Evaluation Certificate

Number **TC7520** revision 9
Project number 3780065

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". – OIML R117-1, 2007: "Dynamic measuring systems for liquids other than water"; – WELMEC 7.2, issue 4: "Software Guide.
Producer	Anderson Instrument Company Inc. 156 Auriesville Road Fultonville, NY 12072 United State of America
Part	A **measuring device** (electromagnetic measuring device), intended to be used as a part of a measuring instrument.

Brand	:	Anderson-Negele
Designation	:	IZM-xxxxx[a] or IZMSA-y/y/yyyy[b]
Accuracy class	:	0,5
Destined for the measurement of	:	Liquid food and chemical products with a minimum conductivity of 5 µS/cm

Further properties and test results are described in the annexes:
– Description TC7520 revision 9;
– Documentation folder TC7520-7.

Initially issued	16 March 2009
Remark	– This revision replaces the previous revisions. – The documentation folder replaces the previous documentation folder.

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a See paragraph 1.2.1.3 for more information on xxxxx.
b See paragraph 1.2.1.4 for more information on y/y/yyyy.

Issuing Authority

NMi Certin B.V., Notified Body number 0122
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Certification Board

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1 General information on the measuring device

Properties of this measuring device, whether mentioned or not, shall not conflict with the Legislation.

This Evaluation 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.

The measuring device is produced in the following locations:
- Negele Messtechnik GmbH Raiffeisenweg 7, 87743 Egg an der Guenz, Germany
- VENTURE MEASUREMENT 150 Venture Blvd. Spartanburg, SC 29306, United State of America.

1.1 Essential parts

Description	Documentation number	Remarks
Measurement sensor/transmitter	7520/4-01; 7520/4-02; 7520/4-16; 7520/6-01	See paragraph 1.2.1.1 for more information
Calculator / Converter / Electronic processing device	7520/4-07 – 7520/4-11; 7520/4-15; 7520/4-17	See paragraph 1.2.1.2 for more information

1.2 Essential characteristics

1.2.1 Construction

1.2.1.1 Measurement sensor/transmitter
The IZM-G1 and IZM G2 sensors have a rectangular housing, the IZMAG and IZMAG² sensors have a round housing. The inner tube is covered with an isolating lining. On the outside of the metering body, two coils are fitted. Two stainless electrodes are fitted, protruding through the lining being in contact with the liquid.
If the sensor is constructed as a separate part, it can be individually calibrated. The calibration data will be memorized in a so-called "MEMbox module" (which must be transferred to a converter before switching on the converter).

There are four versions of the measurement sensor:
- IZM-G1 with PTFE lining;
- IZM-G2 with FEP lining;
- IZMAG^2 with PFA moulded lining;
- IZMAG with PFA moulded lining.

1.2.1.2 Calculator / Converter / Electronic processing device
The Calculator / Converter / Electronic processing device has four versions:
- IZM-SE: Standard version, with optional display and keyboard
  In case the display is not present; the measuring device is connected to the Zevodat Flash calculating / indicating device of Evaluation Certificate TC7521. Service terminal ST1 must be used for service applications. See page 2 of documentation number 7520/4-01 for an example of the service terminal.
- IZM-TE: Temperature version with mandatory display and keyboard, with optional long-term storage. As IZM-SE but can measure the product temperature via a connected PT100 sensor (4-wire connection).

- IZM-ZDC1: Database version with mandatory display and keyboard
  As IZM-SE but with storage of the measurement data (memory device)
- IZM-MEV: Mengen/Vorwahl version with mandatory display and keyboard
  As IZM-SE but with the possibility of volume pre-set.

1.2.1.3 Measurement device before 27 January 2023
The exact type of the measurement device is given in the following table:

Sensor	Calculator	Measuring device	
		Separate	Compact
IZM-G1	IZM-SE	IZMSA-SE + IZM-G1 IZM-SEV + IZM-G1	IZM-SEG1
IZM-G2		IZMSA-SE + IZM-G2 IZM-SEV + IZM-G2	IZM-SEG2
IZMAG^2		IZMSA-SA + IZMAG^2 IZM-SEV + IZMAG^2	IZM-SEAG^2
IZMAG		IZMSA-SE + IZMAG IZM-SEV + IZMAG	IZM-SEAG
IZM-G1	IZM-TE	IZMSA-TE + IZM-G1 IZM-TEV + IZM-G1	IZM-TEG1
IZM-G2		IZMSA-TE + IZM-G2 IZM-TEV + IZM-G2	IZM-TEG2
IZMAG^2		IZMSA-TE + IZMAG^2 IZM-TEV + IZMAG^2	IZM-TEAG^2
IZMAG		IZMSA-TE + IZMAG IZM-TEV + IZMAG	IZM-TEAG
IZM-G1	IZM-ZDC1	IZM-ZDC1 + IZM-G1	-
IZM-G2		IZM-ZDC1 + IZM-G2	-
IZMAG^2		IZM-ZDC1 + IZMAG^2	-
IZMAG		IZM-ZDC1 + IZMAG	-
IZM-G1	IZM-MEV	IZM-MEV + IZM-G1	-
IZM-G2		IZM-MEV + IZM-G2	-
IZMAG^2		IZM-MEV + IZMAG^2	-
IZMAG		IZM-MEV + IZMAG	-

