

# FLUKE®

## Fluke 712B and 714B Temperature Calibrators

### Accuracy and Simplicity

For the temperature calibration professional that wants a highly accurate, easy-to-use, single function temperature calibrator the 712B and 714B are ideal test tools.



### Technical Data

#### Product Highlights

- The 712B can measure and simulate (13) different RTD types and resistance
- The 714B can measure and simulate (17) different thermocouple types and millivolts
- Measure 4 to 20 mA signals while simultaneously sourcing a temperature signal
- Hanging tool designed in and included with every unit
- Configurable 0% and 100% source settings for quick 25% linearity checks
- Linear ramp and 25% step auto ramp based on 0% and 100% settings
- Dual inputs and backlit display for easy interpretation of measurements
- Power down settings remembered at power up for easy restart of tests
- 1-year and 2-year specifications and traceable certificate of calibration

## Specifications

Specifications are based on a one year calibration cycle and apply from +18 °C to +28 °C unless stated otherwise. All specifications assume a 5-minute warmup period.

### General specifications

|                                                                                             |                                                                                                                     |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Maximum voltage applied between any terminal and earth ground or between any two terminals: | 30 V                                                                                                                |
| Operating temperature                                                                       | -10 °C to 50 °C                                                                                                     |
| Storage temperature                                                                         | - 30 °C to 60 °C                                                                                                    |
| Operating altitude                                                                          | 2,000 meters                                                                                                        |
| Storage altitude                                                                            | 12,000 meters                                                                                                       |
| Relative humidity (% RH operating without condensation)                                     | Non condensing<br>90 % (10 °C to 30 °C)<br>75 % (30 °C to 40 °C)<br>45 % (40 °C to 50 °C)<br>(Without condensation) |
| Vibration requirements                                                                      | MIL-T-28800E, Class 2                                                                                               |
| Drop test requirements                                                                      | 1 meter                                                                                                             |
| IP Rating                                                                                   | IEC 60529: IP52                                                                                                     |
| Electromagnetic environment                                                                 | IEC 61326-1, Portable                                                                                               |
| Safety                                                                                      | IEC 61010-1, Max 30 V to earth, Pollution Degree 2                                                                  |
| Power supply                                                                                | 4 AA NEDA 1.5A IEC LR6 batteries                                                                                    |
| Size (H x W x L)                                                                            | 52.5 mm x 84 mm x 188.5 mm                                                                                          |
| Weight                                                                                      | 515 g                                                                                                               |

### DC mA measurement

| Resolution                                                                                        | Range    | Accuracy (% of reading + counts) |
|---------------------------------------------------------------------------------------------------|----------|----------------------------------|
| 0-24 mA                                                                                           | 0.001 mA | 0.010 % + 2 $\mu$ A              |
| Temperature coefficient:<br>$\pm$ (0.002 % of reading + 0.002 % of range) /°C ( <18 °C or >28 °C) |          |                                  |

### Ohms measurement (Fluke 712B)

| Ohms range                                                                                                                                                                                                                                   | Accuracy (% of reading + counts) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 0.00 $\Omega$ to 400.00 $\Omega$                                                                                                                                                                                                             | 0.015 % + 0.05 $\Omega$          |
| 400.0 $\Omega$ to 4000.0 $\Omega$                                                                                                                                                                                                            | 0.015 % + 0.5 $\Omega$           |
| Note: Read accuracy is based on 4-wire input. For 3-wire ohm measurements, assuming all three leads are matched, add 0.05 $\Omega$ (0.00 $\Omega$ ~400.00 $\Omega$ ), 0.2 $\Omega$ (400.0 $\Omega$ ~4000.0 $\Omega$ ) to the specifications. |                                  |
| Temperature coefficient:<br>$\pm$ (0.002 % of reading + 0.002 % of range) /°C ( <18 °C or >28 °C)                                                                                                                                            |                                  |

