APPLICATION

Explosion protected control units type SKX 12 – SKX 15, alone or in various combinations of merged set (combination) are intended for the control, distribution and signaling in the power circles in places with an explosive gas and dust atmosphere. Control units are designed for use in the industrial areas and facilities, indoor and outdoor spaces.
Hazardous areas 1, 2, 21, 22.

CONSTRUCTION

Enclosure: polyester plastic reinforced with glass fiber, color - black
Cover: with integrated Thermoplastic elastomer gasket, closes with four M5 stainless steel screws.
Due to the four available sizes and the modular design, the devices can be used for almost every application. Built-in components, actuators and indicator components can be mounted in or on Ex e enclosures or combination of merged enclosures. Possible combinations and schedules built-in components, actuators and indicator components is determined by the certification documentation. Control units usually aren't wired.

TECHNICAL DATA

Certificate:	CESI 13 ATEX 017X, EXA 13 ATEX 0029
Marking:	CE 0722
Apparatus category:	Ex II 2G II 2D
Marking of explosion protection:	Ex e IIC or Ex de IIC, Ex de mb IIC, Ex ia/ib IIC T6 Gb Ex tb IIIC T80°C Db
Ambient temperature:	-20 °C ≤ T_a ≤ +50 °C
Degree of protection:	IP 66 category 1
Resistance to shock:	IK 08
Protection class:	I (protective earthing)
Rated insulation voltage U_i:	690 V AC (type with mantle terminals type SL Ui=400V AC)
Rated current I_{th}:	Up to 16 A (SKX 12-15) Up to 80A (SKX 16-20)
PE terminals (inside of the enclosure):	max. 2x4 mm2+2x2,5 mm2 , 3x4 mm2 , 2x6 mm2
Cover fixing:	4xM5/M6 cheese head screw, stainless steel A2
Color:	black, RAL 9005
Weight (only GRP boxes):	SKX 12 ..... 0.5 kg SKX 13 ..... 0,7 kg SKX 14 ..... 1.0 kg SKX 15 ..... 1.0 kg SKX 16 ..... 3,5 kg SKX 18 ..... 4,5 kg SKX 20 ..... 7,0 kg

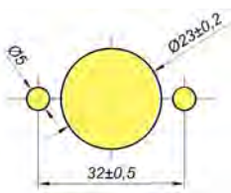
MOUNTING With screw kit through the housing holes f6 mm at the peaks the rectangle:

SKX 12: 75 x 50 mm
SKX 13: 75 x 100 mm
SKX 14: 75 x 150 mm
SKX 15/15H: 125 x 150 mm
SKX 16: 235 x 200 mm
SKX 18: 380 x 200 mm
SKX 20: 580 x 200 mm

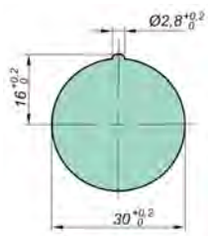
INSTRUCTIONS FOR DESIGN OF CONTROL UNITS type SKX 12/.. - 15/..

Products according to special request of the customer have the type designation which consists of a basic type designation: **SKX 12, SKX13, SKX 14, SKX 15 and MSRU** number that represents the production number assigned by the manufacturer. The customer in the order defined the configuration, eg:
In to enclosure MMK 15 is installed switch SMS 03/3 with the switch actuator SMO 17/3, signal lamps SLP with a red front element SPO 02/01 and green SPO 02/02. On side A two cable glands ISO 25, and on side C two ISO plugs M25
Designation for ordering: MMK15 + SMS03/3 + SMO17/3 + 2xPBT/01+ SPO02/1 + SPO02/2 + A 2xSPU25 + C 2xSPC25

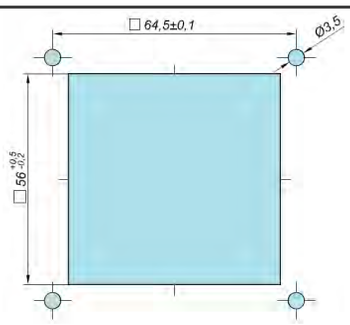
**** mounting proposals and dimensions***



Switch actuator SMO 17/.
Switch mounting

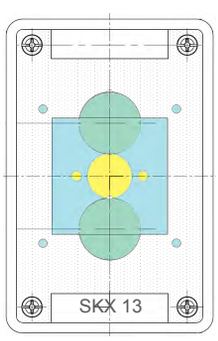


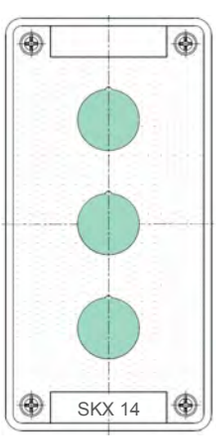
Pushbutton actuator SPO 01/.
Front element of signal lamp SPO 02/.
Pushbutton, signal lamp and potentiometer mounting

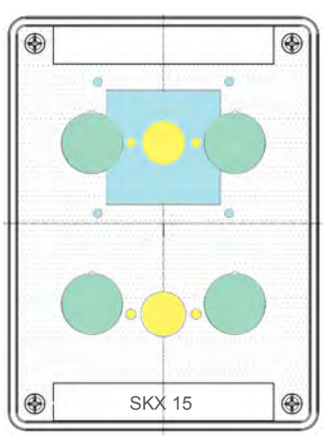


Front element of measuring instrument (AM, VM) SAM 72
Measuring instrument mounting AM, VM

