

PRODUCT SPECIFICATION

48 Series General Purpose Limit Switches



Model Number Selection	48/1
Model Number Structure	48/2
Technical Data	48/3
Ordering Information	48/4
Specifications	48/5 - 48/10
Dimensions and Operating Properties	48/11

General Purpose Limit Switches



WERNER'S 48 series general purpose limit switches have a sturdy construction comparable to any limit switch. It uses a zinc die-cast body, a glass-weave reinforced plastic head, and a cover. The terminal cover also boasts excellent dust-proof and drip-proof capabilities.

Features Overview

- Sturdy construction comparable to any limit switch.
- Provides excellent dust-proof and drip-proof capabilities.
- Zinc die-cast body, glass-weave reinforced plastic head & cover.

Highlights

- Highly accurate position detection is possible in these limit switches.
- Options of various actuator heads available for almost all applications.
- Unique head structure provides a large over travel for smooth operation.
- Ideal in forming, light, printing machines & door closing sensor applications.

The terminals are open as far as flank, when cover is removed, as such no necessity to insert the fingers into the case for wiring up. Highly accurate position detection is possible in these limit switches. As contact detection is possible, the level of conducting fluids can also be controlled. The main unit and the cover are sealed with rubber packing, cord runner is doubly sealed by the cord vent. The actuator in all the models is sealed by a rubber cap and an O ring adding to the ingress protection.

Actuators available are Pin Plunger, Sealed Roller Plunger (Vertical & Horizontal), Plastic Rod (Pointed & Parallel), Roller Lever, Adjustable Roller Lever, Adjustable Rod Lever, Spring Wire, Coil Spring Wire and Adjustable Roller Lever with 50 mm Diameter rubber roller.

Model Number Selection

Appearance	Actuator	Model Number	
		Without Ground Terminal	With Ground Terminal
	Pin Plunger	48.11.00	48.11.11
	Sealed Roller Plunger (Horizontal)	48.15.00	48.15.11
	Sealed Roller Plunger (Vertical)	48.16.00	48.16.11
	Plastic Rod (Point)	48.17.00	48.17.11
	Roller Lever	48.18.00	48.18.11
	Adjustable Roller Lever	48.20.00	48.20.11
	Adjustable Rod Lever	48.21.00	48.21.11
	Spring Wire	48.22.00	48.22.11
	Coil Spring Wire	48.23.00	48.23.11
	Plastic Rod (Parallel)	48.24.00	48.24.11
	Adjustable Roller Lever with 50mm Ø rubber roller	48.25.00	48.25.11

Model Number Structure



48.22.00

Series

48 Series General Purpose Limit Switches

Ground Terminal

00	Without Ground Terminal
11	With Ground Terminal

Actuator

11	Pin Plunger
15	Sealed Roller Plunger (Horizontal)
16	Sealed Roller Plunger (Vertical)
17	Plastic Rod (Point)
18	Roller Lever
20	Adjustable Roller Lever
21	Adjustable Rod Lever
22	Spring Wire
23	Coil Spring Wire
24	Plastic Rod (Parallel)
25	Adjustable Roller Lever with 50mm Ø rubber roller

Technical Data

Economical, Miniature Limit Switch Boasting Rigid Construction

- Easy-to-wire conduit opening design.
- Cover, Box, and the Head mate with ridged surfaces to maintain strength.
- A unique Head structure provides a large OT for smooth operation
- Models with grounding terminals conform to the CE marking.
- Approved by CCC.
- Ideal for application in forming machines, light machines and printing machines.

