

Qty.	Description
------	-------------

1	CR 20-5 A-F-A-E-HQQE
---	----------------------



Note! Product picture may differ from actual product

Product No.: [96500511](#)

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 DIN flanges.

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

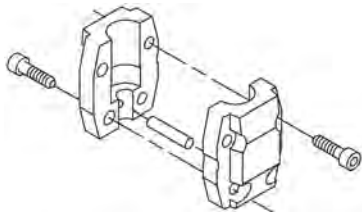
### Further product details

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:

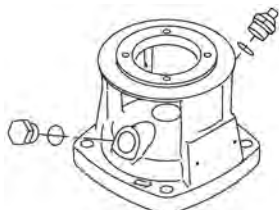
- 1) Alkaline-based cleaning.
  - 2) Zinc phosphating.
  - 3) Cathodic electro-deposition.
  - 4) Curing to a dry film thickness 18-22 my m.
- The colour code for the finished product is NCS 9000/RAL 9005.

### 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.



**Qty. Description**

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.

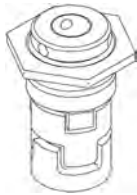
Primary seal:

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

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)

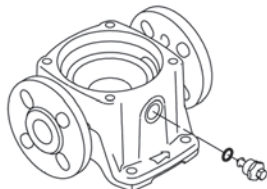
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



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 base is made of cast iron. The flanges and base are cast in one piece. The outlet side of the base has a drain plug. The pump is secured to the foundation by four bolts through the base plate.



### Motor

The motor is a totally enclosed, fan-cooled motor with principal dimensions to IEC and DIN standards. The motor is flange-mounted with free-hole flange (FF).

Motor-mounting designation in accordance with IEC 60034-7: IM B 5 (Code I) / IM 3001 (Code II).

Electrical tolerances comply with IEC 60034.

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

The motor has thermistors (PTC sensors) in the windings in accordance with DIN 44081/DIN 44082. The protection reacts to both slow- and quick-rising temperatures, e.g. constant overload and stalled conditions.

Thermal switches must be connected to an external control circuit in a way which ensures that the automatic reset cannot cause accidents. The motors must be connected to a motor-protective circuit breaker according to local regulations.

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

Qty.	Description
	Density: 998.2 kg/m <sup>3</sup>  <b>Technical:</b> Pump speed on which pump data are based: 2919 rpm Rated flow: 21 m <sup>3</sup> /h Rated head: 58 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: Cast iron EN 1561 EN-GJL-200 ASTM A48-25B Impeller: Stainless steel EN 1.4301 AISI 304 Bearing: SIC  <b>Installation:</b> 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: DIN Size of inlet connection: DN 50 Size of outlet connection: DN 50 Pressure rating for pipe connection: PN 25 Flange rating inlet: 300 lb Flange size for motor: FF265  <b>Electrical data:</b> Motor standard: IEC Motor type: 132SC IE Efficiency class: IE3 Rated power - P2: 5.5 kW Power (P2) required by pump: 5.5 kW Mains frequency: 50 Hz Rated voltage: 3 x 380-415D V Rated current: 11 A Starting current: 1080-1180 % Cos phi - power factor: 0.87-0.82 Rated speed: 2920-2940 rpm Efficiency: IE3 89,2% Motor efficiency at full load: 89.2 % Motor efficiency at 3/4 load: 90.0 % Motor efficiency at 1/2 load: 89.6 % Number of poles: 2 Enclosure class (IEC 34-5): 55 Dust/Jetting Insulation class (IEC 85): F  <b>Others:</b> Minimum efficiency index, MEI $\hat{a}\%_{\hat{a}}$ : 0.70 Net weight: 90 kg Gross weight: 112 kg Shipping volume: 0.285 m <sup>3</sup> Danish VVS No.: 385905350



Company name:

Created by:

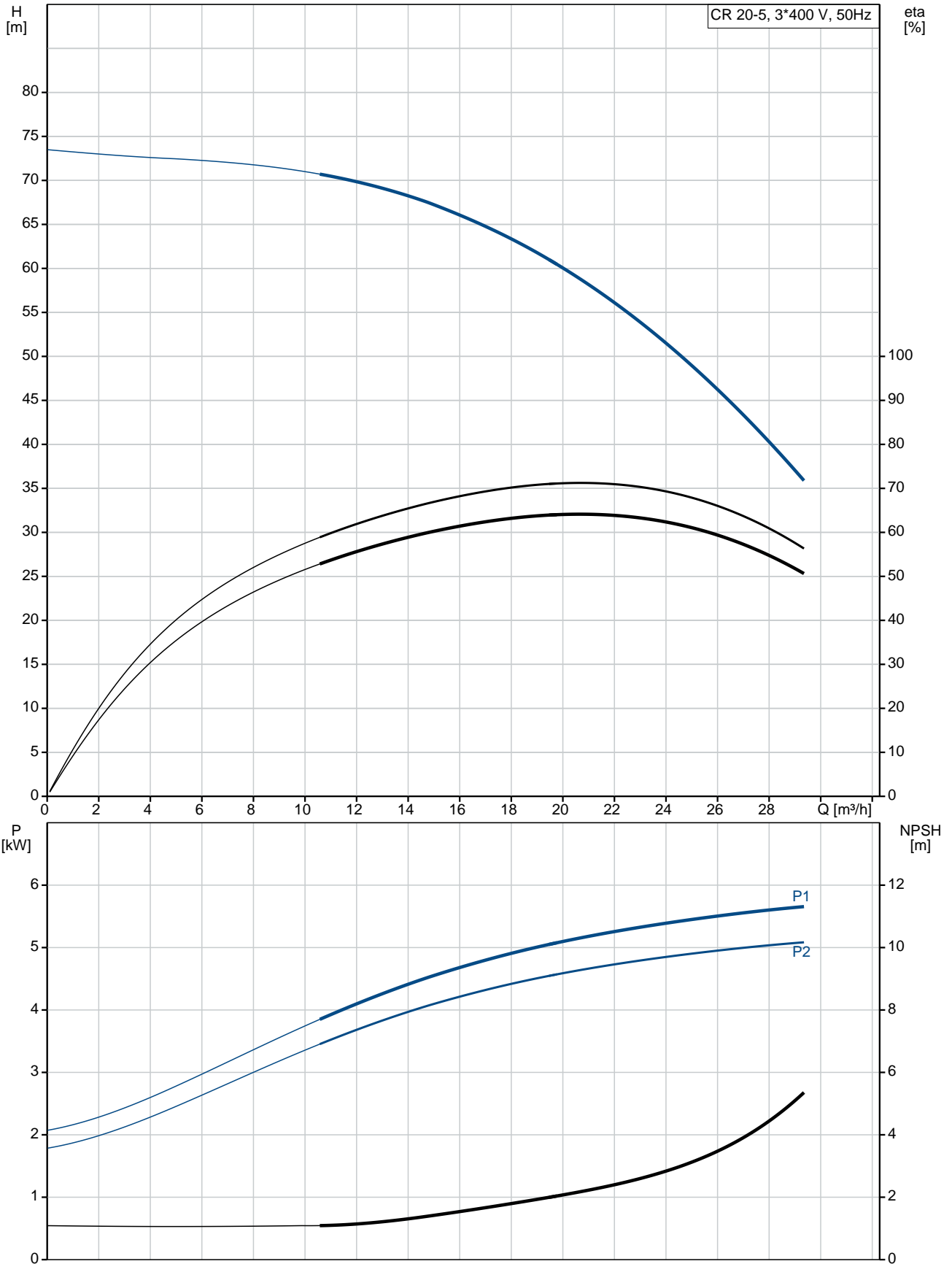
Phone:

Date:

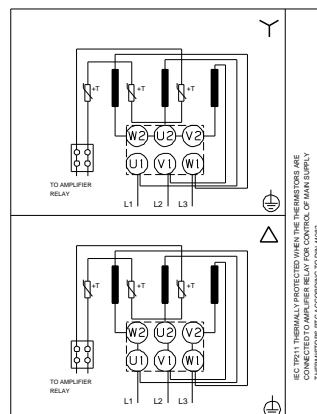
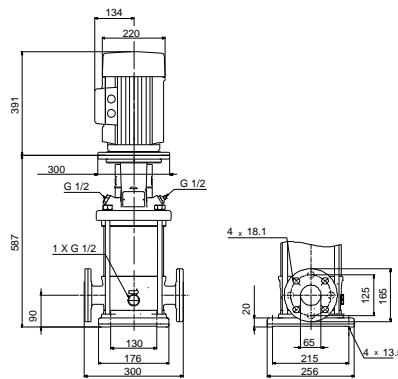
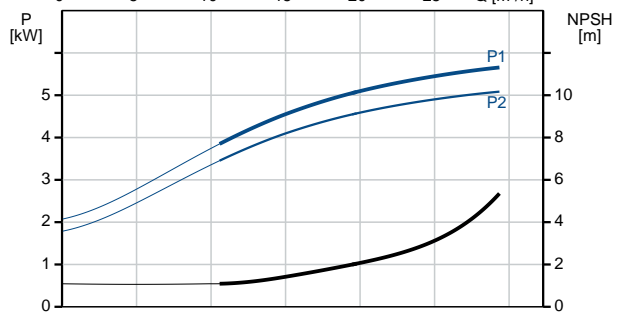
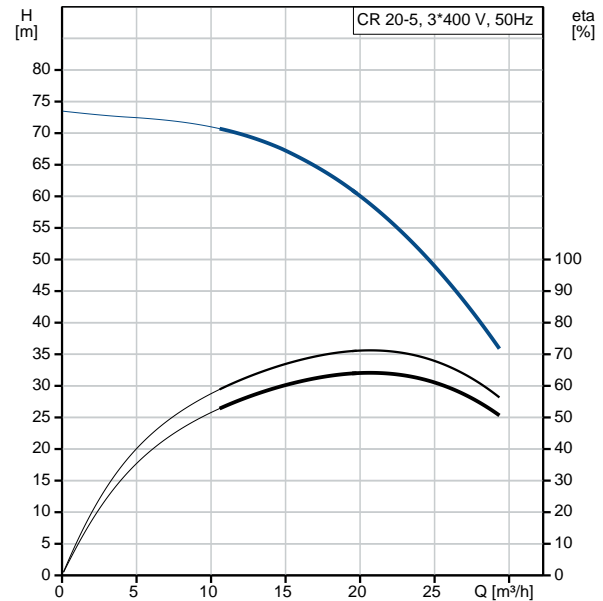
16/02/2019

Qty.	Description
	Swedish RSK No.: 5823489

## 96500511 CR 20-5 A-F-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CR 20-5 A-F-A-E-HQQE
Product No:	96500511
EAN number:	5700396203287
<b>Technical:</b>	
Pump speed on which pump data are based:	2919 rpm
Rated flow:	21 m <sup>3</sup> /h
Rated head:	58 m
Head max:	73.4 m
Stages:	5
Impellers:	5
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:	Cast iron EN 1561 EN-GJL-200
Impeller:	Stainless steel EN 1.4301 AISI 304
Material code:	A
Code for rubber:	E
Bearing:	SIC
<b>Installation:</b>	
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:	DIN
Size of inlet connection:	DN 50
Size of outlet connection:	DN 50
Pressure rating for pipe connection:	PN 25
Flange rating inlet:	300 lb
Flange size for motor:	FF265
Connect code:	F
<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:	132SC
IE Efficiency class:	IE3
Rated power - P2:	5.5 kW
Power (P2) required by pump:	5.5 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 380-415D V
Rated current:	11 A
Starting current:	1080-1180 %





Company name:

Created by:

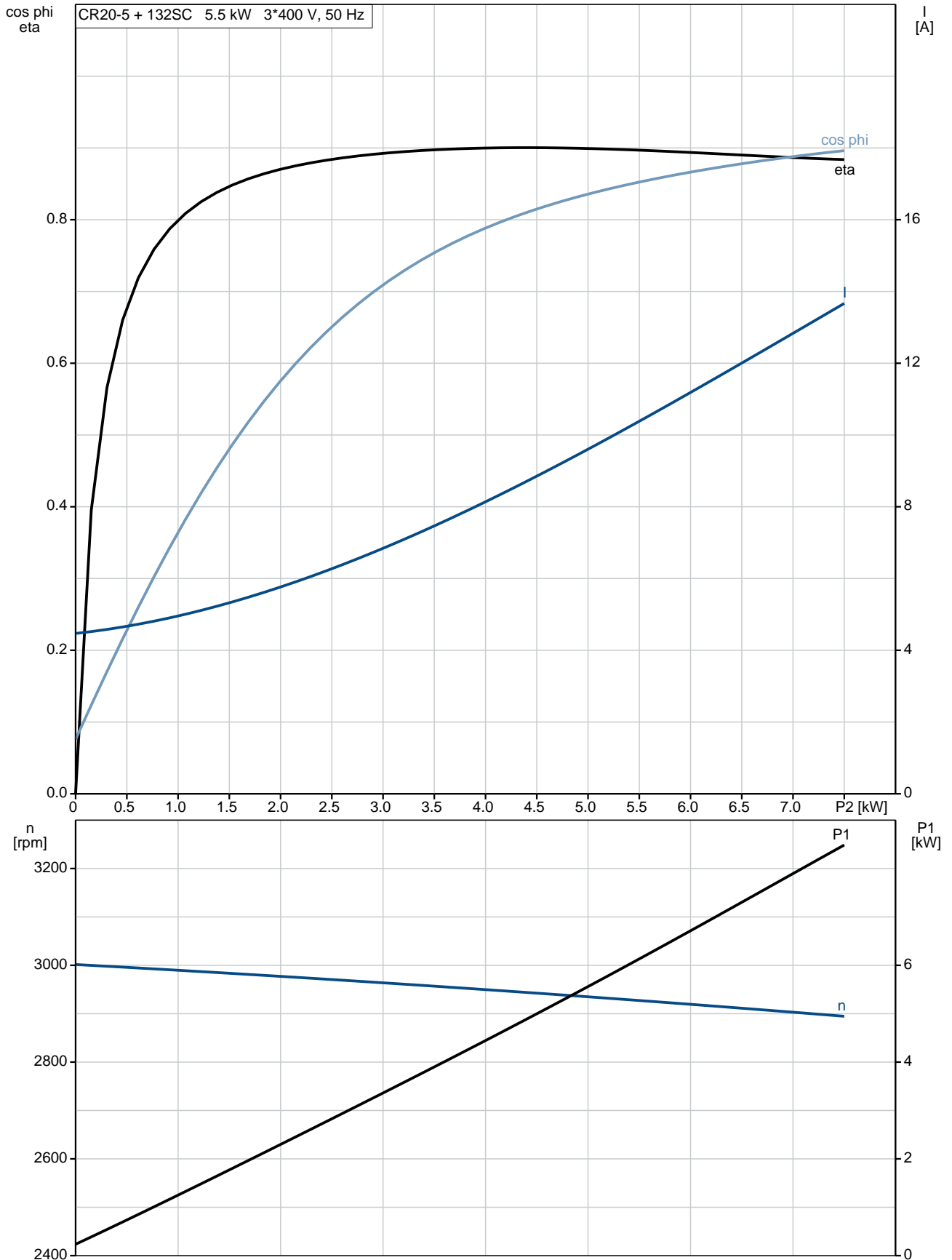
Phone:

Date:

16/02/2019

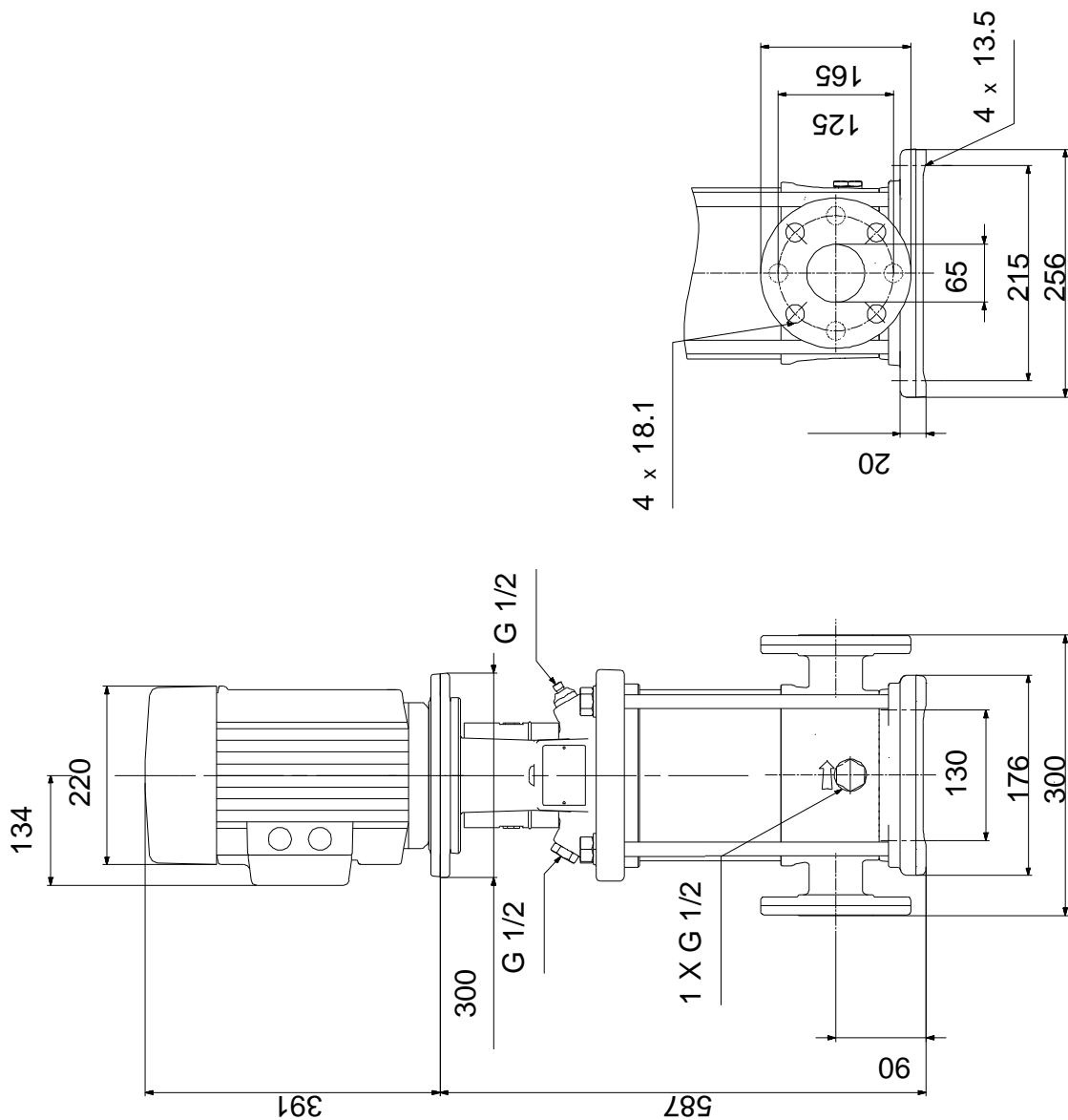
Description	Value
Cos phi - power factor:	0.87-0.82
Rated speed:	2920-2940 rpm
Efficiency:	IE3 89,2%
Motor efficiency at full load:	89.2 %
Motor efficiency at 3/4 load:	90.0 %
Motor efficiency at 1/2 load:	89.6 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	PTC
Motor No:	85U17417
<b>Controls:</b>	
Frequency converter:	NONE
<b>Others:</b>	
Minimum efficiency index, MEI %:	0.70
Net weight:	90 kg
Gross weight:	112 kg
Shipping volume:	0.285 m <sup>3</sup>
Danish VVS No.:	385905350
Swedish RSK No.:	5823489

