

## Closed-coupled Pump

# Etabloc

Fixed Speed / Variable Speed  
50 Hz / 60 Hz

## Type Series Booklet



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Type Series Booklet Etabloc

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## Centrifugal Pumps with Shaft Seal

### Close-coupled Pump

## Etabloc (EU / ME / NA)



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

### 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

### Fluids handled

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

### Related documents

Table 1: Information/documents

| Document                                                     | Reference number |
|--------------------------------------------------------------|------------------|
| General arrangement drawings booklet                         | 1173.391         |
| Characteristic curves booklet (50 Hz)<br>Fixed speed version | 1311.45          |
| Characteristic curves booklet (60 Hz)<br>Fixed speed version | 1311.46          |
| Characteristic curves booklet<br>Variable speed version      | 1311.452         |
| Type series booklet<br>KSB SuPremE                           | 4075.53          |
| Type series booklet<br>PumpDrive 2 / PumpDrive 2 Eco         | 4074.5           |
| Type series booklet PumpDrive R                              | 4073.5           |
| Type series booklet<br>PumpMeter                             | 4072.5           |

### Operating data

Table 2: Operating properties

| Characteristic             |                     | Value  |        |
|----------------------------|---------------------|--------|--------|
|                            |                     | 50 Hz  | 60 Hz  |
| Flow rate                  | Q [m³/h]            | ≤ 660  | ≤ 740  |
| Head                       | H [m]               | ≤ 160  | ≤ 148  |
| Fluid temperature          | T [°C]              | ≥ -30  | ≥ -30  |
|                            |                     | ≤ +140 | ≤ +140 |
| Operating pressure         | p [bar]             | ≤ 16   | ≤ 16   |
| Motor rating <sup>1)</sup> | P <sub>N</sub> [kW] | ≤ 110  | ≤ 110  |

### Design details

#### Design

- Volute casing pump
- Single-stage
- 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 (not for pump casing material G, motor size ≤ 180)
- 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 IE2 (size 71)/ 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

<sup>1</sup> Refer to the overview of pump size / motor combinations

- Rated voltage (50 Hz) 400 V / 690 V  $\geq 3.00$  kW
- Rated voltage (60 Hz) - / 460 V  $\leq 2.20$  kW
- Rated voltage (60 Hz) 460 V / -  $\geq 3.00$  kW
- Type of construction IM V1  $\leq 4.00$  kW
- Type of construction IM V15  $\geq 5.50$  kW
- 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  $\leq 2.50$  kW
- Rated voltage (50 Hz) 400 V / 690 V  $\geq 3.30$  kW
- Rated voltage (60 Hz) - / 460 V  $\leq 2.50$  kW
- Rated voltage (60 Hz) 460 V / -  $\geq 3.30$  kW
- Type of construction IM V1  $\leq 4.00$  kW
- Type of construction IM V15  $\geq 5.50$  kW
- 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 motor<sup>2)</sup> (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 V1  $\leq 4.00$  kW
- Type of construction IM V15  $\geq 5.50$  kW
- 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

**KSB SuPremE 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  $\pm 2$  %

**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  $\pm 2$  %
- Extended power range with a nominal power of 110 kW (standard) or 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**

- Single mechanical seals and double mechanical seals to EN 12756
- Shaft equipped with replaceable shaft sleeve in the shaft seal area

**Impeller type**

- Closed radial impeller with multiply curved vanes

<sup>2)</sup> Motor sizes 0.55 kW / 0.75 kW with 1500 rpm are designed with permanent magnets.

## Designation

**Table 3:** 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 | B |   | 0 | 4 | 0 | - | 0 | 2  | 5  | -  | 1  | 6  | 0  | -  | G  | G  | S  | B  | E  | 1  | 1  | W  | S  | E  | J  | B  | 2  | H  | C  | B  |
| See name plate and data sheet |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Table 4:** Designation key

| Position | Code                              | Description                                                                                                                           |
|----------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 1-4      | Pump type                         |                                                                                                                                       |
|          | ETB                               | Etabloc                                                                                                                               |
|          | ETBF                              | Etabloc bottle rinser variant                                                                                                         |
| 5-16     | Size [mm], e.g.                   |                                                                                                                                       |
|          | 040                               | Nominal suction nozzle diameter                                                                                                       |
|          | 025                               | Nominal discharge nozzle diameter                                                                                                     |
|          | 160                               | Nominal impeller diameter                                                                                                             |
| 17       | Pump casing material              |                                                                                                                                       |
|          | B                                 | Bronze<br>CC480K-GS / B30 C90700                                                                                                      |
|          | C                                 | Stainless steel<br>1.4408 / A743CF8M                                                                                                  |
|          | G                                 | Cast iron<br>EN-GJL-250 / A48 Cl. 35                                                                                                  |
|          | K                                 | Cast iron, electrocoated<br>EN-GJL-250, electrocoated                                                                                 |
|          | S                                 | Nodular cast iron<br>EN-GJS-400-15 / A536 Gr. 60-40-18                                                                                |
| 18       | Impeller material                 |                                                                                                                                       |
|          | B                                 | Bronze<br>CC480K-GS / B30 C90700                                                                                                      |
|          | C                                 | Stainless steel<br>1.4408 / A743CF8M                                                                                                  |
|          | G                                 | Cast iron<br>EN-GJL-250 / A48 Cl. 35                                                                                                  |
|          | P                                 | Cast iron without protective coating<br>EN-GJL-250 without protective coating                                                         |
| 19       | Description                       |                                                                                                                                       |
|          | E                                 | Design as per European Regulation (EC) No. 1935/2004                                                                                  |
|          | F                                 | Bottle rinser variant                                                                                                                 |
|          | H                                 | Approved for drinking water to ACS                                                                                                    |
|          | K                                 | Approved for drinking water to KSB standard                                                                                           |
|          | P                                 | Swimming pool variant                                                                                                                 |
|          | S                                 | Standard                                                                                                                              |
|          | U                                 | Approved for drinking water to UBA                                                                                                    |
| 20       | Casing cover connections          |                                                                                                                                       |
|          | A                                 | Single mechanical seal, conical cover without internal circulation                                                                    |
|          | B                                 | Conical casing cover with connection for venting                                                                                      |
|          | C                                 | Conical casing cover with vent                                                                                                        |
|          | D                                 | Conical casing cover with connection for external flushing                                                                            |
|          | E                                 | Conical casing cover with connection for external flushing from discharge nozzle                                                      |
|          | 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 |
| 21       | Shaft seal type                   |                                                                                                                                       |
|          | 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                                                         |
|          | I                                 | Single mechanical seal, internal circulation, conical casing cover, API Plan: 01                                                      |
|          | T                                 | Double mechanical seal in tandem arrangement with internal circulation, API Plan: 52 <sup>3)</sup> / 55 <sup>4)</sup>                 |
| 22-23    | Seal code, single mechanical seal |                                                                                                                                       |
|          | 01                                | QQVGG<br>KSB's choice<br>≥ -20 - ≤ +110 [°C]                                                                                          |
|          | 07                                | QQEGG DW001<br>KSB's choice<br>≥ -30 - ≤ +110 [°C]                                                                                    |

<sup>3</sup> Applies to: Version without reservoir and version with unpressurised reservoir

<sup>4</sup> Applies to: Version with external circulation system

| Position | Code                                                          | Description                                   |
|----------|---------------------------------------------------------------|-----------------------------------------------|
| 22-23    | 09                                                            | U3U3VGG-Y10                                   |
|          | 10                                                            | QXXGG                                         |
|          | 11                                                            | BQEGG DW001                                   |
|          | 12                                                            | Q12Q1M1GG1                                    |
|          | 13                                                            | BQVGG                                         |
|          | 14                                                            | Q1Q1KY7G                                      |
|          | 15                                                            | Q1Q1KGG                                       |
|          | 17                                                            | Q1BVGG                                        |
|          | 22                                                            | AQ1EGG                                        |
|          | 45                                                            | BQ7EGG-Y10 FD004                              |
|          | 46                                                            | Q7Q7EGG-Y10 FD004                             |
|          | 51                                                            | BQ7VGG-Y10 FD004                              |
|          | 52                                                            | Q7Q7VGG-Y10 FD004                             |
|          | 66                                                            | Q7Q7EGG-Y10 DW001                             |
|          | 76                                                            | AQ7EGG-Y10                                    |
|          | 79                                                            | Q7Q7VGG-Y10                                   |
|          | Seal code, double mechanical seal in tandem arrangement       |                                               |
|          | 18                                                            | Q7Q7EGG-Y10 DW001                             |
|          |                                                               | Q7Q7EGG-Y10 DW001                             |
|          | 20                                                            | Q12Q1M1GG1                                    |
|          |                                                               | Q7Q7EGG-Y10 DW001                             |
|          | 23                                                            | Q12Q1M1GG1                                    |
|          |                                                               | Q7Q7EGG-Y10 DW001                             |
|          | Seal code, double mechanical seal in back-to-back arrangement |                                               |
|          | 21                                                            | Q1Q1KGG                                       |
|          |                                                               | Q1Q1KGG                                       |
|          | 24                                                            | Q1Q1KGG                                       |
|          |                                                               | Q1BVGG                                        |
| 24       | Type of lubrication                                           |                                               |
|          | W                                                             | None                                          |
| 25       | Design                                                        |                                               |
|          | C                                                             | Extended standard                             |
|          | S                                                             | KSB standard                                  |
|          | X                                                             | Special design                                |
| 26       | Bearing bracket/shaft unit                                    |                                               |
|          | E                                                             | Shaft unit 25                                 |
|          | F                                                             | Shaft unit 35                                 |
|          | H                                                             | Shaft unit 55                                 |
| 27-28    | Motor rating P <sub>N</sub> [kW]                              |                                               |
|          | AJ                                                            | 0,37                                          |
|          | ...                                                           | ...                                           |
|          | KP                                                            | 160                                           |
| 29       | Number of motor poles                                         |                                               |
|          | 2                                                             | 2 poles                                       |
|          | 4                                                             | 4 poles                                       |
|          | 6                                                             | 6 poles                                       |
| 30       | Scope of supply                                               |                                               |
|          | A                                                             | Bare-shaft pump                               |
|          | C                                                             | Pump, baseplate                               |
|          | G                                                             | Back pull-out unit                            |
|          | H                                                             | Pump, motor                                   |
| 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 |

| Position | Code               | Description                                 |
|----------|--------------------|---------------------------------------------|
| 31       | 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                                |

## Materials

**Table 5:** Symbols key

| Symbol   | Description                          |
|----------|--------------------------------------|
| <b>X</b> | Standard                             |
| <b>o</b> | Optional                             |
| -        | Version not available / not feasible |

**Table 6:** Overview of available materials

| Part No.<br>(⇒ Page 34) | Description                    | Material                                           | Material variant |          |          |          |          |          |          |          |
|-------------------------|--------------------------------|----------------------------------------------------|------------------|----------|----------|----------|----------|----------|----------|----------|
|                         |                                |                                                    | GG               | GB       | GC       | BB       | SG       | SB       | SC       | CC       |
| 102                     | Volute casing                  | Grey cast iron EN-GJL-250 / A 48 CL 35 B           | <b>X</b>         | <b>X</b> | <b>X</b> | -        | -        | -        | -        | -        |
|                         |                                | Grey cast iron EN-GJL-250 / CATA-PHORESIS          | <b>o</b>         | <b>o</b> | <b>o</b> | -        | -        | -        | -        | -        |
|                         |                                | Bronze CC480K-GS / B30 C90700                      | -                | -        | -        | <b>X</b> | -        | -        | -        | -        |
|                         |                                | Nodular cast iron EN-GJS-400-15 / A536 GR 60-40-18 | -                | -        | -        | -        | <b>X</b> | <b>X</b> | <b>X</b> | -        |
|                         |                                | Stainless steel 1.4408 / A743 GR CF8 M             | -                | -        | -        | -        | -        | -        | -        | <b>X</b> |
| 161                     | Casing cover, conical          | Grey cast iron EN-GJL-250 / A 48 CL 35 B           | <b>X</b>         | <b>X</b> | <b>X</b> | -        | -        | -        | -        | -        |
|                         |                                | Grey cast iron EN-GJL-250 / CATA-PHORESIS          | <b>o</b>         | <b>o</b> | <b>o</b> | -        | -        | -        | -        | -        |
|                         |                                | Bronze CC480K-GS / B30 C90700                      | -                | -        | -        | <b>X</b> | -        | -        | -        | -        |
|                         |                                | Nodular cast iron EN-GJS-400-15 / A536 Gr 60-40-18 | -                | -        | -        | -        | <b>X</b> | <b>X</b> | <b>X</b> | -        |
|                         |                                | Stainless steel 1.4408 / A743 Gr CF8 M             | -                | -        | -        | -        | -        | -        | -        | <b>X</b> |
| 161                     | Casing cover, cylindrical      | Grey cast iron EN-GJL-250 / A 48 CL 35 B           | <b>o</b>         | <b>o</b> | <b>o</b> | -        | -        | -        | -        | -        |
|                         |                                | Grey cast iron EN-GJL-250 / CATA-PHORESIS          | <b>o</b>         | <b>o</b> | <b>o</b> | -        | -        | -        | -        | -        |
|                         |                                | Stainless steel 1.4408 / A743 Gr CF8 M             | -                | -        | -        | <b>o</b> | -        | -        | -        | -        |
|                         |                                | Bronze CC480K-GS / B30 C90700                      | -                | -        | -        | -        | -        | -        | -        | <b>o</b> |
| 210                     | Shaft                          | Tempered steel C45+N                               | <b>X</b>         | <b>X</b> | <b>X</b> | -        | <b>X</b> | <b>X</b> | <b>X</b> | -        |
|                         |                                | Stainless steel 1.4571                             | <b>o</b>         | <b>o</b> | <b>o</b> | <b>X</b> | <b>o</b> | <b>o</b> | <b>o</b> | <b>X</b> |
| 230                     | Impeller                       | Grey cast iron EN-GJL-250 / A 48 CL 35 B           | <b>X</b>         | -        | -        | -        | <b>X</b> | -        | -        | -        |
|                         |                                | Bronze CC480K-DW                                   | -                | <b>X</b> | -        | <b>X</b> | -        | <b>X</b> | -        | -        |
|                         |                                | Stainless steel 1.4408 / A743 Gr CF8 M             | -                | -        | <b>X</b> | -        | -        | -        | <b>X</b> | <b>X</b> |
| 341                     | Drive lantern                  | Grey cast iron EN-GJL-250 / A 48 CL 35 B           | <b>X</b>         | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> |
| 400                     | Gaskets                        | DPAF, asbestos-free                                | <b>X</b>         | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> | <b>X</b> |
| 502.01                  | Casing wear ring, suction side | JL / lamellar graphite cast iron                   | <b>X</b>         | <b>X</b> | <b>X</b> | -        | <b>X</b> | <b>X</b> | <b>X</b> | -        |

| Part No.<br>(⇒ Page 34) | Description                      | Material                                     | Material variant |    |    |    |    |    |    |    |
|-------------------------|----------------------------------|----------------------------------------------|------------------|----|----|----|----|----|----|----|
|                         |                                  |                                              | GG               | GB | GC | BB | SG | SB | SC | CC |
| 502.01                  | Casing wear ring, suction side   | Stainless steel (CrNiMo steel) <sup>5)</sup> | o                | o  | o  | -  | -  | -  | -  | o  |
|                         |                                  | Bronze CC495K-GS                             | -                | o  | -  | x  | -  | o  | -  | -  |
| 502.02                  | Casing wear ring, discharge side | JL / lamellar graphite cast iron             | x                | x  | x  | -  | x  | x  | x  | -  |
|                         |                                  | Stainless steel (CrNiMo steel) <sup>5)</sup> | o                | o  | o  | -  | -  | -  | -  | o  |
|                         |                                  | Bronze CC495K-GS                             | -                | o  | -  | x  | -  | o  | -  | -  |
| 523                     | Shaft sleeve <sup>6)</sup>       | Stainless steel (CrNiMo steel) <sup>5)</sup> | x                | x  | x  | x  | x  | x  | x  | x  |
| 902                     | Studs                            | Steel 8.8                                    | x                | x  | x  | -  | x  | x  | x  | -  |
|                         |                                  | A4-70/ A193 Gr. B8M CL2                      | o                | o  | o  | x  | o  | o  | o  | x  |
| 903                     | Screw plug                       | Steel                                        | x                | x  | x  | -  | x  | x  | x  | -  |
|                         |                                  | A4/ AISI 316                                 | o                | o  | o  | x  | o  | o  | o  | x  |
| 920                     | Nut                              | 8+A2A/ 8+B633 SC1 TP3                        | x                | x  | x  | -  | x  | x  | x  | -  |
|                         |                                  | A4/ AISI 316                                 | o                | o  | o  | x  | o  | o  | o  | x  |
| 920.95                  | Impeller nut                     | A4/ AISI 316                                 | o                | o  | x  | x  | o  | x  | x  | x  |
|                         |                                  | Steel 8                                      | x                | x  | -  | -  | x  | -  | -  | -  |

### Coating and preservation

- Coating and preservation to KSB standard

### Product benefits

- Improved efficiency and NPSH<sub>req</sub> 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
- Casing sealed reliably – even in varying operating conditions – by confined casing gasket
- Large variety of materials as standard for perfectly matching the pump to the fluid handled
- Extended selection chart with additional pump sizes for small flow rates
- Easy to dismantle using forcing screws at the interface of casing cover and drive lantern

- Product's type and size identifier: 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](http://www.europump.org/efficiencycharts)

### Product information

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

For information as per European chemicals regulation (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

- Minimum efficiency 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

### Acceptance tests and warranty

Materials inspection and testing:

- 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.

