

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:** FM19ATEX0203X

4 **Equipment or protective system:
(Type Reference and Name)** Thermatel TD1 Thermal Dispersion Switch with Thermal
probe and Thermatel TD2 Thermal Dispersion Switch
with or without Thermal probe.

5 **Name of Applicant:** Magnetrol International Inc.

6 **Address of Applicant:** 705 Enterprise St
Aurora IL 60504
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 Europe Ltd, notified body number 2809 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:

PR452809 dated 04th August 2020

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:

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012,
EN 60079-26:2015 and EN 60529:1990+A1:2000+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:

Digitally signed
by Richard
Zammitt
Location: IE
Foxit
PhantomPDF
Version: 9.7.2



Richard Zammitt
Certification Manager, FM Approvals Europe Ltd.

Issue date: 05th August 2020

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FM Approvals Europe Limited, One Georges Quay Plaza, Dublin, Ireland. D02 E440
T: +353 (0) 1761 4200 E-mail: atex@fmapprovals.com www.fmapprovals.com

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Depending on the version, TD1, TD2 Thermal Dispersion Switch / Probe shall include the markings as listed below:

TD1-2D00-0Cb. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe.

TD2-cd0e-fCh. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe.

II 1/2 G Ex db + ib / db IIC T5...T4 Ga/Gb

-40°C ≤ Ta +70°C

TD2-cd0e-fCh. Thermal Dispersion Switch.

II 2(1) G Ex db [ib] IIC T4 Gb

-40°C ≤ Ta +70°C

TD1-2D00-0Gb. Integral Thermal Dispersion Switch with Tjk-Dnpr-stu. Thermal Probe.

TD2-cH0e-fGh. Integral Thermal Dispersion Switch with Tjk-Dnpr-stu. Thermal Probe.

II 1/2 G Ex db IIC T5...T4 Ga/Gb

-40°C ≤ Ta +70°C

TD1-2D00-0Gb. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe.

TD2-cd0e-fGh. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe.

II 2 G Ex db IIC T5...T4 Gb

-40°C ≤ Ta +70°C

Tjk-mnpr-stu. Thermal Probe.

II 1/2 G Ex db + ib IIC T5...T4 Ga/Gb

II 2 G Ex db IIC T5 ...T4 Gb

-40°C ≤ Ta +70°C

Tjk-Dnpr-stu. Thermal Probe

II 1/2 G Ex db IIC T5 ...T4 Ga/Gb

II 2 G Ex db IIC T5 ...T4 Gb

-40°C ≤ Ta +70°C

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13 Description of Equipment or Protective System:

General: Thermatel TD1/TD2 can easily be adjusted to detect flow (gases and liquids), level or liquid-liquid interface. The TD1 is a 24Vdc line powered unit with integral electronics and a built-in DPDT relay. The TD2 is either Vdc or Vac line powered, has integral or remote electronics and offers additionally LED indication, time delay and mA output for diagnostics and trending.

The sensor consists of two RTD (Resistance Temperature Detector) elements. One is the reference and the second is heated to a temperature above the process temperature. The electronics detect the temperature difference between the two elements. The temperature difference is greatest in air, then decreases when cooling occurs due to a change in media. An increase in the flow rate further decreases the temperature difference. The set point is adjusted for the switch to alarm at the desired temperature difference. Once the set point is reached, the relay will change state.

The control electronics are mounted in a flameproof enclosure (aluminium alloy or stainless steel) and can include intrinsically safe signal circuits for the probe. In this case the probe uses two independent types of protection in order to achieve EPL Ga (flameproof enclosure + intrinsically safe protection type "ib"), in another case the probe contains a mechanical separation element as part of the equipment to seal off the electrical circuits of the equipment from the zone 0 area in order to achieve EPL Ga. The third probe version only uses the flameproof enclosure for EPL Gb. The probe can be fixed directly on the bushing or via an extension tube. The heat extension tube of the probe reduces the temperature of the process towards the electronics to a max 5°C increase. The device can be made with integrated electronics or remote electronic (TD2 only). In the case of the remote version two flameproof enclosures are used, one of them contains the control electronics while the other contains only a terminal block and is connected to the probe.

The equipment enclosures have an ingress protection rating of IP66.

