

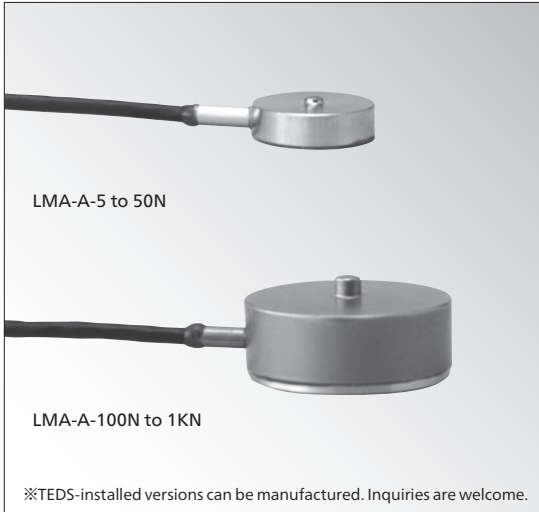
LMA-A

● 12 mm ϕ , 4 mm Thick (5 to 50 N) ● 5 N to 1 kN

Small-Sized Compression Load Cells



TRANSDUCERS



Compact, Lightweight, Low Price Suitable for Load Distribution Measurement

Compact and lightweight LMA-A series load cells can be used by merely putting or bonding on the measurement point or setting in a hollow.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 1\%$ RO
Hysteresis :	Within $\pm 1\%$ RO
Repeatability :	1% RO or less
Rated Output :	0.6 to 2 mV/V (1200 to 4000 $\mu\text{m/m}$) (LMA-A-5N) 0.75 to 2 mV/V (1500 to 4000 $\mu\text{m/m}$) (LMA-A-10N to 1KN)

Note : Rated output is sorted to one of the classes divided by every 2% difference in output value. Since the rated output stated in the Test Data Sheet is the center value of the class, it may have a maximum error of $\pm 1\%$.

Environmental Characteristics

Safe Temperature Range :	-10 to 60°C (however, noncondensing)
Compensated Temperature Range :	0 to 50°C (however, noncondensing)
Temperature Effect on Zero Balance :	Within $\pm 0.3\%$ RO/°C (LMA-A-5N) Within $\pm 0.2\%$ RO/°C (LMA-A-10N to 50N) Within $\pm 0.05\%$ RO/°C (LMA-A-100N to 1KN)
Temperature Effect on Output :	Within $\pm 0.2\%$ /°C (LMA-A-5N to 50N) Within $\pm 0.05\%$ /°C (LMA-A-100N to 1KN)

Electrical Characteristics

Safe Excitation Voltage :	7V AC or DC
Recommended Excitation Voltage :	1 to 5 VAC or DC
Input Resistance :	350 Ω \pm 2.5%
Output Resistance :	350 Ω \pm 2.5%
Cable :	4-conductor (0.035 mm ²) vinyl shielded cable, 1.7 mm diameter by 2 m long, bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

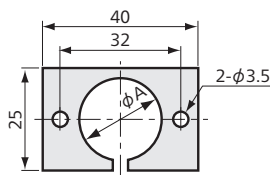
Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below.
Material :	A copper alloy and more than 100N are stainless steel.
Protection Rating :	IP64 JIS C 0920 splash-proof type

Optional Accessory Mount Base CFM-A

Model	Rated Capacity	Natural Frequency (Approx.)	Weight (Approx.)*	Mount Base
LMA-A-5N	5N	15.3kHz	1.5g	CFM-5A
LMA-A-10N	10N	17.5kHz		
LMA-A-20N	20N	24.8kHz		
LMA-A-50N	50N	32.6kHz		
LMA-A-100N	100N	21.6kHz	11g	CFM-100A
LMA-A-200N	200N	29.7kHz		
LMA-A-500N	500N	43.9kHz		
LMA-A-1KN	1kN	53kHz		

*not including cable

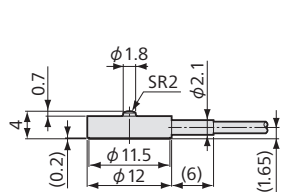
Mount Base CFM-A



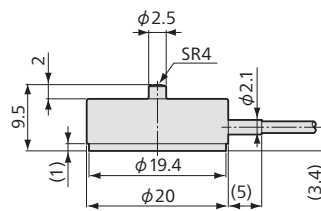
Model	ϕA	Thickness
CFM-5A	12.2	1.5
CFM-100A	20.2	3.0

Material: Aluminum alloy

Dimensions

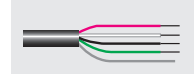


LMA-A-5 to 50N



LMA-A-100N to 1KN

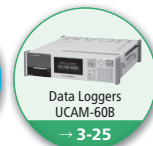
Bared at the tip



● Physical quantity indication

● Static measurement

● Dynamic measurement

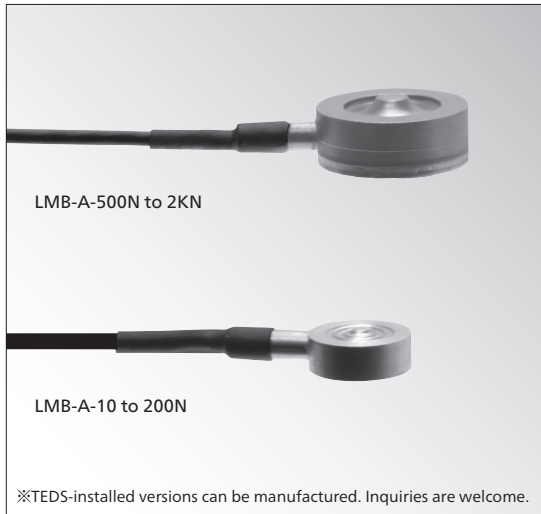


LMB-A

● 10 N to 2 kN

2
-14

Small-Sized Compression Load Cells



Compact, Lightweight, Low Price Suitable for Load Distribution Measurement

Ultra-small and lightweight LMB-A series load cells can be used by merely putting or bonding on the measurement point or setting in a hollow. (Patent pending)

Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within $\pm 0.5\%$ RO
Hysteresis:	Within $\pm 0.5\%$ RO
Repeatability:	Within $\pm 0.3\%$ RO
Rated Output:	1.4mV/V(2800 μ m/m) or more
Note:	Rated output is sorted to one of the classes divided by every 1% difference in output value to the rated capacity. Since the rated output stated in the Test Data Sheet is the center value of the class, it may have a maximum error of $\pm 0.5\%$.

Environmental Characteristics

Safe Temperature Range:	-10 to 80°C (noncondensing)
Compensated Temperature Range:	0 to 70°C (noncondensing)
Temperature Effect on Zero Balance:	Within $\pm 0.1\%$ RO/°C (LMB-A-50N)
	Within $\pm 0.05\%$ RO/°C (LMB-A-100N to 2KN)
Temperature Effect on Output:	Within $\pm 0.05\%$ /°C

Electrical Characteristics

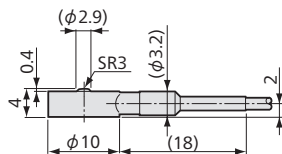
Safe Excitation Voltage:	7V AC or DC
Recommended Excitation Voltage:	1 to 5V AC or DC
Input Resistance:	350 Ω \pm 2.5%
Output Resistance:	350 Ω \pm 2.5%
Cable:	4-conductor (0.035 mm ²) vinyl shielded cable, 1.7 mm diameter by 2 m long, bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

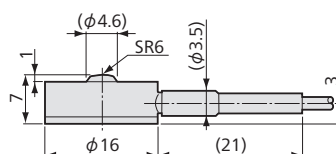
Safe Overload Rating:	150%
Natural Frequency:	See table below.
Material:	Stainless steel
Weight:	10 to 200N : approx. 1.5g (not including cable) 500N to 2kN : approx. 6g (not including cable)
Protection Rating:	IP64 JIS C 0920 splash-proof type

Model	Rated Capacity	Natural Frequency (Approx.)
LMB-A-10N	10N	32kHz
LMB-A-50N	50N	40kHz
LMB-A-100N	100N	47kHz
LMB-A-200N	200N	59kHz
LMB-A-500N	500N	37kHz
LMB-A-1kN	1kN	45kHz
LMB-A-2kN	2kN	54kHz

Dimensions

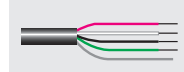


LMB-A-50 to 200N



LMB-A-500N to 2kN

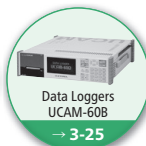
Bared at the tip



● Physical quantity indication

● Static measurement

● Dynamic measurement



TRANSDUCERS

Field to recommend



LMBT-A

● High-Temperature ● 50N to 2kN

Small-Sized Compression Load Cells



TRANSDUCERS



Ultra-Small Sized, Lightweight. Suitable for Load Distribution Measurement

Ultra-small and lightweight. For High temperature by 100°C. Merely putting or bonding on the measurement point or setting in a hollow.

Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within $\pm 0.3\%$ RO
Hysteresis:	Within $\pm 0.3\%$ RO
Repeatability:	Within $\pm 0.3\%$ RO
Rated Output:	1.4 mV/V (2800 μ m/m) or more
Note: Rated output is sorted to one of the classes divided by every 1% difference in output value to the rated capacity. Since the rated output stated in the Test Data Sheet is the center value of the class, it may have a maximum error of 0.5%.	

Environmental Characteristics

Safe Temperature Range:	-20 to 120°C (noncondensing)
Compensated Temperature Range:	-10 to 100°C (noncondensing)
Temperature Effect on Zero Balance:	Within $\pm 0.05\%$ RO/°C
Temperature Effect on Output:	Within $\pm 0.05\%$ /°C

Electrical Characteristics

Safe Excitation Voltage:	7V AC or DC
Recommended Excitation Voltage:	1 to 5V AC or DC
Input Resistance:	350 Ω \pm 2.5%
Output Resistance:	350 Ω \pm 2.5%
Cable: 4-conductor (0.035 mm ²) vinyl shielded cable, 1.7 mm diameter by 2 m long, bared at the tip (Shield wire is not connected to mainframe.)	

Mechanical Properties

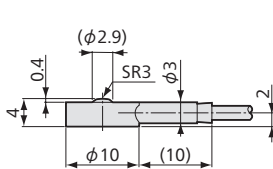
Safe Overload Rating:	150%
Natural Frequency:	See table below.
Material:	Stainless steel
Weight:	50 to 200N: Approx. 1.5g (not including cable) 500N to 2kN: Approx. 6.5g (not including cable)
Protection Rating:	IP64 JIS C 0920 splash-proof type

Model	Rated Capacity	Natural Frequency (Approx.)
LMB-A-50N	50N	40kHz
LMB-A-100N	100N	47kHz
LMB-A-200N	200N	59kHz
LMB-A-500N	500N	37kHz
LMB-A-1kN	1kN	45kHz
LMB-A-2kN	2kN	54kHz

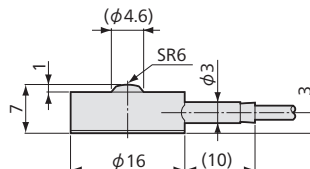
Field to recommend



Dimensions

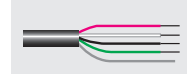


LMBT-A-50 to 200N



LMBT-A-500N to 2kN

Bared at the tip



● Physical quantity indication

● Static measurement

● Dynamic measurement

LMBT-A Recommended products for combination

Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-670B → 2-161

Instrumentation Amplifiers WGI-400A → 2-167

Data Loggers UCAM-60B → 3-25

Strain Amplifiers DPM-900 Series → 3-5

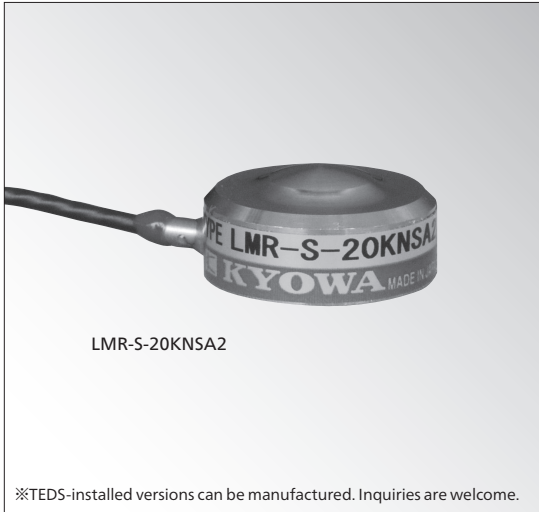
Memory Recorder/Analyzers EDX-3000A → 3-79

LMR-S-SA2

● 21 mm ϕ , 10 mm Thick ● 2 to 20 kN

Small-Sized Compression Load Cells

2
-16



Compact, Lightweight, Low price, Suitable for Load Distribution Measurement

Compact and lightweight LMR-S-SA2 series load cells can be used by merely putting or bonding on the measurement point or setting in a hollow. Major applications include measurement of load distribution by using multiple units, load measurement in pipe making mill or where a measuring site or the weight of load cell itself is limited.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 1\%$ RO (LMR-S-2KNSA2 to 10KNSA2) Within $\pm 2\%$ RO (LMR-S-20KNSA2)
Hysteresis :	Within $\pm 1\%$ RO (LMR-S-2KNSA2 to 10KNSA2) Within $\pm 2\%$ RO (LMR-S-20KNSA2)
Repeatability :	$\pm 1\%$ RO or less
Rated Output :	1 mV/V (2000 μ m/m) or more

Environmental Characteristics

Safe Temperature Range :	-10 to 60°C
Compensated Temperature Range :	0 to 50°C
Temperature Effect on Zero Balance :	Within $\pm 0.05\%$ RO/ $^{\circ}$ C
Temperature Effect on Output :	Within $\pm 0.05\%$ / $^{\circ}$ C

Electrical Characteristics

Safe Excitation Voltage :	7V AC or DC
Recommended Excitation Voltage :	1 to 2V AC or DC
Input Resistance :	350 Ω \pm 2%
Output Resistance :	350 Ω \pm 2%
Cable :	4-conductor (0.035 mm 2) vinyl shielded cable, 1.7 mm diameter by 2 m long, bared at the tip (Shield wire is connected to mainframe.)

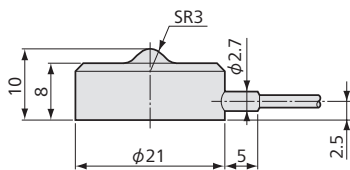
Mechanical Properties

Safe Overload Rating :	120%
Natural Frequency :	Approx. 50kHz
Weight :	Approx. 25g
Material :	Stainless steel

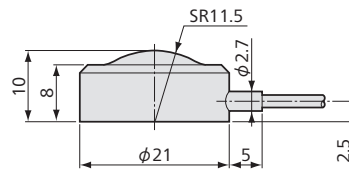
Model	Rated Capacity
LMR-S-2KNSA2	2kN
LMR-S-5KNSA2	5kN
LMR-S-10KNSA2	10kN
LMR-S-20KNSA2	20kN

※Users should be cautioned that operating conditions may adversely affect the stated specifications.

Dimensions

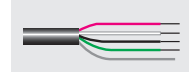


LMR-S to 2KNSA2



LMR-S-5 to 20KNSA2

Bared at the tip

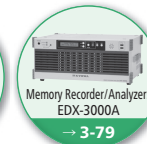


● Physical quantity indication

LMR-S-SA2
Recommended
products for
combination



● Dynamic measurement



TRANSDUCERS

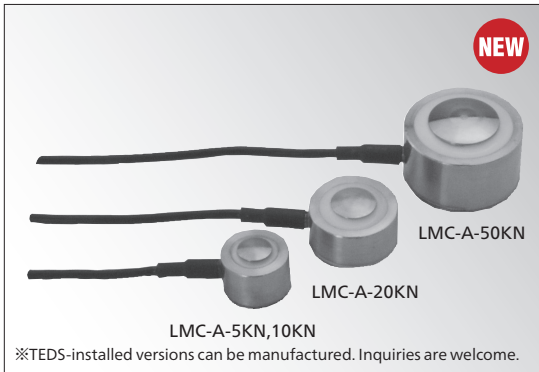
Field
to recommend



Small-Sized Compression Load Cells



TRANSDUCERS

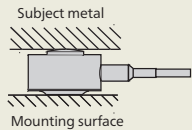


※TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact and high output accuracy Suitable for load distribution measurement

Compact and lightweight load cells can be used by merely placing or bonding on the load site, setting in a hollow, or affixing with a mounting band. Major applications include measurement of load distribution by using multiple units, load measurement in pipe making mills, or where a measuring site or the weight of the load cell itself is limited.

To Ensure Safe Usage

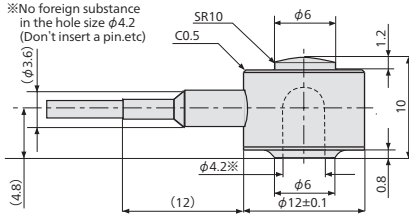


Given that this is a compact high capacity device, this gives high surface pressure on the mounting surface when at rated load. For the mounting seat material, use HRC40 or better metals such as SUS630-H900.

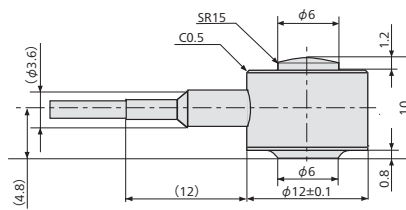
- Example of recommend materials
- Subject metal material: HRC (35 to 38), SCM440, etc.
 - Mounting surface material: HRC40 or better, SUS630-H900 SCM440, etc.

Dimensions

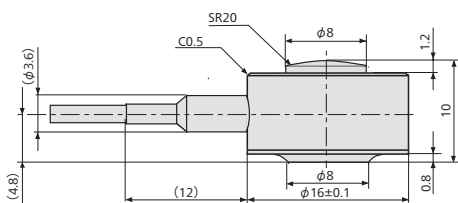
※No foreign substance in the hole size $\phi 4.2$ (Don't insert a pin, etc)



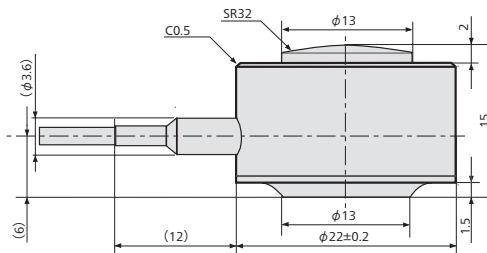
LMC-A-5KN



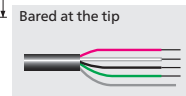
LMC-A-10KN



LMC-A-20KN



LMC-A-50KN



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.5\%$ RO (within $\pm 1\%$ RO 20kN, 50kN)
Hysteresis :	Within $\pm 0.5\%$ RO (within $\pm 1\%$ RO 20kN, 50kN)
Repeatability :	Within 0.5% RO
Rated Output :	1.5 mV/V (3000 $\mu\text{m/m}$) or more

Environmental Characteristics

Safe Temperature Range :	-10 to 80°C
Compensated Temperature Range :	0 to 70°C
Temperature Effect on Zero Balance :	Within $\pm 0.05\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.05\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	7V AC or DC
Recommended Excitation Voltage :	1 to 6V AC or DC
Input Resistance :	350 Ω \pm 2%
Output Resistance :	350 Ω \pm 2%
Cable :	4-conductor (0.035 mm ²) vinyl shielded cable, 2 m long, 1.7 mm diameter, bared at the tip (Shield wire is not connected to mainframe)

Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below
Weight :	See table below (not including cable)
Material :	Stainless steel
Protection rating :	IP64 JIS C 0920 splash-proof type
RoHS Directive	EN50581

Model	Rated Capacity	Natural Frequency (Approx.)	Weight (approx.)
LMC-A-5KN	5kN	32kHz	5g
LMC-A-10KN	10kN	38kHz	6g
LMC-A-20KN	20kN	41kHz	10g
LMC-A-50KN	50kN	29kHz	30g

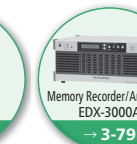
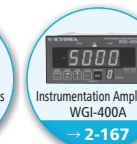
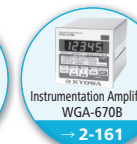
*Operating conditions may adversely affect characteristics. For details, please consult the instruction manual.

Field to recommend

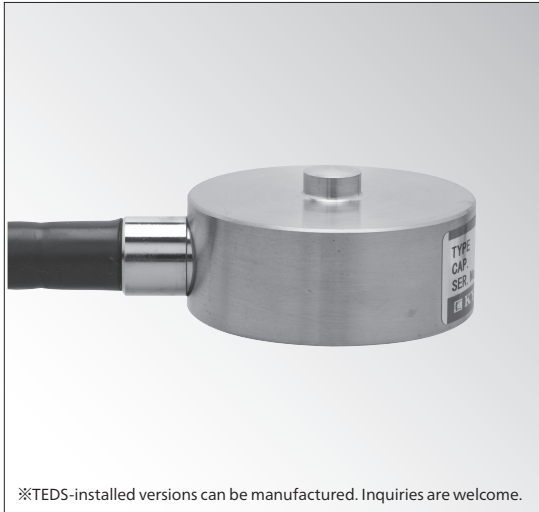


● Physical quantity indication

● Dynamic measurement



Small-Sized Compression Load Cells



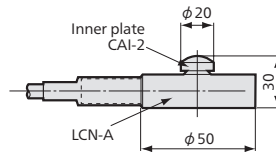
※TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact, Corrosion-Resistant Stainless Steel Enclosure Hermetically Sealed Structure with Inert Gas Filled in

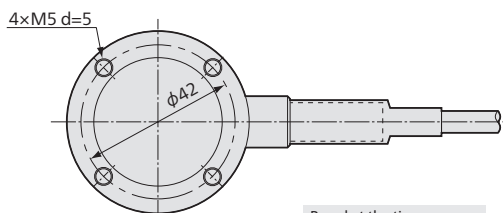
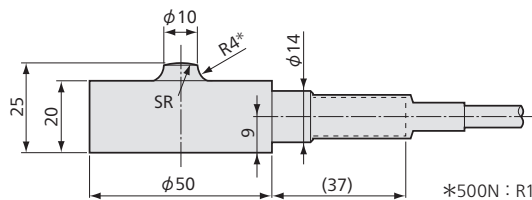
Compact and lightweight design facilitates installation into existing facilities. Excellent stability and reliability are ensured by the hermetically-sealed structure with inert gas filled in. Furthermore, the stainless steel (SUS 630) enclosure makes them widely usable as sensors for equipment requiring corrosion resistance.

Inner Plate CAI-2

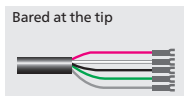
Inner plate is intended to protect the load sensing part at the top of load cell. It prevents the sphere from being flattened due to frequent impact loads.



Dimensions



Model	SR
LCN-A-500N~2KN	15
LCN-A-5~20KN	30



Specifications

Performance

Rated Capacity :	See table at the left.
Nonlinearity :	Within $\pm 0.15\%$ RO
Hysteresis :	Within $\pm 0.1\%$ RO
Repeatability :	0.05% RO or less
Rated Output :	2 mV/V (4000 μ m/m) $\pm 0.3\%$

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within $\pm 0.005\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.01\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 12V AC or DC
Input Resistance :	350 Ω $\pm 0.5\%$
Output Resistance :	350 Ω $\pm 0.5\%$
Cable :	4-conductor (0.5 mm ²) chloroprene shielded cable, 8.5mm diameter by 3m long, with press-fit terminal for 4 mm (Shield wire is not connected to mainframe.)

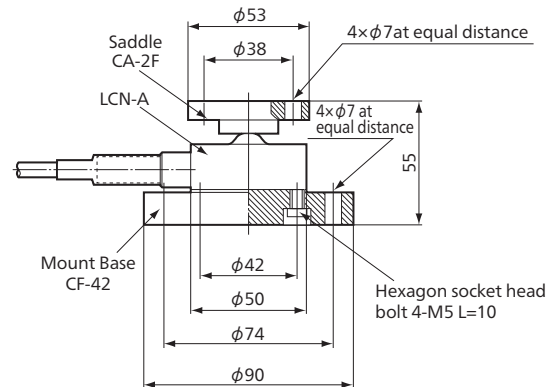
Mechanical Properties

Safe Overload Rating :	200%
Natural Frequency :	See table below
Weight :	220 g
Material :	Main unit : SUS 630 Bottom plate : SUS 304

Model	Rated Capacity	Natural Frequency (Approx.)
LCN-A-500N	500N	6.4kHz
LCN-A-1KN	1kN	5.3kHz
LCN-A-2KN	2kN	7.6kHz
LCN-A-5KN	5kN	13kHz
LCN-A-10KN	10kN	18kHz
LCN-A-20KN	20kN	24kHz

Dimensions with Saddle and Mount Base Mounted

● In Combination with Saddle CA and Mount Base CF



Hexagon socket head bolts to connect the load cell and mount base are attached to the mount base.

Saddle and Mount Base

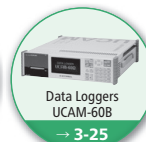
Model	Saddle	Mount Base
Dedicated for LCN-A	CA-2F	CF-42

● Physical quantity indication

● Static measurement

● Dynamic measurement

LCN-A
Recommended
products for
combination



Field to recommend



Small-Sized Compression Load Cells



Compact, Lightweight and Thin Easy to Incorporate into Equipment

This is a compact, lightweight, and thin load cell, easy to incorporate into existing equipment. The mainframe is an all-stainless steel product.

