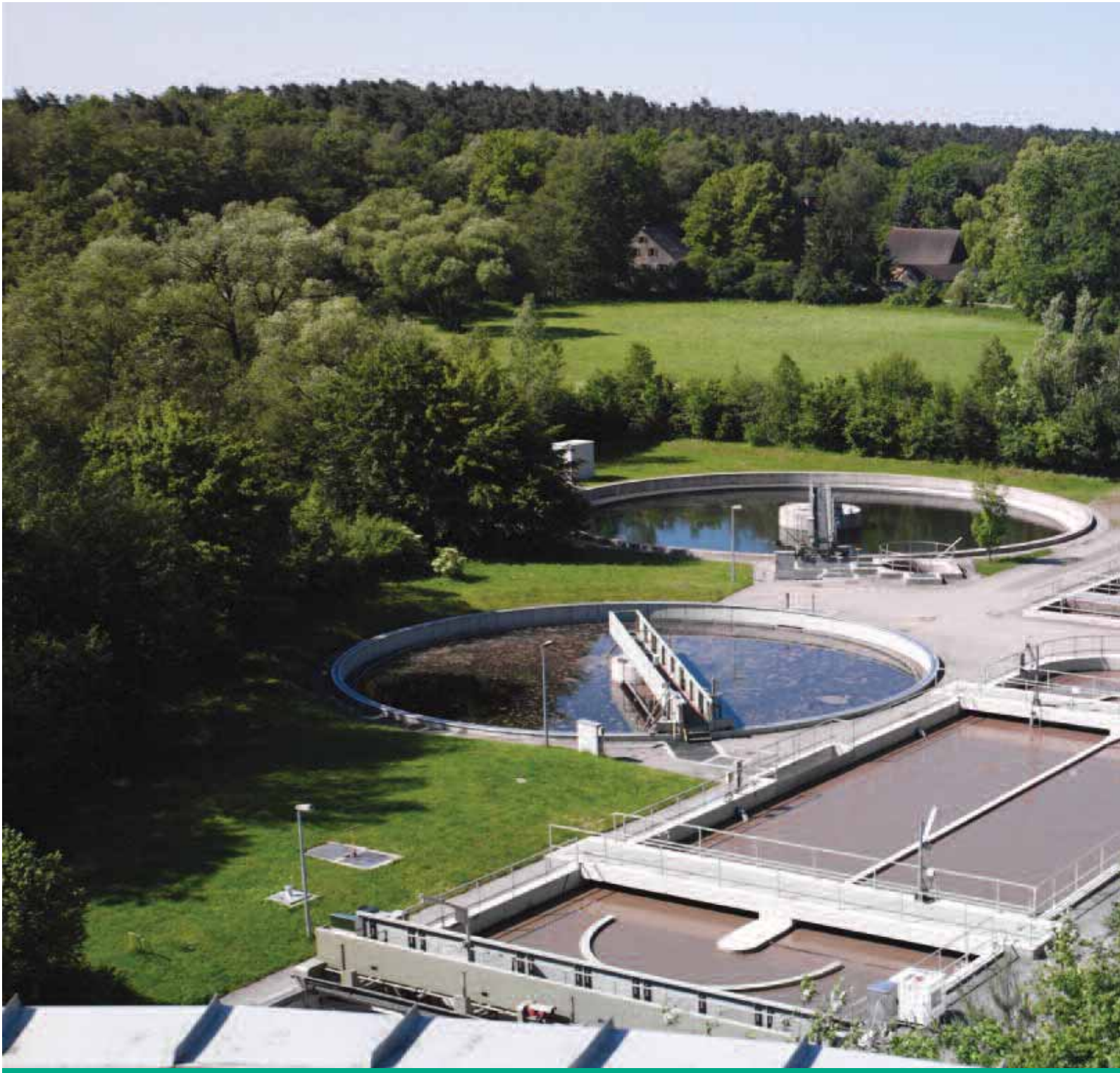
WILO

Pumpen Intelligenz.

Submersible sewage pumps

Technical Information.



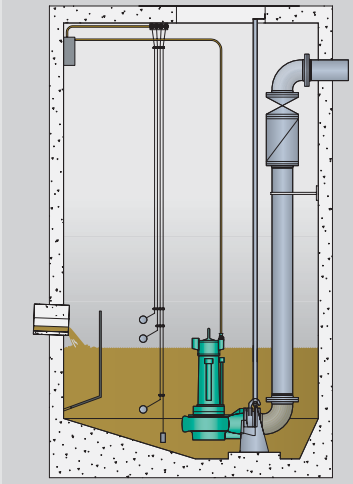
Pumpen Intelligenz.

All over the world Wilo is a term for engineering in first-class German tradition. Our pumps and pump systems for heating, cooling, air-conditioning, water supply and sewage disposal are used in commercial buildings, municipal facilities, in industry and also in private households, of course. For decades we have constantly developed our knowledge in close co-operation with our customers beyond the pump to system expertise. This knowledge is the basis for solutions, which particularly meet our customers' needs. This is what we call PUMPEN INTELLIGENZ.

Types of installation.

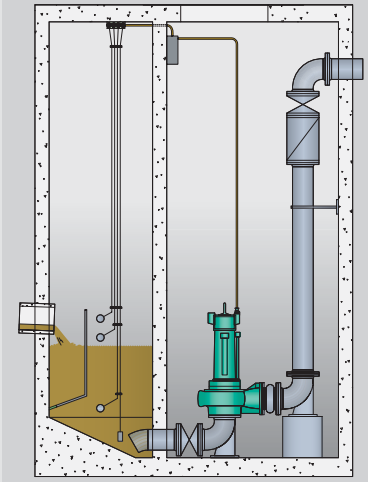
High efficiency and optimized installation.

