



**memmert**  
Experts in Thermostatics

# Climate chambers

ALWAYS AN EYE ON LONG-TERM STABILITY.

CONSTANT CLIMATE CHAMBER HPP

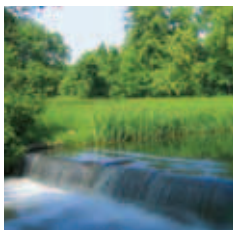
HUMIDITY CHAMBER HCP

CLIMATE CHAMBER ICH

ENVIRONMENTAL TEST CHAMBER CTC/TTC

**100% ATMOSAFE. MADE IN GERMANY.**

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# Reliable. Precise. 100% AtmoSAFE.

Perfect simulation of reality.  
Reproducible, standard compliant, economic.

Each climate chamber creates a climate of temperature and humidity. For Memmert climate chambers, however, that is not enough. Each individual climate chamber is perfectly designed for the high requirements of stability and climate tests, conditioning or ageing. In each individual appliance, there is a homogenous and stable temperature and humidity distribution over the entire chamber. Operation, programming and documentation options feature top-notch convenience. Each individual Memmert climate chamber complies with the strict requirements of DIN 12880:2007-05 and is equipped with a maximum of safety functions. Each individual Memmert climate chamber is 100% AtmoSAFE.



## CONSTANT CLIMATE CHAMBER HPP

PAGE 4 TO 5

TECHNICAL DATA

PAGE 6 TO 7

Stability testing (according to ICH Q1A) in the pharmaceutical industry, long-term storage, growing plants, conditioning and climate testing of plastic material/metal/composite material, storage of electronic components/lacquers/coatings in controlled environment

## HUMIDITY CHAMBER HCP

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TECHNICAL DATA

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Conditioning and climate testing of plastic material/metal/composite material, stability testings in the pharmaceutical industry, storage of electronic components/lacquers/coatings in controlled environment

## CLIMATE CHAMBER ICH

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TECHNICAL DATA

PAGE 14 TO 15

Stability testing (according to ICH Q1A) and photostability testing (according to ICH Q1B) in the pharmaceutical industry, long-term storage, conditioning and climate testing of plastic material/metal/composite material, storage of electronic components/lacquers/coatings in controlled environment

## CLIMATIC TEST CHAMBER CTC

### TEMPERATURE TEST CHAMBER TTC

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TECHNICAL DATA

PAGE 18 TO 19

Accelerated and intermediate tests, alternate stability testing, conditioning and climate-/temperature testing of plastic material/metal/composite material, storage of electronic components/lacquers/coatings in controlled environment with/without humidity

## DECISION-MAKING-AID

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Decision-making-aid for appliances with controlled humidity

## OPTIONS AND ACCESSORIES

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Options and accessories available for all products of Generation 2012 and 2003

## GENERATION 2012

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Features model variants SingleDISPLAY and TwinDISPLAY



## GENERATION 2012

Constant climate chamber HPP  
with TwinDISPLAY  
AtmoCONTROL software

Model sizes: 110 / 260 / 750  
0 °C to +70 °C  
Humidity 10 to 90 % rh  
optional with LED light module

**CONSTANT CLIMATE CHAMBER HPP** They are simply unbeatable in energy efficiency. Furthermore, as constant climate chambers HPP have a very long, maintenance free service life, they are perfectly suited for stability tests, storage in controlled environment and conditioning. The high precision temperature control from 0 °C to +70 °C as well as active humidification and dehumidification from 10 % to 90 % rh were particularly adapted to the ICH guidelines, option Q1A, for stability tests.





### The best climate for samples, environment and budget

Almost without vibrations and extremely quiet, the specially adapted Peltier technology heats up and cools down seamlessly in one system. In this respect, the innovative constant climate chamber HPP not only contributes to climate protection, but it also achieves an additional decrease in operating costs of up to 90 % compared to compressor technology.

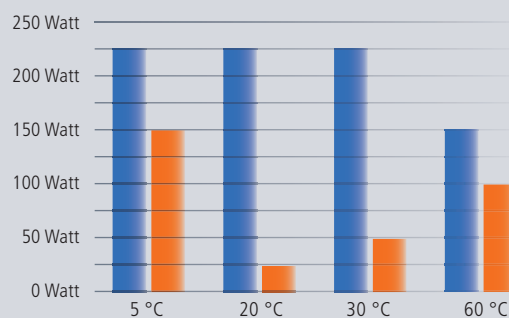
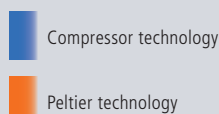


### Cost effective climate protection

The main part of stability testing is performed at temperatures between +20 °C and +30 °C – close to the ambient temperature. The impressive cost effectiveness of Peltier technology can be seen here, since only small amounts of energy are required to raise or lower the temperature slightly, in comparison with compressor technology. Due to its environmentally friendly Peltier elements, the HPP has no need for coolants and requires no regular maintenance.

#### Comparison between compressor and Peltier technology

Reduction in energy consumption of up to 90 %



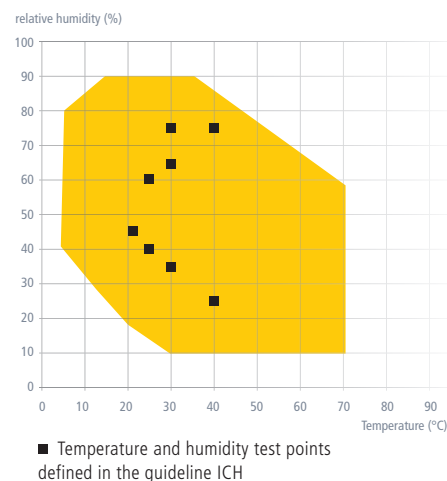
### Top level optimisation

The outstanding precision of the constant climate chambers was further optimised with the introduction of Generation 2012. If required, the Peltier elements can be controlled individually to ensure even more homogenous temperature and humidity distribution inside the chamber. For supporting IQ/OQ/PQ validation, temperature and humidity control can be adjusted directly on the ControlCOCKPIT with three free-selectable measuring points.

### LED light module for HPP 110, 260 and 750: Innovative and environmentally friendly

Dimmable LED light in two alternative colour temperatures protects the environment, reduces energy consumption and ensures ideal conditions of growth in models HPP with light. Available alternatives: Cold-white light (5,500 K) or cold-white plus warm-white light (2,700 K), dimmable in 1 % steps.

