

# FXxQ1xx

**Pressure sensors with temperature measurement**



## Operating Instructions

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# 1. General

## 1.1 Information Concerning these Instructions

- These instructions apply to the product with ID code FXxQ1xx.
- They make it possible to use the product safely and efficiently.
- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- Local accident prevention regulations and national work safety regulations must be complied with as well.
- The product is subject to further technical development, and thus the information contained in these operating instructions may also be subject to change. The current version can be found at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.



### **NOTE!**

The operating instructions must be read carefully before using the product and must be kept on hand for later reference!

## 1.2 Explanations of Symbols

- Safety precautions and warnings are emphasized by means of symbols and attention-getting words.
- Safe use of the product is only possible if these safety precautions and warnings are adhered to.

The safety precautions and warnings are laid out in accordance with the following principle:



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### **Attention-Getting Word**

#### **Type and Source of Danger!**

Possible consequences in the event that the hazard is disregarded.

- Measures for averting the hazard.
-

The meanings of the attention-getting words, as well as the scope of the associated hazards, are listed below.



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**DANGER!**

This word indicates a hazard with a high degree of risk which, if not avoided, results in death or severe injury.

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**WARNING!**

This word indicates a hazard with a medium degree of risk which, if not avoided, may result in death or severe injury.

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**CAUTION!**

This word indicates a hazard with a low degree of risk which, if not avoided, may result in minor or moderate injury.

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**ATTENTION!**

This word draws attention to a potentially hazardous situation which, if not avoided, may result in property damage.

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**NOTE!**

A note draws attention to useful tips and suggestions, as well as information regarding efficient, error-free use.

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### 1.3 Limitation of Liability

- The product has been developed in consideration of the current state-of-the-art and applicable standards and guidelines. Subject to change without notice. A valid declaration of conformity can be accessed at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.
- wenglor sensoric elektronische Geräte GmbH (hereinafter referred to as "wenglor") excludes all liability in the event of:
  - Non-compliance with the instructions
  - Use of the product for purposes other than those intended
  - Use by untrained personnel
  - Use of unapproved replacement parts
  - Unapproved modification of products
- These operating instructions do not include any guarantees from wenglor with regard to the described procedures or specific product characteristics.
- wenglor assumes no liability for printing errors or other inaccuracies contained in these operating instructions, unless wenglor was verifiably aware of such errors at the point in time at which the operating instructions were prepared.

## 1.4 Copyrights

- The contents of these instructions are protected by copyright law.
- All rights are reserved by wenglor.
- Commercial reproduction or any other commercial use of the provided content and information, in particular graphics and images, is not permitted without previous written consent from wenglor.

# 2. For Your Safety

## 2.1 Use for Intended Purpose

This product is used for pressure and temperature acquisition in closed systems.

### Pressure Sensor

weFlux<sup>2</sup> pressure sensors measure the relative pressure of any desired media in closed systems. The pressure acting on a pressure sensor is converted into an electronic signal. The analog outputs read out the measured pressure and temperature values as 4 to 20 mA signals.

**This product can be used in the following industry sectors:**

- |                                   |                            |
|-----------------------------------|----------------------------|
| • Special machinery manufacturing | • Paper industry           |
| • Heavy machinery manufacturing   | • Electronics industry     |
| • Logistics                       | • Glass industry           |
| • Automotive industry             | • Steel industry           |
| • Packaging industry              | • Printing industry        |
| • Clothing industry               | • Construction industry    |
| • Plastics industry               | • Chemicals industry       |
| • Woodworking industry            | • Agriculture industry     |
| • Consumer goods industry         | • Alternative energy       |
|                                   | • Raw materials extraction |

## 2.2 Use for Other than the Intended Purpose

- Measures must be taken to prevent pressure values that exceed the specified overload pressure.
- The device may be destroyed if the bursting pressure is exceeded. Risk of injury!
- Not a safety component in accordance with 2006/42/EC (Machinery Directive).
- The product is not suitable for use in potentially explosive atmospheres.
- The product may only be used with accessories supplied or approved by wenglor, or in combination with approved products. A list of approved accessories and combination products can be accessed at [www.wenglor.com](http://www.wenglor.com) on the product detail page.



