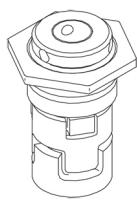
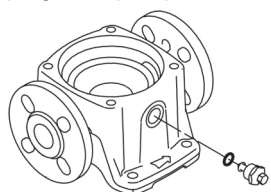


Qty.	Description
1	CR 10-20 A-FJ-A-E-HQQE
	<div data-bbox="343 465 450 817" data-label="Image"> </div> <p data-bbox="595 884 1077 907">Note! Product picture may differ from actual product</p> <p data-bbox="204 913 470 936">Product No.: <a href="#">96501224</a></p> <p data-bbox="204 974 1460 1075">Vertical, 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 combined DIN-JIS flanges.</p> <p data-bbox="204 1115 933 1142">The pump is fitted with a 3-phase, fan-cooled asynchronous motor.</p> <p data-bbox="204 1176 518 1205"><b>Further product details</b></p> <p data-bbox="204 1214 1460 1310">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:</p> <ol data-bbox="204 1326 694 1444" style="list-style-type: none"> <li>1) Alkaline-based cleaning.</li> <li>2) Zinc phosphating.</li> <li>3) Cathodic electro-deposition.</li> <li>4) Curing to a dry film thickness 18-22 my m.</li> </ol> <p data-bbox="204 1444 909 1467">The colour code for the finished product is NCS 9000/RAL 9005.</p> <p data-bbox="204 1505 279 1534"><b>Pump</b></p> <p data-bbox="204 1541 1388 1590">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.</p> <div data-bbox="204 1601 561 1803" data-label="Image"> </div> <p data-bbox="204 1836 1412 1886">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.</p> <div data-bbox="204 1899 478 2101" data-label="Image"> </div>

Qty.	Description
	<p>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.</p> <p>Primary seal:</p> <ul style="list-style-type: none"> <li>Rotating seal ring material: silicon carbide (SiC)</li> <li>Stationary seat material: silicon carbide (SiC)</li> </ul> <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 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.</p>  <p><b>Motor</b></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 free-hole flange (FF).</p> <p>Motor-mounting designation in accordance with IEC 60034-7: IM B 5 (Code I) / IM 3001 (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 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.</p> <p>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.</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><b>Technical data</b></p> <p><b>Controls:</b></p> <p>Frequency converter: NONE</p> <p><b>Liquid:</b></p> <p>Pumped liquid: Water</p> <p>Liquid temperature range: -20 .. 120 °C</p> <p>Liquid temperature during operation: 20 °C</p>

Qty.	Description
	<p>Density: 998.2 kg/m<sup>3</sup></p> <p><b>Technical:</b>  Pump speed on which pump data are based: 2919 rpm  Rated flow: 10 m<sup>3</sup>/h  Rated head: 165.2 m  Pump orientation: Vertical  Shaft seal arrangement: Single  Code for shaft seal: HQQE  Approvals on nameplate: CE, EAC, ACS  Curve tolerance: ISO9906:2012 3B</p> <p><b>Materials:</b>  Base: Cast iron  EN 1561 EN-GJL-200  ASTM A48-25B  Impeller: Stainless steel  EN 1.4301  AISI 304  Bearing: SIC</p> <p><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: DIN / JIS  Size of inlet connection: DN 40  1 1/2 inch  Size of outlet connection: DN 40  Pressure rating for pipe connection: PN 25  Flange rating inlet: 300 lb  Flange size for motor: FF265</p> <p><b>Electrical data:</b>  Motor standard: IEC  Motor type: 132SB  IE Efficiency class: IE3  Rated power - P2: 7.5 kW  Power (P2) required by pump: 7.5 kW  Mains frequency: 50 Hz  Rated voltage: 3 x 380-415D/660-690Y V  Rated current: 14,4-14,0/8,30-8,10 A  Starting current: 780-910 %  Cos phi - power factor: 0.88-0.82  Rated speed: 2910-2920 rpm  Efficiency: IE3 90,1%  Motor efficiency at full load: 90.1-90.4 %  Motor efficiency at 3/4 load: 90.8 %  Motor efficiency at 1/2 load: 90.8 %  Number of poles: 2  Enclosure class (IEC 34-5): 55 Dust/Jetting  Insulation class (IEC 85): F</p> <p><b>Others:</b>  Minimum efficiency index, MEI <math>\hat{a}_{\%}</math>: 0.70  Net weight: 112 kg  Gross weight: 134 kg  Shipping volume: 0.321 m<sup>3</sup></p>



