

# PART4

## LIMIT SWITCH



KL Series

KH-8005 Series

KH-8010 Series

# KL Series

## Features

Housing is made of durable aluminum die - casting.

Heat - resistance, oil - resistance, vibration - resistance structure (protection IP67)

Built - in double - pole double - break standard micro - switches

Operation Indicator (LED or Neon lamp) helps easier inspection and maintenance

Microload models are available



Actuator	Roller lever		75 °	90 °	Roller lever, adjustable roller lever, adjustable rod lever, fork lever lock
	Plunger				Top plunger, top roller plunger, sealed top roller plunger, top ball plunger, side roller plunger
	Flexible rod				Coil spring, coil spring aluminum rod
Load	Standard load	1a1b			Using of normal double pole, double break switch
	Microload	1a1b			
Environment- resistance specification	High enclosed				Using of hermetic sealed built - in switch
	Mold terminal				Lead wire attached Improved hermetic property with epoxy resin in receptacle part
	Heat - resistance	KL - TH			Silicon rubber is used to improve heat - resistance Ambient temperature 120 Available operation temperature ( +5 ~ +120 )
	Cold - resistance	KL - TC			Silicon rubber is used to improve cold - resistance Ambient temperature - 40 Available operation temperature ( - 40 ~ +40 )
Operation indicating lamp	KL - LE				Operation state can be monitored easily.
	KL - LD				Turn on lamp when operating, available to turn on lamp when not - in - operating

## CLASSIFICATION

KL □ □ - □ □ □ □ □ □

CONTROL COMPONENTS  
MICRO SWITCH  
FOOT SWITCH  
LIMIT SWITCH  
POWER SWITCH  
HOIST SWITCH  
CAM SWITCH

### Electric rating

-	Standard load
1	Microload

### Actuator

Code	Actuator
CA2	Roller lever (75 ° actuation)
CA2-2	Roller lever (90 ° actuation)
CA12	Adjustable roller lever (75 ° actuation)
CA12-2	Adjustable roller lever (90 ° actuation)
CL	Adjustable rod lever (75 ° actuation)
CL-2	Adjustable rod lever (90 ° actuation)
CA32-41	Fork lever lock
CA32-42	Fork lever lock
CA32-43	Fork lever lock
CA32-44	Fork lever lock
D	Top plunger
D2	Top roller plunger
D28	Sealed top roller plunger
D3	Top ball plunger
SD2	Side roller plunger
NJ	Coil spring
NJ-A2	Coil spring aluminum rod

### Environment - resistance specification

-	Standard
T	Corrosion - resistance
A	Hermetic

### Identification of operation

Code	Element
-	Standard
LE	Neon lamp
LD	LED

### Lamp Wiring

2	Connecting with NC: Light ON when operating
3	Connecting with NO: Light ON when not operating

### Temperature Specification

-	Standard - 10 ~ +80
TH	Heat - resistance +5 ~ +120
TC	Cold - resistance - 40 ~ +40

Product for heat or cold resistance can be applied to roller lever type, adjustable roller lever type and adjustable rod lever type product.

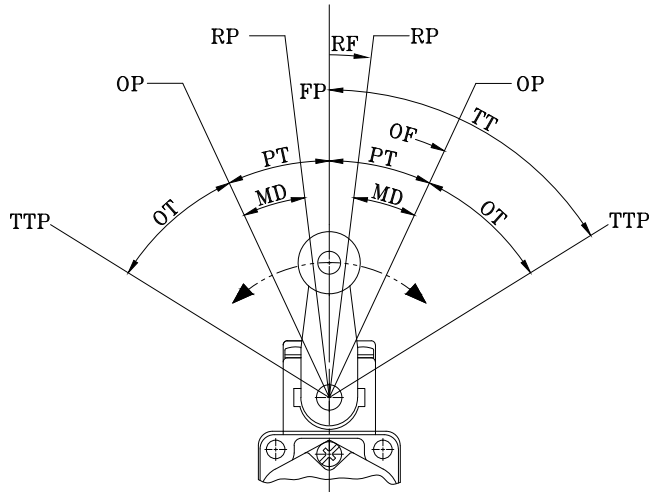
### Lever order specification

-	Standard
SA	Forged lever (Aluminum)
SS	STS lever
S50	S lever (Roller O.D. Ø50)
SA50	Forged lever (Roller O.D. Ø50)

### Connector order specification

SC-D6SW	Seal connector (DC)
SC-A6SW	Seal connector (AC)

ACTUATION RANGE GUIDE



OF	Required force to actuate	Required force to move from free position (FP) to operating position (OP)
RF	Return force	Required force to return from total travel position (TTP) to return position (RP)
PT	Movement to actuation	Distance or angle of movement from free position (FP) to operating position (OP)
MD	Movement differential	Distance or angle of movement from operating position (OP) to return position (RP)
OT	Movement after actuation	Distance or angle of movement from operating position (OP) to total travel position (TTP)
OP	Operating position	Actuator position when a contact point (NO (normal open)) is actuated (On) at free position (FP).
FP	Free position	Actuator position when no external force is applied to actuator
TTP	Total travel position	Actuator position when actuator arrives at stop.
RP	Return position	Actuator when a contact point (NO) is off at operating position (OP).
TT	Entire movement	Distance or angle of movement from free position (FP) to total travel position (TTP).

CONTROL COMPONENTS  
MICRO SWITCH  
FOOT SWITCH  
LIMIT SWITCH  
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CAM SWITCH

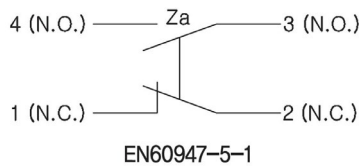
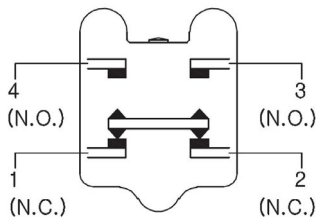
## RATINGS

Normal open circuit

Rated Voltage	Non-inductive load				Inductive load			
	Resistance load		Lamp load		Resistance load		Motor load	
	NC	NO	NC	NC	NC	NO	NC	NO
AC125	10	10	3	1.5	6		5	2.5
AC250	10	10	2	1	6		3	1.5
AC480	6	6	1.5	0.8	3		1.5	0.8
AC600	3	1	1	0.5	1.5		1	0.5
DC8	10		6	3	6		6	
DC14	10		6	3	6		6	
DC30	6		4	3	6		6	
DC125	0.8		0.2	0.2	0.8		0.2	
DC250	0.4		0.1	0.1	0.4		0.1	

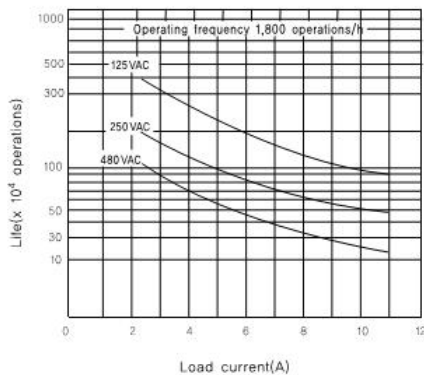
## DPDB Operation

Double - pole, Double - break structure for circuit breaking



## PROPERTY DATA

Electrical durability (cosθ=1)



Rated Voltage (V)	Resistance load (A)
AC 125	0.1
DC 30	

Operational load range: DC5~30V, 0.5~100mA

UL, cUL Safety standards, UL508	
Rated Voltage	Rated current
250VAC	10A(resistance load)
125VAC	10A(resistance load)

