

Evaluation Certificate

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Project number : 12200227
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Issued by NMI Certin B.V.

In accordance with – WELMEC guide 8.8 “General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments under the MID”.
– OIML R117-1 Edition 2007 (E) “Dynamic measuring systems for liquids other than water.

Producer Emerson Process Management Remote Automations Solutions
1612 South 17th Ave. Marshalltown IA
50158 USA

Part An **Electronic calculating and indicating device**, intended to be used as a part of a liquid measuring installation.

Type : DL8000
Software version : See the description
Accuracy class : 0,5
Environment classes : M1 / E2
Ambient temperature range : -25 °C / +55 °C, condensing

Further properties are described in:

- Description TC7661 revision 1;
- Documentation folder TC7661-1.

Remarks This revision 1 replaces the previous revision 0.
The documentation folder TC7661-2 replaces the previous documentation folder TC7661-1.

Issuing Authority **NMI Certin B.V.**
13 March 2013

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1 General information on the measurement transducer

Properties of the electronic calculating and indicating device, whether mentioned or not, shall not be in 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 guide 8.8.

The complete measuring instrument must be covered by an EC-type Examination Certificate.

1.1 Essential Parts

The Emerson DL8000 (photo below) is a complete instrument including all circuit boards and an indication / keypad device in one enclosure.



1.1.1 Hardware components

Component description	Part Number	Documentation
CPU Series 2	W48093X0012 A xxxxxxxx	7661/1-01, -02
PM-12	W38185X0012 E xxxxxxxx	7661/0-01, -02
AI-12	W38201X0012 C xxxxxxxx or W38201X0012 D xxxxxxxx	7661/0-03, -04
DI	W38195X0012 B xxxxxxxx	7661/0-05, -06
RS-485	W38209X0012 B xxxxxxxx	7661/0-07, -08
RTD	W38205X0012 B xxxxxxxx	7661/0-09, -10
DO	W38193X0012 C xxxxxxxx	7661/0-11, -12
DO-RELAY	W38191X0012 F xxxxxxxx	7661/1-03, -04
PI	W38197X0012 D xxxxxxxx or W38197X0012 E xxxxxxxx	7661/0-13, -14, -15
APM	W38257X0012 E xxxxxxxx	7661/0-16, -17
Additional board on APM	W38271	7661/0-18, -19
HART	W38260X0012 E xxxxxxxx	7661/0-20, -21

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Component description	Part Number	Documentation
HART-2	W48097X0022 C xxxxxxxx	7661/1-05, -06
AC I/O	W48089X0012 B xxxxxxxx or W48089X0012 C xxxxxxxx	7661/0-22
Additional board on AC/I/O	W38294 C	7661/0-23
Display board	W48081X0012 A xxxxxxxx	7661/0-24
Keypad board	3-6000-030	7661/0-25, -26
Backplane	W48072X0012	7661/0-27, -28

1.2 Essential characteristics

1.2.1 Software identifications

The format of the version number is: **major. metrology minor (N₁.N₂N₃)**, where all components (N₁,N₂ & N₃) must be integers greater than or equal to 0.

Table with the software versions for firmware in the Smart cards:

Card	Flash Part Number	Flash Revision	Boot Part Number	Boot Revision
CPU module	W68252	2.30	W68253	2.00
APM Module	W68152	1.01 or 1.03	W68178	1.00
AC I/O Module	W68159	1.20	W68177	1.10
HART-2 Module	W68237	1.12	W68236	1.00
Display board	W68198	1.10	W68199	1.01

Remark: The firmware version can be checked with ROCLINK800, a user interface of the manufacturer.

Table with the software versions of the user programs:

User Program	Software version
LiquidCalcs	2.00 or 2.21
TransactionHistory	2.20 or 2.30
Printer	2.20 or 2.30
Additives	2.20 or 2.30
Batching	2.20 or 2.30
KeypadDisplay	2.20 or 2.32

Remark: The software version can be checked with ROCLINK800.

The software fulfils the Welmec guide 7.2,

- Software type P;
- Risk Class C;
- Extensions L, T;
- Not applicable: I, U, S, D

Checking facilities are of type P (permanently).

