

Submersible Motor Pump

# Amarex KRT

60 Hz

## Type Series Booklet



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Type Series Booklet Amarex KRT

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## Waste Water

### Submersible Motor Pump

# Amarex KRT



#### Main applications

- Waste water management
- Service water supply systems
- Disposal
- Waste water treatment plants
- Sludge disposal

#### Fluids handled

- Sewage containing feces
- Activated sludge
- Digested sludge
- Raw sludge
- Fluids containing gas
- Industrial waste water

#### Operating data

Table 1: Operating properties

Characteristic	Value
Flow rate	Q [US.gpm] ≤ 45000
	Q [l/s] ≤ 2800
Head	H [ft] ≤ 330
	H [m] ≤ 100
Fluid temperature	T [°F] ≤ +140
	T [°C] ≤ +60
Motor rating	P <sub>2</sub> [hp] ≤ 1140
	P <sub>2</sub> [kW] ≤ 850

#### Design details

##### Design

- Fully floodable submersible motor pump
- Not self-priming
- Close-coupled design

##### Drive

- Three-phase asynchronous squirrel-cage motor
- Motors integrated in explosion-proof pump sets are supplied in Explosionproof Class I Division 1, Groups C&D, T3.

##### Shaft seal

Depending on the motor design:

- Two bi-directional mechanical seals in tandem arrangement with liquid reservoir, with leakage chamber on some models
- Double cartridge seal with leakage chamber

##### Impeller type

- Various application-oriented impeller types (⇒ Page 14)

##### Bearings

- Various application-oriented bearings (⇒ Page 8)







Drive end:

- Grease-packed bearings sealed for life
- Maintenance-free

Pump end:

- Standard bearings
  - Grease-packed bearings sealed for life
  - Maintenance-free
- Reinforced bearings
  - Grease-packed bearings
  - Can be re-lubricated

**Designation**
**Example: Amarex KRT K 150-503/155 4 UN G-D IE3**
**Table 2: Designation key**

Code	Description	
Amarex KRT	Type series	
K	Impeller type (⇒ Page 14)	
	S/S-max	Impeller with cutter
	F/F-max	Vortex impeller
	E/E-max	Closed single-channel impeller
	D/D-max	Open diagonal single-vane impeller / open radial multi-vane impeller
	K/K-max	Closed multi-channel impeller
150	Nominal discharge nozzle diameter [mm]	
503	Maximum nominal impeller diameter [mm]	
155	Motor size	
4	Number of motor poles	
UN	Motor version (⇒ Page 8)	
	UN/UE	Non-explosion-proof, for fluid temperatures of up to 40 °C <sup>1)</sup>
	UF	Non-explosion-proof, for fluid temperatures of up to 40 °C, ambient temperatures of up to 55 °C
	WN/WE	Non-explosion-proof, for fluid temperatures of up to 60 °C <sup>1)</sup>
	XN/XE	Explosion protection  or  Explosion-proof Class I, Division I, Groups C & D, T3, for fluid temperatures of up to 40 °C <sup>1)</sup>
	XF	Explosion protection  or  Explosion-proof Class I, Division I, Groups C & D, T3, for fluid temperatures of up to 40 °C, ambient temperatures of up to 55 °C
	ZN/ZE	Explosion protection  or  Explosion-proof Class I, Division I, Groups C & D, T3, for fluid temperatures of up to 60 °C <sup>1)</sup>
G	Material variant (⇒ Page 6)	
	G	Standard variant, gray cast iron
	G1	Like G, impeller made of duplex stainless steel
	G2	Like G, impeller made of white cast iron
	GH	Like G, impeller and discharge cover made of white cast iron
	H	Wetted components made of white cast iron
	C1	Wetted parts made of duplex stainless steel, mechanical seal with elastomer bellows, bolts/screws made of A4
	C2	Wetted parts made of duplex stainless steel, mechanical seal with covered spring, bolts/screws made of 1.4462
D	Installation type (⇒ Page 37)	
	D	Stationary dry installation, vertical (S1 duty)
	H	Stationary dry installation, horizontal (S1 duty)
	K	Stationary wet installation (S1 duty with motor outside of the fluid possible) with guide cable arrangement or guide rail arrangement
	S	Stationary wet installation (S1 duty with submerged motor) with guide cable arrangement or guide rail arrangement
	P	Wet installation of transportable model (S1 duty with submerged motor)
IE3	Motor efficiency classification <sup>2)</sup>	
	<sup>3)</sup>	No efficiency classification
	IE3	Premium Efficiency

2553.524/16-EN-US

<sup>1</sup> Maximum fluid temperature and ambient temperature

<sup>2</sup> The IEC 60034-30 standard is not binding for submersible motor pumps. Efficiencies are calculated / determined by analogy with the measurement method specified in IEC 60034-2. The marking is used for submersible motors that achieve efficiency levels similar to those of standardized motors acc. to the IEC 60034-30 standard.

<sup>3</sup> Blank

**Materials**
**Table 3: Overview of available materials**

Part No.	Description	Material variant						
		G	G1	G2	GH	H	C1	C2
Pump set								
101	Pump casing	EN-GJL-250			EN-GJN-HB555		1.4517	
135	Wear plate for D/D-max impeller	EN-GJL-250 <sup>4)</sup>		EN-GJN-HB555		-		
163	Discharge cover	EN-GJL-250			EN-GJN-HB555		1.4517	
210	Shaft	1.4021 (⇒ Page 8)					1.4021/1.4462/C45+N (⇒ Page 8)	
230	Impeller <sup>5)</sup>	EN-GJL-250	JL 1.4517	EN-GJN-HB555			1.4517	
350	Bearing housing	EN-GJL-250					1.4517/EN-GJL-250	
412	O-ring	Nitrile butadiene rubber (NBR)						Viton (FKM)
433.01 / 433	Mechanical seal (drive end) Double mechanical seal (drive end)	Carbon/SiC						
433.02 / 433	Mechanical seal (pump end) Double mechanical seal (pump end)	SiC / SiC						
502	Casing wear ring <sup>6)</sup>	EN-GJL-250			VG 434			
66- 2	Cooling jacket	1.4571			-			
811	Motor housing	EN-GJL-250					1.4517	
824	Power cable	(⇒ Table 8)						
900	Bolts/screws	A4 <sup>7)</sup>						1.4462
Installation parts								
572	Guide cable suspension bracket	1.4571 up to DN 200; EN-GJL-250 from size K200-502					1.4571	
59- 24	Guide cable	1.4401					1.4401/ Tefzel	
72-1	Flanged bend	EN-GJL-250			EN-GJN-HB555		1.4517	
732	Claw	EN-GJL-250 or EN-GJS-400-15/EN-GJS-500-7					1.4517	
885	Lifting chain / lifting rope	Lifting chain: 1.4404 Lifting rope: polyamide / polypropylene					Lifting rope: polypropylene	
892	Foot plate / feet	1.0038 + Z					1.4571	1.4517/ 1.4462
894	Mounting bracket	1.4571 up to DN 200; 1.0038 + Z from size K200-502					1.4571	

**Description of materials**
**EN-GJL-250 gray cast iron (lamellar graphite cast iron)**

Lamellar graphite cast iron to EN 1561 is the most widely used cast material for handling municipal sewage, waste water and sludges as well as stormwater and surface water. It is suitable for neutral fluids which are only slightly aggressive and cause little wear. The pH value should be  $\geq 6.5$ , the sand content  $\leq 0.5$  g/l.

**Nodular cast iron EN-GJS-400-15 (nodular graphite cast iron)**

Its ductile structure, mechanical properties and wear resistance make this nodular cast iron to EN 1561 a suitable propeller material that is also suitable for handling digestion substrate.

**Duplex stainless steel (1.4517 or technically equivalent material)**

This type of cast steel is resistant to cavitation, has excellent strength values and is used for high circumferential speeds. An excellent resistance to pitting corrosion makes ferritic-austenitic stainless steel a popular choice for pumping acidic waste water with a high chloride content as well as seawater and brackish water. Thanks to its good chemical resistance, e.g. against waste water containing phosphorus and sulphuric acid, this material is used in a wide range of applications in the chemical industry and process engineering. Pumps made of duplex stainless steel have a very long service life, even when handling brines, chemical waste water (pH 1 - 12), gray water and landfill leachate.

**Wear-resistant white cast iron (EN-GJN-HB555 [XCR14] or technically equivalent material)**

Wear-resistant white cast iron is suitable for handling highly abrasive fluids containing sand, ash or iron ore sinter, for example. It has a Rockwell hardness (HRC) of 54 as a minimum, which is higher than that of hardened chrome steel. Owing to its hardness, the chromium-molybdenum alloy cast iron features a notably higher wear resistance than EN-GJL-250 gray cast iron and other cast materials. A pH  $\geq 6.5$  should be observed.

<sup>4</sup> D impeller: EN-GJL-250; D-max impeller: EN-GJS-400-15

<sup>5</sup> D impeller: EN-GJL-250, with hardened edges; D-max impeller: EN-GJS-400-15, with hardened edges

<sup>6</sup> For E impeller and K impeller

<sup>7</sup> Equivalent to 1.4571

**Table 4: Comparison of materials**

EN	ASTM
EN-GJL-250	A 48 Class 35 B
EN-GJS-400-15	A 536 Class 60-40-18
EN-GJN-HB555	A 532 Class II Type B (15 % Cr-Mo)
1.4517	A 890 CD4MCuN
1.4021	A 276 Type 410
1.4401	A 276 Type 316 L
1.4462	A 182 F51
VG 434	-
1.4571	A 276 Type 316 Ti
C45+N	A 576 Gr. 1045
NBR	NBR
FKM	FKM

**Product benefits**

- Absolutely water-tight resin-sealed cable entries prevent any water from entering the motor – even in the event of a damaged connection cable.
- Reliable operation ensured by moisture sensors signaling any ingress of moisture into the motor
- Reliable operation ensured by sensors monitoring the motor temperature and preventing overheating
- Non-clogging low-maintenance design with large free passages reduces clogging risk and, consequently, maintenance work.
- Optimum hydraulic and energy efficiency by high-efficiency motors and variable hydraulic systems

Material variants C1 and C2:

- Long service life due to corrosion-resistant wetted components made of stainless steel

**Acceptance tests and warranty**
**Functional test**

- Every pump undergoes functional testing to KSB standard ZN 56535.

**K/K-max impeller:**

- Operating data is guaranteed to DIN EN ISO 9906/2B. It can also be guaranteed to DIN EN ISO 9906/1B, 3B and 1U (with re-evaluation of D2 and η).

**S, F/F-max, E/E-max, D/D-max impellers:**

- Operating data is guaranteed to DIN EN ISO 9906/3B. It can also be guaranteed to DIN EN ISO 9906/2B.

**Power input P<sub>2</sub> of the pump below 10 kW.**

- Operating data is guaranteed to DIN EN ISO 9906 and HI §4.4.2. Other acceptance grades are not approved.

**Acceptance tests**

- Acceptance testing to ISO/DIN or comparable standards is available against a surcharge.

**Warranty**

- Quality is assured by means of an audited and certified quality assurance system to DIN EN ISO 9001.

**Selection information**

- The indicated heads and performance data apply to material variant G, for fluids with a density  $\rho = 1 \text{ kg/dm}^3$  and a kinematic viscosity  $\nu \leq 20 \text{ mm}^2/\text{s}$ .

**Impeller type**

- S, F, E and D impellers can only be supplied with the documented impeller diameters. Indicate the pump set designation and the impeller diameter in the purchase order.
- K and D-max impellers are trimmed to the duty point. Indicate the H/Q data or the impeller diameter in the purchase order. In the hydraulic selection program, the impeller diameter is automatically computed based on the H/Q data and added to the designation of the pump set.

**Pump input power**

- Adjust the power input to the density of the fluid handled:  

$$P_2 \text{ (required)} = \rho \text{ [kg/dm}^3\text{] (fluid handled)} \times P_2 \text{ (documented)}$$
- Select the operating point with the largest power input within an operating range. Select a motor size providing a power reserve to compensate for the tolerances in the system characteristic / pump characteristic.

**Table 5: Recommended motor power reserve<sup>8)</sup>**

P <sub>2</sub>		Reserve	
[hp]	[kW]	Mains operation	With frequency inverter
≤ 40	≤ 30	10 %	15 %
> 40	> 30	5 %	10 %

- For installation types D and K (with cooling jacket) with motors UN/XN/YN, always add a power reserve of 2 hp [1.5 kW] for the cooling circuit.
- The motors are suitable for operation on a frequency inverter.
- The service factor for all motors equals 1.15.

**i** In the case of waste water, too low a flow velocity in the discharge line will lead to clogging and increased wear. The minimum flow velocity required in vertical risers was determined experimentally as a function of the pipe diameter used and shown to be between 3.9 ft/s [1.2 m/s] for nominal size 100 and 7.9 ft/s [2.4 m/s] for nominal size 1000. For more information on flow velocities required in horizontal and vertical discharge lines refer to "KSB Know-how: Planning Information for Amarex KRT Submersible Motor Pumps".

**i** In the case of waste water, too low a circumferential speed of the impeller will lead to clogging of the hydraulic system (operation on frequency inverter). A minimum circumferential speed (measured at the outside diameter of the impeller) of 39,4 ft/s [12 m/s] must be observed.<sup>9)</sup>







<sup>8</sup> If larger power reserves are stipulated by local regulations, these larger reserves must be provided.

<sup>9</sup> For F impellers, a circumferential speed below 39.4 ft/s [12 m/s] is permissible.

## Overview of product features / selection tables

## Overview of product features

Table 6: Material variants G, G1, G2, GH

Feature	Motors								
2 poles	3 2 E ... 26 2 E	-	55 2 E ... 75 2 E	18 2 F ... 75 2 F	-	-	-	-	
4 poles	2 4 E ... 22 4 E	30 4 E ... 37 4 E	45 4 E ... 75 4 E	15 4 F ... 75 4 F	80 4 N ... 110 4 N	130 4 N ... 175 4 N	200 4 N ... 350 4 N	-	
6 poles	7 6 E ... 18 6 E	22 6 E ... 30 6 E	31 6 E ... 55 6 E	15 6 F ... 55 6 F	60 6 N ... 100 6 N	120 6 N ... 165 6 N	190 6 N ... 480 6 N	530 6 N ... 850 6 N	
8 poles	-	11 8 E ... 22 8 E	30 8 E ... 45 8 E	15 8 F ... 45 8 F	50 8 N ... 75 8 N	90 8 N ... 130 8 N	150 8 N ... 400 8 N	460 8 N ... 760 8 N	
10 poles	-	-	-	-	-	40 10 N ... 90 10 N	110 10 N ... 350 10 N	390 10 N ... 660 10 N	
12 poles	-	-	-	-	-	-	105 12 N ... 300 12 N	340 12 N ... 560 12 N	
Suction flange	<sup>10)</sup>								
Shaft material									
Shaft	A 276 Type 420								
Bearings	Grease-packed rolling element bearings sealed for life <sup>11)</sup>				Re-greasable rolling element bearings (pump end) Grease-packed rolling element bearings sealed for life (drive end)				
Explosion protection									
Version U	Non-explosion-proof								
Version X	 or  Explosion-proof Class I, Division I, Groups C & D, T3							-	
Version W	Non-explosion-proof			-	Non-explosion-proof				-
Version Z	 or  Explosion-proof Class I, Division I, Groups C & D, T3			-	 or  Explosion-proof Class I, Division I, Groups C & D, T3				-
Motor									
Starting method	DOL, soft starter, frequency inverter or star-delta <sup>12)</sup>							DOL	
Voltage	460 V, 200 V <sup>13)</sup> , 230 V <sup>13)</sup> , 380 V <sup>13)</sup> , 575 V <sup>13)</sup>							460 V, 380 V <sup>13)</sup> , 575 V <sup>13)</sup>	
Cooling	Cooled by surrounding fluid / air cooling <sup>14)</sup>		With cooling jacket		Cooled by surrounding fluid / with cooling jacket				
Immersion depth	100 ft [30 m] max.								
Power cable									
Type	See the "Overview of power cables" table (⇒ Table 8)								
Length	33 ft [10 m], up to 131 ft [40 m] <sup>13)</sup>								
Cable entry	Absolutely water-tight								

<sup>10)</sup> Drilled to ANSI B16.1 Class 125 on request, not available for all sizes.

