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Specification Sheet  
Digital Revolution Meter CMO-2

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# Specification Sheet

## Digital Revolution Meter CMO-2



**Manufacturer:**

Zakład Budowy Maszyn Doświadczalnych [*Experimental Machinery Building Plant*]  
ZBMD® Sp. z o.o.  
41-708 Ruda Śląska  
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## 1 General description

The CMO-2 Digital RPM Meter is designed to measure the number of revolutions of the measuring shaft driven by the pneumatic turbine and to indicate the speed at which the centrifugal triggers occurring in the brake trolleys, diesel, electric and pneumatic tractors are activated. The CMO-2 Digital Revolution Meter includes the CMI-1 Digital Impulse Meter which can be used in mine workings endangered with methane and coal dust explosion. The CMI-1 Digital Impulse Meter has received the EC type examination certificate: JSHP 20 ATEX0024X.

## 2 Operation of the instrument - measuring

**2.1** Before starting the measurement, correctness of fixing the digital impulse meter CMI-1 and the mechanical turbine KP-1 to the belt transmission body should be checked.

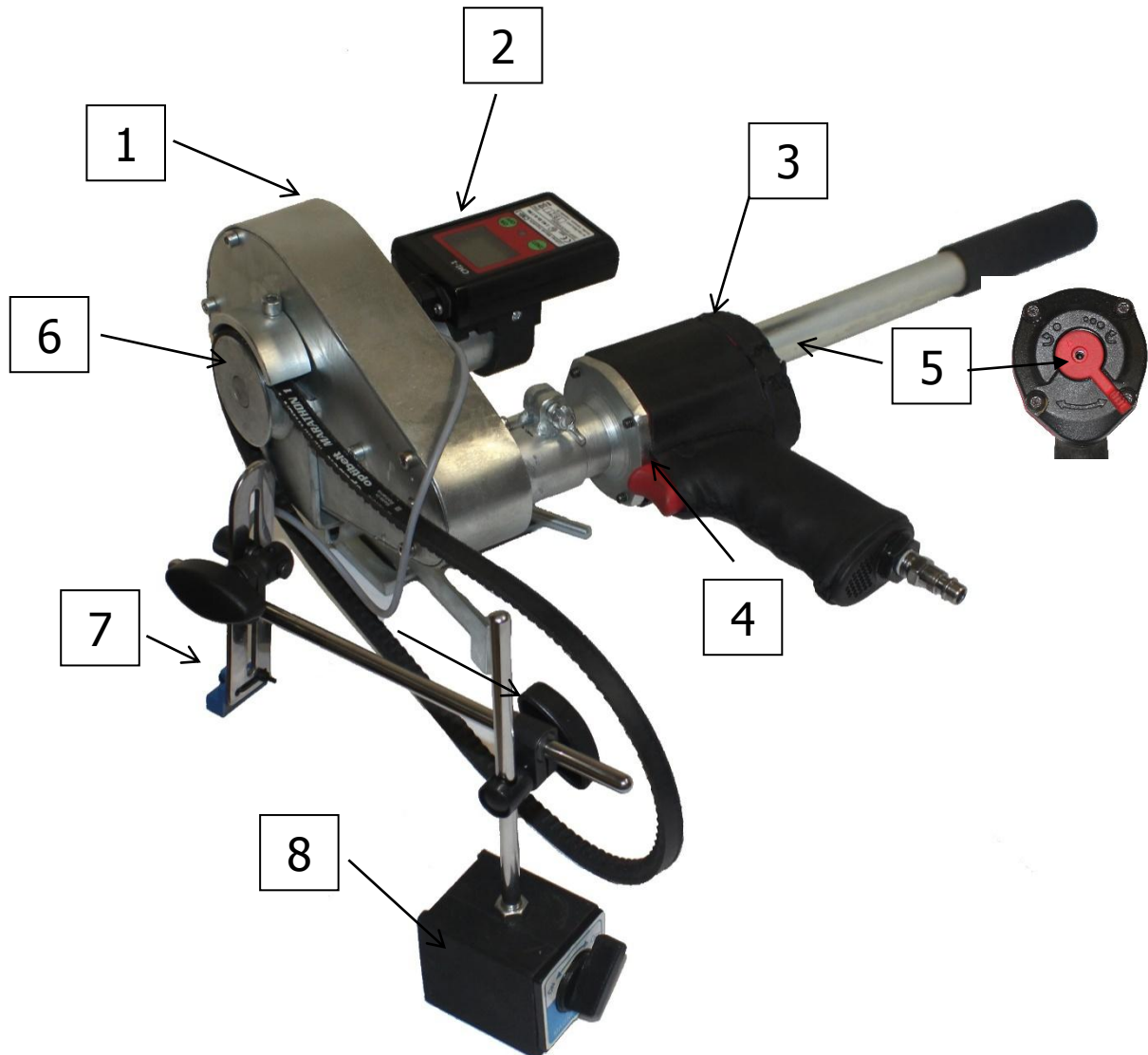
**2.2** Check that the battery has been charged.