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**DANGER!****Risk of personal injury or property damage in case of use for other than the intended purpose!**

Use for other than the intended purpose may lead to hazardous situations.

- Instructions regarding use for intended purpose must be observed.
- 

## 2.3 Personnel Qualifications

- Suitable technical training is a prerequisite.
- In-house electronics training is required.
- Trained personnel must have uninterrupted access to the operating instructions.



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**DANGER!****Risk of personal injury or property damage in case of incorrect initial start-up and maintenance!**

Personal injury and damage to equipment may occur.

- Adequate training and qualification of personnel.
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## 2.4 Modification of Products



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**DANGER!****Risk of personal injury or property damage if the product is modified!**

Personal injury and damage to equipment may occur. Non-observance may result in loss of the CE marking and the guarantee may be rendered null and void.

- Modification of the product is impermissible.
-

## 2.5 General Safety Precautions

### NOTE!

- These instructions are an integral part of the product and must be kept on hand for the entire duration of its service life.
- In the event of possible changes, the respectively current version of the operating instructions can be accessed at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.
- Read the operating instructions carefully before using the product.
- Protect the sensor against contamination and mechanical influences.



## 2.6 Approvals and IP Protection



**RoHS**



### 3. Technical Data

Technical Data		Order Number	FXxQ1xx
<b>Sensor-Specific Data</b>			
Measuring range			-1...10 bar, in various pressure stages
Pressure type			relative
Media temperature			See technical data sheet
Measuring range Temperature			See technical data sheet
Measurement error (incl. hysteresis, linearity, repetition accuracy)			< +/-0,5 %
Temperature measuring accuracy			< +/-1 °C
<b>Ambient Conditions</b>			
Ambient temperature			-25...80 °C
Storage temperature			-25...80 °C
EMC			DIN EN 61326-2-3
Shock resistance per DIN EN 60068-2-27			30 g/11 ms
Vibration resistance per DIN EN 60068-2-6			10 g (10...2000 Hz)
<b>Electrical Data</b>			
Supply power			12...32 V DC
Current consumption (U <sub>o</sub> =24 V)			< 15 mA
Number of analog outputs			2
Response Time			< 10 ms
Output load resistance			4...20 mA  $< \frac{(U_o - U_{min})}{20 \text{ mA}}$
Short-circuit protection			Yes
Reverse polarity protected			Yes
Protection class			III
<b>Mechanical Data</b>			
Housing material			Stainless steel 1.4404
Media contacting materials			Stainless steel 1.4404, Seal material (see technical data sheet), ceramic Al <sub>2</sub> O <sub>3</sub> 96 %
Protection			IP65*
Connector type			M12 x 1 , 4-pin
Connection cable length			max. 30 m
Process connection			G3/4"
<b>Safety-relevant Data</b>			
MTTFd (EN ISO 13849-1)			1157,11 a

\* Not UL certified

The following table specifies the tightening torques of the connector plugs and mounting options in order to assure compliant, error-free operation:

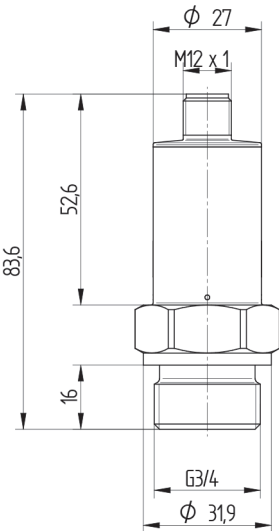
Connector Type	Tightening Torque in Nm
Supply voltage and signal connection	
M12	0,4
Process connection	
G3/4" external thread	30



- CAUTION!**
- The pressure resistance or pressure range specified in the technical data always makes reference to the sensor itself.
  - Amongst other factors, the system's pressure resistance is also dependent on the utilized mounting components (adapters), and is only as high as the pressure resistance of the weakest component.

