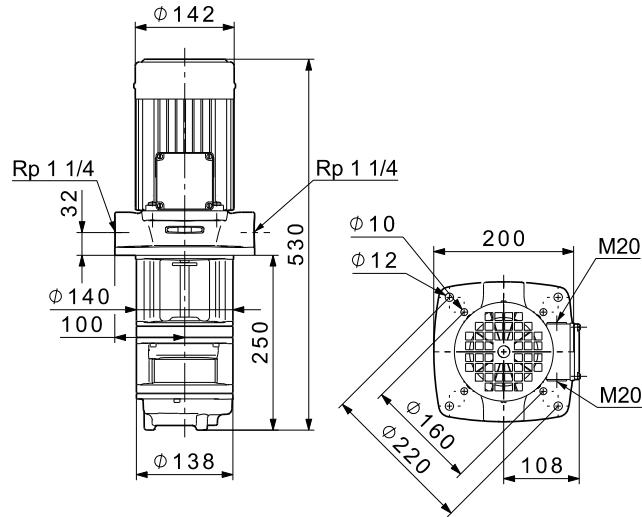
Immersible pumps
MTAD 7/7-250, 50/60 Hz, Japan

MTAD 7/7-250, 50/60 Hz, Japan



TM01 8138 4600

Dimensional sketches



TM04 5869 4409

Electrical data

Supply voltage	50 Hz	3 x 200-220 Δ V/346-380 YV, 50 Hz
	60 Hz	3 x 200-230 Δ V/346-400 YV, 60 Hz
Motor P1 [kW]	50 Hz	1050
	60 Hz	1600
I_{Max} [A]	50 Hz	5.7/3.3
	60 Hz	6.6/3.8
$I_{1/1}$ [A]	50 Hz	5.4/3.1
	60 Hz	5.9/3.4
Weight [kg]	24.4	



TM03 1711 2805

Fig. 57 MG motor



TM03 1710 2805

Fig. 58 Siemens motor



TM03 1712 2805

Fig. 59 MGE motor

Standard motors for MTR and SPK, 50 Hz

Motor brand	Motor P2 [kW]	Frame size	Standard voltage [V]	$I_{1/1}$ [A]	$\cos \varphi_{1/1}$	η [%]	Motor efficiency class	I_{start} [A]	Speed [min^{-1}]	
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	
	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	
Grundfos MG	1.1	80	220-240Δ/380-415Y	4.5/2.6	0.84-0.76	82.8	IE2/EFF1	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/EFF1	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/EFF1	37.8-42.3	2890-2910	
	3.0	100	380-415Δ	6.3-6.3	0.87-0.82	87.5	IE2/EFF1	52.9-58.0	2900-2920	
	4.0	112	380-415Δ	8.0-8.0	0.88-0.84	89.0	IE2/EFF1	89.6-98.4	2910-2930	
	5.5	132	380-415Δ	11.2-11.2	0.88-0.84	90.0	IE2/EFF1	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/EFF1	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/EFF1	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/EFF1	188-203/107-122	2920-2940	
	18.5	160	380-415Δ/660-690Y	35.0-32.0/20.0-19.2	0.91-0.90	91.6-92.6	IE2/EFF1	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/EFF1	311-343/179-203	2930-2940	
	Siemens	30	200	380-415Δ/660-690Y	53.0/30.5	0.88-0.88	93.5	IE2/EFF1	371/214	2960

E-motors for MTR and SPK, 50 Hz

Motor brand	Motor P2 [kW]	Frame size	Phase	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	Motor efficiency class
Grundfos MGE	0.37	71	1	200-240	2.7-2.5	0.96	68.0	-
	0.55	71	1	200-240	3.9-3.6	0.96	70.0	-
	0.75	80	1	200-240	5.1-4.7	0.97	72.0	-
	1.1	80	1	200-240	7.4-6.8	0.97	73.0	-
Grundfos MGE	0.75*	90	3	380-480	2.1-1.8	0.80-0.70	77.0	IE2/EFF1
	1.1*	90	3	380-480	2.6-2.3	0.88-0.77	78.0	IE2/EFF1
	1.5	90	3	380-480	3.3-2.7	0.91-0.87	81.0	IE2/EFF1
	2.2	90	3	380-480	4.6-3.8	0.92-0.90	83.0	IE2/EFF1
	3.0	100	3	380-480	6.2-5.0	0.94-0.92	83.0	IE2/EFF1
	4.0	112	3	380-480	8.1-6.6	0.94-0.92	85.0	IE2/EFF1
	5.5	132	3	380-480	11.0-8.8	0.94-0.93	85.5	IE2/EFF1
	7.5	132	3	380-480	14.8-11.6	0.94-0.95	86.0	IE2/EFF1
	11	132	3	380-480	22.5-18.8	0.90-0.90	86.5	IE2/EFF1
	15	160	3	380-480	30.0-26.0	0.91-0.86	87.5	IE2/EFF1
	18.5	160	3	380-480	37.0-31.0	0.91-0.88	88.0	IE2/EFF1
	22	180	3	380-480	43.0-35.0	0.91-0.90	87.5	IE2/EFF1

