EU-type examination certificate

Number **T11917** revision 0
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NMi Certin B.V.,
designated and notified by the Netherlands to perform tasks with respect to conformity modules mentioned in article 17 of Directive 2014/32/EU, after having established that the Measuring instrument meets the applicable requirements of Directive 2014/32/EU, to:

Manufacturer

FMG International TR
İkitelli OSB, Başak Bulvarı, Başakşehir San. Sit.
C Blok No:10-12, 34230 Başakşehir/İST.
Turkey

Measuring instrument

A **Turbine Gas Meter** with mechanical index.

Type	:	FMiT-L FMiT-S FMiT-Lx FMiT-Dc
Manufacturer's mark or name	:	FMG International TR
Destined for the measurement of	:	Gas volume
Accuracy class	:	Class 1,0
Environment classes	:	M1 / E2
Temperature range	:	-40 °C / +70 °C

Further properties are described in the annexes:
- Description T11917 revision 0;
- Documentation folder T11917-1.

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INSPECTION RvA I 122

1 General information about the gas meter

All properties of the gas meter, whether mentioned or not, shall not be in conflict with the legislation.

1.1 Essential parts

Measuring part
The measuring part consists of all metrological essential parts such as turbine wheel, bearings, shafts, gears and inlet flow straightener as mentioned in the paragraphs below.

1.1.1 Dimensions measuring part
Drawings in document no. 11917/0-01, 11917/0-04, 11917/0-07, 11917/0-05 and 11917/0-08 give the internal and external dimensions of the following meter types:
- FMiT-L Flow Meter Turbine – Long.
- FMiT-S Flow Meter Turbine – Short.
- FMiT-Lx Flow Meter Turbine – Long, variant x.
- FMiT-Dc Flow Meter Turbine – Double cartridge (two FMiT-Lx cartridges)

1.1.2 Turbine blades
The number and the appertaining angle of the turbine blades are mentioned in the table of chapter 4, column "1.1 Essential parts".

1.1.3 Bearings
The bearing characteristics, including the optional bigger bearings, are given in the table of chapter 4, column "1.1 Essential parts". The accompanying drawing is given in document no. 11917/0-15, page 1.

1.1.4 Internal cartridge
An exploded view of the internal cartridge of the FMiT-L and FMiT-S meter is given in document no. 11917/0-02 and 11917/0-05 respectively. The FMiT-S and FMiT-Lx cartridge are identical. The FMiT-Dc meter consists of two FMiT-Lx cartridges in one housing.

1.1.5 Inlet flow straighteners
Document no. 11917/0-09, 11917/0-10 and 11917/0-11 give a detailed drawing including dimensions of all the flow straighteners. The installation condition, with regard to the straight inlet tube, depends on the applied flow straightener. See chapter 3 for the requirements. The FMiT-S and FMiT-Lx flow straighteners are identical.

1.1.6 Straight inlet tubing
See the prescribed installation conditions in chapter 3.

1.2 Essential characteristics

1.2.1 Flow rates
The essential characteristics regarding the flow rates are given in the table of chapter 4, column "1.2 Essential characteristics".

1.2.2 Operating pressure
With a measuring range (MR) of 1:20 the Q_{min} is applicable for an operating pressure from atmospheric up to and including the maximum working pressure of 101 bar(g) with standard bearings. Optional the meter can be equipped with bigger bearings; in this case the pressure rating is 4 up to and including 101 bar(g). See also the "essential parts" column in table 1 and 2 of chapter 4.
The Q_{min} for a measuring range of 1:30 and 1:50, including the corresponding working pressure range, is also given in table 1 and 2 (see the "essential characteristics" column).

1.3 Essential shapes

1.3.1 The nameplate or casing of the meter is bearing at least, good legible, the following information:
- CE marking including the supplementary metrological marking (M + last 2 digits of the year in which the instrument has been put into use);
- Notified Body identification number, following the supplementary metrological marking;
- EU-type examination certificate no. T11917;
- manufacturer's name, registered trade name or registered trade mark;
- manufacturer's postal address;
- serial number of the meter and year of manufacture;
- mechanical environment class (can also be given in the manual);
- electromagnetic environment class (can also be given in the manual);
- Q_{max}, Q_t and Q_{min};
- the working pressure range;
- ambient temperature range;
- accuracy class;
- pulse values of HF and LF frequency outputs (if applicable);
- indication of the flow direction, e.g. an arrow;
- indication of the measuring point for working pressure (pm or pr) and other pressure tappings (p);
- character V or H, if the meter can be operated only in vertical or horizontal position;
- the necessary straight pipe length in front of the meter (WELMEC 11.3, Issue 1, Guide for sealing of Utility meters).

