IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

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Certificate No.:	**IECEx KTL 22.0022X**	Page 1 of 3	Certificate history:
Status:	**Current**	Issue No: 0	
Date of Issue:	2022-07-29		
Applicant:	**POWER-GENEX Ltd.** 99, Eunbong-ro, Namdong-Gu Incheon 21639 **Korea, Republic of**		
Equipment:	**Valve Position Monitor, LSB-1 series, LSB-3 series**		
Optional accessory:			
Type of Protection:	**Intrinsic safety "i"**		
Marking:	Ex ia IIC T6/T5 Gb, Ex ia IIIC T85 °C/T100 °C Db or Ex ia IIC T4 Gb, Ex ia IIIC T135 °C Db		

Approved for issue on behalf of the IECEx Certification Body: **Park, Jong-koo**

Position: **Certification Manager**

Signature: (for printed version)

Date: (for printed version) 2022-07-29

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Certificate issued by:

Korea Testing Laboratory
87, Digital-ro, 26-gil, Guro-gu
Seoul
Korea, Republic of

IECEx Certificate of Conformity

Manufacturer: **POWER-GENEX Ltd.**
99, Eunbong-ro, Namdong-Gu
Incheon 21639
Korea, Republic of

Manufacturing locations: **POWER-GENEX Ltd.**
99, Eunbong-ro, Namdong-Gu
Incheon 21639
Korea, Republic of

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:

KR/KTL/ExTR22.0025/00

Quality Assessment Report:

KR/KTL/QAR11.0002/07

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The LSB-1,3 series valve position monitor is intrinsically safe equipment that is used for monitoring of linear or rotary valve position.

The equipment comprises mechanical switches or proximity sensors/switches, terminal blocks, a feedback shaft, optional position transmitter parts, optional non-metallic beacon parts, and so on. All the parts except the feedback shaft and the optional beacon parts above are housed in an aluminium alloy or a stainless steel enclosure. The terminal blocks inside the enclosure are used for external connections of the equipment. Internal wiring is used for connections between the sensors/switches/position transmitter and the terminal blocks.

The output signal for valve position feedback to external system is provided by possible combinations of a 4~20mA position transmitter, a potentiometer, two or four mechanical limit switches, two or four P&F proximity sensors and two or four hermetically sealed proximity switches.

All the external connection ports shall be supplied within maximum allowable electrical input parameters (Ui, Ii, Pi) of the ports each by connecting to certified intrinsically safe circuits or associated apparatus such as safety barriers.

See Certificate Annex for Model code details, Ex markings, ambient temperature ranges and electrical parameters.

SPECIFIC CONDITIONS OF USE: YES as shown below:
1. WARNING-POTENTIAL ELECTROSTATIC CHARGING HAZARD-SEE INSTRUCTIONS.

If the enclosures of the equipment incorporate the non-metallic parts, which may generate an ignition capable level of electrostatic charge, the equipment shall be installed in a location where the external conditions cannot result in the build-up of electrostatic charge on such surfaces. For example, the equipment shall be installed in the location protected from direct airflow, causing a charge transfer. Additionally, the equipment shall only be cleaned with a damp cloth, and caution should be used when being handled.

2. Separately certified Ex cable glands and blanking elements shall be used suitably to the threaded holes for cable entries.

3. WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT.

The equipment shall not be opened for installation, repair or overhaul in a hazardous area. The user shall consult the manufacturer if there is any problem during the usage.

Annex:

Annex to IECEx_KTL_22.0022X_Issue_0.pdf

87, Digital-ro 26-gil, Guro-gu, Seoul, 08389, Korea	ktl 한국산업기술시험원 Korea Testing Laboratory
Reference IECEx document	IECEx KTL 22.0022X Issue No. 0
Reference project number	PI210830, KR/KTL/ExTR22.0025/00

[Annex to IECEx KTL 22.0022X Issue No. 0]

1. Model Code Description

1) Model Type : LSB-1 series

LSB-1abc-defghij

a = Body Material : 0, 1

b = Switches / Sensors : <Mechanical Switch type> L(2 x SPDT/Honeywell), <Proximity Sensor type> 4(2 x NJ2-V3-N/P&F), T(2 x SJ3,5-S1N/P&F), <Hermetically sealed proximity switch type> A(2 x MS-25), E(2 x MS-100), G(2 x RS-V3201/Euro Switch)

c = Position Transmitter : 0(None)

d = Explosion proof : I

e = Ingress Protection (IP code) : 6, 7, 8

*f = Beacon /Indicator : N, A, T, L

*g = Electrical Connections : C, D, E, H

h = Numbers of Electrical Connections : 2

*i = Feedback Shaft : N, F (for Rotary type) / B, C, D (for Linear type)

*j = Mounting Bracket : N, 1, 2, 3, 4, M

* : Options which do not affect intrinsic safety

2) Model Type : LSB-3 series

LSB-3abc-defghij

a = Body Material : 0, 1

b = Switches / Sensors : <Mechanical Switch type> L(2 x SPDT/Honeywell), M(4 x SPDT/Honeywell), <Inductive & Proximity Sensor type> 4(2 x NJ2-V3-N/P&F), 5(4 x NJ2-V3-N/P&F), 6(2 x NJ4-12GM-N/P&F), T(2 x SJ3,5-S1N/P&F), <Hermetically sealed proximity switch type> A(2 x MS-25), B(4 x MS-25), E(2 x MS-100), F(4 x MS-100), G(2 x RS-V3201/Euro Switch), H(4 x RS-V3201/Euro Switch), X(None)

c = Position Transmitter : 0(None), T(4~20mA), 1(0~1KΩ), 2(0~10KΩ)

d = Explosion proof : I

e = Ingress Protection (IP code) : 6, 7, 8

*f = Beacon /Indicator : N, A, B, C, T, L

*g = Electrical Connections : A, B, C, D, E, I

h = Numbers of Electrical Connections : 2

*i = Feedback Shaft : <Rotary type> N, F, <Linear type> B, C, D

*j = Mounting Bracket : N, 1, 2, 3, 4, M

* : Options which do not affect intrinsic safety

For the detailed information, refer to the manual.

