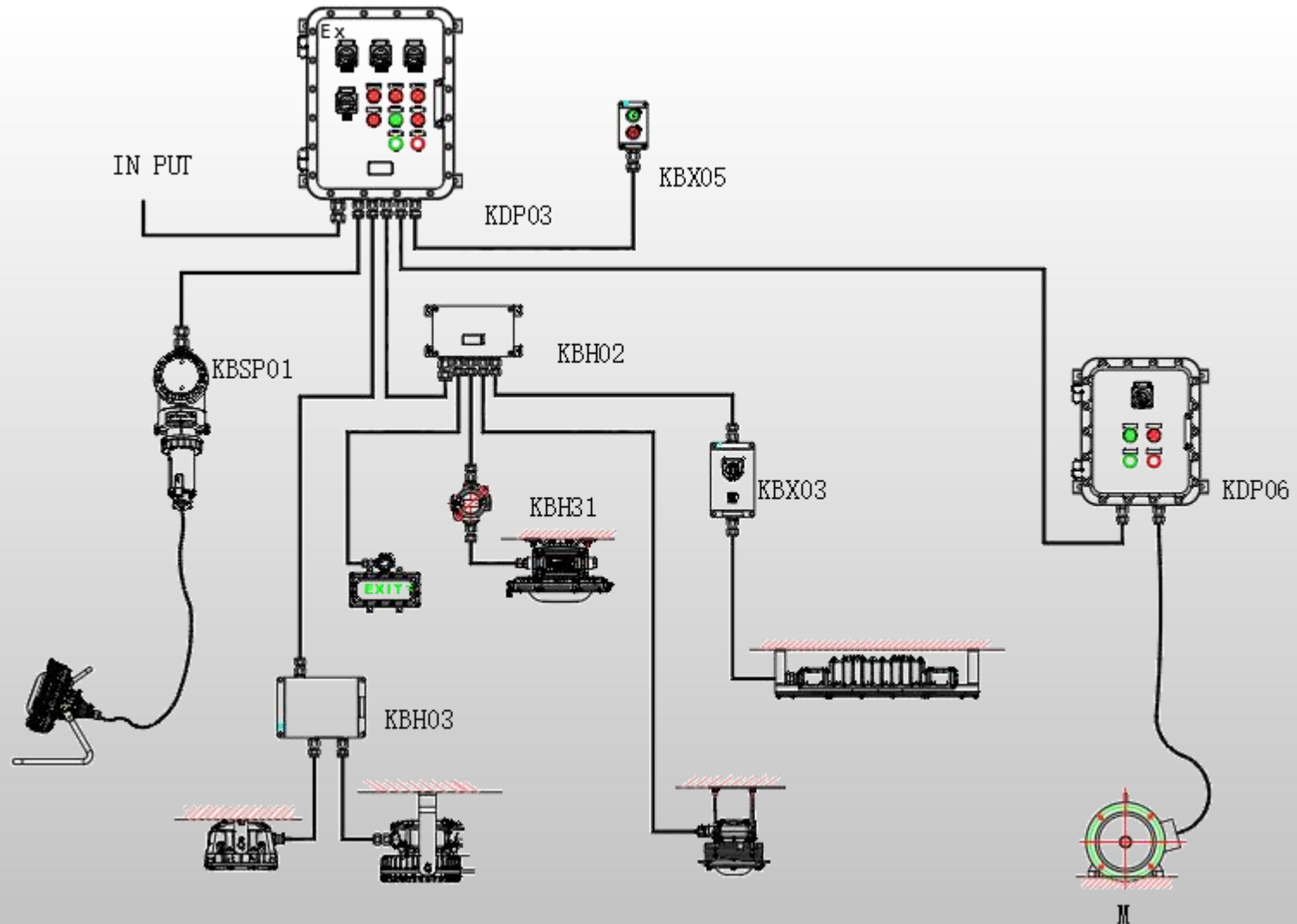


Carry Brightness and Sustainable Future

 **SHENZHEN KHJ SEMICONDUCTOR LIGHTING CO., LTD**



EXPLOSION PROOF ELECTRICAL APPARATUS



Zones System (IECEX/ATEX)

ZONE		Hazardous areas are classified into Zones based upon the frequency of the occurrence and duration of an explosive gas/dust atmosphere, as follows:
Gas	Dust	
0	20	A potentially flammable atmosphere is present continuously or for long periods or frequently.
1	21	A potentially flammable atmosphere is likely to occur in normal operation occasionally.
2	22	A potentially flammable atmosphere is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

