

Qty. Description

1 CR 3-21 A-A-A-E-HQQE



Note! Product picture may differ from actual product

Product No.: [96516604](#)

Vertical, multistage centrifugal pump with inlet and outlet ports on same the level (inline). The pump head and base are in cast iron – all other wetted parts are in stainless steel. A cartridge shaft seal ensures high reliability, safe handling, and easy access and service. Power transmission is via a rigid split coupling. Pipe connection is via oval flanges with internal Rp threads.

The pump is fitted with a 3-phase, fan-cooled asynchronous motor.

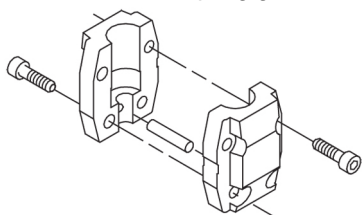
Further product details

Steel, cast iron and aluminium components have an epoxy-based coating made in a cathodic electro-deposition (CED) process. CED is a high-quality dip-painting process where an electrical field around the products ensures deposition of paint particles as a thin, well-controlled layer on the surface. An integral part of the process is a pretreatment. The entire process consists of these elements:

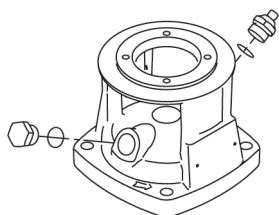
- 1) Alkaline-based cleaning.
 - 2) Zinc phosphating.
 - 3) Cathodic electro-deposition.
 - 4) Curing to a dry film thickness 18-22 my m.
- The colour code for the finished product is NCS 9000/RAL 9005.

Pump

A standard split coupling connects the pump and motor shaft. It is enclosed in the pump head/motor stool by means of two coupling guards.



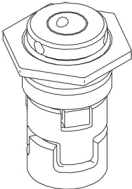
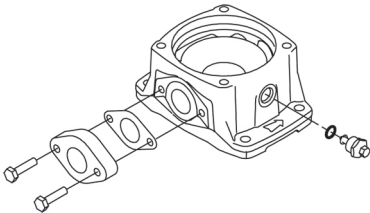
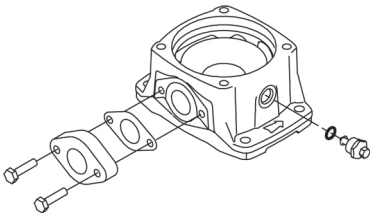
The pump head, pump head cover and flange for motor mounting is made in one piece. The pump head has a combined 1/2" priming plug and vent screw.



The pump is fitted with a balanced O-ring seal unit with a rigid torque-transmission system. This seal type is assembled in a cartridge unit which makes replacement safe and easy. Due to the balancing, this seal type is suitable for high-pressure applications. The cartridge construction also protects the pump shaft from possible wear from a dynamic O-ring between pump shaft and shaft seal.

Primary seal:

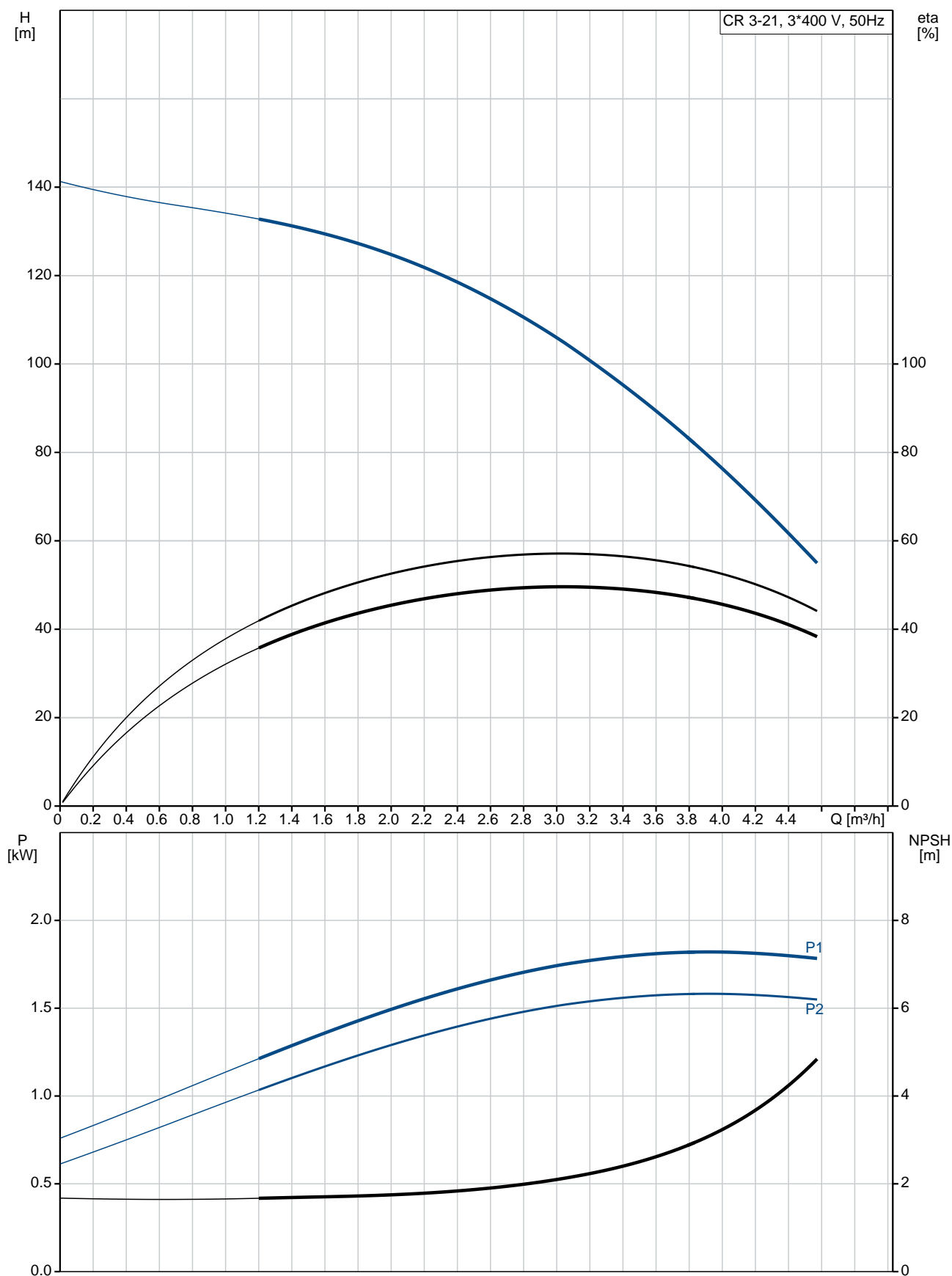
- Rotating seal ring material: silicon carbide (SiC)
- Stationary seat material: silicon carbide (SiC)