<sup>5)</sup> 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. CF8 M, A479 type 316L.

<sup>6)</sup> For versions with mechanical seal

## Overview of product features / selection tables

## Overview of variants

 Other designs on request

Table 7: Symbols key

| Symbol   | Description                          |
|----------|--------------------------------------|
| <b>X</b> | Standard                             |
| -        | Version not available / not feasible |

Table 8: Overview of Etabloc variants

| Variant | 102 / Volute casing                       | 230 / Impeller                            | Mechanical seal                                              | T<br>[°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 |
| 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 QXXGG                                             | ≥ -20 - ≤ +110 | -                                                                                                    | <b>X</b>             | -                      | <b>X</b> <sup>7)</sup> | <b>X</b>              | <b>X</b>                   | <b>X</b>         | -               | -                        | <b>X</b>                 |
| 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 | <b>X</b>                                                                                             | <b>X</b>             | <b>X</b> <sup>8)</sup> | -                      | <b>X</b>              | -                          | -                | -               | <b>X</b> <sup>8)</sup>   | -                        |
| 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<br>SU 55: mech. seal AQ1EGG | ≥ -30 - ≤ +140 | -                                                                                                    | -                    | -                      | -                      | -                     | -                          | -                | <b>X</b>        | -                        | -                        |
| GB10    | Grey cast iron EN-GJL-250 / A 48 Cl. 35 B | Bronze CC480K-DW / B30 C90700             | Mech. seal QXXGG                                             | ≥ -20 - ≤ +110 | -                                                                                                    | <b>X</b>             | -                      | <b>X</b> <sup>7)</sup> | <b>X</b>              | <b>X</b>                   | <b>X</b>         | -               | -                        | <b>X</b>                 |
| GB11    | Grey cast iron EN-GJL-250 / A 48 Cl. 35 B | Bronze CC480K-DW / B30 C90700             | Mech. seal BQEGG DW001                                       | ≥ -30 - ≤ +110 | <b>X</b>                                                                                             | <b>X</b>             | <b>X</b> <sup>8)</sup> | -                      | <b>X</b>              | -                          | -                | -               | <b>X</b> <sup>8)</sup>   | -                        |
| GB76    | Grey cast iron EN-GJL-250 / A 48 Cl. 35 B | Bronze CC480K-DW / B30 C90700             | SU 25, 35: mech. seal AQ7EGG-Y10<br>SU 55: mech. seal AQ1EGG | ≥ -30 - ≤ +140 | -                                                                                                    | -                    | -                      | -                      | -                     | -                          | -                | <b>X</b>        | -                        | -                        |
| CC10    | Stainless steel 1.4408 / A743 Gr. CF8 M   | Stainless steel 1.4408 / A743 Gr. CF8 M   | Mech. seal QXXGG                                             | ≥ -20 - ≤ +110 | -                                                                                                    | <b>X</b>             | -                      | <b>X</b> <sup>7)</sup> | <b>X</b>              | <b>X</b>                   | <b>X</b>         | -               | -                        | <b>X</b>                 |
| CC11    | Stainless steel 1.4408 / A743 Gr. CF8 M   | Stainless steel 1.4408 / A743 Gr. CF8 M   | Mech. seal BQEGG DW001                                       | ≥ -30 - ≤ +110 | <b>X</b>                                                                                             | <b>X</b>             | <b>X</b> <sup>8)</sup> | -                      | <b>X</b>              | -                          | -                | -               | <b>X</b> <sup>8)</sup>   | -                        |
| CC76    | Stainless steel 1.4408 / A743 Gr. CF8 M   | Stainless steel 1.4408 / A743 Gr. CF8 M   | SU 25, 35: mech. seal AQ7EGG-Y10<br>SU 55: mech. seal AQ1EGG | ≥ -30 - ≤ +140 | -                                                                                                    | -                    | -                      | -                      | -                     | -                          | -                | <b>X</b>        | -                        | -                        |

<sup>7)</sup> QXVGG

<sup>8)</sup> QXEGG, fluid handled: water, glycol with inhibitors

## Overview of fluids handled

**Table 9:** Symbols key

| Symbol | Description                          |
|--------|--------------------------------------|
| X      | Standard                             |
| -      | Version not available / not feasible |

**Table 10:** Excerpt from the overview of fluids handled with associated material variants

| Fluid handled                                                                               | T <sup>9)</sup> |         | Materials                         |                               |                                      |                           |                                         | Shaft seal      |             |       |             |            | Comments                                                                                                                                                |    |
|---------------------------------------------------------------------------------------------|-----------------|---------|-----------------------------------|-------------------------------|--------------------------------------|---------------------------|-----------------------------------------|-----------------|-------------|-------|-------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|
|                                                                                             |                 |         | Casing/impeller                   |                               |                                      |                           |                                         | Mechanical seal |             |       |             |            |                                                                                                                                                         |    |
|                                                                                             | Minimum         | Maximum | Grey cast iron/<br>grey cast iron | Grey cast iron/<br>tin bronze | Nodular cast iron/<br>grey cast iron | Tin bronze/<br>tin bronze | CrNiMo cast steel/<br>CrNiMo cast steel | QQEGG           | Q7Q7VGG-Y10 | QXXGG | BQEGG DW001 | Q12Q1M1GG1 |                                                                                                                                                         |    |
|                                                                                             |                 |         | GG                                | GB                            | SG                                   | BB                        | CC                                      |                 | 7           | 79    | 10          | 11         |                                                                                                                                                         | 12 |
| Water                                                                                       |                 |         |                                   |                               |                                      |                           |                                         |                 |             |       |             |            |                                                                                                                                                         |    |
| Brackish water <sup>10)</sup>                                                               | -               | ≤ +25   | -                                 | -                             | -                                    | ✗                         | -                                       | -               | -           | ✗     | -           | -          | CrNiMo cast steel can be used.                                                                                                                          |    |
| Fire-fighting water <sup>11)</sup>                                                          | -               | ≤ +60   | -                                 | ✗                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | Contact the manufacturer for supply to VdS guideline.                                                                                                   |    |
| Heating water <sup>12)</sup>                                                                | -               | ≤ +110  | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | -     | ✗           | -          | If used as a circulating pump to DIN 4752: p maximum ≤ 10 bar. If ductile material has been specified: SG                                               |    |
| Condensate, conditioned                                                                     | -               | ≤ +110  | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | -     | ✗           | -          | -                                                                                                                                                       |    |
| Condensate, not conditioned                                                                 | -               | ≤ +110  |                                   | -                             | -                                    | -                         | ✗                                       | -               | -           | -     | ✗           | -          | -                                                                                                                                                       |    |
| Cooling water without antifreeze                                                            | -               | ≤ +60   | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | Open circuit: GB 10 required                                                                                                                            |    |
| Cooling water with antifreeze <sup>13)</sup> , pH ≥ 7.5                                     | ≥ -30           | ≤ +60   | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | -     | ✗           | -          | Open circuit: BB 66 or CC 66 required                                                                                                                   |    |
| Cooling water with antifreeze <sup>13)</sup> , pH ≥ 7.5                                     | ≥ +60           | ≤ +110  | ✗                                 | -                             | -                                    | -                         | -                                       | ✗               | -           | -     | -           | -          | Open circuit: BB 66 or CC 66 required                                                                                                                   |    |
| Slightly contaminated water                                                                 | -               | ≤ +60   | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | -                                                                                                                                                       |    |
| Seawater                                                                                    | -               | ≤ +25   | -                                 | -                             | -                                    | ✗                         | -                                       | -               | -           | ✗     | -           | -          | CrNiMo cast steel can be used.                                                                                                                          |    |
| Pure water <sup>14)</sup>                                                                   | -               | ≤ +60   | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | -     | ✗           | -          | -                                                                                                                                                       |    |
| Raw water                                                                                   | -               | ≤ +60   | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | -                                                                                                                                                       |    |
| Swimming pool water (fresh water)                                                           | -               | ≤ +60   | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | Also applies to requirements as per DIN 19643                                                                                                           |    |
| Swimming pool water <sup>15)</sup> : filtration                                             | -               | ≤ +40   | -                                 | ✗                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | Variant GB<br>Shaft C45+N, shaft sleeve CrNiMo steel, nut A4/AISI 316, key A2, casing wear ring (suction and discharge side) grey cast iron JL 1040/ CI |    |
| Swimming pool water <sup>15)</sup> : water features; without turbulences and/or air content | -               | ≤ +40   | -                                 | ✗                             | -                                    | -                         | -                                       | -               | -           | ✗     | -           | -          | Variant GB<br>Shaft C45+N, shaft sleeve CrNiMo steel, nut A4/ AISI 316, key A2, casing wear ring (suction and discharge side) CC495K-GS                 |    |
| Swimming pool water <sup>15)</sup> : water features; with turbulences and/or air content    | -               | ≤ +40   | -                                 | -                             | -                                    | ✗                         | -                                       | -               | -           | ✗     | -           | -          | Variant B<br>Shaft 1.4571, shaft sleeve CrNiMo steel, nut A4/ AISI 316, key A2, casing wear ring (suction 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 water <sup>16)</sup>                                                               | -               | ≤ +60   | -                                 | ✗                             | -                                    | -                         | -                                       | -               | -           | -     | ✗           | -          | -                                                                                                                                                       |    |
| Partly desalinated water                                                                    | -               | ≤ +110  | ✗                                 | -                             | -                                    | ✗                         | -                                       | -               | -           | -     | ✗           | -          | -                                                                                                                                                       |    |

<sup>9)</sup> T = fluid temperature

<sup>10)</sup> For components made of bronze: ammonia (NH<sub>3</sub>) ≤ 5 mg/kg, free from hydrogen sulphide (H<sub>2</sub>S); no limitation of Cl content required in this case. Please contact the manufacturer if limits are exceeded.

<sup>11)</sup> General evaluation criteria for results of water analysis: pH ≥ 7; chlorides content (Cl) ≤ 250 mg/kg. Chlorine (Cl<sub>2</sub>) ≤ 0.6 mg/kg

<sup>12)</sup> Treatment to VdTUV 1466, additional requirement: O<sub>2</sub> t ≤ 0.02 mg/l

<sup>13)</sup> Antifreeze on ethylene glycol basis with inhibitors, content > 20 % to 50 % (e.g. Antifrogen N)

<sup>14)</sup> No ultra-pure water. Conductivity at 25 °C: ≤ 800 µS/cm, neutral with regard to chemical corrosion

<sup>15)</sup> For France, observe the applicable rules as per ministerial order dated 18 January 2002.

<sup>16)</sup> For France, ACS approval is required.

| Fluid handled                                                                | T <sup>9)</sup> |         | Materials                         |                               |                                      |                           |                                         | Shaft seal      |             |      |             | Comments |                                                                                                                                                     |
|------------------------------------------------------------------------------|-----------------|---------|-----------------------------------|-------------------------------|--------------------------------------|---------------------------|-----------------------------------------|-----------------|-------------|------|-------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                              |                 |         | Casing/impeller                   |                               |                                      |                           |                                         | Mechanical seal |             |      |             |          |                                                                                                                                                     |
|                                                                              | Minimum         | Maximum | Grey cast iron/<br>grey cast iron | Grey cast iron/<br>tin bronze | Nodular cast iron/<br>grey cast iron | Tin bronze/<br>tin bronze | CrNiMo cast steel/<br>CrNiMo cast steel | QEGG            | Q7Q7VGG-Y10 | QXGG | BQEGG DW001 |          | Q12Q1M1GG1                                                                                                                                          |
|                                                                              |                 |         |                                   |                               |                                      |                           |                                         |                 |             |      |             |          |                                                                                                                                                     |
| 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   | -                                 | -                             | ✗                                    | -                         | -                                       | -               | -           | ✗    | -           | -        | For versions 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 running dry due to excessive emptying of the tank, use an Etanorm with double mechanical seal in tandem arrangement. |
| Beer wort                                                                    | -               | ≤ +100  | ✗                                 | -                             | -                                    | -                         | -                                       | -               | -           | -    | -           | ✗        |                                                                                                                                                     |

## Overview of materials

**Table 11: Symbols key**

| Symbol | Description                          |
|--------|--------------------------------------|
| X      | Standard                             |
| -      | Version not available / not feasible |

**Table 12: Material variants available**

| Size          | GG | GB | GC | BB | SG | SB | SC | CC |
|---------------|----|----|----|----|----|----|----|----|
| 040-025-160   | X  | X  | X  | -  | X  | X  | X  | X  |
| 040-025-200   | X  | X  | X  | -  | X  | X  | X  | X  |
| 050-032-125.1 | X  | X  | X  | X  | X  | X  | X  | X  |
| 050-032-160.1 | X  | X  | X  | X  | X  | X  | X  | X  |
| 050-032-200.1 | X  | X  | X  | X  | X  | X  | X  | X  |
| 050-032-250.1 | X  | X  | X  | -  | -  | -  | -  | X  |
| 050-032-125   | X  | X  | X  | X  | -  | -  | -  | X  |
| 050-032-160   | X  | X  | X  | X  | X  | X  | X  | X  |
| 050-032-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 050-032-250   | X  | X  | X  | -  | X  | X  | X  | X  |
| 065-040-125   | X  | X  | X  | X  | -  | -  | -  | X  |
| 065-040-160   | X  | X  | X  | X  | X  | X  | X  | X  |
| 065-040-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 065-040-250   | X  | X  | X  | X  | X  | X  | X  | X  |
| 065-040-315   | X  | X  | X  | -  | X  | X  | X  | X  |
| 065-050-125   | X  | X  | X  | X  | -  | -  | -  | X  |
| 065-050-160   | X  | X  | X  | X  | X  | X  | X  | X  |
| 065-050-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 065-050-250   | X  | X  | X  | X  | X  | X  | X  | X  |
| 065-050-315   | X  | X  | X  | -  | X  | X  | X  | X  |
| 080-065-125   | X  | X  | X  | X  | -  | -  | -  | X  |
| 080-065-160   | X  | X  | X  | X  | X  | X  | X  | X  |
| 080-065-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 080-065-250   | X  | X  | X  | X  | X  | X  | X  | X  |
| 080-065-315   | X  | X  | X  | X  | X  | X  | X  | X  |
| 100-080-160   | X  | X  | X  | X  | X  | X  | X  | X  |
| 100-080-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 100-080-250   | X  | X  | X  | X  | X  | X  | X  | X  |
| 100-080-315   | X  | X  | X  | -  | X  | X  | X  | X  |
| 100-080-400   | X  | X  | X  | -  | -  | -  | -  | X  |
| 125-100-160   | X  | X  | X  | X  | X  | X  | X  | X  |
| 125-100-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 125-100-250   | X  | X  | X  | X  | X  | X  | X  | X  |
| 125-100-315   | X  | X  | X  | X  | X  | X  | X  | X  |
| 125-100-400   | X  | X  | X  | -  | -  | -  | -  | X  |
| 150-125-200   | X  | X  | X  | X  | X  | X  | X  | X  |
| 150-125-250   | X  | X  | X  | X  | X  | X  | X  | X  |
| 150-125-315   | X  | X  | X  | X  | X  | X  | X  | X  |
| 150-125-400   | X  | X  | X  | -  | X  | X  | X  | X  |
| 200-150-200   | X  | X  | X  | -  | -  | -  | -  | X  |
| 200-150-250   | X  | X  | X  | X  | -  | -  | -  | X  |
| 200-150-315   | X  | X  | X  | X  | X  | X  | X  | X  |
| 200-150-400   | X  | X  | X  | X  | X  | X  | X  | X  |

## Overview of pump size / motor combinations

Table 13: Symbols key

| Symbol | Description                          |
|--------|--------------------------------------|
| X      | Standard                             |
| -      | Version not available / not feasible |