* Pumps are normally fitted with single-phase MGE motors. Dimension tables in section *Performance curves/Technical data* show pumps with single-phase MGE motors.

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

Motor brand	Motor P2 [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	Motor efficiency class	I _{start} [A]	Speed [min ⁻¹]
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	-	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	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
Siemens	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
	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



TM03 1711 2805

Fig. 60 MG motor



TM03 1710 2805

Fig. 61 Siemens motor



TM03 1712 2805

Fig. 62 MGE motor

Standard motors for MTR and SPK, 60 Hz

Motor brand	Motor P2 [kW]	Frame size	Standard voltage [V]	$I_{1/1}$ [A]	$\cos \phi_{1/1}$	η [%]	Motor efficiency class	I_{start} [A]	Speed [rpm]
Siemens	0.06	63	220-277Δ/380-480Y	0.29/0.17	0.83-0.67	0.69	-	1.62/0.95	3360-3460
	0.12	63	220-277Δ/380-480Y	0.55/0.32	0.85-0.67	0.71	-	2.92/1.70	3360-3460
	0.18	63	220-277Δ/380-480Y	0.80/0.46	0.84-0.66	0.705	-	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	0.73	-	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/EFF1	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/EFF1	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	IE2/EFF1	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	84-87.5	IE2/EFF1	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	88-89.5	IE2/EFF1	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/EFF1	188-239/108-138	3510-3540
	7.5	132	380-480Δ	14.8-13.4	0.90-0.79	89.5-89.5	IE2/EFF1	138-174	3490-3530
Siemens	11	160	380-480Δ/660-690Y	21.2-17.2/12.2-11.6	0.91-0.87	90.0-92.5	IE2/EFF1	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/EFF1	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/EFF1	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/EFF1	273-348/157-237	3500-3550
	30	200	380-480Δ/660-690Y	55.0-45.0/31.5-30.0	0.90-0.86	92.5-93.5	IE2/EFF1	358-360/252-240	3540-3565

E-motors for MTR and SPK, 60 Hz

Motor brand	Motor P2 [kW]	Frame size	Phase	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	Motor efficiency class
Grundfos MGE	0.37	71	1	200-240	2.7 - 2.5	0.96	68.0	-
	0.55	71	1	200-240	3.9 - 3.6	0.96	70.0	-
	0.75	80	1	200-240	5.1 - 4.7	0.97	72.0	-
	1.1	80	1	200-240	7.4 - 6.8	0.97	73.0	-
	0.75*	90	3	380-480	2.1 - 1.8	0.80-0.70	77.0	IE2/EFF1
	1.1*	90	3	380-480	2.6 - 2.3	0.88-0.77	78.0	IE2/EFF1
	1.5	90	3	380-480	3.3 - 2.7	0.91-0.87	81.0	IE2/EFF1
	2.2	90	3	380-480	4.6 - 3.8	0.92-0.90	83.0	IE2/EFF1
	3.0	100	3	380-480	6.2 - 5.0	0.94-0.92	83.0	IE2/EFF1
	4.0	112	3	380-480	8.1 - 6.6	0.94-0.92	85.0	IE2/EFF1
	5.5	132	3	380-480	11.0 - 8.8	0.94-0.93	85.5	IE2/EFF1
Siemens	7.5	132	3	380-480	14.8 - 11.6	0.94-0.95	86.0	IE2/EFF1
	11	132	3	380-480	22.5 - 18.8	0.90-0.90	86.5	IE2/EFF1
	15	160	3	380-480	30.0 - 26.0	0.91-0.86	87.5	IE2/EFF1
	18.5	160	3	380-480	37.0 - 31 - 0	0.91-0.88	88.0	IE2/EFF1
	22	180	3	380-480	43.0 - 35.0	0.91-0.90	87.5	IE2/EFF1

* Pumps are normally fitted with single-phase MGE motors. Dimension tables in section *Performance curves/Technical data* show pumps with single-phase MGE motors.