## 96500511 CR 20-5 A-F-A-E-HQQE 50 Hz





**96500511 CR 20-5 A-F-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.

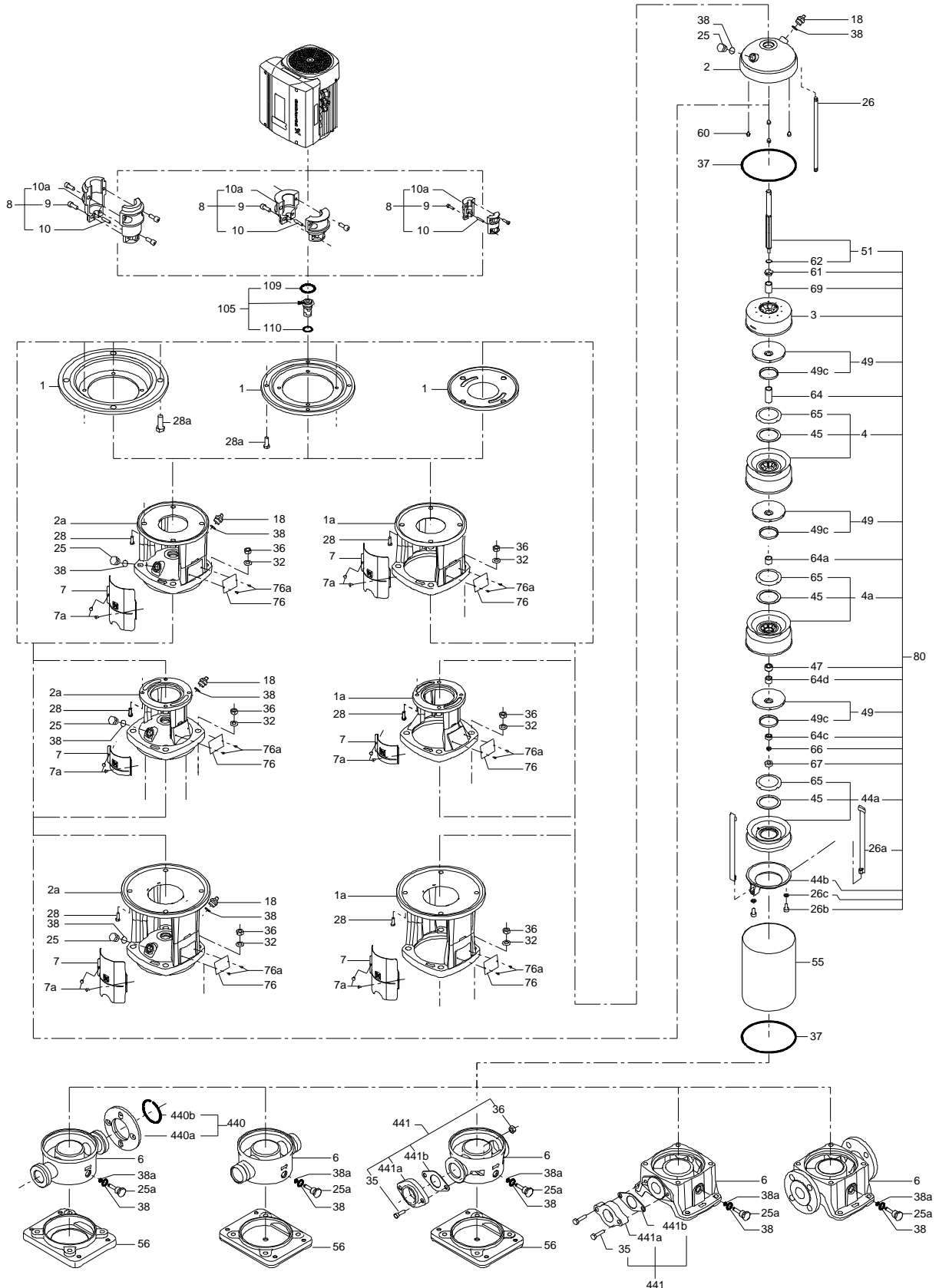
## 96500511 CR 20-5 A-F-A-E-HQQE 50 Hz



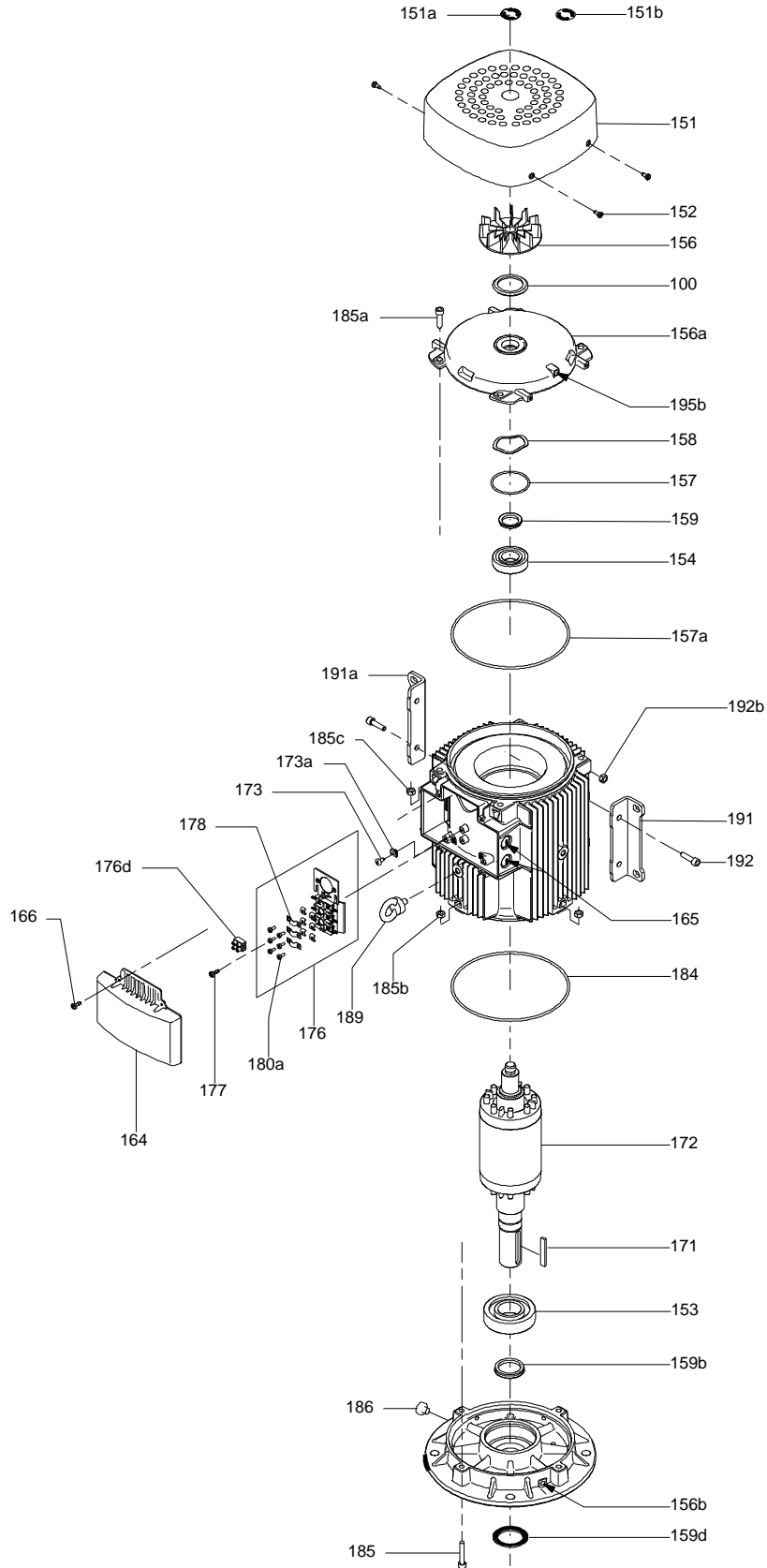
IEC TP211 THERMALLY PROTECTED WHEN THE THERMISTORS ARE  
CONNECTED TO AMPLIFIER RELAY FOR CONTROL OF MAIN SUPPLY  
THERMISTORS PTC ACCORDING TO DIN 44082

