LCCD20 シリーズ

圧縮型デジタルロードセル

LCCD20 Series

Compression Digital Load Cell

取扱説明書

Instruction Manual

LCCD20T010-K	LCCD20T010N-K
LCCD20T020-K	LCCD20T020N-K
LCCD20T030-K	LCCD20T030N-K
LCCD20T010-KC6	LCCD20T010N-KC6
LCCD20T020-KC6	LCCD20T020N-KC6
LCCD20T030-KC6	LCCD20T030N-KC6

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English

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1. List of LCCD20 series compression digital load cells

LCCD20T010-K	(with mounting brackets, rated capacity 98.07 kN (10 t), accuracy class C4)
LCCD20T020-K	(with mounting brackets, rated capacity 196.1 kN (20 t), accuracy class C4)
LCCD20T030-K	(with mounting brackets, rated capacity 294.2 kN (30 t), accuracy class C4)
LCCD20T010-KC6	(with mounting brackets, rated capacity 98.07 kN (10 t), accuracy class C6)
LCCD20T020-KC6	(with mounting brackets, rated capacity 196.1 kN (20 t), accuracy class C6)
LCCD20T030-KC6	(with mounting brackets, rated capacity 294.2 kN (30 t), accuracy class C6)
LCCD20T010N-K	(without mounting brackets, rated capacity 98.07 kN (10 t), accuracy class C4)
LCCD20T020N-K	(without mounting brackets, rated capacity 196.1 kN (20 t), accuracy class C4)
LCCD20T030N-K	(without mounting brackets, rated capacity 294.2 kN (30 t), accuracy class C4)
LCCD20T010N-KC6	(without mounting brackets, rated capacity 98.07 kN (10 t), accuracy class C6)
LCCD20T020N-KC6	(without mounting brackets, rated capacity 196.1 kN (20 t), accuracy class C6)
LCCD20T030N-KC6	(without mounting brackets, rated capacity 294.2 kN (30 t), accuracy class C6)

2. Precautions

Please read the following notes carefully in order to use this product correctly and safely. The contents described here summarize the main matters regarding safe handling of equipment. Notes specific to individual equipment are also described in the following text, so please read this document before use.

2.1. Requirements for construction

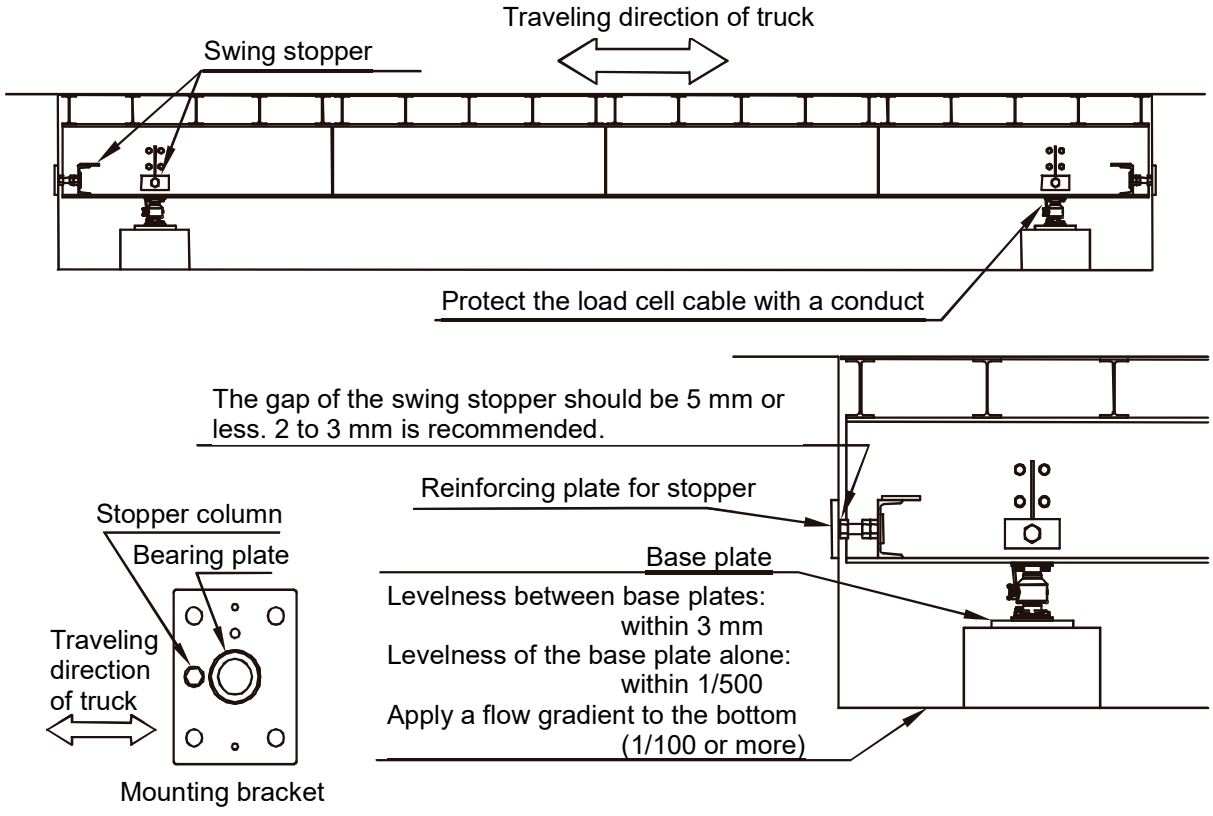
- ❑ The structure to which the load cell is attached should be designed to have the strength to sufficiently withstand the load.
- ❑ Base plates should be installed so they are flat and level.
  Levelness between base plates: within 3 mm (reference)
  Levelness of base plate alone: within 1/500 (reference)
- ❑ When installing the load cell in a pit, take drainage measures to prevent water from accumulating. Leaving the load cell in water for a long period of time may cause a malfunction.
  Add a flow gradient on the bottom (1/100 or more).
  Equip with a drain pipe, a drain sump and a drain pump.
- ❑ Be sure to install a swing stopper to restrict sway. The gap of the stopper should be 5 mm or less. The recommended gap is 2 to 3 mm.
- ❑ When installing the load cell outdoors, take measures to protect against direct sunlight or direct wind and rain exposure.

