

# MTS

Screw pumps  
50/60 Hz



be  
think  
innovate

**GRUNDFOS** 

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# 1. Introduction

## MTS



TM06 3406 0215

**Fig. 1** MTS pump with cutaway

MTS pumps are screw pumps designed for pumping of cooling lubricants and cutting oils for machine tool applications.

Depending on which pump you choose, the pump can be mounted on top of tanks with the pump immersed in the pumped liquid or the pump can be dry-installed with pipe connections to the tank, see page [13](#).

The pumps come in various sizes and screw pitches to provide the flow, pressure and length required.

The pumps consist of a motor and a pump unit. The motor is a Grundfos standard MG or Siemens motor designed to EN standards.

The pump unit consists of optimised hydraulics, various types of connections, a motor stool and various other parts.

Performance range - MTS, 50 Hz

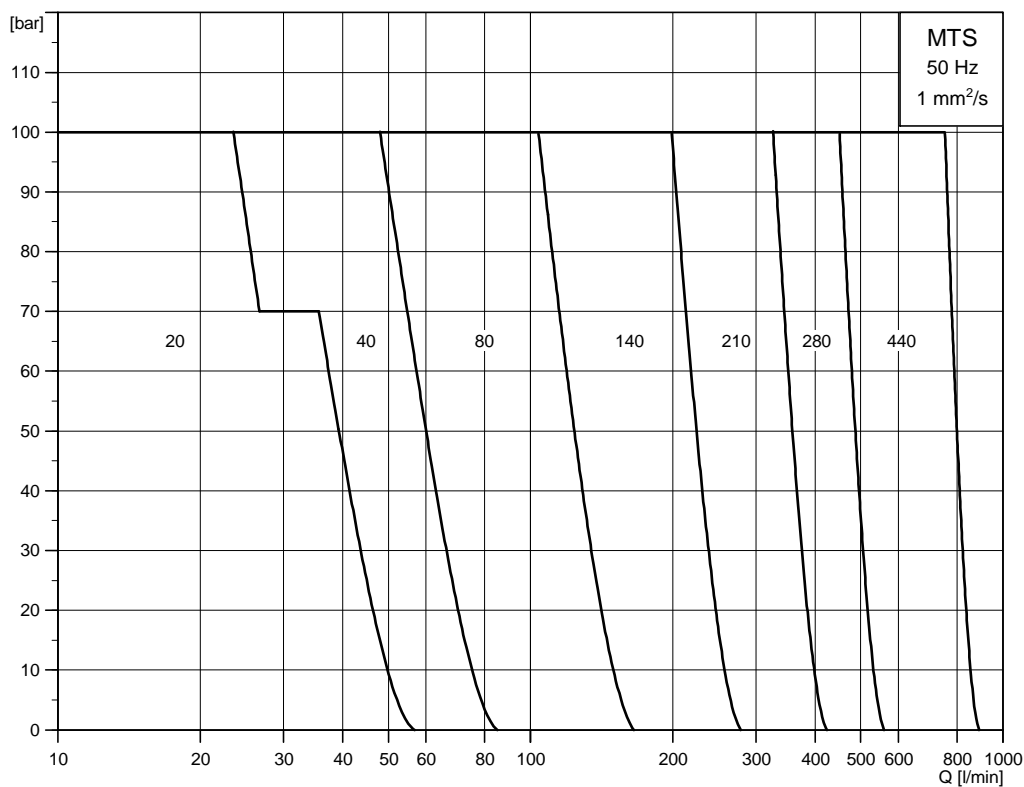


Fig. 2 Performance range - MTS, 50 Hz

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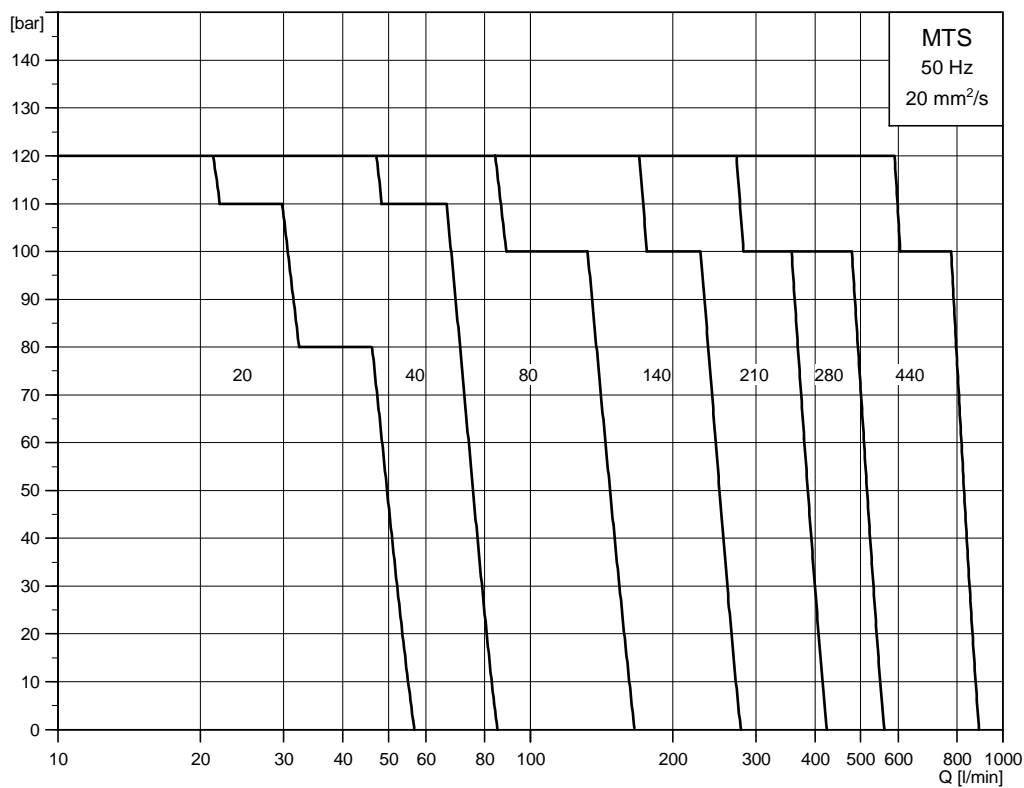


Fig. 3 Performance range - MTS, 50 Hz

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Performance range - MTS, 60 Hz

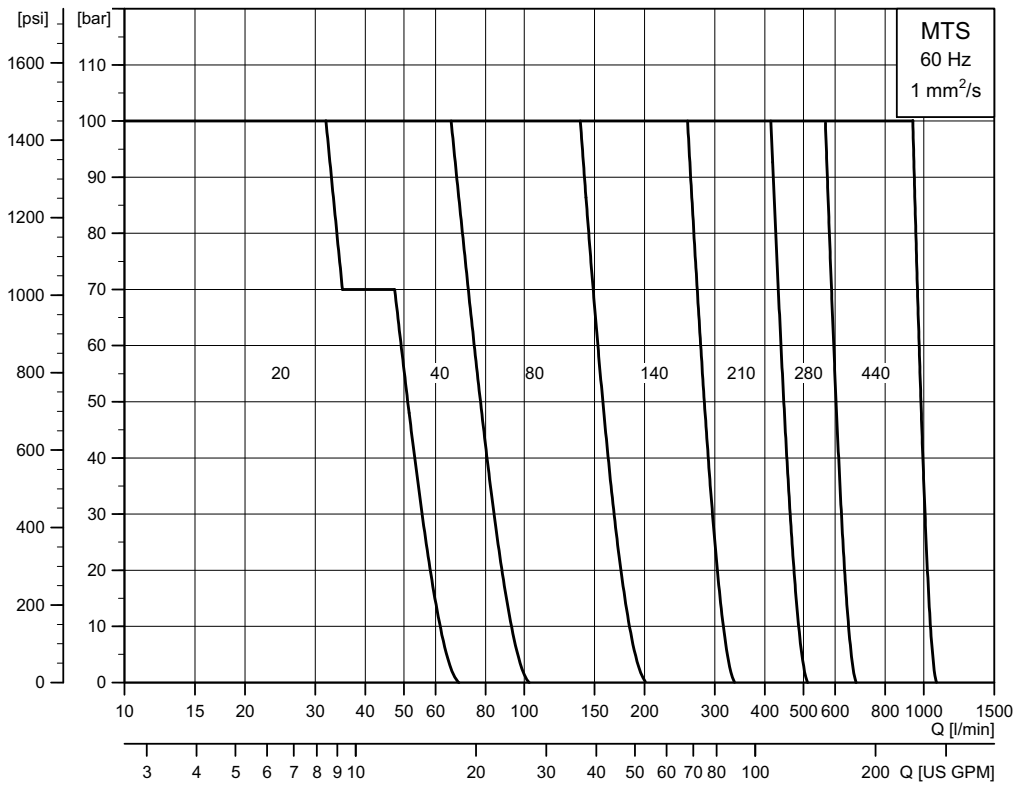


Fig. 4 Performance range - MTS, 60 Hz

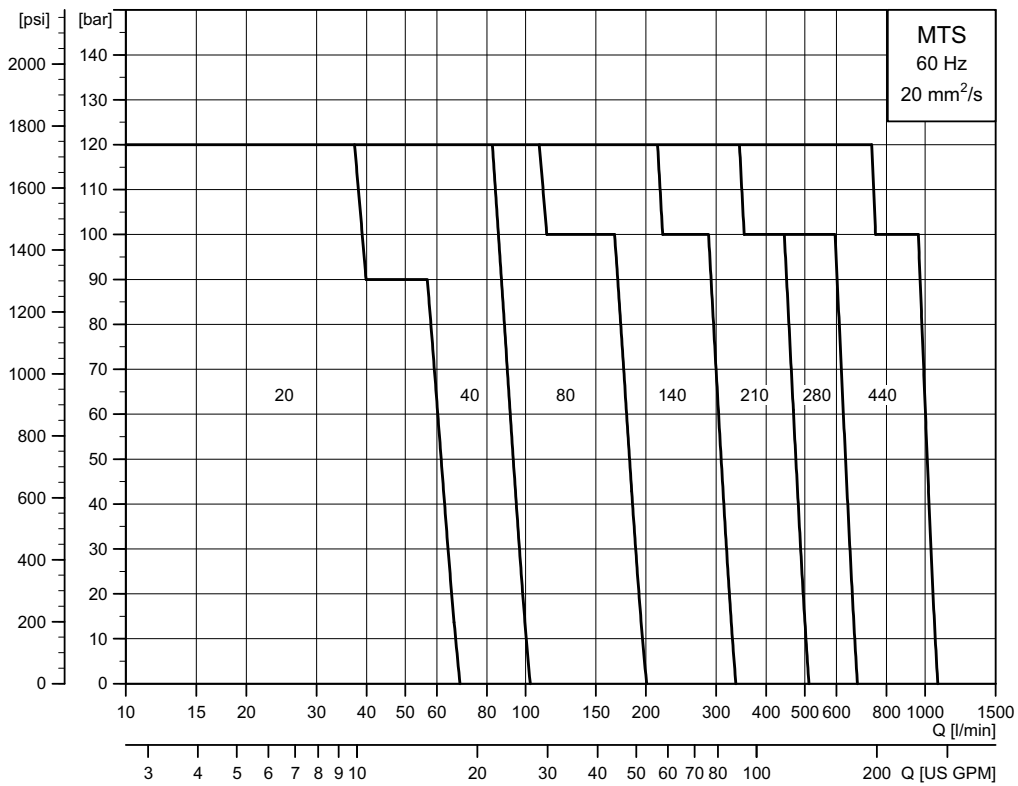


Fig. 5 Performance range - MTS, 60 Hz

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## 2. General description

### Main applications

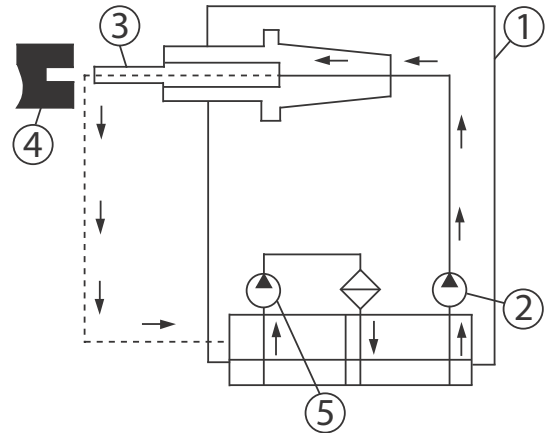
MTS pumps are an important part of modern metal machining centres, transfer lines and grinding and deep-hole drilling machines.

### Application

Transfer of well, conditionally or poorly lubricating abrasive liquids in metal working or process engineering, such as cutting, grinding and deep-hole drilling oils, oil-in-water emulsions and cooling lubricant solutions. The pumped liquid must not attack the materials.

Permissible cooling lubricants:

- Solutions (inorganic substances in water; organic and synthetic substances in water)
- Emulsions (oil-in-water, oil content minimum 2 to 20 %)
- Cutting and grinding oils (without additives; with polar physically acting additives; with mildly acting, lubricating film forming additives; with polar and mildly acting additives; with active, chemical additives; with polar and active additives).



TM04 4563 1709

Fig. 6 Schematic drawing

Pos.	Description
1	Machining centre
2	MTS high pressure pump
3	Drilling tool
4	Work piece
5	Filter pump

### Product range

Range	MTS 20	MTS 40	MTS 80	MTS 140	MTS 210	MTS 280	MTS 440
<b>50 Hz</b>							
Flow range [l/min]	0-56	0-85	0-166	0-279	0-424	0-561	0-891
Motor power P2 [kW]	0.3 - 7.1	0.4 - 16	0.6 - 29.0	1.0 - 48.5	1.7 - 74.3	2.8 - 99.4	4.4 - 158
<b>60 Hz</b>							
Flow range [l/min]	0-68	0-103	0-201	0-336	0-512	0-677	0-1076
Motor power P2 [kW]	0.4 - 10.7	0.5 - 21.7	0.8 - 35.2	1.3 - 58.8	2.3 - 90.1	3.8 - 121	5.8 - 191
<b>General data</b>							
Max. temperature [°C]	80	80	80	80	80	80	80
Max. differential pressure (emulsion) [bar]	100 <sup>1)</sup>	100 <sup>1)</sup>	100	100	100	100	100
Max. differential pressure (oil) [bar]	120 <sup>1)</sup>	120 <sup>1)</sup>	120	120	120	100	120
Max. inlet/suction pressure (DQ version) [bar]	1	1	1	1	-	-	-
Max. inlet/suction pressure (D8.6 version) [bar]	10	10	10	10	10	10	10
<b>Pipe connection</b>							
Suction (DQ version)	G 1 1/4	G 1 1/4	G 2	G 2	-	-	-
Suction (D8.6 version)	SAE 1 1/2"	SAE 1 1/2"	SAE 2"	SAE 2"	SAE 2 1/2"	SAE 3"	SAE 4"
Discharge pipe thread	G 3/4	G 3/4	G 1 1/4	G 1 1/4	-	-	-
Discharge flange	SAE 1"	SAE 1"	SAE 1 1/2"	SAE 1 1/2"	SAE 2"	SAE 2 1/2"	SAE 3"
Installation length [mm]	248	286	335	386	397	467	546
<b>Shaft seal</b>							
DQ (seal ring)	•	•	•	•	-	-	-
D8.6 (mechanical seal)	•	•	•	•	•	•	•

<sup>1)</sup> 150 bar on request.

## Type key

Example	MTS	(E)	80-40	R	46	D	8.6	T
Type range								
With integrated frequency converter								
Frame size - max. pressure (bar)								
Spindle sense of gradient (R = right)								
Spindle pitch angle in degrees								
Construction feature								
D = External ball bearing, shaft seal unheated, uncooled								
Shaft seal/connections								
Q = Shaft seal ring/axial inlet, pipe thread as standard								
8.6 = Mechanical shaft seal/radial inlet, SAE as standard								
T = Pump for tank-top installation								
D = Pump for dry installation								
H = Pump for horizontal installation								

## Construction

Three-screw, self-priming, flange-mounted pump (DIN ISO 3019-2) with special surface-hardened drive and idler screws. The idler screws are hydraulically driven, and the axial thrust is completely neutralised hydrostatically. The drive screw is fixed in position with external, permanently lubricated groove ball bearing. The large overall length with its many chambers results in little surface pressure, low pressure differences and thus reduced wear. The rotor housing has been optimised to ensure maximum resistance to wear. The material used is specially hardened grey cast iron (EN-GJL) that is part of a special safety concept. The housing surface in contact with the screws has a ceramic-like hardness. Additionally, unlike with other materials (such as SiC), wear, shocks, vibration or aeration cannot lead to sudden failure of the pump unit. Construction and materials result in little wear, good controllability and high efficiency.

## Motor

The pumps are fitted with a totally enclosed, fan-cooled, 2-pole Grundfos standard MG or a Siemens motor with principal dimensions according to EN and IEC standards.

Electrical tolerances according to EN 60034.

### Electrical data

<b>Mounting designation</b>	B5/V1	
<b>Insulation class</b>	F	
<b>Efficiency class, 50 Hz</b>	MG motors:	IE3
	Siemens motors:	IE3
<b>Efficiency class, 60 Hz</b>	MG motors:	IE2/IE3 (see page 61)
	Siemens motors:	IE2/IE3 (see page 61)
<b>Enclosure class</b>	IP55	
	P <sub>2</sub> : 1.5 - 22 kW:	3 x 220 - 240D / 380 - 415Y V
<b>Supply voltage, 50 Hz</b> (tolerance - 10 %/+ 10 %)	P <sub>2</sub> : 7.5 - 22 kW:	3 x 380 - 415D / 660 - 690Y V
	P <sub>2</sub> : 30-200 kW:	3 x 380 - 420D / 660 - 725Y V
		3 x 220 - 277D / 380 - 480Y V
<b>Supply voltage, 60 Hz</b> (tolerance - 10 %/+ 10 %)	P <sub>2</sub> : 1.5 - 22 kW:	3 x 380 - 480D / 660 - 690Y V
	P <sub>2</sub> : 30-200 kW:	3 x 380 - 420D / 660 - 725Y V
<b>On request</b>		
<b>Supply voltage, 50 Hz</b>	3 x 200-220/346-380 V	
<b>Supply voltage, 60 Hz</b>	3 x 200-230/346-400 V 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 the UL 1004 standard for electrical motors.

## Motor protection

### MG motors

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

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

### Terminal box positions

As standard, the pumps have their terminal box mounted in position 12 o'clock of the pump; however, other positions are possible.

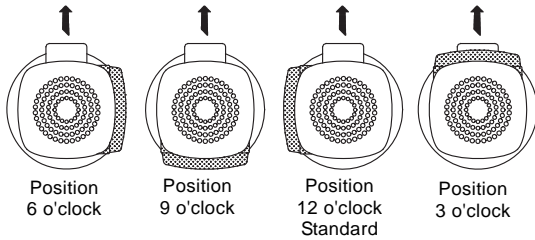


Fig. 7 Terminal box positions

TM02 7777 4003

### Ambient temperature

MG motors (1.5 - 22 kW)	Max. 60 °C
Siemens motors (30-200 kW)	Max. 55 °C

If the ambient temperature exceeds above maximum values or if the motor is located 1000 metres above sea level, the motor output (P2) must be reduced due to 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 output.

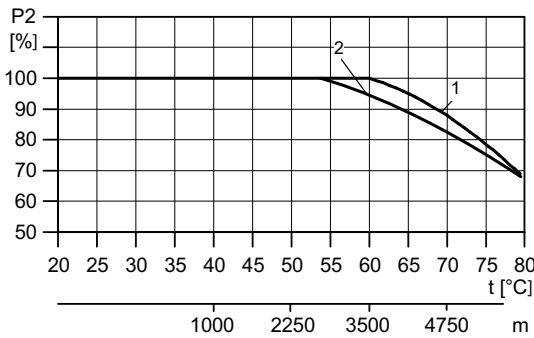


Fig. 8 Relationship between motor output (P2) and ambient temperature/altitude

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Pos.	Description
1	MG motors (1.5 - 22 kW)
2	Siemens motors (30-200 kW)

### Overload protection

The pump has no pressure-relief valve. Thus the overload protection must be provided in the control system or with a pressure-relief valve.

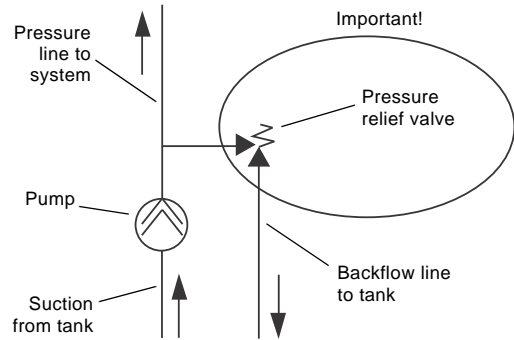


Fig. 9 Overload protection

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### Sound pressure level

MTS construction design allows gentle, even, virtually pulsation-free and low-noise pumping. The noise emission lies between 56 and 74 dBA and depends on speed, pump size and installation. MTS pumps operate significantly quieter than rotary lobe and centrifugal pumps with comparable performance.

Measuring conditions:

- Distance to the pump: 1 m
- Operation: Cavitation-free
- Motor: IEC standard motor
- Tolerance: ± 3 dB.

Size	Sound pressure level [dB]	
	2900 [rpm]	3500 [rpm]
20	56	58
40	59	61
80	61	63
140	64	66
210	67	69
280	69	71
440	72	74

The data are reference values.

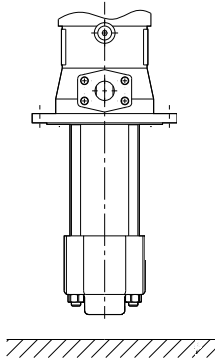
The actual airborne sound level depends especially on the installation conditions.



## Shaft sealing/connections

### Design DQ

Shaft sealing with shaft seal ring. Inlet pressure up to 1 bar. Axial inlet with pipe thread connection (DIN EN ISO 228-1). Radial high-pressure discharge flange according to SAE J518C. MTS 20 to 140 additionally with pipe thread connection (DIN EN ISO 228-1).

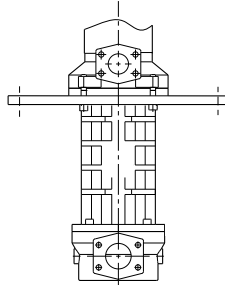


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Fig. 10 Design DQ

### Design D8.6

Shaft sealing with maintenance-free highly wear-resistant mechanical shaft seal according to EN 12756. Radial high-pressure inlet and discharge flanges according to SAEJ518C. Optionally, the pump is available with axial inlet connection with pipe thread (DIN ISO 228-1).



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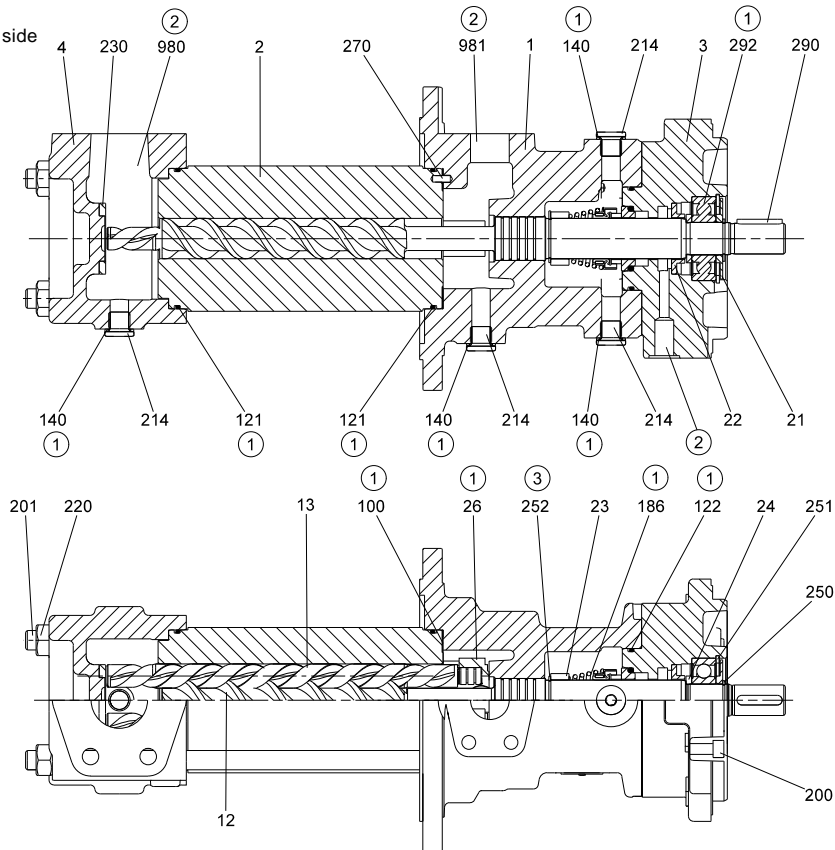
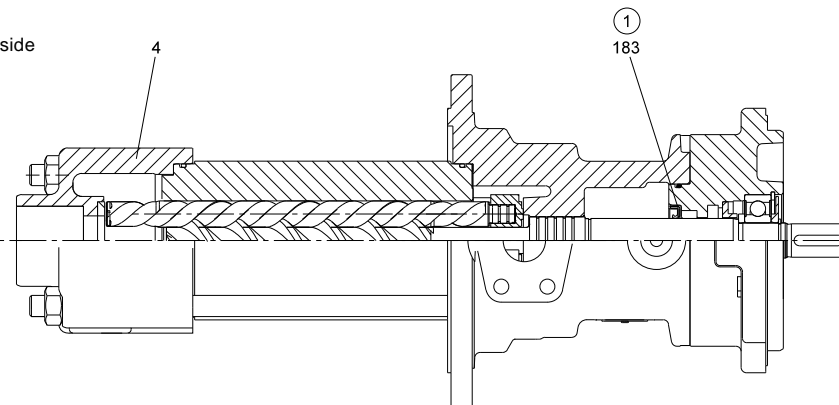
Fig. 11 Design D8.6

### 3. Construction

#### MTS 20 and 40

D 8.6

SAE flange on suction side

DQ  
with axial pipe thread  
connection on suction side

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TM05 2369 5011

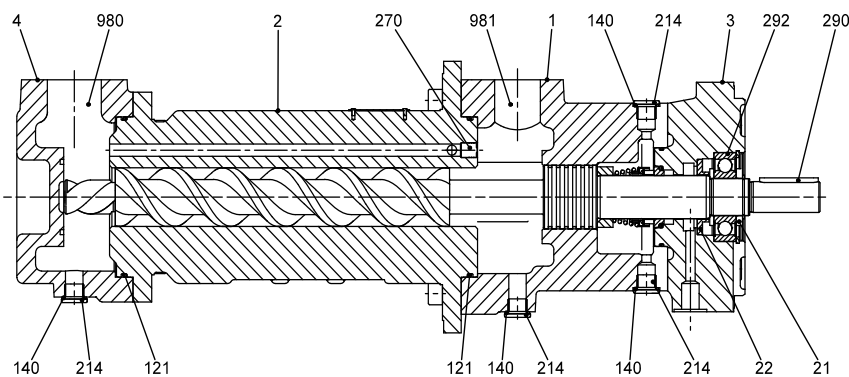
Fig. 12 Sectional drawings of MTS 20 and 40

Pos.	Designation	Pos.	Designation	Pos.	Designation
1	Discharge casing	100	Gasket	250	Circlip
2	Rotor housing	121	O-ring	251	Circlip
3	Pump cover	122	O-ring	252	Circlip
4	Suction casing	140	Seal ring	270	Clamping sleeve
12	Drive screw	183	Shaft seal ring	290	Key
13	Idler screw	186	Mechanical shaft seal	292	Groove ball bearing
21	Labyrinth ring	200	Socket head cap screw	980	Plastic cover
22	Labyrinth ring	201	Stud bolt	981	Plastic cover
23	Spacer ring	214	Screw plug		
24	Spacer ring	220	Hexagon nut		
26	Balance bush	230	Thrust disc		

