[1]

UNITED KINGDOM CONFORMITY ASSESSMENT

UK-TYPE EXAMINATION CERTIFICATE

[2]

Product or Protective System Intended for use in Potentially Explosive Atmospheres
UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1

[3] UK-Type Examination Certificate No.: **UL21UKEX2236X Rev. 0**

[4] Product: **One Series Electronic Pressure and Temperature Switches**

[5] Manufacturer: **United Electric Controls**

[6] Address: **180 Dexter Avenue, Watertown, MA 02471 USA**

[7] This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

[8] UL International (UK) Ltd, Approved Body number 0843, in accordance with Regulation 44 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended by UKSI 2019:696), certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.
The examination and test results are recorded in the confidential report **UKRCC-4789985906.3**

[9] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 **EN 60079-1:2014**
EN 60079-11:2012 **EN 60079-31:2014**

Except in respect of those requirements listed at section 19 of the schedule to this certificate.

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

[11] This UK-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.

[12] The marking of the product shall include the following:

Series 1XSWLL:

II 1 G Ex ia IIC T4 Ga

II 1 D Ex ia IIIC T135℃ Da

II 2 G Ex db IIC T3/T5 Gb (T3 for pressure sensor models P06-P16 only)

II 2 D Ex tb IIIC T90℃ Db

Series 1XTXSW, 1XTX00:

II 2 G Ex db IIC T3/T5 Gb (T3 for pressure sensor models P06-P16 only)

II 2 D Ex tb IIIC T90℃ Db

Series 2SLP:

II 2 G Ex db IIC T3/T5 Gb (T3 for pressure sensor models P06-P16 only)

II 2 D Ex tb IIIC T90℃ Db

Series 1XSWHL, 1XSWHH:

II 2 G Ex db IIC T3/T5 Gb (T3 for pressure sensor models P06-P16 only)

II 2 D Ex tb IIIC T90℃ Db

Certification Manager
Andrew Moffat

This is to certify that the sample(s) of the Product described herein ("Certified Product") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the UKEx Product Certification Program Requirements. This certificate and test results obtained apply only to the product sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured product. UL has not established Follow-Up Service or other surveillance of the product. The Manufacturer is solely and fully responsible for conformity of all product to all applicable Standards, specifications, requirements or Regulations. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

Date of issue: 2022-06-21

Approved Body UL International (UK) Ltd Unit 1-3 Horizon Kingsland Business Park Wade Road, Basingstoke RG24 8AH, UK
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[15] Description of Product

The devices are pressure and temperature operated switches, with a solid-state switch mechanism, an LCD (Liquid Crystal Display), a flameproof enclosure and may contain solid-state analog outputs. The metal enclosure consists of a body and a cover with a glass window, as well as two conduit entries and a sensor port. The cover is secured to the body by a threaded joint. The window is cemented into the cover and additionally secured by a retaining ring that threads into the cover. The sensors engage the body of the enclosure by a threaded joint. The devices are provided with terminal blocks for field installation.

Nomenclature:

2X	2D	0	0	P	10	M124
I	II	III	IV	V	VI	VII

I – Series Designation
- 2S – Safety Transmitter

II – Input Voltage
- LP - 20-40 Vdc (2S Models)

III – Analog Output
- 0 – None
- 4 – 4-20 mA (DC)

IV – Switch Output

2SLP Models:
- N – None
- 7 – 12 – 240 Vac, 5.0 A
- 8 – 0 – 30 Vdc, 6.0 A
- 9 – 0 – 130 Vdc, 2.5 A

V – Sensor Type
- P – Pressure Sensor
- T – Temperature Sensor
- K – Differential Pressure Sensor

