Company name:
Created by:
Phone:

Date: 14/02/2019

Qty.	Description
1	**CR 1-4 A-A-A-E-HQQE**

Note! Product picture may differ from actual product

Product No.: 96516172

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 oval flanges with internal Rp threads.

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

Further product details

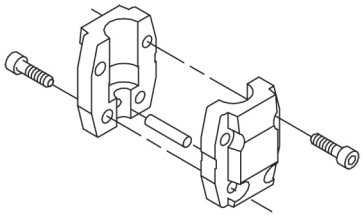
Steel, cast iron and aluminium components have an epoxy-based coating made in a cathodic electro-deposition (CED) process. CED is a high-quality dip-painting process where an electrical field around the products ensures deposition of paint particles as a thin, well-controlled layer on the surface. An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

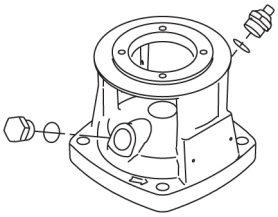
The colour code for the finished product is NCS 9000/RAL 9005.

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, pump head cover and flange for motor mounting is made in one piece. 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:

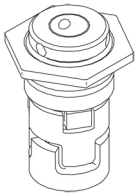
- Rotating seal ring material: silicon carbide (SiC)
- Stationary seat material: silicon carbide (SiC)

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)

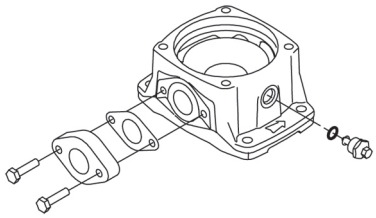
EPDM has excellent resistance to hot water. EPDM is not suitable for mineral oils.



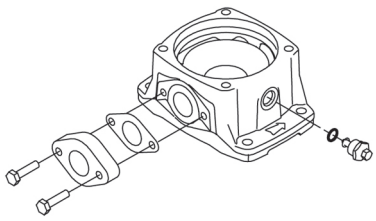
The shaft seal is screwed into the pump head.

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 base is made of cast iron. The oval flanges are bolted to the base. 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 made of cast iron. The oval flanges are bolted to the base. 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.



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 does not incorporate motor protection and must be connected to a motor-protective circuit breaker which can be manually reset. The motor-protective circuit breaker must be set according to the rated current of the motor (I1/1).

Technical data

Controls:

Frequency converter:	NONE

Liquid:

Pumped liquid:	Water
Liquid temperature range:	-20 .. 120 °C

GRUNDFOS

Company name:
Created by:
Phone:

Date: 14/02/2019

Qty.	Description	
	Liquid temperature during operation:	20 °C
	Density:	998.2 kg/m³
	Technical:	
	Pump speed on which pump data are based:	2873 rpm
	Rated flow:	1.8 m³/h
	Rated head:	20.3 m
	Pump orientation:	Vertical
	Shaft seal arrangement:	Single
	Code for shaft seal:	HQQE
	Approvals on nameplate:	CE, EAC,ACS
	Curve tolerance:	ISO9906:2012 3B
	Materials:	
	Base:	Cast iron EN 1561 EN-GJL-200 ASTM A48-25B
	Impeller:	Stainless steel EN 1.4301 AISI 304
	Bearing:	SIC
	Installation:	
	Maximum ambient temperature:	40 °C
	Maximum operating pressure:	16 bar
	Max pressure at stated temp:	16 bar / 120 °C 16 bar / -20 °C
	Type of connection:	Oval / Rp
	Size of inlet connection:	1 inch
	Size of outlet connection:	1 inch
	Pressure rating for pipe connection:	PN 16
	Flange size for motor:	FT85
	Electrical data:	
	Motor standard:	IEC
	Motor type:	71A
	IE Efficiency class:	IE3
	Rated power - P2:	0.37 kW
	Power (P2) required by pump:	0.37 kW
	Mains frequency:	50 Hz
	Rated voltage:	3 x 220-240D/380-415Y V
	Rated current:	1.74/1.00 A
	Starting current:	490-530 %
	Cos phi - power factor:	0.80-0.70
	Rated speed:	2850-2880 rpm
	Efficiency:	IE3 73,8%
	Motor efficiency at full load:	73.8 %
	Motor efficiency at 3/4 load:	79.0 %
	Motor efficiency at 1/2 load:	75.5 %
	Number of poles:	2
	Enclosure class (IEC 34-5):	55 Dust/Jetting
	Insulation class (IEC 85):	F
	Others:	
	Minimum efficiency index, MEI â‰¥:	0.70
	Net weight:	18.9 kg
	Gross weight:	21.5 kg
	Shipping volume:	0.054 m³
	Danish VVS No.:	385900004

GRUNDFOS

Company name:
Created by:
Phone:

