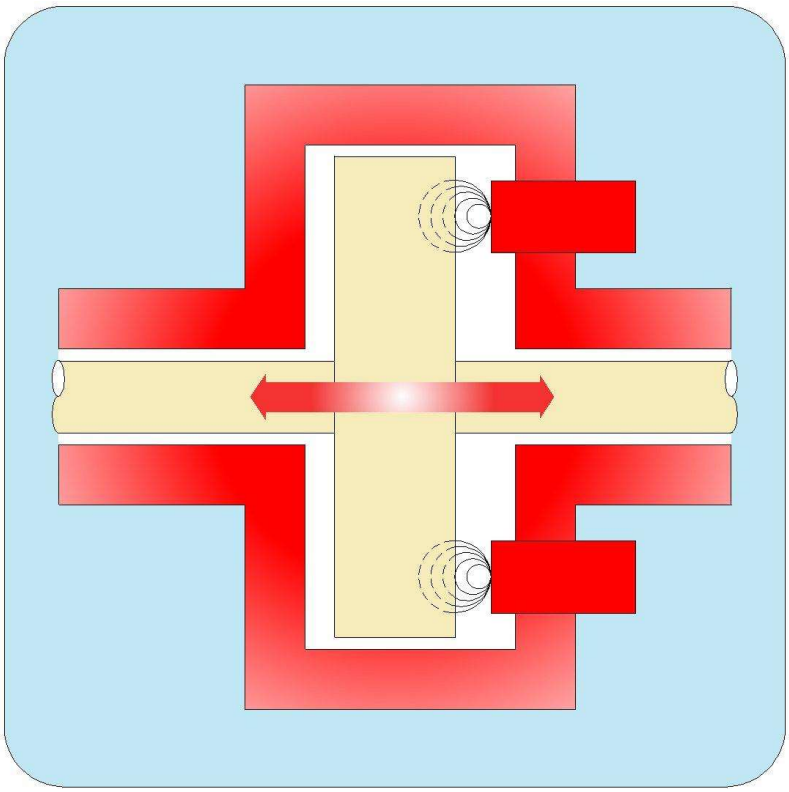
MMS 3210
Dual-channel Shaft Displacement Transmitter



- **Integrated signal converters for both channels**
- **Measurement and processing of shaft displacement**
- **Inputs for eddy current transducers**
- **Integrated micro controller**
- **Corresponds to the most common standards, such as API 670**
- **Two redundant 24 V dc supply inputs**
- **Self-test functions for electronic circuits and transducers**
- **To be mounted directly at the machine**
- **0/4...20 mA current outputs**
- **Limit supervision**

Applications:

The **MMS 3210** Dual-channel Shaft Displacement Transmitter is part of the **MMS 3000** transmitter system for monitoring and protecting any kind of turbo machines. It permits economic measurement and supervision of the absolute shaft displacement by using eddy current sensors. Moreover, this transmitter may also be used for measurements of relative expansions.

Application fields of the system are all types of turbo machines, fans, compressors, gear boxes, pumps and similar machines.
MMS 3000 Transmitters are suitable 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 epro eddy cur-rent sensors:
PR 6422/.., PR 6423/.., PR 6424/.., PR 6425/.. and **PR 6426/..**
The transmitter is not designed for the use in hazardous areas.

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Function and Design:

The Dual-channel Shaft Displacement Transmitter **MMS 3210** 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 settings are made with jumpers and DIP-switches.
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 sensors with "Lemo" connectors; e.g. epro type PR 6422/.., PR 6423/.., PR 6424/.., PR 6425/.. and PR 6426/..

Measuring ranges:
selectable with DIP switches:
at PR 6422/..: ± 0,5 mm
at PR 6423/..: ± 1,0 mm
at PR 6424/.. ± 2,0 mm
at PR 6425/..: ± 2,0 mm
at PR 6426/..: ± 4,0 mm

Frequency range:
0...10 Hz

Linearity error:
0,25 %

Stability of output signal over temperature:
Zero point:
< 0,05 %/K
Gain:
< 0,01 %/K

Stability of output signal over the time:
Zero point:
< 0,05 %/24 h
Gain:
< 0,01 %/24 h

Analog outputs:
Current outputs:
Two, one for each channel, proportional to the measuring signal or one output proportional to the maximum value of both inputs:
0/4...20 mA or 4...20 mA
Permissible burden:
< 500 Ohm
open circuit and short-circuit proof. Cable connection via cage clamp terminals

Additional outputs:
Two test outputs, one for each channel, proportional to the input signal; also to be used for analysis- and diagnosis purposes; cable connection via cage clamp terminals.
Buffered voltage output:
0...+10 V
there is one output for the "OK" status and one limit value per channel; at combination of channels, there are two limit values for the measuring result

Power supply:
18...24...36,0 V dc galvanically isolated by means of dc/dc converters
Current consumption:
approx. 100 mA, at 24 V
Power consumption:
approx. 2.5 W

Environmental conditions:
(according to IEC 359, DIN 43745)
Housing:
Aluminium, non-corroding
Protection class:
IP 65 according to DIN 40050, IEC 144
CE certified
EMC tested:
according to EN 55011 and EN 50082-2
Operating temperature range:
-20...max. +65 °C
Temperature range for storage and transport:
-30...+90 °C
Permissible relative humidity:
0.....95 % non-condensing
Permissible vibration and shock:
shock: 20 g over 2 ms
vibration: 5 g at 60 Hz

Mounting direction:
preferably with the cable glands showing to the bottom.

