

**Qty. Description**

1 CRN 20-2 A-P-A-E-HQQE



Product No.: [96500382](#)

Vertical, multistage centrifugal pump with inlet and outlet ports on same the level (inline). Pump materials in contact with the liquid are in high-grade 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 PJE (Victaulic®) couplings.

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

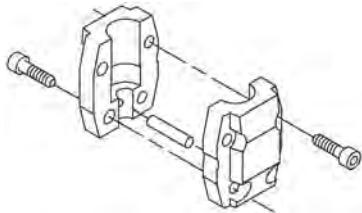
**Further product details**

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:

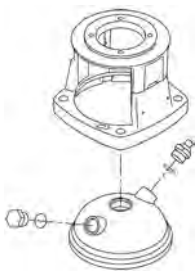
- 1) Alkaline-based cleaning.
  - 2) Zinc phosphating.
  - 3) Cathodic electro-deposition.
  - 4) Curing to a dry film thickness 18-22 my m.
- The colour code for the finished product is NCS 9000/RAL 9005.

**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 and flange for motor mounting is made in one piece (cast iron). The pump head cover is a separate component (stainless steel). 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)

**Qty. Description**

- Stationary seat material: silicon carbide (SiC)

This material pairing is used where higher corrosion resistance is required. The high hardness of this material pairing offers good resistance against abrasive particles.

Secondary seal material: EPDM (ethylene-propylene rubber)

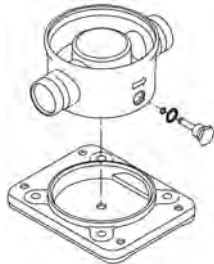
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



The shaft seal is screwed into the pump head.

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.

The pump has a stainless-steel base mounted on a separate base plate. The base and base plate are kept in position by the tension of the staybolts which hold the pump together. The outlet side of the base has a drain plug. The pump is secured to the foundation by four bolts through the base plate. The base is prepared for connection by means of PJE (Victualic®) couplings.



## Motor

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).

Motor-mounting designation in accordance with IEC 60034-7: IM B 14 (Code I) / IM 3601 (Code II).

Electrical tolerances comply with IEC 60034.

The motor efficiency is classified as IE3 in accordance with IEC 60034-30-1.

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).

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.

## Technical data

### Controls:

Frequency converter: NONE

### Liquid:

Pumped liquid: Water  
Liquid temperature range: -20 .. 120 °C  
Liquid temperature during operation: 20 °C  
Density: 998.2 kg/m<sup>3</sup>

### Technical:

Qty.	Description
	Pump speed on which pump data are based: 2899 rpm Rated flow: 21 m <sup>3</sup> /h Rated head: 22 m Pump orientation: Vertical Shaft seal arrangement: Single Code for shaft seal: HQQE Approvals on nameplate: CE, EAC, ACS Curve tolerance: ISO9906:2012 3B  <b>Materials:</b> Base: Stainless steel EN 1.4408 AISI 316 Impeller: Stainless steel EN 1.4401 AISI 316 Bearing: SIC  <b>Installation:</b> Maximum ambient temperature: 60 °C Maximum operating pressure: 25 bar Max pressure at stated temp: 25 bar / 120 °C 25 bar / -20 °C Type of connection: PJE Size of inlet connection: DN 50 2 inch Size of outlet connection: DN 50 2 inch Pressure rating for pipe connection: PN 50 Flange size for motor: FT115  <b>Electrical data:</b> 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 % 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  <b>Others:</b> Minimum efficiency index, MEI $\hat{\alpha}\%$ : 0.70 Net weight: 46 kg Gross weight: 50 kg Shipping volume: 0.094 m <sup>3</sup> Danish VVS No.: 385915020



Company name:

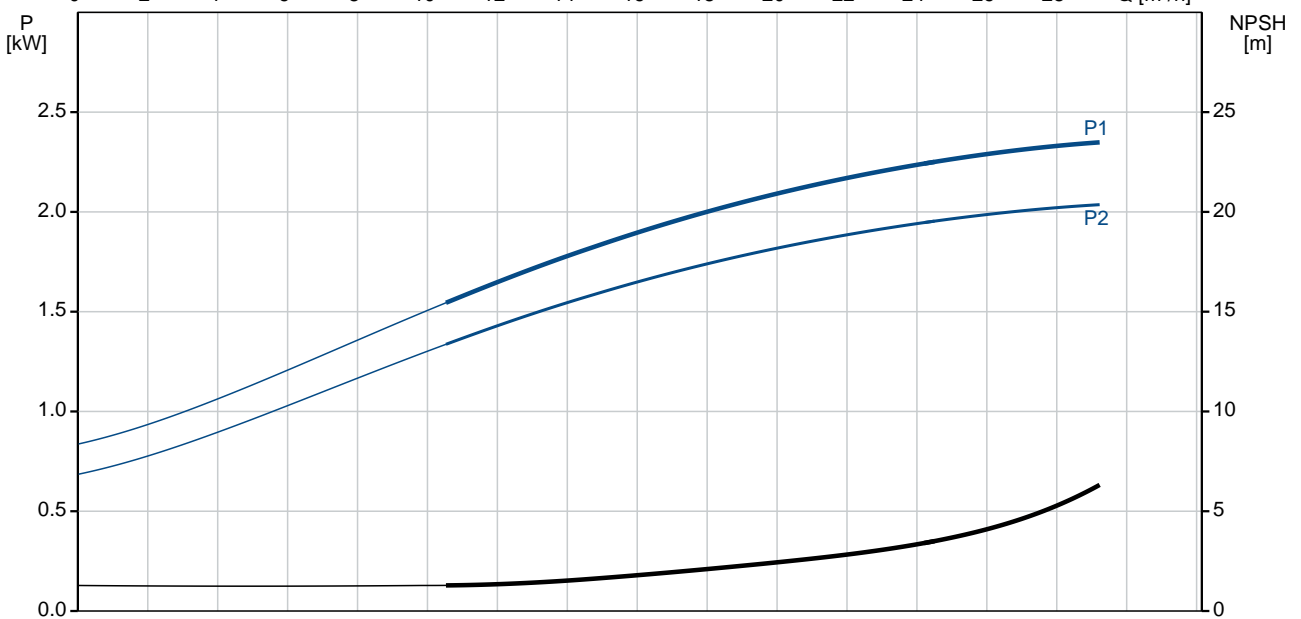
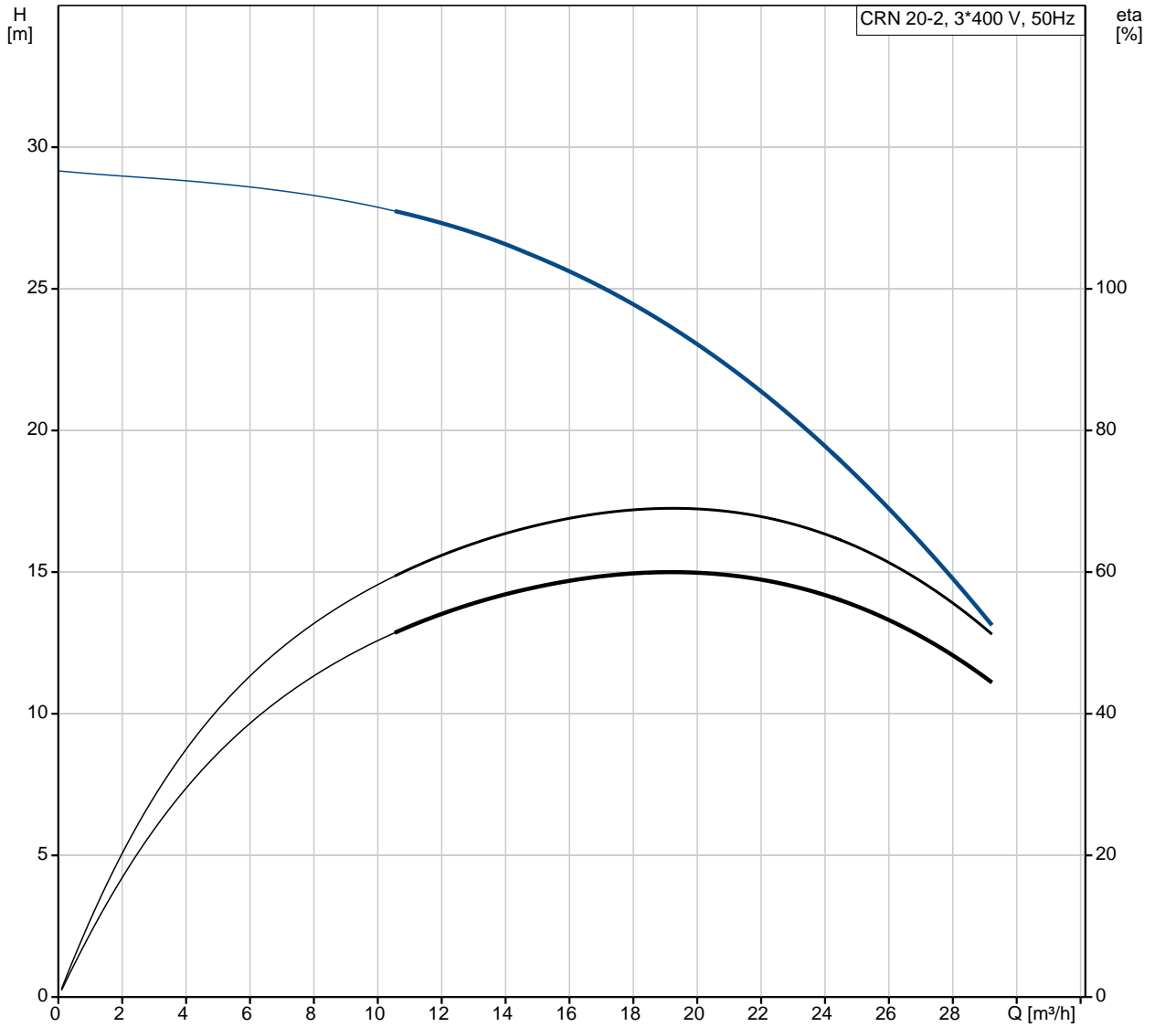
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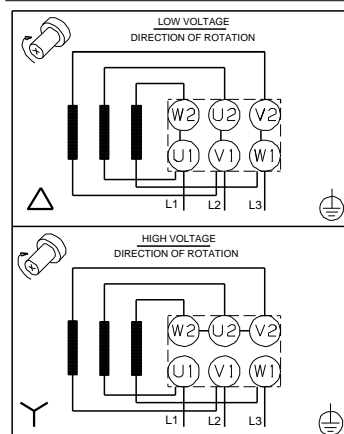
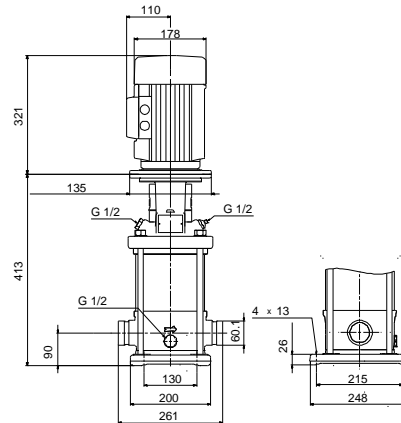
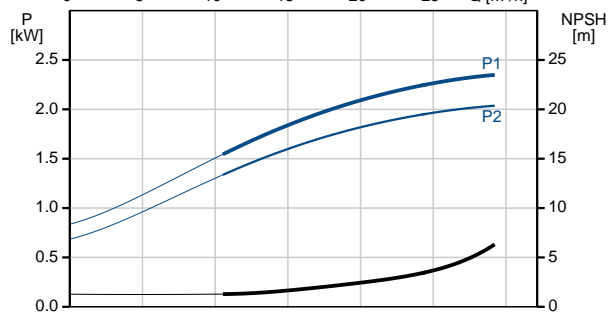
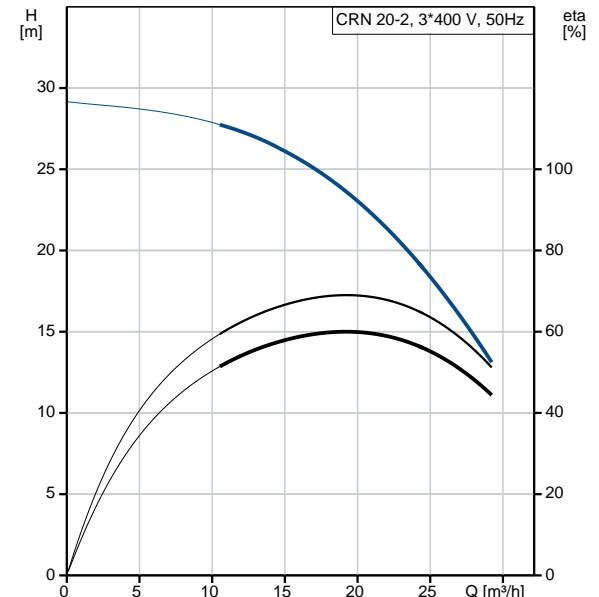
Date:

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### 96500382 CRN 20-2 A-P-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CRN 20-2 A-P-A-E-HQQE
Product No:	96500382
EAN number:	5700396200606
<b>Technical:</b>	
Pump speed on which pump data are based:	2899 rpm
Rated flow:	21 m <sup>3</sup> /h
Rated head:	22 m
Head max:	28.9 m
Stages:	2
Impellers:	2
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
<b>Materials:</b>	
Base:	Stainless steel EN 1.4408 AISI 316
Impeller:	Stainless steel EN 1.4401 AISI 316
Material code:	A
Code for rubber:	E
Bearing:	SIC
<b>Installation:</b>	
Maximum ambient temperature:	60 °C
Maximum operating pressure:	25 bar
Max pressure at stated temp:	25 bar / 120 °C 25 bar / -20 °C
Type of connection:	PJE
Size of inlet connection:	DN 50 2 inch
Size of outlet connection:	DN 50 2 inch
Pressure rating for pipe connection:	PN 50
Flange size for motor:	FT115
Connect code:	P
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	-20 .. 120 °C
Liquid temperature during operation:	20 °C
Density:	998.2 kg/m <sup>3</sup>
<b>Electrical data:</b>	
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





Company name:

Created by:

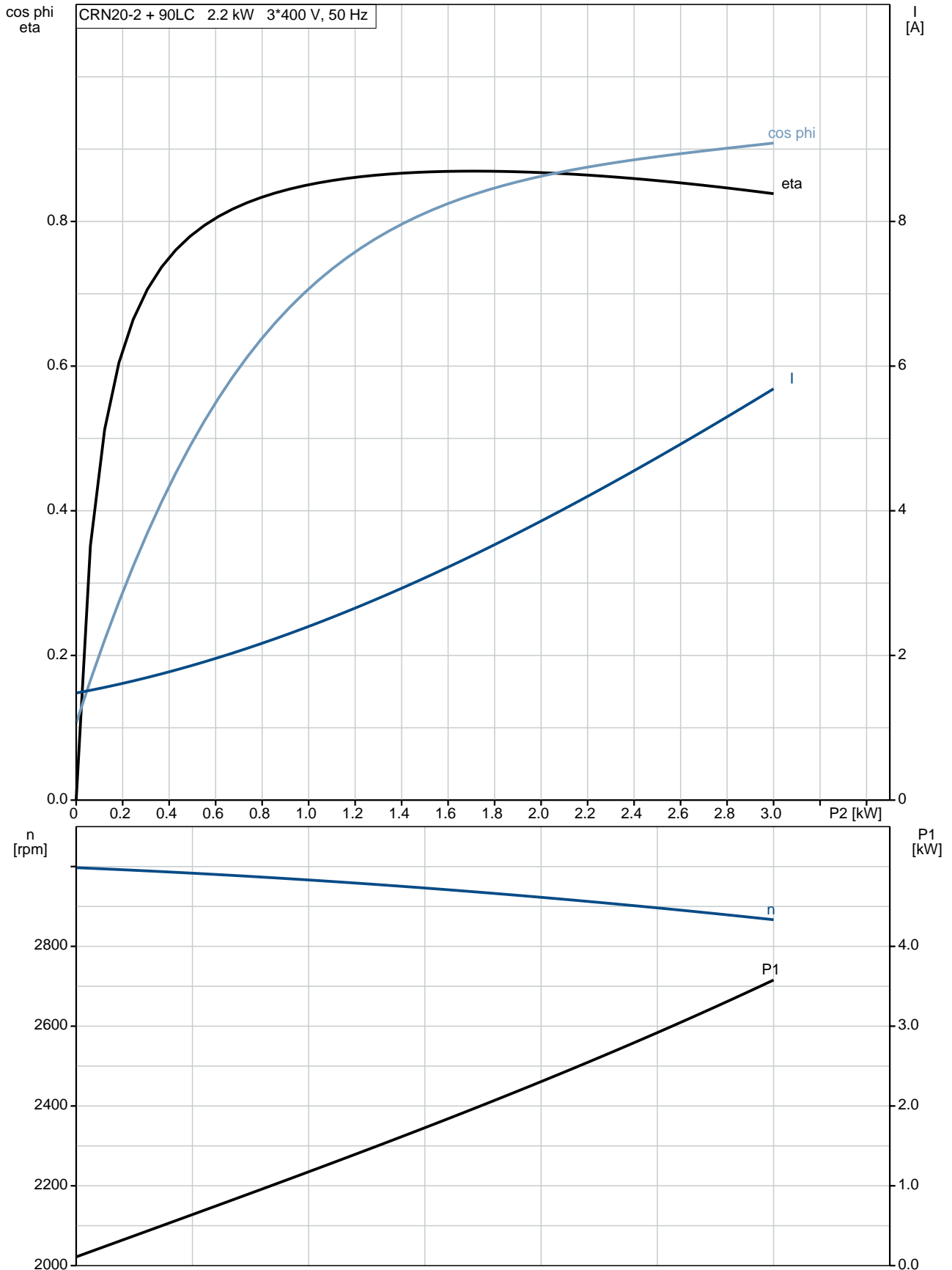
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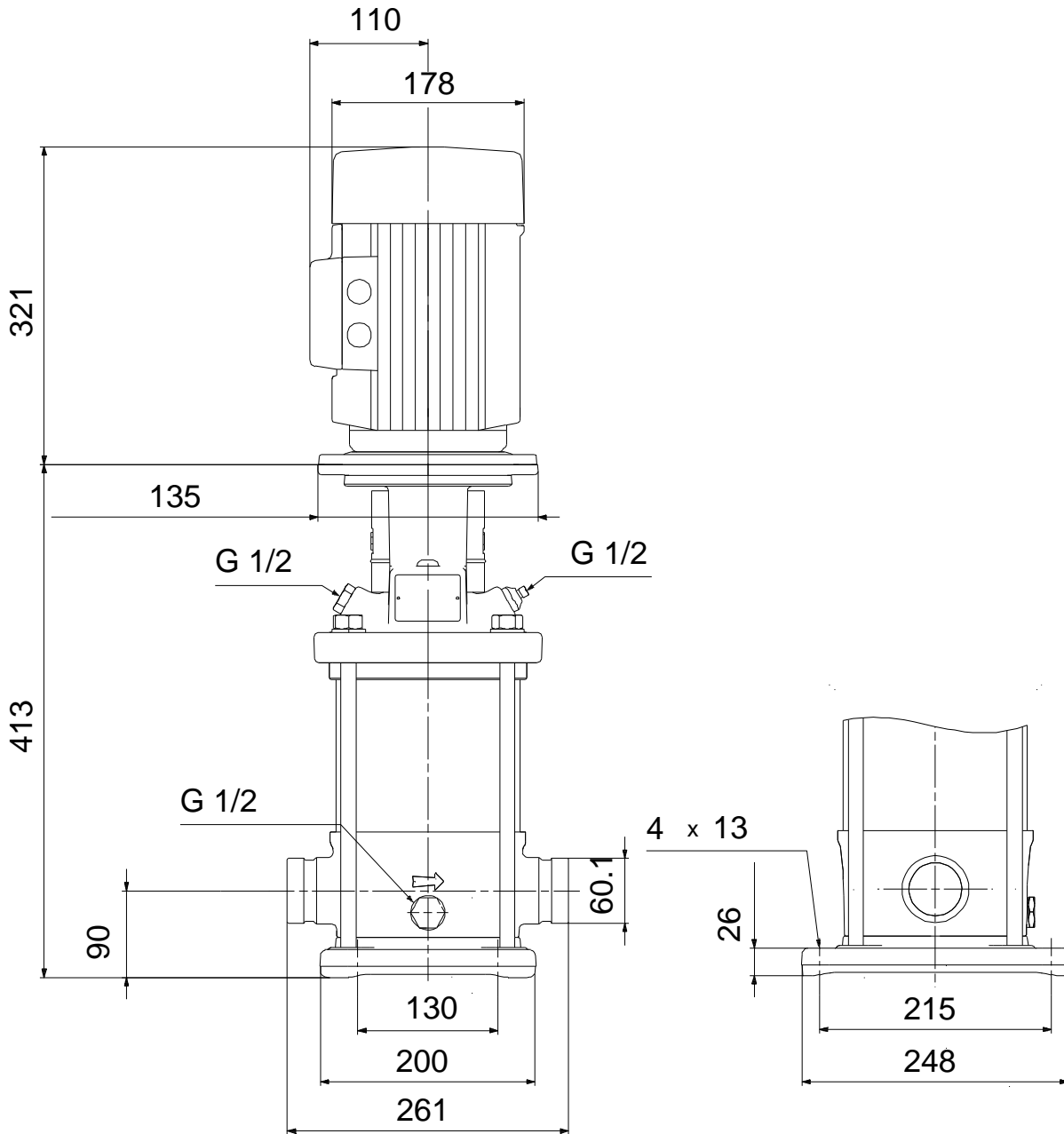
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Description	Value
Rated current:	7.70/4.45 A
Starting current:	850-950 %
Cos phi - power factor:	0.89-0.87
Rated speed:	2890-2910 rpm
Efficiency:	IE3 85,9%
Motor efficiency at full load:	85.9 %
Motor efficiency at 3/4 load:	86.8 %
Motor efficiency 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
<b>Controls:</b>	
Frequency converter:	NONE
<b>Others:</b>	
Minimum efficiency index, MEI $\eta_{min}$ :	0.70
Net weight:	46 kg
Gross weight:	50 kg
Shipping volume:	0.094 m <sup>3</sup>
Danish VVS No.:	385915020