#### Temperature-humidity working range



## CLIMATE CHAMBERS HPP

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



## Standard equipment

Interior: Stainless steel, mat. 1.4301 (ASTM 304), deep-drawn

Internals: 2 stainless steel grids

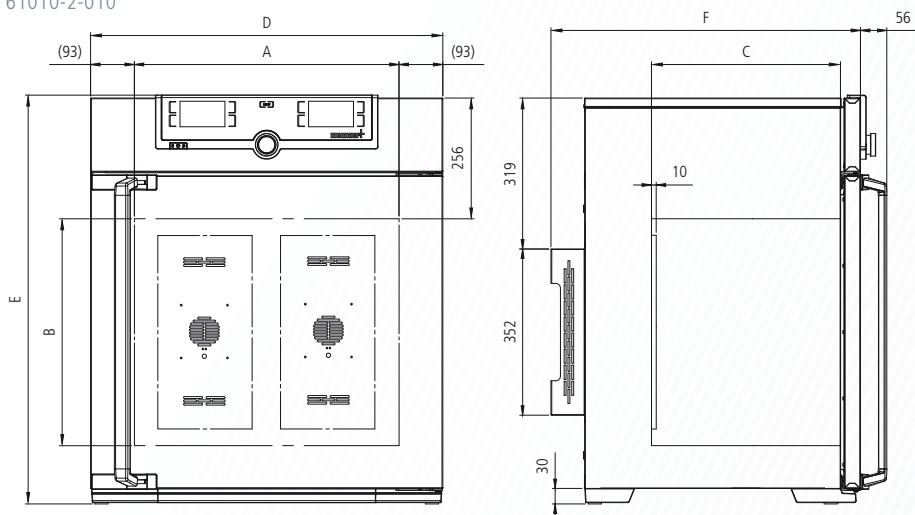
Housing: Textured stainless steel, rear zinc-plated steel, intuitively operated TwinDISPLAY (TFT colour display) with Touchscreen

Double doors: Outside stainless steel, fully insulated, inside glass (size 750 two-leaves)

Connection: Mains cable with plug

Installation: 4 feet; size 750 mounted on lockable castors

Interfaces:



HPP 110: 2 Peltier elements in the rear  
HPP 260: 3 Peltier elements in the rear  
HPP 750: 6 Peltier elements in the rear

Model sizes/Description			110	260	750
Stainless steel interior	Volume	approx. l	108	256	749
	Width	(A) mm	560	640	1040
	Height	(B) mm	480	800	1200
	Depth (less 10 mm for fan – Peltier)	(C) mm	400	500	600
	Stainless steel grids (standard equipment)	number	2		
	Max. number of grids/shelves	number	5	9	14
	Max. loading per grid/shelf	kg	20		
	Max. loading of chamber	kg	150	200	
Textured stainless steel exterior	Width	(D) mm	745	824	1224
	Height (size 750 with castors)	(E) mm	864	1183	1726
	Depth (without door handle), door handle + 56 mm	(F) mm	674	774	874
Further data	Electrical load at 230/115 V, 50/60 Hz	approx. W	650	820	1200
	Working-temperature range without light	°C	0 to +70		
	Working-temperature range with light	°C	+15 to +40		
	Setting temperature range	°C	0 to +70		
	Setting accuracy temperature	°C	0.1		
	Adjustment range humidity without light	% rh	10 to 90		
	Adjustment range humidity with light	% rh	10 to 85		
	Setting accuracy humidity	% rh	0.5		
Standard accessory	Water tank including connection hose		□		
Packing data	Net weight	approx. kg	80	122	208
	Gross weight (packed in carton)	approx. kg	105	173	279
	Width	approx. cm	83	93	133
	Height	approx. cm	106	153	192
	Depth	approx. cm	80	93	105
Order No. Climate Chambers			HPP110	HPP260	HPP750



Options	110	260	750
Chamber modification for the application of reinforced perforated stainless steel shelves or stainless steel grids (bearing rails mounted in the working chamber) – includes replacement of 2 standard grids by 2 reinforced grids	–		K1
Light module cold white 5,500 K: light strips arranged on the side walls of the interior, 10 for model 110, 14 for model 260/750, illumination strength 10,000 Lux, programme-controlled dimming from 0 to 100 % (in 1 % steps), ramp programming in combination with temperature and humidity		T7	
Light module cold white 5,500 K + warm white 2,700 K: LED light strips – 10 for model 110 to 14 for model 260/750 – (5 resp. 7 alternating cold white light strips and 5 resp. 7 warm white light strips) on the side walls of the interior, illumination strength 10,000 Lux, programme-controlled dimming from 0 to 100 % (in 1 % steps), ramp programming in combination with temperature and humidity		T8	
Interior socket, ampacity 230 V/2.2 A, can be switched off with the On/Off switch, cannot be switched individually, moisture tight IP68		R3	
Entry port, 23 mm clear diameter, for introducing connections at the side, moisture tight, can be closed by flap and silicone stopper, standard positions (not available for appliances with light module)	left centre/centre left centre top right centre/centre right centre top	F0 F1 F2 F3	
Entry port, 23 mm clear diameter for introducing connections, moisture tight, can be closed by flap and silicone stopper (please, state location)	left right rear	F4 F5 F6	
Entry port (silicone), 40 mm clear diameter, for introducing connections, moisture tight, can be closed by silicone stopper, at the back (please, state location)		F7	
4 – 20 mA current loop interface (-10 to +80 °C $\pm$ 4 to 20 mA)			
Temperature controller, actual value Temperature of a Pt100 sensor positioned flexibly in chamber for external temperature monitoring (max. 3 TwinDISPLAY)		V3 V6	
Humidity controller, actual value (0 – 100 % rh $\pm$ 4 – 20 mA)		V7	
Works calibration certificate for one (freely selectable) temperature and humidity value Standard works calibration certificate (measuring point chamber centre) at +10 °C, +37 °C as well as 60 % rh at +30 °C		D00105	
Compressed air dehumidification (efficient dehumidification of the interior by means of compressed air)		C9	

Accessories	110	260	750
Stainless steel grid (standard equipment)	E20165	E28891	B04055
Additional reinforced stainless steel grid, max. loading 60 kg; size 750 with guide bars and fixing screws (only in connection with option K1)	E29767	E29766	B32190
Perforated stainless steel shelf	B00325	B29725	B34727
Additional reinforced stainless steel shelf, max. loading 60 kg; with guide bars and fixing screws (only in connection with option K1)	–		B32191
Stainless steel slide-in drip tray, 15 mm rim (may affect the temperature distribution) – cannot be used in connection with option K1	E02073	E29726	–
Stainless steel bottom drip tray, 15 mm rim (may affect the temperature distribution) – cannot be used in connection with option K1	B04359	B29722	B04362
Holder for water tank for mounting on the rear of the appliance or the wall (connection lead 0.5 m); additional water tank included. Standard equipment for size 750		B32371	–
Central water supply (product information on demand)		B04712	
Guarantee extension by 1 year	GA1Q5		GA2Q5



Humidity chamber HCP  
"Celsius" standard software

Model sizes: 108 / 153 / 246  
+20 °C to +90 °C (with humidity)  
+20 °C to +160 °C (without humidity)  
Humidity 20 to 95 % rh

**HUMIDITY CHAMBER HCP** Applications for humidity chambers range from construction physics to corrosion testing and down to biological research. Ramp programming for temperature and humidity, active humidity control between 20 % and 95 % rh as well as exact temperature control of up to +90 °C ensure a controlled, physiologically ideal environment for the simulation of real conditions. Without humidity, the temperature in humidity chambers HCP can be controlled to up to +160 °C.

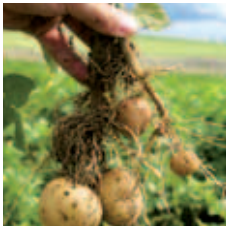






## Homogeneity in the chamber

Heating the working chamber from all six sides is essential for preventing condensation. An aluminium thermal conduction layer supports the optimal temperature distribution, and serves as a heat accumulator in case of a temporary power failure. Turbulence-free ventilation additionally supports the homogenous atmosphere in the working chamber.



## Germ-free through sterilisation

Particularly in highly-sensitive applications with organic chamber loads, hygiene is the decisive factor. Cross contamination must be excluded. Therefore, the chamber including ventilation system and all sensors can be sterilised in a 4-hour programme at +160 °C.