Wet sump installation



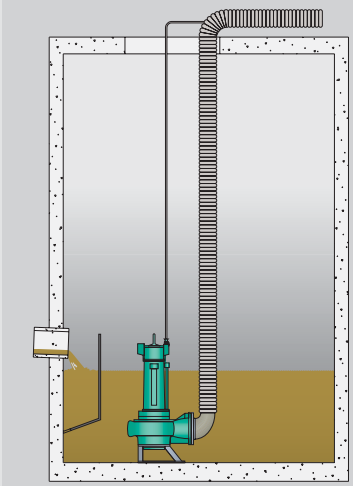
Advantages
– low costs for lift station and assembly
– low space requirement for the pumps
– service-friendly installation and removal thanks to suspension device
– motor is cooled by the pumped medium

Dry sump installation



Advantages
– accessible pump chamber
– pump can be monitored during operation
– quick repairs under hygienic conditions
– pump remains in operation in case of flooding
– internal cooling system, external cooling not required

Transportable installation



Application fields
– deep, narrow shafts
– shallow basins
– dewatering on construction sites
– industrial and municipal sewage disposal
– sewer renewal


K
D

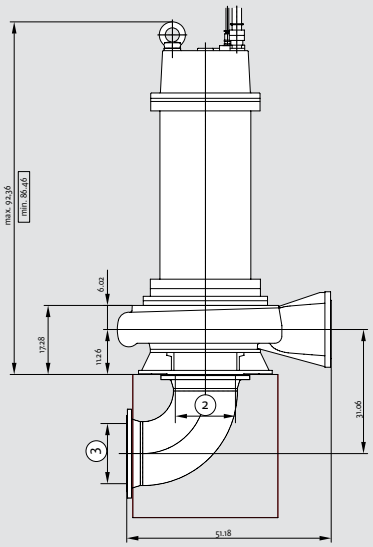
Technical information.
Construction and ranges.

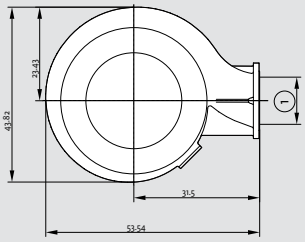
Dimensions with the example of the FA 30.78 D

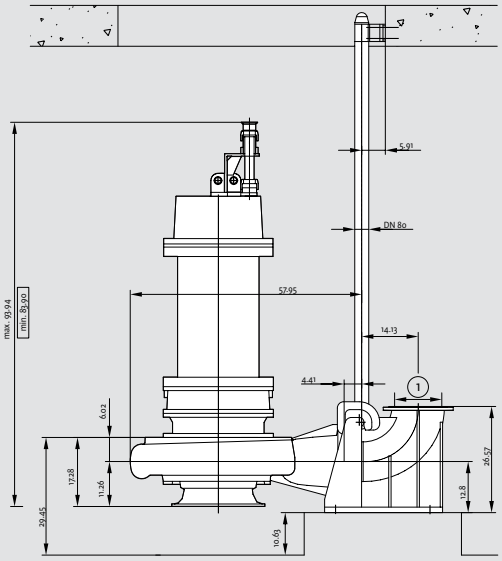
Pump: Casing parts, impeller and neck ring of high-quality cast iron (stainless steel casting on request).

Screwed connections as well as mobile neck ring made of stainless steel.

Motor: Casing parts of high-quality cast iron or steel. Shaft of high-quality heat-treatable steel, screwed connections made of stainless steel.





