Contents

Safety Door Switch

KSD Series 04

KS2D Series 07

Safety Interlock Switch

KESD Series 14

Safety Mode key Switch

NS22-MK Series 34

Safety Emergency Switch

KSE Series 40

KEPB Series 46

Enclosure 50

Easy to install & use

KSD Safety Door Switch

KS2D Safety Door Switch

KSD and KS2D door switches may detect opening and closing of doors of equipment.
The product can be easily installed in various environments, and keys can be inserted in five directions using three operating keys.

Certificates

UL508
CUL/CAN/CSA-C C22.2 NO. 14-13

EN 60947-5-1

S1-G-1-2009
KS S IEC 60947-5-1

GB/T14048.5(KSD only)


Safety Door Switch
KSD-2B
Safety Door Switch
KSD-2B
Safety Door Switch
KS2D-2BA

KSD Series

Safety Door Switch

Feature

IP67 (with cable gland)
Max, surrounding air temperature 40℃

Selection guide

KSD - ❶ ❷ ❸

❶	Product name		Safety door switch
❷	Contacts	AB	1A, 1B
		2B	2B
		A*	1A
		B	1B
❸	Operation key	H	Horizontal
		V	Vertical
		C	Adjutable

* Contact A is not a Direct Opening circuit.

Key insertion (5 directions)

Specification

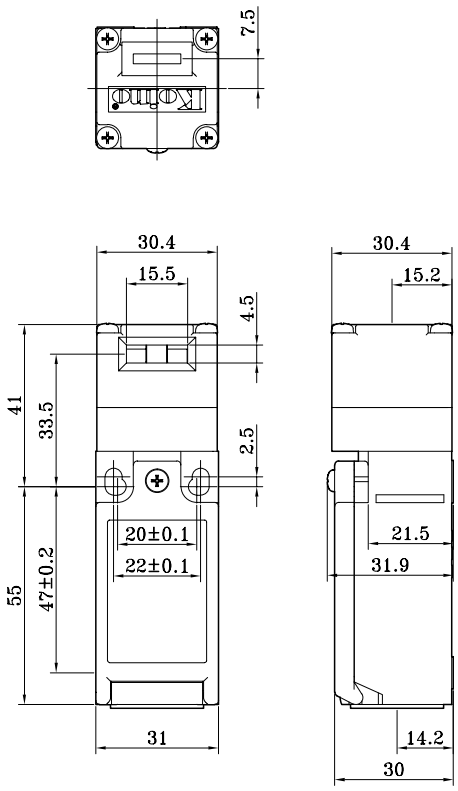
		KSD series
Contact rating		250VAC 3A, 250VDC 0.27A, AC-15, DC-13
Insulation resistance		Minimum 100MΩ (with DC500V Insulation resistance meter)
Withstand voltage		Between terminals: AC1000V, 50/60Hz for 1 min.
		Between live and dead parts: AC1500V, 50/60Hz for 1 min.
Contact resistance		25 mΩ maximum (initial value)
Dielectric strength		500V
Vibration resistance		10 to 50Hz amplitutde 1.5mm from X,Y,Z axis
Shock resistance		Malfuction limit: 30G(300㎨)
Operating ambient temperature		-30℃ ~ +70℃(at no freezing))
Operating ambient humidity		45~85% RH
Operation elevation limit		2,000M
Durability		Mechanical: 1M / Electrical: 0.3M operations
Operation frequency		30 operations per 1 min.
Protection		Body: IP67(NEMA 4X) / Actuator: IP00
Direct opening force		60N
Direct opening distance		Minimum 10mm
IEC protection classes		CLASS II (IEC61140)
Pollution degree		3(EN60947-5-1)
Impulse Withstand Voltag	Between terminals of same poles	2.5kV(EN60947-5-1)
	Between terminals of different poles	4kV(EN60947-5-1)
	Between live and dead parts	6kV(EN-60947-5-1)
Conditional Short-circuit Current		1000A(EN60947-5-1)

KSD Series

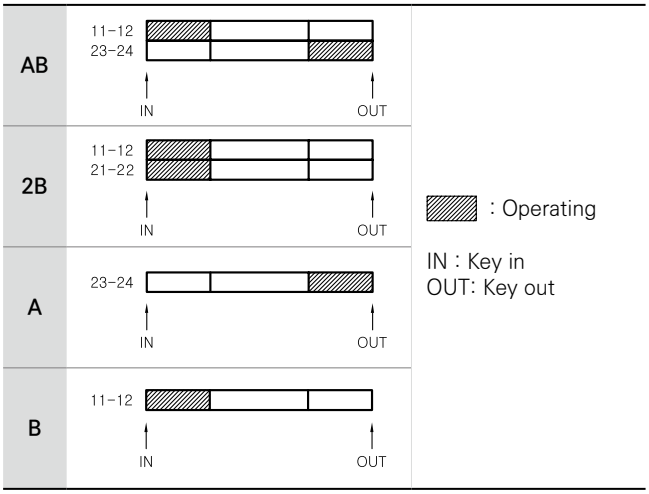
Safety Door Switch

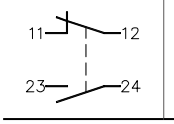
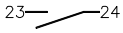
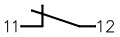
Dimension

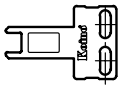
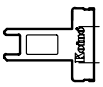
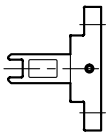
KSD Series



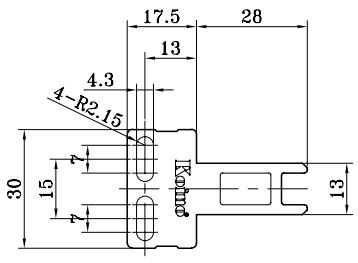
Operation characteristics



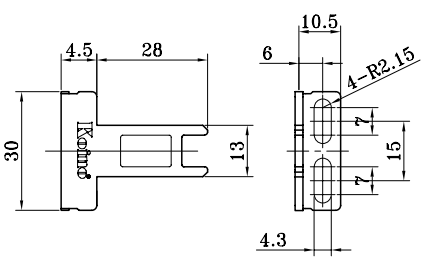
Contacts configurations			
AB	2B	A	B
			

Operation key		
H	V	C
		

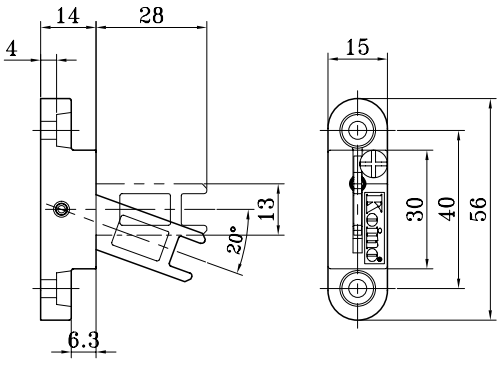
• H Type



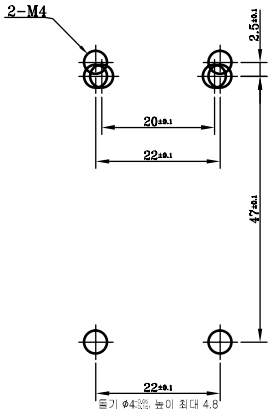
• V Type



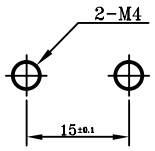
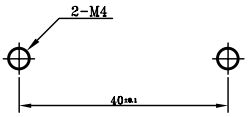
• C Type



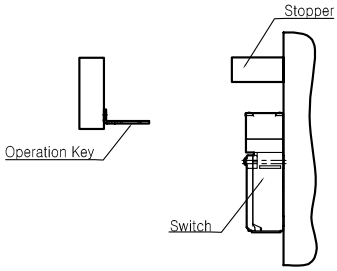
Mounting hole



Screw tightening torque (Nm)	
Terminal (M3)	0.6~0.8Nm
Cover Installation	0.5~0.7Nm
Head Installation	0.5~0.6Nm
Body Installation (M4)	0.5~0.7Nm
Key Installation	2.4~2.8Nm

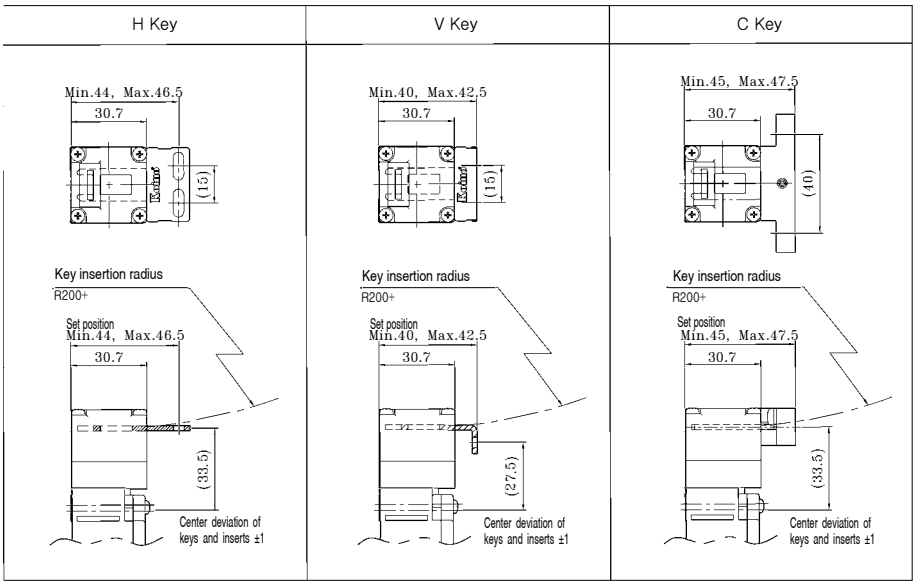
Operation key	
H, V Type	C Type
	

Stopper



- Do not use body as a Stopper
- Make sure to install the stopper so that the end of the operation key does not touch the head

Operation key setting



- When connecting cables to the terminals, use the cable gland.
- The operation key insertion force is up to 15N and the operation key pulling force is up to 30N.

Operating instructions

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- The use of the operation key during the head separation may cause failure.
- The protection structure(IP67) is based on the test method based on the specification (EN60947-5-1). Please check the actual
- environment and conditions in advance.
- The main body is protected from dust, oil, and moisture intrusion. However, care must be taken to prevent wear, brokage and failure, as metal dust, oil, water, and chemicals can penetrate through the keyway.
- Do not use two circuits above AC250V 3A at the same time
- Use at least 5 VDC 1mA with minimum application load
- Switch contacts may use both a micro load and a general load. However, do not connect relatively small loads to contacts used for different types of loads.
- Durable conditions are for ambient temperature of 5℃ to 35℃ and humidity of 40 to 70% RH
- For temperatures of 40℃ or higher, do not exceed 50% RH of humidity.
- Store, transport, and use the product without any deformation or deterioration load, and avoid fire and direct heat

KS2D Series

Safety Door Switch

Selection guide

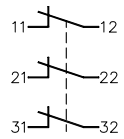
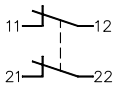
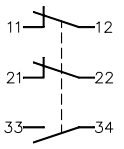
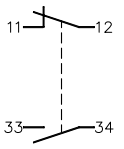
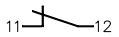
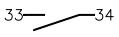
KS2D - ❶ ❷ ❸

	Classification	KS2D	
❷	Contact configuration	3B	3B
		2B	2B
		2BA	2B, 1A
		AB	1A, 1B
		B	1B
		A	1A
❸	Operation key	H	Horizontal
		V	Vertical
		C	Adjustable

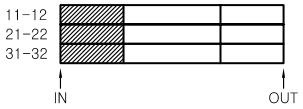
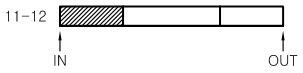
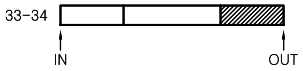
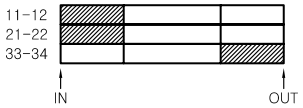
Applicable Standards
EN 60947-5-1
IEC 60947-5-1
IEC 60947-5-5
UL 508

Specification

		KSD series
Contact rating		250VAC 3A, 250VDC 0.27A, AC-15, DC-13
Insulation resistance		Minimum 100MΩ (with DC500V Insulation resistance meter)
Withstand voltage		Between terminals: AC1000V, 50/60Hz for 1 min.
		Between live and dead parts: AC1500V, 50/60Hz for 1 min.
Contact resistance		25 mΩ maximum (initial value)
Dielectric strength		320V
Vibration resistance		10 to 50Hz amplitutde 1.5mm from X,Y,Z axis
Shock resistance		Malfuction limit 10G
Operating ambient temperature		-5℃ ~ +40℃(at no freezing))
Operating ambient humidity		45~85% RH
Operation elevation limit		2,000M
Protection		IP67 (Body)
Durability		Mechanical: 1M / Electrical: 0.3M operations
Operation frequency		15 operations per 1 min.
Direct opening force		60N
Direct opening distance		Minimum 10mm
IEC protection classes		CLASS II (IEC61140)
Pollution degree		3(EN60947-5-1)
Impulse Withstand Voltag	Between terminals of same poles	2.5kV(EN60947-5-1)
	Between terminals of different poles	4kV(EN60947-5-1)
	Between live and dead parts	6kV(EN-60947-5-1)
Conditional Short-circuit Current		100A(EN60947-5-1)

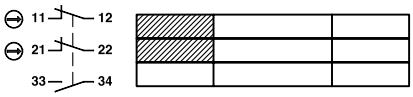
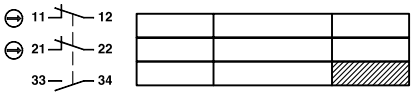
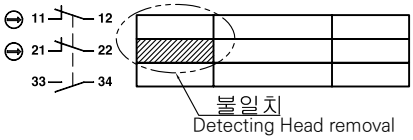
Contact configurations					
3B	2B	2BA	AB	B	A
					

