

<b>TEPEX d.o.o.</b> tel. 049 222 900 fax. 049 426 450 e-mail: tepex@tepex.hr www.tepex.hr	<b>USER MANUAL FOR EXPLOSION PROTECTED CONTROL UNITS TYPE SKX 17, SKX 18 AND SKX 20</b>		
	Broj: TEPEX.RS.090	Rev : 3	Datum: 06.2025.

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## 1. MANUFACTURER

TEP Ex d.o.o.  
Prilaz dr. Franje Tuđmana 6 HR-49210 ZABOK  
Telephone: +385 49 222 900  
Internet: www.tepex.hr

## 2. GENERAL SAFETY INFORMATION'S



### WARNING!

The user manual contains basic information about the product. Mounting, installation, usage and maintenance should be carried out under this user manual to provide and ensure safe operation within the nominal characteristics. This user manual complement national Regulation and Standards. The responsible person shall ensure their implementation. Failure off implement this user manual can reduce explosion protection and endanger people, property and the environment. Any improper and illegal actions as well as non-compliance with the provisions of this user manual excludes all responsibility by manufacturer side.

#### Before installation/commissioning:

- Carefully read all instructions,
- Execute proper training of responsible personnel,
- Check that the contents of these instructions is fully understandable by the responsible personnel,
- Make sure that all the requirements and national Regulations as well as all special security measures are applied.

#### In lack of understanding:

- Contact the manufacturer.

#### During operation:

- Ensure that this user manual and other work instructions are available to the responsible staff at all times,
- Check the implementation of these instructions and all other safety user's instructions.

### 3. PURPOSE

Explosion protected control units type SKX 17, SKX 18, SKX 20 are intended for use in control, distribution and signaling circuits in areas where an explosive gas and/or dust atmosphere may be present, respectively in hazardous areas 1, 2, 21, 22 in accordance with the standards EN 60079-10-1 and EN 60079-10-2.

### 4. PRODUCT COMPLIANCE

Design and construction of products are in accordance with apparatus standards EN 60947-1, EN 60947-5-1, EN 60947-5-5, EN 60204 and all other related standards.

The product complies with the ATEX Directive 2014/34/EU and standards:

- EN IEC 60079-0:2018,
- EN 60079-1:2014,
- EN IEC 60079-7:2015/A1:2018,
- EN 60079-11:2012,
- EN 60079-18:2015/A1:2017,
- EN 60079-31:2014.

The product has been developed, manufactured and tested according to the existing state of technique accordance with the standards EN ISO 9001, EN ISO / IEC 80079-34 and EN ISO 14001.

The product is in compliance with the ATEX Directive 2014/34/EU.

The product is in compliance with the LVD Directive 2014/35 EU.


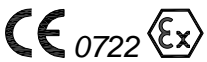
The product is in compliance with the RoHS Directive 2011/65 EU.

The product is in compliance with EMC Directive 2014/30/EU.

The sign X after the certificate number indicates that the equipment or protective system is subject to specific conditions:

Control unit SKX 17, SKX 18, SKX 20 with built-in inspection window type: CZ 8002/1 and CZ 8002/2 satisfy lower impact energy in accordance with EN IEC 60079-0 and must be installed in locations with a lower risk of impact.