Table 14: Available pump size / motor combinations

| Size          | n           |             |            | Motor (IEC) |    |    |     |     |     |     |     |     |     |     |     |     |
|---------------|-------------|-------------|------------|-------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|               | 2900 / 3500 | 1450 / 1750 | 960 / 1160 | 71          | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
|               | [rpm]       | [rpm]       | [rpm]      |             |    |    |     |     |     |     |     |     |     |     |     |     |
| 040-025-160   | X           | -           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 040-025-160   | -           | X           | -          | X           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 040-025-160   | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 040-025-200   | X           | -           | -          | -           | -  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 040-025-200   | -           | X           | -          | X           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 040-025-200   | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-125.1 | X           | -           | -          | X           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-125.1 | -           | X           | -          | X           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-125.1 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-160.1 | X           | -           | -          | -           | X  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 050-032-160.1 | -           | X           | -          | X           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-160.1 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-200.1 | X           | -           | -          | -           | -  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 050-032-200.1 | -           | X           | -          | X           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-200.1 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-250.1 | X           | -           | -          | -           | -  | -  | -   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 050-032-250.1 | -           | X           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-250.1 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-125   | X           | -           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-125   | -           | X           | -          | X           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-125   | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-160   | X           | -           | -          | -           | -  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 050-032-160   | -           | X           | -          | X           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-160   | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-200   | X           | -           | -          | -           | -  | -  | X   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 050-032-200   | -           | X           | -          | X           | X  | X  | X   | X   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-200   | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 050-032-250   | X           | -           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | -   | -   | -   | -   |
| 050-032-250   | -           | X           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |

| Size        | n           |             |            | Motor (IEC) |    |    |     |     |     |     |     |     |     |     |     |     |
|-------------|-------------|-------------|------------|-------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|             | 2900 / 3500 | 1450 / 1750 | 960 / 1160 | 71          | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
|             | [rpm]       | [rpm]       | [rpm]      |             |    |    |     |     |     |     |     |     |     |     |     |     |
| 050-032-250 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-125 | X           | -           | -          | -           | -  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 065-040-125 | -           | X           | -          | X           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-125 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-160 | X           | -           | -          | -           | -  | -  | X   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 065-040-160 | -           | X           | -          | X           | X  | X  | X   | X   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-160 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-200 | X           | -           | -          | -           | -  | -  | -   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 065-040-200 | -           | X           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-200 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-250 | X           | -           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | -   | -   | -   | -   |
| 065-040-250 | -           | X           | -          | -           | X  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 065-040-250 | -           | -           | X          | -           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-040-315 | X           | -           | -          | -           | -  | -  | -   | -   | -   | X   | X   | X   | X   | X   | -   | -   |
| 065-040-315 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 065-040-315 | -           | -           | X          | -           | -  | -  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-125 | X           | -           | -          | -           | -  | X  | X   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 065-050-125 | -           | X           | -          | X           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-125 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-160 | X           | -           | -          | -           | -  | -  | -   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 065-050-160 | -           | X           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-160 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-200 | X           | -           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | -   | -   | -   | -   |
| 065-050-200 | -           | X           | -          | -           | X  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 065-050-200 | -           | -           | X          | -           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-250 | X           | -           | -          | -           | -  | -  | -   | -   | -   | X   | X   | X   | -   | -   | -   | -   |
| 065-050-250 | -           | X           | -          | -           | -  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 065-050-250 | -           | -           | X          | -           | X  | X  | X   | X   | -   | -   | -   | -   | -   | -   | -   | -   |
| 065-050-315 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | -   |
| 065-050-315 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 065-050-315 | -           | -           | X          | -           | -  | -  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 080-065-125 | X           | -           | -          | -           | -  | -  | X   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 080-065-125 | -           | X           | -          | X           | X  | X  | X   | X   | -   | -   | -   | -   | -   | -   | -   | -   |
| 080-065-125 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 080-065-160 | X           | -           | -          | -           | -  | -  | -   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 080-065-160 | -           | X           | -          | -           | X  | X  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 080-065-160 | -           | -           | X          | -           | X  | X  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |

| Size        | n           |             |            | Motor (IEC) |    |    |     |     |     |     |     |     |     |     |     |     |
|-------------|-------------|-------------|------------|-------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|             | 2900 / 3500 | 1450 / 1750 | 960 / 1160 | 71          | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
|             | [rpm]       | [rpm]       | [rpm]      |             |    |    |     |     |     |     |     |     |     |     |     |     |
| 080-065-200 | X           | -           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | -   | -   | -   | -   |
| 080-065-200 | -           | X           | -          | -           | -  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 080-065-200 | -           | -           | X          | -           | X  | X  | X   | X   | -   | -   | -   | -   | -   | -   | -   | -   |
| 080-065-250 | X           | -           | -          | -           | -  | -  | -   | -   | -   | X   | X   | X   | X   | X   | X   | X   |
| 080-065-250 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 080-065-250 | -           | -           | X          | -           | -  | -  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 080-065-315 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | -   | X   | X   | X   | X   | X   |
| 080-065-315 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 080-065-315 | -           | -           | X          | -           | -  | -  | -   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 100-080-160 | X           | -           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | -   | -   | -   | -   |
| 100-080-160 | -           | X           | -          | -           | X  | X  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 100-080-160 | -           | -           | X          | -           | X  | X  | X   | -   | -   | -   | -   | -   | -   | -   | -   | -   |
| 100-080-200 | X           | -           | -          | -           | -  | -  | -   | -   | -   | X   | X   | X   | X   | X   | X   | -   |
| 100-080-200 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | -   | -   | -   | -   | -   |
| 100-080-200 | -           | -           | X          | -           | -  | -  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 100-080-250 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | X   |
| 100-080-250 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 100-080-250 | -           | -           | X          | -           | -  | -  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 100-080-315 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | -   | -   | X   | X   | X   | X   |
| 100-080-315 | -           | X           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | X   | -   | -   | -   |
| 100-080-315 | -           | -           | X          | -           | -  | -  | -   | -   | X   | X   | -   | -   | -   | -   | -   | -   |
| 100-080-400 | -           | X           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | -   |
| 125-100-160 | X           | -           | -          | -           | -  | -  | -   | -   | -   | X   | X   | X   | X   | X   | X   | -   |
| 125-100-160 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 125-100-160 | -           | -           | X          | -           | -  | -  | X   | X   | -   | -   | -   | -   | -   | -   | -   | -   |
| 125-100-200 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | X   |
| 125-100-200 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | X   | -   | -   | -   | -   |
| 125-100-200 | -           | -           | X          | -           | -  | -  | X   | X   | X   | -   | -   | -   | -   | -   | -   | -   |
| 125-100-250 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | -   | X   | X   | X   | X   | X   |
| 125-100-250 | -           | X           | -          | -           | -  | -  | -   | X   | X   | X   | X   | X   | X   | -   | -   | -   |
| 125-100-250 | -           | -           | X          | -           | -  | -  | -   | X   | X   | X   | -   | -   | -   | -   | -   | -   |
| 125-100-315 | -           | X           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | X   | -   | -   | -   |
| 125-100-315 | -           | -           | X          | -           | -  | -  | -   | -   | X   | X   | -   | -   | -   | -   | -   | -   |
| 125-100-400 | -           | X           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | X   |
| 150-125-200 | X           | -           | -          | -           | -  | -  | -   | -   | -   | -   | -   | X   | X   | X   | X   | X   |
| 150-125-200 | -           | X           | -          | -           | -  | -  | X   | X   | X   | X   | X   | X   | X   | -   | -   | -   |
| 150-125-200 | -           | -           | X          | -           | -  | -  | -   | X   | X   | -   | -   | -   | -   | -   | -   | -   |

| Size        | n           |             |            | Motor (IEC) |    |    |     |     |     |     |     |     |     |     |     |     |
|-------------|-------------|-------------|------------|-------------|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|             | 2900 / 3500 | 1450 / 1750 | 960 / 1160 | 71          | 80 | 90 | 100 | 112 | 132 | 160 | 180 | 200 | 225 | 250 | 280 | 315 |
|             | [rpm]       | [rpm]       | [rpm]      |             |    |    |     |     |     |     |     |     |     |     |     |     |
| 150-125-250 | -           | X           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | X   | -   | -   | -   |
| 150-125-250 | -           | -           | X          | -           | -  | -  | -   | -   | X   | X   | -   | -   | -   | -   | -   | -   |
| 150-125-315 | -           | X           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | -   |
| 150-125-400 | -           | X           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | X   |
| 200-150-200 | -           | X           | -          | -           | -  | -  | -   | X   | X   | X   | X   | X   | X   | -   | -   | -   |
| 200-150-200 | -           | -           | X          | -           | -  | -  | -   | -   | X   | X   | -   | -   | -   | -   | -   | -   |
| 200-150-250 | -           | X           | -          | -           | -  | -  | -   | -   | X   | X   | X   | X   | X   | -   | -   | -   |
| 200-150-250 | -           | -           | X          | -           | -  | -  | -   | -   | X   | X   | X   | -   | -   | -   | -   | -   |
| 200-150-315 | -           | X           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | X   |
| 200-150-400 | -           | X           | -          | -           | -  | -  | -   | -   | -   | -   | X   | X   | X   | X   | X   | X   |

## Overview of functions for variable speed version

Table 15: Overview of functions

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

| Functions / firmware | PumpDrive 2 | PumpDrive 2 Eco  |
|----------------------|-------------|------------------|
| Control panel        | ✗           | ✗ <sup>17)</sup> |
| Commissioning wizard | ✗           | ✗ <sup>18)</sup> |
| Favourites list      | ✗           | -                |
| Service interface    | ✗           | ✗                |

## Pressure limits and temperature limits

### Test pressure limits and temperature limits

**Table 16:** Pressure limits and temperature limits as a function of material variant

| Material variant | Fluid temperature <sup>19)20)</sup> | Test pressure <sup>21)</sup> |
|------------------|-------------------------------------|------------------------------|
|                  | [°C]                                | [bar]                        |
| GG, GC           | -30 to +140                         | 21                           |
| GB               | -30 to +140                         | 21                           |
| SG, SB, SC       | -30 to +140                         | 25                           |
| BB               | -30 to +140                         | 15                           |
| CC               | -30 to +140                         | 21                           |

### In-service pressure limits and temperature limits

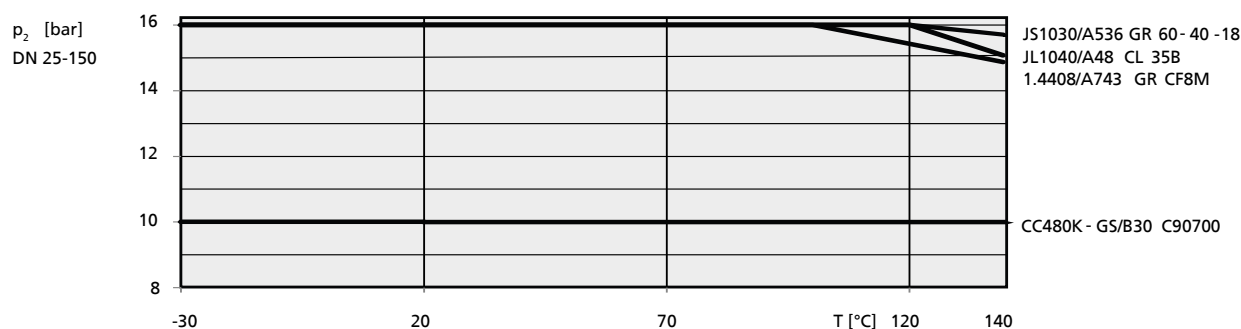


**Fig. 1:** Pump pressure limits and temperature limits DN 25 - DN 150

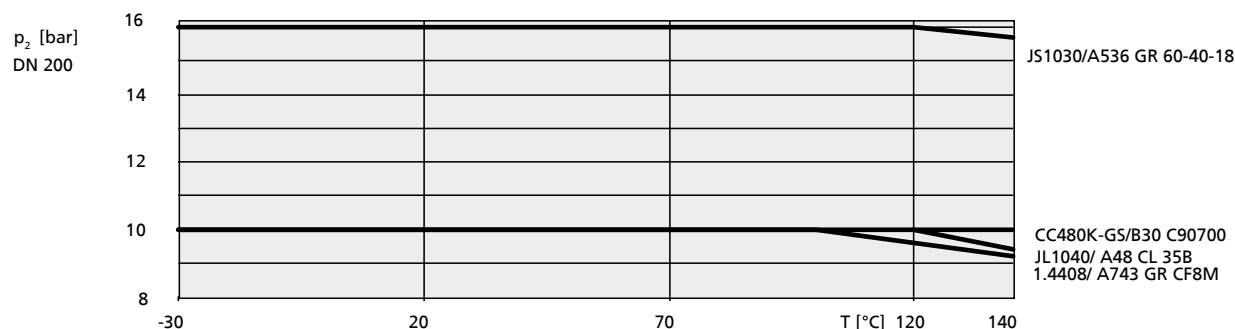


**Fig. 2:** Pump pressure limits and temperature limits DN 200

<sup>17</sup> Some functions can only be parameterised and/or displayed using the KSB ServiceTool (see operating manual).

<sup>18</sup> Only available via KSB ServiceTool or app

<sup>19</sup> For hot water heating systems to DIN 4752, Section 4.5, application limits must be observed.

<sup>20</sup> For fluid temperatures >140 °C use Etanorm SYT.

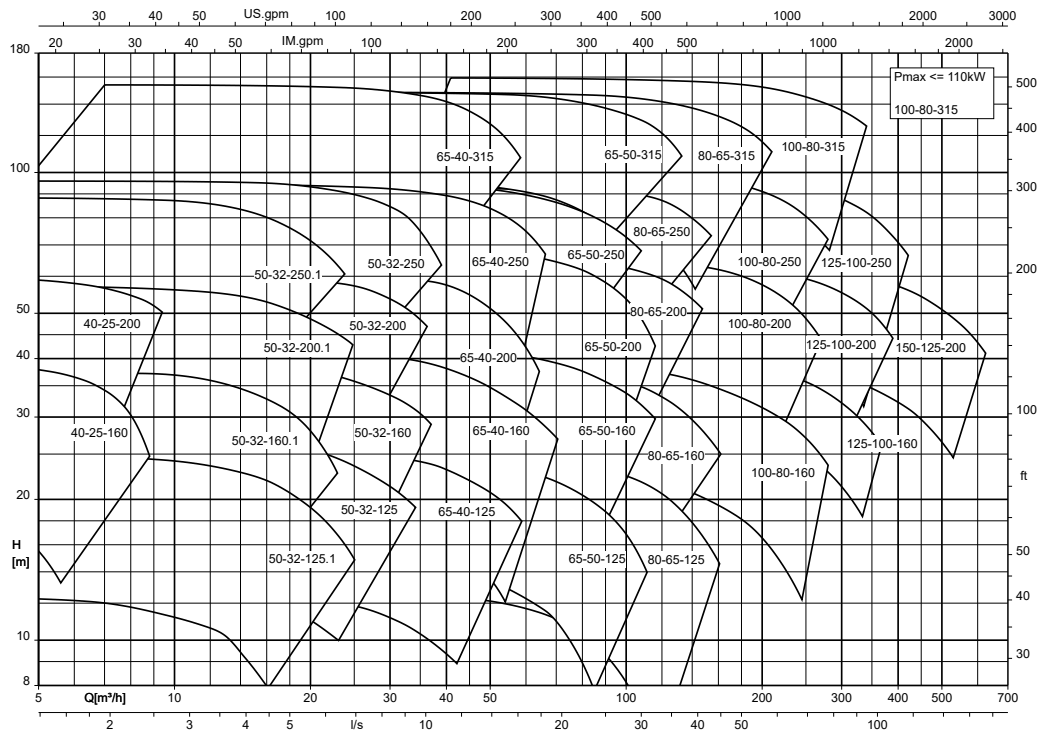
<sup>21</sup> The casing components have been checked for leakage by means of internal pressure tests to ZN 1650 with water.

