

PART2

MICRO SWITCH



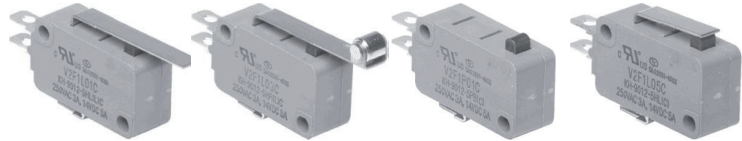
KH-9012 Series

KH-9015 Series

KH-9016 Series

MICRO SWITCH

KH-9012











CLASSIFICATION

KH - 9012 - 5 HLL

① ② ③

① TYPE NUMBER	9012	Micro switch Type V	Micro switch Type V
② CONTACT RATING	NONE	125VAC, 15A (Resistance load)	
	5	125VAC, 5A (Resistance load)	
③ ACTUATOR	PB	Pin plunger	
	HL	Short hinge lever	
	HLL	Long hinge lever	
	HLR	Hinge lever Round type	
	HRL	Long hinge roller lever	
	HRM	Hinge roller lever	
	HRS	Short hinge roller lever	

Rated Voltage	Resistive Load				Inductive Load				Motor Load			
	KH-9012-5		KH-9012		KH-9012-5		KH-9012		KH-9012-5		KH-9012	
	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO	NC	NO
125VAC	5A	5A	15A	15A	3A	3A	10A	10A	1.5A	0.7A	4A	2A
250VAC	3A	3A	10A	10A	2A	2A	5A	5A	1.0A	0.5A	2.5A	1.2A
8VDC	5A	5A	15A	15A	3A	3A	10A	10A	-	-	-	-
14VDC	5A	5A	15A	15A	3A	3A	8A	8A	-	-	-	-
30VDC	5A	5A	6A	6A	3A	3A	4A	4A	-	-	-	-
125VDC	0.6A	0.6A	0.6A	0.6A	0.1A	0.1A	0.3A	0.3A	-	-	-	-
250VDC	0.3A	0.3A	0.3A	0.3A	0.05A	0.05A	0.1A	0.1A	-	-	-	-

Model	Model	OF Max.	PT Max	MD Max.	OT min.	OP	Material
KH-9012-5PBC		250g	1.6mm	1.0mm	0.3mm	14.7mm ± 0.7	Enclosure: PBT glass
KH-9012-5HLC		250g	1.6mm	0.8mm	0.3mm	15.3mm ± 0.6	Enclosure: PBT glass Lever: Stainless steel
KH-9012-5HLLC		150g	4.0mm	1.6mm	0.6mm	15.3mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel
KH-9012-5HRLC		150g	4.0mm	1.6mm	0.6mm	20.7mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel Roller: Brass(Ni plated)
KH-9012-5HRMC		150g	4.0mm	1.6mm	0.6mm	20.6mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel Roller: Brass(Ni plated)
KH-9012-5HRSC		250g	1.6mm	0.8mm	0.3mm	20.6mm ± 1.2	Enclosure: PBT glass Lever: Stainless steel Roller: Brass(Ni plated)
KH-9012-5HLRC		150g	4.0mm	1.6mm	0.6mm	18.3mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel
KH-9012-5PBFC		250g	1.6mm	0.8mm	0.3mm	14.7mm ± 0.7	Enclosure: PBTglass

