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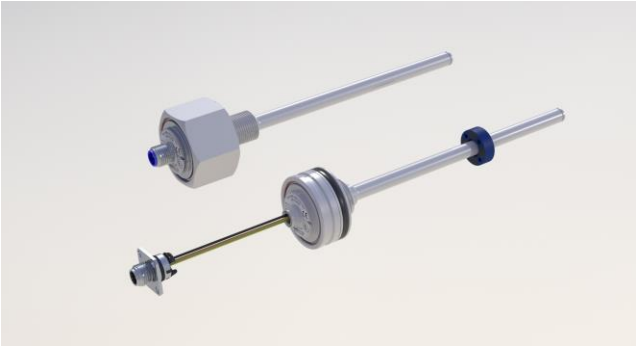
Product Launch TM1 Series



1 Introduction

The new TM1 series is the successor of the previous TIM series.
The rod-style transducer with plug-in flange or screw flange is designed for direct installation in hydraulic and pneumatic cylinders.
Due to the development according to the EMC standards for mobile applications, the TM1 is well-suited for agricultural and construction machinery and in vehicle technology.

Because the transducer has an additional CE conformity, it can also be used outside of a cylinder in traditional mechanical engineering.

2 Technical Features

2.1 Range of Applications, distinguished by specific EMC-Compatibility

- **EMC-Compatibility „Mobile“** for installation **in a cylinder**

according standards ISO 10605 ESD, ISO 11452ff HF-fields, ISO 7637 pulses, EN 13309 construction machinery and ISO 14982 agricult./forestry machines:
The EMC measurements are conducted in a reference cylinder which is connected to Chassis GND. The EMC properties can deviate when using different cylinders.
The rear flange cover with the electrical outlet must be fully integrated in the cylinder or shielded by an appropriate housing.
=> Further installation instructions see user manual.

- **CE-Compatibility according standard DIN 61000-4ff**

The EMC measurements are conducted **outside of a cylinder**.
Transducer and controller must be connected by using a shielded cable. The cable shield must be connected to protection earth (PE).

Note:
The ordering codes of the transducers are not different according to the range of application, since both EMC qualifications are fulfilled with the same internal electronics and the same sensor. However, in order to achieve EMC compatibility, the **way of installation and the cable shielding** as described above are decisive!
For this reason, only product models with M12 flange connector (code 104/106) have additional CE conformity and the customer has to use shielded mating plugs in his application.

An exception is the model with M12 plug system. For compliance with CE conformity, the sensor must be installed in a cylinder.

2.2 Standard Models

- Standard measuring lengths from 50 until 2000 mm in 25 mm-steps, special measuring lengths in 1 mm-steps are available on request with MOQ 1 pcs
- Plug-in flange D = 48 mm TM1-_ _ _ _-305-_ _ _-_ _ _
- Screw flange M18 TM1-_ _ _ _-306-_ _ _-_ _ _
- Diameter of rod 10 mm, optional models with thread M4 at the rod end for a possible support (Code -307-, -308-)
- Interfaces:
  4 … 20 mA, 0.25 … 4.75 V, 0.5 … 4.5 V, 0 … 10 V, CANopen, CAN SAE J1939
- One-channel = 1 position marker
- Electrical outlet:
  - M12 connector => for screw flange and plug-in flange, all models with EMC for mobile applications and CE/Industry
  - M12 plug system 80 … 240 mm => only for plug-in flange, all models with EMC for mobile applications (and CE/Industry when installed in a cylinder)
  - cable => for screw flange and plug-in flange all models with EMC for mobile applications

2.3 Comparison to TIM Series

- 100% intermountable, including position markers
- Position of zero point and dead zone remain unchanged
- Geometric modification at the electrical outlet: round exit geometry at the cover with changed dimensions for all models (see drawings)
- Plug-in flange: additional thread M24x1.5 (previously, it was a round geometry with diameter 24 mm)
- Connection rod/housing: welded instead of brazed
- Full short-circuit protection output against GND and Ub
- Defined conditiones when position marker is missing or if GND cable is broken
- Improved EMC, exceeds the E1 requirements
- Additional CE conformity
- Linearity error ≤ +/- 0.04%FS, min. +/- 300 µm (previously 100 µm)
- Additional falling output characteristic as an order option for analog interfaces
- Additional CAN SAE J1939 interface
- Minor changes in ordering code
- Further data can be found in the data sheets

2.4 Accessories

- The existing position markers (Z-TH1-P18/P19/P21/P22 and Z-TIM-P20) can be used further.
  New type designations and P/N are planned for the ring position marker Z-TIM-P20 (D = 17.4 mm) and the two floating position markers Z-TH1-P21/P22 due to a change of supplier (New: Z-TH1-P30/P31/P32).
  The old types are replaced in the data sheets after exhaust of stock. The functionality of the old and new types remain unchanged.

- Additionaly, new U-shaped position marker Z-TH1-P25.
  Attention: different zero point (minus 0.75 mm) due to greater thickness 9.5 mm of the position marker compared with e.g. Z-TH1-P18 (8 mm thick)

- New mating connectors M12 5-pin for CAN (EEM-33-49/50/51/52), since the cable shield must be placed on the knurled nut for full EMC compliance

3 Benchmark

We are in direct competition with similar products e.g. from MTS (series MH/MH5/MH200) or Balluff (BTL6 E series). However, our TM1 series is absolutely competitive compared to these products.

