

Qty.	Description
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1	CRN 90-1-1 A-F-A-E-HQQE
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Product No.: [96124224](#)

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 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.

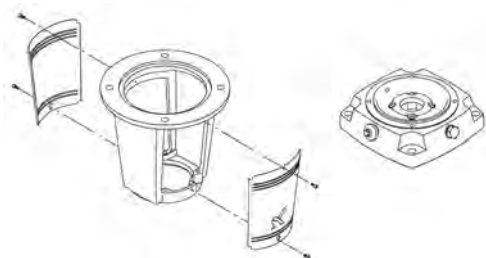
The colour code for the finished product is NCS 9000/RAL 9005.

### 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 motor stool connects the pump head and motor. 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:

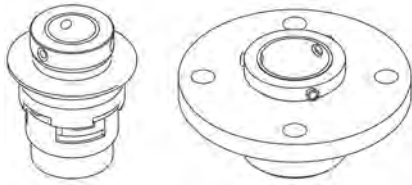
- Rotating seal ring material: silicon carbide (SiC)
- Stationary seat material: silicon carbide (SiC)

**Qty. Description**

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)

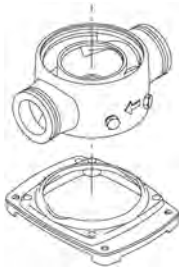
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



The shaft seal is retained in the pump head by a cover and screws. It can be replaced without removing the motor.

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. Both the inlet and the outlet side of the base have two pressure gauge tapings. The pump is secured to the foundation by four bolts through the base plate. The flanges are fastened to the base by means of locking rings.