## 96500382 CRN 20-2 A-P-A-E-HQQE 50 Hz



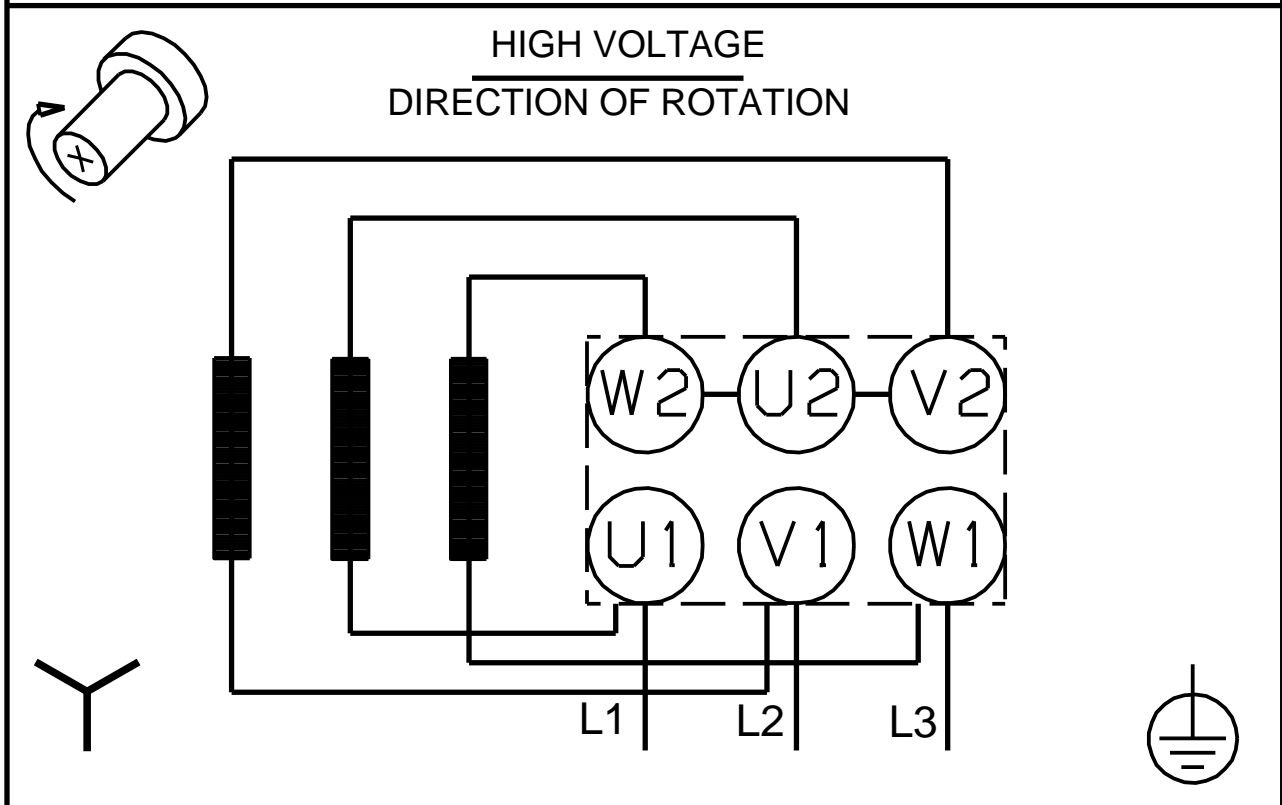
## 96500382 CRN 20-2 A-P-A-E-HQQE 50 Hz



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