2. Marking & Parameters

1) Model Type : LSB-1 series

LSB-1abc-defghij

Model Code		Ex Marking	Ambient Temperature	Electrical Parameters for Intrinsic Safety per each port
b	c			
L	0	Ex ia IIC T6/T5 Gb, Ex ia IIIC T85 °C/T100 °C Db	T6 & T85 °C : -25 °C ~ +40 °C T5 & T100 °C : -25 °C ~ +60 °C	- Mechanical Switches (Terminal 2-3, 5-6) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
4	0		T6 & T85 °C : -40 °C ~ +40 °C T5 & T100 °C : -40 °C ~ +60 °C	- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 40 nF, Li = 50 µH
T	0			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 30 nF, Li = 100 µH
A	0			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
E	0			
G	0		T6 & T85 °C : -20 °C ~ +40 °C T5 & T100 °C : -20 °C ~ +60 °C	- Proximity Switches (Terminal 1-2, 3-4) Ui = 24 V, Ii = 250 mA, Pi = 650 mW, Ci = 120 pF/m, Li = 0.7 µH/m

2) Model Type : LSB-3 series

LSB-3abc-defghij

Model Code		Marking	Ambient Temperature	Electrical Parameters for Intrinsic Safety per each port
b	c			
L	0	Ex ia IIC T6/T5 Gb, Ex ia IIIC T85 °C/T100 °C Db	T6 & T85 °C : -25 °C ~ +40 °C T5 & T100 °C : -25 °C ~ +60 °C	- Mechanical Switches (Terminal 2-3, 5-6) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
M	0			- Mechanical Switches (Terminal 2-3, 5-6, 8-9, 11-12) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
4	0		T6 & T85 °C : -40 °C ~ +40 °C T5 & T100 °C : -40 °C ~ +60 °C	- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 40 nF, Li = 50 µH
5	0			- Proximity Sensors (Terminal 1-2, 3-4, 5-6, 7-8) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 40 nF, Li = 50 µH
6	0			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 45 nF, Li = 50 µH
T	0			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 30 nF, Li = 100 µH
A	0			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
B	0			- Proximity Switches (Terminal 1-2, 3-4, 5-6, 7-8) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
E	0			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0

F	0	Ex ia IIC T6/T5 Gb, Ex ia IIIC T85 °C/T100 °C Db	T6 & T85 °C : -40 °C ~ +40 °C T5 & T100 °C : -40 °C ~ +60 °C	- Proximity Switches (Terminal 1-2, 3-4, 5-6, 7-8) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
G	0		T6 & T85 °C : -20 °C ~ +40 °C	- Proximity Switches (Terminal 1-2, 3-4) Ui = 24 V, Ii = 250 mA, Pi = 650 mW, Ci = 120 pF/m, Li = 0.7 μH/m
H	0		T5 & T100 °C : -20 °C ~ +60 °C	- Proximity Switches (Terminal 1-2, 3-4, 5-6, 7-8) Ui = 24 V, Ii = 250 mA, Pi = 650 mW, Ci = 120 pF/m, Li = 0.7 μH/m
X	T	Ex ia IIC T4 Gb, Ex ia IIIC T135 °C Db	T4 & T135 °C : -40 °C ~ +60 °C	- Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
L	T		T4 & T135 °C : -25 °C ~ +60 °C	- Mechanical Switches (Terminal 2-3, 5-6) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0 - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
4	T		T4 & T135 °C : -40 °C ~ +60 °C	- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 40 nF, Li = 50 μH - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
6	T			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 45 nF, Li = 50 μH - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
T	T			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 30 nF, Li = 100 μH - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
A	T			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0 - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
E	T			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0 - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
G	T		T4 & T135 °C : -20 °C ~ +60 °C	- Proximity Switches (Terminal 1-2, 3-4) Ui = 24 V, Ii = 250 mA, Pi = 650 mW, Ci = 120 pF/m, Li = 0.7 μH/m - Position Transmitter (Terminal 9-10) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 21 nF, Li = 12 μH
X	1,2		T4 & T135 °C : -40 °C ~ +60 °C	- Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0

L	1,2	Ex ia IIC T4 Gb, Ex ia IIIC T135 °C Db	T4 & T135 °C : -25 °C ~ +60 °C	- Mechanical Switches (Terminal 2-3, 5-6) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0 - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0
4	1,2		T4 & T135 °C : -40 °C ~ +60 °C	- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 40 nF, Li = 50 µH - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0
6	1,2			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 45 nF, Li = 50 µH - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0
T	1,2			- Proximity Sensors (Terminal 1-2, 3-4) Ui = 16 V, Ii = 52 mA, Pi = 169 mW, Ci = 30 nF, Li = 100 µH - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0
A	1,2			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0 - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0
E	1,2			- Proximity Switches (Terminal 1-2, 3-4) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0 - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0
G	1,2		T4 & T135 °C : -20 °C ~ +60 °C	- Proximity Switches (Terminal 1-2, 3-4) Ui = 24 V, Ii = 250 mA, Pi = 650 mW, Ci = 120 pF/m, Li = 0.7 µH/m - Position Transmitter (Terminal 8-9, 9-10) Ui = 15 V, Ii = 30 mA, Pi = 100 mW, Ci = 0, Li = 0