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. Reproducable, 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 12 880: 2007-05 and is equipped with a maximum of safety functions. Each individual Memmert climate chamber is 100% AtmoSAFE.

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
HPP 110 and 260 models
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.

AtmoSAFE

The best climate for samples, environment and budget

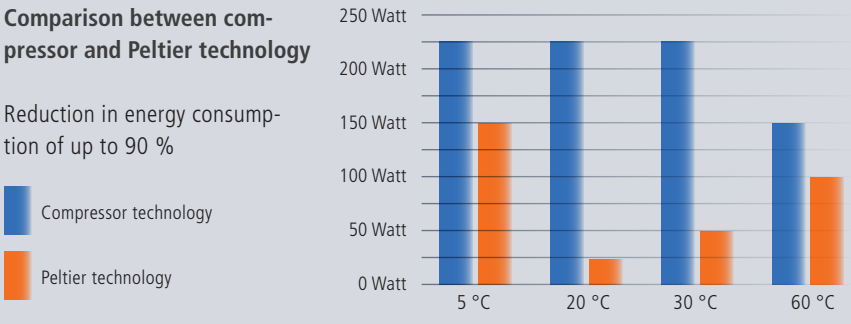
Almost without vibrations and extremely quiet, the specially adapted Peltier technology heats up and cools down seamlessly in one system. In this respect, the innovative constant climate chamber HPP not only contributes to climate protection, but it also achieves an additional decrease in operating costs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



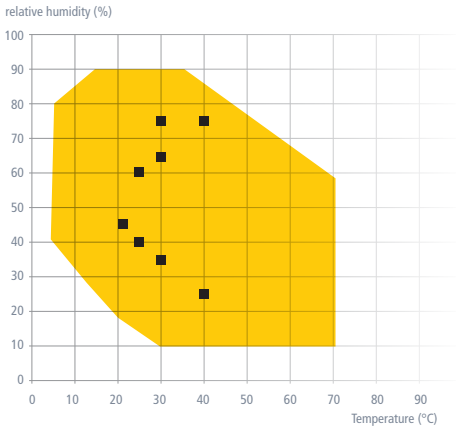
Top level optimisation

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 freely selectable measuring points.

LED light module for HPP 110 and 260: 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 110 and 260 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



