CONTENT

1. MANUFACTURER

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2. GENERAL SAFETY INFORMATIONS

⚠ 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 terminal boxes, type SKX 12/E - SKX15/E, are used for transfer and distribution of electrical energy:
- in areas with a potentially explosive atmosphere in hazardous areas 1, 2, 20, 21 in accordance with EN 60079-10/-1/2.

4. DEGREE OF PROTECTION

Explosion protection ensure utilizing type of protection "increased safety", and "intrinsic safety" in accordance with EN 60079-7 and EN 60079-11 with the "general requirements" according to EN 60079-0 + A11.

Category and explosion protection type:

II 2G Ex eb IIC T6 Gb
II 2G Ex ia/ib IIC T6 Gb
II 2G Ex eb ia/ib IIC T6 Gb
II 2D Ex tb IIIC T80°C Db

Ambient temperature: -20°C ≤ Tamb≤+40°C/+50°C/+55°C
Mechanical protection: IP 66 category 1, according to EN 60529+A1
Shock resistance: IK 08 according to EN 62262
Class of protection: I (protective earthing), internal PE terminal and external PA terminal when using metal glands for armored cables, according to EN 60947-1/A1

Type-examination certificate: EXA 15 ATEX 0044

5. PRODUCT COMPLIANCE

The product has been developed, manufactured and tested according to the existing state of technique according with the standards EN ISO 9001, EN ISO 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 RoHS Directive 2011/65 EC.
The product is in compliance with EMC Directive 2014/30/EU.

6. TABLE TYPES

The sides A, B, C, D of the terminal boxes are drilled for mounting the corresponding cable entries. Measures for drilling are provided in the certification drawings of the terminal boxes MMK12 - MMK15: T64.10.39.00, T 64.10.40.00-2, 64.10.41.00-2 T, T 64.10.42.00-2, type certificate EXA 14 ATEX 0073U. Table gives the maximum number of introductions / glands at the terminal box, noting that the specified position allow drilling of each smaller size cable entry and installation of every minor cable glands.
Max. number of introduction / glands housing per terminal box side:

	ISO 16		ISO 20		ISO 25		ISO 32	
	A-C	B-D	A-C	B-D	A-C	B-D	A-C	B-D
SKX 12	2	2	2	2	1	1		
SKX 13	2	4	2	3	1	2		
SKX 14	2	6	2	4	1	3	1	2
SKX 15	4	6	3	4	2	3	1	2
SKX 15 s N/PE busbar	4	5	3	3	2	3	1	

For terminal boxes SKX 12 SKX 13 SKX 14 the maximum number of terminals with connecting conductors of the same rated cross-section and the maximum continuous current is determined by the method of maximum rated losses (worst case).

SKX 12/E			
Rated cross section conductors / terminals [mm²]	**Max. number of terminals**	**Ambient temperature T_a[°C]**	**I_{max} [A]**
4 / 4	5	40	20
4 / 4	5	50	18
4 / 4	5	55	17

SKX 13/E01			
Rated cross section conductors / terminals [mm²]	**Max. number of terminals**	**Ambient temperature T_a[°C]**	**I_{max} [A]**
4 / 4	8	40	19
4 / 4	8	50	17
4 / 4	8	55	16

SKX 13/E02			
Rated cross section conductors / terminals [mm²]	**Max. number of terminals**	**Ambient temperature T_a[°C]**	**I_{max} [A]**
6 / 6	8	40	25
6 / 6	8	50	22
6 / 6	8	55	19

SKX 14/E01			
Rated cross section conductors / terminals [mm²]	**Max. number of terminals**	**Ambient temperature T_a[°C]**	**I_{max} [A]**
4 / 4	16	40	20
4 / 4	16	50	18
4 / 4	16	55	16

SKX 14/E02			
Rated cross section conductors / terminals [mm²]	**Max. number of terminals**	**Ambient temperature T_a[°C]**	**I_{max} [A]**
6 / 6	16	40	25
6 / 6	16	50	22
6 / 6	16	55	19