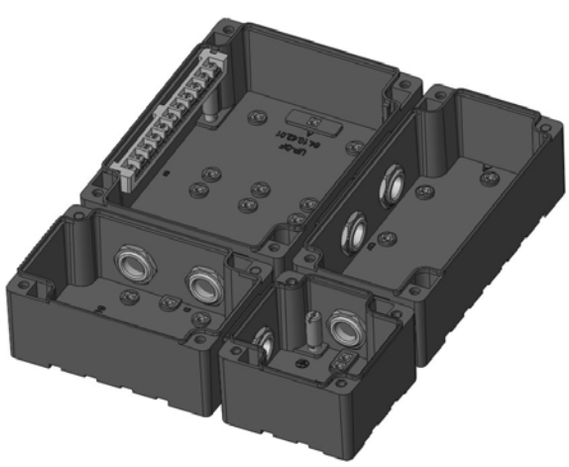
. Possible combinations and layout of indicators and actuators components

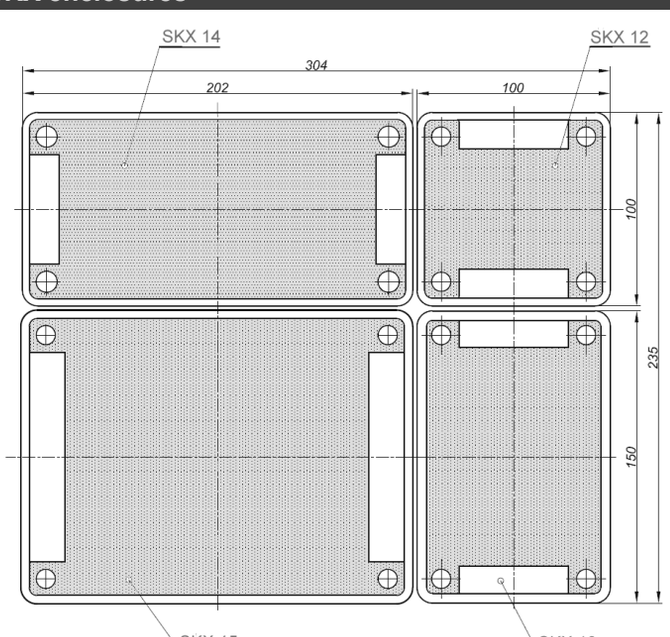




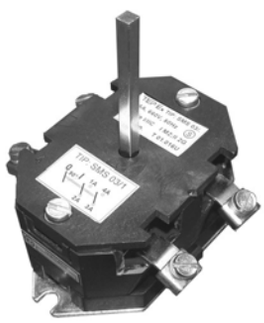


Various combinations of merged set (combination) of SKX enclosures

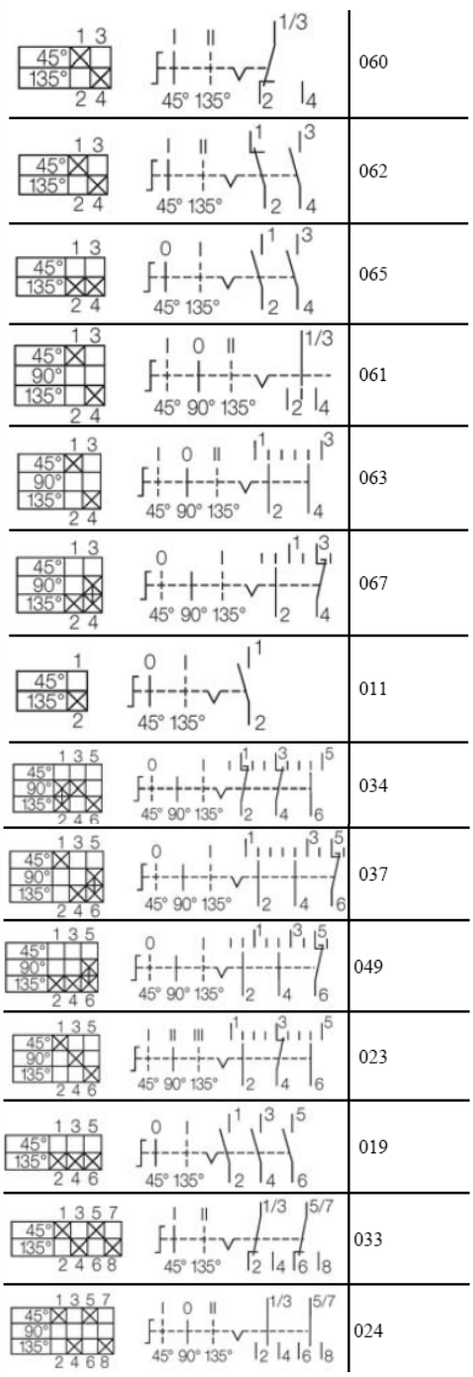
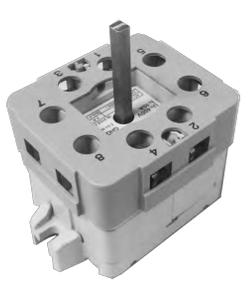
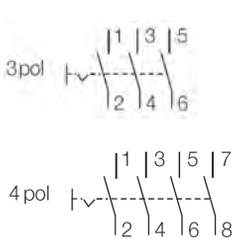




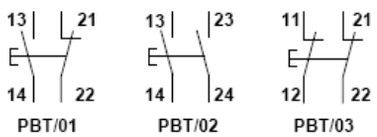
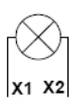
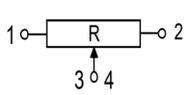
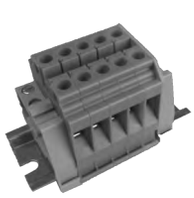
BUILD-IN COMPONENTS

Description, type	Schema	Overview
Control switch SMS 03/. II 2G I M2 Ex de I/IIC Gb Mb • Rated voltage: 630 V AC • Rated current: 16 A • Terminals: 2,5 mm^2	**Type** / **Shema** 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 SMS 03/13	