**Technical data**
**Etabloc**
**Table 17: Technical data**

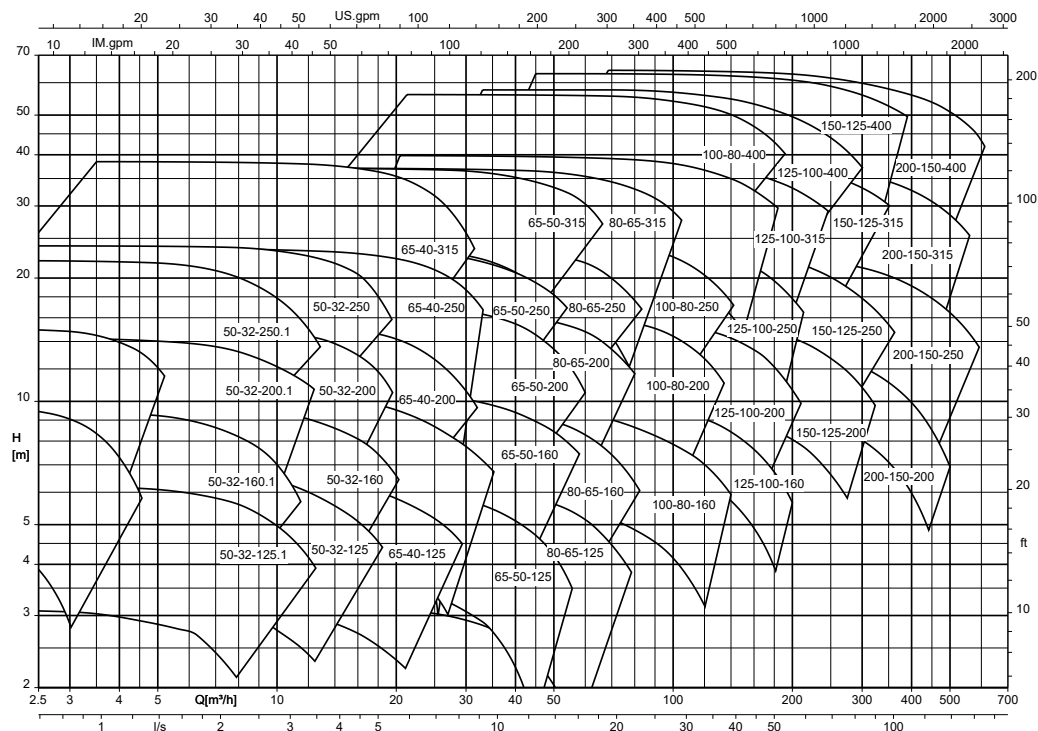
| Size          | Shaft unit | Impeller              |               |                          |                           |         | Speed limit |         |
|---------------|------------|-----------------------|---------------|--------------------------|---------------------------|---------|-------------|---------|
|               |            | Impeller outlet width | Free pas-sage | Impeller inlet dia-meter | Nominal impeller diameter |         | Maximum     | Minimum |
|               |            |                       |               |                          | Maximum                   | Minimum |             |         |
|               |            | [mm]                  |               |                          |                           |         | [rpm]       |         |
| 040-025-160   | WS_25      | 6,0                   | 5,7           | 45,2                     | 169                       | 135     | 3600        | 500     |
| 040-025-200   | WS_25      | 6,0                   | 5,7           | 45,2                     | 209                       | 165     | 3600        | 500     |
| 050-032-125.1 | WS_25      | 6,8                   | 6,0           | 52,4                     | 139                       | 104     | 3600        | 500     |
| 050-032-160.1 | WS_25      | 5,7                   | 5,4           | 52,7                     | 170                       | 135     | 4400        | 500     |
| 050-032-200.1 | WS_25      | 5,6                   | 5,3           | 54,0                     | 204                       | 168     | 3800        | 500     |
| 050-032-250.1 | WS_25      | 5,5                   | 5,2           | 58,3                     | 254                       | 200     | 3600        | 500     |
| 050-032-125   | WS_25      | 9,8                   | 5,7           | 63,4                     | 139                       | 104     | 3600        | 500     |
| 050-032-160   | WS_25      | 8,5                   | 5,8           | 60,6                     | 174                       | 132     | 3600        | 500     |
| 050-032-200   | WS_25      | 7,0                   | 6,7           | 62,9                     | 209                       | 170     | 3700        | 500     |
| 050-032-250   | WS_25      | 7,5                   | 7,1           | 62,6                     | 261                       | 205     | 3600        | 500     |
| 065-040-125   | WS_25      | 14,0                  | 9,6           | 73,9                     | 139                       | 104     | 3600        | 500     |
| 065-040-160   | WS_25      | 13,0                  | 11,5          | 70,0                     | 174                       | 128     | 4400        | 500     |
| 065-040-200   | WS_25      | 9,4                   | 8,9           | 69,4                     | 209                       | 160     | 3700        | 500     |
| 065-040-250   | WS_25      | 8,4                   | 8,0           | 74,1                     | 260                       | 195     | 3600        | 500     |
| 065-040-315   | WS_35      | 7,5                   | 7,1           | 75,3                     | 326                       | 260     | 3000        | 500     |
| 065-050-125   | WS_25      | 19,9                  | 11,6          | 87,9                     | 142                       | 112     | 4500        | 500     |
| 065-050-160   | WS_25      | 16,9                  | 11,6          | 86,9                     | 174                       | 128     | 4400        | 500     |
| 065-050-200   | WS_25      | 13,8                  | 11,9          | 83,6                     | 219                       | 170     | 3600        | 500     |
| 065-050-250   | WS_25      | 10,5                  | 10,0          | 84,0                     | 260                       | 215     | 3600        | 500     |
| 065-050-315   | WS_35      | 10,0                  | 9,5           | 87,0                     | 323                       | 265     | 3000        | 500     |
| 080-065-125   | WS_25      | 25,8                  | 12,9          | 99,0                     | 141                       | 109     | 3900        | 500     |
| 080-065-160   | WS_25      | 21,0                  | 12,2          | 91,9                     | 174                       | 132     | 3900        | 500     |
| 080-065-200   | WS_25      | 17,0                  | 13,3          | 99,7                     | 219                       | 165     | 3600        | 500     |
| 080-065-250   | WS_35      | 15,1                  | 14,3          | 101,0                    | 260                       | 215     | 3600        | 500     |
| 080-065-315   | WS_35      | 13,7                  | 14,0          | 108,2                    | 320                       | 245     | 3000        | 500     |
| 100-080-160   | WS_25      | 31,6                  | 15,1          | 124,0                    | 174                       | 138     | 3600        | 500     |
| 100-080-200   | WS_35      | 24,5                  | 15,2          | 115,3                    | 219                       | 165     | 3600        | 500     |
| 100-080-250   | WS_35      | 19,0                  | 15,8          | 115,1                    | 269                       | 215     | 3600        | 500     |
| 100-080-315   | WS_35      | 18,7                  | 17,8          | 115,6                    | 334                       | 265     | 3000        | 500     |
| 100-080-400   | WS_55      | 15,0                  | 14,3          | 129,9                    | 398                       | 315     | 1900        | 500     |
| 125-100-160   | WS_35      | 37,6                  | 16,4          | 135,4                    | 185                       | 162     | 3600        | 500     |
| 125-100-200   | WS_35      | 32,5                  | 17,9          | 142,0                    | 219                       | 170     | 3600        | 500     |
| 125-100-250   | WS_35      | 27,0                  | 18,8          | 145,0                    | 269                       | 210     | 3600        | 500     |
| 125-100-315   | WS_35      | 23,0                  | 19,9          | 142,1                    | 334                       | 250     | 3000        | 500     |
| 125-100-400   | WS_55      | 18,0                  | 17,1          | 142,8                    | 401                       | 317     | 1900        | 500     |
| 150-125-200   | WS_35      | 40,7                  | 21,1          | 159,2                    | 224                       | 182     | 3600        | 500     |
| 150-125-250   | WS_35      | 37,0                  | 22,4          | 162,4                    | 269                       | 218     | 2000        | 500     |
| 150-125-315   | WS_55      | 30,9                  | 22,6          | 162,3                    | 334                       | 270     | 1900        | 500     |
| 150-125-400   | WS_55      | 25,9                  | 20,9          | 162,4                    | 419                       | 330     | 1800        | 500     |
| 200-150-200   | WS_35      | 59,5                  | 25,2          | 179,4                    | 224                       | 188     | 2100        | 500     |
| 200-150-250   | WS_35      | 48,8                  | 23,0          | 191,0                    | 269                       | 220     | 1800        | 500     |
| 200-150-315   | WS_55      | 39,7                  | 26,9          | 191,5                    | 334                       | 264     | 1800        | 500     |
| 200-150-400   | WS_55      | 33,0                  | 23,8          | 191,4                    | 419                       | 330     | 1800        | 500     |

## Selection charts

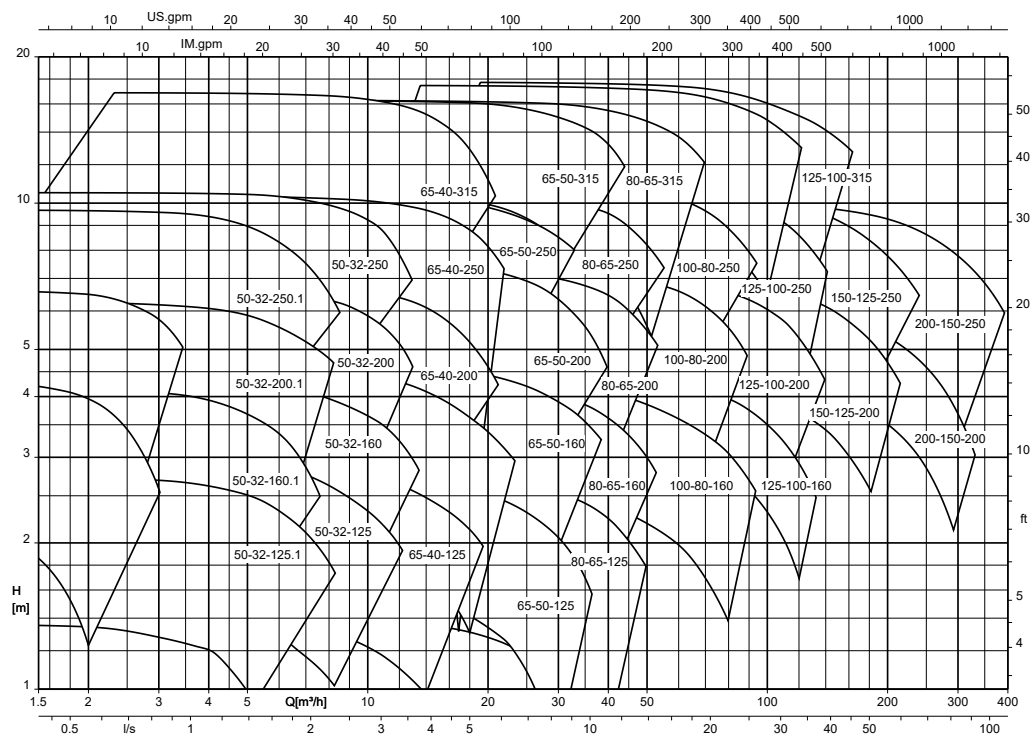
Etabloc, n = 2900 rpm (fixed speed version)



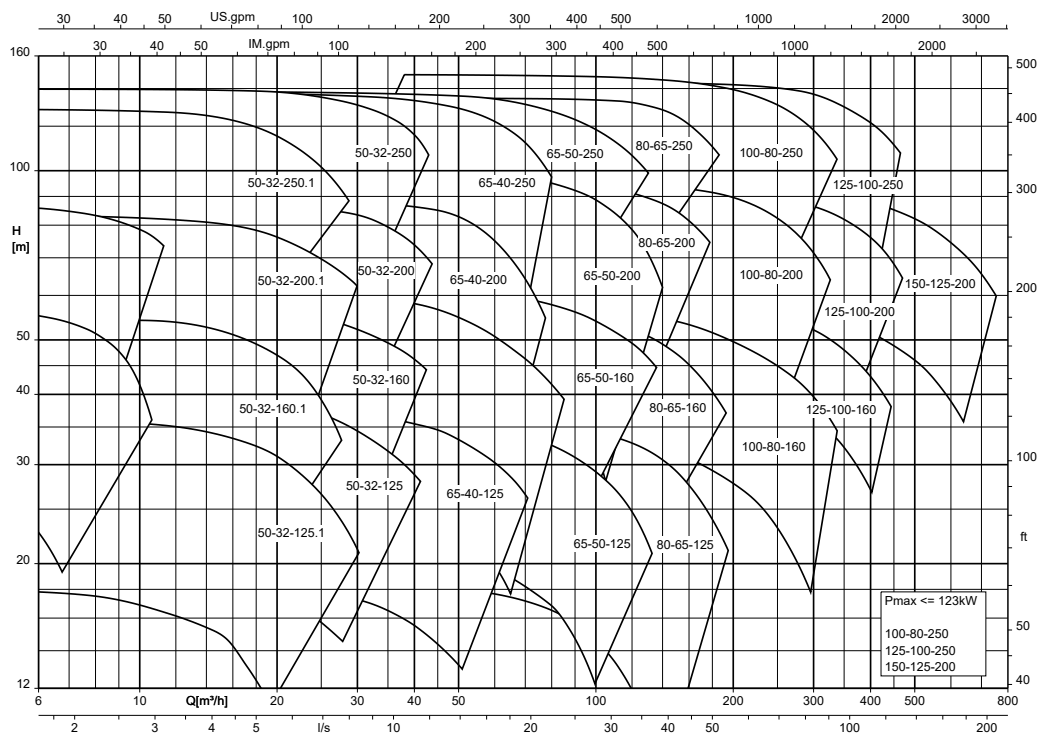
Etabloc, n = 1450 rpm (fixed speed version)



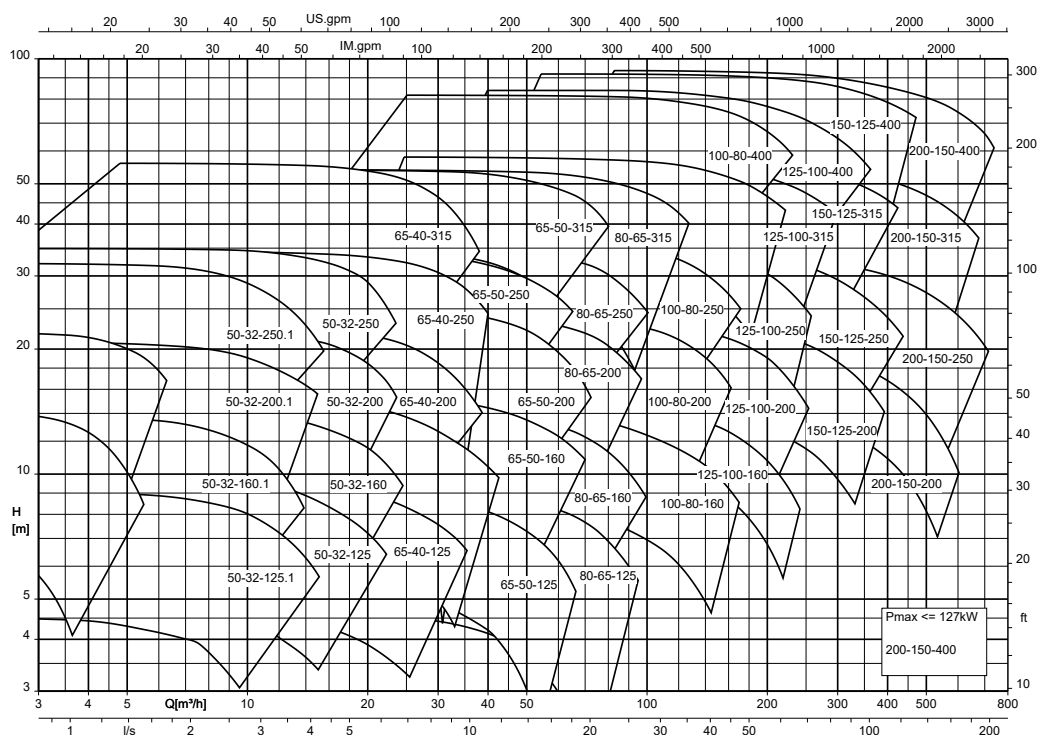
**Etabloc, n = 960 rpm (fixed speed version)**