<sup>11)</sup> For versions with D impeller and motors 55 2 E/F ... 75 2 E/F, 45 4 E/F ... 75 4 E/F, 31 6 E/F ... 55 6 E/F, 30 8 E/F ... 45 8 E/F: re-greasable rolling element bearings (pump end) / grease-packed rolling element bearings sealed for life (drive end)

<sup>12)</sup> Depending on motor size and voltage

<sup>13)</sup> Optional

<sup>14)</sup> Optional for motors 11 2 E ... 26 2 E, 7 4 E ... 22 4 E, 7 6 E ... 18 6 E



Feature	Motors							
	2 poles	3 2 E ... 26 2 E	-	55 2 E ... 75 2 E	18 2 F ... 75 2 F	-	-	-
4 poles	2 4 E ... 22 4 E	30 4 E ... 37 4 E	45 4 E ... 75 4 E	15 4 F ... 75 4 F	80 4 N ... 110 4 N	130 4 N ... 175 4 N	200 4 N ... 350 4 N	-
6 poles	7 6 E ... 18 6 E	22 6 E ... 30 6 E	31 6 E ... 55 6 E	15 6 F ... 55 6 F	60 6 N ... 100 6 N	120 6 N ... 165 6 N	190 6 N ... 480 6 N	530 6 N ... 850 6 N
8 poles	-	11 8 E ... 22 8 E	30 8 E ... 45 8 E	15 8 F ... 45 8 F	50 8 N ... 75 8 N	90 8 N ... 130 8 N	150 8 N ... 400 8 N	460 8 N ... 760 8 N
10 poles	-	-	-	-	-	40 10 N ... 90 10 N	110 10 N ... 350 10 N	390 10 N ... 660 10 N
12 poles	-	-	-	-	-	-	105 12 N ... 300 12 N	340 12 N ... 560 12 N
<b>Sealing elements</b>								
Elastomer seals Nitrile butadiene rubber NBR / Viton = fluorocarbon rubber FPM <sup>13)</sup>								
Shaft seal	Mechanical seal with elastomer bellows / double cartridge seal <sup>13), 15)</sup> , pump-end mechanical seal with covered spring <sup>13), 16)</sup>	Mechanical seal with elastomer bellows / pump-end mechanical seal with covered spring <sup>17)</sup>	Double cartridge seal	Mechanical seal with elastomer bellows / pump-end mechanical seal with covered spring <sup>13)</sup>	Stationary mechanical seal with covered spring			
<b>Monitoring equipment</b>								
Winding temperature, versions U, W; installation types S, P	Temperature switches (bimetal) in the winding		-	Temperature switches (bimetal) in the winding				
Winding temperature, versions X, Z; installation types S, P	Temperature switches (bimetal) in the winding, plus PTC thermistors for explosion protection		-	Temperature switches (bimetal) in the winding, plus PTC thermistors for explosion protection			-	
Winding temperature; installation types D, H, K	PTC thermistor	-	PTC thermistor / Pt100 resistance thermometer <sup>19)</sup>	PTC thermistor				
Coolant temperature; installation types D, K	-		-	PTC thermistor				
Bearing temperature	-	Pt100 resistance thermometer (pump end) <sup>13)</sup>	Pt100 resistance thermometer (pump end) <sup>20)</sup> Pt100 resistance thermometer (drive end) <sup>19)</sup>	Pt100 resistance thermometer (pump end) Pt100 resistance thermometer (drive end) <sup>13)</sup>			Pt100 resistance thermometer (pump end) Pt100 resistance thermometer (drive end)	

<sup>15)</sup> Maximum nominal impeller diameter ≤ 315 mm

<sup>16)</sup> Maximum nominal impeller diameter > 315 mm

<sup>17)</sup> Optional: for maximum nominal impeller diameter > 315

<sup>18)</sup> Only for motors 3 2 E, 2 4 E, 3 4 E

<sup>19)</sup> Option: Premium package

<sup>20)</sup> Option: Basic Plus package or Premium package



Feature	Motors							
2 poles	3 2 E ... 26 2 E	-	55 2 E ... 75 2 E	18 2 F ... 75 2 F	-	-	-	-
4 poles	2 4 E ... 22 4 E	30 4 E ... 37 4 E	45 4 E ... 75 4 E	15 4 F ... 75 4 F	80 4 N ... 110 4 N	130 4 N ... 175 4 N	200 4 N ... 350 4 N	-
6 poles	7 6 E ... 18 6 E	22 6 E ... 30 6 E	31 6 E ... 55 6 E	15 6 F ... 55 6 F	60 6 N ... 100 6 N	120 6 N ... 165 6 N	190 6 N ... 480 6 N	530 6 N ... 850 6 N
8 poles	-	11 8 E ... 22 8 E	30 8 E ... 45 8 E	15 8 F ... 45 8 F	50 8 N ... 75 8 N	90 8 N ... 130 8 N	150 8 N ... 400 8 N	460 8 N ... 760 8 N
10 poles	-	-	-	-	-	40 10 N ... 90 10 N	110 10 N ... 350 10 N	390 10 N ... 660 10 N
12 poles	-	-	-	-	-	-	105 12 N ... 300 12 N	340 12 N ... 560 12 N
Leakage in the motor space	Leakage sensor in the motor space							
Mechanical seal leakage	-			Float switch in leakage area				
Vibration sensor	-			Internal vibration sensor <sup>19)</sup>	Internal vibration sensor <sup>13)</sup>			
Coating	Environmentally friendly KSB standard coating, color RAL 5002 / 250 µm, 2-component epoxy coating <sup>13)</sup>							
<b>Maximum fluid temperature and ambient temperature</b>								
Version U	104 °F [40 °C] <sup>21), 22)</sup>			104 °F [40 °C] <sup>21)</sup> & 131 °F [55 °C] <sup>22)</sup>	104 °F [40 °C] <sup>21), 22)</sup>			
Version X	104 °F [40 °C] <sup>21), 22)</sup>			104 °F [40 °C] <sup>21)</sup> & 131 °F [55 °C] <sup>22)</sup>	104 °F [40 °C] <sup>21), 22)</sup>			-
Versions W, Z	140 °F [60 °C] <sup>21), 22)</sup>			-	140 °F [60 °C] <sup>21), 22)</sup>			-
<b>Tests/inspections</b>								
Hydraulic system	KSB standard (ZN 56525) / S impeller, D impeller, E impeller, F impeller (ISO 9906 / HI 3B) <sup>13)</sup> / K impeller (ISO 9906 / HI 2B) <sup>13)</sup>							
General	KSB standard (ZN 56525)							
<b>Installation type</b>								
Stationary, with guide cable arrangement	Installation depth 15 ft [4.5 m] / up to 49 ft [15 m] <sup>23)</sup> / ≤ 98 ft [30 m] <sup>13)</sup>							
Stationary, with guide rail arrangement	Installation depth 15 ft [4.5 m] / ≤ 98 ft [30 m] <sup>13)</sup>							
Transportable	Up to size 300-403 (except sizes 200-502/503, 200-632)			-	Up to size 300-403 (except sizes 200-502/503, 200-632)			-
Stationary, dry-installed	/ air cooling <sup>14)</sup>			With cooling jacket	With cooling jacket			

<sup>21</sup> Fluid temperature

<sup>22</sup> Ambient temperature

<sup>23</sup> From size K200-503

Table 7: Material variants H, C1, C2

Feature	Motors					
2 poles	3 2 E ... 7 2 E	-	55 2 E ... 75 2 E	-	-	-
4 poles	2 4 E ... 5 4 E	30 4 E ... 37 4 E	45 4 E ... 75 4 E	80 4 N ... 110 4 N	130 4 N ... 175 4 N	200 4 N ... 350 4 N
6 poles	-	22 6 E ... 30 6 E	31 6 E ... 55 6 E	60 6 N ... 100 6 N	120 6 N ... 165 6 N	190 6 N ... 480 6 N
8 poles	-	11 8 E ... 22 8 E	30 8 E ... 45 8 E	50 8 N ... 75 8 N	90 8 N ... 130 8 N	150 8 N ... 480 8 N
10 poles	-	-	-	-	40 10 N ... 90 10 N	110 10 N ... 350 10 N
12 poles	-	-	-	-	-	105 12 N ... 300 12 N
Suction flange	10)					
<b>Shaft material for material variant H</b>						
Shaft	A 276 Type 420		A 276 Type 420 <sup>24)</sup>		A 276 Type 420	
<b>Shaft material for material variants C1, C2</b>						
Shaft	A 182 F51 / A 576 Gr. 1045		A 276 Type 420			
Bearings	Grease-packed rolling element bearings sealed for life		Re-greasable rolling element bearings (pump end) Grease-packed rolling element bearings sealed for life (drive end)			
<b>Explosion protection</b>						
Versions U, W	Non-explosion-proof					
Versions X, Z	 or  Explosion-proof Class I, Division I, Groups C & D, T3					-
<b>Motor</b>						
Starting method	DOL, soft starter, frequency inverter or star-delta <sup>12)</sup>					DOL
Voltage	460 V, 200 V <sup>13)</sup> , 230 V <sup>13)</sup> , 380 V <sup>13)</sup> , 575 V <sup>13)</sup>					
Cooling	Cooled by surrounding fluid					
Immersion depth	100 ft [30 m] max.					
<b>Power cable</b>						
Type	See the "Overview of power cables" table (⇒ Table 8)					
Length	33 ft [10 m], up to 131 ft [40 m] <sup>13)</sup>					
Cable entry	Absolutely water-tight					
<b>Sealing elements</b>						
Elastomer seals	Nitrile butadiene rubber NBR / Viton = fluorocarbon rubber FPM <sup>13)</sup> , C2: always fluorocarbon rubber FPM					
Shaft seal	C1: Mechanical seal with elastomer bellows <sup>25)</sup> H, C2: double cartridge seal <sup>15)</sup> , pump-end mechanical seal with covered spring <sup>16)</sup>		C1: Mechanical seal with elastomer bellows <sup>26)</sup> H, C2: pump-end mechanical seal with covered spring			Mechanical seal with covered spring
<b>Monitoring equipment</b>						
Winding temperature, versions U, W	Temperature switches (bimetal) in the winding					

<sup>24)</sup> For maximum nominal impeller diameters 400 mm / 401 mm / 402 mm / 403 mm: A 182 F51

<sup>25)</sup> Optional: Double cartridge seal, maximum nominal impeller diameter ≤ 315 mm

<sup>26)</sup> Optional: Mechanical seal with covered spring

Feature	Motors					
	3 2 E ... 7 2 E	-	55 2 E ... 75 2 E	-	-	-
2 poles	3 2 E ... 7 2 E	-	55 2 E ... 75 2 E	-	-	-
4 poles	2 4 E ... 5 4 E	30 4 E ... 37 4 E	45 4 E ... 75 4 E	80 4 N ... 110 4 N	130 4 N ... 175 4 N	200 4 N ... 350 4 N
6 poles	-	22 6 E ... 30 6 E	31 6 E ... 55 6 E	60 6 N ... 100 6 N	120 6 N ... 165 6 N	190 6 N ... 480 6 N
8 poles	-	11 8 E ... 22 8 E	30 8 E ... 45 8 E	50 8 N ... 75 8 N	90 8 N ... 130 8 N	150 8 N ... 480 8 N
10 poles	-	-	-	-	40 10 N ... 90 10 N	110 10 N ... 350 10 N
12 poles	-	-	-	-	-	105 12 N ... 300 12 N
Winding temperature, versions X, Z	Temperature switches (bimetal) in the winding, plus PTC thermistors for explosion protection Temperature switches (bimetal) in the winding, plus temperature switches (bimetal) for explosion protection <sup>18)</sup>			Temperature switches (bimetal) in the winding, plus PTC thermistors for explosion protection		-
Bearing temperature	-			Pt100 at the pump end <sup>27)</sup>		
Leakage inside the motor	Leakage sensor in the motor space					
Mechanical seal leakage	-			Float switch in leakage area		
Vibration sensor	-			Internal vibration sensor <sup>13)</sup>		
Coating	Material variant H: environmentally friendly KSB standard coating, primer dry film thickness 1 1/2-2 mils (35-50 µm), top coat: two-component epoxy coating dry film thickness 4 mils (100 µm) / 12 mils (300 µm), <sup>13)</sup> color RAL 5002 Material variants C1, C2: without coating					
<b>Maximum fluid temperature and ambient temperature</b>						
Version U	104 °F [40 °C] <sup>21), 22)</sup>			104 °F [40 °C] <sup>28), 21), 22)</sup> 86 °F [30 °C] <sup>29), 21), 22)</sup>		
Version X	104 °F [40 °C] <sup>21), 22)</sup>			104 °F [40 °C] <sup>28), 21), 22)</sup> 86 °F [30 °C] <sup>29), 21), 22)</sup>		-
Versions W, Z	140 °F [60 °C] <sup>21), 22)</sup>			-		
<b>Tests/inspections</b>						
Hydraulic system	KSB standard (ZN 56525) / S impeller, D impeller, E impeller, F impeller (ISO 9906 / HI 3B) <sup>13)</sup> / K impeller (ISO 9906 / HI 2B) <sup>13)</sup>					
General	KSB standard (ZN 56525)					
<b>Installation type</b>						
Stationary, with guide cable arrangement	Installation depth 15 ft [4.5 m] / up to 49 ft [15 m] <sup>23)</sup> / ≤ 98 ft [30 m] <sup>13)</sup>					
Transportable	Installation depth 15 ft [4.5 m] <sup>30)</sup>			-		

<sup>27)</sup> Optional: Pt100 at the drive end for maximum nominal impeller diameter ≤ 315 mm

<sup>28)</sup> White cast iron H

<sup>29)</sup> Stainless steel C

<sup>30)</sup> Up to size 300-403 (except sizes 200-502/503, 200-632)


**Table 8:** Overview of power cables

Feature	S1BN8-F rubber-sheathed cable	S07RC4N8-F rubber-sheathed cable	TEHSITE Tefzel cable
Design	Standard	Optional	Optional
Rated voltage	1000 V	750 V	750 V
EMC screening	-	✓	-
Insulation material	EPR <sup>31)</sup>	EPR <sup>31)</sup>	ETFE <sup>32)</sup>
Max. continuous temperature of insulation	194 °F [90 °C]	194 °F [90 °C]	275 °F [135 °C]
For permanent immersion in waste water to DIN VDE 0282-16/HD22.16	✓	✓	✓

<sup>31)</sup> EPR = ethylene propylene rubber





<sup>32)</sup> ETFE = ethylene tetrafluoroethylene

### Impellers

	Impeller with cutter (impeller type S/S-max)	<b>Suitable for the following fluids:</b> Fluids containing coarse substances and/or long fibers
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Further fluids (impeller type S/S-max):

- Domestic waste water
- Gray water
- Sewage containing feces

	Vortex impeller (impeller type F/F-max)	<b>Suitable for the following fluids:</b> fluids containing solids and stringy material as well as fluids with entrapped air or entrapped gas
	Closed single-channel impeller (impeller type E/E-max)	<b>Suitable for the following fluids:</b> fluids containing solids and stringy material
	Open, diagonal single-vane impeller (impeller type D)	<b>Suitable for the following fluids:</b> fluids containing solid substances and long fibers
	Open, radial multi-vane impeller (impeller type D-max)	<b>Suitable for the following fluids:</b> fluids containing solid substances and long fibers

Further fluids handled (impeller types F/F-max, E/E-max, D/D-max):

- Activated sludge
- Digested sludge
- Heating sludge
- Mixed water
- Raw waste water
- Raw sludge
- Recirculated sludge

	Closed multi-channel impeller (impeller type K/K-max)	<b>Suitable for the following fluids:</b> contaminated, solids-laden, non-gaseous fluids without stringy material
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Further fluids (impeller type K/K-max):

- Activated sludge
- Landfill waste water
- Industrial waste water
- Industrial gray water
- Mechanically treated waste water
- Pre-screened waste water
- Stormwater

## Overview of fluids handled

The table below for your guidance is based on KSB's long-standing experience. The data are standard values and are not to be considered as generally binding recommendations. More detailed advice is available from KSB. Make use of our laboratory's expertise when selecting materials.

**Table 9:** Selection aid for materials and hydraulic systems per fluid

Fluid handled <sup>33)</sup>	Recommended material variant	Recommended impeller type <sup>34)</sup>	Notes, further recommendations
Gray water	G	K/K-max, D/D-max, E/E-max, F/F-max	Free passage > any solids contained, possibly pre-screened
River water	G	K/K-max, D/D-max, E/E-max, F/F-max	Free passage > any solids contained, possibly pre-screened
Stormwater	G	K/K-max, D/D-max, E/E-max, F/F-max	Free passage > any solids contained, possibly pre-screened
<b>Waste water:</b>			
▪ Untreated municipal waste water	G	F/F-max, S/S-max, D/D-max, E/E-max, K/K-max	ATV <sup>35)</sup> -ATV recommends a free passage of 100 mm, min. 76 mm
▪ Containing air and gas	G	F/F-max	Up to 8 %, contact KSB for fluids with high outgassing rates
<b>Sludges:</b>			
▪ Raw sludge	G	F/F-max, D/D-max, E/E-max	Pumpable up to a dry substance content of: 13 % (D), 8 % (F/D-max), 6 % (E)
▪ Digested sludge	G	F/F-max, D/D-max, E/E-max	Pumpable up to a dry substance content of: 13 % (D), 8 % (F/D-max), 6 % (E)
▪ Activated sludge	G	D/D-max, K/K-max	Pumpable up to a dry substance content of: 13 % (D), 8 % (D-max), 5 % (K)
<b>Industrial waste contaminated with:</b>			
▪ Paint suspensions	G	K/K-max	Solvent-free, observe the operator's instructions !
▪ Lacquer/paint/varnish suspensions	G	F/F-max, E/E-max	Solvent-free, contact KSB to handle silicone-free fluids
▪ Fibers/pulp	G	F/F-max, S/S-max, D/D-max	-
▪ Chips/swarf	G2 / GH	K/K-max, F/F-max	Material variants G2 or GH, special mechanical seal, solids content < 5 g/l
▪ Abrasive substances <sup>36)</sup>	G2 / GH	K/K-max, F/F-max	Material variants G2 or GH, special mechanical seal, solids content < 5 g/l
Mildly acidic industrial waste water	C	K/K-max, F/F-max	pH ≥ 6.5, material variant C1 and FPM (Viton) O-rings
<b>Waste water neutral with regard to chemical corrosion:</b>			
▪ Ammonium hydroxide	G	K/K-max	-
▪ Ammonium hydroxide 5 % NH <sub>4</sub> OH	G	K/K-max	-
▪ Urea 25 % (NH <sub>2</sub> ) <sub>2</sub> -CO	G	K/K-max	-

<sup>33)</sup> For any fluids which are not listed in this table contact KSB.