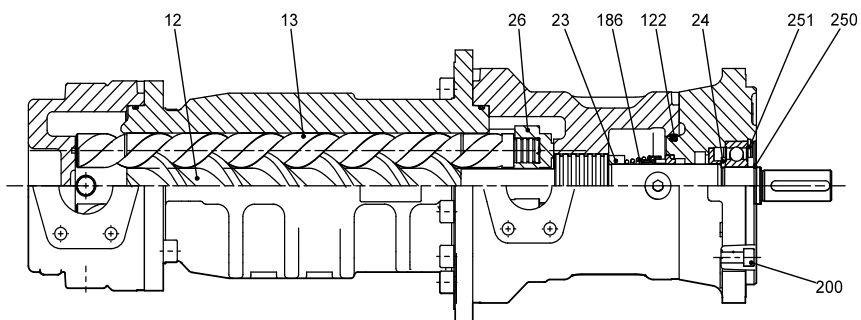
### MTS 80, 140, 210, 280 and 440

D 8.6

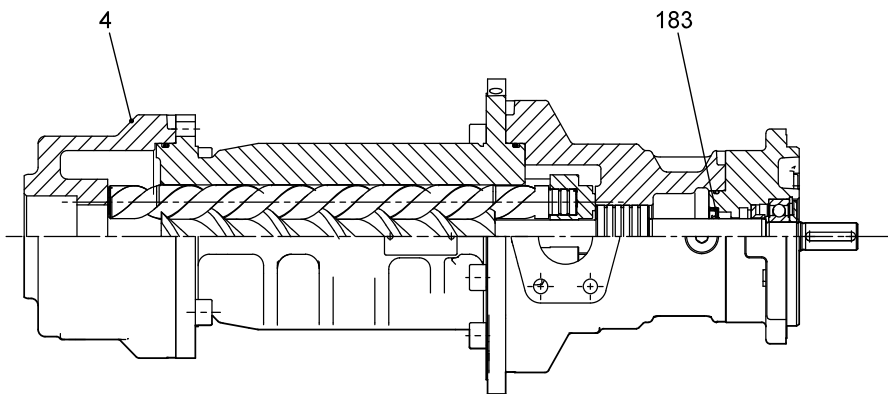
SAE flange on suction side



Sizes 80, 140, 210, 280, 440



DQ  
with axial pipe thread  
connection on suction  
side, only sizes 80,  
140 suction side



Sizes 80, 140

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TM04 2626 3507

Fig. 13 Sectional drawings MTS 80, 140, 210, 280 and 440

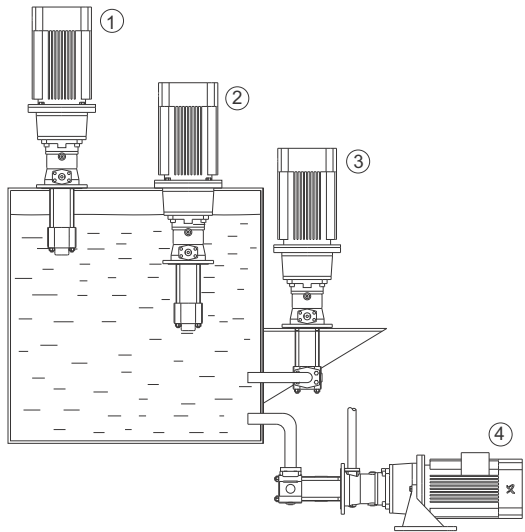
Pos.	Designation	Pos.	Designation	Pos.	Designation
1	Discharge casing	121	O-ring	292	Groove ball bearing
2	Rotor housing	122	O-ring	980	Plastic cover
3	Pump cover	140	Seal ring	981	Plastic cover
4	Suction casing	183	Shaft seal ring		
12	Drive screw	186	Mechanical seal		
13	Idler screw	200	Socket head cap screw		
21	Labyrinth ring	214	Screw plug		
22	Labyrinth ring	250	Circlip		
23	Spacer ring	251	Circlip		
24	Ring	270	Inside ring		
26	Balance bush	290	Key		

## Material specification

Pos.	Designation	Materials W 110221		
2	Rotor housing (basic material)	EN-GJL-250	GG25	Cast iron
	Rotor housing (active surfaces in the spindle bores)	Specially hardened	Basic hardness	62 HRC
			Surface hardness	1200 HV
4	Suction casing	EN-GJL-250	GG25	Cast iron
1	Discharge casing	EN-GJL-250	GG25	Cast iron
13	Screw set (basic material)	1.7139	16MnCrS5	Special steel, nitrided 62 HRC
13	Screw set (surface)	specially treated	(PVD)	1200 HV
3	Pump cover	EN-GJL-250	GG25	Cast iron
186	Mechanical shaft seal	Q1Q1VGG	SiC/SiC, FPM, 1.4571	Silicon carbide, fluoroelastomer, stainless steel
183	Shaft seal ring	FPM		Fluoroelastomer
140	Static gaskets	FPM		Fluoroelastomer

## Pump designs

The pump designs available as standard and on request are shown in fig. 14.



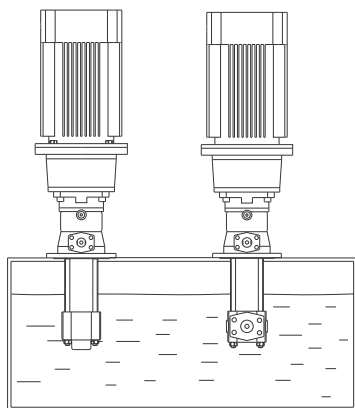
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Fig. 14 Pumps designs

Pos.	Description
1	Pump designed for tank-top installation
2	Pump designed for in-tank installation (on request)
3	Pump designed for dry installation with flange
4	Pump designed for dry installation with mounting foot

## Pumps for tank-top installation

The pump is equipped with a flange for mounting on the tank top, and the discharge port is above the tank cover. This type of installation is easy and economic to install. The pump is equipped with a seal ring and is well-suited for operation with an inlet pressure up to 1 bar. See page 14 for installation requirements.

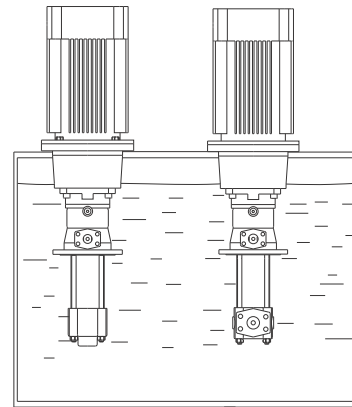


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Fig. 15 Tank-top installation

## In-tank installation

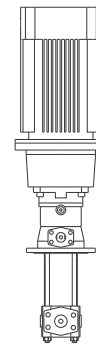
This type of installation saves space compared with pumps which are designed for dry installation. Any leakage remains in the tank. See page 14 for installation requirements.



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Fig. 16 In-tank installation

## Pumps for dry installation

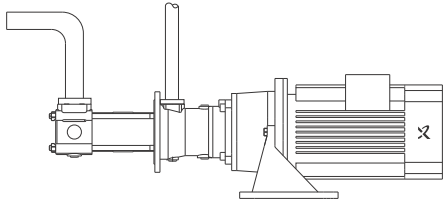


TM06 3350 5214

Fig. 17 Pump designed for dry installation with flange

This type of installation is well-suited for operation with an inlet pressure up to 10 bar and it is easy to access the pump. A silicon carbide mechanical shaft seal ensures a long service life.

## Pumps for horizontal installation



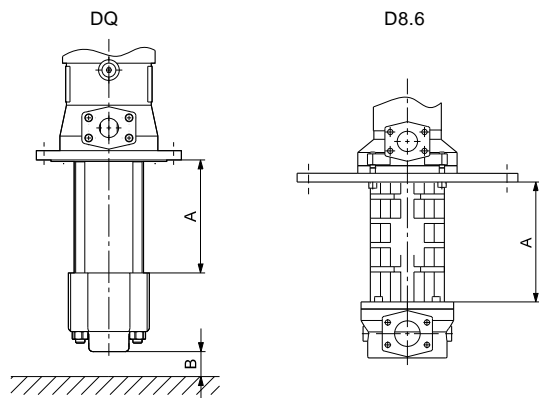
**Fig. 18** Pump designed for dry installation with horizontal mounting foot

The pump is equipped with a mounting foot. This type of installation is well-suited for operation with an inlet pressure up to 10 bar and it is easy to access the pump. A silicon carbide mechanical shaft seal ensures a long service life.

## Installation

The following applies for pumps installed in tanks. In order to protect the pump at startup and to ensure correct performance, observe the requirements in the table below.

Pump type	A [mm]	B [mm]
MTS 20	max. 147	min. 25
MTS 40	max. 190	min. 25
MTS 80	max. 224	min. 25
MTS 140	max. 265	min. 25
MTS 210	max. 286	-
MTS 280	max. 335	-
MTS 440	max. 387	-

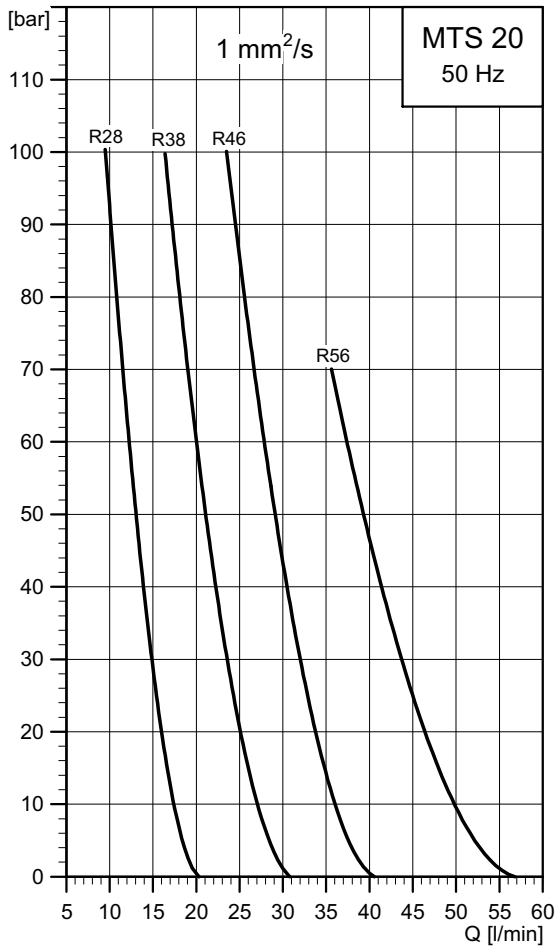


**Fig. 19** Design types DQ and D8.6

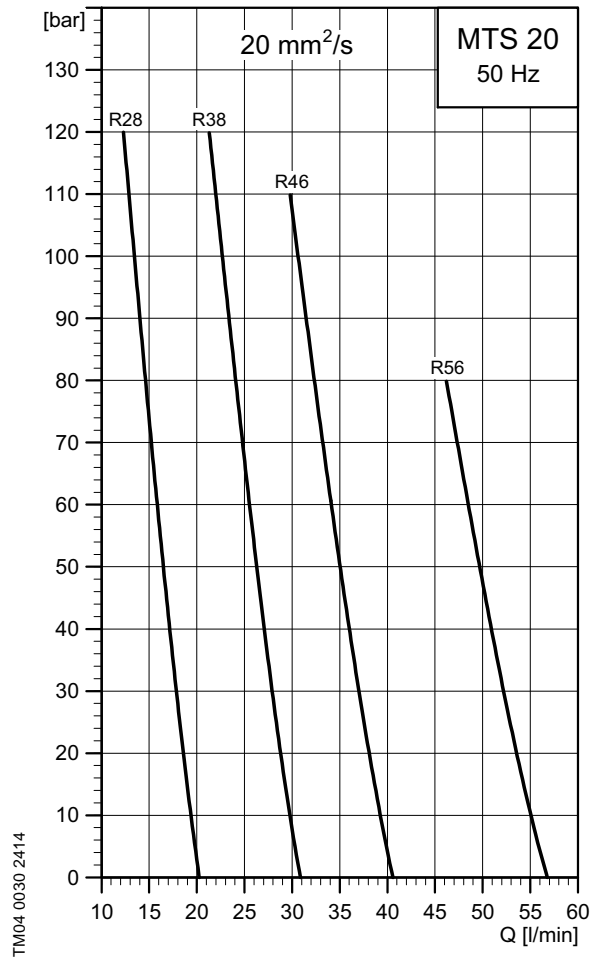
## 4. Technical data

### Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



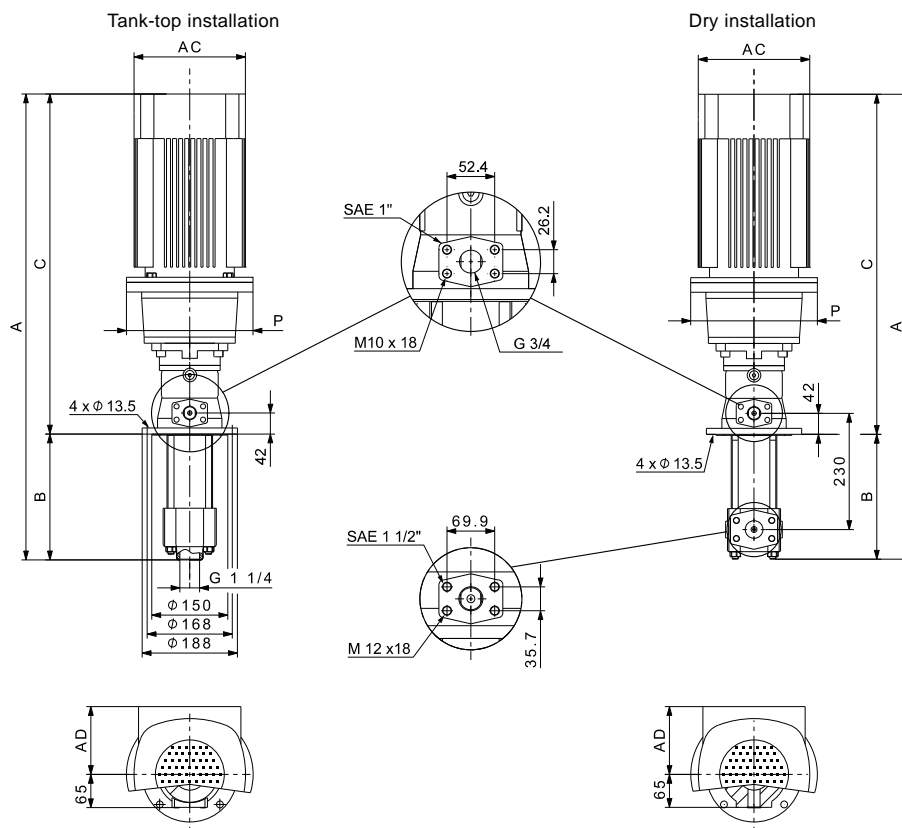
Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)



### Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)								20 mm <sup>2</sup> /s (cutting oil with EP additives)							
	R28		R38		R46		R56		R28		R38		R46		R56	
	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	20.3	0.3	30.9	0.3	40.6	0.3	56.8	0.3	20.3	0.3	30.9	0.3	40.6	0.3	56.8	0.3
10	17.4	0.7	27	0.8	36	1	49.8	1.3	19.3	0.7	29.7	0.8	39.2	1	55	1.3
20	16	1	25.1	1.3	33.8	1.7	46.4	2.2	18.6	1	28.8	1.3	38.1	1.7	53.6	2.2
30	14.9	1.3	23.6	1.9	32	2.3	43.7	3.2	17.8	1.3	27.9	1.9	37	2.3	52.2	3.2
40	13.9	1.7	22.3	2.4	30.5	3	41.4	4.1	17.2	1.7	27.1	2.4	36	3	50.9	4.1
50	13	2	21.1	2.9	29.1	3.7	39.3	5	16.5	2	26.3	2.9	35.1	3.7	49.7	5
60	12.3	2.3	20	3.4	27.8	4.4	37.4	6	15.9	2.3	25.5	3.4	34.1	4.4	48.5	6
70	11.5	2.7	19	3.9	26.7	5	35.6	6.9	15.2	2.7	24.8	3.9	33.2	5	47.3	6.9
80	10.8	3	18.1	4.4	25.6	5.7	-	-	14.6	3	24.1	4.4	32.3	5.7	46.2	7.9
90	10.2	3.4	17.2	4.9	24.5	6.4	-	-	14	3.4	23.4	4.9	31.5	6.4	-	-
100	9.5	3.7	16.4	5.5	23.5	7.1	-	-	13.4	3.7	22.6	5.5	30.6	7.1	-	-
110	-	-	-	-	-	-	-	-	12.9	4	22	6	29.8	7.8	-	-
120	-	-	-	-	-	-	-	-	12.3	4.4	21.3	6.5	-	-	-	-

## Dimensional sketches



TM06 1244 2014

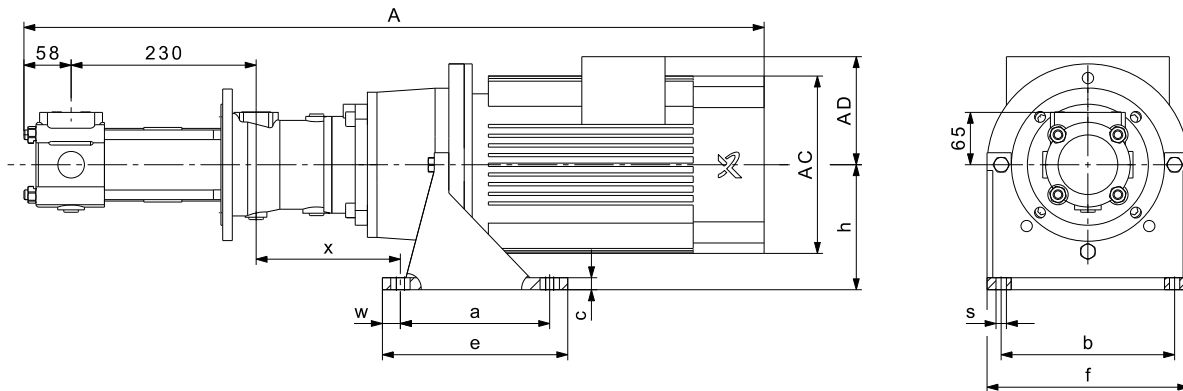
## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 20-30 R28	1.5	822	822	246	248	576	574	178	110	200	45	45
MTS 20-40 R28	2.2	862	862	246	248	616	614	178	110	200	48	48
MTS 20-50 R28	2.2	862	862	246	248	616	614	178	110	200	48	48
MTS 20-60 R28	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-70 R28	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-80 R28	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-90 R28	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-100 R28	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-30 R38	2.2	862	862	246	248	616	614	178	110	200	48	48
MTS 20-40 R38	3	881	881	246	248	635	633	198	120	250	49	53
MTS 20-50 R38	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-60 R38	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-70 R38	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-80 R38	5.5	961	961	246	248	715	713	220	134	300	85	70
MTS 20-90 R38	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-100 R38	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-30 R46	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-40 R46	4	918	918	246	248	672	670	220	134	250	61	65
MTS 20-50 R46	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-60 R46	5.5	961	961	246	248	715	713	220	134	300	80	70
MTS 20-70 R46	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-80 R46	7.5	949	949	246	248	703	701	260	159	300	91	80
MTS 20-90 R46	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-100 R46	11	1085	1085	246	248	839	837	314	204	350	99	117
MTS 20-30 R56	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-40 R56	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-50 R56	5.5	961	961	246	248	715	713	220	134	300	73	70
MTS 20-60 R56	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-70 R56	7.5	949	949	246	248	703	701	260	159	300	85	80



Dimensional sketches

Horizontal installation



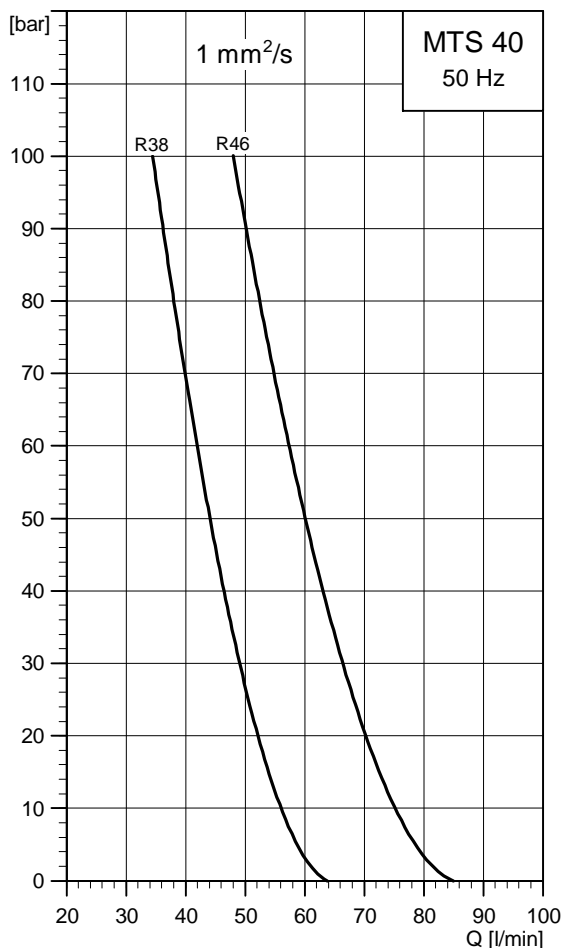
TM06 0972 2014

Dimensions and weights

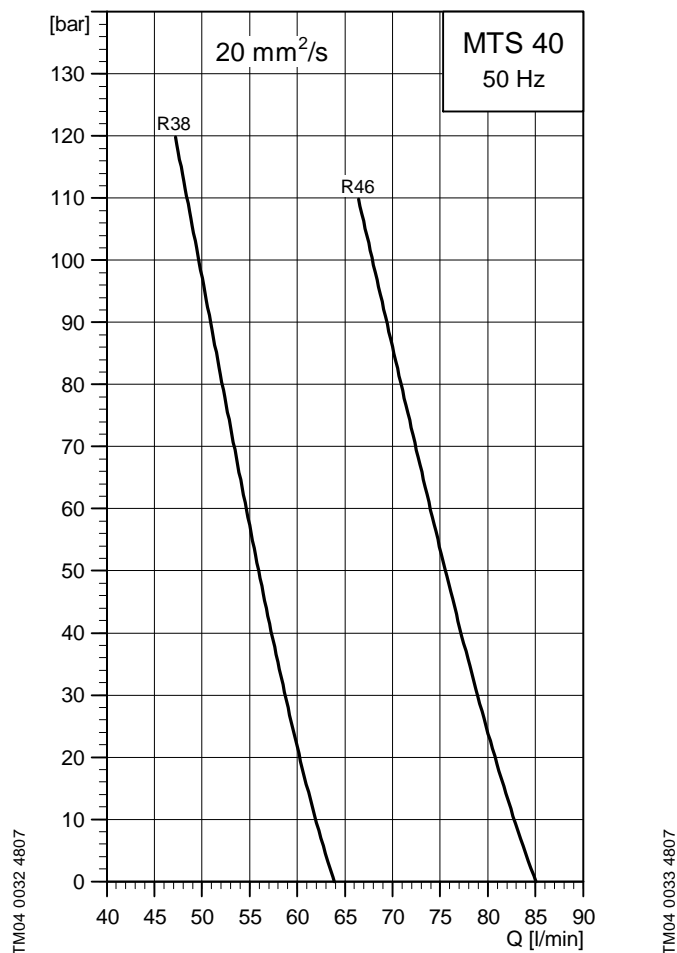
Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 20-30 R28	1.5	822	60	180	12	90	210	112	11	15	158	178	110	45
MTS 20-40 R28	2.2	862	60	180	12	90	210	112	11	15	158	178	110	48
MTS 20-50 R28	2.2	862	60	180	12	90	210	112	11	15	158	178	110	48
MTS 20-60 R28	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-70 R28	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-80 R28	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-90 R28	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-100 R28	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-30 R38	2.2	862	60	180	12	90	210	112	11	15	158	178	110	48
MTS 20-40 R38	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-50 R38	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-60 R38	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-70 R38	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-80 R38	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-90 R38	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-100 R38	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-30 R46	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-40 R46	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-50 R46	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-60 R46	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-70 R46	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-80 R46	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-90 R46	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-100 R46	11	1085	265	300	18	305	350	235	18	20	210	314	204	117
MTS 20-30 R56	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-40 R56	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-50 R56	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-60 R56	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-70 R56	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80

## Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



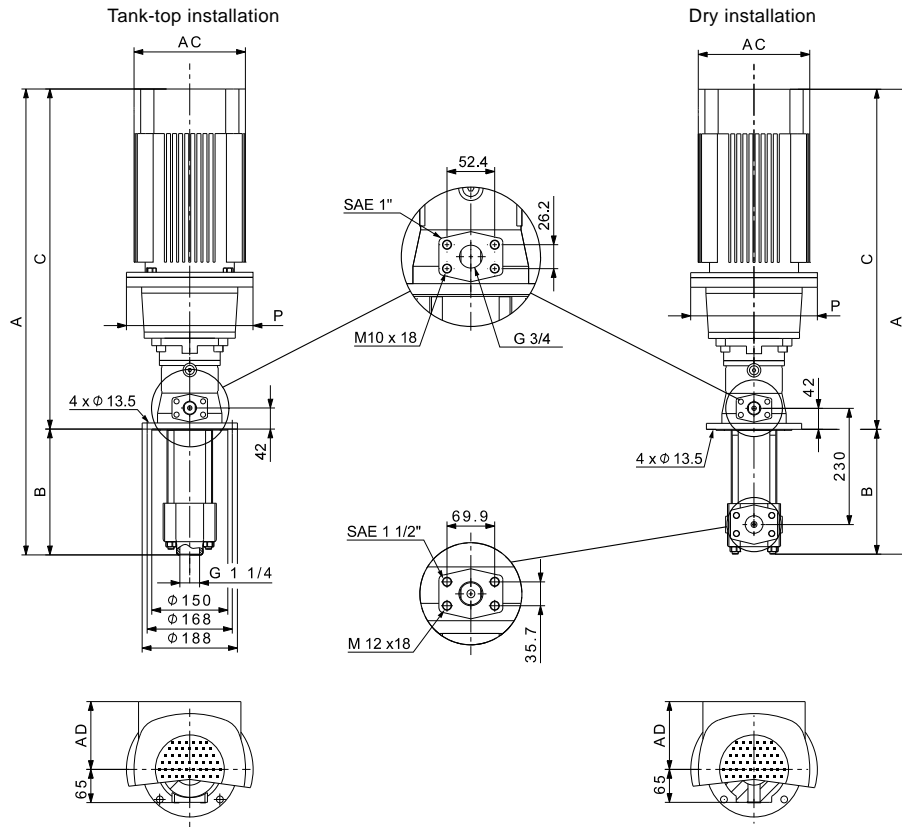
Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)



## Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R38		R46		R38		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	63.9	0.4	85.1	0.4	63.9	0.8	85.1	0.8
10	56	1.5	75.1	1.8	61.9	1.9	82.7	2.3
20	52.1	2.5	70.3	3.2	60.2	3	80.7	3.7
30	49.1	3.6	66.4	4.7	58.7	4	78.9	5.1
40	46.5	4.7	63.1	6.1	57.3	5.1	77.2	6.5
50	44.1	5.7	60.1	7.5	56	6.2	75.6	7.9
60	41.9	6.8	57.4	8.9	54.6	7.2	74	9.4
70	39.9	7.8	54.8	10.3	53.4	8.3	72.4	10.8
80	38	8.9	52.4	11.7	52.1	9.4	70.9	12.2
90	36.2	10	50.2	13.2	50.9	10.4	69.3	13.6
100	34.5	11	48	14.6	49.6	11.5	67.9	15
110	-	-	-	-	48.4	12.6	66.4	16.3
120	-	-	-	-	47.2	13.6	-	-

