

PART7

CAM SWITCH



KH-301 Series

KH-302 Series

KCR-303 Series

KSC-22 Series

KSG Series

KG Series

KC-Series

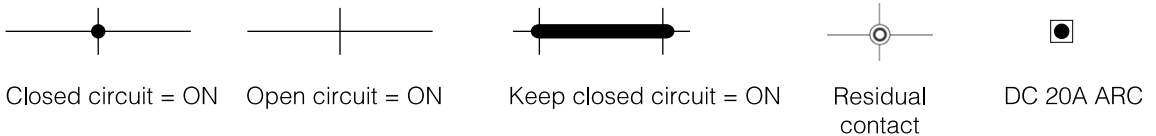
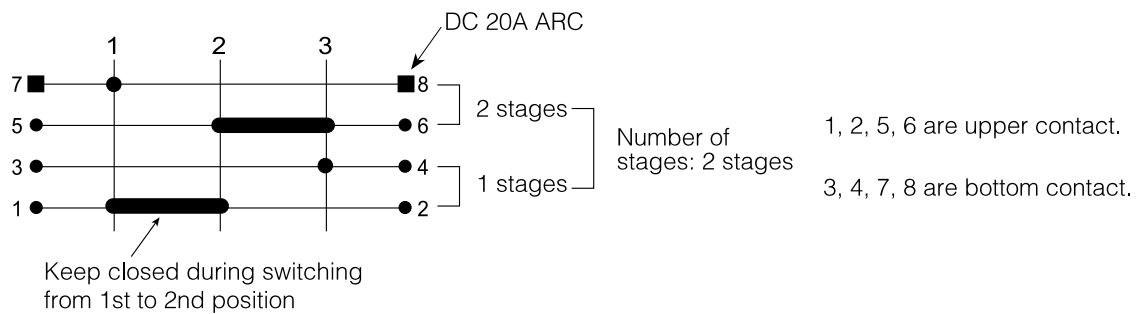
CAM Switches



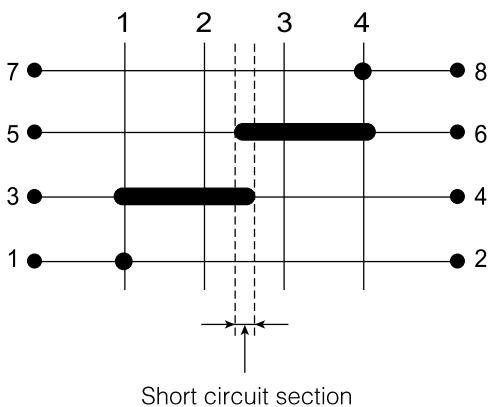
Reference Description

Terms & Circuit Description

Notch positions : 3 positions



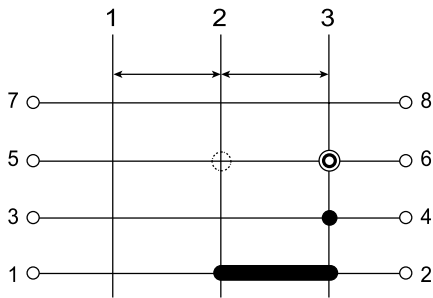
Short circuit when switching



■ What is the 'Short circuit section' ?

A section that maintains a short circuit state between a contact that is turned OFF (terminal #3, #4) and a contact that is turned ON (terminal #5, #6) when the position switching.

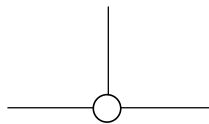
Residual contact circuit



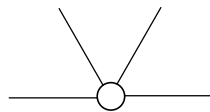
- What is the Residual contact circuit?
 - When returning from 3rd position (ON) to 2nd position, the 3rd position maintains closed.
 - When returning from 1st position to 2nd position, circuit is opened (OFF)

Contacts configuration

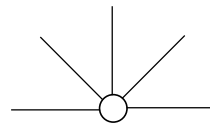
When switching angle is over 180, Terminal 1, 2 and 3, 4 contacts are arranged symmetrically in the housing. Thus when using angle rotates 180, upper contact terminals 1, 2 are closed contacts and bottom contacts terminal 3, 4 are also closed contacts. So please attention when you configure contacts as below. Pay attention to contact configuration if the total transition range is greater than 180 degrees. Terminal #1 & #2 and #3, #4 are arranged symmetrically to the cam. So upper contacts #1 & #2 are indicated by closed contacts at the bottom contacts #3 & #4.



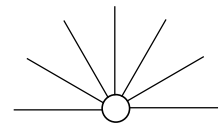
In case of 90° switching



In case of 60° switching

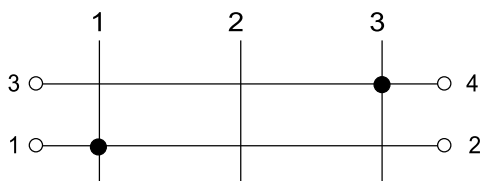


In case of 45° switching

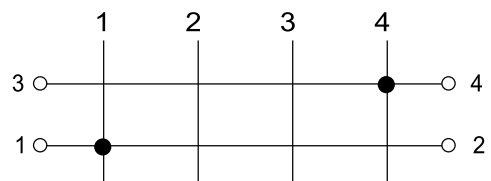


In case of 30° switching

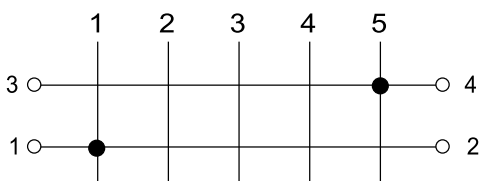
The circuit diagram is as below regarding of upper description.