Sensors for Mobile Hydraulics, analog	Resolution	Repeatability	Linearity
TM1	0,1 mm (12 bit @ 400 mm, 14 bit @ 1600 mm)	+/- 0,1 mm	absolut +/- 0,04%, min. 300 µm
MTS MH	typ. +/- 0,1 mm	k.A.	+/- 0,04%, min. 0,1 mm
Penny &Giles ICT800	12 bit	k.A.	+/- 0,1%
Gefran RK 5	12 bit (min. 50 µm)	0,01 mm	Independ. 0,04%, min. 0,1 mm
Siko SGH 10	12 bit	k.A.	k.A.
Balluff BTL6	typ. +/-7 µA @ 350 or 1100 mm = 0,04%	+/-5 µm @ 350 or 1100 mm	max. +/- 200 µm @ 350 mm, max. +/-0,04% @ 1100 mm
Hydac HLT 1100-R2	12 bit	0,1%	0,5% Accuracy, 0,1% Lin.
Sick Max 48	typ. 1 mm (noise free)	k.A.	+/- 0,04%, min. 0,25 mm

4 Time Schedule

Analog interfaces (voltage/current):
Samples from January 2020, Start of production from February 2020

Digital interfaces (CAN):
Samples from Q2/2020, Start of production Q3/2020 (another NT-News will follow)

5 Marketing

5.1 Sales samples

Sales samples (code TM1-0200-305-821-442) can be ordered for a special price of 133,03 €/pc (max. 3 pcs for each representative, 1 delivery lot). Please send us your order until 01.03.2020.

5.2 Sample Case

Due to only minor deviations from the previous product TIM, we will not replaced the existing sensor TIM-0050-305-851-438.

5.3 Press release

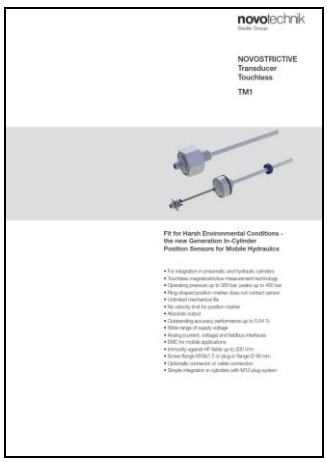
A press release is available in german/english (english version see attachments). If you have any questions, please contact Ms. Sabine Peiler, peiler@novotechnik.de.

5.4 Online available Information

During the ISM 2018 we already pointed out the changes regarding the datasheets by introducing the database PIM.
Consequently, for TM1 series, there is a separate data sheet for
- every mechanical model (plug-in flange and screw flange),
- the respective application range (industrial/CE or mobile application),
- every electrical interface.

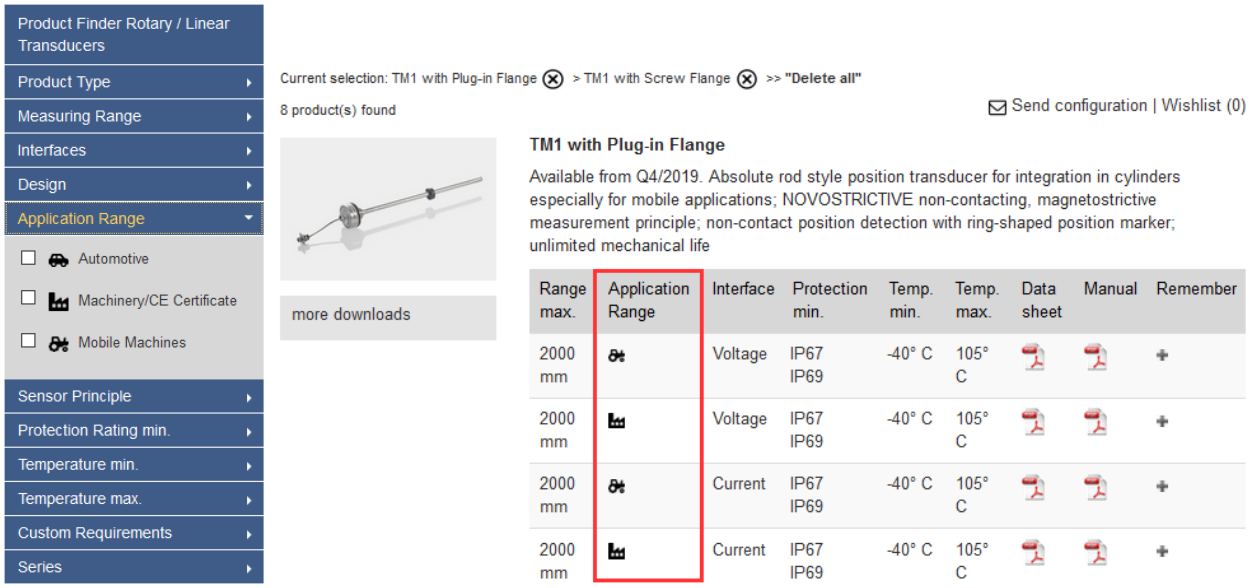
The distinction of the several data sheets is made in the file title, e.g.
28_DS_248_TM1_Current_12_24V_Plug-in-flange--en.pdf
for ordering code TM1-_ _ _ _-305-82_- _ _ _.

In addition, a description of the entire product series is available with the flyer for the TM1 (see webpage under Downloads / Catalog/Brochures).



The data sheets and the manual are available for samples on request or from the start of the series production on our webpage.

The product finder on the Novotechnik website has been improved with further selection features such as “Application Range”.



6 Prices

The sales prices are included in the current price list NT_IL_AL_2001.

7 Attachment

Product finder: https://www.novotechnik.de/en/products/rotary-sensors-linear-position-transducers/?filterconfiguration=19185
Flyer: https://www.novotechnik.de/fileadmin/user_upload/pdfs/kataloge_flyer/Flyer_TM1_e.pdf
Press release: Englisch_nov222__Novotechnik_Positionssensor_für_Mobilhydraulik_und_Maschinenbau.docx