# Data sheet



**ETL 100-100-250 GGSAV11D301854 BKSBIE4 PD2**
Inline pump

## Operating data

| | | | |
|---|---|---|---|
| Requested flow rate | | Actual flow rate | 125.80 m³/h |
| Requested developed head | | Actual developed head | 18.00 m |
| Pumped medium | Water, heating water<br>Heating water up to 100°C (max.), acc. to VDI 2035 | Efficiency | 73.9 % |
| | | MEI (Minimum Efficiency Index) | ≥ 0.70 |
| Pumped medium details | Not containing chemical and mechanical substances which affect the materials | Power absorbed | 8.15 kW |
| | | Pump speed of rotation | 1500 rpm |
| | | NPSH required | 2.67 m |
| Max. ambient air temperature | 20.0 °C | Permissible operating pressure | 16.00 bar.g |
| Min. ambient air temperature | 20.0 °C | | |
| Fluid temperature | 70.0 °C | | |
| Fluid density | 978 kg/m³ | Discharge press. | 1.73 bar.g |
| Fluid viscosity | 0.42 mm²/s | Shutoff head | 23.73 m |
| Suction pressure max. | 0.00 bar.g | Min. allow. flow for continuous stable operation | 15.36 m³/h |
| Mass flow rate | 34.17 kg/s | | |
| Max. power on curve | 9.31 kW | Min. allow. mass flow for continuous stable operation | 4.17 kg/s |
| Max. allow. mass flow | 47.67 kg/s | | |
| | | Design | Single system 1 x 100 %<br>Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2 |

## Design

| | | | |
|---|---|---|---|
| Pump standard | Without | Shaft seal code | 11 |
| Design | Close-coupled in-line | Sealing plan | Single-acting mechanical seal with vented chamber (A-type casing cover, taper bore) |
| Orientation | Vertical | | |
| Suction nominal dia. | DN 100 | Minimum requirements for hot water quality: treatment acc. to VdTÜV regulation TCH 1466 and solids content up to max. 5 mg/l. | |
| Suction nominal pressure | PN 16 | | |
| Suction position | 180° (down) | | |
| Suction flange drilled according to standard | EN1092-2 | Seal chamber design | Conical seal chamber (A-type cover) |
| Discharge nominal dia. | DN 100 | | |
| Discharge norminal pressure | PN 16 | Contact guard | With |
| Discharge position | top (0°/360°) | Wear ring | Casing wear ring |
| Discharge flange drilled according to standard | EN1092-2 | Impeller diameter | 256.0 mm |
| | | Free passage size | 15.8 mm |
| Surface type | Raised face (form B to EN 1092) | Direction of rotation from drive | Clockwise |
| | | Silicon free pump assembly | Yes |
| Shaft seal | Single acting mechanical seal | Bearing bracket construction | Close-coupled |
| Shaft seal manufacturer | KSB | Bearing bracket size | 35 |
| Shaft seal type | 1 | Bearing type | Anti-friction bearings |
| Material code | BQ1EGG-WA | Lubrication type | Grease |
| | | Color | Vermilion (RAL 2002) |

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## Driver, accessories

| | |
|---|---|
| Driver type | Electric motor |
| Drive standard mech. | IEC |
| Model (make) | KSB SuPremE® |
| Type series motor manufacturer | SuPremE C2 (with mounting plate for PumpDrive 2, non removable) |
| Drive supplied by | Standard motor supplied by KSB - mounted by KSB |
| Motor const. type | V1 |

The motor construction type for the supplied motor could be either V1 or V15.

| | |
|---|---|
| Motor size | 180M |
| Efficiency class | Efficiency class IE4 acc. IEC/TS 60034-30-2 (2016) – free of magnets. The efficiency of the motor for a quadratic torque-speed characteristic is > 95% of the nominal efficiency even at 25% of the nominal power. |
| Motor speed | 1500 rpm |
| Frequency | 50 Hz |
| Designed for operation with frequency inverter | Yes |
| Rated voltage | 400 V |
| Rated power P2 | 18.50 kW |
| Available reserve | 125.83 % |
| Insulation class | F to IEC 34-1 |
| Motor enclosure | IP55 |
| Cos phi at 4/4 load | 0.77 |
| Motor efficiency at 4/4 load | 93.4 % |
| Temperature sensor | 3 PTC resistors |
| Terminal box position | 0° same orientation Viewed from the drive |
| Motor winding | 400 V |
| Connection mode | Star |
| Motor cooling method | Surface cooling |
| Motor material | Grey cast iron GG/CAST IRON |
| Motor noise pressure level | 63 dBa |
| Driver colour | Same as the pump |
| CE-approval | Yes |
| Ambient temperature | 40 |
| Max. absolute humidity | 30 |
| Temp. sensor mtr. bearing | Without |