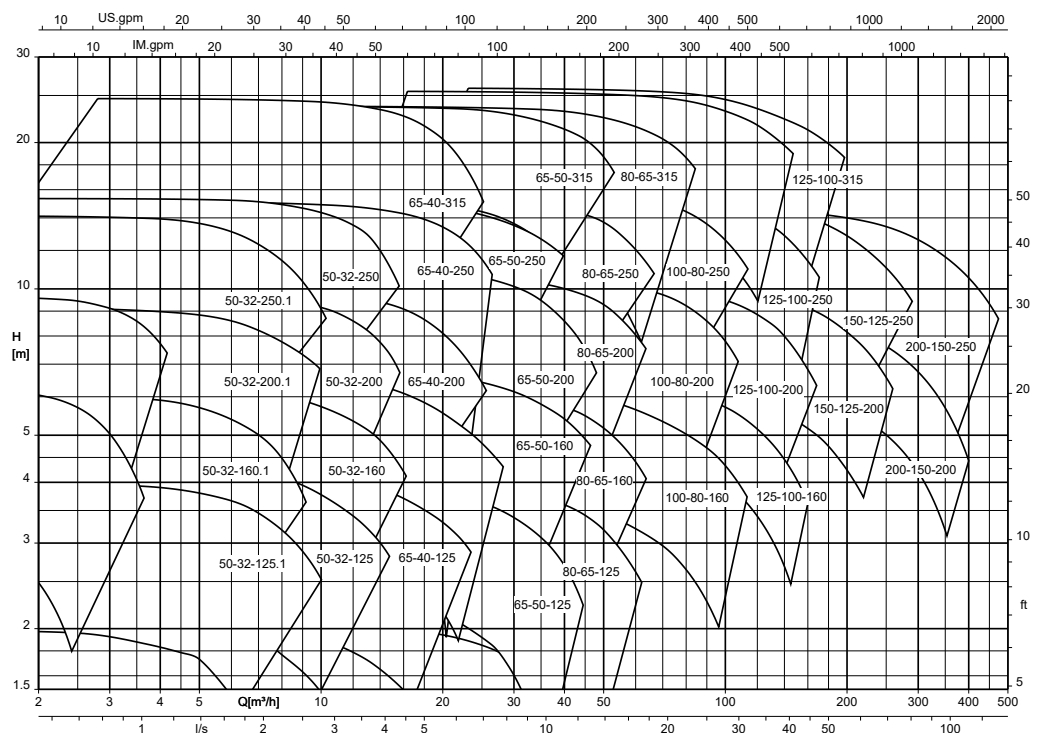
**Etabloc, n = 3500 rpm (fixed speed version)**



Etabloc, n = 1750 rpm (fixed speed version)



Etabloc, n = 1160 rpm (fixed speed version)



## Connections

Single mechanical seal in A-type cover (AV), API Plan 03 (⇒ Page 6) / Single mechanical seal in A-type cover with internal circulation (IA), API Plan: 01 (⇒ Page 6)

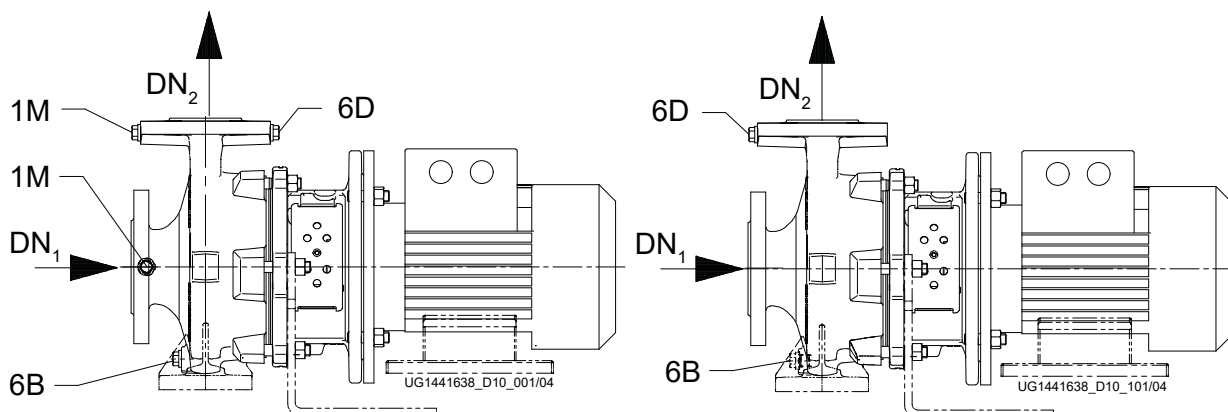


Fig. 3: Left: Version with pressure gauge connection; right: Version without pressure gauge connection

Single mechanical seal in A-type cover with external circulation (EA), API Plan: 11 (⇒ Page 6)

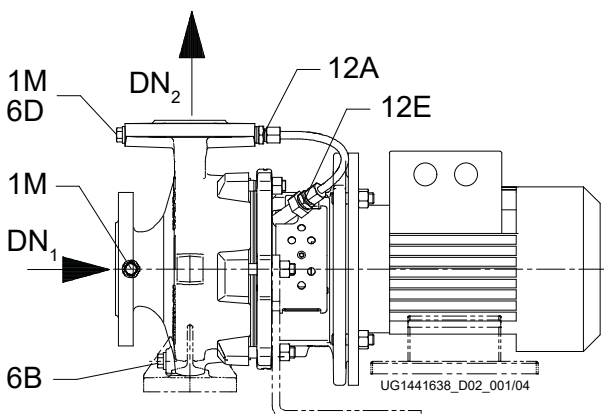


Fig. 4: Version with pressure gauge connection

Single mechanical seal in A-type cover with external flushing (FA), API Plan: 32 (⇒ Page 6)

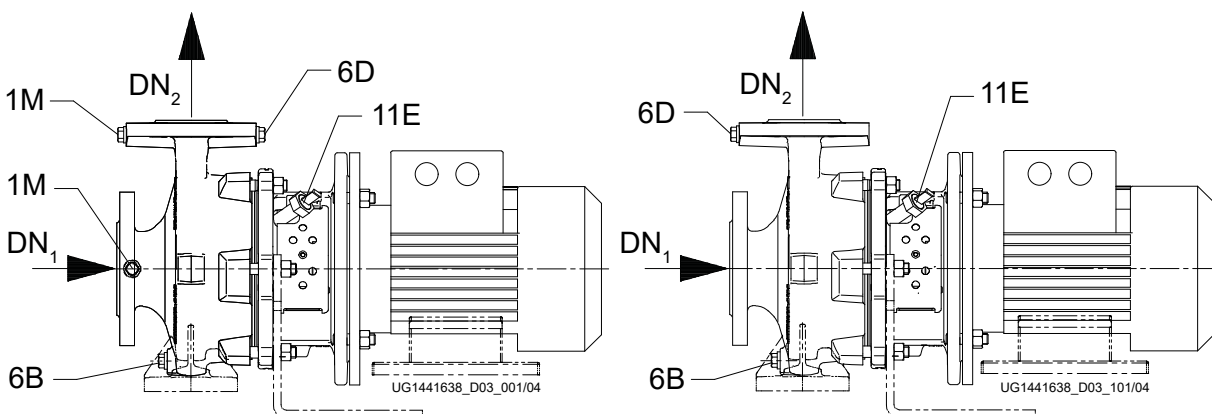


Fig. 5: Left: Version with pressure gauge connection; right: Version without pressure gauge connection

Single mechanical seal in A-type cover (AV) with discharge nozzle turned by 90°, API Plan: 03 (⇒ Page 6)

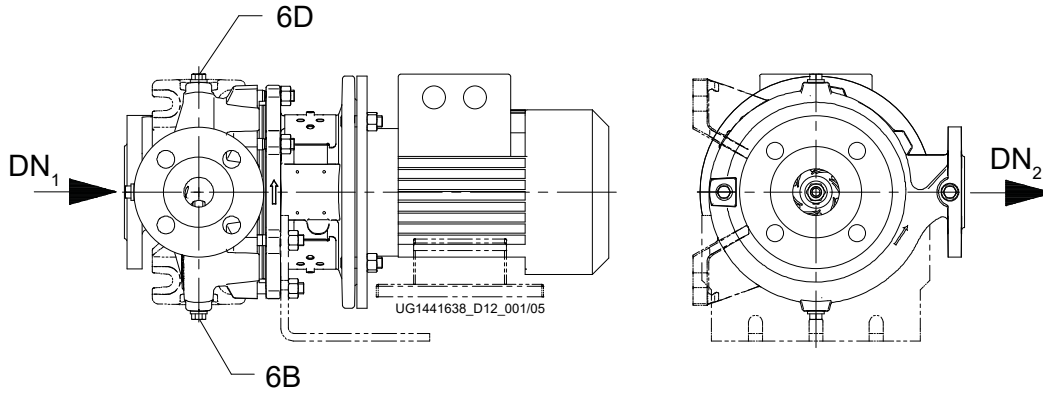


Fig. 6: Version without pressure gauge connection

Single mechanical seal in A-type cover with venting if vertically installed (AV), API Plan: 03 (⇒ Page 6)

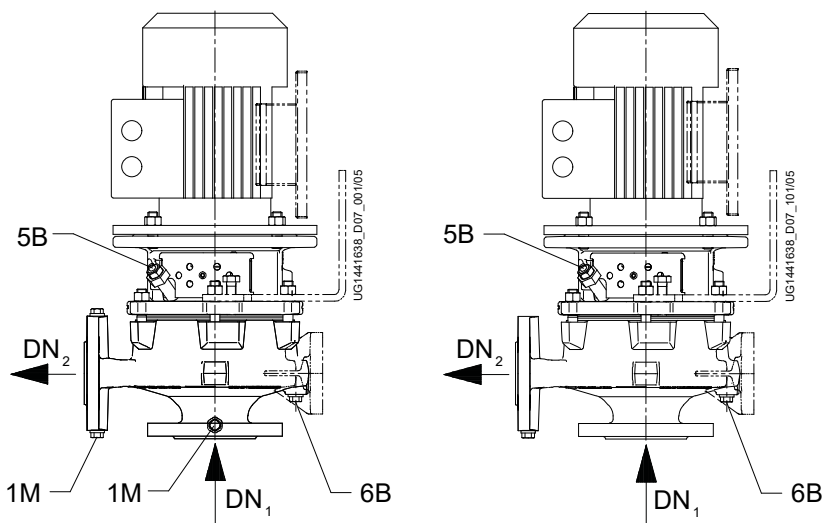


Fig. 7: Left: Version with pressure gauge connection; right: Version without pressure gauge connection

Single mechanical seal in A-type cover with external flushing (FA) and venting if vertically installed, API Plan: 32 (⇒ Page 6)

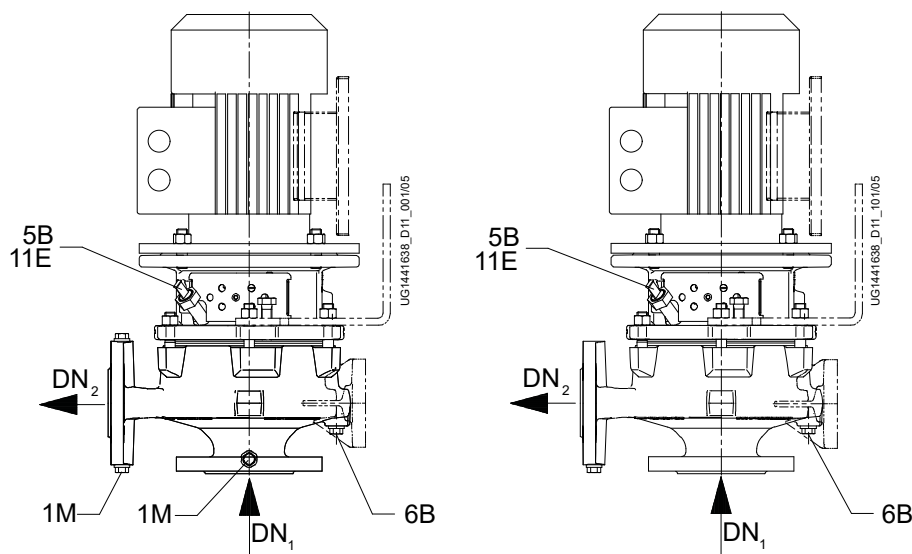


Fig. 8: Left: Version with pressure gauge connection; right: Version without pressure gauge connection

Double mechanical seal in back-to-back arrangement (DB), API Plan: 53A (⇒ Page 6)

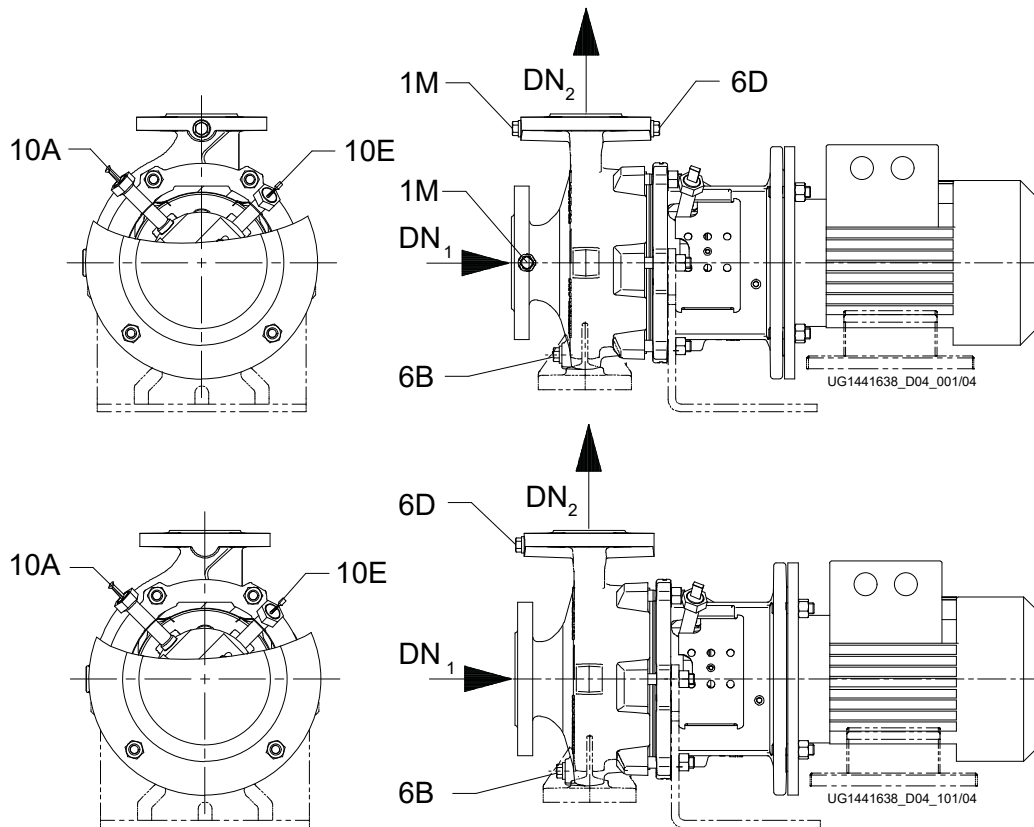


Fig. 9: Top: Version with pressure gauge connection; bottom: Version without pressure gauge connection

Double mechanical seal in tandem arrangement (TI), API Plan: 52/55 (⇒ Page 6)

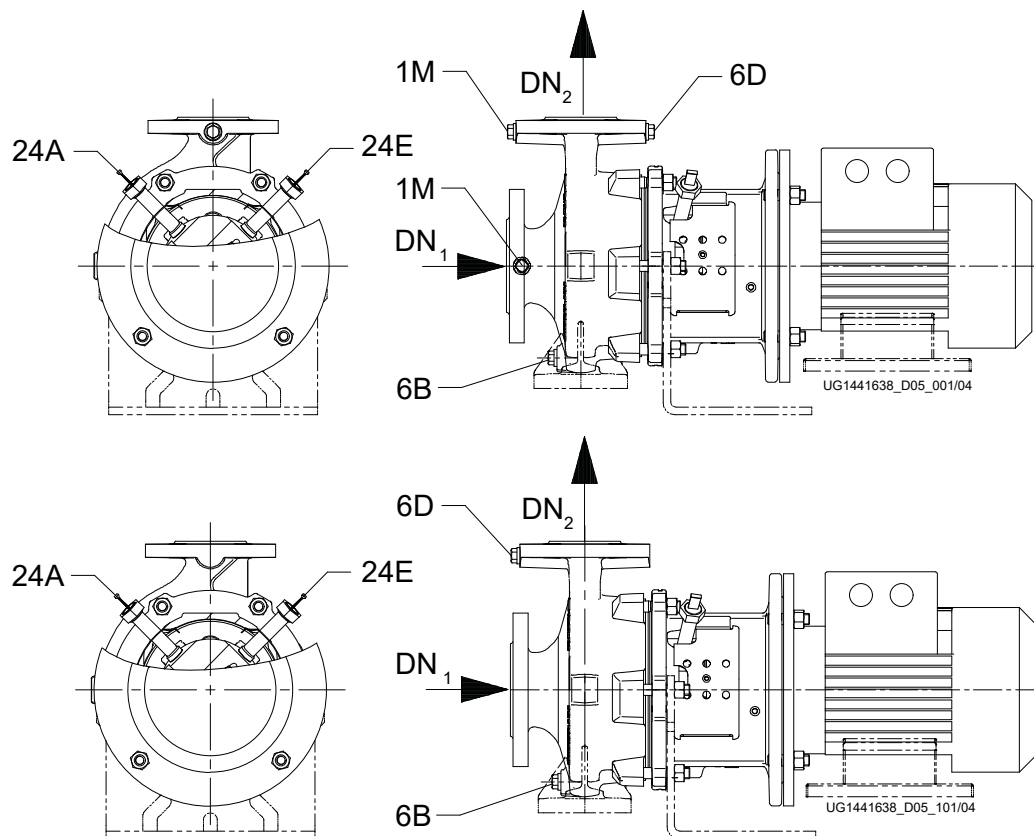


Fig. 10: Top: Version with pressure gauge connection; bottom: Version without pressure gauge connection