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

Motor brand	Motor P2 [kW]	Frame size	Standard voltage [V]	I _{1/1} [A]	Cos φ _{1/1}	η [%]	Motor efficiency class	I _{start} [A]	Speed [min ⁻¹]
SIEMENS	0.06	63	200-230Δ/346-400Y	0.33/0.19	0.81-0.72	69.3	IE2	4.86	3380-3440
SIEMENS	0.12	63	200-230Δ/346-400Y	0.64/0.37	0.84-0.74	70.5	IE2	5.12	3380-3440
SIEMENS	0.18	63	200-230Δ/346-400Y	0.94-0.54-	0.81-0.68	70.3	IE2	4.61	3380-3440
MG	0.25	71A	200-230Δ/346-400Y	1.30/0.75	0.86-0.80	68	IE2	5.0-5.8	3380-3450
MG	0.37	71A	200-230Δ/346-400Y	1.65-1.50/0.96-0.87	0.85-0.76	79.0-80	IE2	5.5-6.5	3410-3470
MG	0.55	71B	200-230Δ/346-400Y	2.36-2.14/1.36-1.24	0.85-0.76	81.5-83	IE2	5.0-6.0	3390-3460
MG	0.75	80A	200-230Δ/346-400Y	3.15-2.80/1.82-1.62	0.86-0.78	83.0-85	IE2	6.0-7.4	3400-3470
MG	1.1	80B	200-230Δ/346-400Y	4.60-4.20/2.70-2.44	0.88-0.82	82.0-84.5	IE2	6.1-7.9	3390-3460
MG	1.5	90SB	200-230Δ/346-400Y	5.85-5.45/3.40-3.15	0.90-0.85	84.0-84.8	IE2	7.8-9.3	3470-3530
MG	2.2	90LC	200-230Δ/346-400Y	8.45-7.65/4.85-4.45	0.91-0.88	85.5-86.3	IE2	7.8-9.5	3470-3500
MG	3	100LC	200-230Δ/346-400Y	11.8-11.2/6.80-6.45	0.89-0.86	84.0-85.9	IE2	8.0-9.6	3430-3480
MG	4	120MC	200-230Δ/346-400Y	15.0-13.8/8.55-7.95	0.90-0.86	88.0-88.8	IE2	10.2-12.8	3510-3530
MG	5.5	132SC	200-230Δ/346-400Y	20.6-19.2/11.8-11.0	0.90-0.86	89.0	IE2	10.0-12.5	3510-3530
MG	7.5	132SD	200-230Δ/380-400Y	28.0-26.5/16.2-15.4	0.90-0.84	89.5-89.5	IE2	9.3-11.3	3490-3510
SIEMENS	11	160M	200-220ΔΔ/400-440D	39.0-35.6/19.5-17.8	0.92-0.92	90.0-90.0	IE2	6.8-8.2	3535-3535
SIEMENS	15	160M	200-220ΔΔ/400-440D	50.0-46.0/25.0-23.0	0.90-0.90	90.0-91.0	IE2	6.8-8.2	3545-3545
SIEMENS	18.5	160L	200-220ΔΔ/400-440D	64.0-58.0/32.0-29.0	0.92-0.92	91.0-92.0	IE2	6.8-8.2	3530-3540
SIEMENS	22	180M	200-220ΔΔ/400-440D	75.0-69.0/37.5-34.5	0.89-0.89	94.1-94.2	IE2	5.7-6.9	3540-3545
SIEMENS	30	200L	200-220ΔΔ/400-440D	104-95.0/52.0-47.5	0.89-0.89	93.5-93.2	IE2	5.5-6.7	3545-3550

Pumped liquids

MTR(E), 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

The 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 type	Strainer passage [mm]	Free strainer passage [cm ²]	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
SPK1	Ø2	-	2.5
SPK2	Ø2	-	2.5
SPK4	Ø2	-	2.5
SPK8	Ø4	-	4
MTH 2	Ø2	23	2
MTH 4	Ø4	28	4

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.

