Standardised Water Pump

Etanorm

Fixed Speed / Variable Speed
50 Hz / 60 Hz
Europe (EU)
Middle East (ME)
North Africa (NA)

Type Series Booklet

Legal information/Copyright

Type Series Booklet Etanorm

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Centrifugal Pumps with Shaft Seal

Standardised Water Pumps

Etanorm (EU / ME / NA)

The product illustrated as an example may include options incurring a surcharge.

Main applications

- Handling cleanor aggressive fluids not chemically and mechanically aggressive to the pump materials.
- Water supply systems
- Cooling circuits
- Swimming pools
- Fire-fighting systems
- General irrigation systems
- Drainage systems
- Heating systems
- Air-conditioning systems
- Spray irrigation systems

Fluids handled

- Seawater
- Brackish water
- Drinking water
- Hot water
- Service water
- Fire-fighting water
- Brine
- Cleaning agents
- Condensate
- Oils

Operating data

Table 1: Operating properties

Characteristic		Value	
		50 Hz	60 Hz
Flow rate	Q	≤ 1930	≤ 2321
Head	[m3/h]	≤ 160	≤ 160
Fluid temperature	H [m] T [°C]	≥ -30 ≤ +140	≥ -30 ≤ +140
Operating pressure	p [bar]	≤ 16	≤ 16

Design details

Design

- Volutecasing pump
- Horizontal installation
- Back pull-out design
- Single-stage
- Dimensions and ratings to EN 733
- Requirements to 2009/125/EC Directive
- Fixed speed version (without PumpDrive 2 / PumpDrive 2 Eco / PumpDrive R) / variable speed version (with PumpDrive 2 / PumpDrive 2 Eco / PumpDrive R)

Pump casing

- Radially split volute casing
- Volute casing with integrally cast pump feet
- Replaceable casing wear rings (optional for pump casing material C)
- Radially split volute casing
- Volute casing with integrally cast pump feet
- Replaceable casing wear rings (optional for pump casing material C)

Drive (fixed speed version)

Standard design:

- KSB/Innomotics surface-cooled IEC three-phase current squirrel-cage motor
- Efficiency class IE3 up to 55 kW and from 250 kW/ IE4 from 75 kW to 200 kW to IEC 60034-30
- Rated voltage (50 Hz) 230 V / 400 V ≤ 2.20 kW
- Rated voltage (50 Hz) 400 V / 690 V ≥ 3.00 kW
- Rated voltage (60 Hz) - / 460 V ≤ 2.20 kW
- Rated voltage (60 Hz) 460 V / - ≥ 3.00 kW
- Type of construction IM B3
- Enclosure IP55
- Duty type: continuous duty S1
- Thermal class F with temperature sensor, 1 PTC thermistor (size 80/90) / 3 PTC thermistors (from size 100)

Explosion-proof design:

- KSB surface-cooled IEC three-phase current squirrel-cage motor
- Efficiency class IE3 to IEC 60034-30
- Rated voltage (50 Hz) 230 V / 400 V ≤ 2.50 kW
- Rated voltage (50 Hz) 400 V / 690 V ≥ 3.30 kW
- Rated voltage (60 Hz) - / 460 V ≤ 2.50 kW
- Rated voltage (60 Hz) 460 V / - ≥ 3.30 kW

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- Type of construction IM B3
- Enclosure IP55 Duty type:
- continuous duty S1
- II 3G Ex ec IIC T3 Gc
- II 2G Ex eb IIC T3 Gb
- II 2G Ex db (eb) IIB T4 Gb
- II 2G Ex db (eb) IIC T4 Gb

Drive (variable speed version)

KSB SuPremE motor:

- Surface-cooled KSB SuPremE motor, IEC-compatible, magnetless synchronous reluctance motor1) (PumpDrive required)
- Efficiency class IE4 / IE5 to IEC TS 60034-30-2:2016
- Mounting points to EN 50347:2001
- Envelope dimensions to DIN VDE 42673-4:2011-07
- Type of construction IM B3
- Enclosure IP55
- Duty type: continuous duty S1
- Thermal class F with temperature sensor, 3 PTC thermistors
- Shaft centreline height 71 to 225 mm
- Rated power 0.55 kW to 45 kW
- Rated speed 1500 rpm or 3000 rpm
- Frequency 50 Hz / 60 Hz (PumpDrive input)
- Voltage 380 V to 480 V (PumpDrive input)

KSB SuPremE C1/D1:

- With terminal box for connecting to PumpDrive 2 or PumpDrive R for mounting on walls and in control cabinets

KSBSuPremE C2/D2:

- Equipped for being fitted with a motor-mounted PumpDrive 2

PumpDrive 2 / PumpDrive 2 Eco:

- Self-cooling frequency inverter of modular design for the continuously variable speed control of asynchronous motors and synchronous reluctance motors by means of analog standard signals, a field bus or the control panel
- Identical design of frequency inverter for motor mounting, wall mounting and cabinet mounting
- Mains voltage 3~ 380 V AC -10 % to 480 V AC +10 %
- Mains frequency 50 Hz to 60 Hz ± 2 %

PumpDrive R:

- Self-cooling frequency inverter of modular design for the continuously variable speed control of asynchronous motors and synchronous reluctance motors, such as KSB SupremE motors or permanent magnet synchronous motors, by means of analog standard signals, a field bus or the control panel
- Identical design of frequency inverter for the mounting types wall mounting and cabinet mounting
- Mains voltage 3~ 380 V AC -10 % to 480 V AC +10 %
- Extended mains voltage range (on request)
- Mains frequency 50 Hz to 60 Hz ± 2 %
- Extended power range with a nominal power of 400 kW (standard) or up to 1400 kW (on request)

PumpMeter:

- Intelligent pressure transmitter for pumps, with on-site display of measured values and operating data
- For recording the load profile of the pump
- Supplied completely assembled and parameterised for the individual pump

KSB Guard

- System for monitoring the pump's condition by means of temperature and vibration sensors
- Measured values and operating data may be retrieved via the KSB Guard app and the web portal at any time.

Shaft seal

- Gland packing
- KSB single mechanical seal
- KSB cartridge seal
- Single mechanical seals and double mechanical seals to EN 12756
- Shaft equipped with replaceable shaft sleeve in the shaft seal area

Impeller type

- Closedradial impeller with multiply curved vanes

Bearings

Standard:

- Deep groove ball bearing (floating bearing assembly)

Reinforced:

- Deep groove ball bearing (floating bearing assembly)

Designation

Table 2: Designation example

Position																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
E	T	N		0	5	0	-	0	3	2	-	1	2	5		G	G	S	A	S	1	1	G	S	E	J	V	2	E	L	B
See name plate and data sheet																															

Table 3: Designation key

Position	Code	Description
1-4	Pump type	
	ETN	Etanorm

1 Motor sizes 0.55 kW / 0.75 kW with 1500 rpm are designed with permanent magnets.

Position	Code	Description	
1-4	ETNE	Etanorm complementary sizes	
	ETNF	Etanorm fire-fighting pump	
5-16	Size [mm], e.g.		
	050	Nominal suction nozzle diameter	
	032	Nominal discharge nozzle diameter	
	125	Nominal impeller diameter	
17	Pump casing material		
	B	Bronze	CC480K-GS / B30 C90700
	C	Stainless steel	1.4408 / A743CF8M
	G	Cast iron	EN-GJL-250 / A48 Cl. 35
	S	Nodular cast iron	EN-GJS-400-15 / A536 Gr. 60-40-18
	P	Cast iron without protective coating	EN-GJL-250 without protective coating
18	Impeller material		
	B	Bronze	CC480K-GS / B30 C90700 1.4408 /
	C	Stainless steel	A743CF8M EN-GJL-250 / A48 Cl. 35
	G	Cast iron	1.4008 / A743 Gr. CA15 EN-GJL-250
	O	Cast steel	without protective coating
	P	Cast iron without protective coating	
19	Description		
	A	Approved for fire fighting to APSAD	
	E	Design as per European Regulation (EC) No. 1935/2004	
	H	Approved for drinking water to ACS	
	K	Approved for drinking water to KSB standard	
	L	Approved for fire fighting toUL	
	M	Approved for fire fighting to FM	
	N	Approved for fire fighting, non-listed	
	S	Standard	
	U	Approved for drinking water to UBA	
	V	Approved for fire fighting to VdS	
	W	Approved for drinking water to WRAS	
20	Casing cover connections		
	A	Conical casing cover without connection	
	D	Conical casing cover with connection for external flushing	
	E	Conical casing cover with connection for external flushing from discharge nozzle	
	F	Cylindrical casing cover for version with gland packing without connection	
	G	Cylindrical casing cover for version with gland packing with external barrier fluid or external flushing	
	H	Cylindrical casing cover for version with double mechanical seal in tandem arrangement with connection for quench system	
	I	Cylindrical casing cover for version with double mechanical seal in back-to-back arrangement with connection for barrier fluid system	
	L	Cylindrical casing cover for version with gland packing or single mechanical seal, prepared for internal circulation	
21	Shaft seal type		
	A	Single mechanical seal, conical casing cover	
	C2)	Internal circulation with cylindrical casing cover, API Plan: 01	
	D	Double mechanical seal in back-to-back arrangement, API Plan: 53A	
	E	Single mechanical seal, external circulation, conical casing cover, API Plan: 11	
	F	Single mechanical seal, external flushing, conical casing cover, API Plan: 32	
	G2)	Internal circulation with cylindrical casing cover for cartridge seal	
	I	Single mechanical seal, internal circulation, conical casing cover, API Plan: 01	
	T	Double mechanical seal in tandem arrangement with internal circulation, API Plan: 523) / 554)	
	1	Gland packing with internal barrier fluid (Na)	
	2	Gland packing without barrier fluid (Nb)	
	3	Gland packing with external barrier fluid (Nc)	

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2 Only for Etanorm complementary sizes
3 Applies to: Version without reservoir and version with unpressurised reservoir
4 Applies to: Version with external circulation system

Position	Code	Description		
21	4	Gland packing with external flushing liquid (VSH)		
22-23	Seal code of gland packing			
	1A	P1, with internal barrier fluid (Na), material RT/P (for hot water of up to 120 °C)		
	1B	P2, without barrier fluid (Nb), material RT/P (for hot water of up to 120 °C)		
	1C	P3, with external barrier fluid (Nc), material RT/P (for hot water of up to 110 °C)		
	1D	P4, with external flushing liquid (VSH), material RT/P (for hot water of up to 110 °C)		
	3B	P2, without barrier fluid (Nb), material BUP901/B5 (for hot water of up to 140 °C)		
	Seal code, single mechanical seal			
	01	QQVGG	KSB's choice	≥ -20 - ≤ +110 [°C]
	07	QQEGG DW001	KSB's choice	≥ -30 - ≤ +110 [°C]
	08 2)	AQ1VGG	M32N69	≥ -30 - ≤ +110 [°C]
	09	U3U3VGG-Y10	EMG13-G6	≥ -20 - ≤ +110 [°C]
	10	QQXGG	KSB's choice	≥ -20 - ≤ +110 [°C]
	11	BQEGG DW001	KSB's choice	≥ -30 - ≤ +110 [°C]
	12	Q12Q1M1GG1	M37GN83	≥ -20 - ≤ +100 [°C]
	13	BQVGG	KSB's choice	≥ -20 - ≤ +110 [°C]
	14	Q1Q1KY7G	KMB13S2G9	≥ -20 - ≤ +120 [°C]
	15	Q1Q1KGG	M7G49	≥ -20 - ≤ +110 [°C]
	17	Q1BVGG	M7N / 5A	≥ -20 - ≤ +110 [°C]
	22	AQ1EGG	M32N69	≥ -30 - ≤ +140 [°C]
	31 2)	BQ7EGG-Y10 DW001	EMG12-G6	≥ -30 - ≤ +120 [°C]
	32 2)	Q7Q7EGG-Y10 DW001	EMG12-G6	≥ -30 - ≤ +80 [°C]
	40 2)	U2U2VGG	4M	≥ -5 - ≤ +150 [°C]
	41 2)	Q1Q1U2GG	5A	≥ -20 - ≤ +150 [°C]
	42 2)	A2Q1TGG	59U	≥ -20 - ≤ +180 [°C]
	43 2)	Q1Q1TGG	59U	≥ -20 - ≤ +180 [°C]
	44 2)	BQ1E4GG	4M	≥ -35 - ≤ +120 [°C]
	45	BQ7EGG-Y10 FD004	EMG13-G6	≥ -30 - ≤ +110 [°C]
	46	Q7Q7EGG-Y10 FD004	EMG13-G6	≥ -30 - ≤ +110 [°C]
	47 2)	BQ1U1MG	5KSCB2S	≥ -5 - ≤ +120 [°C]
	48 2)	Q1Q1U1MG	5KSCB2S	≥ -5 - ≤ +180 [°C]
	50 2)	Q7Q7VGG-Y10	EMG12-G6	≥ -30 - ≤ +85 [°C]
	51	BQ7VGG-Y10 FD004	EMG13-G6	≥ -14 - ≤ +120 [°C]
	52	Q7Q7VGG-Y10 FD004	EMG13-G6	≥ -14 - ≤ +120 [°C]
	66	Q7Q7EGG-Y10 DW001	EMG13-G6	≥ -30 - ≤ +120 [°C]
	76	AQ7EGG-Y10	ERMG13-G6	≥ -30 - ≤ +140 [°C]
	79	Q7Q7VGG-Y10	EMG13-G6	≥ -20 - ≤ +110 [°C]
	Seal code, double mechanical seal in tandem arrangement			
	18	Q7Q7EGG-Y10 DW001	EMG12-G6	≥ -30 - ≤ +110 [°C]
		Q7Q7EGG-Y10 DW001	EMG12-G6	≥ -30 - ≤ +110 [°C]
	20	Q12Q1M1GG1	M37GN85	≥ -20 - ≤ +110 [°C]
		Q7Q7EGG-Y10 DW001	EMG12-G6	≥ -20 - ≤ +110 [°C]
	23	Q12Q1M1GG1	M37GN92	≥ -20 - ≤ +110 [°C]
		Q7Q7EGG-Y10 DW001	EMG12-G6	≥ -20 - ≤ +110 [°C]
	Seal code, double mechanical seal in back-to-back arrangement			
	21	Q1Q1KGG	M7G49	≥ -20 - ≤ +110 [°C]
		Q1Q1KGG	M7G49	≥ -20 - ≤ +110 [°C]
	24	Q1Q1KGG	M7G49	≥ -20 - ≤ +110 [°C]
		Q1BVGG	M7N	≥ -20 - ≤ +110 [°C]
24	Bearing bracket			
	G	Grease lubrication		
	O	Oil lubrication		
25	Order type			
	S	KSB standard		
	C	Extended standard		
	X	Special design		
26	Bearing bracket/shaft unit			
	E	Shaft unit 25		
	F	Shaft unit 35		

Position	Code	Description
26	G	Shaft unit 50
	H	Shaft unit 55
	I	Shaft unit 60
	J	Shaft unit 60.1
	K 2)	Shaft unit 65
	L 2)	Shaft unit 65.1
	M2)	Shaft unit 65.2
	N2)	Shaft unit 85
	O2)	Shaft unit 85.1
	P2)	Shaft unit 85.2
27-28	Motor rating PN [kW]	
	AP	0,55
	...	...
	LN	200
	OU 2)	725
29	Number of motor poles	
	2	2 poles
	4	4 poles
	6	6 poles
30	Scope of supply	
	A	Bare-shaft pump
	B	Bare-shaft pump, baseplate
	C	Pump, baseplate
	D	Pump, baseplate, coupling, coupling guard
	E	Pump, baseplate, coupling, coupling guard, motor
	F	Pump, baseplate, coupling
	G	Back pull-out unit
31	Accessories / Automation	
	A	KSB PumpDrive 2
	B	KSB PumpMeter
	C	KSB PumpDrive 2 + KSB PumpMeter
	D	KSB MyFlow
	E	KSB Guard
	H	None
	I	Version for potentially explosive atmospheres (ATEX)
	J	KSB PumpDrive 2 + KSB Guard
	K	KSB PumpMeter 2 + KSB Guard
	L	KSB PumpDrive 2 + KSB PumpMeter + KSB Guard
	M	KSB MyFlow + KSB Guard
	N	KSB PumpDrive 3
	O	KSB PumpDrive R + KSB PumpMeter
	P	KSB PumpDrive R + KSB Guard
	Q	KSB PumpDrive R + KSB PumpMeter + KSB Guard
	R	KSB PumpDrive R
	W	KSB PumpDrive 3 + KSB Guard
32	Product generation	
	B	Generation B

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Materials

Table 4: Symbols key

Symbol	Description
✗	Standard
o	Optional
-	Version not available / not feasible

Table 5: Overview of available materials

Part No. (Page 36)	Designation	Material	Material variant5)							
			GG	GB	GC	BB	SG	SB	SC	CC
102	Volute casing	Grey cast iron EN-GJL-250 / A 48 Cl. 35B	✗	✗	✗	-	-	-	-	-
		Bronze CC480K-GS / B30 C90700	-	-	-	✗	-	-	-	-
		Nodular cast iron EN-GJS-400-15 / A536 Gr. 60-40-18	-	-	-	-	✗	✗	✗	-
		Stainless steel 1.4408 / A743 Gr. CF8 M	-	-	-	-	-	-	-	✗
161	Conical casing cover	Grey cast iron EN-GJL-250 / A 48 Cl. 35B	✗	✗	✗	-	-	-	-	-
		Bronze CC480K-GS / B30 C90700	-	-	-	✗	-	-	-	-
		Nodular cast iron EN-GJS-400-15 / A536 Gr. 60-40-18	-	-	-	-	✗	✗	✗	-
		Stainless steel 1.4408 / A743 Gr. CF8 M	-	-	-	-	-	-	-	✗
161	Cylindrical casing cover	Grey cast iron EN-GJL-250 / A 48 Cl. 35B	o	o	o	-	-	-	-	-
		Nodular cast iron EN-GJS-400-15 / A536 Gr. 60-40-18								
		Stainless steel 1.4408 / A743 Gr. CF8 M	-	-	-	-	-	-	-	o
		Bronze CC480K-GS / B30 C90700	-	-	-	o	-	-	-	-
210	Shaft	Tempered steel C45+N	✗	✗	✗	-	✗	✗	✗	-
		Chrome steel 1.4057+QT800	o	o	o	-	o	o	o	-
		Duplex stainless steel 1.4462 / UNS S318036)	o	o	o	✗	o	o	o	✗
230	Impeller	Grey cast iron EN-GJL-250 / A 48 Cl. 35B	✗	-	-	-	✗	-	-	-
		Bronze CC480K-DW Stainless steel 1.4408 / A743 Gr. CF8 M	-	✗	-	✗	-	✗	-	-
			-	-	✗	-	-	-	✗	✗
330	Bearing bracket	Grey cast iron EN-GJL-250 / A 48 Cl. 35B7)	✗	✗	✗	✗	✗	✗	✗	✗
		Nodular cast iron EN-GJS-400-18-LT8)	✗	✗	✗	✗	✗	✗	✗	✗
400	Gaskets	DPAF, asbestos-free	✗	✗	✗	✗	✗	✗	✗	✗
502.01	Casing wear ring, suction side	JL / lamellar graphite cast iron	✗	✗	✗	-	✗	✗	✗	-
		Stainless steel (CrNiMoST)9)6)	o	-	o	-	-	-	-	o
		VG434								
		Bronze CC495K-GS	-	o	-	✗	-	o	-	-
502.02	Casing wear ring, discharge side	JL / lamellar graphite cast iron	✗	✗	✗	-	✗	✗	✗	-
		Stainless steel (CrNiMoST)9)6)	o	-	o	-	-	-	-	o
		VG434								
		Bronze CC495K-GS	-	o	-	✗	-	o	-	-
52	Shaft sleeve10)	Stainless steel (CrNiMoST)9)	✗	✗	✗	✗	✗	✗	✗	✗
3	Shaft protecting sleeve11)	Stainless steel (CrNiMoST)9)	-	-	-	✗	-	-	-	✗
52		Chrome steel 1.4122+QT750	✗	✗	✗	-	-	-	-	-
902	Studs	Steel 8.8	✗	✗	✗	-	✗	✗	✗	-
		A4-70/ A193 Gr. B8M Cl. 2	o	o	o	✗	o	o	o	✗
903	Screw plugs	Steel	✗	✗	✗	-	✗	✗	✗	-
		A4/ AISI 316	o	o	o	✗	o	o	o	✗

5 Material variant P: cast iron without protective coating for drinking water
6 For pump type ETNE (ð Page 22)
7 Valid for shaft units WS25, WS35, WS55 - bearing bracket LS (standard)
8 Valid for shaft units WS50, WS60 - bearing bracket LR (reinforced)
9 Possible materials for material group CrNiMo steel INT (material identification code 7605): 1.4401, 1.4404, 1.4408, 1.4571, AISI 316, AISI 316TI, A743 Gr. CF8M, A479 TYPE 316L.
10 For versions with mechanical seal only
11 For versions with gland packing only

Part No. (ð Page 36)	Designation	Material	Material variant5)							
			GG	GB	GC	BB	SG	SB	SC	CC
920	Nut	8+A2A/ 8+B633 SC1 TP3	✗	✗	✗	-	✗	✗	✗	-
		A4/ AISI 316 A4/ AISI	o	o	o	✗		o	o	✗
920.95	Impeller nut	316 Steel 8	o	✗	✗	✗	✗	✗	✗	✗
			✗	-	-	-		-	-	-

Coating and preservation

- Coatingandpreservationto KSB standard

Product benefits

- Improved efficiency and NPSHreq by experimentally verified hydraulic design of impellers (vanes)
- Operating costs reduced by trimming the nominal impeller diameter to match the specified duty point
- Little wear, low vibration levels and excellent smooth running characteristics thanks to good suction performance and virtually cavitation-free operation across a wide operating range
- Large variety of materials as standard for perfectly matching the pump to the fluid handled
- PumpDrive perfectly matched to pump and motor by default factory parameter settings
- Motor-mounted variable speed system up to 45 kW saves space
- Pump operation made fully transparent with PumpMeter
- The efficiency of the motor also exceeds 95 % of the nominal efficiency when the motor runs at 25 % of its nominal power on a quadratic torque-speed curve.
- Sustainable and environmentally friendly because no magnets based on “rare earth elements” such as NdFeB are used

Product information

Product information as per Regulation No. 1907/2006 (REACH)

Forinformationas per Europeanchemicalsregulation (EC) No. 1907/2006 (REACH) see https://www.ksb.com/en-global/company/corporate-responsibility/reach.

