MTB

Centrifugal machine tool pumps

50/60 Hz

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Table of contents

1. General description

Introduction

The MTB machine tool pumps are single-stage centrifugal pumps with axial suction port and radial discharge port.

The unique SuperVortex impeller is capable of handling solids and swarf up to 20 mm.

The pump is directly coupled to a totally enclosed fan-cooled standard motor. Main dimensions are according to IEC and DIN standards.

Applications

The MTB pumps are designed specifically for industrial machine tool and cleaning applications, such as

- machining centres
- cooling systems
- grinding machines
- lathes
- parts-cleaning systems.

Special features

Due to the back-pull-out design, the motor and impeller can be removed without dismantling the pump housing or pipework. This enables a single person with a crane to service even the largest pump.

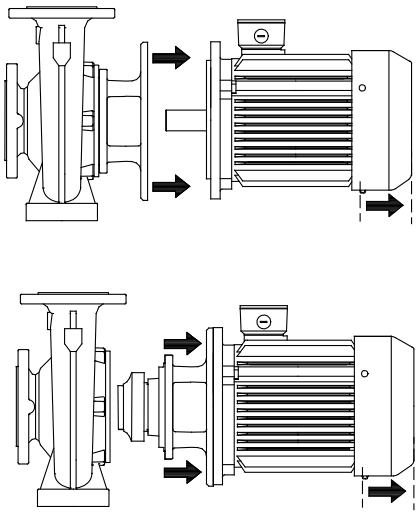

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Fig. 1 Back-pull-out design

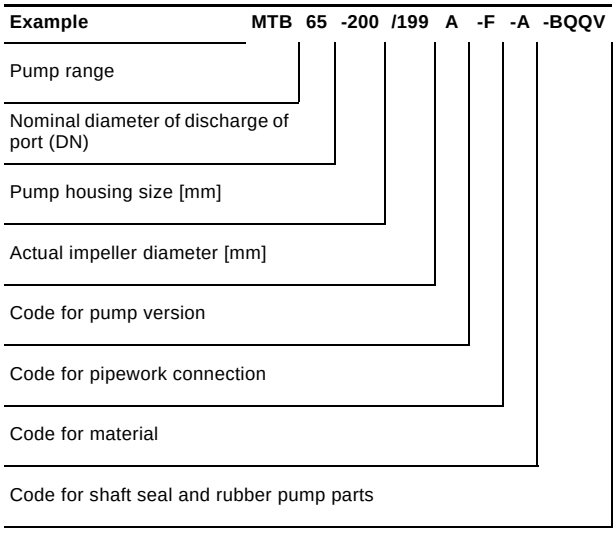
Additional features

- IE3 motor as standard
- excellent solids handling capabilities
- good air handling
- LiqTec sensor ensuring that the pump will stop immediately in the event of dry running
- motor with integrated frequency converter as an option
- different shaft seal solutions
- full range of industrial pumps.

3D CAD drawings and technical information can be found in the Grundfos pump selection tools, WebCAPS and WinCAPS. See pages 30 to 31.

2. Identification

Type key



The example describes an MTB 65-200 pump with an actual impeller diameter of 199 mm, of the basic version, with DIN flanges, made of cast iron and with a BQQV shaft seal.

Codes in type key

Code	Example	A	- F	- A	- B	Q Q	V
	Pump version						
A	Basic version						
	Pipe connection						
F	DIN flange						
	Materials						
A	Cast iron						
	Shaft seal						
B	Rubber bellows seal						
Q	Silicon carbide (SiC)						
E	EPDM						
V	FKM						

The pump is fitted with FKM O-rings as standard.

Pump types and data

Pump type		Mounting design	P2 [kW]	Number of poles	Page
50 Hz	MTB 50-200/215	A	3.0	4	16
	MTB 65-160/158	A	5.5	2	18
	MTB 65-160/171	A	7.5	2	18
	MTB 65-200/183	B	11	2	20
	MTB 65-200/199	B	15	2	20
60 Hz	MTB 50-200/183	A	3.0	4	22
	MTB 50-200/199	A	4.0	4	22
	MTB 50-200/215	A	5.5	4	22
	MTB 65-125/144	A	7.5	2	24
	MTB 65-160/158	B	11	2	26
	MTB 65-160/171	B	15	2	26

3. Construction

Sectional drawing

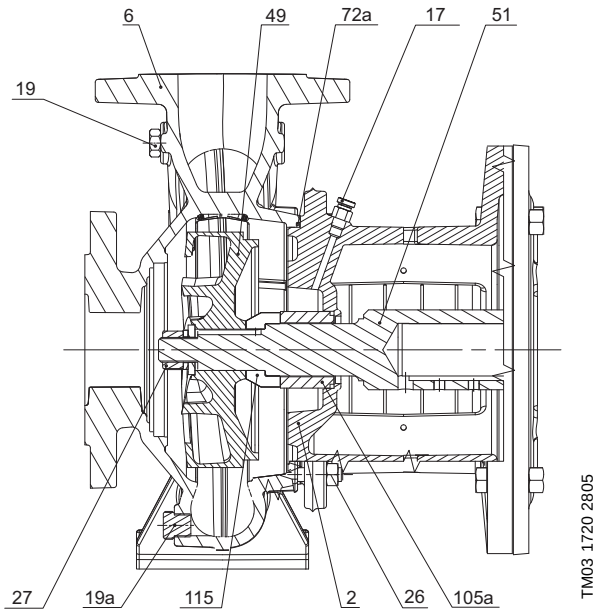


Fig. 2 Sectional drawing, MTB 50-200

Material specification

Pos.	Description	Material
2	Integrated motor stool	Cast iron, EN-GJL-250
6	Pump housing	Cast iron, EN-GJL-250
17	Air vent screw	Brass
19	Plug	-
19a	Plug	-
26	Nut	-
27	Nut	-
49	Impeller	Cast iron, EN-GJL-250
51	Pump shaft	Stainless steel, AISI 304
72a	O-ring	FKM
105a	Mechanical shaft seal	Burgmann 1.4401/AISI 316
115	Spacer	Stainless steel, AISI 304

Mounting

MTB pumps are available in these mounting designs:

- Design A: pump housing with feet
- Design B: motor with feet.

See figures 3 and 4.

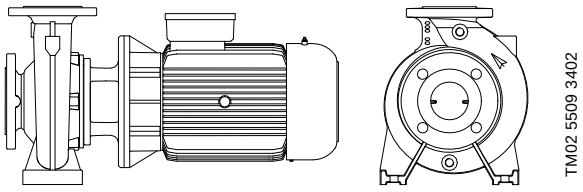


Fig. 3 MTB, design A

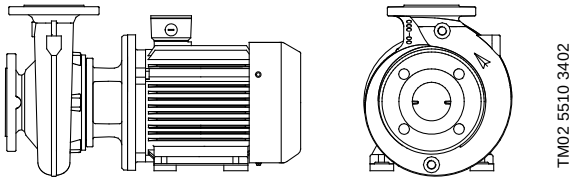


Fig. 4 MTB, design B

Pump type	Mounting design	
	50 Hz	60 Hz
MTB 50-200	A	A
MTB 60-125	-	A
MTB 65-160	A	B
MTB 65-200	B	-

Pump housing

Volute pump housing made of cast iron with axial suction port and radial discharge port.
Flange connection dimensions are in accordance with EN 1092-2.

The bottom of the pump housing incorporates a drain plug.

The discharge port has a priming plug.

Integrated motor stool

The integrated motor stool connecting pump housing and motor is provided with a manual air vent screw for the venting of pump housing and seal chamber.
An O-ring provides a seal between the integrated motor stool and the pump housing.

Coupling guards are fitted in the central part of the integrated motor stool.

To remove the integrated motor stool from the pump housing, use a lever between the pump housing and the integrated motor stool.

MTB pumps are fitted with the following motor mounting designations:

- IM B 5: up to and including frame size 132
- IM B 35: as from frame size 160 and upwards.

Shaft

Stainless-steel shaft, ∅28 or ∅38.

The coupling end of the shaft is cylindrical and has two drilled holes for the set screws of the coupling.

Shaft seal

MTB pumps are fitted with an unbalanced, mechanical SiC/SiC shaft seal.

Maximum operating temperature and pressure

Shaft seal	Operating temperature	Max. operating pressure
BQQV	0 °C to +90 °C	16 bar
BQQE	0 °C to +90 °C	16 bar

Coupling

MTB pumps are fitted with a cylindrical, hollow steel coupling secured by two hexagon socket head set screws.

Impeller

The semi-open impeller is made of cast iron.

All MTB pumps are dynamically balanced. The impeller is hydraulically balanced to compensate for axial thrust.

The impeller is extremely suitable for handling solids and swarf.

Spherical impeller clearance: Max. 20 mm.

Note: When viewed from the motor fan, the impeller should rotate clockwise.

Surface treatment

All stationary cast-iron parts are dip-painted with water-based ether-epoxy no-lead paint.
Thickness: 25 µm ± 5 µm.

In addition, the product is spray-painted with black water-based ether-epoxy no-lead paint (NCS 9000/ RAL 9005). Thickness: 35 µm ± 5 µm.

Test pressure

Prior to delivery, the pumps have been tested at 1.5 times maximum operating pressure.

Test requirements according to EN 733 are 1.3 times maximum operating pressure.

Test liquid: Water at 20 °C.

Motor

MTB pumps are equipped with a totally enclosed, fan-cooled, IE3 motor with main dimensions to IEC and DIN standards.

