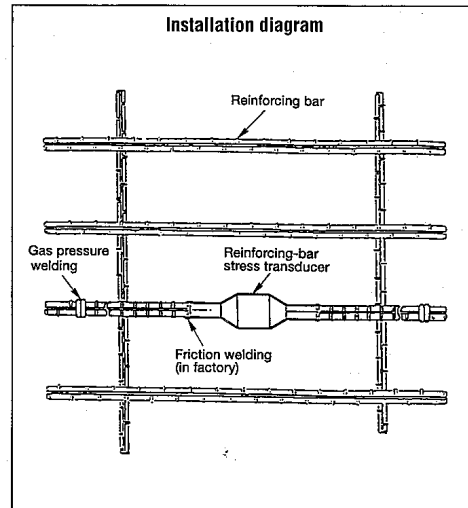


BF-CT Reinforcing-Bar Stress Transducers

INSTRUCTION MANUAL

Thank you for purchasing the KYOWA product. Before using it, please read this instruction manual carefully. Also, keep the manual within easy reach so that you can refer to it whenever necessary.

1. Installation



- Measure the initial unbalance value after connection of the stress transducer to the indicator. Also measure the insulation resistance between the stress transducer and cable conductors.
- At the prescribed installing position of the transducer, cut out the reinforcing bar as much as the transducer length added by shrinkage (diameter) inducible to pressure welding.
- Before gas cutting or pressure welding, check to be sure that there exists no inflammable in the neighborhood.
- Be sure to wear a dust-proof mask when polishing the cut section.
- Connect the stress transducer with the reinforcing bars through gas pressure welding to form one reinforcing bar as prescribed. During pressure welding, keep cooling the stress transducer with damp rags, in order to protect the stress transducer from pressure welding heat. (Even after finishing pressure welding, cool the stress transducer till welding heat goes down.)
- After completion of pressure welding, connect the stress transducer to the indicator and read the measurement value. Also, measure the insulation resistance between the stress transducer and cable conductors.
- Assemble the reinforcing bars.
- Using the cable connection kit, connect the extension cable, which was already distributed, with the stress transducer's cable. Protect the stress transducer's accessory cable from damage, using a hose, etc.

- Place concrete, taking care not to damage the reinforcing-bar stress transducer and cables.
- After completion of placing concrete, connect the stress transducer to the indicator and read the measurement value. Also, measure the insulation resistance between the stress transducer and cable conductors.

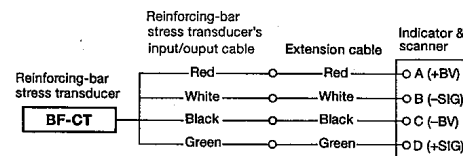
2. Handling precautions

- Check that the stress transducer's manufacturing number agrees with the calibration sheet.
- Check the transducer's insulation resistance value. (It should be higher than 100M Ω /50VDC). Do not use any tester which applies a voltage higher than 50VDC.
- Using the tester, check the input/output resistance values. They should be as stated below.
Input resistance (between red and black wires) approx. 350 Ω
Output resistance (between white and green wires) approx. 450 Ω
- Avoid hitting and other shocks on the transducer, or disconnection or damage may occur to the transducer. If shocks be made on the transducer, its performance stability may be adversely affected in long-term continuous operation.
- During transit, keep the transducer in the case. Bringing it by holding the cable may damage the cable to cause disconnection and deterioration of the insulation resistance. Measurement may thus be impossible.

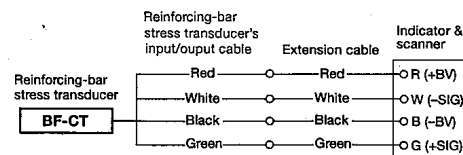
3. Connection

- Connections of the reinforcing-bar stress transducer's cable with the indicator terminals as well as with the scanner terminals are illustrated below. The indicator terminals and the scanner terminals will come with either way of descriptions: A, B, C, D description; and R, W, B, G description.

① A, B, C, D description



② R, W, B, G description



- Use any one of the indicators listed below.