The ambient temperature range of the apparatus is $-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$ with a temperature classification of T5...T4 depending on the maximum operating voltage. The Thermal Probe has an ambient temperature range of $-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$ with a temperature classification of T4.

Electrical Ratings:

The TD1 Transmitter shall be connected to a safety extra low-voltage circuit (SELV) with a $U_m \leq 28.8 \text{ V}$.

Power: TD1: 28.8 Vdc, 3.5 W at 24 Vdc;

TD2: 19.2 – 28.8 Vdc, 4 W, or 100 – 264 Vac, 50-60 Hz, 5 W

Signal Output: TD1: 8 A DPDT relay @ 30 Vdc

TD2: 8 A DPDT relay @ 30 Vdc/250 Vac or

1 A DPDT relay @ 28 Vdc and

4 – 20 mA (not for all models)

The equipment model codes are display as follows:

TD1-2D00-0Cb. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

b = Enclosure type/connection 0 or 1,

j = Measurement system E or M.

k = Sensor tip style A, B, C, D, H, L or M.

m = Material A, D, K, M, N, B, F, C or G.

n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.

p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.

r = Sensitivity 0 or 1.

stu = Probe Length (3 digits) up to 130 inch or 330 cm.

TD2-cd0e-fCh. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

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c = Power 7 or 8.
d = Relay Output D or H.
e = Enclosure Cover 0 or 1.
f = Location 0 or 1.
h = Enclosure type/connection 0, 1, 2, 3.
j = Measurement system E or M.
k = Sensor tip style A, B, C, D, H, L or M.
m = Material A, D, K, M, N, B, F, C or G.
n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.
p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.
r = Sensitivity 0 or 1.
stu = Probe Length (3 digits) up to 130 inch or 330 cm.

TD2-cd0e-fCh. Thermal Dispersion Switch

c = Power 7 or 8.
d = Relay Output D or H.
e = Enclosure Cover 0 or 1.
f = Location 0 or 1.
h = Enclosure type/connection 0, 1, 2, 3.

TD1-2D00-0Gb. Integral Thermal Dispersion Switch with Tjk-Dnpr-stu. Thermal Probe

b = Enclosure type/connection 0 or 1
j = Measurement system E or M.
k = Sensor tip style C or D.
n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.
p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.
r = Sensitivity 0 or 1.
stu = Probe Length (3 digits) up to 130 inch or 330 cm.

TD2-ch0e-fGh. Integral Thermal Dispersion Switch with Tjk-Dnpr-stu. Thermal Probe

c = Power 7 or 8.
e = Enclosure Cover 0 or 1.
f = Location 0 or 1.
h = Enclosure type/connection 0, 1, 2, 3
j = Measurement system E or M.
k = Sensor tip style C or D.
n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.
p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.
r = Sensitivity 0 or 1.
stu = Probe Length (3 digits) up to 130 inch or 330 cm.

TD1-2D00-0Gb. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

b = Enclosure type/connection 0 or 1
j = Measurement system E or M.
k = Sensor tip style A, B, C, D, H, L or M.
m = Material A, D, K, M, N, B, F, C or G.
n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.
p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.
r = Sensitivity 0 or 1.
stu = Probe Length (3 digits) up to 130 inch or 330 cm.

TD2-cd0e-fGh. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

c = Power 7 or 8.

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d = Relay Output D or H.

e = Enclosure Cover 0 or 1.

f = Location 0 or 1.

h = Enclosure type/connection 0, 1, 2, 3.

j = Measurement system E or M.

k = Sensor tip style A, B, C, D, H, L or M.

m = Material A, D, K, M, N, B, F, C or G.

n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.

p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.

r = Sensitivity 0 or 1.

stu = Probe Length (3 digits) up to 130 inch or 330 cm.

Tjk-mnpr-stu. Thermal Probe

j = Measurement system E or M.

k = Sensor tip style A, B, C, D, H, L or M.

m = Material A, D, K, M, N, B, F, C or G.

n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.

p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.

r = Sensitivity 0 or 1.

stu = Probe Length (3 digits) up to 130 inch or 330 cm.

