Evaluation Certificate

Issued by	NMi Certin B.V.
In accordance with	− WELMEC 8.8, 2017 "Guide on the General and Administrative Aspects of the Voluntary System of Modular Evaluation of Measuring instruments"; − WELMEC 7.2, 2015: Software Guide; − WELMEC 7.2, 2023: Software Guide; − OIML R117-1 Edition 2007 (E) "Dynamic measuring systems for liquids other than water; − OIML R117, 2019: Dynamic measuring systems for liquids other than water.
Producer	ABB B.V. Achtseweg Zuid 151A 5651 GW Eindhoven The Netherlands
Part	An **electronic calculating and indicating device** intended to be used as part of a dynamic measuring system for liquids other than water.

Producers mark	: ABB
Designation	: Flow-X/M, Flow-X/P, Flow-X/R, Flow-X/S and Flow-X/K
Accuracy class	: 0,3

Further properties are described in the annexes:
- Description TC7570 revision 26;
- Documentation folder number TC7570-12.

Initially issued	11 February 2010
Remarks	This revision replaces the previous revisions; The documentation folder replaces the previous documentation folder.

Issuing Authority	**NMi Certin B.V., Notified Body number 0122** 7 May 2024 Certification Board

PRODUCTS
RvA C 681

D e s c r i p t i o n

1. General information on the electronic calculating and indicating device

All 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, 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 Flow-X series of flow computers is based on a modular concept where Flow-X/M module is used for connecting one or two meters per stream. These modules can be installed in a number of different enclosures. Each module has its own LCD display.

Flow X/M

The Flow X/P is a Panel mounted enclosure that can contain up to four Flow X/M flow modules, an additional station module with a 7" multi -lingual colour touch-screen and additional serial (3x) and Ethernet interfaces (2x). The Flow-X/P enclosure can be used in both horizontal and vertical position. Field connections are available in standard 37 -pin and 9 -pin D -Sub type connectors at the rear.

Flow X/P

The Flow X/S is a DIN rail mountable enclosure that can contain one Flow-X/M flow module. Field connections are available in direct screw terminals. Interfaces include dual Ethernet with built -in web server via RJ45 connectors. The measured and calculated data is available on the graphical LCD display of the Flow-X/M flow module. The Flow -X/S may be mounted in 3 ways: Horizontally on Din -rail, vertically on Din –rail or Wall mounted.

Flow X/S

The Flow X/R is a 19" rack mountable enclosure that can accommodate up to eight Flow-X/M flow modules. For each module it provides a 24 VDC power supply connector and two 37-pin D-Sub type connectors at the top and 2 Ethernet ports at the bottom. The measured and calculated data of each Flow-X/M flow module is available on its graphical LCD display.

Flow X/R

The Flow-X/K is a compact DIN rail mountable enclosure that can contain one Flow-X/M flow module.
The enclosure has a 24 VDC power supply connection and 2 Ethernet ports at the bottom and two 37-pin D-sub type connectors at the top. The measured and calculated data of the Flow-X/M module is available on its graphical LCD display.

Flow-X/K

1.1   Essential parts

The electronic calculating and indicating device can be composed of the following parts:

1.1.1 Flow X/M

Part	Part number	Documentation	Ambient Temperature range
Digital board	6557-0700-1206	7570/1-04	+5 °C / +55 °C
	6557-0700-1207	7570/1-05	
	6557-0700-1208	7570/1-06	
	6557-0700-1209	7570/1-06	
	6557-0700-1210	7570/3-02	
	6557-0700-1211	7570/3-02	
	xx-211-006	7570/11-01; 7570/17-01	
	xx-211-007	7570/18-01; 7570/18-02	-25 °C / +55 °C
	xx-211-008	7570/20-03; 7570/26-01	
Analog board	6557-0700-1305	7570/1-01	+5 °C / +55 °C
	6557-0700-1308	7570/1-02	
	6557-0700-1309	7570/1-03	
	6557-0700-1310	7570/3-01	
	xx-212-003 xx-212-004	7570/11-03; 7570/17-02	
	xx-212-005	7570/18-03; 7570/18-04	-25 °C / +55 °C
	xx-212-006	7570/20-01; 7570/20-02 7570/24-01	
Power board	6557-0800-8202	7570/1-08	+5 °C / +55 °C
	6557-0800-8203	7570/1-09	
	6557-0800-8204	7570/3-03	
	xx-213-003	7570/11-05; 7570/17-04	
	xx-213-004	7570/18-05; 7570/18-06	-25 °C / +55 °C

