

# Linearized Velocity Sensor

## LVS-101 & LVS-201

*The LVS-101 (Horizontal) and LVS-201 (Vertical) are linearized velocity sensors for low-frequency absolute bearing vibration monitoring, providing accurate measurements down to 0.5 Hz with integrated compensation electronics.*

### KEY FEATURES

- Frequency response down to 0.5 Hz
- Built-in low-frequency linearization
- Horizontal (LVS-101) or vertical (LVS-201) version
- 100 mV/mm/s sensitivity
- Dual output: linearized and raw (non-linearized) signal
- Rugged stainless steel body (IP68)
- Push-pull connector or integral cable option



### MONITORING SOLUTIONS



Shaft & bearing vibration

### TYPICAL APPLICATIONS



Hydrogenerators



Pumps, fans, cooling towers...



Gas & steam turbines



### DESCRIPTION

The LVS-101 and LVS-201 velocity sensors have been designed for low frequency vibration monitoring applications of rotating machines. More specifically, the sensors fulfil the special low frequency requirements

of very low speed hydroelectric machines.

The LVS sensors operate in accordance with the electrodynamic principle and are used for measuring the bearing absolute vibration of the machines.

The sensing element of the sensor is a coil supported by high precision springs moving around a permanent magnet which produces a voltage directly proportional to the vibration velocity.

By design, the sensor has an excellent sensitivity and linearity down to very low vibration levels. The built-in electronics allows the sensor to accurately monitor vibration frequency down to 0.5Hz.

Horizontal and vertical model of sensors are available, for omnidirectional sensor see LVS-301. The sensor provides two voltage outputs proportional to the vibration velocity :

- A raw output corresponding to buffered non-linearized signal
- Low frequency compensated dynamic vibration velocity signal for monitoring purposes down to 0.5 Hz and signal analysis

The sensor can be powered with +24VDC or -24VDC depending on the ordered version.

The sensor can be wired by push-pull connector, so the extension cable can be detached during installation. Or by integral cable.

## GLOBAL SPECIFICATIONS

### OPERATION

|                        |                      |
|------------------------|----------------------|
| Sensitivity            | 100mV/mm/s $\pm 5\%$ |
| Transverse sensitivity | <7% max. of nominal  |
| Maximum displacement   | 3mm peak-peak        |
| Natural frequency      | 8Hz typ.             |
| Spurious Frequency     | >1kHz                |

| Outputs                            | Linearized                                                              | Raw                   |
|------------------------------------|-------------------------------------------------------------------------|-----------------------|
| Impedance                          | 100 $\Omega$                                                            |                       |
| Output bias voltage                | +12V or +6V for +24V <sub>DC</sub> / -12V or -6V for -24V <sub>DC</sub> |                       |
| Output bias voltage tolerance      | $\pm 5\%$ of bias voltage                                               |                       |
| Maximum output voltage             | 10V peak for 12V bias / 5V peak for 6V bias                             |                       |
| Temperature coefficient            | 0.1%/°C typ.                                                            | n/a                   |
| Typical sensitivity error at 2mm/s | $\pm 5\%$ from 2Hz to 400Hz                                             | $\pm 20\%$ above 10Hz |
|                                    | -30% / + 5% from 0.5Hz to 2Hz                                           |                       |

**Power**

|                       |                                                      |
|-----------------------|------------------------------------------------------|
| • Voltage             | +24 V <sub>DC</sub> ±10% or -24 V <sub>DC</sub> ±10% |
| • Current consumption | Approx. 15mA                                         |

**ENVIRONMENTAL****Temperature range**

|             |               |
|-------------|---------------|
| • Operation | -20° to +80°C |
| • Storage   | -40° to +80°C |

|          |                      |
|----------|----------------------|
| Humidity | Resistant to 100% RH |
|----------|----------------------|

**Acceleration limit**

|                        |     |
|------------------------|-----|
| • Shock                | 50g |
| • Continuous vibration | 5g  |

|     |                           |
|-----|---------------------------|
| EMC | Acc. to EN 61326-2-3:2006 |
|-----|---------------------------|

|                     |                                              |
|---------------------|----------------------------------------------|
| Fluid compatibility | Withstands contact with water, oil, solvents |
|---------------------|----------------------------------------------|

|                    |                        |
|--------------------|------------------------|
| Ingress Protection | IP68 as per DIN 40 050 |
|--------------------|------------------------|

**PHYSICAL**

|                        |          |
|------------------------|----------|
| Sensor dimensions [mm] | ø42 × 84 |
|------------------------|----------|

|               |                        |
|---------------|------------------------|
| Body material | Stainless steel 1.4313 |
|---------------|------------------------|

|        |      |
|--------|------|
| Weight | 450g |
|--------|------|

|              |                                                                                                                                                                             |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Output cable | ø5mm cable with top radial exit via push-pull connector or cable gland with ø10mm flexible metal conduit covered by PVC IP68. All version finished by open end termination. |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