Reference: IEC 60079-10

GAS & DUST GROUPS

Gas and Dust Grouping for Electrical Equipment for IEC 60079-0

Group	Representative Gases and Dusts
I	All underground coal mining. Firedamp (methane)
IIA	Industrial methane, propane, petrol and the majority of industrial gasses
IIB	Ethylene, coke oven gas and other industrial gasses
IIC	Hydrogen, acetylene, carbon disulphide
IIIA	Combustible flyings
IIIB	Non-conductive dust
IIIC	Conductive dust

Material Ex Classifications

Gas	Ignition Temp °C	Apparatus Group	Temperature Class
Ammonia	630	IIA	T1
Hydrogen	560	IIC	T1
Methane	537	IIA	T1
Propane	450	IIA	T2
Ethylene	425	IIB	T2
Butane	372	IIA	T2
Acetylene	305	IIC	T2
Cyclohexane	259	IIA	T3
Kerosene	210	IIA	T3
Di-ethyl Ether	160	IIB	T4
Carbon Disulphide	90	IIC	T6

Material Ex Classifications

Dust Typical Ignition Temperatures		
Dust	Cloud (°C)	Layer (°C)
Aluminium	590	>450
Coal dust (ignites)	380	225
Flour	490	340
Grain dust	510	300
Methyl cellulose	420	320
Phenolic resin	530	>450
Polythene	420	(melts)
PVC	700	>450
Soot	810	570
Starch	460	435
Sugar	490	460

Examples of ATEX Directive Marking

 0031  II 2 G

	Denotes that a product complies with all the relevant European Directives
0031	Notified Body Number (Sira Certification Service)
	Specific marking for explosion protection
II	Equipment group (Could be I for mining or II for surface industry)
2	Equipment category (Could be 1, 2, 3 depending upon Zone of intended use)
G	Type of flammable atmosphere (G = Gas, D = Dust)
 0031  I M1	
M1	Mining applications (M1 = equipment remains energised, M2 = de-energised)

Example of Standards Marking – Gas

(Marking derived from the EN and/or IEC standards)

Ex db IIC T4 Gb	
Ex	Denotes explosion protection
db	Denotes type of protection (see protection concepts for alternatives)
IIC	Denotes gas group (see gas groups for alternatives)
T4	Denotes temperature classification (see temp classification for alternatives)
Gb	EPL – Equipment Protection Level (see EPL table for alternatives)

Example of Standards Marking – Dust

(Marking derived from the EN and/or IEC standards)

Ex tb IIIC T135°C Db	
Ex	Denotes explosion protection
tb	Denotes type of protection (see protection concepts for alternatives)
IIIC	Denotes dust group (see dust groups for alternatives)
T135°C	Denotes temperature classification (see temp classification for alternatives)
Db	EPL – Equipment Protection Level (see EPL table for alternatives)

CORRELATION BETWEEN ZONES/EQUIPMENT PROTECTION LEVEL (EPL)/ATEX CATEGORIES

Zone	EPL	Category
0	Ga	1G
1	Gb	2G
2	Gc	3G
20	Da	1D
21	Db	2D
22	Dc	3D
Mining Application (Equipment can remain energised in the presence of flammable atmosphere - firedamp)	Ma	M1
Mining Application (Equipment to be de-energised when flammable atmosphere is detected - firedamp)	Mb	M2
G = Gas, D = Dust, M = Mining		

TEMPERATURE CLASSIFICATION

Maximum Surface Temperature (°C)	Divisions	Zones
450	T1	T1
300	T2	T2
280	T2A	—
260	T2B	—
230	T2C	—
215	T2D	—
200	T3	T3
180	T3A	—
165	T3B	—
160	T3C	—
135	T4	T4
120	T4A	—
100	T5	T5
85	T6	T6

STANDARDS ELECTRICAL

ATEX & IECEX

Zones System (Gas, Vapour & Mists)

Type of Protection	Symbol	IECEX EPL	ATEX Category	Permitted Zone	Standard EN-ATEX IEC-IECEX	Definition
General Requirements	N/A	Ga Gb Gc	1 2 3	0 1 2	60079-0	Applies to all protection concepts
Increased Safety	eb ec	Gb Gc	2 3	1 2	60079-7	No arcs, sparks or hot surfaces. Enclosure IP 54 or better
Type n (non-sparking)	nA	Gc	3	2	60079-15	
Flameproof	da* db dc	Ga* Gb Gc	1* 2 3	0* 1 2	60079-1	Contain the explosion and quench the flame.
Type n (enclosed break)	nC	Gc	3	2	60079-15	*applies to catalytic sensors only
Quartz/Sand Filled	q	Gb Gc	2 3	1 2	60079-5	Quench the flame
Intrinsic Safety	ia ib ic	Ga Gb Gc	1 2 3	0 1 2	60079-11	Energy limitation in sparks and hot surfaces.

