

ETL 050-050-160 GGS AV07D200154 BKS BIE5 PD2E

Inline pump

Operating data

Requested flow rate		Actual flow rate	30.00 m³/h
Requested developed head		Actual developed head	8.00 m
Pumped medium	Antifreeze on ethylene glycol base, inhibited, closed system, e.g. Antifrogen N or similar products	Efficiency	70.1 %
	Concentration 20%	MEI (Minimum Efficiency Index)	≥ 0.70
	Not containing chemical and mechanical substances which affect the materials	Power absorbed	0.95 kW
Ambient air temperature	20.0 °C	Pump speed of rotation	1445 rpm
Fluid temperature	25.0 °C	NPSH required	1.69 m
Fluid density	1024 kg/m³	Permissible operating pressure	16.00 bar.g
Fluid viscosity	1.54 mm²/s		
Suction pressure max.	0.00 bar.g	Discharge press.	0.80 bar.g
Mass flow rate	8.54 kg/s	Min. allow. mass flow for continuous stable operation	1.21 kg/s
Max. power on curve	1.08 kW	Max. allow. mass flow	13.58 kg/s
Min. allow. flow for continuous stable operation	4.25 m³/h	Design	Single system 1 x 100 %
Shutoff head	10.41 m		Tolerances to ISO 9906
			Class 3B; below 10 kW acc. to paragraph 4.4.2

Design

Pump standard	Without	Material code	Q1Q1EGG
Caution: The overall length from suction to discharge can be different to the previous generation of Etaline.		Shaft seal code	7
Design	Close-coupled in-line	Sealing plan	Single-acting mechanical seal with vented chamber (A-type casing cover, taper bore)
Orientation	Horizontal		Conical seal chamber (A-type cover)
Suction nominal dia.	DN 50	Seal chamber design	
Suction nominal pressure	PN 16	Contact guard	With
Suction position	180° (down)	Wear ring	Casing wear ring
Suction flange drilled according to standard	EN1092-2	Impeller diameter	174.0 mm
Discharge nominal dia.	DN 50	Free passage size	11.5 mm
Discharge nominal pressure	PN 16	Direction of rotation from drive	Clockwise
Discharge position	top (0°/360°)	Silicon free pump assembly	Yes
Discharge flange drilled according to standard	EN1092-2	Bearing bracket construction	Close-coupled
Shaft seal	Single acting mechanical seal	Bearing bracket size	25
Manufacturer	KSB	Bearing type	Anti-friction bearings
Type	1A	Lubrication type	Grease
		Color	Vermilion (RAL 2002)