## Materials G

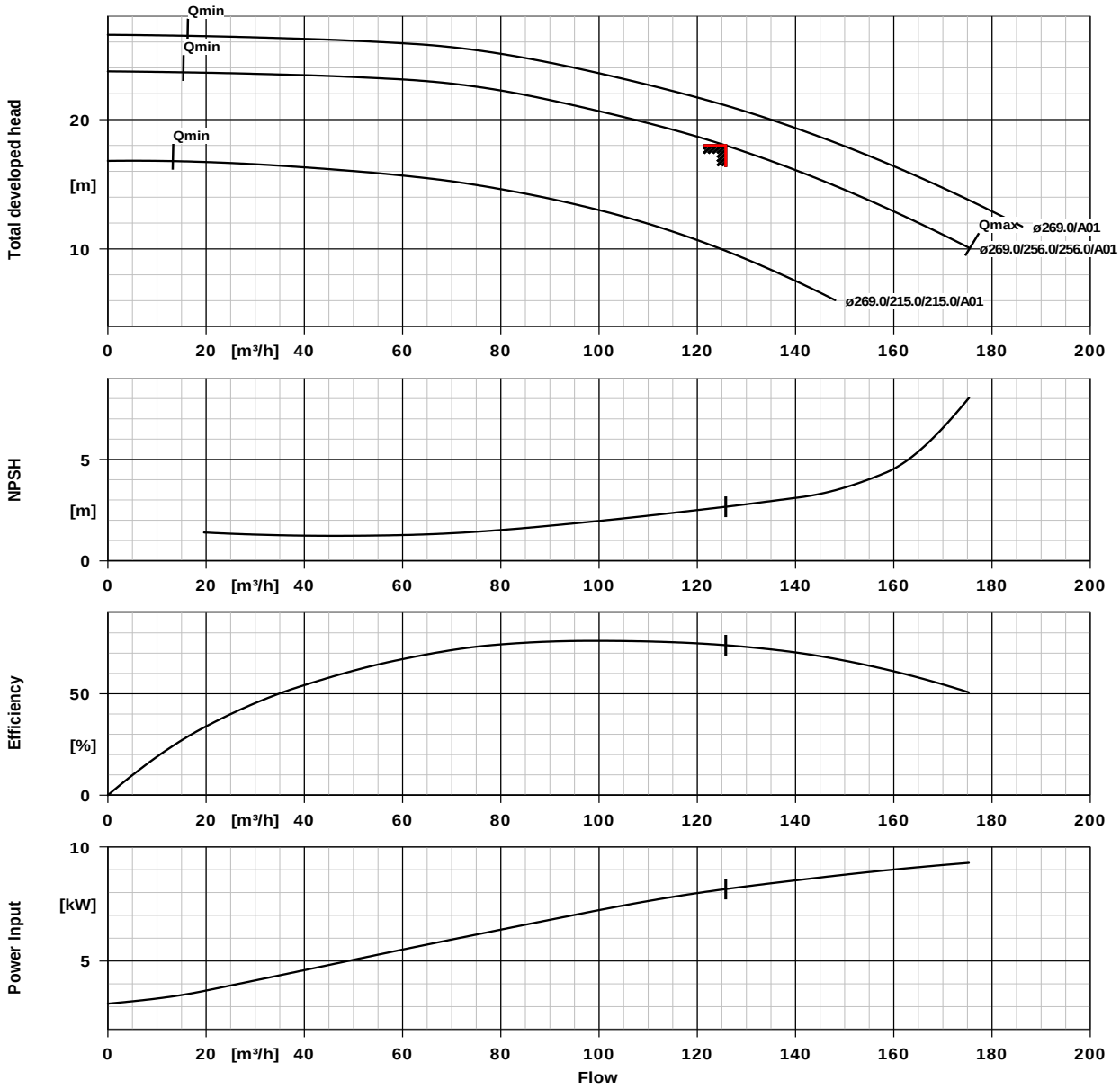
**Notes 1**
Unalloyed cast iron components: pH = 9 to 10.5 and O2 content <= 0.02 mg/kg.