Part	Part number	Documentation	Ambient Temperature range
Display board	6557-0800-6504	7570/1-07	+5 °C / +55 °C
	6557-0800-6505	7570/12-01; 7570/17-03	
	xx-214-003	7570/11-07; 7570/17-08	
	xx-214-004	7570/18-07; 7570/18-08	-25 °C / +55 °C
SD Card Adapter board (optional)	6557-1500-0000	7570/8-01	+5 °C / +55 °C
	6557-1500-0001	7570/9-01	

Remark: In the part number x can represent any character.
The Flow X/M with Part Number starting with '6557-' may contain a normal SD card or the SD Card Adapter board with micro-SD card.

1.1.2   Flow X/P

Part	Part number	Documentation	Ambient Temperature range
Backplane panel	6557-0800-2904	7570/1-13	+5 °C / +55 °C
	6557-0800-2905	7570/1-14	
	xx-215-003	7570/11-09; 7570/17-05	-25 °C / +55 °C
Connector panel	6557-0800-2803	7570/1-15	+5 °C / +55 °C
	6557-0800-2804	7570/1-16	
	xx-217-004	7570/11-11; 7570/17-06	
	xx-217-005	7570/18-09; 7570/18-10	-25 °C / +55 °C
Flow-X/P type 1: GUI module Touchscreen controller	6557-0700-1402	7570/1-10	+5 °C / +55 °C
	6557-0700-1407	7570/1-11	
	6557-0700-1408	7570/1-12	
	6557-0700-1409	7570/1-12	
	6557-0700-1410	7570/3-04	
Flow-X/P type 2: display interconnection board	xx-219-004	7570/11-13; 7570/17-07	+5 °C / +55 °C
	xx-219-005	7570/18-14; 7570/18-15	-25 °C / +55 °C
Flow-X/P type 2: GUI board *)	xx-221-006	7570/18-11; 7570/18-12; 7570/18-13	+5 °C / +55 °C
7"touch screen display drawing	TST070WSBE	7570/18-16; 7570/20-05	-25 °C / +55 °C
Digital board	xx-211-006	7570/11-01; 7570/17-01	+5 °C / +55 °C
	xx-211-007	7570/18-01; 7570/18-02	-25 °C / +55 °C
	xx-211-008	7570/20-03; 7570/26-01	
Power board	6557-0800-8202	7570/1-08	+5 °C / +55 °C
	6557-0800-8203	7570/1-09	
	6557-0800-8204	7570/3-03	
	xx-213-003	7570/11-05; 7570/17-04	
	xx-213-004	7570/18-05; 7570/18-06	-25 °C / +55 °C

Part	Part number	Documentation	Ambient Temperature range
SD Card Adapter board (optional)	6557-1500-0000	7570/8-01	+5 °C / +55 °C
	6557-1500-0001	7570/9-01	

Remark: In the part number x can represent any character.
The Flow-X/P enclosure may contain up to four Flow-X/M flow modules. The Flow X/P with Part Number starting with '6557-' may contain a normal SD card or the SD Card Adapter board with micro-SD card.
*) Flow-X/P may contain a GUI module touchscreen controller or a digital board.

1.1.3 Flow X/S

Part	Part number	Documentation	Ambient Temperature range
Back plane	6557-0800-4901	7570/1-17	+5 °C / +55 °C
	6557-0800-4902	7570/1-18	
	xx-225-001	7570/20-06, 7570/20-07	-25 °C / +55 °C

The Flow-X/S enclosure contains one Flow-X/M flow module.

