



Intellinder™ Absolute Position Sensor

Product Catalog

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.



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The Next Step in Position Sensor Technology

The evolution of position sensing technology has taken a smart step forward with the Intellinder Absolute Position Sensor design. By integrating a highly engineered sensor into the hydraulic cylinder, this Parker design eliminates the time and costs associated with gun drilling, as well as unprotected external sensors with complex linkages. Installation is virtually plug-and-play.

The Intellinder Sensor signals *absolute* positioning, rather than position relative to the starting location of the rod. Position-identifying bar codes are marked right on the rod so its position is communicated continually and

directly to the controller. Position report occurs at power-on. The sensor even enables monitoring in double-rod cylinder applications without the necessity of bolt-ons.

This proprietary technology has undergone exhaustive laboratory and field testing to validate its ability to maintain signal fidelity in extremely challenging environments. The Intellinder Absolute Position Sensor sustains performance in applications exposed to vibration, dust, gravel, corrosives, chemicals, axial load, side load, and immersion. It remains impervious to electronic noise and has been tested to

ensure signal strength for over one million cylinder cycles.

The Intellinder Absolute Position Sensor performs across a wide range of temperatures and provides long stroke capabilities of 20 feet [6,096mm] or more. It features highly sensitive health monitoring to detect and diagnose potential cylinder malfunctions before they can disrupt operations.

The bar code markings are wide enough to allow for misalignment of the rod-eye during welding, assembly stack-up, and torsion under loading, without impeding the sensor's ability to read the rod's position, for highly consistent, accurate monitoring.



The Intellinder Absolute Position Sensor is ideal for material handling, construction, waste handling, forestry and other extreme performance applications.

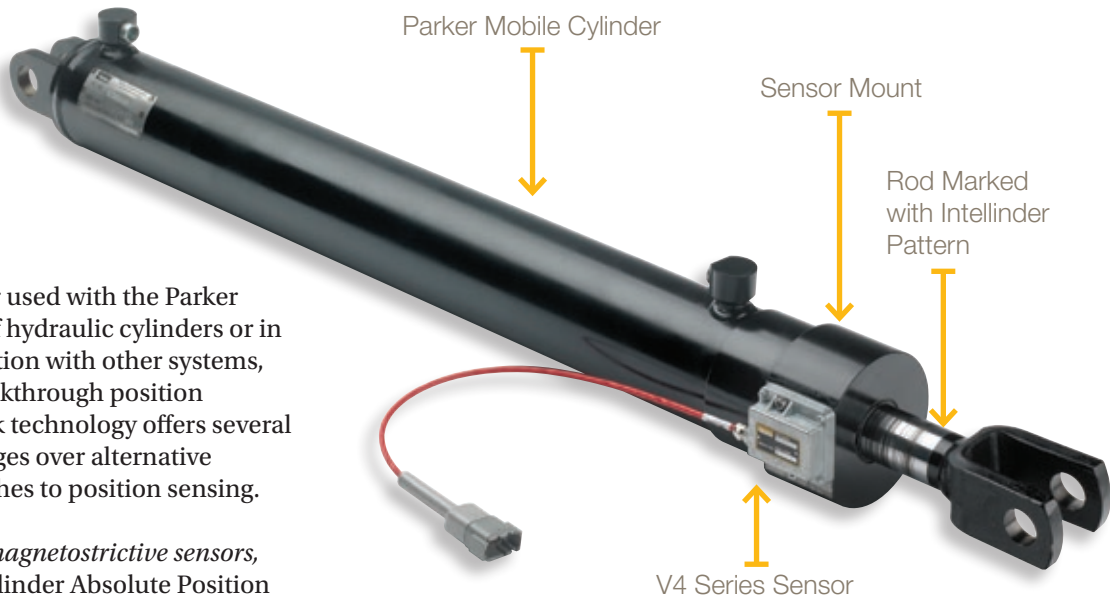
Different by Design

Whether used with the Parker family of hydraulic cylinders or in conjunction with other systems, this breakthrough position feedback technology offers several advantages over alternative approaches to position sensing.

Unlike magnetostrictive sensors, the Intellinder Absolute Position Sensor requires minimal cylinder modification and eliminates gun drilling. Its robust design enables a longer stroke and its compact size eliminates the dead zones associated with magnetostrictive sensors. In the unlikely event of a necessary repair, the Intellinder Sensor can be quickly removed and replaced without time-consuming removal of the entire cylinder.

In contrast with variable resistance sensors (string pots), the Intellinder Sensor never requires calibration, not even during initial installation. It also operates across a wider temperature range and can be expected to provide a longer, trouble-free service life.