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(E)	
			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 ₃ COOH	-	5 %, +20 °C	-	HUUE
Alkaline degreasing agent	D, F	-	HUUE	-
Ammonium bicarbonate, NH ₄ HCO ₃	E	20 %, +30 °C	-	HUUE
Ammonium hydroxide, NH ₄ OH	-	20 %, +40 °C	HUUE	-
Benzoic acid, C ₆ H ₅ COOH	H	0.5 %, +20 °C	-	HUUV
Boiler water	-	<+90 °C	HUUE	-
Calcareous water	-	<+90 °C	HUUE	-
Calcium acetate (as coolant with inhibitor) Ca(CH ₃ COO) ₂	D, E	30 %, +50 °C	HUUE	-
Calcium hydroxide, Ca(OH) ₂	E	Saturated solution, +50 °C	HUUE	-
Chloride-containing water	F	<+30 °C, max. 500 ppm	-	HUUE
Citric acid, HOC(CH ₂ CO ₂ H) ₂ COOH	H	5 %, +40 °C	-	HUUE
Completely desalinated water (demineralized water)	-	<+90 °C	-	HUUE
Condensate	-	<+90 °C	HUUE	-
Copper sulfate, CuSO ₄	E	10 %, +30 °C	-	HUUE
Corn oil	D, E, 3	100 %, +80 °C	HUUV	-
Domestic hot water (potable water)	-	<+120 °C	HUUE	-
Ethylene glycol, HOCH ₂ CH ₂ OH	D, E	50 %, +50 °C	HUUE	-
Formic acid, HCOOH	-	2 %, +20 °C	-	HUUE
Glycerine (glycerol), OHCH ₂ CH(OH)CH ₂ OH	D, E	50 %, +50 °C	HUUE	-
Hydraulic oil (mineral)	E, 2, 3	100 %, +100 °C	HUUV	-
Hydraulic oil (synthetic)	E, 2, 3	100 %, +100 °C	HUUV	-
Lactic acid, CH ₃ CH(OH)COOH	E, H	10 %, +20 °C	-	HUUV
Linoleic acid, C ₁₇ H ₃₁ COOH	E, 3	100 %, +20 °C	HUUV	-
Motor oil	E, 2, 3	100 %, +80 °C	HUUV	-
Cutting oil	E	+90 °C	HUUV	-
Water based cooling lubricant	E	+90 °C	HUUV	-
Naphthalene, C ₁₀ H ₈	E, H	100 %, +80 °C	HUUV	-
Nitric acid, HNO ₃	F	1 %, +20 °C	-	HUUE
Oil-containing water	-	<+90 °C	HUUV	-
Olive oil	D, E, 3	100 %, +80 °C	HUUV	-
Oxalic acid, (COOH) ₂	H	1 %, +20 °C	-	HUUE
Peanut oil	D, E, 3	100 %, +80 °C	HUUV	-
Phosphoric acid, H ₃ PO ₄	E	20 %, +20 °C	-	HUUE
Propylene glycol, CH ₃ CH(OH)CH ₂ OH	D, E	50 %, +90 °C	HUUE	-
Potassium carbonate, K ₂ CO ₃	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 ₄	-	1 %, +20 °C	-	HUUE
Rape seed oil	D, E, 3	100 %, +80 °C	HUUV	-
Salicylic acid, C ₆ H ₄ (OH)COOH	H	0.1 %, +20 °C	-	HUUE

Pumped liquids

Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

Pumped liquid	Note	Liquid concentration, liquid temperature	Recommended pump version / shaft seal	
			MTR(E)	
			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)
Silicone oil	E, 3	100 %	HUUV	-
Sodium bicarbonate, NaHCO ₃	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 ₃	E	10 %, +60 °C	-	HUUE
Sodium phosphate, Na ₃ PO ₄	E, H	10 %, +60 °C	-	HUUE
Sodium sulfate, Na ₂ SO ₄	E, H	10 %, +60 °C	-	HUUE
Softened water	-	<+120 °C	-	HUUE
Soya oil	D, E, 3	100 %, +80 °C	HUUV	-
Unsalted swimming pool water	-	Approx. 2 ppm free chlorine (Cl ₂)	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 crystallization/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.

Counter flanges for MTR, MTRE, SPK, SPKE

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

Counter flange	Pump type	Description	Rated pressure	Pipework connection	Product number
	SPK, SPKE 1 SPK, SPKE 2 SPK, SPKE 4	Threaded	25 bar	Rp 3/4	395104
	MTR, MTRE 1s MTR, MTRE 1 MTR, MTRE 3 MTR, MTRE 5 SPK, SPKE 8	Threaded	16 bar	Rp 1 1/4	405178
	MTR, MTRE 32	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
	MTR, MTRE 45 MTR, MTRE 64	Threaded	16 bar	Rp 3	350540
		For welding	16 bar	80 mm, nominal	350541
		For welding	40 bar	80 mm, nominal	350542

