

**Qty. Description**

1 CRN 90-3-2 A-F-A-E-HQQE



Product No.: [96124228](#)

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.

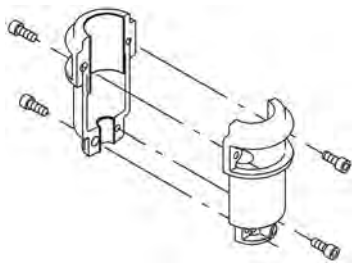
**Further product details**

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:

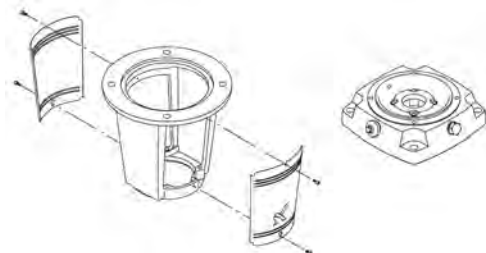
- 1) Alkaline-based cleaning.
  - 2) Zinc phosphating.
  - 3) Cathodic electro-deposition.
  - 4) Curing to a dry film thickness 18-22 my m.
- The colour code for the finished product is NCS 9000/RAL 9005.

**Pump**

A 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 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.

**Qty. Description**

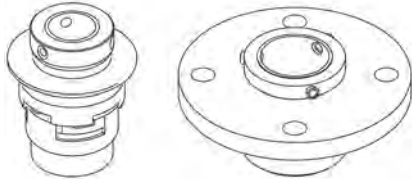
**Primary seal:**

- 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)

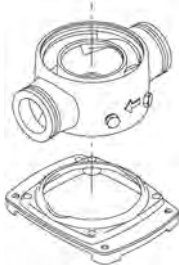
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



The shaft seal is 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

Qty.	Description
	Liquid temperature range: -40 .. 120 °C Liquid temperature during operation: 20 °C Density: 998.2 kg/m <sup>3</sup>
	<b>Technical:</b> Pump speed on which pump data are based: 2934 rpm Rated flow: 90 m <sup>3</sup> /h Rated head: 48.2 m Pump orientation: Vertical Shaft seal arrangement: Single Code for shaft seal: HQQE Approvals on nameplate: CE, EAC, ACS Curve tolerance: ISO9906:2012 3B
	<b>Materials:</b> Base: Stainless steel EN 1.4408 AISI 316 Impeller: Stainless steel EN 1.4401 AISI 316 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: FF300
	<b>Electrical data:</b> Motor standard: IEC Motor type: 160LB IE Efficiency class: IE3 Rated power - P2: 18.5 kW Power (P2) required by pump: 18.5 kW Mains frequency: 50 Hz Rated voltage: 3 x 380-415D/660-690Y V Rated current: 34,5-32,5/20,0-18,8 A Starting current: 830-980 % Cos phi - power factor: 0.89-0.85 Rated speed: 2940-2950 rpm Efficiency: IE3 92,4% Motor efficiency at full load: 92.4-92.4 % Motor efficiency at 3/4 load: 93.2 % Motor efficiency at 1/2 load: 93.2 % Number of poles: 2 Enclosure class (IEC 34-5): 55 Dust/Jetting Insulation class (IEC 85): F
	<b>Others:</b> Minimum efficiency index, MEI $\hat{\alpha}\%$ : 0.70 Net weight: 199 kg Gross weight: 232 kg



Company name:

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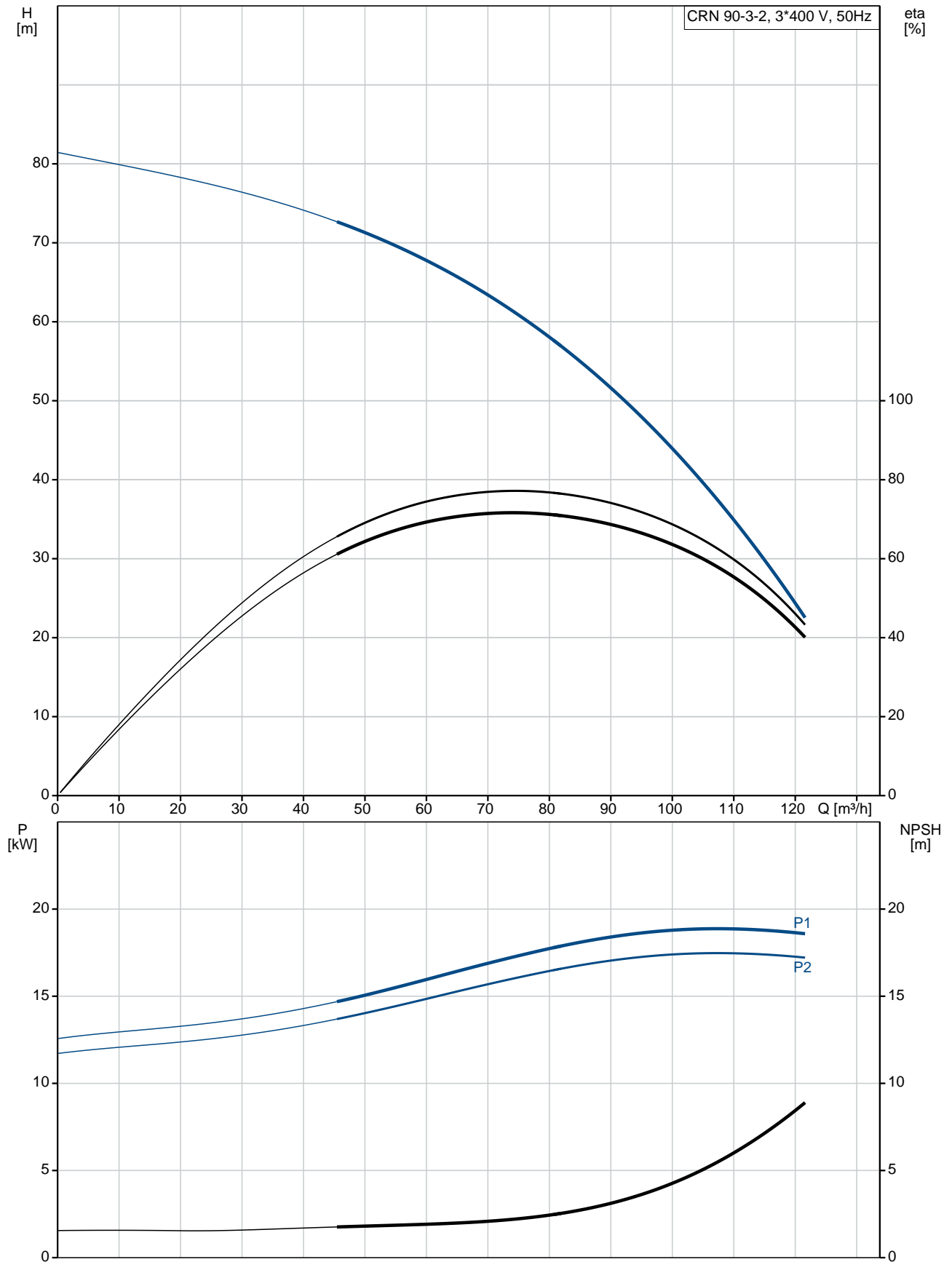
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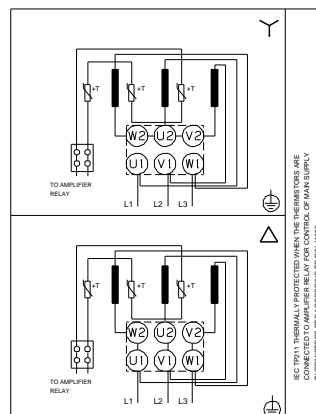
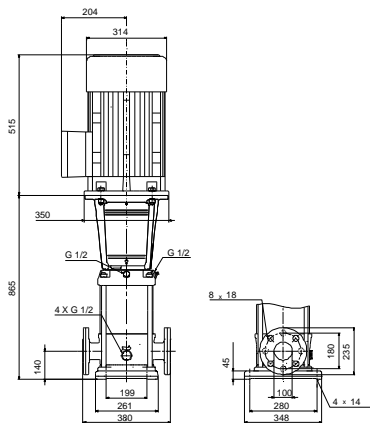
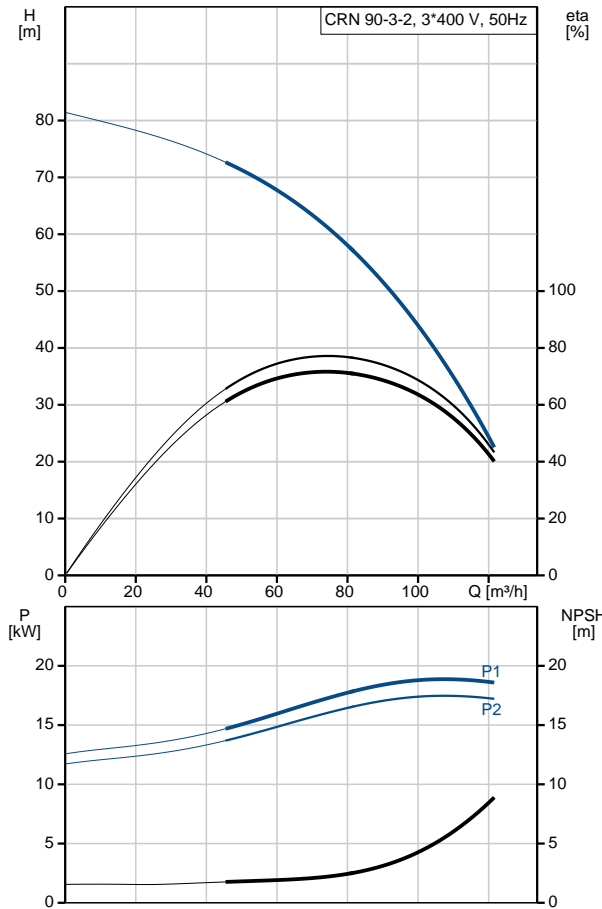
Qty.	Description
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	Shipping volume: 0.495 m <sup>3</sup> Danish VVS No.: 385919032
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## 96124228 CRN 90-3-2 A-F-A-E-HQQE 50 Hz



