



Pressure Sensors

for refrigerants

QBE2001-P...
QBE2101-P...

- Piezo-resistive measuring system
- DC 0...10 V or DC 4...20 mA output signal
- Integral cast encapsulated
- Measurement unaffected by changes in temperature
- High temperature stability
- No mechanical aging or creepage
- Internal thread $\frac{7}{16}$ -20 UNF
- Excellent EMC characteristics
- For use with all media, included ammonia

Use

The pressure sensors are suitable for the measurement of static and dynamic positive pressures in HVAC plant, particularly in hydraulic and refrigeration systems using liquid or gaseous media. In connection with accessory item FT-PZ1, they can also be employed on high-temperature steam applications.

Technical design

The pressure sensors operate on the piezo-resistive measuring principle. The sensors diaphragm (measuring element) which utilises a special grade of steel seal welded to the pressure sensor acquires the pressure through direct contact with the medium. The measurement is converted electronically into a linear output signal of DC 0...10 V or DC 4...20 mA.

Type summary

Type reference	Pressure range		Output signal
QBE2001-P10U	-1...+9 bar	-100... +900 kPa	DC 0...10 V
QBE2001-P25U	-1...+24 bar	-100...+2400 kPa	DC 0...10 V
QBE2001-P30U	-1...+29 bar	-100...+2900 kPa	DC 0...10 V
QBE2001-P60U	-1...+59 bar	-100...+5900 kPa	DC 0...10 V
QBE2101-P10U	-1...+9 bar	-100... +900 kPa	DC 4...20 mA
QBE2101-P25U	-1...+24 bar	-100...+2400 kPa	DC 4...20 mA
QBE2101-P30U	-1...+29 bar	-100...+2900 kPa	DC 4...20 mA
QBE2101-P60U	-1...+59 bar	-100...+5900 kPa	DC 4...20 mA

Ordering

When ordering, please give name and type reference, e.g.:

Pressure sensor **QBE2001-P10U**

Any accessories required must be ordered separately.

Equipment combinations

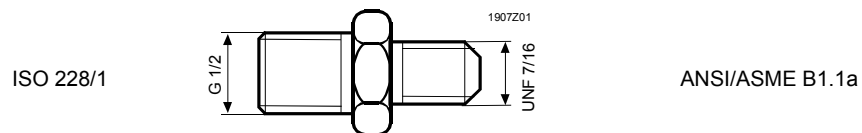
The pressure sensors can be combined with all devices or systems capable of processing the DC 0 ...10 V or DC 4...20 mA output signal from the pressure sensor.

Mechanical design

The pressure sensors are compact units and cannot be dismantled. No changes or adjustments are possible.

Accessories

FT-PZ1 The FT-PZ1 thread adapter kit is available for connection to gas or hydraulic systems with G $\frac{1}{2}$ " threads. The kit comprises 1 stainless steel (1.4306) reducing coupling and 2 copper sealing washers.



Note !

Not usable with refrigerant medium (Ammonia)

Fitting notes

Mounting Instructions are enclosed with the sensor. The FT-PZ1 thread adapter (reducing coupling and copper sealing washer) should be used for connections to systems with G $\frac{1}{2}$ " threads (refer to "Accessories"). To ensure tight fitting without leakage, copper sealing washers should be fitted to the flange seat.

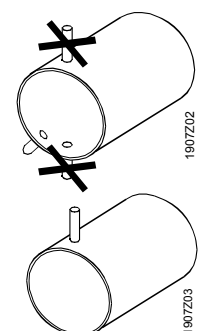
To provide for test measurements without leakage of the medium, it is strongly recommended that an appropriate test adapter and shutoff device should be fitted. The pin on the inside of the screwed fitting of the sensor is designed to ensure that any Schrader-type fitting will be opened (or closed) when the sensor is installed or removed.

Pressure measurement with liquids



The tapping point should be at the side, near the bottom of the pipe. Do not measure the pressure from the top of the pipe (where it may be affected by airlocks) or the bottom (where it may be affected by dirt). Always evacuate the system.

Pressure measurement with condensing gases

The tapping point should be at the top so that no condensate reaches the sensor.



