# JOFRA® calibration

# Digital Temperature Indicator and STS Reference Sensor
# **DTI050 and STS-100**

**» Wide temperature range**
DTI050:
-200 to 2500°C / -328 to 4532°F

STS-100 sensor:
-150 to 650°C / -238 to 1202°F

STS-102 sensor:
-45 to 155°C / -49 to 311°F

**» Improve your accuracy**
DTI050:
accuracy to ±0.012°C / ±0.021°F

DTI050 + STS sensor:
accuracy to ±0.04°C / ±0.072°F

**» Fast response time**
Ensures correct monitoring of the temperature stability

**» Specified low drift**
Maintains a minimum uncertainty budget throughout the period between re-calibration intervals

**» Wide selection of sensors**
Straight sensors, 90° angled sensors or cable sensors, offering flexibility in test methods depending on the sensor-under-test

**» True field instrument**
Low temperature coefficient - high accuracy in the lab and in the field

**» Documentation made easy**
RS232 communication and JOFRACAL calibration software are included in the standard delivery

**ISO 9001 Manufacturer**

Specification Sheet
SS-DTI050_STS100

The JOFRA DTI050 handheld digital temperature indicator, offers a measurement accuracy to ±0.012°C.

Combined with an accurate JOFRA STS-100 temperature reference sensor, the DTI050 temperature reference indicator is the perfect reference thermometer.

This simple to use instrument offers great flexibility, being able to work with both 'smart' and standard temperature sensors. A fast response time ensures precise monitoring of temperature stability and low drift reduces uncertainty of measurement between calibration intervals.

Use the DTI050 and the STS sensors as the working temperature reference in any calibration application or use the set-up directly for critical measurements in the process.

The superior specifications, combined with a long history of reliability and low drift, makes the DTI050 and the STS sensors the perfect choice.

The graphical display makes it is easy to recognize the status of the instrument and take readings. The DTI050 may also handle signals from 4-wire RTD's, TC's and thermistors.

# **AMETEK®**
## SENSORS, TEST & CALIBRATION

# JOFRA DTI050 INDICATOR

### Graphical display
Large digits display the temperature, info lines show current status and mode, and the small digits show the details of the sensor.

### Indicator for low battery
Running low on battery an icon in the display clearly shows this.

### ON / OFF
Auto shut-off to extend battery life (user-programmable).

### Resolution
1 °C - 0.001 °C. Maximum resolution depends on the selected sensor type.

### Hold
Makes it possible to "freeze" the results when doing measurement. The results are saved in the EEPROM, when it is switched off.

### External power supply
It is possible to connect the DTI050 to external 9V supply.

### Intelligent sensor reading
Capable of reading calibration data and other information from the memory of the sensor.

### Input
1 input channel with 6-pin REDEL connector.

### Type
Select type of sensor. When using an STS reference sensor with intelligence, the indicator automatically finds the sensor and the data.

### Serial interface
RS232 serial interface to communicate with JOFRACAL calibration software. Also used if adjustment of the unit is necessary.

### MAX / MIN
Reads the highest and lowest value from last reset. Monitor a safety alarm or look for temperature spikes in the process. Min and max are saved in the EEPROM, when it is switched off.

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## ORDERING INFORMATION DTI050

| Order No. | | | Description |
|---|---|---|---|
| | | | **Temperature Indicator** |
| DTI050 | | | DTI050 Temperature Indicator |
| | G | | **Calibration certificate** |
| | | | Traceable certificate to International standards (Standard) |
| | H | | Accredited certificate - ISO17025 |
| | | C | **Options** |
| | | | Carrying Case (max. 350 mm. straight sensor) |
| | | X | No option used |
| **DTI050GX** | | | **Sample order number** |
| | | | DTI050 temperature indicator with standard traceable calibration certificate. |

## ACCESSORIES

### DTI050 power supply accessories
| | |
|---|---|
| 124720 | Mains adapter 9VDC/200mA - 230VAC/115VAC |
| 124717 | 1x 9 Volt rechargeable battery |
| 124718 | Charger for rechargeable batteries - 115/230 VAC |
| 125002 | Edge port Converter with 4 pcs of RS232 ports |

### DTI050 connectors and cables
| | |
|---|---|
| 125702 | Connector for RTD sensors without intelligence |
| 125703 | Connector for RTD sensors with intelligence |
| 125759 | Connector for TC sensors without intelligence |
| 125704 | Connector for TC sensors with intelligence |
| 125522 | Cable 2 m with LEMO / Redel for DTI050 with intelligence |
| 125523 | Cable to mini TC-connector with intelligence |
| 125521 | LEMO/Banana cable,STS100/STS102,with intelligence |

## STANDARD DELIVERY

- DTI050 indicator
- Traceable calibration certificate in ohm and mV
- Softcase and shoulder strap
- User manual
- 9V battery
- RS232 cable
- JOFRACAL calibration software
- CON050 configuration software

### Softcase (Standard) - SPK-HHC-002
The DTI050 is supplied in a handy softcase designed for easy transportation and vertical operation during the calibration.

### Carrying case (Optional) - 125812
A complete ready-to-use system may be delivered in a practical aluminum carrying case, which can hold the DTI050 and all standard accessories as well as a STS reference sensor.

# SPECIFICATIONS DTI050

## Environmental conditions

Operating temperature .................. -10 to 50°C / 14 to 122°F
Storage temperature .................... -20 to 60°C / -4 to 140°F
Atmospheric humidity............................................. 0 to 90%
All specifications specified
at ambient temperature .................. 23°C ±5°C / 73°F ±9°F
Outside ambient 23°C ±5°C........................ ±0.001% rdg/°C
Outside ambient 73°F ±9°F ..................... ±0.0028% rdg/°F
CJ compensation 18 to 28°C / 64 to 83°F ... 0.2°C / 0.36°F
CJC outside above............................ 0.05°C/°C / 0.05°F/°F

## Power supply

Mains adapter ........................................... 9 VDC / 200 mA
Battery .................................................... 1 x 9 VDC Alkaline
Battery life ............................................... Minimum 10 hours
Low battery indicator.............................................. at 6 VDC
Auto off .................................. user selectable, 1-30 minutes

## Display

LCD ....................................................... Graphical display
Display resolution ...................................... 1°C  - 0.001°C. *
Display update ...........................................twice per second
* Maximum resolution depends on the selected sensor type.

## RS232 communication interface

Connector ......................................................... 3-pin JACK
Communication rate ................................9600 baud, ASCII

## Instrument dimensions

Indicator L x W x H  ..... 188 x 84 x 52 mm / 7.4 x 3.3 x 2.1 in
Indicator weight (including battery).............. 400 g / 14.1 oz

## Shipping dimensions

Indicator L x W x H . 250 x 160 x 100 mm / 9.8 x 6.3 x 3.9 in
Indicator weight (including battery)  .............. 1.1 kg / 2.4 lb

# INPUT SPECIFICATIONS FOR DTI050

| 4-wire RTD Type | Temperature range | | | | 12 months accuracy | |
|---|---|---|---|---|---|---|
| | °C | | °F | | °C | °F |
| | From | To | From | To | | |
| PT385, 100 ohm | -200 | -80 | -328 | -112 | 0.012 | 0.021 |
| | -80 | 100 | -112 | 212 | 0.020 | 0.036 |
| | 100 | 300 | 212 | 572 | 0.030 | 0.054 |
| | 300 | 400 | 572 | 752 | 0.035 | 0.063 |
| | 400 | 630 | 752 | 1166 | 0.047 | 0.084 |
| | 630 | 800 | 1166 | 1472 | 0.057 | 0.102 |

| Ohm | Range | | Accuracy ± |
|---|---|---|---|
| | min | max | 12 months |
| Ohm read (low) | 0.000 | 400.000 | 0.004% rdg +0.002 ohm |

# JOFRA STS REFERENCE SENSORS

To get an ideal reference system, JOFRA offers a range of reference sensors. JOFRA STS Superior Temperature reference Sensors are based on more than 50 years of industrial temperature sensor manufacturing experience. The main requirement of a reference sensor is stability: The less the sensor drifts, the lower the measurement uncertainty. All Superior Temperature Standard sensors are economical and offer fast response times, low immersion depths, compact physical sizes, and specified low drift rates: even at high temperatures. These are all important considerations when selecting a reference sensor.

All sensors are supplied with an accredited or traceable certificate stating the sensor coefficients.

## System accuracy for JOFRA DTI050 with STS-100/102

**STS-100 sensor:**

| | |
|---|---|
| -50 to 250°C (-58 to 482°F): | ±0.040°C (±0.072°F) [1,2] |
| | ±0.055°C (±0.099°F) [1,3] |
| -50 to 320°C (-58 to 608°F): | ±0.050°C (±0.090°F) [1,2] |
| | ±0.060°C (±0.108°F) [1,3] |
| -50 to 400°C (-58 to 752°F): | ±0.065°C (±0.117°F) [1,2] |
| | ±0.080°C (±0.144°F) [1,3] |
| -50 to 650°C (-58 to 1202°F): | ±0.090°C (±0.162°F) [1,2] |
| | ±0.100°C (±0.180°F) [1,3] |

**STS-102 cable sensor:**

| | |
|---|---|
| -45 to 155°C (-49 to 311°F): | ±0.040°C (±0.072°F) [1,2] |
| | ±0.070°C (±0.126°F) [1,3] |

All sensors are as standard supplied with an accredited certificate stating the sensor coefficients. A traceable certificate is optional.

Note 1:  Specified at 95% confidence interval k=2, over full range, including calibration uncertainty, excluding 1 LSD (Least Significant Digit).

Note 2:  Excl. sensor drift

Note 3:  Incl. sensor drift after 100 hours at max. temperature.

## ORDERING JOFRA DTI050 AND STS-100

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DTI050** | | | | | | | **Base model number** |
| | | | | | | | DTI050 Temperature Indicator |

| | **Calibration certificate DTI050** |
|---|---|
| G | Traceable certificate (standard) |
| H | Accredited certificate |

| | **STS reference sensor** |
|---|---|
| 100 | Pt100 reference sensor, solid, -150 to 650°C (-238 to 1207°F) |

| | **Diameter of the sensor** |
|---|---|
| A | Overall diameter 4 mm (0.16 in) |
| B | Overall diameter 6.35 mm (0.25 in) |

| | **Shape and length** |
|---|---|
| 250 | Straight sensor, 250 mm (9.8 in) in alu case |
| 350 | Straight sensor, 350 mm (13.8 in) in alu case |
| 500 | Straight sensor, 500 mm (19.7 in) in alu case |
| 901 | 90° angled sensor, 207 mm (8.1 in) in plastic case |

| | **Calibration certificate** |
|---|---|
| H | Accredited certificate - ISO17025 Standard -45 to 650°C |
| HS | System calibration - Accredited certificate - ISO17025 Option -45 to 650°C |

| | **Options** |
|---|---|
| C | System carrying case (max. 350 mm. sensor) |

**DTI050G100A250HC**  **Sample order number**
DTI050 with traceable certificate and 4 mm
STS-100 reference sensor, straight 250 mm. with accredited
certificate, carrying case and Cable with LEMO / Redel.

## ORDERING JOFRA DTI050 AND STS-102 A

| | **Base model number** |
|---|---|
| DTI050 | DTI050 Temperature Indicator |

| | **Calibration certificate DTI050** |
|---|---|
| G | Traceable certificate (standard) |
| H | Accredited calibration certificate |

| | **STS reference sensor** |
|---|---|
| 102 | Pt100 reference sensor, cable, -50 to 155°C (-58 to 311°F) |

| | **Diameter of the sensor** |
|---|---|
| A | Overall diameter 4 mm (0.16 in) |

| | **Shape and lengthd** |
|---|---|
| 030 | Short sensor 30 mm / 1.18 in in plastic case |

| | **Calibration certificate** |
|---|---|
| H | Accredited certificate  - ISO17025 Standard -45 to 155°C |
| HS | System calibration - Accredited certificate - ISO17025 Option -45 to 155°C |

| | **Options** |
|---|---|
| C | System carrying case (max. 350 mm. sensor) |

**DTI050G102A030HC**  **Sample order number**
DTI050 with traceable certificate and 4 mm
STS-102, short 30mm reference sensor with accredited
certificate, carrying case and Cable with LEMO / Redel.

**AMETEK Test & Calibration Instruments**
A business unit of AMETEK Measurement & Calibration Technologies Division offering the following industry leading brands for test and calibration instrumentation.

**JOFRA Calibration Instruments**
*Temperature Calibrators*
Portable dry-block calibrators, precision thermometers and liquid baths. Temperature ranges from -90°C(-130°F) to 1205°C(2200°F). Temperature sensors for industrial and marine use.
*Pressure Calibrators*
Convenient electronic systems ranging from -25 mbar to 1000 bar  - fully temperature-compensated for problem-free and accurate field use.
*Signal Instruments*
Process signal measurement and simulation for easy control loop calibration and measurement tasks.

**M&G Pressure Testers & Pumps**
Pneumatic floating-ball or hydraulic piston dead weight testers with accuracies to 0.015% of reading. Pressure generators delivering up to 1,000 bar.

**Lloyd Instruments**
Materials testing machines and software from Lloyd Instruments guarantees expert materials testing solutions. The comprehensive program also covers Texture Analysers to perform rapid, general food testing and detailed texture analysis on a diverse range of foods and cosmetics.

**Davenport Polymer Test Equipment**
Allows measurement and characterization of moisture-sensitive PET polymers and polymer density.

**Chatillon Force Measurement**
The hand held force gauges and motorized testers have earned their reputation for quality, reliability and accuracy and they represent the de facto standard for force measurement.

**Newage Testing Instruments**
Hardness testers, durometers, optical systems and software for data acquisition and analysis.

# AMETEK®
## SENSORS, TEST & CALIBRATION

# www.ametekcalibration.com

**UK**
Tel +44 (0)1243 833 302
jofra@ametek.co.uk

**France**
Tel +33 (0)1 30 68 89 40
general.lloyd-instruments@ametek.fr

**Germany**
Tel +49 (0)2159 9136 510
info.mct-de@ametek.de

**Denmark**
Tel +45 4816 8000
jofra@ametek.com

**USA**
Tel +1 (800) 527 9999
cal.info@ametek.com

**India**
Tel +91 22 2836 4750
jofra@ametek.com

**Singapore**
Tel +65 6484 2388
jofra@ametek.com

**China**
Shanghai
Tel +86 21 5868 5111

Beijing
Tel +86 10 8526 2111
jofra.sales@ametek.com.cn