Description	Value
<b>General information:</b>	
Product name:	CRN 90-3-2 A-F-A-E-HQQE
Product No:	96124228
EAN number:	5700396705422
<b>Technical:</b>	
Pump speed on which pump data are based:	2934 rpm
Rated flow:	90 m <sup>3</sup> /h
Rated head:	48.2 m
Head max:	81.7 m
Stages:	3
Impellers:	3
Number of reduced-diameter impellers:	2
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:	FF300
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:	160LB
IE Efficiency class:	IE3
Rated power - P2:	18.5 kW
Power (P2) required by pump:	18.5 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 380-415D/660-690V
Rated current:	34,5-32,5/20,0-18,8 A





Company name:

Created by:

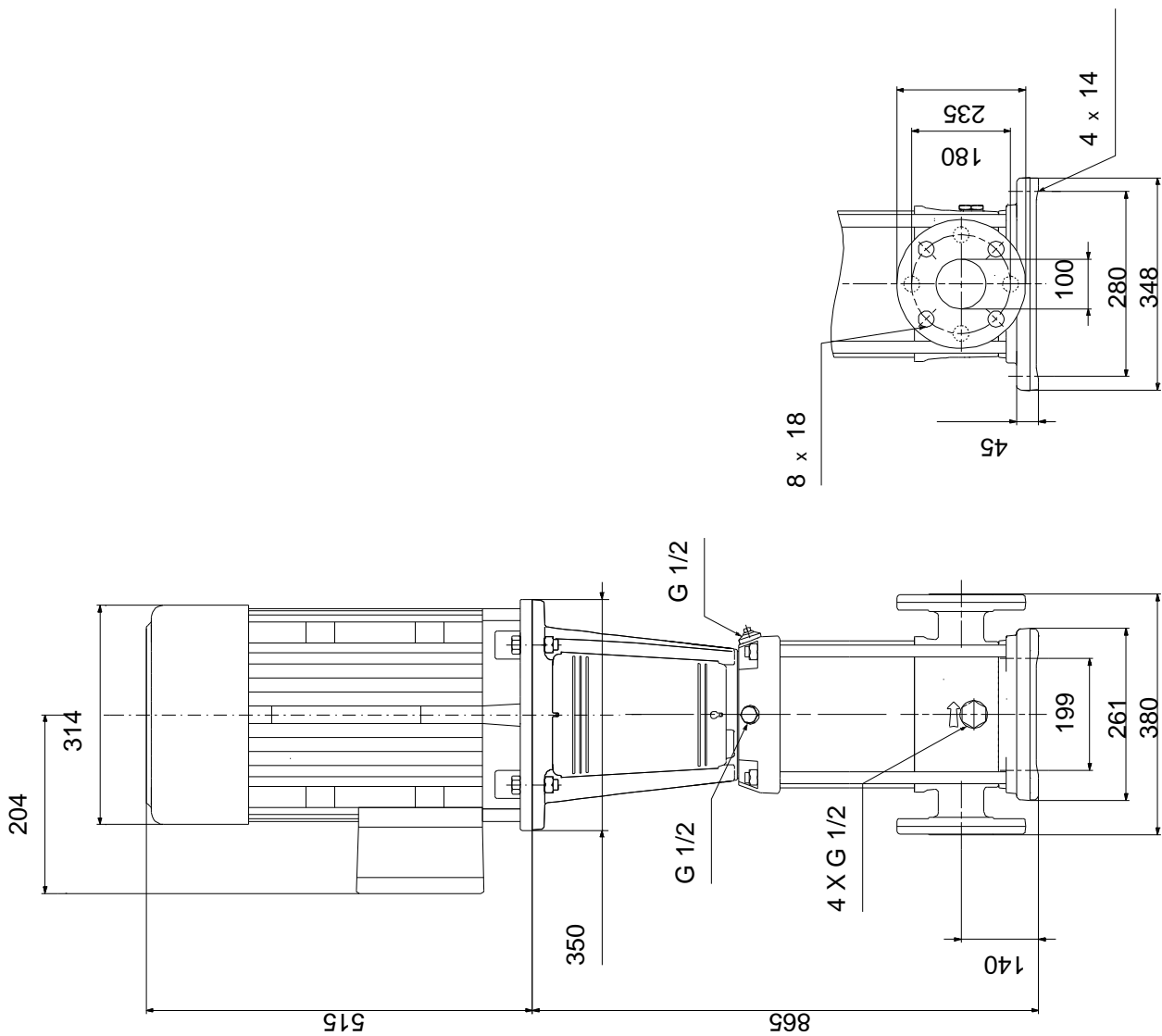
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Date:

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Description	Value
Starting current:	830-980 %
Cos phi - power factor:	0.89-0.85
Rated speed:	2940-2950 rpm
Efficiency:	IE3 92,4%
Motor efficiency at full load:	92.4-92.4 %
Motor efficiency at 3/4 load:	93.2 %
Motor efficiency at 1/2 load:	93.2 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	PTC
Motor No:	85U17528
<b>Controls:</b>	
Frequency converter:	NONE
<b>Others:</b>	
Minimum efficiency index, MEI %:	0.70
Net weight:	199 kg
Gross weight:	232 kg
Shipping volume:	0.495 m <sup>3</sup>
Danish VVS No.:	385919032