1.1.4 Flow X/R

Part	Part number	Documentation	Ambient Temperature range
Back plane	6557-0800-8401	7570/1-19	+5 °C / +55 °C

The Flow-X/R enclosure may contain up to eight Flow-X/M flow modules.

1.1.5 Flow X/K

Part	Part number	Documentation	Ambient Temperature range
Back plane	xx-226-000	7570/20-08, 7570/20-09	+5 °C / +55 °C
	xx-226-001	7570/20-10, 7570/20-11	-25 °C / +55 °C

The Flow-X/K enclosure contains one Flow-X/M flow module.

1.2   Essential characteristics

1.2.1   Environmental class:
-    M2 / E2
-    Humidity class H1: non-condensing temperature controlled enclosed location.

1.2.2   Software specification (see WELMEC 7.2):
- Software type P;
- Risk Class C;
- Extensions L, T , S and I5 are applicable while Extension O and D are not applicable.

Description

Software part	Software version	Software checksum	Remarks
Firmware [1]	Software checksum acts as software version indication.	B4A0633E	Core calculation, reporting and communication engine
		7E40F17AE	
		5B6AEFE1	
		63CBC842	
		A58377C1	
		4581A774	
		651B2653	
		A3DDC66F	
		5ADFEAA2	
		C587C032	
		2F494636	
		11143FE8	
		1AAD4807	
	1.9.0.7041	47E8CD2F	
	2.1.1.9285	712C1E6B	
	2.1.2.10217	0B29E8A2	
	2.1.3.10452	0B29E8A2	
	2.1.4.12541	0B29E8A2	
	3.0.0.10988	A9B2B7D9	
	3.1.1.12149	13D0B0C5	
	3.1.3.12952	13D0B0C5	
	3.2.0.13638	2555BE9D	
	3.2.1.13738	2555BE9D	
	3.2.3.14630	2555BE9D	
	3.2.4.14771	2555BE9D	
	3.2.6.16452	37B727D5	
	3.2.8.17090	37B727D5	
	3.3.x.yyyyy	69D96585	

Software part	Software version and checksum	Remarks
Add-on Programs	1.0.0.3	Boot loader and other auxiliary programs
	1.0.0.1107	
	1.0.0.1108	
	1.0.0.1127	
	1.0.0.1151	
	1.0.0.1157	
	1.0.0.1166	
	1.0.0.1167	
	1.0.0.1169	
	1.0.0.1170	
	1.1.1.6855	
	1.1.2.7027	
	2.0.0.8200	
	2.3.0.11844 Label: Oct 07 2019 16:24:57	
	2.4.0.12900 Label: Apr 14 2020 13:03:41	

Software part	Software version and checksum		Remarks
FPGA	1357-22-1-2009		Field-Programmable Gate Array for X/M
	1422-21-2-2012		Field-Programmable Gate Array for X/M
	1350-29-10-2009		Field-Programmable Gate Array for X/P
	0879.914A.E820.BBF1	20D4.7372.2349.0DFB	
	0879.914A.E820.BBF1	6B1A.43BD.C7C8.F1D5	
	0000.0000.9367.6641	0000.0000.707E.0117	
	0000.0000.4486.EE18	0000.0000.5AF4.9B91	
	0000.0000.4486.EE18	0000.0000.354A.32F1	
	0000.0000.2244.331C	0000.0000.00E4.231B	
	0000.0000.2244.331C	0000.0000.8F26.C78C	
	0000.0000.2244.331C	0000.0000.BE45.0762	
	0000.0000.2244.331C	0000.0000.38D2.DDE6	
Operating system	16.53 (First release)		Real-time operating system
	1.55		
	2.57		
	4.60		
	6.62		
	9.66		
	9.68		
	10.70		
	14.74		
	17.77		
	17.78		
	19.81		
	20.82		
	21.83		
	1.1 (release 20160425)		-> Version with new hardware and new OS.
	1.1 (release 20180327)		
	1.1 (release 20190625)		
	2.0 3175		
	2.0 3186		
	2.0 3423		
	2.0 3753		
	2.0 4121		
	2.0 4616		