Dimensions:
w x h x d
127,5 x 125,75 x 80 mm

Net weight:
approx. 1300 g

Gross weight:
approx. 1500 g

Accessories:
Operating manual contained in the scope of supply

Module and sensor supervision:

The internal module supervision continuously checks the following functions:

- the input signal is within the predefined range
- the cable between transmitter and sensor must be ok (no short-circuit / no broken cable)
- the supply voltage is within the ok-range

The state of module and sensor supervision is indicated via potential-free optocoupler outputs at the terminal strip.

Maximum electric load of the optocoupler output:
U: 48 V DC
I: 100 mA

Programmable measuring parameters:

- operating mode
- characteristical variables
- measuring modes
- measuring range
- warning and alarm limits
- centre of measuring range
- output current

Limit supervision:

In the dual channel mode the characteristical value of channel 1 is supervised on alarm limit exceedings by alarm channel yellow and the characteristical value of channel 2 by alarm channel red. There are two limit values per channel at disposal (1 x positive, 1 x negative), acting on a common optocoupler.

In the single channel mode and in the operating mode with combined channels (cone, double cone and tandem) the limit values are assigned to the common characteristical value, but may be adjusted independently from each other, e.g. yellow for Alert and red for Danger. In this mode there are two positive and two negative limit values at disposal.

Positive and negative pre-alarm (ALERT) act on a common optocoupler, and likewise the positive and negative main alarm (DANGER) act on another common optocoupler.

Maximum electric load of the optocoupler output:

U: 48 V DC
I: 100 mA

Operating modes:

The **MMS 3210** Transmitter provides different measuring modes.

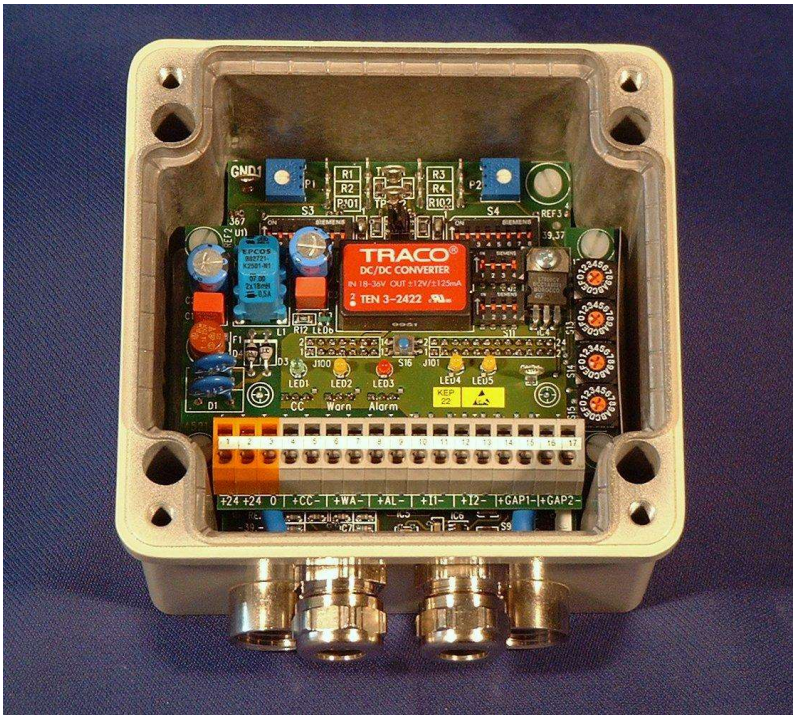
- Single channel mode
- Dual channel mode

Moreover, the two channels may be combined with each other.

