

Qty.	Description
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1	CRN 3-36 A-P-A-E-HQQE
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Product No.: [96516915](#)

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

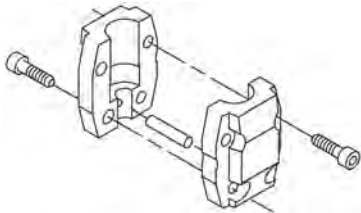
Steel, cast iron and aluminium components have an epoxy-based coating made in a cathodic electro-deposition (CED) process. CED is a high-quality dip-painting process where an electrical field around the products ensures deposition of paint particles as a thin, well-controlled layer on the surface. An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

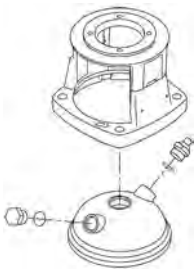
The colour code for the finished product is NCS 9000/RAL 9005.

### 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)

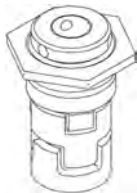
**Qty. Description**

- 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)

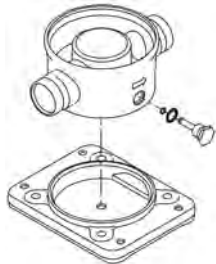
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



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 combined drain plug and bypass valve. 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 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

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

Qty.	Description
	<p><b>Technical:</b>                      Pump speed on which pump data are based: 2902 rpm                      Rated flow: 3 m<sup>3</sup>/h                      Rated head: 176.3 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 32                      1 1/4 inch                      Size of outlet connection: DN 32                      1 1/4 inch                      Pressure rating for pipe connection: PN 50                      Flange size for motor: FT130</p> <p><b>Electrical data:</b>                      Motor standard: IEC                      Motor type: 100LC                      IE Efficiency class: IE3                      Rated power - P2: 3 kW                      Power (P2) required by pump: 3 kW                      Mains frequency: 50 Hz                      Rated voltage: 3 x 220-240D/380-415Y V                      Rated current: 11.0/6.30 A                      Starting current: 840-920 %                      Cos phi - power factor: 0.87-0.82                      Rated speed: 2900-2920 rpm                      Efficiency: IE3 87,1%                      Motor efficiency at full load: 87.1 %                      Motor efficiency at 3/4 load: 88.0 %                      Motor efficiency at 1/2 load: 87.7 %                      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: 50.1 kg                      Gross weight: 54.8 kg                      Shipping volume: 0.148 m<sup>3</sup>                      Danish VVS No.: 385911036</p>



Company name:

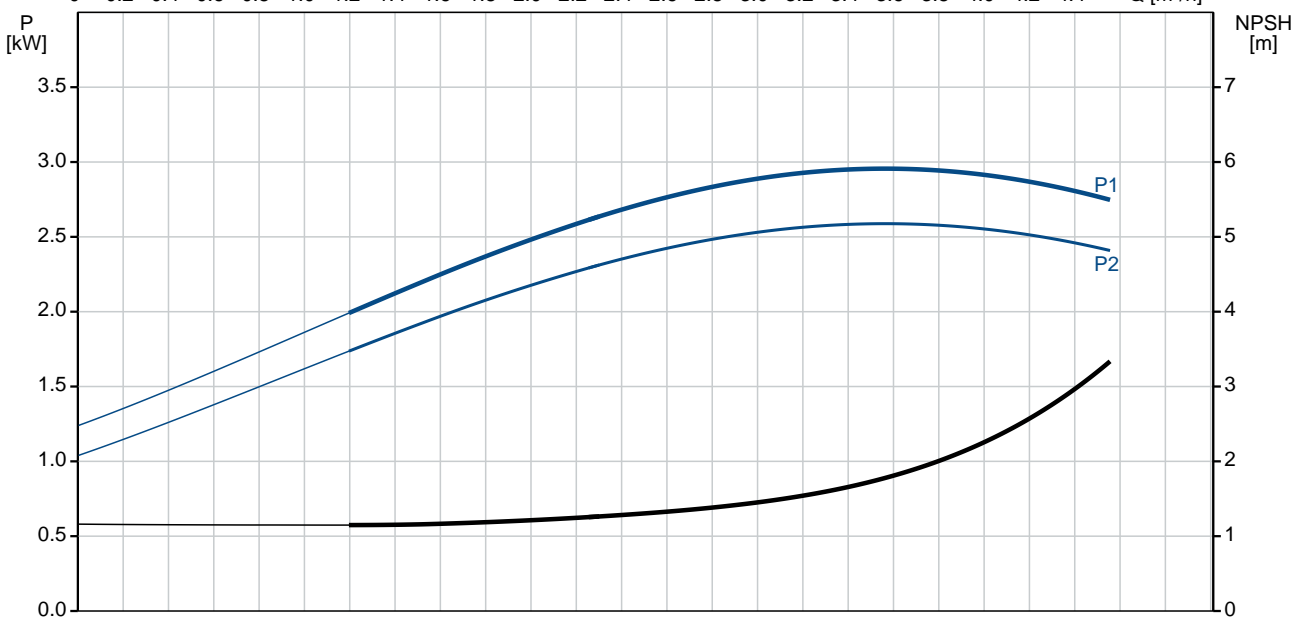
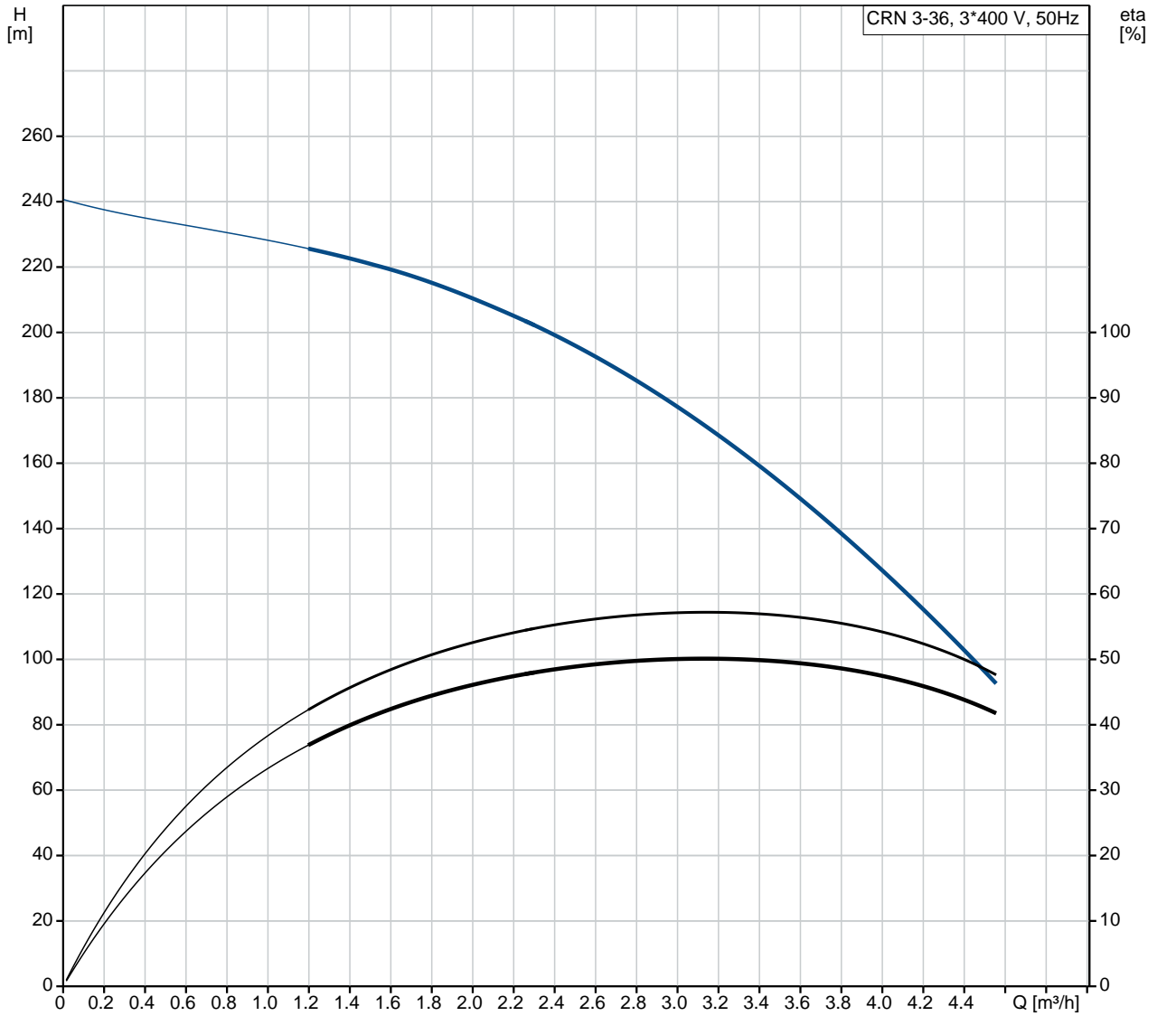
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