

ETL 050-050-160 GGSAV66D200224 BKS BIE4 PD2M

Inline pump

Operating data

Requested flow rate	35.00 m ³ /h
Requested developed head	11.00 m
Pumped medium	Antifreeze on ethylene glycol base, inhibited, closed system, e.g. Antifrogen N or similar products
	Antifrogen N, concentration 40%
	Not containing chemical and mechanical substances which affect the materials
Max. ambient air temperature	20.0 °C
Min. ambient air temperature	20.0 °C
Fluid temperature	90.0 °C
Fluid density	1009 kg/m ³
Fluid viscosity	0.68 mm ² /s
Suction pressure max.	0.00 bar.g
Mass flow rate	9.81 kg/s
Max. power on curve	1.70 kW
Min. allow. flow for continuous stable operation	8.29 m ³ /h
Actual flow rate	35.00 m ³ /h
Actual developed head	11.00 m
Efficiency	70.1 %
MEI (Minimum Efficiency Index)	≥ 0.70
Power absorbed	1.51 kW
Pump speed of rotation	1693 rpm
NPSH required	2.13 m
Permissible operating pressure	16.00 bar.g
Discharge press.	1.09 bar.g
Min. allow. mass flow for continuous stable operation	2.32 kg/s
Shutoff head	14.28 m
Max. allow. mass flow	15.67 kg/s
Design	Single system 1 x 100 % Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2

Design

Pump standard	Without	Material code	Q7Q7EGG
Caution: The overall length from suction to discharge can be different to the previous generation of Etaline.		Shaft seal code	66
Design	Close-coupled in-line	Sealing plan	Single-acting mechanical seal with vented chamber (A-type casing cover, taper bore)
Orientation	Vertical	Seal chamber design	Conical seal chamber (A-type cover)
Suction nominal dia.	DN 50	Contact guard	With
Suction nominal pressure	PN 16	Wear ring	Casing wear ring
Suction position	180° (down)	Impeller diameter	174.0 mm
Suction flange drilled according to standard	EN1092-2	Free passage size	11.5 mm
Discharge nominal dia.	DN 50	Direction of rotation from drive	Clockwise
Discharge nominal pressure	PN 16	Silicon free pump assembly	Yes
Discharge position	top (0°/360°)	Bearing bracket construction	Close-coupled
Discharge flange drilled according to standard	EN1092-2	Bearing bracket size	25
Surface type	Raised face (form B to EN 1092)	Bearing type	Anti-friction bearings
Shaft seal	Single acting mechanical seal	Lubrication type	Grease
Manufacturer	Burgmann	Color	Vermilion (RAL 2002)
Type	MG13G6		

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Inline pump

Driver, accessories

Driver type	Electric motor	Rated current	5.7 A
Drive standard mech.	IEC	Insulation class	F to IEC 34-1
Model (make)	KSB SuPremE®	Motor enclosure	IP55
Type series motor manufacturer	SuPremE C2 (with mounting plate for PumpDrive 2, non removable)	Cos phi at 4/4 load	0.68
Drive supplied by	Standard motor supplied by KSB - mounted by KSB	Motor efficiency at 4/4 load	89.5 %
Motor const. type	V1	Temperature sensor	3 PTC resistors
Motor size	100L	Terminal box position	0° same orientation
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 winding	Viewed from the drive
Speed control selection	Speed adjustment	Connection mode	400 V
Frequency	50 Hz	Motor cooling method	Star
Designed for operation with frequency inverter	Yes	Motor material	Surface cooling
Rated voltage	400 V	Driver colour	Aluminium
Rated power P2	2.20 kW	CE-approval	Same as the pump
Available reserve	45.86 %		Yes