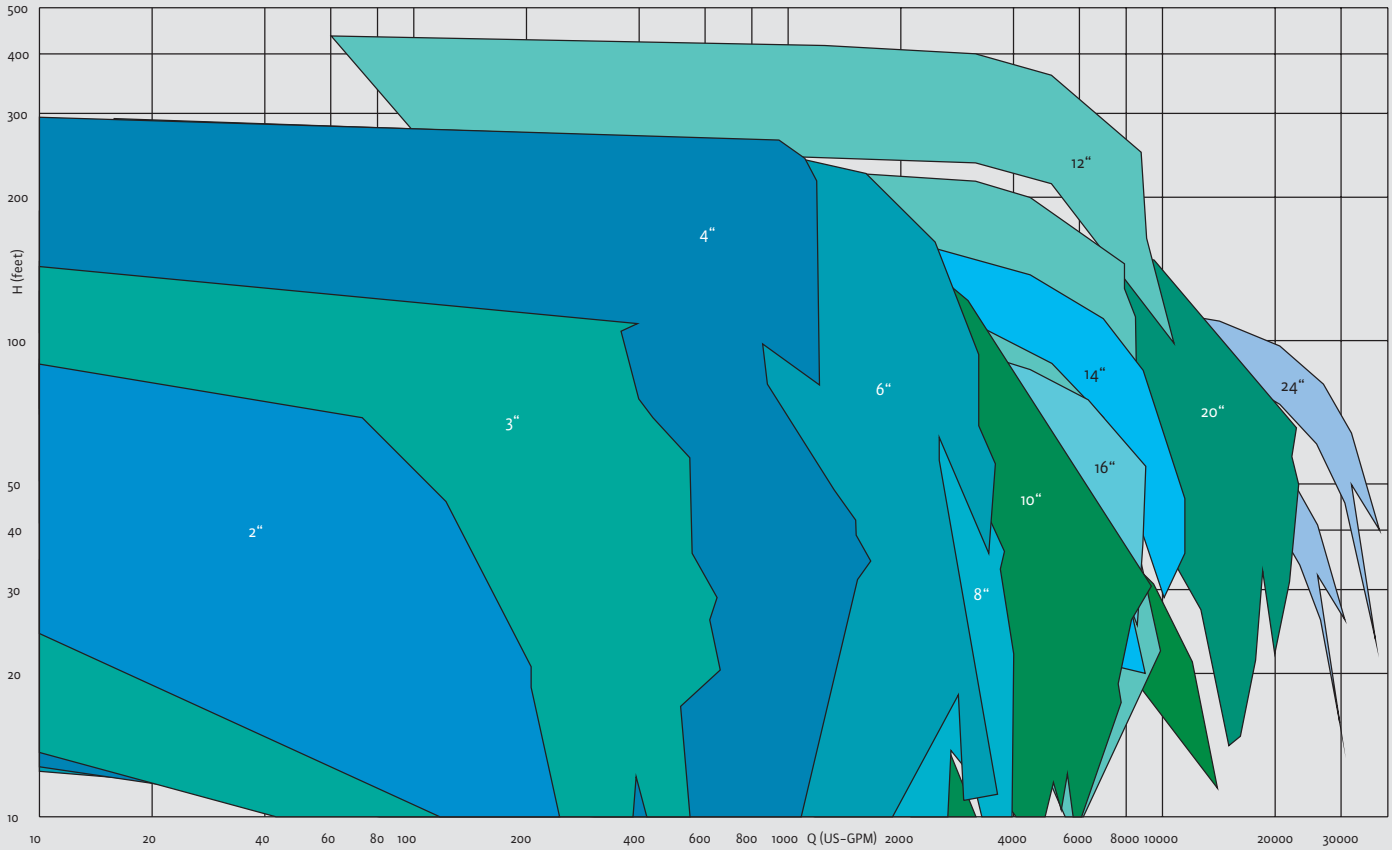


① *DN 300, PN 10 bzw. USA ANSI B 16.1, 125 lb, size 12*

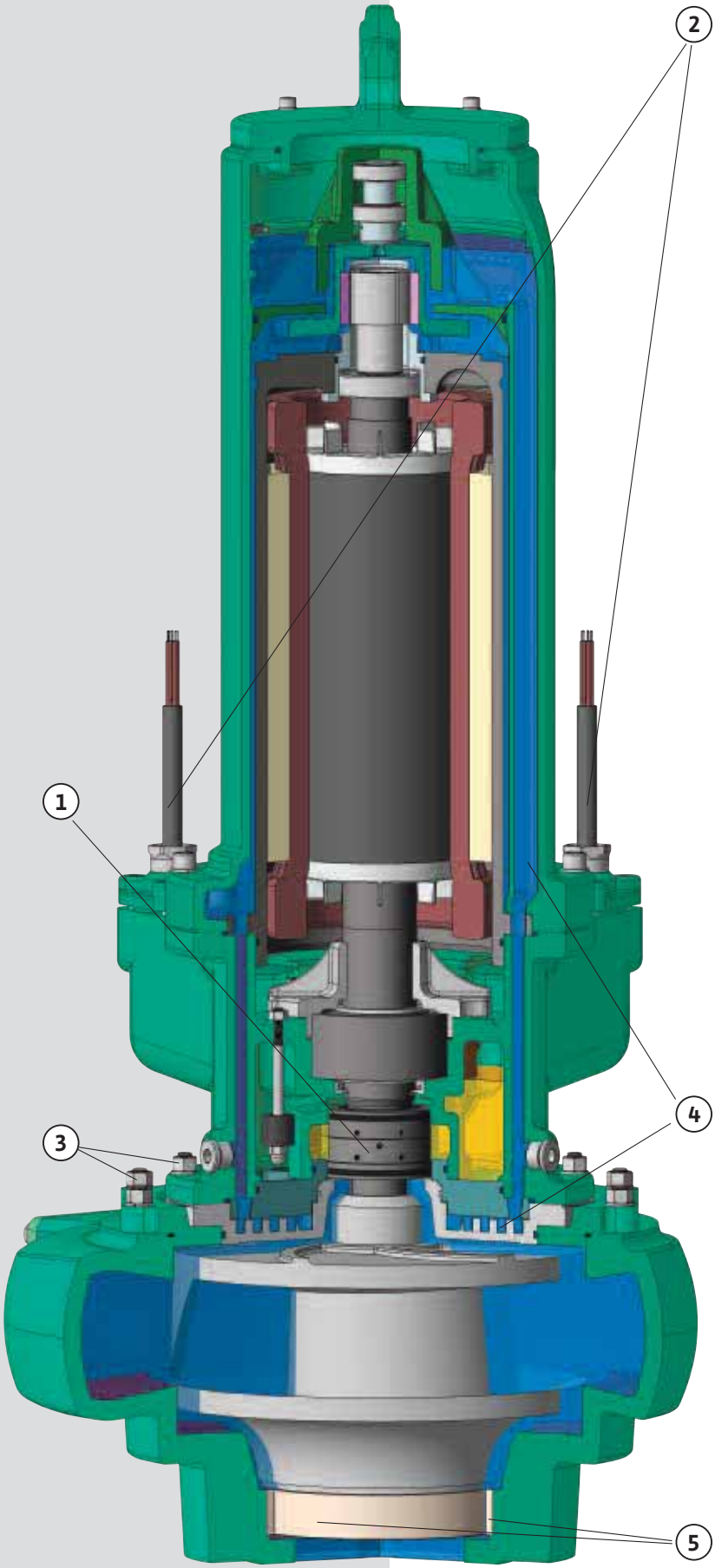
② *DN 400, PN 10 bzw. USA ANSI B 16.1, 125 lb., size 16*

③ *DN 400, PN 10*

Range of sewage pumps 60 Hz



Sewage Plant Design.
Low maintenance.



