

1 EU-TYPE EXAMINATION CERTIFICATE



2 **Equipment or Protective systems intended for use in Potentially
Explosive Atmospheres - Directive 2014/34/EU**

3 **EU-Type Examination Certificate No: FM17ATEX0018X**

4 **Equipment or protective system: Pro V Vortex Models M22, M23, M24 and Pro T Turbine
(Type Reference and Name) Mass Flowmeters**

5 **Name of Applicant: Azbil VorTek LLC**

6 **Address of Applicant: 8475 W I-25 Frontage Rd, Suite 300
Longmont CO 80504 United States**

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8 FM Approvals Ltd, notified body number 1725 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3061361 dated 2nd February 2018

9 Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN60079-0:2012 +A11:2013, EN60079-1:2014, EN60079-31:2014 and EN60529:1991 +A2:2013

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11 This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12 The marking of the equipment or protective system shall include:



Pro T and Pro V (ST Versions)
II 2 G Ex db IIB+H2 T6...T2 Gb
II 2 D Ex tb IIIB T85°C Db
IP66
-40°C ≤ Tamb ≤ 60°C

Pro- V (HT Versions)
II 2 G Ex db IIB+H2 85°C...405°C Gb
II 2 D Ex tb IIIB T85°C Db
IP66
-40°C ≤ Tamb ≤ 60°C

Pro- T (HT Versions)
II 2 G Ex db IIB+H2 85°C...459°C Gb
II 2 D Ex tb IIIB T85°C Db
IP66
-40°C ≤ Tamb ≤ 60°C

**Mick Gower
Certification Manager, FM Approvals Ltd.**

Issue date: 22nd February 2018

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13 Description of Equipment or Protective System:

General – The Model Pro-T Multivariable Mass Turbine Flowmeters measure the flow of liquid, gas or steam by detecting the frequency of rotation of the turbine blades. The turbine blades are mounted external to the insertion probe tip. The frequency at which the turbine rotates is directly proportional to the flow velocity. Flow is measured by detecting the local velocity at a strategically location position within the process pipe. The Model Pro-T detects the turbine blade frequency within the sensor head and uses the local velocity, along with other parameters such as fluid type, pipe size and Reynolds number to calculate the average pipe velocity, and consequently, the volumetric flowrate.

Vortek Instrument's Pro-V™ Multivariable Mass Vortex Flowmeters Models M22, M23, and M24 utilize three primary sensing elements (a vortex shedding velocity sensor, an RTD temperature sensor and a solid-state pressure transducer) to measure the mass flow rate of gases, liquids and steam. The meters are available for in-line (Model M22) and Insertion (M23) applications. The M22 and M24 in-line meter can be configured for pipe sizes from ½ inch to 12 inches while the M23 insertion meter can be installed in any pipe two inches in diameter or greater. The M22 and M24 in-line meter incorporates a new split adapter design which allows the pressure transducer to be field serviceable. In addition, the Pro-V™ flowmeter enclosure incorporates a new method of securing the window in the windowed cover.

Construction – The construction of the Model Pro-T Multivariable Mass Turbine Flowmeters is identical in construction to the Pro-V™ Multivariable Mass Vortex Flowmeters Models M22, M23, and M24 with the exception of the welded insertion probe end section and the minor electronics changes. The Model Pro-T Multivariable Mass Turbine Flowmeters utilize the same power supply section and maintain the same electrical ratings as the Pro-V™ Multivariable Mass Vortex Flowmeters Models M22, M23 and M24. All other aspects of the design remain the same. The Pro-V™ flowmeter enclosure is a cylindrical shaped housing constructed of aluminium with a powder coat finish. Each end of the enclosure is closed via threaded covers (blank or windowed). The enclosure is provided with two ¾ inch-14 NPT entries. The joint between the meter body enclosure and process connection adapter is threaded. O-rings are provided on the threaded covers, in-line split adapter, and insertion adapter for environmental protection.

Ratings – The Model Pro-T Multivariable Mass Turbine Flowmeters operate from 12-36 VDC or 100-240 VAC. The flowmeters can provide any combination of outputs consisting of 4-20 mA, HART, Modbus or Pulse. The transmitters are rated for use in an ambient temperature range of -40°C to +60°C. The Model Pro-T Multivariable Mass Turbine Flowmeters are rated for use in a process temperature range of -40°C to +238°C with a high temperature option (HT) for process temperatures -40°C to +454°C.