| | |
|---|---|
| Volute casing (102) | Grey cast iron EN-GJL-250/A48CL35B |
| Casing cover (161) | Grey cast iron EN-GJL-250/A48CL35B |
| Shaft (210) | Tempered steel C45+N |
| Impeller (230) | Grey cast iron EN-GJL-250/A48CL35B |
| Motor stool (341) | Grey cast iron EN-GJL-250/A48CL35B |
| Flat gasket (400) | DPAF seal plate asbestos free |
| Joint ring (411) | Steel ST |
| Casing wear ring (502.1) | Grey cast iron GG/CAST IRON |
| Casing wear ring (502.2) | Grey cast iron GG/CAST IRON |
| Shaft sleeve (523) | CrNiMo steel |
| Stud (902) | Steel 8.8 |
| Impeller nut (922) | Steel 8 |
| Key (940) | Steel C45+C / A311 GR 1045 CLASS A |

# Performance curve



**ETL 100-100-250 GGSAV11D301854 BKSBIE4 PD2**
Inline pump



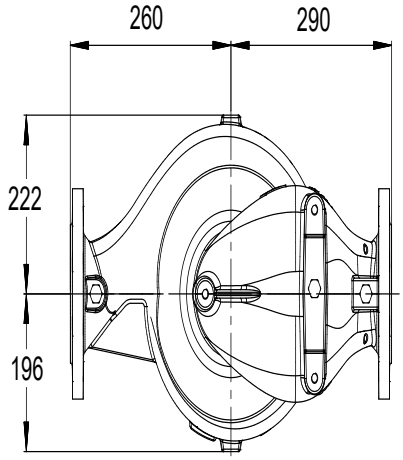

## Curve data

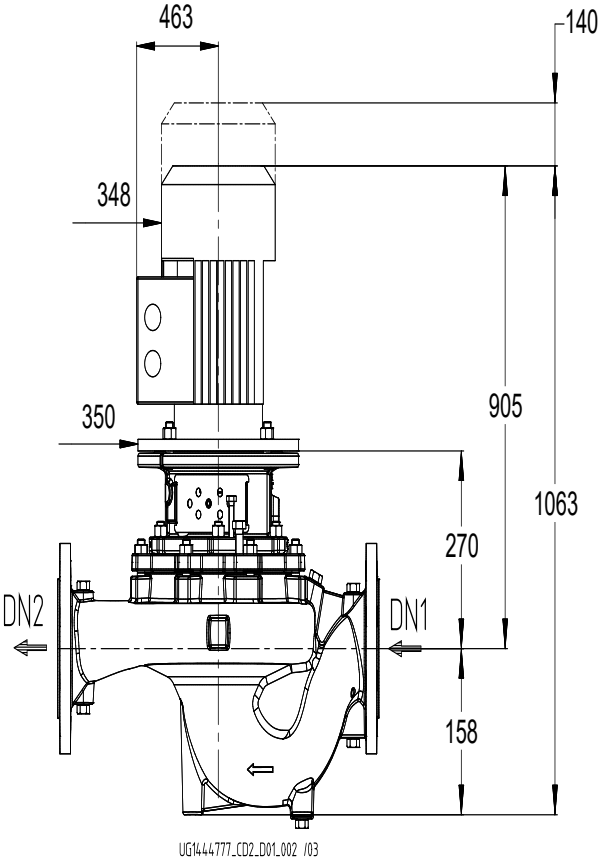
| | |
|---|---|
| Speed of rotation | 1500 rpm |
| Fluid density | 978 kg/m³ |
| Viscosity | 0.42 mm²/s |
| Flow rate | 125.80 m³/h |
| Requested flow rate | 125.80 m³/h |
| Total developed head | 18.00 m |
| Requested developed head | 18.00 m |