IE3 motor range			
	Output P2 [kW]	**2-pole**	**4-pole**
50 Hz	3.0		MG, model H
	5.5	MG, model H	
	7.5		
	11		
	15		
60 Hz	3.0		MG, model H
	4.0		
	5.5		
	7.5	MG, model H	
	11.0		
	15.0		

Motor data

Flange types	Type IM B5 for motors up to frame size 132, according to IEC 60034. Type IM B35 for motor frame size 160, according to IEC 60034.
Insulation class	F, according to IEC 85
Electrical tolerances	According to VDE 0530
Efficiency class	IE3
Enclosure class	IP55
Supply voltage, 50 Hz	3 x 220-240 V Δ / 380-415 V Y 3 x 380-415 V Δ 3 x 380-415 V Δ / 660-690 V Y
Supply voltage, 60 Hz	3 x 220-277 V Δ / 380-480 V Y 3 x 380-480 V Δ 3 x 380-480 V Δ / 660-690 V Y
MTB pumps are also available for special voltage	
Supply voltage, 50 Hz	3 x 200-220 V Δ / 346-380 V Y
Supply voltage, 60 Hz	3 x 200-230 V Δ / 346-400 V Y

The motor must be connected to a motor starter in accordance with local regulations.

4. Operating conditions

Inlet pressure

Minimum inlet pressure according to the NPSH curve plus a safety allowance of at least 2 m. The maximum inlet pressure is limited by the maximum operating pressure.

Minimum inlet pressure - NPSH

We recommend to calculate the inlet pressure "H" in these cases:

- The liquid temperature is high.
- The flow is significantly higher than the rated flow rate.
- Water is drawn from depths.
- Water is drawn through long pipes.
- Inlet conditions are poor.

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

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

p_b	=	Barometric pressure in bar. (Barometric pressure can be set to 1 bar.) In closed systems, p_b indicates the system pressure in bar.
NPSH	=	Net Positive Suction Head in metres head. (To be read from the NPSH curve at the highest flow the pump will be delivering.)
H_f	=	Friction loss in suction pipe in metres head. (At the highest flow the pump will be delivering.)
H_v	=	Vapour pressure in metres head. (To be read from the vapour pressure scale. "H_v" depends on the liquid temperature "T_m".)
H_s	=	Safety margin = minimum 2 metres head.

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

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

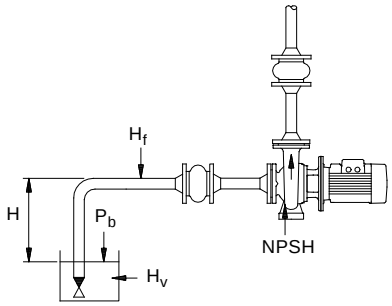


Fig. 5 Schematic view of open system with MTB pump

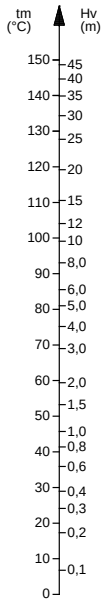


Fig. 6 Relation between liquid temperature and vapour pressure

Check that the pump is not and will not be exposed to cavitation.

Maximum operating pressure

Up to +90 °C: 1.6 MPa (16 bar).

Ambient temperature and altitude

Motor make	Motor efficiency class	Max. ambient temperature [°C]	Max. altitude above sea level [m]
Grundfos MG	IE3	+60	3500

The ambient temperature and the installation altitude are important factors for the motor life, as they affect the life of the bearings and the insulation system.

If the ambient temperature exceeds the recommended maximum ambient temperature or maximum altitude above sea level, the motor must not be fully loaded 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.

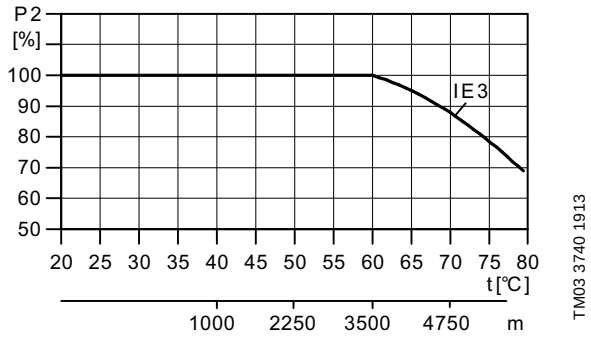


Fig. 7 Maximum motor output in relation to ambient temperature and altitude

5. Installation

Positioning

The pump should never be installed with the motor pointing downwards.

If after installation of the pump the terminal box is pointing downwards, turn the motor to the required position.

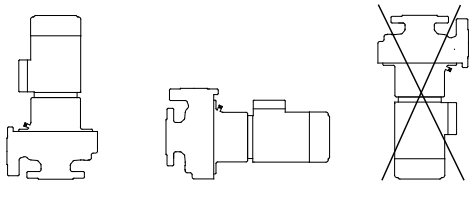


Fig. 8 Installation

Vertical installation

- Pumps fitted with 3-4 kW motors require at least 300 mm clearance above the motor. See fig. 9.
- Pumps fitted with motors of 5.5 kW and up require at least 1 m clearance above the motor to allow the use of lifting equipment. See fig. 9.

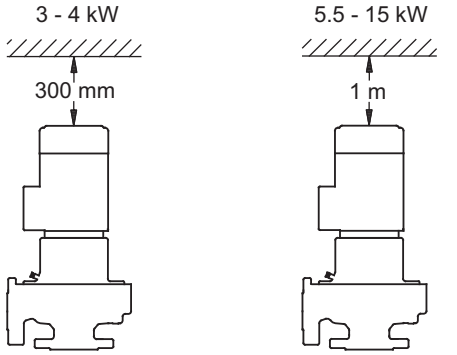


Fig. 9 Vertical installation

Horizontal installation

- Pumps fitted with 3-4 kW motors require at least 300 mm clearance behind the motor. See fig. 10.
- Pumps fitted with motors of 5.5 kW and up require at least 300 mm clearance behind the motor and at least 1 m clearance above the motor to allow the use of lifting equipment. See fig. 10.

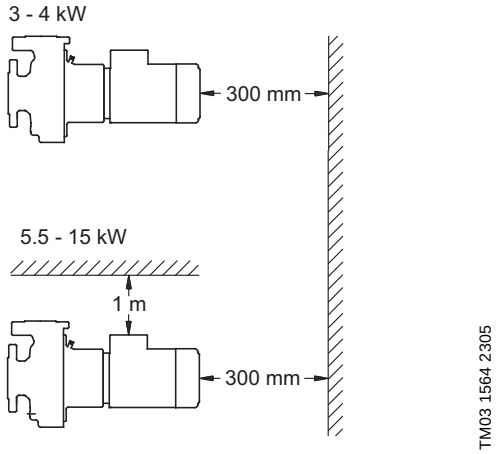


Fig. 10 Horizontal installation

Pipework

When installing the pipes, make sure that the pump housing is not stressed by the pipework.

The suction and discharge pipes must be of an adequate size, taking the pump inlet pressure into account.

Foundation

We recommend that you install the pump on a plane and rigid concrete foundation which is heavy enough to provide permanent support for the entire pump. As a rule of thumb, the weight of the concrete foundation should be 1.5 times the pump weight. See fig. 11.

Elimination of noise and vibration

In order to achieve optimum operation and minimum noise and vibration, consider vibration dampening of the pump. Generally, always consider this for pumps with motors above 7.5 kW. Smaller motor sizes, however, may also cause undesirable noise and vibration.

Noise and vibration are generated by the revolutions of the motor and pump and by the flow in pipes and fittings. The effect on the environment is subjective and depends on correct installation and the state of the remaining system.

Elimination of noise and vibrations is best achieved by means of vibration dampers and expansion joints. See fig. 11.

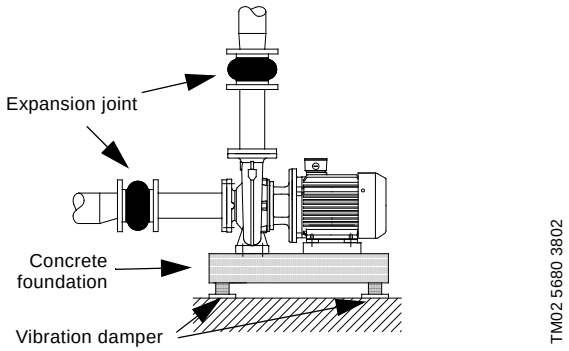


Fig. 11 MTB pump with expansion joints and vibration dampers

Vibration dampers

To prevent the transmission of vibrations to buildings, we recommend you to isolate the pump foundation from building parts by means of vibration dampers.

The selection of the right vibration damper requires the following data:

- forces transmitted through the damper
- motor speed considering speed control, if any
- required dampening in % (suggested value is 70 %).

Which is the right damper varies from installation to installation, and a wrong damper may increase the vibration level. Vibration dampers should therefore be sized by the supplier.

Expansion joints

If you install the pump on a foundation with vibration dampers, always fit expansion joints on the pump flanges. This is important to prevent the pump from "hanging" in the flanges.

Install expansion joints to

- absorb expansions/contractions in the pipework caused by changing liquid temperature
- reduce mechanical strains in connection with pressure surges in the pipework
- isolate mechanical structure-borne noise in the pipework (only rubber bellows expansion joints).

Note: Do not install expansion joints to compensate for inaccuracies in the pipework such as centre displacement of flanges.

Fit expansion joints at a distance of minimum 1 to 1½ times the nominal flange diameter away from the pump on the suction as well as on the discharge side. This will prevent the development of turbulence in the expansion joints, resulting in better suction conditions and a minimum pressure loss on the pressure side. At high water velocities (> 5 m/s), we recommend you to install larger expansion joints corresponding to the pipework.

We always recommend expansion joints with limiting rods for flanges larger than DN 100.

6. Selection of product

Pump size

The selection of pump size should be based on:

- required flow and pressure at the draw-off point
- pressure loss as a result of height differences
- friction loss in the pipework
  It may be necessary to account for pressure loss in connection with long pipes, bends or valves, etc.
- best efficiency at the estimated duty point.

