



CPS9D Series Cylinder Position Switches

NITRA CPS9D Series cylinder position switches are general purpose switches for use with cylinders having a magnetic piston. The switches are designed to mount on cylinders with 1/4 inch 60 degree dovetail slots. The switches can be used with the CPS9D series dovetail adapters for mounting.



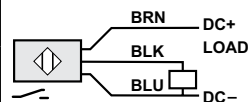
CPS9D-AP-A

CPS9D-AP-F

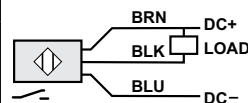


Wiring

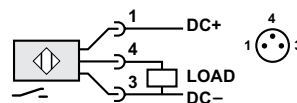
| NITRA CPS9D Series Cylinder Position Switches | | | |
|---|--|---------|--------------|
| Part No. | Description | Price | Weight (lbs) |
| CPS9D-AP-A | Pneumatic cylinder switch, for position sensing, magnetic, dovetail, normally open, 3-wire, 5-28 VDC, electronic PNP transistor output, status LED, 9.8 ft. (3.0m) cable with wire leads. Can be mounted on cylinders with 1/4 inch 60 degree dovetail slots or other dovetail grooves using CPS9D-D adapters. | \$15.50 | 0.2 |
| CPS9D-AN-A | Pneumatic cylinder switch, for position sensing, magnetic, dovetail, normally open, 3-wire, 5-28 VDC, electronic NPN transistor output, status LED, 9.8 ft. (3.0m) cable with wire leads. Can be mounted on cylinders with 1/4 inch 60 degree dovetail slots or other dovetail grooves using CPS9D-D adapters. | \$15.50 | 0.2 |
| CPS9D-AP-F | Pneumatic cylinder switch, for position sensing, magnetic, dovetail, normally open, 3-wire, 5-28 VDC, electronic PNP transistor output, status LED, 0.5 ft. (0.15m) cable with M8 snap-fit connector. Can be mounted on cylinders with 1/4 inch 60 degree dovetail slots or other dovetail grooves using CPS9D-D adapters. | \$15.50 | 0.2 |
| CPS9D-AN-F | Pneumatic cylinder switch, for position sensing, magnetic, dovetail, normally open, 3-wire, 5-28 VDC, electronic NPN transistor output, status LED, 0.5 ft. (0.15m) cable with M8 snap-fit connector. Can be mounted on cylinders with 1/4 inch 60 degree dovetail slots or other dovetail grooves using CPS9D-D adapters. | \$15.50 | 0.2 |



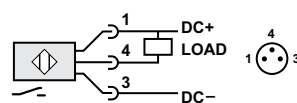
CPS9D-AP-A



CPS9D-AN-A



CPS9D-AP-F

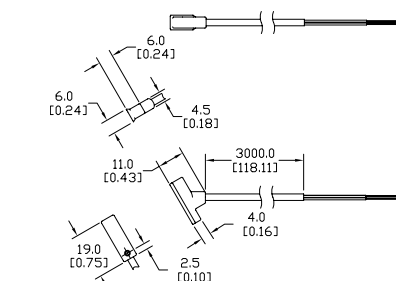


CPS9D-AN-F

| NITRA CPS9D Series Cylinder Switch Specifications | |
|---|--|
| Operating Voltage | 5-28 VDC |
| Voltage Drop | 1.0 V |
| Current Rating | 0.2 Amps Max. |
| Wire Size | 26AWG (0.13mm ²) |
| Switching Power | 4.8 watts Max. |
| Switching Speed | 4μs operate / 4μs release |
| Short Circuit Protection | No |
| Reverse Polarity Protection | Yes |
| Overload Protection | No |
| Leakage Current | < 0.01 mA |
| Sensing Technology | GMR |
| Off Delay Time | 150-200 ms |
| Function Display | PNP switching status yellow / NPN switching status red |
| Switching Frequency | < 1000 Hz |
| Magnetic Sensitivity | 2.5 millitesla (25 gauss) |
| Housing Materials | Zytel |
| Operating Temperature | -4°F to 176°F (-20°C to 80°C) |
| Protection Rating | NEMA 6 / IP 67 |
| Agency Approvals | CE, RoHS, REACH |

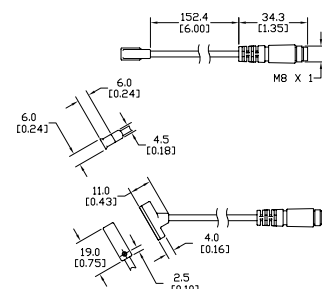
Dimensions

mm [inches]



CPS9D-xx-A

wire length tolerance +12" / -0"



CPS9D-xx-F

cable length tolerance w 1.5"



CPS9D/CPS9E Series Cylinder Position Switch – Accessories

Accessories



CPS9D-D12M



CPS9D-D14M



CPS9D-D38

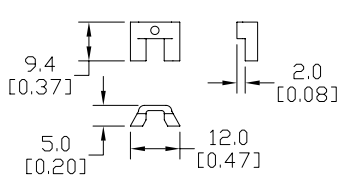


Photo example shows a CPS9D switch mounted in a dovetail groove adapter.