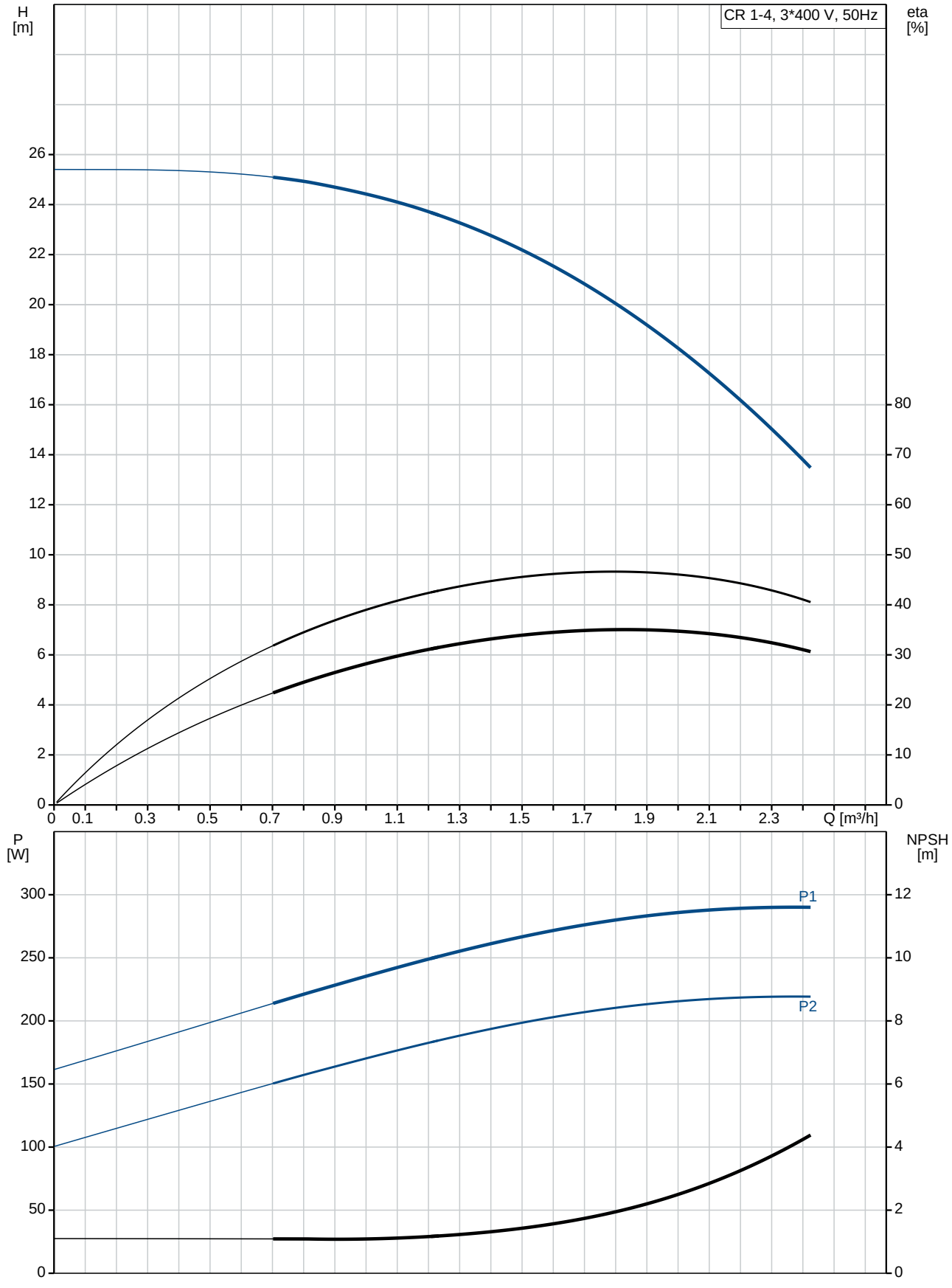
Date: 14/02/2019

Qty.	Description	
	Swedish RSK No.:	5824802
	Norwegian NRF no.:	9040428

Company name:
Created by:
Phone:

Date: 14/02/2019

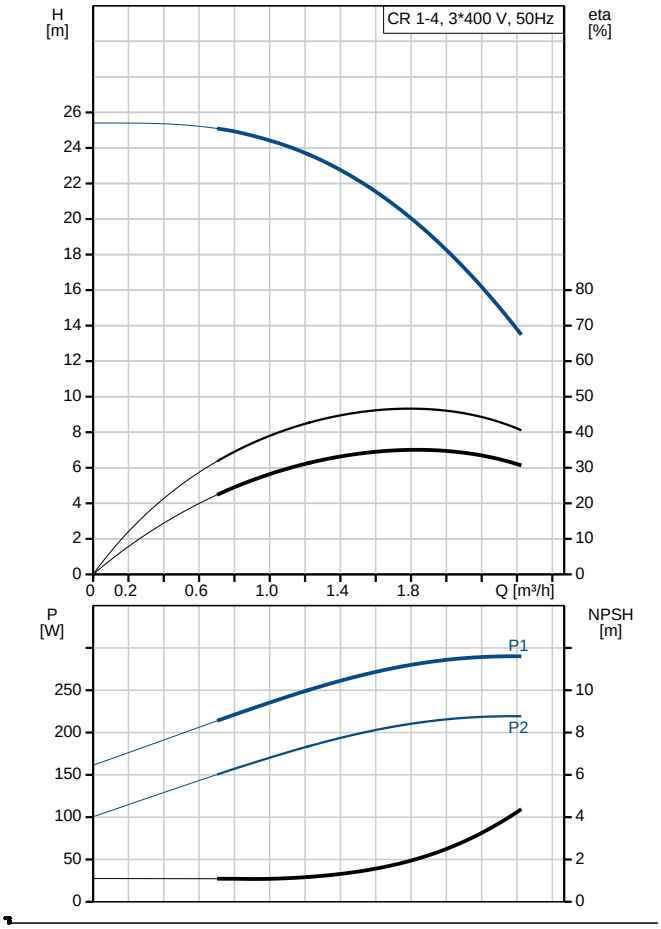
96516172 CR 1-4 A-A-A-E-HQQE 50 Hz

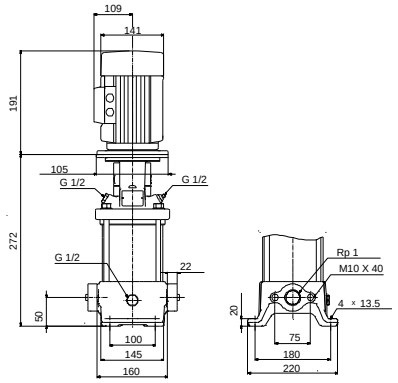


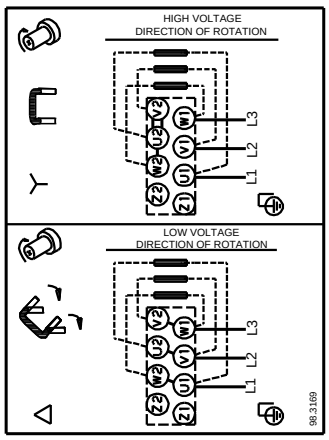
Company name:
Created by:
Phone:

Date: 14/02/2019

Description	Value
General information:	
Product name:	CR 1-4 A-A-A-E-HQQE
Product No:	96516172
EAN number:	5700396738062
Technical:	
Pump speed on which pump data are based:	2873 rpm
Rated flow:	1.8 m³/h
Rated head:	20.3 m
Head max:	25.4 m
Stages:	4
Impellers:	4
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
Materials:	
Base:	Cast iron
	EN 1561 EN-GJL-200
	ASTM A48-25B
Impeller:	Stainless steel
	EN 1.4301
	AISI 304
Material code:	A
Code for rubber:	E
Bearing:	SIC
Installation:	
Maximum ambient temperature:	40 °C
Maximum operating pressure:	16 bar
Max pressure at stated temp:	16 bar / 120 °C
	16 bar / -20 °C
Type of connection:	Oval / Rp
Size of inlet connection:	1 inch
Size of outlet connection:	1 inch
Pressure rating for pipe connection:	PN 16
Flange size for motor:	FT85
Connect code:	A
Liquid:	
Pumped liquid:	Water
Liquid temperature range:	-20 .. 120 °C
Liquid temperature during operation:	20 °C
Density:	998.2 kg/m³
Electrical data:	
Motor standard:	IEC
Motor type:	71A
IE Efficiency class:	IE3
Rated power - P2:	0.37 kW
Power (P2) required by pump:	0.37 kW
Mains frequency:	50 Hz
Rated voltage:	3 x 220-240D/380-415Y V
Rated current:	1.74/1.00 A
Starting current:	490-530 %
Cos phi - power factor:	0.80-0.70







GRUNDFOS

Company name:
Created by:
Phone:

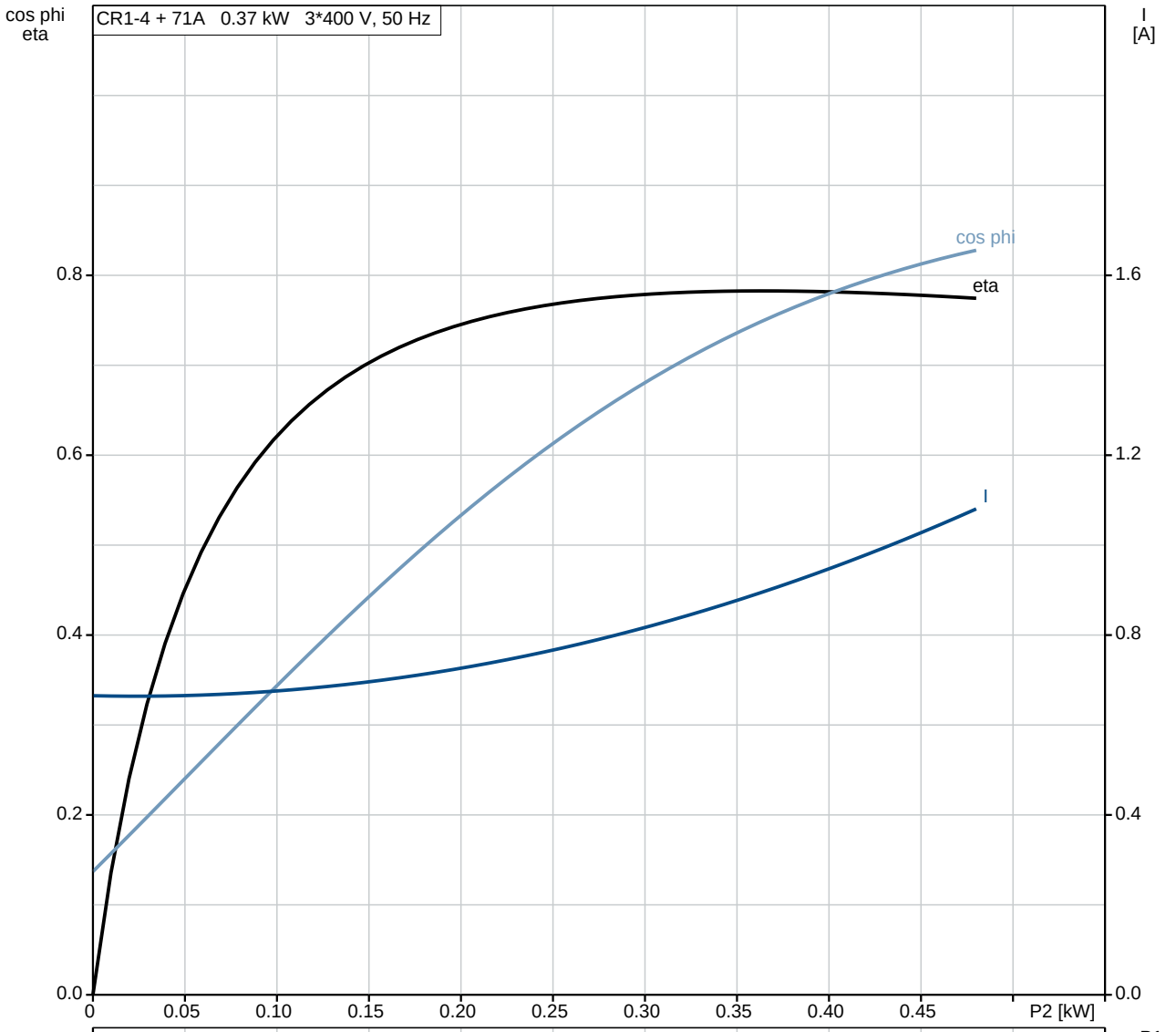
Date: 14/02/2019

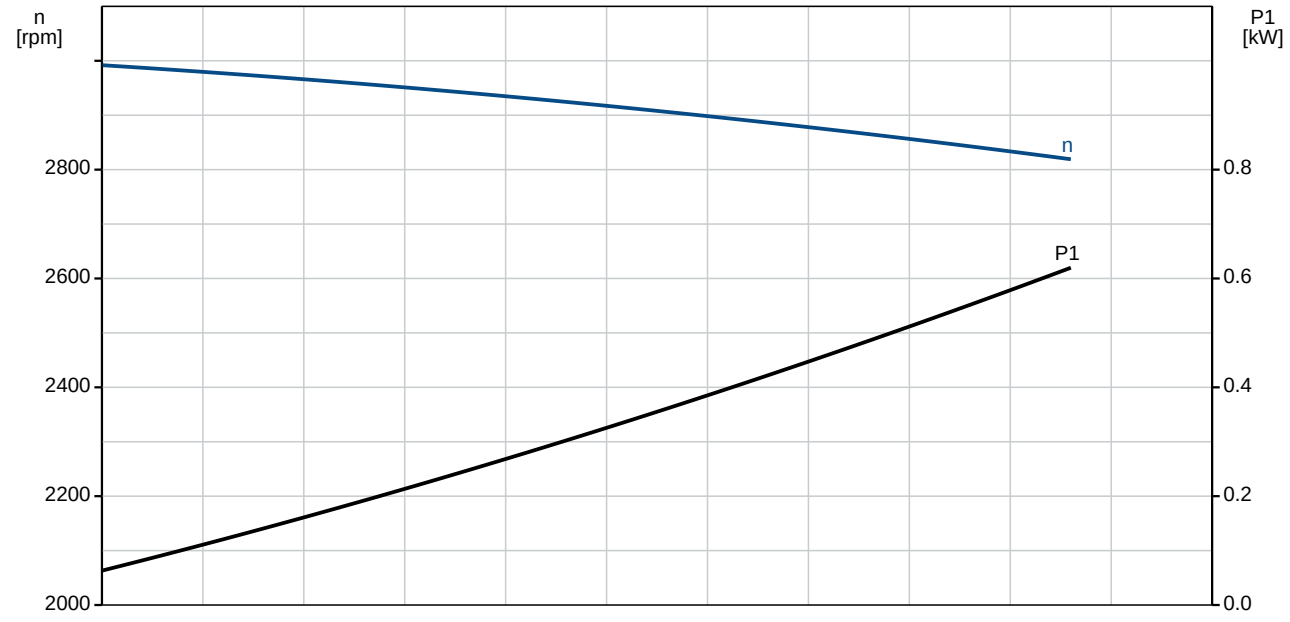
Description	Value
Rated speed:	2850-2880 rpm
Efficiency:	IE3 73,8%
Motor efficiency at full load:	73.8 %
Motor efficiency at 3/4 load:	79.0 %
Motor efficiency at 1/2 load:	75.5 %
Number of poles:	2
Enclosure class (IEC 34-5):	55 Dust/Jetting
Insulation class (IEC 85):	F
Motor protec:	NONE
Motor No:	85805102
Controls:	
Frequency converter:	NONE
Others:	
Minimum efficiency index, MEI â‰¥:	0.70
Net weight:	18.9 kg
Gross weight:	21.5 kg
Shipping volume:	0.054 m³
Danish VVS No.:	385900004
Swedish RSK No.:	5824802
Norwegian NRF no.:	9040428

Company name:
Created by:
Phone:

Date: 14/02/2019

96516172 CR 1-4 A-A-A-E-HQQE 50 Hz

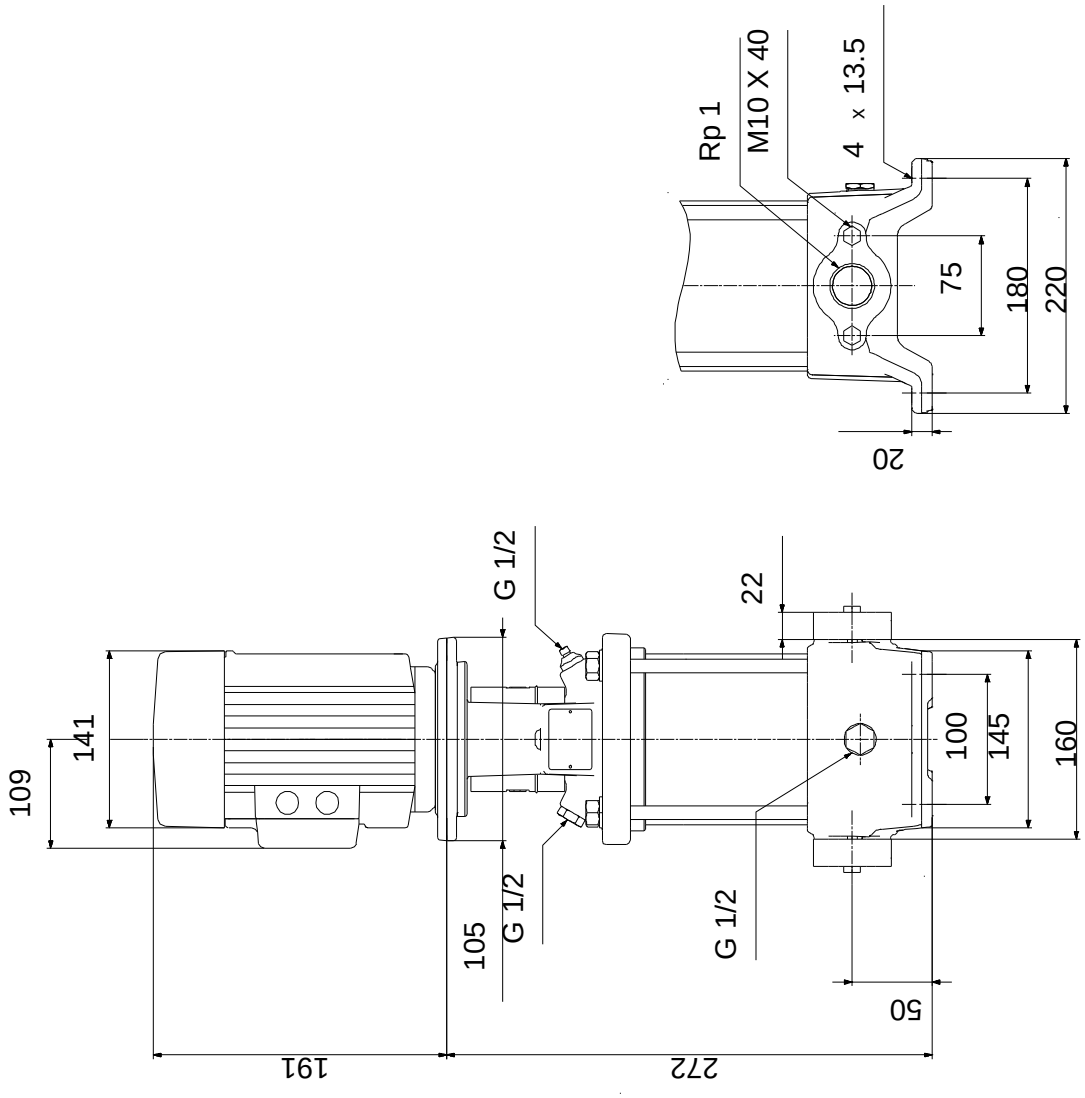




Company name:
Created by:
Phone:

Date: 14/02/2019

96516172 CR 1-4 A-A-A-E-HQQE 50 Hz

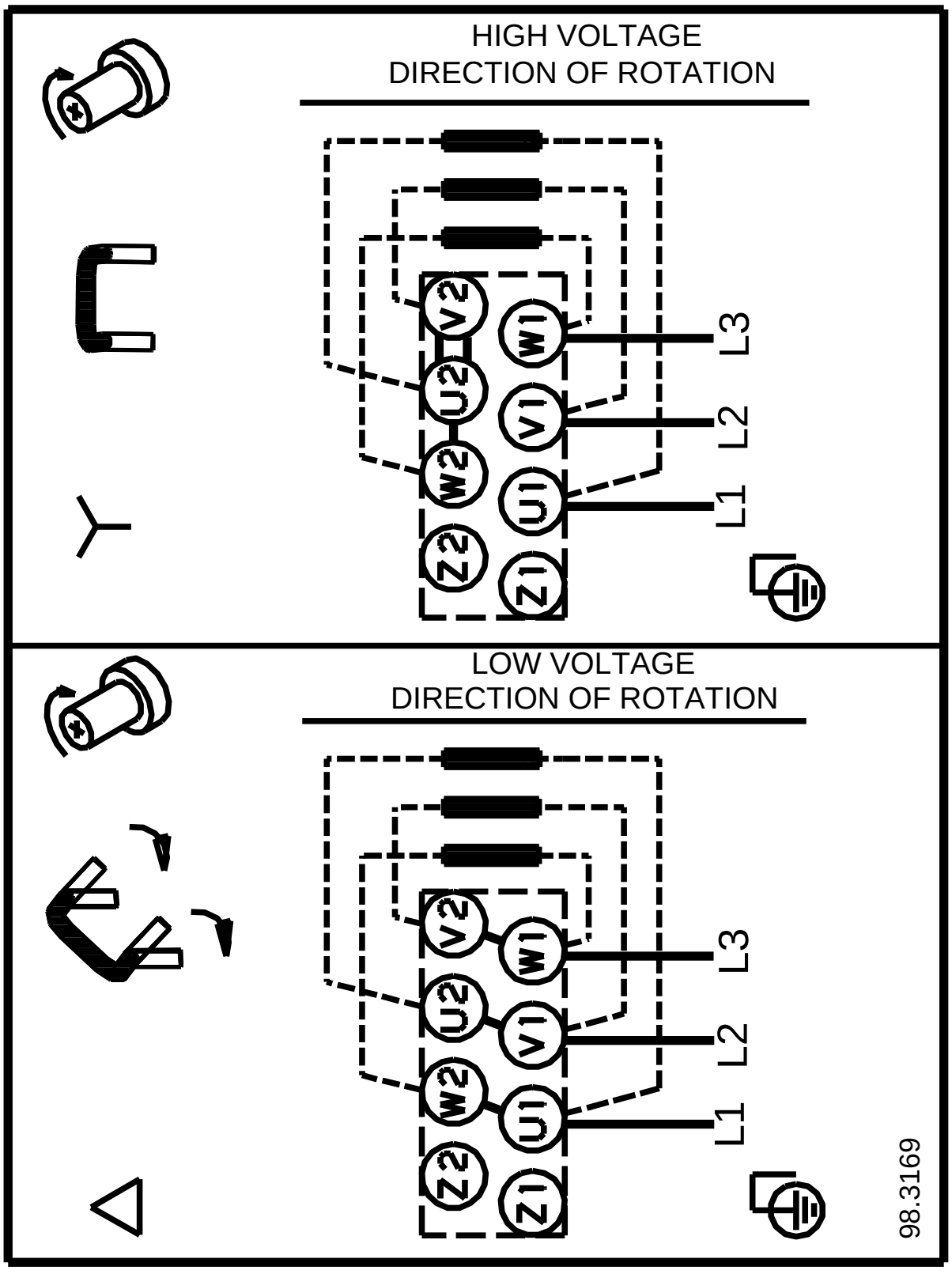


Note! All units are in [mm] unless others are stated.
Disclaimer: This simplified dimensional drawing does not show all details.