2.2. Precautions for construction

- ❑ The base part of the load cell is an important part that supports the load, so perform construction carefully.
- ❑ Read this manual to correctly set the direction of the load cell and the direction of the brackets.
- ❑ Let the load cell cable have slack so it is not pulled. Also protect with a conduit, etc. to prevent damage. Do not share a conduit with the power line.
- ❑ Apply grease to the contact surface between the load cell and the mounting brackets for lubrication and dust proofing.
- ❑ Be careful not to get dirt, mud, etc. on the contact surface between the load cell and the mounting brackets.
- ❑ Use lithium grease (all-purpose type grease) as the grease to be applied.
- ❑ Avoid incorrect wiring of the load cell cable. Incorrect wiring may damage the equipment.
- ❑ Do not connect the load cell to energized equipment. Also make sure that there is no error in connection before energizing.
- ❑ Do not apply a strong shock to the load cell.
- ❑ Do not provide voltage to the load cell exceeding the maximum applied voltage. The inside of the load cell may be damaged if that is done.
- ❑ When performing welding work with the load cell attached, connect the ground near the welding point so that no current flows in the load cell.

2.3. Setup example for truck scale

Construction of the foundation should be done carefully.



2.4. Precautions for installation

- ❑ Confirm that there are no problems with the tools and instruments to be used before performing work. Continued use of damaged or defective tools and equipment may cause serious accidents.
- ❑ For safety, wear a helmet and safety shoes when working.
- ❑ When placing a structure such as a truck scale on the load cell, place it slowly while checking safety. Be careful not to get your fingers caught. If you sense any problems, suspend work temporarily and confirm safety before restarting work.

2.5. Maintenance

Check the following items properly.

- ❑ Is the gap of the swing stopper appropriate? Is it free of clogging from dirt, mud, etc.?
- ❑ Is the pit free of water? (When installing the load cell in a pit)
- ❑ Are the load cell and mounting brackets free of deposits?
- ❑ Are the mounting bolts tight?
- ❑ Is the stopper column tight?
- ❑ Is there slack in the load cell cable?
- ❑ Are cable connections tight?
- ❑ Is the equipment free of electric leakage?

3. Introduction

- ❑ The LCCD20 series compression type digital load cell is a high-performance compression type double convex type digital load cell with rated capacity of 98.07 kN (10 t) to 294.2 kN (30 t) suitable for truck scales.
- ❑ Adjustment work can be done easily and quickly by combining with our indicator for digital load cells.
- ❑ Since the load cell body is a sealed structure and compliant with IP68, it can be safely used in harsh environments.
- ❑ The compact design makes installation and maintenance work easy.

Caution

Because the load cell has excellent accuracy and responsiveness, consideration is required for the structure and installation method of the equipment to be installed.

Please understand the contents of this manual in order to gain maximum performance, and install correctly.

