

**OIML Member State**  
The Netherlands

Number R 117/2019-A-NL1-24.04 revision 0  
Project number 3834652  
Page 1 of 4

Issuing authority NMI Certin B.V.  
Person responsible: M.Ph.D. Schmidt

Applicant and Manufacturer Total Control Systems, A Division of Murray Equipment, Inc.  
2515 Charleston Place  
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United States of America

Identification of the certified type An **electronic calculating and indicating device** intended to be used as a part of an interruptible dynamic measuring systems for liquids other than water.  
Producer mark or name: Total Control Systems  
Type: TCS 3000  
TCS 3000EX

Characteristics See following pages

This OIML Certificate is issued under scheme A.

This Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML Type Evaluation Report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

**R 117-1: 2019** "Dynamic measuring systems for liquids other than water"

Accuracy class 0,5

This Certificate relates only to the metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML International Recommendation identified above. This Certificate does not bestow any form of legal international approval.

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Issuing Authority **NMI Certin B.V., OIML Issuing Authority NL1**  
25 October 2024

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The conformity was established by the results of tests and examinations provided in the associated report(s):

- No. NMI-2267300-01 dated 25 March 2022 that includes 43 pages;
- No. NMI-3739564-01 dated 13 June 2024 that includes 56 pages;
- No. NMI-3834652-01 dated 25 October 2024 that includes 18 pages.

### Characteristics of the measuring instrument

In Table 1 the general characteristics of the electronic calculating and indicating device are presented. The construction of the electronic calculating and indicating device is recorded in the Documentation folder TC8392-3.

The electronic calculating and indicating device TCS 3000 is intended for use on fixed and mobile installations to measure flammable products such as gasoline, diesel, heating oil and LPG. TCS 3000 can calculate the product volume at reference conditions using the measured volume at measured conditions, measured product temperature, the manually input density at reference conditions and the conversion method. Both the manually input density and the conversion method are protected by a seal.

TCS 3000EX is the variation in explosion proof enclosure. It shares the same main board as the TCS 3000, however it has distinct features from TCS 3000 in the interface board, keyboard barrier board and power supply stabilization board.

**Table 1 General characteristics**

Environmental classes	M3 / E2 + E3 / H3
Ambient temperature range	-40 – +55 °C; condensing humidity, open location
Intended for the measurement of	<ul style="list-style-type: none"> <li>- Mass;</li> <li>- Uncorrected volume;</li> <li>- Standard volume;</li> <li>- Density;</li> <li>- Temperature.</li> </ul>
Power supply voltage	12 – 24 V DC 24 V DC (when powered using a vehicle battery)
Approved inputs	<ul style="list-style-type: none"> <li>- Dual frequency pulse input;</li> <li>- Temperature input via 4-wire RTD sensor (PT100);</li> <li>- HART superimposed on the current input;</li> <li>- RS232 or RS485 serial communication.</li> </ul>
Approved outputs	<ul style="list-style-type: none"> <li>- LCD/Segment display;</li> <li>- RS232 or RS485 serial communication.</li> </ul>

Approved conversion methods	<ul style="list-style-type: none"> <li>- API Manual of Petroleum Measurements Standards, Chapter 11, Physical Properties Data, Section 1 (also known as ASTM D1250-07) at reference conditions (0 kPa, 15 °C) <ul style="list-style-type: none"> <li>• tables 54B (refined petroleum products);</li> <li>• tables 54D (lube oils).</li> </ul> </li> <li>- API Manual of Petroleum Measurements Standards, Chapter 11, Physical Properties Data, Section 2 Part 4 (also known as ASTM/GPA TP-27) at reference conditions (0 kPa, 15 °C) <ul style="list-style-type: none"> <li>• tables 54E (NGL and LPG).</li> </ul> </li> </ul>
EMI measures	<ul style="list-style-type: none"> <li>- The power cable is connected with a power fuse.</li> <li>- All the connected signal cables are shielded cables. Both ends of the shielded cable should be grounded.</li> </ul>

**Table 2 Input range of the electronic calculating and indicating device**

Product	Temperature range	Density range
Generalized products, such as Diesel, Fuel oil etc.	-40 – +90 °C	615 kg/m <sup>3</sup> – 1155 kg/m <sup>3</sup>
Liquefied Petroleum Gas (LPG)	-46 – +80 °C	490 kg/m <sup>3</sup> – 685 kg/m <sup>3</sup>

**Table 3 Software identification**

Application	Software versions	CRC checksum
Firmware	V30.05.00	25B5
		5342 25B5
	V30.05.01	F916 A016
	V30.05.03	74D6 113D
Operating system	4.9.118	73b65e4aa7d377f726d074e594fab0a2
		a327ef9d0abbd1797d43f5a50b9fb0c
	5.15.115	ac9c7bb9963745eb13c96cb15680e211
		b1e2cd7d258b0ec3b8d128e60856fd79



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Number R 117/2019-A-NL1-24.04 revision 0  
Project number 3834652  
Page 4 of 4

## Certificate history:

Revision	Date	Description of the modification
Initial	25 October 2024	First issue.