CONTROL COMPONENTS

MICRO SWITCH









FOOT SWITCH

LIMIT SWITCH

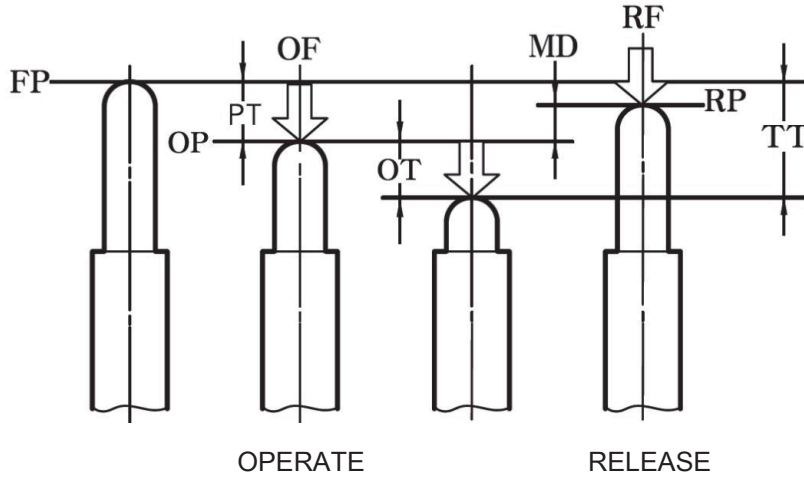
POWER SWITCH

HOIST SWITCH

CAM SWITCH

Model	Model	OF Max.	PT Max	MD Max.	OT min.	OP	Material
KH-9012-PBC		500g	1.6mm	1.0mm	0.3mm	14.7mm ± 0.7	Enclosure: PBT glass
KH-9012-HLC		600g	1.6mm	1.5mm	0.3mm	15.3mm ± 0.6	Enclosure: PBT glass Lever: Stainless steel
KH-9012-HLLC		300g	4.0mm	3.0mm	0.6mm	15.3mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel
KH-9012-HRLC		300g	4.0mm	3.0mm	0.6mm	20.7mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel Roller: Brass(Ni plated)
KH-9012-HRMC		400g	4.0mm	3.0mm	0.6mm	20.6mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel Roller: Brass(Ni plated)
KH-9012-HRSC		600g	1.6mm	1.5mm	0.3mm	20.6mm ± 1.0	Enclosure: PBT glass Lever: Stainless steel Roller: Brass(Ni plated)
KH-9012-HLRC		300g	4.0mm	3.0mm	0.6mm	18.3mm ± 1.6	Enclosure: PBT glass Lever: Stainless steel
KH-9012-PBFC		500g	1.6mm	1.0mm	0.3mm	14.7mm ± 0.7	Enclosure: PBT glass

Reference



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

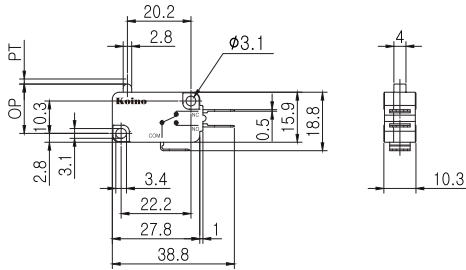
POWER SWITCH

HOIST SWITCH

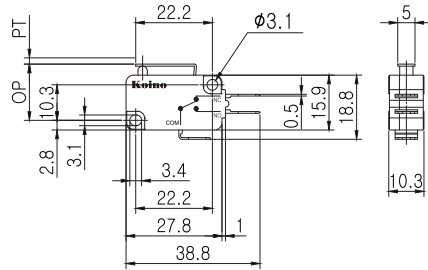
CAM SWITCH

Dimension

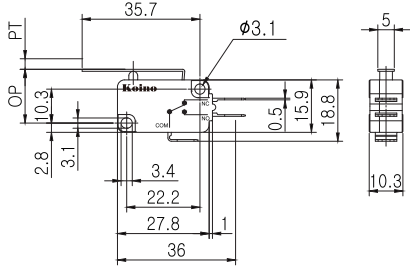
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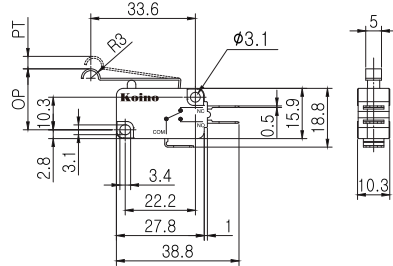
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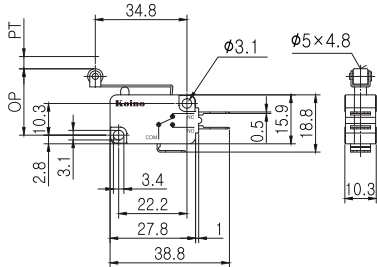
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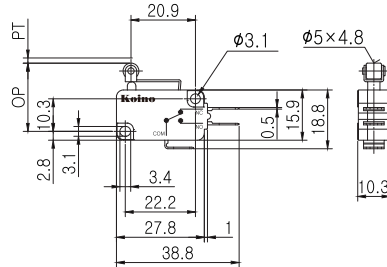
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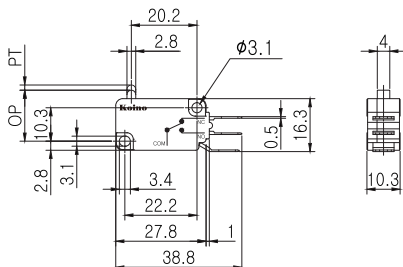
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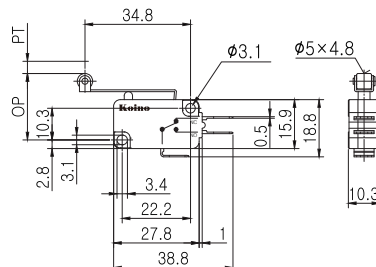
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V2F1P01C (KH-9012-5PB(F)C)

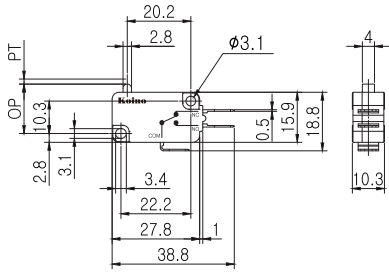


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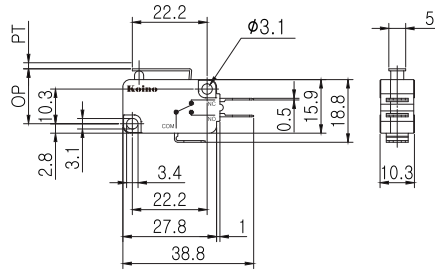