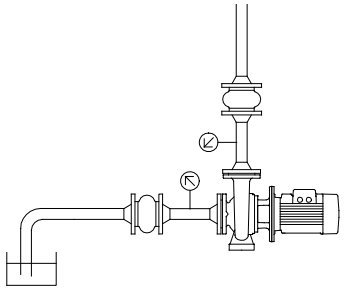


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Fig. 12 Schematic drawing of an installation

Efficiency

If you expect the pump to always operate in the same duty point, select a pump which is operating in a duty point corresponding to the best efficiency of the pump.

In case of controlled operation or varying consumption, select a pump whose best efficiency falls within the duty range covering the greater part of the duty time.

Shaft seal materials

The material variant should be selected on the basis of the liquid to be pumped. See page 12.

7. Pumped liquids

Pumped liquids

Liquid temperature: 0 °C to +90 °C.

Dirty, thin, non-explosive liquids containing solids or swarf up to 20 mm. The liquid must not attack the pump mechanically or chemically.

List of pumped liquids

A number of typical liquids are listed below.

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

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

However, use the list with some caution, as the following factors may affect pump life and cause shaft seal problems:

- concentration of the pumped liquid
- liquid temperature
- pressure
- particle size.

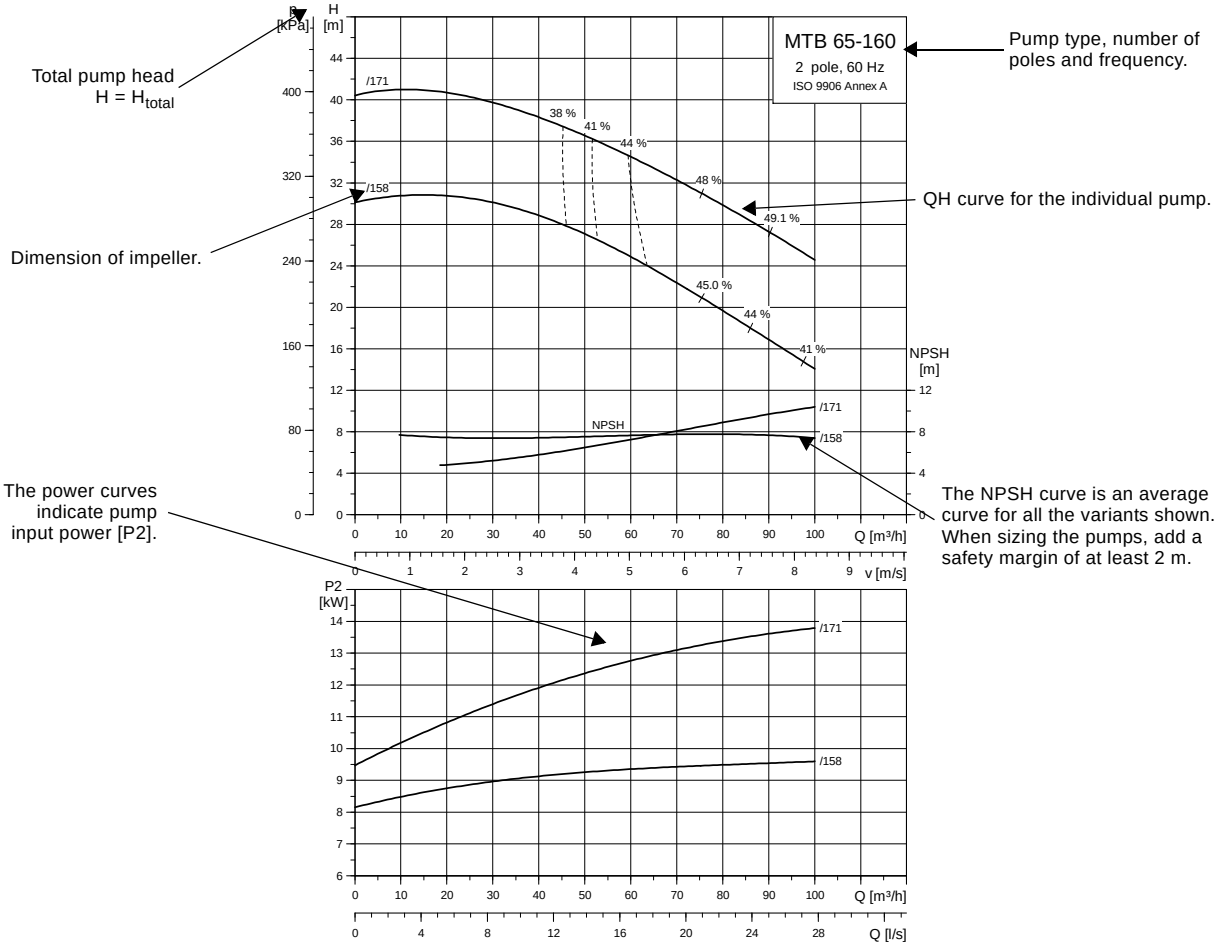
Pumped liquid	Note	Additional information	Shaft seal
Coolant in machine tool			
Calcium chloride	b, d, e, g	< 5 °C, 30 %	BQQE
Ethylene glycol	b, d	< 50 °C	BQQE
Glycerine (glycerol)	b, d	< 50 °C	BQQE
Hydrocarbon-based coolant	d, f	50 °C	BQQV
Potassium acetate (inhibited)	b, d, e, g	< 20 °C	BQQE
Potassium formate (inhibited)	b, d, e, g	< 20 °C	BQQE
Propylene glycol	b, d	< 50 °C	BQQE
Sodium chloride	b, d, e, g	< 5 °C, 30 %	BQQE
Cleaning			
Soap (salts of fatty acids)	b	< 80 °C	BQQV
Alkaline degreasing agent	b, h	< 80 °C	BQQE
Mineral oils			
Crude oil	b, d, f	< 20 °C	BQQV
Mineral lubricating oil	d, f		BQQV
Mineral motor oil	d, f		BQQV

Legend for notes in the above list

a	To minimise the risk of corrosion, the pump must run almost continuously, i.e. standstills must not exceed 6-8 hours.
b	The pumped liquid may contain additives or impurities which can cause shaft seal problems.
c	The pump should run continuously to prevent discolouration of pool tiles. For intermittent operation, use the N version.
d	Density and viscosity may differ from those of water. Consider this when calculating motor and pump performance.
e	In order to avoid corrosion, the liquid must be free of oxygen.
f	Flammable or combustible liquid.
g	Risk of crystallisation/precipitation at the shaft seal.

8. Curve charts

How to read the curve charts



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Curve conditions

The following guide lines apply to the curves shown from page 16 to 26:

- The curve values have been tested at a water temperature of 20 °C.
- The curves apply to the actual speed of the motor types stated at 50 Hz.
- The conversion between head "H [m]" and pressure "p [kPa]" applies to water with a density of $\rho = 1000$ kg/m^3.
  In case of densities other than 1000 kg/m^3, the discharge pressure is proportional to the density. When pumping liquids with a density higher than 1000 kg/m^3, motors with correspondingly higher outputs must be used.
- The curves apply to a kinematic viscosity of $\upsilon = 1$ mm^2/s (1 cSt).
  Maximum kinematic viscosity without any new calculation of motor size being necessary is 3 mm^2/s.
- Tolerances according to ISO 9906, Annex A.

The pumps should not be used at minimum flows below 0.1 x Q at an optimum efficiency because of the danger of overheating of the pump.

NPSH: The curves stated are average values found under the same conditions as the performance curves.

Liquid: Air-free water.

When sizing, add a safety allowance of at least 2 m.

v (m/s) indicates flow velocity in discharge port.

Calculation of total head

The total pump head consists of the height difference between the measuring points + the differential head + the dynamic head.

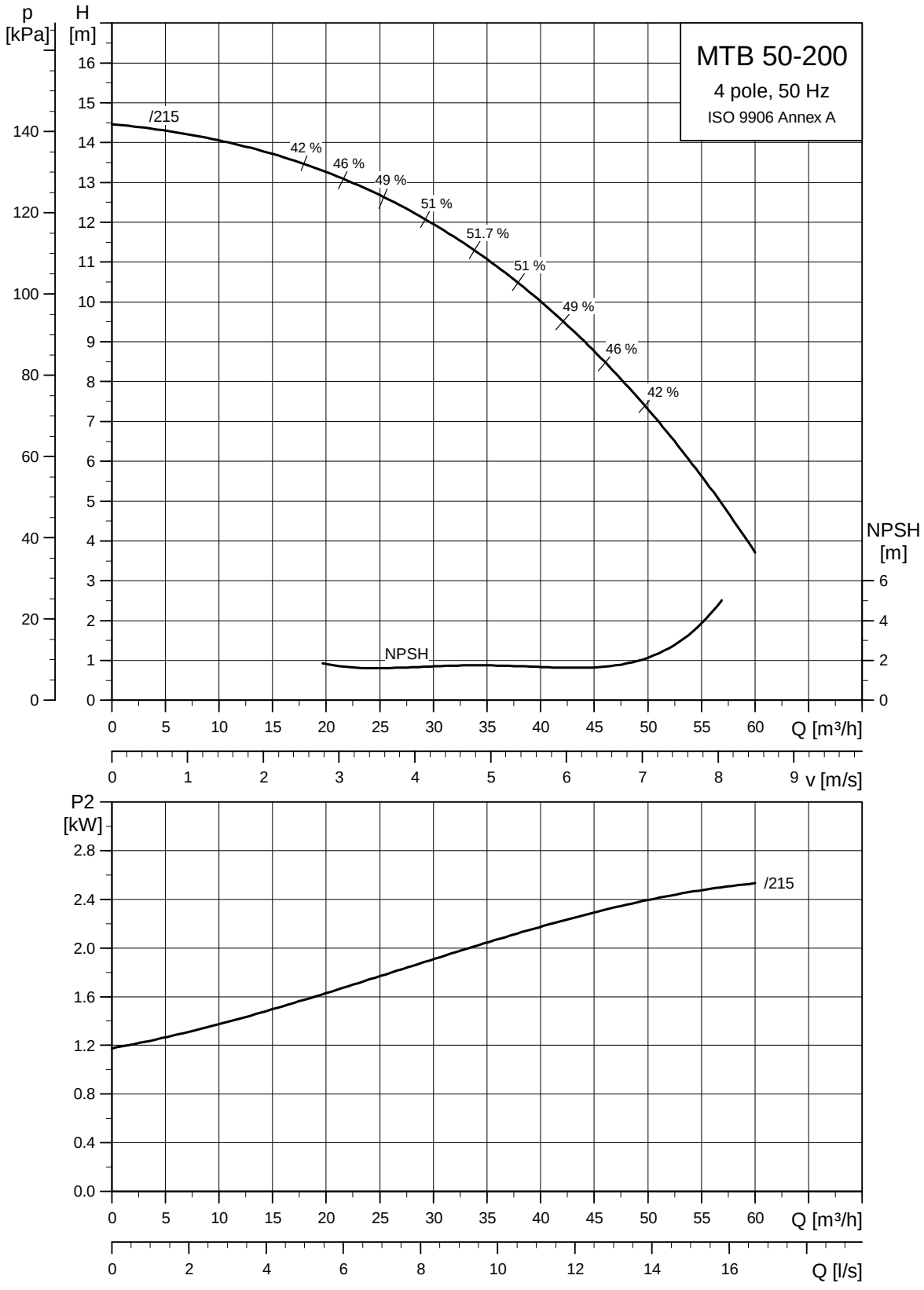
$H_{total} = H_{geo} + H_{stat} + H_{dyn}$