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- 1.2.2 Calculation of flow rates and flow totals from Mass or Volume pulses and / or serial data to produce Volumetric & Mass flow totals and flow rates, using Dual Pulse Integrity according to Level A or B to ISO 6551 / IP 252/76.
A third impulse integrity method uses a so called marker pulse. The number of volume impulses or mass impulses between two marker pulses can be set by the user; see the paragraph 1.4.
- 1.2.3 Registering of volume(s), mass and other measured values and parameters.
- 1.2.4 The user manual should contain a note that "a transaction should always be settled in a period shorter than XXXX", in which text XXXX is the period the transaction should be retained. Only under that condition transactions can automatically deleted without being printed.
- 1.2.5 Check on communications.
- 1.2.6 Conversions
The DL8000 can perform conversion calculations according to the following methods:
- 1.2.6.1 ASTM Technical Publication D1250-04 methods 53A, 53B, 53D, 54A, 54B, 54C, 54D.
 - 1.2.6.2 ASTM Technical Publication D1250-04 methods 59A, 59B, 59D, 60A, 60B, 60C, 60D, all of them with a reference temperature of 20 °C.
The above two methods are also known as API Manual of Petroleum Measurement Standards, Chapter 11, Section 1.
 - 1.2.6.3 GPA Technical Publication TP-27 methods 53E, 54E.
 - 1.2.6.4 GPA Technical Publication TP-27 methods 59E, 60E, both with a reference temperature of 20 °C.
GPA Technical Publication TP-27 is also known as Manual of Petroleum Measurement Standards, Chapter 11, Section 2, Part 4
and as ASTM Technical Publication [Stock No. PETROLTBL-TP27].
 - 1.2.6.5 Manual of Petroleum Measurement Standards, Chapter 11.2.2M.
 - 1.2.6.6 OIML R22

Informative: The DL8000 also supports conversion methods 5, 6, 23 and 24; however, these are not within the scope of the Evaluation Certificate and therefore not tested.

1.3 Essential shapes

- 1.3.1 Inscriptions
The Evaluation certificate number: TC7661;
Name or trade mark of the manufacturer;

Parts of the inscriptions (except for the Evaluation Certificate number and serial number) may be stated on a separate Data Sheet belonging to the complete installation.

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- 1.3.2 The unit of indication is liters for volume and kg for mass, or m³ for volume and ton for mass. Liters are always used in combination with kg's, while cubic meters are always used in combination with tonnes.
- 1.3.3 The minimum measured quantity is inscribed on the calculating and indicating device or on a separate plate in the direct vicinity of the display.
- 1.3.4 In installations where more than one measurement transducer is applied, an identification of the connected measurement transducer shall also be applied on or in the vicinity of the calculating and indicating device.
- 1.3.5 In systems where volume conversion is carried out, a description of the reference conditions is applied on or in the vicinity of the display.
- 1.3.6 Seals
See chapter 2 of this description.
- 1.3.7 In case a printing device is connected, an additional feedback from the printing device to the calculating and indicating device for power off detection and paper out detection.

1.4 Conditional characteristics

The below mentioned Weights & Measures parameters shall be set to the belonging values and in the secure mode "read only".

parameter	Setting	Remarks
Point type 60: Print parameters	Correct setting.	Each presented Weights & Measures figure must have a name and a unit. Setup must be specified and motivated by manufacturer and/or user.
Point type 61: Transaction history parameters / Parameter 124: Clear History setup	Correct setting.	Transaction history setup must be specified and motivated by manufacturer and/or user.
Point type 61: Transaction history / Parameter 130: Storage Memory Full alarm config. setup	Correct setting.	Transaction history setup must be specified and motivated by manufacturer and/or user.
Point type 63: General preset / Parameter 0: Minimum preset quantity settings	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 63: General preset / Parameter 151: Density/Gravity scale settings	Correct settings. Special (if applicable)	Settings to be specified and motivated by manufacturer and/or user.