1 Mechanical shaft seal

Block Seal with 2 mechanical shaft seals (short design) or 2 mechanical shaft seals in face-to-face arrangement.

2 Cable entry

Current supply cable NSSHoeu resists strong mechanical load.

3 Screwed connections SS304/SS316

Fast and low-cost dismantling by means of screwed connections of stainless steel.

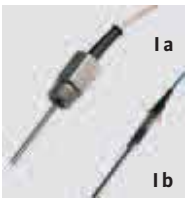
4 Internal circulation cooling

- Internal cooling cycle secures a safe operation.
- Transmission of the motor heat to the pumped liquid via a heat exchanger. Operating temperature and thermal load of the parts remain low.

5 Stationary and mobile wear ring

Stationary and mobile wear ring of stainless steel protect the pump casing and impeller from early wear.

Safety.
Components.



DI-Electrode

Humidity control in the terminal- (b), motor- (b) and sealing chamber (a + b)

Bi-metallic thermistors

Control of the winding temperature in the motor chamber

Cold-type thermistors

Control of the winding temperature in the motor chamber

Pt 100

Control of the winding temperature and bearing temperature

Thermal float switch

Control of the oil level and oil temperature in the motor chamber

Float switches

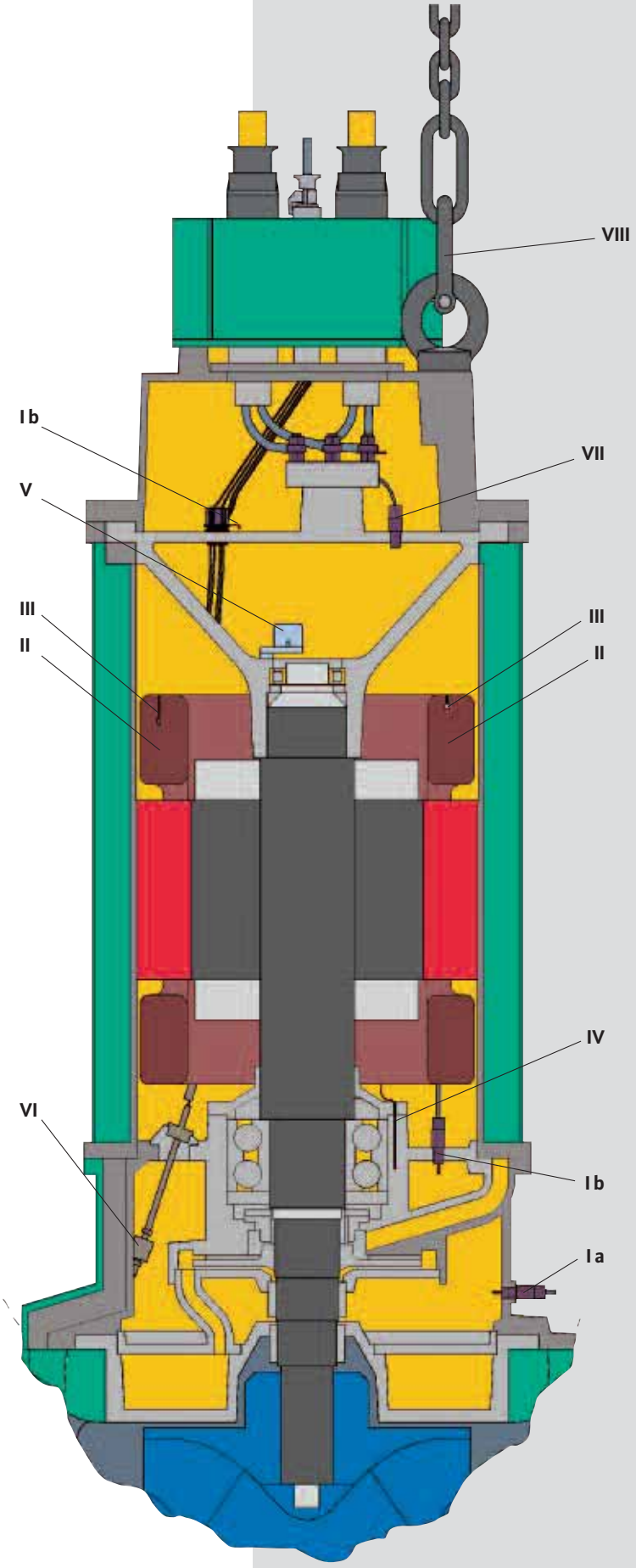
Leakage detection in the control chamber

Pressure switch

Pressure control in the motor chamber

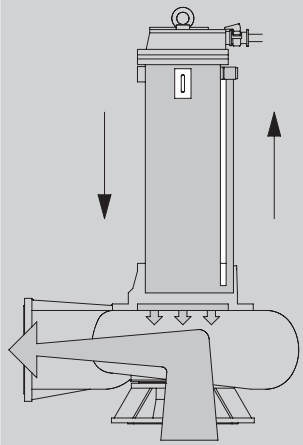
Chains

Installation and removal by means of high-safety chains as per DIN 685 with load lifting links.



Motor selection.
FO/FK-Motors, HC-Motors.

FO/FK-Motor

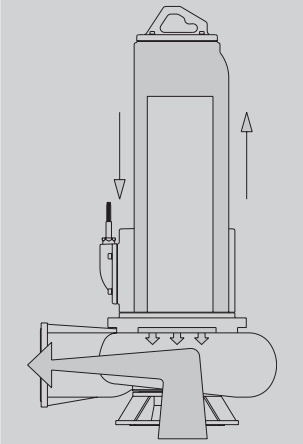


FO/FK motors feature an oil-filled motor chamber. By means of an internal oil circulation cooling system, the heat produced by the motor is dissipated to the pumped media via a heat exchanger. The type FK 17.1 of this series is available in explosion-proof design (more details on request).

Advantages

– Continuous operation in wet and dry sump installation
– Draining pump sump to very low level is possible
– Cooling independent of the type of pumped medium
– Room ventilation not necessary in the event of dry sump installation
– Sump volume can be reduced, resulting in lower construction costs

HC motor



The motor chamber of the HC-motors is dry. Cooling by a hermetically tight cooling system with water/glycol-filling. The heat of the motor is dissipated to the pumped liquid by the cooling liquid - driven by a magnetic coupling – by means of a highly efficient heat exchanger. This series is available in explosion-proof design (further details on request)

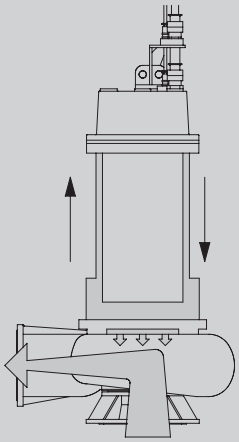
Advantages

– 2-chamber system – therefore control of both mechanical shaft seals possible
– Separate leakage chamber, high process security
– Cooling system hermetically tight, no penetration and leakage of liquid possible
– Same advantages as the FO/FK-motor.

Motor selection.

FKT-Motors, T-Motors.

FKT motor

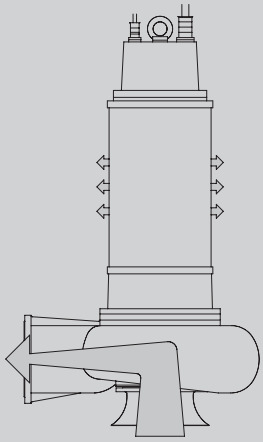


The FKT motor chamber is air-filled with a cooling jacket which contains the cooling fluid. The motor heat is dissipated to the pumped medium via a heat exchanger.

Advantages

– Continuous operation in wet and dry sump installation
– Draining pump sump to very low level is possible
– Cooling independent of the type of pumped media
– Room ventilation not required in the event of dry sump installation
– Sump volume can be reduced, resulting in lower construction costs

T-motor



Air filled T-motors are cooled when submerged in the surrounding pumped medium. Here, the motor waste heat is emitted directly via the casing, to the pumped medium. The types of this series are available in explosion-proof design (more details on request).

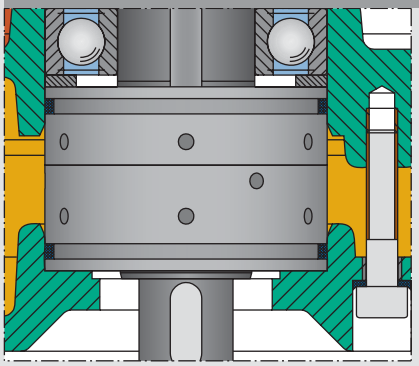
Advantages

– Competitive solution
– Separate cooling system not required


WILO

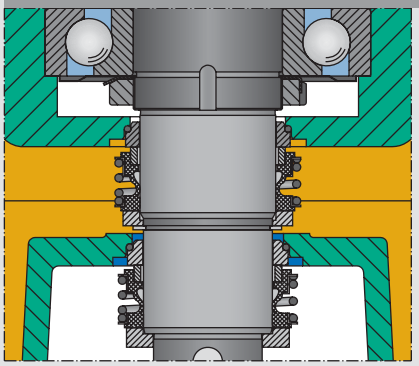
Sealing systems.
Solutions for every application.

Sewage plant design with WILO Block Seal



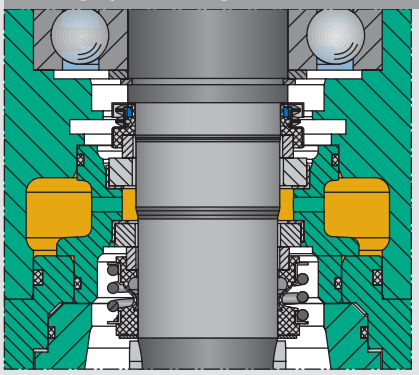
Mechanical shaft seals of highly wear-resistant silicon-carbide at the motor and pump-side integrated in a stainless steel cassette, guarantee
– high wear and corrosion resistance
– high operation safety
– long working life
– operation not dependent on the direction of rotation

Sewage plant design with double mechanical shaft seal – tandem construction



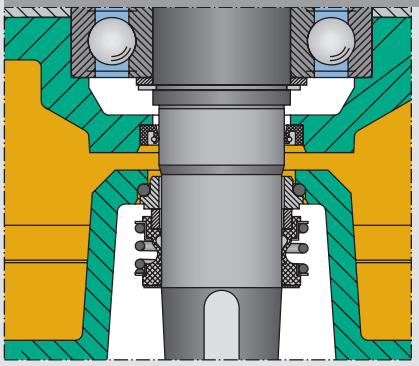
for high stress and difficult applications
– 2 mechanical shaft seals of highly wear-resistant silcon-carbide in tandem arrangement.

Sewage plant design with double mechanical shaft seal – "Face-to-Face" construction



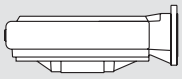
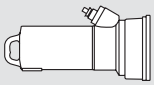
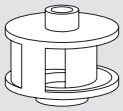
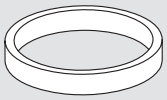
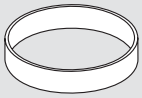
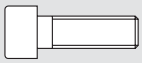
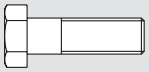
for high stress and difficult applications
– 2 mechanical shaft seals in highly wear-resistant arrangement

Standard design



low-cost sealing for normal applications
– pump-side sealing by means of highly wear-resistant mechanical shaft seal of silicon-carbide
– motor-side sealing by special radial seal

Material designs.
Optimized cost benefit calculation.

Parts	Standard materials					Special materials
	AISI	ASTM		BS	DIN	
Pump casing 	– –	A 48–83 A 536–84	Cl 35, 40 60–45–12	1452 Gr 260 2789 Gr 500/7	EN–GJL–250 EN–GJS–500–7	Ceramics coating Ceram Chill casting Abrasit AISI 316, duplex
Motor casing 	– –	A 48–83 –	Cl 35, 40 –	1452 Gr 260 FE 360B 1449 37/ 23 HR	EN–GJL–250 S235JR	Ceramics coating Ceram AISI 316
Impeller 	– –	A 48–83 A 536–84	Cl 35, 40 60–45–12	1452 Gr 260 2789 Gr 500/7	EN–GJL–250 EN–GJS–500–7	Ceramics coating Ceram Chill casting Abrasit AISI 316, duplex
Shaft 	420 4140	A 276 A 322–90b	420 –	420 S 37 708 M 90	1.4021 1.7225	AISI 304, duplex
Mobile wear ring 	– –	– A 536–84	– 80–55–06	– 2789 Gr 600/3	1.4462 EN–GJS–600–3	
Stationary wear ring 	CF 8 316 Ti – –	A 351/A 743 A 276 A 536–84 A 536–84	– Z316 Ti 60–45–12 80–55–06	304 C 15 320 S 31 2789 Gr 500/7 2789 Gr 600/3	1.4308 1.4571 EN–GJS–500–7 EN–GJS–600–3	
Screwed connections A 2 	304 308	A 271/A 276 –	304 –	304 S 15 –	1.4301 1.4303	
Screwed connections A 4 	316	A 276/A 182	316 Gr F 316	316 S 31	1.4401	

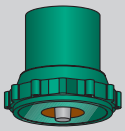
We would be pleased to check the suitability and application of other materials and coatings for the use in corrosive and/or abrasive media in your installation.

Screwed connections A 2 or A 4
- alloy type
- steel group as per DIN 267 part 11
- austenitic chrome–nickle steels

DIN = German Industrial Standard
AISI = American Iron and Steel Institute
ASTM = American Society for Testing and Materials
BS = British Standard

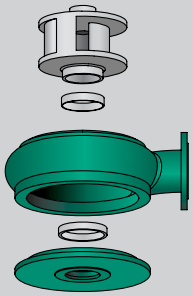
Sealing elements
NBR Butadiene–Acrylnitril–caoutchouc (for ex. Perbunan)
FKM Fluorine caoutchouc (for ex. Viton) everything as per ASTM D 1418

Impellers.
Modular system.



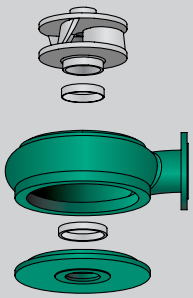
Modular system

Customer-specific combinations of pump ends and motors are possible in a modular system according to a fixed key.



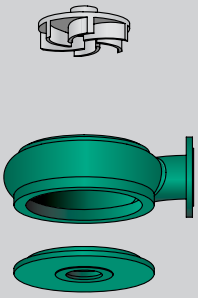
Single-channel impeller

– for pumping highly soiled raw sewage containing solids. This sewage can also contain fibrous materials which tend to agglomerate.
– for gentle pumping of raw sludge and recycled sludge with solids contents up to 8 %.



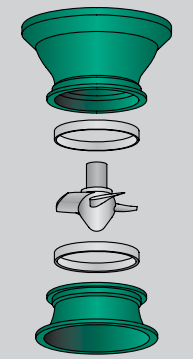
Multi-channel impeller

– for pumping lightly soiled, pre-cleaned fluids without long fibers, e.g. activated sludge and rainwater.
– for pumping raw sewage with big size pumps.



Vortex-type impeller

– for pumping heavily soiled fluids with grain and fibrous constituents.
– for pumping gas-emitting sludges with air inclusions, such as raw sludge and digested sludge and raw sewage with a solids concentration up to 8 %.



Propeller-type impeller

– for pumping large capacities of clean water, service water and waste water to low heads.
– suitable only for lightly soiled pumped media (e.g. rainwater, return sludge, circulation of activated sludge, pumping stations etc.)

· Sewage pumps with mechanical stirring mechanism

· Sewage pumps with cutting mechanism

· Sewage pumps with cast stainless steel

Special designs.
Special solutions.

Sewage pumps with mechanical stirring mechanism
For clearing sand traps and sludge ponds and for stirring up deposits. The mechanical mixer is attached to a vortex impeller.

Sewage pumps with cutting mechanism
For pressure drainage of with long discharge pipelines possessing small cross sections. The cutting system before the impeller disintegrates sewage constituents to the required size. Rotor made of Abrasit.

Sewage pumps of stainless steel
For pumping corrosive media. All parts coming into contact with the media are therefore made of SS 316 stainless steel. With cable protection hose and elastomeres of Viton as a standard.

Sewage pump with ceramic coating Ceram C0 – applied in airless procedure.
For interior and exterior surfaces in contact with the pumped liquid resistant to salt water and industrial sewage. Layer thickness 400 µm, adhesion 15 N/mm^2, solvents free.

