ATAC Solutions Ltd is a leading environmental engineering company based in Maidstone, United Kingdom.

ATAC Solutions is known for its state-of-the-art liquid collection fleet and its expertise in providing bespoke turnkey wastewater process solutions.

With a focus on sustainability and accreditation in ISO 9001 & ISO 14001, the company serves domestic and industrial clients across the South-East and London.

ATAC Solutions Ltd,
Unit A9, Loc 8 Business Park, Ashford Road,
Hollingbourne, Maidstone, England, ME17 1WR

atacsolutions.com
01622 882400

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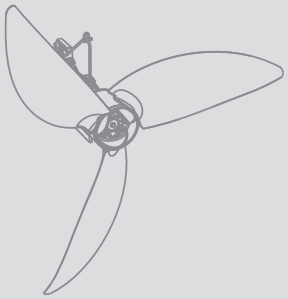
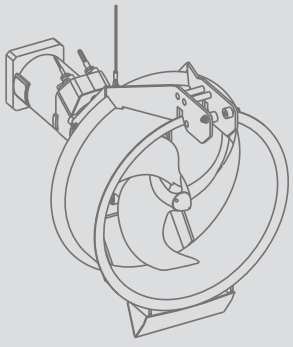
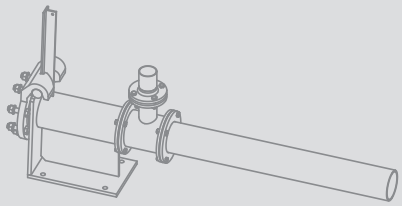
Catalogue Water Management

Drainage and Sewage – Waste Water Treatment

Submersible mixers, axial pumps,
recirculation pumps, jet cleaners,
grit collector pumps and accessories







Edition 2012 – 50 Hz

Programme overview and fields of applications

Catalogue	Water Supply
Water Supply / Heating, Air-conditioning, Cooling	Glanded in-line pumps
	Glanded monobloc pumps
	Glanded norm pumps
	Axially split case pumps
	Condensate lifting units
	High-pressure multistage centrifugal pumps
	Pumps for fire extinguishing and sprinkler systems
Boosting	Single-pump systems
	Multi-pump systems
Raw Water Intake	Submersible pumps
	Polder pumps (Bottom intake pumps)
	Vertical turbine pumps

Catalogue	Drainage and Sewage
Waste Water Collection and Transport	Sewage lifting unit
	Pumps stations
	Submersible sewage pumps with macerator
	Solids separation systems (EMUport)
Waste Water Transport and Dewatering (Stock pumps)	Submersible drainage pumps
	Self-priming drainage pumps
	Submersible sewage pumps
Waste Water Transport and Dewatering (Order-specific production)	Submersible sewage pumps
	Axial submersible pumps (pipe sump pumps)
Waste Water Treatment	Submersible mixer
	Recirculation pumps
	Axial submersible pumps (pipe sump pumps)
	Jet cleaner

Three other catalogues are available for building services applications.

Key:

- Applicable
- – Not applicable

[1]) Local prescriptions and directives must be observed

Fields of application:

- Heating
- Secondary hot water
- Cooling
- Air-conditioning
- Rainwater utilisation
- Water distribution/boosting
- Fire fighting[1])
- Clean water treatment

Programme overview and fields of applications

Main field of application

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Fields of application:

- Raw water intake
- Desalination
- Professional irrigation/agriculture
- Energy/Leisure/Service Special applications
- Wastewater collection and transport
- Wastewater treatment
- Dewatering (incl. Flood Control)
- Industrial process

Deviations of 70 micrometres are barely visible to the naked eye – the so-called hair's breadth. In terms of true quality, this is still too much tolerance. Our quality assurance therefore relies on state-of-the-art measuring methods and extensive test procedures because an endurance test that runs continually for 2,000 hours will expose even the smallest of weaknesses. A product must pass our tests with flying colours before it is approved for distribution to our customers. **For more information regarding quality go to www.wilo.com**

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Contents

Drainage and Sewage – Waste Water Treatment

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Waste water treatment

Dewatering

Drainage and Sewage – Waste Water Treatment

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Dewatering

Waste water transport

Mechanical accessories

Electrical accessories

General notes and abbreviations

Abbreviation	Meaning
1~	1-phase current
3~	3-phase current
-A	Float switch attached
D	Direct activation
DI	Leakage detection
Di	Inside diameter
Di min.	Minimum inside diameter
DM	Three-phase motor, 3~
DN	Nominal diameter of the flange connection
EBM	Individual run signal
EM	Single-phase motor, 1~
ESM	Individual fault signal
GRD/GLRD	Mechanical seal
F	Thrust in newtons (N) (for submersible mixers)
H, Hman	Delivery head
H_A	Suction head; inlet floor to ground level
H_B	Installation depth to inlet floor
H_N	Site altitude above MSL (mean sea level)
H_G	Groundwater level to MSL (mean sea level)
I_A	Starting current
I_N	Nominal current; current at P_2
Inst.	Installation: H = horizontal, V = vertical
P_1	Power consumption (power supplied from the network)
$P_{1.1}$	Power consumption at the duty point
P_2 (P_N)	Nominal 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 value 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 through additional tripping unit)
Y/Δ	Star-delta switching
▲	Operating mode of double pumps: Individual operation of the respective duty 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	Meaning	AISI
1.0570	Steel S355J2G3	A106
1.4021	Chromium steel X20Cr13	420
1.4057	Chromium steel X17CrNi16-2	431
1.4112	Chromium steel X90CrMoV18	440B
1.4122	Chromium steel X39CrMo17-1	
1.4301	Chromium-nickel steel X5CrNi18-10	304
1.4305	Chromium-nickel steel X8CrNiS18-9	303
1.4306	Chromium-nickel steel X2CrNi19-11	304L
1.4308	Chromium-nickel steel GX5CrNi19-10	304 CF8
1.4401	Chromium-nickel-molybdenum steel X5CrNiMo17-12-2	316
1.4404	Chromium-nickel-molybdenum steel X2CrNiMo17-12-2	316L
1.4408	Chromium-nickel-molybdenum steel GX5CrNiMo19-11-2	316
1.4460	Chromium-nickel-molybdenum steel X3CrNiMo 27-5-2	329
1.4462	Chromium-nickel-molybdenum steel X2CrNiMoN22-5-3	329 (2205)
1.4470	Chromium-nickel-molybdenum steel GX2CrNiMoN22-5-3	329
1.4517	Chromium-nickel-molybdenum steel with copper addition GX2CrNiMoCuN25-6-3-3	329
1.4528	Blade steel X105CrCoMo182	440B+ Co
1.4541	Chromium-nickel steel with titanium addition X6CrNiTi18-10	321
1.4542	Chromium-nickel steel with copper and niobium additions X5CrNiCuNb16-4	630
1.4571	Chromium-nickel steel with titanium addition X6CrNiMoTi17-12-2	316Ti
1.4581	Chromium-nickel-molybdenum steel with niobium addition GX5CrNiMoNb19-11-2	316 / 316Nb
Abrasite	Chilled cast iron material for use in strongly abrasive fluids	
Al	Light metal material (aluminium)	
Al-oxide	Aluminium oxide	
C	Carbon	
Ceram	Coating with very high adhesive strength for long-lasting corrosion protection	
Composite	High-strength plastic material	
Cr	Chromium	
EN-GJL	Cast iron with lamellar graphite, also referred to as grey cast iron. The use of grey cast iron in domestic water systems is governed by the Drinking Water Directive 98/83/EC and applicable recognised technical rules and standards!	
EN-GJL 200	Grey cast iron GG20	
EN-GJL 250	Grey cast iron GG25	

Material	Meaning	AISI
EN-GJS	Cast iron with spheroidal graphite, also referred to as spheroidal cast iron. The use of spheroidal cast iron in domestic water systems is governed by the Drinking Water Directive 98/83/EC and applicable recognised technical rules and standards!	
EN-GJS-500-7	Spheroidal cast iron GGG50	
G-Al Si12	Die-cast aluminium	
GfK	Fibreglass plastic	
GG	See EN-GJL	
GGG	See EN-GJS	
Inox	Stainless steel	
ABS	Acrylic butadiene styrene	
PA 30GF	See Composite	
PE-HD	High-density polyethylene	
PP-GF30	Polypropylene, reinforced with 30% fibreglass	
PUR	Polyurethane	
SiC	Silicon carbide	
St	Steel	
St.vz.	Galvanised steel	
V2A	Material group, e.g. 1.4301, 1.4306	304
V4A	Material group, e.g. 1.4404, 1.4571	316

Wear and tear

Pumps or parts of pumps are subject to wear in accordance with the state-of-the-art (DIN 31051/DIN-EN 13306). This wear may vary depending on operating parameters (temperature, pressure, speed, water conditions) and the installation/usage situation and may result in the malfunction or failure at different times of the aforementioned products/components, including their electrical/electronic circuitry. Wearing parts are all components subject to rotary or dynamic stress, including electronic components under tension, in particular:

- Seals (including mechanical seals), seal rings
- Stuffing box
- Bearings and shafts
- Impellers and pump components
- Wear rings and counter rings
- Stationary wear rings/wear plates
- Macerator
- Capacitor
- Relays/contactors/switches
- Electronic circuits, semiconductor components, etc.

Pumps and continuous-flow machines (like submersible mixers and recirculation pumps), as well as their coated components (cataphoretic, 2K or Ceram coating) are subject to constant wear due to the abrasive fluid contents. For this reason the coating is also counted as a wearing part of these units!

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

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

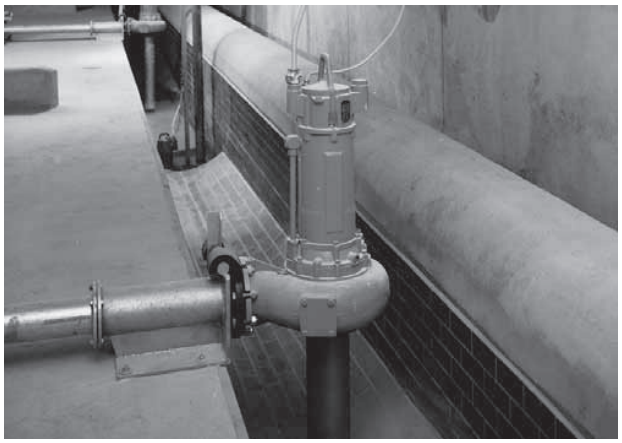
A water treatment system is for cleaning sewage, which has been collected from the sewer system and fed to it.

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.

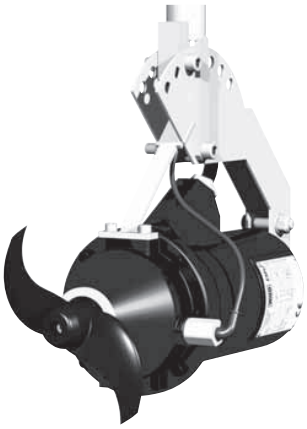
System components
Rain relief
When feeding sewage to the water treatment system, two sewer systems are to be distinguished, the mixing system and the separating system.

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).

Structure of a water treatment system

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 this. These are Wilo-EMU FA pumps with mechanical stirring apparatus (Wilo-EMU FA...WR). 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.

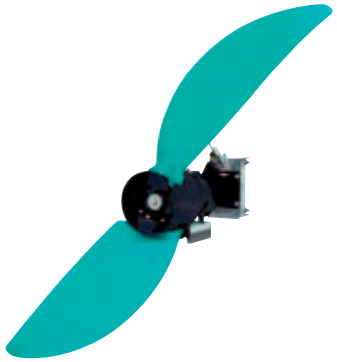
As an example, the activated sludge method is described below. The majority of municipal water treatment systems in central Europe are operated according to this method.

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).

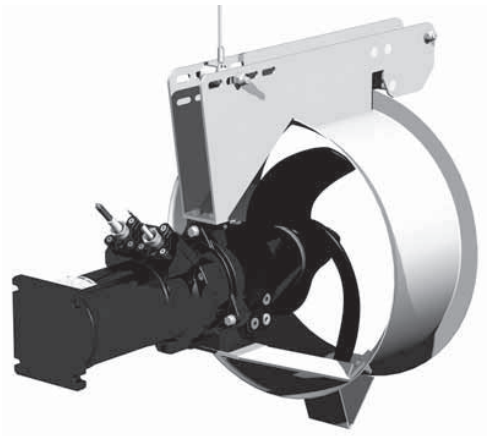


Structure of a water treatment system

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.



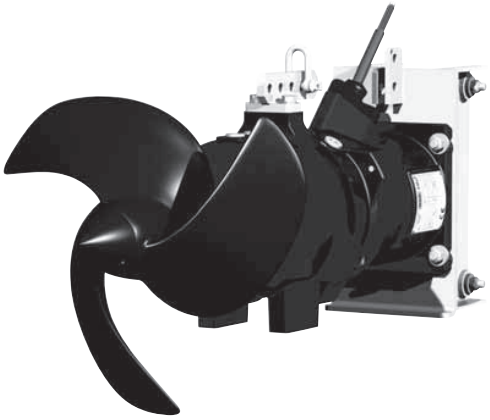
The activated sludge must have good settling properties. If this isn't the case, for example due to massive growth of filamentary microorganisms, the activated sludge drifts out of the secondary clarifier into the following body of water. This phenomenon is called bulking and floating sludge and contaminates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

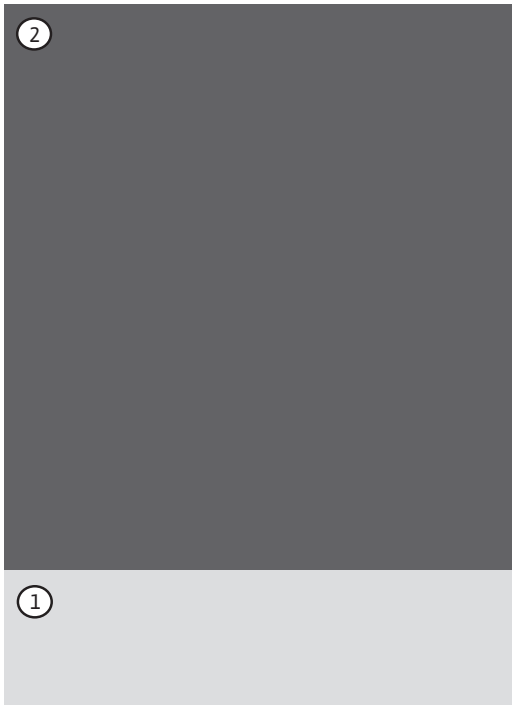
Ceram coatings are available in four different quality levels. These are distinguished in terms of their resistance to abrasive corrosion. While corrosion resistance is very good for all four quality levels, resistance to abrasion increases the higher the ordinal number (C0 = low protection from abrasion; C3 = very good protection from abrasion) of the coating, since coarser aluminium 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 4th coating: 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 more and more economically, the proportion of contaminants is increasing relative to the amount of water. This means that the concentration of corrosive and abrasive constituents is higher.

Sewage units are always 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 the hydraulic efficiency. This results in the units having an increased current consumption. 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. The amortisation is then usually quickly reached due to the higher efficiency.

ceram protected

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 and 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
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 made up of two parts 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
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 composite 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 made up of two parts 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	3.3 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
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 composite 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 made up of two parts 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
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 environments. For this, they are certified in accordance with various standards.

- The European ATEX standard
- The American FM standard

ATEX standard

The units are designed according to “EC 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 environments which require electrical devices of device group II, category 2.

Therefore, they may be used in zone 1 and zone 2. These units may not be used in zone 0.

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

II	Device group II Meaning: intended for potentially explosive locations except for mines
2	Category
G	Substance group Meaning: gases
Ex	Ex-protected device in acc. with European standard
d	Motor housing ignition protection class Meaning: pressure-resistant encapsulation
IIB	Explosion group Meaning: for use together with gases of subdivision B, all gases except for H_2, C_2H_2, CS_2
T4	Temperature class Meaning: max. device surface temperature is 135 °C

FM standard

The units are certified and approved by the recognized testing and licensing authority “FM Approvals” according to standards FM 3600, 3615, 3615.80 and ANSI/UL-1004. They may be operated in potentially explosive areas which require electrical devices of protection class “Explosion-proof, Class 1, Division 1”. Therefore, operation in areas with the required protection class “Explosion-proof, Class 1, Division 2” according to the FM standard is also possible.

The Wilo units are designated as follows:

Class 1	Division 1; Groups C, D Meaning: gases, vapours, mists; Ex-atmosphere continuously or occasionally present under normal conditions; gas groups: ethylene (C), propane (D)
Class 2	Division 1; Groups E, F, G Meaning: dusts; Ex-atmosphere continuously or occasionally present under normal conditions; Dust groups: Metal (E), carbon (F), grains (G)
Class 3	Meaning: fibres and lint
T3C	Temperature class Meaning: max. machine surface temperature 160 °C

Temperature monitors

Ex-certified motors come standard-equipped with temperature monitors. Specifically:

- Motors of sizes T 12 and T 13
  Winding: temperature limiter 140 °C
- Motors of size T 17 and bigger
  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 and FKT 27.2
  Winding: temperature limiter 160 °C, sheet metal package: temperature limiter 110 °C

The temperature monitor is to be connected so that automatic reactivation is possible after the “temperature controller” is triggered. When the “temperature limiter” is triggered, reactivation must only be possible when the “unlock key” has been actuated by hand.

Frequency converter operation

For operation on a frequency converter, motors must be equipped with PTC thermistor temperature sensors. When ordering, let us know this purpose of use so that we can equip the motors accordingly.

Sealing chamber control

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

Ex-zone definitions

The Ex-zones are clearly defined in the respective standards. Marking the zones in the operating area of the units must be done by the operator. When ordering, indicate which Ex standard you are using and in which zone you would like to operate the unit.

Jet cleaners

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 in accordance with 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.

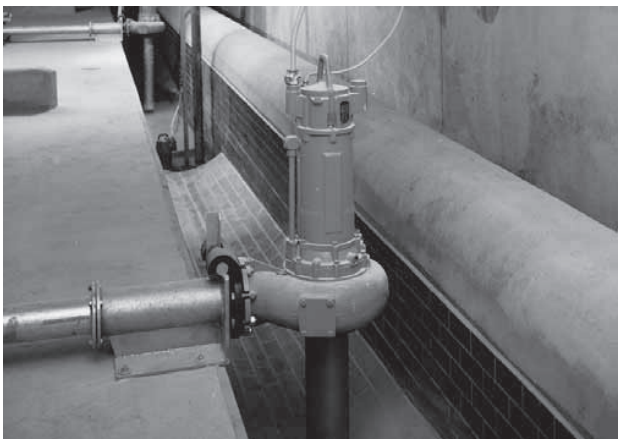
In order to keep the basin cleaning problem under control, a number of basin cleaning devices have been developed and applied, like mechanical evacuation, rinsing/dumping or jet cleaning devices. The cleaning equipment, some of which is very complex, make a considerable improvement, but all have one 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 was very time-consuming.

Function of the jet cleaner

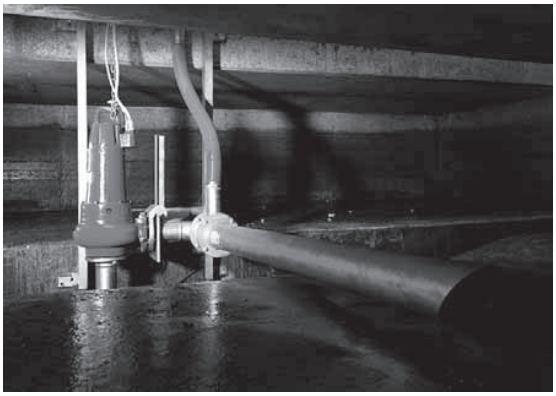
Due to the jet cleaner, a type of cleaning has been developed for rain basins which brings together a number of advantages. The jet cleaner is put into operation already during the start of draining the rain spillway basin. It suspends the solids and dirt particles. These leave the basin together with 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 exiting air/water drive jet is under high pressure and reaches deep 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 become putrid when it is in the basin for a long period.

This 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 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:

Jet cleaners

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 usable volume of at least 3% of the basin area; the drainage channel is for taking up 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 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 must be horizontal without any transverse 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 version. 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 devices are installed which are required for the function and monitoring of the cleaning equipment. Further basin monitoring and recording equipment can be additionally installed. The electro-pneumatic level control, electric capacitive control or the echo-sounder control are recommended as jet cleaner controls.

Technical data

Wilo-EMU...	Pump	Motor	Circulation output (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-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).

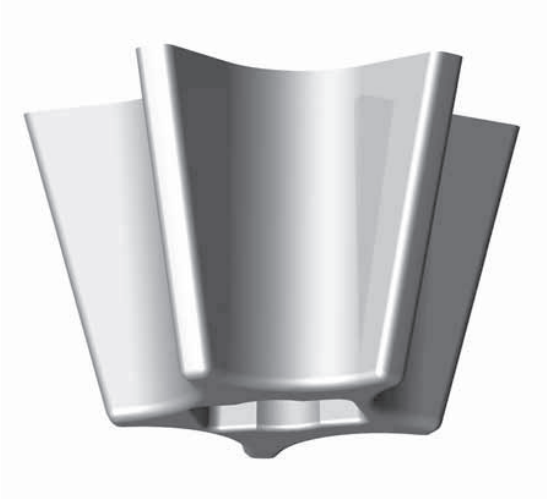
Clearing out the grit chamber therefore poses extreme demands in terms of the wear resistance of the pump. Furthermore, solidified sand deposits are to be loosened up and the unit must be frost- and weather-proof.

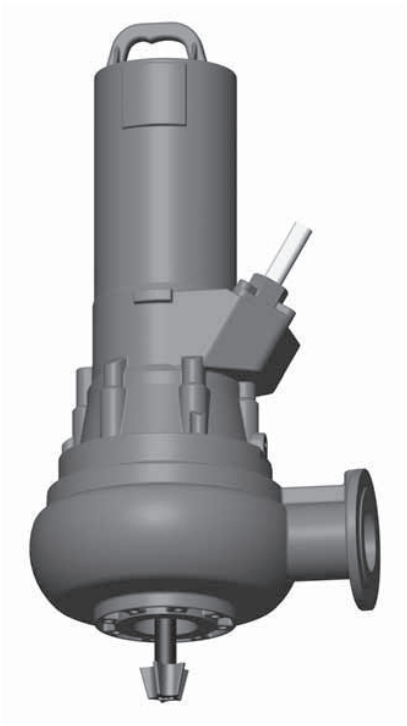
Therefore, sewage pumps are used increasingly in sand-catcher systems. For this area of application, Wilo offers its proven submersible sewage pumps of the type: Wilo-EMU FA...WR. The submersible sewage pumps are submersible and can be directly submerged in the fluid. Thus, suction problems can be avoided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

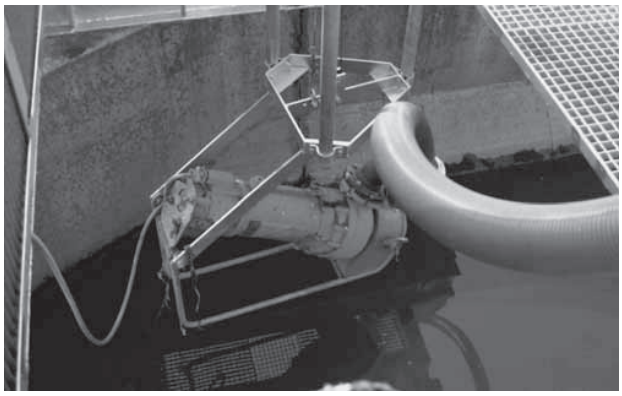
For this application, the Wilo submersible sewage pump is equipped with a vortex impeller and a mechanical stirring device. The stirring device is screwed directly onto the impeller. It consists of a smooth pipe cylinder and a mixer head, which is ground s-shaped on the front surface.

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.







Equipment/function

	Sewage treatment			
	Wilo-EMU TR 14... – TR 28...	**Wilo-EMU TR 22... – TR 40...**	**Wilo-EMU TR 50-2... – TR(E) 90-2...**	**Wilo-EMU TR(E) 216... – TR(E) 326...**
Design				
Submersible	•	•	•	•
Prechamber	–	–	•	•
Gear chamber	–	–	•	•
Sealing chamber	•	•	•	•
FC operation	•	•	•	•
Directly driven	•	•	–	–
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 leakage monitoring	•	•	•	•
Sealing chamber monitoring	optional	optional	optional	optional
Motor temperature monitoring, bimetal	•	•	•	•
Motor temperature monitoring, PTC	optional	optional	optional	optional
Explosion protection	optional	optional	optional	optional
Propeller blades can be replaced individually	–	–	–	•

Equipment/function

	Dewatering			Sewage transport
	Wilo-EMU RZP 20... – RZP 80-2...	**Wilo-EMU KPR**	**Wilo-EMU SR**	**Wilo-EMU FA...WR**
Design				
Submersible	•	•	•	•
Single-channel impeller	–	–	•	–
Vortex impeller	–	–	–	•
Multi-channel impeller	–	•	–	–
Open multi-channel impeller	–	–	–	–
Prechamber	•	–	–	–
Gear chamber	•	–	–	–
Sealing chamber	•	•	•	•
Leakage chamber	-	-	•	•
Sealing for mechanical seal on motor side	•	•	•	•
Sealing for rotary shaft seal on motor side	•	–	–	–
Sealing for mechanical seal on fluid side	•	•	•	•
Single-phase AC motor	–	–	–	–
Three-phase motor	•	•	•	•
Direct activation	•	•	•	•
Star-delta activation	•	•	•	•
FC operation	•	•	•	•
Dry motor	•	•	–	•
Motor with oil cooling	-	-	•	•
Dry motor with closed-circuit cooling	-	-	•	•
Sheath current cooling	–	–	–	–
Application				
Wet well installation, stationary	•	•	•	•
Dry well installation, stationary	–	–	–	–
Wet well installation, ground installation	–	–	•	–
Wet well installation, wall-mounted installation	–	–	–	–
Lowering device for wet well installation	•	–	–	–
Wet well installation, portable	–	–	–	•
Dry well installation, portable	–	–	–	–
Equipment/function				
Motor leakage monitoring	•	•	•	•
Sealing chamber monitoring	optional	optional	optional	optional
Leakage chamber monitoring	-	-	•	•
Motor temperature monitoring, bimetal	•	optional	•	optional
Motor temperature monitoring, PTC	optional	optional	optional	optional
Explosion protection	optional	optional	optional	optional
Float switch	–	–	–	–

Series overview

Series	**Wilo-EMU TR 14... – TR 28...**	**Wilo-EMU TR 22... – TR 40...**
Product photo		
Design	Compact directly driven submersible mixer	Compact directly driven submersible mixer
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	• 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
Max. thrust	330 N	1100 N
Max. circulation power	0.15 m^3	0.35 m^3
Special features/ product advantages	• Extremely low power consumption: • Low weight • ATEX and FM versions • Self-cleaning propeller with helix hub • Easy-to-install propeller attachment • Propeller in steel or PUR version • Optional: Motor shaft made of 1.4462 material	• Self-cleaning propeller with helix hub • Easy-to-install propeller attachment • Propeller in cast iron, steel or PUR version • ATEX and FM versions
Further information	Series information from page 28 Wilo online catalogue at www.wilo.de	Series information from page 32 Wilo online catalogue at www.wilo.de

Series overview

Series	**Wilo-EMU TR 50-2... – TR(E) 90-2...**	**Wilo-EMU TR(E) 216... – TR(E) 326...**
Product photo		
Design	Submersible mixer with single-stage planetary gear	Slow-running submersible mixer reduced by two-stage planetary 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	• Energetically optimized mixing and circulation of activated sludges • Generation of flow rates in circulation channels • Further areas of application in industry
Max. thrust	3940 N	5270 N
Max. circulation power	1.14 m^3	4.25 m^3
Special features/ product advantages	• Single-stage planetary gear for adapting the propeller speed • Self-cleaning propeller • TRE units with IE3 motor • Easy-to-install propeller attachment • Propeller in steel, PUR or PUR/GRP version • ATEX and FM versions • 1.4462 gear shaft	• 2-stage planetary gear for adjusting the propeller speed • Self-cleaning propeller • TRE units with IE3 motor • Propeller blades can be replaced individually • Easy-to-install blades and hub • Propeller in GRP version • ATEX and FM versions • 1.4462 gear shaft
Further information	Series information from page 44 Wilo online catalogue at www.wilo.de	Series information from page 62 Wilo online catalogue at www.wilo.de

Series description Wilo-EMU TR 14... – TR 28...

Wilo-EMU TR 14... – TR 28...

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 advantages
- Extremely low power consumption:
- Low weight
- ATEX and FM versions
- Self-cleaning propeller with helix hub
- Easy-to-install propeller attachment
- Propeller in steel or PUR version
- Optional: Motor shaft made of 1.4462 material

Technical data
- Mains connection: 3~400 V, 50 Hz
- Submerged operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Mechanical shaft seal with SiC/SiC pairing
- Permanently lubricated roller bearings
- Max. immersion depth: 20 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.

Series description Wilo-EMU TR 14... – TR 28...

Options
- Special voltages
- Thermistor temperature sensor
- External sealing chamber monitoring
- Ceram C0 coating
- Ex-rated to ATEX or FM

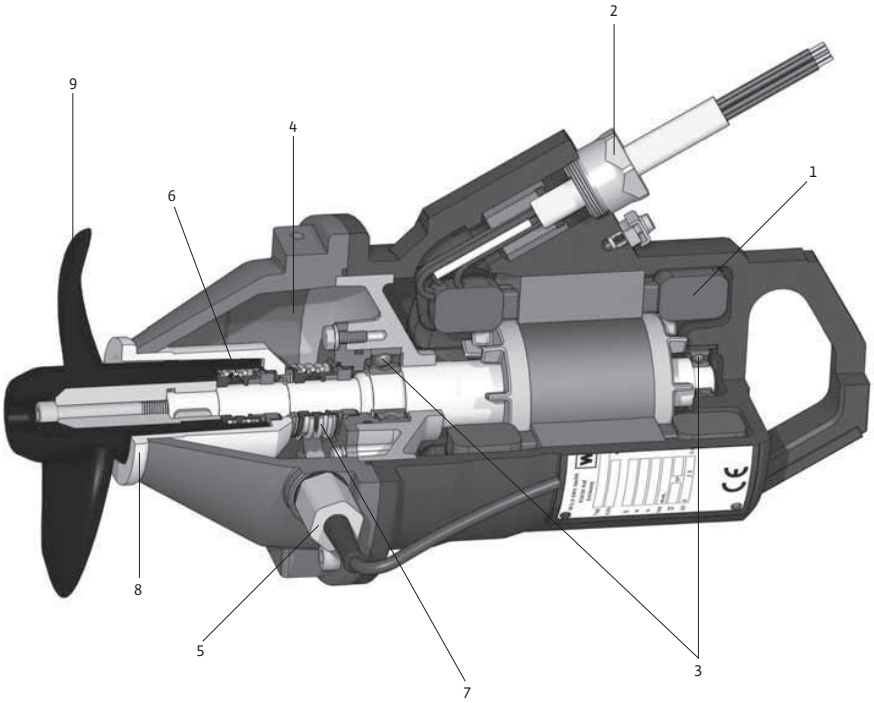
Scope of delivery
- Submersible mixer with mounted propeller and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

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.

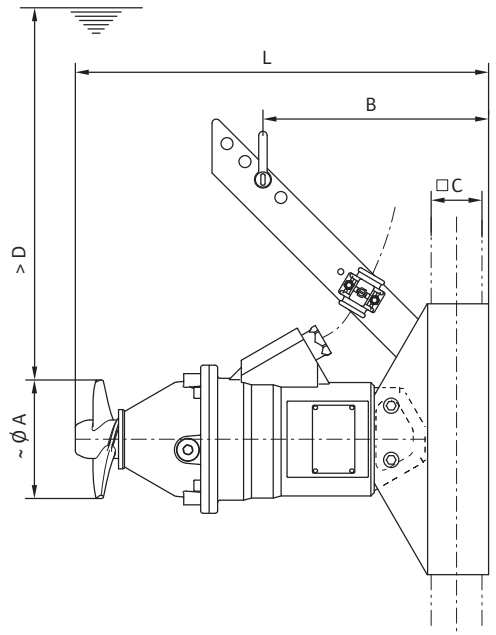
Accessories
- Lowering device
- Auxiliary hoisting gear
- Wall and floor fixation bracket
- Special fastening pieces for the use of an auxiliary hoisting gear for multiple units
- Terminal stop
- Additional rope anchoring
- Fixation sets with anchor bolts

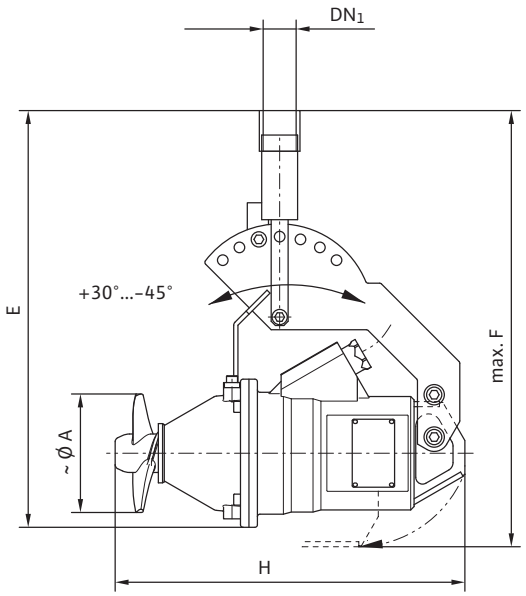


1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = sealing chamber; 5 = external electrode for monitoring the sealing chamber; 6 = mechanical seal on fluid side; 7 = mechanical seal on motor side; 8 = seal bushing, 9 = propeller

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

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Connection	Weight	Max. weight*
	A	*B*	*C*	*D*	*E*	*F*	*H*	*L*	*DN_1*	*Unit*	*M*
	mm									kg	
TR 14...-.../6	140	245	60	200	495	520	415	475	Rp 1¼	20	32
TR 16...-.../6	160	245	60	200	495	520	415	475	Rp 1¼	20	32
TR 21...-.../6	220	245	60	200	480	530	415	475	Rp 1¼	20	32
TR 21...-.../6 S..	210	245	60	200	480	530	415	475	Rp 1¼	22	35
TR 21...-.../11	220	300	60	200	480	530	470	530	Rp 1¼	26	37
TR 21...-.../11 S..	210	300	60	200	480	530	470	530	Rp 1¼	28	40
TR 28...-.../11	280	300	60	300	515	603	505	565	Rp 1¼	27	37

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 14.145-4/6	0.3	1336	1.000	45
TR 16.145-4/6	0.3	1336	1.000	65
TR 21.145-4/6	0.3	1336	1.000	75
TR 21.145-4/6 S5	0.5	1336	1.000	95
TR 21.145-4/11	0.5	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

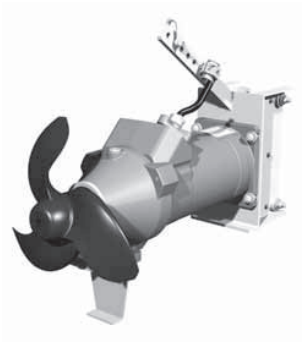
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 12-4/11 (Ex)	1.3	1.7	3.3	16	6	1392	•	•
T 12-4/6 (Ex)	0.5	0.7	1.42	6	2	1336	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Series description Wilo-EMU TR 22... – TR 40...

Wilo-EMU TR 22... – TR 40...



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 advantages
- Self-cleaning propeller with helix hub
- Easy-to-install propeller attachment
- Propeller in cast iron, steel or PUR version
- ATEX and FM versions

Technical data
- Mains connection: 3~400 V, 50 Hz
- Submerged operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Mechanical shaft seal with SiC/SiC pairing
- Permanently lubricated roller bearings
- Max. immersion depth: 20 m

Equipment/function
- Stationary installation on wall and floor
- Flexible installation via lowering device
- Can be swivelled horizontally when installed with a lowering device

Materials
- Housing parts: EN-GJL-250
- Propeller: EN-GJL-250, PUR or stainless steel 1.4571
- Propeller hub: Stainless steel 1.4571
- Screwed connections: Stainless steel 1.4301 or 1.4571
- Seal bushing: Stainless steel 1.4571

Description/design
Propeller
2- or 3-blade propeller with a nominal propeller diameter from 220 mm to 400 mm. Entwining-free design made possible by backward-curved incoming flow edge and patented helix hub.

Motor
Wilo-submersible motor of the T-series with standard connection for an easy and efficient adaptation of the motor output. 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 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
- Thermistor temperature sensor
- External sealing chamber control
- Ceram C0 coating
- Ex-rated to ATEX or FM

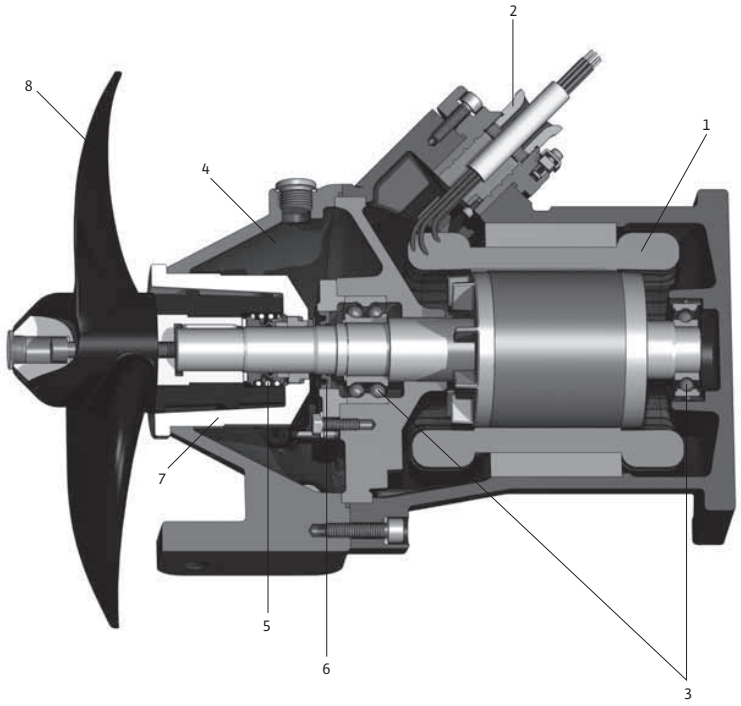
Series description Wilo-EMU TR 22... – TR 40...

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
Operating mode S1 – permanent operation:
The submersible mixer must be immersed when operated. Surfacing the propeller 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. The power cables must be installed in a way that these cannot be drawn into the propeller!

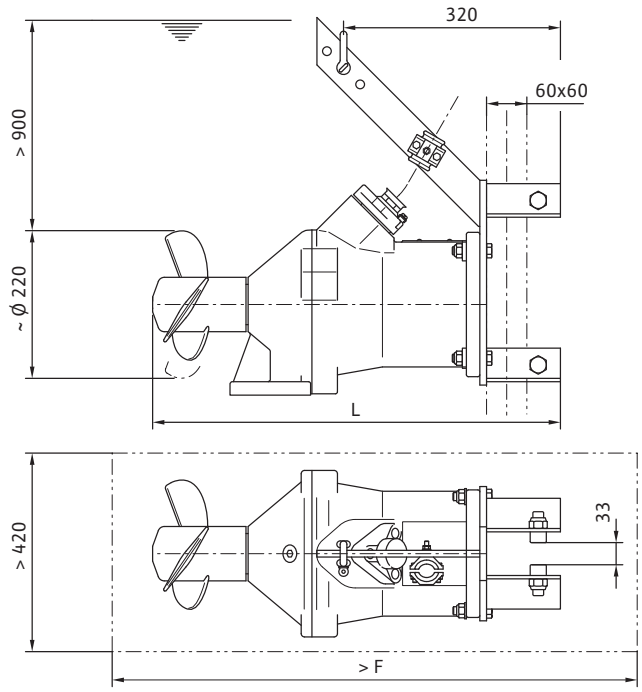
Accessories
- Lowering device
- Auxiliary hoisting gear
- Floor fixation bracket
- Special fastening pieces for the use of an auxiliary hoisting gear for multiple units
- Terminal stop
- Additional rope anchoring
- Fixation sets with anchor bolts

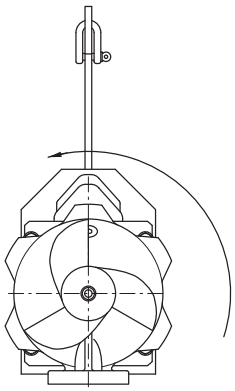


1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = sealing chamber; 5 = mechanical seal on fluid side; 6 = rotary shaft seal on motor side; 7 = seal bushing, 8 = propeller

Dimensions, weights Wilo-EMU TR 22

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 22...-.../8	755	605	70	100
TR 22...-.../12	790	640	78	105

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 22

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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

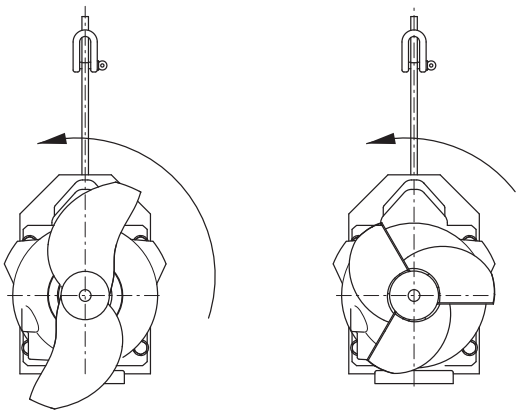
Motor data

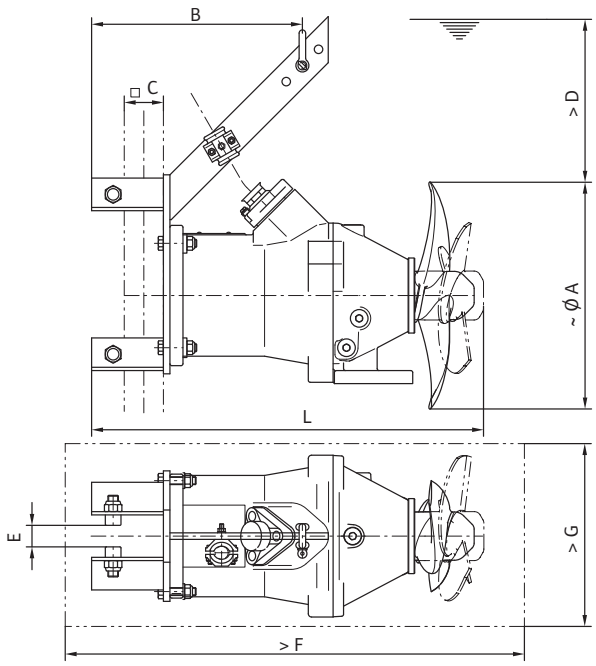
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 36

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions								Weight	Max. weight*
	A	*B*	*C*	*D*	*E*	*F*	*G*	*L*	*Unit*	*M*
	mm								kg	
TR 36...-.../8	360	320	60	500	33	740	560	590	61	95
TR 36...-.../8 S...	250	320	60	500	33	755	450	605	65	95
TR 36...-.../12	360	350	60	500	33	775	560	625	69	100
TR 36...-.../16	360	370	80	500	53	835	560	685	80	115
TR 36...-.../16 S...	250	370	80	500	53	850	450	700	84	115

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 36

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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	4.9	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	7.0	1400	1.000	830

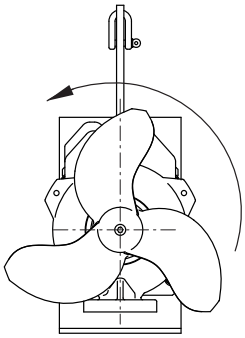
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•
T 17-8/8R (Ex)	1.1	1.7	3.2	14	5	700	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

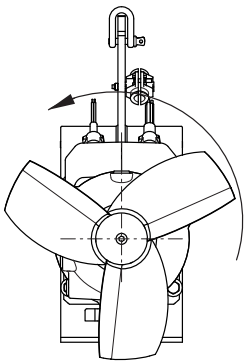
The value $P_{1.1}$ corresponds to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 40

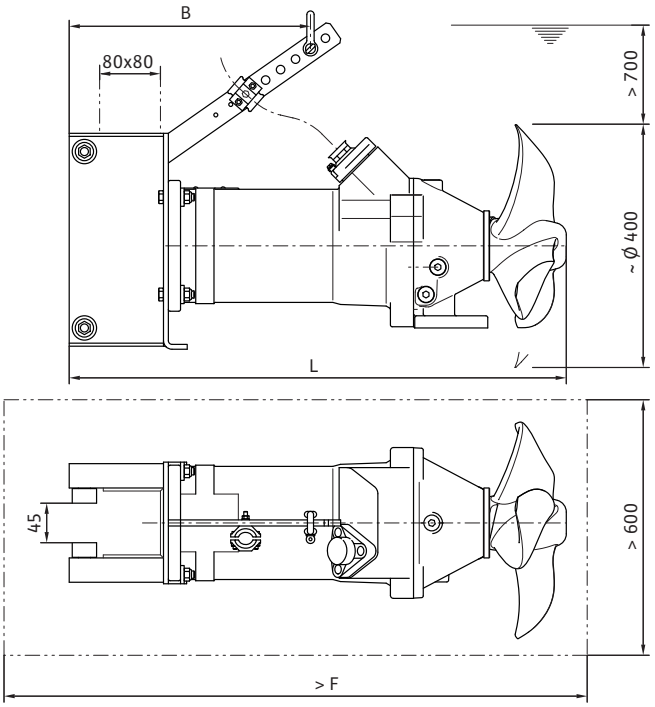
Dimension drawing



TR 40...



TR 40...S..



Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 40...-.../16	355	865	715	84	120
TR 40...-.../16 S...	355	835	685	84	120
TR 40...-.../24	380	945	795	93	125
TR 40...-.../24 S...	380	915	765	93	125

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 40

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 40.74-8/16	2.3	710	1.000	620
TR 40.74-8/16 S7	2.3	710	1.000	505
TR 40.74-8/24	2.4	705	1.000	630
TR 40.74-8/24 S7	2.5	705	1.000	525
TR 40.74-8/24 S13	4.7	705	1.000	970
TR 40.95-6/24	5.2	927	1.000	1100
TR 40.95-6/24 S7	5.2	927	1.000	930

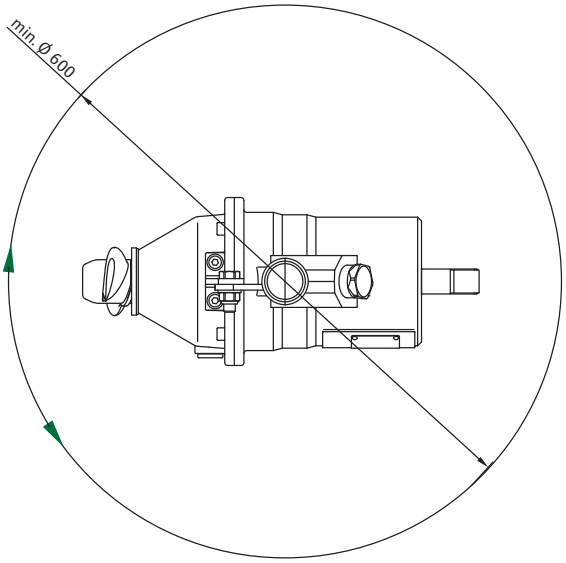
Motor data

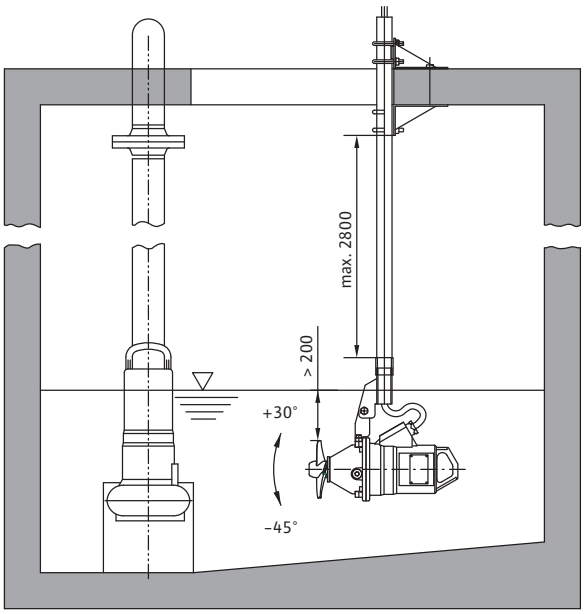
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-6/24R (Ex)	6.0	7.7	13.6	65	22	927	•	•
T 17-8/16R (Ex)	2.8	4.0	7.4	36	12	710	•	•
T 17-8/24R (Ex)	5.1	7.7	14.3	63	21	705	•	•

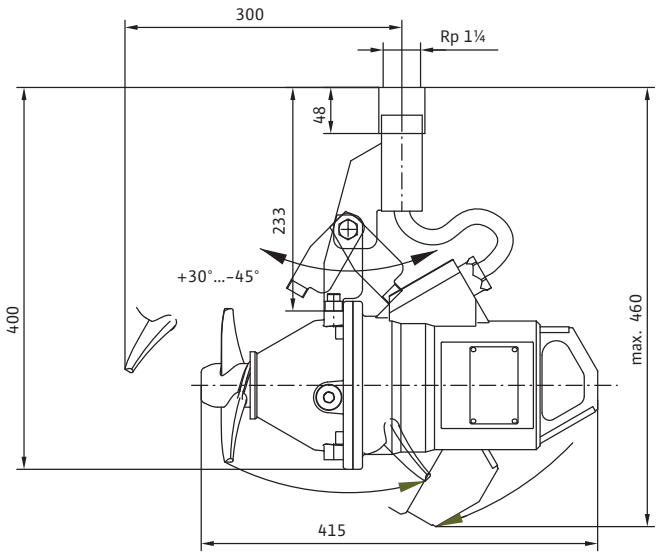
The value $P_{1.1}$ corresponds to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Installation example

Wilo-EMU mixer TR 14 with pipe installation

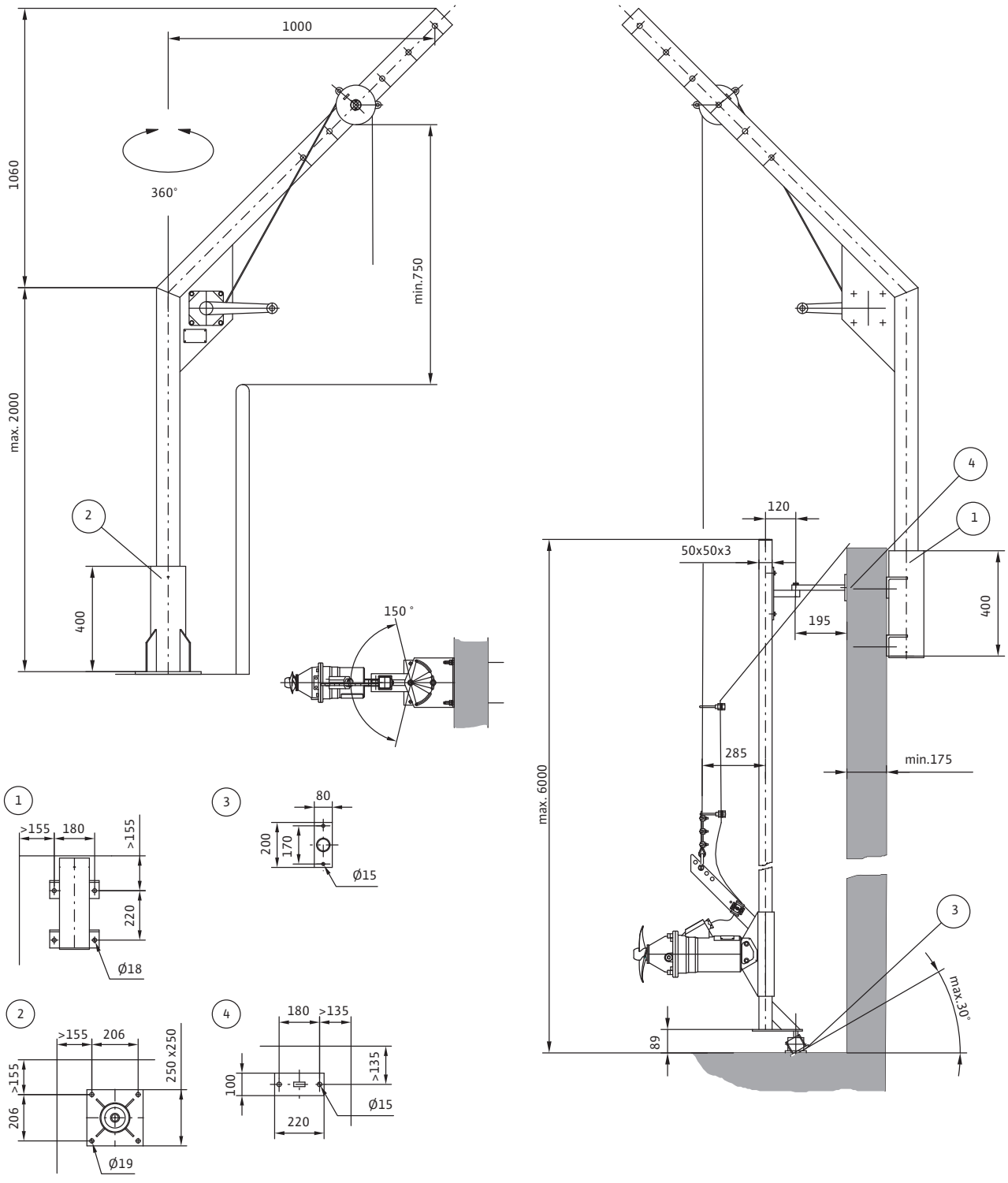






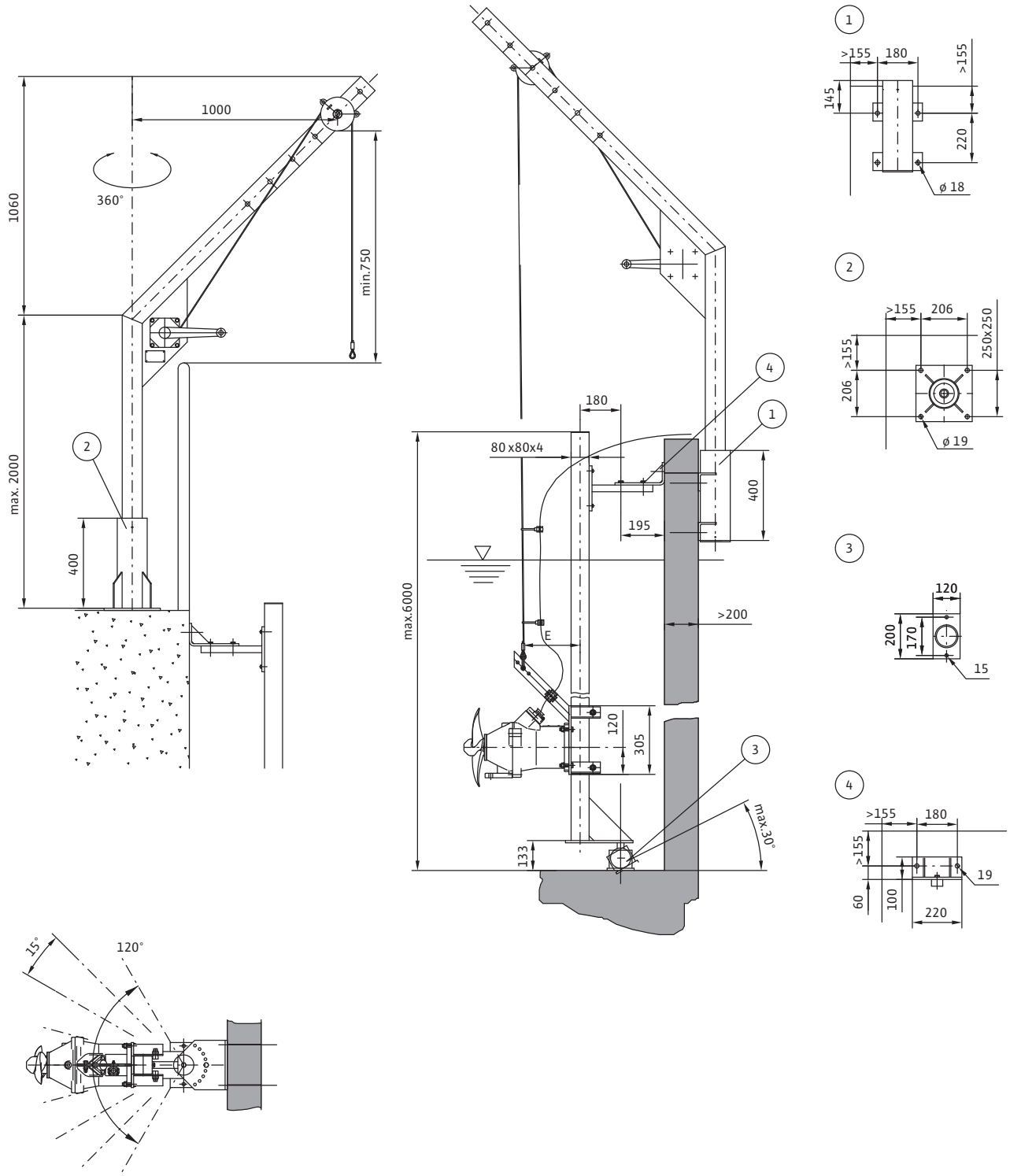
Installation example

Wilo-EMU mixer TR 21 with lowering device AVU50



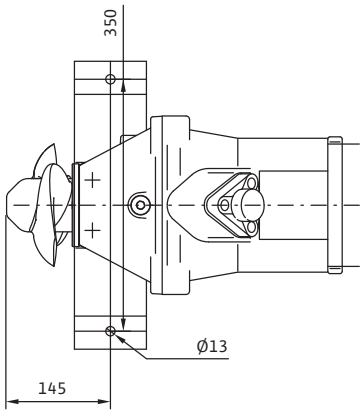
Installation example

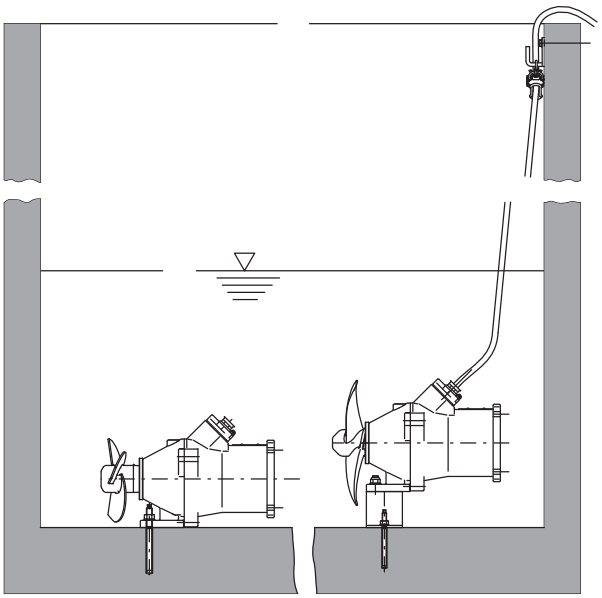
Wilo-EMU mixer TR 36 with lowering device AVU80

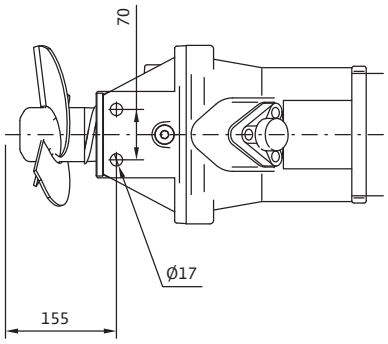


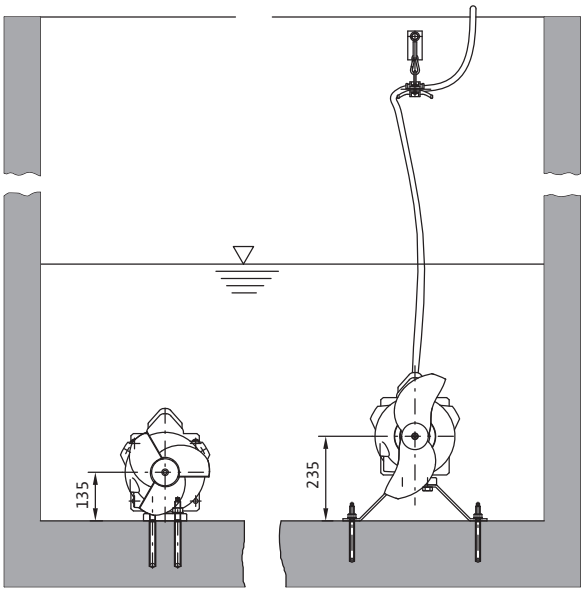
Installation example

Wilo-EMU mixer TR 36 for ground installation









Series description Wilo-EMU TR 50-2... – TR(E) 90-2...

