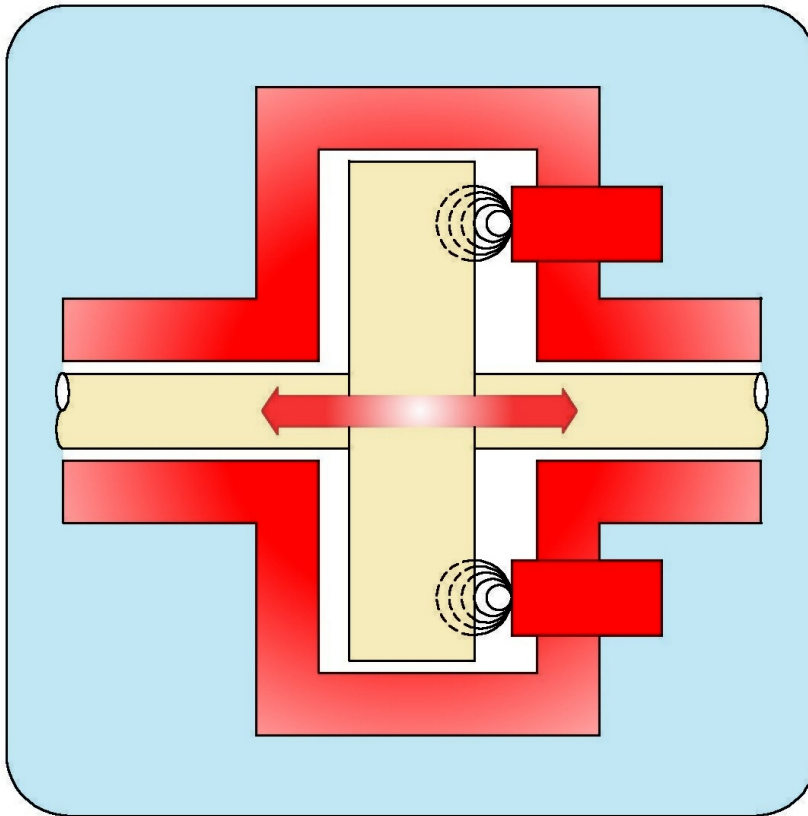


# MMS 3210/xxx-xxx

## Dual Channel Shaft Position Transmitter for Eddy Current Sensors



- Highly flexible due to numerous hardware options
- Precisely adaptable to the requirements by versatile combination possibilities
- Integrated signal converters for both channels, also with extended measuring range
- Optional with external converter for operation in explosive areas
- For measurement and processing relative shaft displacement signals
- Inputs for eddy current transducers
- Integrated microcontroller
- Compliant to API 670
- Two redundant 24 V DC supply inputs
- Supervision functions for electronic and sensors
- To be mounted directly at the machine
- 2 Current outputs 0/4...20 mA
- Up to 5 configurable function outputs

### Application:

The **MMS 3210/..** dual channel shaft position transmitter is part of the revised **MMS 3000** transmitter system for monitoring and protecting any kind of turbo machines.

The transmitters of the new generation are characterised by their highly flexible hardware options and their versatile combination possibilities and can thus optimally be adapted on the demands of the respective plant.

They permit economic measurement and supervision of relative shaft displacement and shaft

position with eddy current sensors.

Application fields of the transmitters are all kind of turbo machines, fans, compressors, gear boxes, pumps and similar, rotational machines.

Due to the bus capability, **MMS 3000** transmitters are applicable for big systems with programmable logic controls and host computers as used in power stations, refineries and chemical plants, as well as for small plants with only few measuring points and decentralized data processing.

The inputs of the transmitter may be operated with all standard types of **epro** eddy current sensors:

**PR 6422/.., PR 6423/..,  
PR 6424/.., PR 6425/..,  
PR 6426/..**

## Function and Design:

The **MMS 3210/..** Dual-channel Shaft Displacement Transmitter converts the input signals of eddy current sensors to two independent signals proportional to the shaft displacement resp. the relative expansion.

The integrated module and sensor supervision detects fault functions of both - sensor and module electronic. In this case the status of the ok output (Channel Clear) changes and the 4...20 mA current output indicates 0 mA.

All required configurations are made by means of the **MMS 3910W** configuration software.

The transmitters are delivered with a standard configuration suitable for most applications, if desired, any other configuration can be prepared in the factory.

