
# DynaLabs DYN-C-3000-LN Triaxial Capacitive Accelerometers User Manual



Contents



DynaLabs

## DynaLabs DYN-C-3000-LN Triaxial Capacitive Accelerometers




**Product Support**
If at any time you have questions or problems with the DYN-C-3000-LN sensors, please contact a Dynalabs engineer at:

- Phone: +90 312 266 33 34 (9 a.m. to 5 p.m., UTC +3)
- E-mail: **info@dynalabs.com.tr**.

**Warranty**
Our products are warranted against defective materials and workmanship for one year. Defects arising from user errors are not covered by the warranty.

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## Introduction

Capacitive accelerometers are based on proven micro-electro-mechanical systems (MEMS) technology. These capacitive accelerometers are reliable and long-term stable. These sensors are Differential Ended type DC

response sensors. The advantages of these sensors are their outstanding temperature stability, external noise immunity, and their lightweight. These sensors feature standard reliable aluminum housing with protection class IP68. Steel housing is also possible.

Dynalabs 3000LN series triaxial accelerometers provide Low noise – high resolution with an outstanding noise performance from 9 to 680 µg/√Hz. These accelerometers provide a wide frequency range (±5%) from 250 Hz to 1,500 Hz

**DYN-C-3000-LN sensors offer the following options;**

- Custom Cable Length
- Custom Housing Material
- Custom Connector
- Base plate


## General Information

**Unpacking and Inspection**
Dynalabs products provide adequate protection for undamaged products to be transported. Document the damages that occur indirectly during the transport and contact the customer representative.

**System Components**
The DYN-C-3000-LN has the following components:

- MEMS Sensor
- Calibration Certificate
- Product Manual

#### Specifications

**Specifications Datasheet**

| | | 3002LN | 3005LN | 3010LN | 3030LN | 3050LN | 3100LN | 3200LN |
|---|---|---|---|---|---|---|---|---|
| **Full scale acceleration** | (g) | ±2 | ±5 | ±10 | ±30 | ±50 | ±100 | ±200 |
| Sensitivity | (mV/g) | 1,350 | 540 | 270 | 90 | 54 | 27 | 13.5 |
| Frequency range (±5%) | (Hz) | 700 | 1,150 | 2,000 | 2,300 | 2,700 | 2,900 | 2,500 |
| Non-linearity (full scale) | (%) | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| Noise (in-band) | (µg/√Hz) | 9 | 21 | 40 | 100 | 180 | 340 | 680 |
| Bias temperature | (mg/°C) | ±0.2 | ± 0.5 | ± 1 | ± 3 | ± 5 | ± 10 | ± 20 |
| Shock survivability | (g) | 2,500 | 2,500 | 2,500 | 3,000 | 3,000 | 3,000 | 3,000 |

#### Environmental

### Environmental Specifications Datasheet

| | |
|---|---|
| Protection Level | IP 68 |
| Operating Voltage | 5 V – 20 V |
| Operating Temperature | -40 °C to +100 °C |
| Operating Current Consumption mA | 21 mA |
| Isolation | Case isolated |