Additionally, the cable is connected using a connector, therefore there are no problems with wiring when situating, and cable replacement is easy. Work is also possible if the cable is replaced with one resistant to repeated bending (flexible cable). Please add M1Z3K to the end of the model name.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within \pm 0.1% RO
Hysteresis :	Within \pm 0.1% RO
Repeatability :	0.05% RO or less
Rated Output :	1.0 mV/V (2000 μ m/m) or more (LCX-A-500N-ID) 1.5 mV/V (3000 μ m/m) or more (LCX-A-1KN to 20KN-ID)

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within \pm 0.01% RO/°C (LCX-A-500N-ID) Within \pm 0.005% RO/°C (LCX-A-1KN to 20KN-ID)
Temperature Effect on Output :	Within \pm 0.005%/°C

Electrical Characteristics

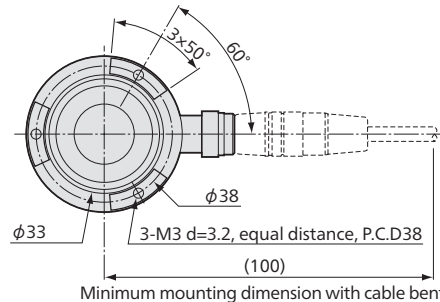
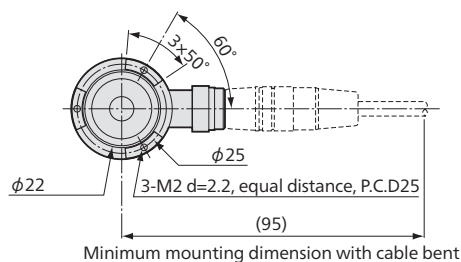
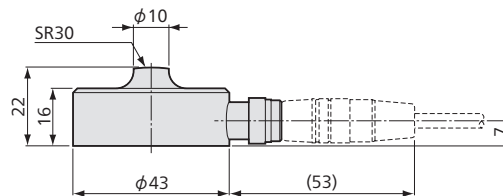
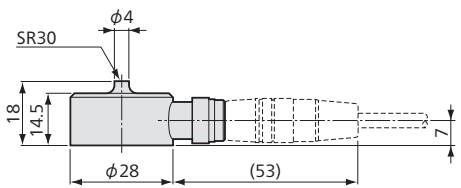
Safe Excitation Voltage :	15V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	375 Ω \pm 5 Ω
Output Resistance :	350 Ω \pm 3.5 Ω
Dedicated connection cable :	TE-45
Included cable :	6-conductor (0.08 mm ²) chloroprene shielded cable, 4.4 mm diameter by 3 m long, terminated with connector plug to the transducer side and bared at the other side (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Safe Lateral Load Rating :	15% the rated capacity
Natural Frequency :	See table below.
Material :	SUS, metallic finish
Weight :	Approx. 45g (500N to 2kN) (not including cable) Approx. 120g (5 to 20kN) (not including cable)
Protection Rating :	IP67 (Watertight structure conforming to JIS C 0920)

Model	Rated Capacity	Natural Frequency (Approx.)
LCX-A-500N-ID	500N	24kHz
LCX-A-1KN-ID	1kN	29kHz
LCX-A-2KN-ID	2kN	37kHz
LCX-A-5KN-ID	5kN	24kHz
LCX-A-10KN-ID	10kN	28kHz
LCX-A-20KN-ID	20kN	37kHz

Dimensions



LCX-A-500N to 2KN

LCX-A-5 to 20KN

Press-fit terminal
TEDS compatible



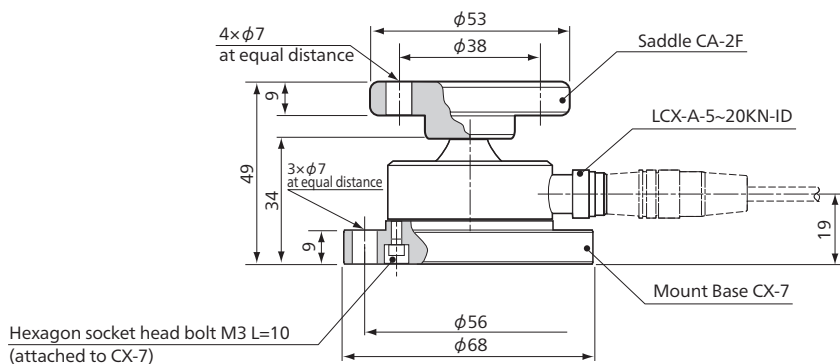
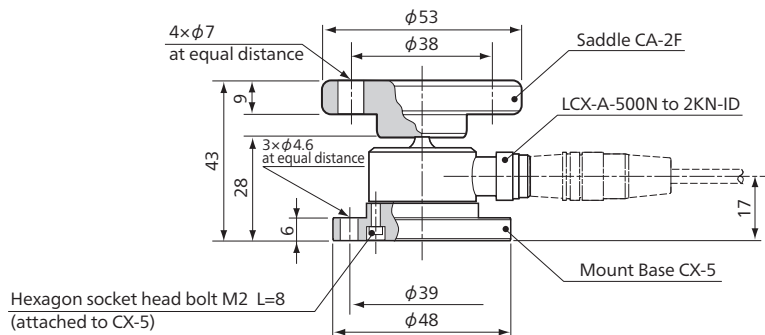
Field
to recommend





Dimensions with Saddle and Mount Base Mounted

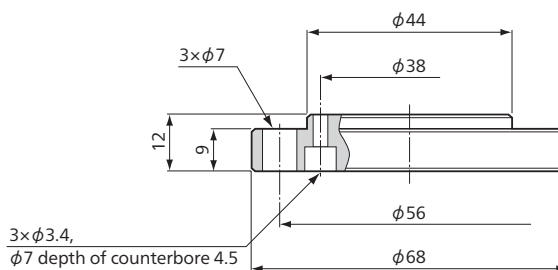
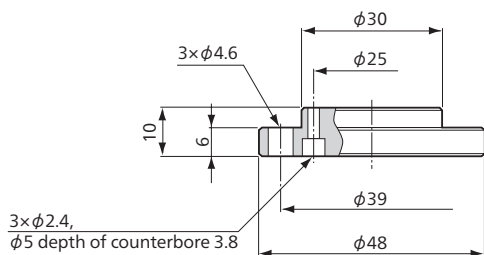
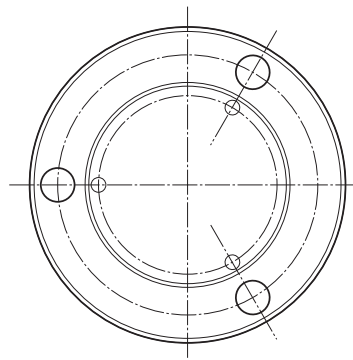
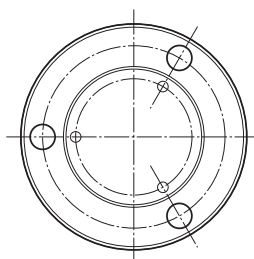
● In Combination with Saddle (CA) and Mount Base (CX)



Dimensions for Mount Base

● Mount Base CX-5 Weight(Approx.)100g

● Mount Base CX-7 Weight(Approx.)280g



● Physical quantity indication

● Static measurement

● Dynamic measurement

LCX-A-ID
Recommended
products for
combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-670B
→ 2-161

Data Loggers
UCAM-60B
→ 3-25

Strain Amplifiers
DPM-900 Series
→ 3-5

Universal Recorders
EDX-100A
→ 3-65

Memory Recorder/Analyzers
EDX-3000A
→ 3-79

Field to recommend



Small-Sized Compression Load Cells



※Steady brace CR is available. (See page 2-22)

※TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact and lightweight Nonlinearity : within $\pm 0.05\%$ RO

- Hermetically sealed structure with inert gas filled in
- Service life: 10 million times or more
- BISELCOM gage is used.

Compact and lightweight design facilitates installation into existing facilities. While nonlinearity of within 1/2000 is ensured, the hermetically-sealed structure with inert gas filled in enables highly stable and reliable measurement. (Patented)

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.05\%$ RO
Hysteresis :	Within $\pm 0.05\%$ RO
Repeatability :	0.03% RO or less
Rated Output :	2.5 mV/V (5000 μ m/m) $\pm 0.2\%$

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within $\pm 0.003\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.003\%$ /°C

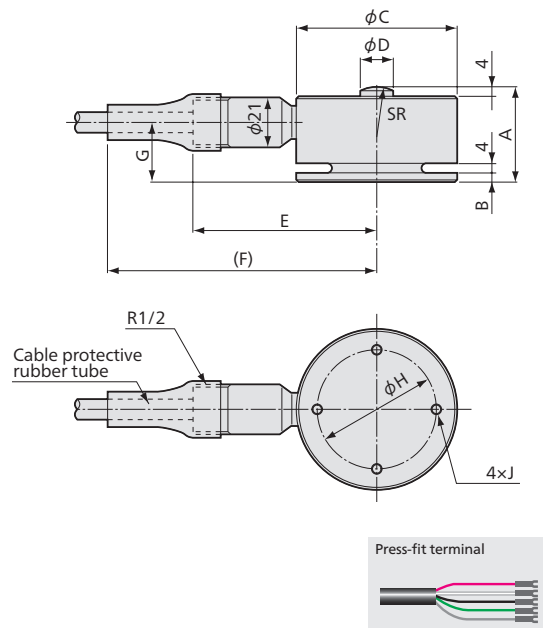
Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350 Ω $\pm 0.5\%$
Output Resistance :	350 Ω $\pm 0.5\%$
Cable :	4-conductor (0.5 mm ²) chloroprene shielded cable, 8.5mm diameter by 5m long, with press-fit terminal for 4 mm (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below.
Protection Rating :	IP67 (Watertight type conforming to JIS C 0920)

Dimensions



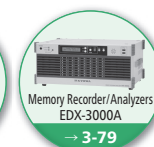
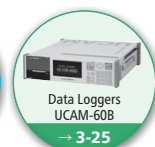
Model	Rated Capacity	Natural Frequency (Approx.)	A	B	ϕ C	ϕ D	E	(F)	G	ϕ H	J	SR	Weight (Approx.)*
LC-5TV	50kN	17kHz	40	4	68	14	78	114	25	50	M5	40	1kg
LC-10TV	100kN	16kHz	45	5	78	20	83	119	29	60	M6	70	1.3kg
LC-20TV	200kN	15kHz	55	6	98	26	93	129	36	80	M8	120	3.1kg

*not including cable

● Physical quantity indication

● Static measurement

● Dynamic measurement

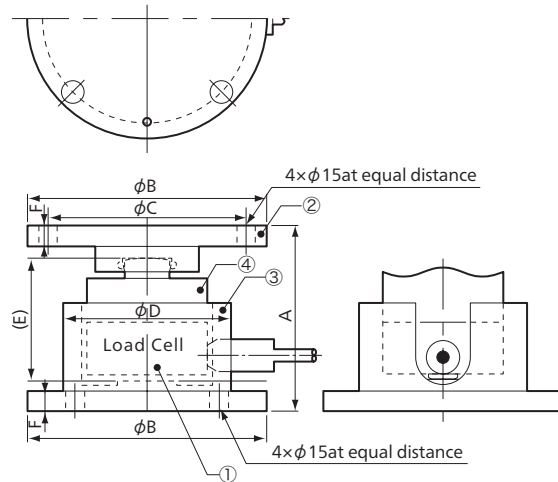


Steady Braces



■ Dimensions in Combination

● Load Cell LC-V in Combination with Steady Brace CR



① Load Cell	②③④ Steady Brace	A	φB	φC	φD	(E)	F	Weight (Approx.)
LC-5TV	CR-5	120	148	126	96	80	13	7kg
LC-10TV	CR-10	120	158	136	110	80	13	8.5kg
LC-20TV	CR-20	145	187	164	136	95	15	15.6kg

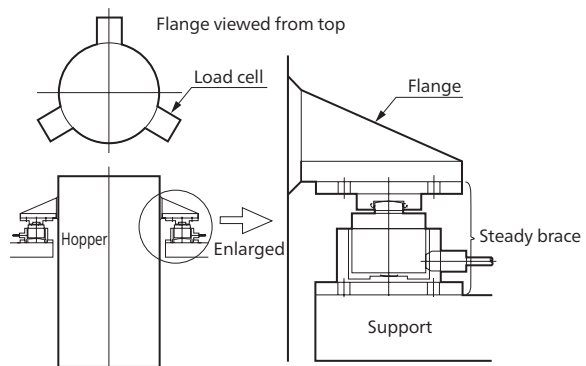
Steady Braces for Hopper scale with Rolling Prevention Mechanism

This product is a bracket used when fitting a hopper scale with a load cell in place of a load striker plate or mounting base. Using this product cancels out horizontal displacement caused by thermal expansion from the tank itself, and resulting lateral load.

To Ensure Safe Usage

- To prevent the hopper from falling down, the hopper's center of gravity should be low enough from the installation position of load cell.
- When the stirrer etc. are carried in equipment, it is not suitable for use under oscillating environment.
- Steady braces and load cell will be assembled and shipped out. (The upper and the lower part are fixed)(Fig.1.)
- Please be sure to order an assembled load cell with steady braces. (It is option)
- Please do not decompose before installation.
- If you already have the load cell (LC-V), we take it and have it assembled with steady braces. (it is option)

■ Installation Example



■ Behavior of Steady Brace Against Lateral Force

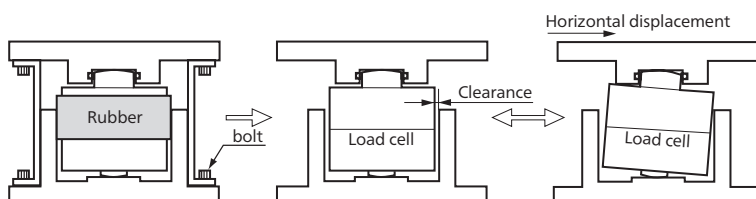


Fig. 1. When at the installation

Fig. 2. Normal condition

Fig. 3. At horizontal displacement

① In the event of horizontal displacement as in Fig. 2, the internal load cell will tilt as in Fig. 3, and in this example, the top of the vibration prevention bracket will move to the right.

② When the lateral force is removed, the load cell and steady brace return to the normal condition shown in Fig. 2.

Field to recommend



Small-Sized Compression Load Cells



TRANSDUCERS



※TEDS-installed versions can be manufactured. Inquiries are welcome.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within ±0.1% RO
Hysteresis :	Within ±0.1% RO
Repeatability :	0.05% RO or less
Rated Output :	2.5 mV/V (5000µm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within ±0.005% RO/°C
Temperature Effect on Output :	Within ±0.005%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±0.5%
Output Resistance :	350Ω±0.5%
Cable :	4-conductor (0.5 mm ²) chloroprene shielded cable, 8.5 mm diameter by 5 m long, with press-fit terminal for 4 mm (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency & Weight :	See table below.
Protection Rating :	IP67 (Watertight type conforming to JIS C 0920)

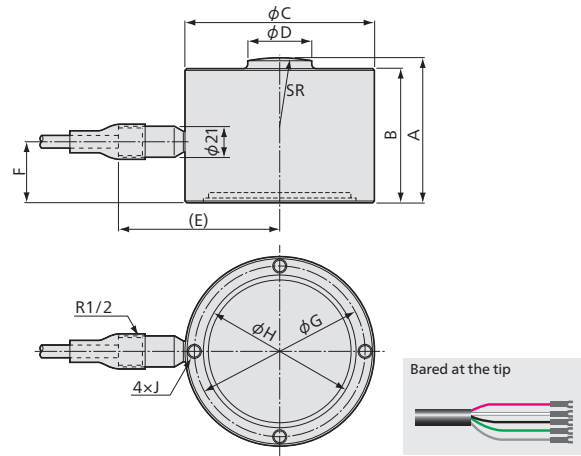
Compact and Lightweight Nonlinearity : 1/1000

- Service life : 10 million times or more
- BISELCOM® gage is used.

LCV-A series is a compact and lightweight load cell developed for large capacity of 500kN and 1MN. They can easily be installed into existing facilities. The hermetically-sealed structure with inert gas filled in ensures stable and reliable performance with 1/1000 nonlinearity. Use of BISELCOM gage ensures increased output and improved reliability.

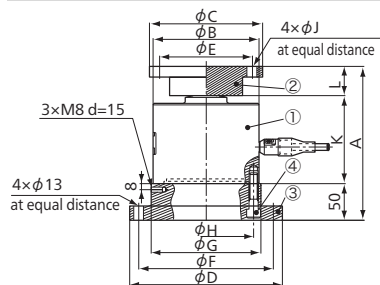
※BISELCOM gage is a self temperature compensated gage with the sensitivity temperature compensation function added.

Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	A	B	φC	φD	(E)	F	φG	φH	J	SR	Weight (Approx.)
LCV-A-500KN	500kN	13kHz	95	88	126	42	107	40	113	101	M10 d=12	125	6kg
LCV-A-1MN	1MN	12kHz	120	110	146	58	117	50	130	115	M12 d=18	180	10kg

Dimensions in Combination with Accessories



● In Combination with Saddle CA and Mount Base CF

① Load Cell	② Saddle	③ Mount Base	④ Hex. socket Head Bolt	A	φB	φC	φD	φE	φF	φG	φH	φJ	K	L
LCV-A-500KN	CA-50B	CF-113F	4xM10 L=45	173	126	118	178	100	154	130	113	11	95	28
LCV-A-1MN	CA-1MH	CF-130F	4xM12 L=50	210	146	156	208	128	184	150	130	13	120	40

Hexagon socket head bolts to connect the load cell to the mount base are attached to the mount base.

● Physical quantity indication

● Static measurement ● Dynamic measurement

LCV-A Recommended products for combination

Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-650B → 2-163

Instrumentation Amplifiers WGA-670B → 2-161

Data Loggers UCAM-60B → 3-25

Strain Amplifiers DPM-900 Series → 3-5

Memory Recorder/Analyzers EDX-3000A → 3-79

Field to recommend



LCR-G-SA2

● $\phi 20$ & 25 mm ● 10 to 50 kN

Small-Sized Large-Capacity Compression Load Cells



Compact, Lightweight, Large Capacity Measurement for Cylinder.

Since the diameter is small and the cable comes from the bottom, LCR-G-SA2 series load cells can be inserted into cylindrical object for measurement.

Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within $\pm 1\%$ RO
Hysteresis:	Within $\pm 1\%$ RO
Rated Output:	1 mV/V (2000 μ m/m) or more

Environmental Characteristics

Safe Temperature Range:	-10 to 70°C
Compensated Temperature Range:	0 to 60°C
Temperature Effect on Zero Balance:	Within $\pm 0.1\%$ RO/°C
Temperature Effect on Output:	Within $\pm 0.05\%$ /°C

Electrical Characteristics

Safe Excitation Voltage:	7V AC or DC
Recommended Excitation Voltage:	1 to 2V AC or DC
Input Resistance:	350 Ω \pm 5%
Output Resistance:	350 Ω \pm 5%
Cable:	4-conductor (0.05 mm ²) chloroprene shielded cable, 3 mm diameter by 5 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

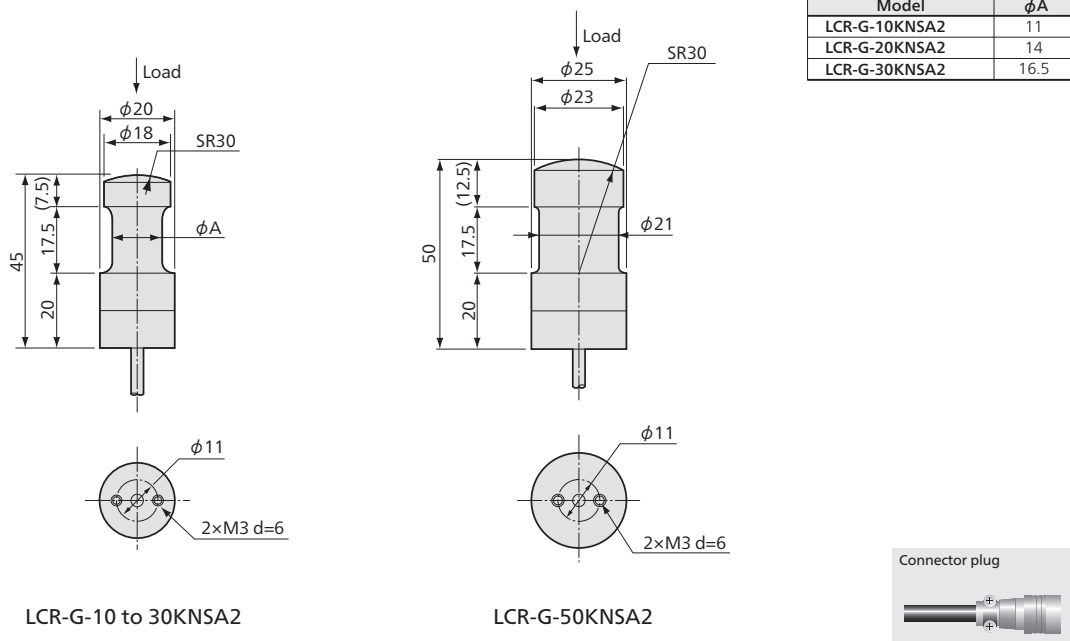
Mechanical Properties

Safe Overload Rating:	120%
Weight:	See table below
Material:	Metallic

Model	Rated Capacity	Weight (Approx.)*
LCR-G-10KNSA2	10kN	100g
LCR-G-20KNSA2	20kN	
LCR-G-30KNSA2	30kN	
LCR-G-50KNSA2	50kN	130g

*not including cable

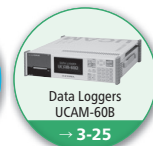
Dimensions



● Physical quantity indication

● Static measurement

● Dynamic measurement



TRANSDUCERS

Field to recommend



General-Purpose Compression Load Cells



TRANSDUCERS



※Watertight type (JIS C 0920) is also available.
 ※TEDS-installed versions can be manufactured. Inquiries are welcome.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.5% RO
Hysteresis :	Within±0.2% RO
Repeatability :	0.1% RO or less
Rated Output :	2 mV/V (4000µm/m) ±1%

Environmental Characteristics

Safe Temperature Range :	-30 to 85°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within±0.005% RO/°C
Temperature Effect on Output :	Within±0.005%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±0.5%
Output Resistance :	350Ω±0.5%
Cable :	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, terminated with connector plug (Shield wire is connected to mainframe.)

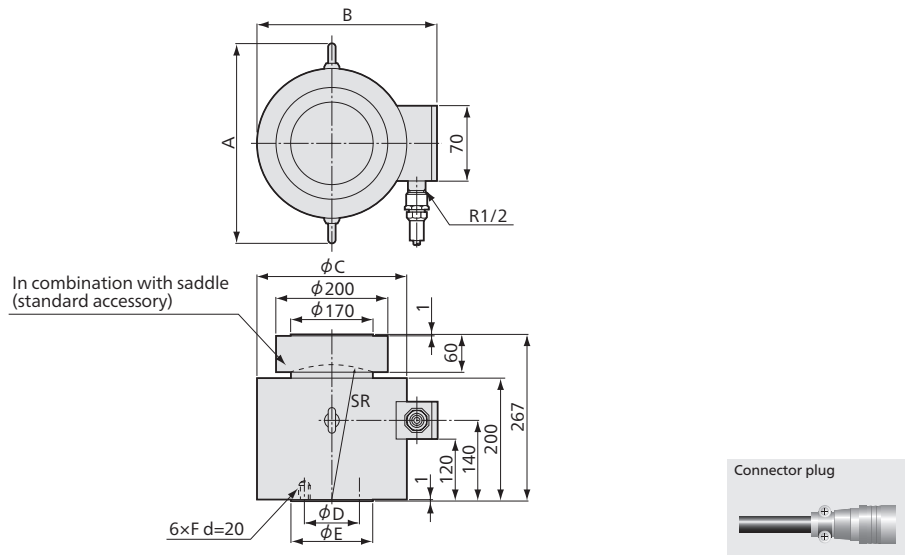
Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below.

High Stability and Hermetically Sealed Structure with Inert Gas Filled in.

Inert Gas is filled in the detector portion, thereby preventing aging deterioration and ensuring a stable and reliable operation.

Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	A	B	φC	φD	φE	F	SR	Weight (Approx.)*
LC-200TE	2MN	3.5kHz	310	246	210	90	135	M14	180	49kg
LC-500TE	5MN	4kHz	340	277	240	130	170	M16	230	65kg

*not including cable

● Physical quantity indication

● Static measurement ● Dynamic measurement

LC-E Recommended products for combination

Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-650B → 2-163

Instrumentation Amplifiers WGA-670B → 2-161

Data Loggers UCAM-60B → 3-25

Strain Amplifiers DPM-900 Series → 3-5

High Temp. Compression Load Cells



※TEDS-installed versions can be manufactured. Inquiries are welcome.

High Reliability, Airtight Structure, Selectable from a Wide Range of Rated Capacities.

Able to continuously operate under temperatures up to 150°C without any external cooling.

Specifications

Performance

Rated Capacity :	See table below
Nonlinearity :	Within $\pm 0.5\%$ RO
Hysteresis :	Within $\pm 0.5\%$ RO
Repeatability :	0.05% RO or less
Rated Output :	1.5mV/V (3000 μ m/m) $\pm 0.2\%$

Environmental Characteristics

Safe Temperature Range :	-10 to 150°C (Excluding connector part)
Compensated Temperature Range :	-10 to 150°C (Excluding connector part)
Temperature Effect on ZERO Balance :	Within $\pm 0.005\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.01\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	20 VAC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350 Ω $\pm 0.5\%$
Output Resistance :	350 Ω $\pm 0.5\%$
Cable :	4-conductor (0.03mm ²) fluoroplastic shielded cable, 5mm diameter by 5m long, terminated with connector plug. (Shield wire is not connected to mainframe)

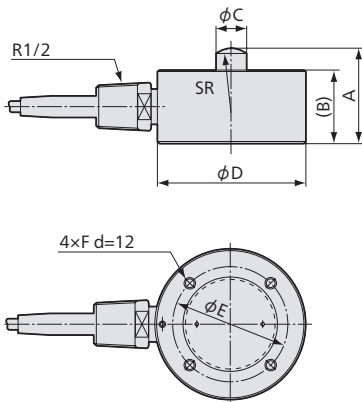
Mechanical Properties

Safe Overload Rating :	200%
Natural Frequency :	See table below
Weight :	See table below

Model	Rated Capacity	Natural Frequency (Approx.)	Weight (Approx.)*
LC-50KFH	500N	3.2kHz	800g
LC-100KFH	1kN	5.1kHz	
LC-200KFH	2kN	7.2kHz	
LC-500KFH	5kN	11kHz	800g
LC-1TFH	10kN	17kHz	
LC-2TFH	20kN	21kHz	
LC-5TFH	50kN	16kHz	2.0kg
LC-10TFH	100kN	11kHz	3.4kg
LC-20TFH	200kN	8.6kHz	7.0kg

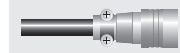
*not including cable

Dimensions



Model	A	(B)	ϕ C	ϕ D	ϕ E	F	SR
LC-50KFH	44	32	14	68	52	M5	12
LC-100KFH							
LC-200KFH							
LC-500KFH	44	32	14	68	52	M5	30
LC-1TFH	44	34	14	68	52	M5	30
LC-2TFH							
LC-5TFH	60	45	18	96	80	M8	70
LC-10TFH	75	55	26	116	100	M8	100
LC-20TFH	95	70	36	156	130	M8	100

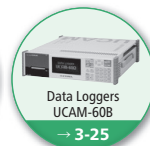
Connector plug



●Physical quantity indication

●Static measurement

●Dynamic measurement



Field to recommend



Thin Compression Load Cells



TRANSDUCERS

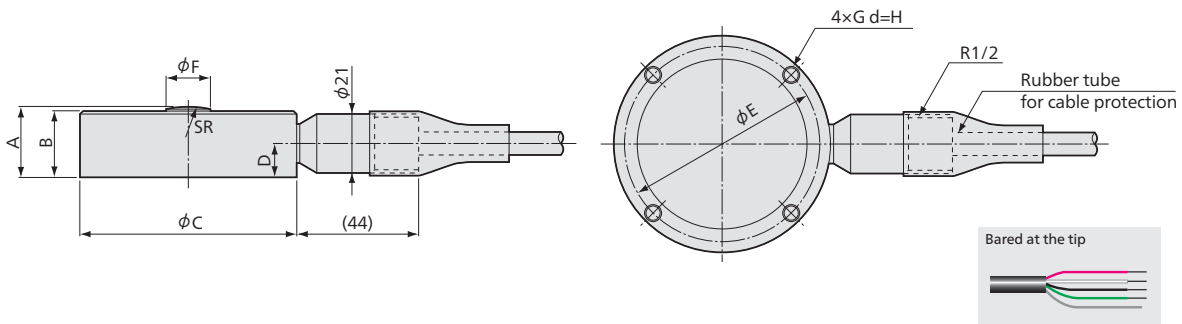


※TEDS-installed versions can be manufactured. Inquiries are welcome.

Thin Design, High Reliability, Hermetically-Sealed Structure with Inert Gas Filled in

The LCK-A series load cells have excellent accuracy, reliability, stability, and response. They also have a thin design for convenient installation as detection terminals of weighing systems. This thin design makes them suitable for applications such as conveyors, vehicles, cranes, hoppers, and tanks where the space, especially the height, is limited and the detecting part needs to be downsized.

■ Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	A	B	φC	D	φE	φF	G	H	SR	Weight (Approx.)*
LCK-A-5KN	5kN	10.7kHz	25	23.5	78	12	70	16	M5	8	50	700g
LCK-A-10KN	10kN	11.4kHz										
LCK-A-20KN	20kN	14.2kHz										
LCK-A-50KN	50kN	24.2kHz	30	28	98	14.5	80	18	M8	12	70	1.5kg
LCK-A-100KN	100kN	14.8kHz	35	33	108	17.5	90	25	M8	12	70	2.2kg
LCK-A-200KN	200kN	12.6kHz	50	45	118	25	100	35	M8	12	100	3.5kg

*not including cable

Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within±0.2% RO (LCK-A-5KN to 100KN) Within±0.5% RO (LCK-A-200KN)
Hysteresis:	Within±0.2% RO (LCK-A-5KN to 100KN) Within±0.5% RO (LCK-A-200KN)
Repeatability:	0.05% RO or less
Rated Output:	2 mV/V (4000μm/m)±0.5%

Environmental Characteristics

Safe Temperature Range:	-30 to 80°C
Compensated Temperature Range:	-10 to 70°C
Temperature Effect on Zero Balance:	Within ±0.007% RO/°C
Temperature Effect on Output:	Within ±0.005%/°C

Electrical Characteristics

Safe Excitation Voltage:	20V AC or DC
Recommended Excitation Voltage:	1 to 10V AC or DC
Input Resistance:	350Ω±0.5%
Output Resistance:	350Ω±0.5%
Cable:	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, with bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating:	150%
Natural Frequency:	See table below
Weight:	See table below

Field to recommend



LCK-A Recommended products for combination

● Physical quantity indication
Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-650B → 2-163

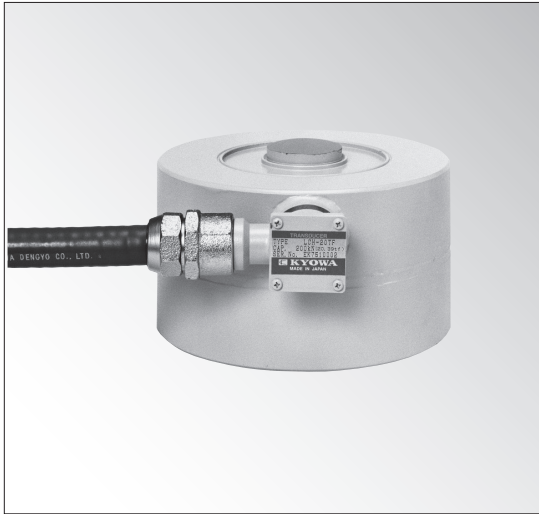
Instrumentation Amplifiers WGA-670B → 2-161

4-Channel Signal Conditioner WGC-140A → 2-173

● Dynamic measurement
Strain Amplifiers DPM-900B → 3-5

Memory Recorder/Analyzers EDX-3000A → 3-79

High-Accuracy Compression Load Cells



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.02\%$ RO
Hysteresis :	Within $\pm 0.02\%$ RO
Repeatability :	0.02% RO or less
Rated Output :	2 mV/V (4000 $\mu\text{m/m}$) $\pm 0.1\%$

Environmental Characteristics

Safe Temperature Range :	-35 to 80°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within $\pm 0.0015\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.001\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350 $\Omega \pm 0.5\%$
Output Resistance :	350 $\Omega \pm 0.5\%$
Cable :	6-conductor (0.5 mm ²) chloroprene shielded cable, 9.5mm diameter by 5m long, with press-fit terminal for 4 mm (Shield wire is not connected to mainframe.)