Dimensional sketches



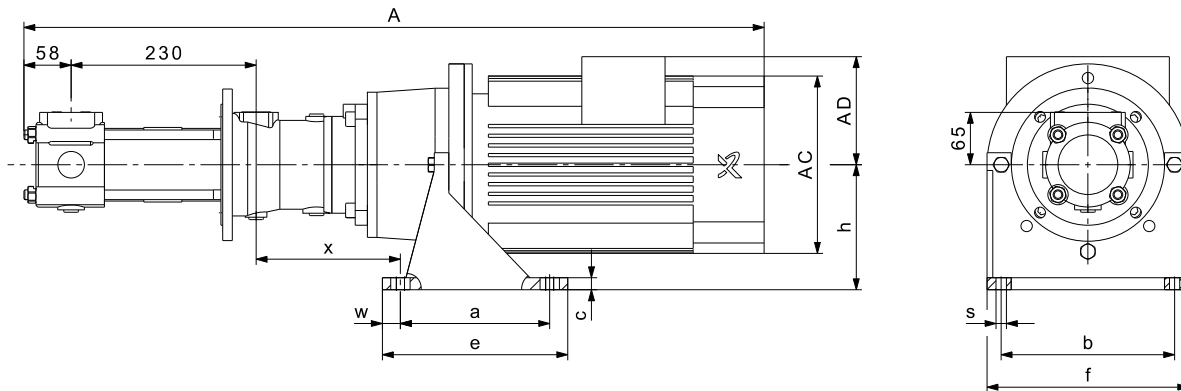
TM06 1244 2014

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]								Net weight [kg]		
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 40-30 R38	4	968	970	286	286	682	684	220	134	250	70	70
MTS 40-40 R38	5.5	1011	1013	286	286	725	727	220	134	300	75	75
MTS 40-50 R38	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-60 R38	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-70 R38	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-80 R38	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-90 R38	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-100 R38	15	1135	1137	286	286	849	851	314	204	350	134	134
MTS 40-30 R46	5.5	1011	1013	286	286	725	727	220	134	300	75	75
MTS 40-40 R46	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-50 R46	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-60 R46	11	1135	1137	286	286	849	851	314	204	350	104	122
MTS 40-70 R46	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-80 R46	15	1135	1137	286	286	849	851	314	204	350	134	134
MTS 40-90 R46	15	1135	1137	286	286	849	851	314	204	350	134	134
MTS 40-100 R46	18.5	1179	1181	286	286	893	895	314	204	350	147	147

## Dimensional sketches

Horizontal installation



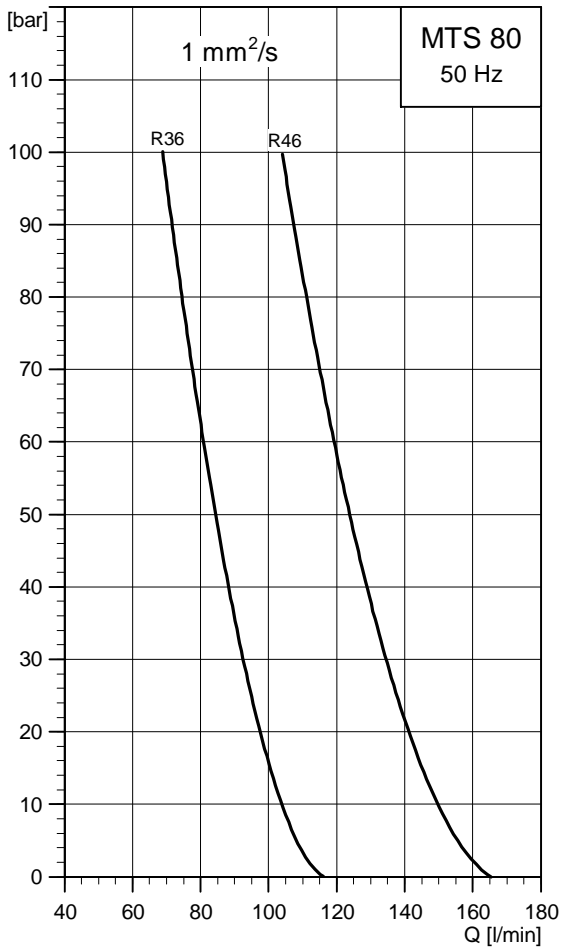
TM06 0972 2014

## Dimensions and weights

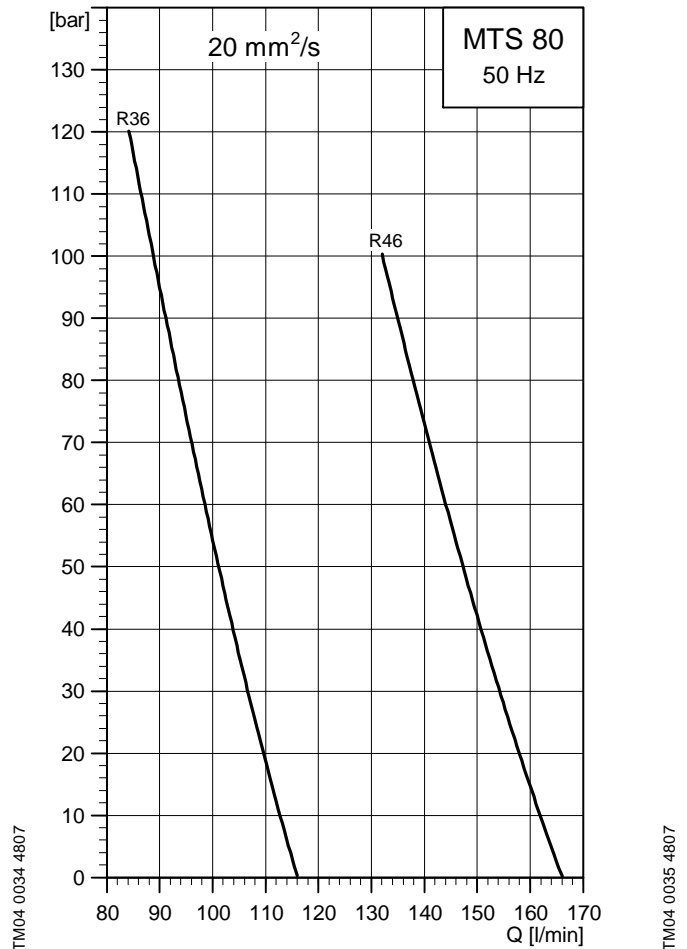
Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 40-30 R38	4	970	185	215	15	230	250	155	14	23	191	220	134	70
MTS 40-40 R38	5.5	1013	225	265	18	270	300	185	14	23	199	220	134	75
MTS 40-50 R38	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-60 R38	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-70 R38	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-80 R38	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-90 R38	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-100 R38	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-30 R46	5.5	1013	225	265	18	270	300	185	14	23	199	220	134	75
MTS 40-40 R46	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-50 R46	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-60 R46	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-70 R46	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-80 R46	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-90 R46	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-100 R46	18.5	1181	265	300	18	305	350	235	18	20	222	314	204	147

Performance range

Performance data at 1 mm<sup>2</sup>/s (emulsion)



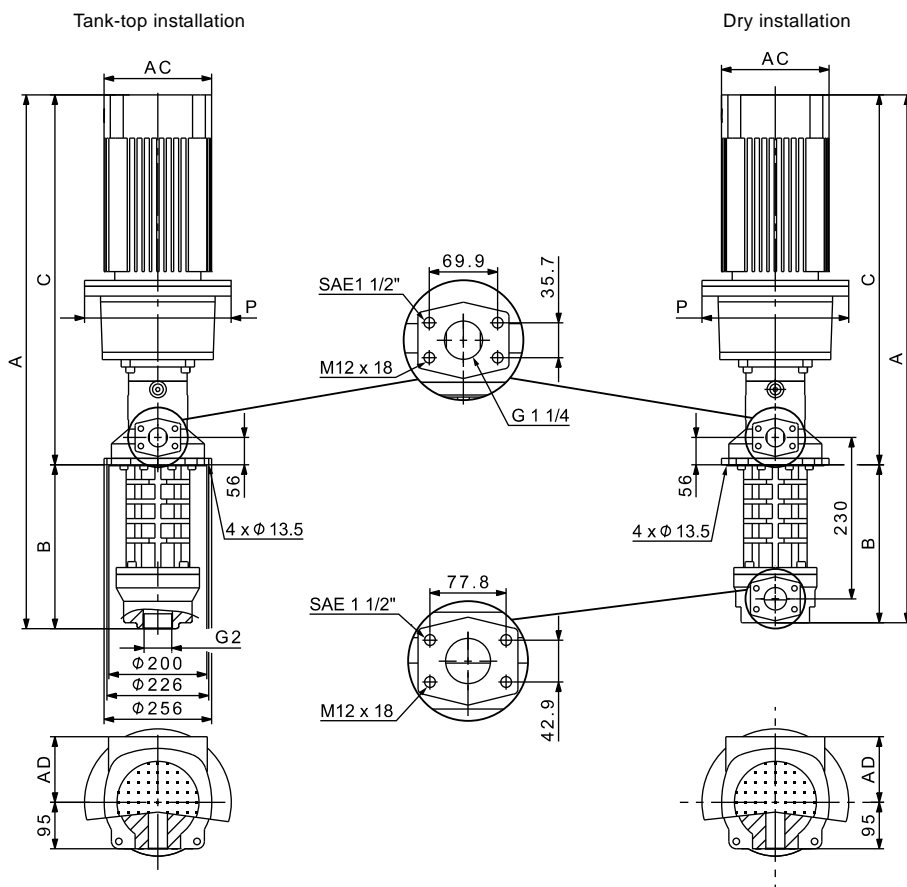
Performance data at 20 mm<sup>2</sup>/s (cutting oil with EP additives)



Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R36		R46		R36		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	116	0.6	166	0.6	116	1.3	166	1.3
10	104	2.6	149	3.4	113	3.3	162	4.1
20	97.4	4.5	141	6.2	109	5.2	158	6.9
30	92.5	6.4	135	8.9	107	7.1	154	9.6
40	88.2	8.4	129	11.7	104	9.1	151	12.4
50	84.4	10.3	124	14.5	101	11	147	15.2
60	80.9	12.3	119	17.3	98.5	13	144	18
70	77.6	14.2	115	20	96	14.9	141	20.7
80	74.5	16.1	111	22.8	93.6	16.8	138	23.5
90	71.6	18.1	107	25.6	91.2	18.8	135	26.3
100	68.8	20	104	28.3	88.8	20.7	132	29
110	-	-	-	-	86.5	22.7	-	-
120	-	-	-	-	84.2	24.6	-	-

## Dimensional sketches



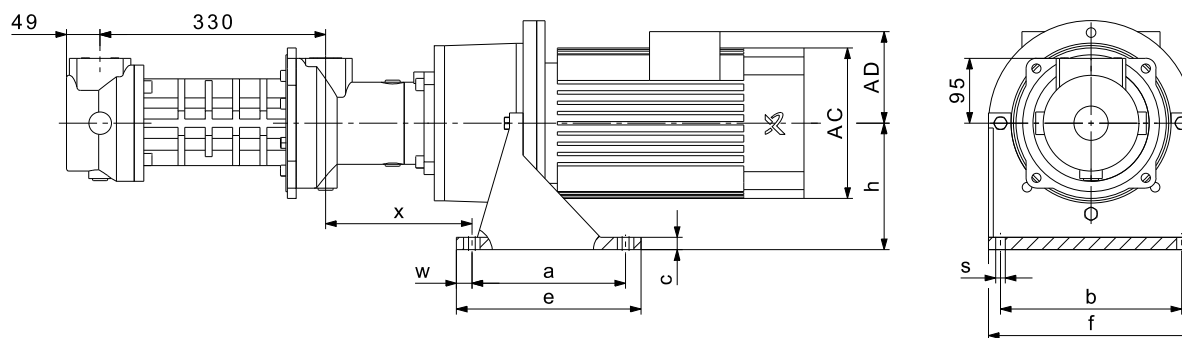
TM06 2286 4114

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 80-20 R36	5.5	1089	1079	335	323	754	756	220	134	300	95	95
MTS 80-30 R36	7.5	1077	1067	335	323	742	744	260	159	300	105	105
MTS 80-40 R36	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-50 R36	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-60 R36	15	1207	1197	335	323	872	874	314	204	350	154	154
MTS 80-70 R36	15	1207	1197	335	323	872	874	314	204	350	154	154
MTS 80-80 R36	18.5	1251	1241	335	323	916	918	314	204	350	167	167
MTS 80-90 R36	22	1293	1283	335	323	958	960	314	204	350	182	182
MTS 80-100 R36	22	1293	1283	335	323	958	960	314	204	350	182	182
MTS 80-20 R46	7.5	1077	1067	335	323	742	744	260	159	300	105	105
MTS 80-30 R46	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-80 R46	15	1207	1197	335	323	872	874	314	204	350	154	154
MTS 80-50 R46	18.5	1251	1241	335	323	916	918	314	204	350	167	167
MTS 80-60 R46	18.5	1251	1241	335	323	916	918	314	204	350	167	167
MTS 80-70 R46	22	1293	1283	335	323	958	960	314	204	350	182	182
MTS 80-80 R46	30	1363	1353	335	323	1028	1030	396	315	400	297	297
MTS 80-90 R46	30	1363	1353	335	323	1028	1030	396	315	400	297	297
MTS 80-100 R46	30	1363	1353	335	323	1028	1030	396	315	400	297	297

### Dimensional sketches

Horizontal installation



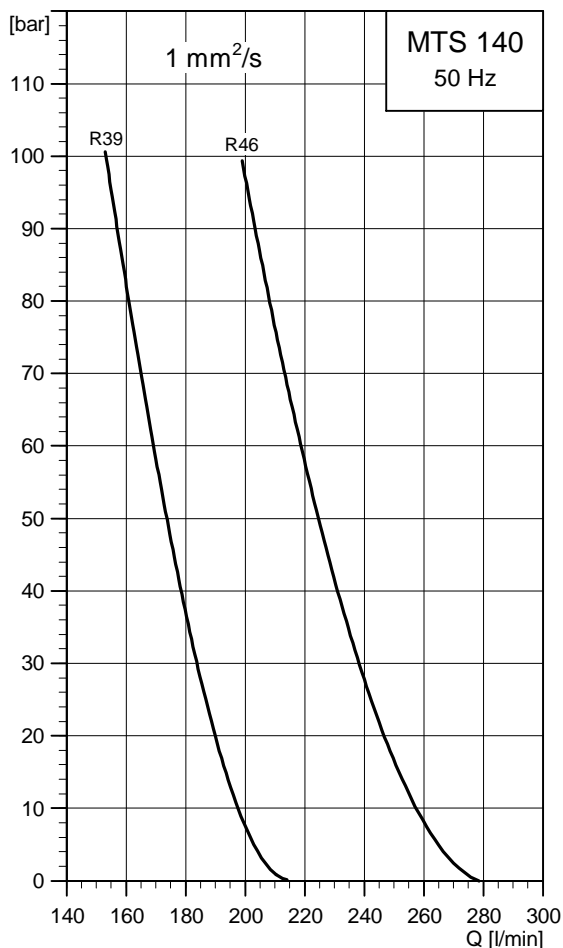
TM06 2284 4114

### Dimensions and weights

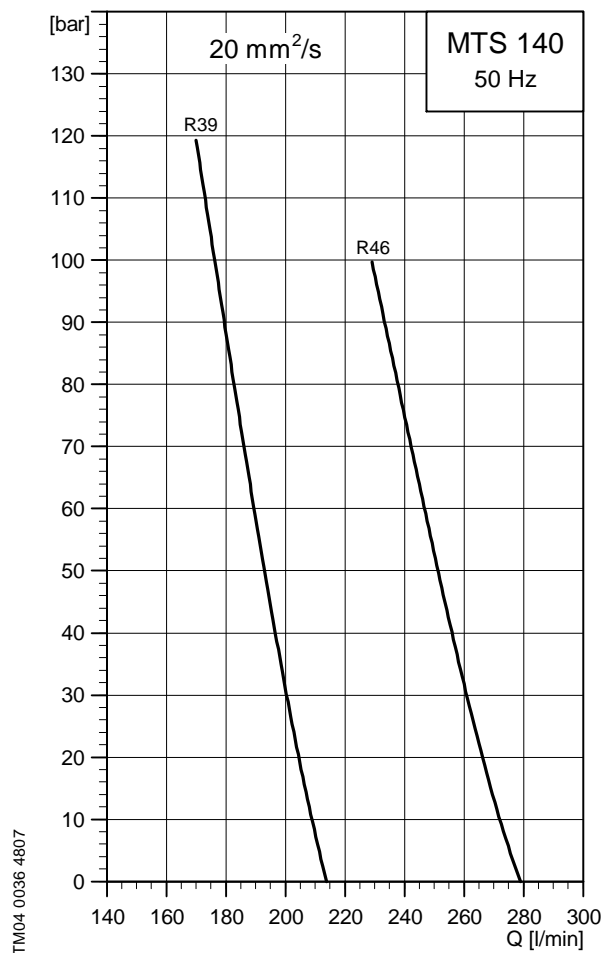
Pump type	P2 [kW]	Dimensions [mm]											Net weight [kg]	
		A	a	b	c	e	f	h	s	w	x	AC		AD
MTS 80-20 R36	5.5	1079	225	265	18	270	300	185	14	23	214	220	134	95
MTS 80-30 R36	7.5	1067	225	265	18	270	300	185	14	23	214	260	159	105
MTS 80-40 R36	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-50 R36	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-60 R36	15	1197	265	300	18	305	350	235	18	20	231	314	204	154
MTS 80-70 R36	15	1197	265	300	18	305	350	235	18	20	231	314	204	154
MTS 80-80 R36	18.5	1241	265	300	18	305	350	235	18	20	231	314	204	167
MTS 80-90 R36	22	1283	265	300	18	305	350	235	18	20	247	314	204	182
MTS 80-100 R36	22	1283	265	300	18	305	350	235	18	20	247	314	204	182
MTS 80-20 R46	7.5	1067	225	265	18	270	300	185	14	23	214	260	159	105
MTS 80-30 R46	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-40 R46	15	1197	265	300	18	305	350	235	18	20	231	314	204	154
MTS 80-50 R46	18.5	1241	265	300	18	305	350	235	18	20	231	314	204	167
MTS 80-60 R46	18.5	1241	265	300	18	305	350	235	18	20	231	314	204	167
MTS 80-70 R46	22	1283	265	300	18	305	350	235	18	20	247	314	204	182
MTS 80-80 R46	30	1353	300	350	20	350	400	260	18	25	237	396	315	297
MTS 80-90 R46	30	1353	300	350	20	350	400	260	18	25	237	396	315	297
MTS 80-100 R46	30	1353	300	350	20	350	400	260	18	25	237	396	315	297

## Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)

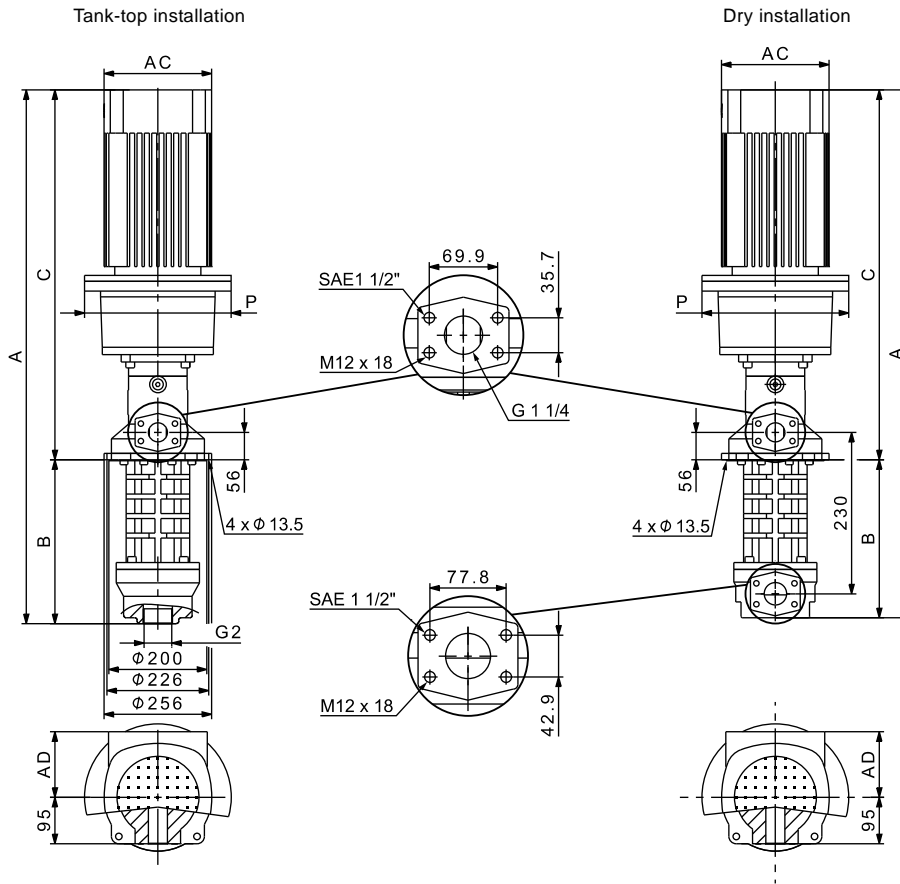


## Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R39		R46		R39		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	214	1	279	1	214	2.1	279	2.1
10	198	4.6	257	5.6	209	5.6	272	6.7
20	190	8.1	247	10.3	204	9.2	266	11.3
30	184	11.7	238	14.9	200	12.8	261	16
40	178	15.3	231	19.6	197	16.3	256	20.6
50	173	18.8	225	24.2	193	19.9	251	25.3
60	169	22.4	219	28.8	190	23.5	247	29.9
70	166	26	213	33.5	186	27	242	34.6
80	161	29.5	208	38.1	183	30.6	238	39.2
90	157	33.1	203	42.8	179	34.2	233	43.8
100	153	36.7	199	47.4	176	37.7	229	48.5
110	-	-	-	-	173	41.3	-	-
120	-	-	-	-	170	44.9	-	-



Dimensional sketches



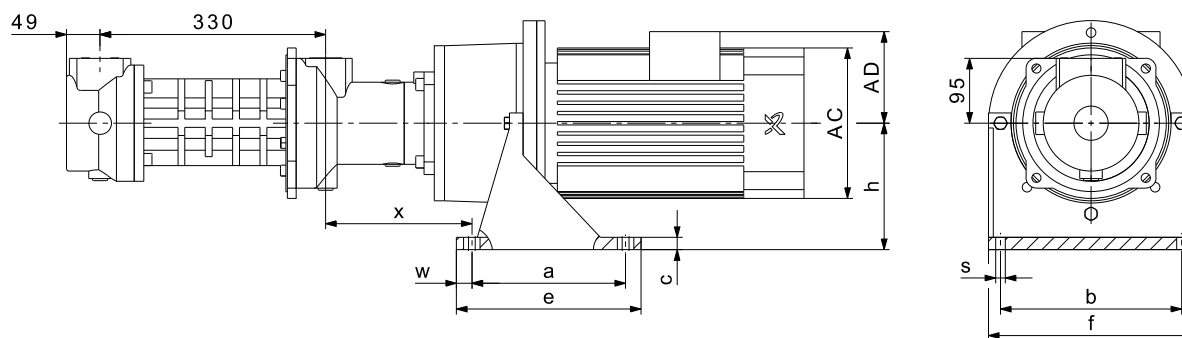
TM06 2286 4114

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 140-20 R39	11	1307	1287	386	364	921	923	314	204	350	163	163
MTS 140-30 R39	15	1307	1287	386	364	921	923	314	204	350	174	174
MTS 140-40 R39	18.5	1351	1331	386	364	965	967	314	204	350	187	187
MTS 140-50 R39	22	1377	1357	386	364	991	993	314	204	350	202	202
MTS 140-60 R39	30	1447	1427	386	364	1061	1063	396	315	400	317	317
MTS 140-70 R39	30	1447	1427	386	364	1061	1063	396	315	400	260	317
MTS 140-80 R39	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-90 R39	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-100 R39	45	1574	1554	386	364	1188	1190	449	338	450	416	416
MTS 140-20 R46	15	1307	1287	386	364	921	923	314	204	350	174	174
MTS 140-30 R46	18.5	1351	1331	386	364	965	967	314	204	350	187	187
MTS 140-40 R46	22	1377	1357	386	364	991	993	314	204	350	202	202
MTS 140-50 R46	30	1447	1427	386	364	1061	1063	396	315	400	317	317
MTS 140-60 R46	30	1447	1427	386	364	1061	1063	396	315	400	317	317
MTS 140-70 R46	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-80 R46	45	1574	1554	386	364	1188	1190	449	338	450	416	416
MTS 140-90 R46	45	1574	1554	386	364	1188	1190	449	338	450	416	416
MTS 140-100 R46	55	1627	1607	386	364	1241	1243	497	410	550	500	500

## Dimensional sketches

Horizontal installation



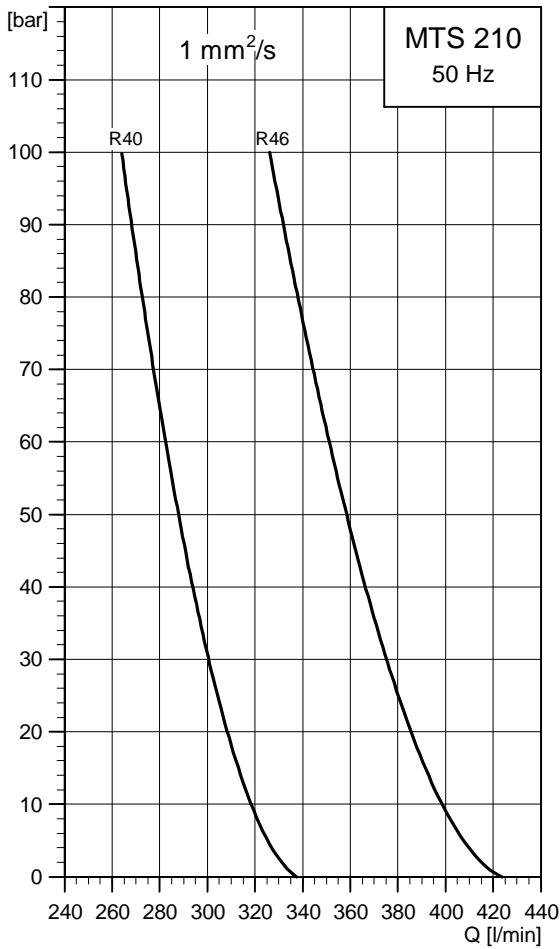
TM06 2284 4114

## Dimensions and weights

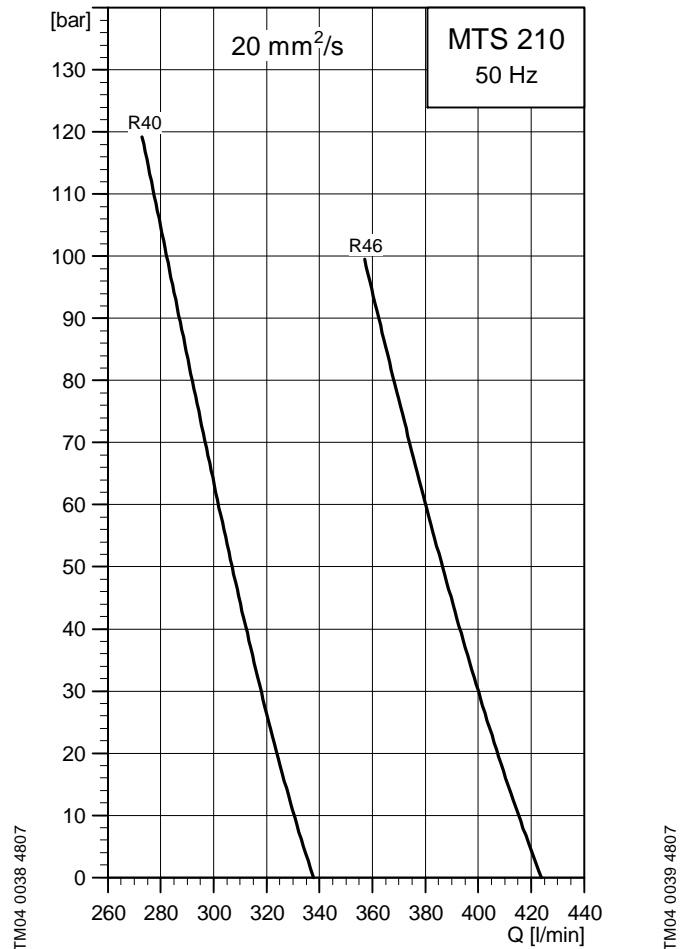
Pump type	P2 [kW]	Dimensions [mm]										Net weight [kg]		
		A	a	b	c	e	f	h	s	w	x		AC	AD
MTS 140-20 R39	11	1287	265	300	18	305	350	235	18	20	273	314	204	163
MTS 140-30 R39	15	1287	265	300	18	305	350	235	18	20	273	314	204	174
MTS 140-40 R39	18.5	1331	265	300	18	305	350	235	18	20	273	314	204	187
MTS 140-50 R39	22	1357	265	300	18	305	350	235	18	20	273	314	204	202
MTS 140-60 R39	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-70 R39	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-80 R39	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-90 R39	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-100 R39	45	1554	335	400	20	385	450	295	18	25	283	449	338	416
MTS 140-20 R46	15	1287	265	300	18	305	350	235	18	20	273	314	204	174
MTS 140-30 R46	18.5	1331	265	300	18	305	350	235	18	20	273	314	204	187
MTS 140-40 R46	22	1357	265	300	18	305	350	235	18	20	273	314	204	202
MTS 140-50 R46	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-60 R46	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-70 R46	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-80 R46	45	1554	335	400	20	385	450	295	18	25	283	449	338	416
MTS 140-90 R46	45	1554	335	400	20	385	450	295	18	25	283	449	338	416
MTS 140-100 R46	55	1607	415	500	25	465	550	350	18	25	268	497	410	500