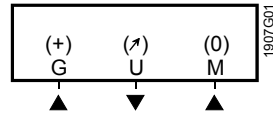
Technical data

Electrical interface QBE2001... / QBE2101...	Power supply	with extra-low voltage only (SELV, PELV)
	Operating voltage (QBE2001...)	AC 24 V ±15 %, 50...60 Hz or DC 16...33 V
	Current consumption	<5 mA
	Operating voltage (QBE2101...)	DC 8...33 V
	Current consumption	20 mA
	Output signal QBE2001...	DC 0 ...10 V, $R_{Load} > 10 \text{ k}\Omega$ (not galvanically separated, 3-wire connection, short-circuit proof and protected against polarity reversal)
Output signal QBE2101...	DC 4...20 mA, $R_{Load} \leq \frac{\text{Operating voltage} - 8 \text{ V}}{0.02 \text{ A}}$ Ohm (not galvanically separated, 2-wire connection, short-circuit proof and protected against polarity reversal)	
Functional data	Accuracy:	(FS = Full Scale)
	Total of linearity, hysteresis and reproducibility	<±0.5 % FS
	Zero point, Full scale	<±0.5 % FS
	Long term stability	±1 % FS to DIN EN 60 770
	Temperature drift:	
	TC zero point	<±0.03 % FS/K
	TC sensitivity	<±0.015 % FS/K
	Response time	<2 ms (1 ms typically)
	Nominal pressure	relative pressure as in "Type summary" (measurement of difference from ambient pressure)
	Max. admissible pressure	3 x scale end value of measuring range (FS)
	Rupture pressure	6 x scale end value of measuring range (FS)
	Media	for use with all media, included ammonia, see also paragraph "Accessories".
	Admissible temperature of medium	-40...+150 °C
Maintenance	maintenance-free	
Mounting position	optional	
Protection	Protection standard	IP 67 to EN 60 529
	Protection class	III to EN 60 730
Connections	Connecting cable QBE2001	PVC-cable, length 1.5 m, 3 x 0.5 mm ²
	QBE2101	PVC-cable, length 1.5 m, 2 x 0.5 mm ²
Environmental conditions	Screwed fitting	internal thread T_{16-20} UNF
	Operation to	IEC 60 721-3-3
	Climatic conditions	class 3K7
	Temperature	-40...+85 °C
Humidity	insensitive to condensation	
Storage / transport	IEC 60 721-3-2	
Climatic conditions	class 2K4	
Temperature	-40...+85 °C	
Humidity	insensitive to condensation	
Directives and Standards	Electromagnetic compatibility	
	Immunity to	EN 61 000-6-2, EN 61 326-1
	Emissions to	EN 61 000-6-3, EN 61 326-1
	 conformity to EMC directive	2004/108/EC
	 C-Tick conformity (EMC)	EN 61 000-6-3
	Mechanical robustness	
	Shock	DIN IEC 60 066-2-27
Constant shock	DIN IEC 60 068-2-29	
Vibration	DIN IEC 60 068-2-6	
Environmental compatibility	Environmental product declaration	ISO 14001 (environment)
	CE1E1907en provides information on environmentally compatible product design and assessment (RoHS compliance, composition of substances, packaging, environmental benefit, disposal).	ISO 9001 (quality)
		SN 36350 (environ. compat. products) RL 2002/95/EG (RoHS)
Materials	Pressure connection	stainless steel (1.4305)
	Measuring element	stainless steel diaphragm
	Cover	stainless steel (1.4305)

Weight	Sealant	metallically welded
	FT-PZ1 coupling	stainless steel (1.4305)
	Flat-faced seal for FT-PZ1	Copper (not usable with refrigerant medium (Ammonia))
	Including packaging	0.172 kg

Internal diagram

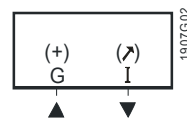
QBE2001-P...



Legend

SBT terminal marking	Color of core	Meaning
G (+)	brown	Operating voltage AC 24 V or DC 16 ...33 V
U (↗)	green	Output signal DC 0...10 V (signal ground GND)
M (0)	white	GND

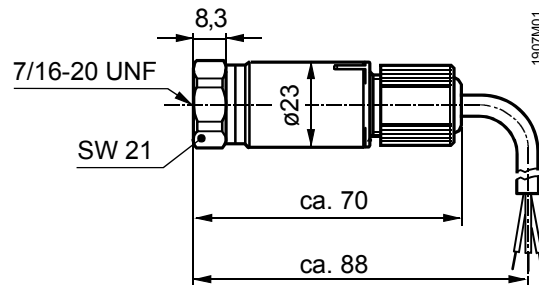
QBE2101-P...



Legend

SBT terminal marking	Color of core	Meaning
G (+)	brown	Operating voltage DC 8 ...33 V
I (↗)	green	Output signal DC 4...20 mA

Dimensions



Dimensions in mm