<sup>34)</sup> The first impeller type listed should be given preference.

<sup>35)</sup> ATV = German regulatory body for waste water management

<sup>36)</sup> Severe hydroabrasive wear occurs if solids contents of approx. 0.5 g/l or higher are combined with circumferential speeds exceeding 20 m/s or part-load conditions to the left of the duty point.

Fluid handled <sup>33)</sup>	Recommended material variant	Recommended impeller type <sup>34)</sup>	Notes, further recommendations
▪ Potassium hydroxide 10 % KOH	G	K/K-max	-
▪ Calcium hydroxide 5 % Ca(OH) <sub>2</sub>	G	K/K-max	-
▪ Sodium hydroxide 5 % NaOH	G	K/K-max	-
▪ Sodium carbonate 30 % Na <sub>2</sub> CO <sub>3</sub>	G	K/K-max	-
Neutral, non-corrosive waste water containing:			
▪ Aliphatic hydrocarbons, e.g. oils, petrol, butane, methane	G	K/K-max	-
▪ Aromatic hydrocarbons, e.g. benzene, styrene	G	K/K-max	FPM (Viton) O-rings <sup>37)</sup>
▪ Chlorinated hydrocarbons, e.g. tetrachloroethylene, ethylene chloride, chloroform, methylene chloride	G	K/K-max	FPM (Viton) O-rings <sup>37)</sup>
Highly abrasive industrial waste water causing wear (chemically neutral): <sup>38)</sup>			
▪ Water containing iron ore sinter	GH / H	K/K-max	Sinter content < 5 g/l: material variant GH Sinter content > 5 g/l: material variant H
▪ Lime milk containing quartz and pigment suspensions	GH / H	K/K-max	Lime milk content < 15 %: material variant GH Lime milk content > 15 %: material variant H
▪ Wash water containing solids	Wear-resistant white cast iron	K/K-max, F/F-max	Material selection based on fluid analysis
▪ Waste water containing dust or ash	GH / H	K/K-max	Material selection based on fluid analysis
Water/sand mixture	GH / H	K/K-max, F/F-max	Solids content < 5 g/l: material variant GH Solids content > 5 g/l: material variant H
Seawater	C	K/K-max, F/F-max	Material variant C2 ≤ 25 °C fluid temperature <sup>39)</sup>
Brackish water	G1 / C1	K/K-max, F/F-max	Material variant C1 or G1 (with 250 µm two-component epoxy resin), depending on salt content
Corrosive industrial waste water	C	K/K-max, F/F-max	Material variant C1 or C2 based on fluid analysis

<sup>37)</sup> The hydrocarbons mentioned may occur in very high concentrations due to the difference in specific weight and their low solubility. If this is the case, contact KSB.

<sup>38)</sup> The required material variants highly depend on the operating hours, rotational speed and flow velocity.

<sup>39)</sup> Higher fluid temperatures on request.



**Shaft seal**

Available shaft seal types per bearing bracket

Table 10: UE/WE/XE/YE/ZE motors

Mechanical seal with elastomer bellows <sup>40)</sup>	Double cartridge seal <sup>41)</sup>	Pump-end mechanical seal with covered spring <sup>41)</sup>

Table 11: UF/XF motors

Double cartridge seal

Table 12: UN/WN/XN/YN/ZN motors

Mechanical seal with elastomer bellows <sup>40)</sup>	Pump-end mechanical seal with covered spring <sup>41)</sup>	Stationary mechanical seal with spring outside of fluid handled

For more information, see overview of product features.

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<sup>40)</sup> For all types of waste water

<sup>41)</sup> For very abrasive fluids or fluids containing metallic particles (e.g. shavings from drilling)

**Technical data**
**Table 13: Gray cast iron (G, G1, G2, GH)**

Size	Impeller type	Material variant	Impeller				Installation type				Mass moment of inertia J <sup>(42)</sup> [kgm <sup>2</sup> ]
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	D, H		K, S, P		
							Max. operating pressure <sup>(43)</sup> [psi]	Max. test pressure [psi]	Max. operating pressure <sup>(43)</sup> [psi]	Max. test pressure [psi]	
Quantity	["]	["]	["]	[psi]	[psi]	[psi]	[psi]	[kgm <sup>2</sup> ]			
40-252	S	G	4	1/4	9 1/4	6 7/8	-	-	145,0	188,5	0,03
40-252	F	G, G1, G2, GH	-	1	8 1/4	5 7/8	145,0	217,6	110,2	142,1	0,03
40-252	K	G, G1, G2, GH	3	9/16	10 1/4	5 7/8	145,0	217,6	145,0	188,5	0,047
50-215	F	G, G1, G2, GH	-	1 5/8	8 1/4	5 1/8	145,0	217,6	116,0	152,3	0,019
50-216	S	G	4	3/16	8 1/4	6 7/8	-	-	130,5	174,0	0,018
50-216	F	G, G1, G2, GH	-	1	8 1/4	5 1/8	145,0	217,6	94,3	123,3	0,025
65-215	F	G, G1, G2, GH	-	2 9/16	8 1/4	5 1/8	87,0	130,5	79,8	108,8	0,025
65-216	E	G	1	2 9/16	7 1/16	5 1/2	87,0	130,5	79,8	108,8	0,02
65-217	F	G, G1, G2, GH	-	2 9/16	7 7/8	5 1/8	101,5	152,3	87,0	116,0	0,02
80-216	F	G, G1, G2, GH	-	3	8 1/4	5 1/8	101,5	152,3	72,5	94,3	0,025
80-216	E	G	1	3	8 1/4	6 5/16	101,5	152,3	79,8	108,8	0,035
80-217	F	G, G1, G2, GH	-	3	7 7/8	5 1/8	87,0	130,5	72,5	94,3	0,022
80-252	F	G, G1, G2, GH	-	3	10 7/16	5 7/8	87,0	130,5	91,4	118,9	0,14
80-253	F	G, G1, G2, GH	-	3	9 5/16	5 7/8	104,4	156,6	104,4	136,3	0,055
80-253	E	G	1	3	10 5/8	8 7/8	87,0	130,5	40,6	53,7	0,17
80-253	K	G, G1, G2, GH	2	1 5/16	8 11/16	5 1/2	95,7	145,0	95,7	124,7	0,15
80-315	D	G, G1	1	2 9/16	10 1/4	9 1/16	145,0	217,6	159,5	217,6	0,124
80-315	K	G, G1, G2	2	1 5/16	10 1/4	5 1/2	145,0	217,6	132,0	172,6	0,11
80-317	F	G, G1, G2, GH	-	3	9 7/16	5 7/8	145,0	217,6	101,5	132,0	0,14
80-317	D	G, G1	1	3	8 11/16	7 1/16	145,0	217,6	87,0	130,5	0,047
100-215	F	G, G1, G2, GH	-	3 15/16	8 1/4	5 1/8	87,0	130,5	58,0	79,8	0,025
100-253	E	G	1	3	10 5/8	8 1/4	79,8	123,3	65,3	87,0	0,15
100-253	D	G, G1	1	3	10 7/16	9 3/16	87,0	130,5	50,8	66,7	0,115
100-253	K	G, G1, G2, GH	2	3	10 1/16	7 7/8	65,3	101,5	50,8	66,7	0,15
100-254	F	G, G1, G2, GH	-	3 15/16	10 7/16	7 7/8	87,0	130,5	49,3	65,3	0,056
100-315	D	G, G1	1	2 15/16	8 3/4	7 11/16	145,0	217,6	98,6	127,6	0,065
100-316	D	G, G1	1	3 3/8	12 1/16	10 5/8	145,0	217,6	52,2	68,2	0,233
100-316	F	G, G1, G2, GH	-	3 15/16	12 3/16	9 5/16	87,0	130,5	71,1	92,8	0,075
100-316	K	G, G1, G2, GH	2	3	12 3/16	9 1/4	87,0	130,5	71,1	92,8	0,13
100-317	E	G	1	3	12 15/16	11 1/4	101,5	152,3	87,0	116,0	0,25
100-400	K	G, G1, G2, GH	2	3	16 1/16	14	145,0	217,6	133,4	174,0	1,1
100-403	D	G, G1, G2	2	3	16 1/16	14	145,0	217,6	133,4	174,0	0,5
100-401	F	G, G1, G2, GH	-	3 15/16	15 3/8	12 13/16	145,0	188,5	110,2	142,1	0,248
100-401	K	G, G1, G2, GH	2	1 15/16	15 7/8	12 3/16	145,0	188,5	134,9	175,5	0,504
150-253	D	G, G1	1	3 15/16	10	8 7/8	87,0	130,5	27,6	34,8	0,15
150-315	F	G, G1, G2, GH	-	4 3/4	11 7/16	9 13/16	87,0	130,5	26,1	33,4	0,144
150-315	D	G, G1	1	3 15/16	12 1/2	11	87,0	130,5	47,9	62,4	0,289
150-317	D	G, G1, G2	2	3	12 3/16	9 13/16	87,0	130,5	72,5	94,3	0,17
150-317	E	G	1	4 5/16	12 5/8	10	87,0	130,5	45,0	59,5	0,31
150-317	K	G, G1, G2, GH	2	3	12 3/16	9 13/16	87,0	130,5	72,5	94,3	0,28
150-400	D	G, G1	1	3 15/16	14 5/16	12 13/16	145,0	217,6	75,4	98,6	0,573
150-400	K	G, G1, G2, GH	3	3	15 7/8	11 13/16	145,0	217,6	121,8	159,5	0,83
150-401	F	G, G1, G2, GH	-	5 5/16	15 3/8	10 5/8	145,0	217,6	60,9	79,8	0,248
150-401	E	G	1	4 1/2	16	13 11/16	145,0	217,6	91,4	118,9	0,68
150-401	D	G, G1	1	4 5/16	15 1/8	14 9/16	145,0	217,6	76,9	100,1	0,999
150-403	D	G, G1, G2	2	3	16 1/16	13 3/8	145,0	217,6	123,3	161,0	0,53
150-403	K	G, G1, G2, GH	2	3	16 1/16	13 3/8	145,0	217,6	123,3	161,0	0,691
150-503	D	G, G1, G2	2	3 15/16	20	15 3/4	200,2	300,2	200,2	261,1	1,13

<sup>42</sup> Data applies to maximum impeller diameter and impeller with water fill

<sup>43</sup> Permissible operating pressure = inlet pressure + pressure at Q = 0

Size	Impeller type	Material variant	Impeller				Installation type				Mass moment of inertia J <sup>(42)</sup> [kgm <sup>2</sup> ]
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	D, H		K, S, P		
							Max. operating pressure <sup>(43)</sup>	Max. test pressure	Max. operating pressure <sup>(43)</sup>	Max. test pressure	
150-503	K	G, G1, G2	2	3 15/16	20	15 3/4	200,2	300,2	200,2	261,1	0,91
151-403	K	G, G1, G2, GH	2	3	16 1/16	13 3/8	145,0	217,6	134,9	172,6	0,691
200-401	E	G	1	4 3/4	15 3/4	12 9/16	145,0	217,6	82,7	107,3	0,86
200-315	D	G, G1	1	3 15/16	12 3/8	11	87,0	130,5	39,2	49,3	0,261
200-315	K	G, G1, G2, GH	3	2 3/4	11 5/8	9 5/8	87,0	130,5	27,6	34,8	0,22
200-316	K	G, G1, G2, GH	2	3 15/16	12	10 7/16	87,0	130,5	24,7	31,9	0,22
200-317	K	G, G1, G2, GH	3	3	12 3/16	9 7/16	43,5	65,3	50,8	72,5	0,4
200-318	K	G, G1, G2, GH	2	3 15/16	12 3/16	9 1/16	43,5	65,3	43,5	58,0	0,28
200-400	D	G, G1	1	3 15/16	14 3/4	14	145,0	217,6	60,9	79,8	0,825
200-402	D	G, G1, G2	3	3 1/8	16 1/16	11 13/16	145,0	217,6	94,3	142,1	0,5
200-402	K	G, G1, G2, GH	3	3 1/8	16 1/16	11 13/16	126,2	165,3	126,2	165,3	0,84
200-405	D	G, G1, G2	2	3 9/16	16 1/16	11 13/16	145,0	217,6	126,2	165,3	0,55
200-403	K	G, G1, G2, GH	2	3 9/16	16 1/16	11 13/16	126,2	165,3	126,2	165,3	0,931
200-502	K	G, G1	3	3	20	15 3/4	145,0	217,6	140,7	182,7	0,83
200-503	D	G, G1, G2	2	3 9/16	20	15 3/4	145,0	217,6	142,1	185,6	1,2
200-503	K	G, G1	2	3 9/16	20	15 3/4	174,0	261,1	174,0	261,1	1,636
250-400	D	G, G1	1	4 3/4	14 9/16	12 5/8	145,0	217,6	50,8	66,7	0,653
250-401	K	G, G1, G2, GH	2	4 1/8	15 3/4	12 3/16	145,0	217,6	87,0	113,1	0,55
250-402	D	G, G1, G2	3	4 3/16	16 5/8	11 13/16	145,0	217,6	87,0	113,1	0,6
250-403	K	G, G1, G2, GH	2	4 3/16	16 1/16	11 13/16	145,0	217,6	101,5	132,0	1,13
250-632	K	G, G1	3	4 1/8	25 1/8	19 11/16	145,0	217,6	153,7	200,2	5,684
250-900	K	G, G1	3	4 5/16	33 1/16	28 1/4	188,5	282,8	169,7	220,5	19,03
300-400	D	G, G1	1	5 7/8	16 1/16	14 3/4	145,0	217,6	24,7	31,9	0,925
300-400	K	G, G1, G2, GH	3	3 15/16	16 1/16	13 1/16	145,0	217,6	50,8	66,7	0,75
300-401	K	G, G1, G2, GH	2	5 5/16	16 1/16	14 7/16	145,0	217,6	33,4	42,1	0,75
300-402	D	G, G1, G2	3	3 15/16	16 1/16	11 13/16	145,0	217,6	50,8	66,7	0,63
300-403	K	G, G1, G2, GH	2	4	16 1/16	11 13/16	145,0	217,6	55,1	72,5	1,439
300-420	K	G, G1	3	3 15/16	16 1/16	14 9/16	87,0	130,5	81,2	105,9	0,95
300-500	K	G, G1	3	3 9/16	19 13/16	16 15/16	145,0	217,6	89,9	116,0	1,48
300-502	D	G, G1, G2	2	4	20	15 3/4	145,0	217,6	116,0	150,8	2,5
300-505	D	G, G1, G2	2	5	20	15 3/4	145,0	217,6	123,3	159,5	2,5
300-505	K	G, G1	2	4	20	15 3/4	145,0	217,6	116,0	150,8	2,919
350-500	K	G, G1	3	4 5/16	20	16 3/4	87,0	130,5	82,7	107,3	3,12
350-502	D	G, G1, G2	2	5 11/16	20	15 3/4	87,0	130,5	66,7	87,0	3,5
350-503	D	G, G1, G2	2	5 1/2	20	15 3/4	87,0	130,5	66,7	87,0	3,5
350-503	K	G, G1	2	5 1/2	20	15 3/4	87,0	130,5	66,7	87,0	4,073
350-632	K	G, G1	3	5 1/2	25 1/8	19 11/16	145,0	217,6	94,3	121,8	6,451
350-633	K	G, G1	2	5 5/16	25 1/8	19 11/16	145,0	217,6	136,3	176,9	6,979
350-710	K	G, G1	3	4 5/16	28 3/4	22 13/16	145,0	217,6	136,3	176,9	10,6
350-713	K	G, G1	2	4 15/16	29 1/16	22 13/16	188,5	282,8	176,9	232,1	14,557
400-500	K	G, G1	3	5 1/8	20	17 7/16	87,0	130,5	49,3	65,3	3,37
400-632	K	G, G1	3	5 9/16	25 1/8	20 3/4	87,0	130,5	82,7	107,5	9,074
400-900	K	G, G1	3	5 1/8	32 11/16	25 15/16	188,5	282,8	163,9	213,2	17,79
401-710	K	G, G1	3	6 1/2	29 1/8	23 1/8	145,0	217,6	127,6	166,8	16
401-713	K	G, G1	2	5 5/8	29 1/16	22 13/16	166,8	250,9	166,8	217,6	15,894
500-634	K	G, G1	3	5 3/16	25 1/8	19 11/16	65,3	87,0	65,3	87,0	9,503
501-710	K	G, G1	3	5 7/8	27 9/16	23 1/16	123,3	188,5	123,3	166,8	16
501-900	K	G, G1	3	7	35 3/4	28 3/8	130,5	195,8	116,0	149,4	45
600-520	K	G, G1	3	5 11/16	20 15/16	18	58,0	87,0	34,8	46,4	7,02
600-710	K	G, G1	3	6 1/2	29	26 15/16	58,0	87,0	60,9	79,8	16,96
700-901	K	G, G1	3	7 1/16	35 3/4	29 15/16	130,5	195,8	104,4	134,9	50
700-902	K	G, G1	3	7 1/2	34 15/16	26 3/4	50,8	72,5	50,8	66,7	40
701-902	K	G, G1	3	7 1/2	34 15/16	26 3/4	-	-	72,5	94,3	40