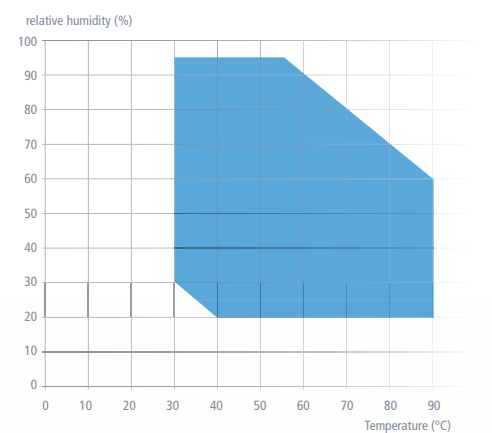
## Ramp programming

Essential for the exact simulation of environmental conditions in research: user-friendly ramp programming. Thanks to the "Celsius" standard software, an unlimited amount of different set values of temperature and humidity can be combined on time ramps.

### Ramp programming



### Temperature-humidity working range



## HUMIDITY CHAMBERS HCP

**with automatic sterilisation** (with all interior fittings incl. humidity sensor sterilised inside the humidity chamber!)

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



### Standard equipment

- Interior:** Stainless steel, material 1.4301 (ASTM 304), deep-drawn, electropolished
- Internals:** 2 perforated stainless steel shelves
- Housing:** Textured stainless steel, rear zinc-plated steel, aesthetic functional glass-stainless steel operating panel with multifunction display and input module; fully insulated stainless steel door and inner glass door

**Connection:** Mains cable with plug

**Installation:** 4 adjustable feet

**Interfaces:**



parallel interface

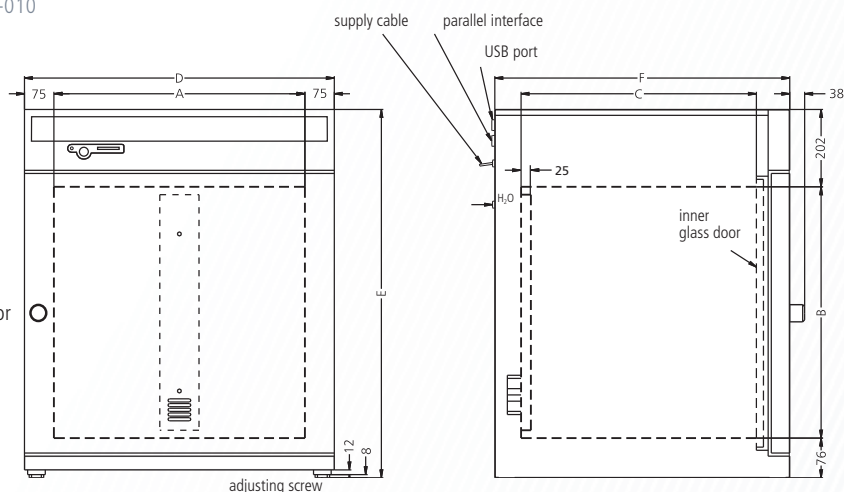


Optional

Ethernet



LAN



Model sizes/Description			108	153	246
Stainless steel interior electropolished	Volume	approx. l	108	153	246
	Width (A)	mm	560	480	640
	Height (B)	mm	480	640	640
	Depth (less 25 mm for fan) (C)	mm	400	500	600
	Provision for stainless steel grids or shelves	number	5	7	
Textured stainless steel exterior	Width (D)	mm	710	630	790
	Height (variable through adjustable feet) (E)	mm	778	938	938
	Depth (without door handle, door handle 38 mm) (F)	mm	550	650	750
	Fully insulated, heated stainless steel door		<input type="checkbox"/>		
	Extra internal glass door		<input type="checkbox"/>		
Ventilation	Uniform atmosphere and temperature distribution through enclosed non-turbulent ventilation system, fully covered by the sterilisation process		<input type="checkbox"/>		
Temperature	Electronic microprocessor temperature controller with Pt100 and auto-diagnostic system		<input type="checkbox"/>		
	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	from +20 to +90 (temperature at 8 over RT to +90)		
	Temperature range without humidity control: during sterilisation the temperature is fixed at +160 °C – set value	°C	from +20 to +160 (temperature at 8 over RT to +160)		
	Temperature fluctuations with time (to DIN 12880:2007-05)	K	≤ ± 0.1		
	Temperature variation in chamber at +50 °C (to DIN 12880:2007-05)	K	≤ ± 0.3		
Sterilisation	STERICard for automatic chamber sterilisation cycle 4 h at +160 °C (not for sterilising the load!)		<input type="checkbox"/>		
Humidity	Capacitive humidity sensor (sterilisable)		<input type="checkbox"/>		
	Active microprocessor control for humidifying and dehumidifying (20 – 95 % rh), incl. digital indication and auto-diagnostic system ensures even more rapid reaching of set humidity and very short recovery times while avoiding condensate formation; humidity supply with distilled water (from an external tank) by a self-priming pump; integral bacteria block by generating hotsteam, dehumidifying via sterile filter.		<input type="checkbox"/>		

Model sizes/Description			108	153	246
Monitor	Microprocessor temperature monitor acting as overtemperature protection (protection class 3.1), with Pt100 incorporating fault diagnostics with visual and audible alarm			<input type="checkbox"/>	
	Digital over- and undertemperature monitor			<input type="checkbox"/>	
	Temperature monitoring band automatically linked to the setpoint (ASF)			<input type="checkbox"/>	
	Relay for reliable heating cut-off in case of fault			<input type="checkbox"/>	
	Mechanical temperature limiter (TB)			<input type="checkbox"/>	
	Audible alarm: Over- and undertemperature, underhumidity, open door and empty water tank			<input type="checkbox"/>	
Timer functions	Real-time/weekly programmer with group function (e.g. Monday – Friday), programme operation with up to 40 ramps for temperature and humidity (MEMoryCard XL)			<input type="checkbox"/>	
Documentation	Internal log memory 1024 kB as ring memory for all setpoints, actual values, errors, settings with real-time and date; capacity approx. 3 months at 1 min intervals.			<input type="checkbox"/>	
	Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories)			<input type="checkbox"/>	
	"Celsius" software for control and documentation of temperature and relative humidity.			<input type="checkbox"/>	
Setup	Calibration (no separate PC required), Temperature: 3-point calibration on controller, Humidity: 2-point calibration at 20 % and 90 %			<input type="checkbox"/>	
	Setting of language for dialogue and display DE / EN / ES / FR / IT			<input type="checkbox"/>	
Further data	Electrical load at 230/115 V (50/60 Hz)	approx. W	1000	1500	2000
Standard accessories	Perforated stainless steel shelves	number		2	
	Works calibration certificate (test point chamber centre at +60 °C)			<input type="checkbox"/>	
Packing data	Net weight	approx. kg	70	80	110
	Gross weight (packed in carton)	approx. kg	78	96	125
	Width	approx. cm	82	75	93
	Height	approx. cm	97	114	114
	Depth	approx. cm	67	84	93
Order No. Humidity Chambers			HCP108	HCP153	HCP246

