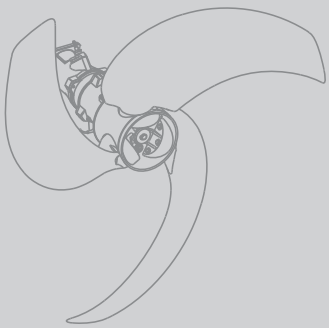
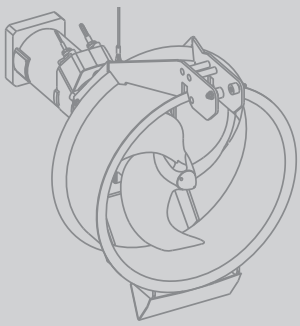
WILO
Pumpen Intelligenz.

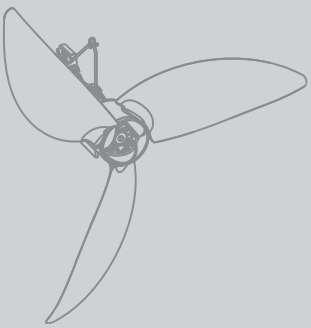
Catalogue Drainage and Sewage

Submersible Mixers

Mixers, Re-circulation Pumps,
Jet Cleaners, Grit Collector Pumps and
Accessories for Municipal Applications
in Water Treatment Systems







Catalogue C4 – 50 Hz – 2009

C4

Programme overview and fields of applications

Submersible mixers and recirculation pumps

Product type		Main fields of application												Page
		Activated sludge tank	Bioreactors	Industrial sewage treatment	Pump sumps	Rain spillway facilities	Sludge tanks, digestion tanks	Slurry and biogas installations	De-icing	Kaldnes and special sewage treatment processes	Aquaculture, large aquariums, ocean water	Generation of fluid	Recirculation	
Miniprop submersible mixers Wilo-EMU...														
	TR 14...	–	–	•	•	•	o	–	–	o	•	o	–	26
	TR 16...	–	–	•	•	•	o	–	–	o	•	o	–	26
	TR 21...	o	–	•	•	o	o	o	o	o	•	o	–	26
	TR 28...	•	o	•	•	o	o	–	o	•	•	•	–	26
Uniprop submersible mixers – directly driven Wilo-EMU...														
	TR 22...	–	–	o	•	•	•	•	o	–	–	o	–	32
	TR 36...	–	–	o	•	•	•	•	o	–	–	o	–	32
	TR 40...	–	–	o	•	•	•	•	•	–	–	o	–	32
Uniprop submersible mixers – with gearing Wilo-EMU...														
	TR 50-2...	o	o	•	•	o	•	•	•	o	o	•	–	42
	TR 60-2...	o	o	•	•	o	•	•	•	o	o	•	–	42
	TR 75-2...	•	•	•	o	o	•	•	•	•	o	•	–	42
	TR 80-1...	–	–	•	o	–	•	•	•	o	o	•	–	42
	TR 90-2...	•	•	•	–	–	–	o	o	•	o	•	–	42
Maxi- / Megaprop submersible mixers Wilo-EMU...														
	TR 215/315	•	•	•	–	–	–	•	•	•	o	•	–	60
	TR 221/321	•	•	•	–	–	–	•	•	o	o	•	–	60
☞	**TR 226/326**	•	•	•	–	–	–	•	o	o	o	•	–	60
Rezijet recirculation pump Wilo-EMU...														
	RZP 20...	•	–	•	–	–	–	–	–	–	–	–	•	78
	RZP 25...	•	–	•	–	–	–	–	–	–	–	–	•	78
	RZP 50-3...	•	–	•	–	–	–	–	–	–	–	–	•	78
	RZP 60-3...	•	–	•	–	–	–	–	–	–	–	–	•	78
☞	**RZP 80-2...**	•	–	•	–	–	–	–	–	–	–	–	•	78

Key: • = Applicable; o = Applicable depending on the type; – = Not applicable

☞ **New in the programme or series extension or modification**

Contents

General notes and abbrevaitions

Abbreviations used and what they mean

Abbreviation	Meaning
1~	1-phase current
3~	3-phase current
-A	Float switch attached
D	Direct activation
DI	Leakage detection
DM	Three-phase motor in direct activation
DN	Nominal diameter of the flange connection
EBM	Individual run signal
EM	Single-phase motor with starting capacitor
ESM	Individual fault signal
GRD/GLRD	Mechanical seal
H	Delivery head
I_A	Starting current
I_N	Rated current; current at P_2
Inst.	Installation: H = horizontal, V = vertical
LB	Supply availability (L = warehoused goods, C = available in 2 weeks, K = available in 4 weeks, A = delivery time on request)
P_1	Power consumption (power supplied from the mains)
$P_N = P_2$	Rated motor power
PN	Pressure class in bar (e. g. PN10 = suitable up to 10 bar)
PTC	Positive Temperature Coefficient (PTC thermistor sensor)
PT 100	Platinum temperature sensor with a resistance of 100 Ω at 0 °C
Q (= $\dot{V}$)	Volume flow
-S	Float switch attached
SBM	Run signal or collective run signal
SSM	Fault signal or collective fault signal
WSK	Thermal winding contacts (in motor for monitoring the winding temperature, full motor protection by additional tripping unit)
Y/Δ	Star/delta activation
⏏	Operating mode of double pumps: Individual operation of the relevant operating pump
⏏+⏏	Operating mode of double pumps: Parallel operation of both pumps
Ⓜ	Number of poles of electric motors: 2-pole motor = approx. 2900 rpm at 50 Hz
Ⓜ	Number of poles of electric motors: 4-pole motor = approx. 1450 rpm at 50 Hz
Ⓜ	Number of poles of electric motors: 6-pole motor = approx. 950 rpm at 50 Hz

Material designations and their meaning

Material	Meaning
1.4021	Chromium steel X20Cr13
1.4057	Chromium steel X17CrNi16-2
1.4112	Chromium steel X 90 Cr Mo V 18
1.4122	Chromium steel X39CrMo17-1
1.4301	Chromium nickel steel X5CrNi18-10
1.4305	Chromium nickel steel X8CrNiS18-9
1.4306	Chromium nickel steel X2CrNi19-11
1.4308	Chromium nickel steel GX5CrNi19-10
1.4401	Chromium nickel molybdenum steel X5CrNiMo17-12-2
1.4408	Chromium nickel molybdenum steel GX5CrNiMo19-11-2
1.4462	Chromium nickel molybdenum steel X2CrNiMoN22-5-3
1.4470	Chromium nickel molybdenum steel GX2CrNiMoN22-5-3
1.4517	Chromium nickel molybdenum steel with copper addition GX2CrNiMoCuN25-6-3-3
1.4541	Chromium nickel steel with titanium addition X6CrNiTi18-10
1.4542	Chromium nickel steel with copper and niobium addition X5CrNiCuNb16-4
1.4571	Chromium nickel steel with titanium addition X6CrNiMoTi17-12-2
1.4581	Chromium nickel molybdenum steel with niobium addition GX5CrNiMoNb19-11-2
Abrasite	Chilled cast iron for use with heavily abrasive fluids
Al	Aluminium
Al-oxid	Aluminium oxide
C	Carbon
Ceram	Coating with very high adhesive strength, protection from corrosion and abrasion
Composite	High-strength plastic material
CR	Chromium
EN-GJL	Cast iron (with lamellar graphite)
EN-GJS	Cast iron (with spheroidal cast iron)
G-AlSi12	Diecast aluminium
GfK	Glass fibre reinforced plastic
GG	see EN-GJL
GGG	see EN-GJS
Inox	Stainless steel
PA 30GF	see Composite

Material	Meaning
PE-HD	Polyethylene with high density
PP-GF30	Polypropylene, reinforced with 30% fibreglass

Material	Meaning
PUR	Polyurethane
SiC	Silicon carbide
ST	Steel
St.vz.	Galvanized steel
V2A (A2)	Material group, e.g. 1.4301, 1.4306
V4A (A4)	Material group, e.g. 1.4404, 1.4571

Wear and tear

Pumps or parts of pumps are subject to wear in accordance with state-of-the-art technology (DIN 31051/DIN-EN 13306). This wear may vary depending on operating parameters (temperature, pressure, speed, water condition) and installation/usage situation and may result in the malfunction or failure at different times of the above-mentioned products/components including their electrical/electronical ciruitry.

Wear parts are all components subject to rotary or dynamic strain including electronic components under tension, in particular:

- Seals (incl. mechanical seal), seal ring
- Stuffing box
- Bearing and shaft
- Impellers and pump part
- Ball race and wear ring
- Wear ring / wear plate
- Macerator
- Capacitor
- Relay / contactor / switch
- Electronic circuits, semiconductor components etc.

Pumps and continuous-flow machines (lie submersible mixers and recirculation pumps), as well as their components with coatings (cataphoresis coating, 2K- or Ceram-coating) are subject to constant wear due to the abrasive fluid contents. It is for that reason that the coating is also listed with the wearing parts contained in these units!

We do not accept liability for faults or defects arising from natural tear and wear.

Wilo – General terms of delivery and service

The latest version of our general terms of delivery and service can be found on the Internet at

www.wilo.com/agb

Structure of a water treatment system

A water treatment system is for cleaning sewage, which has been collected from the sewer system and fed to it.

To clean the undesirable sewage contents, mechanical, biological and chemical methods are used. Modern water treatment systems are designed accordingly as multistage systems. The first water treatment system on the European continent was put into operation in 1882 Frankfurt am Main.

System components

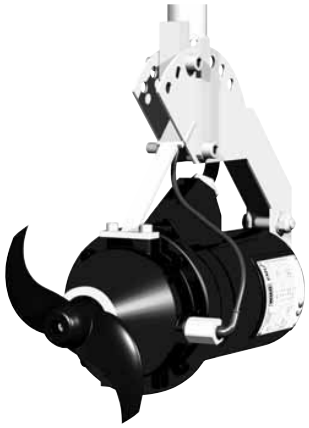
Rain relief

When feeding sewage to the water treatment system, two sewer systems are to be distinguished, the mixing system and the separating system.

In the case of the mixing system, the rainwater and wastewater are fed into a common drainage pipe of the water treatment system. Here, the sewage network usually has to be relieved by a rain overflow or a rain spillway basin so that the water treatment system isn't hydraulically overloaded. This can be done using a rain spillway basin (RSB), either already in the sewage network or later on in the water treatment system. If such facilities are not available, the water treatment system must be provided with the corresponding reserve capacity.

The incoming rainwater is particularly severely contaminated after long dry periods. There are deposits due to the long dwell times in the RSB. These deposits can lead to major odour problems in an anaerobic environment. These is where Wilo jet cleaners are used. They are equipped with Wilo submersible pumps of the Wilo-EMU type and can therefore also be operated in submerged state. The jet cleaners add oxygen to the fluid and prevent solids from depositing.

Another option for suspending potential deposits in the RSB is the use of our directly driven Wilo Miniprop submersible mixers. These can be fastened directly to the basin's base or wall and generate sufficient turbulence to counteract the depositing of solids.



In the case of the separating system, the sewage is fed to a separate pipe of the water treatment system while the rainwater is pumped through a separate pipe, if necessary, after cleaning in a rainwater treatment basin, directly to surface water.

Rake

In the raking system, the sewage is pumped through a rake or screen drum. The coarse contaminants, such as monthly hygiene articles, condoms, toilet paper, cotton swabs, stones or even leaves and dead animals are caught in the rake. The more narrow the passage for the sewage, the less coarse material remains in the sewage after the rake, which has a positive effect on the wear of the machines in the subsequent cleaning stages.

A distinction is made between fine rakes with a few millimetres gap width and coarse rakes with a few centimetres. The material caught in the rake is mechanically washed to remove the faecal matter. The water is removed with a rake material press (to save weight) and then the material is burned, composted (fertiliser) or is brought to a landfill.

Grit chamber

A grit chamber is a sedimentation tank with a defined dwell time. Its task is to remove coarse, depositable contaminants from the sewage, such as sand, stones or pieces of glass. These substances can easily lead to system malfunctions (wear, clogging). The purpose is to separate inorganic particulate substances from organic constituents, which are eliminated in further cleaning stages and which contribute to gas production when the sludge decays.

Possible designs include:
- Long grit chamber
- Ventilated long grit chamber, in which both grease and oil on the surface are separated
- Round grit chamber
- Deep grit chamber

There is a ventilation unit installed on the basin's base, through which turbulence is generated. Due to the air that is blown in, the density of the sewage is reduced. Due to these effects, the heavy mineral components (mostly sand) settle on the base of the basin.

In modern systems, the collected sand is washed after removing it from the grit chamber, i.e. it is freed of organic constituents in order to improve drainage and make subsequent recycling possible (for example for road construction).

When emptying the grit chamber, high demands are placed on the wear resistance of the used pumps. Deposits (especially sand) must be stirred up and pumped out. Wilo offers grit collector pumps for

Structure of a water treatment system

this. These are Wilo-EMU FA pumps with mechanical stirring apparatus (Wilo-EMU FA...RF). With these, the sand is only stirred up in the area of the pump inlet. Solid deposits are loosened up and can be pumped. Due to the narrowly limited flow zone, the settling of sand is not disturbed. The smooth pipe cylinder can usually be rinsed free of long fibrous substances on its own. Since the stirring apparatus is subject to a high degree of wear, it is made of the chilled cast iron material Abrasite. The pumps are directly fastened to the chamber bridge and submerged in the fluid.

Primary clarifier

The hydraulic dwell time in the primary clarifier is significantly longer than in the grit chamber. For this reason, the grain size of the particles eliminated here by means of sedimentation is much smaller than in the grit chamber. Undissolved substances (faecal matter, paper, etc.) are deposited or float on the surface. About 30 % of the organic matter can be removed in this manner. Primary sludge is formed, which is transferred to what are called pre-thickeners in most water treatment systems. It is thickened there, together with the surplus sludge from the sludge activation system: The sludge is deposited and the surplus water (cloudy water) is removed to establish a higher dry substance content. The cloudy water is fed back to the cleaning circuit of the water treatment system. The thickened sludge is pumped into the digestion tank for further anaerobic treatment.

In the case of modern systems with nitrogen elimination, this part of the system can be omitted or often has small dimensions. This is justified by the necessary presence of organic substances in sewage for supporting denitrification.

This system component is not used for water treatment systems with simultaneous, aerobic sludge stabilisation in the biological stage either, otherwise non-stabilised primary sludge would continue to accumulate.

Biological stage

In this process stage, the undesirable sewage constituents are biologically degraded by microorganisms. This is called activated sludge. For this purpose, the sewage is oxygenated. Numerous methods have been developed: The activated sludge method, the percolating filter method and the fixed bed reactor method.

As an example, the activated sludge method is described below. The majority of municipal water treatment systems in central Europe are operated according to this method.

Activated sludge tank

With the sludge activation method, the organic sewage constituents are oxidatively degraded to CO_2 and H_2O in activated sludge tanks by aerating the suspension made up of sewage and activated sludge. At the same time, the nitrogen compounds are oxidised to form nitrate, which is the first step for the elimination of nitrogen.

The second step, denitrification, takes place under anoxic conditions (absence of dissolved oxygen). For this reason, it must take place at a different time/place than nitrification.

The activated sludge method is run continuously. This means that sewage and activated sludge are continuously fed into the activated sludge tank. At the same time, the suspension from the sewage and activated sludge takes place to the same degree. By adding flocculating agents, the nutrient phosphorus can also be removed by means of chemical reactions.

In the activated sludge tank, Wilo Maxiprop/Megaprop submersible mixers are used to ensure sufficient mixing and flow rate during the non-aerated phases (denitrification).

Structure of a water treatment system

Secondary clarifier
The secondary clarifier forms a process unit with the activated sludge tank. The activated sludge is separated there from the sewage by sedimentation. Part of the sludge is fed back into the activated sludge tank (return sludge) in order to keep the concentration of microorganisms in the activated sludge tank constant.

The surplus (growth of biomass, surplus sludge) is fed away to the pre-thickener for further treatment, usually together with the sludge of the primary clarifier.

Wilo recirculation pumps ensure that the sludge is fed back. These are able to pump a high volume flow over low heights.

The activated sludge must have good settling properties. If this isn't the case, for example due to massive growth of filamentary microorganisms, the activated sludge drifts out of the secondary clarifier into the following body of water. This phenomenon is called bulking and floating sludge and contaminates the receiving water.

Digestion tank
The growth of biomass created by the degradation of sewage constituents is eliminated as sewage sludge, but usually degraded in so-called digestion tanks under anaerobic conditions by other microorganisms to form digested sludge and combustible digester gas (mostly a mixture of methane and carbon dioxide). The processes are similar to those in a biogas system.

The digester gas (in cleaned form) is frequently used in gas motors (or even in combined heat and power plants) for covering the current (and heat) requirements of the plant.

The digested sludge is then fed to a post-thickener. There it settles and is thus thickened which further reduces the volume and water content. The cloudy water is specifically removed with a special height-adjustable removal mechanism. Wilo Uniprop submersible mixers are used there for homogenising the thickened sludge.

The formed sludge can be used in agriculture as an organic fertiliser if it's free of toxic substances and poisons. Otherwise, more water is removed in chamber filter presses or centrifuges and it is burned in waste incineration plants or is disposed of in other ways.

Treatment processes

1st stage: The first treatment stage usually consists of mechanical processes. Roughly 20 – 30 % of the solid (undissolved) floating and suspended matter is removed. In advanced wastewater treatment and in industrial water management, adsorption, filtration and stripping are used.

2nd stage: Biological processes are used in the second treatment stage of municipal wastewater treatment systems and for degrading organically highly contaminated sewage in aerobic and anaerobic wastewater treatment. They use microbiological degrading processes. Here, the degradable organic sewage constituents are mineralised as completely as possible, which means, in aerobic wastewater treatment, the sewage is degraded down to the inorganic end products water, carbon dioxide, nitrate, phosphate and sulphate.

In anaerobic wastewater treatment, they are converted to organic acids, methane and carbon dioxide. Usually, the carbon compounds are removed from the sewage this way. Also, nitrogen and ammonium in organic compounds are removed by means of bacterial nitrification and denitrification. Phosphorus is also being increasingly eliminated using bacteria in medium-sized and large water treatment systems.

3rd stage: Chemical processes: Abiotic/chemical processes make use of chemical reactions, such as oxidation and precipitation without the participation of microorganisms. In municipal wastewater treatment, they mostly serve to remove phosphorus using precipitation reactions. This process is very important for avoiding the eutrophication of the receiving water. In addition, abiotic/chemical methods are used for precipitation in industrial water management and for advanced wastewater treatment (for example flocculation/precipitation/filtration).

Structure of a water treatment system

Physical processes

Process	Water treatment system component	Purpose
Screening	Rake, revolving strainer, micro-strainer	Removal of large solid particles and floating solids
Precipitation	Floating solid / oil separator	Removal of greases and oils
Sedimentation	Grit chamber, sedimentation tank, centrifugal separator, primary and secondary clarifiers	Removal of smaller floating solids, sand, flocculated suspended solids; removal of activated sludge from the treated sewage
Filtration	Sand filter	Removal of suspended matter
Flotation	Flotation tank, grease collector	Removal of fine dirt particles by blowing in air
Adsorption	Active carbon filter	Adsorption of halogenated hydrocarbon compounds (AOX), for example, or dyes

Biological processes

Process	Water treatment system component	Purpose
Biochemical oxidation	Activated sludge method, percolating filter	Aerobic degradation of organic constituents to inorganic end products (H_2O, CO_2, NO_3-, N_2, PO_4^{3}-, SO_4^{2}-) by means of activated sludge (activated sludge tank) or slime mould (percolating filter). By means of suitable management of activated sludge systems, the phosphorus absorption in the biomass can be optimised (Bio-P). Thus, less flocculating agent is required to eliminate phosphorus. The basic objective is always to convert the sewage constituents to be removed by means of biological processes (respiration, biomass growth) into forms which can be removed from the sewage by sedimentation or stripping (gaseous expulsion) and also are as harmless as possible.
Biochemical oxidation for small water treatment systems	Constructed wetland, activated sludge process, percolating filter	Aerobic and anaerobic degradation in flat basins and subsequent ground penetration in the case of constructed wetlands or degradation by means of activated sludge in activated sludge tanks or by slime mould in percolating filters
Sludge digestion	Digestion tank	Anaerobic degradation of organic constituents of the primary or surplus sludge to form inorganic end products: Carbon dioxide (CO_2), methane (CH_4), ammonia (NH_3), hydrogen sulphide (H_2S)
Anaerobic wastewater treatment	Reactor	Anaerobic degradation of organic constituents to form inorganic end products: Carbon dioxide (CO_2), methane (CH_4), ammonia (NH_3), hydrogen sulphide (H_2S). Especially suited for severely organically contaminated sewage (for example: food industry, carcass disposal).

Chemical processes

Process	Water treatment system component	Purpose
Flocculation	Flocculation basin	Removal of colloid substances and fine dirt particles by adding flocculating agents or adjusting the pH value
Neutralisation / pH value	Neutralisation basin	Adjusting the pH value by adding acids or bases.
Precipitation	Precipitation basin, Bio-P basin	Precipitation of phosphate ions (PO_4^{3}-) with iron and aluminium salts
Simultaneous precipitation	Activated sludge tank / secondary clarifier	Removal of phosphorus (as phosphate) by adding iron or aluminium salts to the activated sludge.
Primary precipitation	Mixing tank / primary clarifier	Removal of phosphorus (as phosphate) by adding iron or aluminium salts upstream of the primary clarifier.
Post-precipitation	Mixing tank / sedimentation tank downstream of the secondary clarifier	Removal of phosphorus (as phosphate) by adding iron or aluminium salts downstream of the primary clarifier.
Abiotic oxidation	Special tank	Destruction of organic compounds which cannot be degraded by biotic methods, such as ozone or UV light. Possibly with the purpose of being able to degrade the rest biotically (for example by bleaching the sewage)
Disinfection	Special tank	Killing germs by adding chlorine or ozone or by UV radiation

Structure of a water treatment system

Load parameters

The load of water treatment systems is determined according to the total number of inhabitants and population equivalents (PT). This is the sum of the actual inhabitants (population, P) and the population equivalent (PE). The population equivalent is the agreed quantity of sewage emissions assumed for one "standard inhabitant".

For commercial, industrial and agricultural production, the loads are specified with reference to the production amounts (e.g. 10 PT BOD_5 per hectares vineyard acreage). It is to be observed, however, that the ratios between the individual parameters can vary. Sewage can have a higher concentration (less sewage volume for the same amount of contamination), or it can be rich in organic carbon compounds and have fewer nutrients.

The content of biodegradable substances is quantified with the sum parameter Biochemical Oxygen Demand, or BOD for short. As a rule, it is measured in milligrams of the biochemical oxygen consumption within 5 days under standard conditions of 20 °C and is referred to as BOD_5. For biotic degradation, a nutrient ratio of BOD5:N:P of about 100:5:1 is favourable in order to supply the microorganisms with a sufficient amount of nitrogen and phosphorus. This is based on the assumption that about 50 % of the degraded organic substances are used for biomass growth and that the biomass consists of about 10 % nitrogen and about 2 % phosphorus.

The total number of inhabitants and population equivalents, or PT for short, is equivalent to the following values:

Amount of sewage

Formerly, a wastewater value of 150 to 200 litres per inhabitant and day was assumed as the load for a water treatment system with sewage. The wastewater value is roughly equivalent to the water consumption. For new planning or advance planning, the location-specific water consumption is determined and an estimation is attempted to be made for the future. Normally, wastewater volumes of around 130 litres per inhabitant and day are assumed.

This value takes the usual values for dense sewage networks in Central Europe into account. For dimensioning the water treatment system, however, usually an additional amount is taken into account for external water (leaky channels, feed from drainage, etc.). This can amount to up to 100 % of the wastewater value. The volume of external water refers to the connected sealed surface and should not be more than 0.15 l/(s*hectare).

In the case of mixed sewer systems (rainwater and wastewater in one channel), the corresponding additional amounts for processing the rainwater are to be taken into account, which are usually assumed to be 100 % of the daily peak value during dry weather.

For the hydraulic calculation (number and size of the pumps) of the water treatment system, the daily load curve is also significant. For dimensioning therefore, the average daily sewage amount is not to be divided by 24 hours, but instead by a smaller value (10 to 14) for the maximum hourly value.

Degree of contamination

BOD_5

For the BOD_5 value, i.e. the biochemical oxygen demand during a measured time of 5 days under standard conditions, the oxygen demand is measured which arises due to the oxidation of organic substances by aerobic microorganisms. It belongs to what are called sum parameters, since the degradation of single compounds cannot be determined with it.

60 g per inhabitant and day are assumed as the normal BOD_5 value. Of this, about 20 g can be removed by means of sedimentation during primary treatment.

Chemical oxygen demand

The chemical oxygen demand, or COD for short, is also among the sum parameters, since no individual compounds can be quantified with it. It is determined by means of oxidation of the sewage contents by potassium chromate and measures the oxygen demand for oxidising a majority of organic substances. If there are also oxidisable inorganic compounds, such as sulphites, in the sewage, these are also registered as COD.

This parameter is also used for balancing the system.

For the COD, a value of 120 g per inhabitant and day is assumed.

Nitrogen

In untreated sewage, nitrogen exists mainly in the form of organic compounds (e.g. in proteins, nucleic acids, urea) and in the form of ammonium ions (NH_4^+) as well as in small amounts in the form of nitrate (NO_3^-) and nitrite ions (NO_2^-).

About 10 to 12 g per inhabitant and day are applied here.

Phosphorus

Phosphorus exists organically as phosphate group and as free phosphate ions.

About 1.8 g per inhabitant and day are applied here.

Cost and energy efficiency of Wilo submersible mixers

The right choice

For the operator of water treatment systems, it is not easy to make a decision for the most economical mixing system. The least expensive investment price should not be the decisive factor under any circumstances. Economical mixers should be compared taking all relevant influencing factors into account. This only makes sense, however, when all factors involved in the mixing process have been considered.

These include:
- Investment costs
- Installation and commissioning costs
- Energy and operating costs
- Maintenance and repair costs
- Operating failure costs
- Disposal costs

Only once the above-listed influencing factors have been expressed in euros it is possible to make an objective mixer comparison.

Energy costs

Since many mixer applications require permanent operation, the energy costs have a considerable influence. The decisive parameters of submersible mixers are thrust (F*) and the consumed electric power at the duty point ($P_{1.1}$*).

This allows important power parameters to be determined.

- **Specif. thrust output [N/kW]** = thrust [F] / power [$P_{1.1}$]
  This parameter can be used to compare the energy efficiency of different products.
- **Specif. power density** = power [$P_{1.1}$ges] / tank volume
  This parameter is for the comparison of different mixer designs and provides information on the energy costs to be expected.

Cost calculation

A small calculation example shows that considerable cost savings are possible with a mixer design optimised in terms of energy.
Tank volume: 2950 m^3
Mixer selection:
- According to investment costs: 3.63 W/m^3 (specif. power density)
- Optimised according to operating costs: 1.7 W/m^3 (specif. power density)

The optimisation according to operating costs brings an advantage of 1.93 W/m^3, which corresponds to a savings for this tank of approx. 5700 W.

At an annual operating time of 8760 hours and a kilowatt price of EUR 0.15, that means savings of EUR 7480 EUR per basin per year.

These savings are possible by using highly efficient submersible mixers from Wilo.

Competence

WILO selects submersible mixers with the help of modern design software for your specific application, and can therefore offer you the most economical alternative. Give us your design-relevant basin and fluid data.

WILO is the right contact partner when economical solutions have to be found at good value for money. We would be happy to offer you optimised solutions with a flexible and robust system technology.

From initial planning and the implementation period to the final acceptance test, we'll be there for you with an expert team of specialists.

We would like to prove our performance to you. That is Pumpen Intelligenz.

*in accordance with DIN ISO 21630

Ceram coating

Modern corrosion and abrasion protection

Units that come into contact with the fluid are subject both to highly corrosive as well as abrasive influences. For this, WILO offers its Ceram coating. It provides reliable protection against this type of stress.

Normal heavy corrosion protection methods, such as zinc dust priming with three coats of tar epoxy resin are called onion layer models. The advantage of the zinc dust priming is that the zinc dust sacrifices and the zinc carbonate can seal microscopic cracks. This is referred to as the self-healing effect of the coating. The disadvantage is that the wet adhesion of this zinc dust priming isn't very high. Due to the onion layer model of conventional coatings that contain solvent, the adhesive force depends on the quality of the individual layers.

The Ceram coating, on the other hand, is based on the diamond model. It unifies the positive properties of two materials by combining aluminium oxide particles in one polymer matrix.

The aluminium oxide particles are enclosed in the matrix. Thus, there are no predetermined breaking points and the adhesion is very high, e.g. in the case of Ceram C0 15 N/mm^2. Since Ceram is solvent-free, these coatings can be applied with one layer.

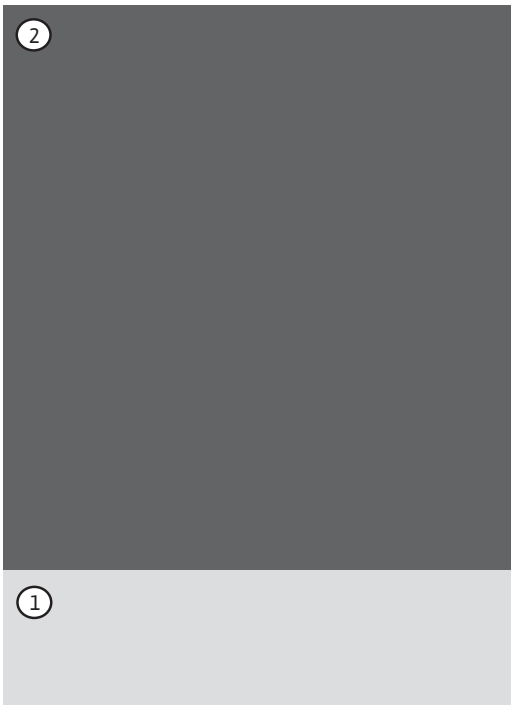
Ceram coatings are available in four different quality levels. These are distinguished in terms of their resistance to abrasive corrosion. While the corrosion resistance is very good for all four quality levels, the resistance to abrasion increases the higher the ordinal number (C0 = low protection from abrasion; C3 = very good protection from abrasion) of the coating, since coarser aluminium oxide particles are processed. The individual layers get thicker and the mixture of large, medium-sized and small aluminium oxide particles is such that even in the case of abrasion with fine sand, the coatings are very stable.

- Ceram C0: The coating is applied using the airless method in one layer of 0.4 mm.
- Ceram C1: The coating is applied with a paintbrush and may consist of up to three layers. The layer thickness is 1.5 mm.
- Ceram C2: The coating is applied with a spatula. The layer thickness is 1.5 mm and consists of one coat.
- Ceram C3: The coating is applied with a spatula. The layer thickness is 3 mm and consists of one coat. For tight gaps/clearance, a mechanical process is necessary.

For use in special fluids, the individual Ceram qualities can be combined with one another, e.g. C2 + C1.

Structure of different coatings

1.) Basic material e.g. housing in cast iron
2.) 1st coating: zinc dust priming (50 µm), adhesiveness 2.5 N/mm^2
3.) 2nd to 4thcoating: tar epoxy resin (110 µm), adhesiveness 5 N/mm^2
The illustration shows the structure of a tar expoxy resin coating with zinc dust priming. The coating consists of 4 individual layers with total layer thickness of 380 µm. The three lines in dark grey represent the weak points of this coating, the black line shows the predetermined breaking point.



1.) Basic material e.g. housing in cast iron
2.) 1st coating: Ceram C0 (400 µm), adhesiveness 15 N/mm^2
This illustration shows the structure of a Ceram C0 coating. The coating consists of a one individual layer with a total layer thickness of 400 µm. The airless application method allows a very high surface quality.

Ceram coating

The Ceram coating is also very well suited for use in maritime environments. For its Ceram C0 coating, Wilo grants a guarantee of 5 years for use in seawater. The prerequisite is that the coating is intact.

Increase efficiency, reduce costs

Since water is being used ever more economically, the proportion of contaminants is on the increase in relation to the amount of water. This means that the concentration of corrosive and abrasive constituents is higher.

Sewage units are permanently exposed to this aggressive fluid. Corrosion and abrasion affect the surfaces and material structures of the units, sometimes with considerable impairments to the material, and thus also the performance.

This significantly reduces their hydraulic efficiency. This results in an increased current consumption of the units. On the other hand, the pumps no longer work at their optimum, the radial forces increase, there is more stress on the bearings and mechanical seals and the service life of the machines is reduced.

When standard materials are used, such as grey cast iron, under high stress, it may be necessary to exchange the components already after 500 hours of operation. Ceram coatings allow the service life to be increased by a factor of 4, and this at the same high efficiency, which means minimum energy costs.

If one takes the overall costs over the entire service life of the pump into account, the investment costs for a unit coated with Ceram are less than 10 % and thus negligible. On the other hand, there is a high savings potential due to the fact that fewer repairs are required, resulting in a significant reduction of system downtimes. That soon pays off due to the higher efficiency.

Use of the various Ceram qualities

- Ceram C0 is used for the complete outer and inner coating. It's ideally suited for corrosion protection.
- Ceram C1 is used for the inner coating of pump components. The main field of application is the coating of the impeller and the suction port .
- Ceram C2 und C3 are used for the inner coating of pump components. The main field of application is the coating of the pump housing.

In order to guarantee protection even in especially aggressive and corrosive fluids, the Ceram types are combined with each other, e.g. C2 + C1 or C3 + C1.

Ceram coating

Ceram C0 – Technical data

Description

Ceram C0 is a sprayable, solvent-free two-component polymer coating substance with an aluminium oxide basis for protecting our products against corrosion when there is additional strong mechanical stress.

Composition

Solvent-free epoxy polymer with solvent-free polyamine hardener and various extenders.

Properties

- Tough and durable coating with high mechanical and chemical resistance and very good abrasion resistance.
- Excellent wet adhesion and compatibility with cathodic corrosion protection as single-layer coating on steel surfaces.
- Very good adhesion to steel surfaces.
- Replaces bituminous coatings.
- Saves costs due to the long service life, low maintenance and easy reparability.
- Tested by the "Bundesanstalt für Wasserbau" (German Federal Institute for Hydraulic Engineering) (BAW).
- Solvent-free.
- Hardened coating has a high-gloss finish.

Technical data		
Density (mixture) adhesive strength/steel	ASTM D 792 ISO 4624	1.4 g/cm^3 15 N/mm^2
Impact resistance / strength	DIN EN ISO 6272	9 J
Temperature resistance: dry, long-term		60 °C
Temperature resistance: dry, short-term		120 °C
Temperature resistance: wet / liquid	Depending on the fluid; on request	
Solid content (mixture)	Volume weight	97 % 98 %

Resistance table		
Fluid	**Temperature**	**Factor**
Sewage, alkaline (pH 11)	+20 °C	1
Sewage, alkaline (pH 11)	+40 °C	1
Sewage, slightly acidic (pH 6)	+20 °C	1
Sewage, slightly acidic (pH 6)	+40 °C	1
Sewage, highly acidic (pH 1)	+20 °C	2
Sewage, highly acidic (pH 1)	+40 °C	3
Ammonium hydroxide (5 %)	+40 °C	3
Decanol (fatty alcohol)	+20 °C	1
Decanol (fatty alcohol)	+50 °C	1
Ethanol (40 %)	+20 °C	1
Ethanol (96 %)	+20 °C	3
Ethylene glycol	+20 °C	1
Heating oil/diesel	+20 °C	1
Compressor oil	+20 °C	1
Methyl ethyl ketone (MEK)	+20 °C	3

Resistance table		
Fluid	**Temperature**	**Factor**
Caustic soda (5 %)	+20 °C	1
Caustic soda (5 %)	+50 °C	2
Sodium chloride solution (10 %)	+20 °C	1
Hydrochloric acid (5 %)	+20 °C	2
Hydrochloric acid (10 %)	+20 °C	2
Hydrochloric acid (20 %)	+20 °C	3
Sulphuric acid (10 %)	+20 °C	2
Sulphuric acid (20 %)	+20 °C	3
Nitric acid (5 %)	+20 °C	3
Toluene	+20 °C	2
Water (cooling/industrial water)	+50 °C	1
Xylene	+20 °C	1

Key: 1 = stable; 2 = stable, short-term; 3 = overflow-stable, immediate cleaning; 4 = not recommended for direct contact

Ceram coating

Ceram C1 – Technical data

Description

Ceram C1 is a cold-hardening, solvent-free composite material based on two components with selected reinforcement fillers and extenders.

Composition

Polymer/aluminium oxide composite material made of a base compound and reinforcement.
Base compound: A modified polymer consisting of two components with an aliphatic hardening agent.
Reinforcement: A mixture (protected by proprietary rights) made up of aluminium oxide and extenders.
This mixture has excellent abrasion resistance and can be applied very easily.

Properties

- The completely hardened Ceram C1 coating has a glossy finish, no pores and is easy to clean, mechanically very resistant, abrasion-proof and has excellent adhesive properties.
- Ceram C1 hardens without shrinking and is resistant to a large number of chemicals, oils, greases, solvents, diluted organic and inorganic acids and bases and saline solutions.
- Ceram C1 reduces friction and improves flow and efficiency.
- Excellent corrosion protection.

Technical data		
Hardness	Buchholz	115
Density / mixture	ASTM D 792	1.4 g/cm^3
Shrinkage during hardening	ASTM D 2566	0.002 mm/cm
Tensile shear resistance	ASTM D 1002	13.8 N/mm^2
Tensile strength / ultimate strain	ASTM D 638	26.2 N/mm^2
Compressive strength	ASTM D 695	60 N/mm^2
Bending strength	ASTM D 790	55.2 N/mm^2
Adhesive strength / steel	ISO 4624	13.8 N/mm^2
Impact resistance / strength	ASTM D 256	11 J/m
Coefficient of linear expansion	ASTM D 696	34.5 x 10^{-61} 1/K
Electrical resistance	ASTM D 257	8 Ohm cm
Thermal conductivity	ASTM C 177	0.7 W/m x K
Porosity test	Test voltage	5 V/µm layer thickness
Temperature resistance, dry	ASTM D 648	140 °C
Temperature resistance, wet	ASTM D 648	60 °C

Resistance table	
Fluid	**Factor**
Acids	
Sulphuric acid (10 %)	2
Sulphuric acid (20 %)	3
Hydrochloric acid (5 %)	1
Hydrochloric acid (10 %)	2
Hydrochloric acid (20 %)	3
Nitric acid (5 %)	1

Resistance table	
Fluid	**Factor**
Nitric acid (10 %)	3
Phosphoric acid (5 %)	1
Phosphoric acid (20 %)	3
Bases and bleaches	
Sodium hydroxide (10 %)	1
Sodium hydroxide (50 %)	1
Ammonia (5 %)	2
Ammonium hydroxide (28 %)	1
Potassium hydroxide (10 %)	1
Potassium hydroxide (50 %)	1
Fixing salt (6 %)	1
Soap solution (5 %)	1
Cement mortar / concrete	1
Other compounds	
Isopropanol	1
Kerosene	1
Naphtha	1
Salt water	1
Sewage	1
Toluene	1
Xylene	1
Bunker C	1
Diesel oil	1

Tested at 20 °C. Sample hardened for 12 days at 20 °C. Longer hardening improves the chemical resistance.
Key: 1 = stable; 2 = stable, short-term; 3 = overflow-stable, immediate cleaning; 4 = not recommended for direct contact

Ceram coating

Ceram C2 – Technical data

Description

Ceram C2 is a high-performance compound material for repairing and protecting all metal surfaces which are subject to abrasion, corrosion, cavitation and chemical exposure. Ceram C2 is applied with a coating thickness of 1.5 mm. It does not shrink and consists almost entirely of solids. Ceram C2 contains a high percentage of carbides for use under extremely abrasive operating conditions which involve complex and expensive repair measures. The material can either be used for restoring abraded metal surfaces or as a preventive coating which is superior to the original metal in terms of its abrasive strength. Ceram C2 can be used instead of metal applications, tiles, rubber fillers, etc. Its thermal stability is outstanding.

Composition

Polymer/aluminium oxide composite material made of a base compound and reinforcement.
Base compound: A modified polymer consisting of two components with an aliphatic hardening agent.
Reinforcement: A mixture (protected by proprietary rights) made up of aluminium oxide and silicon carbide particles. This mixture has excellent abrasion resistance and can be applied very easily.

Properties

- Excellent abrasion resistance ensures long operation and usually lasts longer than a welded-on metal coating.
- Can be easily moulded to any metal surface.
- Its tough synthetic resin structure is resistant to temperature shocks and impact.
- Excellent adhesion ensures reliability and prevents stripping.
- Simple application reduces work expenses and downtimes.
- Withstands varying chemical operating conditions when metals fail.
- Practical 4:1 weight and volume mixture ratio.

Technical data		
Hardness	Shore D	90
Density	ASTM D 792	1.85 g/cm^2
Shrinkage during hardening	ASTM D 2566	0 mm/cm
Tensile shear resistance	ASTM D 1002	13.24 N/mm^2
Tensile strength / ultimate strain	ASTM D 638	27 N/mm^2
Compressive strength	ASTM D 695	103.4 N/mm^2
Bending strength	ASTM D 790	69.0 N/mm^2
Adhesive strength / steel	ASTM C 633	---
Impact resistance / strength	ASTM D 256	3. J/m
Linear expansion coefficient	ASTM D 696	---
Electrical resistance	ASTM D 257	---
Thermal conductivity	ASTM C 177	---
Dielectric strength	ASTM D 149	4 KV/mm
Temperature resistance, dry	ASTM D 648	250 °C
Temperature resistance, wet	ASTM D 648	80 °C

Resistance table	
Fluid	**Factor**
Acids	
Sulphuric acid (10 %)	1
Sulphuric acid (20 %)	2

Resistance table	
Fluid	**Factor**
Hydrochloric acid (5 %)	1
Hydrochloric acid (10 %)	2
Hydrochloric acid (20 %)	3
Acetic acid (5 %)	2
Acetic acid (10 %)	4
Bases and bleaches	
Caustic soda (10 %)	1
Caustic soda (30 %)	1
Ammonium hydroxide (28 %)	1
Potassium hydroxide (10 %)	1
Potassium hydroxide (50 %)	1
Other compounds	
Isopropyl alcohol	1
Kerosene	1
Naphtha	1
Salt water	1
Sewage	1
Toluene	1
Xylene	1
Bunker C	1
Diesel	1

Tested at 20 °C. Sample hardened for 7 days at 20 °C. Longer hardening improves the chemical resistance.
Key: 1 = stable; 2 = stable, short-term; 3 = overflow-stable, immediate cleaning; 4 = not recommended for direct contact

Ceram coating

Ceram C3 – Technical data

Description

Ceram C3 is a high-performance compound material for repairing and protecting all metal surfaces which are subject to abrasion, corrosion, cavitation and chemical exposure. Ceram C3 is applied with a coating thickness of 3 mm. It does not shrink and consists almost entirely of solids. Ceram C3 contains a high percentage of carbides for use under extremely abrasive operating conditions which involve complex and expensive repair measures. The material can either be used for restoring abraded metal surfaces or as a preventive coating which is superior to the original metal with regard to abrasive strength. Ceram C3 can be used instead of metal applications, rubber fillers, etc.