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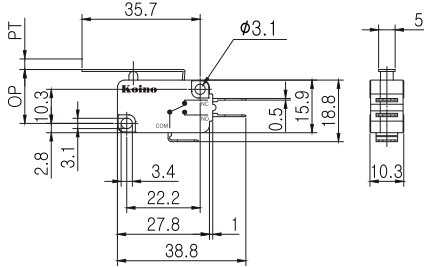
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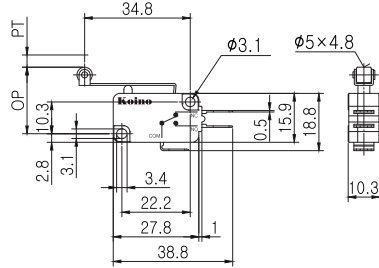
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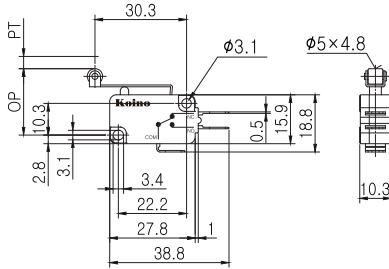
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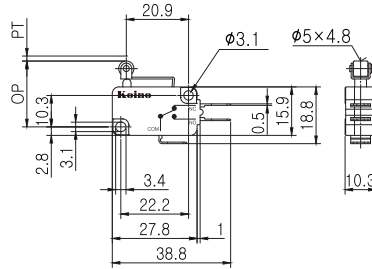
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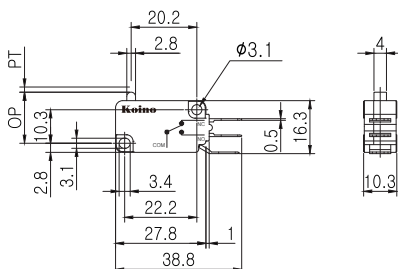
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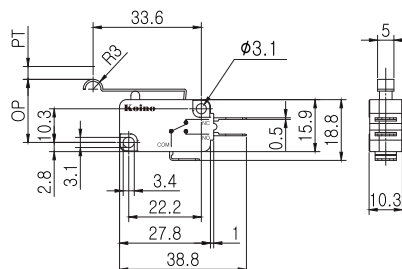
V4F1L07C (KH-9012-HR(SC))



V4F1P01C (KH-9012-PB(FC))



V4F1L01(RC) (KH-9012-HL(RC))



CONTROL COMPONENTS

MICRO SWITCH

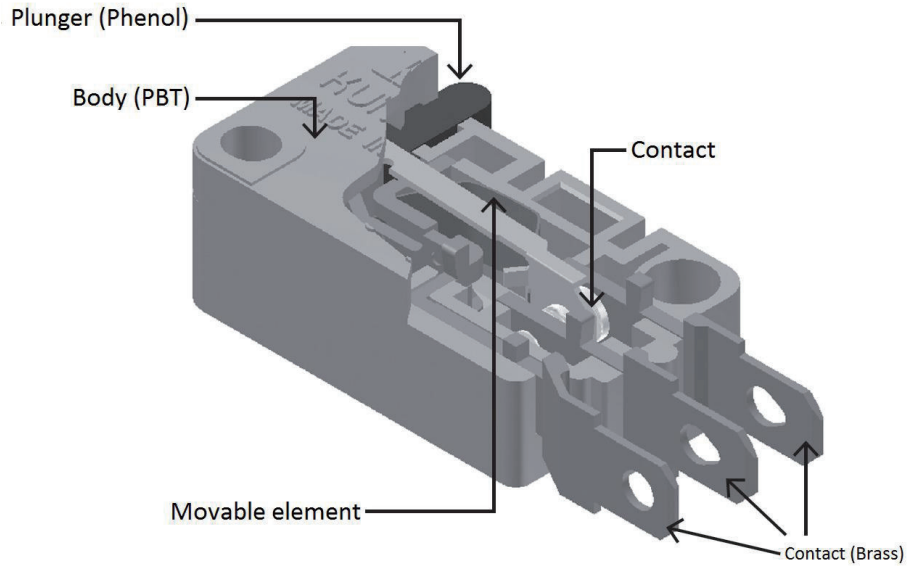
FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH



Technical Information

Allowed Operating Velocity		0.1mm/s~1mm/s
Operating Frequency	Mechanical	240 operations/minute
Operating Frequency	Electrical	20 operations/minute
Insulation Resistance		100MΩ min. (DC500V)
Contact Resistance		15mΩ Max.
Dielectric Strength	Between live parts	1,000VAC(50/60Hz) for 1 minute
	Between dead parts	1,500VAC(50/60Hz) for 1 minute
Vibration Resistance	Malfunction	10~55Hz double amplitude 1.5mm, X,Y,Z at each direction
Shock Resistance	Destruction	100G
	Malfunction	5G
Durability	Mechanical	1,000,000 operations
	Electrical	100,000 operations
Protection		IP40
Ambient Temperature		-25~+80°C (not freezing condition)
Ambient Humidity		45~85% RH
Weight		6.2~10.5g