Qty.	Description
	<p>This material pairing is used where higher corrosion resistance is required. The high hardness of this material pairing offers good resistance against abrasive particles.</p> <p>Secondary seal material: EPDM (ethylene-propylene rubber)</p> <p>EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.</p>  <p>The shaft seal is screwed into the pump head.</p> <p>The chambers and impellers are made of stainless-steel sheet. The chambers are provided with a PTFE neck ring offering improved sealing and high efficiency. The impellers have smooth surfaces, and the shape of the blades ensure a high efficiency.</p> <p>The base is made of cast iron. The oval flanges are bolted to the base. The outlet side of the base has a combined drain plug and bypass valve. The pump is secured to the foundation by four bolts through the base plate.</p>  <p>The base is made of cast iron. The oval flanges are bolted to the base. The outlet side of the base has a combined drain plug and bypass valve. The pump is secured to the foundation by four bolts through the base plate.</p>  <p>Motor</p> <p>The motor is a totally enclosed, fan-cooled motor with principal dimensions to IEC and DIN standards. The motor is flange-mounted with tapped-hole flange (FT).</p> <p>Motor-mounting designation in accordance with IEC 60034-7: IM B 14 (Code I) / IM 3601 (Code II).</p> <p>Electrical tolerances comply with IEC 60034.</p> <p>The motor efficiency is classified as IE3 in accordance with IEC 60034-30-1.</p> <p>The motor does not incorporate motor protection and must be connected to a motor-protective circuit breaker which can be manually reset. The motor-protective circuit breaker must be set according to the rated current of the motor (I1/1).</p> <p>The motor can be connected to a variable speed drive for adjustment of pump performance to any duty point. Grundfos CUE offers a range of variable speed drives. Please find more information in Grundfos Product Center.</p> <p>Technical data</p> <p>Controls:</p> <p>Frequency converter: NONE</p>