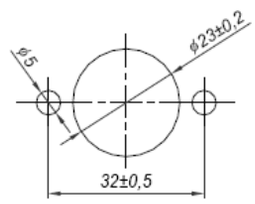
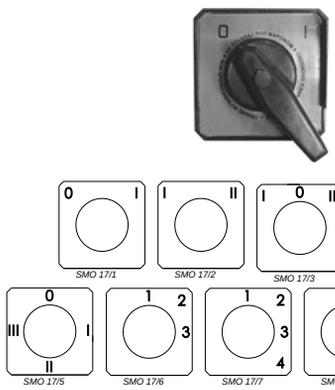
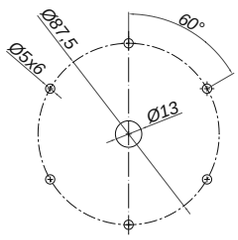
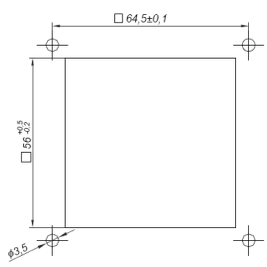
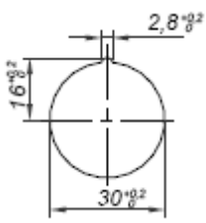
BUILD-IN COMPONENTS

Description, type	Schema	Overview
Control switch GHG 23. II 2GD Ex de IIC • Rated voltage: 690 V AC • Rated current : 10 A • Terminals: 2,5 mm^2		
Main curent switch GHG 260 • Rated voltage: 690 V AC • Rated current : 40 - 80 A • Terminals: 16 - 25 mm^2		

BUILD-IN COMPONENTS

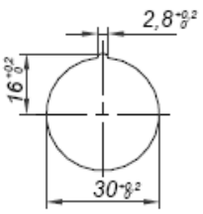
Description, type	Schema	Overview
Pushbutton PBT/. • Rated voltage: 630V AC • Rated current: 16A • Terminals: 2,5 mm^2		
Signal lamp SLP • Rated voltage: 12-250 V AC/DC • Max. current: 20-8 mA • Terminals: 2,5 mm^2		
Potentionmeter PBT/POT • Rated voltage: 315 V AC/DC • Rated power: 1W • Scale: 0-100% / 270° • Tolerance: ±20% • Characteristic: linear • Terminals: 2,5 mm^2	 Resistance R: 1,0 kΩ 2,2 kΩ 4,7 kΩ 10 kΩ 470 kΩ	
Measuring instruments AM 72, VM 72 • Measuring range: AM: n/1 A, 0-20 mA, 0-25 A direct 4-20 mA VM: n/1A, 6-415V, 6-660 V • Scale: according to customer demand • Terminals: 1,5 - 4 mm^2	-	
Mantle terminals SL5 , SL8 • Rated voltage: 400 V • Rated current: 16 A AC • Terminals: 4 mm^2 • Max. No. of wire under one clamp: 2x4mm^2 + 2x2,5mm^2, 3x4mm2	-	
Terminals TH 35-7.5 • 5 terminals 4mm^2 • 2 terminals 16mm^2 • Rated voltage: 690 V AC • Rated current: 16 A	-	
N/PE busbar (only for SKX 15) • 11x max. 2x4mm^2	-	

ACTUATORS AND INDICATORS

Description, type	Mounting	Overview
Switch actuator SMO 17/. II 2G II 2D I M2 Ex e I/IIC Gb Mb Ex t IIIC Db		
Switch actuator GHG 260 1006		
Front element of measuring instruments SAM 72 II 2G II 2D I M2 Ex e I/IIC Gb Mb Ex t IIIC Db		
Puschbitton actuator SPO 01/. II 2G II 2D I M2 Ex e I/IIC Gb Mb Ex t IIIC Db		

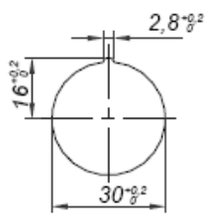
Type SPO 01/.

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

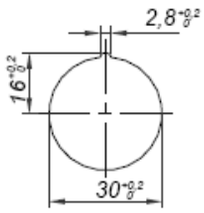
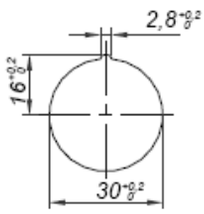
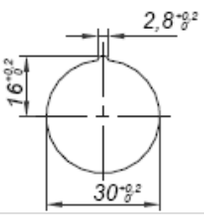
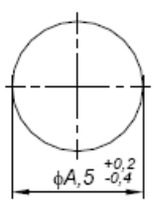
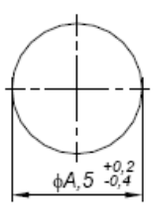
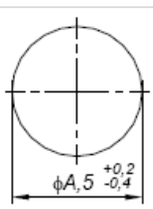
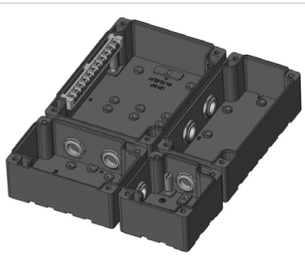
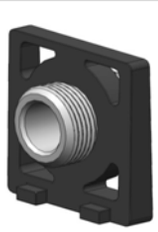
Description, type	Mounting	Overview
Front element of signal lamp SPO 02/. II 2G II 2D I M2 Ex e I/IIC Gb Mb Ex t IIIC Db		

Type SPO 02/.