**Performance range**

Performance data at 1 mm<sup>2</sup>/s (emulsion)



Performance data at 20 mm<sup>2</sup>/s (cutting oil with EP additives)

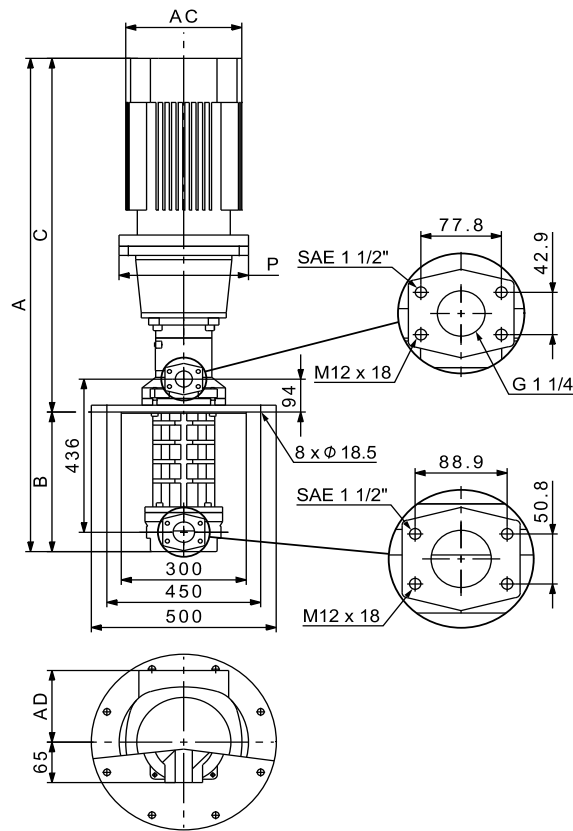


**Performance table**

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R40		R46		R40		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	338	1.7	424	1.7	338	3.5	424	3.5
10	318	7.3	398	8.8	330	9.2	415	10.6
20	308	13	386	15.8	324	14.8	407	17.7
30	301	18.6	375	22.9	318	20.4	400	24.8
40	294	24.2	366	30	312	26.1	393	31.8
50	288	29.9	359	37.1	307	31.7	387	38.9
60	282	35.5	351	44.1	302	37.3	380	46
70	277	41.1	344	51.2	297	43	374	53.1
80	273	46.8	338	58.3	292	48.6	368	60.1
90	268	52.4	332	65.4	287	54.2	362	67.2
100	264	58	326	72.4	282	59.9	357	74.3
110	-	-	-	-	277	65.5	-	-
120	-	-	-	-	273	71.1	-	-

## Dimensional sketches

Tank-top and dry installation



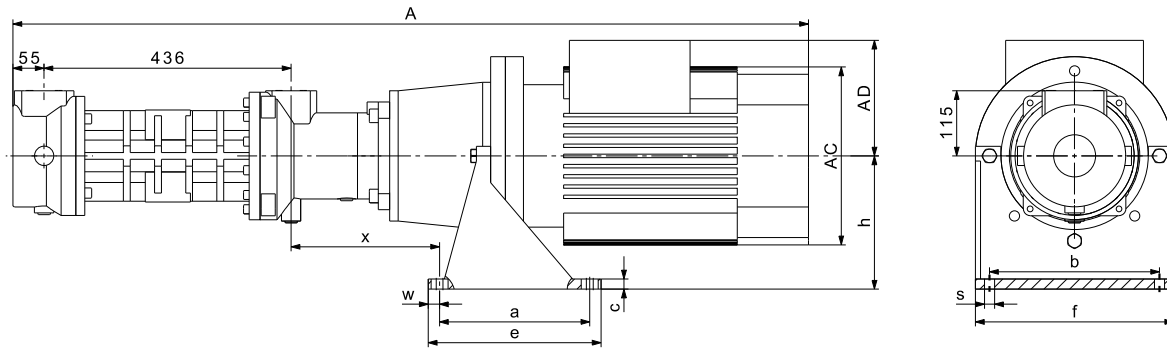
TM06 2288 4114

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]							Net weight [kg]			
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 210-20 R40	15	1340	1340	397	397	943	943	314	204	350	222	199
MTS 210-30 R40	22	1410	1410	397	397	1013	1013	314	204	350	250	227
MTS 210-40 R40	30	1480	1480	397	397	1083	1083	396	315	400	365	342
MTS 210-50 R40	37	1505	1505	397	397	1108	1108	396	315	400	390	367
MTS 210-60 R40	37	1505	1505	397	397	1108	1108	396	315	400	390	367
MTS 210-70 R40	45	1607	1607	397	397	1210	1210	449	338	450	464	441
MTS 210-80 R40	55	1660	1660	397	397	1263	1263	497	410	550	548	525
MTS 210-90 R40	55	1660	1660	397	397	1263	1263	497	410	550	548	525
MTS 210-100 R40	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-20 R46	18.5	1384	1384	397	397	987	987	314	204	350	235	212
MTS 210-30 R46	30	1480	1480	397	397	1083	1083	396	315	400	365	342
MTS 210-40 R46	37	1505	1505	397	397	1108	1108	396	315	400	390	367
MTS 210-50 R46	45	1607	1607	397	397	1210	1210	449	338	450	464	441
MTS 210-60 R46	55	1660	1660	397	397	1263	1263	497	410	550	548	525
MTS 210-70 R46	55	1660	1660	397	397	1263	1263	497	410	550	548	525
MTS 210-80 R46	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-90 R46	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-100 R46	75	1733	1733	397	397	1336	1336	551	433	550	658	635

Dimensional sketches

Horizontal installation



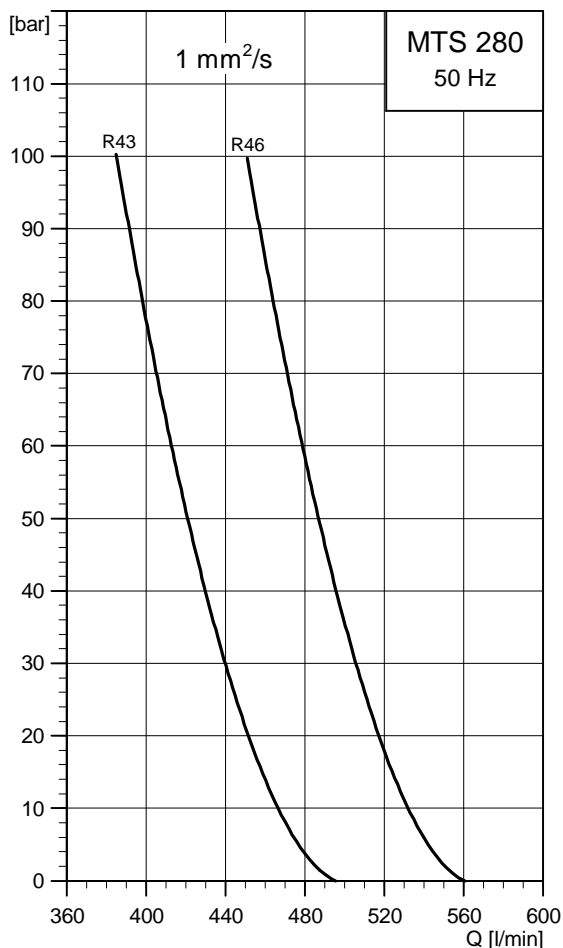
TM06 2287 4114

Dimensions and weights

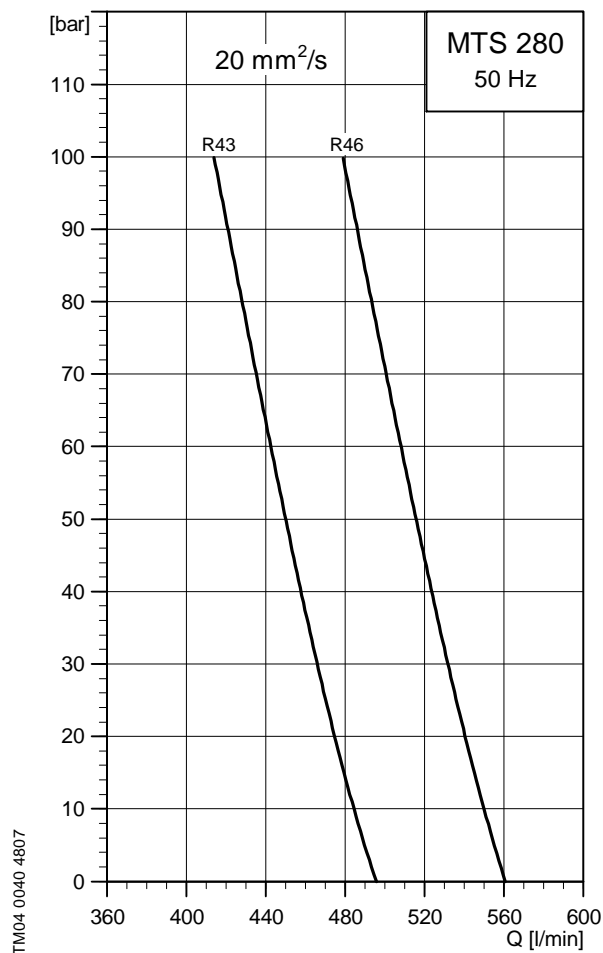
Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 210-20 R40	15	1340	265	300	18	305	350	235	18	20	262	314	204	199
MTS 210-30 R40	22	1410	265	300	18	305	350	235	18	20	262	314	204	227
MTS 210-40 R40	30	1480	300	350	20	350	400	260	18	25	252	396	315	342
MTS 210-50 R40	37	1505	300	350	20	350	400	260	18	25	252	396	315	367
MTS 210-60 R40	37	1505	300	350	20	350	400	260	18	25	252	396	315	367
MTS 210-70 R40	45	1607	335	400	20	385	450	295	18	25	272	449	338	441
MTS 210-80 R40	55	1660	415	500	25	465	550	350	18	25	257	497	410	525
MTS 210-90 R40	55	1660	415	500	25	465	550	350	18	25	257	497	410	525
MTS 210-100 R40	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-20 R46	18.5	1384	265	300	18	305	350	235	18	20	262	314	204	212
MTS 210-30 R46	30	1480	300	350	20	350	400	260	18	25	252	396	315	342
MTS 210-40 R46	37	1505	300	350	20	350	400	260	18	25	252	396	315	367
MTS 210-50 R46	45	1607	335	400	20	385	450	295	18	25	272	449	338	441
MTS 210-60 R46	55	1660	415	500	25	465	550	350	18	25	257	497	410	525
MTS 210-70 R46	55	1660	415	500	25	465	550	350	18	25	257	497	410	525
MTS 210-80 R46	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-90 R46	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-100 R46	75	1733	415	500	25	465	550	350	18	25	257	551	433	635

## Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)

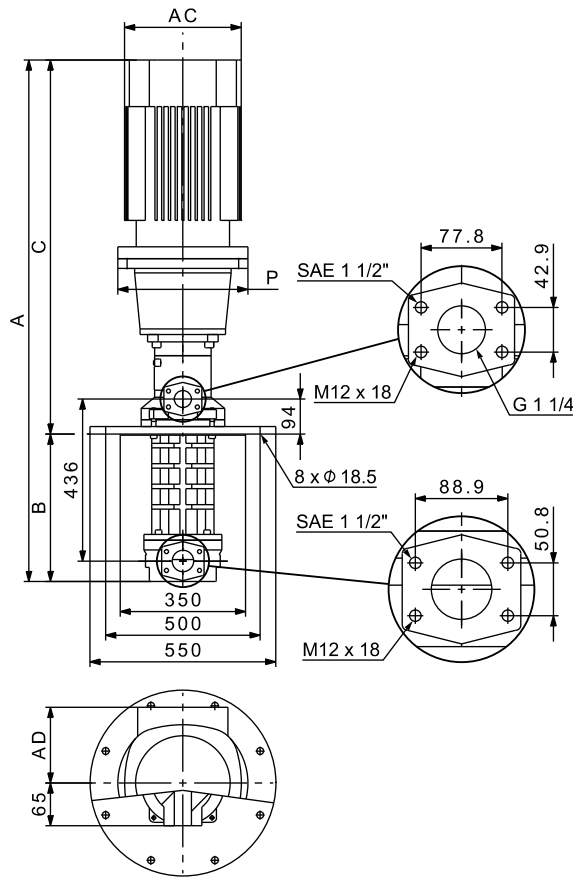


## Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R43		R46		R43		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	496	2.8	561	2.8	496	5.9	561	5.9
10	466	11.1	532	12.2	484	14.1	550	15.2
20	452	19.4	517	21.5	475	22.4	540	24.6
30	440	27.6	506	30.9	466	30.7	532	33.9
40	430	35.9	496	40.2	458	38.9	524	43.3
50	421	44.1	487	49.6	450	47.2	516	52.7
60	413	52.4	479	59	443	55.5	508	62
70	405	60.7	471	68.3	435	63.7	501	71.4
80	398	68.9	464	77.7	428	72	493	80.7
90	392	77.2	457	87	421	80.2	486	90.1
100	385	85.5	451	96.4	414	88.5	479	99.4
110	-	-	-	-	-	-	-	-
120	-	-	-	-	-	-	-	-

Dimensional sketches

Tank-top and dry installation



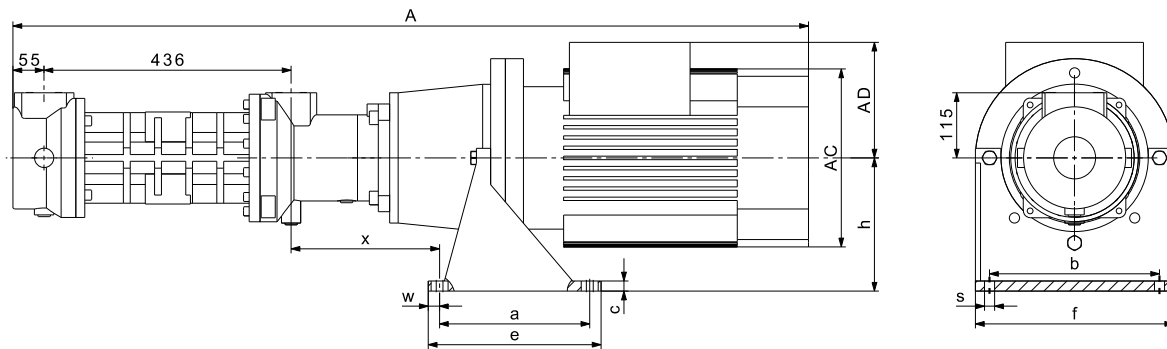
TM06 3323 4114

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]								Net weight [kg]		
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 280-20 R43	22	1544	1544	467	467	1077	1077	314	204	350	302	279
MTS 280-30 R43	30	1610	1610	467	467	1143	1143	396	315	400	415	392
MTS 280-40 R43	45	1713	1713	467	467	1246	1246	449	338	450	514	491
MTS 280-50 R43	55	1783	1783	467	467	1316	1316	497	410	550	600	577
MTS 280-60 R43	55	1783	1783	467	467	1316	1316	497	410	550	600	577
MTS 280-70 R43	75	1856	1856	467	467	1389	1389	551	433	550	710	687
MTS 280-80 R43	75	1856	1856	467	467	1389	1389	551	433	550	710	687
MTS 280-90 R43	90	1966	1966	467	467	1499	1499	551	433	550	795	772
MTS 280-100 R43	90	1966	1966	467	467	1499	1499	551	433	550	795	772
MTS 280-20 R46	30	1610	1610	467	467	1143	1143	396	315	400	415	392
MTS 280-30 R46	37	1635	1635	467	467	1168	1168	396	315	400	440	417
MTS 280-40 R46	45	1713	1713	467	467	1246	1246	449	338	450	514	491
MTS 280-50 R46	55	1783	1783	467	467	1316	1316	497	410	550	600	577
MTS 280-60 R46	75	1856	1856	467	467	1389	1389	551	433	550	710	687
MTS 280-70 R46	75	1856	1856	467	467	1389	1389	551	433	550	710	687
MTS 280-80 R46	90	1966	1966	467	467	1499	1499	551	433	550	795	772
MTS 280-90 R46	110	1958	1958	467	467	1491	1491	616	515	660	960	937
MTS 280-100 R46	110	1958	1958	467	467	1491	1491	616	515	660	960	937

## Dimensional sketches

Horizontal installation



TM06 2287 4114

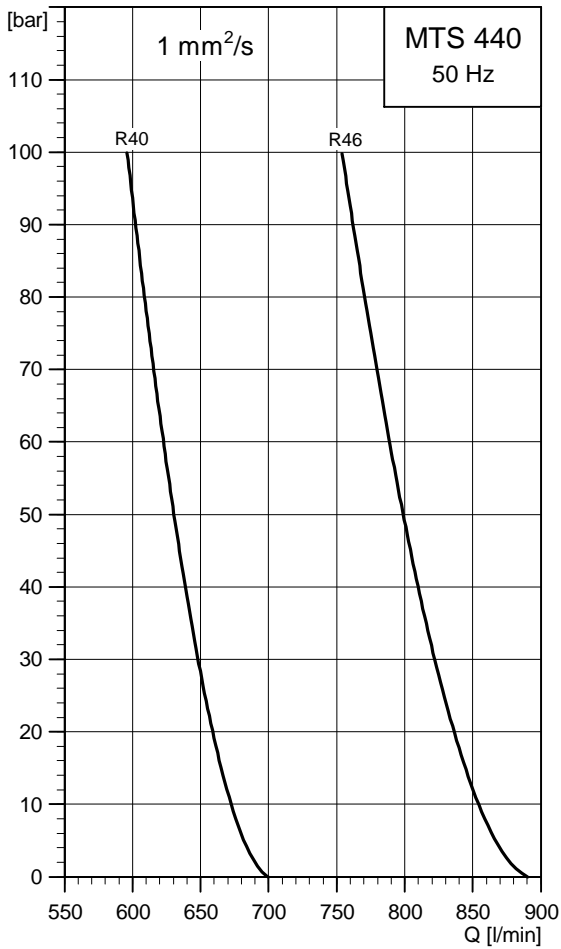
## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 280-20 R43	22	1544	265	300	18	305	350	235	18	20	336	314	204	279
MTS 280-30 R43	30	1610	300	350	20	350	400	260	18	25	322	396	315	392
MTS 280-40 R43	45	1713	335	400	20	385	450	295	18	25	318	449	338	491
MTS 280-50 R43	55	1783	415	500	25	465	550	350	18	25	320	497	410	577
MTS 280-60 R43	55	1783	415	500	25	465	550	350	18	25	320	497	410	577
MTS 280-70 R43	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-80 R43	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-90 R43	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-100 R43	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-20 R46	30	1610	300	350	20	350	400	260	18	25	322	396	315	392
MTS 280-30 R46	37	1635	300	350	20	350	400	260	18	25	322	396	315	417
MTS 280-40 R46	45	1713	335	400	20	385	450	295	18	25	318	449	338	491
MTS 280-50 R46	55	1783	415	500	25	465	550	350	18	25	320	497	410	577
MTS 280-60 R46	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-70 R46	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-80 R46	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-90 R46	110	1958	495	600	30	555	660	380	22	30	280	616	515	937
MTS 280-100 R46	110	1958	495	600	30	555	660	380	22	30	280	616	515	937

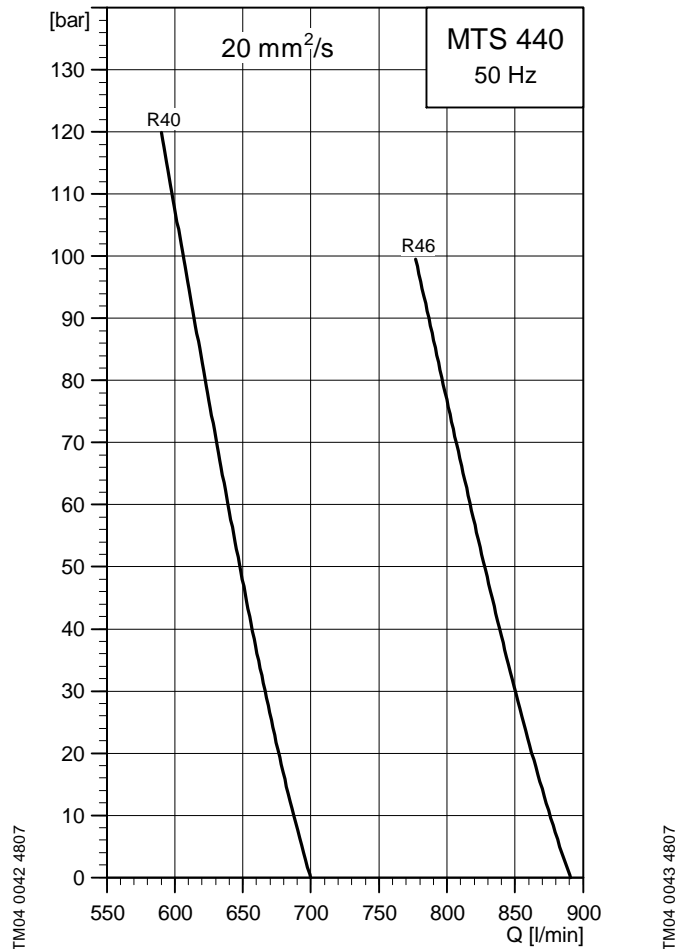


**Performance range**

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



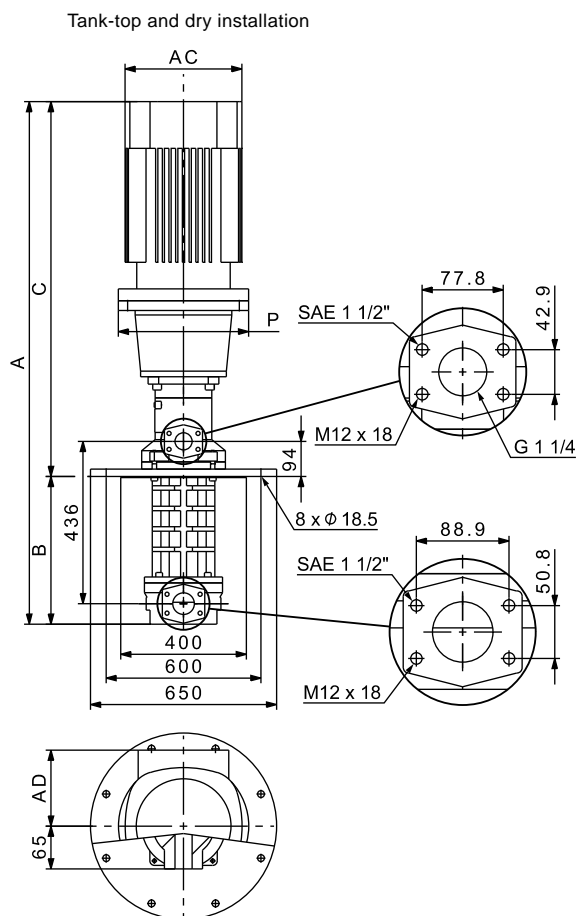
Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)



**Performance table**

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R40		R46		R40		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	700	4.4	891	4.4	700	9.1	891	9.1
10	672	16	854	19.2	687	20.8	875	24
20	659	27.7	836	34.1	676	32.5	862	38.8
30	648	39.4	822	48.9	666	44.1	850	53.7
40	639	51	810	63.8	657	55.8	839	68.6
50	630	62.7	799	78.6	648	67.5	828	83.4
60	623	74.4	789	93.5	639	79.2	817	98.3
70	615	86.1	779	108	631	90.8	807	113
80	609	97.7	770	123	622	103	796	128
90	602	109.4	762	138	614	114	786	143
100	596	121.1	754	153	606	126	777	158
110	-	-	-	-	598	138	-	-
120	-	-	-	-	590	149	-	-

## Dimensional sketches



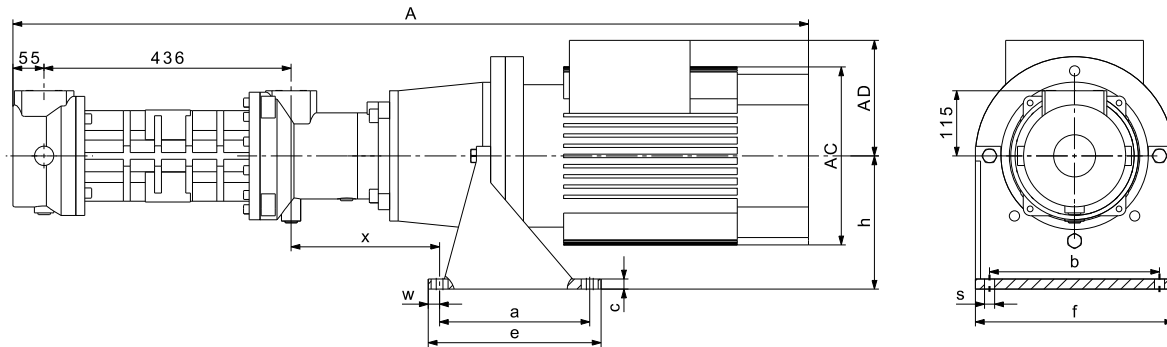
TM06 3324 4114

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]							Net weight [kg]			
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 440-20 R40	30	1688	1688	546	546	1142	1142	396	315	400	480	457
MTS 440-30 R40	45	1791	1791	546	546	1245	1245	449	338	450	579	556
MTS 440-40 R40	55	1861	1861	546	546	1315	1315	497	410	550	665	642
MTS 440-50 R40	75	1934	1934	546	546	1388	1388	551	433	550	775	752
MTS 440-60 R40	90	2044	2044	546	546	1498	1498	551	433	550	860	837
MTS 440-70 R40	90	2044	2044	546	546	1498	1498	551	433	550	860	837
MTS 440-80 R40	110	2071	2071	546	546	1525	1525	616	515	660	1025	1002
MTS 440-90 R40	132	2236	2236	546	546	1690	1690	616	515	660	1155	1132
MTS 440-100 R40	132	2236	2236	546	546	1690	1690	616	515	660	1155	1132
MTS 440-20 R46	37	1713	1713	546	546	1167	1167	396	315	400	505	482
MTS 440-30 R46	55	1861	1861	546	546	1315	1315	497	410	550	665	642
MTS 440-40 R46	75	1934	1934	546	546	1388	1388	551	433	550	775	752
MTS 440-50 R46	90	2044	2044	546	546	1498	1498	551	433	550	860	837
MTS 440-60 R46	110	2071	2071	546	546	1525	1525	616	515	660	1025	1002
MTS 440-70 R46	132	2236	2236	546	546	1690	1690	616	515	660	1155	1132
MTS 440-80 R46	132	2236	2236	546	546	1690	1690	616	515	660	1155	1132
MTS 440-90 R46	160	2236	2236	546	546	1690	1690	616	515	660	1255	1232
MTS 440-100 R46	160	2236	2236	546	546	1690	1690	616	515	660	1255	1232