### Millivolt measurement and source (Fluke 714B)

| Resolution                                                                                        | Range   | Accuracy (% of reading + counts) |
|---------------------------------------------------------------------------------------------------|---------|----------------------------------|
| -10 mV to 75 mV                                                                                   | 0.01 mV | 0.015 % + 10 $\mu$ A             |
| Temperature coefficient:<br>$\pm$ (0.002 % of reading + 0.002 % of range) /°C ( <18 °C or >28 °C) |         |                                  |

### Ohms source (Fluke 712B)

| Ohms range                                                                                                                                                                   | Excitation current from measurement device | Accuracy (% of reading + counts) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------|
| 1.0 $\Omega$ to 400.0 $\Omega$                                                                                                                                               | 0.1 mA to 0.5 mA                           | 0.015 % + 0.1 $\Omega$           |
| 1.00 $\Omega$ to 400.00 $\Omega$                                                                                                                                             | 0.5 mA to 3 mA                             | 0.015 % + 0.05 $\Omega$          |
| 400.0 $\Omega$ to 1500.0 $\Omega$                                                                                                                                            | 0.05 mA to 0.8 mA                          | 0.015 % + 0.5 $\Omega$           |
| 1500.0 $\Omega$ to 4000.0 $\Omega$                                                                                                                                           | 0.05 mA to 0.4 mA                          | 0.015 % + 0.5 $\Omega$           |
| Resolution                                                                                                                                                                   |                                            |                                  |
| 0.00 $\Omega$ to 400.00 $\Omega$                                                                                                                                             | 0.01 $\Omega$                              |                                  |
| 400.0 $\Omega$ to 4000.0 $\Omega$                                                                                                                                            | 0.1 $\Omega$                               |                                  |
| Temperature coefficient:<br>$\pm$ (0.002 % of reading + 0.002 % of range) /°C ( <18 °C or >28 °C)<br>Supports pulsed transmitters and PLCs with pulse times as short as 5 ms |                                            |                                  |