**2.3** Connect the magnetic probe connector to the instrument and fix the measuring head in very close proximity (touching gently, safely) to the centrifugal trigger actuating screw so that the screw, when actuated, is outside the magnetic field of the measuring head (Figures 2a and 2b).

**2.4** Then switch on the meter with the ON/OFF button.

**2.5** Before direct measurement, press the INIT button on the left. Start the turbine by pressing the trigger button and using the control valve knob slowly increase the revolutions which will cause the measuring shaft to rotate faster and the indication on the device display to increase. The central and lower part of the display shows the result in revolutions per minute (RPM) and the upper part shows the result in revolutions per second (RPS). When the screw indicating the trigger is moved, the measurement in the central part of the display will stop and the measurement in the upper and lower parts will continue showing the value of the still rotating measuring shaft. **If the magnetic probe is not in contact with the metal screw in the trigger, pressing INIT will not initiate a new measurement. (Fig. 2a and 2b)**

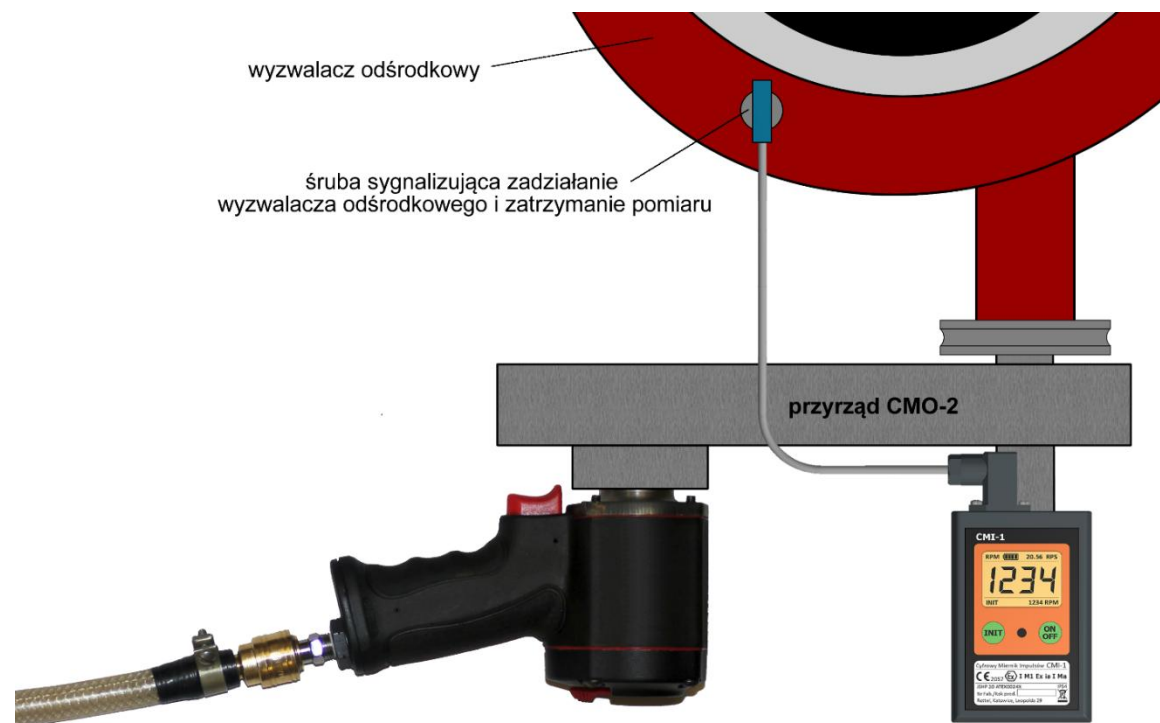
**IMPORTANT! The device and the pneumatic spanner KP-1 may only be used for measuring the speed of centrifugal triggers. It is forbidden to use for drilling, screwing!**



*Fig. 1. Digital revolution meter CMO-2 - design*

**LEGEND:**

1. Belt transmission housing.
2. Digital pulse meter CMI-1 with LCD display.
3. Pneumatic spanner KP-1 protected with a dust cover with a valve.
4. Button to start the turbine.
5. Reversing switch.
6. Belt pulley including V-belt.
7. Magnetic probe measuring head.
8. Magnetic stand for convenient mounting of the measuring probe head with switch



*Fig. 2a. Digital rotation meter CMO-2 - example application, at the beginning of the measurement.  
centrifugal trigger; screw indicating activation of the centrifugal trigger and stopping the measurement;*