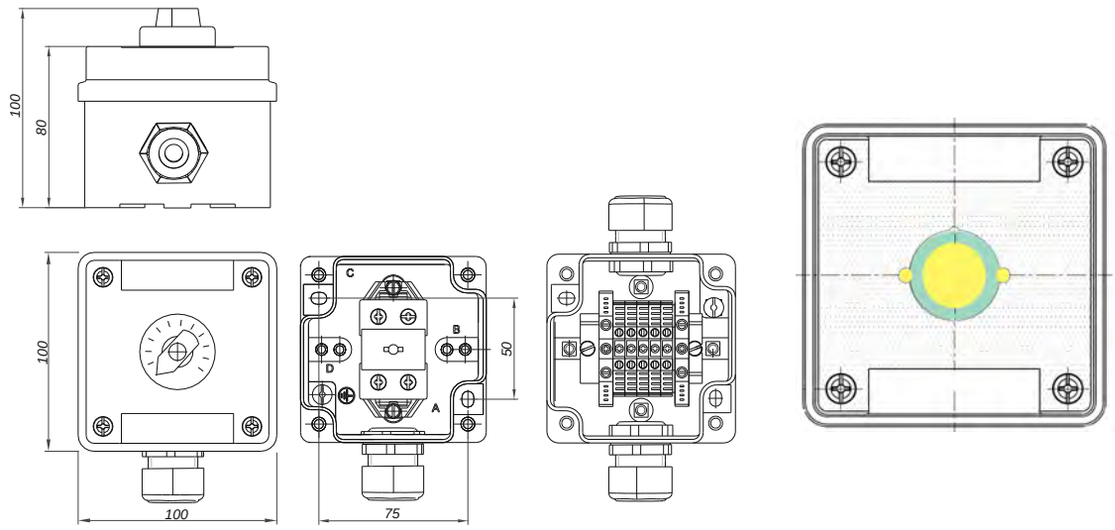
SPO 02/01	RED
SPO 02/02	GREEN
SPO 02/03	YELLOW
SPO 02/04	TRANSPARENT

Description, type	Mounting	Overview
Key-operated pushbutton actuator GHG 410 1904 R0012 II 2GD Ex e II IP66		

ACTUATORS AND INDICATORS

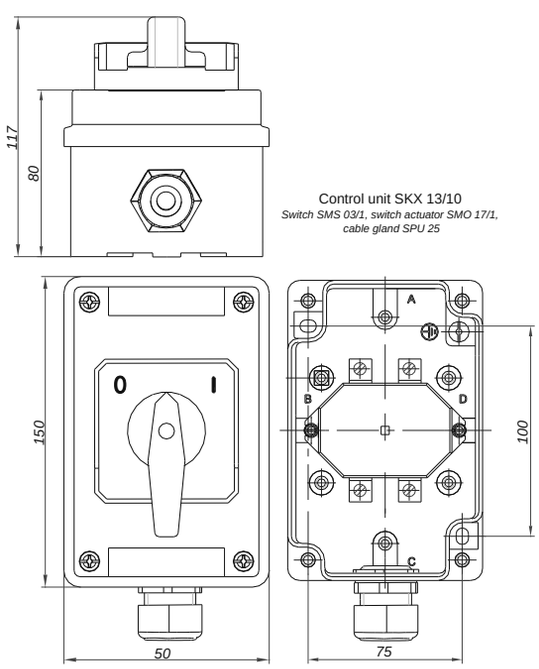
Description, type	Mounting	Overview
Mushroom-head pushbutton actuator GHG 418 815 ..R .. (EMERGENCY-STOP) II 2GD Ex e II IP66		
Key-operated mushroom-head pushbutton actuator GHG 418 815 ..R.. (EMERGENCY-STOP) II 2GD Ex e II IP66		
Potentiometer acuator GHG 410 1944 R0010 II 2GD Ex e II IP66		
Cable gland SPU ISO 16 - ISO 40 II 2G II 2D Ex e I/IIC Gb Ex t IIIC Db		
Cable gland for armourd cable SPU A ISO 16 - ISO 40 II 2G II 2D Ex e I/IIC Gb Ex t IIIC Db		
Plug SPC .. ISO 16 - ISO M40 II 2G II 2D Ex e I/IIC Gb Ex t IIIC Db		
Main fuse NH0 300XX, NH0, 301XX	-	
Connection part SKX		