**Company name:**

**Created by:**

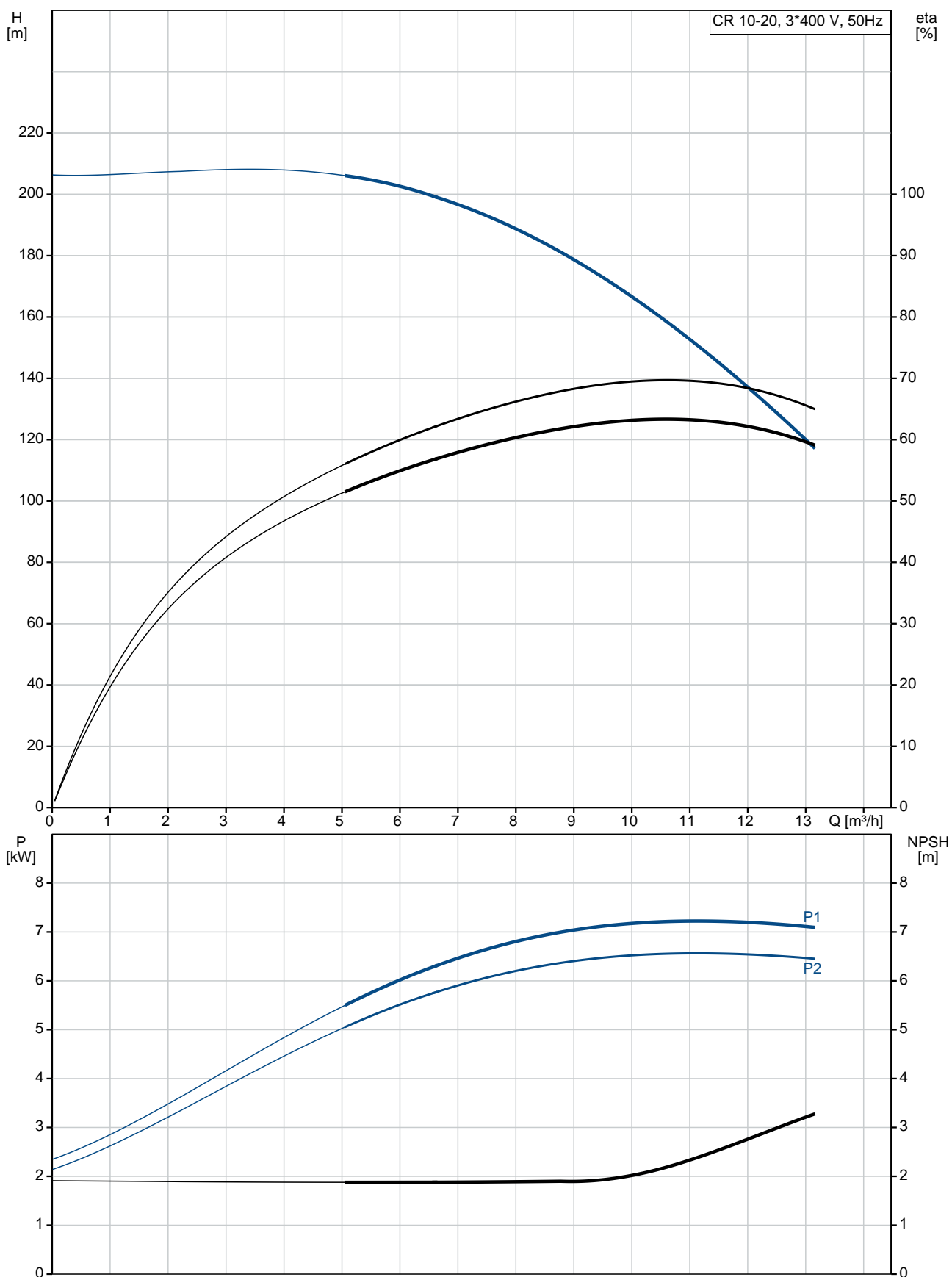
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**Date:**

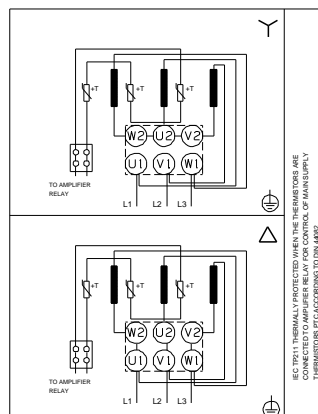
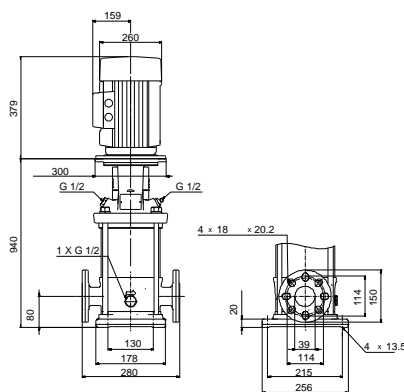
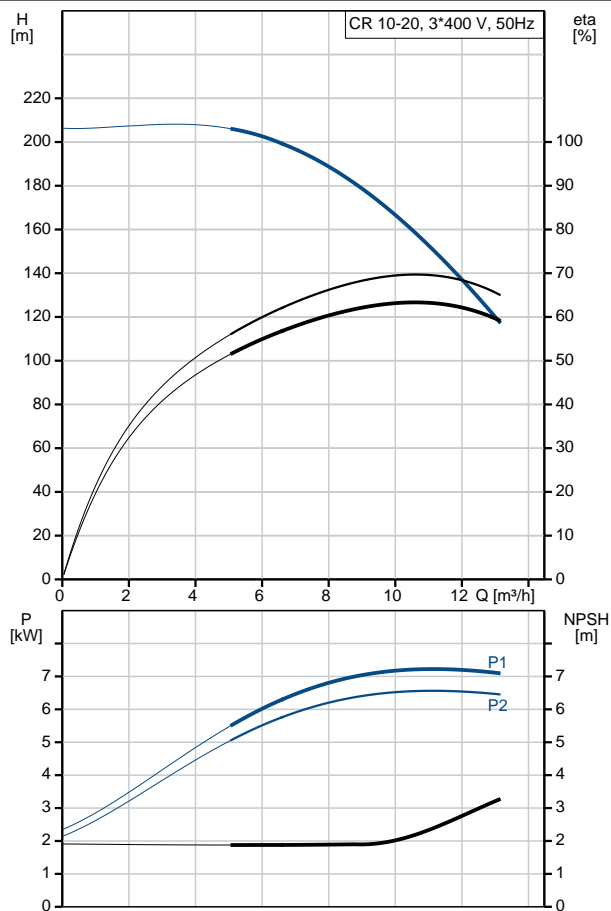
16/02/2019

Qty.	Description
	<div data-bbox="204 338 691 398"><div>Danish VVS No.: 385903200</div><div>Swedish RSK No.: 5823470</div></div>

## 96501224 CR 10-20 A-FJ-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CR 10-20 A-FJ-A-E-HQQE
Product No:	96501224
EAN number:	5700396217833
<b>Technical:</b>	
Pump speed on which pump data are based:	2919 rpm
Rated flow:	10 m <sup>3</sup> /h
Rated head:	165.2 m
Head max:	205 m
Stages:	20
Impellers:	20
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 ASTM A48-25B
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:	25 bar
Max pressure at stated temp:	25 bar / 120 °C 25 bar / -20 °C
Type of connection:	DIN / JIS
Size of inlet connection:	DN 40 1 1/2 inch
Size of outlet connection:	DN 40
Pressure rating for pipe connection:	PN 25
Flange rating inlet:	300 lb
Flange size for motor:	FF265
Connect code:	FJ
<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:	132SB
IE Efficiency class:	IE3
Rated power - P2:	7.5 kW
Power (P2) required by pump:	7.5 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 380-415D/660-690V V