Mechanical Properties

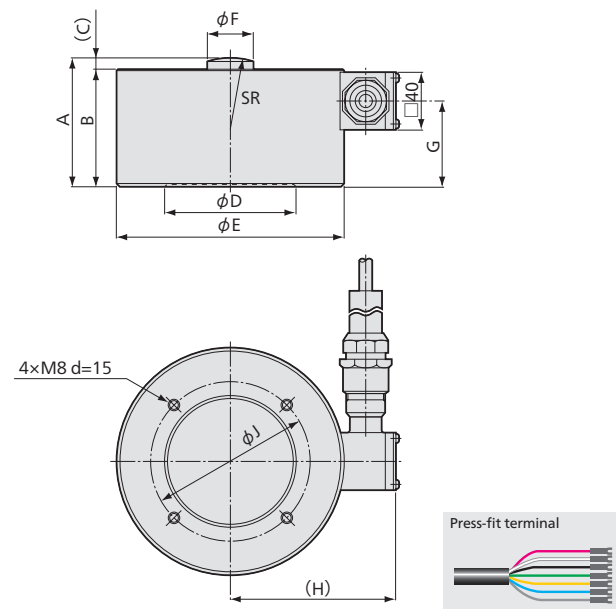
Safe Overload Rating :	200%
Natural Frequency :	See table below.
Weight :	See table below.
Protection Rating :	IP67 (watertight type conforming to JIS C 0920)

Can Measure Compression Loads with 1/5000 Accuracy.

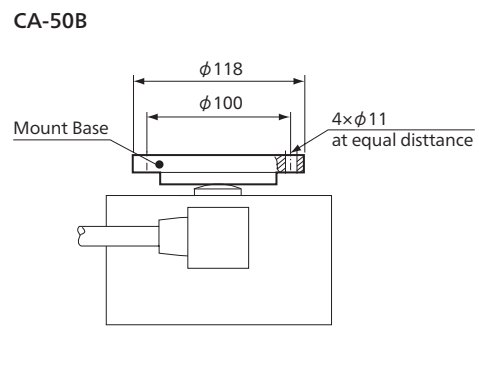
- Remote sensing possible
- Watertight structure

Useable in high humidity.

■ Dimensions



■ Dimensions for mount Base



Model	Rated Capacity	Natural Frequency (Approx.)	A	B	(C)	ϕD	ϕE	ϕF	G	(H)	ϕJ	SR	Weight (Approx.)*	Movable Saddle
LCH-10TF	100kN	7.5kHz	90	82	8	90	156	32	60	113.5	110	50	12kg	CA-50B
LCH-20TF	200kN	7kHz	110	100	10	110	176	45	75	123.5	130	70	17kg	—

*not including cable

● Physical quantity indication

● Static measurement ● Dynamic measurement

LCH-F Recommended products for combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-650B
→ 2-163

Instrumentation Amplifiers
WGA-670B
→ 2-161

Data Loggers
UCAM-60B
→ 3-25

Strain Amplifiers
DPM-900 Series
→ 3-5

Universal Recorders
EDX-100A
→ 3-65



TRANSDUCERS

Field to recommend



Explosion-proof construction Compression Load Cells



TRANSDUCERS



Dedicated Compression Load Cell of Explosion-Proof Construction.

※Please contact us for details

Specifications

Performance

Rated Capacity :	See table below
Nonlinearity :	Within ±0.2%RO
Hysteresis :	Within ±0.2%RO
Repeatability :	0.2% RO or less
Rated Output :	2mV/V (4000µm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-15 to 75°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on ZERO Balance :	Within ±0.007%RO/°C
Temperature Effect on Output :	Within ±0.005%/°C
Explosion-proof Environmental Conditions :	
Ambient Temperature :	-10 to 40°C
Relative Humidity :	45 to 85%RH

Electrical Characteristics

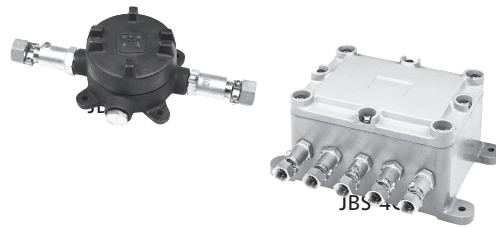
Safe Excitation Voltage :	15V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±0.5%
Output Resistance :	350Ω±0.5%
Cable : 4-conductor (0.03mm ²) chloroprene shielded cable, 5mm diameter by 7.6m long, terminated with connector plug. (Shield wire is not connected to mainframe)	

Mechanical Properties

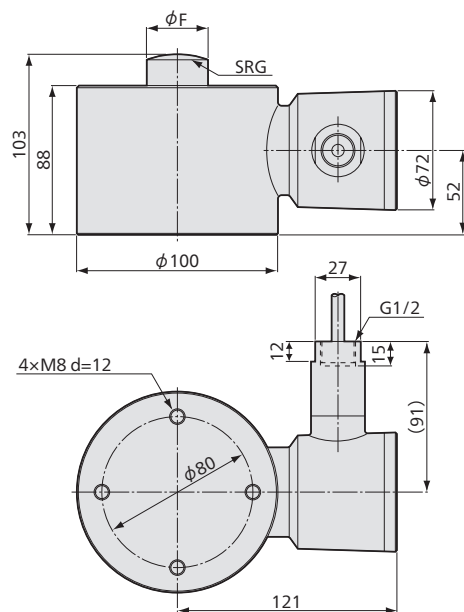
Safe Overload Rating :	120%
Natural Frequency :	See table below
Weight :	See table below

■ Junction Box for Explosion - proof JBS-1C,4C

- JBS-1C 1 CH
- JBS-4C 4 CH

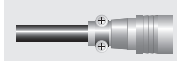


■ Dimensions



Model	Rated Capacity	SRG	Natural Frequency (Approx)	ΦF	Weight (Approx)	Load-bearing Unit	Movable Saddle	Mounting Base
LCS-500KD	5kN	30	4kHz	18	4kg	—	—	CF-80
LCS-1TD	10kN		5.3kHz					
LCS-2TD	20kN	50	6.2kHz	23	4kg	CA-10B	ER-5B	CF-80
LCS-5TD	50kN		6kHz					

Connector plug



● Physical quantity indication

● Static measurement

● Dynamic measurement

LCS-D Recommended products for combination

Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-670B → 2-161

Instrumentation Amplifiers WGA-710C → 2-164

Data Loggers UCAM-60B → 3-25

Strain Amplifiers DPM-900 Series → 3-5

Universal Recorders EDX-100A → 3-65

Field to recommend



Corrosion-Resistant Compression Load Cells



Built to order

※TEDS-installed versions can be manufactured. Inquiries are welcome.

Suited for Weighing in Food Processing or Where they are Exposed to Corrosive Liquids or Gases.

- Corrosion-resistant
- Hermetically-sealed structure with inert gas filled in
- High overload rating of 400%

The hermetically-sealed stainless steel structure with inert gas filled in enables use for weighing in food processing or where they are exposed to corrosive liquids or gases. The high overload rating minimizes the ratio of breakdown due to overload.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.5% RO
Hysteresis :	Within±0.5% RO
Repeatability :	0.1% RO or less
Rated Output :	1 mV/V (2000µm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-35 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within ±0.005% RO/°C
Temperature Effect on Output :	Within ±0.005%/°C

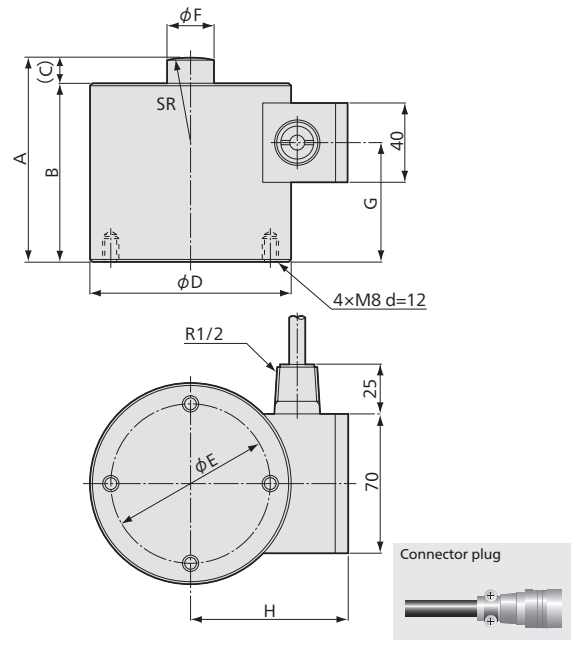
Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 12V AC or DC
Input Resistance :	350Ω±0.5%
Output Resistance :	350Ω±0.5%
Cable :	4-conductor (0.3mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, terminated with connector plug (Shield wire is connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	400%
Natural Frequency :	See table below.
Weight :	See table below.

Dimensions



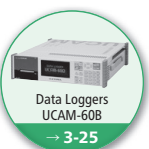
Model	Rated Capacity	Natural Frequency (Approx.)	A	B	C	φD	φE	φF	G	H	SR	Weight (Approx.)*
LC-500KJ	5kN	5.2kHz	103	90	13	100	80	24	60	77	50	3kg
LC-1TJ	10kN	6kHz	103	90	13	100	80	24	60	77	70	
LC-2TJ	20kN	5.8kHz										
LC-5TJ	50kN	5.7kHz										
LC-10TJ	100kN	5.5kHz	110	95	15	120	90	36	60	90	100	5kg
LC-20TJ	200kN	6kHz	135	115	20	120	90	46	80	90	130	6kg

※LC-1TJ/2TJ is provision for movable saddle, please inquire to us.

*not including cable

● Physical quantity indication

● Static measurement ● Dynamic measurement



TRANSDUCERS

Field to recommend



LCW-C-SA3

Washer-Type Load Cells

● For Press Forming ● 10 to 300 kN



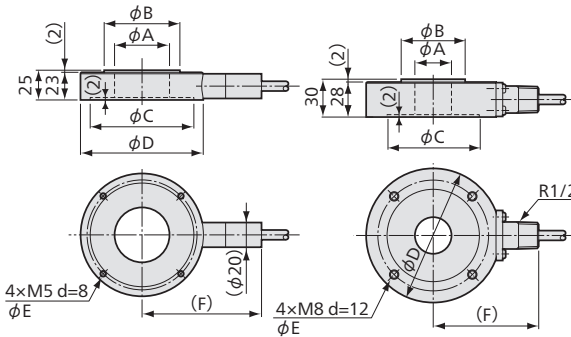
TRANSDUCERS



Thin, High Stability Wide Range of Rated Capacities

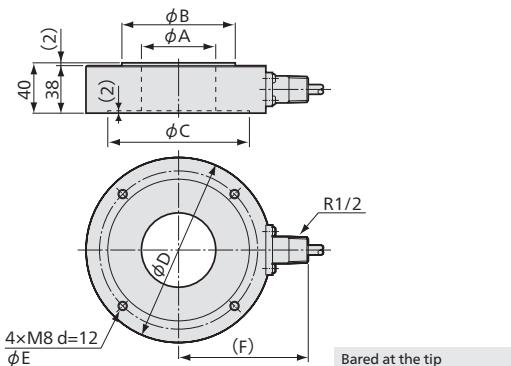
Extremely simple structure facilitates handling and maintenance. Widely applicable for bolt tension control, press forming, etc.

Dimensions

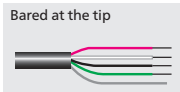


LCW-C-10,20KNSA3

LCW-C-50,100KNSA3



LCW-C-200,300KNSA3



Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within ±1% RO
Hysteresis:	Within ±1% RO
Rated Output:	Approx. 1 mV/V (2000 μm/m)

Environmental Characteristics

Safe Temperature Range:	-35 to 80°C
Compensated Temperature Range:	-10 to 70°C
Temperature Effect on Zero Balance:	Within ±0.01% RO/°C
Temperature Effect on Output:	Within ±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage:	15V AC or DC
Recommended Excitation Voltage:	1 to 10V AC or DC
Input Resistance:	350 Ω ±1%
Output Resistance:	350 Ω ±1%
Cable:	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

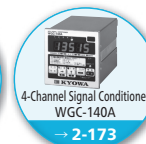
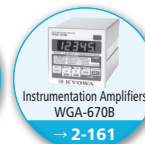
Safe Overload Rating:	150%
Weight:	See table below.

Model	Rated Capacity	φA	φB	φC	φD	φE (F)	Weight (Approx.) [*]
LCW-C-10KN25SA3	10kN	25	42	64	80	70 87	0.6kg
LCW-C-10KN35SA3		35	52	74	90	80 92	0.7kg
LCW-C-10KN45SA3		45	62	84	100	90 97	0.8kg
LCW-C-10KN55SA3		55	72	94	110	100 102	0.9kg
LCW-C-10KN65SA3		65	82	104	120	110 107	1.0kg
LCW-C-20KN25SA3	20kN	25	42	64	80	70 87	0.6kg
LCW-C-20KN35SA3		35	52	74	90	80 92	0.7kg
LCW-C-20KN45SA3		45	62	84	100	90 97	0.8kg
LCW-C-20KN55SA3		55	72	94	110	100 102	0.9kg
LCW-C-20KN65SA3		65	82	104	120	110 107	1.0kg
LCW-C-50KN30SA3	50kN	30	52	74	108	90 85	1.7kg
LCW-C-50KN40SA3		40	62	84	118	100 90	1.9kg
LCW-C-50KN50SA3		50	72	94	128	110 95	2.1kg
LCW-C-50KN60SA3		60	82	104	138	120 100	2.3kg
LCW-C-50KN70SA3		70	92	114	148	130 105	2.5kg
LCW-C-50KN80SA3	80	102	124	158	140 110	2.7kg	
LCW-C-100KN30SA3	100kN	30	52	74	108	90 85	1.7kg
LCW-C-100KN40SA3		40	62	84	118	100 90	1.9kg
LCW-C-100KN50SA3		50	72	94	128	110 95	2.1kg
LCW-C-100KN60SA3		60	82	104	138	120 100	2.3kg
LCW-C-100KN70SA3		70	92	114	148	130 105	2.5kg
LCW-C-100KN80SA3	80	102	124	158	140 110	2.7kg	
LCW-C-200KN60SA3	200kN	60	92	114	148	130 105	3.7kg
LCW-C-200KN70SA3		70	102	124	158	140 110	4.1kg
LCW-C-200KN80SA3		80	112	134	168	150 115	4.4kg
LCW-C-200KN90SA3		90	122	144	178	160 121	4.8kg
LCW-C-200KN100SA3		100	132	154	188	170 126	5.1kg
LCW-C-300KN60SA3	300kN	60	92	114	148	130 105	3.7kg
LCW-C-300KN70SA3		70	102	124	158	140 110	4.1kg
LCW-C-300KN80SA3		80	112	134	168	150 115	4.4kg
LCW-C-300KN90SA3		90	122	144	178	160 121	4.8kg
LCW-C-300KN100SA3		100	132	154	188	170 126	5.1kg

*not including cable

Physical quantity indication

LCW-C-SA3
Recommended
products for combination



Field to recommend



LCW-D-S/E-S

Washer-Type Load Cells

- For Rolling/Depressing Pressure Measurement under Harsh Environment
- 1 to 5 MN



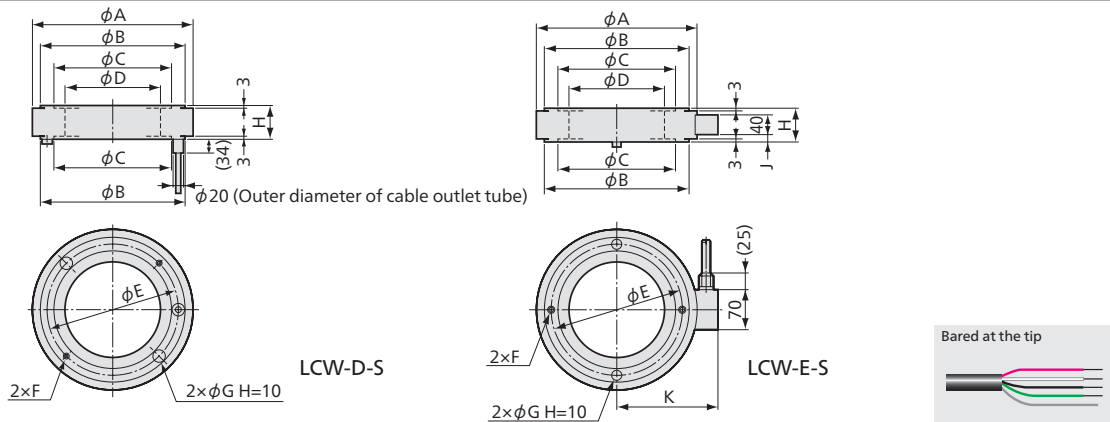
※Load cells which meet individual rolling mills can also be manufactured. Inquiries are welcome.

The Flat Washer-Type Structure of Loadcell Well Suited to Rolling Mills.

- Hermetically-sealed structure with inert gas filled in
- Heat and oil resistant cable.
- High reliability

The hermetically-sealed structure with inert gas filled in ensures a reliable and stable operation under harsh conditions. The flat washer type structure only requires processing of the screw nuts for installation to existing rolling mills.

Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	φA	φB	φC	φD	φE	F	φG	H	J	K	Weight (Approx.)*
LCW-D-1MNS	1MN	16kHz	241	202	178	140	190	M8 d=8	8	64	—	—	7kg
LCW-D-2MNS	2MN	14kHz	355	307	277	230	292	M10 d=10	12	70	—	—	15kg
LCW-D-3MNS	3MN	15kHz	355	314	270	230	292	M10 d=12	20	70	—	—	17kg
LCW-D-5MNS	5MN	16kHz	355	312	252	210	282	M10 d=12	20	70	—	—	20kg
LCW-E-1MNS	1MN	16kHz	241	202	178	140	190	M8 d=8	8	64	16	155	7kg
LCW-E-2MNS	2MN	14kHz	355	307	277	230	292	M10 d=10	12	70	18	213	15kg
LCW-E-3MNS	3MN	15kHz	355	314	270	230	292	M10 d=12	20	70	18	213	17kg
LCW-E-5MNS	5MN	16kHz	355	312	252	210	282	M10 d=12	20	70	18	213	20kg

*not including cable

Physical quantity indication

LCW-D-S/E-S Recommended products for combination

- Instrumentation Amplifiers WGA-900A → 2-159
- Instrumentation Amplifiers WGA-650B → 2-163
- Instrumentation Amplifiers WGA-670B → 2-161
- 4-Channel Signal Conditioner WGC-140A → 2-173

Field to recommend





※TEDS-installed versions can be manufactured. Inquiries are welcome.

Developed for Weighing Hoppers and Tanks, LCTS-B Series is a Stainless Steel Compression Load Cells with Built-In Steady Brace Mechanism.

- Stainless steel structure enables use under conditions where the load cell is exposed to moisture and corrosive gases.
- "Thin" and "Top and Bottom plates integrated" design facilitates installation to hopper brackets or tank's feet.
- Hermetically-sealed structure (protection rating IP67)
- Built-in steady brace mechanism makes LCTS-B suitable for weighing stirring tanks or tanks with feet, while simplifying peripheral facilities by eliminating check rod, etc.
- Since the load cell can be fixed with bolts, dropping or floating of the load cell can be prevented.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.05% RO
Hysteresis :	Within±0.05% RO
Repeatability :	0.02% RO or less
Rated Output :	2 mV/V (4000μm/m) ±0.1%

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within±0.003% RO/°C
Temperature Effect on Output :	Within±0.003%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	700Ω±0.7%
Output Resistance :	700Ω±0.7%
Cable :	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long (10 m long with 50 and 100kN), bared at the tip (Shield wire is not connecte to mainframe)

Mechanical Properties

Safe Overload Rating :	150%
Critical Lateral Load :	10 kN (30 kN with 50 and 100kN) (Maximum load which does not cause any mechanical damage)
Weight :	See table below.
Material :	Stainless steel alloy
Protection Rating :	IP67 (Watertight type conforming to JIS C 0920)

Model	Rated Capacity	Weight (Approx.)*
LCTS-B-5KN	5kN	5kg
LCTS-B-10KN	10kN	
LCTS-B-20KN	20kN	6kg
LCTS-B-30KN	30kN	
LCTS-B-50KN	50kN	11kg
LCTS-B-100KN	100kN	13kg

*not including cable

To Ensure Safe Usage

■ Accessories to Load Cell

Do not disassemble or remodel accessories such as top plate and mounting plate designed for installation of LCTS-B series load cells.

■ Installation of Floating Prevention Stopper

Install the hazard prevention stopper when using in an environment where the load cell may be damaged or the hopper or tank may overturn due to lateral load or lateral displacement caused by thermal expansion of structure or vibration of stirrer.

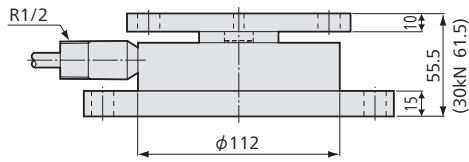
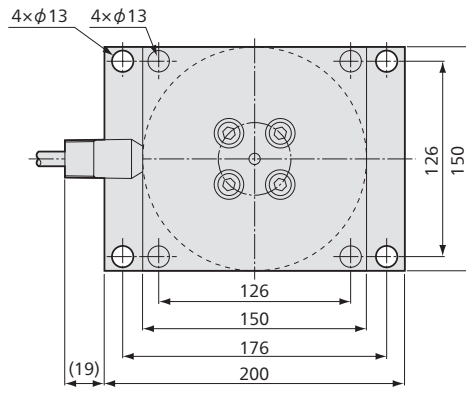
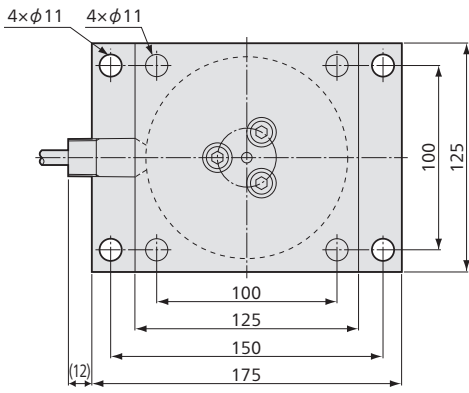
Precautions

1. LCTS-B cannot be used for any onboard measurement.
2. LCTS-B cannot be used in an environment where it is frequently exposed to lateral load.
3. LCTS-B cannot be installed to any inclined or vertical surface.

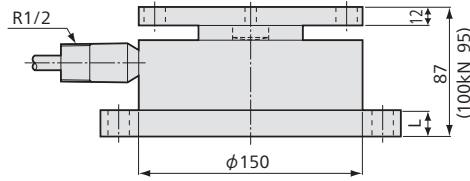
Field
to recommend



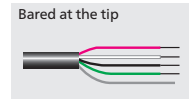
■ Dimensions



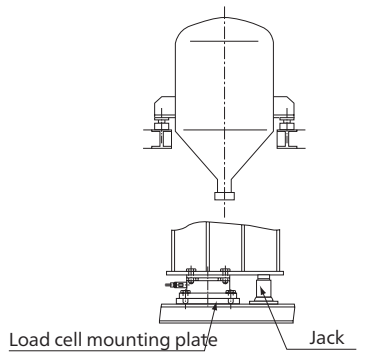
LCTS-B-5 to 30KN



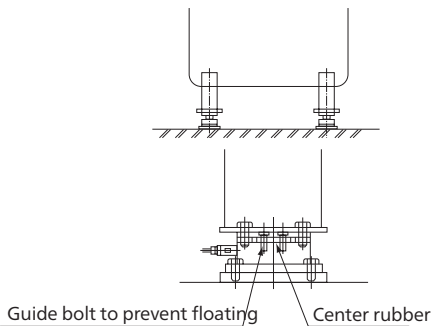
LCTS-B-50 & 100KN



■ Installation Examples

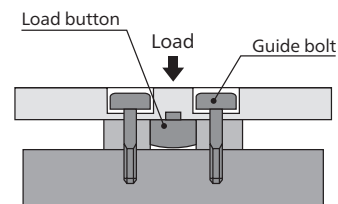
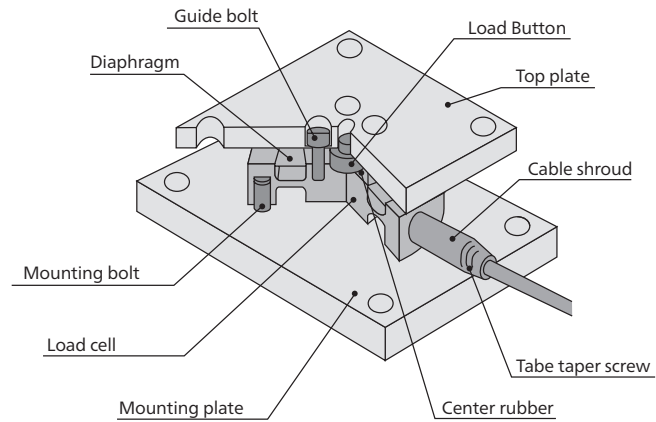


Installation to Tank's Brackets



Installation to Tank's Feet

■ Internal Structure



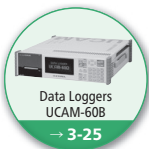
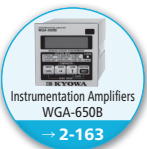
Mechanical stopper(steady brace):patent pending

Field to recommend



● Physical quantity indication

● Static measurement ● Dynamic measurement



Thin Load Cells "Multi Force Sensors"



※TEDS-installed versions can be manufactured. Inquiries are welcome.

Advanced Thin Design. Compared to the Conventional Load Cell, the Height is 1/2 to 1/3 Enabling a Wider Range of Applications.

Original ideas and advanced technologies cultivated in weight control of large scale airplanes made the revolutionary thin design of the LCTA-A series load cells possible. The integrated design and rubber attachment enable use with the top and bottom fixed and provide excellent buffer.