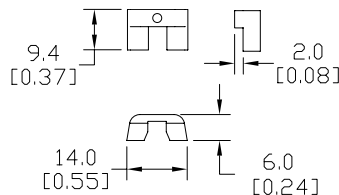
| NITRA CPS9D/CPS9E Series Cylinder Position Switch Accessories | | | |
|---|--|--------|--------------|
| Part No. | Description | Price | Weight (lbs) |
| <u>CPS9D-D12M</u> | Dovetail groove adapter, mounts a CPS9D/CPS9E cylinder position switch in a 12mm 60 degree dovetail slot | \$2.00 | 0.2 |
| <u>CPS9D-D14M</u> | Dovetail groove adapter, mounts a CPS9D/CPS9E cylinder position switch in a 14mm 60 degree dovetail slot | \$1.75 | 0.2 |
| <u>CPS9D-D38</u> | Dovetail groove adapter, mounts a CPS9D/CPS9E cylinder position switch in a 3/8 inch 60 degree dovetail slot | \$1.75 | 0.2 |

Dimensions

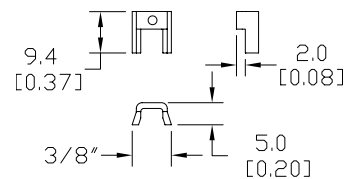
mm [inches]



CPS9D-D12M



CPS9D-D14M



CPS9D-D38



CPS Series Cylinder Position Switches

The NITRA CPS Series of cylinder position switches offers a robust, yet cost-effective, interface between pneumatic or hydraulic actuators and electrical control systems. Using state-of-the-art magnetic sensing technology, these switches are designed for use with cylinders that have a magnet incorporated in the cylinder piston. They can be used to provide cylinder position indication, cycle count, or to confirm operation.

NITRA cylinder position switches are now available in nine styles with accessories to fit many different styles of cylinders or actuators. The switches are designed for general purpose applications on most popular cylinder brands with sensor grooves, on round body cylinders using CPSB Series mounting bands or on tie rod cylinders using CPSA Series adapters. Harsh duty applications can use the CPSF Series switches with CPSS stainless steel mounting bands if needed.

NITRA cylinder position switches are available in 3-wire DC, PNP normally open, PNP normally closed, and NPN normally open electronic solid state configurations. Switches include integral cable with either an M8 or M12 wiring connector or wire leads. Integral

LED indication provides switch status for speedy switch positioning and troubleshooting. Pre-tested for use with NITRA pneumatic cylinders, these switches are also suitable for use with other brands of cylinders with magnetic pistons.

Features

- Electronic switch output, PNP (normally open or normally closed) or NPN (normally open)
- Solid state reliability, no moving parts for longer life
- AMR sensing technology with small hysteresis for precise sensing
- GMR sensing technology for basic industrial applications
- Compact and easy to mount on round body, tie rod, and extruded body cylinders
- LED switch status indication
- Integral cable with M8 or M12 wiring connector or 2-meter wire leads
- Electronic switch performance at reed switch prices



CPSB Band Assembly



CPSA Adapter Assembly



E-series cylinder with switch

Technology Comparison

| Reed Switch vs. AutomationDirect CPS Series Electronic Switch | | | |
|---|----------------------------------|---|--|
| | Mechanical Reed Switch | AutomationDirect CPS Series Electronic Switch | Details |
| Durability | low (1-2 million cycles typical) | high (virtually unlimited number of cycles) | Reed switches can stick, break, bounce and are prone to wear |
| Repeatability | low | high | Mechanical wear of reed switches can lead to switch point drift |
| Response time | low | high | Reed switches have a slower response time than electronic switches, resulting in lower switch accuracy |
| Sensitivity to magnetic fields | low | high | Electronic sensors, more sensitive than reed switches, operate reliably even with weak magnetic fields |
| Temperature stability | high | high | Both switch technologies are extremely stable over the entire temperature range |
| Longevity | low | high | Electronic sensors are insensitive to long term effects of magnetic fields. Reed switches can become permanently magnetized over time. |
| Response sensitivity | medium | high | Electronic sensors have small hysteresis and are exceptional for short stroke cylinders |
| Price | low | low | Reed switches are usually much less expensive than electronic switches. The AutomationDirect CPS Series offers all the advantages of an electronic cylinder position switch at reed switch prices. |

AMR vs. GMR Technology

Two solid state magnetic sensing technologies used for pneumatic cylinder position are GMR (Giant Magnetoresistive) and AMR (Anisotropic Magnetoresistive). Both sensing technologies consist of layers of ferromagnetic material that change in electrical

resistance when exposed to an external magnetic field. AMR based switches have a higher sensitivity and narrower sensing field compared to less expensive GMR based switches. AMR switches are a better choice for cylinders with short strokes.



CPS Series Cylinder Position Switches

Position Switch Cross Reference Chart

| NITRA Switch Type | Cylinder Brand (may fit some of these cylinders) | Photo Example | Groove Illustration | |
|---------------------|--|---------------|---------------------|--|
| CPS CPSF | NITRA A-Series NITRA D-Series NITRA F-Series | | | |
| CPS9C | DE-STA-CO Robohand SMC Compact Air Bimba Fabco | | | |
| CPS9D | NITRA L-Series Fabco Numatics Rotomation | | | |
| CPS9E | NITRA L-Series Fabco Numatics Rotomation | | | |
| CPS9F | NITRA G-Series Fabco Festo Numatics Rotomation | | | |
| CPS9H | NITRA E-Series NITRA H-Series | | | |
| CPS9M | Norgren | | | |
| CPS9Q | NITRA L-Series NITRA G-Series Parker Fabco Festo Numatics Rotomation | | | |