# Instruction Manual

## 1. Marking

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| Frequency Converter with Trip Values<br>KFD2-UFC-Ex1.D<br>Frequency Converter with Direction and Synchronization Monitor<br>KFD2-UFT-Ex2.D |
| ATEX certificate: TÜV 99 ATEX 1471<br>ATEX marking:<br>Ⓔx II (1)G [Ex ia Ga] IIC<br>Ⓔx II (1)D [Ex ia Da] IIIC<br>Ⓔx I (M1) [Ex ia Ma] I<br>ATEX certificate: TÜV 02 ATEX 1885 X<br>ATEX marking: Ⓔx II 3G Ex nA nC IIC T4 Gc |
| IECEx certificate:<br>IECEx TUN 04.0007<br>IECEx TSA 18.0007X<br>IECEx marking:<br>[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I<br>Ex ec nC IIC T4 Gc |
| North America Certifcates: FM22CA0016X / Project ID: 3009603 (FM)<br>Class I, Division 2, Groups A-D, T4<br>Class I, Zone 2, AEx nC, Group IIC, T4<br>Class I, Zone 2, Ex nA nC, Group IIC, T4<br>Associated apparatus with intrinsically safe circuits for:<br>Class I, Division 1, Groups A-D; Class II, Division 1, Groups E-G;<br>Class III<br>Class I, Zone 0, [AEx ia] IIC, Class I, Zone 0, [Ex ia] IIC |
| North America Certifcates: E223772 (UL) |
| CCC certificate: 2020322316001449<br>CCC marking: [Ex ia Ga] IIC, [Ex ia Da] IIIC |


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## 2. Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

Prior to using the product make yourself familiar with it. Read the instruction manual carefully.

## 3. Reference to Further Documentation

Observe directives, standards, and national laws applicable to the intended use and the operating location.

For mining applications, observe directives, standards, and national laws applicable to the operating location.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable supplement this document. You can find this information under www.pepperl-fuchs.com.

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com/device-information.

If you use the device in safety-related applications, observe the requirements for functional safety. You can find these requirements in the functional safety documentation under www.pepperl-fuchs.com.

## 4. Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device is used in control and instrumentation technology (C&I technology) for the galvanic isolation of signals such as 20 mA and 10 V standard signals or alternatively for adapting or standardizing signals. The device has intrinsically safe circuits that are used for operating intrinsically safe field devices in hazardous areas.

Use the device only within the specified ambient and operating conditions.

Only use the device stationary.

The device is an associated apparatus according to IEC/EN 60079-11.

The device is an electrical apparatus for hazardous areas of Zone 2.

The device may be installed in the non-hazardous area.

If you use the device in safety-related applications, observe the information for safety function and safe state.

**Frequency Converter with Trip Values**

The device changes a digital input signal into a proportional free adjustable 0/4 mA to 20 mA analog output signal and functions as a switch amplifier and a trip alarm.

**Frequency Converter with Direction and Synchronization Monitor**

The device analyzes 2 digital signals (NAMUR sensor/mechanical contact) from a explosion-hazardous area and functions as a rotation direction indicator, slip monitor, frequency monitor or synchronization monitor.

## 5. Improper Use

Protection of personnel and the plant is not ensured if the device is not used according to its intended use.

If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i.

## 6. Mounting and Installation

Do not mount a damaged or polluted device.

The device is designed for mounting on a 35 mm DIN mounting rail according to EN 60715.

Mount the device in a way that the device is protected against mechanical hazard. Mount the device in a surrounding enclosure for example.

Ensure that the surrounding enclosure can only be opened with a tool.

The device fulfills a degree of protection IP20 according to IEC/EN 60529.

The device must be installed and operated only in a controlled environment that ensures a pollution degree 2 (or better) according to IEC/EN 60664-1.

If used in areas with higher pollution degree, the device needs to be protected accordingly.

Do not mount the device in the dust hazardous area.

The device must be installed and operated only in an environment of overvoltage category II (or better) according to IEC/EN 60664-1.

Supply the device with a power supply that meets the requirements for safety extra-low voltage (SELV) or protective extra-low voltage (PELV).

If you are using the Power Rail, supply the Power Rail only via the corresponding power feed modules or power supplies. Do not supply the Power Rail via isolators.

Observe the installation instructions according to IEC/EN 60079-14.

If you install the device in safety-related applications, observe the requirements for functional safety.

**Requirements for Cables and Connection Lines**

Observe the permissible core cross section of the conductor.

When using stranded conductors, crimp wire end ferrules on the conductor ends.

Use only copper conductors.

Use only one conductor per terminal.

When installing the conductors the insulation must reach up to the terminal.

Observe the tightening torque of the terminal screws.

If the voltage is greater than 50 V AC or 120 V DC, switch off the voltage before connecting or disconnecting the device.

Only use cables and connection lines with a temperature range appropriate to the application.

**Requirements for Usage as Associated Apparatus**

If circuits with type of protection Ex i are operated with non-intrinsically safe circuits, they must no longer be used as circuits with type of protection Ex i.

Observe the respective peak values of the field device and the associated apparatus with regard to explosion protection when connecting intrinsically safe field devices with intrinsically safe circuits of associated apparatus (verification of intrinsic safety). Also observe IEC/EN 60079-14 and IEC/EN 60079-25.

Intrinsically safe circuits of associated apparatus can be led into hazardous areas. Observe the compliance of the separation distances to all non-intrinsically safe circuits according to IEC/EN 60079-14.

Observe the compliance of the separation distances between two adjacent intrinsically safe circuits according to IEC/EN 60079-14.

**Requirements for Equipment Protection Level Gc**

The device must be installed and operated only in surrounding enclosures that

- comply with the requirements for surrounding enclosures according to IEC/EN 60079-0,
- are rated with the degree of protection IP54 according to IEC/EN 60529.

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

Provide a transient protection. Ensure that the peak value of the transient protection does not exceed 140 % of the rated voltage.

## 7. Operation, Maintenance, Repair

If you operate the device in safety-related applications, observe the requirements for functional safety. In case of operating in low demand mode, plan appropriate intervals for the proof test.
If the voltage is greater than 50 V AC or 120 V DC, switch off the voltage before connecting or disconnecting the device.
Do not use a damaged or polluted device.

Do not repair, modify, or manipulate the device.

If there is a defect, always replace the device with an original device.

**Requirements for Equipment Protection Level Gc**

Connection or disconnection of energized non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

Only use operating elements in the absence of a potentially explosive atmosphere.

Only use the programming socket in the absence of a potentially explosive atmosphere.

## 8. Delivery, Transport, Disposal

Check the packaging and contents for damage.
Check if you have received every item and if the items received are the ones you ordered.
Always store and transport the device in the original packaging.
Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.
The device, built-in components, packaging, and any batteries contained within must be disposed in compliance with the applicable laws and guidelines of the respective country.