Product information as per Regulation No. 547/2012 (for water pumps with a maximum shaft power of 150 kW) implementing "Ecodesign" Directive 2009/125/EC

- Minimumefficiency index: see data sheet
- The benchmark for the most efficient water pumps is MEI ≥ 0.70.
- Year of construction: see data sheet
- Manufacturer’s name or trade mark, commercial registration number and place of manufacture: see data sheet or order documentation
- Product’s type and size identificator: see data sheet
- Hydraulic pump efficiency (%) with trimmed impeller: see data sheet
- Pump performance curves, including efficiency characteristics: see documented characteristic curve
- The efficiency of a pump with a trimmed impeller is usually lower than that of a pump with the full impeller diameter. Trimming of the impeller will adapt the pump to a fixed duty point, leading to reduced energy consumption. The minimum efficiency index (MEI) is based on the full impeller diameter.
- Operation of this water pump with variable duty points may be more efficient and economic when controlled, for example, by the use of a variable speed drive that matches the pump duty to the system.
- Information relevant for disassembly, recycling or disposal at end of life: see installation/operating manual
- Information on benchmark efficiency or benchmark efficiency graph for MEI = 0.70 (0.40) for the pump based on the model shown in the Figure are available at: www.europump.org/efficiencycharts

Acceptance tests and warranty

Materials inspection andtesting:

- Test report 2.2 on request

Final inspection:

- Inspection certificate 3.1 to EN 10204 on request

Hydraulic test against surcharge

- Duty point to ISO 9906/2B
- NPSH test

Other inspections/tests on request

Warranty:

- Warranties are given within the scope of the valid terms and conditions of sale and delivery.

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Overview of product features / selection tables

Overview of material variants

Other designs on request

Table 6: Symbols key

Symbol	Description
✗	Standard
-	Version not available / not feasible

Table 7: Overview of Etanorm variants

Variant	102 / Volute casing	230 / Impeller	Gland packing / mechanical seal	T [°C]	Main applications								
					Handling clean or aggressive fluids not chemically and mechanically aggressive to the pump materials	Water supply systems	Cooling circuits	Swimming pools	Fire-fighting systems	General irrigation systems	Drainage systems	Heating systems	Air-conditioning systems	Spray irrigation systems
GG01	Grey cast iron EN-GJL-250/ A 48 Cl. 35 B	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Gland packing RT/P	≥ -20 - ≤ +110	-	-	✗	-	-	-	-	✗	✗	-
GG76	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	SU 25, 35: mech. seal AQ7EGG-Y10 SU 55: mech. seal AQ1EGG	≥ -30 - ≤ +140	-	-	-	-	-	-	-	✗	-	-
GG10	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Mech. seal QQXGG	≥ -20 - ≤ +110	-	✗	-	✗ [12]	✗	✗	✗	-	-	✗
GG11	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Mech. seal BQEGG DW001	≥ -30 - ≤ +110	✗	✗	✗ [13]	-	✗	-	-	-	✗ [13]	-
GB01	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Bronze CC480K-GS/ B30 C90700	Gland packing RT/P	≥ -20 - ≤ +110	-	-	✗	-	-	-	-	✗	✗	-
GB76	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Bronze CC480K-GS/ B30 C90700	SU 25, 35: mech. seal AQ7EGG-Y10 SU 55: mech. seal AQ1EGG	≥ -30 - ≤ +140	-	-	-	-	-	-	-	✗	-	-
GB10	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Bronze CC480K-GS/ B30 C90700	Mech. seal QQXGG	≥ -20 - ≤ +110	-	✗	-	✗ [12]	✗	✗	✗	-	-	✗
GB11	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Bronze CC480K-GS/ B30 C90700	Mech. seal BQEGG DW001	≥ -30 - ≤ +110	✗	✗	✗ [13]	-	✗	✗	✗	-	✗ [13]	-
SG10	Nodular cast iron EN-GJS-400-15 / A536 Gr. 60-40-18	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Mech. seal QQXGG	≥ -20 - ≤ +110	-	✗	-	✗ [12]					-	✗
SG11	Nodular cast iron EN-GJS-400-15 / A536 Gr. 60-40-18	Grey cast iron EN-GJL-250 / A 48 Cl. 35 B	Mech. seal BQEGG DW001	≥ -30 - ≤ +110	✗	✗	✗ [13]	-	✗	-	-	-	✗ [13]	-
BB01	Bronze CC480K-GS / B30 C90700	Bronze CC480K-GS/ B30 C90700	Gland packing RT/P	≥ -20 - ≤ +110	-	-	✗	-	-	-	-	✗	✗	-
BB10	Bronze CC480K-GS / B30 C90700	Bronze CC480K-GS/ B30 C90700	Mech. seal QQXGG	≥ -20 - ≤ +110	-	✗	-	✗ [12]	✗	✗	✗	-	-	✗
BB11	Bronze CC480K-GS / B30 C90700	Bronze CC480K-GS/ B30 C90700	Mech. seal BQEGG DW001	≥ -30 - ≤ +110	✗	✗	✗ [13]	-	✗	-	-	-	✗ [13]	-

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12 QQVGG
13 QQEGG, fluid handled: water, glycol with inhibitors

Variant	102 / Volute casing	230 / Impeller	Gland packing / mechanical seal		Handling clean or aggressive fluids not chemically and mechanically aggressive to the pump materials	Water supply systems	Cooling circuits	Swimming pools	Fire-fighting systems	General irrigation systems	Drainage systems	Heating systems	Air-conditioning systems	Spray irrigation systems
CC01	Stainless steel 1.4408 / A743 Gr. CF8 M	Stainless steel 1.4408 / A743 Gr. CF8 M	Gland packing RT/P	≥ -20 - ≤ +110	-	-	✗	-	-	-	-	✗	✗	-
CC10	Stainless steel 1.4408 / A743 Gr. CF8 M	Stainless steel 1.4408 / A743 Gr. CF8 M	Mech. seal QQXGG≥	-20 - ≤ +110	-	✗	-	✗ 12)	✗	✗	✗	-	-	✗
CC11	Stainless steel 1.4408 / A743 Gr. CF8 M	Stainless steel 1.4408 / A743 Gr. CF8 M	Mech. seal BQEGG DW001	≥ -30 - ≤ +110	✗	✗	✗ 13)	-	✗	-	-	-	✗ 13)	-

Overview of fluids handled

Table 8: Symbols key

Symbol	Description
✗	Standard Version not available /
-	not feasible

Table 9: Excerpt from the overview of fluids handled with associated material variants

Fluid handled	T14)		Materials					Shaft seal								Notes
			Casing / impeller							Mechanical seal						
	Minimum	Maximum	Grey cast iron / grey cast iron	Grey cast iron / tin bronze	Nodular cast iron / grey cast iron	Tin bronze / tin bronze	Gland packing RTP cast steel	CrNiMo cast steel / CrNiMo	Gland packing, pure graphite	AQ7EGG-Y10	QQEGG DW001	Q7Q7VGG-Y10 [15]	QQXGG	BQEGG DW001	Q7Q7EGG-Y10 FD004	
	[°C]		GG	GB	SG	BB	CC	1	3B	76	7	79	10	11	46	
Water																
Brackish water16)	-	≤ 25	-	-	-	✗	-	✗	-	-	-	-	✗	-	-	CrNiMo cast steel can be used.
Fire-fighting water17)	-	≤ 60	-	✗	-	-	-	✗	-	-	-	-	✗	-	-	Contact the manufacturer for supply to VdS guideline.
Heating water18)	-	≤ 110	✗	-	-	-	-	✗	-	-	-	-	-	✗	-	If used as circulating pump to DIN 4752: p ≤ 10 bar. If ductile material has been specified: "S"
Heating water	-	≤ 140	✗	-	-	-	-	-	✗	✗	-	-	-	-	-	
Condensate	-	≥ 110	✗	-	-	-	-	✗	-	-	-	-	✗	✗	-	
Condensate, not conditioned	-	≤ 110	-	-	-	-	-	✗	-	-	-	-	-	✗	-	-
Cooling water without antifreeze	-	≤ 60	✗	-	-	-	✗	✗	-	-	-	-	✗	-	-	-
Cooling water with antifreeze19), pH ≥ 7.5	≥ 30	≤ 60	✗	-	-	-	-	✗	-	-	-	-		-	-	Open circuit: GB 10 required
Cooling water with antifreeze19), pH ≥ 7.5	≤ 60	≤ 110	✗	-	-	-	-	✗	-	-	✗	-	-		-	Open circuit: BB66 or CC66 required
Slightly contaminated water	-	≤ 60	- ✗	-	-	- ✗	-	✗	-	-	-	-	✗	-	-	Open circuit: BB66 or CC66 required
Seawater	-	≤ 25	✗	-	-	-	-	✗	-	-	-	-	✗	-	-	-
Pure water20)	-	≤ 60	✗	-	-	-	-	✗	-	-	-	-	-	✗	-	CrNiMo cast steel can be used.
Raw water	-	≤ 60	-	-	-	-	-	✗	-	-	-	-	✗	-	-	-
Swimming pool water (fresh water)	-	≤ 60	-	- ✗	-	-	-	-	-	-	-	-	✗ ✗	-	-	-
Swimming pool water21): filtration	-	≤ 40	-		-	-	-		-	-	-	-		-	-	Also applies to requirements as per DIN 19643
Swimming pool water21): water features; without turbulences and/or air content	-	≤ 40	-	✗	-	-	-	-	-	-	-	-	✗	-	-	Variant GB; shaft C45+N, shaft sleeve CrNiMo steel, nut A4/ AISI 316, key A2, casing wear ring (suction side and discharge side) JL / lamellar graphite cast iron
																Variant GB; shaft C45+N, shaft sleeve CrNiMo steel, nut A4/ AISI 316, key A2, casing wear ring (suction side and discharge side) CC495K-GS

14 T = fluid temperature
15 Can be used if electrical conductivity > 10 µS/cm; U3U3VGG-Y10 required otherwise
16 For components made of bronze: ammonia (NH3) ≤ 5 mg/kg, free from hydrogen sulphide (H2S); no limitation of CI content required in this case. Please contact the manufacturer if limits are exceeded.
17 General evaluation criteria for results of water analysis: pH ≥ 7, chlorides content (Cl) ≤ 250 mg/kg, chlorine (Cl2) ≤ 0.6 mg/kg.
18 Treatment to VdTÜV 1466, additional requirement: O2 t ≤ 0.02 mg/l
19 Antifreeze on ethylene glycol basis with inhibitors, content > 20 % to 50 % (e.g. Antifrogen N)
20 No ultra-pure water, electrical conductivity at 25 °C: ≤ 800 µS/cm, neutral with regard to chemical corrosion
21 France: Observe the rules as per ministerial order dated 18 January 2002.

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Fluid handled	T14)		Materials					Shaft seal								Notes
			Casing / impeller							Mechanical seal						
	Minimum	Maximum	Grey cast iron / grey cast iron	Grey cast iron / tin bronze	Nodular cast iron / grey cast iron	Tin bronze / tin bronze	CrNiMo cast steel / CrNiMo cast steel	Gland packing RTP	Gland packing, pure graphite	AQ7EGG-Y10	QQEGG DW001	Q7Q7VGG-Y10 [15]	QQXGG	BQEGG DW001	Q7Q7EGG-Y10 FD004	
	[°C]		GG	GB	SG	BB	CC	1	3B	76	7	79	10	11	46	
Swimming pool water21): water features; with turbulences and/or air content	-	≤ 40	-		-	✗	-	-	-	-	-	-	✗	-	-	Variant B; shaft 1.4571, shaft sleeve CrNiMo steel, nut A4/AISI 316, key A2, casing wear ring (suction side and discharge side) CC495K-GS
Swimming pool water (seawater)	-	≤ 40	-	-	-	✗	-	✗	-	-	-	-	✗	-	-	CrNiMo cast steel for t ≤ 25 °C
Dam water	-	≤ 60	-	✗	-	-	-	✗	-	-	-	-	✗	-	-	If solids are contained, contact the manufacturer.
Drinking water22)	-	≤ 60	-	✗	-	-	-	-	-	-	-	-	-	✗	-	Select material variant PB or PP (without protective coating) for drinking water.
Partly desalinated water	-	≤ 110	✗	-	-	✗	-	✗	-	-	-	-	-	✗	-	-
Fully desalinated water	-	≤ 110	-	-	-	✗	✗	✗	-	-	-	-	-	✗	-	Purity requirements cannot be met.
Fully desalinated water as boiler feed water	-	≤ 110	✗	-	-	-		✗	-	-	-	-	-	✗	-	-
Refrigerants, cooling brines																
Cooling brine; inorganic, pH > 7.5, inhibited	≥ 30	≤ 25	✗	-	-	-	-	✗	-	-	-	-	-	✗	-	-
Water with antifreeze, pH ≥ 7.5	≥ 30	≤ 60	✗	-	-	-	-	✗	-	-	- ✗	-	-	✗	-	-
Water with antifreeze, pH ≥ 7.5	≤ 60	≤ 110	✗	-	-	-	-	✗	-	-		-	-	-	-	-
Oils/emulsions																
Diesel fuel, extra light fuel oil	-	≤ 60	-	-	✗	-	-	-	-	-	-	-	✗	-	-	GG possible, unless specific standards have to be observed
Lubricating oil, turbine oil, does not apply to SF-D oils (hardly flammable)	-	≤ 80	-	-	✗	-	-	-	-	-	-	-	✗	-	-	If specified without internal primer contact the manufacturer. GG possible, unless specific standards have to be observed
Drilling emulsion, grinding emulsion	-	≤ 60	✗	-	-	-	-	-	-	-	-	✗	-	-	-	-
Oil-water emulsion	-	≤ 60	✗	-	-	-	-	-	-	-	-	✗	-	-	-	-
Brewery applications																
Beer mash	-	≤ 100	✗	-	-	-	-	-	-	-	-	-	-	-	✗	If there is a risk of the pump
Beer wort	-	≤ 100	✗	-	-	-	-	-	-	-	-	-	-	-	✗	running dry due to excessive emptying of the tank, use an Etanorm with double mechanical seal in tandem arrangement.

22 Approval to ACS (F), UBA (D) or WRAS (GB) is required.

Overview of material variants

Table 10: Symbols key

Symbol	Description
✗	Standard Version not available /
-	not feasible

Table 11: Material variants available

Etanorm	Material variants							
	GG	GB	GC	BB	SG	SB	SC	C
040-025-160	✗	✗	✗	-	✗	✗	✗	
040-025-200	✗	✗	✗	-	✗	✗	✗	✗
050-032-125.1	✗	✗	✗	✗	✗	✗	✗	✗
050-032-160.1	✗	✗	✗	✗	✗	✗	✗	✗
050-032-200.1	✗	✗	✗	✗	✗	✗	✗	✗
050-032-250.1	✗	✗	✗	-	-	-	-	✗
050-032-125	✗	✗	✗	✗	-	-	-	✗
050-032-160	✗	✗	✗	✗	✗	✗	✗	✗
050-032-200	✗	✗	✗	✗	✗	✗	✗	✗
050-032-250	✗	✗	✗	-	✗	✗	✗	✗
065-040-125	✗	✗	✗	✗	-	-	-	✗
065-040-160	✗	✗	✗	✗	✗	✗	✗	✗
065-040-200	✗	✗	✗	✗	✗	✗	✗	✗
065-040-250	✗	✗	✗	✗	✗	✗	✗	✗
065-040-315	✗	✗	✗	-	✗	✗	✗	✗
065-050-125	✗	✗	✗	✗	-	-	-	✗
065-050-160	✗	✗	✗	✗	✗	✗	✗	✗
065-050-200	✗	✗	✗	✗	✗	✗	✗	✗
065-050-250	✗	✗	✗	✗	✗	✗	✗	✗
065-050-315	✗	✗	✗	-	✗	✗	✗	✗
080-065-125	✗	✗	✗	✗	-	-	-	✗
080-065-160	✗	✗	✗	✗	✗	✗	✗	✗
080-065-200	✗	✗	✗	✗	✗	✗	✗	✗
080-065-250	✗	✗	✗	✗	✗	✗	✗	✗
080-065-315	✗	✗	✗	✗	✗	✗	✗	✗
100-080-160	✗	✗	✗	✗	✗	✗	✗	✗
100-080-200	✗	✗	✗	✗	✗	✗	✗	✗
100-080-250	✗	✗	✗	✗	✗	✗	✗	✗
100-080-315	✗	✗	✗	-	✗	✗	✗	✗
100-080-400	✗	✗	✗	-	-	-	-	✗
125-100-160	✗	✗	✗	✗	✗	✗	✗	✗
125-100-200	✗	✗	✗	✗	✗	✗	✗	✗
125-100-250	✗	✗	✗	✗	✗	✗	✗	✗
125-100-315	✗	✗	✗	✗	✗	✗	✗	✗
125-100-400	✗	✗	✗	-	-	-	-	✗
150-125-200	✗	✗	✗	✗	✗	✗	✗	✗
150-125-250	✗	✗	✗	✗	✗	✗	✗	✗
150-125-315	✗	✗	✗	✗	✗	✗	✗	✗
150-125-400	✗	✗	✗	-	✗	✗	✗	✗
150-125-510	✗	✗	✗	-	✗	✗	✗	✗
200-150-200	✗	✗	✗	-	-	-	-	-
200-150-250	✗	✗	✗	✗	-	-	-	✗
200-150-315	✗	✗	✗	✗	✗	✗	✗	✗
200-150-400	✗	✗	✗	✗	✗	✗	✗	✗
200-150-510	✗	✗	✗	-	✗	✗	✗	✗
200-200-250	✗	✗	✗	-	-	-	-	-
250-200-275	✗	✗	✗	-	✗	✗	✗	-
250-200-320	✗	✗	✗	-	✗	✗	✗	-
250-200-375	✗	✗	✗	-	✗	✗	✗	-
250-200-435	✗	✗	✗	-	✗	✗	✗	-

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Etanorm	Material variants							
	GG	GB	GC	BB	SG	SB	SC	CC
250-200-510	✗	✗	✗	-	✗	✗	✗	-
300-250-295	✗	✗	✗	-	✗	✗	✗	-
300-250-295.1	✗	✗	✗	-	✗	✗	✗	-
300-250-320	✗	✗	✗	-	✗	✗	✗	-
300-250-375	✗	✗	✗	-	✗	✗	✗	-
300-250-435	✗	✗	✗	-	✗	✗	✗	-
300-250-510	✗	✗	✗	-	✗	✗	✗	-
350-300-350	✗	✗	✗	-	✗	✗	✗	-
350-300-350.1	✗	✗	✗	-	✗	✗	✗	-
350-300-375	✗	✗	✗	-	✗	✗	✗	-
350-300-435	✗	✗	✗	-	✗	✗	✗	-
350-300-510	✗	✗	✗	-	✗	✗	✗	-

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Bearings

Standard:

- Deep groove ball bearing (floating bearing assembly)

Reinforced:

- Deep groove ball bearing (floating bearing assembly)

Example: WS_25_LS

Table 12: Bearing bracket designation

Designation	Description
WS	Bearing bracket, standardised water pump
25	Size code23)
LS	Standard
LR	Reinforced
WA	Bearing bracket, water pump

