

Sensor Series Open & Close Confirmation Sensor

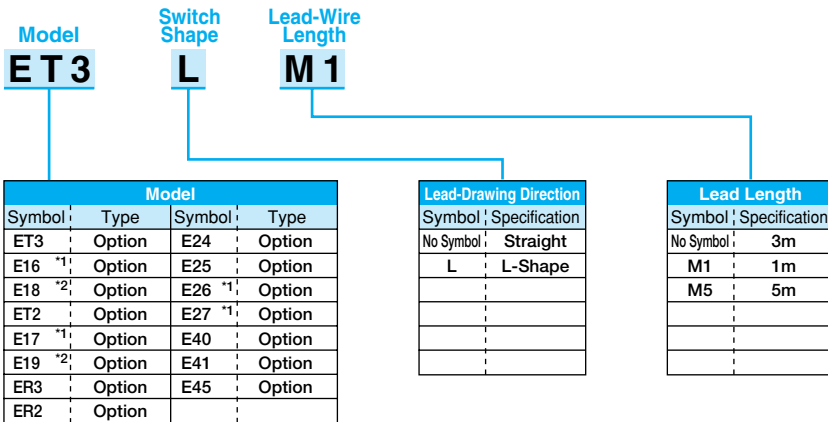
Compact Non-Contact Reed Switch

Key Features

- Contact switch, bicolor display, and oil-proof
- Many sensor types available for various gripper models



How To Order

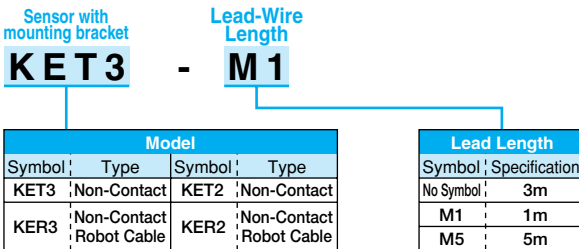


^{*1} Available for HLA, HLAG, HLB, and HLBG only

^{*2} Available for LHA-006AS and BSA-006BS only

Note) ET3, ET3L, ET2, and ET2L can be replaced with old model; E14, E14L, E15, and E15L respectively. ET3 and ET2 with mounting bracket can also be replaced with E10 and E11. Robot cable type of ET3 and ET2 are ER3 and ER2.