Company name:

Created by:

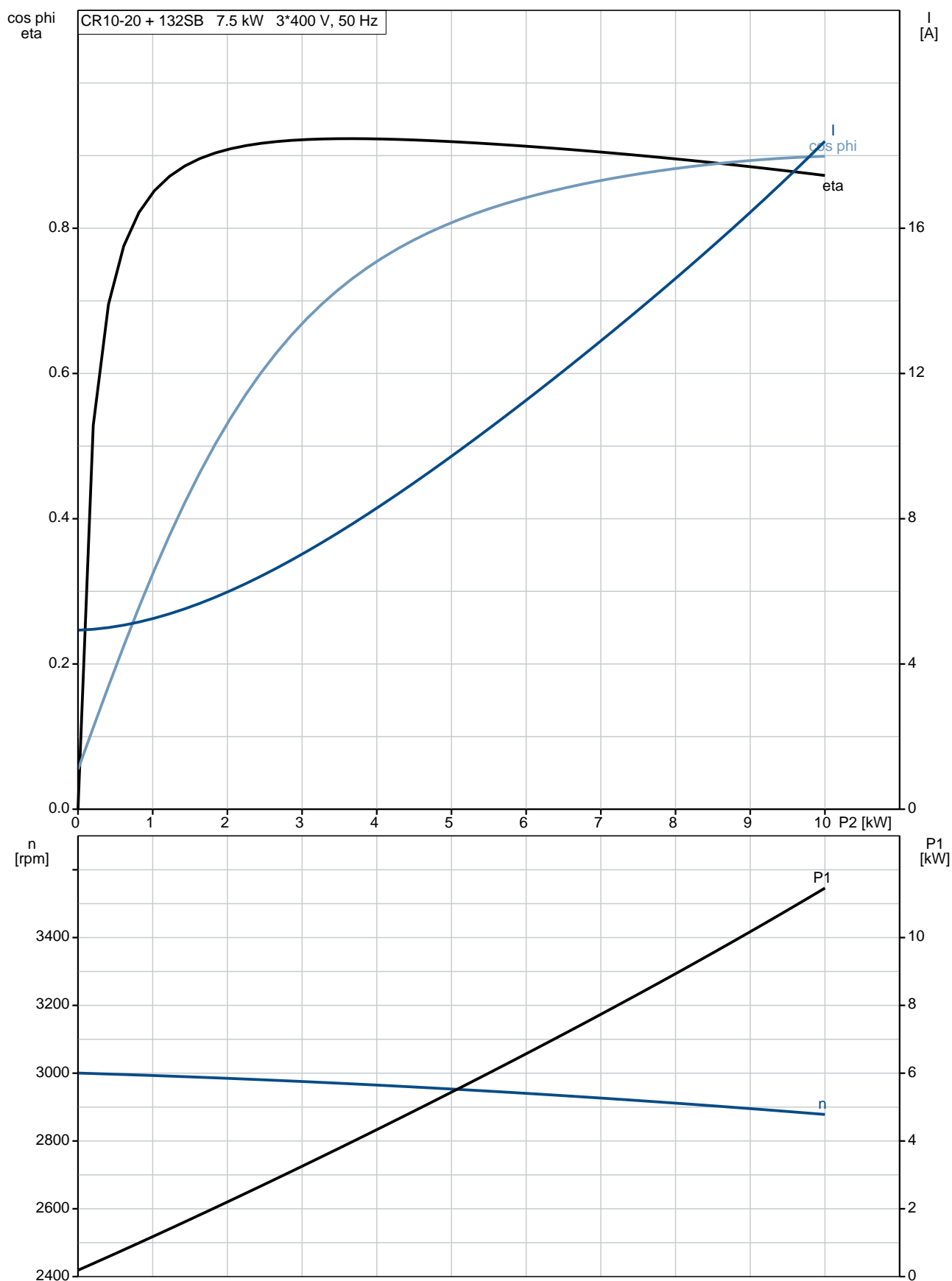
Phone:

Date:

16/02/2019

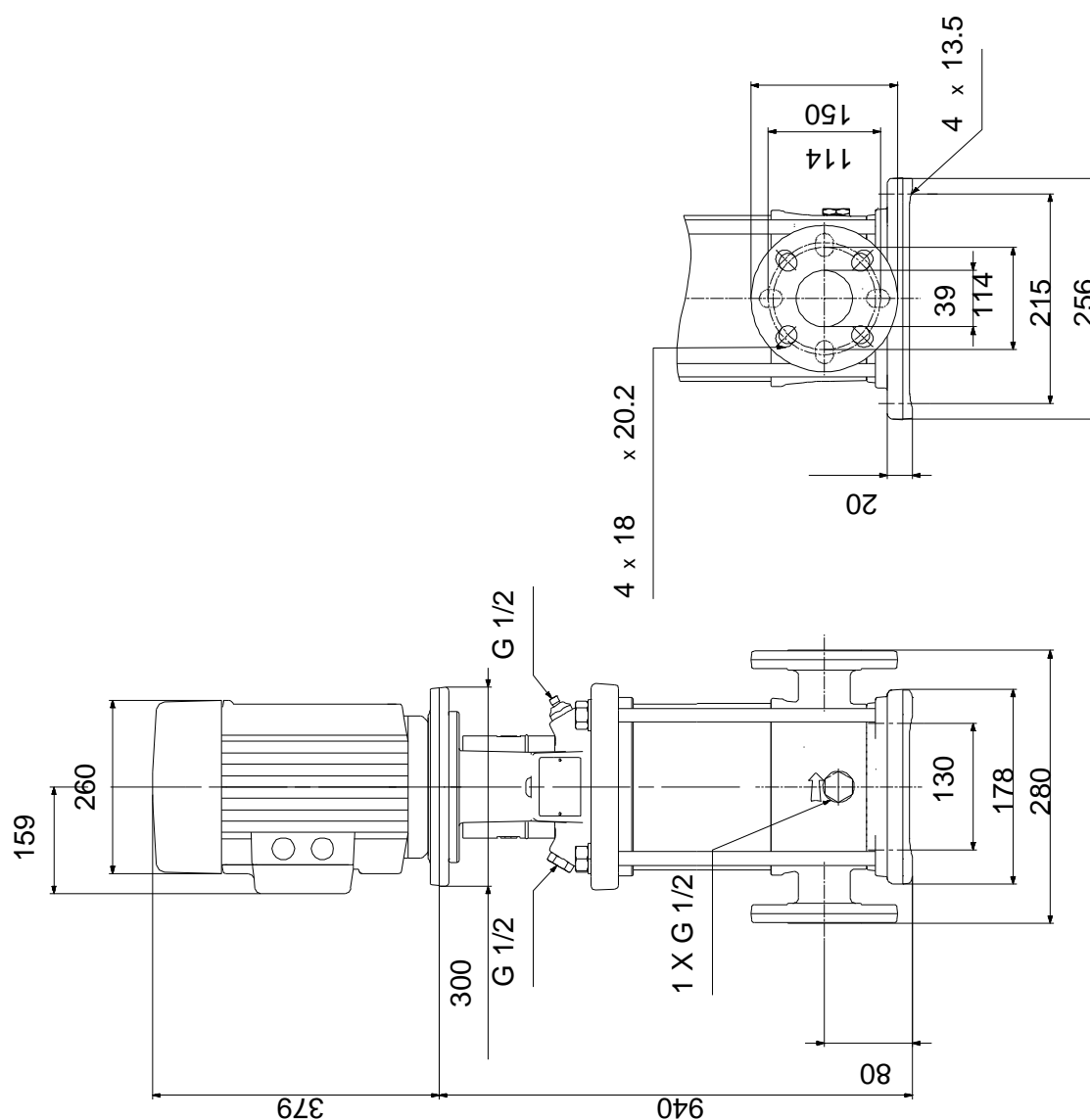
Description	Value
Rated current:	14,4-14,0/8,30-8,10 A
Starting current:	780-910 %
Cos phi - power factor:	0.88-0.82
Rated speed:	2910-2920 rpm
Efficiency:	IE3 90,1%
Motor efficiency at full load:	90.1-90.4 %
Motor efficiency at 3/4 load:	90.8 %
Motor efficiency at 1/2 load:	90.8 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	PTC
Motor No:	85U17522
<b>Controls:</b>	
Frequency converter:	NONE
<b>Others:</b>	
Minimum efficiency index, MEI $\eta_{\%}$ :	0.70
Net weight:	112 kg
Gross weight:	134 kg
Shipping volume:	0.321 m <sup>3</sup>
Danish VVS No.:	385903200
Swedish RSK No.:	5823470

## 96501224 CR 10-20 A-FJ-A-E-HQQE 50 Hz





## 96501224 CR 10-20 A-FJ-A-E-HQQE 50 Hz



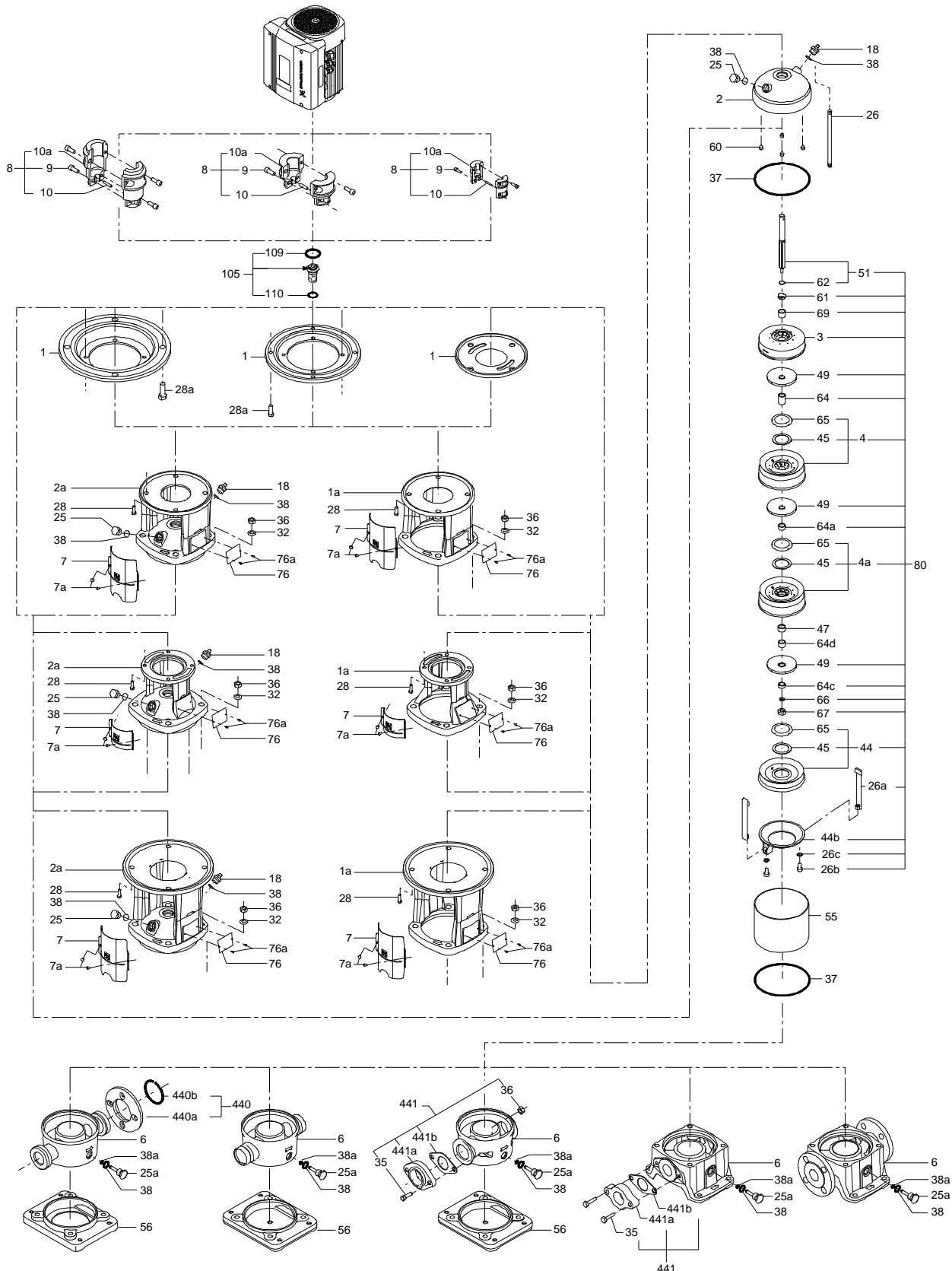
Note! All units are in [mm] unless others are stated.  
Disclaimer: This simplified dimensional drawing does not show all details.