Operation characteristics

AB		3B	
B		2B	
A		2BA	

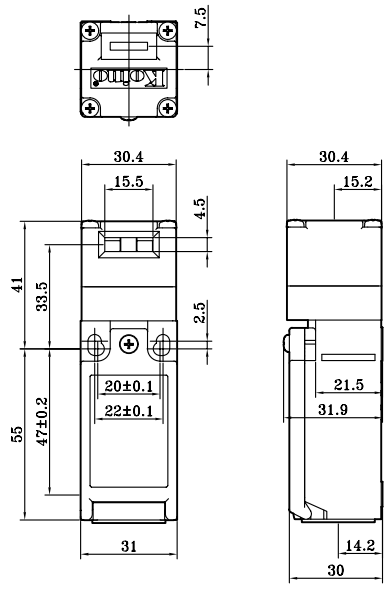
: Operating IN: Key in OUT: Key out

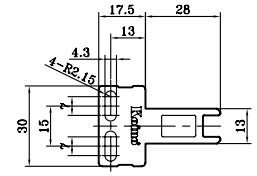
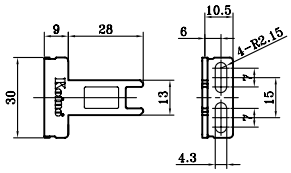
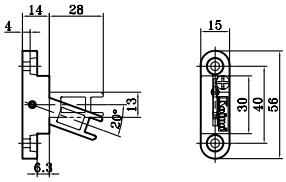
Operational-head removal detection

Key inserted (KS2D-2BA)	
Key removed (KS2D-2BA)	
Head removed (KS2D-2BA)	

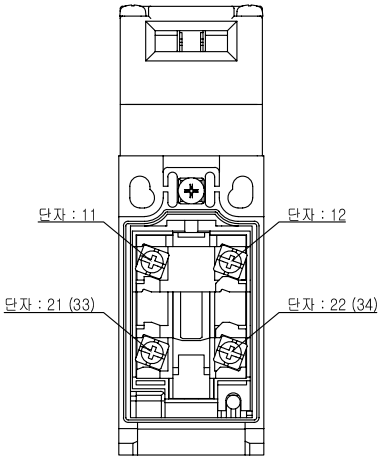
If the operational-head is removed, NC contacts are not the same state. (11-12: OFF 21-22:ON)
Through the different states between NC contacts, it can be confirmed that it is an abnormal situation in which the headhas been removed.

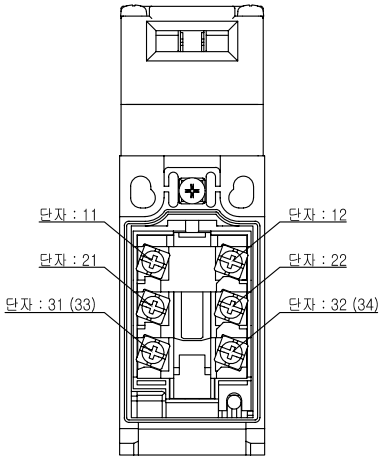
Dimension

KS2D Series


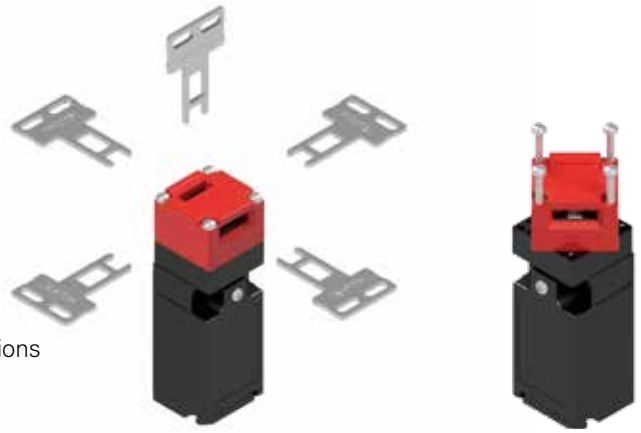
Operation key	
H type	
V type	
C type	

Terminal layout

KS2D (2B, AB)


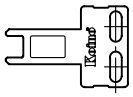
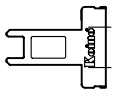
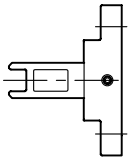
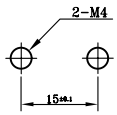
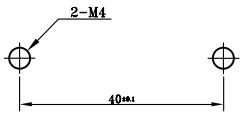
KS2D (3B, 2BA)


Head angle conversion and key insertion

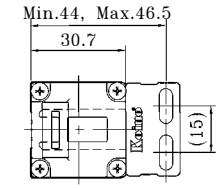
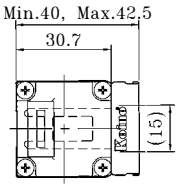
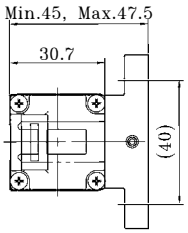
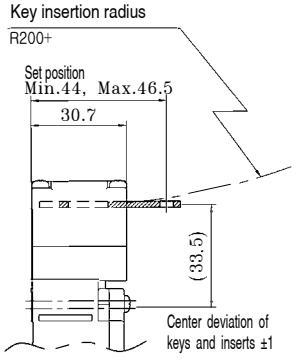
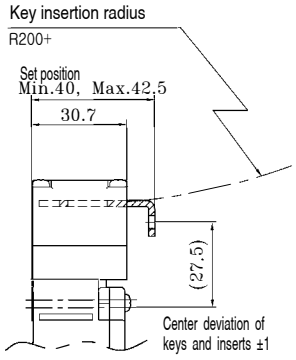
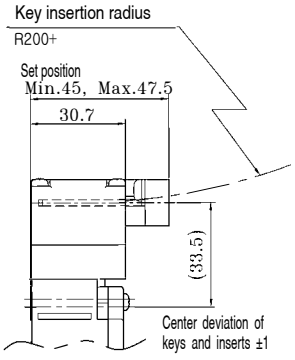


※ 5 directions

Operation key

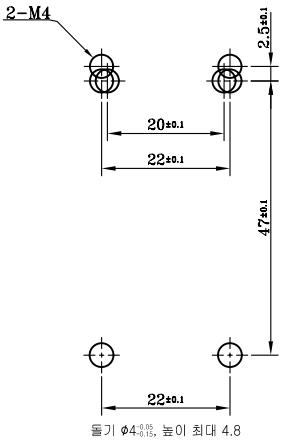
H	V	C	Cut hole	
			H, V Type	C Type
				

Operation key setting

H Key	V Key	C Key
		
		

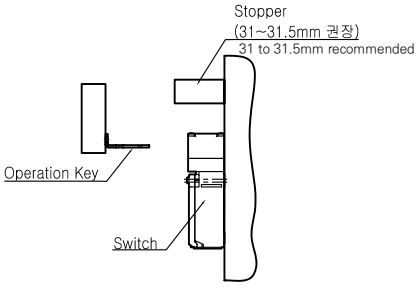
- When connecting cables to the terminals, use the cable gland.
- The operation key insertion force is up to 15N and the operation key pulling force is up to 30N.

Mounting hole



Stopper

- Do not use body as a Stopper
- Make sure to install the stopper so that the end of the operation key does not touch the head



Screw tightening torque(Nm)	
Terminal screw(M3)	0.5~0.7Nm
Cover Installation Screw	0.5~0.7Nm
Head Installation Screw	0.5~0.6Nm
Body Installation Screw (M4)	0.5~0.7Nm
Key Installation Screw	2.4~2.8Nm

* To prevent damage to product,do not exceed the recommended torque

Operating instructions

- The use of the operation key during the head separation may cause failure.
- The protection structure(IP67) is based on the test method based on the specification (EN60947-5-1). Please check the actual
- environment and conditions in advance.
- The main body is protected from dust, oil, and moisture intrusionuse. However, Metal powder, oil, moisture, and chemicals
- penetrating the operation key inlet may cause wear, damage, and failure of the product.
- It causes wear, breakage, and failure
- Do not use two circuits above AC250V 3A at the same time
- Use at least 5 VDC 1mA with minimum application load
- Switch contacts may use both a micro load and a general load. However, do not connect relatively small loads to contacts used for
- different types of loads.
- Durable conditions are for ambient temperature of 5 to 35 tons and humidity of 40 to 70% RH
- For temperatures of 40℃ or higher, do not exceed 50% RH of humidity.
- Store, transport, and use the product without any deformation or deterioration load
- Avoid fire and direct heat

KESD Series
Safety Interlock Switch

Door opening/closing detection in equipment
Solenoid detection
Insert key in five directions
Wrist wear key(KSK-KCW) compatible with KSK safety selector switch
Heat protection to prevent malfunction

Certificates

UL 60947-5-1
cUL CSA C22.2 NO. 60947-5-1-14
EN 60947-5-1
S1-G-1-2009
KS S IEC 60947-5-1

KESD Series
Safety Interlock Switch

Feature

- Built-in solenoid.
- You can easily check the door status with the lock & monitor function
- Emergency lock (operation key) can be released via manual lever
- The keyhead shutter can prevent arbitrary key manipulation
- The operation key insertion may be adjusted in five directions

Selection guide

KESD - ❶ ❷ ❸ - ❹

	Classification	Code	Safety interlock switch
❶	Manufacturer	K	Koino
	Product name	ESD	Electric Safety Door Switch
❷	Door Lock / Release type	M	Mechanical lock / Solenoid release (DC 24V)
❸	Contact(Lock after key insertion)	A	2NC(locking)+1NO(Door)+1NO(Solenoid)
		B	2NC(locking)+1NC(Door)+1NO(Solenoid)
		C	2NC(locking)+1NC/NO(Door)
❹	Operation key	H	Horizontal
		V	Vertical
		C	Adjustable

Accessories

K ESD - □ □
❶ ❷ ❸ ❹

		Code	Slide unit
❶	Manufacturer	K	Koino
❷	P/N	ESD	Electric Safety Door Switch
❸	Sliding unit	SU	Sliding unit
		SKU	Sliding unit with key shutter
❹	Release lever	None	Without release lever
		L	With release lever

* When using the sliding unit, the horizontal operation key (H) should be used.

K ESD - □
❶ ❷ ❸

		Code	Key shutter unit
❶	Manufacturer	K	Koino
❷	P/N	ESD	Electric Safety Door Switch
❸	Key shutter unit	KU	Key shutter unit

* Contains key (KSK-KCW).

K ESD - □
❶ ❷ ❸

		Code	Key shutter unit
❶	Manufacturer	K	Koino
❷	P/N	ESD	Electric Safety Door Switch
❸	Release lever	L	Release lever

Product type

Lock / Release	Indicator	Contact confifuration (Lock after key insertion)	Cable inlet	P/N
Mechanical lock / Solenoid release	Solenoid DC24V / LED(Green) DC24V	A TYPE: 2NC (Lock monitoring) + 1NO ⊖ (Door monitoring) + 1NO (Solenoid monitoring)	G1/2	KESD-MA
		B TYPE: 2NC (Lock monitoring) + 1NC ⊖ (Door monitoring) + 1NO ⊖ (Solenoid monitoring)		KESD-MB
		C TYPE: 2NC (Lock monitoring) + 1NC/1NO ⊖ (Solenoid monitoring)		KESD-MC

⊖ Direct Opening

Specification

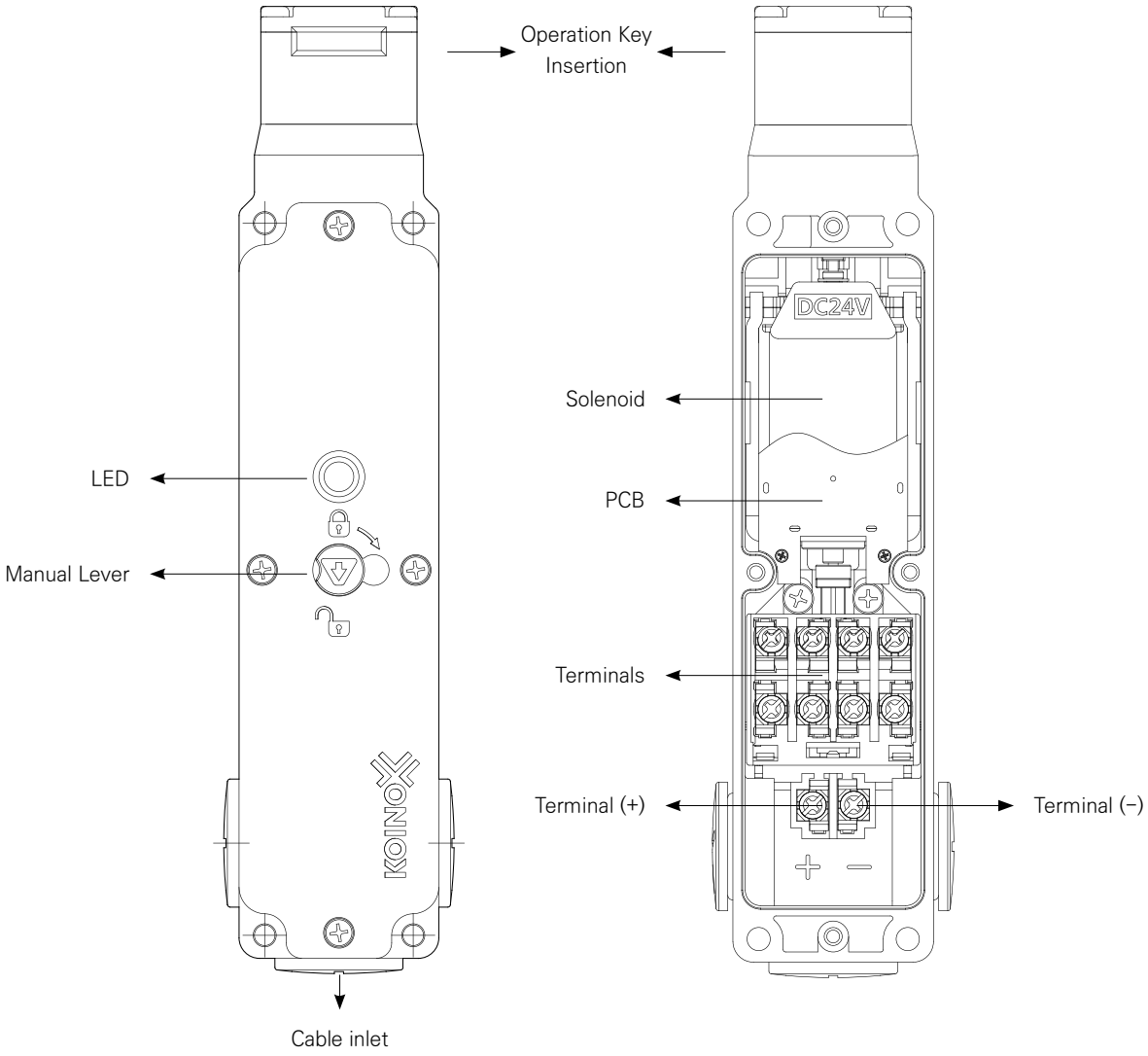
		KESD Series
Contact rating		250VAC 3A, 125VDC 0.55A 〈AC-15, DC-13〉
Insulation resistance		100MΩ+ (with DC500V Insulation resistance meter)
Conatct resistance		25 mΩ maximum (initial value)
Dielectric strength		250V
Vibration resistance		10 to 50Hz amplitude 1.5mm from X,Y,Z axis
Shock resistance		Minimum 30G
Operating ambient temperature		-10 ~ +55 ° C
Operating ambient humidity		Maximum 95% RH
Durability		Mechanical: 1M / Electrical: 0.5M operations
Operation frequency		Maximum 30 operations per 1 minute
Locking force		Minimum 1,000N
Minimal open force		60N
Minimum direct opening distance		Minimum 13mm
Rated open thermal current		2.5A (EN 60947-5-1)
Protection		Body: IP67(NEMA 4X) / Actuator: IP00
IEC protection classes		Class II
Pollution degree		3 (EN60947-5-1)
Impulse Withstand Voltage	Between terminals of same poles	2.5KV (EN60947-5-1)
	Between live and dead parts	2.5KV (EN60947-5-1)
Conditional Short-circuit Current		100A
*Solenoid overcurrent protection		Overcurrent limit above 800 mA
*Recommended Short-Circuit Protection Device		5A
Altitude		Maximum 2000m
Solenoid	Rated voltage	DC 24V ± 10%
	Power consumption	In operation : 300mA ± 10%, Idle: (10 seconds after Power on) : 150mA
	Insulation classes	Class E
Indicator		DC24V , 18mA (Green LED)