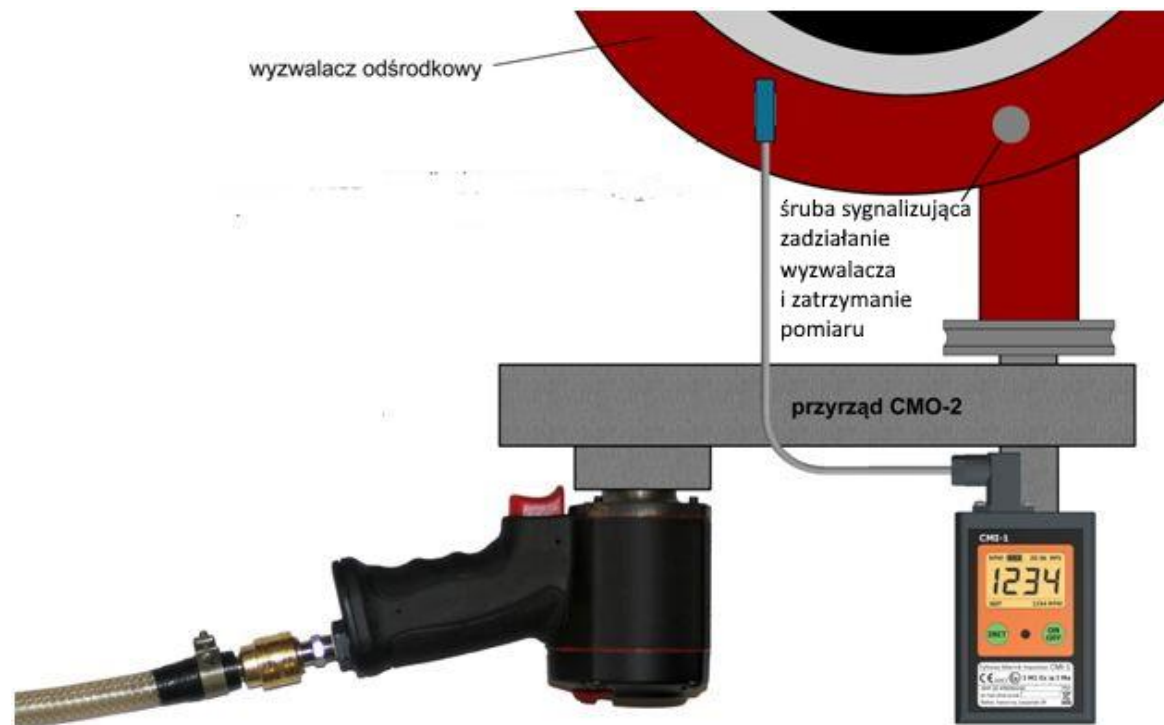


Fig. no. 2b. CMO-2 Digital Revolution Meter - example application, end of measurement

### 3 Description of display indications

During normal operation the LCD display (fig. 3) shows the measurement of the rotational speed of the rotating element driven by the measuring turbine. In the central part of the display the speed measured in revolutions per minute RPM is indicated, whereas in the upper part of the display the speed measured in revolutions per second RPS.

The top section indicates the battery charge status.

A magnetic probe is connected to the connector at the top of the device, which controls the pulse counting process.



Fig 3. Digital pulse meter CMI-1 - view of LCD display



## 4 Technical data

### Digital Revolution Meter

Type	CMO-2
EC Type Examination Certificate CMI-1	JSHP 20 ATEX 0024X
KP-1 certificate	KOMAG/21/ZASW/0278
Designation	ZBMD-CMO-2-sequential number/year of production
Manufacturer	ZBMD Sp. z o.o.
Max. turbine supply pressure	6,3 bar.
Pneumatic connection of the turbine	1/ 4inch
Max. hose length min. hose diameter	10m, fi 8mm
Weight	8 kg
Degree of protection for housing	IP 54
Ambient temperature	-20C <sup>0</sup> to +40C <sup>0</sup>
Relative humidity	up to 96% RH non-condensing
Performance	intrinsically safe
Maximum measured speed	1500 rpm.
Measurement error	0.1 per cent
Automatic switch-off time	after approx. 30 sec.

## 5 Scope of delivery

Delivery includes:

- complete CMO-2 revolution meter in a mining bag with the logo of ZBMD<sup>®</sup> or your company - illustration below,
- warranty card,
- Original operation and maintenance manual/user's manual,
- EC type examination certificate ATEX,
- EC/EU declaration of conformity.





## 6 Product ordering

The CMO-2 digital revolution meter can be ordered from:

Zakład Budowy Maszyn Doświadczalnych Sp. z o.o. ul.

Pawła 6;

41-708 Ruda Śląska

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