Approvals

Approbations and Declaration of conformity

CE

CE

Ordering Information

Actuator		Without Ground Terminal	With Ground Terminal
Pin plunger		48.11.00	48.11.11
Sealed roller plunger (Horizontal)		48.15.00	48.15.11
Sealed roller plunger (Vertical)		48.16.00	48.16.11
Plastic rod (Point)		48.17.00	48.17.11
Roller lever		48.18.00	48.18.11
Adjustable Roller lever		48.20.00	48.20.11
Adjustable Rod lever		48.21.00	48.21.11
Spring Wire		48.22.00	48.22.11
Coil Spring Wire		48.23.00	48.23.11
Plastic rod (Parallel)		48.24.00	48.24.11
Adjustable Roller Lever with 50mm Ø rubber roller		48.25.00	48.25.11

Weight		Inrush Current	
Weight (approx).	290 g	NC	30 A max
		NO	20 A max

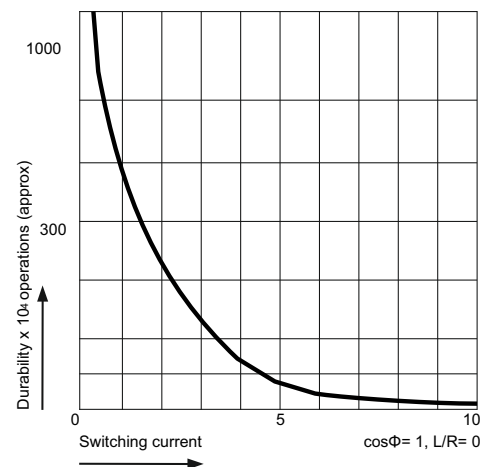
Contact Ratings				
Rated Voltage			AC	DC
			250V	30V
Load	Resistive Load	NO	5 A	3 A
		NC	5 A	3 A
Load	Inductive Load	NO	2 A	—
		NC	2 A	—

Note: Inductive loads have a power factor of 0.4 min (AC), and a time constant of 7.2 ms max (DC).

Specifications

Dielectric strength	1,500 VAC, 50/60 Hz for 1 min between terminals of the same polarity	
	2000 VAC, 50/60 Hz for 1 min between current-carrying metal parts and ground	
	2000 VAC, 50/60 Hz for 1 min between each terminal and non-current-carrying metal part	
Rated frequency		50/60 Hz
Vibration resistance	Malfunction	10 to 55 Hz, 1.5-mm double amplitude
Shock resistance	Destruction	1,500 m/s ² min.
	Malfunction	400 m/s ² min.
Ambient operating temperature		-20°C to +60°C (No Freezing)
Ambient operating humidity		35% to 95%RH
Durability	Mechanical	12,000,000 operations min. (under rated conditions)
	Electrical	150V - AC See the following <i>Electrical Durability</i> .
Operating speed		5 mm/s to 0.5 m/s
Operating frequency	Mechanical	125 operations/min
	Electrical	35 operations/min
Insulation resistance		100 MΩ min. (at 500 VDC)
Contact resistance		25 mΩ max.
Degree of protection		IP65

Engineering Data AC 240V

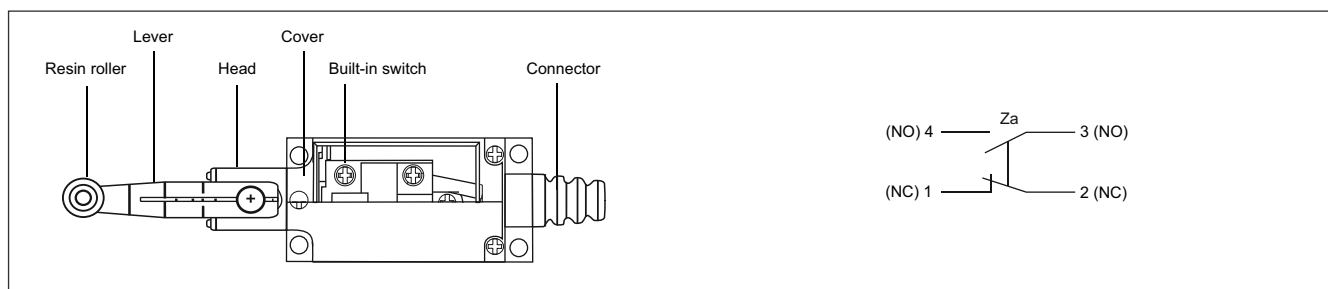


Electrical Durability

Operating temperature: -5°C to +60°C (No Freezing)
 Operating humidity: 40% to 70%RH
 Operating frequency: 30 operations/min