An example of the markings (on the main nameplate) is shown in document no. 11917/0-13.

1.3.2 Sealing: see chapter 2.

1.4 Conditional parts

1.4.1 Construction
In addition to the essential parts as mentioned at 1.1, the meter contains at least the following conditional parts:
- housing;
- Gear transmission including the adjustment gears.
- Register.
- Pressure measuring point.

1.4.2 Meter position
The turbine meter (FMiT-S, FMiT-L, FMiT-Lx, FMiT-Dc) can operate in the following positions: horizontal flow, vertical flow up and vertical flow down.

1.4.3 Housing
The gas meter has a housing, which has sufficient tensile strength. An example is shown in document no. 11917/0-01, 11917/0-04, 11917/0-07 and 11917/0-08.

1.4.4 Gear transmission
The transmission from the internal cartridge to the register is carried out via a magnet coupling. The register is adjustable via adjusting wheels. Examples of the possible gear transmissions are presented in document number 11917/0-16.

1.4.5 Register
The measured volume is presented by means of a mechanical register. Examples of the register are stated in document no. 11917/0-13 and 11917/0-14. The amount of numbers before and after the comma and the value of the control element are given in the table of chapter 4, column “1.4 Conditional parts”.

The register can also be equipped with an extended drive shaft. This increases the distance between register and meter body. A drawing is given on page 2 of document no. 11917/0-14.

1.4.6 Pressure measuring point
The housing contains a pressure tapping to determine the reference pressure at the inlet of the meter. This pressure tapping is provided with the indication “p_m” or “p_r”. Multiple pressure tappings, marked with the indication “p” can be provided optionally.

1.4.7 Low and/or high frequency impulse outputs (optional)
The meter can be provided with low and/or high frequency impulse outputs, at which the appertaining impulse value is stated on the meter.

1.4.8 Encoder output (optional)
The meter can be provided with an encoder output, at which the relevant data is stated on the meter.

1.5 Non-essential parts

The meter has the following non-essential parts:
- Temperature measuring points and thermo wells.
- Reverse flow stops.
- Lubrication system (optional).
- When the meter is not equipped with an external lubrication system, the meter uses self-lubricating ball bearings.

1.6 Interchangeable components

The mechanical index, equipped with a reed contact, Wiegand or encoder, is an interchangeable component.

2 Seals

To secure components that may not be dismantled or adjusted by the user, the turbine gas meter has to be secured in a suitable manner on the location as indicated in document no. 11917/0-14. The following items are than sufficiently sealed:
- The nameplate of the meter;
- The entrance to the register;
- The entrance to the measuring part.

This way the index cannot de dismounted, therefore none of the parts of the meter can be dismantled or entered without breaking the seal(s) on the index.

3 Conditions for conformity assessment

The FMiT-L meter can be equipped with two different flow straighteners. When the large one is installed a straight inlet pipe of 1xDN is applicable. With the small one installed a straight inlet pipe of 5xDN shall be applied.
The FMiT-S can only be equipped with the large flow straightener, and therefore needs a minimum of 1xDN straight pipe length in front of the inlet.

The FMiT-Lx meter has no installation requirements concerning straight inlet tubing. The inlet flow straightener is identical to the FMiT-S configuration due to the fact that the FMiT-Lx and FMiT-S have identical cartridges.

The FMiT-Dc meter consists of two FMiT-Lx cartridges in one housing. The same installation conditions and flow straighteners are applicable for the FMiT-Dc as given for the FMiT-Lx.

Document no. 11917/0-12 gives a schematic drawing of the installation conditions with mandatory straight inlet piping (if applicable) and appertaining flow straightener. As given in document no. 11917/0-13 the necessary straight pipe length is stated on the name plate.

Any components which could affect the gas flow must be avoided within the prescribed inlet pipe length. The inlet pipe must be designed as a straight pipe section of the same nominal diameter as the gas meter.

4 Characteristics

Table 1 and 2 on the following pages present the main and essential characteristics including the essential and conditional parts for all the different turbine meters.