Composition

Polymer/aluminium oxide composite material made of a base compound and reinforcement.
Base compound: A modified polymer consisting of two components with an aliphatic hardening agent.
Reinforcement: A mixture (protected by proprietary rights) made up of aluminium oxide and silicon carbide particles. This mixture has excellent abrasion resistance and can be applied very easily.

Properties

- Excellent abrasion resistance ensures long operation and usually lasts longer than a welded-on metal coating.
- Its tough synthetic resin structure is resistant to temperature shocks and impact.
- Excellent adhesion ensures reliability and prevents stripping.
- Simple application reduces work expenses and downtimes.
- Withstands varying chemical operating conditions when metals fail.
- Can be easily moulded to any metal surface.
- Practical 1.7:1 weight and volume mixture ratio.

Technical data		
Hardness	Shore D	90
Density	ASTM D 792	1.87 g/cm^3
Shrinkage during hardening	ASTM D 2566	0 mm/cm
Tensile shear resistance	ASTM D 1002	17 N/mm^2
Tensile strength / ultimate strain	ASTM D 638	29.7 N/mm^2
Compressive strength	ASTM D 695	103 N/mm^2
Bending strength	ASTM D 790	69 N/mm^2
Adhesive strength / steel	ASTM C 633	15.9 N/mm^2
Impact resistance / strength	ASTM D 256	12 J/m
Linear expansion coefficient	ASTM D 696	61.8 x 10^{-61} 1/K
Electrical resistance	ASTM D 257	8 Ohm cm
Thermal conductivity	ASTM C 177	0.75 w/m x K
Dielectric strength	ASTM D 149	13.4 KV/mm
Temperature resistance, dry	ASTM D 648	190 °C
Temperature resistance, wet	ASTM D 648	65 °C

Resistance table	
Fluid	**Factor**
Acids	
Sulphuric acid (10 %)	1
Sulphuric acid (20 %)	2
Hydrochloric acid (5 %)	1
Hydrochloric acid (10 %)	2

Resistance table	
Fluid	**Factor**
Hydrochloric acid (20 %)	3
Acetic acid (5 %)	2
Acetic acid (10 %)	4
Bases and bleaches	
Caustic soda (10 %)	1
Caustic soda (30 %)	1
Ammonium hydroxide (28 %)	1
Potassium hydroxide (10 %)	1
Potassium hydroxide (50 %)	1
Other compounds	
Isopropyl alcohol	1
Kerosene	1
Naphtha	1
Salt water	1
Sewage	1
Toluene	1
Xylene	1
Bunker C	1
Diesel	1

Tested at 20 °C. Sample hardened for 7 days at 20 °C. Longer hardening improves the chemical resistance.
Key: 1 = stable; 2 = stable, short-term; 3 = overflow-stable, immediate cleaning; 4 = not recommended for direct contact

Ex protection

Wilo units are approved for use in potentially explosive areas. For this, they are certified according to two different standards: The European ATEX standard as well as the American FM standard.

Atex standard

The units are designed in accordance with "EU Directive 94/09/EC" (ATEX 95) and the European standards DIN EN 60079-0 and EN 60079-1. They may be operated in potentially explosive atmospheres which require electrical devices of device group II, category 2.

It is therefore possible to use them in zone 1 and zone 2. These units may not be used in zone 0.

The Wilo units are labelled as follows: II 2 G Ex d IIB T4

II	Device group II Description: For potentially explosive locations with the exception of mines
2	Category
G	Substance group Description: Gases
Ex	Ex-protected device in accordance with European standard
d	Ignition protection category for motor housing Description: Pressure-proof enclosure
IIB	Explosion group Description: For use in combination with gases of subdivision B, all gases with the exception of H_2, C_2H_2, CS_2
T4	Temperature class Description: Max. surface temperature of the device is 135 °C

FM standard

The units are certified and approved by the recognised testing and approval authority "FM Approvals" in accordance with the standards FM 3600, 3615, 3615.80 and ANSI/UL-1004. They may be operated in potentially explosive areas which require electrical devices with the protection class "Explosionproof, Class 1, Division 1". Operation in areas with the required protection class "Explosionproof, Class 1, Division 2" in accordance with the FM standard is also possible.

The Wilo units are labelled as follows:

Class 1	Division 1; Groups C, D Description: Gases, vapours, mists; explosive atmosphere present constantly or occasionally during normal conditions; Gas groups: ethylene (C), propane (D)
Class 2	Division 1; Groups E, F, G Description: Dusts; explosive atmosphere present constantly or occasionally during normal conditions; Dust groups: Metal (E), carbon (F), grain (G)
Class 3	Description: Fibres and lint
T3C	Temperature class Description: Max. surface temperature of the machine 160 °C

Temperature monitoring

Standard explosion-certified motors are equipped with a temperature monitor. This includes:

- Motors of size T 12 and T 13
  winding: Temperature limiter 140 °C
- Motors of size T 17 and large
  winding: Temperature controller 130 °C, temperature limiter 140 °C
- Motors of size FK 17.1
  winding: Temperature limiter 120 °C, oil: Temperature limiter 100 °C
- Motors of size T 20.1, HC 20.1 and FKT 27.1
  winding: Temperature limiter 160 °C, laminated core: Temperature limiter 110 °C

The temperature monitor is to be connected so that automatic reactivation is possible when the "temperature controller" is triggered. When the "temperature limiter" is triggered, reactivation should only be possible when the "release button" has been pressed by hand.

Frequency converter operation

For operation with a frequency converter, the motors must be equipped with a PTC thermistor temperature sensor. Specify the intended use when making your order so that we can equip the motors accordingly.

Sealing chamber control

The units can be equipped with an external sealing chamber control. This can also be retrofitted. If the unit is equipped with an external sealing chamber control, this may only be connected to an intrinsically safe electric circuit.

Definition of the Ex zones

The Ex zones are defined in the respective standards. The identification of the zones in the operating area of the units must be performed by the operator. When ordering, please state which Ex standard you are using as the basis and in which zone you want to operate the unit.

Ex protection

Equipment/Function

	Miniprop mixers	Uniprop mixers – directly driven	Uniprop mixers – with gear	Maxiprop/ Megaprop mixers	Rezijet recirculation pumps
Design					
Explosion protection	•	•	•	•	•
Sealing chamber	•	•	•	•	•
Prechamber	–	–	•	•	•
Gear chamber	–	–	•	•	•
Directly driven	•	•	–	–	•
FC operation	•	•	•	•	•
Single-stage planetary gear	–	–	•	–	•
Two-stage planetary gear	–	–	–	•	–
Sealing for mechanical seal on motor side	•	–	•	•	•
Sealing for rotary shaft seal on motor side	–	•	•	•	•
Sealing for mechanical seal on fluid side	•	•	•	•	•
Sealing for rotary shaft seal on fluid side	–	–	–	–	–
Application					
Wet well installation, ground installation	•	•	–	–	–
Wet well installation, wall-mounted installation	•	•	–	–	–
Lowering device for wet well installation	•	•	•	–	•
Tripod for wet well installation	–	–	•	•	–
Materials					
Cast propeller	–	•	–	–	–
Steel propeller	•	•	•	–	•
PUR propeller	•	•	•	–	•
PUR/GRP propeller	–	–	•	–	–
GRP propeller	–	–	–	•	–
Equipment/function					
Motor temperature monitoring, bimetal	•	•	•	•	•
PTC motor temperature monitoring	optional	optional	optional	optional	optional
Motor impermeability monitoring	•	•	•	•	•
Sealing chamber monitoring	optional	optional	optional	optional	optional
Propeller blades can be replaced individually	–	–	–	•	–

Motor data

Wilo-EMU...	Starting current – direct	Starting current – star-delta	Nominal current	Power consumption	Nominal motor power	Efficiency	Operating mode (submerged)	Ex protection according to		Insulation class	Max. fluid temperature	Max. switching frequency /h
	I_A		I_N	P_1	P_2	η_M	–	ATEX	FM	–	T	–
	[A]			[kW]			–				[°C]	–
T 12-4/6 (Ex)	6	2	1.42	0.73	0.5	0.69	S1	•	•	F	40	15
T 12-4/11 (Ex)	16	6	2.5	0.76	0.5	0.66	S1	•	•	F	40	15
T 17-2/15R (Ex)	77	26	12.8	7.9	6.75	0.86	S1	•	•	F	40	15
T 17-2/22R (Ex)	171	57	20.5	12.3	10.5	0.86	S1	•	•	F	40	15
T 17-2/8R (Ex)	55	19	7.2	4.35	3.5	0.81	S1	•	•	F	40	15
T 17-4/8V (Ex)	28	10	5.9	3.5	2.5	0.72	S1	•	•	F	40	15
T 17-4/12R (Ex)	47	16	9.4	5.8	4.5	0.78	S1	•	•	F	40	15
T 17-4/16R (Ex)	68	23	13.5	8.2	6.5	0.8	S1	•	•	F	40	15
T 17-4/24R (Ex)	123	41	21	12.2	10	0.82	S1	•	•	F	40	15
T 17-4/8R (Ex)	37	13	7.9	4.5	3.5	0.78	S1	•	•	F	40	15
T 17-6/12R (Ex)	31	11	6.2	3.45	2.5	0.73	S1	•	•	F	40	15
T 17-6/16R (Ex)	39	13	9.1	5.2	3.7	0.72	S1	•	•	F	40	15
T 17-6/24R (Ex)	65	22	13.6	7.7	6	0.78	S1	•	•	F	40	15
T 17-6/8R (Ex)	17	6	4.45	2.5	1.75	0.7	S1	•	•	F	40	15
T 17-8/12R (Ex)	24	8	5.2	2.75	1.8	0.66	S1	•	•	F	40	15
T 17-8/16R (Ex)	36	12	7.4	3.95	2.75	0.7	S1	•	•	F	40	15
T 17-8/24R (Ex)	63	21	14.3	7.7	5.1	0.67	S1	•	•	F	40	15
T 17-8/8R (Ex)	14	5	3.2	1.67	1.1	0.66	S1	•	•	F	40	15
T 20-2/22R (Ex)	215	71	30.5	18.6	15.5	0.83	S1	•	•	F	40	15
T 20-4/22R (Ex)	156	52	26	15.3	12.5	0.82	S1	•	•	F	40	15
T 20-4/27R (Ex)	192	64	32	18.9	16	0.85	S1	•	•	F	40	15
T 20-4/30R (Ex)	220	73	36.5	22	18.5	0.86	S1	•	•	F	40	15
T 20-6/22R (Ex)	97	33	19.4	11.2	9	0.81	S1	•	•	F	40	15
T 20-6/27R (Ex)	121	40	24.5	14.1	11.5	0.82	S1	•	•	F	40	15
T 20-6/32R (Ex)	140	47	26	14.9	12.5	0.84	S1	•	•	F	40	15
T 20-8/22R (Ex)	82	27	16.2	8.4	6.8	0.81	S1	•	•	F	40	15
T 20-8/27R (Ex)	100	33	20	10.5	8.6	0.82	S1	•	•	F	40	15
T 20-8/32R (Ex)	110	37	21.5	11.5	9.6	0.84	S1	•	•	F	40	15

Series overview Wilo-EMU Miniprop, Uniprop, Maxiprop, Megaprop

Series: Wilo-EMU Miniprop

> Application
- Swirling of deposits and solids in rain spillway basin and pump sump
- Destruction of floating sludge layers
- Other areas of application in agriculture and water supply

Series: Wilo-EMU Uniprop – directly driven

> Application
- Swirling of deposits and solids in rain spillway basin and pump sump
- Destruction of floating sludge layers
- Other areas of application in agriculture and water supply

Series: Wilo-EMU Uniprop – with gear

> Application
Utilisation in activated-sludge tank and sludge tanks for:
- Generation of flow
- Suspension of solids
- Homogenisation
- Prevention of floating sludge layers
- Other areas of application in industry, agriculture and water supply

Series overview Wilo-EMU Miniprop, Uniprop, Maxiprop, Megaprop

Series: Wilo-EMU Miniprop

> Special features/product benefits
- Submersible
- Low power consumption
- Low weight
- ATEX and FM version
- Self-cleaning propeller with helix hub
- Easy-to-install propeller attachment
- Propeller in steel or PUR version
- Optional: 1.4462 motor shaft

> More information **Page**

Series: Wilo-EMU Uniprop – directly driven

> Special features/product benefits
- Submersible
- Self-cleaning propeller with helix hub
- Easy-to-install propeller attachment
- Propeller in cast, steel or PUR version
- ATEX and FM version

> More information **Page**

Series: Wilo-EMU Uniprop – with gear

> Special features/product benefits
- Submersible
- Single-stage planetary gear for adapting the propeller speed
- Self-cleaning propeller
- Easy-to-install propeller attachment
- Propeller in steel, PUR or PUR/GFK version
- ATEX and FM version
- 1.4462 gear shaft

> More information **Page**

Series overview Wilo-EMU Miniprop, Uniprop, Maxiprop, Megaprop

Series: Wilo-EMU Maxiprop/Megaprop

> Application
- Energy-optimised mixing and circulation of activated sludge
- Creation of flow rates in circulation channels
- Further areas of application in industry

Series overview Wilo-EMU Miniprop, Uniprop, Maxiprop, Megaprop

Series: Wilo-EMU Maxiprop/Megaprop

> Special features/product benefits
- Submersible
- 2-stage planetary gear for adapting the propeller speed
- Self-cleaning propeller
- Propeller blades can be exchanged individually
- Easy-to-install blades and hub
- Propeller in GFK version
- ATEX and FM version
- 1.4462 gear shaft

> More information **Page**

Submersible mixers

Miniprop mixers

Series description Wilo-EMU Miniprop

Design
Compact directly driven submersible mixer

Type key

e.g.:	**Wilo-EMU TR 21.145-4/11 S10**
TR	Submersible mixer
21	x 10 = nominal propeller diameter in mm
145	x 10 = propeller speed in rpm
4	Number of poles
11	x 10 = stator length in mm
S10	Propeller code for welded propellers (without = PUR propeller)

Application
- Swirling of deposits and solids in rain spillway basin and pump sump
- Destruction of floating sludge layers
- Other areas of application in agriculture and water supply

Special features/product benefits
- Submersible
- Low power consumption
- Low weight
- ATEX and FM version
- Self-cleaning propeller with helix hub
- Easy-to-install propeller attachment
- Propeller in steel or PUR version
- Optional: 1.4462 motor shaft

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Mechanical seal with SiC/SiC combination
- Permanently lubricated roller bearing
- Max. submersion depth: 12.5 m

Equipment/function
- Stationary installation on walls and floors
- Flexible installation through the use of lowering device or special pipe attachment
- Can be swivelled vertically and horizontally during installation with lowering device

Materials
- Housing parts made of EN-GJL
- Propeller made of PUR or stainless steel
- Propeller hub made of stainless steel
- Screwed connections made of stainless steel

Description/design
Propeller
2-bladed propeller made of PUR or stainless steel. Nominal propeller diameter from 140 mm to 280 mm. Entwining-free design made possible by backward-curved incoming flow edge and patented helix hub. The propeller blades are permanently fixed, which guarantees the best possible hydraulic efficiency.

Motor
Wilo T-series submersible motor with standard connection, enabling simple and efficient adaptation of the motor power classes The motor heat is given off directly to the fluid via the housing. The winding is equipped with a temperature monitor. Large-sized grooved ball bearings ensure long service life of the motor bearings.

Sealing
Double shaft sealing with large-volume sealing chamber to collect leakage from the mechanical seal; available with external sealing chamber electrode upon request. On the motor and fluid side, a corrosion- and wear-resistant mechanical seal made of solid silicon carbide material is used. A seal bushing made of stainless steel ensures long-term corrosion-protected fit of the mechanical seal.

Cable
The power cable is a type H07 cable for heavy mechanical loads. The power cable enters the motor housing through a water pressure-tight cable lead-in with strain relief and bend protection.

Options
- Special voltages
- PTC thermistor temperature sensor
- External sealing chamber control
- Coating Ceram C0
- Ex-rated to ATEX or FM

Scope of delivery
- Submersible mixer with mounted propeller and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

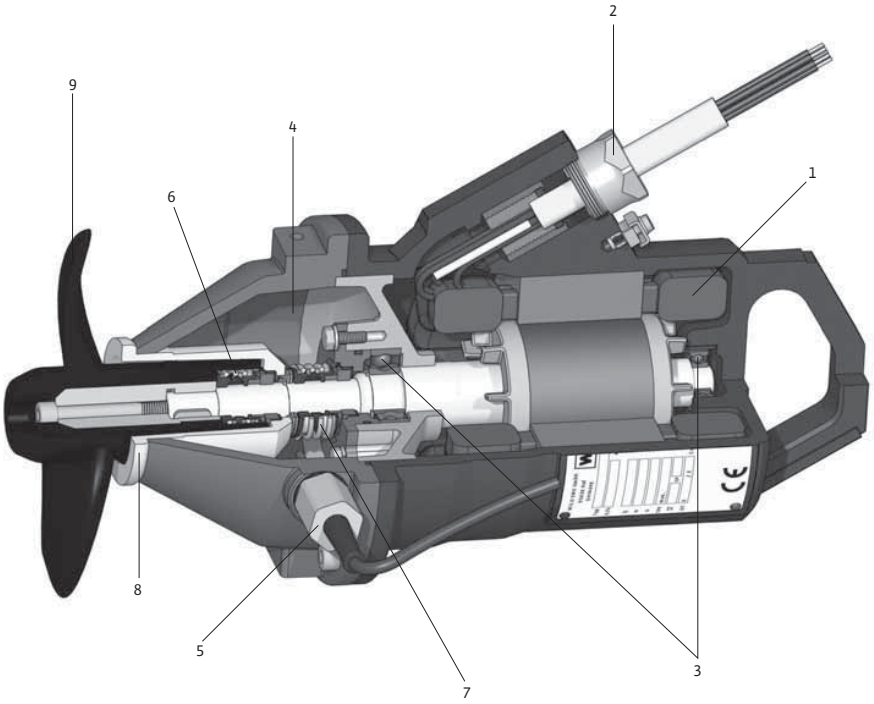
Configuration
A separate configuration must be carried out for each application to ensure optimum generation of fluid current. Carefully follow the instructions for the supplied configuration when installing the units.

Commissioning
Immersed operating mode S1:
The unit can be used immersed in permanent operation (max. 1000 h/year). Surfacing the propeller or motor is strictly prohibited. In the case of fluctuating fluid levels, the system should switch off automatically if the degree of water submersion drops below the minimum level.

When installing the power cables, make sure that they are not drawn into the propeller by the fluid current.

Series description Wilo-EMU Miniprop

Accessories
- Lowering device
- Auxiliary hoisting gear
- Wall and floor fixation bracket
- Special fixation parts to enable use of an auxiliary hoisting gear for multiple units
- Terminal stop
- Additional cable anchoring
- Fixation sets with anchor bolt



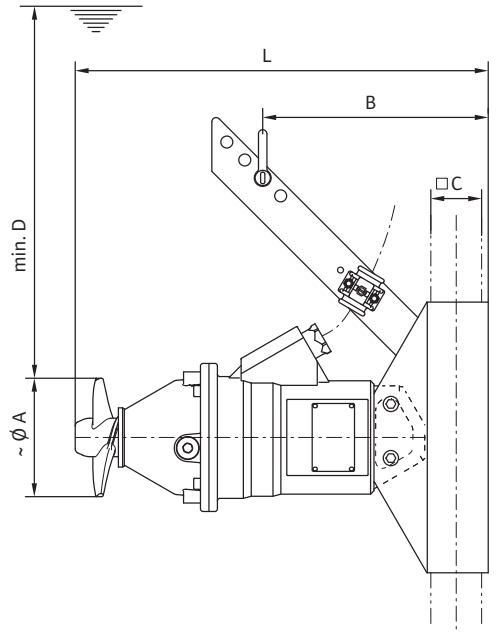
1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = sealing chamber; 5 = external electrode for monitoring the sealing chamber; 6 = mechanical seal on fluid side; 7 = mechanical seal on motor side; 8 = seal bushing, 9 = propeller

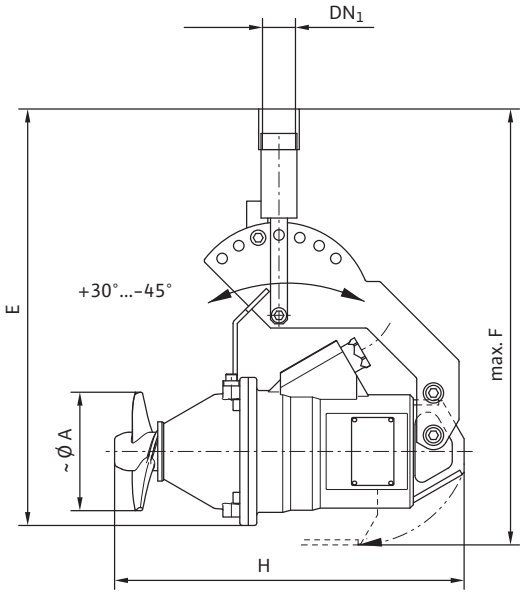
Submersible mixers

Miniprop mixers

Dimensions, weights Wilo-EMU TR 14, TR 16, TR 21, TR 28

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Connection	Weight
	A	W	C	D	E	F	H	L	DN_1	Unit
	[mm]									[kg]
TR 14...-.../6	140	245	60	200	495	520	415	475	Rp 1¼	20
TR 16...-.../6	160	245	60	200	495	520	415	475	Rp 1¼	20
TR 21...-.../6	220	245	60	200	480	530	415	475	Rp 1¼	20
TR 21...-.../6 S..	210	245	60	200	480	530	415	475	Rp 1¼	22
TR 21...-.../11	220	300	60	200	480	530	470	530	Rp 1¼	26
TR 21...-.../11 S..	210	300	60	200	480	530	470	530	Rp 1¼	28
TR 28...-.../11	280	300	60	300	515	603	505	565	Rp 1¼	27

Technical data, motor data Wilo-EMU TR 14, TR 16, TR 21, TR 28

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 14.145-4/6	0.26	1336	1.000	45
TR 16.145-4/6	0.3	1336	1.000	65
TR 21.145-4/6	0.34	1336	1.000	75
TR 21.145-4/6 S5	0.45	1336	1.000	95
TR 21.145-4/11	0.51	1392	1.000	80
TR 21.145-4/11 S10	0.9	1392	1.000	170
TR 21.145-4/11 S14	1.2	1392	1.000	240
TR 28.145-4/11	1.3	1392	1.000	330

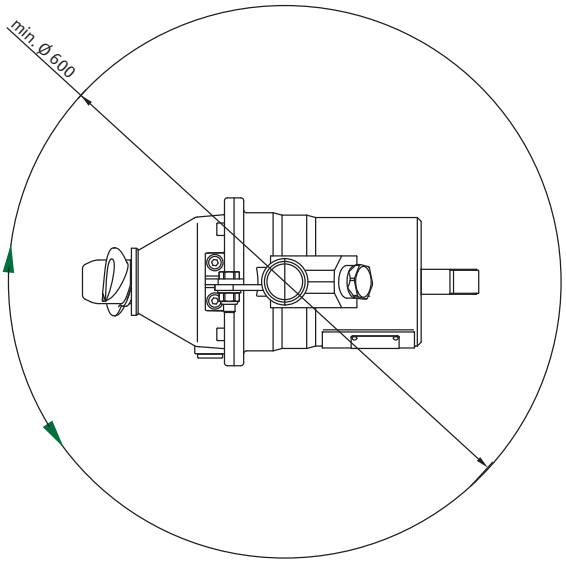
Motor data

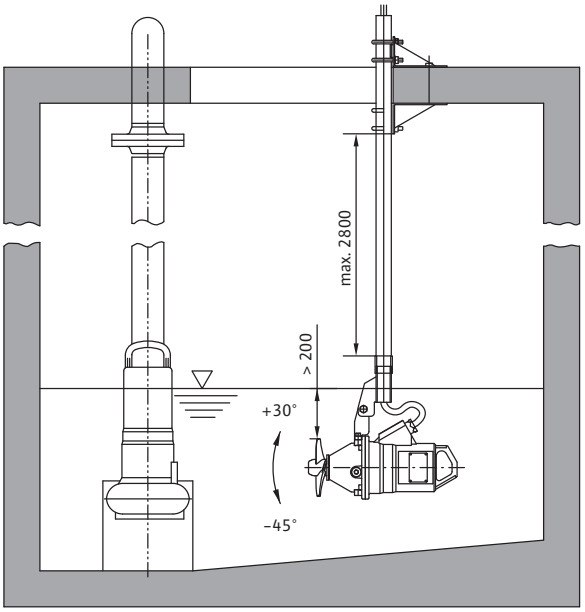
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 12-4/11 (Ex)	1.3	1.74	3.3	1392	•	•
T 12-4/6 (Ex)	0.5	0.73	1.42	1336	•	•

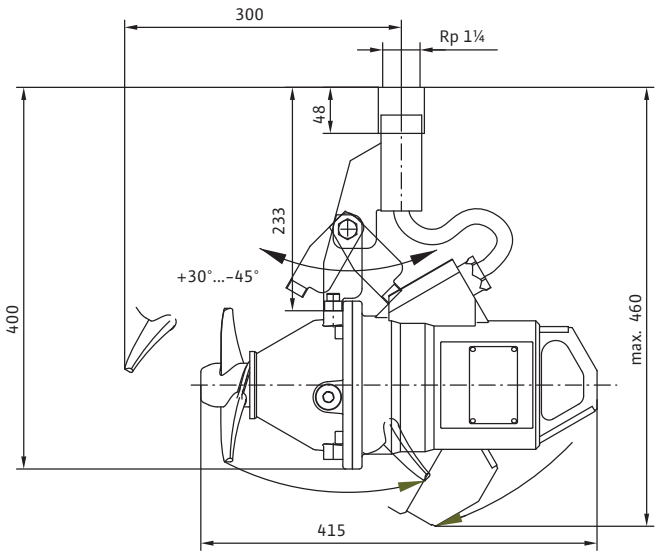
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Installation example

Wilo-EMU mixer TR 14 with pipe installation

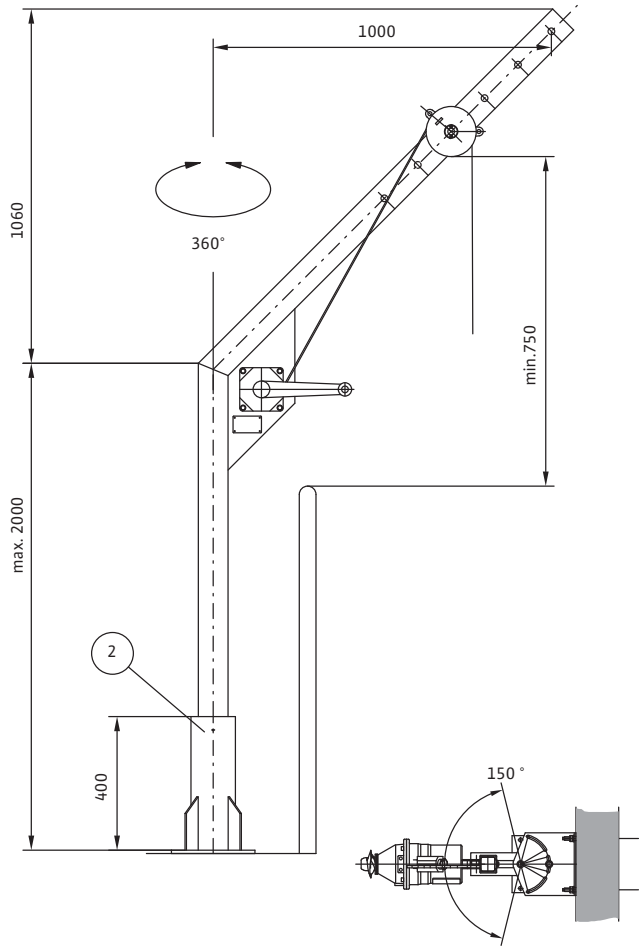


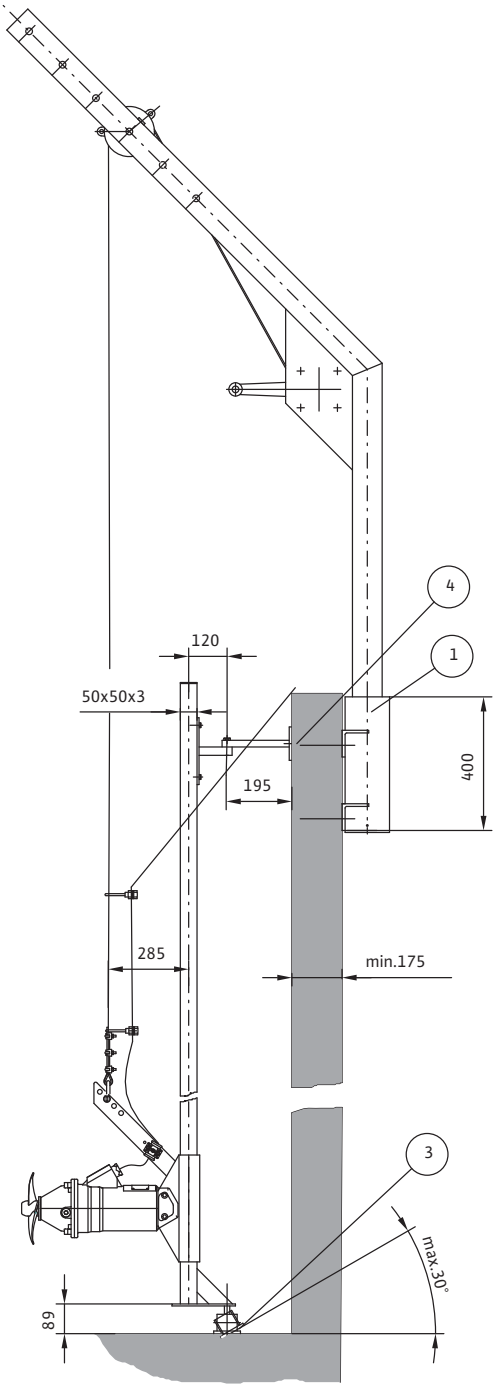


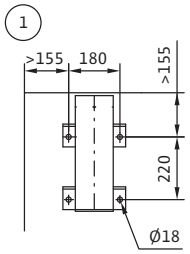


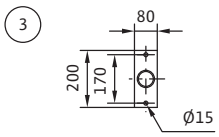
Installation example

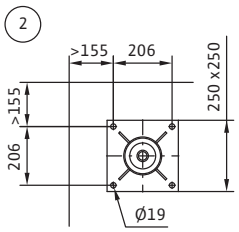
Wilo-EMU mixer TR 21 with lowering device AVU50

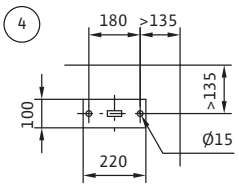








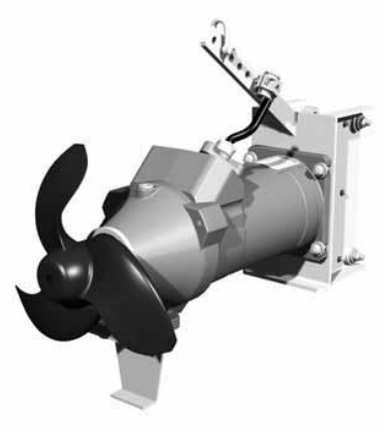




Submersible mixers

Uniprop mixers – directly driven

Series description Wilo-EMU Uniprop – directly driven



Design
Compact directly driven submersible mixer

Type key

e.g.:	**Wilo-EMU TR 36.95-6/8 S17**
TR	Submersible mixer
36	x 10 = nominal propeller diameter in mm
95	x 10 = propeller speed in rpm
6	Number of poles
8	x 10 = stator length in mm
S17	Propeller code for welded propellers (without = PUR propeller)

Application
- Swirling of deposits and solids in rain spillway basin and pump sump
- Destruction of floating sludge layers
- Other areas of application in agriculture and water supply

Special features/product benefits
- Submersible
- Self-cleaning propeller with helix hub
- Easy-to-install propeller attachment
- Propeller in cast, steel or PUR version
- ATEX and FM version

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Mechanical seal with SiC/SiC combination
- Permanently lubricated roller bearing
- Max. submersion depth: 12.5 m

Equipment/function
- Stationary installation on walls and floors
- Flexible installation through the use of lowering device
- Can be swivelled vertically and horizontally during installation with lowering device

Materials
- Housing parts made of EN-GJL
- Propeller made of EN-GJL, PUR or stainless steel
- Propeller hub made of stainless steel
- Screwed connections made of stainless steel

Description/design
Propeller
2- or 3-bladed propeller made of cast material, PUR or stainless steel. Nominal propeller diameter from 220 mm to 400 mm. Entwining-free design made possible by backward-curved incoming flow edge and patented helix hub. The propeller blades are permanently fixed, which guarantees the best possible hydraulic efficiency.

Motor
Wilo T-series submersible motor with standard connection, enabling simple and efficient adaptation of the motor power classes The motor heat is given off directly to the fluid via the housing. The winding is equipped with a temperature monitor. Large-sized inclined and grooved ball bearings ensure long service life of the motor bearings.

Sealing
Double shaft sealing with large-volume sealing chamber to collect leakage from the mechanical seal; available with external sealing chamber electrode upon request. On the fluid side, a corrosion- and wear-resistant mechanical seal made of solid silicon carbide material is used; on the motor side, a rotary shaft seal is used. On TR 36 / TR 40 types, a seal bushing made of stainless steel ensures long-term corrosion-protected fit of the mechanical seal.

Cable
The power cable is a type NSSHÖU cable for heavy mechanical loads. The power cable enters the motor housing through a water pressure-tight cable lead-in with strain relief and bend protection. The individual wires as well as the cable sheath are additionally sealed to keep out fluids.

Options
- Special voltages
- PTC thermistor temperature sensor
- External sealing chamber control
- Coating Ceram C0
- Ex-rated to ATEX or FM

Scope of delivery
- Submersible mixer with mounted propeller and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

Configuration
A separate configuration must be carried out for each application to ensure optimum generation of fluid current. Carefully follow the instructions for the supplied configuration when installing the units.

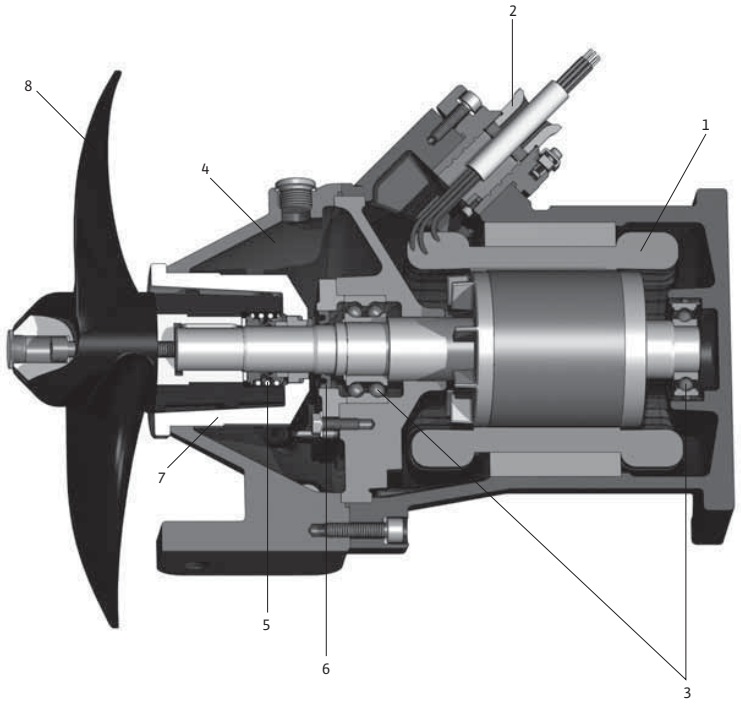
Commissioning
Immersed operating mode S1:
The unit can be used immersed in permanent operation (max. 1000 h/year). Surfacing the propeller or motor is strictly prohibited. In the case of fluctuating fluid levels, the system should switch off automatically if the degree of water submersion drops below the minimum level.

When installing the power cables, make sure that they are not drawn into the propeller by the fluid current.