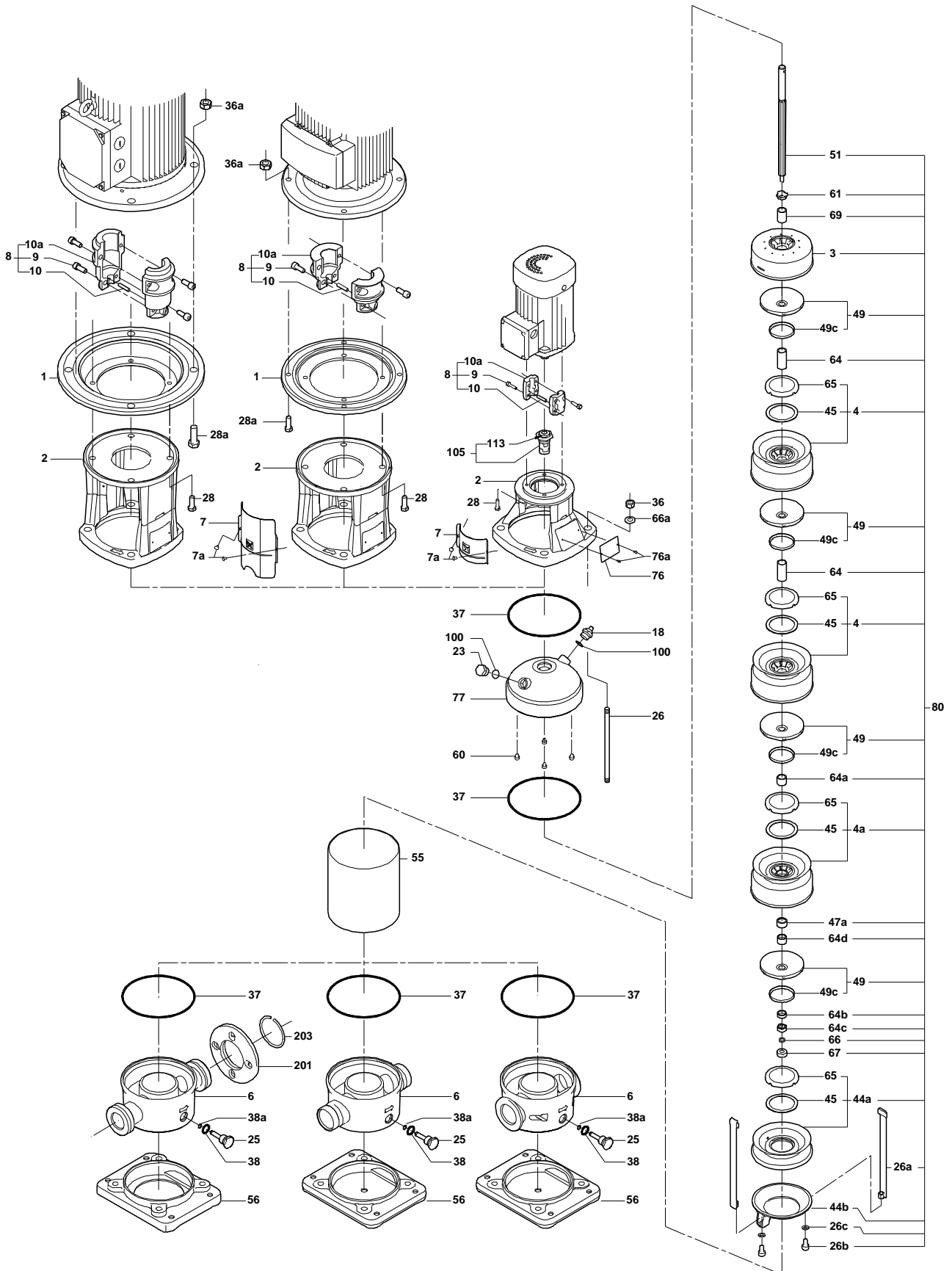


**96500382 CRN 20-2 A-P-A-E-HQQE 50 Hz**



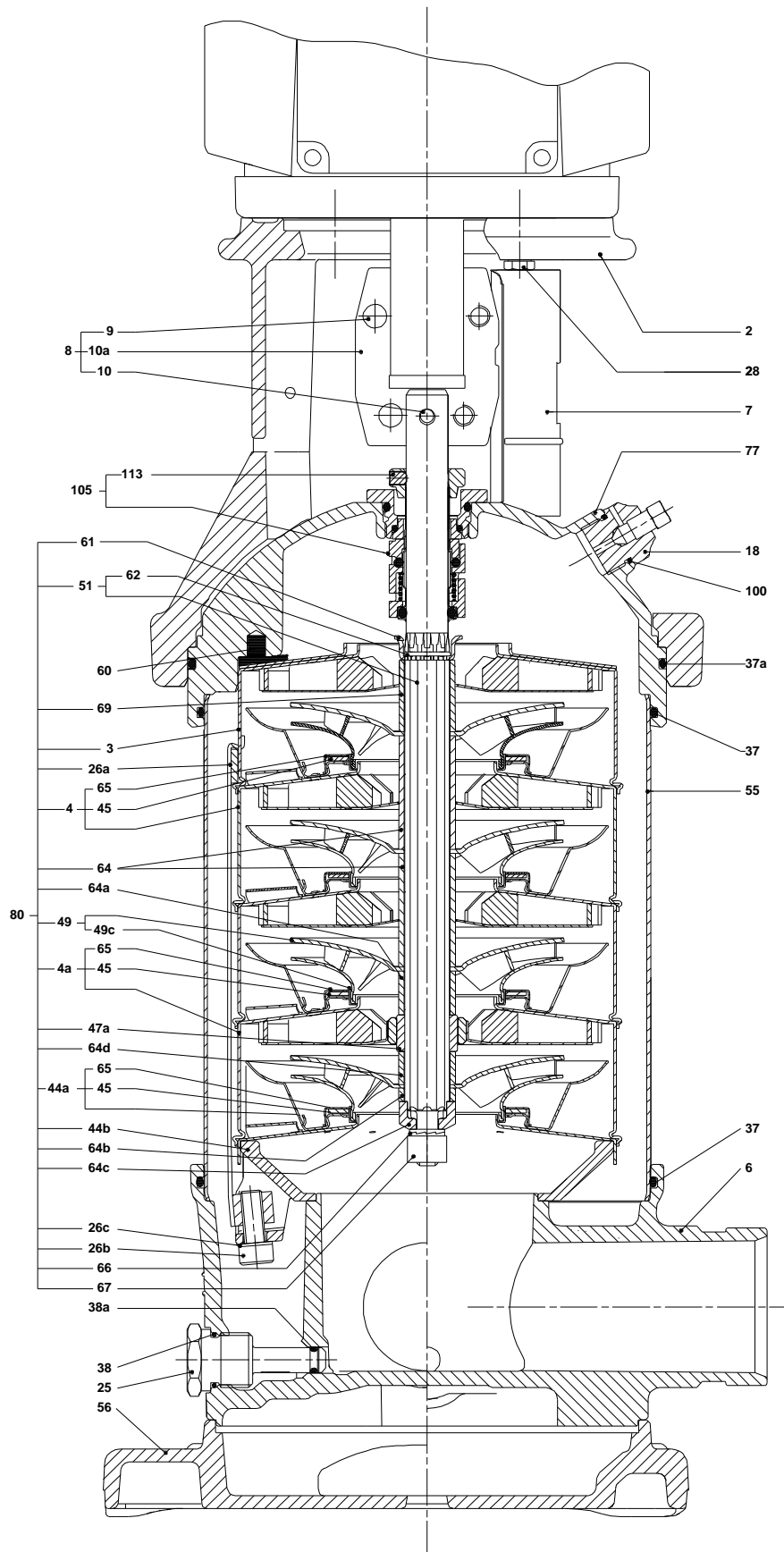
Note! All units are in [mm] unless others are stated.

(TM02 6498 1003)