**Table 14: Industrial materials (H, C1, C2)**

Size	Impeller type	Material variant	Impeller				Installation type		Mass moment of inertia J <sup>(42)</sup> [kgm <sup>2</sup> ]
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	S, P		
							Max. operating pressure <sup>(43)</sup> [psi]	Max. test pressure [psi]	
Quantity	["]	["]	["]	[psi]	[psi]	[kgm <sup>2</sup> ]			
40-252	F	H, C1, C2	-	15/16	8 1/4	5 7/8	110,2	142,1	0,03
40-252	K	H, C1, C2	3	9/16	10 1/4	5 7/8	145,0	188,5	0,047
50-215	F	H, C1, C2	-	1 5/8	8 1/4	5 1/8	116,0	152,3	0,019
50-216	F	H, C1, C2	-	1	8 1/4	5 1/8	94,3	123,3	0,025
65-215	F	H, C1, C2	-	2 9/16	8 1/4	5 1/8	79,8	108,8	0,025
80-216	F	H, C1, C2	-	3	8 1/4	5 1/8	72,5	94,3	0,025
80-252	F	H, C1, C2	-	3	10 7/16	5 7/8	91,4	118,9	0,14
80-253	F	H, C1, C2	-	1 5/16	9 5/16	5 1/2	104,4	136,3	0,055
80-253	K	H, C1, C2	2	1 5/16	8 11/16	5 1/2	104,4	136,3	0,15
100-253	K	H, C1, C2	2	3	10 1/16	7 7/8	50,8	72,5	0,15
100-254	F	H, C1, C2	-	3 15/16	10 7/16	7 7/8	49,3	65,3	0,056
100-316	F	H, C1, C2	-	3 15/16	11 7/16	9 5/16	71,1	92,8	0,075
100-316	K	H, C1, C2	2	3	11 5/8	9 1/4	71,1	92,8	0,15
100-400	K	C1, C2	2	3	16 1/16	14	133,4	174,0	1,1
100-401	F	H, C1, C2	-	3 15/16	15 3/8	12 13/16	110,2	142,1	0,248
100-401	K	H, C1, C2	2	1 15/16	15 7/8	12 3/16	134,9	175,5	0,504
150-315	F	H, C1, C2	-	4 3/4	11 7/16	9 13/16	26,1	33,4	0,144
150-317	K	H, C1, C2	2	3	12 3/16	9 13/16	72,5	94,3	0,28
150-400	K	H, C1, C2	3	3	15 7/8	11 13/16	121,8	159,5	0,83
150-401	F	H, C1, C2	-	5 5/16	15 3/8	10 5/8	60,9	79,8	0,248
150-403	K	H, C1, C2	2	3	16 1/16	13 3/8	123,3	161,0	0,691
150-503	K	C1, C2	2	3 15/16	20	15 3/4	200,2	261,1	0,91
151-403	K	H, C1, C2	2	3	16 1/16	13 3/8	134,9	172,6	0,691
200-315	K	H, C1, C2	3	2 3/4	11 5/8	9 5/8	27,6	34,8	0,22
200-316	K	H, C1, C2	2	3 15/16	12	10 7/16	24,7	31,9	0,22
200-402	K	H, C1, C2	3	3 1/8	16 1/16	11 13/16	94,3	142,1	0,84
200-403	K	H, C1, C2	2	3 9/16	16 1/16	11 13/16	126,2	165,3	0,931
200-502	K	C1, C2	3	3	20	15 3/4	140,7	182,7	0,83
200-503	K	C1, C2	2	3 9/16	20	15 3/4	174,0	261,1	1,636
250-401	K	H, C1, C2	2	4 1/8	15 3/4	12 3/16	87,0	113,1	0,55
250-403	K	H, C1, C2	2	4 3/16	16 1/16	11 13/16	101,5	132,0	1,13
300-400	K	H, C1, C2	3	3 15/16	16 1/16	13 1/16	50,8	66,7	0,75
300-401	K	H, C1, C2	2	5 5/16	16 1/16	14 7/16	33,4	42,1	0,75
300-403	K	H, C1, C2	2	4	16 1/16	11 13/16	55,1	72,5	1,439
300-420	K	C1, C2	3	3 15/16	16 1/16	14 9/16	81,2	105,9	0,95
300-500	K	C1, C2	3	3 9/16	19 13/16	16 15/16	89,9	116,0	1,48
350-500	K	C1, C2	3	4 5/16	20	16 3/4	82,7	107,3	3,12
350-503	K	C1, C2	2	5 1/2	20	15 3/4	66,7	87,0	4,073
350-632	K	C1, C2	3	5 1/2	25 1/8	19 11/16	94,3	121,8	6,451
350-633	K	C1, C2	2	5 5/16	25 1/8	19 11/16	136,3	176,9	6,979
350-710	K	C1, C2	3	4 5/16	28 3/4	22 13/16	136,3	176,9	10,6
350-713	K	C1, C2	2	4 15/16	29 1/16	22 13/16	176,9	232,1	14,557
400-500	K	C1, C2	3	5 1/8	20	17 7/16	49,3	65,3	3,37
400-632	K	C1, C2	3	5 9/16	25 1/8	20 3/4	82,7	107,5	9,074
401-713	K	C1, C2	2	5 5/8	29 1/16	22 13/16	166,8	217,6	15,894
500-634	K	C1, C2	3	5 1/4	22 15/16	20 1/2	65,3	87,0	6,11
600-520	K	C1, C2	3	5 11/16	20 15/16	18	34,8	46,4	7,02
600-710	K	C1, C2	3	6 1/2	29	26 15/16	60,9	79,8	16,96
700-901	K	C1, C2	3	7 1/16	35 3/4	29 15/16	104,4	134,9	50
700-902	K	C1, C2	3	7 1/2	34 15/16	26 3/4	50,8	66,7	40

**Table 15: Gray cast iron (G, G1, G2, GH)**

Size	Impeller type	Material variant	Impeller				Installation type				Moment of inertia J <sup>44)</sup>
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	D, H		K, S, P		
							Max. operating pressure <sup>45)</sup>	Max. test pressure	Max. operating pressure <sup>45)</sup>	Max. test pressure	
			Qty	[mm]	[mm]	[mm]	[bar]	[bar]	[bar]	[bar]	
40-252	S	G	4	7	235	175	-	-	10	13	0,03
40-252	F	G, G1, G2, GH	-	25	210	150	10	15	7,6	9,8	0,03
40-252	K	G, G1, G2, GH	3	15	260	150	10	15	10	13	0,047
50-215	F	G, G1, G2, GH	-	42	210	130	10	15	8	10,5	0,019
50-216	S	G	4	4	210	175	-	-	9	12	0,018
50-216	F	G, G1, G2, GH	-	25	210	130	10	15	6,5	8,5	0,025
65-215	F	G, G1, G2, GH	-	65	210	130	6	9	5,5	7,5	0,025
65-216	E	G	1	65	180	140	6	9	5,5	7,5	0,02
65-217	F	G, G1, G2, GH	-	65	200	130	7	10,5	6	8	0,02
80-215	F	G, G1, G2, GH	-	76	200	130	5,5	8,5	4,5	6	0,025
80-216	F	G, G1, G2, GH	-	76	210	130	7	10,5	5	6,5	0,025
80-216	E	G	1	76	210	160	7	10,5	5,5	7,5	0,035
80-252	F	G, G1, G2, GH	-	76	265	150	6	9	6,3	8,2	0,14
80-253	F	G, G1, G2, GH	-	76	237	150	7,2	10,8	7,2	9,4	0,055
80-253	E	G	1	76	270	225	6	9	2,8	3,7	0,17
80-253	K	G, G1, G2, GH	2	33	220	140	6,6	10	6,6	8,6	0,15
80-315	D	G, G1	1	65	260	230	10	15	11	15	0,124
80-315	K	G, G1, G2	2	33	260	140	10	15	9,1	11,9	0,11
80-317	F	G, G1, G2, GH	-	76	240	150	10	15	7	9,1	0,14
80-317	D	G, G1	1	76	220	180	10	15	6	9	0,047
100-215	F	G, G1, G2, GH	-	100	210	130	6	9	4	5,5	0,025
100-253	E	G	1	76	270	210	5,5	8,5	4,5	6	0,15
100-253	D	G, G1	1	76	265	234	6	9	3,5	4,6	0,115
100-253	K	G, G1, G2, GH	2	76	256	200	4,5	7	3,5	4,6	0,15
100-254	F	G, G1, G2, GH	-	100	265	200	6	9	3,4	4,5	0,056
100-254	K	G, G1, G2, GH	2	71	256	210	6	9	2,5	3,2	0,07
100-315	F	G, G1, G2, GH	-	100	310	270	-	-	3,5	4,6	0,056
100-315	E	G	1	100	330	262	-	-	4,3	5,6	0,26
100-315	D	G, G1	1	75	222	196	10	15	6,8	8,8	0,065
100-315	K	G, G1, G2, GH	2	80	312	254	-	-	4	5,2	0,15
100-316	D	G, G1	1	85	306	270	10	15	3,6	4,7	0,233
100-316	F	G, G1, G2, GH	-	100	310	236	6	9	4,9	6,4	0,075
100-316	K	G, G1, G2, GH	2	76	309	235	6	9	4,9	6,4	0,13
100-317	E	G	1	76	328	286	7	10,5	6	8	0,25
100-400	K	G, G1, G2, GH	2	76	408	355	10	15	9,2	12	1,1
100-403	D	G, G1, G2	2	76	408	300	10	15	9,2	12	0,5
100-401	F	G, G1, G2, GH	-	100	390	325	10	13	7,6	9,8	0,248
100-401	E	G	1	80	412	389	-	-	5,1	6,6	0,6
100-401	K	G, G1, G2, GH	2	50	404	310	10	13	9,3	12,1	0,504
150-253	D	G, G1	1	100	254	225	6	9	1,9	2,4	0,15
150-315	F	G, G1, G2, GH	-	120	290	250	6	9	1,8	2,3	0,144
150-315	D	G, G1	1	100	317	280	6	9	3,3	4,3	0,289
150-317	D	G, G1, G2	2	76	309	250	6	9	5	6,5	0,17
150-317	E	G	1	110	320	254	6	9	3,1	4,1	0,31
150-317	K	G, G1, G2, GH	2	76	309	250	6	9	5	6,5	0,28
150-400	D	G, G1	1	100	363	326	10	15	5,2	6,8	0,573
150-400	K	G, G1, G2, GH	3	76	404	300	10	15	8,4	11	0,83
150-401	F	G, G1, G2, GH	-	135	390	270	10	15	4,2	5,5	0,248

<sup>44</sup> Data applies to maximum impeller diameter and impeller with water fill.

<sup>45</sup> Permissible operating pressure = inlet pressure + pressure at Q = 0

Size	Impeller type	Material variant	Impeller				Installation type				Moment of inertia J <sup>(4)</sup> [kgm <sup>2</sup> ]
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	D, H		K, S, P		
							Max. operating pressure <sup>(5)</sup>	Max. test pressure	Max. operating pressure <sup>(5)</sup>	Max. test pressure	
			Qty	[mm]	[mm]	[mm]	[bar]	[bar]	[bar]	[bar]	
150-401	E	G	1	115	407	348	10	15	6,3	8,2	0,68
150-401	D	G, G1	1	110	384	370	10	15	5,3	6,9	0,999
150-403	D	G, G1, G2	2	76	408	340	10	15	8,5	11,1	0,53
150-403	K	G, G1, G2, GH	2	76	408	340	10	15	8,5	11,1	0,691
150-503	D	G, G1, G2	2	76	508	400	10	15	10	13	1,13
150-503	K	G, G1, G2	2	76	508	400	10	15	10	13	0,91
151-403	K	G, G1, G2, GH	2	76	408	340	10	15	9,3	11,9	0,691
200-401	E	G	1	120	400	319	10	15	5,7	7,4	0,86
200-315	D	G, G1	1	100	315	280	6	9	2,7	3,4	0,261
200-315	K	G, G1, G2, GH	3	70	295	245	6	9	1,9	2,4	0,22
200-316	K	G, G1, G2, GH	2	100	305	265	6	9	1,7	2,2	0,22
200-317	K	G, G1, G2, GH	3	76	309	240	3	4,5	3,5	5	0,4
200-318	K	G, G1, G2, GH	2	100	309	230	3	4,5	3	4	0,28
200-400	D	G, G1	1	100	375	355	10	15	4,2	5,5	0,825
200-402	D	G, G1, G2	3	80	408	300	10	15	6,5	9,8	0,5
200-402	K	G, G1, G2, GH	3	80	408	300	6,5	9,8	6,5	9,8	0,84
200-405	D	G, G1, G2	2	90	408	300	10	15	8,7	11,4	0,55
200-403	K	G, G1, G2, GH	2	90	408	300	6,5	9,8	6,5	9,8	0,931
200-502	K	G, G1	3	76	508	400	10	15	9,7	12,6	0,83
200-503	D	G, G1, G2	2	90	508	400	10	15	9,8	12,8	1,2
200-503	K	G, G1	2	90	508	400	10	15	9,8	12,8	1,636
250-400	D	G, G1	1	120	370	320	10	15	3,5	4,6	0,653
250-401	K	G, G1, G2, GH	2	105	400	310	10	15	6	7,8	0,55
250-402	D	G, G1, G2	3	106	398	300	10	15	6	7,8	0,6
250-403	K	G, G1, G2, GH	2	107	408	300	10	15	7	9,1	1,13
250-632	K	G, G1	3	105	638	500	10	15	10,6	13,8	5,684
250-900	K	G, G1	3	110	840	717	13	19,5	11,7	15,2	19,03
300-400	D	G, G1	1	150	408	375	10	15	1,7	2,2	0,925
300-400	K	G, G1, G2, GH	3	100	408	332	10	15	3,5	4,6	0,75
300-401	K	G, G1, G2, GH	2	135	408	367	10	15	2,3	2,9	0,75
300-402	D	G, G1, G2	3	100	408	300	10	15	3,5	4,6	0,63
300-403	K	G, G1, G2, GH	2	102	408	300	10	15	3,8	5	1,439
300-420	K	G, G1	3	100	408	370	6	9	5,6	7,3	0,95
300-500	K	G, G1	3	90	504	430	10	15	6,2	8	1,48
300-502	D	G, G1, G2	2	102	508	400	10	15	8	10,4	2,5
300-505	D	G, G1, G2	2	127	508	400	10	15	8,5	11	2,5
300-505	K	G, G1	2	102	508	400	10	15	8	10,4	2,919
350-500	K	G, G1	3	110	508	426	6	9	5,7	7,4	3,12
350-502	D	G, G1, G2	2	145	508	400	6	9	4,6	6	3,5
350-503	D	G, G1, G2	2	140	508	400	6	9	4,6	6	3,5
350-503	K	G, G1	2	140	508	400	6	9	4,6	6	4,073
350-632	K	G, G1	3	140	638	500	10	15	6,5	8,4	6,451
350-633	K	G, G1	2	135	638	500	10	15	9,4	12,2	6,979
350-710	K	G, G1	3	110	730	580	10	15	9,4	12,2	10,6
350-713	K	G, G1	2	125	738	580	13	19,5	12,2	16	14,557
400-500	K	G, G1	3	130	508	443	6	9	3,4	4,5	3,37
400-632	K	G, G1	3	142	638	527	6	9	5,7	7,41	9,074
400-900	K	G, G1	3	130	830	659	13	19,5	11,3	14,7	17,79
401-710	K	G, G1	3	165	739	587	10	15	8,8	11,5	16
401-713	K	G, G1	2	143	738	580	11,5	17,3	11,5	15	15,894
500-634	K	G, G1	3	132	638	500	4,5	6	4,5	6	9,503
501-710	K	G, G1	3	150	700	586	8,5	13	8,5	11,5	16
501-900	K	G, G1	3	178	908	721	9	13,5	8	10,3	45
600-520	K	G, G1	3	145	532	457	4	6	2,4	3,2	7,02