**Table 18:** Connections, \* = optional

| Connection | Description                    | Configuration                              | Position                       |
|------------|--------------------------------|--------------------------------------------|--------------------------------|
| 1M*        | Pressure gauge with connection | On pump set with pressure sensor           | DN <sub>2</sub>                |
| 1M*        | Pressure gauge with connection | Drilled and closed or with pressure sensor | DN <sub>1</sub>                |
| 5B         | Vent                           | Connection G 1/4 fitting, closed           | -                              |
| 6B         | Fluid drain                    | Drilled and closed                         | -                              |
| 6D         | Fluid priming and venting      | Drilled and closed                         | DN <sub>2</sub> , suction side |
| 6D*        | Fluid priming and venting      | Drilled and closed                         | DN <sub>2</sub> , drive end    |
| 10A*       | External barrier water outlet  | Connection G 1/4 fitting, closed           | -                              |
| 10E*       | External barrier water inlet   | Connection G 1/4 fitting, closed           | -                              |
| 11E*       | Flushing liquid inlet          | Connection G 1/4 fitting, closed           | -                              |
| 12A*       | Circulation liquid outlet      | Drilled and connected                      | DN <sub>2</sub> , drive end    |
| 12E*       | Circulation liquid inlet       | Drilled and connected                      | -                              |
| 24A*       | Quench fluid outlet            | Connection G 1/4 fitting, closed           | -                              |
| 24E*       | Quench fluid inlet             | Connection G 1/4 fitting, closed           | -                              |

**Table 19:** Connections

| Size          | Shaft unit | Pump casing material |       |             |       |       |       |             |
|---------------|------------|----------------------|-------|-------------|-------|-------|-------|-------------|
|               |            | G, B, C, S           |       |             |       |       |       |             |
|               |            | Connection           |       |             |       |       |       |             |
|               |            | 1M / 6B / 6D         | 5B    | 10A/<br>10E | 11E   | 12A   | 12E   | 24A/<br>24E |
| 040-025-160   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 040-025-200   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-125.1 | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-160.1 | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-200.1 | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-250.1 | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-125   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-160   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-200   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 050-032-250   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-040-125   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-040-160   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-040-200   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-040-250   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-040-315   | 35         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-050-125   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-050-160   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-050-200   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-050-250   | 25         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 065-050-315   | 35         | G 1/4                | G 1/4 | G 1/4       | G 1/4 | G 1/4 | G 1/4 | G 1/4       |
| 080-065-125   | 25         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 080-065-160   | 25         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 080-065-200   | 25         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 080-065-250   | 35         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 080-065-315   | 35         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 100-080-160   | 25         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 100-080-200   | 35         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 100-080-250   | 35         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 100-080-315   | 35         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 100-080-400   | 55         | G 3/8                | G 1/4 | G 1/4       | G 1/4 | G 3/8 | G 1/4 | G 1/4       |
| 125-100-160   | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 125-100-200   | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 125-100-250   | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 125-100-315   | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 125-100-400   | 55         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 150-125-200   | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 150-125-250   | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |

| Size        | Shaft unit | Pump casing material |       |             |       |       |       |             |
|-------------|------------|----------------------|-------|-------------|-------|-------|-------|-------------|
|             |            | G, B, C, S           |       |             |       |       |       |             |
|             |            | Connection           |       |             |       |       |       |             |
|             |            | 1M / 6B / 6D         | 5B    | 10A/<br>10E | 11E   | 12A   | 12E   | 24A/<br>24E |
| 150-125-315 | 55         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 150-125-400 | 55         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 200-150-200 | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 200-150-250 | 35         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 200-150-315 | 55         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |
| 200-150-400 | 55         | G 1/2                | G 1/4 | G 1/4       | G 1/4 | G 1/2 | G 1/4 | G 1/4       |

### Discharge nozzle positions

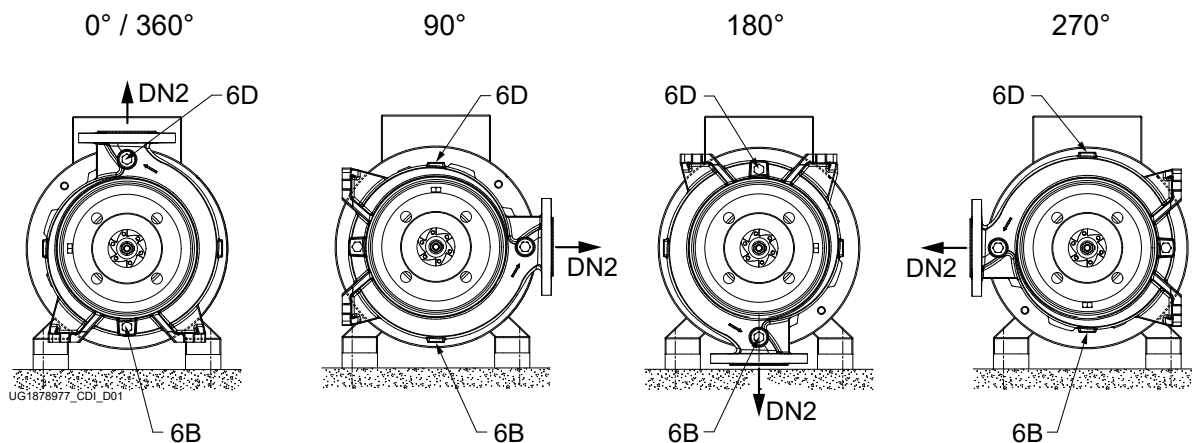


Fig. 11: Nozzle positions

Table 20: Overview

| Nozzle position<br>Discharge nozzle | Material variant |    |    |            | Installation |          | Possible options |           |
|-------------------------------------|------------------|----|----|------------|--------------|----------|------------------|-----------|
|                                     | GG, GB, GC       | BB | CC | SG, SB, SC | Horizontal   | Vertical | PumpDrive        | PumpMeter |
| 0°                                  | X                | X  | X  | X          | X            | X        | X                | X         |
| 90°                                 | X                | -  | X  | -          | X            | X        | X                | -         |
| 180°                                | X                | X  | X  | X          | X            | X        | X                | X         |
| 270°                                | X                | -  | X  | -          | X            | X        | X                | -         |

### Flange design

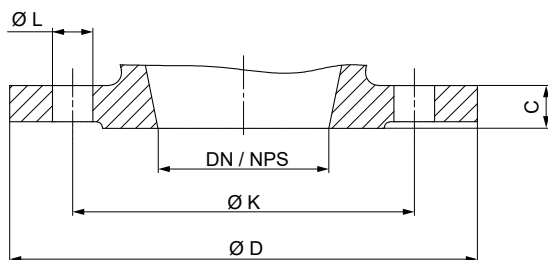


Fig. 12: Flange dimensions

**Flange dimensions to EN 1092-1, EN 1092-3**
**Table 21: 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 |     |              |
|                                      | Ø D                               | Ø K | Number x Ø L | Ø D       | Ø K | Number x Ø L | Ø D   | Ø K | Number x Ø L |
| 25                                   | 115                               | 85  | 4 x Ø 14     | -         | -   | -            | 115   | 85  | 4 x Ø 14     |
| 32                                   | 140                               | 100 | 4 x Ø 18     | -         | -   | -            | 140   | 100 | 4 x Ø 18     |
| 40                                   | 150                               | 110 | 4 x Ø 18     | -         | -   | -            | 150   | 110 | 4 x Ø 18     |
| 50                                   | 165                               | 125 | 4 x Ø 18     | -         | -   | -            | 165   | 125 | 4 x Ø 18     |
| 65                                   | 185                               | 145 | 4 x Ø 18     | -         | -   | -            | 185   | 145 | 4 x Ø 18     |
| 80 (DN <sub>1</sub> ) <sup>22)</sup> | 229                               | 160 | 8 x Ø 18     | -         | -   | -            | 230   | 160 | 8 x Ø 18     |
| 80 (DN <sub>2</sub> ) <sup>23)</sup> | 200                               | 160 | 8 x Ø 18     | -         | -   | -            | 200   | 160 | 8 x Ø 18     |
| 100                                  | 229                               | 180 | 8 x Ø 18     | -         | -   | -            | 230   | 180 | 8 x Ø 18     |
| 125                                  | 254                               | 210 | 8 x Ø 18     | -         | -   | -            | 255   | 210 | 8 x Ø 18     |
| 150                                  | 285                               | 240 | 8 x Ø 22     | -         | -   | -            | 285   | 240 | 8 x Ø 22     |
| 200                                  | 343                               | 295 | 8 x Ø 22     | 345       | 295 | 8 x Ø 22     | -     | -   | -            |

**Flange dimensions to EN 1092-2**
**Table 22: Flange dimensions [mm]**

| Nominal size                         | Standard                          |     |              |       |     |              |       |     |              |
|--------------------------------------|-----------------------------------|-----|--------------|-------|-----|--------------|-------|-----|--------------|
|                                      | EN 1092-2                         |     |              |       |     |              |       |     |              |
|                                      | Material variant of volute casing |     |              |       |     |              |       |     |              |
|                                      | G                                 |     |              |       |     |              | S     |     |              |
|                                      | PN 10                             |     |              | PN 16 |     |              | PN 16 |     |              |
|                                      | Ø D                               | Ø K | Number x Ø L | Ø D   | Ø K | Number x Ø L | Ø D   | Ø K | Number x Ø L |
| 25                                   | -                                 | -   | -            | 115   | 85  | 4 x Ø 14     | 115   | 85  | 4 x Ø 14     |
| 32                                   | -                                 | -   | -            | 140   | 100 | 4 x Ø 19     | 140   | 100 | 4 x Ø 19     |
| 40                                   | -                                 | -   | -            | 150   | 110 | 4 x Ø 19     | 150   | 110 | 4 x Ø 19     |
| 50                                   | -                                 | -   | -            | 165   | 125 | 4 x Ø 19     | 165   | 125 | 4 x Ø 19     |
| 65                                   | -                                 | -   | -            | 185   | 145 | 4 x Ø 19     | 185   | 145 | 4 x Ø 19     |
| 80 (DN <sub>1</sub> ) <sup>22)</sup> | -                                 | -   | -            | 229   | 160 | 8 x Ø 19     | 229   | 160 | 8 x Ø 19     |
| 80 (DN <sub>2</sub> ) <sup>23)</sup> | -                                 | -   | -            | 200   | 160 | 8 x Ø 19     | 200   | 160 | 8 x Ø 19     |
| 100                                  | -                                 | -   | -            | 229   | 180 | 8 x Ø 19     | 229   | 180 | 8 x Ø 19     |
| 125                                  | -                                 | -   | -            | 254   | 210 | 8 x Ø 19     | 254   | 210 | 8 x Ø 19     |
| 150                                  | -                                 | -   | -            | 285   | 240 | 8 x Ø 23     | 285   | 240 | 8 x Ø 23     |
| 200                                  | 343                               | 295 | 8 x Ø 23     | -     | -   | -            | 343   | 295 | 12 x Ø 23    |

**Flange drilled to: ASME B 16.1, Class 125, ASME B 16.5, Class 150**
**Table 23: 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   |       |              |
|               | Ø D                                            | Ø K | Number x Ø L | Ø D | Ø K   | Number x Ø L |
|               | Ø D                                            | Ø K | Number x Ø L | Ø D | Ø K   | Number x Ø L |
| 25/ NPS 1     | 115                                            | 79  | 4 x Ø 15,7   | 115 | 79,2  | 4 x Ø 15,9   |
| 32/ NPS 1 1/4 | 140                                            | 89  | 4 x Ø 15,7   | 140 | 88,9  | 4 x Ø 15,9   |
| 40/ NPS 1 1/2 | 150                                            | 98  | 4 x Ø 15,7   | 150 | 98,6  | 4 x Ø 15,9   |
| 50/ NPS 2     | 165                                            | 121 | 4 x Ø 19,1   | 165 | 120,7 | 4 x Ø 19,1   |
| 65/ NPS 2 1/2 | 185                                            | 140 | 4 x Ø 19,1   | 185 | 139,7 | 4 x Ø 19,1   |

<sup>22</sup> Suction flange; suction line NPS 4 must be used.

<sup>23</sup> Discharge flange

| Nominal size                                | Standard                                       |     |              |     |       |              |
|---------------------------------------------|------------------------------------------------|-----|--------------|-----|-------|--------------|
|                                             | ASME B 16.1, Class 125, ASME B 16.5, Class 150 |     |              |     |       |              |
|                                             | Material variant of volute casing              |     |              |     |       |              |
|                                             | B, G, S                                        |     |              | C   |       |              |
|                                             | Ø D                                            | Ø K | Number x Ø L | Ø D | Ø K   | Number x Ø L |
| 80/ NPS 3 (DN <sub>1</sub> ) <sup>22)</sup> | 229                                            | 191 | 8 x Ø 19,1   | 230 | 190,5 | 8 x Ø 19,1   |
| 80/ NPS 3 (DN <sub>2</sub> ) <sup>23)</sup> | 200                                            | 152 | 4 x Ø 19,1   | 200 | 152,4 | 4 x Ø 19,1   |
| 100/ NPS 4                                  | 229                                            | 191 | 8 x Ø 19,1   | 230 | 190,5 | 8 x Ø 19,1   |
| 125/ NPS 5                                  | 254                                            | 216 | 8 x Ø 22,4   | 255 | 215,9 | 8 x Ø 22,2   |
| 150/ NPS 6                                  | 285                                            | 241 | 8 x Ø 22,4   | 285 | 241,3 | 8 x Ø 22,2   |
| 200/ NPS 8                                  | 345                                            | 299 | 8 x Ø 22,4   | 345 | 298,5 | 8 x Ø 22,2   |

**Table 24:** Flange design by materials

| Material variant | Standard                             | Nominal size   | Pressure class           |
|------------------|--------------------------------------|----------------|--------------------------|
| GG, GB, GC       | EN 1092-2                            | DN 25 - DN 150 | PN 16                    |
|                  |                                      | DN 200         | PN 10                    |
|                  | Drilled to ASME B16.1 <sup>24)</sup> | DN 25 - DN 200 | Class 125 <sup>25)</sup> |
| SG, SB, SC       | EN 1092-2                            | DN 25 - DN 200 | PN 16                    |
|                  | Drilled to ASME B16.1 <sup>24)</sup> | DN 25 - DN 200 | Class 125 <sup>25)</sup> |
| BB               | EN 1092-3                            | DN 25 - DN 200 | PN 10                    |
|                  | Drilled to ASME B16.1 <sup>24)</sup> | DN 25 - DN 200 | Class 125 <sup>26)</sup> |
| CC               | EN 1092-1                            | DN 25 - DN 150 | PN 16                    |
|                  |                                      | DN 200         | PN 10                    |
|                  | Drilled to ASME B16.5 <sup>24)</sup> | DN 25 - DN 200 | Class 150                |