Company name:
Created by:
Phone:

Date: 14/02/2019

96516172 CR 1-4 A-A-A-E-HQQE 50 Hz

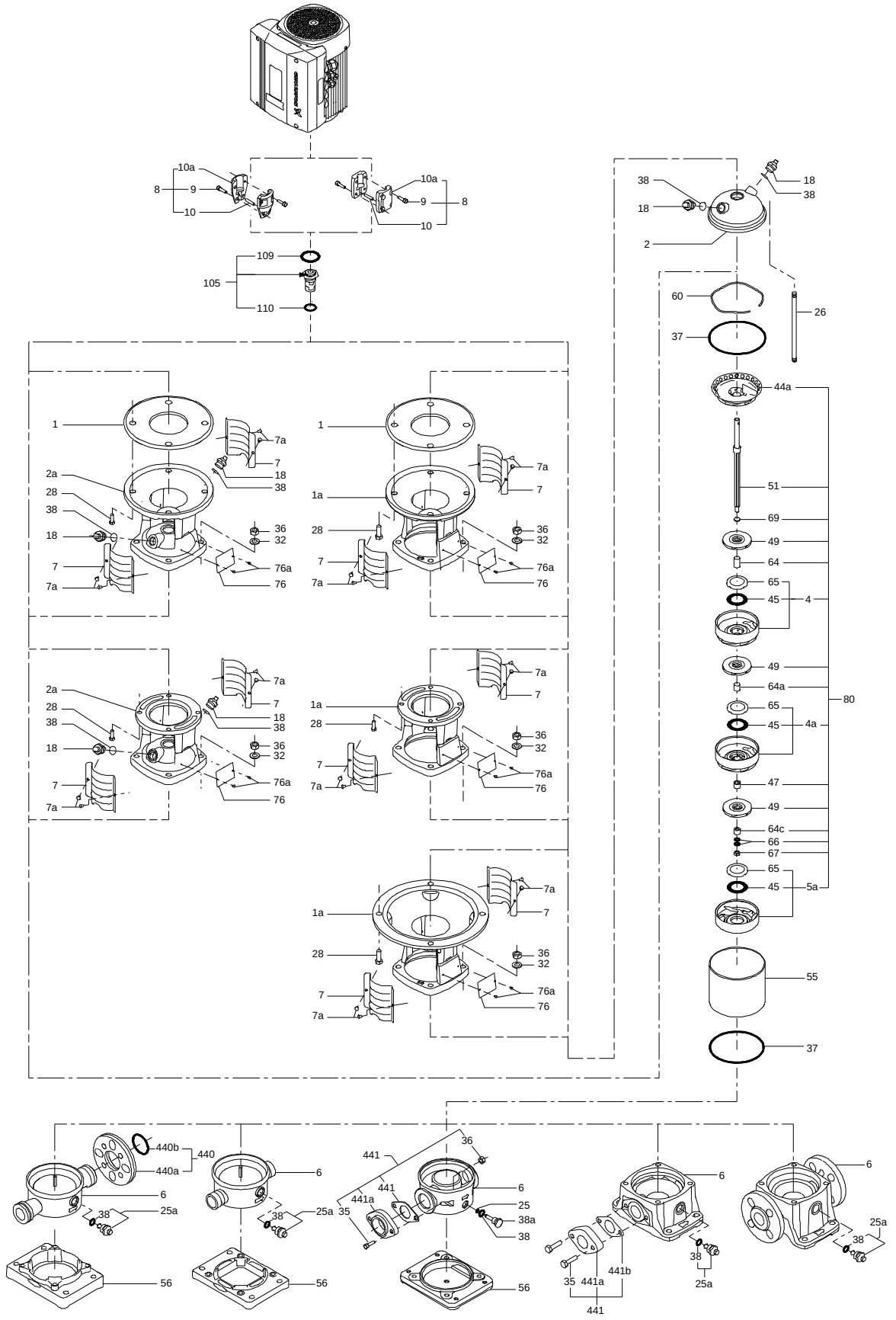


Note! All units are in [mm] unless others are stated.

Company name:
Created by:
Phone:

Date: 14/02/2019

(TM069451 for SMCR standard)

