

Qty.	Description
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1	CRN 20-14 A-P-A-E-HQQE
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Product No.: [96500567](#)

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

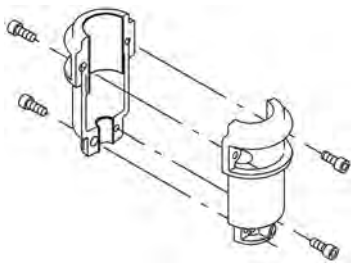
Steel, cast iron and aluminium components have an epoxy-based coating made in a cathodic electro-deposition (CED) process. CED is a high-quality dip-painting process where an electrical field around the products ensures deposition of paint particles as a thin, well-controlled layer on the surface. An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

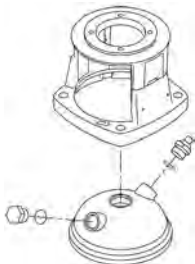
The colour code for the finished product is NCS 9000/RAL 9005.

### Pump

A long split coupling connects the pump and motor shaft. It is enclosed in the motor stool by means of two coupling guards. The long coupling makes it possible to replace the shaft seal without removing the motor from the pump.



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)
- 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)

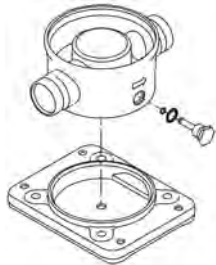
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



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 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

Qty.	Description
	<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></p> <p><b>Technical:</b>                      Pump speed on which pump data are based: 2923 rpm                      Rated flow: 21 m<sup>3</sup>/h                      Rated head: 165.4 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: Stainless steel                      EN 1.4408                      AISI 316                      Impeller: Stainless steel                      EN 1.4401                      AISI 316                      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: 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: FF300</p> <p><b>Electrical data:</b>                      Motor standard: IEC                      Motor type: 160MD                      IE Efficiency class: IE3                      Rated power - P2: 15 kW                      Power (P2) required by pump: 15 kW                      Mains frequency: 50 Hz                      Rated voltage: 3 x 380-415D/660-690Y V                      Rated current: 28,0-26,0/16,2-15,6 A                      Starting current: 660-780 %                      Cos phi - power factor: 0.89-0.87                      Rated speed: 2930-2950 rpm                      Efficiency: IE3 91,9%                      Motor efficiency at full load: 91.9-91.9 %                      Motor efficiency at 3/4 load: 92.4 %                      Motor efficiency at 1/2 load: 92.4 %                      Number of poles: 2                      Enclosure class (IEC 34-5): 55 Dust/Jetting                      Insulation class (IEC 85): F</p> <p><b>Others:</b></p>