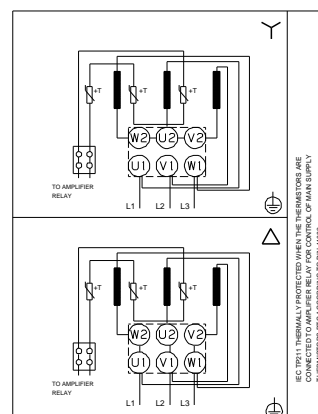
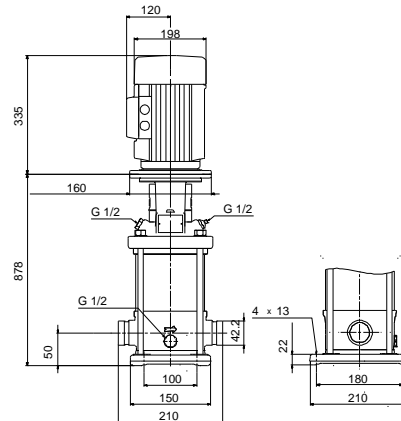
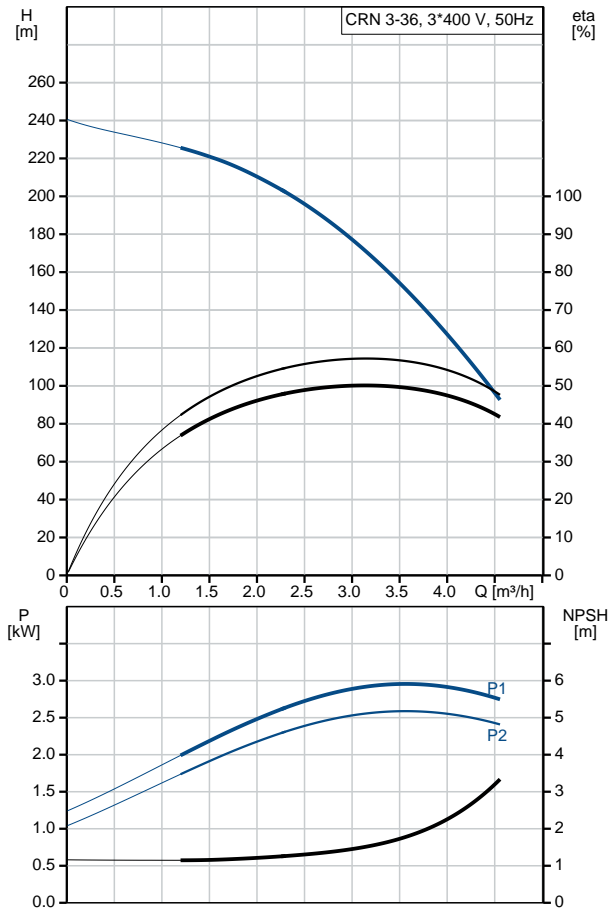
Date:

15/02/2019

### 96516915 CRN 3-36 A-P-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CRN 3-36 A-P-A-E-HQQE
Product No:	96516915
EAN number:	5700396752433
<b>Technical:</b>	
Pump speed on which pump data are based:	2902 rpm
Rated flow:	3 m <sup>3</sup> /h
Rated head:	176.3 m
Head max:	239.3 m
Stages:	36
Impellers:	36
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 32 1 1/4 inch
Size of outlet connection:	DN 32 1 1/4 inch
Pressure rating for pipe connection:	PN 50
Flange size for motor:	FT130
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:	100LC
IE Efficiency class:	IE3
Rated power - P2:	3 kW
Power (P2) required by pump:	3 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 220-240D/380-415V V





Company name:

Created by:

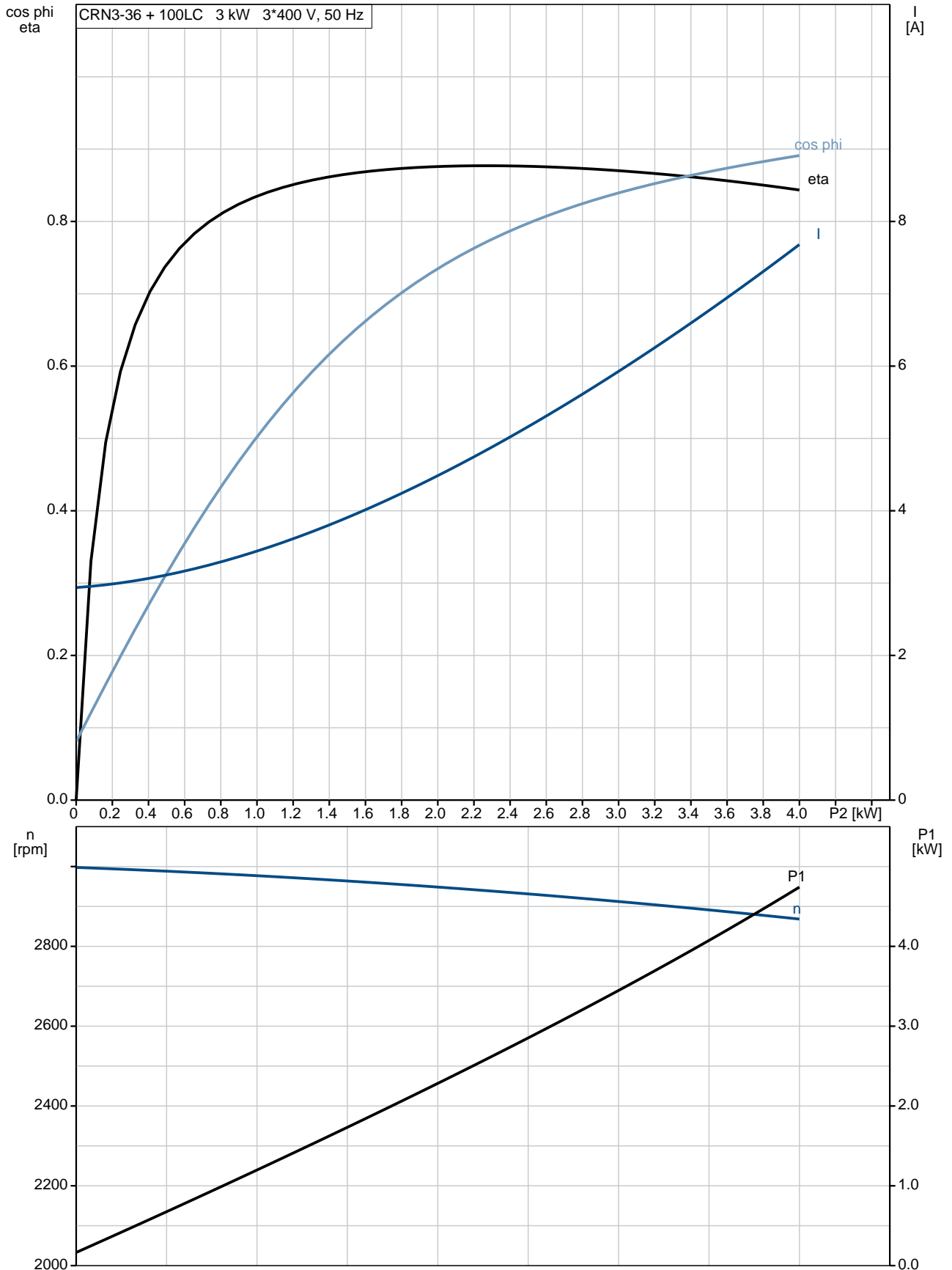
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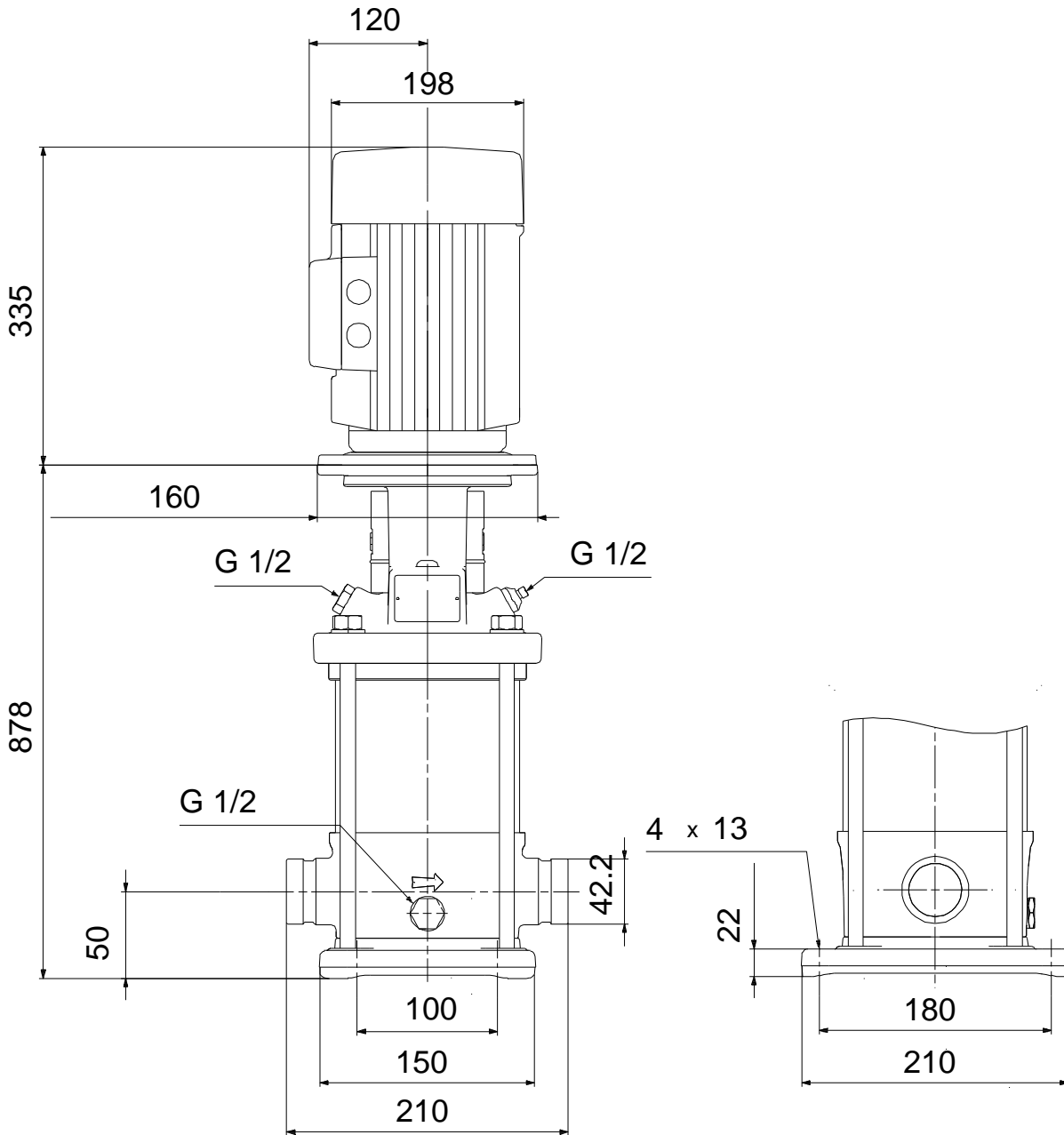
15/02/2019