*Solenoid overcurrent protection : In case of overcurrent operation over 500mA, the product power is cut off by current limitation, and the product can be operated again after power reset when the product returns to normal operation. (Overcurrent limit consumption may vary depending on temperature)

*Recommended Short Circuit Protection Device (SCPD) : Use a gG or gL fuse conforming to IEC 60269 as a short circuit protection device. The main unit does not have a built-in fuse.

Internal and external structures

KESD-M

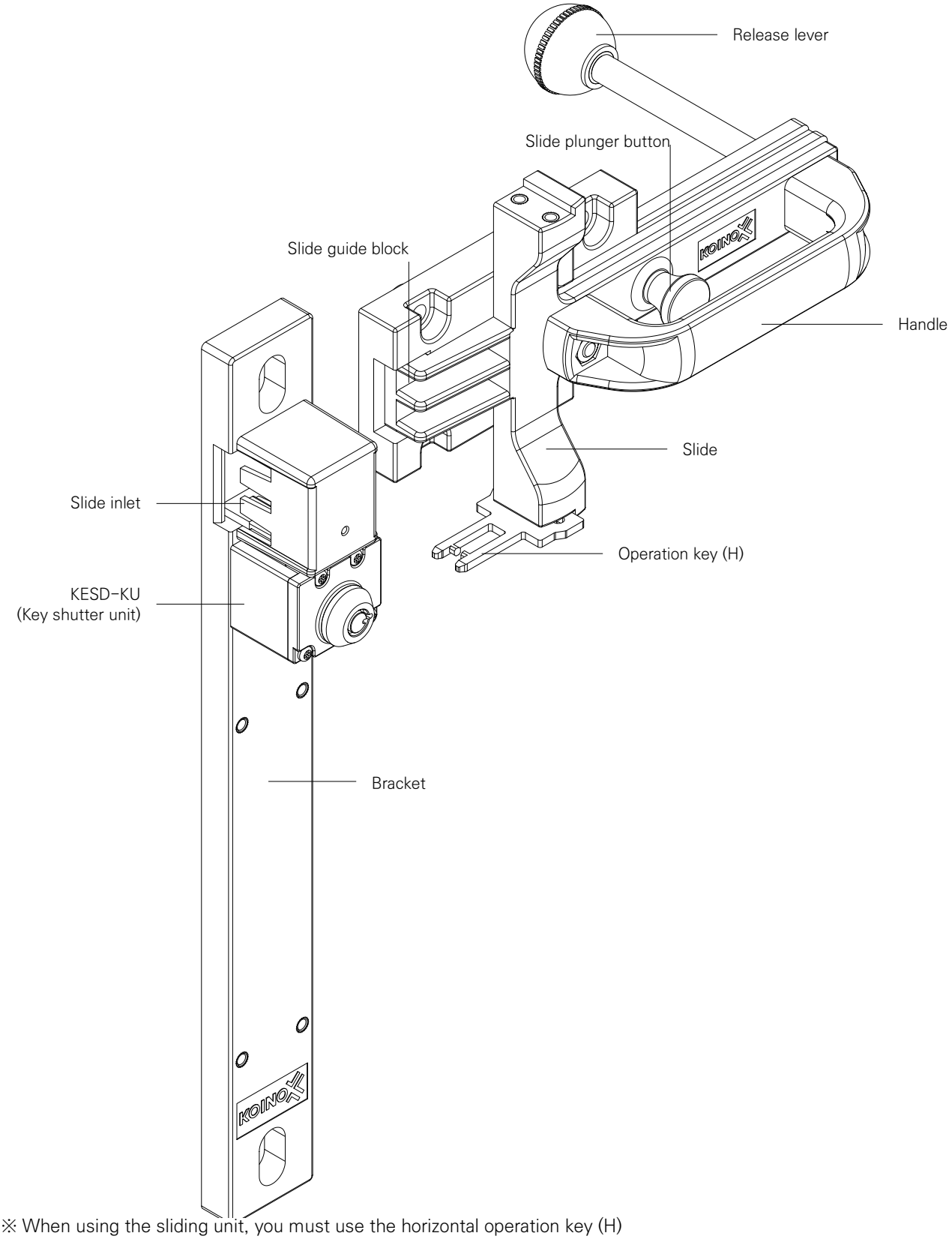


Terminal array

A type	B type	C type
11 12 21 22 33 34 43 44 + -	11 12 21 22 31 32 43 44 + -	11 12 21 22 33 34 41 42 + -

Internal and external structures

KESD-SKU-L (Sliding unit + Key shutter unit + Release lever)

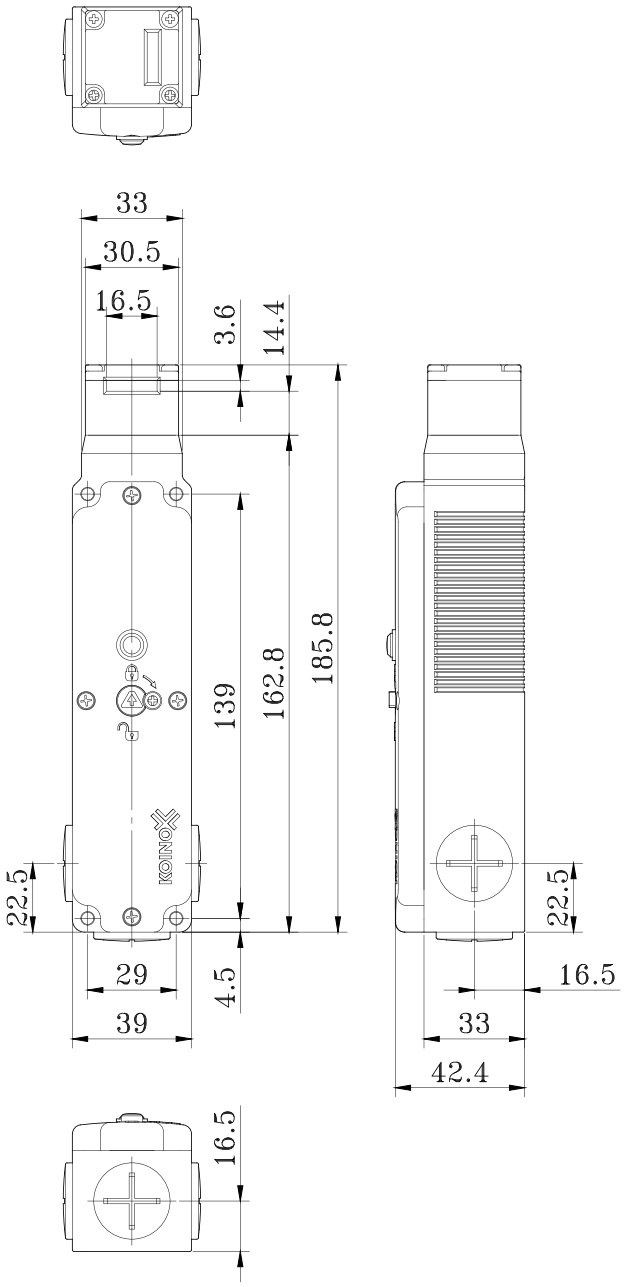


※ When using the sliding unit, you must use the horizontal operation key (H)

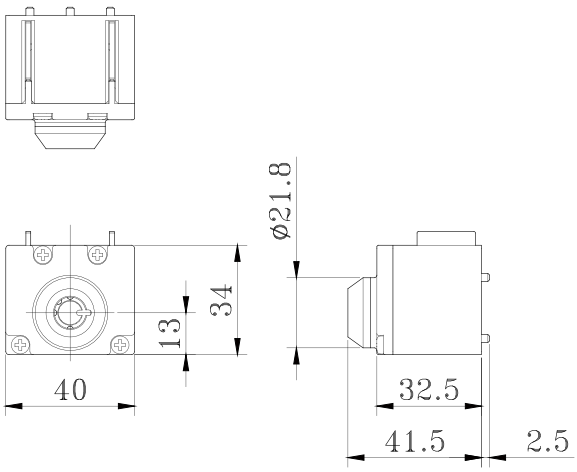
※ Slide handles can be installed in both directions

Dimension

KESD-M

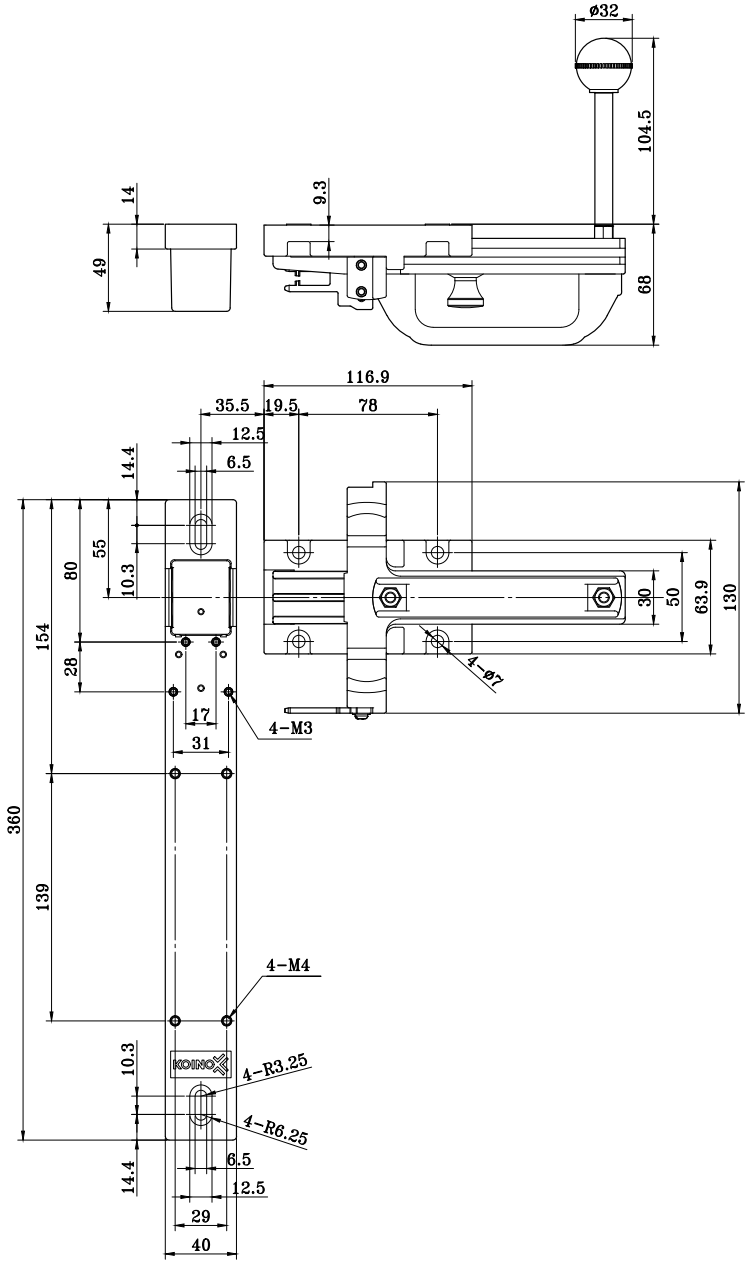


KESD-KU(Key shutter unit)