<sup>24)</sup> Suction-side DN 80 machined like DN 100

<sup>25)</sup> Nozzle drilled to Class 125 with pressure class PN 16

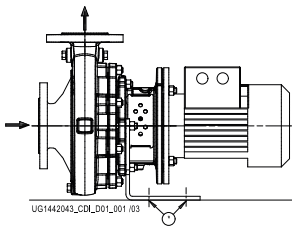
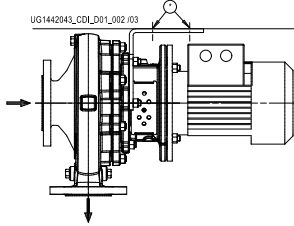
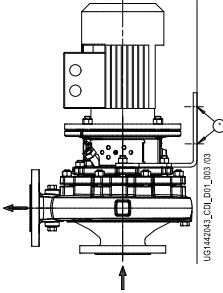
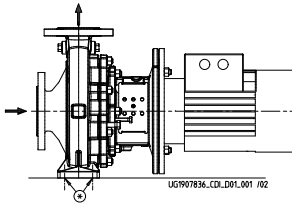
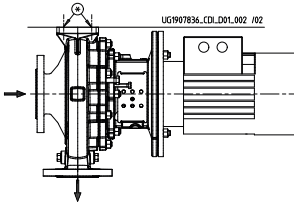
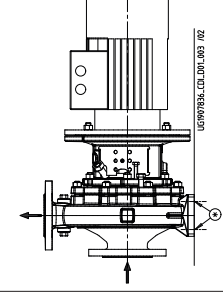
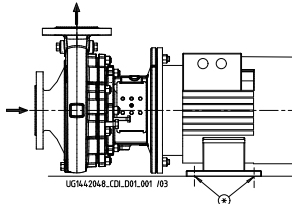
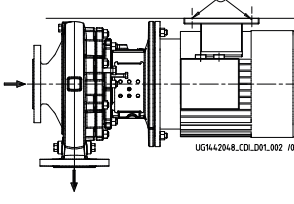
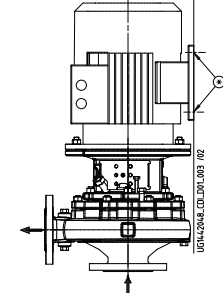
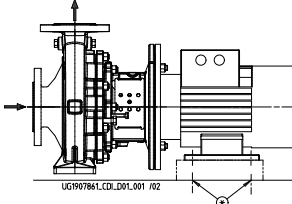
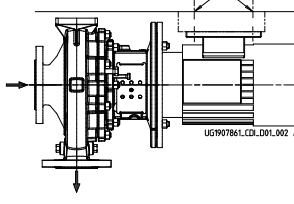
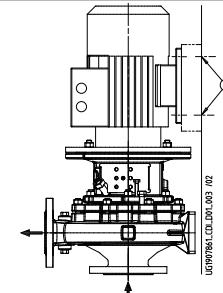
<sup>26)</sup> Nozzle drilled to Class 125 with pressure class PN 10

## Installation types

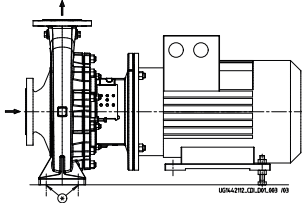
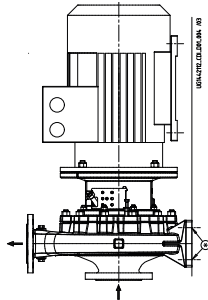
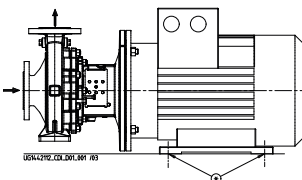
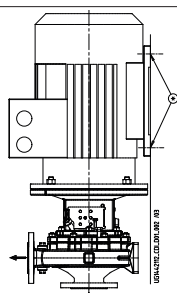
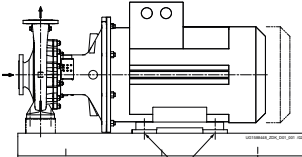
Table 25: Symbols key

| Symbol | Description                                                            |
|--------|------------------------------------------------------------------------|
| *      | Symbolises areas in which the pump set is connected to the foundation. |
| A      | PumpDrive, motor-mounted                                               |
| B      | PumpDrive, wall-mounted                                                |
| C      | PumpDrive, cabinet-mounted                                             |
| O      | Without PumpDrive                                                      |

Table 26: Overview of installation types

| IEC motor  | Pump foot provided | Fastening                                                    | Installation types incl. PumpDrive variants                                         |                                                                                      |                                                                                       |
|------------|--------------------|--------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|            |                    |                                                              | Horizontal installation, floor-mounted                                              | Horizontal installation, ceiling-mounted                                             | Vertical installation                                                                 |
| 71 to 112  | No                 | Support foot <sup>27)</sup> or suspended in the piping       |    |    |    |
|            |                    |                                                              | A • B • C • O                                                                       | B • C • O                                                                            | A • B • C • O                                                                         |
|            | Yes                | Volute casing foot <sup>27)</sup> or suspended in the piping |  |  |  |
|            |                    |                                                              | A • B • C • O                                                                       | B • C • O                                                                            | A • B • C • O                                                                         |
| 132 to 180 | No                 | Motor foot <sup>27)</sup>                                    |  |  |  |
|            |                    |                                                              | A • B • C • O                                                                       | B • C • O                                                                            | A • B • C • O                                                                         |
|            | Yes                | Motor foot <sup>27)</sup>                                    |  |  |  |
|            |                    |                                                              | A • B • C • O                                                                       | B • C • O                                                                            | A • B • C • O                                                                         |

<sup>27)</sup> Shims may be required. The required shims are **not** included in KSB's scope of supply.

| IEC motor  | Pump foot provided | Fastening                                                                       | Installation types incl. PumpDrive variants                                         |                                          |                                                                                      |
|------------|--------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------------------------------|
|            |                    |                                                                                 | Horizontal installation, floor-mounted                                              | Horizontal installation, ceiling-mounted | Vertical installation                                                                |
| 132 to 180 | Yes                | Motor foot <sup>27)</sup>                                                       | A • B • C • O                                                                       | B • C • O                                | A • B • C • O                                                                        |
| 200 to 315 | Yes                | Pump foot <sup>27)</sup> ; motor foot supported but not fastened                |    | Not available                            |   |
|            |                    |                                                                                 | 200 to 225: A • B • C • O<br>250 to 315: O                                          | -                                        | 200 to 225: A • B • C • O<br>250 to 315: O                                           |
|            |                    | Motor foot <sup>27)</sup> ; pump foot supported <sup>27)</sup> but not fastened |    | Not available                            |  |
|            |                    |                                                                                 | 200 to 225: A • B • C • O<br>250 to 315: O                                          | -                                        | 200 to 225: A • B • C • O<br>250 to 315: O                                           |
| 250 to 315 | Yes                | Pump set on base-plate; motor fastened, shims under pump                        |  | Not available                            | Not available                                                                        |
|            |                    |                                                                                 | O                                                                                   | -                                        | -                                                                                    |

### Scope of supply

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

- Pump
- Drive
- PumpDrive
- PumpMeter

### Recommended spare parts stock

**Table 27:** 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/.02 | Mechanical seal <sup>28)</sup> | 1               | 1 | 1 | 2 | 2 | 2 | 2 | 3  | 3  | 25 %        |
| 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 %       |
| 400.15     | Gasket <sup>28)</sup>          | 2               | 4 | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 150 %       |
| 411.15     | Joint ring <sup>28)</sup>      | 2               | 4 | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 150 %       |
| 412.15     | O-ring <sup>28)</sup>          | 2               | 4 | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 150 %       |

**Table 28:** 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 %        |
| 433        | Mechanical seal                       | 1               | 1 | 1 | 2 | 2 | 2 | 2 | 3  | 3  | 25 %        |
| 433.01/.02 | Mechanical seal <sup>28)</sup>        | 1               | 1 | 1 | 2 | 2 | 2 | 2 | 3  | 3  | 25 %        |
| 502.01/.02 | Casing wear ring <sup>29)</sup> (set) | 1               | 2 | 2 | 2 | 3 | 3 | 3 | 4  | 4  | 50 %        |
| 523        | Shaft sleeve                          | 1               | 2 | 2 | 2 | 3 | 3 | 3 | 4  | 4  | 50 %        |
| 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 %       |
| 400.15     | Gasket <sup>28)</sup>                 | 2               | 4 | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 150 %       |
| 411.15     | Joint ring <sup>28)</sup>             | 2               | 4 | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 150 %       |
| 412.15     | O-ring <sup>28)</sup>                 | 2               | 4 | 6 | 8 | 8 | 9 | 9 | 12 | 12 | 150 %       |

<sup>28)</sup> For double mechanical seal

<sup>29)</sup> If any

## General assembly drawings

### Version with single mechanical seal and bolted casing cover

**Table 29:** 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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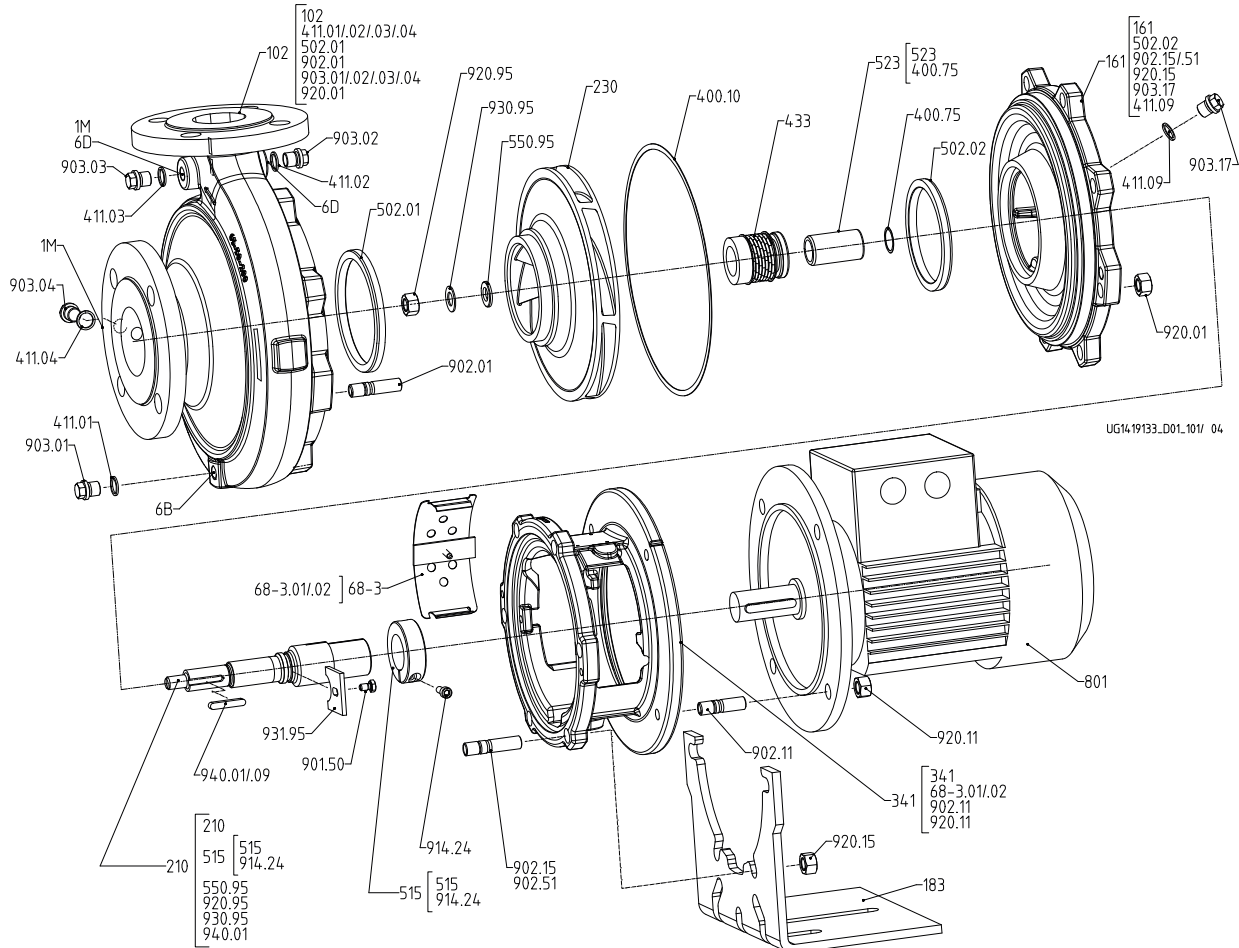


**Fig. 13:** Version with single mechanical seal and bolted casing cover, without pump foot

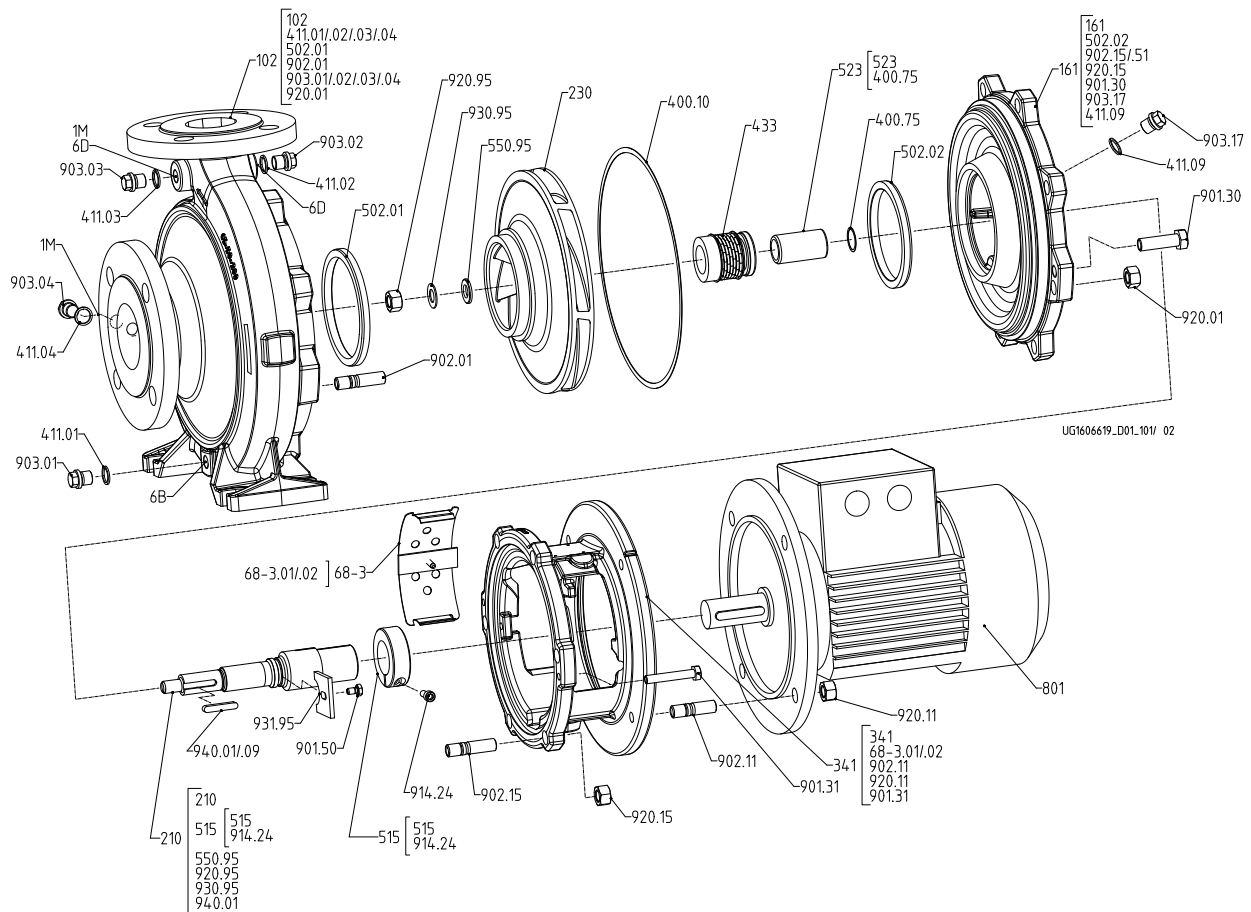


Fig. 14: Version with single mechanical seal and bolted casing cover, with pump foot

Table 30: List of components<sup>30)</sup>

| Part No.                   | Description          | Part No.                                       | Description                   |
|----------------------------|----------------------|------------------------------------------------|-------------------------------|
| 102                        | Volute casing        | 523                                            | Shaft sleeve                  |
| 146                        | Intermediate lantern | 550.95                                         | Disc                          |
| 161                        | Casing cover         | 68-3.01/.02                                    | Cover plate                   |
| 183                        | Support foot         | 801                                            | Flanged motor                 |
| 210                        | Shaft                | 901.30 <sup>31)</sup> /.31 <sup>31)</sup> /.50 | Hexagon head bolt             |
| 230                        | Impeller             | 902.01/.06/.11/.15/.50/.51                     | Stud                          |
| 341                        | Drive lantern        | 903.01/.02/.03/.04/.08 <sup>32)</sup> /.17     | Screw plug                    |
| 400.10/.75                 | Gasket               | 914.24                                         | Hexagon socket head cap screw |
| 411.01/.02/.03/.04/.08/.09 | Joint ring           | 920.01/.06/.11/.15/.95                         | Nut                           |
| 433                        | Mechanical seal      | 930.95                                         | Spring washer                 |
| 502.01/.02                 | Casing wear ring     | 931.95                                         | Lock washer                   |
| 515                        | Locking ring         | 940.01/09 <sup>33)</sup>                       | Key                           |

Table 31: Connections

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

<sup>30</sup> Some individual components might not be applicable, depending on the pump size and material.