Wilo-EMU TR 50-2... – TR(E) 90-2...

Design
Submersible mixer with single-stage planetary gear

Type key

e.g.:	**Wilo-EMU TRE 90-2.20-4/12 x**
TR	Submersible mixer
E	High-efficiency motor in accordance with IE3 (derived from IEC 60034-30)
90	x 10 = nominal propeller diameter in mm
2	Model
20	x 10 = propeller speed in rpm
4	Number of poles
12	x 10 = stator length in mm
x	Propeller code for welded propellers, e.g. S20 (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 advantages
- Single-stage planetary gear for adapting the propeller speed
- Self-cleaning propeller
- TRE units with IE3 motor
- Easy-to-install propeller attachment
- Propeller in steel, PUR or PUR/GRP version
- ATEX and FM versions
- 1.4462 gear shaft

Technical data
- Mains connection: 3~400 V, 50 Hz
- Submerged operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Single-stage planetary gear
- Mechanical shaft seal with SiC/SiC pairing
- Permanently lubricated roller bearings
- Max. immersion depth: 20 m

Equipment/function
- Protection class IP X4D
- Flexible installation via lowering device
- Can be swivelled horizontally when installed with a lowering device
- Can be freely placed in the basis when installing via a stand
- Single-stage planetary gear

Materials
- Housing parts: EN-GJL-250
- Propeller: PUR, stainless steel 1.4571 or PUR/GRP
- Propeller hub: Stainless steel 1.4571
- Screwed connections: Stainless steel 1.4301 or 1.4571
- Seal bushing: Stainless steel 1.4571
- Gear shaft: Stainless steel 1.4462

Description/design
Propeller
2 or 3-blade propeller with a nominal propeller diameter of 500 mm to 900 mm. Entwining-free design made possible by backward-curved incoming flow edge.

Motor
Wilo-submersible motor of the T-series with standard connection for an easy and efficient adaptation of the motor output. 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.

TRE units are equipped with the high-efficiency TE 20 motor which meets the IE3 classification (derived from IEC 60034-30).

Series description Wilo-EMU TR 50-2... – TR(E) 90-2...

Seal
Sealing is achieved through the use of a 3-chamber system (pre-chamber, gear chamber and sealing chamber). The large-volume pre-chamber and sealing chamber collect leakage from the mechanical seal. If desired, the pre-chamber can be equipped with an external sealing chamber electrode. The sealing between the fluid and the pre-chamber, 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 pre-chamber and gear chamber as well as between the sealing chamber and motor are realised by radial sealing rings. A seal bushing ensures long-term corrosion-protected fit of the mechanical seal.

Gear
Single-stage planetary gear with exchangeable transmissions. 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 inlet 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
- Thermistor temperature sensor
- External sealing chamber control
- Ceram C0 coating
- Ex-rated to ATEX or FM

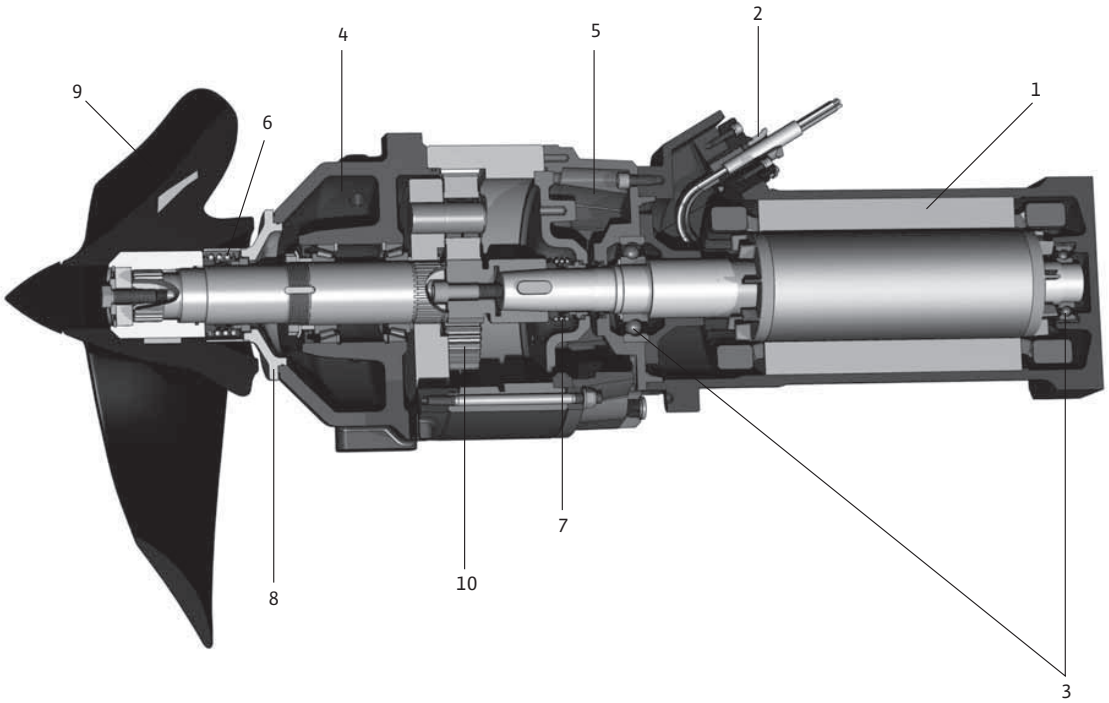
Scope of delivery
- Submersible mixer with mounted propeller and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

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. 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.

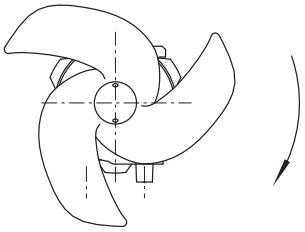
Accessories
- Lowering device
- Stand for free positioning of the units in the basin
- Auxiliary hoisting gear
- Special fastening pieces for the use of an auxiliary hoisting gear for multiple units
- Terminal stop
- Additional rope anchoring
- Fixation sets with anchor bolts

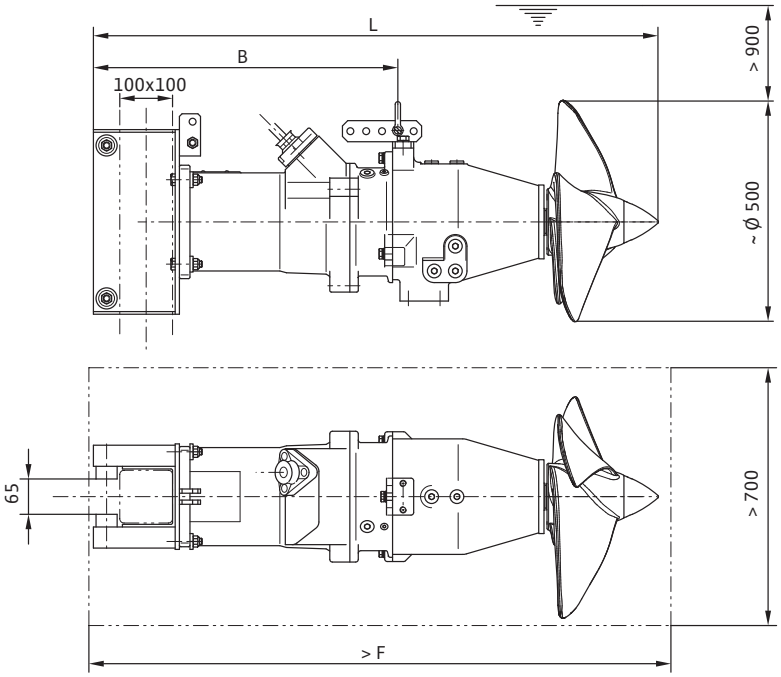


1 = motor; 2 = cable lead-in; 3 = motor bearing, 4 = prechamber; 5 = sealing chamber; 6 = mechanical seal on fluid side; 7 = mechanical seal on motor side; 8 = seal bushing, 9 = propeller; 10 = single-stage planetary gear

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

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 50-2...-.../8	445	1150	1000	102	140
TR 50-2...-.../12	480	1185	1035	110	145
TR 50-2...-.../16	490	1225	1075	121	160
TR 50-2...-.../22	525	1300	1150	129	170

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 50-2.25-6/8	1.0	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 50-2.47-4/12	5.2	473	3.000	1130
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
TR 50-2.61-2/22	10.1	619	4.714	1840

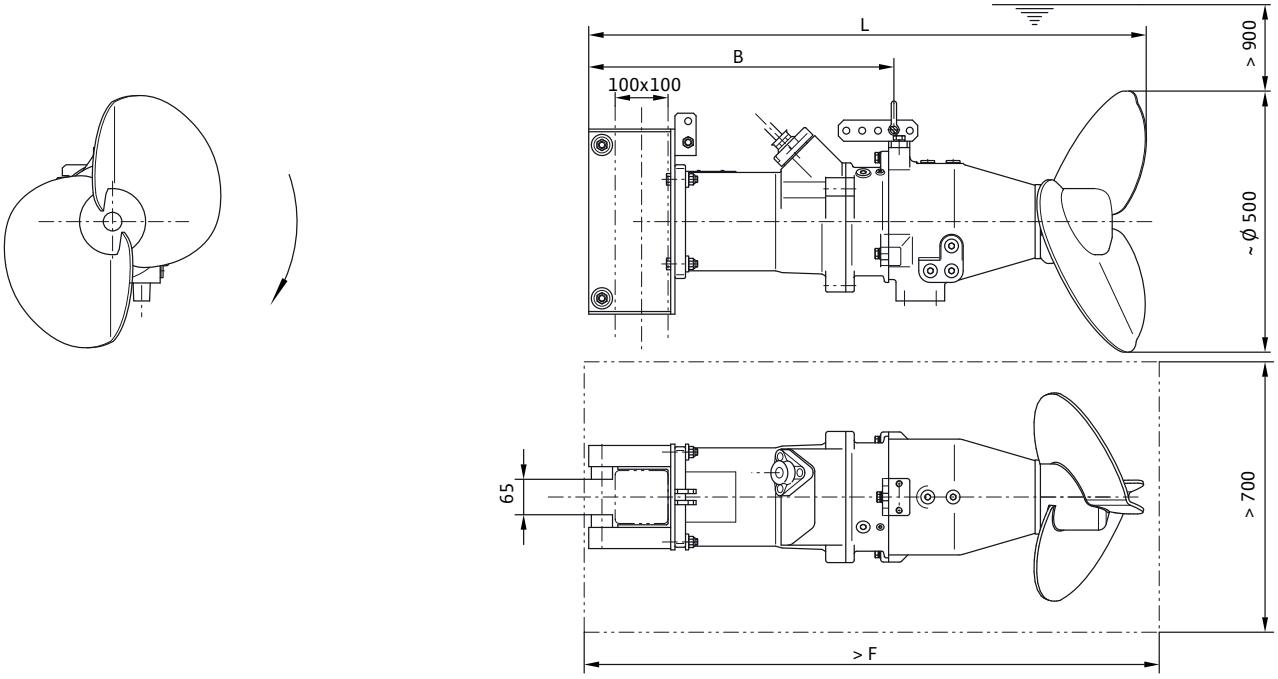
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-2/22R (Ex)	10.5	12.3	20.5	171	57	2914	•	•
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•
T 17-6/16R (Ex)	3.7	5.2	9.1	39	13	931	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, - = not available

Dimensions, weights Wilo-EMU TR 50-2 (steel propeller)

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 50-2...-.../8 S	505	1135	985	110	150
TR 50-2...-.../12 S	510	1170	1020	118	155
TR 50-2...-.../16 S	520	1205	1055	129	170
TR 50-2...-.../24 S	555	1285	1135	138	180

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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	2.0	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	7.0	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

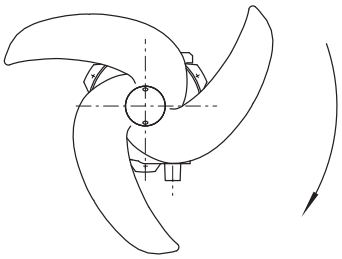
Motor data

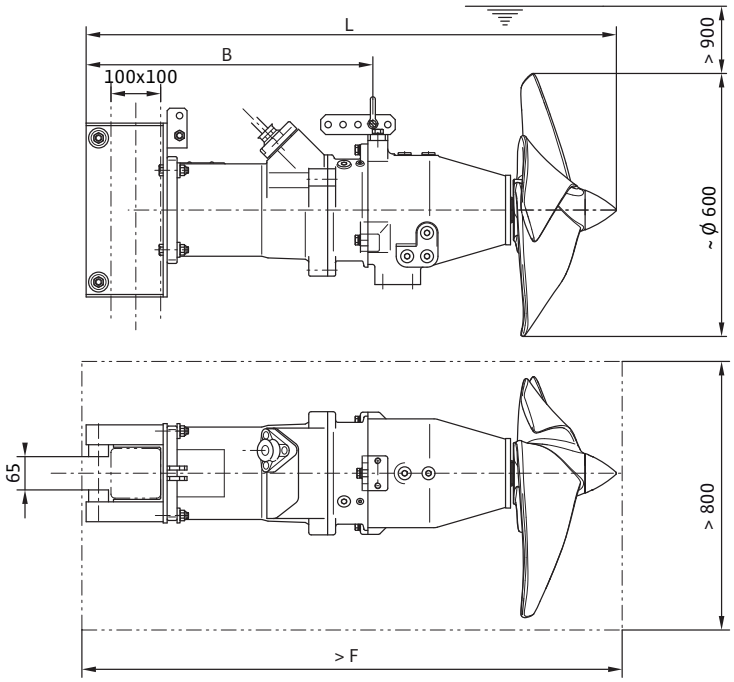
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•
T 17-4/24R (Ex)	10.0	12.2	21	123	41	1417	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

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

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 60-2...-.../8	445	1145	995	103	140
TR 60-2...-.../12	480	1180	1030	111	145
TR 60-2...-.../16	490	1220	1070	122	160
TR 60-2...-.../22	525	1300	1150	130	170
TR 60-2...-.../24	525	1300	1150	130	170

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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	4.0	373	3.880	1300
TR 60-2.41-4/16	4.8	400	3.600	1450
TR 60-2.41-4/24	5.0	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 60-2.45-4/16	6.5	447	3.167	1760
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
TR 60-2.54-2/22	10.6	544	5.330	2370

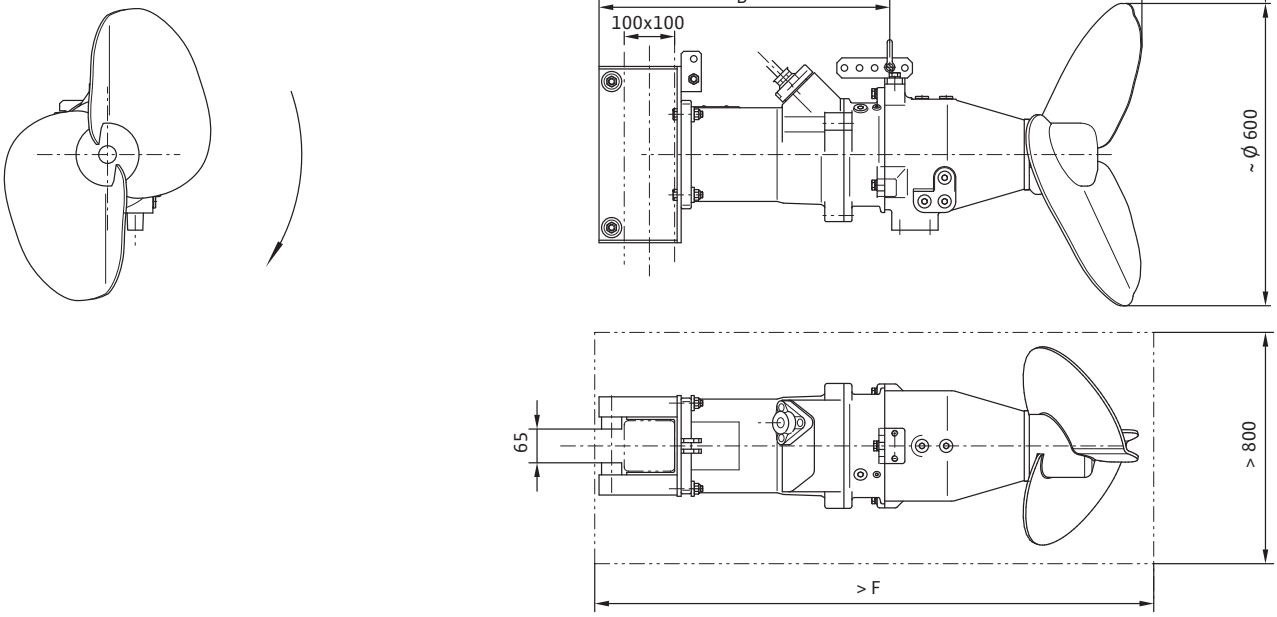
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-2/22R (Ex)	10.5	12.3	20.5	171	57	2914	•	•
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•
T 17-4/24R (Ex)	10.0	12.2	21	123	41	1417	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 60-2 (steel propeller)

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 60-2...-.../8 S	505	1155	1005	112	150
TR 60-2...-.../12 S	510	1190	1040	120	155
TR 60-2...-.../16 S	520	1230	1080	131	170
TR 60-2...-.../24 S	555	1310	1160	140	180

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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	5.0	272	5.330	1220
TR 60-2.29-4/16 S	6.0	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

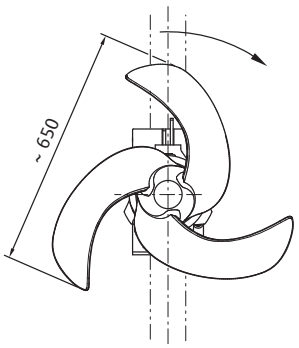
Motor data

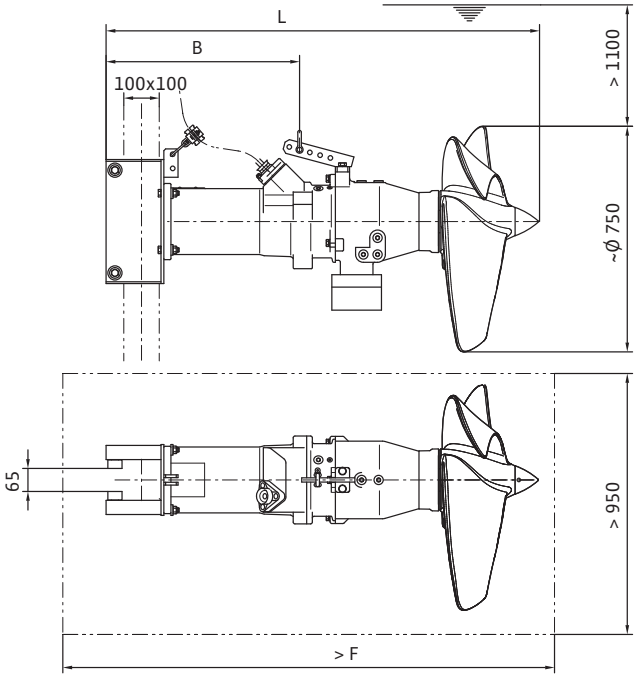
Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•
T 17-4/24R (Ex)	10.0	12.2	21	123	41	1417	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 75-2

Dimension drawing





Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 75-2...-.../16	490	1295	1145	127	175
TR 75-2...-.../24	525	1375	1225	135	185

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 75-2.15-6/16	3.0	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	6.0	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

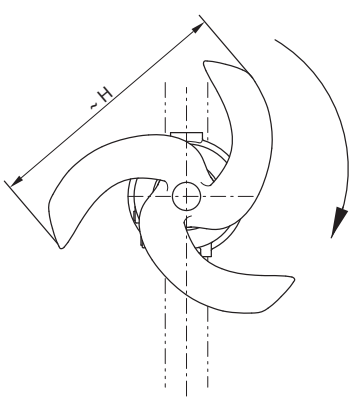
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•
T 17-4/24R (Ex)	10.0	12.2	21	123	41	1417	•	•
T 17-6/16R (Ex)	3.7	5.2	9.1	39	13	931	•	•
T 17-6/24R (Ex)	6.0	7.7	13.6	65	22	927	•	•

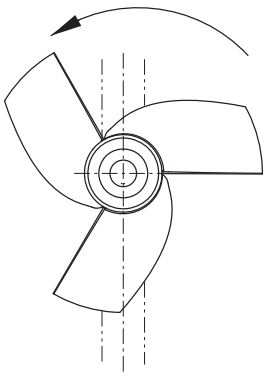
The value $P_{1.1}$ corresponds to the electrical power consumption at the duty point. P_1 refers to the max. electrical power consumption.
All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Thrust and power measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 80-1

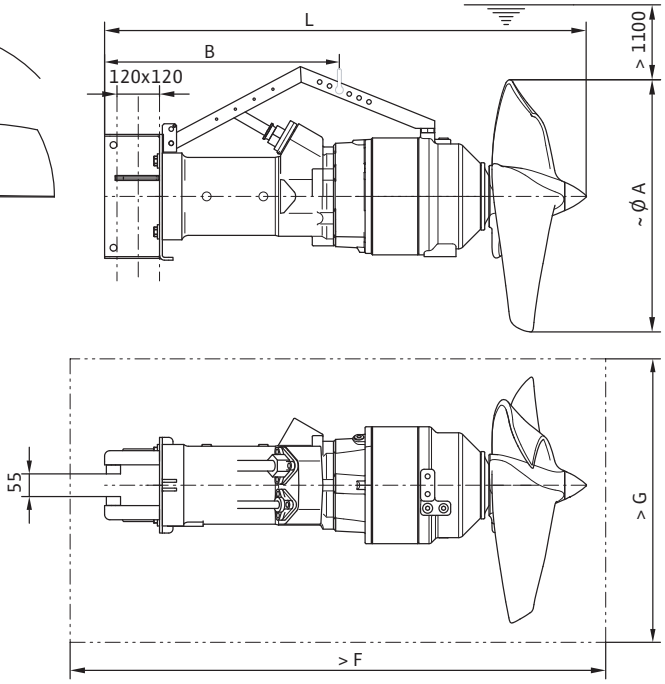
Dimension drawing



TR 80-1...



TR 80-1...S..



Dimensions, weights

Wilo-EMU...	Dimensions						Weight	Max. weight*
	A	*B*	*F*	*G*	*H*	*L*	*Unit*	*M*
	mm						kg	
TR 80-1...-.../22	740	595	1565	940	720	1415	284	300
TR 80-1...-.../22 S	785	595	1565	985	760	1415	316	336
TR 80-1...-.../27	740	675	1615	940	720	1465	298	320
TR 80-1...-.../30	740	675	1615	940	720	1465	303	325
TR 80-1...-.../30 S	785	675	1615	985	760	1465	321	345

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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	9.0	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

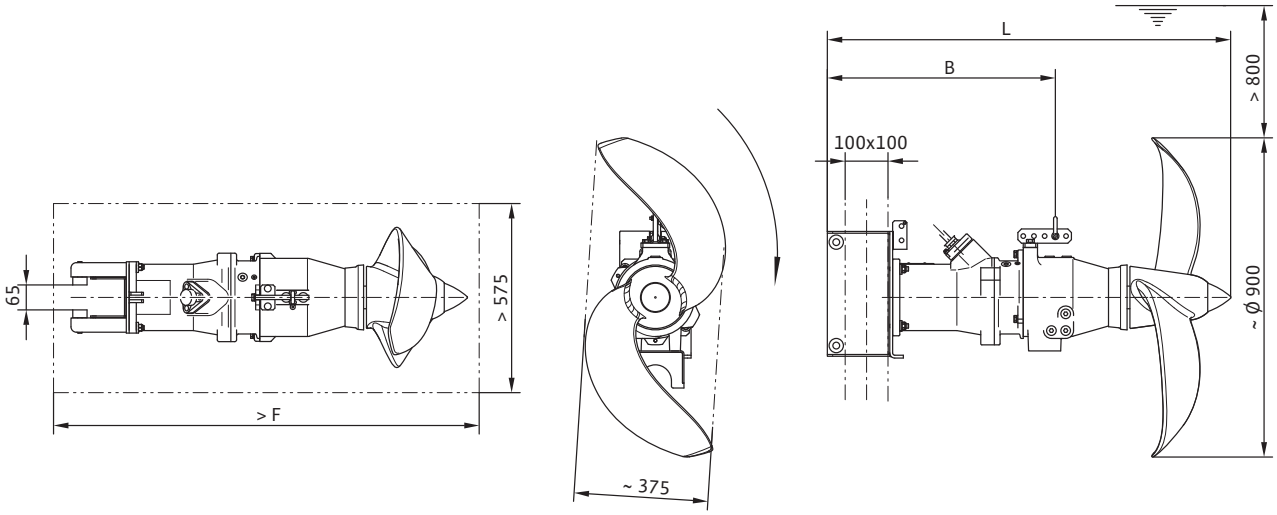
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 20-4/22R (Ex)	12.5	15.3	26	156	52	1430	•	•
T 20-4/27R (Ex)	16.0	18.9	32	192	64	1430	•	•
T 20-4/30R (Ex)	18.5	22.0	36.5	220	73	1435	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 90-2

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions			Weight	Max. weight*
	B	*F*	*L*	*Unit*	*M*
	mm			kg	
TR 90-2...-.../8	445	1225	1075	107	150
TR 90-2...-.../12	480	1260	1110	117	155

* = maximum weight including accessories

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

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. 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	3.0	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
TR 90-2.24-4/12	4.7	241	5.875	1960
TR 90-2.25-4/12	5.2	251	5.590	2120

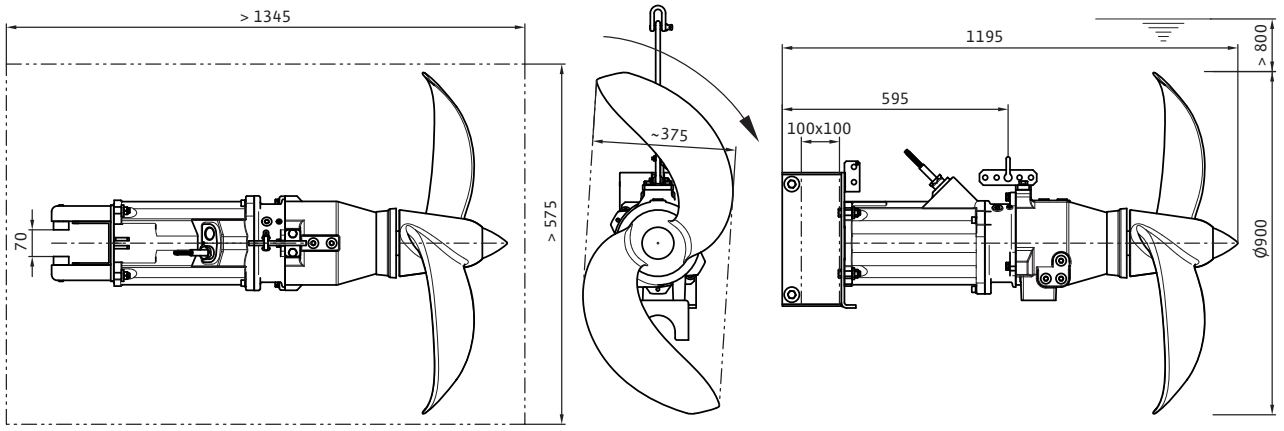
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•
T 17-8/8R (Ex)	1.1	1.7	3.2	14	5	700	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, - = not available

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

Dimension drawing



Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust	Weight	Max. weight*
	max. $P_{1.1}$	*n*		*F*	*Unit*	*M*
	kW	rpm		N	kg	
TRE 90-2.20-4/12	2.8	197	7.500	1500	129	146
TRE 90-2.22-4/17	3.8	224	6.571	1810	137	154
TRE 90-2.24-4/17	4.4	236	6.200	2000	137	154

* = maximum weight including accessories

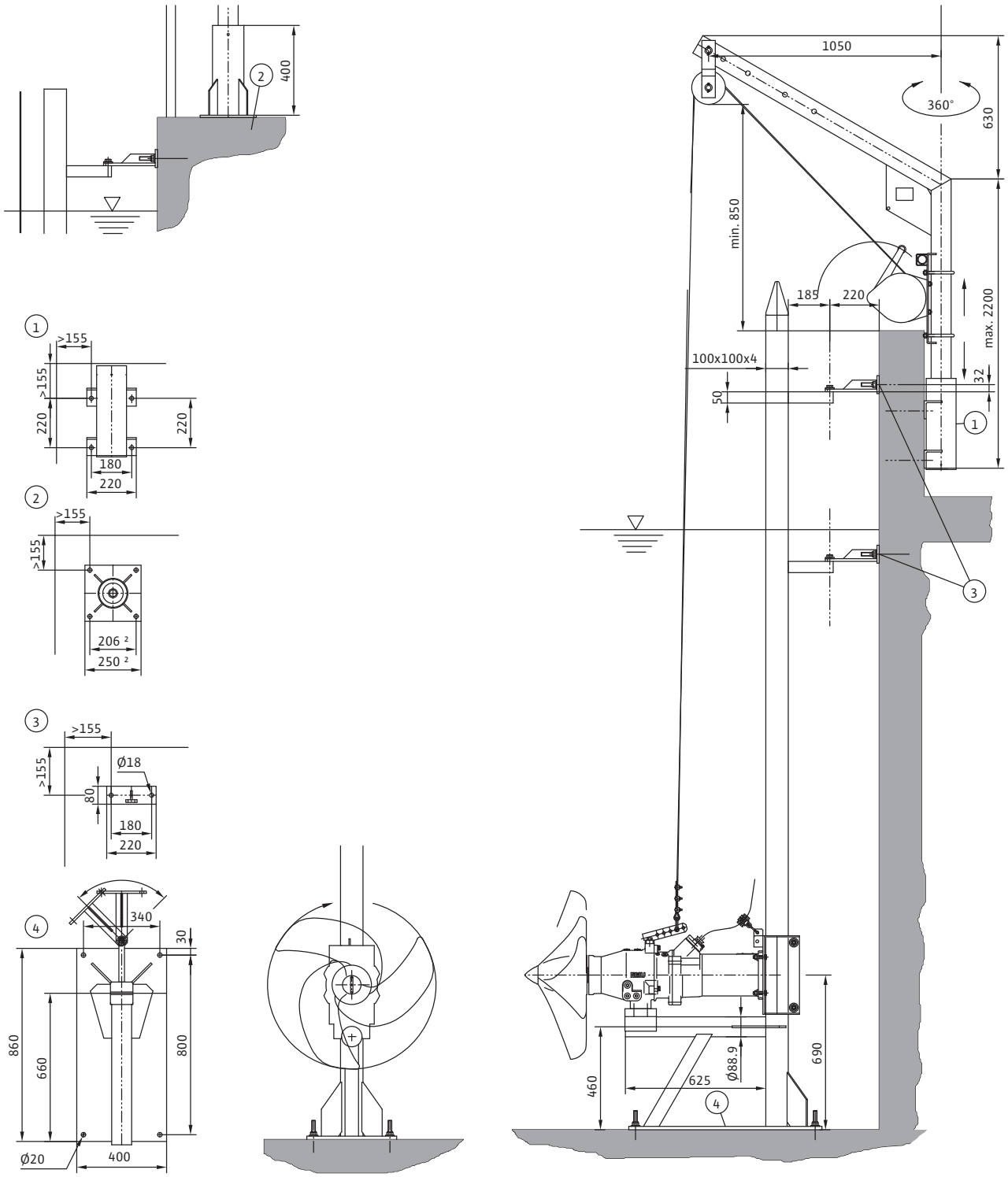
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
TE 20-4/12R	3.0	3.5	6.3	49	17	1460	-	-
TE 20-4/17R	4.0	4.5	7.9	70	–	1461	-	-

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, - = not available

Installation example

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



Series description Wilo-EMU TR(E) 216... – TR(E) 326...

Wilo-EMU TR(E) 216... – TR(E) 326...

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

Type key

e.g.:	**Wilo-EMU TRE 321.36-4/12**
TR	Submersible mixer
E	High-efficiency motor in accordance with IE3 (derived from IEC 60034-30)
3	Number of blades
21	x 100 = nominal propeller diameter in mm
36	Propeller speed in rpm
4	Number of poles
12	x 10 = stator length in mm

Application
- Energetically optimized mixing and circulation of activated sludges
- Generation of flow rates in circulation channels
- Further areas of application in industry

Special features/product advantages
- 2-stage planetary gear for adjusting the propeller speed
- Self-cleaning propeller
- TRE units with IE3 motor
- Propeller blades can be replaced individually
- Easy-to-install blades and hub
- Propeller in GRP version
- ATEX and FM versions
- 1.4462 gear shaft

Technical data
- Mains connection: 3~400 V, 50 Hz
- Submerged operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- 2-stage planetary gear with an exchangeable 2nd planetary gear
- Mechanical shaft seal with SiC/SiC pairing
- Permanently lubricated roller bearings
- Max. immersion depth: 20 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-blade propeller with a nominal propeller diameter of 1500 mm to 2600 mm. Entwining-free design made possible by backward-curved incoming flow edge.

Motor

Wilo-submersible motor of the T-series with standard connection for an easy and efficient adaptation of the motor output. 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.

TRE units are equipped with the high-efficiency TE 20 motor which meets the IE3 classification (derived from IEC 60034-30).

Seal

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

Series description Wilo-EMU TR(E) 216... – TR(E) 326...

Gear
2-stage planetary gear with exchangeable transmissions. 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 inlet 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 sensor
- External sealing chamber control
- Ceram coating C0
- Ex-rated to ATEX or FM

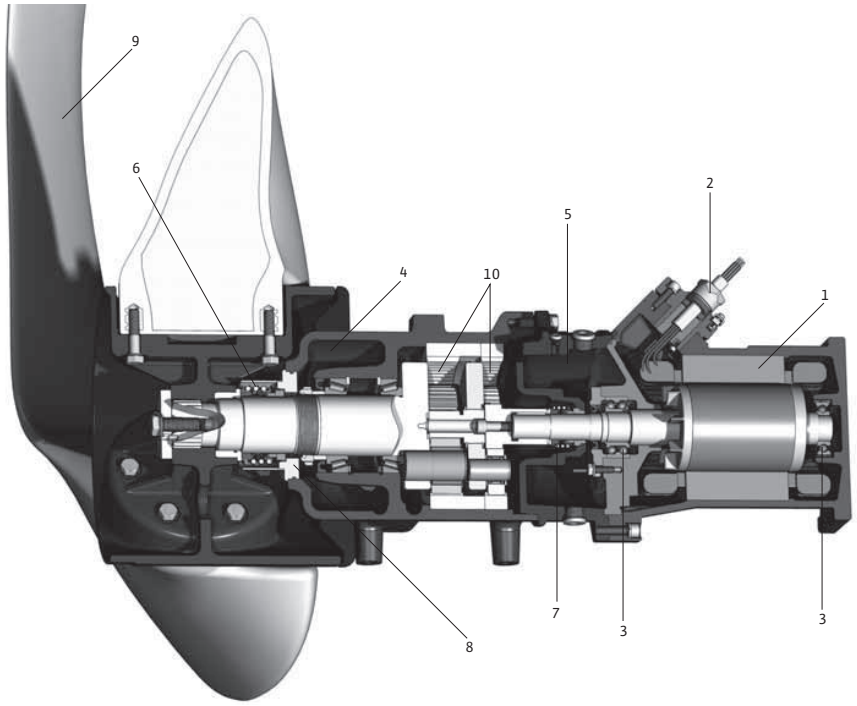
Scope of delivery
- Submersible mixer with mounted propeller hub and cable
- Cable length per customer request
- 2- or 3-bladed - delivered separately, installation is performed onsite.
- Accessories per customer request
- Operating and maintenance manual

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. 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.

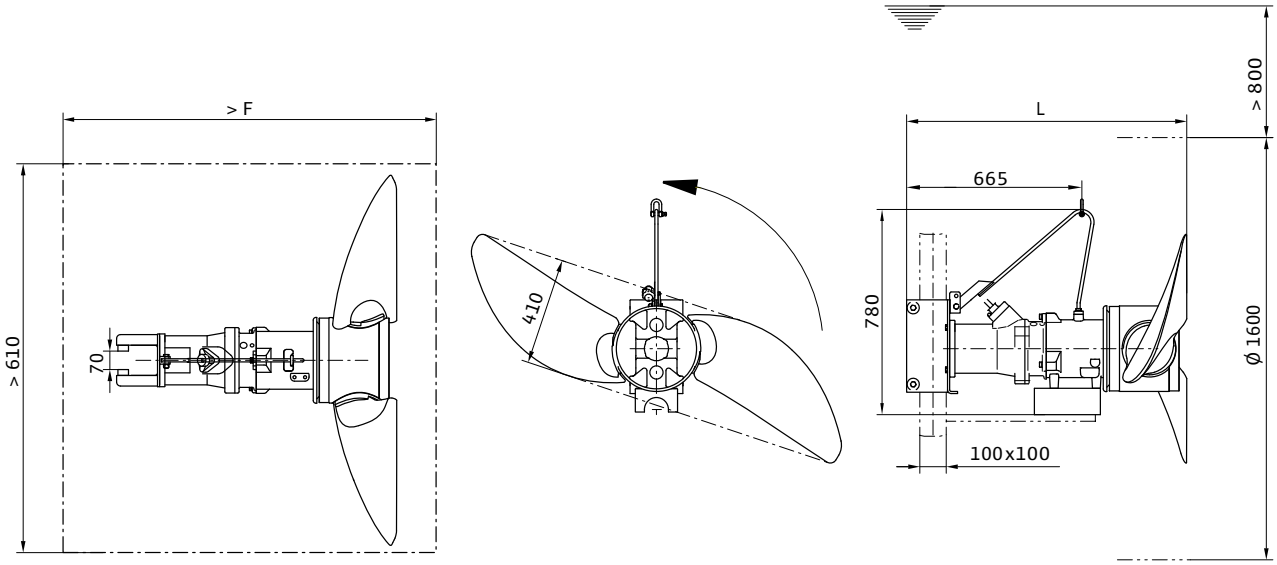
Accessories
- Stand for free positioning of the units in the basin
- Auxiliary hoisting gear
- Special fastening pieces for the use of an auxiliary hoisting gear for multiple units
- Additional rope anchoring
- Fixation sets with anchor bolts



1 = Motor; 2 = Cable inlet; 3 = Motor bearing, 4 = Pre-chamber; 5 = Sealing chamber; 6 = Mechanical shaft seal on the fluid side; 7 = Mechanical shaft seal on the motor side; 8 = Seal bushing, 9 = Propeller blade; 10 = 2-stage planetary gear

Dimensions, weights Wilo-EMU TR 216

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 216...-.../8	1175	1025	166	195
TR 216...-.../12	1210	1060	176	200

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 216

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 216.32-6/8	0.6	32	30.380	470
TR 216.34-6/8	0.7	34	29.227	540
TR 216.37-6/8	0.8	37	26.350	600
TR 216.41-6/8	0.9	41	24.056	710
TR 216.44-6/8	1.1	44	22.320	860
TR 216.47-6/8	1.2	47	20.857	980
TR 216.51-4/8V	1.6	51	29.227	1150
TR 216.56-4/8V	2.1	56	26.350	1400
TR 216.61-4/8V	2.4	61	24.056	1660
TR 216.65-4/8	2.9	65	22.320	1900
TR 216.65-4/12	2.8	65	22.320	1890
TR 216.69-4/8	3.4	69	20.857	2140
TR 216.70-4/12	3.3	70	20.857	2110
TR 216.77-4/12	4.4	77	18.600	2600

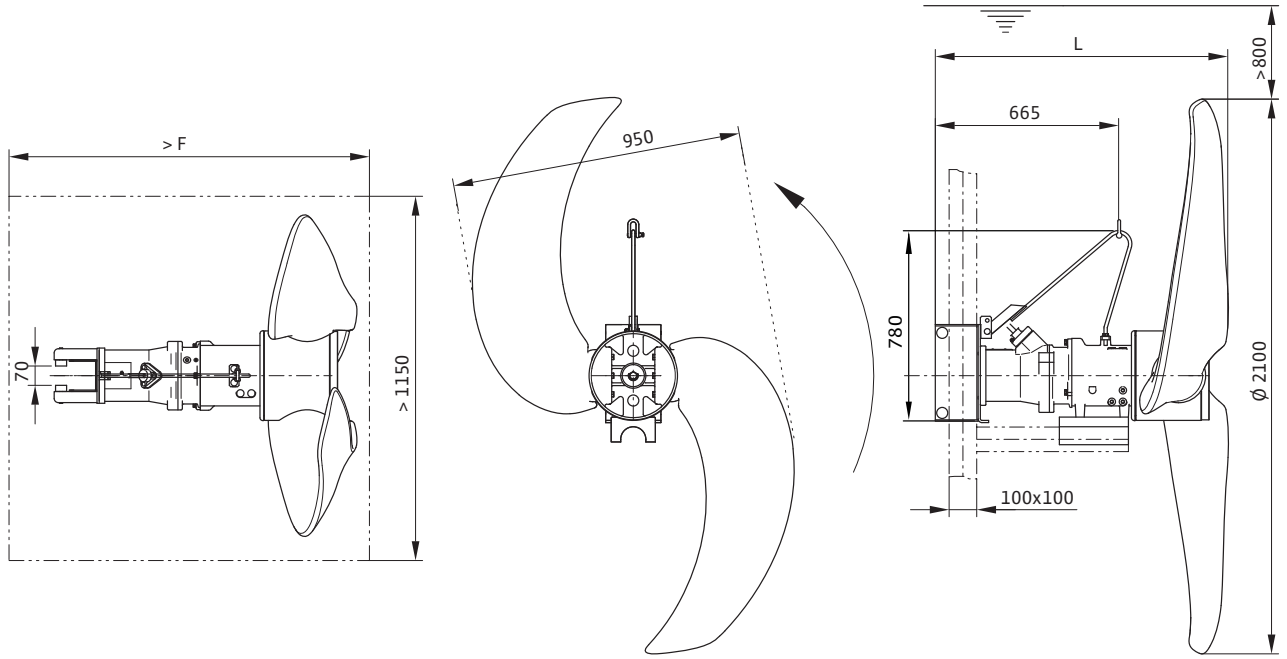
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 221

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 221...-.../8	1290	1140	178	200
TR 221...-.../12	1325	1175	188	205

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 221

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 221.25-8/8	0.7	25	29.227	670
TR 221.27-8/8	0.8	27	26.350	750
TR 221.30-8/8	1.0	30	24.056	870
TR 221.32-8/8	1.2	32	22.320	1000
TR 221.33-6/8	1.2	33	29.227	1120
TR 221.36-6/8	1.4	36	26.350	1360
TR 221.39-6/8	1.8	39	24.056	1630
TR 221.41-4/8V	2.2	41	34.658	1870
TR 221.45-4/8V	2.9	45	30.380	2300
TR 221.46-4/8	2.9	46	30.380	2280
TR 221.50-4/8	3.1	50	29.227	2340
TR 221.53-4/8	3.8	53	26.350	2760
TR 221.57-4/12	3.8	57	26.350	2900
TR 221.59-4/12	4.8	59	24.056	3400

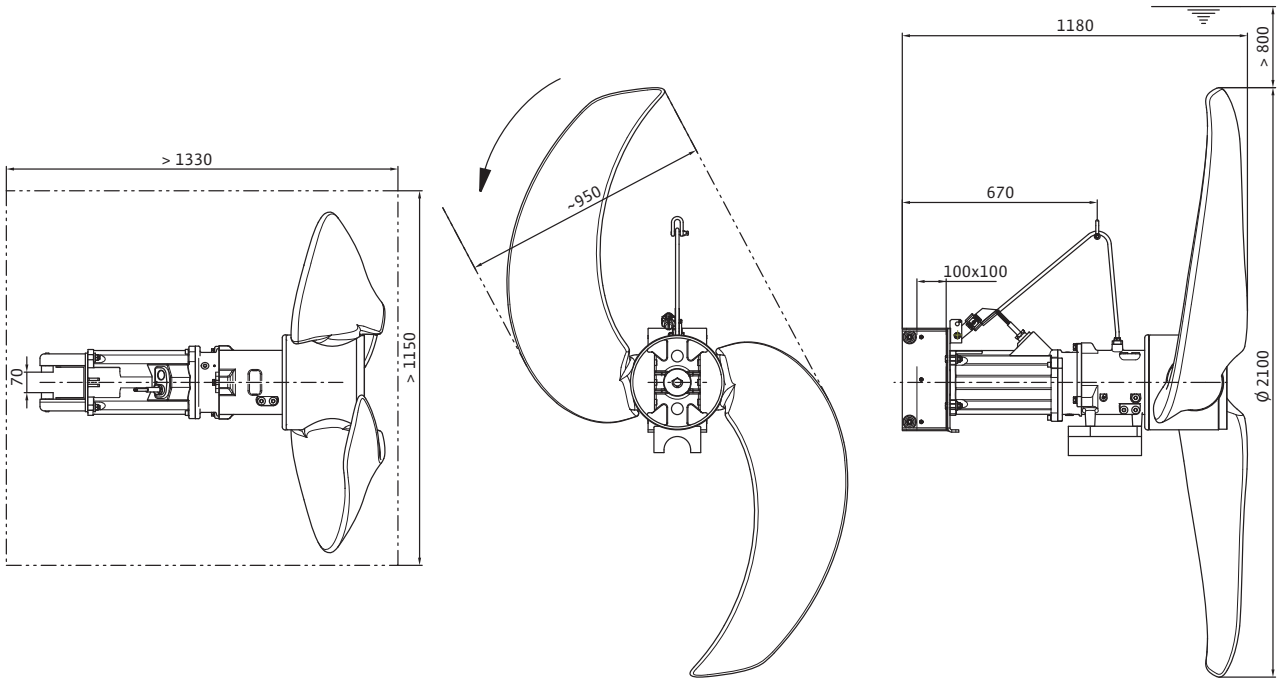
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•
T 17-8/8R (Ex)	1.1	1.7	3.2	14	5	700	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, - = not available

Dimensions Wilo-EMU TRE 221

Dimension drawing



Technical data, motor data Wilo-EMU TRE 221

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust	Weight	Max. weight*
	max. $P_{1.1}$	*n*		*F*	*Unit*	*M*
	kW	rpm		N	kg	
TRE 221.41-4/12	1.7	41	5.875	1650	194	211
TRE 221.46-4/12	2.5	46	5.105	2350	194	211
TRE 221.49-4/12	2.8	49	4.900	2400	194	211
TRE 221.50-4/12	3.0	50	4.714	2500	194	211
TRE 221.56-4/17	3.7	56	4.250	3000	200	217

* = maximum weight including accessories

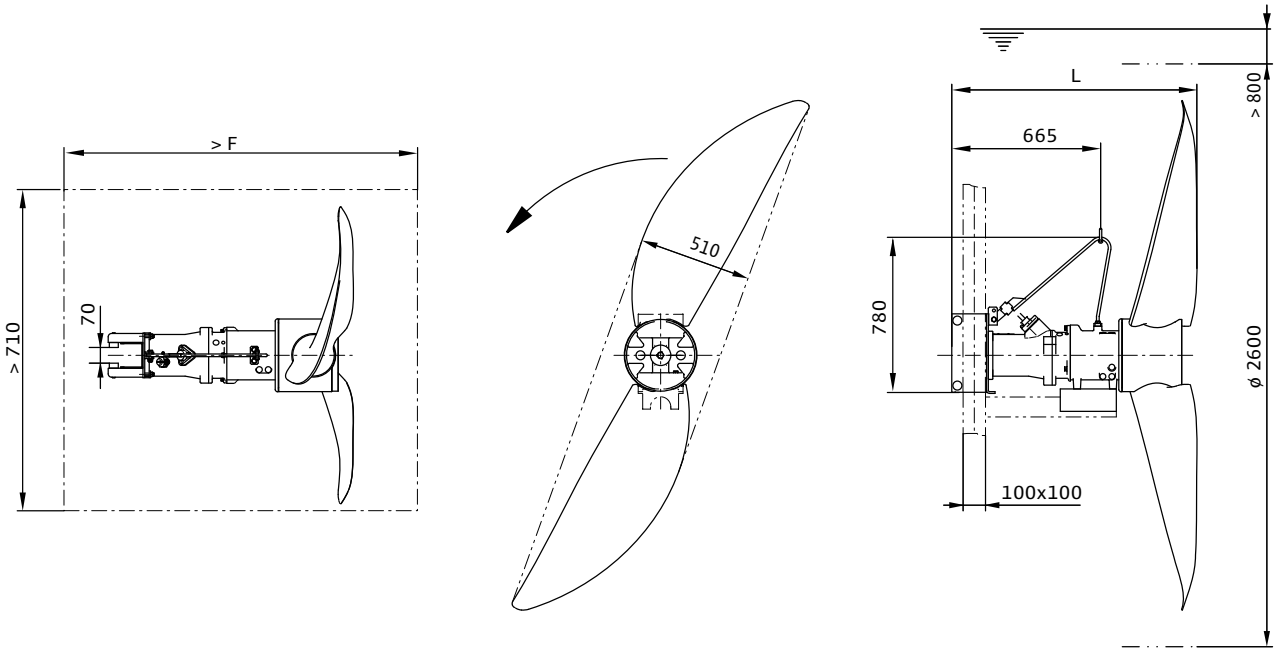
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	*P_1*	*I_N*	*I_A*		*n*	*FM*	*ATEX*
	kW		A			rpm		
TE 20-4/12R	3.0	3.5	6.3	49	17	1460	-	-
TE 20-4/17R	4.0	4.5	7.9	70	–	1461	-	-