■ Temperature and humidity test points defined in the guideline ICH

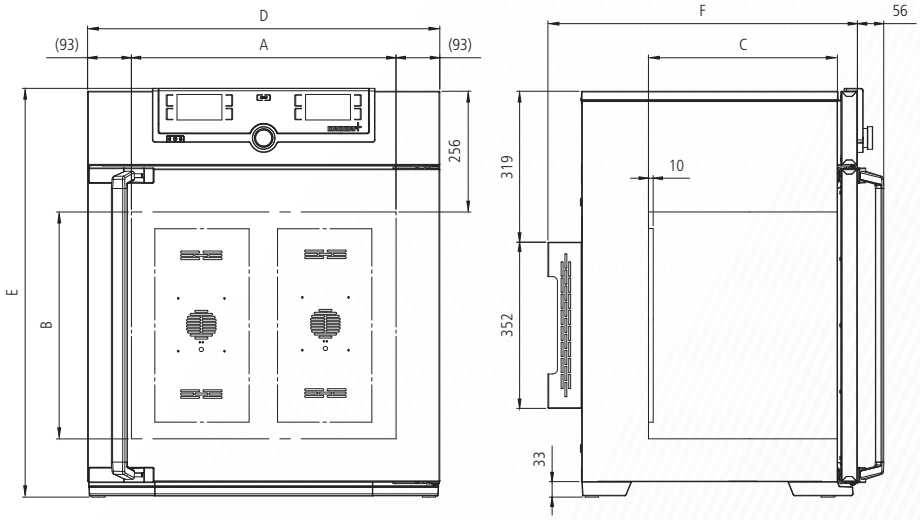
CLIMATE CHAMBERS HPP

according to DIN 12 880: 2007-05

CE

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:	USB, Ethernet, LAN



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		30	
	Max. loading of chamber		kg	150	200	
Textured stainless steel exterior	Width	(D)	mm	745	824	1224
	Height (size 750 with castors)	(E)	mm	867	1186	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 temperatur 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		1	
Standard accessory	Water tank including connection hose				□	
Packing data	Net weight		approx. kg	80	122	208
	Gross weight (packed in carton)		approx. kg	94	178	283
	Width		approx. cm	85	93	133
	Height		approx. cm	114	153	192
	Depth		approx. cm	79	92	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, 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 by model 110 to 14 by model 260 – (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	F0		
left centre top	F1		
right centre/centre	F2		
right centre top	F3		
Entry port, 23 mm clear diameter for introducing connections, moisture tight, can be closed by flap and silicone stopper (please, state location)			
left	F4		
right	F5		
rear	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 ≙ 4 to 20 mA)			
Temperature controller, actual value	V3		
Temperature of a Pt100 sensor positioned flexibly in chamber for external temperature monitoring (max. 3 TwinDISPLAY)	V6		
Humidity controller, actual value (0 – 100 % rh ≙ 4 – 20 mA)	V7		
Works calibration certificate for one (freely selectable) temperature and humidity value Works calibration certificate (measuring point chamber centre) at +10 °C, +37 °C as well as 60 % rh at +30 °C standard equipment	D00105		

Accessories	110	260	750
Stainless steel grid (standard equipment)	E20165	E28891	E20182
Reinforced stainless steel grid, max. loading 60 kg (model 750 only in connection with option K1)	E29767	E29766	E26696
Perforated stainless steel shelf	B00325	B29725	B00328
Reinforced perforated stainless steel shelf, max. loading 60 kg (only in connection with option K1)	–		B31120
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
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.

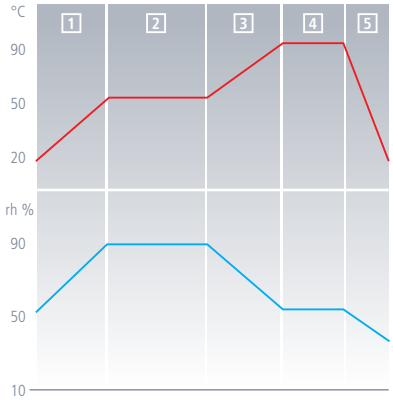
Germ-free through sterilisation

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.

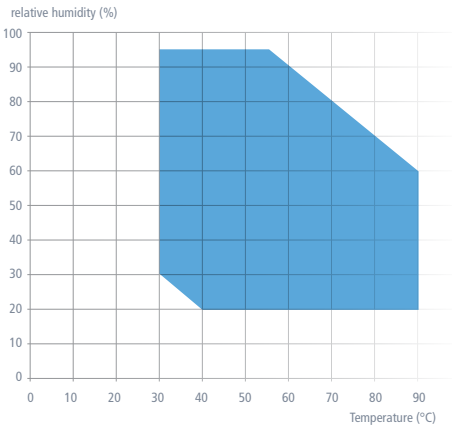
Ramp programming

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 12 880: 2007-05 , EN 61010-1 (IEC 61010-1), 61010-2-010

CE

Standard equipment

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

Internals: 2 perforated stainless steel shelves

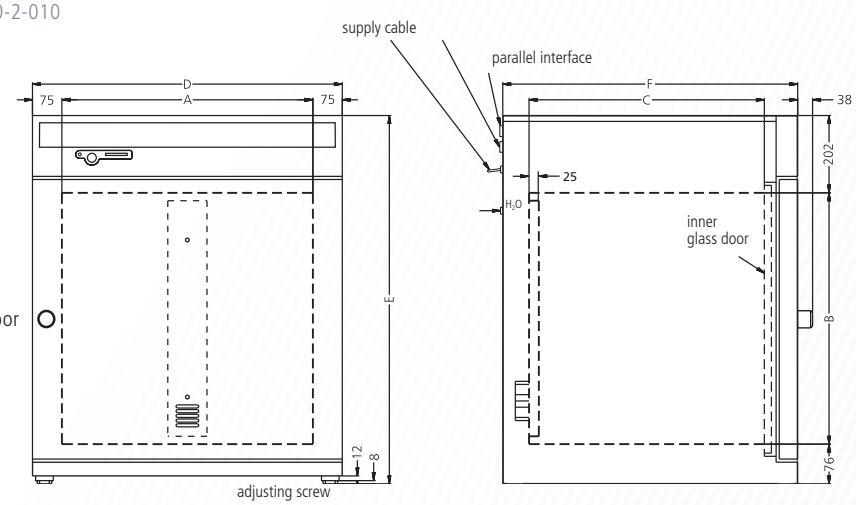
Housing: Textured stainless steel, rear zinc-plated steel, aesthetic functional glass-stainless steel operating panel with multifunction display and input module; fully insulated stainless steel door and inner glass door