### 5. DEGREE OF PROTECTION AND TECHNICAL DATA

Certificate:	FIDI 19 ATEX 0052X		
Marking:			
Category and explosion protection:	 II 2G Ex db eb ia/ib [ia] mb IIC T4 - T6 Gb II 2D Ex tb IIIC T80°C Db		
Ambient temperature:	$-20^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C} / +50^{\circ}\text{C}$		
Mechanical protection:	IP 66		
Resistance to shock:	IK 08		
Class of protection:	I (PE - protective earthing)		
Rated insulation voltage $U_i$ :	- up to 690 V AC		
Rated operating voltage $U_e$ :	- depending on the equipment installed		
Maximum safe voltage for Ex i terminal blocks $U_m$ :	- 60 V <sub>peak</sub>		
Rated thermal current $I_{th}$ :	$I_{th}$	Connection Cable H07Z-K	Temperature class
			$-20^{\circ}\text{C} \leq T_a \leq +40^{\circ}\text{C}$ $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$
	$\leq 16\text{ A}$	$\geq 2,5\text{ mm}^2$	T6    T6
	$\leq 25\text{ A}$	$\geq 4\text{ mm}^2$	T6    T5
	$\leq 35\text{ A}$	$\geq 6\text{ mm}^2$	T5    T4
	$\leq 50\text{ A}$	$\geq 10\text{ mm}^2$	T5    T4
	$\leq 63\text{ A}$	$\geq 25\text{ mm}^2$	T4    T4
	$\leq 80\text{ A}$	$\geq 35\text{ mm}^2$	T4    T4
PE terminals (inside of the enclosure):	- max. 2x4 mm <sup>2</sup> +2x2,5 mm <sup>2</sup> , 3x4 mm <sup>2</sup> , 2x6 mm <sup>2</sup> - solid, stranded, flexible		
Cover fixing::	- combo head screw M5x25/10-Z4 A2 ISO 7045 with plate 4,5 A2 - tightening torque 2,0 Nm		
Cable glands:	- Pressure torque of the nuts and glands of the body depending on the size according to the manufacturer's instructions		
Surface resistance:	$< 10^9\ \Omega$		
Resistance to shock:	7 J		
Color:	black, RAL 9005		
Dimensions: (LxWxH) without cable glands	MMK 17-1 – 300x250x120mm		MMK 17-2 – 300x250x160 mm
	MMK 18-1 – 400x250x120 mm		MMK 18-2 – 400x250x160 mm
	MMK 20-1 – 600x250x120 mm		MMK 20-2 – 600x250x160 mm
Weight (only GRP boxes):	MMK 17-1 - 3,6 kg		MMK 17-2 - 4,0 kg
	MMK 18-1 - 4,50 kg		MMK 18-2 - 4,80 kg
	MMK 20-1 - 6,80 kg		MMK 20-2 - 7,10 kg
Mounting:	- with screw kit M6x16 of the housing in the tops of the rectangle:		
	SKX 17: 280 x 200 mm		
	SKX 18: 380 x 200 mm		
	SKX 20: 580 x 200 mm		

## 6. TYPES

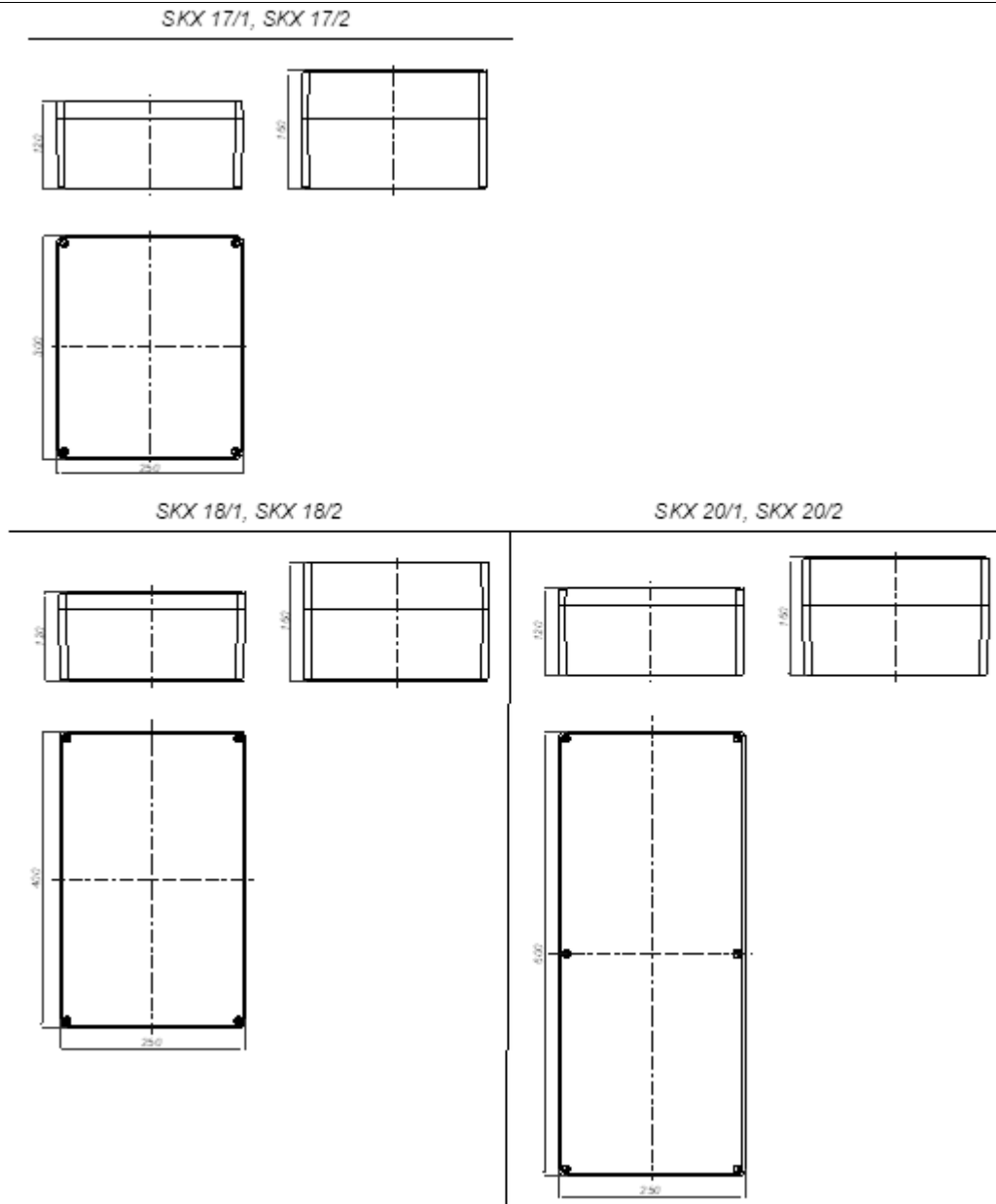
**Control unit according to customer's request** is marked with standard model code - SKX 17, SKX 18, SKX 20 and MSRU number. MSRU number represents the factory serial number.

