

Issued by NMI Certin B.V.

In accordance with

- WELMEC 8.8, 2017 "General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments under the MID".
- WELMEC 7.2, 2015: Software Guide
- OIML R117-1 Edition 2007 (E) "Dynamic measuring systems for liquids other than water".
- EN 12405-1/A2 Edition 2010 "Gas meters – Conversion devices – Part 1: Volume conversion".
- OIML R140-1 Edition 2007 (E) "Measuring systems for gaseous fuel".

Producer

Endress+Hauser Wetzer GmbH + Co. KG  
Obere Wank 1  
87484 Nesselwang  
Germany

Part

A **resistance temperature transducer** intended to be used as a part of a dynamic measuring system for liquids other than water or in combination with an Electronic Volume Conversion Device (EVCD) for gas applications.

Producer's mark or name : Endress+Hauser

Type designation : TM1xx<sup>1</sup>; TM6xx<sup>1</sup>; TR62; TR66; TR88

Accuracy class : 0,3

Further properties and test results are described in the annexes:

- Description TC8683 revision 4;
- Documentation folder TC8683-4.

Initially Issued

22 December 2014

Remarks

- This revision replaces the previous revisions;
- The documentation folder replaces the previous documentation folder.

<sup>1</sup> xx can be any number as this shows the model. The convertor inside is type TMT82.

Issuing Authority

**NMI Certin B.V., Notified Body number 0122**  
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Certification Board

## 1 General information about the resistance temperature transducer

Properties of this resistance temperature transducer, whether mentioned or not, shall not conflict with the legislation.

This Parts Certificate is the positive result of the applied voluntary, modular approach, for a component of a measuring instrument, as described in WELMEC 8.8, 2017.

The complete measuring instrument must be covered by relevant metrological certification that is valid in the country where the instrument is put into use.



Example: Convertor



Example: Assembly with convertor and sensor

### 1.1 Essential parts

The resistance temperature transducer can be composed of the following parts:

Description	Manufacturer	Type	Remarks
Convertor	Endress + Hauser Wetzer GmbH + Co. KG	TMT82-xxxxx	
		TMT182-x41Bxx	From January 2020 Type TMT 182 is no longer produced

#### Remarks

The "x"-positions order codes are presented for various Ex types, fittings and name plate MI markings. Those type variations do not affect Weights & Measures applications.

See documentation numbers 8683/1-01, -02, -03, -04, 8683/2-01 and 8683/5-01 for overview of the parts.

## 1.2 Essential characteristics

### 1.2.1 Measuring range

The resistance temperature transducer has the following characteristics:

Application	T <sub>min</sub> [°C]	T <sub>max</sub> [°C]	Sensor type
Liquid	-200	+200	All described in paragraph 1.1
Gas	-30	+120	

### 1.2.2 Temperature range ambient

- TMT182: -40°C / +85 °C
- TMT82: -40°C / +70 °C

### 1.2.3 Environment classes

- M3 / E2 + E3

### 1.2.4 Power supply

The resistance temperature transducer is powered in the range 11 - 42V DC.

### 1.2.5 Software specification (refer to WELMEC 7.2)

- Software type P;
- Risk Class C;
- Extension T, I2 and I5 while extensions S, L and D, are not applicable.

Software versions	CRC Checksum	Remarks
01.01.08	9A014314	-
01.01.10	A11EAD81	-
01.01.16	C89BA929	-
01.02.11	C3A4A00D	-
01.02.12	3C685F5E	-

The software version is printed on the type plate of the electronic insert and on the tag of the transducer. The software is not separated in a legal part and a non-legal part, and as such can be considered as one essential part. The validity of the program and the parameters are continuously checked. If these checks fail, an alarm is generated.

### 1.2.6 Data communication

The following outputs can be used for legally relevant data:

- 4...20 mA analogue output;
- HART superimposed;

## 1.3 Essential shapes

### 1.3.1 Inscriptions

On the resistance temperature transducer, clearly visible, at least the following is inscribed:

- Parts Certificate number TC8683;
- Name or trademark of the producer;
- Type designation;
- Serial number and year of manufacture;
- FW: Firmware version
- Measuring range  $T_{min}$  and  $T_{max}$ ;
- Ambient temperature range;
- Output range of 4-20 mA (if applicable).

See documentation number 8683/4-01 for an example of the markings.

### 1.3.2 EMI protection measures

The following measures are taken for EMI protection:

- The shield of the cable shall be electrically connected to the housing of the instrument the temperature probe is connected to.

## 1.4 Conditional parts

### 1.4.1 Housing

The housing of the resistance temperature transducer is made of aluminium or stainless steel.

### 1.4.2 Transducer assembly

The transducer may have different assemblies and can be found in documentation number 8683/2-01 and 8683/5-01.

### 1.4.3 Temperature sensor

The temperature sensor shall be a Class A Pt100

## 1.5 Conditional characteristics

### 1.5.1 Programming

Weights & Measures parameters can be changed after opening to housing, thus breaking a seal, and connecting to the transducer with the Endress+Hauser "FieldCare" tool. After setting the parameters the transducer must be set to "write protect".

Setting of parameters with a remote HART terminal is also possible only when the transducer is set to "write protect off" with the "FieldCare" tool.

Detail parameter setting information can be found in the user manual; this information is part of the documentation folder see documentation no. 8683/1-05.

### 1.5.2 Parameter settings

The legally relevant settings, which cannot be altered anymore after putting the device into Custody Transfer Mode as follows:

Parameter	Setting
Setup / unit	°C or K
Setup / Sensor type and connection type	4 wire Pt100

Parameter	Setting
Setup / lower range and upper range value	To be specified and clarified by the user or manufacturer.
Setup / Advanced setup / Sensor / Sensor offset	Correct setting.
Setup / Advanced setup / Current output / Current trimming 4 mA and Current trimming 20 mA	Correct settings.
Setup / Advanced setup / Display / Decimal places	At least two.
Setup / Advanced setup / SIL / SIL option	Yes
Setup / Advanced setup / SIL / SIL parameters	To be specified and clarified by the user or manufacturer.
Expert / System / Damping	To be specified and clarified by the user or manufacturer.
Expert / System / Sensor trimming	Only allowed before and / or during verification
Expert / Communication / HART configuration / HART address	Correct setting

- All parameter settings may be read out and displayed:
  - by the electronic calculating/indicating device connected to the resistance temperature transducer, or
  - for example via a computer (HART terminal) temporarily connected to the resistance temperature transducer;

### 1.5.3 Alarm handling

Under the following conditions the resistance temperature transducer generates an accountable alarm:

- if the resistance temperature transducer is in the test mode or in the maintenance mode;
- if the temperature is outside certain pre-programmed limits;

## 2 Seals

The following seals are applied:

- The inscriptions are fixed to the resistance temperature transducer and secured against removal by seal or it will be destroyed when removed.
- The housing of the resistance temperature transducer is sealed against opening after the resistance temperature transducer is set to Custody Transfer mode.

### 3 Conditions for conformity assessment

- Before taken into use, the resistance temperature transducer shall be calibrated over the operational measuring range, within the  $T_{\min}$  and  $T_{\max}$  values as mentioned in chapter 1.2.1.
- The calibration can be performed on site or at a test laboratory. In the latter case the relevant parameter settings have to be registered and checked at the initial verification on site.

### 4 Reports

An overview of the performed tests is given in Evaluation Report ER8683 revision 5 issued together with this Parts Certificate.