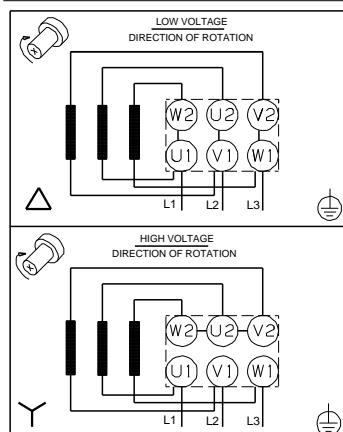
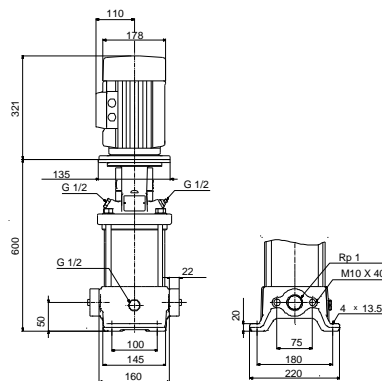
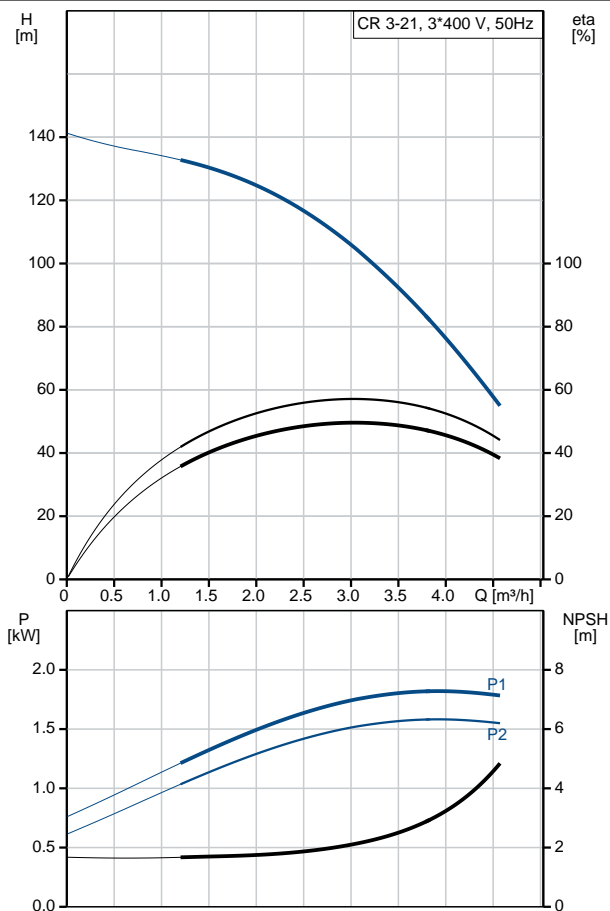
Qty.	Description
	<p>Liquid:</p> <p>Pumped liquid: Water</p> <p>Liquid temperature range: -20 .. 120 °C</p> <p>Liquid temperature during operation: 20 °C</p> <p>Density: 998.2 kg/m³</p> <p>Technical:</p> <p>Pump speed on which pump data are based: 2899 rpm</p> <p>Rated flow: 3 m³/h</p> <p>Rated head: 103.6 m</p> <p>Pump orientation: Vertical</p> <p>Shaft seal arrangement: Single</p> <p>Code for shaft seal: HQQE</p> <p>Approvals on nameplate: CE, EAC, ACS</p> <p>Curve tolerance: ISO9906:2012 3B</p> <p>Materials:</p> <p>Base: Cast iron EN 1561 EN-GJL-200 ASTM A48-25B</p> <p>Impeller: Stainless steel EN 1.4301 AISI 304</p> <p>Bearing: SIC</p> <p>Installation:</p> <p>Maximum ambient temperature: 60 °C</p> <p>Maximum operating pressure: 16 bar</p> <p>Max pressure at stated temp: 16 bar / 120 °C 16 bar / -20 °C</p> <p>Type of connection: Oval / Rp</p> <p>Size of inlet connection: 1 inch</p> <p>Size of outlet connection: 1 inch</p> <p>Pressure rating for pipe connection: PN 16</p> <p>Flange size for motor: FT115</p> <p>Electrical data:</p> <p>Motor standard: IEC</p> <p>Motor type: 90LC</p> <p>IE Efficiency class: IE3</p> <p>Rated power - P2: 2.2 kW</p> <p>Power (P2) required by pump: 2.2 kW</p> <p>Mains frequency: 50 Hz</p> <p>Rated voltage: 3 x 220-240D/380-415Y V</p> <p>Rated current: 7.70/4.45 A</p> <p>Starting current: 850-950 %</p> <p>Cos phi - power factor: 0.89-0.87</p> <p>Rated speed: 2890-2910 rpm</p> <p>Efficiency: IE3 85,9%</p> <p>Motor efficiency at full load: 85.9 %</p> <p>Motor efficiency at 3/4 load: 86.8 %</p> <p>Motor efficiency at 1/2 load: 86.0 %</p> <p>Number of poles: 2</p> <p>Enclosure class (IEC 34-5): 55 Dust/Jetting</p> <p>Insulation class (IEC 85): F</p> <p>Others:</p> <p>Minimum efficiency index, MEI η_{MEI}: 0.70</p> <p>Net weight: 41.6 kg</p>

15/02/2019

96516604 CR 3-21 A-A-A-E-HQQE 50 Hz



Description	Value
General information:	
Product name:	CR 3-21 A-A-A-E-HQQE
Product No:	96516604
EAN number:	5700396746210
Technical:	
Pump speed on which pump data are based:	2899 rpm
Rated flow:	3 m³/h
Rated head:	103.6 m
Head max:	139.9 m
Stages:	21
Impellers:	21
Number of reduced-diameter impellers:	0
Low NPSH:	N
Pump orientation:	Vertical
Shaft seal arrangement:	Single
Code for shaft seal:	HQQE
Approvals on nameplate:	CE, EAC, ACS
Curve tolerance:	ISO9906:2012 3B
Pump version:	A
Model:	A
Materials:	
Base:	Cast iron EN 1561 EN-GJL-200 ASTM A48-25B
Impeller:	Stainless steel EN 1.4301 AISI 304
Material code:	A
Code for rubber:	E
Bearing:	SIC
Installation:	
Maximum ambient temperature:	60 °C
Maximum operating pressure:	16 bar
Max pressure at stated temp:	16 bar / 120 °C 16 bar / -20 °C
Type of connection:	Oval / Rp
Size of inlet connection:	1 inch
Size of outlet connection:	1 inch
Pressure rating for pipe connection:	PN 16
Flange size for motor:	FT115
Connect code:	A
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-20 .. 120 °C
Liquid temperature during operation:	20 °C
Density:	998.2 kg/m³
Electrical data:	
Motor standard:	IEC
Motor type:	90LC
IE Efficiency class:	IE3
Rated power - P2:	2.2 kW
Power (P2) required by pump:	2.2 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 220-240D/380-415Y V
Rated current:	7.70/4.45 A
Starting current:	850-950 %





Company name:

Created by:

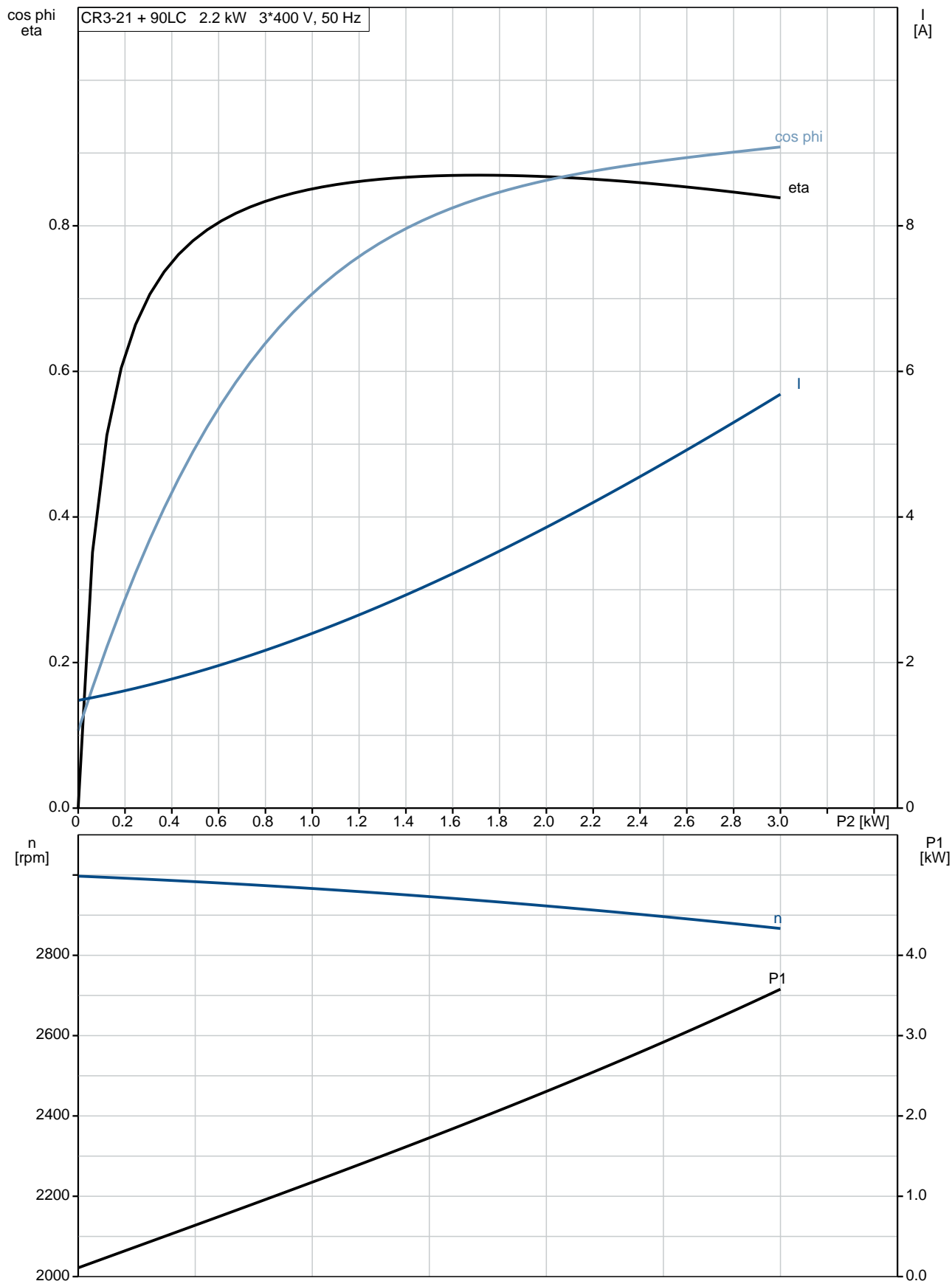
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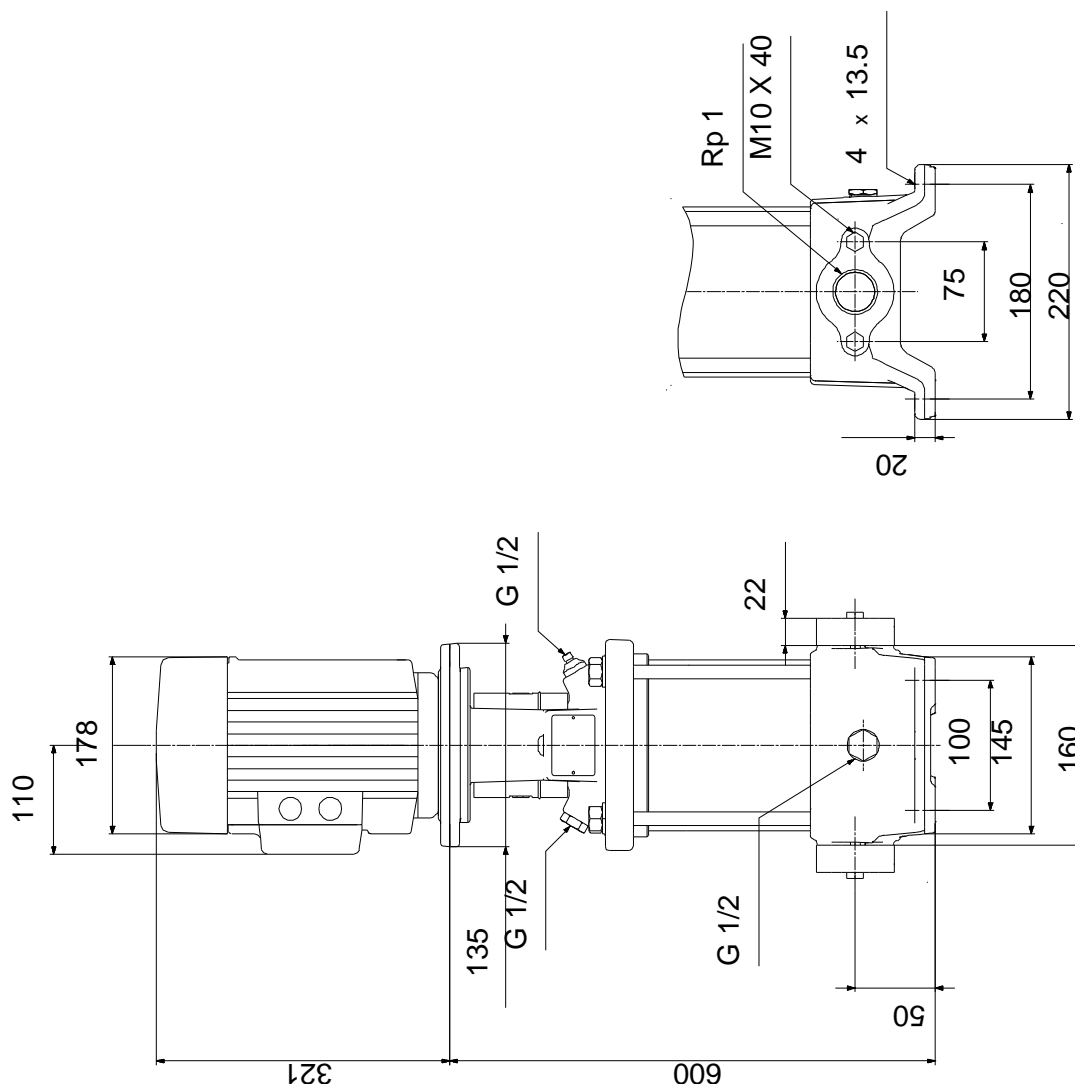
15/02/2019