VI – Sensor Model

Pressure Sensors:
- 06 -14.7 to 30 psi
- 08 - 0.8 – 14.7 psi
- 10 – 0 to 5 psi (0.345 bar)
- 11 – 0 to 15 psi (1.034 bar)
- 12 – 0 to 30 psi (2.068 bar)
- 13 – 0 to 50 psi (3.447 bar)
- 14 – 0 to 100 psi (6.895 bar)
- 15 – 0 to 300 psi (20.68 bar)
- 16 – 0 to 500 psi (34.47 bar)
- 17 – 0 to 1000 psi (68.95 bar)
- 18 – 0 to 3000 psi (206.84 bar)
- 19 – 0 to 4500 psi (275.79 bar)
- 20 – 0 to 6000 psi (413.69 bar)

Temperature Sensors:
- L1 – 4 in. Length Local Mount
- L2 – 6 in. Length Local Mount
- L3 – 10 in. Length Local Mount
- R1 – 6 ft. Remote Probe Low Temp
- RC – Custom Length Remote Probe Low Temp
- H1 – 6 ft. Remote Probe High Temp
- HC – Custom Length Remote Probe High Temp
- C1 – 6 ft. Remote Probe Low Temp
- CC – Custom Length Remote Probe Low Temp
- TC – Custom Length Thermowell
- Ux – User Installed Sensor, where “x” is any alphanumeric character denoting sensor temperature range

Differential Pressure Sensors:
- 10 – 0 to 5 psid (0.345 bar)
- 11 – 0 to 50 psid (3.447 bar)
- 12 – 0 to 100 psid (6.895 bar)
- 13 – 0 to 200 psid (13.790 bar)

VII – Options
- M- 70 or Four character alphanumeric code not affecting electrical or mechanical ratings of the device

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Customer Specification Number
The above nomenclature may be replaced by 2X/4X/8X, followed by a five-digit code, corresponding to a configuration per the preceding nomenclature per customer, not affecting maximum electrical ratings or maximum mechanical ratings. Changes to the preceding nomenclature are not allowed, except for new sensor model ranges only, so long as (a) maximum electrical/mechanical ratings as tested are not exceeded and (b) sensor assembly configurations are approved to or above the range specified.

For the 1XSWLL series:

1X	SW	L	L	P	10	M124
I	II	III	IV	V	VI	VII

I – Series Designation
1X – 2-wire switch

II – Type
SW – Switch only

III – Input Voltage (Range)
L – Low Voltage, 7.8 – 50 Vdc

IV – Input Current
L – Low Current, @ .1 A

V – Sensor Type
P – Pressure Sensor
T – Temperature Sensor
K – Differential Pressure Sensor

VI – Sensor Model
Pressure Sensors:
06 – 14.7 to 30 psi
08 – 14.7 to 100 psi
10 – 0 to 5 psi
11 – 0 to 15 psi
12 – 0 to 30 psi
13 – 0 to 50 psi
14 – 0 to 100 psi
15 – 0 to 300 psi
16 – 0 to 500 psi
17 – 0 to 1000 psi
18 – 0 to 3000 psi
19 – 0 to 4500 psi
20 – 0 to 6000 psi

Temperature Sensors:
L1 – 4 in. Length Local Mount
L2 – 6 in. Length Local Mount
L3 – 10 in. Length Local Mount
R1 – 6 ft. Remote Probe Low Temp
RC – Custom Length Remote Probe Low Temp
H1 – 6 ft. Remote Probe High Temp
HC – Custom Length Remote Probe High Temp
C1 – 6 ft. Remote Probe Low Temp
CC – Custom Length Remote Probe Low Temp

Differential Pressure Sensors:
10 – 0 to 5 psid
11 – 0 to 50 psid
12 – 0 to 100 psid
13 – 0 to 200 psid

VII – Options
M-041 Dual Seal Adapter or Four character alphanumeric code not affecting electrical or mechanical ratings of the device

For the 1XTX series:

1X	TX	00	P	10	M124
I	II	III	IV	V	VI

I – Series Designation
1X – 2-wire switch

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II – Communication
TX – 4-20 mA Transmitter

III – Output
SW – Switch Outputs
00 – No Switch Outputs

IV – Sensor Type
P – Pressure Sensor
T – Temperature Sensor
K – Differential Pressure Sensor