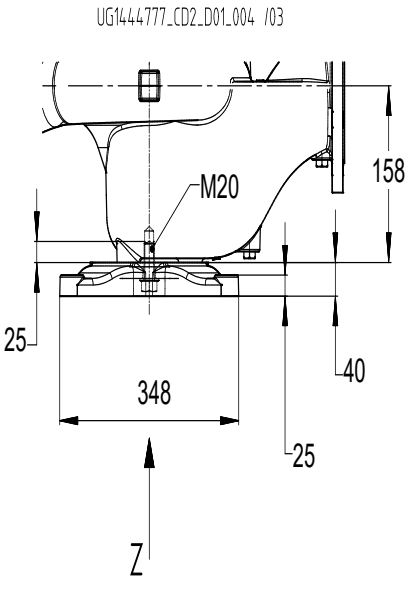
| | |
|---|---|
| Efficiency | 73.9 % |
| MEI (Minimum Efficiency Index) | ≥ 0.70 |
| Power absorbed | 8.15 kW |
| NPSH required | 2.67 m |
| Curve number | K1159.454/42/0 |
| Effective impeller diameter | 256.0 mm |
| Acceptance standard | Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2 |

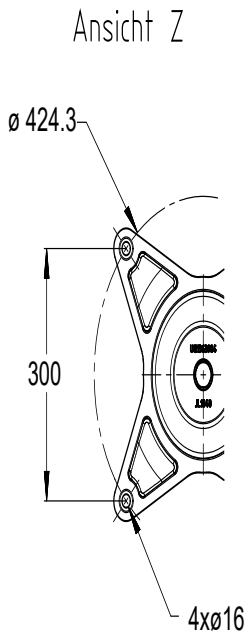
**ETL 100-100-250 GGSAV11D301854 BKSBIE4 PD2**

Inline pump




*Drawing is not to scale*

*Dimensions in mm*

# Installation plan



**ETL 100-100-250 GGSAV11D301854 BKSBIE4 PD2**
Inline pump

**Motor**

| | |
|---|---|
| Motor manufacturer | KSB |
| Motor size | 180M |
| Motor power | 18.50 kW |
| Number of poles | 4 |
| Speed of rotation | 1500 rpm |
| Position of terminal box | 0° same orientation<br>Viewed from the drive |

**Connections**

| | |
|---|---|
| Suction nominal size DN1 | DN 100 / EN1092-2 |
| Discharge nominal size DN2 | DN 100 / EN1092-2 |
| Nominal pressure suct. | PN 16 |
| Rated pressure disch. | PN 16 |

**Weight net**

| | |
|---|---|
| Pump | 88 kg |
| Motor | 189 kg |
| Total | 277 kg |

**Connect pipes without stress or strain!**

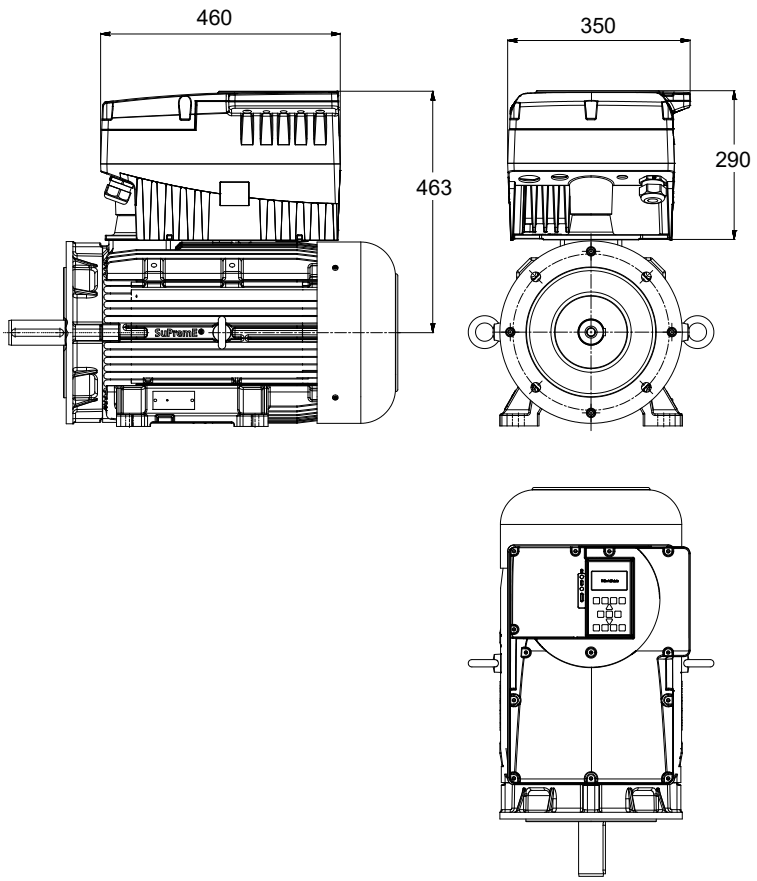
**For auxiliary connections see separate drawing.**