Structure

Contact Form



Operating properties	Abbrev	48.17.00	48.20.00	48.21.00	48.11.00	48.15.00
Release force	RF min.	1.28 N	0.98 N	0.98 N	1.47 N	1.47 N
Operating force	OF max.	1.47 N	7.35 N	7.35 N	8.83 N	8.83 N
Overtravel	OT min.	60°	60°	50°	4 mm	4 mm
Pretravel	PT max.	20°	20°	20°	20°	20°
Movement Differential	MD max.	20°	12°	12°	1 mm	1 mm
Operating position	OP	90±0.8mm	35±0.8mm	30±0.8 mm	30±0.8 mm	40±0.8 mm

Operating properties	Abbrev	48.16.00	48.18.00	48.23.00	48.22.00	48.24.00	48.25.00
Release force	RF min.	0.98 N	0.98 N	0.09 N	0.09 N	0.09 N	0.98 N
Operating force	OF max.	7.35 N	7.35 N	1.47 N	0.90 N	0.39 N	7.35 N
Overtravel	OT min.	60°	60°	60°	65°	60°	60°
Pretravel	PT max.	20°	20°	20°	15°	20°	20°
Movement Differential	MD max.	12°	12°	12°	12°	30°	12°
Operating position	OP	35±0.8mm	—	30±0.8mm	—	—	35±0.8mm

Note: 1. The above figures are initial values.

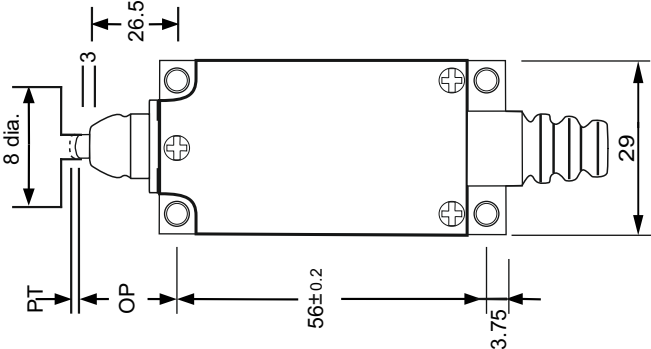
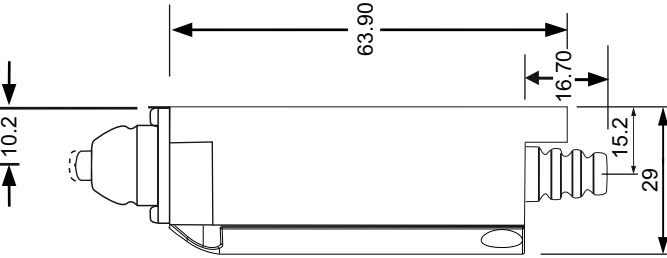
2. The characteristics may vary depending on the model. For further details, contact your **WERNER** sales representative.

Durability:

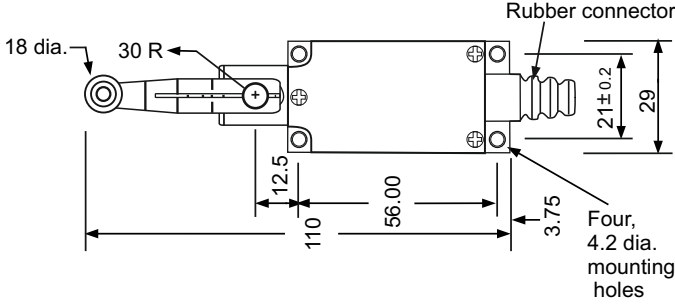
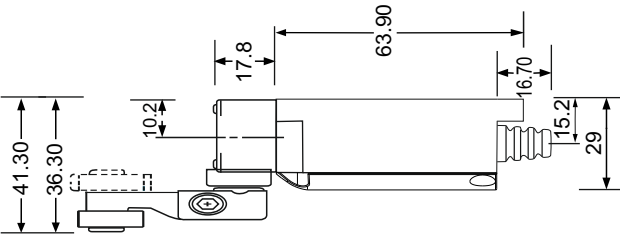
The values are calculated at an operating temperature of -5°C to +60°C, and an operating humidity of 40% to 70%RH. Contact your **WERNER** sales representative for more detailed information on other operating environments.

