SINGLE POINT BEAM LOAD CELL

# LCB27 Series Instruction Manual

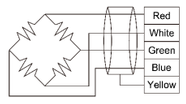
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## 1 Introduction

- The LCB27 Series single-point load cells feature a compact design with dimensions of 100 mm in length and 15 mm in height. The LCB27 Series is ideal for weighing platforms used in weighing, mixing, and filling applications. The single point design allows for simplified construction of weighing systems.
- To ensure proper installation of high-accuracy, high-responsiveness load cells, both the installation environment and structural design must be carefully considered. To install the load cell properly, the static conditions, as well as dynamic factors (e.g., shock and vibration) must be considered. Please read this instruction manual thoroughly and install the load cell correctly to achieve high-accuracy performance.

## 2 Specifications

| MODEL | LCB27K006 | LCB27K010 | LCB27K015 | LCB27K020 |
|---|---|---|---|---|
| Rated capacity (Mass) (R.C.) | 58.8 N (6 kg) | 98 N (10 kg) | 147 N (15 kg) | 196 N (20 kg) |
| Allowable moment | 2.08 N·m | 3.47 N·m | 5.20 N·m | 6.93 N·m |
| Rated deflection | 0.30 mm | 0.15 mm | 0.15 mm | 0.17 mm |
| Natural frequency | 335 Hz | 503 Hz | 598 Hz | 666 Hz |
| Net weight | 96 g | 107 g | 108 g | 108 g |
| Rated output (R.O.) | 2 mV/V ± 10% | | | |
| Combined error | 0.02 % of R.O. | | | |
| Non-linearity | 0.012 % of R.O. | | | |
| Hysteresis | 0.012 % of R.O. | | | |
| Repeatability | 0.011 % of R.O. | | | |
| Recommended excitation voltage | 5 V to 12 V DC | | | |
| Maximum excitation voltage | 15 V DC | | | |
| Zero balance | ± 5 % of R.O. | | | |
| Input resistance | 420 Ω ± 30 Ω | | | |
| Output resistance | 350 Ω ± 5 Ω | | | |
| Insulation resistance | Greater than 2000 MΩ at 50 V DC | | | |
| Temperature effect on zero | 0.023 % of R.O./10 °C | | | |
| Temperature effect on span | 0.014 % of Load/10 °C Typ. | | | |
| Compensated temperature range | -10 °C to 40 °C | | | |
| Operating temperature range | -10 °C to 40 °C | | | |
| Safe overload limit | 150 % of R.C. | | | |
| Ultimate overload | 200 % of R.C. | | | |
| Cable specifications | Type: Φ 3.5, 4-core shielded cable<br>Soldered: Soldered<br>Length: 0.4 m | | | |
| Cable color code and signals |  Red: EXC (+)<br>White: EXC (-)<br>Green: SIG (+)<br>Blue: SIG (-)<br>Yellow: SHIELD | | | |
| IP rating | IP65 | | | |
| Material | Aluminum | | | |
| Platform size | 300 × 300 mm | | | |

## 3 Notes on Installation

Use care not to damage the resin coating of the load cell. When installing, do not apply excessive load to the load cell.

### 3.1 Installing on the base/Attaching the platform

1) The base should be rigid to prevent it from slanting or curving under normal operating conditions. If the base yields, the platform will bend and adversely affect the load cell.
2) The tare and the platform should be as light as possible to prolong the service life and excellent performance of the load cell.
3) Insert one spacer of 2 mm or greater thickness between the base and the load cell.
4) Ensure that the mounting surfaces for the load cell and the spacer have a surface roughness of Ra 25 or finer.
5) Use hexagon socket head bolts or high-tension hexagon head bolts with a minimum strength rating of Class 10.9 (JIS equivalent) when installing the load cell. Do not use standard commercial bolts, as their tensile strength is insufficient. For the LCB27 Series, the recommended tightening torque for M6 bolts is 12 N·m.
6) Make sure that the attaching surface is clean and free from foreign matter. Tighten the bolts while using much care not to apply unnecessary force (torsion or lateral load) to the load cell.
7) For the allowable dimensions of the platform, see Figure 1. Also, when designing a platform, refer to the "3.2. Overload precautions".

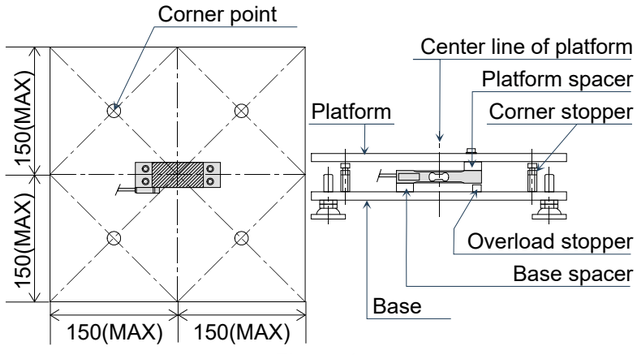



**Figure 1**

### 3.2 Overload precautions

1) **Safe overload limit**

When a load is applied to the center of the load cell, the safe overload limit is 150% of the rated capacity. The load cell will maintain its performance and functionality as long as the applied load remains within the safe overload limit. If a load exceeding the safe overload limit is applied, the load cell may no longer function properly, and its service life may be significantly reduced. If there is a possibility that the load may exceed the safe overload limit, be sure to install an overload stopper as described below to protect the load cell.

2) **Overload stopper**

Even a slight impact when placing a load on the platform can easily cause the applied force to exceed the safe overload limit. Therefore, be sure to attach an overload stopper just below the load end of the load cell.

**[Recommended installation]**

Attach the overload stopper so that the stopper comes into contact with the load cell before 150% of the rated capacity (including the measured load, platform, and tare weight) is applied to the center of the load cell. Ensure that the stopper has the largest possible contact area when in contact with the load cell. (See Figure 2.)

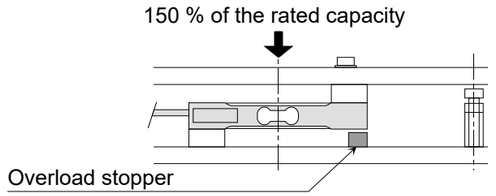



**Figure 2**

3) **Corner stoppers**

Even if the overload stopper is properly adjusted, excessive load may still be applied to the load cell due to base deflection when force is applied to the corners of the platform. If corner loading is expected during use, it is advisable to install four corner stoppers.

**[Recommended installation]**

It is advisable to attach the corner stoppers so that they come into contact with the platform before a moment greater than the specified maximum value is applied to the load cell. Ensure that each stopper has the largest possible contact area when in contact with the platform. (See Figure 3.)

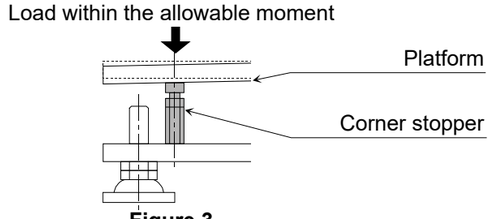



**Figure 3**

4) **Other safeguards**

If an overload or excessive shock force is likely to occur, overlay the platform with a shock absorbing pad.

If overloads occur frequently, consider using a load cell with a rated capacity approximately 2 to 3 times greater than the combined weight of the load to be measured, the platform, and the tare.

5) **Allowable moment**

If a moment greater than the specified maximum value is applied to the center of the load cell, the load cell may not function properly. Especially when the load is over one-third of the rated capacity, it may cause the moment to exceed the specified maximum value, even when within the maximum loading area. Under such a condition, place the object to be weighed on the platform directly above the center of the loading area so that the maximum moment will not be exceeded.

The moment applied to the load cell can be obtained as follows:

Moment [N ·m] = Distance from the center of gravity of the object to the load cell center [m] x mass of the object [kg]) x 9.8

## 4 Maintenance

1) Remove all dirt and dust from the load cell, and always use it in a clean environment.
2) Use a blower to clean the load cell. Do not wash using water.
3) Periodically inspect the overload stopper and corner stoppers.

## 5 Dimensions

Unit: mm

