



PROXIMITY SWITCHES

INSTALLATION, OPERATION & MAINTENANCE MANUAL
FOR SERIES: **T18**

STYLES

324A, 324B, 324C,
324D, 324E, 324F



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PRODUCT QUICK SPECS.

Feature	Style					
	324A	324B	324C	324D	324E	324F
Output Function	N.O.	N.C.	N.O./N.C. Programmable	N.O.	N.C.	N.O./N.C. Programmable
Housing Material	Polybutylene Teraphthalate (PBT)	Polybutylene Teraphthalate (PBT)	PBT / Brass (Nickel-Plated)	Polybutylene Teraphthalate (PBT)	Polybutylene Teraphthalate (PBT)	PBT / Brass (Nickel-Plated)
Thread	M30x1.5			M18x1		
Connection	PVC Cable		1/2" Connector (PVC Cable)	PVC Cable		1/2" Connector (PVC Cable)
Output Status Indication LED	Yellow	Red		Yellow	Red	
Mounting	Non-Flush Mountable					
Electrical Design	AC/DC					
Current Rating (Continuous) (mA)	200; 250 (to 122°F)			150 AC/ 100 DC; 350AC (to 122°F)		200; 250 (to 122°F)
Current Peak (mA)	1.5A		2.2A	1.5A		2.2A
Switching Frequency	25 AC / 40DC		25 AC / 50 DC			
Operating Voltage	20-250 AC/DC					
Operating Distance (mm)	0-12.1			0-6.5		
Voltage Drop (V)	<10 AC / <8 DC			<6		
Minimum Load Current (mA)	5			4		
Leakage Current	2.5 (250VAC) / <1.7 (110VAC) / <1.5 (24VDC)					2.0 (250VAC) <1.5 (110VAC) <0.8 (24VDC)
Sensing Range (mm)	15, Adjustable (3 - 15 mm)			8, Adjustable (2.5 - 8 mm)		
Real Sensing Range (mm)	15 ±10%			8 ±10%		
Switch - Point Drift (% to Sr)	-15 to 15					
Hysteresis (% to Sr)	1 to 15					
Temperature Range	-13°F to 158°F		-4°F to 158°F	-13°F to 158°F		-4°F to 158°F

I. INTRODUCTION

This manual is a guide for the personnel installing, operating, and maintaining these items. It is imperative that instructions are read and understood thoroughly before attempting any installation, operation and maintenance. Failure to follow any of these instructions could result in a malfunction or failure of the gauge valves, resulting in leakage, property damage, and/or physical injury to personnel.

These proximity switches detect metals, almost all plastics, glass, ceramics, wood, paper, oils, greases, water and all hydrous materials without contact and indicates their presence by providing a switched signal.

While in use the products are exposed to influences which may have an effect on function, life quality and reliability of the product.

It is the customer's responsibility to ensure that the products are suitable for the intended application. This applies in particular to applications in hazardous areas and with adverse environmental influence such as pressure, chemicals, temperature fluctuations, moisture and radiation as well as mechanical stress, especially if the products are not installed properly.

⚠ DANGER

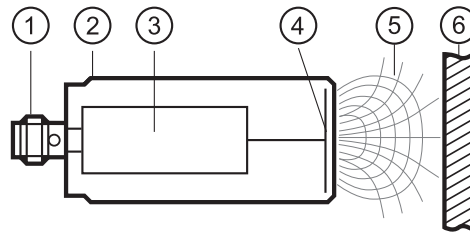
Using the products in applications where safety of people depends on the function of the product is not permitted. If the instructions are not adhered to, death or severe injury may occur.

Operating Principle

The active electrode of the sensor builds up a capacitance in relation to the environment. The capacitance depends on the distance, the size and the material properties (dielectric constant) of the environment.

A change in the external capacitance is evaluated and leads to a switching signal.

The sensor can detect liquid, solid, conductive and non-conductive media.