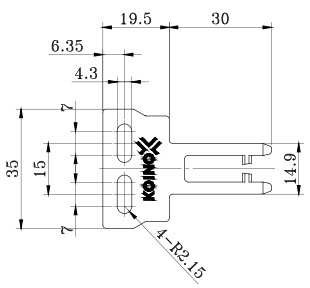
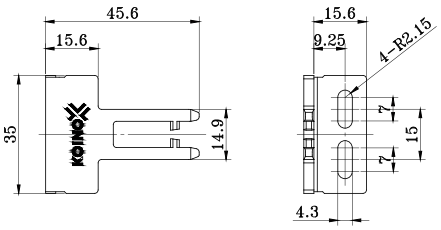
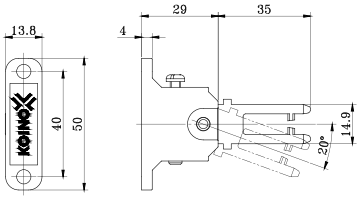


Dimension

KESD-SU (Slide unit)

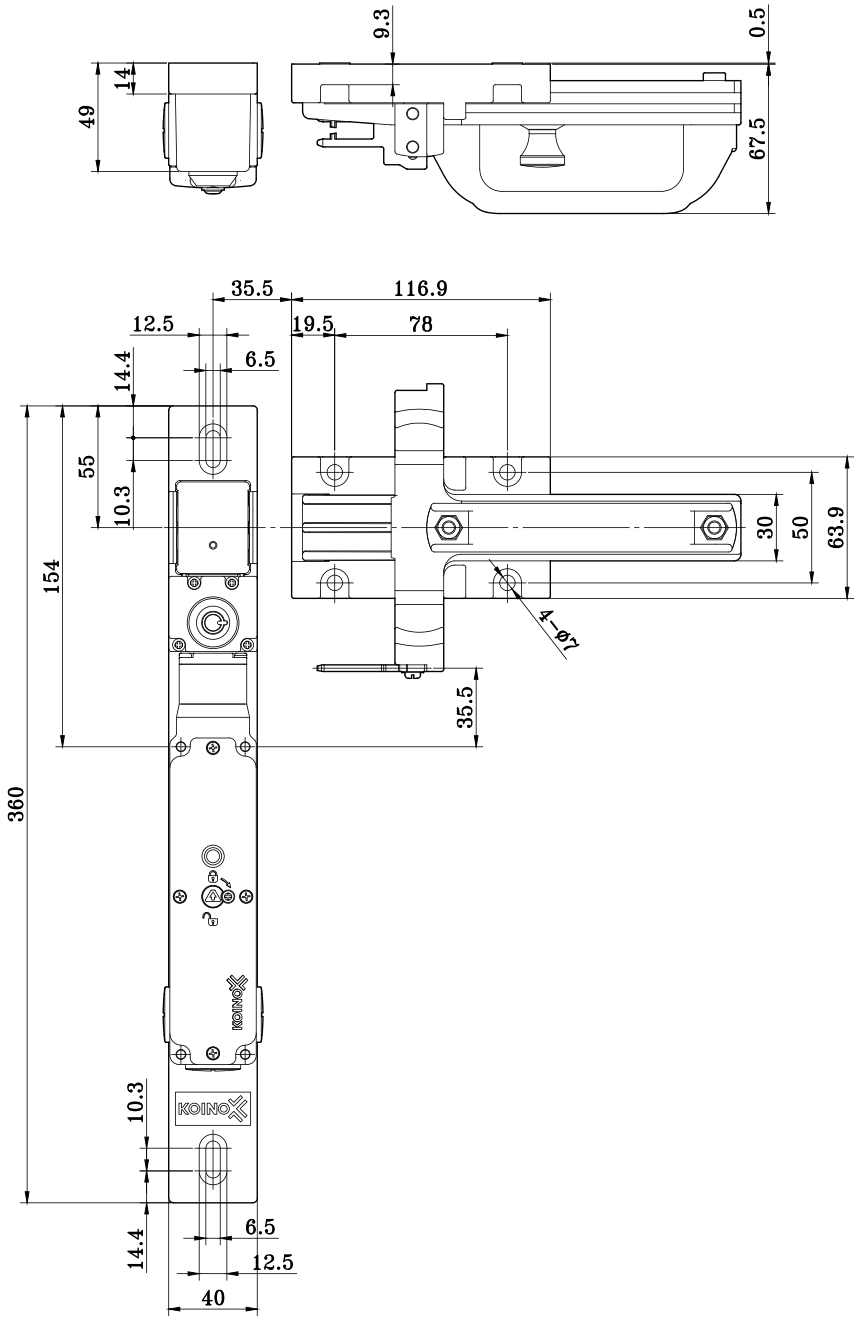


Operation key

H Type (Horizontal)	V Type (Vertical)	C Type (Adjustable)
		

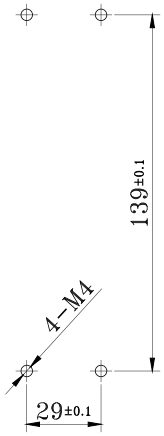
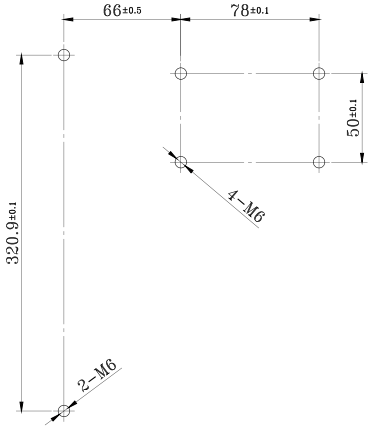
Dimension

KESD-M + KESD-SKU (Interlock switch + Key shutter slide unit)

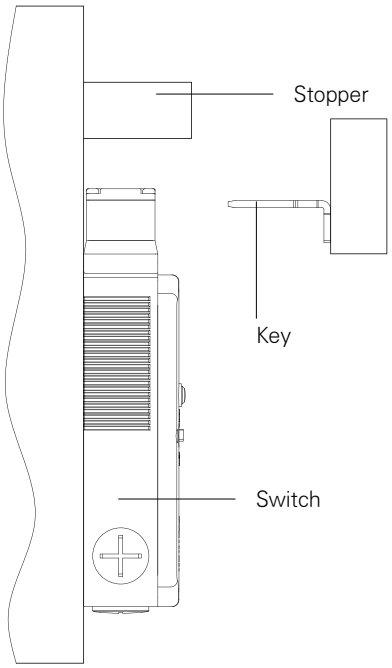


Mounting hole

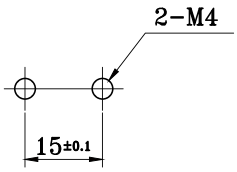
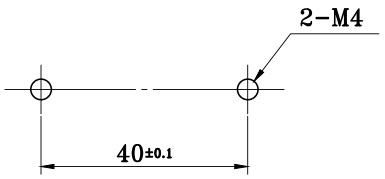
Cut hole

KESD-M□	KESD-SU
	

Stopper



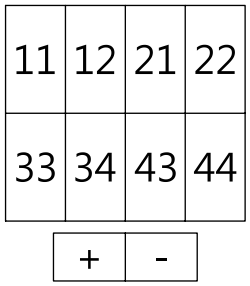
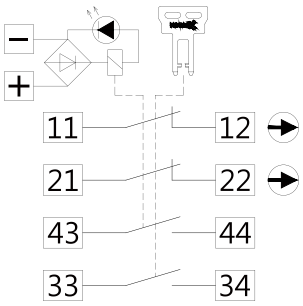
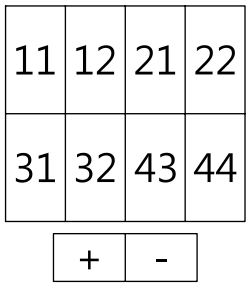
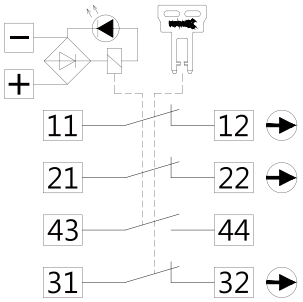
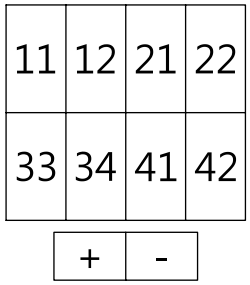
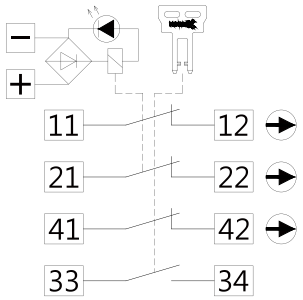
Operation key

H,V Type	C Type
	

※ Do not use body as a Stopper

※ Install the stopper as shown in the figure above so that the end of the control key does not touch the head

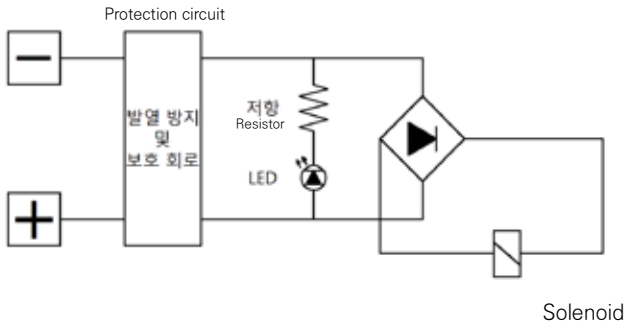
Circuit diagram

	Terminal layout	Cirduit	Description
A			2NC ⊖ 11-12,21-22 (Locking monitoring) 1NO 33-34 (Door monitoring) 1NO 43-44 (Solenoid monitoring)
B			2NC ⊖ 11-12,21-22 (Locking monitoring) 1NC ⊖ 31-32 (Door monitoring) 1NO 43-44 (Solenoid monitoring)
C			2NC ⊖ 11-12,21-22 (Locking monitoring) 1NO/1NC 33-34 / 41-42 (Door monitoring)

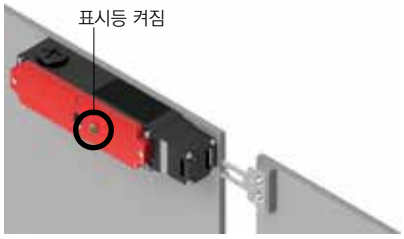
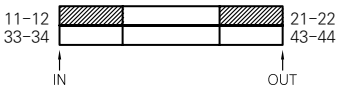
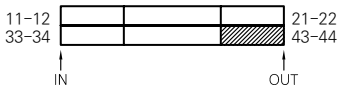
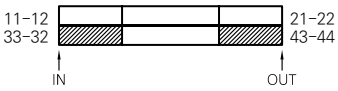
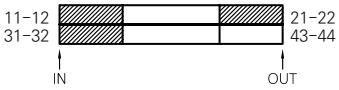
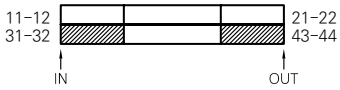
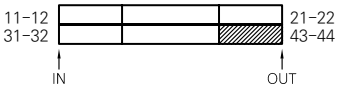
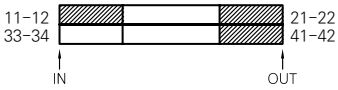
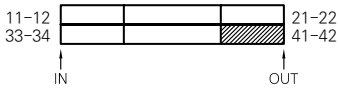
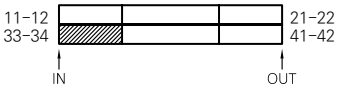
※ Power (+,-) : Connect the power lines

※ Direct opening mark ⊖

Internal circuit (Solenoid & Indicator)



Operation characteristics

Status	Door closed / Locked	Door closed / Unlocked	Door opened / Unlocked
			
MA			
MB			
MC			

※ ▨ Power on

※ IN : Key in, OUT : Key out

Forced release using manual lever

- Forced release using manual lever in case of power failure or emergency
- The lock can be released by the manual lever regardless of the solenoid condition
- Only the person in charge should release the auxiliary lock using the manual lever
- Release the manual lever fixing bolt and turn the manual lever 180 degrees with the arrow pointing downward using the manual lever key.
- After the manual lever is released, it must be restored to its original state.

Manual lever

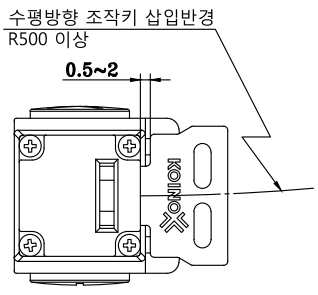
Key for Manual lever

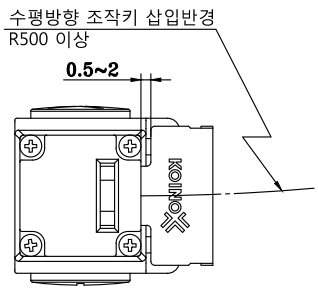
Operation key instruction

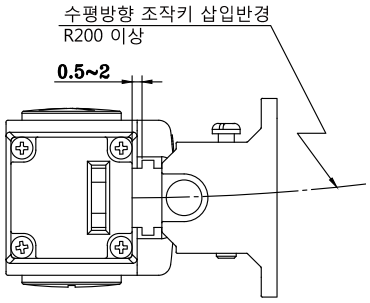
- When the head bolts are released, the head orientation can be changed to four directions. Be careful not to get debris stuck.
- Do not disassemble the inside of the head during head direction conversion to prevent malfunction.
- Ensure that the head bolt temporary head is level to avoid load on the inner lock function.
- Make sure that the head bolt tightens to the end of the temporary thread.
- Change the head direction after changing the manual lever to unlock.