Description

Software part	Software version	Software checksum	Remarks
Liquid application [1]	1.0.5	9B8787B4C	
	1.0.6	BD3588EB1	
	1.0.6a	75D0D16D2	
	1.0.6b	9E9346FB7	
	1.0.6c	9E5FE73A3	
	1.0.7	820C4EEF6	
	1.1.0	73DB658CE	
	1.3.0	68E1D69EF	
	1.3.1	90B40510D	
	1.3.3	CEFAF4BBC	
	1.4.0	CEFAF4BBC	
	1.4.1	CE37D25F3	
	2.0.1	D8AE10682	
	2.0.2	EDD57D8F7	
	2.1.0	E21B13310	
	2.1.0.x	E21B13310	
	2.2.0.x	D5CF6C993	
	2.3.0.x	E48FE7BA4	
	2.3.1.x	E629A5DAF	
	3.0.0.x	12B497603A	
	3.0.0.x	12B8F70806	
	3.0.0.x	1C190AD587	
	3.1.0.x	11B78C6249	
	3.1.0.x	1D7F5633C8	
	3.1.0.x	30663BE481	
	5.0.0.x	128D4AADEC, 187280E671	

[1] Where 'x' and if applicable 'y' is related to metrologically non relevant part of the software and could be any number.

Remark: The version number and identification can be inspected on the local display by selecting display 'Metrological', 'Software version'.

1.2.3   Legal software functions:

1.2.3.1   Monitoring and protection of volume and / or mass impulse input from meters, from analog temperature inputs, from analog pressure, from analog density input and from digital inputs, for instance from HART devices.

1.2.3.2   Meter factor curve is available for a maximum of 16 different products. Each meter factor curve is coupled to a product. Selecting a product automatically selects the appertaining meter factor curve.

1.2.3.3   Registering of volume(s), mass and other measured values and parameters.
For each run and for both forward and reverse flow direction the calculating and indication device supports the following totalizers.

- cumulative accountable indicated (volume or mass depending on the meter type)
- cumulative accountable gross volume
- cumulative accountable gross standard volume
- cumulative accountable net standard volume
- cumulative accountable mass

1.2.3.4   The calculating and indicating device may be equipped with an application that allows connection of two temperature transmitters, for calculating and presenting the average value of the two measured temperature values (starting from application version 2.0.1).
In case the deviation between the temperature transmitters is larger than a preset value, the following options are available:

- The temperature indications of both transmitters are still used.
- The indication of temperature transmitter A is used.
- The indication of temperature transmitter B is used.
- The deviation is considered as a transmitter failure; depending of the fallback type setting the calculating and indicating device either shows the last good value or the keypad value or the fallback value.

The checks on that temperature transmitter value (not out of service, not defective, etc.) apply.
One of the transmitters can be manually taken out of service for calibration purposes. In that case the measured temperature of the other transmitter is used.

1.2.3.5   The calculating and indicating device may be equipped with an application that allows connection of two pressure transmitters, for calculating and presenting the average value of the two measured pressure values (starting from application version 2.0.1).
In case the deviation between the pressure transmitters is larger than a preset value, the following options are available:

- The pressure indications of both transmitters are still used.
- The indication of pressure transmitter A is used.
- The indication of pressure transmitter B is used.
- The deviation is considered as a transmitter failure; depending of the fallback type setting the calculating and indicating device either shows the last good value or the keypad value or the fallback value.

The checks on that pressure transmitter value (not out of service, not defective, etc.) apply.
One of the transmitters can be manually taken out of service for calibration purposes. In that case the measured pressure of the other transmitter is used.

1.2.3.6   In case no product density temperature transmitter is configured the measured product temperature at the meter is used as the product density temperature.
The meter density is assumed to be equal to the measured density.

1.2.3.7   In case no product density pressure transmitter is configured the measured product pressure at the meter is used as the product density pressure.
The meter density is assumed to be equal to the measured density.