MICRO SWITCH

KH-9015



CLASSIFICATION

KH - 9015 - HLL

① ②

① TYPE NUMBER	9015	Micro switch, Standard type
② ACTUATOR	PBF	Slim spring plunger
	PBL	Panel mount plunger
	RP	Panel mount roller plunger
	CRP	Panel mount cross roller plunger
	PBS	Short spring plunger
	HL	Short hinge lever
	HLL	Long hinge lever
	HP	Leaf spring
	HRL	Long hinge roller lever
	HRM	Medium hinge roller lever
	HRS	Short hinge roller lever
	HLZ	Hinge lever Z type
	HR(S)W	Hinge roller lever W type

UL, cUL Standards UL508 No. E117960

Rated Voltage	600VAC	250VAC	125VAC	8VDC	14VDC	30VDC	125VDC	250VDC
Rated Current	3A Resistive	10A Resistive	15A Resistive	15A	15A	6A	0.4A	0.2A

CONTROL COMPONENTS

MICRO SWITCH









FOOT SWITCH







LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH

Model	Model	OF Max.	RF min.	PT Max.	OT min.	MD Max.	FP Max.	OP	Material
KH-9015-PBF		380g	110g	1.0mm	1.3mm	0.13mm	-	28.2mm ± 0.6	Body: Phenol Pushbutton: Brass(Ni Plated) Roller: Stainless steel
KH-9015-RP		380g	110g	1.0mm	5.2mm	0.13mm	-	21.8mm ± 0.8	
KH-9015-PBL		380g	110g	1.0mm	1.3mm	0.13mm	-	21.2mm ± 0.8	
KH-9015-PBS		380g	110g	1.0mm	3.2mm	0.13mm	-	33.3mm ± 1.4	
KH-9015-HP		70g	24g	7.6mm	7.6mm	1.3mm	31.0mm	23.4mm ± 0.8	Body: Phenol Lever: Stainless Steel Roller: Stainless steel
KH-9015-CRP		380g	110g	1.0mm	1.0mm	0.13mm	-	33.4mm ± 1.4	
KH-9015-HL		100g	14g	10mm	4.0mm	2.4mm	28.2mm	19.1mm ± 1.0	
KH-9015-HLL		70g	14g	12.2mm	7mm	1.5mm	33.0mm	19.0mm ± 0.8	

Model	Model	OF Max.	RF min.	PT Max.	OT min.	MD Max.	FP Max.	OP	Material
KH-9015-HRL		100g	14g	8.0mm	3.6mm	2.4mm	36.5mm	30.2mm ± 1.0	Body: Phenol Lever: Stainless Steel Roller: Stainless steel
KH-9015-HLZ		130g	31g	5.5mm	3.4mm	0.8mm	36.0mm	30.5mm ± 0.4	
KH-9015-HRS		160g	28g	5.0mm	2.0mm	1.2mm	32.5mm	30.2mm ± 1.0	
KH-9015-HRM		180g	30g	5.0mm	2.0mm	1.2mm	44.0mm	38.5mm ± 2.0	
KH-9115-HRS		160g	28g	-	2.6mm	1.2mm	43.6mm	41.3mm ± 0.8	
KH-9015-HRSW		160g	28g	5.0mm	2.0mm	1.2mm	32.5mm	30.2mm ± 1.0	

CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

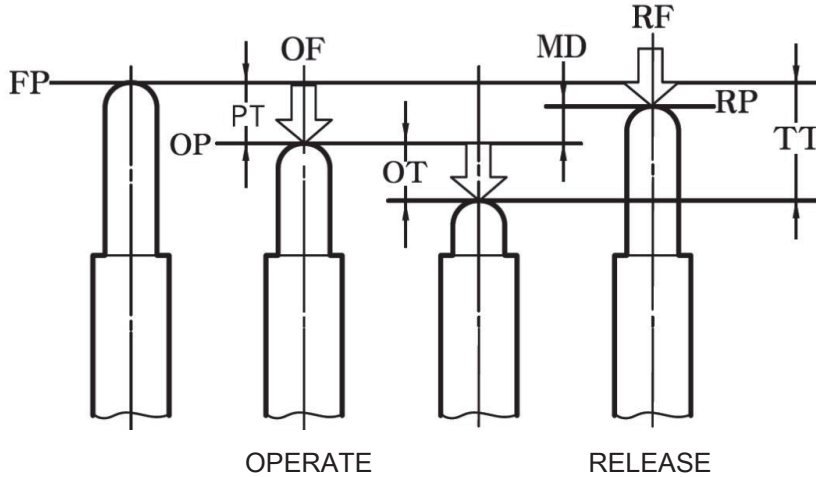
LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

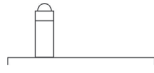
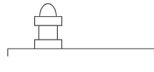


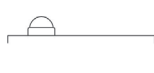
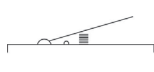
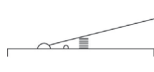
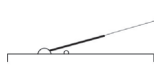


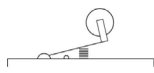


CAM SWITCH

Reference



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).

