Company name:
Created by:
Phone:

Date: 18/02/2019

Qty.	Description
1	**CR 90-3-2 A-F-A-E-HQQE**

Note! Product picture may differ from actual product

Product No.: 96124078

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 DIN flanges.

The pump is fitted with a 3-phase, fan-cooled asynchronous motor.

Further product details

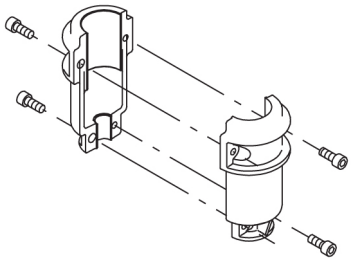
Steel, cast iron and aluminium components have an epoxy-based coating made in a cathodic electro-deposition (CED) process. CED is a high-quality dip-painting process where an electrical field around the products ensures deposition of paint particles as a thin, well-controlled layer on the surface. An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

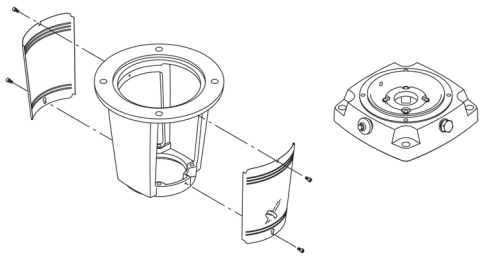
The colour code for the finished product is NCS 9000/RAL 9005.

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.

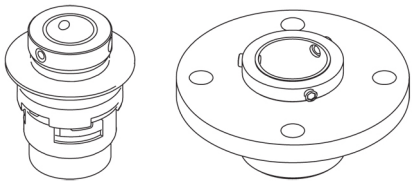
Primary seal:

- 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)

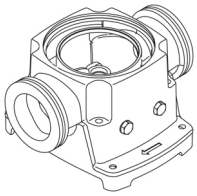
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



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 base is made of cast iron. Both the inlet and the outlet side of the base have two pressure gauge tappings. 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.

GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/02/2019

Qty.	Description

Technical data

Controls:

Frequency converter:	NONE

Liquid:

Pumped liquid:	Water
Liquid temperature range:	-30 .. 120 °C
Liquid temperature during operation:	20 °C
Density:	998.2 kg/m³

Technical:

Pump speed on which pump data are based:	2934 rpm
Rated flow:	90 m³/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

Materials:

Base:	Cast iron EN 1563 EN-GJS-500-7 ASTM A536 80-55-06
Impeller:	Stainless steel EN 1.4301 AISI 304
Bearing:	SIC
Support bearing:	Graflon

Installation:

Maximum ambient temperature:	60 °C
Maximum operating pressure:	16 bar
Max pressure at stated temp:	16 bar / 120 °C 16 bar / -30 °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

Electrical data:

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

GRUNDFOS

Company name:
Created by:
Phone:

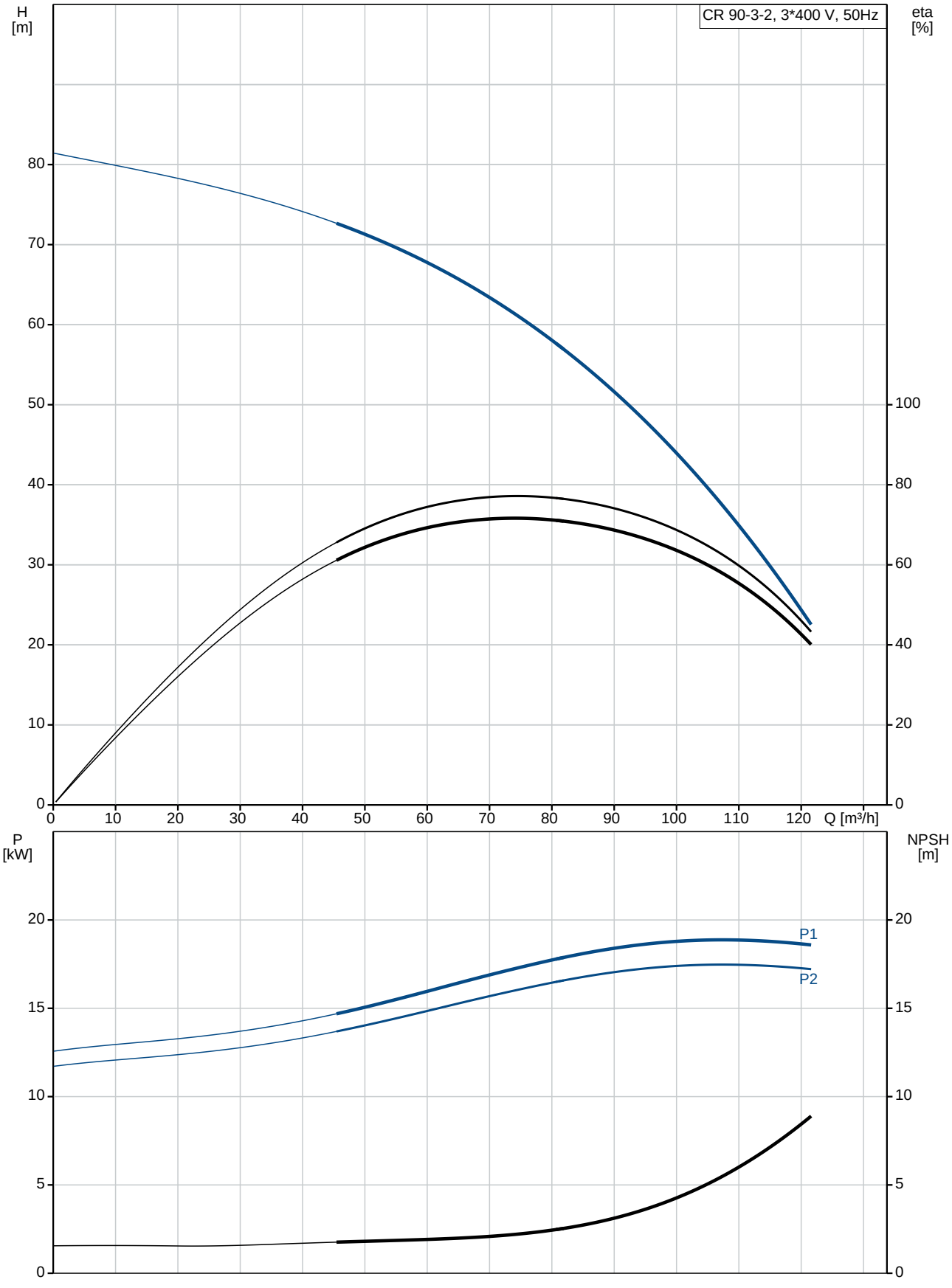
Date: 18/02/2019

Qty.	Description
	Enclosure class (IEC 34-5): 55 Dust/Jetting Insulation class (IEC 85): F **Others:** Minimum efficiency index, MEI â‰¥: 0.70 Net weight: 197 kg Gross weight: 230 kg Shipping volume: 0.495 m³ Danish VVS No.: 385909032

Company name:
Created by:
Phone:

Date: 18/02/2019

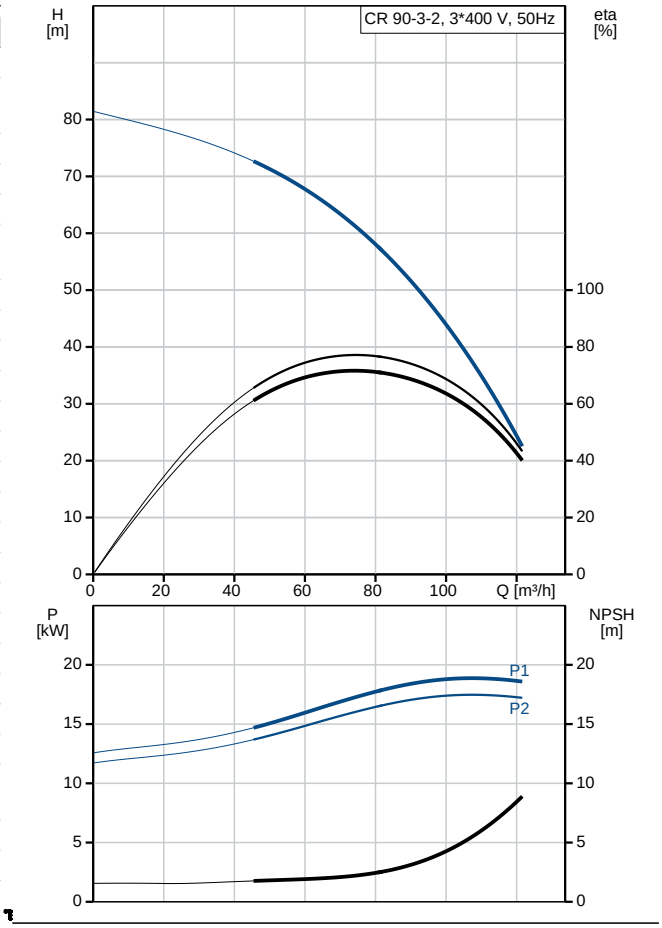
96124078 CR 90-3-2 A-F-A-E-HQQE 50 Hz

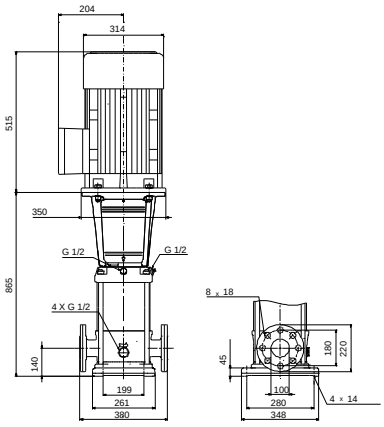


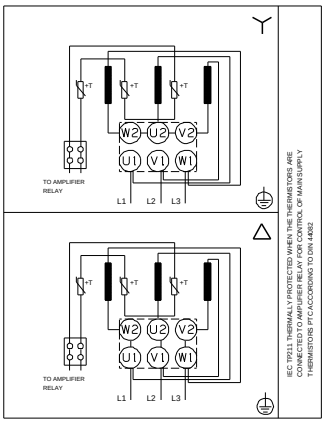
Company name:
Created by:
Phone:

Date: 18/02/2019

Description	Value
General information:	
Product name:	CR 90-3-2 A-F-A-E-HQQE
Product No:	96124078
EAN number:	5700396703824
Technical:	
Pump speed on which pump data are based:	2934 rpm
Rated flow:	90 m³/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
Materials:	
Base:	Cast iron
	EN 1563 EN-GJS-500-7
	ASTM A536 80-55-06
Impeller:	Stainless steel
	EN 1.4301
	AISI 304
Material code:	A
Code for rubber:	E
Bearing:	SIC
Support bearing:	Graflon
Installation:	
Maximum ambient temperature:	60 °C
Maximum operating pressure:	16 bar
Max pressure at stated temp:	16 bar / 120 °C
	16 bar / -30 °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
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-30 .. 120 °C
Liquid temperature during operation:	20 °C
Density:	998.2 kg/m³
Electrical data:	
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







GRUNDFOS

Company name:
Created by:
Phone:

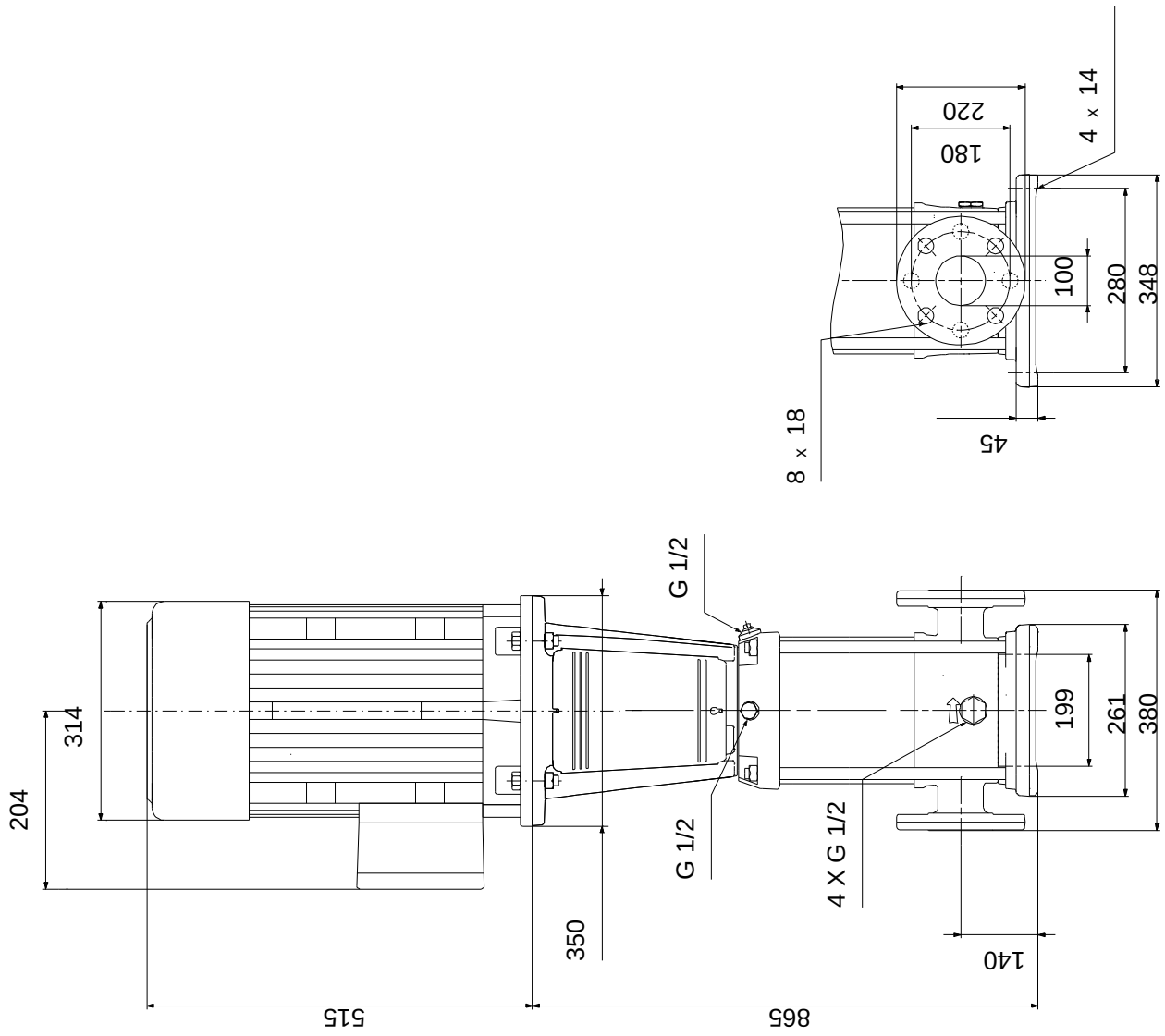
Date: 18/02/2019

Description	Value
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
Motor protec:	PTC
Motor No:	85U17528
Controls:	
Frequency converter:	NONE
Others:	
Minimum efficiency index, MEI â‰¥:	0.70
Net weight:	197 kg
Gross weight:	230 kg
Shipping volume:	0.495 m³
Danish VVS No.:	385909032

Company name:
Created by:
Phone:

Date: 18/02/2019

96124078 CR 90-3-2 A-F-A-E-HQQE 50 Hz

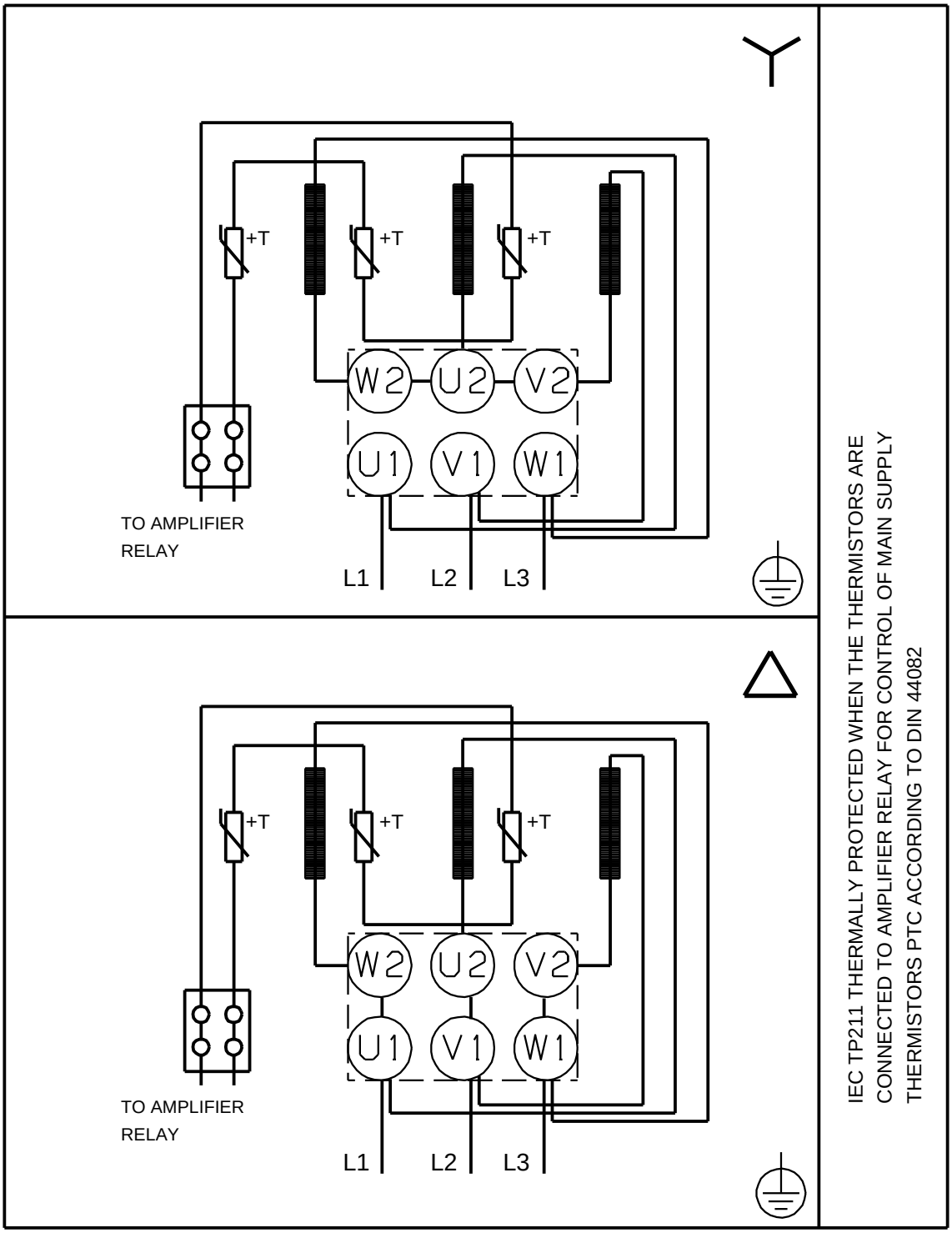


Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

Company name:
Created by:
Phone:

Date: 18/02/2019

96124078 CR 90-3-2 A-F-A-E-HQQE 50 Hz

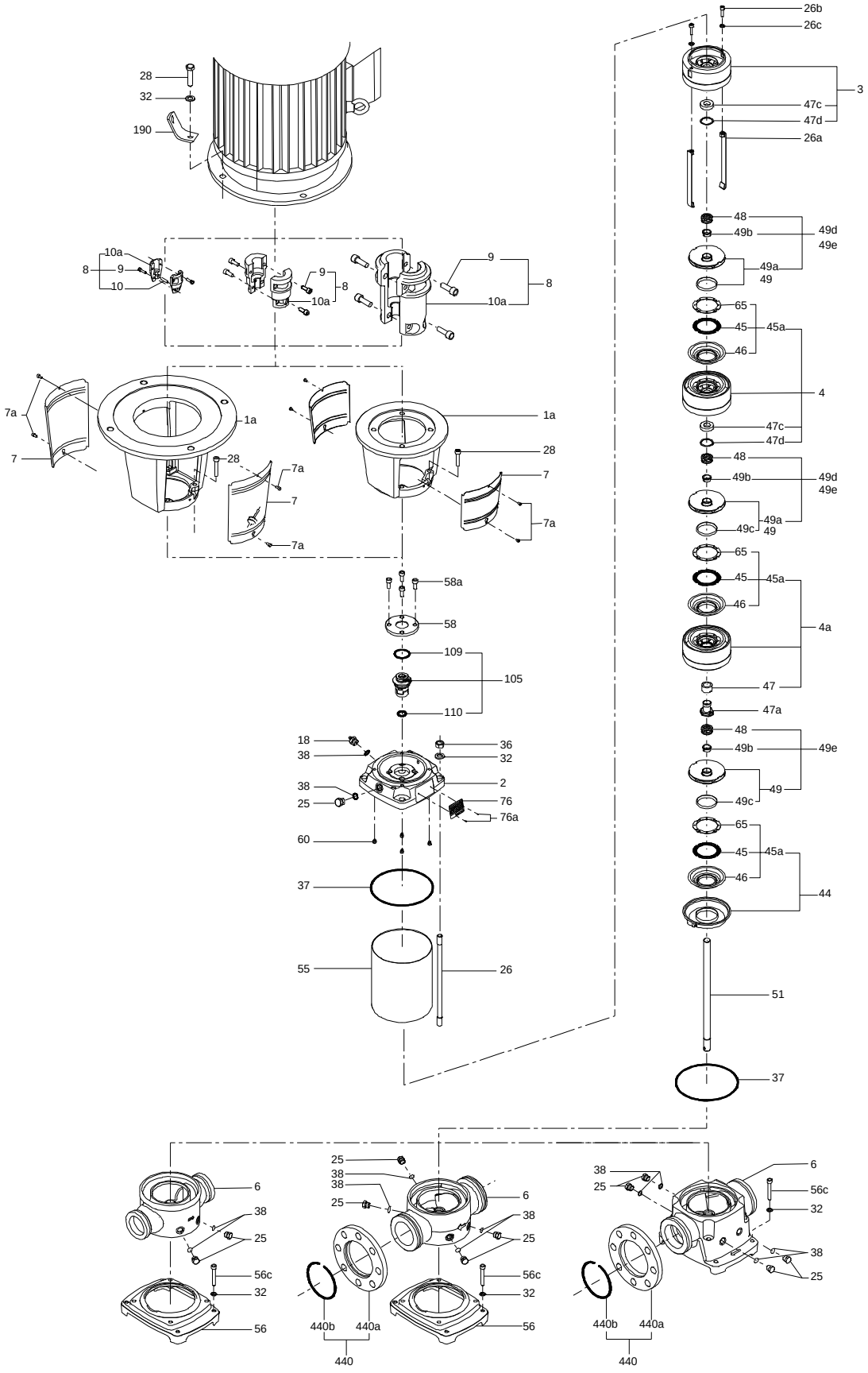


Note! All units are in [mm] unless others are stated.