Description	Value
Rated current:	11.0/6.30 A
Starting current:	840-920 %
Cos phi - power factor:	0.87-0.82
Rated speed:	2900-2920 rpm
Efficiency:	IE3 87,1%
Motor efficiency at full load:	87.1 %
Motor efficiency at 3/4 load:	88.0 %
Motor efficiency at 1/2 load:	87.7 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	PTC
Motor No:	85U05510
<b>Controls:</b>	
Frequency converter:	NONE
<b>Others:</b>	
Minimum efficiency index, MEI $\eta_{min}$ :	0.70
Net weight:	50.1 kg
Gross weight:	54.8 kg
Shipping volume:	0.148 m <sup>3</sup>
Danish VVS No.:	385911036

## 96516915 CRN 3-36 A-P-A-E-HQQE 50 Hz



## 96516915 CRN 3-36 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.



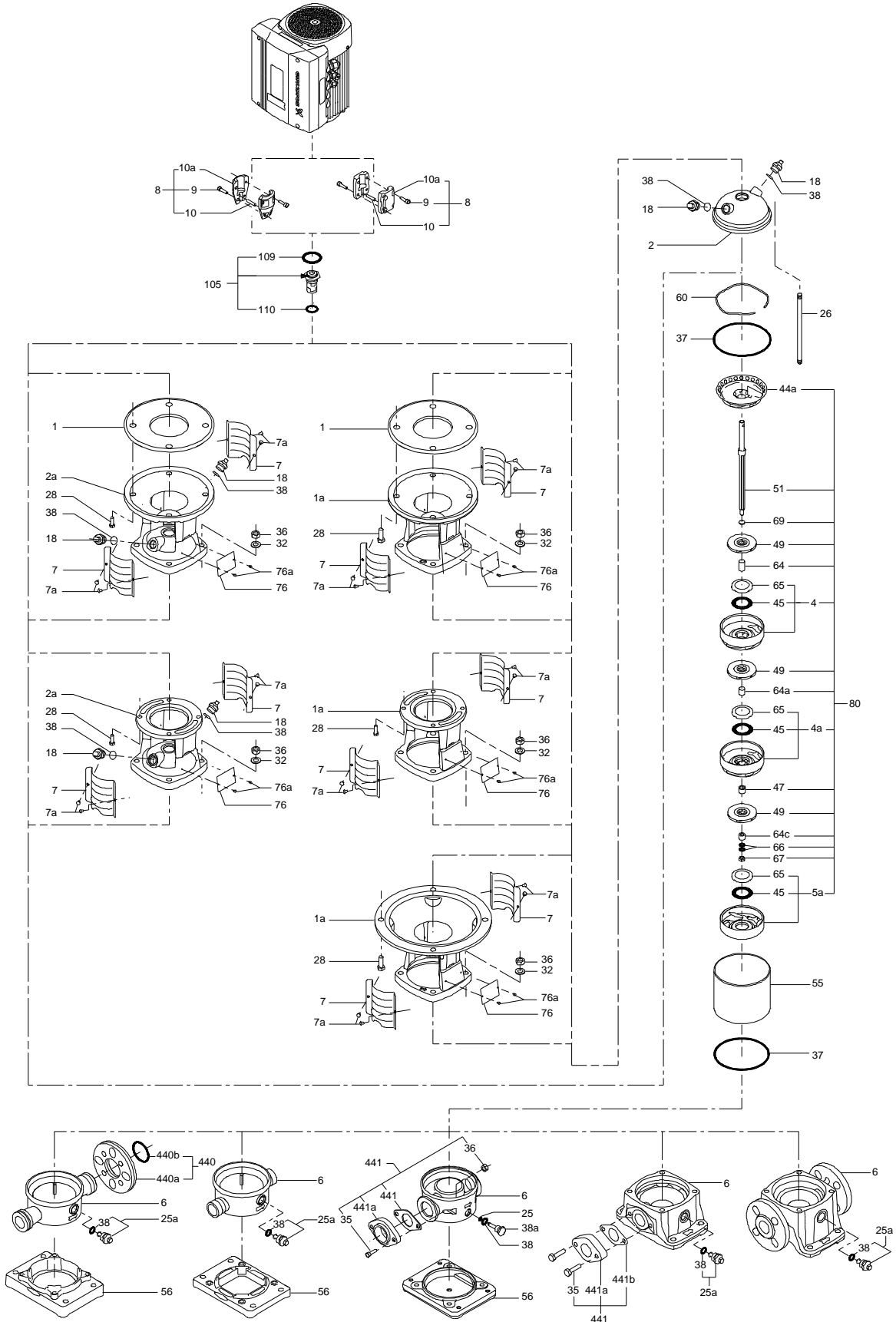
## 96516915 CRN 3-36 A-P-A-E-HQQE 50 Hz



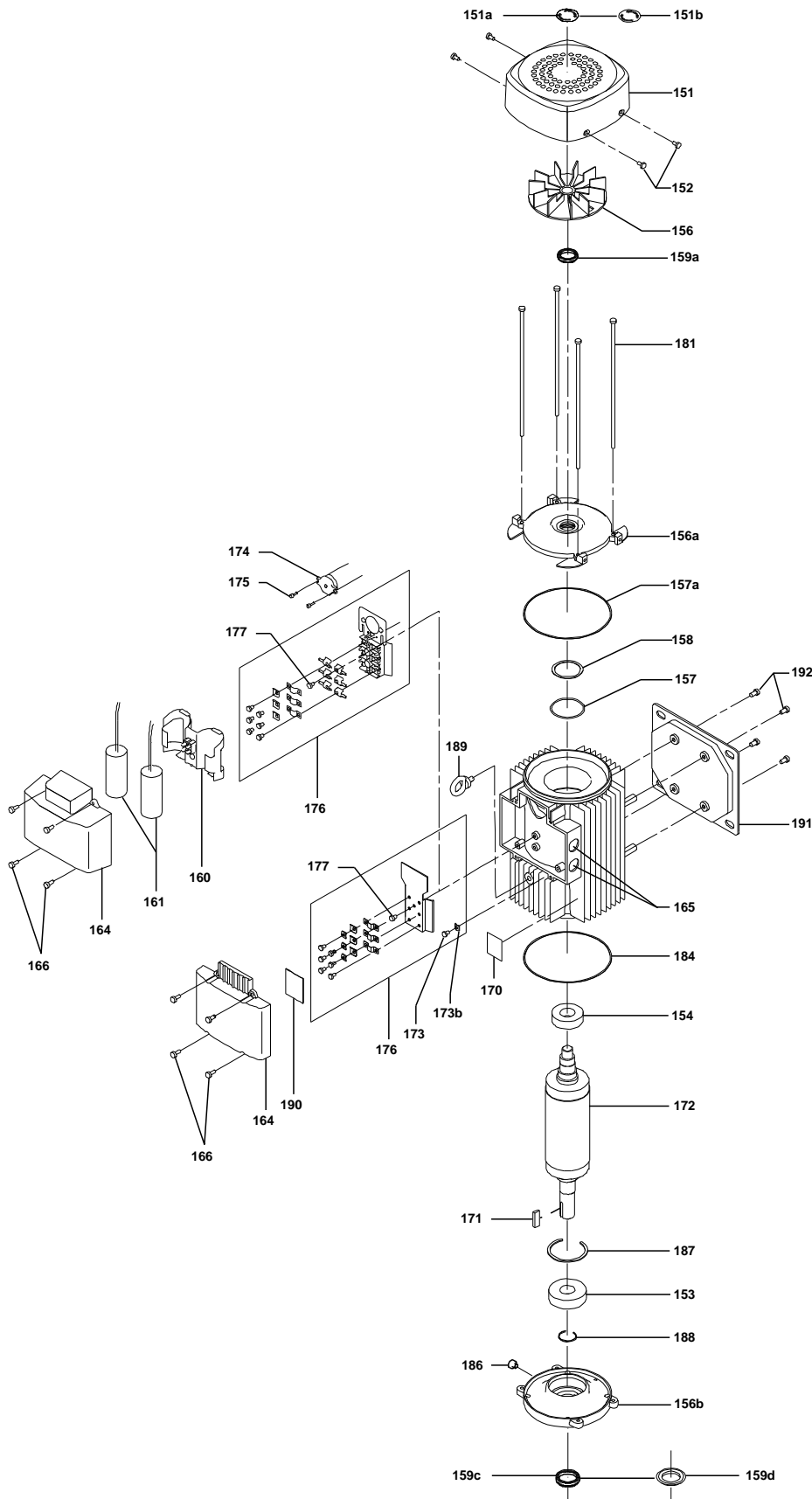
IEC TP211 THERMALLY PROTECTED WHEN THE THERMISTORS ARE  
CONNECTED TO AMPLIFIER RELAY FOR CONTROL OF MAIN SUPPLY  
THERMISTORS PTC ACCORDING TO DIN 44082