Size	Impeller type	Material variant	Impeller				Installation type				Moment of inertia J <sup>(4)</sup>
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	D, H		K, S, P		
							Max. operating pressure <sup>(5)</sup>	Max. test pressure	Max. operating pressure <sup>(5)</sup>	Max. test pressure	
Qty	[mm]	[mm]	[mm]	[bar]	[bar]	[bar]	[bar]	[kgm <sup>2</sup> ]			
600-710	K	G, G1	3	165	736	685	4	6	4,2	5,5	16,96
700-901	K	G, G1	3	180	908	760	9	13,5	7,2	9,3	50
700-902	K	G, G1	3	190	887	680	3,5	5	3,5	4,6	40
701-902	K	G, G1	3	190	887	680	-	-	5	6,5	40



**Table 16: Industrial materials (H, C1, C2)**

Size	Impeller type	Material variant	Impeller				Installation type		Moment of inertia J <sup>(4)</sup>
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	S, P		
							Max. operating pressure <sup>(5)</sup>	Max. test pressure	
Qty	[mm]	[mm]	[mm]	[bar]	[bar]	[kgm <sup>2</sup> ]			
40-252	F	H, C1, C2	-	24	210	150	7,6	9,8	0,03
40-252	K	H, C1, C2	3	15	260	150	10	13	0,047
50-215	F	H, C1, C2	-	42	210	130	8	10,5	0,019
50-216	F	H, C1, C2	-	25	210	130	6,5	8,5	0,025
65-215	F	H, C1, C2	-	65	210	130	5,5	7,5	0,025
80-216	F	H, C1, C2	-	76	210	130	5	6,5	0,025
80-252	F	H, C1, C2	-	76	265	150	6,3	8,2	0,14
80-253	F	H, C1, C2	-	76	237	150	7,2	9,4	0,055
80-253	K	H, C1, C2	2	33	220	140	7,2	9,4	0,15
100-253	K	H, C1, C2	2	76	256	200	3,5	5	0,15
100-254	F	H, C1, C2	-	100	265	200	3,4	4,5	0,056
100-254	K	H, C1, C2	2	71	256	210	2,5	3,2	0,07
100-315	F	H, C1, C2	-	100	310	270	3,5	4,6	0,056
100-315	K	H, C1, C2	2	80	312	254	4	5,2	0,15
100-316	K	H, C1, C2	2	76	309	235	4,9	6,4	0,15
100-400	K	C1, C2	2	76	408	355	9,2	12	1,1
100-401	F	H, C1, C2	-	100	390	325	7,6	9,8	0,248
100-401	K	H, C1, C2	2	50	404	310	9,3	12,1	0,504
150-315	F	H, C1, C2	-	120	290	250	1,8	2,3	0,144
150-317	K	H, C1, C2	2	76	309	250	5	6,5	0,28
150-400	K	H, C1, C2	3	76	404	300	8,4	11	0,83
150-401	F	H, C1, C2	-	135	390	270	4,2	5,5	0,248
150-403	K	H, C1, C2	2	76	408	340	8,5	11,1	0,691
150-503	K	C1, C2	2	76	508	400	10	13	0,91
151-403	K	H, C1, C2	2	76	408	340	9,3	11,9	0,691
200-315	K	H, C1, C2	3	70	295	245	1,9	2,4	0,22
200-316	K	H, C1, C2	2	100	305	265	1,7	2,2	0,22
200-402	K	H, C1, C2	3	80	408	300	6,5	9,8	0,84
200-403	K	H, C1, C2	2	90	408	300	6,5	8,5	0,931
200-502	K	C1, C2	3	76	508	400	9,7	12,6	0,83
200-503	K	C1, C2	2	90	508	400	9,8	12,8	1,636
250-401	K	H, C1, C2	2	105	400	310	6	7,8	0,55
250-403	K	H, C1, C2	2	107	408	300	7	9,1	1,13
300-400	K	H, C1, C2	3	100	408	332	3,5	4,6	0,75
300-401	K	H, C1, C2	2	135	408	367	2,3	2,9	0,75
300-403	K	H, C1, C2	2	102	408	300	3,8	5	1,439
300-420	K	C1, C2	3	100	408	370	5,6	7,3	0,95
300-500	K	C1, C2	3	90	504	430	6,2	8	1,48
350-500	K	C1, C2	3	110	508	426	5,7	7,4	3,12
350-503	K	C1, C2	2	140	508	400	4,6	6	4,073
350-632	K	C1, C2	3	140	638	500	6,5	8,4	6,451
350-633	K	C1, C2	2	135	638	500	9,4	12,2	6,979
350-710	K	C1, C2	3	110	730	580	9,4	12,2	10,6
350-713	K	C1, C2	2	125	738	580	12,2	16	14,557
400-500	K	C1, C2	3	130	508	443	3,4	4,5	3,37
400-632	K	C1, C2	3	142	638	527	5,7	7,41	9,074
401-713	K	C1, C2	2	143	738	580	11,5	15	15,894
500-634	K	C1, C2	3	133	582	520	4,5	6	6,11
600-520	K	C1, C2	3	145	532	457	2,4	3,2	7,02



Size	Impeller type	Material variant	Impeller				Installation type		Moment of inertia J <sup>(4)</sup>
			Impeller channels	Free passage	Max. impeller diameter	Min. impeller diameter	S, P		
							Max. operating pressure <sup>(5)</sup>	Max. test pressure	
Qty	[mm]	[mm]	[mm]	[bar]	[bar]	[kgm <sup>2</sup> ]			
600-710	K	C1, C2	3	165	736	685	4,2	5,5	16,96
700-901	K	C1, C2	3	180	908	760	7,2	9,3	50
700-902	K	C1, C2	3	190	887	680	3,5	4,6	40

**Mass moments of inertia per motor**
**Table 17: 2 poles**

Motor	Motor type	J
		[kgm <sup>2</sup> ]
3 2 E	1	0,002
4 2 E	1	0,005
5 2 E	1	0,006
7 2 E	1	0,011
11 2 E	2	0,012
15 2 E	2	0,022
18 2 E	2	0,034
22 2 E	2	0,044
26 2 E	2	0,044
30 2 E	3	0,06
37 2 E	3	0,08
55 2 E	3	0,190
65 2 E	3	0,220
75 2 E	3	0,250
18 2 F	5	0,034
22 2 F	5	0,044
26 2 F	5	0,044
30 2 F	5	0,077
37 2 F	5	0,097
55 2 F	5	0,189
65 2 F	5	0,219
75 2 F	5	0,249

**Table 18: 4 poles**

Motor	Motor type	J
		[kgm <sup>2</sup> ]
2 4 E	1	0,003
3 4 E	1	0,004
4 4 E	1	0,011
5 4 E	1	0,011
7 4 E	2	0,022
11 4 E	2	0,032
15 4 E	2	0,054
18 4 E	2	0,064
22 4 E	2	0,074
30 4 E	3	0,136
37 4 E	3	0,176
45 4 E	3	0,263
55 4 E	3	0,323
65 4 E	3	0,380
75 4 E	3	0,450
15 4 F	5	0,054
18 4 F	5	0,064
22 4 F	5	0,074
30 4 F	5	0,137
37 4 F	5	0,177
55 4 F	5	0,326
65 4 F	5	0,379
75 4 F	5	0,449
35 4 N	4	0,25
50 4 N	4	0,28
65 4 N	4	0,33
80 4 N	4	0,46
95 4 N	4	0,55
110 4 N	4	0,63
130 4 N	4	1,26

Motor	Motor type	J
		[kgm <sup>2</sup> ]
155 4 N	4	1,43
175 4 N	4	1,57
200 4 N	4	3,78
250 4 N	4	4,13
300 4 N	4	4,82
350 4 N	4	5,51

**Table 19: 6 poles**

Motor	Motor type	J
		[kgm <sup>2</sup> ]
7 6 E	2	0,032
11 6 E	2	0,042
15 6 E	2	0,094
18 6 E	2	0,114
22 6 E	3	0,186
30 6 E	3	0,216
31 6 E	3	0,463
37 6 E	3	0,463
45 6 E	3	0,550
55 6 E	3	0,650
15 6 F	5	0,094
18 6 F	5	0,114
22 6 F	5	0,187
30 6 F	5	0,217
31 6 F	5	0,466
37 6 F	5	0,466
45 6 F	5	0,549
55 6 F	5	0,649
32 6 N	4	0,37
40 6 N	4	0,45
50 6 N	4	0,54
60 6 N	4	0,66
80 6 N	4	0,80
100 6 N	4	0,94
120 6 N	4	1,98
140 6 N	4	2,25
165 6 N	4	2,55
190 6 N	4	7,30
225 6 N	4	8,57
260 6 N	4	9,84
320 6 N	4	14,32
360 6 N	4	15,89
400 6 N	4	17,58
440 6 N	4	19,15
480 6 N	4	20,71
530 6 N	4	32,54
580 6 N	4	37,34
630 6 N	4	42,06
690 6 N	4	46,82
770 6 N	4	51,58
850 6 N	4	56,34

**Table 20: 8 poles**

Motor	Motor type	J
		[kgm <sup>2</sup> ]
11 8 E	3	0,186
15 8 E	3	0,186
18 8 E	3	0,226
22 8 E	3	0,276

Motor	Motor type	J
		[kgm <sup>2</sup> ]
30 8 E	3	0,463
37 8 E	3	0,550
45 8 E	3	0,650
15 8 F	5	0,187
18 8 F	5	0,227
22 8 F	5	0,277
30 8 F	5	0,466
37 8 F	5	0,549
45 8 F	5	0,649
26 8 N	4	0,40
35 8 N	4	0,50
50 8 N	4	0,66
65 8 N	4	0,80
75 8 N	4	0,94
90 8 N	4	1,98
110 8 N	4	2,25
130 8 N	4	2,55
150 8 N	4	7,30
185 8 N	4	8,57
220 8 N	4	9,84
260 8 N	4	13,27
300 8 N	4	15,88
350 8 N	4	19,13
400 8 N	4	20,70
460 8 N	4	32,54
530 8 N	4	37,30
580 8 N	4	42,06
630 8 N	4	46,82
690 8 N	4	51,58
760 8 N	4	56,34

Motor	Motor type	J
		[kgm <sup>2</sup> ]
340 12 N	4	42,64
380 12 N	4	48,17
450 12 N	4	53,69
490 12 N	4	59,21
560 12 N	4	64,73

Table 21: 10 poles

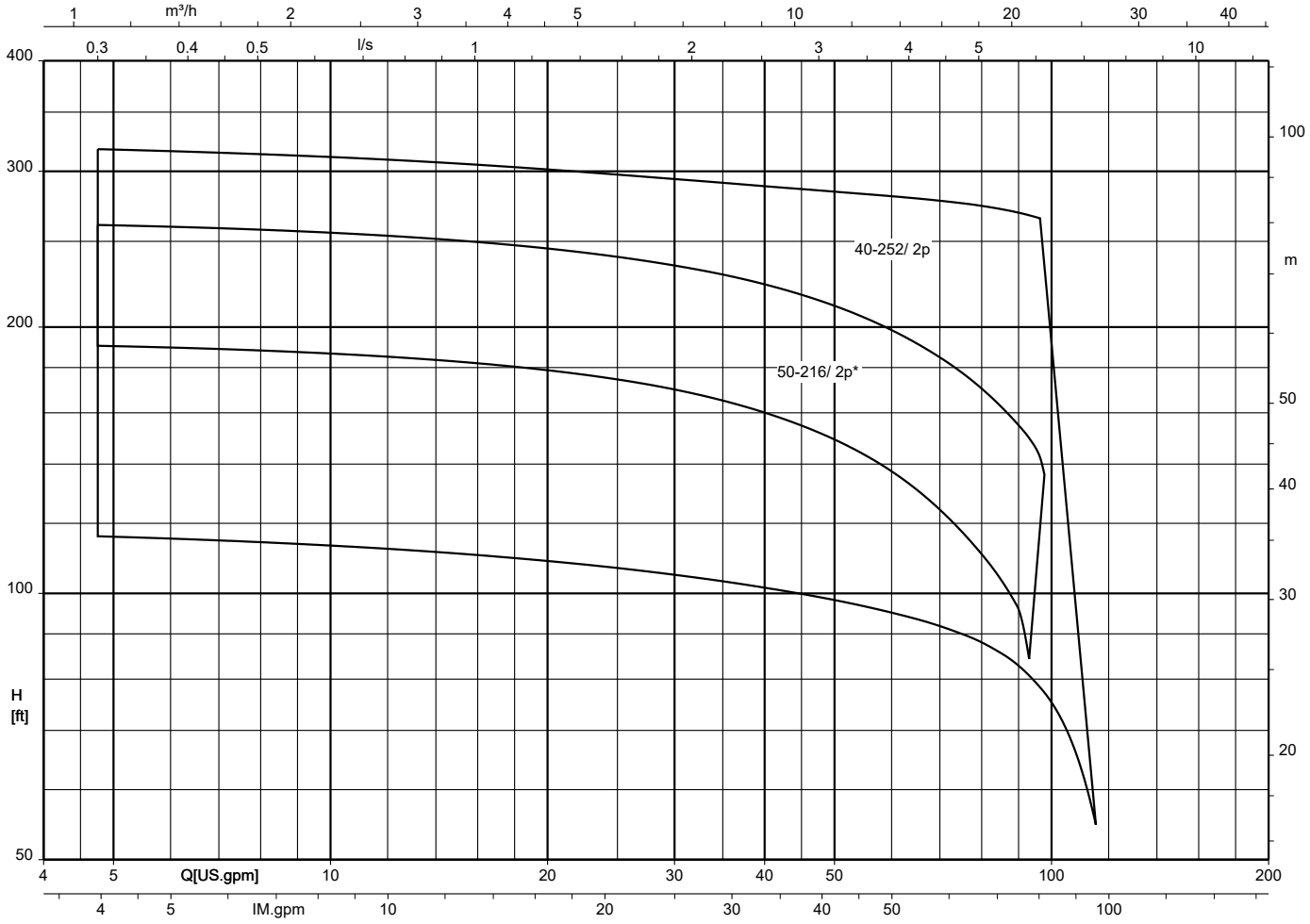
Motor	Motor type	J
		[kgm <sup>2</sup> ]
40 10 N	4	1,75
60 10 N	4	1,93
75 10 N	4	2,20
90 10 N	4	2,49
110 10 N	4	7,96
150 10 N	4	9,66
190 10 N	4	11,83
230 10 N	4	17,73
270 10 N	4	20,50
310 10 N	4	23,15
350 10 N	4	25,79
390 10 N	4	37,12
430 10 N	4	42,64
475 10 N	4	48,17
535 10 N	4	53,69
600 10 N	4	59,21
660 10 N	4	64,73

Table 22: 12 poles

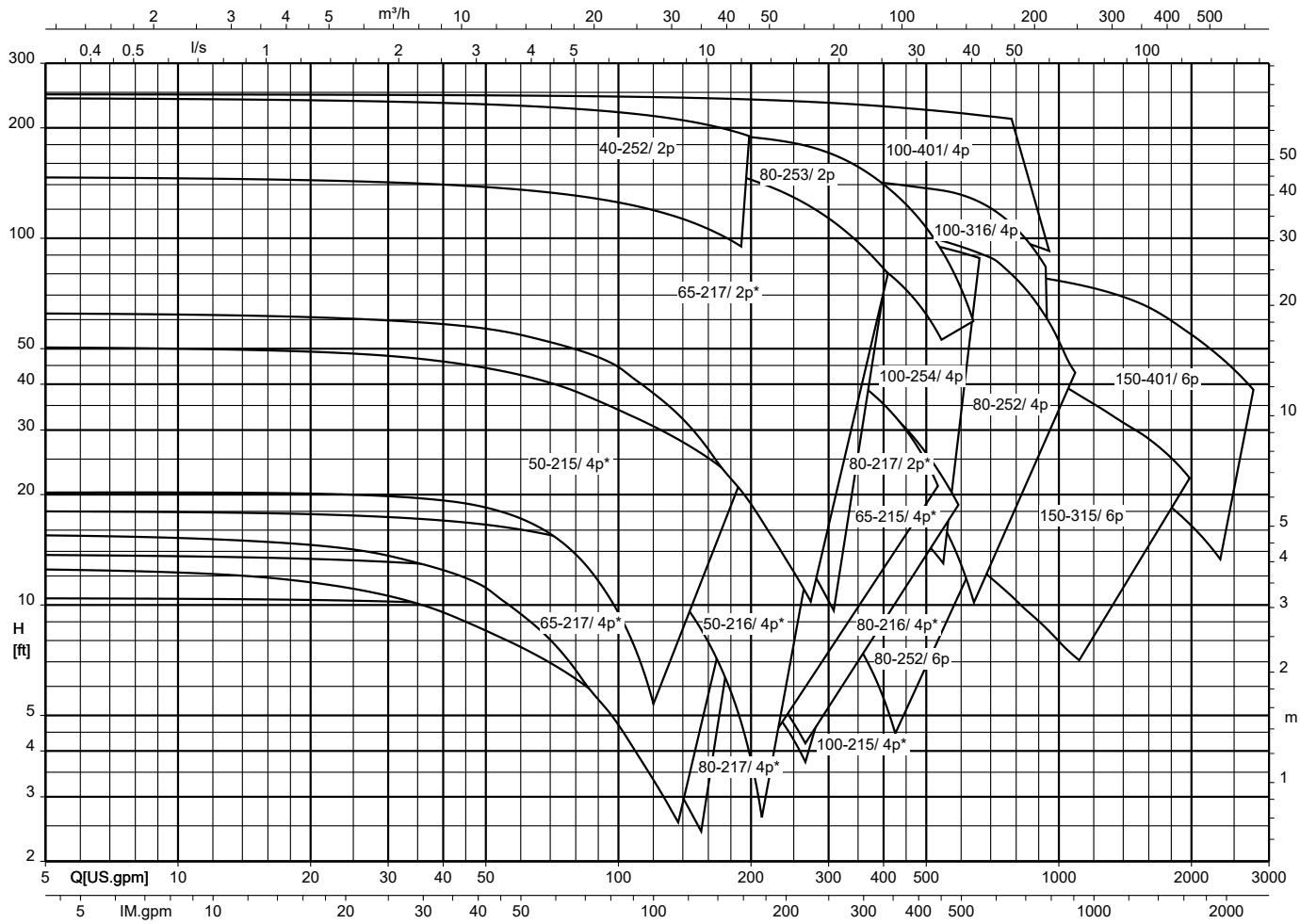
Motor	Motor type	J
		[kgm <sup>2</sup> ]
195 12 N	4	17,73
230 12 N	4	20,50
265 12 N	4	23,15
300 12 N	4	25,79