When compared with the optics used in laser gauges, the Intellinder Sensor's optical design is not subject to the dirt and fog associated with reflective mirrors. Its protected lens is highly resistant to dust and other contaminants.



An Eye for Performance

The Intellinder Absolute Position Sensor combines time-tested, highly engineered optics with a proprietary lens design that provides excellent resolution, linearity, repeatability, accuracy, and hysteresis. The resulting sharp bar code imaging translates into consistent, predictable control of your critical operations.

How It Works

With the Intellinder Absolute Precision Sensor, you simply turn the sensor "on" and look at the bar to identify precise position. No calibration is required.

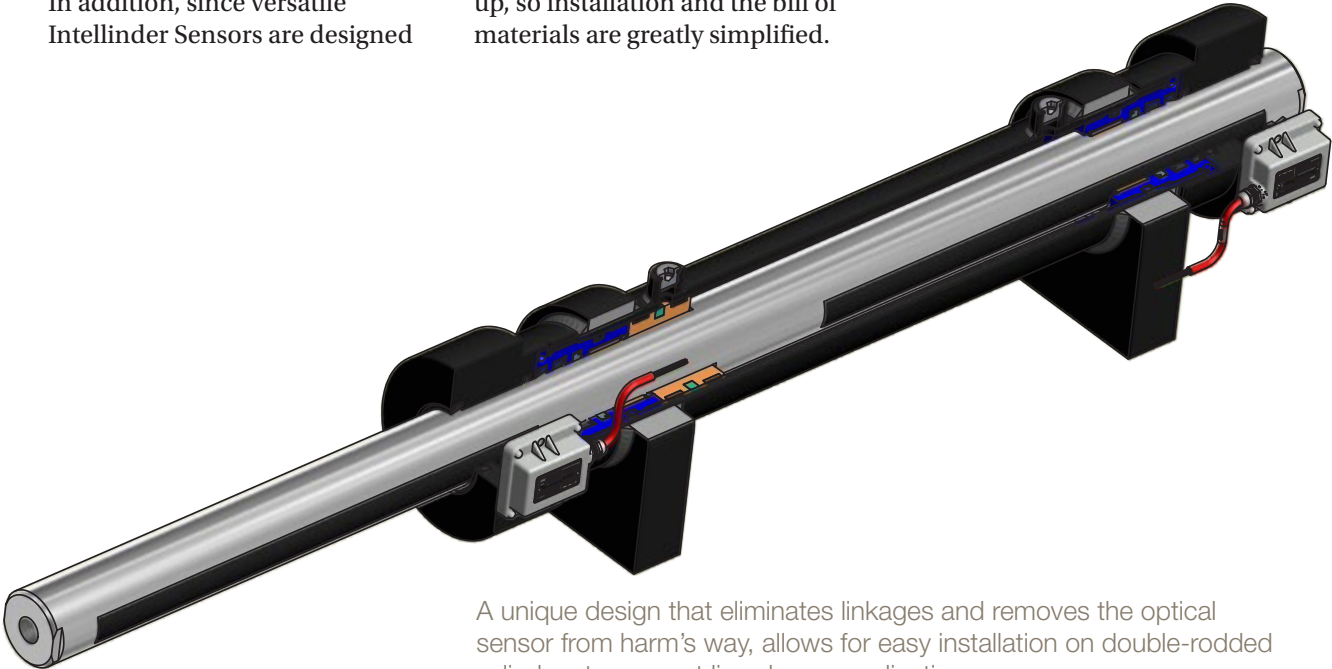
Innovation at Work

Sensors can be installed in multiple independent configurations for monitoring and controlling diverse functions, such as auto-level, load management, and steering.

In addition, since versatile Intellinder Sensors are designed

to be interchangeable across multiple systems and in diverse applications, inventory requirements and downtime can be significantly reduced. Only two screws and an electrical connector are required for set-up, so installation and the bill of materials are greatly simplified.

This robust sensor technology also features health monitoring that continuously scans the rod surface to identify conditions that might, left undetected, cause sensor damage, seal leaks, and system downtime.

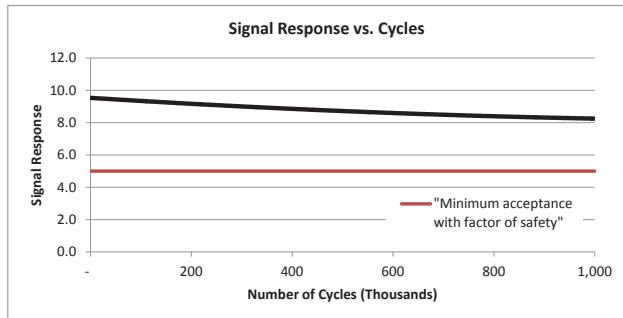


A unique design that eliminates linkages and removes the optical sensor from harm's way, allows for easy installation on double-rodDED cylinders to support limp-home applications.