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Driver, accessories

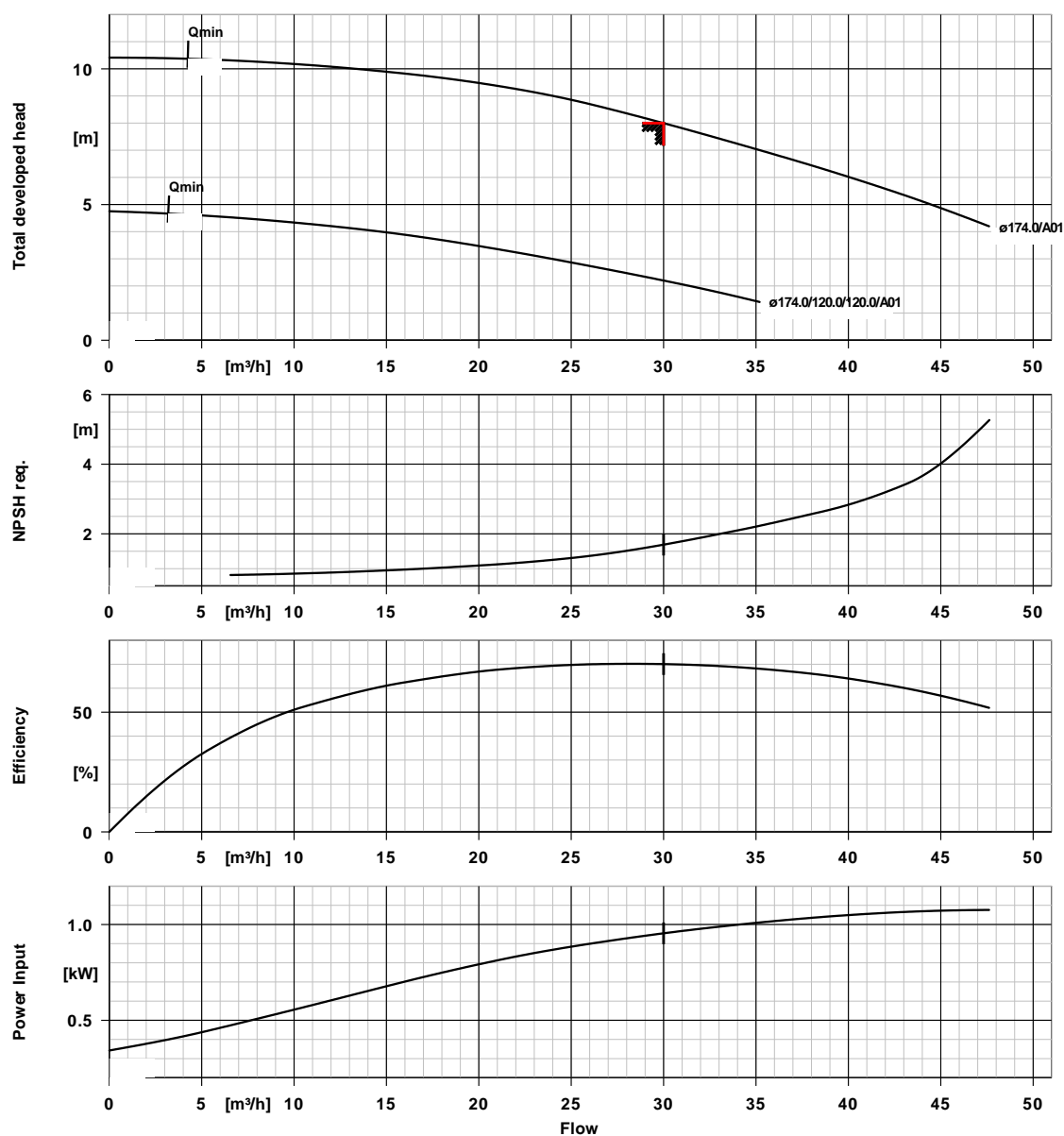
Driver type	Electric motor	Rated current	4.0 A
Drive standard mech.	IEC	Insulation class	F to IEC 34-1
Model (make)	KSB SuPremE®	Motor enclosure	IP55
Type series motor manufacturer	SuPremE C2 (with mounting plate for PumpDrive 2, non removable)	Cos phi at 4/4 load	0.67
Drive supplied by	Standard motor supplied by KSB - mounted by KSB	Motor efficiency at 4/4 load	88.2 %
Motor const. type	V1	Temperature sensor	3 PTC resistors
Motor size	90L	Terminal box position	0°/360° (top)
Efficiency class	Efficiency class IE5 acc. IEC/TS 60034-30-2 (2016) – free of magnets. Motor size 80 with ferrite 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	Motor noise pressure level	Aluminium
Rated power P2	1.50 kW	Driver colour	60 dBa
Available reserve	57.12 %		Same as the pump

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 CLASS A
Joint ring (411)	Steel ST		