Connection: Mains cable with plug

Installation: 4 adjustable feet

Interfaces: USB, 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				□	
	Extra internal glass door				□	
Ventilation	Uniform atmosphere and temperature distribution through enclosed non-turbulent ventilation system, fully covered by the sterilisation process				□	
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		from +20 up 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 up to +160 (temperature at 8 over RT to +160)	
	Temperature fluctuations with time (to DIN 12 880: 2007-05)		K		≤ ± 0.1	
	Temperature variation in chamber at +50 °C (to DIN 12 880: 2007-05)		K		≤ ± 0.3	
Sterilisation	STERICard for automatic chamber sterilisation cycle 4 h at +160 °C (not for sterilising the load!)				□	
Humidity	Capacitive humidity sensor (sterilisable)				□	
	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.				□	

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			□	
	Digital over- and undertemperature monitor			□	
	Temperature monitoring band automatically linked to the setpoint (ASF)			□	
	Relay for reliable heating cut-off in case of fault			□	
	Mechanical temperature limiter (TB)			□	
	Audible alarm: Over- and undertemperature, underhumidity, open door and empty water tank			□	
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)			□	
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.			□	
	Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories)			□	
	"Celsius" software for control and documentation of temperature and relative humidity.			□	
Setup	Calibration (no separate PC required), Temperature: 3-point calibration on controller, Humidity: 2-point calibration at 20 % and 90 %			□	
	Setting of language for dialogue and display DE / EN / ES / FR / IT			□	
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)			□	
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
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_2 control

Temperature range with humidity
ICH +10 °C to +60 °C
ICH L +10 °C to +60 °C
ICH C +10 °C to +60 °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 0 °C to +60 °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.

AtmoSAFE

* available as Generation 2012 from July 1, 2013

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 for three adjustable temperature values, two humidity values 20 % and 80 % and three CO_2 values 5 %, 10 % and 15 % (for ICH) directly on the appliance.

ICH air jacket system

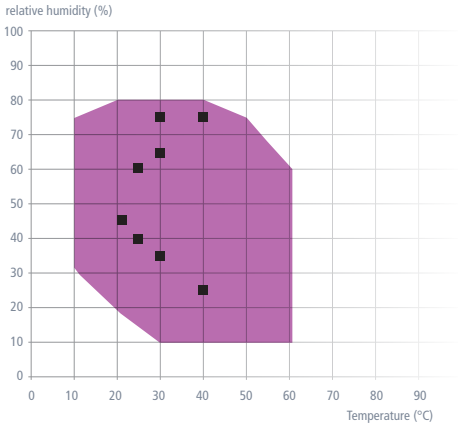
Illumination complies with ICH Q1B, option 2

For tests in accordance with ICH Q1B, option 2, an illumination unit with a light intensity of about 6,000 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, 5 W/m² serve as light source.