## CHARACTERISTICS

Items	Actuator	Roller lever	Adjustable roller lever	Adjustable rod lever	Fork lever lock	Plunger	Flexible Rod
	Model number	KLCA2	KLCA12	KLCL	KLCA32 - 41	KLD	KLNJ
		KLCA2 - 2	KLCA12 - 2	KLCL - 2	KLCA32 - 42	KLD2	KLNJ - A2
		KLCA2 - S50			KLCA32 - 43	KLD28	
		KLCA2 - SA50			KLCA32 - 44	KLD3	
					KLSD2		
External specification	Standard specification	IEC					
	Certified specification	CE, certified for electric product safety					
Structure	Contact point type		Dual terminal 2 circuit switch				
	Load	Standard load	Silver alloy				
		Microload	Silver (gold plating)				
Protection structure		IP67(IEC60529), KLD2(IP47)					
Electrical properties	Withstand voltage		Between live parts: AC1,000V 60/60Hz for 1minute Between dead parts: AC2,000V 50/60Hz for 1 minute				
	Isolation resistance		Isolation resistance 100MΩ or more(DC500V isolation resistance gauge)				
	Contact resistance (initial value)	Standard load	25mΩ or below				
Allowed operating velocity		1 mm/s ~ 1 m/s					
Mechanical performance	Impact resistance		Roller lever : 200 m/s <sup>2</sup> of total travel position Non - directive actuation: 300 m/s <sup>2</sup> of total travel position Others: 300 m/s <sup>2</sup> free position and total travel position (Contact point in free position and total travel position or total travel position				
	Vibration-resistance		Double vibration width: 1.5 mm, frequency 10~55Hz, for 2 consecutive hours (Others: free position and total travel position)				
Durability	Mechanical		10 million operations <plunger type à 5million operations, fork lever lock type à 2million operations>				
	Electrical		750,000 operations (when resistance is loaded 250VAC 10A)				
	Electrical (microload)		1 million operations				
Operating frequency	Mechanical		120operations/min				
	Electrical		30operations/min				
Environment conditions	Ambient temperature		- 10 ~ +80				

## LEVER TYPES AND FIGURE

Model No.	Actuator	Model No.	Actuator
KLCA2(75 Max.) KLCA2-2(90 Max.) Roller lever		KLCA-S50 Ø50 Roller lever	
Right / Left		Right / Left	
KLCA12(75 Max.) KLCA12-2(90 Max.) Adjustable roller lever		KLSD2 Side roller plunger	
Right / Left		Right / Left	
KLCL(75 Max.) KLCL-2(90 Max.) Rod lever		KLNJ-A2 Coil spring aluminium rod	
Right / Left		Non-directional	
KLCA32-41, 42, 43, 44 FORK roller lever		KLD3 Top ball plunger	
Right / Left (90 Max.)		Up / Down	
KLNJ Coil spring		KLD28 Sealed top roller plunger	
Non-directional		Up / Down	
KLD2 Top roller plunger		KLD Top plunger	
Up / Down		Up / Down	

CONTROL  
COMPONENTS

MICRO  
SWITCH

FOOT  
SWITCH

LIMIT  
SWITCH

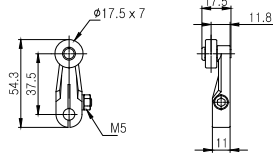
POWER  
SWITCH

HOIST  
SWITCH

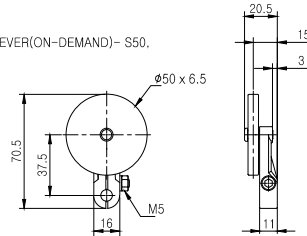
CAM  
SWITCH

## LEVER TYPES AND FIGURE

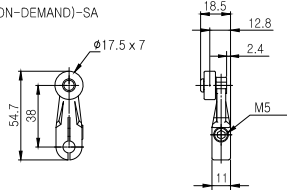
ROLLER LEVER (STANDARD)



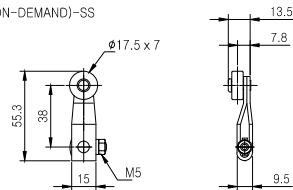
ROLLER LEVER(ON-DEMAND)- S50.  
SA50



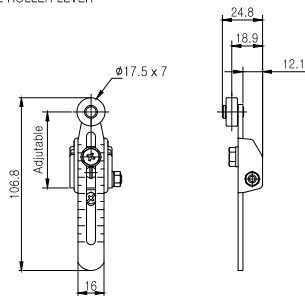
ROLLER LEVER(ON-DEMAND)-SA  
Forging



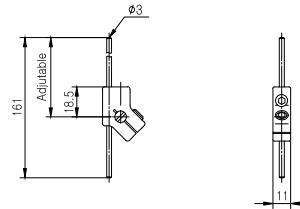
ROLLER LEVER(ON-DEMAND)-SS  
Stainless



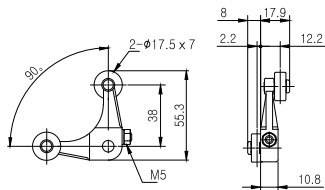
ADJUSTABLE ROLLER LEVER  
(STANDARD)



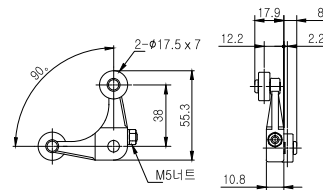
ADJUSTABLE ROD LEVER(STANDARD)



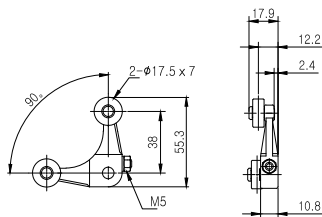
FORK LEVER(CA32-41)



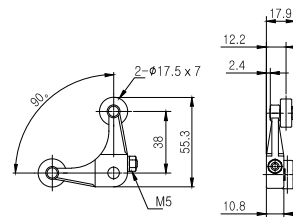
FORK LEVER(CA32-42)



FORK LEVER(CA32-43)