Bearings used

Table 13: Standard bearings: grease-lubricated deep groove ball bearings

Bearing bracket	Pump end	Drive end
WS_25_LS	6305 2Z C3	6305 2Z C3
WS_35_LS	6307 2Z C3	6307 2Z C3
WS_55_LS	6311 2Z C3	6311 2Z C3
WA_65_LS	6313 2Z C3	6313 2Z C3
WA_85_LS	6317 2Z C3	6317 2Z C3

Table 14: Standard bearings: oil-lubricated deep groove ball bearings

Bearing bracket	Pump end	Drive end
WS_25_LS	6305 C3	6305 C3
WS_35_LS	6307 C3	6307 C3
WS_55_LS	6311 C3	6311 C3
WA_65_LS	6313 C3	6313 C3
WA_85_LS	6317 C3	6317 C3

Table 15: Reinforced bearings: grease-lubricated deep groove ball bearings

Bearing bracket	Pump end	Drive end
W_50_LR	6310 2Z C3	6310 2Z C3
W_60_LR	6312 2Z C3	6312 2Z C3

Table 16: Reinforced bearings: oil-lubricated deep groove ball bearings

Bearing bracket	Pump end	Drive end
WS_50_LR	6310 C3	6310 C3
WS_60_LR	6312 C3	6312 C3

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23 Referring to the dimensions of seal chamber and shaft end

Overview of functions for variable speed version

Table 17: Overview of functions

Functions / firmware	PumpDrive 2	PumpDrive 2 Eco
Protective functions		
Thermalmotor protection	✗	✗
Mains voltage monitoring	✗	✗
Phase failure, motor side	✗	✗
Short-circuit monitoring, motor side (phase to phase and phase to earth)	✗	✗
Dynamic overload protection by speed limitation (i2t control)	✗	✗
Resonant frequency suppression	✗	✗
Broken wire detection (live zero)	✗	✗
Protection against dry running and hydraulic blockage (sensorless due to learning function)	✗	✗
Dry running protection (external control signal)	✗	✗
Operating point estimation and characteristic curve control	✗	✗
Open-loop control		✗
Open-loop control mode	✗	✗
Closed-loop control		
Closed-loop control mode via integrated PID controller	✗	✗
Pressure control / differential pressure control (Δp const)	✗	✗
Pressure control / differential pressure control with dynamic pressure compensation (Δp var)	✗	✗
Flow rate control	✗	✗
Sensorless differential pressure control (Δp const) in a single-pump configuration	✗	✗
Sensorless differential pressure control with dynamic pressure compensation (Δp var) in a single-pump configuration	✗	✗
Sensorless flow rate control	✗	
Level control	✗	✗
Temperature control	✗	✗
Alternative setpoint	✗	✗
Operation and monitoring (display)	✗	-
Measured value display (pressure, head, speed, electric power, motor voltage, motor current, torque)	✗	✗
Fault history	✗	✗
Operating hours counter	✗	✗
Fault reporting via relay	✗	✗
Frequency inverter functions	✗	
Programmable start ramps and stop ramps	✗	✗
Field-oriented control (vector control), V/f control	✗	✗
Configurable motor control method (asynchronous motor, KSB SuPremE)	✗	✗
Automatic motor adaptation (AMA)	✗	✗
Motor standstill heater	✗	✗
Manual-0-automatic mode	✗	✗
External OFF	✗	✗
External minimum speed	✗	✗
Sleep mode (stand-by mode)	✗	✗
Energy savings meter	✗	-
Pump functions	✗	
Flow rate estimation	✗	✗
M12 module with PumpMeter bus connection	✗	✗
M12 module for dual-pump configuration	✗	✗
M12 module for multiple pump configuration with up to 6 pumps	✗	✗
Functional check run	✗	✗
Deragging	✗	✗
Integrated dual-pump configuration (1×100 % with redundant pump or 2×50 % without redundant pump)	✗	✗
Multiple pump configuration with up to 6 pumps	✗	✗
Waste water function: start-up at maximum speed	✗	-
Waste water function: rinsing function	✗	-
Operation		

Functions / firmware	PumpDrive 2	PumpDrive 2 Eco
Control panel	✗	✗ 24)
Commissioning wizard	✗	✗ 25)
Favourites list	✗	-
Service interface	✗	✗

Pressure limits and temperature limits

Test pressure limits and temperature limits

Table 18: Pressure limits and temperature limits as a function of material variant

Material variant	Fluid temperature [26)27)] [°C]	Discharge pressure p2 [bar]	Test pressure [28)] [bar]
GG, GB, GC	-30 to +140	16/10[29)]	21/15[29)]
SG, SB, SC	-30 to +140	1	2
BB	-30 to +140	6	5
CC	-30 to +140	1	1
		0	5
		1	2
		6	1

In-service pressure limits and temperature limits

With flange to EN 1092-1, 1092-2 and 1092-3

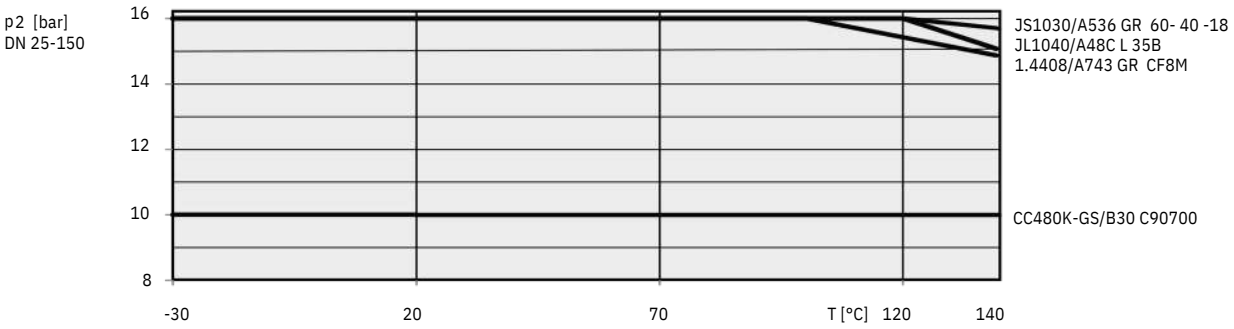

Fig. 1: Pump pressure limits and temperature limits DN 25 - DN 150 for ETN[30)]

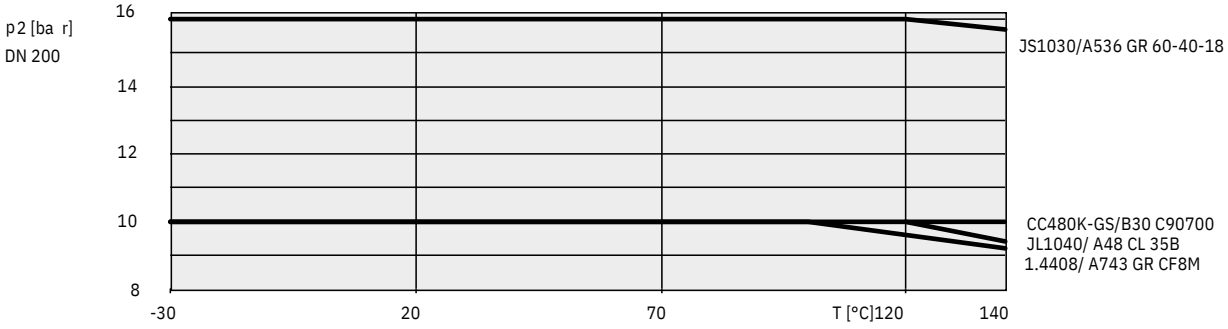

Fig. 2: Pump pressure limits and temperature limits DN 200 for ETN[30)]

24 Some functions can only be parameterised and/or displayed using the KSB ServiceTool (see operating manual).
25 Only available via KSB ServiceTool or app
26 For hot water heating systems to DIN 4752, Section 4.5, application limits must be observed.
27 For fluid temperatures >140 °C use Etanorm SYT.
28 The casing components have been checked for leakage by means of internal pressure tests to ZN 1650 with water.
29 For pump type ETNE (ð Page 22)
30 For pump type ETN (ð Page 22)

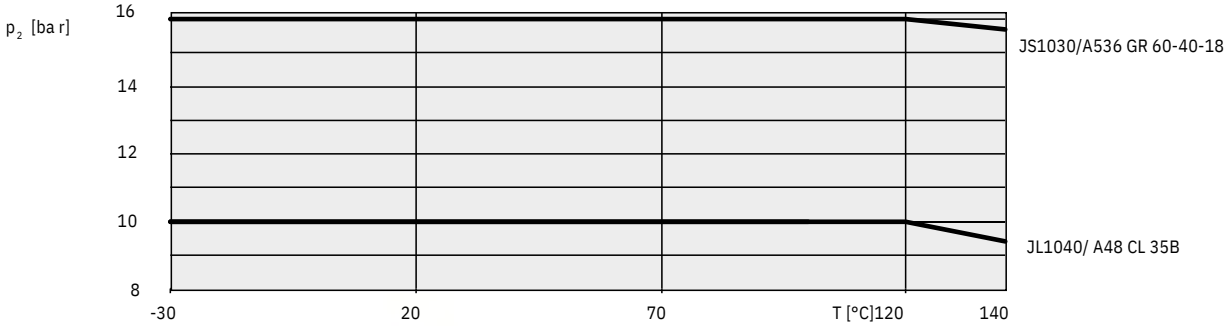

Fig. 3: Pump pressure limits and temperature limits[31)] ETNE[29)]

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31 The sum of inlet pressure and shut-off head must not exceed the values indicated in the diagram.

Technical data

Etanorm

Table 19: Technical data

Size	Pump type		Shaft unit		Impeller					Speed limit	
	ETN	ETNE	LS (standard) Bearing bracket	Bearing bracket LR (reinforced) width	Impeller outlet diameter	Free passage diameter	Impeller inlet diameter	Nominal impeller diameter Max-imum	Nominal impeller diameter Min-imum	Maximum	Minimum
					[mm]					[rpm]	
040-025-160	✗	-	WS_25_LS	- -	6,0	5,7	45,2	169	135	3600	500
040-025-200	✗	-	WS_25_LS	-	6,0	5,7	45,2	209	165	3600	500
050-032-125.1	✗	-	WS_25_LS	-	6,8	6,0	52,4	139	104	3600	500
050-032-160.1	✗	-	WS_25_LS	-	5,7	5,4	52,7	170	135	4400	500
050-032-200.1	✗	-	WS_25_LS	-	5,6	5,3	54,0	204	168	3800	500
050-032-250.1	✗	-	WS_25_LS	-	5,5	5,2	58,3	254	200	3600	500
050-032-125	✗	-	WS_25_LS	-	9,8	5,7	63,4	139	104	3600	500
050-032-160	✗	-	WS_25_LS	-	8,5	5,8	60,6	174	132	3600	500
050-032-200	✗	-	WS_25_LS	-	7,0	6,7	62,9	209	170	3700	500
050-032-250	✗	-	WS_25_LS	-	7,5	7,1	62,6	261	205	3600	500
065-040-125	✗	-	WS_25_LS	-	14,0	9,6	73,9	139	104	3600	500
065-040-160	✗	-	WS_25_LS	-	13,0	11,5	70,0	174	128	4400	500
065-040-200	✗	-	WS_25_LS	-	9,4	8,9	69,4	209	160	3700	500
065-040-250	✗	-	WS_25_LS	-	8,4	8,0	74,1	260	195	3600	500
065-040-315	✗	-	WS_35_LS	WS_50_LR	7,5	7,1	75,3	326	260	2300	500
065-040-315	✗	-	-	-	7,5	7,1	75,3	326	260	3000	500
065-050-125	✗	-	WS_25_LS	-	19,9	11,6	87,9	142	112	4500	500
065-050-160	✗	-	WS_25_LS	-	16,9	11,6	86,9	174	128	4400	500
065-050-200	✗	-	WS_25_LS	-	13,8	11,9	83,6	219	170	3600	500
065-050-250	✗	-	WS_25_LS	-	10,5	10,0	84,0	260	215	3600	500
065-050-315	✗	-	WS_35_LS	-	10,0	9,5	87,0	323	265	2400	500
065-050-315	✗	-	-	WS_50_LR	10,0	9,5	87,0	323	265	3000	500
080-065-125	✗	-	WS_25_LS	-	25,8	12,9	99,0	141	109	3900	500
080-065-160	✗	-	WS_25_LS	-	21,0	12,2	91,9	174	132	3900	500
080-065-200	✗	-	WS_25_LS	-	17,0	13,3	99,7	219	165	3600	500
080-065-250	✗	-	WS_35_LS	-	15,1	14,3	101,0	260	215	3600	500
080-065-315	✗	-	WS_35_LS	-	13,7	14,0	108,2	320	245	1900	500
080-065-315	✗	-	-	WS_60_LR	13,7	14,0	108,2	320	245	3000	500
100-080-160	✗	-	WS_25_LS	-	31,6	15,1	124,0	174	138	3600	500
100-080-200	✗	-	WS_35_LS	-	24,5	15,2	115,3	219	165	3600	500
100-080-250	✗	-	WS_35_LS	-	19,0	15,8	115,1	269	215	3600	500
100-080-315	✗	-	WS_35_LS	-	18,7	17,8	115,6	334	265	1900	500
100-080-315	✗	-	-	WS_60_LR	18,7	17,8	115,6	334	265	3000	500
100-080-400	✗	-	WS_55_LS	-	15,0	14,3	129,9	398	315	1900	500
125-100-160	✗	-	WS_35_LS	-	37,6	16,4	124,0	185	162	3600	500
125-100-200	✗	-	WS_35_LS	-	32,5	17,9	115,3	219	170	3600	500
125-100-250	✗	-	WS_35_LS	-	27,0	18,8	115,1	269	210	3600	500
125-100-315	✗	-	WS_35_LS	-	23,0	19,9	115,6	334	250	1900	500
125-100-315	✗	-	-	WS_60_LR	23,0	19,9	115,6	334	250	3000	500
125-100-400	✗	-	WS_55_LS	-	18,0	17,1	129,9	401	317	1900	500
150-125-200	✗	-	WS_35_LS	-	40,7	21,1	159,2	224	182	3600	500
150-125-250	✗	-	WS_35_LS	-	37,0	22,4	162,4	269	218	2000	500
150-125-315	✗	-	WS_55_LS	-	30,9	22,6	162,3	334	270	1900	500
150-125-400	✗	-	WS_55_LS	-	25,9	20,9	162,4	419	330	1800	500
150-125-510	-	✗	WA_65_LS	-	23,2	23	174,9	508	400	1800	500
200-150-200	✗	-	WA_35_LS	-	59,5	25,2	179,4	224	188	2100	500
200-150-250	✗	-	WA_35_LS	-	48,8	23,0	191,0	269	220	1800	500

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Size	Pump type		Shaft unit		Impeller					Speed limit	
	ETN	ETNE	LS (standard) Bearing bracket	Bearing bracket LR (reinforced) width	Impeller outlet diameter	Free passage diameter	Impeller inlet diameter	Nominal impeller diameter Max-imum	Nominal impeller diameter Min-imum	Maximum	Minimum
					[mm]					[rpm]	
200-150-315	✗	-	WA_55_LS	-	39,7	26,9	191,5	334	264	1800	500
200-150-400	✗	-	WA_55_LS	-	33,0	23,8	191,4	419	330	1800	500
200-150-510	-	✗	WA_65_LS	-	30,2	22	196	508	404	1800	500
200-200-250	-	✗	WA_65_LS	-	62	37	190,1	260	215	1800	500
250-200-275	-	✗	WA_65_LS	-	72	38	213,6	280	253	1800	500
250-200-320	-	✗	WA_65_LS	-	57,6	24	213,5	325	256	1800	500
250-200-375	-	✗	WA_65_LS	-	48	25	212,5	373	324	1800	500
250-200-435	-	✗	WA_65_LS	-	40,6	26	218,9	433	364	1800	500
250-200-510	-	✗	WA_65_LS	-	35	26	221,6	508	400	1800	500
300-250-295	-	✗	WA_65_LS	-	88,1	45	251,6	322	258	1800	500
300-250-295.1	-	✗	WA_65_LS	-	90,5	45	229,5	322	258	1800	500
300-250-320	-	✗	WA_65_LS	-	81	45	251	327	270	1800	500
300-250-375	-	✗	WA_65_LS	-	67,7	31	248,3	373	301	1800	500
300-250-435	-	✗	WA_85_LS	-	56,4	25	250,1	433	354	1800	500
300-250-510	-	✗	WA_85_LS	-	47	31	255	508	424	1800	500
350-300-350	-	✗	WA_85_LS	-	102,5	52	293,9	348	313	1800	500
350-300-350.1	-	✗	WA_85_LS	-	105,3	52	269,9	345	285	1800	500
350-300-375	-	✗	WA_85_LS	-	94	52	292,2	383	311	1800	500
350-300-435	-	✗	WA_85_LS	-	76,7	35	285	434	350	1800	500
350-300-510	-	✗	WA_85_LS	-	65	35	287	508	465	1800	500

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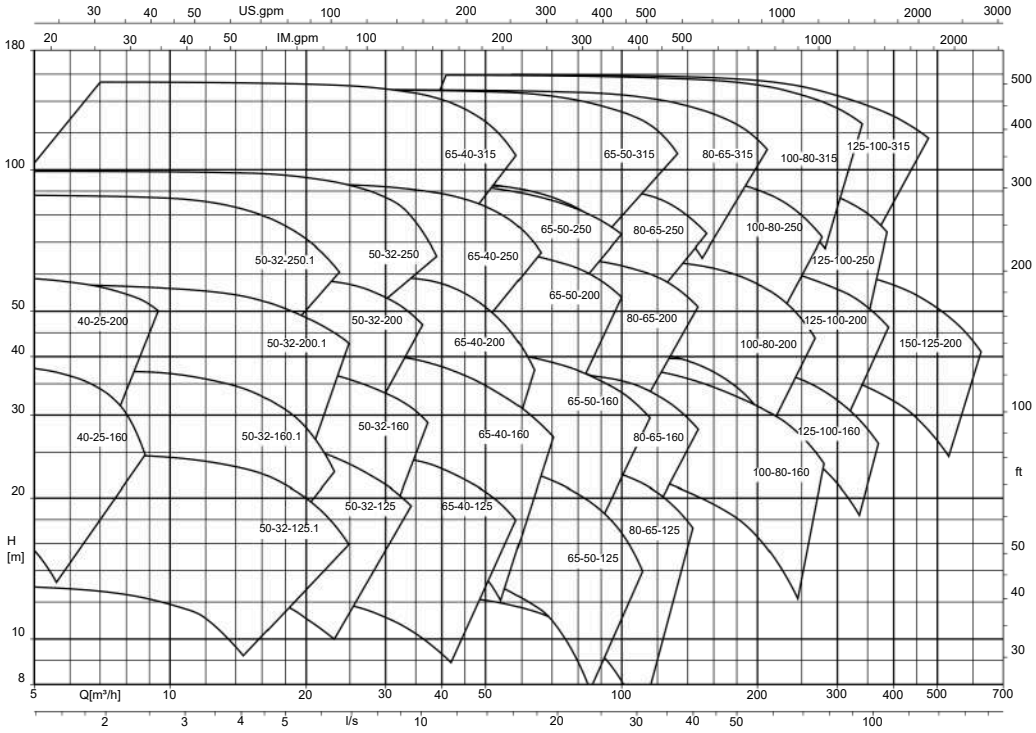
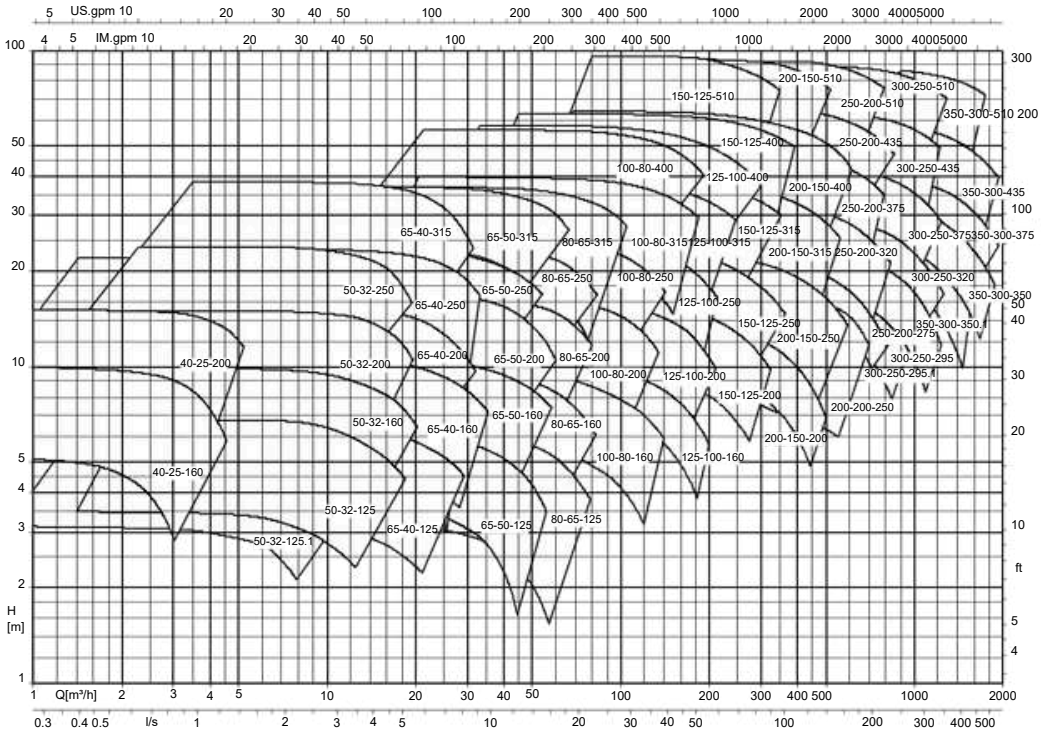
Selection charts