**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

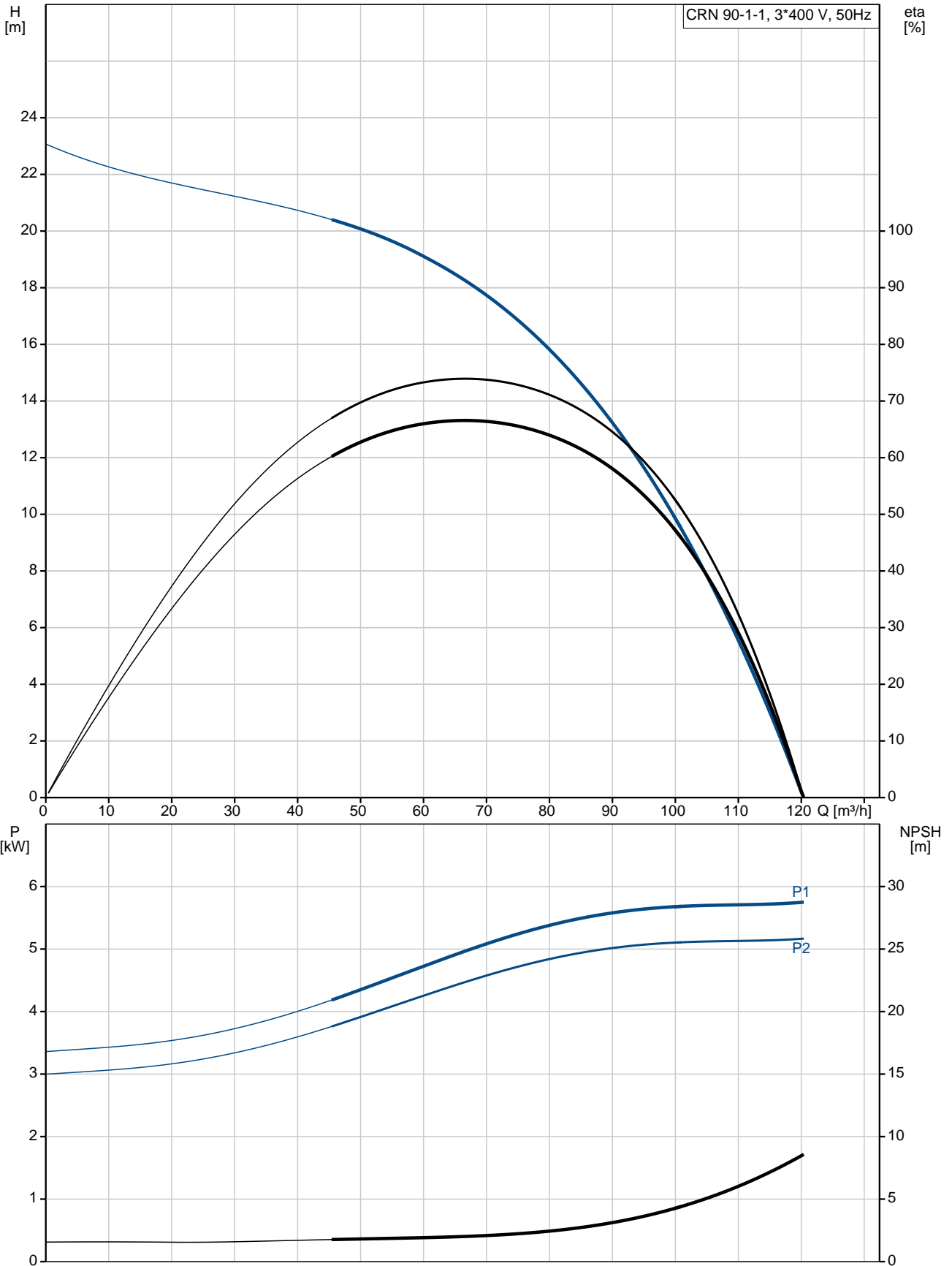
Liquid temperature range: -40 .. 120 °C

Liquid temperature during operation: 20 °C

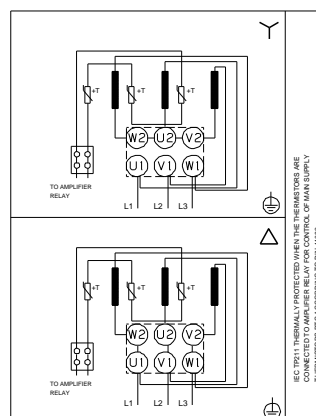
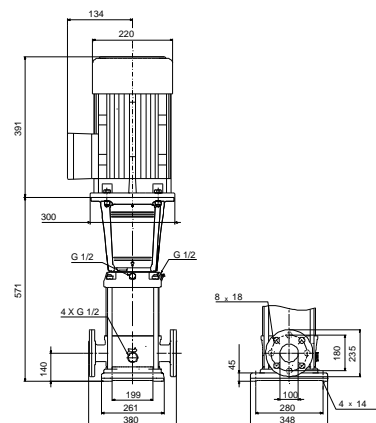
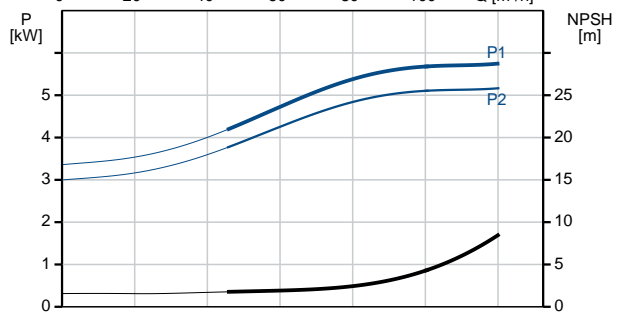
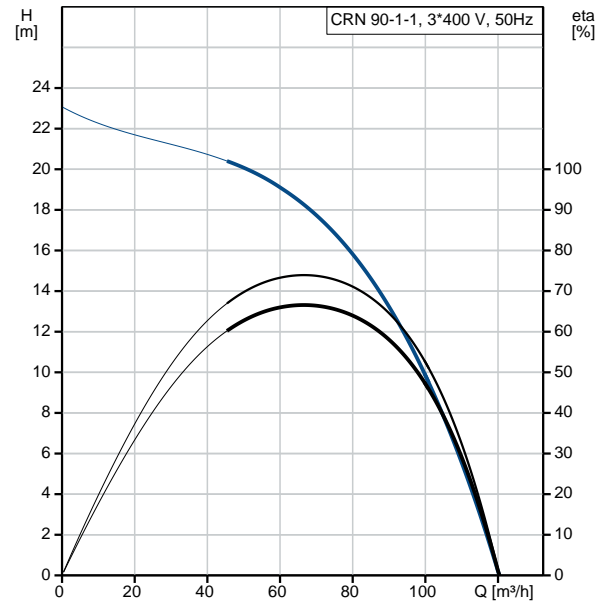
Density: 998.2 kg/m<sup>3</sup>

Qty.	Description
	<p><b>Technical:</b>                      Pump speed on which pump data are based: 2919 rpm                      Rated flow: 90 m<sup>3</sup>/h                      Rated head: 13.1 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                      Support bearing: Graflon</p> <p><b>Installation:</b>                      Maximum ambient temperature: 60 °C                      Maximum operating pressure: 16 bar                      Max pressure at stated temp: 16 bar / 120 °C                        16 bar / -40 °C                      Type of connection: DIN                      Size of inlet connection: DN 100                      Size of outlet connection: DN 100                      Pressure rating for pipe connection: PN 16                      Flange size for motor: FF265</p> <p><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</p> <p><b>Others:</b>                      Minimum efficiency index, MEI <math>\hat{\alpha}_{\%}</math>: 0.70                      Net weight: 109 kg                      Gross weight: 132 kg                      Shipping volume: 0.309 m<sup>3</sup>                      Danish VVS No.: 385919011</p>

## 96124224 CRN 90-1-1 A-F-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CRN 90-1-1 A-F-A-E-HQQE
Product No:	96124224
EAN number:	5700396705385
<b>Technical:</b>	
Pump speed on which pump data are based:	2919 rpm
Rated flow:	90 m <sup>3</sup> /h
Rated head:	13.1 m
Head max:	23.3 m
Stages:	1
Impellers:	1
Number of reduced-diameter impellers:	1
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:	B
<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
Support bearing:	Graflon
<b>Installation:</b>	
Maximum ambient temperature:	60 °C
Maximum operating pressure:	16 bar
Max pressure at stated temp:	16 bar / 120 °C 16 bar / -40 °C
Type of connection:	DIN
Size of inlet connection:	DN 100
Size of outlet connection:	DN 100
Pressure rating for pipe connection:	PN 16
Flange size for motor:	FF265
Connect code:	F
<b>Liquid:</b>	
Pumped liquid:	Water
Liquid temperature range:	-40 .. 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:

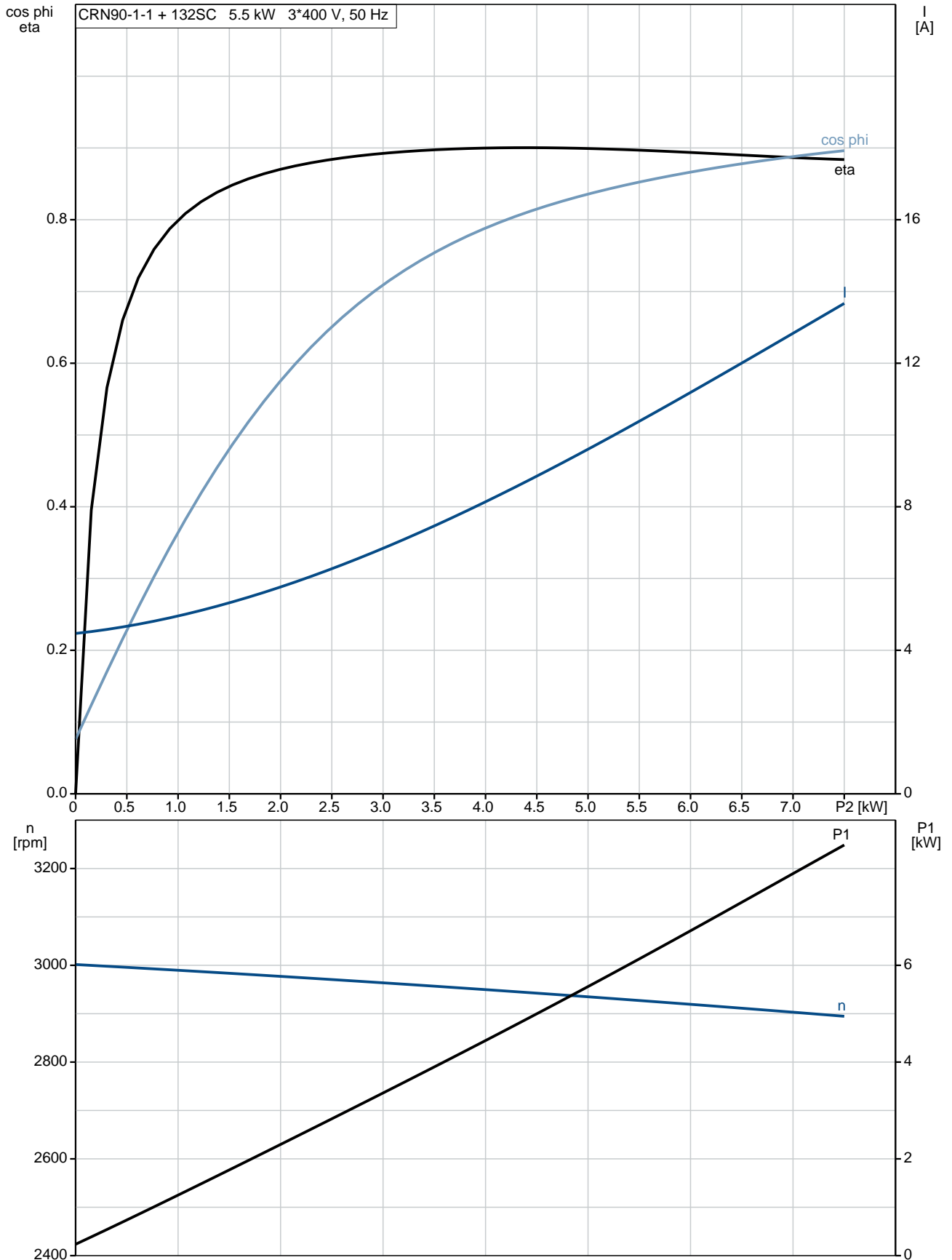
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Date:

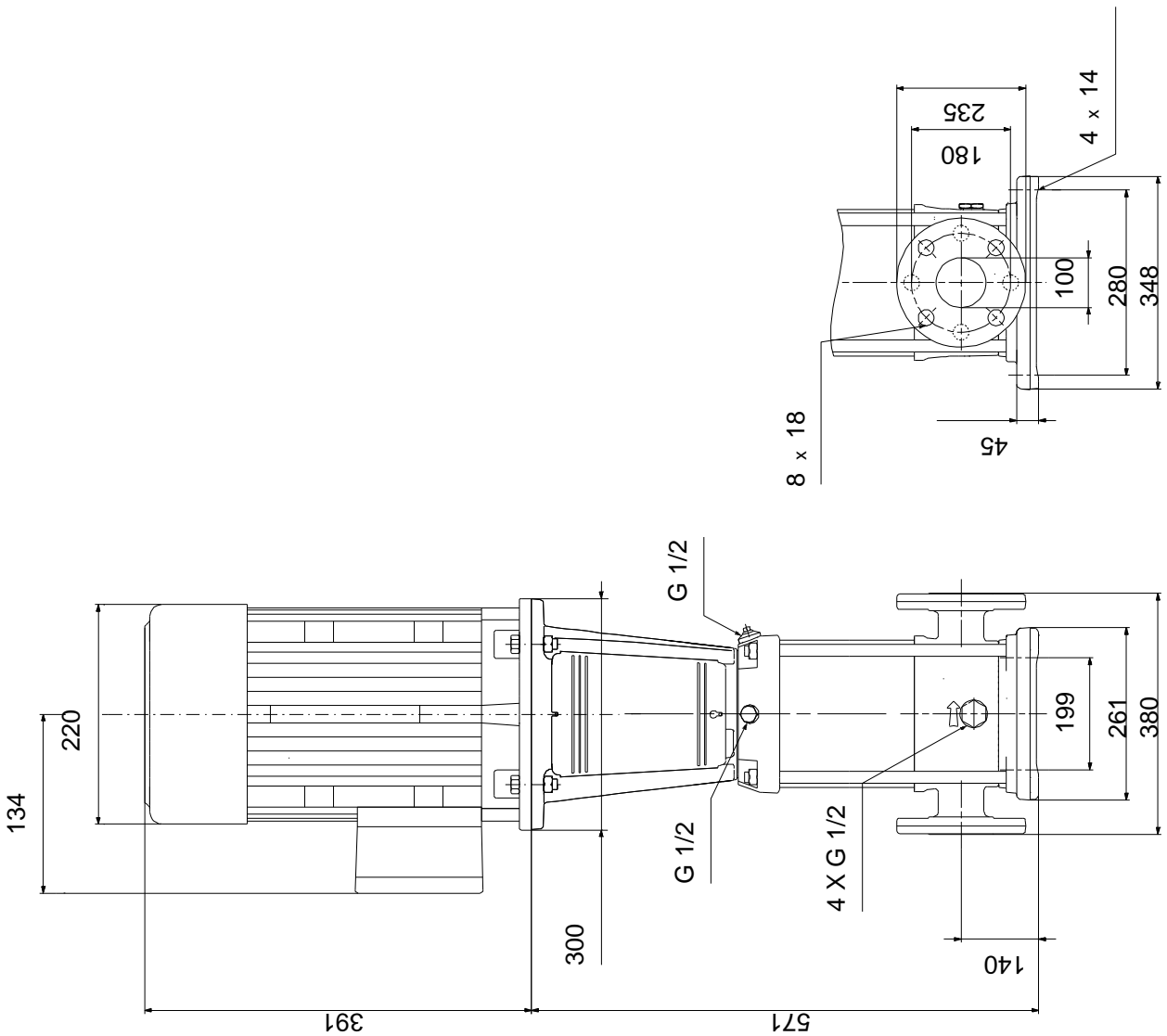
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Description	Value
Cos phi - power factor:	0.87-0.82
Rated speed:	2920-2940 rpm
Efficiency:	IE3 89,2%
Motor efficiency at full load:	89.2 %
Motor efficiency at 3/4 load:	90.0 %
Motor efficiency at 1/2 load:	89.6 %
Number of poles:	2
Enclosure class (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:	109 kg
Gross weight:	132 kg
Shipping volume:	0.309 m <sup>3</sup>
Danish VVS No.:	385919011