V – Sensor Model
Pressure Sensors:
06 – 14.7 to 30 psi
08 – 14.7 to 100 psi
10 – 0 to 5 psi
11 – 0 to 15 psi
12 – 0 to 30 psi
13 – 0 to 50 psi
14 – 0 to 100 psi
15 – 0 to 300 psi
16 – 0 to 500 psi
17 – 0 to 1000 psi
18 – 0 to 3000 psi
19 – 0 to 4500 psi
20 – 0 to 6000 psi

Temperature Sensors:
L1 – 4 in. Length Local Mount
L2 – 6 in. Length Local Mount
L3 – 10 in. Length Local Mount
R1 – 6 ft. Remote Probe Low Temp
RC – Custom Length Remote Probe Low Temp
H1 – 6 ft. Remote Probe High Temp
HC – Custom Length Remote Probe High Temp
C1 – 6 ft. Remote Probe Low Temp
CC – Custom Length Remote Probe Low Temp

Differential Pressure Sensors:
10 – 0 to 5 psid
11 – 0 to 50 psid
12 – 0 to 100 psid
13 – 0 to 200 psid

VI – Options
M-041 Dual Seal Adapter or Four character alphanumeric code not affecting electrical or mechanical ratings of the device

For Models 1XSWHL, 1XSWHH:

1X	SW	HL	P	10	M041
I	II	III	IV	V	VI

I – Series Designation
1X – 1X Series

II- Communication
SW – Switch output

III – Output
HL – 70 – 240 VAC/VDC 10 A max. De-rate 1Ma per 1℃ › 25℃
HH – 24 – 280 VAC/VDC 10 A max. De-rate 8% per 10℃ › 25℃

IV – Sensor Type
P – Pressure Sensor
T – Temperature Sensor
K – Differential Pressure Sensor

V – Sensor Model

Pressure Sensors:

06 – 14.7 to 30 psi
08 – 14.7 to 100 psi
10 – 0 to 5 psi
11 – 0 to 15 psi
12 – 0 to 30 psi
13 – 0 to 50 psi
14 – 0 to 100 psi
15 – 0 to 300 psi
16 – 0 to 500 psi
17 – 0 to 1000 psi
18 – 0 to 3000 psi
19 – 0 to 4500 psi
20 – 0 to 6000 psi

Temperature Sensors:

L1 – 4 in. Length Local Mount
L2 – 6 in. Length Local Mount
L3 – 10 in. Length Local Mount
R1 – 6 ft. Remote Probe Low Temp
RC – Custom Length Remote Probe Low Temp
H1 – 6 ft. Remote Probe High Temp
HC – Custom Length Remote Probe High Temp
C1 – 6 ft. Remote Probe Low Temp
CC – Custom Length Remote Probe Low Temp

Differential Pressure Sensors:

10 – 0 to 5 psid
11 – 0 to 50 psid
12 – 0 to 100 psid
13 – 0 to 200 psid

VI – Options

M-041 - Dual Seal Adapter

Four character alphanumeric code other than M-041 are single seal. These do not affect electrical or mechanical ratings of the device.

Temperature Range

The relation between ambient temperature and the assigned temperature class is as follows:

Ambient Temperature Range	Temperature Class	Model
-40°C to +85°C	T5 (“db”) or T3 (“db” Pressure sensor models P06-P16) or T4 (“ia”) or T90 (“db”)	1XSWLL
-40°C to +80°C	T5 or T3 (Pressure sensor models P06-P16) or T90 (“db”)	1XTXSW, 1XTX00
-40°C to +70°C	T5 or T3 (Pressure sensor models P06-P16) or T90 (“db”)	2SLP
-40°C to +80°C	T5 or T3 (Pressure sensor models P06-P16) or T90 (“tb”)	1XSWHL, 1XSWHH