Pipework connection

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

Sensors for MTR, MTRE and SPK, SPK

Accessory	Type	Supplier	Measuring range	Product number
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	1 - 5 m ³ (DN 25)	ID8285
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	3 - 10 m ³ (DN 40)	ID8286
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	6 - 30 m ³ (DN 65)	ID8287
Flowmeter	SITRANS FM MAGFLO MAG 5100 W	Siemens	20 - 75 m ³ (DN 100)	ID8288
Temperature sensor	TTA (0) 25	Carlo Gavazzi	0 °C to +25 °C	96432591
Temperature sensor	TTA (-25) 25	Carlo Gavazzi	-25 °C to +25 °C	96430194
Temperature sensor	TTA (50) 100	Carlo Gavazzi	+50 °C to +100 °C	96432592
Temperature sensor	TTA (0) 150	Carlo Gavazzi	0 °C to +150 °C	96430195
Accessory for temperature sensor. All with G 1/2 connection	Protecting tube ∅ 9 x 50 mm	Carlo Gavazzi		96430201
	Protecting tube ∅ 9 x 100 mm	Carlo Gavazzi		96430202
	Cutting ring bush	Carlo Gavazzi		96430203
Temperature sensor, ambient temperature	WR 52	tmg (DK: Plesner)	-50 °C to +50 °C	ID8295
Differential temperature sensor	ETSD	Honsberg	0 °C to +20 °C	96409362
Differential temperature sensor	ETSD	Honsberg	0 °C to +50 °C	96409363

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

Danfoss pressure sensor kits for MTR, MTRE 1s, 1, 3, 5, 10, 15, 20, 32, 45, 64 and SPK, SPKE 1, 2, 4, 8

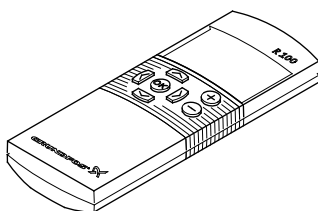
The kit comprises:	Pressure range	Temperature range	Product number
<ul style="list-style-type: none"> Danfoss pressure transmitter, type MBS 3000, with 2 m screened cable Connection: G 1/2 A (DIN 16288 - B6kt) 5 cable clips (black) Instruction manual PT (00 40 02 12) 	0 - 4 bar	-40 °C to +85 °C	96428014
	0 - 6 bar		96428015
	0 - 10 bar		96428016
	0 - 16 bar		96428017
	0 - 25 bar		96428018

DPI differential pressure sensor kit

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

Remote control, R100

R100 is used for wireless communication with the MTRE pump. The communication takes place by means of infrared light.



TM00 4498 2802

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

Product	Product number
R100	96615297

List of variants - on request

Below please find the range of options available for customizing the MTR, MTRE, SPK, SPKE, 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	See page 142
	SPK, SPKE	See page 143
Horizontally mounted pump	MTR, MTRE SPK, SPKE	see page 144
120 ° solution	MTR, MTRE SPK, SPKE	see page 144
Suction pipe	MTR, MTRE SPK, SPKE MTH	see page 144
High-pressure pump up to 38 bar	MTRE 1-19/19	see page 146

Shaft seals

Variant	Applies to	Description
Shaft seal with FFKM, FXM or EDPM O-ring material	MTR, MTRE SPK, SPKE MTH	Shaft seals with FFKM, FXM or EPDM O-ring material are recommended 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, SPKE	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 MTAD 7/7	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.
	Note: Contact Grundfos if you require a certificate.
Inspection certificate	We offer the following inspection certificates: <ul style="list-style-type: none"> • Lloyds Register of Shipping (LRS) • Det Norske Veritas (DNV) • Germanischer Lloyd (GL) • Bureau Veritas (BV) • American Bureau of Shipping (ABS) • Registro Italiano Navale Agenture (RINA) • China Classification Society (CCS) • Russian maritime register of Shipping (RS) • Biro Klassifikasio Indonesia (BKI) • United States Coast Guard (USCG) • Nippon Kaiji Koykai (NKK)
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.