For example SKX 17/MSRU 1280

**Control unit, as a single unit formed of more enclosures**, are marked with standard model code of each used enclosure - SKX 17, SKX 18, SKX 20 and MSRU number. MSRU number represents the factory serial number.

For example SKX 18/SKX 20/MSRU 1281

## 7. DIMENSIONS OF CONTROL UNITS (without cable glands)




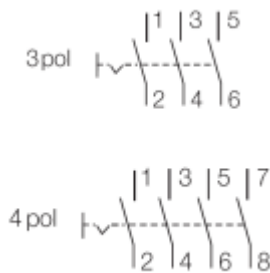







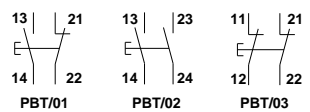

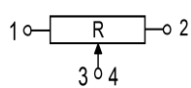
## 8. ACTUATOR/INDICATOR COMPONENTS:

Description, type, display	Description, type, display																						
<p><b>SWITCH ACTUATOR SMO 17/.</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db I M2 Ex eb I Mb</p> 	<p><b>SWITCH ACTUATOR 40A/80A</b> <b>GHG 263 ...R...., GHG 264 ...R....</b> Marking of explosion protection: II 2G Ex eb IIB/IIC T6/T5 Gb II 2D Ex tb IIIC T80°C Db <b>CZ 8003/3</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 																						
<p><b>DOUBLE PUSHBUTTON ACTUATOR 4000-P2</b> Protueksplodzijska zaštita: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 	<p><b>MEASURING INSTRUMENT FRONT PANEL SAM 72</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db I M2 Ex eb I Mb</p> 																						
<p><b>PUSH BUTTON ACTUATOR SPO 01/.</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p>  <table border="1"> <thead> <tr> <th colspan="2">Tip SPO 01/.</th> </tr> </thead> <tbody> <tr> <td>SPO 01/01</td><td>0</td> </tr> <tr> <td>SPO 01/02</td><td>I</td> </tr> <tr> <td>SPO 01/03</td><td>II</td> </tr> <tr> <td>SPO 01/04</td><td>RED</td> </tr> <tr> <td>SPO 01/05</td><td>GREEN</td> </tr> <tr> <td>SPO 01/06</td><td>WHITE</td> </tr> <tr> <td>SPO 01/07</td><td>START</td> </tr> <tr> <td>SPO 01/08</td><td>STOP</td> </tr> <tr> <td>SPO 01/09</td><td>ON</td> </tr> <tr> <td>SPO 01/10</td><td>OFF</td> </tr> </tbody> </table>	Tip SPO 01/.		SPO 01/01	0	SPO 01/02	I	SPO 01/03	II	SPO 01/04	RED	SPO 01/05	GREEN	SPO 01/06	WHITE	SPO 01/07	START	SPO 01/08	STOP	SPO 01/09	ON	SPO 01/10	OFF	<p><b>MUSHROOM-HEAD PUSHBUTTON ACTUATOR (EMERGENCY-STOP) 4000-P3</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 
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SPO 01/08	STOP																						
SPO 01/09	ON																						
SPO 01/10	OFF																						
<p><b>FRONT ELEMENT OF SIGNAL LAMP SPO 02/.</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p>  <table border="1"> <thead> <tr> <th colspan="2">Tip SPO 02/.</th> </tr> </thead> <tbody> <tr> <td>SPO 02/01</td><td>RED</td> </tr> <tr> <td>SPO 02/02</td><td>GREEN</td> </tr> <tr> <td>SPO 02/03</td><td>YELLOW</td> </tr> <tr> <td>SPO 02/04</td><td>TRANSPARENT</td> </tr> </tbody> </table>	Tip SPO 02/.		SPO 02/01	RED	SPO 02/02	GREEN	SPO 02/03	YELLOW	SPO 02/04	TRANSPARENT	<p><b>POTENTIOMETER ACTUATOR 4000-DW</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 												