Selection charts

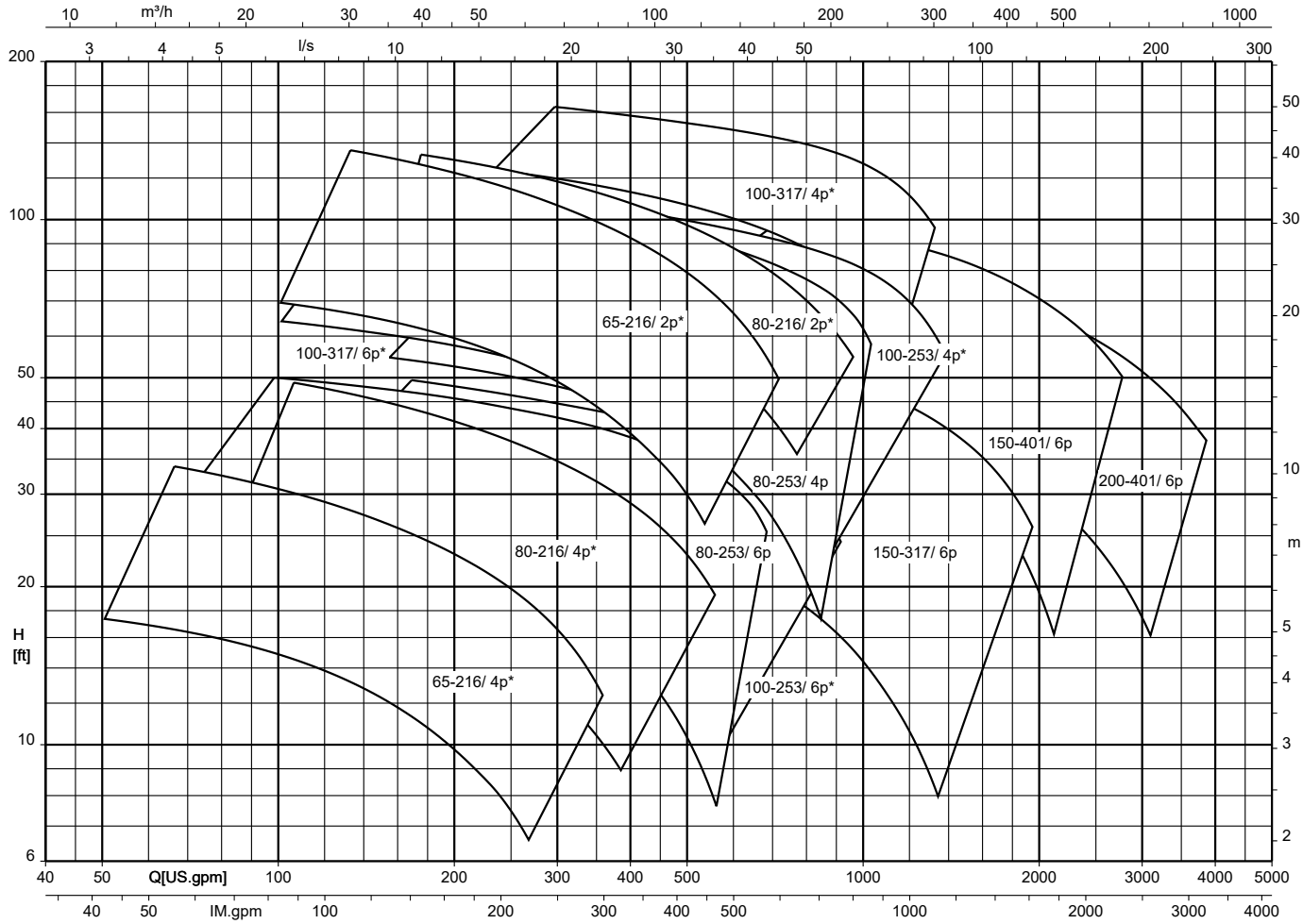
Amarex KRT S + \*S-max, n = 3500 rpm



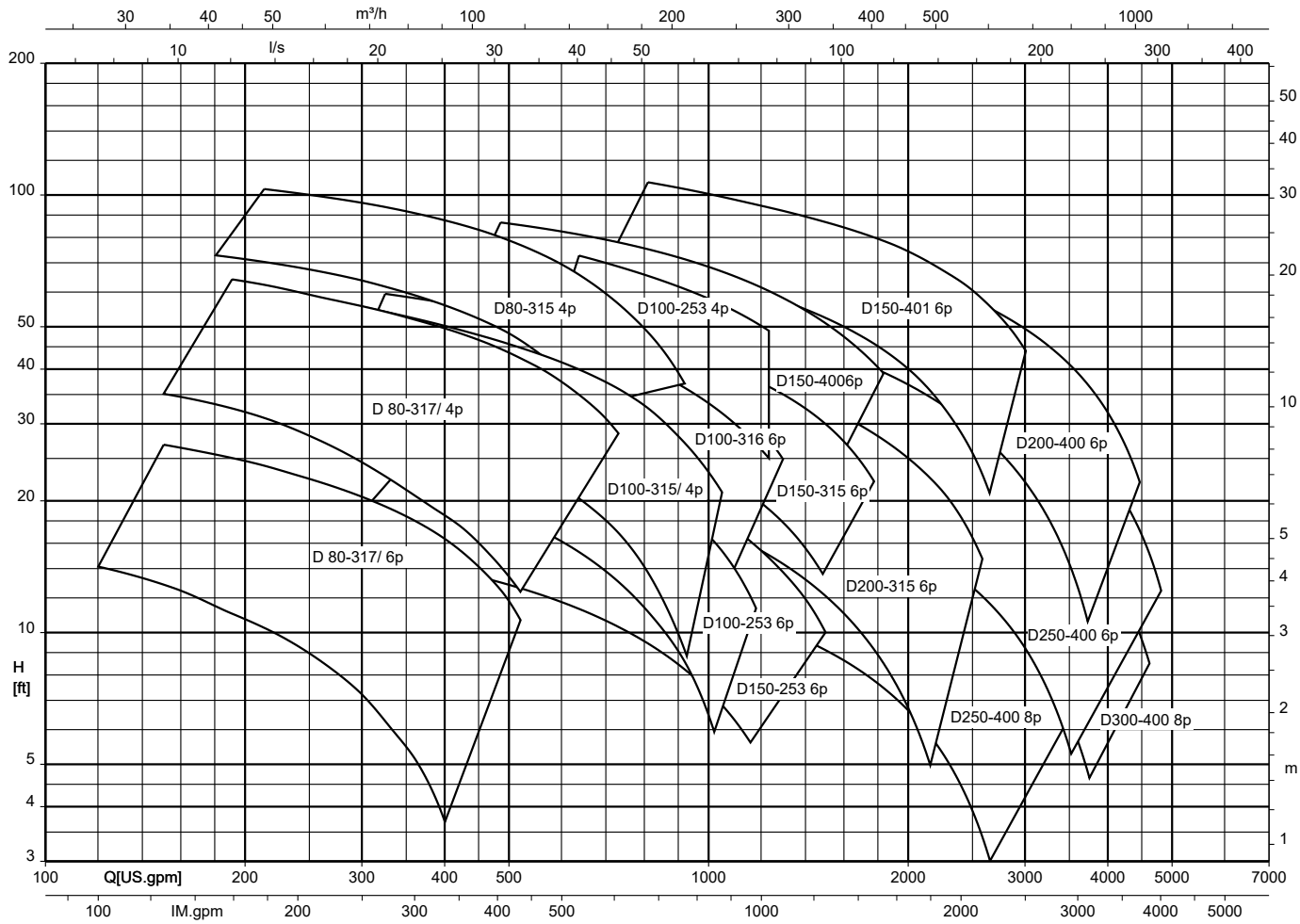
Amarex KRT F + \*F-max, n = 3500/1750/1160 rpm



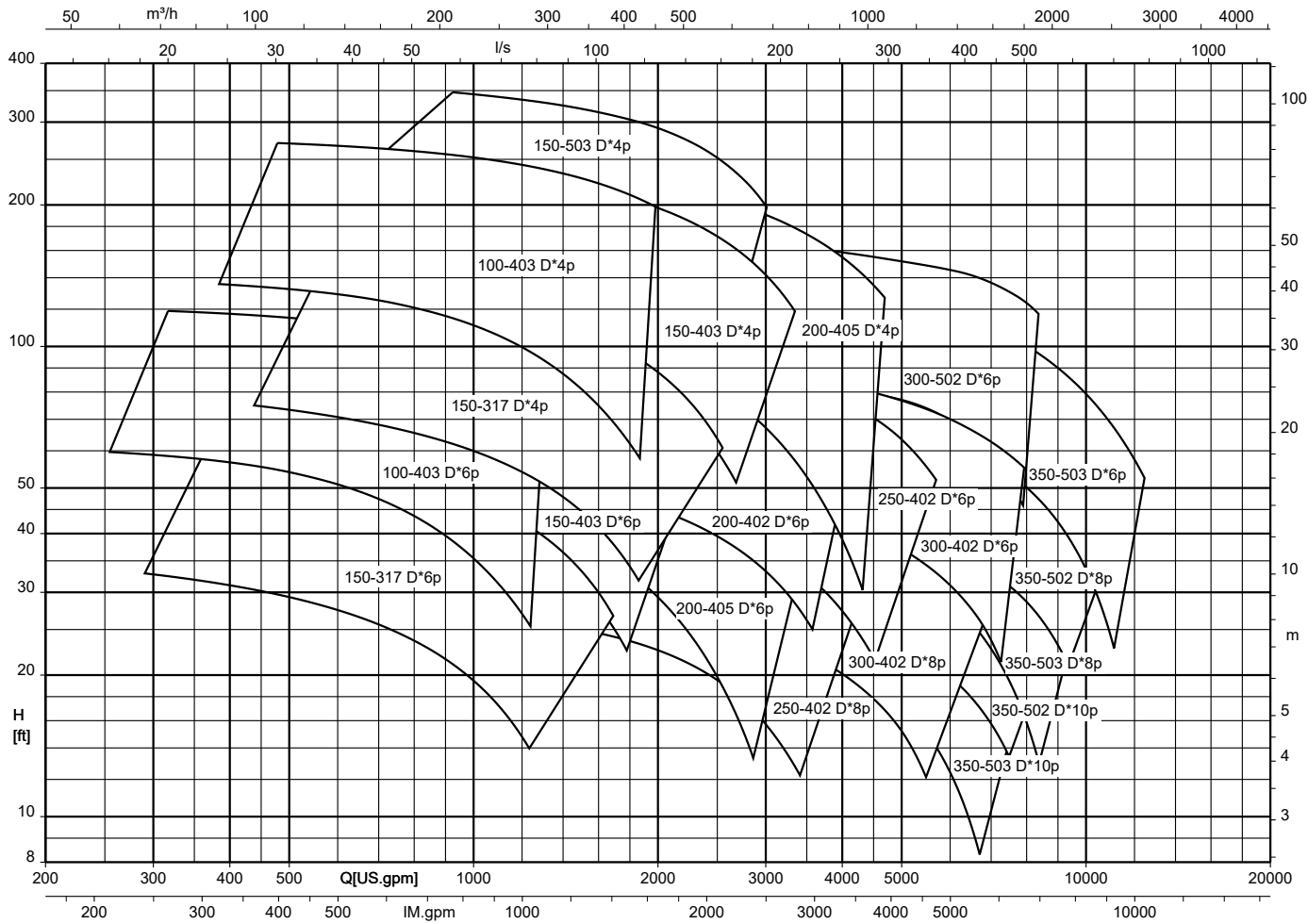
Amarex KRT E + \*E-max, n = 3500/1750/1160 rpm



