

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:** FM15ATEX0054X

4 **Equipment or protective system:
(Type Reference and Name)** Series 100, 200 and 300 Connection Head and Assemblies
Connection Head with Spring Loaded or Immersion
Temperature Assemblies

5 **Name of Applicant:** Burns Engineering Inc

6 **Address of Applicant:** 10201 Bren Rd E
Minnetonka MN 55343
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:

3051889 dated 11th January 2017

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 60079-0: 2012 + A11: 2013; EN60079-1: 2014; EN 60079-31: 2014;
EN 60529: 1991 + 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:



II 2 G Ex db IIC 80°C...140°C Gb; Ta*; IP66

II 2 D Ex tb IIIC T80°C...T140°C Db; Ta*; IP66

*Ambient Temperature ranges detailed in Special Conditions of use.

Andrew Was
Deputy Certification Manager, FM Approvals Ltd.

Issue date: 09th April 2018

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FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: atex@fmaprovals.com www.fmaprovals.com

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13 Description of Equipment or Protective System:

Control Head Assemblies - The temperature sensors used with the assemblies described are identified by Series 100, Series 200 or Series 300 and are shown schematically within Burns Drawing 18938. All direct immersion "A" or "B" type sensors have a threaded housing to interface with an enclosure / connection head, and is intended for direct immersion applications. All spring-loaded hex fitting "L" type sensors incorporate a threaded housing to interface with an enclosure, various thermowells and extension fittings. Spring-loaded "C", "E" and "K" type sensors incorporate a spring mechanism that enable the sensor to be removed through the enclosure without disconnecting (unthreading) the assembly components.

The Series 100 Connection Head Assembly - are thermocouple Types: E, J, K, K3, T or N in single or dual element configurations.

The Series 200 Connection Head Assembly - are wire wound three or four wire single element or three wire dual element Platinum RTDs.

The Series 300 Connection Head Assembly - are thin-film three or four wire single element or three wire dual element Platinum RTDs.

Connection Heads - The Burns #5 connection head is certified and carries an ATEX certificate FM15ATEX0007U as flameproof Ex db IIC Gb, and for use in dust as Ex tb IIIC Db with Ingress Protection IP66. The Burns #5 Connection Head includes aluminum (3A, 5A) or epoxy coated aluminum (3E, 5E) enclosures. The "3" configuration is the #5 control head supplied with a moisture proofing kit applied by the user internal to the head as noted in ATEX certificate FM15ATEX0007U. The XD-1, XD-lwin, and XD-ILwin (19A & 22A) are ATEX certified and carry an ATEX Certificate of Conformity of FTZU 03 ATEX 0207U as flameproof Ex db IIC Gb and for use in dust as Ex tb IIIC Db, IP68. The Killark enclosure model HK (25A) carries ATEX certificate # DEMKO 06 ATEX 141023X and DEMKO 01 ATEX 015742U certified as flameproof Ex db IIC T4...T3 Gb and for use in dust as Ex tb IIIC T110°C.T140°C Db, IP66. The Yung Chan enclosure model XDS (14S) carries ATEX certificate # Sira 14ATEX1107U for Flameproof Ex db IIC Gb and for use in dust as Ex tb IIIC Db IP68.

Temperature Transmitters - Optional head mounted temperature transmitters provide a 4 to 20 ma loop output proportional to a temperature input from one of the temperature sensors described above.

Direct Immersion Assemblies - Direct immersion Type "A" and "B" assemblies consist of a temperature sensor described above, a connection head described above and, optionally, a temperature transmitter described above.

Spring Loaded Assemblies (in-Direct Immersion) - Spring loaded hex fitting Type "L" assemblies consist of a temperature sensor described above, a connection head described above, optionally, a temperature transmitter described above. Spring loaded Type "C", "E", and "K" assemblies consist of a temperature sensor described

a-b-cd-e-f/A/g/hj [k to l]m. Connection Head with Direct Immersion Assembly.

a = Series 100A, 110A, 120A, 200A, 300A, 100B, 110B, 120B, 200B or 300B.

b = Accuracy option 10, 05 or blank.

c = Element lead wire configuration or thermocouple type A, B, C, E, J, K, K3, N or T.

d = Thermocouple configuration D, E, F, G or blank.

e = Connection head 3A, 3E, 5A, 5E, 14S, 19A or 22A, 25A, 75A or "N".

f = Sheath length Specify LLL (12.5 inches, shown as "125") for L<=99.9. Code LLLL for L>99.9 (L=150" = 1500).