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	Minimum efficiency index, MEI $\eta_{\%}$ : 0.70 Net weight: 161 kg Gross weight: 192 kg Shipping volume: 0.619 m <sup>3</sup> Danish VVS No.: 385915140
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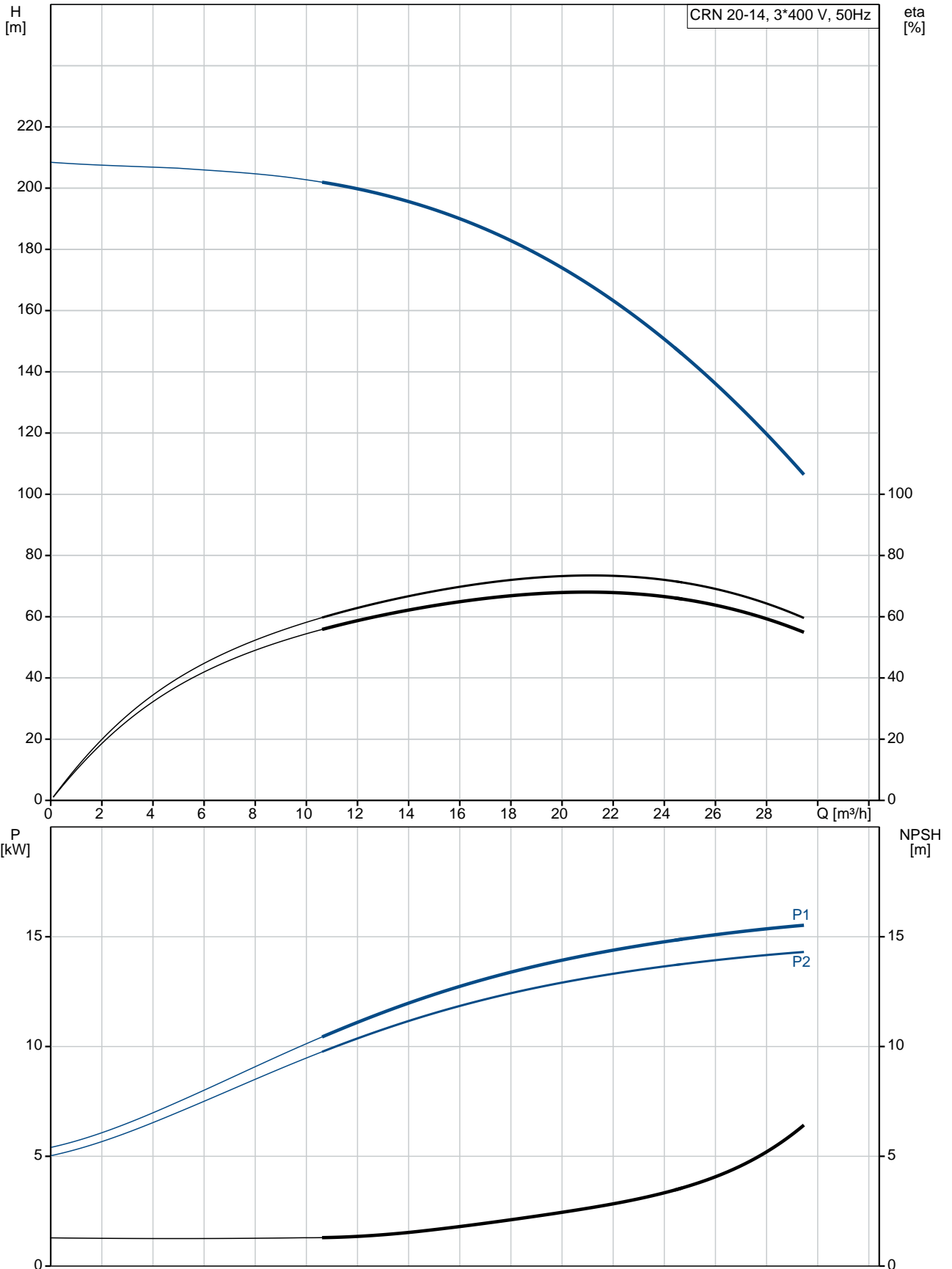
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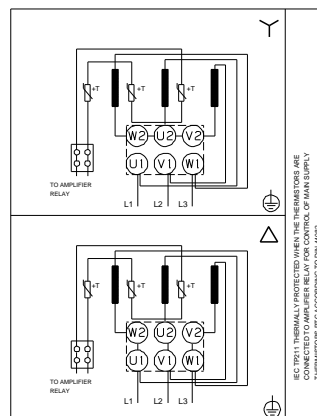
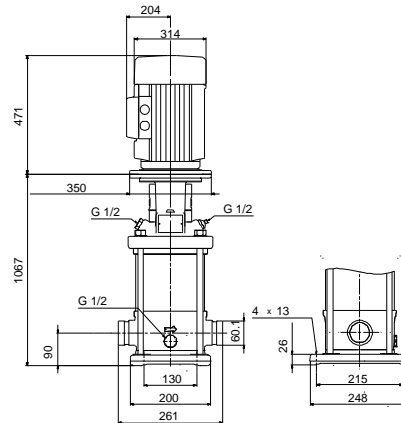
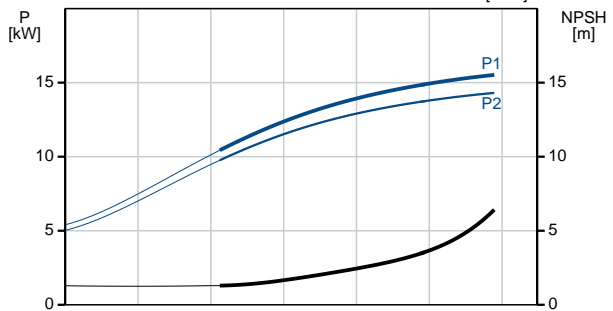
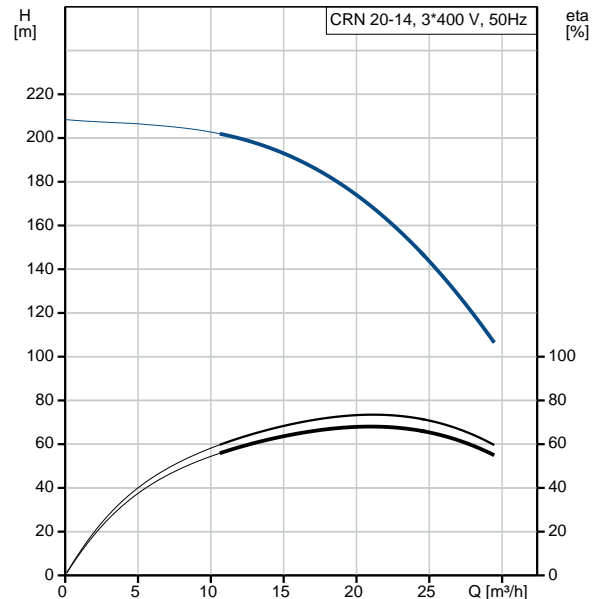
Date:

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### 96500567 CRN 20-14 A-P-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CRN 20-14 A-P-A-E-HQQE
Product No:	96500567
EAN number:	5700396204406
<b>Technical:</b>	
Pump speed on which pump data are based:	2923 rpm
Rated flow:	21 m <sup>3</sup> /h
Rated head:	165.4 m
Head max:	207 m
Stages:	14
Impellers:	14
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:	FF300
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:	160MD
IE Efficiency class:	IE3
Rated power - P2:	15 kW
Power (P2) required by pump:	15 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 380-415D/660-690Y V