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<p><b>KEY-OPERATED PUSHBUTTON ACTUATOR 4000-Y1</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 	<p><b>KEY-OPERATED MUSHROOM-HEAD PUSHBUTTON ACTUATOR (EMERGENCY-STOP) 4000-Y0</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 																						
<p><b>PUSH BUTTON ACTUATOR -4000-SB5204, -4000-KB5204.</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 	<p><b>INSPECTION WINDOW - 8002/1, 8002/2</b> Marking of explosion protection: II 2G Ex eb IIC Gb II 2D Ex tb IIIC Db</p> 																						

Max. number of inspection windows on one cover:

	CZ8002/2		CZ8002/1	
	7J	4J – znak „X“	7J	4J – znak „X“
SKX 17	1	2	-	-
SKX 18	1	2	-	1
SKX 20	2	4	1	2

## 9. BUILD-IN COMPONENTS:

Description, type, display	Description, type, display					
<p><b>MAIN CONTROL SWITCH 40A/80A</b> <b>GHG 263 ...R...., GHG 264 ...R....</b> Marking of explosion protection: II 2G Ex db eb IIC Gb - <b>CZ0513.040, CZ0513.080</b> Marking of explosion protection: II 2G Ex db eb IIC Gb</p>  	<p><b>MCB - MINIATUR CIRCUIT BRAKER 1p/2p/3p/4p,B/C, 0,5-63A, 6/10 kA, GHG 622....</b> Marking of explosion protection: II 2G Ex db e [ia] ib IIB/IIC Gb</p> 					
<p><b>RESIDUAL CURRENT CIRCUIT BREAKERS 2p/3p/4p 25/40/63 A, 30 mA, 10 kA with or without auxiliary contact</b> <b>GHG 624</b> Marking of explosion protection: II 2G Ex db e [ia] ib IIB/IIC Gb</p> 	<p><b>BUILD IN SOCKET 16 A (3p/5p), 32A (4p) 16, 32A</b> Marking of explosion protection: II 2G Ex de IIC II 2D Ex tD A21 IP66</p> 					
<p><b>DIGITAL INDIKATOR VEGADIS 176 Ex</b> Marking of explosion protection: II 2G Ex ib IIC T6 Gb</p> 	<p><b>SIGNAL LAMP SLP</b> Marking of explosion protection: II 2G Ex db eb IIC Gb I M2 Ex db eb I Mb Rated insulation voltage: 690 V Rated voltage: 12 to 250 V AC/DC Rated current: 12 to 2,5 mA Connection terminals: 2 x 1,0 -2,5 mm2</p>  					
<p><b>PUSHBUTTON PBT/ ., PTB/ . G</b> Marking of explosion protection: II 2G Ex db eb IIC Gb I M2 Ex db eb I Mb Rated voltage: 690 V Rated current: 16 A Application category AC 15: 250 V/6 A 500 V/4 A Application category DC 13: 24 V/6 A 60 V/0,8 A 110 V/0,5 A Connection terminals: 2 x 1,0 - 2,5mm2</p>  <p><b>PTB/ . G</b> – gold-plated contacts For voltage up to 60 V and current from 1 mA to 200 mA</p> 	<p><b>POTENCIOMETAR - GHG 410 1901 R....</b> Marking of explosion protection: II 2G Ex d e IIC/IIB Gb I Mb Ex d e I Mb - <b>0203-A</b> Protueksplozijska zaštita: II 2G Ex db eb IIC Gb Rated voltage: from 250 V Rated power: 1 W Rev range: 270° Scale: 0-100% Connection terminals: 2 x 1,0 - 2,5 mm2</p>  <p>Resistance R:</p> <table><tr><td>1,0 kΩ</td></tr><tr><td>2,2 kΩ</td></tr><tr><td>4,7 kΩ</td></tr><tr><td>10 kΩ</td></tr><tr><td>470 kΩ</td></tr></table> 	1,0 kΩ	2,2 kΩ	4,7 kΩ	10 kΩ	470 kΩ
1,0 kΩ						
2,2 kΩ						
4,7 kΩ						
10 kΩ						
470 kΩ						