**Supplementary drawing for PumpDrive**

# Installation plan



**ETL 100-100-250 GGSAV11D301854  BKSBIE4 PD2**
Inline pump

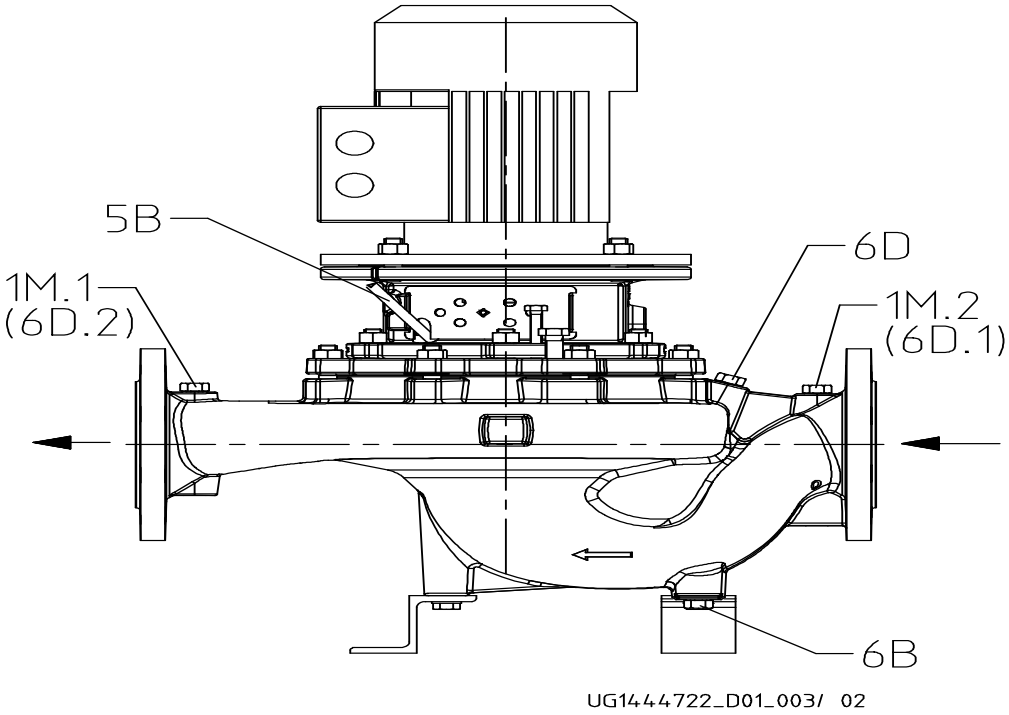



*Drawing is not to scale*

# Connection plan



**ETL 100-100-250 GGSAV11D301854 BKSBIE4 PD2**
Inline pump




## Connections

| | | |
|---|---|---|
| Pump casing variant | | XX46 |
| 1M.1 Pressure gauge connection | G 3/8 | Drilled and plugged. |
| 1M.2 Pressure gauge connection | G 3/8 | Drilled and plugged. |
| 6B Pumped liquid drain | G 3/8 | Drilled and plugged. |
| 6D Pumped medium - filling / venting | G 3/8 | Drilled and plugged. |
| 5B venting | G 1/4 | Closed with venting plug |