Series description Wilo-EMU Uniprop – directly driven

Accessories

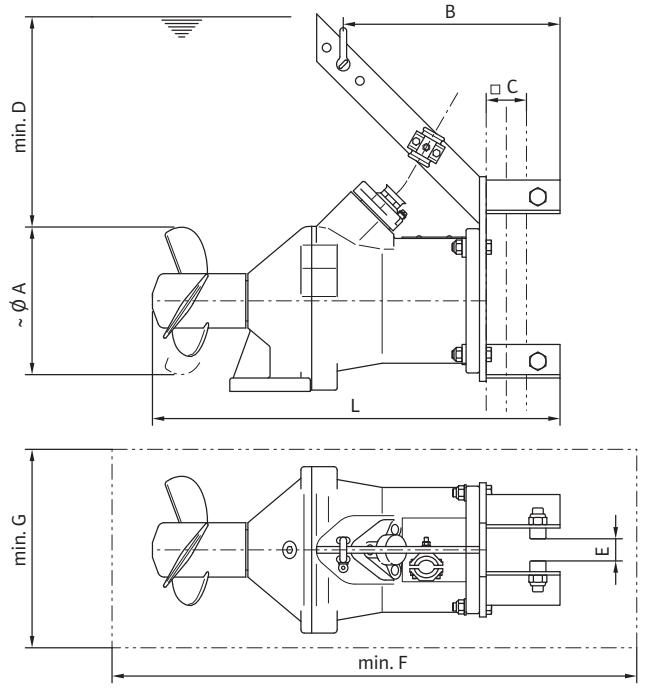
- Lowering device
- Auxiliary hoisting gear
- Floor fixation bracket
- Special fixation parts to enable use of an auxiliary hoisting gear for multiple units
- Terminal stop
- Additional cable anchoring
- Fixation sets with anchor bolt

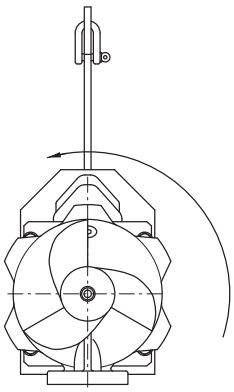


1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = sealing chamber; 5 = mechanical seal on fluid side; 6 = rotary shaft seal on motor side; 7 = seal bushing, 8 = propeller

Dimensions, weights Wilo-EMU TR 22

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 22...-.../8	220	320	60	900	33	755	420	605	70
TR 22...-.../12	220	320	60	900	33	790	420	640	78

Technical data, motor data Wilo-EMU TR 22

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 22.95-6/8	1.3	915	1.000	185
TR 22.145-4/8V	2.2	1400	1.000	310
TR 22.145-4/8	2.8	1410	1.000	350
TR 22.145-4/12	2.7	1405	1.000	350

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

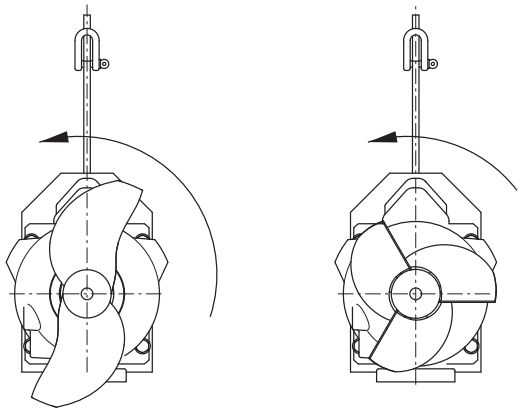
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

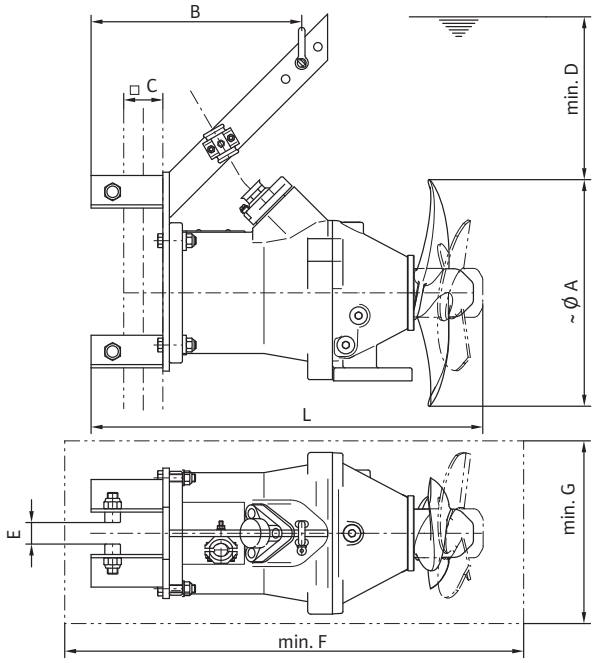
Submersible mixers

Uniprop mixers – directly driven

Dimensions, weights Wilo-EMU TR 36

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 36...-.../8	360	320	60	500	33	740	560	590	61
TR 36...-.../12	360	350	60	500	33	775	560	625	69
TR 36...-.../8 S...	250	320	60	500	33	755	450	605	65
TR 36...-.../16	360	370	80	500	53	835	560	685	80
TR 36...-.../16 S...	250	370	80	500	53	850	450	700	84

Technical data, motor data Wilo-EMU TR 36

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 36.74-8/8	0.8	700	1.000	220
TR 36.74-8/8 S21	1.1	700	1.000	210
TR 36.95-6/8	1.4	915	1.000	380
TR 36.95-6/8 S17	1.6	915	1.000	320
TR 36.145-4/12	4.6	1405	1.000	820
TR 36.145-4/12 S12	3.3	1405	1.000	530
TR 36.145-4/12 S17	4.94	1405	1.000	700
TR 36.145-4/16	4.8	1400	1.000	830
TR 36.145-4/16 S17	5.1	1400	1.000	720
TR 36.145-4/16 S21	7	1400	1.000	830

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-8/8R (Ex)	1.1	1.67	3.2	700	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

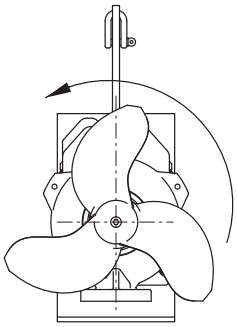
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

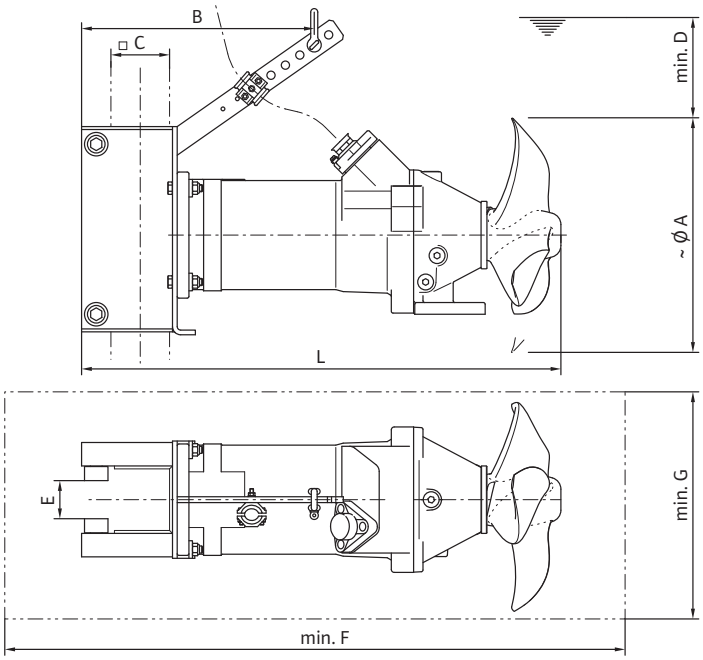
Submersible mixers

Uniprop mixers – directly driven

Dimensions, weights Wilo-EMU TR 40

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 40...-.../16	400	355	80	700	45	865	600	715	84
TR 40...-.../24	400	380	80	700	45	945	600	795	93

Technical data, motor data Wilo-EMU TR 40

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 40.74-8/16	2.3	710	1.000	620
TR 40.74-8/24	2.4	705	1.000	630
TR 40.95-6/24	5.2	927	1.000	1100

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-6/24R (Ex)	6	7.7	13.6	927	•	•
T 17-8/16R (Ex)	2.75	3.95	7.4	710	•	•
T 17-8/24R (Ex)	5.1	7.7	14.3	705	•	•

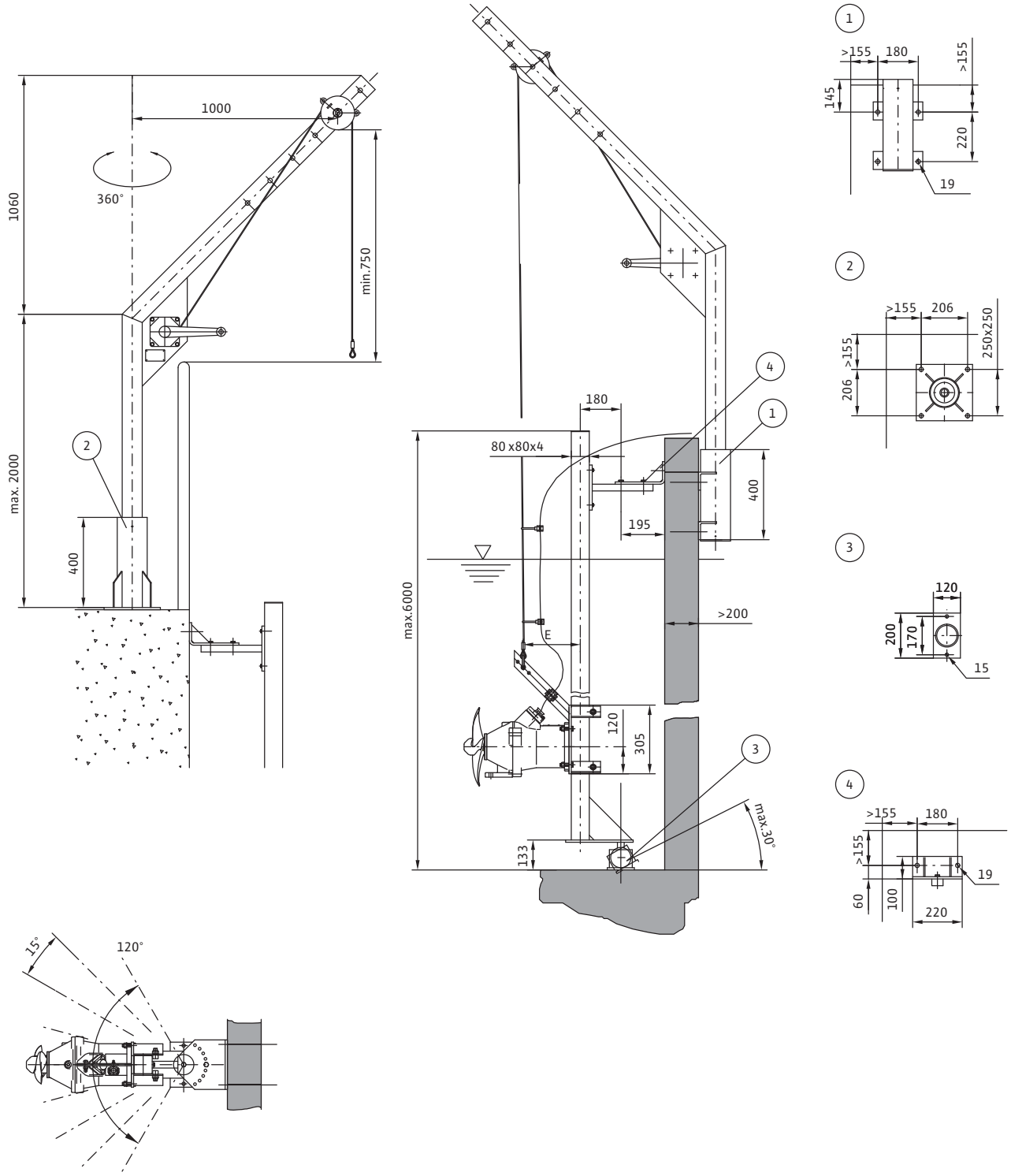
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

Uniprop mixers – directly driven

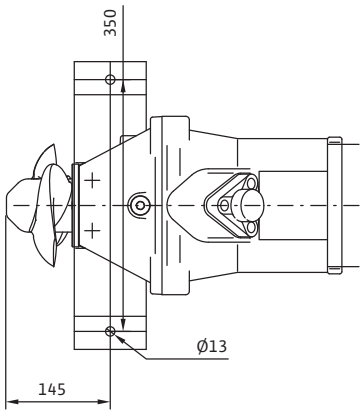
Installation example

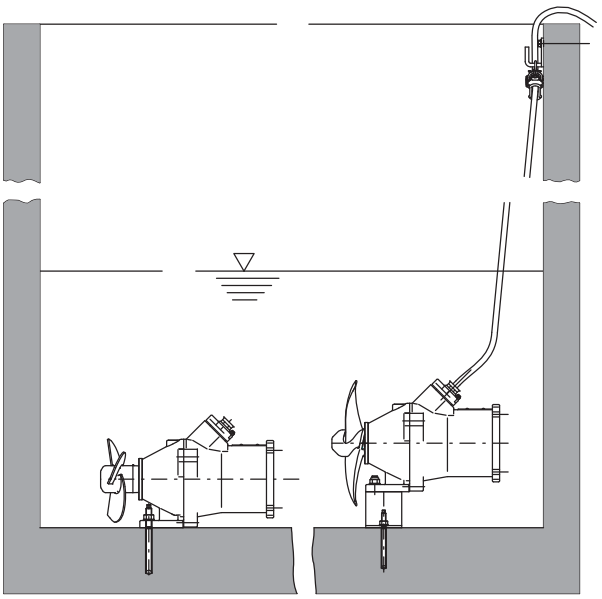
Wilo-EMU mixer TR 36 with lowering device AVU80

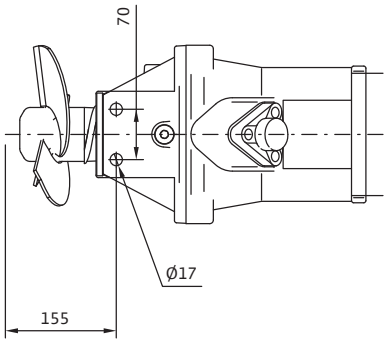


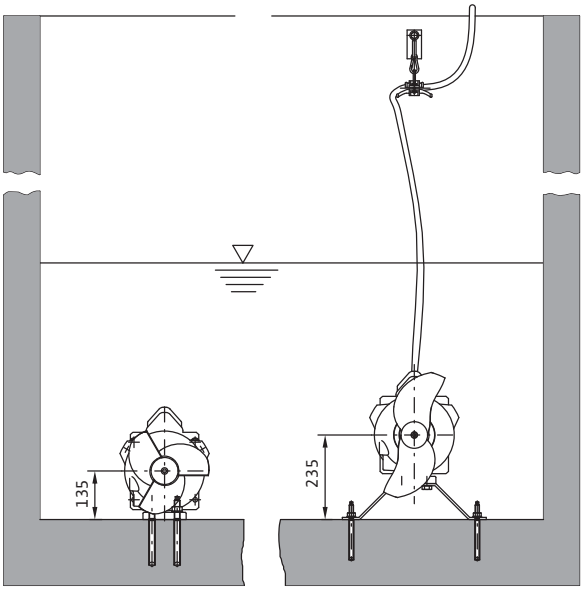
Installation example

Wilo-EMU mixer TR 36 for ground installation









Submersible mixers

Uniprop mixers – with gear

Series description Wilo-EMU Uniprop – with gear

Design
Submersible mixer with single-stage planetary gear

Type key

e.g.:	**Wilo-EMU TR 80-1.30-4/30 S20**
TR	Submersible mixer
80	x 10 = nominal propeller diameter in mm
1	Model
30	x 10 = propeller speed in rpm
4	Number of poles
30	x 10 = stator length in mm
S20	Propeller code for welded propellers (without = PUR propeller)

Application
Utilisation in activated-sludge tank and sludge tanks for:
- Generation of flow
- Suspension of solids
- Homogenisation
- Prevention of floating sludge layers
- Other areas of application in industry, agriculture and water supply

Special features/product benefits
- Submersible
- Single-stage planetary gear for adapting the propeller speed
- Self-cleaning propeller
- Easy-to-install propeller attachment
- Propeller in steel, PUR or PUR/GFK version
- ATEX and FM version
- 1.4462 gear shaft

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Single-stage planetary gear
- Mechanical seal with SiC/SiC combination
- Permanently lubricated roller bearing
- Max. submersion depth: 12.5 m

Equipment/function
- Stationary installation on walls
- Flexible installation through the use of lowering device
- Can be swivelled horizontally during installation with lowering device
- Installation with stand allows free placement in basin
- Single-stage planetary gear

Materials
- Housing parts made of EN-GJL
- Propeller made of PUR, stainless steel or PUR/GFK
- Propeller hub made of stainless steel
- Screwed connections made of stainless steel
- Gear shaft made of 1.4462

Description/design
Propeller
2- or 3-bladed propeller made of PUR or stainless steel. Nominal propeller diameter from 500 mm to 900 mm. Entwining-free design made possible by backward-curved incoming flow edge. The propeller blades are permanently fixed, which guarantees the best possible hydraulic efficiency.

Motor
Wilo T-series submersible motor with standard connection, enabling simple and efficient adaptation of the motor power classes The motor heat is given off directly to the fluid via the housing. The winding is equipped with a temperature monitor. Large-sized inclined (not with TR 80-1) and grooved ball bearings ensure long service life of the motor bearings.

Sealing
Sealing is achieved through the use of a 3-chamber system (prechamber, gear chamber and sealing chamber). The large-volume prechamber and sealing chamber collect leakage from the mechanical seal. If desired, the sealing chamber can be equipped with an external sealing chamber electrode. The sealing between the fluid and the prechamber, as well as between the gear and sealing chamber are realized by a corrosion-resistant and wear-proof mechanical seal made of solid silicon carbide material. The sealing between the prechamber and gear chamber as well as between the sealing chamber and motor are realised by radial sealing rings. A seal bushing made of stainless steel ensures long-term corrosion-protected fit of the mechanical seal.

Gear
Single-stage planetary gear with exchangeable transmissions. The gear shaft is made of saltwater-resistant stainless steel 1.4462. The gear bearings are dimensioned so that the resulting mixing forces are absorbed and are not transferred to the motor bearings.

Cable
The power cable is a type NSSHÖU cable for heavy mechanical loads. The power cable enters the motor housing through a water pressure-tight cable lead-in with strain relief and bend protection. The individual wires as well as the cable sheath are additionally sealed to keep out fluids.

Options
- Special voltages
- PTC thermistor temperature sensor
- External sealing chamber control
- Coating Ceram C0
- Ex-rated to ATEX or FM

Scope of delivery
- Submersible mixer with mounted propeller and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

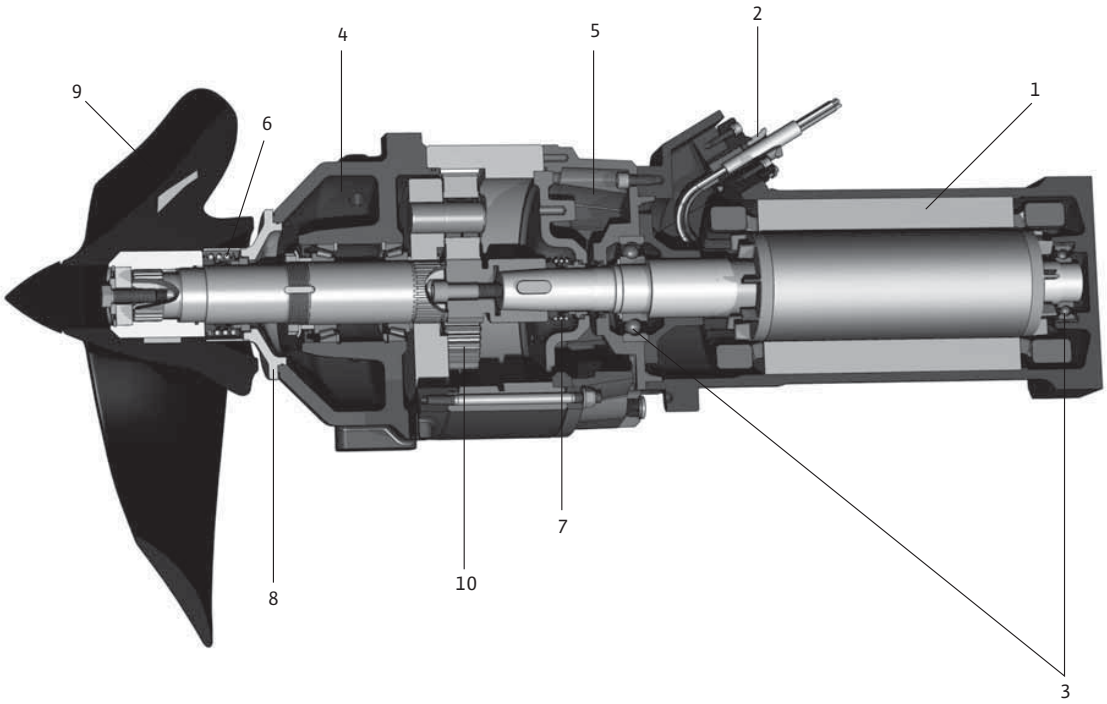
Series description Wilo-EMU Uniprop – with gear

Configuration
A separate configuration must be carried out for each application to ensure optimum generation of fluid current. Carefully follow the instructions for the supplied configuration when installing the units.

Commissioning
Immersed operating mode S1:
The unit can be used immersed in permanent operation. Surfacing the propeller or motor is strictly prohibited. In the case of fluctuating fluid levels, the system should switch off automatically if the degree of water submersion drops below the minimum level.

When installing the power cables, make sure that they are not drawn into the propeller by the fluid current.

Accessories
- Lowering device
- Stand for free placement of units in basin
- Auxiliary hoisting gear
- Special fixation parts to enable use of an auxiliary hoisting gear for multiple units
- Terminal stop
- Additional cable anchoring
- Fixation sets with anchor bolt



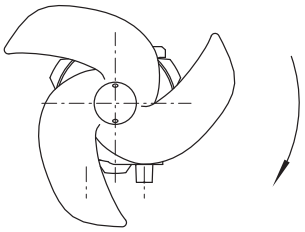
1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = prechamber; 5 = sealing chamber; 6 = mechanical seal on fluid side; 7 = mechanical seal on motor side; 8 = seal bushing, 9 = propeller; 10 = single-stage planetary gear

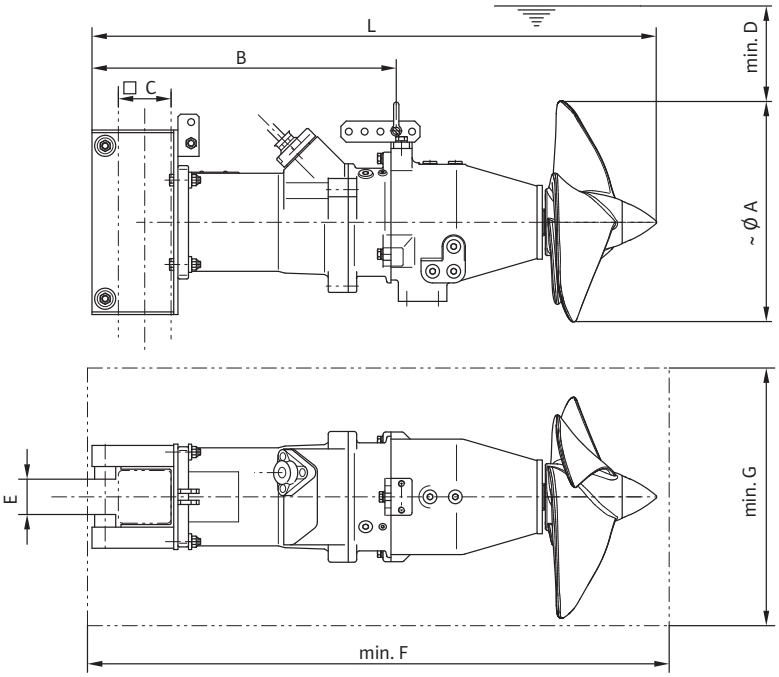
Submersible mixers

Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 50-2 (PUR)

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 50-2...-.../8	500	445	100	900	65	1145	700	1005	102
TR 50-2...-.../12	500	480	100	900	65	1180	700	1040	110
TR 50-2...-.../16	500	490	100	900	65	1220	700	180	121
TR 50-2...-.../22	500	525	100	900	65	1300	700	1160	129

Technical data, motor data Wilo-EMU TR 50-2 (PUR)

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 50-2.25-6/8	1	250	3.880	350
TR 50-2.25-6/16	1.2	250	3.880	350
TR 50-2.28-6/8	1.4	288	3.364	440
TR 50-2.29-6/8	1.6	292	3.167	490
TR 50-2.30-4/8	1.6	299	4.900	500
TR 50-2.30-4/8V	1.6	298	4.900	500
TR 50-2.30-6/8	1.8	306	3.000	540
TR 50-2.31-4/8	1.7	312	4.714	520
TR 50-2.31-4/8V	1.7	312	4.714	520
TR 50-2.34-4/8	2.2	345	4.250	620
TR 50-2.34-4/8V	2.2	344	4.250	640
TR 50-2.37-4/8	2.6	372	3.880	720
TR 50-2.37-4/8V	2.8	371	3.880	750
TR 50-2.42-4/12	3.9	428	3.364	930
TR 50-2.43-4/16	3.9	434	3.364	1000
TR 50-2.45-4/12	4.5	452	3.167	1020
TR 50-2.46-4/16	4.5	458	3.167	1110
TR 50-2.48-4/16	5.2	479	3.000	1240
TR 50-2.52-2/22	6.6	528	5.590	1400
TR 50-2.55-2/22	7.5	552	5.330	1570
TR 50-2.59-2/22	9.2	598	4.900	1740

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-2/22R (Ex)	10.5	12.3	20.5	2914	•	•
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•
T 17-6/16R (Ex)	3.7	5.2	9.1	931	•	•

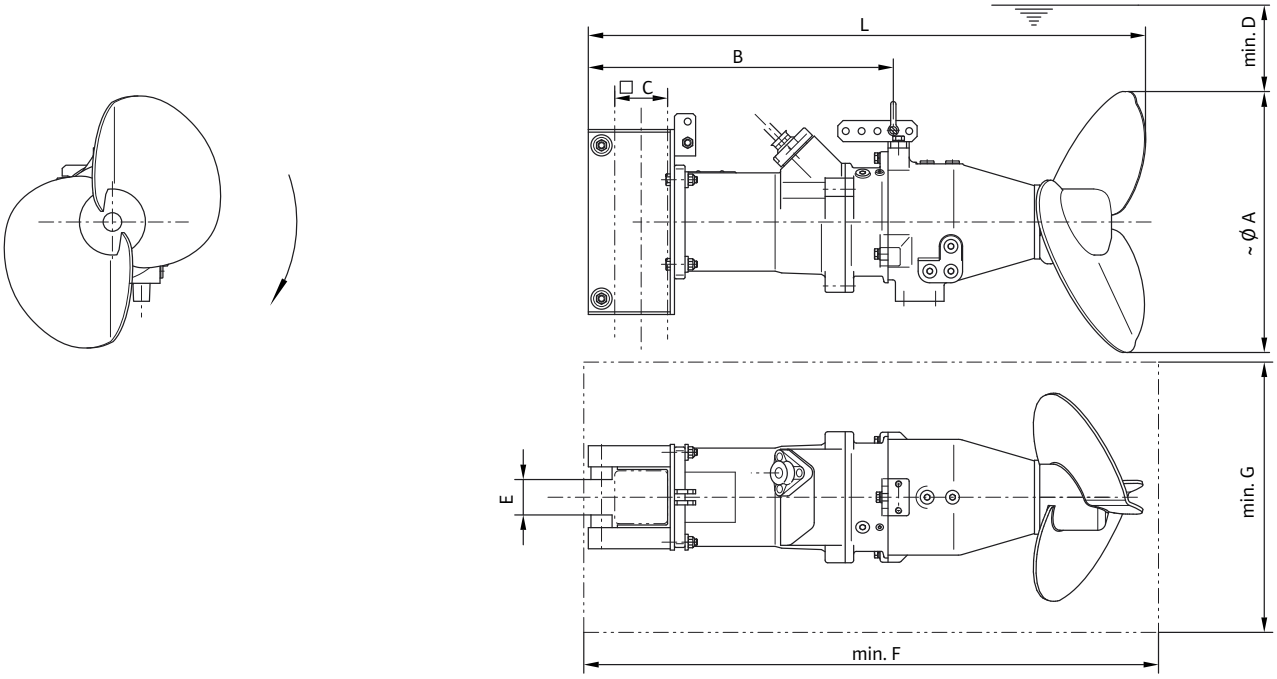
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 50-2 (St.)

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 50-2...-.../8 S	500	505	100	900	65	1135	700	1005	110
TR 50-2...-.../12 S	500	510	100	900	65	1170	700	1040	118
TR 50-2...-.../16 S	500	520	100	900	65	1210	700	1080	129
TR 50-2...-.../24 S	500	555	100	900	65	1290	700	1160	138

Technical data, motor data Wilo-EMU TR 50-2 (St.)

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 50-2.22-6/8 S	1.5	229	4.250	450
TR 50-2.24-6/8 S	1.9	247	3.880	540
TR 50-2.25-4/8V S	2	251	5.875	530
TR 50-2.28-4/8V S	3.2	296	4.900	790
TR 50-2.30-4/8 S	3.4	306	4.714	800
TR 50-2.31-4/12 S	3.4	309	4.714	830
TR 50-2.34-4/12 S	4.4	338	4.250	970
TR 50-2.34-4/16 S	4.5	344	4.250	1010
TR 50-2.37-4/16 S	5.6	373	3.880	1170
TR 50-2.37-4/24 S	6.2	379	3.880	1270
TR 50-2.40-4/16 S	7	399	3.600	1350
TR 50-2.40-4/24 S	7.4	406	3.600	1430
TR 50-2.43-4/24 S	8.9	433	3.364	1600
TR 50-2.45-4/24 S	10.6	453	3.167	1800
TR 50-2.47-4/24 S	11.9	475	3.000	1920

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-4/24R (Ex)	10	12.2	21	1417	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

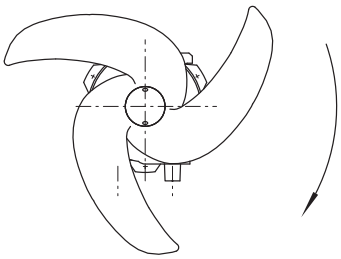
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

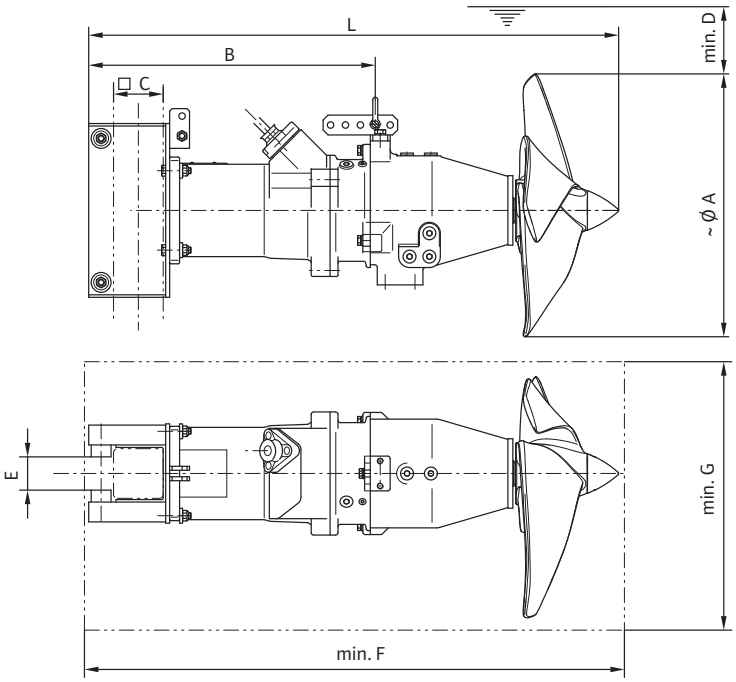
Submersible mixers

Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 60-2 (PUR)

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 60-2...-.../8	600	445	100	900	65	1145	800	1005	103
TR 60-2...-.../12	600	480	100	900	65	1180	800	1040	111
TR 60-2...-.../16	600	490	100	900	65	1220	800	1080	122
TR 60-2...-.../22	600	525	100	900	65	1300	800	1160	130
TR 60-2...-.../24	600	525	100	900	65	1300	800	1160	130

Technical data, motor data Wilo-EMU TR 60-2 (PUR)

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 60-2.23-6/8	1.2	229	4.250	510
TR 60-2.25-6/8	1.4	250	3.880	580
TR 60-2.29-6/8	2.1	288	3.364	760
TR 60-2.30-4/8	2.3	297	4.900	840
TR 60-2.30-4/8V	2.2	297	4.900	820
TR 60-2.31-4/8V	2.4	308	4.714	880
TR 60-2.33-4/8	3.3	337	4.250	1070
TR 60-2.34-4/12	3.2	341	4.250	1060
TR 60-2.37-4/12	3.9	367	3.880	1220
TR 60-2.38-4/12	4.9	389	3.600	1430
TR 60-2.38-4/16	4	373	3.880	1300
TR 60-2.41-4/16	4.8	400	3.600	1450
TR 60-2.41-4/24	5	405	3.600	1450
TR 60-2.43-4/16	5.8	424	3.364	1670
TR 60-2.43-4/24	5.8	430	3.364	1610
TR 60-2.46-4/24	6.9	460	3.167	1830
TR 60-2.48-4/24	7.7	480	3.000	1950
TR 60-2.49-2/22	8.5	497	5.875	2150
TR 60-2.52-2/22	9.6	520	5.590	2280

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-2/22R (Ex)	10.5	12.3	20.5	2914	•	•
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-4/24R (Ex)	10	12.2	21	1417	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

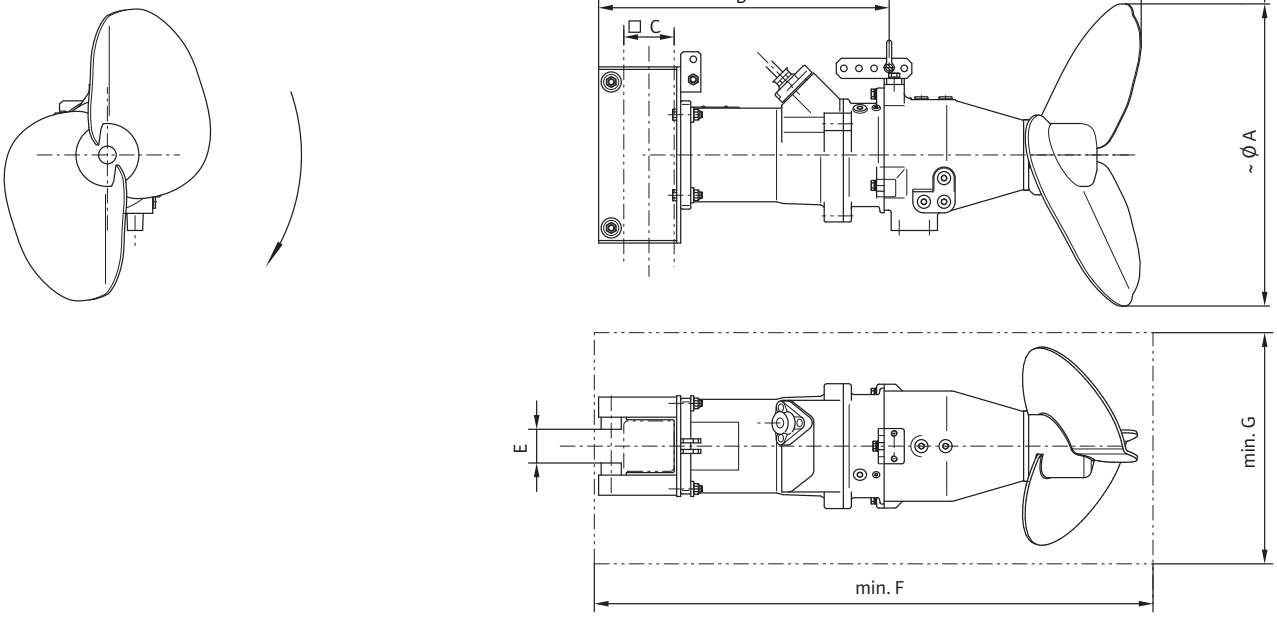
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 60-2 (St.)

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions								Weight
	A	W	C	D	E	F	G	L	Unit
	[mm]								[kg]
TR 60-2...-.../8 S	600	505	100	900	65	1155	800	1005	112
TR 60-2...-.../12 S	600	510	100	900	65	1190	800	1040	120
TR 60-2...-.../16 S	600	520	100	900	65	1230	800	1080	131
TR 60-2...-.../24 S	600	555	100	900	65	1310	800	1160	140

Technical data, motor data Wilo-EMU TR 60-2 (St.)

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 60-2.19-6/8 S	2.2	195	4.714	650
TR 60-2.22-4/8V S	2.8	221	6.571	810
TR 60-2.23-4/8 S	3.4	234	6.200	920
TR 60-2.24-4/8 S	3.8	245	5.875	950
TR 60-2.24-4/12 S	3.7	245	5.875	980
TR 60-2.25-4/12 S	4.5	256	5.590	1140
TR 60-2.26-4/16 S	4.3	260	5.590	1070
TR 60-2.27-4/16 S	5	272	5.330	1220
TR 60-2.29-4/16 S	6	293	4.900	1340
TR 60-2.30-4/16 S	6.8	303	4.714	1460
TR 60-2.30-4/24 S	6.3	300	4.900	1370
TR 60-2.31-4/24 S	7.3	310	4.714	1500
TR 60-2.34-4/24 S	9.5	340	4.250	1860

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-4/24R (Ex)	10	12.2	21	1417	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

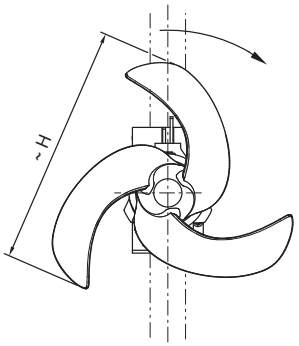
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

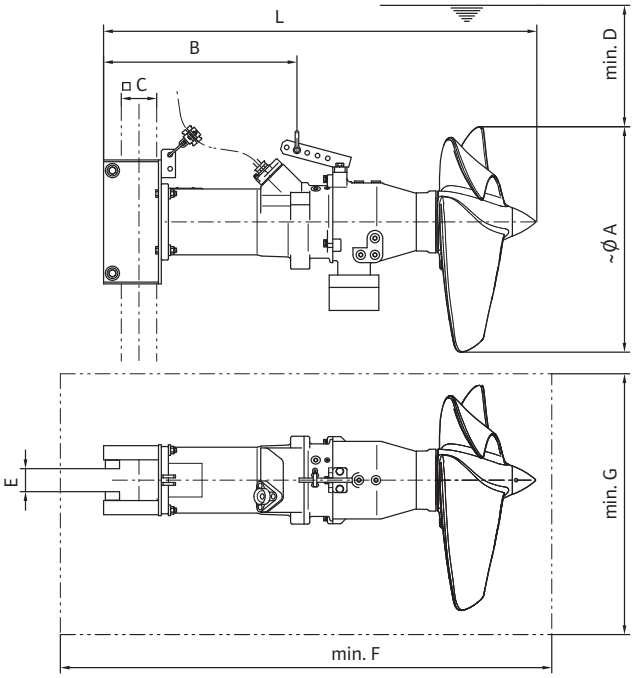
Submersible mixers

Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 75-2

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 75-2...-.../16	750	490	100	1100	65	1290	950	650	1140	127
TR 75-2...-.../24	750	525	100	1100	65	1370	950	650	1220	135

Technical data, motor data Wilo-EMU TR 75-2

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 75-2.15-6/16	3	156	6.200	1145
TR 75-2.16-6/16	3.5	163	5.875	1220
TR 75-2.17-6/16	3.8	170	5.590	1275
TR 75-2.18-6/16	4.3	176	5.330	1350
TR 75-2.19-4/16	5.1	193	7.500	1630
TR 75-2.19-4/24	5.3	197	7.500	1660
TR 75-2.19-6/24	5.4	194	4.900	1660
TR 75-2.20-6/24	6	201	4.714	1800
TR 75-2.21-4/16	7.2	217	6.571	1980
TR 75-2.21-4/24	7.5	219	6.571	2140
TR 75-2.23-4/24	8.6	233	6.200	2310
TR 75-2.24-4/24	9.9	244	5.875	2410
TR 75-2.25-4/24	10.8	254	5.590	2850

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-4/24R (Ex)	10	12.2	21	1417	•	•
T 17-6/16R (Ex)	3.7	5.2	9.1	931	•	•
T 17-6/24R (Ex)	6	7.7	13.6	927	•	•

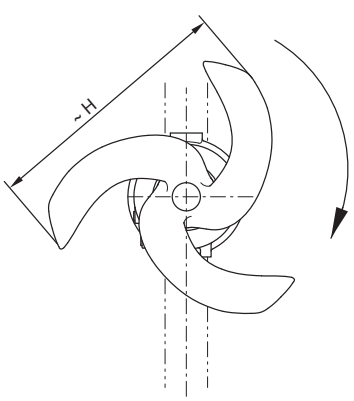
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

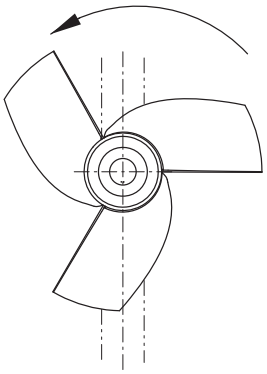
Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 80-1

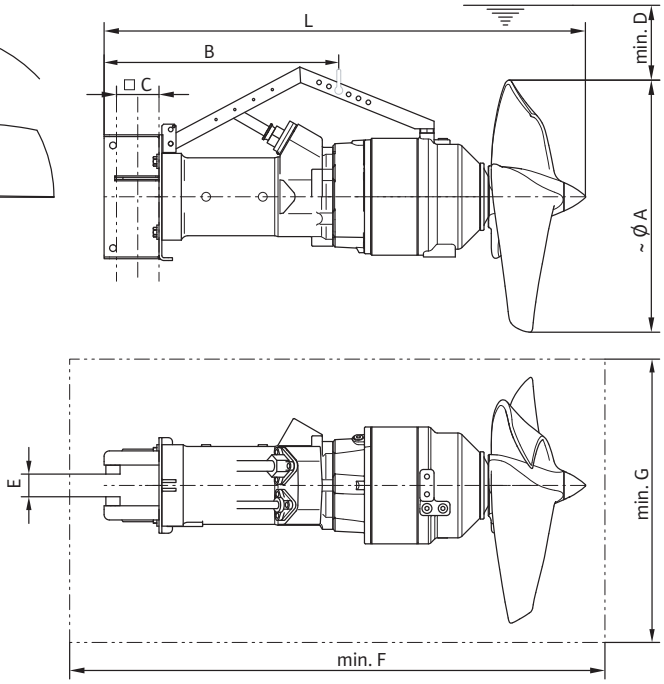
Dimension drawing



TR 80-1...



TR 80-1...S..