Compact: the converter is mounted on top of the sensor
Separate: the converter is placed separate from the sensor and connected via cable

1.2.1.4 Measurement device from 27 January 2023 onwards
The exact type of the measurement device is given in the following table:

Sensor	Calculator	Measuring device	
		Separate	Compact
IZMAG	IZM-SE	IZMSA-R/ */ FTyyy/ */ */ DC/ So/ E	IZMSA-C/ FTyyy/ */ */ DC/ So/ E
		IZMSA-R/ */ FTyyy/ */ */ DC/ TV/ E	IZMSA-C/ FTyyy/ */ */ DC/ TV/ E
IZMAG	IZM-TE	IZMSA-R/ */ FTyyy/ */ */ DC/ T0/ E	IZMSA-C/ FTyyy/ */ */ DC/ To/ E
IZMAG	IZM-MEV	IZMSA-R/ */ FTyyy/ */ */ DC/ SV/ E	IZMSA-C/ FTyyy/ */ */ DC/ SV/ E

* Denotes a non-metrological relevant part of the model type
yyy denotes the meter size, see 1.2.2 for the approved sizes

Compact: the converter is mounted on top of the sensor
Separate: the converter is placed separate from the sensor and connected via cable

1.2.2 Flow characteristics

Meter size [mm]	Minimum flow rate [L/min]	Maximum flow rate [L/min]	Minimum measured quantity [L]	Maximum pressure [bar]
25	10	200	10	16
32	15	400		
40	20	500	20	
50	20	750		
65	40	2000	100	
80	60	3000	200	
100	90	4500	500	
125	150	7500	1000	10

Note:
The minimum and maximum flow rate can be freely chosen within the values mentioned in the table above, under the condition that the ratio Qmax:Qmin is at least 10:1.

1.2.3 Temperature range liquid
- -10 °C / +50 °C

1.2.4 Temperature range ambient
- -25 °C / +55 °C

1.2.5 Environment classes:
- M3 / E3 for the 24 V DC version;
- M3 / E2 for the AC version.

1.2.6 Measuring principle
The coils generate a magnetic field. If a conductive liquid is flowing through the measurement sensor, a voltage is induced which is measured via the electrodes. The voltage is proportional to the flow rate.

1.2.7 Outputs
- Pulse output, 2 or 3 channels.

1.2.8 Software specification (refer to WELMEC 7.2)
- Software type P;
- Risk Class C;
- Extensions L (Long-term storage, applicable to IZM-ZDC1 and IZM-TE only) and I-5 apply, while extension T, S and D are not applicable.

Converter	EPRSUM Checksum	Remarks
IZM-SE[b]	201402; 328241; 167634	-
IZM-TE	151690; 167634; 1574963	-
IZM-ZDC1	124675; 265146;	-
IZM-MEV	145974; 162308	-

The checksum is part of the information that is displayed with "MENU 06". All other information contained in this menu is not metrological relevant.

1.3 Essential shapes

1.3.1 Inscriptions
On the measuring device, clearly visible, at least the following is inscribed:
- The Evaluation Certificate number "TC7520";
- Name and/or trademark of the producer;
- Type designation;
- Serial number and year of manufacture;

See documentation number 7520/6-01 and 7520/9-01 for an example of the inscriptions.

This measuring device was previously placed on the market by manufacturer "GEA Diessel GmbH".

1.4 Conditional parts

1.4.1 Power supply:
- 115 VAC @ 60 Hz or 230 VAC @ 50 Hz;
  Voltage tolerance -15% +10%
- 24 V DC (±20 %);
- Power consumption 30 VA.

1.4.2 In- and outlet parts
- The meter inlet is a straight pipe of:
  - 10D for the IZM-G1 sensor and IZMAG sensor;
  - 2D for the IZM-G2 and IZMAG^2 sensor.
- The meter outlet is a straight pipe of:
  - 5D for the IZM-G1 sensor and IZMAG sensor;
  - 0D for the IZM-G2 and IZMAG^2 sensor.

1.4.3 Connection cable between sensor and converter
The cable must fulfil the requirements as described in point 4.4 of documentation number 7520/4-14. The maximum length of the cable is 100 m.

1.5 Conditional characteristics

1.5.1 Programming
On the main board of the converter, the calibration switch is placed in the MEAS position to prevent changing of the metrological relevant parameters. It is not possible to change the position of the calibration switch without breaking a seal. See documentation numbers 7520/4-03, 7520/4-04 or 7520/4-05 for details on the calibration switch.

1.5.2 Parameter settings

Menu	Description	Parameter	Mandatory setting	Remarks
02 Device Parameters	diameter	DN	Diameter of the sensor	Stored in the MEMbox
	Quantity unit	unit	Litre or m^3	See remark 2)
	Flow suppression	LFS		See remark 3)
	Pulse outputs	output mode	2, 6; 7	
	Flow damping	average		See remark 1)
	Empty pipe detection	pipe detection	pipe detect	See remark 4)
	Counting mode	Standby mode	1	Always counting
	Sealing-mode	parameter mode	1 or 2	-
03 Input/output parameters	Maximum flow rate	Qmax	Correct value	See remark 5)
	Pulse output 1	pv1		Max. Freq. shall not be exceeded.
	Pulse output 2	Pv2		
04 Display Parameters	Number of decimals in volume display	V Format frac		Insignificant scale intervals shall be avoided.
		V2 format frac		
	Control Indicating Device	display mode	0; 1	See remark 6)
	Printer config.	printer mode	Correct setting	Default = 0 (= no printer)
	Long term memory	Long Term Memory	0; 1	Default = 0 (= no LTM active)

05 Calibration Parameters	Calibration date measuring part	Span	Determined by the producer	Stored in the MEMbox
		Offset		
	Calibration factor	m spe	Will be determined during the verification	-
	Correction factor positive flow	p spe		
	Correction factor negative flow	n spe		
	Correction factor for the minimum flow	b spe		
	Correction factor Quantity unit	m dim		Parameter is locked by setting parameter unit in menu 02.
	Minimum measured quantity	V min	Correct value	Depends on the size of the sensor.
	Free quantity unit configuration	Free unit text	Not applicable	Parameter is locked by setting parameter unit in menu 02.

Remarks to the parameter settings:

1) Setting shall be explained by the producer or the manufacturer of the complete system or by the end user of the complete system.
2) Setting this parameter to Cubic meter or to Liter has the following effects:
   - The parameter “m dim” of menu 05 “Calibration parameters” is set to the appropriate conversion factor, 1 for Liter and 0,001 for Cubic meter. The parameter “m dim” is locked against changes
   - The parameter “Free quantity unit configuration” of menu 05 is locked and cannot be set.
3) The value is a percentage, range 0 … 4,00%, of the maximum flow.
   Settings shall be such that the meter starts registering when the flow is above 20% of the minimum flow rate of the measuring system.
4) In case empty pipe is detected, pulse output 2 will be switched off. Thus, triggering an error in the electronic counter to which the measuring device is connected.
5) The value may be set to the maximum flow rate of the measuring system, even if this maximum flow rate of lower than the maximum flow rate of the meter.
6) If the display of the converter has to be considered as the primary indication (for example the IZM meter is not connected to a flow computer), the mandatory setting is 1.
   If the IZM meter is connected to a flow computer and the display of this flow computer can be considered as the primary indication, this parameter may be set to 0.

1.6 Conditional shapes

See documentation number 7520/8-01 for the construction (design) of the type plate.

2 Seals

- The inscriptions are fixed to the measuring device and secured against removal, either via self-destructive sticker or via a seal;
- The calibration switch is sealed in the secured position;
- The cables between sensor and converter are sealed against removal on both sides. This sealing is mandatory from 1 July 2018, before this date this sealing can be applied.

See documentation number 7520/5-01 for an example of the sealing.

3 Conditions for conformity assessment

- Other parties may use this Evaluation Certificate only with the written permission of the producer.
- Before taken into use the measurement sensor shall be calibrated on the product it is going to measure or on a product with similar properties (conductivity) at operating temperature and pressure (if possible).
- 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.
- In case the measuring device is used bi-directional, the measurement accuracy shall be determined in both directions.

4 Reports

An overview of the performed tests is given in Evaluation Report ER7520 revision 9 issued together with this Evaluation Certificate.