**RTD input and output (Fluke 712B)**

| RTD Type (α)          | Range (°C)     | Measure (°C)    |                |                | Source (°C)     |                |
|-----------------------|----------------|-----------------|----------------|----------------|-----------------|----------------|
|                       |                | 1-year          | 2-year         | Source current | 1-year          | 2-year         |
| <b>10Ω Pt(385)</b>    | -200 to 100 °C | 1.5 °C          | 3 °C           | 1 mA           | 1.5 °C          | 3 °C           |
|                       | 100 to 800 °C  | 1.8 °C          | 3.6 °C         | 1 mA           | 1.8 °C          | 3.6 °C         |
| <b>50Ω Pt(385)</b>    | -200 to 100 °C | 0.4 °C          | 0.7 °C         | 1 mA           | 0.4 °C          | 0.7 °C         |
|                       | 100 to 800 °C  | 0.5 °C          | 0.8 °C         | 1 mA           | 0.5 °C          | 0.8 °C         |
| <b>100 Ω Pt(385)</b>  | -200 to 100 °C | 0.2 °C          | 0.4 °C         | 1 mA           | 0.2 °C          | 0.4 °C         |
|                       | 100 to 800 °C  | 0.015 %+0.18 °C | 0.03 %+0.36 °C |                | 0.015 %+0.18 °C | 0.03 %+0.36 °C |
| <b>200 Ω Pt(385)</b>  | -200 to 100 °C | 0.2 °C          | 0.4 °C         | 500 μA         | 0.2 °C          | 0.4 °C         |
|                       | 100 to 630 °C  | 0.015 %+0.18 °C | 0.03 %+0.36 °C |                | 0.015 %+0.18 °C | 0.03 %+0.36 °C |
| <b>500 Ω Pt(385)</b>  | -200 to 100 °C | 0.3 °C          | 0.6 °C         | 250 μA         | 0.3 °C          | 0.6 °C         |
|                       | 100 to 630 °C  | 0.015 %+0.28 °C | 0.03 %+0.56 °C |                | 0.015 %+0.28 °C | 0.03 %+0.56 °C |
| <b>1000 Ω Pt(385)</b> | -200 to 100 °C | 0.2 °C          | 0.4 °C         | 250 μA         | 0.2 °C          | 0.4 °C         |
|                       | 100 to 630 °C  | 0.015 %+0.18 °C | 0.03 %+0.36 °C |                | 0.015 %+0.18 °C | 0.03 %+0.36 °C |
| <b>100 Ω Pt(3916)</b> | -200 to 100 °C | 0.2 °C          | 0.4 °C         | 1 mA           | 0.2 °C          | 0.4 °C         |
|                       | 100 to 630 °C  | 0.015 %+0.18 °C | 0.03 %+0.36 °C |                | 0.015 %+0.18 °C | 0.03 %+0.36 °C |
| <b>100 Ω Pt(3926)</b> | -200 to 100 °C | 0.2 °C          | 0.4 °C         | 1 mA           | 0.2 °C          | 0.4 °C         |
|                       | 100 to 630 °C  | 0.015 %+0.18 °C | 0.03 %+0.36 °C |                | 0.015 %+0.18 °C | 0.03 %+0.36 °C |
| <b>10 Ω Cu(427)</b>   | -100 to 260 °C | 1.5 °C          | 3 °C           | 1 mA           | 1.5 °C          | 3 °C           |
| <b>120 Ω Ni(672)</b>  | -80 to 260 °C  | 0.15 °C         | 0.3 °C         | 1 mA           | 0.15 °C         | 0.3 °C         |
| <b>50 Ω Cu(427)</b>   | -180 to 200 °C | 0.4 °C          | 0.7 °C         | 1 mA           | 0.4 °C          | 0.7 °C         |
| <b>100 Ω Cu(427)</b>  | -180 to 200 °C | 0.2 °C          | 0.4 °C         | 1 mA           | 0.2 °C          | 0.4 °C         |
| <b>YSI400</b>         | 15 to 50 °C    | 0.2 °C          | 0.4 °C         | 250 μA         | 0.2 °C          | 0.4 °C         |

1. Sensor inaccuracies not included.
2. Resolution: 0.1 °C.
3. Read accuracy is based on 4-wire input. For 3-wire RTD measurements, assuming all three RTD leads are matched, add 1.0 °C (Pt10 and Cu10), 0.6 °C (Pt50 and Cu50), 0.4 °C (Other RTD types) to the specifications.
4. Source Accuracy in source mode is based on 0.5 mA~3 mA (1.00 Ω~400.00 Ω), 0.05 mA~0.8 mA (400.0 Ω~1500.0 Ω), 0.05 mA~0.4 mA (1500.0 Ω~4000.0 Ω), excitation current (0.25 mA for Pt1000 range).
5. Temperature Coefficient: ±0.05 °C /°C for measure, ± 0.05 °C /°C (<18 °C or >28 °C) for source.
6. Supports pulsed transmitters and PLCs with pulse times as short as 5 ms.