Options	108	153	246
Door hinged on the left		B8	
Entry port, 23 mm clear diameter, for introducing connections at the side, moisture tight, can be closed by flap and silicone stopper, standard positions left centre/centre, left centre top, right centre/centre, right centre top		F0,F1,F2,F3	
Entry port (silicone), 40 mm clear diameter, for introducing connections, moisture tight, can be closed by silicone stopper, at the back (please, state location)		F7	
Works calibration certificate for 80 % rh (measured at +50 °C)		D00107	
Start-up of HCP and brief training (D, A, CH only) through MEMMERT service		K9	
Stacking version for 2 units of equal size (bottom unit modification)		G3	
Process-dependent electromagnetic door lock		D4	

Accessories	108	153	246
Additional perforated stainless steel shelf	B00325	B00321	B03813
Additional stainless steel grid	E20165	E20166	B03492
Subframe, adjustable in height (622 mm high)	B02792	B02732	B02793
Subframe (130 mm high for 2 stacked cabinets)	B02794	B02740	B02795
STERICard (additional or as replacement) for automatic chamber sterilisation cycle (not for sterilising the load!)		E04337	
Central water supply (product information on demand)		B04712	



## GENERATION 2012



Climate chamber ICH  
with TwinDISPLAY + AtmoCONTROL software

Model sizes: 110 / 260 / 750

ICH with humidity control

ICH L with humidity control and light

ICH C with humidity and CO<sub>2</sub> control

Temperature range with humidity

ICH +10 °C to +60 °C

ICH L +10 °C to +60 °C

ICH C +10 °C to +50 °C

Humidity range 10 – 80 % rh

Temperature range without humidity

ICH -10 °C to +60 °C

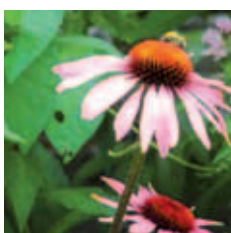
ICH L 0 °C to +60 °C

ICH C +10 °C to +50 °C

**CLIMATE CHAMBER ICH** Compressor-cooled stability test chambers developed by Memmert stand out due to their unparalleled temperature and humidity homogeneity for long-term stable ambient conditions. The climate chamber ICH has been specially designed for testing pharmaceutical products according to ICH, Q1A and Q1B, option 2, and similar global standards for stability tests of cosmetics and food.



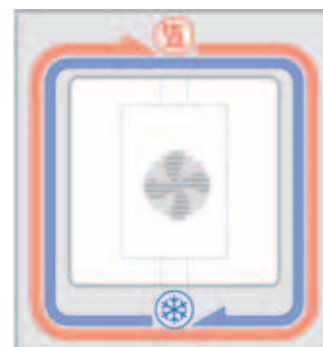




## All-round protection of samples

No icing, no drying out of samples, no dehumidification of the working chamber. Cooling aggregate and heating of the ICH are situated outside the working chamber in the air jacket surrounding the entire chamber thus ensuring quick and precise temperature control. Furthermore, the motor-driven forced air circulation, adjustable in 10 % steps, ensures particularly homogenous temperature distribution.

For supporting IQ/OQ/PQ validation, the control can be adjusted directly on the appliance:  
on models ICH, ICH L, ICH C of size 110/260: for three free-selectable values each, temperature/humidity/CO<sub>2</sub>  
on models ICH, ICH L, ICH C of size 750: for three free-selectable values each, temperature/humidity;  
for two selectable values CO<sub>2</sub>



ICH air jacket system

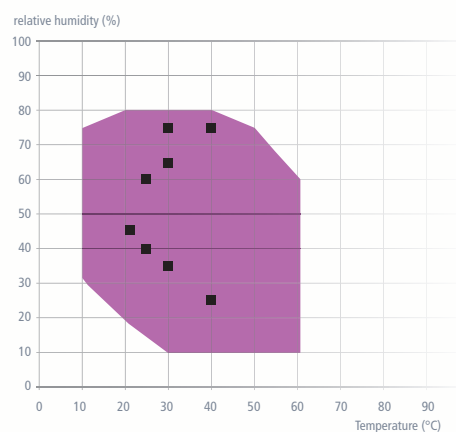
## Illumination complies with ICH Q1B, option 2

For tests in accordance with ICH Q1B, option 2, an illumination unit with a light intensity of about 8.000 Lux is available for model ICH L. Fluorescent lights with cold-white light (standard illuminant D65, 6,500 K) as well as UV radiation in the spectral range of 315 – 400 nm, 8 W/m<sup>2</sup> serve as light source.

### Model ICH C with CO<sub>2</sub> control

In addition to the features of the basic model ICH, the ICH C model is equipped with an electronic CO<sub>2</sub> control with automatic zero setting, NDIR measurement system, auto-diagnostic system, acoustic alarm and air pressure compensation.

### Temperature-humidity working range



■ Temperature and humidity test points defined in the ICH guideline



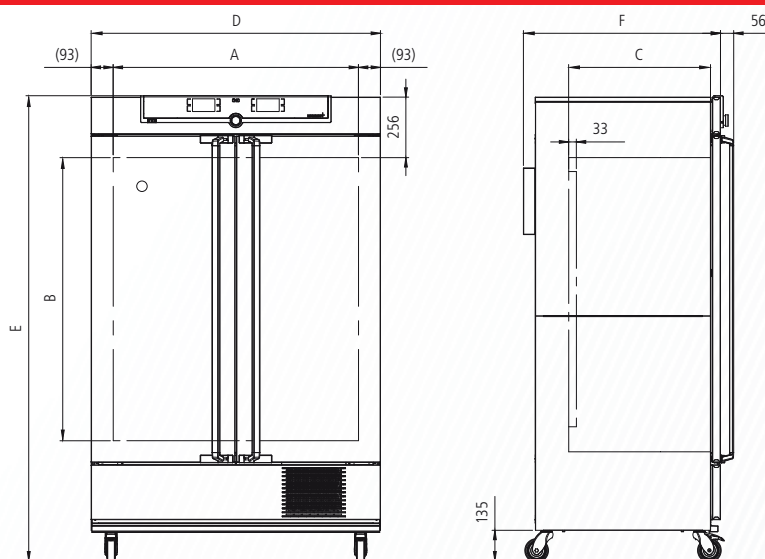
## CLIMATE CHAMBERS ICH

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



## Standard equipment

- Interior: Stainless steel, mat. 1.4301 (ASTM 304), deep-drawn
- Internals: 2 stainless steel grids
- Housing: Textured stainless steel, rear zinc-plated steel, intuitively operated TwinDISPLAY (TFT colour display) with Touchscreen
- Double doors: Outside stainless steel, fully insulated, inside glass (size 750: two-leaves)
- Connection: Mains cable with plug
- Installation: Mounted on lockable castors
- Interfaces:



Model sizes/Description			110	260	750
Stainless steel interior	Volume	approx. l	108	256	749
	Width	(A) mm	560	640	1040
	Height	(B) mm	480	800	1200
	Depth (less 33 mm for fan)	(C) mm	400	500	600
	Stainless steel grids (standard equipment)	number		2	
	Max. number of grids/shelves	number	5	9	14
	Max. loading per grid/shelf	kg		20	30
Textured stainless steel exterior	Max. loading of chamber	kg	150	200	
	Width	(D) mm	745	824	1224
	Height (with castors)	(E) mm	1233	1552	1950
	Depth (without door handle), door handle + 56 mm	(F) mm	634	734	834
Further data	Entry port (silicone), 40 mm clear diameter, for introducing connections, moisture tight, can be closed by a silicone stopper, standard position			□	
	Electrical load at 230/115 V, 50/60 Hz ICH and ICH C	ca. W		1350	
	Electrical load at 230/115 V, 50/60 Hz ICH L	ca. W	1450		1530
	Working temperature range ICH / ICH L with humidity and/or light	°C		+10 to +60	
	Working temperature range ICH C with and without humidity	°C		+10 to +50	
	Working temperature range without humidity ICH	°C		-10 to +60	
	Working temperature range without humidity ICH L	°C		0 to 60	
	Setting temperature range ICH	°C		-10 to +60	
	Setting temperature range, ICH L	°C		0 to +60	
	Setting temperature range ICH C	°C		+10 to +50	
	Setting accuracy	°C		0.1	
	Adjustment range humidity	% rh		10 to 80	
	Setting accuracy humidity	% rh		0.5	
	Digital electronic CO <sub>2</sub> control with autozero, NDIR system, with auto-diagnostic system and acoustic fault indication, barometric pressure compensation (only ICH C), adjustment range	% CO <sub>2</sub>	0 to 20		0 to 10
	Control accuracy 0 – 10 % CO <sub>2</sub> 11 – 15 % CO <sub>2</sub>	%	+/- 0.2 +/- 0.5		+/- 0.3 –
	Setting accuracy CO <sub>2</sub> (only model ICH C)	% CO <sub>2</sub>		0.1	
	Illumination unit (only model ICH L) acc. ICH Q1B option 2; light intensity approx. 8.000 Lux; separately switchable via controller, one box Number of fluorescent lights with cold white light size 110: 3, sizes 260/750: 4 Number of fluorescent lights with UV lamps all sizes: 2			standard illuminant D65, 6,500 K spectral range of 315 to 400 nm, 8 W/m <sup>2</sup>	
Standard accessories	Water tank including connection hose			□	
Packing data	Net weight	approx. kg	109	172	249
	Gross weight (packed in carton)	approx. kg	138	233	320
	Width	approx. cm	88	93	133
	Height	approx. cm	153	185	215
	Depth	approx. cm	81	93	105
Order No. Climate Chambers ICH = Climate chamber ICH L = Climate chamber with light ICH C = Climate chamber with CO <sub>2</sub> control			ICH110	ICH260	ICH750
			ICH110L	ICH260L	ICH750L
			ICH110C	ICH260C	ICH750C



Options	110	260	750
Chamber modification for the application of reinforced perforated stainless steel shelves or stainless steel grids (bearing rails mounted in the working chamber) – includes replacement of 2 standard grids by 2 reinforced grids (only ICH and ICH C)	–		K1
Illumination unit consisting of 4 fluorescent lights with cold white light (standard illuminant D65, 6,500 K) and 2 UV lamps in the spectral range of 315 to 400 nm, 8 W/m <sup>2</sup> , in accordance with ICH Q1B, option 2; light intensity approx. 8,000 Lux; separately switchable via controller (only ICH L) second box		T72	
Alternative light boxes (replace the standard lighting; have to be ordered together with the chamber); light intensity approx. 13,000 Lux; number of fluorescent lamps: size 110: 5, sizes 260/750: 6, with cold white light (standard illuminant D65, 6.500 K) (only ICH L) one box second box (cannot be switched on separately)	–	T81 T82	
Alternative light boxes (replace the standard lighting; have to be ordered together with the chamber); number of UV lamps: size 110: 5, sizes 260/750: 6 in the spectral range of 315 to 400 nm, 22 W/m <sup>2</sup> (only ICH L) one box second box (cannot be switched on separately)	–	T01 T02	
Interior socket, ampacity 230 V/2.2 A, can be switched off with the On/Off switch, cannot be switched individually, moisture tight IP68		R3	
Entry port, 23 mm clear diameter, for introducing connections at the side, moisture tight, can be closed by flap and silicone stopper, standard positions left centre/centre left centre top right centre top	–	F0 F1 F3	
Entry port (silicone), 40 mm clear diameter, for introducing connections, moisture tight, can be closed by silicone stopper, at the back (please, state location)		F7	
4 – 20 mA current loop interface (-20 to +70 °C $\pm$ 4 to 20 mA) (Models ICH C max. 2 interfaces – only combination V3 + V7 or V3 + V9 possible) Temperature controller, actual value Temperature of a Pt100 sensor positioned flexibly in chamber for external temperature monitoring (max. 3 TwinDISPLAY) – price per sensor Humidity controller, actual value (0 – 100 % rh $\pm$ 4 – 20 mA) CO <sub>2</sub> controller, actual value (0 – 25 % CO <sub>2</sub> $\pm$ 4 – 20 mA)		V3 V6 V7 V9	
Works calibration certificate for one (freely selectable) temperature and humidity value Standard works calibration certificate (measuring point chamber centre) at +10°C, +37 °C and +30 °C with 60 % rh		D00121	
Compressed air dehumidification (efficient dehumidification of the interior by means of compressed air – for models ICH and ICH L)		C9	

Accessories	110	260	750
Stainless steel grid (standard equipment)	E20165	E28891	E20182
Additional reinforced stainless steel grid, max. loading 60 kg; size 750 with guide bars and fixing screws (only in connection with option K1)	E29767	E29766	B32190
Stainless steel shelf	B00325	B29725	B00328
Additional reinforced stainless steel shelf, max. loading 60 kg; with guide bars and fixing screws (only in connection with option K1)	–		B32191
Stainless steel slide-in drip tray, 15 mm rim (may affect the temperature distribution) – cannot be used in connection with option K1	E02073	E29726	E02075
Stainless steel bottom drip tray, 15 mm rim (may affect the temperature distribution) – cannot be used in connection with option K1	B04359	B29722	B04362
Holder for water tank for mounting on the rear of the appliance or the wall (connection lead 0.5 m); additional water tank included. Standard equipment for size 750	B32371		–
Central water supply (product information on demand)		B04712	



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

100% AtmoSAFE: In Memmert environmental test chambers CTC and TTC, the perfect atmosphere for climate and temperature tests, specifically in accordance with DIN EN 60068-2-1, 2-2 and 2-3 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.

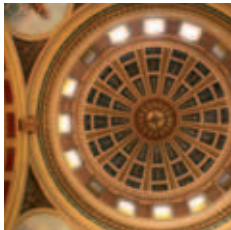






## Reliable and efficient climate technology

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.

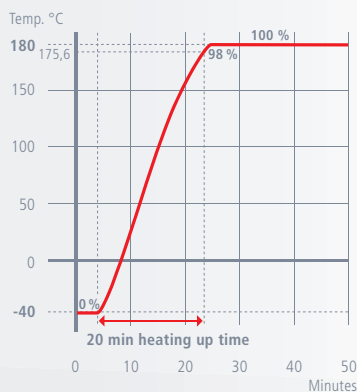


## Economical at high performance

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. Thus, the environmental test chambers CTC and TTC cool down from +180 °C to -40 °C (98 % of setpoint) in only 95 minutes, for example, and heat back up again from -40 °C to +180 °C (98 % of setpoint) in only 20 minutes. However, this high-performance duo proves to be extremely cost-efficient not only in their procurement costs, but also in their operating costs.