Table 1

Main characteristics				***1.2 Essential characteristics***					***1.4 Conditional parts***		***1.1 Essential parts***					
Type	**DN body**	**DN cartr.**	**G-value**	**Qmax**	**Qt**	**Qmin**			**Number of drums**	**Control element**	**Blade angle**	**Blade qty**	**Bearing dimensions** *Inside diameter x Outside diameter x Width in mm*			
						MR 1:20 ***0..101 bar(g)***	MR 1:30 ***4..101 bar(g)***	MR 1:50 ***8..101 bar(g)***	*Before and after comma*				*standard bearings* ***0..101 bar(g)***		*Optional bearings* ***4...101 bar(g)***	
-	*mm*	*mm*	-	*m³/h*	*m³/h*	*m³/h*	*m³/h*	*m³/h*	-	*m³/h*	*degree*	-	*front*	*rear*	*front*	*rear*
FMiT-Lx or FMiT-Dc	50	80	100	160	32	8	5	3	7 / 1	0,02	55	12	3x6x3	2x5x2	3x8x4	3x6x3
			160	250	50	12,5	8	5			45	14				
			250	400	80	20	12,5	8			35	16				
FMiT-L, FMiT-S, FMiT-Lx or FMiT-Dc	80	80	100	160	32	8	5	3	7 / 1	0,02	55	12	3x6x3	2x5x2	3x8x4	3x6x3
			160	250	50	12,5	8	5			45	14				
			250	400	80	20	12,5	8			35	16				
FMiT-Lx or FMiT-Dc	80	100	160	250	50	12,5	8	5	7 / 1	0,02	55	12	3x8x4	3x6x3	5x10x3	3x6x3
			250	400	80	20	12,5	8			45	14				
			400	650	130	32,5	20	12,5			35	16				
FMiT-Lx or FMiT-Dc	100	80	100	160	32	8	5	3	7 / 1	0,02	55	12	3x6x3	2x5x2	3x8x4	3x6x3
			160	250	50	12,5	8	5			45	14				
			250	400	80	20	12,5	8			35	16				
FMiT-L, FMiT-S, FMiT-Lx or FMiT-Dc	100	100	160	250	50	12,5	8	5	7 / 1	0,02	55	12	3x8x4	3x6x3	5x10x3	3x6x3
			250	400	80	20	12,5	8			45	14				
			400	650	130	32,5	20	12,5			35	16				
FMiT-Lx or FMiT-Dc	100	150	400	650	130	32,5	20	12,5	7 / 1	0,02	55	12	5x11x5	5x11x5	5x16x5	5x11x5
			650	1000	200	50	32	20			45	14				
			1000	1600	320	80	50	32	8 / 0	0,2	35	16				
FMiT-Lx or FMiT-Dc	150	100	160	250	50	12,5	8	5	7 / 1	0,02	55	12	3x8x4	3x6x3	5x10x3	3x6x3
			250	400	80	20	12,5	8			45	14				
			400	650	130	32,5	20	12,5			35	16				
FMiT-L, FMiT-S, FMiT-Lx or FMiT-Dc	150	150	400	650	130	32,5	20	12,5	7 / 1	0,02	55	12	5x11x5	5x11x5	5x16x5	5x11x5
			650	1000	200	50	32	20			45	14				
			1000	1600	320	80	50	32	8 / 0	0,2	35	16				
FMiT-Lx or FMiT-Dc	150	200	650	1000	200	50	32	20	7 / 1	0,02	55	12	5x16x5	5x16x5	8x22x7	5x16x5
			1000	1600	320	80	50	32	8 / 0	0,2	45	14				
			1600	2500	500	125	80	50			35	16				
FMiT-Lx or FMiT-Dc	200	150	400	650	130	32,5	20	12,5	7 / 1	0,02	55	12	5x11x5	5x11x5	5x16x5	5x11x5
			650	1000	200	50	32	20			45	14				
			1000	1600	320	80	50	32	8 / 0	0,2	35	16				
FMiT-L, FMiT-S, FMiT-Lx or FMiT-Dc	200	200	650	1000	200	50	32	20	7 / 1	0,02	55	12	5x16x5	5x16x5	8x22x7	5x16x5
			1000	1600	320	80	50	32	8 / 0	0,2	45	14				
			1600	2500	500	125	80	50			35	16				
FMiT-Lx or FMiT-Dc	250	200	650	1000	200	50	32	20	7 / 1	0,02	55	12	5x16x5	5x16x5	8x22x7	5x16x5
			1000	1600	320	80	50	32	8 / 0	0,2	45	14				
			1600	2500	500	125	80	50			35	16				