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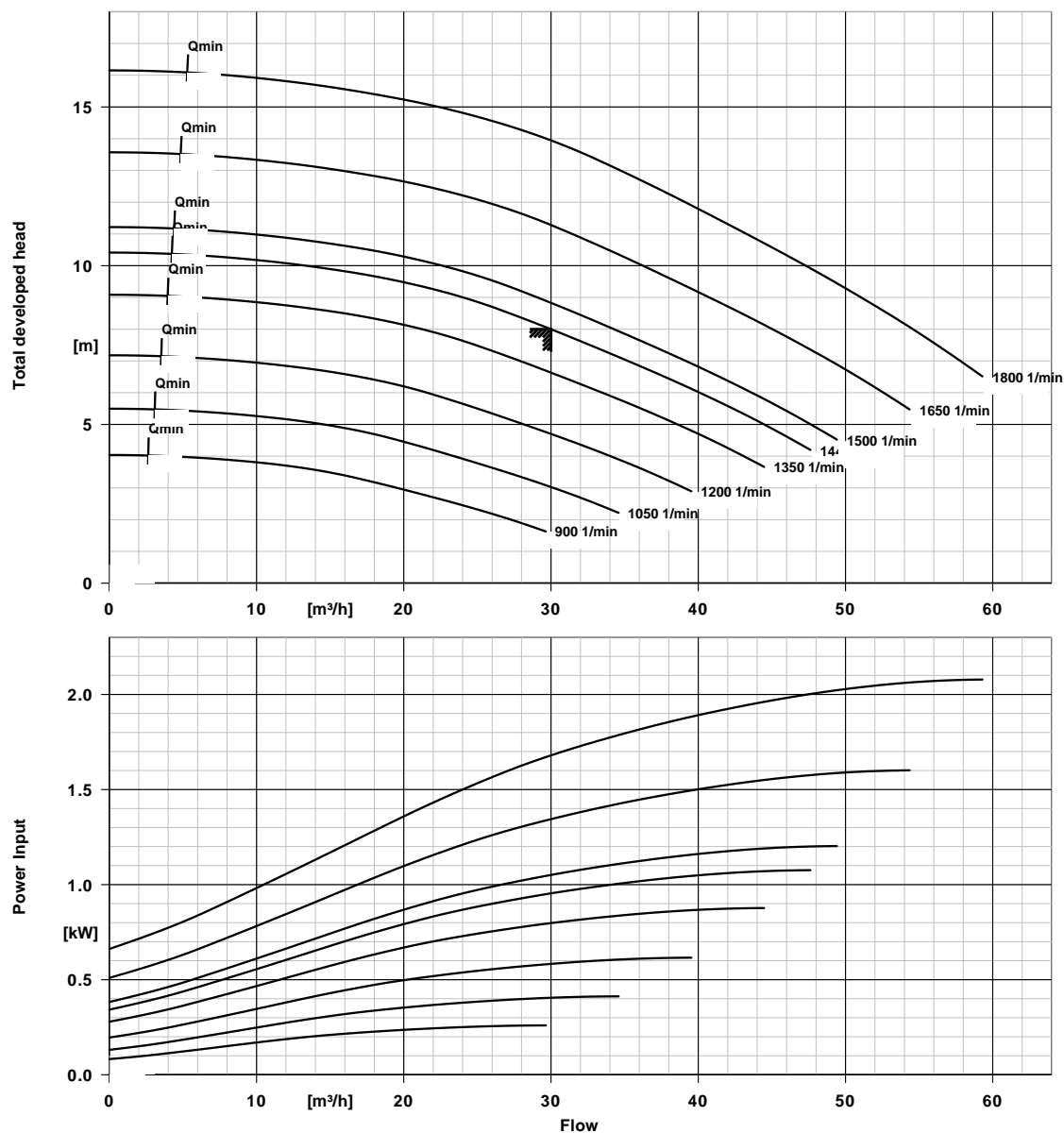
Inline pump

**Curve data**

Speed of rotation	1445 rpm	Efficiency	70.1 %
Fluid density	1024 kg/m ³	MEI (Minimum Efficiency Index)	≥ 0.70
Viscosity	1.54 mm ² /s	Power absorbed	0.95 kW
Flow rate	30.00 m ³ /h	NPSH required	1.69 m
Requested flow rate	30.00 m ³ /h	Curve number	K1159.454/26
Total developed head	8.00 m	Effective impeller diameter	174.0 mm
Requested developed head	8.00 m	Acceptance standard	Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2

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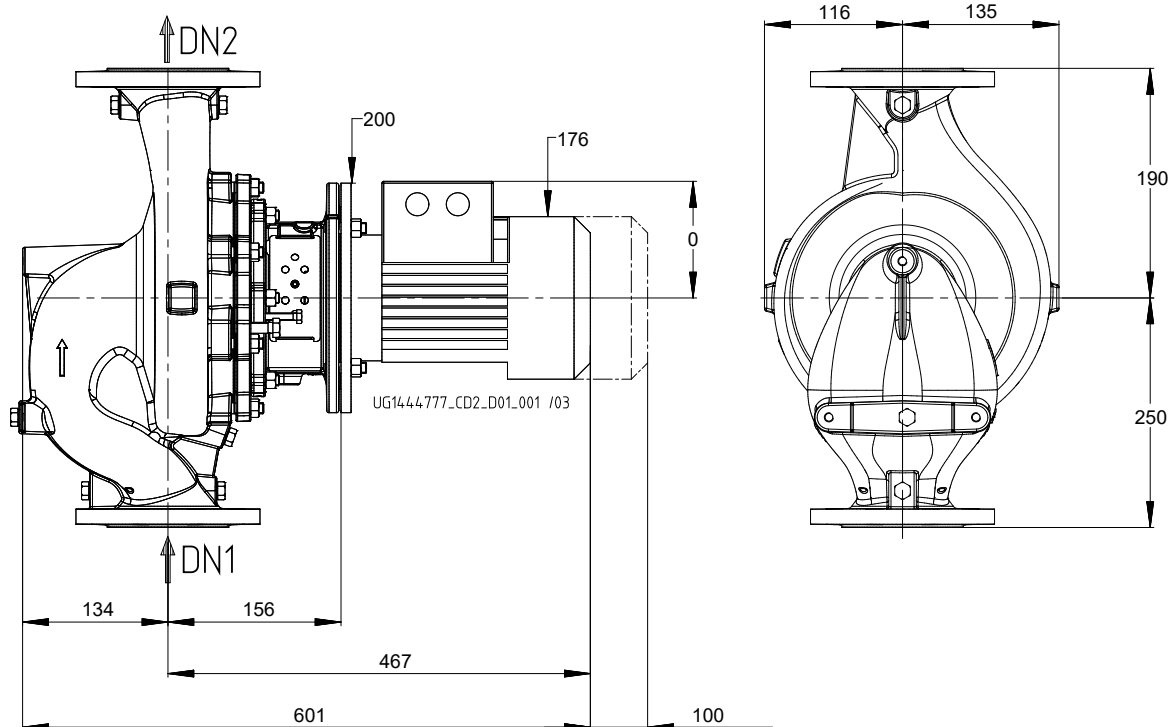
Inline pump

