



VISHAY INTERTECHNOLOGY, INC.

RESISTIVE PRODUCTS

# SOLUTIONS FOR OFF-ROAD VEHICLES

Vishay Sfernice

CAPABILITIES





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## Precision Potentiometers / Motion Transducers

Vishay Sfernice precision potentiometers are built with a conductive plastic ink laid upon various types of supports. This resistive element is then mounted inside a housing or directly in the customer's sub-assemblies and joined to a high-quality wiper assembly constructed from precious metal alloy. The range of Vishay Sfernice motion transducers includes both single-turn, rotational, and linear devices.

Vishay Sfernice also offers some products based on a contact-less Hall effect solution for all applications requiring a high level of dithering. The models are easily recognizable by the letters "HE" in their reference.

### Features and Benefits

- Long operational life: 10 million cycles and up
- Linearity of 1 % or less and excellent repeatability
- Redundant track and fully sealed options available
- Wide operating temperature range of -55 °C to +125 °C
- For harsh environments, models based on Hall effect technology are highly recommended as these products can withstand high levels of vibration

- All products are then customized to fit in each application
- Throttle body case can also be offered with a spring return option (Model 981HE can be offered either in hollow shaft or in steel D-shaft version)
- Special housings can be designed in partnership with our customers (see cover image)

### Available Custom Kits for Forklifts, Tractors, and Trucks

- Generally based on the following catalog products: **KIT LMF / KIT RMF / Model 357...** (for conductive plastic models)
- Generally based on the following catalog products: **KIT RMHE / 981HE / 351HE...** (for Hall effect sensors)

### Major Off-Road Vehicle Applications

- Forklift positioning and steering
- Speed control
- Accelerator – control of the angle of the pedal
- Plow – height control
- Gear shift – tractor
- Hitch control – tractor
- Ladder steering assembly (fire truck)
- Clutch – pedal position
- Dashboard control



| Panel Potentiometers   |                        |                        |                        |                        |                   |                     |
|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------|---------------------|
| Models                 | 357                    | KIT LMF                | KIT RMF                | 351HE                  | RMHE              | 981HE               |
| Main Features          | Conductive plastic     | Conductive plastic     | Conductive plastic     | Hall effect            | Hall effect       | Hall effect         |
| Life Cycles            | 5 M                    | 25 M                   | 25 M                   | 10 M                   | 20 M              | 10 M                |
| Linearity              | ±1 %                   | ±0.1 %                 | ±0.1 %                 | ±0.5 %                 | ±0.5 %            | ±0.25 %             |
| Miscellaneous Features | Fully customized model | Fully customized model | Fully customized model | 360 ° electrical angle | Fully sealed IP67 | Spring loaded shaft |



## Panel Potentiometers

Vishay Sfernice offers both cermet and conductive plastic single-turn panel potentiometers. Our wide range of products includes standard sealed designs units, modular potentiometers, robust high-power, and long-life sealed solutions. Our value-added and custom capabilities help customers to reduce their assembly costs.

**Products: P11S, PE30, PRV4, P30L, and PRV6S**

### Features and Benefits

- IP67 sealing
- High operating and end-stop torques
- Long operational life: 1 million cycles for P30L
- Multi-gang assembly with switch/detent options






### Available Custom Features

- Shaft and panel sealing
- Locking devices
- Cable, harness, and connectors to customer's specification
- Custom bushings and shafts
- Special tapers and track angles
- Special linearity or inter-linearity

### Major Off-Road Vehicle Applications

- Climate control
- Dashboard and interior illumination
- Compartment HVAC
- Fork lift speed control
- Fork lift dashboard control
- Lighting controls



| Panel Potentiometers   |   |   |   |   |   |
|------------------------|---|---|---|---|---|
|                        | PE30  | P11S  | PRV4  | P30L  | PRV6S   |
| Models                 |  |  |  |  |  |
| Main Features          | Fully sealed<br>3 W<br>Robust<br>High torque  | Versatile<br>Modular<br>Options   | Fully sealed<br>2 W<br>Robust<br>High torque  | High rotational life<br>Fully sealed<br>High torque                                   | Fully sealed<br>Mil design  |
| Life Cycles            | 25,000  | 50,000<br>(1,000,000)   | 25,000  | 1,000,000   | 50,000  |
| Size                   | 19.7 mm diam.<br>3/4"   | 12.5 mm square<br>1/2"  | 19.7 mm diam.<br>3/4"   | 19.7 mm diam.<br>3/4"   | 12.5 mm diam.<br>1/2"   |
| Power Rating (PR)      | 3 W   | 1 W   | 2 W   | 2 W   | 1.5 W   |
| Miscellaneous Features | 300° Mech. travel<br>IP67 Sealing<br>Panel sealing optional                         | 300° Mech. travel<br>IP64 Sealing<br>Panel sealing optional                         | 300° Mech. travel<br>IP67 Sealing<br>Panel sealing optional                         | 300° Mech. travel<br>IP67 Sealing<br>Panel sealing optional                           | 300° Mech. travel<br>IP67 Sealing<br>Panel sealing optional                           |



