

# Beamex MC6-T

MULTIFUNCTION TEMPERATURE CALIBRATOR  
AND COMMUNICATOR

799773487598347598043  
879846545465346  
7987465465465132132131  
62587965636458734657  
655367675684653400



1

Versatile temperature calibration



**beamex**  
A BETTER WAY TO CALIBRATE



# Versatile temperature calibration

The Beamex MC6-T is an extremely versatile portable automated temperature calibration system. It combines a state-of-the-art temperature dry-block with Beamex MC6 multifunction process calibrator technology. It offers versatility, that no other temperature calibrator can match.

With the ability to generate temperature as well as measure and simulate temperature and electrical signals, it offers a really unique combination of functionality. In addition to temperature calibration abilities, the MC6-T also offers electrical and pressure calibration capability, all in one device.

The MC6-T provides superior metrological performance and accuracy for temperature calibrations, while being robust, light and easy to carry field calibrator.

The calibrator is designed for industrial environments and it is designed to minimize the impact of varying environmental conditions and AC power fluctuations.

A large multilingual color touch screen, combined with numerical and graphical views, provides an easy to use system available in multiple languages.

The MC6-T has a built-in field communicator for HART, FOUNDATION Fieldbus H1 and Profibus PA instruments. This enables calibration, configuration and trimming of modern smart instruments with a single device, without the need to carry a separate field communicator.

MC6-T is a documenting calibrator that communicates with calibration management software to enable a fully digitalized, paperless calibration process and documentation database. Thanks to the internal rechargeable battery, the process calibrator functionality in the MC6-T can be used also without mains voltage. The mains voltage is needed only for heating and cooling.

MC6-T includes several unique safety features, such as a tilt sensor, warning light and stand-alone overheating protection.



## MC6-T comes in two versions:

With all its functionality, the MC6-T can be considered a mobile calibration laboratory, replacing a large number of conventional separate single-function calibration equipment, making it easy to carry it with you out in the field.

### MC6-T150

Generate temperatures between -30 ... 150 °C (-22 ... 302 °F)



### MC6-T660

Generate temperatures between 50 ... 660 °C (122 ... 1220 °F)





beamex MC6-T



Navigation buttons: Home, Back, Forward, Stop, Refresh

Please see user manual for safe use of the equipment  
All terminals, max input: 60 VDC, 30 VAC, 100mA

Q RTD R2 TC1 TC2 TC mV  
R1 R2 RTD HEAT SENSE  
OUT V. mA Hz V. Hz mA Fieldbus  
IN LOOP

MC6-T150  
-30 ... 150 °C

115 / 230 VAC, 50...60 Hz  
MAX 380 W  
FUSES 230 V: T 3.15 A 250 V  
115 V: T 3.15 A 250 V

MAINS SWITCH  
ON / OFF

# Automatic documenting calibrator – digitalize your calibration process

## Superior metrological specifications and performance

MC6-T660 features an active triple zone temperature control technology for superior temperature gradient. MC6-T150 features a dual zone heating and cooling for optimum temperature control. The multizone temperature control technology ensures an excellent temperature gradient and compensates for the heat loss caused by the temperature sensors installed in the insert.

MC6-T offers excellent accuracy and stability. The unique temperature control algorithm provides fast heating and cooling without overshoots, improving efficiency and saving time. The adjustable control speed let you optimize for the speed and accuracy.

An accredited calibration certificate is included as standard as evidence of the accuracy.

## Made for industrial use

MC6-T is designed for demanding industrial environments. It is designed to minimize the effects of varying environmental conditions, typical in process industry field conditions.

It is also designed to minimize the effects of any mains voltage fluctuations, and it remains very stable in spite of changes in AC mains power voltage.

As MC6-T is a portable, small, lightweight and robust device, ideal for industrial field usage. Being a multifunctional device, it replaces several traditional single-function devices. It is easier to carry just one device with you.

With the optional carrying case, you can take the MC6-T and required accessories conveniently with you out to the field.