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

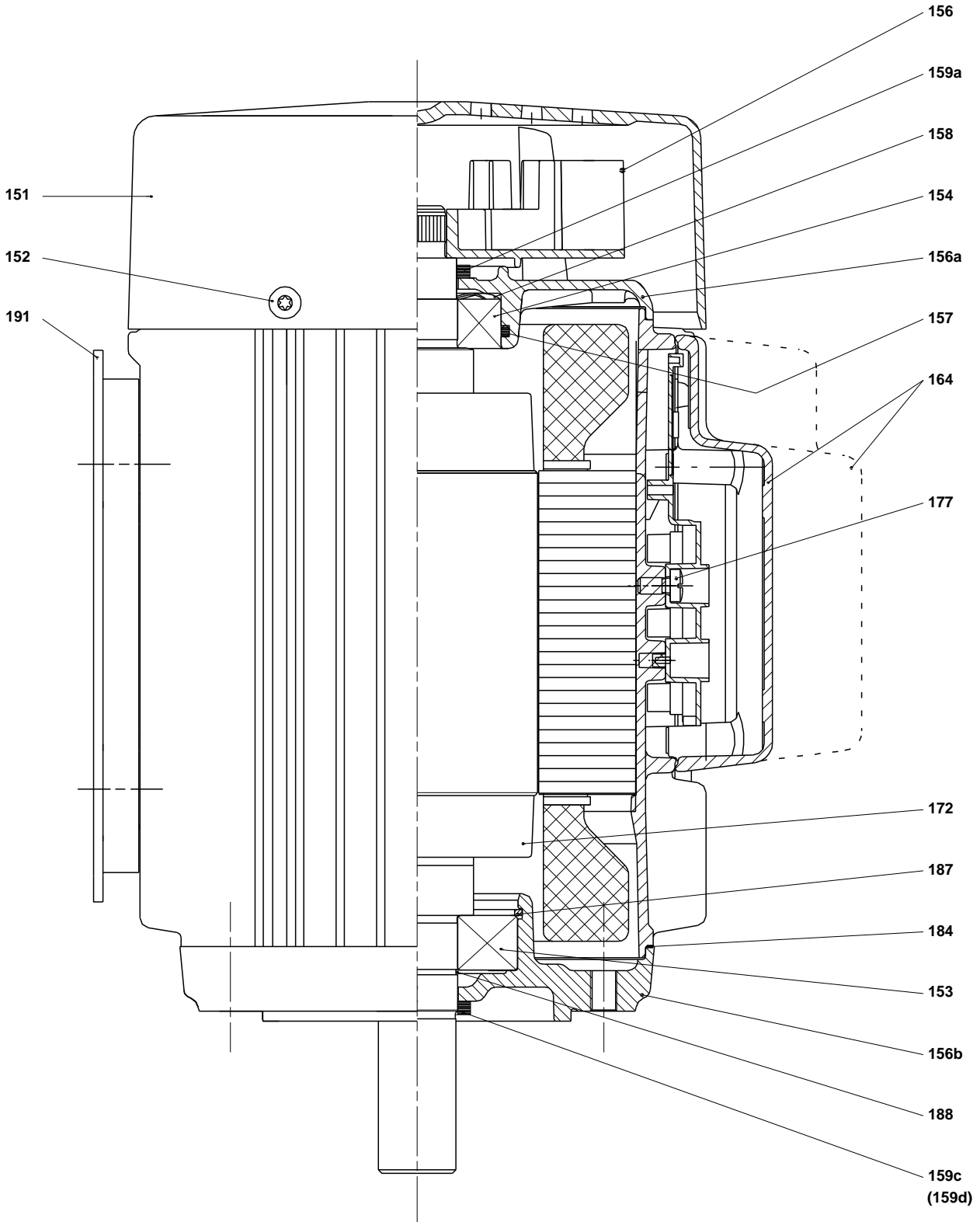
( TM069451 for SMCR standard)



(tm029184 0505)



(tm029178 2004)



**Spare parts CRN 3-36, Product No. 96516915**  
**Valid from 1.1.2011 (1152)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
- 80	Kit, chamber stack			96453574	1	pcs
- 4a	Chamber w. bearing cpl.				4	
4a	Intermediate chamber					
45	Neck ring					
65	Neck ring retainer					
- 4	Chamber cpl.				31	
4a	Intermediate chamber					
45	Neck ring					
65	Neck ring retainer					
- 5a	Chamber cpl.				1	
4a	Intermediate chamber					
45	Neck ring					
65	Neck ring retainer					
- 44a	Guide vane cpl.				1	
	Plate					
	Guide vane					
50	Top plate					
47	Bearing ring, rotating				4	
49	Impeller cpl.				36	
- 51	Shaft, spline, cpl.				1	
	Shaft					
62	Stop ring					
64d	Spacing pipe		Internal diameter: 12,85 Outer diameter: 15,85 Length (mm): 4,50		4	
64c	Clamp, splined		Internal diameter: 8,5 Outer diameter: 15		1	
64a	Spacing pipe				31	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
-	Kit, coupling			00415063	1	pcs
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			96505131	1	pcs
7.a	Combi Slot Torx screw				4	
7	Coupling guard				2	
-	Kit, gaskets			96455090	1	pcs
37	O-ring				2	
38	O-ring		Diameter: 16,3 Material type: EPDM Thickness: 2,4		1	
38	O-ring		Diameter: 16,3 Material type: EPDM Thickness: 2,4		2	
109	O-ring		Diameter: 22,00 Material type: EPDM Thickness: 2,75		1	
-	Kit, plug			96505133	1	pcs
- 18	Air vent screw				1	

