

防爆合格证

Electrical Apparatus for Explosive Atmospheres CERTIFICATE OF CONFORMITY



国家防爆

Manufacturer Topworx Incorporated
3300 Fern Valley Road, Louisville, Kentucky, 40213, United States of America

Product Switchboxes

Type DX*-*0*****

Marking Ex ia IIC T4/T5/T6 Gb, Ex tD A21 IP66/67 T*°C (*See Annex)

Standard(s) --

Drawing No. CERT-ES-04311-1

The drawings, technical documents and the samples are verified and certified according to standard(s) for safety as below:

- GB 3836.1-2010 Explosive atmospheres - Part 1: Equipment - General requirements
- GB 3836.4-2010 Explosive atmospheres - Part 4: Equipment protection by intrinsic safety "i"
- GB12476.1-2013 Electrical apparatus for use in the presence of combustible dust - Part 1: General requirements
- GB12476.5-2010 Electrical apparatus for use in the presence of combustible dust - Part 5: Protection by enclosure "tD"

Note:

See Annex (7 pages in total).

Director

Date:

2022-03-07

Valid until:

2027-03-06



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CHINA NATIONAL QUALITY SURVEY AND TEST CENTER FOR EXPLOSION PROTECTED ELECTRICAL PRODUCTS
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1.This product has been certified, under certificate number IECEx SIR 14.0078X, issue 8, dated 2021-07-08.

2.Type designation:

DX*_0*****

DX	*	-	*	0	*	*	*	*	*	*	*	*	*	*****
1)	2)		3)	4)	5)	6)	7)	8)	9)	10)	11)	12)	13)	14)

- 1) Enclosure
- 2) Enclosure Material
 - P=Aluminum
 - S=316SS
 - R=Engineered Resin
- 3) Bus/Sensor
 - B1, B2, B3, B4 = P+F NJ2-12GK-SN
 - E1, E2, E3, E4, E5, E6 = P+F NJ2-V3-N
 - EX = (2) P+F NJ2-V3-N w/4-20mA Transmitter
 - EH = (2) P+F NJ2-V3-N w/HART Transmitter
 - F1, F2 = P+F NJ2-12GK-N
 - J1, J2 = P+F NJ2-11-SN-G
 - K1, K2, K3, K4, K5, K6 = MECH SWITCH SPDT w/GOLD CONTACTS
 - KX = (2) MECH SWITCH SPDT w/4-20mA Transmitter
 - KH or HK = (2) MECH SWITCH SPDT w/HART Transmitter
 - L1, L2, L3, L4 = GO SWITCH SPDT
 - LX = (2) GO SWITCH SPDT w/4-20mA Transmitter
 - LH or HL = (2) GO SWITCH SPDT w/HART Transmitter
 - M1, M2, M3, M4, M5, M6 = MECH SWITCH SPDT
 - MX = (2) MECH SWITCH SPDT w/4-20mA Transmitter
 - MH or HM = (2) MECH SWITCH SPDT w/HART Transmitter
 - N1, N2, N3, N4, N5, N6 = ANY NAMUR SWITCH
 - NX = (2) ANY NAMUR SWITCH w/4-20mA Transmitter
 - NH = (2) ANY NAMUR SWITCH w/HART Transmitter
 - PN = (2) Reed Switch Module w/LEDs
 - T2 = MECH SWITCH DPDT
 - TX = MECH SWITCH DPDT w/4-20mA Transmitter
 - V1, V2, V3, V4 = P+F NJ3-18GK-S1N
 - Z1, Z2, Z3, Z4 = GO SWITCH DPDT
 - ZX = (2) GO SWITCH DPDT w/4-20mA Transmitter

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ZH = (2) GO SWITCH DPDT w/HART Transmitter
 00 = NO SWITCH
 31, 32, 33, 34 = P+F NJ5-30GK-S1N
 81, 82, 83, 84 = ITW MECH SWITCH DPDT

- 4) Area Class
0 – Intrinsic Safety
- 5) Visual Display
ANY NUMBER OR LETTER
- 6) Shaft
ANY NUMBER OR LETTER
- 7) Conduit Entries
ANY NUMBER OR LETTER
- 8) O-Rings
B=BUNA
E=EPDM
S=SOLICONE S7395
V=VITON
- 9) Pilot
0 or BLANK = NO PILOT
1=24VDC FAIL Open/Closed
2=24VDC FAIL Last Position
- 10) Spool
ANY NUMBER OR LETTER OR BLANK
- 11) Cv
ANY NUMBER OR LETTER OR BLANK
- 12) Override
ANY NUMBER OR LETTER OR BLANK
- 13) Regional
0 or BLANK = UL (North America), IECEx, ATEX
B = InMetro (Brazil)
K = KCs (Korea)
N = CCCEX (China)
P = PESO (India)
R = EAC (Eurasian Economic Union)
T = ITRI (China Taiwan)
- 14) Custom Build Indents
6 digits (without relevance for explosion protection)

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3.The certification codes, ambient temperature ranges and (where applicable) dust temperature marking shall be as shown in the table below. The ambient temperature range marked is dependent on the internal devices fitted and shall reflect the most restrictive values.