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

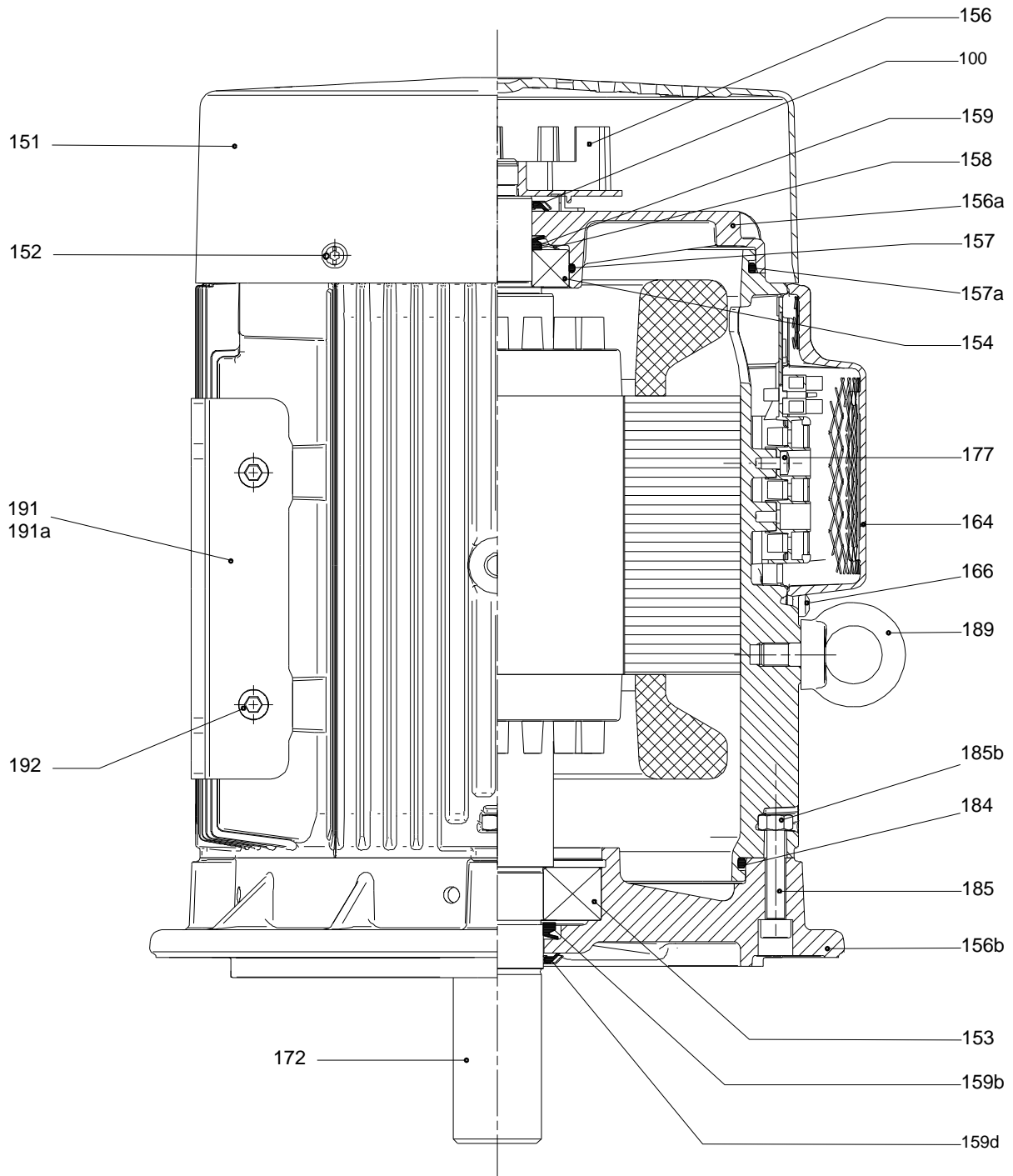
( tm069469 for MECR15,20 standard)