## MANTLE TERMINALS SL 5

Marking of explosion protection:

II 2G Ex eb IIC Gb

Rated voltage: 400 V

Rated current: 10/16 A

Connection terminals:

3 x 4 mm<sup>2</sup>, 2 x 4 mm<sup>2</sup> + 2 x 2,5 mm<sup>2</sup>



## MANTLE TERMINALS SL 8

Marking of explosion protection:

II 2G Ex eb IIC Gb

Rated voltage: 400 V

Rated current: 10/16 A

Connection terminals:

3 x 4 mm<sup>2</sup>, 2 x 4 mm<sup>2</sup> + 2 x 2,5 mm<sup>2</sup>



## - DOUBLE PUSHBUTTON- 0201

Marking of explosion protection :

II 2G Ex db eb IIC Gb



## TRANSFORMATOR Ex e

STA 0,1, STA 0,2, STA 0,3, STA 0,4

Marking of explosion protection:

II 2G Ex eb IIC Gb

Installation allowed only in MMK 20/2

Tamb ≤ +40 ° C

It is factory-protected against overload



## CONTROL SWITCH SMS 03/.

Marking of explosion protection:

II 2G Ex db eb IIC Gb

I M2 Ex db eb I Mb

Rated voltage: 690 V

Rated current: 16 A

Application category AC 23:

690 V/8 A

Application category AC 3:

380 V/10 A

Application category DC 21:

60 V/10 A 110 V/1,85 A 220 V/0,6 A

Connection terminals: 2 x 1,0 - 2,5mm<sup>2</sup>



## CONTROL SWITCH GHG 23. ...R...

Marking of explosion protection:

I M2 Ex d e I Mb II 2G Ex d e IIB/IIC Gb

II 2G Ex d ia/ib IIB/IIC Gb

Rated voltage: 690 V

Rated current: 10 A

Application category AC 11:

230 V/10 A 500 V/6 A

Application category DC 11:

24 V/2 A 230 V/0,4 A

Connection terminals: 2 x 1,0 - 2,5mm<sup>2</sup>



		SMS 03/1
		SMS 03/2
		SMS 03/3
		SMS 03/4
		SMS 03/5
		SMS 03/6
		SMS 03/7
		SMS 03/8
		SMS 03/9
		SMS 03/10
		SMS 03/11
		SMS 03/12

		060
		062
		065
		061
		063
		067
		011
		034
		037
		049
		023
		019
		033
		024

## HRC FUSE, Ex d HOUSING 3p NH00C the base and fuse, GHG 6113001V0

Marking of explosion protection:  
II 2G Ex de IIC 1 M2 Ex de I



### MEASURING INSTRUMEN

- GHG 41098 09 R... (AM 72)