Dimensions and Operating Properties

Pin Plunger

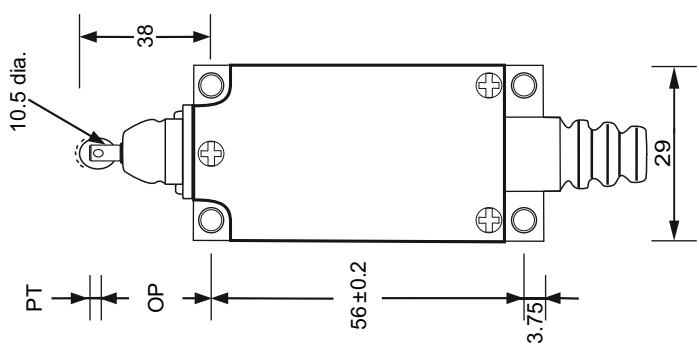
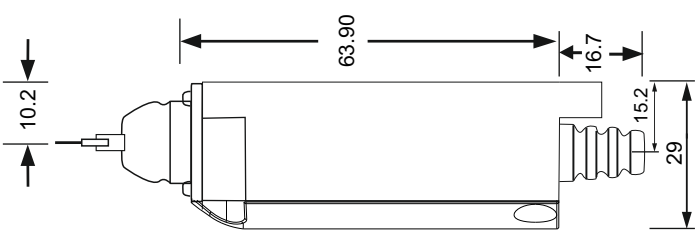
		Front Elevation 
Side Elevation 		
Actuator	Pin Plunger	
Without Ground	48.11.00	
With Ground	48.11.11	

Roller Lever

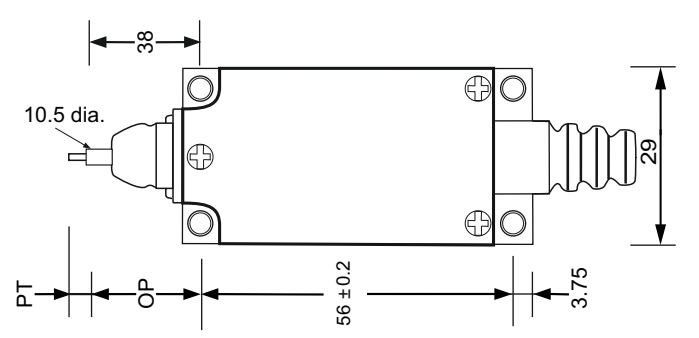
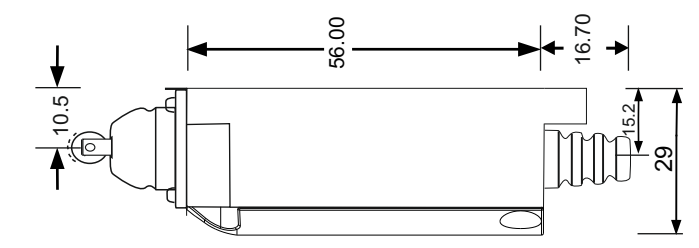
		Front Elevation 
Side Elevation 		
Actuator	Roller Lever	
Without Ground	48.18.00	
With Ground	48.18.11	

Dimensions and Operating Properties

Sealed Roller Plunger (Horizontal)

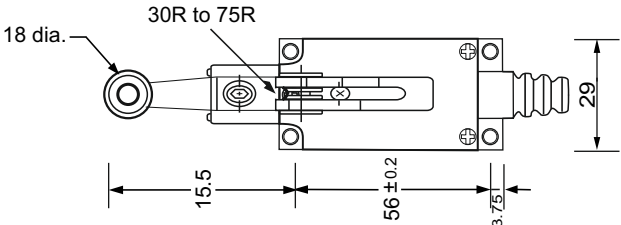
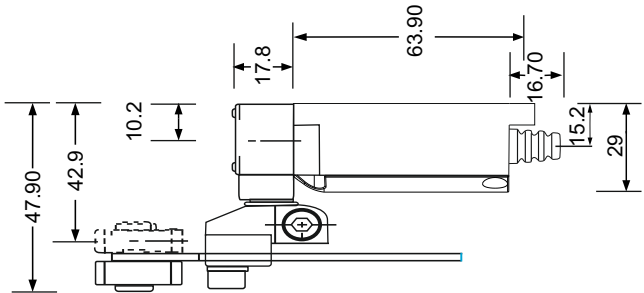
		Front Elevation	
		Side Elevation	
Actuator	Sealed Roller Plunger (Horizontal)		
Without Ground	48.15.00		
With Ground	48.15.11		