## Technical Data:

### Sensor inputs:

Two independent inputs for eddy current sensor of the type series PR 6422/.., PR 6423/..; PR 6424/.., PR 6425 and PR 6426/..

#### Standard:

- Int. CON;  
„Lemo“ Connector

#### Optional:

- Int. CON with extended meas. range  
„Lemo“ Connector
- Ext. CON; “Harting” connector

### Measuring ranges:

Freely selectable by means of the configuration software depending on the applied sensors.

### Frequency range (-3dB):

Low-pass filter: 10 Hz

### Output characteristic value:

#### Standard:

- Two current outputs, proportional to the chosen characteristic and related to the the system ground. The outputs may be freely assigned to the measuring channels.

#### Optional:

- Two galvanically separated current outputs, proportional to the chosen characteristic. The outputs may be freely assigned to the measuring channels.
- Without current output

Current output ranges:

0/4...20 mA or 20...4/0 mA

Maximum burden:

500 Ohm

Open circuit and short-circuit proof.

### Buffered sensor signal:

Two signal outputs for analysis and diagnosis purposes, one for each channel, proportional to the dynamic sensor signal. Accessible via terminals.

Unfiltered voltage output:

2-10 V; Error  $\pm 2,5\%$

### Limit value- and channel supervision:

The transmitter provides altogether 5 function outputs.

Limit values can be programmed either on individual measurements or for the sum value of the combined measurements. Beyond this, the function outputs can be used to indicate the Channel Clear state. The function outputs can be freely assigned by means of the configuration software.

The following options are possible:

- Without function outputs
- 5 x opto-coupler output  
 $U_{MAX}$ : 48 V DC  
 $I_{MAX}$ : 100 mA  
 $P_{MAX}$ : 5 W
- 5 x relay contact (make contact)  
 $U_{MAX}$ : 48 V DC  
 $I_{MAX}$ : 1 A  
 $P_{MAX}$ : 50 W
- 5 x photomos relays  
 $U_{MAX}$ : 48 V DC  
 $I_{MAX}$ : 500 mA  
 $P_{MAX}$ : 25 W

### Data interfaces:

#### Standard:

- RS 232 interface for configuration of the transmitter and for displaying the measured data.

#### Optional:

- RS485 bus with epro protocol V2.0
- PROFIBUS DP

### Linearity error (without sensor):

0,25% at 25°C

### Linearity error (with sensor):

Standard measuring range

PR 6422: max.  $\pm 1,75\%$  at 25°C

PR 6423: max.  $\pm 1,25\%$  at 25°C

PR 6424: max.  $\pm 1,75\%$  at 25°C

PR 6425: max.  $-6,25\%$  at 25°C

PR 6426: max.  $\pm 1,75\%$  at 25°C

### linearity error (incl. sensor) with extended measuring range:

See specification in the data sheet

CON 011/91: + 0,25%.

### Output stability over temperature:

< 0,08%/10 K

### Long-term drift:

max. 1% of f.s.d.

### Power supply:

Option for redundant power supply, decoupled via diodes.

Nominal:

+24 V DC

Permissible voltage range:

+18...+31,2 V DC

Power consumption:

Depending on the built-in options.

max. 6 W

### Housing:

Aluminium, non-corroding

### Protection class:

IP 65 according to DIN 40050, IEC 144, CE certified.

### EMC tested:

according to EN 55011 and EN 61326

### Environmental conditions:

(according to IEC 359, DIN 43745)

Maximum permissible temperature of the mounting surface 65°C.

Operating temperature range: -20...+65°C

Mounted on 10 mm spacing bolts:

Maximum permissible temperature of the mounting surface 90°C.

Operating temperature range: -20...+45°C

By all means, heat concentrations must be avoided by constructive measures.

### Permissible relative humidity:

0.....95 % non-condensing

### Vibration and shock :

shock: 20 g over 2 ms

vibration: 5 g at 60 Hz

### Mounting direction:

Preferably with the cable glands downwards.

### Dimensions:

See drawing

### Weight:

Depending on the chosen hardware options.

Net weight: max. 1,3 kg

Gross weight: max. 1,5 kg

## Module and sensor supervision:

The internal module supervision continuously checks the following functions:

- whether the input signal is within the predefined range.

- whether the cable between transmitter and sensor is ok (no short-circuit / no broken cable).
- The system voltages.

The state of module and sensor supervision can be signalled by means of switching contacts of the function outputs. Specifications of the different options can be found in the technical data.