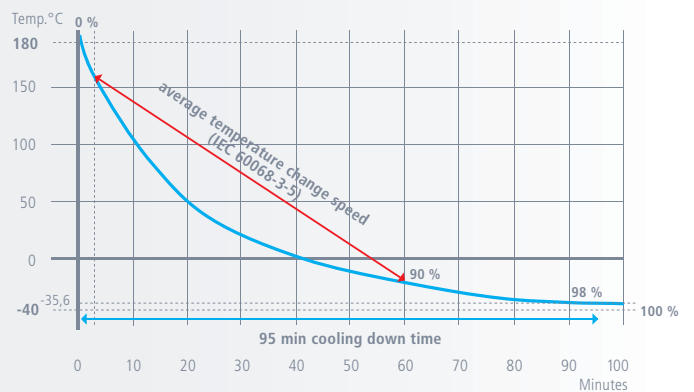
### Heating up speed TTC / CTC 256

-40 °C to +180 °C in 20 minutes to 98 % of setpoint



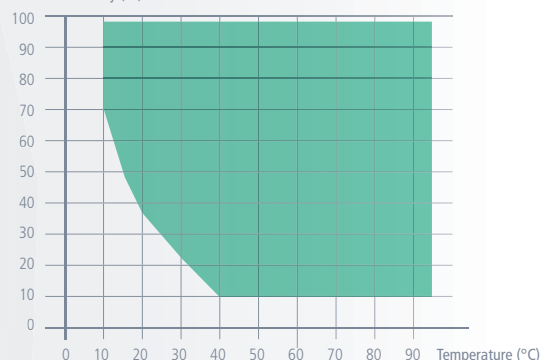
### Cooling down speed TTC / CTC 256

+180 °C to -40 °C in 95 minutes to 98 % of setpoint



### Temperature-humidity working range CTC

relative humidity (%)



## CLIMATIC TEST CHAMBERS CTC – TEMPERATURE TEST CHAMBERS TTC

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

Standard equipment

Interior:	Stainless steel, material 1.4301 (ASTM 304)
Internals:	1 stainless steel grid
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
Installation:	On lockable castors
Interfaces:	



printer interface

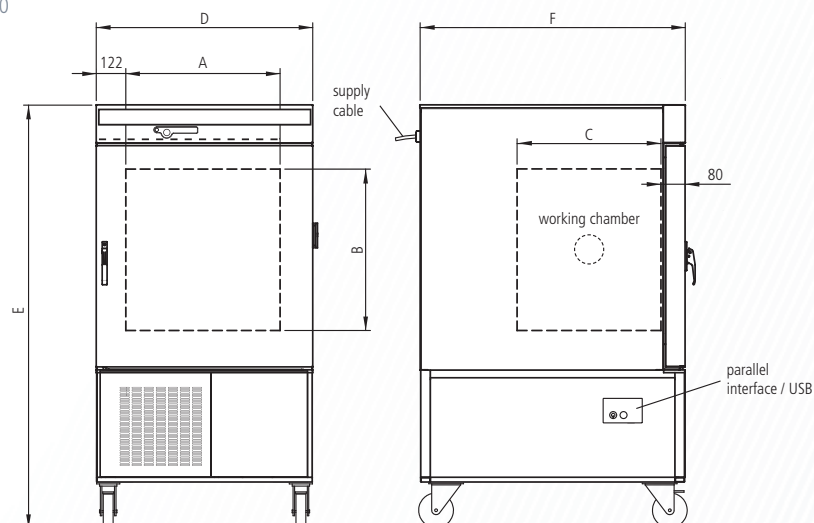


Optional

Ethernet



LAN



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	
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 door handle 50 mm (F)	mm	1100	
	Fully insulated heated stainless steel door		□	
	Lockable castors for ease of transport		□	
	Entry port, right, 80 mm with plug		□	
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	
	Average heating up speed (acc. to IEC 60068-3-5) -40 to +180 °C		10 K / minute	
	Average cooling down speed (acc. to IEC 60068-3-5) +190 °C to 0 °C		5 K / minute	
	Average cooling down speed (acc. to IEC 60068-3-5) +180 to -40 °C		3 K / minute	
	Heating up time from -40 °C up to +180 °C (98 % of setpoint)		20 minutes	
	Cooling down time from +180 °C to -40 °C (98 % of setpoint)		95 minutes	
Humidity	Temperature variation in time (to DIN 12880:2007-05) (setpoint dependent)	K	± 0.2 ... 0.5	
	Temperature uniformity in chamber (setpoint dependent)	K	± 0.5 ... 2	
	Capacitive humidity sensor		□	—
Monitor	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 distilled water by self-priming pump		□	—
	Telescopic slide for each 2 x 10 l tanks for distilled water as well as 2 x 10 l tanks as condensate collector		□	—
	Automatic water tank change-over with alarm for continuous operation		□	—
	Microprocessor temperature monitor acting as over- and undertemperature protection (protection class 3.3), with Pt100 incorporating fault diagnostics with visual and acoustic alarm		□	—
Monitor	Temperature monitoring band automatically linked to the setpoint (ASF)		□	—
	Monitor relay for reliable heating cut-off in case of fault		□	—
	Mechanical temperature limiter (TB)		□	—

Model sizes/Description		CTC256	TTC256
Acoustic and optical alarm	Over- and undertemperature	<input type="checkbox"/>	
	Door-open	<input type="checkbox"/>	
	Underhumidity	<input type="checkbox"/>	–
	Empty water tank	<input type="checkbox"/>	–
Timer functions	Real-time/weekly programmer with group function (e.g. Monday – Friday)	<input type="checkbox"/>	
	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	<input type="checkbox"/>	
Air Circulation	High-performance air fan, speed adjustable in 10 % steps with monitoring function of fan speed and automatic speed adjustment	<input type="checkbox"/>	
Documentation	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	<input type="checkbox"/>	
	Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories)	<input type="checkbox"/>	
	“Celsius” software for control and documentation of temperature and relative humidity	<input type="checkbox"/>	
Setup	Calibration (no separate PC required), temperature: 3-point calibration on controller	<input type="checkbox"/>	
	Calibration (no separate PC required), humidity: 2-point calibration at 20 % and 90 %	<input type="checkbox"/>	–
	Setting of language for dialogue and display DE / EN / ES / FR / IT	<input type="checkbox"/>	
Refrigeration	High-performance twin compressor (refrigerant R404A) with adjustable speed condenser fan and electronically controlled refrigerant injection	<input type="checkbox"/>	
	Large-area stainless steel evaporator	<input type="checkbox"/>	
Lighting	Halogen interior lighting 2 x 25 W	<input type="checkbox"/>	
Further data	Electrical load at 400 V/50 Hz	approx. W	7000
Standard accessories	Stainless steel grid	number	1
	Works calibration certificate (measuring point chamber centre at -20 °C and +160 °C)	<input type="checkbox"/>	
	Works calibration certificate (measuring point chamber centre at +30 °C and 60 % rh)	<input type="checkbox"/>	–
Packing data	Net weight	approx. kg	297
	Gross weight	approx. kg	420
	Width	approx. cm	103
	Height	approx. cm	194
	Depth	approx. cm	126
Order No. Climatic Test Chambers		CTC256	–
Order No. Temperature Test Chambers		–	TTC256