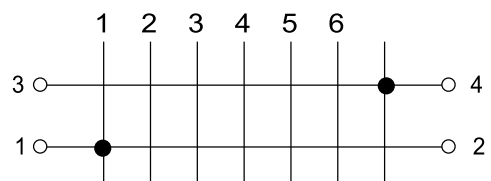
In case of 90 switching



In case of 60 switching



In case of 45 switching



In case of 30 switching

Knob standard operating position

		Knob position				Remark
		30 °	45 °	60 °	90 °	
2Step	Manual return					
	Manual return					
3Step	Auto return			Handle is auto- return to center.		
	Auto return: Pull to switch			Handle is auto- return to center. When you switch handle, make sure pull handle		
	Mixed type				Auto- return from left to center. Manual- return from right to center.	
				Manual- return from right to center. Auto- return from left to center.		
4Step	Manual return					
	Mixed type			Auto- return from 4 stages to 3 stages Manual- return from 1 stages to 3 stages		
					Auto- return from 1 stages to 2 stages Manual- return from 2 stages to 4 stages	
5Step	Manual return					
6Step	Manual return					
7Step	Manual return					
8Step	Manual return					
9Step	Manual return					
10Step	Manual return					
11 Step	Manual return					

Features

KSG Series

- Easy to install because control part and contact part can be separated.
- Easy to separate that control part and contact part by one touch.
- Available to choose installation method by fixing ring tightening or fixing screw tightening on the panel.
- Terminal is available structure to tighten at rear, so can mount protect cover.
- It is available to customize for variety contact circuits.
- IP65 is possible due to the structure with enhanced environmental specifications.



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH

Quick Selection Guide

1. By Ratings

Ratings	Model
125VAC 10A 250VAC 7.5A	KH- 301
125VAC 20A 250VAC 10A	KH- 302, KCR- 303
125VAC 15A 250VAC 10A	KSC- 22

2. Need Flame Resisting Model?

KCR- 303 and KSC- 22 use UL94- V0 grade material

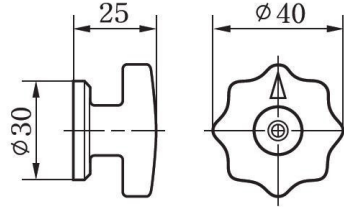
3. Need Easy Install?

KSC- 22 is very easily installed.

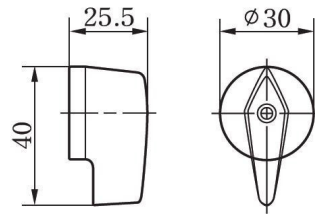
KSC- 22 Contact Block is easily released with one touch

Type

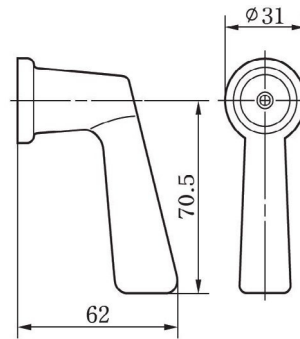
R type



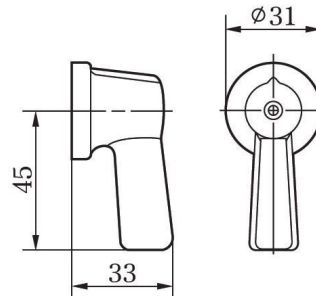
H type



P type



F type



KH-301 Series



CLASSIFICATION

KH-301- □ □ □ □ (R)
 ① ②

① Refer to the Appendix	' OPTIONAL CIRCUITS '	
② Reset Mode	none	Manual Return
	(R)	Auto Return by spring

※ Please specify handle type (R, H, P and F type available). See pictures below.

Contact ratings

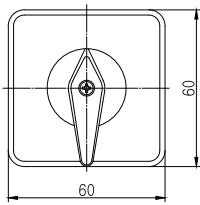
AC					DC				
Voltage	Resistive Load		Inductive Load		Voltage	Resistive Load		Inductive Load	
	Current	Capacity	Current	Capacity		Current	Capacity	Current	Capacity
125VAC	10A	1250VA	6A	750VA	24VDC	10A	240W	7A	168W
250VAC	7.5A	1875VA	3.5A	875VA	110VDC	2A	220W	1.3A	143W
440VAC	2.5A	1100VA	0.8A	352VA	250VDC	1A	250W	0.45A	112W

Specification

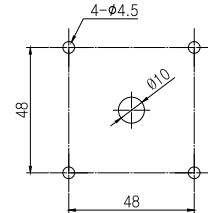
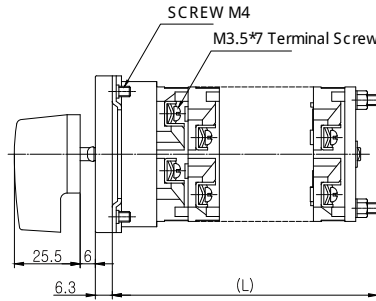
Insulation Resistance	min. 100MΩ (DC 500V)
Dielectric Strength	1,500VAC (50/60Hz) for 1 minute
Contact Resistance	Max. 50mΩ
Vibration Resistance	10 □55Hz 1.5mm double amplitude at X,Y,Z axis for 1 hour
Impact Resistance	30G
Operation Frequency	20 operations/minute
Durability	Electrical: 200,000 operations Mechanical: 500,000 operations
Protection	IP40
Ambient Temperature	- 25 □+ 50°C (not freezing condition)
Ambient Humidity	45 □85% RH
Material	Contact block: Phenol Front Panel: ABS Printing Panel: Aluminum