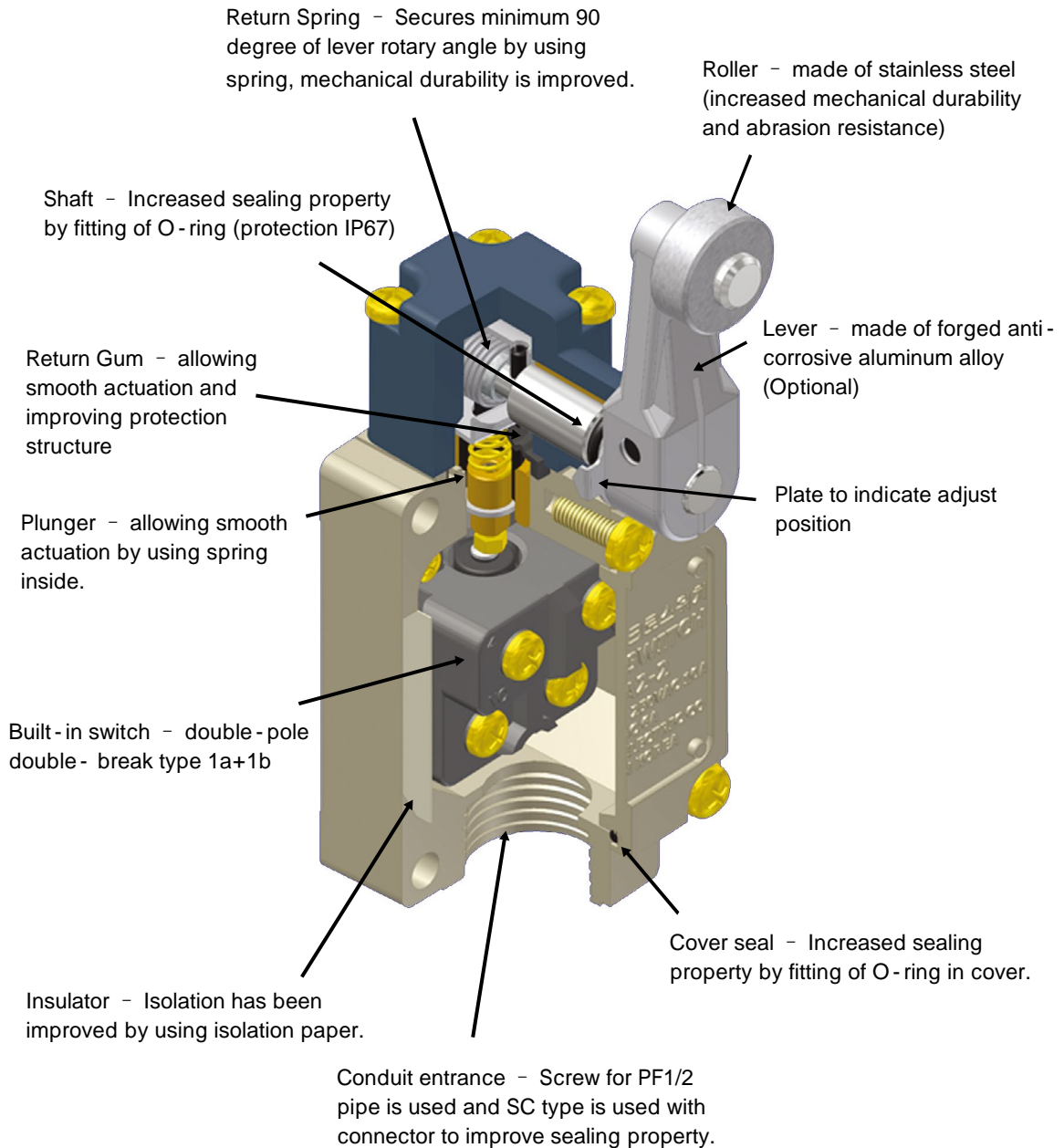


FORK LEVER(CA32-44)





## STRUCTURE



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

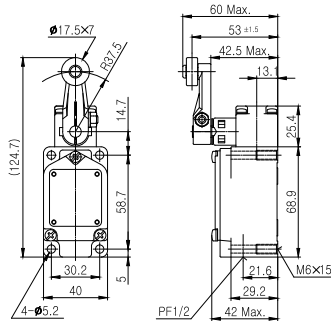
HOIST SWITCH

CAM SWITCH

## KLCA2 Roller lever type



KLCA2  
KLCA2-2



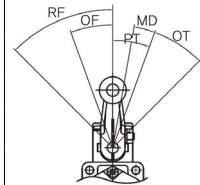
KLCA2  
KLCA2-2



KLCA2-LD  
KLCA2-2LD

## ACTUATION PROPERTY

Model	OF Max.	RF Max.	PT	OT Min.	MD Max.	Material	
KLCA2	910g	100g	20 °	30 °	12 °	Body: Aluminium alloy die-casting Head: Aluminium alloy die-casting Roller: Stainless steel Protection degree: IP67	
KLCA2-2	910g	100g	30 °	70 °	10 °		
KLCA2-LE	Optional parts						
KLCA2-2LE							
KLCA2-LD							
KLCA2-2LD							



## NOTE

- Excessive force or impact to limit switch roller lever to activate switch may cause unstable actuation of actuator, shortening electrical and mechanical durability.
- Right and wrong examples of installation.

WRONG

RIGHT

WRONG

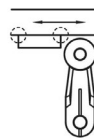
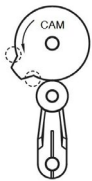
RIGHT

WRONG

RIGHT

WRONG

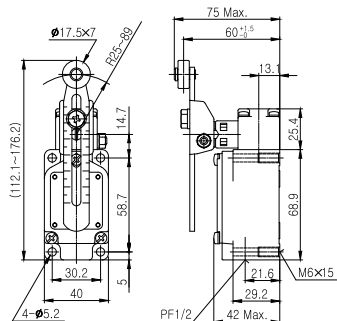
RIGHT



## KLCA12 Adjustable roller lever type



KLCA2  
KLCA2-2



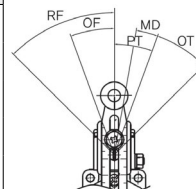
KLCA12  
KLCA12-2



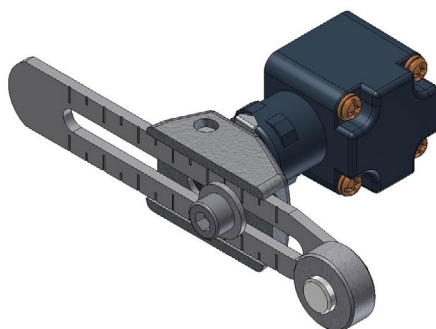
KLCA2-LD  
KLCA2-2LD

## ACTUATION PROPERTY

Model	OF Max.	RF Max.	PT	OT Min.	MD Max.	Material	
KLCA12	290g	25g	20 °	30 °	12 °	Body: Aluminium alloy die-casting Head: Aluminium alloy die-casting Roller: Stainless steel Protection degree: IP67	
KLCA12-2	290g	25g	20 °	70 °	10 °		
KLCA12-LE	Optional parts						
KLCA12-2LE							
KLCA12-LD							
KLCA12-2LD							

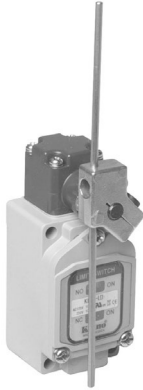


## NOTE

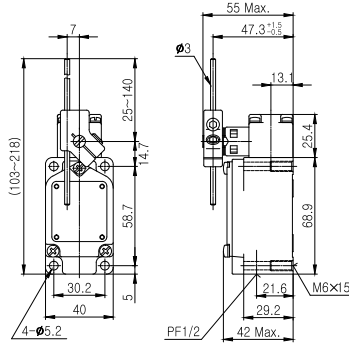


Please adjust the length of the lever by loosening the screw. (0~64mm)

## KLCL Adjustable rod lever type



KLCL  
KLCL - 2



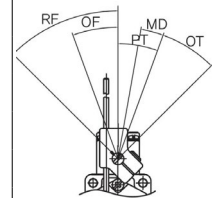
KLCL  
KLCL - 2



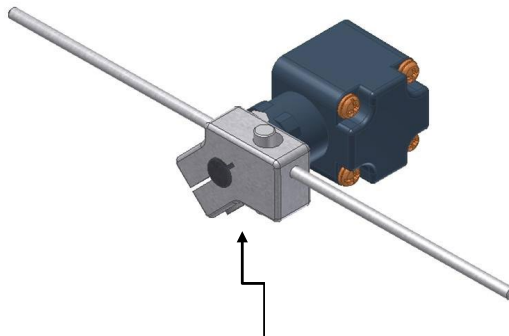
KLCL-LD  
KLCL - 2LD

## ACTUATION PROPERTY

Model	OF Max.	RF Max.	PT	OT Min.	MD Max.	Material
KLCL	290g	25g	20 °	30 °	12 °	Body: Aluminium alloy die-casting Head: Aluminium alloy die-casting Roller: Stainless steel Protection degree: IP67
KLCL - 2	290g	25g	20 °	70 °	10 °	
KLCL - LE	Optional parts					
KLCL - 2LE						
KLCL - LD						
KLCL - 2LD						