Legend

H_{geo}	=	Height difference between the measuring points
H_{stat}	=	Differential head between the suction and the discharge side of the pump.
H_{dyn}	=	Calculated values based on the velocity of the pumped liquid on the suction and the discharge side of the pump.

9. Performance curves and technical data

MTB 50-200, 4-pole, 50 Hz



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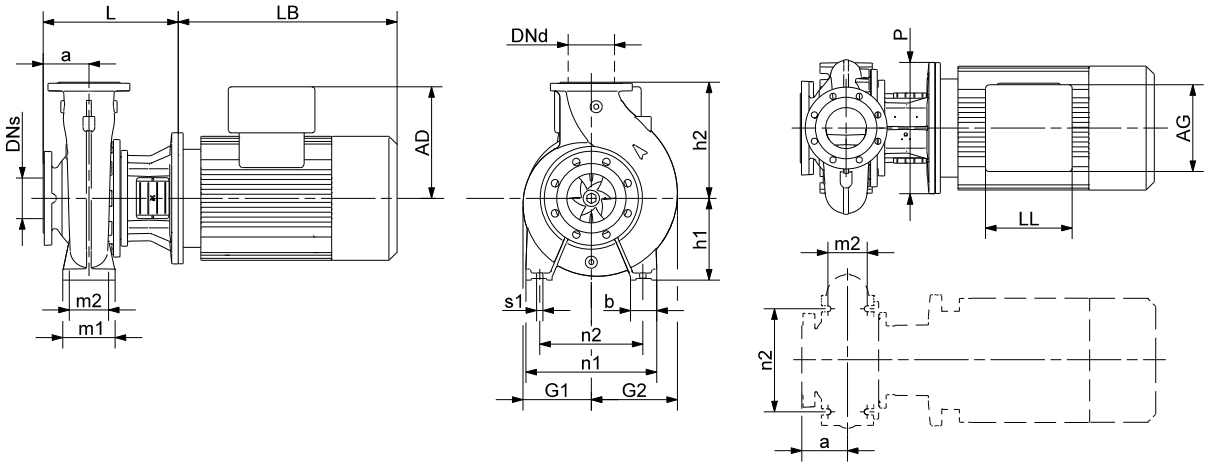

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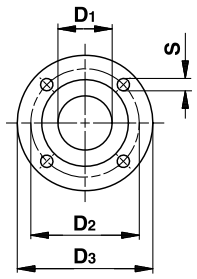

	EN 1092-2 PN 16	
	Nominal diameter (DN)	
	50	65
D_1	50	65
D_2	125	145
D_3	165	185
S	4 x 19	4 x 19

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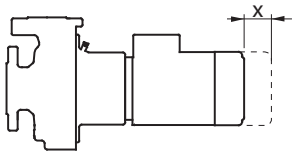

	x [mm]
Motor only	60
Motor and pump head	140

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Minimum clearance for removal of motor/pump head

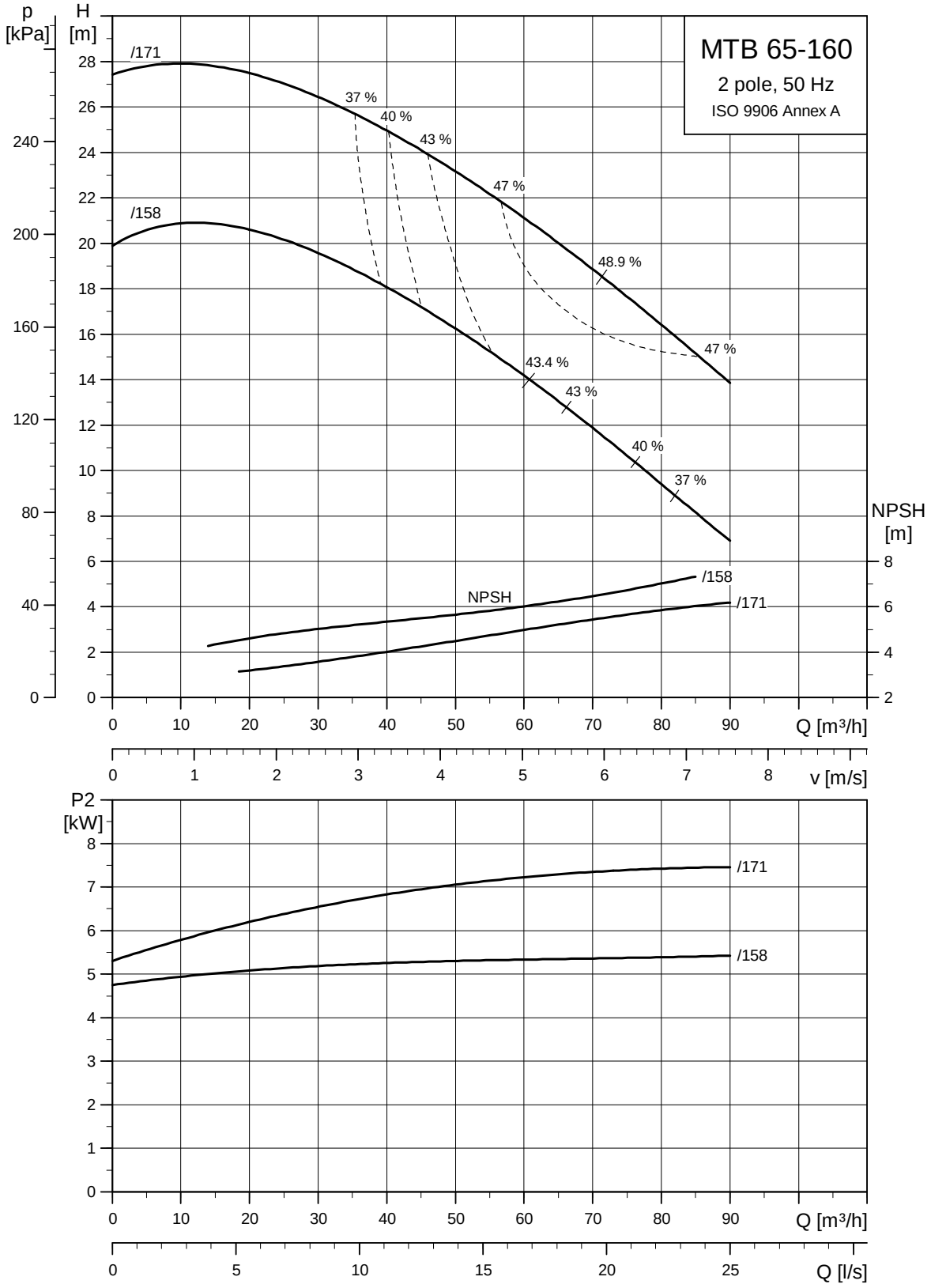
Dimensions and weights

Pump type	Motor [kW]	Dimensions [mm]																			Net weight [kg]
		DNs	DNd	a	AD	AG	b	G1	G2	h1	h2	L	LL	LB	m1	m2	n1	n2	P	s1	
MTB 50-200/215	3	65	50	100	120	162	50	141	162	160	200	274	103	335	100	70	265	212	250	M12	65

Electrical data
3 x 220-240 V Δ / 380-415 V Y, 4-pole, 50 Hz

Pump type	Motor type	P2 [kW]	$I_{1/1}$ [A]	η_{max} [%]	Power factor cos φ	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MTB 50-200/215	MG 100LC-H3	3.0	11.0 / 6.30	87.7	0.82-0.76	1440-1450	7.0-7.7