ATEX & IECEx

Zones System (Gas, Vapour & Mists)

Type of Protection	Symbol	IECEx EPL	ATEX Category	Permitted Zone	Standard EN-ATEX IEC-IECEx	Definition
Pressurised	pxb	Gb	2	1	60079-2	Keep the flammable gas out.
	pyb	Gb	2	1		
	pzc	Gc	3	2		
Encapsulation	ma	Ga	1	0	60079-18	
	mb	Gb	2	1		
	mc	Gc	3	2		
Oil Immersion	ob	Gb	2	1	60079-6	
	oc	Gc	3	2		
Type n (sealing & hermetic sealing)	nC	Gc	3	2	60079-15	
Type n (restricted breathing)	nR	Gc	3	2	60079-15	
Optical Radiation	Op is	Ga	1	0	60079-28	
	Op sh	Ga	1	0		
	Op pr	Gb	2	1		

Equipment suitable for use in a Zone 0 is permitted in a Zone 1 or 2

Equipment suitable for use in a Zone 1 is permitted in a Zone 2, but **not** in a Zone 0

Equipment suitable for use in a Zone 2 is **not** permitted in either a Zone 0 or Zone 1

ATEX & IECEx Zones System (Dusts)

Type of Protection	Symbol	IECEx EPL	ATEX Category	Permitted Zone	Standard EN -ATEX IEC -IECEx	Definition
General Requirements	N/A	Da Db Dc	1 2 3	20 21 22	60079-0	Applies to all protection concepts
Enclosure	ta tb tc	Da Db Dc	1 2 3	20 21 22	60079-31	Prevents dust coming into contact with electrical parts
Pressurised	pxb pyb pzc	Db Db Dc	2 2 3	21 21 22	60079-2	
Encapsulation	ma mb mc	Ga Gb Gc	1 2 3	20 21 22	60079-18	
Intrinsic Safety	ia ib ic	Da Db Dc	1 2 3	20 21 22	60079-11	
Optical Radiation	Op is Op sh Op pr	Da Da Db	1 1 2	20 20 21	60079-28	To prevent ignition by thermal, photochemical or plasma means

Equipment suitable for use in a Zone 20 is permitted in a Zone 21 or 22

Equipment suitable for use in a Zone 21 is permitted in a Zone 22, but **not** in a Zone 20

Equipment suitable for use in a Zone 22 is **not** permitted in either a Zone 20 or Zone 21



0031



II 2 G D II 2 G Ex db eb IIC T6 Gb
II 2 D Ex tb IIIC T80°C Db



®

TM

KBX02 Series Explosion proof Control Station



Ex mark: II 2 G Ex db eb IIC T6 Gb
II 2 D Ex tb IIIC T80°CDb

Rated voltage: Max. 415V AC, 250V DC

Rated current: 6, 10A, 16A

Material: Stainless steel, anti-drop structure

IP code: IP66

Temperature: : -40 °C ~+40/45/50/55/60/65/70°C

Application area: Zone 1 and Zone 2,
Zone 21 and Zone 22

Cable entries: M16 × 1.5 ~ M63 × 1.5

IECEX SEV 22.0011X, SEV 22 ATEX 0606 X

Application and Features

- Explosion proof certificates
 - ATEX : SEV 22 ATEX 0606 X
 - IECEx : IECEx SEV 22.0011X
- Application in hazardous area
 - Zone 1 and Zone 2,
 - Zone 21 and Zone 22
- Seven types of enclosure size, built-in explosion-proof components (control button, control switch, signal lamp, potentiometer, ammeter, etc.) and terminal blocks. The components is rail mounting type, which can be installed on the guide rail quickly and accurately, easy for installation and maintenance.
- Emergency stop button can be equipped with anti misoperation mechanism and padlock (If need).
- Stainless steel exposed fastener, anti dropping structure, easy for installation and maintenance.