## NOTE

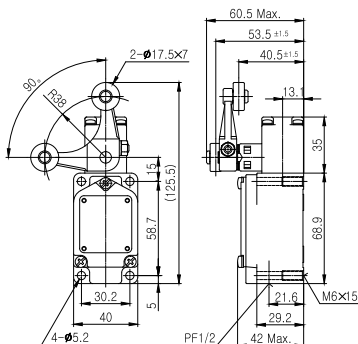


Please adjust the length of the rod by loosening the screw. (0~115mm)

## KLCA32 Fork roller lever type



KLCA32-41



KLCA32-41 ~ 44



KLCA32-42



KLCA32-43

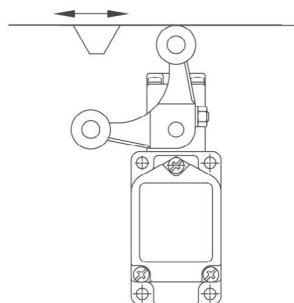


KLCA32-44

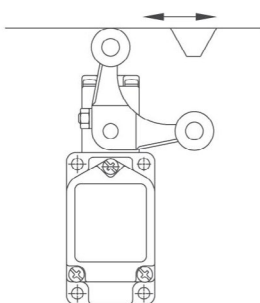
## ACTUATION PROPERTY

Model	OF Max.	PT	OT Min.	Material	
KLCA32	1,220g	30 °	30 °	Body: Aluminium alloy die - casting	
KLCA32-LE	Optional parts			Head: Aluminium alloy die - casting	
KLCA32-LD				Roller: Stainless steel	
				Protection degree: IP67	

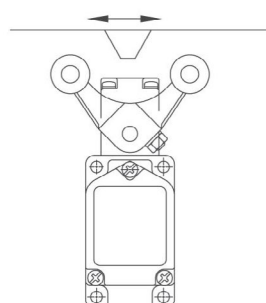
## NOTE



NC current



NO current



NO current

CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

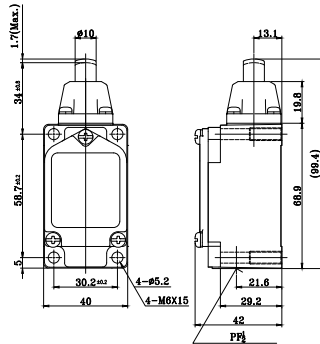
HOIST SWITCH

CAM SWITCH

## KLD Top plunger type



KLD



KLD



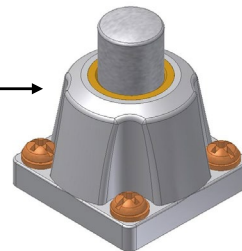
KLD-LD

## ACTUATION PROPERTY

Model	OF Max.	RF Min.	PT Max.	OT Min.	MD Max.	Material
KLD	2,720g	820g	1.7mm	6.4mm	1mm	Body: Aluminium alloy die - casting
KLD - LE	Optional parts					Head: Aluminium alloy die - casting
KLD - LD						Roller: Stainless steel
						Protection degree: IP67

## NOTE

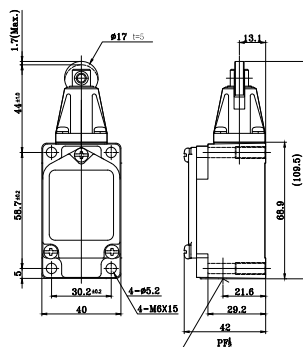
Please do not click the operation of more than 8mm from the tip of the plunger.



## KLD2 Roller plunger type



KLD2



KLD2



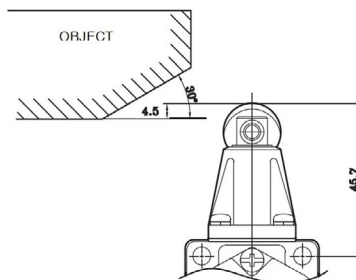
KLD2-LD

## ACTUATION PROPERTY

Model	OF Max.	RF Min.	PT Max.	OT Min.	MD Max.	Material
KLD2	2,850g	810g	1.7mm	5.6mm	1mm	Body: Aluminium alloy die - casting
KLD2 - LE	Optional parts					Head: Aluminium alloy die - casting
KLD2 - LD						Roller: Stainless steal
						Protection degree: IP67

## NOTE

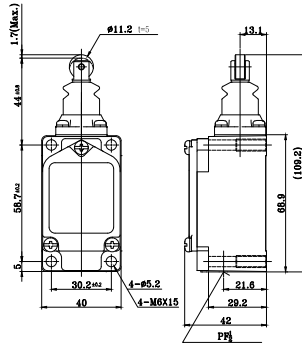
For side actuation of the product, recommended dimension is indicated as shown in the diagram.



## KLD28 Sealed top roller plunger type



KLD28



KLD28



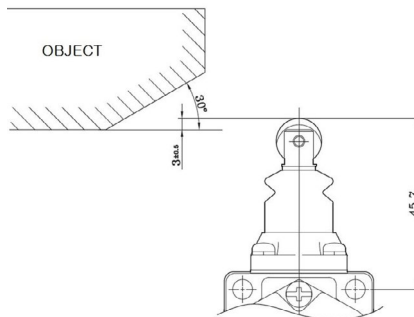
KLD28-LD

## ACTUATION PROPERTY

Model	OF Max.	RF Min.	PT Max.	OT Min.	MD Max.	Material
KLD28	1,700g	450g	1.7mm	5.6mm	1mm	Body: Aluminium alloy die - casting
KLD28 - LE	Optional parts					Head: Aluminium alloy die - casting
KLD28 - LD						Roller: Stainless steel
						Protection degree: IP67

## NOTE

For side actuation of the product, recommended dimension is indicated as shown in the diagram.

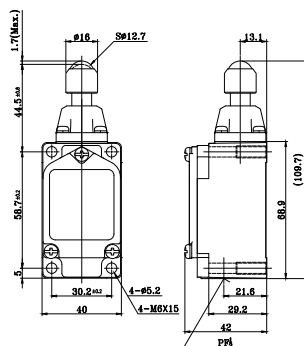




## KLD3 Top ball plunger type



KLD3



KLD3



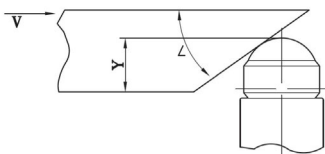
KLD3-LD

## ACTUATION PROPERTY

Model	OF Max.	RF Min.	PT Max.	OT Min.	MD Max.	Material
KLD3	2,720g	820g	1.7mm	4mm	1mm	Body: Aluminium alloy die - casting
KLD3 - LE	Optional parts					Head: Aluminium alloy die - casting
KLD3 - LD						Roller: Stainless steel
						Protection degree: IP67

## NOTE

For side actuation of the product, recommended dimension is indicated as shown in the diagram.