Sealed Roller Plunger (Vertical)

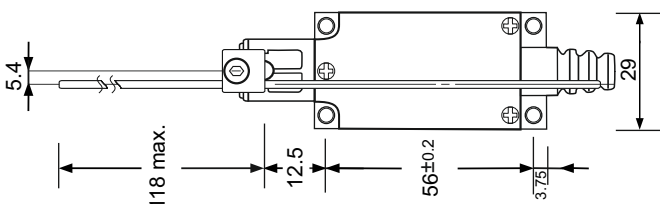
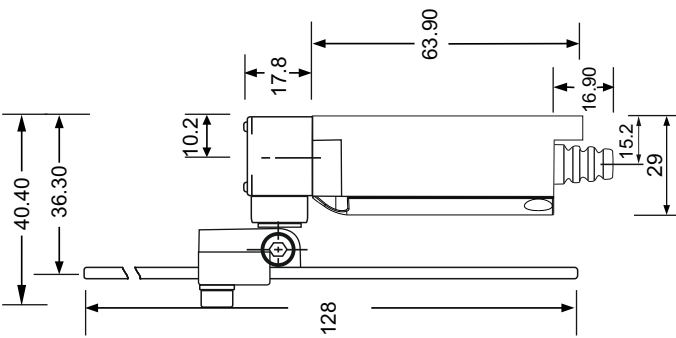
		Front Elevation	
		Side Elevation	
Actuator	Sealed Roller Plunger (Vertical)		
Without Ground	48.16.00		
With Ground	48.16.11		

Dimensions and Operating Properties

Adjustable Roller Lever

		Front Elevation 
Side Elevation 		
Actuator	Adjustable Roller lever	
Without Ground	48.20.00	
With Ground	48.20.11	

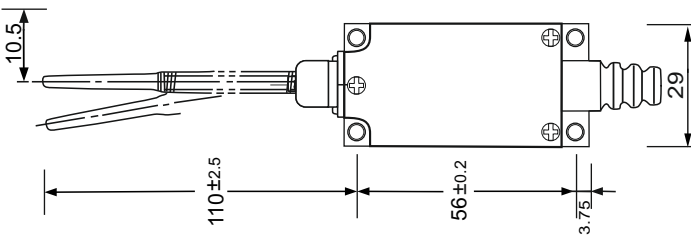
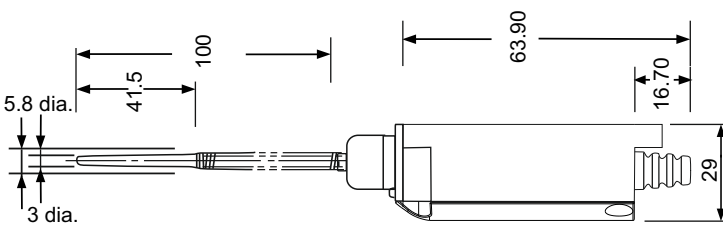
Adjustable Rod Lever

		Front Elevation 
Side Elevation 		
Actuator	Adjustable Rod	
Without Ground	48.21.00	
With Ground	48.21.11	

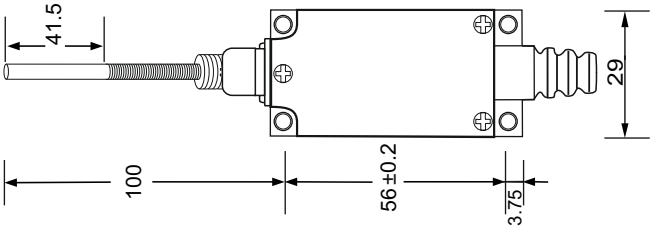
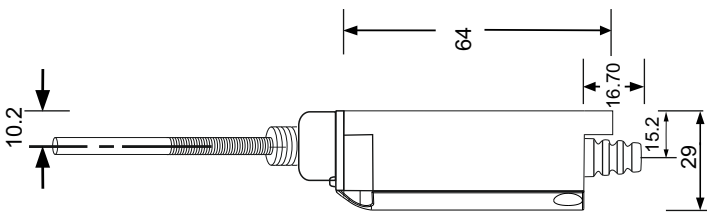
Dimensions and Operating Properties