On the each terminal is allowed to connect smaller cross section conductor than the rated size of the terminal block, according to the technical data, with the obligatory reduction of the maximum current of the conductors. Maximum current of the conductor that are smaller cross section than the rated (S2) is obtained by multiplying the maximum current od the conductors with the rated cross-section (Sn) factor

$\sqrt{\frac{S_2}{S_n}}$, i.e. I2=In $\sqrt{\frac{S_2}{S_n}}$

SKX 15/ E - according to the table of the permitted number of the combination of the terminals, rated cross sections and maximum current for rated cross sections

Table of permitted combinations of conductors on the principle of maximum rated losses:1)

SKX 15/E			
Rated cross section conductors / terminals [mm²]	**Max. number of terminals 1)**	**Ambient temperature T_a[°C]**	**I_{max} [A]**
2,5 / 2,5	2	40	18
2,5 / 2,5	4		16
2,5 / 2,5	24		13
2,5 / 2,5	28		12
2,5 / 2,5	2	50	16
2,5 / 2,5	4		14
2,5 / 2,5	24		11
2,5 / 2,5	28		10
2,5 / 2,5	2	50	15
2,5 / 2,5	4		13
2,5 / 2,5	24		10

2,5 / 2,5	28		9
4 / 4	4	40	21
4 / 4	8		18
4 / 4	24		16
4 / 4	4	50	18
4 / 4	8		16
4 / 4	24		14
4 / 4	4	55	17
4 / 4	8		15
4 / 4	24		12
6 / 6	2	40	36
6 / 6	4		32
6 / 6	8		22
6 / 6	16		20
6 / 6	2	50	30
6 / 6	4		26
6 / 6	8		19
6 / 6	16		17
6 / 6	2	55	26
6 / 6	4		23
6 / 6	8		16
6 / 6	16		14
10 / 10	2	40	50
10 / 10	4		45
10 / 10	8		37
10 / 10	12		33
10 / 10	2	50	42
10 / 10	4		37
10 / 10	8		30
10 / 10	12		26
10 / 10	2	55	38
10 / 10	4		34
10 / 10	8		27
10 / 10	12		23
16 / 16	2	40	66
16 / 16	4		58
16 / 16	8		55
16 / 16	12		50
16 / 16	2	50	58
16 / 16	4		50
16 / 16	8		45
16 / 16	12		40
16 / 16	2	55	52
16 / 16	4		45
16 / 16	8		40
16 / 16	12		35
25 / 25	2	40	80
25 / 25	4		70
25 / 25	8		60
25 / 25	2	50	70
25 / 25	4		60
25 / 25	8		50
25 / 25	2	55	60
25 / 25	4		50
25 / 25	8		40
35 / 35	2	40	109
35 / 35	4		80
35 / 35	2	50	95
35 / 35	4		70
35 / 35	2	55	85
35 / 35	4		60

	Rated cross section of conductors – rated cross section of terminals (mm^2)						
	2,5	**4**	**6**	**10**	**16**	**25**	**35**
The maximum number of terminals specified by the measures of the terminal boxes	28 + sabirnica 22PE	24	16	14	12	8	4
Width of terminal [mm]	5	6	7	10	12	12	15
Allowed number of conductors per terminal	1x2,5-1,5 mm^2	1x4-1,5 mm^2	1x6-1,5 mm^2	1x10-2.5 mm^2	1x16-2.5 mm^2	1x25-6 mm^2	1x35-6 mm^2
Width of PE terminal [mm]	6	6	8	10	12	16	16
Width of final terminal [mm]	9						
Space for a terminal on DIN rail without end terminals	max. 140 mm						

1) Two conductors are connected on one terminal
PE conductors and jumpers are not taken in the calculation

It is possible to connect on one terminal smaller nominal cross-section conductors, but the maximum number of conductors and maximum current for the nominal wire size must be respected according to "Table of permitted installation". Combination of many different nominal cross-section terminals and conductors in one terminal box is allowed. Possible combinations are calculated on the basis of the "Table of permitted installation" so that the total maximum losses and the possibility of a physical installation is possible.

