



**Model DYN-PM-10  
10 N PM Shaker  
Product Manual**

## **Product Support**

If at any time you have questions or problems with the DYN-PM-10 shaker, please contact a Dynalabs engineer at:

Phone: +90 312 386 21 89 (9 a.m. to 5 p.m., UTC +3)

e-mail: info@dynamalabs.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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## 1) Introduction

The DYN-PM-10 is designed to provide dynamic force excitation for vibration and shock testing of small sized mechanical structures.

The DYN-PM-10 is a compact, lightweight and powerful general purpose electrodynamic shaker providing up to 10 N peak sine force.

## 2) General Information

### 2.1) 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. Check all components of the shaker. If there is a defect, please contact us.

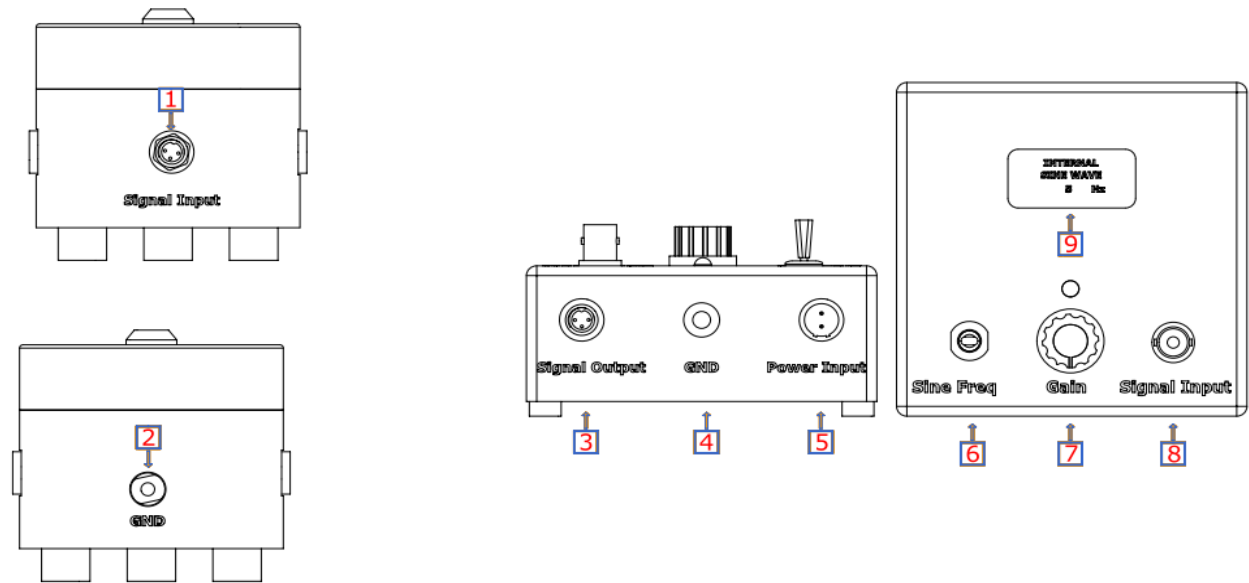
### 2.2) System Components

DYN-PM-10 has the following components:

- Electrodynamic Shaker Body
- Amplifier (DYN-SA-150)
- Power Adapter
- Power Cable
- Signal Cable
- Ground Cable
- User Manual

### 2.3) Theory of Operation

DYN-PM-10 is an electromagnetic actuator. Electromagnetic actuators are basically a voice coil consisting of magnet and coil. The moving element can be a coil or magnet depending on the design requirements. The moving element is usually suspended by an elastic spring. DYN-PM-10 has a stationary coil (drive coil) whose current is controlled to produce vibration. The stationary magnetic field is produced by a magnet.



Item	Description
1	External Signal Input
2	GND
3	Signal Output
4	GND
5	DC Power Input
6	Sine Frequency Generator
7	Gain Knob
8	External Signal Input
9	LCD Display

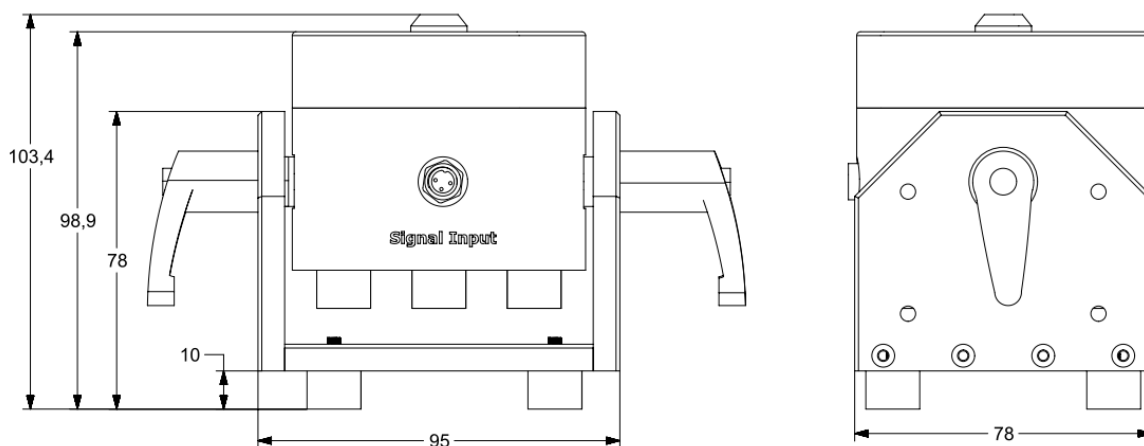
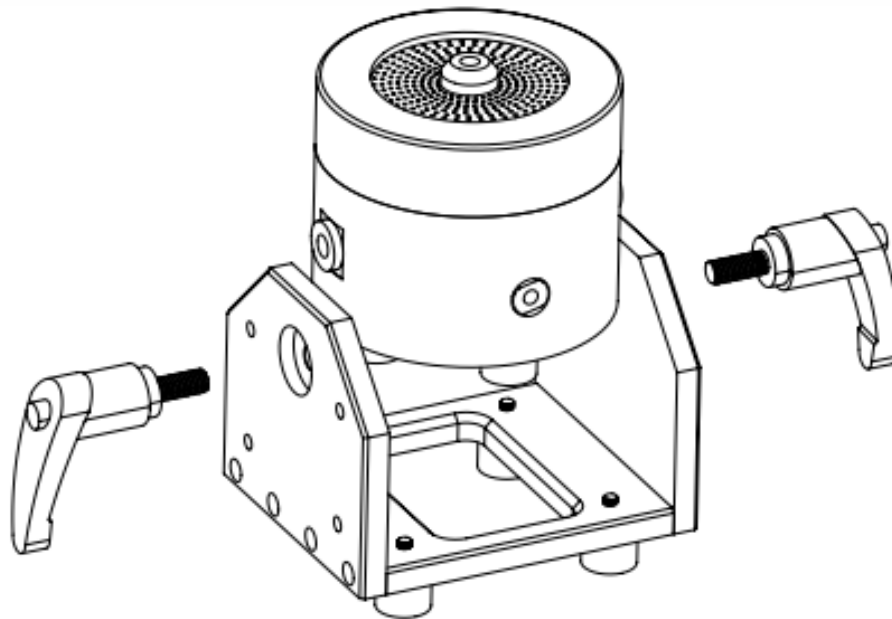
## 2.4) Specifications

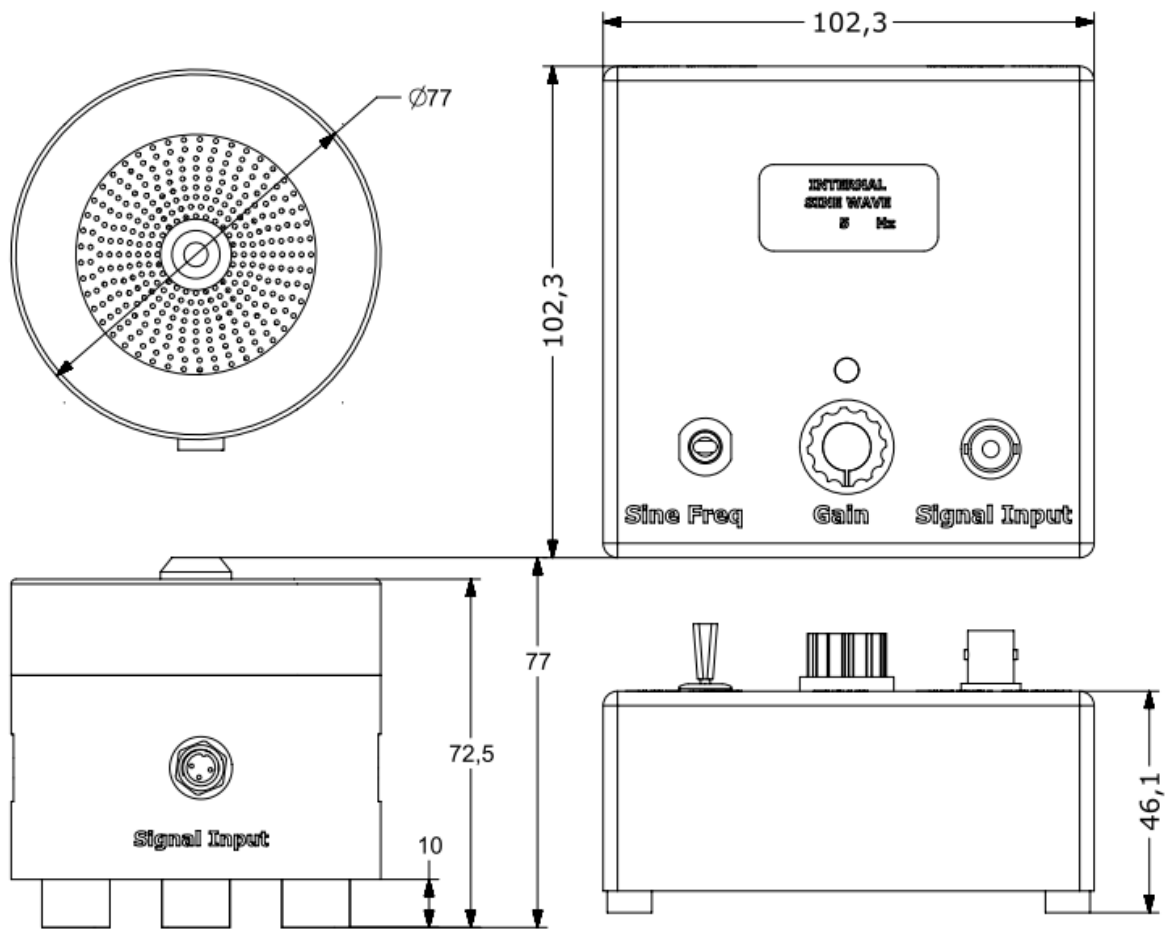
<b>Parameters</b>	<b>Specifications</b>
Excitation Type	Vertical or Horizontal
Output Force (Sinus)	10 N
Frequency	10-10000 Hz
Displacement (Peak to Peak)	4 mm
Shaker Weight	Shaker body (1 kg) + outer frame (0.3 kg)
Suspension	Carbon Fiber
Cooling System	Natural Convection
Operating Temperature Range	5-35 °C
Maximum Input Current	4A (RMS)
<b>AMPLIFIER</b>	<b>EXTERNAL</b>
Amplifier Weight	0.65 kg
Power Supply Voltage	19V DC
Power Supply Current	4.74 A
External Signal Voltage Level	1 VAC(PEAK)

## 2.5) Outline Drawing

The dimensional properties of DYN-PM-10 shakers are given below. All dimensions are in mm.

It can be used by removing the outer frame and the shaker body.



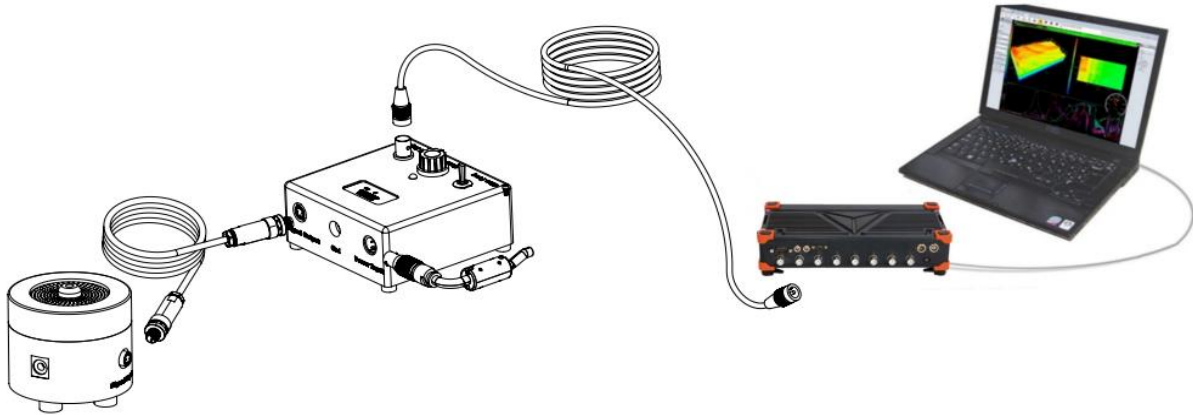




## 3) Operation and Installation

### 3.1) General

The general shaker connector configuration is given below.

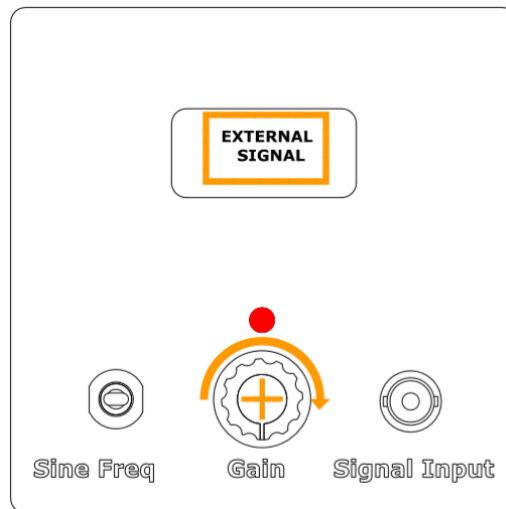


The Gain Knob is a push-pull and rotational switch. The amplifier is in External Signal Mode when the Gain Knob is pushed in and the amplifier is in Internal Signal Mode when it is pulled out.

In order to protect the amplifier from electrical problems, it is advised to turn the Gain Knob counter clockwise to the lowest gain position before connecting the external signal cable or before changing operational modes.

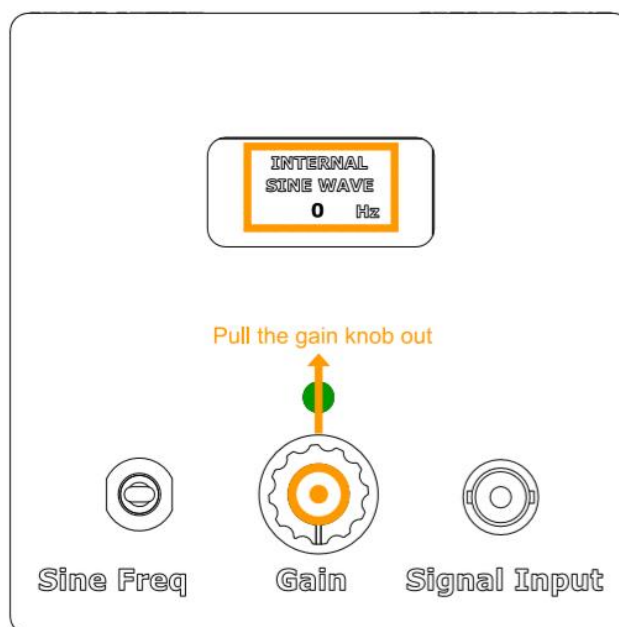
### 3.1.1-) External Signal Mode:

Connect DC power source and drive signal to shaker power input and signal input respectively. Start the external signal source. Adjust the Gain of the amplifier by turning the Gain Knob clockwise.

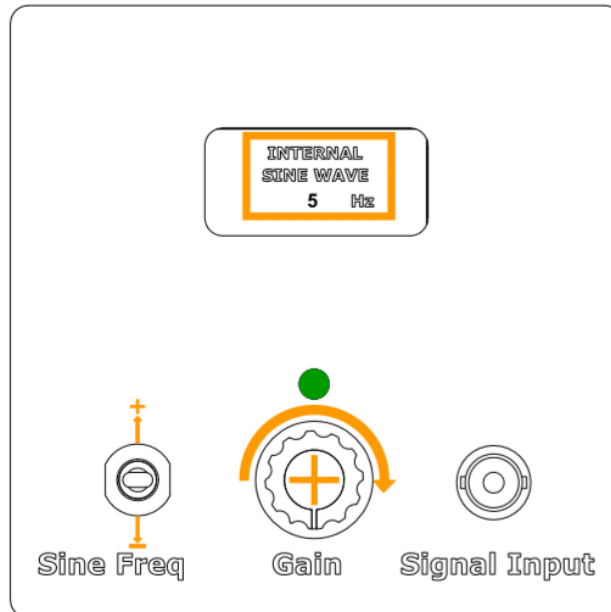


### 3.1.2-) Internal Signal Mode:

The amplifier can generate sine signal from 1Hz to 15kHz with 1 Hz increments that the user can adjust with the Sine Frequency Generator Switch. Connect DC power source and drive signal to shaker power input. Pull the Gain Knob out.



Raise or lower the Sine Frequency Generator Switch to the desired Sine frequency. Adjust the Gain of the amplifier by turning the Gain Knob clockwise. The frequency of the generated sine signal will be visible on the LCD Screen.



### 3.2) Power Requirements

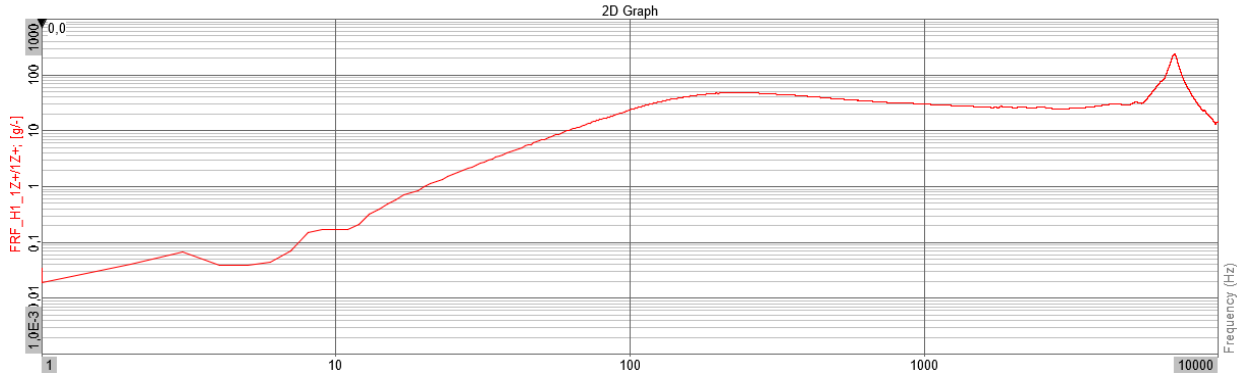
DYN-PM-10 has an external power amplifier which is powered by its power adaptor. Please note the output voltage and current ratings of the adaptor if a replacement adaptor is to be used.

### 3.3) Cooling

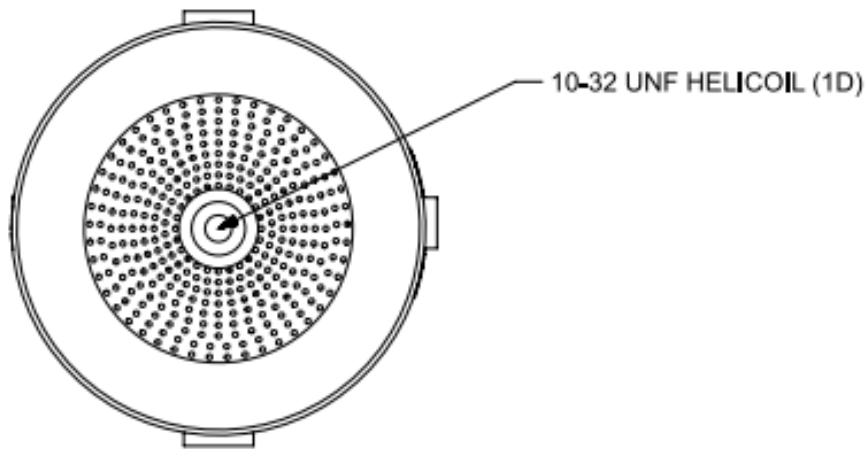
DYN-PM-10 does not require forced cooling. Air convection cooling is sufficient for the force levels given in the specifications.

## 3.4) Frequency Response

The following figure shows the acceleration levels/Input voltage versus frequency of the shaker.



## 3.5) Mounting Interface



## **4) Maintenance and Troubleshooting**

The DYN-PM-10 shaker is a sealed device requiring no maintenance if the operating instructions described in this manual are followed. Repair of the coil, exciter body or magnet core should not be attempted. Please return the shaker to Dynalabs for proper repair.

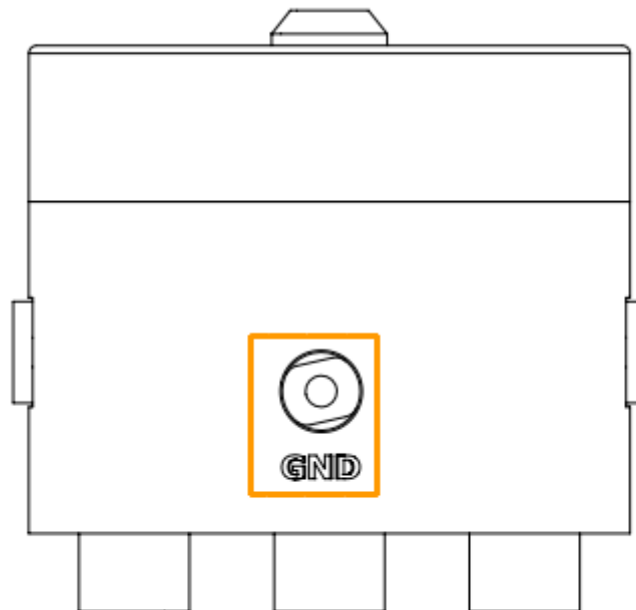
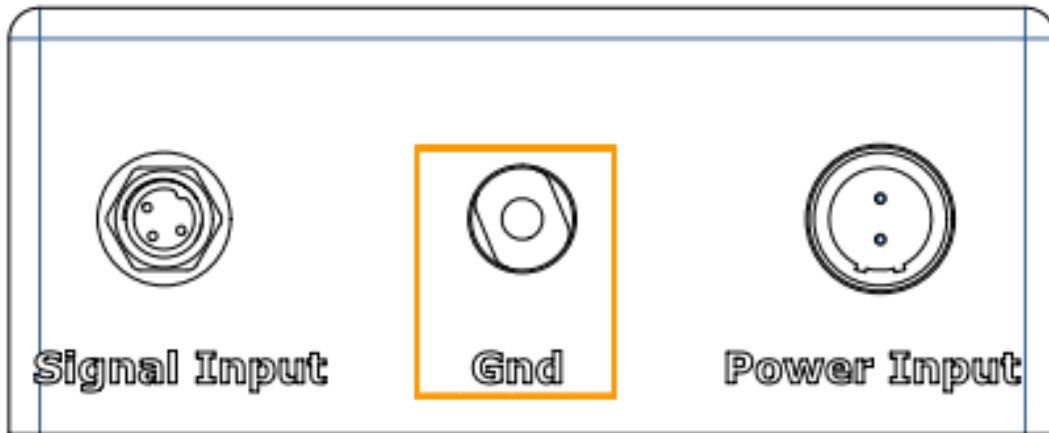
## **5) Safety**

Please ensure that this manual section is reviewed and understood prior to installation, operation or maintenance of the equipment. The danger of electrical shock or fire always exists in electrical equipment.

The DYN-PM-10 Shaker is designed for safe operation. Safety features such as electrical insulation on outer surfaces are provided for the safe operation of the shaker system. Always monitor the applied voltage to the amplifier and shut down the shaker if the temperature of the shaker body rises drastically or smoke is observed from the shaker due to high voltage levels applied.

## 5.1) Grounding

The shaker is internally grounded via the power adapter. However, if further grounding is necessary a grounding socket is available on the shaker as shown. Appropriate grounding cable is also supplied with the shaker.



## 6) Declaration of Conformity

# DynaLabs



*This declaration of conformity is issued under the sole responsibility of the manufacturer. The product(s) are developed, produced and tested according to 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 above mentioned products meet all the requirements of the above mentioned standards and regulations.*

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Canan Karadeniz, General Manager  
Ankara, 15.07.2021