Dimensional sketches

Horizontal installation



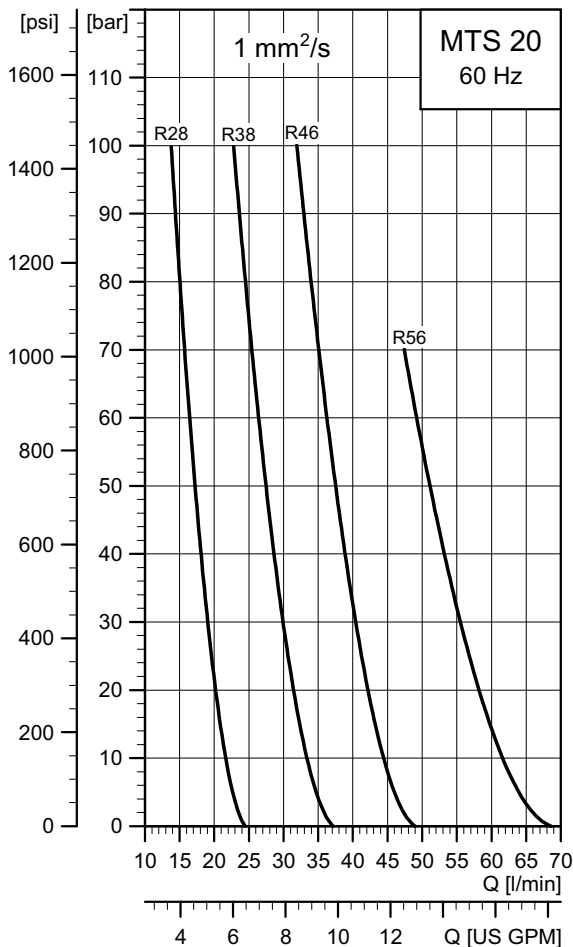
TM06 2287 4114

Dimensions and weights

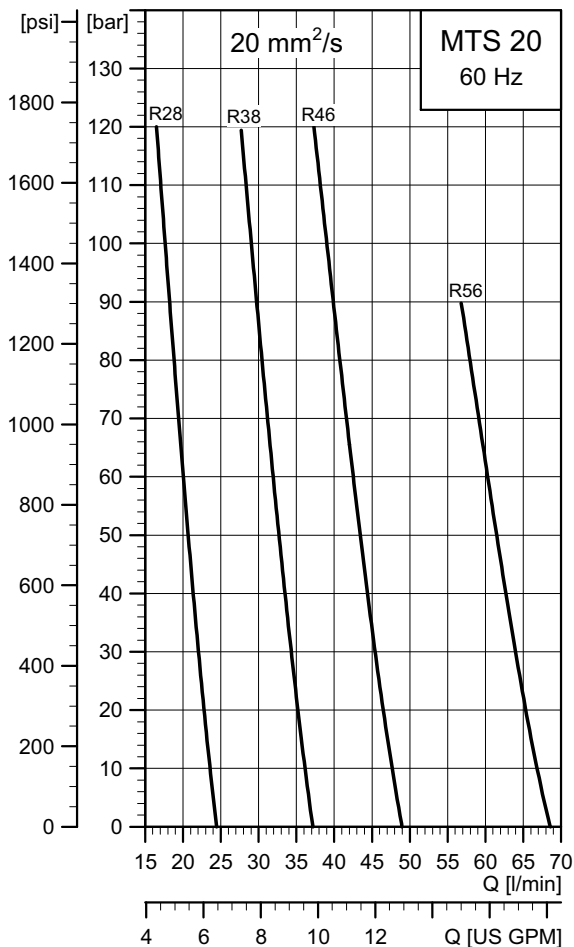
Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 440-20 R40	30	1688	300	350	20	350	400	260	18	25	316	396	315	457
MTS 440-30 R40	45	1791	335	400	20	385	450	295	18	25	312	449	338	556
MTS 440-40 R40	55	1861	415	500	25	465	550	350	18	25	314	497	410	642
MTS 440-50 R40	75	1934	415	500	25	465	550	350	18	25	314	551	433	752
MTS 440-60 R40	90	2044	415	500	25	465	550	350	18	25	314	551	433	837
MTS 440-70 R40	90	2044	415	500	25	465	550	350	18	25	314	551	433	837
MTS 440-80 R40	110	2071	495	600	30	555	660	380	22	30	328	616	515	1002
MTS 440-90 R40	132	2236	495	600	30	555	660	380	22	30	328	616	515	1132
MTS 440-100 R40	132	2236	495	600	30	555	660	380	22	30	328	616	515	1132
MTS 440-20 R46	37	1713	300	350	20	350	400	260	18	25	316	396	315	482
MTS 440-30 R46	55	1861	415	500	25	465	550	350	18	25	314	497	410	642
MTS 440-40 R46	75	1934	415	500	25	465	550	350	18	25	314	551	433	752
MTS 440-50 R46	90	2044	415	500	25	465	550	350	18	25	314	551	433	837
MTS 440-60 R46	110	2071	495	600	30	555	660	380	22	30	328	616	515	1002
MTS 440-70 R46	132	2236	495	600	30	555	660	380	22	30	328	616	515	1132
MTS 440-80 R46	132	2236	495	600	30	555	660	380	22	30	328	616	515	1132
MTS 440-90 R46	160	2236	495	600	30	555	660	380	22	30	328	616	515	1232
MTS 440-100 R46	160	2236	495	600	30	555	660	380	22	30	328	616	515	1232

Performance range

Performance data at 1 mm<sup>2</sup>/s (emulsion)



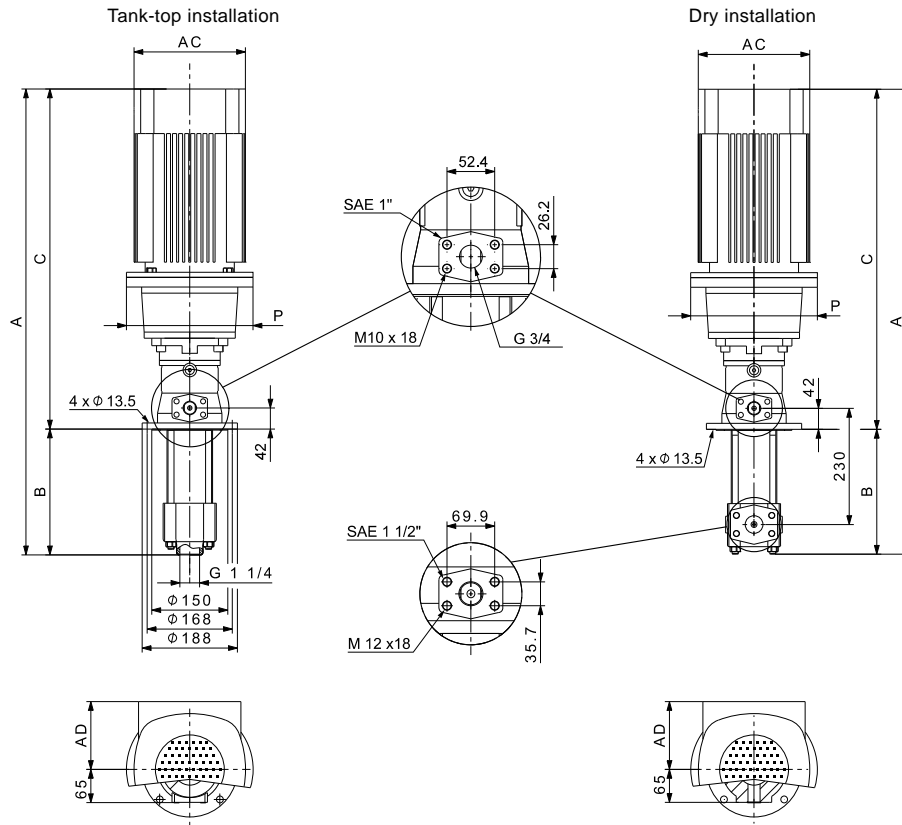
Performance data at 20 mm<sup>2</sup>/s (cutting oil with EP additives)



Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)								20 mm <sup>2</sup> /s (cutting oil with EP additives)							
	R28		R38		R46		R56		R28		R38		R46		R56	
	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P	Q	P
0	24.5	0.4	37.2	0.4	49	0.4	68.6	0.4	24.5	0.4	37.2	0.4	49	0.4	68.6	0.4
10	21.6	0.8	33.3	1	44.4	1.2	61.6	1.6	23.5	0.8	36.1	1	47.6	1.2	66.8	1.6
20	20.2	1.2	31.5	1.7	42.2	2	58.2	2.7	22.8	1.2	35.2	1.7	46.5	2	65.3	2.7
30	19.1	1.6	29.9	2.3	40.4	2.9	55.5	3.8	22	1.6	34.3	2.3	45.4	2.9	64	3.8
40	18.1	2.1	28.6	2.9	38.9	3.7	53.2	5	21.4	2.1	33.5	2.9	44.4	3.7	62.7	5
50	17.2	2.5	27.5	3.5	37.5	4.5	51.1	6.1	20.7	2.5	32.7	3.5	43.5	4.5	61.5	6.1
60	16.5	2.9	26.4	4.1	36.2	5.3	49.2	7.3	20.1	2.9	31.9	4.1	42.5	5.3	60.3	7.3
70	15.7	3.3	25.4	4.8	35.1	6.1	47.4	8.4	19.4	3.3	31.2	4.8	41.6	6.1	59.1	8.4
80	15	3.7	24.5	5.4	34	6.9	-	-	18.8	3.7	30.5	5.4	40.7	6.9	57.9	9.6
90	14.4	4.1	23.6	6	32.9	7.8	-	-	18.2	4.1	29.7	6	39.9	7.8	56.8	10.7
100	13.8	4.5	22.8	6.6	31.9	8.6	-	-	17.6	4.5	29	6.6	39	8.6	-	-
110	-	-	-	-	-	-	-	-	17.1	4.9	28.3	7.2	38.2	9.4	-	-
120	-	-	-	-	-	-	-	-	16.5	5.3	27.7	7.9	37.3	10.2	-	-

Dimensional sketches



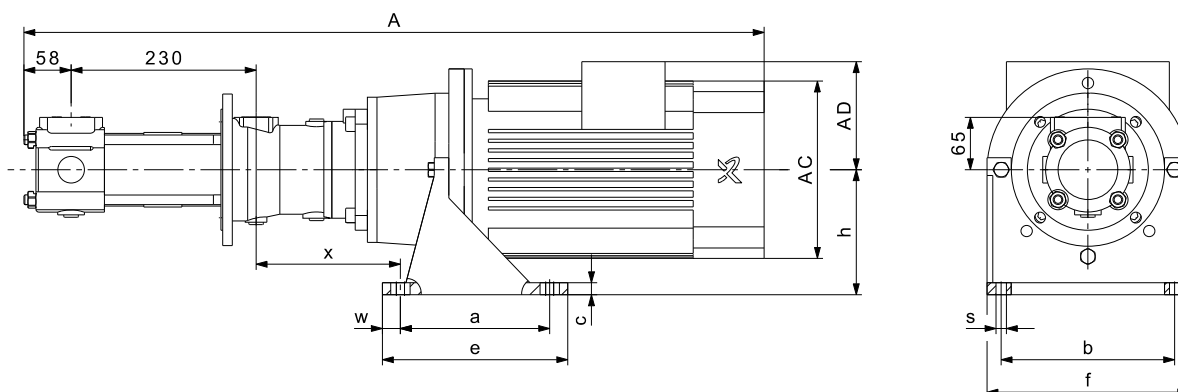
TM06 1244 2014

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]								Net weight [kg]		
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 20-30 R28	2.2	862	862	246	248	616	614	178	110	200	48	48
MTS 20-40 R28	2.2	862	862	246	248	616	614	178	110	200	48	48
MTS 20-50 R28	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-60 R28	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-70 R28	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-80 R28	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-90 R28	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-100 R28	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-30 R38	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-40 R38	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-50 R38	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-60 R38	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-70 R38	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-80 R38	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-90 R38	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-100 R38	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-30 R46	3	881	881	246	248	635	633	198	120	250	53	53
MTS 20-40 R46	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-50 R46	5.5	961	961	246	248	715	713	220	134	300	65	70
MTS 20-60 R46	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-70 R46	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-80 R46	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-90 R46	11	1085	1085	246	248	839	837	314	204	350	117	117
MTS 20-100 R46	11	1085	1085	246	248	839	837	314	204	350	117	117
MTS 20-30 R56	4	918	918	246	248	672	670	220	134	250	65	65
MTS 20-40 R56	5.5	961	961	246	248	715	713	220	134	300	70	70
MTS 20-50 R56	7.5	949	949	246	248	703	701	260	159	300	70	80
MTS 20-60 R56	7.5	949	949	246	248	703	701	260	159	300	80	80
MTS 20-70 R56	11	1085	1085	246	248	839	837	314	204	350	117	117

## Dimensional sketches

Horizontal installation



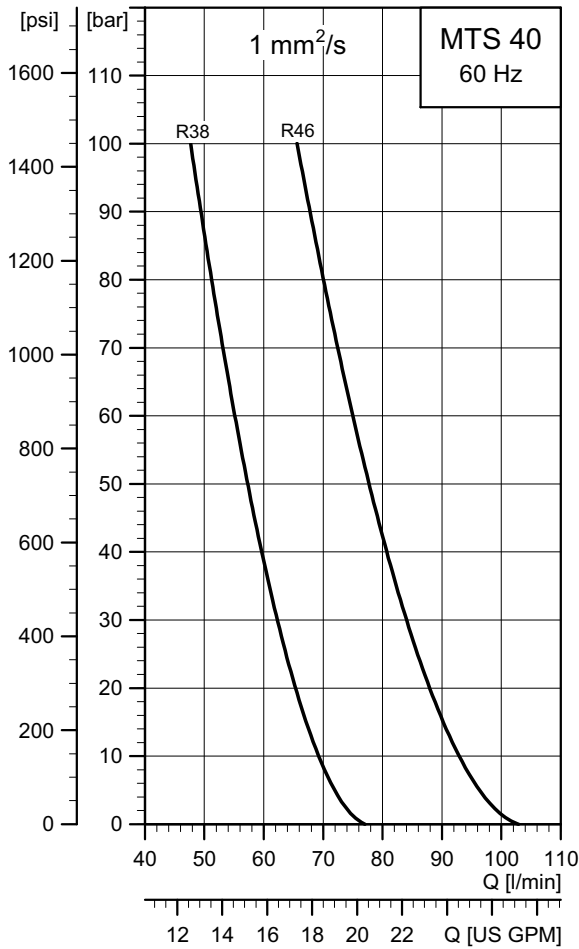
TM06 0972 2014

## Dimensions and weights

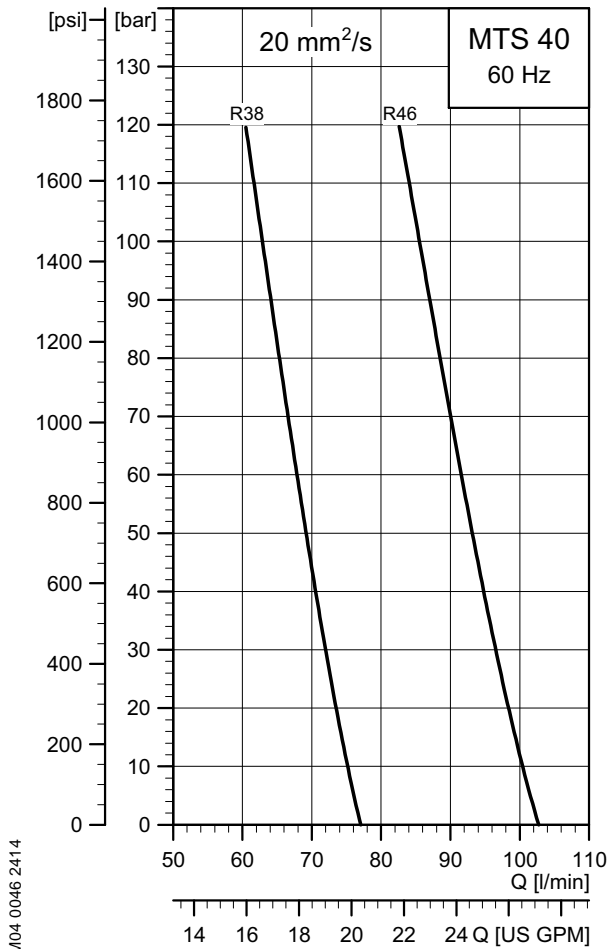
Pump type	P2 [kW]	Dimensions [mm]											Net weight [kg]	
		A	a	b	c	e	f	h	s	w	x	AC		AD
MTS 20-30 R28	2.2	862	60	180	12	90	210	112	11	15	158	178	110	48
MTS 20-40 R28	2.2	862	60	180	12	90	210	112	11	15	158	178	110	48
MTS 20-50 R28	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-60 R28	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-70 R28	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-80 R28	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-90 R28	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-100 R28	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-30 R38	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-40 R38	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-50 R38	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-60 R38	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-70 R38	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-80 R38	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-90 R38	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-100 R38	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-30 R46	3	881	185	215	15	230	250	155	14	23	179	198	120	53
MTS 20-40 R46	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-50 R46	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-60 R46	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-70 R46	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-80 R46	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-90 R46	11	1085	265	300	18	305	350	235	18	20	210	314	204	117
MTS 20-100 R46	11	1085	265	300	18	305	350	235	18	20	210	314	204	117
MTS 20-30 R56	4	918	185	215	15	230	250	155	14	23	179	220	134	65
MTS 20-40 R56	5.5	961	225	265	18	270	300	185	14	23	187	220	134	70
MTS 20-50 R56	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-60 R56	7.5	949	225	265	18	270	300	185	14	23	187	260	159	80
MTS 20-70 R56	11	1085	265	300	18	305	350	235	18	20	210	314	204	117

**Performance range**

Performance data at 1 mm<sup>2</sup>/s (emulsion)



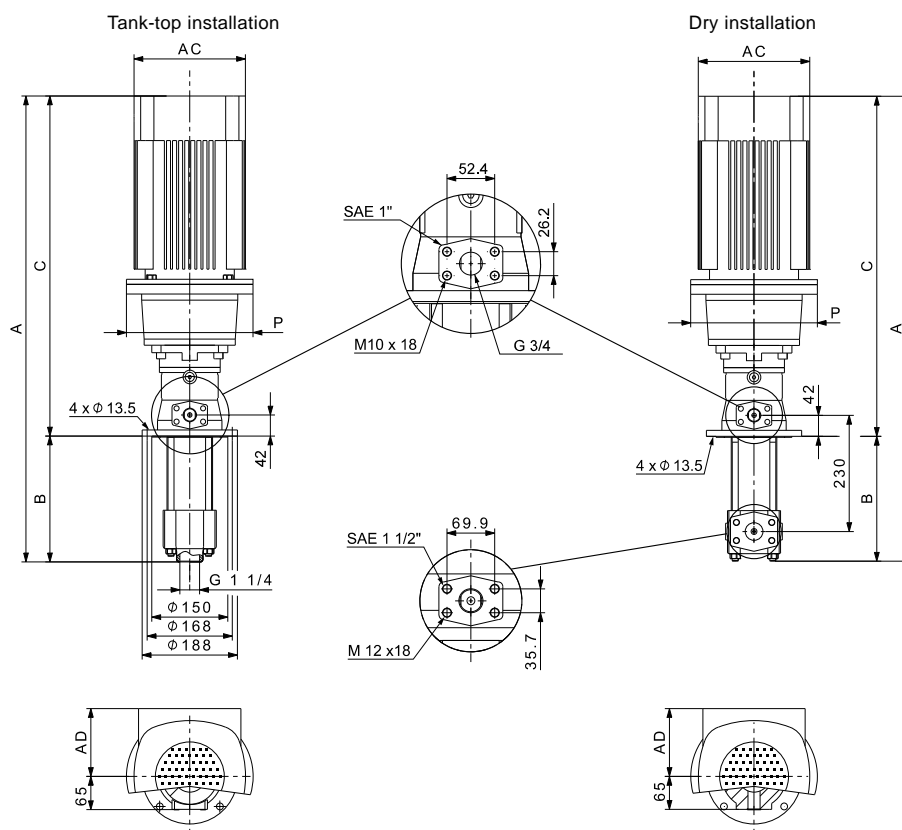
Performance data at 20 mm<sup>2</sup>/s (cutting oil with EP additives)



**Performance table**

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R38		R46		R38		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	77.1	0.5	103	0.5	77.1	1.1	102.8	1.1
10	69.2	1.8	92.8	2.2	75.1	2.4	100.3	2.8
20	65.3	3.1	87.9	4	73.5	3.7	98.4	4.6
30	62.3	4.4	84.1	5.7	72	5	96.5	6.3
40	59.7	5.7	80.7	7.4	70.5	6.3	94.8	8
50	57.3	6.9	77.7	9.1	69.2	7.5	93.2	9.7
60	55.1	8.2	75	10.8	67.9	8.8	91.6	11.4
70	53.1	9.5	72.4	12.5	66.6	10.1	90	13.1
80	51.2	10.8	70	14.2	65.3	11.4	88.5	14.8
90	49.4	12.1	67.8	15.9	64.1	12.7	87	16.5
100	47.7	13.4	65.6	17.7	62.8	14	85.5	18.3
110	-	-	-	-	61.6	15.3	84	20
120	-	-	-	-	60.5	16.5	82.6	21.7

## Dimensional sketches



TM06 1244 2014

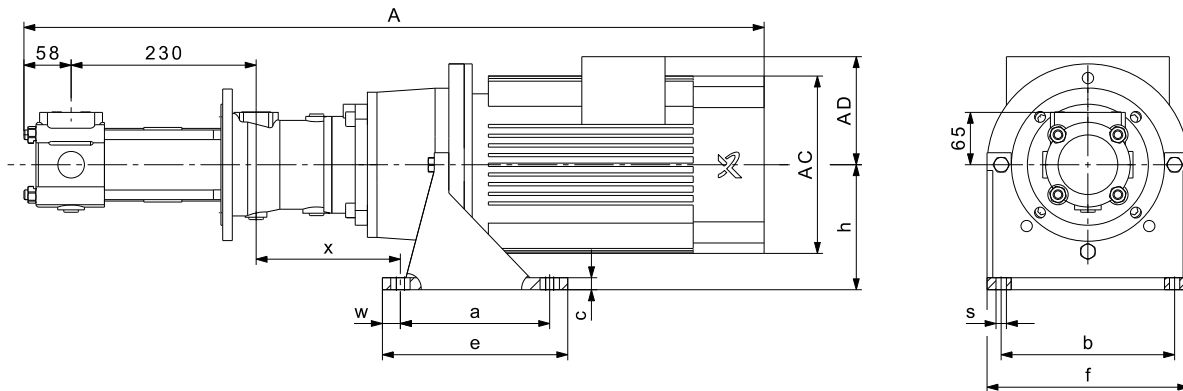
## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]								Net weight [kg]		
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 40-30 R38	5.5	1011	1013	286	286	725	727	220	134	300	75	75
MTS 40-40 R38	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-50 R38	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-60 R38	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-70 R38	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-80 R38	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-90 R38	15	1135	1137	286	286	849	851	314	204	350	134	134
MTS 40-100 R38	15	1135	1137	286	286	849	851	314	204	350	117	134
MTS 40-30 R46	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-40 R46	7.5	999	1001	286	286	713	715	260	159	300	85	85
MTS 40-50 R46	11	1135	1137	286	286	849	851	314	204	350	90	122
MTS 40-60 R46	11	1135	1137	286	286	849	851	314	204	350	122	122
MTS 40-70 R46	15	1135	1137	286	286	849	851	314	204	350	134	134
MTS 40-80 R46	15	1135	1137	286	286	849	851	314	204	350	110	134
MTS 40-90 R46	18.5	1179	1181	286	286	893	895	314	204	350	147	147
MTS 40-100 R46	18.5	1179	1181	286	286	893	895	314	204	350	147	147



Dimensional sketches

Horizontal installation



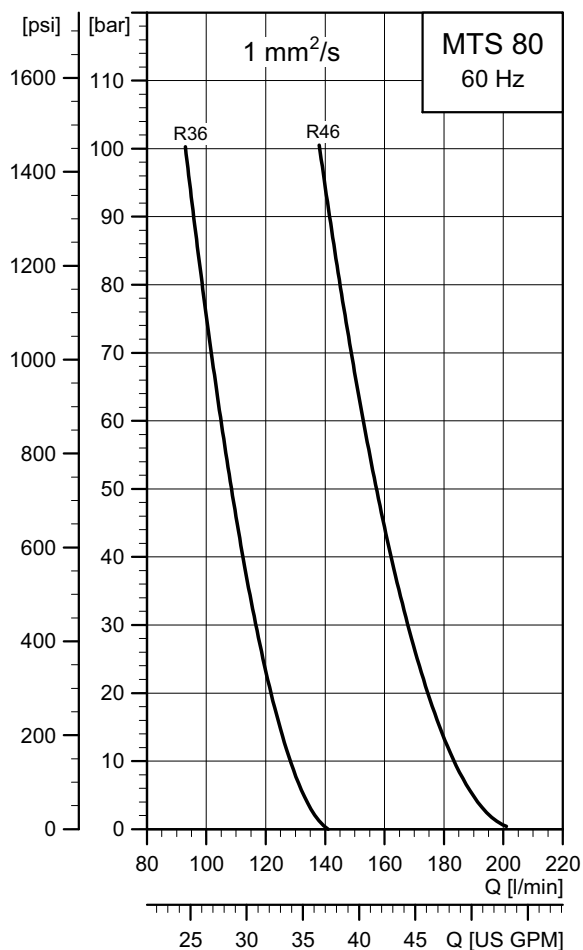
TM06 0972 2014

Dimensions and weights

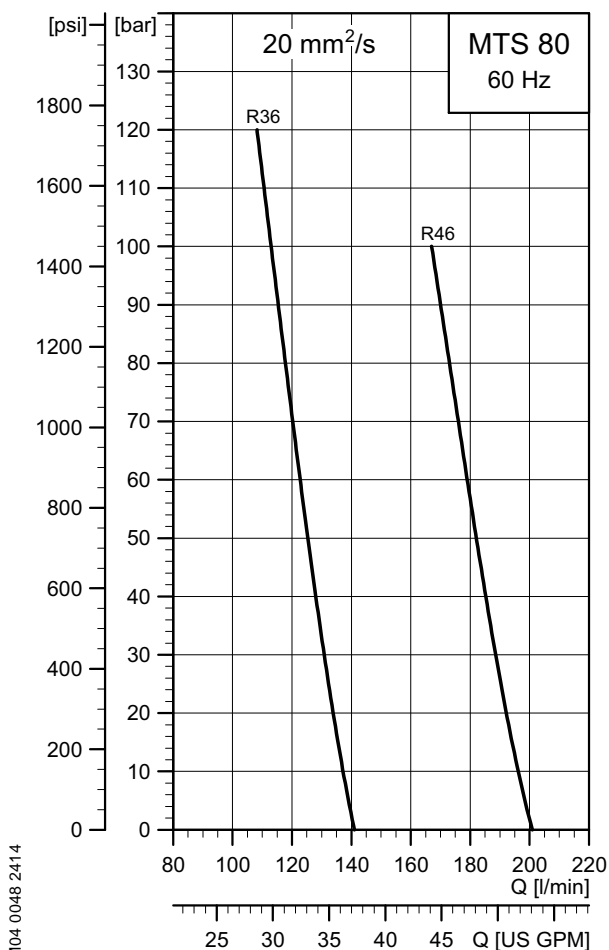
Pump type	P2 [kW]	Dimensions [mm]											Net weight [kg]	
		A	a	b	c	e	f	h	s	w	x	AC		AD
MTS 40-30 R38	5.5	1013	225	265	18	270	300	185	14	23	199	220	134	75
MTS 40-40 R38	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-50 R38	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-60 R38	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-70 R38	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-80 R38	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-90 R38	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-100 R38	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-30 R46	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-40 R46	7.5	1001	225	265	18	270	300	185	14	23	199	260	159	85
MTS 40-50 R46	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-60 R46	11	1137	265	300	18	305	350	235	18	20	222	314	204	122
MTS 40-70 R46	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-80 R46	15	1137	265	300	18	305	350	235	18	20	222	314	204	134
MTS 40-90 R46	18.5	1181	265	300	18	305	350	235	18	20	222	314	204	147
MTS 40-100 R46	18.5	1181	265	300	18	305	350	235	18	20	222	314	204	147

## Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



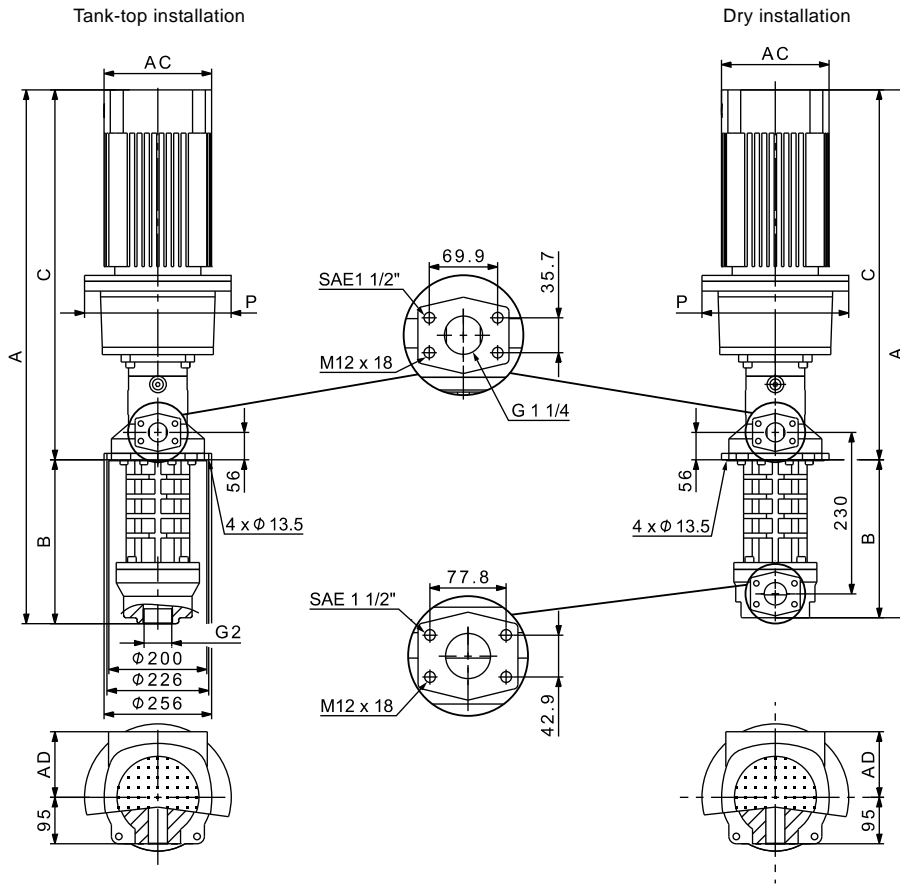
Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)



## Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R36		R46		R36		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	141	0.8	201	0.8	141	1.8	201	1.8
10	128	3.2	184	4.2	137	4.1	196	5.1
20	122	5.5	176	7.5	134	6.4	192	8.5
30	117	7.8	161	10.9	131	8.8	189	11.8
40	112	10.2	164	14.2	128	11.1	185	15.1
50	108	12.5	158	17.6	125	13.5	182	18.5
60	105	14.9	154	20.9	123	15.8	179	21.8
70	102	17.2	150	24.2	120	18.2	176	25.2
80	98.6	19.6	145	27.6	118	20.5	173	28.5
90	95.7	21.9	142	30.9	115	22.8	170	31.9
100	92.9	24.2	138	34.3	113	25.2	167	35.2
110	-	-	-	-	111	27.5	-	-
120	-	-	-	-	108	29.9	-	-

Dimensional sketches



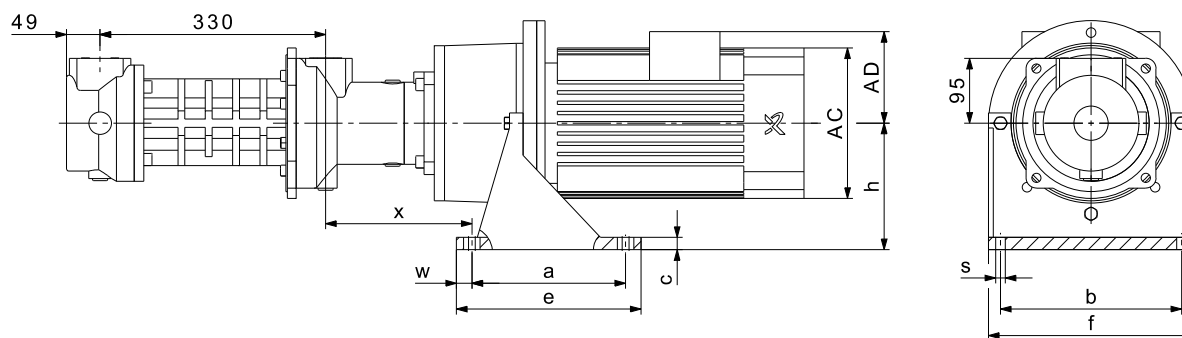
TM06 2286 4114

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 80-20 R36	7.5	1077	1067	335	323	742	744	260	159	300	105	105
MTS 80-30 R36	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-40 R36	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-50 R36	15	1207	1197	335	323	872	874	314	204	350	154	154
MTS 80-60 R36	15	1207	1197	335	323	872	874	314	204	350	154	154
MTS 80-70 R36	18.5	1251	1241	335	323	916	918	314	204	350	167	167
MTS 80-80 R36	22	1293	1283	335	323	958	960	314	204	350	182	182
MTS 80-90 R36	30	1363	1353	335	323	1028	1030	396	315	400	297	297
MTS 80-100 R36	30	1363	1353	335	323	1028	1030	396	315	400	297	297
MTS 80-20 R46	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-30 R46	11	1207	1197	335	323	872	874	314	204	350	142	142
MTS 80-40 R46	15	1207	1197	335	323	872	874	314	204	350	154	154
MTS 80-50 R46	18.5	1251	1241	335	323	916	918	314	204	350	167	167
MTS 80-60 R46	22	1293	1283	335	323	958	960	314	204	350	170	182
MTS 80-70 R46	30	1363	1353	335	323	1028	1030	396	315	400	297	297
MTS 80-80 R46	30	1363	1353	335	323	1028	1030	396	315	400	297	297
MTS 80-90 R46	37	1388	1378	335	323	1053	1055	396	315	400	322	322
MTS 80-100 R46	37	1388	1378	335	323	1053	1055	396	315	400	322	322

## Dimensional sketches

Horizontal installation

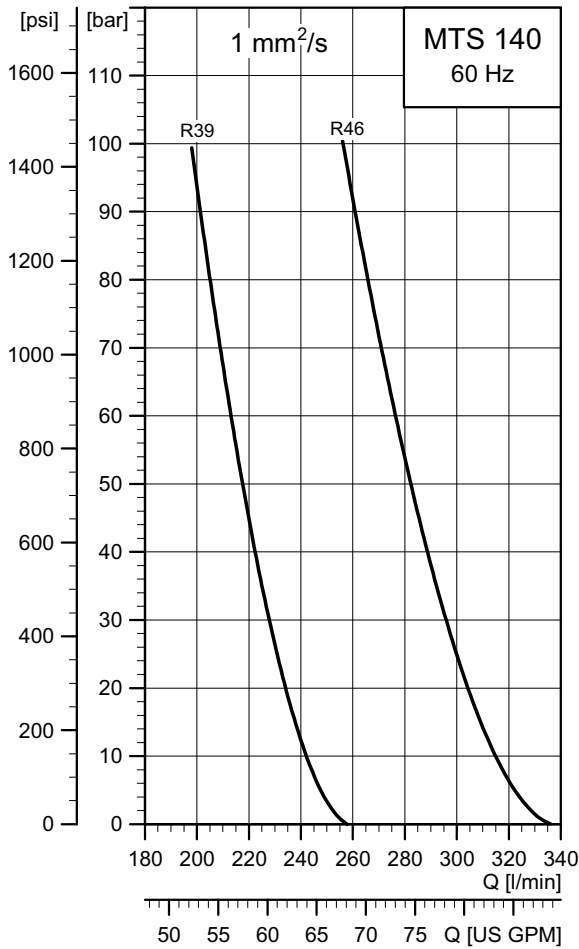


## Dimensions and weights

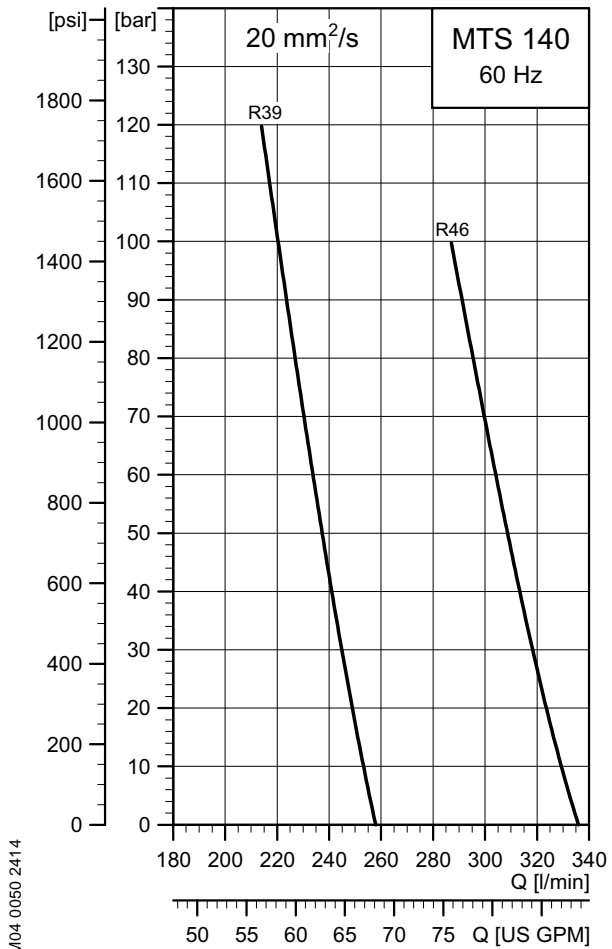
Pump type	P2 [kW]	Dimensions [mm]											Net weight [kg]	
		A	a	b	c	e	f	h	s	w	x	AC		AD
MTS 80-20 R36	7.5	1067	225	265	18	270	300	185	14	23	214	260	159	105
MTS 80-30 R36	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-40 R36	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-50 R36	15	1197	265	300	18	305	350	235	18	20	231	314	204	154
MTS 80-60 R36	15	1197	265	300	18	305	350	235	18	20	231	314	204	154
MTS 80-70 R36	18.5	1241	265	300	18	305	350	235	18	20	231	314	204	167
MTS 80-80 R36	22	1283	265	300	18	305	350	235	18	20	247	314	204	182
MTS 80-90 R36	30	1353	300	350	20	350	400	260	18	25	237	396	315	297
MTS 80-100 R36	30	1353	300	350	20	350	400	260	18	25	237	396	315	297
MTS 80-20 R46	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-30 R46	11	1197	265	300	18	305	350	235	18	20	231	314	204	142
MTS 80-40 R46	15	1197	265	300	18	305	350	235	18	20	231	314	204	154
MTS 80-50 R46	18.5	1241	265	300	18	305	350	235	18	20	231	314	204	167
MTS 80-60 R46	22	1283	265	300	18	305	350	235	18	20	247	314	204	182
MTS 80-70 R46	30	1353	300	350	20	350	400	260	18	25	237	396	315	297
MTS 80-80 R46	30	1353	300	350	20	350	400	260	18	25	237	396	315	297
MTS 80-90 R46	37	1378	300	350	20	350	400	260	18	25	237	396	315	322
MTS 80-100 R46	37	1378	300	350	20	350	400	260	18	25	237	396	315	322

**Performance range**

Performance data at 1 mm<sup>2</sup>/s (emulsion)



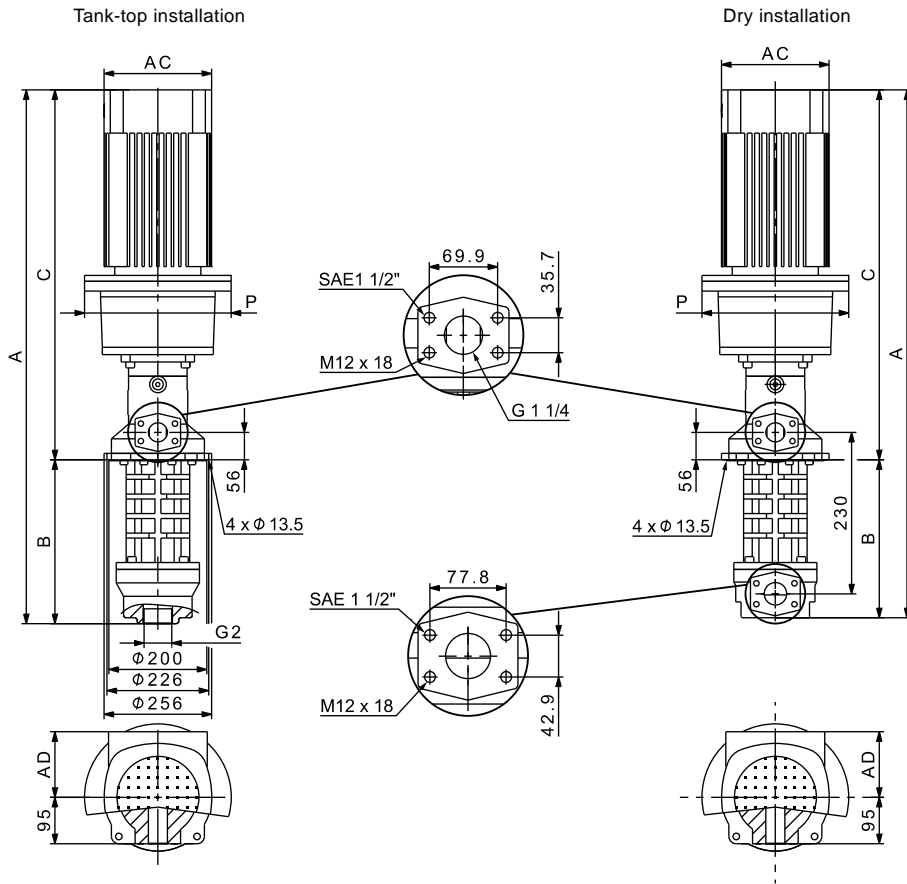
Performance data at 20 mm<sup>2</sup>/s (cutting oil with EP additives)



**Performance table**

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R39		R46		R39		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	258	1.3	336	1.3	258	2.7	336	2.7
10	242	5.6	315	6.9	253	7	329	8.3
20	234	9.9	304	12.5	249	11.3	324	13.9
30	228	14.2	296	18.12	245	15.7	318	19.5
40	222	18.5	289	23.7	241	20	313	25.1
50	218	22.8	282	29.3	237	24.3	309	30.7
60	213	27.1	276	34.9	234	28.6	304	36.3
70	209	31.4	271	40.5	230	32.9	300	41.9
80	205	35.7	266	46.1	227	37.2	295	47.6
90	201	40.1	261	51.7	224	41.5	291	53.2
100	198	44.4	256	57.3	220	45.8	287	58.8
110	-	-	-	-	217	50.1	-	-
120	-	-	-	-	214	54.4	-	-

## Dimensional sketches



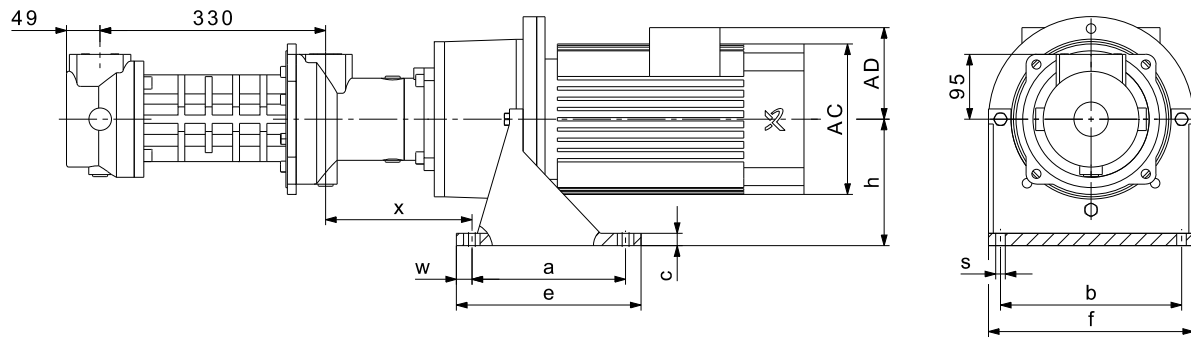
TM06 2286 4114

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 140-20 R39	11	1307	1287	386	364	921	923	314	204	350	163	163
MTS 140-30 R39	15	1307	1287	386	364	921	923	314	204	350	174	174
MTS 140-40 R39	22	1377	1357	386	364	991	993	314	204	350	202	202
MTS 140-50 R39	30	1447	1427	386	364	1061	1063	396	315	400	317	317
MTS 140-60 R39	30	1447	1427	386	364	1061	1063	396	315	400	235	317
MTS 140-70 R39	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-80 R39	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-90 R39	45	1574	1554	386	364	1188	1190	449	338	450	416	416
MTS 140-100 R39	55	1627	1607	386	364	1241	1243	497	410	550	500	500
MTS 140-20 R46	15	1307	1287	386	364	921	923	314	204	350	174	174
MTS 140-30 R46	22	1377	1357	386	364	991	993	314	204	350	202	202
MTS 140-40 R46	30	1447	1427	386	364	1061	1063	396	315	400	317	317
MTS 140-50 R46	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-60 R46	37	1472	1452	386	364	1086	1088	396	315	400	342	342
MTS 140-70 R46	45	1574	1554	386	364	1188	1190	449	338	450	295	416
MTS 140-80 R46	55	1627	1607	386	364	1241	1243	497	410	550	500	500
MTS 140-90 R46	55	1627	1607	386	364	1241	1243	497	410	550	500	500
MTS 140-100 R46	75	1700	1680	386	364	1314	1316	551	433	550	610	610

Dimensional sketches

Horizontal installation

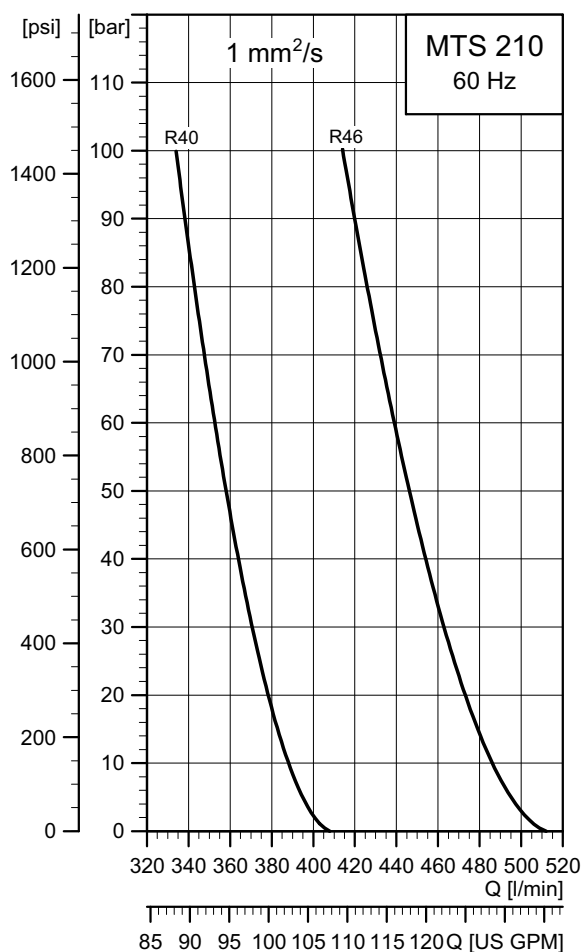


Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]										Net weight [kg]		
		A	a	b	c	e	f	h	s	w	x		AC	AD
MTS 140-20 R39	11	1287	265	300	18	305	350	235	18	20	273	314	204	163
MTS 140-30 R39	15	1287	265	300	18	305	350	235	18	20	273	314	204	174
MTS 140-40 R39	22	1357	265	300	18	305	350	235	18	20	273	314	204	202
MTS 140-50 R39	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-60 R39	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-70 R39	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-80 R39	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-90 R39	45	1554	335	400	20	385	450	295	18	25	283	449	338	416
MTS 140-100 R39	55	1607	415	500	25	465	550	350	18	25	268	497	410	500
MTS 140-20 R46	15	1287	265	300	18	305	350	235	18	20	273	314	204	174
MTS 140-30 R46	22	1357	265	300	18	305	350	235	18	20	273	314	204	202
MTS 140-40 R46	30	1427	300	350	20	350	400	260	18	25	263	396	315	317
MTS 140-50 R46	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-60 R46	37	1452	300	350	20	350	400	260	18	25	263	396	315	342
MTS 140-70 R46	45	1554	335	400	20	385	450	295	18	25	283	449	338	416
MTS 140-80 R46	55	1607	415	500	25	465	550	350	18	25	268	497	410	500
MTS 140-90 R46	55	1607	415	500	25	465	550	350	18	25	268	497	410	500
MTS 140-100 R46	75	1680	415	500	25	465	550	350	18	25	268	551	433	610

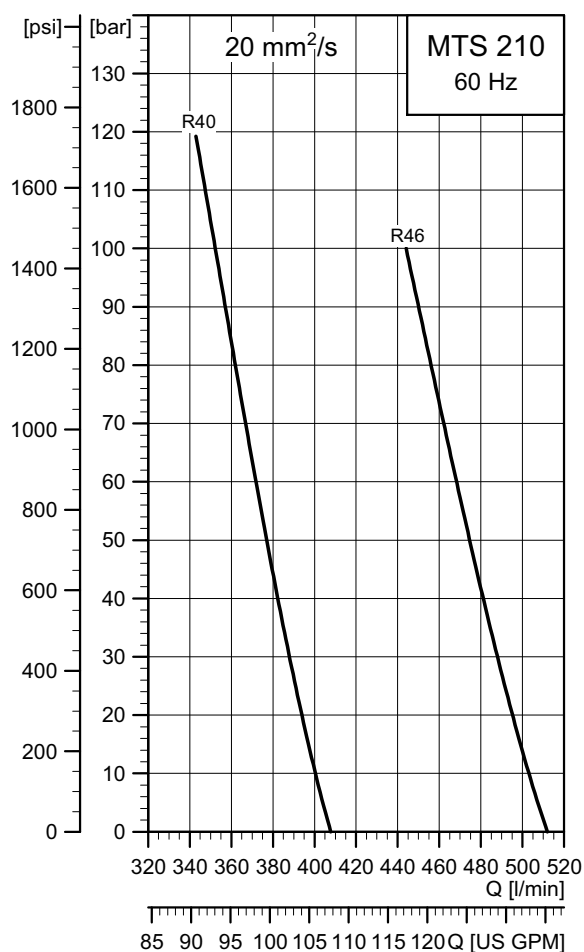
## Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



TM04 0052 2414

Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)



TM04 0053 2414

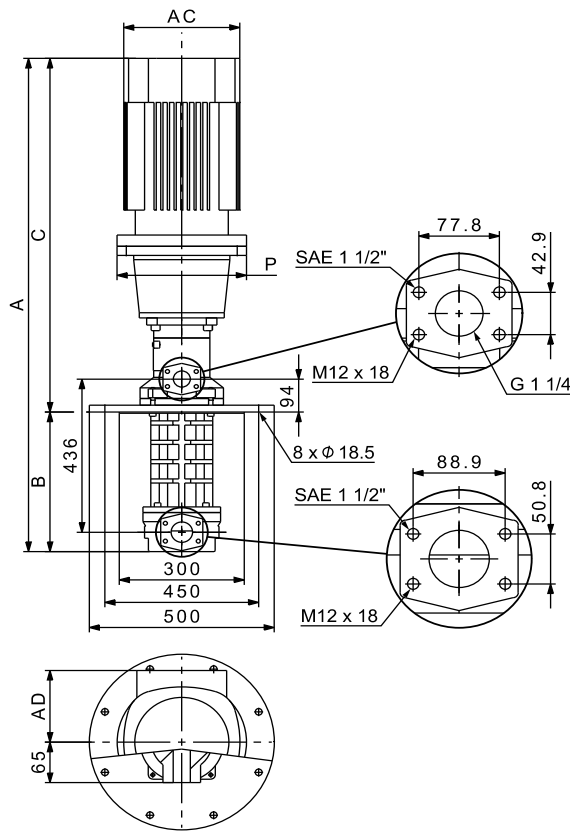
## Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R40		R46		R40		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	408	2.3	512	2.3	408	4.7	512	4.7
10	388	9	486	10.8	400	11.5	503	13.2
20	378	15.8	473	19.3	394	18.3	495	21.8
30	371	22.6	463	27.9	388	25.1	488	30.3
40	364	29.4	454	36.4	382	31.9	481	38.8
50	358	36.2	446	44.9	377	38.7	475	47.4
60	352	43	439	53.5	372	45.5	468	55.9
70	348	49.8	432	62	367	52.3	462	64.5
80	343	56.6	426	70.6	362	59.1	456	73
90	338	63.4	420	79.1	357	65.9	450	81.5
100	334	70.2	414	87.6	352	72.7	444	90.1
110	-	-	-	-	347	79.5	-	-
120	-	-	-	-	343	86.3	-	-