A = Approvals: ATEX

g = Lead wire 'L_', Lead wire length in inches 'Y_', Sheath 'S_', Sheath Diameter 'D_', Sheath Material 'M_'
Sheath Finish 'F_' Sheath Certifications 'R_' Sheath Coating 'C_' Sheath Bending 'B_', Compression

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Fitting FC032, FC132, Lead wire Configuration C01, C10, C20, C22, C23, C24, C30, C54, C60, Lead Wire Termination 'T', Strain Relief 'F' and Lead Wire Material Options M01, M02, M03 and M05 not affecting hazardous ratings. Order of CODE use in part number is determined by the manufacturer.

- h = Transmitter type: Txx, various head mounted transmitters not affecting the hazardous rating.
- j = XMTR calibration blank or M.
- k = Min temperature for 4mA output.
- l = Max temperature for 20 mA output.
- m = Temperature scale C or F.

Note: Separator character "/" used prior to additional option code details. If no additional options "/" is omitted. Separator character "'" used prior to transmitter related option code details. If no transmitter options "/" is omitted.

ab-c-de-f-g-h-ijklm/A/n/W-o-p-q-r/uw [x to y]z. Connection Head (style C, E & K) with Spring Loaded and Spring Loaded Hex (style L) Thermowell Assembly.

- a = Series 100, 200 or 300.
- b = Sensor style C, E, K or L.
- c = Accuracy option 10, 05 or blank.
- d = Sensor type A, B, C, E, J, K, K3, N or T.
- e = Thermocouple configuration D, E, F, G or blank.
- f = Connection head 3A, 3E, 5A, 5E, 14S, 19A, 22A, 25A, 75A or "N". (19A, 22A, 25A, allowed only with L style sensors)
- g = Standard Length Extension material type 1A, 2A, 3A, 1B, 2B, 3B, 1C, 2C, 3C, 1D, 2D, 3D (nA and nB allowed with C, E & K style sensors, nC and nD allowed with L style sensors) or 'N' for no extension.
- h = Immersion length Specify LLL (12.5 inches, shown as "125"). Code LLLL for lengths >99.9", 150" = 1500.
- i = Thermowell shape: Various codes not affecting Hazardous Ratings
- j = Thermowell type: Various codes not affecting Hazardous Ratings
- k = Thermowell size: Various codes not affecting Hazardous Ratings
- l = Flanged thermowell rating: Various codes not affecting Hazardous Ratings
- m = Thermowell material: Various codes not affecting Hazardous Ratings
- A = Approvals: ATEX
- n = Extension Option 'E', Length option if other than standard of 3.0 inches. 'EN__', Various Extension type and material options, (codes TA, TB, TC, TD, TE, TN, and/or M01, M02, M03, M05, M06, M09) not affecting hazardous ratings.
- o = Lag extension length blank (0.0 in.), T30, T60 or TXX (X.X inches).
- p = Various thermowell feature options, (codes T, F, E, C, R, Z01, Z02, Z03, Z05, Z08 or Q01, Q02, Q03, Q04, Q05) not affecting hazardous ratings
- q = Calibration Options 'C', codes 'I', 'F', and/or 'R', blank if no calibration. Not affecting hazardous ratings.
- r = lead wire, sheath and Miscellaneous options not affecting hazardous ratings
- u = Transmitter type: Txx, various head mounted transmitters not affecting the hazardous rating.
- w = XMTR calibration blank or M.
- x = Min temperature for 4mA output.
- y = Max temperature for 20 mA output.
- z = Temperature scale C or F.

Note: Separator character '/' used prior to additional related option code details. If no additional options '/' is omitted. /W is added when any of the thermowell options in this category are selected (codes T, F, E, C, R, Z, or Q), otherwise /W is omitted. These options do not affect hazardous ratings, otherwise blank. Separator character '/' used prior to transmitter related option code details. If no transmitter options '/' is omitted. The Thermowell is optional, not required for the Hazardous rating, ATEX.

