TC 6621 / 6622

Handheld temperature calibrator for thermocouples or resistive probes with memory

TC 6621 temperature calibrator measures or generates thermocouple temperatures (16 different types) and voltage at an accuracy of 0.02%.

TC 6622 temperature calibrator measures or generates RTD temperatures (12 different types) and resistance at an accuracy of 0.02%.

Description

Easy-to-use and equipped with a large graphical display, TC temperature calibrators are the perfect field tools for easy and quick maintenance and commissioning of temperature transmitters and probes.

TC 6621 temperature calibrator measures or generates thermocouple temperatures (16 different types) and voltage at an accuracy of 0.02%.

TC 6622 temperature calibrator measures or generates RTD temperatures (12 different types) and resistance at an accuracy of 0.02%.

With a very low temperature coefficient (10 ppm/°C in thermocouples and 7ppm/°C in resistance), IP54 protection and robust design, TC calibrators are suitable for onsite use even in demanding environmental conditions. They are widely used in the energy field, engineering sector, metal industry and automotive field.

TC calibrators use a graphical interface making programming and reading easier, under graphical or test format. Due to memory feature (10,000 values) and extended functionalities (square root, steps, synthesizer, statistical functions...), TC are well adapted to different process job procedures and ensure full data traceability as well as advanced data exploitation. Use them together with DATACAL calibration software to display, manage data and issue your own customized calibration certificates.

TC calibrators are delivered with 4 alkaline AA batteries in standard. The optional battery charger used a rechargeable battery.

Key features:

- High accuracy: 0.02% reading with an adjustable resolution of 1 µV (TC 6621) and 1 mΩ (TC 6622)
- Values displayed in °C, °F, mV and Ω
- Low temperature coefficient: 10 ppm /°C for thermocouples and 7 ppm/°C for resistance
- Measurements with HOLD function
- Simulation of ramps, preprogrammed steps and synthetizer values
- Correction of calibrated sensors
- Display of minimum, maximum and average value
- Backlight

- 10,000 values stored and displayed graphically

Specifications

Specifications and performances of TC 6621 @23°C ±5°C

DC voltage

Function	Range	Res.	Accuracy / 1 year	Measuring range
IN	100 mV	1 µV	0.020% RDG + 3 µV	-10 mV / 100 mV
OUT	80 mV	1 µV	0.020% RDG + 3 µV	-9.5 mV / 80 mV

Temperature coefficient < 15 ppm/°C beyond reference domain

Thermocouples: Measurement and simulation

Type	Input range	Resolution	Accuracy / 1 year (Measurement)	Output range	Resolution	Accuracy / 1 year (Simulation)
K	-250 to -200°C -200 to -120°C -120 to 0°C 0 to +1372°C	0.2°C 0.1°C 0.05°C 0.05°C	0.90°C 0.3°C 0.02% RDG + 0.12°C 0.02% RDG + 0.11°C	-240 to -50°C -50 to +120°C +120 to +1372°C	0.2°C 0.1°C 0.05°C	0.8°C 0.3°C 0.02% RDG + 0.11°C
T	-250 to -200°C -200 to -50°C -50 to +400°C	0.2°C 0.05°C 0.05°C	0.8°C 0.25°C 0.02% RDG + 0.09°C	-240 to -100°C -100 to -40°C -40 to +400°C	0.2°C 0.05°C 0.05°C	0.5°C 0.25°C 0.02% RDG + 0.10°C
J	-210 to -200°C -200 to -120°C -120 to +60°C +60 to +1200°C	0.05°C 0.05°C 0.05°C 0.05°C	0.3°C 0.25°C 0.02% RDG + 0.11°C 0.02% RDG + 0.09°C	-210 to +50°C +50 to +500°C +500 to +1200°C	0.05°C 0.05°C 0.05°C	0.35°C 0.02% RDG + 0.11°C 0.02% RDG + 0.09°C
E	-250 to -200°C -200 to -100°C -100 to +450°C +450 to	0.1°C 0.05°C 0.05°C 0.05°C	0.55°C 0.2°C 0.02% RDG + 0.07°C 0.02% RDG + 0.05°C	-240 to -100°C -100 to +40°C +40 to +1000°C	0.1°C 0.1°C 0.05°C	0.55°C 0.2°C 0.02% RDG + 0.06°C