4. Specifications

Item CD	LCCD20T010-K LCCD20T010N-K LCCD20T010KEX LCCD20T010NKEX	LCCD20T020-K LCCD20T020N-K LCCD20T020KEX LCCD20T020NKEX	LCCD20T030-K LCCD20T030N-K LCCD20T030KEX LCCD20T030NKEX	LCCD20T010-KC6 LCCD20T010N-KC6 LCCD20T010K6EX LCCD20T010NK6EX	LCCD20T020-KC6 LCCD20T020N-KC6 LCCD20T020K6EX LCCD20T020NK6EX	LCCD20T030-KC6 LCCD20T030N-KC6 LCCD20T030K6EX LCCD20T030NK6EX
Model	LCCD20T010-K	LCCD20T020-K	LCCD20T030-K	LCCD20T010-K	LCCD20T020-K	LCCD20T030-K
Rated capacity (R.C.)	98.07 kN (10 t)	196.1 kN (20 t)	294.2 kN (30 t)	98.07 kN (10 t)	196.1 kN (20 t)	294.2 kN (30 t)
OIML R60 accuracy class	C					
Maximum number of load cell intervals	4000			6000		
Humidity symbol	CH					
Minimum dead load (E_{min})	0 kg					
Maximum capacity (E_{max})	10 t	20 t	30 t	10 t	20 t	30 t
Safe load limit (E_{lim})	15 t	30 t	45 t	15 t	30 t	45 t
Minimum verification interval (V_{min})	1 kg	2 kg	3 kg	1 kg	2 kg	3 kg
Rated output (R.O.)	10000±5	20000±10	30000±15	10000±5	20000±10	30000±15
Combined error	0.025%R.O.			0.016%R.O.		
Compensated temperature range	-10°C ~+40°C					
Recommended excitation voltage	8VDC					
Maximum excitation voltage	12VDC					
Temperature effect on zero balance	0.019%R.O. / 10°C Typ.					
Temperature effect on span	0.010%Load / 10°C Typ.					
Output signal	RS-485 2wire type					
Cable diameter/length	4-core shielded cable φ8 / 12 m					
Protection class	Compliant with IP68 (Depth of water 1.5 m/100 hours)					
Surge countermeasures	Built-in gas tube arrester etc.					
Net weight	Approx. 11 kg (with mounting brackets), approx. 6 kg (loadcell)					

The correspondence between the color of the load cell cable core wire and the connection is as follows.

CAUTION Be careful not to make wiring mistakes.

