MMS 3311/xxx–xxx

Speed– and Key–Transmitter

- **Highly flexible due to numerous hardware options**
- **Precisely adaptable to the requirements by versatile combination possibilities**
- **Integrated signal converters for both channels**
- **Optional with external converter for operation in explosive areas**
- **For measuring of speed and generation of key pulses**
- **Inputs for eddy current transducers**
- **Integrated microcontroller**
- **Two redundant 24 V DC power supply inputs**
- **Supervision functions for electronic and sensors**
- **To be mounted directly at the machine**
- **2 current outputs 0/4...20mA**
- **Up to 5 configurable function outputs**
- **Key pulse output**

Application:

The Speed– and Key–Transmitter **MMS 3311** 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 characterized 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 speed and generation of key pulses.

Application fields of the **MMS 3311** transmitters are all kinds of rotating machines, e.g. turbo machines, fans, compressors, gear boxes, pumps and similar, rotating machines.

MMS 3000 transmitter 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/..**

The transmitter mustn't be used in hazardous areas.

Function and Design:

The Speed- and Key-Transmitter **MMS 3311** measures the shaft speed and generates key pulses. A trigger wheel or a key mark on the shaft is required for measurement of the speed and generation of the key signals.
Both channels can be used independently from each other. Channel 1 is used for speed measuring and channel 2 for generation of key pulse.

The integrated transmitter and sensor supervision detects fault functions of both - sensor and transmitter 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 configuration software **MMS 3910**, which is contained in the **MMS Para Kit**.

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 of type
PR 6422/.., PR 6423/..
PR 6424/.. and PR 6425/..
Standard:

- Int. CON;
  "Lemo" connector

Optional:

- Ext. CON;
  "Harting" connector

Linearity error (excluding sensor):
0,25% at 25°C

Linearity error (including sensor):
PR 6422: ≤ ±1,5% at 25°C
PR 6423: ≤ ±1,0% at 25°C
PR 6424: ≤ ±1,5% at 25°C
PR 6425: ≤ -6% at 25°C

Output stability as function of temperature:
< 0,08%/10 K

Long-term drift:
Max. 1% of the measuring range

Measuring range:
Freely selectable via the configuration software, max. 65535 rpm
limited by the input frequency

Frequency range:
0...20 kHz,
automatic setting of trigger level

Parameter outputs:
Standard:

- Two current outputs, proportional to the chosen characteristic value and related to the system ground. Both outputs can be assigned to channel 1.

Optional:

- Two galvanically separated current outputs, proportional to the chosen characteristic. Both outputs can be assigned to channel 1.
- 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 ±2,5 %

Limit value and channel supervision:
The transmitter provides altogether 5 function outputs. Limit values can be programmed for the speed measurement. Beyond this, the function outputs can be used to indicate of operating states e.g. 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 relay
  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 measuring data.

Optional:

- RS 485 bus with epro protocol V2.0
- PROFIBUS DP

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:
Diecast aluminum, 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 avoid by constructive measure.

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

Transmitter and sensor supervision:

The internal transmitter 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 the transmitter and sensor supervision can be signaled 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 3910** configuration software.
The configuration software is part of the software packet **MMS Para Kit** and must be ordered separately.
The adjustable parameters, shown in the list below may differ, depending on the chosen operation mode and the measuring function.

- Point ID – identification per channel
- Number of teeth
- Measuring mode
- Serial resistance at Ex.- app.
- Offset tracking
- Trigger level
- GAP limit values
- Output pulse form
- Speed measuring range
- Current suppression
- Current calibration
- Current smoothing
- Current shift
- Channel Clear limits
- Warning and alert limits
- Operating principle of function outputs
- Limit value hysteresis
- Response delay of alarm outputs
- Limit suppression
- Test values

Limit supervision and function outputs:

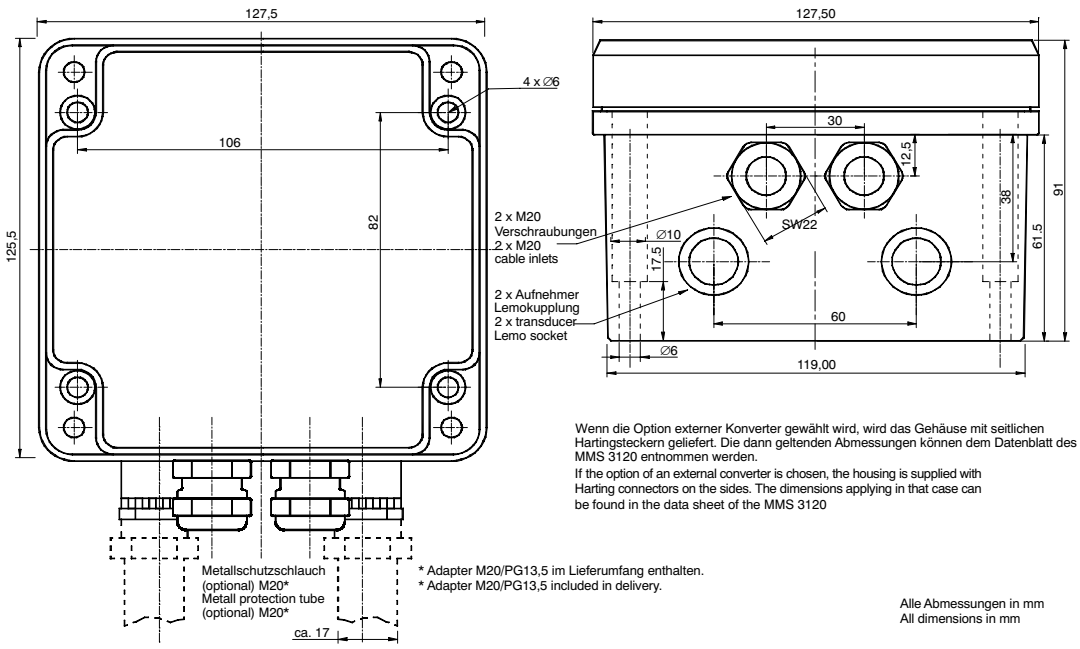
The transmitter provides altogether five so-called function outputs. Each of these function outputs can be assigned to a limit value as well as to an operation state indicator as zero speed, rotational direction, Channel Clear or gap error. Beside this, the assignment between input channel and function output can be freely selected.