Sewage pumps with cast stainless steel
Impeller, sealing flange, pump casing and suction port are made of special material and therefore protected against corrosive or abrasive sewage. Motor with Ceram-coating against corrosion, cable with protection hose.

Special Materials.
Different combinations.

Wear-resistant materials and coatings
More and more wear-resistant materials and coatings are used in municipal and industrial application fields for pumping abrasive media instead of normal casting materials. These special materials are longer resistant to abrasive attacks due to their specific quality: WILO-liquid ceramics Ceram C1, C2, C3, WILO-Abrasit (Chill casting)

Advantages:
- very good protection against corrosion (Ceram)
- high abrasion-resistance, high wear-resistance
- resistant to a lot of chemicals, oils, greases, solvents, diluted organic and inorganic acids and leaches (Ceram)
- high resistance to corrosive wear, aggressive chemicals and organic solvents (Ceram)

Corrosion-resistant materials and coatings
In industrial application fields corrosion-resistant materials and coatings are required to pump chemically aggressive media. These special materials are very corrosion-resistant to acids and bases: WILO-liquid ceramics Ceram C0, C1, C2, C3, AISI 316, duplex further materials on inquiry

Advantages:
- very good resistance to corrosion by acids and bases
- high resistance to intercrystalline corrosion and stress corrosion
- excellent stability and tenacity values

Attention: Not all combinations are possible. During a personal consultation we will find the best solution for you

ceram protected

Ceram C0 is the highly efficient two-component coating (polymer + ceramics) of the company WILO. Units with Ceram C0 have a longer surface roughness increasing the efficiency. And: Ceram C0 coating prolong the service life of the units and reduce the maintenance work.

· Wear-resistant materials and coatings

· Corrosion-resistant materials and coatings

· Ceram coating

Product Range.

The right solution for each application.

Discharge connection		G1¼" / G2" / G2½"	2 inch	3 inch	4 inch	
Frequency	Hz	60	60	60	60	
Speed	RPM	1,740–3480	1,740–3480	1,740–3480	1,140–1,740	
Rated Power	HP	0.80–9.00	0.67–3.00	1.60–24.8	2.30–127.3	
Flow Capacity Q_{max}	gpm	15–110	19–170	26–570	70–1400	
Head Range	ft	3–180	8–95	4–140	4–300	
Weight (Pump + motor)	lb	48/137	64/81	75/519	144/1,880	
Installation Type		wet pit/dry pit/ portable	wet pit/dry pit/ portable	wet pit/dry pit/ portable	wet pit/dry pit/ portable	w
Internal oil-circulation cooling		o	o	o	o	
Internal water glycol cooling		–	–	o	o	
Standard design, 1 mech. shaft seal + 1 radial seal (depending on motor type)		X	X	X	X	
Sewage plant design, 2 mech. shaft seals (depending on motor type)		X	X	X	X	
Temperature monitoring		X	X	X	X	
Special materials						
Coatings						
Ceramics coating Ceram		o	o	o	o	
Solid execution						
Abrasit chill casting		◊	◊	◊	◊	
AISI 316		◊	◊	◊	◊	
Duplex		◊	◊	◊	◊	

o = Special design, X = Standard design, – = not available, ◊ = on request

6 inch	8 inch	10 ich	12 inch	14 inch	16 inch	20 inch	24 inch
60	60	60	60	60	60	60	60
1,140–1,740	1,140–1,740	890–1740	890–1140	890–1140	890	700–890	700–890
2.3–127.3	7.20–110.6	9–134	194–730	73.7–248	93.8–174.2	73.7–583	235–710
200–2,650	480–6,100	770–6,300	1,600–8,700	2,800–11,600	3,000–9,000	4,300–21,000	10,500–37,000
6–160	8–370	8–192	16–370	20–145	25–98	12–170	25–120
276/2,337	455/2,306	463/2,601	4,740/11,565	2,489/5,540	3,649/4,961	3,379/13,790	7,254/16,455
et pit/dry pit/ portable	wet pit/dry pit/ portable	wet pit/dry pit/ portable	wet pit/dry pit/ portable	wet pit/dry pit	wet pit/dry pit	wet pit/dry pit	wet pit/dry pit
o	o	o	o	o	o	o	o
o	o	o	◊	◊	◊	◊	◊
X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X
o	o	o	o	o	o	o	o
◊	◊	◊	◊	◊	◊	◊	◊
◊	◊	◊	◊	◊	◊	◊	◊
◊	◊	◊	◊	◊	◊	◊	◊

Axial machines.
Additional pipe pressure.

Applications
Axial machines pump large capacities of clean water, river water, pre-cleaned waste water and storm water, service water and cooling water or activated sludge to small heads.
Tube well pumps are directly installed in the discharge pipeline in vertical or in inclined position. In order to do this exact planning documents are required which are worked out by our experts.

- Submersible compact unit for clean and raw water, river water, pretreated muddy water and sewage (free from coarse and long fibrous matter), activated sludge, industrial and cooling water etc.
- Wide range of duties. Best characteristics and adaptation to modified system conditions by adjustable axial propeller.
- High safety of operation and good efficiencies.
- Space and cost saving underground civil engineering
- Minimal service and maintenance cost. Screwless installation into steel or concrete pipe
- Low noise level in operation.
- Driven be dry, 3 phase A.C., asynchronous motor, pressure water-proof, insulation class F, for all usual electric systems. Surface cooled.
- Common shaft for pump and motor. Permanently lubricated, long-life antifriction bearings requiring no maintenance.
- Shaft seal of treatment plant design. Two highly wear resistant mechanical shaft seals entirely made of silicon carbide with oil chamber in between.