Device	Style	Type	Description	Limiting ambient temp. range					
				Ex ia IIC T4 Gb (3.78W max.)		Ex ia IIC T5 Gb (1.36W max.)		Ex ia IIC T6 Gb (1.36W max.)	
				DXS/DXP (8 K internal temp. rise)	DXR (15 K internal temp. rise)	DXS/DXP (3 K internal temp. rise)	DXR (13 K internal temp. rise)	DXS/DXP (3 K internal temp. rise)	DXR (13 K internal temp. rise)
Mechanical switch	K	V7	Simple Switch						
Micro/Limit Switch	M	VS10N001 C2	Simple Switch						
Reed Switch	P	HSR-V933	Simple Switch						
Reed Switch	R	LV-ELE145	Simple Switch	-60°C ~+92°C	-60°C ~+85°C	-60°C ~+85°C	-60°C ~+75°C	-60°C ~+70°C	-60°C ~+60°C
Go Switch	L/Z	35 Series	Simple Switch						
DPDT Micro Switch	T/8	Cherry Burrell E19 or ITW DPDT-ZZ #26-804	Simple Switch						
Line fault detection	-	-	-60°C to +100°C	-60°C ~ +92°C	-60°C ~ +85°C	Not permitted	Not permitted	Not permitted	Not permitted
Topworx Cube	PN	2 reed switch with LEDs	-60°C to +100°C	-60°C ~ +92°C	-60°C ~ +85°C	Not permitted	Not permitted	Not permitted	Not permitted
ASCO Electro-valve	1 or 2	3021....IA	--	-40°C ~ +82°C	-40°C ~ +75°C	Not permitted	Not permitted	Not assessed	Not assessed

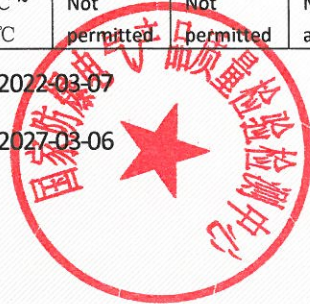
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Pepperl & Fuchs Slot Type Initiators	N	SJ... & SC... T4: with supply types 1, 2 +3 only T6: with supply type 1 only	--	-60°C ~ +67°C	-60°C ~ +60°C	Not permitted	Not permitted	-60°C ~ +69°C	-60°C ~ +59°C
Pepperl & Fuchs Valve Position sensor	N	NCN-...-N4..., PL.-F25.-N4..., NC.-F31.-N5... (with supply types 1, 2 +3 only)	--	-60°C ~ +74°C	-60°C ~ +67°C	Not permitted	Not permitted	-60°C ~ +59°C	-60°C ~ +49°C
Pepperl & Fuchs Cuboidal Inductive Proximity sensor	E	Type NJ2-V3-N... only (with supply types 1, 2 +3 only)	--	-60°C ~ +81°C	-60°C ~ +74°C	Not permitted	Not permitted	-60°C ~ +70°C	-60°C ~ +60°C
		All other types (with supply types 1, 2 +3 only)	--	-60°C ~ +55°C	-60°C ~ +48°C	Not permitted	Not permitted	-60°C ~ +52°C	-60°C ~ +42°C
TopWorx 4-20 mA Transmitter Module and associated potentiometer	X	N/A	--	-40°C ~ +72°C	-40°C ~ +65°C	Not permitted	Not permitted	Not permitted	Not permitted
TopWorx HART v7 Module	H	N/A	--	-40°C ~ +72°C	-40°C ~ +65°C	Not permitted	Not permitted	Not permitted	Not permitted