## The most important configuration parameters:

All configurations are made by means of the **MMS 3910W** configuration software.

The configuration software is not contained in the transmitter's extent of supply and must be ordered separately.

The adjustable parameters, shown in the list below may differ, depending on the chosen operation mode and measuring function.

- KKS identification per channel
- Operating mode
- Sensor sensitivity
- Series resistance of safety barriers
- Measuring range
- Measuring mode
- Linearization per channel
- Inversion of meas. direction
- Characteristical variables
- Current suppression

- Current calibration
- Current smoothing
- Shift of output current
- Channel clear limits
- Warning and alarm limits
- Operating principle of function outputs
- Limit value hysteresis
- Response delay of alarm outputs
- Limit downscaling
- Test values

## Limit supervision and Function outputs:

The transmitter provides altogether five so-called function outputs. Each of these function outputs can be assigned to a limit value as well as to the channel clear function.

Beside this, the assignment between input channel and function output can be freely selected.

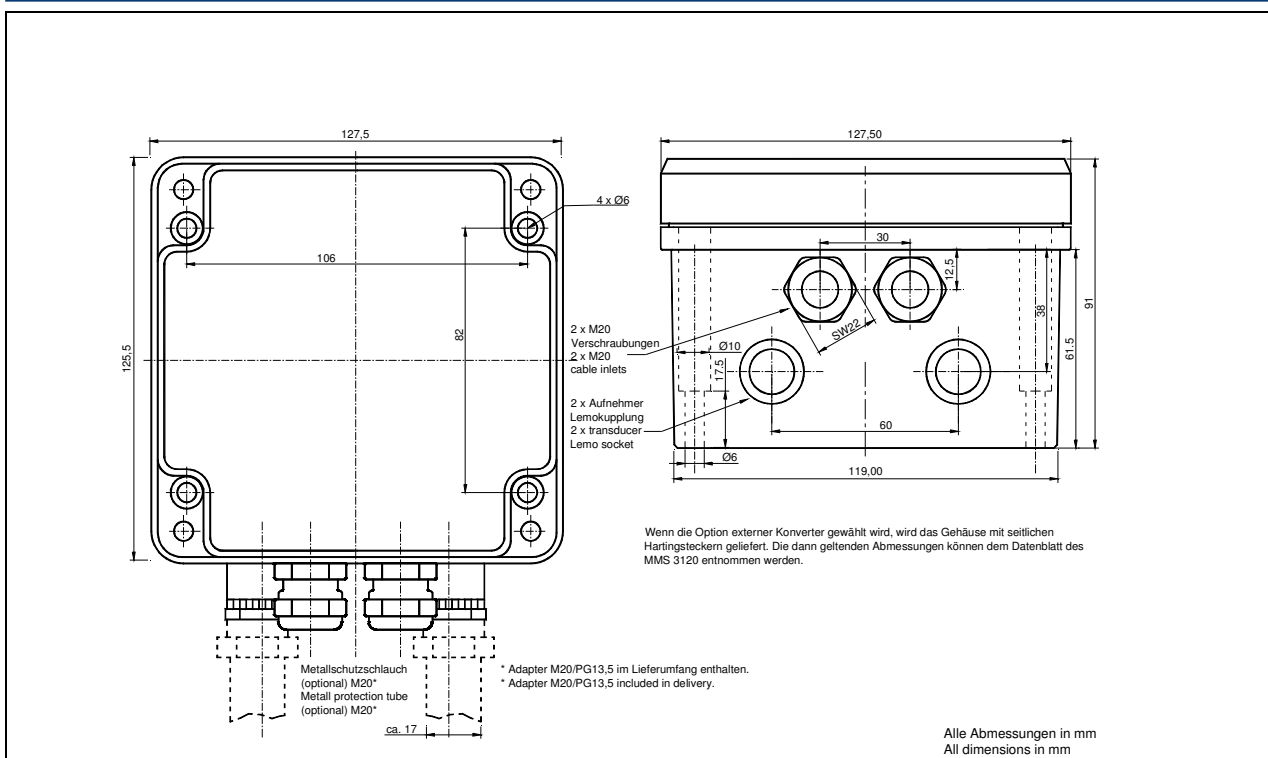
The output of channel clear can be made either individually for each channel or with a logical OR resp. AND combination.