Example: SKX 15/E $-20°C \leq T_{amb} \leq +40°$				
Cross-section [mm^2] conductors and terminal	Current [A]	No. of terminals	% of max. losses	mounting dimensions
2,5	12	8 (max. 28)	28,6 %	8x5=40
4	21	1 (max. 4)	25,0 %	1x6=6
6	22	1 (max. 8)	12,5 %	1x7=7
10	33	4 (max. 12)	33,3 %	4x10=40
			ukupno = 99,4% < 100%	93mm<140mm

7. TECHNICAL DATA

Rated voltage: up to 630 V
Rated cross-section of terminal: up to 35 mm^2
Max- number of conductors / terminals for rated cross-section / terminals and the maximum currents: see "Table types" and "Table of permitted installation"

Striping length of conductors:
2,5 mm^2 - 10 mm
4 mm^2 - 10 mm
6 mm^2 - 12 mm
10 mm^2 - 12 mm
16 mm^2 - 14 mm
25 mm^2 - 14 mm
35 mm^2 - 18 mm

Maximum safe voltage Um for intrinsically safe circuits: 60 V

PE terminal inside terminal box:	max. 2 x 4 mm2 + 2 x 2,5 mm2 , 3 x 4 mm2 , 2 x 6 mm2 - single-core, multi-core, flexible (s(r), s(s), f)
N/PE busbar (SKX 15/E):	2 x (11 x max. 2 x 2,5 mm2), single-core, multi-core, flexible (s(r), s(s), f)
Striping length of conductors for each terminal:	CTS2.5UN, CTS4UN – 9 mm CTS6U, CTS10U – 12 mm CTS16U – 16 mm CTS25U – 18 mm CTS35UN – 18 mm
Final lugs:	Conductor with final lugs according DIN 46228 T1
Screw tightening torque of each cross-section terminal:	CTS2.5UN – 0,4 Nm CTS4UN – 0,5 Nm CTS6U – 0,8 Nm CTS10U – 1,2 Nm CTS16U – 2,0 Nm CTS25U – 2,0 Nm CTS35UN – 2,5 Nm
Cable entry's:	ISO 16 – ISO 32 according to EN 62444, according to the data from "Table type"
Screw of the cover:	Combo screw M5x2 (Z4) - 4.8 A2, tightening torque of the screws 1,5 Nm
Surface Resistivity:	$< 10^9$ Ω
Impact energy:	7 J
Color:	black, RAL 9005
Dimensions (LxWxH)	SKX 12 : 100 x 100 x 80 mm SKX 13 : 150 x 100 x 80 mm SKX 14 : 200 x 100 x 80 mm SKX 15 : 200 x 150 x 80 mm
Mounting the surface:	screw accessories through a hole ø 6x8 mm in to the terminal box: SKX 12 : 75 x 50 mm SKX 13 : 75 x 100 mm SKX 14 : 75 x 150 mm SKX 15 : 125 x 150 mm
Weight:	SKX 12 : ca. 0,5 kg SKX 13 : ca. 0,7 kg SKX 14 : ca. 1,0 kg SKX 15 : ca. 1,0 - 1,5 kg

8. 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
- 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.

9. SPARE PARTS

- Cover gasket of the housing MMK12, MMK13, MMK 14, MMK 15
- Ex e II cable gland M16, M20, M25, M32, M40, set
- Ex e II plug M16, M20, M25, M32, M40, set
- Ex e II terminal - tip: CTS4UN (0,5-4 mm2), CTS6U (1,5-6 mm2), CTS16U (2,5-16 mm2), CTS25U (6-25 mm2), CTS35U (6-35 mm2) with end plates
- Screw of the cover – Combo screw M25x2 (Z4) - 4.8 A2

10. STORAGE AND TRANSPORT

Transportation and warehousing is only allowed in the original packaging, as outlined in a cardboard box.