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Pepperl+Fuchs Switches /sensors	N, E, B, F, J, V, 3 and N_+ N_ --	SC, SJ, NC or NJ (Only one type of switch to be used as per drawing CERT-ES-08677-1 without any other components)	--	Tamb and Tcode will depend on number of switches inside, as marked on internal labels(reference drawing CERT-ES-08677-1)					
Group dust minimum ambient temperature (silicone S7395-60 flange O-ring, S70R2 shaft O-rings)				-60°C	-20°C	Not permitted	Not permitted	-60°C	-20°C
Dust maximum ambient temperature:				As Gp. II	40°C	Not permitted	Not permitted	As Gp. II	42°C
Ex tD A21 T*°C where T*°C is:				Ta(max) + 14 K	T55°C	Not permitted	Not permitted	Ta(max) + 10 K	T55°C
IP rating:				IP66/67	IP67	IP66/67	IP67	IP66/67	IP67

The switch box shall only be fitted with devices that that are listed in the table above. Where applicable; these devices shall also conform to the certificates, supplements and amendments that are also listed therein. Because the exact composition of the switch box is variable, Topworx Inc. shall:

- 1) Supply the installer/end user with a full set of appropriate certificates and instructions that are relevant to the contents of the enclosure.
- 2) Indicate which certificates apply to the contents of the enclosure.

4. Ex marking: Ex ia IIC T4/T5/T6 Gb, Ex tD A21 IP66/67 T*°C

(*) The temperature class, dust temperature marking and ambient temperature depends on the electrical devices that are fitted in the Switchbox.)

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5. Specific conditions of safety use:

1) The Switchbox may contain one or more devices covered by the following certificates:

Description	Parameters
ASCO Electro-valve Module type 3021....IA	If fitted, the entity parameters are $U_i = 28\text{ V}$, $I_i = 300\text{ mA}$, $P_i = 1.6\text{ W}$, $C_i = 0$, $L_i = 0$.
Pepperl & Fuchs slot-type initiators, types SJ... & SC...	If a T6 temperature class is marked, the input entity parameters to sensors covered by this certificate (if fitted) shall be limited to $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$ ("type 1" supply)
Pepperl & Fuchs Valve Position sensor types NCN...-N4..., PL.-F25.-N4..., NC...-F31.-N5...	If a T6 temperature class is marked, the input entity parameters to sensors covered by this certificate (if fitted) shall be limited to $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$ ("type 1" supply).
Pepperl & Fuchs cuboidal inductive sensors, type NJ...	If a T6 temperature class is marked, the input entity parameters to sensors covered by this certificate (if fitted) shall be limited to $U_i = 16\text{ V}$, $I_i = 25\text{ mA}$, $P_i = 34\text{ mW}$ ("type 1" supply).
TopWorx HART v7 Module	If fitted, the entity parameters are $U_i = 28\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 700\text{ mW}$, $C_i = 11\text{ nF}$, $L_i = 14\text{ }\mu\text{H}$; $U_o = 7.71\text{ V}$, $I_o = 100\text{ mA}$, $P_o = 700\text{ mW}$, $C_o = 0.993\text{ }\mu\text{F}$, $L_o = 3541\text{ }\mu\text{H}$.

- 2) The installer shall confirm which certified sub-assemblies are contained within the equipment and ensure compliance with the appropriate certificate (with particular reference to entity parameters).
- 3) If fitted, the entity parameters for uncertified simple mechanical or reed switches (including the Topworx R2 and R4 Cubes), with or without line fault detection, are $U_i = 30\text{ V}$, $I_i = 200\text{ mA}$ and $P_i = 0.34\text{ W}$ per switch circuit.
- 4) If fitted, the entity parameters for the Topworx PN Cube are $U_i = 28\text{ V}$, $I_i = 250\text{ mA}$ and $P_i = 0.8\text{ W}$ per switch circuit.

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- 5) The supplies to all internal devices shall be treated as separate intrinsically safe circuits.
- 6) The DXP version of the Switchbox has an enclosure that is manufactured from aluminium alloy. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered when the equipment is installed.
- 7) The plastic parts of the Switchbox may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
- 8) When marked for use in flammable dust, the DXR (resin) enclosure shall only be installed where there is a low risk of mechanical damage.
- 9) The air pressure to the valve block, when fitted, shall not exceed 10.0 bar.
- 10) If the equipment is fitted with a HART v7 Module, it may be supplied with a bonding strap that could be used to connect the shield (screen) of the cable to ground when installed in a metallic enclosure. In this case, the user/installer shall take this into consideration and ensure that earthing arrangements of the final circuitry comply with the requirements of the relevant Code of Practice.
- 11) The Switchbox may contain Pepperl+Fuchs switches/sensors (type SC, SJ, NC or NJ) covered by the following certificates, when only one type of switch/sensor is used as per drawing CERT-ES-08677-1 without any other components.

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