MTB 65-160, 2-pole, 50 Hz



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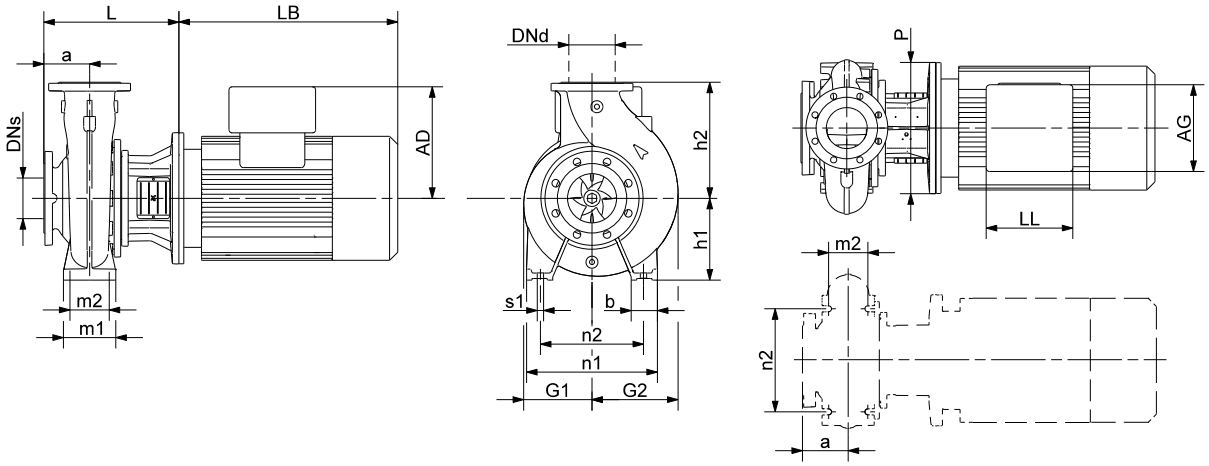

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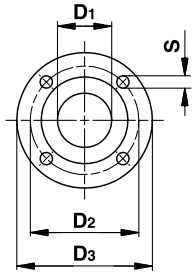

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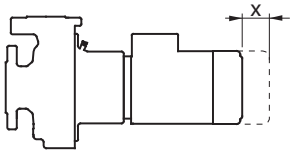
	EN 1092-2 PN 16	
	Nominal diameter (DN)	
	65	80
D_1	65	80
D_2	145	160
D_3	185	200
S	4 x 19	8 x 19



TM03 3547 0606

	x [mm]
Motor only	80
Motor and pump head	100

Minimum clearance for removal of motor/pump head

Dimensions and weights

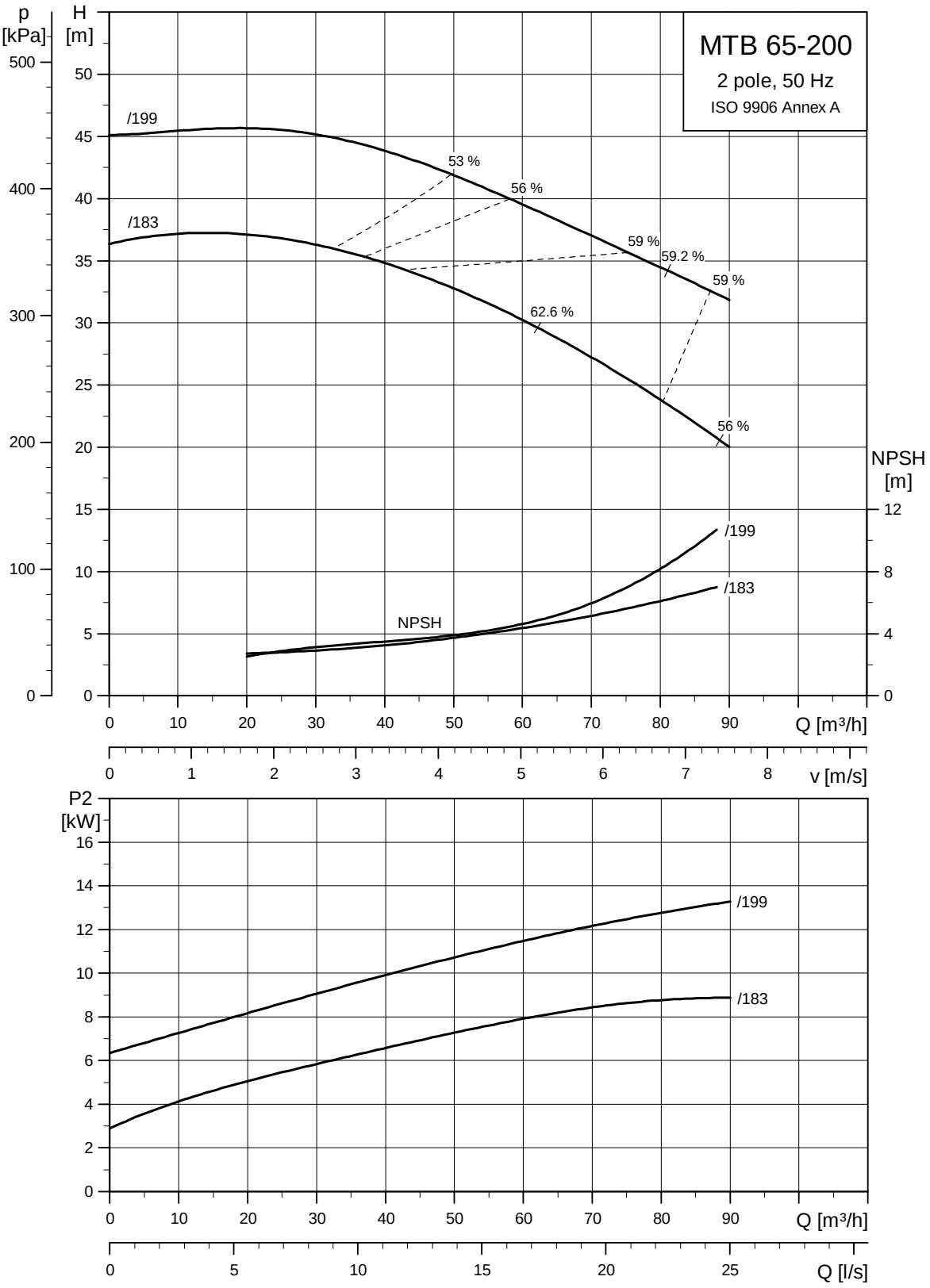
Pump type	Motor [kW]	Dimensions [mm]																			Net weight [kg]
		DNs	DNd	a	AD	AG	b	G1	G2	h1	h2	L	LL	LB	m1	m2	n1	n2	P	s1	
MTB 65-160/158	5.5	80	65	100	134	202	65	127	161	160	200	313	103	391	125	95	280	212	300	M12	85
MTB 65-160/171	7.5	80	65	100	159	203	65	127	161	160	200	313	135	379	125	95	280	212	300	M12	97

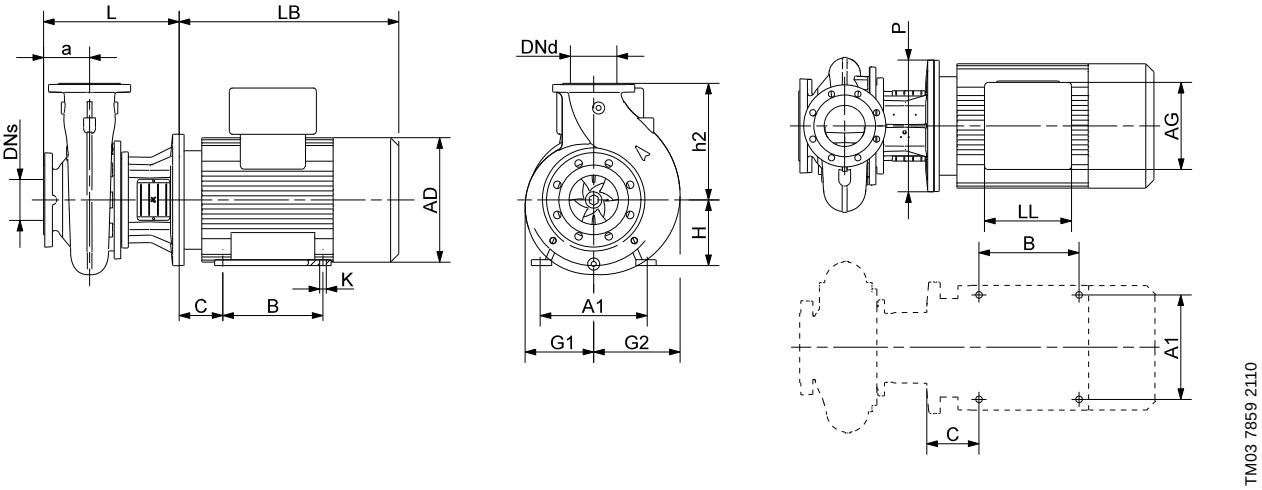
Electrical data
3 x 380-415 V Δ, 2-pole, 50 Hz

Pump type	Motor type	P2 [kW]	$I_{1/1}$ [A]	η_{max} [%]	Power factor cos φ	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MTB 65-160/158	MG 132SC-H3	5.5	11.0	89.2	0.87-0.82	2920-2940	10.8-11.8
MTB 65-160/171	MG 132SB-H3[1)]	7.5	14.4-14.0 / 8.30-8.10	90.1	0.88-0.82	2910-2920	7.8-9.1

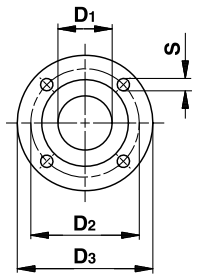
1) The supply voltage for MG 132SB-H3 is 3 x 380-415 V Δ / 660-690 V Y.