Dimensional sketches

Tank-top and dry installation



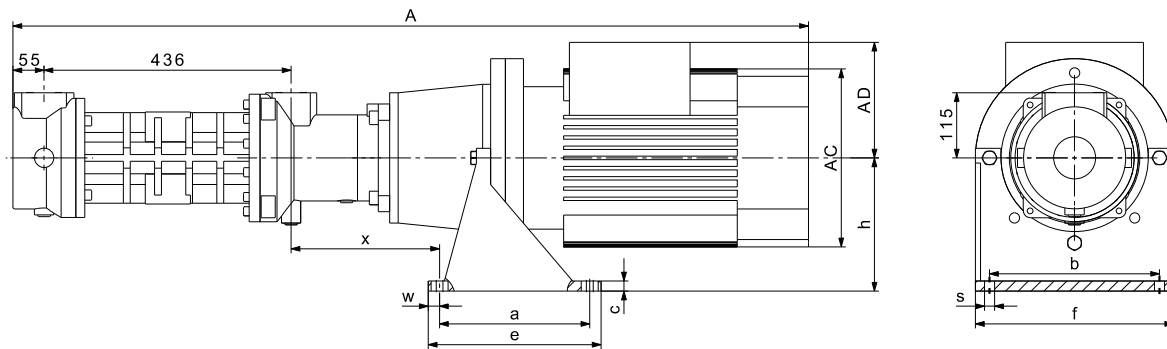
TM06 2288 4114

Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 210-20 R40	18.5	1384	1384	397	397	987	987	314	204	350	235	212
MTS 210-30 R40	30	1480	1480	397	397	1083	1083	396	315	400	365	342
MTS 210-40 R40	37	1505	1505	397	397	1108	1108	396	315	400	390	367
MTS 210-50 R40	45	1607	1607	397	397	1210	1210	449	338	450	464	441
MTS 210-60 R40	45	1607	1607	397	397	1210	1210	449	338	450	464	441
MTS 210-70 R40	55	1660	1660	397	397	1263	1263	497	410	550	548	525
MTS 210-80 R40	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-90 R40	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-100 R40	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-20 R46	22	1410	1410	397	397	1013	1013	314	204	350	250	227
MTS 210-30 R46	30	1480	1480	397	397	1083	1083	396	315	400	365	342
MTS 210-40 R46	45	1607	1607	397	397	1210	1210	449	338	450	464	441
MTS 210-50 R46	55	1660	1660	397	397	1263	1263	497	410	550	548	525
MTS 210-60 R46	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-70 R46	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-80 R46	75	1733	1733	397	397	1336	1336	551	433	550	658	635
MTS 210-90 R46	90	1843	1843	397	397	1446	1446	551	433	550	743	720
MTS 210-100 R46	110	1825	1825	397	397	1428	1428	616	515	660	910	887

## Dimensional sketches

Horizontal installation



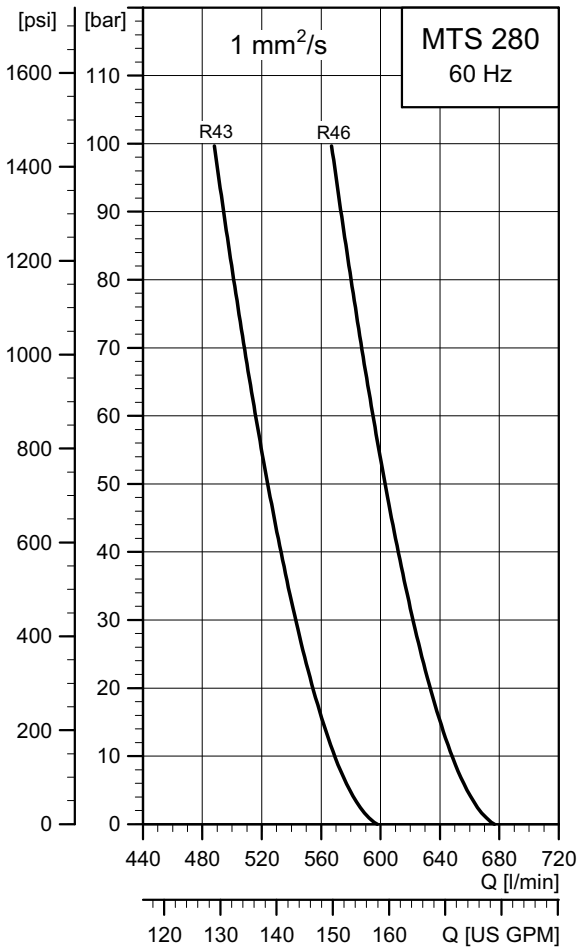
TM06 2287 4114

## Dimensions and weights

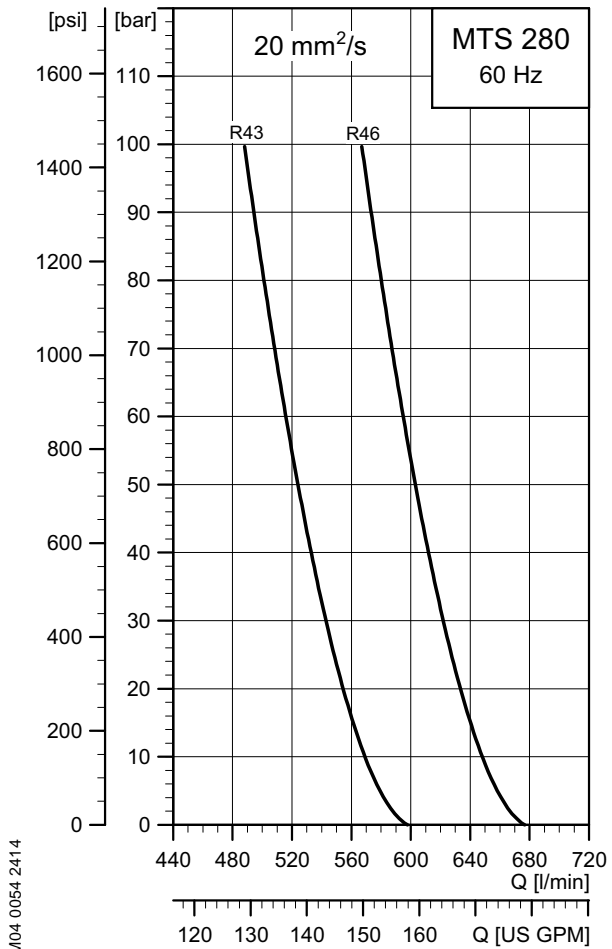
Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 210-20 R40	18.5	1384	265	300	18	305	350	235	18	20	262	314	204	212
MTS 210-30 R40	30	1480	300	350	20	350	400	260	18	25	252	396	315	342
MTS 210-40 R40	37	1505	300	350	20	350	400	260	18	25	252	396	315	367
MTS 210-50 R40	45	1607	335	400	20	385	450	295	18	25	272	449	338	441
MTS 210-60 R40	45	1607	335	400	20	385	450	295	18	25	272	449	338	441
MTS 210-70 R40	55	1660	415	500	25	465	550	350	18	25	257	497	410	525
MTS 210-80 R40	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-90 R40	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-100 R40	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-20 R46	22	1410	265	300	18	305	350	235	18	20	262	314	204	227
MTS 210-30 R46	30	1480	300	350	20	350	400	260	18	25	252	396	315	342
MTS 210-40 R46	45	1607	335	400	20	385	450	295	18	25	272	449	338	441
MTS 210-50 R46	55	1660	415	500	25	465	550	350	18	25	257	497	410	525
MTS 210-60 R46	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-70 R46	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-80 R46	75	1733	415	500	25	465	550	350	18	25	257	551	433	635
MTS 210-90 R46	90	1843	415	500	25	465	550	350	18	25	257	551	433	720
MTS 210-100 R46	110	1825	495	600	30	555	660	380	22	30	217	616	515	887

**Performance range**

Performance data at 1 mm<sup>2</sup>/s (emulsion)



Performance data at 20 mm<sup>2</sup>/s (cutting oil with EP additives)

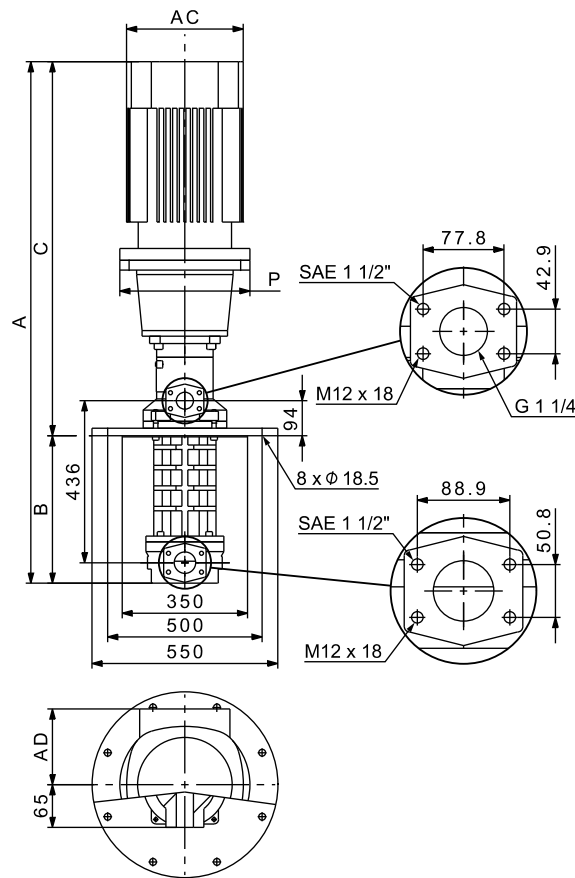


**Performance table**

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R43		R46		R43		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	598	3.8	677	3.8	598	7.8	677	7.8
10	569	13.7	648	15	587	17.8	666	19.1
20	554	23.7	633	26.3	577	27.7	657	30.4
30	543	33.7	622	37.6	569	37.7	648	41.7
40	533	43.6	612	48.9	561	47.7	640	53
50	524	53.6	603	60.2	553	57.7	632	64.2
60	516	63.6	595	71.5	545	67.6	624	75.5
70	508	73.6	587	82.8	538	77.6	617	86.8
80	501	83.5	580	94.1	530	87.6	609	98.1
90	494	93.5	573	105	523	97.6	602	109
100	488	104	567	117	516	108	595	121
110	-	-	-	-	-	-	-	-
120	-	-	-	-	-	-	-	-

## Dimensional sketches

Tank-top and dry installation



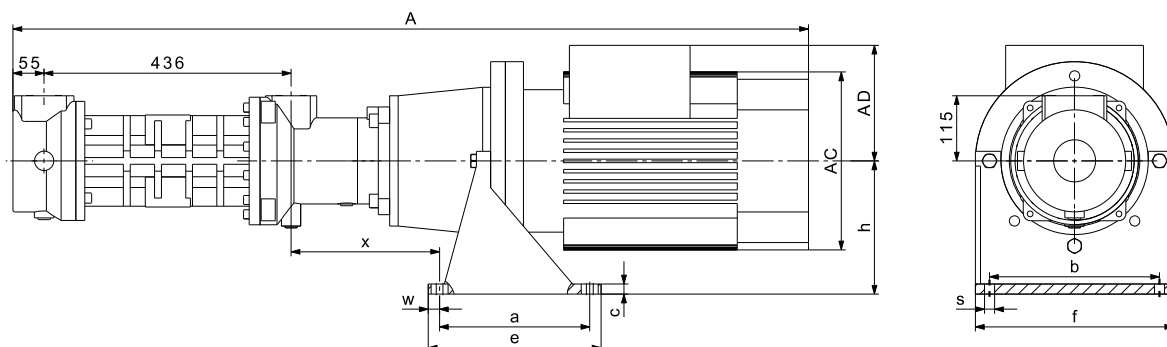
TM06 3323 4114

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]									Net weight [kg]	
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 280-30 R43	37	1635	1635	467	467	1168	1168	396	315	400	415	417
MTS 280-40 R43	55	1783	1783	467	467	1316	1316	497	410	550	440	577
MTS 280-50 R43	75	1856	1856	467	467	1389	1389	551	433	550	600	687
MTS 280-60 R43	75	1856	1856	467	467	1389	1389	551	433	550	710	687
MTS 280-70 R43	90	1966	1966	467	467	1499	1499	551	433	550	710	772
MTS 280-80 R43	90	1966	1966	467	467	1499	1499	551	433	550	795	772
MTS 280-90 R43	110	1958	1958	467	467	1491	1491	616	515	660	795	937
MTS 280-100 R43	110	1958	1958	467	467	1491	1491	616	515	660	960	937
MTS 280-20 R46	30	1610	1610	467	467	1143	1143	396	315	400	960	392
MTS 280-30 R46	45	1713	1713	467	467	1246	1246	449	338	450	415	491
MTS 280-40 R46	55	1783	1783	467	467	1316	1316	497	410	550	514	577
MTS 280-50 R46	75	1856	1856	467	467	1389	1389	551	433	550	600	687
MTS 280-60 R46	90	1966	1966	467	467	1499	1499	551	433	550	710	772
MTS 280-70 R46	90	1966	1966	467	467	1499	1499	551	433	550	795	772
MTS 280-80 R46	110	1958	1958	467	467	1491	1491	616	515	660	795	937
MTS 280-90 R46	110	1958	1958	467	467	1491	1491	616	515	660	960	937
MTS 280-100 R46	132	2123	2123	467	467	1656	1656	616	515	660	960	1067

### Dimensional sketches

Horizontal installation



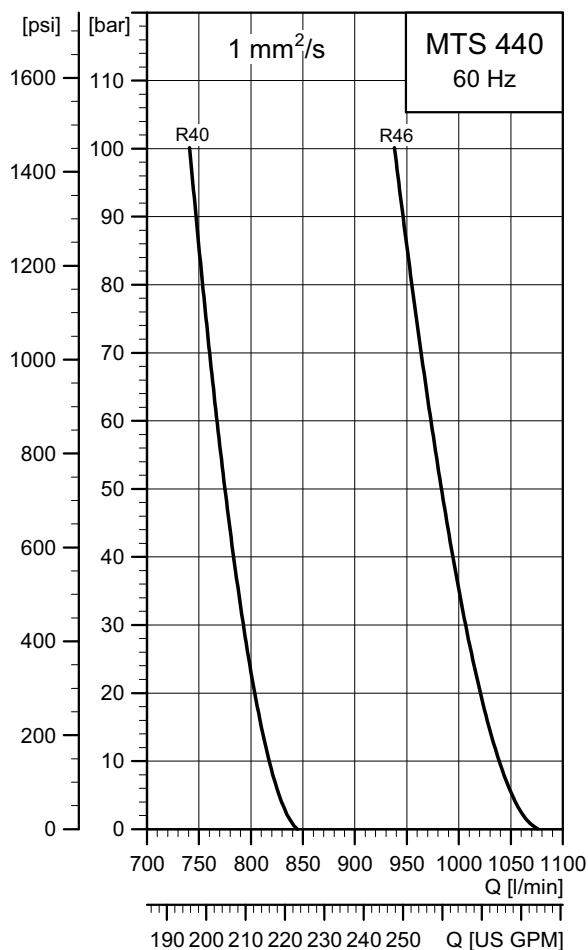
TM06 2287 4114

### Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 280-30 R43	37	1635	300	350	20	350	400	260	18	25	322	396	315	417
MTS 280-40 R43	55	1783	415	500	25	465	550	350	18	25	320	497	410	577
MTS 280-50 R43	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-60 R43	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-70 R43	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-80 R43	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-90 R43	110	1958	495	600	30	555	660	380	22	30	280	616	515	937
MTS 280-100 R43	110	1958	495	600	30	555	660	380	22	30	280	616	515	937
MTS 280-20 R46	30	1610	300	350	20	350	400	260	18	25	322	396	315	392
MTS 280-30 R46	45	1713	335	400	20	385	450	295	18	25	318	449	338	491
MTS 280-40 R46	55	1783	415	500	25	465	550	350	18	25	320	497	410	577
MTS 280-50 R46	75	1856	415	500	25	465	550	350	18	25	320	551	433	687
MTS 280-60 R46	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-70 R46	90	1966	415	500	25	465	550	350	18	25	320	551	433	772
MTS 280-80 R46	110	1958	495	600	30	555	660	380	22	30	280	616	515	937
MTS 280-90 R46	110	1958	495	600	30	555	660	380	22	30	280	616	515	937
MTS 280-100 R46	132	2123	495	600	30	555	660	380	22	30	280	616	515	1067

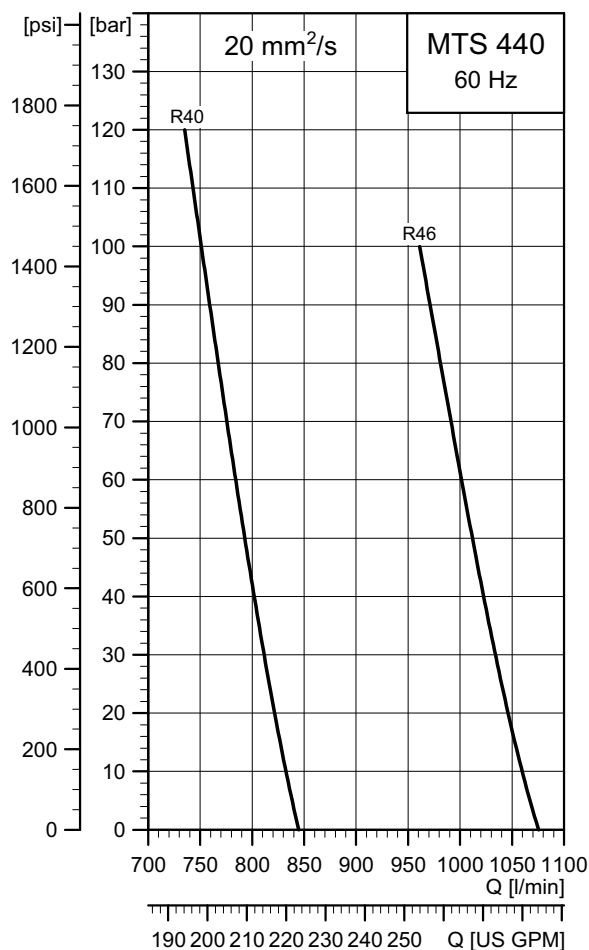
## Performance range

Performance data at 1 mm<sup>2</sup>/s  
(emulsion)



TM04 0056 2414

Performance data at 20 mm<sup>2</sup>/s  
(cutting oil with EP additives)

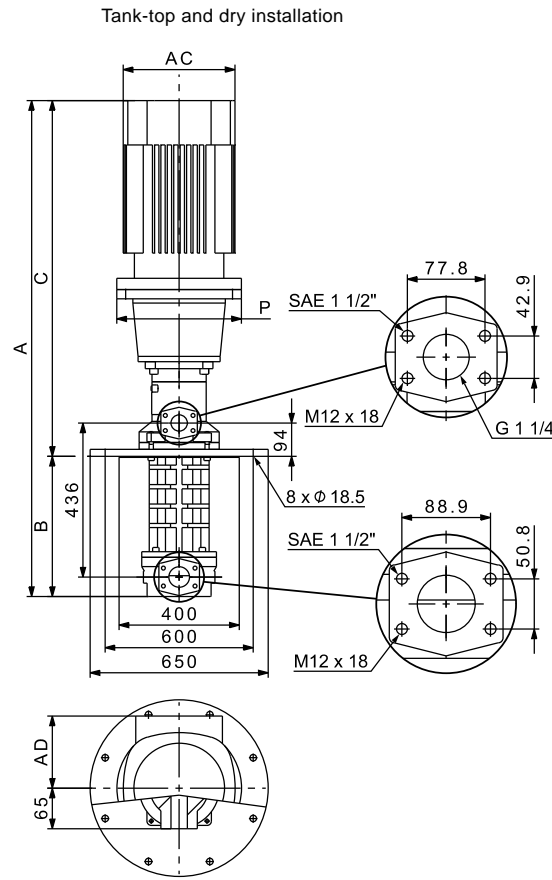


TM04 0057 2414

## Performance table

Pressure	1 mm <sup>2</sup> /s (emulsion)				20 mm <sup>2</sup> /s (cutting oil with EP additives)			
	R40		R46		R40		R46	
	Q	P	Q	P	Q	P	Q	P
bar	l/min	kW	l/min	kW	l/min	kW	l/min	kW
0	845	5.8	1076	5.8	845	12.1	1076	12.1
10	817	19.9	1039	23.7	832	26.2	1059	30
20	804	33.9	1021	41.6	822	40.3	1046	48
30	793	48	1006	59.6	811	54.4	1034	65.9
40	783	62.1	994	77.5	802	68.5	1023	83.8
50	775	76.2	983	95.4	793	82.5	1012	102
60	767	90.3	973	113	784	96.6	1001	120
70	760	104	964	131	776	111	991	138
80	754	119	955	149	767	125	981	156
90	747	133	946	167	759	139	971	174
100	741	147	938	185	751	153	961	191
110	-	-	-	-	743	167	-	-
120	-	-	-	-	735	181	-	-

Dimensional sketches



TM06 3324 4114

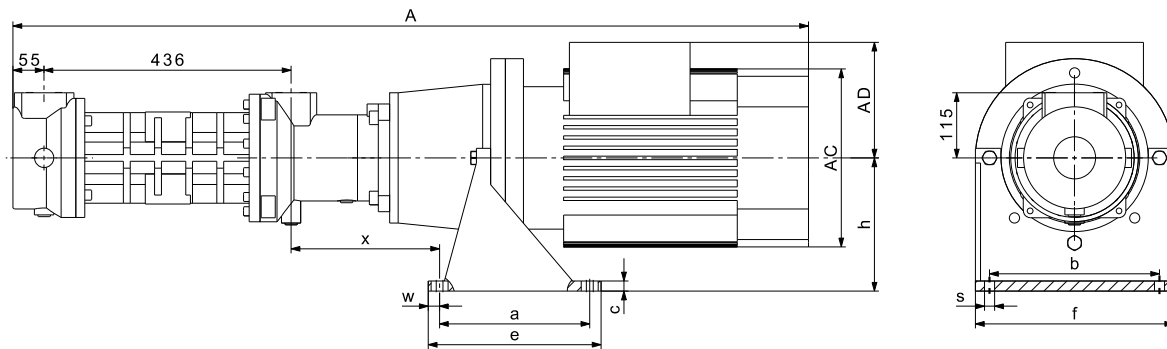
Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]						Net weight [kg]				
		A		B		C		AC	AD	P	Tank-top	Dry
		Tank-top	Dry	Tank-top	Dry	Tank-top	Dry					
MTS 440-20 R40	45	1791	1791	546	546	1245	1245	449	338	450	579	556
MTS 440-30 R40	55	1861	1861	546	546	1315	1315	497	410	550	665	642
MTS 440-40 R40	75	1934	1934	546	546	1388	1388	551	433	550	775	752
MTS 440-50 R40	90	2044	2044	546	546	1498	1498	551	433	550	860	837
MTS 440-60 R40	110	2071	2071	546	546	1525	1525	616	515	660	1025	1002
MTS 440-70 R40	110	2071	2071	546	546	1525	1525	616	515	660	1025	1002
MTS 440-80 R40	132	2236	2236	546	546	1690	1690	616	515	660	1155	1132
MTS 440-90 R40	160	2236	2236	546	546	1690	1690	616	515	660	1255	1232
MTS 440-100 R40	160	2236	2236	546	546	1690	1690	616	515	660	1255	1232
MTS 440-20 R46*	55	1861	-	546	-	1315	-	497	410	550	665	-
MTS 440-30 R46*	75	1934	-	546	-	1388	-	551	433	550	775	-
MTS 440-40 R46*	90	2044	-	546	-	1498	-	551	433	550	860	-
MTS 440-50 R46*	110	2071	-	546	-	1525	-	616	515	660	1025	-
MTS 440-60 R46*	132	2236	-	546	-	1690	-	616	515	660	1155	-
MTS 440-70 R46*	160	2236	-	546	-	1690	-	616	515	660	1255	-
MTS 440-80 R46*	160	2236	-	546	-	1690	-	616	515	660	1255	-
MTS 440-90 R46*	185	2391	-	546	-	1845	-	616	515	660	1425	-
MTS 440-100 R46*	185	2391	-	546	-	1845	-	616	515	660	1425	-

\* Not available for dry installation.

## Dimensional sketches

Horizontal installation



TM06 2287 4114

## Dimensions and weights

Pump type	P2 [kW]	Dimensions [mm]												Net weight [kg]
		A	a	b	c	e	f	h	s	w	x	AC	AD	
MTS 440-20 R40	45	1791	335	400	20	385	450	295	18	25	312	449	338	556
MTS 440-30 R40	55	1861	415	500	25	465	550	350	18	25	314	497	410	642
MTS 440-40 R40	75	1934	415	500	25	465	550	350	18	25	314	551	433	752
MTS 440-50 R40	90	2044	415	500	25	465	550	350	18	25	314	551	433	837
MTS 440-60 R40	110	2071	495	600	30	555	660	380	22	30	328	616	515	1002
MTS 440-70 R40	110	2071	495	600	30	555	660	380	22	30	328	616	515	1002
MTS 440-80 R40	132	2236	495	600	30	555	660	380	22	30	328	616	515	1132
MTS 440-90 R40	160	2236	495	600	30	555	660	380	22	30	328	616	515	1232
MTS 440-100 R40	160	2236	495	600	30	555	660	380	22	30	328	616	515	1232



## 5. NPSH curves for MTS pumps

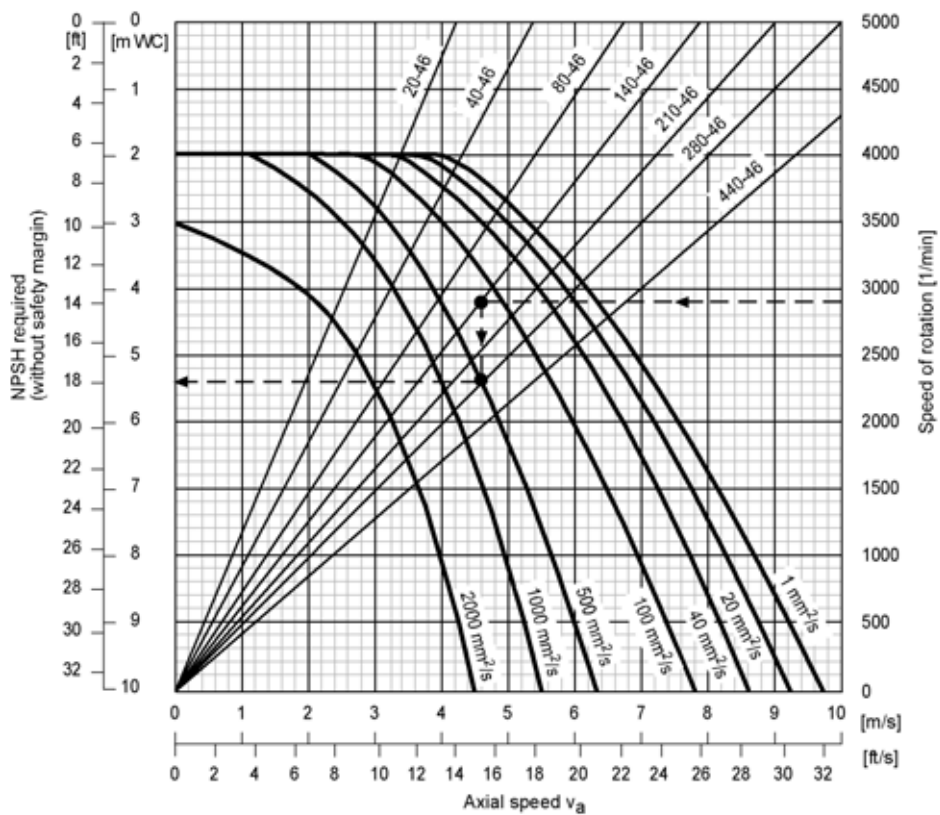
The performance curves refer to liquids without any air enclosed and show the beginning of aeration. For this reason, a safety margin of 0.5 m must be added to the NPSH value taken from the curve. For liquids with air inclusions (undissolved air), an additional value must be added to the NPSH value derived. When dealing with critical conditions in your plant, always consult Grundfos.

### Maximum allowable air content

Emulsion: 10 %

Oil: 7 %.