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, - = not available

Dimensions, weights Wilo-EMU TR 226

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 226...-.../8	1210	1060	177	200
TR 226...-.../12	1245	1095	187	205

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 226

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 226.20-8/8	0.7	20	36.425	800
TR 226.23-8/8	0.9	23	30.380	1140
TR 226.24-8/8	1.0	24	29.227	1220
TR 226.27-8/8	1.2	27	26.350	1430
TR 226.29-6/8	1.4	29	33.046	1670
TR 226.31-6/8	1.7	31	30.380	1970
TR 226.32-6/8	1.8	32	29.227	2110
TR 226.35-4/8	2.5	35	40.740	2640
TR 226.35-4/8V	2.5	35	40.740	2620
TR 226.37-4/8	2.9	37	38.440	2830
TR 226.37-4/8V	2.8	37	38.440	2810
TR 226.41-4/8	3.6	41	34.658	3400
TR 226.41-4/12	3.7	41	34.658	3440
TR 226.43-4/8	4.0	43	33.046	3670
TR 226.43-4/12	4.1	43	33.046	3710

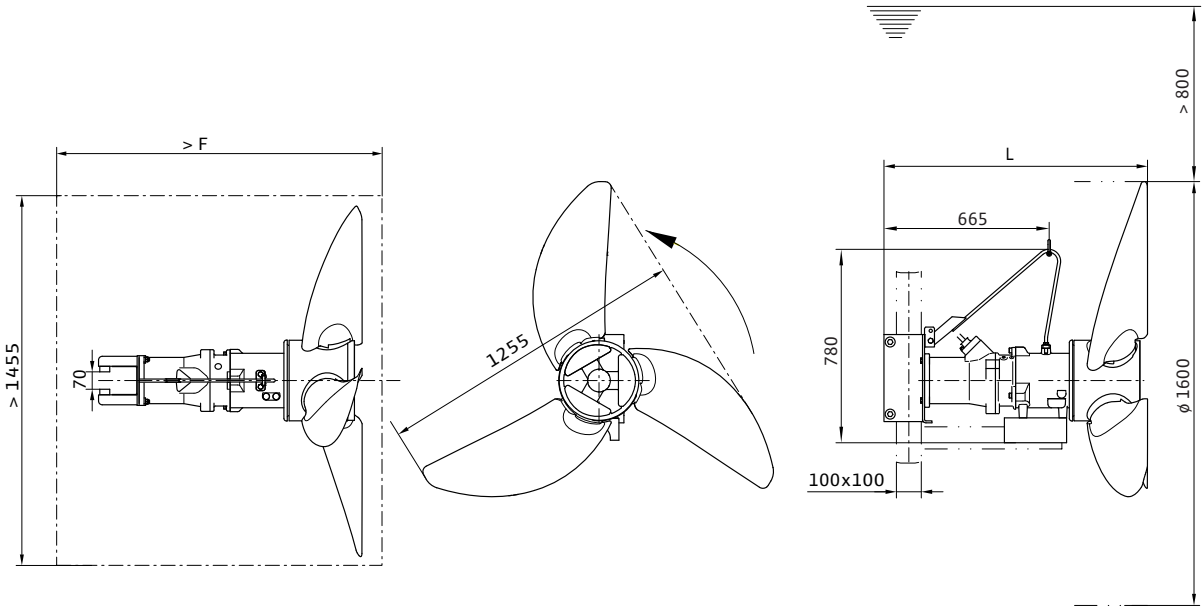
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•
T 17-8/8R (Ex)	1.1	1.7	3.2	14	5	700	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 316

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 316...-.../8	1175	1025	181	205
TR 316...-.../12	1210	1060	191	210

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 316

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 316.43-6/8	1.3	43	22.320	1090
TR 316.46-6/8	1.6	46	20.857	1230
TR 316.48-4/8V	1.9	48	30.380	1320
TR 316.50-4/8V	2.1	50	29.227	1420
TR 316.55-4/8V	2.6	55	26.350	1740
TR 316.60-4/8V	3.2	60	24.056	2060
TR 316.61-4/12	3.4	61	24.056	2100
TR 316.64-4/8V	3.8	64	22.320	2410
TR 316.65-4/12	3.7	65	22.320	2350
TR 316.68-4/12	4.4	68	20.857	2580
TR 316.72-4/12	5.2	72	19.635	3000

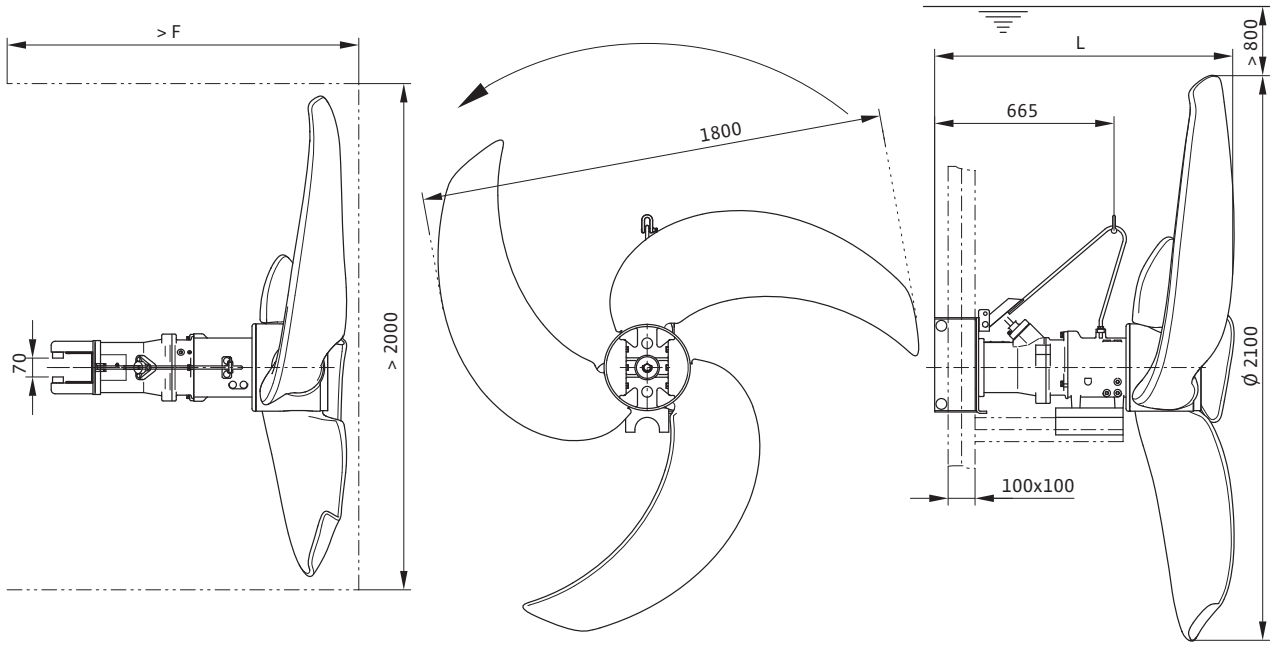
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions, weights Wilo-EMU TR 321

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 321...-.../8	1265	1115	199	215
TR 321...-.../12	1300	1150	209	220

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 321

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 321.23-8/8	0.8	23	30.380	740
TR 321.25-8/8	0.8	25	29.227	800
TR 321.28-8/8	1.0	28	26.350	950
TR 321.31-8/8	1.4	31	22.320	1250
TR 321.33-6/8	1.4	33	29.227	1390
TR 321.35-6/8	1.8	35	26.350	1650
TR 321.36-4/8V	1.9	36	40.740	1650
TR 321.39-4/8V	2.4	39	36.425	2000
TR 321.41-4/8	2.7	41	34.658	2190
TR 321.45-4/8	3.0	45	33.046	2450
TR 321.49-4/12	3.8	49	29.227	2950
TR 321.52-4/12	4.9	52	26.350	3500

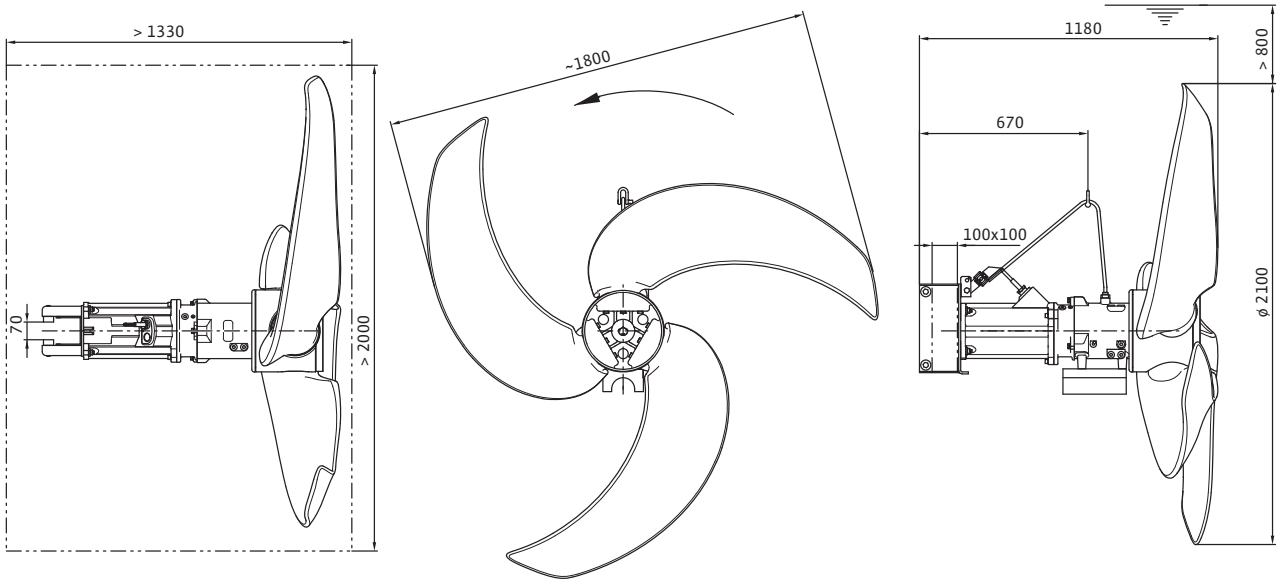
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	1400	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•
T 17-8/8R (Ex)	1.1	1.7	3.2	14	5	700	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

Dimensions Wilo-EMU TRE 321

Dimension drawing



Technical data, motor data Wilo-EMU TRE 321

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust	Weight	Max. weight*
	max. $P_{1.1}$	*n*		*F*	*Unit*	*M*
	kW	rpm		N	kg	
TRE 321.36-4/12	1.8	36	6.571	1730	215	232
TRE 321.41-4/12	2.2	41	5.875	1970	215	232
TRE 321.45-4/12	2.8	45	5.330	2350	215	232
TRE 321.50-4/17	3.5	50	4.714	3120	233	240

* = maximum weight including accessories

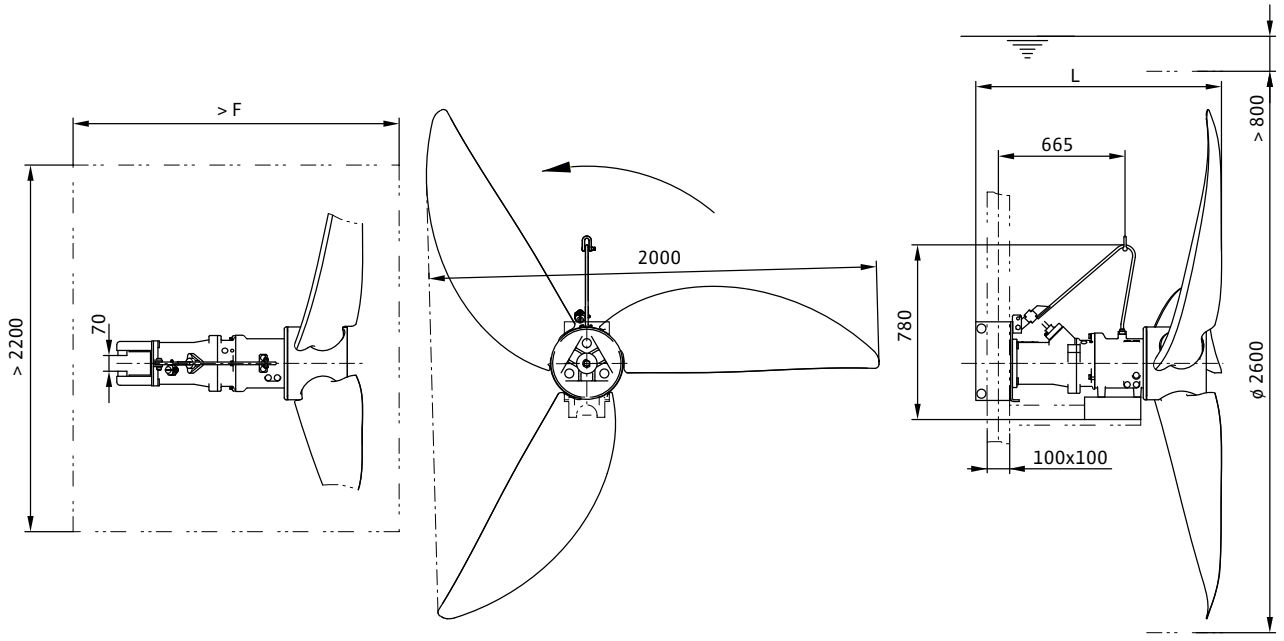
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current - direct	Starting current - star-delta	Nominal speed	Explosion protection according to	
	P_2	*P_1*	*I_N*	*I_A*		*n*	*FM*	*ATEX*
	kW		A			rpm		
TE 20-4/12R	3.0	3.5	6.3	49	17	1460	-	-
TE 20-4/17R	4.0	4.5	7.9	70	–	1461	-	-

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, - = not available

Dimensions, weights Wilo-EMU TR 326

Dimension drawing



Dimensions, weights

Wilo-EMU...	Dimensions		Weight	Max. weight*
	F	*L*	*Unit*	*M*
	mm		kg	
TR 326...-.../8	1210	1060	197	215
TR 326...-.../12	1245	1095	207	220

* = maximum weight including accessories

Technical data, motor data Wilo-EMU TR 326

Technical data

Wilo-EMU...	Power consumption	Propeller speed	Transmission ratio	Max. thrust
	max. $P_{1.1}$	*n*		*F*
	kW	rpm		N
TR 326.24-6/8	1.1	24	40.740	1390
TR 326.26-6/8	1.4	26	36.425	1720
TR 326.29-6/8	1.7	29	33.046	2040
TR 326.30-6/8	2.1	30	30.380	2260
TR 326.31-4/8	2.2	31	46.500	2330
TR 326.35-4/8	3.1	35	40.740	2990
TR 326.37-4/8	3.5	37	38.440	3330
TR 326.39-4/8	3.9	39	36.425	3600
TR 326.41-4/12	4.4	41	34.658	4030

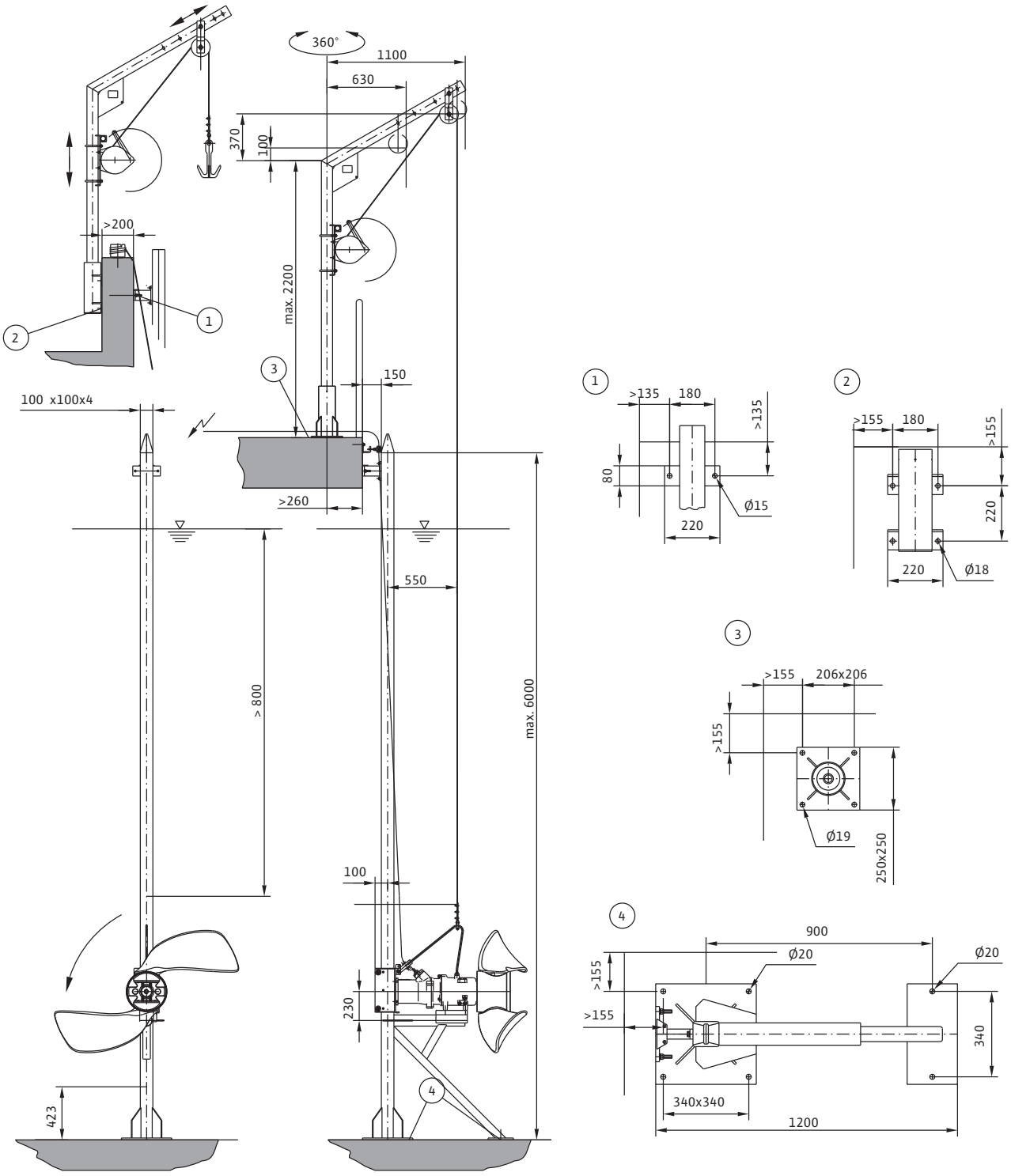
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm		
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	1410	•	•
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	1405	•	•
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	915	•	•

The value $P_{1.1}$ corresponds 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 measured in accordance with ISO 21630; thrust and power values vary for mixers with ceram propeller coatings.
• = available, – = not available

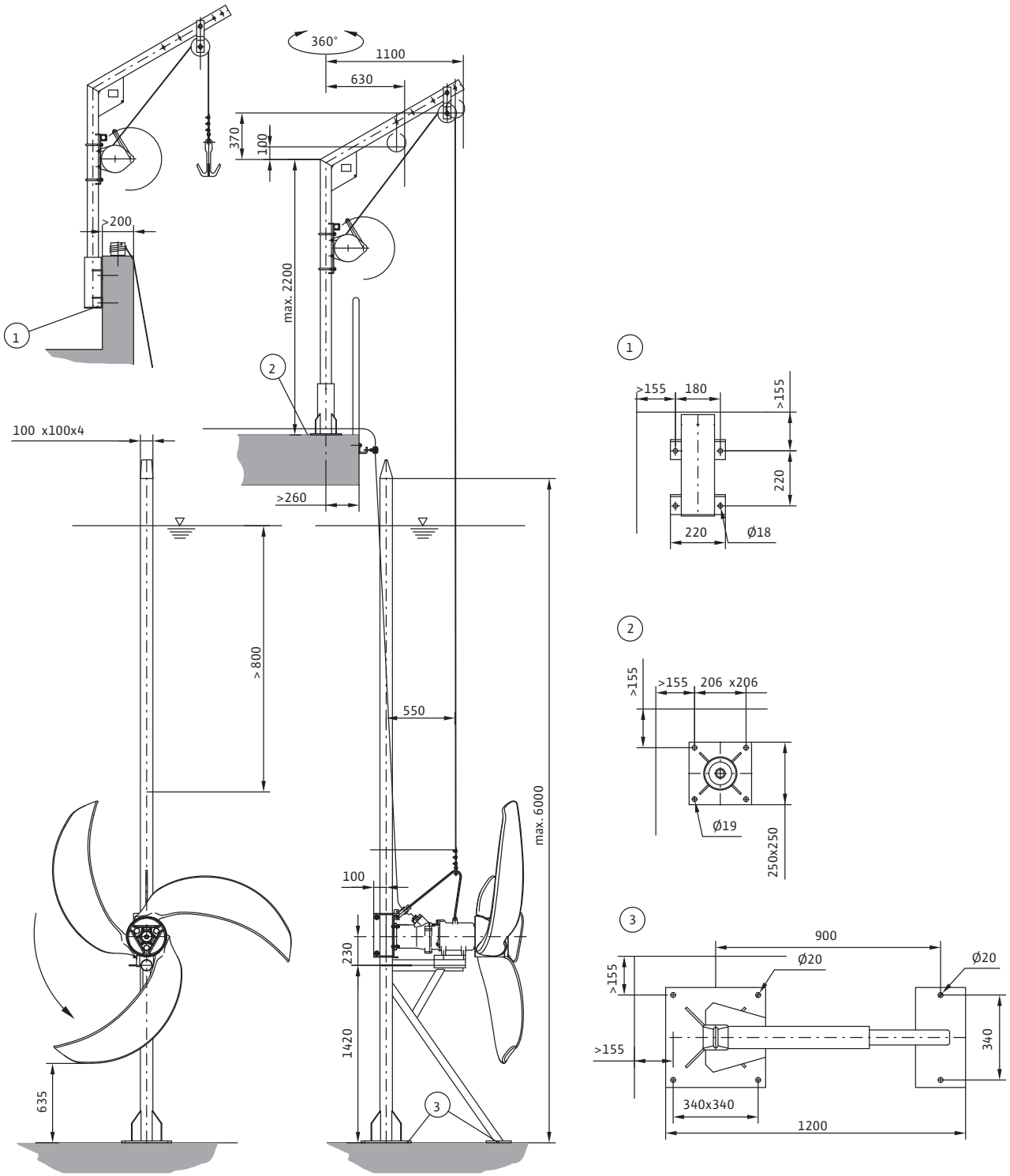
Installation example

Wilo-EMU Maxiprop mixer with lowering device AVMSH

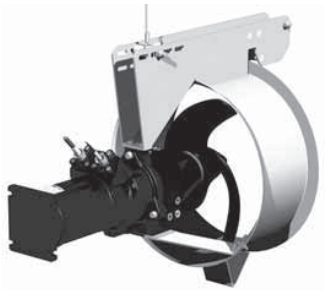
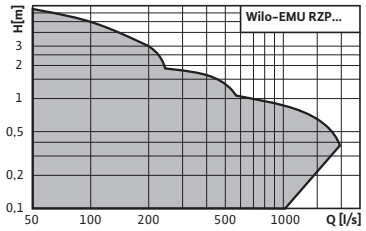
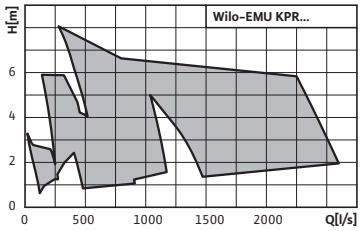


Installation example

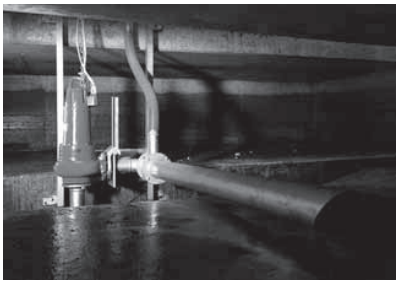
Wilo-EMU Megaprop mixer with lowering device AVMS



Series overview

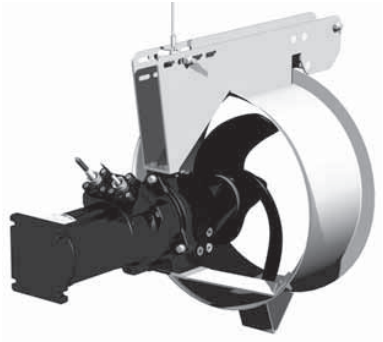
Series	**Wilo-EMU RZP 20... – RZP 80-2...**	**Wilo-EMU KPR**
Product photo		
Duty chart		
Design	Submersible mixers with flow housing, directly driven (RZP 20, RZP 25-2..., RZP 40...) or with single-stage planetary gear (RZP 50-3..., RZP 60-3..., RZP 80-2...)	Axial submersible pump with dry motor for use in pipe sumps
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	• For pumping cooling water or rainwater • Pumping of purified sewage • For irrigation and pumping sludge.
Q_{max}	6800 m^3/h	9500 m^3/h
H_{max}	1.1 m	8.4 m
Special features/ product advantages	• Vertical or in-line construction • Self-cleaning propeller in part with helix hub • Propeller in steel or PUR version • ATEX and FM versions	• Submersible • Special materials and coatings against abrasion and corrosion • Longitudinally watertight cable inlet • Angle of propeller blades adjustable by hand
Further information	Series information from page 84 Wilo online catalogue at www.wilo.de	Series information from page 138

Series overview

Series	**Wilo-EMU SR**
Product photo	
Design	Jet cleaner for cleaning the rain spillway basin
Application	• For cleaning the rain spillway basin even during the emptying phase. • For reducing the build-up of slime by injecting air • For agitating the organic and inorganic materials
Max. circulation power	200 m^3
Special features/ product advantages	• With a submersible sewage pump • This can be operated even during the filling phase • It can be installed in new and existing basins • The rainwater that is present is used for cleaning • Oxygen is injected via a separate suction pipe during operation • The length of the jet pipe and air suction pipe can be adjusted individually • For agitating the organic and inorganic materials in rainwater • Oxygen injection reduces the build-up of slime when water is standing for long period in the rainwater basin
Further information	Series information from page 156

Series description Wilo-EMU RZP 20... – RZP 80-2...

Wilo-EMU RZP 20... – RZP 80-2...



Design
Submersible mixers with flow housing, directly driven (RZP 20, RZP 25-2..., RZP 40...) 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 advantages
- Vertical or in-line construction
- Self-cleaning propeller in part with helix hub
- Propeller in steel or PUR version
- ATEX and FM versions

Technical data
- Mains connection: 3~400 V, 50 Hz
- Submerged operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 40 °C
- Units or directly driven or with single-stage planetary gear
- Mechanical shaft seal with SiC/SiC pairing
- Permanently lubricated roller bearings
- Max. immersion depth: 20 m

Equipment/function
- Stationary installation directly at the flow pipe
- Flexible installation via lowering device
- Vertical or in-line installation possible

Materials
- Housing parts: EN-GJL-250
- Propeller: PUR or stainless steel 1.4571
- Propeller hub: Stainless steel 1.4571
- Screwed connections: Stainless steel 1.4301 or 1.4571
- Gear shaft: Stainless steel 1.4462 (RZP 50-3, RZP 60-3, RZP 80-2)
- Flow housing: Stainless steel 1.4571

Description/design
Propeller
2-, 3- or 4-blade propeller with a nominal propeller diameter of 200 mm to 800 mm. Entwining-free design made possible by backward-curved incoming flow edge . Propeller up to a diameter of 400 mm have a patented helix hub.

Motor
Wilo-submersible motor of the T-series with standard connection for an easy and efficient adaptation of the motor output. 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.

Seal
RZP 20 ... 40

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 ensures long-term corrosion-protected fit of the mechanical seal.

Series description Wilo-EMU RZP 20... – RZP 80-2...

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 prechamber 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 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 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 sensor
- External sealing chamber control
- Ceram C0 coating
- Ex-rated to ATEX or FM

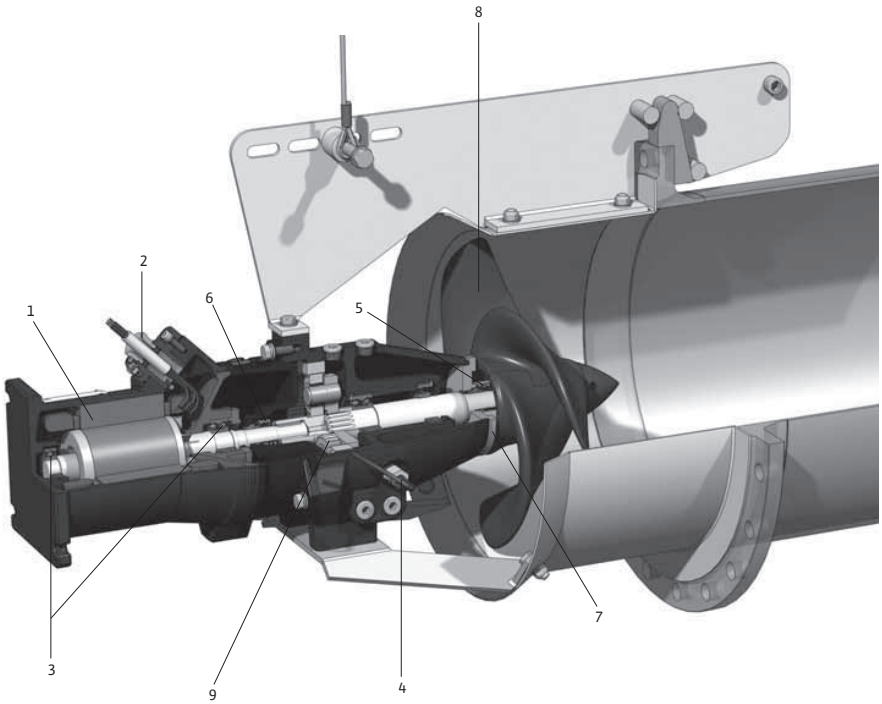
Scope of delivery
- Recirculation pump with mounted propeller, flow housing and cable
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

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.

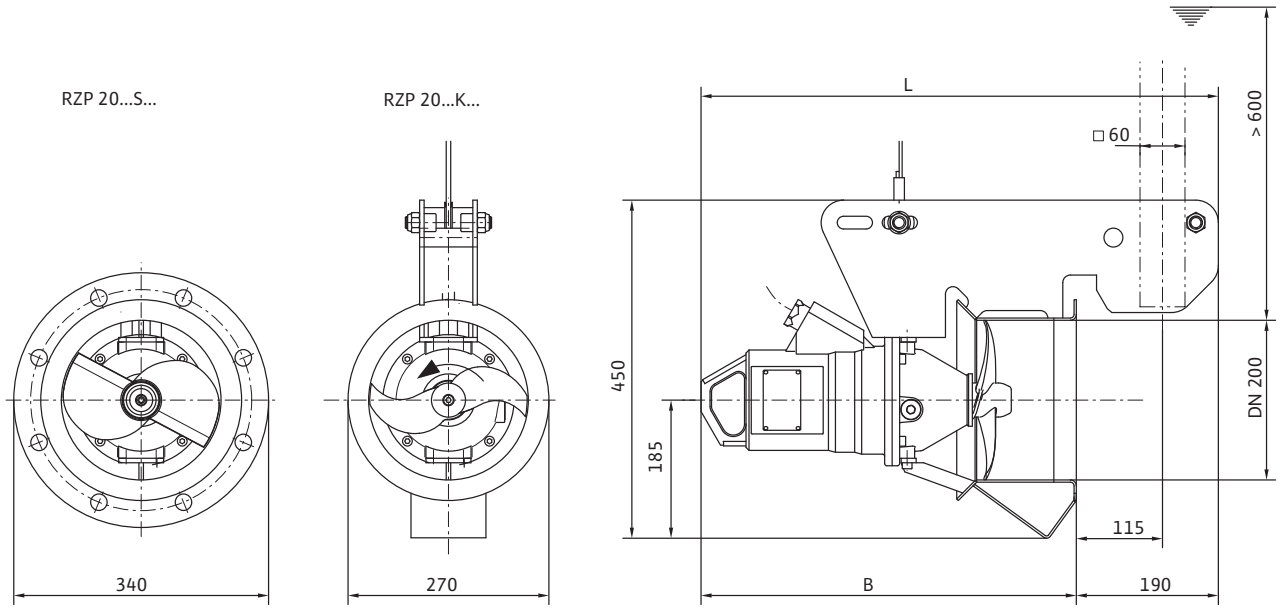
Accessories
- Lowering device
- Auxiliary hoisting gear
- Special fastening pieces for the use of an auxiliary hoisting gear for multiple units
- Additional rope anchoring
- Fixation sets with anchor bolts
- In-line version



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

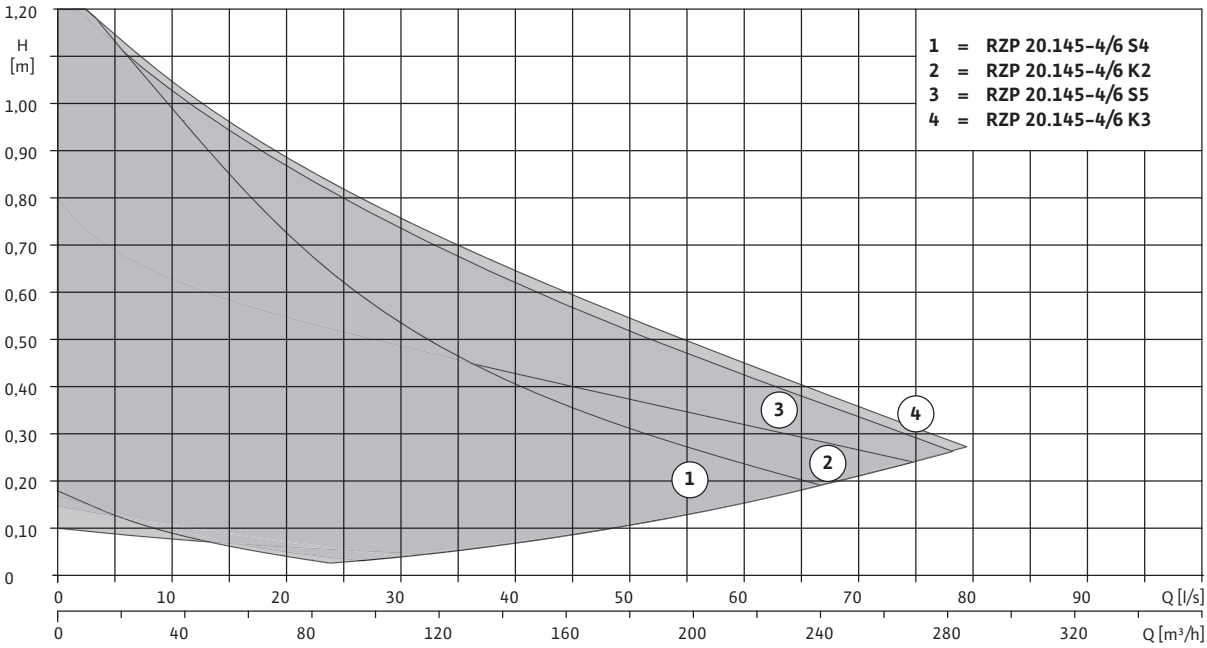


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 20...-.../6 K...	500	690	35
RZP 20...-.../6 S...	500	690	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

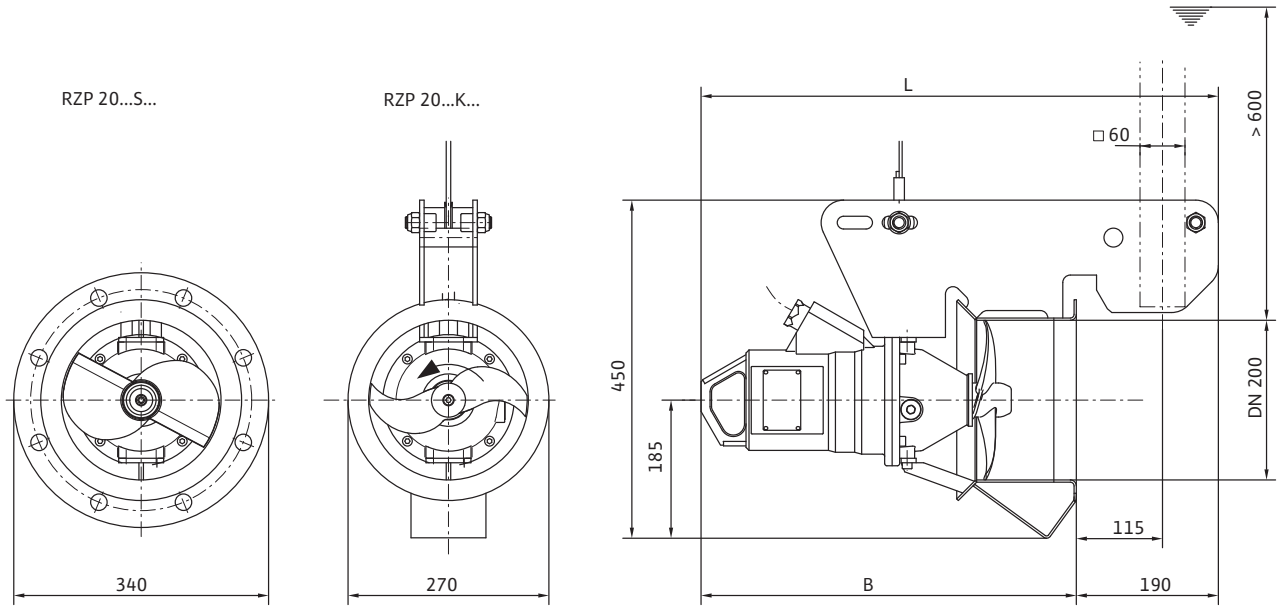
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 12-4/6 (Ex)	0.5	0.7	1.42	6	2	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

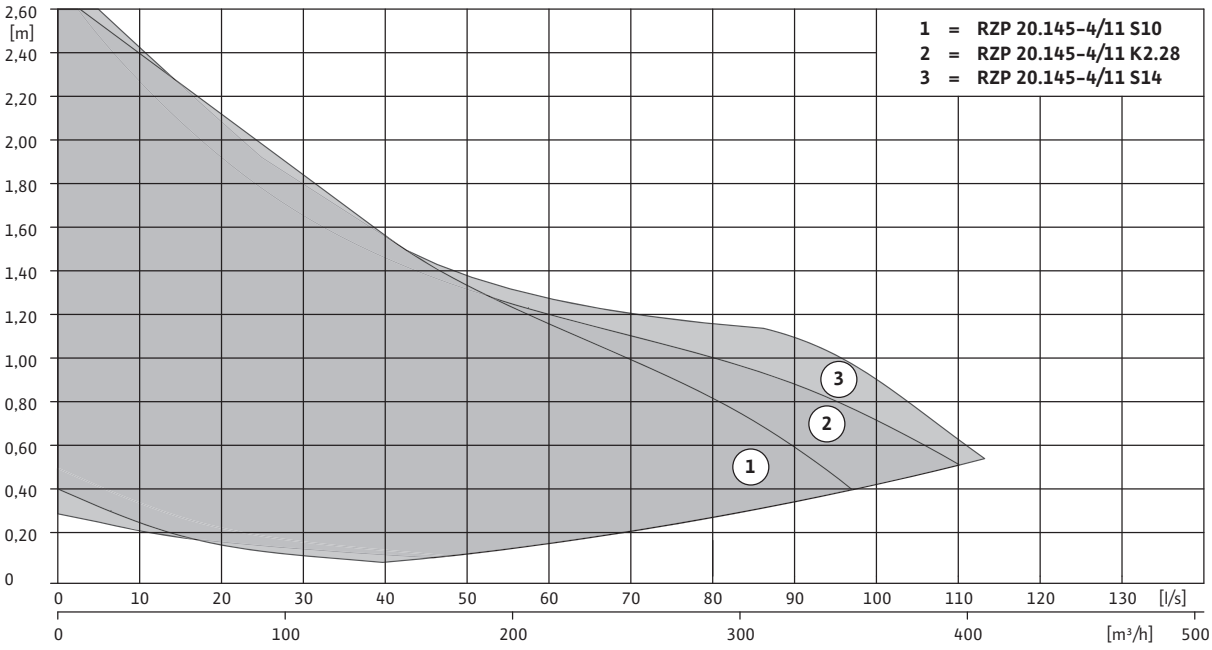


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 20...-.../11 K...	596	786	41
RZP 20...-.../11 S...	596	786	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

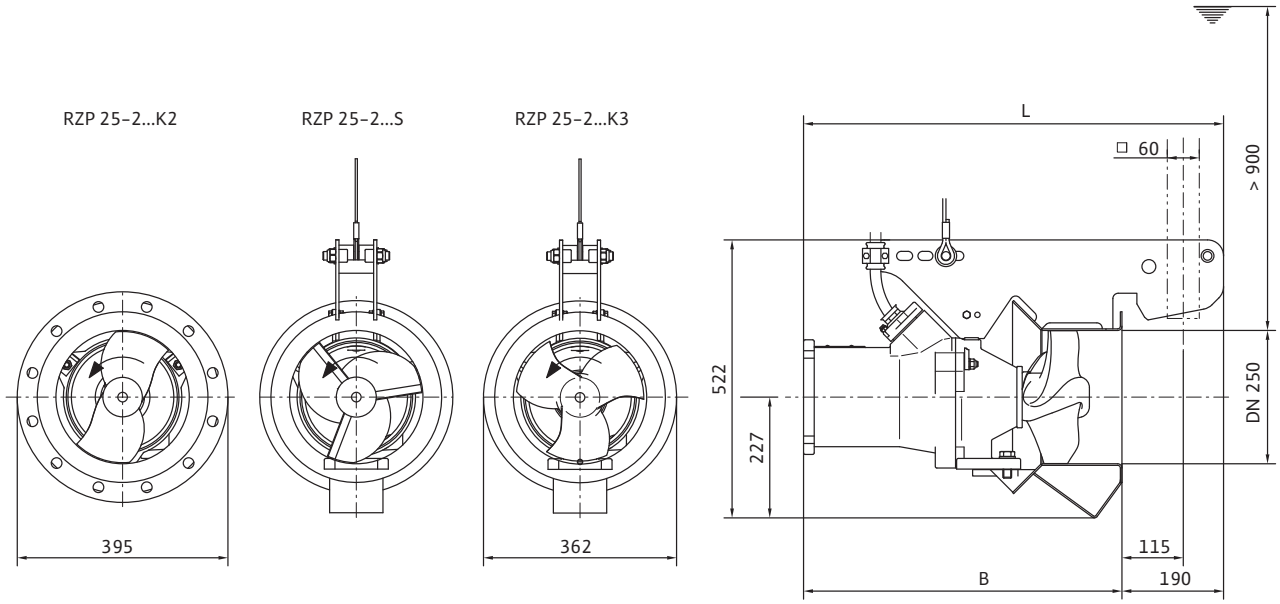
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 12-4/11 (Ex)	1.3	1.7	3.3	16	6	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

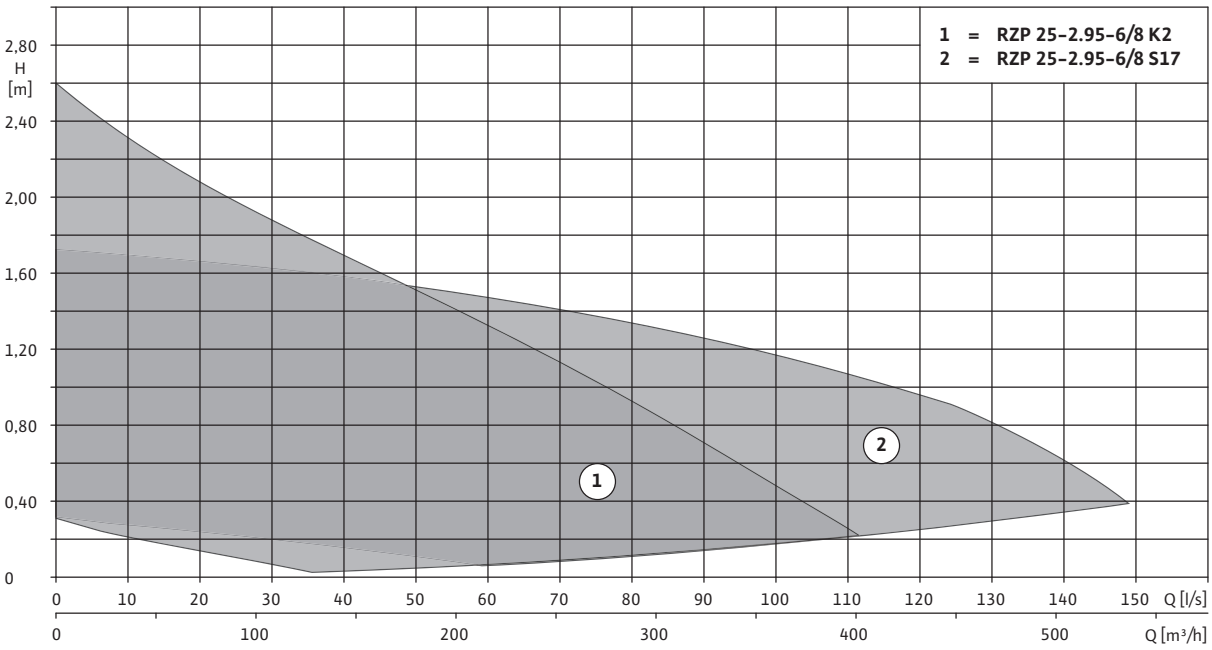


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../8 K...	562	752	65
RZP 25-2...-.../8 S...	562	752	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

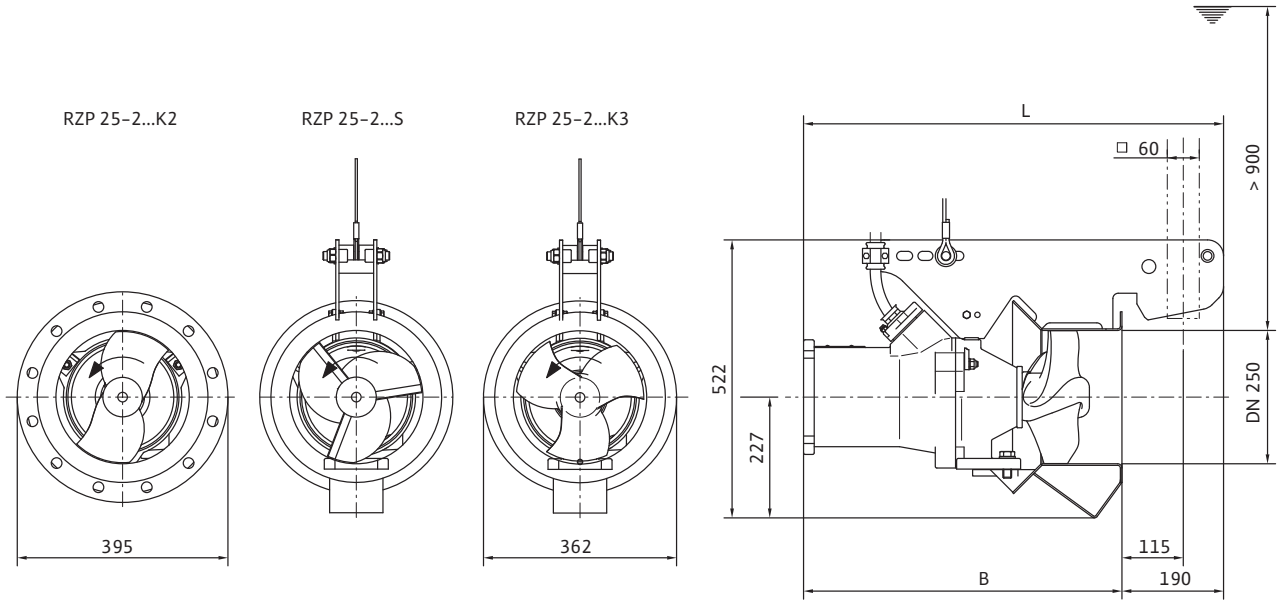
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-6/8R (Ex)	1.8	2.5	4.45	17	6	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

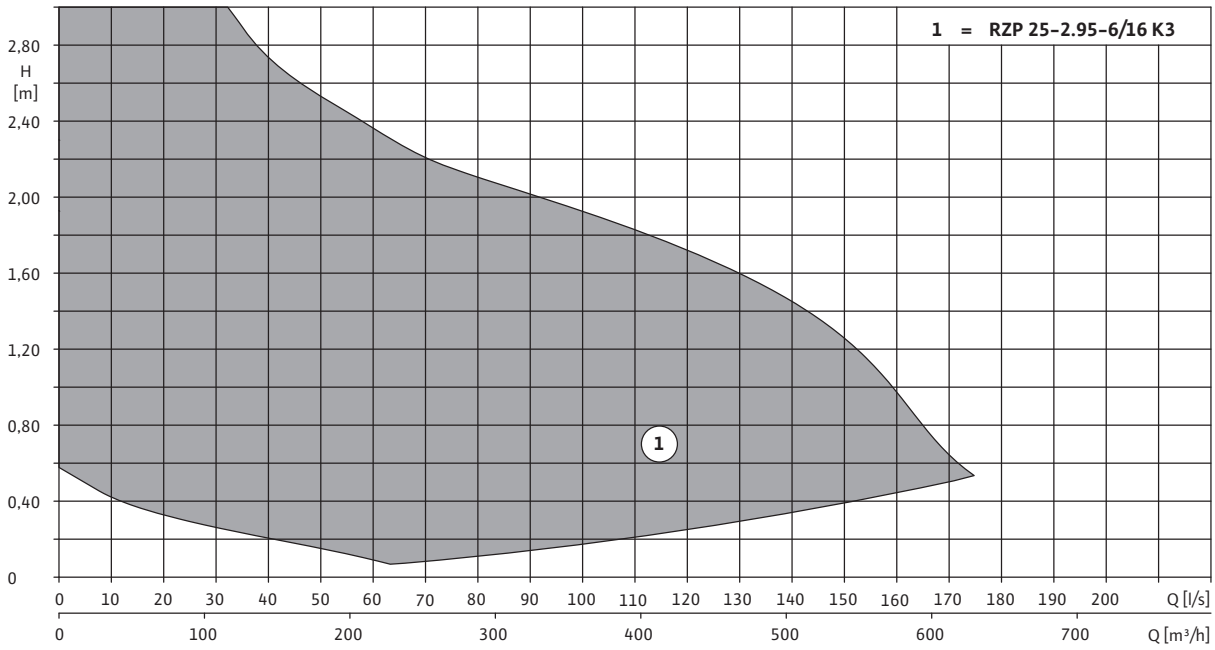


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../16 K...	635	825	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

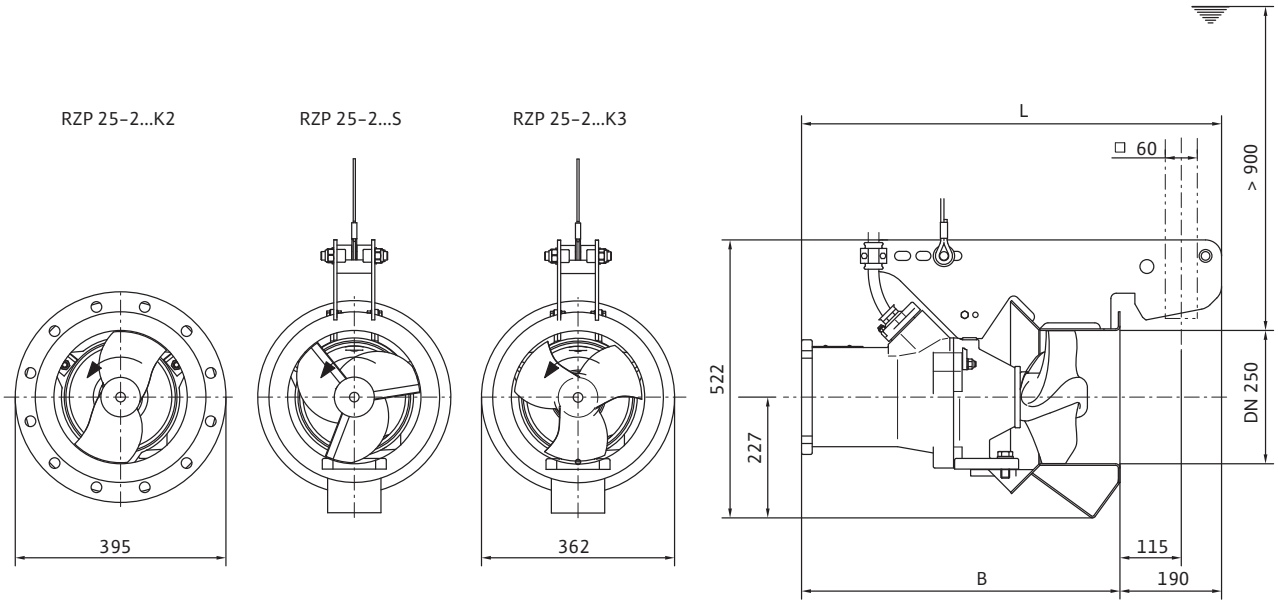
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-6/16R (Ex)	3.7	5.2	9.1	39	13	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