1.2.3.8   Option to use pressure and temperature from a smart meter as meter pressure and temperature.

1.2.3.9   Option to disable totalizers of one meter when two meters are in serial configuration.

1.2.3.10 Check on communications.

1.2.3.11 The Weights and Measures part of the program that contains the test routines for memory, transmissions and calculation.

1.2.4   Conversions
The Flow X series can perform conversion calculations according to the following methods:
- API Manual of Petroleum Measurements Standards API-2540, Chapter 11.1; 1980 tables (ASTM D1250-80) tables 53A and/or 54A (crude oil), 53B and/or 54B (refined petroleum products), table 54C, table 53D and/or 54D (lube oils);
- API Manual of Petroleum Measurements Standards API MPMS, Chapter 11.1; 2004 tables (ASTM D1250-04) tables 53A and/or 54A (crude oil), 53B and/or 54B (refined petroleum products), table 54C, table 53D and/or 54D (lube oils);
- GPA-27 table 53E and/or 54E (light products);
- API MPMS 11.2.1M and 11.2.2M (pressure correction)
- OIML R22 (Alcohol, ethanol).
- ISO6578-2017 LNG density calculation using Klosek-McKinley formula.

1.3   Essential shapes
1.3.1 The name plate should bear at least the following information.
- the Evaluation certificate number: TC7570;
- trademark or name of the Producer;
- part number;
- serial number.

1.3.2 For non-interruptible applications an external uninterruptible power supply must be used.

1.3.3 Ethernet cable if connected to the instrument should be less than 10 metres long.

1.4   Conditional characteristics

For information on and the programming of the parameters see documentation 7570/11-15. The below mentioned parameters shall be set to the belonging values and in the secure mode "read only".

Menu	Parameter	Value
Common settings		
Configuration, Overall setup, Common settings	Atmospheric pressure	1)
	Base pressure	1)
	Density of water	1)
	Disable totals if meter is inactive	No
	MID compliance	Enabled
	Calculation out of range alarms	Enabled
Meter ticket		
Configuration, Overall setup, Meter ticket	'API 12.2.2 Measurement Tickets' compliance	1)
	API rounding	1)
	Calculation extrapolation allowed	1)
Metrological		
Configuration, Metrological	Minimum accountable batch size (volume)	1)
	Minimum accountable batch size (mass)	1)
	Minimum accountable flow rate	1)
	Maximum accountable flow rate	1)
	Minimum accountable temperature	1)
	Maximum accountable temperature	1)
	Minimum accountable pressure	1)
	Maximum accountable pressure	1)
	Equilibrium pressure accountable limit	1)
	Minimum accountable standard density	1)
	Maximum accountable standard density	1)
	Accountable alarm neutralization enabled	1) 3)
	Accountable alarm neutralization quantity	1) 3)
	Accountable alarm neutralization reset quantity	1) 3)
Products		
Configuration, Products (for each individual product; max. 16)	Name	1)
	Density conversion method	1)
	Standard density override value	1)
	Standard density override unit type	1)
	Densitometer correction factor	1)
	Equilibrium pressure method	1)
	Equilibrium pressure override	1)
	TP15 P100 correlation	1)
	Vapor pressure at 100F	1)
	Equilibrium pressure coefficients A,B,C	1)
	Compressibility F override enabled	1)
	Compressibility F override value	1)