## 96501224 CR 10-20 A-FJ-A-E-HQQE 50 Hz

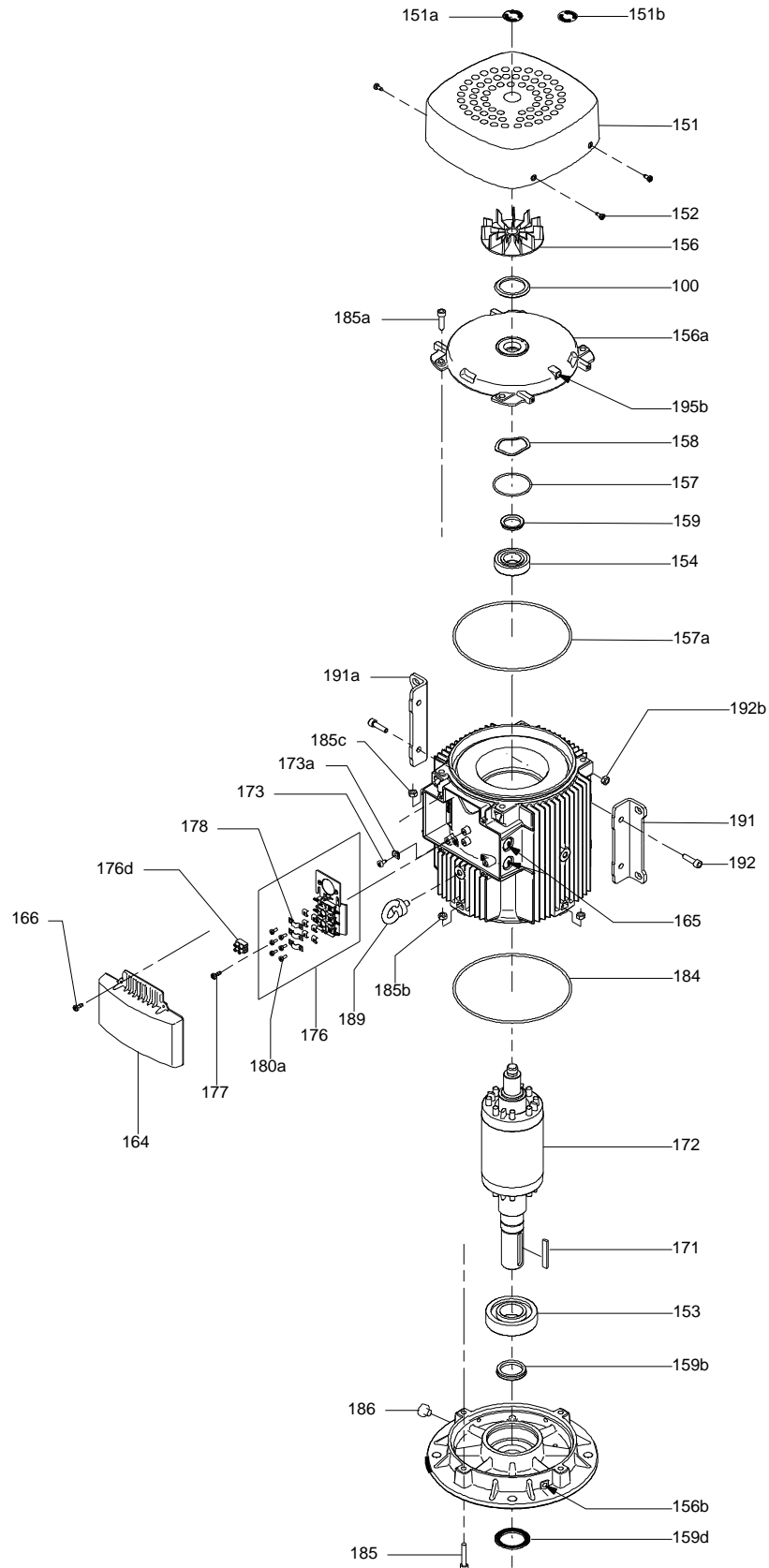


Note! All units are in [mm] unless others are stated.