Materials G

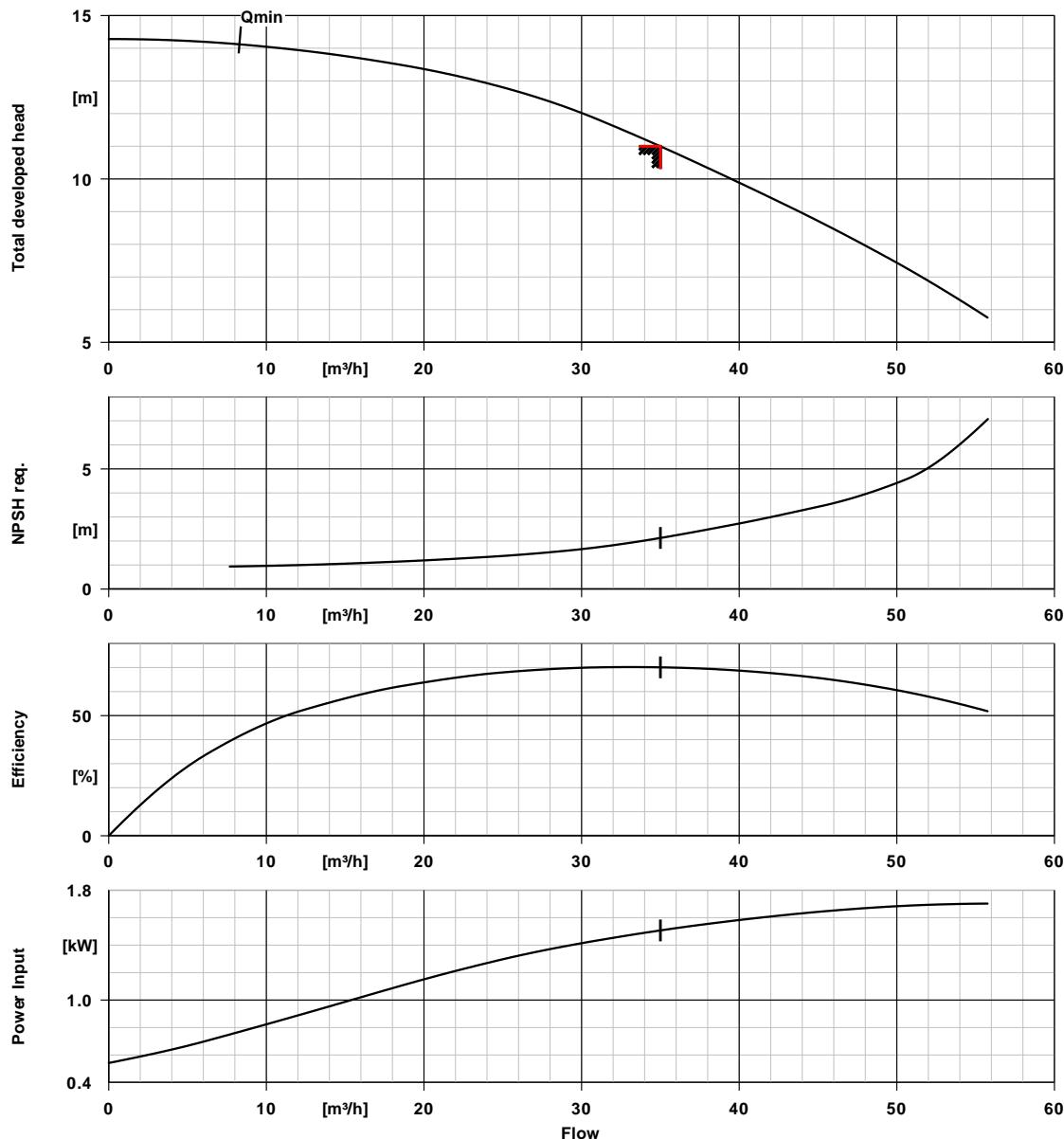
Volute casing (102)	Grey cast iron EN-GJL-250/A48CL35B	Casing wear ring (502.1)	Grey cast iron GG/CAST IRON
Casing cover (161)	Grey cast iron EN-GJL-250/A48CL35B	Casing wear ring (502.2)	Grey cast iron GG/CAST IRON
Shaft (210)	Tempered steel C45+N	Shaft sleeve (523)	CrNiMo steel
Impeller (230)	Grey cast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