The Pro-V™ Multivariable Mass Vortex Flowmeters Model M22, M23, and M24 operate from 12-36 VDC or 100-240 VAC, 4-20 ma. The Pro-V™ Multivariable Mass Vortex Flowmeters Models M22, M23, and M24 are for use in process temperatures of -40°C to 260°C with a high temperature option (HT) for process temperatures -40°C to +400°C.

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PRO-Tabcdefghij. Insertion TurboPro™ Multivariable Mass Turbine Flowmeter.

- a = Multivariable options V, VT, VTP, VTEP, VETEP, VT-EM, VTP-EM, VTEP-EM or VETEP-EM.
- b = Probe length SL, CL or EL.
- c = Electronics enclosure L or R (*). *Specify cable length.
- d = Display options DD or ND.
- e = Input power DCL, DCH or AC.
- f = Output 1AB, 1AHL, 1AH, 1AM, 3AB, 3AH or 3AM.
- g = Temperature options ST or HT.
- h = Pressure options P0, P1, P2, P3, P4 or P5.
- i = Process connections CNPT, C150, C16, C300, C40, C600, C64, PNPT, P150, P16, P300, P40, PNPTR, P150R, P16R, P300R, P40R, P600R, or P64R.
- j = Rotor options R40, R30, R25, R20, R15, R10 or L40.

M22abcdefghij. In-Line Pro-V™ Multivariable Mass Vortex Flowmeter.

- a = Multivariable options V, VT, VTP, VTEP, VETEP, VT-EM, VTP-EM, VTEP-EM or VETEP-EM.
- b = Flow body 04, 06, 08, 12, 16, 24, 32, 48, 64, 80 or 96.
- c = Meter body material C, S or H.
- d = Process connection 150, 300, 600, W, 16, 40, 64 or 100.
- e = Electronics enclosure L or R (*). *Specify cable length
- f = Display options DD or ND.
- g = Input power DCL, DCH or AC.
- h = Output 1AB, 1AH, 1AHL, 1AM, 3AB, 3AH or 3AM.
- i = Process ST or HT.
- j = Process pressure P0, P1, P2, P3, P4 or P5.

M23abcdefghi. Insertion Pro-V™ Multivariable Mass Vortex Flowmeter.

- a = Multivariable options V, VT, VTP, VTEP, VETEP, VT-EM, VTP-EM, VTEP-EM or VETEP-EM.
- b = Probe length SL, CL or EL.
- c = Electronics enclosure L or R (*). *Specify cable length
- d = Display options DD or ND.
- e = Input power DCL, DCH or AC.
- f = Output signal 1AB, 1AH, 1AHL, 1AM, 3AB, 3AH or 3AM.
- g = Temperature options ST or HT.
- h = Pressure options P0, P1, P2, P3, P4 or P5.
- i = Process connections CNPT, C150, C16, C300, C40, C600, C64, PNPT, P150, P16, P300, P40, PNPTR, P150R, P16R, P300R, P40R, P600R, or P64R.

M24abcdefghij. In-Line Pro-V™ Multivariable Mass Vortex Flowmeter.

- a = Multivariable options V, VT, VTP, VTEP, VETEP, VT-EM, VTP-EM, VTEP-EM or VETEP-EM.
- b = Flow body 04, 06, 08, 12, 16, 24, 32, 48, 64, 80 or 96.
- c = Meter body material C, S or H.
- d = Process connection 150, 300, 600, W, 16, 40, 64 or 100.
- e = Electronics enclosure L or R (*). *Specify cable length
- f = Display options DD or ND.
- g = Input power DCL, DCH or AC.
- h = Output 1AB, 1AH, 1AHL, 1AM, 3AB, 3AH or 3AM.
- i = Process ST or HT.
- j = Process pressure P0, P1, P2, P3, P4 or P5.

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14 Specific Conditions of Use:

1. Contact Manufacturer regarding flamepath information.
2. Clean with a Damp cloth only to avoid build-up of electrostatic charge.
3. The Model Pro-T Multivariable Mass Turbine Flowmeters standard temperature option (ST) process temperature range is -40°C to +238°C. The high temperature option (HT) process temperatures range is -40°C to +454°C.

The Model Pro-T Multivariable Mass Turbine Flowmeters		
Tmax (Process)	Temperature Class Value (Gas)	
	ST Version	HT Version
80°C	T6	85°C
95°C	T5	100°C
130°C	T4	135°C
195°C	T3	200°C
238°C	T2	300°C
445°C	N / A	450°C
454°C	N / A	459°C

4. The Pro-V™ Multivariable Mass Vortex Flowmeters Model M22, M23, and M24 standard temperature option (ST) process temperature range is -40°C to 260°C. The high temperature option (HT) process temperature range is -40°C up to +400°C.