Electrical Data

Model	Input Voltage	Switch Output (+)	Analog Output	IAW Circuit
2SLP	20- 40 Vdc	12 – 240Vac, 5.0 A; or 0 – 30Vdc, 6.0 A; or 0 – 130Vdc, 2.5 A	4 – 20 mA	N/A
1XSWLL	“d” /” nA” (+): 7.8-50Vdc “ia”: Ui = 12 V; Ii = 20mA; Pi= 60mW, Ci = 23.1nF, Li = 705 uH	N/A	N/A	“d” /” nA” (+): 7.8-50Vdc “ia”: Ui = 12 V; Ii = 20mA; Pi= 60mW, Ci = 23.1nF, Li = 705 uH
1XTXSW	30 Vdc 20mA	0-280 Vac, 300 mA	4-20 mA	30 Vdc, 20mA
1XTX00	30 Vdc 20mA	-	4-20 mA	30 Vdc, 20mA
1XSWHL	N/A (++)-	70-240 Vac/Vdc, 100 mA	N/A	7.8-50 V dc, 100 mA max
1XSWHH	70-240 V AC, 100 mA	24-280 Vac/Vdc, 10 A	N/A	7.8-50 V dc, 100 mA max

+ - Switch current outputs are de-rated, based on ambient temperature, as shown in the “Switch Ratings Table” provided in the Installation Instructions (Drawing No. IM_ONEX, IM_ONE Safety, IM_1XTXSW-01, IM_ONETXSW-04, and IM_1XTXSW-05).

++ - The load from the switch also powers the electronic and does not need a separate power supply.

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Routine Tests
The welds between the fitting and sheath of the local welded temperature sensor and around the pressure connection housing of the pressure sensors must be leak tested in accordance with the manufacturer's procedure G-60.

[16] Test Report No. (associated with this certificate issue)
US UL ExTR08.0022/11

[17] Specific conditions of use:

Flameproof and Dust-Ignition Proof ("db" and "tb")
- Field wiring must be rated 105°C minimum. For ambient temperatures below –10°C, use suitable field wiring.
- Blanking elements from factory have been tested for flameproof "d" and dust "tb" with the enclosure as an assembly and carry no markings.
- A suitable thermowell made from corrosion-resistant material and engaging 5 threads minimum (with thread sealant) is required for the local spring loaded temperature sensor to maintain IP66.
- User installed temperature sensors must be certified to flameproof "d" and dust "tb" requirements for the same groups and ambient temperature range, made from a corrosion resistant material, and engage 5 threads min with grease required on threads. This UK-Type Examination Certificate applies to the device described herein only and does not cover the user installed temperature sensor.
- Flameproof joint and gap details:
  - Enclosure to cover threaded joint: 4"-16 UN-2, 7 threads engaged minimum.
  - Glass to cover cemented joint: 0.753" (19.1 mm) rabbet/spigot minimum length
  - Breather element threaded joint: M8-1.25 (6g/6H medium fit class, 11 threads engaged minimum
  - Electrical conduit threaded joint: ¾"-14 NPT, 5 threads engaged minimum
  - Enclosure to sensor threaded joint:
    - Pressure models: 1"-20 UNEF-2, 10 threads engaged minimum
    - Temperature models: ½"-14 NPT, 5 threads engaged minimum
    - Remote and local spring loaded temperature sensor gap joints: 0.0045" (0.114 mm) maximum annular gap by 1.25" (31.8 mm) minimum length
- The device must be cleaned with a damp cloth to avoid static discharge.

- Dual Seal Adaptor Option:
  - Threaded Dual Seal Adaptor Option Enclosure to One Series Enclosure : 1"-20 UNEF-2, 10 threads engaged minimum
  - Breather element threaded joint: ¼"-20 UNC-2, 10 threads engaged minimum
  - Secondary Seal Housing to union housing joint: 0 .580" (14.73 mm) rabbet/spigot minimum length, maximum gap 0.003 in. (0.08 mm).
  - Sensor to union housing joint: 0 .580" (14.73 mm) rabbet/spigot minimum length, maximum annular gap 0.003 in. (0.08 mm).
  - Threaded Dual Seal Adaptor Option to Sensor 1"-20 UNEF-2, 10 threads engaged minimum or ½"-14 NPT 5 threads engaged minimum.