Dimensions

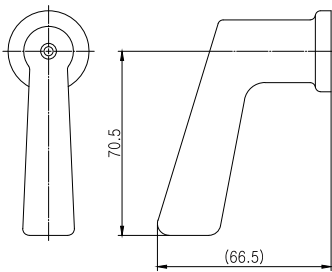
KH- 301



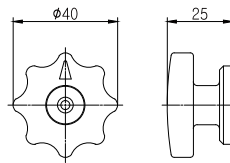
$(L)=(n \times 12)+28$
n: STAGE



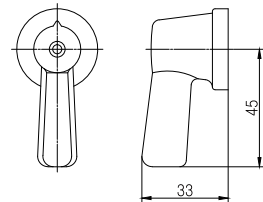
PANEL CUT



(TYPE P)

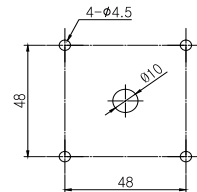
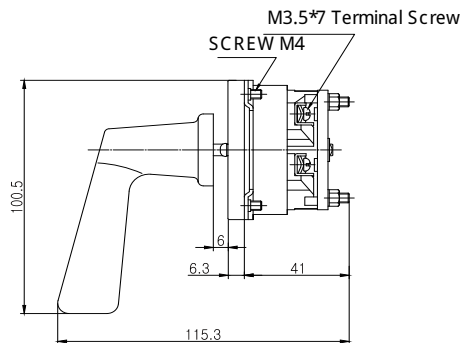
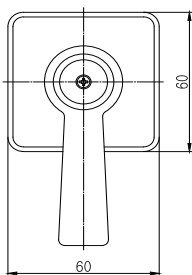


(TYPE R)



(TYPE F)

KH- 301C- 1, KH- 301CL- 1



PANEL CUT

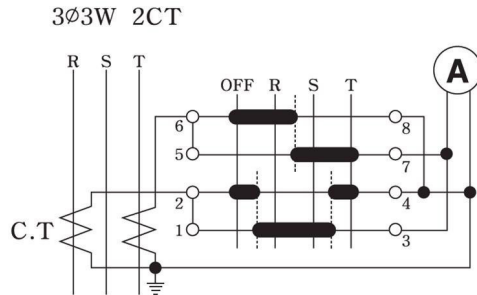
Standard Products

Ammeter change-over Switch	3Φ 3W	2CT	KH- 301A- 2
		3CT	KH- 301A- 33
Voltmeter Change-over Switch	3Φ 3W	2PT	KH- 301V- 2
		3PT	KH- 301V- 33
		3Φ 4W	3PT
Control Switch	Auto- release		KH- 301C- 1
	LOCK, Auto- release		KH- 301CL- 1

