Data sheet

MovitecV 002/02-B4G13FE071D5WA
High pressure Inline Pump With PumpDrive and PumpMeter

Operating data

Requested flow rate	1.60 m³/h	Actual flow rate	1.60 m³/h
Requested developed head	20.41 m	Actual developed head	20.49 m
Pumped medium	Water, heating water Heating water up to 100°C (max.), acc. to VDI 2035 Not containing chemical and mechanical substances which affect the materials	Efficiency	49.5 %
		MEI (Minimum Efficiency Index)	≥ 0.70
		Power absorbed	0.17 kW
		Pump speed of rotation	3502 rpm
		NPSH required	2.70 m
Max. ambient air temperature	20.0 °C	Permissible operating pressure	16.00 bar.g
Min. ambient air temperature	20.0 °C		
Fluid temperature	90.0 °C		
Fluid density	965 kg/m³	Discharge press.	1.94 bar.g
Fluid viscosity	0.33 mm²/s	Min. allow. mass flow for continuous stable operation	0.08 kg/s
Suction pressure max.	0.00 bar.g		
Mass flow rate	0.43 kg/s	Shutoff head	22.57 m
Max. power on curve	0.25 kW	Max. allow. mass flow	1.07 kg/s
Min. allow. flow for continuous stable operation	0.32 m³/h	Design	Single system 1 x 100 % Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2

Design

Pump standard	KSB high pressure in-line international execution	Manufacturer	DP
		Type	RMG-FX
Design	Close-coupled	Material code	Q1BEGG-WRC
Orientation	Vertical	Shaft seal code	13
Suction nominal dia.	G 1	Sealing plan	I Single-acting mechanical seal(internal circulation)
Suction nominal pressure	PN 16		
Suction position	90° (right)	Minimum requirements for hot water quality: treatment acc. to VdTÜV regulation TCH 1466 with SiO2-content up to max. 10 mg/l and conductivity up to max. 250 µS/cm. Solids content up to max. 5 mg/l and no additives forming a greasy film on the mechanical seal faces.	
Connection standard discharge	EN ISO 228-1		
Discharge nominal dia.	G 1		
Discharge norminal pressure	PN 16		
Discharge position	270° (left 90°)	Minimum requirements for hot water quality: treatment acc. to VdTÜV regulation TCH 1466 and solids content up to max. 5 mg/l.	
Oval flange			
Shaft seal	Single acting mechanical seal	Seal chamber design	Standard seal chamber
		Contact guard	With
		Impeller diameter	80.0 mm
		Direction of rotation from drive	Clockwise
		Color	Graphite black (RAL 9011)

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Driver, accessories

Driver type	Electric motor	Rated current	1.6 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
		Motor efficiency at 4/4 load	83.7 %
		Temperature sensor	Without
Drive supplied by	Standard motor supplied by KSB - mounted by KSB	Terminal box position	90° (right) Viewed from the drive
Motor const. type	V18	Motor winding	400 V
Motor size	071M	Fixed bearing reinforced	radial
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.	Connection mode	Star
		Motor cooling method	Surface cooling
		Motor material	Aluminium
		Motor noise pressure level	70 dBa
Speed control selection	Speed adjustment		
Frequency	100 Hz		
Designed for operation with frequency inverter	Yes		
Rated voltage	400 V		
Rated power P2	0.55 kW		
Performance limit P2max	0.55 kW		
Available reserve	214.88 %		

Materials V

Pump shroud (10-6)	Stainless steel 1.4301	O-Ring (412)	EPDM WRc / ACS Approved
Pump casing (101)	Stainless Steel 1.4308	Seal cover (471)	Stainless Steel 1.4308
Stage casing (108)	Stainless steel 1.4301	Bearing sleeve (529)	Tungsten Carbide
Cover (160)	Stainless steel 1.4301	Flange (723)	Stainless Steel 1.4308
Diffuser (171)	Stainless steel 1.4301	Baseplate (890)	Ductile cast iron EN-GJS-400-15
Shaft (210)	Chrome steel 1.4057+QT800		
Impeller (230)	Stainless steel 1.4301	Screwed plug (903)	Stainless steel 1.4301
Motor stool (341)	Grey cast iron EN-GJL-250	Tie bolt (905)	Chrome steel 1.4057+QT800
		Nut (920)	Stainless steel 1.4301