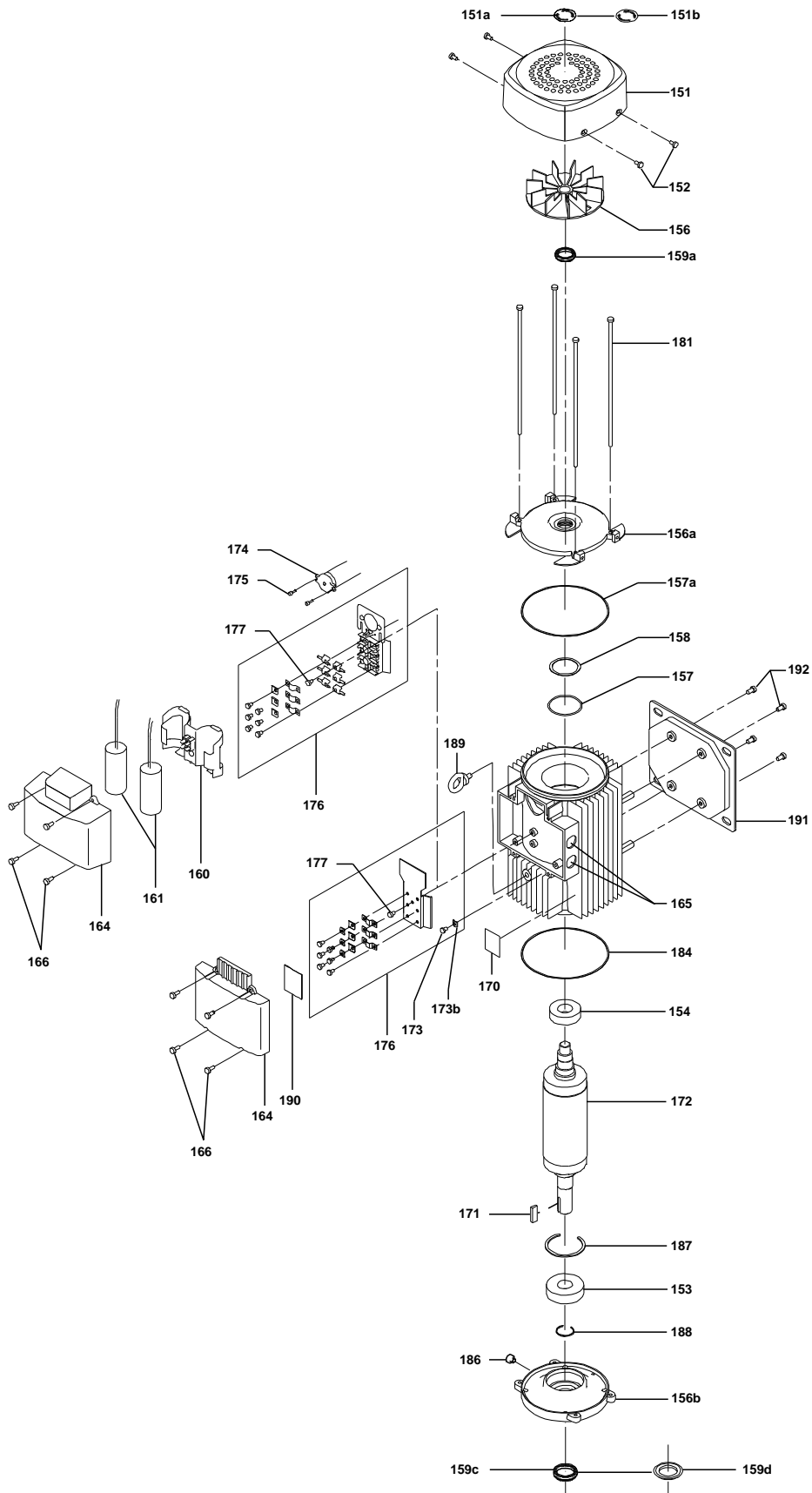


TM02

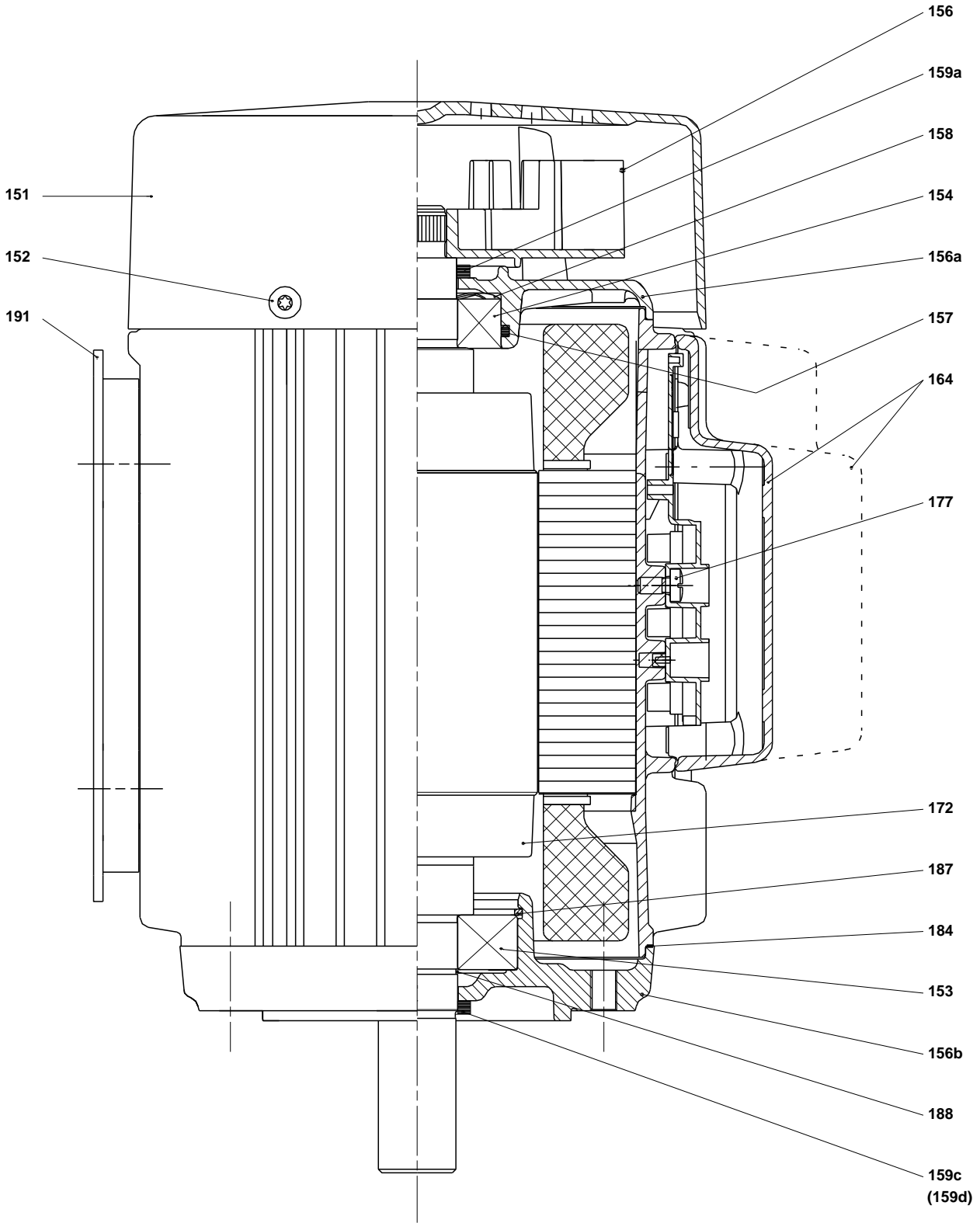
(TM02 6540 1003)



(tm029184 0505)



(tm029178 2004)