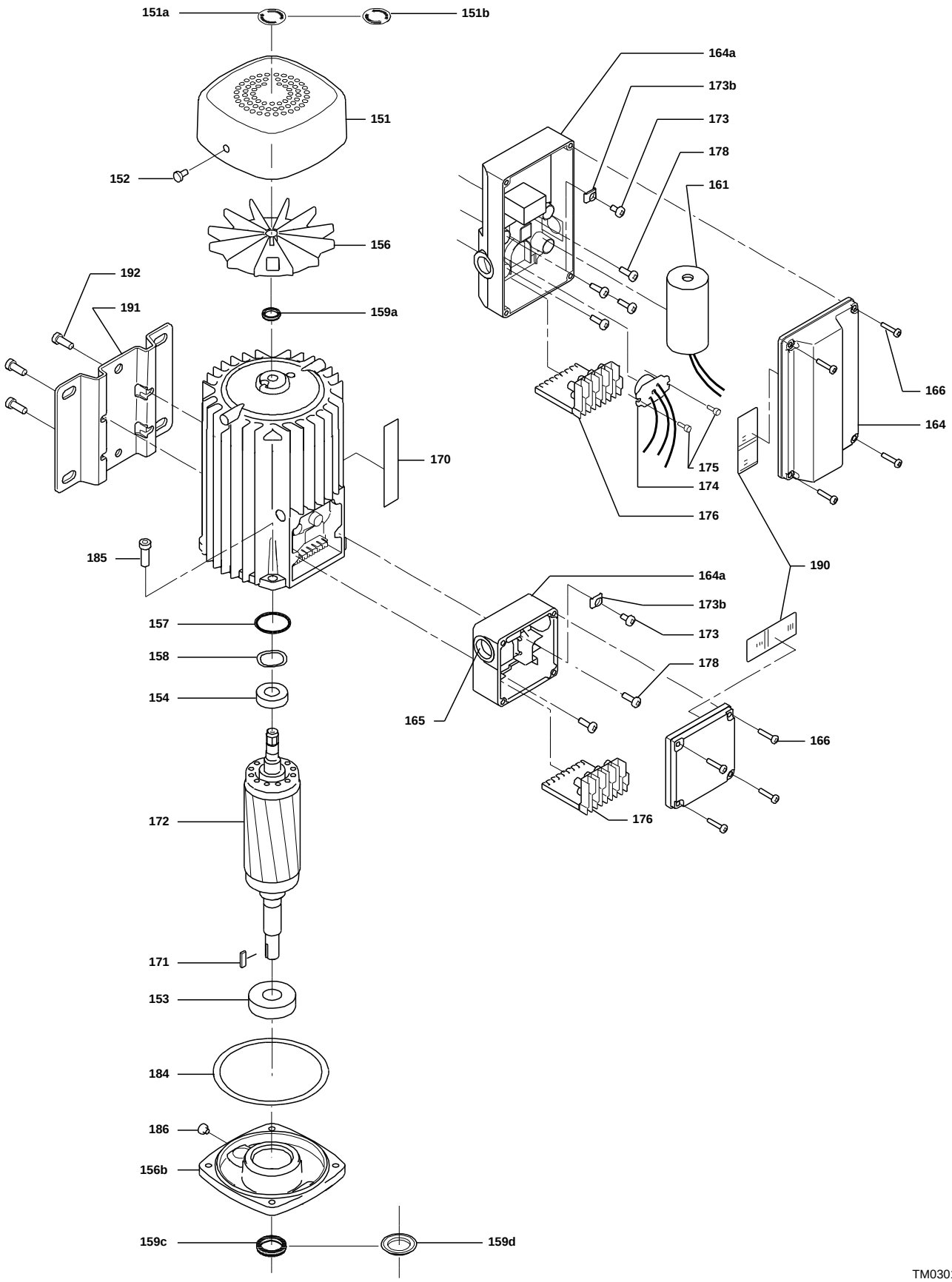


GRUNDFOS

Company name:
Created by:
Phone:

Date: 14/02/2019

(TM030163 0505)



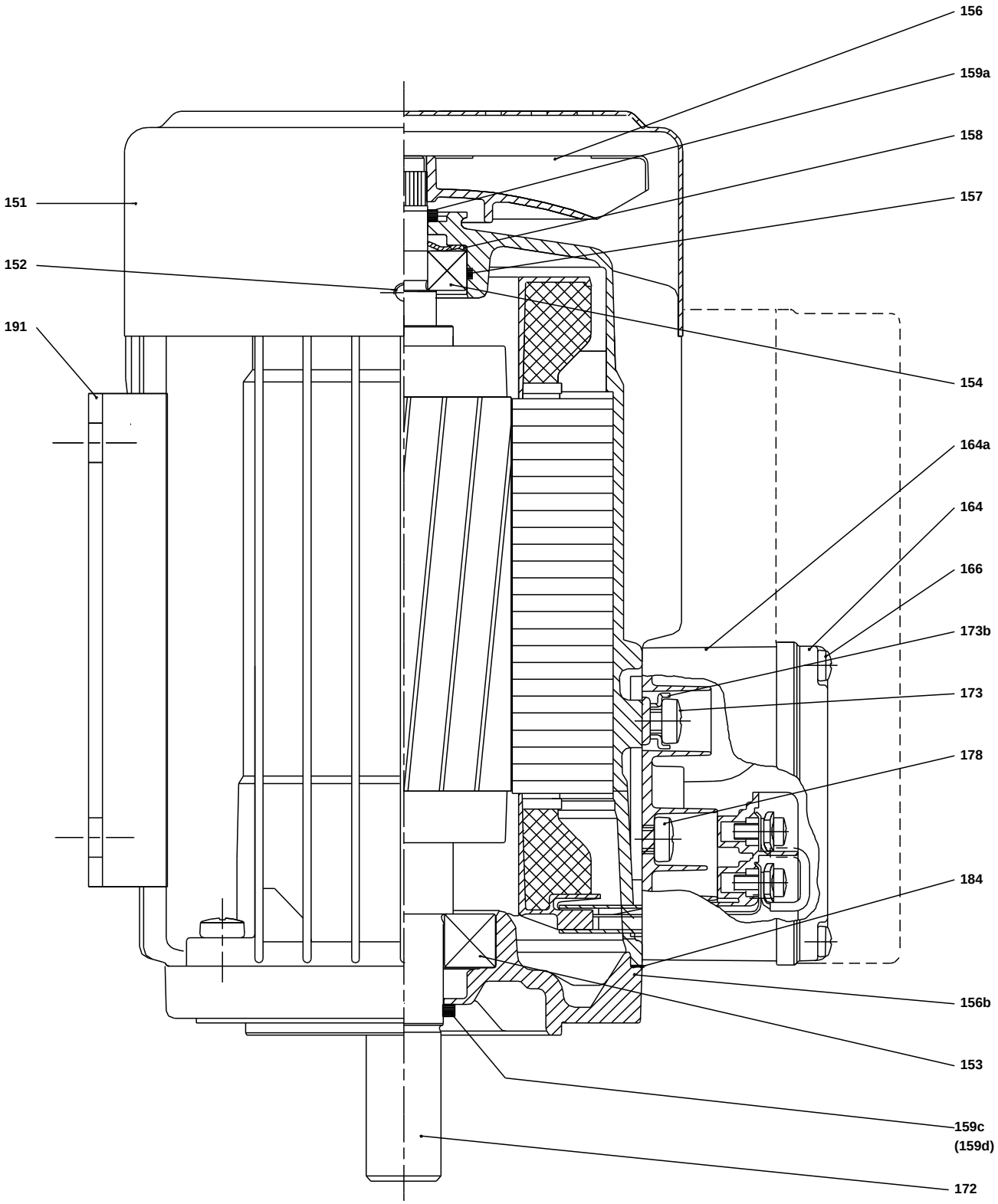
TM030163

GRUNDFOS

Company name:
Created by:
Phone:

Date: 14/02/2019

(TM029177)



TM029177)

GRUNDFOS

Company name:
Created by:
Phone:

Date: 14/02/2019

Spare parts CR 1-4, Product No. 96516172
Valid from 1.1.2004 (0401)

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
-		Kit, chamber stack		Bearing type: SILICON CARBIDE	96453487	1	pcs
-	4a	Chamber w. bearing cpl.				1	
		Vane					
		Intermediate chamber					
		Retainer for bearing					
		Guide vane					
	45	Neck ring					
	47	Bearing bush					
	65	Retainer					
	65	Retainer					
-	4	Chamber cpl.				2	
		Vane					
		Intermediate chamber					
		Plate					
		Guide vane					
	45	Neck ring					
	65	Retainer					
	65	Retainer					
-	5a	Chamber cpl.				1	
		Vane					
		Intermediate chamber					
	45	Neck ring					
	65	Retainer					
	65	Retainer					
-	44a	Guide vane cpl.				1	
		Plate					
		Guide vane					
	50	Top plate					
	47	Bearing ring, rotating				1	
	49	Impeller				4	
	51	Shaft, spline, cpl.				1	
	64d	Spacing pipe		Internal diameter: 12,85		1	
				Outer diameter: 15,85			
				Length (mm): 4,50			
	64c	Clamp, splined		Internal diameter: 8,5		1	
				Outer diameter: 15			
	64a	Spacing pipe				2	
	66	Wedge lock washer				1	
	67	Lock nut		Thread: M8		1	
-		Kit, coupling			00415060	1	pcs
	9	Hex socket head cap screw		Designation: DIN 912		4	
				Length (mm): 20			
				Thread: M6			
	10a	Coupling half				2	
	10	Shaft pin		Diameter: 5		1	
				Length (mm): 26			
-		Kit, coupling guard			96505130	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		1	
				Material type: EPDM			

GRUNDFOS

Company name:
Created by:
Phone:

Date: 14/02/2019

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
				Thickness: 2,4			
	38	O-ring		Diameter: 16,3		2	
				Material type: EPDM			
				Thickness: 2,4			
	109	O-ring		Diameter: 22,00		1	
				Material type: EPDM			
				Thickness: 2,75			
-		Kit, plug			96505133	1	pcs
-	18	Air vent screw				1	
		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	96455095	1	pcs
-	4a	Chamber w. bearing cpl.				1	
	4a	Intermediate chamber					
	45	Neck ring					
	65	Neck ring retainer					
	45	Neck ring				8	
	47	Bearing ring, rotating				1	
	64d	Spacing pipe		Internal diameter: 12,85		1	
				Outer diameter: 15,85			
				Length (mm): 4,50			
	64c	Clamp, splined		Internal diameter: 8,5		1	
				Outer diameter: 15			
	65	Neck ring retainer				8	
	66	Wedge lock washer				1	
	67	Lock nut		Thread: M8		1	
	441b	Gasket				2	
-		Motor			85900331	1	pcs
-		Kit, Ball bearing			96279730	1	
	111	Ball bearing		Designation: 6204.2Z.C3.SYN			
	111	Ball bearing					
	157	O-ring		Diameter: 32			
				Material type: NBR			
				Thickness: 2			
	158	Waved washer					
+		Kit, fan			96279721	1	
+		Kit, fan cover			96279720	1	
-		Kit, flange			96279727	1	
	156b	Flange					
	159c	Seal ring					
	184	Gasket		Internal diameter: 114,80			

GRUNDFOS

Company name:
Created by:
Phone:

Date: 14/02/2019

	Pos	Description	Annotation	Classification Data	Part no.	Qty.	Unit
				Outer diameter: 121,20			
				Thickness: 0,25			
	185	Pan head screw					
	186	Drain plug					
+		Kit, shaft seal			96279722	1	
-		Kit, terminal box			96279724	1	
	152	Pan head thread forming screw					
	164a	Terminal box w/gasket					
	164	Terminal box cover w/gasket					
	173a	Washer		Designation: SQUARE			
				Internal diameter: 5,5			
				Outer diameter: 10X10			
				Thickness: 1,5			
	173a	Base					
	173	Pan head thread forming screw		Designation: COMBI TORX T25			
	173	Pan head screw		Designation: DIN 7985			
	175	Pan head screw		Designation: DIN 7985			
	176	Terminal cpl.					
	6	Base			96588138	1	pcs
	10	Bulk, Shaft pin (10 pcs)		Diameter: 5	96536473	1	pcs
				Length (mm): 26			
-	25a	Drain plug w/bypass valve			96588242	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	Bulk, Staybolt (4 pcs)		Length (mm): 97	96536314	4	pcs
				Thread: M12			
	26	Staybolt		Length (mm): 97	98986269	4	pcs
				Thread: M12			
	36	Bulk, Nut (20 pcs)		Thread: M12	96620479	4	pcs
	37	Bulk, O-ring (24 pcs)			96547656	2	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			
	55	Outer sleeve			98811265	1	pcs
+	105	Bulk, Shaft seal (15 pcs)		Material type: HQQE	96983415	1	pcs
	441b	Bulk, Gasket (24 pcs)			96536206	2	pcs
+	441a	Flange		Thread: RP 1	96547453	2	pcs