Performance curve

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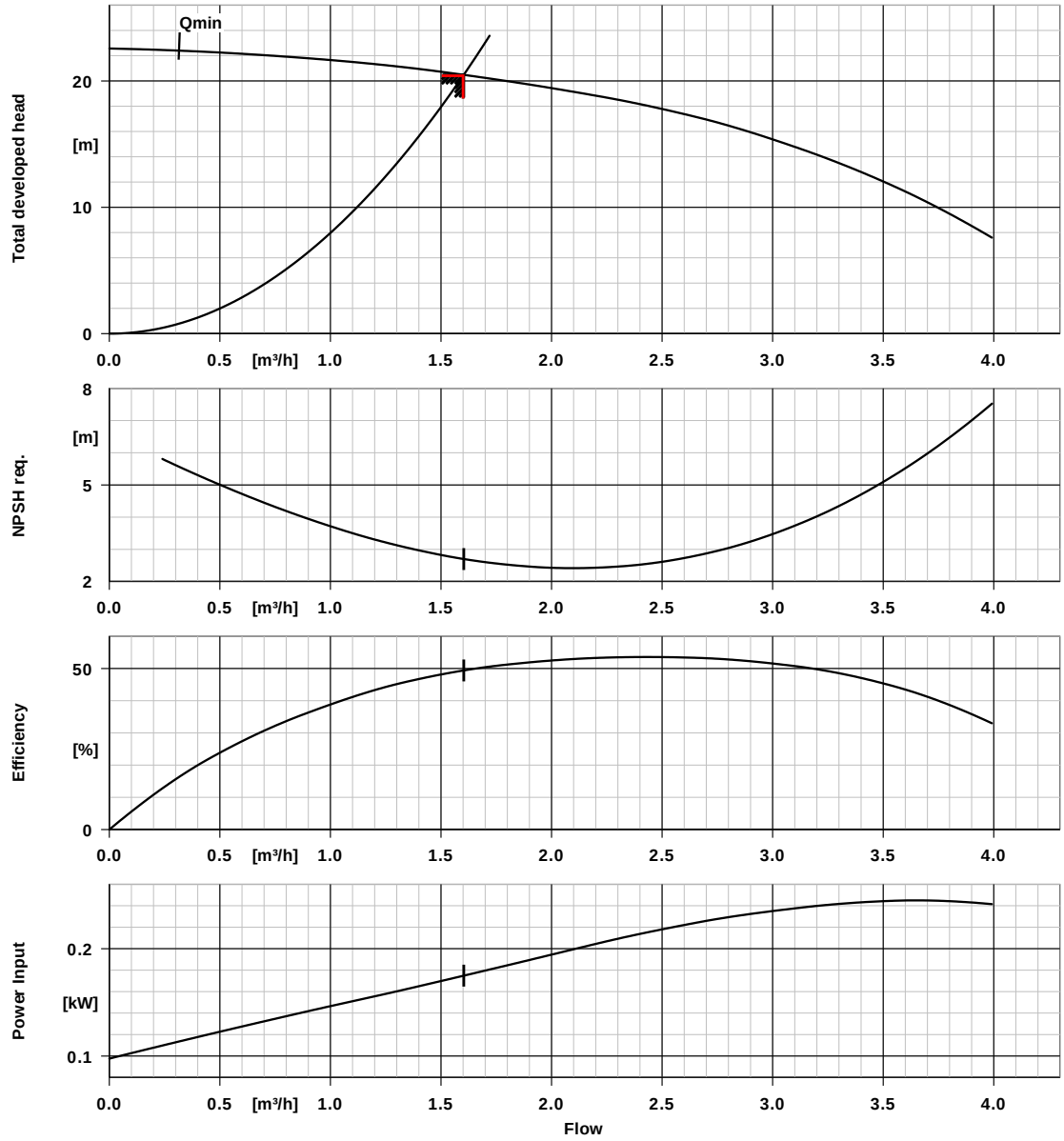