- (1) SMD-20A
- (2) UCAM-70A-20 Used in combination
USB-70A-30
- (3) UCAM-20PC Used in combination
USB-23A
USS-23A
- (4) UCAM-5DM-99
- (5) RMH-201A, 210A
- (6) RDT-110A, 170A

4. Conversion

- For conversion, use the calibration factor stated in the calibration sheet.
- When a strain amplifier is used, its outputs read in $\epsilon \times 10^{-6}$ equivalent strain. Reinforcing-bar stress corresponding to 1×10^{-6} equivalent strain is stated in the calibration sheet. Reinforcing-bar stress can then be found through multiplication.

$$\text{Reinforcing-bar stress} = (\text{Strain amplifier's output: } \epsilon \times 10^{-6}) \times (\text{Calibration factor: MPa/} 1 \times 10^{-6})$$

- When other type of amplifier or a recorder is used, it is necessary to accurately measure the bridge excitation voltage applied. The calibration sheet states reinforcing-bar stress corresponding to 1 μ V voltage output against 1V bridge excitation voltage. Reinforcing-bar stress can then be found through multiplication.

$$\text{Reinforcing-bar stress} = \frac{\text{Bridge output voltage: } \mu\text{V}}{\text{Bridge excitation voltage: V}} \times (\text{Calibration factor: MPa/} 1 \mu\text{V/V})$$

- Conversion of temperatures measured with the temperature measuring function

Conversion formula of temperatures measured with the temperature measuring function

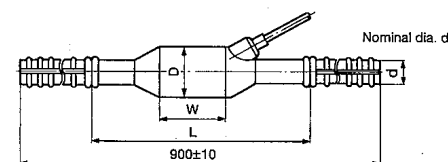
$$\text{Temperature } t = (S - S_0) \times \beta$$

where S: Amplifier's temperature reading ($\times 0.01\Omega$)

S₀: Reading at 0°C ($\times 0.01\Omega$)

β : Temperature coefficient ($^{\circ}\text{C}/0.01\Omega$)

5. Dimensions



6. Specifications

Model	d (deformed reinforcing bar)	D	W	L	Weight (approx.)
BF-10CT	D10	43	55	(190)	0.9kg
BF-13CT	D13	43	55	(190)	1.3kg
BF-16CT	D16	49	56	(200)	1.8kg
BF-19CT	D19	49	56	(200)	2.5kg
BF-22CT	D22	49	56	(200)	3.2kg
BF-25CT	D25	61	70	(220)	4.3kg
BF-29CT	D29	61	70	(220)	5.3kg
BF-32CT	D32	61	70	(220)	6.3kg

Cable: 0.5mm², 4-conductor chloroprene 1m, ϕ 8mm, terminated in soldered end SD345

Reinforcing-bar material:

- Strain measurement
 - Rated capacity: 300MPa (3059kgf/cm²)
 - Rated output: 1.85mV/V (3700 $\times 10^{-6}$ strain) min.
 - Allowable overload: 120%
 - Non-linearity: Within $\pm 1\%$ RO
 - Hysteresis: Within $\pm 1.5\%$ RO
 - Input resistance (at 0°C): 350 $\Omega \pm 7\Omega$
 - Output resistance (at 0°C): 450 $\Omega \pm 7\Omega$
 - Recommended bridge excitation voltage: 2 to 10V AC or DC
 - Guaranteed temp. range: -20 to +70°C
 - Allowable temp. range: -30 to +80°C
 - Temp. effect on zero: Within $\pm 0.05\%$ RO/ $^{\circ}\text{C}$
 - Temp. effect on output: Within $\pm 0.05\%$ / $^{\circ}\text{C}$
- Temperature measurement
 - Rated capacity: -30 to +70°C
 - Accuracy: $\pm 0.5^{\circ}\text{C}$ (-30 to +70°C)

(In combination with UCAM-5D M99, UCAM-70A-20, UCAM-20PC, RMH-201A, RMH-210A or SMD-20A)

Note: The rated capacity (CAP.) labelled on the product is in a conventional unit and therefore it is cited here in parentheses for your reference.

■ Accessories

Calibration sheet	1
Instruction manual	1
Warranty	1
Vinyl cap	1

7. Other

If any question should arise, contact KYOWA or KYOWA representative for information.