Dimensions, weights										
Wilo-EMU...	**Dimensions**									**Weight**
	A	**W**	**C**	**D**	**E**	**F**	**G**	**H**	**L**	**Unit**
	[mm]									**[kg]**
TR 80-1...-.../22	740	595	120	1100	55	1535	985	730	1385	284
TR 80-1...-.../22 S	785	595	120	1100	55	1535	985	730	1385	316
TR 80-1...-.../27	740	675	120	1100	55	1585	985	730	1435	298
TR 80-1...-.../30	740	675	120	1100	55	1585	985	730	1435	303
TR 80-1...-.../30 S	785	675	120	1100	55	1585	985	730	1435	321

Technical data, motor data Wilo-EMU TR 80-1

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 80-1.20-4/22	6.9	204	7.000	1910
TR 80-1.21-4/22 S20	6.1	205	7.000	1670
TR 80-1.23-4/22 S20	9	239	6.000	2220
TR 80-1.23-4/27	10.5	239	6.000	2520
TR 80-1.23-4/30	10.8	240	6.000	2610
TR 80-1.24-4/22	10.4	238	6.000	2600
TR 80-1.24-4/30 S20	9.6	239	6.000	2350
TR 80-1.26-4/22	14.9	269	5.286	3320
TR 80-1.27-4/22 S20	12.4	267	5.286	2680
TR 80-1.27-4/27	15.1	272	5.286	3320
TR 80-1.27-4/30	15.1	274	5.286	3380
TR 80-1.27-4/30 S20	13.2	270	5.286	2870
TR 80-1.30-4/30	20.1	301	4.750	3940
TR 80-1.30-4/30 S20	16.9	301	4.750	3430

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 20-4/22R (Ex)	12.5	15.3	26	1430	•	•
T 20-4/27R (Ex)	16	18.9	32	1430	•	•
T 20-4/30R (Ex)	18.5	22	36.5	1435	•	•
T 20-6/27R (Ex)	11.5	14.1	24.5	930	•	•
T 20-6/32R (Ex)	12.5	14.9	26	930	•	•

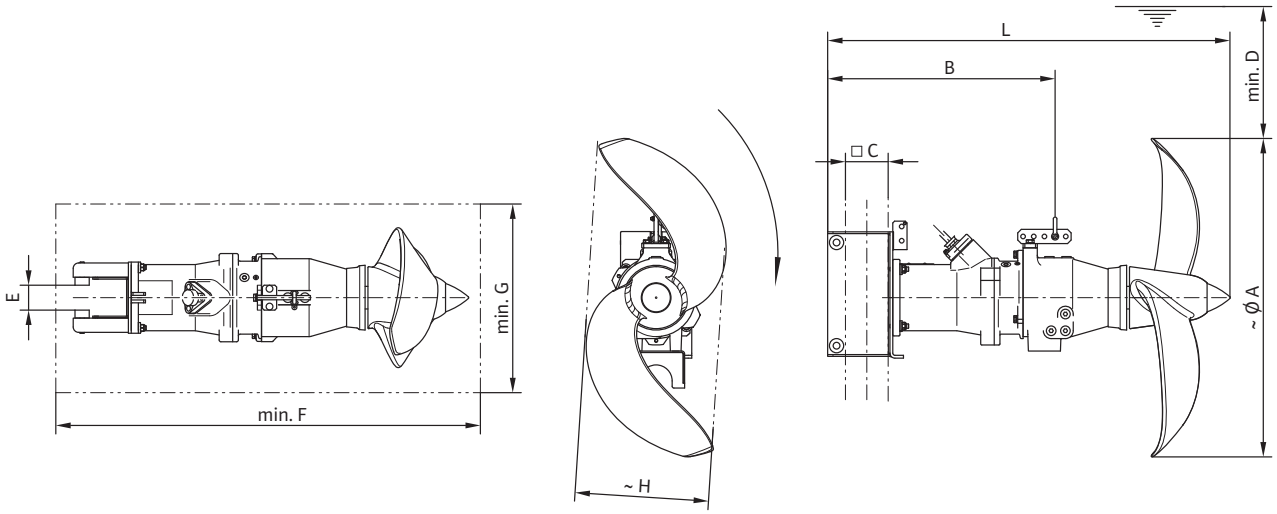
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

Uniprop mixers – with gear

Dimensions, weights Wilo-EMU TR 90-2

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 90-2...-.../8	900	445	100	1100	65	1230	575	375	1080	107
TR 90-2...-.../12	900	480	100	1100	65	1265	575	375	1115	117

Technical data, motor data Wilo-EMU TR 90-2

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 90-2.9-8/8	0.7	98	7.500	430
TR 90-2.11-8/8	1.1	116	6.200	570
TR 90-2.12-6/8	1.2	129	7.500	730
TR 90-2.12-8/8	1.3	126	5.590	690
TR 90-2.14-6/8	1.5	145	6.751	860
TR 90-2.15-6/8	1.7	153	6.200	960
TR 90-2.16-6/8	2.2	166	5.590	1100
TR 90-2.19-4/8	2.9	193	7.500	1390
TR 90-2.19-4/8V	3	192	7.500	1390
TR 90-2.21-4/8	3.9	215	6.571	1690
TR 90-2.21-4/12	3.7	219	6.571	1750
TR 90-2.23-4/12	4.2	230	6.200	1830

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•
T 17-8/8R (Ex)	1.1	1.67	3.2	700	•	•

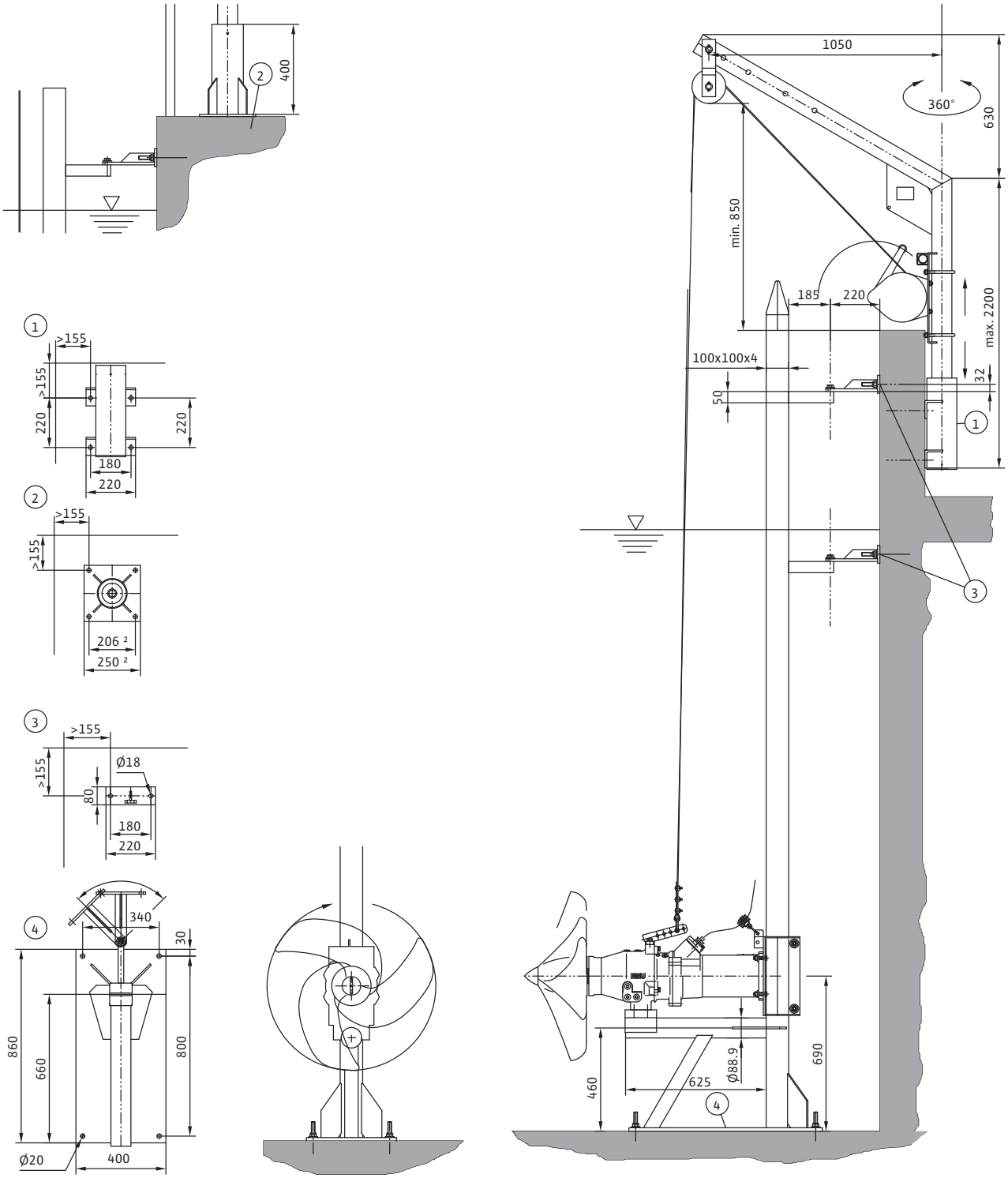
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

Uniprop mixers – with gear

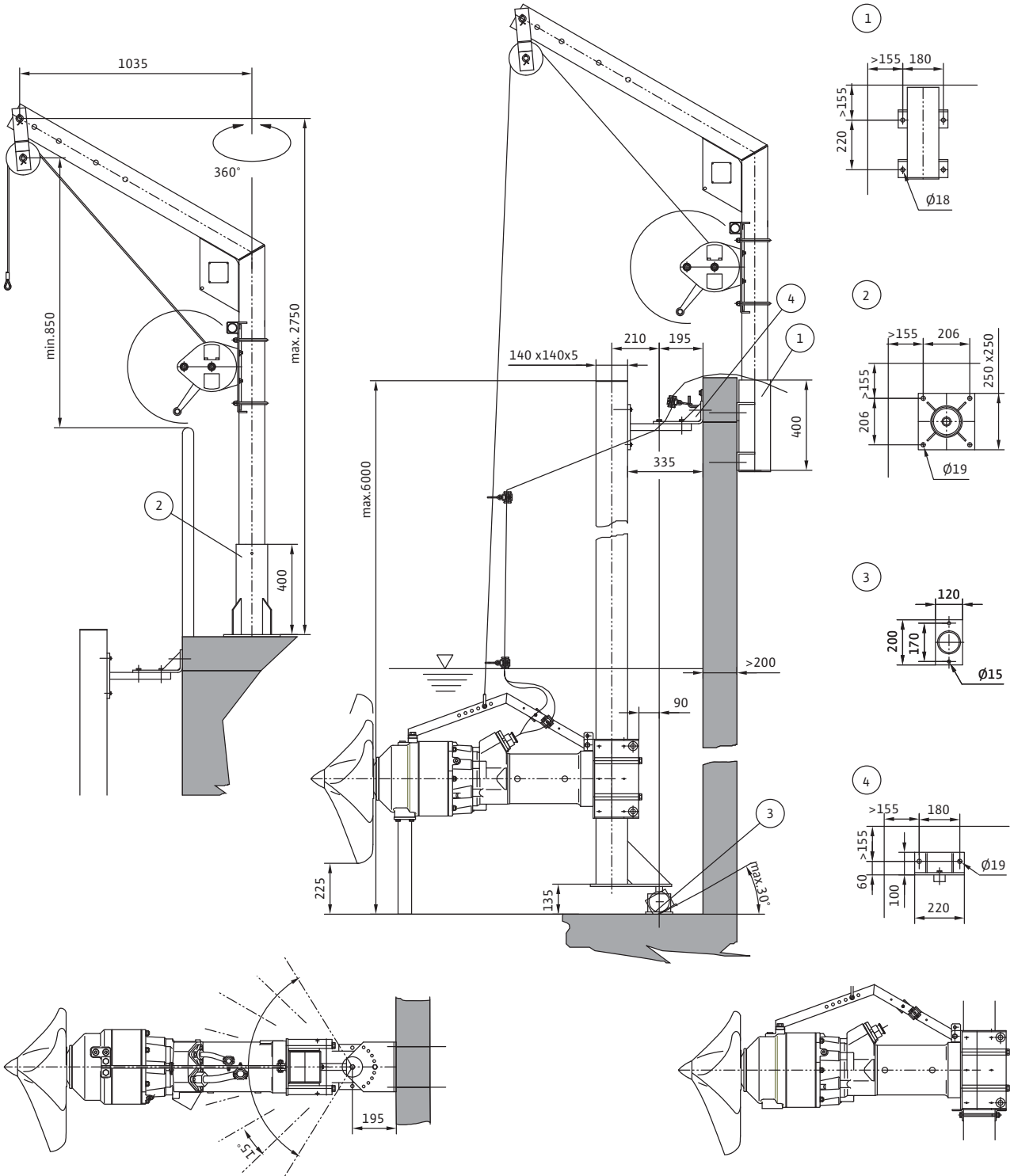
Installation example

Wilo-EMU mixer TR 75-2 with lowering device AVUSHH



Installation example

Wilo-EMU mixer TR 80-1 with lowering device AVU140



Submersible mixers

Maxiprop/Megaprop mixers

Series description Wilo-EMU Maxiprop/Megaprop

Design
Slow-running submersible mixer reduced by two-stage planetary gear

Type key

e.g.:	**Wilo-EMU TR 321.23-8/8**
TR	Submersible mixer
3	Number of blades
21	x 100 = nominal propeller diameter in mm
23	Propeller speed in rpm
8	Number of poles
8	x 10 = stator length in mm

Application
- Energy-optimised mixing and circulation of activated sludge
- Creation of flow rates in circulation channels
- Further areas of application in industry

Special features/product benefits
- Submersible
- 2-stage planetary gear for adapting the propeller speed
- Self-cleaning propeller
- Propeller blades can be exchanged individually
- Easy-to-install blades and hub
- Propeller in GFK version
- ATEX and FM version
- 1.4462 gear shaft

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Two-stage planetary gear with exchangeable second planetary stage
- Mechanical seal with SiC/SiC combination
- Permanently lubricated roller bearing
- Max. submersion depth: 12.5 m

Equipment/function
- Installation with stand allows free placement in basin
- Flexible installation
- Two-stage planetary gear with exchangeable second planetary stage

Materials
- Housing parts made of EN-GJL
- Propeller blades made of GFK
- Propeller hub made of EN-GJS
- Screwed connections made of stainless steel
- Gear shaft made of 1.4462

Description/design
Propeller
2- or 3-bladed propellers made of GFK in sandwich design; the blade hub is made of cast iron. Nominal propeller diameter from 1500 mm to 2600 mm. Entwining-free design made possible by backward-curved incoming flow edge. The propeller blades are permanently fixed, which guarantees the best possible hydraulic efficiency.

Motor
Wilo T-series submersible motor with standard connection, enabling simple and efficient adaptation of the motor power classes The motor heat is given off directly to the fluid via the housing. The winding is equipped with a temperature monitor. Large-sized inclined and grooved ball bearings ensure long service life of the motor bearings.

Sealing
Sealing is achieved through the use of a 3-chamber system (prechamber, gear chamber and sealing chamber). The large-volume prechamber and sealing chamber collect leakage from the mechanical seal. If desired, the sealing chamber can be equipped with an external sealing chamber electrode. The sealing between the fluid and the prechamber, as well as between the gear and sealing chamber are realized by a corrosion-resistant and wear-proof mechanical seal made of solid silicon carbide material. The sealing between the prechamber and gear chamber as well as between the sealing chamber and motor are realised by radial sealing rings. A seal bushing made of stainless steel ensures long-term corrosion-protected fit of the mechanical seal.

Gear
2-stage planetary gear with exchangeable transmissions. The gear shaft is made of saltwater-resistant stainless steel 1.4462. The gear bearings are dimensioned so that the resulting mixing forces are absorbed and are not transferred to the motor bearings.

Cable
The power cable is a type NSSHÖU cable for heavy mechanical loads. The power cable enters the motor housing through a water pressure-tight cable lead-in with strain relief and bend protection. The individual wires as well as the cable sheath are additionally sealed to keep out fluids.

Options
- Special voltages
- PTC thermistor temperature sensor
- External sealing chamber control
- Coating Ceram C0
- Ex-rated to ATEX or FM

Scope of delivery
- Submersible mixer with mounted propeller hub and cable
- Cable length per customer request
- 2- or 3-bladed - delivered separately, installation is performed on-site.
- Accessories per customer request
- Operating and maintenance manual

Configuration
A separate configuration must be carried out for each application to ensure optimum generation of fluid current. Carefully follow the instructions for the supplied configuration when installing the units.

Series description Wilo-EMU Maxiprop/Megaprop

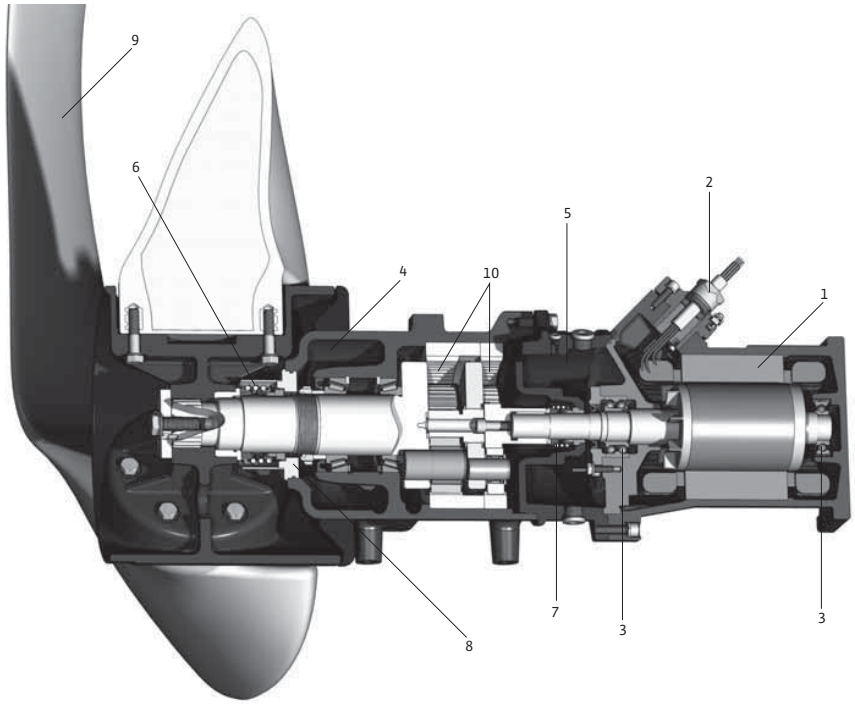
Commissioning

Immersed operating mode S1:
The unit can be used immersed in permanent operation. Surfacing the propeller or motor is strictly prohibited. In the case of fluctuating fluid levels, the system should switch off automatically if the degree of water submersion drops below the minimum level.

When installing the power cables, make sure that they are not drawn into the propeller by the fluid current.

Accessories

- Stand for free placement of units in basin
- Auxiliary hoisting gear
- Special fixation parts to enable use of an auxiliary hoisting gear for multiple units
- Additional cable anchoring
- Fixation sets with anchor bolt



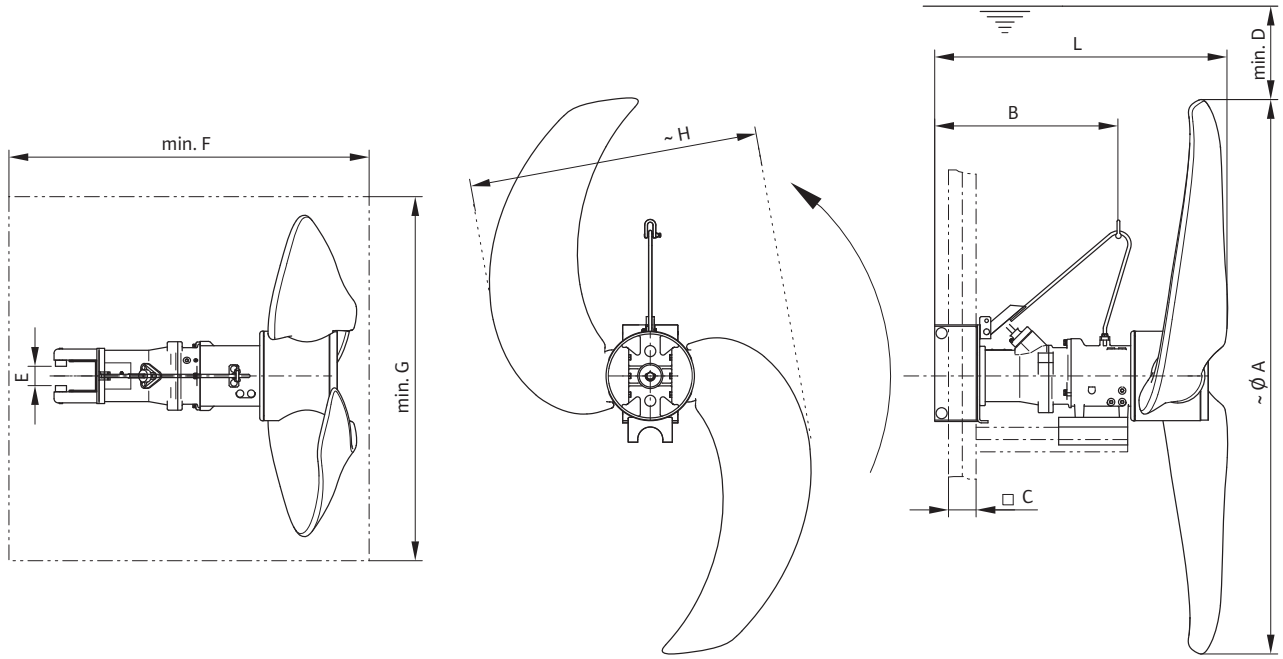
1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = prechamber; 5 = sealing chamber; 6 = mechanical seal on fluid side; 7 = mechanical seal on motor side; 8 = seal bushing, 9 = propeller blade; 10 = 2-stage planetary gear

Submersible mixers

Maxiprop/Megaprop mixers

Dimensions, weights Wilo-EMU TR 215

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 215...-.../8	1500	650	100	800	65	1305	1000	800	1155	172
TR 215...-.../12	1500	650	100	800	65	1340	1000	800	1190	182

Technical data, motor data Wilo-EMU TR 215

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 215.17-6/8	0.6	17	56.250	300
TR 215.19-6/8	0.6	19	49.283	450
TR 215.21-6/8	0.6	21	46.500	500
TR 215.22-6/8	0.7	22	44.063	560
TR 215.23-6/8	0.7	23	41.925	600
TR 215.24-6/8	0.8	24	39.975	630
TR 215.26-4/8V	0.9	26	56.250	700
TR 215.29-4/8V	1.1	29	49.283	850
TR 215.31-4/8V	1.3	31	46.500	900
TR 215.33-4/8V	1.5	33	44.063	1000
TR 215.34-4/8V	1.7	34	41.925	1100
TR 215.36-4/8V	2	36	39.975	1200
TR 215.39-4/8V	2.3	39	36.750	1360
TR 215.40-4/8	2.5	40	35.355	1420
TR 215.40-4/8V	2.5	40	35.355	1420
TR 215.44-4/8	3.3	44	31.875	1700
TR 215.53-4/12	4.9	53	27.000	2400

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

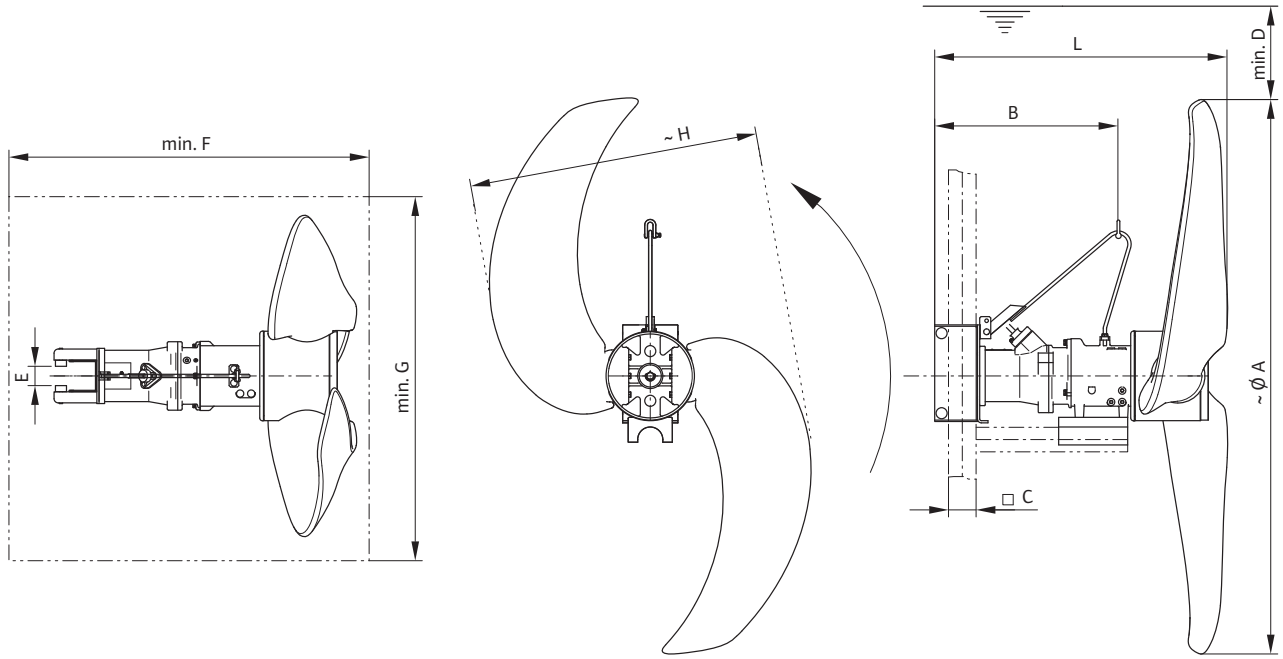
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Submersible mixers

Maxiprop/Megaprop mixers

Dimensions, weights Wilo-EMU TR 221

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 221...-.../8	2100	650	100	800	65	1305	1150	950	1155	178
TR 221...-.../12	2100	650	100	800	65	1340	1150	950	1190	188

Technical data, motor data Wilo-EMU TR 221

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 221.25-8/8	0.6	25	29.227	650
TR 221.27-8/8	0.8	27	26.350	800
TR 221.30-8/8	1	30	24.056	950
TR 221.32-8/8	1.1	32	22.320	1100
TR 221.33-6/8	1.2	33	29.227	1200
TR 221.36-6/8	1.4	36	26.350	1400
TR 221.39-6/8	1.7	39	24.056	1700
TR 221.41-4/8V	1.7	41	34.658	1850
TR 221.45-4/8V	2	45	30.380	2150
TR 221.46-4/8	2.5	46	30.380	2200
TR 221.50-4/8	3.1	50	29.227	2600
TR 221.53-4/8	3.7	53	26.350	2900
TR 221.57-4/12	4.2	57	26.350	3400
TR 221.59-4/12	4.9	59	24.056	3650

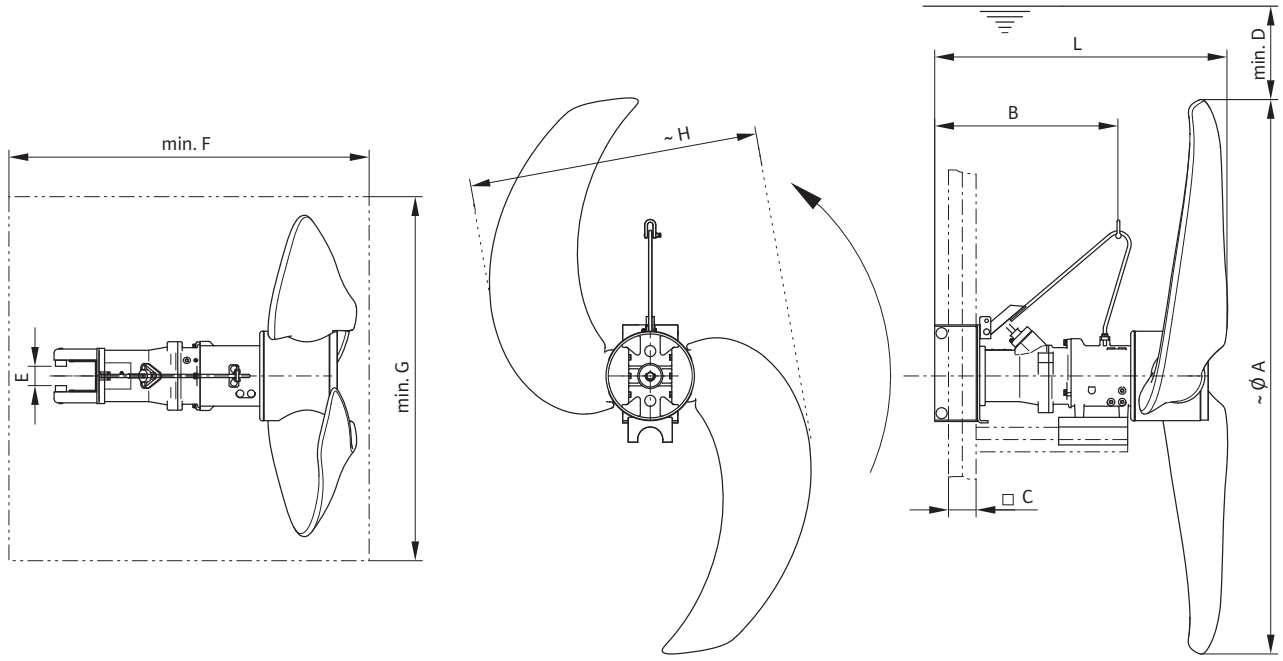
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•
T 17-8/8R (Ex)	1.1	1.67	3.2	700	•	•

The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 226

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 226...-.../8	2600	650	100	800	65	1220	710	510	1070	187

Technical data, motor data Wilo-EMU TR 226

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 226.20-8/8	0.68	20	36.425	800
TR 226.23-8/8	0.92	23	30.380	1140
TR 226.24-8/8	0.98	24	29.227	1220
TR 226.27-8/8	1.19	27	26.350	1430
TR 226.29-6/8	1.36	29	33.046	1670
TR 226.31-6/8	1.66	31	30.380	1970
TR 226.32-6/8	1.82	32	29.227	2110
TR 226.35-4/8V	2.48	35	40.740	2620
TR 226.37-4/8V	2.8	37	38.440	2810
TR 226.39-4/8V	3.13	39	36.425	3060
TR 226.41-4/8	3.55	41	34.658	3400
TR 226.43-4/8	4.01	43	33.046	3670

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•
T 17-8/8R (Ex)	1.1	1.67	3.2	700	•	•

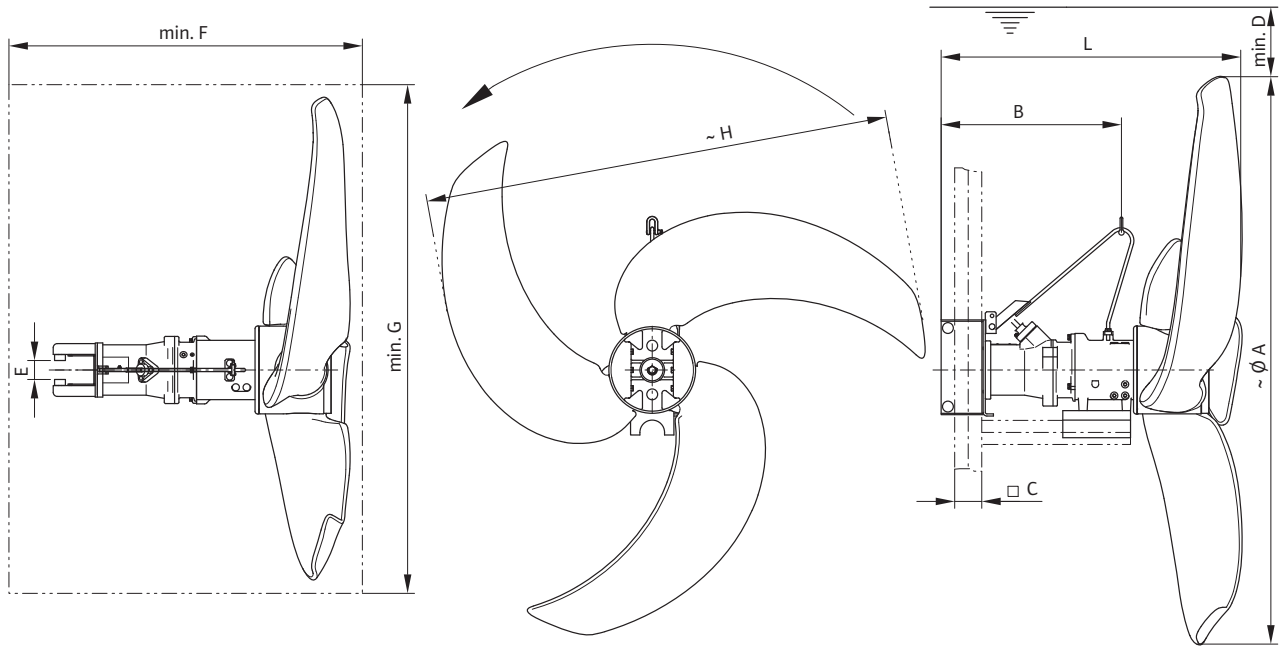
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

Submersible mixers

Maxiprop/Megaprop mixers

Dimensions, weights Wilo-EMU TR 315

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 315...-.../8	1500	650	100	800	65	1305	1450	1250	1155	190
TR 315...-.../12	1500	650	100	800	65	1340	1450	1250	1190	200

Technical data, motor data Wilo-EMU TR 315

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 315.17-6/8	0.6	17	56.250	450
TR 315.19-6/8	0.7	19	49.283	500
TR 315.21-6/8	0.7	21	46.500	580
TR 315.22-6/8	0.8	22	44.063	650
TR 315.23-6/8	0.8	23	41.925	700
TR 315.24-6/8	0.9	24	39.975	750
TR 315.26-4/8V	1.1	26	56.250	830
TR 315.29-4/8V	1.4	29	49.283	1000
TR 315.31-4/8V	1.7	31	46.500	1200
TR 315.32-4/8V	2	32	44.063	1350
TR 315.34-4/8V	2.2	34	41.925	1500
TR 315.36-4/8V	2.7	36	39.975	1650
TR 315.38-4/8V	3.1	38	36.750	1780
TR 315.40-4/8	3.4	40	35.355	1920
TR 315.44-4/12	4.6	44	31.875	2450

Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

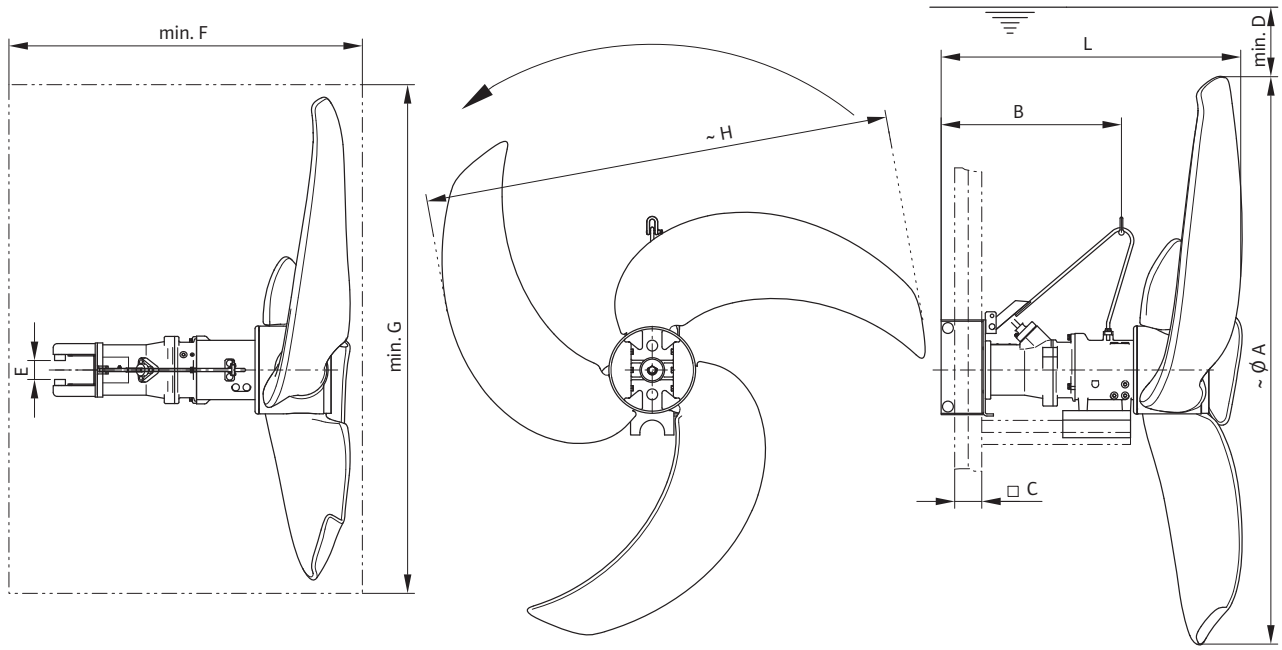
The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Submersible mixers

Maxiprop/Megaprop mixers

Dimensions, weights Wilo-EMU TR 321

Dimension drawing



Dimensions, weights										
Wilo-EMU...	**Dimensions**									**Weight**
	A	**W**	**C**	**D**	**E**	**F**	**G**	**H**	**L**	**Unit**
	[mm]									**[kg]**
TR 321...-.../8	2100	650	100	800	65	1305	2000	1800	1155	199
TR 321...-.../12	2100	650	100	800	65	1340	2000	1800	1190	209

Technical data, motor data Wilo-EMU TR 321

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 321.23-8/8	0.7	23	30.380	750
TR 321.25-8/8	0.9	25	29.227	900
TR 321.28-8/8	1.1	28	26.350	1150
TR 321.31-8/8	1.3	31	22.320	1300
TR 321.33-6/8	1.5	33	29.227	1450
TR 321.35-6/8	1.8	35	26.350	1650
TR 321.36-4/8V	1.8	36	40.740	1800
TR 321.39-4/8V	2.3	39	36.425	2100
TR 321.41-4/8	2.5	41	34.658	2250
TR 321.45-4/8	3.2	45	33.046	2700
TR 321.49-4/12	4	49	29.227	3250
TR 321.52-4/12	4.9	52	26.350	3700

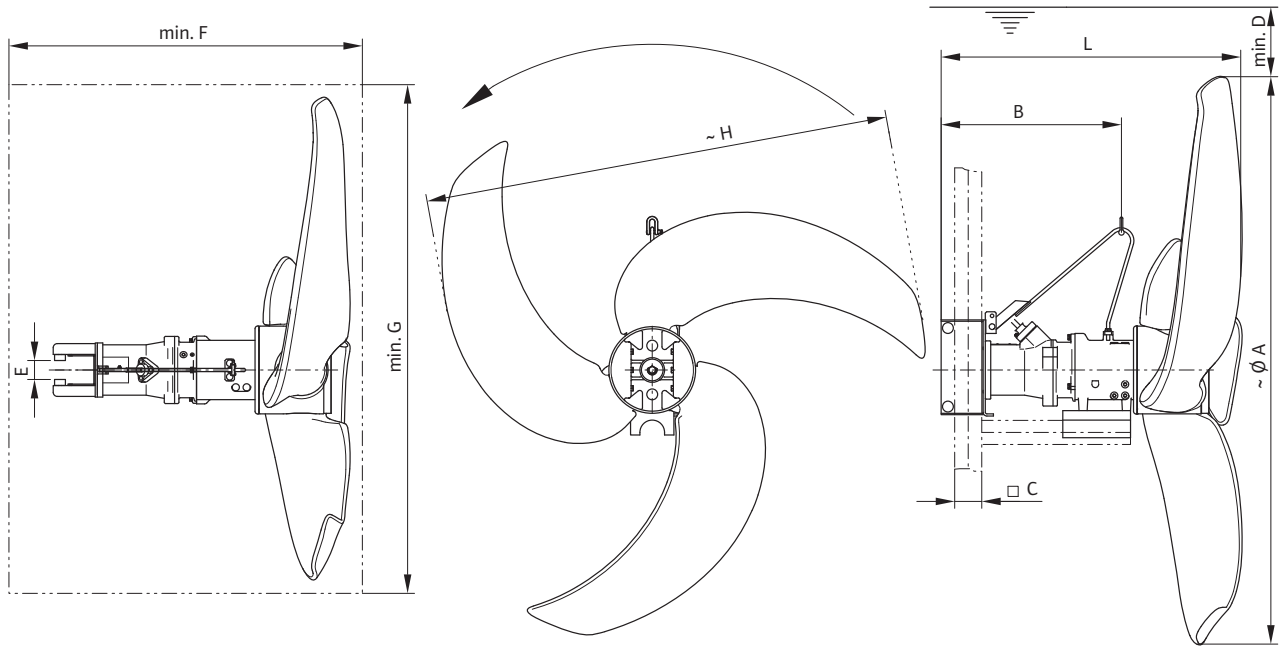
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•
T 17-8/8R (Ex)	1.1	1.67	3.2	700	•	•

The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 326

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Weight
	A	W	C	D	E	F	G	H	L	Unit
	[mm]									[kg]
TR 326...-.../8	2600	650	100	800	65	1220	2200	2000	1070	197
TR 326...-.../12	2600	650	100	800	65	1260	2200	2000	1110	207

Technical data, motor data Wilo-EMU TR 326

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Thrust
	max. $P_{1.1}$	n	–	F
	[kW]	[rpm]	–	[N]
TR 326.26-6/8	1.42	26	36.425	1720
TR 326.30-6/8	2.08	30	30.380	2260
TR 326.31-4/8	2.2	31	46.500	2330
TR 326.35-4/8	3.08	35	40.740	2990
TR 326.37-4/8	3.53	37	38.440	3330
TR 326.39-4/8	3.92	39	36.425	3600
TR 326.41-4/12	4.42	41	34.658	4030
TR 326.43-4/12	4.98	43	33.046	4340

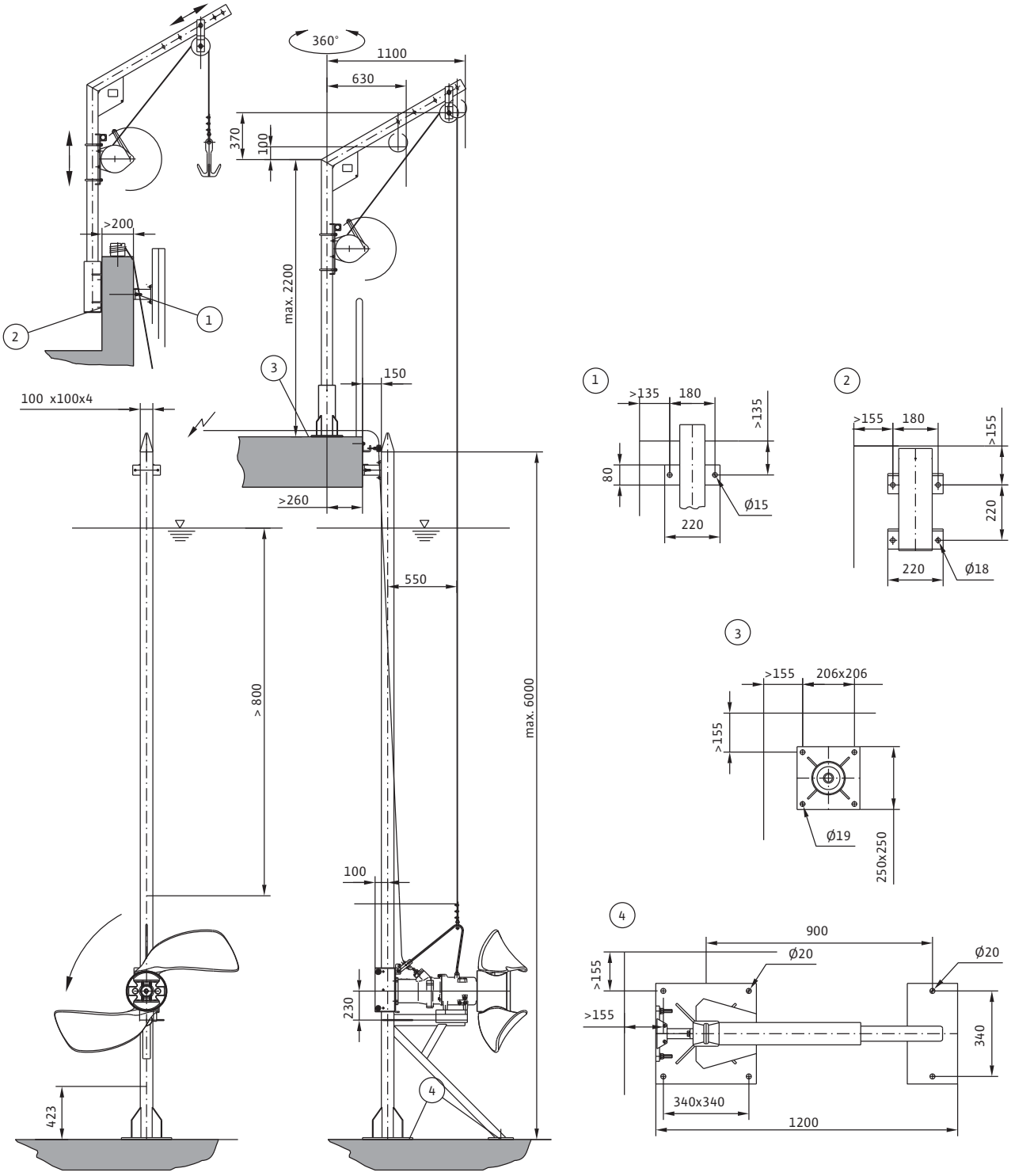
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

The value $P_{1.1}$ is equivalent to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measurement in accordance with ISO 21630.
• = available, – = not available

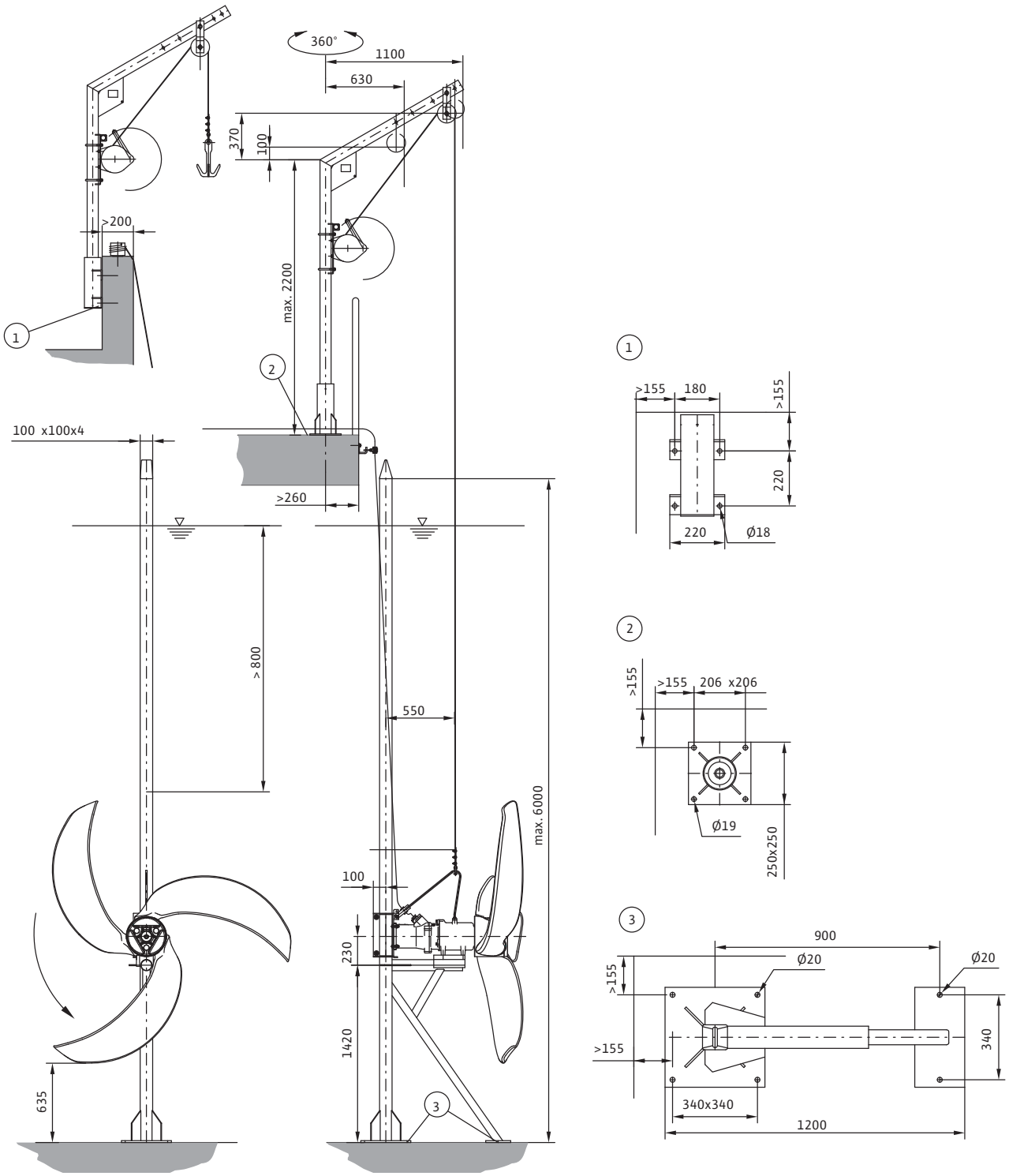
Installation example

Wilo-EMU Maxiprop mixer with lowering device AVMSH



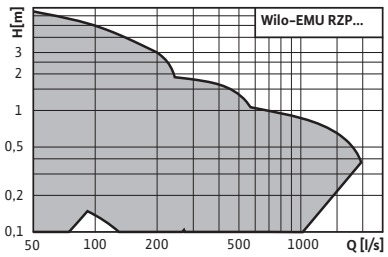
Installation example

Wilo-EMU Megaprop mixer with lowering device AVMS



Series overview Wilo-EMU Rezijet

Series: Wilo-EMU Rezijet



> Application

- Pumping sewage via low delivery heads at high flow rates, e.g. between balancing, nitrification and denitrification basins
- Pumping of industrial, raw, pure and cooling water, e.g. in paint finishing systems or for secondary hot water treatment
- Creation of fluid current in water channels, e.g. amusement parks

Series overview Wilo-EMU Rezijet

Series: Wilo-EMU Rezijet

> Special features/product benefits
- Submersible
- Vertical or in-line construction
- Self-cleaning propeller, partially with helix hub
- Propeller in steel or PUR version
- ATEX and FM version

> More information **Page**

Recirculation pumps

Rezijet recirculation pumps

Series description Wilo-EMU Rezijet

Design
Submersible mixers with flow housing, directly driven (RZP 20..., RZP 25-2...) or with single-stage planetary gear (RZP 50-3..., RZP 60-3..., RZP 80-2...)