## 96124224 CRN 90-1-1 A-F-A-E-HQQE 50 Hz



**96124224 CRN 90-1-1 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.



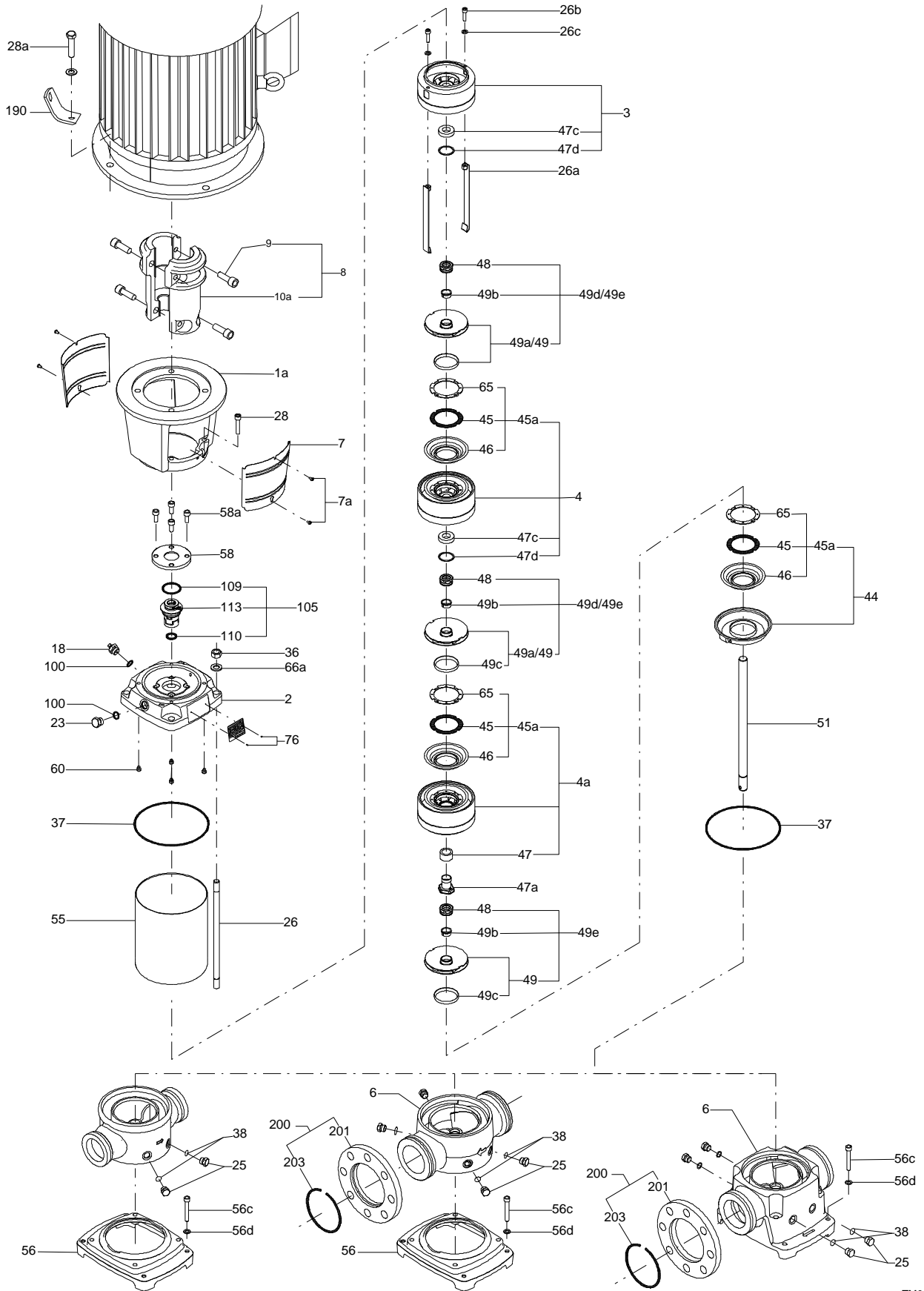
## 96124224 CRN 90-1-1 A-F-A-E-HQQE 50 Hz



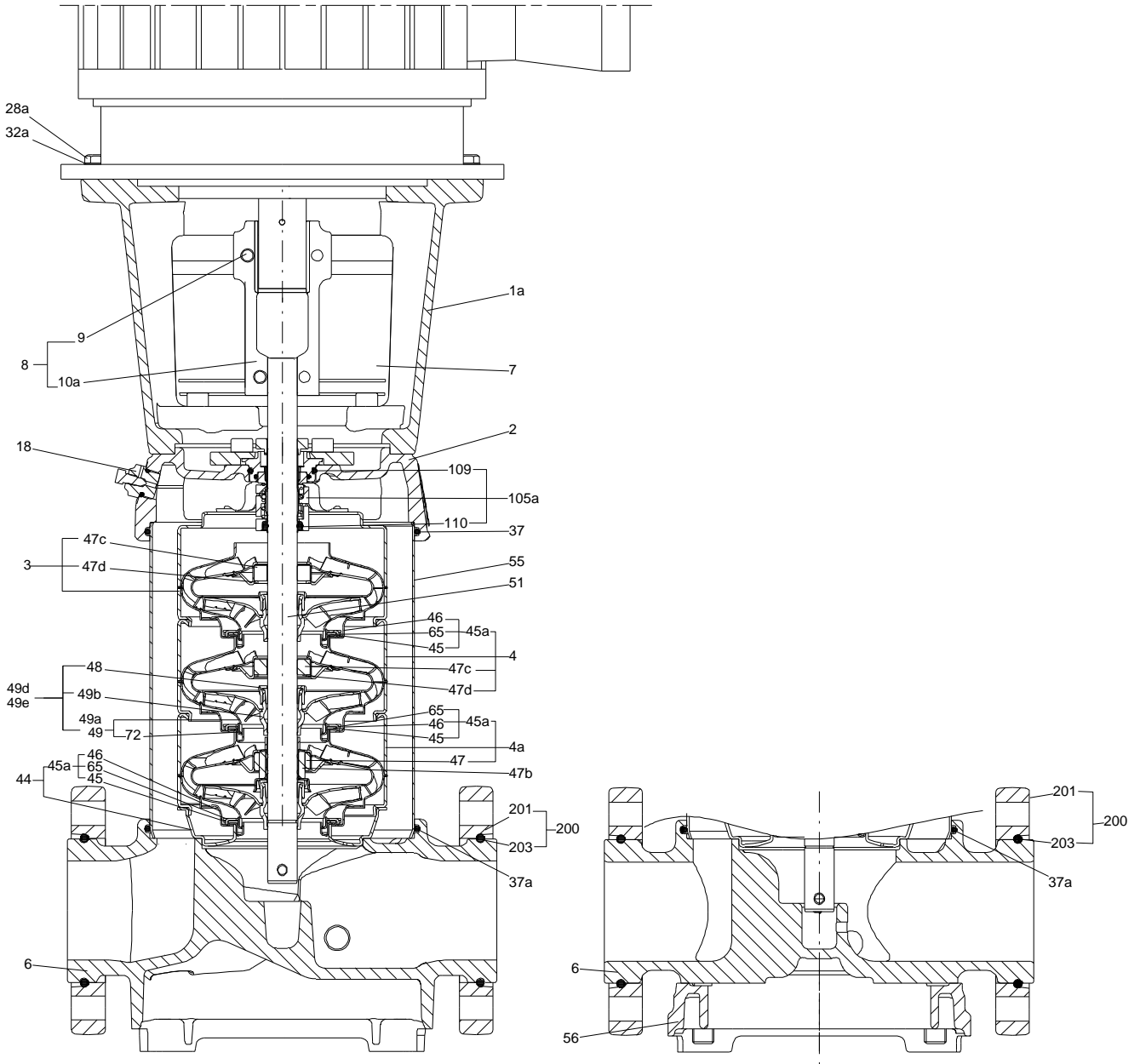
IEC TP211 THERMALLY PROTECTED WHEN THE THERMISTORS ARE  
CONNECTED TO AMPLIFIER RELAY FOR CONTROL OF MAIN SUPPLY  
THERMISTORS PTC ACCORDING TO DIN 44082