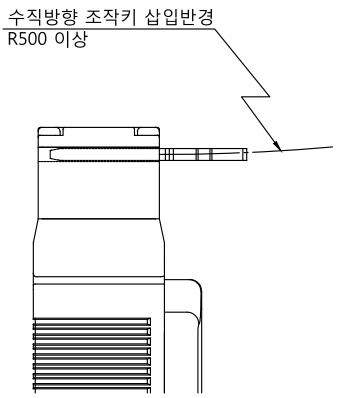
Operation key setting

Keep the space between the operation key and the key insertion at 0.5 to 2 mm

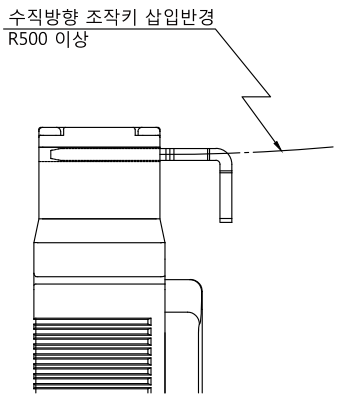




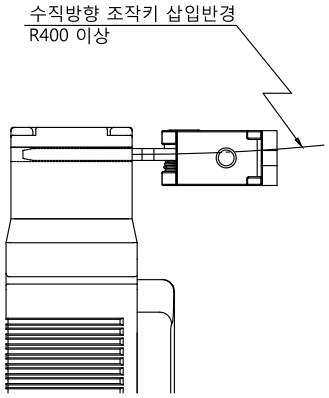




H Type
(Horizontal)



V Type
(Vertical)

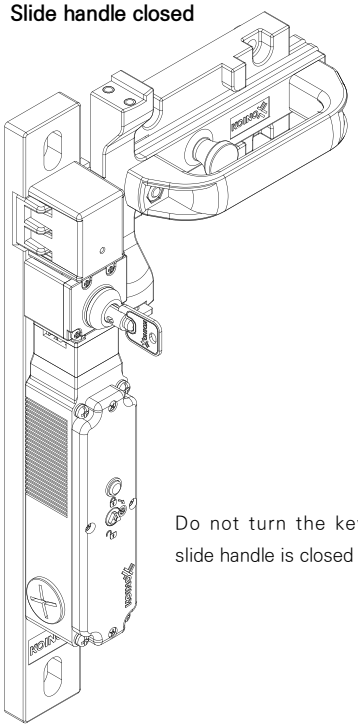


C Type
(Adjustable)

Operation example

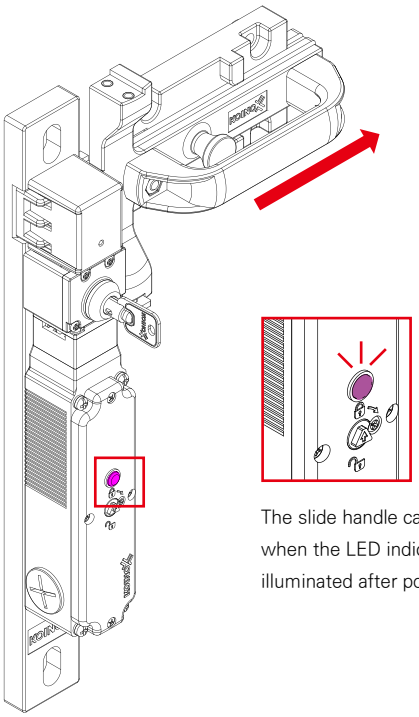
Lockout key to prevent entrapment

1. Door closing lock
(solenoid non-energizing)
Slide handle closed



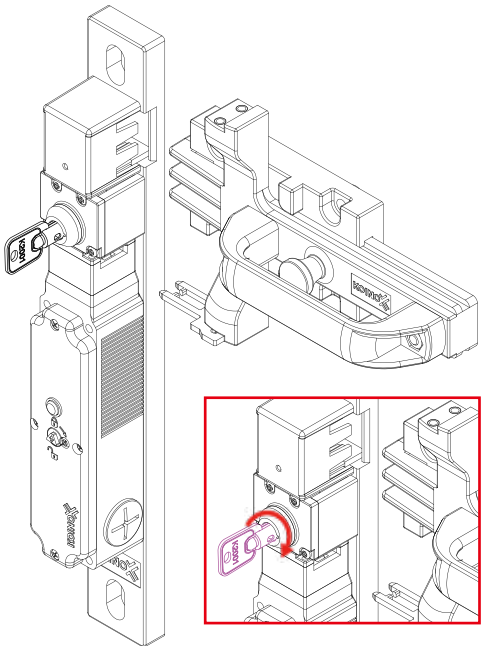
Do not turn the key when slide handle is closed

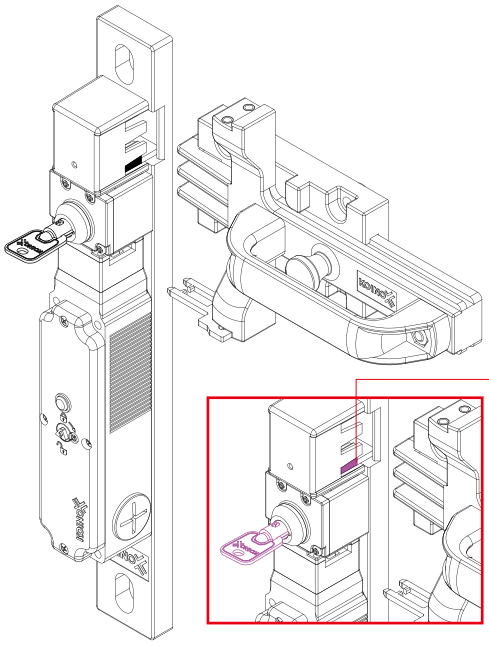
2. Door closing lock (solenoid non-energizing)
Slide handle closed



The slide handle can be opened when the LED indicator is illuminated after powering on

3. Door Open – Slide Handle Open





- The lockout key can be turned when the slide handle is open.
- Turning the lockout key clockwise raises the key shutter (Lock status) and blocks the slide inlets to prevent insertion of the operating key
- Once the lockout key is removed, the door cannot be locked from the outside

Precautions

Usage Environment

- This product is for indoor use only. Outdoor use is prohibited.
- Do not use in places where temperature changes and vibrations are severe, where humidity is high or condensation is likely, where chemicals, metal powders, processing chips are affected, where solvents such as thinner and detergents are affected, or where explosive gases are present.
- Do not use in oil, water or in an environment where oil and water are always in contact. There is a risk of water or oil entering the interior.
- The main body is protected from intrusion of dust, oil, moisture, etc., but use it away from where metal powder, oil, moisture, and medicine are not affected by the key unit or key insertion port.
- When opening and closing the door, attach the operating key to a place that does not come into contact with the body to avoid a risk of injury.
- Keep away from fire and direct heat.
- Keep away from gas, dust, and hot and humid places when storing the products

Precautions for installation

- Do not drop the product as the switch may not function properly and may cause injury.
- Do not use KESD body as a door stopper.
- When installing the cover after wiring, install the KOINO logo on the cover facing down to avoide internal part breakage`
- Do not use metal connector or metal pipe to avoid part breakage and electric shock Make sure to change the manual lever to unlock when changing the direction
- Install hinged door opening/closing door close to handle. If installed close to the hinge, a load greater than or equal to the operating force is applied to the lock of the product, causing damage to the lock function.

Functional check points

- Make sure that there are no people in the dangerous area before performing a functional check.
- Mechanical function check: Make sure that the operation key is easily inserted into the head.
- Electrical function check: When inserting the operation key, the operation key must not be removed even if the machine inside the door is operated automatically.
- Solenoid check : The operating key must not be released when the solenoid power is turned off during door lock conditions
- Insert the operation key three to four times and check the operation of the contact point
- If the sealing rubber is biased or foreign substances are attached, the sealing property will be degraded, so check if there is any problem.
- The durability of the KESD depends on the pull strength and opening travel distance, so be sure to use it within the number of openings and closings that meet the conditions of use and do not cause performance issues.

Precautions for Use

- When installing, be sure to check that the safety functions are working properly before operation. Safety functions may not operate properly due to wiring errors, incorrect function settings, switch failures, etc.
- Do not disassemble or modify the product
- Do not force the slide handle to move when the lockout key is removed or when the door is locked. It can cause a problem with the behavior of the product.
- The solenoid must be energized to open the door. If the solenoid is de-energized, forcing the door open can cause it to malfunction.

Screw tightening torque

Screws	Recommended torque
Terminal (M3)	0.5~0.7N.m
Cover Installation (M3)	0.5~0.7N.m
Operation key head installation(M3)	0.5~0.7N.m
Body insatllation (M4)	0.5~0.7N.m
Key shutter unit installation (M3)	0.5~0.7N.m

Parts installation method and precautions

- KESD switch & operation key

  -Install the KESD switch and the operating key using M4 screws and spring washers at proper tightening torque

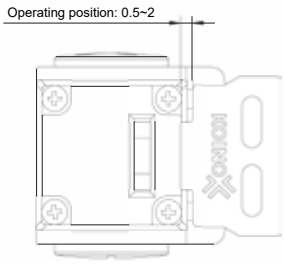
  -Operations other than the dedicated operation keys may cause damage to the product, so use the dedicated operation keys for the safety of the device.

  -Use the operating key perpendicular to the key insert at the specified insertion radius

  -Applying or dropping an excessive load on the front of the key with the operating key mounted on the switch body can cause the key to deform or damage to the body

- Secure the door

  - When the door is closed (with the operating key inserted), attempts to push the door (operating key) above the operating position due to the weight of the door, vibration of the machine, cushioning rubber, etc. can cause malfunction. Secure the door with a lock (hook) etc. to fit into the operating position



• Solenoid

– As the solenoid is energized, heat is generated. Do not touch the solenoid while operating

– Check the polarity of the terminals and wire them

– Do not open or close the solenoid diode cover to avoid electric shock

• Wiring

–Do not energize during wiring as there is a risk of electric shock.

–As there is a risk of electric shock, be sure to install the cover when wiring is complete and do not energize with the cover open.

–Be careful not to allow foreign objects into the switch body during wiring work and to avoid any foreign objects on the tool (screw driver) or terminals.

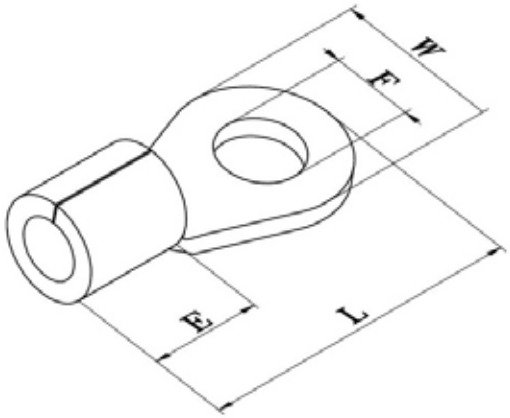
–The proper lead wire specification is AWG22–16. If the remaining part of the lead wire comes into contact with the cover, it will cause the cover to float, so wiring the lead wire to an appropriate length.

–Do not over–pull the lead wires as this may cause wiring disconnection.

–When exchanging and maintaining the KESD, make sure to work with the power off.

–Do not insert the compression terminal into the gap inside the case as it can cause damage or deformation of the case.

–Check the polarity of the terminals before connecting the wiring.(E1 : +, E2 : –)



KS standard : R 1.5–3
W : 5.5
F : 3.2(+0.2,–0)
E : 4.1(Minimum)
L : 12.5(Maximum)

Manufacturer	W	F	E	L
Jeono Electric (JOR 1.5–3)	5.5	3	5	12.5
Kyounsung Electric (KSTR 1.5–3)	5.6	3.5	5.5	15
ES Terminals (ESTE 1.5–3M)	5.6	3	5.5	15

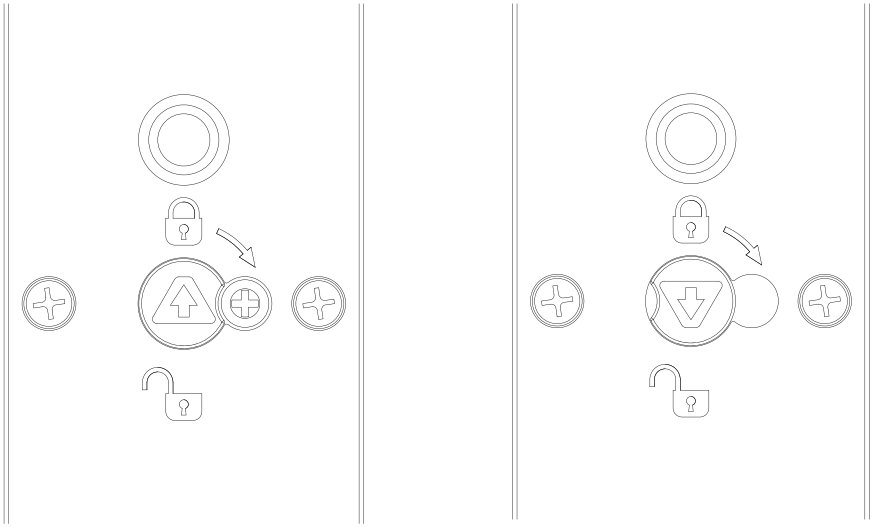
Parts installation method and precautions

- Cable inlet

  –If you tighten it with excessive torque, it can cause damage to the case, so tighten it with proper tightening torque.
  –Use the attached cap screw to tighten the unused inlet to the proper tightening torque.
  –Use the cable with the appropriate external diameter required by the connector.

- Recommended connector
  –To avoid affecting the internal wiring of the switch case, use connectors with screw length of 10,9 mm or less.
  –Use the recommended connector (G1/2, M20) to secure NEMA4X (IP67).

- Manual lever
  –Use it to release the lock in case of a power failure or emergency.
  –The location of the manual lever is shipped in a locked state.
  –Do not use the manual lever for stopping or starting the machine.
  –If the direction of the arrow on the manual lever changes from Lock to Unlock, the lock is released to open the door.
  –Please make sure to return the manual lever to the lock position before using it.
  –To prevent easy unlocking using the manual lever, keep the manual lever locked and tighten screws to prevent movement of the manual lever.
  –Do not apply excessive force to the key for the manual lever.
  –If the door is locked and the manual lever is in an unlocked state, do not remove the cover as it may malfunction the product.