Etanorm (fixed speed version), n = 2900 rpm



Etanorm (fixed speed version), n = 1450 rpm



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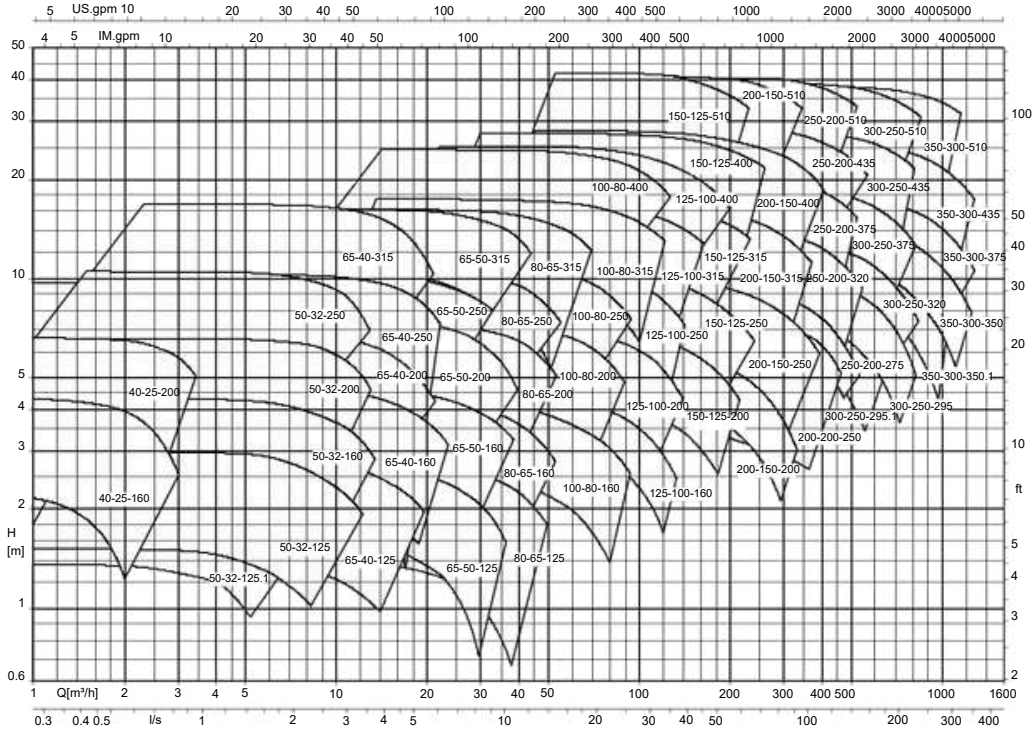
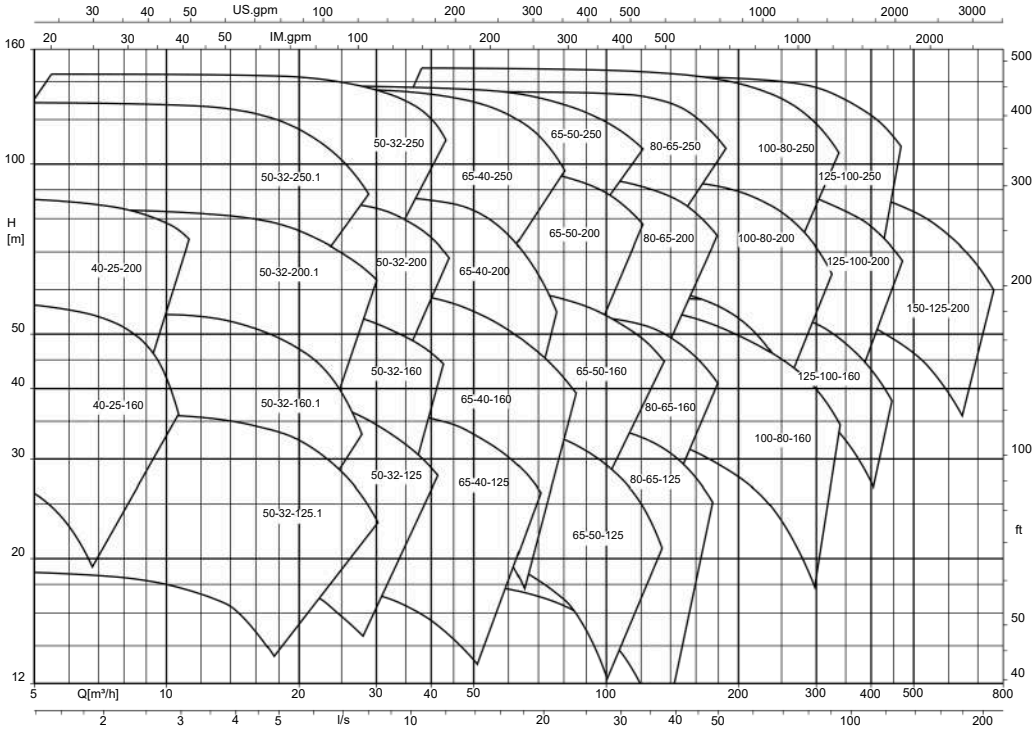
Etanorm (fixed speed version), n = 960 rpm



Etanorm (fixed speed version), n = 3500 rpm



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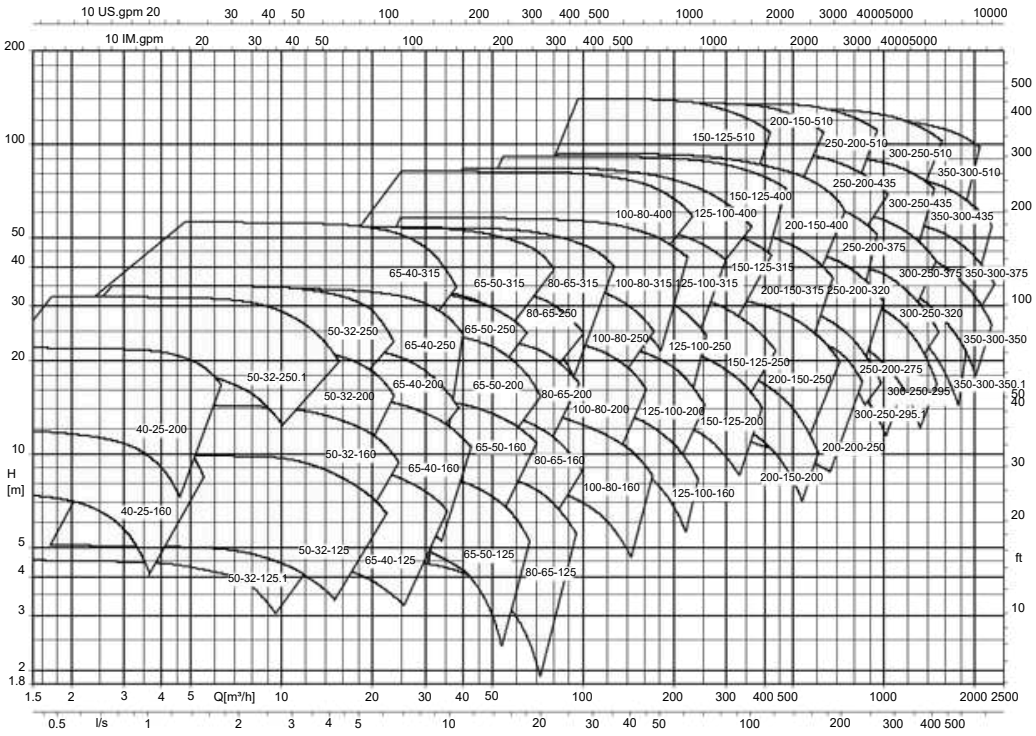
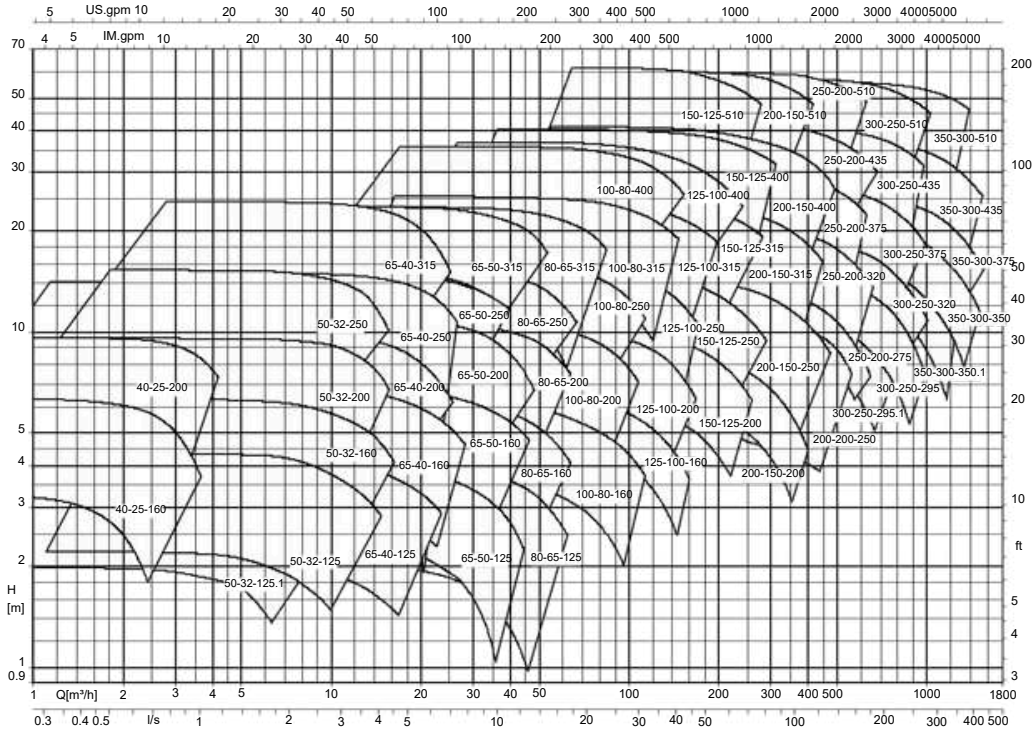
Etanorm (fixed speed version), n = 1750 rpm



Etanorm (fixed speed version), n = 1160 rpm



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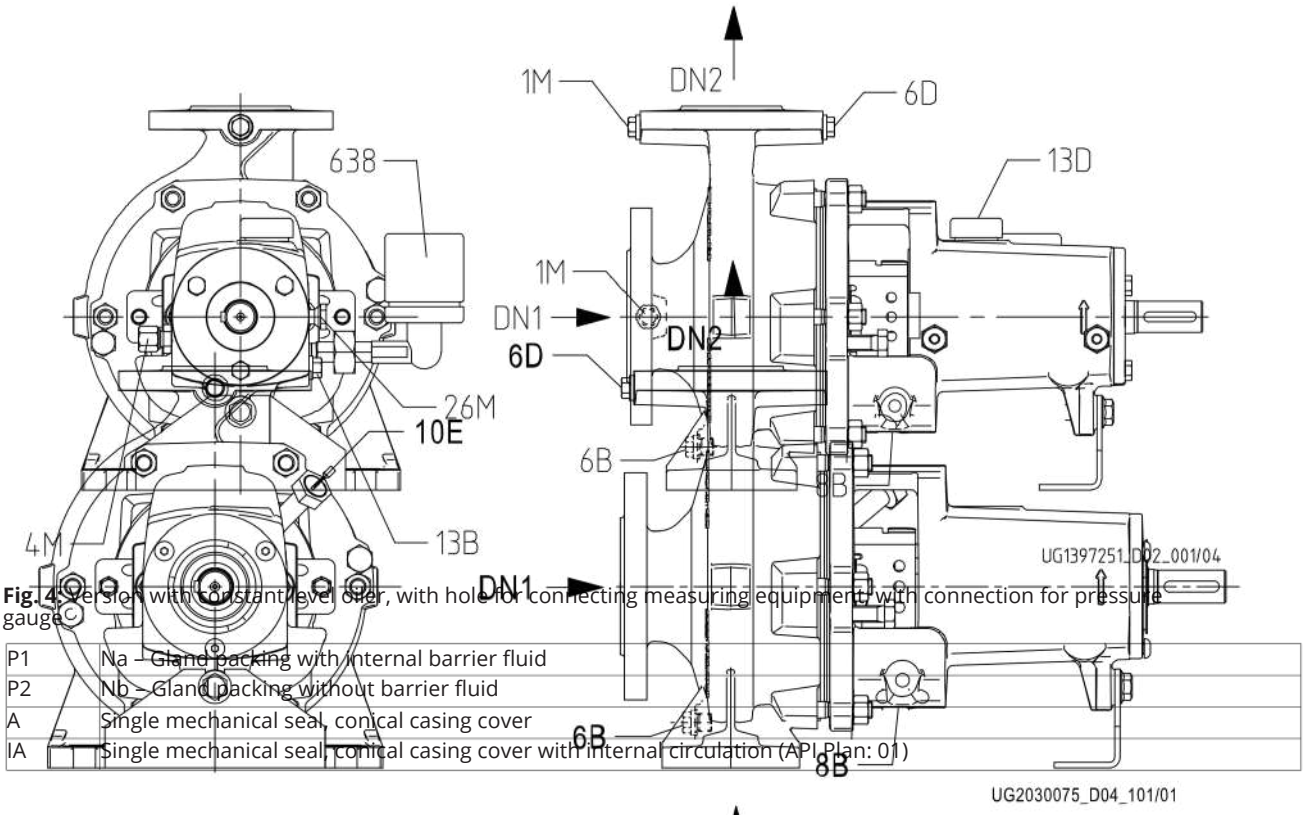

Fig. 4: Version with constant level oiler, with hole for connecting measuring equipment, with connection for pressure gauge

P1	Na – Gland packing with internal barrier fluid
P2	Nb – Gland packing without barrier fluid
A	Single mechanical seal, conical casing cover
IA	Single mechanical seal, conical casing cover with internal circulation (API Plan: 01)

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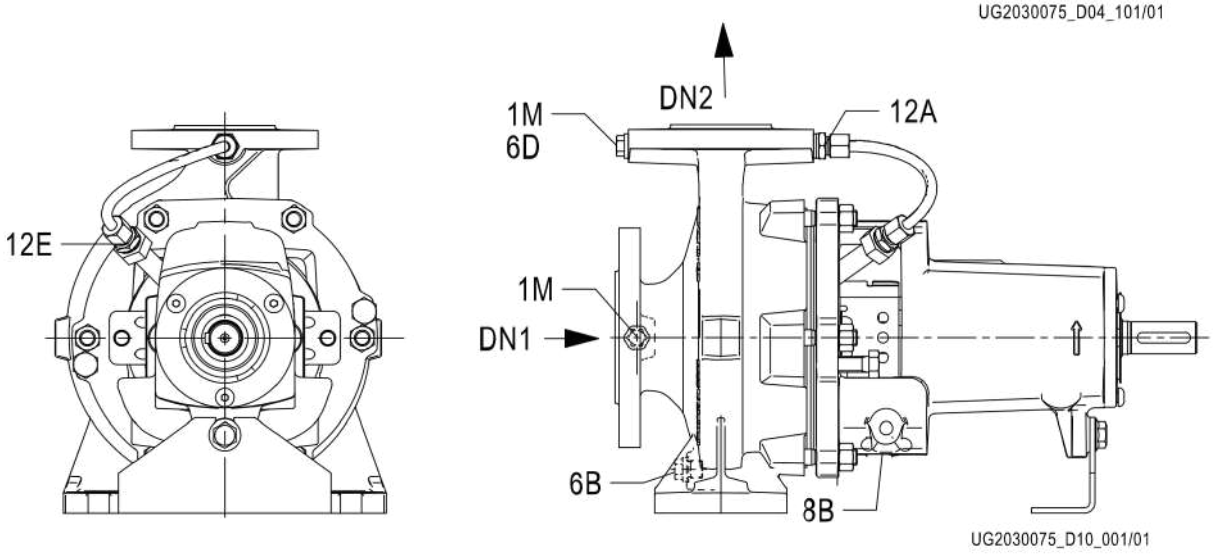

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Fig. 5: Version with grease lubrication, no hole for connecting measuring equipment, with connection for pressure gauge

EA	External circulation, conical casing cover (API Plan: 11)
E	External circulation, cylindrical casing cover (API Plan: 11)

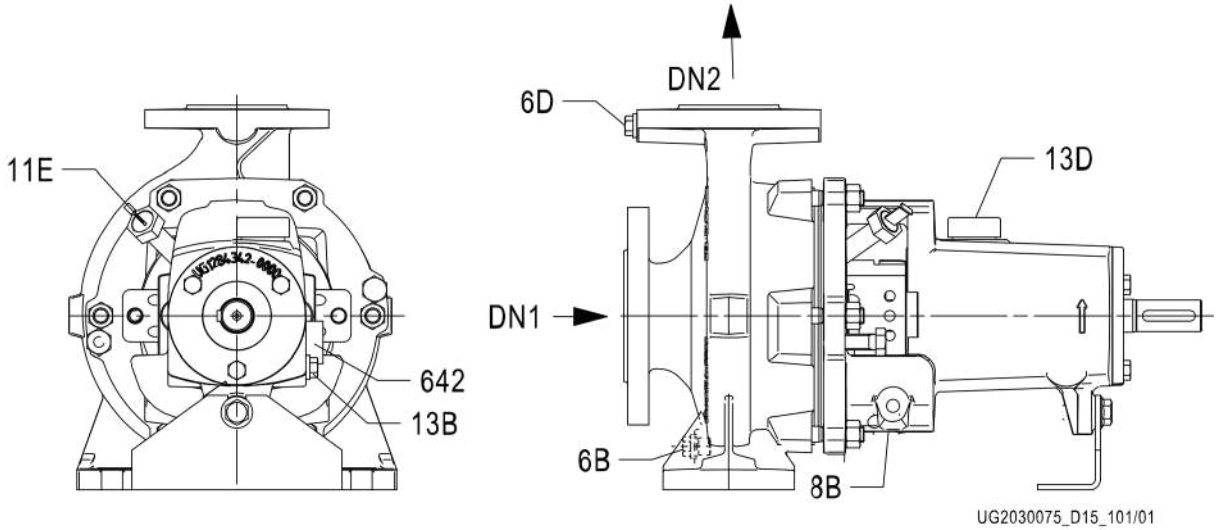

Fig. 6: Version with oil level sight glass, no hole for connecting measuring equipment, no connection for pressure gauge

FA	External flushing, conical casing cover (API Plan: 32)

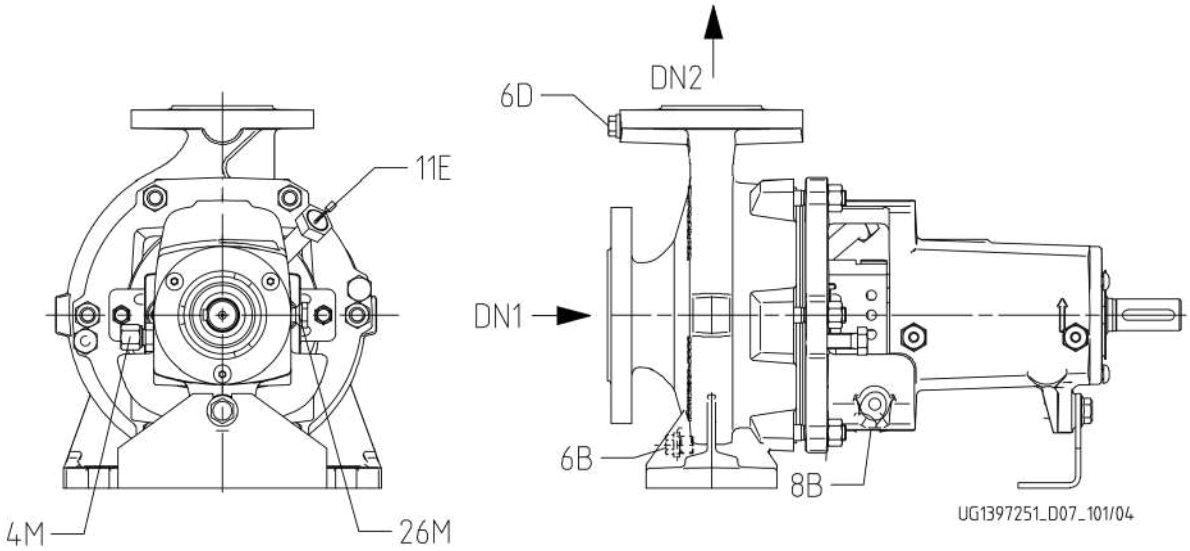

Fig. 7: Version with grease lubrication, with hole for connecting measuring equipment, no connection for pressure gauge