Actuator

KH-9015-PBF	Slim spring plunger	
KH-9015-PBL	Panel mount plunger	
KH-9015-RP	Panel mount roller plunger	
KH-9015-CRP	Panel mount cross roller plunger	
KH-9015-PBS	Short spring plunger	
KH-9015-HL	Short hinge lever	
KH-9015-HLL	Long hinge lever	
KH-9015-HP	Leaf spring	
KH-9015-HRL	Long hinge roller lever	
KH-9015-HRM	Medium hinge roller lever	
KH-9015-HRS	Short hinge roller lever	
KH-9015-HLZ	Hinge lever Z type	
KH-9015-HR(S)W	Hinge roller lever W type	

CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

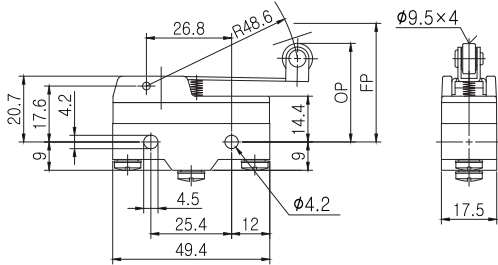
POWER SWITCH

HOIST SWITCH

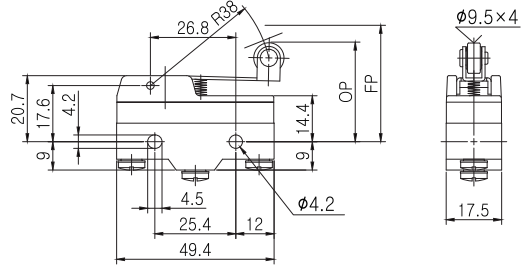
CAM SWITCH

Dimension

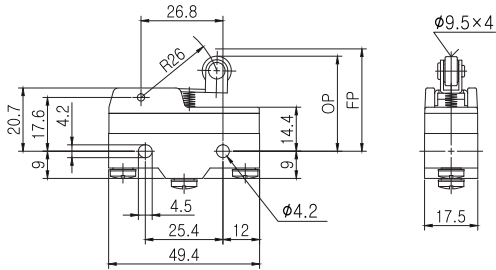
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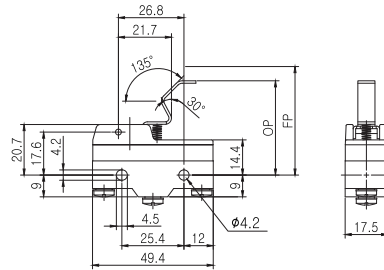
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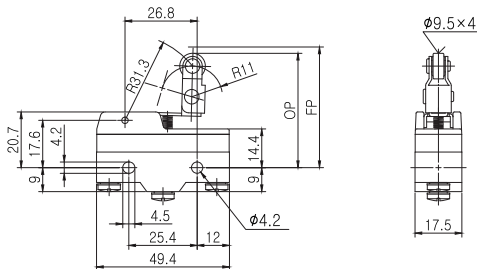
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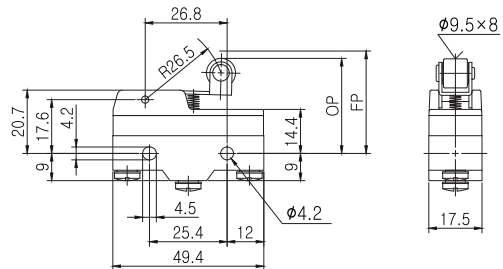
Z4G1L01B (KH-9015-HLZ)



KH-9115-HR(S)



Z4G1L07B (KH-9015-HR(S)W)