	1000°C					
R	-50 to +150°C +150 to +550°C +550 to 1768°C	0.5°C 0.2°C 0.1°C	0.95°C 0.4°C 0.02% RDG + 0.3°C	-50 to +350°C +350 to +900°C 900°C to +1768°C	0.5°C 0.2°C 0.1°C	0.95°C 0.4°C 0.02% RDG + 0.3°C
S	-50 to +150°C +150 to +550°C +550 to +1768°C	0.5°C 0.2°C 0.1°C	0.85°C 0.02% RDG + 0.4°C 0.02% RDG + 0.3°C	-50 to +350°C +350 to 900°C +900 to +1768°C	0.5°C 0.2°C 0.1°C	0.9°C 0.02% RDG + 0.4°C 0.02% RDG + 0.3°C
B	+400 to +900°C +900 to +1820°C	0.2°C 0.1°C	0.95°C 0.5°C	+400 to +850°C +850 to +1820°C	0.2°C 0.1°C	0.95°C 0.5°C
U	-200 to -100°C -100 to +600°C	0.05°C 0.05°C	0.35°C 0.2°C	-200 to -70°C -70 to +600°C	0.05°C 0.05°C	0.35°C 0.2°C
L	-200 to -100°C -100°C to +900°C	0.05°C 0.05°C	0.3°C 0.2°C	-200 to -70°C -70 to +900°C	0.05°C 0.05°C	0.3°C 0.25°C
C	-20 to +900°C +900 to 2310°C	0.1°C 0.1°C	0.3°C 0.02% RDG + 0.15°C	-20 to +900°C +900 to 2310°C	0.1°C 0.1°C	0.35°C 0.02% RDG + 0.15°C
N	-240 to -190°C -190 to -110°C -110 to +0°C +0 to +1300°C	0.2°C 0.1°C 0.05°C 0.05°C	0.6°C 0.25°C 0.15°C 0.02% RDG + 0.07°C	-240 to +10°C +10 to +250°C +250 to +1300°C	0.2°C 0.1°C 0.05°C	0.9°C 0.2°C 0.02% RDG + 0.09°C
Platine	-100 to +1400°C	0.05°C	0.3°C	-100 to +1400°C	0.05°C	0.35°C
Mo	+0 to +1375°C	0.05°C	0.02% RDG + 0.1°C	+0 to +1375°C	0.05°C	0.25°C
NiMo/NiCo	-50 to +1410°C	0.05°C	0.02% RDG + 0.35°C	-50 to +1410°C	0.05°C	0.02% RDG + 0.35°C

Thermocouples G, D: For specifications, refer to the instruction manual (Available on request)
Accuracy is given for reference @ 0°C.
When using the internal reference junction (except couple B) add an additional uncertainty of 0.3 °C at 0 °C.
It is possible (thermocouple B excepted) to choose by programming the cold junction localization: External at 0°C, internal (temperature compensation of instrument’s terminals) or

manually entered.
Temperature coefficient: <10% of accuracy /°C

Specifications and performances of TC 6622 @23°C ±5°C

Resistance

Function	Range	Resolution	Accuracy / 1 year	Notes
IN	400 Ω	1 mΩ	0.012% RDG + 10 mΩ	Automatic detection: 2, 3 or 4 wires
3600 Ω	10 mΩ	0.012% RDG + 100 mΩ	Automatic detection: 2, 3 or 4 wires	
OUT	400 Ω (DC current)	1 mΩ	0.012% RDG + 30 mΩ	Acceptable current: 0.1 to 1 mA
3550 Ω (DC current)	10 mΩ	0.012% RDG + 300 mΩ	Acceptable current: 0.1 to 1 mA	

Connection in resistance and RTDs through banana plugs or 4-pin round connector
Temperature coefficient: < 7 ppm/°C beyond reference domain
Rising time in simulation: < 1 ms
R internal: < 1 Ω
Noise VLF < 1 mV (@ F< 100 Hz)

Resistive probes: Measurement and simulation

Sensor	Range (Input and Output)	Resolution	Accuracy / 1 year (Measurement)	Accuracy / 1 year (Simulation)
Pt50 (α = 3851)	-220°C to +850°C	0.01°C	0.012% RDG + 0.06°C	0.012% RDG + 0.18°C
Pt100 (α = 3851)	-220°C to +850°C	0.01°C	0.012% RDG + 0.05°C	0.012% RDG + 0.12°C
Pt100 (α = 3916)	-200°C to +510°C	0.01°C	0.012% RDG + 0.05°C	0.012% RDG + 0.12°C
Pt100 (α = 3926)	-210°C to +850°C	0.01°C	0.012% RDG + 0.05°C	0.012% RDG + 0.12°C
Pt200 (α = 3851)	-220°C to +120°C	0.01°C	0.012% RDG + 0.12°C	0.012% RDG + 0.33°C
Pt500 (α = 3851)	-220°C to +1200°C	0.01°C	0.012% RDG + 0.07°C	0.012% RDG + 0.18°C
Pt1000 (α = 3851)	-220°C to +760°C	0.01°C	0.012% RDG +	0.012% RDG +