P4	VSH – Gland packing, external flushing liquid

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Fig. 8: Version with grease lubrication, no hole for connecting measuring equipment, no connection for pressure gauge

P3	Nc – Gland packing, external barrier fluid

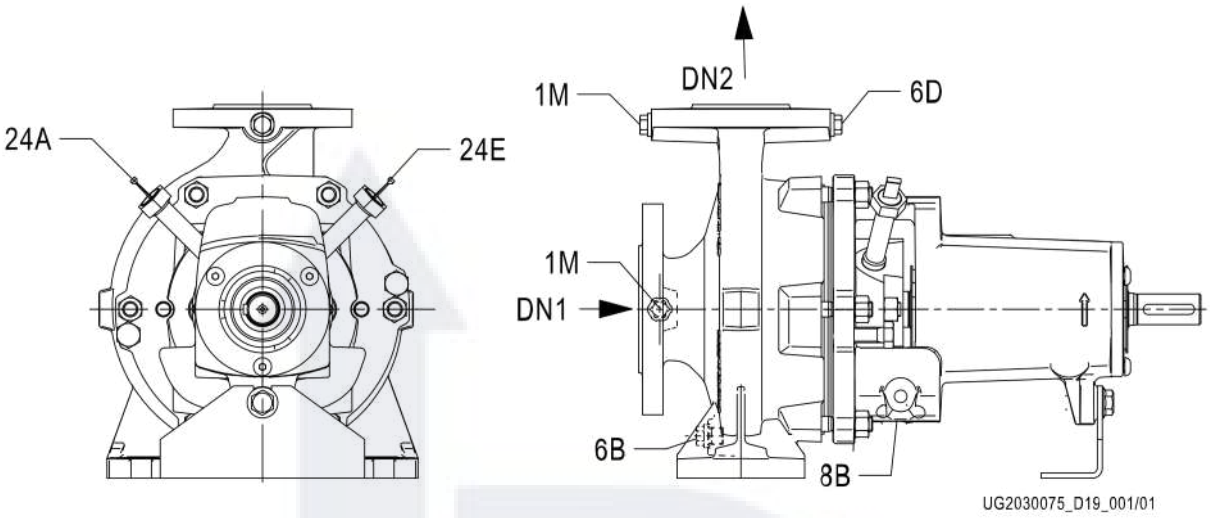

Fig. 9: Version with grease lubrication, no hole for connecting measuring equipment, with connection for pressure gauge

TI	Double mechanical seal in tandem arrangement with internal circulation (API Plan: 52 / 55)

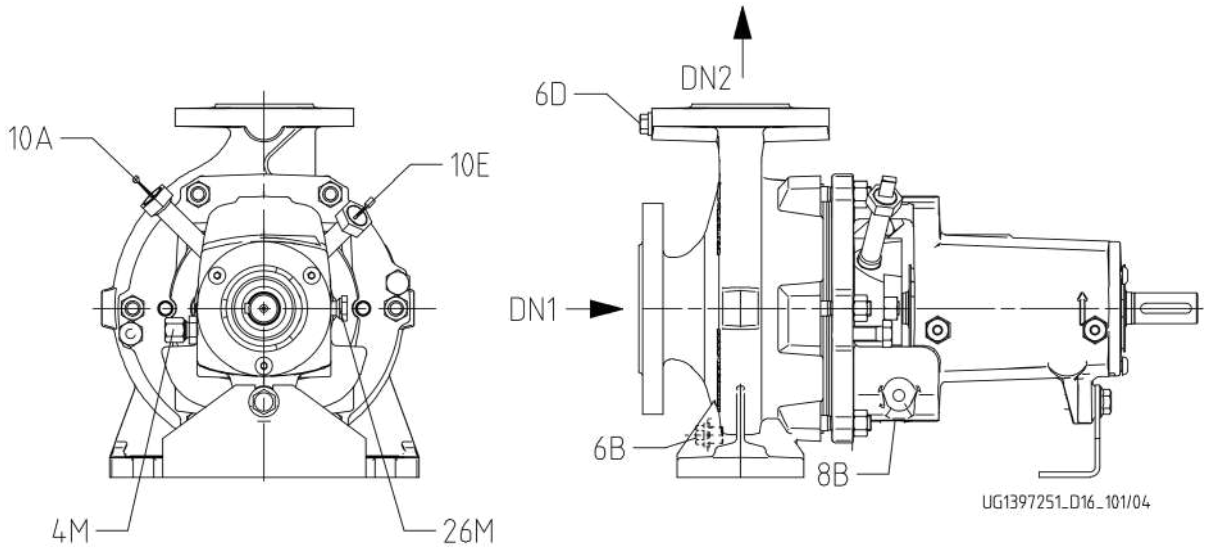

Fig. 10: Version with grease lubrication, with hole for connecting measuring equipment, no connection for pressure gauge

DB	Double mechanical seal in back-to-back arrangement (API Plan: 53A)

Table 20: Connections

Connection * = optional	Description	Configuration	Position
1M*	Pressure gauge	On pump set with pressure sensor	DN2 DN1
1M*	Pressure gauge	Drilled and closed or with pressure sensor	-
4M*	Temperature measurement	Drilled and closed	-
6B	Fluid drain	Drilled and closed	DN2, suction side
6D	Fluid priming and venting	Drilled and closed	DN2, drive end
6D*	Fluid priming and venting	Drilled and closed	-
8B	Leakage drain	Drilled and closed32)	-
10A*	Barrier fluid outlet (external)	Connection G 1/4 fitting, closed	-
10E*	Barrier fluid inlet (external)	Connection G 1/4 fitting, closed	-
11E*	Flushing liquid inlet	Connection G 1/4 fitting, closed	-
12A*	Circulation liquid outlet	Drilled and connected	-
12E*	Circulation liquid inlet	Drilled and connected	-
13B*	Oil drain	Drilled and closed	-
13D*	Oil filling and venting	Drilled and closed	-
24A*	Quench liquid outlet	Connection G 1/4 fitting, closed	-
24E*	Quench liquid inlet	Connection G 1/4 fitting, closed	-
26M*	Shock pulse measurement	Drilled and closed	-

Table 21: Connections

Size	Bearing bracket	Connection								
		1M.1/6D/ 1M.2/6B/6D	8B	10A/ 10E	11E	12A	12E	13B	13D	24A/ 24E
040-025-160	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
040-025-200	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-125.1	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-160.1	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-200.1	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-250.1	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-125	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-160	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4

32 For bearing bracket LS only

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Size	Bearing bracket	Connection								
		1M.1/6D/ 1M.2/6B/6D	8B	10A/ 10E	11E	12A	12E	13B	13D	24A/ 24E
050-032-200	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
050-032-250	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-040-125	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-040-160	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-040-200	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-040-250	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-040-315	35	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-040-315	50	G 1/4	-	G 1/4	G 1/4	G 1/4	G 1/4	G 3/8	DN 20	G 1/4
065-050-125	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-050-160	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-050-200	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-050-250	25	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-050-315	35	G 1/4	G 1/2	G 1/4	G 1/4	G 1/4	G 1/4	G 1/4	DN 20	G 1/4
065-050-315	50	G 1/4	-	G 1/4	G 1/4	G 1/4	G 1/4	G 3/8	DN 20	G 1/4
080-065-125	25	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
080-065-160	25	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
080-065-200	25	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
080-065-250	35	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
080-065-315	35	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
080-065-315	60	G 3/8	-	G 1/4	G 1/4	G 3/8	G 1/4	G 3/8	DN 20	G 1/4
100-080-160	25	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
100-080-200	35	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
100-080-250	35	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
100-080-315	35	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
100-080-315	60	G 3/8	-	G 1/4	G 1/4	G 3/8	G 1/4	G 3/8	DN 20	G 1/4
100-080-400	55	G 3/8	G 1/2	G 1/4	G 1/4	G 3/8	G 1/4	G 1/4	DN 20	G 1/4
125-100-160	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
125-100-200	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
125-100-250	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
125-100-315	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
125-100-315	60	G 1/2	-	G 1/4	G 1/4	G 1/2	G 1/4	G 3/8	DN 20	G 1/4
125-100-400	55	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
150-125-200	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
150-125-250	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
150-125-315	55	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
150-125-400	55	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
150-125-510	65	G 1/2	G 1/2	G 1/4	-	G 1/2	-	G 3/8	DN 20	G 1/4
200-150-200	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
200-150-250	35	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
200-150-315	55	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
200-150-400	55	G 1/2	G 1/2	G 1/4	G 1/4	G 1/2	G 1/4	G 1/4	DN 20	G 1/4
200-150-510	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
200-200-250	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
250-200-275	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
250-200-320	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
250-200-375	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
250-200-435	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
250-200-510	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
300-250-295	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
300-250-295.1	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
300-250-320	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
300-250-375	65	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
300-250-435	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
300-250-510	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-

Size	Bearing bracket	Connection								
		1M.1/6D/ 1M.2/6B/6D	8B	10A/ 10E	11E	12A	12E	13B	13D	24A/ 24E
350-300-350	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
350-300-350.1	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
350-300-375	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
350-300-435	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-
350-300-510	85	G 1/2	G 1/2	G 1/4	-	G 1/2	G 1/4	G 3/8	DN 20	-

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Flange design

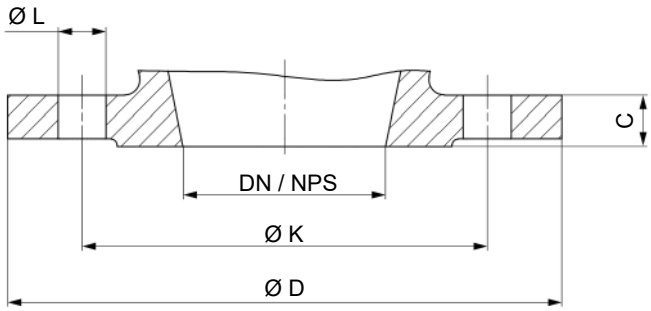

Fig. 11: Flange dimensions

Flange dimensions to EN 1092-1, EN 1092-3

Table 22: Flange dimensions [mm]

Nominal size	Standard											
	EN 1092-3				EN 1092-1							
	Material variant of volute casing											
	B				C							
	PN 10				PN 10				PN 16			
	C	∅ D	∅ K	Number x ∅ L	C	∅ D	∅ K	Number x ∅ L	C	∅ D	∅ K	Number x ∅ L
25 32	1	115	85	4 × ∅ 14	1	-	-	-	19	115	85	4 ×∅ 14
40 50	5	140	100	4 × ∅ 18	9	-	-	-	19	140	100	4 ×∅ 18
65 80	1	150	110	4 × ∅ 18	1	-	-	-	19	150	110	4 ×∅ 18
(DN1	7	165	125	4 × ∅ 18	9	-	-	-	19	165	125	4 ×∅ 18
80	1	185	145	4 × ∅ 18	1	-	-	-	19	185	145	4 ×∅ 18
(DN2 100 [33])	7 1	229	160	8 × ∅ 18	9 1	-	-	-	21	230	160	8 × ∅ 18
125 150 [34])	9 25 1	200	160	8 × ∅ 18	9 21 1	-	-	-	21	200	160	8 × ∅ 18
2003	25	229	180	8 × ∅ 18	21	-	-	-	21	230	180	8 × ∅ 18
5)	26	254	210	8 × ∅ 18	23	-	-	-	23	255	210	8 × ∅ 18
2003	27	285	240	8 × ∅ 22	23	-	-	-	23	285	240	8 × ∅ 22
6)	30	343	295	8 × ∅ 22	25	345	295	8 × ∅ 22	25	-	-	-
250	-	-	-	-	-	-	-	-	-	-	-	-
300	-	-	-	-	-	-	-	-	-	-	-	-
350	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-

Flange dimensions to EN 1092-2

Table 23: Flange dimensions [mm]

Nominal size	Standard											
	EN 1092-2											
	Material variant of volute casing											
	G								S			
	PN 10				PN 16				PN 16			
	C	∅ D	∅ K	Number x ∅ L	C	∅ D	∅ K	Number x ∅ L	C	∅ D	∅ K	Number x ∅ L
25	15	-	-	-	15	115	85	4 × ∅ 14	15	115	85	4 ×∅ 14
32	17	-	-	-	17	140	100	4 × ∅ 19	17	140	100	4 ×∅ 19
40	17	-	-	-	17	150	110	4 × ∅ 19	17	150	110	4 ×∅ 19
50	19	-	-	-	19	165	125	4 × ∅ 19	19	165	125	4 × ∅ 19

33 Suction flange; suction line NPS 4 must be used.
34 Discharge flange
35 For pump type ETN (ð Page 22)
36 For pump type ETNE (ð Page 22)

Nominal size	Standard											
	EN 1092-2											
	Material variant of volute casing											
	G								S			
	PN 10				PN 16				PN 16			
	C	∅ D	∅ K	Number x ∅ L	C	∅ D	∅ K	Number x ∅ L	C	∅ D	∅ K	Number x∅ L
65	1	-	-	-	19	185	145	4× ∅ 19	1	185	145	4 ×∅ 19
80 (DN1[33])	9 2	-	-	-	21	229	160	8× ∅ 19	9 2	229	160	8 × ∅ 19
80 (DN2[34])	25	-	-	-	25	200	160	8× ∅ 19	25	200	160	8 × ∅ 19
100	25	-	-	-	25	229	180	8× ∅ 19	25	229	180	8 × ∅ 19
125	26	-	-	-	26	254	210	8× ∅ 19	26	254	210	8 × ∅ 19
150	27	-	-	-	27	285	240	8× ∅ 23	27	285	240	8 × ∅ 23
20035)	30	343	295	8 × ∅ 23	30	-	-	-	30	343	295	12 × ∅ 23
20036)	-	345	295	8 × ∅ 23	-	-	-	-	-	345	295	12 × ∅ 23
250	-	405	350	12 × ∅ 23	-	-	-	-	-	405	355	12 × ∅ 28
300	-	485	400	12 × ∅ 23	-	-	-	-	-	485	410	12 × ∅ 28
350	-	535	460	16 × ∅ 23	-	-	-	-	-	535	470	16 × ∅ 28

Flange drilled to: ASME B 16.1, Class 125, ASME B 16.5, Class 150

Table 24: Flange dimensions [mm]

Nominal size	Standard					
	ASME B 16.1, Class 125, ASME B 16.5, Class 150					
	Material variant of volute casing					
	B, G, S			C		
	∅ D	∅ K	Number x L∅	∅ D	∅ K	Number x ∅ L
25/ NPS 1	115	79	4 × ∅ 15,7	115	79,2	4 × ∅15,9
32/ NPS 1 1/4	140	89	4 × ∅ 15,7	140	88,9	4 × ∅15,9
40/ NPS 1 1/2	150	98	4 × ∅ 15,7	150	98,6	4 × ∅15,9
50/ NPS 2	165	121	4 × ∅ 19,1	165	120,7	4 × ∅19,1
65/ NPS 2 1/2	185	140	4 × ∅ 19,1	185	139,7	4 × ∅19,1
80/ NPS 3 (DN1[33])	229	191	8 × ∅ 19,1	230	190,5	8 × ∅19,1
80/ NPS 3 (DN2[34])	200	152	4 × ∅ 19,1	200	152,4	4 × ∅19,1
100/ NPS 4	229	191	8 × ∅ 19,1	230	190,5	8 × ∅19,1
125/ NPS 5	254	216	8 × ∅ 22,4	255	215,9	8 × ∅22,2
150/ NPS 6	285	241	8 × ∅ 22,4	285	241,3	8 × ∅22,2
200/ NPS 8	345	299	8 × ∅ 22,4	345	298,5	8 × ∅22,2
250/ NPS 10	405	362	12 × ∅ 25,4	-	-	-
300/ NPS 12	485	432	12 × ∅ 25,4	-	-	-
350/ NPS 14	535	476	12 × ∅ 28,6	-	-	-

Table 25: Flangedesign by materials

Material variant	Standard	Nominal size	Pressure class
GG, GB, GC GG,	EN 1092-2	DN 25 - DN 150	PN 16
GB, GC GG, GB,	EN 1092-2	DN 200 - DN 350	PN 10
GC	Drilled to ASME B16.1[37)]	DN 25 - DN 350	Class 125[38)]
SG, SB, SC	EN 1092-2	DN 25 - DN 350	PN 16
SG, SB, SC	Drilled to ASME B16.1[37)]	DN 25 - DN 200	Class 125[38)]
SG, SB, SC39)	Drilled to ASME B16.5	DN125 - DN350	Class 150
BB	EN 1092-3	DN 25 - DN 200	PN 10
BB	Drilled to ASME B16.1[37)]	DN 25 - DN 200	Class 125[40)]

37 Suction-side DN 80 machined like DN 100
38 Nozzle drilled to Class 125 with pressure class PN 16.
39 For pump type ETNE (ð Page 22)
40 Nozzle drilled to Class 125 with pressure class PN 10.

Material variant	Standard	Nominal size	Pressure class
CC	EN 1092-1 EN 1092-1	DN 25 - DN 150	PN 16
CC	Drilled to ASME B16.5	DN 200 DN 25 -	PN 10
CC	[37]	DN 200	Class 150

Scope of supply

Depending onthemodel, the following items are included in the scope of supply:

- Pump
- Baseplate
- Coupling
- Coupling guard
- Drive
- Supply system for double mechanical seal

Recommended spare parts stock

Table 26: Quantity of spare parts for recommended spare parts stock for commissioning

Part No.	Description	Number of pumps									
		1	2	3	4	5	6	7	8	9	10 and more
433	Mechanical seal	1	1	1	2	2	2	2	3	3	25 %
433.01/.0 [41]	Mechanical seal[42]	1	1	1	2	2	2	2	3	3	25 %
2 400.10	Gasket	2	4	6	8	8	9	9	12	12	150 %
400.75	Gasket	2	4	6	8	8	9	9	12	12	150 %
400.1541)	Gasket42)	2	4	6	8	8	9	9	12	12	150 %
411.1043)	Gasket	2	4	6	8	8	9	9	12	12	150 %
411.1541)	Joint ring42)	2	4	6	8	8	9	9	12	12	150 %
412.1541)	O-ring42)	2	4	6	8	8	9	9	12	12	150 %

Table 27: Quantity of spare parts for recommended spare parts stock for 2 years' operation to DIN 24296

Part No.	Description	Number of pumps									
		1	2	3	4	5	6	7	8	9	10 and more
210	Shaft	1	1	1	1	2	2	2	2	2	20 %
230	Impeller	1	1	1	1	2	2	2	2	2	20 %
321.01/.0	Rolling element bearing (set)	1	1	1	2	2	2	2	3	3	25 %
2 433	Mechanical seal	1	1	1	2	2	2	2	3	3	25 %
433.01/.02[41]	Mechanical seal42)	1	1	1	2	2	2	2	3	3	25 %
502.01/.02	Casing wear ring44) (set)	1	2	2	2	3	3	3	4	4	50 %
523	Shaft sleeve	1	2	2	2	3	3	3	4	4	50 %
524	Shaft protecting sleeve	1	2	2	2	3	3	3	4	4	50 %
461	Gland packing (set)	2	4	4	6	6	6	6	8	8	100 %
458	Lantern ring44)	2	4	4	6	6	6	8	8	8	100 %
400.10	Gasket	2	4	6	8	8	9	9	12	12	150 %
400.1541)	Gasket42)	2	4	6	8	8	9	9	12	12	150 %
400.75	Gasket	2	4	6	8	8	9	9	12	12	150 %
411.1043)	Gasket	2	4	6	8	8	9	9	12	12	150 %
411.1541)	Joint ring42)	2	4	6	8	8	9	9	12	12	150 %
412.1541)	O-ring42)	2	4	6	8	8	9	9	12	12	150 %

41 For pump type ETN (ə Page 22)
42 For double mechanical seal
43 For pump type ETNE (ə Page 22)
44 If any

General assembly drawings

Version with standardised mechanical seal and bolted casing cover

Table 28: This illustration applies to the following pump sizes:

040-025-200	050-032-200.1	050-032-200	065-040-200	065-050-200	080-065-200	100-80-250	125-100-250	150-125-250	200-150-250
	050-032-250.1	050-032-250	065-040-250	065-050-250	080-065-250	100-80-315	125-100-315	150-125-315	200-150-315
[Supplied in packaging units only			065-040-315	065-050-315	080-065-315	100-80-400	125-100-400	150-125-400	200-150-400

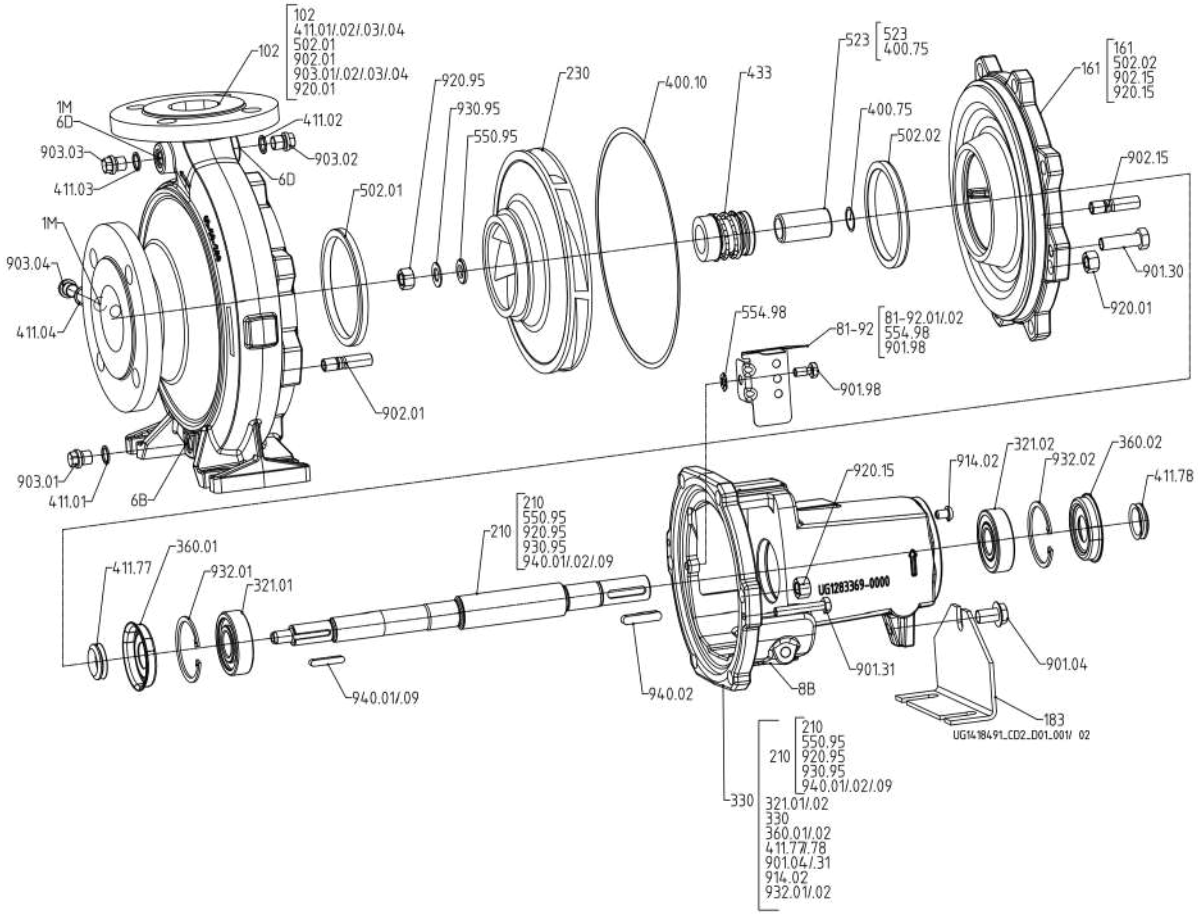

Fig. 12: Version with standardised mechanical seal and bolted casing cover

Table 29: List of components

Part No.	Description	Part No.	Description
102	Volute casing Casing	523	Shaft sleeve Disc
161	cover	550.9545)	Lock washer
183	Support foot	554.98	Cover plate
210	Shaft	81-92.01/.02	Hexagon head bolt
230	Impeller	901.04/.30/.31/.98	Stud
321.01/.02	Deep groove ball bearing	902.01/.15	Screw plug
330	Bearing bracket	903.01/.02/.03/.04	Round-head screw
360.01./02	Bearing cover	914.02	Hexagon nut
400.10/.75	Gasket	920.01/.15/.95	Spring washer
411.01/.02/.03/.04	Joint ring	930.95	

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45 For shaft unit 25 only

Part No.	Description	Part No.	Description
411.77/.78	Axial seal ring	932.01/.0	Circlip
433	Mechanical seal	940.01/.02/.09[46]	Key
502.01/.02	Casing wear ring[47]		

Table 30: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

46 For shaft units 55, 60 and 60.1 only
47 Optional for casing material C

Version with standardised mechanical seal and bolted casing cover

This illustration applies to the following pump sizes:

150-125-510	200-150-510	250-200-375 250-200-435 250-200-510	300-250-375 300-250-435 300-250-510	350-300-350 350-300-350.1 350-300-375 350-300-435 350-300-510

[Supplied in packaging units only

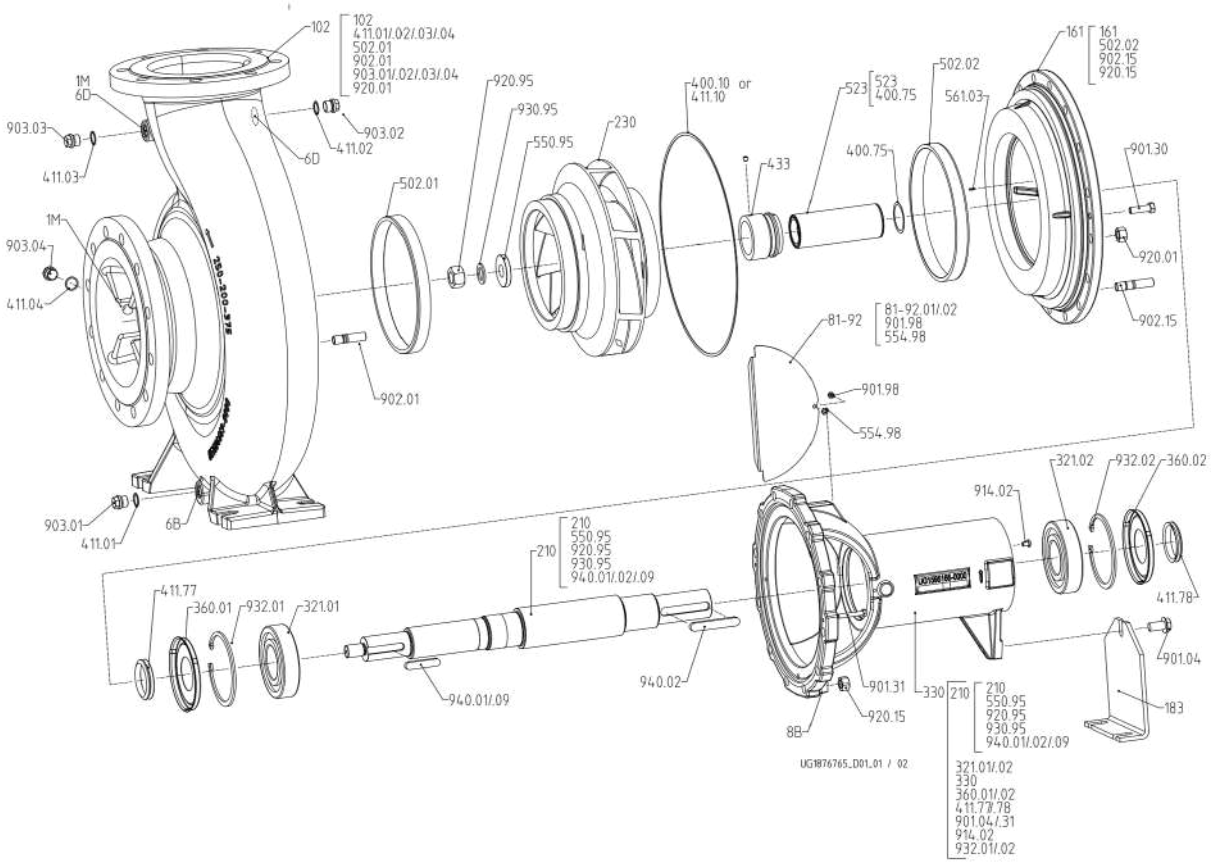

Fig. 13: Version with standardised mechanical seal and bolted casing cover

Table 31: List of components

Part No.	Description	Part No.	Description
102	Volute casing	523	Shaft sleeve
161	Casing cover	550.95	Disc
183	Support foot	554.98	Lock washer
210	Shaft	561.03	Grooved pin
230	Impeller	81-92.01/.02	Cover plate
321.01/.02	Deep groove ball bearing	901.04/.30/.31/.98	Hexagon head bolt
330	Bearing bracket	902.01/.15	Stud
360.01./02	Bearing cover	903.01/.02/.03/.04	Screw plug
400.10/.75	Gasket	914.02	Round-head screw
411.01/.02/.03/.04/.10	Joint ring	920.01/.15/.95	Hexagon nut
411.77/.78	Axial seal ring	930.95	pring washer
433	Mechanical seal	932.01/.02	Circlip
502.01/.02	Casing wear ring	940.01/.02/.09	Key

Table 32: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

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Version with standardised mechanical seal and clamped casing cover

Table 33: This illustration applies to the following pump sizes:

040-025-160	050-032-125.1	050-032-125	065-040-125	065-050-125	080-065-125	100-80-160	125-100-160	150-125-200	200-150-200
	050-032-160.1	050-032-160	065-040-160	065-050-160	080-065-160	100-80-200	125-100-200		

[Supplied in packaging units only

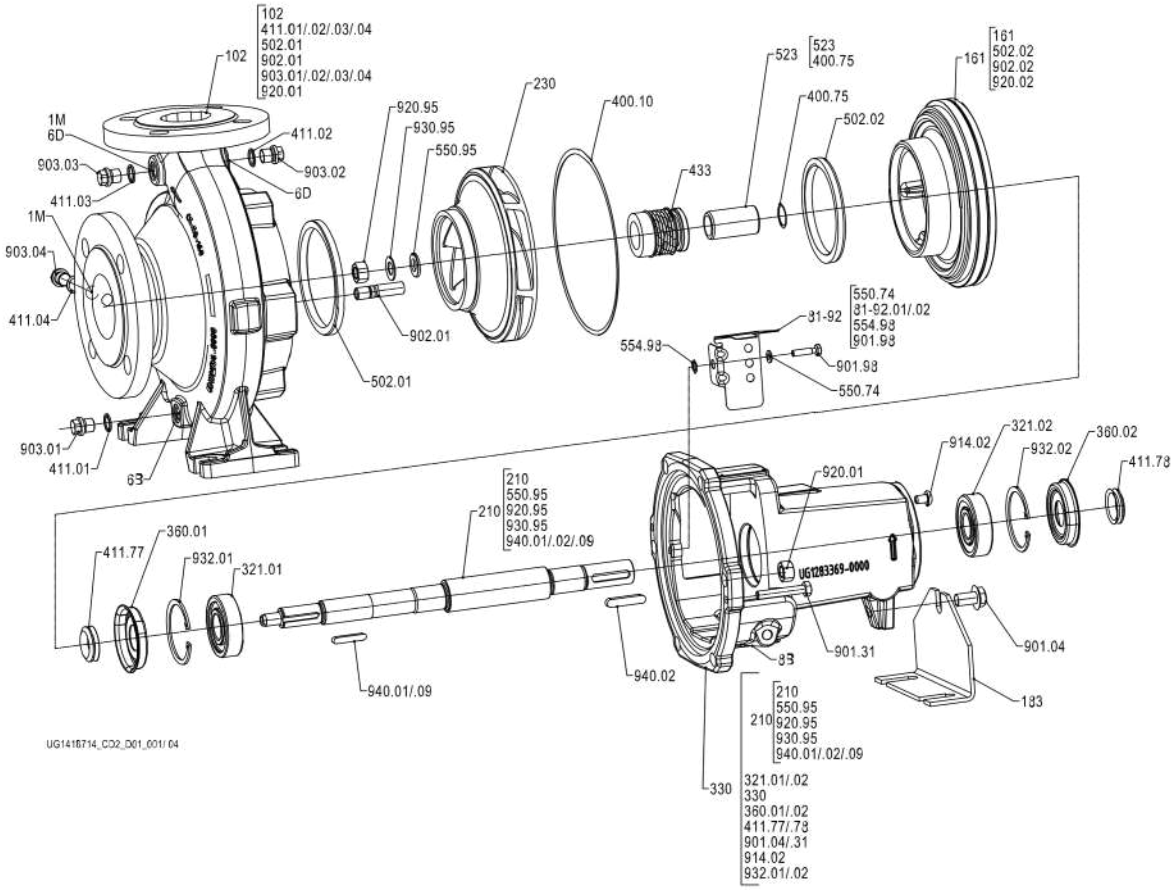

Fig. 14: Version with standardised mechanical seal and clamped casing cover

Table 34: List of components

Part No.	Description	Part No.	Description
102	Volute casing Casing	523	Shaft sleeve Disc
161	cover	550.74/.9548)	Lock washer
183	Support foot	554.98 81-	Cover plate
210	Shaft	92.01/.02	Hexagon head bolt
230	Impeller	901.04/.31/.98	Stud
321.01/.02	Deep groove ball bearing	902.01	Screw plug
330	Bearing bracket	903.01/.02/.03/.0	Round-head screw
360.01./02	Bearing cover	4 914.02	Hexagon nut
400.10/.75	Gasket	920.01/.95	Spring washer
411.01/.02/.03/.04	Joint ring	930.95	Circlip
411.77/.78	Axial seal ring	932.01/.02	Key
433	Mechanical seal	940.01/.02/.0949)	
502.01/.0250)	Casing wear ring51)		

48 For shaft unit 25 only
49 For shaft units 55, 60 and 60.1 only
50 Not on sizes 040-025-160, 050-032-125.1, 050-032-160.1, 050-032-125, 065-040-125
51 Optional for casing material C

Table 35: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

Version with standardised mechanical seal and clamped casing cover

Table 36: This illustration applies to the following pump sizes:

200-200-250	250-200-275	300-250-295
	250-200-320	300-250-295. 1
		300-250-320

[Supplied in packaging units only

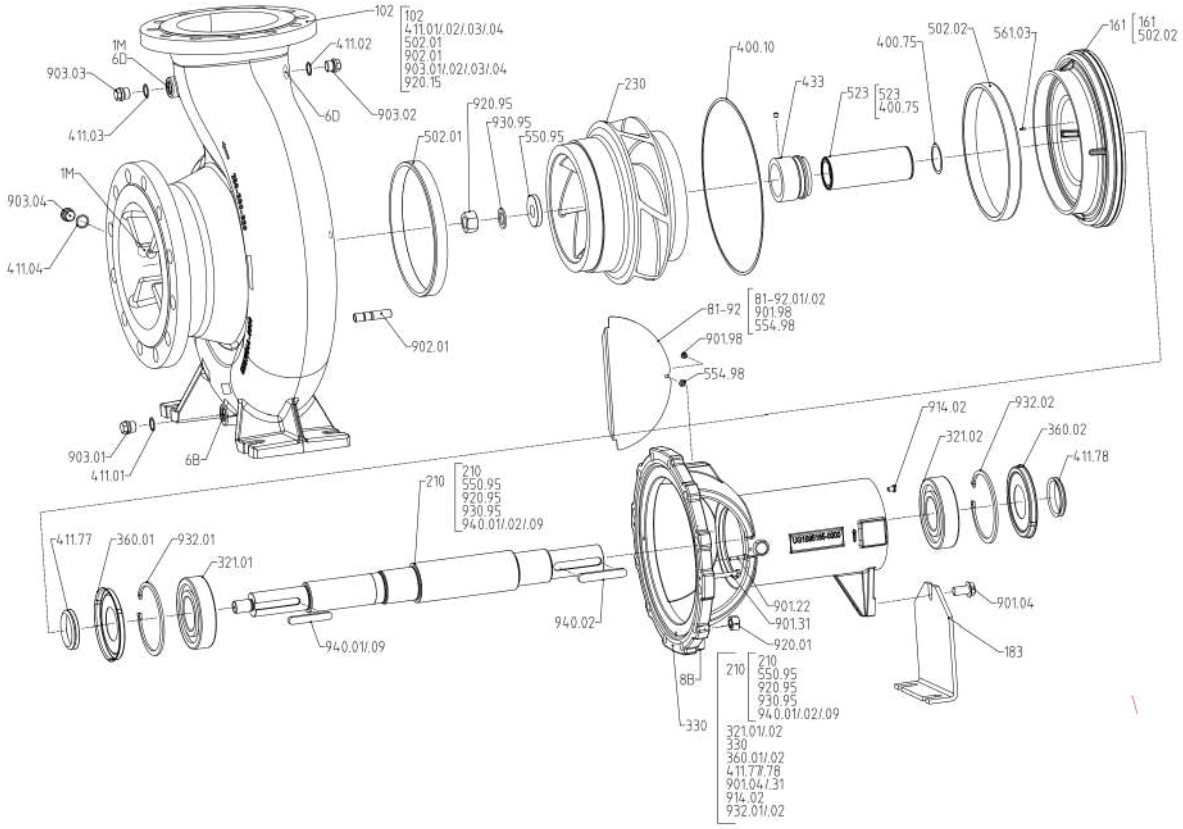

Fig. 15: Version with standardised mechanical seal and clamped casing cover

Table 37: List of components

Part No.	Description	Part No.	Description
102	Volute casing	523	Shaft sleeve
161	Casing cover	550.95	Disc
183	Support foot	554.98	Lock washer
210	Shaft	561.03	Grooved pin
230	Impeller	81-92.01/.02	Cover plate
321.01/.02	Deep groove ball bearing	901.04/.22/.31/.98	Hexagon head bolt
330	Bearing bracket	902.01	Stud
360.01./02	Bearing cover	903.01/.02/.03/.04	Screw plug
400.10/.75	Gasket	914.02	Round-head screw
411.01/.02/.03/.04	Joint ring	920.01/.95	Hexagon nut
411.77/.78	Axial seal ring	930.95	Spring washer
433	Mechanical seal	932.01/.02	Circlip
502.01/.02	Casing wear ring	940.01/.02/.09	Key

Table 38: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

Version with gland packing and bolted casing cover

Table 39: This illustration applies to the following pump sizes:

040-025-200	050-032-200.1	050-032-200	065-040-200	065-050-200	080-065-200	100-80-250	125-100-250	150-125-250	200-150-250
	050-032-250.1	050-032-250	065-040-250	065-050-250	080-065-250	100-80-315	125-100-315	150-125-315	200-150-315
			065-040-315	065-050-315	080-065-315	100-80-400	125-100-400	150-125-400	200-150-400