Plastic Rod (Point)

			
Actuator	Plastic Rod (Point)		
Without Ground	48.17.00		
With Ground	48.17.11		

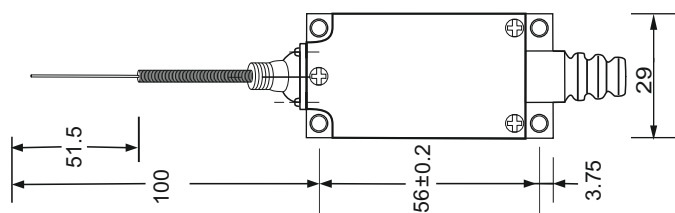
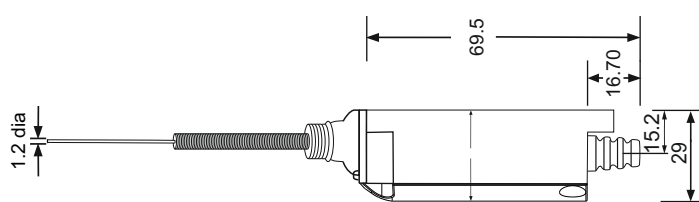
Front Elevation	
	

Plastic Rod (Parallel)

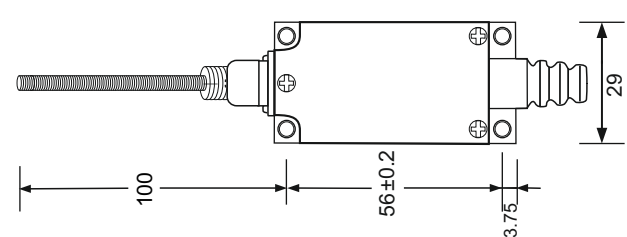
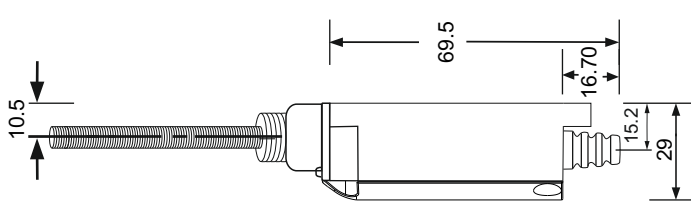
		Front Elevation	
		Side Elevation	
Actuator	Plastic Rod (Parallel)		
Without Ground	48.24.00		
With Ground	48.24.11		

Dimensions and Operating Properties

Spring Wire

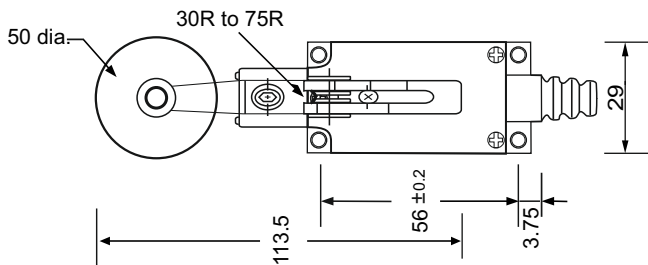
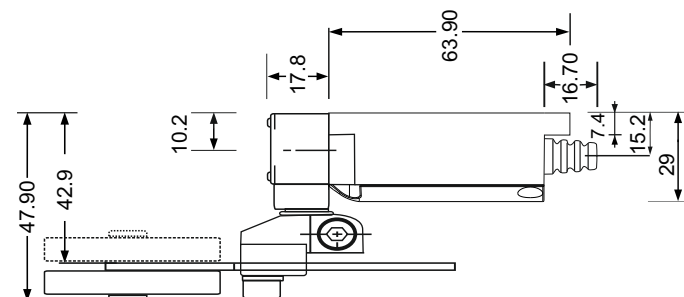
		Front Elevation	
		Side Elevation	
Actuator	Spring Wire		
Without Ground	48.22.00		
With Ground	48.22.11		