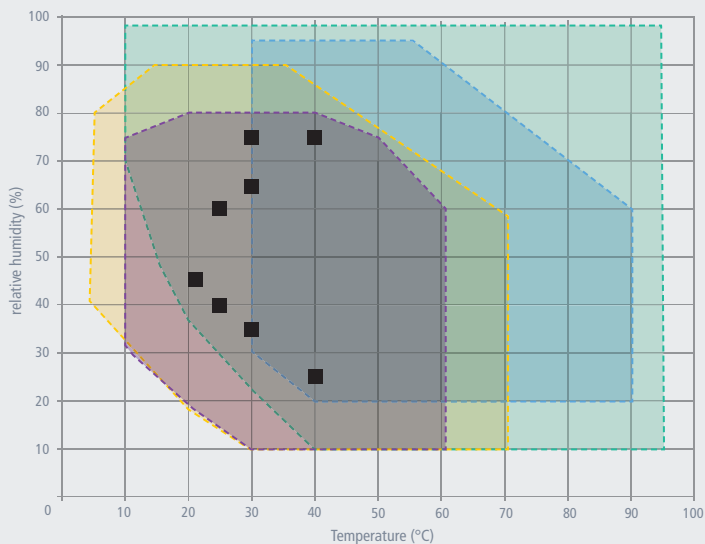
Options	CTC256	TTC256
Works calibration certificate for one temperature and humidity according to customer specification	D00110	
Door hinged on the left	B8	
Full-sight glass door (5-layer insulating glazing), heated	B0	
Entry port, left, 80 mm, with stopper	F0	
Start-up of CTC and TTC chambers and brief training (D, A, CH only) through Memmert service	K9	

Accessories	CTC256	TTC256
Additional stainless steel grid	E20591	
External control and logging package consisting of mini-Notebook and software “Celsius”, pre-configured, and lateral swinging arm	B04410	



### Temperature/humidity combinations of Memmert climate chamber\*

100% AtmoSAFE: Made by Memmert. As decision-making-aid for the right climate chamber, this graph shows all temperature/humidity combinations of the Memmert climate chambers.



- HPP constant climate chamber (page 4 to 7)
- HCP humidity chamber (page 8 to 11)
- ICH climate chamber (page 12 to 15)
- CTC environmental test chamber (page 16 to 19)
- Temperature and humidity test points defined in the guideline ICH

## Decision-making-aid

### Relying on perfectly controlled processes

Active humidification and dehumidification are essential to exactly reach the desired set temperatures and set humidity values, also in areas with high ambient temperature and extremely high or low air humidity. Furthermore, to guarantee long term homogeneity, interaction between humidity and temperature control has been perfectly adjusted in all Memmert climate chambers.

\* 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.

The higher the humidity content of the chamber load, the more water evaporates inside the chamber. This may influence the maintenance of the constant humidity considerably. Some applications can be implemented with compressed air drying (on request).

## SPECIAL EQUIPMENT – GENERATION 2012

Options – available for all appliances	30	55	75	110	160	260	450	750	1060
Door with lock (safety lock) standard on SN/SF and SNplus/SFplus 450 and 750	B6								
Door hinged on the left	B8						–		
Potential-free contact (24 V/2 A) with socket to NAMUR NE 28 for external monitoring (indicates when setpoint is reached)	H5								
Potential-free contact for combination error message (e.g. supply failure, sensor fault, fuse)	H6								
Potential-free contact (24 V/2 A) with socket to NAMUR NE 28, for signal generation, controlled by programme segment, for free-selectable functions to be activated (e.g. activation of audible and visual signals, exhaust motors, fans, stirrers, etc.). Only for units with TwinDISPLAY; max. 2 contacts on 1-phase appliances; max. 4 contacts on 3-phase appliances	H72								
2 contacts 4 contacts	H74								
Process-dependent door lock (only for units with TwinDISPLAY)	D4								
Door-open-recognition (only for units with TwinDISPLAY)	V5								
Flexible Pt100 for positioning in chamber or in load with socket, 4-pin, according to NAMUR NE 28, for external temperature recording (load temperature) max. 3 sensors	H4								
Flexible Pt100 temperature sensor, positioned flexibly in chamber or load, for local temperature measurement (up to 3 additional sensors are possible). The measured temperature can, if required, be indicated on the display, recorded in the integral data store, and can be documented via the AtmoCONTROL software	H8								
MobileALERT, notification by SMS in case of any error or alarm of the device. Requires option H6 “floating contact for alarm”	C3								
Temperature restriction (for UN/UF/UNplus/UFplus) Temperatures: +60, +70, +80, +95, +100, +120, +160, +180, +200, +220 or +250°C (Please, indicate upon ordering)	A8								



## SPECIAL EQUIPMENT – GENERATION 2012

Accessories – available for all appliances	30	55	75	110	160	260	450	750	1060
USB-Ethernet adapter	E06192								
Ethernet connection cable 5 m for computer interface	E06189								
USB User-ID stick (with User-ID licence): Oven-linked authorisation licence (User-ID-programme) on Memory-stick, prevents undesired manipulation by unauthorised third parties. When reordering please specify serial number. (Only for units with TwinDISPLAY)	E29778								
USB stick with documentation software AtmoCONTROL and operation manual for products with SingleDISPLAY, standard for appliances with TwinDISPLAY	E29780								
Set of height adjustable feet (4 pcs)	B29768						–		
Stacking set (4 pcs) for stacking of appliances of same size (not for models 160, 260, 450, 750 and 1060)	B29744				–				
Plug-in tube extension (outer diam. 60,3 mm, inner 57 mm), straight, for exhaust air ducting (if necessary for connection by hose), only models U, I, S	B29718								
Plug-in tube extension (outer diam. 60,3 mm, inner 57 mm), angled, for exhaust air ducting (if necessary for connection by hose), only models U, I, S	B29719								
Flush-fit unit (stainless steel frame covering gap between oven and wall opening), with air slots – technical clarification required	B29728	B29730	B29732	B29734	B29736	B29738	B29740	B29742	
Flush-fit unit (stainless steel frame covering gap between oven and wall opening), without air slots – technical clarification required	B29729	B29731	B29733	B29735	B29737	B29739	B29741	B29743	
Subframe, adjustable in height (size 30 to 75: height 600 mm, size 110 to 450: height 500 mm)	B29745	B29747		B29749		B29751	B29753	–	
Subframe, on castors (size 30 to 75: height 660 mm, size 110 to 160: height 560 mm)	B29746	B29748		B29750		–			
Subframe, adjustable in height (height 130 mm, for example for units with fresh air filter)	B33657	B33659		B33661		B33664	–		
Castor frame (2-part), height 140 mm	B29762	B29763		B29764		B29765	–		
Software conforming to FDA AtmoCONTROL. 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 (only for units with TwinDISPLAY)	FDAQ1								
Integration of additional units (up to max. 15 units) into an already existent FDA-software licence (only for units with TwinDISPLAY)	FDAQ2								
IQ document with works test data for chamber, OQ/PQ check list as support for validation by customer	D00124								
IQ/OQ document with works test data for chamber, incl. temperature distribution survey for one free-selectable temperature value. 9 measuring points (size 30), 27 measuring points (sizes 55 – 1060) to DIN 12880:2007-05 (further temperature values on demand), PQ check list as support for validation by customer	D00125	D00127							
IQ/OQ document with works test data for chamber, incl. temperature distribution survey for one free-selectable temperature and humidity value. 27 measuring points to DIN 12880:2007-05, PQ check list as support for validation by customer (models HPP and ICH)	–			D00136	–	D00136	–	D00136	–
IQ/OQ document with works test data for chamber, incl. temperature distribution survey for one free-selectable temperature, humidity and light value. 27 measuring points to DIN 12880:2007-05, PQ check list as support for validation by customer (models HPP with light and ICH L)	–			D00137	–	D00137	–	D00137	–
External measuring instrument with sensors for daylight and UV-light (product information on demand)	B04713								
Ditto with additional measuring head for temperature and humidity measurement (product information on demand)	B04714								