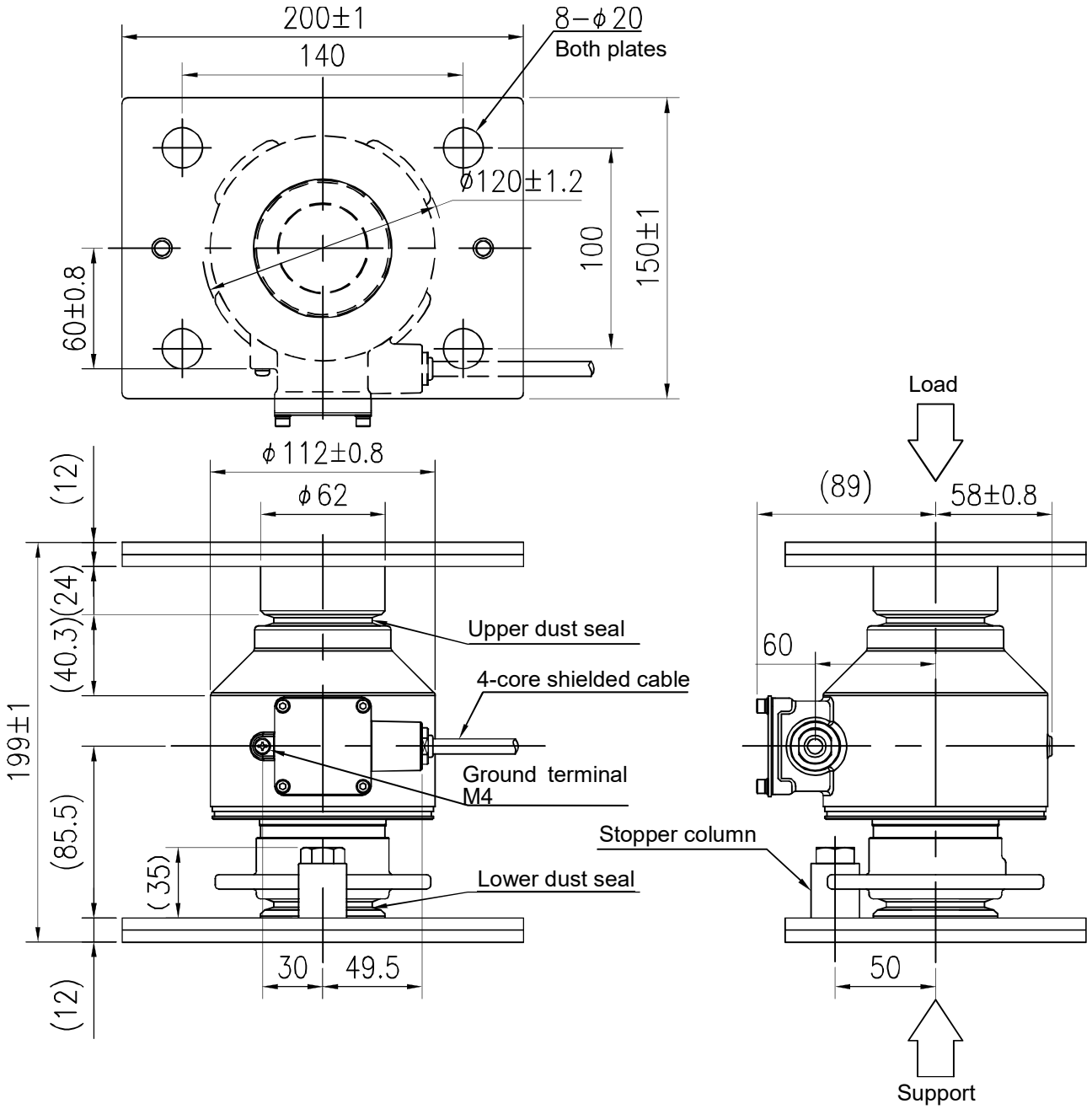
Red…Power **+** Green…Data **+**

White…Power **-** Blue…Data **-**

Yellow…Shield

・The polarity of data is assumed to be "+" for positive logic and "-" for negative logic.

5. External dimensions



Unit: mm

6. About the mounting brackets

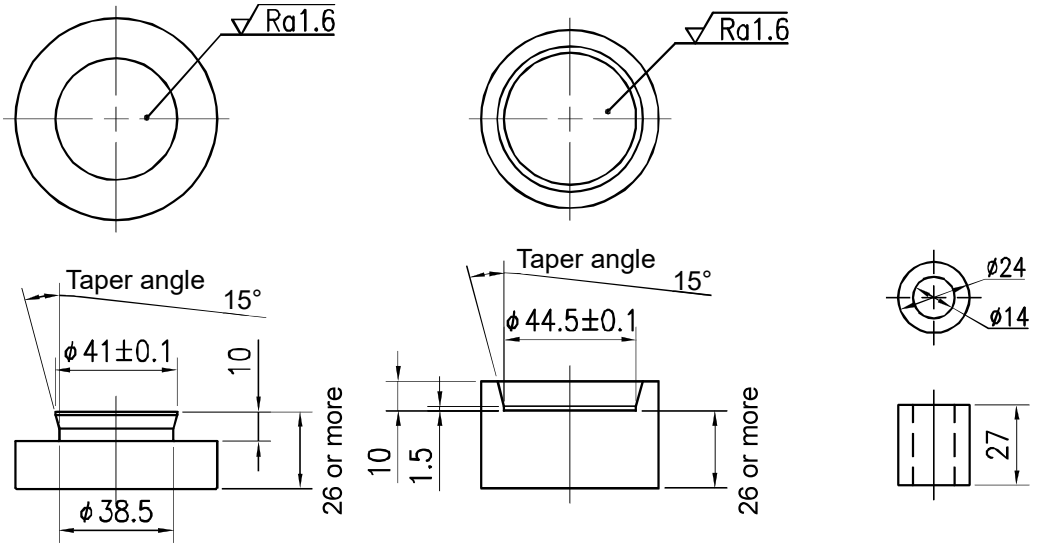
When manufacturing the mounting brackets, make the guide holes of the bearing plates to which load is applied and the stopper column are of the dimensions shown below. The hardness of the bearing plate and stopper column should be HRC 32~38.

The fastening bolts used for mounting the stopper column are as follows.

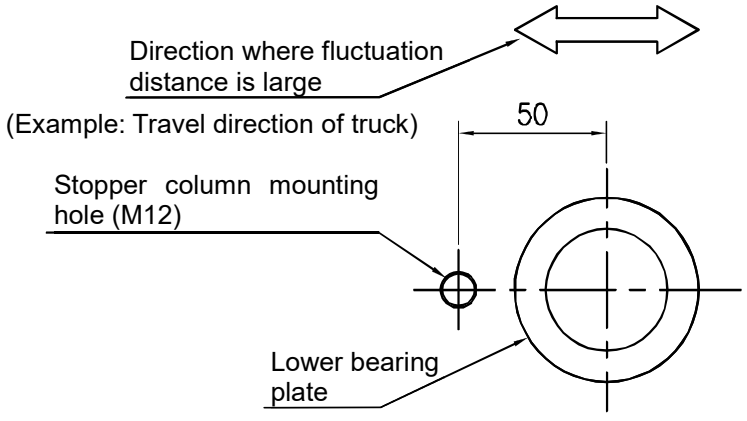
Fastening bolts: M12 hex bolts (Tensile strength class: 10.9)

Recommended tightening torque: 76 Nm

Attach the stopper column at a position 50 mm from the center, referring to the figure below.