CONTROL COMPONENTS

MICRO SWITCH

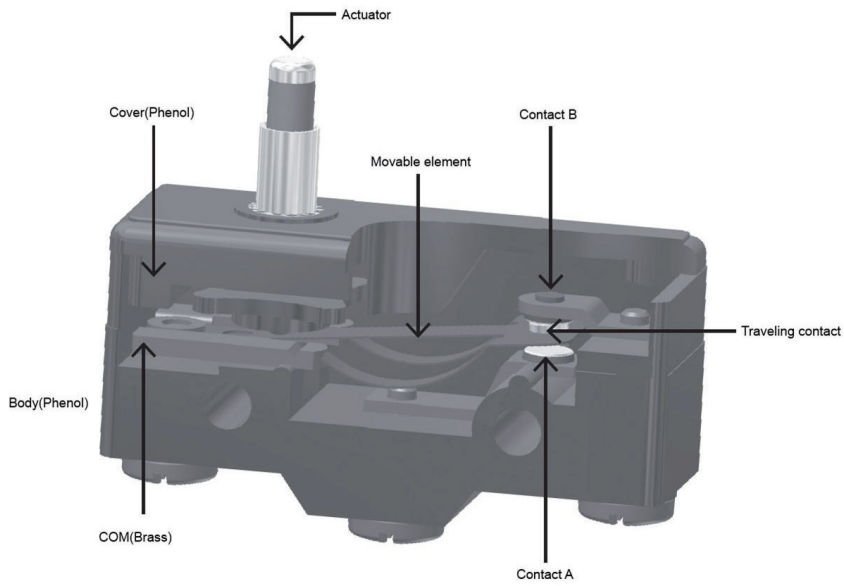
FOOT SWITCH

LIMIT SWITCH

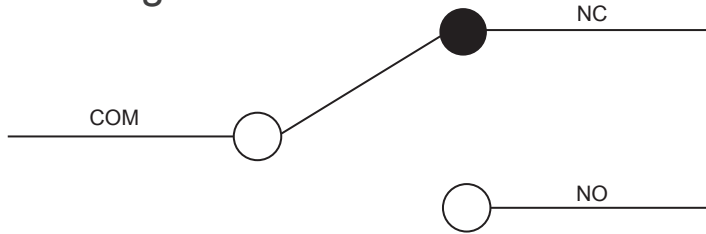
POWER SWITCH

HOIST SWITCH

CAM SWITCH



Circuit Diagram



Contact Ratings

Rated Voltage	Resistive Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO
125VAC	15A		10A		3A	1.5A
250VAC	10A		6A		2A	1A
500VAC	3A		2A		1.5A	0.75A
8VDC	15A		10A		-	-
14VDC	15A		10A		-	-
30VDC	6A		6A		-	-
125VDC	0.4A		0.1A		-	-
250VDC	0.2A		0.05A		-	-

Technical Information

Allowed Operating Velocity		0.1mm/s~1mm/s
Operating Frequency	Mechanical	240 operations/minute
Operating Frequency	Electrical	20 operations/minute
Insulation Resistance		100MΩ min. (DC500V)
Contact Resistance		15mΩ Max.
Dielectric Strength	Between live parts	1,000VAC(50/60Hz) for 1 minute
	Between dead parts	2,000VAC(50/60Hz) for 1 minute
Vibration Resistance	Malfunction	10~55Hz double amplitude 1.5mm, X,Y,Z at each direction
Shock Resistance	Destruction	100G
	Malfunction	5G
Durability	Mechanical	5,000,000 operations
	Electrical	500,000 operations
Protection		IP50
Ambient Temperature		-25~+80°C (not freezing condition)
Ambient Humidity		45~85% RH
Weight		31.5~59.5g

CONTROL
COMPONENTS

MICRO
SWITCH

FOOT
SWITCH

LIMIT
SWITCH

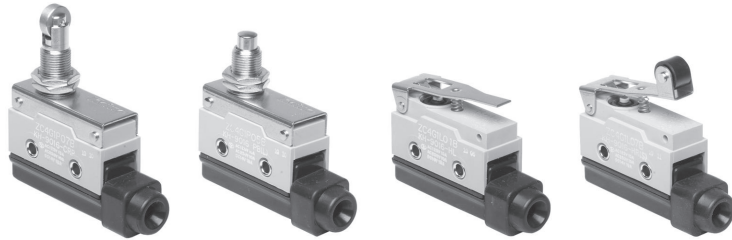
POWER
SWITCH

HOIST
SWITCH

CAM
SWITCH

MICRO SWITCH

KH-9016



CLASSIFICATION

KH - 9016 - PBL

①

②

① TYPE NUMBER	9016	Compact Micro switch,	
		125VAC, 15A	
② ACTUATOR	PBL	Panel mount plunger	
	RP	Panel mount roller plunger	
	CRP	Panel mount cross roller plunger	
	HL	Short hinge lever	
	HLL	Long hinge lever	
	HRL	Long hinge roller lever	
	HRS	Short hinge roller lever	

Model	OF Max.	RF min.	PT Max.	OT min.	MD Max.	OP	Material
KH-9016-PBL	600g	100g	1.0mm	4.0mm	0.13mm	22.8mm ± 1.0	Body: PBT glass Cover: Nylon glass
KH-9016-RP	600g	100g	1.0mm	3.5mm	0.13mm	33.4mm ± 1.0	Terminal Cover: Acetal Roller/Head: Stainless steel
KH-9016-CRP	600g	100g	1.0mm	3.5mm	0.13mm	33.4mm ± 1.0	Roller/Head: Stainless steel