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

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

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, SPKE

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

For the SPK, SPKE 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	-	-

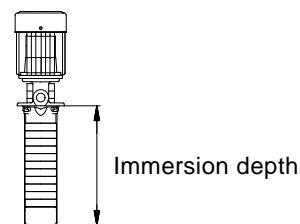


Fig. 63 Immersion depth

TM01 4460 1299

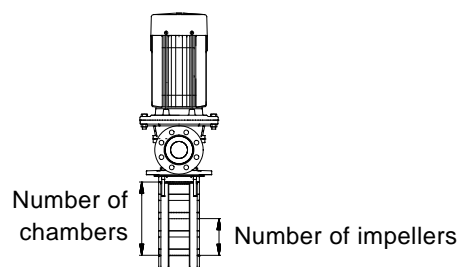


Fig. 64 Number of chambers/impellers

TM01 4991 1299

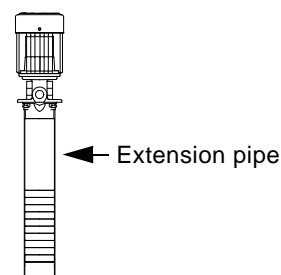
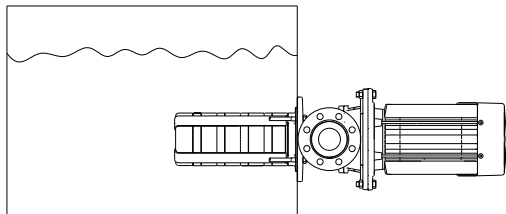


Fig. 65 Extension pipe

TM01 4214 1299

Horizontal mounting

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



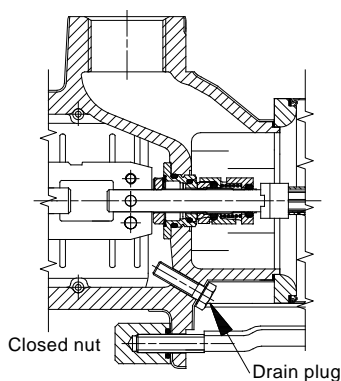
TM04 6542 0610

Fig. 66 Horizontal mounting of an MTR pump

Note: If the MTR, MTRE or SPK, SPKE 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. 67 Horizontal installation

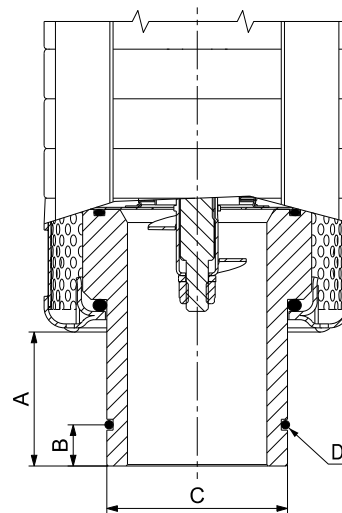
120 °C solution

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

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	∅ 64.8	∅ 60 x 3
MTR, MTRE 10, 15, 20	48	15	∅ 88.8	∅ 84 x 3
MTR, MTRE 32	48	15	∅ 104.8	∅ 100 x 3
MTR, MTRE 45	48	15	∅ 124.8	∅ 119.5 x 3
MTR, MTRE 64	48	15	∅ 133.7	∅ 128 x 3
SPK 1, 2, 4	48	15	∅ 56	∅ 51.2 x 3
SPK 8	48	15	∅ 56	∅ 51.2 x 3
MTH 2, 4	48	15	∅ 64.8	∅ 60 x 3