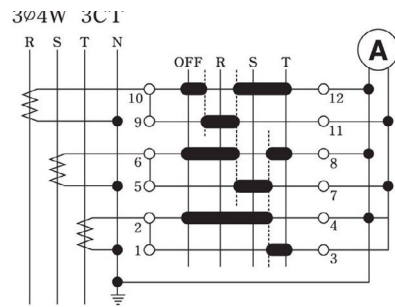
Circuit Diagram



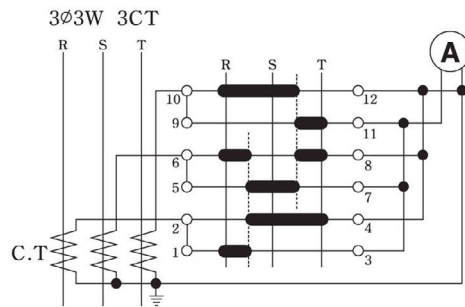
KH-301A-2



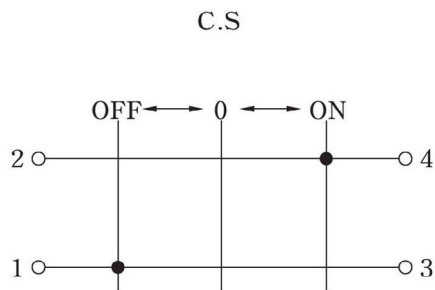
KH-301A-3



KH-301A-33



KH-301C-1



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

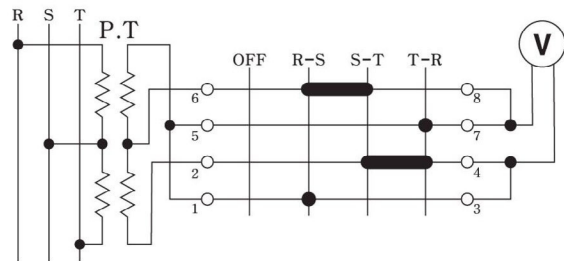
CAM SWITCH

Circuit Diagram



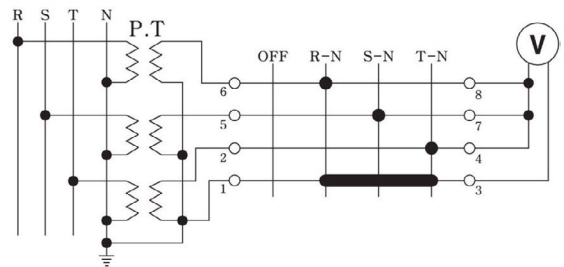
KH-301V-2

3Ø3W 2PT



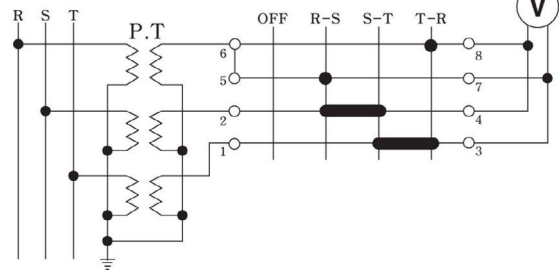
KH-301V-3

3Ø4W 3PT



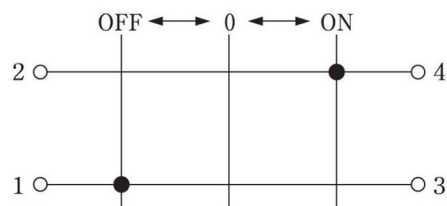
KH-301V-33

3Ø3W 3PT

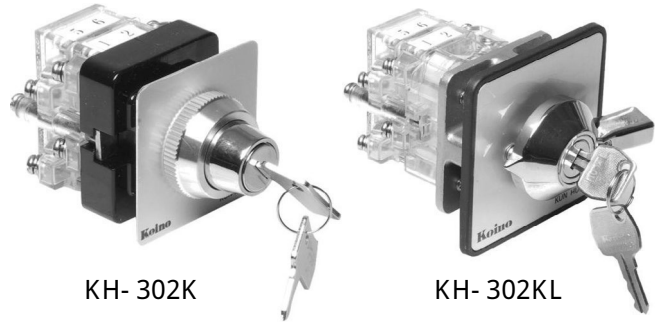


KH-301CL-1

C.S



KH-302 Series



KH- 302K

KH- 302KL

CLASSIFICATION

KH- 302- □ - □ □ □ □ (R)
 ① ② ③

① Handle type	none	Standard type
	R	fix with ring
	K	operate with Key
	KL	Key Locker type
② Refer to the Appendix	' OPTIONAL CIRCUITS '	
③ Reset Mode	none	Manual Return
	R	Auto Return by spring

※ Please specify handle type (R, H, P and F type available).

Specification

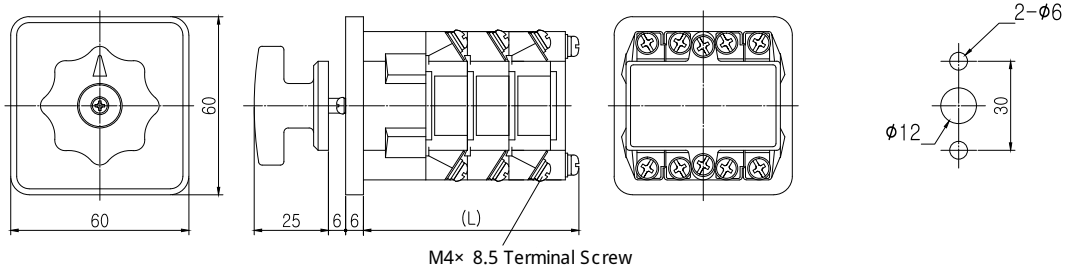
Insulation Resistance	min. 100MΩ (DC 500V)
Dielectric Strength	1,500VAC (50/60Hz) for 1 minute
Contact Resistance	Max. 50mΩ
Vibration Resistance	10 □55Hz 1.5mm double amplitude at X,Y,Z axis for 1 hour
Impact Resistance	30G
Operation Frequency	20 operations/minute
Durability	Electrical: 200,000 operations Mechanical: 500,000 operations
Protection	IP40
Ambient Temperature	- 25 □+ 50°C (not freezing condition)
Ambient Humidity	45 □85% RH
Material	Contact block: PC Front Panel: ABS Printing Panel: Aluminum

Contact ratings

AC					DC				
Voltage	Resistive Load		Inductive Load		Voltage	Resistive Load		Inductive Load	
	Current	Capacity	Current	Capacity		Current	Capacity	Current	Capacity
125VAC	20A	2500VA	10A	1250VA	24VDC	20A	480W	15A	360W
250VAC	10A	2500VA	6A	1500VA	110VDC	5A	550W	3A	330W
440VAC	2.5A	1100VA	2A	880VA	250VDC	1A	250W	0.5A	125W

Dimensions

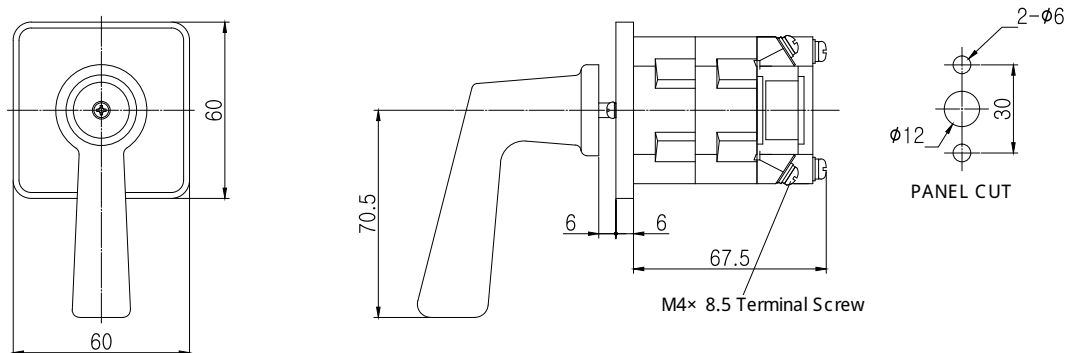
KH- 302



M4× 8.5 Terminal Screw

(L)= 30+(n× 13) n: STAGE

KH- 302C- 1, KH- 302CL- 1

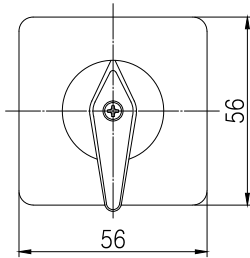


M4× 8.5 Terminal Screw

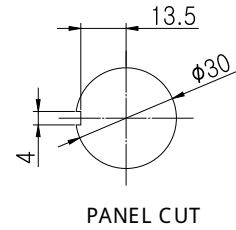
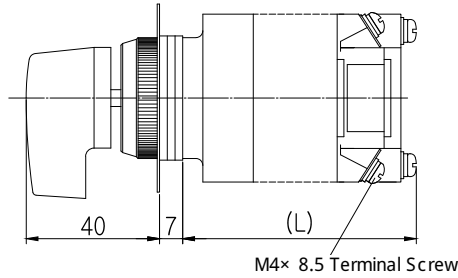
PANEL CUT