**Curve data**

Fluid density 1024 kg/m^3
 Viscosity 1.54 mm^2/s
 Flow rate 30.00 m^3/h
 Requested flow rate 30.00 m^3/h

Total developed head 8.00 m
 Requested developed head 8.00 m
 MEI (Minimum Efficiency Index) ≥ 0.70
 Effective impeller diameter 174.0 mm

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Drawing is not to scale

Dimensions in mm

Motor

Motor manufacturer	KSB
Motor size	90L
Motor power	1.50 kW
Number of poles	4
Speed of rotation	1500 rpm
Position of terminal box	0°/360° (top) 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

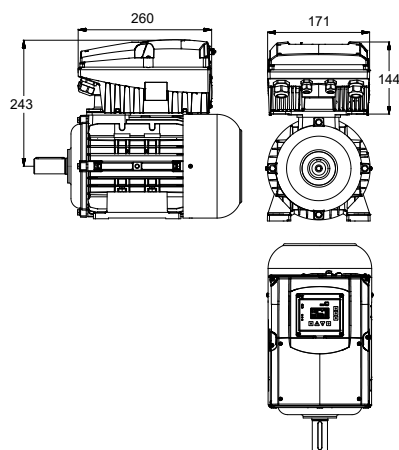
Pump	25 kg
Motor	18 kg
Total	43 kg

Connect pipes without stress or strain!

For auxiliary connections see separate drawing.

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Inline pump

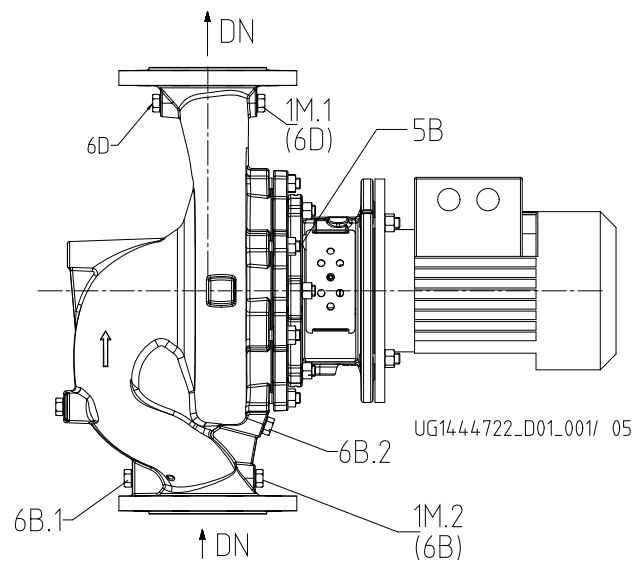
Supplementary drawing for PumpDrive



Drawing is not to scale

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Inline pump



Connections

Pump casing variant

1M.1 Pressure gauge connection

1M.2 Pressure gauge connection

6B.1 Pumped liquid drain

6B.2 Pumped liquid drain

6D Pumped medium - filling / venting

5B venting

G 1/4

G 1/4

G 1/4

G 1/4

G 1/4

G 1/4

XX46

Drilled and plugged.

Drilled and plugged.

Not executed

Drilled and plugged.

Not executed

Drilled and plugged.

PDRV2E_001K50M_KSUPBE5P4_OMOOO**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 Eco	Weight	4 kg
Display type	With standard control panel	PumpDrive length	260.0 mm
Rated power	1.50 kW	PumpDrive width	171.0 mm
Max. allowed current	4.9 A	PumpDrive height	144.0 mm
M12 module	Without	Manufacturer	KSB
Remote operation	Without	PumpDrive adapter	No
Mounting	MM - Mounted on the motor	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

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

3 parameterisable inputs

Relay output: 2 NO 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: Polyamid, glass fibre reinforced

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
- 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
- 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
- Functional check run

PDRV2E_001K50M_KSUPBE5P4_OMOOO

Operation and display:

- Operating point estimation (Q, H)
- Optical service interface for connection to KSB Service Tool

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 module Modbus RTU, as an alternative to the M12 module.