



Climatic test chamber CTC  
with humidity control  
Temperature test chamber TTC  
"Celsius" standard software

Model size: 256  
- 42 °C to +190 °C (without humidity)  
+10 °C to +95 °C (CTC with humidity)  
Humidity 10 to 98 % rh (CTC)

## **CLIMATIC TEST CHAMBER CTC / TEMPERATURE TEST CHAMBER TTC**

In Memmert environmental test chambers CTC and TTC, the perfect atmosphere for climate and temperature tests, specifically in accordance with IEC 60068 are simulated. Ramp operation, active humidification and dehumidification of 10 to 98 % rh and precise temperature control from -42 °C to +190 °C (without humidity) with humidity control from +10 °C to +95 °C provide unlimited flexibility for controlled material and function tests as well as ageing tests.





## Reliable and efficient climate technology

The components of the climate system interact perfectly for quick, precise and energy-saving temperature changes. The 3-layer insulation system for the chamber, derived from aerospace engineering applications, impresses with an excellent K-value and prevents moisture penetration of the insulation material. The electronically controlled injection of refrigerants guarantees an optimal cooling performance and thanks to the automatic defrosting system, the TTC and CTC test chambers run in continuous operation without interruption.



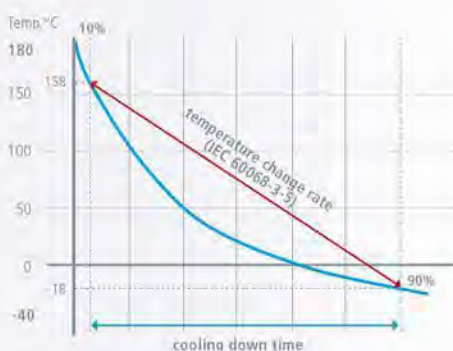
The stainless steel evaporator stands out with a long and corrosion-free life and the twin-compressor, regulated according to the output, saves valuable energy. The temperature-dependent speed-controlled condenser fan ensures low noise level in partial load operation.



## Economical at high performance

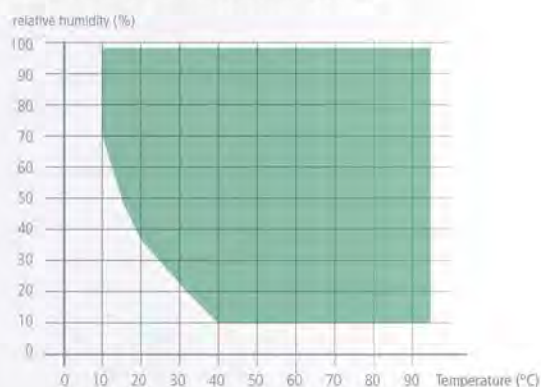
The high level of standardisation and the highly efficient principle of equal parts in production at Memmert allow an extensive range of standard features, along with constantly excellent quality at an outstanding cost/benefit ratio. However, this high-performance duo proves to be extremely cost-efficient not only in their procurement costs, but also in their operating costs. Thanks to the steam generator and the twin compressor, which is regulated according to the output, the CTC consumes only about half of what standard environmental simulation chambers do in climate control operation.

### Temperature change rate in cooling operation



According to Newton's law of cooling, the rate of temperature change follows an exponential curve. The rate of temperature change calculated according to IEC 60068-3-5 applies to cooling from 90 % to 10 %. In the upper temperature range, the rate of temperature change is significantly higher, in the lower temperature range it is significantly lower.

### Temperature-humidity working range



#### Note:

Within the respective temperature-humidity range, condensation-free permanent operation is possible. To which extent condensation may occur in the threshold range depends on the humidity content of the chamber load and the ambient conditions.

## ENVIRONMENTAL TEST CHAMBERS CTC / TTC

according to DIN 12880:2007-05, EN 61010-1 (IEC 61010-1), EN 61010-2-010, IEC 60068

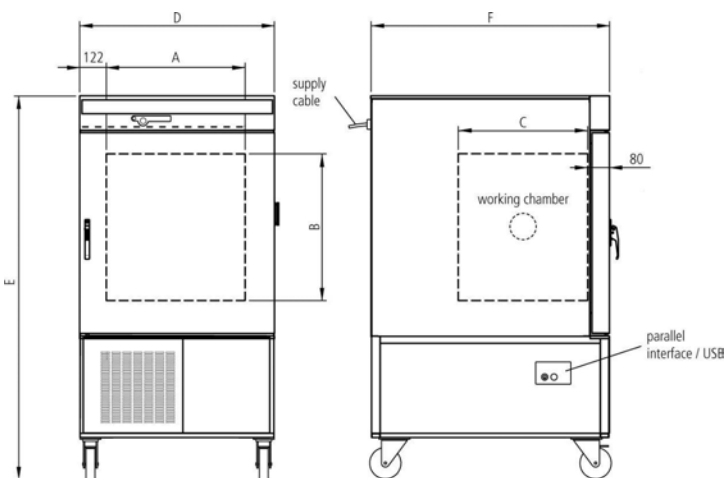
Standard units are safety-approved and bear the test marks:



- Interior: Stainless steel, material 1.4301 (ASTM 304)  
 Housing: Textured stainless steel, rear zinc-plated steel, aesthetic functional glass-stainless steel operating panel with multifunction display and input module  
 Door: Stainless steel, fully insulated, heated  
 Connection: Mains cable with plug (CEE)  
 Installation: Mounted on lockable castors



Ethernet interface is optional (extra cost)



Model sizes/Description		CTC256	TTC256	
Stainless steel interior	Volume	approx. l	256	
	Width	(A) mm	640	
	Height	(B) mm	670	
	Depth	(C) mm	597	
	Support ribs for stainless steel grids	number	6	
	Max. loading per grid	kg	25	
	Max. loading of chamber	kg	100	
Textured stainless steel exterior	Width (plus 20 mm for silicone plug and 5 mm for interfaces)	(D) mm	898	
	Height	(E) mm	1730	
	Depth (without door handle, depth of handle +50 mm)	(F) mm	1100	
	Fully insulated heated stainless steel door		●	
Lockable castors for ease of transport		●		
Standard equipment	Stainless steel grids, electropolished	number	1	
	Entry port right, 80 mm, with stopper		●	
	High-performance air fan, speed adjustable in 10 % steps with monitoring function of fan speed and automatic speed adjustment		●	
	Works calibration certificate (measuring point chamber centre)	°C	-20 and +160	
Works calibration certificate (measuring point chamber centre)		+30 °C and 60 % rh	-	
Temperature	Electronic microprocessor temperature controller with Pt100 and auto-diagnostic system		●	
	Temperature sensors Pt100 Class A in 4-wire circuit for uninterrupted operation on failure of one Pt100 with warning indication		double	
	Temperature range with humidity control	°C	+10 to +95	-
	Temperature range without humidity control	°C	-42 to +190	
	Setting accuracy	°C	-42 to 99,9: 0.1 / 100 to 190: 0.5	
	Temperature change rate in heating operation (acc. to IEC 60068-3-5) -40 °C to +180 °C measured at an ambient temperature of 22 °C	°C	10 K / minute	
	Temperature change rate in cooling operation (acc. to IEC 60068-3-5) +180 °C to -40 °C measured at an ambient temperature of 22 °C	°C	3 K / minute	
	Temperature variation in time (setpoint dependent of min. temperature up to +150 °C and humidity > 20 %)	K	± 0.2 ... 0.5	
Temperature uniformity in chamber (setpoint dependent)	K	± 0.5 ... 2		
Humidity	Capacitive humidity sensor		●	-
	Active microprocessor control for humidifying and dehumidifying (10 - 98 % rh) incl. digital indication and auto-diagnostic system ensures rapid reaching of set humidity and very short recovery times; humidity supply with water (only for demineralised water with a conductivity of 5 to 10 µS/cm and a pH value between 5 and 7; from an external tank) by self-priming pump		●	-
	Humidity stability in time	% rh	± 1 ... 3	-
	Telescopic slide for each 2 x 10 l tanks for water (only for demineralised water with a conductivity of 5 to 10 µS/cm and a pH value between 5 and 7) as well as 2 x 10 l tanks as condensate collector		●	-
	Automatic water tank change-over with alarm for continuous operation		●	-

Model sizes/Description		CTC256	TTC256
Control technology	Timer with residual running time: max. 40 ramps (each 1 min. up to 999 h) programmable through controller or MEMoryCard XL; programming via PC and free-of-charge software: unlimited number of ramps	●	
	Real-time/weekly programmer with group function (e.g. Monday – Friday)		●
	Calibration (no separate PC required), Temperature: 3-point calibration on controller		●
	Calibration (no separate PC required), humidity: 2-point calibration at 20 % and 90 % rh	●	-
	Setting of language for dialogue and display DE / EN / ES / FR / IT		●
	Microprocessor temperature monitor acting as overtemperature protection (protection class 3.3), with Pt100 incorporating fault diagnostics with visual and acoustic alarm		●
	Temperature monitoring band automatically linked to the setpoint (ASF)		●
	Monitor relay for reliable heating cut-off in case of fault		●
Communication	Mechanical temperature limiter (TB)		●
	Internal log memory 1024 kB as ring memory for all setpoints, actual values, errors, settings with real-time and date; capacity approx. 3 months (CTC) resp. 6 months (TTC) at 1 min. intervals		●
	Parallel printer interface for printing logging files, suitable for all PCL3- compatible ink jet printers (USB available via converter, see accessories)		●
Refrigeration	"Celsius" software for control and documentation of temperature and relative humidity (CTC)		●
	High-performance twin compressor (refrigerant R449A) with adjustable speed condenser fan and electronically controlled refrigerant injection		●
Light	Large-area stainless steel evaporator		●
	Halogen interior lighting 2 x 25 W		●
Further data	Acoustic and optical alarm: Door-open		●
	Acoustic and optical alarm: Empty water tank	●	-
	Acoustic and optical alarm: Over- and undertemperature		●
	Acoustic and optical alarm: Underhumidity	●	-
	Electrical load at 400 V, 3 ph N, 50 Hz	approx. W	7000
Packing data	Net weight	approx. kg	337
	Gross weight (packed in carton)	approx. kg	463
	Width	approx. mm	1020
	Height	approx. mm	1910
	Depth	approx. mm	1310