## 96124228 CRN 90-3-2 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.



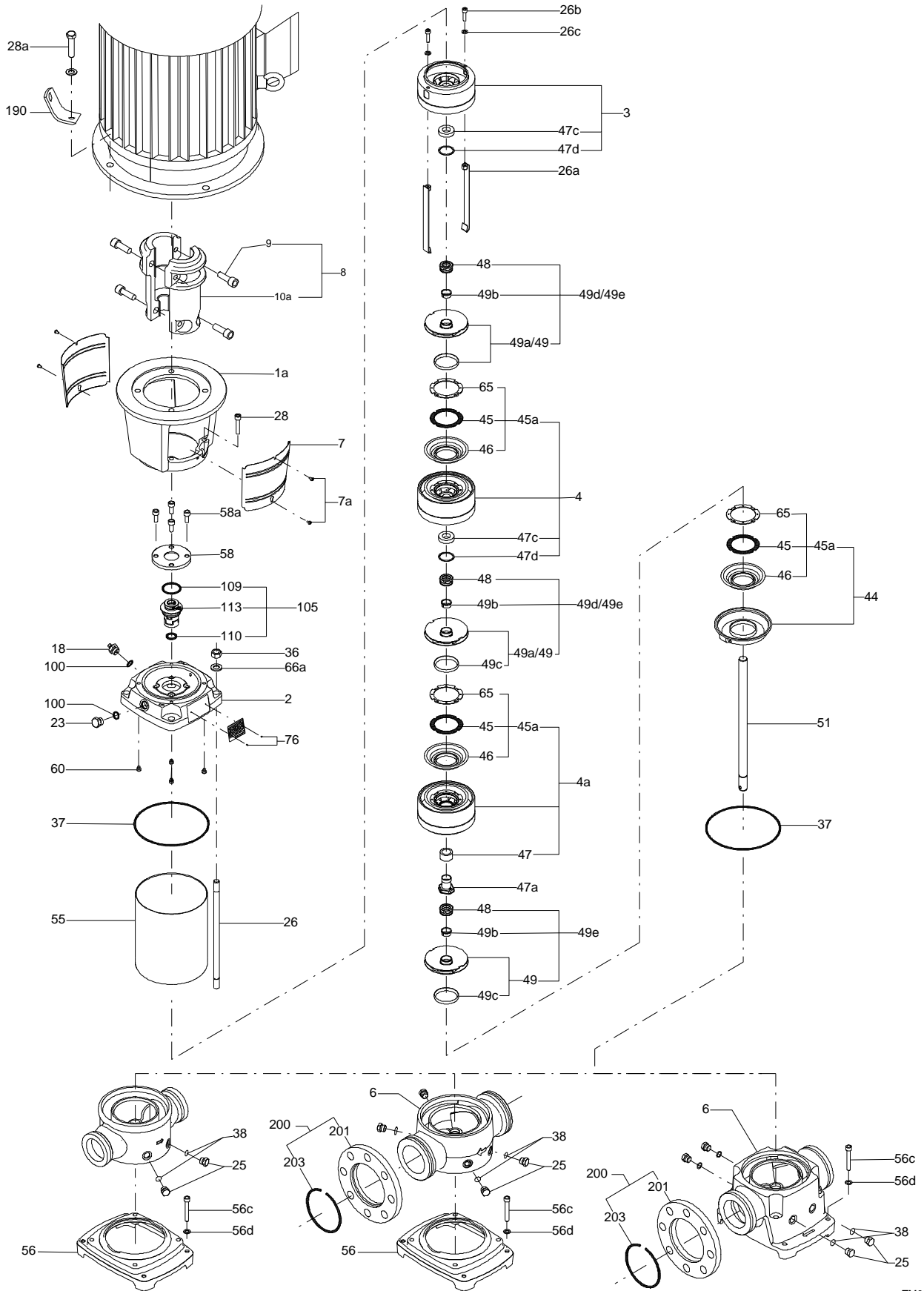
## 96124228 CRN 90-3-2 A-F-A-E-HQQE 50 Hz