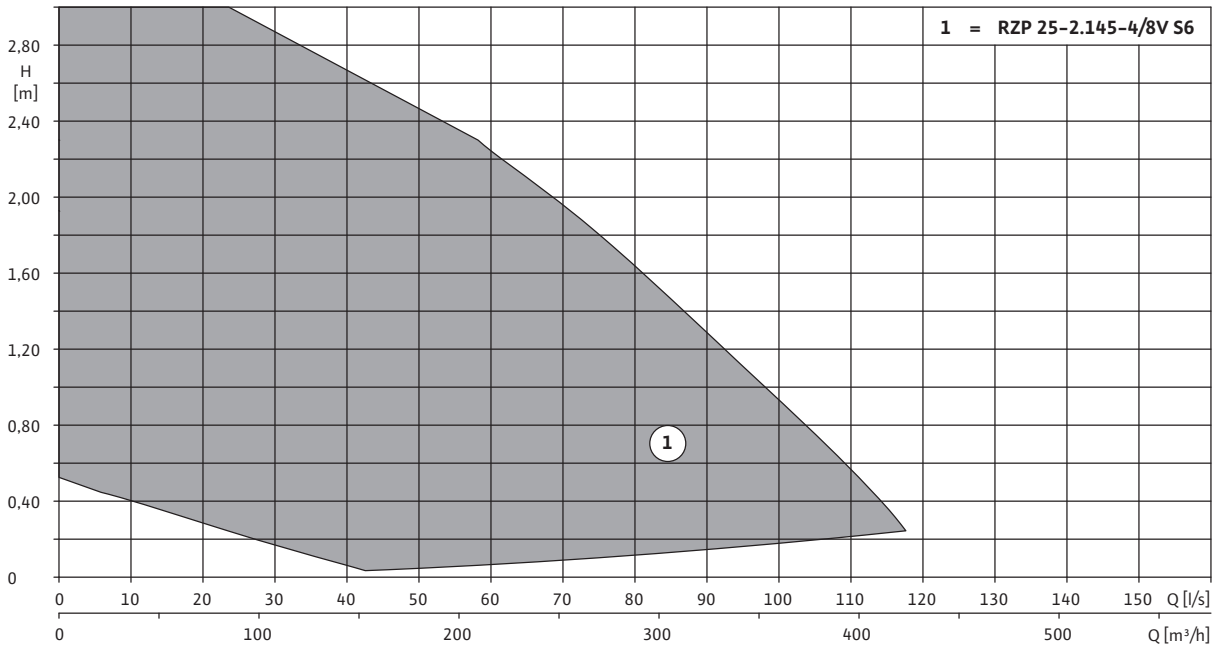


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../8 S...	562	752	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

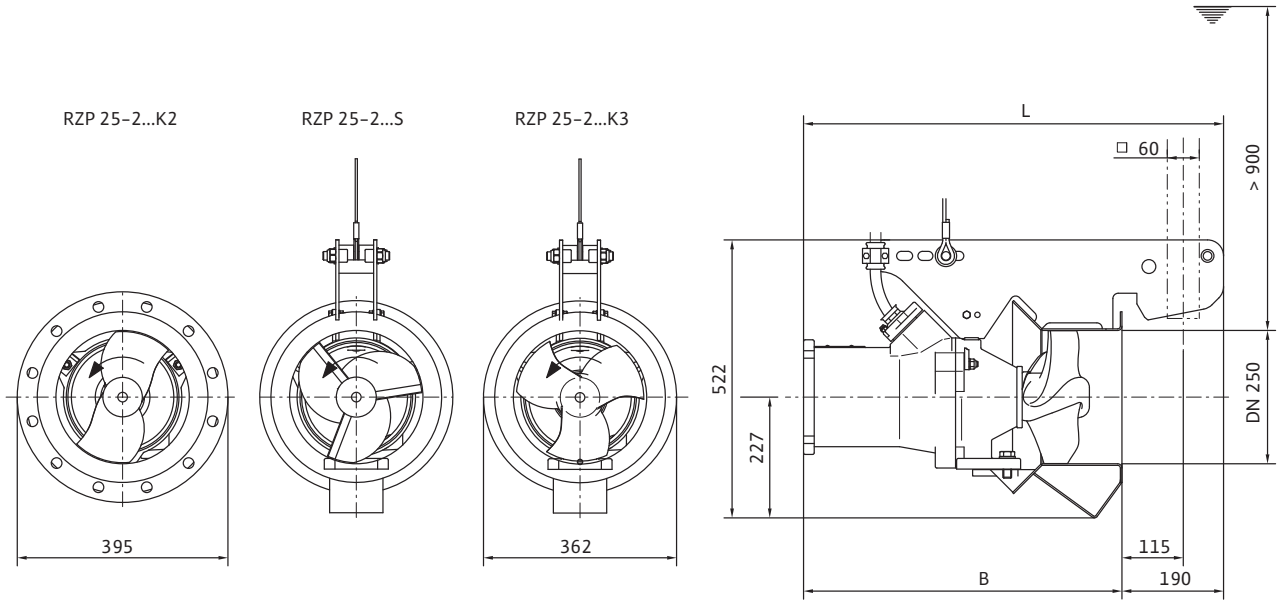
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/8V (Ex)	2.5	3.5	5.9	28	10	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

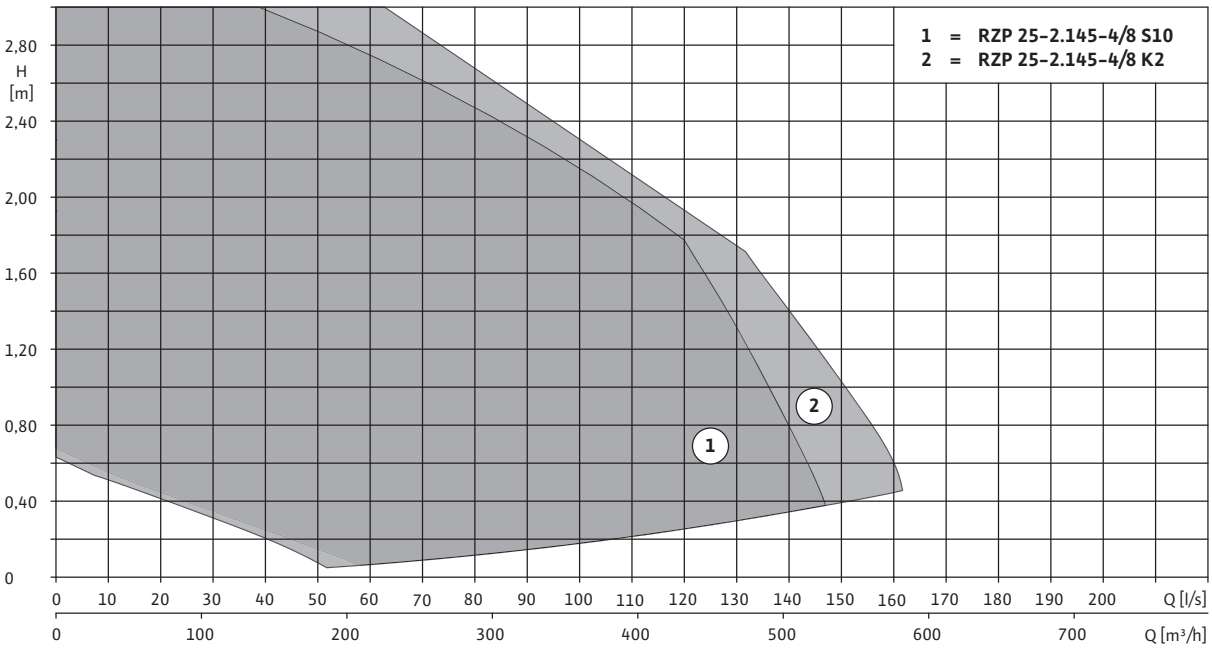


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../8 K...	562	752	67
RZP 25-2...-.../8 S...	562	752	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

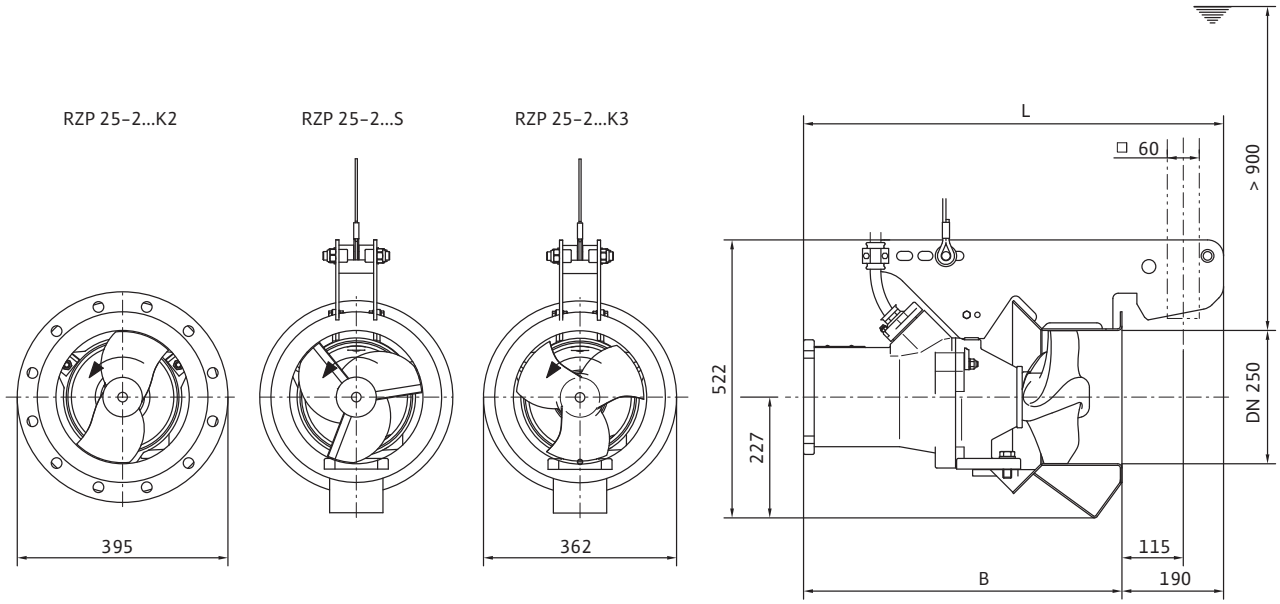
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	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

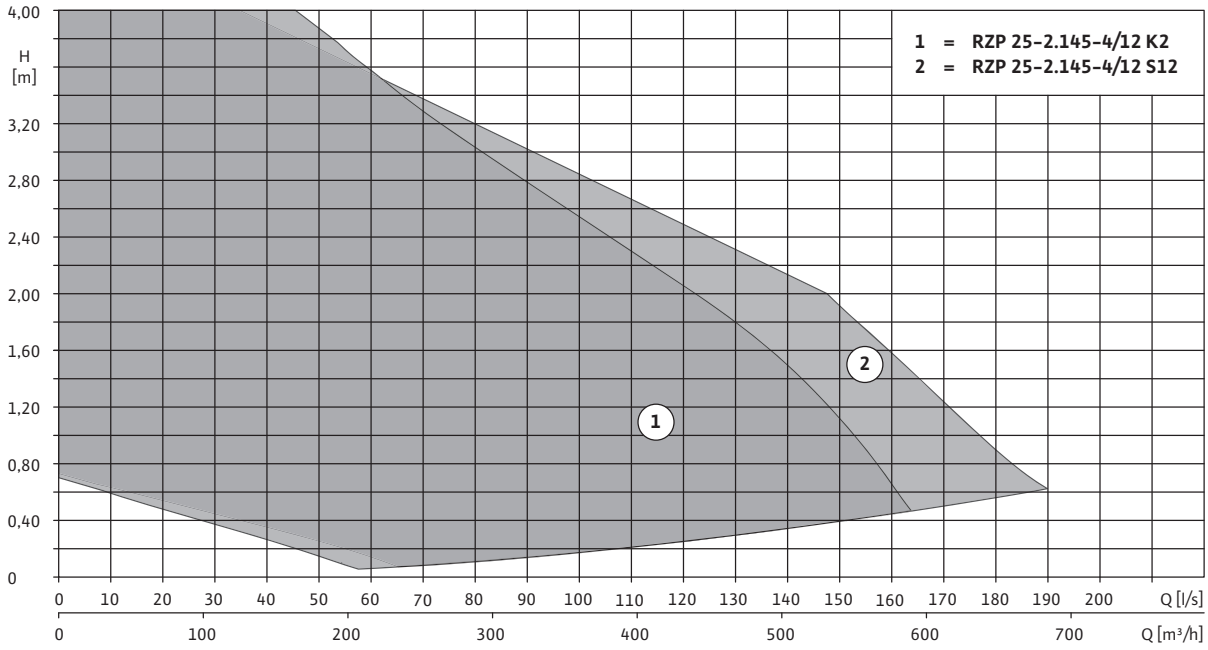


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../12 K...	597	787	73
RZP 25-2...-.../12 S...	597	787	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

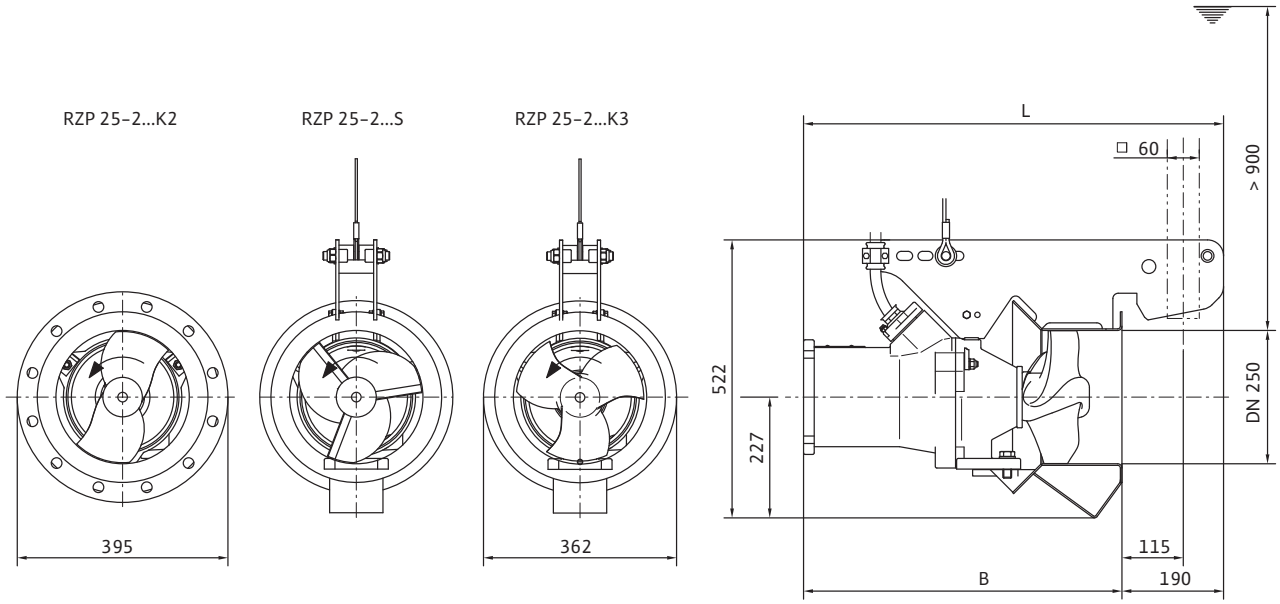
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	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

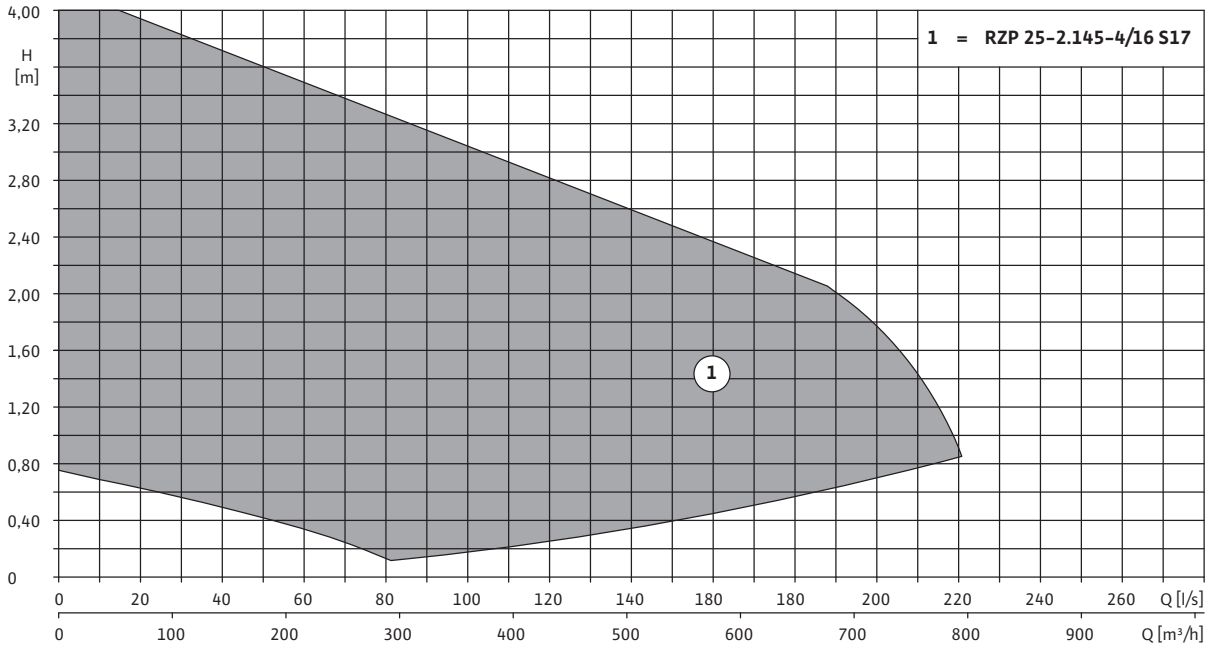


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../16 S...	635	825	89

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

Pump curves



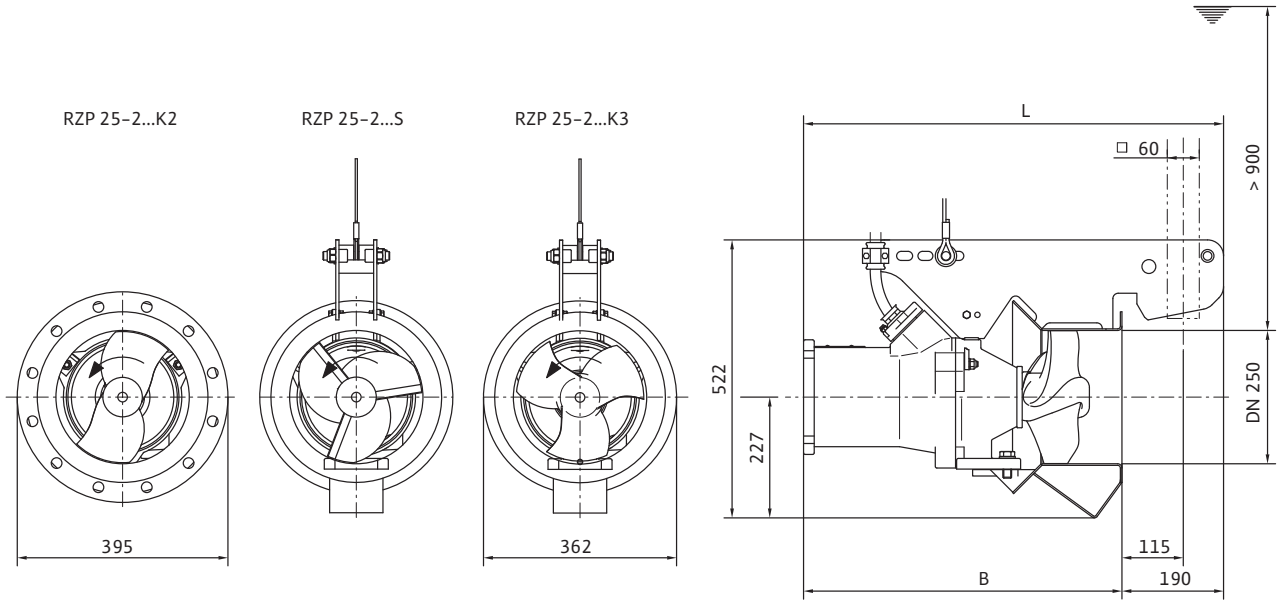
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	–
	rpm	–
RZP 25-2.145-4/16 S17	1400	1.000

Motor data								
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Starting current – direct**	**Starting current – star-delta**	**Nominal speed**	**Explosion protection according to**	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	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

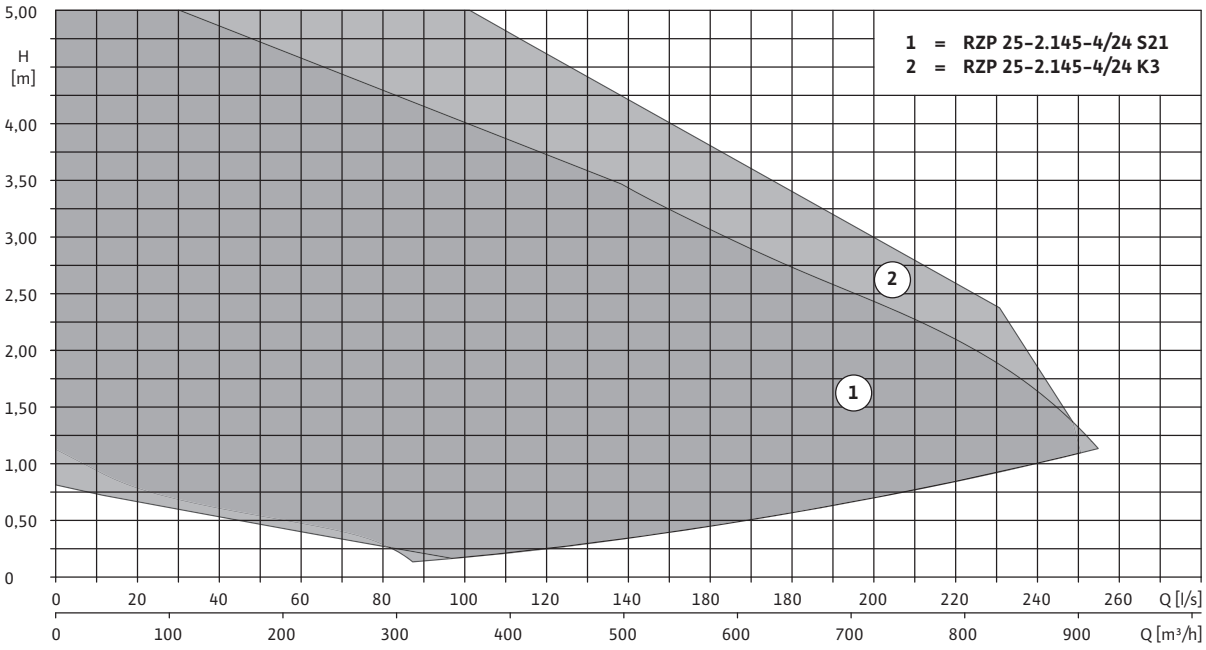


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 25-2...-.../24 K...	715	905	101
RZP 25-2...-.../24 S...	715	905	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

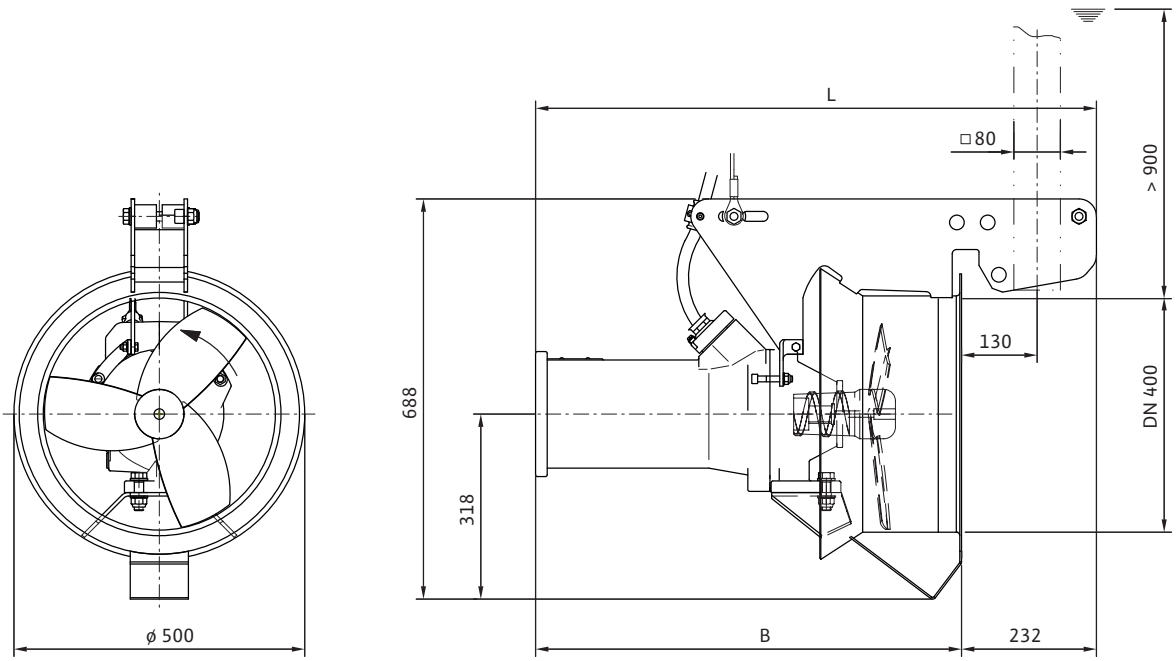
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/24R (Ex)	10.0	12.2	21	123	41	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 40...8/16

Dimension drawing

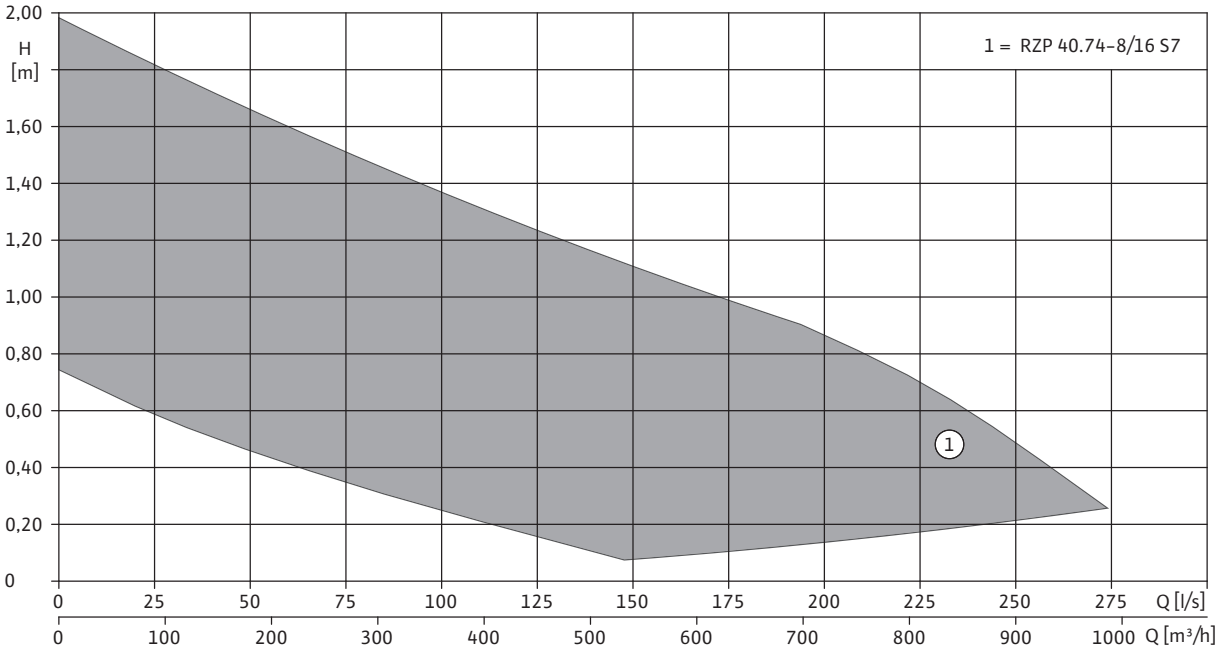


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 40...-.../16 S...	652	884	101

Technical data, motor data Wilo-EMU RZP 40...8/16

Pump curves



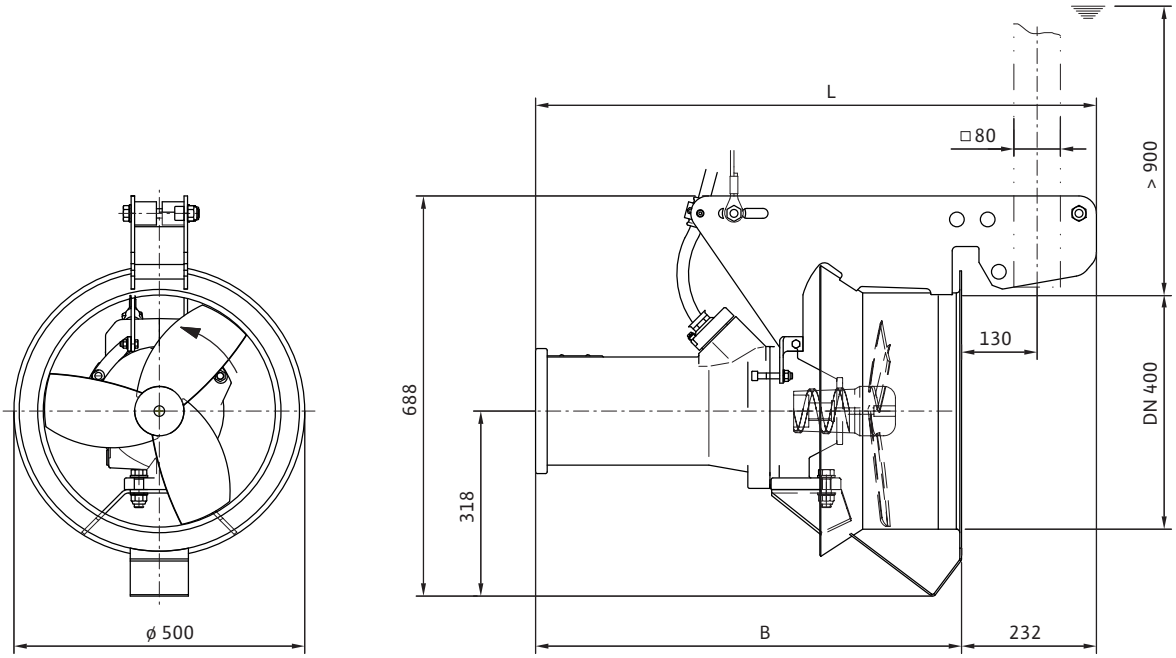
Technical data		
Wilo-EMU...	**Propeller speed**	**Transmission ratio**
	n	–
	rpm	–
RZP 40.74-8/16 S7	710	1.000

Motor data								
Wilo-EMU...	**Nominal motor power**	**Power consumption**	**Nominal current**	**Starting current – direct**	**Starting current – star-delta**	**Nominal speed**	**Explosion protection according to**	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-8/16R (Ex)	2.8	4.0	7.4	36	12	710	•	•

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 40...8/24

Dimension drawing

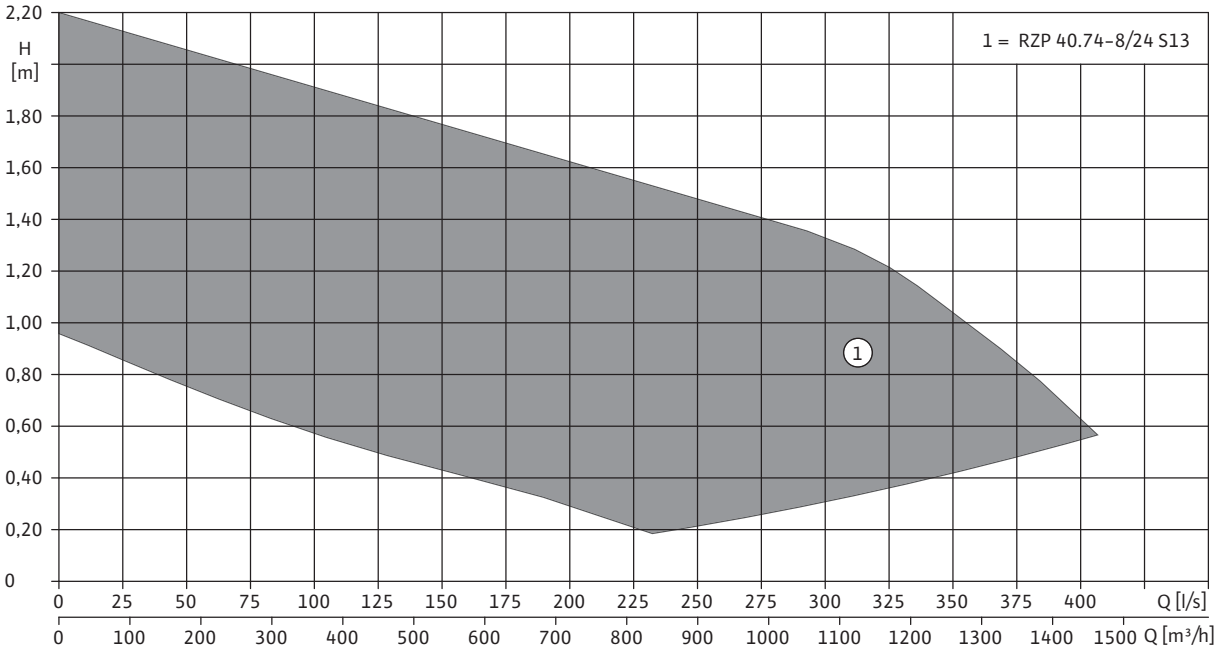


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 40...-.../24 S...	732	964	115

Technical data, motor data Wilo-EMU RZP 40...8/24

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	rpm	–
RZP 40.74-8/24 S13	705	1.000

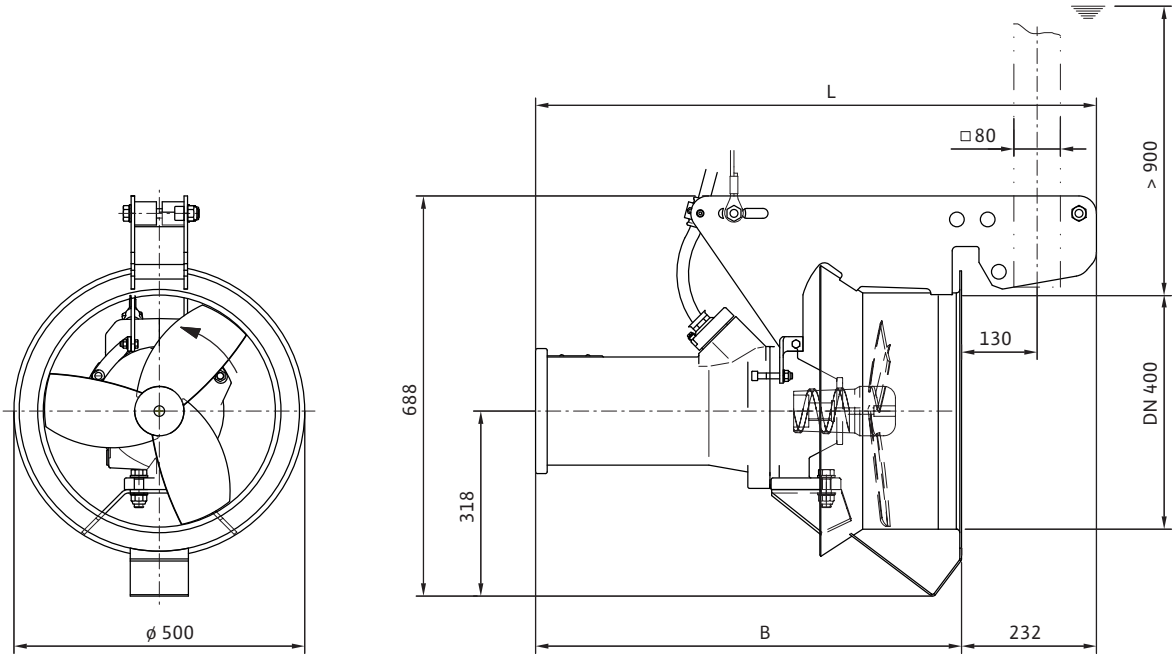
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-8/24R (Ex)	5.1	7.7	14.3	63	21	705	•	•

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 40...6/24

Dimension drawing

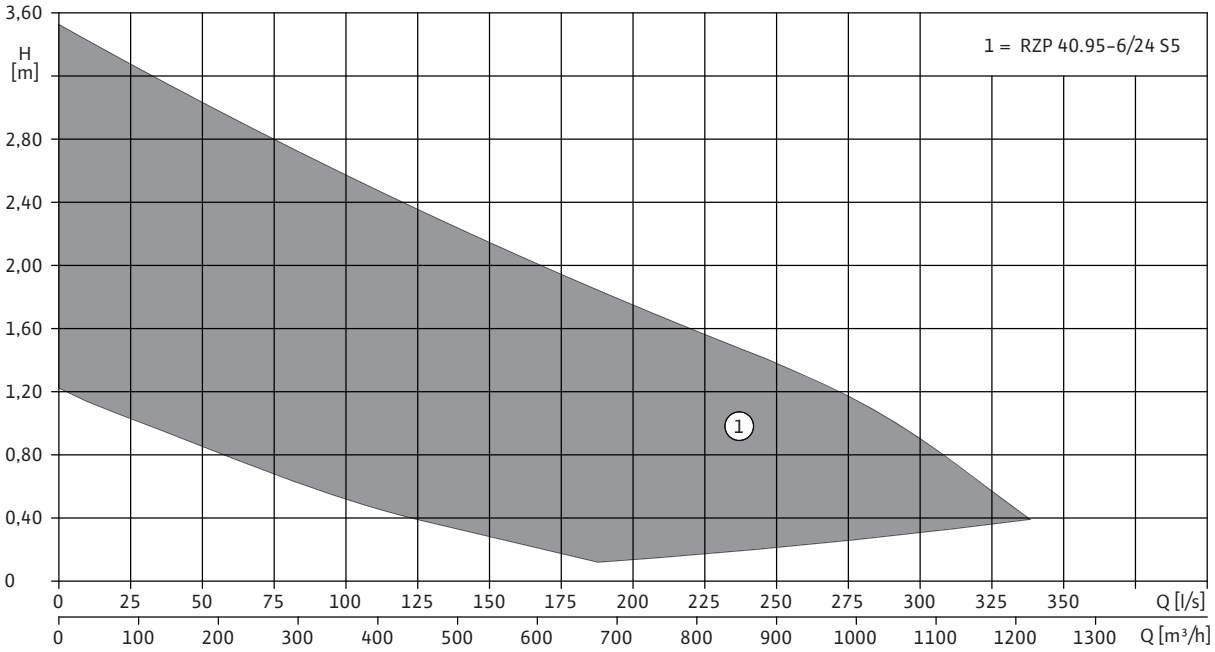


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 40...-.../24 S...	732	964	115

Technical data, motor data Wilo-EMU RZP 40...6/24

Pump curves



Technical data

Wilo-EMU...	Propeller speed	Transmission ratio
	n	–
	rpm	–
RZP 40.95-6/24 S5	927	1.000

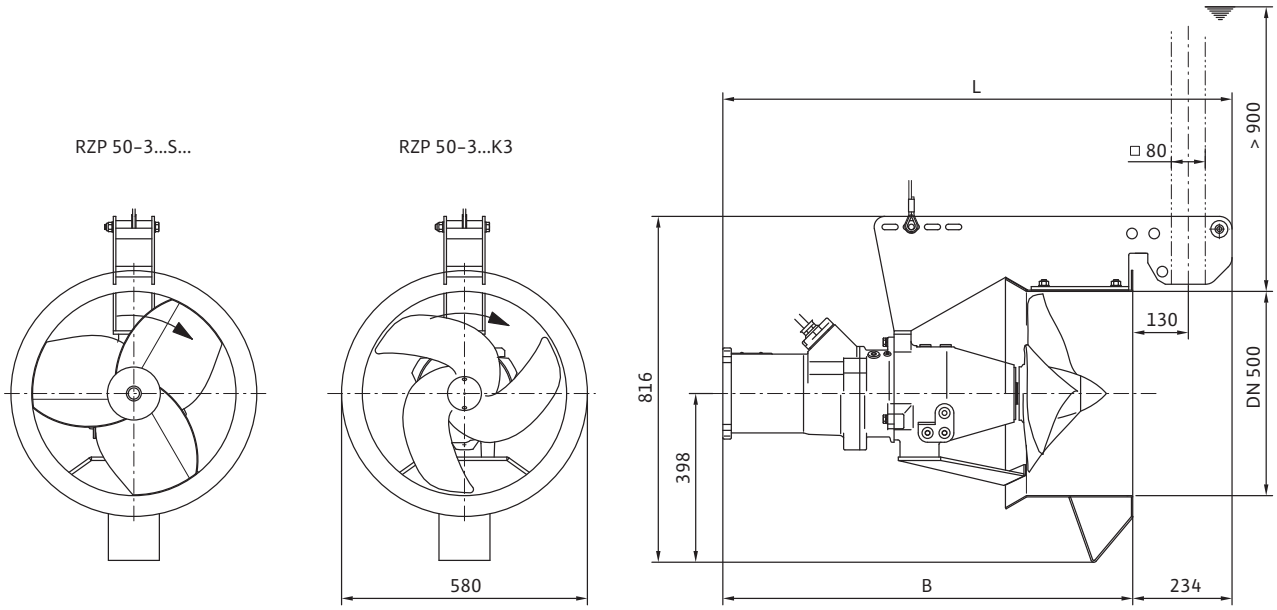
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-6/24R (Ex)	6.0	7.7	13.6	65	22	927	•	•

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

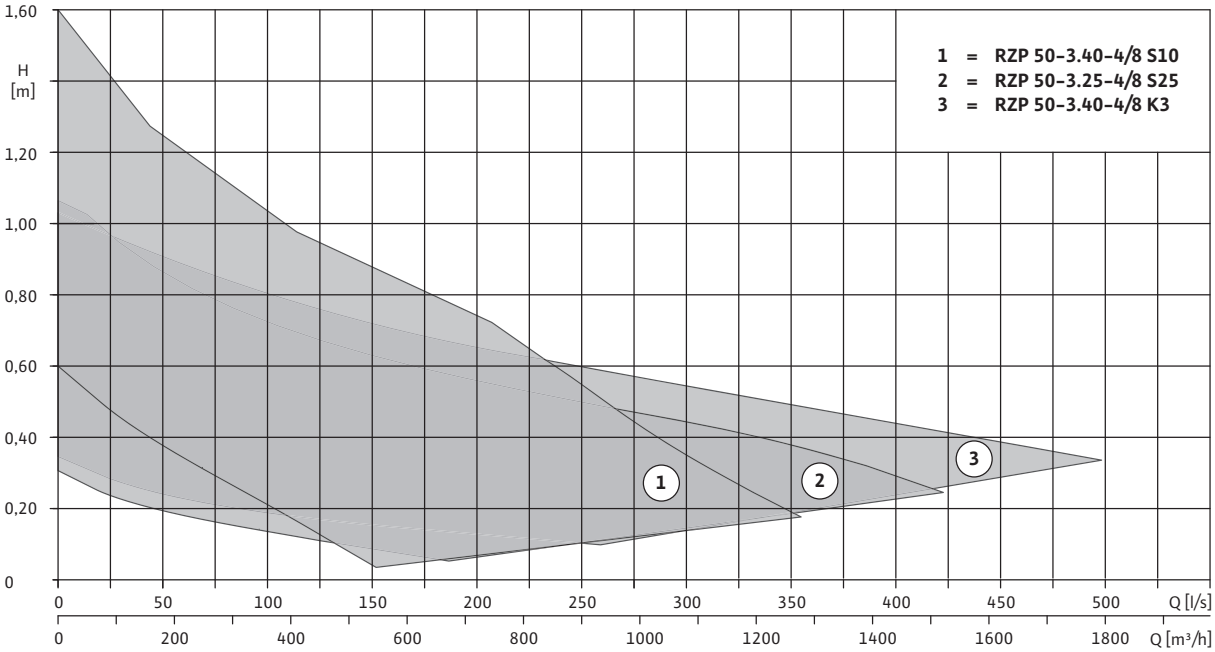


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 50-3...-.../8 K...	897	1129	129
RZP 50-3...-.../8 S...	897	1129	140

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

Pump curves



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

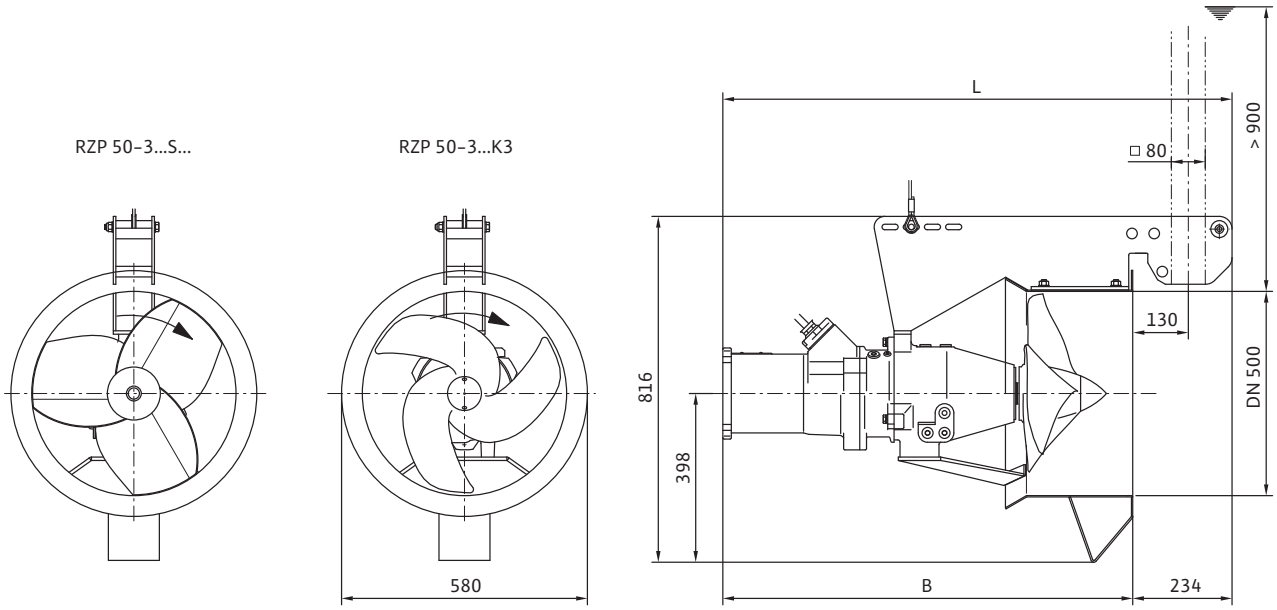
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/8R (Ex)	3.5	4.5	7.9	37	13	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

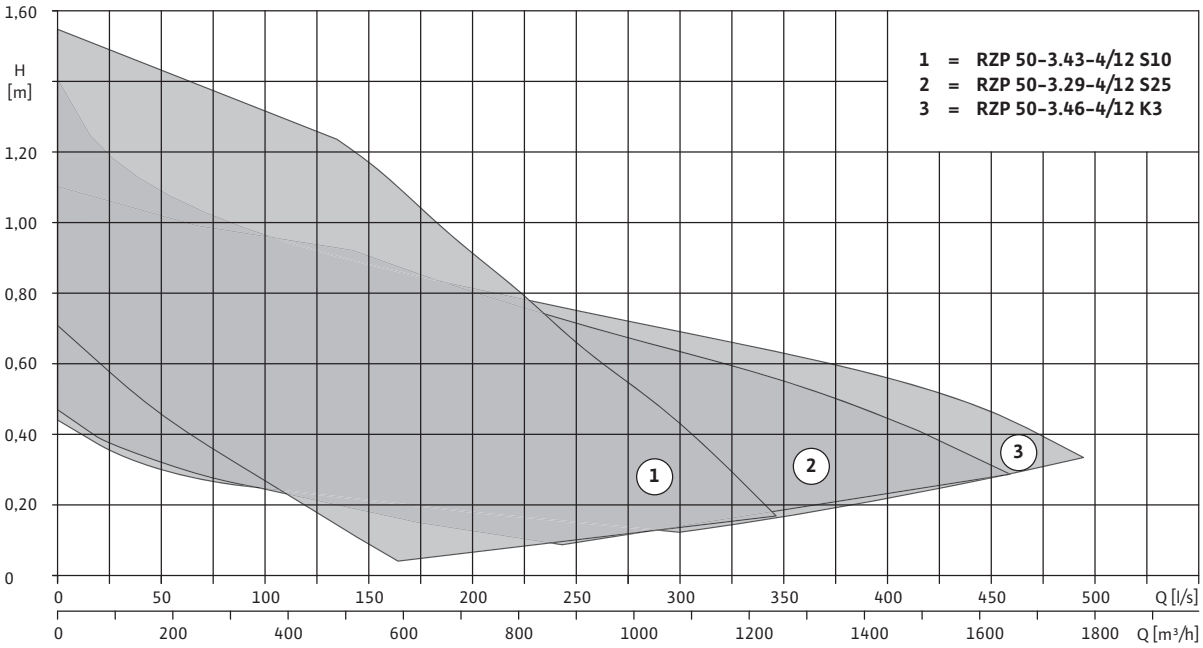


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 50-3...-.../12 K...	932	1164	137
RZP 50-3...-.../12 S...	932	1164	148

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

Pump curves



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

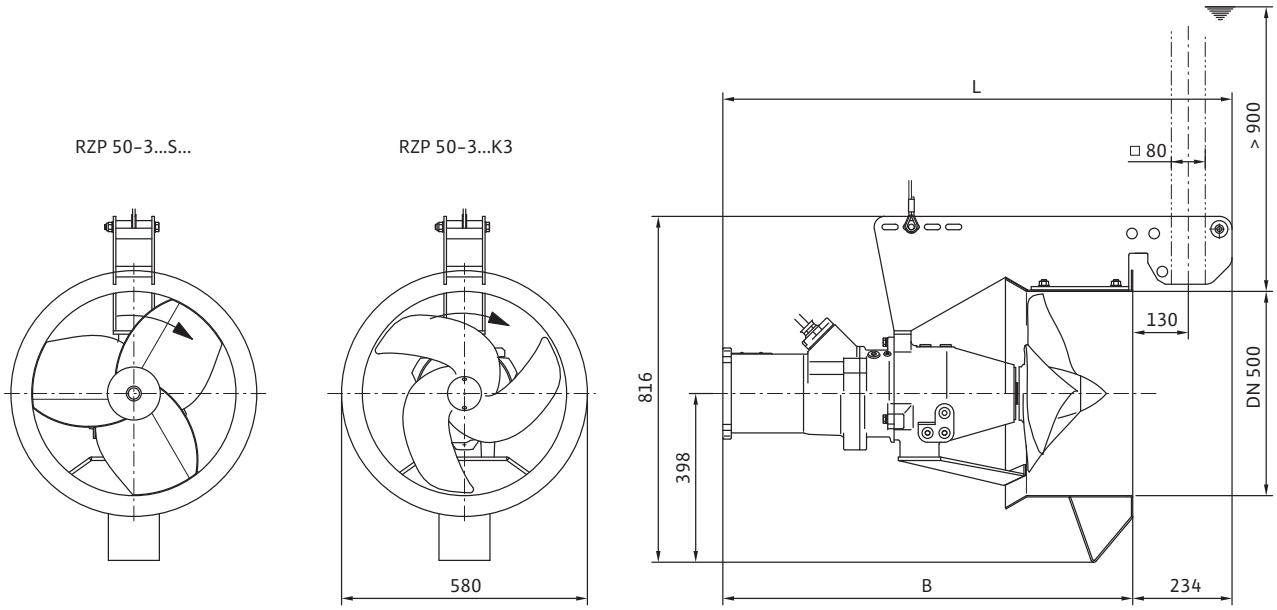
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	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

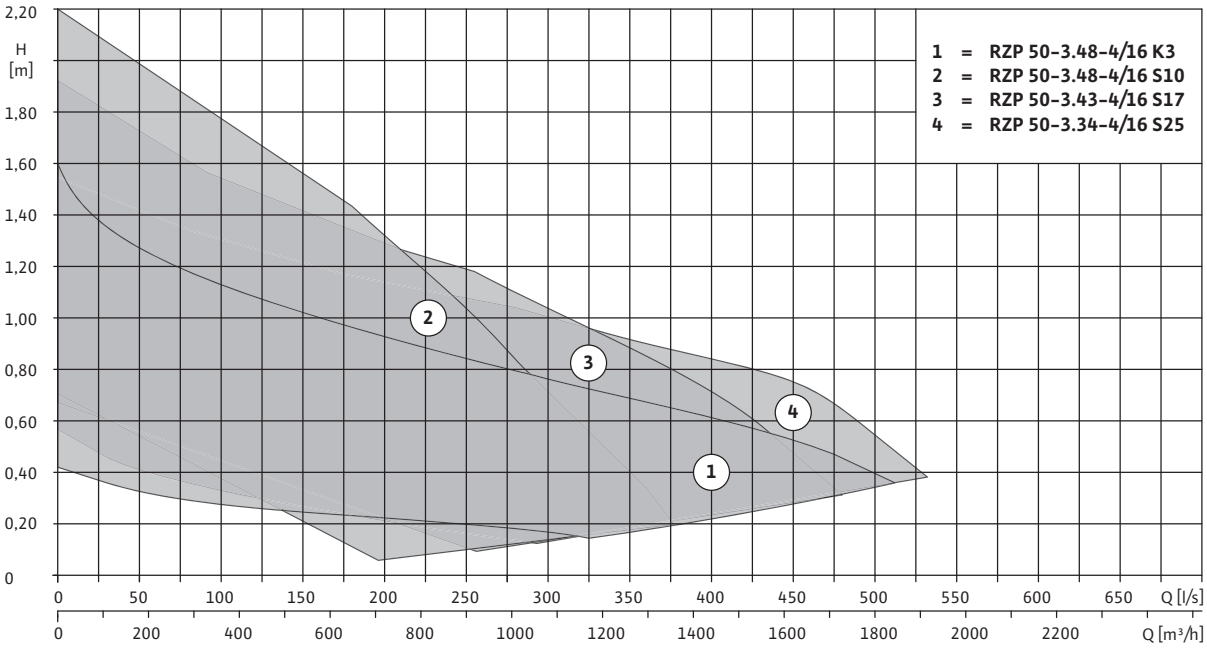


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 50-3...-.../16 K...	970	1202	147
RZP 50-3...-.../16 S...	970	1202	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