L(Degree)	Vmax(m/s)	y
30 °	0.25	0.6~0.8(TT)
20 °	0.5	0.5~0.7(TT)



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

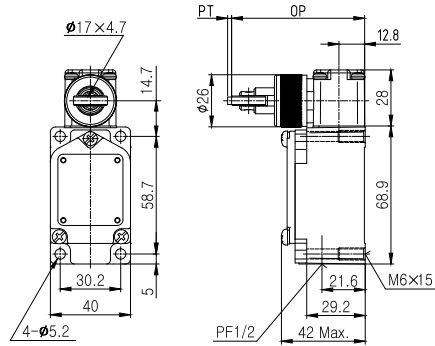
HOIST SWITCH

CAM SWITCH

KLSD2 Side roller plunger type



KLSD2



KLSD2



KLSD2-LD

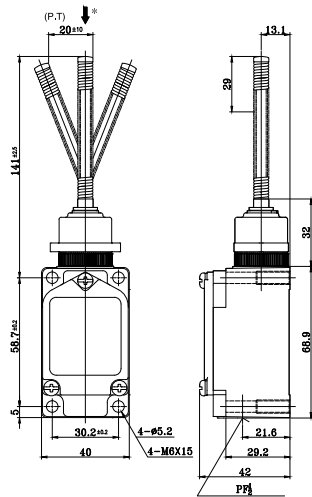
ACTUATION PROPERTY

Model	OF Max.	RF Min.	PT Max.	OT Min.	MD Max.	Material
KLSD2	4,087g	97g	2.77mm	5.6mm	1mm	Body: Aluminium alloy die - casting
KLSD2 - LE	Optional parts					Head: Aluminium alloy die - casting
KLSD2 - LD						Roller: Stainless steal
						Protection degree: IP67

## KLNJ Coil spring type



KLNJ



KLNJ



KLNJ-LD

## ACTUATION PROPERTY

Model	OF Max.	PT Max.	Material
KLNJ	150g	20mm ± 10	Body: Aluminium alloy die - casting
KLNJ - LE	Optional parts		Head: Aluminium alloy die - casting
KLNJ - LD			Roller: Stainless steal
			Protection degree: IP67

CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

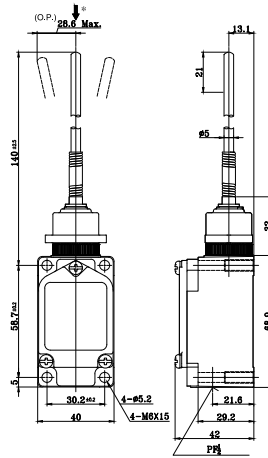
HOIST SWITCH

CAM SWITCH

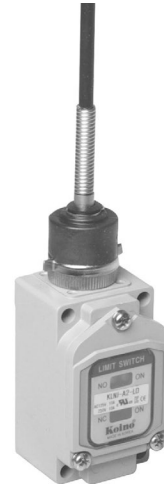
**KLNJ - A2 Coil spring & Aluminium rod type**



KLNJ



KLNJ - A2



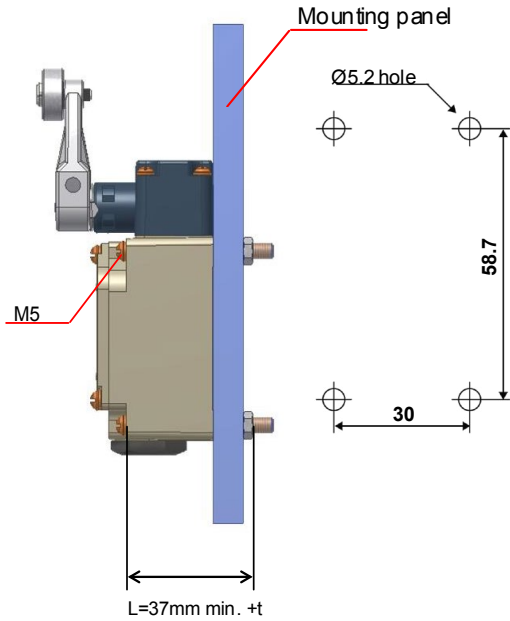
KLNJ-LD

**ACTUATION PROPERTY**

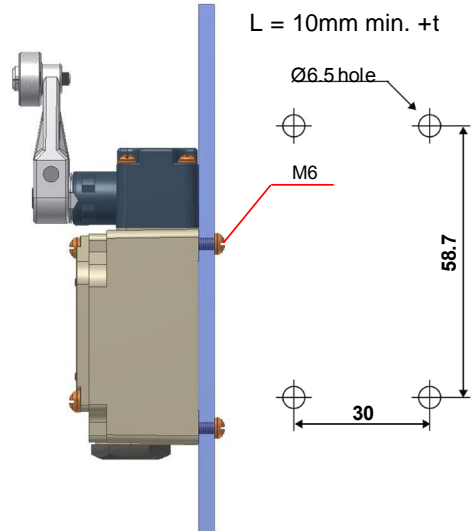
Model	OF Max.	PT Max.	Material
KLNJ - A2	150g	28.6mm	Body: Aluminium alloy die - casting
KLNJ - A2LE	Optional parts		Head: Aluminium alloy die - casting
KLNJ - A2LD			Roller: Stainless steel
			Protection degree: IP67

Mounting

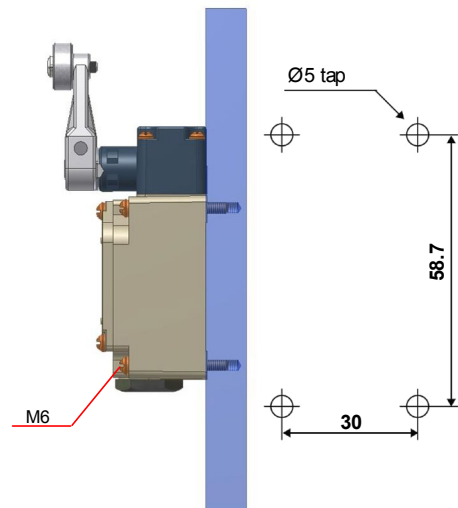
Front mounting



Rear mounting



Tap mounting



To install the Switch, make a mounting panel, as shown in the diagram

L = 29.2mm+Tap depth  
Tap depth = 8mm min.

CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

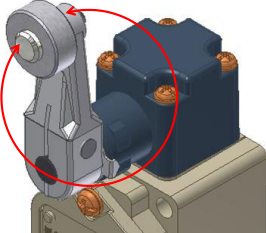
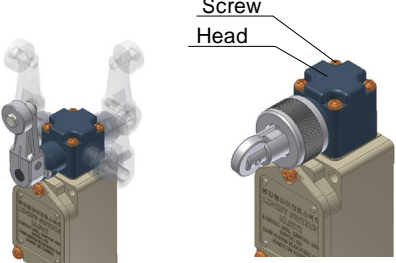
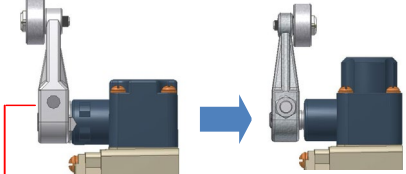
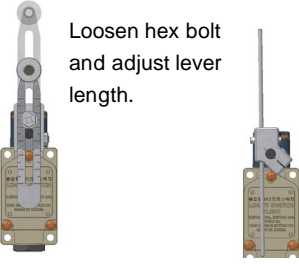
LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH

## USING THE SWITCHES

Instructions	Applicable actuators	Description
<p>The position to install actuator can be changed.</p> <p>Actuator position can be adjusted 360 ° by loosening hex bolt at actuator lever. In case the actuation indicating lamp is attached, please be careful to set the lever rotation because actuator lever may touch the top of lamp cover. Symmetrical lever does not touch the lamp cover.</p>	<p>Roller lever, Adjustable roller lever, Adjustable rod lever</p>	<p>Loosen M5 bolt and adjust its position. And then fix the bolt.</p> 
<p>Head direction can be changed.</p> <p>By unscrewing 4 of corner screws of the head it can be adjusted to any of 4 directions. In this case the control plunger inside shall be adjusted as same.</p>	<p>Roller lever, Adjustable roller lever, Adjustable rod lever, Roller plunger, Side roller, Plunger</p>	
<p>Roller can be installed inside.</p> <p>Roller can be installed inside by attaching roller upside down. (Please set to stop actuation within 180 ° horizontal range).</p>	<p>Roller lever, Fork lever LOCK</p>	 <p>Loosen hex bolt or nut.</p>
<p>Lever rod length can be adjusted.</p> <p>Lever or rod length can be adjusted by loosening hex bolt.</p>	<p>Adjustable roller lever, Adjustable roller lever,</p>	 <p>Loosen hex bolt and adjust lever length.</p> <p>Rod length can be adjusted by unscrewing nut.</p>

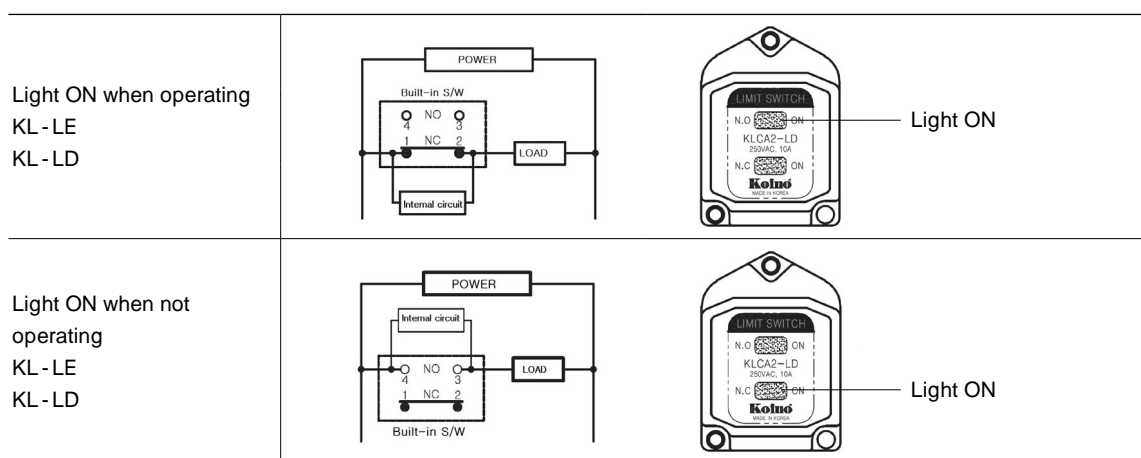
## LAMP INDICATOR

- It is convenient to check operation state and circuit and to find actuation by neon lamp (for AC power) or LED (for DC power).
- Lamp terminal (indicating lamp cover) connection is made through contact spring (coil spring) by using terminal screw of built-in switch. No wiring is required for lamp terminal.
- Indicating lamp cover is made of transparent resin together with aluminum die - casting so as to assure high sealing property, which allows normal operation even in the environment with cutting oil. Also, it enables monitoring the operating state. Further, it is easy to switch either light ON when Operating or light ON when not operating.
- This is most suitable to verify passing of goods in conveyor line or verifying operation in an area where verification is not easy.
- It ' s not necessary to change polarity for LED type because LED type has rectifying element internally.

## Ratings

	Rated voltage	Leakage current	Switch to install lamp	Lamp cover
				Type
Neon lamp	125VAC	0.7mA Max	KL - LE	KL - LE
LED	AC/DC 12~25V	4mA Max	KL - LE	KL - LD

## Operation



Factory setting is at “ light ON when operating ” mode.

For “ light ON when not operating ” mode, please switch LED to downward direction as shown in the figure.

## SEAL CONNECTOR & CABLE

### KL Series

KL series main body can be used as connector type by assembling components .



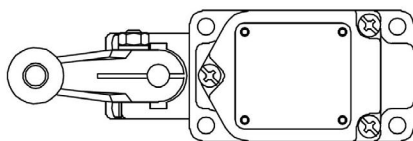
#### SEAL CONNECTOR

ITEM	PRODUCT NAME	POWER	NUMBER OF COR WIRES
KL -SC -D6SW	Seal connector type	Direct current (DC)	4 wires
KL -SC -A6SW		Alternating current (AC)	4 wires

#### SPECIFICATION

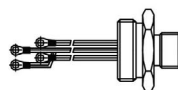
Rated Current	10A	6A
Rated voltage	AC125V	AC 250V
Contact resistance	40mΩ or below(DC20mV or below, at 100mA or below)	
Insulation resistance	100MΩ or above( at DC500V)	
Dielectric strength	AC 1500V 1min.(Between live parts / Between dead parts)	
Protection	IP67(IEC529)	
Tightening torque	0.8 NM	
Tensile strength	98N	
Operating temperature	- 25 ~ +70	
Contact pin material	Brass (gold plating)	
Fixture material	Brass (nickel plating)	
Pin block material	PBT Glass(UL94 - V0)	
O-ring material	NBR	
Housing material	Polyester elastomer	
Cord property (cable)	Increased resistance to oil / increased flexibility (300V 80 )	

#### COMBINATION



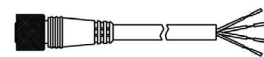
Limit switch

+



Seal connector

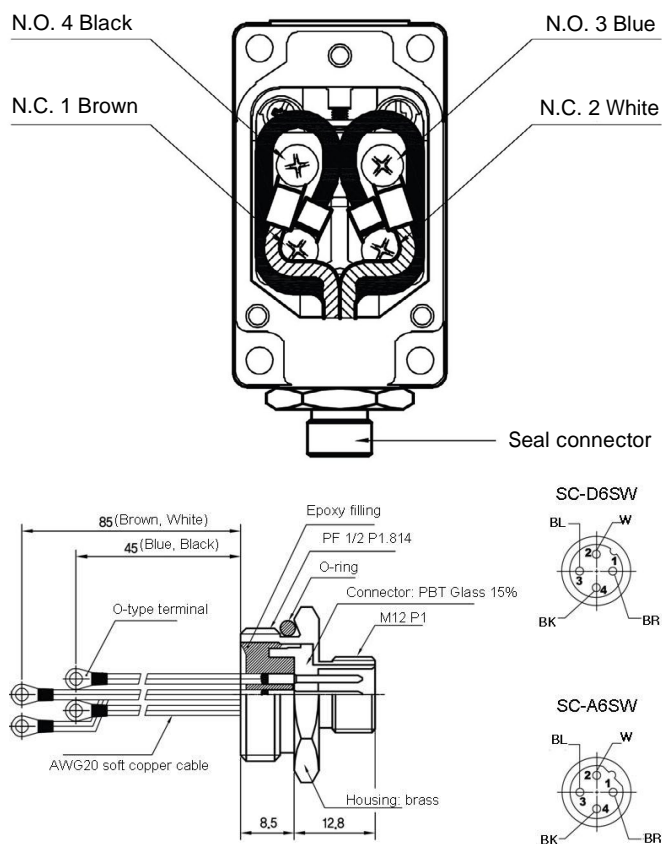
+



Connector cable



## WIRING METHOD



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH

## CONNECTOR CABLE

ITEM	CORE WIRE	POWER	CORD LENGTH	WIRE COLOR	MATERIAL
D6SW - 1	4 wires	Direct current (DC)	2 m	1(brown), 2(white), 3(blue), 4(black)	Soft PVC
A6SW - 1	4 wires	Alternating current (AC)	2 m	1(brown), 2(white), 3(blue), 4(black)	Soft PVC