## SPECIAL EQUIPMENT – GENERATION 2003

Options – available for all appliances	Sizes: 200 / 400 / 500 / 600 / 800 108 / 153 / 246 256
Interface Ethernet instead of USB including software	W4
RS232 interface instead of USB	W6
Computer interface RS485 (for networking a max. of 16 ovens) instead of RS232	V2
Door with lock (safety lock – standard on sterilisers of size 700 and 800 – not available for VO, VOcool, TTC/CTC)	B6
Flexible Pt100 for positioning in chamber or in load with socket, 4-pin, according to NAMUR NE 28, for external temperature recording (load temperature)	H4
Additional Pt100 temperature sensor, positioned flexibly in chamber or load, for local temperature measurement (up to 3 additional sensors are possible). The measured temperature can, if required, be indicated on the multifunction display, recorded in the integral ring store, and can be documented via the "Celsius" software or on an attached printer. (Not available for VO, VOcool, TTC and CTC)	H8
Potential-free contact (24 V/2 A) with socket, according to NAMUR NE 28 for external monitoring (indicates when setpoint is reached)	H5
Ditto, according to NAMUR NE 28 for combination error message (e.g. supply failure, sensor fault, fuse)	H6
Ditto, triple, for signal generation, controlled by programme segment for a total of 3 freely selected functions to be activated (e.g. acoustic and visual signals, exhaust motors, fans, stirrers etc.)	H7

Accessories – available for all appliances	Sizes: 200 / 400 / 500 / 600 / 800 108 / 153 / 246 256
USB connection cable for computer interface	E03643
Parallel/USB converter cable with integrated power supply unit to connect HP printers with USB interface to MEMMERT units	E05300
Documentation package consisting of parallel USB converter cable including PCL3-compatible HP colour inkjet printer with USB interface (HP OfficeJet 6000 or successor) for direct connection of printer to Memmert unit	B04432
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). Not available for INCOmed models	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 per additional unit (up to max. 15 units) into an already existent FDA-software licence (E05019)	FDAQ4
IQ check list with works test data for chamber as support for validation by customer	D00103
OQ check list with works test data for one free-selectable temperature value incl. temperature distribution survey for 27 measuring points to DIN 12880:2007-05 as support for validation by customer	D00104
OQ check list with works test data for one free-selectable temperature value incl. temperature distribution survey for 5 measuring points to DIN 12880:2007-05 as support for validation by customer (VO and VOcool only)	D00117
OQ check list with works test data for one free-selectable humidity and temperature value incl. temperature distribution survey for 27 measuring points to DIN 12880:2007-05 as support for validation by customer (models HCP and CTC)	D00104
OQ check list with works test data for one free-selectable CO <sub>2</sub> , humidity and temperature value incl. temperature distribution survey for 27 measuring points to DIN 12880:2007-05 as support for validation by customer (models INCOmed)	D00104
External measuring instrument with sensors for daylight and UV-light. Product information on demand	B04713
Ditto with additional measuring head for temperature and humidity measurement. Product information on demand	B04714



## Model variations of Generation 2012

GENERATION 2012

**SingleDISPLAY****ControlCOCKPIT with one TFT display****AVAILABLE APPLIANCES****UN / UF / IN / IF / SN / SF / IPP / IPS**

One high-resolution TFT colour display with touch-sensitive buttons for selection of functions

Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time

One temperature sensor Pt100 DIN class A in a 4-wire circuit

AtmoCONTROL software for reading out, managing and organising the data logger via Ethernet interface (90-days test version can be downloaded). USB stick with AtmoCONTROL software available as accessory (on demand)

Ethernet interface on the rear of the appliance for reading out the protocol log and for online logging

Double overtemperature protection: Electronic temperature monitoring with freely adjustable monitoring temperature, for models U, I, S with option A6 TWW/TWB (protection class 3.1 or 2), mechanical temperature limiter TB acc. to DIN 12880

**TwinDISPLAY****ControlCOCKPIT with two TFT displays****AVAILABLE APPLIANCES****UNplus / UFplus / UNpa / INplus / IFplus / SNplus / SFplus  
IPPplus / ICP / HPP / ICH**

Two high-resolution TFT colour displays with touch-sensitive buttons for selection of functions

Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, relative humidity, illumination, CO<sub>2</sub>

Two Pt100 sensors DIN class A in a 4-wire circuit for mutual monitoring, taking over functions in case of an error

HeatBALANCE function for application specific adjustment of heat output distribution (balance) between the upper and lower heating groups in an adjustment range between -50 % and +50 % (not valid for models 30, HPP110, IPP110plus, ICP, ICH)

AtmoCONTROL software on a USB stick for programming, managing and transferring programmes via Ethernet interface or USB port

ControlCOCKPIT with USB port for uploading programmes, reading out protocol logs, activating the User-ID function

Displaying of already logged protocol data on the ControlCOCKPIT (max 10,000 values correspond to approx. 1 week)

Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging

Multiple overtemperature protection: Electronic temperature monitoring TWW/TWB (protection class 3.1 or 2 resp. 3.3 for units with active cooling) and mechanical temperature limiter TB (protection class 1) acc. to DIN 12880, AutoSAFETY automatically adjusts to the set value within a freely adjustable tolerance range. Setting individual MIN / MAX values for over/undertemperature alarm and also for all other parameters such as relative humidity, CO<sub>2</sub>

PID microprocessor control with integrated auto-diagnostic system

Structured stainless steel housing, scratch-resistant, robust and durable; rear of zinc-plated steel

High-temperature connectors on the rear of the appliance for single-phase power connection according to country specific systems and IEC standards

Internal data logger with a storage capacity of at least 10 years

German, English, French, Spanish language settings available on the ControlCOCKPIT

Digital backwards counter with target time setting, adjustable from 1 minute to 99 days

The SetpointWAIT function guarantees that the process time does not start until the set temperature is reached at all measuring points – optional for temperature values recorded by the freely positionable Pt100 sensors inside the chamber.

Adjustment of three calibration values for temperature and additional appliance specific parameters directly at the ControlCOCKPIT



**memmert**  
Experts in Thermostatics

YOUR MEMMERT PARTNER

#### HEATING AND DRYING OVENS

UNIVERSAL OVEN U

PASS-THROUGH OVEN UFP TS

PARAFFIN OVEN UNpa

STERILISER S

VACUUM OVEN VO

COOLED VACUUM OVEN VOcool

#### INCUBATORS

INCUBATOR I

CO<sub>2</sub> INCUBATOR INCOmed

COMPRESSOR-COOLED INCUBATOR ICP

PELTIER-COOLED INCUBATOR IPP

STORAGE COOLED INCUBATOR IPS

#### CLIMATE CHAMBERS

CONSTANT CLIMATE CHAMBER HPP

HUMIDITY CHAMBER HCP

CLIMATE CHAMBER ICH

ENVIRONMENTAL TEST CHAMBER CTC/TTC

#### WATERBATHS / OILBATHS

WATERBATH W

OILBATH O

Memmert GmbH + Co. KG  
P.O. Box 1720 | D-91107 Schwabach  
Tel. +49 9122 925-0 | Fax +49 9122 14585  
E-Mail: [sales@memmert.com](mailto:sales@memmert.com)  
[facebook.com/memmert.family](https://facebook.com/memmert.family)  
The platform for experts: [www.atmosafe.net](http://www.atmosafe.net)