TM04 6335 0210

Fig. 68 Suction pipe

Variants

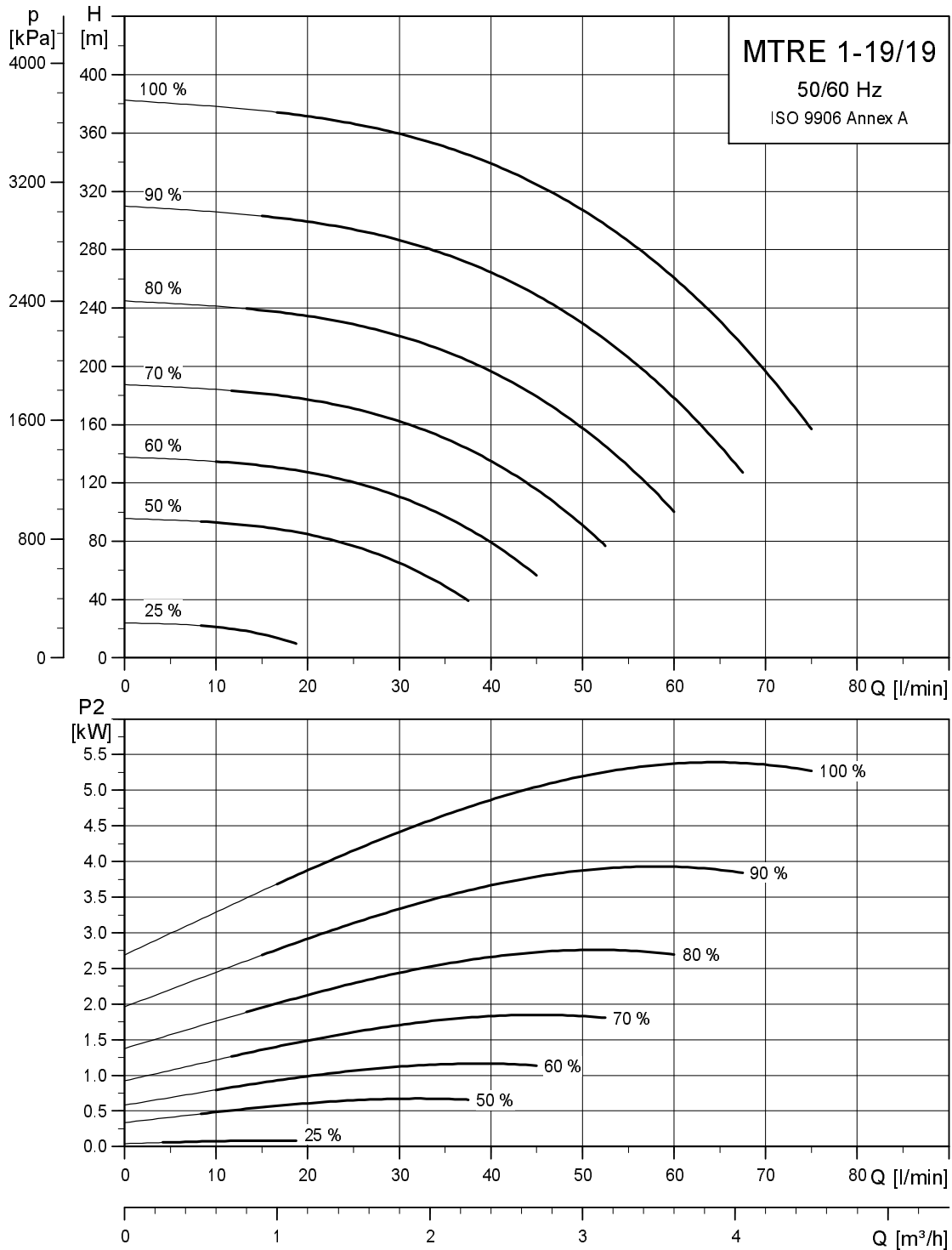
Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

E-variants

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

This pump is equipped with a high-speed motor, type MGE.

MTRE 1 high-pressure pump

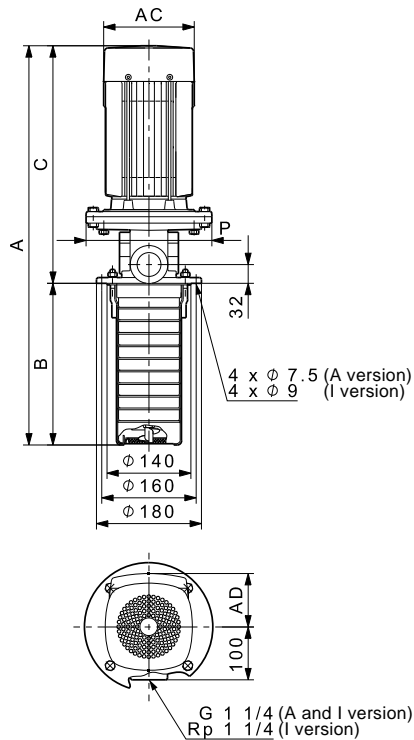


TM04 5677 0610

Variants

Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA

Dimensional sketches



TM04 5754 3809

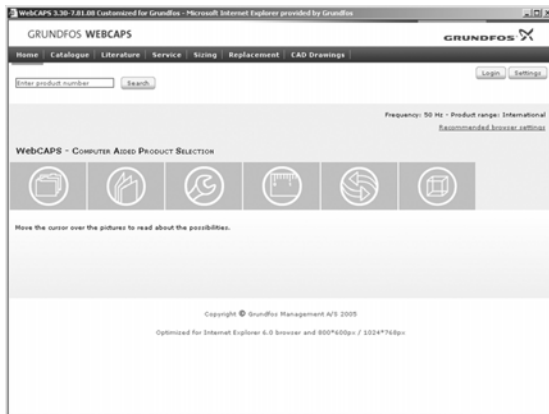
Dimensions and weight

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

Electrical data: 3 x 380-480V 50/60Hz

Pump type	P2 [kW]	Type	Full load current $I_{1/1}$ [A]	Motor		Motor efficiency		Maximum motor speed [min ⁻¹]
				Starting current I_{start} [A]	Power factor $\cos \varphi_{1/1}$	η [%]	class	
MTRE1-19/19 J-W-A-HUUV	5.5	MGE132SC	11-8.8	11-8.8	0.94-0.93	85.5	EFF1 / IE2	5400