**PDRV2 _018K50M_KSUPBE4P4_OOOOO**

## PumpDrive 2

Modular, self-cooling frequency inverter enabling continuously variable speed control of asynchronous and synchronous reluctance motors.

| | |
|---|---|
| Design concept of control unit | PumpDrive 2 |
| Display type | With graphic control panel |
| Rated power | 18.50 kW |
| Max. allowed current | 44.0 A |
| M12 module | Without |
| Remote operation | Without |
| Main switch | Without |
| Fieldbus | without fieldbus |

| | |
|---|---|
| Optional IO module | Without |
| Mounting | MM - Mounted on the motor |
| Weight | 36 kg |
| PumpDrive length | 460.0 mm |
| PumpDrive width | 350.0 mm |
| PumpDrive height | 290.0 mm |
| Manufacturer | KSB |
| PumpDrive adapter | No |
| Designation | - |

**Characteristic**

Mains voltage: 3 ~ 380 V AC -10% to 480 V AC +10 %
Mains frequency: 50 - 60 Hz +/- 2%
Interference suppression class: <= 11 kW: EN 61800-3 C1 / EN 55011 Class B / cable length <= 5 m
Interference suppression class: > 11 kW: EN 61800-3: C2 / EN 55011 Class A, Group 1 / cable length <= 50 m
Internal power supply: 24 V +/- 10 %, max. 600 mA DC
Service interface: optical
2 analog inputs, 0/2-10 V or 0/4-20 mA
1 analog output, 0-10 V or 4-20 mA
Digital inputs:
1 hardware enable input
5 parameterisable inputs
Relay output: 2 changeover contacts, parameterisable

Environment:
IP 55 enclosure (acc. EN 60529)
Ambient temperature: -10 to 50 °C
Rel. humidity in operation: 5 % to 85 % (non-condensing)
Note regarding Outdoor installation: Provide the frequency inverter with suitable protection when installed outdoors to prevent condensation on the electronic equipment and exposure to excessive sunlight.

Housing:
Heat sink: die-cast aluminium
Housing cover: die-cast aluminium
Control panel: Polyamid, glass fibre reinforced

Protective functions:
- Full protection by means of overcurrent limitation and PTC thermistor monitoring.
- Automatic speed reduction at overload and excessive temperatures. Protection against phase failure motor side, short-circuit monitoring motor side (phase to phase and phase to earth), overvoltage/undervoltage
- Protection against motor overload.
- Suppression of resonant frequencies.
- Cable integrity monitoring (live zero).
- Protection against dry running and hydraulic blockage (sensorless via learning function)
- Characteristic curve control

Open/closed-loop control
- Open-loop control via analog input, display or fieldbus
- User-definable max. speed (0 to 70 Hz or 140 Hz).
- Closed-loop control mode via integrated PID controller
- Controlled variables: pressure, differential pressure delta-p (constant) or delta-p (variable), temperature, level control, flow rate

**PDRV2 _018K50M_KSUPBE4P4_OOOOO**

- Sensorless differential pressure control (Δp const) in a single-pump configuration
- Sensorless differential pressure control with dynamic pressure compensation (Δp var) in a single-pump configuration
- Sensorless flow rate control
- Sensorless dynamic pressure compensation for pipe friction losses (DFS curve), enabling higher energy savings.
- Flow rate estimation
- Alternative setpoint
- Functional check run

Operation and display:
- Display of measured values and alerts and for setting parameters, incl. fault history, operating hours counter (motor, frequency inverter)
- Display of operating point (Q, H)
- Energy savings meter
- Optical service interface for connection to KSB Service Tool.
- Commissioning Wizard
- Display can be removed and mount on a wall or piping

PumpDrive functions
- Programmable start and stop ramps
- Field-oriented control (vector control) with selectable motor control method (ASM, SuPremE)
- Automatic motor adaptation (AMA)
- Manual-0-automatic operation.
- Sleep mode (stand-by mode)

Installation options:
- M12 module for bus connection of PumpMeter and for multiple pump operation of up to six pumps
- Wireless module for communication with a Smartphone
- Field bus modules Profibus DP, LON, Modbus RTU, BACnet MS/TP, Profinet
- I/O extension board
- Master switch