## Thick Film Power Resistors

Vishay Sfernice offers the widest range of thick film power resistors in the industry. Offered in standard semiconductor packages such as the TO220, TO247, DPAK, or D<sup>2</sup>PAK, our thick film technology is non-inductive by design and allows high power dissipation in small cases.

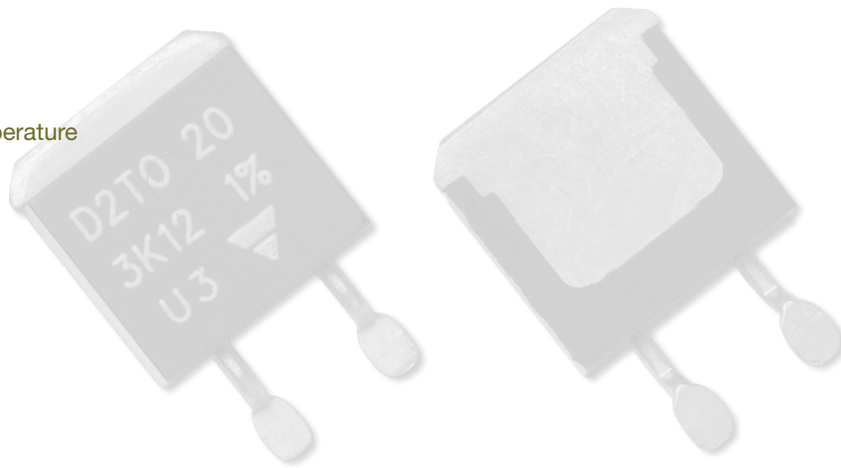
**Products: RTO20, RTO50, LTO30, LTO50, D2TO20, D2TO35, and DTO25**

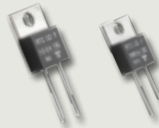

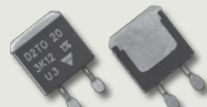

### Features and Benefits

- High power in standard TO-220, DPAK or D<sup>2</sup>PAK packages
- Non-inductive by design
- Low profile and small size
- Low thermal radiation
- Cost competitive
- RoHS-compliant for high-temperature soldering of SMD products