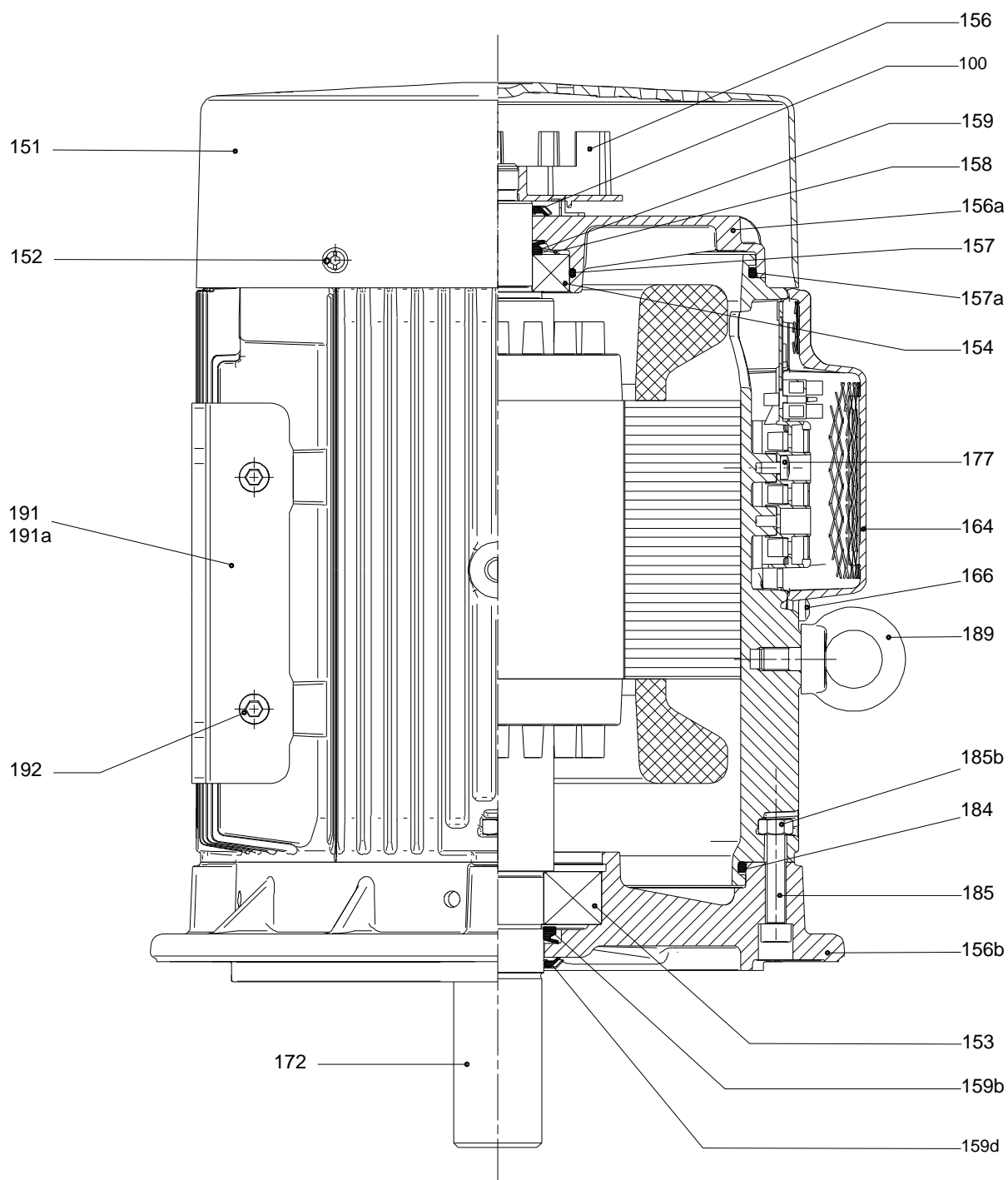
( tm069460 for MECR 10 standard)