The output of the Channel Clear and gap error can be made either individually for each channel or with a logical OR respectively AND combination.

The limits can be set for channel 1 (speed measurement), with or without latching function. They are switching by exceeding or fall below limit level.

Exceeding or falling below the limit values can be signaled by means of switching contacts of the function outputs. Specifications of the function output can be found in the technical data.

Dimensions:



Wenn die Option externer Konverter gewählt wird, wird das Gehäuse mit seitlichen Hartingsteckern geliefert. Die dann geltenden Abmessungen können dem Datenblatt des MMS 3120 entnommen werden.
If the option of an external converter is chosen, the housing is supplied with Harting connectors on the sides. The dimensions applying in that case can be found in the data sheet of the MMS 3120

* Adapter M20/PG13,5 im Lieferumfang enthalten.
* Adapter M20/PG13,5 included in delivery.

Alle Abmessungen in mm
All dimensions in mm

Additional functions:

The transmitter **MMS 3311/xxx-xxx** contains the following additional functions, which can be used depending on the configuration of the transmitter:

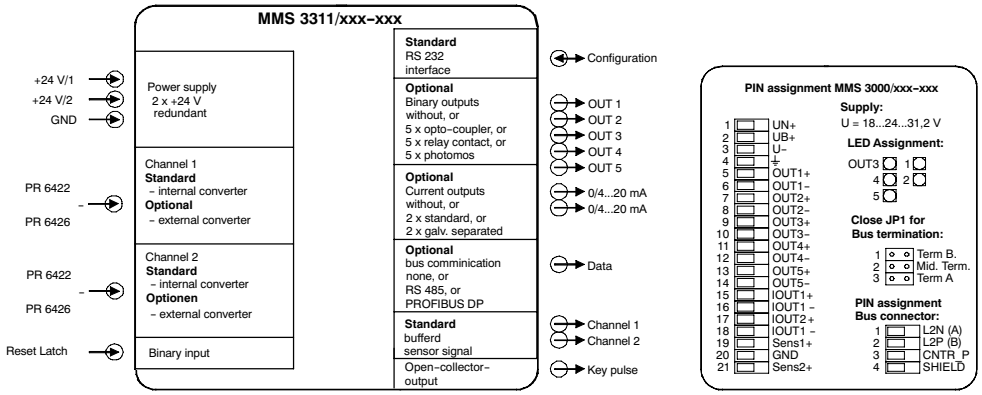
Zero speed and rotational direction detection :
If the transmitter does not receive pulses within a certain time period, the transmitter recognises this as machine-standstill and indicates it via a function output.

When using two speed sensors, it is possible to detect the rotational direction of the machine. The detected direction is indicated via a function output.

Redundant modus (speed):
This mode requires two speed sensors. Both sensors provide their signal to the transmitter inputs. In case of an error, the program switches automatically to the second, redundant sensor.

Dual current mode:
This function splits the output current in two ranges.
Example:
Measuring range 0...3000 rpm.
One part of this range, e.g. 0...300 rpm, is scaled to 0/4...20mA.
Having exceeded the limit of 300rpm, the total measuring range of the transmitter will be scaled to 0/4...20mA.

In- / outputs:



Ordering options:

For the Speed- and Key-Transmitter **MMS 3311/xxx-xxx**, the following order options are possible:

Sensor inputs C1 und C2:
Two identical input channels; no mixed applications!

- Internal converter **[Standard]**
- External converter

Communication:

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

Parameter output:

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

Function outputs:

- 5x opto-coupler **[Standard]**
- 5x relays (make contact)
- 5x photomos

Display:

- without **[Standard]**
- with 8-digit display

Standard types:

MMS 3311/010-000	Internal signal converter, RS 232, without bus-communication, current output with common ground, no function outputs, without display.	**9100-03081**
MMS 3311/011-000	Internal signal converter, RS 232, without bus-communication, current output with common ground, with function outputs (opto-coupler), without display.	**9100-03080**
Accessories: MMS Para Kit	Configuration kit with configuration software **MMS 3910** for **MMS 3000** transmitter	**9510-00027**

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 error of not authorized persons.

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