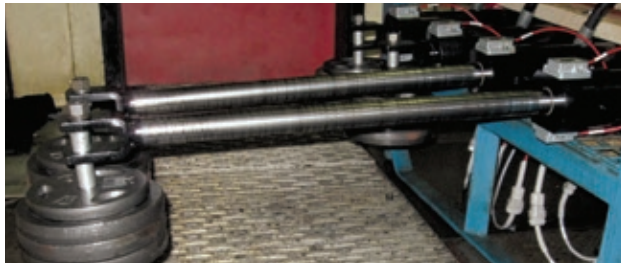
Performance Tested

The Intellinder Absolute Position Sensor technology has been comprehensively tested and proven to retain signal strength and seal life, using a full range of industry standard and Parker customized testing protocols.

Cylinder Testing



Over 1 million cycles under Axial Load conditions per SAE J214 – sharp fidelity, no leaks



Over 1 million cycles under Side Load conditions – sharp fidelity, no leaks



Under Arizona Road Dust Testing – sharp fidelity, no leaks

Sensor Testing



The Intellinder Absolute Position Sensor retained fidelity and maintained seal integrity in:

- Environmental Testing – operating temperatures, thermal shock, humidity, and vibration
- Ingression Testing - dust and water in powerwash and fully immersed conditions
- Electrical Testing - radiated susceptibility, radiated emission, and electrical transients

Specifications




Sensor Performance	Accuracy ± 0.010 in Resolution 0.0013 in Hysteresis 0.0038 in Repeatability 0.0014 in Linearity 0.0026 in
Salt Spray Corrosion Testing of Rods per ASTM B117 to 200 hours	Nickel Chrome Plated 1045 Chrome Plated 1045 Chrome Plated 17-4PH
Chemical Resistance	Resistant to fertilizers, cleaners, bleach, moisture, and dust control agents
Environmental Robustness	Operating Temperature: -40°C to 105°C Shock: Per IEC 68-2-27, 100g, 6 directions Vibration: Per SAE J1455, 12g RMS 25Hz to 2kHz Ingression: IP68, IP65
Rod Diameter	1.0 to 5.0 in [25 to 125mm]
Stroke Length	0 to 96 in [2438mm] 0 to 20 ft [6096mm] (longer lengths also available)
Power Input	8-32VDC, <2W
Report Rate	10 to 1000 ms
Electrical Performance	Supply Voltage: 8-32VDC (less than 2 watts)
Electrical Immunity	EN 61000-6-4
Radiated Susceptibility	EN 61000-6-2
Control/Networking Protocol	Data I/O Generic J1939 CAN: Proprietary PDU, 250 Kbaud, 29-bit ID Networking: Up to 8 sensors per CAN network with separate PGNs Connector: Flying Leads or Deutsch 8-Pin

Rod Testing

In testing to ASTM B117, marked rods remained corrosion free after 200 hours of exposure to salt spray. When tested for resistance to fertilizer, ammonia, bleach, battery acid, cleaners, moisture-control agents, and dust-control agents, the marked rods exhibited durability on par with standard chrome rods.



Versatile in Application

Real-World Validation with Sensor Positions as Shown	Application	Endurance
	<p>Tactical Assault Vehicle with Rear Steering</p>	<p>Sustained performance for 2152 mls [3645 km]</p>
	<p>Off-Road Backhoe</p>	<p>Nine months of daily use</p>
	<p>Telehandler with Lift, Tilt, and Frame Sway Capabilities</p>	<p>Accelerated Life Tested for the equivalent of seven years of field performance</p>

The Intellinder Absolute Position Sensor has been field proven in these grueling high-performance applications.

Waste Removal



Material Handling



Agriculture



Marine



Military





- Tilt Cylinder:**
This actuator controls the pivoting of the implement (forks shown here) at the end of the telescoping arm.
- Extend Cylinder:** This cylinder extends the telescoping arm. As shown here, the external cylinder is mounted inside the square cross-section arm; it can also be mounted external to and under the arm.
- Lift Cylinder:**
This actuator controls the lift of the main arm, as it pivots about its base.
- Steering Cylinder:**
This is typically a double-rod cylinder that connects the steering linkages to the wheels on either side of a vehicle.

The Proof is in the Performance

With the Parker Intellinder Absolute Position Sensor you can deploy a wide range of functions such as electronic cushioning, auto-leveling, load monitoring, and return to position, improving productivity and reducing downtime. To further ensure optimum uptime, integrated condition monitoring provides on-screen alerts.