Description	Value
Cos phi - power factor:	0.89-0.87
Rated speed:	2890-2910 rpm
Efficiency:	IE3 85,9%
Motor efficiency at full load:	85.9 %
Motor efficiency at 3/4 load:	86.8 %
Motor efficiency at 1/2 load:	86.0 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	NONE
Motor No:	85U05908
Controls:	
Frequency converter:	NONE
Others:	
Minimum efficiency index, MEI %:	0.70
Net weight:	41.6 kg
Gross weight:	44.5 kg
Shipping volume:	0.13 m ³
Danish VVS No.:	385901021

96516604 CR 3-21 A-A-A-E-HQQE 50 Hz

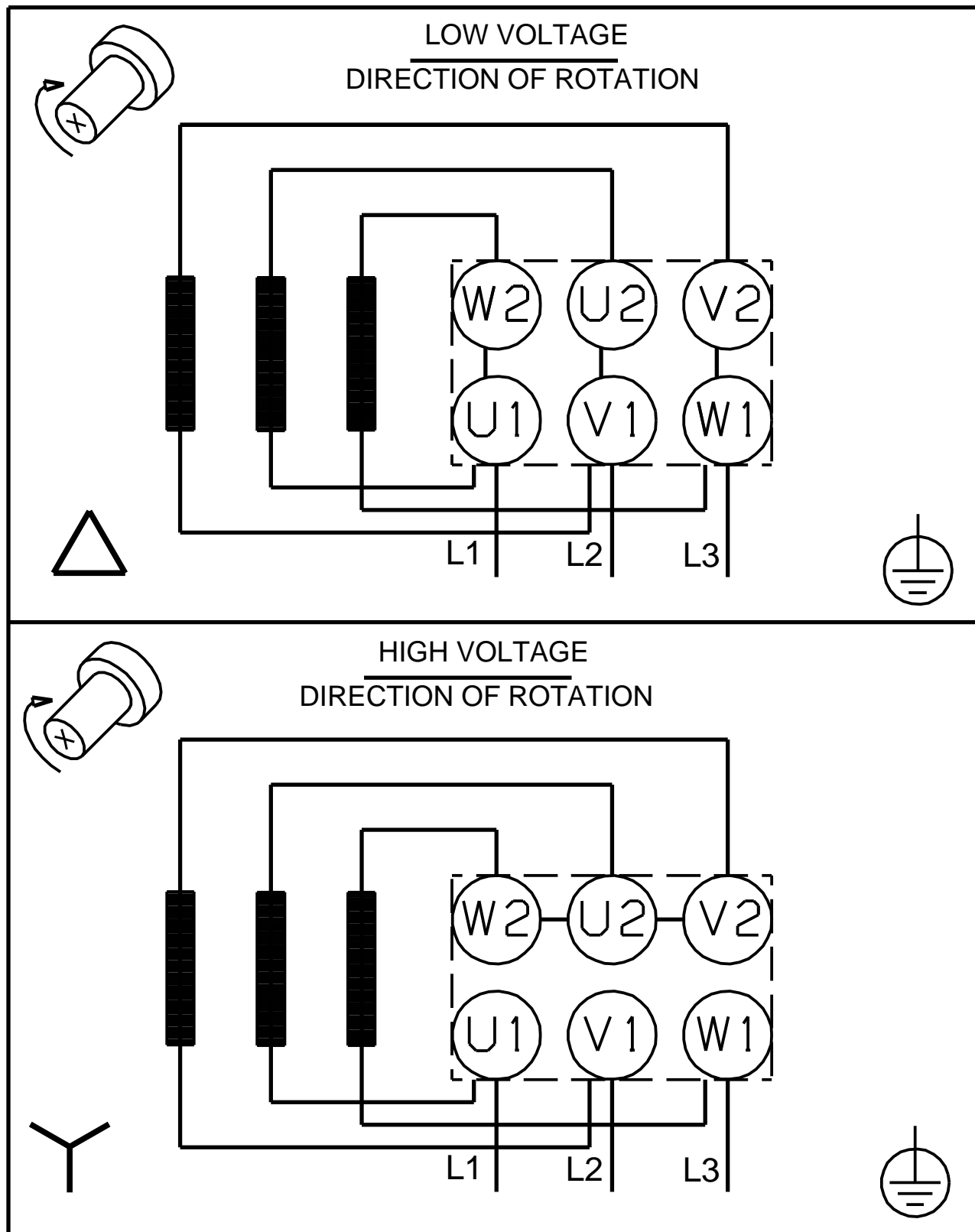


96516604 CR 3-21 A-A-A-E-HQQE 50 Hz

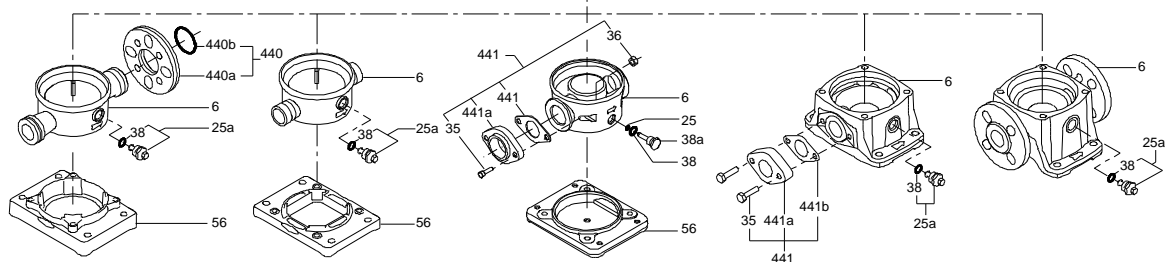


Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

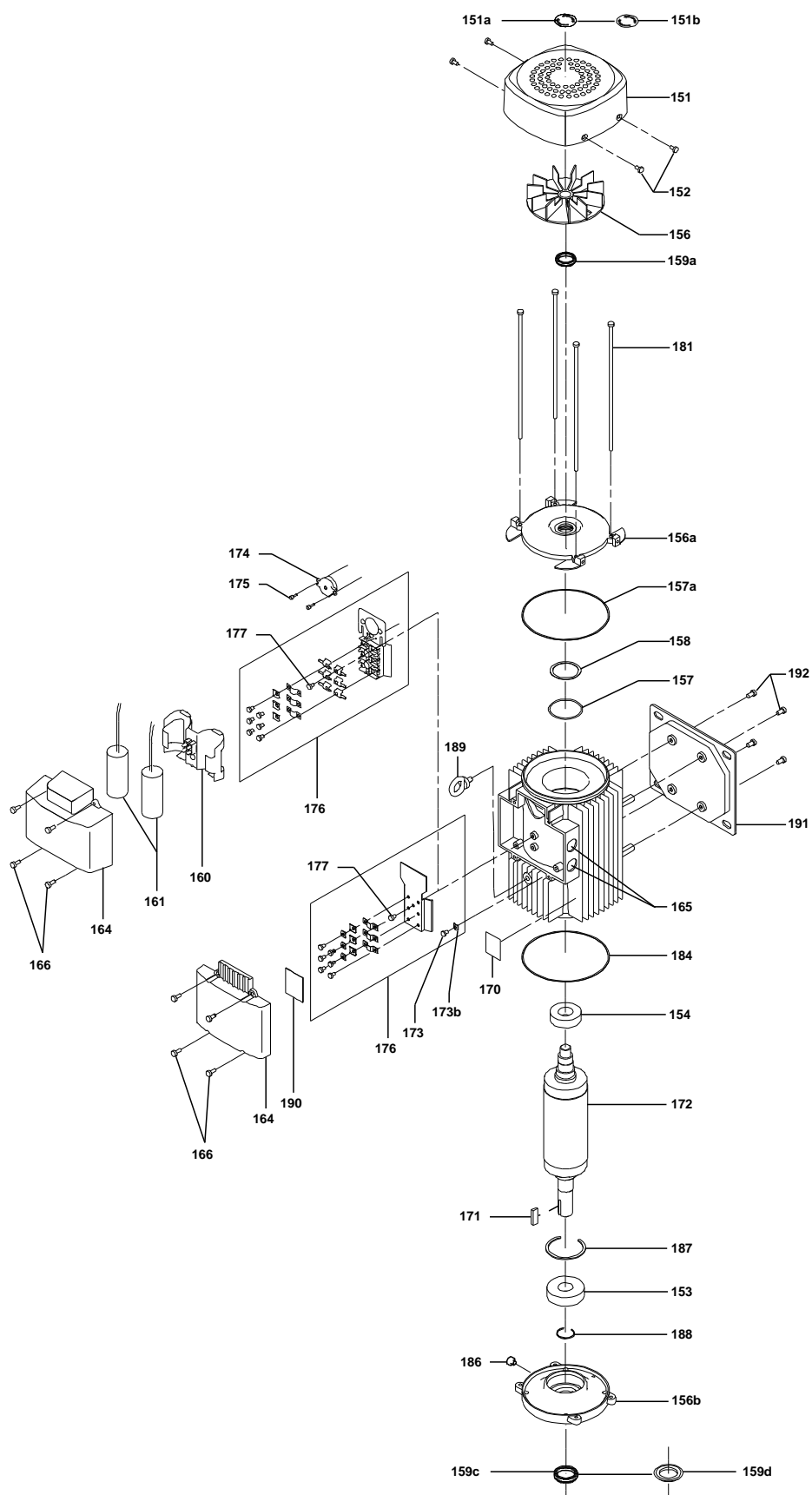
96516604 CR 3-21 A-A-A-E-HQQE 50 Hz