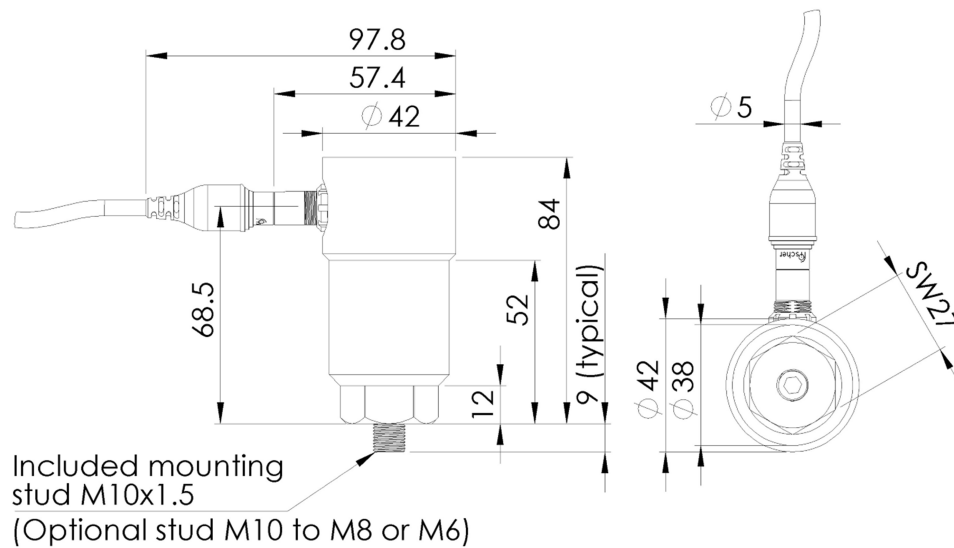
|                          |                                                            |
|--------------------------|------------------------------------------------------------|
| Mounting stud (included) | M10x1.5, length 20mm, stainless steel or adapter in option |
|--------------------------|------------------------------------------------------------|

**FIELD WIRING**

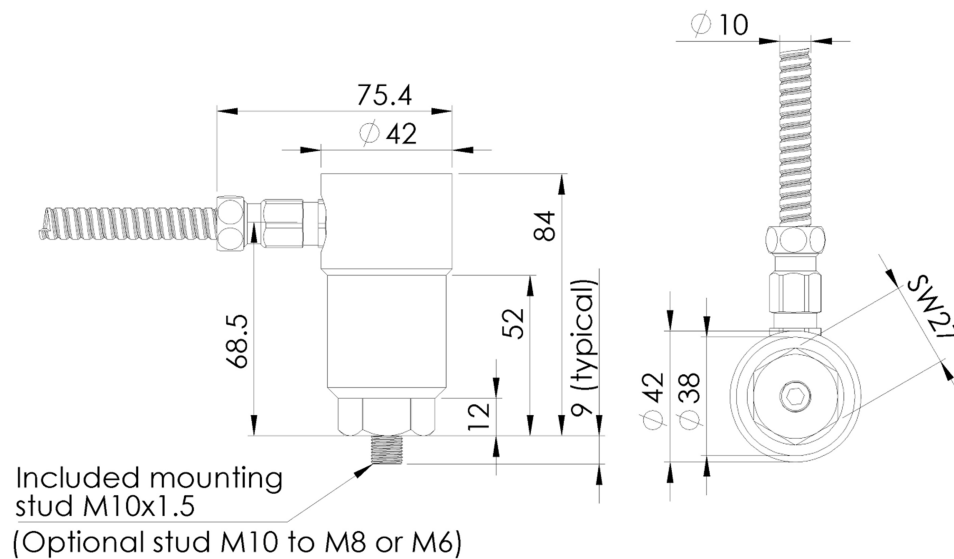
| Termination colour | +24V <sub>DC</sub> version  | -24V <sub>DC</sub> version |
|--------------------|-----------------------------|----------------------------|
| Brown              | +24V                        | 0V                         |
| White              | 0V                          | +24V                       |
| Green              | Linearized output           |                            |
| Yellow             | Non-linearized output (raw) |                            |
| Clear              | Shield                      |                            |

## MECHANICAL DRAWING

### C3 OPTION (PUSH-PULL CONNECTOR)



### C1 OPTION (INTEGRAL CABLE)



## ORDERING INFORMATION

Part type LVS-101 & LVS-201  
 Ordering Number 05.X01.008 CX-YX-LX

|          |                        |            |                      |
|----------|------------------------|------------|----------------------|
| <b>X</b> | Mounting position      | <b>1</b>   | Horizontal (LVS-101) |
|          |                        | <b>2</b>   | Vertical (LVS-201)   |
| <b>C</b> | Connection Options     | <b>1</b>   | Integral cable       |
|          |                        | <b>3</b>   | Push-pull connector  |
| <b>Y</b> | Power supply & bias    | <b>0</b>   | +24V / +12V Bias     |
|          |                        | <b>1</b>   | -24V / -12V Bias     |
|          |                        | <b>2</b>   | +24V / +6V Bias      |
|          |                        | <b>3</b>   | -24V / -6V Bias      |
| <b>L</b> | Extension cable length | <b>5M</b>  | 5m                   |
|          |                        | <b>10M</b> | 10m                  |

Exemple : 05.101.008 C3-Y2-L10M: LVS-101, push-pull connector, +24V / +6V Bias, 10m extension cable length.

## ACCESSORIES

| Ordering code | Description                             |
|---------------|-----------------------------------------|
| 901.0751      | Mounting stud M10 to M8                 |
| 901.0752      | Mounting stud M10 to M6                 |
| 25.140.681    | Temporary mounting magnet : See PMH-140 |

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Quality certification



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