Performance curve



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Inline pump



Curve data

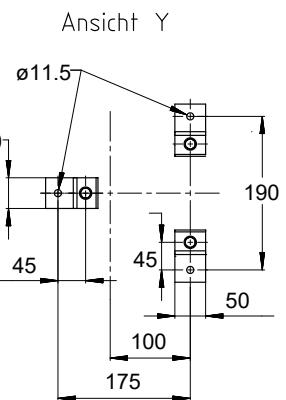
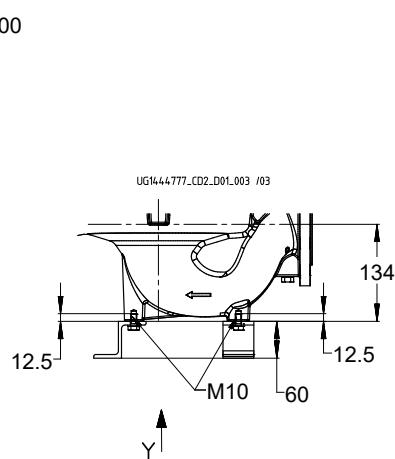
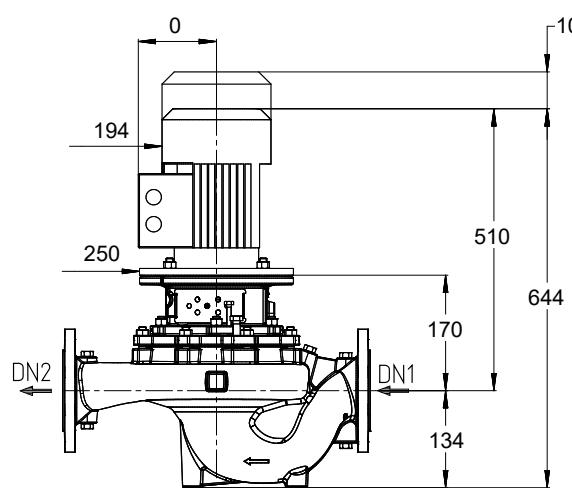
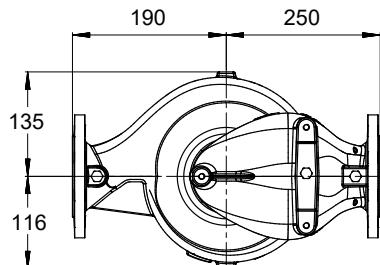
Speed of rotation	1693 rpm	Efficiency	70.1 %
Fluid density	1009 kg/m³	MEI (Minimum Efficiency Index)	≥ 0.70
Viscosity	0.68 mm²/s	Power absorbed	1.51 kW
Flow rate	35.00 m³/h	NPSH required	2.13 m
Requested flow rate	35.00 m³/h	Curve number	K1159.464/26
Total developed head	11.00 m	Effective impeller diameter	174.0 mm
Requested developed head	11.00 m	Acceptance standard	Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2

Installation plan



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Inline pump



Drawing is not to scale

Dimensions in mm

Motor

Motor manufacturer	KSB
Motor size	100L
Motor power	2.20 kW
Number of poles	4
Speed of rotation	1500 rpm
Position of terminal box	0° same orientation Viewed from the drive

Connections

Suction nominal size DN1	DN 50 / EN1092-2
Discharge nominal size DN2	DN 50 / EN1092-2
Nominal pressure suct.	PN 16
Rated pressure disch.	PN 16

Weight net

Pump	25 kg
Motor	24 kg
Total	49 kg

Connect pipes without stress or strain!