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

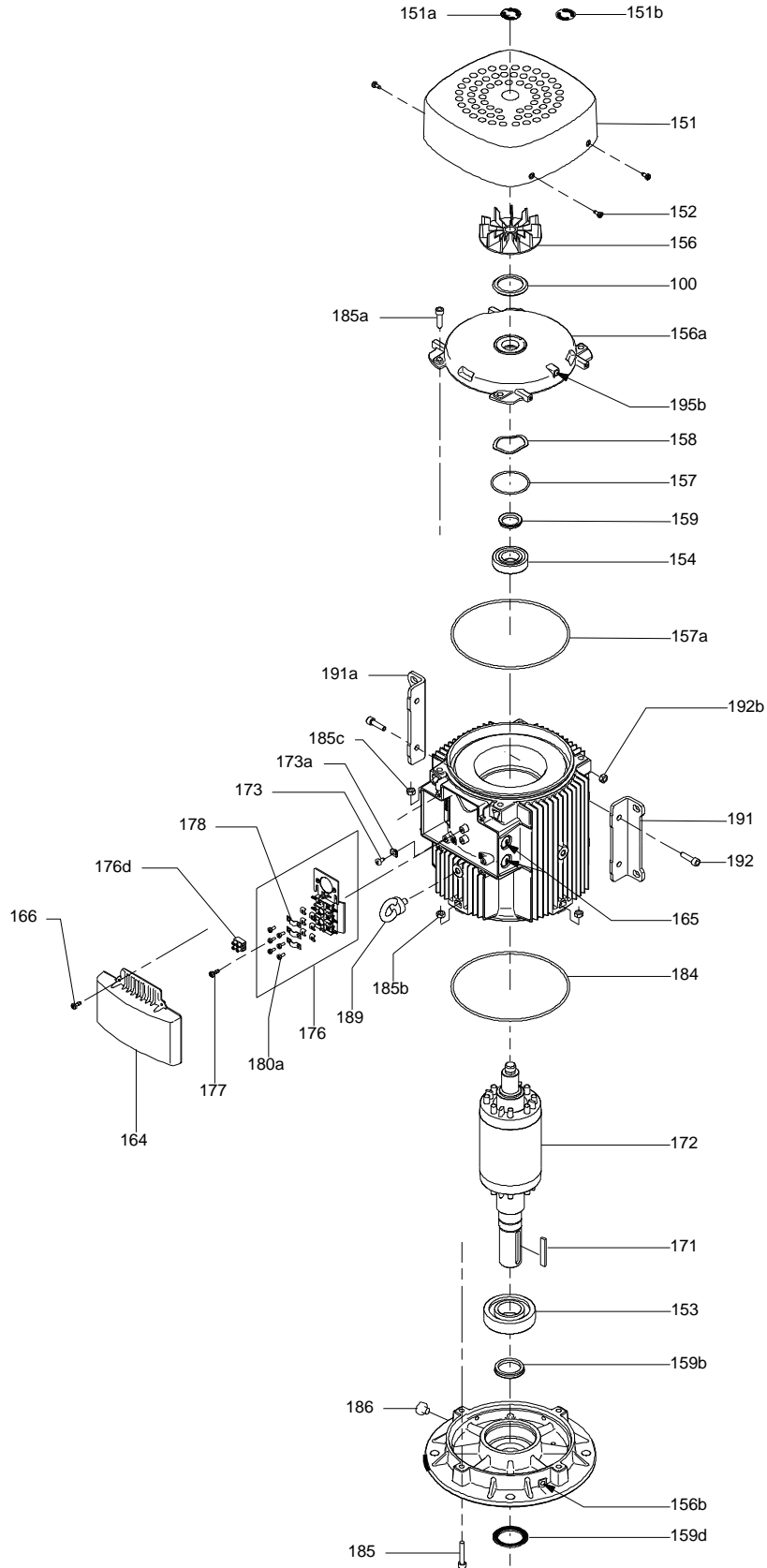
(TM065558 LACR )