Type key

e.g.:	**Wilo-EMU RZP 50-3.25-4/8 S25**
RZP	Recirculation pump
50	x 10 = nominal propeller diameter in mm
3	Model
25	x 10 = propeller speed in rpm
4	Number of poles
8	x 10 = stator length in mm
S25/K3	S = welded propeller, specification of the blade angle in ° / K = PUR propeller, specification of the number of blades

Application
- Pumping sewage via low delivery heads at high flow rates, e.g. between balancing, nitrification and denitrification basins
- Pumping of industrial, raw, pure and cooling water, e.g. in paint finishing systems or for secondary hot water treatment
- Creation of fluid current in water channels, e.g. amusement parks

Special features/product benefits
- Submersible
- Vertical or in-line construction
- Self-cleaning propeller, partially with helix hub
- Propeller in steel or PUR version
- ATEX and FM version

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Units are directly driven or with single-stage planetary gear
- Mechanical seal with SiC/SiC combination
- Permanently lubricated roller bearing
- Max. submersion depth: 12.5 m

Equipment/function
- Stationary installation directly on flow pipe
- Flexible installation through the use of lowering device
- Vertical or in-line installation possible

Materials
- Housing parts made of EN-GJL
- Propeller made of PUR or stainless steel
- Propeller hub made of stainless steel
- Screwed connections made of stainless steel
- Gear shaft made of 1.4462 on RZP 50-3, RZP 60-3 and RZP 80-2
- Flow housing made of V4A material (1.4571)

Description/design
Propeller
2- or 3-bladed propellers made of PUR or steel or 4-bladed propellers made of steel. Nominal propeller diameter from 200 mm to 800 mm. Entwining-free design made possible by backward-curved incoming flow edge, PUR propeller up to 250 mm with helix hub. The propeller blades are permanently fixed, which guarantees the best possible hydraulic efficiency.

Motor
Wilo T-series submersible motor with standard connection, enabling simple and efficient adaptation of the motor power classes The motor heat is given off directly to the fluid via the housing. The winding is equipped with a temperature monitor. Large-sized inclined (not with RZP 80-2) and grooved ball bearings ensure long service life of the motor bearings.

Sealing
RZP 20 ... 25-2
Double shaft sealing with large-volume sealing chamber to collect leakage from the mechanical seal. If desired, the sealing chamber can be equipped with an internal or external sealing chamber electrode. On the fluid side, sealing is achieved using a corrosion- and wear-resistant mechanical seal made of solid silicon carbide material; on the motor side, a rotary shaft seal is used. A seal bushing made of stainless steel ensures long-term corrosion-protected fit of the mechanical seal.

RZP 50-3 ... 80-2
Double shaft sealing with large-volume gate and sealing chamber to collect leakage from the mechanical seal. If desired, the sealing chamber can be equipped with an external sealing chamber electrode. On the motor and fluid side, sealing is achieved using a corrosion- and wear-resistant mechanical seal made of solid silicon carbide material. The sealing between the individual chambers is achieved using rotary shaft seals. A seal bushing made of stainless steel ensures long-term corrosion-protected fit of the mechanical seal.

Gear RZP 50-3...80-2
Single-stage planetary gear with exchangeable transmissions. The gear shaft is made of saltwater-resistant stainless steel 1.4462. The gear bearings are dimensioned so that the resulting mixing forces are absorbed and are not transferred to the motor bearings.

Cable
The power cable is a type H07 cable (with T 12 motor) or NSSHÖU (with T 17 and T 20 motor) for heavy mechanical loads. The power cable enters the motor housing through a water pressure-tight cable lead-in with strain relief and bend protection. The individual wires as well as the cable sheath are additionally sealed to keep out fluids.

Options
- Special voltages
- PTC thermistor temperature sensor
- External sealing chamber control
- Coating Ceram C0
- Ex-rated to ATEX or FM

Series description Wilo-EMU Rezijet

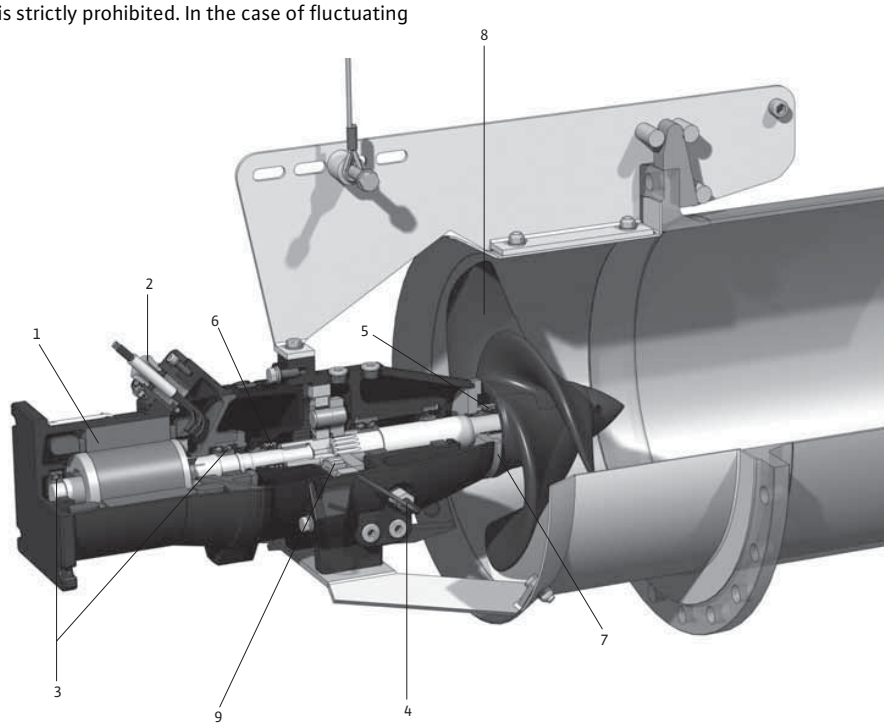
Scope of delivery
- Recirculation pump with mounted propeller, flow housing and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

Configuration
A separate configuration must be carried out for each application to ensure optimum pumping results. Carefully follow the instructions for the supplied configuration when installing the units.

Commissioning
Immersed operating mode S1:
The unit can be used immersed in permanent operation. Surfacing the propeller or motor is strictly prohibited. In the case of fluctuating fluid levels, the system should switch off automatically if the degree of water submersion drops below the minimum level.

When installing the power cables, make sure that they are not drawn into the propeller by the fluid current.

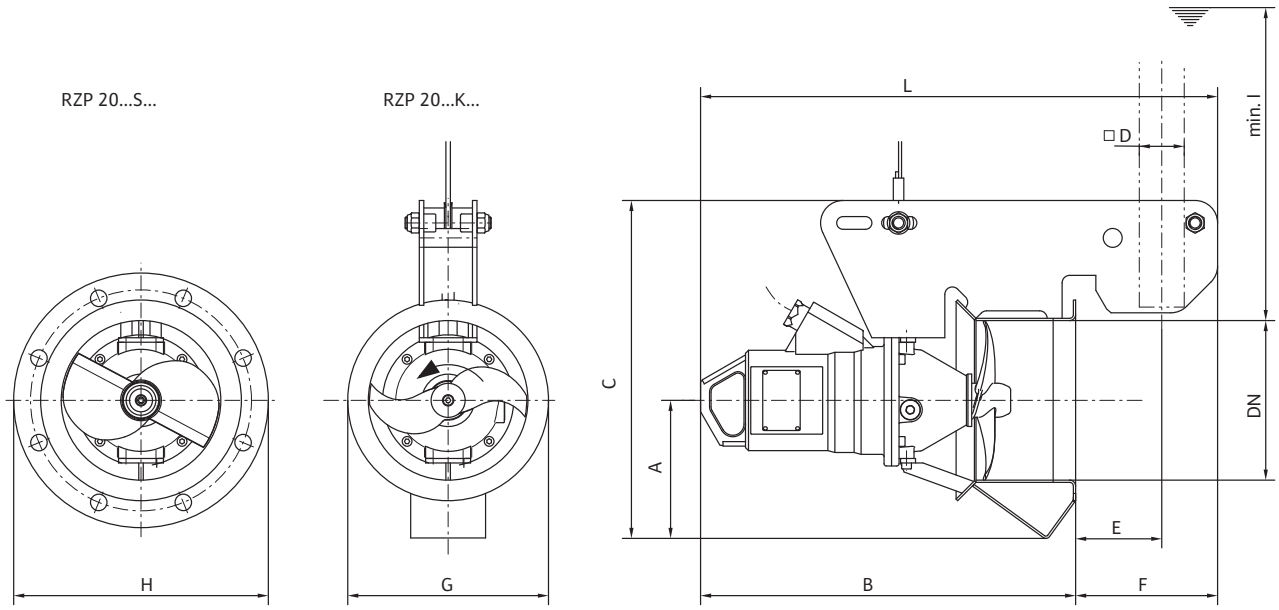
Accessories
- Lowering device
- Auxiliary hoisting gear
- Special fixation parts to enable use of an auxiliary hoisting gear for multiple units
- Additional cable anchoring
- Fixation sets with anchor bolt
- In-line version



1 = motor; 2 = cable lead-in; 3 = motor bearing; 4 = external electrode for monitoring the sealing chamber; 5 = mechanical seal on fluid side; 6 = mechanical seal on motor side; 7 = seal bushing; 8 = flow housing; 9 = single-stage planetary gear

Dimensions, weights Wilo-EMU RZP 20...4/6

Dimension drawing

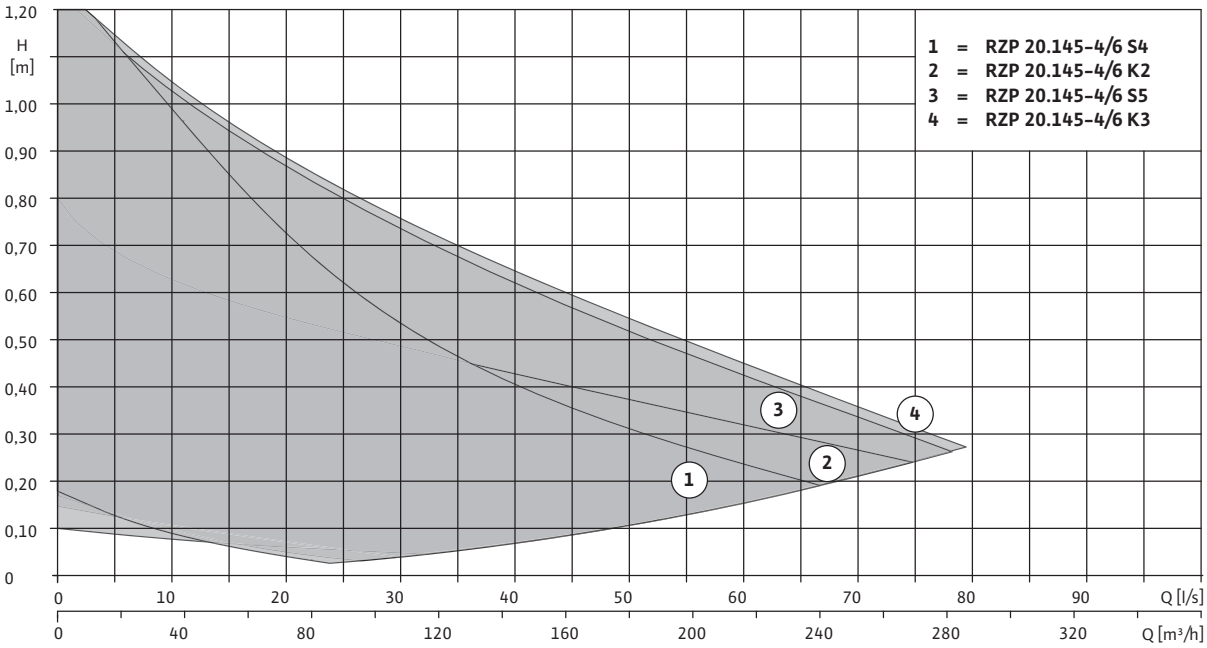


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 20...-.../6 K...	185	500	450	60	115	190	270	340	600	690	200	35
RZP 20...-.../6 S...	185	500	450	60	115	190	270	340	600	690	200	37

Technical data, motor data Wilo-EMU RZP 20...4/6

Pump curves



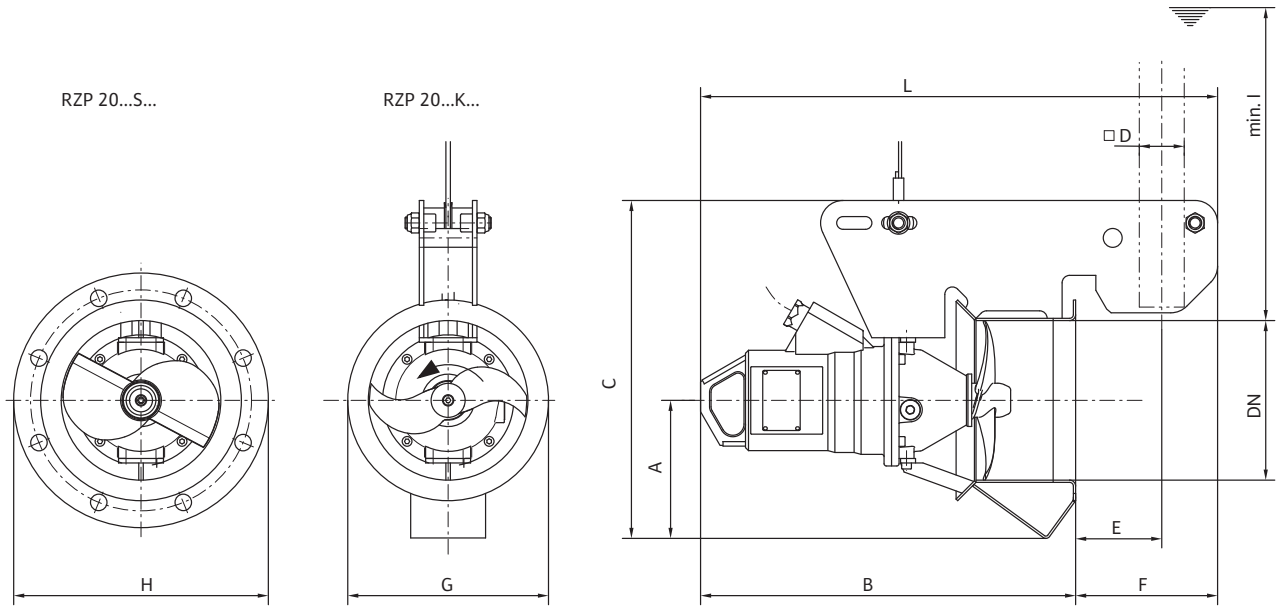
Technical data		
Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 20.145-4/6 K2	1336	1.000
RZP 20.145-4/6 K3	1336	1.000
RZP 20.145-4/6 S4	1336	1.000
RZP 20.145-4/6 S5	1336	1.000

Motor data						
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 12-4/6 (Ex)	0.5	0.73	1.42	1336	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 20...4/11

Dimension drawing

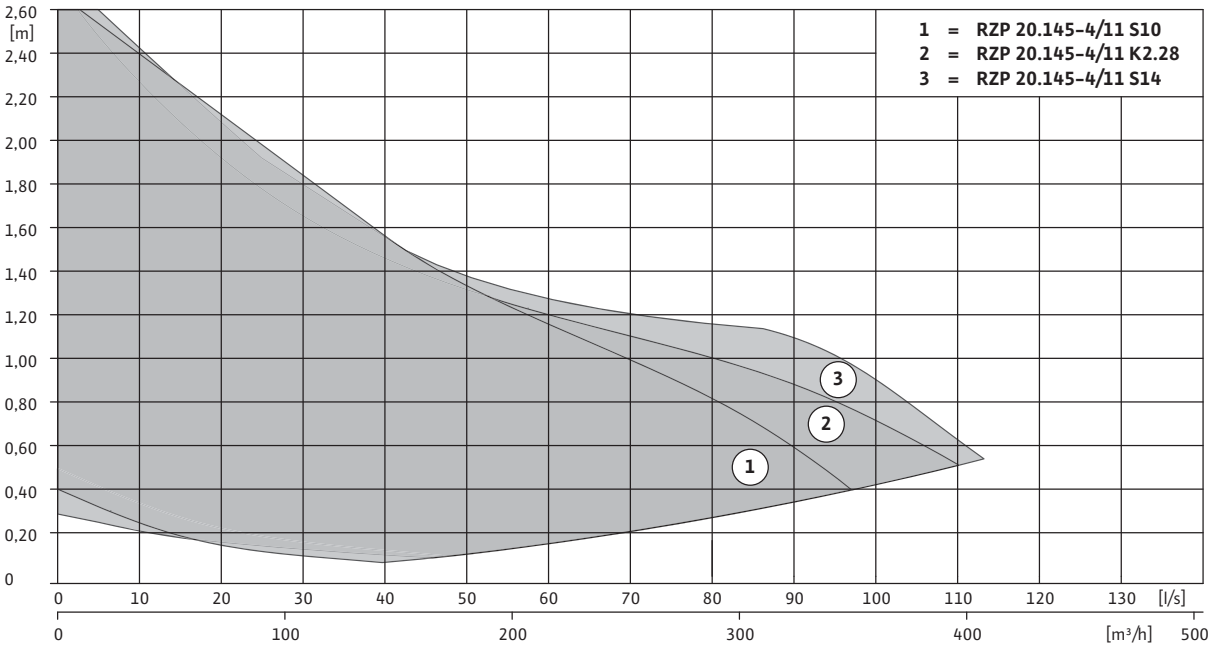


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 20...-.../11 K...	185	596	450	60	115	190	270	340	600	786	200	41
RZP 20...-.../11 S...	185	596	450	60	115	190	270	340	600	786	200	43

Technical data, motor data Wilo-EMU RZP 20...4/11

Pump curves



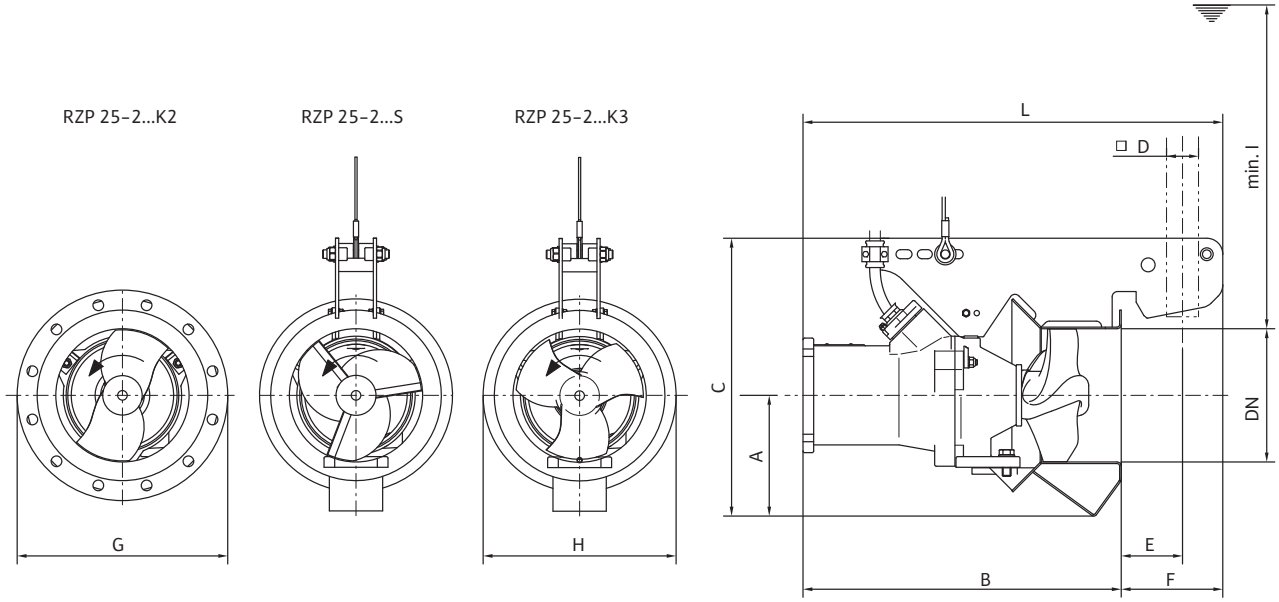
Technical data		
Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 20.145-4/11 K2.28	1392	1.000
RZP 20.145-4/11 S10	1392	1.000
RZP 20.145-4/11 S14	1392	1.000

Motor data						
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 12-4/11 (Ex)	1.3	1.74	3.3	1392	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...6/8

Dimension drawing

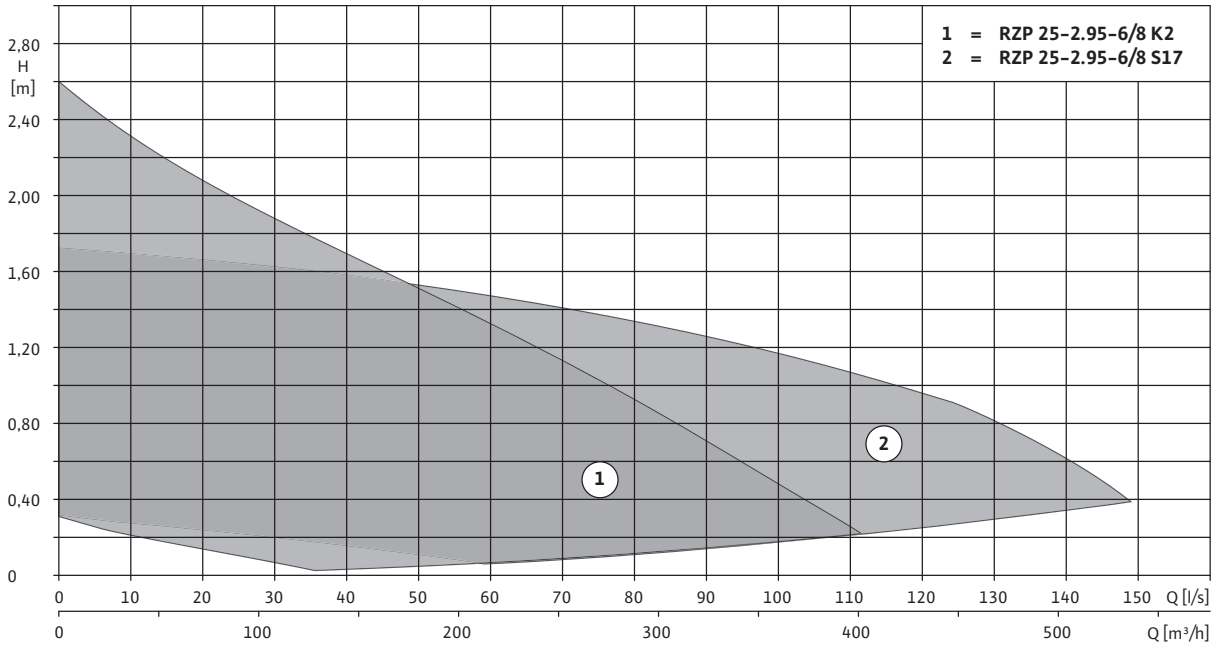


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../8 K...	227	562	522	60	115	190	395	362	900	752	250	65
RZP 25-2...-.../8 S...	227	562	522	60	115	190	395	362	900	752	250	69

Technical data, motor data Wilo-EMU RZP 25-2...6/8

Pump curves



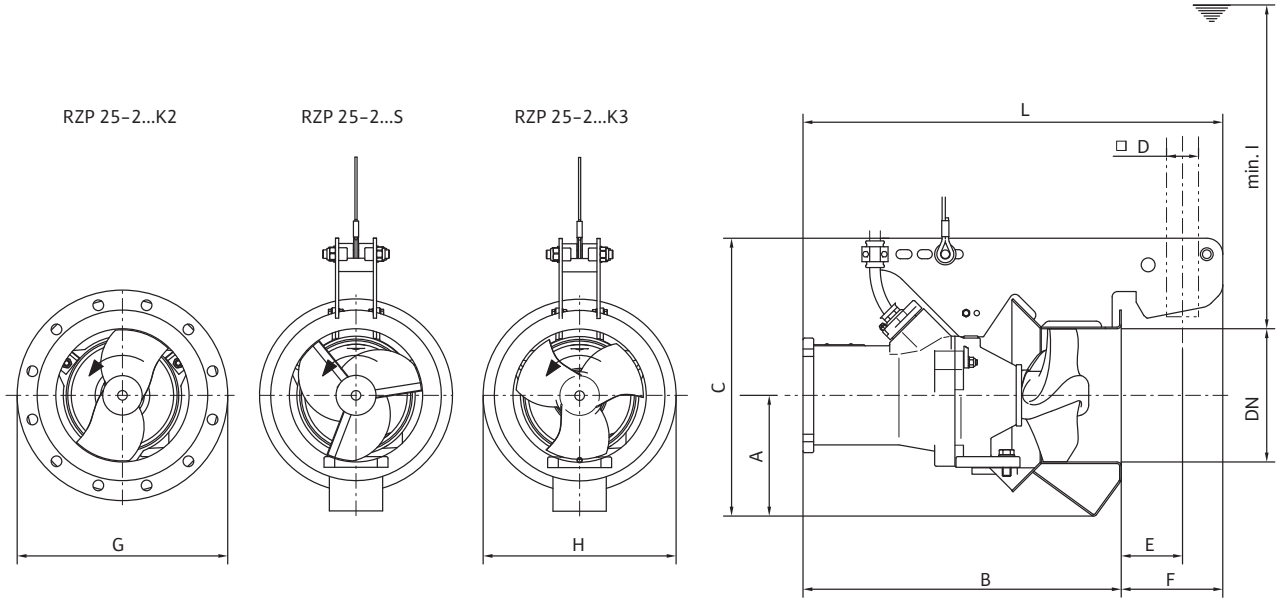
Technical data		
Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 25-2.95-6/8 K2	915	1.000
RZP 25-2.95-6/8 S17	915	1.000

Motor data						
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-6/8R (Ex)	1.75	2.5	4.45	915	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...6/16

Dimension drawing

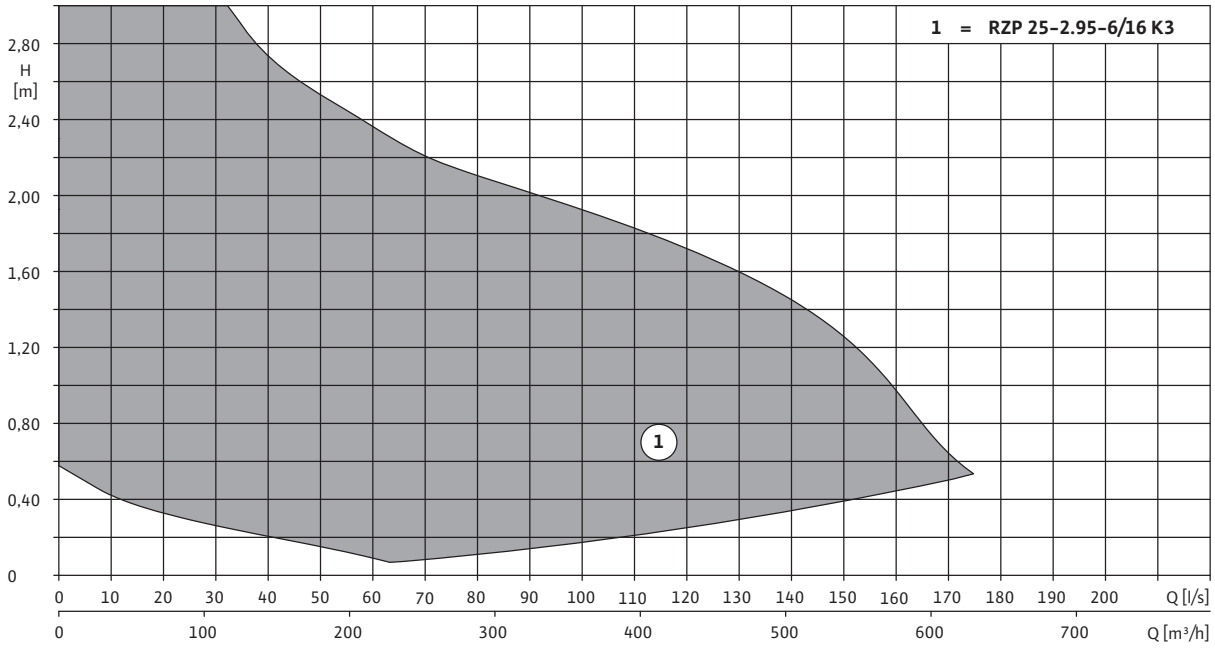


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../16 K...	227	635	522	60	115	190	395	362	900	825	250	85

Technical data, motor data Wilo-EMU RZP 25-2...6/16

Pump curves



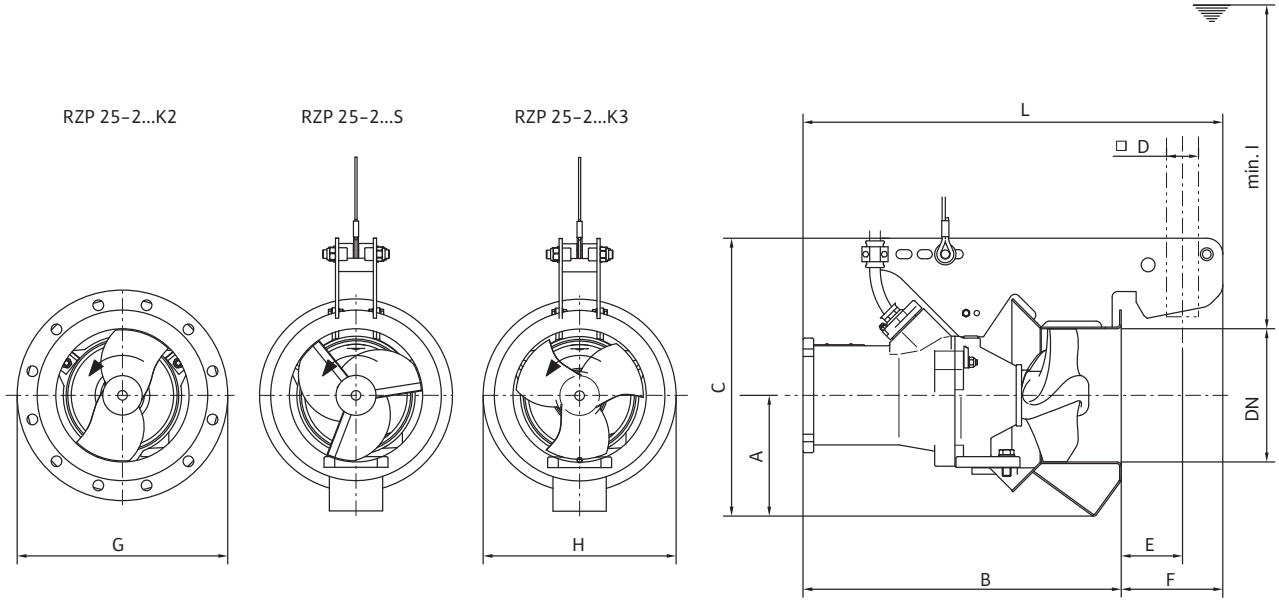
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 25-2.95-6/16 K3	931	1.000

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-6/16R (Ex)	3.7	5.2	9.1	931	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...4/8V

Dimension drawing

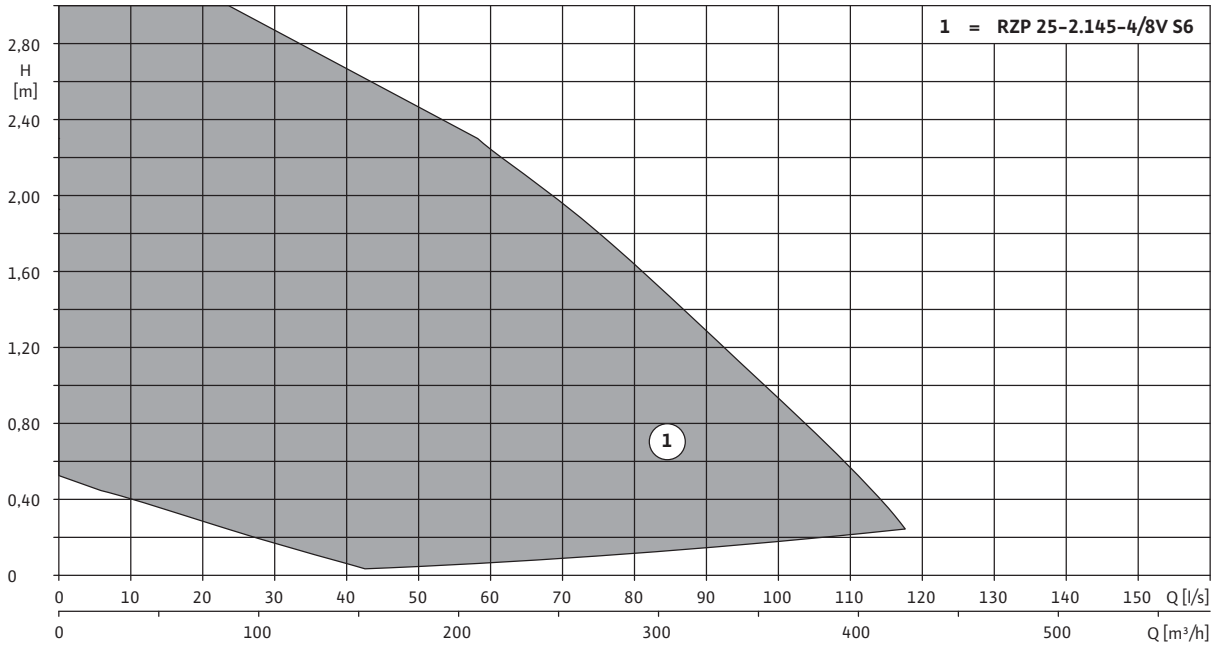


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../8 S...	227	562	522	60	115	190	395	362	900	752	250	71

Technical data, motor data Wilo-EMU RZP 25-2...4/8V

Pump curves



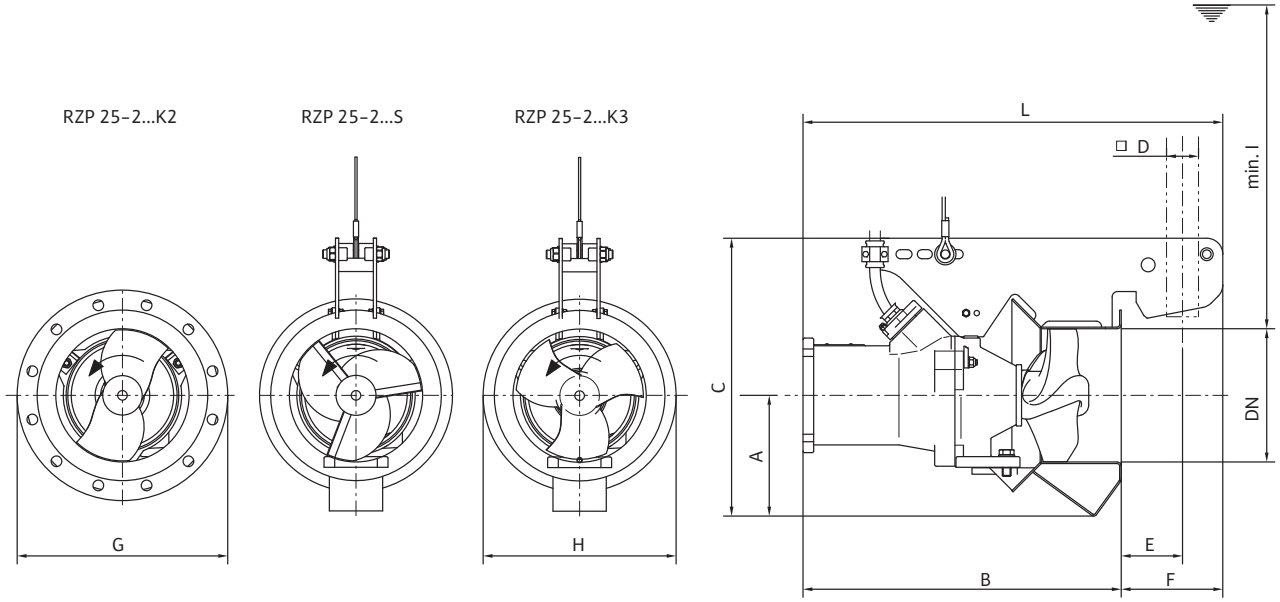
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 25-2.145-4/8V S6	1400	1.000

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-4/8V (Ex)	2.5	3.5	5.9	1400	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...4/8