Company name:

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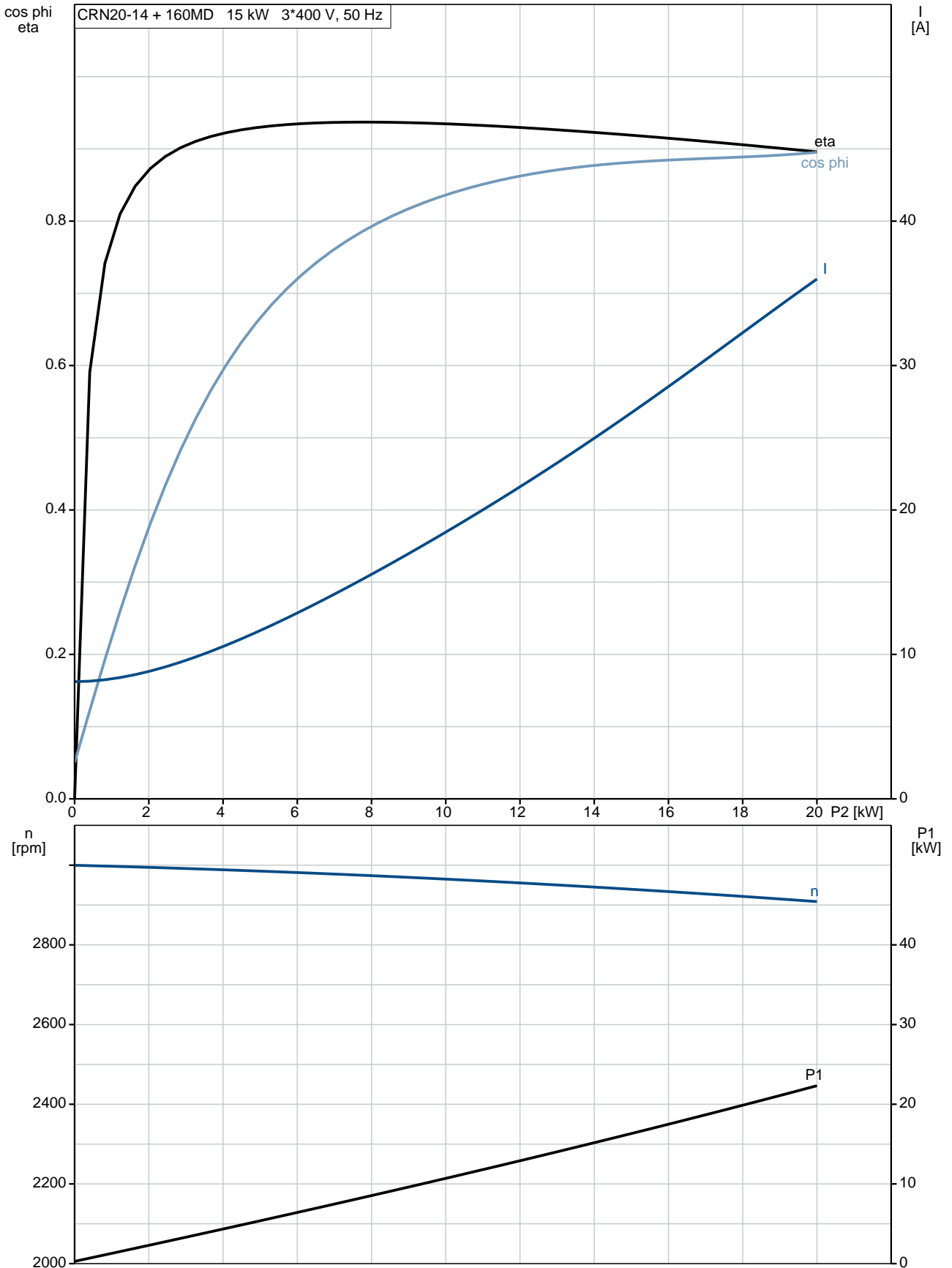
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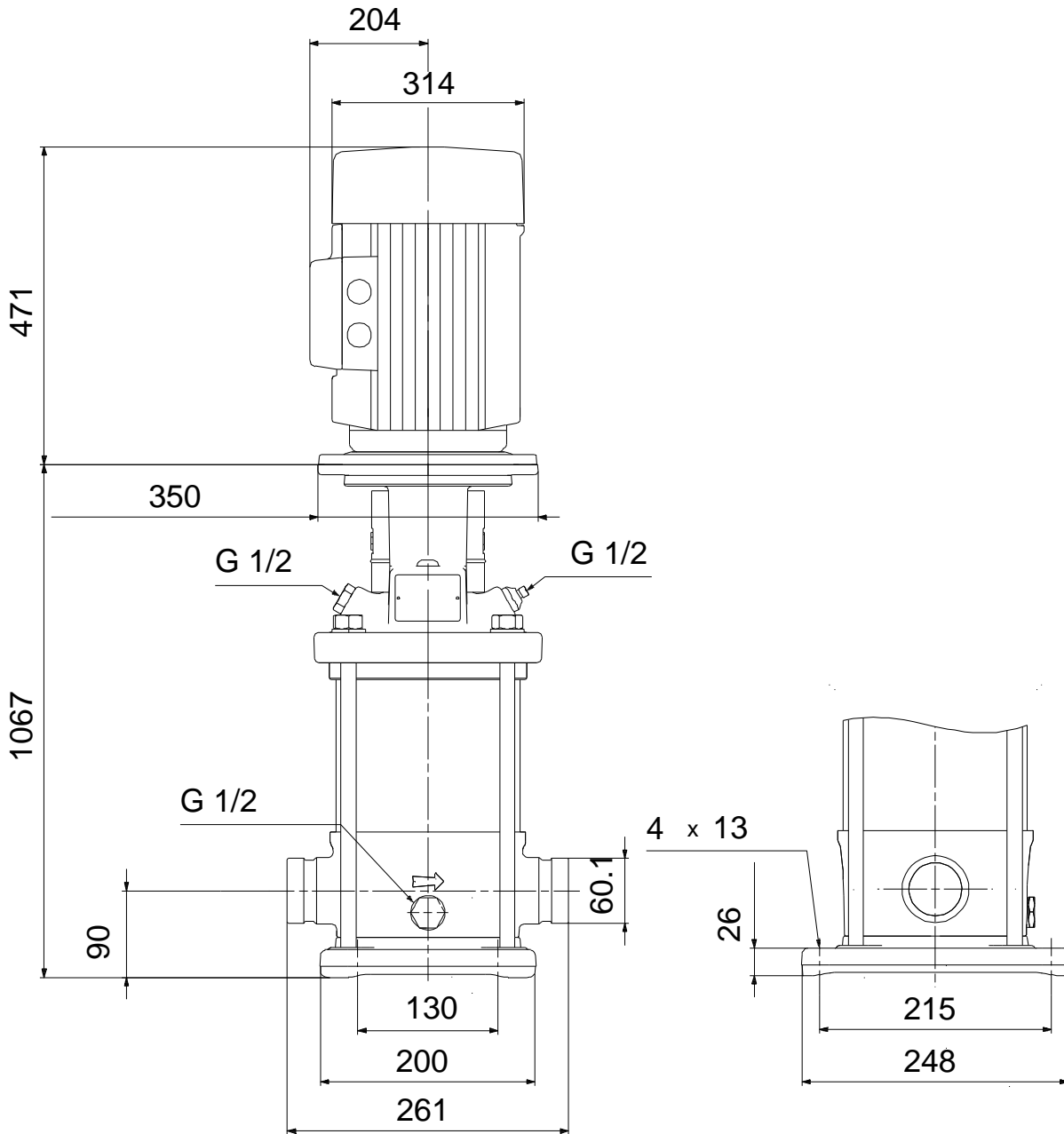
Description	Value
Rated current:	28,0-26,0/16,2-15,6 A
Starting current:	660-780 %
Cos phi - power factor:	0.89-0.87
Rated speed:	2930-2950 rpm
Efficiency:	IE3 91,9%
Motor efficiency at full load:	91.9-91.9 %
Motor efficiency at 3/4 load:	92.4 %
Motor efficiency at 1/2 load:	92.4 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	PTC
Motor No:	85U17526
<b>Controls:</b>	
Frequency converter:	NONE
<b>Others:</b>	
Minimum efficiency index, MEI $\eta_{min}$ :	0.70
Net weight:	161 kg
Gross weight:	192 kg
Shipping volume:	0.619 m <sup>3</sup>
Danish VVS No.:	385915140