Curve data

Speed of rotation	3502 rpm
Fluid density	965 kg/m³
Viscosity	0.33 mm²/s
Flow rate	1.60 m³/h
Requested flow rate	1.60 m³/h
Total developed head	20.49 m
Requested developed head	20.41 m

Efficiency	49.5 %
MEI (Minimum Efficiency Index)	≥ 0.70
Power absorbed	0.17 kW
NPSH required	2.70 m
Curve number	K96000201
Effective impeller diameter	80.0 mm
Acceptance standard	Tolerances to ISO 9906 Class 3B; below 10 kW acc. to paragraph 4.4.2

Speed curve

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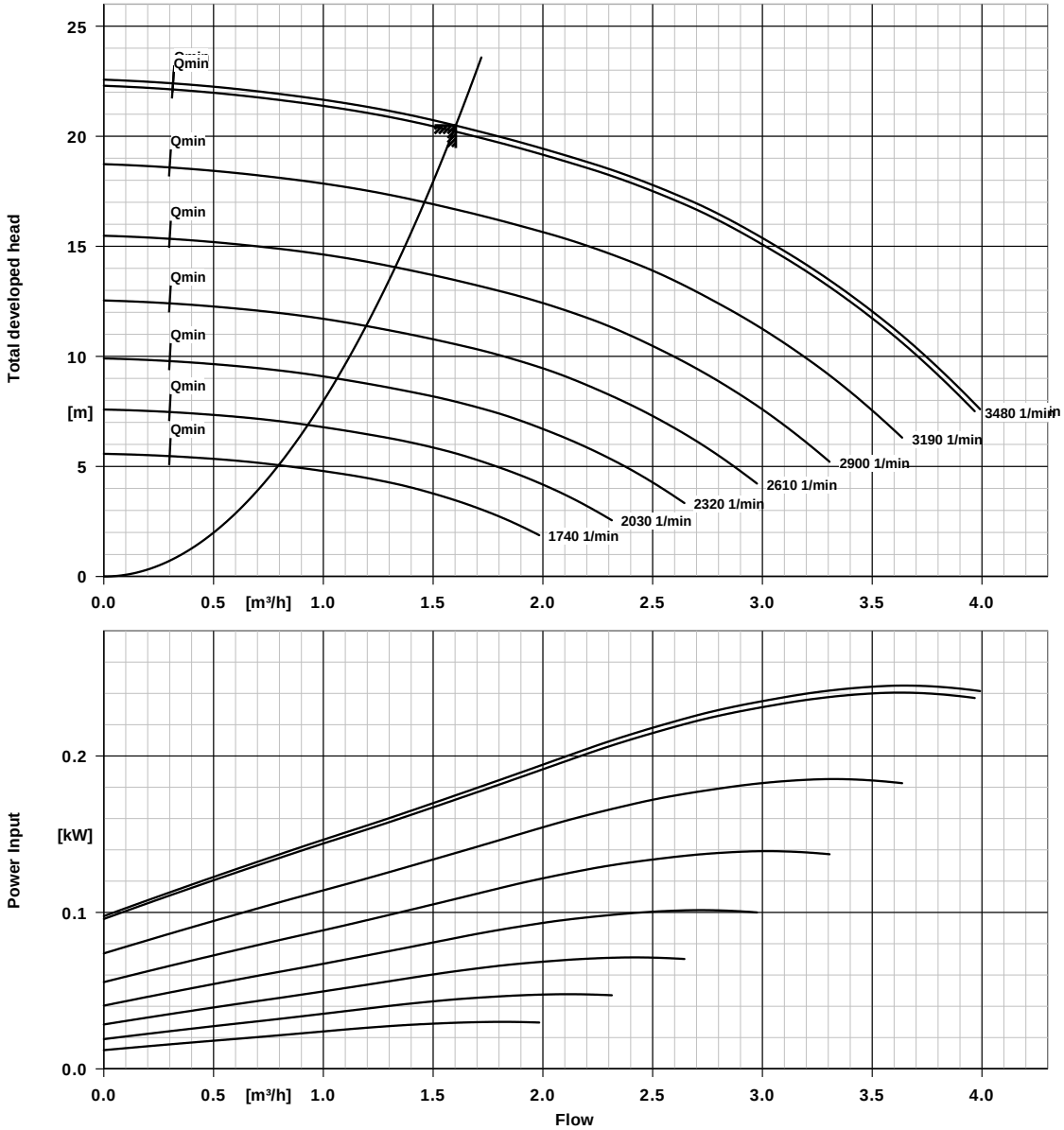