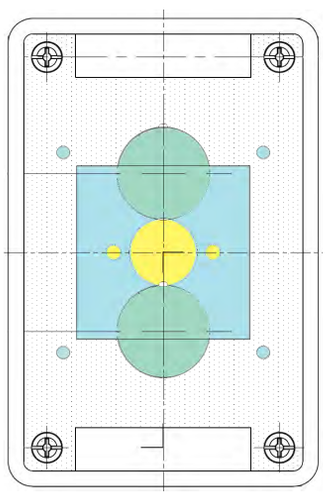
Enclosure type SKX 12



Max. No. of cable glands			
cable gland side	M16	M20	M25
A-C	2	2	1
B-D	1	1	1

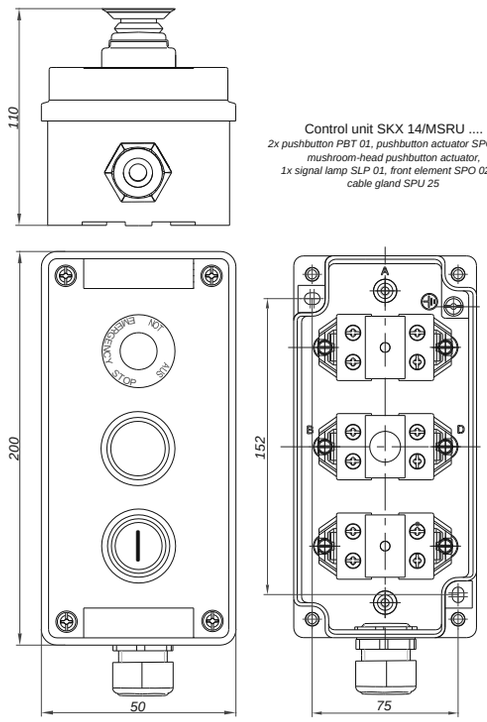
Enclosure type SKX 13



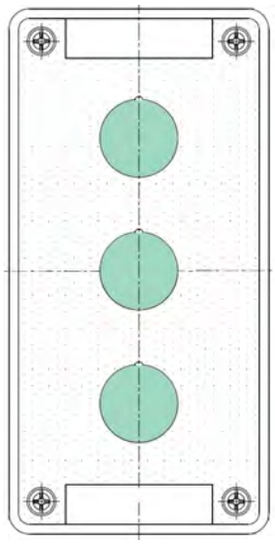


Max. No. of cable glands			
cable gland side	M16	M20	M25
A-C	2	2	1
B-D	4	3	2

Enclosure type SKX 14

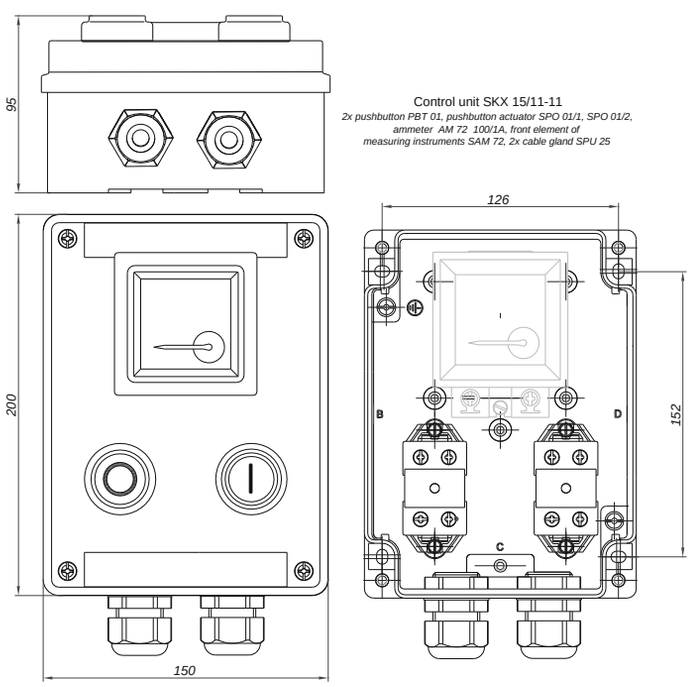


Control unit SKX 14/MSRU ....
2x pushbutton PBT 01, pushbutton actuator SPO 01/1, mushroom-head pushbutton actuator, 1x signal lamp SLP 01, front element SPO 02/02 cable gland SPU 25

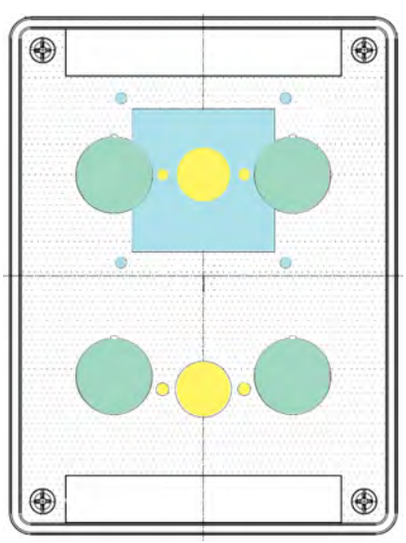


Max. No. of cable glands				
cable gland / side	M16	M20	M25	M32
A-C	2	2	1	1
B-D	6	4	3	2

Enclosure type SKX 15



Control unit SKX 15/11-11
2x pushbutton PBT 01, pushbutton actuator SPO 01/1, SPO 01/2, ammeter AM 72 100/1A, front element of measuring instruments SAM 72, 2x cable gland SPU 25



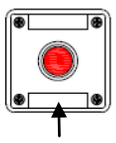
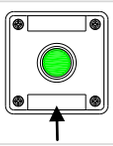
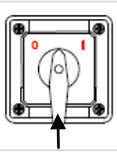
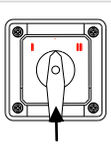
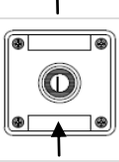
Max. No. of cable glands					
cable gland / side	M16	M20	M25	M32	M40
A-C	4	3	2	2	1
B-D	6	4	3	2	2

* with built-in N/PE busbar

cable gland / side	M16	M20	M25	M32	M40
A-C	4	3	2	2	1
B-D	5	3	3	-	-

STANDARD PRODUCTS OF CONTROL UNITS

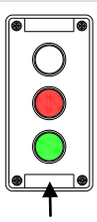
SKX 12/ ..

Type	Build-in components and actuator / indicator	Overview
SKX 12/1	Signal lamp SLP - red SPO 02/1 - cable gland SPU 25	
SKX 12/2	Signal lamp SLP - green SPO 02/2 - cable gland SPU 25	
SKX 12/3	Signal lamp SLP - white SPO 02/4 - cable gland SPU 25	-
SKX 12/21	Control switch SMS 03/1 - switch actuator SMO 17/1 - cable gland SPU 25	
SKX 12/22	Serial switch SMS 03/8 - switch actuator SMO 17/5 - cable gland SPU 25	**0 - I - II - III**
SKX 12/23	Control switch SMS 03/6 - switch actuator SMO 17/2 - cable gland SPU 25	
SKX 12/31	Pushbutton PBT 01 - Key-operated mushroom-head pushbutton actuator GHG 410 1906 R0005 - cable gland SPU 25	-
SKX 12/32	Pushbutton PBT 01 - pushbutton actuator SPO 01/1 - cable gland SPU 25	
SKX 12/33	Pushbutton PBT 01 - pushbutton actuator SPO 01/2 - cable gland SPU 25	
SKX 12/34	Pushbutton PBT 01 - Mushroom-head pushbutton actuator GHG 410 1905 R0005 - cable gland SPU 25	-
SKX 12/35	Pushbutton PBT 01 - Mushroom-head pushbutton actuator GHG 410 1906 R0005 with protector - 2x cable gland SPU 20	-
SKX 12/36	Pushbutton PBT 011 - Key-operated pushbutton GHG 410 1906 R0005 - 2x cable gland SPU 20	-
SKX 12/37	Potentiometer GHG 4101901 R0193 - GHG 410 1944 R0010 - cable gland SPU 25	-

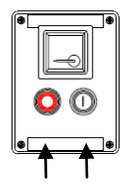
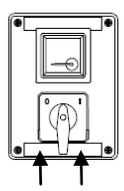
SKX 13/ ..