- Optional dedicated rubber attachment enables fixing the top and bottom with bolts, thereby making it possible to design the system with no tension rod or stay rod used.
- Safety factor is 3 to 5 times higher than conventional type. Endures lateral loads up to 20% of the rated capacity.
- Rubber attachment attenuates impact energy and lessens the effects of thermal expansion of system and the moment of fixed section.
- Rubber attachment enables easy installation without concern for parallelism.
- Varieties of accuracies and outputs are available, enabling configuration of the most suitable system for each application.
- Peripheral instruments such as amplifiers can easily be connected since the wirings are the same as conventional load cells.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.05\%$ RO
Hysteresis :	Within $\pm 0.05\%$ RO
Repeatability :	0.03% RO or less
Rated Output :	2 mV/V (4000 μ m/m) $\pm 0.2\%$

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within $\pm 0.01\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.01\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	20V DC
Recommended Excitation Voltage :	1 to 10V DC
Input Resistance :	350 Ω $\pm 1.5\%$
Output Resistance :	350 Ω $\pm 1.5\%$
Dedicated connection cable :	HW005-40AD
Included cable :	4-conductor (0.5 mm ²) shielded vinyl sheath, 8.5mm diameter by 5m long, bared at the tip (Shield wire is not connected to mainframe)

Mechanical Properties

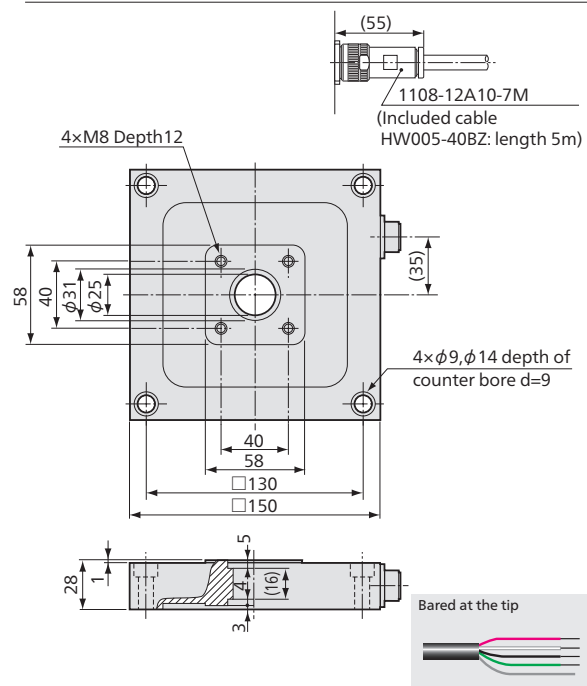
Safe Overload Rating :	150%
Critical Lateral Load :	20% (maximum load which does not cause any mechanical damage)
Weight :	Approx. 1.1kg (not including cable)
Material :	Aluminum alloy

Precautions

1. LCTA-A cannot be used for any onboard measurement.
2. LCTA-A cannot be used in an environment where it is frequently exposed to lateral load.
3. LCTA-A cannot be installed to any inclined or vertical surface.

Model	Rated Capacity
LCTA-A-500N	500N
LCTA-A-800N	800N
LCTA-A-1KN	1kN
LCTA-A-2KN	2kN
LCTA-A-3KN	3kN

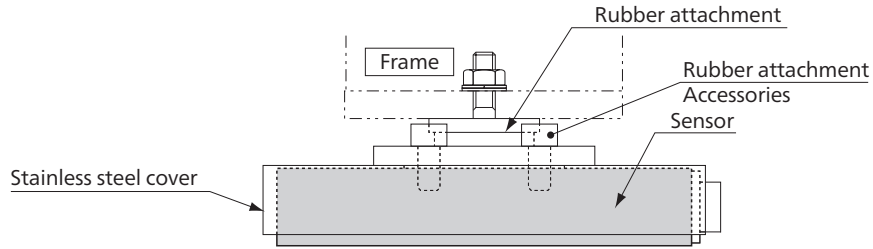
Dimensions



Field to recommend

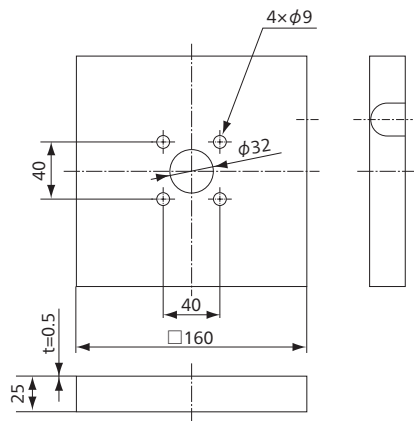


Accessories



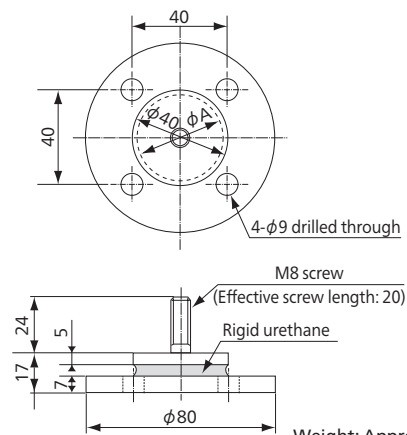
Applicable Accessories

Model	Stainless Steel Cover	Rubber Attachment
LCTA-A-500N	COV03-300K	RA02-100K
LCTA-A-800N		
LCTA-A-1KN		RA02-300K
LCTA-A-2KN		
LCTA-A-3KN		



Weight: Approx. 180 g

Stainless Steel Cover



Weight: Approx. 500 g

Rubber Attachment

Model	φA
RA02-100K	30
RA02-300K	36

Field to recommend



● Physical quantity indication

● Static measurement ● Dynamic measurement

LCTA-A
Recommended
products for
combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-650B
→ 2-163

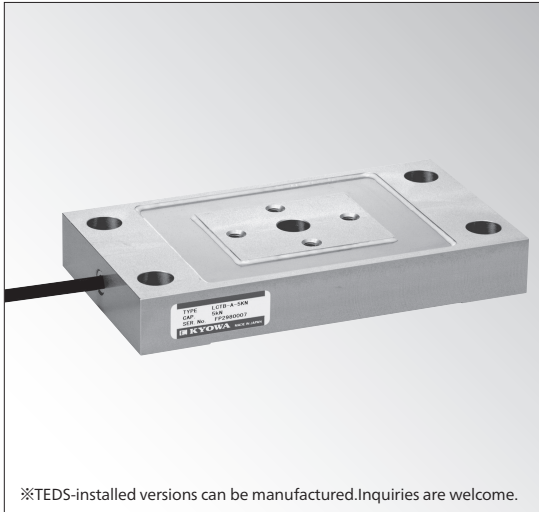
Instrumentation Amplifiers
WGA-670B
→ 2-161

4-Channel Signal Conditioner
WGC-140A
→ 2-173

Data Loggers
UCAM-60B
→ 3-25

Universal Recorders
EDX-100A
→ 3-65

Thin Load Cells "Multi Force Sensors"



※TEDS-installed versions can be manufactured. Inquiries are welcome.

Advanced Thin Design. Compared to the Conventional Load Cell, the Height is 1/2 to 1/3 Enabling a Wider Range of Applications.

- Optional dedicated rubber attachment enables fixing the top and bottom with bolts, thereby making it possible to design the system with no tension rod or stay rod used.
- Safety factor is 3 to 5 times higher than conventional type. Endures lateral loads up to 20% of the rated capacity.
- Rubber attachment attenuates impact energy and lessens the effects of thermal expansion of system and the moment of fixed section.
- Rubber attachment enables easy installation without concern for parallelism.
- Varieties of accuracies and outputs are available, enabling configuration of the most suitable system for each application.
- Peripheral instruments such as amplifiers can easily be connected since the wirings are the same as conventional load cells.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.03% RO
Hysteresis :	Within±0.03% RO
Repeatability :	0.02% RO or less
Rated Output :	1.5 mV/V (3000μm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within±0.005% RO/°C
Temperature Effect on Output :	Within±0.005%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V DC
Recommended Excitation Voltage :	1 to 10V DC
Input Resistance :	350Ω±1.5%
Output Resistance :	350Ω±1.5%
Cable :	4-conductor (0.3mm ²) chloroprene shielded cable, 6 mm diameter by 5 m long, bared at the tip

Mechanical Properties

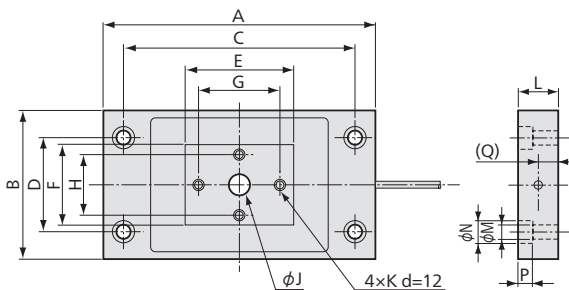
Safe Overload Rating :	150%
Critical Lateral Load :	50% (maximum load which does not cause any mechanical damage)
Weight :	See table below.
Material :	Aluminum alloy

Precautions

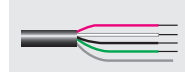
1. LCTB-A cannot be used for any onboard measurement.
2. LCTB-A cannot be used in an environment where it is frequently exposed to lateral load.
3. LCTB-A cannot be installed to any inclined or vertical surface.

※Model name for intrinsic safety construction is "M4AL2".

Dimensions



Bared at the tip

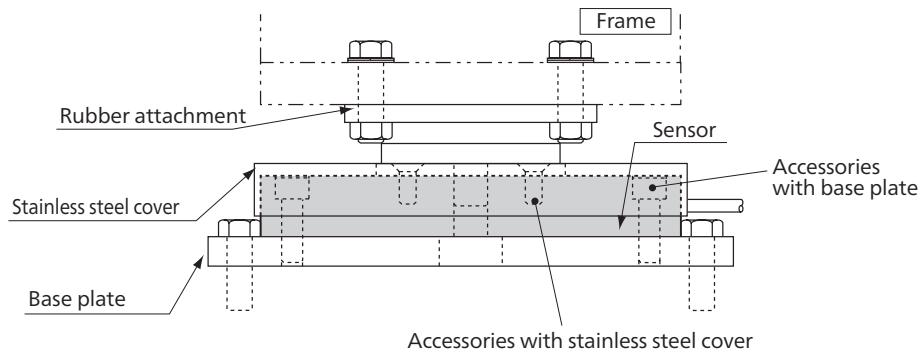


Model	Rated Capacity	A	B	C	D	E	F	G	H	φJ	K	L	φM	φN	P	(Q)	Weight (Approx.)*
LCTB-A-5KN	5kN	200	110	170	70	80	60	60	45	16	M8	29	11	17	11	15	1.8kg
LCTB-A-10KN	10kN											35				16.5	2.3kg
LCTB-A-20KN	20kN											39				19	4.3kg
LCTB-A-30KN	30kN	260	150	220	90	90	80	60	60	20	M10	49	13	19	13	24	5.3kg
LCTB-A-50KN	50kN											49				24	5.3kg

*not including cable

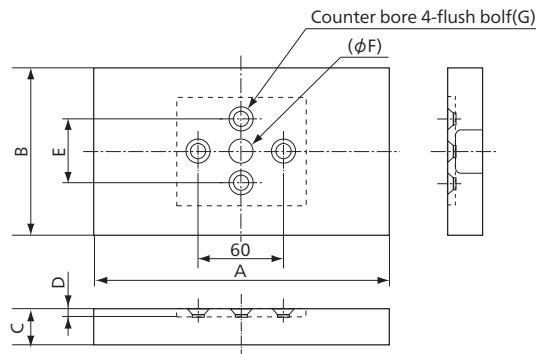
Field to recommend





Applicable Accessories

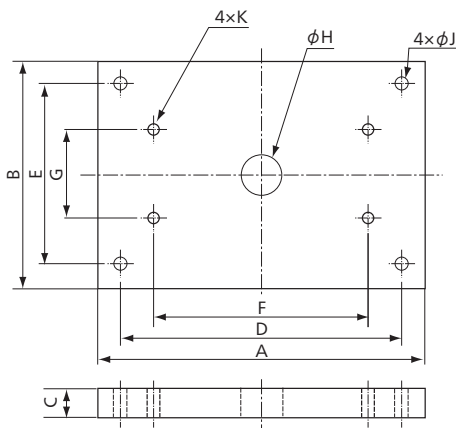
Model	Stainless Steel Cover	Rubber Attachment	Base Plate
LCTB-A-5KN	COV01-2T	RA01-2T	BP01-2T
LCTB-A-10KN			
LCTB-A-20KN			
LCTB-A-30KN	—	RA01-5T	—
LCTB-A-50KN			



Stainless Steel Cover

Model	A	B	C	D	E	(φF)	G	Weight(Approx.)
COV01-2T	206	116	25	5.5	45	18	M8	400g
COV01-5T	270	160	35	9.5	60	22	M10	900g

Base plate



Load Cells Model	Base plate Model	A	B	C	D	E	F	G	φH	φJ	K
LCTB-A-5KN	BP01-2T	250	250	14	220	138	170	70	30	13	M10
LCTB-A-10KN											
LCTB-A-20KN											

Field to recommend



● Physical quantity indication

● Static measurement ● Dynamic measurement

LCTB-A
Recommended
products for
combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-650B
→ 2-163

Instrumentation Amplifiers
WGA-670B
→ 2-161

4-Channel Signal Conditioner
WGC-140A
→ 2-173

Data Loggers
UCAM-60B
→ 3-25

Universal Recorders
EDX-100A
→ 3-65

Thin Load Cells "Multi Force Sensors"



※TEDS-installed versions can be manufactured. Inquiries are welcome.

Advanced Thin Design. Compared to the Conventional Load Cell, the Height is 1/2 to 1/3 Enabling a Wider Range of Applications.

- Optional dedicated rubber attachment enables fixing the top and bottom with bolts, thereby making it possible to design the system with no tension rod or stay rod used.
- Safety factor is 3 to 5 times higher than conventional type. Endures lateral loads up to 20% of the rated capacity.
- Rubber attachment attenuates impact energy and lessens the effects of thermal expansion of system and the moment of fixed section.
- Rubber attachment enables easy installation without concern for parallelism.
- Varieties of accuracies and outputs are available, enabling configuration of the most suitable system for each application.
- Peripheral instruments such as amplifiers can easily be connected since the wirings are the same as conventional load cells.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.05% RO (0.1% RO with 100KN)
Hysteresis :	Within±0.05% RO (0.1% RO with 100KN)
Repeatability :	0.03% RO (±0.05% RO with 100KN) or less
Rated Output :	2 mV/V (4000µm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within±0.003% RO/°C
Temperature Effect on Output :	Within±0.003%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V DC
Recommended Excitation Voltage :	1 to 10V DC
Input Resistance :	350Ω±1.5%
Output Resistance :	350Ω±1.5%
Cable :	4-conductor (0.3mm ²) chloroprene shielded cable, 6 mm diameter by 5 m long (10 m long with 100KN), bared at the tip (Shield wire is not connected to mainframe)

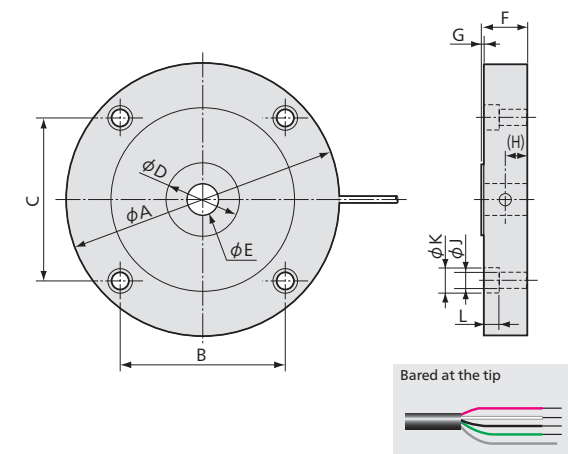
Mechanical Properties

Safe Overload Rating :	150%
Critical Lateral Load :	50% (maximum load which does not cause any mechanical damage)
Weight :	See table below.
Material :	Special steel

Precautions

1. LCTE-A cannot be used for any onboard measurement.
2. LCTE-A cannot be used in an environment where it is frequently exposed to lateral load.
3. LCTE-A cannot be installed to any inclined or vertical surface.

Dimensions



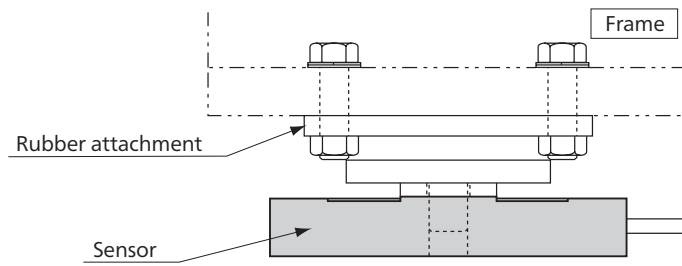
Model	Rated Capacity	φA	B	C	φD	φE	F	G	(H)	φJ	φK	L	Weight (Approx.)*
LCTE-A-10KN	10kN	148	90	90	40	16	25	1	13	9	14	8.5	3.2kg
LCTE-A-20KN	20kN	178	110	110	62		31		15	11	18	11	5.1kg
LCTE-A-30KN	30kN					20	35	17	14	20	13	6.9kg	
LCTE-A-50KN	50kN	37	7.2kg										
LCTE-A-100KN	100kN	198	124	124	80								

*not including cable

Field to recommend



Accessories



Applicable Accessories

Model	Rubber Attachment
LCTE-A-10KN	RA01-2T
LCTE-A-20KN	RA01-5T
LCTE-A-30KN	RA01-5T
LCTE-A-50KN	RA01-5T, RA01-10T
LCTE-A-100KN	RA01-5T, RA01-10T

Field to recommend



● Physical quantity indication ● Static measurement ● Dynamic measurement

LCTE-A
Recommended
products for
combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-650B
→ 2-163

Instrumentation Amplifiers
WGA-670B
→ 2-161

4-Channel Signal Conditioner
WGC-140A
→ 2-173

Data Loggers
UCAM-60B
→ 3-25

Universal Recorders
EDX-100A
→ 3-65

Thin Load Cells "Multi Force Sensors"



TRANSDUCERS

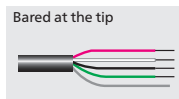
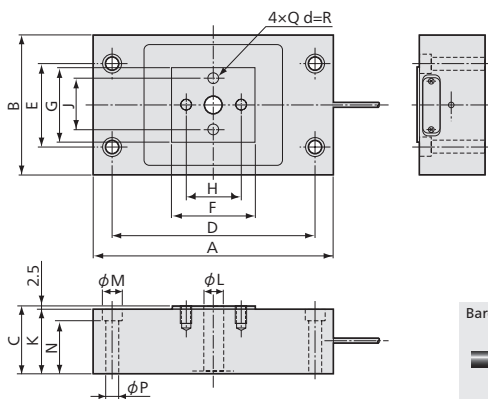


※TEDS-installed versions can be manufactured. Inquiries are welcome.

Advanced Thin Design. Compared to the Conventional Load Cell, the Height is 1/2 to 1/3 Enabling a Wider Range of Applications.

- Optional dedicated rubber attachment enables fixing the top and bottom with bolts, thereby making it possible to design the system with no tension rod or stay rod used.
- Safety factor is 3 to 5 times higher than conventional type. Endures lateral loads up to 20% of the rated capacity.
- Rubber attachment attenuates impact energy and lessens the effects of thermal expansion of system and the moment of fixed section.
- Rubber attachment enables easy installation without concern for parallelism.
- Varieties of accuracies and outputs are available, enabling configuration of the most suitable system for each application.
- Peripheral instruments such as amplifiers can easily be connected since the wirings are the same as conventional load cells.

Dimensions



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.03% RO
Hysteresis :	Within±0.03% RO
Repeatability :	0.02% RO or less
Rated Output :	2 mV/V (4000µm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within±0.003% RO/°C
Temperature Effect on Output :	Within±0.003%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V DC
Recommended Excitation Voltage :	1 to 10V DC
Input Resistance :	350Ω±1.5%
Output Resistance :	350Ω±1.5%
Cable :	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 10 m long, bared at the tip (Shield wire is not connected to mainframe)

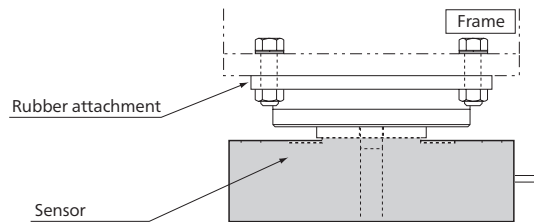
Mechanical Properties

Safe Overload Rating :	150%
Critical Lateral Load :	50% (maximum load which does not cause any mechanical damage)
Weight :	See table below.
Material :	Special steel

Precautions

- 1.LCTD-A cannot be used for any onboard measurement.
- 2.LCTD-A cannot be used in an environment where it is frequently exposed to lateral load.
3. LCTD-A cannot be installed to any inclined or vertical surface.

Accessories



Applicable Accessories

Model	Rubber Attachment
LCTD-A-100KN	RA01-10T
LCTD-A-200KN	RA01-30T
LCTD-A-300KN	

For rubber attachment and base plate, refer to page 2-42.

Model	Rated Capacity	A	B	C	D	E	F	G	H	J	K	φL	φM	N	φP	Q	R	Weight (Approx.)*
LCTD-A-100KN	100kN	260	150	74	220	90	90	80	60	56	71.5	20	20	58.5	14	M12	18.5	18kg
LCTD-A-200KN	200kN			93							90.5							73
LCTD-A-300KN	300kN	300	200	94	250	140	100	130	70	80	91.5	36	26	74	18	M16	28.5	33kg

*not including cable

●Physical quantity indication

●Static measurement ●Dynamic measurement

LCTD-A Recommended products for combination

Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-650B → 2-163

Instrumentation Amplifiers WGA-670B → 2-161

4-Channel Signal Conditioner WGC-140A → 2-173

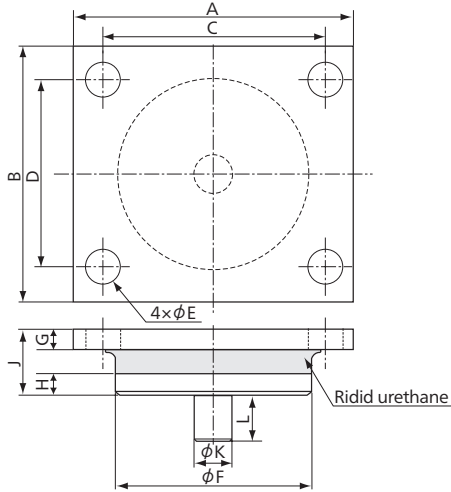
Data Loggers UCAM-60B → 3-25

Universal Recorders EDX-100A → 3-65



Accessories

● Rubber Attachments



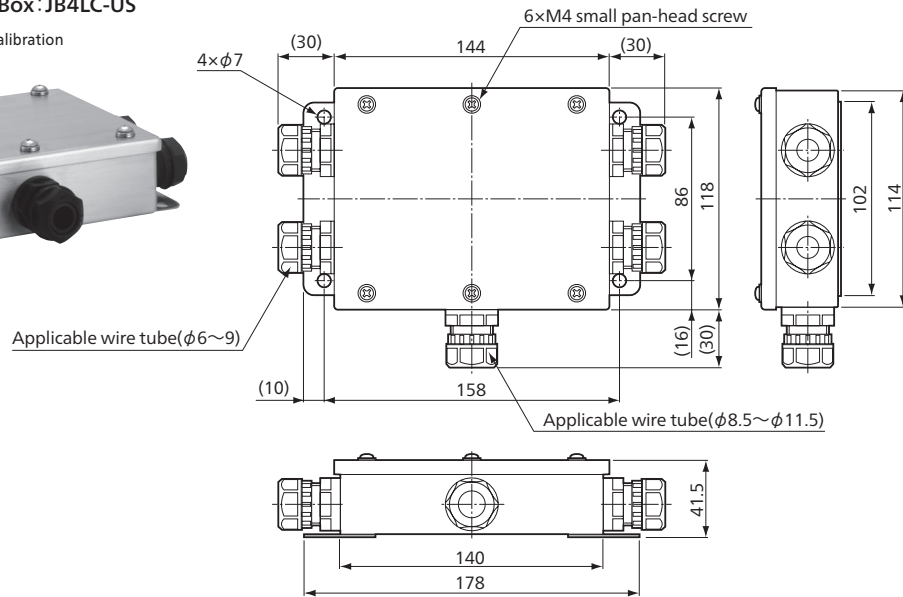
● Grounding Conductors for Weighing Sensors

Model	Length
JA3-200	200 mm
JA3-400	400 mm

Model	A	B	C	D	φE	φF	G	H	J	φK	L	Weight (Approx.)
RA01-2T	120	110	95	80	14	85	8.5	9.5	28	16		1.4kg
RA01-5T	170	150	140	120		130		12.5	35	20	20	3.2kg
RA01-10T	220	200	186	140	18	180	11.5	15.5	45			7.4kg
RA01-30T	300	250	250	200	23	240	18.5	20.5	63	35	40	19.2kg

● 4-channel Junction Box : JB4LC-US

Note: Adjustment through calibration with actual load is required.



Field to recommend



LTZ-A

High-Accuracy Tension Load Cells

- Small-Sized, High-Accuracy
- 500 N to 50 kN



TRANSDUCERS

Field to recommend



※TEDS-installed versions can be manufactured. Inquiries are welcome.
 ※Usable also for compression load measurement (Extra calibration and patch are required.)

Nonlinearity : within $\pm 0.05\%$ RO

- Compact and lightweight
- Large output
- Usable also for compression load measurement (Extra calibration and patch are required.)

The LTZ-A series load cells adopt a Roberval's mechanism to ensure 1/3333 nonlinearity and easy handling and maintenance. Since they can be installed with less burden to existing facilities, they are used as compact, lightweight load cells with excellent cost performance for weighing or testing systems in various fields. (Patented)

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.03\%$ RO (LTZ-50KA to 200KA) Within $\pm 0.05\%$ RO (LTZ-500KA to 5TA)
Hysteresis :	Within $\pm 0.03\%$ RO (LTZ-50KA to 200KA) Within $\pm 0.05\%$ RO (LTZ-500KA to 5TA)
Repeatability :	0.03% RO or less
Rated Output :	3 mV/V (6000 μ m/m) $\pm 0.2\%$

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within $\pm 0.005\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.005\%$ /°C

Electrical Characteristics

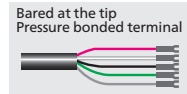
Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350 Ω $\pm 0.5\%$
Output Resistance :	350 Ω $\pm 0.5\%$
Cable :	4-conductor (0.5 mm ²) chloroprene shielded cable, 8.5mm diameter by 3m long, with press-fit terminal for 4mm (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Material :	Aluminum alloy (mainframe of 50 to 200KA)
Natural Frequency :	See table below.
Weight :	See table below.
Protection Rating :	IP64 (Splashproof type conforming to JIS C 0920)

Model	Rated Capacity	Natural Frequency (Approx.)	Weight (Approx.)*
LTZ-50KA	500N	1.25kHz	300g
LTZ-100KA	1kN	1.75kHz	
LTZ-200KA	2kN	2kHz	350g
LTZ-500KA	5kN	2.5kHz	700g
LTZ-1TA	10kN	2.8kHz	
LTZ-2TA	20kN	2.6kHz	1.5kg
LTZ-5TA	50kN	4.3kHz	4.4kg

*not including cable

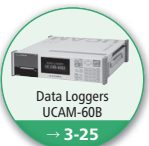
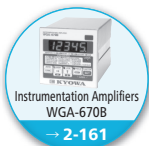


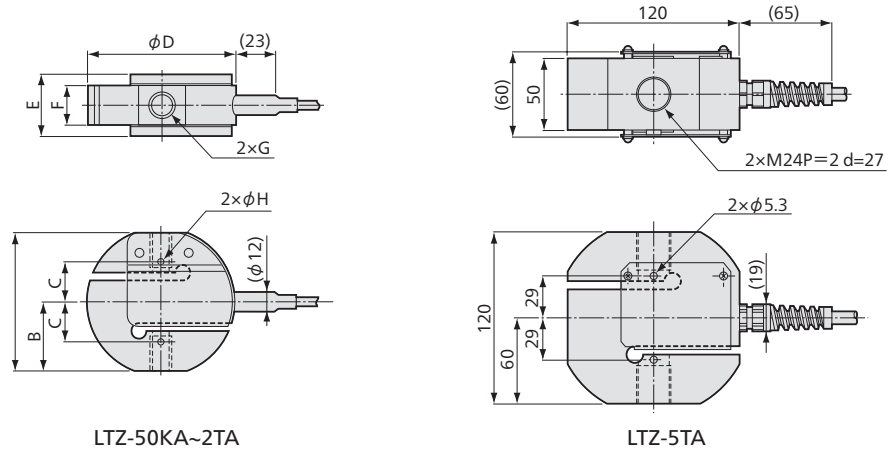
In Combination with Ball Joint



※Note: Not usable for special accessories for tension loads except ball joint.