MTB 65-200, 2-pole, 50 Hz



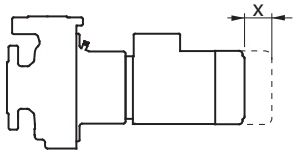


TM03 7859 2110



TM01 1538 4997

	EN 1092-2 PN 16	
	Nominal diameter (DN)	
	65	80
D_1	65	80
D_2	145	160
D_3	185	200
S	4 x 19	8 x 19



TM03 3547 0606

	x [mm]
Motor only	110
Motor and pump head	100

Minimum clearance for removal of motor/pump head

Dimensions and weights

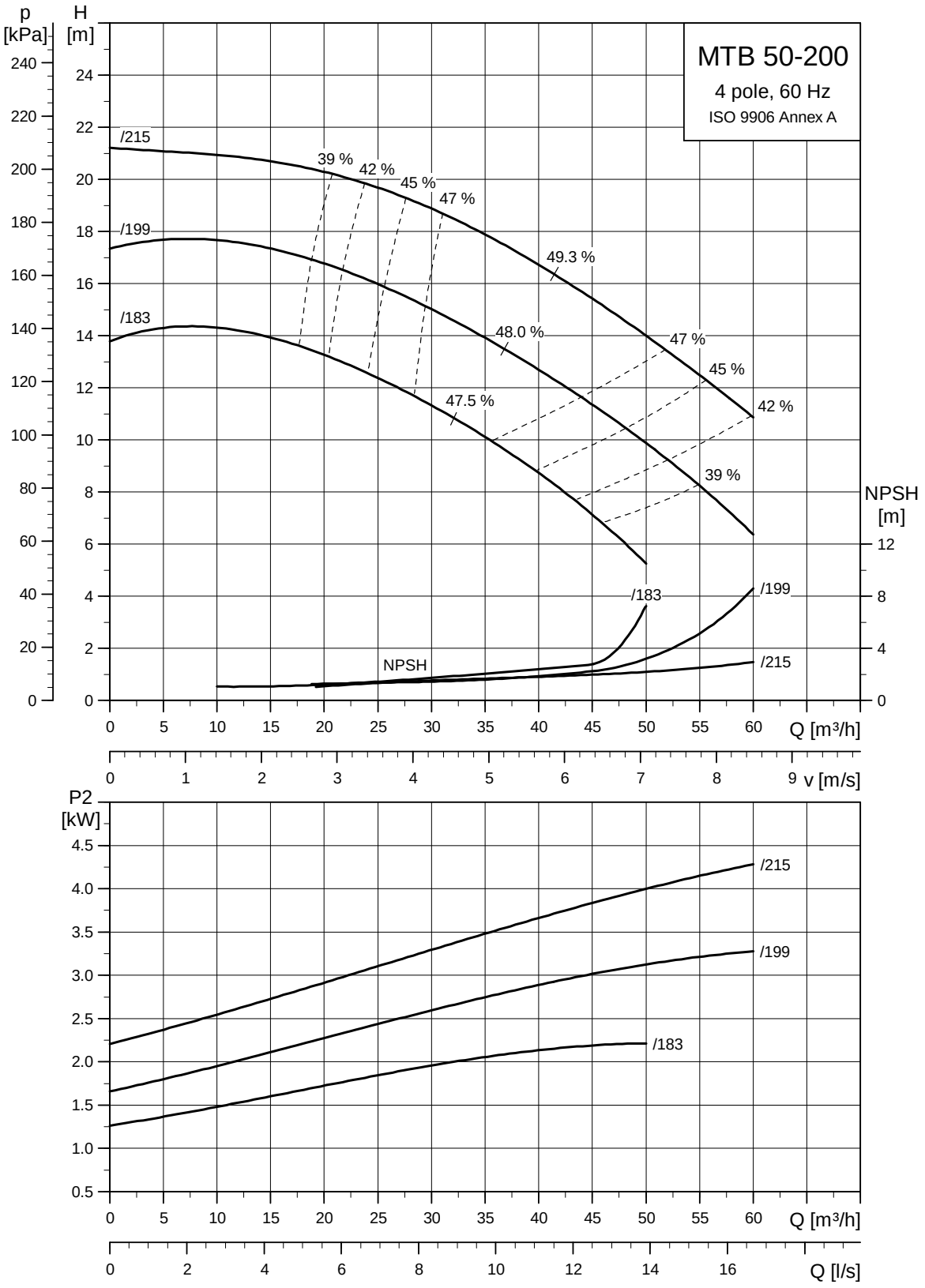
Pump type	Motor [kW]	Dimensions [mm]																	Net weight [kg]
		DNs	DNd	a	A1	AD	AG	B	C	G1	G2	H	h2	K	L	LB	LL	P	
MTB 65-200/183	11	80	65	100	254	204	243	210	108	149	173	160	225	15	343	471	213	350	148
MTB 65-200/199	15	80	65	100	254	204	243	210	108	149	173	160	225	15	343	471	213	350	161

Motor feet are to be underpinened by support blocks, see "Accessories" on page 28

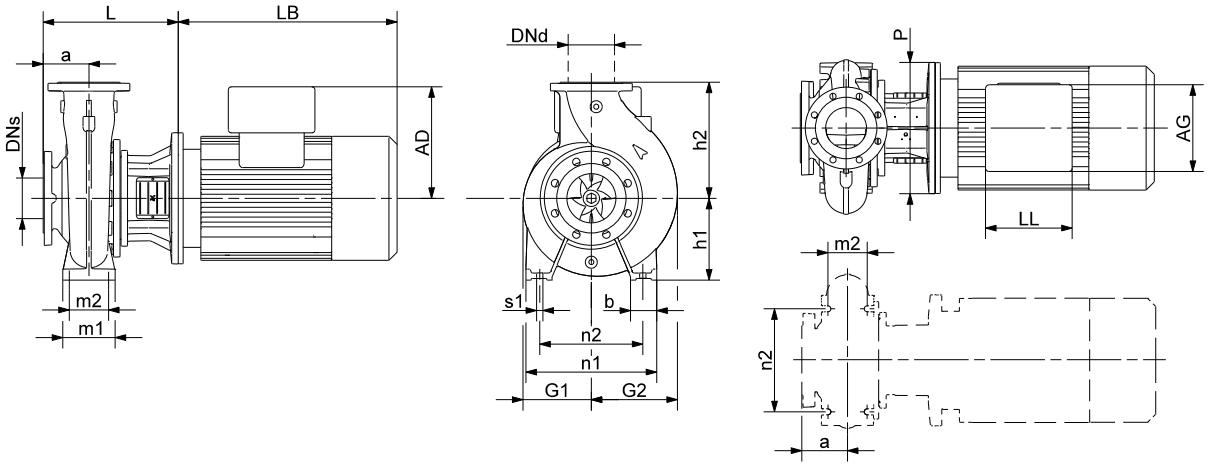
Electrical data
3 x 380-415 V Δ, 2-pole, 50 Hz

Pump type	Motor type	P2 [kW]	$I_{1/1}$ [A]	η_{max} [%]	Power factor cos φ	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MTB 65-200/183	MG 160MB-H3	11.0	20.8-19.8	91.2	0.88-0.84	2940-2950	6.6-7.8
MTB 65-200/199	MG 160MD-H3	15.0	28.0-26.0	91.9	0.89-0.87	2930-2950	6.6-7.8

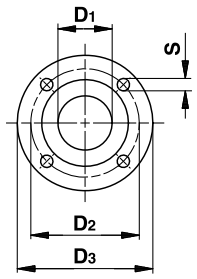
MTB 50-200, 4-pole, 60 Hz



TM03 7751 4806

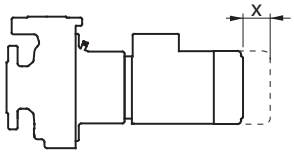


TM03 7858 2110



	EN 1092-2 PN 16	
	Nominal diameter (DN)	
	50	65
D_1	50	65
D_2	125	145
D_3	165	185
S	4 x 19	4 x 19

TM01 1538 4997



	x [mm] (-/183 and -/199)	x [mm] (-/215)
Motor only	60	80
Motor and pump head	140	140

TM03 3547 0606

Minimum clearance for removal of motor/pump head

Dimensions and weights

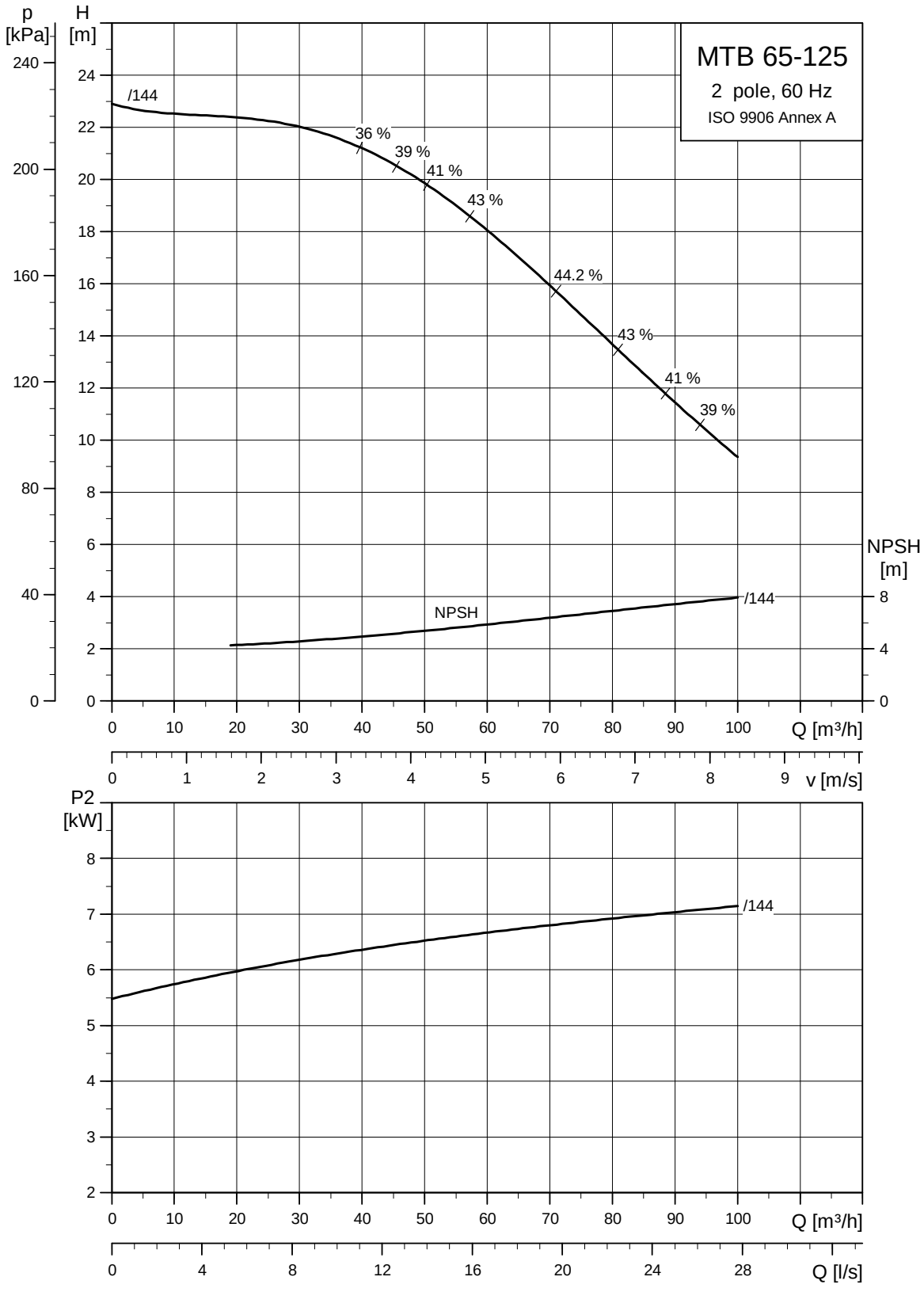
Pump type	Motor [kW]	Dimensions [mm]																			Net weight [kg]
		DNs	DNd	a	AD	AG	b	G1	G2	h1	h2	L	LL	LB	m1	m2	n1	n2	P	s1	
MTB 50-200/183	3	65	50	100	120	162	50	141	162	160	200	274	103	335	100	70	265	212	250	M12	65
MTB 50-200/199	4	65	50	100	134	202	50	141	162	160	200	274	103	372	100	70	265	212	250	M12	80
MTB 50-200/215	5.5	65	50	100	159	203	50	141	162	160	200	313	135	379	100	70	265	212	300	M12	98