Type	Build-in components and actuator / indicator	Overview
SKX 13/1	2x pushbutton PBT 01 - SPO 01/1 - SPO 01/2 - cable gland SPU 25	
SKX 13/11	Pushbutton PBT 01 - SPO 01/1 - Signal lamp SLP - Front element of signal lamp SPO 02/2 - cable gland SPU 25	
SKX 13/21	Mantle terminals SL8 - 6x cable gland SPU 25	-
SKX 13/71	Switch GHG 23. ...R.... (Ex 23 4 024) - switch actuator SMO 17/2 - cable gland SPU 25	-
SKX 13/72	Switch GHG 23. ...R.... (Ex 23 8 067) - switch actuator SMO 17/1 - cable gland SPU 25	-
SKX 13/10	Switch SMS 03/1 - switch actuator SMO 17/1 - cable gland SPU 25	
SKX 13/20	SMS 03/4 - SMO 17/2 - SPU 25	
SKX 13/30	SMS 03/5 - SMO 17/2 - SPU 25	
SKX 13/40	SMS 03/6 - SMO 17/2 - SPU 25	
SKX 13/60	SMS 03/3 - SMO 17/3 - SPU 25	
SKX 13/70	SMS 03/2 - SMO 17/1 - SPU 25	
SKX 13/80	SMS 03/7 - SMO 17/1 - SPU 25	
SKX 13/100	SMS 03/8 - SMO 17/5 - SPU 25	
SKX 13/110	SMS 03/9 - SMO 17/1 - SPU 25	
SKX 13/120	SMS 03/11 - SMO 17/2 - SPU 25	

SKX 14/ ..

Type	Build-in components and actuator / indicator	Overview
SKX 14/1	2x pushbutton PBT 01 - SPO 01/1 - SPO 01/2 - Signal lamp SLP - SPO 02/2 - cable gland SPU 25	
SKX 14/11	3x pushbutton PBT 01 - pushbutton actuator SPO 01/1 - SPO 01/2 - SPO 01/3 - cable gland SPU 25	
SKX 14/21	Mantle terminals SL 8 - 8x cable gland SPU 25	-
SKX 14/22	3x signal lamp SLP front element of signal lamp SPO 02/1 - SPO 02/2 - SPO 02/3 - cable gland SPU 25	
SKX 14/31	3x pushbutton PBT 01 - pushbutton actuator SPO 01/1 - SPO 01/2 Mushroom-head pushbutton actuator GHG 410 1906 R0005 - cable gland SPU 25	-

SKX 15/ ..

Type	Build-in components and actuator / indicator	Overview
SKX 15/1	2x pushbutton PBT 01 - SPO 01/1 - SPO 01/2 - 2x signal lamp SLP - 02/1 - SPO 02/2 - 2x cable gland SPU 25	
SKX 15/11-11	2x pushbutton PBT 01 - pushbutton actuator SPO 01/1 - SPO 01/2 - ammeter AM 72 100/1A - 2x cable gland SPU 25	
SKX 15/11-12	2xPBT 01 - SPO 01/1 - SPO 01/2 - AM 72 50/1 A - 2xSPU 25	
SKX 15/11-21	2xPBT 01 - SPO 01/1 - SPO 01/2 - AM 72 100/5 A - 2xSPU 25	
SKX 15/11-22	2xPBT 01 - SPO 01/1 - SPO 01/2 - AM 72 50/1 A - 2xSPU 25	
SKX 15/21-11	Switch GHG 23. .R.. - switch actuator SMO 17/1 - ammeter AM 72 100/1 A - 2x uvodnica SPU 25	
SKX 15/21-12	Switch GHG 23. ...R… - switch actuator SMO 17/1 - ammeter AM 72 100/1 A - 2x uvodnicaSPU 25	
SKX 15/21-21	Switch GHG 23. ...R.... - Switch actuator SMO 17/1 - ammeter AM 72 100/5 A - 2x uvodnica SPU 25	
SKX 15/21-22	Switch GHG 23. ...R.... - switch actuator SMO 17/1 - ammeter AM 72 50/5 A - 2x cable gland SPU 25	
SKX 15/34	4x pushbutton PBT/1 - 2xSPO 01/1 - 2xSPO 01/2 - 2x cable gland SPU 25	-
SKX 15/41	Switch SMS 03/1 - 2x terminal EURO E16-25 - 2x cable gland SPU 25	-
SKX 15/50	Switch SMS 03/12 - SMO 17/2 - cable gland SPU 25	-
SKX 15/90	Switch SMS 03/10 - SMO 17/3 - cable gland SPU 25	-
SKX 15/51	Switch SMS 03/9 - SMO 17/1 - 2x pushbutton PBT/1 - SPO 01/1 - SPO01/2 - 2x cable gland SPU 25	-
SKX 15/61	Switch GHG 23. ...R.... (Ex 23 4 024) - SMO 17/2 - 5x terminal EURO E4 - cable gland SPU 25	-
SKX 15/62	Switch GHG 23. ...R.... (Ex 23 8 067) - SMO 17/1 - 5x terminal EURO E4 - cable gland SPU 25	-
SKX 15/65	4x mantle terminals SL5 - 8x cable gland SPU 25	-

INSTRUCTIONS FOR DESIGN OF LOW VOLTAGE SWITCHGEAR AND CONTROL GEAR ASSEMBLYES type SKX 16/.., SKX 18/.., SKX 20/..