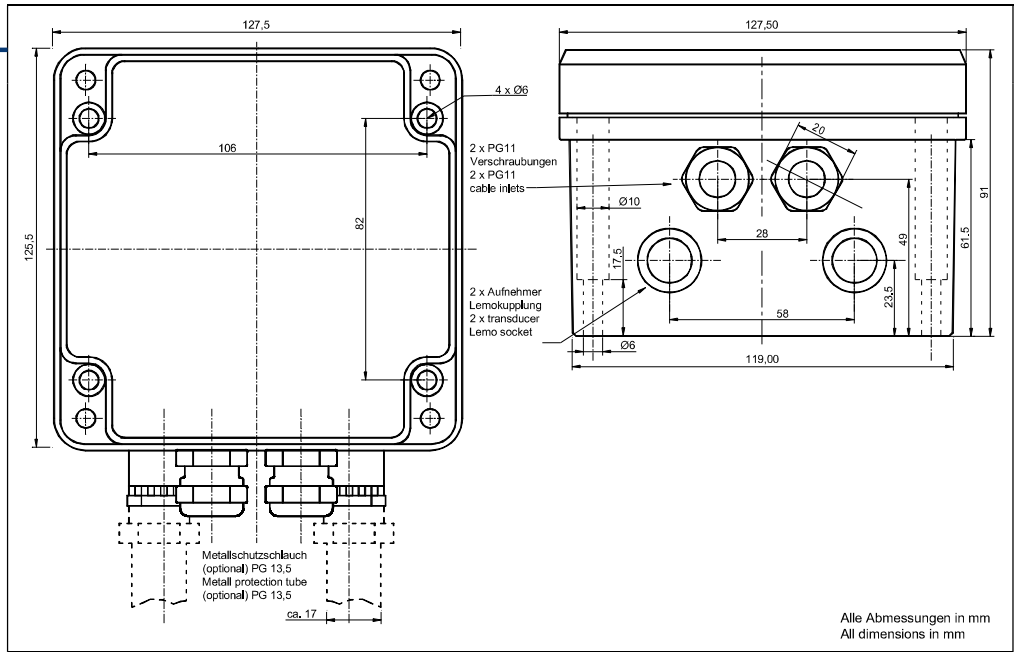
The following measuring functions will then result

- cone measurement with compensation sensor
  channel 1 measurement, channel 2 compensation sensor
- Double cone measurement
- Tandem measurements

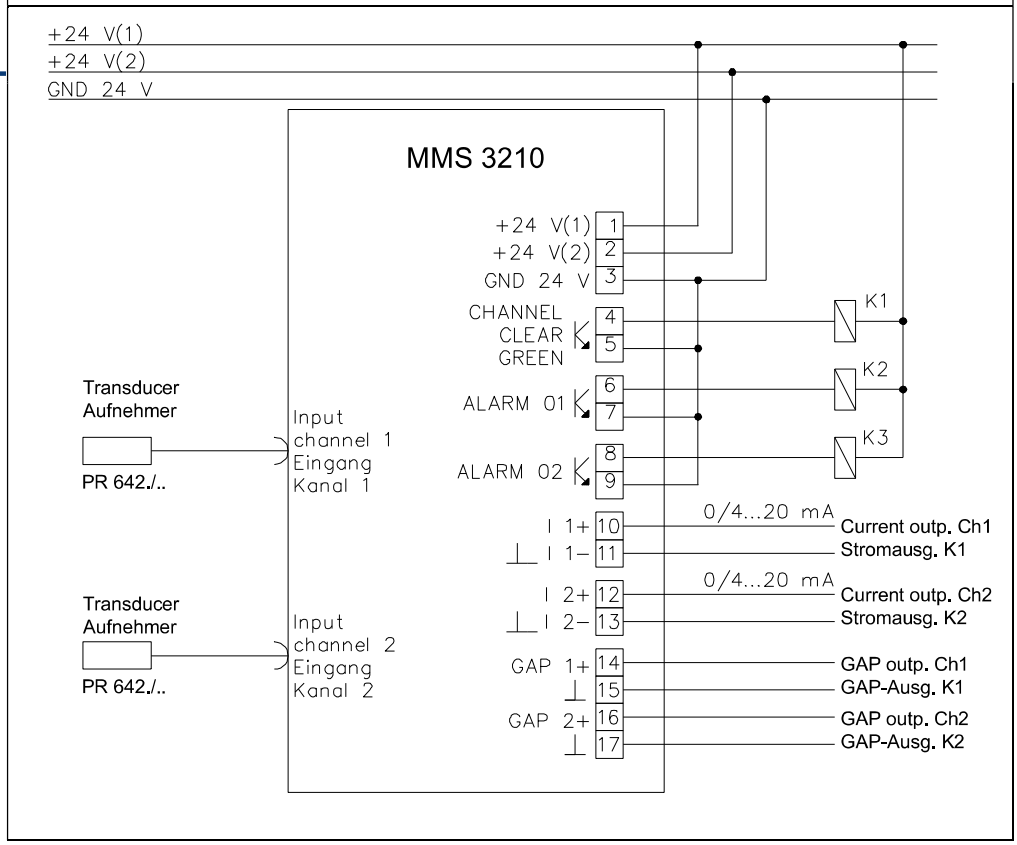
Internal view of the transmitter:



Dimensions:



Connection diagram:



Order number:

MMS 3210	Dual-channel shaft displacement transmitter:	**9100 – 00013**
MMS 3210/91	Dual-channel shaft displacement transmitter with exten ded measuring range up to 24 mm	**on request**

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