- Physical quantity indication
- Static measurement
- Dynamic measurement



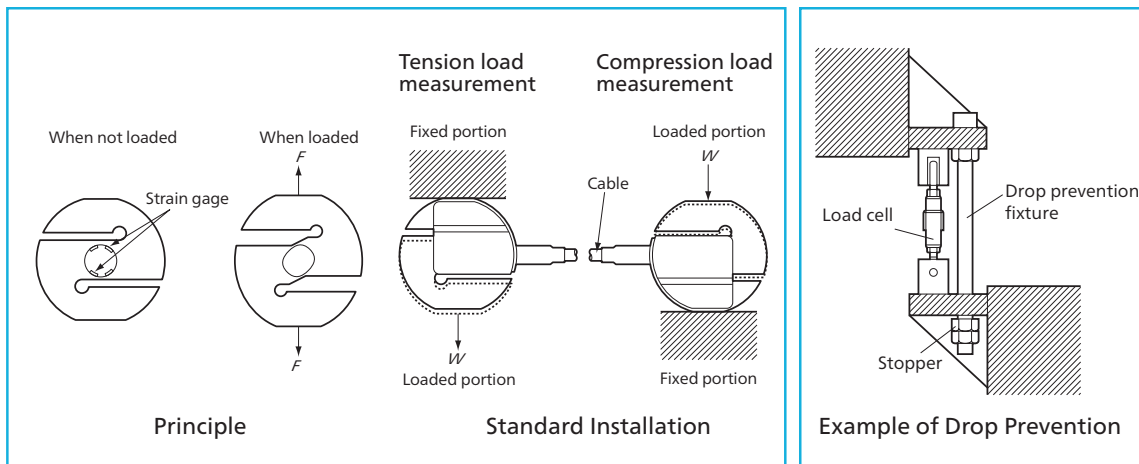
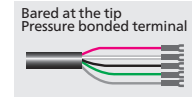


LTZ-50KA~2TA

LTZ-5TA

Model	A	B	C	ϕD	E	F	G	ϕH
LTZ-50KA	64	32	19	68	32	22	M6 P=1 d=14	1.6
LTZ-100KA								
LTZ-200KA								
LTZ-500KA	74	37	21	78	32	22	M12 P=1.75 d=18	3.5
LTZ-1TA								
LTZ-2TA	94	47	23	98	40	30	M18 P=1.5 d=25	3.5
LTZ-5TA								

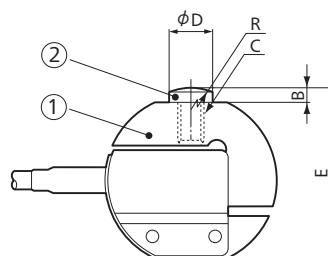
See the above dimensional drawing.



■ Dimensions in Combination with Special Accessories

Contact us for using the tension load cell in combination with special accessories.

● In Combination with Patch CWM



① Load Cell	② Patch	B	C	ϕD	E	R
LTZ-50KA	CWM-6	4	M6 P=1	10	68	SR30
LTZ-100KA						
LTZ-200KA						
LTZ-500KA	CWM-12	7	M12 P=1.75	19	81	SR30
LTZ-1TA						
LTZ-2TA	CWM-18	10	M18 P=1.5	26	104	SR30
LTZ-5TA	CWM-24	17	M24 P=2	36	137	

Field to recommend

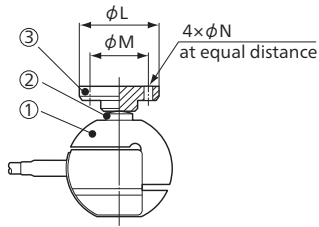


Field to recommend



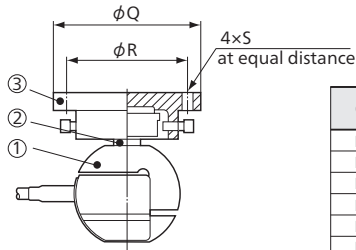
Dimensions in Combination with Special Accessories

In Combination with Patch CWM, Mount Base CF and Saddle CA



① Load Cell	② Patch	③ Mount Base	ϕL	ϕM	ϕN
LTZ-50KA	CWM-6	CA-2B	53	38	7
LTZ-100KA					
LTZ-200KA					
LTZ-500KA	CWM-12	CA-2B	53	38	7
LTZ-1TA					
LTZ-2TA					
LTZ-5TA	CWM-24	CA-10B	98	80	11

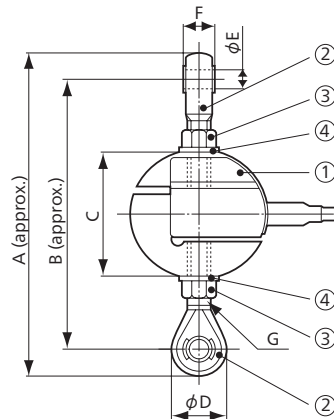
In Combination with Patch CWM, Mount Base CF and Movable Saddle ER



① Load Cell	② Patch	③ Movable Saddle	ϕQ	ϕR	S
LTZ-50KA	CWM-6	ER-2B	108	90	M8
LTZ-100KA					
LTZ-200KA					
LTZ-500KA	CWM-12	ER-2B	108	90	M8
LTZ-1TA					
LTZ-2TA					
LTZ-5TA	CWM-24	ER-5B	148	128	M12

In Combination with Ball Joint TU

Note: Ball joint (TU) should be mounted to load cell at our factory.



① Load Cell	② Ball Joint	③ Hexagon Nut/Hexagon Nut	④ Spring Washer	A	B	C	ϕD	ϕE	F	G	Static Breaking Load (Approx.)
LTZ-50KA	TU-6C	M6 P=1	2# 6S	128	110	64	18	6	9	M6 P=1	1.4kN
LTZ-100KA											2.9kN
LTZ-200KA											5.8kN
LTZ-500KA	TU-12C	M12 P=1.75	2# 12S	196	166	74	30	12	16	M12 P=1.75	14.7kN
LTZ-1TA											29.4kN
LTZ-2TA											58.8kN
LTZ-5TA	TU-24C	M24 P=2	3# 24S	346	276	120	70	25	37	M24 P=2	147kN

Dimensions A and B are approximate, since the ball joint is screw-in type.

LT-FH/FL

- High-temperature -10 to 150°C
- Low-temperature -196 to 30°C
- 500N to 50kN

High/Low Temp. Tension Load Cells



※TEDS-installed versions can be manufactured. Inquiries are welcome.

High Reliability, Airtight Structure, Selectable from a Wide Range of Rated Capacities.

- Mechanical stopper that activates at 500% overload

LT-FH series enables continuous operation under temperature as high as 150°C with no external cooling. LT-FL series enable operation at ultra-low temperatures ranging from -196°C.

Specifications

Performance

Rated Capacity :	See table below
Nonlinearity :	Within $\pm 0.5\%$ RO
Hysteresis :	Within $\pm 0.5\%$ RO
Repeatability :	0.05% RO or less
Rated Output :	1.5mV/V (3000 μ m/m) $\pm 0.2\%$

Environmental Characteristics

Safe Temperature Range :	
FH :	-10 to 150°C (Excluding connector part)
FL :	-200 to 80°C (Excluding connector part)
Compensated Temperature Range :	
FH :	-10 to 150°C (Excluding connector part)
FL :	-196 to 30°C (Excluding connector part)
Temperature Effect on ZERO Balance :	
	Within $\pm 0.005\%$ RO/°C
Temperature Effect on Output :	
	Within $\pm 0.01\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350 Ω $\pm 0.5\%$
Output Resistance :	350 Ω $\pm 0.5\%$
Cable : 4-conductor (0.03mm ²) fluoroplastic shielded cable, 5mm diameter by 5m long, terminated with connector plug. (Shield wire is not connected to mainframe)	

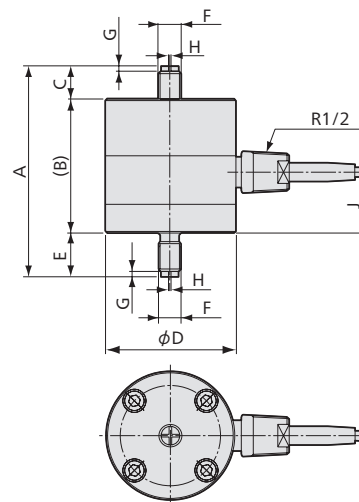
Mechanical Properties

Safe Overload Rating :	200%
Critical Overload :	500%
Natural Frequency :	See table below
Weight :	See table below

Model(FH)	Model(FL)	Rated Capacity	Natural Frequency (Approx.)	Weight (Approx.)*
LT-50KFH	LT-50KFL	500N	1.5kHz	1.7kg
LT-100KFH	LT-100KFL	1kN	2.6kHz	
LT-200KFH	LT-200KFL	2kN	4.1kHz	
LT-500KFH	LT-500KFL	5kN	5.0kHz	2.0kg
LT-1TFH	LT-1TFL	10kN	5.2kHz	2.1kg
LT-2TFH	LT-2TFL	20kN	5.8kHz	2.4kg
LT-5TFH	LT-5TFL	50kN	4.5kHz	7.0kg

*not including cable

Dimensions

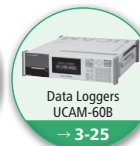
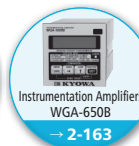


Model		A	(B)	C	ϕ D	E	F	G	H	J
LT-50KFH	LT-50KFL									
LT-100KFH	LT-100KFL	111	71	17	68	23	M12 P=1.75	3	1.6	32
LT-200KFH	LT-200KFL									
LT-500KFH	LT-500KFL	129	82	20	68	27	M14 P=2	5	3	36
LT-1TFH	LT-1TFL	143	84	26	68	33	M18 P=1.5	5	3	
LT-2TFH	LT-2TFL	168	89	35	68	44	M24 P=2	5	3	
LT-5TFH	LT-5TFL	236	126	55	96	55	M39 P=3	6	6	48

Connector plug

- Physical quantity indication

- Static measurement
- Dynamic measurement



Field to recommend



Compact Tension/Compression Load Cells



Note: For transducers providing both positive and negative outputs, an average of both outputs are written as the rated output.

Suitable for Measuring and Controlling Loads Applied to Small-Scale Presses and Press-Fitting Devices

- High sensitivity
- Waterproof connector
- Stainless steel
- Easy installation

Compact and lightweight design with a screw-shape load receiving portion facilitates easy installation to equipment. Furthermore, the cable is connected using a connector, therefore there are no problems with wiring when situating, and cable replacement is easy. Work is also possible if the cable is replaced with one resistant to repeated bending (flexible cable). Please add M1Z3K to the end of the model name.

Specifications

Performance

Rated Capacity :	See table below
Nonlinearity:	Within $\pm 0.15\%$ RO (LUX-B-50N to 2KN) Within $\pm 0.1\%$ RO (LUX-B-5KN to 20KN)
Hysteresis :	Within $\pm 0.15\%$ RO (LUX-B-50N to 2KN) Within $\pm 0.1\%$ RO (LUX-B-5KN to 20KN)
Repeatability :	0.05% RO or less
Rated Output :	$\pm 0.85\text{mV/V}$ ($\pm 1700\mu\text{m/m}$) or more (LUX-B-50) $\pm 0.9\text{mV/V}$ ($\pm 1800\mu\text{m/m}$) or more (LUX-B-100N to 1KN) $\pm 1.3\text{mV/V}$ ($\pm 1900\mu\text{m/m}$) or more (LUX-B-2KN to 20KN)

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within $\pm 0.03\%$ RO/°C (LUX-B-50N to 200N) Within $\pm 0.005\%$ RO/°C (LUX-B-500N to 20KN)
Temperature Effect on Output :	Within $\pm 0.005\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	10V AC or DC (LUX-B-50N to 200N) 15V AC or DC (LUX-B-500N to 20KN)
Recommended Excitation Voltage :	1 to 5V AC or DC (LUX-B-50N to 20KN) 1 to 10V AC or DC (LUX-B-500N to 20KN)
Input Resistance :	$375\Omega \pm 1.5\%$
Output Resistance :	$350\Omega \pm 1\%$
Dedicated connection cable :	TE-45
Included cable :	4-conductor (0.08mm ²) chloroprene shielded cable, 4mm diameter by 3m long, with connector plug to mainframe side, and bared to amplifier side (Shield wire is not connected to mainframe)

Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below
Material :	SUS (metallic finish)
Weight :	Approx. 260g (5 to 20KN) Approx. 90g (500 to 2KN) Approx. 50g (200N or less) (not including cable)
Protection Rating :	IP67 (Watertight type conforming to JIS 0920)

Model	Rated Capacity	Natural Frequency (Approx.)	※Recommended Tightening Torque (N.m)
LUX-B-50N-ID	$\pm 50\text{N}$	8kHz	3N-m
LUX-B-100N-ID	$\pm 100\text{N}$	11kHz	
LUX-B-200N-ID	$\pm 200\text{N}$	14kHz	
LUX-B-500N-ID	$\pm 500\text{N}$	16kHz	10N-m
LUX-B-1KN-ID	$\pm 1\text{kN}$	21kHz	
LUX-B-2KN-ID	$\pm 2\text{kN}$	27kHz	
LUX-B-5KN-ID	$\pm 5\text{kN}$	18kHz	80N-m
LUX-B-10KN-ID	$\pm 10\text{kN}$	21kHz	
LUX-B-20KN-ID	$\pm 20\text{kN}$	25kHz	

Bared at the tip
(for TEDS installation)



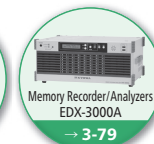
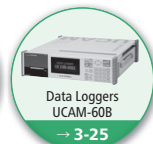
To Ensure Safe Usage

If impacts are expected in receiving tension loads, select a load cell with the rated capacity higher by one rank than the operating load.

● Physical quantity indication

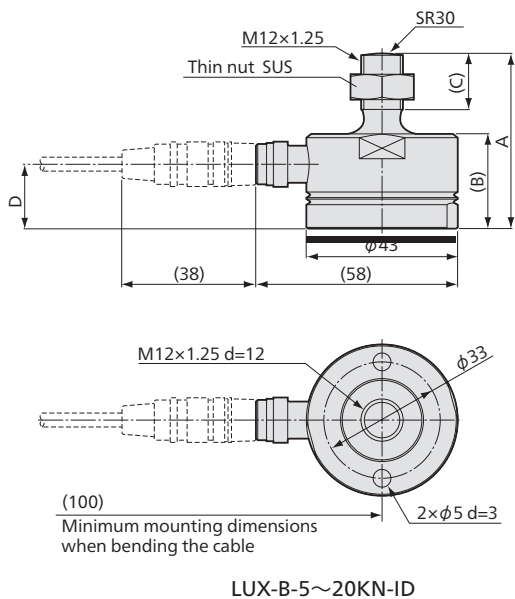
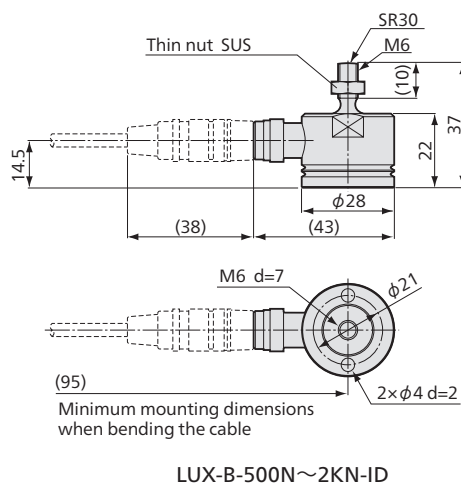
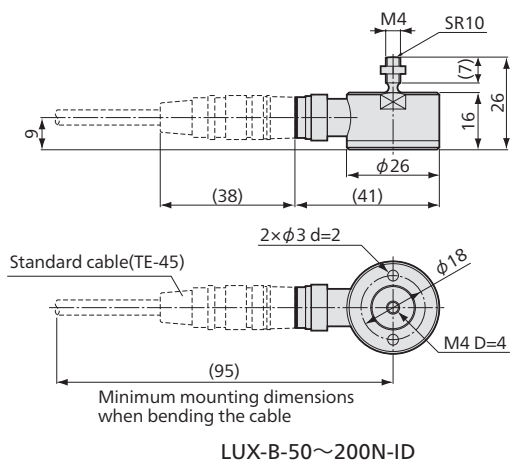
● Static measurement

● Dynamic measurement

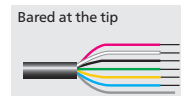




Dimensions

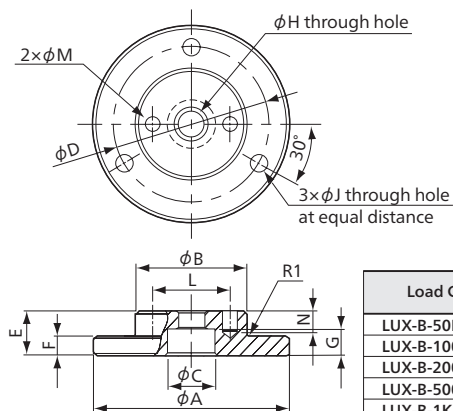


Model	A	B	C	D
LUX-B-5KN-ID	49	26.5	15	19.5
LUX-B-10KN-ID	51	27.5	16	18
LUX-B-20KN-ID	53	27	16	18



Dimensions of Mount Base

Mount Base CX



Load Cell	Mount Base	φA	φB	φC	φD	E	F	G	φH	φJ	L	φM	N	Weight (Approx.)
LUX-B-50N-ID	CX-2	43	26	9	35	7	2.5	4.5	4.5	5	18±0.1	3 ^{+0.20} / _{+0.06}	4.5	40g
LUX-B-100N-ID														
LUX-B-200N-ID														
LUX-B-500N-ID	CX-4	48	29	13	39	12	5	7	7	5	21±0.1	4 ^{+0.2} / _{+0.1}	6	100g
LUX-B-1KN-ID														
LUX-B-2KN-ID														
LUX-B-5KN-ID														
LUX-B-10KN-ID	CX-6	68	44	20	57	20	10	13	13	7	33±0.1	5 ^{+0.2} / _{+0.1}	6	350g
LUX-B-20KN-ID														

Hexagon socket head bolt for connection between load cell and mount base and locking pins are attached to the mount base.

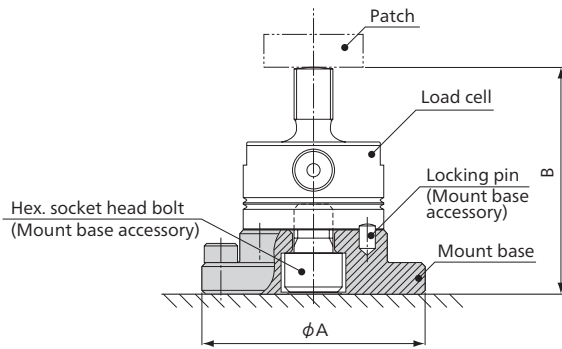
Field to recommend



■ Dimensions in Combination with Special Accessories

● In Combination with Mount Base CX

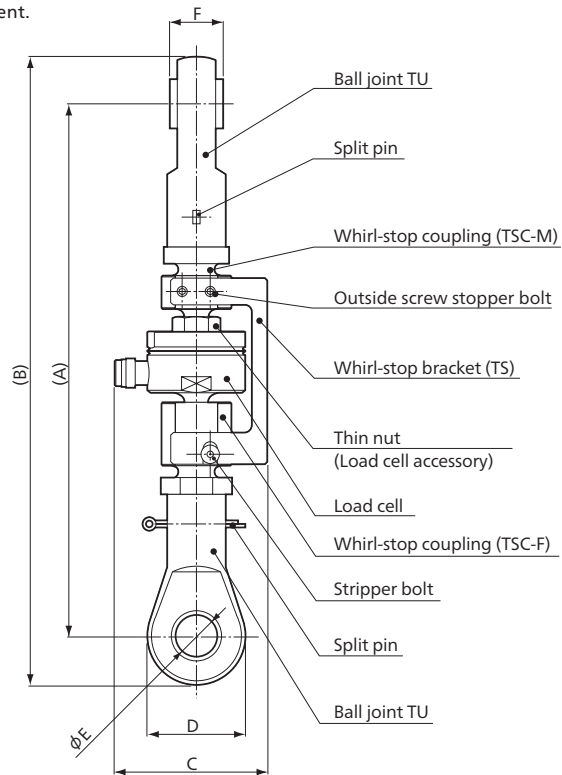
The patch should be prepared by user or CA-2F or the equivalent should be used.
This combination does not apply to tension load measurement.



Load cell	Mount Base	(A)	(B)
LUX-B-50N-ID	CX-2	43	33
LUX-B-100N-ID			
LUX-B-200N-ID			
LUX-B-500N-ID	CX-4	48	49
LUX-B-1KN-ID			
LUX-B-2KN-ID			
LUX-B-5KN-ID	CX-6	68	69
LUX-B-10KN-ID			71
LUX-B-20KN-ID			73

● In Combination with Ball Joint TU, Whirl-Stop Coupling TSC and Whirl-Stop Bracket TS

This combination does not apply to compression load measurement.



※Note that the Whirl-Stop Bracket TS is not a safety device to be used when a load exceeding the safe overload is applied. If exceeding safe overload is applied, install a safety device on customer side before use.

Load Cell	Whirl-stop Coupling	Whirl-stop Bracket	Ball Joint	(A)	(B)	C	D	ϕE	F
LUX-B-50N-ID	TSC-2M TSC-2F	TS-2	TU-6B	102	120	44.7	18	6	9
LUX-B-100N-ID									
LUX-B-200N-ID									
LUX-B-500N-ID	TSC-4MB TSC-4FB	TS-4B	TU-12B	165	195	50.5	30	12	16
LUX-B-1KN-ID									
LUX-B-2KN-ID									
LUX-B-5KN-ID	TSC-6MB TSC-6FB	TS-6B	TU-18B	237	279	67	42	18	23
LUX-B-10KN-ID				239	281				
LUX-B-20KN-ID				241	283				

To Ensure Safe Usage

Check the strength of the material to which the load cell is tightened.

If a load cell with the rated capacity of 2 kN or more is selected, the material to which the load cell is tightened should have a tensile strength σ_b of 800 : N/mm² or higher.

Typical recommended materials : SUS630(H900) HRC40 to 47
SCM435 HRC30 to 38

※For tension load measurement, take care never to exceed the safe overload rating.

Field to recommend





Field to recommend



LUX-B Safe Bending Moment (N.mm)

● Figures below show the safe bending moment against lateral load with a load applied in sensitivity direction (vertical direction)

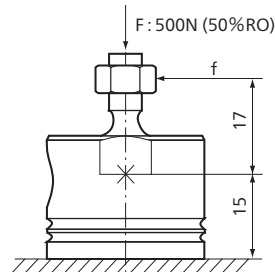
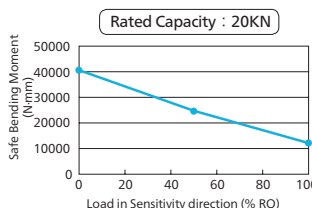
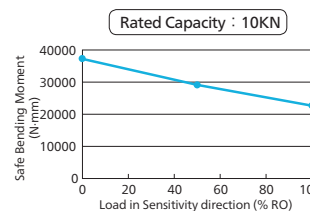
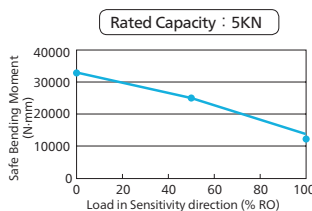
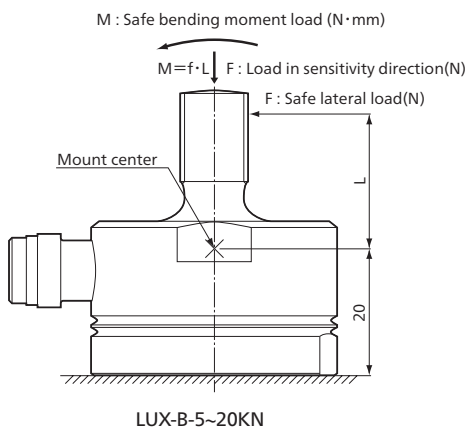
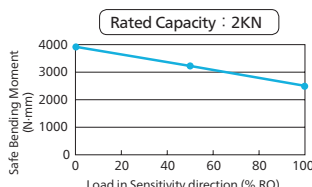
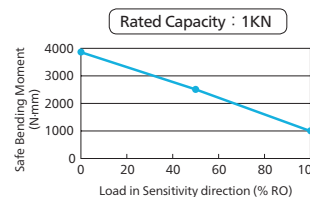
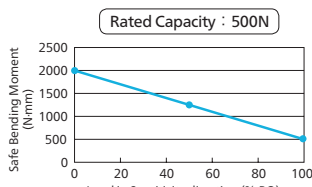
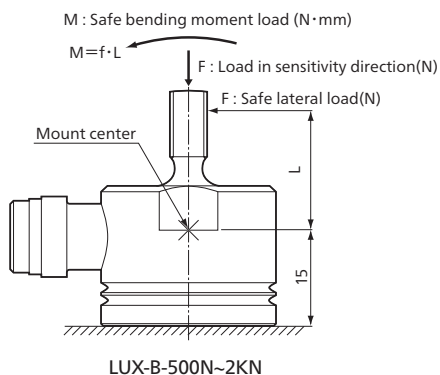
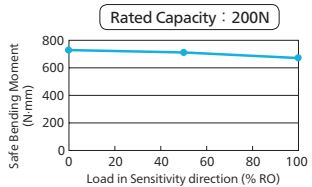
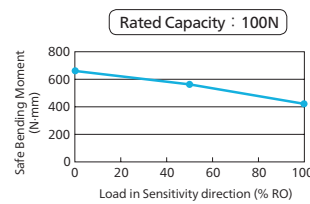
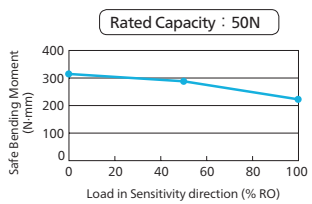
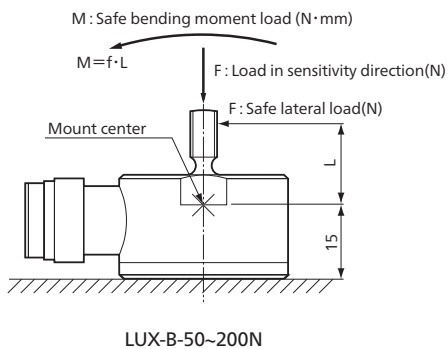
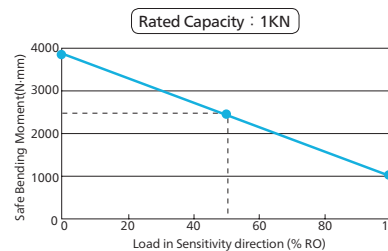


fig:1



Graph-1

How to Obtain Safe Lateral Load

Shown here is an example calculating the safe lateral load when the LUX-B-1KN receives a load in sensitivity direction (vertical direction). (See Fig. 1.)

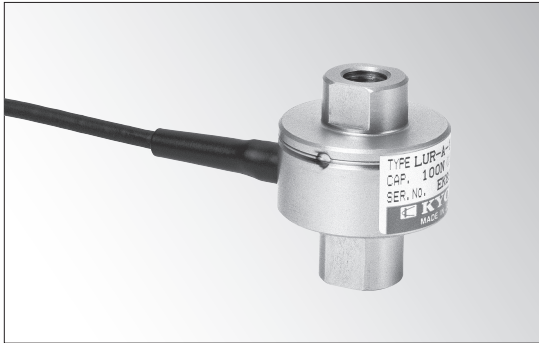
The safe lateral load f (N) which can be applied to the screw at the distance of 17 mm from the center of moment when a load of 500 N (50% the rated capacity) is applied in sensitivity direction and is obtained as follows:

According to Graph-1, safe bending moment, M, is approximately 2500 N·m when a load of 50% the rated capacity is applied in sensitivity direction. Since the relation between safe lateral load f, and safe bending moment M is $M = f \cdot L$,

$$f = \frac{M}{L} = \frac{2500}{17} = 147.1\text{N}$$

Therefore, the safe lateral load f is 147.1 N.