In and on Ex e enclosure or combination of multiple enclosures, interconnected by bushing, are mounted " Ex e d m ia/ib" and Ex e built-in components, actuators and indicators.
There are no limitation in orientation of enclosure/combination of multiple enclosures, (longer side of enclosure is mounted horizontally or vertically) and the manner of which the mounting is set to the surface.
In horizontal orientation of enclosure, built-in components and actuators and indicators are mounted in maximum two rows.
In vertical orientation of enclosure , built-in components and actuators and indicators are mounted in maximum:

SKX 16 - 2 rows
SKX 18 - 3 rows
SKX 20 - 5 rows

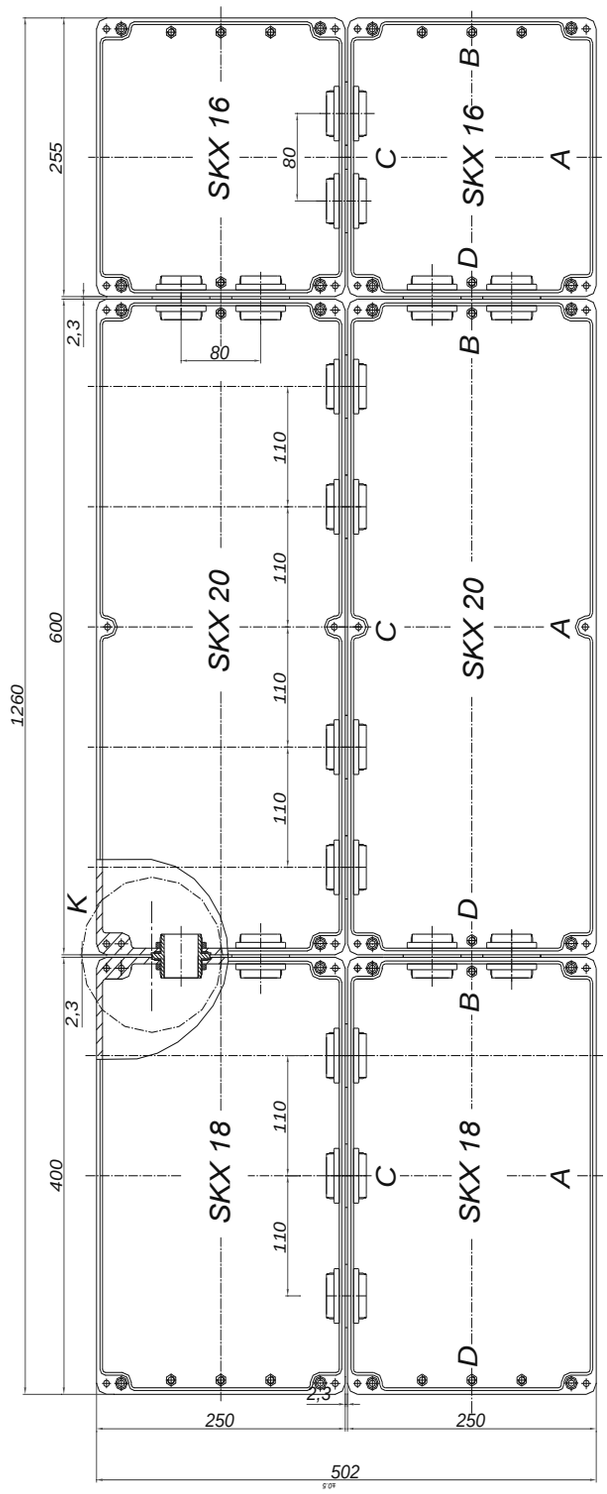
The actual nuber of mounted rows depends on the device configuration.
Circuit breaker 3p/4p I_{th} = 40 A, 80 A with its matching actuator or block NH 00 main fuse always occupies two hole rows,
Actuators and indicators – circuit breaker which are not connected with the actuator, always occupies one and a half row. In one row there can be maximally be:

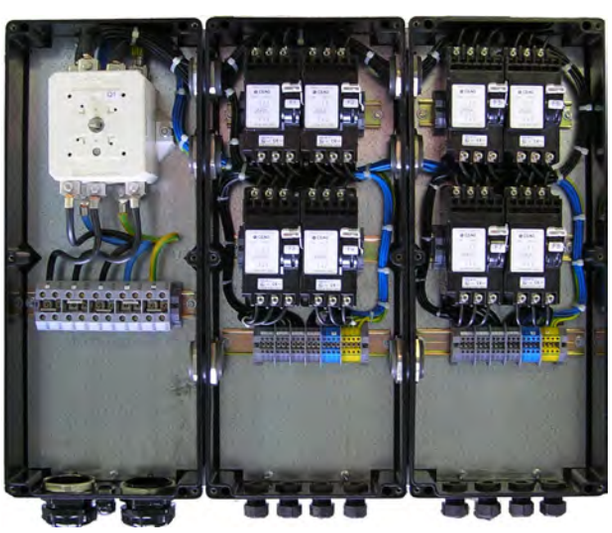
SKX 16 - 6 pols, horizontal and vertical orientation of the enclosure,
SKX 18 - 12 pols vertical, 8 pols horizontal orientation of the enclosure,
SKX 20 - 18 pols vertical, 12 pols horizontal orientation of the enclosure.