Dimension drawing

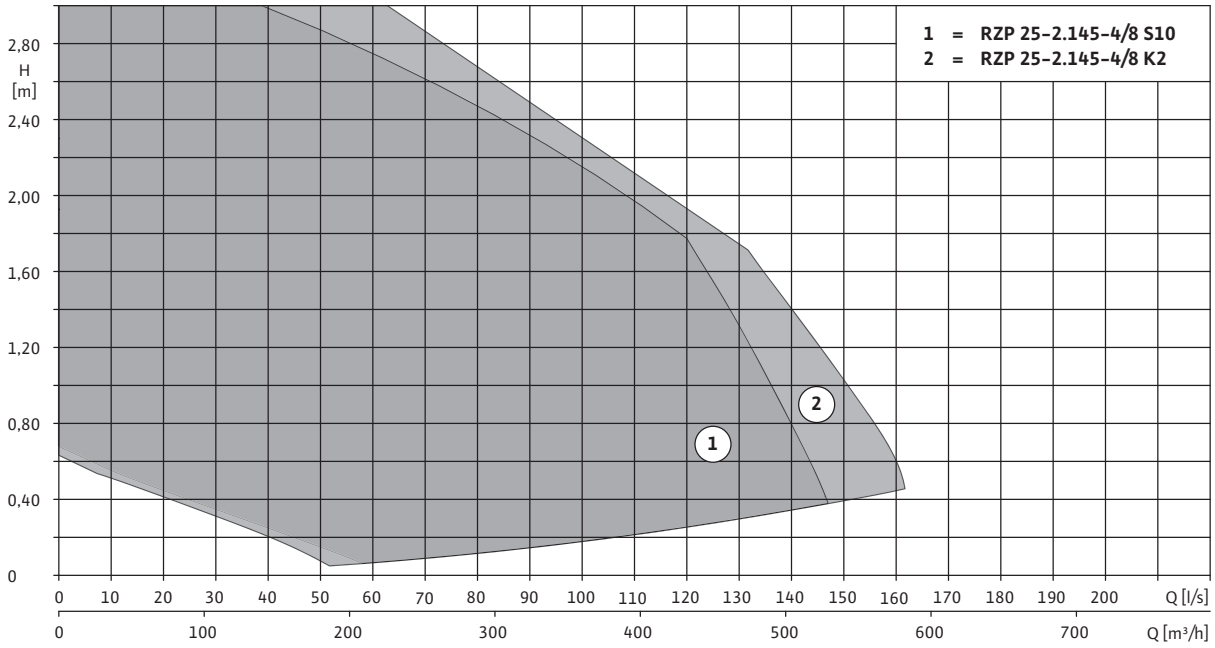


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../8 K...	227	562	522	60	115	190	395	362	900	752	250	67
RZP 25-2...-.../8 S...	227	562	522	60	115	190	395	362	900	752	250	71

Technical data, motor data Wilo-EMU RZP 25-2...4/8

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 25-2.145-4/8 K2	1410	1.000
RZP 25-2.145-4/8 S10	1410	1.000

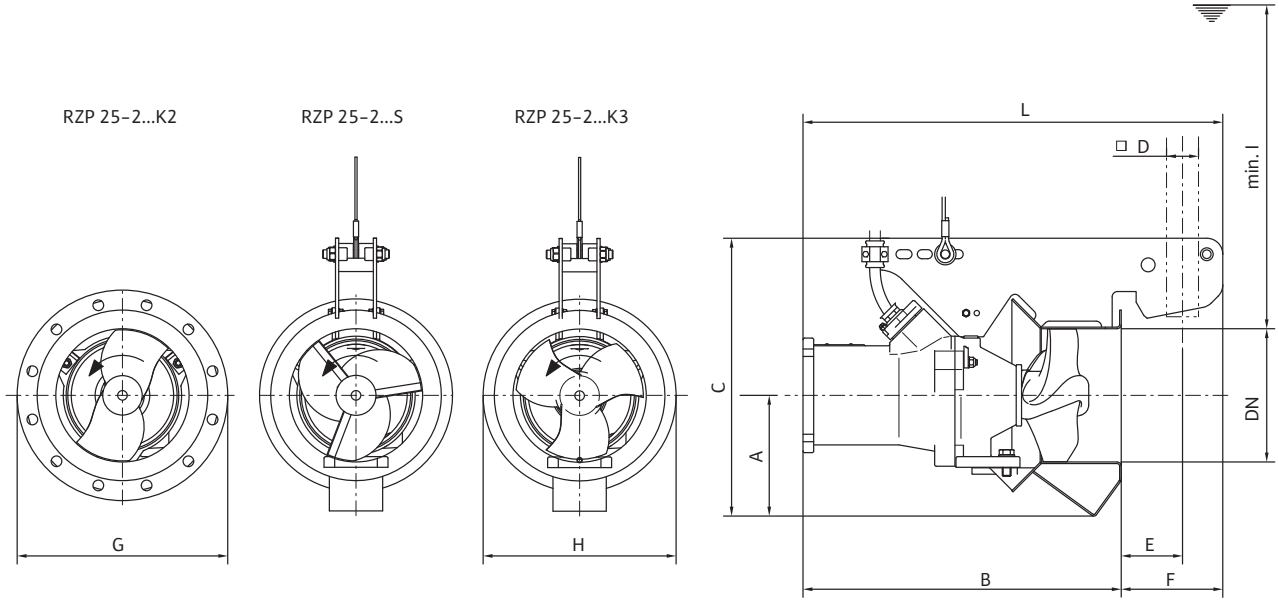
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...4/12

Dimension drawing

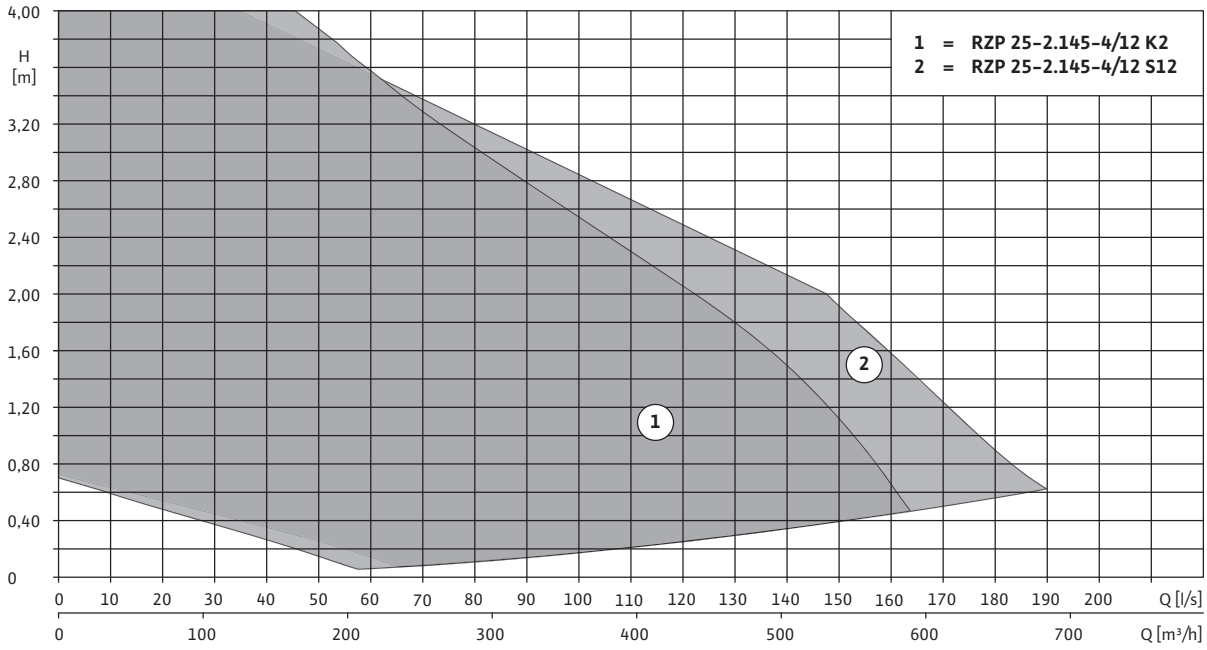


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../12 K...	227	597	522	60	115	190	395	362	900	787	250	73
RZP 25-2...-.../12 S...	227	597	522	60	115	190	395	362	900	787	250	77

Technical data, motor data Wilo-EMU RZP 25-2...4/12

Pump curves



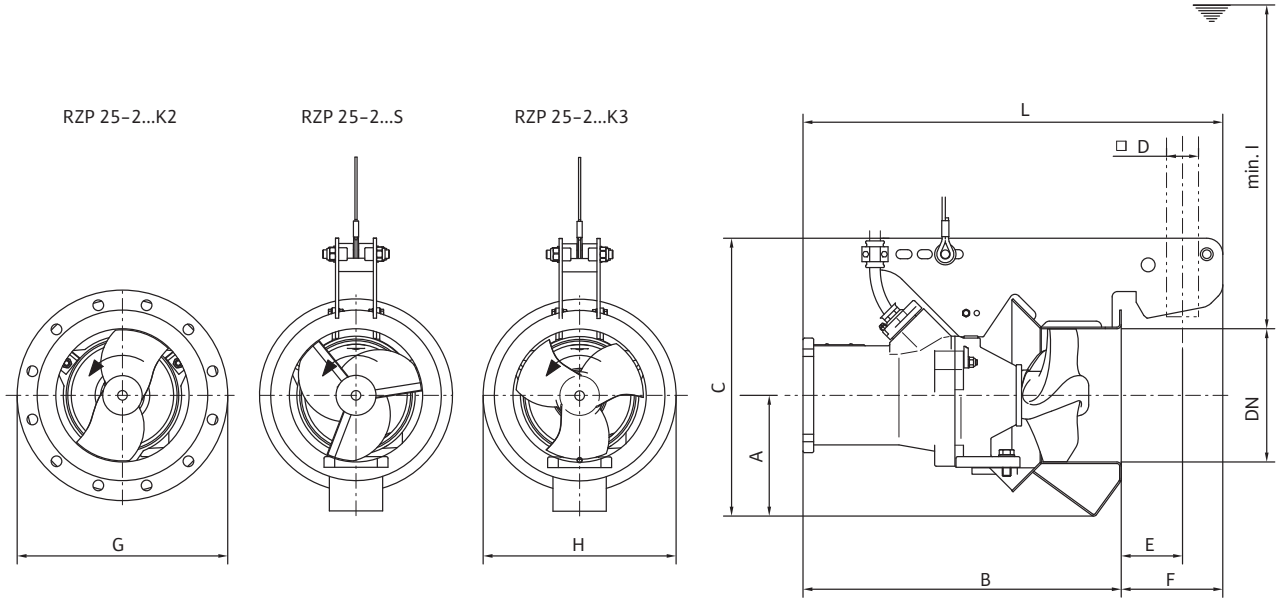
Technical data		
Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 25-2.145-4/12 K2	1405	1.000
RZP 25-2.145-4/12 S12	1405	1.000

Motor data						
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...4/16

Dimension drawing

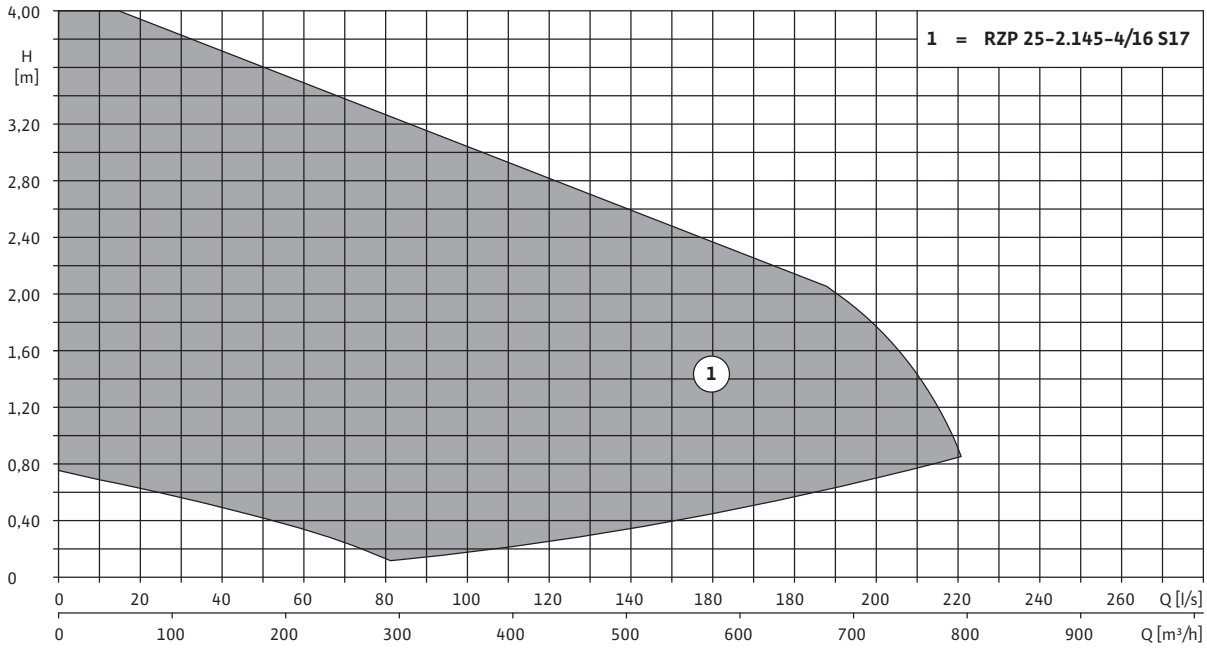


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../16 S...	227	635	522	60	115	190	395	362	900	825	250	89

Technical data, motor data Wilo-EMU RZP 25-2...4/16

Pump curves



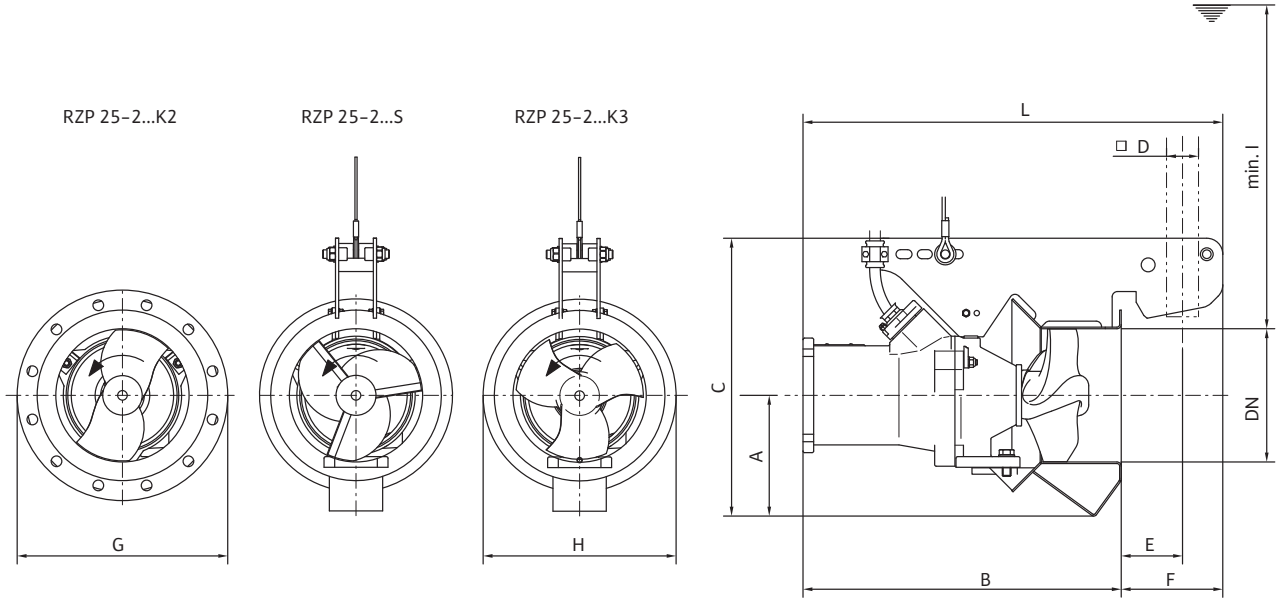
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 25-2.145-4/16 S17	1400	1.000

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 25-2...4/24

Dimension drawing

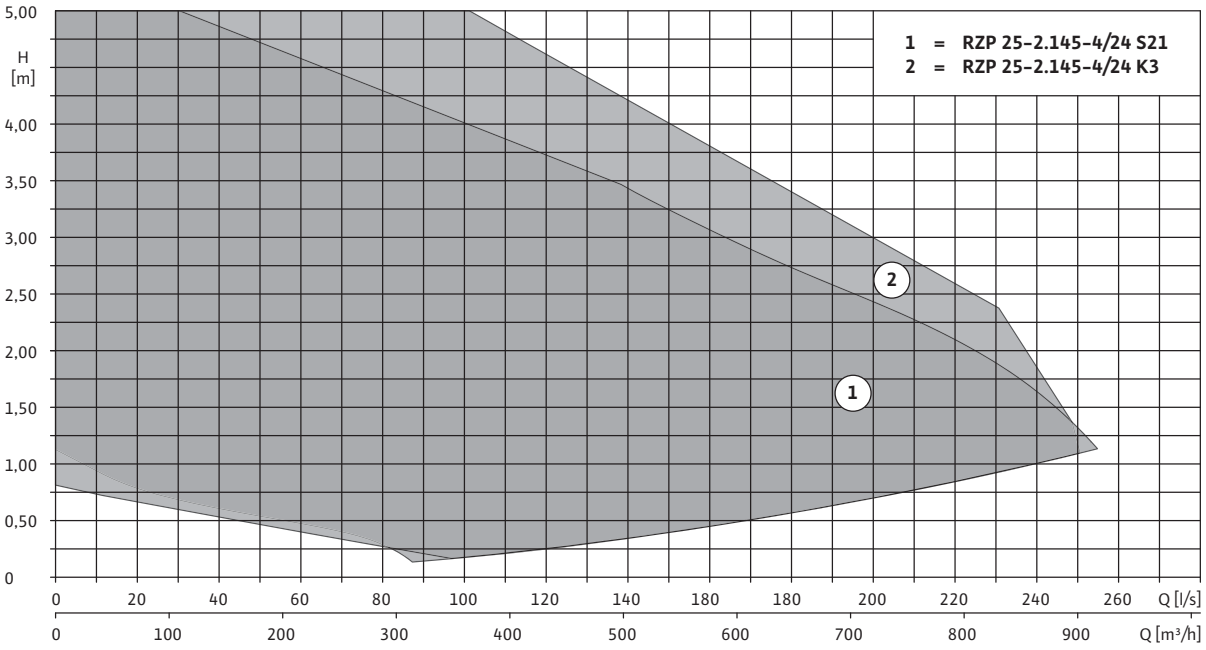


Dimensions, weights

Wilo-EMU...	Dimensions										Nominal flange diameter	Weight
	A	W	C	D	E	F	G	H	I	L	DN	Unit
	[mm]										–	[kg]
RZP 25-2...-.../24 K...	227	715	522	60	115	190	395	362	900	905	250	101
RZP 25-2...-.../24 S...	227	715	522	60	115	190	395	362	900	905	250	104

Technical data, motor data Wilo-EMU RZP 25-2...4/24

Pump curves



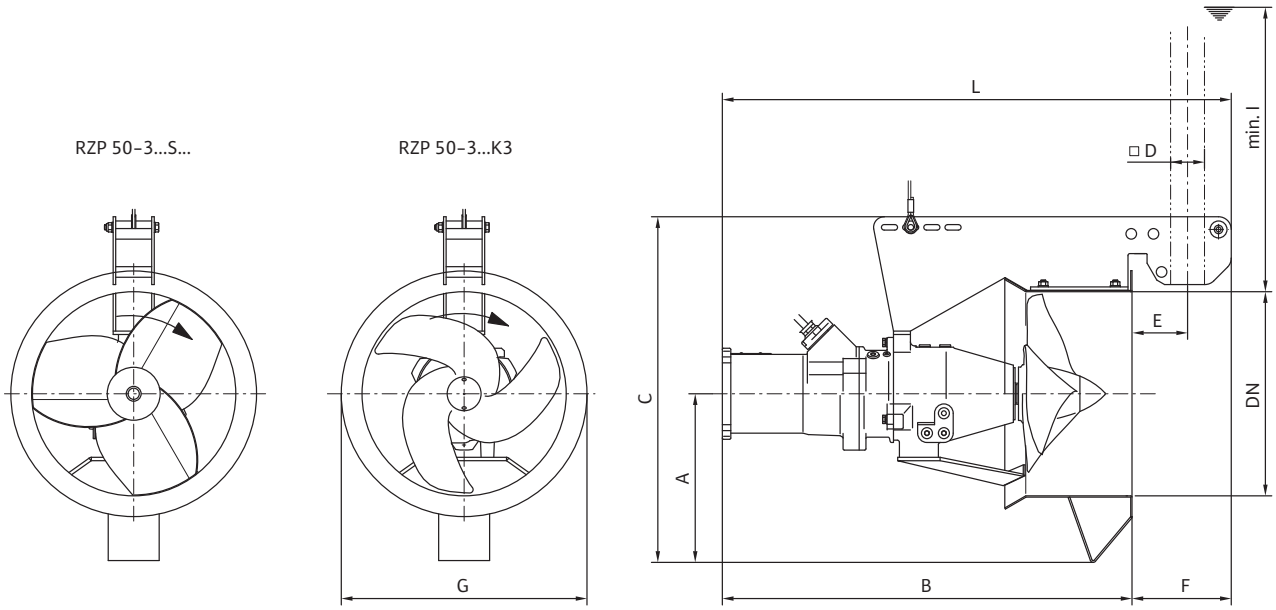
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 25-2.145-4/24 K3	1417	1.000
RZP 25-2.145-4/24 S21	1417	1.000

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-4/24R (Ex)	10	12.2	21	1417	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 50-3...4/8

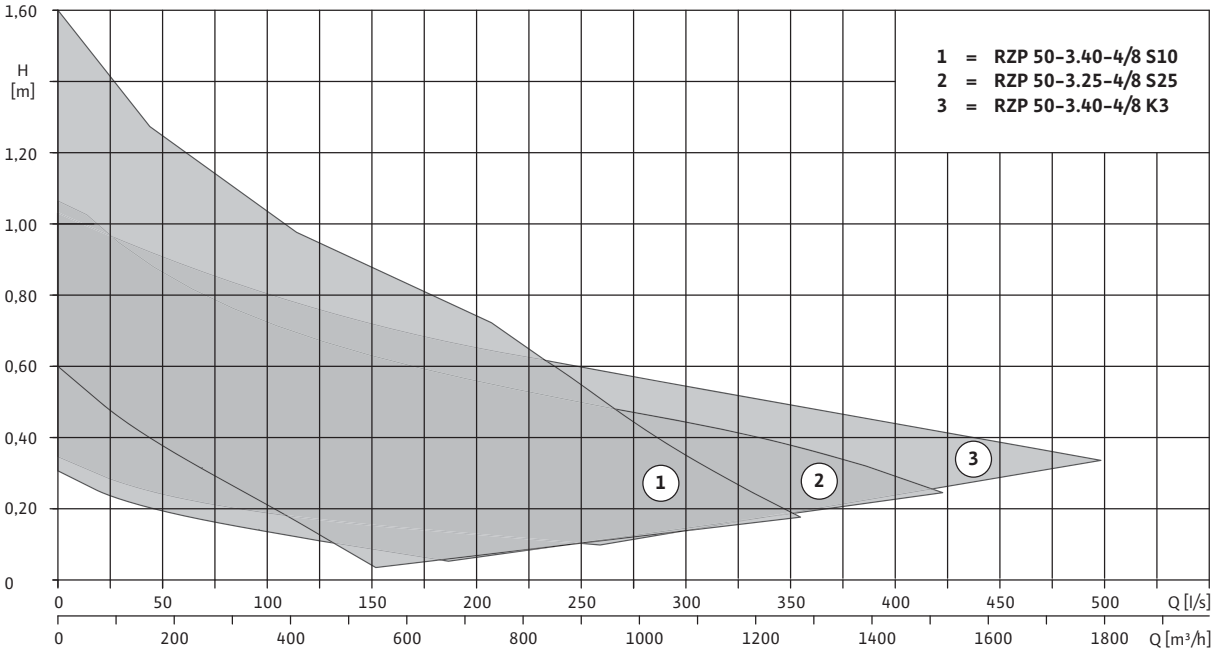
Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 50-3...-.../8 K...	398	897	816	80	130	234	580	900	1129	500	129
RZP 50-3...-.../8 S...	398	897	816	80	130	234	580	900	1129	500	140

Technical data, motor data Wilo-EMU RZP 50-3...4/8



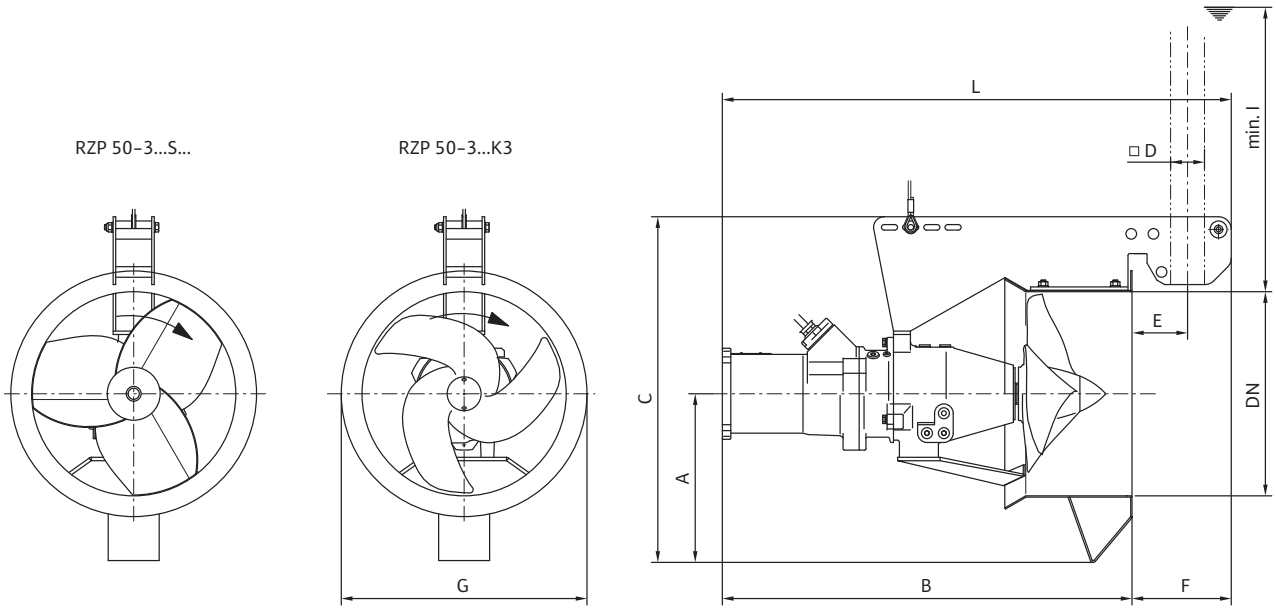
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 50-3.25-4/8 S25	250	5.590
RZP 50-3.40-4/8 K3	400	3.600
RZP 50-3.40-4/8 S10	400	3.600

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-4/8R (Ex)	3.5	4.5	7.9	1410	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 50-3...4/12

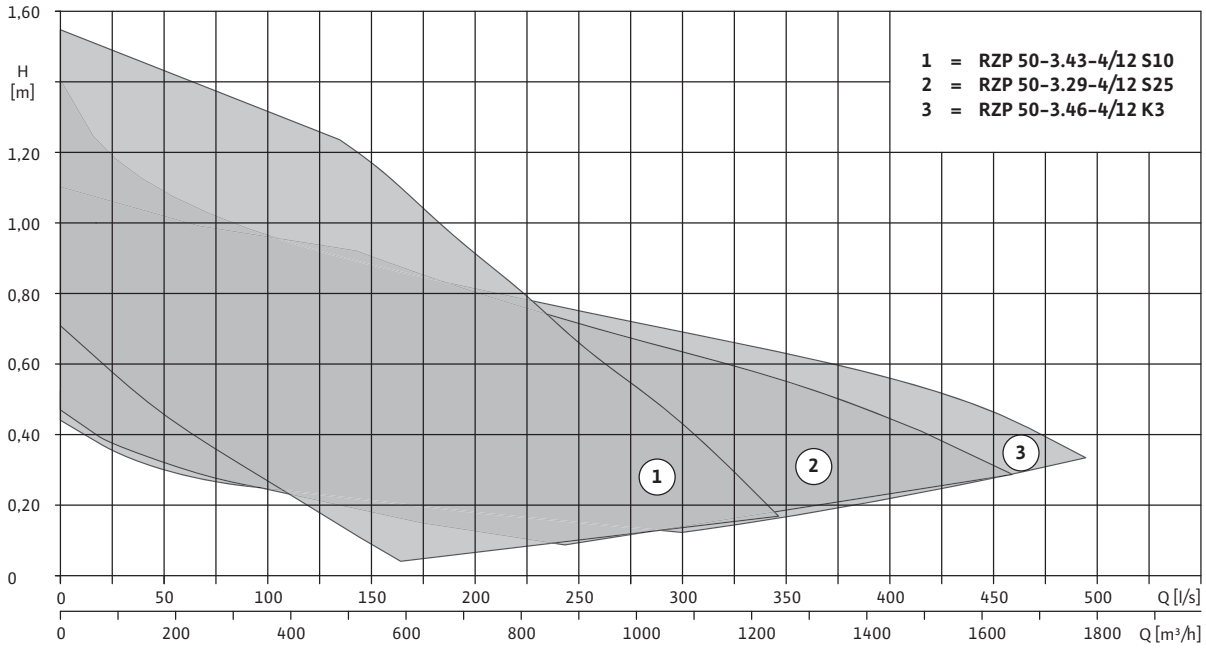
Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 50-3...-.../12 K...	398	932	816	80	130	234	580	900	1164	500	137
RZP 50-3...-.../12 S...	398	932	816	80	130	234	580	900	1164	500	148

Technical data, motor data Wilo-EMU RZP 50-3...4/12



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 50-3.29-4/12 S25	290	4.900
RZP 50-3.43-4/12 S10	430	3.364
RZP 50-3.46-4/12 K3	460	3.167

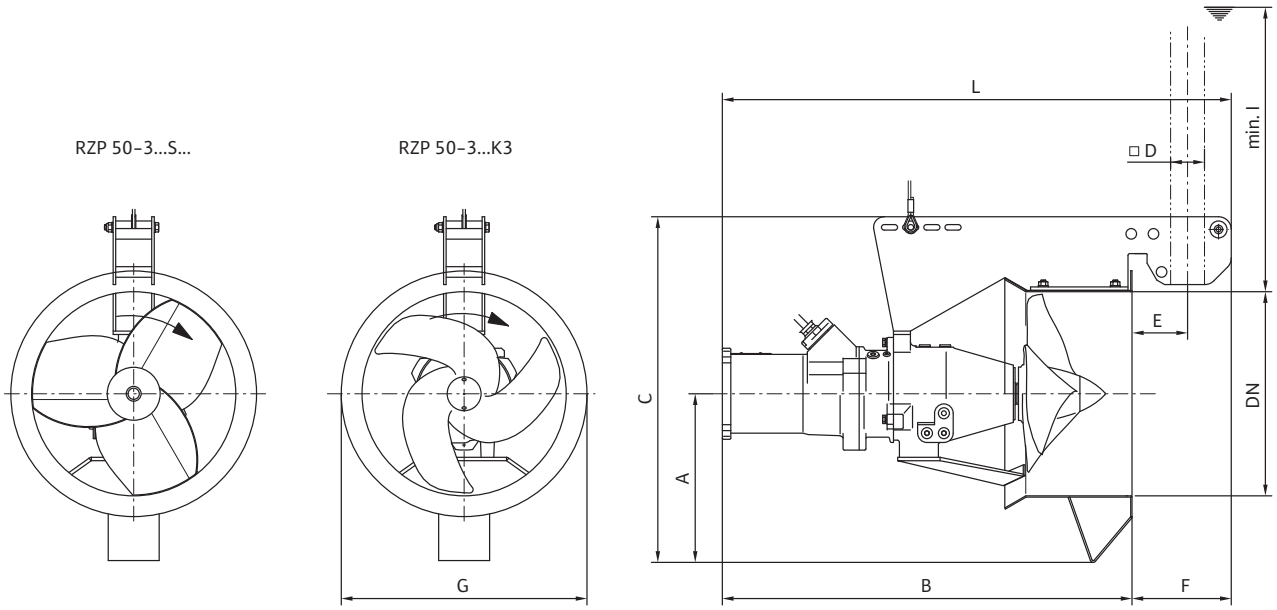
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 50-3...4/16

Dimension drawing

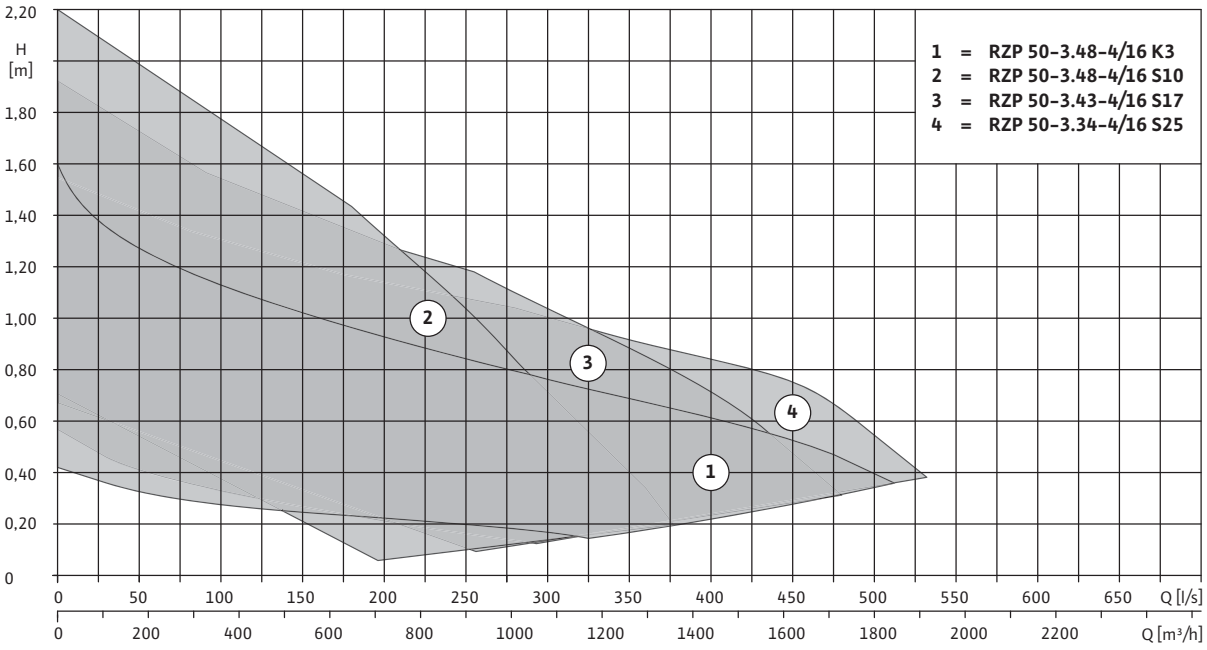


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 50-3...-.../16 K...	398	970	816	80	130	234	580	900	1202	500	147
RZP 50-3...-.../16 S...	398	970	816	80	130	234	580	900	1202	500	158

Technical data, motor data Wilo-EMU RZP 50-3...4/16

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 50-3.34-4/16 S25	340	4.250
RZP 50-3.43-4/16 S17	430	3.364
RZP 50-3.48-4/16 K3	480	3.000
RZP 50-3.48-4/16 S10	480	3.000

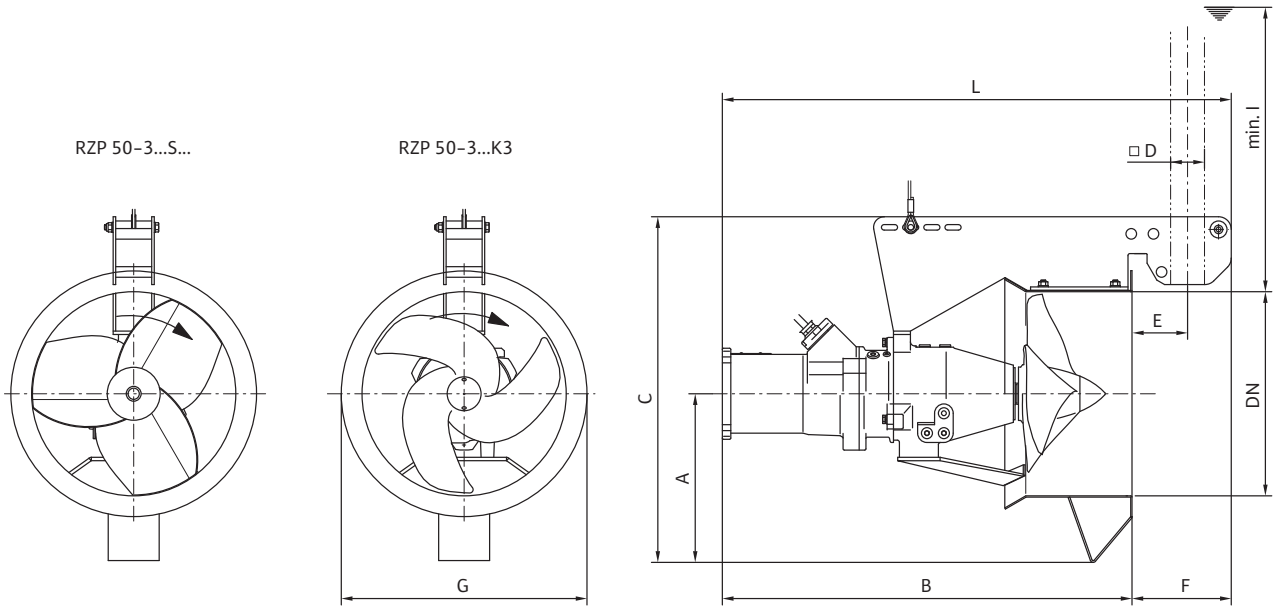
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 50-3...4/24

Dimension drawing

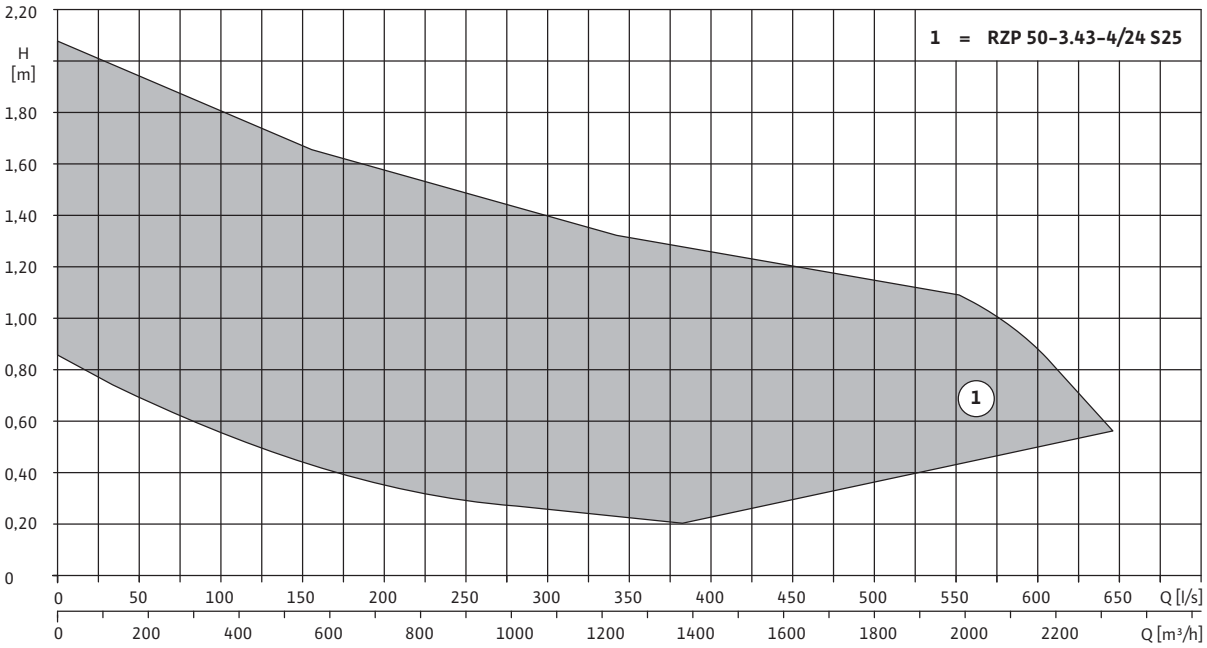


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 50-3...-.../24 S...	398	1050	816	80	130	234	580	900	1282	500	170

