

# Electrical Equipment for Explosive Atmospheres

## Certificate of Type Verification

<b>Applicant</b>	TopWorx Inc.		
<b>Applicant address</b>	3300 Fern Valley Road Louisville, Kentucky 40213 United States of America	TEL	+1-502-969-8000
<b>Manufacturer</b>	1. TopWorx Inc. 2. Emerson Machinery Equipment (Shenzhen) Co. Ltd. 3. Emerson Automation Fluid Control & Pneumatics Poland Sp. z o. o. (Emerson AFCP Poland Sp. z o.o.)		
<b>Manufacturer address</b>	1. 3300 Fern Valley Road Louisville, Kentucky 40213 United States of America 2. 101 Building 2, COFCO Park, Honglang North 2nd Road, Xin'an Street Bao'an District, Shenzhen 51801 China 3. Kurezaki 132 Lodz 93-331 Poland	TEL	
<b>Name of product Type</b>	Switchbox DX-Series		
<b>Ex marking</b>	Ex ia IIC T6...T4 Gb Ex tb IIIC T* C Db The temperature class depends on the electrical device fitted in the Switchbox, refer to Annex.		
<b>Certificate No.</b>	(ITRI)2021 07-00205X		
<b>Date of first issue</b>	October 25, 2021		
<b>Date of Renewal</b>			
<b>Valid period</b>	October 25, 2021 to October 24, 2024		
<b>Standards:</b>	CNS 3376-0 : 2014 / IEC 60079-0 : 2011 IEC 60079-11 : 2011 IEC 60079-31 : 2013		
<b>Ratings:</b>	Refer to Specific conditions of use.		
<b>Ambient temperature:</b>	The ambient temperature depends on the electrical devices fitted in the Switchbox, refer to Annex.		
<b>Main components:</b>	Lower casting, upper casting, shaft, switch, O-ring, indicator.		
<b>Type variants:</b>	Refer to Annex.		
<b>Specific conditions of use:</b>	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 local code of practice. 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.		



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<p>If fitted, the entity parameters for TopWorx PN Cube are <math>U_i=28</math> V, <math>I_i=250</math> mA and <math>P_i=0.8</math> W per switch circuit.</p> <p>The installer shall confirm which certified sub-assemblies are contained within the equipment and ensure compliance with the appropriate certificate. The Switchbox may contain one or more devices covered by the following certificates:</p>	
Description	Certificate number
ASCO Electro-valve Module type 3021...IA	IECEX INE 10.0002X Issue 1. If fitted, the entity parameters are $U_i=28$ V, $I_i=300$ mA, $P_i=1.6$ W, $C_i=0$ , $L_i=0$
IFM inductive proximity switch type NE****, NF****, NG****, NI****, NN****, NT****, NS****	IECEX BVS 06.0003 Issue 4. Refer to certificate for entity parameters specific to the model number.
Pepperl+Fuchs slot-type initiators, type SJ... & SC...	IECEX TUN 04.00016X Issue 0 If T6 temperature class is marked, the input entity parameters to sensors covered by this certificate (if fitted) shall be limited to $U_i=16$ V, $I_i=25$ mA, $P_i=34$ mW (type 1 supply).
Pepperl+Fuchs Valve Position sensor types NCN-...-N4..., PL.-F25.-N4..., NC.-F31.-N5...	IECEX TUN 04.00014X Issue 0 If T6 temperature class is marked, the input entity parameters to sensors covered by this certificate (if fitted) shall be limited to $U_i=16$ V, $I_i=25$ mA, $P_i=34$ mW (type 1 supply).
Pepperl+Fuchs cuboidal inductive sensors, type NJ...	IECEX PTB 11.00021X Issue 0 If T6 temperature class is marked, the input entity parameters to sensors covered by this certificate (if fitted) shall be limited to $U_i=16$ V, $I_i=25$ mA, $P_i=34$ mW (type 1 supply).
TopWorx HART v7 Module	IECEX SIR16.0107U Issue 1 If fitted, the entity parameters are $U_i=28$ V, $I_i=100$ mA, $P_i=700$ mW, $C_i=11$ nF, $L_i=14$ $\mu$ H; $U_o=7.71$ V, $I_i=100$ mA, $P_i=700$ mW, $C_i=0.993$ nF, $L_i=3541$ $\mu$ H
Hans Turck two-wire proximity sensors type ...-Y1...	IECEX KEM 06.0036X Issue 3. Refer to certificate for entity parameters specific to the model number.
<p>The supplies to all internal devices shall be treated as separate intrinsically safe circuits.</p> <p>The DXP version of the Switchbox has an enclosure that is manufactured from aluminum alloy. In rare cases, ignition sources due to impact and frictional sparks could occur. This shall be considered when the equipment is installed.</p> <p>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.</p> <p>When marked for use in combustible dust atmospheres, the DXR (resin) enclosure shall only be installed where there is a low risk of mechanical damage.</p> <p>The air pressure to the valve block, when fitted, shall not exceed 10.0 bar.</p> <p>The Switchbox may contain switch/sensors 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.</p>	