**Spare parts CRN 20-2, Product No. 96500382**  
**Valid from 1.1.2011 (1152)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, chamber stack			96491785	1	pcs
- 80	Chamber stack				1	
- 3	Top intermediate chamber					
	Guide vane					
	Cover plate					
3	Intermediate chamber					
- 4a	Intermediate chamber cpl.					
	Sand Lifter					
	Guide cup					
	Bearing plate					
	Guide vane					
3	Intermediate chamber					
45a	Neck ring cpl.					
47	Bearing bush					
65	Retainer					
26a	Strap cpl.					
26.c	Washer		Designation: DIN 125A Thickness: 1,6			
26.b	Hex head screw					
44b	Inlet part					
- 44a	Inlet part cpl.					
45a	Neck ring cpl.					
65	Retainer					
47	Bearing ring					
- 49	Impeller cpl.					
49c	Wear ring					
49	Impeller					
- 51	Shaft, spline, cpl.					
62	Retaining ring					
64d	Spacing bush					
64c	Spacing pipe		Length (mm): 12.7			
64b	Spacing bush		Length (mm): 5.00			
64a	Spacing pipe		Internal diameter: 17,5 Length (mm): 17			
66	Wedge lock washer					
67	Lock nut		Thread: M8			
69	Spacing bush					
-	Kit, coupling			96511319	1	pcs
	Adjusting fork				1	
9	Hex socket head cap screw		Designation: DIN 912 Length (mm): 25 Thread: M8		4	
10a	Coupling half				2	
10	Shaft pin		Diameter: 5 Length (mm): 26		1	
-	Kit, coupling guard			96509612	1	pcs
7.a	Combi Slot Torx screw				4	
7	Coupling guard				2	
-	Kit, gaskets			96509609	1	pcs
	Gasket				2	
24	O-ring				2	
37	O-ring				2	
38a	O-ring		Diameter: 5,3		1	

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
			Material type: EPDM			
			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			
60	Spring				4	
415	Gasket				2	
441b	Gasket		Internal diameter: 49		2	
			Outer diameter: 92			
			Thickness: 2			
-	Kit, plug			96511312	1	pcs
- 18	Air vent screw				1	
	Spindle					
	Plug					
25a	Drain plug				1	
25	Plug				1	
38a	O-ring		Diameter: 5,3		1	
			Material type: FKM			
			Thickness: 2,4			
38a	O-ring		Diameter: 5,3		1	
			Material type: EPDM			
			Thickness: 2,4			
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			96511844	1	pcs
	Emery cloth				1	
	Grinding device				1	
105	Shaft seal		Material type: HQQE		1	
-	Kit, wear parts			96511824	1	pcs
- 4a	Intermediate chamber cpl.				1	
	Sand Lifter					
	Guide cup					
	Bearing plate					
	Guide vane					
3	Intermediate chamber					
45a	Neck ring cpl.					
47	Bearing bush					
65	Retainer					
26.c	Washer		Designation: DIN 125A		2	
			Thickness: 1,6			
26.b	Hex head screw				2	
45a	Neck ring cpl.				5	
47	Bearing ring				1	
49c	Wear ring				6	
62	Retaining ring				1	
64d	Spacing bush				1	

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
64c	Spacing pipe		Length (mm): 12.7		1	
64b	Spacing bush		Length (mm): 5.00		1	
64a	Spacing pipe		Internal diameter: 17,5		1	
			Length (mm): 17			
65	Retainer				5	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
-	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			
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					





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Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, terminal box			96279771	1	
164	Terminal box cover w/gasket					
166	Pan head thread forming screw					
1a	Pump head			98933809	1	pcs
2	Pump cover			98481138	1	pcs
+ 3	Bulk, Top intermediate chamber (3 pcs)			98371113	1	pcs
+ 3	Top intermediate chamber			98734577	1	pcs
- 4a	Bulk, Intermediate chamber cpl. (10 pcs)			96538853	1	pcs
3	Intermediate chamber			98371143	1	
65	Retainer			96547341	1	
+ 4a	Intermediate chamber cpl.			98371117	1	pcs
6	Base			98654159	1	pcs
7.a	Bulk, Combi Slot Torx screw (1000 pcs)			96886324	4	pcs
10	Bulk, Shaft pin (10 pcs)		Diameter: 5 Length (mm): 26	96536473	1	pcs
+ 18	Bulk, Air vent screw (5 pcs)			96547461	1	pcs
+ 18	Air vent screw			95061351	1	pcs
25	Bulk, Plug (10 pcs)			96536013	1	pcs
26a	Strap cpl.			98967067	2	pcs
26.c	Bulk, Washer (4 pcs)		Designation: DIN 125A Thickness: 1,6	99262704	2	pcs
26.c	Washer		Designation: DIN 125A Thickness: 1,6	96586880	2	pcs
26	Staybolt			98982874	4	pcs
37.a	Bulk, O-ring (20 pcs)			96538857	1	pcs
38a	Bulk, O-ring (10 pcs)		Diameter: 5,3 Material type: EPDM Thickness: 2,4	99198791	1	pcs
38	Bulk, O-ring (10 pcs)		Diameter: 16,3 Material type: EPDM Thickness: 2,4	99198815	2	pcs
38	Bulk, O-ring (50 pcs)		Diameter: 16,3 Material type: EPDM Thickness: 2,4	99412727	2	pcs
44b	Inlet part			98814593	1	pcs
+ 44a	Inlet part cpl.			98818922	1	pcs
47	Bulk, Bearing ring (10 pcs)			96538795	1	pcs
- 49	Bulk, Impeller cpl. (5 pcs)			98394310	2	pcs
49c	Bulk, Wear ring (10 pcs)			96547340	1	
+ 49	Impeller cpl.			98394459	2	pcs
- 51	Shaft, spline, cpl.			98368626	1	pcs
62	Retaining ring			96588022	1	
55	Outer sleeve			98812632	1	pcs
56	Base plate			98481136	1	pcs
60	Bulk, Spring (20 pcs)			96538963	4	pcs
64d	Bulk, Spacing bush (20 pcs)			96538947	1	pcs
64c	Bulk, Spacing pipe (5 pcs)		Length (mm): 12.7	97980241	1	pcs
64b	Bulk, Spacing bush (20 pcs)		Length (mm): 5.00	96535098	1	pcs
64a	Bulk, Spacing pipe (10 pcs)		Internal diameter: 17,5 Length (mm): 17	98417487	1	pcs
66	Bulk, Wedge lock washer (10 pcs)			96536157	1	pcs
67	Bulk, Lock nut (10 pcs)		Thread: M8	98277008	1	pcs
69	Bulk, Spacing bush (20 pcs)			96538949	1	pcs
76a	Bulk, Rivet (100 pcs)			96620489	2	pcs
105	Bulk, Shaft seal (11 pcs)		Material type: HQQE	96538914	1	pcs