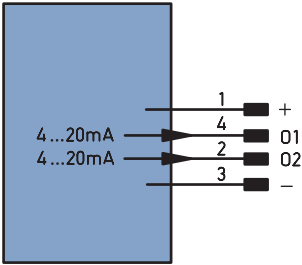
### 3.1 Housing Dimensions

G3/4"




### 3.2 Wiring Diagram

141

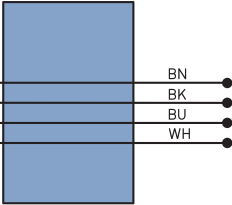


#### Legend

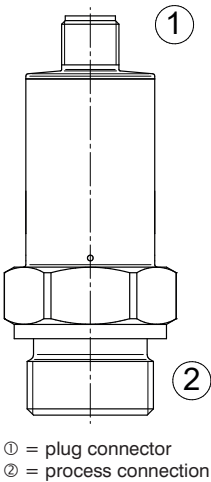
+	Supply Voltage +	PT	Platinum measuring resistor	ENAR5422	Encoder A/Ā (TTL)
–	Supply Voltage 0 V	nc	not connected	ENBR5422	Encoder B/B̄ (TTL)
~	Supply Voltage (AC Voltage)	U	Test Input	ENa	Encoder A
A	Switching Output (NO)	Ū	Test Input inverted	ENb	Encoder B
Ā	Switching Output (NC)	W	Trigger Input	AMIN	Digital output MIN
V	Contamination/Error Output (NO)	W–	Ground for the Trigger Input	AMAX	Digital output MAX
∇	Contamination/Error Output (NC)	O	Analog Output	AOK	Digital output OK
E	Input (analog or digital)	O–	Ground for the Analog Output	SY In	Synchronization In
T	Teach Input	BZ	Block Discharge	SY OUT	Synchronization OUT
Z	Time Delay (activation)	AMV	Valve Output	Q.LT	Brightness output
S	Shielding	a	Valve Control Output +	M	Maintenance
RxD	Interface Receive Path	b	Valve Control Output 0 V	rsv	reserved
TxD	Interface Send Path	SY	Synchronization	Wire Colors according to IEC 60757	
RDY	Ready	SY–	Ground for the Synchronization	BK	Black
GND	Ground	E+	Receiver-Line	BN	Brown
CL	Clock	S+	Emitter-Line	RD	Red
E/A	Output/Input programmable	⊥	Grounding	OG	Orange
	IO-Link	SnR	Switching Distance Reduction	YE	Yellow
PoE	Power over Ethernet	Rx+/-	Ethernet Receive Path	GN	Green
IN	Safety Input	Tx+/-	Ethernet Send Path	BU	Blue
QSSD	Safety Output	Bus	Interfaces-Bus A(+)/B(-)	VT	Violet
Signal	Signal Output	La	Emitted Light disengageable	GY	Grey
BL-D +/-	Ethernet Gigabit bidirect. data line (A-D)	Mag	Magnet activation	WH	White
ENBR5422	Encoder 0-pulse 0-0̄ (TTL)	RES	Input confirmation	PK	Pink
		EDM	Contactur Monitoring	GNYE	Green/Yellow

### 3.3 Complementary Products

wenglor can provide you with suitable connection technology for your product.

Suitable mounting technology no.	G3/4": 920
Suitable connection technology no.	2
	S02
	

### 3.4 Layout



### 3.5 Scope of Delivery

- Pressure Sensor FXxQ1xx
- Quickstart guide
- Seal

## 4. Transport and Storage

### 4.1 Transport

Upon receipt of shipment, inspect the goods for damage in transit. In the case of damage, conditionally accept the package and notify the manufacturer of the damage. Then return the device, making reference to damage in transit.

### 4.2 Storage

The following points must be taken into condition with regard to storage:

- Do not store the product outdoors.
- Store the product in a dry, dust-free place.
- Protect the product against mechanical impacts.



#### **ATTENTION!**

#### **Risk of property damage in case of improper storage!**

The product may be damaged.