INTERNAL COMPONENTS



K0101-Control button



K0101-A2 Two control button



K0102-Signal lamp



K0101-A Control button with signal lamp



K0109-Ammeter



K0155 Switch



φ38 Operating handle

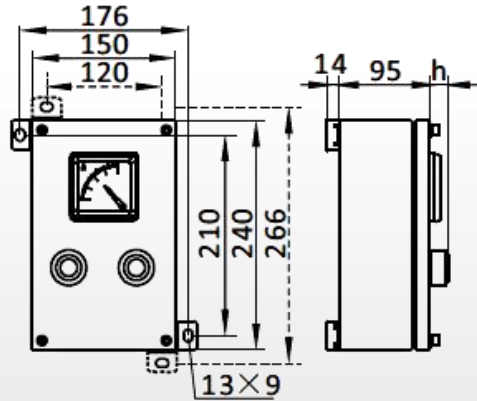


φ65 Operating handle

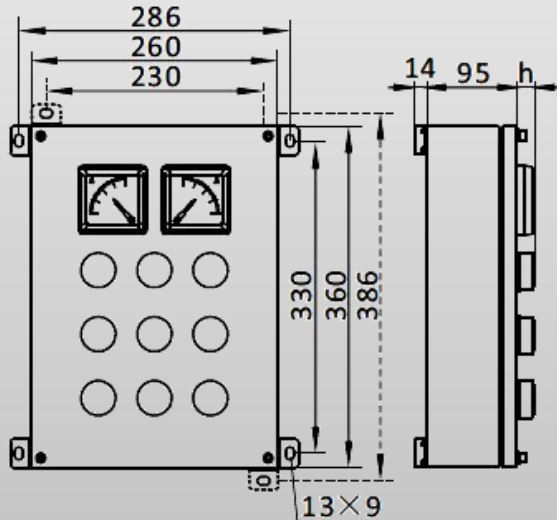


Square operating handle

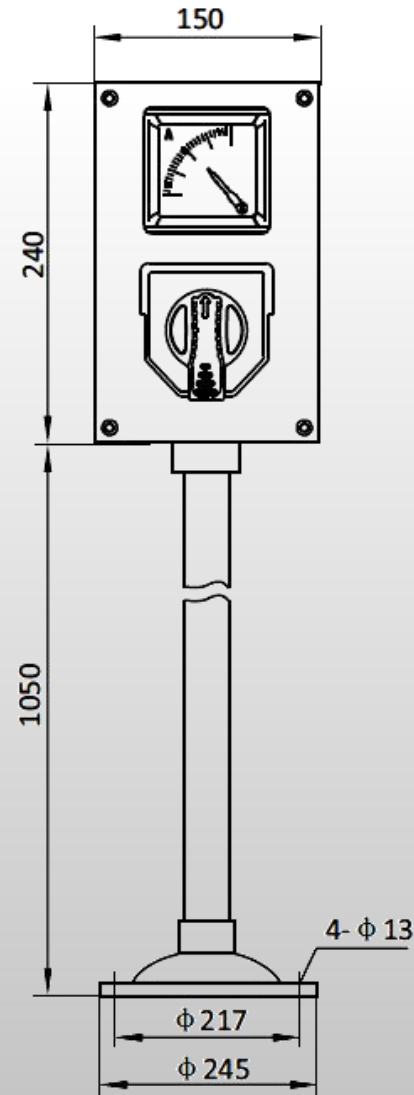
Typical dimensions



Enclosure 07

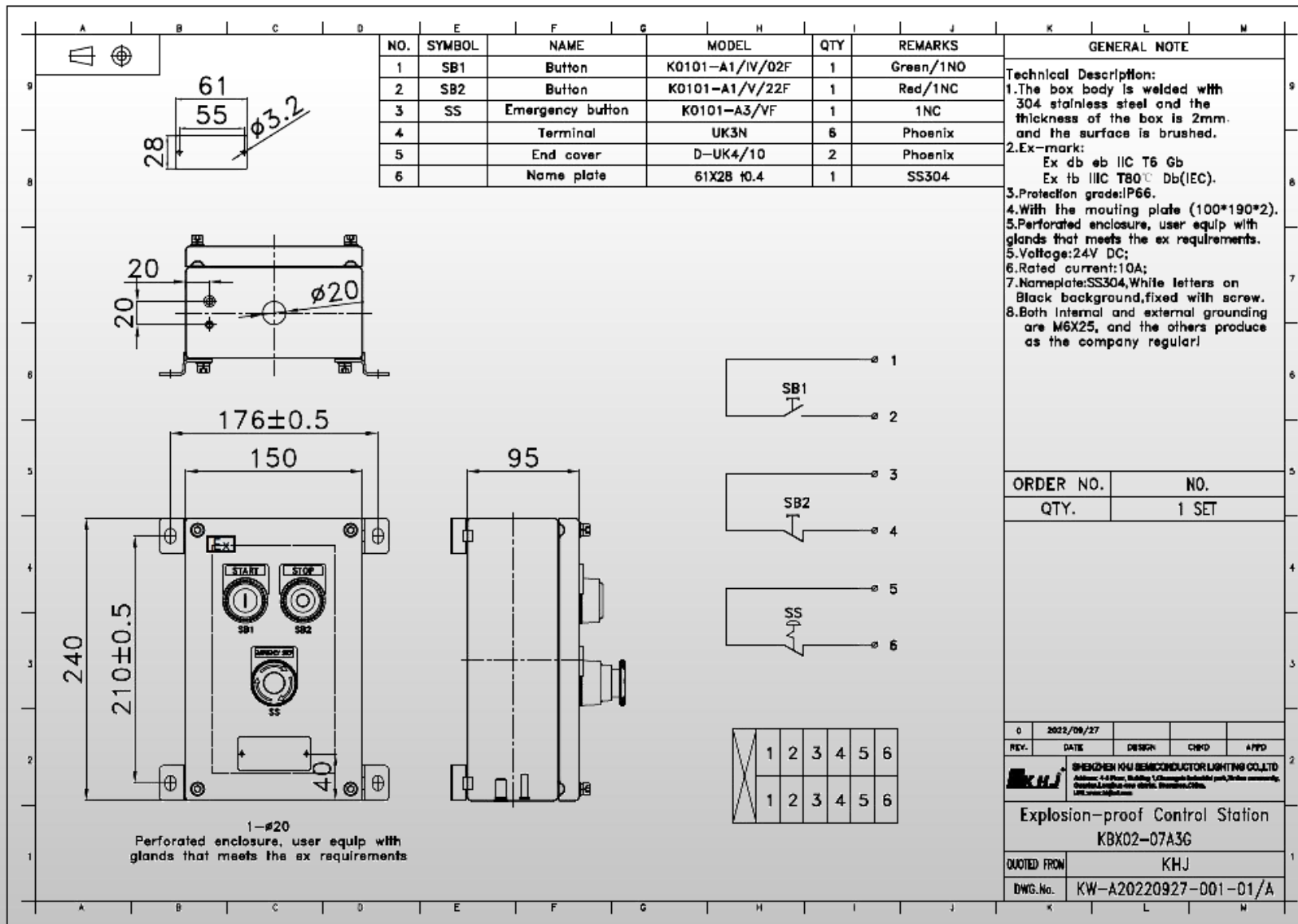


Enclosure 19



Enclosure 07

Case:



KBX03 Series Explosion proof Control Station



Ex mark: II 2 G Ex db eb IIC T6 Gb
II 2 D Ex tb IIIC T80°C Db

Rated voltage: Max. 415V AC, 250V DC

Rated current: 6, 10A, 16A

Material: GRP (Polyester resin, glass fibre reinforced), antistatic

IP code: IP66

Temperature: : -40 °C ~+40/45/50/55/60/65/70°C

Application area: Zone 1 and Zone 2,
Zone 21 and Zone 22

Cable entries: M16 × 1.5 ~ M63 × 1.5

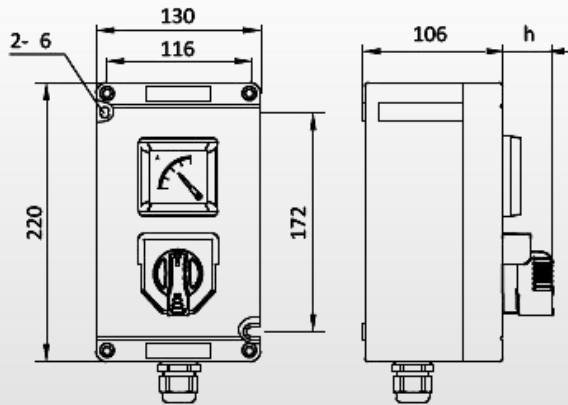
IECEX SEV 22.0011X, SEV 22 ATEX 0606 X

Application and Features

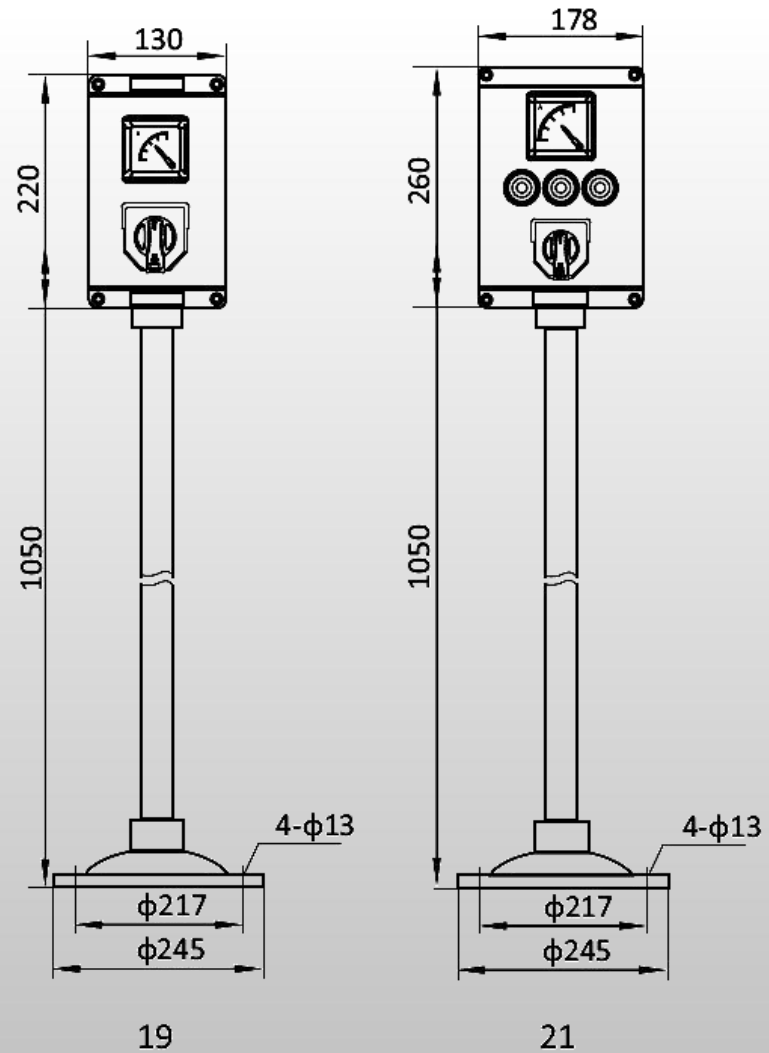
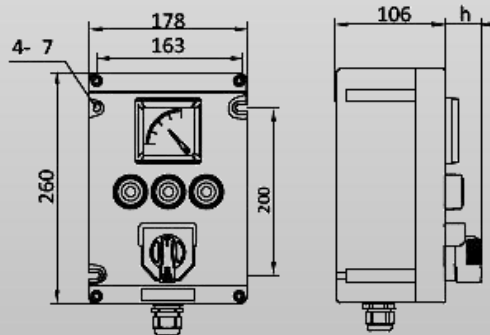
- Explosion proof certificates
 - ATEX : SEV 22 ATEX 0606 X
 - IECEx : IECEx SEV 22.0011X
- Application in hazardous area
 - Zone 1 and Zone 2,
 - Zone 21 and Zone 22
- There are 5 types of enclosure, assembled with explosion-proof components (control buttons, switches, indicator lights, potentiometers, ammeters, etc. see KBX02) and terminal blocks. The components are rail-type structure, which can be quickly installed and convenient for installation and maintenance.
- The emergency stop button can be equipped with anti-misoperation mechanism and padlock by requirements.
- Stainless steel exposed fasteners, anti-drop structure, convenient for installation and maintenance.