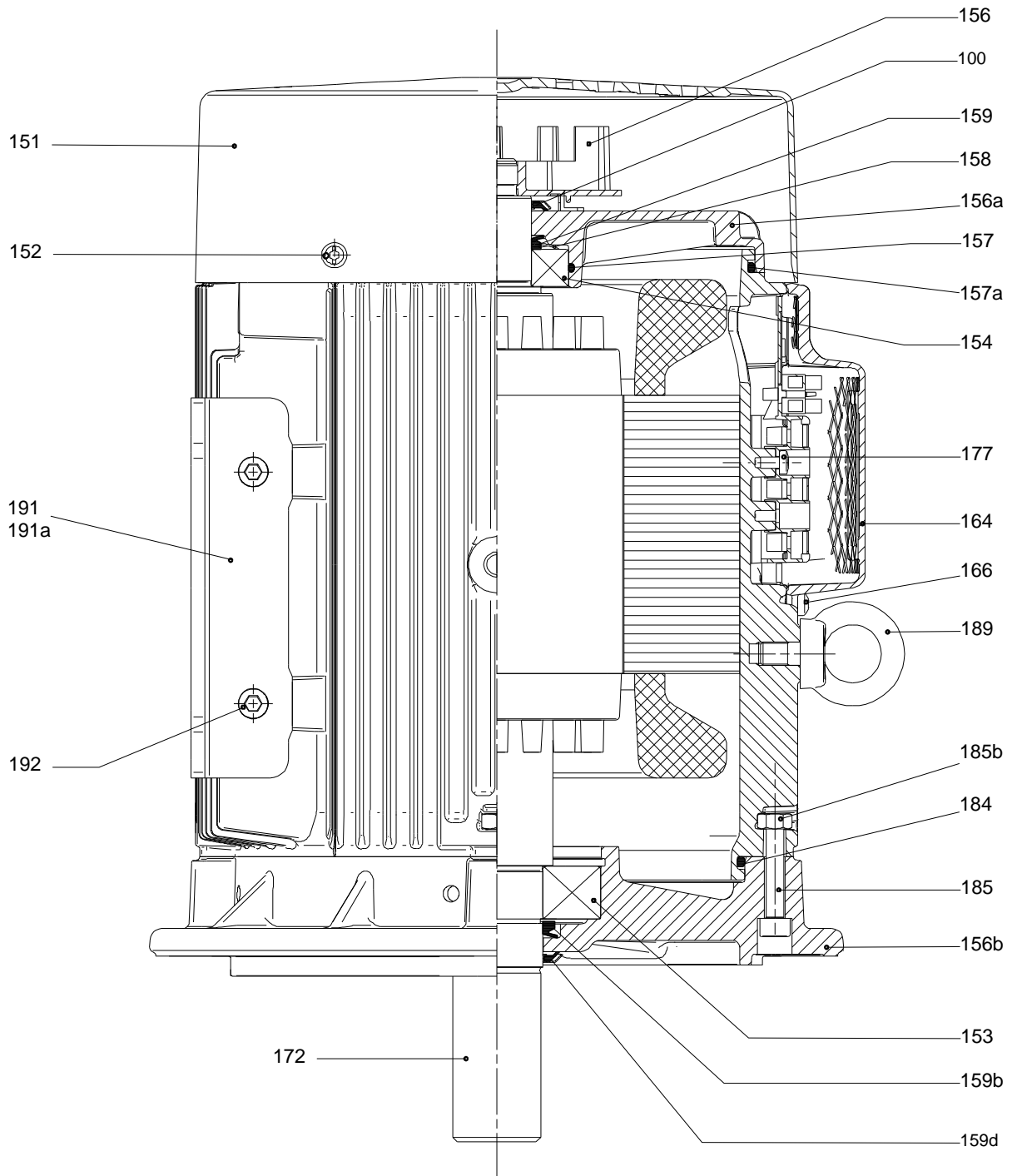
( TM065571 LACR)



## Exploded view



## Sectional drawing



**Spare parts CRN 90-1-1, Product No. 96124224**  
**Valid from 3.3.2014 (1410)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Base			96587699	1	pcs
6	Base				1	
-	80	Kit, chamber stack		96458124	1	pcs
-	80	Chamber stack			1	
-	3	Upper chamber cpl.				
		Cone				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
47	Bearing					
26c	Washer		Designation: DIN 125A			
			Thickness: 1,6			
26b	Hex socket head cap screw					
26a	Strap cpl.		Length (mm): 101			
			Thread: M8			
-	44	Suction interconnector cpl.				
		Suction interconnector				
45a	Neck ring cpl.					
-	47a	Bearing				
		Driver				
		Holder				
		Disc spring				
		Bearing ring				
47f	Hairpin clip					
-	49d	Impeller cpl.				
48	Nut					
49b	Split cone					
49a	Impeller					
51	Shaft					
-	Kit, chambers			98635099	1	pcs
-	3	Upper chamber cpl.				1
		Cone				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
		Spare, turbulence optimizer KP				
47	Bearing					
-	47a	Bearing				1
		Driver				
		Holder				
		Disc spring				
		Bearing ring				
47f	Hairpin clip					
-	Kit, coupling			96416591	1	pcs
		Adjusting fork				1
9	Hex socket head cap screw		Designation: DIN 912			4
			Length (mm): 25			
			Thread: M10			
10a	Coupling		Type: SPACER			1
-	Kit, coupling guard			96505134	1	pcs