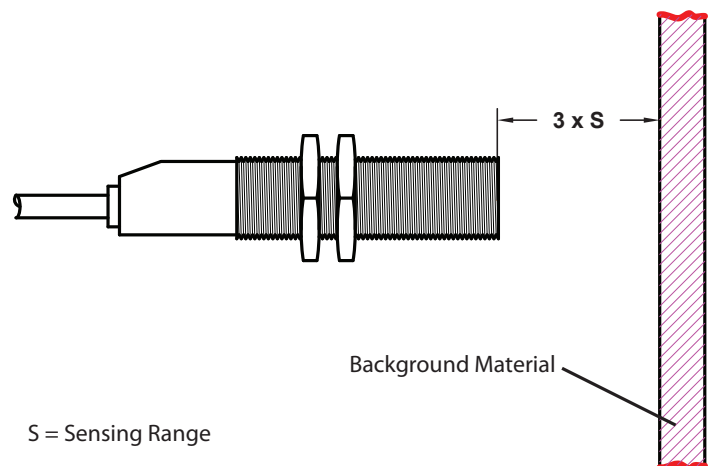
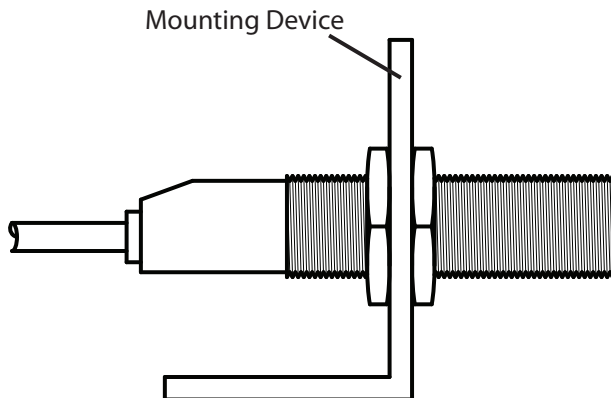


- ① connection
- ② housing
- ③ evaluation electronics
- ④ electrode system
- ⑤ alternating electric field = active zone
- ⑥ target (environment) conductive or non conductive

II. INSTALLATION

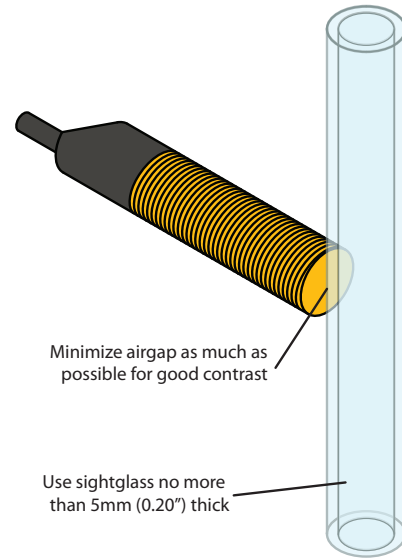
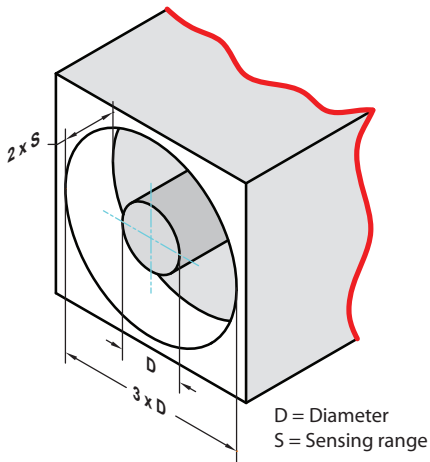
Mounting

Mount by the means of a mounting device. Secure by the nuts provided so that it cannot work loose.