Electrical data
3 x 220-277 V Δ / 380-480 V Y, 4-pole, 60 Hz

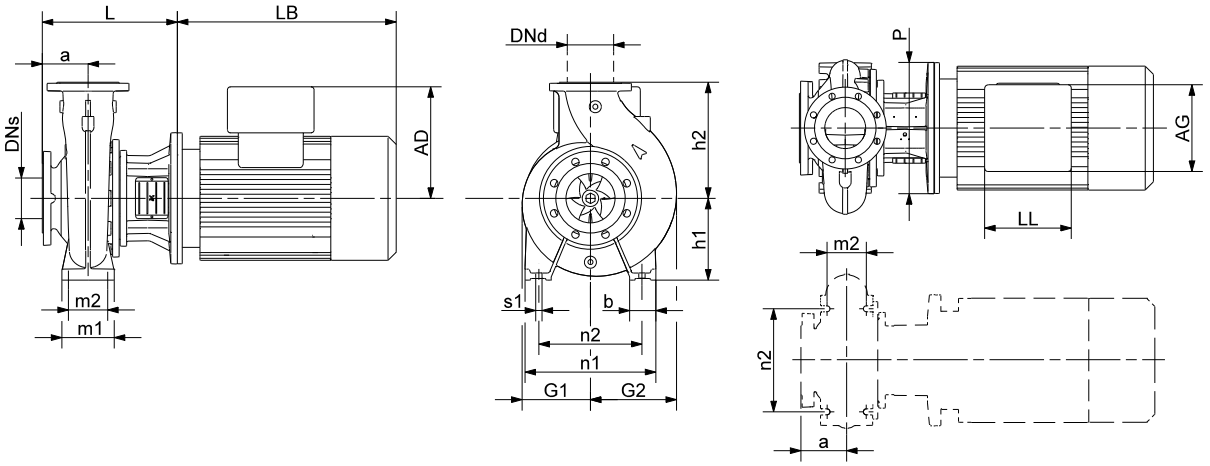
Pump type	Motor type	P2 [kW]	$I_{1/1}$ [A]	η [%]	Power factor cos φ	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MTB 50-200/183	MG 100LC-H3	3	10.6-9.55 / 6.10-5.50	87.5-89.5	0.85-0.73	1730-1760	6.2-8.8
MTB 50-200/199	MG 112MC-H3	4	14.8-14.4 / 8.60-8.30	87.5-89.5	0.79-0.64	1750-1770	7.7-9.1
MTB 50-200/215	MG 132SB-H3[1)]	5.5	11.0-9.40 / 6.35-6.20	87.0-89.5	0.88-0.79	1750-1770	6.7-8.5

1) The supply voltage for MG 132SB-H3 is 3 x 380-480 V Δ / 660-690 V Y.

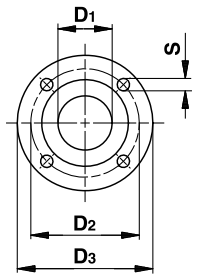
MTB 65-125, 2-pole, 60 Hz



TM03 7752 4806

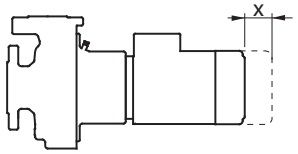


TM03 7858 2110



TM01 1538 4997

	EN 1092-2 PN 16	
	Nominal diameter (DN)	
	65	80
D_1	65	80
D_2	145	160
D_3	185	200
S	4 x 19	8 x 19



TM03 3547 0606

	x [mm]
Motor only	80
Motor and pump head	100

Minimum clearance for removal of motor/pump head

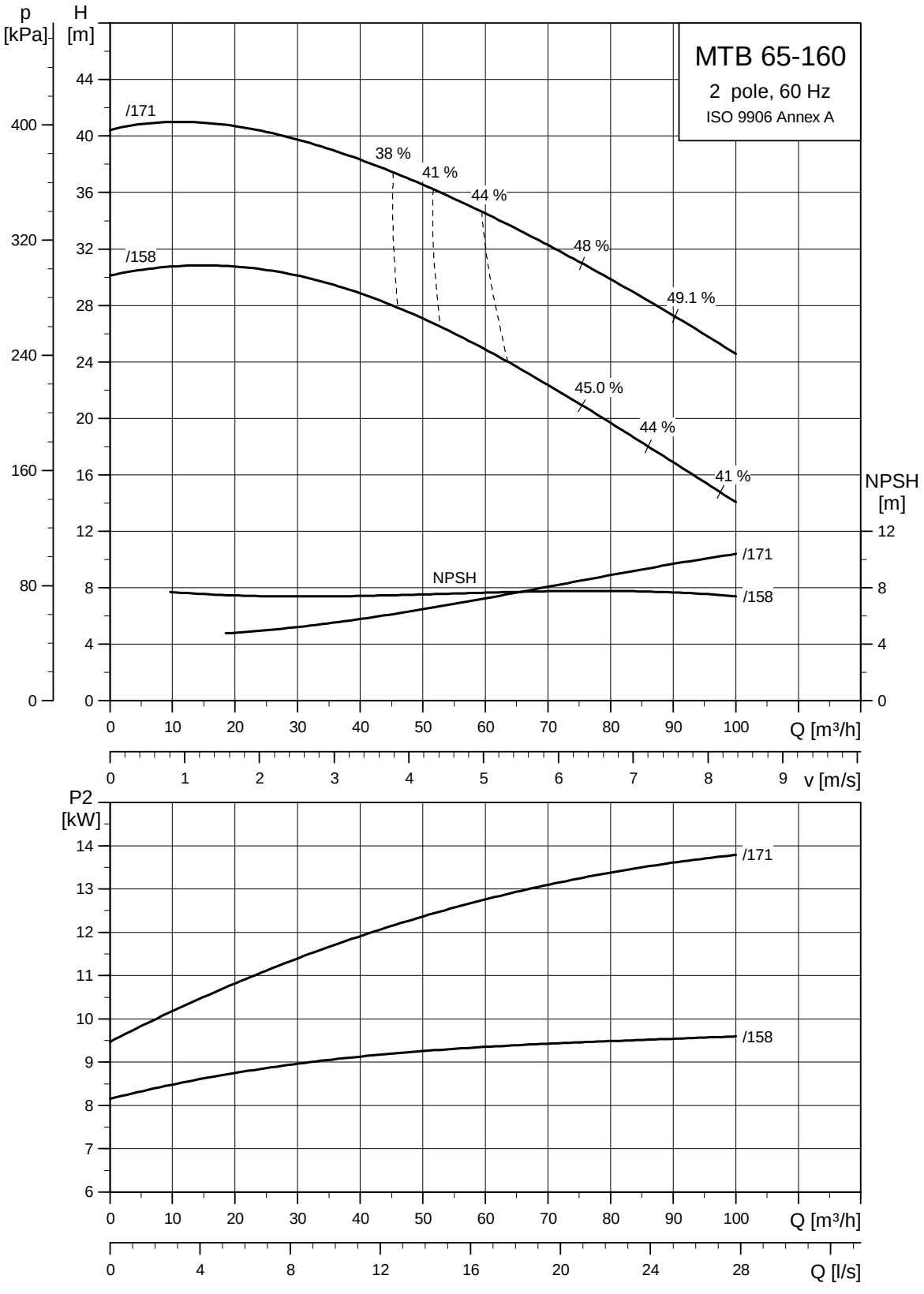
Dimensions and weights

Pump type	Motor [kW]	Dimensions [mm]																			Net weight [kg]
		DNs	DNd	a	AD	AG	b	G1	G2	h1	h2	L	LL	LB	m1	m2	n1	n2	P	s1	
MTB 65-125/144	7.5	80	65	100	159	203	65	117	146	160	180	313	135	379	125	95	280	212	300	M12	99