Coil Spring Wire

		Front Elevation	
			
Actuator	Coil Spring Wire		
Without Ground	48.23.00		
With Ground	48.23.11		

Dimensions and Operating Properties

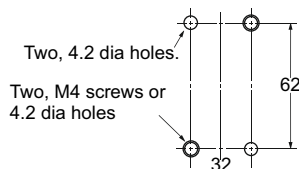
Adjustable Roller Lever with 50 mm Ø rubber roller

		Front Elevation 
Side Elevation 		
Actuator	Adjustable Roller Lever with 50 mm Ø rubber roller	
Without Ground	48.25.00	
With Ground	48.25.11	

Safety Precautions

Mounting

To mount the Limit Switch securely, be sure to use two M5 Allen head bolts and washers. The tightening torque applied to each bolt is 5.90 to 6.50 N·m. To mount the Limit Switch more securely, use two M4 screw holes on the rear panel and rear holes for positioning of WERNER's 48 Series General Purpose Limit Switch.



Actuator Position Change

(48.16.00, 48.20.00, 48.21.00)

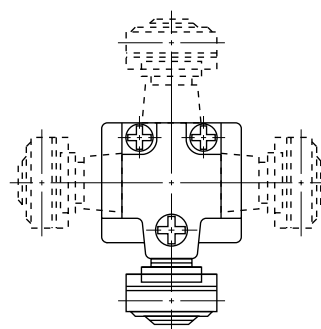
To change the angle of the actuator, loosen the Allen-head bolt on the side of the actuator lever. Then the actuator can be set at any angle.



Head Direction Change

(48.18.00, 48.20.00, 48.21.00)

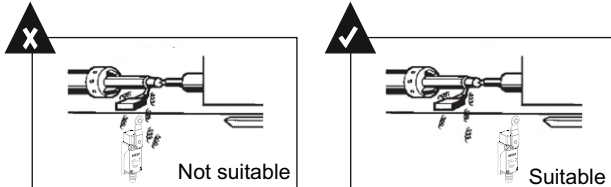
By removing one screw, Actuator heads can be rotated in any 90° directions as shown below.



Safety Precautions

Operating Instructions

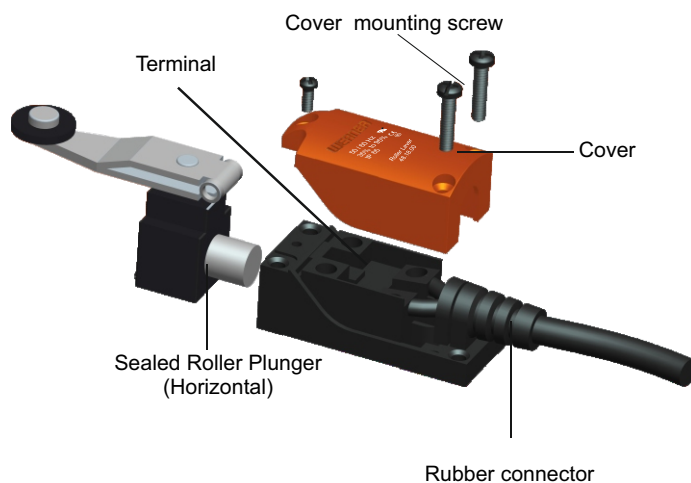
- Install Switches where they will not be directly subject to cutting chips, dust, or dirt. The Actuator and Switch must also be protected from the accumulation of cutting chips or sludge.



- If a Switch is used outdoor or where subject to special cutting oils or chemicals, Seal material may deteriorate. Appraise performance under actual application conditions and set suitable maintenance and replacement periods.
- 48 Series Limit Switches have physical contacts. Using them in environments containing silicon gas will result in the formation of silicon oxide (SiO_2). Contact interference can occur If silicon oxide accumulates on the contacts. If silicon oil, silicon filling agents or other silicon products are present near the Switch, suppress arcing with contact protective circuits or remove the source of silicon gas.