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T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: atex@fmapprovals.com www.fmapprovals.com

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14 Specific Conditions of Use:

1. Consult the manufacturer if dimensional information on the flameproof joints is necessary.
2. Consult the manufacturer's instructions for the specific information regarding wiring entry number, sizes, position and thread type.
3. Potential electrostatic charging hazard – cleaning of enclosure surfaces should be done with damp cloth.
4. The ambient temperature and maximum surface temperature for the assembled connection head /enclosure is based on the connection head incorporated into the assembly. See table for temperature ratings for connection head selection.

| Connection Head # | Enclosure Description | "Ta" Range | Max. Surface Temp of Enclosure (Gas Atmosphere) | Max. Surface Temp of Enclosure (Zone 21 Dust Atmosphere) |
|-------------------|-------------------------------------------------------|----------------|-------------------------------------------------|----------------------------------------------------------|
| 3A | Aluminum enclosure with Waterproofing Kit | -40°C to 100°C | 105°C | T105°C |
| 3E | Aluminum enclosure with Waterproofing Kit | -40°C to 100°C | 105°C | T105°C |
| 5A | Aluminum enclosure | -40°C to 100°C | 105°C | T105°C |
| 5E | Aluminum enclosure | -40°C to 100°C | 105°C | T105°C |
| 14S | Stainless Steel enclosure | -40°C to 80°C | 100°C | T100°C |
| 19A | Aluminum enclosure with LED indicator | -20°C to 75°C | 80°C | T80°C |
| 22A | Aluminum enclosure with LCD indicator | -20°C to 75°C | 80°C | T80°C |
| 25A | Aluminum enclosure | -20°C to 70°C | 140°C | T140°C |
| 75A | Aluminum enclosure with T75 Transmitter and indicator | -40°C to 85°C | 100°C | T100°C |

5. Equipment with Connection Head option "N" is to be connected to a suitably certified Ex d IIC / Ex tb IIC connection head.
6. Temperature class for probe portion of equipment may be equal to connected process temperature and service temperature limits of the probe used in the installation.

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 |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20 th January 2017 | Original Issue. |
| 03 rd March 2017 | <u>Supplement 1:</u> Report Reference: – RR208304 dated 2 nd March 2017 Description of the Change: Minor updates to equipment description and documentation. |
| 27 th April 2017 | <u>Supplement 2:</u> Report Reference: – RR208998 dated 17 th April 2017. Description of the Change: Minor updates to documentation. |
| 05 th October 2017 | <u>Supplement 3:</u> Report Reference: – RR210227 dated 27 th September 2017. Description of the Change: Minor updates to documentation, model code structure, temperature class, ambient temperature ratings and “Specific Conditions of Use”. |
| 09 th April 2018 | <u>Supplement 4:</u> Report Reference: – 3062038 dated 6 th April 2018. Description of the Change: Drawing additions and manual update for PLA 3062038. |

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Blueprint Report

Burns Engineering Inc (100001358)

Class No 3615

Original Project I.D. 3051889

Certificate I.D. FM15ATEX0054X

| <u>Drawing No.</u> | <u>Revision Level</u> | <u>Drawing Title</u> | <u>Last Report</u> | <u>Electronic Drawing</u> |
|-------------------------------|-----------------------|------------------------------------------------------------------------------------------------------|--------------------|---------------------------|
| 17563 | K | MOUNTING AND OUTLINE DRAWING. TAGS FOR FM APPROVED SERIES 100, 200, 300 EXPLOSIONPROOF ASSEMBLIES | 3051889 | Yes (pdf) |
| 18938 | M | SERIES 100, 200, 300 EXPLOSION PROOF INSTALLATION DRAWING, APPROVAL BODY FACTORY MUTUAL | 3062038 | Yes (pdf) |
| 23118 | E | PURCHASED PART FLAME PROOF EXTENSION C AND K STYLE SENSORS | RR208998 | Yes (pdf) |
| 23258 | E | PURCHASED PART FLAME PROOF EXTENSION L STYLE SENSORS | RR208998 | Yes (pdf) |
| 23386 | E | PURCHASED PART HAZARDOUS ENVIRONMENT RATING TAG | RR210227 | Yes (pdf) |
| 23387 | D | PURCHASED PART HAZARDOUS ENVIRONMENT RATING TAG | 3062038 | Yes (pdf) |
| 23570 | C | PRIVATE LABELER/ TRADE AGENT CONTROL; SERIES 100, 200, 300 | 3062038 | Yes (pdf) |
| 23635 | C | Hazardous Environmental Rating Tag Yokogawa - PLA | 3062038 | Yes (pdf) |
| 23713 | A | TSD & TSE SERIES 100, 200 AND 300 EXPLOSION PROOF INSTALLATION DRAWING, APPROVAL BODY FACTORY MUTUAL | 3062038 | Yes (pdf) |
| BPM101 | 2/1/18 | Series 100, 200, and 300 RTD & Thermocouple Instruction Manual BPM101 | 3062038 | Yes (pdf) |
| TSE_TSD Series Ex Inst Manual | 2/1/18 | Yokogawa TSE & TSD Series Instruction Manual | 3062038 | Yes (pdf) |