Locked state Unlocked state

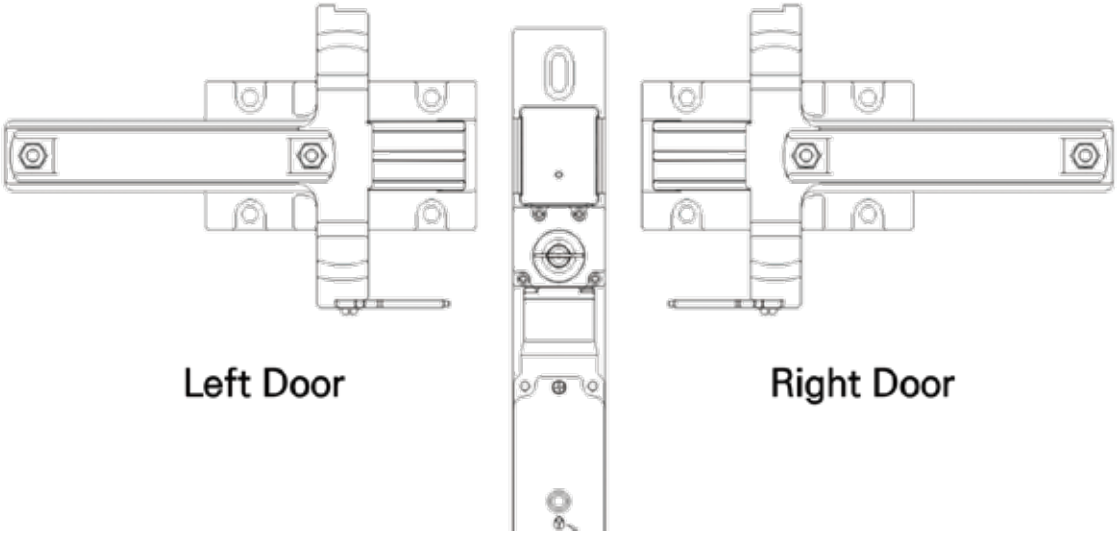
- Interlock key head & Slide unit

  –When using the slide unit, the keyhead can be adjusted in both directions, right and left.

  –KESD–SU is exclusively for the KESD series and cannot be used in combination with door switches from other vendors.

  –Only use the sliding handle in the direction of the left door or the direction of the right door as shown on the right

  –Loose screws can cause premature failure, use spring washers to tighten to proper tightening torque.




AUTO
TEACH
SAFETY

Safety Mode key Switch
NS22-MK MKP Series

NS22-MK, MPK mode key switch is a selector switch that can be synchronized with a safety interlock switch to ensure the safety of the operator by performing equipment maintenance work without removing the operation key.

The operation keys in this product are interchanvgeable with KESD interlock switch's keyshutter unit (KESD-SKU).

Certificates

CE IEC 60947-5-1

S1-G-1-2009
KS C IEC 60947-5-1

NS22-MK Series

Mode key switch

Feature

- When used in conjunction with a KESD interlock switch, it provides even more safety
- AUTO TEACH function can be selected.
- Supports KEY anti-separation function.
- Supports various configurations including forced disconnect contacts.
- Supports left key isolation and right key isolation functions

Selection guide

NS22 - ❶ ❷ ❸

	Code	Description
❶ Classification	MK	Mode Key selector switch
	MKP	Mode Key selector switch (Panel mounting)

	Code	Description
❷ Contacts	1B1B1A	2NC 1NO
	2B02A	2NC 2NO
	1B1B1B	3NC
	1B2B1A	3NC 1NO

Note: The contact configuration guarantees safety certification only for the above four types.

	Code	KEY Separation	NC Energized Position
❸ Key positions	LL	↖	↖
	RL	↗	↖
	LR	↖	↗
	RR	↗	↗

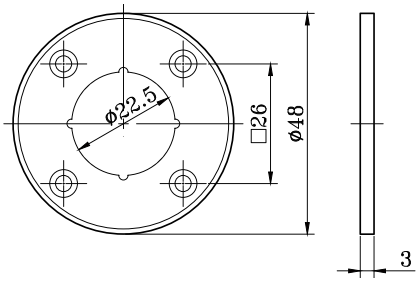
Example) 2 NC contact blocks (1B+1B) + 1 NO contact block (1A) +
Detach key from right + Energizing NC from the left

NS22-MK-1B1B1A RL

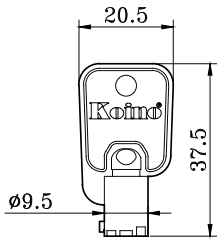
Specification

P/N	NS22-MK	NS22-MKP
Contact Rating	125VAC 6A, 250Vac 3A.(Under resistive load)	
Insulation Resistance	100MΩ (DC500V Insulation Resistance Meter)	
Withstand Voltage	2,500VAC (1 minute at 50Hz/60Hz)	
Contact resistance	30mΩ or less (Initial Value)	
Electrical Life	100,000+ (Open/Close Frequency 30 times/minute maximum)	
Mechanical life	100,000+ (Open/Close Frequency 30 times/minute maximum)	
Vibration resistance	10~55 Hz oscillation 1.5 m in each direction X, Y, Z 1 hour (within 1 ms)	
Shock resistance	Endurance: 50G+, malfunction: 10G+ (within 1ms)	
Protective structure	IP 66(Panel front controls)	
Ambient Temperature	-25℃~+70℃ (non-freezing conditions)	
Storage ambient temperature	-45℃~+85℃	
Ambient humidity	45~85% RH	
Rated insulation voltage (Ui)	600V	
Rated impulse withstand voltage (Uimp)	6KV	
Enclosure thermal current (Ith)	10A	

Accessory



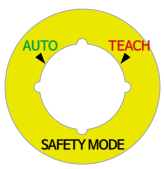
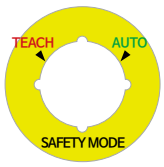
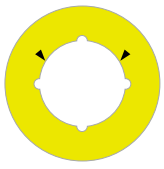
MK-MTP

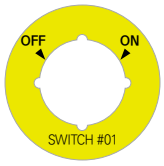
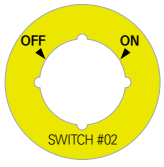
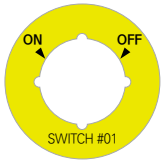
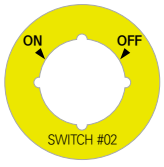
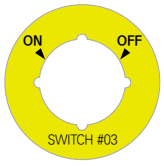


MK-KCW

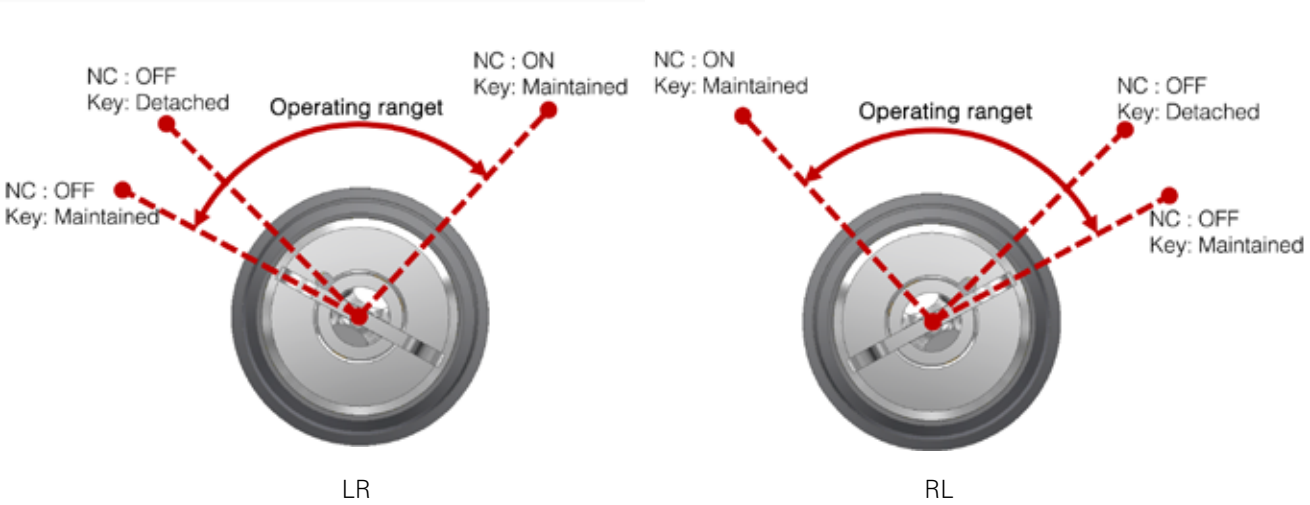
※Accessories are included in the product package

Accessories selection guide

Label Sticker for mode selection		Common Label Sticker	Plate & Key	
MK-AT-ON	MK-TA-IN	MK-NN-GN	MK-MTP	MK-KCW
				

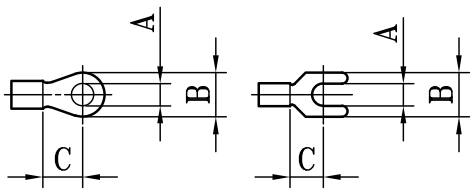
External Multi-user switch			Internal Multi-user switch	
MK-MP1-ON	MK-MP2-ON	MK-MP1-IN	MK-MP2-IN	MK-MP3-IN
				

Operating range



Panel mounting

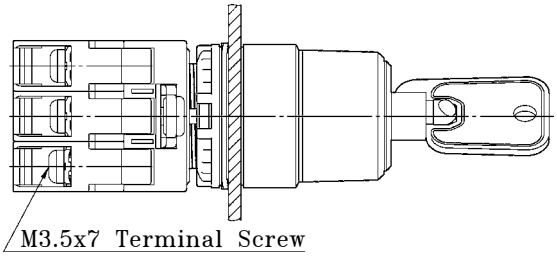
Terminal

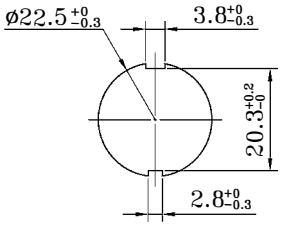


A	ø3.7 Min.
B	ø8.0 Max.
C	7.0 Min.

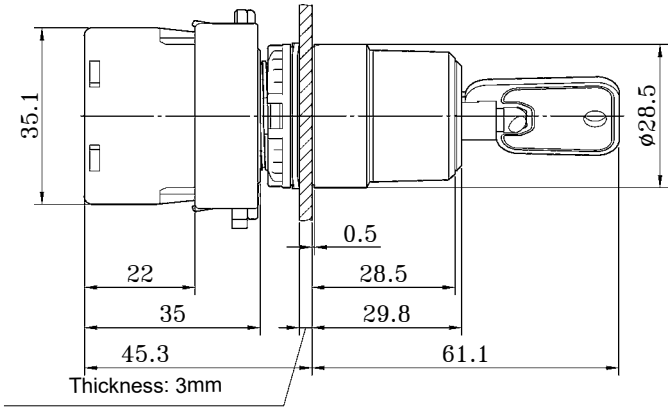
Dimension

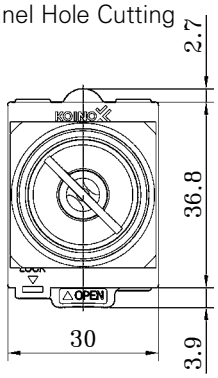
NS22-MK



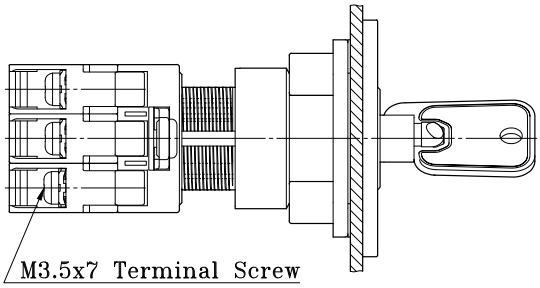


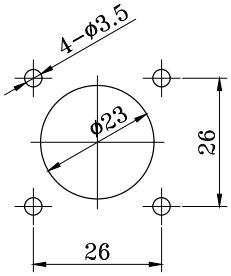
<판넬 취부 홀 가공 치수>
Panel Hole Cutting





NS22-MKP





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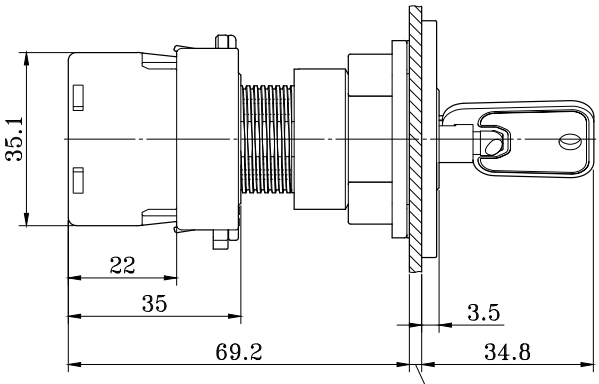
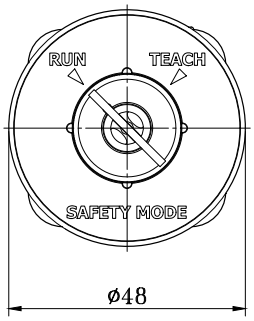
Panel Hole Cutting





취부판넬 두께 : MAX 3mm
Thickness: 3mm

Safety Emergency switch

KSE Series
KEPB22/25/30 Series
KEPB160ER Series

IP65

Listed UL

EMO / EMS printing with non-illuminated type

Certificates

KSE Series

UL 508
IEC 60947-5-5
CSA-C 22.2 No. 14
IEC 60947-5-5

Listed NISD

EN60947-5-1
EN60947-5-5

S1-G-1-2009
IEC 60947-5-5

Certificates

KEPB Series

UL 508
IEC 60947-5-5
CUL CSA-C 22.2 No.14

EN60947-5-1
EN60947-5-5
IEC 60947-5-1
IEC 60947-5-5

S1-G-1-2009
IEC 60947-5-5

KSE Sereis

Emergency stop switch

※ Engraving EMO .EMS by order-made

Feature

- Illuminated / Non-illuminated types
- Mounting panel thickness: Maximum 5mm
- IP65(Frint panel), IP20(Contact block)
- Altenate, Turn-to-reset, Push - Pull
- Direct opening structure