Dimensions

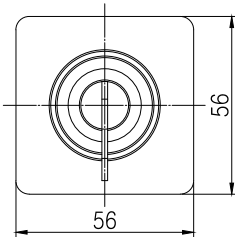
KH- 302R



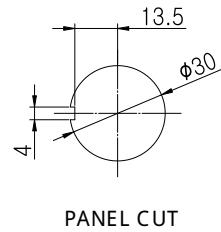
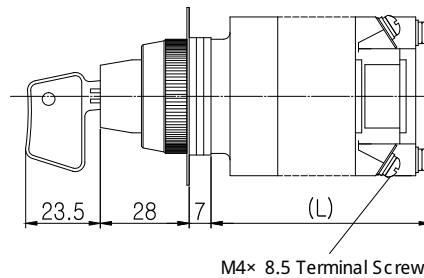
(L)= 30+(n× 13) n: STAGE



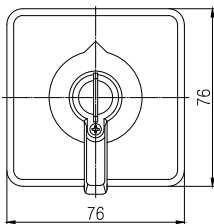
KH- 302K



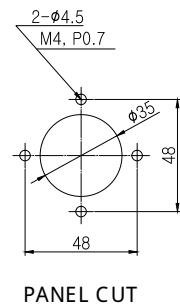
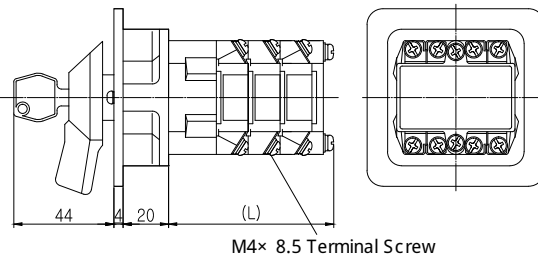
(L)= 30+(n× 13) n: STAGE