Electrical data
3 x 380-480 V Δ / 660-690 V Y, 2-pole, 60 Hz

Pump type	Motor type	P2 [kW]	$I_{1/1}$ [A]	η_{max} [%]	Power factor cos φ	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MTB 65-125/144	MG 132SB-H3	7.5	14.2-12.0 / 8.20-8.10	89.5-90.2	0.90-0.82	3490-3530	6.8-10.5

MTB 65-160, 2-pole, 60 Hz



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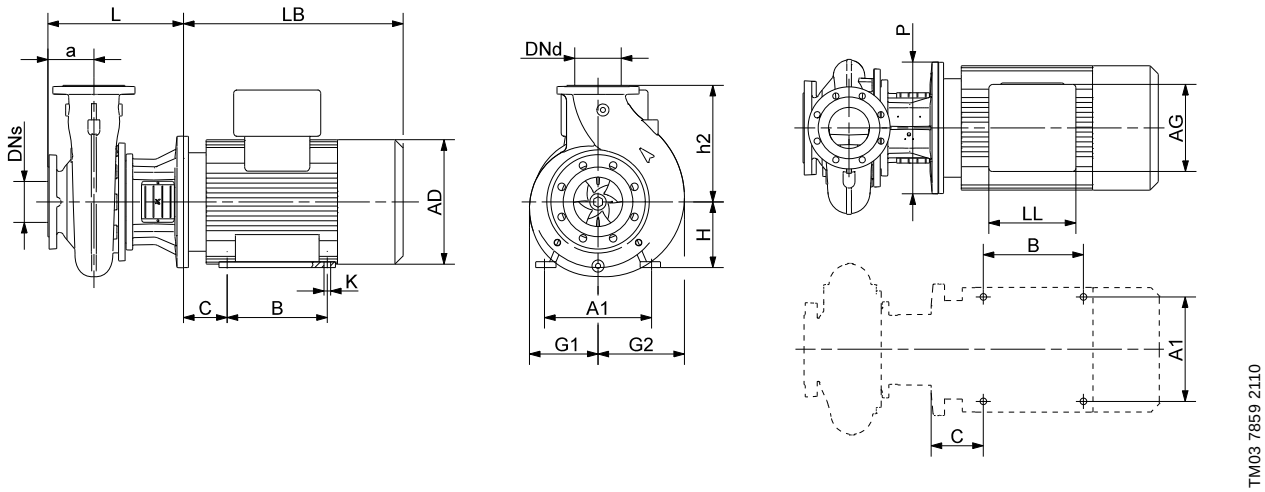
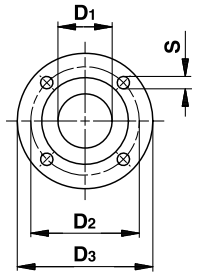
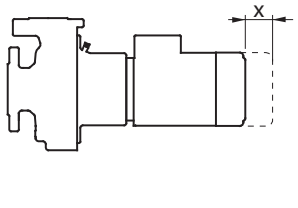




	EN 1092-2 PN 16	
	Nominal diameter (DN)	
	65	80
D_1	65	80
D_2	145	160
D_3	185	200
S	4 x 19	8 x 19



	x [mm]
Motor only	110
Motor and pump head	100

Minimum clearance for removal of motor/pump head

Dimensions and weights

Pump type	Motor [kW]	Dimensions [mm]																	Net weight [kg]
		DNs	DNd	a	A1	AD	AG	B	C	G1	G2	H	h2	K	L	LB	LL	P	
MTB 65-160/158	11	80	65	100	254	204	243	210	108	127	161	160	200	15	343	471	213	350	141
MTB 65-160/171	15	80	65	100	254	204	243	210	108	127	161	160	200	15	343	471	213	350	154

Motor feet are to be underpinened by support blocks, see "Accessories" on page 28

Electrical data

3 x 380-480 V Δ / 660-690 V Y, 2-pole, 60 Hz

Pump type	Motor type	P2 [kW]	$I_{1/1}$ [A]	η [%]	Power factor cos φ	n [min^{-1}]	$\frac{I_{start}}{I_{1/1}}$
MTB 65-160/158	MG 160MB-H3	11	20.8-17.2 / 12.0-11.6	90.2-91.0	0.89-0.83	3520-3550	5.8-8.9
MTB 65-160/171	MG 160MD-H3	15	28.0-22.4 / 16.2-15.6	90.2-91.0	0.90-0.86	3520-3550	5.8-8.9

10. Accessories

Support blocks

During installation, support blocks can be fitted under the motor feet in order to compensate for dimensional differences between pump housing and motor frame sizes, thus enabling easy horizontal mounting of the pumps.

The product number refers to a set of two support blocks having the dimensions specified in the following table.

[Hz]	Pump type	P2 [kW]	Dimensions w x l x h [mm]	Product number
50	MTB 65-200/183	11	80 x 290 x 25	95921203
	MTB 65-200/199	15		
60	MTB 65-160/158	11	80 x 290 x 25	95921203
	MTB 65-160/171	15		

11. Service

Spare parts

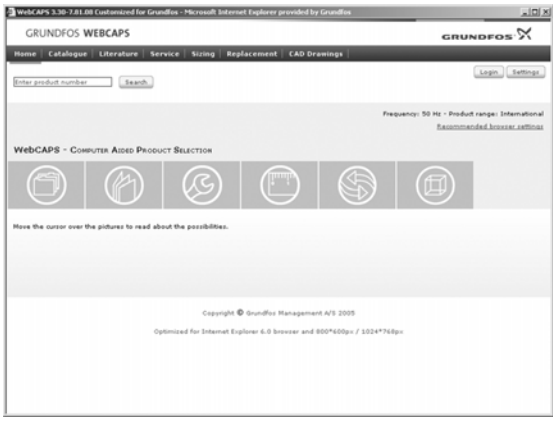
Available spare parts kits:

- mechanical shaft seal complete
- shaft with spacer
- impeller.

For more information on spare parts and kits, see Grundfos WinCAPS/WebCAPS or the Grundfos Service Kit Catalogue.

12. Further product information

WebCAPS

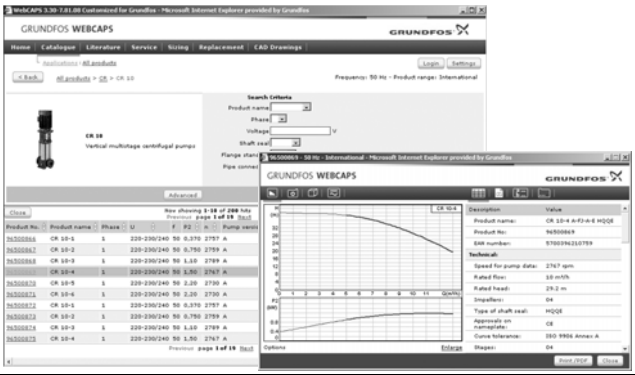


WebCAPS is a **Web**-based **C**omputer **A**ided **P**roduct **S**election program available on www.grundfos.com.

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

Information in WebCAPS is divided into six sections:

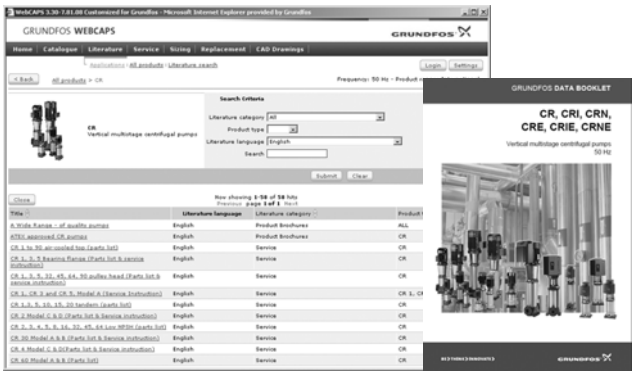
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



Catalogue

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

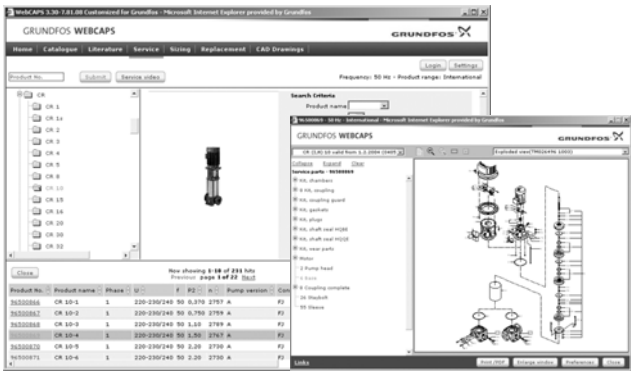
- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



Literature

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

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



Service

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

Sizing

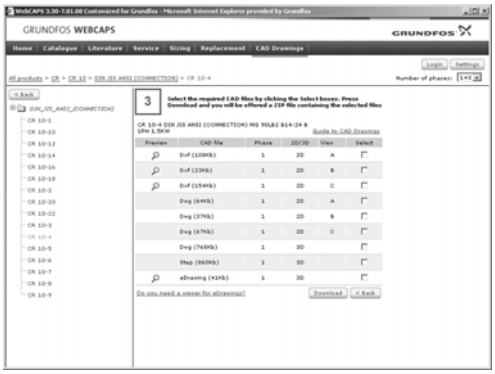
This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

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

Replacement

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump.
The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

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



CAD drawings

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

These formats are available in WebCAPS:

2-dimensional drawings:
- .dxf, wireframe drawings
- .dwg, wireframe drawings.

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

WinCAPS

Fig. 13 WinCAPS DVD

WinCAPS is a **Win**dows-based **C**omputer **A**ided **P**roduct **S**election program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

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

WinCAPS is available on DVD and updated once a year.

GO CAPS

Mobile solution for professionals on the GO!

CAPS functionality on the mobile workplace.

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