## Enhanced usability

MC6-T offers a large 5.7-inch backlit multilingual color touch screen user interface that can be easily used with bare fingers, gloved hands or any stylus. Direct numerical and QWERTY keyboards make it very easy and fast to enter data. There is no need to use clumsy arrow keys to enter a set point, just enter the temperature set point value. User interface can also be used with the membrane keys.

The user interface is divided into different operation modes for enhanced usability. The user interface offers numerical and graphical information.

## Extensive process calibrator functionality

MC6-T includes a built-in multifunctional process calibrator, based on the Beamex MC6 technology. The process calibrator can calibrate temperature, electrical and pressure signals.

It offers three simultaneous RTD / resistance and two thermocouple measurement channels. It can also simulate RTD and thermocouples signals, for calibrating temperature transmitters and other temperature instruments. It can also measure and generate various DC electrical signals.

So, in addition to calibrating temperature sensors and temperature loops, you can calibrate different kinds of process instruments.

MC6-T offers also a connection for Beamex external pressure modules (EXT) and can also be used for various pressure calibrations.

## Digital transformation of your calibration process

MC6-T is a documenting calibrator and communicates with calibration software. This enables a digitalized and fully paperless calibration process. Send an unlimited number of workorders from the calibration software, perform the calibration with MC6-T using automatic documentation, and finally send results back to the calibration software for viewing, analysis and storage.

You may also have the Beamex calibration software connected with your maintenance system, for a fully paperless flow of workorders and calibration data between the systems.

Using the MC6-T in conjunction with Beamex CMX calibration software, enables you to minimize any ALCOA related data integrity issues. MC6-T identifies users with their electronic signature and protects data against any tampering.





# Truly multifunctional - carry less

## Built-in Field Communicator

MC6-T includes a field communicator for HART, FOUNDATION Fieldbus H1 and Profibus PA instruments. All protocols are modular, so you can choose the ones you need, and you can also add protocols later on as the requirements arise. With the help of the built-in communicator, you can configure and trim/adjust your smart instruments with a single MC6-T without the need to carry a separate field communicator with you. The communicator includes built-in loop supply and required impedances for the communications, so there is no need for separate power supply or impedances.

## Stability control adds confidence in temperature calibration

In temperature calibration, stability is a very important feature. Temperature changes slowly and the user must be sure that the readings are stable. MC6-T follows the stability and 2 sigma standard deviation of the temperature measurements and makes sure that only readings that are within the stability requirements are being used. This takes the guessing out of the picture and adds confidence in calibration, ensuring the best calibration uncertainty even for a novice user. The stability control is used for the reference sensor as well as the sensors to be calibrated.

## Advanced safety features

The MC6-T includes several advanced safety features. The unit has a red indicator light whenever the block is hot, as well as indication in the display. For safety reasons the MC6-T660 units has a tilt/orientation sensor. This will warn the user if the unit is tilted so much that calibration uncertainty is jeopardized. Also, it will switch off heating and turn on the fan if the unit is tilted too much, or if it falls on side. There is also processor independent stand-alone overheat protectors that will prevent overheating.

## Short and sanitary sensor calibration

In some industries, such as food and beverage and pharmaceutical, short and sanitary temperature sensors are used. These kinds of sensors, sometimes provided with a flange, are difficult to calibrate with traditional temperature dry-blocks. The MC6-T150 is designed so that it enables the calibration of short and flanged sanitary sensors. A dedicated insert used together with a special very short reference sensor with flexible cable. The cover of the block includes grooves for the reference sensor cable, allowing a sensor with a flange being accurately calibrated.

## External controllers

MC6-T supports communication with external temperature and pressure controllers. It can be used to automate temperature calibration with another (Beamex models or selected non-Beamex models) temperature block. For example, use it with your Beamex FB temperature dry block to extend the temperature range. Or use MC6-T to control your existing temperature block to automate the calibration process. Also, MC6-T can be used to automate pressure calibration by controlling an external pressure controller, such as Beamex POC8. This enables automatic calibration of various pressure instruments with MC6-T.