Marking of explosion protection:

II 2G Ex e IIC Gb II 2G Ex e mb IIC Gb

II 2G Ex ib IIC Gb

- 0205-.A, 0205-.mA

Marking of explosion protection:

II 2G Ex eb mb IIC Gb II 2G Ex eb IIC Gb

Instrument with moving iron

Measuring range: n / 1 A, up to 25 A direct

Overloading area: 1: 1,5

Measuring accuracy: class 2,5

Connection terminals: 2 x 1,5 - 4 mm<sup>2</sup>



Instrument with moving-coil

Measuring range: 0 - 20 mA, 4 - 20 mA

Measuring accuracy: class 1,5

Overloading area: 1: 1,2

Connection terminals: 2 x 1,5 - 4 mm<sup>2</sup>

Parameters of Intrinsic Safety:

$L_i = 0,1$  mH max.

$C_i = 0,1$  nF max.

$U_i = 30$  V max.

$U_i = 150$  mA max.

$U_m = 690$  V<sub>rms</sub>

### MEASURING INSTRUMEN

- GHG 41098 08 R... (VM 72)

Marking of explosion protection:

II 2G Ex e IIC Gb II 2G Ex e mb IIC Gb

II 2G Ex ib IIC Gb

- 0205-.V

Marking of explosion protection:

II 2G Ex eb mb IIC Gb

II 2G Ex eb IIC Gb

Instrument with moving iron

Measuring range : 6 - 660 V

Measuring accuracy: class 2,5

Overload range: 1: 1,5

Connection terminals: 2 x 1,5 - 4 mm<sup>2</sup>



### ASSEMBLY OF TERMINAL BLOCK ON THE APPARATUS CARRIER

TH 35-7.5

2 x 16 mm<sup>2</sup> CTS16U

5 x 4 mm<sup>2</sup> CTS4UN

5 x 4 mm<sup>2</sup> CTS4UN RAL 5012

Screw connection terminals 2x16 mm<sup>2</sup> or 5 x 4 mm<sup>2</sup> on the apparatus carrier TH 35-7,5

Marking of explosion protection:

II 2G Ex eb IIC Gb

Rated voltage: 630 V

Rated current: 10/16 A

Screw connection terminals 5 x 4 mm<sup>2</sup> RAL 5012 on the apparatus carrier TH 35-7,5

Marking of explosion protection:

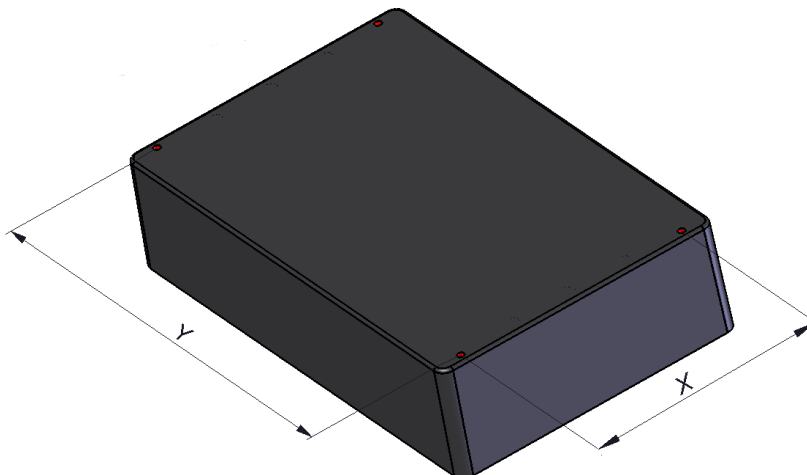
II 2G Ex ib IIC Gb

Maximum safe voltage: 60 V



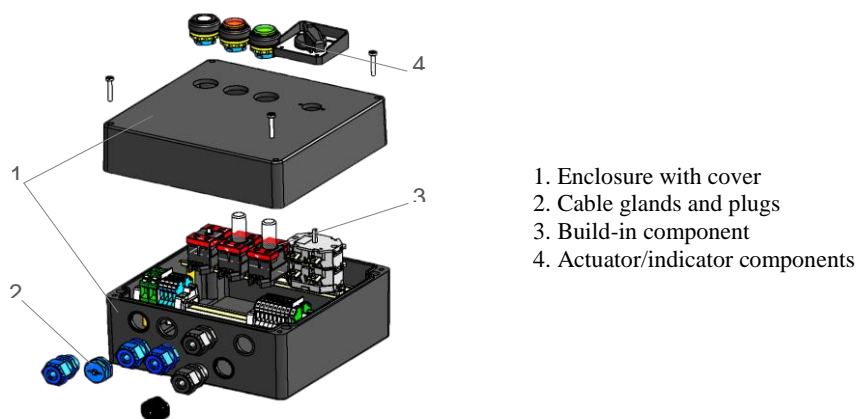
## 10. MOUNTING

Mounting of explosion protected control unit SKX 16 – SKX 20 is done by tightening on a flat surface or wall with a screw kit M6x16 on the given dimensions.



Enclosure	Dimension	
	X[mm]	Y[mm]
SKX 17	200	280
SKX 18	200	380
SKX 20	200	580

## 11. SPARE PARTS AND ACCESSORIES



## 12. INSPECTION, MAINTENANCE, REPAIR AND OVERHAUL

Inspections are carried out in accordance with EN 60079-17, general and special conditions of manufacturer and users Regulations and includes supervision of parts on which the explosion protection depends, especially:

- that the housing, cover and gasket of cover are without rupture and damage,
- that the screw of cover, cable glands, plugs and terminal are fastened with nominal torque
- that the terminals are undamaged and properly attached to a DIN rail
- that the build-in and actuator/indicator components are undamaged and properly fixed to the housing and cover, and that seals from a build-in components are intact, the screws of the connecting terminals are tightened with nominal torque,
- that the cable glands and plugs are installed in accordance with manufacturer's instructions and fasten with the nominal torque and the gaskets are undamaged.

All the repairs are performed by the manufacturer or the manufacturer's authorized personal and the original parts must be provided according to the product documentation, all in accordance with EN 60079-19.

If repair or any other procedure are performed on the product by unauthorized person, all manufacturer responsibility for the product and the warranty and the manufacturer's declaration of conformity becomes invalid.

## 13. RESPONSIBILITY AND AUTHORIZATION

This instruction is the basic information about the product. It is completed by the corresponding national laws and regulations. Production, use, certification and supervision are determined at the national level:

- a) Regulations concerning equipment and protective systems intended for use in potentially explosive atmospheres EU directive 2014/34/EU and
- b) Regulations on minimum requirements for safety and health protection of workers and technical inspection of facilities, equipment, installations and equipment in hazardous areas EU directive 1999/92/EC (ATEX 137).

The responsible person shall ensure their implementation at the working facility.

## 14. STORAGE AND TRANSPORT

Storage and transport should only be made in the original packaging, as outlined in the cardboard box.

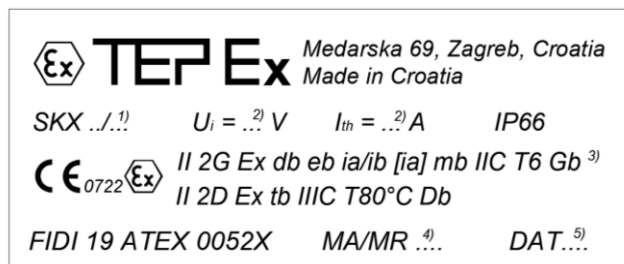
## 15. MANUFACTURER'S WARRANTY

The manufacturer gives guarantee on the product for a period of one year under the provisions of the Law on Obligations. This statement has the force of the guarantee list.

## 16. MARKING

Explosion protected control unit SKX 17 – SKX 20 are marked:

- marking plate and marking label with technical data on housing cover and in the housing



- 1) type code of the explosion control unit
- 2) technical data of fitted equipment
- 3) correct explosion protection marking depending on the correct version of the fitted explosion protected elements
- 4) MR manufacturer marking (product number)
- 5) manufacturing date (month / year)

- warning plate on the housing cover

**WARNING**  
DO NOT OPEN WHEN ENERGIZED

**WARNING**  
DO NOT OPEN WHEN DUST EXPLOSIVE  
ATMOSPHERE IS PRESENT