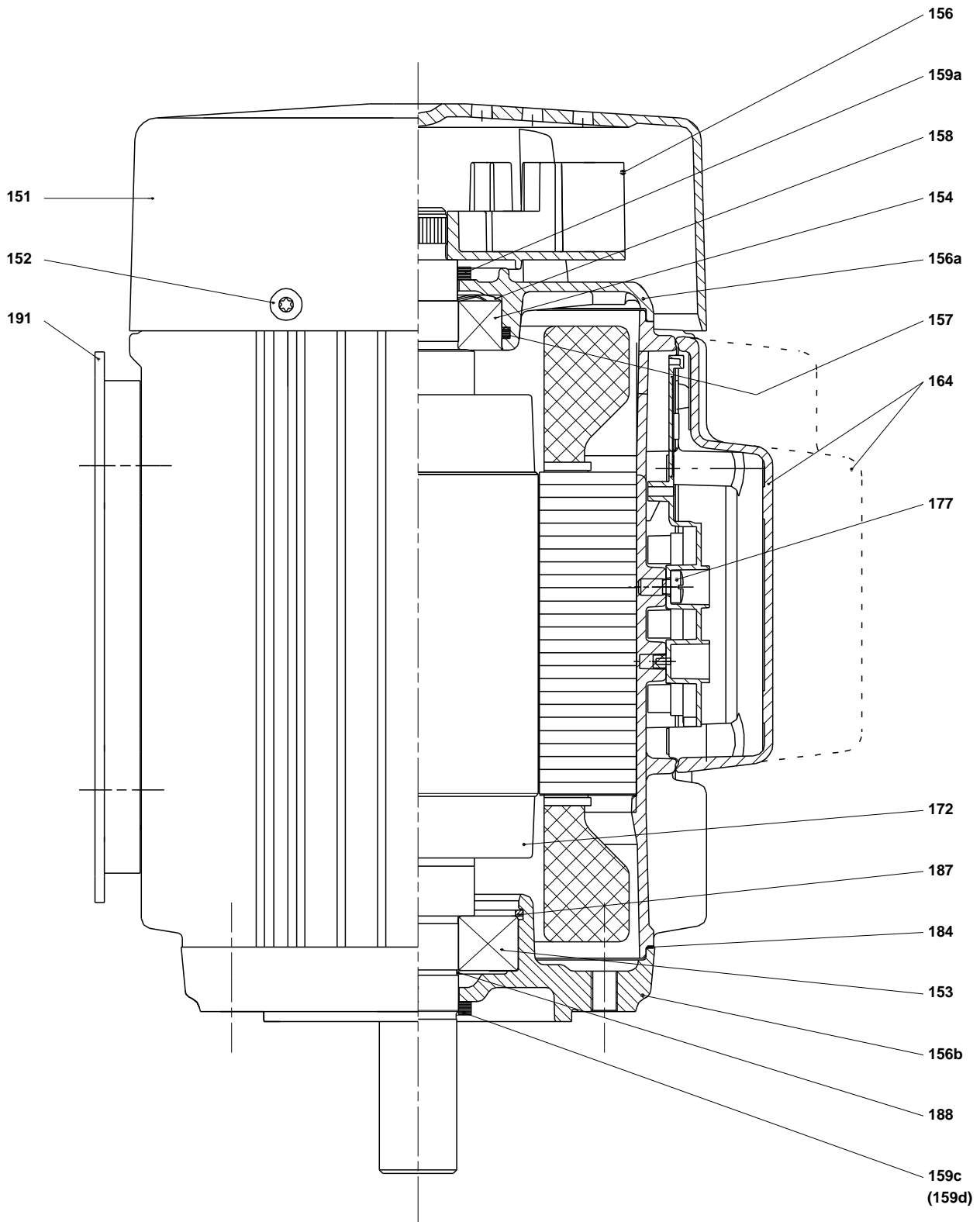
Note! All units are in [mm] unless others are stated.



(tm029184 0505)



(tm029178 2004)



Spare parts CR 3-21, Product No. 96516604
Valid from 1.1.2011 (1152)

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
- 80	Kit, chamber stack		Bearing type: SILICON CARBIDE	96453544	1	pcs
- 4a	Chamber w. bearing cpl.				3	
	Vane					
	Intermediate chamber					
	Retainer for bearing					
	Guide vane					
45	Neck ring					
47	Bearing bush					
65	Retainer					
65	Retainer					
- 4	Chamber cpl.				17	
	Vane					
	Intermediate chamber					
	Plate					
	Guide vane					
45	Neck ring					
65	Retainer					
65	Retainer					
- 5a	Chamber cpl.				1	
	Vane					
	Intermediate chamber					
45	Neck ring					
65	Retainer					
65	Retainer					
- 44a	Guide vane cpl.				1	
	Plate					
	Guide vane					
50	Top plate					
47	Bearing ring, rotating				3	
49	Impeller cpl.				21	
51	Shaft, spline, cpl.				1	
64d	Spacing pipe		Internal diameter: 12,85		3	
			Outer diameter: 15,85			
			Length (mm): 4,50			
64c	Clamp, splined		Internal diameter: 8,5		1	
			Outer diameter: 15			
64a	Spacing pipe				17	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
-	Kit, coupling			00415062	1	pcs
9	Hex socket head cap screw		Designation: DIN 912		4	
			Length (mm): 25			
			Thread: M8			
10a	Coupling half				2	
10	Shaft pin		Diameter: 5		1	
			Length (mm): 26			
-	Kit, coupling guard			96505131	1	pcs
7.a	Combi Slot Torx screw				4	
7	Coupling guard				2	
-	Kit, gaskets			96455090	1	pcs
37	O-ring				2	
38	O-ring		Diameter: 16,3		1	
			Material type: EPDM			

