

Optimum Series

Narrow bodied high performance displacement sensors

Description

The Optimum Series of LVDT sensors is an ideal choice for process control and research applications. The free core variants are designed for precise linear positioning and measurement of moving parts where zero friction and hysteresis is required within a restricted space.

The free core version is available with an optional lightweight core for mounting on to small, rapidly moving structures without affecting their performance and integrity, which is important in some control applications.

A version of a lightweight core with a 1.9 mm diameter is available which improves core to bore clearance, making alignment easier. A light titanium core carrier can be supplied on request.

The optimum is also available as a guided product and with universal joints either as an LVDT or digital product for use in applications where it is not possible to mount the core and carrier on the moving part.

Features

- Good measurement range to body length ratio
- Small body diameter
- Larger radial bore clearance
- Rugged construction
- High temperature (200 °C) available on request
- High pressure (vented case) available



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Technical Specification

Generic Product Types

| | | | | | |
|------------------------|-------|------|------|--------|------|
| LVDT | OP1.5 | OP6 | OP10 | OP12.5 | OP25 |
| Digital Output (Orbit) | DO3 | DO12 | DO20 | DO25 | DO50 |

Measurement

| | | | | | |
|--|-------|-------|-------|-------|-------|
| Measurement Range LVDT (mm) | ±1.5 | ±6 | ±10 | ±12.5 | ±25 |
| Measurement Range ORBIT (mm) | 3 | 12 | 20 | 25 | 50 |
| Linearity (% FSO) | <0.25 | <0.25 | <0.25 | <0.25 | <0.25 |
| Resolution µm (Note 1) | <0.10 | <0.10 | <0.10 | <0.20 | <0.40 |
| Pre-travel ±0.5 mm (Guided Versions only) | 1.78 | 1.53 | 1.53 | 2.33 | 2.10 |
| Post Travel ±0.5 mm (Guided Versions only) | 1.20 | 1.67 | 1.67 | 2.47 | 2.30 |
| Temperature Coefficients (%FSO/°C) LVDT | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Temperature Coefficients (%FSO/°C) DC/4-20mA | <0.07 | <0.07 | <0.07 | <0.07 | <0.07 |
| Tip Force ±20% (Horizontal at middle of range) N | 0.66 | 0.94 | 0.94 | 0.93 | 0.50 |

Mechanical

| | | | | | |
|---|----------------------------|-----|-----|-----|-----|
| Nominal Mass (g) LVDT | 7 | 12 | 12 | 20 | 20 |
| Nominal Mass of Core (g) | 1.5 | 2.5 | 2.0 | 3.5 | 4.0 |
| Body diameter (mm) | 9.52 | | | | |
| Case material | 400 Series Stainless Steel | | | | |
| Core material | Nickel Iron | | | | |
| Cable Standard Type/Length (m) (Note 2) | F.E.P. / 3 Style A or B | | | | |

Electrical Interface (LVDT)

| | | | | | |
|------------------------------------|-----|-----|--------------------|-----|------|
| Energising Voltage (Vrms) at 5 kHz | 1-5 | | | | |
| Energising Current at 5kHz (mA/V) | 6.0 | 4.5 | 3.2 ⁽³⁾ | 7.0 | 1.25 |
| Sensitivity at 5kHz ±5% mV/V/mm | 108 | 78 | 85 ⁽³⁾ | 67 | 25 |

Electrical Interface (ORBIT)

| | |
|------------------------|--|
| Bandwidth | Up to 460 Hz (selectable) Solartron Orbit 5±0.25 @ 0.06A IP43 |
| Output | |
| Power (VDC) | |
| Sealing (Orbit Module) | |

Environment

| | |
|----------------------------|--------------|
| Operating Temperature (°C) | -40 to +150 |
| Storage Temperature (°C) | -40 to +150 |
| Sealing | Splash Proof |

Note 1: Resolution specification is only applicable to ORBIT digital transducers.

The resolution of LVDT transducers is effectively infinite and is only limited by the conditioning electronics

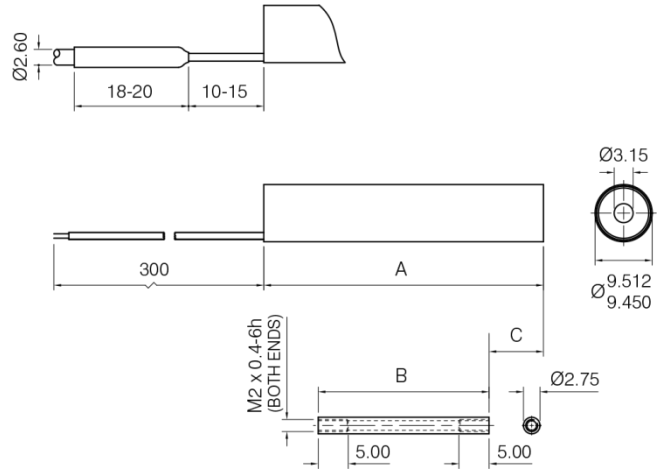
Note 2: Cable Style A comprises of individual twisted cores , Style B comprises a sheathed and screened cable

Note 3: OP10 at 20 kHz

OP Series Dimensions

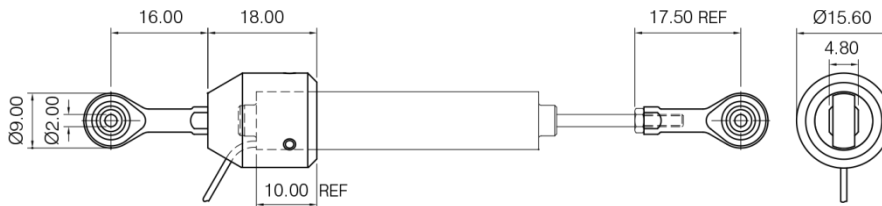
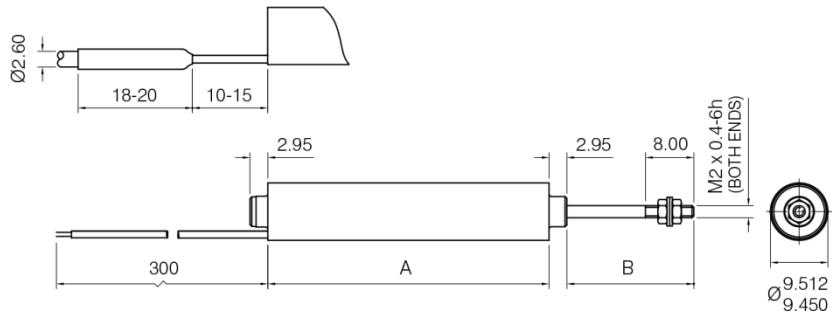
Free Core

| Type | A | B | C (at Null) |
|--------|-------|-------|-------------|
| OP1.5 | 20.60 | 11.00 | 4.80 |
| OP6 | 46.50 | 28.40 | 9.05 |
| OP10 | 46.50 | 20.40 | 13.05 |
| OP12.5 | 83.50 | 50.80 | 16.35 |
| OP25 | 83.50 | 26.00 | 28.75 |



Guided Core & Universal Joints

| Type | A | B (at Null) |
|--------|-------|-------------|
| OP1.5 | 20.60 | 14.00 |
| OP6 | 46.50 | 20.90 |
| OP10 | 46.50 | 29.40 |
| OP12.5 | 83.50 | 31.50 |
| OP25 | 83.50 | 48.65 |



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