Wiring Procedure

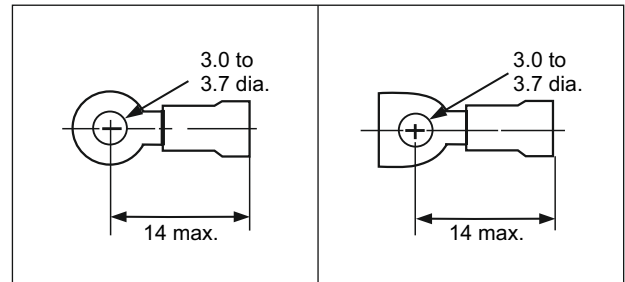
1. Using a phillips screwdriver, loosen the cover mounting screws and remove the cover
2. Remove the rubber connector from the box conduit and crimp a solderless terminal.
3. Insert the solderless terminal through rubber connector into the Switch and tighten the terminal screws properly.
4. Once wiring the Limit Switch, place the rubber connector into the groove of the box.
5. Tighten the three mounting screws according to the tightening torque table.



Applicable Solderless Terminal

The following solderless terminals are suitable. Prevent using fork or any other type of terminals or an accidental disconnection may result.

Terminal with insulated grip

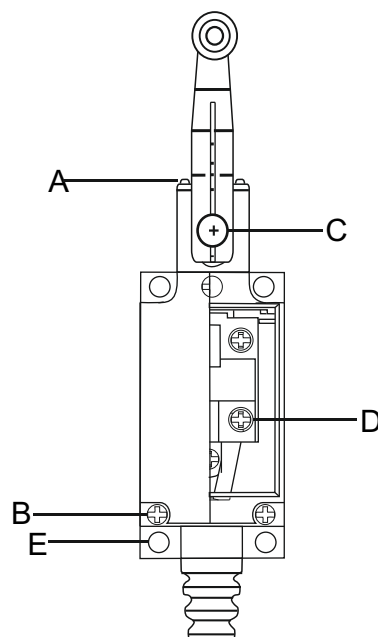


Tightening Torque

A loose screw may result in a malfunction. Below is the appropriate tightening torque for each screw.

	Type	Tightening torque
A	Head mounting screw	0.49 to 0.59 N·m
B	Cover mounting screw	0.49 to 0.59 N·m
C	Allen-head bolt	4.90 to 5.88 N·m
D	Terminal screw (M3 screw)	0.49 to 0.59 N·m
E	Switch mounting screw (M5 Allen-head bolt)	4.90 to 5.88 N·m

Note: Check the torque of each screw and each screw is tightened to the proper torque If the head direction has changed.



Terms And Conditions

Please read this catalog before purchasing any products. Please consult your *WERNER* representative for any clarifications or comments.

Application Considerations

WERNER shall not be responsible for conformity with any regulations, codes or standards that apply to use of the products. *WERNER* shall provide applicable third party certification documents identifying ratings and limitations of use that apply to the products in case of the customer's request.

Prevent use the products for an application involving risk to life or property. Be sure that the *WERNER*'s products are properly rated and installed for the overall system or equipment.

WERNER shall not be responsible for the user's programming of a programmable products.

Warranty

WERNER's warranty represents that the products are free from defects in materials and workmanship for a period of one year.

WERNER shall not be responsible for any special loss of profit, commercial loss, indirect or consequential damages relevant to products.

WERNER shall not be responsible for repair, warranty or any claims regarding the products unless *WERNER*'s Analysis conform that the products were properly stored, installed, handled, maintained and not a the results from accident, insufficient, abuse, misuse, natural disaster, improper installation excessive electrical supply, environmental conditions or abnormal mechanical.

Disclaimers

WERNER shall practice to change type/model numbers when published ratings or features are changed, however some specifications and international certifications of the products may be changed without any notice.

When in doubt, please consult with your *WERNER* representative to confirm actual specifications and approvals on the products.

WERNER shall change product specifications and accessories at any time based on improvements and other reasons.

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Inventing Innovation...

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