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		2	
			Material type: EPDM			
			Thickness: 2,4			
109	O-ring		Diameter: 22,00		1	
			Material type: EPDM			
			Thickness: 2,75			
-	Kit, plug			96505133	1	pcs
- 18	Air vent screw				1	
	Spindle					
	Plug					
23b	Spindle				1	
25	Plug				1	
25	Plug				1	
38	O-ring		Diameter: 16,3		1	
			Material type: FKM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		2	
			Material type: FKM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		1	
			Material type: EPDM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		2	
			Material type: EPDM			
			Thickness: 2,4			
-	Kit, shaft seal HQQE			96455086	1	pcs
+ 105	Shaft seal		Material type: HQQE		1	
-	Kit, wear parts		Material type: SILICON CARBIDE	96455093	1	pcs
- 4a	Chamber w. bearing cpl.				3	
4a	Intermediate chamber					
45	Neck ring					
65	Neck ring retainer					
45	Neck ring				24	
47	Bearing ring, rotating				3	
64d	Spacing pipe		Internal diameter: 12,85		3	
			Outer diameter: 15,85			
			Length (mm): 4,50			
64c	Clamp, splined		Internal diameter: 8,5		1	
			Outer diameter: 15			
65	Neck ring retainer				24	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
441b	Gasket				2	
-	Motor			85903722	1	pcs
-	Kit, bearing cpl.			96279794	1	
111	Ball bearing					
111	Ball bearing					
157	O-ring		Diameter: 52			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
187	Retaining ring					
188	Retaining ring					
-	Kit, end shield			96279789	1	
156a	End shield					
157a	Gasket		Internal diameter: 141,2			
			Outer diameter: 145,5			
			Thickness: 0,2			

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
157	O-ring		Diameter: 52			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
159a	Seal ring					
-	Kit, fan			96279757	1	
156	Fan					
159a	Seal ring					
-	Kit, fan cover			96279755	1	
151	Fan cover					
152	Pan head thread forming screw					
-	Kit, flange			96279777	1	
156b	Flange					
159.c	Seal ring					
184	Gasket		Internal diameter: 141,2			
			Outer diameter: 145,5			
			Thickness: 0,2			
186	Drain plug					
-	Kit, retaining ring			96279798	1	
187	Retaining ring					
188	Retaining ring					
-	Kit, shaft seal			96279761	1	
159c	Seal ring					
159a	Seal ring					
-	Kit, staybolts			96279792	1	
181	Pan head staybolt					
-	Kit, terminal board			96279769	1	
173a	Base					
173	Pan head thread forming screw		Designation: COMBI TORX T25			
176	Slot cheese head screw		Designation: COMBI TORX T25			
			Length (mm): 10			
			Thread: M5			
176	Terminal					
176	Connecting piece					
176	Wire clamp					
176	Terminal board					
177	Pan head screw					
-	Kit, terminal box			96279771	1	
164	Terminal box cover w/gasket					
166	Pan head thread forming screw					
+ 4a	Bulk, Chamber w. bearing cpl. (3 pcs)			98371208	3	pcs
+ 4a	Bulk, Chamber w. bearing cpl. (5 pcs)			97690601	3	pcs
+ 4a	Bulk, Chamber w. bearing cpl. (5 pcs)			97690590	3	pcs
+ 4a	Chamber w. bearing cpl.			98371207	3	pcs
- 4	Bulk, Chamber cpl. (5 pcs)			97690020	17	pcs
45	Bulk, Neck ring (24 pcs)			96536194	1	
65	Bulk, Retainer (24 pcs)			98270018	1	
+ 4	Bulk, Chamber cpl. (10 pcs)			96547662	17	pcs
+ 4	Chamber cpl.			98371206	17	pcs
+ 5a	Bulk, Chamber cpl. (10 pcs)			98371205	1	pcs
+ 5a	Chamber cpl.			96588148	1	pcs
6	Base			96588138	1	pcs
10	Bulk, Shaft pin (10 pcs)		Diameter: 5	96536473	1	pcs
			Length (mm): 26			
- 25a	Drain plug w/bypass valve			96588242	1	pcs
38	Bulk, O-ring (10 pcs)		Diameter: 16,3	99198815	1	
			Material type: EPDM			
			Thickness: 2,4			

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
38	Bulk, O-ring (50 pcs)		Diameter: 16,3	99412727	1	
			Material type: EPDM			
			Thickness: 2,4			
26	Staybolt		Length (mm): 400	98986331	4	pcs
			Thread: M12			
36	Bulk, Nut (20 pcs)		Thread: M12	96620479	4	pcs
37	Bulk, O-ring (24 pcs)			96547656	2	pcs
38	Bulk, O-ring (10 pcs)		Diameter: 16,3	99198815	2	pcs
			Material type: EPDM			
			Thickness: 2,4			
38	Bulk, O-ring (50 pcs)		Diameter: 16,3	99412727	2	pcs
			Material type: EPDM			
			Thickness: 2,4			
+ 44a	Bulk, Guide vane cpl. (5 pcs)			96547659	1	pcs
47	Bulk, Bearing ring, rotating (10 pcs)			97905743	3	pcs
47	Bearing ring, rotating			96547649	3	pcs
49	Bulk, Impeller cpl. (5 pcs)			98426771	21	pcs
49	Bulk, Impeller cpl. (10 pcs)			98394269	21	pcs
49	Bulk, Impeller cpl. (24 pcs)			96547599	21	pcs
49	Impeller cpl.			98394415	21	pcs
51	Shaft, spline, cpl.			96588236	1	pcs
64c	Bulk, Clamp, splined (5 pcs)		Internal diameter: 8,5	98496968	1	pcs
			Outer diameter: 15			
64a	Bulk, Spacing pipe (24 pcs)			96536198	17	pcs
66	Bulk, Wedge lock washer (10 pcs)			96536157	1	pcs
67	Bulk, Lock nut (10 pcs)		Thread: M8	98277008	1	pcs
+ 105	Bulk, Shaft seal (15 pcs)		Material type: HQQE	96983415	1	pcs
441b	Bulk, Gasket (24 pcs)			96536206	2	pcs
+ 441a	Flange		Thread: RP 1	96547453	2	pcs