Curve data

Fluid density	965 kg/m³	Total developed head	20.49 m
Viscosity	0.33 mm²/s	Requested developed head	20.41 m
Flow rate	1.60 m³/h	MEI (Minimum Efficiency Index)	≥ 0.70
Requested flow rate	1.60 m³/h	Effective impeller diameter	80.0 mm

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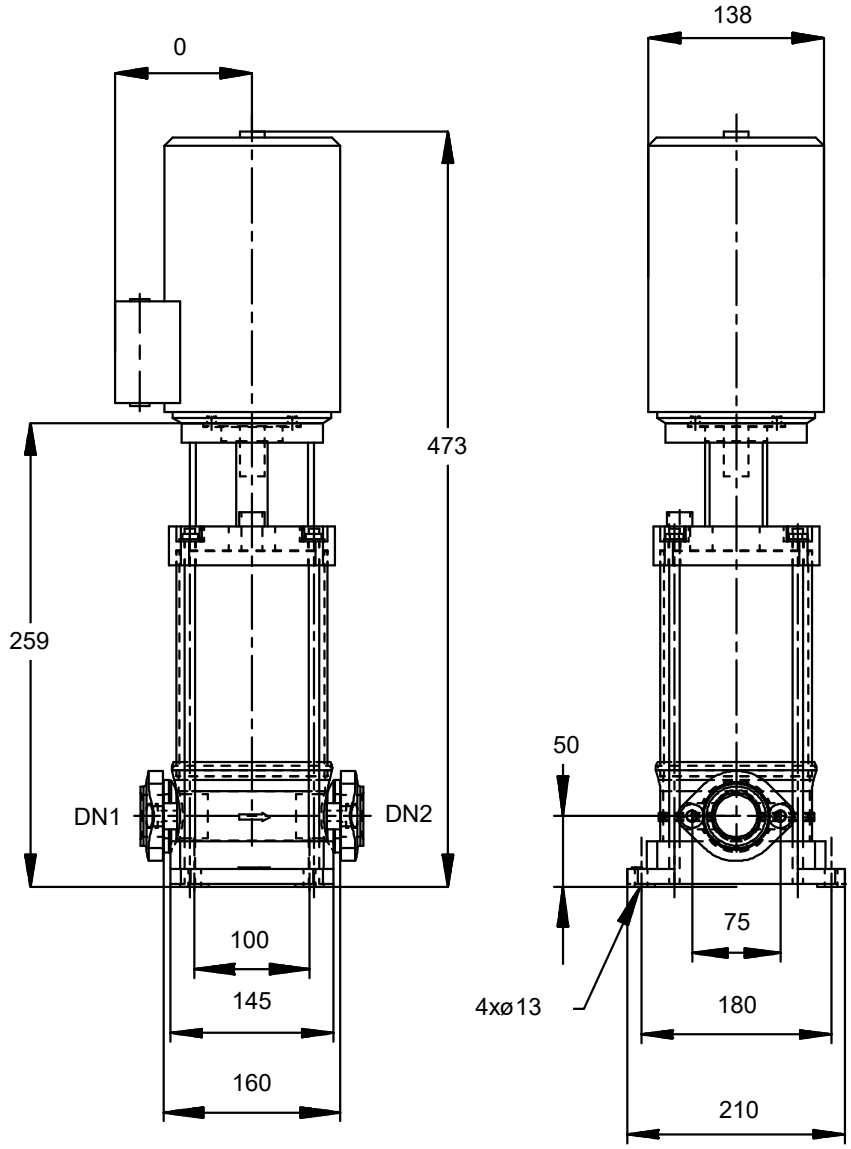