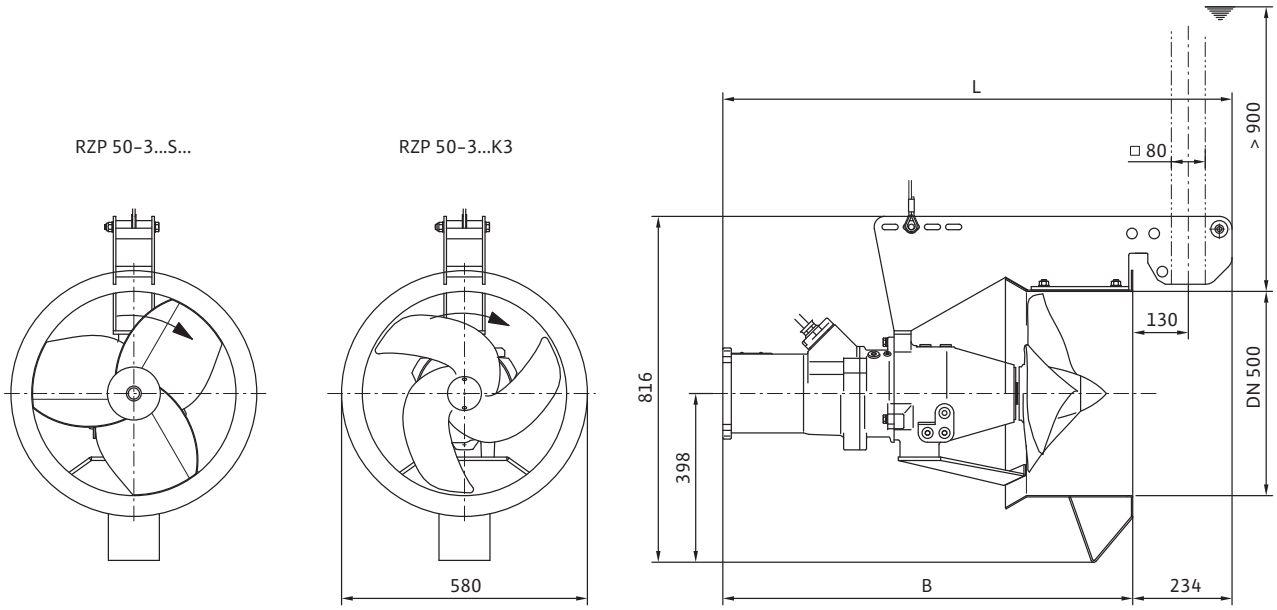
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	1400	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm³.
• = available, – = not available

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

Dimension drawing

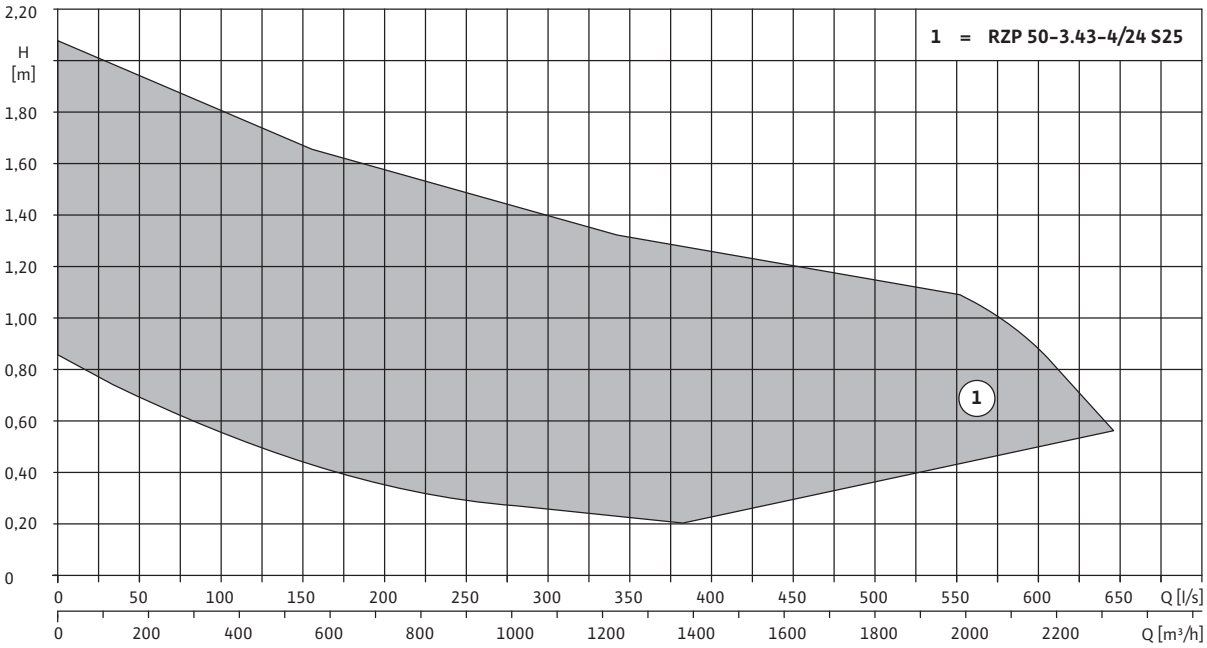


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 50-3...-.../24 S...	1050	1282	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

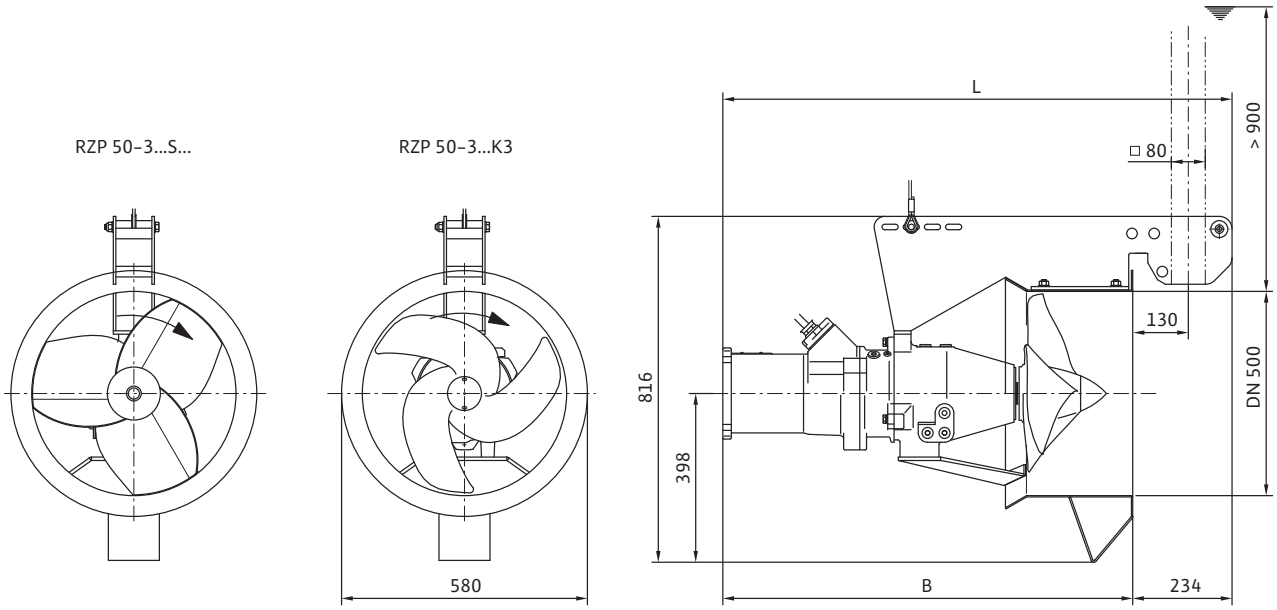
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/24R (Ex)	10.0	12.2	21	123	41	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

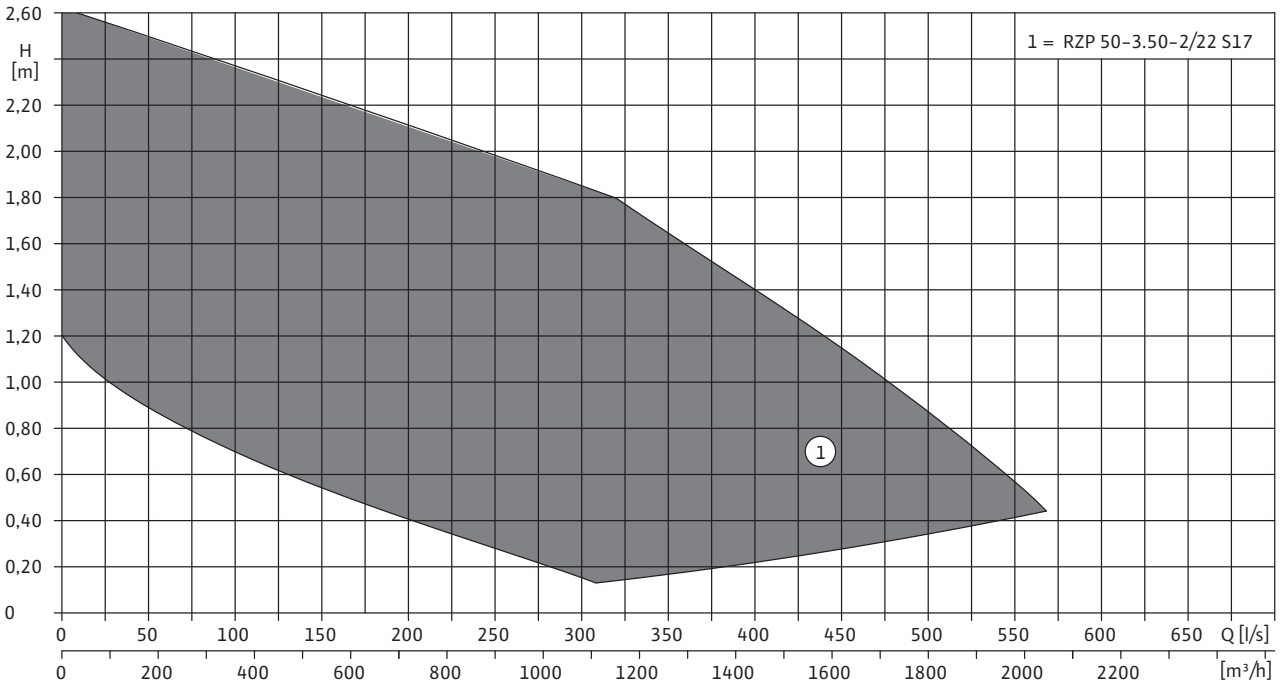


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 50-3...-.../22 S...	1050	1282	170

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

Pump curves



Technical data

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

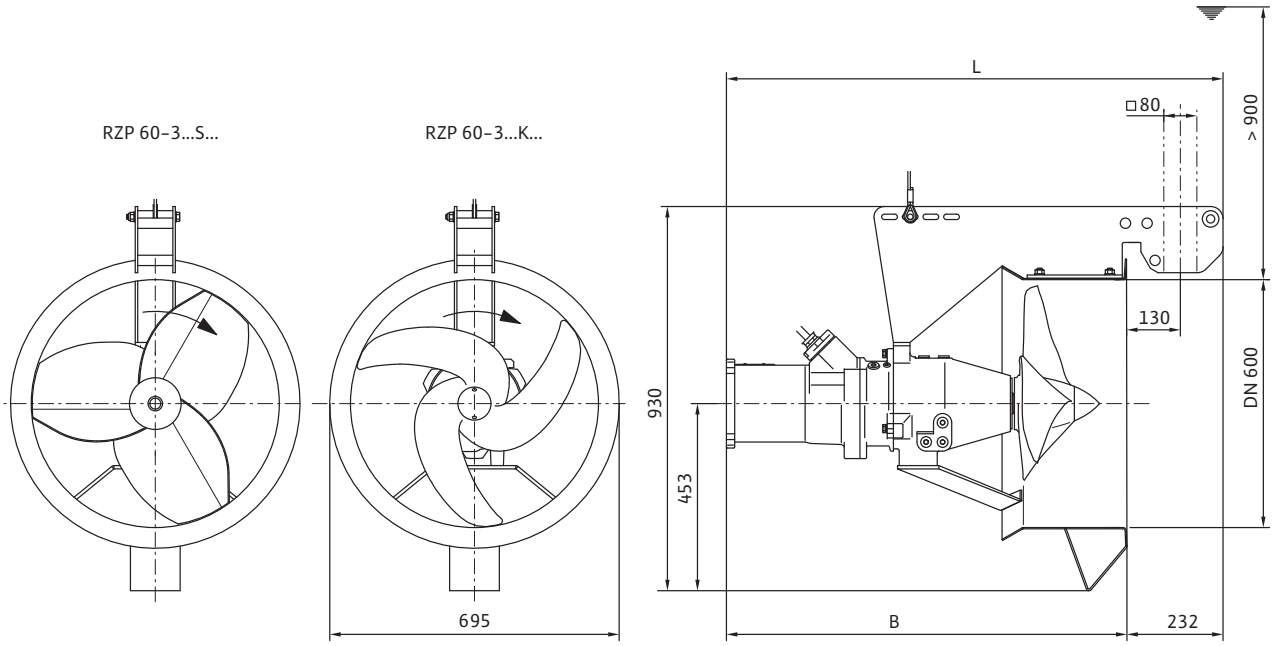
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-2/22R (Ex)	10.5	12.3	20.5	171	57	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

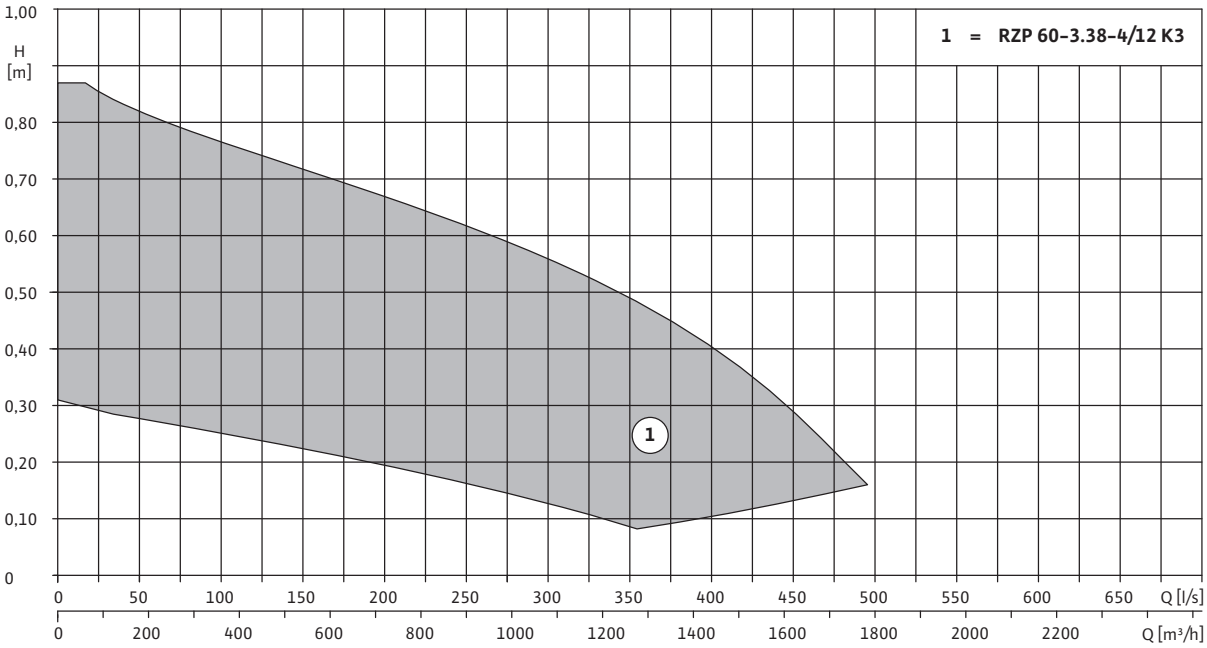


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 60-3...-.../12 K...	920	1152	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

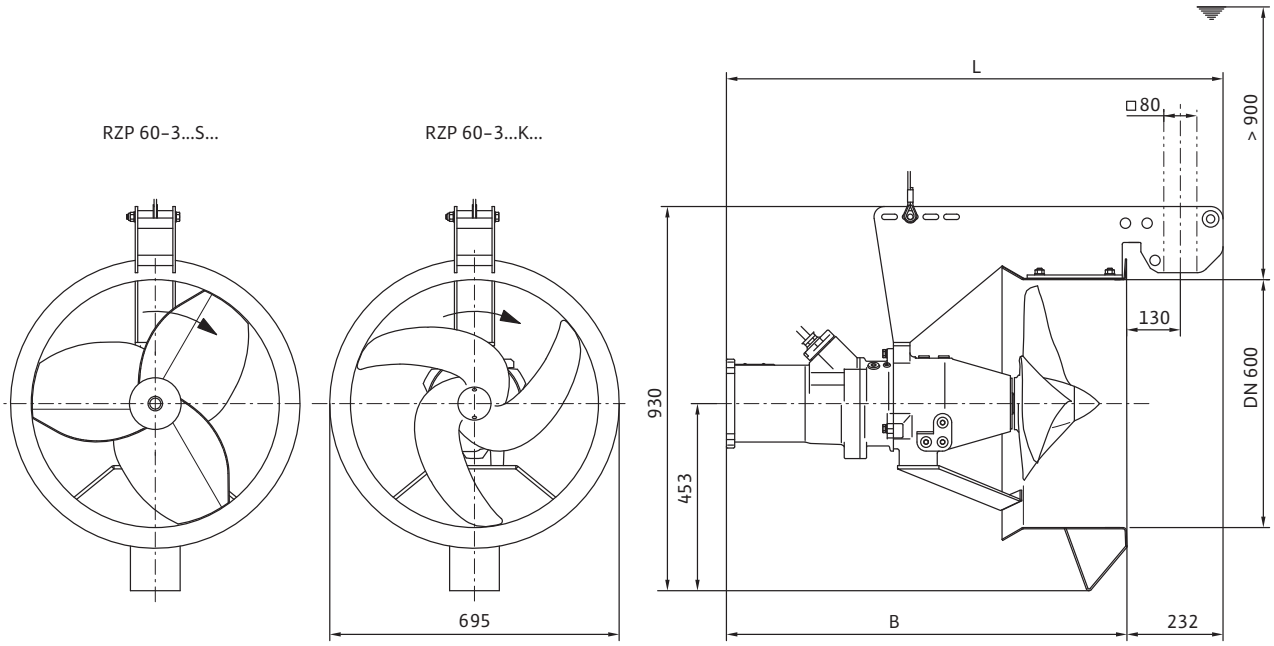
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/12R (Ex)	4.5	5.8	9.4	47	16	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

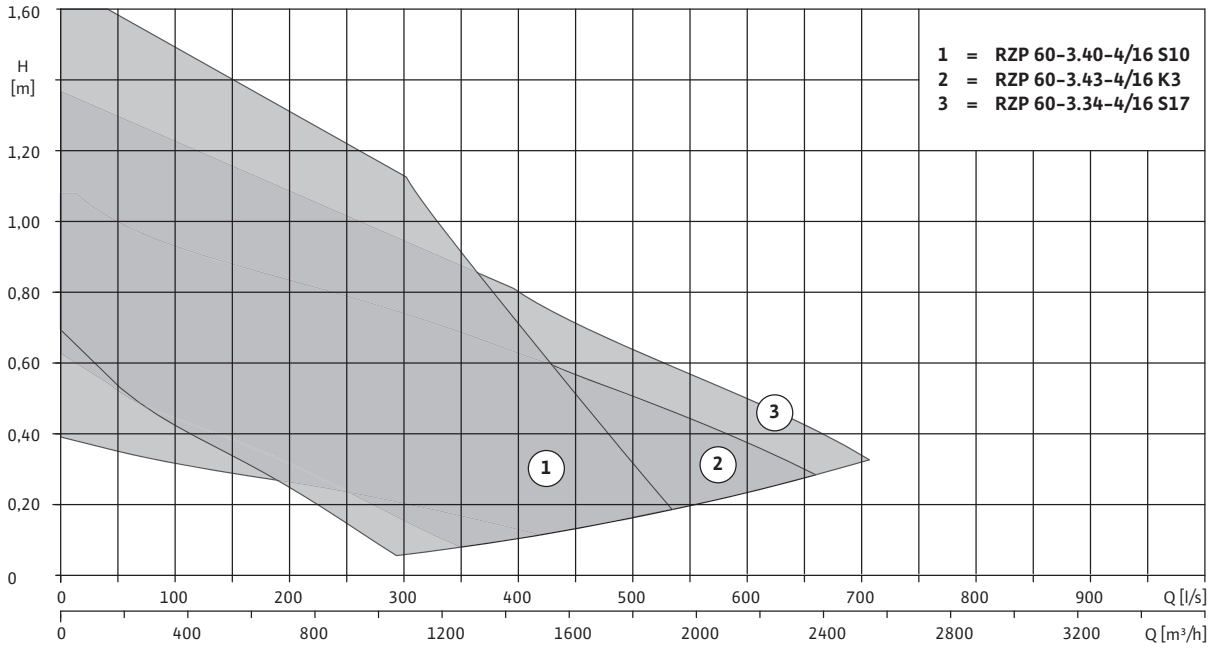


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 60-3...-.../16 K...	958	1190	153
RZP 60-3...-.../16 S...	958	1190	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

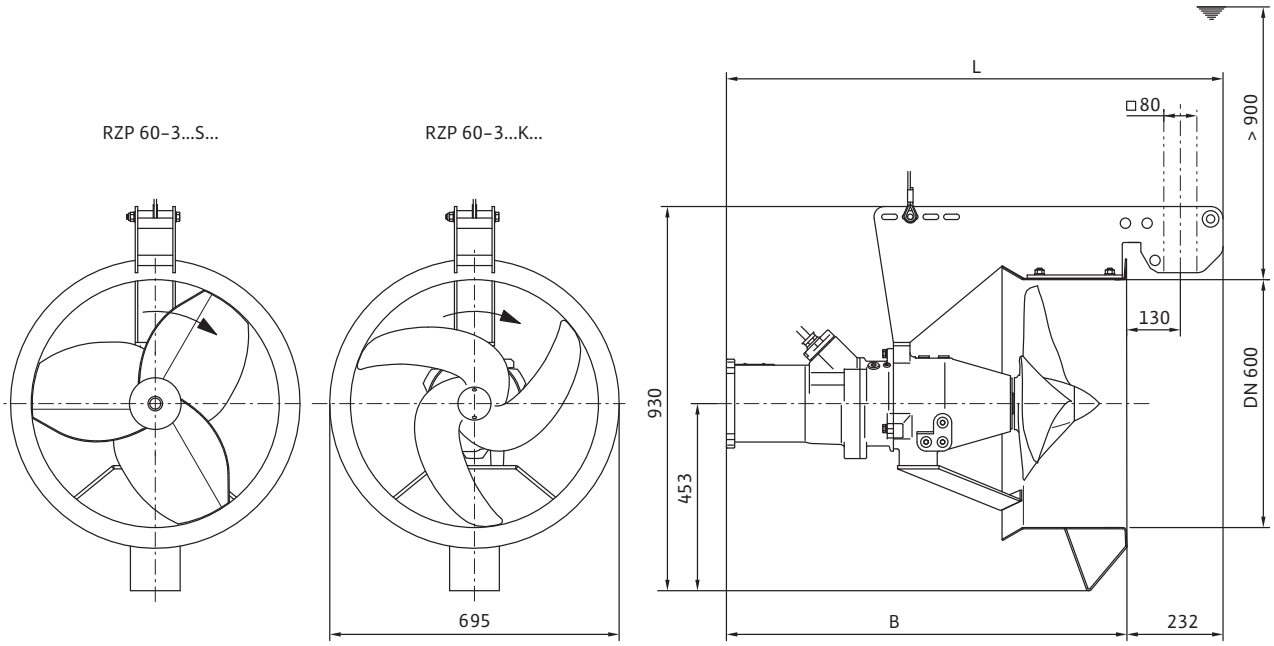
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/16R (Ex)	6.5	8.2	13.5	68	23	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

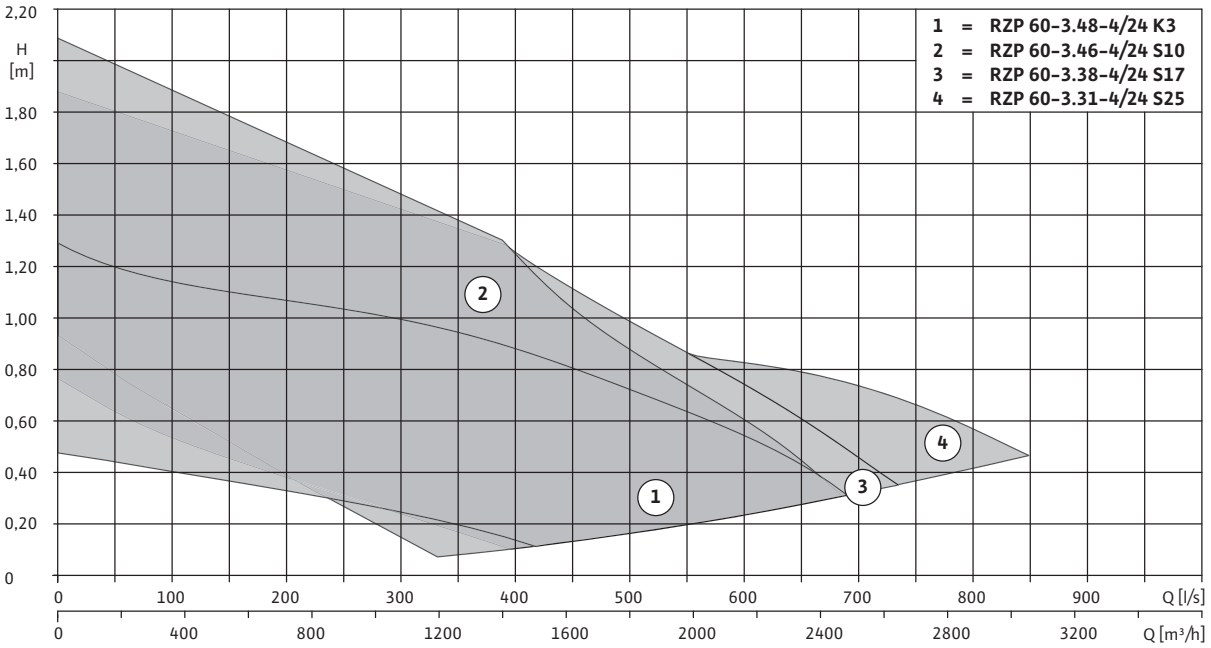


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 60-3...-.../24 K...	1038	1270	165
RZP 60-3...-.../24 S...	1038	1270	176

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

Pump curves



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

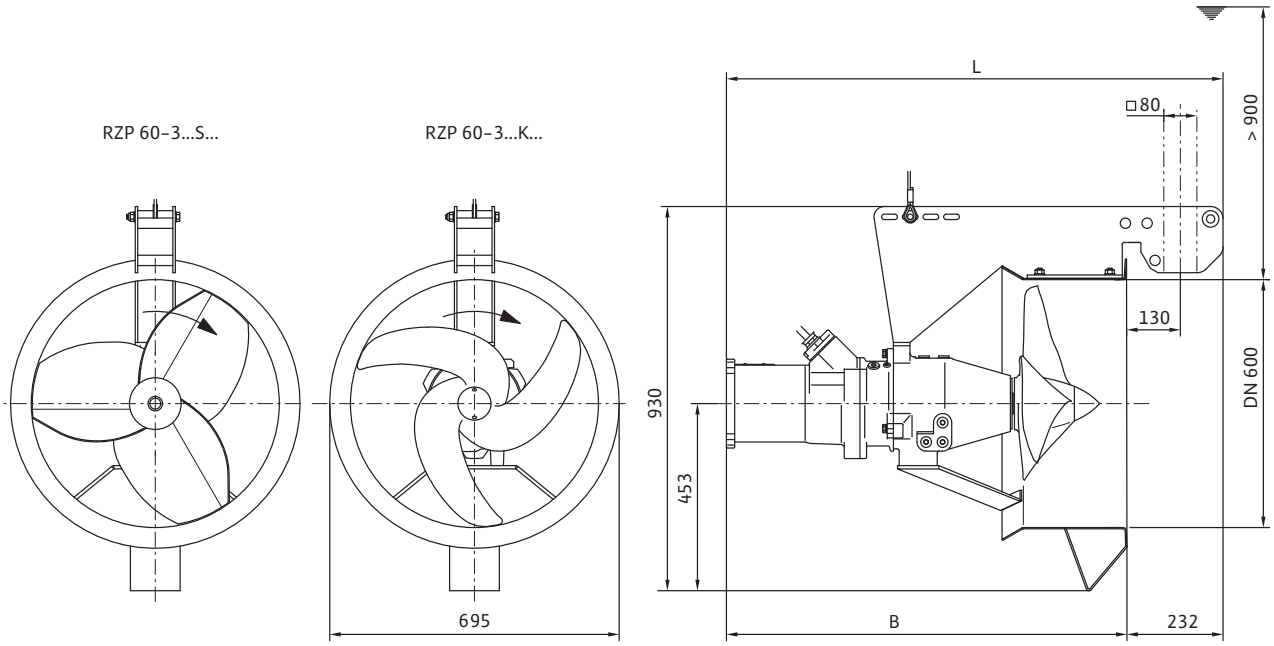
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-4/24R (Ex)	10.0	12.2	21	123	41	1417	•	•

All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm³.
• = available, – = not available

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

Dimension drawing

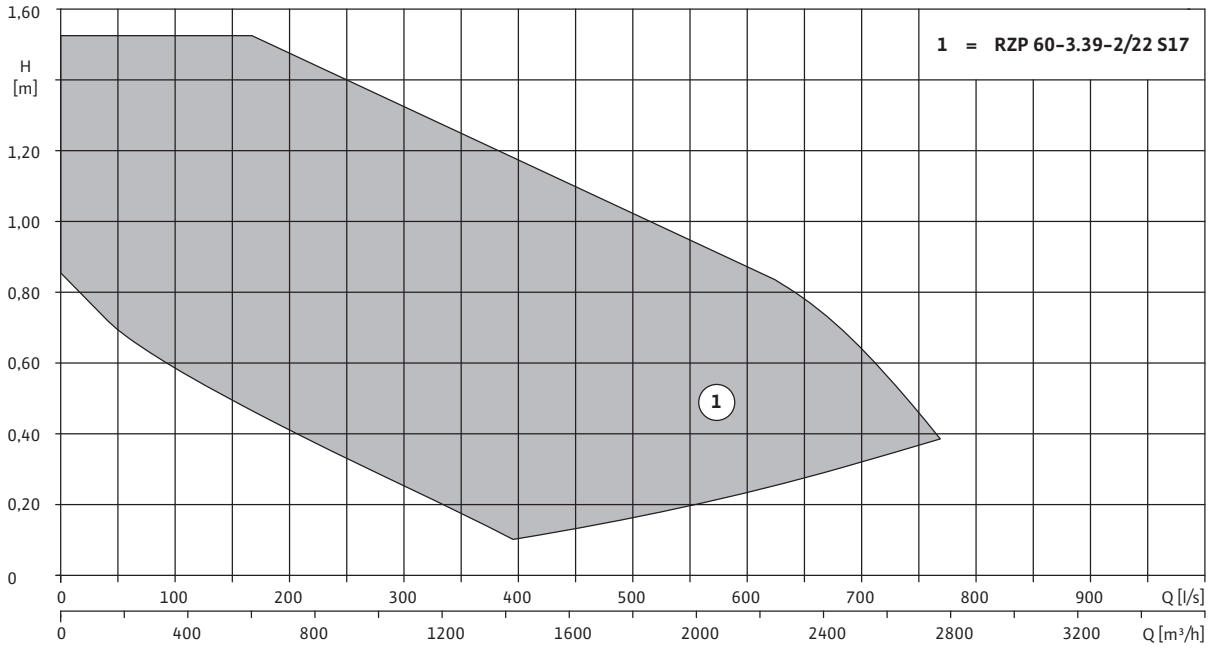


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 60-3...-.../22 S...	1038	1270	174

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

Pump curves



Technical data

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

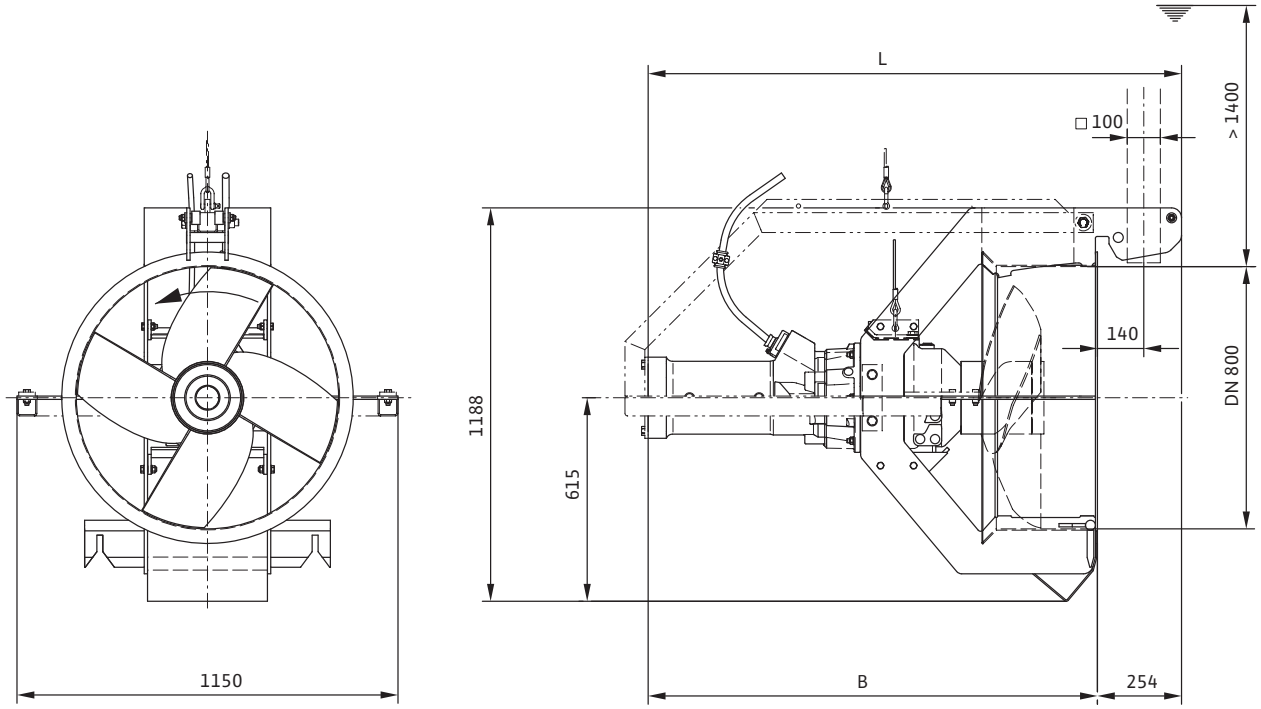
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 17-2/22R (Ex)	10.5	12.3	20.5	171	57	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

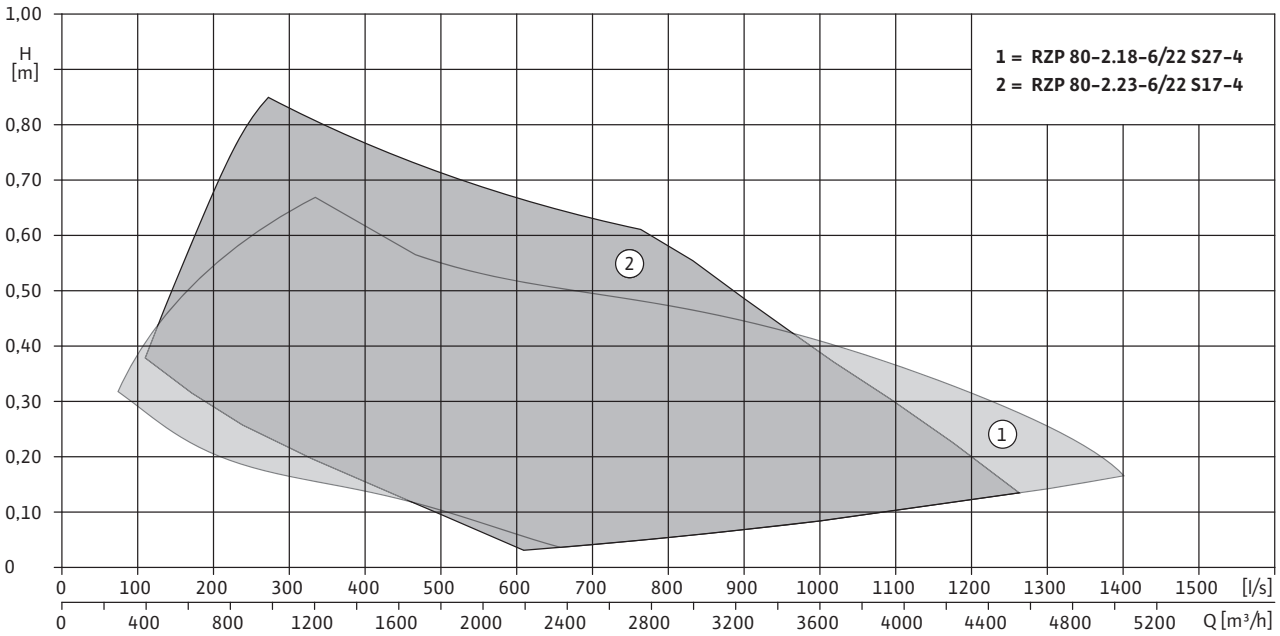


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 80-2...-.../22 S...	1307	1560	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

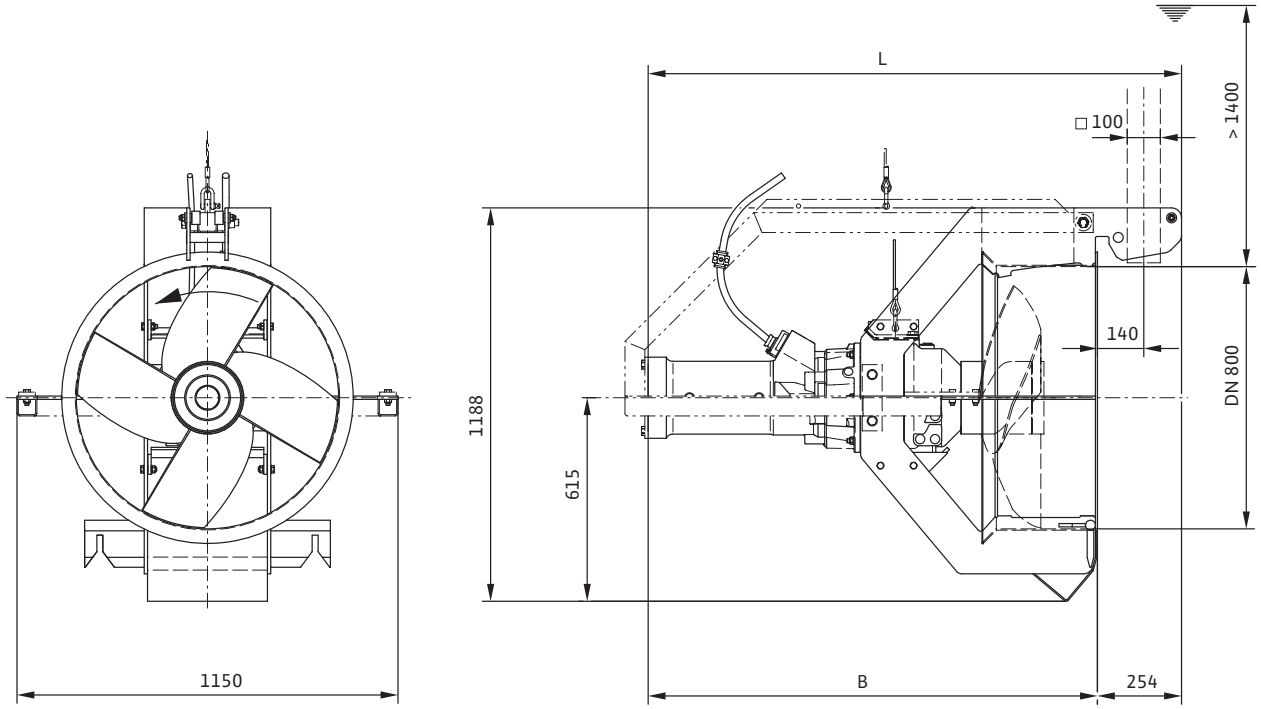
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 20-6/22R (Ex)	9.0	11.2	19.4	97	33	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

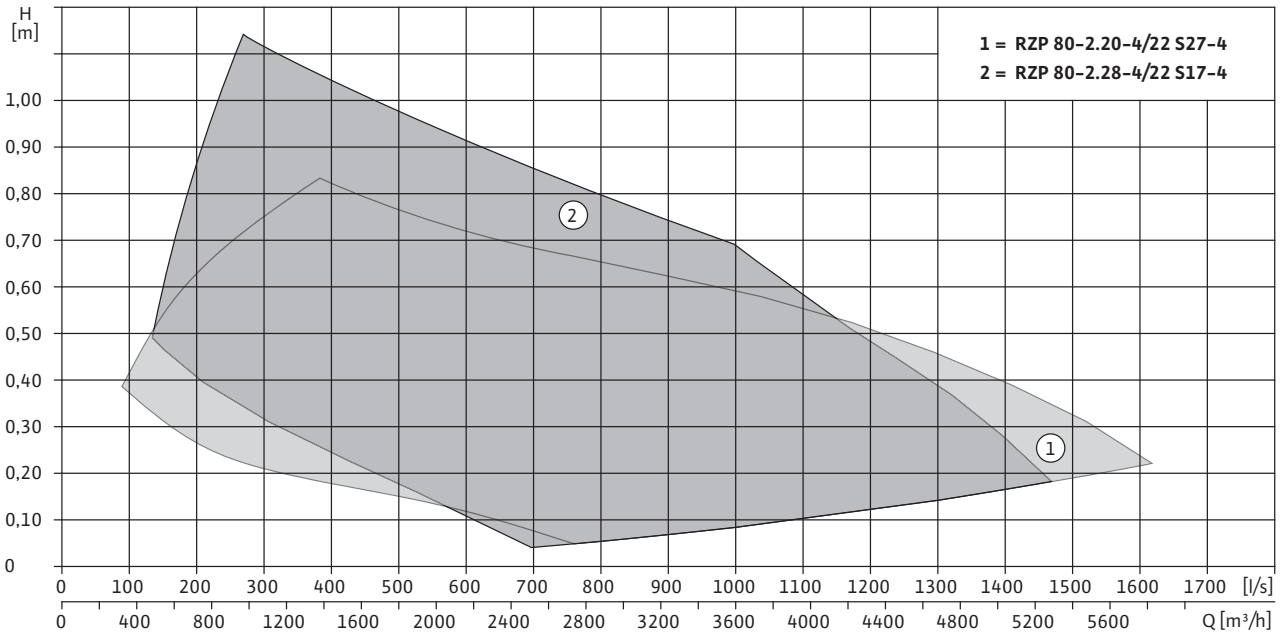


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 80-2...-.../22 S...	1307	1560	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

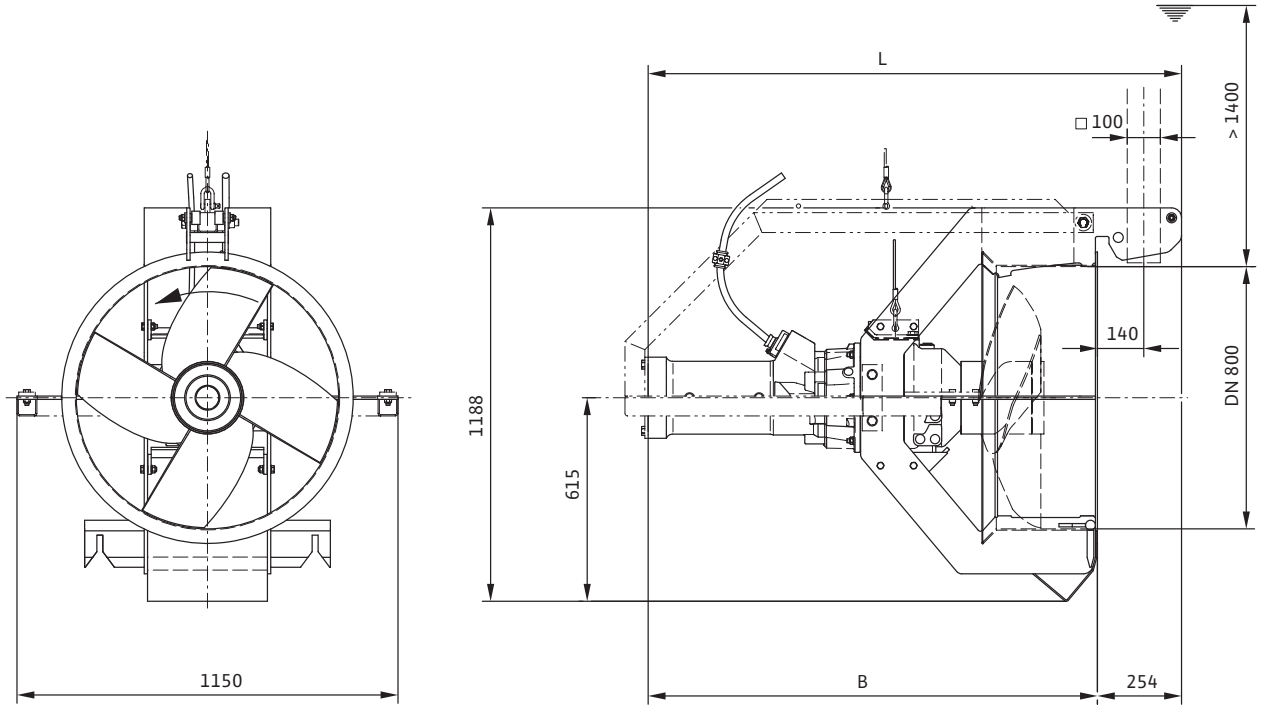
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 20-4/22R (Ex)	12.5	15.3	26	156	52	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

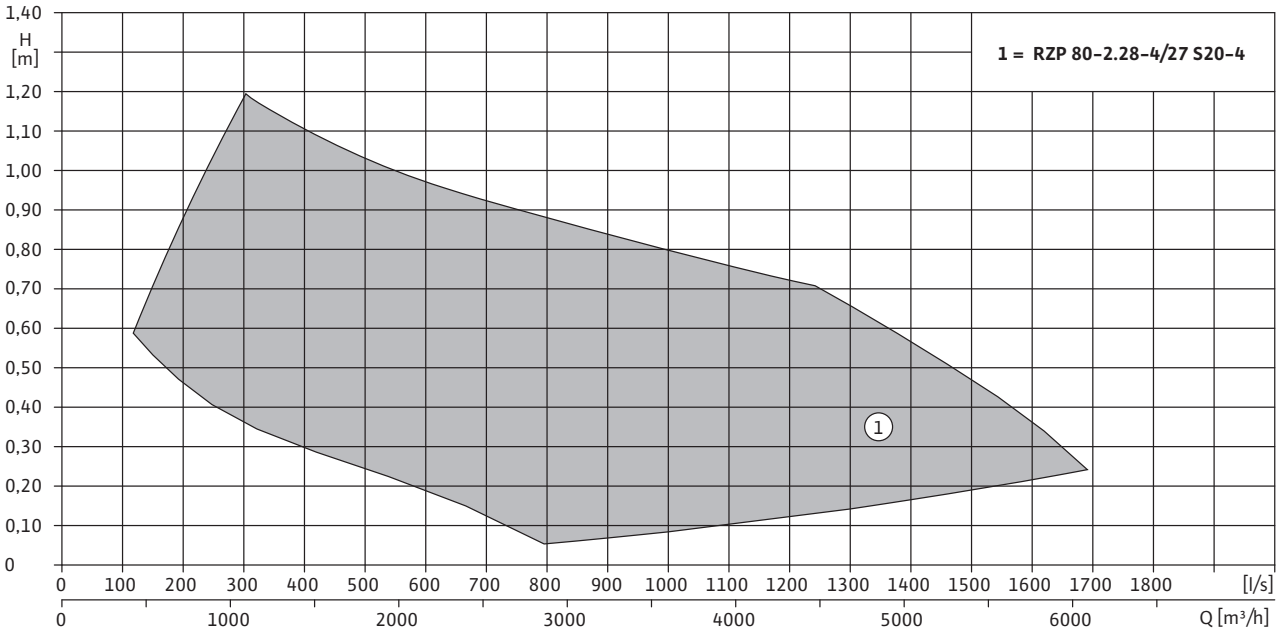


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 80-2...-.../27 S...	1357	1610	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

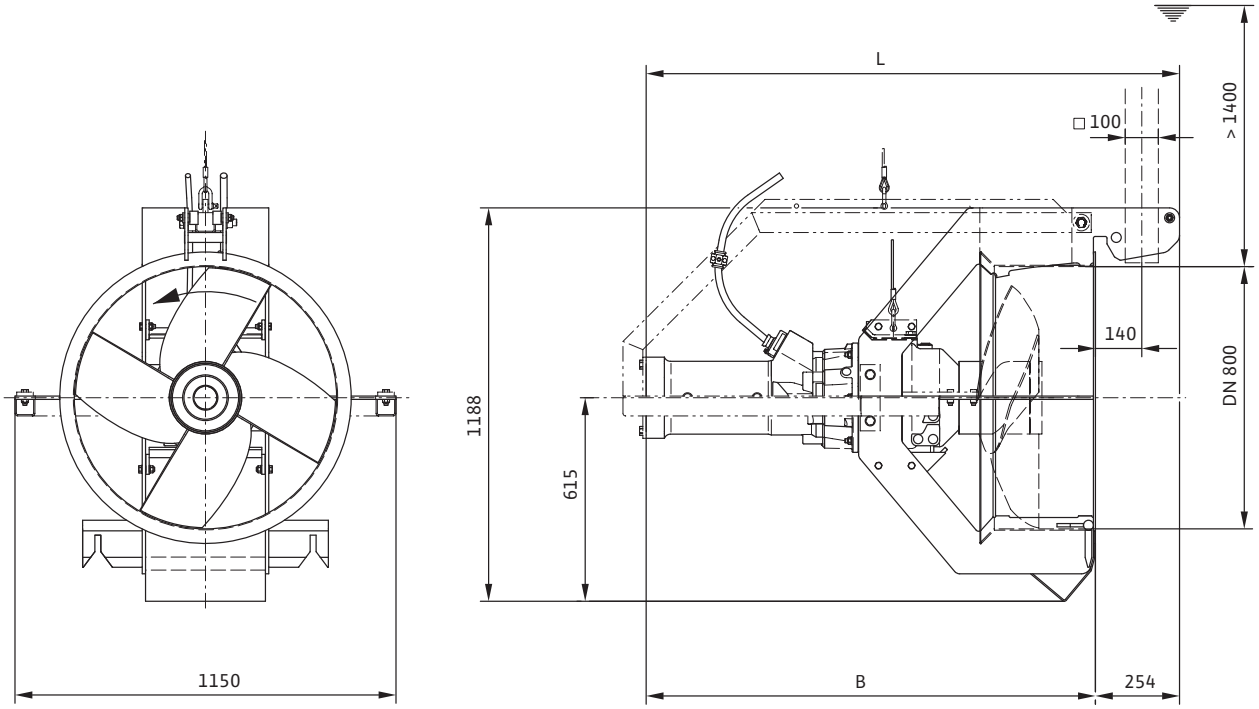
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 20-4/27R (Ex)	16.0	18.9	32	192	64	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

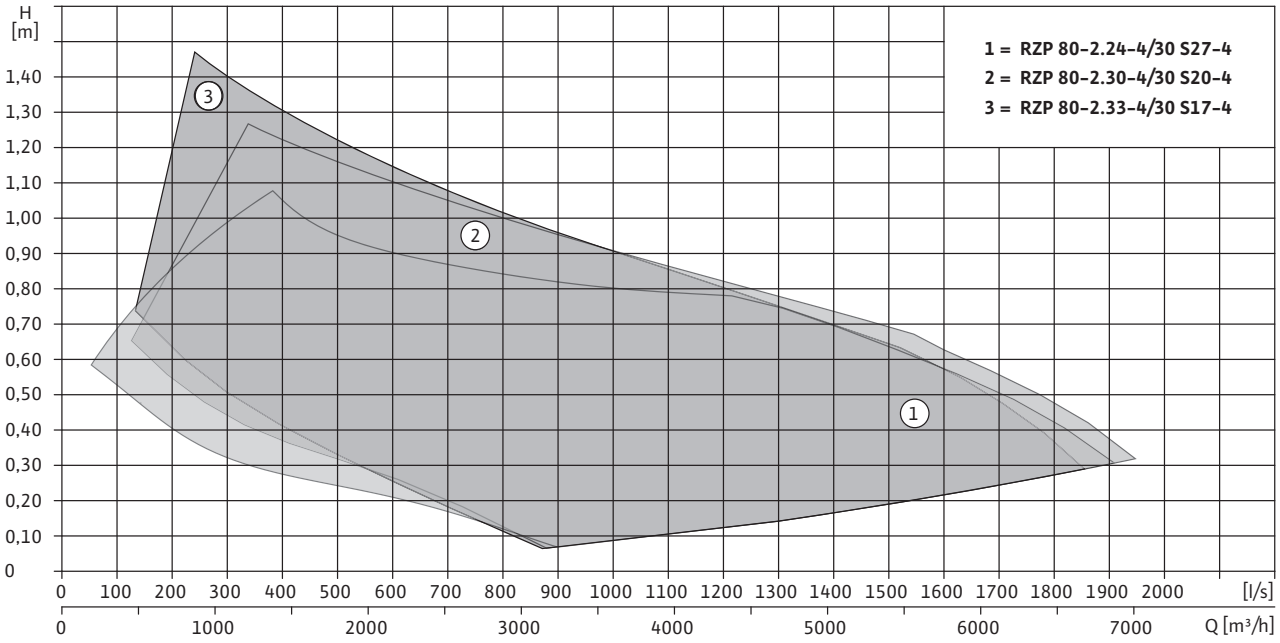


Dimensions, weights

Wilo-EMU...	Dimensions		Weight
	B	*L*	*Unit*
	mm		kg
RZP 80-2...-.../30 S...	1357	1610	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