Company name:
Created by:
Phone:

Date: 18/02/2019

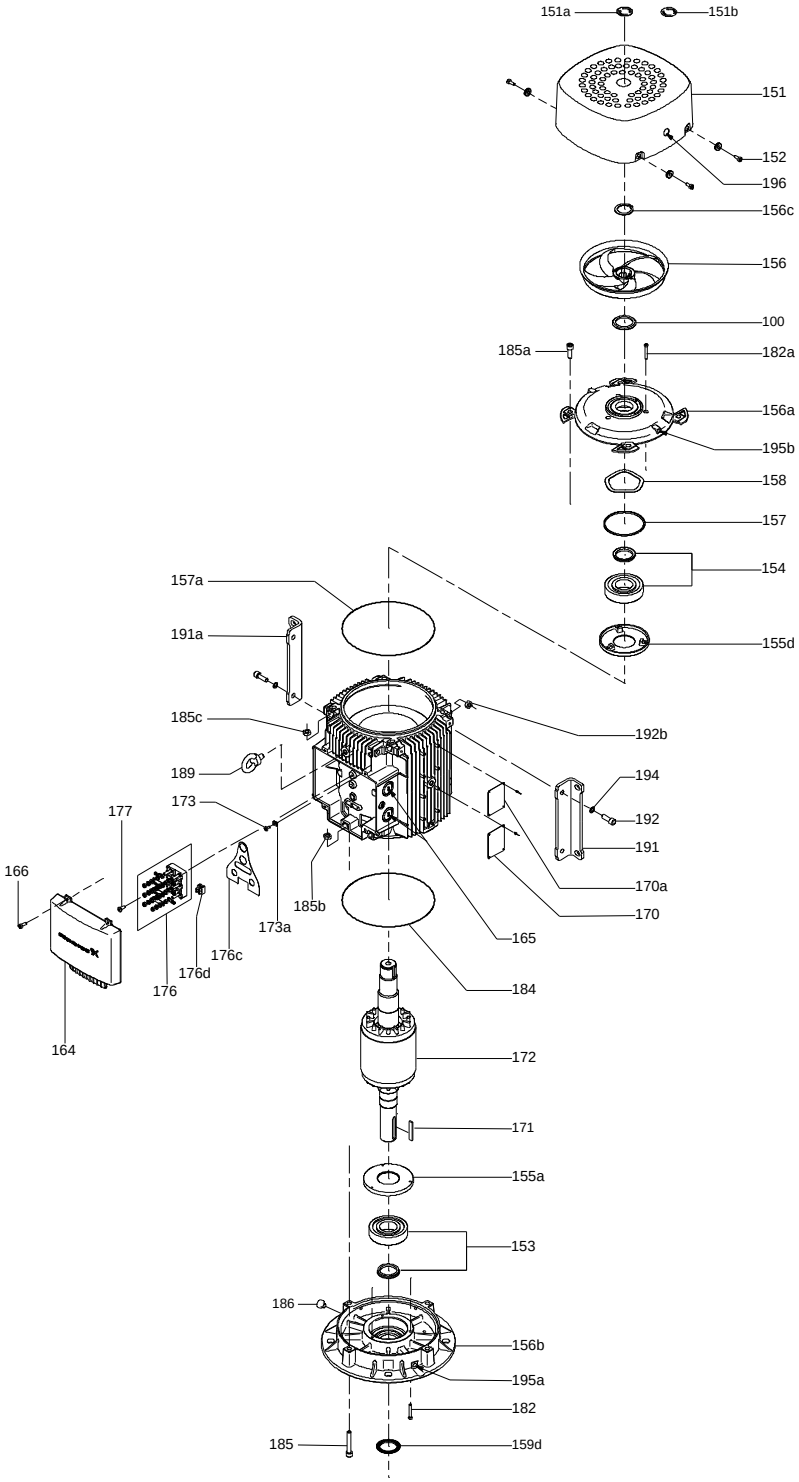
(tm069487 for LACR model B standard)



Company name:
Created by:
Phone:

Date: 18/02/2019

Exploded view

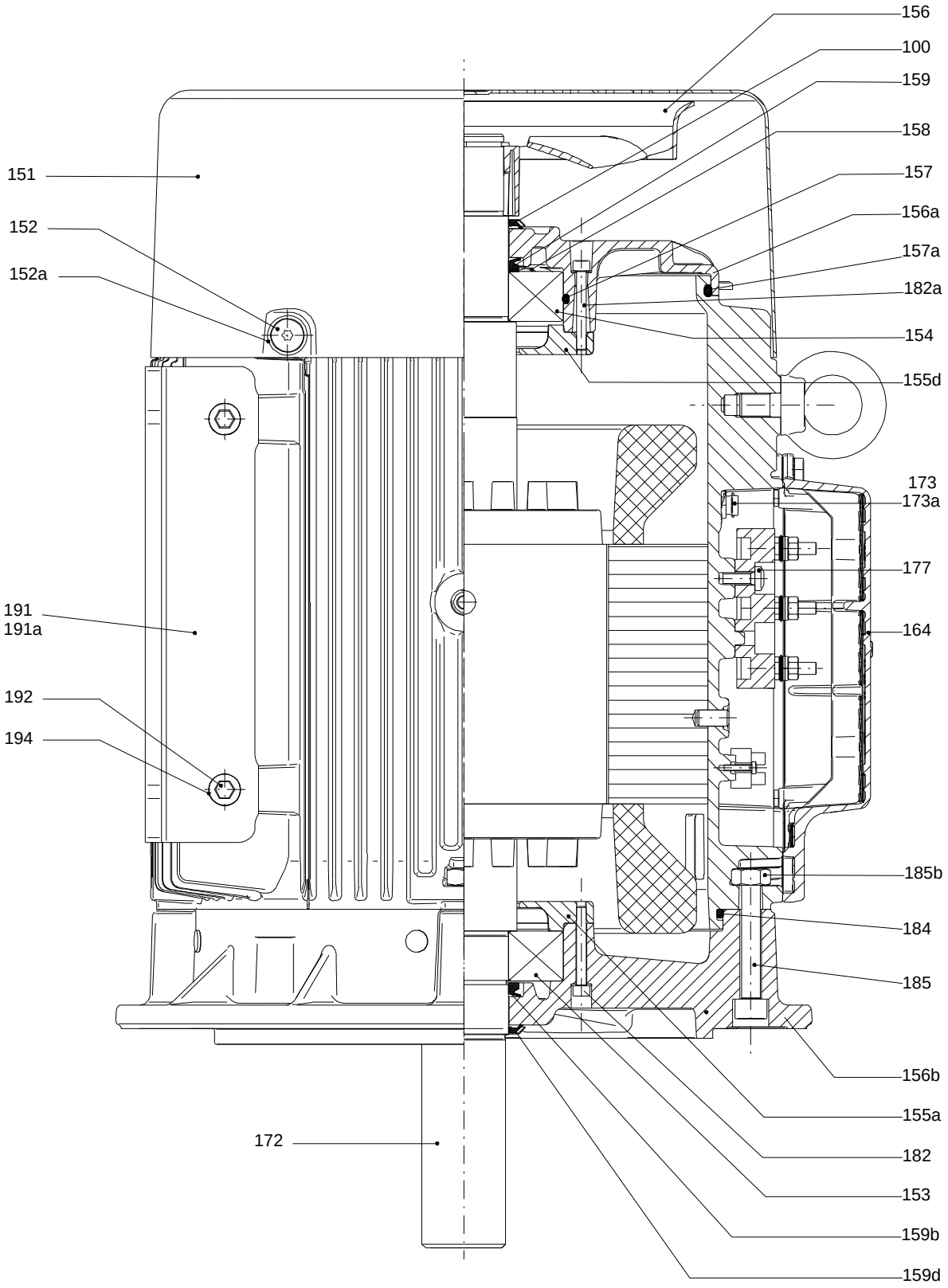


GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/02/2019

Sectional drawing



GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/02/2019

Spare parts CR 90-3-2, Product No. 96124078
Valid from 3.3.2014 (1410)

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-		Base			98807603	1	pcs
	6	Base				1	
		Kit, chamber stack			97764086	1	pcs
-		Kit, chambers			98497515	1	pcs
-	4a	Intermediate chamber cpl.				1	
		Guide cup					
		Guide cup					
		Cone					
		Guide vane					
		Chamber					
		Chamber					
	45a	Neck ring cpl.					
	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			98497518	1	pcs
	48	Nut				1	
	48	Nut				1	
	49b	Split cone				1	
-	49	Impeller				1	
		Impeller hub					
	49c	Wear ring					
-		Kit, Impeller, reduced diamete			98635110	1	pcs
	48	Nut				1	
	48	Nut				1	
	49b	Split cone				1	

GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/02/2019

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-	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
		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
-		Kit, bearing cpl.			96796676	1	
	32b	Waved washer					

GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/02/2019

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
	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			98593647	1	pcs
-	3	Upper chamber cpl.			98635130	1	pcs
	47c	Bulk, Bush (10 pcs)			99321194	1	

GRUNDFOS

Company name:
Created by:
Phone:

Date: 18/02/2019

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
+	4	Bulk, Intermediate chamber cpl. (3 pcs)			99481466	1	pcs
+	4a	Bulk, Intermediate chamber cpl. (5 pcs)			99262903	1	pcs
-	4	Bulk, Intermediate chamber cpl. (10 pcs)			99481467	1	pcs
	45a	Bulk, Neck ring cpl. (10 pcs)			96547446	1	
	6	Base			99321771	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
	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): 285	98983907	2	pcs
				Thread: M8			
	26	Bulk, Staybolt (4 pcs)		Length (mm): 444	96547449	4	pcs
				Thread: M16			
	26	Staybolt		Length (mm): 444	98976752	4	pcs
				Thread: M16			
	28.a	Bulk, Hex head screw (20 pcs)			96620478	4	pcs
	28	Bulk, Hex socket head cap screw (10 pcs)		Designation: DIN 912	96536147	4	pcs
				Length (mm): 50			
				Thread: M10			
	32	Bulk, Washer (100 pcs)		Designation: DIN 125 A	98923051	8	pcs
				Internal diameter: 17			
				Outer diameter: 30			
				Thickness: 3			
	36	Bulk, Hex nut (20 pcs)		Thread: M16	96620480	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)			99270663	1	pcs
+	49e	Bulk, Impeller cpl. (10 pcs)			99557799	1	pcs
-	49d	Impeller cpl. reduced diameter			98394470	2	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	
+	49a	Bulk, Impeller (5 pcs)			99500073	1	
+	49a	Impeller			96547450	1	
	55	Outer sleeve		Outer diameter: 225,0	98820402	1	pcs
				Length (mm): 299,5			
	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