Amarex KRT D, n = 1750/1160/875 rpm

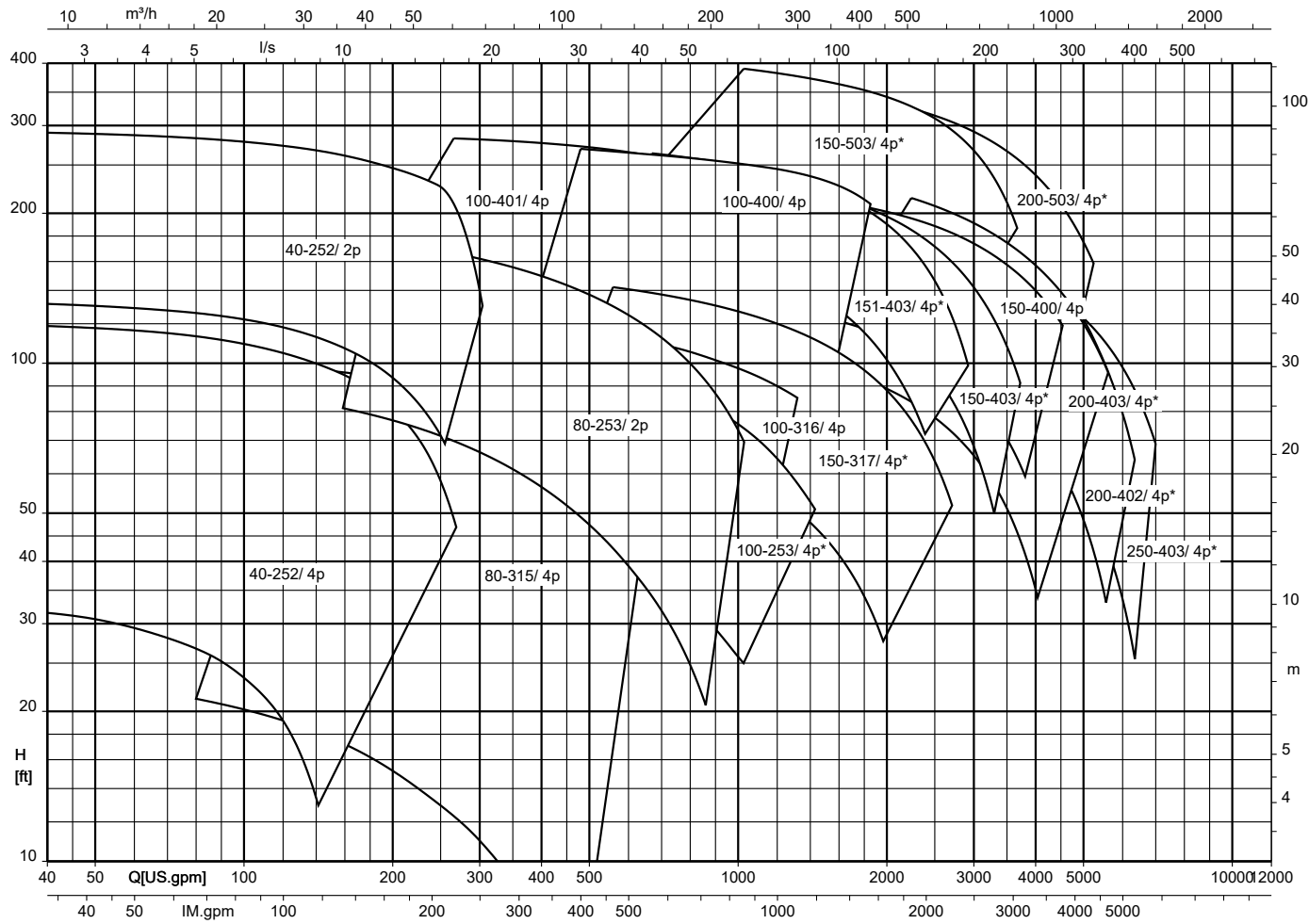


Amarex KRT, D-max, n = 1750/1160/875 rpm

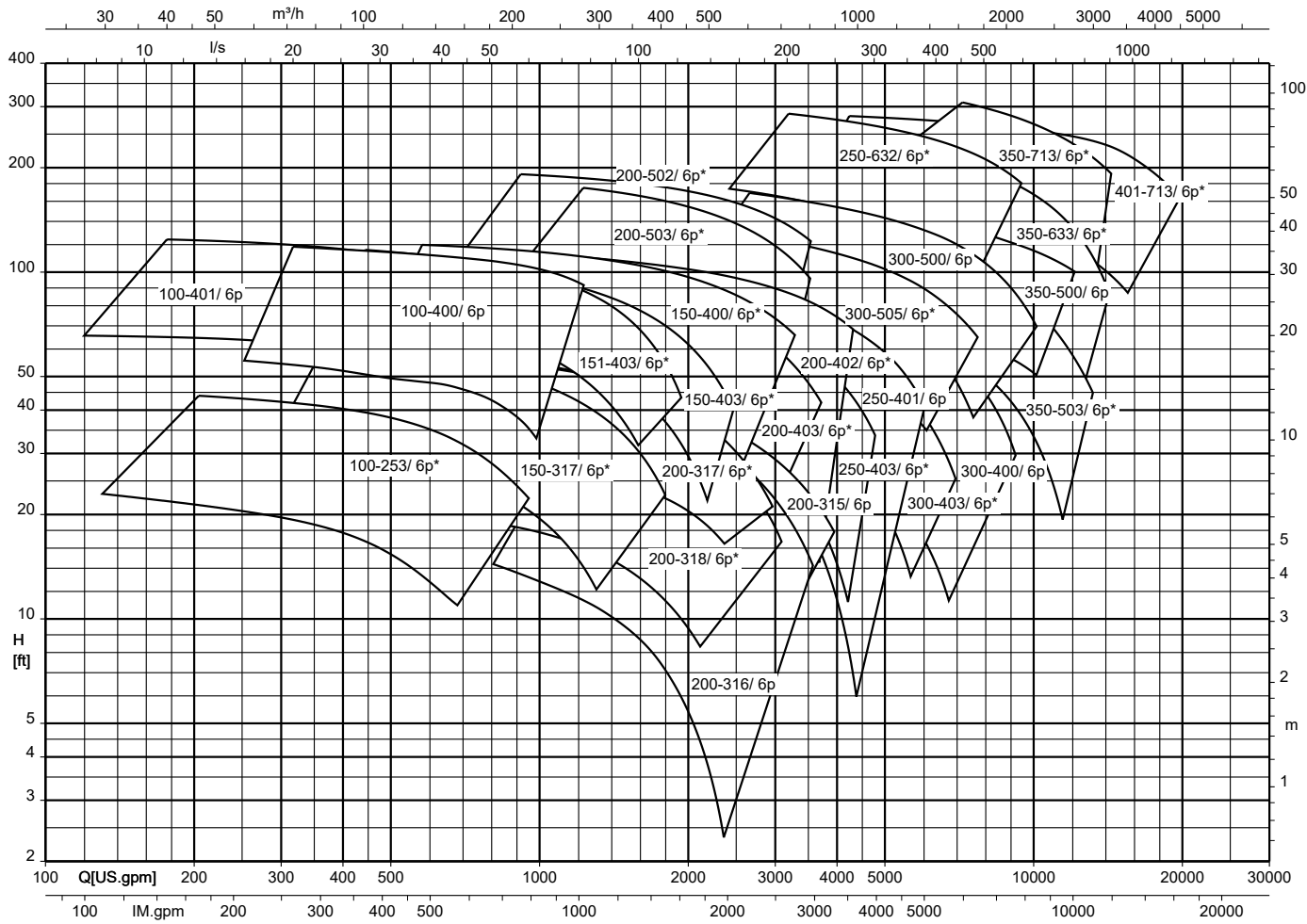




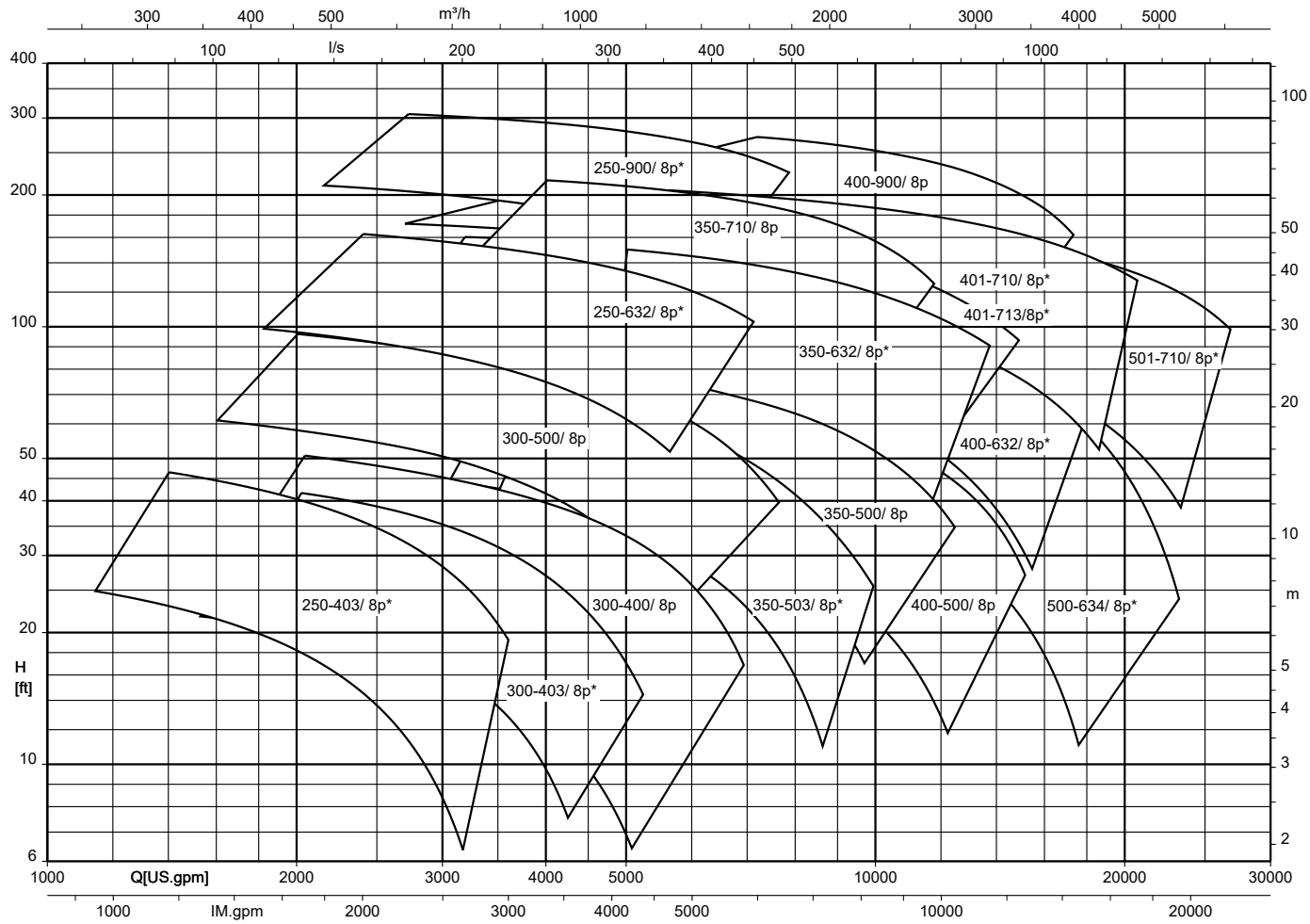
Amarex KRT K + \*K-max 40-.../80-.../100-.../150-.../200-.../250-..., n = 3500/1750 rpm



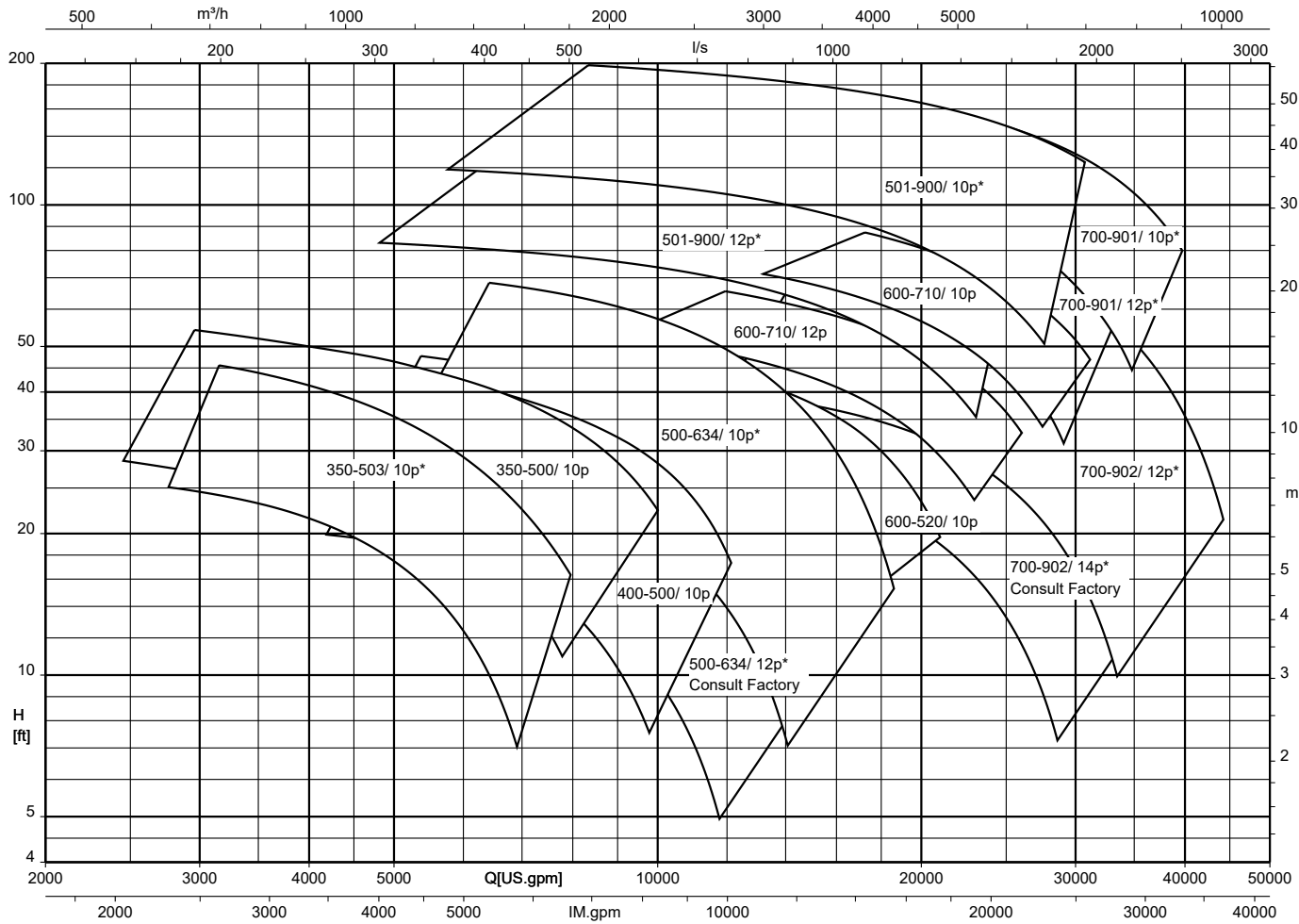
Amarex KRT K + \*K-max 100-.../150-.../151-.../200-.../250-.../300-.../350-..., n = 1160 rpm



Amarex KRT K + \*K-max 200-.../250-.../300-.../350-.../400-.../500-..., n = 875 rpm



Amarex KRT K + \*K-max 350-.../500-.../600-.../700-..., n = 700/585/500 rpm



## Installation types



Fig. 1: Installation types

1	Installation type D: stationary dry installation, vertical (S1 duty)
2	Installation type H: stationary dry installation, horizontal (S1 duty)
3	Installation type K: wet installation (S1 duty with motor outside of the fluid possible) with guide rail arrangement Installation type S: stationary wet installation (S1 duty with submerged motor) with guide rail arrangement
4	Installation type K: stationary wet installation (S1 duty with motor outside of the fluid possible) with guide cable arrangement Installation type S: stationary wet installation (S1 duty with submerged motor) with guide cable arrangement
5	Installation type P: wet installation of transportable model (S1 duty with submerged motor)

### Pump sets of installation types D, H and K

are suitable for continuous operation with the motor outside the fluid. Cooling is effected by means of air convection. Versions with a cooling jacket have an additional internal cooling circuit.

### Pump sets of installation types P and S

are designed for continuously submerged operation. The motor is cooled by the fluid handled on the motor surface. Operation with the motor outside the fluid handled is possible for short periods.

## Scope of supply

### Stationary dry installation - vertical (installation type D)

- Pump set complete with electric cables
- Suction elbow with inspection hole<sup>46)</sup> (optional) and fastening elements
- Optional: intake elbow with inspection hole

### Stationary dry installation - horizontal (installation type H)

- Pump set complete with electric cables
- Foundation rails<sup>47)</sup>
- Suction-side flanged spacer with inspection hole<sup>48)</sup> (optional)
- Amaslide maintenance aid (optional)

### Stationary wet installation (installation types K and S)

- Pump set complete with electric cables
- Claw with sealing elements and mounting elements
- Lifting rope, lifting chain or lifting bail (optional)
- Mounting bracket with mounting elements
- Flanged bend and fastening elements
- Guide cable / guide rail (guide rails are not included in KSB's scope of supply)

### Transportable model for wet installation (installation type P)

- Pump set complete with electric cables
- Foot plate or pump stool with mounting elements

<sup>46)</sup> For nominal discharge nozzle diameter  $\geq$  DN100

<sup>47)</sup> For UE/XE motors only

<sup>48)</sup> For nominal discharge nozzle diameter  $\geq$  DN100

General assembly drawings with list of components

Amarex KRT, motor type 1

Correlation of motor and motor type: (⇒ Page 26)

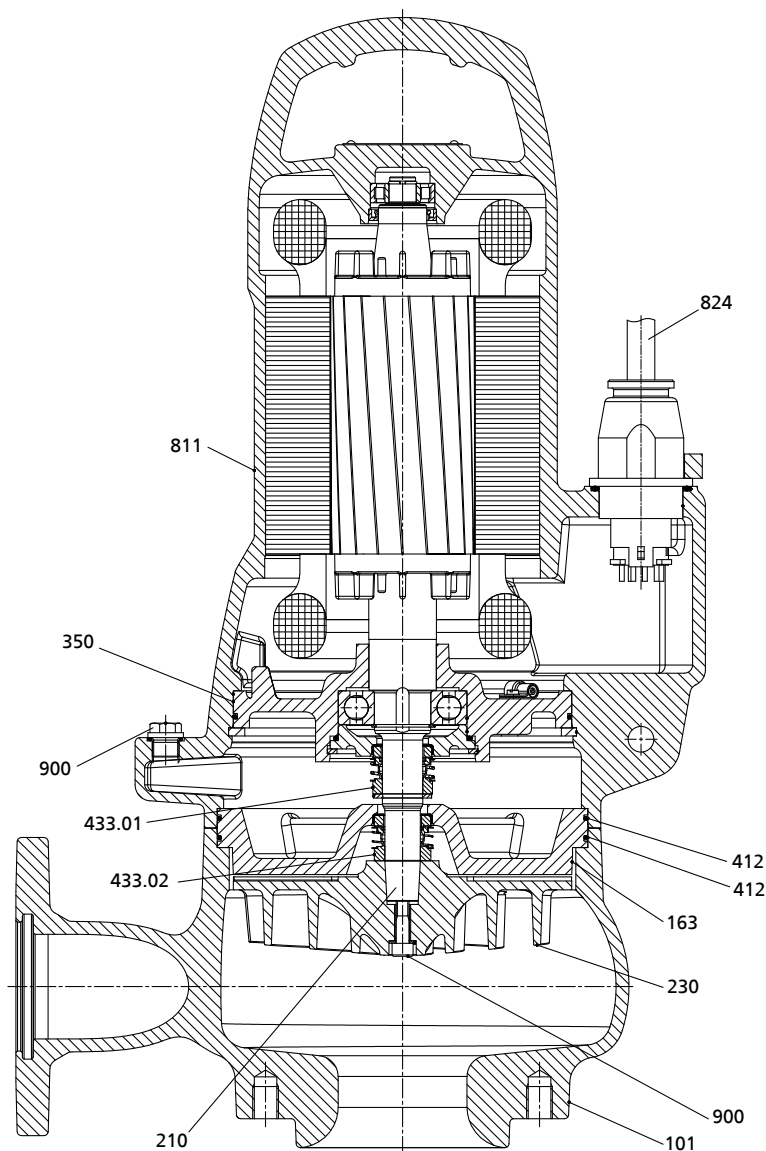


Fig. 2: General assembly drawing, example: Amarex KRT F65-215

Table 23: List of components

Part No.	Description	Part No.	Description
101	Pump casing	412	O-ring
163	Discharge cover	433.01/02	Mechanical seal
210	Shaft	811	Motor housing
230	Impeller	824	Power cable
350	Bearing housing	900	Screw