Description

Table 2

Main characteristics				***1.2 Essential characteristics***				***1.4 Conditional parts***		***1.1 Essential parts***					
Type	**DN body**	**DN cartr.**	**G-value**	**Qmax**	**Qt**	**Qmin**		**Number of drums**	**Control element**	**Blade angle**	**Blade qty**	**Bearing dimensions** *Inside diameter x Outside diameter x Width in mm*			
						0..101 bar(g) MR 1:30	***4..101 bar(g)*** MR 1:50	*Before and after comma*				***0..101 bar(g)***			
												standard bearings		*Optional bearings*	
-	*mm*	*mm*	-	*m³/h*	*m³/h*	*m³/h*	*m³/h*	-	*m³/h*	*degree*	-	*front*	*rear*	*front*	*rear*
FMiT-Lx or FMiT-Dc	200	250	1000	1600	320	50	32	8 / 0	0,2	45	24	10x26x8	6x16x5	12x28x8	6x19x6
			1600	2500	500	80	50			45 / 30	24				
			2500	4000	800	125	80			30	24				
FMiT-S, FMiT-Lx or FMiT-Dc	250	250	1000	1600	320	50	32	8 / 0	0,2	45	24	10x26x8	6x16x5	12x28x8	6x19x6
			1600	2500	500	80	50			45 / 30	24				
			2500	4000	800	125	80			30	24				
FMiT-Lx or FMiT-Dc	250	300	1600	2500	500	80	50	8 / 0	0,2	45	24	12x28x8	6x19x6	17x40x12	8x22x7
			2500	4000	800	125	80			45 / 30	24				
			4000	6500	1300	216	130			30	24				
FMiT-Lx or FMiT-Dc	300	250	1000	1600	320	50	32	8 / 0	0,2	45	24	10x26x8	6x16x5	12x28x8	6x19x6
			1600	2500	500	80	50			45 / 30	24				
			2500	4000	800	125	80			30	24				
FMiT-S, FMiT-Lx or FMiT-Dc	300	300	1600	2500	500	80	50	8 / 0	0,2	45	24	12x28x8	6x19x6	17x40x12	8x22x7
			2500	4000	800	125	80			45 / 30	24				
			4000	6500	1300	216	130			30	24				
FMiT-Lx or FMiT-Dc	300	400	2500	4000	80	133	80	8 / 0	0,2	45	24	15x35x11	8x22x7	17x40x12	8x22x7
			4000	6500	1300	216	130			45 / 30	24				
			6500	10000	2000	333	200			30	24				
FMiT-Lx or FMiT-Dc	400	300	1600	2500	500	80	50	8 / 0	0,2	45	24	12x28x8	6x19x6	17x40x12	8x22x7
			2500	4000	800	125	80			45 / 30	24				
			4000	6500	1300	216	130			30	24				
FMiT-S, FMiT-Lx or FMiT-Dc	400	400	2500	4000	80	133	80	8 / 0	0,2	45	24	15x35x11	8x22x7	17x40x12	8x22x7
			4000	6500	1300	216	130			45 / 30	24				
			6500	10000	2000	333	200			30	24				
FMiT-Lx or FMiT-Dc	400	500	4000	6500	1300	216	130	8 / 0	0,2	45	24	20x47x14	10x26x8	20x47x20	10x26x8
			6500	10000	2000	333	200			45 / 30	24				
			10000	16000	3200	533	320			30	24				
FMiT-Lx or FMiT-Dc	500	400	2500	4000	80	133	80	8 / 0	0,2	45	24	15x35x11	8x22x7	17x40x12	8x22x7
			4000	6500	1300	216	130			45 / 30	24				
			6500	10000	2000	333	200			30	24				
FMiT-S, FMiT-Lx or FMiT-Dc	500	500	4000	6500	1300	216	130	8 / 0	0,2	45	24	20x47x14	10x26x8	20x47x20	10x26x8
			6500	10000	2000	333	200			45 / 30	24				
			10000	16000	3200	533	320			30	24				
FMiT-Lx or FMiT-Dc	500	600	6500	10000	2000	333	200	8 / 0	0,2	45	24	20x47x20	10x26x8	20x47x20	10x26x8
			10000	16000	3200	533	320			45 / 30	24				
			16000	25000	5000	800	400			30	24				
FMiT-Lx or FMiT-Dc	600	500	4000	6500	1300	216	130	8 / 0	0,2	45	24	20x47x14	10x26x8	20x47x20	10x26x8
			6500	10000	2000	333	200			45 / 30	24				
			10000	16000	3200	533	320			30	24				
FMiT-S, FMiT-Lx or FMiT-Dc	600	600	6500	10000	2000	333	200	8 / 0	0,2	45	24	20x47x20	10x26x8	20x47x20	10x26x8
			10000	16000	3200	533	320			45 / 30	24				
			16000	25000	5000	800	400			30	24				