Lower bearing plate　　Upper bearing plate　　Stopper column



Unit: mm

Stopper column mounting position

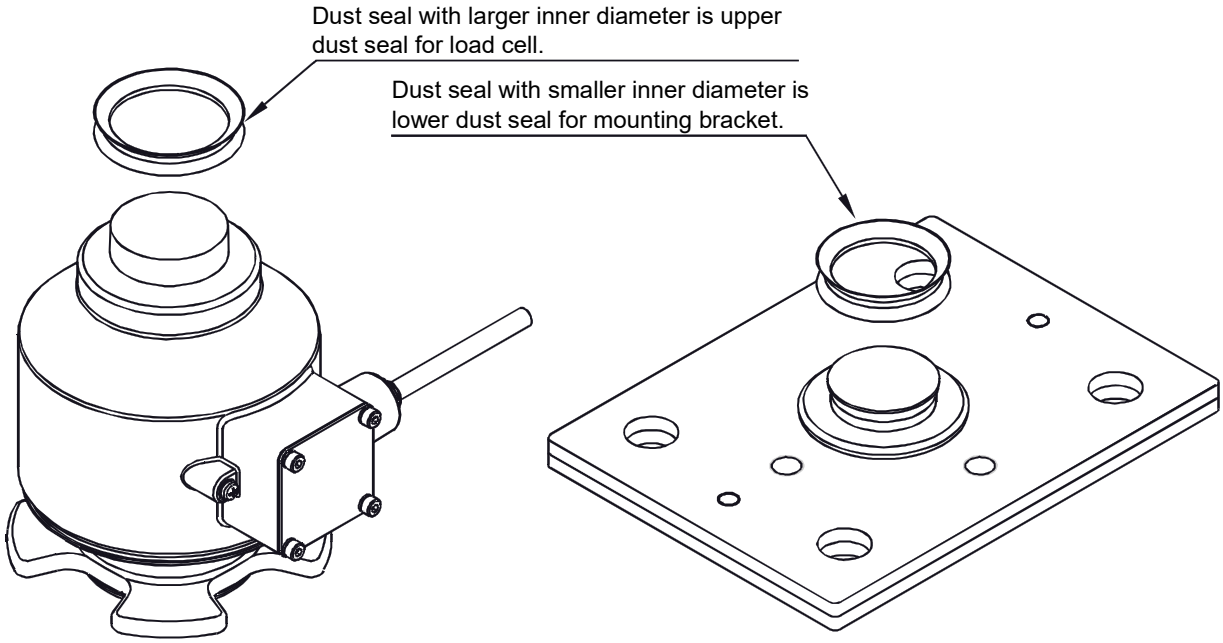
7. Installing the load cell

The description here is based on the type with mounting brackets. Refer to this installation method when installing the type without mounting brackets as well.

Step 1

Fit the upper dust seal onto the top of the load cell.

Fit the lower dust seal onto the lower mounting bracket.