KH- 302KL



(L)= 30+(n× 13) n: STAGE



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

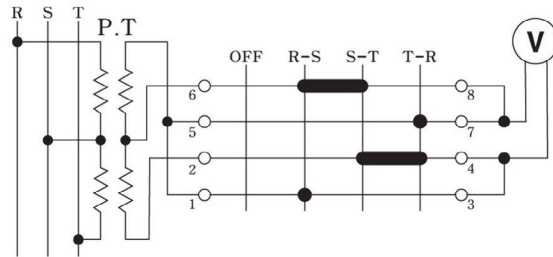
CAM SWITCH

Circuit Diagram



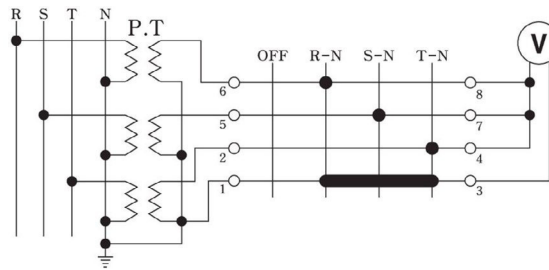
KH-302V-2

3Ø3W 2PT



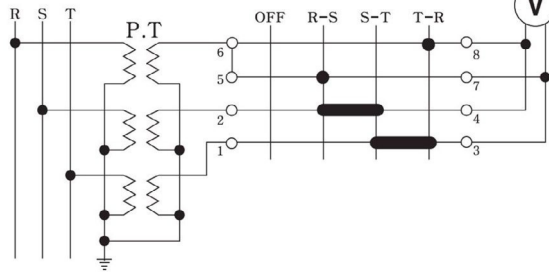
KH-302V-3

3Ø4W 3PT



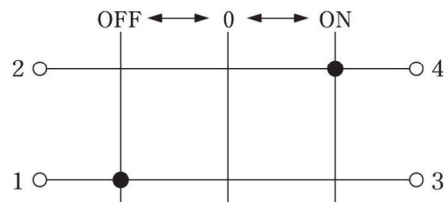
KH-302V-33

3Ø3W 3PT



KH-302CL-1

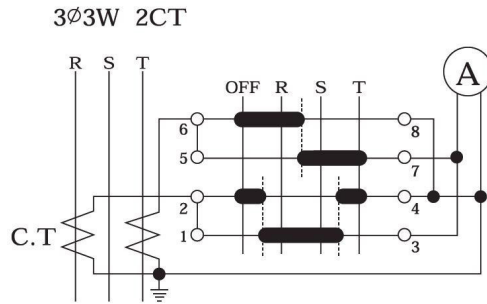
C.S



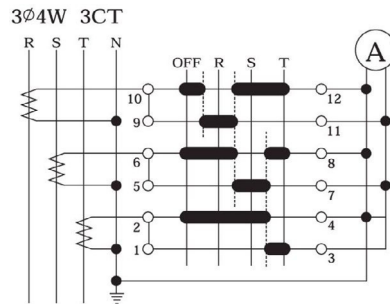
Circuit Diagram



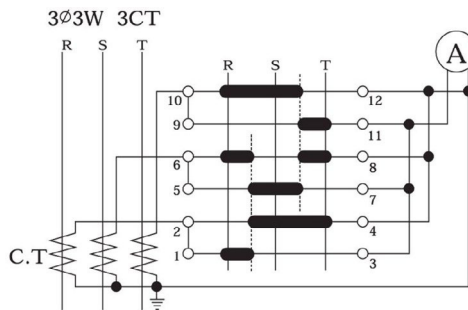
KH-302A-2



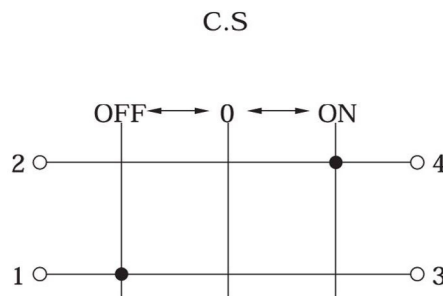
KH-302A-3



KH-302A-33



KH-302C-1



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

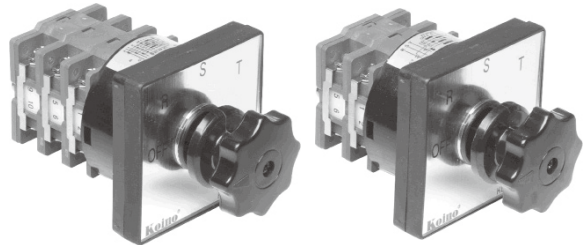
LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH

KCR-303 Series



CLASSIFICATION

KCR- 303- -

① ② ③

① Refer to the Appendix	' OPTIONAL CIRCUITS '		
② Handle type	R, H, P and F type available		
③ Reset Mode	none	Manual operation	
	PL	Pull to LOCK	

Contact ratings

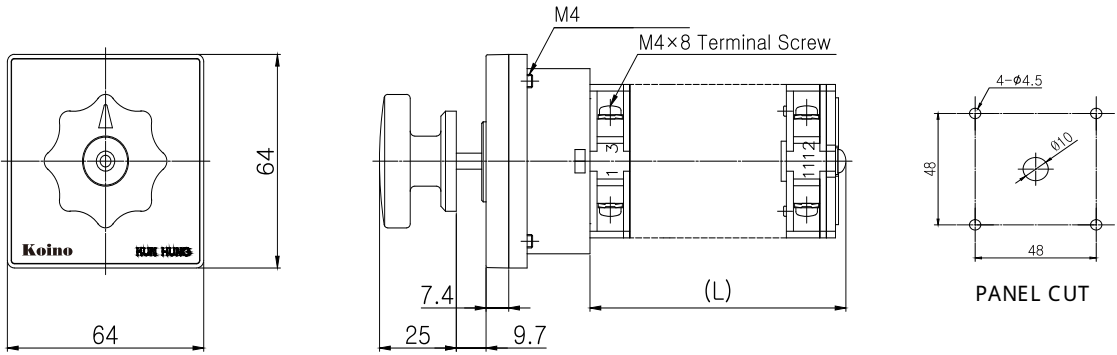
AC					DC				
Voltage	Resistive Load		Inductive Load		Voltage	Resistive Load		Inductive Load	
	Current	Capacity	Current	Capacity		Current	Capacity	Current	Capacity
125VAC	20A	2500VA	10A	1250VA	24VDC	20A	480W	15A	360W
250VAC	10A	2500VA	6A	1500VA	110VDC	5A	550W	3A	330W
440VAC	2.5A	1100VA	2A	880VA	250VDC	1A	250W	0.5A	125W

Specification

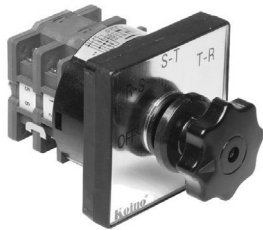
Insulation Resistance	min. 100MΩ (DC 500V)
Dielectric Strength	1,500VAC (50/60Hz) for 1 minute
Contact Resistance	Max. 50mΩ
Vibration Resistance	10 [55Hz 1.5mm double amplitude at X,Y,Z axis for 1 hour
Impact Resistance	30G
Operation Frequency	20 operations/minute
Durability	Electrical: 200,000 operations Mechanical: 500,000 operations
Protection	IP40
Ambient Temperature	- 25 [+50°C (not freezing condition)
Ambient Humidity	45 [85% RH
Material	Contact block: Nylon (Flame- resist grade UL94- V0) Front Panel: ABS Printing Panel: PC