### Major Off-Road Vehicle Applications

- Engine control units
- Converters

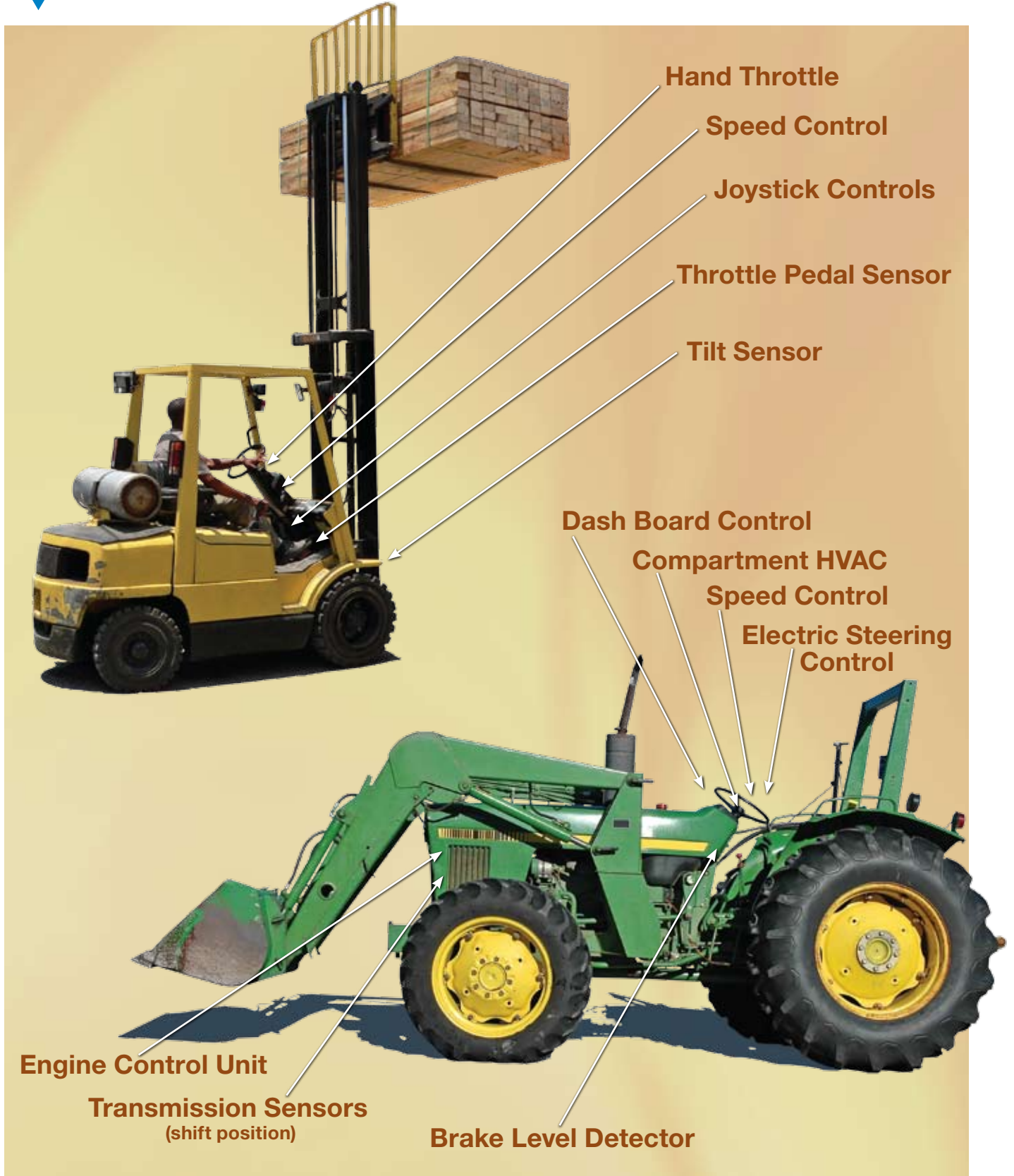


| Thick Film Power Resistors       |  |   |  |   |
|----------------------------------|--|---|--|---|
|                                  | RTO  | LTO   | D2TO   | DTO 25  |
| <b>Models</b>                    |   |    |    |    |
| <b>Power Rating Mounted (PR)</b> | 20 W & 50 W  | 30 W to 100 W   | 20 W & 35 W  | 25 W  |
| <b>Thermal Resistance</b>        | RTO20 = 6.5 °C/W<br>RTO50 = 2.6 °C/W   | 4.2 °C/W to 1.5 °C/W  | D2TO20: 6.5 °C/W<br>D2TO35: 4.2 °C/W   | 5 °C/W  |
| <b>Package</b>                   | TO220  | TO220 and TO247   | TO263 Style (D2 PAK)   | TO252 Style (D PAK)   |
| <b>Features</b>                  | <ul style="list-style-type: none"> <li>• 2 models within range</li> <li>• Custom designs available</li> <li>• Through hole and SMD</li> <li>• Lead (Pb)-free and RoHS available</li> </ul> | <ul style="list-style-type: none"> <li>• 3 models within range</li> <li>• Direct mounting ceramic on heatsink</li> <li>• Lead (Pb)-free and RoHS compliant</li> <li>• Custom designs available</li> </ul> | <ul style="list-style-type: none"> <li>• 2 models within range</li> <li>• Standard package for SMD</li> <li>• Lead (Pb)-free and RoHS compliant</li> <li>• Solder reflow secure at 270 °C/10s</li> </ul> | <ul style="list-style-type: none"> <li>• Standard package for SMD</li> <li>• Lead (Pb)-free and RoHS compliant</li> <li>• Solder reflow secure at 270 °C/10s</li> </ul> |



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## SEMICONDUCTORS:

Rectifiers • High-Power Diodes and Thyristors • Small-Signal Diodes • Zener and Suppressor Diodes  
• FETs • Optoelectronics • ICs • Modules

## PASSIVE COMPONENTS:

Resistive Products • Magnetics • Capacitors • Strain Gage Transducers and Stress Analysis Systems



One of the World's Largest Manufacturers of  
**Discrete Semiconductors and Passive Components**

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