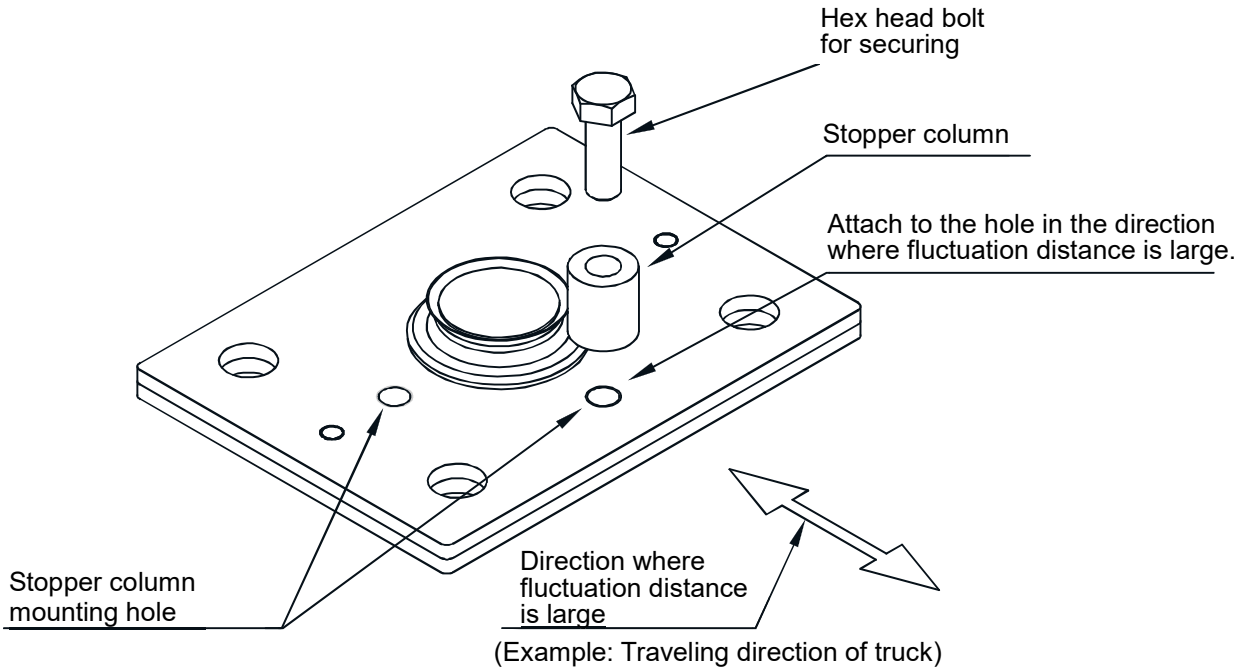
Step 2

Align the lower mounting bracket in the same direction as at installation, and then attach the stopper column with the M12 hex bolt to the mounting hole in the direction where fluctuation distance is large.

For example, in the case of a truck scale, align with the traveling direction of the vehicle.

Refer to the following recommended tightening torque for the bolt used to install the stopper column.

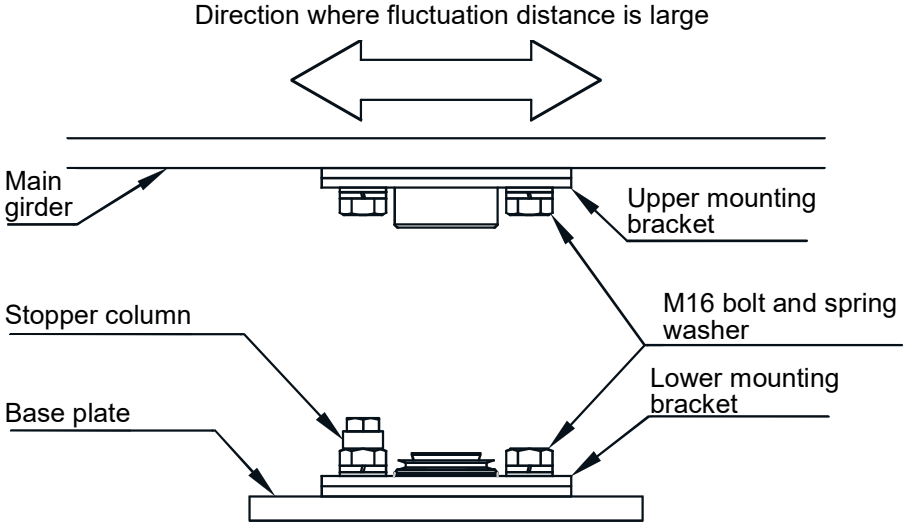
M12 hex bolt: 76 Nm



Step 3

Temporarily secure the lower mounting bracket to the base plate and the upper mounting bracket to the main girder respectively, referring to the figure shown below. To temporarily secure them, use M16 bolts and spring washers.

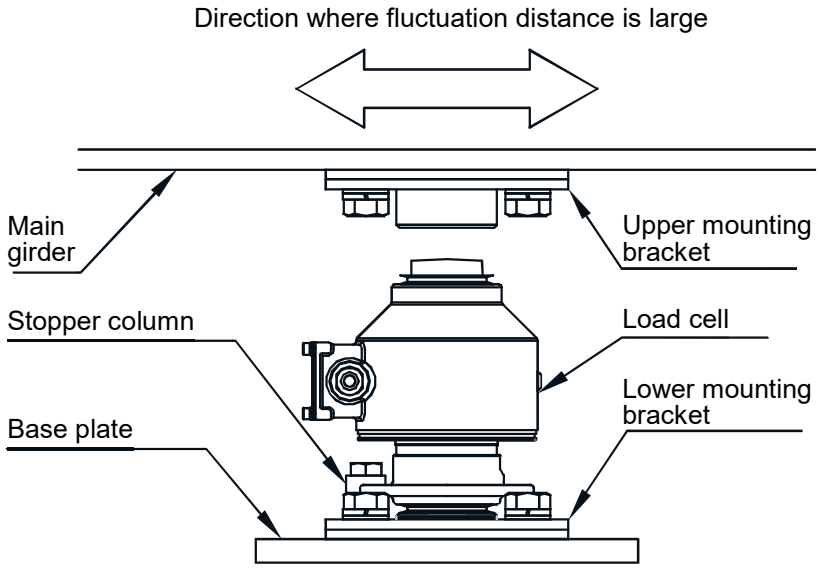
Before mounting, align the mounting brackets in the same direction as at installation.