## 96500567 CRN 20-14 A-P-A-E-HQQE 50 Hz





## 96500567 CRN 20-14 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.

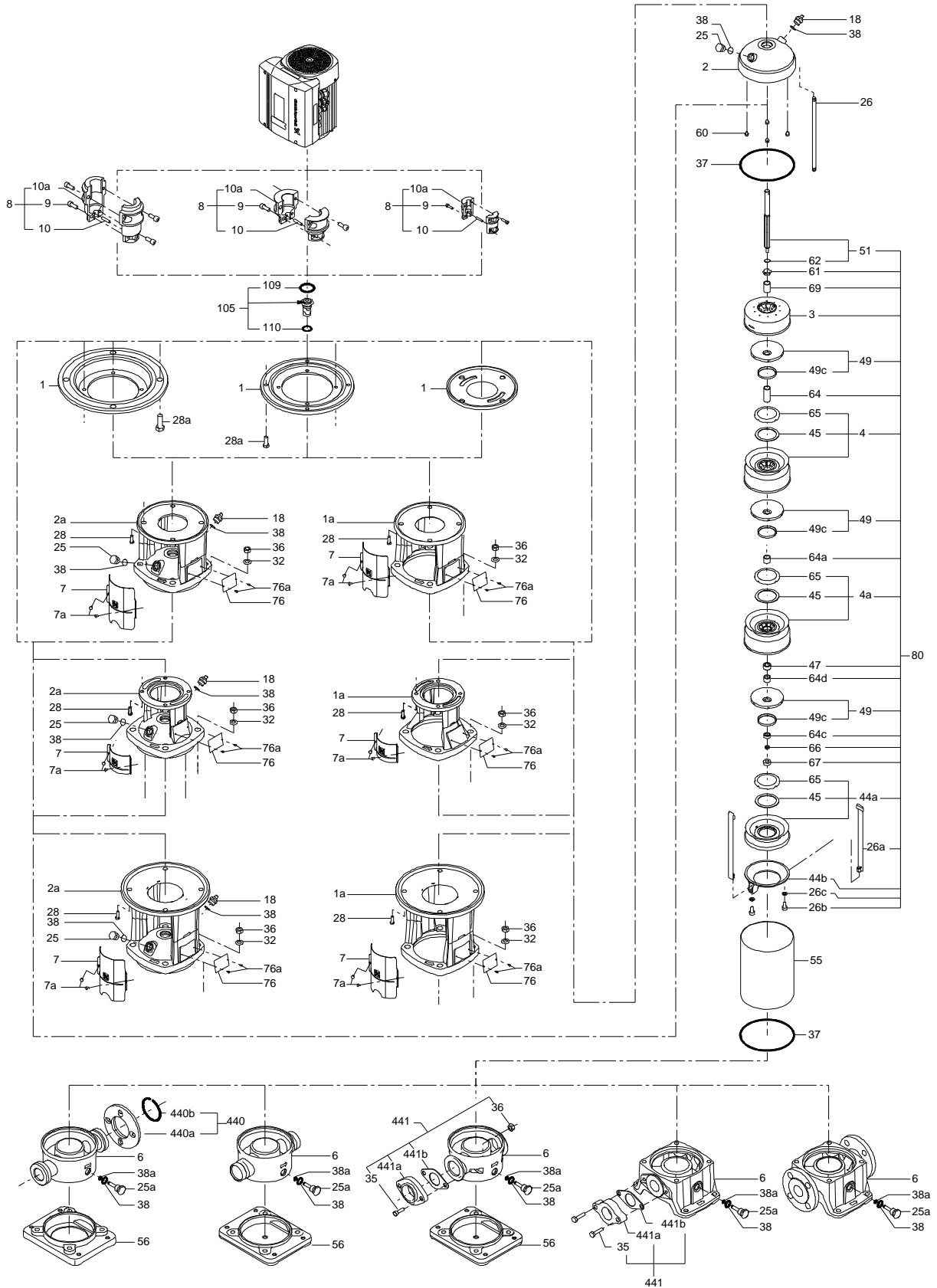
## 96500567 CRN 20-14 A-P-A-E-HQQE 50 Hz



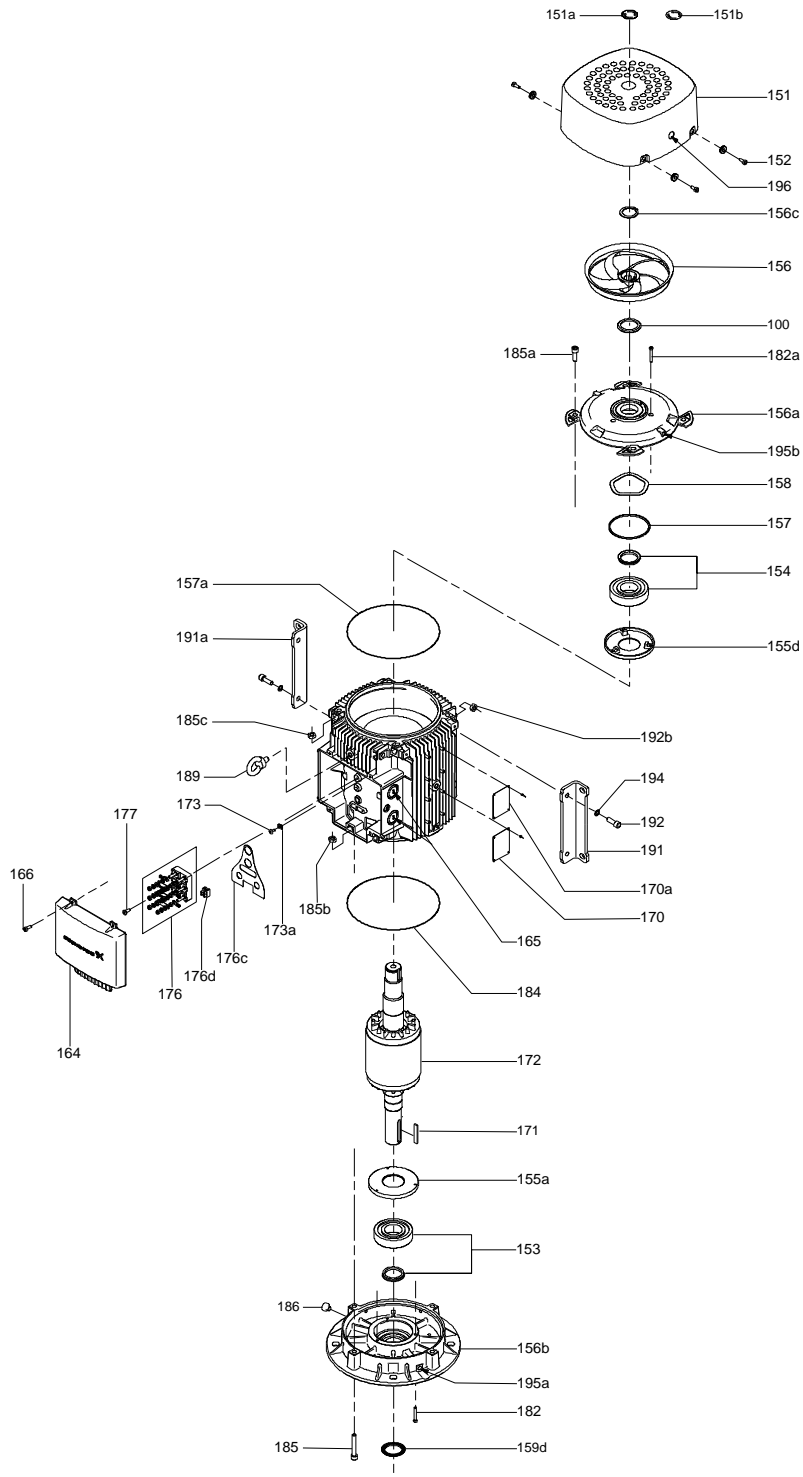
IEC TP211 THERMALLY PROTECTED WHEN THE THERMISTORS ARE  
CONNECTED TO AMPLIFIER RELAY FOR CONTROL OF MAIN SUPPLY  
THERMISTORS PTC ACCORDING TO DIN 44082