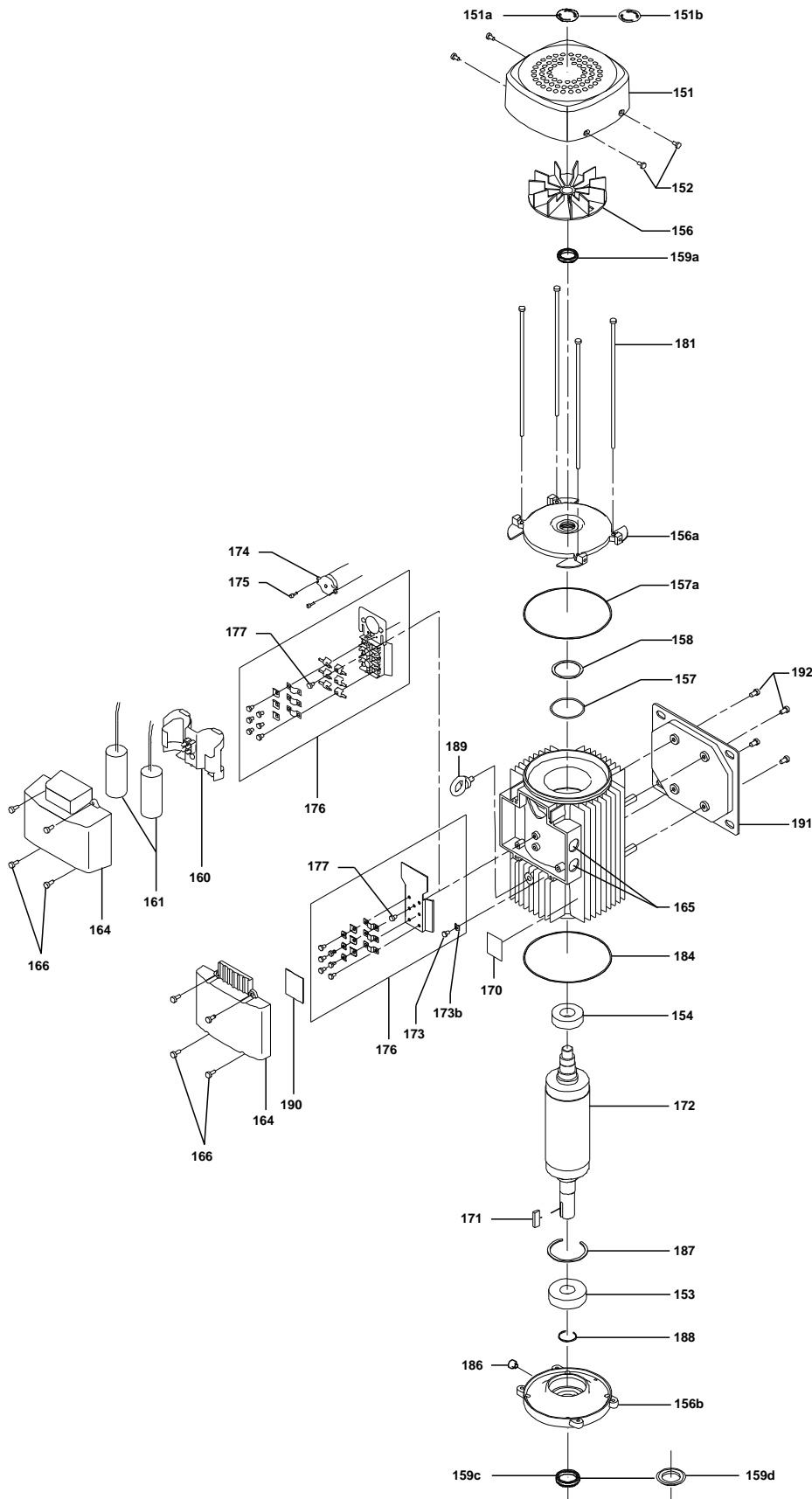
## Exploded view



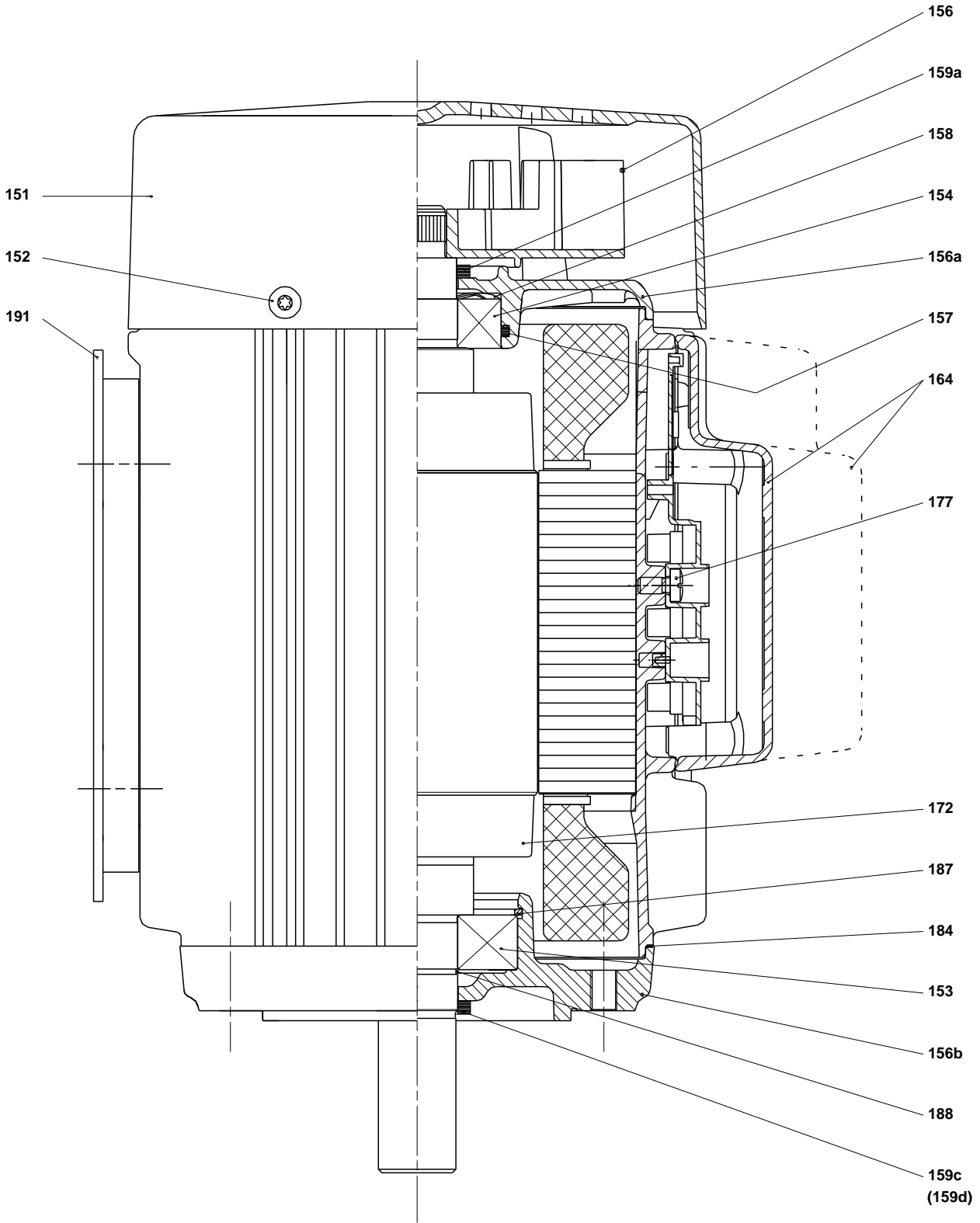
**Sectional drawing**



(tm029184 0505)



(tm029178 2004)



**Spare parts CR 20-5, Product No. 96500511**  
**Valid from 1.1.2011 (1152)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, chamber stack			96508545	1	pcs
- 80	Chamber stack				1	
- 3	Top intermediate chamber					
	Front plate					
	Spare, turbulence optimizer KP					
	Guide vane					
- 4a	Intermediate chamber cpl.					
	Bearing plate					
3	Intermediate chamber					
45a	Neck ring cpl.					
47	Bearing bush					
65	Retainer for upper seal ring					
- 4	Intermediate chamber cpl.					
45a	Neck ring cpl.					
65	Retainer for upper seal ring					
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 for upper seal ring					
47	Bearing ring					
- 49	Impeller cpl.					
	Impeller blade					
	Impeller plate					
	Impeller plate					
49c	Wear ring					
- 51	Shaft, spline, cpl.					
	Bar					
62	Stop ring					
64d	Spacing bush					
64c	Spacing pipe		Length (mm): 12.7			
64a	Spacing pipe		Internal diameter: 17,5			
			Length (mm): 17			
64	Spacing pipe		Length (mm): 43.6			
66	Wedge lock washer					
67	Lock nut		Thread: M8			
69	Spacing bush					
-	Kit, coupling			96511351	1	pcs
	Adjusting fork				1	
- 8	Coupling				1	
9	Hex socket head cap screw		Designation: DIN 912 Length (mm): 25 Thread: M10			
10a	Coupling half					
10	Shaft pin		Diameter: 5 Length (mm): 26			
-	Kit, coupling guard			96509613	1	pcs
7.a	Combi Slot Torx screw				4	
7	Coupling guard				2	
-	Kit, gaskets			96509609	1	pcs



Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
	Gasket				2	
24	O-ring				2	
37	O-ring				2	
38a	O-ring		Diameter: 5,3		1	
			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			96511311	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	



Company name:

Created by:

Phone:

Date:

16/02/2019

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
47	Bearing ring				1	
49c	Wear ring				6	
62	Retaining ring				1	
64d	Spacing bush				1	
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			85904020	1	pcs
-	Kit, bearing cpl.			96279803	1	
111	Ball bearing		Designation: 6206.2Z.C3.SYN			
153	Angular-contact bearing					
157	O-ring		Diameter: 62			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
-	Kit, end shield			96279790	1	
156a	End shield					
157	O-ring		Diameter: 62			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
159a	Seal ring					
-	Kit, eyebolt			96279825	1	
189	Eyebolt					
-	Kit, fan			96279758	1	
156	Fan					
159c	Seal ring					
159a	Seal ring					
-	Kit, fan cover			96279756	1	
151b	Label					
151	Fan cover					
152	Pan head thread forming screw					
-	Kit, flange			96279784	1	
156b	Flange					
159.c	Seal ring					
186	Drain plug					
-	Kit, retaining ring			96279801	1	
187	Retaining ring					
188	Retaining ring					
-	Kit, shaft seal			96279764	1	
159d	Seal ring					
159c	Seal ring					
-	Kit, staybolts			96279793	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					



Company name:

Created by:

Phone:

Date:

16/02/2019

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, terminal box			96279772	1	
164	Terminal box cover w/gasket					
166	Pan head thread forming screw					
-	Motor			85901556	1	pcs
-	Kit, bearing cpl.			96279803	1	
111	Ball bearing		Designation: 6206.2Z.C3.SYN			
153	Angular-contact bearing					
157	O-ring		Diameter: 62 Material type: NBR Thickness: 3			
158	Waved washer					
-	Kit, end shield			96279790	1	
156a	End shield					
157	O-ring		Diameter: 62 Material type: NBR Thickness: 3			
158	Waved washer					
159a	Seal ring					
-	Kit, eyebolt			96279825	1	
189	Eyebolt					
-	Kit, fan			96279758	1	
156	Fan					
159c	Seal ring					
159a	Seal ring					
-	Kit, fan cover			96279756	1	
151b	Label					
151	Fan cover					
152	Pan head thread forming screw					
-	Kit, flange			96279784	1	
156b	Flange					
159.c	Seal ring					
186	Drain plug					
-	Kit, retaining ring			96279801	1	
187	Retaining ring					
188	Retaining ring					
-	Kit, shaft seal			96279764	1	
159d	Seal ring					
159c	Seal ring					
-	Kit, staybolts			96279793	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			96279772	1	
164	Terminal box cover w/gasket					
166	Pan head thread forming screw					
1	Flange			99104283	1	pcs
2a	Pump head			98770239	1	pcs
+ 3	Bulk, Top intermediate chamber (3 pcs)			96538971	1	pcs
+ 3	Top intermediate chamber			98371105	1	pcs



Company name:

Created by:

Phone:

Date:

16/02/2019

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
- 4a	Bulk, Intermediate chamber cpl. (10 pcs)			96538842	1	pcs
3	Bulk, Intermediate chamber (3 pcs)			96535086	1	
+ 4a	Intermediate chamber cpl.			98371109	1	pcs
- 4	Bulk, Intermediate chamber cpl. (10 pcs)			96538817	3	pcs
65	Bulk, Retainer for upper seal ring (20 pcs)			97699527	1	
65	Retainer for upper seal ring			96587913	1	
+ 4	Intermediate chamber cpl.			98371107	3	pcs
6	Base			98681111	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
25a	Bulk, Drain plug (10 pcs)			96535881	1	pcs
26a	Strap cpl.			98967460	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	Bulk, Staybolt (4 pcs)			98429009	4	pcs
26	Staybolt			98982844	4	pcs
32	Bulk, Washer (100 pcs)		Designation: DIN 125 A Internal diameter: 17 Outer diameter: 30 Thickness: 3	98923051	4	pcs
36	Bulk, Hex nut (20 pcs)		Thread: M16	96620480	4	pcs
37	Bulk, O-ring (20 pcs)			96538857	2	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			98814595	1	pcs
+ 44a	Inlet part cpl.			98818924	1	pcs
47	Bulk, Bearing ring (10 pcs)			96538795	1	pcs
- 49	Bulk, Impeller cpl. (5 pcs)			98394308	5	pcs
49c	Bulk, Wear ring (10 pcs)			96547340	1	
+ 49	Bulk, Impeller cpl. (10 pcs)			96538799	5	pcs
+ 49	Impeller cpl.			98394458	5	pcs
+ 51	Shaft, spline, cpl.			98368611	1	pcs
55	Outer sleeve			98771299	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
64a	Bulk, Spacing pipe (10 pcs)		Internal diameter: 17,5 Length (mm): 17	98417487	1	pcs
64	Bulk, Spacing pipe (20 pcs)		Length (mm): 43.6	96535107	3	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	1	pcs
105	Bulk, Shaft seal (11 pcs)		Material type: HQQE	96538914	1	pcs