Step 4

Attach the load cell to the lower mounting bracket. When installing the load cell, adjust the cable direction to an angle of 90 degrees to the direction where the fluctuation distance is large.

For example, in the case of a truck scale, align at an angle of 90 degrees to the traveling direction of the vehicle.

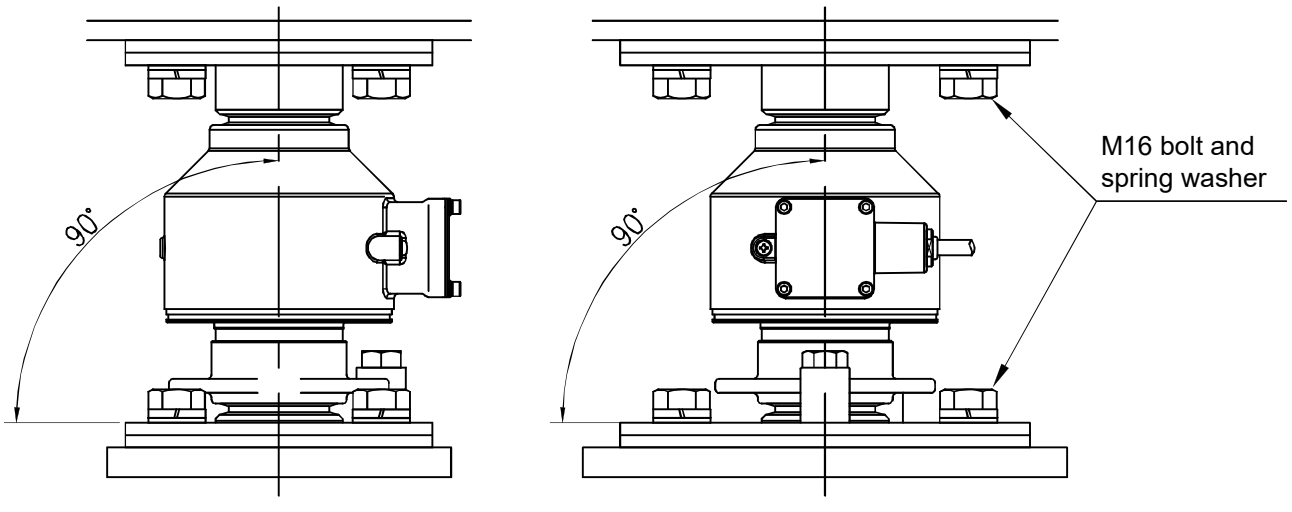


Step 5

Lower the main girder gradually while confirming the position of the mounting bracket and load cell.

Step 6

When the mounting bracket slightly touches the load cell, adjust the position of the mounting bracket so that the load cell stands vertically. Confirm the verticalness at two directions that differ by 90°. Make fine adjustments to the position of the lower or upper mounting bracket so that the tilt angle of the load cell is 0.5° or less.



Step 7

Once the position of the load cell (mounting bracket) is fixed, lower the main girder completely and tighten the mounting bolts.

The recommended tightening torque for the M16 bolts is as follows. Please use this for reference.

When using normal bolts: 100 Nm

When using high tension bolts: 200 Nm

Step 8

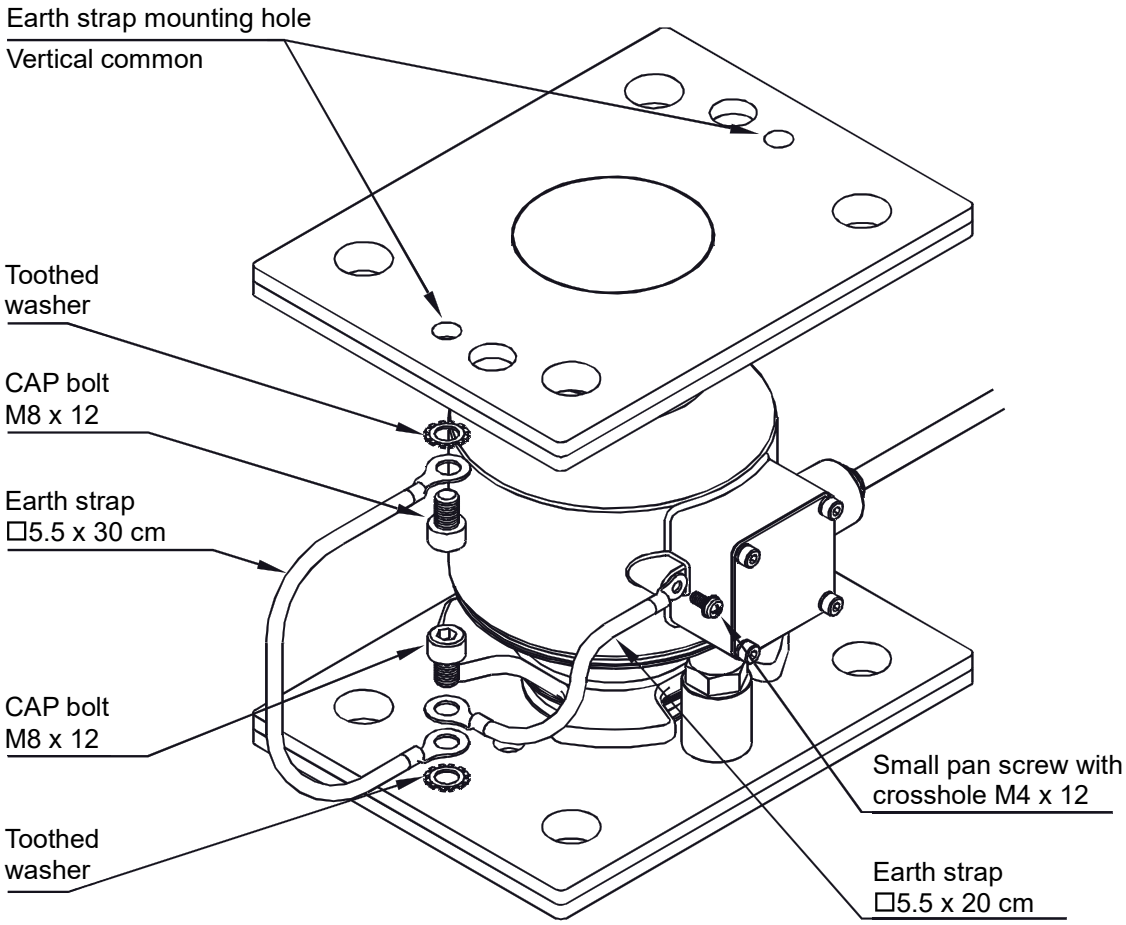
Two earth straps for surge protection are included with this load cell.

When installation of the load cell is completed, please attach the earth strap referring to the figures.

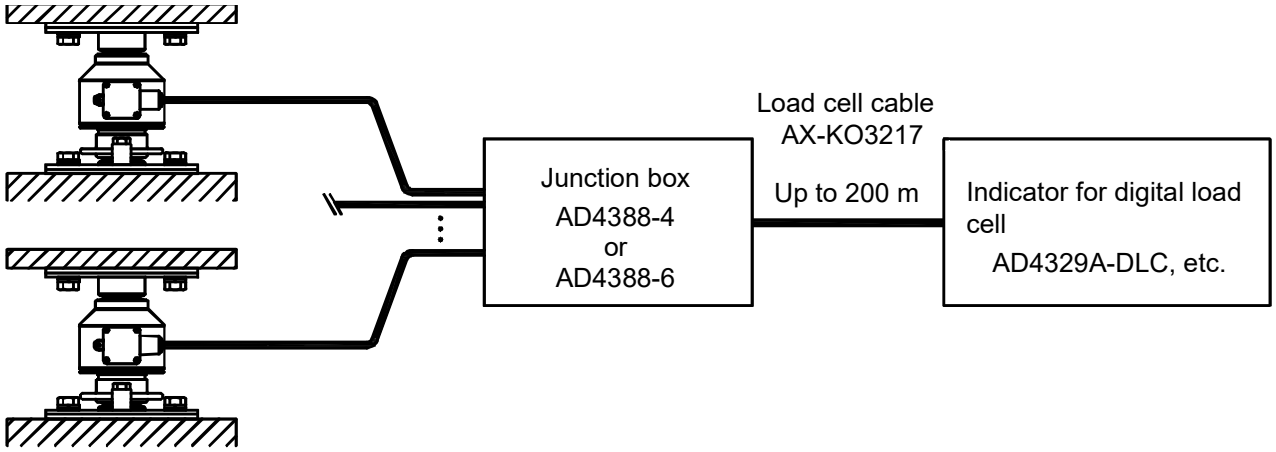
The recommended tightening torque of the bolt used to secure the ground strap is as follows. Please use this for reference.

CAP bolt (M8): 12.5 Nm

Small pan screw with crosshole (M4): 1.5 Nm



8. Examples of major systems



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