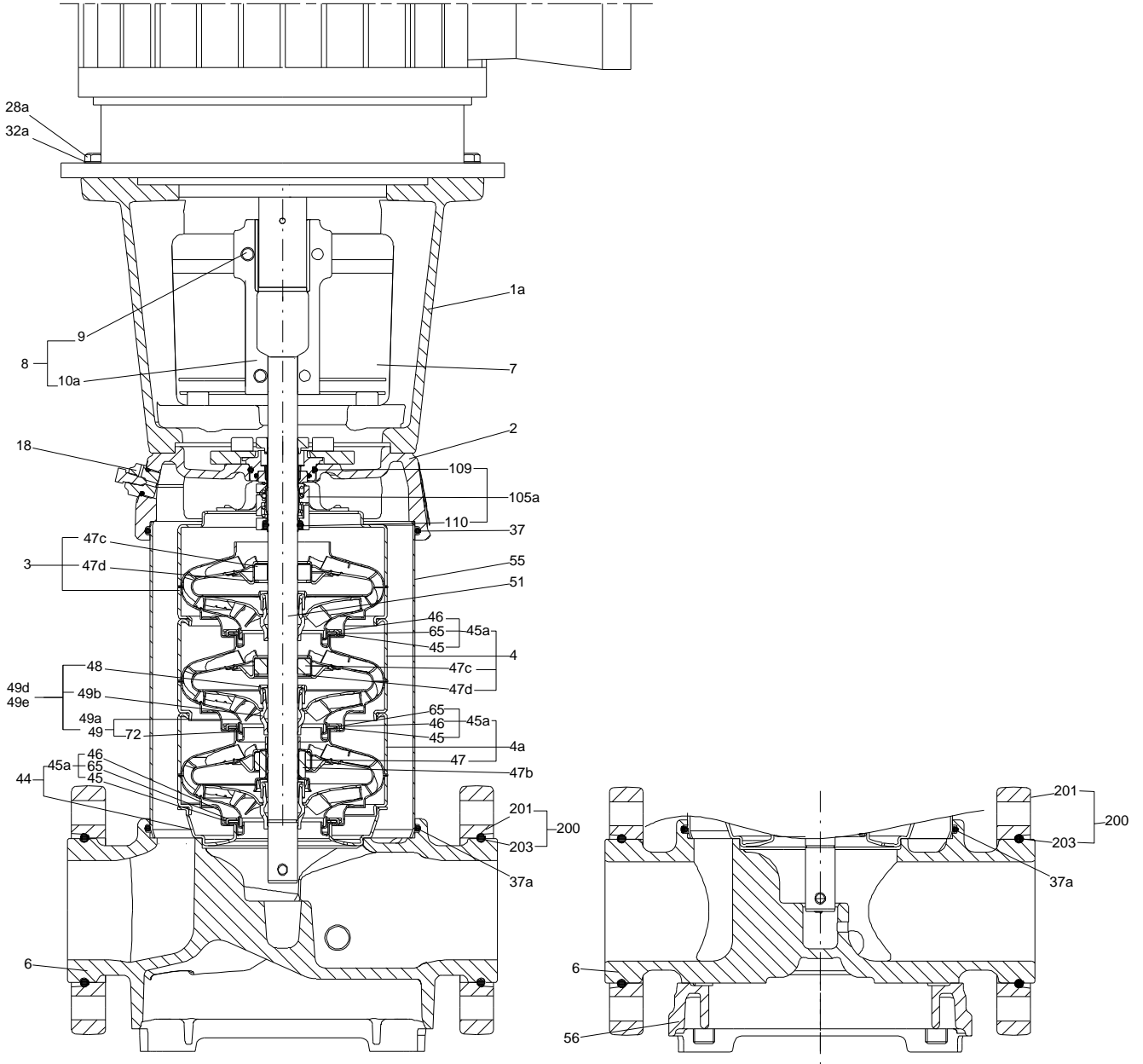
IEC TP211 THERMALLY PROTECTED WHEN THE THERMISTORS ARE  
CONNECTED TO AMPLIFIER RELAY FOR CONTROL OF MAIN SUPPLY  
THERMISTORS PTC ACCORDING TO DIN 44082