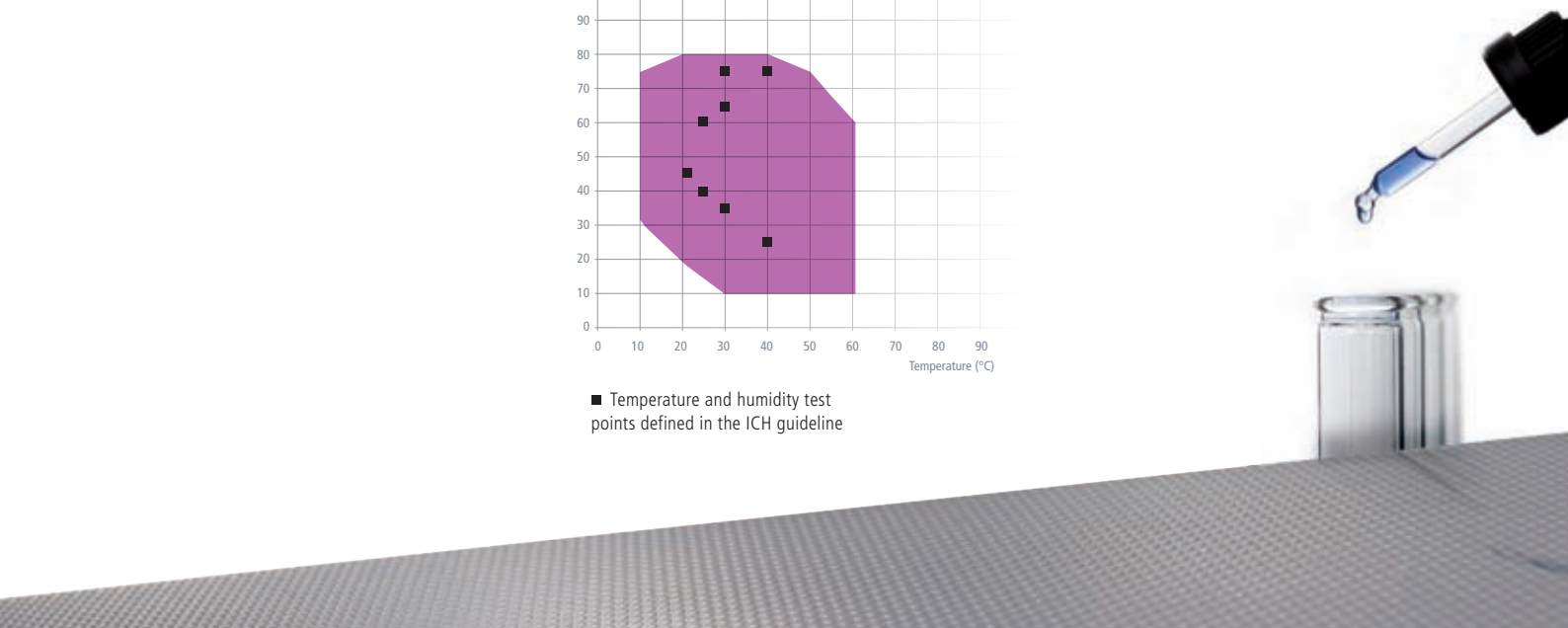
Model ICH C with CO_2 control

In addition to the features of the basic model ICH, the ICH C model is equipped with an electronic CO_2 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



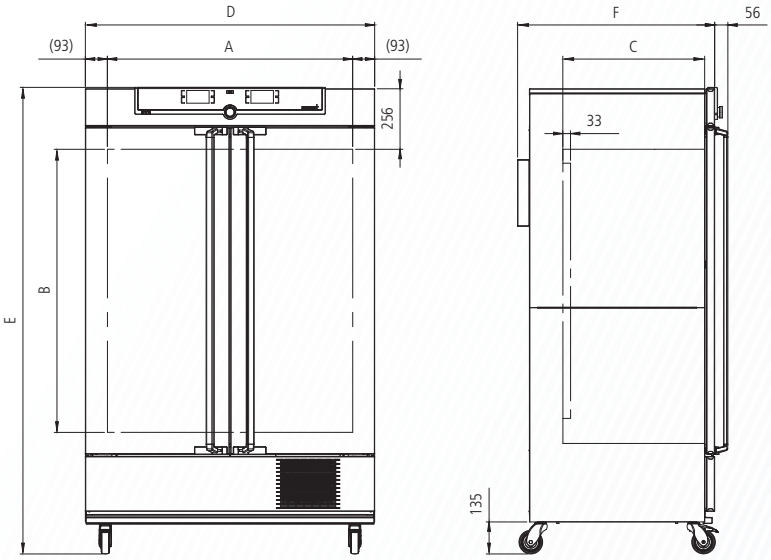
CLIMATE CHAMBERS ICH

according to DIN 12 880: 2007-05 , EN 61010-1 (IEC 61010-1), 61010-2-010

CE

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 Touchscreenn
Double doors:	Outside stainless steel, fully insulated, inside glass (size 750: two-leaves)
Connection:	Mains cable with plug
Installation:	Mounted on lockable castors
Interfaces:	USB, Ethernet LAN