Limit values can be set for the single channels as well as on the sum value when both channels are combined, in each case with or without latching function. The following alarm functions are selectable:

- Limit exceeding pos. direction
- Limit exceeding neg. direction
- Limit exceeding pos. and neg. direction

Exceeding of limit values can be signalled by means of switching contacts of the function outputs. Specifications of the function output options can be found in the technical data.

## Dimensions:



## Operating modes:

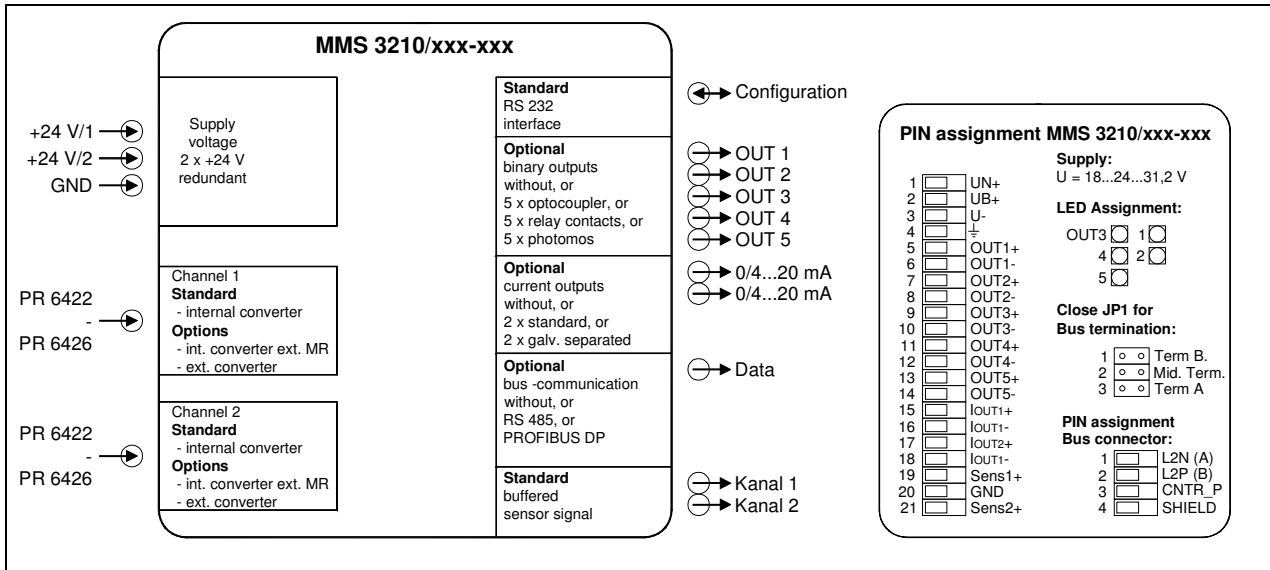
The **MMS 3210/..** position transmitters provide different measuring modes, each of them to be configured by means of the **MMS 3910W** configuration software.

At operation modes single channel or dual channel transmitter without combination of channel results, relative positions according to the used sensors can be measured.

In the dual channel mode with combination of the channel results, the following measuring modes can be realized:

- Difference measurement (K1/K2)
- Max value (K1/K2)
- Cone measurement
- Double cone measurement
- Tandem measurement

## In- / Outputs:



## Order options:

For **MMS 3210/..** shaft displacement transmitters the following order options are possible:

### Sensor inputs K1 and K2:

Two identical input channels, no mixed application!

- Internal converter [Standard]
- Internal converter, extended range
- External converter

### Communication:

- RS 232 [Standard]
- RS 485
- PROFIBUS DP

### Output characteristic:

- Without
- 2 x with system ref. [Standard]
- 2 x galvanically separated

### Function outputs:

- Without
- 5 x opto coupler [Standard]
- 5 x relay (make contact)
- 5 x photomos

### Display:

- Without [Standard]
- With 8-digit display

## Standard types, deliverable ex stock:

**MMS 3210/010-000** Internal signal converters, RS 232, without Bus-communication, current output with common ground, no function outputs, no display. **9100-03021**

**MMS 3210/011-000** Internal signal converters, RS 232, without Bus-communication, current output with common ground, with function outputs, no display. **9100-03022**

### Accessories:

**MMS 3910 W** Configuration kit for **MMS 3000** Transmitter **9510-00023**

## Warning note:



Installation and commissioning of the transmitter may only be made by trained staff. The manufacturer is not liable for damages which were caused by improper use or by operation errors of not authorized persons.