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ELGAS, s.r.o.,
Semtínská 211, Ohrazenice, 533 53 Pardubice, IČO 474 699 78
Metrological center

Conformity with API Ch 21.1

TESTED OBJECT	Volume conversion device. Type: ELCORplus.
GENERAL INFORMATION OF TESTED OBJECT	Volume conversion device ELCORplus is used to measure the volume of gas and its conversion to volume at basic conditions and energy. It is designed to be used at gas measuring station and pressure reduction-measuring stations.
MANUFACTURER	ELGAS, s.r.o. Semtínská 211, Ohrazenice, 533 53 Pardubice, IČO 474 699 78
TEST SPECIFICATIONS	API Ch 21.1 2013
DATE OF TEST	May 23 — July 8, 2022
RESULT OF TEST	Approved. Volume Conversion Device ELCORplus complies with the guidelines of the standard API Ch 21.1

ELGAS, s.r.o.
Ohrazenice 211
533 53 Pardubice
metrologické středisko
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Checked by: Zdeněk Alinče

Head of the Metrology Department

Paragraph API Ch 21.1	**Requirement**	**Result/Comment**
1	Scope	informative
2	Normative References	informative
3	Descriptions, Definitions, and Symbols	informative
3.1	Description of an Electronic Gas Measurement System	informative
3.2	Elements of Gas Measurement System	informative
3.2.1	Transducers/Transmitters	informative
3.2.2	Signal Processing	informative
3.2.3	System Uncertainties	informative
3.2.4	Data Management:	informative
3.3	Definitions	informative
3.4	Symbols	informative
4	Electronic Gas Measurement System Algorithms	informative
4.1	General	informative
4.2	Overview	informative
4.2.1	Intent	informative
4.2.2	Total Quantity	pass
4.3	Quantity Calculation Period (QCP)	pass
4.4	Differential Meter Measurement	N/A
4.4.1	General	N/A
4.4.2	Sampling Flow Variables	N/A
4.4.3	Quantity Determination from the Full Flow Rate Calculation	N/A
4.4.4	Quantity Determination from the Factored Flow Rate Calculation	N/A
4.4.4.1	General	N/A

Paragraph API Ch 21.1	**Requirement**	**Result/Comment**
4.4.4.2	Integral Value (IV) Calculation	N/A
4.4.4.3	Integral Multiplier Value (IMV) Calculation	N/A
4.4.4.4	Differential Pressure for Expansion Factor Calculations	N/A
4.4.4.5	Volume Calculation	N/A
4.4.5	No Flow Cutoff	N/A
4.5	Linear Meter Measurement	pass
4.5.1	Sampling Flow Variables	pass
4.5.2	Integral Value (IV) Calculation	pass
4.5.3	Integral Multiplier Value (IMV) Calculation	pass
4.5.4	Q_f —Flow Rate at Flowing Conditions	pass
4.5.4.1	Linear Meters with Synchronous Pulse Outputs	pass
4.5.4.2	Linear Meters with Manufactured Pulse Outputs	pass
4.5.4.3	Linear Meters with Rate Output	N/A
4.5.4.4	Linear Meters with Accumulator Output	N/A
4.5.5	No Flow Detection/No Flow Cutoff	pass
4.5.6	Volume Calculation	pass
4.6	Value Determination For Live Inputs	pass
4.7	Compressibility, Density, Heating Value, and Composition	pass
5	Audit and Reporting Requirements	informative
5.1	Introduction	pass
5.2	Quantity Transaction Record (QTR)	pass
5.2.1	Rounding and Reporting	pass
5.2.2	QTR for Differential Type Meters	N/A
5.2.3	Daily QTR for Differential Type Meters	N/A
5.2.4	QTR for Linear Type meters	pass

Paragraph API Ch 21.1	**Requirement**	**Result/Comment**
5.2.5	Daily QTR for Linear Type Meters	pass
5.3	Software/Firmware Identifiers	pass
5.4	Configuration Log	N/A
5.4.1	General	pass
5.4.2	Flow Computer Snapshot Report	pass
5.5	Event Log	pass
5.6	Alarm and Operating Data	pass
5.7	Corrected Quantity Transaction Record (QTRcorr)	N/A
5.7.1	Recalculation of Data	N/A
5.8	Test Record	N/A
6.	Data Availability	informative
6.1	General .	pass
6.2	Onsite Data Requirements	pass
6.3	Off-Site Data Requirements	N/A
6.4	Data Retention	N/A
7	Commissioning	informative
7.1	General	pass
7.2	Documentation Review	informative
7.2.1	Primary Device	N/A
7.2.2	Secondary Devices	N/A
7.2.3	Tertiary Devices	pass
7.3	Final Integrated EGM System Site Commissioning	informative
7.3.1	General	informative
7.3.2	Primary Device Commissioning	N/A
7.3.3	Secondary Devices Commissioning	N/A

Paragraph API Ch 21.1	**Requirement**	**Result/Comment**
7.3.4	Tertiary Devices Commissioning	pass
7.3.5	End-to-End Operational Check—Integrated System Commissioning	informative
7.4	Commissioning Documentation	informative
8	Equipment Verification and Calibration	informative
8.1	Components Requiring Calibration/Verification	pass
8.2	Verification and Calibration	informative
8.2.1	General	pass
8.2.2	Verification/Calibration of Pressure and Temperature Devices	pass
8.2.2.1	General	pass
8.2.2.2	Verification Tolerance	pass
8.2.2.3	Differential Pressure	N/A
8.2.2.4	Static Pressure	pass
8.2.2.5	Temperature	pass
8.2.3	Verification/Calibration of On-line Analyzers	N/A
8.2.4	Verification/Calibration of Other EGM Equipment	pass
8.3	Ambient Temperature, Line Pressure and Atmospheric Pressure Effects	informative
8.3.1	Ambient Temperature Effect	pass
8.3.2	Line Pressure Effect	N/A
8.3.3	Atmospheric Pressure Effect	N/A
8.4	Calibration and Verification Equipment	N/A
9	Security and Data Integrity	informative
9.1	Introduction	informative
9.2	Restricting Access	pass
9.3	Intelligent Device Data Communication Integrity	N/A
9.4	Integrity of Logged Data	pass

Paragraph API Ch 21.1	**Requirement**	**Result/Comment**
9.5	Algorithm Protection	pass
9.6	EGM Memory Protection	pass
9.7	Integrity of Transferred Data	pass

Paragraph API Ch 21.1	**Requirement**	**Result/Comment**
Annex A	RANS Methodology for Estimating Sampling Frequency and Calculation Algorithm Errors	N/A
Annex B	Averaging Techniques	pass
Annex C	Correction Methodology	N/A
Annex D	Calculation of Normal Operating Range and Percent Fluctuation	N/A
Annex E	Example Flow Computer Variable Input Type Testing - Differential Meters	informative
Annex F	Example Commissioning Checklist	informative
Annex G	Examples of configuration Log Data	informative
Annex H	Calculation of Differential Pressure ”As-Found”	N/A
Annex I	Example of a Redundancy Verification Report	informative
Annex J	Examples of Applying Linear Meter Equations	pass J.1, Ex.2
Annex K	Example of Using DPIV, DPY, and a Volumetric Flow Rate Calculator to Recalculate a QCP or QTR	informative