**Thermocouple input and output (Fluke 714B)**

| TC Type   | Range (°C)      | Measure (°C) |        | Source (°C) |        |
|-----------|-----------------|--------------|--------|-------------|--------|
|           |                 | 1 year       | 2 year | 1 year      | 2 year |
| <b>E</b>  | -250 to 200 °C  | 1.3          | 2.0    | 0.6         | 0.9    |
|           | -200 to -100 °C | 0.5          | 0.8    | 0.3         | 0.4    |
|           | -100 to 600 °C  | 0.3          | 0.4    | 0.3         | 0.4    |
|           | 600 to 1000 °C  | 0.4          | 0.6    | 0.2         | 0.3    |
| <b>N</b>  | -200 to -100 °C | 1.0          | 1.5    | 0.6         | 0.9    |
|           | -100 to 900 °C  | 0.5          | 0.8    | 0.5         | 0.8    |
|           | 900 to 1300 °C  | 0.6          | 0.9    | 0.3         | 0.4    |
| <b>J</b>  | -210 to -100 °C | 0.6          | 0.9    | 0.3         | 0.4    |
|           | -100 to 800 °C  | 0.3          | 0.4    | 0.2         | 0.3    |
|           | 800 to 1200 °C  | 0.5          | 0.8    | 0.3         | 0.3    |
| <b>K</b>  | -200 to -100 °C | 0.7          | 1.0    | 0.4         | 0.6    |
|           | -100 to 400 °C  | 0.3          | 0.4    | 0.3         | 0.4    |
|           | 400 to 1200 °C  | 0.5          | 0.8    | 0.3         | 0.4    |
|           | 1200 to 1372 °C | 0.7          | 1.0    | 0.3         | 0.4    |
| <b>T</b>  | -250 to -200 °C | 1.7          | 2.5    | 0.9         | 1.4    |
|           | -200 to 0 °C    | 0.6          | 0.9    | 0.4         | 0.6    |
|           | 0 to 400 °C     | 0.3          | 0.4    | 0.3         | 0.4    |
| <b>B</b>  | 600 to 800 °C   | 1.3          | 2.0    | 1.0         | 1.5    |
|           | 800 to 1000 °C  | 1.0          | 1.5    | 0.8         | 1.2    |
|           | 1000 to 1820 °C | 0.9          | 1.3    | 0.8         | 1.2    |
| <b>R</b>  | -20 to 0 °C     | 2.3          | 2.8    | 1.2         | 1.8    |
|           | 0 to 100 °C     | 1.5          | 2.2    | 1.1         | 1.7    |
|           | 100 to 1767 °C  | 1.0          | 1.5    | 0.9         | 1.4    |
| <b>S</b>  | -20 to 0 °C     | 2.3          | 2.8    | 1.2         | 1.8    |
|           | 0 to 200 °C     | 1.5          | 2.1    | 1.1         | 1.7    |
|           | 200 to 1400 °C  | 0.9          | 1.4    | 0.9         | 1.4    |
|           | 1400 to 1767 °C | 1.1          | 1.7    | 1.0         | 1.5    |
| <b>C</b>  | 0 to 800 °C     | 0.6          | 0.9    | 0.6         | 0.9    |
|           | 800 to 1200 °C  | 0.8          | 1.2    | 0.7         | 1.0    |
|           | 1200 to 1800 °C | 1.1          | 1.6    | 0.9         | 1.4    |
|           | 1800 to 2316 °C | 2.0          | 3.0    | 1.3         | 2.0    |
| <b>L</b>  | -200 to -100 °C | 0.6          | 0.9    | 0.3         | 0.4    |
|           | -100 to 800 °C  | 0.3          | 0.4    | 0.2         | 0.3    |
|           | 800 to 900 °C   | 0.5          | 0.8    | 0.2         | 0.3    |
| <b>U</b>  | -200 to 0 °C    | 0.6          | 0.9    | 0.4         | 0.6    |
|           | 0 to 600 °C     | 0.3          | 0.4    | 0.3         | 0.4    |
| <b>BP</b> | 0 to 1000 °C    | 1.0          | 1.5    | 0.4         | 0.6    |
|           | 1000 to 2000 °C | 1.6          | 2.4    | 0.6         | 0.9    |
|           | 2000 to 2500 °C | 2.0          | 3.0    | 0.8         | 1.2    |
| <b>XK</b> | -200 to 300 °C  | 0.2          | 0.3    | 0.2         | 0.5    |
|           | 300 to 800 °C   | 0.4          | 0.6    | 0.3         | 0.6    |
| <b>G</b>  | 100 to 300 °C   | 1.6          | 2.4    | 1.2         | 1.8    |
|           | 300 to 1500 °C  | 1.0          | 1.5    | 1.0         | 1.5    |
|           | 1500 to 2320 °C | 2.0          | 3.0    | 1.6         | 2.4    |
| <b>D</b>  | 0 to 300 °C     | 1.6          | 2.4    | 1.2         | 1.8    |
|           | 300 to 1500 °C  | 1.0          | 1.5    | 1.0         | 1.5    |
|           | 1500 to 2315 °C | 2.0          | 3.0    | 1.6         | 2.4    |
| <b>P</b>  | 0 to 1000 °C    | 1.6          | 2.4    | 0.6         | 0.9    |
|           | 1000 to 1395 °C | 2.0          | 3.0    | 0.8         | 1.2    |
| <b>M</b>  | -50 to 100 °C   | 1.0          | 1.5    | 0.4         | 0.6    |
|           | 100 to 1000 °C  | 1.6          | 2.4    | 0.6         | 0.9    |
|           | 1000 to 1410 °C | 2.0          | 3.0    | 0.8         | 1.2    |