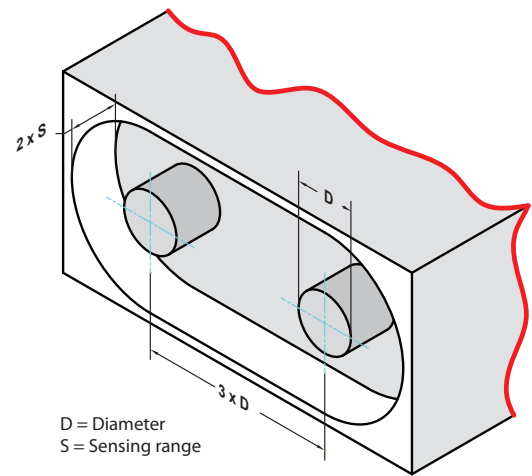
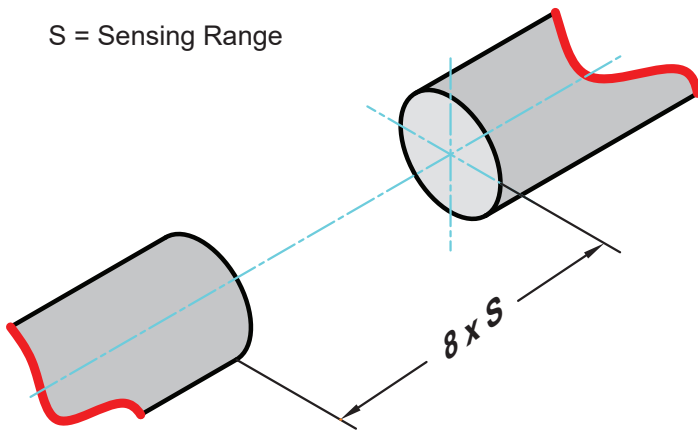


S = Sensing Range

Observe open space around sensing face:



Minimum distance between several switches of the same type:



Wiring

Before proceeding please disconnect power.

CAUTION

The unit must be connected by a qualified electrician. The national and international regulations for the installation of electrical equipment must be adhered to.

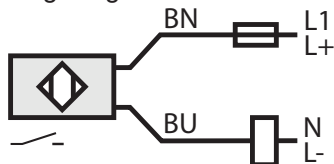
Recommendations:

- Use a miniature fuse according to the technical data sheet, if specified.
- Check the safe functioning of the unit after a short circuit.

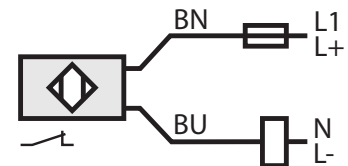
Core colors:

- BN** = Brown
- BU** = Blue
- BK** = Black
- WH** = White

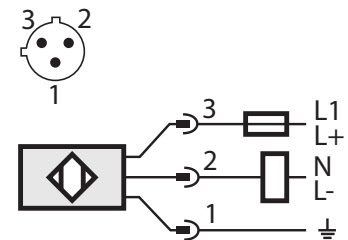
Wiring Diagram for 324A & 324D



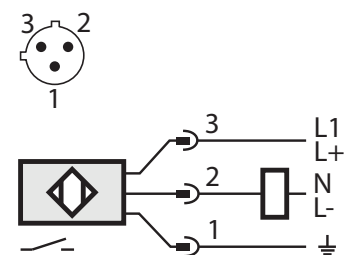
Wiring Diagram for 324B & 324E



Wiring Diagram for 324C



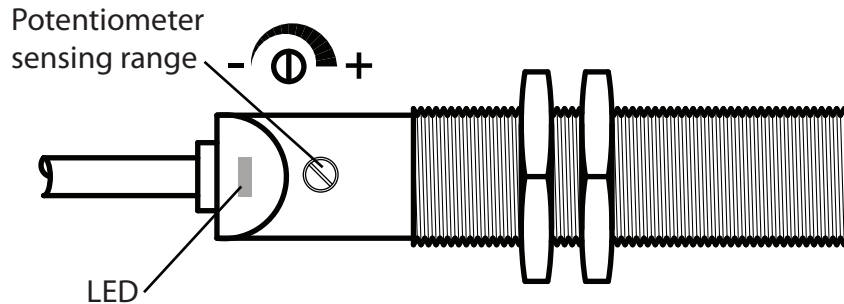
Wiring Diagram for 324F



III. OPERATING

Adjustment

All capacitive switches have a potentiometer which allows switch sensitivity to be adjusted for the best results. To establish the proper sensitivity for a particular set of target conditions, follow these procedures.



Normally Open Sensor

1. Mount the switch in the application. Set up the worst case conditions which can cause a false "ON" signal. As an example, assume the switch is being used to sense the level of a liquid through a sight glass. The worst case condition exists when moisture is present on the inside surface of the glass. Turn the potentiometer clockwise until the LED is **ON**, then turn the potentiometer counterclockwise until it just turns **OFF**.
2. Bring the target into position. In the example, bring the water above the level of the switch. The LED should be **ON**. Turn the potentiometer counterclockwise and count the number of turns until the LED turns **OFF**.
3. Turn the potentiometer clockwise for 1/2 the number of turns counted in step 2. For example, if it took 4 turns counterclockwise to have the LED go **OFF**, now turn the potentiometer to 2 turns clockwise. The switch will now be set.

Normally Closed Sensor

1. Mount the switch in the application. Set up the worst case conditions which can cause a false "OFF" signal. As an example, assume the switch is being used to sense the level of a liquid through a sight glass. The worst case condition exists when moisture is present on the inside surface of the glass. Turn the potentiometer clockwise until the LED is **OFF**, then turn the potentiometer counterclockwise until it just turns **ON**.
2. Bring the target into position. In the example, bring the water above the level of the switch. The LED should be **OFF**. Turn the potentiometer counterclockwise and count the number of turns until the LED turns **ON**.
3. Turn the potentiometer clockwise for 1/2 the number of turns counted in step 2. For example, if it took 4 turns counterclockwise to have the LED go **ON**, now turn the potentiometer to 2 turns clockwise. The switch will now be set.

IV. MAINTENANCE

The operation of these units is maintenance-free. To ensure a correct function, keep the sensing face and a clear space, if any, free from deposits and foreign bodies.

It is not possible to repair these units.

LIMITED WARRANTY

Period of Coverage

The John C. Ernst LLC. expressly warrants products to the original purchaser to be free from defects in the material and workmanship for 12 months from date of shipment. John C. Ernst LLC. will, at its option, replace or repair any products which fail during the warranty period due to defective material or workmanship. Evaluations, repairs, and replacements will most often occur in Sparta NJ 07871 USA, or another facility determined by the John C. Ernst LLC.. The warranty does not cover costs required to transport warranted units to or from the John C. Ernst facility.

Limitations

The responsibility of the John C. Ernst LLC. is hereunder limited to repairing or replacing the product at its expense. This warranty shall not apply if the product has been disassembled, tampered with, repaired, subjected to misuse, neglect, accident, or otherwise altered in any way. The warranty does not guarantee products against normal wear, glass breakage, clouding, or corrosion. The John C. Ernst LLC. shall not be liable for loss, shipping costs, damage, or expenses related directly or indirectly to the installation or use of its products. It is expressly understood that the John C. Ernst LLC. is not responsible for damage or injury caused to other products, buildings, personnel, citizens, or property by reason of the installation or use of its products.

Advertised ratings apply only to units serviced with parts supplied by the John C. Ernst LLC. Service must be done in accordance with the instructions of the product that is being serviced.

THIS IS JOHN C. ERNST, LLC'S. SOLE WARRANTY AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. WE WILL NOT BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY NATURE.

How to get Warranty Service

Prior to submitting any claim for warranty service, the owner must submit proof of purchase, and obtain written authorization to return the product. All returns must be sent back with an MSDS for the application that the product was used in, and with a maintenance log of all service including inspections. Thereafter, the product shall be returned to the John C. Ernst LLC. with freight paid and packaged to prevent damage in transit. Should damage in transit occur the John C. Ernst LLC. will not be held liable.

GENERAL PRESERVATION

Recommended Practice for Long Term Storage of John C. Ernst Products

1. All units should be inspected upon receipt to ensure that no damage has been incurred during transit. If there has been damage, a claim should be filed with the carrier immediately. Units should be stored in an area protected from the elements and corrosive fumes, in a secure manner where they can neither fall nor be struck by other objects. Care should be taken to protect the glass and the end connections from damage. Avoid placing any objects directly on the glass(es) at any time.
2. Units should be checked to ensure that they contain no foreign matter and that the end connections are clean, undamaged, and in line with adjoining piping. Examine each glass carefully using a flashlight for any indications of chips, scratches, blemishes or cloudiness. Inspect for scratches, shining a bright concentrated light (powerful flashlight will suffice) at about a 45° angle. Any scratch that glistens and catches a fingernail, or star or crescent-shaped mark that glistens, is cause for replacement. Process surface that appears cloudy or roughened, after cleaning, is evidence of chemical attack and is cause for replacement. If any type of flaw is apparent, the unit should not be installed until the glass and gaskets have been replaced. Follow the torquing recommendations given by the gasket and piping manufacturers to achieve proper sealing pressures.
3. Some products are shipped unassembled, as they are to be welded into position and then assembled. Individual pieces should be carefully stored in a manner to avoid damage until installation. The glass requires special attention. It should not be stored or mixed with objects that may cause damage and should remain wrapped or boxed until assembly.
4. Gaskets frequently assume a compression-set over a period of time. Some materials, however, may compress/relieve or creep. Visually inspect the gaskets for gaps or looseness before start-up. If the gaskets are not compressed, adjust the unit gasket compression. Do not tighten any fasteners or clamps while the unit is in operation.
5. Periodic visual inspection should be made to ensure that no leaks are evident and that there is no clouding, scratching, or blemishing of the glass. Keep glasses clean using commercial glass cleaners. Cleaning should be done without removing glass. This may require recirculation of cleaning material if process side of glass is not accessible. Never use harsh abrasives, wire brushes, metal scrapers, or anything that may scratch the glass. Do not attempt to clean glasses while equipment is in operation.
6. Should leaking around the glass occur, first check the glass for damage. If the glass appears to be in good condition, the gasket seal should be checked, but only after the system pressure has been brought down to zero. If the gasket appears to be loose, or hardly compressed, the spacers must be adjusted. If the leak persists after repressurizing, disassemble and replace the gaskets.
7. Glass, shields and gaskets that have been removed, **MUST BE REPLACED**. Used parts may contain hidden damage. Induced stress in glass and de-tempering are **NOT** visible to the naked eye. Be sure that the replacement glass is proper for the service.
8. Inspect protective coating (if applied) for chipping.
9. Store within the temperature extremes of the nameplate or specification documents – do not expose to direct sunlight or other UV sources.
10. Products should be stored off of the floor on suitable skids, pallets, or racks and protected from dirt, debris, and exposure to direct sunlight, particularly to soft sealing surfaces.
11. Store in a cool dry place, room temperatures between 40°F - 80°F with a relative humidity level between 40 – 75%.
12. Store in dry areas, avoiding any contamination with any liquids. Products should be kept in a clean, heated, weather-tight (dry), well ventilated facility.
13. If a flanged product is to be stored for any extended period of time, the flange or end protector should be examined to ensure they are fastened securely, and any other open areas should be sealed to prevent any moisture damage.
14. Product assemblies with electrical components, pneumatic tubing, positioners, actuators, and other accessories should be protected from impact.
15. Useful Life When Stored:
 - a. Unit: Indefinite, based on ideal storage conditions.
 - b. Spare Gaskets: Indefinite, based on ideal storage conditions.
 - c. After 9 months, the torque of the bolting should be checked as the gasket relaxes. This should be done for units not in service as well as those installed in process.
 - d. The useful life of the material, when the storage conditions differ from the recommended factors is not known. It has been established, however, that room temperature has a significant influence on the shelf life of material.
 - e. Spare Gaskets should be stored flat.
16. Periodical checks at least every 6 months have to be carried out in the storage area to verify that the above mentioned conditions are maintained.

If there are any questions or concerns, please contact the John C. Ernst LLC. Sales Office at 888-943-5000.

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