	ITEM	SHAPE	OUTER DIAGRAM
	D6SW - 1		
	A6SW - 1		

MINI LIMIT SWITCH

# KH-8005 Series



## CLASSIFICATION

KH - 80 05 - S

① CONTACT RATING	05	250VAC, 5A(RESTANCE LOAD)
② ACTUATOR	S	ROLLER LEVER
	C	ADJUSTABLE ROLLER LEVER
	R	ROD LEVER
	P	PUSH PLUNGER
	PR	ROLLER PLUNGER
	CPR	CROSS - ROLLER PLUNGER
	SR	COIL SPRING

KH-8005-S KH-8005-C KH-8005-R KH-8005-P KH-8005-PR KH-8005-CPR KH-8005-SR



MODEL	OF(MAX.)	RF(min.)	PT	MD(MAX.)	OT(min.)	TT(min.)	MATERIAL
KH-8005-S	600g	50g	15 ± 5 °	10 °	75 °	90 °	Body, head: zinc - alloy die - casting Cover, roller: nylon glass Lever: Stainless steel
KH-8005-C	800g	21~50g	15 ± 5 °	10 °	75 °	90 °	Body, head: zinc - alloy die - casting Cover, roller: nylon glass Lever: Stainless steel
KH-8005-R	208~800g	12~50g	15 ± 5 °	10 °	75 °	90 °	Body, head: zinc - alloy die - casting Cover: nylon glass Rod: Stainless steel
KH-8005-P	900g	150g	2.0mm ± 1.0	0.7mm	4mm	4.5mm	Body, head: zinc - alloy die - casting Cover: nylon glass Shaft: free - cutting steel
KH-8005-PR KH-8005-CPR	900g	150g	1.5mm ± 0.5	0.7mm	4mm	5.5mm	Body, head: zinc - alloy die - casting Cover: nylon glass Roller : Stainless steel
KH-8005-SR	90g	-	10mm ± 5	-	20mm	20 °	Body, head: zinc - alloy die - casting Cover: nylon glass Spring lever: Stainless steel

CONTROL  
COMPONENTS

MICRO  
SWITCH

FOOT  
SWITCH

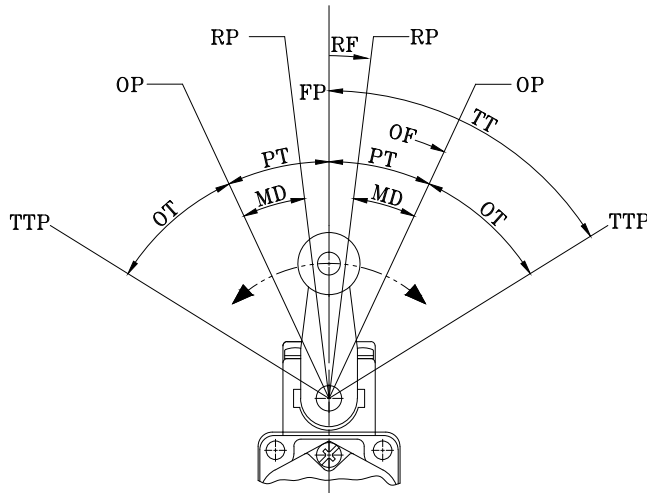
LIMIT  
SWITCH

POWER  
SWITCH

HOIST  
SWITCH

CAM  
SWITCH

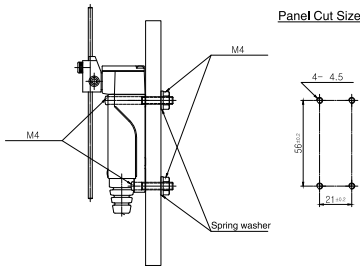
## ACTUATION RANGE GUIDE



OF	Required force to actuate	Required force to move from free position (FP) to operating position (OP)
RF	Return force	Required force to return from total travel position (TTP) to return position (RP)
PT	Movement to actuation	Distance or angle of movement from free position (FP) to operating position (OP)
MD	Movement differential	Distance or angle of movement from operating position (OP) to return position (RP)
OT	Movement after actuation	Distance or angle of movement from operating position (OP) to total travel position (TTP)
OP	Operating position	Actuator position when a contact point (NO (normal open)) is actuated (On) at free position (FP).
FP	Free position	Actuator position when no external force is applied to actuator
TTP	Total travel position	Actuator position when actuator arrives at stop.
RP	Return position	Actuator when a contact point (NO) is off at operating position (OP).
TT	Entire movement	Distance or angle of movement from free position (FP) to total travel position (TTP).

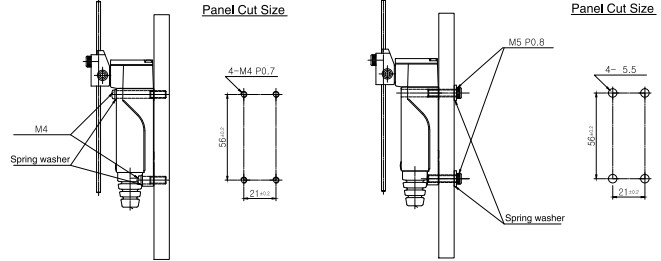
## Installation

### Front side installation



Maximum panel thickness must be less than 5mm.

### Back side installation

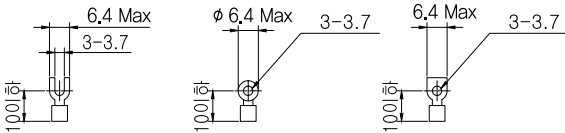


Hole depth must be 15mm(minimum).

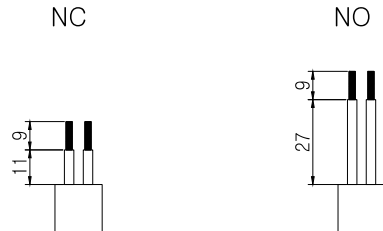
Maximum panel thickness must be less than 7mm.

