

1.Product outline

USH series are compact compression type loadcells with high-capacity.
There are suitable for built-in applications.

2.Handling prohibitions and precautions

Prohibitions Prohibited actions while operating the product (Prohibited actions)

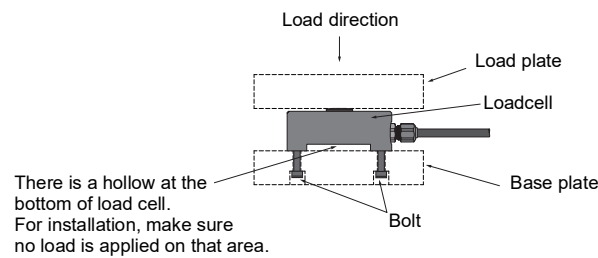
- PROHIBITION** Do not disassemble this product.
- PROHIBITION** Avoid dropping or giving a shock to the product.

Precautions Events that may cause injury to personnel or material damage in case of misuse.

- Do not install the product in the following environments:
 - In an atmosphere with corrosive or combustible gases;
 - Locations where temperature or humidity exceeds specifications;
 - Locations subject to drastic temperature fluctuations or icing and condensation;
 - Locations exposed to direct sunlight;
 - Locations subject to direct vibration or shock
- Consult us if this product is to be used under a special environment.
- Provide sufficient strength to the installation location.
- Perform adequate isolation if the product is used in the following locations:
 - Locations subject to noise such as static electricity;
 - Locations subject to strong electric field and intense magnetic field.
- Perform electric welding before mounting the loadcell. Take caution not to make current flow in the loadcell if the welding needs to be performed after mounting.
- Handle this product as industrial waste when disposing.

3.Installation procedure

- For loadcell mounting, be sure to use proper screws by the specifications. Screw insertion length should be around 1.5times longer than diameter of a screw. Screws must be tightened at instructed torque. Use screw locking adhesive if needed.
Recommended tightening torque.....M2: 0.32 N·m, M4: 2.7 N·m
- The base plate must be made of steel having enough rigidity. Also its flatness should be 0.01mm or less and surface roughness should be less than Ra3.2.
- The load plate must be made of steel having enough rigidity and hardness. Also its flatness should be 0.01mm or less, surface roughness should be less than Ra3.2, and hardness should be more than HRC50. The loadcell characteristics may be changed with the flatness of the base.



4.Wiring color of loadcell cables

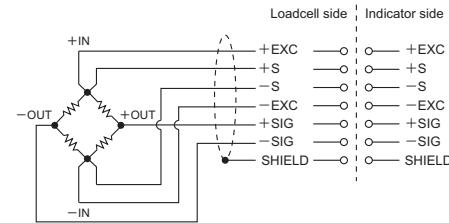
Core wire	Signal name / wiring color						
	+EXC	+S	-S	-EXC	+SIG	-SIG	SHIELD
Six wires	Red	Yellow	Orange	Black	Green	White	Blue

5.Indicator connection

Check the signal name and wiring color before connection.

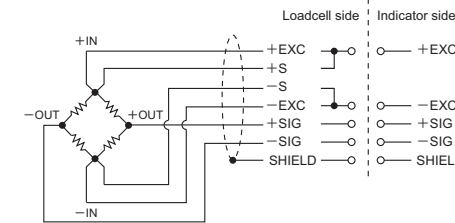
- The cable of USH loadcell has 6 bare wire ends. Therefore USH should be used with an indicator that accepts 6-wire input. In case USH is used with a 4-wire input indicator, both +EXC and +S wires must be inserted to +EXC terminal of an indicator, also both -EXC and -S wires must be inserted to -EXC terminal of an indicator. In this case, sensitivity may change a little.
Please connect SHIELD wire to SHIELD terminal of indicator.
Since load cell main body is insulated from SHIELD cable, make sure main body and indicator ground point is connected in single-point grounding.
- Apply the recommended voltage for the excitation. If the applied voltage exceeds the maximum excitation voltage, USH may get permanent damage.
- To extend loadcell cable, make sure to use a cable with the same diameter or bigger diameter than standard cable. A voltage drop may occur when small diameter cable (having high resistance) is used, and it may affect the result of measurement.
Re-calibration with a standard weight could be needed if USH is used with a 4-wire input indicator.
Please consult our sales representative for cable extension.

■Six-wire type loadcell → Six-wire type indicator



* SHIELD wire is not connected to load cell main body.

■Six-wire type loadcell → Four-wire type indicator



6.Calibration

If calibration is needed, do it on indicator. For more information, refer to the manual of indicator.

■Actual load calibration

In this calibration method, actual load is applied to a loadcell, and the value of the actual load is input using the keys. Accurate calibration with minimal error can be performed.
Prepare a reference item such as a weight in advance.

■Equivalent input calibration

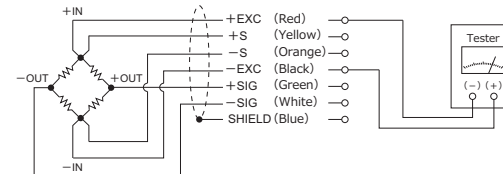
In this calibration method, only the rated output value and the rated capacity value of the loadcell are input using the keys. This method does not involve actual load.
The values are stated on the attached data sheet upon the purchase of loadcell.