KH-9016-PBL



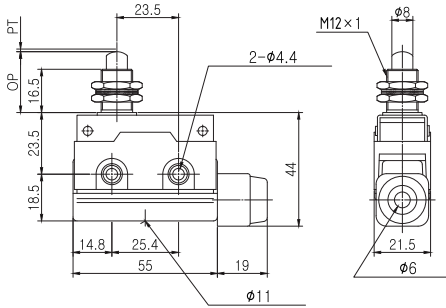
KH-9016-RP



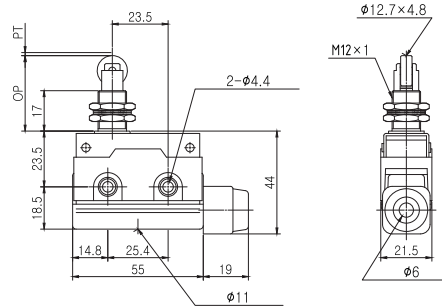
KH-9016-CRP



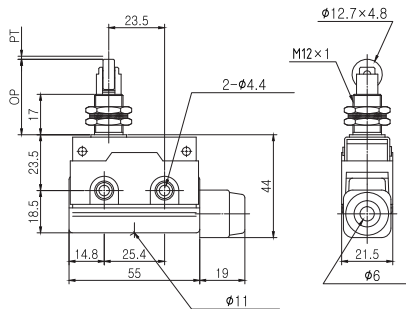
ZC4G1P05B (KH-9016-PB(L))



ZC4G1P07B (KH-9016-RP)



KH-9016-CRP



CONTROL COMPONENTS

MICRO SWITCH

FOOT SWITCH

LIMIT SWITCH

POWER SWITCH

HOIST SWITCH

CAM SWITCH

Model	OF Max.	RF min.	PT Max.	OT min.	MD Max.	FP Max.	OP	Material
KH-9016-HL	300g	80g	5.9mm	2.0mm	1.2mm	32mm	25.9mm ± 1.0	Body: PBT glass Cover: Nylon glass
KH-9016-HLL	200g	50g	8.3mm	7.0mm	0.8mm	34mm	26.5mm ± 1.0	Terminal Cover: Acetal Lever: Stainless steel
KH-9016-HRL	200g	50g	8.1mm	4.0mm	0.5mm	48mm	39.4mm ± 1.0	Roller: Nylon glass
KH-9016-HRS	300g	80g	3.7mm	3.0mm	0.35mm	45mm	40.4mm ± 1.0	

KH-9016-HL



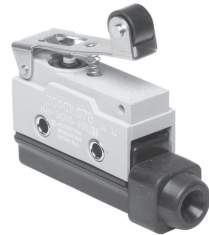
KH-9016-HLL



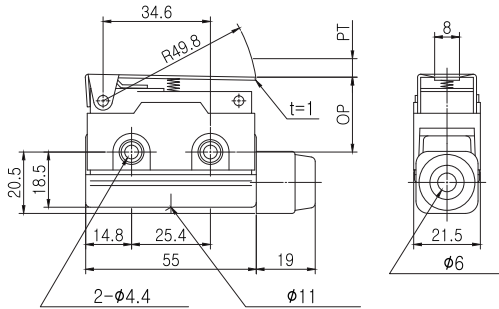
KH-9016-HRL



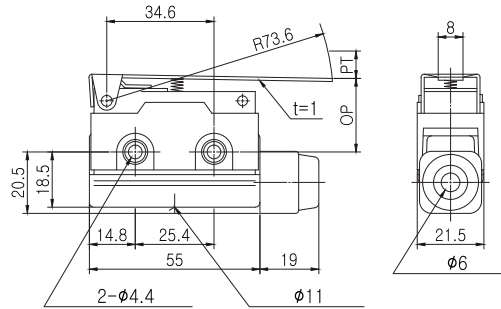
KH-9016-HRS



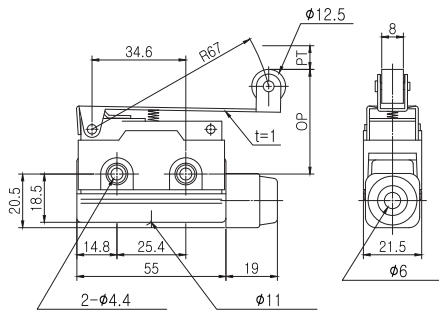
ZC4G1L01B (KH-9016-HL)



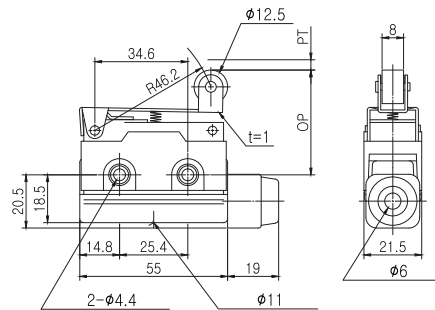
ZC4G1L02B (KH-9016-HL(L))