Drawing is not to scale

Dimensions in mm

Installation plan

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Motor

Motor manufacturer	KSB
Motor size	071M
Motor power	0.55 kW
Number of poles	2
Speed of rotation	2900 rpm
Position of terminal box	90° (right) Viewed from the drive
Thrust bearing housing	No

Connections

Suction nominal size DN1	G 1 / EN ISO 228-1
Discharge nominal size DN2	G 1 / EN ISO 228-1
Nominal pressure suct.	PN 16
Rated pressure disch.	PN 16

Oval flange

Weight net

Pump	49 kg
Motor	9 kg
Total	58 kg

Connect pipes without stress or strain!

For auxiliary connections see separate drawing.

Supplementary drawing for PumpDrive

Installation plan

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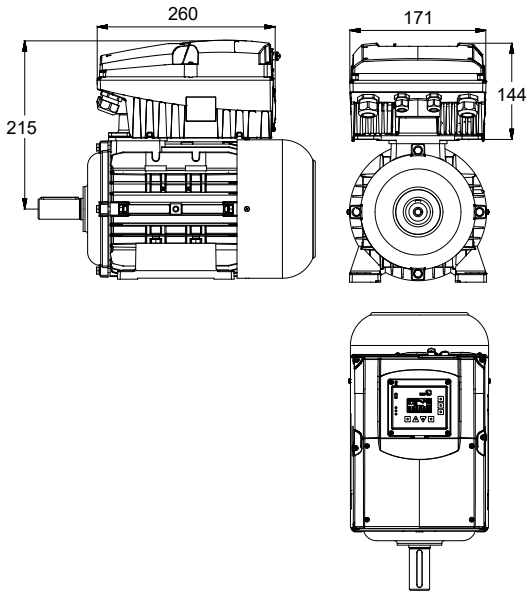

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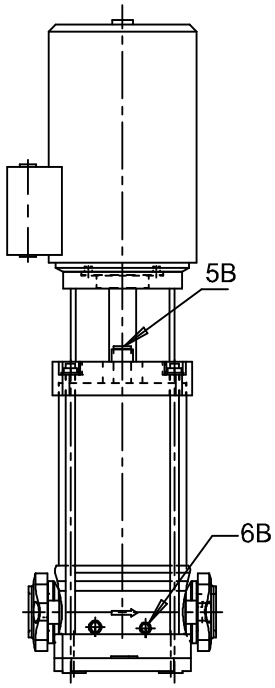

Connections

5B venting	G 3/8	Closed with venting plug
6B Pumped liquid drain	G 1/4	Drilled and plugged.

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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
Display type	With standard control panel
Rated power	0.55 kW
Max. allowed current	1.8 A
M12 module	With
Remote operation	Without
Mounting	MM - Mounted on the motor

Weight	4 kg
PumpDrive length	260.0 mm
PumpDrive width	171.0 mm
PumpDrive height	144.0 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
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

PDRV2E_000K55M_KSUPBE5P2_MOOOO

- Functional check run

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.

PumpMeter

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

General description:

PumpMeter in 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 pumps 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)