Typical dimensions

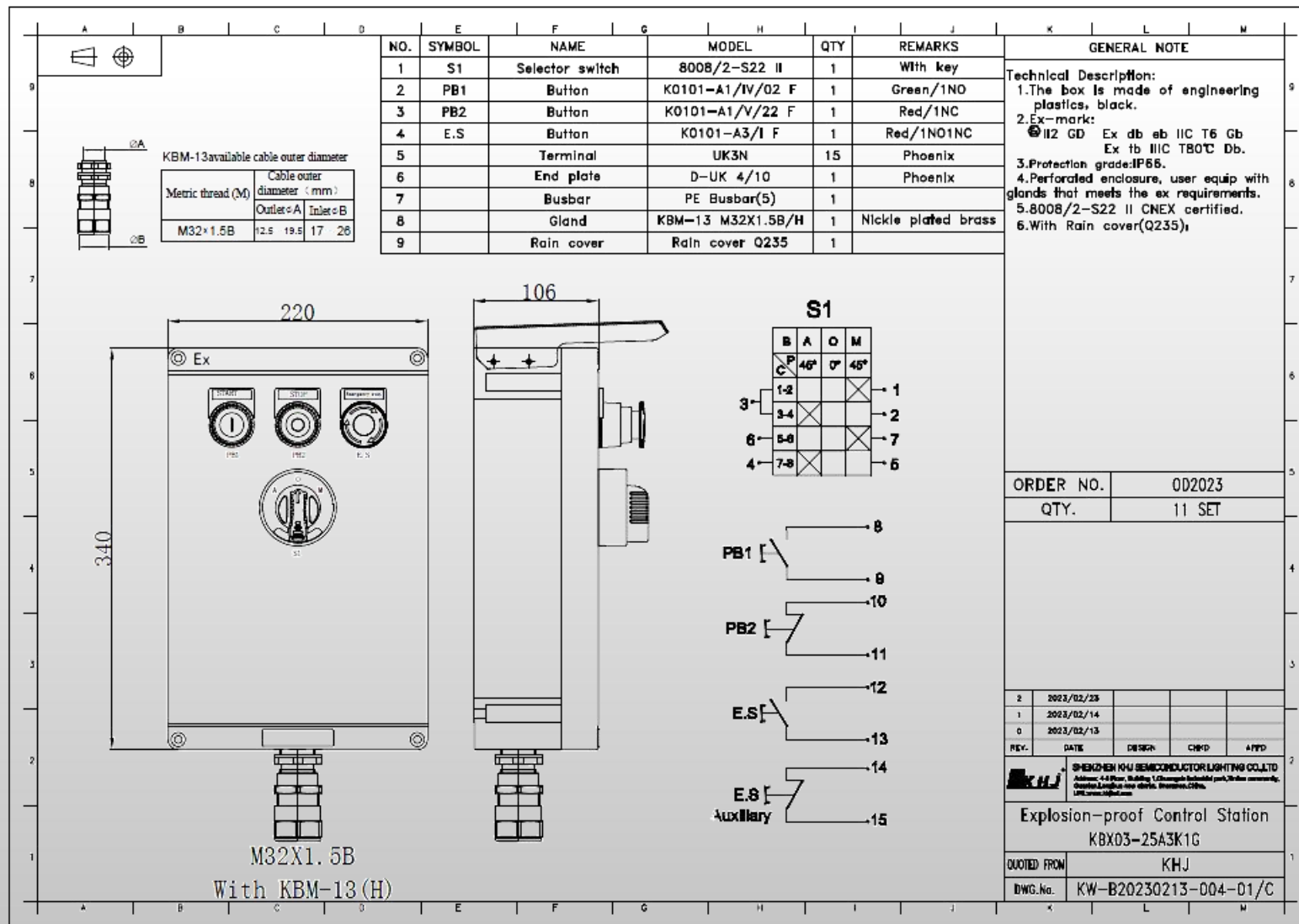
19#



21#



Case:



KBX05 Series Explosion proof Control Station



Ex mark: II 2 G Ex db eb IIC T6 Gb
II 2 D Ex tb IIIC T80°C Db

Rated voltage: Max. 415V AC, 250V DC

Rated current: 6, 10A, 16A

Material: GRP (Polyester resin, glass fibre reinforced), antistatic

IP code: IP66

Temperature: : -40 °C ~+40/45/50/55/60/65/70°C

Application area: Zone 1 and Zone 2,
Zone 21 and Zone 22

Cable entries: Φ 25.5mm

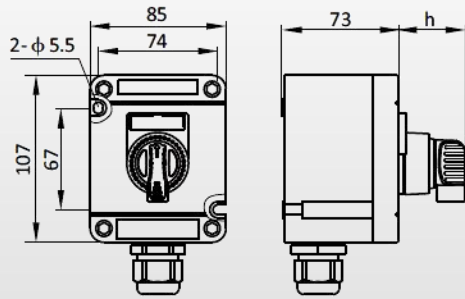
(The cable gland is not available when delivery, please indicate if necessary)

IECEX SEV 22.0011X, SEV 22 ATEX 0606 X

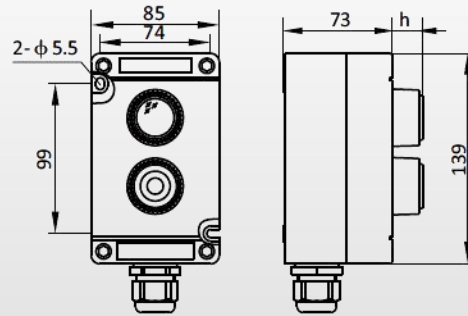
Application and Features

- Explosion proof certificates
 - ATEX : SEV 22 ATEX 0606 X
 - IECEx : IECEx SEV 22.0011X
- Application in hazardous area
 - Zone 1 and Zone 2,
 - Zone 21 and Zone 22
- Three types of enclosure size, built-in explosion-proof components (control button, control switch, signal lamp, potentiometer, ammeter, etc.see KBX02). The components is rail mounting type,which can be installed on the guide rail quickly and accurately, easy for installation and maintenance.
- Component arrangement can be combined upon request.
- Emergency stop can be equipped with anti misoperation mechanism and padlock (If need).
- Stainless steel exposed fastener, anti dropping structure, easy for installation and maintenance.