Compact Tension/Compression Load Cells



Compact, Lightweight Tension/Compression Load Cells

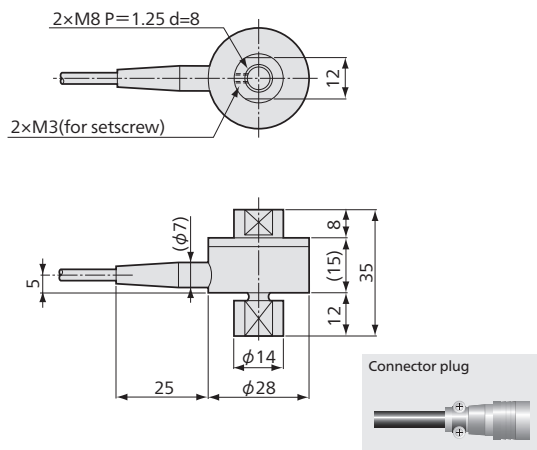
Compact and lightweight LUR-A-S1 series is easy to use tension/compression load cells, which can be used in various fields ranging from production lines to experiments.

To Ensure Safe Usage

- Consult with our sales engineer when using in combination with special accessories.
- Special accessories for tension loads should be mounted to the load cell at our factory.
- When using for tension loads, be sure to fix the load cell with accessory hexagon socket head setscrews (M3 L=4).

※Note: The connector plug at the cable tip may be replaced with R05-PB5M, when ordering, Suffix "-R" to the model number.

Dimensions



Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within \pm 0.5% RO
Hysteresis:	Within \pm 0.5% RO
Rated Output:	\pm 0.5 mV/V (\pm 1000 μ m/m) or more (LUR-A-100NSA1 to 2KNSA1) Approx. \pm 0.4 mV/V (\pm 800 μ m/m) (LUR-A-50NSA1)

Environmental Characteristics

Safe Temperature Range:	-10 to 70 $^{\circ}$ C
Compensated Temperature Range:	0 to 70 $^{\circ}$ C
Temperature Effect on Zero Balance:	Within \pm 0.05% RO/ $^{\circ}$ C (LUR-A-100NSA1 to 2KNSA1) Within \pm 0.1% RO/ $^{\circ}$ C (LUR-A-50NSA1)
Temperature Effect on Output:	Within \pm 0.05%/ $^{\circ}$ C (LUR-A-100NSA1 to 2KNSA1) Within \pm 0.1%/ $^{\circ}$ C (LUR-A-50NSA1)

Electrical Characteristics

Safe Excitation Voltage:	7V AC or DC
Recommended Excitation Voltage:	1 to 2V AC or DC
Input Resistance:	350 Ω \pm 2%
Output Resistance:	350 Ω \pm 2%
Cable:	4-conductor (0.05 mm 2) chloroprene shielded cable, 3 mm diameter by 5 m long, terminated with NDIS connector plug

Mechanical Properties

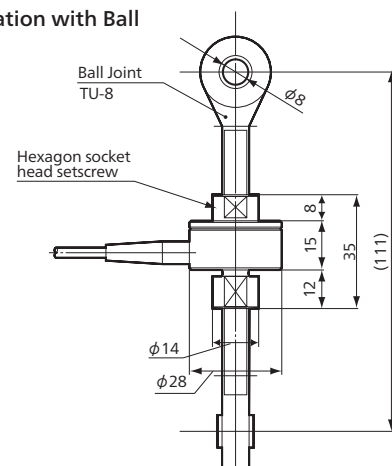
Safe Overload Rating:	150%
Natural Frequency:	See table below.
Weight:	Approx. 80g (not including cable)

Standard Accessories Hexagon socket head setscrew M3 L=4

Model	Rated Capacity	Natural Frequency (Approx.)
LUR-A-50NSA1	\pm 50N	2kHz
LUR-A-100NSA1	\pm 100N	4kHz
LUR-A-200NSA1	\pm 200N	5kHz
LUR-A-500NSA1	\pm 500N	9kHz
LUR-A-1KNSA1	\pm 1kN	14kHz
LUR-A-2KNSA1	\pm 2kN	20kHz

Dimensions in Combination with Ball Joint

● In Combination with Ball Joint TU-8

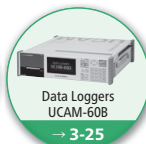


● Physical quantity indication

● Static measurement

● Dynamic measurement

LUR-A-SA1
Recommended
products for
combination



Field
to recommend

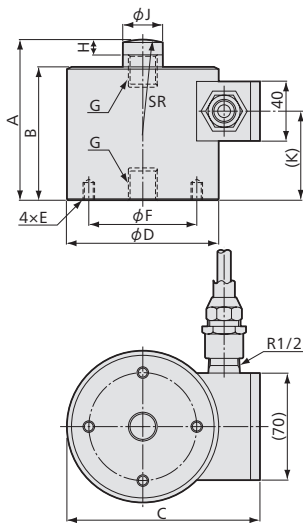


Tension/Compression Load Cells

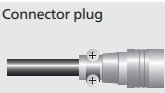


※TEDS-installed versions can be manufactured. Inquiries are welcome.

Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	A	B	C	φD	E	φF	G	H	φJ	(K)	SR	Weight (Approx.)*	Saddle	Mount Base
LU-50KE	±500N	1.54kHz	91.5	77.5	114	80	M5 d=8	50	M8 P=1.25 d=12	10	12	32.5	30	2.8kg	CA-1B	CF-50
LU-100KE	±1kN	2.16kHz														
LU-200KE	±2kN	3.28kHz														
LU-500KE	±5kN	2.66kHz	105	90	134	100	M8 d=8	80	M12 P=1.75 d=17	10	19	40	30	2.8kg	CA-1B	CF-80
LU-1TE	±10kN	4.2kHz	108	90	130	100	M8 d=12	80	M14 P=2 d=22	10	26	60	50	2.8kg		
LU-2TE	±20kN	4.97kHz	108	90	130	100	M8 d=12	80	M18 P=1.5 d=22	10	26	60	70	2.8kg		
LU-5TE	±50kN	3.5kHz	167	140	144	112	M8 d=15	95	M26 P=2 d=35	17	36	100	70	5.0kg		
LU-10TE	±100kN	3.14kHz	220	190	172.5	138	M8 d=15	120	M36 P=2 d=45	20	50	145	70	9.5kg		
LU-20TE	±200kN	2.5kHz	277	235	221	186	M8 d=15	160	M50 P=3 d=65	27	64	190	100	22.0kg		



Connector plug

Hermetically-Seal Structure With Inert Gas Filled in Usable for both Tension and Compression Loads

The detection portion is hermetically sealed with inert gas filled in to prevent aging deterioration and to ensure reliability and stability for a long period of time.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.2% RO
Hysteresis :	Within±0.1% RO
Repeatability :	0.1% RO or less
Rated Output :	2 mV/V (4000μm/m) ±0.2%

Environmental Characteristics

Safe Temperature Range :	-30 to 85°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within±0.005% RO/°C
Temperature Effect on Output :	Within±0.005%/°C

Electrical Characteristics

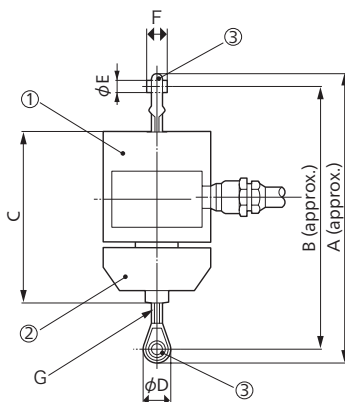
Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±0.5%
Output Resistance :	350Ω±0.5%
Cable :	4-conductor (0.3mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, terminated with NDIS connector plug (Shield wire is connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below.

Dimensions in Combination with Special Accessories

● In Combination with Rotating Attachment RJ and Ball Joint TU



① Load Cell	② Rotating Attachment	③ Ball Joint	A	B	C	φD	φE	F	G	Static Breaking Load (Approx.)
LU-50KE	RJ-02	TU-8	217	195	125	22	8	11	M8 P=1.25	1.4kN
LU-100KE										2.9kN
LU-200KE										5.8kN
LU-500KE	RJ-05	TU-12	262	232	140	30	12	16	M12 P=1.75	14.7kN
LU-1TE	RJ-1	TU-14	283	246	160	37	14	17	M14 P=2	29.4kN
LU-2TE	RJ-2	TU-18	304	262	160	42	18	23	M18 P=1.5	58.8kN
LU-5TE	RJ-5	TU-26	463	393	235	70	25	37	M26 P=2	136.3kN
LU-10TE	RJ-10	TU-36	678	573	315	105	40	60	M36 P=2	—
LU-20TE	RJ-20	TU-50	842	706	414	136	50	75	M50 P=3	—

Notes: 1. Rotation attachment RJ is not applicable for compression load measurement.
2. Special accessories for tension loads should be mounted at our factory.
3. Dimensions A and B are approximate, since the ball joint is screw-in type.

● Physical quantity indication

● Static measurement

● Dynamic measurement

LU-E Recommended products for combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-670B
→ 2-161

Data Loggers
UCAM-60B
→ 3-25

Universal Recorders
EDX-200A
→ 3-69

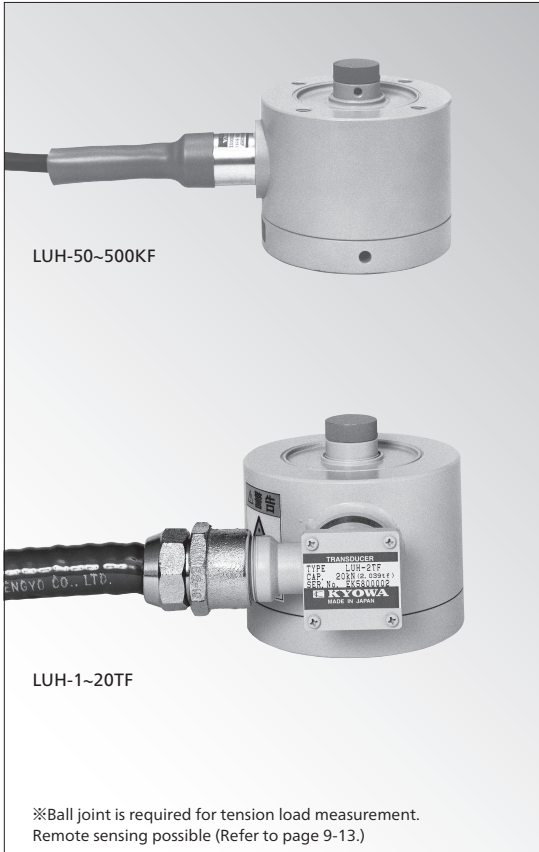


TRANSDUCERS

Field to recommend



High-Accuracy Tension/Compression Load Cells

Field
to recommend

LUH-50~500KF

LUH-1~20TF

※Ball joint is required for tension load measurement.
Remote sensing possible (Refer to page 9-13.)

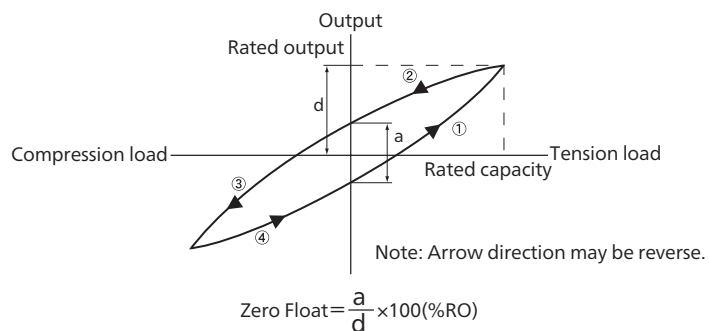
Excellent Zero Float Characteristics
(LUH-50 to 500KF)
Tension/Compression Load Cells

- Remote sensing possible (Refer to page 9-13.)

LUH-F series is tension/compression load cells featuring within ±0.05%RO nonlinearity. The hermetically-sealed structure with inert gas filled in ensures stable characteristics.

ZERO FLOAT

Zero float means such a phenomenon that a cycle of continuously applied tension and compression loads causes the zero to float. The value is expressed in percentage of the rated output. It is also called cyclic zero shift.



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within ±0.02% RO
Hysteresis :	Within ±0.02% RO
Repeatability :	0.02% RO or less
Zero Float :	0.02% RO or less (LUH-50KF to 500KF)
Rated Output :	2 mV/V (4000 μm/m) ±0.1%

Environmental Characteristics

Safe Temperature Range :	-35 to 80°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within ±0.0015% RO/°C
Temperature Effect on Output :	Within ±0.001%/°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω ±0.5%
Output Resistance :	350Ω ±0.5%
Cable :	6-conductor (0.5 mm ²) chloroprene shielded cable, 9.5 mm diameter by 5 m long, with press-fit terminal for 4 mm (Shield wire is not connected to mainframe.)

Mechanical Properties

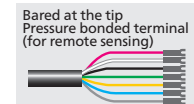
Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below.
Others :	Drop prevention stopper mountable(※)
Critical overload :	1000% (LUH-50 to 500KF)

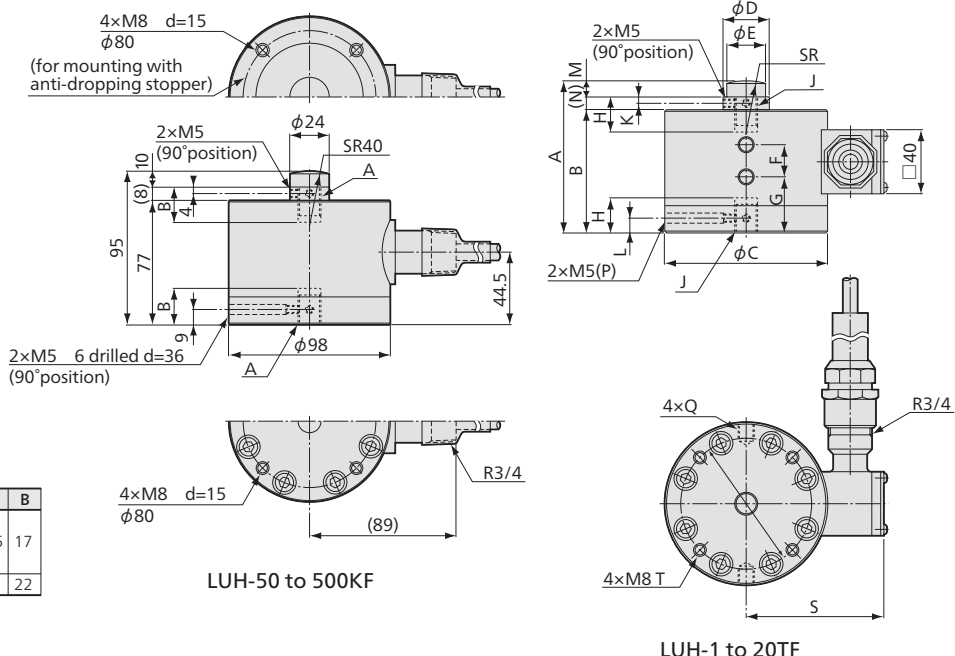
Standard Accessories 4 hexagon socket head setscrews M5 L=10 mm
(30 mm with LUH-10TF and 20TF)
1 hexagon bar (opposite side 25 mm)

Model	Rated Capacity	Natural Frequency (Approx.)	Weight (Approx.)*
LUH-50KF	±500N	1.4kHz	2.1kg
LUH-100KF	±1kN	2.2kHz	
LUH-200KF	±2kN	3.1kHz	
LUH-500KF	±5kN	4.6kHz	4kg
LUH-1TF	±10kN	4.2kHz	4kg
LUH-2TF	±20kN	6kHz	9kg
LUH-5TF	±50kN	5.2kHz	18kg
LUH-10TF	±100kN	4.5kHz	38kg
LUH-20TF	±200kN	3.7kHz	

*not including cable

(※)Customers have to prepare anti-dropping stoppers by them self.





Model	A	B
LUH-50KF		
LUH-100KF	M12 P=1.75	17
LUH-200KF		
LUH-500KF	M18 P=1.5	22

LUH-50 to 500KF

LUH-1 to 20TF

Model	A	B	φC	φD	φE	F	G	H	J	K	L	M	(N)	(P)	Q	SR	S	T	U	φV
LUH-1TF	95	77	100	24	24	20	35	22	M14 P=2	4	9	10	8	6 drilled d=36	M8 d=10	40	84.5	d=12	24.5	80
LUH-2TF	95	77	100	24	24	20	35	22	M18 P=1.5	4	9	10	8	6 drilled d=36	M8 d=10	40	84.5	d=12	24.5	80
LUH-5TF	127	100	130	36	36	30	50	30	M26 P=2	5	13	17	10	9 drilled d=42	M16 d=16	60	99.5	d=15	40	95
LUH-10TF	170	135	160	50	50	40	60	45	M36 P=2	8	17	20	15	9 drilled d=54	M20 d=15	70	115.5	d=15	60	120
LUH-20TF	228	175	200	68	64	50	80	65	M50 P=3	12	23	28	25	9 drilled d=65	M24 d=20	100	135.5	d=15	80	160

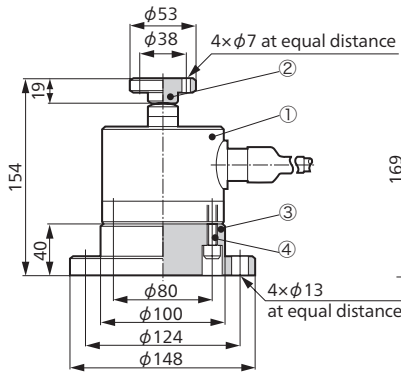
■ LUH-50KF to 5TF Dimensions in Combination with Mount Base

When using in combination with special accessories, consult with our sales engineer.

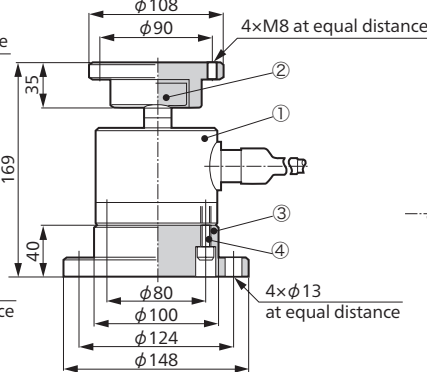
● In Combination with Saddle CA and Mount Base CF (LUH-50 to 500KF)

● In Combination with Movable Saddle ER and Mount Base CF (LUH-50KF to 2TF)

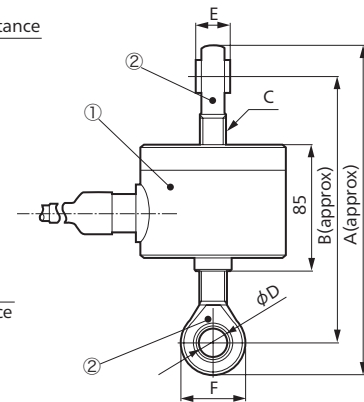
● In Combination with Ball Joint TU



- ① Load cell LUH-F
- ② Saddle CA-2B
- ③ Mount base CF-80
- ④ Hexagon socket head bolt 4-M8 L=30 (included in standard accessories of mount base)



- ① Load cell LUH-F
- ② Movable saddle ER-2B
- ③ Mount base CF-80 (1T, 2T)
- ④ Hexagon socket head bolt 4-M8 L=30 (included in standard accessories of mount base)



① Load Cell	② Ball Joint	A	B	C	D	E	F	Static Breaking Load (Approx.)
LUH-50KF								1.4kN
LUH-100KF	TU-12	207	177	M12 P=1.75	12	16	30	2.9kN
LUH-200KF								5.8kN
LUH-500KF	TU-18	231	189	M18 P=1.5	18	23	42	14.7kN

※From the viewpoint of guaranteed accuracy, hook and shackle cannot be combined.

Note: Special accessories for tension load measurement should be assembled at our factory.

● Physical quantity indication

● Static measurement

● Dynamic measurement

LUH-F Recommended products for combination

Instrumentation Amplifiers WGA-900A → 2-159

Instrumentation Amplifiers WGA-670B → 2-161

Data Loggers UCAM-60B → 3-25

Strain Amplifiers DPM-900 Series → 3-5

Memory Recorder/Analyzers EDX-3000A → 3-79

Field to recommend



Tension/Compression Load Cells



TRANSDUCERS

Field
to recommend

LUK-A-5 to 20KN

LUK-A-50 to 500KN

※ TEDS-installed versions can be manufactured. Inquiries are welcome.

Compact, Light Weight, Tension/
Compression Load Cells

The thin structure is suitable for installation where the height is limited. The service life can be extended by using with one-half the rated capacity if repetitive loads are applied continuously.

※When used for tension, special accessories such as ball-joint and rotating attachment.

To Ensure Safe Usage

Be sure to prevent the shaft from turning when using for hanging load measurement.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.1% RO (LUK-A-5KN to 200KN) Within±0.2% RO (LUK-A-500KN to 2MN)
Hysteresis :	Within±0.1% RO (LUK-A-5KN to 200KN) Within±0.2% RO (LUK-A-500KN to 2MN)
Repeatability :	0.05% RO or less (LUK-A-5KN to 200KN) 0.1% RO or less (LUK-A-500KN to 2MN)
Rated Output :	±2.4mV/V (±4800µm/m) ±0.1% (±2.4mV/V (±4000µm/m) ±10% with 5KN to 20KN)

Environmental Characteristics

Safe Temperature Range :	-35 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within±0.005% RO/°C
Temperature Effect on Output :	Within±0.005%/°C

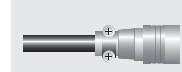
Electrical Characteristics

Safe Excitation Voltage :	15V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±1%
Output Resistance :	350Ω±1%
Cable :	4-conductor (0.3mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

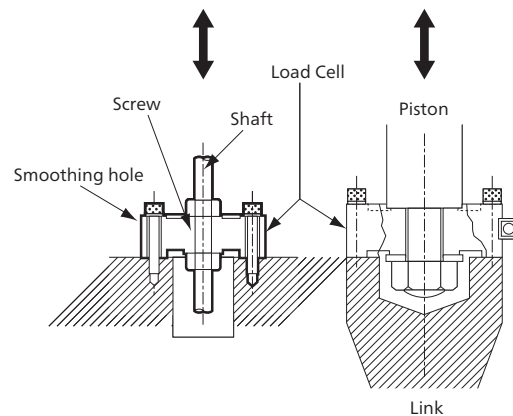
Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below (not including cable)
Safe Lateral Force Component :	See table below.
Safe Moment :	See table below.

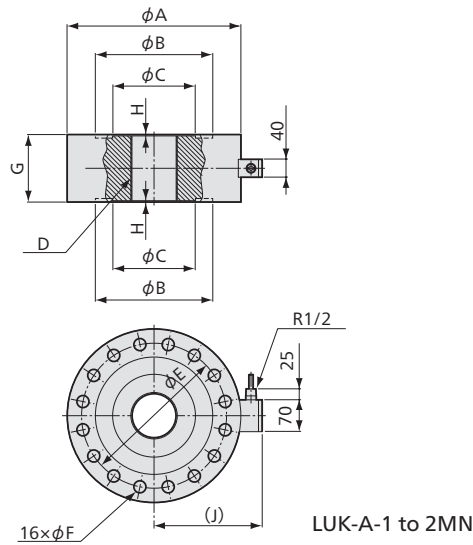
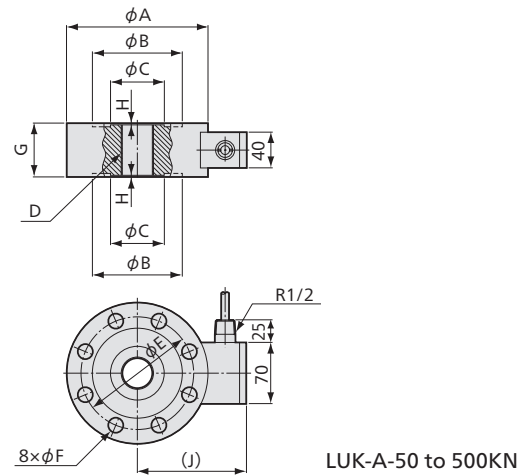
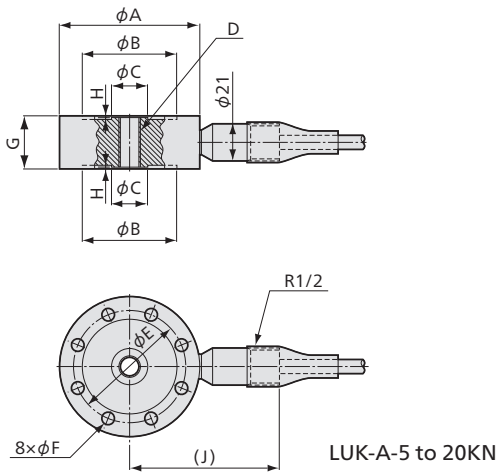
Connector plug



Installation Example



Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	Safe Moment	Safe Lateral Force Component	ϕA	ϕB	ϕC	D	ϕE	ϕF	G	H	(J)	Weight (Approx.)
LUK-A-5KN	±5kN	7.4kHz	15N·m	250N	77	52	20	M12 P=1.75	62	7	30	1	82	900g
LUK-A-10KN	±10kN	10.8kHz	30N·m	500N										
LUK-A-20KN	±20kN	8.5kHz	60N·m	1kN	107	70	34	M18 P=1.5	85	9	40	1	97	2kg
LUK-A-50KN	±50kN	11kHz	150N·m	2.5kN	127	77	40	M24 P=1.5	95	13	50	2	102	4kg
LUK-A-100KN	±100kN	9kHz	500N·m	5kN	157	100	60	M36 P=2	125	17	60	2	119	7kg
LUK-A-200KN	±200kN	7.5kHz	1kN·m	10kN	227	136	90	M50 P=2	180	22	70	2	157	18kg
LUK-A-500KN	±500kN	5.2kHz	2.5kN·m	25kN	307	200	138	M76 P=3	256	26	105	3	198	50kg
LUK-A-1MN	±1MN	5kHz	5kN·m	50kN	375	254	180	M100 P=3	314	26	150	3	233	90kg
LUK-A-2MN	±2MN	3.9kHz	10kN·m	100kN	560	410	260	M150 P=4	485	36	200	3	326	245kg

Field to recommend

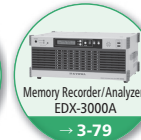
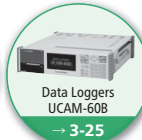


● Physical quantity indication

● Static measurement

● Dynamic measurement

LUK-A Recommended products for combination



LVS-A/LTS-A

Ultra Small-Capacity Load Cells

- Compact & Lightweight
- 50 mN to 20 N

2
-58



TRANSDUCERS



LVS-A

LTS-A

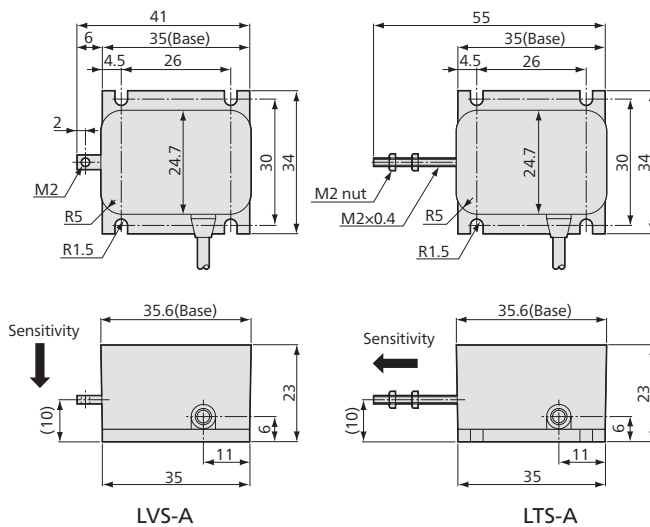
※TEDS-installed versions can be manufactured. Inquiries are welcome.

These Load Cells are Designed to Accurately Measure Small Loads Ranging from 50 mN to 20 N

- Compact and lightweight
- High accuracy
- Easy to handle

These load cells are designed to accurately measure small loads ranging from 50 mN to 20 N. Easy to install and handle, the LVS-A series measures loads in vertical direction to the mounted surface and the LTS-A series, in horizontal direction.