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Point type 63: General preset / Parameter 157/158: Minimum and maximum component temperature	$t = -10\text{ °C} \dots +75\text{ °C}$	Settings to be specified and motivated by manufacturer and/or user.
Point type 63: General preset / Parameter 160/161: Minimum and maximum component pressure	$P = 205\text{ kPa} \dots 1016\text{ kPa}$	Settings to be specified and motivated by manufacturer and/or user.
Point type 63: General preset / Parameter 163/164: Minimum and maximum component density	$\text{Rho} = 695\text{ kg/m}^3 \dots 999\text{ kg/m}^3$	Settings to be specified and motivated by manufacturer and/or user.
Point type 63: General preset / Parameter 181/182/183: Temperature, pressure and density Fail alarm action	Correct settings. OFF is not allowed	Settings to be specified and motivated by manufacturer and/or user.
Point type 63: General preset / Parameter 219: Linearization alarm action	Correct settings. OFF is not allowed	Settings to be specified and motivated by manufacturer and/or user.
Point type 69: Components / Parameter 7: Meter	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 69: Components / Parameter 8: K-factor	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 69: Components / Parameter 9: Meter factor	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 69: Components / Parameter 75-98: Meter Factor/K-factor # (# = number 1-12)	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 70: Liquid preference parameters	These setting may or may not be within the Weights & Measures scope.	Each presented Weights & Measures figure must have a name and the correct unit. (l \leftrightarrow kg, m ³ \leftrightarrow ton) Only metric units are allowed.
Point type 71: Liquid station parameters / Parameter 1: Product	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 71: Liquid station parameters / Parameter 9: Base temperature option	Correct settings. Only metric units are allowed.	Settings to be specified and motivated by manufacturer and/or user.
Point type 72: Product parameters / Parameter 1: Fluid type	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.

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Point type 72: Product parameters / Parameter 2: API standard version	Correct tables	Settings to be specified and motivated by manufacturer and/or user.
Point type 72: Product parameters / Parameter 7: Alpha coefficient	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 72: Product parameters / Parameter 8: Base density	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 74: Densitometer parameters	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 75: Meters / Parameter 2: Minimum flow rate	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point type 75: Meters / Parameter 3: Maximum flow rate	Correct settings.	Settings to be specified and motivated by manufacturer and/or user.
Point ???: Number of volume impulses or mass impulses between two marker impulses.	Correct number of impulses.	The number of impulses should be such that the maximum error in the volume or mass does not exceed the maximum permissible error in volume or mass.

Prior to verification a list with the parameters settings and a motivation of these setting should be present at the flow computer location.

1.5 Conditional shapes

1.5.1 Presentation on the display

During the delivery the display can show all meters.

The display gives the total delivery of the streams and also the streams separately. The base and actual volume is clearly visible with identification of the stream.

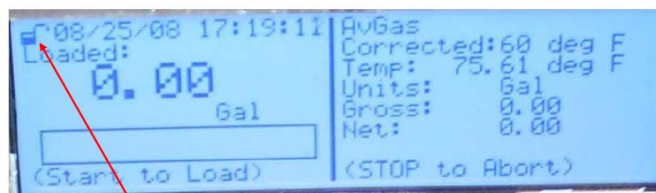
2 Sealings

2.1 Sealing against unauthorized opening (see top photo on the next page);

2.2 Sealing of the software by means of the Weights & Measures switch (see the bottom photo on the next page).

Description

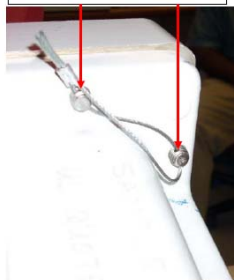
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Unlocked and locked icons
Showing remote configuration status conditions



Housing cover sealing provision



Example of the sealings.

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3 Conditions for Conformity Assessment

- 3.1 The electronic calculating and indicating device must be constructed in accordance with this Evaluation Certificate and the appertaining documentation.
- 3.2 Other parties may use this Evaluation Certificate only with the written permission of Emerson Process Management.

4 Test reports

An overview of the performed tests is given in the test reports and test result files:

- CPC/ 9200563
- NMI-12200227