### Spindle pitch angle 46 degrees



TM04 4807 2109

### Example

#### Given:

- Size 140-46
- Speed  $n = 2900 \text{ min}^{-1}$
- Viscosity  $\nu = 500 \text{ mm}^2/\text{s}$

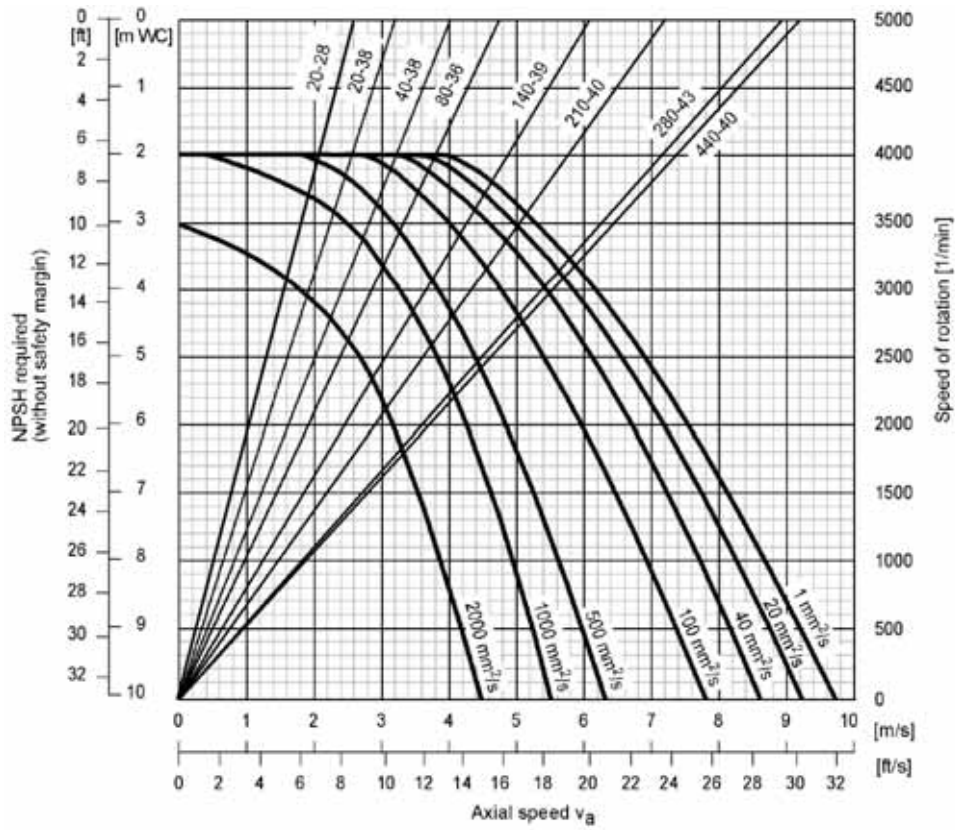
#### Wanted:

NPSH required.

#### Solution:

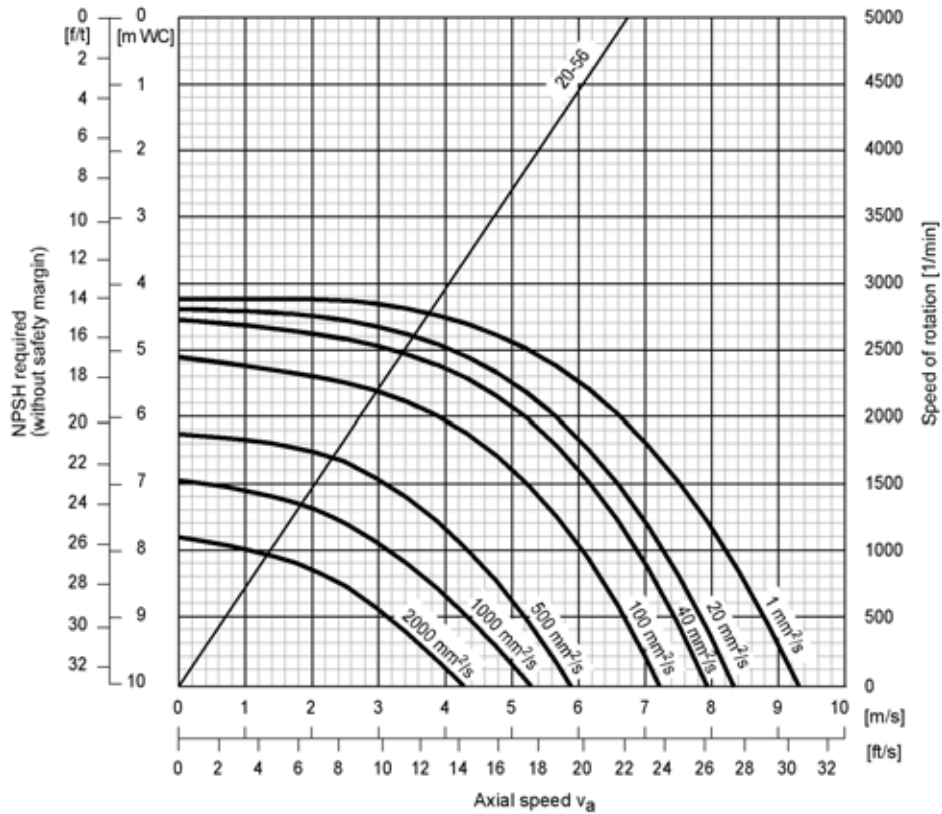
- NPSH taken from curve = 5.4 m H
- + safety margin 0.5 m
- = 5.9 m H.

### Spindle pitch angle smaller than 46 degrees



TM06 3113 4814

### Spindle pitch angle 56 degrees



TM04 4809 2109

## 6. Pumped liquids

### List of pumped liquids

The composition, oil content (ability to provide lubrication) and cooling effect of the liquid determine the pump maintenance intervals and maximum permissible performance data.

Cooling lubricants according to DIN 51 385 are divided into three groups according to water and oil content. The pump also pumps cooling lubricants with a very low lubricating effect, but very high cooling performance.

Cooling lubricant main group	Subgroup	Effect at the processing spot
L Solutions	Solutions of inorganic materials in water	Higher cooling effect, lower lubricating effect
	Solutions, dispersions of organic (synthetic materials in water)	
E Emulsions	Oil-in-water emulsions (Oil content E 2 to E 20 %)	Cooling-lubricating effect
S Petroleum-based cutting and grinding oils (natural and synthetic)	Cutting oils without additives (pure)	Higher lubricating effect, lower cooling effect
	Cutting oils with polar (physically effective) additives	
	Cutting oils with mild-effect (lubricating film forming) EP additives	Better surface adhesion provides protection against corrosion
	Cutting oils with polar and mild-effect EP additives	
	Cutting oils with active (chemical) EP additives	Higher temperature and pressure resistance
Cutting oils with polar and active EP additives		

### Filtration

To reach an acceptable pump life, we recommend that you filtrate the cooling lubricants to following cleanness classes according ISO 4406/99. The recommended cleanness class depends on pumping pressure and abrasive class 1 to 7. There are process examples for abrasive classes given below the table.

The additional specifications to filter mesh and mass proportion are guide values for orientation. The decisive factor is the cleanness of the liquid indicated by the cleanness class.

To avoid damage by coarse particles, we recommend that you use a filter mesh of 65 µm (nominal, two dimensional) and finer.

	Abrasive class						
	1	2	3	4	5	6	7
Material	steel, GG, Al	steel, GG, Al	Al (Si > 5 %)	steel	steel, hard.	hard metal	titanium
Process	drilling	turning/milling	turning/milling	grinding	grinding	grinding	grinding
Tool	HSS	hard metal	hard metal	corundum	corundum	CBN	diamond
Pressure stage							
≤ 120 bar	<b>21/19/16</b>	<b>21/19/16</b>	<b>21/19/16</b>	<b>20/18/15</b>	<b>20/18/15</b>	<b>19/17/14</b>	<b>18/16/13</b>
	≤ 30 µm	≤ 25 µm	≤ 20 µm	≤ 17 µm	≤ 15 µm	≤ 10 µm	≤ 6 µm
	≤ 30 mg/l	≤ 25 mg/l	≤ 20 mg/l	≤ 15 mg/l	≤ 10 mg/l	≤ 5 mg/l	≤ 3 mg/l
≤ 90 bar	<b>22/20/17</b>	<b>22/20/17</b>	<b>22/20/17</b>	<b>21/19/16</b>	<b>21/19/16</b>	<b>20/18/15</b>	<b>19/17/14</b>
	≤ 50 µm	≤ 45 µm	≤ 40 µm	≤ 30 µm	≤ 20 µm	≤ 15 µm	≤ 10 µm
	≤ 60 mg/l	≤ 50 mg/l	≤ 40 mg/l	≤ 30 mg/l	≤ 20 mg/l	≤ 10 mg/l	≤ 5 mg/l
≤ 60 bar	<b>23/21/18</b>	<b>23/21/18</b>	<b>23/21/18</b>	<b>22/20/17</b>	<b>22/20/17</b>	<b>21/19/16</b>	<b>20/18/15</b>
	≤ 80 µm	≤ 75 µm	≤ 60 µm	≤ 50 µm	≤ 40 µm	≤ 20 µm	≤ 15 µm
	≤ 120 mg/l	≤ 100 mg/l	≤ 80 mg/l	≤ 60 mg/l	≤ 40 mg/l	≤ 20 mg/l	≤ 10 mg/l
≤ 30 bar	<b>24/22/19</b>	<b>24/22/19</b>	<b>24/22/19</b>	<b>23/21/18</b>	<b>23/21/18</b>	<b>22/20/17</b>	<b>21/19/16</b>
	≤ 150 µm	≤ 120 µm	≤ 100 µm	≤ 80 µm	≤ 60 µm	≤ 40 µm	≤ 20 µm
	≤ 250 mg/l	≤ 200 mg/l	≤ 160 mg/l	≤ 120 mg/l	≤ 80 mg/l	≤ 40 mg/l	≤ 20 mg/l

## 7. Motor data

### Mains-operated motors for MTS, 50 Hz

#### MG motors



TM03 1711 2805

Motor $P_2$ [kW]	Frame size	Efficiency class	Standard voltage [V]	$I_{1/1}$ [A]	$\cos \varphi_{1/1}$	$\eta$ [%]	$\frac{I_{start}}{I_{1/1}}$ [%]
1.50	90SB	IE3	3 x 220 - 240 $\Delta$ / 380 - 415Y	5.45 / 3.15	0.87 - 0.82	84.2	850-1050
2.20	90LC			7.70 / 4.45	0.89 - 0.87	85.9	850-1100
3.00	100LC			11.0 / 6.30	0.87 - 0.82	87.1	840-1100
4.00	112MC			13.6 / 7.90	0.87	88.1	1000-1470
5.50	132SC			19.0 / 11.0	0.87 - 0.82	89.2	1080-1480
7.50	132SB			25.0 - 24.2 / 14.4 - 14.0	0.88 - 0.82	90.1 - 90.4	780-1050
11.0	160MB			36.0 - 34.5 / 20.8 - 19.8	0.88 - 0.84	91.2	660-890
15.0	160MD			48.5 - 45.0 / 28.0 - 26.0	0.89 - 0.87	91.9	660-890
18.5	160LB			59.5 - 56.5 / 34.5 - 32.5	0.89 - 0.85	92.4	830-1100
22.0	180MB			68.5 / 39.5	0.90	92.7	830-1040
1.50	90SB	IE3	3 x 380 - 415 $\Delta$	3.15	0.87 - 0.82	84.2	850-1050
2.20	90LC			4.45	0.89 - 0.87	85.9	850-1100
3.00	100LC			6.30	0.87 - 0.82	87.1	840-1100
4.00	112MC			7.90	0.87	88.1	1000-1470
5.50	132SC			11.0	0.87 - 0.82	89.2	1080-1480
7.50	132SB	IE3	3 x 380 - 415 $\Delta$ / 660 - 690Y	14.4 - 14.0 / 8.30 - 8.10	0.88 - 0.86	90.4	780-1050
11.0	160MB			20.8 - 19.8 / 12.0 - 11.8	0.88 - 0.84	91.2	660-890
15.0	160MD			28.0 - 26.0 / 16.2 - 15.6	0.89 - 0.87	91.9	660-890
18.5	160LB			34.5 - 32.5 / 20.0 - 18.8	0.89 - 0.85	92.4	830-1100
22.0	180MB			39.5 / 22.8	0.90	92.7	830-1040

#### Siemens motors



TM03 1710 2805

Motor $P_2$ [kW]	Frame size	Efficiency class	Standard voltage [V]	$I_{1/1}$ [A]	$\cos \varphi_{1/1}$	$\eta$ [%]	$\frac{I_{start}}{I_{1/1}}$ [%]
30	200L	IE3	3 x 380 - 420 $\Delta$ / 660 - 725Y	56.0 - 51.0 / 32.0 - 29.5	0.86	93.3	660
37	200L			68.0 - 63.0 / 39.0 - 36.0	0.87	93.7	670
45	225M			82.0 - 75.0 / 47.5 - 43.5	0.89	94.0	690
55	250M			99.0 - 92.0 / 57.0 - 53.0	0.89	94.3	670
75	280S			134-126 / 77.0 - 72.0	0.89	94.7	680
90	280M			160-148 / 92.0 - 85.0	0.90	95.0	720
110	315S			192-176 / 110-102	0.91	95.2	710
132	315M			230-210 / 134-122	0.91	95.4	720
160	315L			280-255 / 162-148	0.92	95.6	780
200	315L			345-310 / 200-180	0.92	95.8	720

## Mains-operated motors for MTS, 60 Hz

### MG motors



TM03 1711 2805

Motor P <sub>2</sub> [kW]	Frame size	Efficiency class	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η [%]	I <sub>start</sub> /I <sub>1/1</sub> [%]
1.50	90SB	IE2 - IE3	3 x 220 - 277Δ / 380 - 480Y	5.35 - 4.70 / 3.10 - 2.70	0.90 - 0.81	84.2	850-1050
2.20	90LC	IE2 - IE3		7.70 - 6.35 / 4.45 - 3.70	0.91 - 0.85	85.9	850-1100
3.00	100LC	IE2 - IE3		10.8 - 9.35 / 6.20 - 5.40	0.91 - 0.84	87.1	840-1100
4.00	112MC	IE3		13.6 - 11.8 / 7.80 - 6.80	0.91 - 0.82	88.1	1000-1470
5.50	132SC	IE3		18.4 - 16.2 / 10.6 - 9.30	0.90 - 0.80	89.2	1080-1480
7.50	132SB	IE2 - IE3		24.6 - 20.8 / 14.2 - 12.0	0.90 - 0.82	90.4	780-1050
11.0	160MB	IE2 - IE3		36.0 - 30.0 / 20.8 - 17.2	0.89 - 0.83	91.2	660-890
15.0	160MD	IE2 - IE3		48.5 - 39.0 / 28.0 - 22.4	0.90 - 0.86	91.9	660-890
18.5	160LB	IE2 - IE3		59.5 - 48.5 / 34.5 - 28.0	0.89 - 0.84	92.4	830-1100
22.0	180MB	IE3		69.5 - 56.5 / 40.0 - 32.5	0.91	92.7	830-1040
1.50	90SB	IE2 - IE3	3 x 380 - 480Δ / 660 - 690Y	3.10 - 2.70	0.90 - 0.81	84.2	850-1050
2.20	90LC	IE2 - IE3		4.45 - 3.70	0.91 - 0.85	85.9	850-1100
3.00	100LC	IE2 - IE3		6.20 - 5.40	0.91 - 0.84	87.1	840-1100
4.00	112MC	IE3		7.80 - 6.80	0.91 - 0.82	88.1	1000-1470
5.50	132SC	IE3		10.6 - 9.30	0.90 - 0.80	89.2	1080-1480
7.50	132SB	IE2 - IE3		14.2 - 12.0 / 8.20 - 8.10	0.90 - 0.82	90.1 - 90.4	780-1050
11.0	160MB	IE2 - IE3		20.8 - 17.2 / 12.0 - 11.6	0.89 - 0.83	91.2	660-890
15.0	160MD	IE2 - IE3		28.0 - 22.4 / 16.2 - 15.6	0.90 - 0.86	91.9	660-890
18.5	160LB	IE2 - IE3		34.5 - 28.0 / 20.0 - 16.6	0.89 - 0.84	92.4	830-1100
22.0	180MB	IE3		40.0 - 32.5 / 23.0 - 22.2	0.91	92.7	830-1040

### Siemens motors



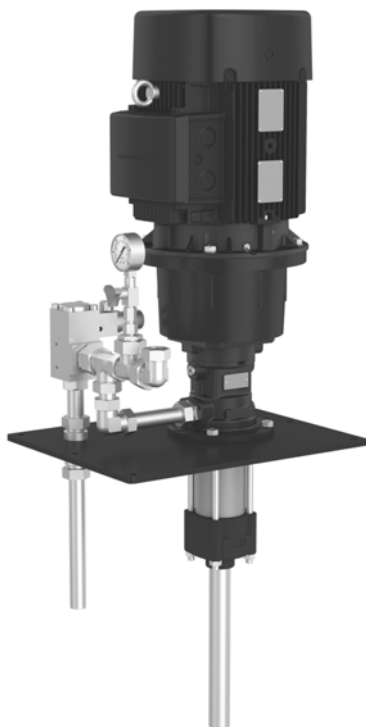
TM03 1710 2805

Motor P <sub>2</sub> [kW]	Frame size	Efficiency class	Standard voltage [V]	I <sub>1/1</sub> [A]	Cos φ <sub>1/1</sub>	η [%]	I <sub>start</sub> /I <sub>1/1</sub> [%]
30.0	200L	IE3	3 x 380 - 420Δ / 660 - 725Y	56.0 - 50.0 / 32.0 - 29.0	0.89	92.4	610
37.0	200L	IE3		69.0 - 62.0 / 38.5 - 35.0	0.90	93.0	580
45.0	225M	IE3		81.0 - 73.0 / 47.0 - 42.0	0.90	94.2	760
55.0	250M	IE3		96.0 - 89.0 / 55.0 - 51.0	0.90	94.0	730
75.0	280S	IE2		136 - 122 / 78.0 - 70.0	0.90	93.8	740
90.0	280M	IE2		162 - 146 / 93.0 - 84.0	0.91	94.4	780
110	315S	IE3		194 - 174 / 112 - 102	0.91	95.1	780
132	315M	IE2		230 - 210 / 134 - 122	0.92	94.8	800
160	315L	IE2		260 - 236 / 150 - 136	0.92	95.3	910
200	315L	IE2		320 - 285 / 186 - 166	0.92	95.0	850

## 8. System solutions

### MTS pump system

Assembled MTS pump system with MTS screw pump, mounting plate, pressure relief valve and piping.



TM05 4422 2312

### Features and benefits

#### Fully integrated all-in-one system

All components, including valves, are preassembled to customer specifications.

#### Pump design

The pumps are screw pumps designed for pumping cooling lubricants and cutting oils for machine tool applications.

#### Long lifetime

Highly wear resistant, PVD coated spindles and special, hardened rotor housing extend the lifetime.

#### High-efficiency motor

IE2 motors are standard, and IE3 motors are optional.

#### Economical pump operation

- Pump efficiency above 80 %,
- low heat transfer into the coolant system,
- low cooling requirements.

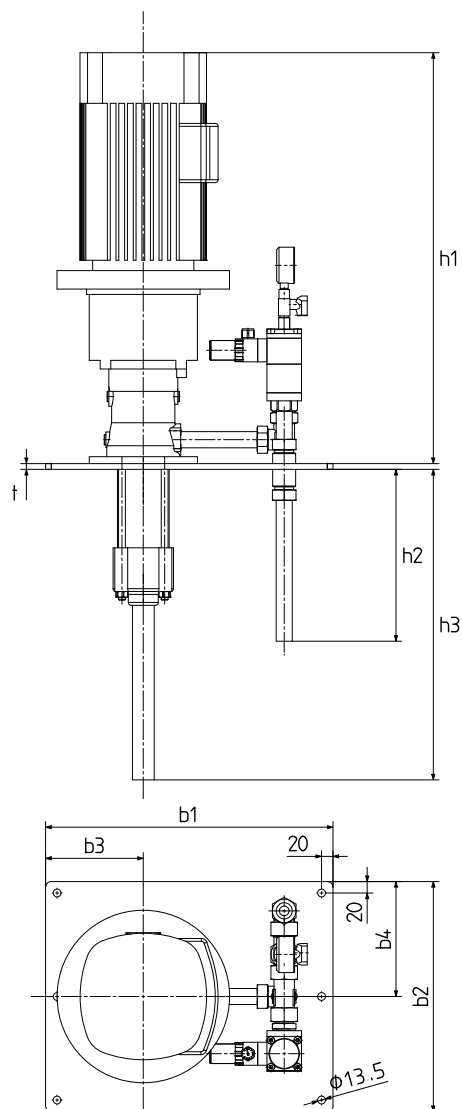
#### Noiseless

The design of MTS allows gentle, pulsation-free and low-noise pumping.

#### Wide pump range

- seven pump sizes
- 16 versions.

### Dimensional sketches



TM05 4423 2212

### Dimensions

Pump type	Dimensions [mm]						
	t	h1	h2	h3	b1	b2	b3
MTS 20	10	*	250	**	500	400	170
MTS 40	10		290		500	400	170
MTS 80							
MTS 140							
MTS 210							
MTS 280							
MTS 440							

\* See section [Technical data](#) on page 15.




\*\* On request

## Pressure relief valves

Screw spindle pumps are positive-displacement pumps which must be pressure controlled in order to protect the motor and pipe system. The pumped liquid which is not needed is returned to the tank via the pressure relief valve. Selection of valves depends on the following factors:

- required pressure, flow rate and viscosity of the pumped liquid
- required valve adjustability/control.

The pressure relief valves below are especially designed for use in coolant applications.

Type	Description	
H	<p>Manually operated, continuously adjustable pressure relief valve.</p> <ul style="list-style-type: none"> <li>• The valve working pressure can be adjusted by means of a hand wheel.</li> </ul>	 <p style="writing-mode: vertical-rl; transform: rotate(180deg);">TM05 4391 2212</p>
P	<p>Manually operated, continuously adjustable pressure relief valve with air pilot valve and solenoid valve for pressureless circulation.</p> <ul style="list-style-type: none"> <li>• The valve working pressure can be adjusted by means of a hand wheel.</li> <li>• Circulation with minimised pressure can be electrically activated. The valve is open at zero current and pressure.</li> </ul>	 <p style="writing-mode: vertical-rl; transform: rotate(180deg);">TM05 4390 2212</p>
E	<p>Electrically controlled, continuously adjustable pressure relief valve with proportional solenoid air pilot valve.</p> <ul style="list-style-type: none"> <li>• The vario valve type enables the setting of any pressure from 5 to 120 bar. For pressure regulation, the machine control sends an analogue signal (0-10 V). The pneumatic control pressure is changed in proportion to the analogue signal and regulates the working pressure.</li> <li>• The valve is open in case of power loss or loss of pressure.</li> </ul>	 <p style="writing-mode: vertical-rl; transform: rotate(180deg);">TM05 4392 2212</p>

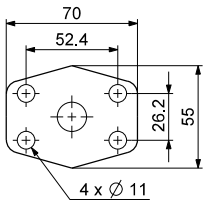
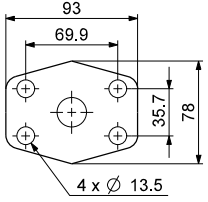
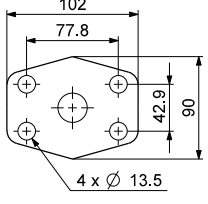
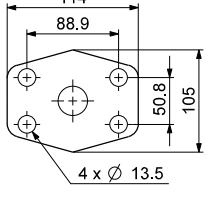
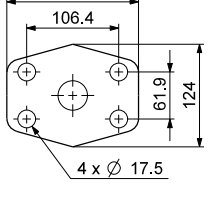
## Customisation

The pump system can be customised to fit your special needs. Please contact Grundfos.

## 9. Accessories

### Counter flanges for discharge port

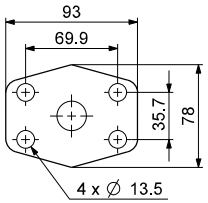
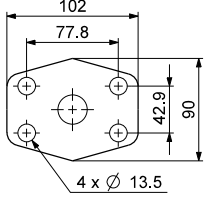
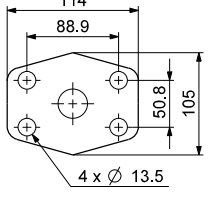
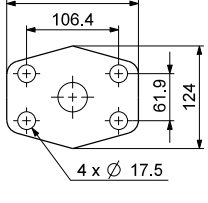
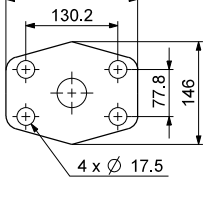
A set consists of one counter flange, one O-ring, bolts and lock washers.

SAE flange	Pump type	SAE size	Description	Rated pressure	Pipework connection	Product number
	MTS 20 MTS 40	1"	Threaded For welding	345 bar 160 bar	G1 25 mm, nominal	96397165 96397171
	MTS 80 MTS 140	1 1/2"	Threaded For welding	207 bar 160 bar	G1 1/2 38 mm, nominal	96397166 96397172
	MTS 210	2"	Threaded For welding	207 bar 160 bar	G2 49 mm, nominal	96397167 96397173
	MTS 280	2 1/2"	Threaded For welding	172 bar 160 bar	G2 1/2 62 mm, nominal	96397168 96397174
	MTS 440	3"	Threaded For welding	138 bar 160 bar	G3 62 mm, nominal	96397169 96397175



### Counter flanges for suction port (only D8.6)

A set consists of one counter flange, one O-ring, bolts and lock washers

SAE flange	Pump type	SAE size	Description	Rated pressure	Pipework connection	Product number
	MTS 20 MTS 40	1 1/2"	Threaded For welding	207 bar 160 bar	G1 1/2 38 mm, nominal	96397166 96397176
	MTS 80 MTS 140	2"	Threaded For welding	207 bar 160 bar	G2 49 mm, nominal	96397167 96397177
	MTS 210	2 1/2"	Threaded For welding	172 bar 160 bar	G2 1/2 62 mm, nominal	96397168 96397178
	MTS 280	3"	Threaded For welding	138 bar 160 bar	G3 74 mm, nominal	96397169 96397179
	MTS 440	4"	Threaded For welding	345 bar 160 bar	G4 102 mm, nominal	96397170 96397180

## 10. Grundfos Product Center

Online search and sizing tool to help you make the right choice.

<http://product-selection.grundfos.com>



**SIZING** enables you to size a pump based on entered data and selection choices.

**REPLACEMENT** enables you to find a replacement product. Search results will include information on

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.

The screenshot shows the Grundfos Product Center website. At the top, there is a navigation bar with the Grundfos logo and 'PRODUCT CENTER'. Below this is a search bar with a 'SEARCH' button. The main content area features four large buttons: 'SIZING' (Enter pump sizing), 'CATALOGUE' (Products and services), 'REPLACEMENT' (Replace an old pump with a new), and 'LIQUIDS' (Find pump by liquid). Below these buttons is a 'QUICK SIZING' section with input fields for 'Flow (Q)\*' and 'Head (H)\*', and radio buttons for 'Select what to size by: Size by application', 'Size by pump design', and 'Size by pump family'. A 'START SIZING' button is also present. At the bottom of the screenshot, there are callout boxes explaining each feature: 'SIZING' enables you to size a pump based on entered data and selection choices; 'REPLACEMENT' enables you to find a replacement product, with search results including information on the lowest purchase price, lowest energy consumption, and lowest total life cycle cost; 'CATALOGUE' gives you access to the Grundfos product catalogue; and 'LIQUIDS' enables you to find pumps designed for aggressive, flammable or other special liquids.

### All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

### Downloads

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc. in PDF format.



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