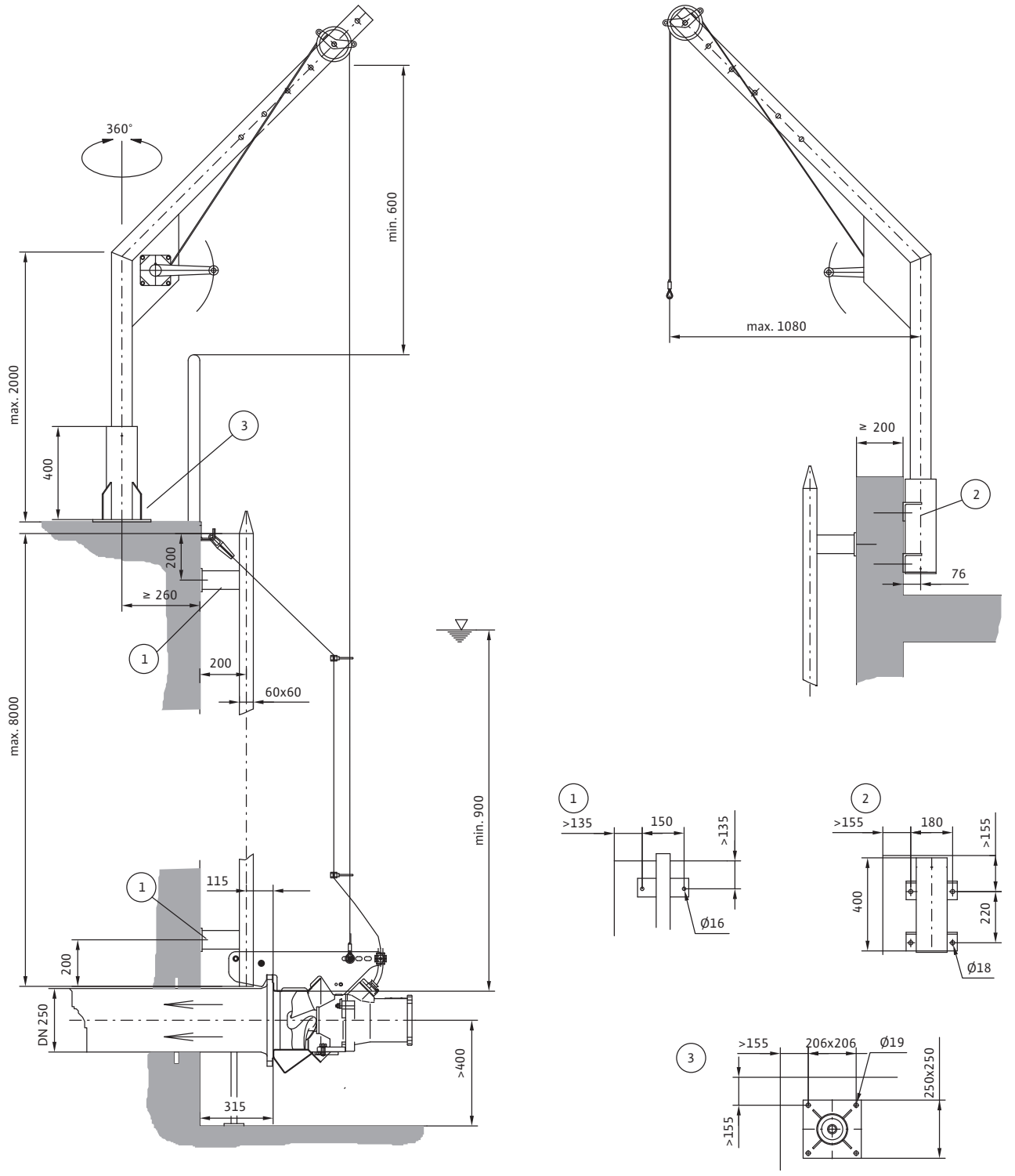
Motor data

Wilo-EMU...	Nominal motor power	Power consumption	Nominal current	Starting current – direct	Starting current – star-delta	Nominal speed	Explosion protection according to	
	P_2	P_1	I_N	I_A		*n*	*FM*	*ATEX*
	kW		A			rpm	–	
T 20-4/30R (Ex)	18.5	22.0	36.5	220	73	1435	•	•

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

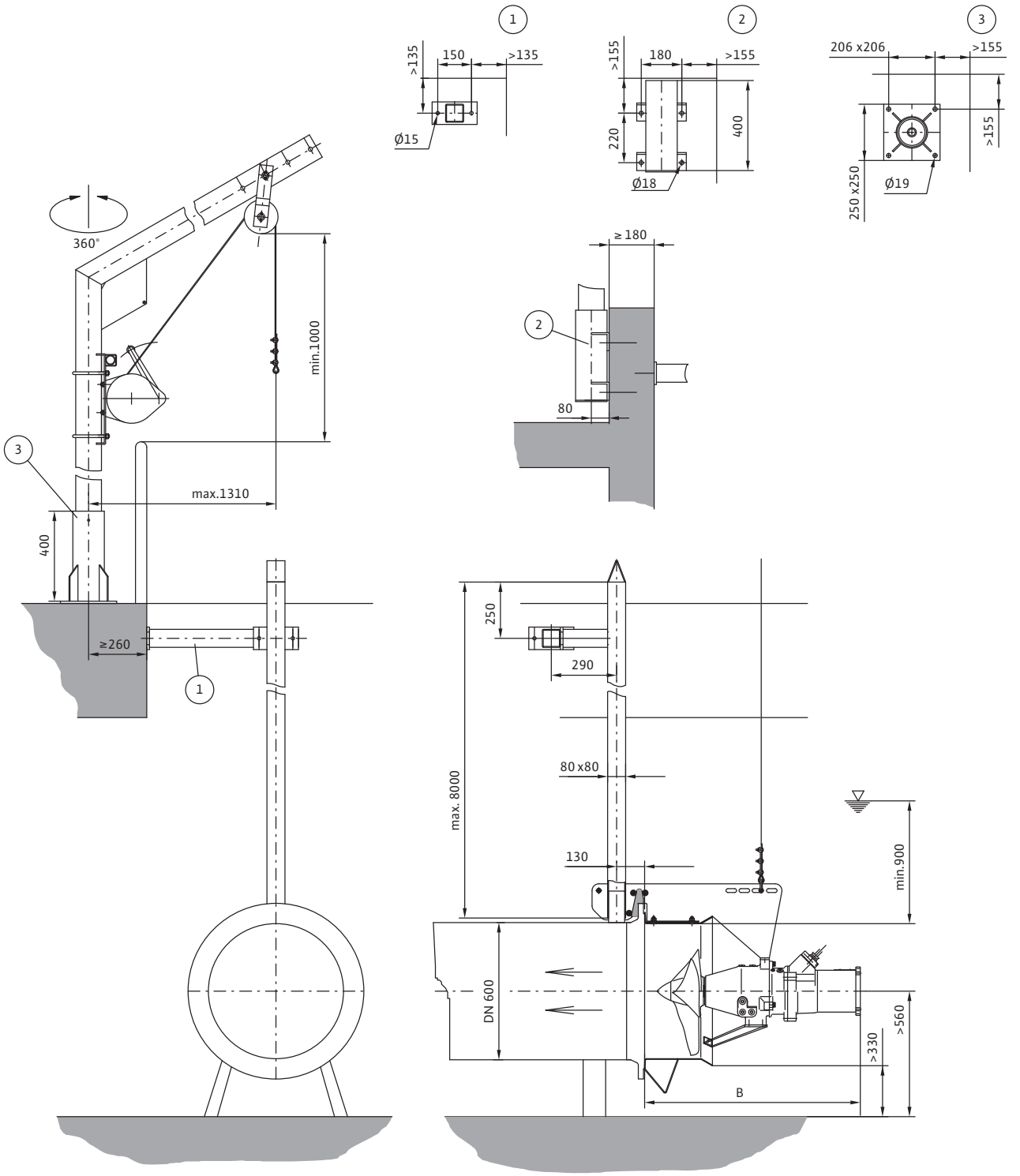
Installation example

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



Installation example

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



Series description Wilo-EMU KPR

Wilo-EMU KPR

Design
Axial submersible pump with dry motor for use in pipe sumps

Type key

e.g. hydraulics:	**Wilo-EMU KPR 760-16°**
KPR	Axial pump
760	Propeller diameter
16°	Angular position of the propeller blades

e.g. motor:	**Wilo-EMU T 49-10/53P Ex**
T	Motor version
49	Overall size
10	Number of poles
53	x10 = package length [mm]
P	Motor for axial pump
Ex	Ex-rated

Application
- For pumping cooling water or rainwater
- Pumping of purified sewage
- For irrigation and pumping sludge.

Special features/product advantages
- Submersible
- Special materials and coatings against abrasion and corrosion
- Longitudinally watertight cable inlet
- Angle of propeller blades adjustable by hand

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 3 – 40°C, higher temperatures on request
- Sealing: With two mechanical seals or one block seal cartridge, depending on the motor
- Free ball passage: 85 – 130 mm.
- Short common pump/motor shaft
- Permanently lubricated roller bearings
- Max. immersion depth: 20 m

Materials
- Housing components: EN-GJL
- Propeller: Stainless steel
- Sealing on pump side: SiC/SiC
- Sealing on motor side: SiC/SiC
- Static seals: NBR
- Shaft: Stainless steel 1.4021

Equipment/function
- Heavy-duty version in cast iron

Description/design
Axial submersible pump as submersible monobloc unit for stationary wet installation

Hydraulics
The angle of the propeller/impeller blades can be adjusted by hand. This makes it possible to adapt the unit to use in different conditions.

Motor
Dry motors (T motors) give off their heat directly to the surrounding fluid via the housing components and can be used in immersed state for permanent operation.

A sealing chamber protects the motor from fluid ingress. It can be accessed from the outside and can be monitored with an optional sealing chamber electrode.

All filling fluids used are potentially biodegradable and environmentally safe.

The cable inlet of the T motors is longitudinally watertight. Cable lengths can be individually configured.

Sealing
Fluid-side and motor-side sealing is possible in the following versions depending on the motor type:
- Version G: Two independently operating mechanical seals
- Version K: Block seal cartridge with two independently operating mechanical seals

Series description Wilo-EMU KPR

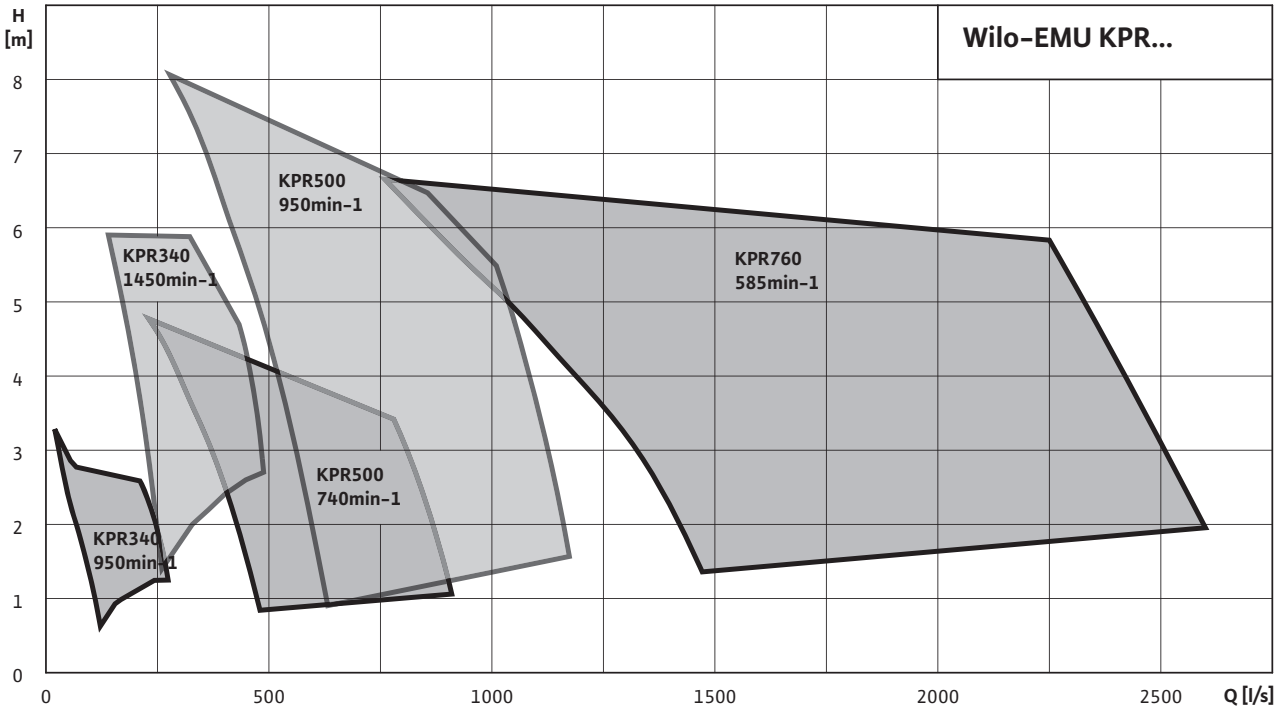
Options
- Special voltages
- PTC thermistor sensor
- Internal or external sealing chamber control
- Monitoring units for leakage and bearing temperature
- Ceram coating C0, C1
- Ex-rated according to ATEX or FM

Scope of delivery
- Axial submersible pump
- Cable length per customer request
- Accessories per customer request
- Operating and maintenance manual

Accessories
- Switchgears, relays and plugs

Commissioning
Operation with surfaced motor:
Dry motors (T motors) can be surfaced only if there is an operating mode for surfaced operation.

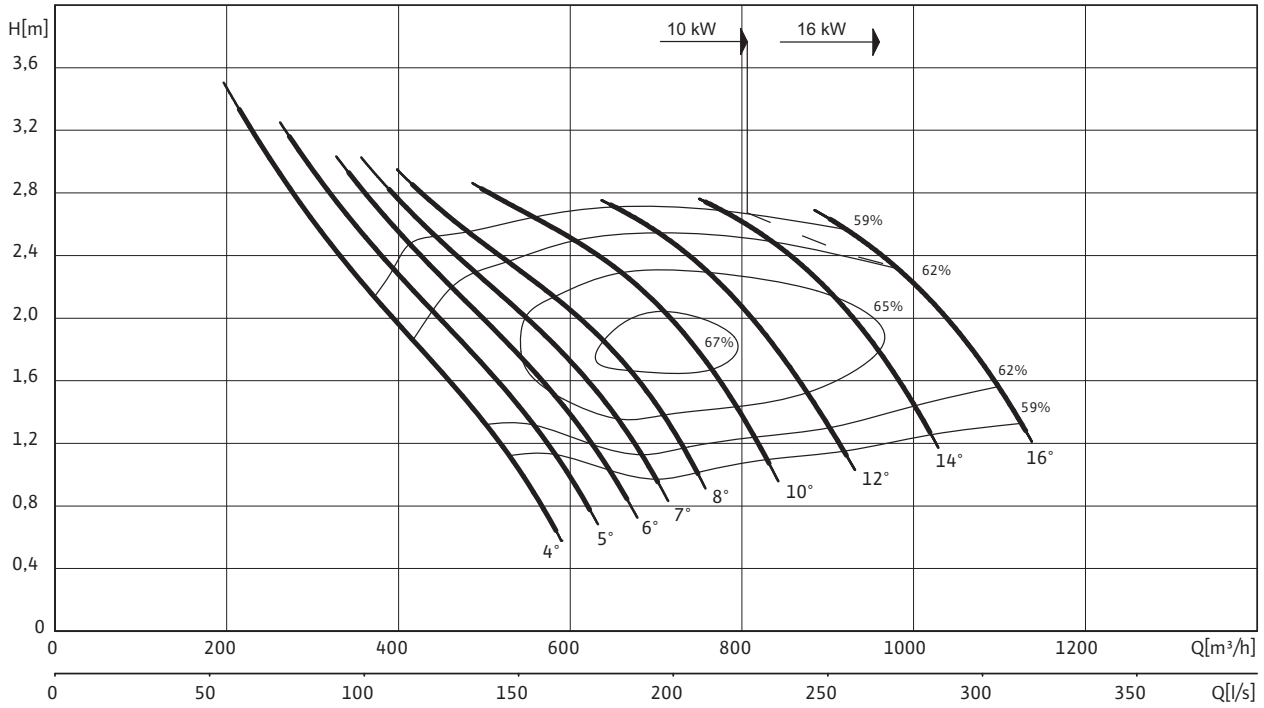
Dry-running protection system:
The hydraulics housing must always be immersed to prevent air from being drawn in. In the case of fluctuating fluid levels, the system should switch off automatically once the minimum water submersion is reached.



Pump curves, technical data Wilo-EMU KPR 340 (950 rpm)

Pump curves Wilo-EMU KPR 340 – 50 Hz – 950 rpm

Axial impeller – Free ball passage: 85 mm



Hydraulic data			
Wilo-EMU...	**Free ball passage**	**Type of impeller**	**Weight of hydraulic unit**
	mm		kg
KPR 340	85	Axial impeller	160

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A.

Motor data for 3~400 V, 50 Hz								
Wilo-EMU...	**Nominal current**	**Starting current – direct**	**Starting current – star-delta**	**Nominal motor power**	**Power consumption**	**Operating mode (immersed/non-immersed)**	**Motor weight**	**Dimensions**
	I_N	I_A		P_2	P_1			*A*
	A			kW			kg	mm
T 24-6/16P (Ex)	21	125	42	10.0	12.2	S1/–	140	893
T 24-6/22P (Ex)	33.5	200	66	16.5	19.9	S1/–	155	893

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/– 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU KPR 340 (950 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
T 24...P	NBR	–	–	SiC/SiC, SiC/SiC

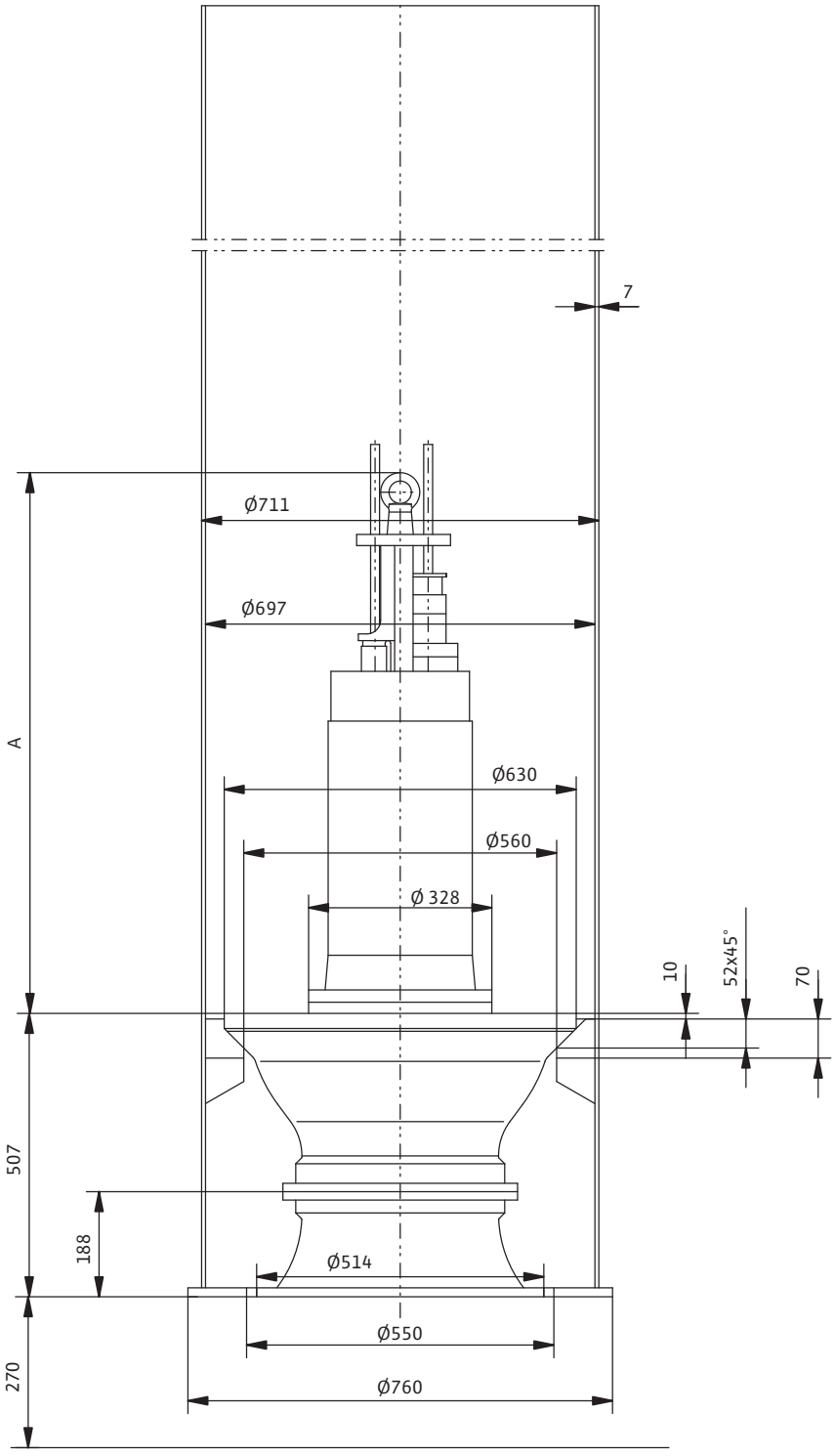
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
T 24...P	•	•	•	•	•	–	optional	•

Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU KPR 340 (950 rpm)

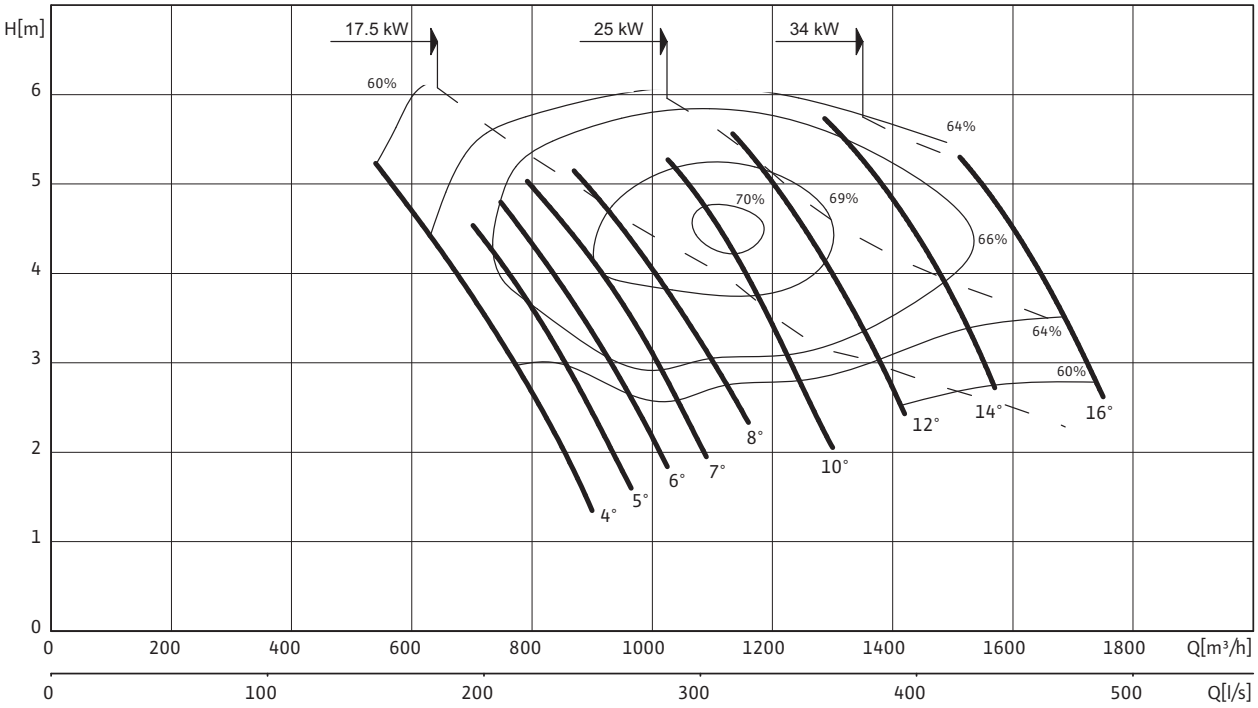
Dimension drawing Wilo-EMU KPR – stationary wet well installation



Pump curves, technical data Wilo-EMU KPR 340 (1450 rpm)

Pump curves Wilo-EMU KPR 340 – 50 Hz – 1450 rpm

Axial impeller – Free ball passage: 85 mm



Hydraulic data

Wilo-EMU...	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
KPR 340	85	Axial impeller	160

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A.

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions
	I_N	I_A		P_2	P_1			A
	A			kW			kg	mm
T 24-4/21P (Ex)	35.5	230	76	17.5	20.5	S1/–	155	893
T 24-4/29P (Ex)	49.5	320	106	25.0	28.5	S1/–	190	958
T 24-4/36P (Ex)	68	480	159	34.0	39.0	S1/–	217	1028

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU KPR 340 (1450 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
T 24...P	NBR	–	–	SiC/SiC, SiC/SiC

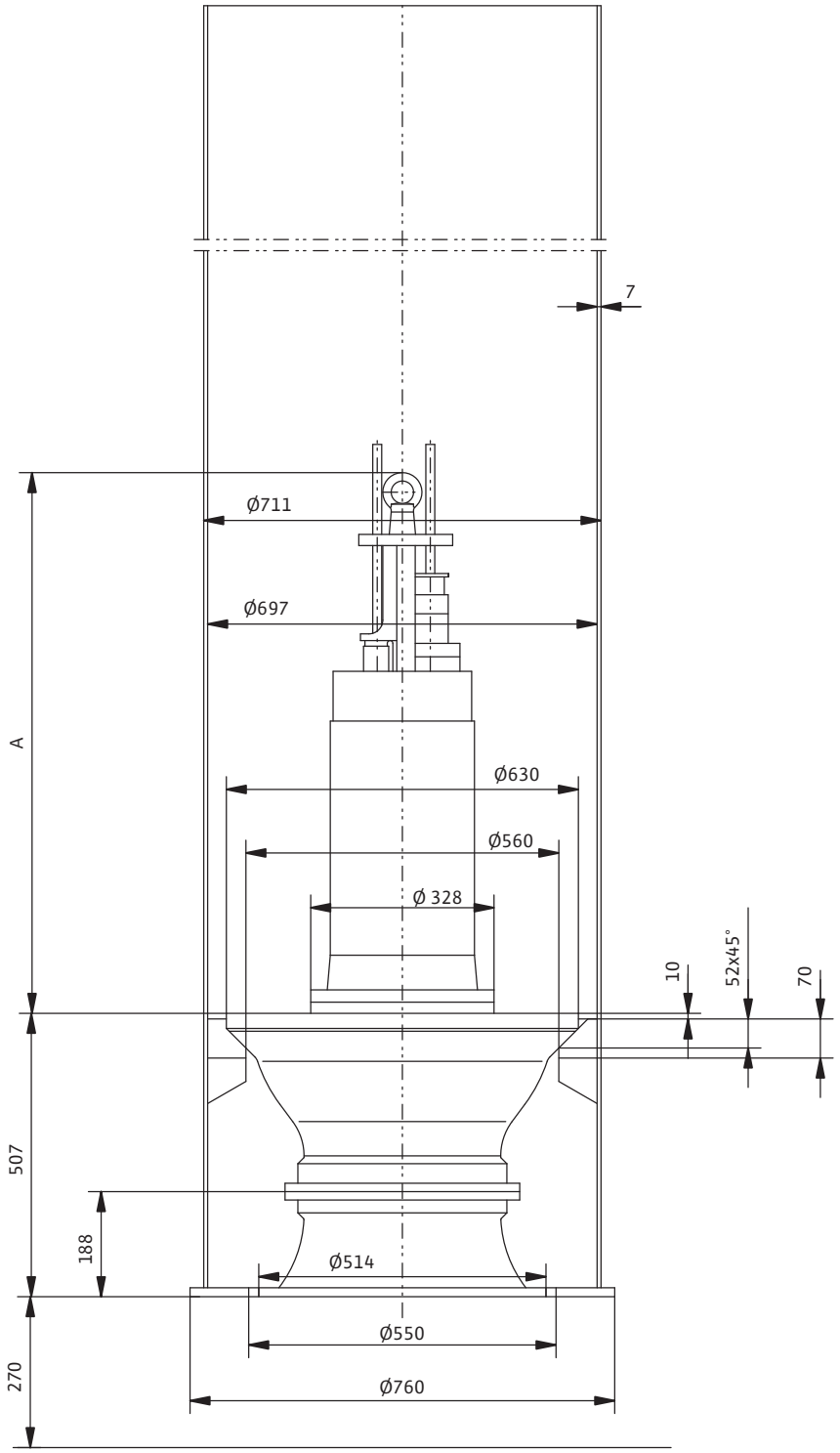
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
T 24...P	•	•	•	•	•	–	optional	•

Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU KPR 340 (1450 rpm)

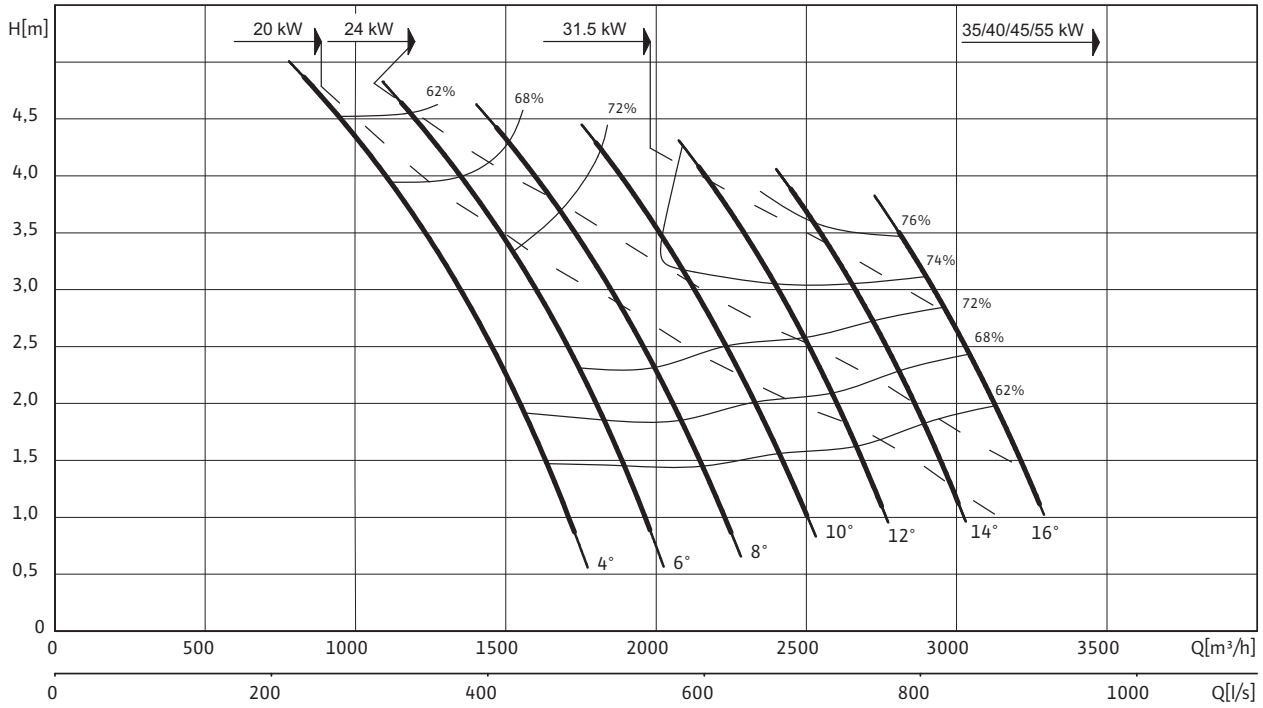
Dimension drawing Wilo-EMU KPR – stationary wet well installation



Pump curves, technical data Wilo-EMU KPR 500 (740 rpm)

Pump curves Wilo-EMU KPR 500 – 50 Hz – 740 rpm

Axial impeller – Free ball passage: 110 mm



Hydraulic data			
Wilo-EMU...	**Free ball passage**	**Type of impeller**	**Weight of hydraulic unit**
	mm		kg
KPR 500	110	Axial impeller	385

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A.

Motor data for 3~400 V, 50 Hz								
Wilo-EMU...	**Nominal current**	**Starting current – direct**	**Starting current – star-delta**	**Nominal motor power**	**Power consumption**	**Operating mode (immersed/non-immersed)**	**Motor weight**	**Dimensions**
	I_N	I_A		P_2	P_1			A
	A			kW			kg	mm
T 30-8/29P (Ex)	42.5	220	73	20.0	23.0	S1/–	330	1022
T 30-8/35P (Ex)	51	270	90	24.0	27.5	S1/–	364	1082
T 30-8/45P (Ex)	67	360	119	31.5	36.0	S1/–	415	1172
T 30-8/57P (Ex)	85	450	149	40.0	45.5	S1/–	487	1281
T 34-8/29P (Ex)	66	360	119	32.5	37.5	S1/–	391	1076
T 34-8/32P (Ex)	73	400	132	35.0	40.0	S1/–	420	1076
T 34-8/41P (Ex)	93	510	169	45.0	52.0	S1/–	478	1156
T 34-8/50P (Ex)	111	630	210	55.0	62.0	S1/–	544	1226

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU KPR 500 (740 rpm)

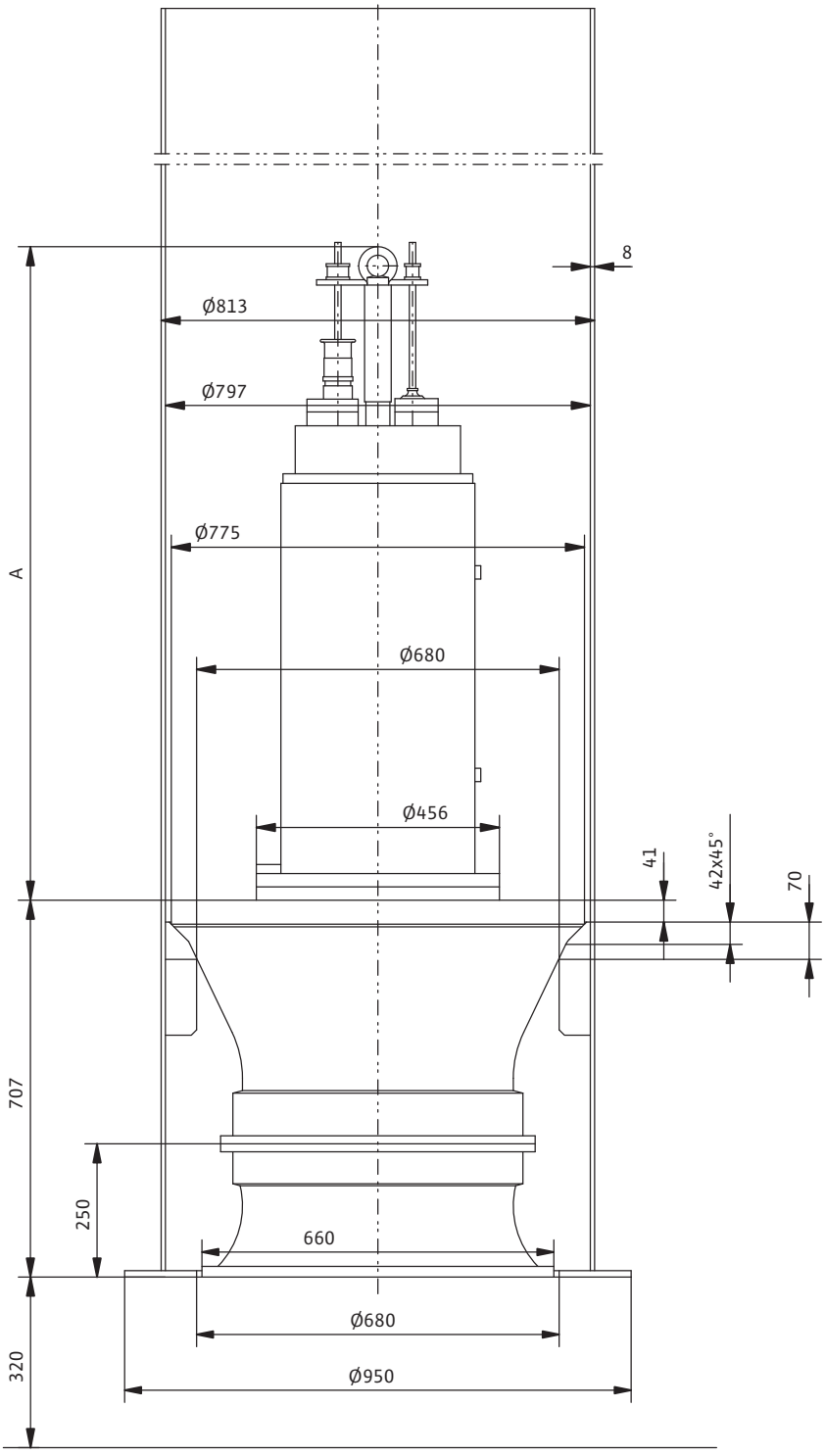
Materials: Seals				
Wilo-EMU...	**Static seal**	**Sealing**		
		Version H	*Version G*	*Version K*
T 30...P	NBR	–	–	SiC/SiC, SiC/SiC
T 34...P	NBR	–	–	SiC/SiC, SiC/SiC

Equipment/function								
Wilo-EMU...	**Explosion protection according to**		**Motor temperature monitoring**	**Motor leakage detection**	**Sealing chamber leakage detection**	**Leakage chamber leakage detection**	**Bearing temperature monitoring**	**Terminal chamber leakage detection**
	ATEX	*FM*						
T 30...P	•	•	•	•	•	–	optional	•
T 34...P	•	•	•	optional	optional	–	optional	•

Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU KPR 500 (740 rpm)

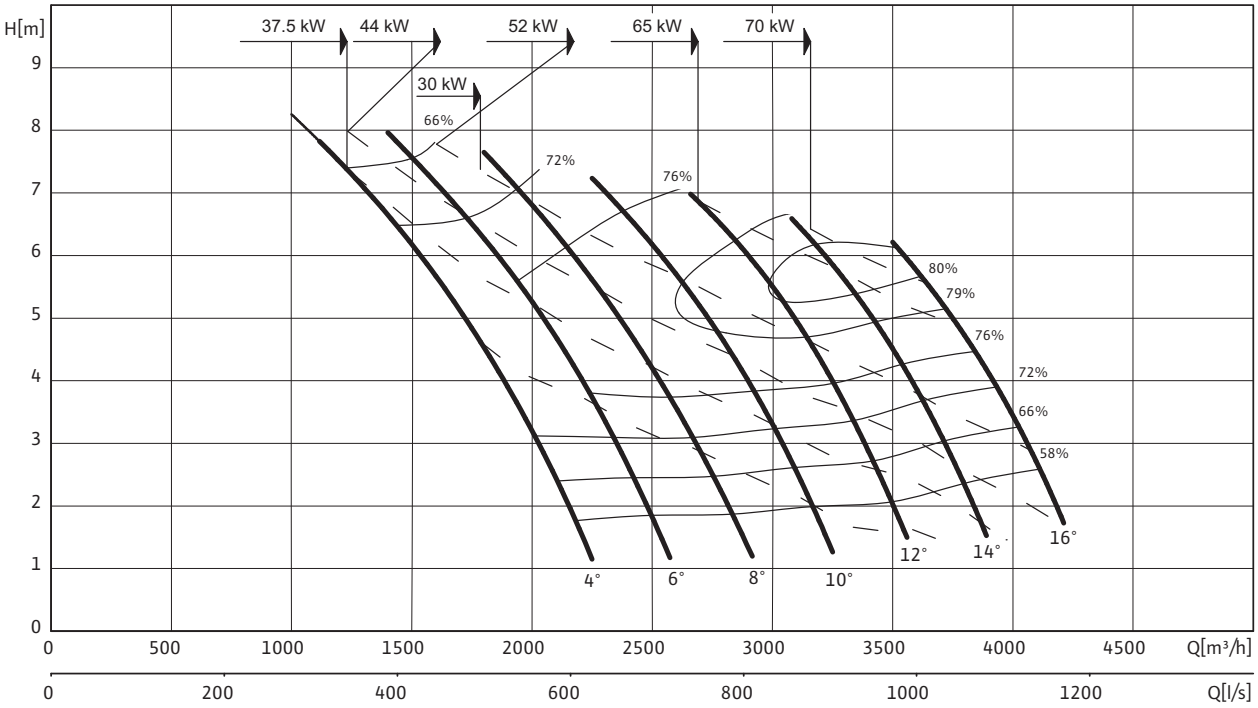
Dimension drawing Wilo-EMU KPR – stationary wet well installation



Pump curves, technical data Wilo-EMU KPR 500 (950 rpm)

Pump curves Wilo-EMU KPR 500 – 50 Hz – 950 rpm

Axial impeller – Free ball passage: 110 mm



Hydraulic data

Wilo-EMU...	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
KPR 500	110	Axial impeller	385

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A.

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions
	I_N	I_A		P_2	P_1			A
	A			kW			kg	mm
T 30-6/28P (Ex)	60	330	109	30.0	34.0	S1/–	324	1022
T 30-6/35P (Ex)	75	410	136	37.5	42.5	S1/–	364	1082
T 30-6/41P (Ex)	88	480	159	44.0	49.5	S1/–	395	1172
T 30-6/48P (Ex)	102	580	192	51.5	58.0	S1/–	506	1281
T 34-6/29P (Ex)	85	490	162	45.0	49.0	S1/–	391	1076
T 34-6/32P (Ex)	94	540	179	50.0	55.0	S1/–	420	1076
T 34-6/41P (Ex)	124	670	225	65.0	70.0	S1/–	478	1156
T 34-6/50P (Ex)	136	790	265	70.0	78.0	S1/–	544	1226

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU KPR 500 (950 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
T 30...P	NBR	–	–	SiC/SiC, SiC/SiC
T 34...P	NBR	–	–	SiC/SiC, SiC/SiC

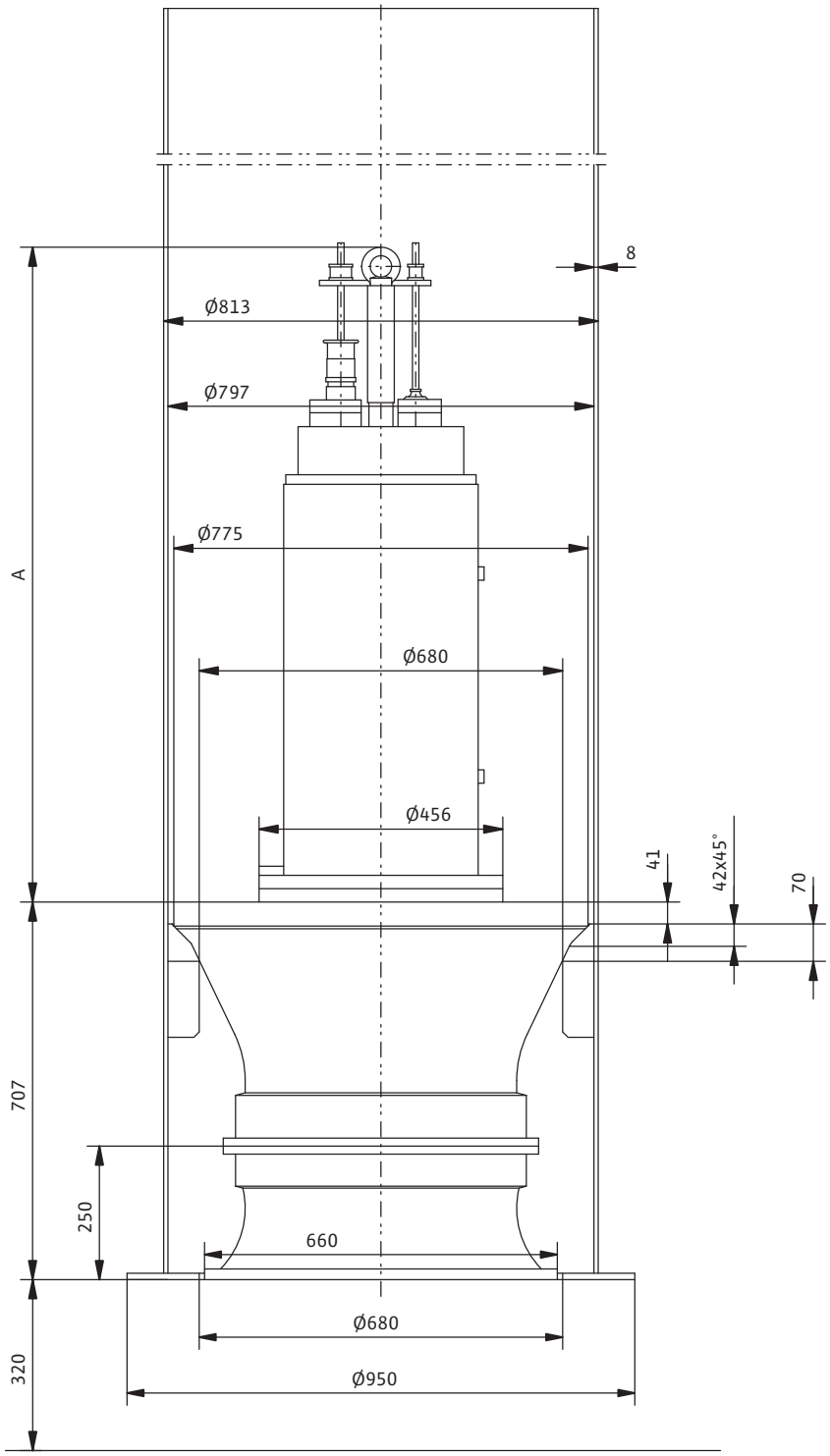
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
T 30...P	•	•	•	•	•	–	optional	•
T 34...P	•	•	•	optional	optional	–	optional	•

Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU KPR 500 (950 rpm)

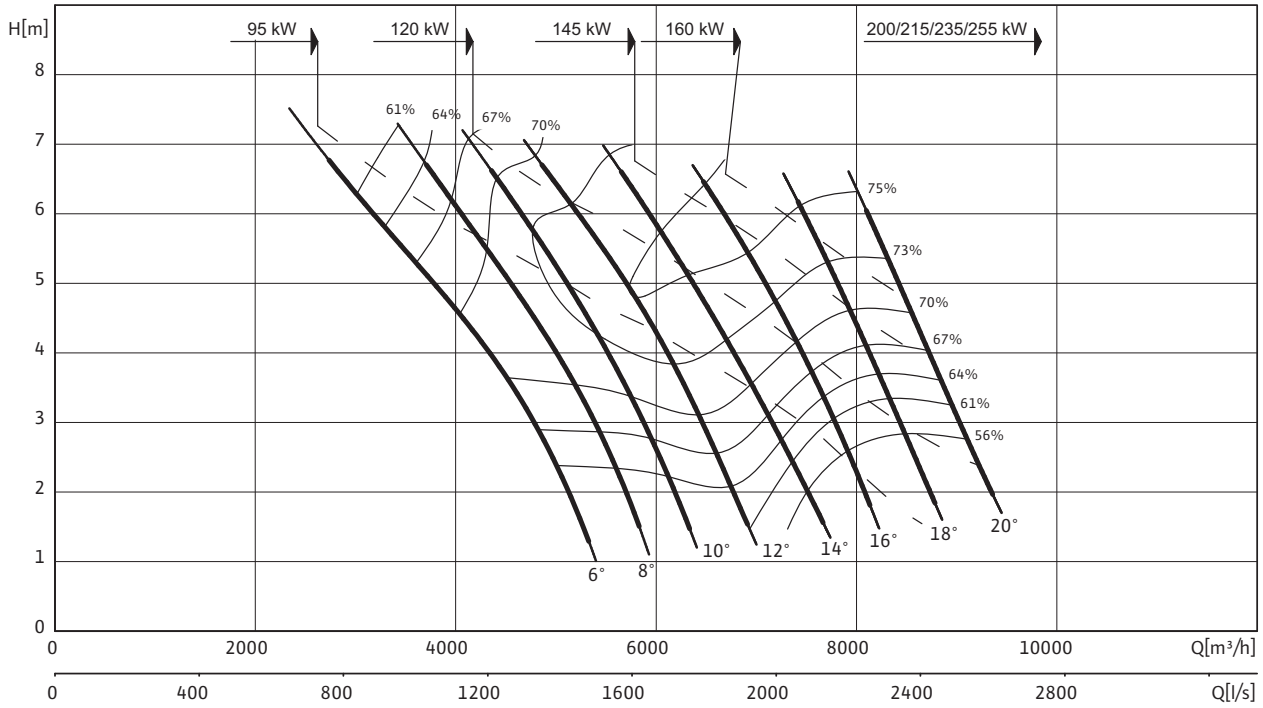
Dimension drawing Wilo-EMU KPR – stationary wet well installation



Pump curves, technical data Wilo-EMU KPR 760 (585 rpm)

Pump curves Wilo-EMU KPR 760 – 50 Hz – 585 rpm

Axial impeller – Free ball passage: 130 mm



Hydraulic data			
Wilo-EMU...	**Free ball passage**	**Type of impeller**	**Weight of hydraulic unit**
	mm		kg
KPR 760	130	Axial impeller	1050

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A.

Motor data for 3~400 V, 50 Hz								
Wilo-EMU...	**Nominal current**	**Starting current – direct**	**Starting current – star-delta**	**Nominal motor power**	**Power consumption**	**Operating mode (immersed/non-immersed)**	**Motor weight**	**Dimensions**
	I_N	I_A		P_2	P_1			A
	A			kW			kg	mm
T 49-10/36P (Ex)	188	830	275	95.0	103.0	S1/–	1485	1906
T 49-10/43P (Ex)	240	1020	340	120.0	130.0	S1/–	1600	1906
T 49-10/53P (Ex)	285	1260	420	145.0	156.0	S1/–	1765	2056
T 49-10/58P (Ex)	315	1450	480	160.0	171.0	S1/–	1850	2056
T 56-10/53P	380	1800	600	200.0	215.0	S1/–	2160	2051
T 56-10/58P	405	1950	650	215.0	230.0	S1/–	2260	2051
T 56-10/64P	445	2150	710	235.0	250.0	S1/–	2375	2171
T 56-10/70P	480	2400	800	255.0	270.0	S1/–	2490	2171
T 56-10/78P	540	2700	900	285.0	305.0	S1/–	2235	2251

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/– 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU KPR 760 (585 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
T 49...P	NBR	–	SiC/SiC, SiC/SiC	–
T 56...P	NBR	–	SiC/SiC, SiC/SiC	–

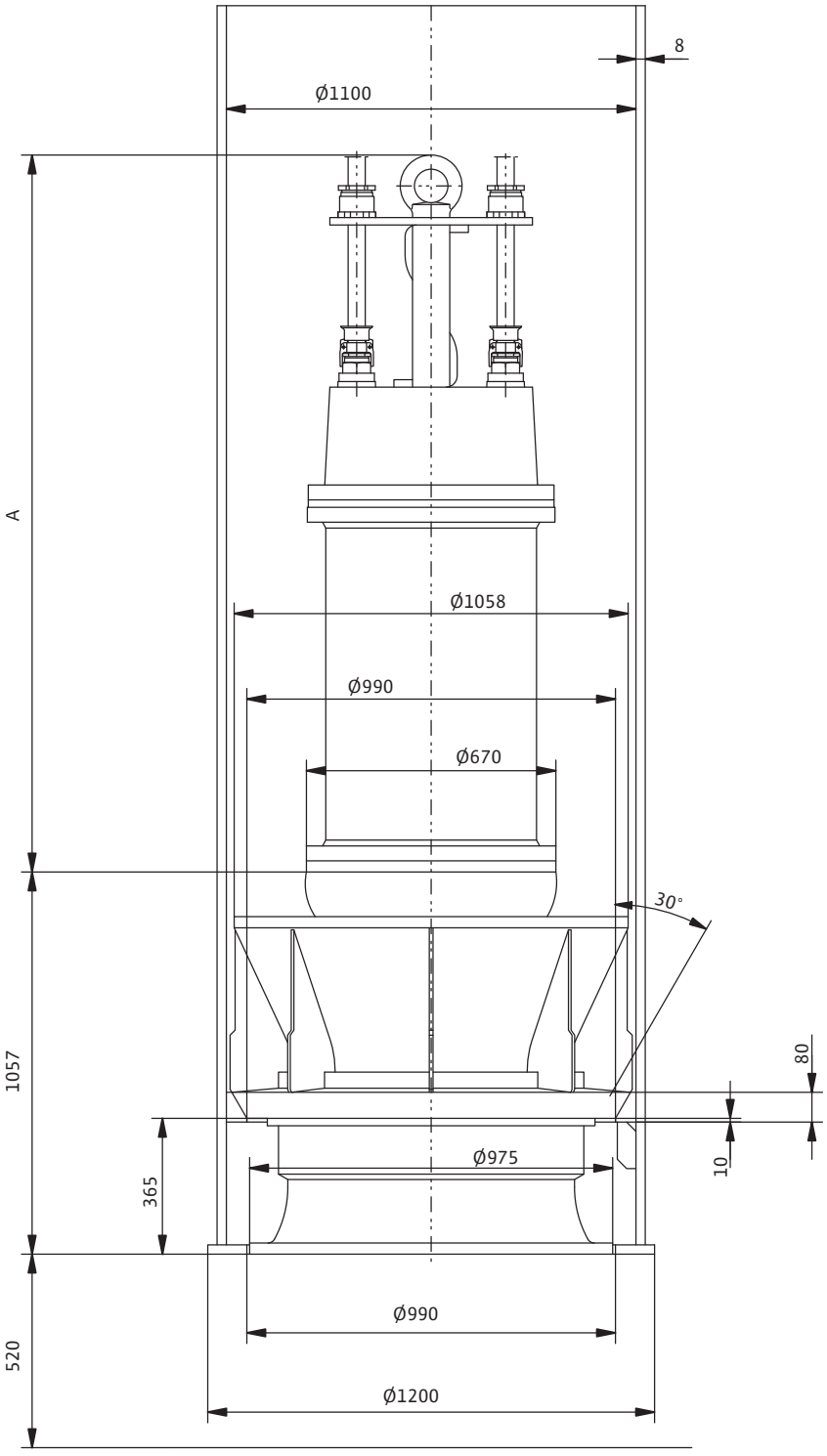
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
T 49...P	–	•	•	•	•	–	optional	•
T 56...P	–	–	•	•	•	–	optional	optional

Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU KPR 760 (585 rpm)

Dimension drawing Wilo-EMU KPR – stationary wet well installation



Wilo-EMU TR 326

Series description Wilo-EMU SR

Wilo-EMU SR

Design
Jet cleaner for cleaning the rain spillway basin

Type key

Example:	**Wilo EMU SR 100/D65**
SR	Jet cleaner
100	Nominal diameter of the pressure connection for the submersible pump, in mm
D65	Diameter of injector nozzle

Application
- For cleaning the rain spillway basin even during the emptying phase.
- For reducing the build-up of slime by injecting air
- For agitating the organic and inorganic materials

Special features/product advantages
- With a submersible sewage pump
- This can be operated even during the filling phase
- It can be installed in new and existing basins
- The rainwater that is present is used for cleaning
- Oxygen is injected via a separate suction pipe during operation
- The length of the jet pipe and air suction pipe can be adjusted individually
- For agitating the organic and inorganic materials in rainwater
- Oxygen injection reduces the build-up of slime when water is standing for long period in the rainwater basin

Technical data
Jet cleaner:
- Circulation output:100...200 m³
- max. basin size: 15 m (round), 10x20 m (rectangular)
- Pressure connection:DN100 or DN150

Sewage pump:
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Surfaced operating mode: S1
- Protection class: IP 68
- Max. fluid temperature: 3 - 40 °C
- Max. immersion depth: 20 m

Materials
- Pump completely of EN-GJL 250
- Jet cleaner completely of galvanised steel or V4A

Equipment/function
- Submersible sewage pump with self-cooling motor
- Jet cleaner with jet pipe, air suction pipe and injector nozzle

Description/design
Jet cleaner comprising jet pipe, air suction pipe, injector nozzle and submersible sewage pump for stationary wet well installation.