**Thermocouple Probes**

|                     | Bead                                                                              | HVAC                                                                              | Immersion                                                                         | Surface                                                                           | Air                                                                                | Piercing                                                                            | General purpose                                                                     | Industrial surface                                                                  |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |  |  |  |  |  |  |  |  |
|                     | 80PK-1<br>80PJ-1                                                                  | 80PK-11                                                                           | 80PK-22                                                                           | 80PK-3A                                                                           | 80PK-24                                                                            | 80PK-25<br>80PT-25                                                                  | 80PK-26                                                                             | 80PK-27                                                                             |
| Lowest temperature  | -40 °C                                                                            | -30 °C                                                                            | -40 °C                                                                            | 0 °C                                                                              | -40 °C                                                                             | K Type:<br>-40 °C<br>T Type:<br>-196 °C                                             | -40 °C                                                                              | -127 °C                                                                             |
| Highest temperature | 260 °C                                                                            | 105 °C                                                                            | 1090 °C                                                                           | 260 °C                                                                            | 816 °C                                                                             | 350 °C                                                                              | 816 °C                                                                              | 600 °C                                                                              |
| Probe material      | Type K wire with teflon insulation                                                | Velcro                                                                            | Inconel 600                                                                       | Type K sensor with teflon body                                                    | Inconel                                                                            | 316 Stainless Steel                                                                 | 304 Stainless Steel                                                                 |                                                                                     |
| Probe length        | 1 m lead wire                                                                     | 48.26 cm velcro cuff                                                              | 21.27 cm                                                                          | 9.525 cm                                                                          | 21.59 cm                                                                           | 10.16 cm                                                                            | 21.57 cm                                                                            | 20.32 cm                                                                            |
| Cable length        | 1 m                                                                               |                                                                                   |                                                                                   | 1.3 m                                                                             | 1 m                                                                                |                                                                                     |                                                                                     |                                                                                     |
| Connection          | Molded thermocouple plug                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| SureGrip handle     | No                                                                                | No                                                                                | Yes                                                                               | No                                                                                | Yes                                                                                | Yes                                                                                 | Yes                                                                                 | Yes                                                                                 |
| Key feature         | Ideal for initial troubleshooting. Can be secured in place with a magnet.         | Velcro probe allows hands free temperature measurement.                           | For use in liquids or in gels.                                                    | Exposed junction for direct contact with flat or slightly convex surfaces.        | Perforated baffle for air and non-caustic gas measurements.                        | Probe material safe for use in foods. Sharp tip pierces solid surfaces.             | Use for general purpose air or surface measurements.                                | Low conductivity stainless steel minimizes thermal shunting. Extra rugged.          |
| Thermocouple types  | K, J                                                                              | K                                                                                 | K                                                                                 |                                                                                   |                                                                                    | K, T                                                                                | K                                                                                   |                                                                                     |
| Typical use         |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |                                                                                     |
| General purpose     | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   | •                                                                                   |
| HVAC                | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | —                                                                                   | •                                                                                   | •                                                                                   |
| Food service        | —                                                                                 | —                                                                                 | •                                                                                 | —                                                                                 | —                                                                                  | •                                                                                   | —                                                                                   | —                                                                                   |
| Industrial          | •                                                                                 | •                                                                                 | —                                                                                 | —                                                                                 | —                                                                                  | —                                                                                   | —                                                                                   | •                                                                                   |
| Residential         | •                                                                                 | —                                                                                 | —                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | —                                                                                   | —                                                                                   |
| Commercial          | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   | •                                                                                   |

## Thermocouple kits and accessories

|                                                                      |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                             |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Thermocouple Plug Kits</b>                                        |    | <b>700TC1</b><br>A kit of ten mini-plug connectors. One each of the following:<br>Type J (black)<br>Type K (yellow)<br>Type T (blue)<br>Type E (purple)<br>Type R/S (green)<br>Type B or Cu (white)<br>Type L (J-DIN) (blue)<br>Type U (T-DIN) (brown)<br>Type C (red)<br>Type N (orange)                                                                                                                                                                                                                                                                                                                                                                                                   | <b>700TC2</b><br>A kit of seven mini-plug connectors.<br>Type J (black), two<br>Type K (yellow), two<br>Type E (purple), one<br>Type T (blue), one<br>Type R/S (green), one |
| <b>80PK-8, 80PK-10, Pipe Clamp Temperature Probes</b>                |    | <ul style="list-style-type: none"> <li>Type K thermocouples clamp securely onto pipes for fast temperature and superheat measurements</li> <li>Durable ribbon sensors</li> <li>1 m lead</li> <li>Measure from -29 °C to 149 °C</li> <li>80PK-8 for 6.4 mm to 34.9 mm</li> <li>80PK-10 for 32 mm to 64 mm</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                             |
| <b>80CK-M and 80CJ-M Type K and J Male Mini-Connectors</b>           |    | <ul style="list-style-type: none"> <li>Isothermal screw terminal for K or J wire</li> <li>Suitable for up to 20 gauge thermocouple wire</li> <li>Color coded to industry standards (K-yellow, J-black)</li> <li>Two per package</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                             |
| <b>80PJ-EXT, 80PK-EXT, 80PT-EXT Thermocouple Wire Extension Kits</b> |    | For extending and repairing type J, K or T thermocouple wires.<br><ul style="list-style-type: none"> <li>Kit includes 3 m of thermocouple wire and 1 pair of male/female mini-connectors</li> <li>Maximum continuous exposure temperature: 260 °C</li> <li>80PK-EXT is compatible with type K thermometers; 80PJ-EXT is designed for type J thermometers, and 80PT-EXT is designed for type T thermometers</li> </ul>                                                                                                                                                                                                                                                                       |                                                                                                                                                                             |
| <b>5627A-6-J, 5627A-9-J and 5627A-12-J Industrial RTD probes</b>     |  | 5627A-6-J, 5627A-9-J and 5627A-12-J Industrial RTD probes for Fluke-712B<br><ul style="list-style-type: none"> <li>15.24 cm and 22.86 cm (6 and 9 inch) models measure to 300 °C, 30.48 cm model (12 inch) measures up to 420 °C</li> <li>Accuracy to <math>\pm 0.025</math> °C.</li> <li>NVLAP-accredited calibration included</li> <li>Uses IEC standard PT-100-385 RTD curve</li> <li>Each probe is individually calibrated and includes a NVLAP-accredited report of calibration</li> <li>Terminated with (4) Banana plugs for 4-wire temperature measurement with the 712B</li> <li>Add 2601 (22.86 cm, 9 in) or 2609 (63.5 cm, 25 in) protective case to protect the probe</li> </ul> |                                                                                                                                                                             |

## Ordering information

FLUKE-712B Temperature Calibrator

FLUKE-714B Temperature Calibrator

### Included equipment

Magnetic hanging tool, batteries, manual, traceable calibration certificate, and test leads

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