Selection guide

KSE ❶ ❷ - ❸ ❹ ❺ ❻ ❼

	P/N		Code
❷	Illuminating	P	Non-illuminated
		B	Illuminated
❸	Hole diameter	22	Ø22mm
		25	Ø25mm
		30	Ø30mm
❹	Button diameter	4	Ø40mm
		6	Ø60mm
❺	LED voltage	1C	DC 6V
		2C	DC 12V
		3C	DC 24V
		1A	AC 110V
		2A	AC 220V
❻	A contacts	0	None
		1	1a
		2	2a
❼	B contacts	1	1b
		2	2b
		3	3b
		4	4b

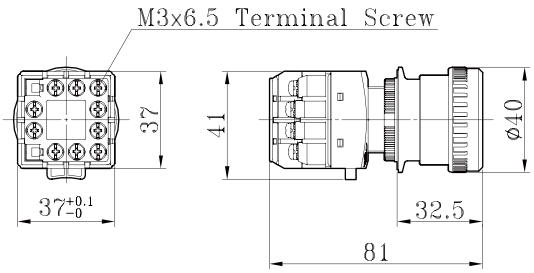
* Number of A(NO) contacts: Max. 2,
B(NC) contacts: Max. 4
Total number of contacts: 4

Specification

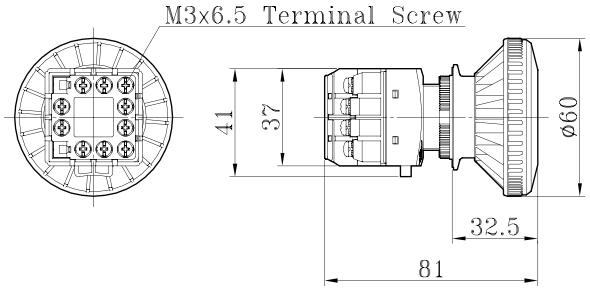
P/N	KSE Series
Contact rating	250VAC 3A
Insulation resistance	Minimum 100MΩ (with DC500V Insulation resistance meter)
Contact resistance	Maximum 50mΩ (initial value)
Withstand voltage	Between terminals of same poles 2,500VAC(50/60Hz) for 1 minute
Vibration resistance	10 to 50Hz amplitutde 1.5mm from X,Y,Z axis
Shock resistance	Durability 100G(1,000㎨), Malfunction at over 15G(150㎨)
Operation frequency	900 operations per 1 hour
Electrical durability	Minimum 100K operations(15/min.)
Mechanical durability	Minimum 250K operations
Protection	IP65(Front panel), IP20(Contact block)
Operating ambient temperature	-25℃ ~ +50℃(at no freezing)
Storing ambient temperature	-25℃ ~ +80℃(at no freezing)
Operating ambient humidity	45~85% RH
Contact opening/closing structure	NO/NC Direct opening structure
Operating structure	Altenate, Turn-to-reset, Push - Pull
Minimum operating load	5Kgf (49N)
Operating range	3.8mm - 4.5mm

Dimension

KSE□-□4□□□

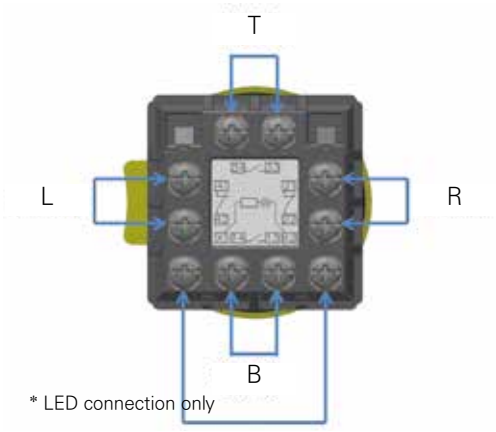


KSE□-□6□□□



Contact configuration

Bottom View



	Top	Bottom	Left	Right	Remark
1A		●			
2A	●	●			
1B				●	
2B			●	●	
3B	●		●	●	
4B	●	●	●	●	
1A1B		●		●	"B": A contact
1A2B		●	●	●	"B": A contact
1A3B	●	●	●	●	"B": A contact
2A1B	●	●		●	"T","B": A contact
2A2B	●	●	●	●	"T","B": A contact

EMERGENCY STOP SWITCH

Instructions

■ Detaching button

1. Push the eject button
2. Turn the Push button to CCW
3. Pull out the part

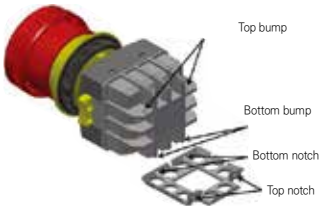
■ Assembling button

1. Insert push button to the center of contact block 2. Turn the push button to CW

■ Detaching terminal cover

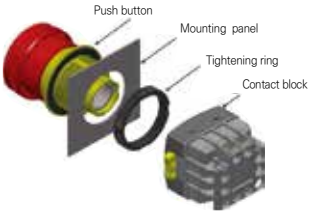
Lift both projections of the terminal cover up enough to separate from the locking hook.

■ Assembling terminal cover



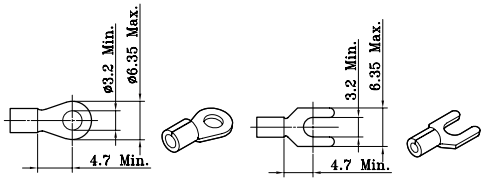
Top bump – To notch
Bottom bump – Bottom notch

■ Mounting



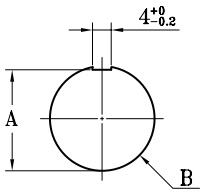
Secure the Push button to the Mounting panel using the Tightening ring and install it in conjunction with the Contact block.

■ Terminal lug



Ring Terminal Spade Terminal

Mounting hole



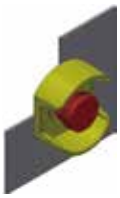
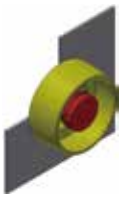
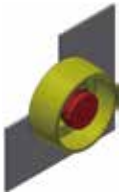
P/N	A	B
KSE22	21.5~21.7mm	22.2~22.5mm
KSE25	24~24.3mm	25.2~25.5mm
KSE30	29~29.3mm	30.2~30.5mm

Precaution

- Make sure to check the wiring connection before operating the switch.
- There is a risk of electric shock or fire, so make sure to check the wiring connection before applying power.
- Use wiring that does not meet voltage and current requirements as this may cause a fire.
- Too loose connection of the terminal tightening may cause overheating and fire. Tighten to appropriate tightening torque.

(Recommended torque for terminal tightening: 0.6 to 1.0 N.m.)

SAFETY COVER for KSE Series

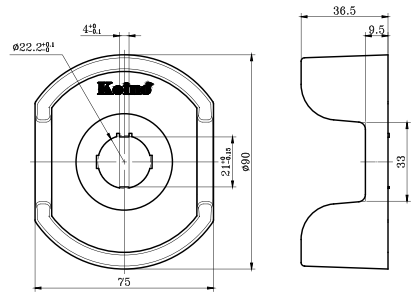
Figure	Product name	Mounting	Label(Sold separately)
	**Half cover – Yellow** KSE22-A-P0(Yellow) KSE25-A-P0(Yellow) KSE30-A-P0(Yellow) KSE22-A-P0-1(White) KSE25-A-P0-1(White) KSE30-A-P0-1(White)		**EMERGENCY STOP** KSE-A-S1 **EMERGENCY OFF** KSE-A-S2
	**Flush mounted** SE22-A-U1(Yellow) SE25-A-U1(Yellow) SE30-A-U1(Yellow) SE22-A-U2(White) SE25-A-U2(White) SE30-A-U2(White)		**EMERGENCY STOP** SE-A-S1 **EMERGENCY OFF** SE-A-S2
	**Raised – Plastic** SE22-90 SE25-90 SE30-90		**EMERGENCY STOP** 22-90-1 **EMERGENCY OFF** 22-90-2
	**Raised – Aluminium** SE22-90AL SE25-90AL SE30-90AL		**EMERGENCY STOP** SE22-90AL-1 **EMERGENCY OFF** SE22-90AL-2
	**Aluminium** SE-22 SE-25 SE-30		
	**Plastic** KSE22-A-L1(STOP) KSE25-A-L1(STOP) KSE30-A-L1(STOP) KSE22-A-L2(OFF) KSE25-A-L2(OFF) KSE30-A-L2(OFF)		
	**Plastic (Transparent)** KSE-224-A-P1 KSE-254-A-P1 KSE-304-A-P1		

※ Label stckers are sold separately

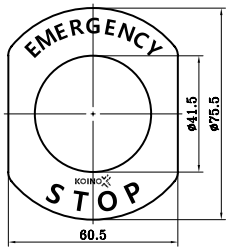
SAFETY COVER

Dimensions

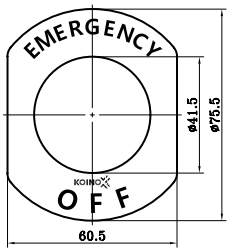
KSE22-A-PO



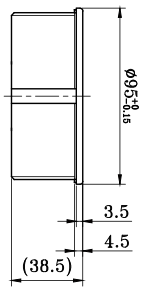
KSE-A-S1

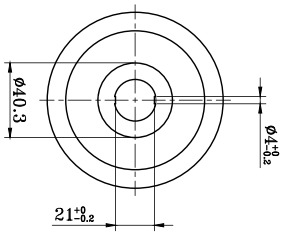


KSE-A-S2

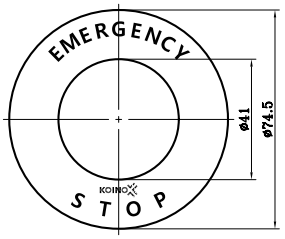


SE22-A-U1

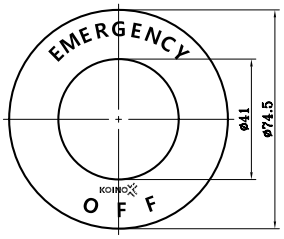




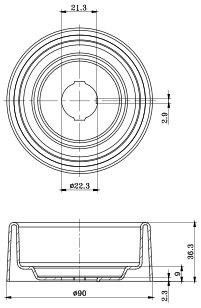
SE-A-S1



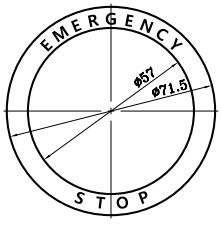
SE-A-S2



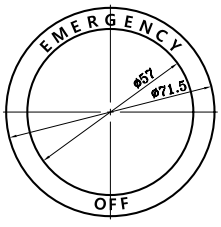
SE22-90



SE22-90-1



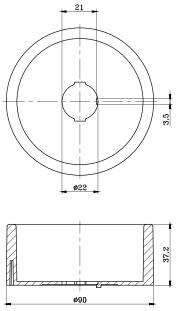
SE22-90-2



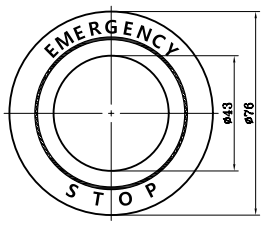
SAFETY COVER

Dimensions

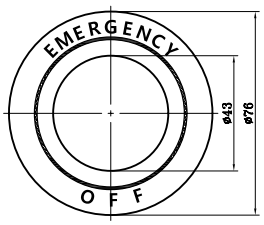
SE22-90AL



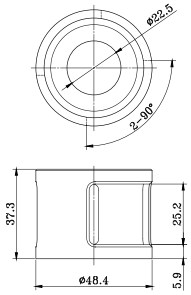
SE22-90AL-1



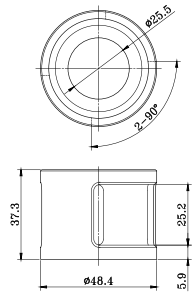
SE22-90AL-2



SE22



SE-22



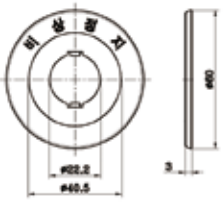
SE-25

KSE-A-L

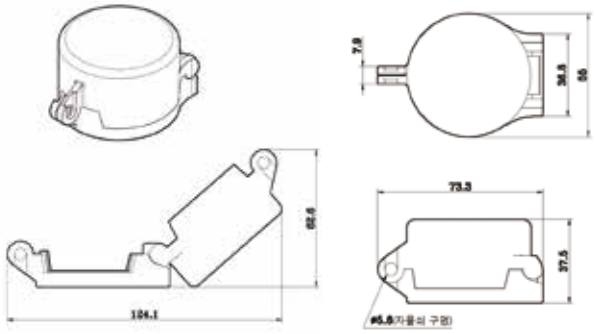
KSE22(25, 30)-A-L1

KSE22(25, 30)-A-L2

KSE22(25, 30)-A-L3



KSE224-A-P / KSE254-A-P1 / KSE-30-A-P1



Ø22
Emergency stop switch

Feature

- Certificate
- Certificate
- "For use on a flat surface of a type 1 enclosure"
- Materials have strong heat resistance, oil resistance and mechanical strength.
- Maximum panel thickness w/ label plate: 5mm
- IP65
- NC contacts can be forcibly separated even if fused
- Safety lock structure