Only for sensor with mounting bracket



*Mounting bracket cannot be used for L-shaped Sensor

Applicable Model

Model	Size	ET3·ET2 ER3·ER2	ET3L·ET2L ER3L·ER2L	E16·E17 E16L·E17L	E18·E19 E18L·E19L	E24·E25 E24L·E25L	E26·E27 E26L·E27L	E40·E41·E45 E40L·E41L·E45L
LHA	006AS to 06AS	○	○		○ ^{06AS only}	○ ^{06AS only}		
BSA	006BS				○			
BHA	01AS to 06AS	○	○			○ ^{06AS only}		
BHG	01AS to 06AS	○	○			○ ^{06AS only}		
BHE	01AS to 06AS	○	○			○ ^{06AS only}		
HMA	01AS to 05AS	○	○					
HA	2MS to 4MS	○ ^{*1}						
HC	2MS to 4MS	○ ^{*1}						
HLC	08AS to 30AS	○	○			○ ^{30AS only}		
HLF	08AS1 to 20AS1	○	○			○		○
HMF	12AS to 40AS	○	○			○		
HF	2MS to 5MS	○ ^{*1}						
HG	3MS	○ ^{*1}						
HK	32MS to 63AS1	○ ^{*1}	○ ^{*3}			○ ^{*3}		○ ^{*3}
HK	80AS	○	○			○		
HLG	06AS				○			
HLA (G) ^{*2}	12AS to 20AS			○			○	
HLB (G) ^{*2}	12AS to 20AS			○			○	
HH	100AS to 200AS	○	○					
HHA·B	150AS	○	○			○		
HHC·D	100AS to 160AS	○	○			○		○
HJQ	32AS to 63AS1	○ ^{*1}	○ ^{*1}			○ ^{*3}		○ ^{*3}
HMD	12AS to 25AS	○	○			○		
HB	1MS to 4MS	○ ^{*1}						
HJD	32AS to 63AS1	○ ^{*1}	○ ^{*3}			○ ^{*3}		○ ^{*3}
HJ	32AS to 63AS1	○ ^{*1}	○ ^{*3}			○ ^{*3}		○ ^{*3}
HMB	01AS to 04AS	○	○					
HD	3MS to 4MS	○ ^{*1}						
CKS (F)	08AS to 32AS	○	○					
CKJ (B)	16AS to 63AS (The size, 100AS, is available only for CKJ(B))	○	○			○		
CKL	16AS·25AS	○	○		○ ^{16AS only}	○		
	32AS to 100AS	○	○			○		○
CKT·CKU	160AS to 250AS	○	○			○		○
CKG	16AS to 40AS	○	○			○ ^{Except 16AS}		
	50AS	○ ^{*1}						
CKF	15AS to 25AS	○	○					
	30AS to 40AS	○ ^{*1}						
CK	1AS to 2AS	○	○					
CKA	15AS to 40AS	○	○			○ ^{Except 15AS}		
	50AS to 70AS	○ ^{*1}						
BHS	01AS to 06AS	○	○			○ ^{06AS only}		
PLA	25AS	○	○		○			
CKP (B)	20AS	○	○			○		
WHA·WHF	200AS to 450AS	○	○					
WHB	300AS to 450AS	○	○					
TNB	25A		○					
ZRT	16AS	○	○					
ZRA	20A to 32A	○	○			○		
ZRB	16 A to 30A	○	○			○ ^{30A only}		
ZA·ZC	20A to 63A	○	○			○		
ZB·ZD	25A to 50A	○	○			○		
EXL	20AS to 63AS	○	○			○		
CKR	20AS to 63AS	○	○			○		

● For sensors on CKB and CKD, please refer to model, CK and CKA. (Note: Please refer to CKA-50MS for CKB-40AS and CKD-40AS)

*1 Bracket is required to mount this switch

*2 L-shape sensor can not be used for HLAG and HLBG.

*3 Available only for 50AS1 and 63AS1

Sensor Series Open & Close Confirmation Sensor

Specification

Model	ET3·ET3L	ER3·ER3L	ET2·ET2L	ER2·ER2L	E16·E16L	E17·E17L	E18·E18L	E19·E19L
Setting	Option ▶276▶							
Type	Non-Contact							
Application	Programmable Controller, for Relay		Exclusively for Programmable Controller		Programmable Controller, for Relay	Exclusively for Programmable Controller	Programmable Controller, for Relay	Exclusively for Programmable Controller
Power Supply Voltage	DC10 to 28V		—		DC10 to 28V	—	DC10 to 28V	—
Load Voltage & Current	DC30V or less, 100mA or less		DC10 to 30V, 5 to 20mA		DC30V or less, 50mA or less	DC10 to 30V, 5 to 25mA	DC30V or less, 50mA or less	DC10 to 30V, 5 to 20mA
Current Consumption	10mA or less at DC24V (when powered ON)		—		10mA or less at DC24V (when powered ON)	—	10mA or less at DC24V (when powered ON)	—
Internal Voltage Drop	0.5V or less at 100mA		4V or less		0.5V or less at 50mA	4V or less	0.5V or less at 50mA	4V or less
Lamp	LED (lighting when powered on)							
Leakage Current	10μA or less		1mA or less		10μA or less	1mA or less	10μA or less	1mA or less
Lead-Wire Length	Oil-Proof Vinyl Cabtyre Cord (3-Lead 0.15mm ²)	Robot Cable 3-Lead 0.15mm ²	Oil-Proof Vinyl Cabtyre Cord (2-Lead 0.15mm ²)	Robot Cable 2-Lead 0.15mm ²	Oil-Proof Vinyl Cabtyre Cord (3-Lead 0.2mm ²)	Oil-Proof Vinyl Cabtyre Cord (2-Lead 0.2mm ²)	Oil-Proof Vinyl Cabtyre Cord (3-Lead 0.15mm ²)	Oil-Proof Vinyl Cabtyre Cord (2-Lead 0.15mm ²)
Max. Impact	100G							
Insulation Resistance	20MΩ or more at DC500V Megger							
Dielectric Withstand Voltage	No Abnormality at AC1000V for 1 min.							
Ambient Temperature	-10 to +60°C							
Protective Structure	IEC Standard IP67 & JIS C0920 (Watertight) Oil-Proof							