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	<b>Description</b>	<b>Certificate number</b>									
	Pepperl+Fuchs Switches/Sensors SC, SJ, NC or NJ	IECEX TUN 04.0016X Issue 0 IECEX TUN 04.0014X Issue 0 IECEX PTB 11.0021X Issue 0 IECEX PTB 11.0091X Issue 1 IECEX PTB 11.0092X Issue 1 IECEX PTB 11.0037X Issue 1									
	Cable glands or blanking plugs for enclosure entries are not provided with the equipment. For safe use, certified cable glands or blanking plugs with proper type of protections shall be correctly fitted to maintain the integrity of specified protections.										
<b>Routine tests:</b>	The manufacturer shall carry out the routine tests as prescribed in Clause 6.3.13 and Clause 10.3 of IEC 60079-11. The dielectric test shall be performed at the voltage 700 Vrms applied for 1 s.										
<b>Approval reference:</b>	The assessment of the above equipment is based on the review of IECEX Certificate of Conformity (IECEX SIR 14.0078X Issue 8) issued by CSA Group Testing UK Ltd (CSAE), UK and the associate test report(s) (GB/SIR/ExTR15.0178/00, GB/SIR/ExTR17.0150/00, GB/SIR/ExTR18.0194/00, GB/SIR/ExTR19.0053/00, GB/SIR/ExTR20.0142/00, GB/SIR/ExTR20.0155/00, GB/SIR/ExTR20.0214/00, GB/SIR/ExTR21.0088/00, GB/CSAE/ExTR21.0022/00).										
<b>Certificate history:</b>	Issue 1 (B202100318)					(2021-10-25)					
<b>Annex:</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
	DX	P	-	L	2	0	*	*	*	B 0	
	<p>(1)Series : DX</p> <p>(2)Enclosure material : P : aluminum ; S : stainless 316SS ; R : resin</p> <p>(3)(4)Bus/sensor</p> <p>Code of column (3) : K, M, P, R, L, Z, T, 8, 0, PN, I, N, E, B, F, J, V, 3, C, G, Y (Code C, G, Y are only combined with code H)</p> <p>Code of column (4) : H, X, 1,2,3,4,5,6 (Code 5 and 6 are only for DXP/DXS)</p> <p>(5)Area class : 0 : Ex i</p> <p>(9)O-ring : S : silicone ; B : BUNA</p> <p>(10)Pilot : 0/blank : not installed ; 1 : 24 Vdc fail O/C ; 2 : 24 Vdc fail L/P</p> <p>Column (6), (7), (8) are not related to Ex protection.</p>										

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Applicant		TopWorx Inc.						
Device	Style	Type	Limiting ambient temperature range					
			T4		T5		T6	
			DXS/ DXP	DXR	DXS/ DXP	DXR	DXS/ DXP	DXR
Mechanical switch	K	V7						
Micro/Limit switch	M	VS10N001C2						
Reed switch	P	HSR-V933						
GO switch	R	LV-ELE145	-60 °C to +92 °C	-60 °C to +85 °C	-60 °C to +85 °C	-60 °C to +75 °C	-60 °C to +70 °C	-60 °C to +60 °C
DPDT micro switch	L/Z	35 Series						
	T/8	Cherry Burrell E19 or ITW DPDT-ZZ #26-804						
Line fault detection	-	-	-60 °C to +92 °C	-60 °C to +85 °C	not permitted	not permitted	not permitted	not permitted
TopWorx Cube	PN	2 reed switch LEDs						
ASCO Electro-valve	1 or 2	3021....1A	-40 °C to +82 °C	-40 °C to +75 °C	not permitted	not permitted	not permitted	not permitted
IFM Electronic Inductive Proximity Switch	N	N*50**, N95001 & K15030	-20 °C to +52 °C	-20 °C to +45 °C	not permitted	not permitted	-20 °C to +57 °C	-20 °C to +47 °C
Pepperl+Fuchs Slot Type Initiators	N	S1...&SC... T4: with supply types 1, 2+3 only T6: with supply type 1 only	-60 °C to +67 °C	-60 °C to +60 °C	not permitted	not permitted	-60 °C to +69 °C	-60 °C to +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 to +74 °C	-60 °C to +67 °C	not permitted	not permitted	-60 °C to +59 °C	-60 °C to +49 °C
Pepperl+Fuchs Cuboidal Inductive Proximity Sensor	E	Type NI2-V3-N... only (with supply 1, 2+3 only)	-60 °C to +81 °C	-60 °C to +74 °C	not permitted	not permitted	-60 °C to +70 °C	-60 °C to +60 °C
		All other types (with supply types 1, 2+3 only)	-60 °C to +55 °C	-60 °C to +48 °C	not permitted	not permitted	-60 °C to +52 °C	-60 °C to +42 °C

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			T4		T5		T6	
			DXS/ DXP	DXR	DXS/ DXP	DXR	DXS/ DXP	DXR
TopWorx 4-20 mA Transmitter Module and associated potentiometer	X	N/A	-40 °C to +72 °C	-40 °C to +65 °C	not permitted	not permitted	not permitted	not permitted
TopWorx HART v7 Module	H	N/A						
Hans Turk two wire proximity sensors	N	Type ..... Y1.....	-25 °C to +62 °C	-25 °C to +55 °C	not permitted	not permitted	-25 °C to +67 °C	-25 °C to +57 °C
Pepperl + Fuchs switches/sensors	N, E, B, F, J, V, 3 and N_+N	SC, SJ NC or NI (Only one type of switch to be used as per drawing CERT-ES-08677-1 without any other components)	The ambient temperature and the temperature class will depend on number of switches inside, as marked on internal labels (reference drawing CERT-ES-08677-1)					
Group III (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
Group III (dust) maximum ambient temperature			As Gp. II	40 °C	not permitted	not permitted	As Gp. II	42 °C
Ex tb IIIC T* °C Db where T* °C is:			Ta (max) +14 K	T55 °C	not permitted	not permitted	Ta (max) +10 K	T55 °C

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