- Lift, Extend, Handle**
- Rough Terrain Forklifts
 - Access Systems
 - Forestry Vehicles
 - Reach Stackers
 - Gantry Cranes

- Compress, Compact**
- Refuse Vehicles

- Steer, Brake**
- Truck Systems
 - Skid Steer

- Open, Close**
- Door Systems
 - Grabs and Buckets

- Load, Tip**
- Loader Arm

Forestry



Construction



The highly engineered Intellinder Absolute Position Sensor has been specifically designed to provide consistent monitoring and control in challenging high-performance applications like these.

Application Considerations

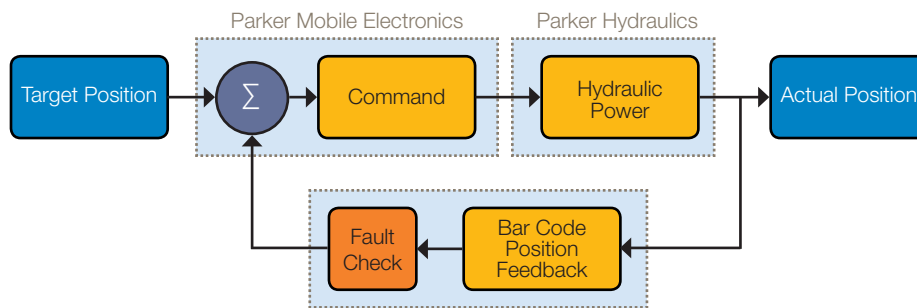
Parker Hannifin Corporation is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace

markets. Parker has been supporting the mobile hydraulics industry with highly engineered solutions for over 90 years.

Intellinder technology is designed to provide load monitoring,

auto-leveling, danger zone avoidance, speed control, auto-stow, and other challenging functions, in conjunction with the Parker IQAN Electronic Control System, Parker Hydraulics, and Parker Mobile Electronics.

Control Loop



A Parker Technical Representative can help you integrate Parker Absolute Position Sensor technology with system-compatible pumps, valves, cylinders, fittings, hoses, and mobile electronic controls for successful monitoring and control in harsh application environments.

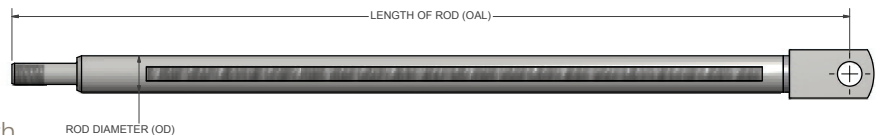
Ordering Information

Its fully integrated design makes the Intellinder Absolute Position Sensor easy to change-out should replacement be required. The system is so simple to install that it is virtually plug-and-play! Sensors are shipped standard with Deutsch DTM04-08 Connector.

Sensor Ordering Part Numbers	
V4 Series sensor (8 ft stroke)	376 8888 008
V4 Series sensor (22 ft stroke)	376 8888 012
V4 Series sensor with mm output 8 ft [2438mm] stroke	376 8888 011
V4 Series sensor with mm output 20 ft [6096mm] stroke	376 8888 014
Accessories	
Installation kit	376 8888 004
Installation kit (metric)	376 8888 003
Deutsch connector kit (Sensor)	376 8888 006
Deutsch connector kit (Controller)	376 8888 007
Channel selector resistor kit	376 8888 005

Minimum Rod Diameter	1.0 in [25 mm]
Maximum Rod Diameter	5.0 in [125mm]
Maximum Stroke	96 in [2438.40mm]
<i>Standard</i> Maximum Rod Length	20 ft [6,096mm]
<i>Optional</i> Maximum Rod Length	Customized diameters, strokes, lengths available
Rod Surface Options	Nickel Chrome Plated 1045, Chrome Plated 1045, Chrome Plated 17-4PH

Create a preliminary design based on the parameters in the chart above, using this rod diagram as your guide. Once you have identified the diameter, stroke, and length of your rod, along with the number of strips/degrees desired, your Parker Technical Representative can work with you to ensure a custom design to meet your requirements. Keep in mind that the additional build length to your cylinder will be minimal. Multiple redundancies can be built in by using two or more sensors mounted around a single piston rod.



Rod Marking Considerations	
Rod Diameter (OD)	
Length of Stroke (SL)	
Length of Rod (OAL)	
Marking Coverage*	

* 1 strip, 2 strip, or full 360° marking is available.

Please consult the full Parker Cylinder Catalog for a complete range of bore, mount and porting options.



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