Linear Transducers

Innovative Position Sensing Technology for Mobile Applications

Rota Engineering Ltd

Tel: +44 (0) 161 764 0424
info@rota-eng.com
www.rota-eng.com
New Technology

Hydraulic cylinder users are always looking for a more cost effective method of fitting linear transducers as deep hole drilling can be particularly expensive.

Now Rota, using patent applied for technology, have designed a linear transducer that can be simply mounted externally onto a standard carbon steel cylinder wall. The cylinder position is measured when a magnet, pre-fitted in the piston, is moved by hydraulic pressure.

Conventional steering cylinders can now be monitored by a linear transducer.

All our existing solid state Hall Effect linear transducers have improved accuracy options and reduced dead lengths for even easier fitting into short pin to pin length cylinders.

We also have a totally new combined linear & pressure transducer, capable of monitoring long strokes with working pressures up to 720 bar (10,500 psi).

A new explosive atmosphere, intrinsically safe, ATEX and IEC Ex approved linear transducer for surface and underground applications.

Non-Contact, Absolute, Hall Effect Sensors

• LA/B series is the smallest active transducer on the market, using a “clip in” mounting it does not change the pin to pin dimension on existing cylinder designs

• Optional 5 VDC powered transducer gives 4.5 VDC output, allows customer to upgrade from resistive type transducers to non-contact Hall Effect without upgrading the mobile equipment electronics

• Submersible sensors capable of 6,000m ocean depths

• Sensors from 60mm up to 15m length, and working pressures of up to 720bar

• ATEX, IEC approved sensors for hazardous area applications

• Internal and External cylinder designs and Independent Mount.

• Dual circuit and radial versions

• All models give an absolute signal from inbuilt electronics

Click here to send enquiry
Development

Reed Switch Technology

Introduced Reed Switch technology in the early 90’s for mining then into offshore and subsea engineering.

Reed switch technology has good vibration resistance and well sealed. With their low power input they are ideal for Intrinsically Safe and battery powered applications.

2 wire, 4 – 20 mA loop powered options. Reed switch technology is limited by 1.5mm resolution.

Hall Effect Technology

The Hall Effect was introduced in the early 00’s.

Simple and robust construction, proved to be very reliable.

Resolution improves > 10x compared to reed technology.

Very fast position update.

Current package size so small it does not increase the critical pin to pin dimension of most existing cylinder designs, opens the door to more applications.

Microprocessor based sensor allows great design flexibility.

High volume capability.

Automation drives down cost, improves quality.
Integrated Transducer

Overview

Signal electronics built inside
Non contact operation
Miniature mounting

Short length maintains pin to pin dimensions

Absolute Signal

Analogue or digital outputs -
High cycling and vibration life

Mounting Options

Screw in heads
Quick mount connectors
Push fit / Grubscew mounting
Pre assembled Connector

Click here to send enquiry
The LA Transducers use the latest version of even more compact electronics, all packaged in a very cost effective, high tensile aluminium enclosure rated to 325 bar (4750psi) operating pressure. Its cost effective design makes it ideal for replacing limit switches, brackets and the associated cables, potentiometers etc where the 5 volt supply option is ideal.

The LAC “clip-in” version is extremely compact and excellent for welded cylinders with eyes, clevises etc requiring no increase in the cylinder pin to pin mounting length. Together with the prewired M12 connector the “clip in” transducer design allows quick cost effective use in volume cylinder manufacture.

Quick assembly M12 connector

Attach a length of cord to the inserts 1.5mm holes, feed cord through the machined hole to pull the transducer through.

Pull the insert all the way through the cylinder, then push transducer into place until it clicks in.

Push the metal M12 body over the insert

Align connector and push into recess and secure into place with standard circlip.
External mounted transducer

No extra end cap costs
On site replaceable
Magnet works through carbon steel
No deep drilling costs

Maintains piston rod and end cap strength

Absolute non contact operation
High cycling and vibration resistance

Steering Cylinders  Long Stroke Cylinders  Redundancy
There are several advantages that stem from this technological approach:-

- The cost of achieving a smart cylinder is reduced by eliminating the need for gun-drilling the piston rod and end cap machining.
- Accuracy of the transducer is typically +/- 0.5mm (0.02 in) – which is more than adequate for most mobile equipment.
- The transducer is easily field replaceable.
- The cylinder is stronger, easier to assemble, install and service.
- The cylinders can be supplied with magnets already fitted, so that if the stroke sensing function is required, the transducer can be added at a later date.
- Full stroke monitoring of Steering cylinders.
- Two transducers can be used for redundancy on safety critical applications.
## Model LA/LB
- Internal mounting, Mobile equipment
- 10mm diameter
- Strokes: LA - up to 2m
  - LB - up to 3m
- Pressure: LA - 325bar
  - LB - 375bar
- Temp up to: -40 to + 105°C
  - -40 to + 221°F
- Key Benefits: Low cost, compact

## Model LM
- Internal mounting, Mobile equipment
- 10mm diameter
- Strokes: Up to 3m
- Pressure: 375bar
- Temp up to: -40 to + 105°C
  - -40 to + 221°F
- Key Benefits: Very compact, Robust

## Model ELA
- Internal mounting, Mobile equipment
- 10mm diameter
- Strokes: Very long
- Steering Cylinders
- Key Benefits: Very low installation costs
  - Field replaceable
  - Dual redundant option

### Electrical
- Outputs Voltage, Current, PWM & Digital
- 5V input option
- Resolutions: 0.5mm
  - 0.3mm
- Resolutions: 0.5mm
  - 0.3mm
- Resolutions: 1.0mm
  - 0.5mm

### Mechanical
- Enclosure material:
  - LA - Aluminium
  - LB - St. Steel 304L
- Mounting options:
  - Clip in heads
  - Screw in heads
- Enclosure material:
  - St. Steel 304L
  - All welded design
- Mounting options:
  - Push in head
  - Screw in heads
- Enclosure material:
  - Aluminium
- Mounting options:
  - Angled head
  - Flat head
  - Parallel offset head

### Connectors or Cables
- Ingress Protection up to IP69

---

Click here to send enquiry
Special Designs

- Combination namur proximity switch and linear transducer in one package
- Combination linear position, pressure and temperature transducer
- Dual output transducers for redundancy
- Higher temperature capability – LT transducer rated up to 150°C
- Flexibility to handle special outputs
- 90° and 360° radial transducers
- Higher pressure ratings
- Long strokes
- ATEX, IEC or CSA certified for explosive atmospheres
- High ingress protection – subsea
- Special design mountings
- Higher resolutions

Click here to send enquiry

Rota Engineering Ltd
Wellington Street, Bury, Manchester, BL8 2BD, UK
Tel: +44 (0) 161 764 0424
info@rota-eng.com
www.rota-eng.com