Intrinsic Safety ("ia")
- Enclosure and cover are made from Aluminum Alloy, do not strike with heavy object.
- Separation Distances were assessed to Annex F.
- The device must be powered by galvanic isolated intrinsic safety barriers.

[18] Conditions of certification:
None

[19] Essential Health and Safety Requirements (Regulations Schedule 1)
In addition to the Essential Health and Safety Requirements covered by the standards listed at item 9, all other requirements are demonstrated in the relevant reports.

Additional information
The device has in addition passed the tests for Ingress Protection to IP 66 in accordance with EN60529:1991+A1:2000+A2:2013.

The trademark  will be used as the company identifier on the marking label.

The manufacturer shall inform the approved body concerning all modifications to the technical documentation as described in Annex III to UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1.

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[20] Drawings and Documents

Title:	Drawing No.:	Rev. Level:	Date:
One Series Enclosure Assembly and Nameplate	B-62174-45	J	2021-09-09
One Series Pressure Sensors	B-62174-46	A	2009-03-05
One Series Temperature Sensors	B-62174-47	B	2014-03-26
2SLP Installation and Maintenance Instructions	IM_ONE_Safety	09	N/A
DUAL Seal Option Drawing	B-62174-50	B	2014-06-20
Schematic, One Series 2 Wire Switch	6247-694	F	2019-01-10
One Series Critical Components, Resistors	A-6289-789	B	2017-01-09
Resistor, Through Hole	A-6289-708	B	2015-05-07
Diode, Schottky	A-62132-109	D	2015-05-07
Diode, Schottky	A-62132-139	C	2021-05-20
Model 1, One Series PC Panel	B-62137-491	D	2019-01-10
Intrinsically Safe (I.S.) Control Drawing	A-62174-64	D	2019-01-14
One Series Critical Components for Intrinsic Safety Circuit	62174-76	B	2021-02-25
PCB Ass'y 1XSWLL	B-63136-404	G	2019-02-28
1XTXSW, 1XTX00 Installation and Maintenance Instructions	IM_1XTXSW	09	N/A
1XTXSW One Series Mainboard	6247-698	D	2019-01-10
PCB Ass'y 1XTXSW	63136-406	F	2020-08-13
1XTXSW One Series PC Panel	B-62137-494	D	2019-01-10
Schematic, Model 4 Relay Board	6247-699	E	2015-10-14
PCB ASSY Relay 1XTXSW	A-63136-405	F	2015-10-14
PC Board Model 4 Relay	B-62137-495	C1	2015-08-05
1XSWLL, 1XSWHL, 1XSWHH Installation and Maintenance Instructions	IM_1XSW	04	N/A
1XSWHL,1XSWHH One Series Mainboard	6247-708	G	2019-01-10
PCB Ass'y 1XSWHL,1XSWHH	B-63136-414	H	2019-02-28
1XSWHL,1XSWHH One Series PC Panel	B-62137-506	G	2019-01-10
Schematic, 1XSWHH Relay Board	6247-709	B	2017-02-27
PCB ASSY Relay 1XSWHH	A-63136-415	B	2017-02-27
ADDENDUM for ADDENDUM for ONE SERIES OPTION UKCA (United Kingdom Conformity Assessed)	UKCA_ONE-01	-	2022-06-03
ONE SERIES 2S NAMEPLATE OPTION: UKCA M462	6311-6	A	2022-05-23
ONE SERIES 1XSWLL NAMEPLATE OPTION: UKCA M462	6311-7	A	2022-05-23
ONE SERIES 1XTXSW, 1XTX00 NAMEPLATE OPTION: UKCA M462	6311-8	A	2022-05-23
ONE SERIES 1XSWHL, 1XSWHH NAMEPLATE OPTION: UKCA M462	6311-9	A	2022-05-23