WebCAPS

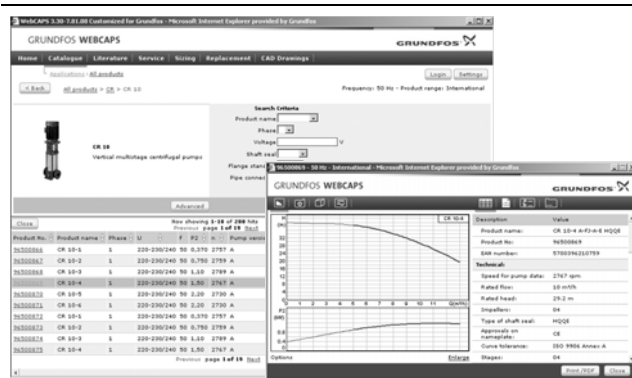


WebCAPS is a **Web-based Computer Aided Product Selection** program available on www.grundfos.com.

WebCAPS contains detailed information on more than 185,000 Grundfos products in more than 20 languages.

In WebCAPS, all information is divided into 6 sections:

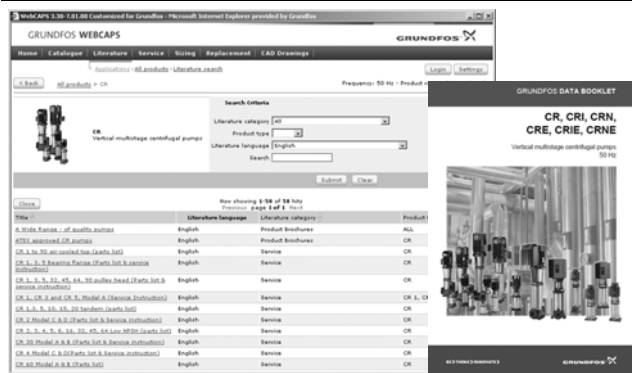
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

With a starting point in areas of applications and pump types, this section contains

- 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

In this section you can access 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, etc.



Service

This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and cancelled Grundfos pumps. Furthermore, this section contains service videos showing you how to replace service parts.

Further product documentation

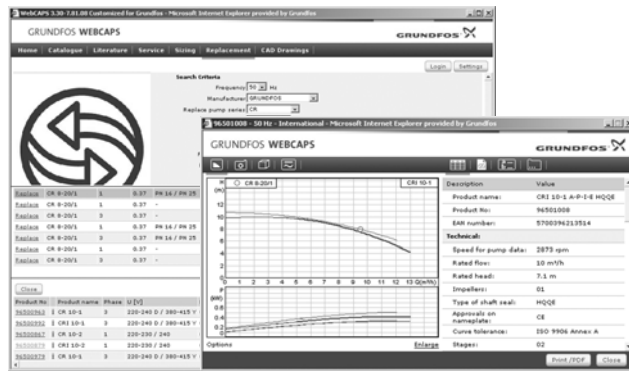
Immersible pumps
MTR, MTRE, SPK, SPKE, MTH, MTA



Sizing

With a starting point in different application areas and installation examples, this section gives easy step-by-step instructions in how to

- select the most suitable and efficient pump for your installation
- carry out advanced calculations based on energy consumption, payback periods, load profiles, lifecycle costs, etc.
- analyse your selected pump via the built-in lifecycle cost tool
- determine the flow velocity in wastewater applications, etc.

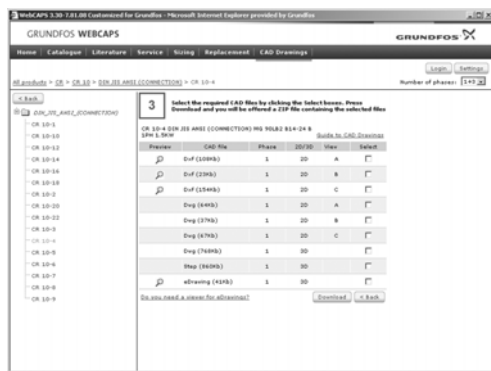


Replacement

In this section you find a guide to select and compare 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. After having specified the installed pump, the guide suggests 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.

The following 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



Fig. 69 WinCAPS CD-ROM

WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 185,000 Grundfos products in more than 202 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 CD-ROM and updated once a year.

Subject to alterations

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Repl. 96538374 0306	

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