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

( tm069469 for MECR15,20 standard)



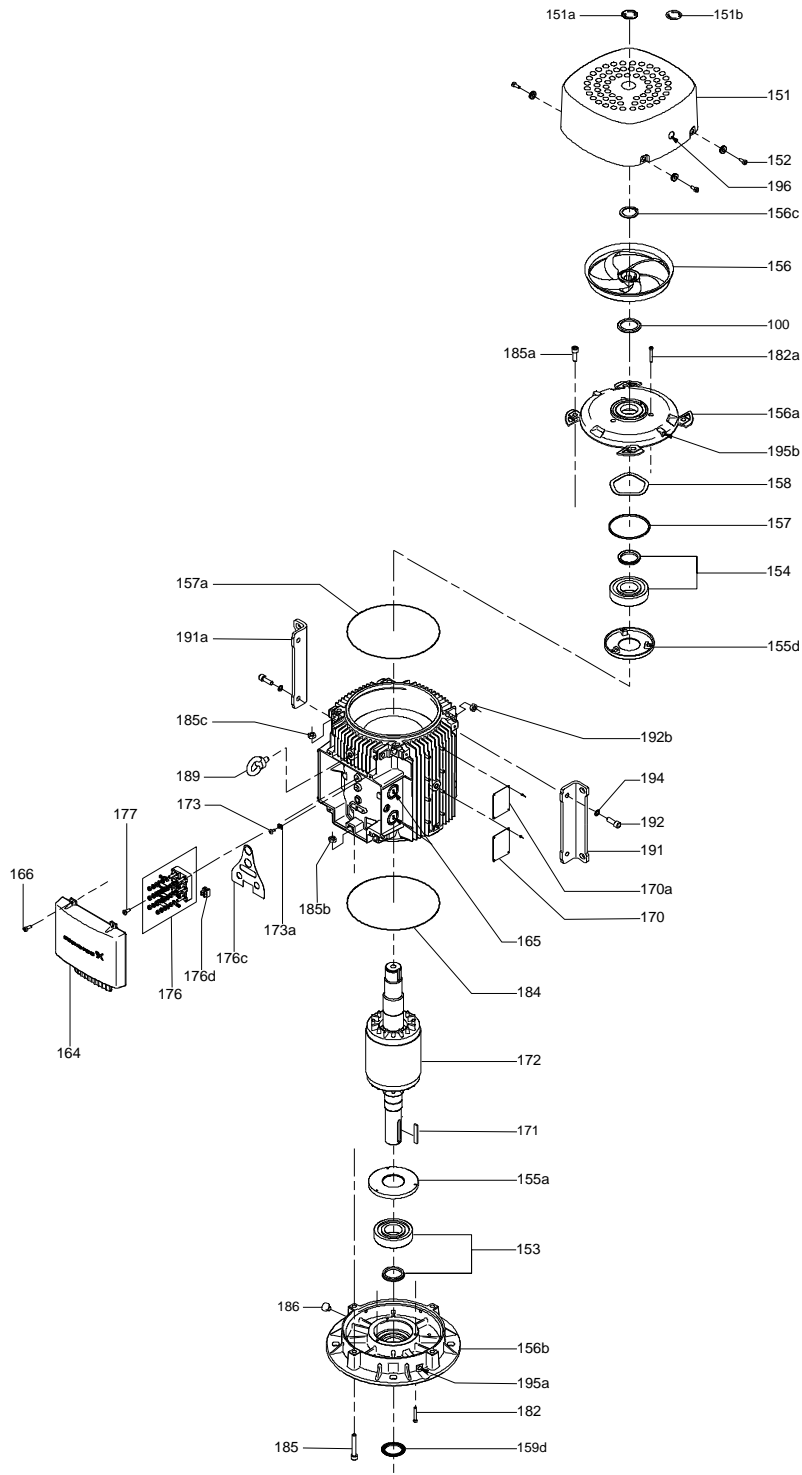
## Exploded view



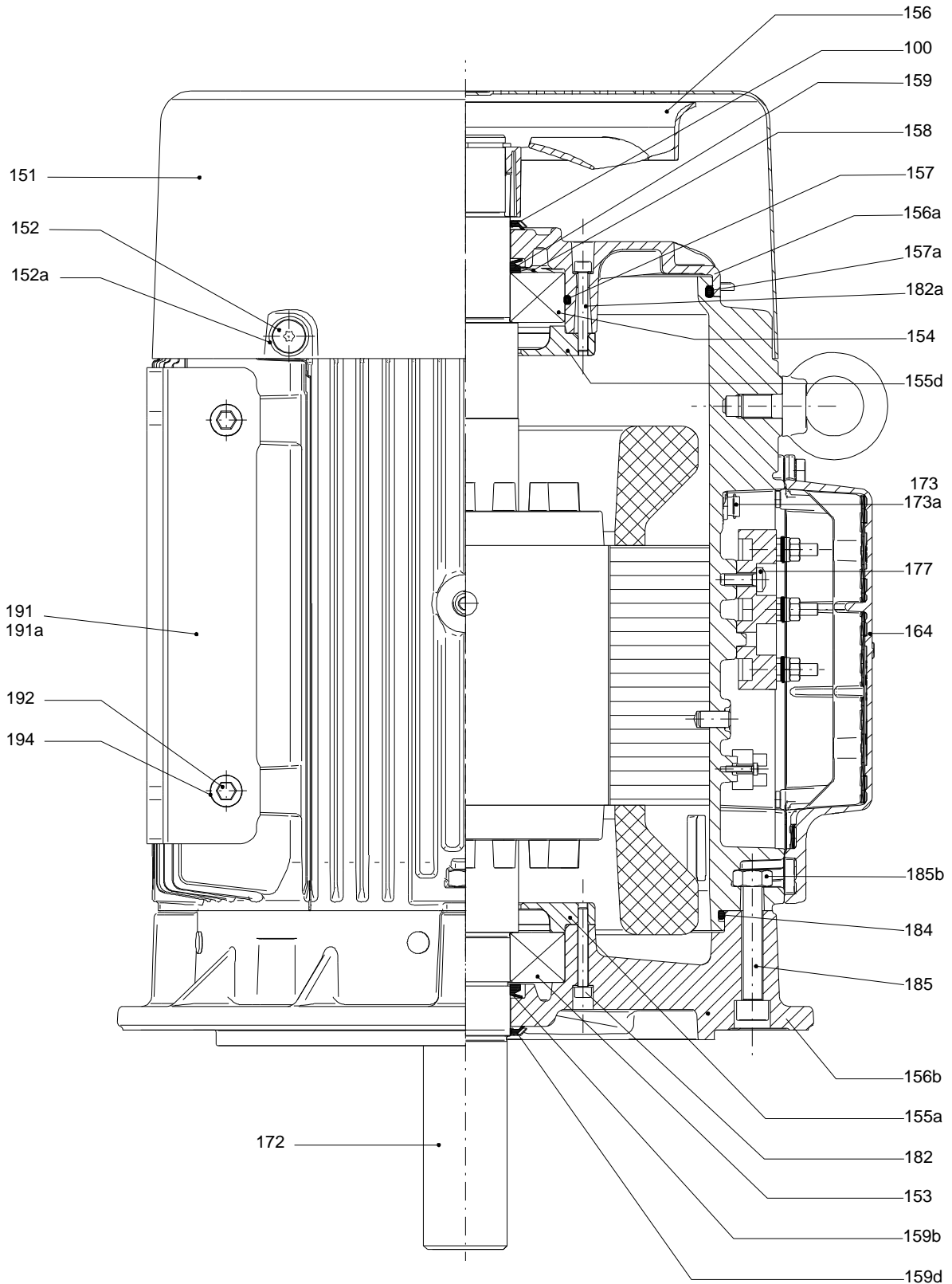
## Sectional drawing



## Exploded view



## Sectional drawing



**Spare parts CRN 20-14, Product No. 96500567**  
**Valid from 1.1.2011 (1152)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, chamber stack			96491794	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					
- 4	Intermediate chamber cpl.					
3	Intermediate chamber					
45a	Neck ring cpl.					
65	Retainer					
26a	Strap cpl.		Length (mm): 629MM			
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.					
	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			96511352	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			96509614	1	pcs
7.a	Combi Slot Torx screw				4	



Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
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	
			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			96511830	1	pcs
- 4a	Intermediate chamber cpl.				3	
	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			