## Terminal lug

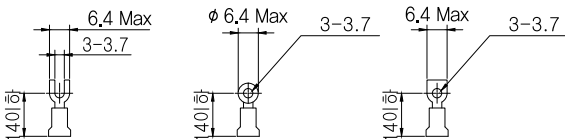
### Without insulation sleeve



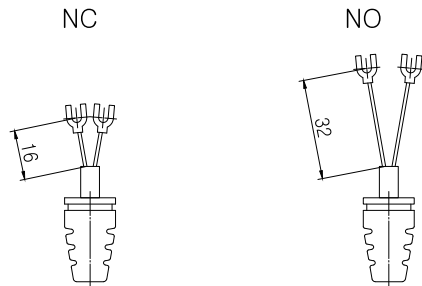
### Without terminal lug



### With insulation sleeve



### With terminal lug



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

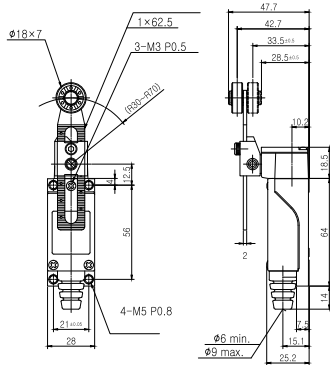
POWER SWITCH

HOIST SWITCH

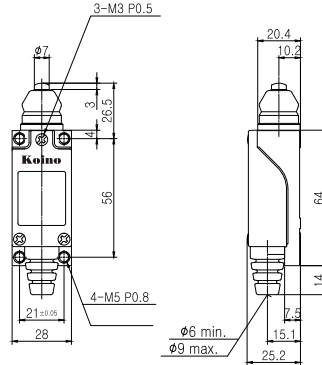
CAM SWITCH

Dimensions

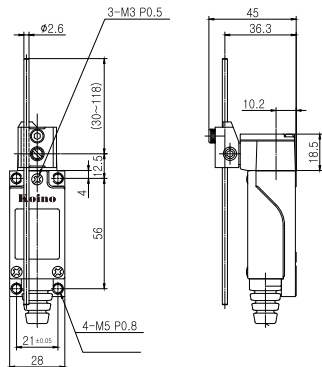
KH-8005-C



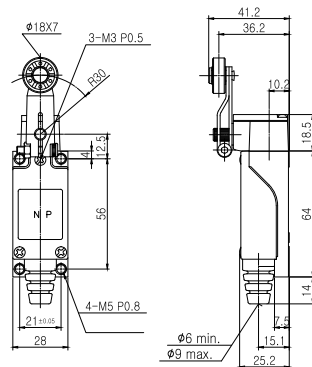
KH-8005-P



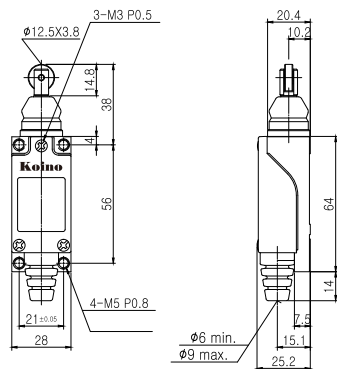
KH-8005-R



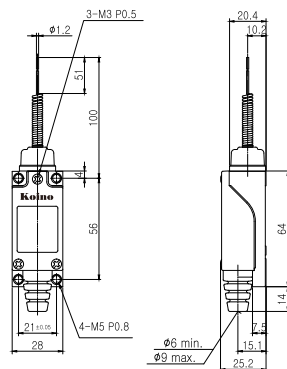
KH-8005-S



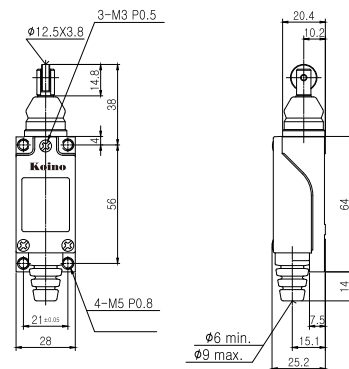
KH-8005-PR



KH-8005-SR



KH-8005-CPR



## Technical Information

### Ratings

Rated Voltage	Resistive Load	Inductive Load
125VAC	5A	3A
250VAC	5A	2A
125VDC	0.4A	0.1A

### Mechanical Characteristics

Mechanical Lifetime  
Minimum 1,000,000 operation

Switching Frequency  
120 operation per 1min.

Allowed Operating Rate  
1mm/s ~ 1m/s

### Electrical Characteristics

Standards  
This product comply with “ Standards for low-voltage switching devices ” EN IEC 60947-5-1

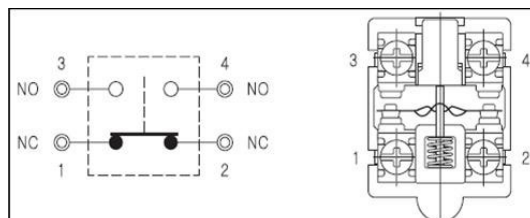
Insulation Resistance  
Minimum 100M (500VDC)

Contact Resistance  
Maximum 25m

Electrical Lifetime  
100,000 cycles of operation

Dielectric Strength  
Between Live Parts: 1,000VAC(50/60Hz)  
for 1 minute  
Between Live and Dead Parts:  
2,000VAC(50/60Hz) for 1 minute

### Contacts



### Environmental conditions

Operational Temperature  
-25 °C~+50 °C

Operational Humidity  
45~85%RH

Protection Degree  
IP55

Shock Resistance  
Approximately 100G(1,000m/s<sup>2</sup>)  
Approximately 30G(300m/s<sup>2</sup>) at false operation

Vibration Resistance  
10~55Hz double amplitude 1.5mm  
(at X, Y and Z axis)

### Approvals

Approbations  
N/A

Declaration of Conformity  
CE

LIMIT SWITCH - MOUNTING TYPE

KH-8010 Series



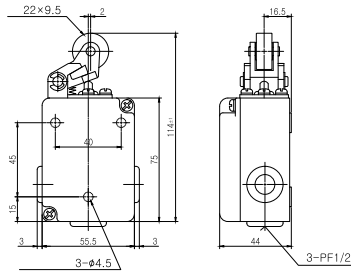
KH-8010-RP



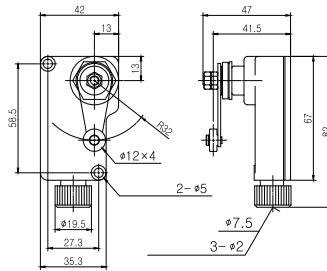
KH-8010-V1

CLASSIFICATION

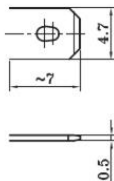
KH-8010-RP - LEVER PUSH TYPE



KH-8010-V1 - CAM ROLLER ARM TYPE



KH-8010-V1 TERMINAL





## Technical Information

### Operation Specification

MODEL	MAX. OF	MIN. RF	PT	MIN. OT	MAX. MD
KH-8010-RP	1,500g	-	-	-	-
KH-8010-V1	682g	114g	15 ± 5	55 °	10 °

### Material

#### BODY

KH-8010-RP: Aluminum Alloy Die Casting

KH-8010-V1: Aluminum Alloy Die Casting

#### LEVER

KH-8010-RP: Zinc Alloy Die Casting

KH-8010-V1: Stainless Steel

#### ROLLER

KH-8010-RP: Stainless Steel

KH-8010-V1: Stainless Steel

### Mechanical Characteristics

#### Mechanical Lifetime

Minimum 1,000,000 operation

#### Switching Frequency

120 operation per 1min.

#### Allowed Operating Rate

1mm/s ~ 1m/s

### Electrical Characteristics

#### Standards

This product comply with “ Standards for low-voltage switching devices ” EN IEC 60947 - 5 - 1

#### Contact Ratings

KH-8010-RP: 380VAC, 10A (resistive load)

KH-8010-V1: 125VAC , 15A (resistive load)

#### Insulation Resistance

Minimum 100M (500VDC)

#### Contact Resistance

Maximum 25m

### Electrical Characteristics—continues

#### Electrical Lifetime

Minimum 100,000 operation

#### Dielectric Strength

Between Live Parts: 1,000VAC(50/60Hz) for 1 minute

Between Live and Dead Parts: 2,000VAC(50/60Hz) for 1 minute

### Environmental conditions

#### Operational Temperature

- 25 °C ~ +50 °C

#### Operational Humidity

45~85%RH

#### Protection Degree

IP40

#### Shock Resistance

Approximately 100G(1,000m/s<sup>2</sup>)

Approximately 30G(300m/s<sup>2</sup>) at false operation

#### Vibration Resistance

10~55Hz double amplitude 1.5mm (at X, Y and Z axis)

### Approvals

#### Approbations

UL

#### Declaration of Conformity

N/A

**KOINO** 