Dimensions

KCR- 303

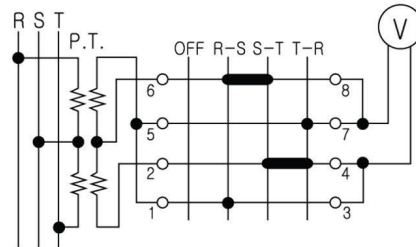


电路图



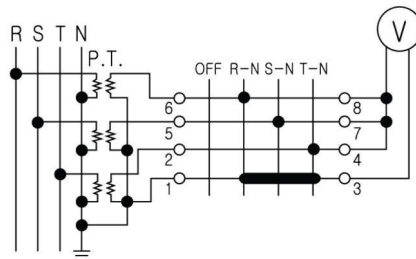
KCR- 303V - 2

3 ϕ 3W 2PT



KCR- 303V - 3

3 ϕ 4W 3PT



CONTROL COMPONENTS

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HOIST SWITCH

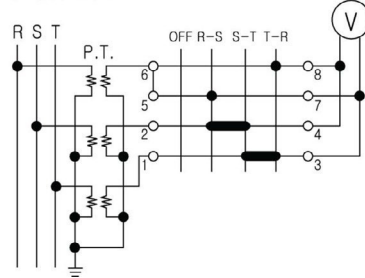
CAM SWITCH

Circuit Diagram



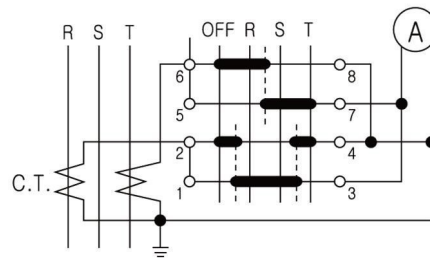
KCR-303V-33

3Ø3W 3PT



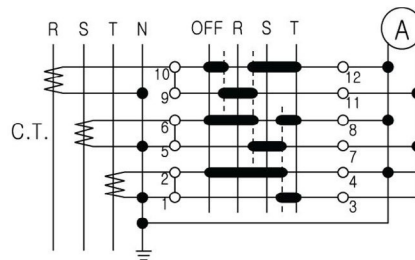
KCR-303A-2

3Ø3W 2CT



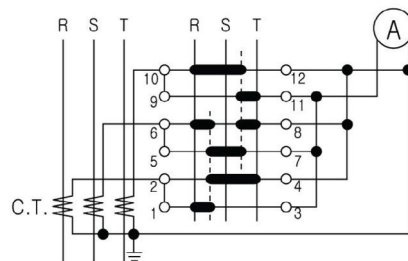
KCR-303A-3

3Ø4W 3CT



KCR-303A-33

3Ø3W 3CT



KSC Series

CLASSIFICATION

KSC $\left\{ \begin{array}{l} 22 \square - \square \square \square \square \text{ H} \\ 25 \text{ ①} \quad \quad \quad \text{②} \quad \quad \quad \text{③} \\ 30 \end{array} \right.$



① Reset Mode	none	Manual Return
	R	Auto Return
	K	Key type
② Refer to the Appendix	'OPTIONAL CIRCUITS'	
③ Handle type	H type	

Contact ratings

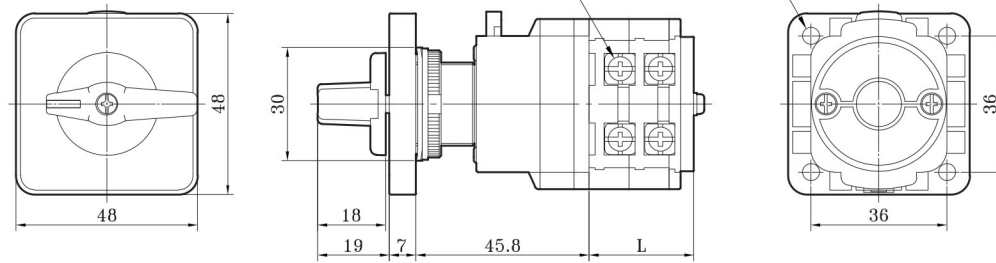
AC					DC				
Voltage	Resistive Load		Inductive Load		Voltage	Resistive Load		Inductive Load	
	Current	Capacity	Current	Capacity		Current	Capacity	Current	Capacity
125VAC	15A	2500VA	10A	1250VA	24VDC	20A	480W	15A	360W
250VAC	10A	2500VA	6A	1500VA	110VDC	5A	550W	3A	330W
440VAC	2.5A	1100VA	2A	880VA	250VDC	1A	250W	0.5A	125W

Specification

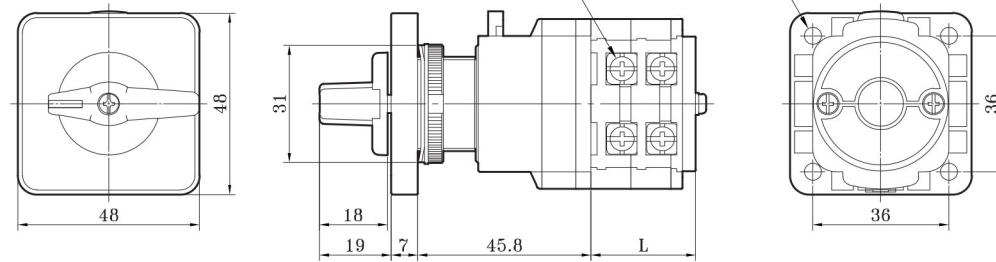
Insulation Resistance	min. 100M Ω (DC 500V)
Dielectric Strength	1,500VAC (50/60Hz) for 1 minute
Contact Resistance	Max. 50m Ω
Vibration Resistance	10 ⁻⁵ 55Hz 1.5mm double amplitude at X,Y,Z axis for 1 hour
Impact Resistance	30G
Operation Frequency	20 operations/minute
Durability	Electrical: 200,000 operations Mechanical: 500,000 operations
Protection	IP65
Ambient Temperature	-25 ⁺ +50 ⁺ °C (not freezing condition)
Ambient Humidity	45 ⁻ 85% RH
Material	Contact back: Nylon (Flame-resistant grade UL94-V0) Front Panel: ABS Printing Panel: PC