We design systems to suit your requirements on the basis of the data you supply us with:

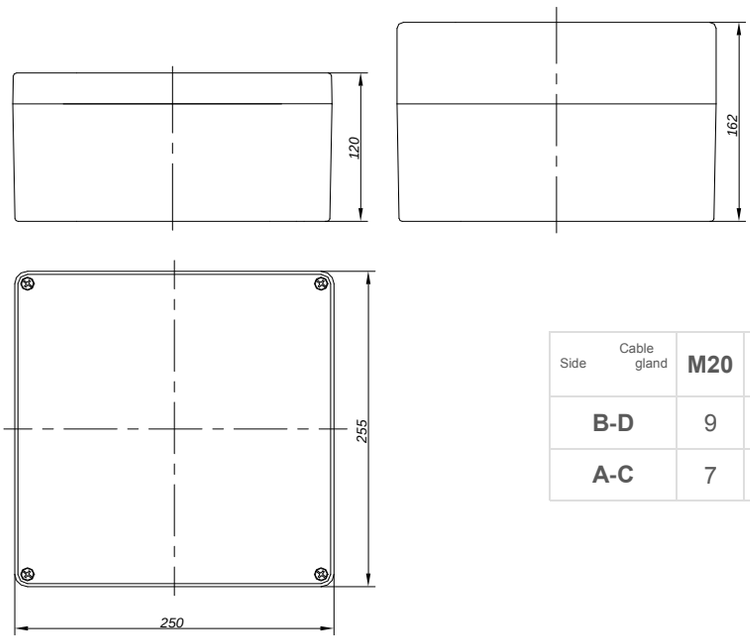
- the required minimum type of protection
- as appropriate, details of the hazardous atmosphere for which the equipment must be suitable
- single line or wiring diagram
- schematic for control systems
- operating, auxiliary and control voltages
- frequency
- power and current ratings of connected loads
- quantities and types of components required, e.g. contactors, switches, circuit-breakers, fuses, thermal relays, instruments, terminals etc
- quantity and types of cables
- number and size of conductors
- quantity and location of entries (from top, bottom, side, centre)
- environmetal conditions
- method of installation

Various combinations of merged set (combination) of SKX enclosures



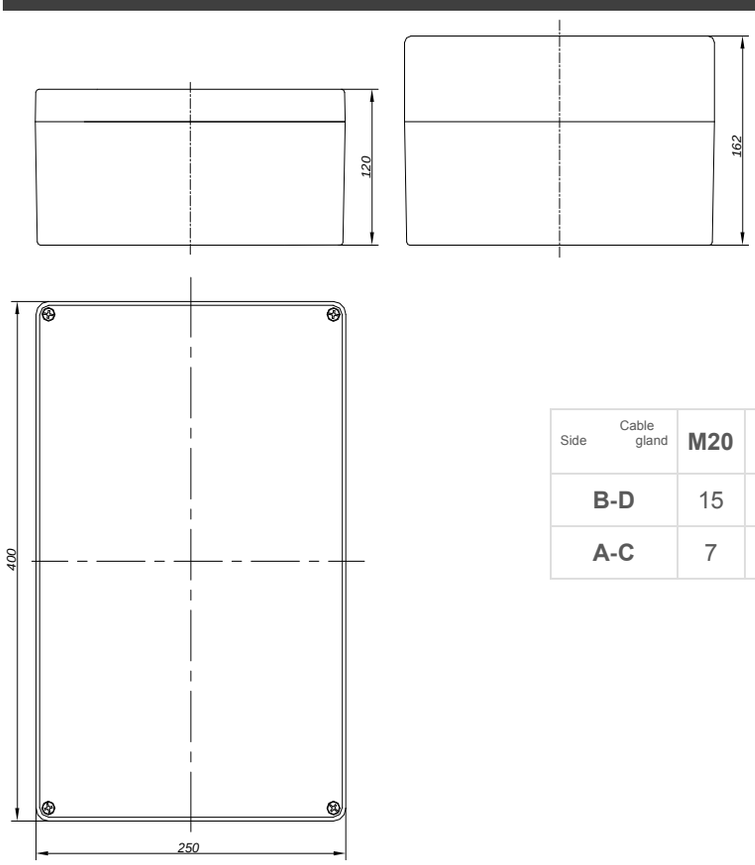


Enclosure type SKX 16



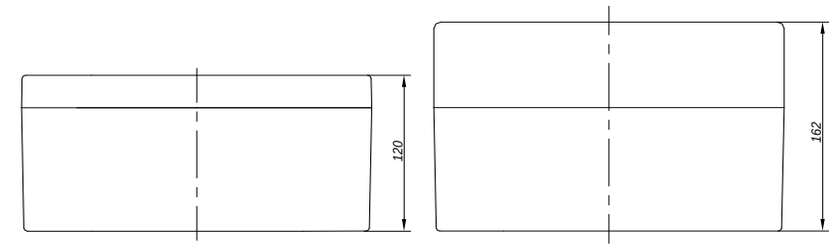
Side / Cable gland	M20	M25	M32	M40	M50	M63
B-D	9	9	5	3	3	2
A-C	7	5	3	3	-	-

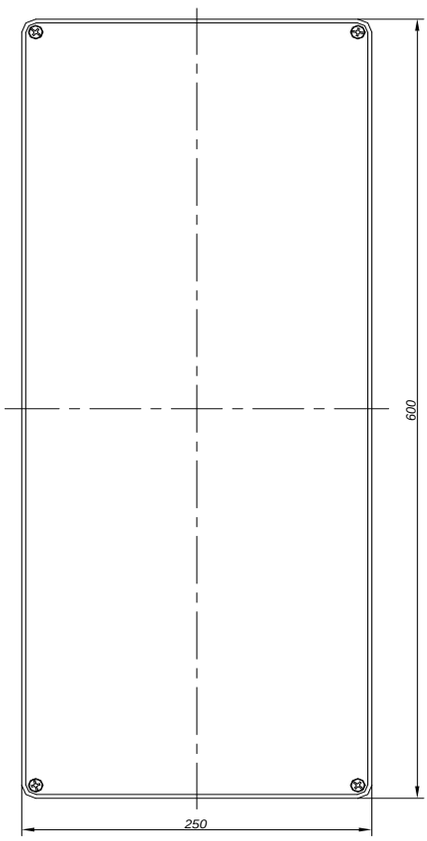
Enclosure type SKX 18



Side / Cable gland	M20	M25	M32	M40	M50	M63
B-D	15	15	9	6	5	4
A-C	7	5	3	3	-	-

Enclosure type SKX 20





Side / Cable gland	M20	M25	M32	M40	M50	M63
B-D	22	22	12	8	6	6
A-C	7	5	3	3	-	-