Dimensions



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.5% RO
Hysteresis :	Within±0.5% RO
Repeatability :	0.5% RO or less
Rated Output :	1.2 mV/V (2400µm/m) or more (LVS-5GA & 10GA) 1.5 mV/V (3000µm/m) or more (LVS/LTS-20GA to 2KA)

Environmental Characteristics

Safe Temperature Range :	-10 to 70°C
Compensated Temperature Range :	0 to 60°C
Temperature Effect on Zero Balance :	Within±0.05% RO/°C
Temperature Effect on Output :	Within±0.1%/°C

Electrical Characteristics

Safe Excitation Voltage :	6V AC or DC
Recommended Excitation Voltage :	1 to 2V AC or DC
Input Resistance :	120Ω±10%
Output Resistance :	120Ω±10%
Cable :	4-conductor (0.05 mm ²) chloroprene shielded cable, 3 mm diameter by 1 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

Mechanical Properties

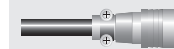
Safe Overload Rating :	120%
Critical Overload :	See table above.
Weight :	Approx. 50g (not including cable)

Model	Natural Frequency (Approx.)	Rated Capacity	Critical Overload
LVS-5GA	50Hz	50mN	1000%
LVS-10GA	111Hz	100mN	
LVS-20GA	147Hz	200mN	
LVS-50GA	294Hz	500mN	500%
LVS-100GA	455Hz	1N	
LVS-200GA	667Hz	2N	
LVS-500GA	1220Hz	5N	250%
LVS-1KA	1600Hz	10N	
LVS-2KA	2500Hz	20N	
LTS-50GA	256Hz	500mN	500%
LTS-100GA	385Hz	1N	
LTS-200GA	625Hz	2N	
LTS-500GA	1000Hz	5N	250%
LTS-1KA	1670Hz	10N	
LTS-2KA	1700Hz	20N	

To Ensure Safe Usage

- The load cell should be carefully installed. Especially, never apply any impact (force) in sensitivity direction.
- When mounting the rod to the measuring object, do not apply any bending or twisting force.

Connector plug

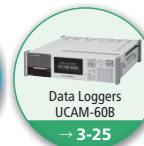


● Physical quantity indication

● Static measurement

● Dynamic measurement

LVS-A/LTS-A
Recommended
products for
combination



Field to recommend



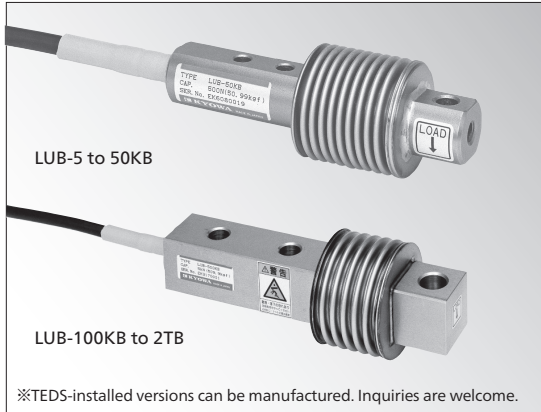
LUB-B

Beam-Type Load Cells

- Nonlinearity : within±0.05%RO(50 to 500 N)
- 50 N to 20 kN



TRANSDUCERS



※TEDS-installed versions can be manufactured. Inquiries are welcome.

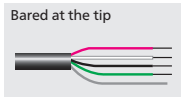
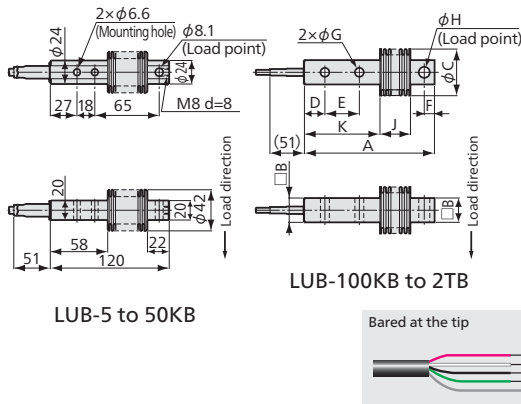
Compact and Lightweight, Metal Bellows

- Nonlinearity : within±0.05%RO*1
- Special steel body*1
- Corrosion-resistant*2

※1: 5 to 50KB ※2: 100KB to 2TB

LUB-5KB to 50KB feature a nonlinearity of within ±0.05%RO and LUB-100KB to 2TB feature corrosion-resistant stainless steel body and bellows. As load detectors, they enable configuration of accurate and stable weighing systems for conveyors and tanks.

Dimensions



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.03% RO (LUB-B-5KB to 50KB) Within±0.05% RO (LUB-B-100KB to 2TB)
Hysteresis :	Within±0.03% RO (LUB-B-5KB to 50KB) Within±0.05% RO (LUB-B-100KB to 2TB)
Repeatability :	0.03% RO or less
Rated Output :	2 mV/V (4000µm/m)±0.3%

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within±0.003% RO/°C
Temperature Effect on Output :	Within±0.003%/°C

Electrical Characteristics

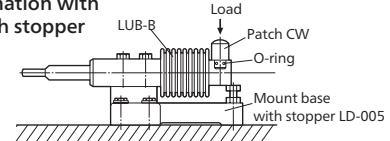
Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 12V AC or DC
Input Resistance :	435Ω±60Ω(LUB-B-5KB to 50KB) 400Ω±50Ω(LUB-B-100KB to 2TB)
Output Resistance :	350Ω±2 Ω
Cable :	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 3 m long (5 m long with LUB-B-100KB to 2TB), bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

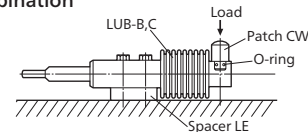
Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below (not including cable)
Protection Rating :	IP67 (Watertight type conforming to JIS C 0920)

In Combination with Special Accessories

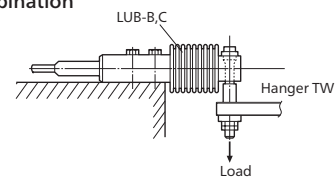
- LUB-B in combination with mount base with stopper



- LUB-B/C in combination with spacer



- LUB-B/C in combination with hanger



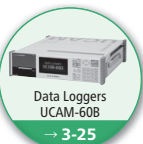
Model	Rated Capacity	Natural Frequency (Approx.)	A	B	φC	D	E	F	φG	φH	J	K	Weight (Approx.)	Patch	Mount Base w/ Stopper	Spacer	Hanger
LUB-5KB	50N	250Hz	See dimensional drawing above.										350g	CW-005	LD-005	LE-005	TW-002 (for 5 to 20KB)
LUB-10KB	100N	350Hz															TW-005 (for 5 to 50KB)
LUB-20KB	200N	500Hz															
LUB-30KB	300N	650Hz															
LUB-50KB	500N	800Hz															
LUB-100KB	1kN	1.8kHz	120	20	42	25	20	10	8.4	10.1	36	60	350g	CW-02	—	LE-02	TW-02
LUB-200KB	2kN	1.9kHz	190	35	67	30	50	15	13	16.1	45	110	1.5kg	CW-1	—	LE-1	TW-1
LUB-500KB	5kN	1.1kHz	220	44	84	30	60	20	17	20.2	54	124	2.8kg	CW-2	—	LE-2	TW-2
LUB-1TB	10kN	1.2kHz															
LUB-2TB	20kN	1.1kHz															

● Physical quantity indication

● Static measurement

● Dynamic measurement

LUB-B Recommended products for combination



LUB-C

Beam-Type Load Cells



- Nonlinearity : within $\pm 0.05\%$ RO
- 5 to 20 kN

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.05\%$ RO
Hysteresis :	Within $\pm 0.05\%$ RO
Repeatability :	0.03% RO or less
Rated Output :	2 mV/V (4000 $\mu\text{m/m}$) $\pm 0.5\%$

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within $\pm 0.003\%$ RO/°C
Temperature Effect on Output :	Within $\pm 0.003\%$ /°C

Electrical Characteristics

Safe Excitation Voltage :	20V AC or DC
Recommended Excitation Voltage :	1 to 12V AC or DC
Input Resistance :	380 Ω $\pm 8\%$
Output Resistance :	350 Ω $\pm 1\%$
Cable :	4-conductor (0.14mm ²) chloroprene shielded cable 6mm diameter by 2m long bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

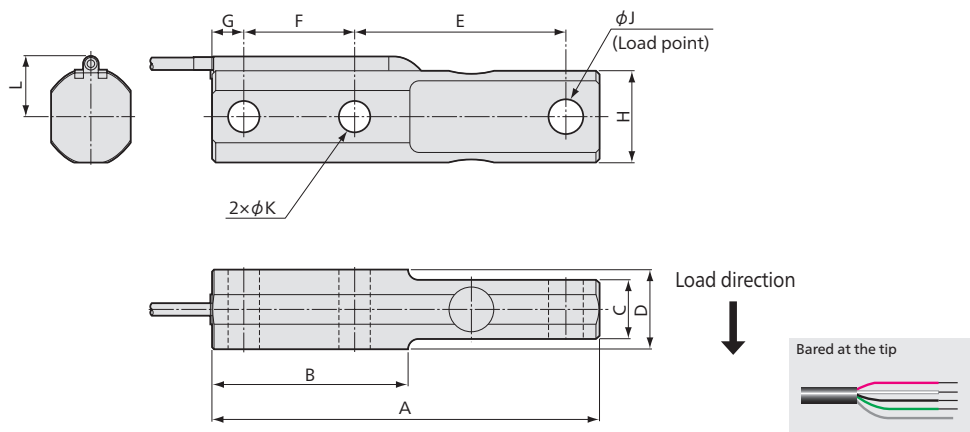
Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table below (not including cable)

Developed as OEM-Oriented Industrial Beam-Type Load Cells

- Low price
- Compact and lightweight
- Nonlinearity : within $\pm 0.05\%$ RO

Developed as OEM-oriented industrial beam-type load cells with nonlinearity of within $\pm 0.05\%$ RO. As load detectors, LUB-C series enables configuration of accurate and stable weighing systems for conveyors and tanks.

Dimensions



Model	Rated Capacity	Natural Frequency (Approx.)	A	B	C	D	E	F	G	H	ϕJ	ϕK	L	Weight (App.) including cable	Patch	Spacer	Hanger
LUB-500KC	5kN	1.3kHz	174	88	23.4	95	50	14	38	16.1	14	27	1.3kg			LE-1	
LUB-2TC	20kN	1.3kHz	206	106	32.6	110	60	16	53	20.2	18	34	2.7kg			LE-2	

● Physical quantity indication

● Static measurement

● Dynamic measurement

LUB-C Recommended products for combination

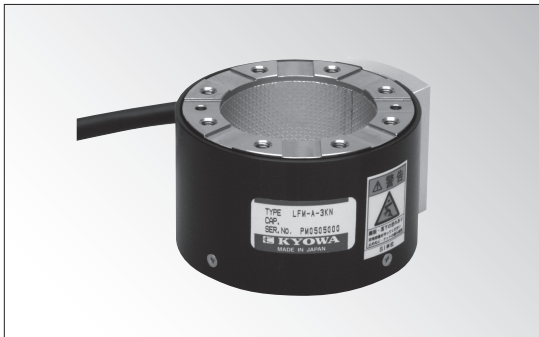
- Instrumentation Amplifiers WGA-900A → 2-159
- Instrumentation Amplifiers WGA-670B → 2-161
- Data Loggers UCAM-60B → 3-25
- Strain Amplifiers DPM-900 Series → 3-5
- Sensor Interfaces PCD-430A → 3-51



Field to recommend



Compact 6-Component Force Transducers



Compact, High Sensitivity Center Hole Type of 6-Component Force Transducers

Enables simultaneous measurement of 3 forces (F_x , F_y , F_z) in 3 axial directions orthogonal to the transducer and 3 moments (M_x , M_y , M_z) around the axes. An 8-channel measuring instrument amplifies the transducer's 8 output components in strain quantity and calculates 6-component force.

※The equation is described in the LFM-A manual.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within $\pm 0.5\%$ RO
Hysteresis :	Within $\pm 0.5\%$ RO
Interference :	$\pm 1.5\%$ RO (after correction by interference correction coefficient stated in Calibration Sheet)
Rated Output :	See table below.

Environmental Characteristics

Safe Temperature Range :	-10 to 70°C (noncondensing)
Compensated Temperature Range :	0 to 60°C (noncondensing)
Temperature Effect on Zero Balance :	Within $\pm 0.05\%$ RO/°C or less
Temperature Effect on Output :	Within $\pm 0.05\%$ /°C or less

Electrical Characteristics

Safe Excitation Voltage :	12V AC or DC
Recommended Excitation Voltage :	1 to 5V AC or DC
Input/Output Resistance :	350Ω \pm 3%
Cable :	16-conductor (0.11 mm ²) twisted pair vinyl shielded cable, 6.6 mm diameter by 55 cm long, bared at the tip (Shield wire is not connected to mainframe)

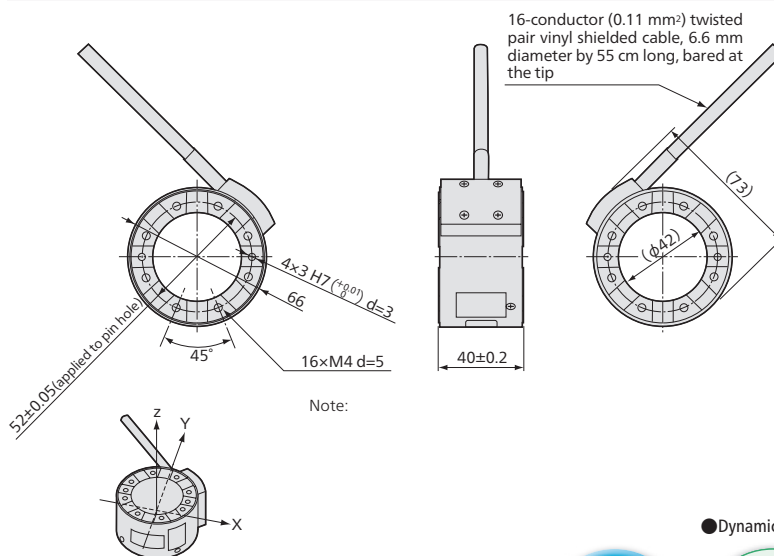
Mechanical Properties

Safe Overload Rating :	150%
Material :	Main unit LFM-A-1KN: Aluminum (metallic finish) Main unit LFM-A-3KN: SUS (metallic finish) Cover: Black anodic oxide coating aluminum Cable holder: Anodic oxide coating aluminum
Weight :	See table (not including cable)
Protection Rating :	IP40

Model	Rated Capacity	Rated Output	Natural Frequency (Approx.)	Weight (Approx.)
LFM-A-1KN	FX : $\pm 1000\text{N}$		5kHz	
	FY : $\pm 1000\text{N}$			
	FZ : $\pm 1000\text{N}$			
	MX : $\pm 50\text{N}\cdot\text{m}$			
	MY : $\pm 50\text{N}\cdot\text{m}$			
	MZ : $\pm 25\text{N}\cdot\text{m}$			
LFM-A-3KN	FX : $\pm 3000\text{N}$		5kHz	
	FY : $\pm 3000\text{N}$			
	FZ : $\pm 3000\text{N}$			
	MX : $\pm 100\text{N}\cdot\text{m}$			
	MY : $\pm 100\text{N}\cdot\text{m}$			
	MZ : $\pm 50\text{N}\cdot\text{m}$			

※The Rated Output is an Interference Correction Further Output.

Dimensions



To Ensure Safe Usage

Prepare a plate shaped member for installing the LFM-A with sufficient strength.

It is recommendable that LFM-A-3KN should be applied on the steelplate whose thickness is more than 10mm. With same reason, we recommend as follows. LFM-1KN should be applied on an aluminum alloy board which is not less than 15mm thick. If the LFM-A is installed on a low rigid mounting plate, interference may be increased.

● Dynamic measurement

LFM-A
Recommended
products for
combination

Sensor Interfaces
PCD-400A
→ 3-51

Universal Recorders
EDX-200A
→ 3-69

Compact Recording System
EDX-10A
→ 3-61

Field
to recommend



LFX-A

●With Built-in Amplifier

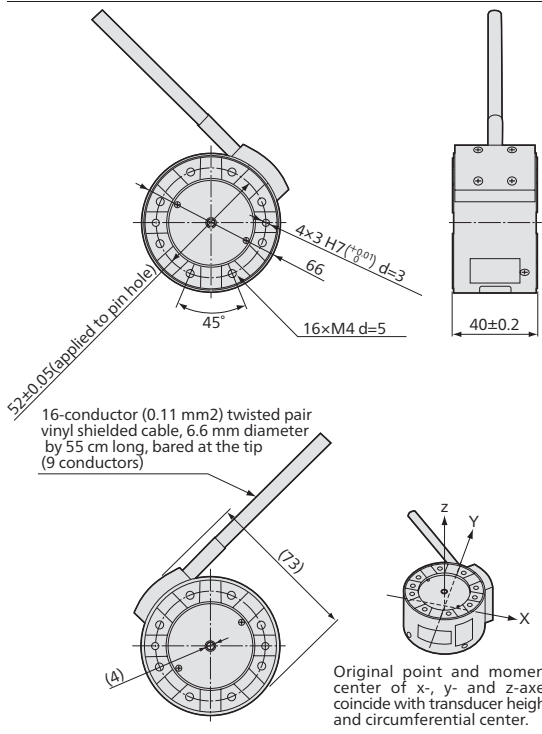
Compact 6-Component Force Transducers with Built-in Amplifier



Compact, Amplifier Built in Wiring Hole, 4 mm Diameter, Provided at the Center

Enables simultaneous measurement of 3 forces (Fx, Fy, Fz) in 3 axial directions orthogonal to the transducer and 3 moments (Mx, My, Mz) around the axes. It outputs 6 voltage signals proportionated to 6 detected components.

■ Dimensions



Specifications

Performance

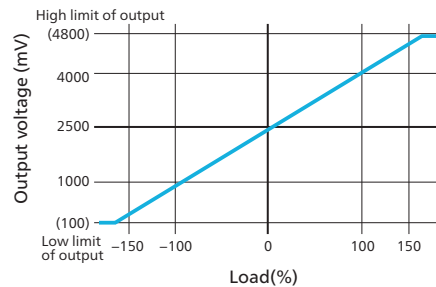
Rated Capacity	See table below.
Nonlinearity	Within±0.5% RO
Hysteresis	Within±0.5% RO
Interference	±1.5% RO (after correction by interference correction coefficient stated in Calibration Sheet)
Note	Output voltage signals of 6-component force should be corrected by interference correction coefficient. Output of each component concerns output of other components.
Rated Output	Approx. ±1500 mV (from 2500 mV output with no load at the center)

Environmental Characteristics

Safe Temperature Range	-10 to 70°C (noncondensing)
Compensated Temperature Range	0 to 60°C (noncondensing)
Temperature Effect on Zero Balance	Within±0.05% RO/°C
Temperature Effect on Output	Within±0.05%/°C

Electrical Characteristics

No-Load Output: 2500 mV at the center (See figure below.)



Frequency Response	DC to 500 Hz (+1 dB to -3dB)
Power Supply	5V DC±10%, 160 mA or less
Cable	16-conductor (0.11mm ²) twisted pair vinyl shielded cable, 6.6 mm diameter by 55 cm long, bared at the tip (9 conductors) (Shield wire is not connected to mainframe)

Mechanical Properties

Safe Overload Rating	150%
Material	Main unit LFX-A-1KN: Aluminum (metallic finish) Main unit LFX-A-3KN: SUS (metallic finish) Cover: Black anodic oxide coating aluminum Cable holder: Anodic oxide coating aluminum
Weight	See table (not including cable)
Protection Rating	IP40

※To obtain the rated output of ±1500 mV for each of 6-component force, zero drift due to installation conditions including tightening and loading should be made within ±200 mV.

Model	Rated Capacity	Weight (Approx.)
LFX-A-1KN	FX : ±1000N	210g
	FY : ±1000N	
	FZ : ±1000N	
	MX : ±40N·m	
	MY : ±40N·m	
	MZ : ±25N·m	
LFX-A-3KN	FX : ±3000N	420g
	FY : ±3000N	
	FZ : ±3000N	
	MX : ±100N·m	
	MY : ±100N·m	
	MZ : ±50N·m	

To Ensure Safe Usage

- Prepare a plate shaped member for installing the LFX-A with sufficient strength. It is recommendable that LFX-A-3KN should be applied on the steelplate whose thickness is more than 10mm. With same reason, we recommend as follows. LFX-1KN should be applied on an aluminum alloy board which is not less than 15mm thick. If the LFX-A is installed on a low rigid mounting plate, interference may be increased.

●Dynamic measurement

LFX-A Recommended products for combination

Sensor Interfaces
PCD-430A
→ 3-51

Compact Recording System
EDX-10A
→ 3-61

Universal Recorders
EDX-100A
→ 3-65

Universal Recorders
EDX-200A
→ 3-69

Memory Recorder/Analyzers
EDX-3000A
→ 3-79



Field to recommend





LAT-1000A Series

●300N

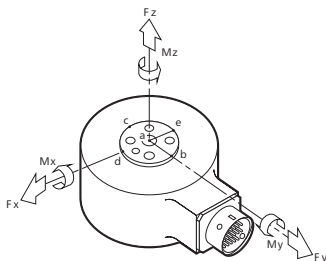
6-Component Force Measuring Systems



Enables Highly Accurate Measurement Possible to Inference Correction by Arithmetic Processing.

Each system in the LAT-1000A series consists of the LAT-A 6-component force transducer and the FDP-106A signal processor. The LAT-A simultaneously detects 3 forces in 3 axial directions orthogonal to the transducer and 3 moments around the 3 axes. The FDP-106A automatically eliminates interference components contained in transducer output through calculation. By minimizing errors due to interference, the system enables highly accurate measurement of both single and multiple component force loads. (Patented)

- 5-V output available with the rated load
- To guarantee measurement accuracy, performance with multiple component force loaded is indicated with a maximum error (see note in the next page).
- Highly accurate measurement possible even with multiple component force loaded
- Simultaneous sampling of 6-component force and processing signals up to approximately 300 Hz possible
- The compact, lightweight transducer is strain gage based and is cased with a highly rigid special aluminum alloy.
- Calibration coefficient is preset in the signal processor, enabling immediate measurement by connecting a monitor indicator.
- Force and moment can be read directly on a PC if connected.
- Direct reading mode is provided to read force and moment at the load point.
- High/low limit and hysteresis width of the high/low limit are set to alarm output.



Configuration

- 6-component force transducer LAT-A
- Signal processor FDP-106A
- PC (not included)

General Specifications

Rated Capacity :	See table below
Safe Overload Rating :	120%
Nonlinearity :	Within±0.5% RO
Hysteresis :	Within±0.5% RO
Interference :	±0.8% RO
Maximum Error :	±1.5% RO (±3% RO with LAT-KA-2)
Resolution :	0.05% FS
Temperature Effect on Zero Balance :	Within ±0.25% RO/°C
Temperature Effect on Output :	Within ±0.05%/°C
Compensated Temperature Range :	0 to 50 °C

Specifications stated above are values measured with our calibrators under incompany standard conditions.

Model	Rated Capacity					
	Fx N	Fy N	Fz N	Mx N·m	My N·m	Mz N·m
LAT-1030KA-1	300	300	300	10	10	10
LAT-1030KA-2	300	300	300	20	20	20

6-Component Force Transducer LAT-A Specifications

Rated Capacity :	$F_x, F_y, F_z=300\text{N}$
	$M_x, M_y, M_z=10, 20\text{N}\cdot\text{m}$
	See table in the previous page for combinations.
Safe Overload Rating :	120%
Natural Frequency (with all models) :	F_x, F_y : Approx. 2.3 kHz, F_z : Approx. 5.5 kHz
	M_x, M_y : Approx. 8 kHz, M_z : Approx. 4 kHz
Recommended Excitation Voltage :	2.5V DC
Safe Excitation Voltage :	5V DC
Input Resistance :	58.3Ω ±10%
Output Resistance :	350Ω ±2%
Compensated Temperature Range :	0~60°C
Safe Temperature Range :	0~70°C
Temperature Effect on Zero Balance :	Within 0.05% RO/°C
Temperature Effect on Output :	Within 0.05%/°C
Weight :	Each model approx. 250g (not including cable)
Protection Rating :	IP30(JIS C 0920)
Cable :	14-conductor (0.3 mm ²) PVC shielded cable, 9 mm diameter, with connector plug at both ends. N-78 for connection to FDP-106A (Shield wire is not connected to mainframe)
	For measurement of displacement and inclination angle, contact us.

Standard Accessories Communications program (Windows version), torque wrench, hexagon socket wrench, parallel pins $\phi 4$ and $\phi 8$, connection cable N-78

Field to recommend





Field to recommend



Signal Processor FDP-106A Specifications

Input :	Number of channels: Max. 6 (6-component force) Zero balance adjustment : Automatic (true electron method) Bridge excitation voltage : 2.5V DC
Analog Output :	Number of channels: 6 Output: ± 5 V (150% the rated output of 6-component force transducer may be made ± 5 V) Resolution: 0.05% FS Frequency response range: DC to approx. 300 Hz Initial setting: ± 5 V analog output for the rated capacity of 6-component force transducer, 0 mm for coordinates X, Y and Z at the load point
Serial Interface :	RS-232C Transmission mode: Start-stop synchronized mode Transmission rate: 9600 bps fixed Data: 8 bits, Parity: None, Stop bit: 1 Transmission contents: Data, setting conditions Data format: Binary or ASCII Connector: D-Sub 25 pin, female PC connection: Optional interface cable for RS-232C
Sampling Frequency :	When not using digital output 0.72 ms/6 channels (cutoff frequency 366 Hz) When using digital output 22.9 ms/6 channels in binary format (cutoff frequency 11 Hz) 45.7 ms/6 channels in ASCII format (cutoff frequency 6 Hz)
Nonlinearity :	Within $\pm 0.05\%$ FS
Calculation Error : in Interference : Compensation :	Within $\pm 0.1\%$ FS
Stability :	Zero $\pm 0.25\mu\text{V}/\text{V}/^\circ\text{C}$, Sensitivity $\pm 0.01\%/^\circ\text{C}$
Functions :	Overinput checking, automatic zero balance, load point correction, alarm
Monitor Indicator :	LED
Alarm Output :	Open collector
Operating Temperature/Humidity Range :	0 to 50°C, 95% RH or less (noncondensing)
Power Supply :	AC 100V $\pm 10\%$
Dimensions :	255 (W) x 180 (D) x 88 (H) mm (excluding protrusions)
Weight :	Approx. 2.5 kg

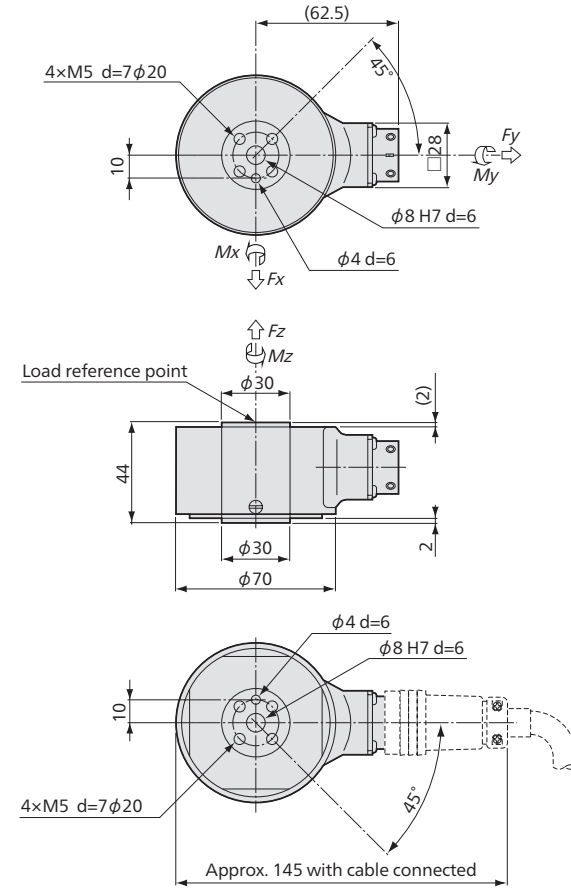
Standard Accessories Output cable U-58 (6 pcs.)
AC power cable P-18 with conversion adapter CM-33

Options RS cross cable N-23, Mounting fixture FL-1A

Communication Program(Attached to LAT-A)

(Windows Version)	
Operating Environment	
OS :	Windows XP/7
Memory :	64M or more
Display :	800x600 dots or more

Dimensions



Note on Maximum Error

Definition

A maximum error denotes a maximum deviation in plus and minus directions from the characteristic curve observed when testing devices or equipment according to stipulated procedures under standard operating conditions.