Dimensions

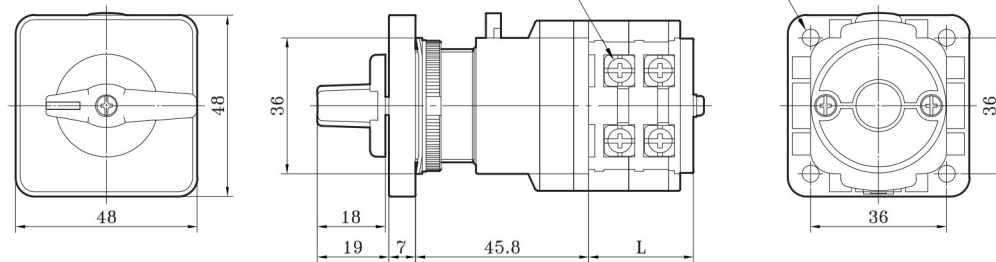
KSC-22



KSC-25

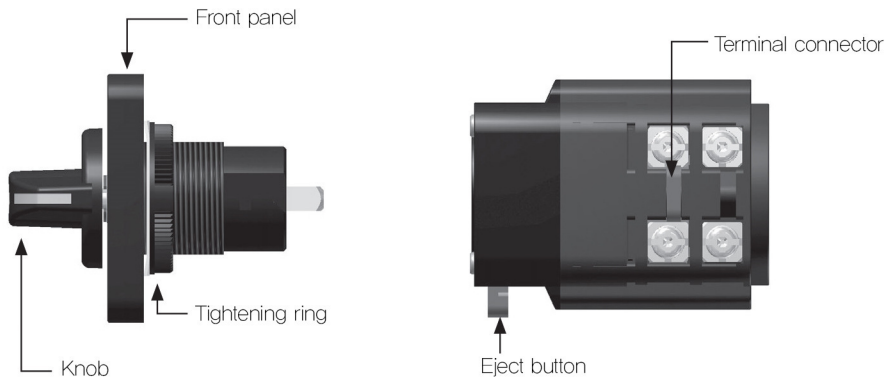


KSC-30

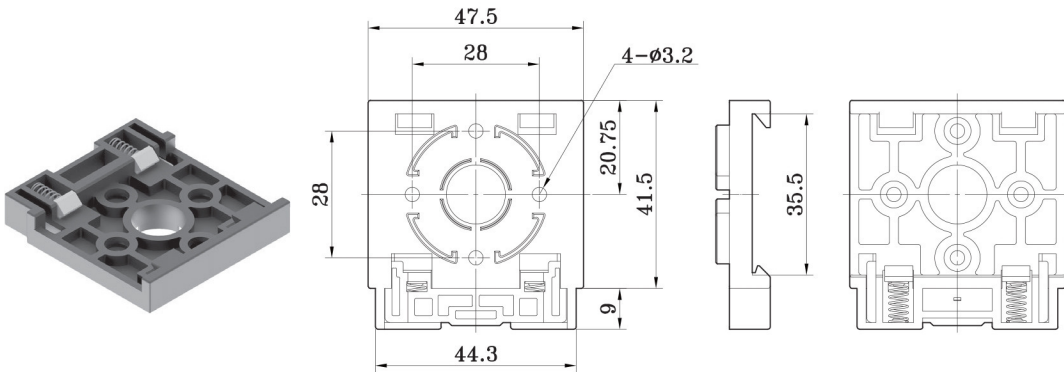


■ $L = 6.5 + (n \times 10.5)$, n = number of poles

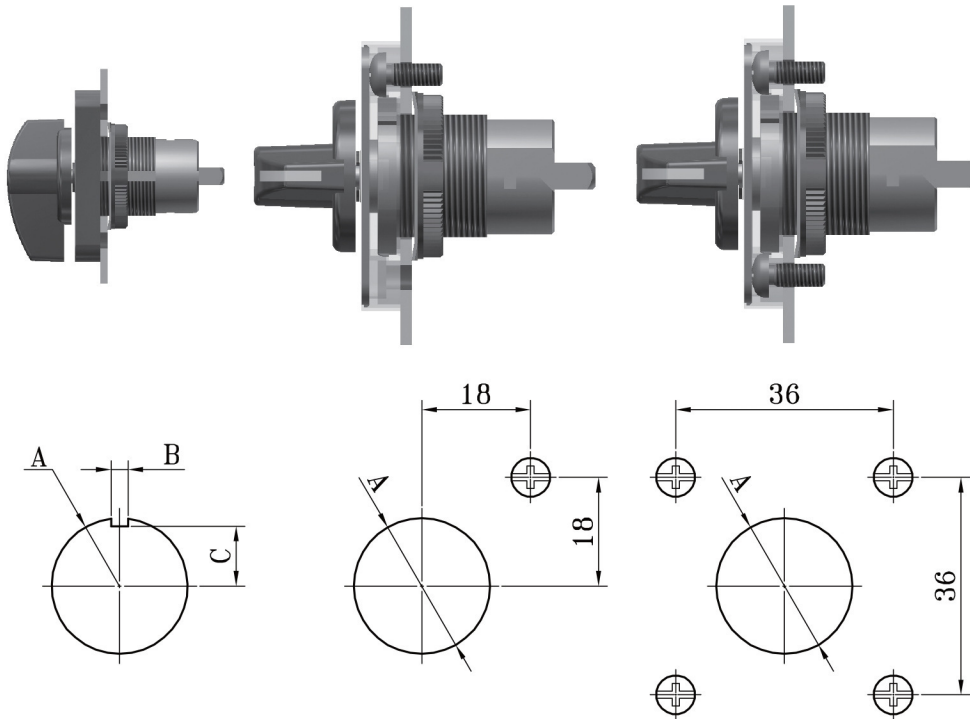
Parts



Panel locker



Installation



Panel-cut diameter

	A	B	C
KSC-22	Ø22.5	2.8 ^{+0.1} _{-0.2}	10±0.2
KSC-25	Ø25.5 ⁺⁰ _{-0.3}	4 ⁺⁰ _{-0.2}	11 ^{+0.2} ₋₀
KSC-30	Ø30.5 ⁺⁰ _{-0.3}	4 ⁺⁰ _{-0.2}	13.5 ^{+0.2} ₋₀

CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH