

Installation Notes:

- Refrain from excessive force twisting, bending or torquing the sensor. 50 in/lbs. maximum.

- Recommend non-ferrous mounting brackets, nuts, washers, lock washers, clamps, etc.

- Minimize stress at installation from weight of connected cables, conduit, connectors.

- In vibration environments lock washers are recommended for securing the sensor.

Specifications:

SPDT, Single Pole Double Throw

Sensing Distance: 0.150 inch to standard target
1.000 inch to actuator magnet

Differential: Typical: .200 inch
Thread Options: 5/8-18 UNF; M18 X 1.0

Thread Engagement: Minimum Thread Engagement is 7 turns

Response Time: 4.2 milliseconds

Temperature Rating: -50 to +105 degrees C

Contact Material: Pure Tungsten sealed in vacuum

Contact Arrangement: Dry Contact, Single Pole Double Throw, Form C Switch

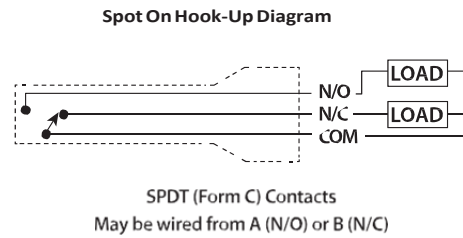
Wiring Diagram

Black Common
Red Normally Closed
Blue/White Normally Open
Green Ground

Electrical Ratings, resistive load
3 Amp @ 120 VAC, 2 Amp @ 240 VAC, 2 Amp @ 24 VDC.
Consult factory for performance data at these loads or a specific electrical load.

Target Material: Ferrous Metal or Magnet
Conduit Connection: 1/2 inch -14 NPT at cable exit on specific models

Sensor Housing Material: Stainless Steel, 316 or 304.



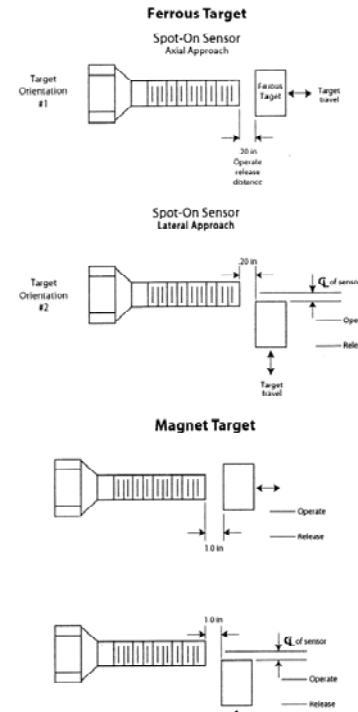
Optimum Performance Set-Up:

Spot On sensors feature a unique and patent pending dual magnet design. There are no internal moving magnets, rather a balanced magnetic field with an internal powerful reed switch. The two magnets create a balanced magnetic field with the reed switch positioned in the center balance. When the target approaches the sensing side, the balance is disturbed and the reed switch normally closed contact breaks and normally open contact makes. When the target is withdrawn the balance returns and the internal reed switch goes inactive and returns to its original position.

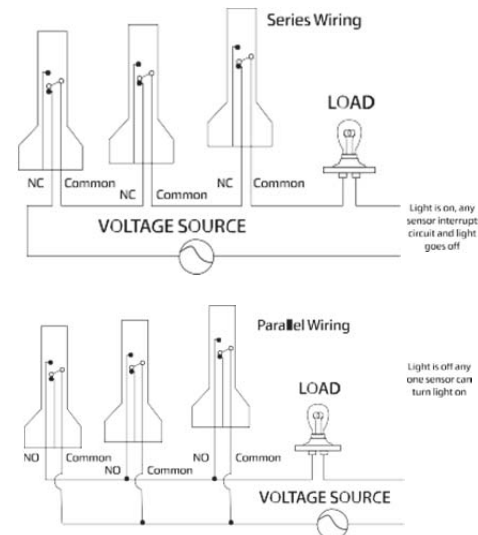
The sensing distance is the recommended operational space between the sensor and HSI standard target. The sensors will typically trigger before the exact operate point is reached. It is recommended the target move closer than the exact operate point to increase the contact pressure for switch cycle longevity. Remove the target beyond the exact point the sensor deactivates to allow sufficient contact pressure to the original normally closed contact.

The operate point and release points are nominal and can vary slightly depending on the actuating target (variations in iron content) or actuating magnet (depends on the strength). Target approach and withdrawal will also affect the operate point and release point. The illustrations to the right show axial approach and lateral approach. Ferrous targets will have a closer differential than magnetic targets. Magnetic targets will allow for greater separation between the sensor and the target.

After installation the sensor will operate consistently, with no internal moving components. The sensor will perform consistently for its entire life. Reed switches are known for extremely long life cycles because the contacts are sealed in an inert atmosphere. These contacts pass the voltage signal with virtually no voltage drop, while exceeding 1000 mega-ohm open circuit resistance.



Contacts can be wired in parallel or in series. Open contacts will not leak any electrical current (as is the case with solid state proximity sensors).



Spot On Sensors Installation and Owner's Manual

PRX+14000 Series
QA-660 Rev B



HSI SENSING
SPOT ON
HERMETIC SWITCH INC

HSI SENSING CONDITIONS OF SALE

1. **PRICES**-All prices are based on anticipated continuous production and shipment as scheduled. Changes in the shipment schedule made by Buyer will result in products being invoiced at the price in effect at the time of shipment. Prices are for products of the design and material listed in the specifications.

2. **TERMS OF PAYMENT**-All orders are subject to approval of the credit department and full or partial payment may be required in advance. All invoices are due within thirty (30) days of shipping date. Payments are to be in U.S. dollars and made to HSI Sensing, 3100 Norge Road, Chickasha, OK 73018.

3. **PAST DUE PAYMENTS**-Unpaid invoices are past due and in default when not paid as provided in paragraph 2. A late charge of the less of 1-1/2% per month or the maximum allowed interest will be imposed on past due amounts. When any invoice becomes sixty (60) days old, legal or other appropriate action will be taken to collect the entire account balance. The customer agrees company will indemnify HSI Sensing for all expenses incurred in connection with collection of past due amounts.

4. **TAXES**-Sales are considered to be taxable, unless otherwise specifically exempt. Tax will be added to all invoices unless an Exemption Certificate, acceptable to the appropriate tax authority, is in the possession of HSI Sensing, prior to delivery. Purchaser shall reimburse HSI Sensing, prior to delivery. Purchaser shall reimburse HSI Sensing, for any sales, use occupation, excise or similar tax that may be imposed upon HSI Sensing, for any reason, arising out of or in connection with its sales to Purchaser.

5. **CANCELLATION**-No order may be cancelled except upon written agreement with HSI Sensing, and upon payment by Purchaser of all costs arising in connection with the order.

6. **FREIGHT**-Pricing for this order is FOB Chickasha, Oklahoma. Shipping charges will be prepaid by shipper and charged to Purchaser's invoice.

7. **MATERIAL DAMAGED IN TRANSIT**-Purchaser shall inspect shipments upon receipt from common carriers and in the event of damage or loss shall promptly file a claim against the carrier. If the customer is in urgent need of replacements for damaged or lost material, he should give HSI Sensing a new order marked as follows: "For replacement of material damaged in transit." Purchaser shall pay the invoice for such replacements and request a duplicate receipt to facilitate filing the claim against the carrier.

8. **RETURN OF NEW MATERIAL**-No material shall be returned without written authorization and shipping instructions first having been obtained from HSI Sensing. Permission to return an item is in the sole discretion of HSI Sensing and may be exercised arbitrarily. Any item for which permission is granted to return the item must be returned freight prepaid and will be subject to a 20% re-stocking charge, \$50 minimum. The return ticket must show the invoice number and date on which each item was purchased.

MATERIAL RETURNED WITHOUT WRITTEN AUTHORIZATION WILL NOT BE ACCEPTED.

9. **LIMITED WARRANTY AND LIABILITY**-HSI Sensing ("HSI") hereby expressly warrants its products to be free from defects in material and workmanship under normal use for a period of 30 days from the date of sale to Purchaser. This warranty extends to the original Purchaser only. This limited warranty does not cover damage caused by accident, unreasonable use or modifications.

HSI's sole obligation under this limited warranty and the purchaser's exclusive remedy is limited to the repair or replacement, without charge, FOB shipping point of any defective products or parts of products (excluding any labor or installation) which HSI, after inspection, has determined to be defective; provided that (1) Purchaser immediately notifies HSI in writing upon the discovery of any claimed defect and (2) the product is returned, freight prepaid to HSI, FOB shipping point. Purchaser must contact HSI within the warranty period to obtain warranty service and provide documentation

of the installation and use of the product in strict compliance with HSI's recommended practices and guidelines. HSI is not responsible for costs incurred in repairing or replacing defective products without HSI warranty service authorization.

HSI EXCLUDES LIABILITY, WHETHER BASED ON CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR ANY DAMAGE TO PURCHASER'S OR OTHER END USER'S EQUIPMENT OR ANY PUNITIVE, SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, OR FAILURE OF THE PRODUCTS, EVEN IF HSI HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THIS DISCLAIMER OF LIABILITY SHALL NOT BE AFFECTED EVEN IF ANY REMEDY PROVIDED HEREIN FAILS ITS ESSENTIAL PURPOSE.

Purchaser shall indemnify and hold HSI harmless from and against all claims of loss or damage other than the cost of repair or replacement of its products or parts of products, as described above. Purchaser acknowledges and agrees that the above warranty is in addition to and not in replacement of any warranty provided by the original manufacturer of any components used by HSI in manufacturing the products sold to Purchaser. HSI assumes no liability for warranties granted by the original manufacturer.

HSI MAKES NO EXPRESS OR IMPLIED WARRANTIES OTHER THAN AS SPECIFICALLY SET OUT IN THIS SECTION. EXCEPT FOR THE EXPRESS LIMITED WARRANTY SET FORTH IN THIS SECTION, ALL PRODUCTS ARE SOLD "AS IS" "WITH ALL FAULTS" AND THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, COMPLIANCE WITH DESCRIPTION AND NON-INFRINGEMENT IN CONNECTION WITH ANY SALE.

Purchaser acknowledges and agrees that it must perform adequate engineering and quality control to assure that the product is suitable for Purchaser's application. HSI shall not be responsible or liable to Purchaser, any third party or end user, or for design assembly or end use of Purchaser's product. Upon accepting the product from HSI, Purchaser assumes full responsibility for use of and care of the product.

No statement, agreement, representation, promise or understanding, oral or written, made by HSI or its agent, representative or employee, that is not contained in these terms and conditions will be recognized or enforceable or binding upon HSI. PURCHASER AGREES THERE ARE NO UNDERSTANDINGS OR UNDERTAKINGS OF ANY KIND WITH RESPECT TO THE PRODUCTS OR ANY PART THEREOF NOT EXPRESSLY SET FORTH AND CONTAINED IN THESE TERMS AND CONDITIONS.

If any provision of this Section is held to be illegal or unenforceable by any court or competent jurisdiction, the remaining provisions shall remain effective. Some states or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers or the limitation of liability for personal injury, so the limitations and exclusions above may be limited in their applications to Purchaser. When the implied warranties cannot be excluded in their entirety, they will be limited to the duration of the written warranty. This warranty gives Purchaser specific legal rights that may vary depending upon local law.

Any action for breach of this the limited warranty contained in this Section must be commenced within one (1) year after the product is delivered to Purchaser.

10. **PERFORMANCE**-HSI Sensing will not be responsible for any delay or failure in performance caused by circumstances beyond the reasonable control of HSI Sensing and affecting them or others, including but not limited to the following: acts of God, riots, embargoes, strikes or other concerted acts of workmen, casualties or

accidents, delays in transportation, shortage of power, fuel, labor or materials.

11. **PATENTS**-Purchaser shall hold HSI Sensing harmless from and release and not make claim or suit against HSI Sensing, Inc. because of any suits, claims, losses or other liability made against or suffered by Purchaser arising from any claim of or infringement of patent copyright, trademark or other proprietary right, at common law or claim of unfair trade or of unfair competition, resulting from or occasioned by Buyer's use, possession, sale or delivery of the merchandise sold to Buyer by Seller.

12. **PURCHASE ORDER**-If this quotation is accepted and Purchaser's order form is used for the purpose, it is expressly agreed that the terms and conditions set forth in this HSI Sensing Order Acknowledgment Sale Agreement shall prevail insofar as the same may in any way conflict with the terms and conditions set forth in Purchaser's order form or other Purchaser documents. The issuance of such order by Purchaser shall be deemed to denote Purchaser's assent to the foregoing.

13. **CHOICE OF LAW**-This order shall be construed and interpreted according to the law of the State of Oklahoma, provided however, that is a Government Prime Contract number appears on the face of this Order or if the face of this Order otherwise indicates that this Order is placed under a Government Contract and the law of the State of Oklahoma is not dispositive, the federal common law of government contract shall govern as said law is enunciated and applied by federal judicial bodies, boards of contract appeals and quasi-judicial agencies of the federal government.



For PRX-14XXX Models, the following statements apply:

- This equipment is suitable for use in Class I, Division I, Groups A, B, C, & D, Class II, Division I, Groups E, F, & G and Class III, Division I, Hazardous Locations.
- This equipment has been approved with an Operating Temperature Code of T4.
- **Warning-Explosion Hazard**- Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- **CAUTION**- To reduce the risk of ignition of hazardous atmospheres, disconnect sensor from the supply circuit before moving.
- "GARDER LE COUVERCLE BIEN FERMÉ TANT QUE LES CIRCUITS SONT SOUS TENSION"
- **FACTORY SEALED**



Installation & Owner's Manual

HSI Engineers welcome the opportunity to provide technical assistance on Spot On products. However, suitability of the product in the application is the customer's responsibility. Compliance to regional electrical codes and regulations is also the customer's responsibility.

Introduction

Spot On sensors operate on the principle of magnetic influence, activated by either ferrous metal targets or actual magnetic material as they approach the sensor and enter the sensing range. The sensing range is different for magnetic material versus only ferrous materials. The functional operating points are referenced to our 'standard' targets, identified in the document.

Spot On sensors can be installed near ferrous materials or components but these may affect the operation, research in these applications should be checked for operational influence. For optimum performance, avoid ferrous components such as bolts, brackets, screws in the immediate mounting area.

Spot On sensors can also be affected by components or devices that emit a magnetic field (such as sensors, magnetic holding clamps, etc.). Research in these applications should be checked for operational influence. For optimum performance, avoid components with internal magnets.

Installation

Spot On sensors sense ferrous metals such as 1018 steel, 400 series, 17/4 steel. The iron content of the metal will determine the operate and release distance. HSI standard target is 1" x 3" by 1/16" thick – 1018 cold rolled steel.

We recommend the target does not make physical contact with the sensor, it just enters the sensing range, which will vary depending on the material and mass. Magnet Targets, some available from HSI, will greatly increase the sensing range of the Spot On sensor. Polarity of the magnet is important to achieve this extended operating distance.

Optimum performance of the sensor is achieved by having a target of sufficient mass and moving it fully into the operating range and full withdrawal away from sensor. Contact pressure is related to target travel beyond the exact trip point.

For high amperage, inductive or capacitive loads contact protection devices are recommended. In applications where signals travel over long distances intermediate relays or signal devices are recommended. Consult factory for assistance in applications.