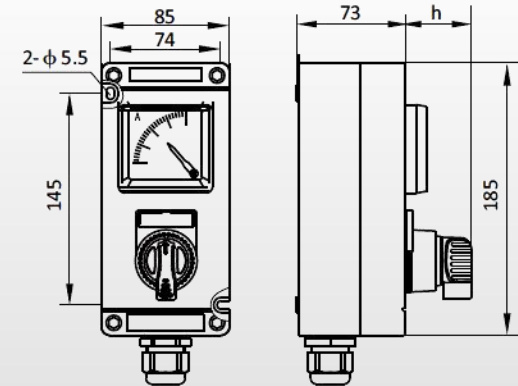
Typical dimensions



03#

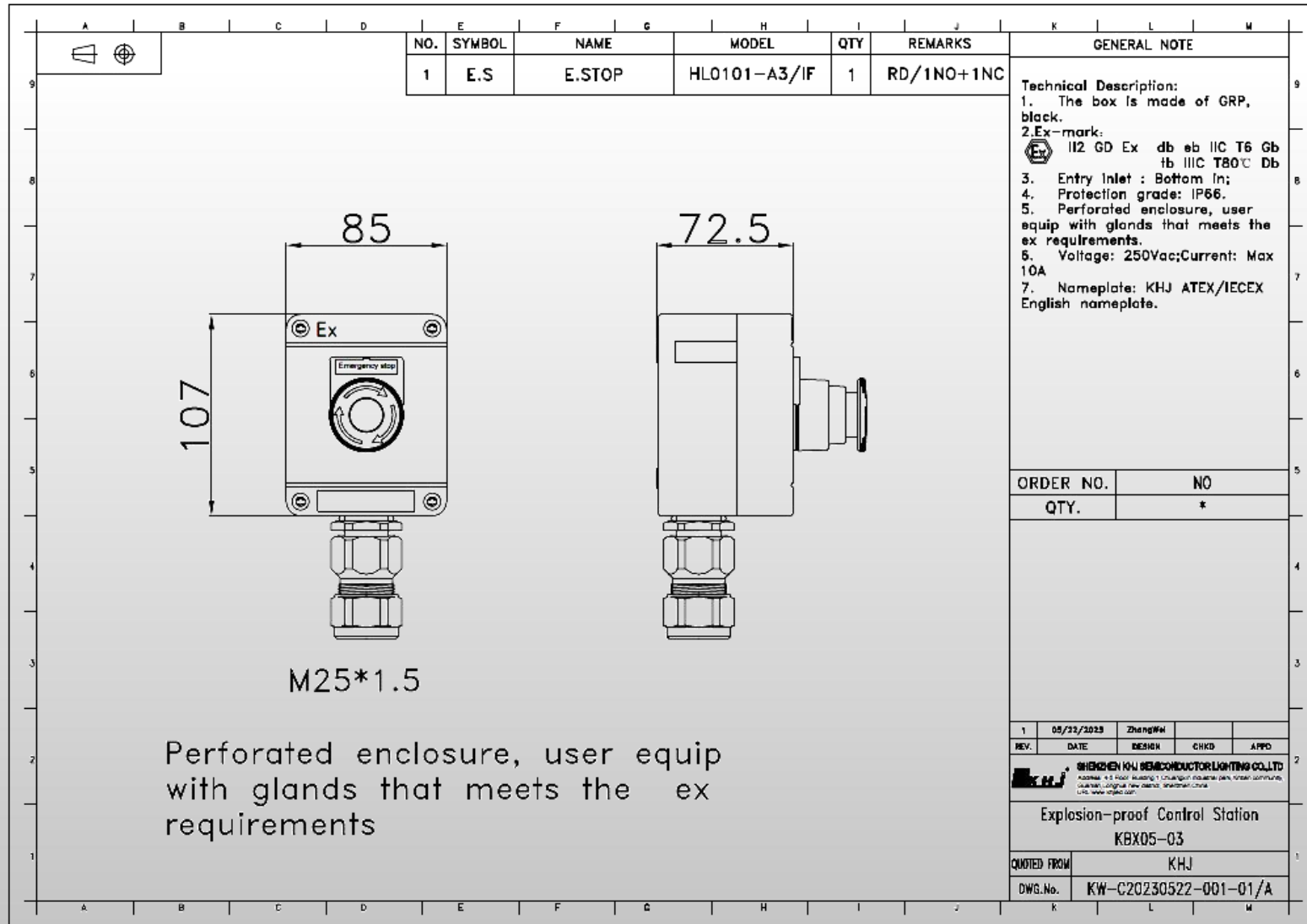


07#



11#

Case:



Note:

- Please advise the classification of the equipment used for and the certificate type :ATEX,IECEX.
- Please advise the enclosure material:GRP, SS304 or SS316 .
- Please advise the brand of internal terminal: Weidmüller or Phoenix.
- Please advise the installation location:indoor or outdoor .Whether it needs to be equipped with rain cover, outer cabinet, etc..
- Please advise the installation method: hanging or vertical, whether it needs to be equipped with a bracket or installation accessories.
- Please advise the specification and direction of the cable gland.
- Please advise the electrical system and wire color.
- Please advise if any other special requirements .
- Please provide the necessary information during the design process.



Thank you!