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
	Spindle					
	Plug					
23b	Spindle				1	
25	Plug				1	
25	Plug				1	
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			96455086	1	pcs
+ 105	Shaft seal		Material type: HQQE		1	
-	Kit, wear parts		Material type: SILICON CARBIDE	96455094	1	pcs
- 4a	Chamber w. bearing cpl.				4	
4a	Intermediate chamber					
45	Neck ring					
65	Neck ring retainer					
45	Neck ring				32	
47	Bearing ring, rotating				4	
64d	Spacing pipe		Internal diameter: 12,85		4	
			Outer diameter: 15,85			
			Length (mm): 4,50			
64c	Clamp, splined		Internal diameter: 8,5		1	
			Outer diameter: 15			
65	Neck ring retainer				32	
66	Wedge lock washer				1	
67	Lock nut		Thread: M8		1	
441b	Gasket				2	
-	Motor			85903730	1	pcs
-	Kit, Ball bearing			96279795	1	
99a	Retaining ring					
99	Retaining ring					
111	Ball bearing					
111	Ball bearing					
157	O-ring		Diameter: 52			
			Material type: NBR			
			Thickness: 3			
158	Waved washer					
-	Kit, end shield			96279831	1	
156a	End shield					
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			96279826	1	
151b	Label					
151	Fan cover					
152	Pan head thread forming screw					

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, flange			96279828	1	
156b	Flange					
156.c	Drain plug					
159.c	Seal ring					
-	Kit, retaining ring			96279799	1	
99	Retaining ring					
188	Retaining ring					
-	Kit, shaft seal			96279762	1	
159c	Seal ring					
159a	Seal ring					
-	Kit, staybolts			96279832	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			96279771	1	
164	Terminal box cover w/gasket					
166	Pan head thread forming screw					
1a	Pump head			98804047	1	pcs
2	Pump cover			96588244	1	pcs
+ 4a	Bulk, Chamber w. bearing cpl. (5 pcs)			97690603	4	pcs
+ 4a	Bulk, Chamber w. bearing cpl. (5 pcs)			96547661	4	pcs
+ 4a	Chamber w. bearing cpl.			98371226	4	pcs
- 4	Bulk, Chamber cpl. (5 pcs)			97690021	31	pcs
45	Bulk, Neck ring (24 pcs)			96536194	1	
65	Bulk, Neck ring retainer (8 pcs)			99490745	1	
65	Bulk, Neck ring retainer (24 pcs)			99490747	1	
+ 4	Bulk, Chamber cpl. (10 pcs)			96547663	31	pcs
+ 4	Chamber cpl.			98371224	31	pcs
+ 5a	Chamber cpl.			98371222	1	pcs
6	Base			96588139	1	pcs
7.a	Bulk, Combi Slot Torx screw (1000 pcs)			96886324	4	pcs
7	Bulk, Coupling guard (10 pcs)			96603690	2	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	Drain plug w/bypass valve			96588243	1	pcs
38	Bulk, O-ring (10 pcs)		Diameter: 16,3	99198815	1	
			Material type: EPDM			
			Thickness: 2,4			
38	Bulk, O-ring (50 pcs)		Diameter: 16,3	99412727	1	
			Material type: EPDM			
			Thickness: 2,4			
26	Staybolt		Length (mm): 745	98985621	4	pcs
			Thread: M12			
28	Bulk, Hex head screw (4 pcs)		Length (mm): 25	99335941	4	pcs
			Thread: M8			
37	Bulk, O-ring (24 pcs)			96547656	2	pcs



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Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
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
+ 44a	Guide vane cpl.			98928568	1	pcs
47	Bulk, Bearing ring, rotating (10 pcs)			97905743	4	pcs
47	Bearing ring, rotating			96547649	4	pcs
49	Bulk, Impeller cpl. (4 pcs)			98271529	36	pcs
49	Bulk, Impeller cpl. (10 pcs)			98394270	36	pcs
49	Bulk, Impeller cpl. (24 pcs)			96547601	36	pcs
49	Impeller cpl.			98394417	36	pcs
+ 51	Shaft, spline, cpl.			96588238	1	pcs
55	Outer sleeve			98716703	1	pcs
56	Base plate			96588142	1	pcs
60	Formed wire spring			96547664	1	pcs
64c	Bulk, Clamp, splined (5 pcs)		Internal diameter: 8,5 Outer diameter: 15	98496968	1	pcs
64a	Bulk, Spacing pipe (24 pcs)			96536198	31	pcs
66	Bulk, Wedge lock washer (10 pcs)			96536157	1	pcs
67	Bulk, Lock nut (10 pcs)		Thread: M8	98277008	1	pcs
+ 105	Bulk, Shaft seal (15 pcs)		Material type: HQQE	96983415	1	pcs