Pump
Submersible sewage pump as submersible monobloc unit with self-cooling motor. The pressure-side outlet is connected directly to the jet pipe. The maximum possible dry matter is 8 %. Single-channel impellers are used as the impeller shape. The use of self-cooling motors allows the units to be operated continuously in either submerged and dry condition.

Jet cleaner
The submersible sewage pump sucks any rainwater present out of the drain channel in the basin, and pumps it through the injector nozzle via the jet pipe back into the basin.
According to the principle of the water jet pump, at the same time oxygen is sucked into the rainwater via the air suction pipe during this operation. The exiting air/water drive jet is under high pressure and reaches far into the basin. This causes a turbulent flow, which, in turn, prevents solids from depositing.
So as to ensure a stable process, the jet cleaner is equipped with submersible units with self-cooling motors. This means the jet cleaner can be installed directly in the basin, and operated during the filling of the basin until the rain spillway basin has been emptied. This agitates the solids and dirt so that they form a suspension and are carried out of the basin together with the rainwater.

Series description Wilo-EMU SR

Options
Jet cleaner:
- The length of the air suction and jet pipe is as required by the customer

Sewage pump:
- Ceram -coating for protection against corrosion and abrasion
- In "Abrasite" special material
- With Ex protection in accordance with ATEX or FM
- PTC temperature sensor for winding monitoring
- Special voltages

Scope of delivery
- Submersible sewage pump
- Jet cleaner
- Operating and maintenance manual

Accessories
- Chains
- T guide rail for easy deinstallation of the sewage pump
- Suction pipe for better use of the residual water in the water channel
- External sealing chamber monitoring for monitoring the sewage pump
- Fixation sets with anchor bolts
- Switchgears and relays

Commissioning
Operation with non-immersed motor:
The use of self-cooling motors allows replacement of the motor at any time.

Technical data Wilo-EMU SR

Jet cleaners

Wilo-EMU...	Max. circulation power	Rectangular basin	Round basin	Hydraulics type	Type of motor
		Length x width	*max. Ø*		
	m^3	mm			
SR 100 DN55	100	4000x8000	6000	FA 10.51E-179	FK 17.1-4/8KEx
SR 100 DN65	110	5000x10000	8000	FA 10.51E-195	FK 17.1-4/12KEx
SR 100 DN65	145	6000x12000	10000	FA 10.82E-215	FK 17.1-4/16KEx
SR 100 DN65	165	8000x16000	13000	FA 10.82E-230	HC 20.1-4/17KEx
SR 100 DN70	185	9000x18000	14000	FA 10.82E-245	HC 20.1-4/17KEx
SR 150 DN70	200	10000x20000	15000	FA 15.52E-260	HC 20.1-4/22KEx

Hydraulic data

Wilo-EMU...	Free ball passage	Impeller	Pressure connection	Connection, nominal diameters DN suction side	Weight of hydraulic unit
	mm				kg
FA 10.51E-179	100	179	DN 100	DN 100	26
FA 10.51E-195	100	195	DN 100	DN 100	26
FA 10.82E-215	100	215	DN 100	DN 150	57
FA 10.82E-230	100	230	DN 100	DN 150	57
FA 10.82E-245	100	245	DN 100	DN 150	57
FA 15.52E-260	100	260	DN 150	DN 150	82

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current - direct	Starting current - star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight
	I_N	I_A		P_2	P_1		
	A			kW			kg
FK 17.1-4/8 (Ex)	5.7	36.5	12	2.2	3.05	S1/S1	85
FK 17.1-4/8 (Ex)	9.5	36	12	4	5.5	S1/S1	85
FK 17.1-4/12 (Ex)	10.8	43	14	5	6.5	S1/S1	92
FK 17.1-4/16 (Ex)	14.1	69	23	6.6	8.4	S1/S1	107
HC 20.1-4/17 (Ex)	21	99	33	10	12.1	S1/S1	172
HC 20.1-4/22 (Ex)	31	126	42	15	18.1	S1/S1	188

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	-	-	SiC/SiC, SiC/SiC
HC 20.1...	NBR	-	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC

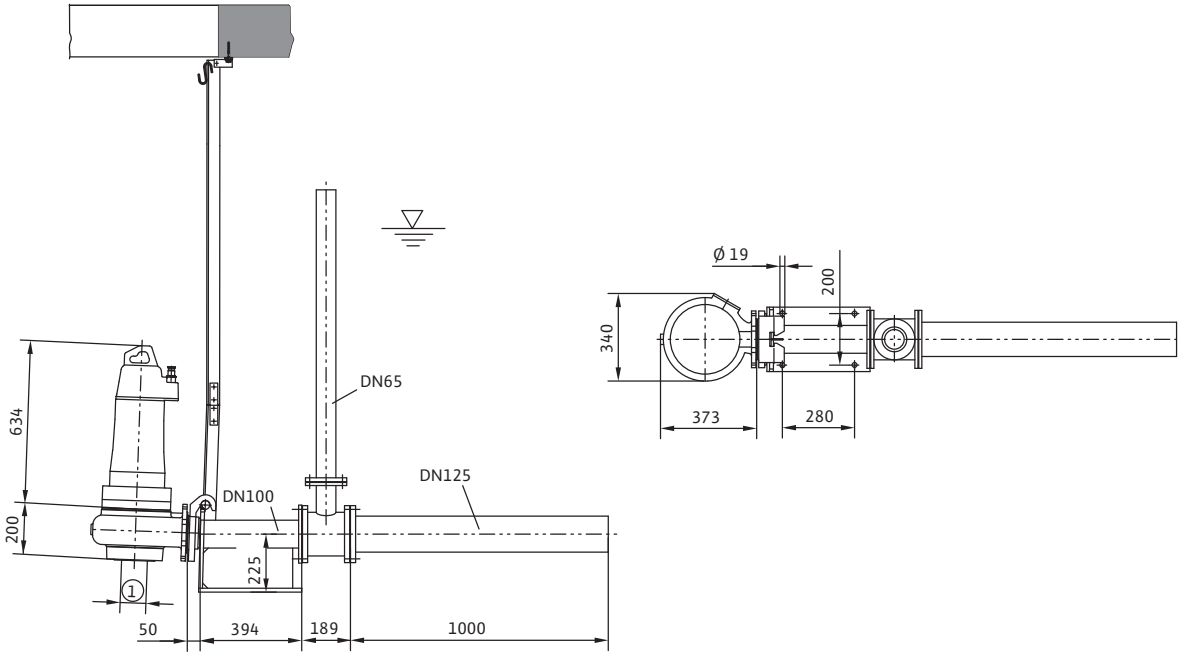
Technical data Wilo-EMU SR

Equipment/function								
Wilo-EMU...	**Explosion protection according to**		**Motor temperature monitoring**	**Motor leakage detection**	**Sealing chamber leakage detection**	**Leakage chamber leakage detection**	**Bearing temperature monitoring**	**Terminal chamber leakage detection**
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
HC 20.1...	•	•	•	•	optional	•	–	•

Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

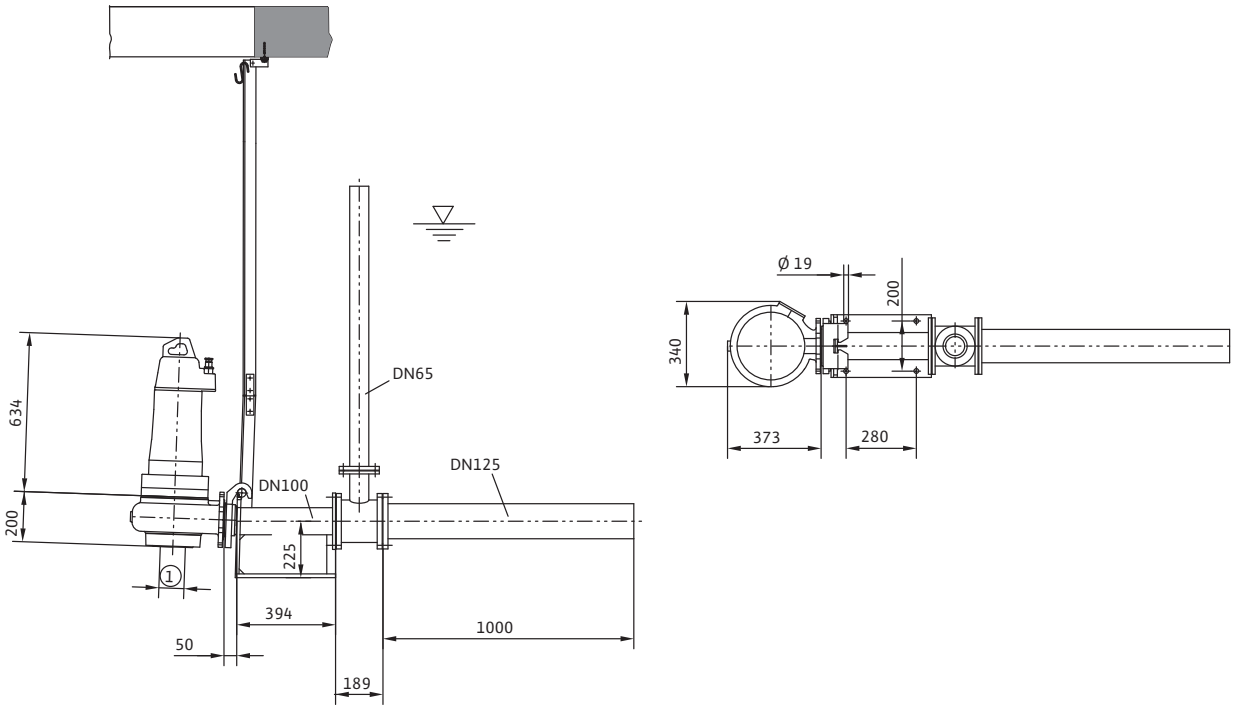
Dimensions, weights Wilo-EMU SR

Dimension drawing Wilo-EMU SR 100 with FA 10.51E and FK 17.1-4/8



1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4

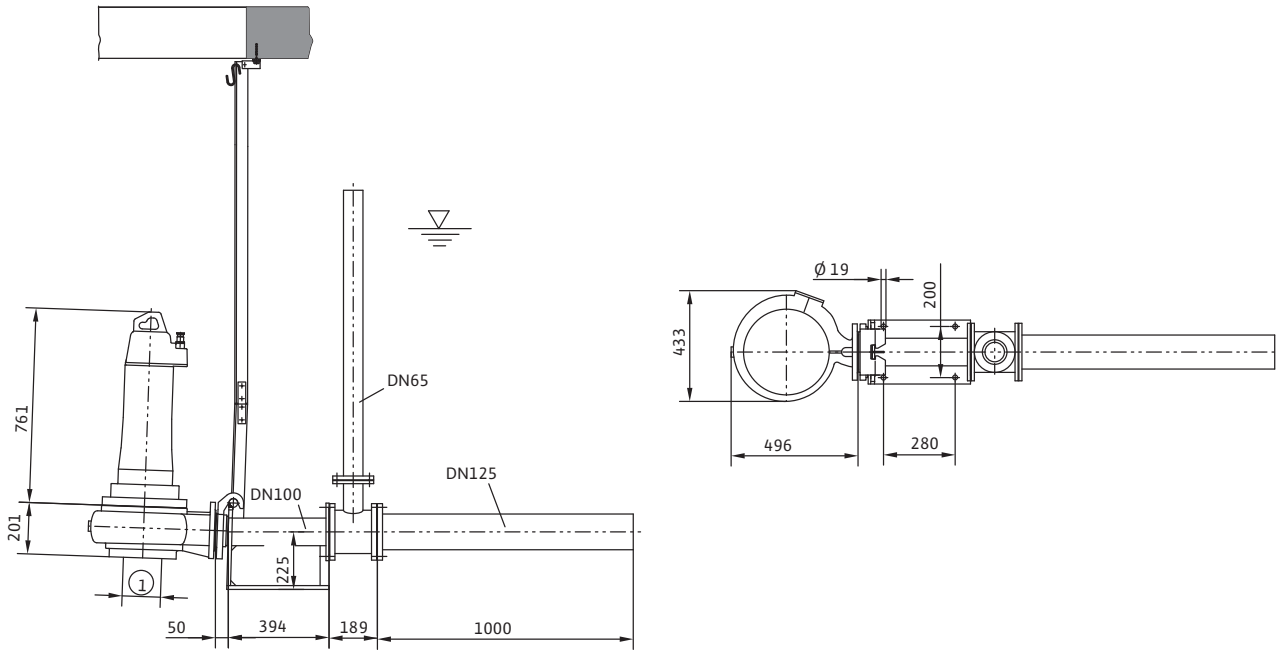
Dimension drawing Wilo-EMU SR 100 with FA 10.51E and FK 17.1-4/12



1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4

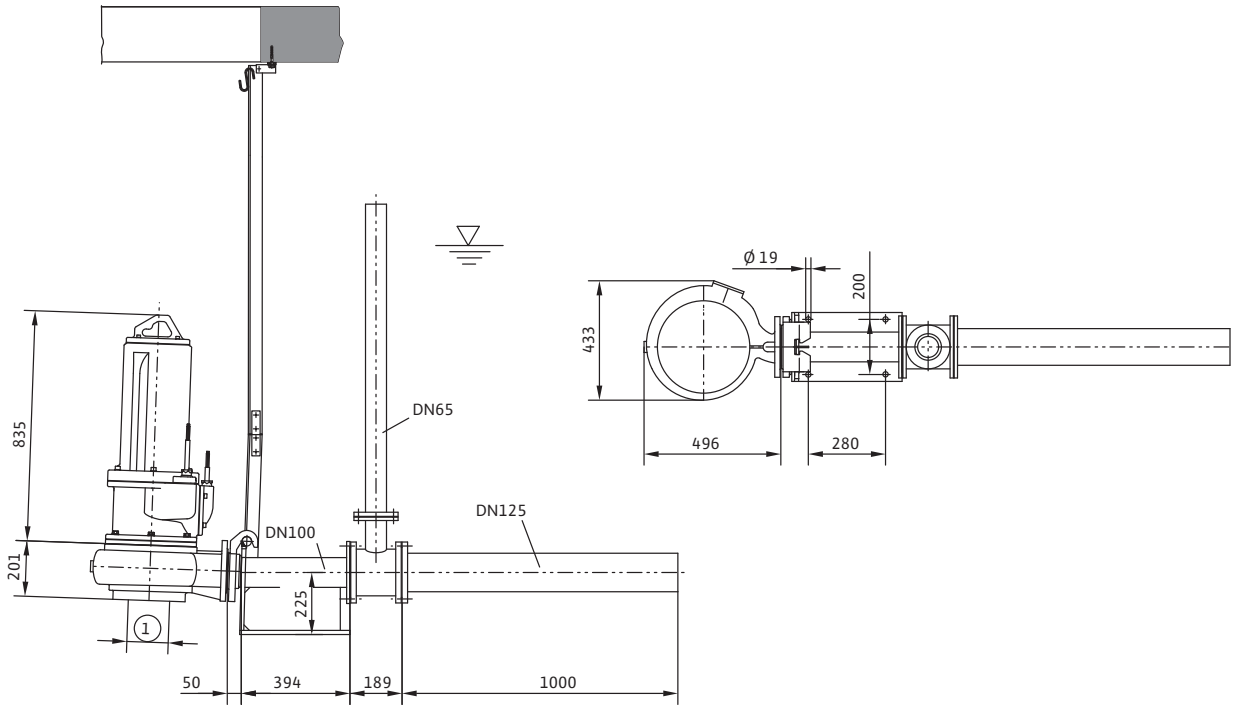
Dimensions, weights Wilo-EMU SR

Dimension drawing Wilo-EMU SR 100 with FA 10.82E and FK 17.1-4/16



1 = DN150 PN10 / ANSI B16.1, Class 125, Size 6

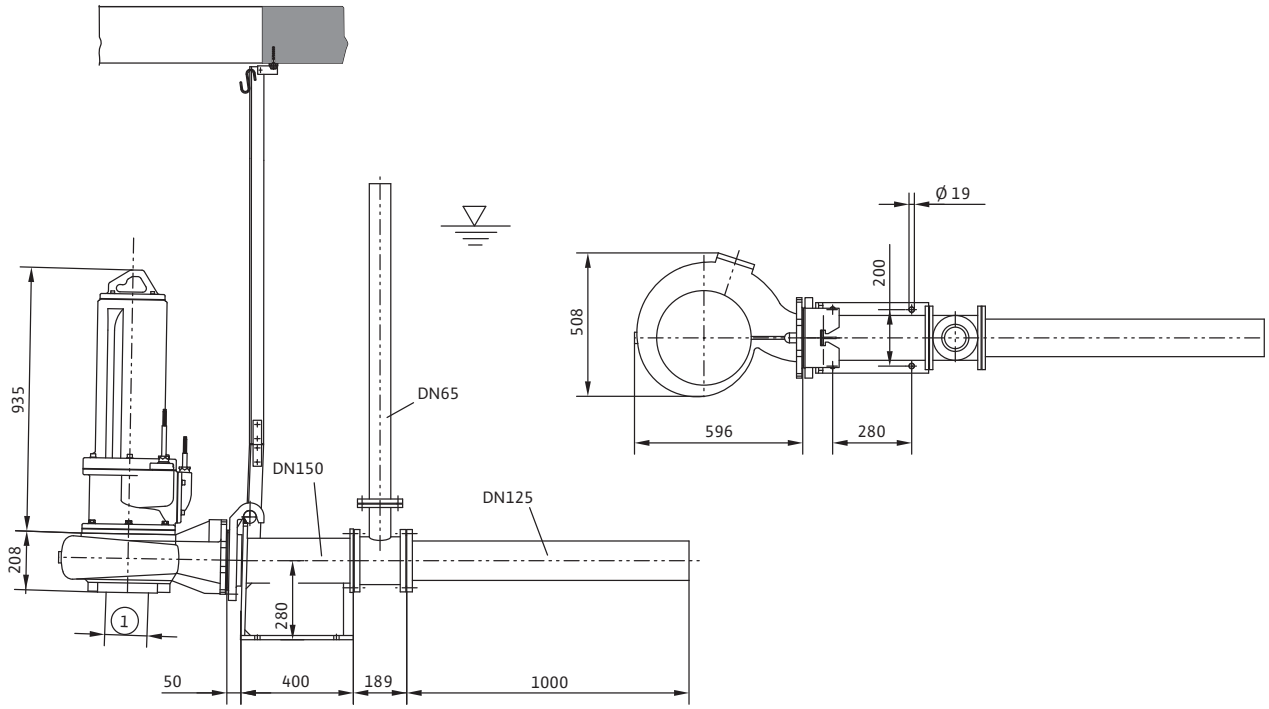
Dimension drawing Wilo-EMU SR 100 with FA 10.82E and HC 20.1-4/17



1 = DN150 PN10 / ANSI B16.1, Class 125, Size 6

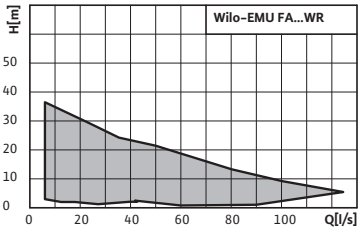
Dimensions, weights Wilo-EMU SR

Dimension drawing Wilo-EMU SR 150 with FA 15.52E and HC 20.1-4/22



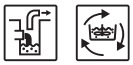
1 = DN150 PN10 / ANSI B16.1, Class 125, Size 6

Series overview

Series	**Wilo-EMU FA...WR**
Product photo	
Duty chart	
Design	Submersible sewage pump with mechanical stirring apparatus
Application	• In grit chambers • For pumping sludge
Q_{max}	72 m^3/h
H_{max}	27 m
Special features/product advantages	• Operation in stationary and portable wet well installation • Submersible • Avoidance of deposits in the suction area of the pump • Easy installation due to suspension unit or pump base • Coatings against abrasion and corrosion • Longitudinally watertight cable lead-in (depending on motor) • Adjustment of duty point by trimming the impeller
Further information	Series information from page 164

Series description Wilo-EMU FA...WR

Wilo-EMU FA...WR



Design
Submersible sewage pump with mechanical stirring apparatus

Type key

e.g. hydraulics:	**Wilo-EMU FA 08.52WR**
FA	Submersible sewage pump
08	x10 = nominal diameter of the pressure port, e.g. DN80
52	Performance indicator
WR	Vortex impeller with mechanical stirring apparatus

e.g. motor:	**Wilo-EMU T 17--6/16H Ex**
T	Motor version
17	Overall size
6	Number of poles
16	x10 = package length [mm]
H	Sealing version
Ex	Ex-rated

Application
- In grit chambers
- For pumping sludge

Special features/product advantages
- Operation in stationary and portable wet well installation
- Submersible
- Avoidance of deposits in the suction area of the pump
- Easy installation due to suspension unit or pump base
- Coatings against abrasion and corrosion
- Longitudinally watertight cable lead-in (depending on motor)
- Adjustment of duty point by trimming the impeller

Technical data
- Mains connection: 3~400 V, 50 Hz
- Immersed operating mode: S1
- Surfaced operating mode with self-cooling motor: S1
- Protection class: IP 68
- Max. fluid temperature: 3 - 40 °C, higher temperatures on request
- Sealing: With rotary shaft seal and mechanical seal, two mechanical seals or one block seal cartridge, depending on the motor
- Free ball passage: 23 - 58 mm.
- Permanently lubricated roller bearings
- Max. immersion depth: 20 m

Materials
- Housing components: EN-GJL
- Impeller: EN-GJL or EN-GJS
- Static seals: NBR
- Sealing on pump side: SiC/SiC
- Sealing on motor side: NBR or SiC/SiC
- Shaft: Stainless steel 1.4021
- Stirring apparatus: Abrasite

Equipment/function
- Heavy-duty version made of grey cast iron
- Self-cooling motors with 1- or 2-chamber system
- Simple installation via suspension unit or pump base
- Mechanical stirring apparatus is fastened directly to the impeller
- Mixer head made of chilled cast iron, Abrasite

Description/design
Submersible sewage pump with mechanical stirring apparatus as submersible monobloc unit for stationary and portable wet well installation.

Hydraulics
The outlet on the pressure side is designed as horizontal flange connection. The maximum possible dry matter content is 8%, depending on the hydraulics and impeller type.

Vortex impellers are used exclusively as the impeller shape. A mechanical stirring apparatus is mounted to these as an axial extension of the motor shaft. The mixer head is made of Abrasite chilled cast iron.

Motor
Dry motors (T motors) give off their heat directly to the surrounding fluid via the housing components and can be used in immersed state for permanent operation.

Series description Wilo-EMU FA...WR

The oil-filled motors (FK motors) and self-cooling dry motors (FKT, HC motors) give off their heat to the pumped fluid via a built-in heat exchanger. As a result, these motors are suitable for permanent operation either in immersed or non-immersed state.

All motors have a sealing chamber that protects the motor from fluid ingress. It can be accessed from the outside and can be monitored with an optional sealing chamber electrode.

All filling fluids used are potentially biodegradable and environmentally safe.

The cable inlet on T, HC and FKT motors is longitudinally watertight. Up to motor size 17, cable lengths are available in fixed lengths measured in 10 m intervals. Starting from motor size 20, the cable length can be individually configured.

Sealing

Fluid-side and motor-side sealing is possible in the following versions depending on the motor type:

- Version H: Mechanical seal for the fluid side, rotary shaft seal for the motor side
- Version G: Two independently operating mechanical seals
- Version K: Block seal cartridge with two independently operating mechanical seals

Options

- Special voltages
- PTC thermistor sensor
- Internal or external sealing chamber control
- Monitoring units for leakage and bearing temperature
- Special materials, e.g. Abrasite
- Ceram coating C0, C1, C2, C3
- Ex-rated according to ATEX or FM

Scope of delivery

- Submersible sewage pump with mechanical stirring apparatus
- Up to motor size 17, cable lengths are available in fixed lengths measured in 10 m intervals; starting from motor size 20, per customer request
- Accessories per customer request
- Operating and maintenance manual

Accessories

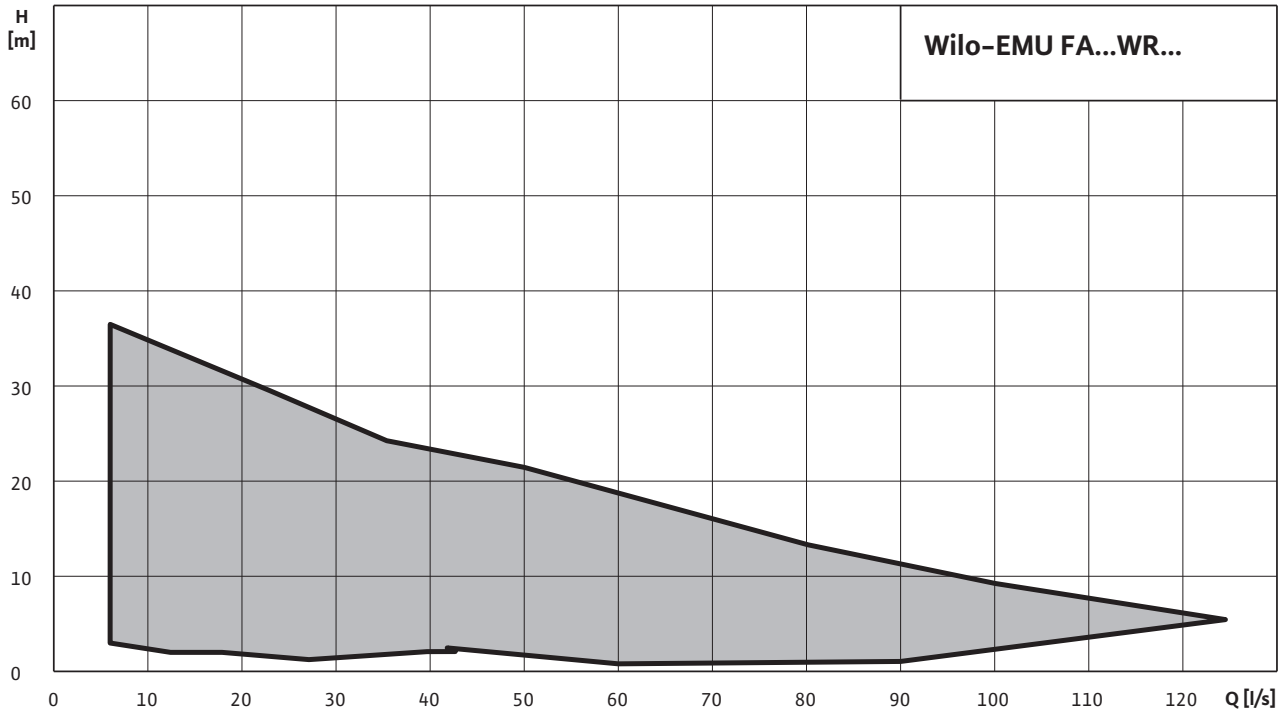
- Suspension unit or pump base
- Various pressure outlets and Storz couplings
- Chains
- Fixation sets with anchor bolts
- Switchgears, relays and plugs

Commissioning

Operation with surfaced motor:
The surfacing of self-cooling motors (FK, FKT, HC motors) is permitted.

Dry motors (T motors) can be surfaced only if there is an operating mode for surfaced operation.

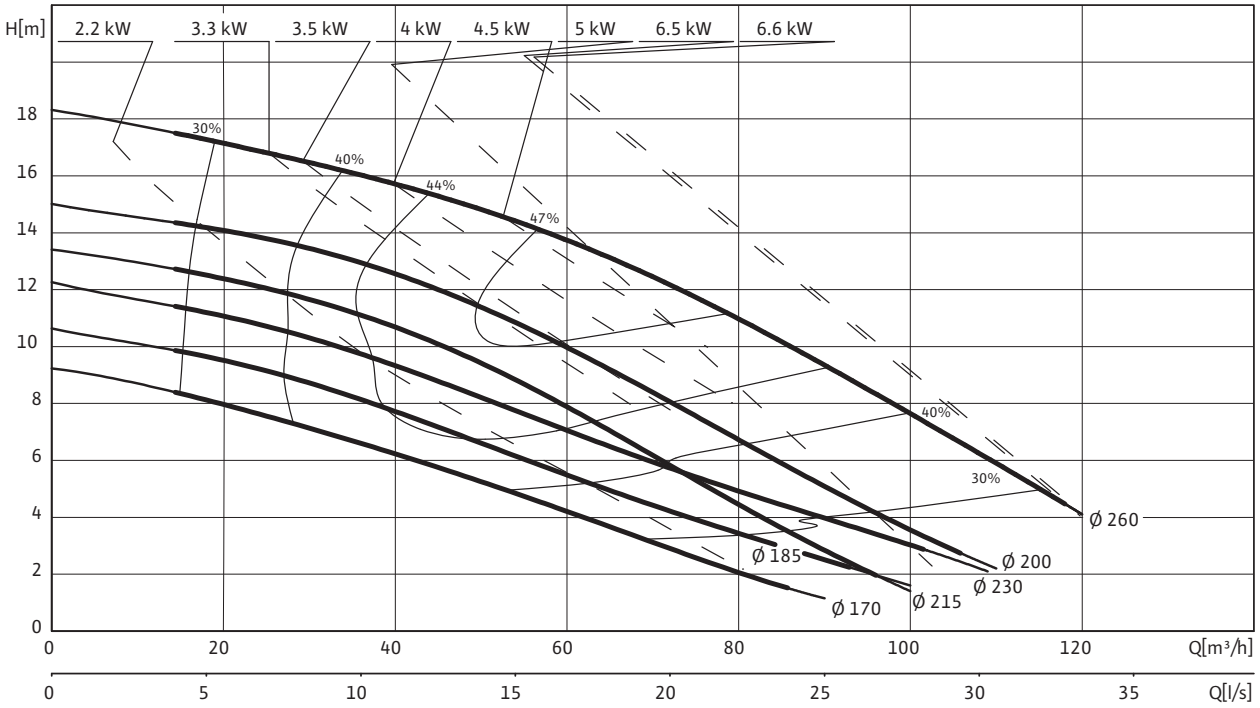
Dry-running protection system:
The hydraulics housing must always be immersed to prevent air from being drawn in. In the case of fluctuating fluid levels, the system should switch off automatically once the minimum water submersion is reached.



Pump curves, technical data Wilo-EMU FA 08.52WR (1450 rpm)

Pump curves Wilo-EMU FA 08.52WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 23 mm



Hydraulic data

Wilo-EMU…	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 08.52WR	23	Vortex impeller with mixer head	35

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU…	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 17.1-4/8 (Ex)	5.7	36.5	12	2.20	3.05	S1/S1	85	640	430
FK 17.1-4/8 (Ex)	9.5	36	12	4.00	5.50	S1/S1	85	640	430
FK 17.1-4/12 (Ex)	10.8	43	14	5.00	6.50	S1/S1	92	640	430
FK 17.1-4/16 (Ex)	14.1	69	23	6.60	8.40	S1/S1	107	760	550
T 17-4/8 (Ex)	7.9	37	13	3.50	4.50	S1/–	43	410	338
T 17-4/12 (Ex)	9.4	47	16	4.50	5.80	S1/–	51	445	373
T 17-4/16 (Ex)	13.5	68	23	6.50	8.20	S1/–	62	483	411

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU FA 08.52WR (1450 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	–	–	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	–	SiC/SiC, SiC/SiC

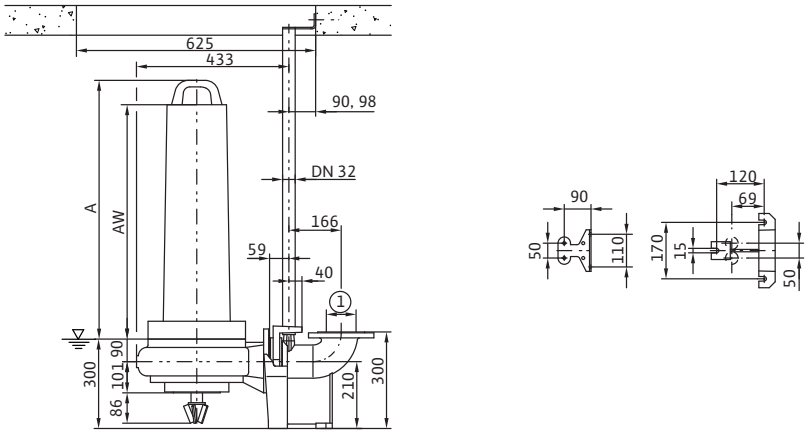
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
T 17...	•	•	•	•	•	–	–	–

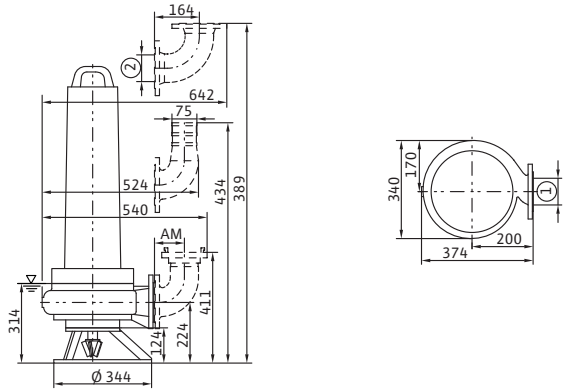
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 08.52WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

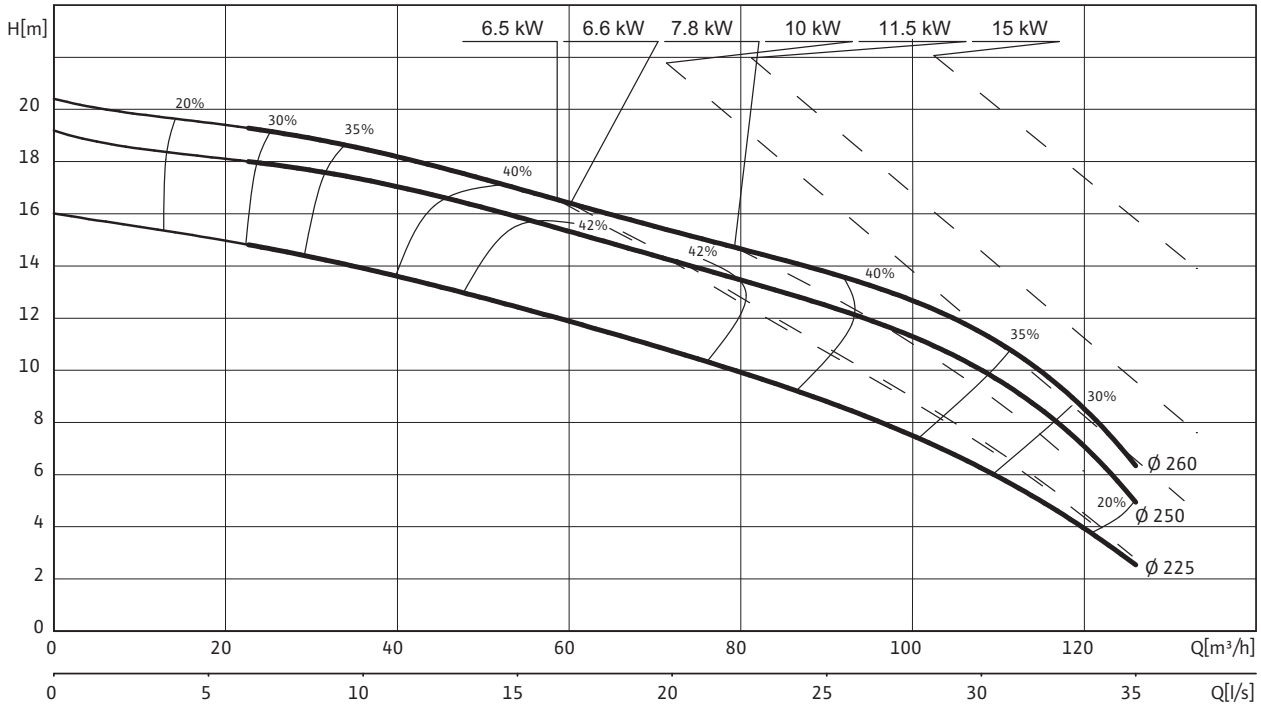


1 = DN80 PN10 / ANSI B16.1, Class 125, Size 3; 2 = DN80 PN10

Pump curves, technical data Wilo-EMU FA 08.73WR (1450 rpm)

Pump curves Wilo-EMU FA 08.73WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 23 mm



Hydraulic data

Wilo-EMU...	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 08.73WR	23	Vortex impeller with mixer head	35

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 17.1-4/8 (Ex)	9.5	36	12	4.00	5.50	S1/S1	85	640	430
FK 17.1-4/12 (Ex)	10.8	43	14	5.00	6.50	S1/S1	92	640	430
FK 17.1-4/16 (Ex)	14.1	69	23	6.60	8.40	S1/S1	107	760	550
FK 202-4/12	16.6	67	23	7.80	9.90	S1/S1	106	726	619
FK 202-4/17	24.5	98	33	11.50	14.60	S1/S1	119	771	664
HC 20.1-4/17 (Ex)	21	99	33	10.00	12.10	S1/S1	172	835	730
HC 20.1-4/22 (Ex)	31	126	42	15.00	18.10	S1/S1	188	935	830
T 17-4/12 (Ex)	9.4	47	16	4.50	5.80	S1/–	51	445	373
T 17-4/16 (Ex)	13.5	68	23	6.50	8.20	S1/–	62	483	411
T 17-4/24 (Ex)	21	123	41	10.00	12.20	S1/–	91	563	491

Pump curves, technical data Wilo-EMU FA 08.73WR (1450 rpm)

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
T 20.1-4/22 (Ex)	30.5	156	52	15.00	18.10	S1/S2-15 min	168	764	674

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	–	–	SiC/SiC, SiC/SiC
FK 202...	NBR	–	–	SiC/SiC, SiC/SiC
HC 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	–	SiC/SiC, SiC/SiC
T 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC

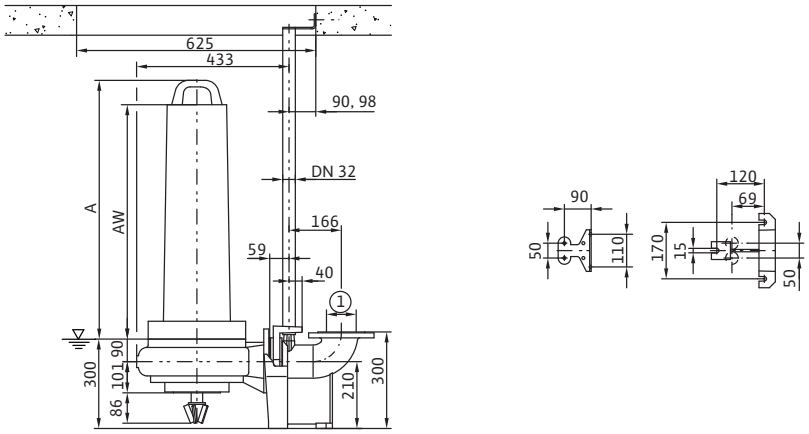
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
FK 202...	–	–	•	optional	optional	–	–	–
HC 20.1...	•	•	•	•	optional	•	–	•
T 17...	•	•	•	•	•	–	–	–
T 20.1...	•	•	•	•	optional	•	–	•

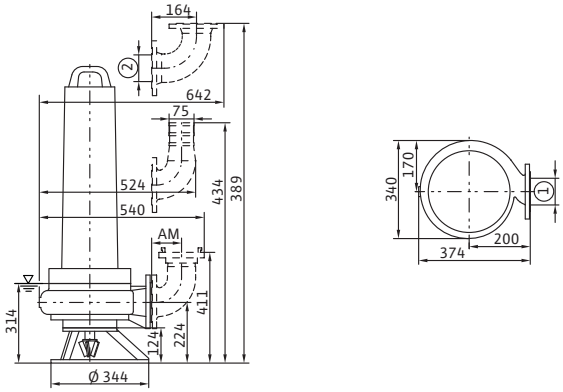
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 08.73WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

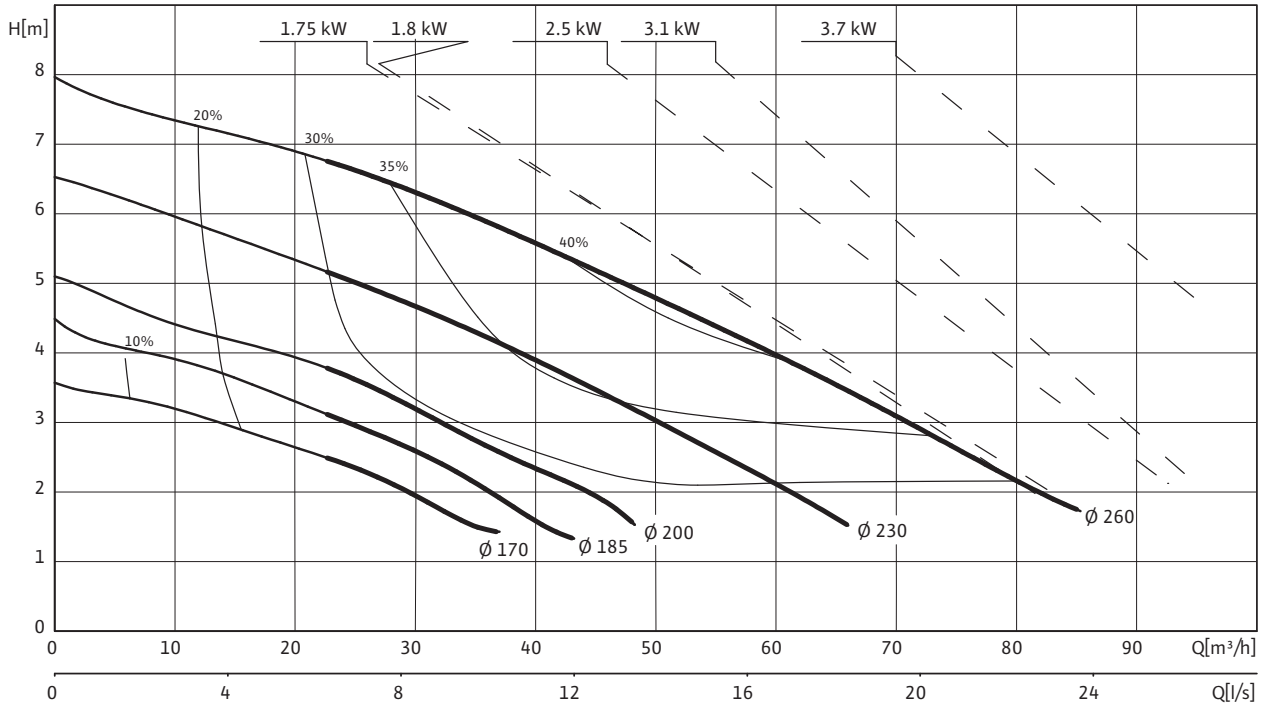


1 = DN80 PN10 / ANSI B16.1, Class 125, Size 3; 2 = DN80 PN10

Pump curves, technical data Wilo-EMU FA 10.22WR (950 rpm)

Pump curves Wilo-EMU FA 10.22WR – 50 Hz – 950 rpm

Vortex impeller with mixer head – Free ball passage: 33 mm



Hydraulic data			
Wilo-EMU…	**Free ball passage**	**Type of impeller**	**Weight of hydraulic unit**
	mm		kg
FA 10.22WR	33	Vortex impeller with mixer head	37

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU…	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
FK 17.1-6/8 (Ex)	5.2	17	6	1.80	2.80	S1/S1	85	640	430
FK 17.1-6/12 (Ex)	7.5	29	10	3.10	4.20	S1/S1	92	640	430
T 17-6/8 (Ex)	4.45	17	6	1.75	2.50	S1/–	43	410	338
T 17-6/12 (Ex)	6.2	31	11	2.50	3.45	S1/–	51	445	373
T 17-6/16 (Ex)	9.1	39	13	3.70	5.20	S1/–	62	483	411

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU FA 10.22WR (950 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	–	–	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	–	SiC/SiC, SiC/SiC

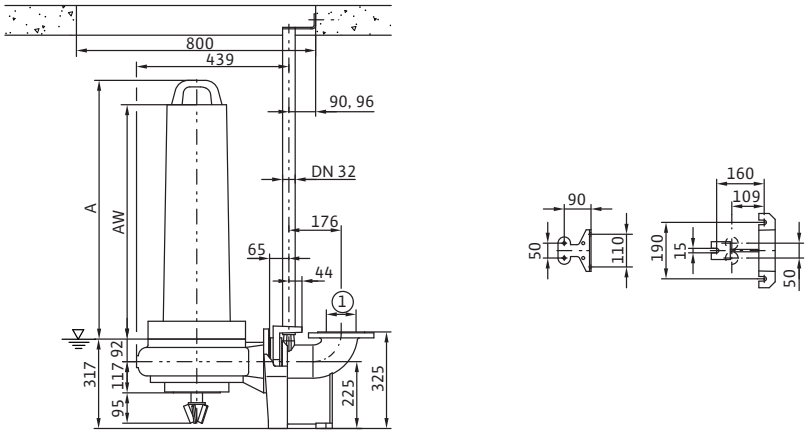
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
T 17...	•	•	•	•	•	–	–	–

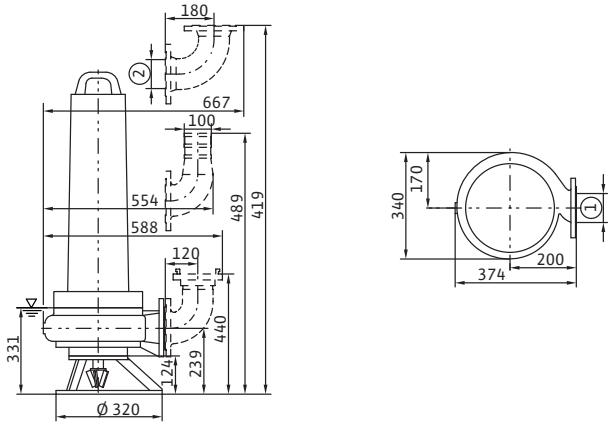
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 10.22WR (950 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

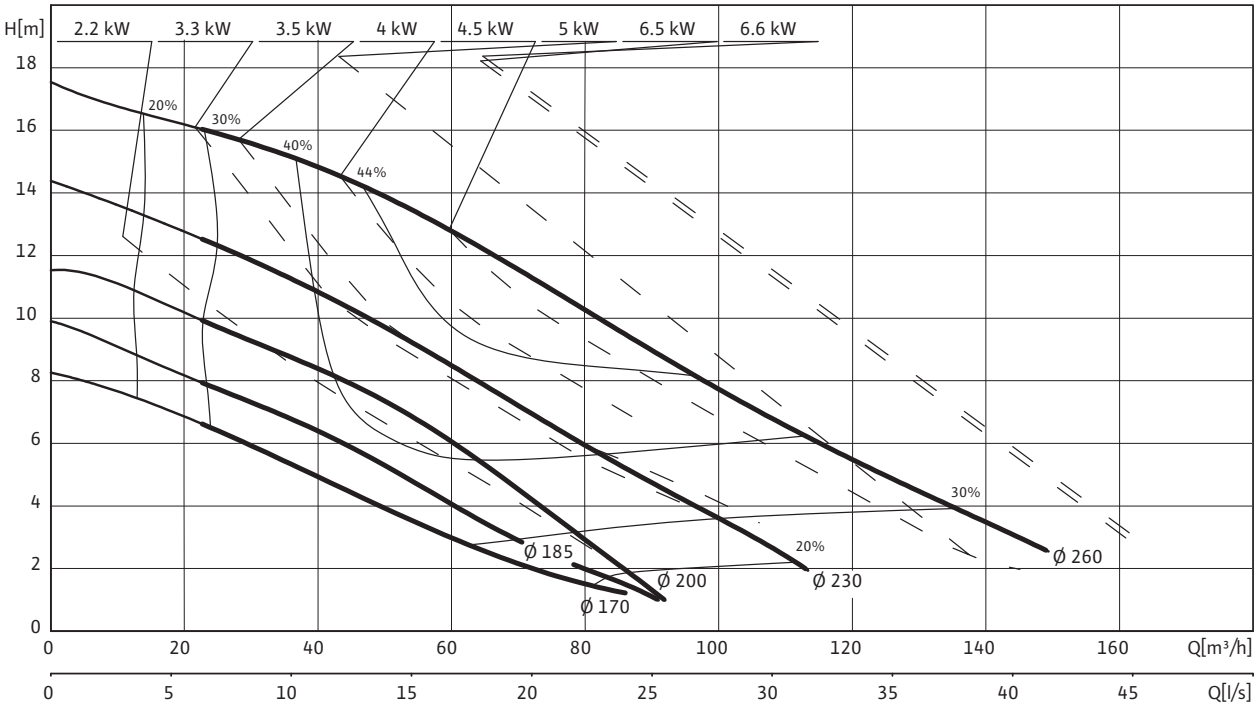


1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4; 2 = DN100 PN10

Pump curves, technical data Wilo-EMU FA 10.22WR (1450 rpm)

Pump curves Wilo-EMU FA 10.22WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 33 mm



Hydraulic data

Wilo-EMU...	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 10.22WR	33	Vortex impeller with mixer head	37

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 17.1-4/8 (Ex)	5.7	36.5	12	2.20	3.05	S1/S1	85	640	430
FK 17.1-4/8 (Ex)	9.5	36	12	4.00	5.50	S1/S1	85	640	430
FK 17.1-4/12 (Ex)	10.8	43	14	5.00	6.50	S1/S1	92	640	430
FK 17.1-4/16 (Ex)	14.1	69	23	6.60	8.40	S1/S1	107	760	550
T 17-4/8 (Ex)	7.9	37	13	3.50	4.50	S1/–	43	410	338
T 17-4/12 (Ex)	9.4	47	16	4.50	5.80	S1/–	51	445	373
T 17-4/16 (Ex)	13.5	68	23	6.50	8.20	S1/–	62	483	411

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Pump curves, technical data Wilo-EMU FA 10.22WR (1450 rpm)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	–	–	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	–	SiC/SiC, SiC/SiC

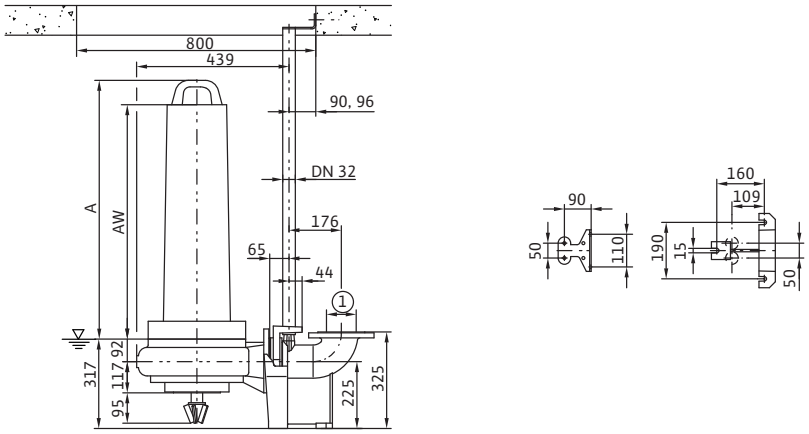
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
T 17...	•	•	•	•	•	–	–	–

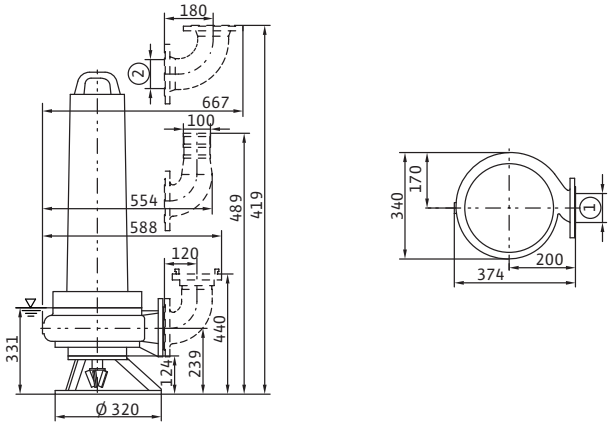
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 10.22WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