## Smart reference temperature sensor

Beamex smart temperature reference sensors include a memory chip with the sensor coefficients. With a plug-and-play technology, MC6-T automatically reads and uses these coefficients to ensure correct temperature measurements every time. Beamex smart reference temperature sensors are available as a straight one, or as 90 degrees bent version, convenient for calibrating sensors with connection heads.

## Internal rechargeable battery

MC6-T includes an internal rechargeable battery pack. This unique feature allows you to use all other functions, except the temperature control, without mains voltage. For example, you can use the process calibrator functionality, field communicator, or communication with software, without the need to have mains power available.

## Carry less

Being a truly multifunctional device, the MC6-T can replace a large amount of conventional single-function devices. MC6-T includes a temperature dry block, temperature calibrator, electrical calibrator, pressure calibrator, multibus field communicator, loop supply, note pad, and many more. Using MC6-T allows you to carry less.

# Specifications

## GENERAL SPECIFICATIONS

FEATURE	VALUE
Dimensions	322 mm x 180 mm x 298 mm (12,68" x 7,09" x 11,73")
Weight	MC6-T150: 9.4 kg (20.7 lbs) MC6-T660: 8.6 kg (18.96 lbs)
Display	5.7" Diagonal 640 x 480 TFT LCD Module
Touch Panel	5-wire resistive touch screen
Keyboard	Membrane keyboard
Backlight	LED backlight, adjustable brightness
Power requirements	230 V $\pm$ 10%, 50/60 Hz, 380 W (MC6-T150), 1560 W (MC6-T660) 115 V $\pm$ 10%, 50/60 Hz, 380 W (MC6-T150), 1560 W (MC6-T660)
Fuse size (MC6-T660)	230 V: T 8A 250V / 115 V: T 16A 250V
Fuse size (MC6-T150)	230 V: T 3.15A 250V / 115 V: T 3.15A 250V
Max. input voltage	30 V AC, 60 V DC
Operating temperature	0 ... 45 °C (32 ... 113 °F)
Operating humidity	0 ... 90% R.H. non condensing
Storage temperature	-20 ... 60 °C (-4 ... 140 °F)
Computer interface	USB
Calibration certificate	Accredited calibration certificate
Warmup time	Specifications valid after a 5 minute warmup period
Battery type	Rechargeable lithium-ion polymer, 4300 mAh, 11.1 V
Charging time	Approximately 4 hours
Battery operation time	10 ... 16 hours
Battery operated functions	All functions except temperature control and R3 measurement
Safety	Directive 2014/35/EU, EN 61010-1:2010
EMC	Directive 2014/30/EU, EN 61326-1:2013
RoHS compliance	RoHS II Directive 2011/65/EU, EN 50581:2012
Drop	EN 61010-1:2013
Warranty	Warranty 3 years, 1 year for battery pack. Warranty extension programs available.

8

## MEASUREMENT, GENERATION AND SIMULATION FUNCTIONS

- Temperature generation
- Pressure measurement (internal/external pressure modules)
- Voltage measurement ( $\pm$ 1 V and  $-1 \dots 60$  VDC)
- Current measurement ( $\pm$ 100 mA) (internal or external supply)
- Frequency measurement (0...50 kHz)
- Pulse counting (0...10 Mpulse)
- Switch state sensing (dry/wet switch)
- Built-in 24 VDC loop supply (low impedance, HART impedance or FF/PA impedance)
- Voltage generation ( $\pm$ 1 V and  $-3 \dots 24$  VDC)
- Current generation (0...55 mA) (active/passive, i.e. Internal or external supply)
- Resistance measurement, three simultaneous channels (0...4 k $\Omega$ )
- Resistance simulation (0...4 k $\Omega$ )
- RTD measurement, three simultaneous channels
- RTD simulation
- TC measurement, two simultaneous channels (universal connector/mini-plug)
- TC simulation
- Frequency generation (0...50 kHz)
- Pulse queue generation (0...10 Mpulse)
- HART communicator
- FOUNDATION Fieldbus communicator
- Profibus PA communicator

(Some of the above functions are optional)