11. RESPONSIBILITY AND AUTHORIZATION

This instruction is the basic information about the product. It is complementing with 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 94/9 EC (ATEX 94)

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).

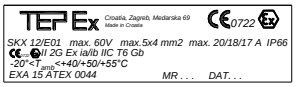
The responsible person shall ensure their implementation at the working facility.

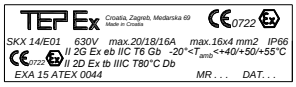
12. MARKING

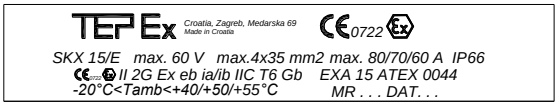
Explosion protected terminal box SKX 12/E - SKX 15/E is marked:

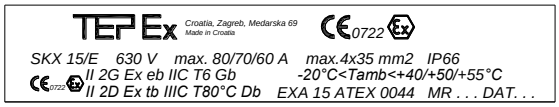
- inner label with technical data inside housing:

- external label with technical data on housing cover:









- warning label on housing cover:

WARNING
DO NOT OPEN WHEN ENERGIZED

Terminal box SKX 15/E is marked on the internal side of the cover with “Table of permitted installation”:

SKX 15/E							
Nazivni presjek vodiča / stezaljki [mm²]	Najveći broj stezaljki	Temperatura okoline T_a[°C]	I_{max} [A]	Nazivni presjek vodiča / stezaljki [mm²]	Najveći broj stezaljki	Temperatura okoline T_a[°C]	I_{max} [A]
2,5 / 2,5	2	40	18	10 / 10	2	50	42
2,5 / 2,5	4		16	10 / 10	4		37
2,5 / 2,5	24		13	10 / 10	8		30
2,5 / 2,5	28		12	10 / 10	12		26
2,5 / 2,5	2	50	16	10 / 10	2	55	38
2,5 / 2,5	4		14	10 / 10	4		34
2,5 / 2,5	24		11	10 / 10	8		27
2,5 / 2,5	28		10	10 / 10	12		23
2,5 / 2,5	2	50	15	16 / 16	2	40	66
2,5 / 2,5	4		13	16 / 16	4		58
2,5 / 2,5	24		10	16 / 16	8		55
2,5 / 2,5	28		9	16 / 16	12		50
4 / 4	4	40	21	16 / 16	2	50	58
4 / 4	8		18	16 / 16	4		50
4 / 4	24		16	16 / 16	8		45
4 / 4	4	50	18	16 / 16	12		40
4 / 4	8		16	16 / 16	2	55	52
4 / 4	24		14	16 / 16	4		45
4 / 4	4	55	17	16 / 16	8		40
4 / 4	8		15	16 / 16	12		35
4 / 4	24		12	25 / 25	2	40	80
6 / 6	2	40	36	25 / 25	4		70
6 / 6	4		32	25 / 25	8		60
6 / 6	8		22	25 / 25	2	50	70
6 / 6	16		20	25 / 25	4		60
6 / 6	2	50	30	25 / 25	8		50
6 / 6	4		26	25 / 25	2	55	60
6 / 6	8		19	25 / 25	4		50
6 / 6	16		17	25 / 25	8		40
6 / 6	2	55	26	35 / 35	2	40	109
6 / 6	4		23	35 / 35	4		80
6 / 6	8		16	35 / 35	2	50	95
6 / 6	16		14	35 / 35	4		70
10 / 10	2	40	50	35 / 35	2	55	85
10 / 10	4		45	35 / 35	4		60
10 / 10	8		37				
10 / 10	12		33				