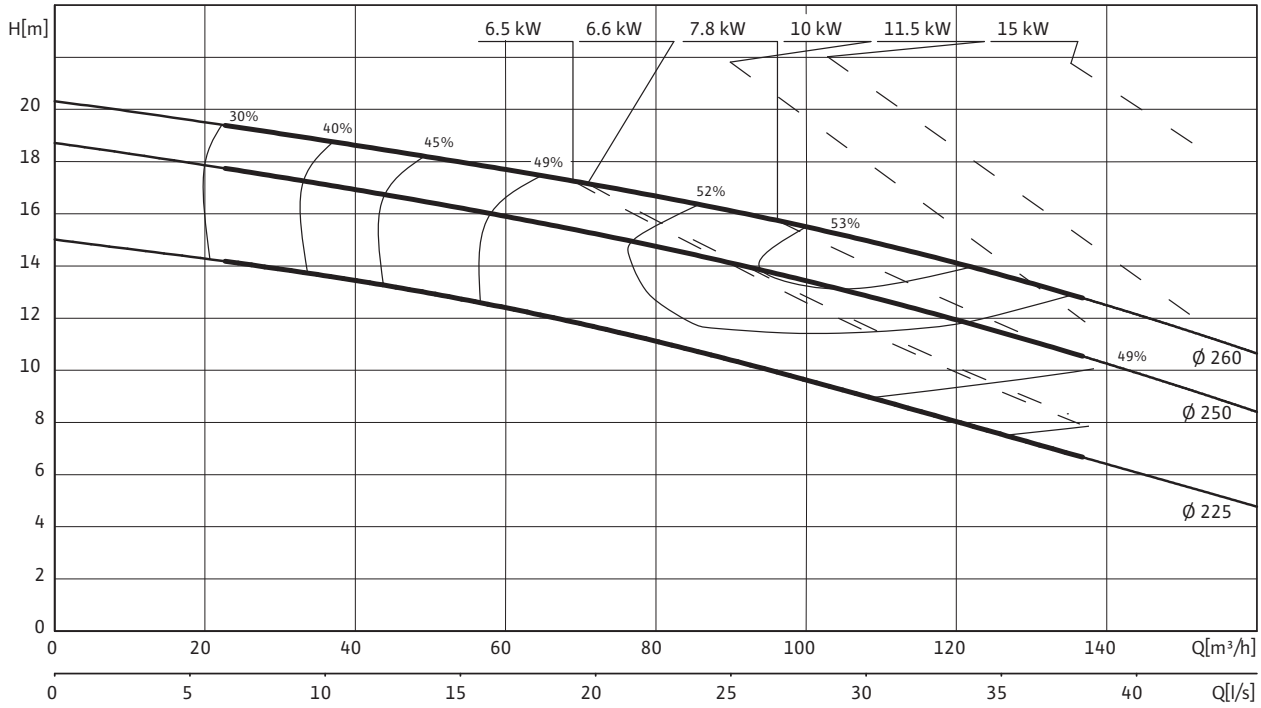


1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4; 2 = DN100 PN10

Pump curves, technical data Wilo-EMU FA 10.43WR (1450 rpm)

Pump curves Wilo-EMU FA 10.43WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 33 mm



Hydraulic data

Wilo-EMU…	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 10.43WR	33	Vortex impeller with mixer head	37

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU…	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 17.1-4/8 (Ex)	9.5	36	12	4.00	5.50	S1/S1	85	640	430
FK 17.1-4/12 (Ex)	10.8	43	14	5.00	6.50	S1/S1	92	640	430
FK 17.1-4/16 (Ex)	14.1	69	23	6.60	8.40	S1/S1	107	760	550
FK 202-4/12	16.6	67	23	7.80	9.90	S1/S1	106	726	619
FK 202-4/17	24.5	98	33	11.50	14.60	S1/S1	119	771	664
HC 20.1-4/17 (Ex)	21	99	33	10.00	12.10	S1/S1	172	835	730
HC 20.1-4/22 (Ex)	31	126	42	15.00	18.10	S1/S1	188	935	830
T 17-4/12 (Ex)	9.4	47	16	4.50	5.80	S1/–	51	445	373
T 17-4/16 (Ex)	13.5	68	23	6.50	8.20	S1/–	62	483	411
T 17-4/24 (Ex)	21	123	41	10.00	12.20	S1/–	91	563	491

Pump curves, technical data Wilo-EMU FA 10.43WR (1450 rpm)

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current - direct	Starting current - star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
T 20.1-4/22 (Ex)	30.5	156	52	15.00	18.10	S1/S2-15 min	168	764	674

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	-	-	SiC/SiC, SiC/SiC
FK 202...	NBR	-	-	SiC/SiC, SiC/SiC
HC 20.1...	NBR	-	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	-	SiC/SiC, SiC/SiC
T 20.1...	NBR	-	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC

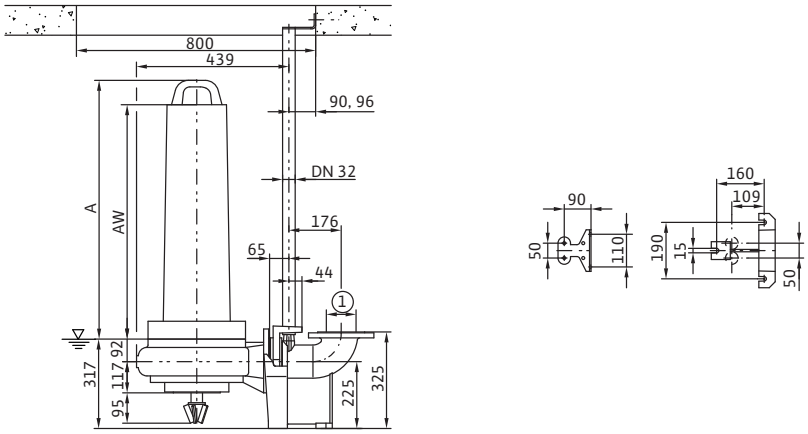
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	-	-
FK 202...	-	-	•	optional	optional	–	-	-
HC 20.1...	•	•	•	•	optional	•	-	•
T 17...	•	•	•	•	•	–	-	-
T 20.1...	•	•	•	•	optional	•	-	•

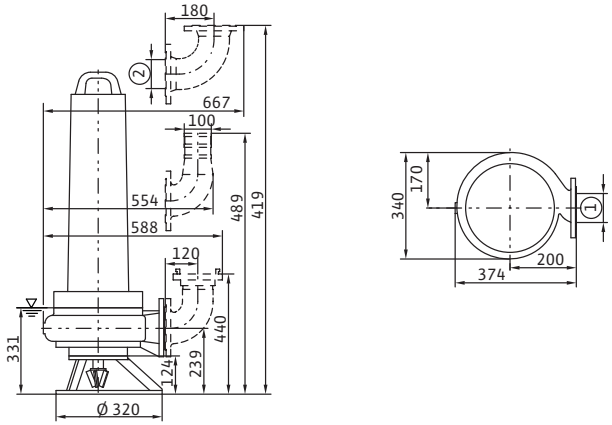
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; - = not available

Dimensions Wilo-EMU FA 10.43WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

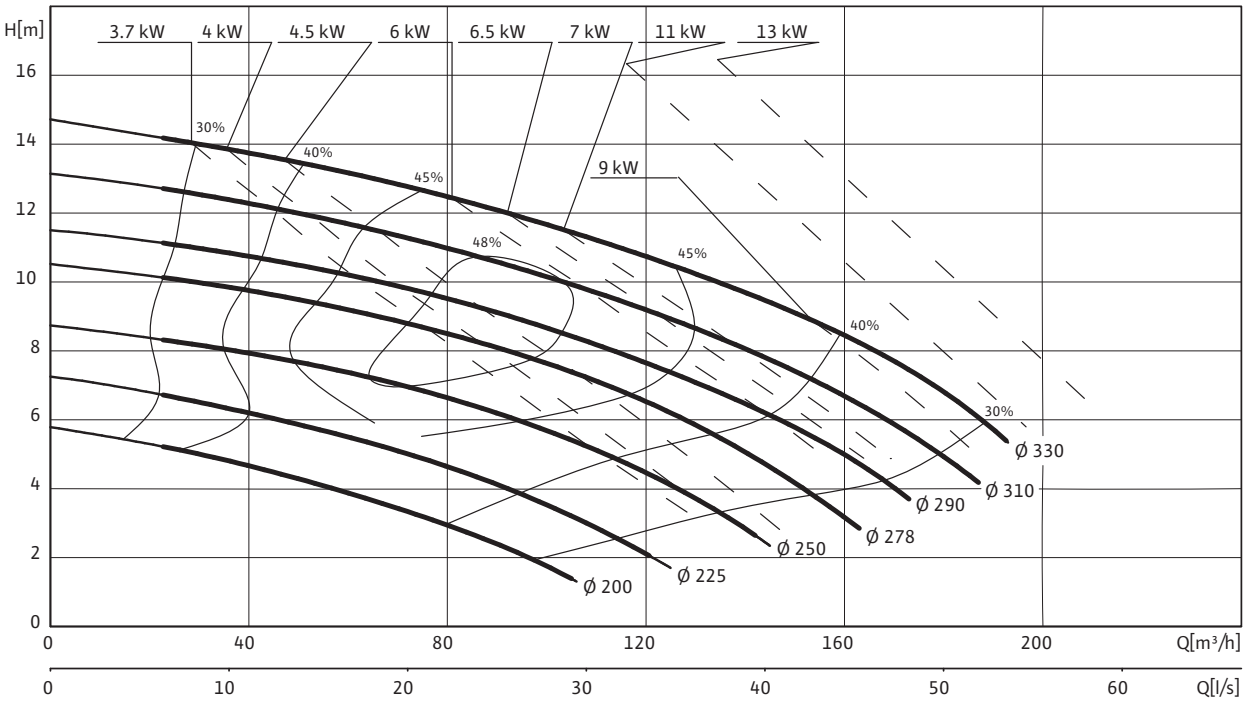


1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4; 2 = DN100 PN10

Pump curves, technical data Wilo-EMU FA 10.44WR (950 rpm)

Pump curves Wilo-EMU FA 10.44WR – 50 Hz – 950 rpm

Vortex impeller with mixer head – Free ball passage: 33 mm



Hydraulic data

Wilo-EMU...	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 10.44WR	33	Vortex impeller with mixer head	69

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 17.1-6/16 (Ex)	9.3	40	14	4.00	5.40	S1/S1	107	760	550
FK 202-6/12	10.9	44	15	4.50	5.90	S1/S1	106	726	619
FK 202-6/17	15.3	61	21	6.50	8.30	S1/S1	119	771	664
FK 202-6/22	19.3	82	27	9.00	11.00	S1/S1	138	821	714
FK 202-6/27	24	99	33	11.00	13.80	S1/S1	155	871	764
HC 20.1-6/17 (Ex)	15.3	61	21	7.00	9.00	S1/S1	172	835	730
HC 20.1-6/22 (Ex)	20	82	28	9.00	11.70	S1/S1	188	935	830
HC 20.1-6/32 (Ex)	27.5	99	33	13.00	16.10	S1/S1	207	935	830
T 17-6/16 (Ex)	9.1	39	13	3.70	5.20	S1/–	62	483	411
T 17-6/24 (Ex)	13.6	65	22	6.00	7.70	S1/–	91	563	491

Pump curves, technical data Wilo-EMU FA 10.44WR (950 rpm)

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
T 20.1-6/22 (Ex)	20	97	33	9.00	11.60	S1/S2-15 min	168	764	674
T 20.1-6/32 (Ex)	27.5	140	47	13.00	16.10	S1/S2-15 min	185	764	674

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	–	–	SiC/SiC, SiC/SiC
FK 202...	NBR	–	–	SiC/SiC, SiC/SiC
HC 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	–	SiC/SiC, SiC/SiC
T 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC

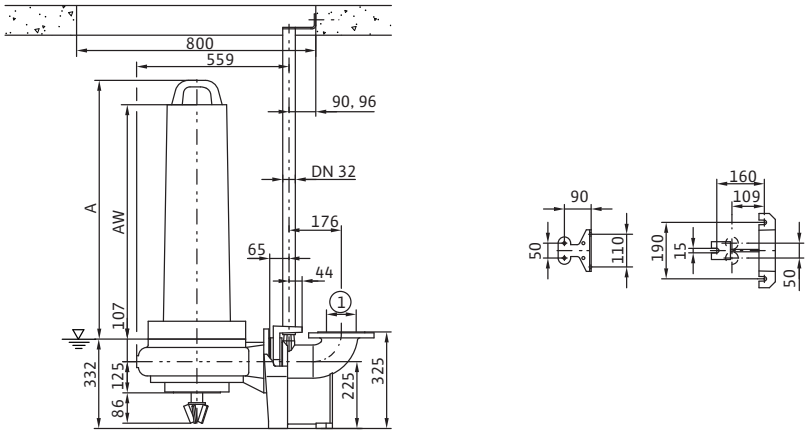
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
FK 202...	–	–	•	optional	optional	–	–	–
HC 20.1...	•	•	•	•	optional	•	–	•
T 17...	•	•	•	•	•	–	–	–
T 20.1...	•	•	•	•	optional	•	–	•

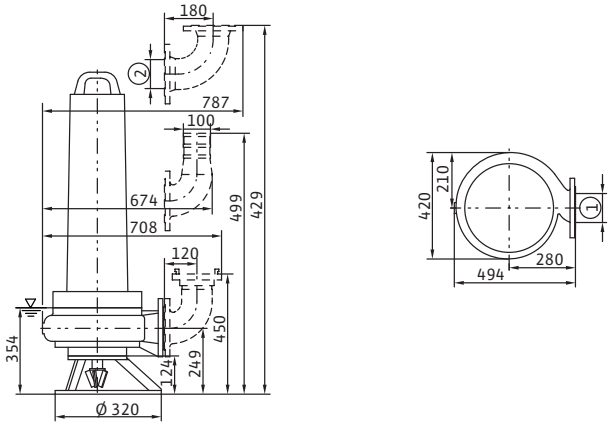
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 10.44WR (950 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

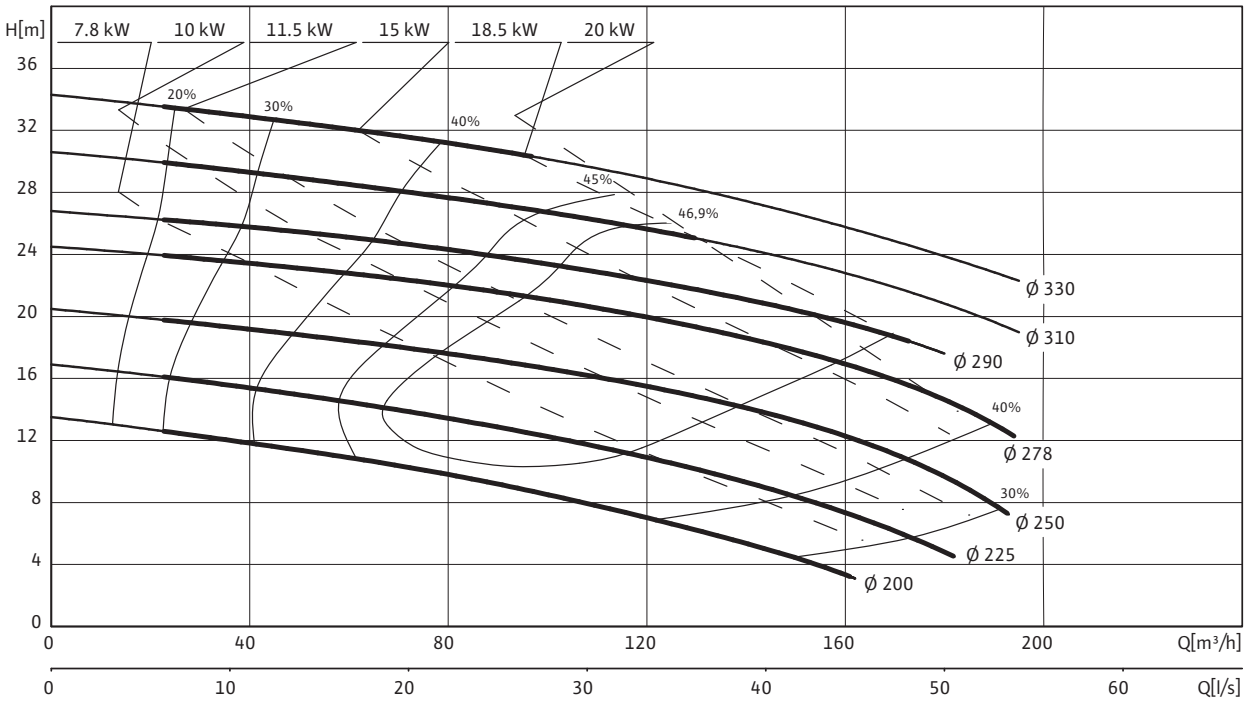


1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4; 2 = DN100 PN10

Pump curves, technical data Wilo-EMU FA 10.44WR (1450 rpm)

Pump curves Wilo-EMU FA 10.44WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 33 mm



Hydraulic data

Wilo-EMU…	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 10.44WR	33	Vortex impeller with mixer head	69

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU…	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 202-4/12	16.6	67	23	7.80	9.90	S1/S1	106	726	619
FK 202-4/17	24.5	98	33	11.50	14.60	S1/S1	119	771	664
FK 202-4/22	31.5	125	42	15.00	18.30	S1/S1	138	821	714
FK 202-4/27	37.5	148	49	18.50	23.00	S1/S1	155	871	764
HC 20.1-4/17 (Ex)	21	99	33	10.00	12.10	S1/S1	172	835	730
HC 20.1-4/22 (Ex)	31	126	42	15.00	18.10	S1/S1	188	935	830
HC 20.1-4/30 (Ex)	41	220	74	20.00	24.00	S1/S1	204	935	830
T 17-4/24 (Ex)	21	123	41	10.00	12.20	S1/–	91	563	491
T 20.1-4/22 (Ex)	30.5	156	52	15.00	18.10	S1/S2-15 min	168	764	674

Pump curves, technical data Wilo-EMU FA 10.44WR (1450 rpm)

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current - direct	Starting current - star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
T 20.1-4/30 (Ex)	41	220	73	20.00	24.00	S1/S2-15 min	182	764	674

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 202...	NBR	-	-	SiC/SiC, SiC/SiC
HC 20.1...	NBR	-	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	-	SiC/SiC, SiC/SiC
T 20.1...	NBR	-	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC

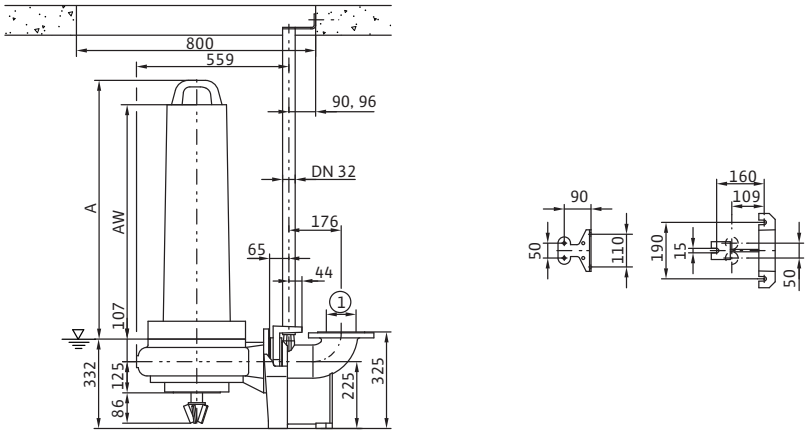
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 202...	-	-	•	optional	optional	–	-	-
HC 20.1...	•	•	•	•	optional	•	-	•
T 17...	•	•	•	•	•	–	-	-
T 20.1...	•	•	•	•	optional	•	-	•

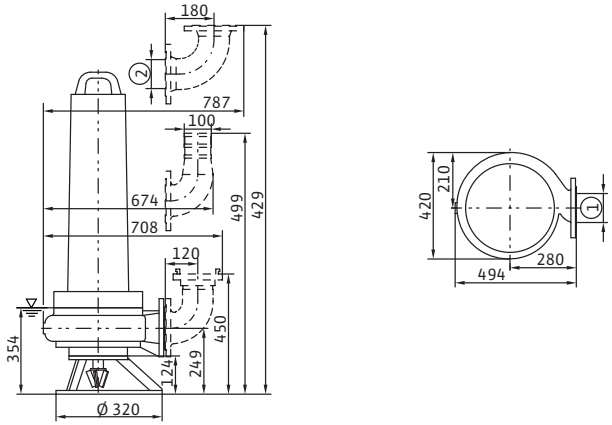
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; - = not available

Dimensions Wilo-EMU FA 10.44WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

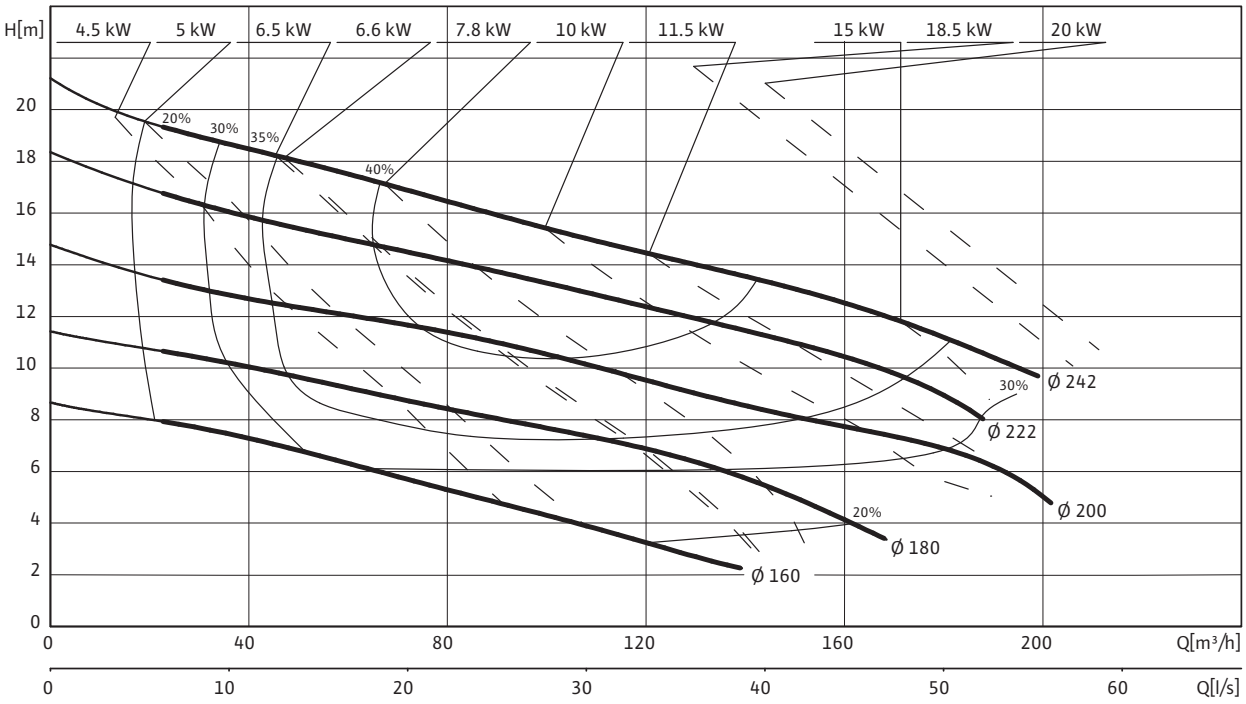


1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4; 2 = DN100 PN10

Pump curves, technical data Wilo-EMU FA 10.53WR (1450 rpm)

Pump curves Wilo-EMU FA 10.53WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 33 mm



Hydraulic data

Wilo-EMU...	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 10.53WR	33	Vortex impeller with mixer head	36.5

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 17.1-4/12 (Ex)	10.8	43	14	5.00	6.50	S1/S1	92	640	430
FK 17.1-4/16 (Ex)	14.1	69	23	6.60	8.40	S1/S1	107	760	550
FK 202-4/12	16.6	67	23	7.80	9.90	S1/S1	106	726	619
FK 202-4/17	24.5	98	33	11.50	14.60	S1/S1	119	771	664
FK 202-4/22	31.5	125	42	15.00	18.30	S1/S1	138	821	714
FK 202-4/27	37.5	148	49	18.50	23.00	S1/S1	155	871	764
HC 20.1-4/17 (Ex)	21	99	33	10.00	12.10	S1/S1	172	835	730
HC 20.1-4/22 (Ex)	31	126	42	15.00	18.10	S1/S1	188	935	830
HC 20.1-4/30 (Ex)	41	220	74	20.00	24.00	S1/S1	204	935	830
T 17-4/12 (Ex)	9.4	47	16	4.50	5.80	S1/–	51	445	373

Pump curves, technical data Wilo-EMU FA 10.53WR (1450 rpm)

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
T 17-4/16 (Ex)	13.5	68	23	6.50	8.20	S1/–	62	483	411
T 17-4/24 (Ex)	21	123	41	10.00	12.20	S1/–	91	563	491
T 20.1-4/22 (Ex)	30.5	156	52	15.00	18.10	S1/S2-15 min	168	764	674
T 20.1-4/30 (Ex)	41	220	73	20.00	24.00	S1/S2-15 min	182	764	674

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 17.1...	VITON	–	–	SiC/SiC, SiC/SiC
FK 202...	NBR	–	–	SiC/SiC, SiC/SiC
HC 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 17...	VITON	NBR, SiC/SiC	–	SiC/SiC, SiC/SiC
T 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC

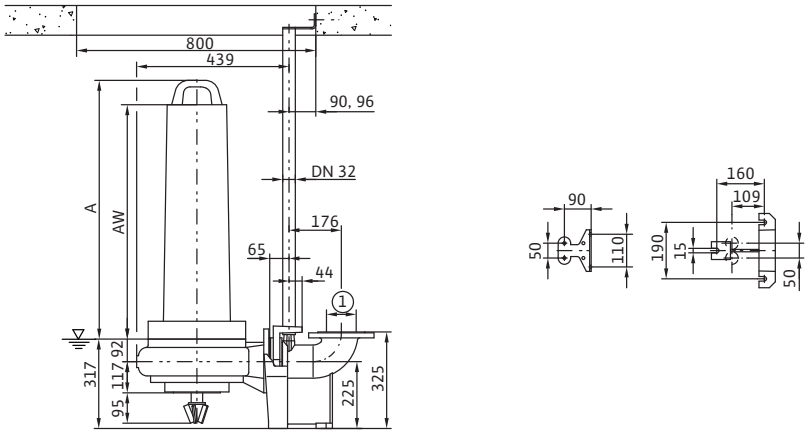
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 17.1...	•	•	•	–	optional	–	–	–
FK 202...	–	–	•	optional	optional	–	–	–
HC 20.1...	•	•	•	•	optional	•	–	•
T 17...	•	•	•	•	•	–	–	–
T 20.1...	•	•	•	•	optional	•	–	•

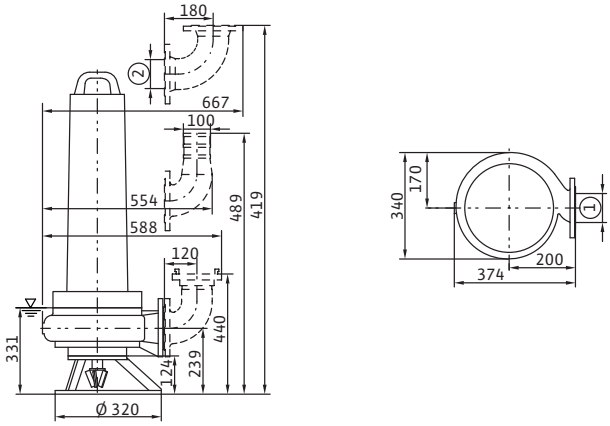
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 10.53WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation

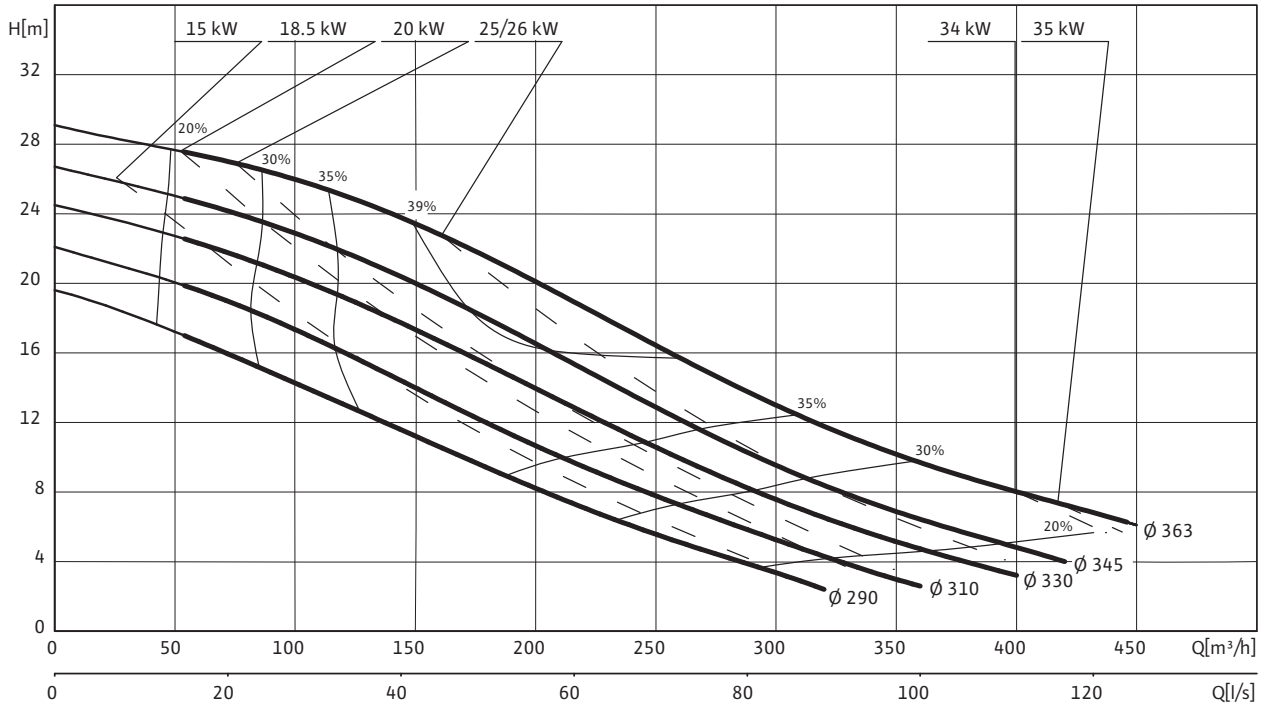


1 = DN100 PN10 / ANSI B16.1, Class 125, Size 4; 2 = DN100 PN10

Pump curves, technical data Wilo-EMU FA 15.44WR (1450 rpm)

Pump curves Wilo-EMU FA 15.44WR – 50 Hz – 1450 rpm

Vortex impeller with mixer head – Free ball passage: 58 mm



Hydraulic data

Wilo-EMU…	Free ball passage	Type of impeller	Weight of hydraulic unit
	mm		kg
FA 15.44WR	58	Vortex impeller with mixer head	98

Pump curves apply to 3~400 V, 50 Hz, at nominal speed and a density of 1 kg/dm^3. Pump curves according to ISO 9906, appendix A. The specified degrees of efficiency correspond to the hydraulic efficiency.

Motor data for 3~400 V, 50 Hz

Wilo-EMU…	Nominal current	Starting current – direct	Starting current – star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			A	AW
	A			kW			kg	mm	
FK 202-4/22	31.5	125	42	15.00	18.30	S1/S1	138	821	714
FK 202-4/27	37.5	148	49	18.50	23.00	S1/S1	155	871	764
FKT 27.1-4/22 (Ex)	53	295	98	26.00	30.00	S1/S1	370	1246	820
FKT 27.1-4/28 (Ex)	71	375	124	35.00	40.00	S1/S1	390	1246	820
HC 20.1-4/22 (Ex)	31	126	42	15.00	18.10	S1/S1	188	935	830
HC 20.1-4/30 (Ex)	41	220	74	20.00	24.00	S1/S1	204	935	830
T 20.1-4/22 (Ex)	30.5	156	52	15.00	18.10	S1/S2-15 min	168	764	674
T 20.1-4/30 (Ex)	41	220	73	20.00	24.00	S1/S2-15 min	182	764	674
T 24-4/29 (Ex)	49.5	320	106	25.00	28.50	S1/–	233	931	678

Pump curves, technical data Wilo-EMU FA 15.44WR (1450 rpm)

Motor data for 3~400 V, 50 Hz

Wilo-EMU...	Nominal current	Starting current - direct	Starting current - star-delta	Nominal motor power	Power consumption	Operating mode (immersed/non-immersed)	Motor weight	Dimensions	
	I_N	I_A		P_2	P_1			*A*	*AW*
	A			kW			kg	mm	
T 24-4/36 (Ex)	68	480	159	34.00	39.00	S1/–	260	1001	748

P_1 refers to the maximum power consumption. All of the data applies to 3~400 V, 50 Hz and a density of 1 kg/dm^3.
Voltage tolerance +/- 10 % (specifications according to DIN EN 60034)

Materials: Seals

Wilo-EMU...	Static seal	Sealing		
		Version H	*Version G*	*Version K*
FK 202...	NBR	–	–	SiC/SiC, SiC/SiC
FKT 27.1...	NBR	–	–	SiC/SiC, SiC/SiC
HC 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 20.1...	NBR	–	C/ceramic, SiC/SiC	SiC/SiC, SiC/SiC
T 24...	NBR	–	–	SiC/SiC, SiC/SiC

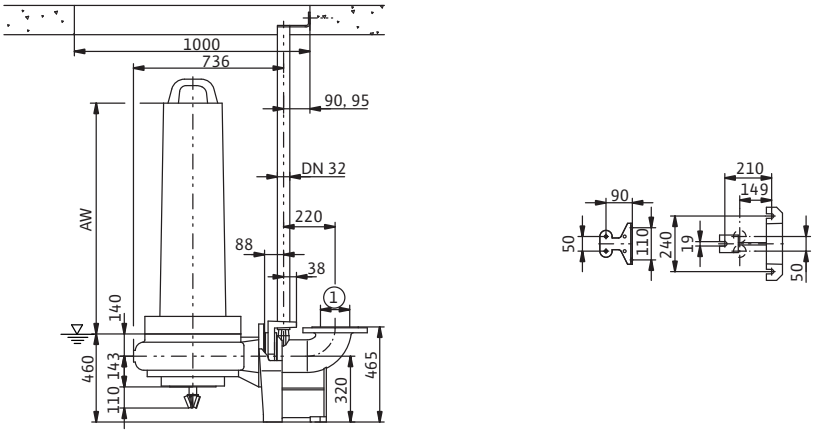
Equipment/function

Wilo-EMU...	Explosion protection according to		Motor temperature monitoring	Motor leakage detection	Sealing chamber leakage detection	Leakage chamber leakage detection	Bearing temperature monitoring	Terminal chamber leakage detection
	ATEX	*FM*						
FK 202...	–	–	•	optional	optional	–	–	–
FKT 27.1...	•	•	•	•	optional	•	–	•
HC 20.1...	•	•	•	•	optional	•	–	•
T 20.1...	•	•	•	•	optional	•	–	•
T 24...	•	•	•	optional	optional	–	optional	optional

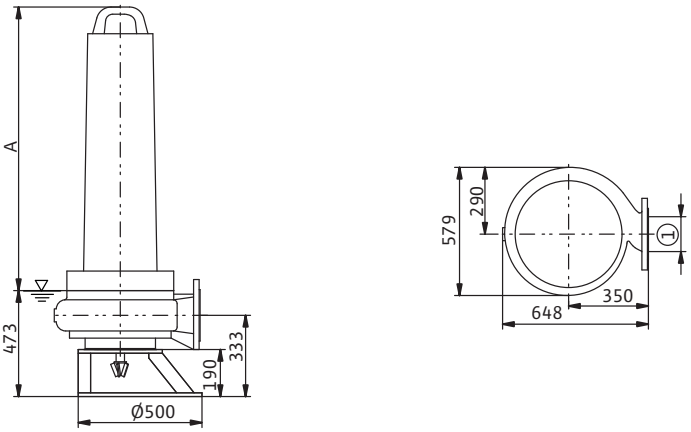
Note: the specifications may vary in the case of motors with Ex-protection.
Customised configurations are available on request.
• = available; – = not available

Dimensions Wilo-EMU FA 15.44WR (1450 rpm)

Dimension drawing Wilo-EMU FA...WR – stationary wet well installation



Dimension drawing Wilo-EMU FA...WR – portable installation



1 = DN150 PN10 / ANSI B16.1, Class 125, Size 6

Auxiliary hoisting gear

The auxiliary hoisting gears have a bearing capacity between 125 and 500 kg and are used as simple-to-use lifting gear for raising and lowering of submersible mixers or pumps. Smaller submersible mixers up to size TR 40 can also be used to operate the units at different heights.

The auxiliary hoisting gear consists of a separate holding sleeve for the wall or floor fixation and the auxiliary hoisting gear with manual winch. The height of the manual winch is infinitely variable starting from the 250 kg version. Furthermore the hoisting gears (version ZT) are also available with 2 or 3 booms with a jib length of up to 3.2 metres.

Additionally, another cable bollard is available upon which the bearing cable (if it can not remain in the hoisting gear) can be wound up and secured. This makes it possible for one auxiliary hoisting gear to be used for several units.

The auxiliary hoisting gears as well as the holding sleeve are made of galvanised steel materials, A2 (1.4301) and A4 steel (1.4571); the cable bollard is make of A2 and A4 steel. The rope pulley and the sliding elements in the holding sleeve are of sewage-resistant plastic. The manual winch can be made of either aluminium or stainless steel. All auxiliary hoisting gears have been tested and certified by the LGA and have the GS quality mark.

Mechanical accessories

Type	Description	–	Art no.
Auxiliary hoisting gear 125 kg to 350 kg	Made of A2 stainless steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 4 mm	Max. bearing capacity 125 kg	6010941
	Made of A2 stainless steel with manual aluminium winch and 12 m wire cable; Cable diameter: 6 mm	Max. bearing capacity 250 kg	6011079
		Max. bearing capacity 300 kg	6011076
		Max. bearing capacity 350 kg	6011071
	Made of A2 stainless steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 6 mm	Max. bearing capacity 250 kg	6011073
		Max. bearing capacity 300 kg	6011078
		Max. bearing capacity 350 kg	6011072
	Made of A4 stainless steel with manual aluminium winch and 12 m wire cable; Cable diameter: 4 mm	Max. bearing capacity 125 kg	6001288
	Made of A4 stainless steel with manual aluminium winch and 12 m wire cable; Cable diameter: 6 mm	Max. bearing capacity 250 kg	6000753
		Max. bearing capacity 300 kg	6024841
		Max. bearing capacity 350 kg	6024842
	Made of A4 stainless steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 6 mm	Max. bearing capacity 250 kg	6001042
		Max. bearing capacity 300 kg	6019898
		Max. bearing capacity 350 kg	6024840
	Made of galvanised steel with manual aluminium winch and 12 m wire cable; Cable diameter: 4 mm	Max. bearing capacity 125 kg	6011083
	Made of galvanised steel with manual aluminium winch and 12 m wire cable; Cable diameter: 6 mm	Max. bearing capacity 250 kg	6011086
		Max. bearing capacity 300 kg	6011075
		Max. bearing capacity 350 kg	6011069
	Made of galvanised steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 6 mm	Max. bearing capacity 250 kg	6011085
		Max. bearing capacity 300 kg	6011074
		Max. bearing capacity 350 kg	6011070
Auxiliary hoisting gear Z	Made of A2 stainless steel with manual aluminium winch and 12 m wire cable; Cable diameter: 6 mm	Max. projection: 1.6 m; max. bearing capacity: 500 kg	6011094
	Made of A2 stainless steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 6 mm		6011105

Auxiliary hoisting gear

Mechanical accessories			
Type	**Description**	**–**	**Art no.**
Auxiliary hoisting gear ZT1	Made of A2 stainless steel with manual aluminium winch and 12 m wire cable; Cable diameter: 6 mm	Max. projection: 2.1 m; max. bearing capacity: 350 kg	6011095
		Max. projection: 3.2 m; max. bearing capacity: 250 kg	6011101
	Made of A2 stainless steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 6 mm	Max. projection: 2.1 m; max. bearing capacity: 350 kg	6011103
		Max. projection: 3.2 m; max. bearing capacity: 250 kg	6011104
	Made of A2 stainless steel with manual aluminium winch and 12 m wire cable; Cable diameter: 6 mm		6011107
Auxiliary hoisting gear ZT2	Made of A2 stainless steel with manual stainless steel winch and 12 m wire cable; Cable diameter: 6 mm		6011102

Mechanical accessories			
Type	**Description**	**–**	**Art no.**
Holding sleeve for auxiliary hoisting gear	For wall fixation made of galvanized steel	Max. bearing capacity 250 kg	6011022
		Max. bearing capacity 350 kg	6011021
	For wall fixation made of A2 stainless steel	Max. bearing capacity 250 kg	6011013
		Max. bearing capacity 350 kg	6011011
	For wall fixation made of A4 stainless steel	Max. bearing capacity 250 kg	6010955
		Max. bearing capacity 350 kg	6020139
		Max. bearing capacity 500 kg	6011109

Mechanical accessories			
Type	**Description**	**–**	**Art no.**
Holding sleeve for auxiliary hoisting gear	For floor fixation made of galvanized steel	Max. bearing capacity 250 kg	6011020
		Max. bearing capacity 350 kg	6011014
	For floor fixation made of stainless steel A2	Max. bearing capacity 250 kg	6011012
		Max. bearing capacity 350 kg	6011008
	For floor fixation made of A4 stainless steel	Max. bearing capacity 250 kg	6010943
		Max. bearing capacity 350 kg	6011089
		Max. bearing capacity 500 kg	6011110

Mechanical accessories			
Type	**Description**	**–**	**Art no.**
Special fixation components	Made of A2 stainless steel, including wire cable	Cable diameter: 4 mm; cable length: 12 m	6010944
		Cable diameter: 4 mm; cable length: 15 m	6020511
		Cable diameter: 6 mm; cable length: 12 m	6010945
		Cable diameter: 6 mm; cable length: 15 m	6020706
	Made of A4 stainless steel, including wire cable	Cable diameter: 4 mm; cable length: 12 m	6024839
		Cable diameter: 6 mm; cable length: 12 m	6011025

Catch hook and catch device

Firstly, in order to use an auxiliary hoisting gear for more than one unit, the bearer cable must always be removed and secured. Secondly, the bearer cable is always exposed to enormous traction forces within the fluid and is therefore subject to increased wear.

When a catch hook or catch device is used, the unit can be lowered as usual. As soon as the unit is on the support, the catch device hooks or the catch device is released and can be pulled out of the fluid again. In this way, the bearer cable does not have to be removed and secured and is not exposed to the fluid.

The catch hook is swivelled back and forth with the bearer cable until it hooks into the unit's handle. Due to the operating principle of the catch hook, it is only suitable for use in depths of not more than 3 metres.

The catch device is a further development of the normal catch hook and consists of a catch hook and a guide element. While one has to know exactly where the catch clip is positioned when using the catch hook, the guild element ensures the correct distance. This is simply put onto the guide pipe of the lowering device and lowered onto this until the catch hook engages the guide bracket. In this way, the catch device is suitable for use in greater depths.

Mechanical accessories		
Type	**Description**	**Art no.**
Catch hook	Made of A2 stainless steel, including wire cable	6011175

Mechanical accessories		
Type	**Description**	**Art no.**
Catch device	Made of A4 stainless steel, suitable for use with lowering device AV... 60	6037436
	Made of A4 stainless steel, suitable for use with lowering device AV... 80	6037437
	Made of A4 stainless steel, suitable for use with lowering device AV... 100	6049331
	Made of A4 stainless steel, suitable for use with lowering device AV... 120	6010988

Lowering devices

Different lowering devices are available for the simple installation of the submersible mixers and recirculation pumps. These fixtures are flexible guidance systems for wall and floor fixation for simple raising and lowering of the units. Furthermore, the lowering device absorbs the mixing forces which arise and transfer them to the structure. A high resisting torque in the guide pipes, plastic linings in the sliding carriage and large-area rubberised supports guarantee high stability and long service life.

The lowering devices of type AVU... are designed for use with submersible mixers of the series TR 14 ... TR 90-2. These are fixtures for wall and floor fixation. The floor fixation is done by a ball joint made of plastic. This permits even slight unevenness on the floor to be compensated for during installation. For optimum mixing results during this, the mixer can be swivelled horizontally. In connection with auxiliary hoisting gear, mixers up to the size TR 40 can also be operated in different heights.

The lowering devices of type AVM... are designed for use with submersible mixers of the series TR 216 ... TR 326. These are fixed stand systems for free positioning at the base of the basin. These permit the mixers to be placed for optimum mixing results. If the stand is pre-mounted to a concrete slab, this can also be installed later in an already filled basin.

The lowering devices of type AVR... are designed for use with recirculation pumps. These are fixed stand systems for wall-mounted installation. Recirculation pumps can be directly flanged on the discharge pipe using these.. Due to the different variants of this lowering device, corner installations are also possible.

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

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

Mechanical accessories

Type	Description	–	Art no.
Lowering devices AVU...	for wall and floor fixation; with ball joint to compensate for minor unevenness; for TR 14... to TR(E) 90-2...	Standard length: 6 m; other lengths on request.	–
Lowering devices AVUS...	as stand for free positioning at the on the base of the basin; for TR 50-2 to TR(E) 90-2		–
Lowering devices AVUSH...	as stand with wall holder for fixation on the floor and on the wall; for high reaction forces; for TR 75-2 to TR(E) 90-2		–
Lowering devices AVUSHH...	as stand with two wall holders for fixation on the floor and on the wall; for high reaction forces; for TR 80-1 and TR(E) 90-2		–
Lowering devices AVMS...	as stand for free positioning at the on the base of the basin; for TR(E) 216 to TR(E) 326		–
Lowering devices AVMSH...	as stand with wall holder for fixation on the floor and on the wall; for high reaction forces; for TR(E) 226 and TR(E) 326		–
Lowering devices AVR...	for wall fixation with two attachment points; for all RZP types		–
Lowering devices AVRD...	for lateral wall fixation with two attachment points; for all RZP types		–
Lowering devices AVRZ...	for wall fixation with an attachment point, the guide pipe lies directly in the discharge pipe; for all RZP types		–
Lowering devices AVRZD...	for lateral wall fixation with an attachment point, the guide pipe lies directly in the discharge pipe; for all RZP types		–

Additional cable anchoring

Normally, the power lines are fastened to the traction rope and are installed upwards.

To prevent damage to the cable at the edge of the basin, we recommend a rope anchoring with a separate holder at the edge of the basin. This can prevent cable abrasion and cable breaks.

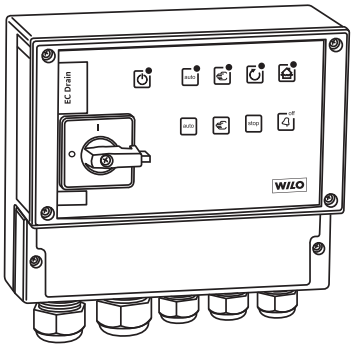
In addition, high flow rates in the fluid can cause strong traction forces to act on the traction rope and the power cables and lead to increased wear. To relieve both, we recommend an additional rope anchoring made of nylon can be used. The traction forces are then absorbed by the polyamide rope.

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

Mechanical accessories

Type	Description	Art no.
Cable anchoring	for additional anchoring of the power supply cable; comprising 15-metre nylon rope, 8 x cable terminals (17...25 mm), 1 x wall holder with cable suspension and fixation material	6033587
	for additional anchoring of the power supply cable; comprising 15-metre nylon rope, 8 x cable terminals (26...36 mm), 1 x wall holder with cable suspension and fixation material	6060617
Cable anchoring for wall fixation	for suspension of the power supply cable at the edge of the basin; comprising of 1 x wall holder, 1 x cable terminal 10...16 mm with snap hooks and fixation material	6010947
	for suspension of the power supply cable at the edge of the basin; comprising of 1 x wall holder, 1 x cable terminal 17...25 mm with snap hooks and fixation material	6010946
	for suspension of the power supply cable at the edge of the basin; comprising of 1 x wall holder, 1 x cable terminal 26...36 mm with snap hooks and fixation material	6011029
	for suspension of the power supply cable at the edge of the basin; comprising of 1 x wall holder, 2 x cable terminals (17...25 and 10...16 mm), snap hooks and fixation material	6061714
	for suspension of the power supply cable at the edge of the basin; comprising of 1 x wall holder, 2 x cable terminals (26...36 and 10...16 mm), snap hooks and fixation material	6061715
Cable terminal	For fixation of the power supply cable at a separate rope or wall holder; with snap hook, terminal sizes: 17...25 mm	6011156
	For fixation of the power supply cable at a separate rope or wall holder; with snap hooks, terminal sizes: 10...16 mm	6011155
	For fixation of the power supply cable at a separate rope or wall holder; with snap hook, terminal sizes: 26...36 mm	6011164

Switchgear Wilo EC-Drain 1x4.0



Microprocessor-controlled switchgear for automatic, transmitter-dependent control of 1 submersible wastewater/sewage pump of the series Wilo-Drain or Wilo-EMU
- Motor protection by means of integrated motor current monitoring and WSK evaluation
- Lockable main switch
- Transmitter connection for float switch, type WA 65, WA 95
- Button for manual mode of the pump
- High water alarm
- Forced activation with high water
- Potential-free fault signal (changeover contact) and potential-free run signal (changeover contact)
- Integrated mains-dependent alarm buzzer
- Operation, high water and malfunction display via LEDs on the front panel

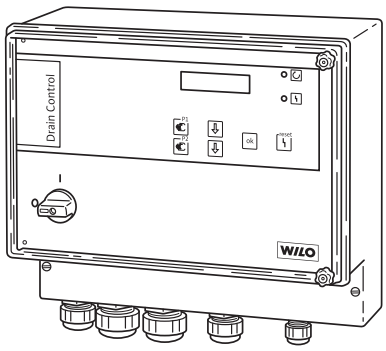
Technical data:
- Operating voltage: 1~230 V, 3~400 V, 3~230 V
- Connected load P_2: 4.0 kW
- Maximum current: 12 A
- Frequency: 50/60 Hz
- Protection class: IP 65 (within buildings/switch cabinets)
- Dimensions (W x H x D): 215 x 220 x 125 mm

Important: Switchgears are not protected against explosions and may only be used outside of potentially explosive areas. Ex-rated cut-off relays are to be provided for controlling pumps in potentially explosive areas.

Electrical accessories

Type	Description	Art no.
EC-Drain 1x4.0	For single-pump systems up to 4 kW.	2523488

Switchgear Wilo DrainControl 1/2



Microprocessor-controlled switchgear with multi-language, menu-prompted operation via membrane keyboard and a two-row LC display for fully automatic control of a submersible pump. Level measurement can be performed either via a level sensor or a float switch.

- Two-line LCD-display with 2 x 16 characters, multilingual, switchable, menu-driven operating option via membrane keyboard
- Manual-0-Automatic switch via membrane keyboard
- Input terminals for connecting a level sensor:
  - Standard: 0-2.5 mWs (4-20 mA)
  - Optional: 0-1 mWs (4-20 mA) or 0- 5 mWs (4-20 mA)
- Input terminals for connecting float switches WA 65, WA 95 or MS 1
- Automatic phase failure and rotating field monitoring
- Operating hours counter
- Potential-free contacts for:
  - Collective fault signal
  - Horn (NO contact)
  - Operation of pump 1 (NO contact)
- Main switch
- Integrated electronic motor current monitoring
- Starting mode: Direct or star-delta

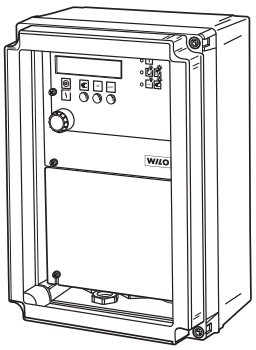
Technical data:
- Operating voltage: 1~230 V, 3~400 V, 3~230 V
- Frequency: 50 Hz
- Protection class: IP 54
- Housing: Plastic for wall-mounted installation
- Max. ambient temperature 40 °C
- Dimensions (W x H x D): depending on the model

Attention: Switchgears are not protected against explosions and may only be used outside of potentially explosive areas. A level sensor in the potentially explosive area (with breakdown barrier!) or a float switch (in the potentially explosive area with ex-rated cut-off relay) is to be provided for controlling the pump.

Electrical accessories

Type	Description	Art no.
DrainControl 1 (0.5-10A) DE	For single-pump systems; for control of pump via level sensor or float switch	2519930
DrainControl 1 (9.0-12 A) DE		2522161
DrainControl 1 (9.0-12 A) SD		2519932
DrainControl 1 (12.5-16 A) SD		2519934
DrainControl 1 (16.1-20 A) SD		2519936
DrainControl 1 (20-24 A) SD		2522163
DrainControl 1 (24-32 A) SD		2519938
DrainControl 1 (32.1-42 A) SD		2519940
DrainControl 1 (42.1-55 A) SD		2519942
DrainControl 1 (56-71 A) SD		2521257

Switchgear Wilo DrainControl PL 1



Switchgear for controlling the level of 1 submersible pump. Level measurement can be carried out with either the bubbling-through or the dynamic pressure system, via an electronic level sensor 0-1 mWs (4-20 mA) or float switch (WA 65, WA 95 or MS1).

- LC display
- LED for alarm, operation/run-on time, manual/automatic mode
- Potential-free contact for collective fault signal and high water alarm
- Forced switch-on of the pump
- Pump switch-off with run-on time (0...180 s)
- Integrated buzzer
- Operating hours counter, pump starts

Technical data:

- Operating voltage: 1~230 V, 3~400 V
- Connected load P_2: 4.0 kW
- Frequency: 50/60 Hz
- Protection class: IP 65 (within buildings/switch cabinets)
- Dimensions (W x H x D): 180 x 255 x 180 mm

Attention: Switchgear is not protected against explosions and may only be used outside of potentially explosive areas. A level sensor in the potentially explosive area (with breakdown barrier!) or a float switch (in the potentially explosive area with ex-rated cut-off relay) is to be provided for controlling the pump.

Electrical accessories

Type	Description	Art no.
DrainControl PL 1 (0.3-12 A)	For single-pump systems, factory setting: level sensor 0-1 mWS (4-20 mA)	2522619

Electrical accessories			
Type	**Description**	**–**	**Art no.**
Overload relay CM-MSS	Electronic overload relay for connection of PTC or bimetal temperature sensor, with auto-reclosure lockout and Ex-rated. For switch cabinet installation!	230 V/50...60 Hz	6003277
		24 V AC/DC	6049312
Relay PS2DF	Relay for monitoring the power supply for phase failure, phase asymmetry and undervoltage For installation in switch cabinet	–	6003283
Ex cut-off relay ER 143	Ex cut-off relay for connection of 2 float switches or 3 electrodes, relay in the ISO housing with transparent cover, IP 40		6003269
Electrode relay NIV 105/S	Electrode relay for level control device with electrodes or float switch. For switch cabinet installation!	230 V/50 Hz	6003270
Electrode relay NIV 101/A	Electrode relay for connection of external sealing chamber electrode. In addition the temperature monitoring (bimetal or PTC sensor) can also be connected. For switch cabinet installation!	230 V/50...60 Hz	6045175
Sealing chamber electrode	For monitoring of leakage ingress in the oil barrier chamber. External version with rod electrode in the stainless steel housing.	Standard length: 10 m; other lengths on request.	–
	For monitoring of leakage ingress in the oil barrier chamber. External version with double rod electrode in the stainless steel housing.		–

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