**For auxiliary connections see
separate drawing.**

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Inline pump

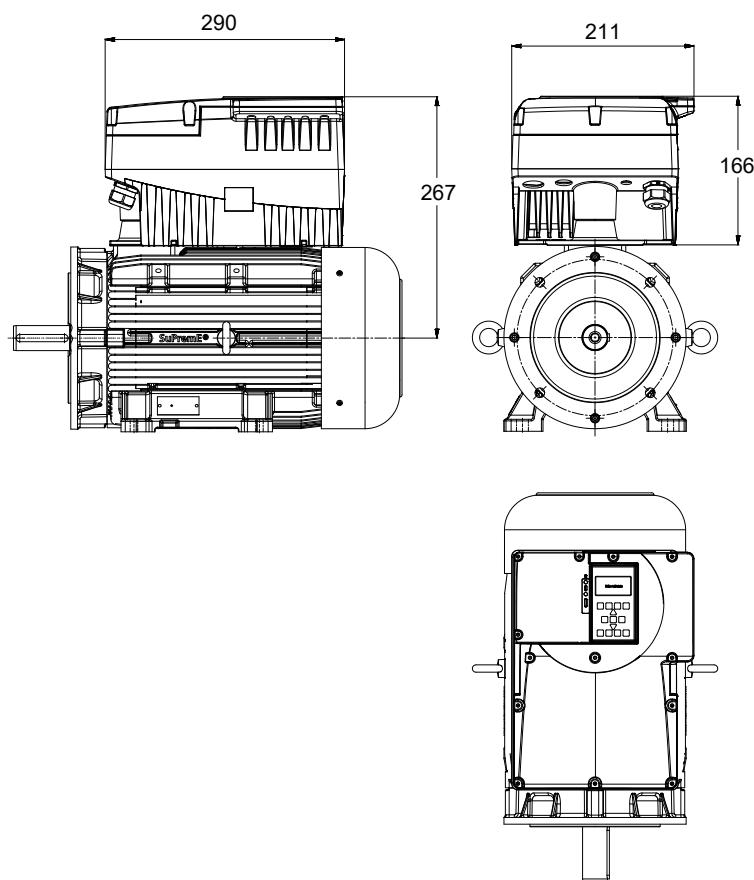
Supplementary drawing for PumpDrive

Installation plan



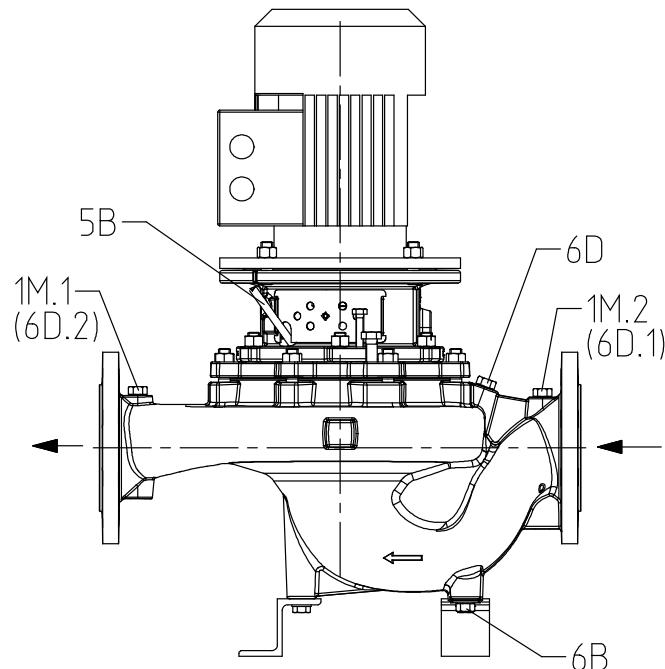
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Inline pump



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Inline pump



UG1444722_D01_003/ 02

Connections

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

PDRV2 _002K20M_KSUPBE4P4_MOOOO**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	2.20 kW
Max. allowed current	6.0 A
M12 module	With
Remote operation	Without
Main switch	Without
Fieldbus	without fieldbus

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 _002K20M_KSUPBE4P4_MOOOO

- 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

PumpMeter

Intelligent Pressure Transmitter PumpMeter - with on-site display of operating point

General description:

PumpMeter is an intelligent pressure transmitter with on-site display of measurement values and operating data of the pump. It comes factory-provided completely assembled and parameterised for your individual pump, to be connected via M12 connector and immediately ready to operate. PumpMeter records the pump's load profile during operation in order to – if applicable – provide information on the potential for energy savings or increased availability.

On-site display unit:

Backlit display unit for on-site display of measurement values and operating data of pump with intuitive and internationally comprehensible icons, rotatable in steps of 90°.

Display values:

suction pressure, pressure at inlet of pump in bar, gauge pressure
discharge pressure, pressure at outlet of pump in bar, gauge pressure
differential pressure between in- and outlet of pump in bar
qualitative indication of operating point

Connection of display unit via connector (M12 x 1, 5-pin for power supply and utilization of communication interface).

Making alternatively available:

measurement value of discharge pressure via analogue signal 4 ... 20 mA
calculated value of differential pressure via analogue signal 4 ... 20 mA
all display values via serial interface RS 485 (Modbus RTU).
Service interface RS232 for parameterisation.
Factory provided parameterisation for individual pump.

Sensors:

Two gauge pressure transmitters, one each factory provided on both, inlet and discharge side of pump. Connected to display unit via connector.

Accuracy of measurement (sum of errors; relating to measurement range):

±1% for fluid temperature -10 ... 100 °C

±2.5% for fluid temperature -30 ... -10 °C and 100 ... 140 °C

Material of measuring cell: stainless steel (no internal gasket)

Available measurement ranges:

-1 ... 10 bar (gauge pressure)

-1 ... 10 bar (gauge pressure)

Ambient conditions:

Type of protection: IP 65

Ambient temperature:

-30°C ... 80°C (during transport, storage)
-10°C ... 60°C (operation)

Fluid temperature: -30°C ... 140°C

Scuff resistance:

Ultraviolet resistance (outdoor installation)

Resistance to most cleaning agents

Resistance to oil mist

Silicone free:

No detrimental to paint adhesion

Electric data:**Power supply:**

24V DC ± 10%, min. 140 mA

Interfaces, alternatively utilisable:

4 ... 20 mA, 3-conductor (discharge pressure or differential pressure)

RS485, Modbus RTU (Slave)

Service interface: RS232

EMC:

EN 61326 (Immunity: industrial environment, Emissions: applicable in home and building environment)