**Amarex KRT, motor type 2**

Correlation of motor and motor type: (⇒ Page 26)

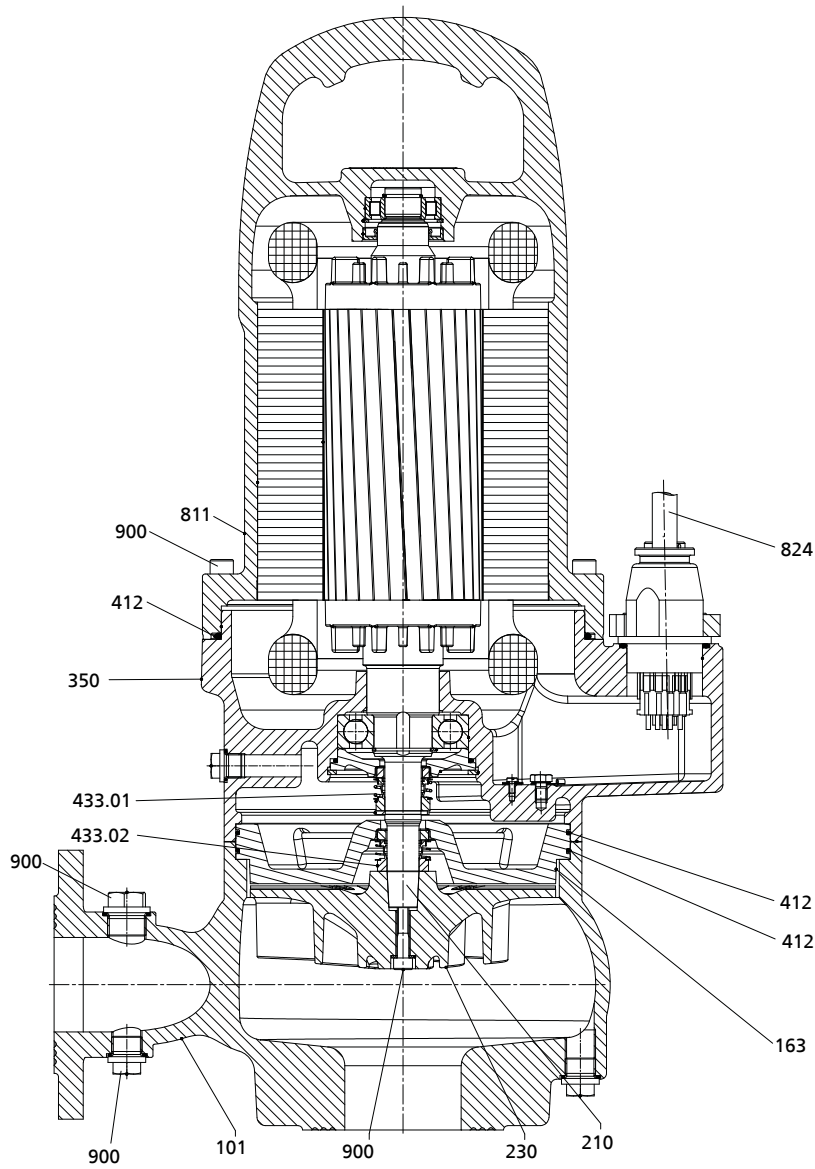


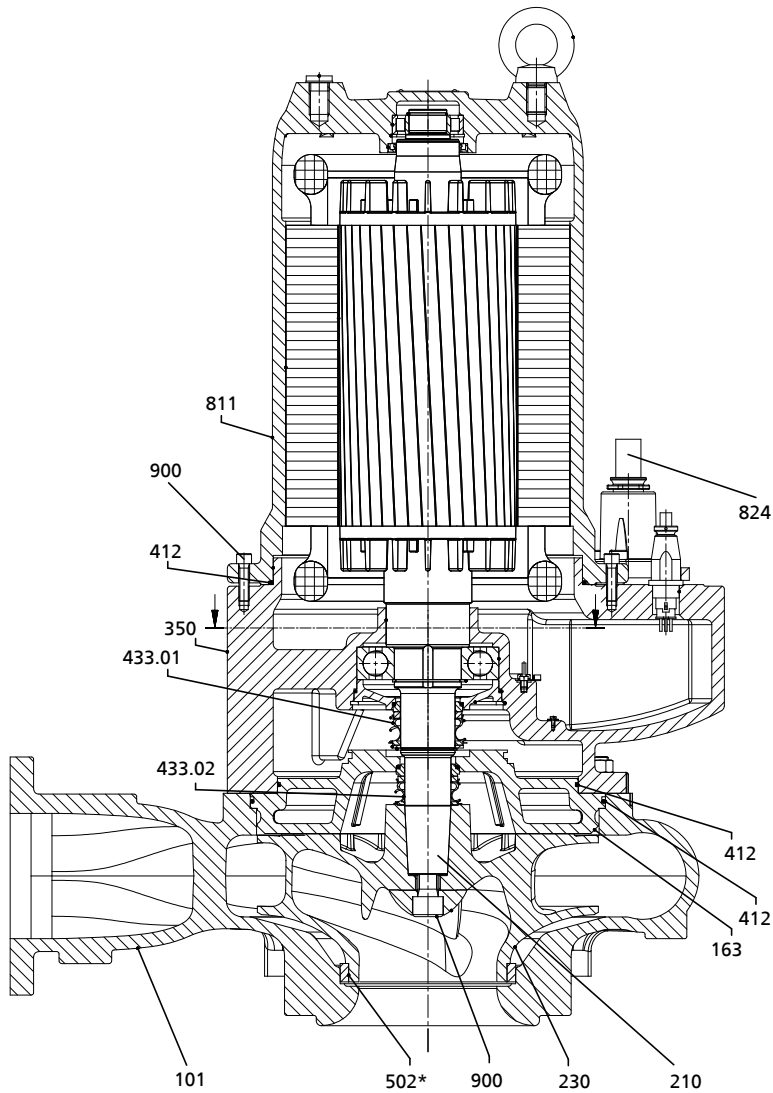
Fig. 3: General assembly drawing, example: Amarex KRT F 65-215

Table 24: List of components

Part No.	Description	Part No.	Description
101	Pump casing	412	O-ring
163	Discharge cover	433.01/02	Mechanical seal
210	Shaft	811	Motor housing
230	Impeller	824	Power cable
350	Bearing housing	900	Screw

**Amarex KRT, motor type 3**

Correlation of motor and motor type: (⇒ Page 26)



**Fig. 4:** General assembly drawing, example: Amarex KRT E/K 100-400/75 4 XEG

\*: On specific designs only

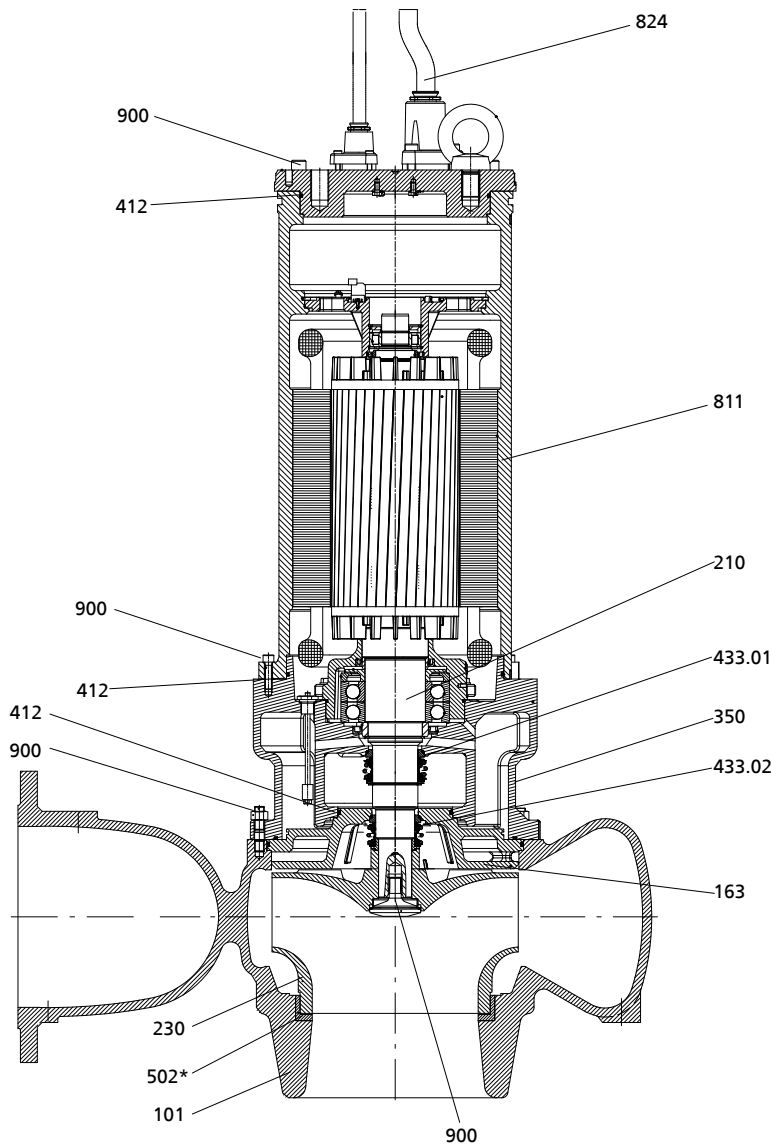
**Table 25:** List of components

Part No.	Description	Part No.	Description
101	Pump casing	433.01/.02	Mechanical seal
163	Discharge cover	502	Casing wear ring
210	Shaft	811	Motor housing
230	Impeller	824	Power cable
350	Bearing housing	900	Screw
412	O-ring		



**Amarex KRT, motor type 4, installation types S and P**

Correlation of motor and motor type: (⇒ Page 26)



**Fig. 5:** General assembly drawing, example: Amarex KRT K 150-403 / 130 4 XNG-S without cooling jacket

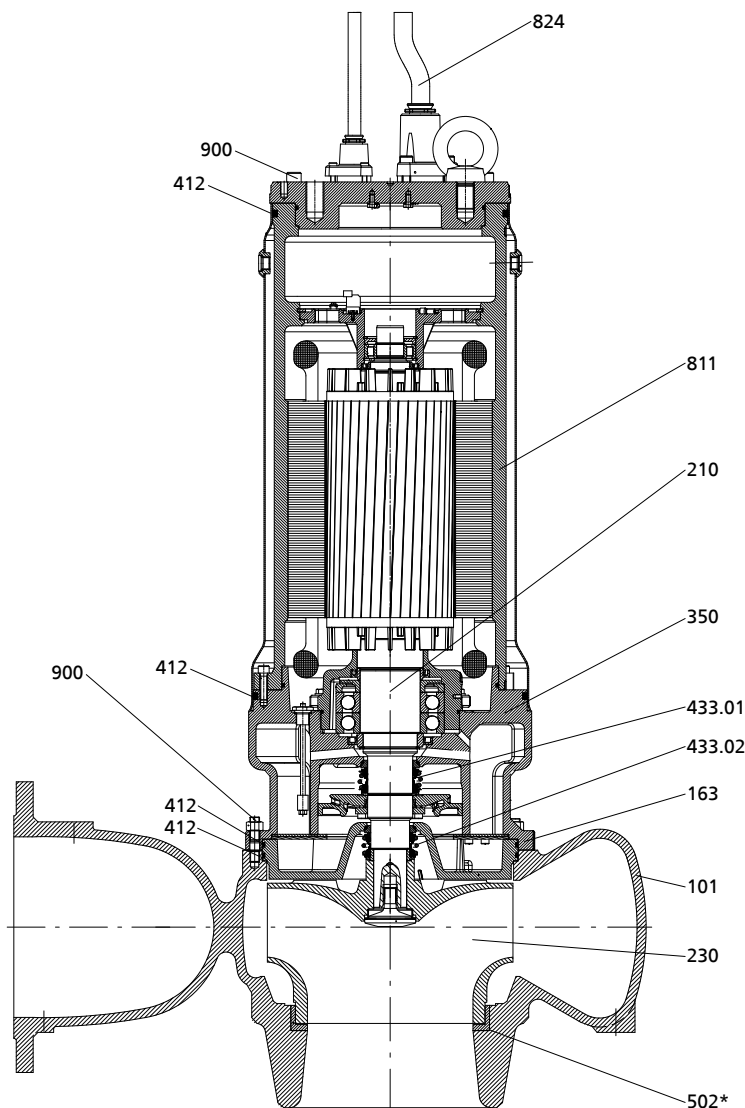
\*: On specific designs only

**Table 26:** List of components

Part No.	Description	Part No.	Description
101	Pump casing	433.01/.02	Mechanical seal
163	Discharge cover	502	Casing wear ring
210	Shaft	811	Motor housing
230	Impeller	824	Power cable
350	Bearing housing	900	Bolt/screw
412	O-ring		

**Amarex KRT, motor type 4, installation types K and D**

Correlation of motor and motor type: (⇒ Page 26)



**Fig. 6:** General assembly drawing, example: Amarex KRT K 150-403 / 130 4 XNG-K with cooling jacket

\*: On specific designs only

**Table 27:** List of components

Part No.	Description	Part No.	Description
101	Pump casing	433.01/.02	Mechanical seal
163	Discharge cover	502	Casing wear ring
210	Shaft	811	Motor housing
230	Impeller	824	Power cable
350	Bearing housing	900	Bolt/screw
412	O-ring		

**Amarex KRT, motor type 5**

Correlation of motor and motor type: (⇒ Page 26)

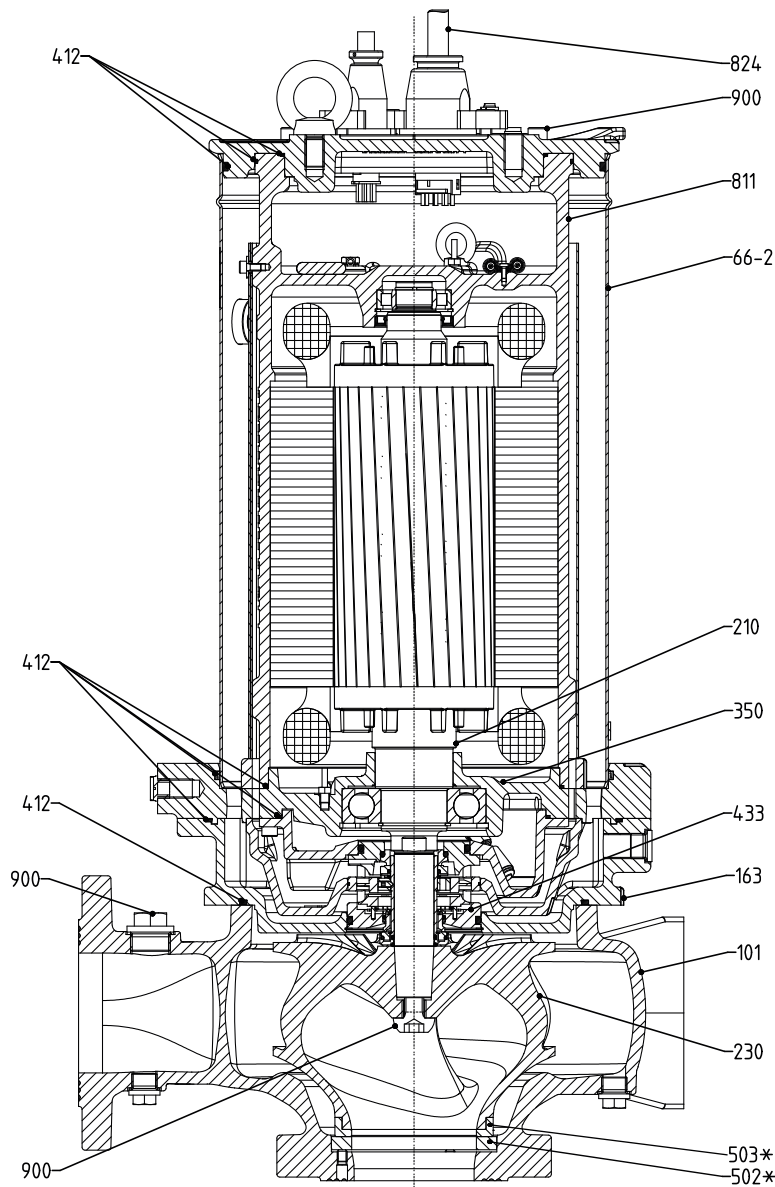


Fig. 7: General assembly drawing, example: Amarex KRT K 100-253 / 22 4 UFG-K with cooling jacket

\*: On specific designs only

Table 28: List of components

Part No.	Description	Part No.	Description
101	Pump casing	502	Casing wear ring
163	Discharge cover	503	Impeller wear ring
210	Shaft	66-2	Cooling jacket
230	Impeller	811	Motor housing
350	Bearing housing	824	Power cable
412	O-ring	900	Bolt/screw
433	Mechanical seal		







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