[Supplied in packaging units only

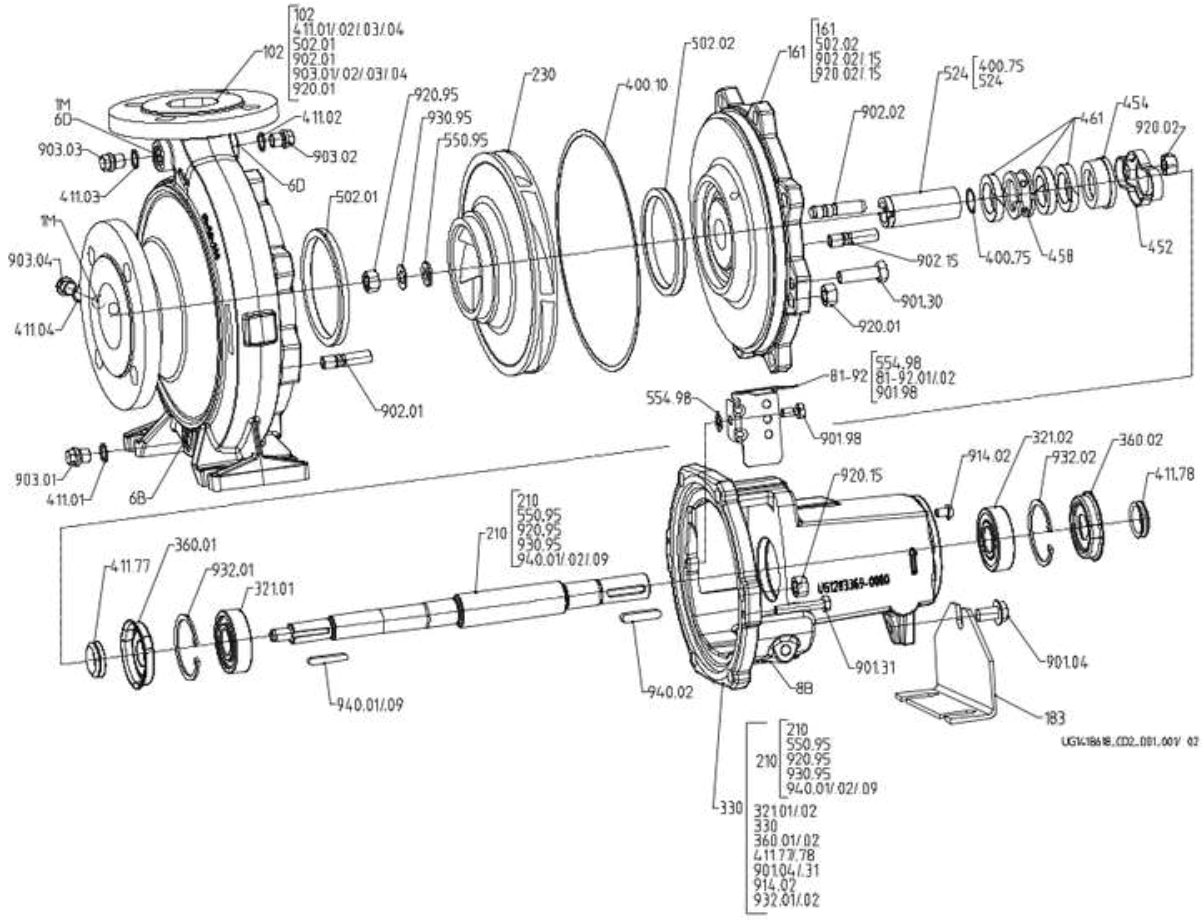

Fig. 16: Version with gland packing and bolted casing cover

Table 40: List of components

Part No.	Description	Part No.	Description
102	Volute casing Casing	461	Gland packing
161	cover	502.01/.02	Casing wear ring52)
183	Support foot	524	Shaft protecting sleeve
210	Shaft	550.9553)	Disc
230	Impeller	554.98	Lock washer
321.01/.02	Deep groove ball bearing	81-92.01/.02	Cover plate
330	Bearing bracket	901.04/.30/.31/.98	Hexagon head bolt
360.01./02	Bearing cover	902.01/.02/.15	Stud
400.10/.75	Gasket	903.01/.02/.03/.04	Screw plug
411.01/.02/.03/.04	Joint ring	914.02	Round-head screw
411.77/.78	Axial seal ring	920.01/.02/.15/.95	Hexagon nut
452	Gland follower	930.95	Spring washer
454	Stuffing box ring	932.01/.02	Circlip
458	Lantern ring	940.01/.02/.0954)	Key

52 Optional for casing material C
53 For shaft unit 25 only
54 For shaft units 55, 60 and 60.1 only

Table 41: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

Version with gland packing and bolted casing cover

Table 42: This illustration applies to the following pump sizes:

150-125-510	200-150-510	250-200-375	300-250-375	350-300-350
		250-200-435	300-250-435	350-300-350.1
		250-200-510	300-250-510	350-300-375
				350-300-435
				350-300-510

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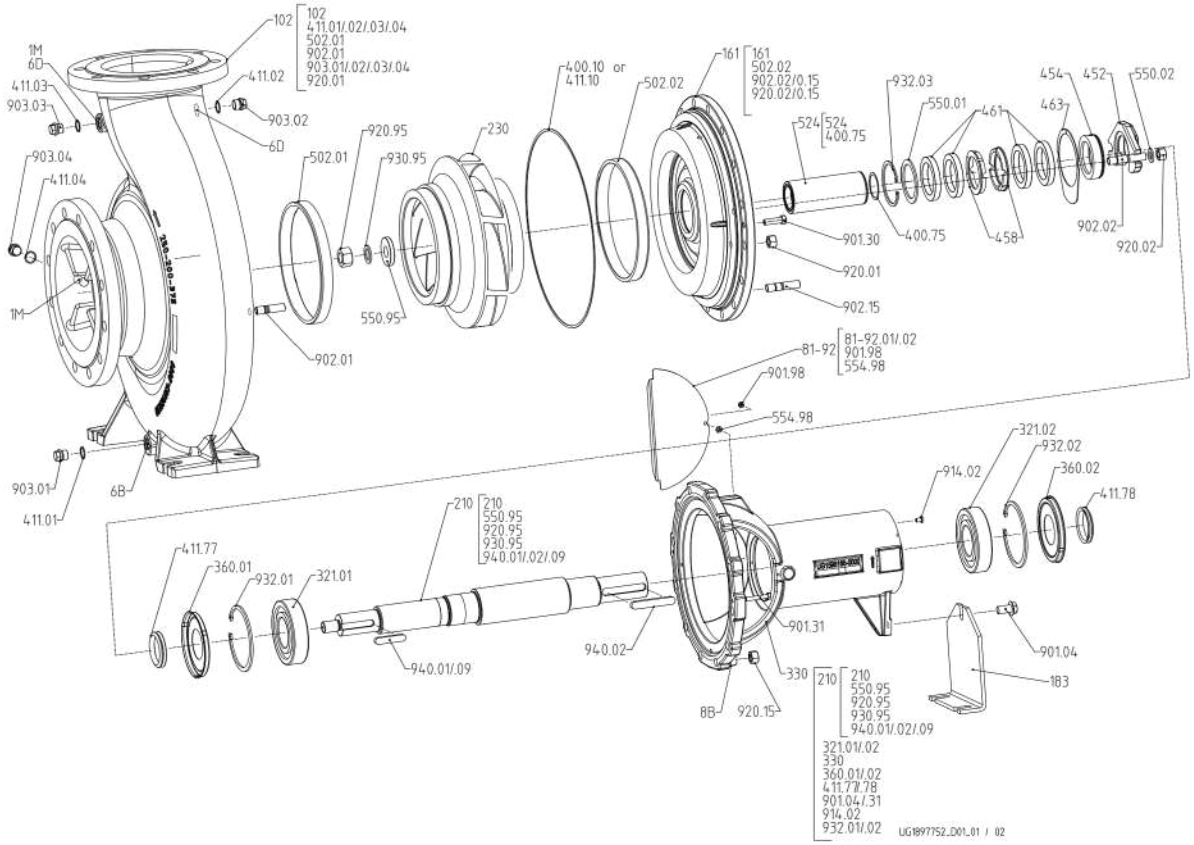

Fig. 17: Version with gland packing and bolted casing cover

Table 43: List of components

Part No.	Description	Part No.	Description
102	Volute casing	461	Gland packing
161	Casing cover	502.01/.02	Casing wear ring
183	Support foot	524	Shaft protecting sleeve
210	Shaft	550.95	Disc
230	Impeller	554.98	Lock washer
321.01/.02	Deep groove ball bearing	81-92.01/.02	Cover plate
330	Bearing bracket	901.04/.30/.31/.98	Hexagon head bolt
360.01./02	Bearing cover	902.01/.02/.15	Stud
400.10/.75	Gasket	903.01/.02/.03/.04	Screw plug
411.01/.02/.03/.04/.10	Joint ring	914.02	Round-head screw
411.77/.78	Axial seal ring	920.01/.02/.15/.95	Hexagon nut
452	Gland follower	930.95	Spring washer
454	Stuffing box ring	932.01/.02	Circlip
458	Lantern ring	940.01/.02/.09	Key

Table 44: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

Version with gland packing and clamped casing cover

Table 45: This illustration applies to the following pump sizes:

040-025-160	050-032-125.1	050-032-125	065-040-125	065-050-125	080-065-125	100-80-160	125-100-160	150-125-200	200-150-200
	050-032-160.1	050-032-160	065-040-160	065-050-160	080-065-160	100-80-200	125-100-200		

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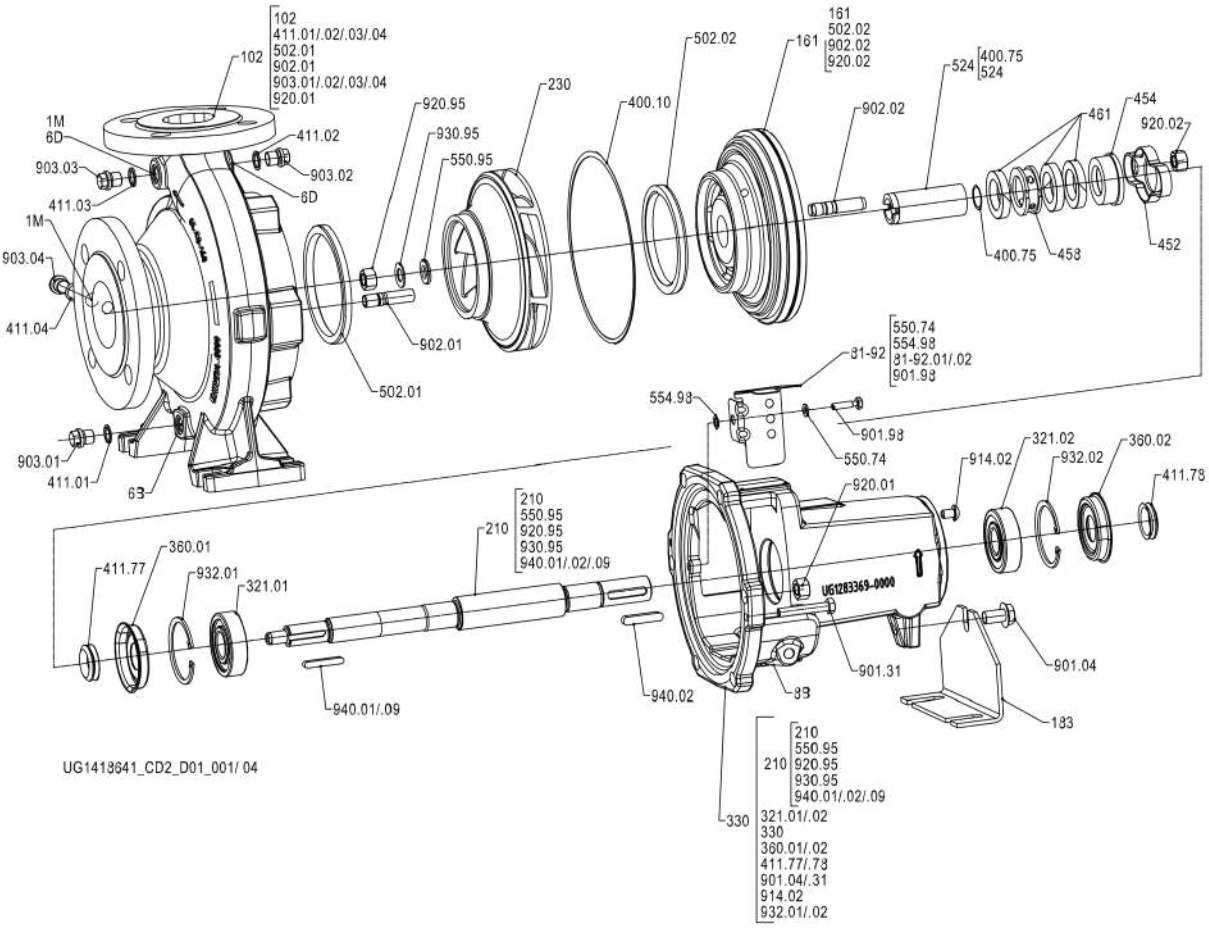

Fig. 18: Version with gland packing and clamped casing cover

Table 46: List of components

Part No.	Description	Part No.	Description
102	Volute casing Casing	461	Gland packing
161	cover	502.01/.0255)	Casing wear ring56)
183	Support foot	524	Shaft protecting sleeve
210	Shaft	550.74/.9557)	Disc
230	Impeller	554.98	Lock washer
321.01/.02	Deep groove ball bearing	81-92.01/.02	Cover plate
330	Bearing bracket	901.04/.31/.98	Hexagon head bolt
360.01./02	Bearing cover	902.01/.02	Stud
400.10/.75	Gasket	903.01/.02/.03/.04	Screw plug
411.01/.02/.03/.04	Joint ring	914.02	Round-head screw
411.77/.78	Axial seal ring	920.01/.02/.95	Hexagon nut

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55 Not on sizes 040-025-160, 050-032-125.1, 050-032-160.1, 050-032-125, 065-040-125
56 Optional for casing material C
57 For shaft unit 25 only

Part No.	Description	Part No.	Description
452	Gland follower	930.95	Spring washer
454	Stuffing box ring	932.01/.02	Circlip
458	Lantern ring	940.01/.02/.09[58)]	Key

Table 47: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

58 For shaft units 55, 60 and 60.1 only

Version with gland packing and clamped casing cover

Table 48: This illustration applies to the following pump sizes:

200-200-250	250-200-275	300-250-295
	250-200-320	300-250-295.1
		300-250-320

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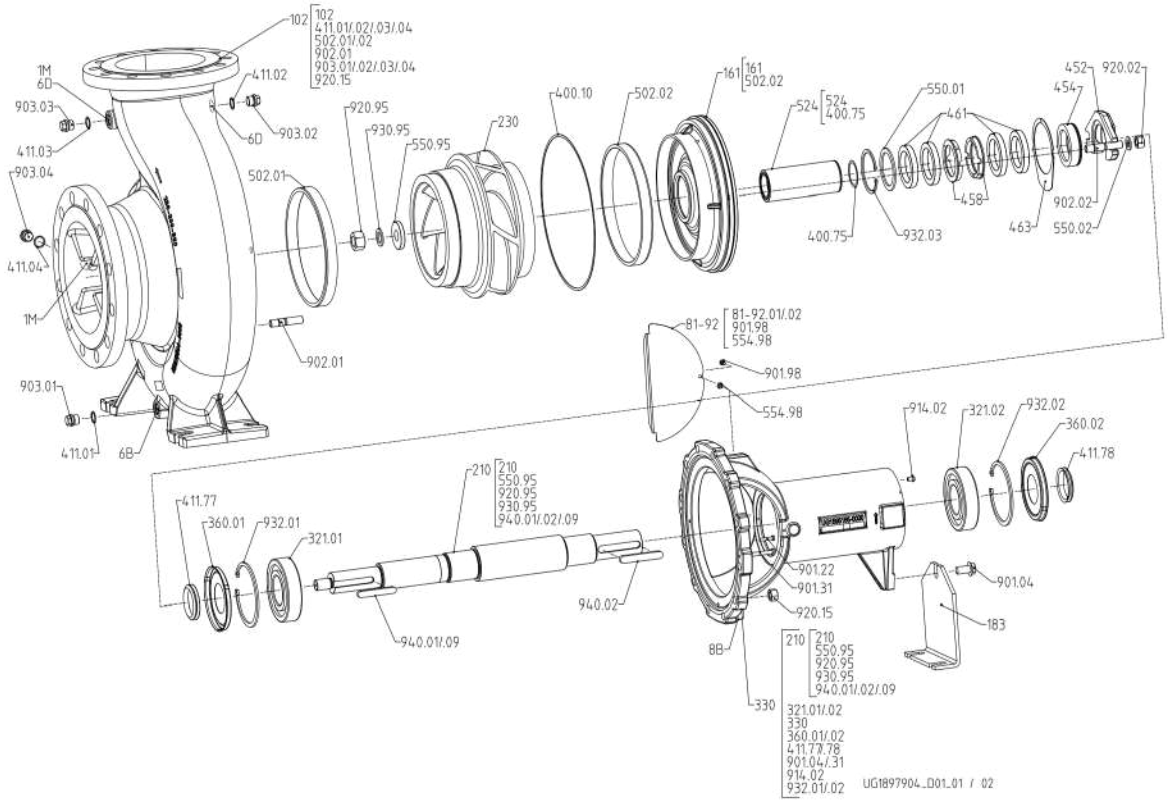

Fig. 19: Version with gland packing and clamped casing cover

Table 49: List of components

Part No.	Description	Part No.	Description
102	Volute casing	461	Gland packing
161	Casing cover	502.01/.02	Casing wear ring
183	Support foot	524	Shaft protecting sleeve
210	Shaft	550.95	Disc
230	Impeller	554.98	Lock washer
321.01/.02	Deep groove ball bearing	81-92.01/.02	Cover plate
330	Bearing bracket	901.04/.22/.31/.98	Hexagon head bolt
360.01./02	Bearing cover	902.01/.02	Stud
400.10/.75	Gasket	903.01/.02/.03/.04	Screw plug
411.01/.02/.03/.04	Joint ring	914.02	Round-head screw
411.77/.78	Axial seal ring	920.01/.02/.95	Hexagon nut
452	Gland follower	930.95	Spring washer
454	Stuffing box ring	932.01/.02	Circlip
458	Lantern ring	940.01/.02/.09	Key

Table 50: Connections

Part No.	Description	Part No.	Description
1M	Pressure gauge with connection	6D	Fluid priming and venting
6B	Fluid drain	8B	Leakage drain

Version with double mechanical seal in back-to-back arrangement

Table 51: This illustration applies to the following pump sizes:

040-025-200	050-032-200.1	050-032-200	065-040-200	065-050-200	080-065-200	100-80-250	125-100-250	150-125-250	200-150-250
	050-032-250.1	050-032-250	065-040-250	065-050-250	080-065-250	100-80-315	125-100-315	150-125-315	200-150-315
			065-040-315	065-050-315	080-065-315	100-80-400	125-100-400	150-125-400	200-150-400

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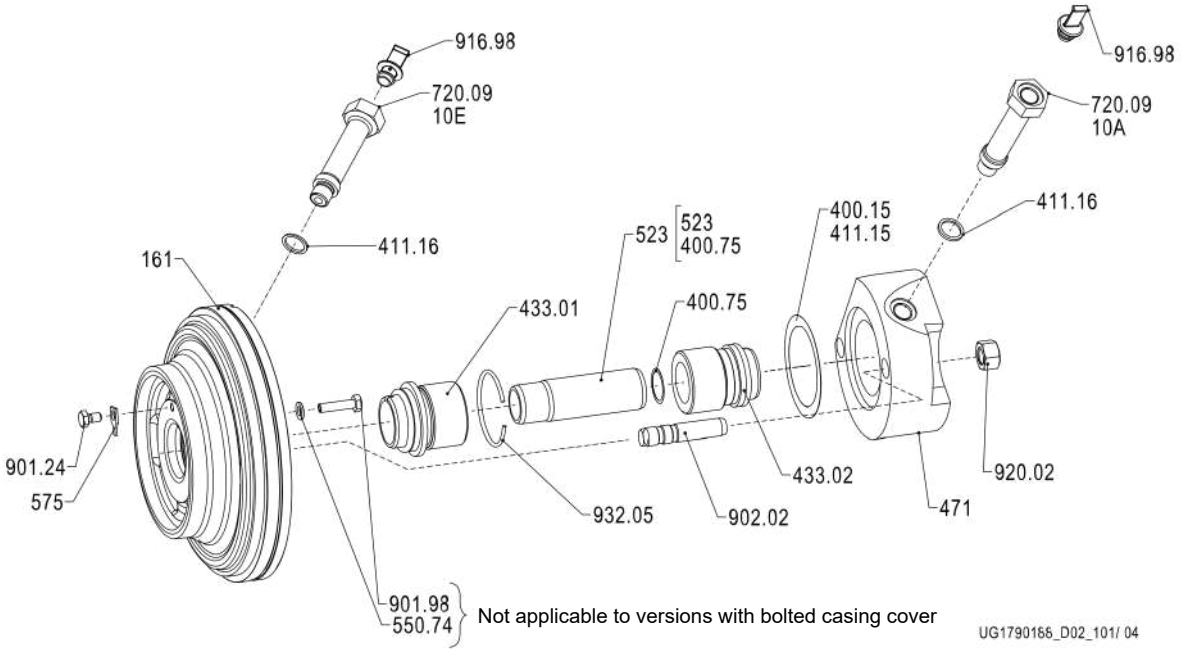

Fig. 20: Version with double mechanical seal in back-to-back arrangement

Table 52: List of components59)

Part No.	Description	Part No.	Description
161	Casing cover	575	Strip
400.15/.75	Gasket Joint	720.09	Fitting
411.15/.16	ring	901.24/.98[60]	Hexagon head bolt
433.01/.02	Mechanical seal	916.98	Plug
471	Seal cover	902.02	Stud
523	Shaft sleeve	920.02	Hexagon nut
550.7460)	Disc	932.05	Circlip

Table 53: Auxiliary connections

Part No.	Description	Part No.	Description
10A	External barrier water outlet	10E	External barrier water inlet

59 Some individual components might not be applicable, depending on the pump size and material.
60 Not applicable to versions with bolted casing cover

Version with double mechanical seal in tandem arrangement

Table 54: This illustration applies to the following pump sizes:

040-025-160 040-025-200	050-032-125.1 050-032-160.1 050-032-200.1 050-032-250.1	050-032-125 050-032-160 050-032-200 050-032-250	065-040-125 065-040-160 065-040-200 065-040-250 065-040-315	065-050-125 065-050-160 065-050-200 065-050-250 065-050-315	080-065-125 080-065-160 080-065-200 080-065-250 080-065-315	100-80-160 100-80-200 100-80-250 100-80-315 100-80-400	125-100-160 125-100-200 125-100-250 125-100-315 125-100-400	150-125-200 150-125-250 150-125-315 150-125-400	200-150-200 200-150-250 200-150-315 200-150-400

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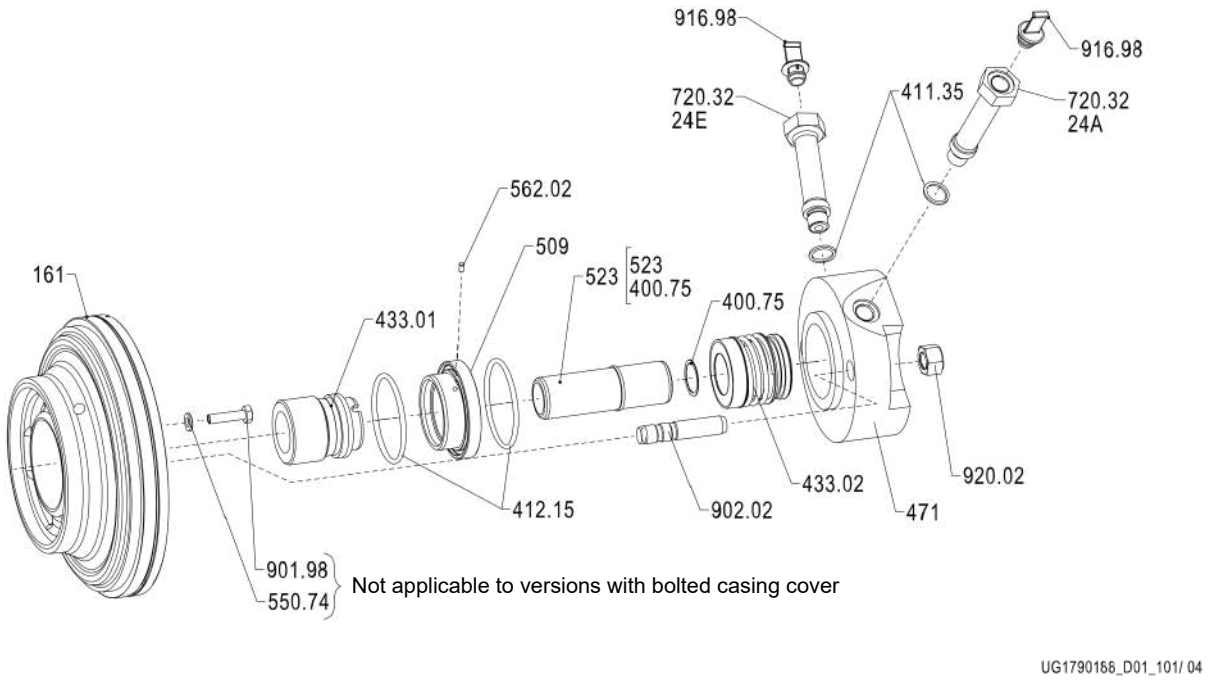

Fig. 21: Version with double mechanical seal in tandem arrangement

Table 55: List of components61)

Part No.	Description	Part No.	Description
161	Casing cover	550.74	Disc62)
400.75	Gasket	562.02	Parallel pin
411.35	Joint ring	720.32	Fitting
412.15	O-ring	901.98	Hexagon head bolt[62)]
433.01/.02	Mechanical seal	902.02	Stud
471	Seal cover	916.98	Plug
509	Intermediate ring	920.02	Hexagon nut
523	Shaft sleeve		

Table 56: Auxiliary connections

Part No.	Description	Part No.	Description
24A	Quench liquid outlet	24E	Quench liquid inlet

61 Some individual components might not be applicable, depending on the pump size and material.
62 Not applicable to versions with bolted casing cover

Version with reinforced bearings

Table 57: This illustration applies to the following pump sizes:

040-025-160 040-025-200	050-032-125.1	050-032-125	065-040-125	065-050-125	080-065-125	100-80-160	125-100-160	150-125-200	200-150-200	250-150-400
	050-032-160.1	050-032-160	065-040-160	065-050-160	080-065-160	100-80-200	125-100-200	150-125-250	200-150-250	
	050-032-200.1	050-032-200	065-040-200	065-050-200	080-065-200	100-80-250	125-100-250	150-125-315	200-150-315	
	050-032-250.1	050-032-250	065-040-250	065-050-250	080-065-250	100-80-315	125-100-315	150-125-400	200-150-400	
			065-040-315	065-050-315	080-065-315	100-80-400	125-100-400			

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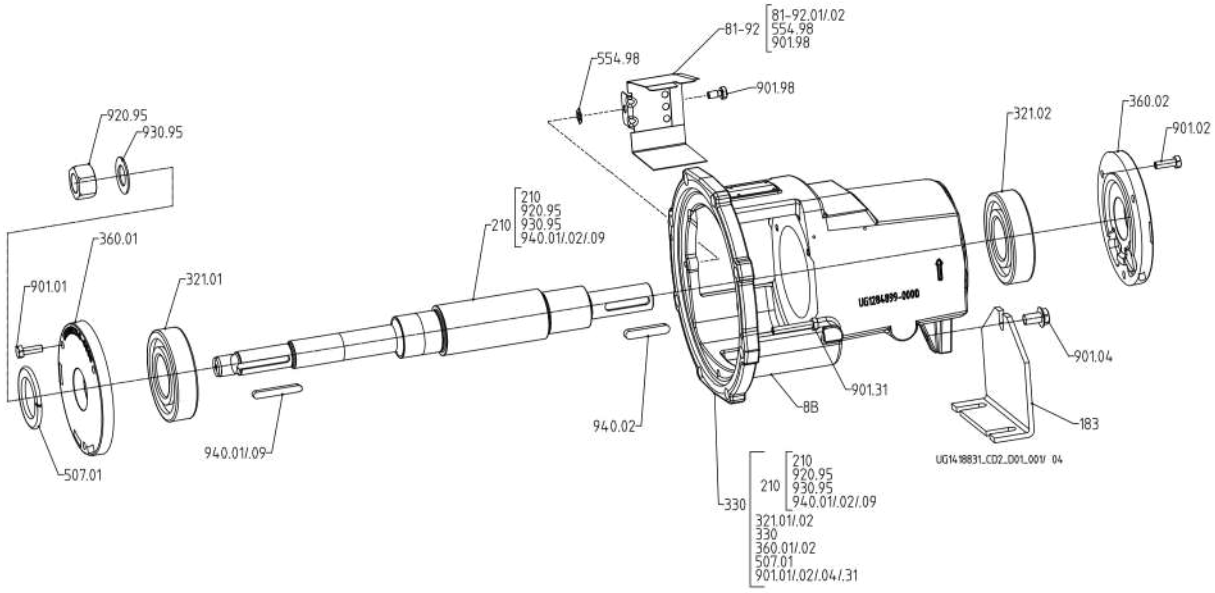

Fig. 22: Version with reinforced bearings (shaft units 50, 60 and 60.1)

Table 58: List of components63)

Part No.	Description	Part No.	Description
183	Support foot	81-92.01/.02	Cover plate
210	Shaft	901.01/.02/.04/.31/.98	Hexagon head bolt
330	Bearing bracket	920.95	Hexagon nut
321.01/.02	Deep groove ball bearing	930.95	Spring washer
360.01/.02	Bearing cover	940.01/.02/.09 64)	Key
507.01	Thrower		

Table 59: Connections

Part No.	Description	Part No.	Description
8B	Leakage drain		

63 Some individual components might not be applicable, depending on the pump size and material.
64 For shaft units 60 and 60.1 only

Version with oil lubrication and constant level oiler

Table 60: This illustration applies to the following pump sizes:

040-025-160 040-025-200	050-032-125.1 050-032-160.1 050-032-200.1 050-032-250.1	050-032-125 050-032-160 050-032-200 050-032-250	065-040-125 065-040-160 065-040-200 065-040-250 065-040-315	065-050-125 065-050-160 065-050-200 065-050-250 065-050-315	080-065-125 080-065-160 080-065-200 080-065-250 080-065-315	100-80-160 100-80-200 100-80-250 100-80-315 100-80-400	125-100-160 125-100-200 125-100-250 125-100-315 125-100-400	150-125-200 150-125-250 150-125-315 150-125-400	200-150-200 200-150-250 200-150-315 200-150-400

[Supplied in packaging units only

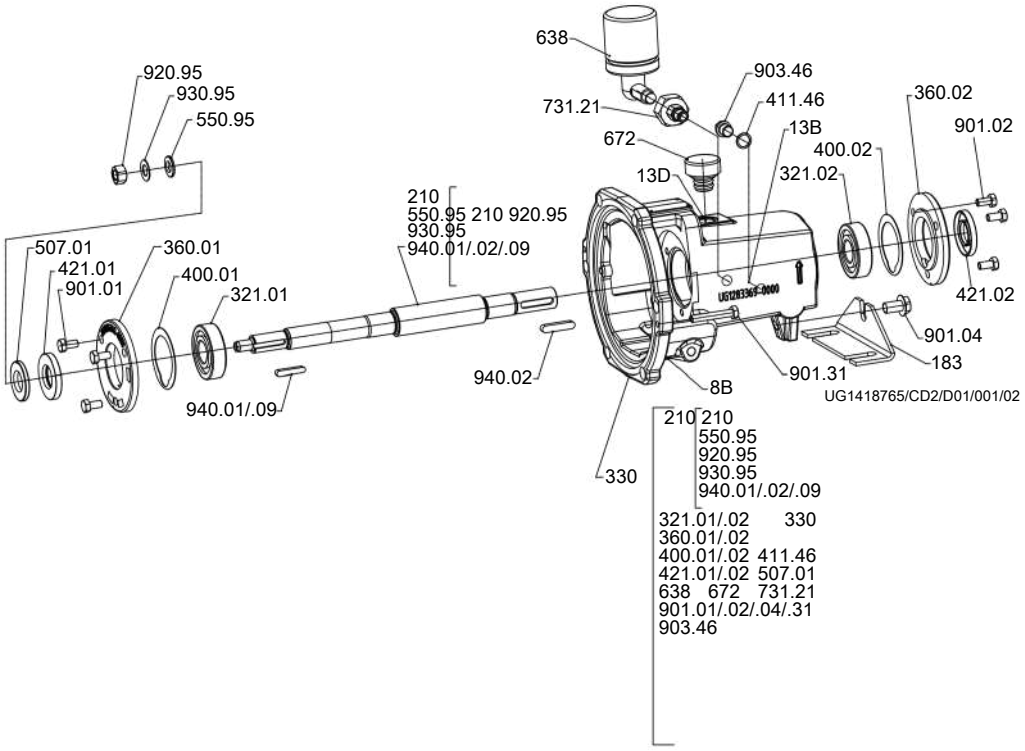

Fig. 23: Version with oil lubrication and constant level oiler

Table 61: List of components65)

Part No.	Description	Part No.	Description
183 210	Support foot	550.9566)	Disc Constant level
330	Shaft	638	oiler
321.01/.02	Bearing bracket	672	Vent
360.01/.02	Deep groove ball bearing	731.21	Pipe union
400.01/.02	Bearing cover	901.01/.02/.04/.31	Hexagon head bolt
411.46	Gasket	903.46	Screw plug
421.01/.02	Joint ring	920.95	Hexagon nut
507.01	Lip seal	930.95	Spring washer
	Thrower	940.01/.02/.0967)	Key

Table 62: Connections

Part No.	Description	Part No.	Description
8B	Leakage drain	13D	Oil filling and venting
13B	Oil drain		

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65 Some individual components might not be applicable, depending on the pump size and material.
66 For shaft unit 25 only
67 For shaft units 55 and 60 only

Version with oil lubrication and constant level oiler

Table 63: This illustration applies to the following pump sizes:

150-125-510	200-150-510	250-200-275	300-250-295	350-300-350 350-
	200-200-250	250-200-320	300-250-295.1	300-350.1 350-
		250-200-375	300-250-320	300-375 350-300-
		250-200-435	300-250-375	435 350-300-510
		250-200-510	300-250-435	
			300-250-510	

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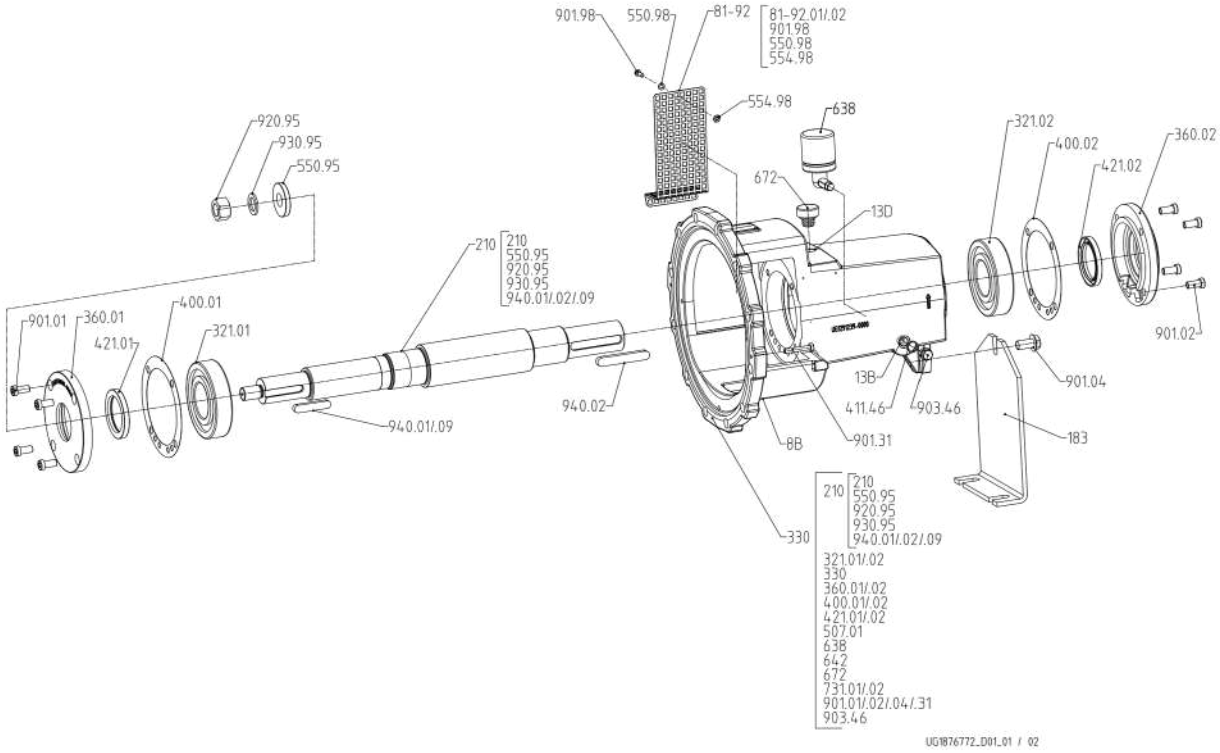

Fig. 24: Version with oil lubrication and constant level oiler

Table 64: List of components68)

Part No.	Description	Part No.	Description
183	Support foot	554.98	Lock washer
210	Shaft	638	Constant level oiler
330	Bearing bracket	672	Vent
321.01/.02	Deep groove ball bearing	81-92.1/.2	Cover plate
360.01/.02	Bearing cover	901.01/.02/.04/.31/.98	Hexagon head bolt
400.01/.02	Gasket	903.46	Screw plug
411.46	Joint ring	920.95	Hexagon nut
421.01/.02	Lip seal	930.95	Spring washer
507.01	Thrower	940.01/.02/.09	Key
550.95/.98	Disc		

Table 65: Connections

Part No.	Description	Part No.	Description
8B	Leakage drain	13D	Oil filling and venting
13B	Oil drain		

68 Some individual components might not be applicable, depending on the pump size and material.

Version with oil lubrication and oil level sight glass

Table 66: This illustration applies to the following pump sizes:

040-025-160	050-032-125.1	050-032-125	065-040-125	065-050-125	080-065-125	100-80-160	125-100-160	150-125-200	200-150-200
040-025-200	050-032-160.1	050-032-160	065-040-160	065-050-160	080-065-160	100-80-200	125-100-200	150-125-250	200-150-250
	050-032-200.1	050-032-200	065-040-200	065-050-200	080-065-200	100-80-250	125-100-250	150-125-315	200-150-315
	050-032-250.1	050-032-250	065-040-250	065-050-250	080-065-250	100-80-315	125-100-315	150-125-400	200-150-400
			065-040-315	065-050-315	080-065-315	100-80-400	125-100-400		

[Supplied in packaging units only

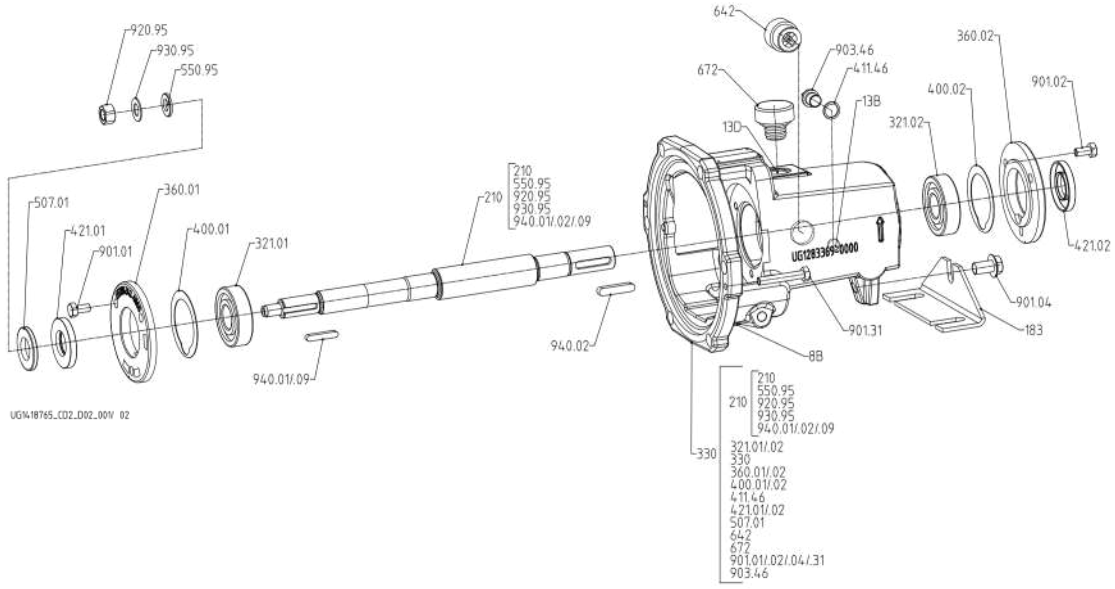

Fig. 25: Version with oil lubrication and oil level sight glass

Table 67: List of components[69]

Part No.	Description	Part No.	Description
183	Support foot	550.95[70]	Disc
210	Shaft	642	Oil level sight glass
330	Bearing bracket	672	Vent
321.01/.02	Deep groove ball bearing	901.01/.02/.04/.31	Hexagon head bolt
360.01/.02	Bearing cover	903.46	Screw plug
400.01/.02	Gasket	920.95	Hexagon nut
411.46	Joint ring	930.95	Spring washer
421.01/.02	Lip seal	940.01/.02/.09[71]	Key
507.01	Thrower		

Table 68: Connections

Part No.	Description	Part No.	Description
8B	Leakage drain	13D	Oil filling and venting
13B	Oil drain		

1311.5/12-EN

69 Some individual components might not be applicable, depending on the pump size and material.
70 For shaft unit 25 only
71 For shaft units 55 and 60 only

Glossary

ACS
French drinking water regulations (ACS = Attestation de Conformité Sanitaire)

Back pull-out design
Thecompleteback pull-out unit can be pulled out without having to remove the pump casing from the piping.

FM
Certification by FM Global (FM = Factory Mutual) regarding property insurance in industry and risk management; FM Approved products

IE3
Efficiency class to IEC 60034-30: 3 = Premium Efficiency (IE = International Efficiency)

IE4
Efficiency class to IEC TS 60034-30-2:2016 = Super Premium Efficiency (IE = International Efficiency)

IE5
Efficiency class for rotating electrical machinery to IEC TS 60034-30-2:2016 = Ultra Premium Efficiency (IE = International Efficiency)

Mech. seal
Mechanical seal

SU
Shaft unit

UBA
German drinking water regulations to German Environment Agency

UL
Certification of materials, components and end products regarding product safety (UL = Underwriters Laboratories)

VdS
Certification for fire protection and safety by VdS

WRAS
Approved by all water suppliers in the UK (WRAS = Water Regulations Advisory Scheme)

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