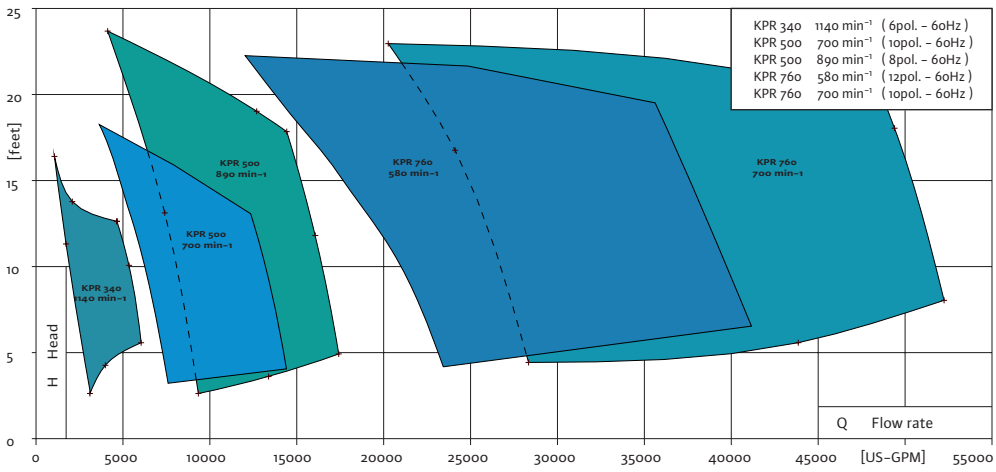
· Axial machine KPR 500

· Axial machine KPR 340

· Axial machines

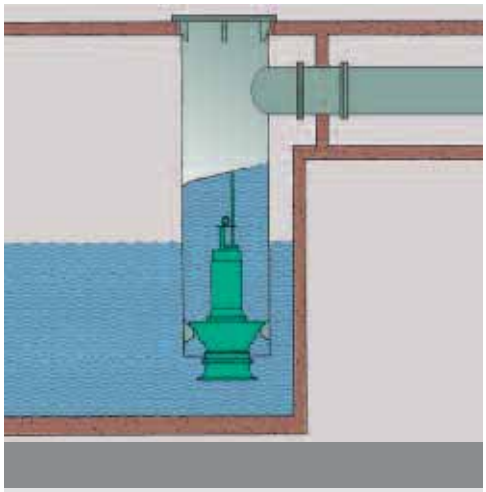
Axial machines.

Vertical or inclined installation.

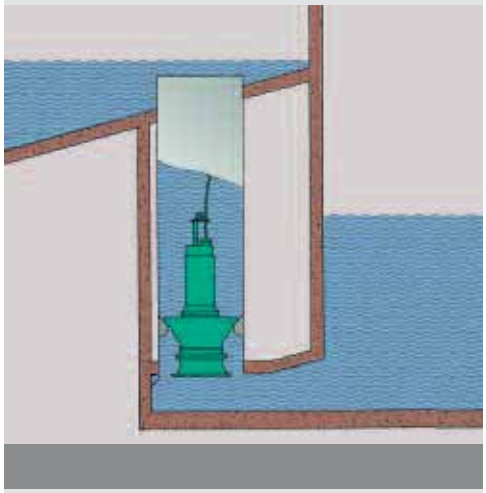


Axial pump		KPR 340	KPR 500	KPR 760
Frequency	Hz	60	60	60
Speed	RPM	950–1450	740–890	585–700
Rated Power	HP	6.1 – 50	26–110	109–382
Flow Capacity	pgm	1585	8560	1280 – 20.6
Head Range	ft	1–20	1.34 – 26.77	26.77
Weight Pump+Motor	lb	661 – 829	1596 – 2048	5124 – 6900
Propeller diameter	in	13.4	19.7	29.9
Material of blades		316 SS	316 SS	316 SS
Blades adjustable		x	x	x
Sewage Plant Design		x	x	x
Tube inside diameter	in	27.44	31.38	1100
Ball passage	in	3.3	4.3	5.1
Temperature control		x	x	x
Moisture control		x	x	x
Ceramics coating Ceram		o	o	o
Special painting		o	o	o
Pump with reactive anodes		o	o	o
Seawater design		o	o	o

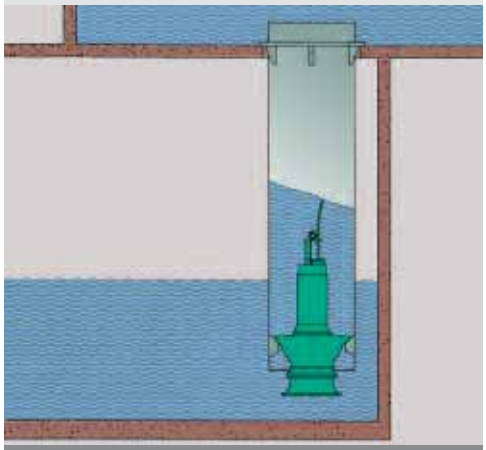
x = Standard design o = Special design



· Installation example A



· Installation example B



· Installation example C

Pumpen Intelligenz.

Wilo-EMU USA LLC
170 Big Star Drive
Thomasville, GA 31757
Toll Free: 866-476-0362
Direct: 229-584-0225
Mobile: 229-200-1290
Fax: 229-584-0234
Web: www.wilo-emu-usa.com

Wilo-EMU USA LLC
170 Big Star Drive
Thomasville, GA 31757
Toll Free: 866-476-0362
Direct: 229-584-0225
Mobile: 229-200-1290
Fax: 229-584-0234
Web: www.wilo-emu-usa.com

W 2912/5T/0710/US