Model	E24·E24L	E25·E25L	E26·E26L	E27·E27L	E40·E40L	E41·E41L	E45·E45L *
Setting	Option ▶276▶						
Type	Contact				Non-Contact		
Application	Programmable Controller, for Relay, IC Circuit (No Lamp), for Series Connection	Programmable Controller, for Relay	Programmable Controller, for Relay, IC Circuit (No Lamp), for Series Connection	Programmable Controller, for Relay	Programmable Controller, for Relay	Exclusively for Programmable Controller	
Power Supply Voltage	—				DC10 to 28V		—
Load Voltage & Current	50mA or less at DC24V, 20mA or less at AC100V	5 to 50mA at DC24V, 7 to 20mA at AC100V	50mA or less at DC24V, 20mA or less at AC100V	5 to 50mA at DC24V, 7 to 20mA at AC100V	DC30V or less 50mA or less	DC10 to 30V 5 to 20mA	
Current Consumption	—				10mA at DC24V (when powered ON)		—
Internal Voltage Drop	0V	2.4V or less	0V	2.4V or less	0.5V or less		4V or less
Lamp	—	LED (light ON when powered ON)	—	LED (light ON when powered ON)	Red / Green LED (light on when powered ON)		
Leakage Current	0				10μA or less		1mA or less
Lead-Wire Length	3m (Oil-Proof Vinyl Cabtyre Cord 2-Lead 0.2mm ²)				Oil-Proof Vinyl Cabtyre Cord 0.2mm ² , 3-Lead 3m		Oil-Proof Vinyl Cabtyre Cord 0.3mm ² , 2-Lead 3m
Max. Impact	30G				980m/S ² {100G}		
Insulation Resistance	20MΩ or more at DC500V Megger				100MΩ or more at DC500V Megger		
Dielectric Withstand Voltage	No Abnormality at AC1000V for 1 min.				No Abnormality at AC1000V for 1 min.		
Ambient Temperature	-10 to +60°C				-10 to 60°C (Storage Temperature -20 to 80°C)		
Protective Structure	IEC Standard IP67, JIS C0920 (Watertight), Oil-Proof				IEC Standard IP67, JIS C0920 (Watertight), Oil-Proof		

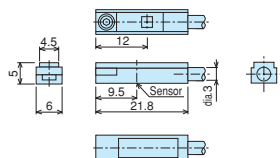
*Bend-Proof Sensor

Model Comparison

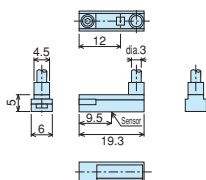
Specification	KONSEI Model	CKD Model	Specification	KONSEI Model	CKD Model
Oil-Proof, Non-Contact 3-Lead, and Straight	E40	T3YLH	Oil-Proof, Bend-Proof, Non-Contact, 2-Lead, and Straight	E45	T2YLHR
Oil-Proof, Non-Contact 3-Lead, and L-shape	E40L	T3YLV	Oil-Proof, Bend-Proof, Non-Contact, 2-Lead, and L-shape	E45L	T2YLVLR
Oil-Proof, Non-Contact 2-Lead, and Straight	E41	T2YLH			
Oil-Proof, Non-Contact 2-Lead, and L-shape	E41L	T2YLV			