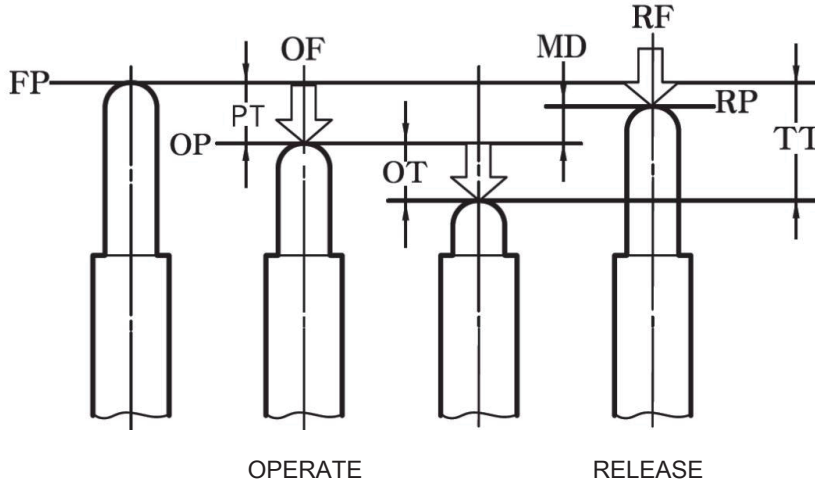
ZC4G1L03B (KH-9016-HR(L))



ZC4G1L07B (KH-9016-HR(S))



Reference



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

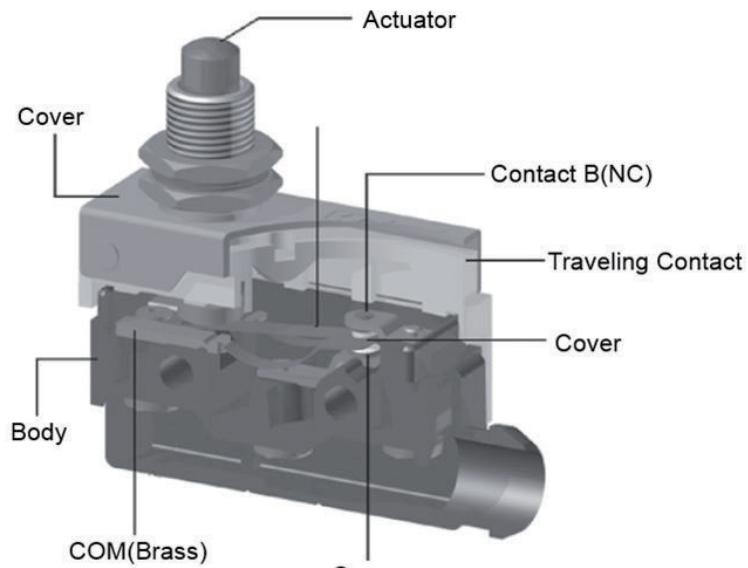
FOOT SWITCH

LIMIT SWITCH

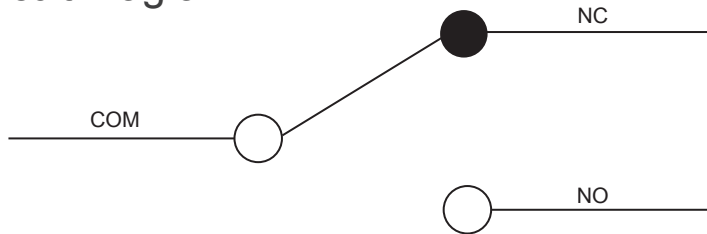
POWER SWITCH

HOIST SWITCH

CAM SWITCH



Circuit Diagram



Contact Ratings

Rated Voltage	Resistive Load		Inductive Load		Motor Load	
	NC	NO	NC	NO	NC	NO
125VAC	15A		10A		3A	1.5A
250VAC	10A		6A		2A	1A
500VAC	3A		2A		1.5A	0.75A
8VDC	15A		10A		-	-
14VDC	15A		10A		-	-
30VDC	10A		6A		-	-
125VDC	0.6A		0.1A		-	-
250VDC	0.3A		0.05A		-	-

Technical Information

Allowed Operating Velocity		0.1mm/s~1mm/s
Operating Frequency	Mechanical	240 operations/minute
Operating Frequency	Electrical	20 operations/minute
Insulation Resistance		100MΩ min. (DC500V)
Contact Resistance		15mΩ Max.
Dielectric Strength	Between live parts	1,000VAC(50/60Hz) for 1 minute
	Between dead parts	2,000VAC(50/60Hz) for 1 minute
Vibration Resistance	Malfunction	10~55Hz double amplitude 1.5mm, X,Y,Z at each direction
Shock Resistance	Destruction	100G
	Malfunction	5G
Durability	Mechanical	5,000,000 operations
	Electrical	500,000 operations
Protection		IP50
Ambient Temperature		-25~+80°C (not freezing condition)
Ambient Humidity		45~85% RH
Weight		31.5~59.5g

CONTROL
COMPONENTS

MICRO
SWITCH

FOOT
SWITCH

LIMIT
SWITCH

POWER
SWITCH

HOIST
SWITCH

CAM
SWITCH

KOINOX