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

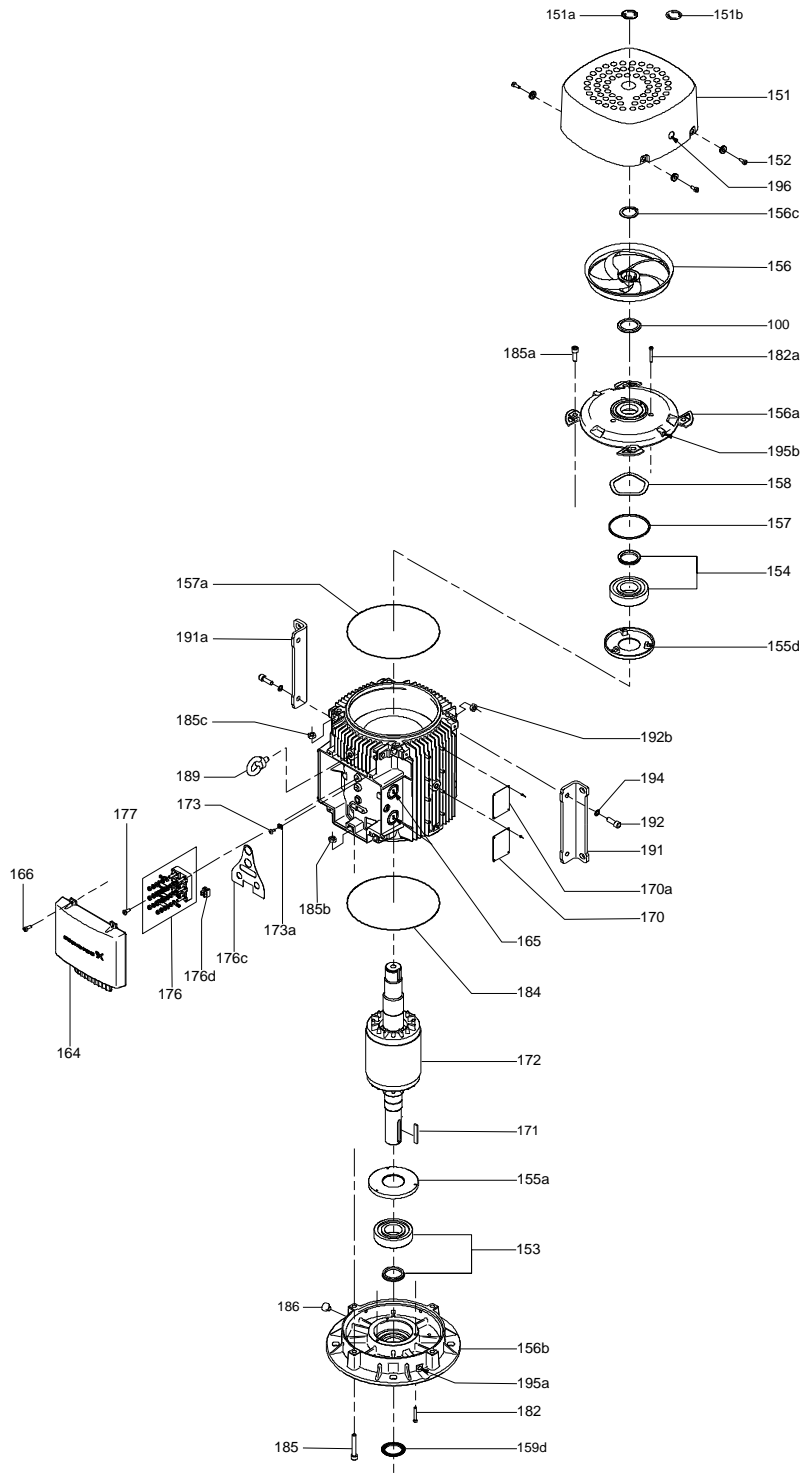
(TM065558 LACR )



( TM065571 LACR)



## Exploded view



## Sectional drawing



**Spare parts CRN 90-3-2, Product No. 96124228**  
**Valid from 3.3.2014 (1410)**

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Base			96587699	1	pcs
6	Base				1	
-	Kit, chambers			98634157	1	pcs
-	4a Intermediate chamber cpl.				1	
	Cone					
	Spare, turbulence optimizer KP					
	Spare, turbulence optimizer KP					
	Spare, turbulence optimizer KP					
	Spare, turbulence optimizer KP					
	Spare, turbulence optimizer KP					
-	45a Neck ring cpl.					
45	Neck ring					
46	Neck ring					
65	Top f/neck ring					
47	Bearing					
-	47a Bearing				1	
	Driver					
	Holder					
	Disc spring					
	Bearing ring					
-	Kit, coupling			96416592	1	pcs
	Adjusting fork				1	
-	8 Coupling cpl.		Dimension: 22/42		1	
9	Hex socket head cap screw		Designation: DIN 912			
			Length (mm): 25			
			Thread: M10			
10a	Coupling half					
-	Kit, coupling guard			96505135	1	pcs
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			98635108	1	pcs
48	Nut				1	
48	Nut				1	
49b	Split cone				1	
-	49 Impeller				1	
	Impeller hub					
49c	Wear ring					
-	Kit, Impeller, reduced diamete			98635123	1	pcs
48	Nut				1	