Technical data, motor data Wilo-EMU RZP 50-3...4/24

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 50-3.43-4/24 S25	430	3.364

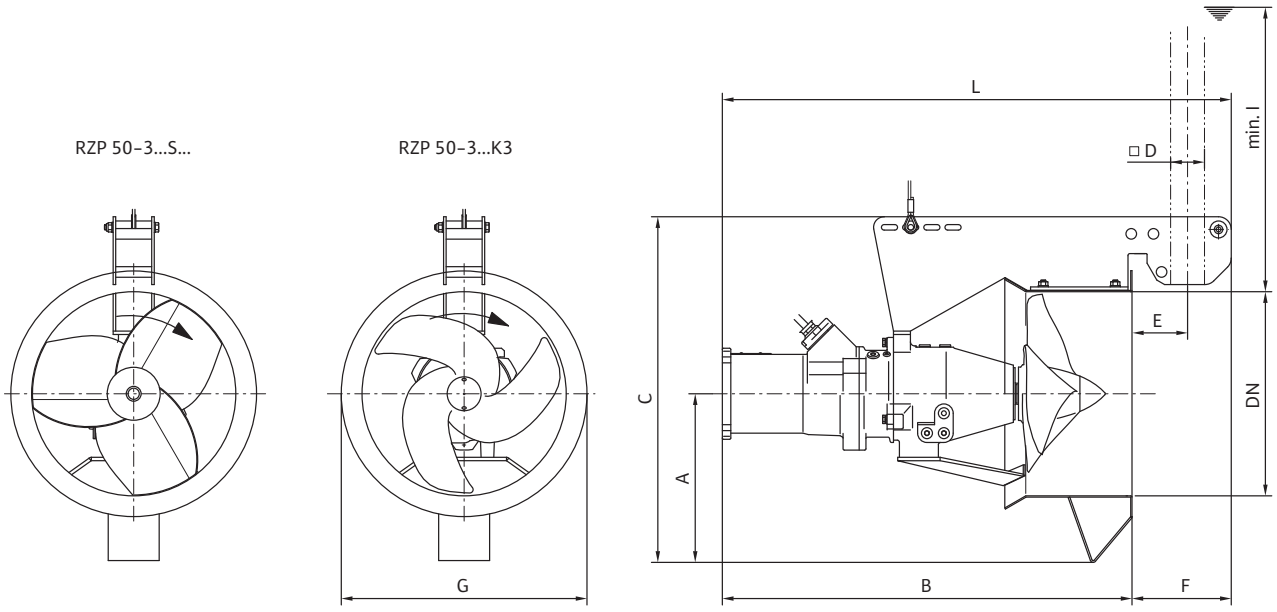
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/24R (Ex)	10	12.2	21	1417	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 50-3...2/22

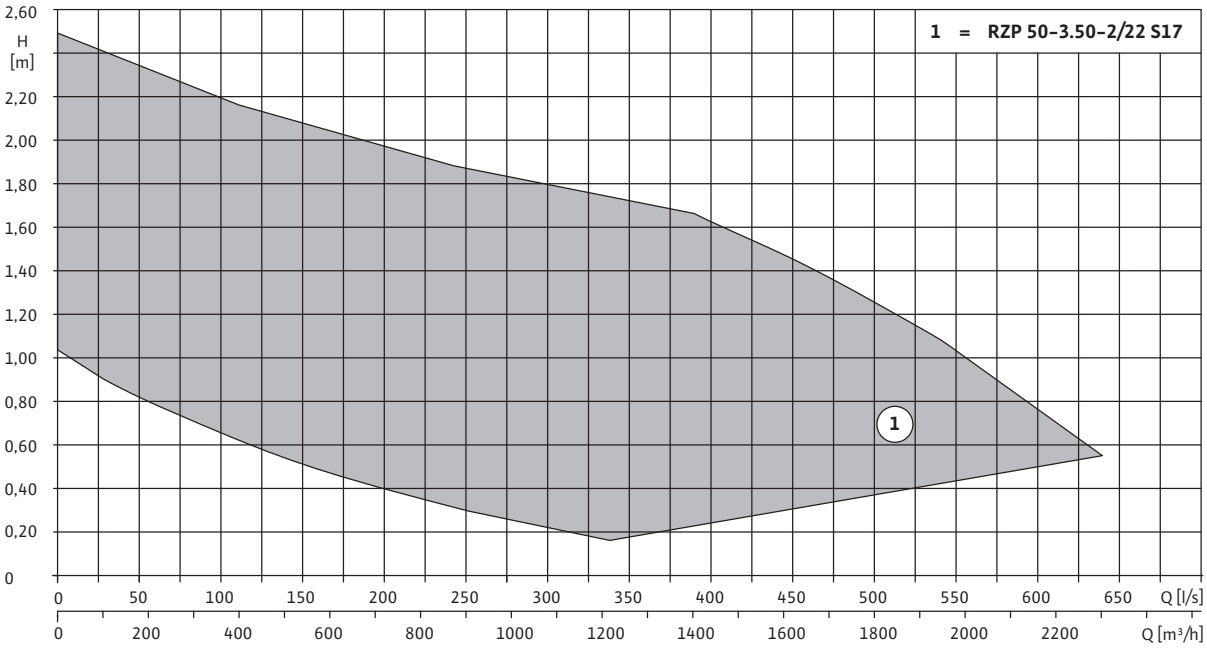
Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 50-3...-.../22 S...	398	1050	816	80	130	234	580	900	1282	500	170

Technical data, motor data Wilo-EMU RZP 50-3...2/22



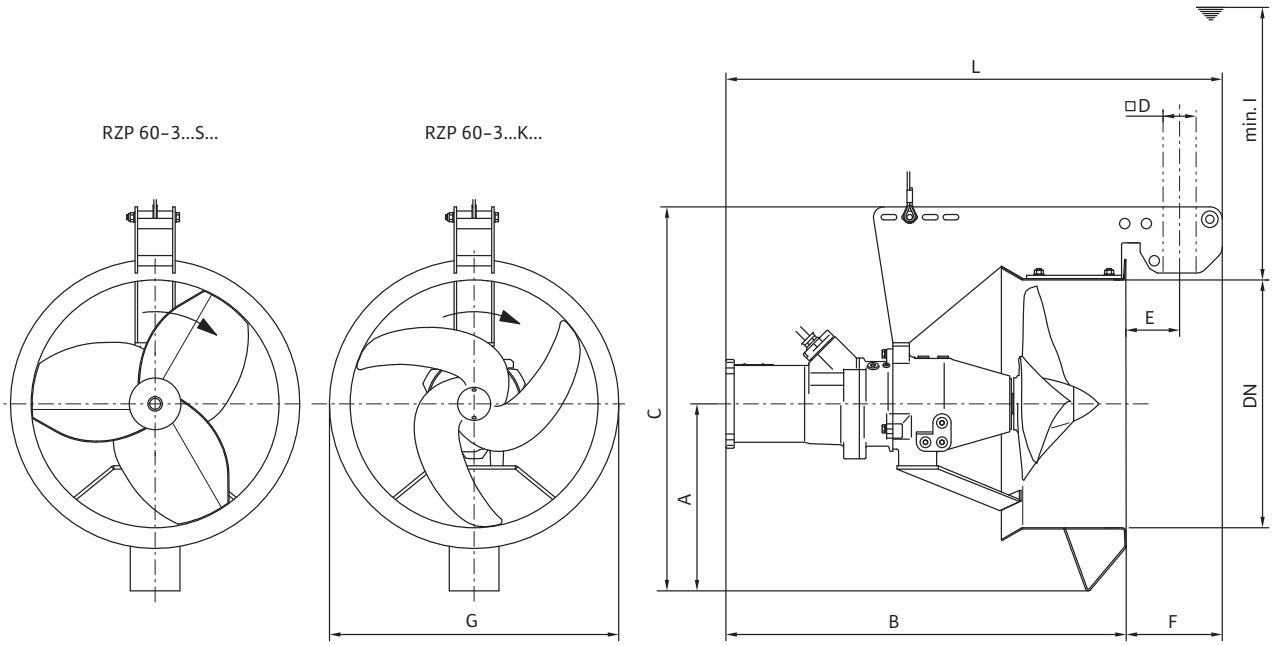
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 50-3.50-2/22 S17	500	5.875

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-2/22R (Ex)	10.5	12.3	20.5	2914	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 60-3...4/12

Dimension drawing

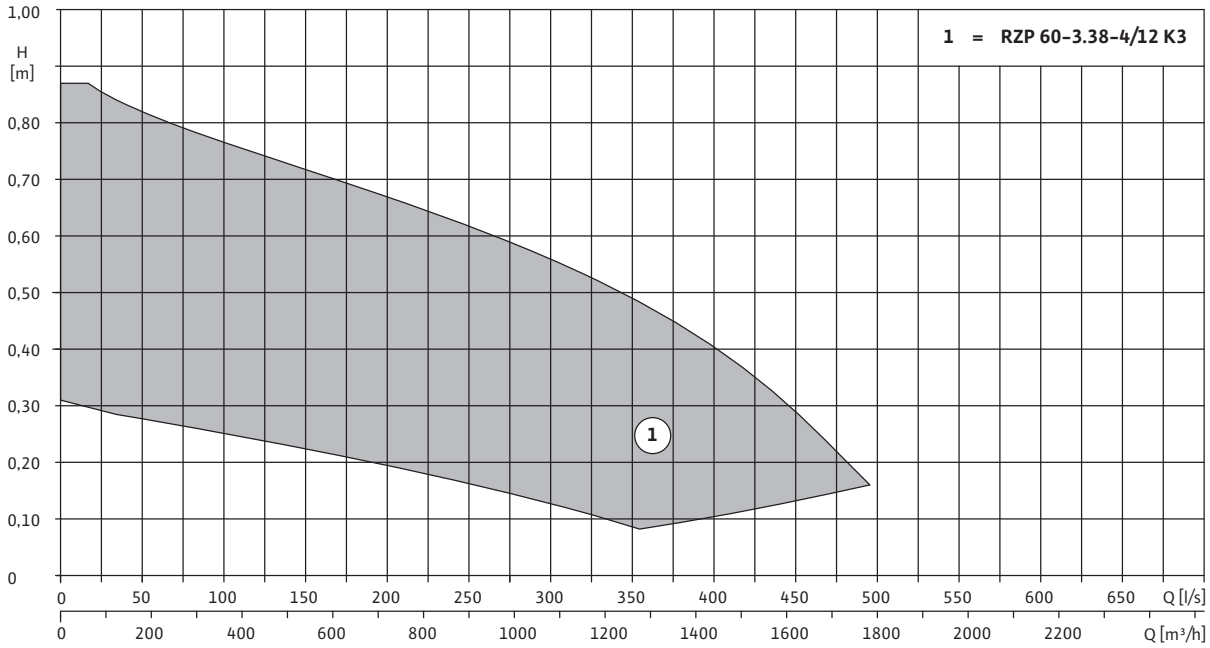


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 60-3...-.../12 K...	453	920	930	80	130	232	695	900	1152	600	143

Technical data, motor data Wilo-EMU RZP 60-3...4/12

Pump curves



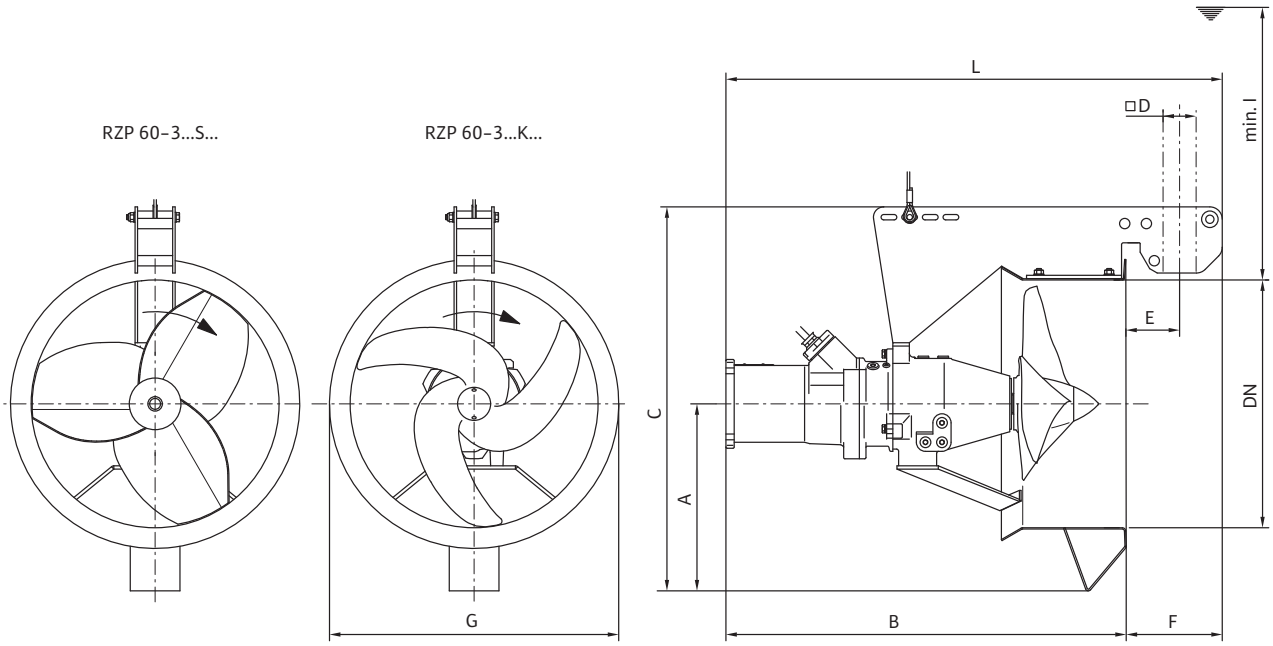
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 60-3.38-4/12 K3	380	3.880

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 17-4/12R (Ex)	4.5	5.8	9.4	1405	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 60-3...4/16

Dimension drawing

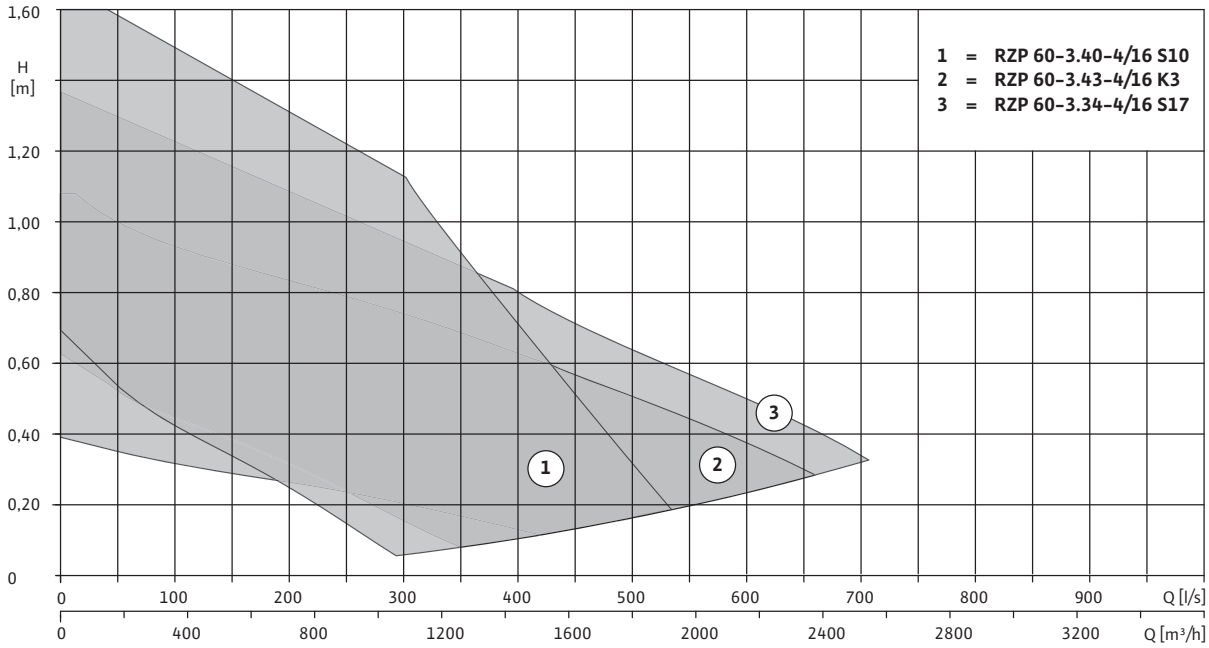


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 60-3...-.../16 K...	453	958	930	80	130	232	695	900	1190	600	153
RZP 60-3...-.../16 S...	453	958	930	80	130	232	695	900	1190	600	164

Technical data, motor data Wilo-EMU RZP 60-3...4/16

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 60-3.34-4/16 S17	340	4.250
RZP 60-3.40-4/16 S10	400	3.600
RZP 60-3.43-4/16 K3	430	3.364

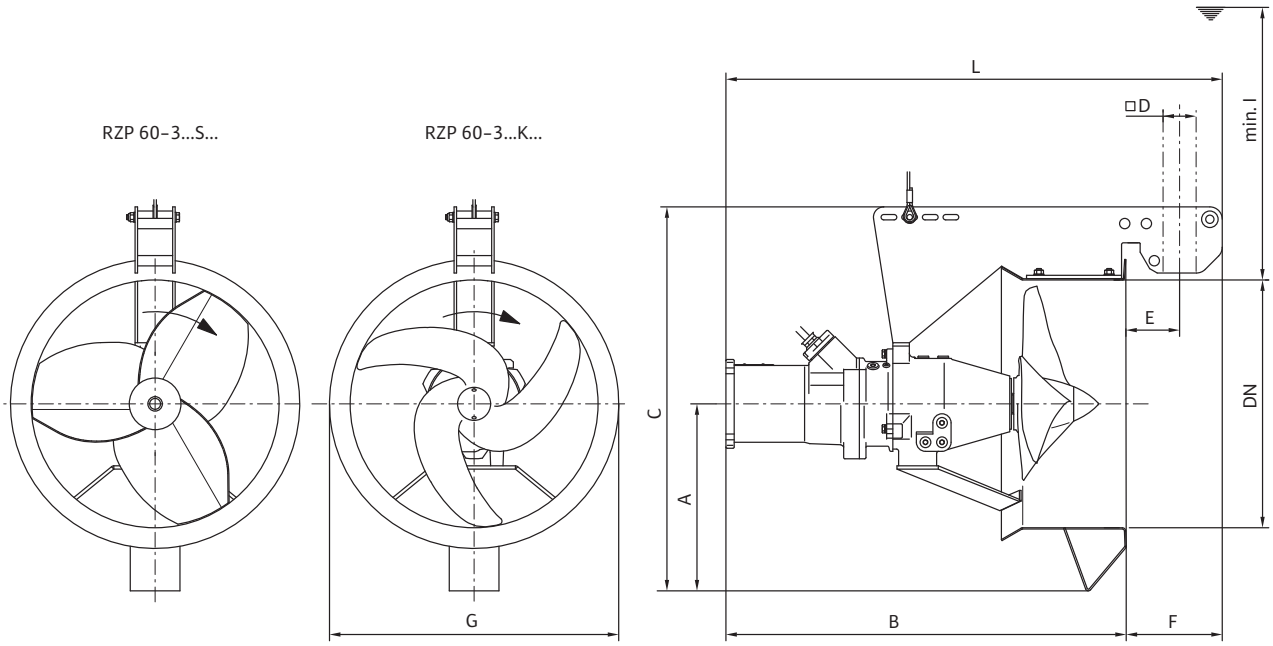
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/16R (Ex)	6.5	8.2	13.5	1400	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 60-3...4/24

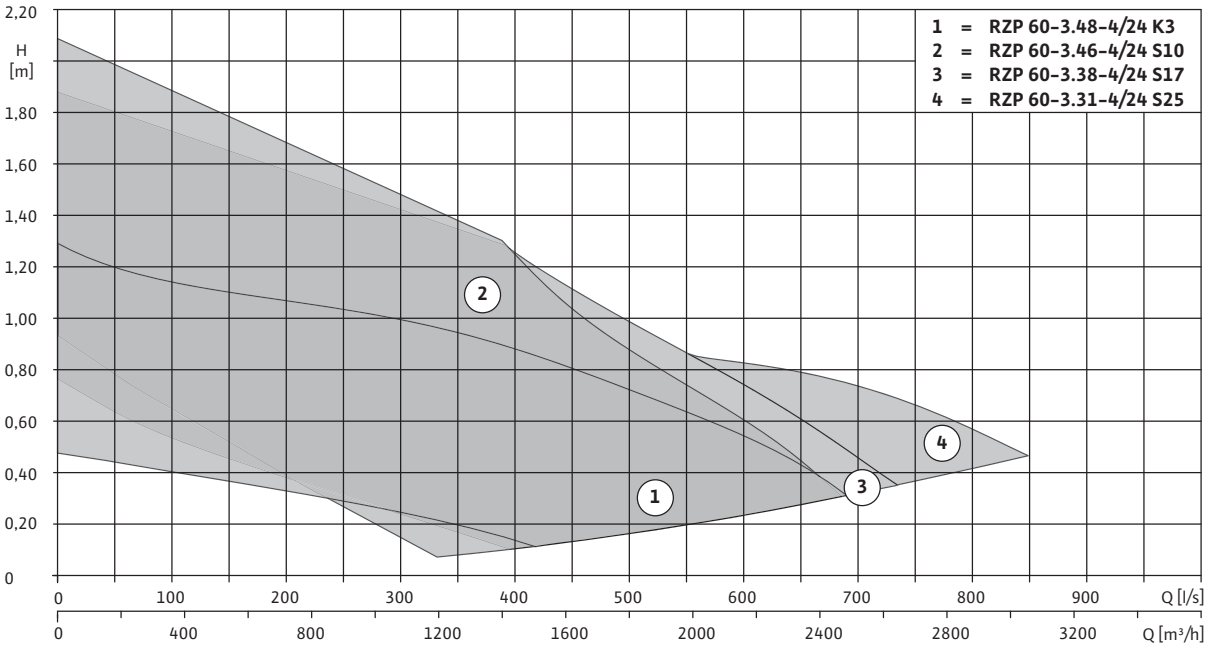
Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 60-3...-.../24 K...	453	1038	930	80	130	232	695	900	1270	600	165
RZP 60-3...-.../24 S...	453	1038	930	80	130	232	695	900	1270	600	176

Technical data, motor data Wilo-EMU RZP 60-3...4/24



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 60-3.31-4/24 S25	310	4.714
RZP 60-3.38-4/24 S17	380	3.880
RZP 60-3.46-4/24 S10	460	3.167
RZP 60-3.48-4/24 K3	480	3.000

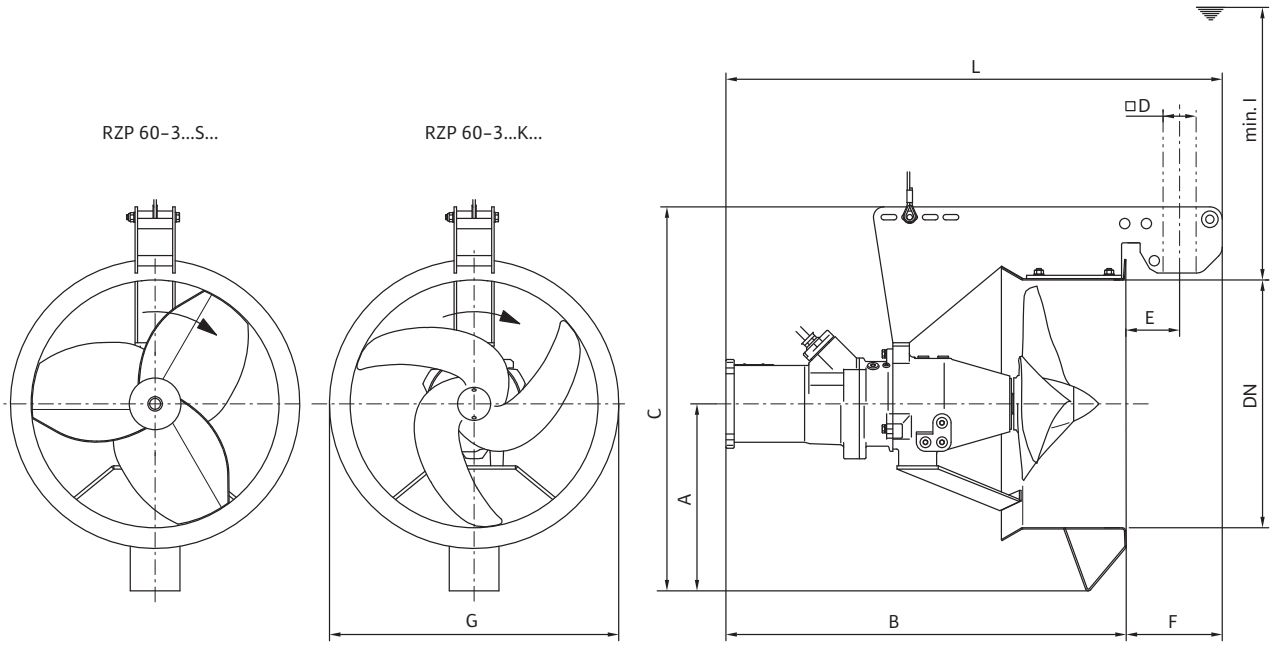
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-4/24R (Ex)	10	12.2	21	1417	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 60-3...2/22

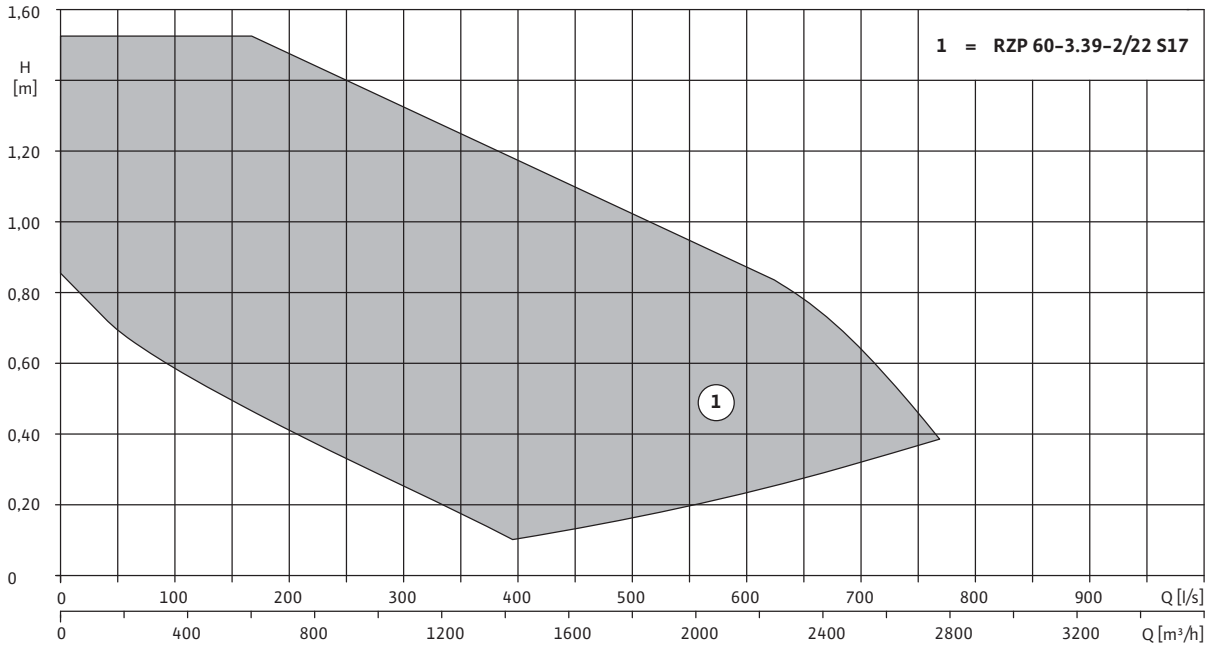
Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 60-3...-.../22 S...	453	1038	930	80	130	232	695	900	1270	600	174

Technical data, motor data Wilo-EMU RZP 60-3...2/22



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 60-3.39-2/22 S17	390	7.500

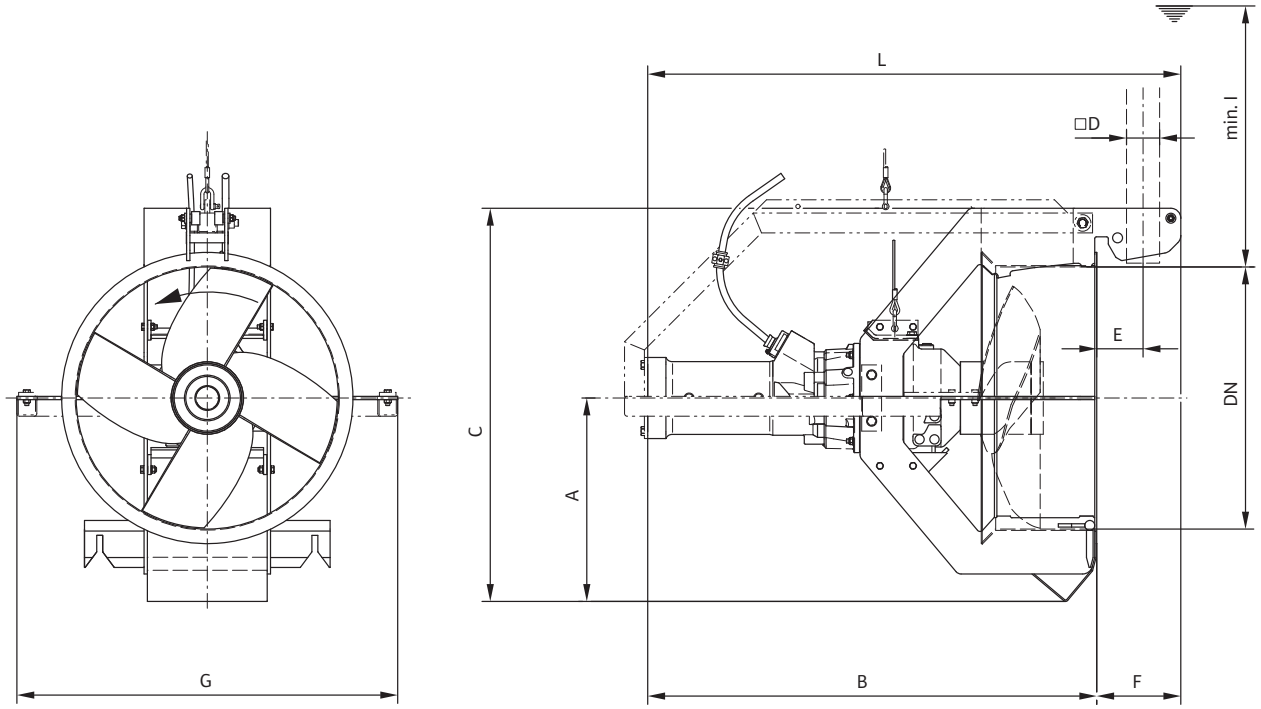
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 17-2/22R (Ex)	10.5	12.3	20.5	2914	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 80-2...6/22

Dimension drawing

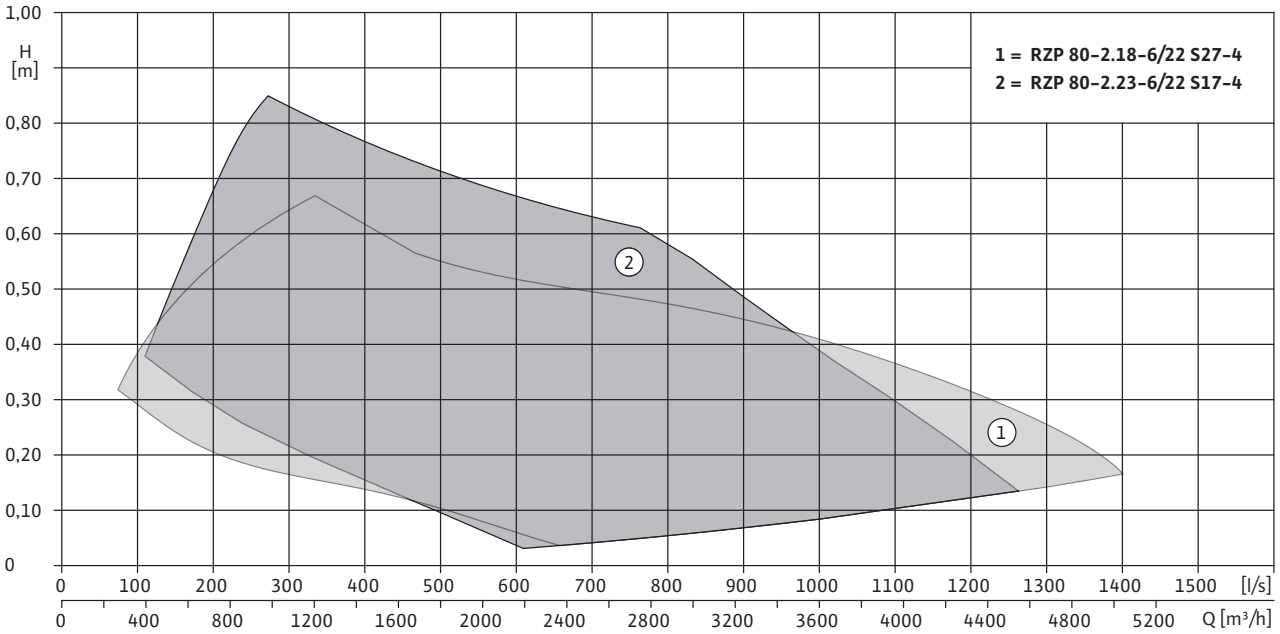


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 80-2...-.../22 S...	615	1307	1188	100	140	254	1150	1400	1560	800	415

Technical data, motor data Wilo-EMU RZP 80-2...6/22

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 80-2.18-6/22 S27-4	180	5.286
RZP 80-2.23-6/22 S17-4	230	4.000

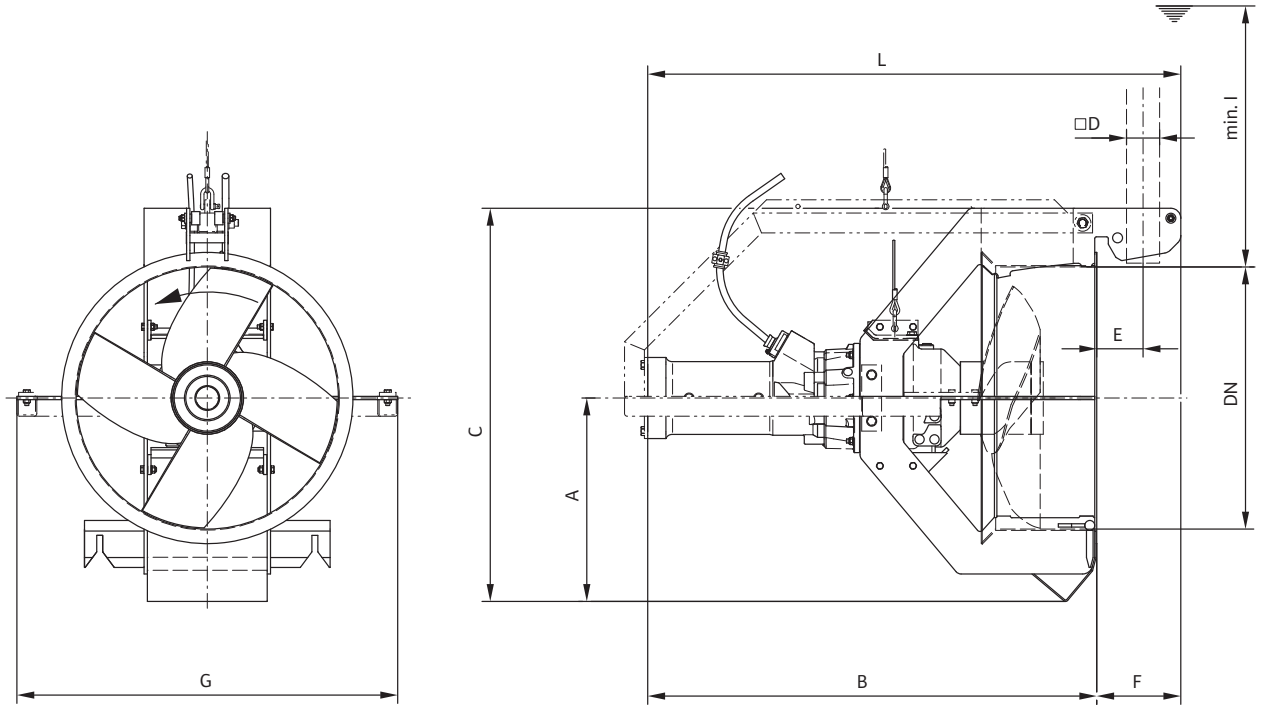
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 20-6/22R (Ex)	9	11.2	19.4	930	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 80-2...4/22

Dimension drawing

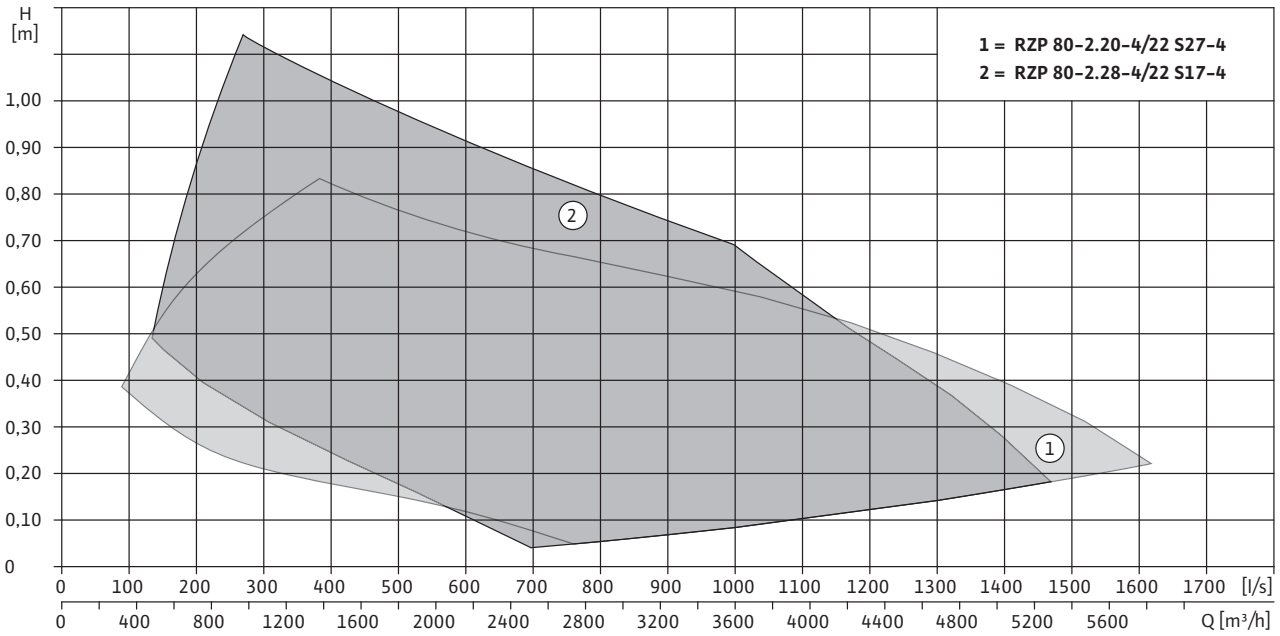


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 80-2...-.../22 S...	615	1307	1188	100	140	254	1150	1400	1560	800	415

Technical data, motor data Wilo-EMU RZP 80-2...4/22

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 80-2.20-4/22 S27-4	200	7.000
RZP 80-2.28-4/22 S17-4	280	5.286

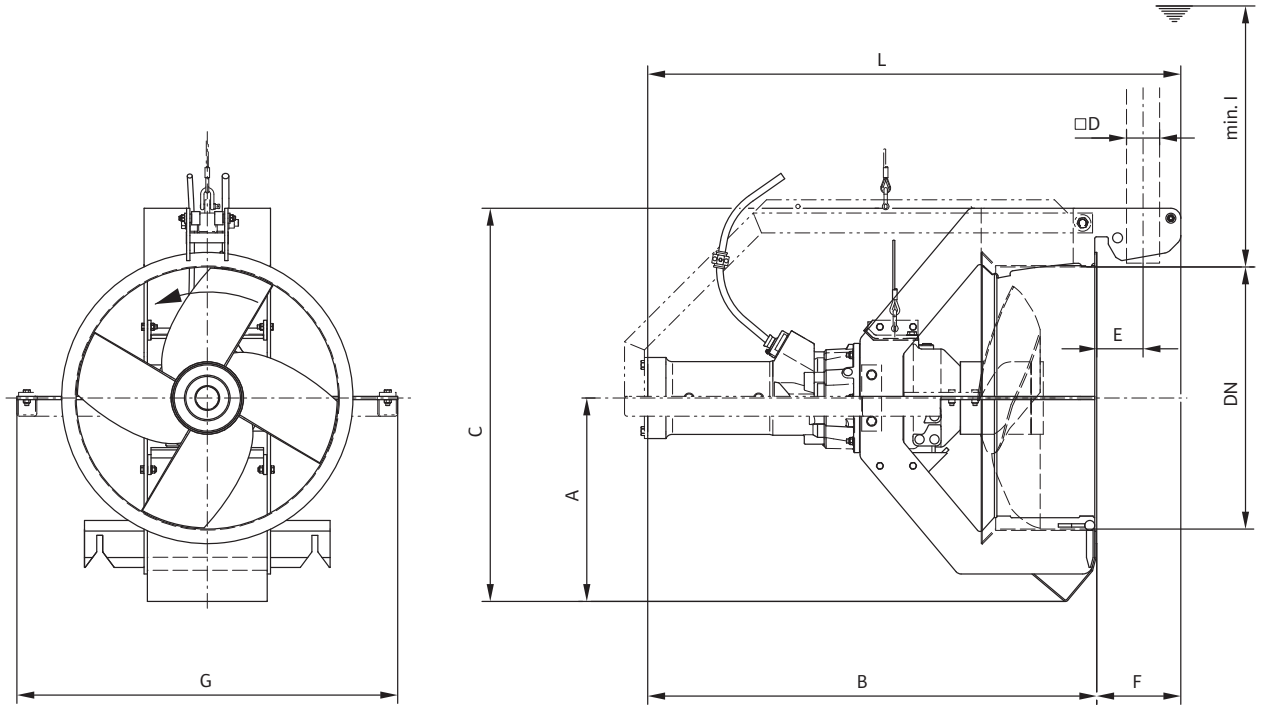
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 20-4/22R (Ex)	12.5	15.3	26	1430	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 80-2...4/27