Menu	Parameter	Value
Run setup		
Configuration, Run, Run setup	Meter device type	1)
	Observed density input type	1)
	Density temperature input type	1)
	Density pressure input type	1)
	Standard density input type	1)
	Single or dual meter temperature transmitter(s)	1)
	Single or dual meter pressure transmitter(s)	1)
Pulse input		
Configuration, Run, Flow meter, Pulse input (if applicable)	Type of pulse input (single or dual pulse)	1)
	Pulse input quantity type	1)
	Dual pulse fidelity level	1)
	Meter active threshold frequency	1)
Smart meter		
Configuration, Run, Flow meter, Smart meter (if applicable)	Smart meter input type	1)
	Smart meter internal device number	1)
	Use flow rate or total	1)
	Pulse is primary	1)
	Fallback to secondary flow signal	1)
	Meter active threshold flow rate	1)
Meter K-factor		
Configuration, Run, Flow meter, Meter K-factor (if applicable)	K-factor curve enabled	1)
	Curve extrapolation allowed	1)
	Fwd nominal K-factor	1)
	Rev nominal K-factor	1)
	Fwd K-factor curve (max. 12 points)	1)
	Rev K-factor curve (max. 12 points)	1)
Meter factor		
Configuration, Run, Flow meter, Meter factor	Type of input value (meter factor or meter error)	1)
	Meter factor / error curve enabled	1)
	Curve extrapolation allowed	1)
for each product (max. 16 products):	Fwd MF / error	1)
	Rev MF / error	1)
	Fwd meter factor curve (max. 12 points)	1)
	Rev meter factor / error curve (max. 12 points)	1)
Data valid input		
Configuration, Run, Flow meter, Data valid input	Data valid input type	1)
	Data valid digital input module	1)
	Data valid digital input channel	1)
Meter body correction		
Configuration, Run, Flow meter, Meter body correction (if applicable)	Meter body correction enabled	1)
	Body corr reference temperature	1)
	Body corr reference pressure	1)
	Cubical temperature expansion coefficient	1)
	Cubical pressure expansion coefficient	1)

Description

Menu	Parameter	Value
Viscosity correction		
Configuration, Run, Flow meter, Viscosity correction (if applicable)	Viscosity correction enabled	1)
	Viscosity correction type	1)
	Coefficients for the applicable viscosity correction calculation method	1)
Temperature		
Configuration, Run / Station, Temperature (for each individual temperature transmitter)	Temperature input type	1)
	Analog / PT100 input module	1)
	Analog / PT100 input channel	1)
	HART internal device number	1)
	HART variable	1)
	HART to analog fallback	1)
	Fallback type	1)
	Fallback value	1)
	Dual transmitter mode	1)
	Dual transmitter deviation limit	1)
	Dual transmitter deviation fallback mode	1)
Pressure		
Configuration, Run / Station, Pressure (for each individual pressure transmitter)	Pressure input type	1)
	Pressure input units (gauge or absolute)	1)
	Analog input module	1)
	Analog input channel	1)
	HART internal device number	1)
	HART variable	1)
	HART to analog fallback	1)
	Fallback type	1)
	Fallback value	1)
	Dual transmitter mode	1)
	Dual transmitter deviation limit	1)
	Dual transmitter deviation fallback mode	1)
Observed density		
Configuration, Run / Station, Density, Observed density (if applicable)	Observed density input type	1)
	Observed density input unit type	1)
	Analog input module	1)
	Analog input channel	1)
	HART internal device number	1)
	HART variable	1)
	HART to analog fallback	1)
	Fallback type	1)
	Fallback value	1)
	High fail limit	1)
	Low fail limit	1)
	Failure delay	Default: 0 sec.

Menu	Parameter	Value
Standard density		
Configuration, Run / Station, Density, Standard density	Standard density input type	1)
	Standard density input unit type	1)
	Analog input module	1)
	Analog input channel	1)
	HART internal device number	1)
	HART variable	1)
	HART to analog fallback	1)
	Fallback type	1)
	Fallback value	1)
	High fail limit	1)
	Low fail limit	1)
Densitometer setup		
Configuration, Run / Station, Density, Densitometer setup (if applicable; for each individual densitometer)	Densitometer type	1)
	Time period input module	1)
	Time period input number	1)
	Time period averaging	Default: disabled
	Use product density correction factor	1)
	Densitometer nominal DCF	1)
Densitometer constants		
Configuration, Run / Station, Density, Densitometer constants (if applicable; for each individual densitometer)	Densitometer constants as given on the appertaining calibration certificate (Solartron / Sarasota / UGC / Anton Paar)	1)
BS&W		
Configuration, Run / Station, BS&W (if applicable)	BS&W input type	1)
	Analog input module	1)
	Analog input channel	1)
	HART internal device number	1)
	HART variable	1)
	HART to analog fallback	1)
	Fallback type	1)
	Fallback value	1)
Viscosity		
Configuration, Run / Station, Viscosity (if applicable)	Viscosity input type	1)
	Analog input module	1)
	Analog input channel	1)
	HART internal device number	1)
	HART variable	1)
	HART to analog fallback	1)
	Fallback type	1)
	Fallback value	1)