Model M22, M23, M24 and Pro-V™ Multivariable Mass Vortex Flowmeters		
Tmax (Process)	Temperature Class Value (Gas)	
	ST Version	HT Version
80°C	T6	85°C
95°C	T5	100°C
130°C	T4	135°C
195°C	T3	200°C
260°C	T2	300°C
400°C	N / A	405°C

15 Essential Health and Safety Requirements:

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

16 Test and Assessment Procedure and Conditions:

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Ltd's ATEX Certification Scheme.

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17 **Schedule Drawings**

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
22 nd February 2018	Original Issue.



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Blueprint Report

Vortek Instruments LLC (100007881)

Class No 3615

Original Project I.D. 3061361

Certificate I.D. FM17ATEX0018X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
9705123	D	PRESSURE TUBE(INsertION)	3061361	Yes (pdf)
1108032	D	Vortek Approvals Label	3061361	Yes (pdf)
1110037	C	Model Code Label	3061361	Yes (pdf)
1110038	A	WARNINGS - DO NOT OPEN / CLEAN WITH A DAMP CLOTH (ENGLISH / FRENCH)	3061361	Yes (pdf)
1302006	D	INLINE SADDLE (STD. LINE SIZES)	3061361	Yes (pdf)
200052	A	3/4"NPT EXTERNAL / STOPPING PLUG, FM / ATEX / IECEX CERTIFIED	3061361	Yes (pdf)
2004112	E	THERMAL WELL, INLINE, STD. SIZES (1/2" - 12")	3061361	Yes (pdf)
2004147	C	PRESSURE TUBE (INLINE)	3061361	Yes (pdf)
2203107	H	SPLIT SADDLE / ENCLORURE ADAPTOR - BOTTOM SECT.	3061361	Yes (pdf)
2203108	H	SPLIT SADDLE / ENCL. ADAPTOR - BOTTOM SECTION	3061361	Yes (pdf)
2504112	E	LABEL, TERMINAL BOARD, LOW POWER	3061361	Yes (pdf)
2507115	C	LABEL, TERMINAL BOARD, DC HIGH POWER	3061361	Yes (pdf)
2507116	E	LABEL, TERMINAL BOARD, AC	3061361	Yes (pdf)
2611112	L	FLAMEPATH, INLINE AND INSERTION	3061361	Yes (pdf)
2707114	D	FM PRIVATE LABELER	3061361	Yes (pdf)
9600139	F	STEM/CONDUIT ADAPTER	3061361	Yes (pdf)
9600140	C	ALIGNMENT HANDLE	3061361	Yes (pdf)
9704110	F	STEM / ENCLOSURE ADAPTER	3061361	Yes (pdf)
9705129	C	PTX HOUSING\ENCLOSURE ADAPTER	3061361	Yes (pdf)
9705129	C	PTX HOUSING\ENCLOSURE ADAPTER	3061361	Yes (pdf)
9705130	D	PTX ADAPTER	3061361	Yes (pdf)
9705143	I	PTX HOUSING (STD) INSERTION	3061361	Yes (pdf)
9705145	D	3/4X1/2 MALE X MALE NPT REDUCER MODIFICATION	3061361	Yes (pdf)
9903112	E	INSERTION / RT SADDLE	3061361	Yes (pdf)
9903113	E	V-TAB	3061361	Yes (pdf)
9903114	D	241 RT STEM / SADDLE ADAPTOR	3061361	Yes (pdf)
9903115	E	STEM, INSERTION	3061361	Yes (pdf)
9903118	H	PTX Filter (flame arrestor)	3061361	Yes (pdf)
9904134	O	ENCLOSURE BODY	3061361	Yes (pdf)
9904135	M	BLIND CAP	3061361	Yes (pdf)
9904136	Q	WINDOW CAP	3061361	Yes (pdf)
9904137	I	GLASS, DISPLAY	3061361	Yes (pdf)
9906172	L	WINDOW CAP, ASSEMBLY	3061361	Yes (pdf)
9906173	E	RETAINING RING, CAST ENCLOSURE	3061361	Yes (pdf)
M-000-00010	2/2018	Instruction Manual	3061361	Yes (pdf)
M-000-00020	2/2018	Instruction Manual	3061361	Yes (pdf)