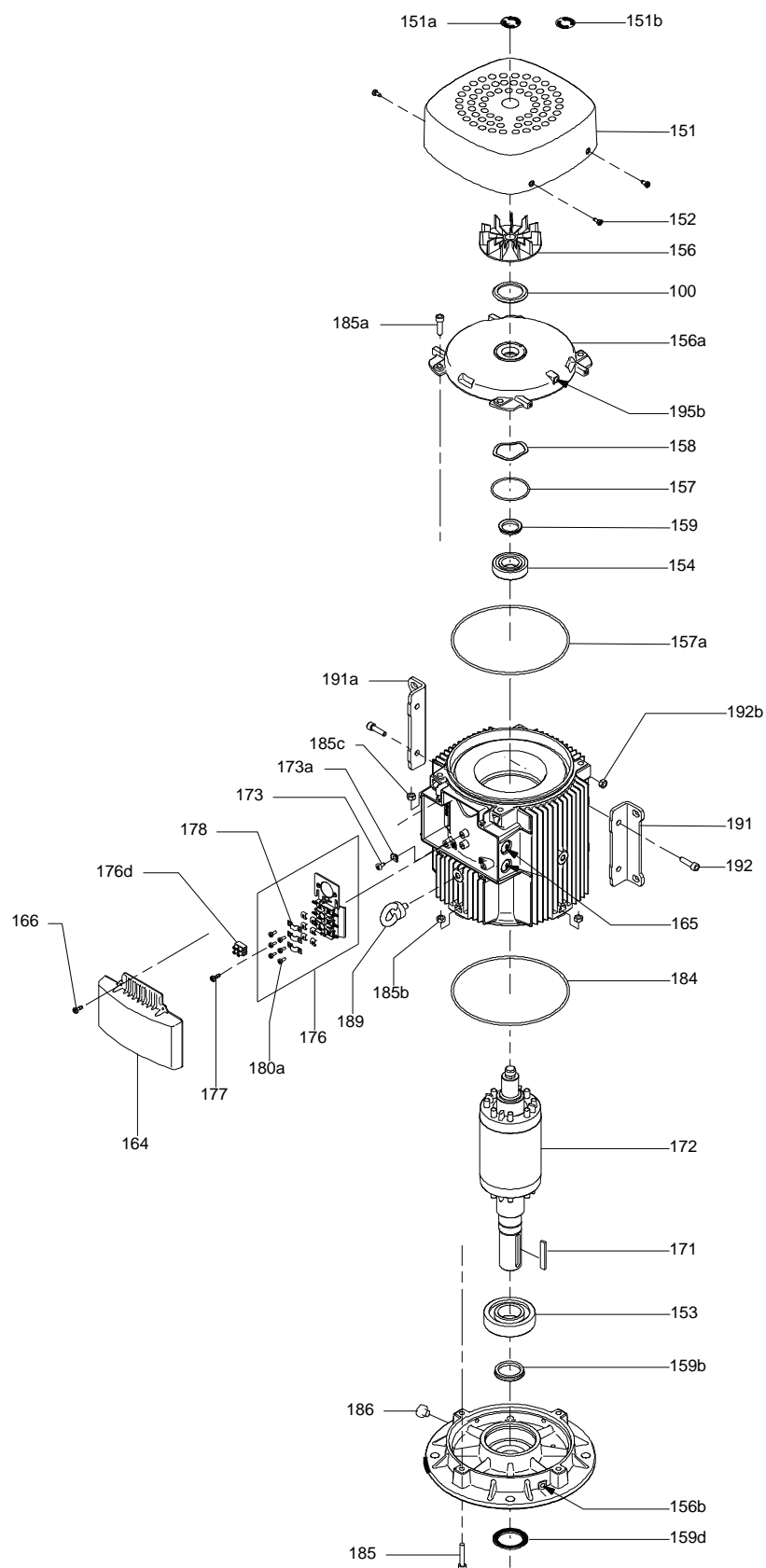
## Exploded view



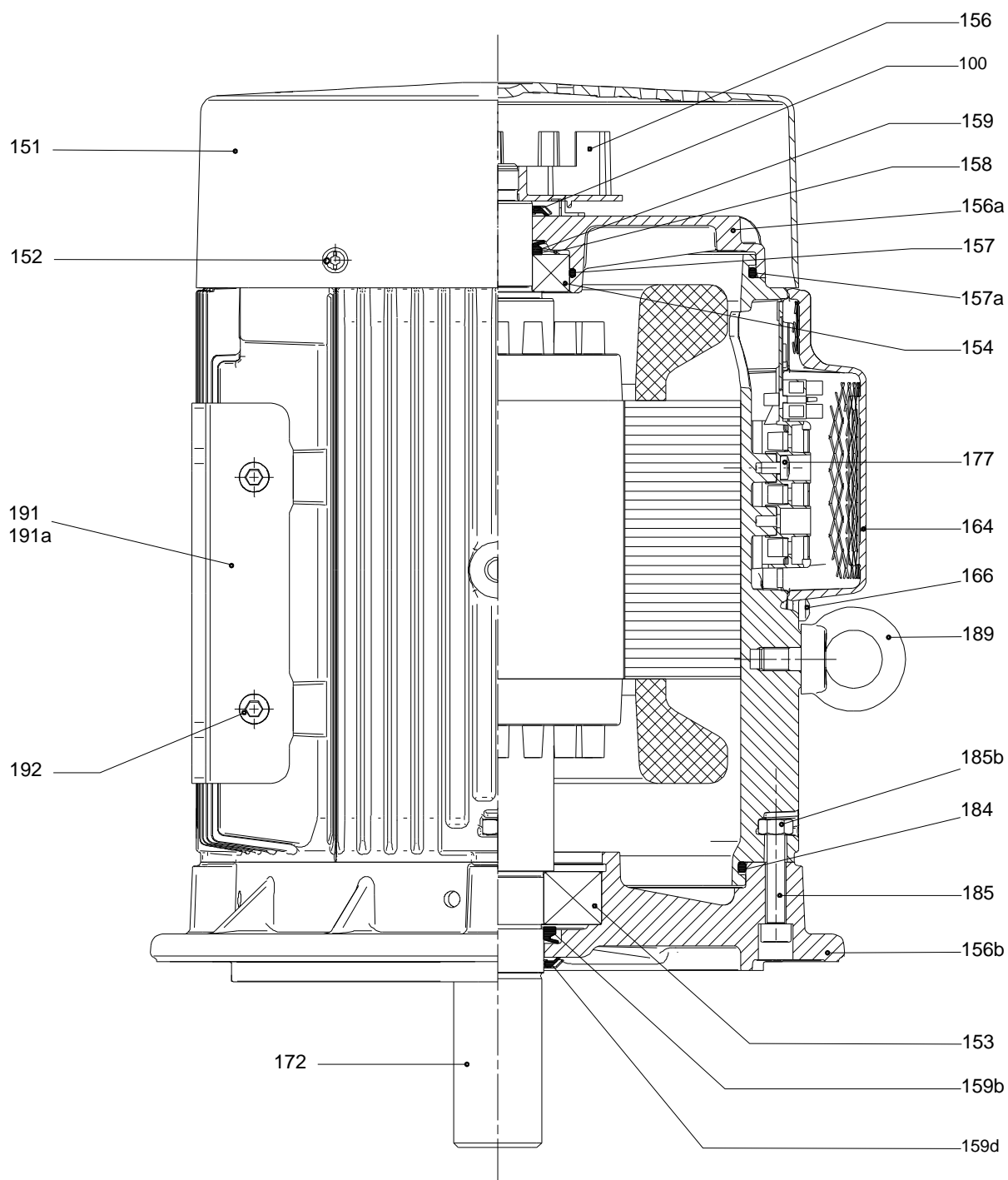
## Sectional drawing



## Exploded view



## Sectional drawing



**Spare parts CR 10-20, Product No. 96501224**
**Valid from 1.1.2011 (1152)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, chamber stack			96508417	1	pcs
- 80	Chamber stack		Bearing type: SIC		1	
- 3	Top intermediate chamber					
	Spare, turbulence optimizer KP					
	Guide vane					
- 4a	Intermediate chamber cpl.					
	Guide cup					
	Bearing plate					
	Guide vane					
3	Intermediate chamber					
45	Neck ring cpl.					
47	Bearing bush					
65	Retainer					
- 4	Intermediate chamber cpl.					
	Guide cup					
	Guide vane					
3	Intermediate chamber					
45	Neck ring cpl.					
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.					
	Guide cup					
	Inlet part					
45	Neck ring cpl.					
65	Retainer					
47	Bearing ring					
49	Impeller cpl.					
- 51	Shaft, spline, cpl.					
	Bar					
62	Stop ring					
64c	Spacing pipe		Length (mm): 12.7			
64a	Spacing bush		Length (mm): 9.00			
64.d	Spacer					
64	Spacing pipe		Length (mm): 29.05			
66	Wedge lock washer					
67	Lock nut		Thread: M8			
69	Spacing bush		Length (mm): 18.00			
-	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	



Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, gaskets			96509609	1	pcs
	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			96511925	1	pcs
- 4a	Intermediate chamber cpl.				3	
	Sand Lifter					
	Guide cup					
	Bearing plate					
	Guide vane					
3	Intermediate chamber					
45	Neck ring cpl.					
47	Bearing bush					
65	Retainer					
26.c	Washer		Designation: DIN 125A		2	
			Thickness: 1,6			
26.b	Hex head screw				2	

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
45	Neck ring cpl.				19	
47	Bearing ring				3	
62	Retaining ring				1	
64c	Spacing pipe		Length (mm): 12.7		1	
64a	Spacing bush		Length (mm): 9.00		3	
64.d	Spacer				3	
65	Retainer				19	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
-	Motor			91333038	1	pcs
-	Kit, bearing cpl.			96796642	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					
159.b	V-ring					
159	V-ring					
-	Kit, eyebolt			96279874	1	
189	Lifting eye					
-	Kit, fan			96796189	1	
156	Fan					
-	Kit, fan cover			96796188	1	
151	Fan cover					
152	Pan head thread forming screw					
-	Kit, flange			96796224	1	
156.b	Flange					
159.b	V-ring					
185c	Nut					
185	Hex socket head cap screw					
186	Drain plug					
-	Kit, gaskets			96798510	1	
184	O-ring					
-	Kit, ND-end shield cpl.			96796598	1	
156.a	End shield NDE					
157	O-ring		Diameter: 62			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
159	V-ring					
185.c	Nut					
185.a	Hex socket head cap screw					
-	Kit, shaft seal			96843458	1	
159.b	V-ring					
159	V-ring					
-	Kit, terminal board			96030209	1	
176	Terminal					
176	Terminal board					
178	Connecting piece					
179	Cable shoe					
180a	Slot cheese head screw		Designation: COMBI TORX T25			
			Length (mm): 10			
			Thread: M5			
180	Wire clamp					
-	Kit, terminal box cover			96796215	1	
164	Terminal box cover w/gasket					
166	Pan head thread forming screw					
-	Motor			85903585	1	pcs

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, bearing cpl.			96796642	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					
159.b	V-ring					
159	V-ring					
-	Kit, eyebolt			96279874	1	
189	Lifting eye					
-	Kit, fan			96796189	1	
156	Fan					
-	Kit, fan cover			96796188	1	
151	Fan cover					
152	Pan head thread forming screw					
-	Kit, flange			96796224	1	
156.b	Flange					
159.b	V-ring					
185c	Nut					
185	Hex socket head cap screw					
186	Drain plug					
-	Kit, gaskets			96798510	1	
184	O-ring					
-	Kit, ND-end shield cpl.			96796598	1	
156.a	End shield NDE					
157	O-ring		Diameter: 62			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
159	V-ring					
185.c	Nut					
185.a	Hex socket head cap screw					
-	Kit, shaft seal			96843458	1	
159.b	V-ring					
159	V-ring					
-	Kit, terminal board			96030209	1	
176	Terminal					
176	Terminal board					
178	Connecting piece					
179	Cable shoe					
180a	Slot cheese head screw		Designation: COMBI TORX T25			
			Length (mm): 10			
			Thread: M5			
180	Wire clamp					
-	Kit, terminal box cover			96796215	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)			96538970	1	pcs
+ 3	Top intermediate chamber			98415149	1	pcs
+ 4a	Bulk, Intermediate chamber cpl. (10 pcs)			96538850	3	pcs
+ 4a	Intermediate chamber cpl.			98371073	3	pcs
- 4	Intermediate chamber cpl.			98371071	16	pcs
3	Intermediate chamber			98415145	1	
65	Bulk, Retainer (20 pcs)			98354675	1	
6	Base			98681110	1	pcs

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
7.a	Bulk, Combi Slot Torx screw (1000 pcs)			96886324	4	pcs
10	Bulk, Shaft pin (10 pcs)		Diameter: 5	96536473	1	pcs
			Length (mm): 26			
+ 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.			98959210	2	pcs
26.c	Bulk, Washer (4 pcs)		Designation: DIN 125A	99262704	2	pcs
			Thickness: 1,6			
26.c	Washer		Designation: DIN 125A	96586880	2	pcs
			Thickness: 1,6			
26	Staybolt			98982851	4	pcs
32	Bulk, Washer (100 pcs)		Designation: DIN 125 A	98923051	4	pcs
			Internal diameter: 17			
			Outer diameter: 30			
			Thickness: 3			
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	99198791	1	pcs
			Material type: EPDM			
			Thickness: 2,4			
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			
44b	Inlet part			98814595	1	pcs
+ 44a	Inlet part cpl.			97973678	1	pcs
47	Bulk, Bearing ring (10 pcs)			96538795	3	pcs
49	Bulk, Impeller cpl. (10 pcs)			96538796	20	pcs
49	Impeller cpl.			98394441	20	pcs
+ 51	Shaft, spline, cpl.			98368621	1	pcs
55	Outer sleeve			98812647	1	pcs
60	Bulk, Spring (20 pcs)			96538963	4	pcs
64c	Bulk, Spacing pipe (5 pcs)		Length (mm): 12.7	97980241	1	pcs
64a	Bulk, Spacing bush (20 pcs)		Length (mm): 9.00	96538950	3	pcs
64.d	Bulk, Spacer (20 pcs)			97516851	3	pcs
64	Bulk, Spacing pipe (20 pcs)		Length (mm): 29.05	96535101	16	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)		Length (mm): 18.00	96538948	1	pcs
76a	Bulk, Rivet (100 pcs)			96620489	1	pcs
105	Bulk, Shaft seal (11 pcs)		Material type: HQQE	96538914	1	pcs