Menu	Parameter	Value
Analog inputs		
IO, Module, Configuration, Analog inputs (for each individual analog input)	Input type	1)
	Averaging method	1)
	Full scale	1)
	Zero scale	1)
	Unit type	1) 2)
	Unit	1) 2)
	High fail limit	1)
	Low fail limit	1)
PT100 inputs		
IO, Module, Configuration, PT100 inputs (for each individual PT100 input)	Input type	1)
	High fail limit	1)
	Low fail limit	1)
Pulse input		
IO, Module, Configuration, Pulse input	Pulse input A channel	1)
	Pulse input B channel	1)
	Dual pulse fidelity level	1)
	Fall back to secondary pulse	1)
	Error pulses limit	1)
	Good pulses reset limit	1)
	Error rate limit	1)
	Dual pulse fidelity threshold	1)
Time period inputs		
IO, Module, Configuration, Time period inputs (for each individual time period input)	Time period input channel	1)
Calibration		
IO, Module, Calibration, Analog inputs	Selected analog input	None
	Freeze all analog and PT100 inputs	Disabled
IO, Module, Calibration, PT100 inputs	Selected PT100 input	None
	Freeze all analog and PT100 inputs	Disabled
Calibration, HART inputs	HART freeze mode	Off
	HART value offsets	Correct values

Menu	Parameter	Value
Forces		
IO, Module, Force IO, Analog inputs (for each individual analog input)	Force mode	Disabled
IO, Module, Force IO, PT100 inputs (for each individual PT100 input)	Force mode	Disabled
IO, Module, Force IO, Digital IO (for each individual digital IO)	Force mode	Normal
IO, Module, Force IO, Pulse input	Force mode	Disabled
IO, Module, Force IO, Time period inputs (for each individual time period input)	Force mode	Disabled
Communication, HART transmitters (for each individual HART transmitter)	Force mode	Disabled
Communication, flow meter	Force mode	Disabled
Maintenance mode		
Maintenance mode	Maintenance mode	Disabled

1) These values should be specified and motivated by the Producer or the owner of the flow computer. Prior to Weights & Measures verification a list with the parameters settings and a motivation of these setting should be present at the flow computer location.
2) Applicable from firmware revision 5.0.0.x.
3) Neutralization

Neutralization enable / disable	If neutralization is enabled, flow range, temperature range, pressure range and standard density range accountable alarms are delayed until a neutralization quantity is reached. If neutralization is enabled, each time an accountable defect appears a neutralization counter (indicated volume or mass depending on meter quantity type) is started. The accountable totalizers are running, until the counter reaches the neutralization quantity, the accountable alarm is set, and the non accountable totalizers start running. When there is no more pending defect, the non-accountable totalizers stop running and the accountable totalizers start running again. The neutralization counter is reset after the neutralization reset quantity is reached without any accountable alarm.
Neutralization counter	Setting depends on the minimum measured quantity of the liquid measuring installation.

1.5   Non-essential characteristics

1.5.1 Output lines (only for version 2 products)
- impulse outputs
- 4 … 20 mA output

1.5.2 Totalizer information

Additional to the totalizers that are specified in paragraph 1.2.3.3, the following totalizers are available. These totalizers are not intended for Weights and Measures use.
For the station:
- cumulative accountable gross volume
- cumulative accountable gross standard volume
- cumulative accountable net standard volume
- cumulative accountable mass

Furthermore, for station, run 1, run 2, run 3 and run 4, and for both forward and reverse flow direction the calculation and indication device supports the following totalizers:
- cumulative non-accountable indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- cumulative non-accountable gross volume
- cumulative non-accountable gross standard volume
- cumulative non-accountable net standard volume
- cumulative non-accountable mass
- cumulative indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- cumulative gross volume
- cumulative gross standard volume
- cumulative net standard volume
- cumulative mass
- cumulative number of impulses (does not apply to station totalizers)
- cumulative number of error impulses (does not apply to station totalizers)
- current [xxx] indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- current [xxx] gross volume
- current [xxx] gross standard volume
- current [xxx] net standard volume
- current [xxx] mass
- current [xxx] number of impulses (does not apply to station totalizers)
- current [xxx] number of error impulses (does not apply to station totalizers)
- current [xxx] accountable indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- current [xxx] accountable gross volume
- current [xxx] accountable gross standard volume
- current [xxx] accountable net standard volume
- current [xxx] accountable mass
- current [xxx] non accountable indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- current [xxx] non accountable gross volume
- current [xxx] non accountable gross standard volume
- current [xxx] non accountable net standard volume

- current [xxx] non accountable mass
- previous [xxx] indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- previous [xxx] gross volume
- previous [xxx] gross standard volume
- previous [xxx] net standard volume
- previous [xxx] mass
- previous [xxx] number of impulses (does not apply to station totalizers)
- previous [xxx] number of error impulses (does not apply to station totalizers)
- previous [xxx] accountable indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- previous [xxx] accountable gross volume
- previous [xxx] accountable gross standard volume
- previous [xxx] accountable net standard volume
- previous [xxx] accountable mass
- previous [xxx] non accountable indicated (volume or mass depending on the meter type; does not apply to station totalizers)
- previous [xxx] non accountable gross volume
- previous [xxx] non accountable gross standard volume
- previous [xxx] non accountable net standard volume
- previous [xxx] non accountable mass

With [xxx] either 'batch', 'batch open', 'hour', 'hour open', 'day', 'day open', 'period A', 'period An open', 'period B' or 'period B open'

"Current" totalizers register during the batch or during the applicable time period. At the start of the batch or applicable time period, the respective "current" totalizer values are zero.
"Previous" totalizers show the totals of the previous batch or previous applicable time period.
Totalizers indicated with the word "open" show the value of the cumulative totalizers at the start of the batch or applicable time period.
Finally, cumulative and current batch open gross volume totalizers per product are available for run 1, run 2, run 3, run 4 and station.

2. Seals

The following items of are sealed:
- Each Flow-X/M flow module must be locked by operating the tampering switch (push button) and the tampering switch must be sealed if the access to the tamper switch is not protected by a sealed bar;

- All enclosures have the option of locking the flow computer with a seal by an authorized body, to prevent access to the tamper switch of the individual modules (see above). In a Flow-X/P (Panel) and a Flow-X/R, one bar is used to seal all installed modules with one seal;
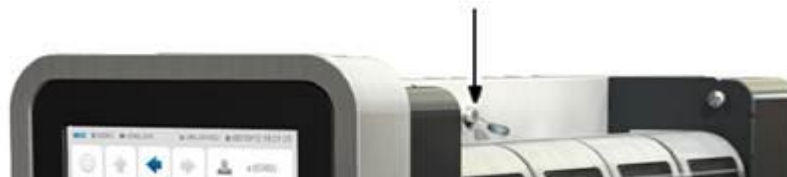
- Removal without destroying the nameplate shall not be possible; otherwise, the nameplate shall be sealed to the housing.

Remark: If the tamper switch is unlocked while MID compliance is enabled an alarm is raised.

3. Conditions for conformity assessment

-The electronic calculating and indicating device must be constructed in accordance with this Evaluation Certificate and the appertaining documentation.

-Other parties may use this Evaluation Certificate only with the written permission of the Producers.

4. Reports

An overview of the performed tests is given in Evaluation Report ER7570 issued together with this Evaluation Certificate.