Selection guide

KEPB ❶ 22 ❷ ER ❸ S ❹ - 11 ❺

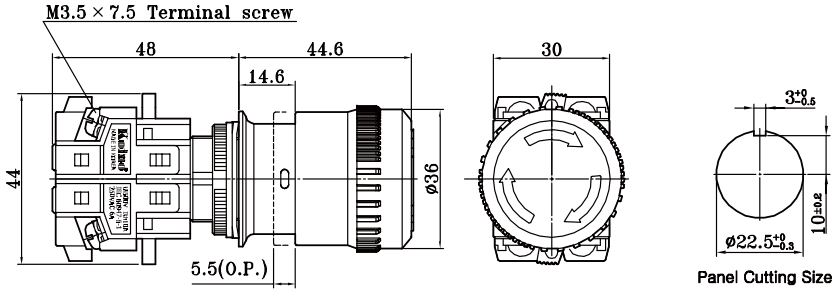
	Classification	KEPB	Emergency Push Button Switch
❷	Diameter	22	Ø22mm
		25	Ø25mm
		30	Ø30mm
❸	Actuator	ER	Push to lock – Turn to reset
		ERK	Push to lock – Turn(Key) to reset
❹	Arrow marking	S	White arrow
		None	Arrow (No painting)
❺	Contacts	Number of NO	
		Number of NC	

Specification

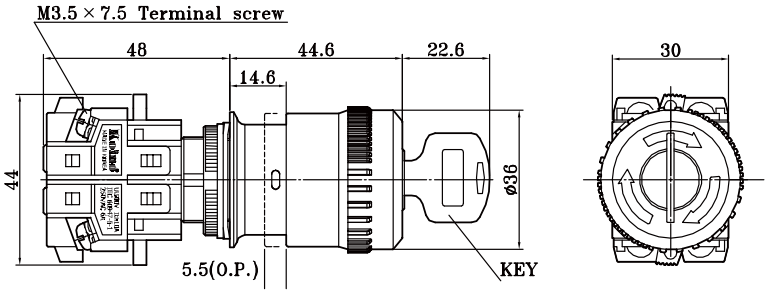
Classification		KEPB160ER
Contact rating		125VAC 10A, 250VAC 6A(at resistor loaded)
Insulation resistance		Minimum 100MΩ (DC500V Insulation resistance meter)
Contact resistance		Maximum 30mΩ (Initial value)
Withstand voltage		2,500VAC (50/60㎐)에서 for 1 min.
Vibration resistance		10 to 50Hz amplitutde 1.5mm from X,Y,Z axis
Shock resistance		About 100G(1,000㎨)
Operating ambient temperature		-15℃ ~ +50℃(at no freezing)
Operating ambient humidity		45~85% RH
Protection		IP 65
Operation frequency		30 per 1 minute (Lock – Reset : 1 operation)
Durability	Electrical	Minimum 100K operations
	Mechanical	Minimum 300K operations
Materials & Colors		Body : Nylon(Yellow), Button : Nylon(Red)

Dimension

KEPB22ER



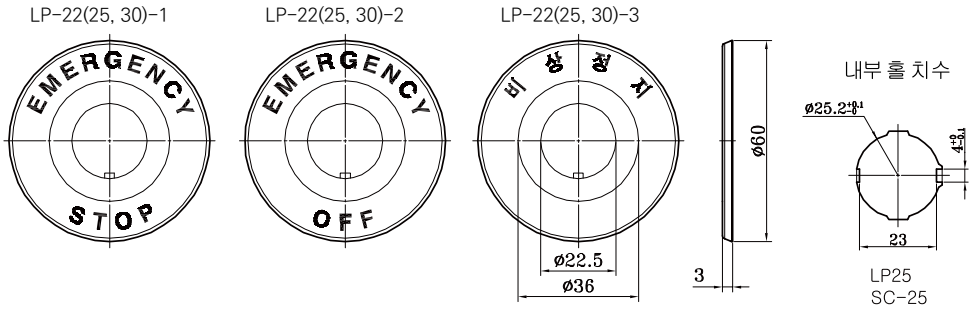
KEPB22ERK



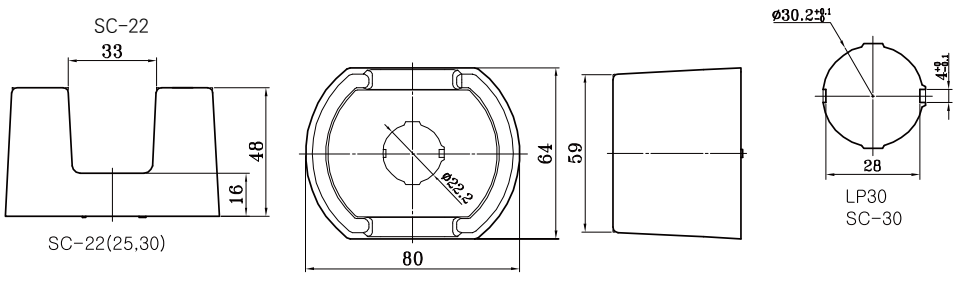
※ Ø22, 25 & 30 are the same

Optional parts

Label plate



Safety cover



Ø16
Emergency stop switch

Feature

- Certificate
- Certificate
- "For use on a flat surface of a type 1 enclosure"
- Materials have strong heat resistance, oil resistance and mechanical strength.
- IP65
- NC contacts can be forcibly separated even if fused
- Safety lock structure

Selection guide

KEPB ❶ 160 ❷ ER ❸ S ❹ - 1B ❺

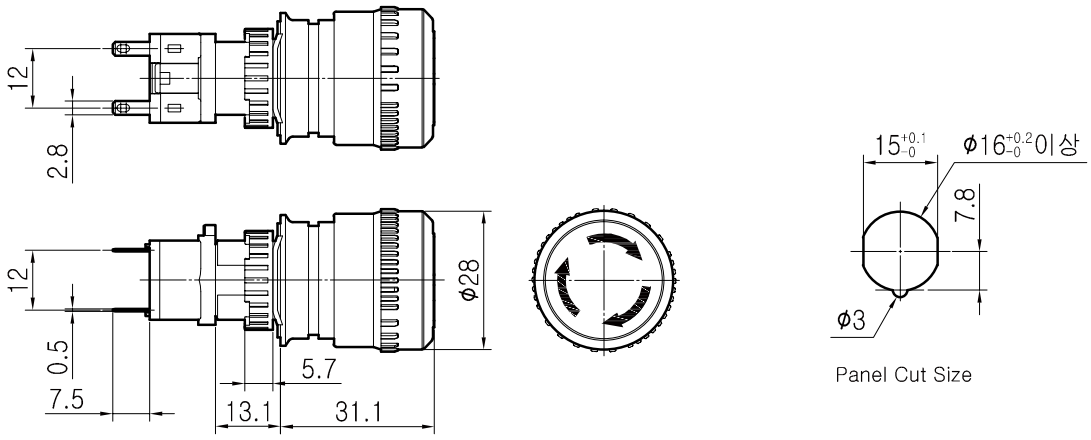
	Classification	KEPB	Emergency Push Button Switch
❷	Diameter	160	Ø16mm
❸	Actuator	ER	Push to lock – Turn to reset
❹	Arrow marking	S	White arrow
		None	Arrow (No painting)
❺	Contacts	1A	A contact: 1
		2A	A contact: 2
		1B	B contact: 1
		2B	B contact: 2
		1A1B	A contact: 1, B contact: 1

Specification

Classification		KEPB160ER
Contact rating		250VAC 3A(at resistor loaded)
Insulation resistance		Minimum 100MΩ (DC500V Insulation resistance meter)
Contact resistance		Maximum 30mΩ (Initial value)
Withstand voltage		1,000VAC (50/60㎐)에서 for 1 min.
Vibration resistance		10 to 50Hz amplitutde 1.5mm from X,Y,Z axis
Shock resistance		About 15G(1,000㎳)
Operating ambient temperature		-15℃ ~ +50℃(at no freezing)
Operating ambient humidity		45~85% RH
Protection		IP 65
Operation frequency		30 per 1 minute (Lock – Reset : 1 operation)
Durability	Electrical	Minimum 100K operations
	Mechanical	Minimum 150K operations
Materials & Colors		Body : Nylon(Yellow), Button : Nylon(Red)

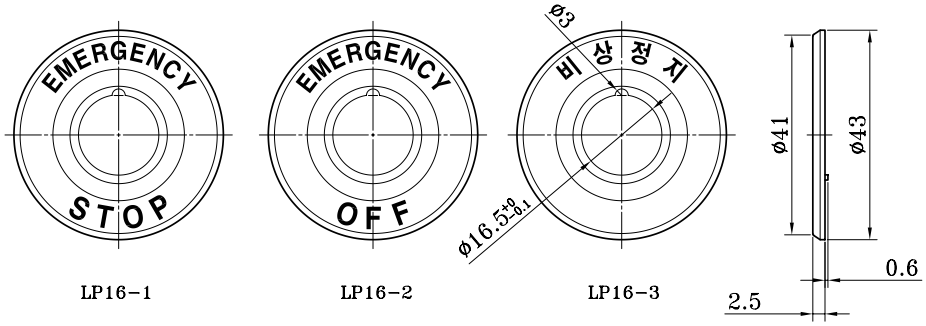
Dimension

KEPB160ERS



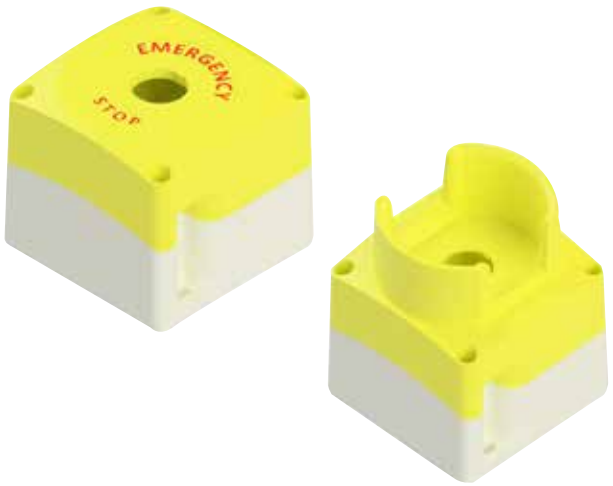
Optional parts

Lebal plate



LP16-1 LP16-2 LP16-3

Accessory
Enclose Box



Feature

- Mounting hole: ø22, ø25, ø30
- IP65
- Materials are light weight and high durability
- Flame retardant grade: UL V-0

Selection guide

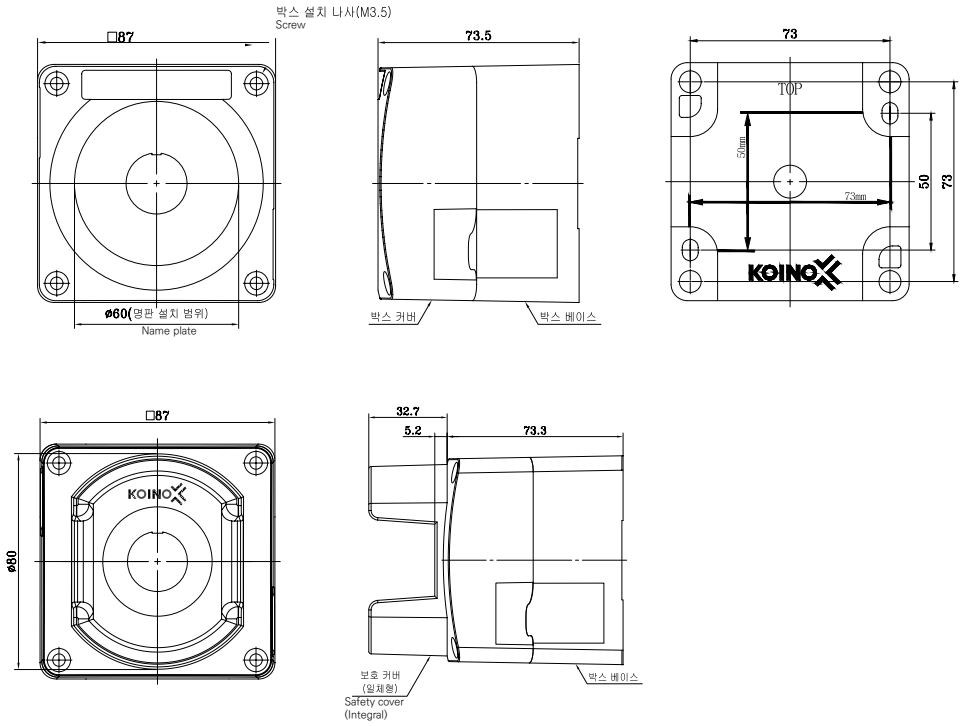
KSE ❶ 221 ❷ S ❸ 1 ❹

	Manaufacturer	KOINO
❶	Product name	Safety Enclose Box
❷	Diameter	221 : ø22mm One Hole type
		251 : ø25mm One Hole type
		301 : ø30mm One Hole type
❸	Safety cover	None: No cover
		S : Safety cover
❹	Label printing	None: No printing
		1 : EMERGENCY STOP (Red)
		2 : EMERGENCY OFF (Red)

Specification

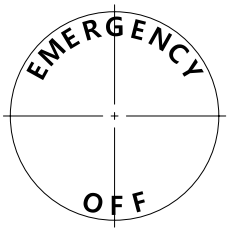
Cassification	Description
Materials	ABS(UL V-0)
Default Color	Body: Yellow, Printing: Red
Operating ambient humidity	45 ~ 85% RH(at no freezing)
Operating ambient temperature	-25~ +60℃(at no freezing)
Storing ambient temperature	-40~ +80℃(at no freezing)
Pollution degree	3
Protection	IP65
Insulation classes	Class II

Dimension



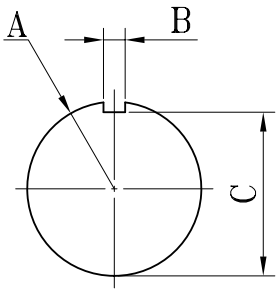
Label sticker

KSE-□-1



KSE-□-2

Mounting hole



구분 / 형명	A	B	C
KSE-221	$\phi 22.3^{+0.3}_{-0}$	$3.4^{+0}_{-0.2}$	$21.7^{+0.2}_{-0}$
KSE-251	$\phi 25.3^{+0.3}_{-0}$		$24.3^{+0.3}_{-0}$
KSE-301	$\phi 30.3^{+0.3}_{-0}$		$29.2^{+0.3}_{-0}$

OVERSEAS DISTRIBUTORS

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