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
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 Material type: FKM Thickness: 2,4		2	
38	O-ring		Diameter: 16,3 Material type: FKM Thickness: 2,4		4	
38	O-ring		Diameter: 16,3 Material type: FKM Thickness: 2,4		6	
38	O-ring		Diameter: 16,3 Material type: EPDM Thickness: 2,4		2	
38	O-ring		Diameter: 16,3 Material type: EPDM Thickness: 2,4		4	
-	Kit, seals			96416601	1	pcs
	Adjusting fork				1	
37	O-ring				2	
38	O-ring		Diameter: 16,3 Material type: EPDM Thickness: 2,4		2	
38	O-ring		Diameter: 16,3 Material type: EPDM Thickness: 2,4		4	
60	Spring				4	
109	O-ring				1	
110	O-ring		Diameter: 21,2 Material type: EPDM Thickness: 3,55		1	
-	Kit, shaft seal HQQE			96525458	1	pcs
	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			98497510	1	pcs
45	Seal ring				1	
45	Neck ring				6	
47d	Lock ring				6	
47c	Bush				4	
49c	Wear ring				1	
49c	Wear ring				6	
65	Top f/neck ring				1	
65	Top f/neck ring				6	
-	Motor			85904228	1	pcs



Company name:

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Phone:

Date:

18/02/2019

Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	Kit, bearing cpl.			96796676	1	
32b	Waved washer					
153	Angular-contact bearing					
154	Ball bearing					
157	O-ring					
159	V-ring					
-	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	Motor stool			98993921	1	pcs
2	Pump head			97789459	1	pcs



Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
- 3	Upper chamber cpl.			98635152	1	pcs
47c	Bulk, Bush (10 pcs)			99321194	1	
+ 4	Bulk, Intermediate chamber cpl. (3 pcs)			99481468	1	pcs
+ 4a	Bulk, Intermediate chamber cpl. (5 pcs)			99262866	1	pcs
- 4	Bulk, Intermediate chamber cpl. (10 pcs)			99481469	1	pcs
+ 45a	Bulk, Neck ring cpl. (5 pcs)			99517702	1	
+ 4	Intermediate chamber cpl.			98635126	1	pcs
6	Base			97974018	1	pcs
7a	Bulk, Socket button head screw (10 pcs)			96549696	4	pcs
7	Bulk, Coupling guard (10 pcs)			96603279	2	pcs
+ 8	Coupling cpl.		Dimension: 22/42	96587704	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
26	Staybolt		Length (mm): 505 Thread: M16	98976758	4	pcs
26c	Bulk, Washer (4 pcs)		Designation: DIN 125A Thickness: 1,6	99262704	2	pcs
26c	Washer		Designation: DIN 125A Thickness: 1,6	96586880	2	pcs
26b	Bulk, Hex socket head cap screw (10 pcs)			98931380	2	pcs
26a	Strap cpl.			98983913	2	pcs
28.a	Bulk, Hex head screw (20 pcs)			96620478	4	pcs
28	Bulk, Hex socket head cap screw (10 pcs)		Designation: DIN 912 Length (mm): 50 Thread: M10	96536147	4	pcs
32	Bulk, Washer (100 pcs)		Designation: DIN 125 A Internal diameter: 17 Outer diameter: 30 Thickness: 3	98923051	8	pcs
36	Bulk, Hex nut (20 pcs)		Thread: M16	96620480	4	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
+ 47a	Bulk, Bearing (5 pcs)			99270663	1	pcs
48	Bulk, Nut (3 pcs)			99262680	1	pcs
48	Bulk, Nut (10 pcs)			99262683	1	pcs
48	Bulk, Nut (10 pcs)			96536016	1	pcs
- 49e	Bulk, Impeller cpl. (10 pcs)			99557799	1	pcs
48	Bulk, Nut (3 pcs)			99262680	1	
48	Bulk, Nut (10 pcs)			99262683	1	
48	Bulk, Nut (10 pcs)			96536016	1	
49b	Bulk, Split cone (10 pcs)			96536010	1	
49b	Bulk, Split cone (10 pcs)			96536010	1	pcs
+ 49a	Bulk, Impeller (5 pcs)			99500065	1	pcs
+ 49a	Impeller			98394481	1	pcs
55	Outer sleeve			98820408	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