Tjk-Dnpr-stu. Thermal Probe

j = Measurement system E or M.

k = Sensor tip style A, B, C, D, H, L or M.

n = Process connector size 0, 1, 2, 3, 4, B, C, D, T or V.

p = Process connection type 0, 1, 2, 3, 4, 5, 7, 8, A, B, C, D, E, G, J, N, P, S, T or V.

r = Sensitivity 0 or 1.

stu = Probe Length (3 digits) up to 130 inch or 330 cm.

14 **Specific Conditions of Use:**

TD1-2D00-0Cb. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

TD2-cd0e-fCh. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

TD2-cd0e-fCh. Thermal Dispersion Switch

TD1-2D00-0Gb. Integral Thermal Dispersion Switch with Tjk-Dnpr-stu. Thermal Probe

TD2-cH0e-fGh. Integral Thermal Dispersion Switch with Tjk-Dnpr-stu. Thermal Probe

TD1-2D00-0Gb. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

TD2-cd0e-fGh. Integral Thermal Dispersion Switch with Tjk-mnpr-stu. Thermal Probe

1. The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction.
2. To maintain the T5 to T4 temperature code care shall be taken to ensure the "Enclosure Temperature" does not exceed 70°C
3. The risk of electrostatic discharge shall be minimized at installation, following the direction given in the instructions.
4. Contact the original manufacturer for information in the dimensions of flameproof joints.
5. For Installation with ambient temperature of 70°C, refer to the manufacturer's instructions for guidance on proper selection of conductors.
6. The TD1 Transmitter shall be connected to a safety extra low-voltage circuit (SELV) with a $U_m \leq 28.8$ V.

Tjk-mnpr-stu. Thermal Probe

Tjk-Dnpr-stu. Thermal Probe

1. The Thermal Probe is only for use with the TD1 and TD2 Thermal Dispersion Switch.
2. To maintain the T5 to T4 temperature code care shall be taken to ensure the "Enclosure

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Temperature" does not exceed 70°C

3. The risk of electrostatic discharge shall be minimized at installation, following the direction given in the instructions.
4. Contact the original manufacturer for information in the dimensions of flameproof joints.

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 Europe 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 Europe Ltd's ATEX Certification Scheme.

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. The documents are maintained under project number 3022611.

18 **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
05 th August 2020	Original Issue.

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Blueprint Report

Magnetrol International Inc (1000000020)

Class No 3615

Original Project I.D. 3022611

Certificate I.D. FM19ATEX203X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
009-9305	L	ARTWORK THERMATEL TD2 POWER PC Board	PR452809
009-9306	K	ARTWORK THERMATEL TD2 LOGIC PC Board	PR452809
009-9308	D	ARTWORK THERMATEL TD1 POWER PC Board	PR452809
009-9309	G	ARTWORK THERMATEL TD1 POWER PC Board	PR452809
009-9326	B	ARTWORK THERMATEL TD2 (ZONE 0) POWER PCB	PR452809
009-9332	B	ARTWORK THERMATEL TD2 HERMETIC POWER PCB	PR452809
030-3580	A	THERMATEL TD2 POWER PC Board ASSY. 4 pages	PR452809
030-3581	P	THERMATEL TD2 LOGIC PC Board ASSY. 1 page	PR452809
030-3583	G	THERMATEL TD1 POWER PC Board ASSY. 1 pages	PR452809
030-3584	K	THERMATEL TD1 LOGIC PC Board ASSY. 1 pages	PR452809
030-3596	P	THERMATEL TD2 (ZONE 0) POWER PCB ASSY. 2 pages	PR452809
094-5038	P	Schematic THERMATEL TD2 POWER PC Board 2 pages	PR452809
094-5039	F	Schematic THERMATEL TD2 LOGIC PC Board 2 pages	PR452809
094-5040	B	Schematic THERMATEL TD1 POWER PC Board 1 page	PR452809
094-5041	E	Schematic THERMATEL TD1 LOGIC PC Board 2 pages	PR452809
094-5055	C	Schematic THERMATEL TD2 (ZONE 0) POWER PCB 2 pages	PR452809
099-6524	R	TD1 & TD2 THERMATEL FLOW SWITCH	PR452809
54-610.12	July 2020	Installation and Operating Manual	PR452809