**Order No. Climatic Test Chamber – Temperature Test Chamber**

CTC256 | TTC256

Options	CTC256	TTC256
Works calibration certificate for one (freely selectable) temperature value according to customer specification	-	D00109
Works calibration certificate for one (freely selectable) temperature and humidity value according to customer specification	D00105	-
Door hinged on the left		B8
Full-sight glass door (5-layer insulating glazing), heated		B0
Entry port, left, 80 mm, with stopper		F0
Interface Ethernet instead of USB including software		W4
RS232 interface instead of USB		W6
Potential-free contact (24 V/2 A) with socket, for combination error message (e.g. supply failure, sensor fault, fuse)		H6
MobileALERT, notification by SMS in case of any error or alarm of the device (requires option H6)		C3

Accessories	CTC256	TTC256
Stainless steel grid, electropolished		E20591
External control and logging package consisting of mini-Notebook and software "Celsius", pre-configured, and lateral swivel arm		B04410
USB connection cable for computer interface		E03643
Temperature profile write/read unit for programming via PC, for writing to and reading from the chip card, up to 40 ramps		E05284
Additional chip card, blank, formatted (32 kB MEMoryCard XL for a maximum of 40 ramps)		E04004
Oven-linked authorisation card (User-ID-Card) prevents undesired manipulation by unauthorised third parties. When reordering please specify serial number		E04159
Software conforming to FDA "Celsius FDA Edition". Meets the requirements for the use of electronically stored data sets and electronic signatures as laid down in Regulation 21 CFR Part 11 of the US Food and Drug Administration (FDA). Base licence for the control of one unit		E05019
Integration of additional units (up to max.15 units) into an already existent FDA-software licence (E05019)		FDAQ4
External measuring instrument with sensors for daylight and UV-light, with additional measuring head for temperature and humidity. Product information on demand	B04714	-
DAkKS calibration for one (freely selectable) temperature and humidity value according to method C (DKD-R 5-7)	E48847	-
DAkKS calibration for further temperature and humidity values according to method C (DKD-R 5-7)	E48848	-
DAkKS calibration for one free-selectable temperature value according to method C (DKD-R 5-7)		E39696
DAkKS calibration for further temperature values according to method C (DKD-R 5-7)		E39697
IQ check list with device-specific works test data as support for validation by customer		D00103
OQ check list with device-specific works test data for one free-selectable temperature value, incl. temperature distribution survey at Memmert for 27 measuring points to DIN 12880:2007-05 as support for validation by customer		D00104
OQ check list with device-specific works test data for one free-selectable humidity and temperature value, incl. temperature distribution survey at Memmert for 27 measuring points to DIN 12880:2007-05 as support for validation by customer	D00144	-

Accessories	CTC256	TTC256
On-site IQ/OQ for a freely selectable temperature and humidity value, including temperature distribution survey for 27 measuring points to DIN 12880: 2007-05 (excluding travel costs, not subject to discount, GER, AT, FR only)	DLQ101	-
Extension of DLQ101 by an additional freely selectable temperature and humidity value (not subject to discount)	DLQ101A	-
On-site IQ/OQ for a freely selectable temperature value, including temperature distribution survey for 27 measuring points to DIN 12880: 2007-05 (excluding travel costs, not subject to discount, GER, AT, FR only)	-	DLQ100
Extension of DLQ100 by an additional freely selectable temperature value (not subject to discount)	-	DLQ100A
Individual on-site Performance Qualification (PQ)	DLQ200	
Maintenance "Basic" - carrying out and documentation according to Memmert maintenance plan (excluding travel costs, not subject to discount, GER, AT, FR only)	S00400	
Maintenance "Medium" - carrying out and documentation according to Memmert maintenance plan (excluding travel costs, not subject to discount, GER, AT, FR only)	S00401	
Maintenance "Premium" - carrying out and documentation according to Memmert maintenance plan (excluding travel costs, not subject to discount, GER, AT, FR only)	S00402	
Calibration of one freely selectable temperature value (excluding travel costs, not subject to discount, GER, AT, FR only)	S00205	
Calibration of an additional temperature value (not subject to discount)	S00215	
Calibration of one freely selectable temperature and humidity value (excluding travel costs, not subject to discount, GER, AT, FR only)	S00207	-
Calibration of an additional temperature and humidity value (not subject to discount)	S00216	-