7.Trouble shooting

Determine whether the error is occurring on the loadcell side or the indicator side.
Check the damage of USH in the following ways.

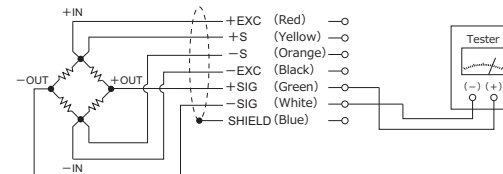
- In case a load is applied larger than safe overload or a load in unexpected direction is applied to the USH, make sure to check if it didn't get damaged after recalibration.
- When the reading on indicator is unstable or odd, do an inspection as follows after checking wiring and precautions.

① Check the input resistance of loadcell under no-load condition. (between +EXC and -EXC)



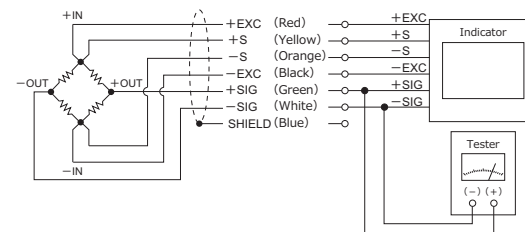
Disconnect the USH from the indicator. And verify if the input resistance of loadcell (between +EXC and -EXC) is within the specification range under no-load condition.

② Check the output resistance of loadcell under no-load condition.(between +SIG and -SIG)



Disconnect the USH from the indicator. And verify if the output resistance of loadcell (between +SIG and -SIG) is within the specification range under no-load condition.

③ Check the signal output of loadcell (Zero-balance) under no-load condition



Connect the USH with an indicator. And measure the output voltage ($V_{out}[mV/V]$) under no-load condition, while an excitation voltage ($V_{in}[V]$) is applied. Verify if the signal output of loadcell ($\frac{V_{out}}{V_{in}}[mV/V]$) is within the specification range. (Zero-balance)

In case measured values above are out-of-specification, please consult us.

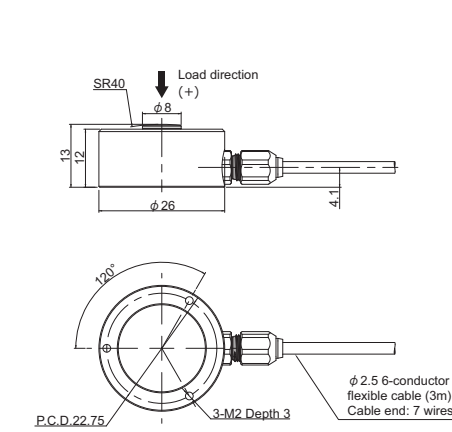
If no problem found on USH, check the indicator in the following ways.

- Disconnect the USH from indicator. Check if the reading on indicator is near 0, while short the input terminals(+SIG and -SIG).
- Measure the voltage of the output terminals(+EXC and -EXC) of indicator, and verify if the excitation voltage is applied properly.

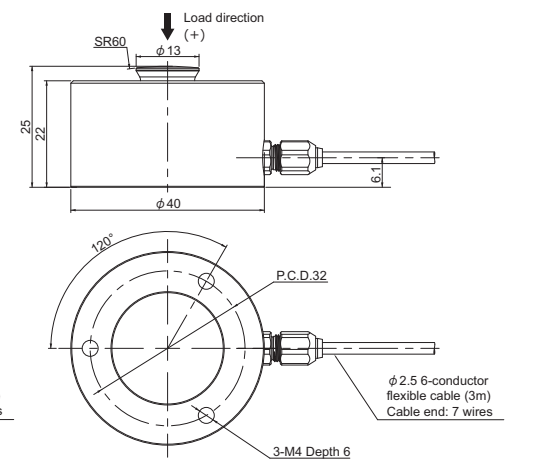
For more information, refer to the manual of indicator.

8.External dimension

■USH-10KN, USH-20KN



■USH-50KN



Unit: mm

9.Specifications

Model	USH-10KN	USH-20KN	USH-50KN	
Rated capacity	10	20	50	kN
Rated output	1±20%			mV/V
Safe overload	200			%R.C.
Zero balance	±20			%R.O.
Non-linearity	0.2			%R.O.
Hysteresis	0.15			%R.O.
Repeatability	0.1			%R.O.
Compensated temperature range	-10 to +70			°C
Safe temperature range	-30 to +85			°C
Temperature effect on zero	0.2			%R.O./10°C
Temperature effect on span	0.2			%R.O./10°C
Input resistance	Approx. 1000			Ω
Output resistance	Approx. 1000			Ω
Recommended excitation voltage	5			V
Maximum excitation voltage	7.5			V
Insulation resistance (DC50V)	1000 or more			MΩ
Cable	φ 2.5 6-conductor flexible cable (3m) Cable end: 7 wires			
Deflection at rated capacity	0.06		0.07	mm
Natural frequency	20		15	kHz
Loadcell material	Stainless steel			
Weight	0.1		0.18	kg

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