Dimension drawing

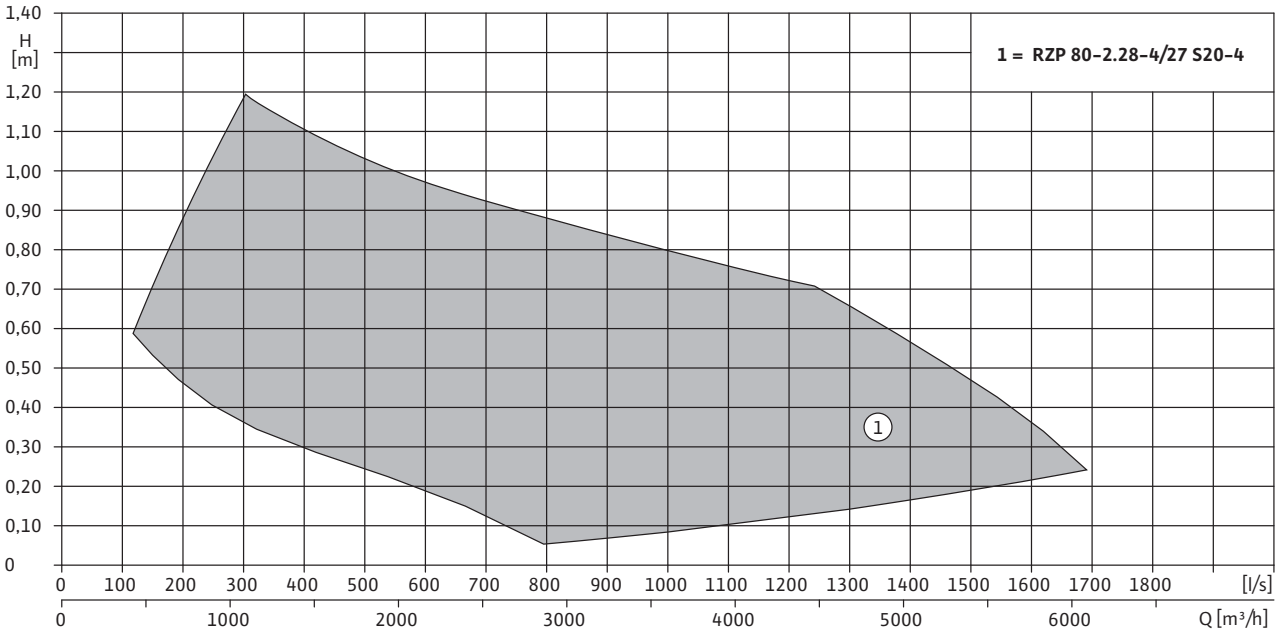


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 80-2...-.../27 S...	615	1357	1188	100	140	254	1150	1400	1610	800	430

Technical data, motor data Wilo-EMU RZP 80-2...4/27

Pump curves



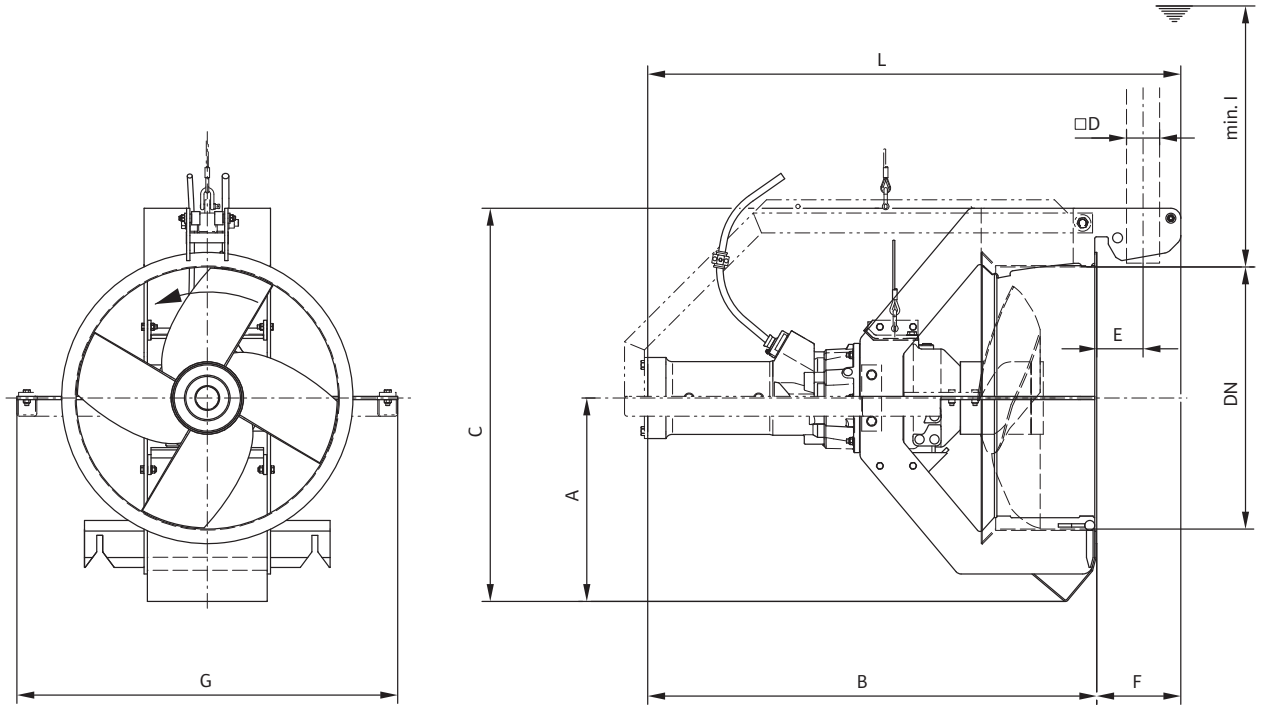
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	**–**
	[rpm]	**–**
RZP 80-2.28-4/27 S20-4	280	5.286

Motor data						
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Nominal speed**	**Ex protection according to**	
	P_2	**P_1**	**I_N**	**n**	**FM**	**ATEX**
	[kW]		**[A]**	**[rpm]**	**–**	
T 20-4/27R (Ex)	16	18.9	32	1430	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

Dimensions, weights Wilo-EMU RZP 80-2...4/30

Dimension drawing

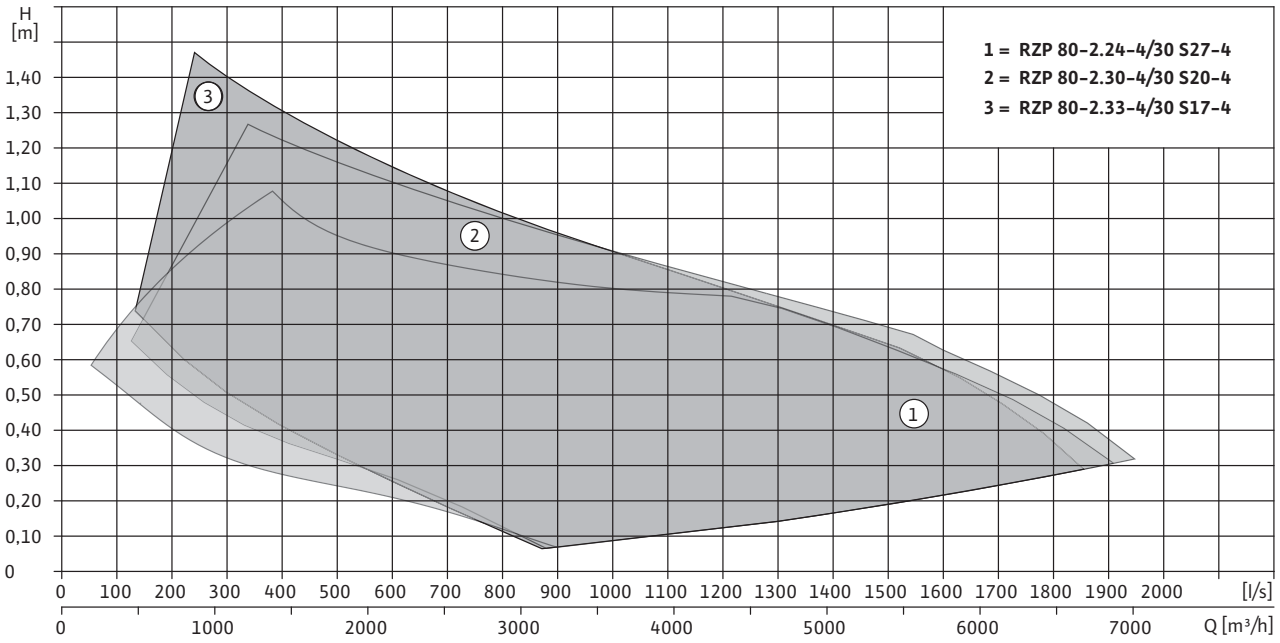


Dimensions, weights

Wilo-EMU...	Dimensions									Nominal flange diameter	Weight
	A	W	C	D	E	F	G	I	L	DN	Unit
	[mm]									–	[kg]
RZP 80-2...-.../30 S...	615	1357	1188	100	140	254	1150	1400	16010	800	435

Technical data, motor data Wilo-EMU RZP 80-2...4/30

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	[rpm]	–
RZP 80-2.24-4/30 S27-4	240	6.000
RZP 80-2.30-4/30 S20-4	300	4.750
RZP 80-2.33-4/30 S17-4	330	4.330

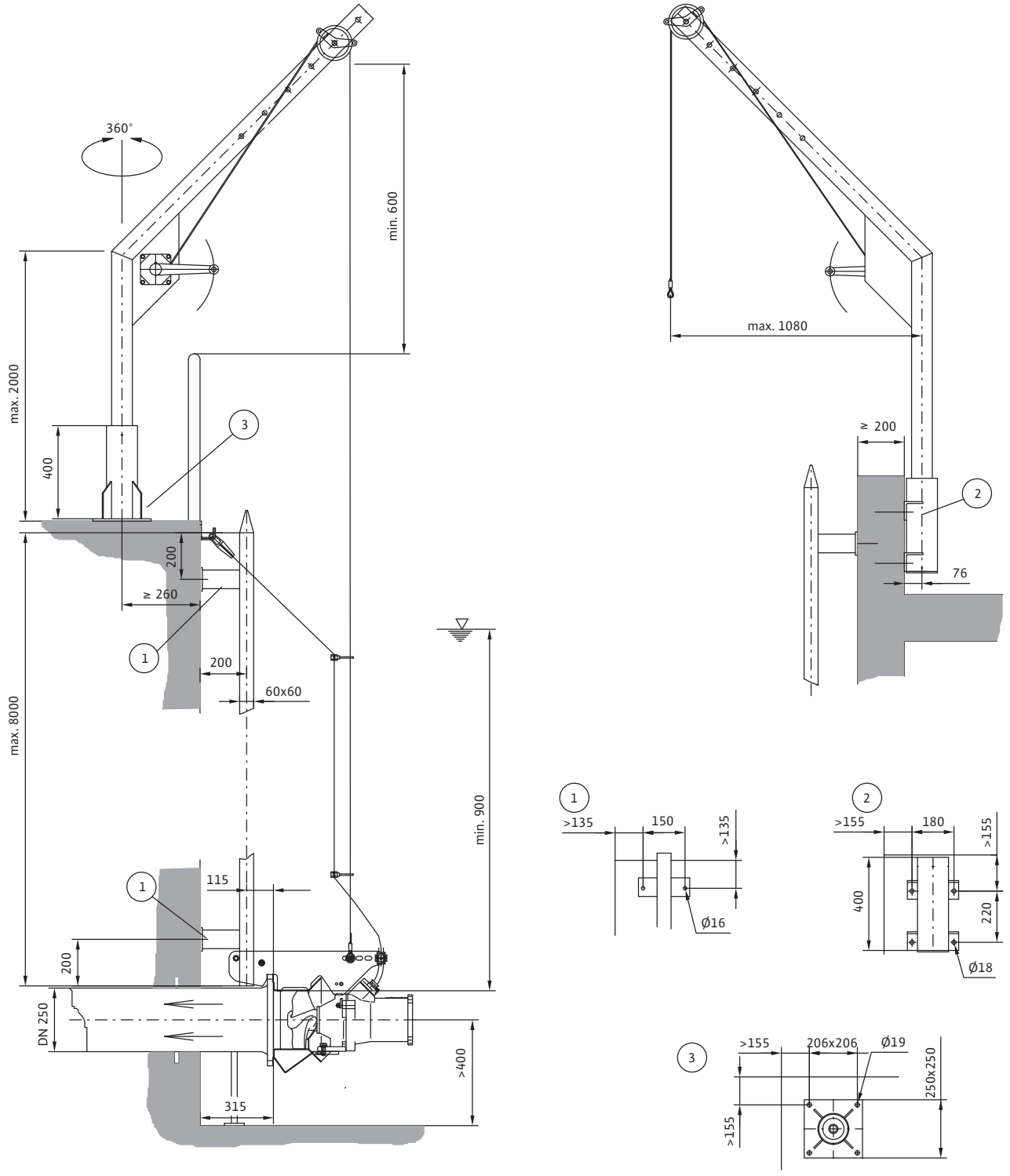
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Nominal speed	Ex protection according to	
	P_2	P_1	I_N	n	FM	ATEX
	[kW]		[A]	[rpm]	–	
T 20-4/30R (Ex)	18.5	22	36.5	1435	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
• = available, – = not available

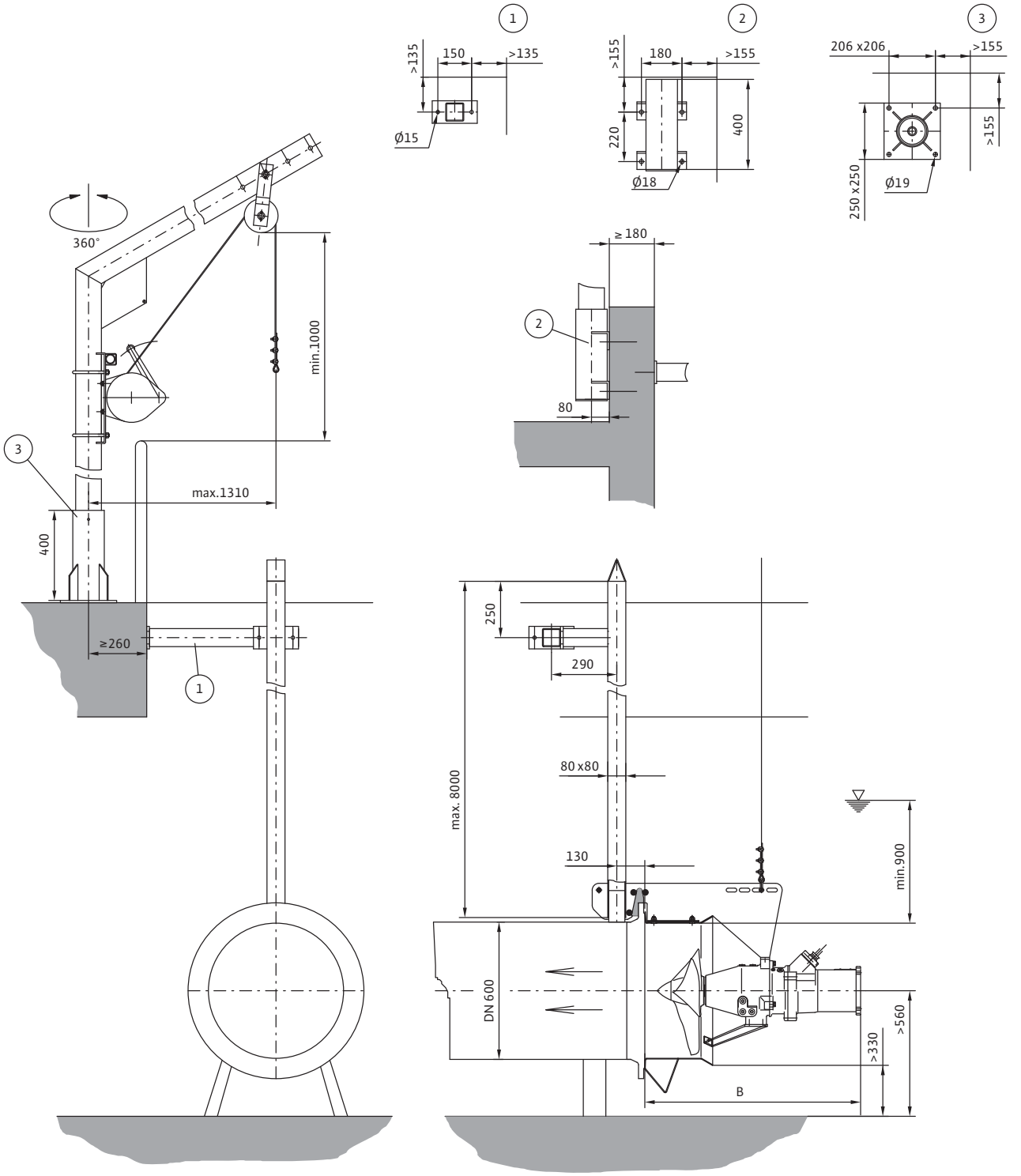
Installation example

Wilo-EMU recirculation pump RZP 25-2 with lowering device AVR



Installation example

Wilo-EMU recirculation pump RZP 60-3 with lowering device AVRZD



Accessories

Submersible mixers

Mechanical accessories

AVU lowering device... for Miniprop and Uniprop submersible mixers

The lowering devices of type AVU... are flexible tripod systems for wall mounting. Due to a ball joint made of plastic, even slight unevenness is smoothed out during installation. The lowering device absorbs the mixing forces which arise and transfer them to the structure. A high resisting torque in the guide tubes, plastic linings in the sliding carriage and large-area rubberised supports for large mixers guarantee high mounting security and long service life.

For optimum mixing results, the mixer can be swivelled horizontally. In connection with auxiliary hoisting gear, the mixer can also be operated at different heights..

The material of the lowering device depends on the sewage constituents, such as the chloride content. Wilo can process and deliver the materials common in water treatment system construction: galvanized steel, A2-steel (1.4301) and A4-steel (1.4571). Standard lengths up to 6 m are available. Custom lengths available on request

Installation is complete without welding work. The lowering device is installed using building-approved anchor bolts directly on the structure. In the case of fixation to steel construction parts, installation is done using rust-proof screwed connections.

AVM lowering device... for Uniprop, Maxiprop and Megaprop submersible mixers

The lowering devices of type AVM... are fixed tripod systems for free installation in basins. With these, mixers can be placed for optimum mixing results. The lowering device absorbs the mixing forces which arise and transfer them to the structure. A high resisting torque in the guidetubes, plastic linings in the sliding carriage and large-area rubberised supports guarantee high mounting security and long service life.

If the lowering device is mounted to a concrete slab, this can be installed later in an already filled basin.

The material of the lowering device depends on the sewage constituents, such as the chloride content.Wilo can process and deliver the materials common in water treatment system construction: galvanized steel, A2-steel (1.4301) and A4-steel (1.4571).Standard lengths up to 6 m are available. Custom lengths available on request

Installation is complete without welding work. The lowering device is installed using building-approved anchor bolts directly on the structure. In the case of fixation to steel construction parts, installation is done using rust-proof screwed connections.

AVR lowering device... for Rezijet recirculation pumps

The lowering devices of type AVR... are fixed tripod systems for wall mounting. Re-circulation pumps can be directly flanged on the discharge pipe using these.. Due to the different variants of the lowering device, installations are also possible on the basin walls.

The material of the lowering device depends on the sewage constituents, such as the chloride content. Wilo can process and deliver the materials common in water treatment system construction: galvanized steel, A2-steel (1.4301) and A4-steel (1.4571). Standard lengths up to 6 m are available. Custom lengths available on request

Installation is complete without welding work. The lowering device is installed using building-approved anchor bolts directly on the structure. In the case of fixation to steel construction parts, installation is done using rust-proof screwed connections.

Mechanical accessories

Auxiliary hoisting gear 125 kg to 350 kg

By using an auxiliary hoisting gear, the submersible mixers or recirculation pumps can be easily installed or hoisted from the basin for maintenance purposes at any point of time. The auxiliary hoisting gear consists of a holding sleeve and the actual auxiliary hoisting gear. This is why one auxiliary hoisting gear can be used for several units. The holding sleeve can be mounted on the ground or laterally on the wall.

For Miniprop and smaller Uniprop submersible mixers, the hoisting gear can be used to operate the unit at different heights.
The auxiliary hoisting gear as well as the holding sleeves are produced in galvanised steel, A2-steel (1.4301) and A4-steel (1.4571) and have a max. bearing capacity of 125 kg, 250 kg, 300 kg or 350 kg. The rope pulley and the sliding elements in the holding sleeve are of sewage-resistant plastic. The hoisting gears can be equipped with a hand winch in aluminium or stainless steel. This is adjustable to any heights from the 250 kg version onwards.

All auxiliary hoisting gears have been tested and certified by the LGA and have the GS quality mark.

Auxiliary hoisting gear Z, ZT1 and ZT2

By using an auxiliary hoisting gear, the submersible mixers or recirculation pumps can be easily installed or hoisted from the basin for maintenance purposes at any point of time. The auxiliary hoisting gear consists of a holding sleeve, a supporting tube and up to three booms (Z, ZT1, ZT2). By using several holding sleeves, auxiliary hoisting gear can be used for several units. The holding sleeve can be mounted on the ground or laterally on the wall.

The auxiliary hoisting gear as well as the holding sleeves are made of A2 steel (1.4301) and have a max. bearing capacity between 500 kg with a jib length of 1.6 m to 250 kg with a jib length of 3.2 m. The rope pulley and the sliding elements in the holding sleeve are of sewage-resistant plastic. The hoisting gears can be equipped with a hand winch in aluminium or stainless steel. This is continuously height-adjustable.

All auxiliary hoisting gears have been tested and certified by the LGA and have the GS quality mark.

Additional cable anchoring

In most cases, the power lines are fastened to the traction cable and are installed upwards

At high flow rates, very strong traction forces act on the traction cable and on the power lines. To relieve both, additional rope anchoring made of polyamide can be used.The traction forces are then absorbed by the polyamide rope.

Furthermore, rope anchoring is recommended when using a catch hook or catch device, since here the traction cable does not remain in the basin.

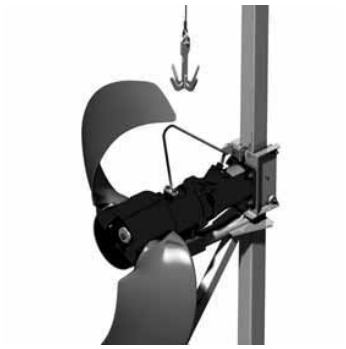
Mechanical accessories

Special fixation components

When using auxiliary hoisting gear for several units, the traction cable must be removed after lowering from the auxiliary hoisting gear.

In order to securely fasten the traction cable, we recommend the use of a rope fixation.This is mounted on the edge of the basin near the holding sleeve.Here, the traction cable can be wound up and fastened with a rope clamp.

Catch hook



When the units are installed, the traction cable usually stays in the fluid. Here, it is subject to considerable traction forces, however, and is therefore subject to a high amount of wear.

When a catch hook is used, the unit can be lowered as usual. Once the unit has been lowered onto the support, the catch hook is released and can be pulled out of the fluid again. This way, the traction cable is not subject to the fluid.

The catch hook is suitable for use in shallow depths up to max. 3 m.

The combination catch hook and auxiliary hoisting gear is especially a good choice when auxiliary hoisting gear is to be used for several units. Then one doesn't have to remove the traction cable from the auxiliary hoisting gear and doesn't require any more equipment for securing the traction cable.

Catch device with guide element

When the units are installed, the traction cable usually stays in the fluid. Here, it is subject to considerable traction forces, however, and is therefore subject to a high amount of wear.

When using the catch device with a guide element, the unit can be lowered as usual.Once the unit has been lowered onto the support, the catch device is released and can be pulled out of the fluid again.This way, the traction cable is not subject to the fluid.

The catch device with guide element is a further development of the normal catch hook.If one has to know exactly where the catch clip is with this one, a guide element is used.This is simply stuck onto the guide tube of the lowering device and lowered on this.Thus, lifting the units is also no problem, since the catch device automatically engages in the catch clip.

The catch device is suitable for use from 2 m depth onwards.

The combination catch device with guide element and auxiliary lifting gear is especially a good choice when auxiliary hoisting gear is to be used for several units.Then one doesn't have to remove the traction cable from the auxiliary hoisting gear and doesn't require any more equipment for securing the traction cable.

Mechanical accessories

Custom-made accessories upon customer request

Since Wilo manufactures its accessories completely in-house, it is possible to accommodate special customer wishes. For example, lowering devices can also be made for depths deeper than 6 m.

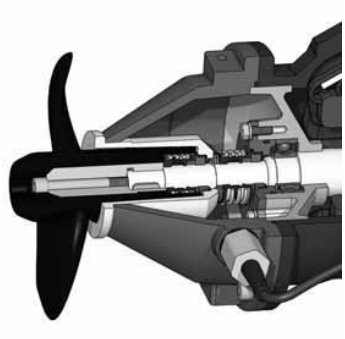
Furthermore, special versions can also be made for special customer requirements. For example, a special lowering device was designed for a water treatment system.. This lowering device had to be fastened to a concrete bridge and the mixers had to be installed while the system was in operation.

For another water treatment system, a mixer was installed in a floating raft. This way, it was possible to optimally position the mixer for different requirements. The raft was stabilized by four ropes.In order to lift the mixer out of the raft for maintenance purposes, a lowering device was also built into the raft..

Wilo has the possibility of accommodating the wishes of its customers with custom-made solutions. That is Pumpen Intelligenz.

Electrical accessories

Leakage monitoring



Leakage which comes in through the mechanical seal on the fluid side, is absorbed by the sealing chamber (Miniprop and Uniprop directly driven) or pre-chamber (Uniprop with gear, Maxiprop and Megaprop). In order to guarantee optimum control, an external sealing chamber electrode can be attached. As soon as a certain amount of water is in the sealing chamber, this can be signalized by a lamp or the unit can be switched off. The external sealing chamber electrode can be retrofitted on all units.

Jet cleaner

Cleaning rainwater basins

In mixed water sewer systems, rain spillway basins are placed upstream of the water treatment system. They serve as buffers between the sewer system and the water treatment system. In the event of a hydraulic overload, these basins take up the surge of water with its high amount of wastewater, temporarily store the rainwater, and after the rainfall dies down, they release the rainwater according to the maximum water treatment system capacity.

The rainwater is particularly severely contaminated after long dry spells. Due to the long emptying times, there are deposits in the basin. After emptying the basin, these deposits must be removed, since otherwise the sedimentation layer will begin to decay, which can result in strongly unpleasant odours.

In order to keep the basin cleaning problem under control, a number of basin cleaning devices have been developed and applied, like mechanical evacuation, rinsing/dumping or jet cleaning devices. The cleaning equipment unit, some of which are very complex, make a considerable improvement, but all have one thing in common: they only are put into action when the basin is already empty.

All of these solutions did not achieve satisfactory cleaning results. The water treatment system personnel still had to clean the basin by hand, which is very time-consuming.

Function of the jet cleaner

Due to the jet cleaner, a type of cleaning has been developed for rain basins which combines several advantages. The jet cleaner is put into operation already during the start of draining the rain spillway basin. It suspends the solids and dirt particles. These leave the basin together with the water.

The Wilo jet cleaner consists of a Wilo submersible sewage pump with injector, air suction pipe and jet pipe. The jet cleaner can be installed in nearly any new basin and can be retrofitted in existing basins.

The Wilo submersible sewage pump sucks the rainwater out of the drain channel and pumps it through the injector nozzle via the jet pipe and back into the basin.

According to the principle of the water jet pump, air is sucked simultaneously via the air suction pipe during this operation. The sucked air is mixed with the rainwater in the jet pipe. The air/water jet is expelled under high pressure and reaches far into the basin. This causes a turbulent flow, which, in turn, prevents solids from depositing.

Advantages of the jet cleaner

Due to the onsite down slope from the basin to the drainage channel of 2–3 %, there is an equivalent return flow during the circulation process. During this process, organic and inorganic substances are stirred up and conveyed to the drainage channel. In addition to the cleaning effect, the water is also enriched with oxygen. This side-effect is significant since the water cannot go foul when it is in the basin for a long period.

That means:

- No odour emission due to escaping gases.
- No contamination of the water treatment system by foul water, which saves energy when cleaning the sewage water.
- Elimination of a hazard of the downstream channels due to hydrogen sulphide.
- Prevention of the development of sewer slime.
- No use of external water for the cleaning process. Rainwater is used.
- The cleaning process already begins when the basin is drained and continues until the basin is drained completely.
- The dirt particles are distributed almost evenly to the out-flowing basin water.
- The water treatment system is not subject to a flow surge.
- The basin walls are washed off by the wash of the waves.
- The rainwater is constantly enriched with oxygen. As a result, there is no formation of hydrogen sulphide and no unpleasant odours.
- Comminution and dissolving of organic coarser solids.
- Low investment and maintenance costs, and longer service life of the equipment.
- Overall reduced operating costs due to efficient operation and fully automatic operating sequence.

Basin design

For using the jet cleaner as a cleaning device, the following design features should be observed when planning a rainwater basin:

Rectangular basin

- The ideal relationship between width and length is 1:2
- The bottom of the basin should be horizontal without any transverse inclination, but designed with a longitudinal inclination of 2–3 % to the drainage channel.
- The volume of the drainage channel is to be adapted to the basin size and should include a useable volume of at least 3 % of the basin area; the drainage channel is for taking the inorganic solids and as a water reservoir for the remaining cleaning of the bottom of the basin. The inclination in the channel should be as steep as possible towards the outlet flap or to the drainage sump (5 %).
- The basin should be drained as quickly as possible. While this is guaranteed during the pumping process, when draining via the outlet flaps it must be ensured that these are installed at a height that is

Jet cleaner

sufficient to prevent them from being blocked by the external water level during draining.
- The basin inlet is to be placed on the side of the outlet channel. If there are minor deposits in the channel from the last cleaning operation, they are rinsed off during the aeration process.
- The jet cleaner is installed on the bottom of the basin directly next to the drainage channel.

Round basin
- In the case of the round basin, the bottom is to have a horizontal design with no lateral inclination and with an inclination of 2–3 % in relation to the basin wall (like a disc) on one side.
- The round basin should also have a rinsing channel.
- The other design features of the rectangular basin are to be applied.

Technical data with design criteria
When selecting the jet cleaner, observe that the energy density should be 30–40 W/m^3 (in relation to 30 % of the basin's volume).

The motors are also available in Ex design. Fastening mechanism and jet pipe are made of hot-dip galvanised steel or stainless steel.

Control and switching systems
The cleaning operation is always automatic. Depending on requirements, the jet cleaner works intermittently or in permanent operation initially. If a defined remaining water level has been reached in the basin, the cleaning process runs in permanent operation until the basin is completely drained.

In the switching system, all switching, control and display units are installed that are required for operation and monitoring of the cleaning equipment. Further basin monitoring and recording equipment can also be installed. The electro-pneumatic level control, electric capacitive control or the echo-sounder control are recommended as jet cleaner controls.

You can find more information on the units used in our C2 catalogue.

Technical data

Wilo-EMU...	Pump	Motor	Circulation capacity (m^3)	Rectangular basin max. (m)	Round basin max. (m)
SR100 D55	FA 10.51E-179	FK 17.1-4/8K Ex	~100	4x8	6
SR100 D65	FA 10.51E-195	FK 17.1-4/12K Ex	~110	5x10	8
SR100 D65	FA 10.82E-215	FK 17.1-4/16K Ex	~145	6x12	10
SR100 D65	FA 10.82E-230	HC 20.1-4/17K Ex	~165	8x16	13
SR100 D70	FA 10.82E-240 FA 10.82E-245	HC 20.1-4/17K Ex	~185	9x18	14
SR100 D70	FA 15.52E-260	HC 20.1-4/22K Ex	~200	10x20	15

Grit collector pumps

A grit chamber is a sedimentation tank for removing course, settleable contaminants from the sewage, such as sand, stones or bits of broken glass. These substances would easily lead to operational malfunctions in the water treatment system (wear, clogging).

Clearing out the grit chamber therefore poses extreme demands in terms of the wear resistance of the pump. Furthermore, solidified sand deposits are to be loosened up and the unit must be frost- and weather-proof.

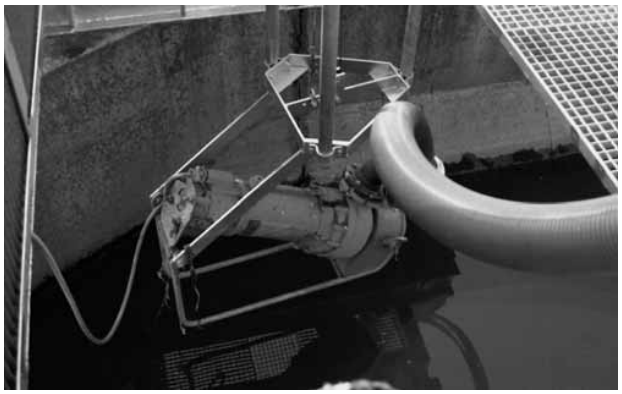
Therefore, sewage pumps are used increasingly in sand-catcher systems. For this area of application, Wilo offers its proven submersible sewage pumps of the type: Wilo-EMU FA...WR. The submersible sewage pumps are submersible and can be directly submerged in the fluid. Thus, suction problems can be avoided and a machine housing is not necessary.

For this application, the Wilo submersible sewage pump is equipped with a vortex impeller and a mechanical stirring device. The stirring device is screwed directly onto the impeller. It consists of a smooth pipe cylinder and a mixer head, which is ground to an s-shape on the front surface.

The sand is thus only stirred up in the area of the pump inlet. Solid deposits are loosened up and can be pumped. Due to the narrowly limited flow zone, the settling of sand is not disturbed. The smooth pipe cylinder can usually flush long fibrous substances away on its own. Since the mixer head is subject to a high amount of wear, it is made of the chilled cast iron material, Abrasite.

The combination of suitable wear-proof materials and coatings ensures long-term and trouble-free operation.

You can find more information on Wilo submersible sewage pumps of the Wilo-EMU FA...WR type in Catalogue C2.



Wilo Catalogue Edition 2009

Heating, air-conditioning, cooling
Circulation pumps
Glandless pumps and accessories, package heat exchanger assembly

Catalogue A1

Heating, air-conditioning, cooling
Glanded pumps
Pumps with in-line design and accessories

Catalogue A2

Heating, air-conditioning, cooling, water supply
Monobloc and norm pumps, axial split case pumps
Pumps and accessories

Catalogue A3

Water supply
Domestic water supply, rainwater utilisation
Pumps, systems and accessories

Catalogue B1

Water supply
Borehole pumps, 3" to 24"
Pumps and systems for building services, domestic, municipal and industrial water supply

EMU Technologie

Catalogue B2

Water supply
High-pressure multistage centrifugal pumps
Pumps and accessories

Catalogue B3

Water supply
Pressure boosting systems
Single-pump and multi-pump systems in dry well installations

Catalogue B4

Water supply
Sprinkler pumps with VdS approval
Borehole pumps and accessories

EMU Technologie

Catalogue B5

Drainage and sewage
Drainage pumps
Submersible pumps, self-priming pumps and accessories

EMU Technologie

Catalogue C1

Drainage and sewage
Sewage pumps, DN 32 to DN 600
Submersible pumps and accessories for building services, municipal and industrial applications

EMU Technologie

Catalogue C2

Drainage and sewage
Wastewater and sewage lifting units, pumps stations
Pump systems and accessories

Catalogue C3

Drainage and sewage
Submersible mixers
Mixers, re-circulation pumps, jet cleaners, grit collector pumps and accessories for municipal application in water treatment systems

EMU Technologie

Catalogue C4

Heating, air-conditioning, cooling

Water supply

Drainage and sewage

WILO

Pumpen Intelligenz.

WILO SE
Nortkirchenstraße 100
44263 Dortmund
Germany
T +49 231 4102-0
F +49 231 4102-7363
wilo@wilo.com
www.wilo.com

Wilo – International (Subsidiaries)

Argentina
WILO SALMSON
Argentina S.A.
C1295ABI Ciudad
Autónoma de Buenos Aires
T+ 54 11 4361 5929
info@salmson.com.ar

Austria
WILO Pumpen
Österreich GmbH
1230 Wien
T +43 507 507-0
office@wilo.at

Azerbaijan
WILO Caspian LLC
1065 Baku
T +994 12 5962372
info@wilo.az

Belarus
WILO Bel OOO
220035 Minsk
T +375 17 2503393
wilobel@wilo.by

Belgium
WILO SA/NV
1083 Ganshoren
T +32 2 4823333
info@wilo.be

Bulgaria
WILO Bulgaria Ltd.
1125 Sofia
T +359 2 9701970
info@wilo.bg

Canada
WILO Canada Inc.
Calgary, Alberta T2A 5L4
T +1 403 2769456
bill.lowe@wilo-na.com

China
WILO China Ltd.
101300 Beijing
T +86 10 80493900
wilobj@wilo.com.cn

Croatia
WILO Hrvatska d.o.o.
10090 Zagreb
T +38 51 3430914
wilo-hrvatska@wilo.hr

Czech Republic
WILO Praha s.r.o.
25101 Cestlice
T +420 234 098711
info@wilo.cz

Denmark
WILO Danmark A/S
2690 Karlslunde
T +45 70 253312
wilo@wilo.dk

Estonia
WILO Eesti OÜ
12618 Tallinn
T +372 6509780
info@wilo.ee

Finland
WILO Finland OY
02330 Espoo
T +358 207401540
wilo@wilo.fi

France
WILO S.A.S.
78390 Bois d'Arcy
T +33 1 30050930
info@wilo.fr

Great Britain
WILO (U.K.) Ltd.
DE14 2WJ Burton-
Upon-Trent
T +44 1283 523000
sales@wilo.co.uk

Greece
WILO Hellas AG
14569 Anixi (Attika)
T +302 10 6248300
wilo.info@wilo.gr

Hungary
WILO Magyarország Kft
2045 Törökbálint
(Budapest)
T +36 23 889500
wilo@wilo.hu

Ireland
WILO Engineering Ltd.
Limerick
T +353 61 227566
sales@wilo.ie

Italy
WILO Italia s.r.l.
20068 Peschiera
Borromeo (Milano)
T +39 25538351
wilo.italia@wilo.it

Kazakhstan
WILO Central Asia
050002 Almaty
T +7 727 2785961
in.pak@wilo.kz

Korea
WILO Pumps Ltd.
621-807 Gimhae
Gyeongnam
T +82 55 3405800
wilo@wilo.co.kr

Latvia
WILO Baltic SIA
1019 Riga
T +371 67 145229
mail@wilo.lv

Lebanon
WILO SALMSON
Lebanon
12022030 El Metn
T +961 4 722280
wsl@cyberia.net.lb

Lithuania
WILO Lietuva UAB
03202 Vilnius
T +370 5 2136495
mail@wilo.lt

The Netherlands
WILO Nederland b.v.
1551 NA Westzaan
T +31 88 9456 000
info@wilo.nl

Norway
WILO Norge AS
0975 Oslo
T +47 22 804570
wilo@wilo.no

Poland
WILO Polska Sp. z.o.o.
05-090 Raszyn
T +48 22 7026161
wilo@wilo.pl

Portugal
Bombas Wilo-Salmson
Portugal Lda.
4050-040 Porto
T +351 22 2080350
bombas@wilo.pt

Romania
WILO Romania s.r.l.
077040 Com. Chiajna
Jud. Ilfov
T +40 21 3170164
wilo@wilo.ro

Russia
WILO Rus ooo
123592 Moscow
T +7 495 7810690
wilo@orc.ru

Saudi Arabia
WILO ME – Riyadh
Riyadh 11465
T +966 1 4624430
wshoula@wataniaind.com

Serbia and Montenegro
WILO Beograd d.o.o.
11000 Beograd
T +381 11 2851278
office@wilo.co.yu

Slovakia
WILO Slovakia s.r.o.
82008 Bratislava 28
T +421 2 45520122
wilo@wilo.sk

Slovenia
WILO Adriatic d.o.o.
1000 Ljubljana
T +386 1 5838130
wilo.adriatic@wilo.si

South Africa
Salmson South Africa
1610 Edenvale
T +27 11 6082780
errol.cornelius@
salmson.co.za

Spain
WILO Ibérica S.A.
28806 Alcalá de Henares
(Madrid)
T +34 91 8797100
wilo.iberica@wilo.es

Sweden
WILO Sverige AB
35246 Växjö
T +46 470 727600
wilo@wilo.se

Switzerland
EMB Pumpen AG
4310 Rheinfelden
T +41 61 83680-20
info@emb-pumpen.ch

Taiwan
WILO-EMU Taiwan Co. Ltd.
110 Taipeh
T +886 227 391655
nelson.wu@
wiloemutaiwan.com.tw

Turkey
WILO Pompa Sistemleri
San. ve Tic. A.Ş.
34530 Istanbul
T +90 216 6610211
wilo@wilo.com.tr

Ukraina
WILO Ukraina t.o.w.
01033 Kiew
T +38 044 2011870
wilo@wilo.ua

Vietnam
Pompes Salmson Vietnam
Ho Chi Minh-Ville Vietnam
T +84 8 8109975
nkm@salmson.com.vn

United Arab Emirates
WILO ME – Dubai
Dubai
T +971 4 3453633
info@wilo.com.sa

USA
WILO-EMU USA LLC
Thomasville,
Georgia 31792
T +1 229 5840097
info@wilo-emu.com

USA
WILO USA LLC
Melrose Park, Illinois 60160
T +1 708 3389456
mike.easterley@
wilo-na.com

Wilo – International (Representation offices)

Algeria
Bad Ezzouar, Dar El Beida
T +213 21 247979
chabane.hamdad@salmson.fr

Armenia
375001 Yerevan
T +374 10 544336
info@wilo.am

Bosnia and Herzegovina
71000 Sarajevo
T +387 33 714510
zeljko.cvjetkovic@wilo.ba

Georgia
0179 Tbilisi
T +995 32 306375
info@wilo.ge

Macedonia
1000 Skopje
T +389 2 3122058
valerij.vojneski@wilo.com.mk

Mexico
07300 Mexico
T +52 55 55863209
roberto.valenzuela@wilo.com.mx

Moldova
2012 Chisinau
T +373 2 223501
sergiu.zagurean@wilo.md

Rep. Mongolia
Ulaanbaatar
T +976 11 314843
wilo@magicnet.mn

Tajikistan
734025 Dushanbe
T +992 37 2232908
farhod.rahimov@wilo.tj

Turkmenistan
744000 Ashgabad
T +993 12 345838
wilo@wilo-tm.info

Uzbekistan
100015 Tashkent
T +998 71 1206774
info@wilo.uz

March 2009

2101005/2T/0809/MP