Description

Performance specifications of a load cell include non-linearity, hysteresis and repeatability. In the case of a 6-component force transducer, interference is added to these performance specifications. All these specifications apply to a single component force, that is, force or moment in a single direction. However, the 6-component force transducer rarely receives a single component force and detects 2 or more component force. Accordingly, characteristic values for multiple component force should be considered. To solve the problem, a maximum error is newly included in performance specifications of the LAT-A series. The maximum error is obtained as follows: Apply an external force F_M of known value to the 6-component force transducer and read resultant output values of F_x, F_y, F_z, M_x, M_y and M_z . Referring to the magnitude and direction of the external force F_M , calculate 6-component force $F_{XM}, F_{YM}, F_{ZM}, M_{XM}, M_{YM}$ and M_{ZM} .

A maximum error of F_x is calculated using the following equation:

$$\text{Maximum error of } F_x = (F_x - F_{XM}) / F_{X0} \times 100 (\% \text{ RO})$$

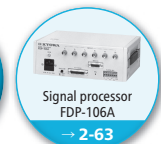
*Indentation is not aligned.

where, F_{X0} is the rated capacity for the force in X direction.

Maximum errors of other components are calculated in the same manner. Practically, we tested through simultaneous application of 3-component force in 3 directions and 6-component force/moment in 3 directions and confirmed that the calculated maximum errors satisfy the stated specification.

Thus, the LAT-A series 6-component force transducers are assured of the accuracy in measurement of multiple component force loads, enabling safe operation under any loading conditions.

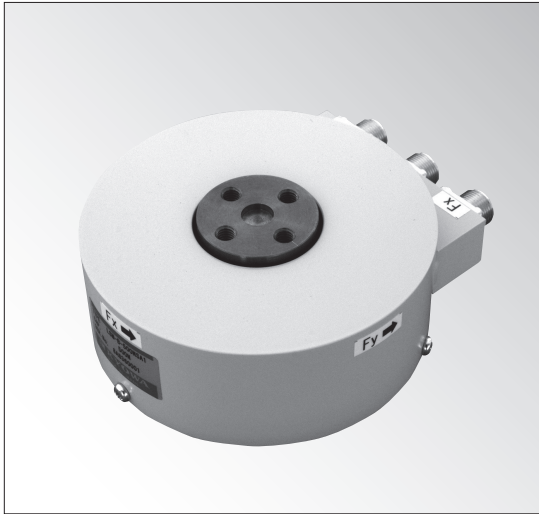
● Static measurement



3-Component Force Transducers



TRANSDUCERS



Enables Force Measurement in X, Y and Z Directions. The Compact, Lightweight Strain Gage Based Design is Suitable for Model Experiments. (Patented)

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.5% RO
Hysteresis :	Within±0.5% RO
Rated Output :	Approx. 0.5 mV/V (1000µm/m)
Interference :	Within ±3%RO

Environmental Characteristics

Safe Temperature Range :	0 to 80°C
Compensated Temperature Range :	0 to 70°C
Temperature Effect on Zero Balance :	Within±0.05% RO/°C
Temperature Effect on Output :	Within±0.05%/°C

Electrical Characteristics

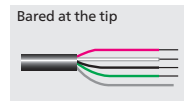
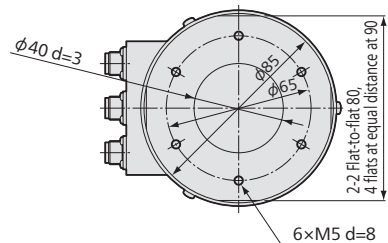
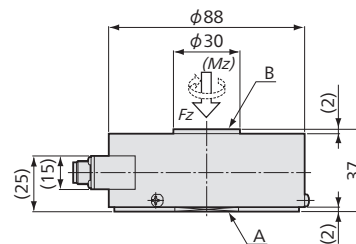
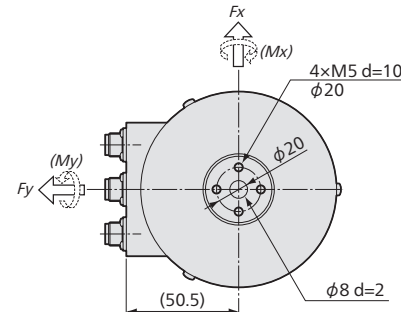
Safe Excitation Voltage :	10V AC or DC
Recommended Excitation Voltage :	1 to 5V AC or DC
Input Resistance :	240Ω±5%
Output Resistance :	240Ω±5%
Cable :	4-conductor (0.08 mm ²) chloroprene shielded cable, 4 mm diameter by 5 m long, with connector plug to the transducer side and bared to the amplifier side (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Natural Frequency :	See table below.
Weight :	See table (not including cable)
Safe Moment :	See table below.

※For the cable terminated with NDIS connector, suffix "-P" to the model number.

Dimensions



To Ensure Safe Usage

LSM-B-SA1 series does not feature waterproof structure.

- Notes: 1. Mx, My and Mz cannot be measured.
2. Arrows indicate directions of component force in plus polarity acting to the B plane with the A plane fixed.

Model	Rated Capacity	Natural Frequency (Approx.)			Safe Moment (Approx.)	Weight (Approx.)
	F _x , F _y , F _z	X	Y	Z	M _x , M _y , M _z	
LSM-B-10NSA1	10N	0.3kHz	0.2kHz	1.2N·m	600g	
LSM-B-20NSA1	20N	0.4kHz	0.3kHz	2.4N·m		
LSM-B-50NSA1	50N	0.8kHz	0.6kHz	5.9N·m		
LSM-B-100NSA1	100N	1.3kHz	0.9kHz	9.8N·m		
LSM-B-200NSA1	200N	2.5kHz	2.0kHz	24N·m		
LSM-B-500NSA1	500N	2.2kHz	1.8kHz	59N·m		1.6kg

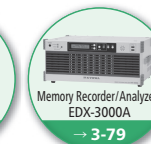
Safe moment is stated for reference to strength.

Field to recommend



● Static measurement

LSM-B-SA1 Recommended products for combination



LUR-B-SA1

Jack Load Cells

● 10kN to 2MN

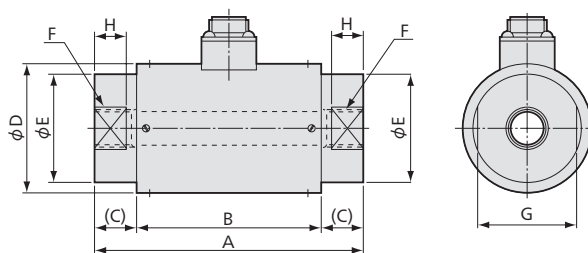
2
-66



Special Design for Jacks, Low Price Various Capacity Ranges

LUR-B-SA1 series load cells are designed to measure loads applied to jacks when lifting up or moving a large machinery or structure in civil engineering and construction fields. These load cells enable the operators to prevent overloads, unbalanced loads, or movement of the center of gravity.

■ Dimensions



Model	Rated Capacity	A	B	(C)	ϕD	ϕE	F	G	H	Weight (Approx.)
LUR-B-10KNSA1	$\pm 10\text{kN}$	100	70	15	55	25	M12 P=1.75 d=15	20	10	1.4kg
LUR-B-20KNSA1	$\pm 20\text{kN}$	110	70	20	60	50	M18 P=1.5 d=20	46	15	2.1kg
LUR-B-30KNSA1	$\pm 30\text{kN}$	125	85	20	60	50	M24 P=2 d=30	46	15	2.2kg
LUR-B-50KNSA1	$\pm 50\text{kN}$									
LUR-B-100KNSA1	$\pm 100\text{kN}$	175	105	35	65	55	M39 P=2 d=45	50	25	2.5kg
LUR-B-200KNSA1	$\pm 200\text{kN}$	255	125	65	80	70	M50 P=2 d=65	65	40	5.2kg
LUR-B-300KNSA1	$\pm 300\text{kN}$	255	125	65	100	90	M65 P=3 d=65	-	-	8kg
LUR-B-500KNSA1	$\pm 500\text{kN}$	330	170	80	130	120	M85 P=3 d=85	-	-	15kg
LUR-B-1MNSA1	$\pm 1\text{MN}$	430	210	110	188	158	M110 P=3 d=118	-	-	55kg
LUR-B-1.5MNSA1	$\pm 1.5\text{MN}$	530	250	140	220	200	M140 P=4 d=140	-	-	85kg
LUR-B-2MNSA1	$\pm 2\text{MN}$	590	270	160	260	228	M160 P=4 d=170	-	-	100kg

Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within $\pm 0.2\%$ RO (LUR-B-10 to 200KNSA1)
	Within $\pm 0.5\%$ RO (LUR-B-300KNSA1 to 5MNSA1)
Hysteresis:	Within $\pm 0.1\%$ RO (LUR-B-10 to 200KNSA1)
	Within $\pm 0.5\%$ RO (LUR-B-300KNSA1 to 5MNSA1)
Rated Output:	$\pm 1 \text{ mV/V (2000}\mu\text{m/m)} \pm 1\%$

Environmental Characteristics

Safe Temperature Range:	-10 to 60°C
Compensated Temperature Range:	0 to 60°C
Temperature Effect on Zero Balance:	Within $\pm 0.01\%$ RO/°C
Temperature Effect on Output:	Within $\pm 0.01\%$ /°C

Electrical Characteristics

Safe Excitation Voltage:	15V AC or DC
Recommended Excitation Voltage:	1 to 12V AC or DC
Input Resistance:	$350\Omega \pm 2\%$
Output Resistance:	$350\Omega \pm 2\%$
Cable:	4-conductor (0.3 mm ²) chloroprene shielded cable, 7.6 mm diameter by 10 m long, terminated with connector plug

Mechanical Properties

Safe Overload Rating:	200%
Weight:	See table (not including cable)

With the capacity of 200 kN or more, calibration is performed for compression load only.

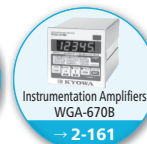


TRANSDUCERS

Field to recommend



● Physical quantity indication





Field to recommend



High Strength, Easy to Handle High Reliability, High Stability

These series of tension load cells can be used as detectors for jib crane weighing systems and for general tension measurement.

To Ensure Safe Usage

- Install the load cell carefully to avoid applying tensile and impact force to the cable and prevent the load cell from receiving bending or twisting force.
- Prepare a safety device such as a link against accidental hazards so that it supports loads in place of a broken load cell.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±1% RO
Hysteresis :	Within±1% RO
Rated Output :	Approx. 0.6 to 0.7 mV/V (1200 to 1400μm/m)

Environmental Characteristics

Safe Temperature Range :	-20 to 70°C
Compensated Temperature Range :	-10 to 60°C
Temperature Effect on Zero Balance :	Within±0.05% RO/°C
Temperature Effect on Output :	Within±0.05%/°C

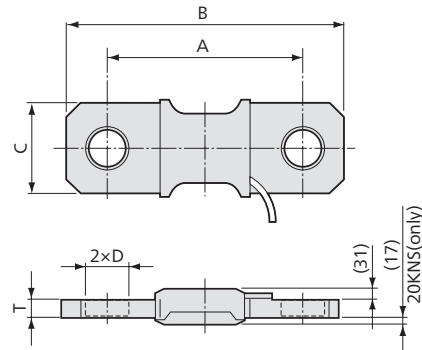
Electrical Characteristics

Safe Excitation Voltage :	12V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±5%
Output Resistance :	350Ω±5%
Cable :	4-conductor (0.75 mm ²) chloroprene shielded cable, 10 mm diameter by 10 m long, with press-fit terminal (Shield wire is not connected to mainframe.)

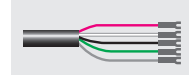
Mechanical Properties

Breaking Overload Rating :	Approx. 500%
Safe Overload Rating :	150%
Weight :	See table (not including cable)

Dimensions



Press-fit terminal



Model	Rated Capacity	A	B	C	D	T	Weight (Approx.)
LTA-C-20KNS	20kN	310	410	90	φ45	14	5kg
LTA-C-50KNS	50kN	310	430	110	φ45	15	5.5kg
LTA-C-100KNS	100kN	330	470	126	φ60	30	11kg
LTA-C-200KNS	200kN	360	540	170	φ65	36	21kg
LTA-C-300KNS	300kN	400	610	195	φ75	47	35kg
LTA-C-500KNS	500kN	440	670	240	φ85	60	60kg

● Physical quantity indication

LTA-C-S
Recommended
products for
combination

Instrumentation Amplifiers
WGA-900A
→ 2-159

Instrumentation Amplifiers
WGA-670B
→ 2-161

Instrumentation Amplifiers
WGI-400A
→ 2-167

LTR-S-SA1

● 20 to 50 kN

2
-68

One-End Revolving Tension Load Cells



Compact, Lightweight, Low price For Measurement of Traction and Tensile Force of Rope

LTR-S-SA1 series load cells are suitable for measurement of tensile force of rope. Since the hook at one end revolves together with the rope which may revolve due to twisting, easy installation and handling are ensured.

Specifications

Performance

Rated Capacity:	See table below.
Nonlinearity:	Within $\pm 0.5\%$ RO
Hysteresis:	Within $\pm 0.5\%$ RO
Rated Output:	Approx. 1mV/V (2000 μ m/m)

Environmental Characteristics

Safe Temperature Range:	-20 to 70°C
Compensated Temperature Range:	-10 to 60°C
Temperature Effect on Zero Balance:	Within $\pm 0.05\%$ RO/°C
Temperature Effect on Output:	Within $\pm 0.05\%$ /°C

Electrical Characteristics

Safe Excitation Voltage:	12V AC or DC
Recommended Excitation Voltage:	1 to 5V AC or DC
Input Resistance:	350 Ω \pm 2%
Output Resistance:	350 Ω \pm 2%
Cable:	4-conductor (0.3mm ²) chloroprene shielded cable, 7.6 mm diameter by 5 m long, terminated with connector plug (Shield wire is not connected to mainframe.)

Mechanical Properties

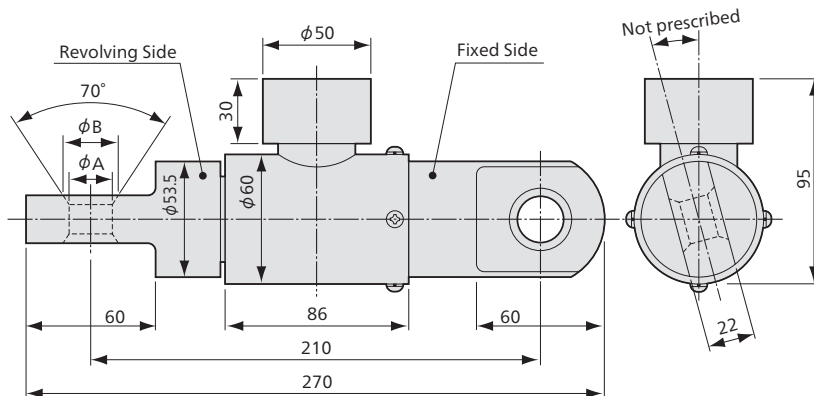
Safe Overload Rating:	150%
Static Breaking Overload Rating:	200% (150% with 50KNSA1)
Weight:	Approx. 3.6kg (not including cable)

Model	Rated Capacity	ϕ A	ϕ B
LTR-S-20KNSA1	20kN	20	26
LTR-S-30KNSA1	30kN	20	26
LTR-S-50KNSA1	50kN	22	29

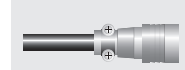
To Ensure Safe Usage

- When loaded, sliding friction prevents the revolving part from revolving.
- Do not use for measurement of hanging load.

Dimensions



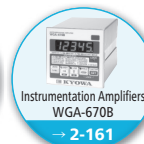
Connector plug



● Physical quantity indication

● Dynamic measurement

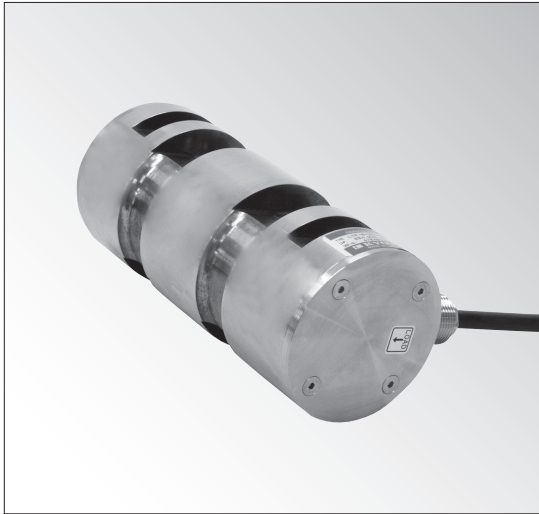
LTR-S-SA1
Recommended
products for
combination



TRANSDUCERS

Field
to recommend



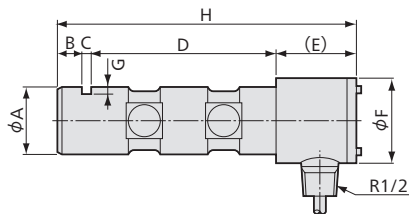


Compact, Space-Saving Design For Mounted in the Place of the Axis of Crane's Pulley

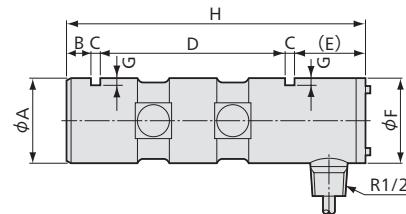
- Specially designed for installation to pin connection

Mounted in place of the axis of crane's pulley, LTP-S-S series pin-type load cells enable measurement of hanging loads. Such the feature ensures easy installation and handling. Since strain gages are used as the load detector, each load cell in this series is compact, lightweight and economically priced.

■ Dimensions



LTP-S-10 to 50KNS



LTP-S-100 to 500KNS

Model	Rated Capacity	φA	B	C	D	(E)	φF	G	H
LTP-S-10KNS	10kN	40	15	5	112	40	50	4	172
LTP-S-20KNS	20kN								
LTP-S-50KNS	50kN	50	15	7	140	40	55	6	202
LTP-S-100KNS	100kN	60	20	8	168	40	60	8	244
LTP-S-200KNS	200kN	70	20	10	212	40	70	8	292
LTP-S-500KNS	500kN	95	22	12	262	45	95	10	341

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±1 to 2% RO (depends on user's spec.)
Hysteresis :	Within±1 to 2% RO (depends on user's spec.)
Rated Output :	Approx. 0.5 to 1 mV/V (1000 to 2000μm/m)

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within±0.05% RO/°C
Temperature Effect on Output :	Within±0.05%/°C

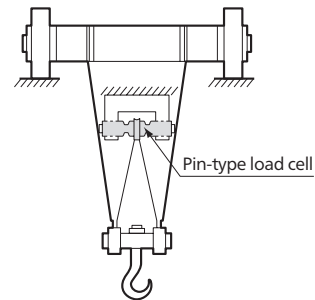
Electrical Characteristics

Safe Excitation Voltage :	15V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	700Ω±3%
Output Resistance :	700Ω±3%
Cable :	4-conductor chloroprene shielded cable (length is as required)

Mechanical Properties

Safe Overload Rating :	150%
-------------------------------	------

■ Installaton Example



Field to recommend



- Physical quantity indication

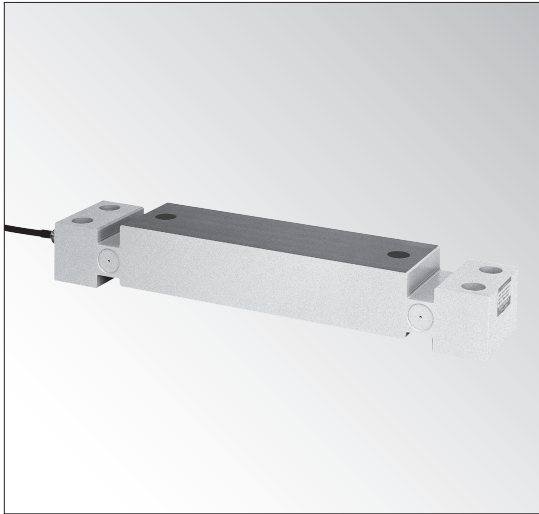


LCD-A-S1 to S9

●30 to 100kN

2
-70

Rectangular Load Cells



Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±1% RO
Hysteresis :	Within±1% RO
Rated Output :	Approx. 1 mV/V (2000μm/m) or more

Environmental Characteristics

Safe Temperature Range :	-20 to 80°C
Compensated Temperature Range :	-10 to 70°C
Temperature Effect on Zero Balance :	Within±0.01% RO/°C
Temperature Effect on Output :	Within±0.01%/°C

Electrical Characteristics

Safe Excitation Voltage :	15V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±5%
Output Resistance :	350Ω±5%
Cable :	4-conductor (0.75 mm ²) fluoronlex shielded cable, approx. 8 mm diameter by 10 m long, bared at the tip (Shield wire is not connected to mainframe.)

Mechanical Properties

Safe Overload Rating :	150%
Weight :	See table (not including cable)
Protection Rating :	IP64 (Splashproof type conforming to JIS C 0920)

For Measurement of Loads to Pillow Block

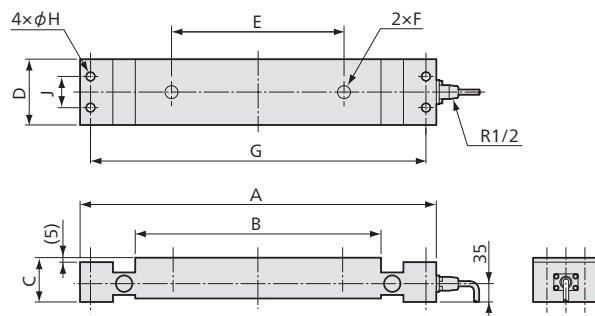
●Hermetically-sealed structure

Having a flat top and bottom, LCD-A-S series rectangular compression load cells enable stable installation of a flat board. Can be used for weighing systems of waste and ash cranes or for measurement of compression loads of pillow blocks placed on them.

To Ensure Safe Usage

Take care that there is no foreign matter on the top and bottom of the load cell and the surface of mounting board.

■Dimensions



Model	Rated Capacity	A	B	C	D	E	F	G	H	J	Weight (Approx.)
LCD-A-30KNS1	30kN	520	340	70	95	280	M22 d=30	484	14	50	22kg
LCD-A-30KNS2		580	400	70	105	280	M22 d=30	544	14	50	28kg
LCD-A-30KNS3		580	400	70	105	330	M27 d=35	544	14	50	28kg
LCD-A-50KNS4	50kN	610	430	80	105	280	M22 d=30	574	14	50	35kg
LCD-A-50KNS5		580	400	80	105	330	M27 d=35	540	26	60	33kg
LCD-A-50KNS6		610	430	80	105	360	M27 d=35	550	26	60	35kg
LCD-A-50KNS7	100kN	690	510	80	105	410	M30 d=35	626	26	50	40kg
LCD-A-100KNS8		690	510	80	105	410	M30 d=35	626	26	50	40kg
LCD-A-100KNS9		690	510	80	105	430	M30 d=35	626	26	50	40kg

●Physical quantity indication

LCD-A-S1 to S9
Recommended
products for
combination



TRANSDUCERS

Field
to recommend



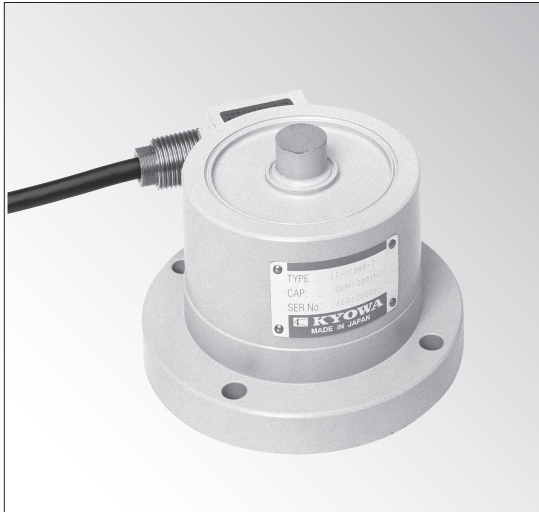
LCR-B-S7

● 5 to 100kN

Tension Meter Load Cells



TRANSDUCERS



Excellent Environmental Resistance Tension Meter Load Cells

- High safe overload rating of 300% max.
 - Mechanical stopper activating against overloads of 150 to 200%
 - Hermetically-sealed structure with inert gas filled in
 - Highly reliable structure (IP64)
 - Corrosion resistant
 - Cable direction selectable from either left or right
- Designed for tension meters, LCR-B-S7 series load cells are suitable for load measurement under environments where heat resistance, oil resistance, corrosion resistance and high overload rating are required.

Specifications

Performance

Rated Capacity :	See table below.
Nonlinearity :	Within±0.1% RO (LCR-B-5 to 50KNS7), Within±0.2% RO (LCR-B-100KNS7)
Hysteresis :	Within±0.1% RO (LCR-B-5 to 50KNS7), Within±0.2% RO (LCR-B-100KNS7)
Repeatability :	0.1% RO or less
Rated Output :	1 mV/V (2000µm/m) ±1%

Environmental Characteristics

Safe Temperature Range :	-20 to 120°C
Compensated Temperature Range :	-10 to 100°C
Temperature Effect on Zero Balance :	Within±0.005% RO/°C
Temperature Effect on Output :	Within±0.005%/°C

Electrical Characteristics

Safe Excitation Voltage :	15V AC or DC
Recommended Excitation Voltage :	1 to 10V AC or DC
Input Resistance :	350Ω±1%
Output Resistance :	350Ω±1%
Cable :	4-conductor (0.75 mm ²) fluonlex shielded cable, 8 mm diameter by 10 m long, bared at the tip (Shield wire is not connected to mainframe.)

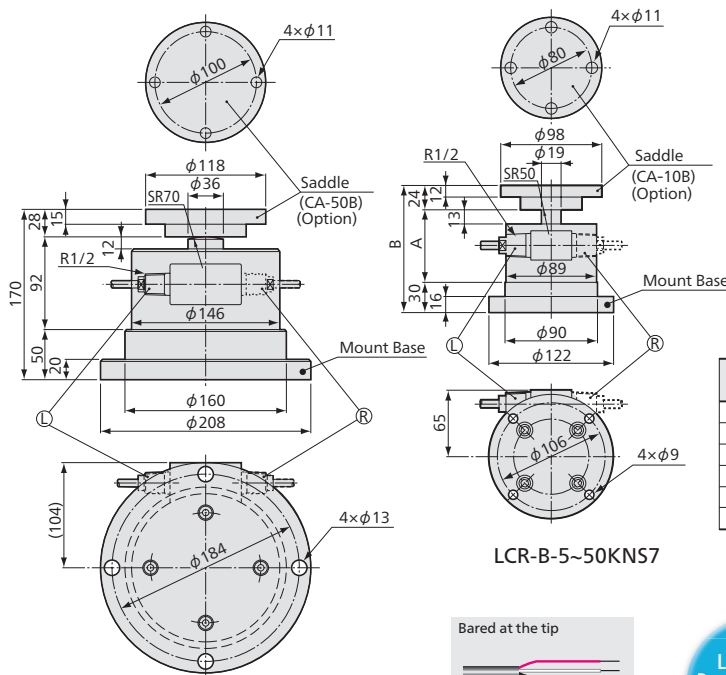
Mechanical Properties

Critical Overload Rating :	1000% (400% with 100KNS7)
Safe Overload Rating :	300% (200% with 100KNS7)
Material :	Stainless steel (excluding the mount base of 100 & 100KNS7)
Protection Rating :	IP64 (Splashproof type conforming to JIS C 0920)
Weight :	See table (not including cable)

To Ensure Safe Usage

Never disassemble the mount base, which has the stopper mechanism activating against overloads of 150 to 200%. Once removed, overload protection is not guaranteed.

Dimensions



Model	Rated Capacity	A	B	Weight (Approx.)
LCR-B-5KNS7(L, R)	5kN	57	111	4kg
LCR-B-10KNS7(L, R)	10kN			
LCR-B-20KNS7(L, R)	20kN			
LCR-B-30KNS7(L)	30kN	70	124	4.5kg
LCR-B-50KNS7(L, R)	50kN			
LCR-B-100KNS7(L, R)	100kN	See drawing upper left.		19kg

LCR-B-S7
Recommended
products for
combination



For further information please contact:

TEST **M**ACHINES **A**USTRALIA
0418 369 505
sales@testmachines.com.au
www.testmachines.com.au