Layout Drawing

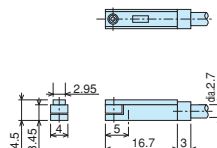
■ET3/ET2/ER3/ER2



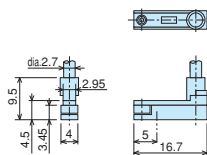
■ET3L/ET2L/ER3L/ER2L



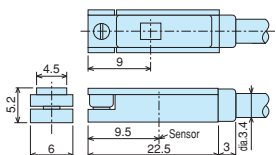
■E18/E19



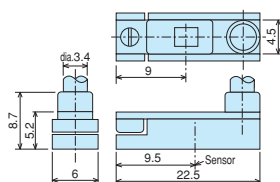
■E18L/E19L



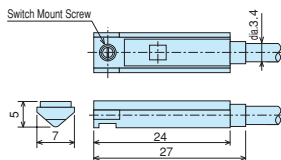
■E24/E25



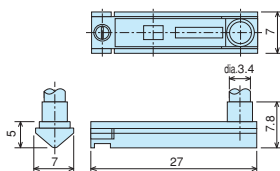
■E24L/E25L



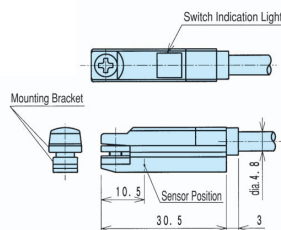
■E16/E17/E26/E27



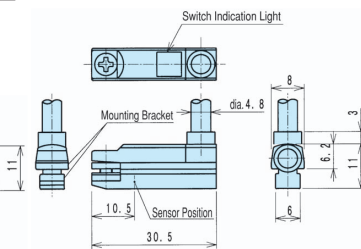
■E16L/E17L/E26L/E27L



■E40/E41/E45

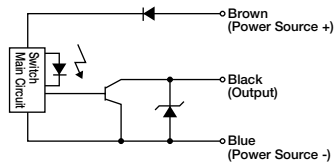


■E40L/E41L/E45L

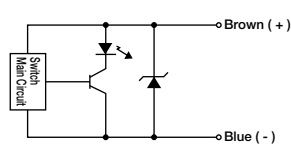


Internal Circuit

■ET3/ET3L/E16/E16L/E18/E18L ER3/ER3L/E40/E40L



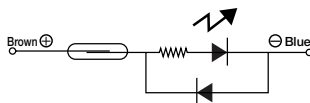
■ET2/ET2L/E17/E17L/E19/E19L ER2/ER2L/E41/E41L/E45/E45L



■E24/E24L/E26/E26L



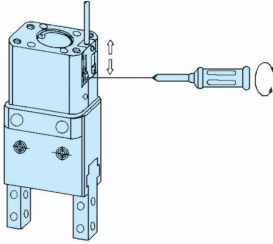
■E25/E25L/E27/E27L



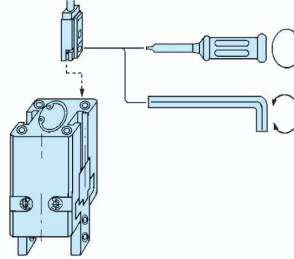
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Adjustment Method

■ ET3 / ET2 with bracket



■ ET3/ET2/E24/E25/E16/E17/ E18/E18L/E19/E19L/E26/E27



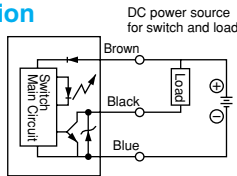
Connection

■ Non-contact Switch

(ET3/ET3L/ET2/ET2L/E16L/E17/E17L/E18/E18L/E19/E19L)

Lead-Wire Connection

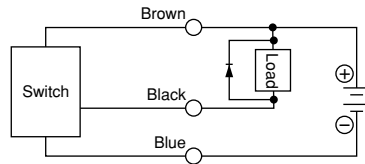
Please connect lead wires properly by color of the lead wire. Please make sure to turn off the power before connecting the wires.