<sup>31</sup> Not available for version without pump foot

<sup>32</sup> Not shown in the drawing

<sup>33</sup> For shaft unit 55 only

**Table 32:** This illustration applies to the following pump sizes:

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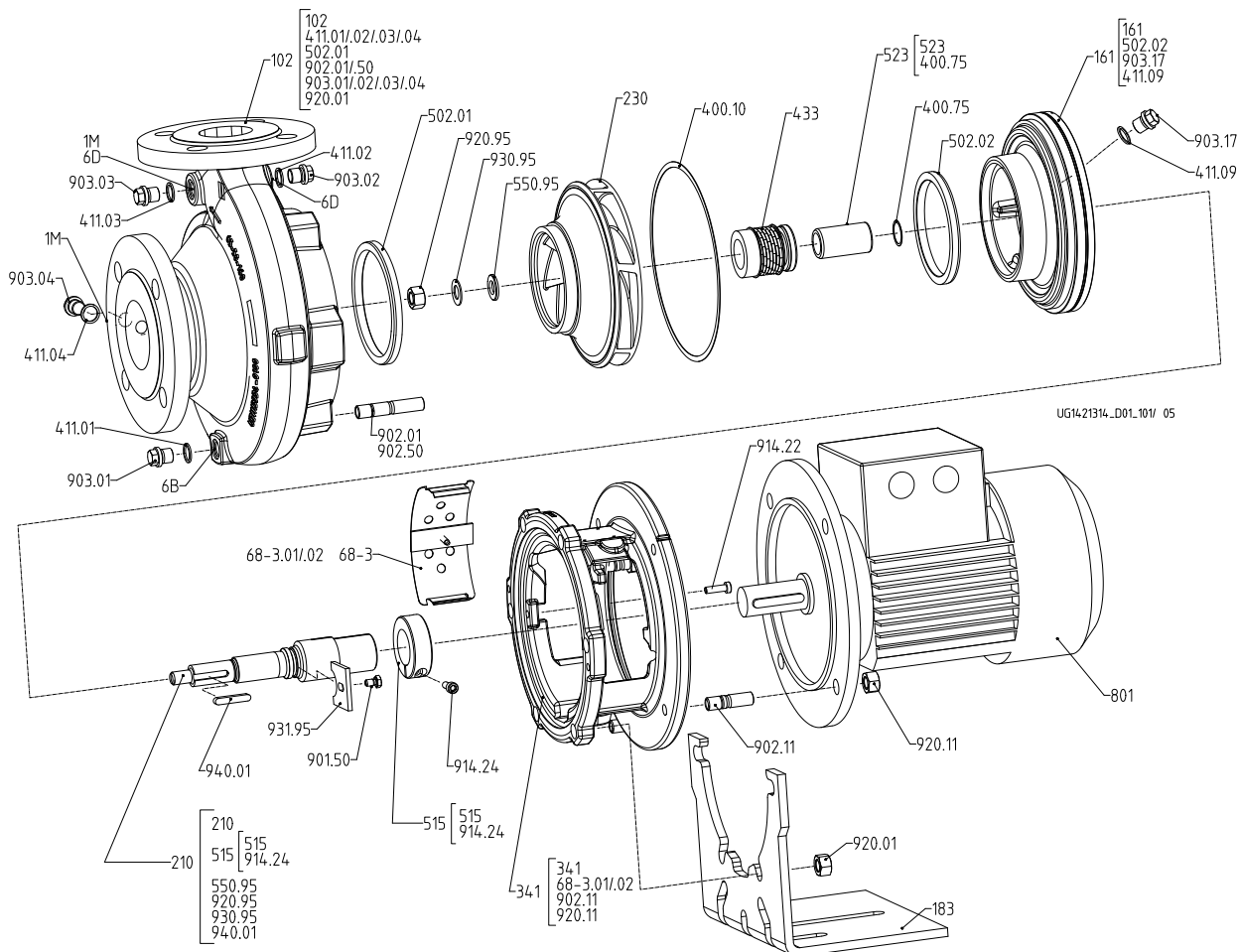


**Fig. 15:** Version with single mechanical seal and clamped casing cover, without pump foot

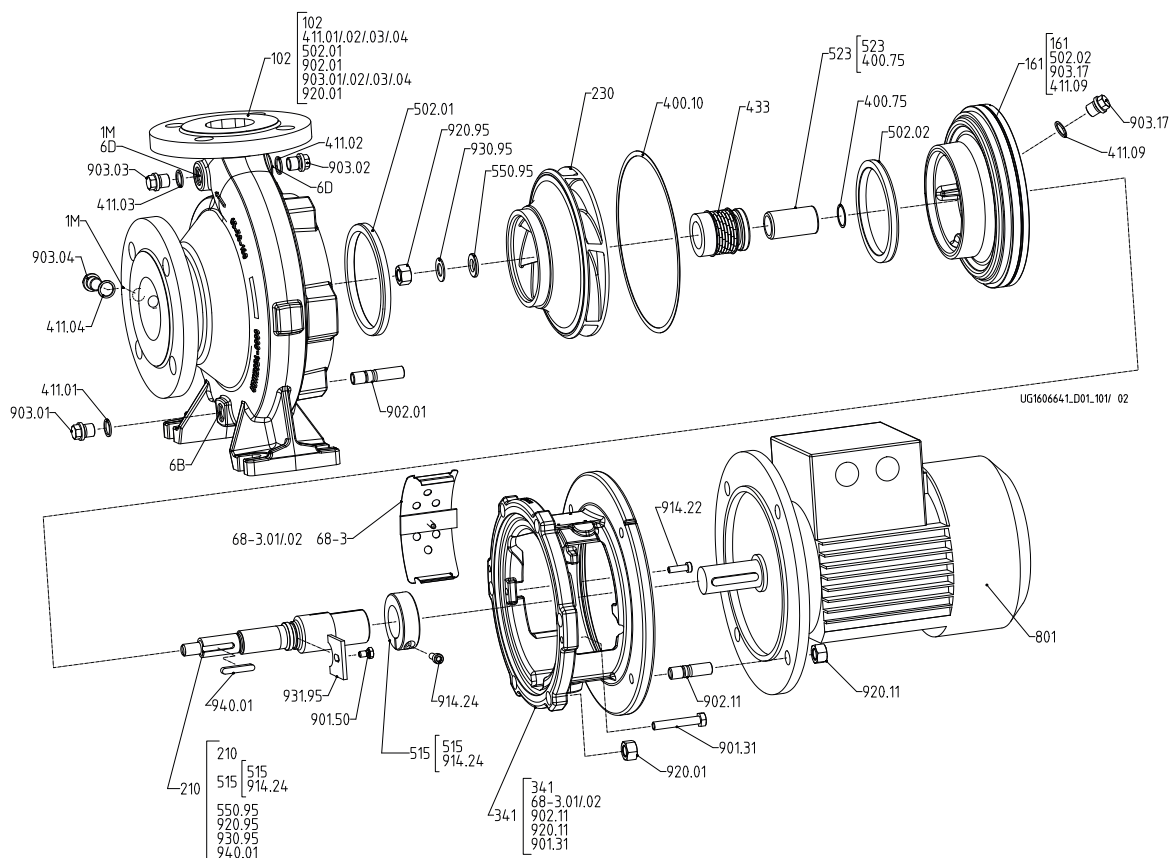


Fig. 16: Version with single mechanical seal and clamped casing cover, with pump foot

Table 33: List of components<sup>34)</sup>

| Part No.                   | Description          | Part No.                   | Description                   |
|----------------------------|----------------------|----------------------------|-------------------------------|
| 102                        | Volute casing        | 523                        | Shaft sleeve                  |
| 146                        | Intermediate lantern | 550.95                     | Disc                          |
| 161                        | Casing cover         | 68-3.01/.02                | Cover plate                   |
| 183                        | Support foot         | 801                        | Flanged motor                 |
| 210                        | Shaft                | 901.31 <sup>35)</sup> /.50 | Hexagon head bolt             |
| 230                        | Shaft                | 902.01/.06/.11/.15/.50/.51 | Stud                          |
| 341                        | Drive lantern        | 903.01/.02/.03/.04/.08/.17 | Screw plug                    |
| 400.10/.75                 | Gasket               | 914.22/.24                 | Hexagon socket head cap screw |
| 411.01/.02/.03/.04/.08/.09 | Joint ring           | 920.01/.06/.11/.15/.95     | Hexagon nut                   |
| 433                        | Mechanical seal      | 930.95                     | Spring washer                 |
| 502.01/.02 <sup>36)</sup>  | Casing wear ring     | 931.95                     | Lock washer                   |
| 515                        | Locking ring         | 940.01                     | Key                           |

Table 34: Connections

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

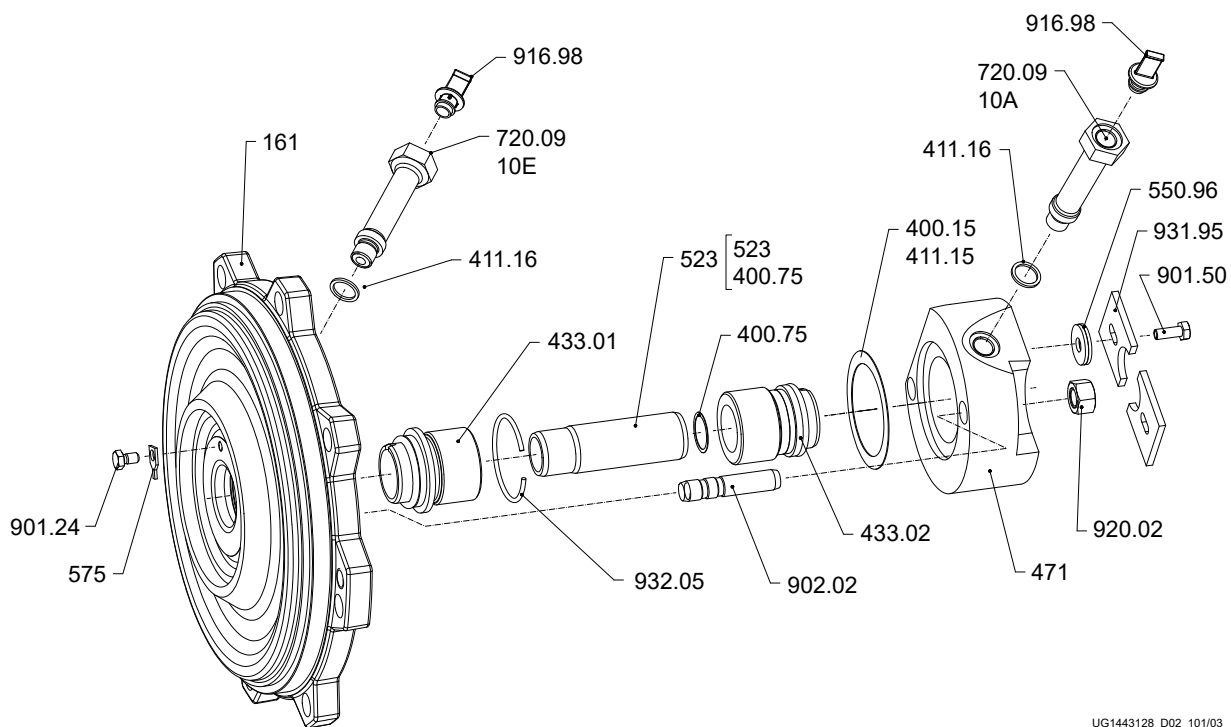
<sup>34</sup> Some individual components might not be applicable, depending on the pump size and material.

<sup>35</sup> Not available for version without pump foot

<sup>36</sup> Not with sizes 40-25-160, 50-32-125, 50-32-125.1, 50-32-160.1 and 65-40-125

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

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Fig. 17: Version with double mechanical seal in back-to-back arrangement

Table 35: List of components<sup>37)</sup>

| Part No.   | Description     | Part No.   | Description       |
|------------|-----------------|------------|-------------------|
| 161        | Casing cover    | 575        | Strip             |
| 400.15/.75 | Gasket          | 720.09     | Fitting           |
| 411.15/.16 | Joint ring      | 901.24/.50 | Hexagon head bolt |
| 433.01/.02 | Mechanical seal | 902.02     | Stud              |
| 471        | Seal cover      | 916.98     | Plug              |
| 523        | Shaft sleeve    | 920.02     | Hexagon nut       |
| 550.96     | Disc            | 931.95     | Lock washer       |
| 562.02     | Parallel pin    | 932.05     | Circlip           |

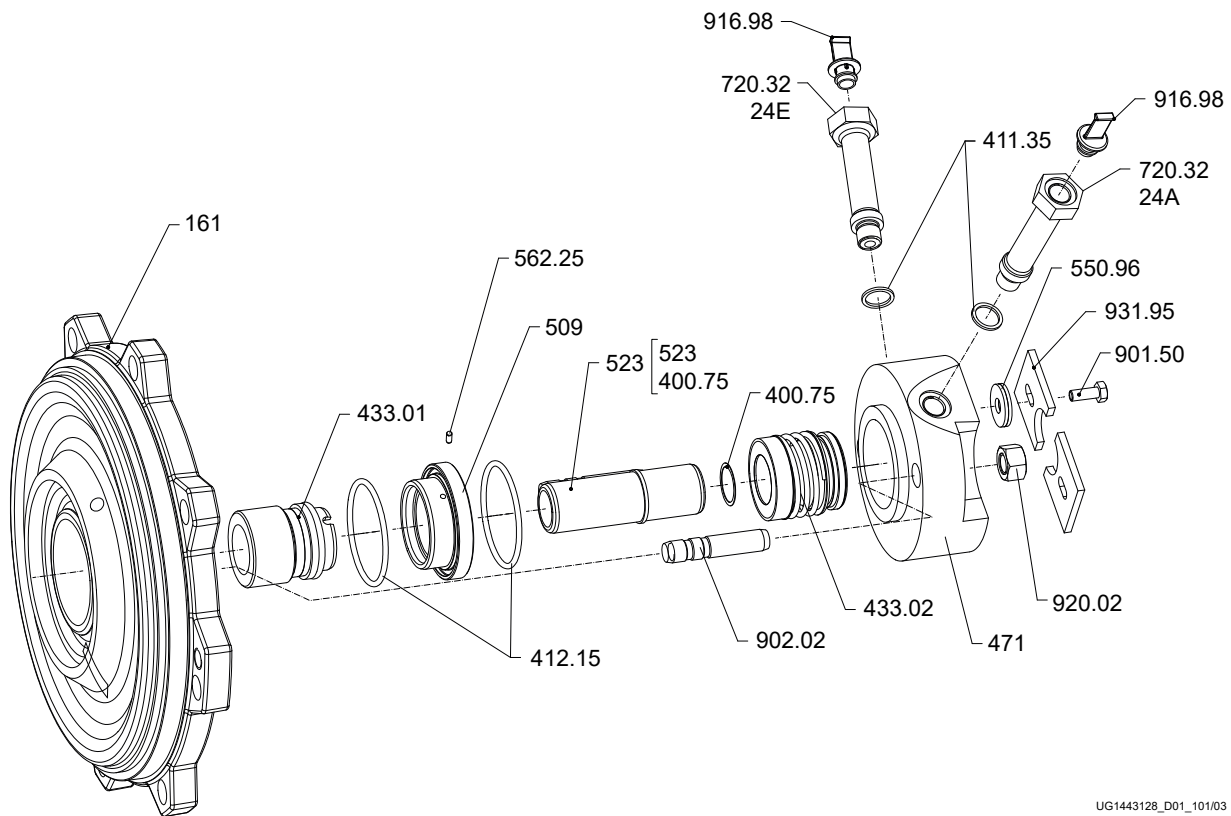
Table 36: Auxiliary connections

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

<sup>37)</sup> Some individual components might not be applicable, depending on the pump size and material.

### Version with double mechanical seal in tandem arrangement

Supplied in packaging units only



UG1443128\_D01\_101/03

Fig. 18: Version with double mechanical seal in tandem arrangement

Table 37: List of components<sup>38)</sup>

| Part No.  | Description       | Part No. | Description       |
|-----------|-------------------|----------|-------------------|
| 161       | Casing cover      | 550.96   | Disc              |
| 400.75    | Gasket            | 562.25   | Parallel pin      |
| 411.35    | Joint ring        | 720.32   | Fitting           |
| 412.15    | O-ring            | 901.50   | Hexagon head bolt |
| 433.01/02 | Mechanical seal   | 902.02   | Stud              |
| 471       | Seal cover        | 916.98   | Plug              |
| 509       | Intermediate ring | 920.02   | Hexagon nut       |
| 523       | Shaft sleeve      | 931.95   | Lock washer       |

Table 38: Auxiliary connections

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

<sup>38)</sup> Some individual components might not be applicable, depending on the pump size and material.

## Glossary

### ACS

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

### IE2

Efficiency class to IEC 60034-30: 2 = High Efficiency (IE = International Efficiency)

### 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

### WRAS

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





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