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
26.b	Hex head screw				2	
45a	Neck ring cpl.				14	
47	Bearing ring				3	
49c	Wear ring				17	
62	Retaining ring				1	
64d	Spacing bush				3	
64c	Spacing pipe		Length (mm): 12.7		1	
64b	Spacing bush		Length (mm): 5.00		1	
64a	Spacing pipe		Internal diameter: 17,5		3	
			Length (mm): 17			
65	Retainer				14	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
-	Motor			85904134	1	pcs
+	Kit, bearing cpl.			96796676	1	
-	Kit, bearing plate			96796664	1	
155.a	Bearing cover					
208a	Gasket					
208	Hex socket head cap screw		Designation: DIN912			
			Length (mm): 40			
			Thread: M5			
-	Kit, eyebolt			96796712	1	
189	Eyebolt					
-	Kit, fan			96796654	1	
156.c	Retaining ring					
156	Fan					
-	Kit, fan cover			96796647	1	
151	Fan cover					
152.a	Rubber bush					
152	Hex head cap screw					
196	Diaphragm					
-	Kit, flange			96796662	1	
156.b	Flange					
159.b	Seal ring					
185.b	Nut					
185	Hex socket head cap screw					
186	Drain plug					
195.a	Grease nipple					
-	Kit, gaskets			96798508	1	
184	O-ring		Diameter: 235			
-	Kit, lubrication nipple			96796671	1	
195.b	Grease nipple					
195.a	Grease nipple					
-	Kit, ND-end shield cpl.			96796669	1	
32b	Waved washer					
156.a	End shield NDE					
157	O-ring					
159	V-ring					
185.c	Nut					
185.a	Hex socket head cap screw					
195.b	Grease nipple					
-	Kit, shaft seal			96843459	1	
159.b	V-ring					
159	V-ring					
-	Kit, terminal board			96796657	1	
	Terminal connection					
	Washer					
36	Hex nut					
173	Torx Screw					



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Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
176.d	Terminal board					
176	Terminal board					
177	Torx Screw					
-	Kit, terminal box cover			96796659	1	
164	Terminal box cover					
273a	Pan head thread forming screw					
-	Motor			85904034	1	pcs
+	Kit, bearing cpl.			96796676	1	
-	Kit, bearing plate			96796664	1	
155.a	Bearing cover					
208a	Gasket					
208	Hex socket head cap screw		Designation: DIN912			
			Length (mm): 40			
			Thread: M5			
-	Kit, eyebolt			96796712	1	
189	Eyebolt					
-	Kit, fan			96796654	1	
156.c	Retaining ring					
156	Fan					
-	Kit, fan cover			96796647	1	
151	Fan cover					
152.a	Rubber bush					
152	Hex head cap screw					
196	Diaphragm					
-	Kit, flange			96796662	1	
156.b	Flange					
159.b	Seal ring					
185.b	Nut					
185	Hex socket head cap screw					
186	Drain plug					
195.a	Grease nipple					
-	Kit, gaskets			96798508	1	
184	O-ring		Diameter: 235			
-	Kit, lubrication nipple			96796671	1	
195.b	Grease nipple					
195.a	Grease nipple					
-	Kit, ND-end shield cpl.			96796669	1	
32b	Waved washer					
156.a	End shield NDE					
157	O-ring					
159	V-ring					
185.c	Nut					
185.a	Hex socket head cap screw					
195.b	Grease nipple					
-	Kit, shaft seal			96843459	1	
159.b	V-ring					
159	V-ring					
-	Kit, terminal board			96796657	1	
	Terminal connection					
	Washer					
36	Hex nut					
173	Torx Screw					
176.d	Terminal board					
176	Terminal board					
177	Torx Screw					
-	Kit, terminal box cover			96796659	1	
164	Terminal box cover					
273a	Pan head thread forming screw					
1a	Pump head			98998053	1	pcs



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Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
1	Flange			98913788	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	3	pcs
+ 4a	Intermediate chamber cpl.			98371117	3	pcs
- 4	Bulk, Intermediate chamber cpl. (10 pcs)			96538840	10	pcs
3	Intermediate chamber			98371143	1	
65	Retainer			96547341	1	
+ 4	Intermediate chamber cpl.			98371115	10	pcs
6	Base			98654159	1	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	Bulk, Strap cpl. (2 pcs)		Length (mm): 629MM	98862086	2	pcs
26a	Strap cpl.		Length (mm): 629MM	98984433	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			98982889	4	pcs
28	Hex head screw		Length (mm): 25 Thread: M12	99522923	4	pcs
36	Bulk, Hex nut (20 pcs)		Thread: M16	96620480	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	3	pcs
- 49	Bulk, Impeller cpl. (5 pcs)			98394310	14	pcs
49c	Bulk, Wear ring (10 pcs)			96547340	1	
+ 49	Impeller cpl.			98394459	14	pcs
+ 51	Shaft, spline, cpl.			98368645	1	pcs
55	Outer sleeve			98812648	1	pcs
56	Base plate			98481136	1	pcs
60	Bulk, Spring (20 pcs)			96538963	4	pcs
64d	Bulk, Spacing bush (20 pcs)			96538947	3	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	3	pcs
64	Bulk, Spacing pipe (20 pcs)		Length (mm): 43.6	96535107	10	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