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
7a	Socket button head screw				4	
7	Coupling guard				2	
-	Kit, cover			98832448	1	pcs
58a	Hex socket head cap screw		Designation: DIN 912		4	
			Length (mm): 25			
			Thread: M10			
58	Cover				1	
-	Kit, impeller			98593755	1	pcs
-	44 Suction interconnector cpl.				1	
	Suction interconnector					
45a	Neck ring cpl.					
48	Nut				1	
-	49d Impeller cpl.				1	
48	Nut					
49b	Split cone					
49a	Impeller					
-	Kit, Impeller, reduced diamete			98635123	1	pcs
48	Nut				1	
48	Nut				1	
49b	Split cone				1	
-	49a Impeller				1	
	Impeller hub					
49c	Wear ring					
-	Kit, plug			96505136	1	pcs
-	18 Air vent screw				1	
	Spindle					
	Plug					
25	Plug				4	
25	Plug				1	
38	O-ring		Diameter: 16,3		2	
			Material type: FKM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		4	
			Material type: FKM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		6	
			Material type: FKM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		2	
			Material type: EPDM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		4	
			Material type: EPDM			
			Thickness: 2,4			
-	Kit, seals			96416601	1	pcs
	Adjusting fork				1	
37	O-ring				2	
38	O-ring		Diameter: 16,3		2	
			Material type: EPDM			
			Thickness: 2,4			
38	O-ring		Diameter: 16,3		4	
			Material type: EPDM			
			Thickness: 2,4			
60	Spring				4	
109	O-ring				1	
110	O-ring		Diameter: 21,2		1	
			Material type: EPDM			
			Thickness: 3,55			
-	Kit, shaft seal HQQE			96525458	1	pcs

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
	Grinding device				1	
- 105	Shaft seal		Material type: HQQE		1	
	Adjusting fork					
109	O-ring					
110	O-ring		Diameter: 21,5			
			Material type: EPDM			
			Thickness: 4,25			
-	Kit, wear parts			98497509	1	pcs
45	Seal ring				1	
45	Neck ring				2	
47d	Lock ring				2	
47c	Bush				1	
49c	Wear ring				1	
49c	Wear ring				2	
65	Top f/neck ring				1	
65	Top f/neck ring				2	
-	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			





Company name:

Created by:

Phone:

Date:

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Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
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					
1a	Motor stool			96547431	1	pcs
2	Pump head			97789459	1	pcs
+ 3	Bulk, Upper chamber cpl. (5 pcs)			99262805	1	pcs
6	Base			97974018	1	pcs
7a	Bulk, Socket button head screw (10 pcs)			96549696	4	pcs
7	Bulk, Coupling guard (10 pcs)			96603300	2	pcs
+ 8	Coupling cpl.		Dimension: 22/38	96587705	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
26c	Bulk, Washer (4 pcs)		Designation: DIN 125A	99262704	2	pcs
			Thickness: 1,6			
26c	Washer		Designation: DIN 125A	96586880	2	pcs
			Thickness: 1,6			
26b	Bulk, Hex socket head cap screw (10 pcs)			98931380	2	pcs
26a	Strap cpl.		Length (mm): 101	98983911	2	pcs
			Thread: M8			
26	Staybolt		Length (mm): 321	98976756	4	pcs
			Thread: M16			
28	Bulk, Hex socket head cap screw (10 pcs)		Designation: DIN 912	96536147	4	pcs
			Length (mm): 50			
			Thread: M10			
28	Bulk, Hex head screw (20 pcs)		Length (mm): 45 MM	96620474	4	pcs
			Thread: M12			
36	Bulk, Nut (20 pcs)		Thread: M12	96620479	4	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			
+ 47a	Bulk, Bearing (5 pcs)			99270667	1	pcs
49b	Bulk, Split cone (10 pcs)			96536010	1	pcs
55	Outer sleeve			98820406	1	pcs
56	Base plate			97789433	1	pcs
58	Cover			98893158	1	pcs
60	Bulk, Spring (20 pcs)			96536032	4	pcs
- 105	Bulk, Shaft seal (12 pcs)		Material type: HQQE	96984086	1	pcs
	Adjusting fork			96587896	1	
109	Bulk, O-ring (10 pcs)			96547586	1	
+ 105	Bulk, Shaft seal (12 pcs)		Material type: HQQE	96984070	1	pcs
440b	Bulk, Lock ring (4 pcs)			96547435	1	pcs