- Comply with storage instructions.
-

## 5. Installation and Electrical Connection

### 5.1 System Overview



#### Connector Cables

ZCCL001 (straight, PVC, IP69K) 10 m

S23-2M (straight, PVC) 2 m

S23-2MPUR (straight, PUR) 2 m

S23-5M (straight, PVC) 5 m

S23-5MPUR (straight, PUR) 5 m

S23-10M (straight, PVC) 10 m

S23-10MPUR (straight, PUR) 10 m

S29-2M (angled, PVC) 2 m

S29-5M (angled, PVC) 5 m

S29-5MPUR (angled, PUR) 5 m

S29-10M (angled, PVC) 10 m

#### Adapters

...for G3/4":

Welding fitting: ZH4C009

### 5.2 Installation

- Protect the product from contamination during installation.
- Observe all applicable electrical and mechanical regulations, standards, and safety rules.
- Protect the product against mechanical influences.
- Make sure that the sensor is mounted in a mechanically secure fashion.
- Specified torque values must be complied with (see [“3. Technical Data” on page 9](#)).



#### ATTENTION!

##### **Risk of property damage in case of improper installation!**

The product may be damaged.

- Comply with installation instructions.



#### CAUTION!

##### **Risk of personal injury or property damage during installation!**

Personal injury and damage to the product may occur.

- Ensure a safe installation environment.
- Before dismantling, make sure that the system is pressure-free.

## 5.3 Electrical Connection

- Connect the sensor to 12 to 32 V DC (see “3.4 Layout” on page 12).
- The cable may not exceed a length of 30 m.



### **DANGER!**

#### **Risk of personal injury or property damage due to electric current!**

Voltage conducting parts may cause personal injury or damage to equipment.

- The electric device may only be connected by appropriately qualified personnel.
- 

## 5.4 Diagnostics

Required action in case of fault:



### **NOTE!**

- Shut down the machine.
- If the error cannot be eliminated, please contact wenglor's support department.
- Do not operate in case of indeterminate malfunctioning.
- The machine must be shut down if the error cannot be unequivocally clarified or reliably eliminated.



### **DANGER!**

#### **Risk of personal injury or property damage in case of non-compliance!**

The system's safety function is disabled. Personal injury and damage to equipment.

- Required action as specified in case of fault.
-

## 6. Default Settings

		FXxQ1xx
Function A1 (Pin 4)	Output	Analog output
	Physical quantity	Temperature
	Output function	Current 4...20 mA
	Start value Analog output	-40 °C
	End value Analog output	125 °C
Function A2 (Pin 2)	Output	Analog output
	Physical quantity	Pressure
	Output function	Current: 4...20 mA
	Initial value, analog output	0 % of the MUL
	Final value, analog output	100 % of the MUL

## 7. Maintenance Instructions

**NOTE!**



- This wenglor sensor is maintenance-free.
- Cleaning and inspection of the plug connections at regular intervals is advisable.
- Do not clean the sensor with solvents or cleansers which could damage the product.
- The product must be protected against contamination during initial start-up.
- Deposits upstream from the pressure measuring cell may influence results.

## 8. Returns

Due to legal regulations and for the protection of employees, wenglor sensoric GmbH requires a signed declaration of decontamination before your order can be processed.  
The corresponding form is available at [www.wenglor.com](http://www.wenglor.com) → Download → General Terms and Conditions and Returns.

## 9. Proper Disposal

wenglor sensoric GmbH does not accept the return of unusable or irreparable products. Respectively valid national waste disposal regulations apply to product disposal.

## 10. Appendix

### 10.1 List of Abbreviations

Abbreviation	Meaning
MUL	Measuring range upper limit

### 10.2 Change Index, Operating Instructions

Version	Date	Description/Change
1.0.0	29.04.2019	Initial version of the operating instructions
1.1.0	17.12.2019	Updates of "3. Technical Data" on page 9
1.2.0	23.01.2020	Updates of "3. Technical Data" on page 9
1.3.0	12.02.2020	Updates of "3. Technical Data" on page 9
1.4.0	30.06.2020	Update of "2.6 Approvals and IP Protection" on page 8

### 10.3 EU Declaration of Conformity

The EU declaration of conformity can be found on our website at [www.wenglor.com](http://www.wenglor.com) in the product's separate download area.

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