Output Circuit Protection

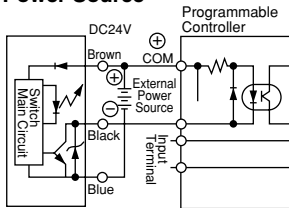
When inductive load (relay & solenoid valve) is connected for use, please make sure to prepare a protection circuit because surge voltage occurs when the switch is turned off.

Example when a surge absorber (diode) is combined with inductive load.

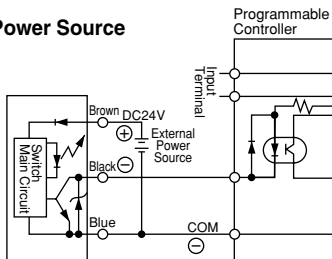


Example of connection with programmable controller

● External Power Source



● Internal Power Source

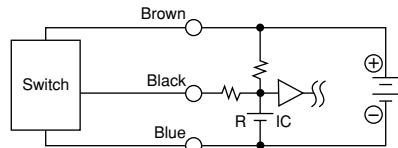


When capacitive load (condenser) is connected for use, please make sure to prepare a protection circuit because inrush current occurs when the switch is turned on.

Example when current limit resistance R is added to the capacitive load.

Please use resistance R (Ω) that meets the at least the following formula:

$$\frac{V}{0.10} = R (\Omega)$$

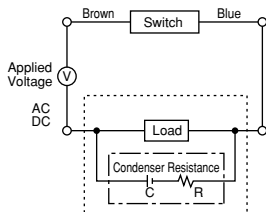


Contact Switch (E24/E24L/E25/E25L/E26/E26L/E27/E27L)

Lead-Wire Connection

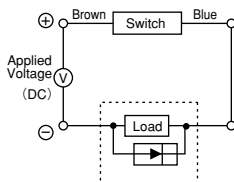
Please do not connect the lead-wires of the switch directly to power source. Please make sure to connect the load in a series.

● When condenser resistance is used



User Wiring
Protection Circuit (Spark-Quenching Circuit)
 Recommended Value C Condenser 0.1μ
 FR Resistance 1K Ω

● When diode is used

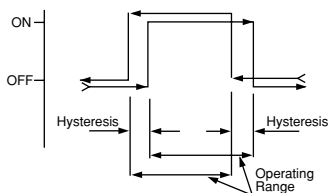


User Wiring
Protection Circuit
 General Rectifier Diode

When used for DC, please connect brown line on \oplus side and blue line on \ominus side. If connected reversely, the switch will operate, but the lamp will not light. When connected to AC relay and programmable controller input, and half-wave rectification is used in those circuits, the switch lamp may not light. In that case, the lamp will light if the polarity of the switch lead-wire is reversed.

***Do not use this product in places where a strong magnetic field or high current (large magnets, spot welding machines, etc.) is generated.**

Operating Range and Hysteresis



Operating Range

- The range from the position where the piston travels and the switch is turned on, to the position where the piston travels further in the same direction and the switch is turned off.
- The center of the operating range is the position at maximum sensitivity. If the piston stop position is set in this position, switch operation will be stable because less disturbance is received.

Hysteresis

- The distance from the position where the piston travels and the switch is turned on, to the position where the piston travels in the reverse direction and the switch is turned off.
- If the piston stops between these positions, switch operation will be unstable because more disturbance is received. Please be cautious.

***Wiring must be considered so that bending stress and tensile force will not be applied to lead wires. Please use bend-proof cables such as cables for robots in the moving part.**