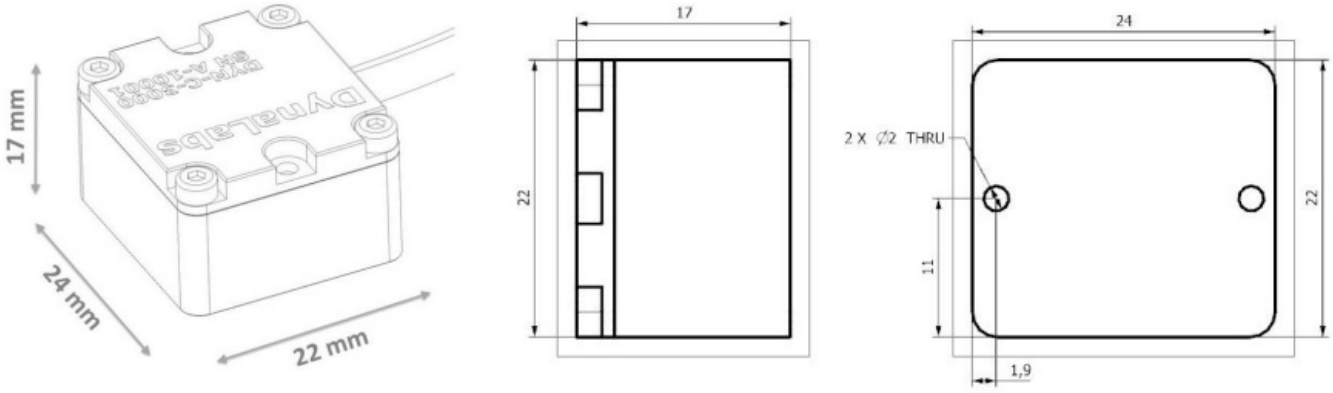
#### Physical

### Physical Specifications Datasheet

| | |
|---|---|
| Sensing Element | MEMS Capacitive |
| Housing Material | Aluminum or Steel |
| Connector (Optional) | D-Sub 9 or 15 pin, Lemo, Binder |
| Mounting | Adhesive or screw mount |
| Base plate (Optional) | Aluminum or Steel |
| Weight (without cable) | 21g (aluminum)<br>45 g (steel) |

#### Outline Drawing

The dimensional properties of DYN-C-3000-LN sensors are given below;




## Operation and Installation

### General

The general sensor connector configuration is given below; Cable Code/Pin Configuration:

- **Red:** V + Power supply voltage +5 to +20 VDC
- **Black:** Ground Power GND
- **X-Axis:** Yellow: Signal(+) Positive, analog output voltage signal for differential mode.
    - **Purple:** Signal(-) Negative, analog output voltage signal for differential mode.
- **Y-Axis: Blue:** Signal(+) Positive, analog output voltage signal for differential mode.
    - **Y-Axis: Blue:** Signal(+) Positive, analog output voltage signal for differential mode.
- **Z-Axis: White:** Signal(+) Positive, analog output voltage signal for differential mode.
    - **Orange:** Signal(-) Negative, analog output voltage signal for differential mode.

#### WARNING

- Never connect the power supply and/or the power ground to yellow, purple, blue, green, white, and/or orange cables.
- Never connect the power supply to the power ground. Always use a clean power source and check the voltage range.

## Sensor Static Calibration Verification

Using gravity, voltage values are measured in the + and – gravity directions, providing a value of ±1 g. The measurement should be made as follows;

When the acceleration value of 3000LN series sensors is entered into the data acquisition system, the sensor shows +1 g with the effect of gravity, which is in the direction of the axis to be calibrated. When the sensor is positioned in the opposite direction to the axis to be calibrated, the arrow shows -1g as shown below under the effect of gravity. Using gravity, the voltage values that provide 1 g in the + and – directions are measured and compared with the catalog value. The calibration value should be close to the catalog value with 10% tolerance. Sensor catalog sensitivity values are given.



## Declaration of Conformity

This declaration of conformity is issued under the sole responsibility of the manufacturer. The product(s) are developed, produced, and tested according to the following EC- directives:

- 2014/35/EU – Low Voltage Directive (LVD)
- 2006/42/EU – Machinery Safety Directive
- 2015/863/EU – RoHS Directive

**Applied standards:**

- EN 61010-1:2010
- EN ISO 12100:2010
- MIL-STD-810-H-2019 (Test Methods: 501.7 – High Temperature, 502.7 – Low Temperature, 514.8 – Vibration, 516.8 – Shock)

DYNALABS MÜHENDİSLİK SANAYİ TİCARET LİMİTED ŞİRKETİ declares that the above-mentioned products meet all the requirements of the above-mentioned standards and regulations.

Murat Aykan, Technical Manager Ankara, 15.07.2021.

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## Documents / Resources

| | |
|---|---|
| DynaLabs | DynaLabs DYN-C-3000-LN Triaxial Capacitive Accelerometers [pdf] User Manual<br>DYN-C-3000-LN Triaxial Capacitive Accelerometers, DYN-C-3000-LN, Triaxial Capacitive Accelerometers, Capacitive Accelerometers, Accelerometers |