			0.05°C	0.08°C
Ni100 (α = 618)	-60°C to 180°C	0.01°C	0.012% RDG + 0.03°C	0.012% RDG + 0.08°C
Ni120 (α = 672)	-40°C to +205°C	0.01°C	0.012% RDG + 0.03°C	0.012% RDG + 0.08°C
Ni1000 (α = 618)	-60°C to +180°C	0.01°C	0.012% RDG + 0.03°C	0.012% RDG + 0.08°C
Cu10 (α = 427)	-50°C to 150°C	0.01°C	0.012% RDG + 0.18°C	0.012% RDG + 0.1°C
Cu50 (α = 428)	-50°C to +150°C	0.01°C	0.012% RDG + 0.06°C	0.012% RDG + 0.15°C

Resistive probes measurements in 2, 3 or 4 wires: automatic recognition of number of connected wires, with indication on screen
Accuracies are given for 4-wire mounted probes
Take into account particular error of temperature sensor used and implementation conditions
Measuring current: 0.65 mA
Simulation current: 0.1 mA to 1mA
Minimal current pulse duration: < 1 ms
Temperature coefficient: < 10% of accuracy /°C

Further features

Scaling in measurement and simulation modes	This function allows sensors to be corrected after a calibration. Scaling is performed using up to 10 segments, in order to fit with the real calibrated value.
Calibrated sensors	A database can be created to design curves for sensor s after calibration according to the corrections mentioned on a calibration report.
Data recording	Data are recorded either manually on event or automatically with programmable frequency. Data is stored with date and time and can be displayed as list or curve.
Statistical functions	Continuous display of average, minimum and maximum value of the signal under monitoring, as well as number of measurements.
Simple and cyclical ramp generation	Ramps can be generated by setting low and high dwell, rising and falling times, stabilization and delay times (1 to 3,600 s). Delay time enables a single user to launch the ramp and go to the control panel.
Steps simulation	This mode allows predefined values to be sent with programmable amplitude and frequency.
Synthesizer	This mode allows predefined values to be sent with programmable frequency.

General specifications

Size	157 x 85 x 45 mm
Weight	306 g
Display	160 x 160 pixel liquid crystal graphical display with backlite Display of result as table of values or trend curve
Power supply	4 AA batteries 1.5 V or rechargeable Ni-Mh batteries with internal charger in option
Communication ports	USB
Storage capacity	10,000 data with date and time into one or several acquisition bursts

Environmental specifications

Reference range	23°C ±5°C (RH: 45 to 75% w/o condensing)
Operating reference range	-10 to 50°C (RH: 20 to 80% w/o condensing)
Limit operating range	-15°C to +55°C (RH: 10 to 80% w/o condensing) (70% at 55°C)
Storage temperature limits	-30°C to +60°C
Maximum height	0 to 2,200 m
IP protection	IP54 according to EN60529

Safety specifications

Protections	• Electronic protection up to 250 V for ‘voltage’ wires • Fuse protection for ‘current’ wires • Protection against ‘current’ circuit breaking during inductive resistance measurements
Class	In accordance with EN 61010-1 Category II, pollution 2
Rated voltage	60 V
Chocks and vibrations	EN 61010-1
EMC conformity	Immunity: • EN 61000-4-2 • EN 61000-4-3 • EN 61000-4-5 • EN 61000-4-6 • EN 61000-4-11 EN 61000-4-4

	Conducted and radiated emissions: • EN 55022, class B • EN 61000-3-2 • EN 61000-3-3

Models and accessories

Instrument:

TC 6621 Handheld calibrator for thermocouples with memory

Delivered in standard with:

- User manual
- 4 AA batteries
- Protection sheath
- Carrying strap
- Factory test report

TC 6622 Handheld calibrator for resistive probes with memory

Delivered in standard with:

- User manual
- 4 AA batteries
- Protection sheath
- Carrying strap
- Factory test report

Probes for TC 6621:

ER 48145-130 Male compensated plug type T

ER 48145-140 Male compensated plug type J

ER 48145-150 Male compensated plug type S

ER 48145-160 Male compensated plug type K

ACC-A-R Male compensated plug type LNRBEUC or D

T101 Flexible type K sensor

T102 Rigid K type sensor

T104 Soft K sensor

T105 Penetration K sensor

T106 Surface K sensor

T703A Surface temp. sensor K couple

T704 Surface K sensor + springplate

Probes for TC 6622:

ER 48457-000 4-pin circular connector for Pt100*

S101D Pt100 environment sensor

S102D	Pt100 immersion sensor
S103	Flexible housing sensor

*This accessory is necessary for RTDs with bare wires

Accessories:

AC6908	Soft carrying case for hand-held instruments
AN6011	Charger + batteries for hand-held instruments
ER 49519-000	USB cable mini B

Software:

DATACAL TCTM	Calibration software for TC / TM series
	Supplied with USB cable mini B

Certification:

QMA11EN	COFRAC certificate of calibration
	With all relevant data points where the device has been tested

Packing information:

Size	157 x 85 x 45 mm
Weight without packing	306 g