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		30	
	Max. loading of chamber	kg	150	200	
Textured stainless steel exterior	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
	Entry port (silicone), 40 mm clear diameter, for introducing connections, moisture tight, can be closed by a silicone stopper, standard position			□	
Further data	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 /ICH C with humidity and/or light and/or CO_2	°C		+10 to +60	
	Working temperature range without humidity ICH	°C		-10 to +60	
	Working temperature range without humidity ICH L /ICH C	°C		0 up to 60	
	Setting temperature range ICH	°C		-10 to +60	
	Setting temperature range, ICH L and ICH C	°C		0 to +60	
	Setting accuracy	°C		0.1	
	Adjustment range humidity	% rh		10 to 80	
	Setting accuracy humidity	% rh		1	
	Digital electronic CO_2 control with autozero, NDIR system, with auto-diagnostic system and acoustic fault indication, barometric pressure compensation (only ICH C), adjustment range	% CO_2		0 to 20	
	Setting accuracy CO_2 (only model ICH C)	% CO_2		0.1	
	Illumination unit (only model ICH L) acc. ICH Q1B option 2; light intensity approx. 6,000 Lux; separately switchable via controller, one box 4 fluorescent lights with cold white light 2 fluorescent lights with UV lamps			standard illuminant D65, 6,500 K spectral range of 315 to 400 nm, 5 W/m²	
Packing data	Net weight	approx. kg	109	153	249
	Gross weight (packed in carton)	approx. kg	127	209	324
	Width	approx. cm	85	93	133
	Height	approx. cm	150	181	221
	Depth	approx. cm	79	92	105

Order No. Climate Chambers			
ICH = Climate chamber	**ICH110**	**ICH260**	**ICH750**
ICH L = Climate chamber with light	**ICH110L**	**ICH260L**	**ICH750 L**
ICH C = Climate chamber with CO_2 control	**ICH110C**	**ICH260C**	**ICH750 C**

available from July 1, 2013

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
Alternative light boxes (replace the standard lighting; have to be ordered together with the chamber); 6 fluorescent lamps with cold white light (standard illuminant D65, 6,500 K) (only ICH L) one box		T81	
Alternative light boxes (replace the standard lighting; have to be ordered together with the chamber); 6 UV lamps in the spectral range of 315 to 400 nm, 5 W/m² (only ICH L) one box		T01	
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		F0	
left centre top		F1	
right centre/centre		F2	
right centre top		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 to 20 mA current loop interface (-20 to +70 °C ≙ 4 to 20 mA)			
Temperature controller, actual value		V3	
Temperature of a Pt100 sensor positioned flexibly in chamber for external temperature monitoring (max. 3 TwinDISPLAY)		V6	
Humidity controller, actual value (0 – 100 % rh ≙ 4 – 20 mA		V7	
CO_2 controller, actual value (0 – 25 % CO_2 ≙ 4 – 20 mA)		V9	
Works calibration certificate for one (freely selectable) temperature and humidity value Works calibration certificate (measuring point chamber centre) at +10 °C, +37 °C as well as 60 % rh at +30 °C standard equipment		D00121	

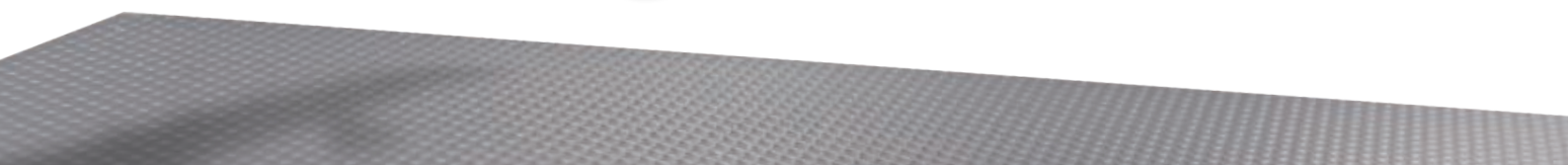
Accessories	110	260	750
Stainless steel grid (standard equipment)	E20165	E28891	E20182
Reinforced stainless steel grid, max. loading 60 kg (model 750 only in connection with option K1)	E29767	E29766	E26696
Stainless steel shelf	B00325	B29725	B00328
Reinforced perforated stainless steel shelf, max. loading 60 kg (only in connection with option K1)	–		B31120
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
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

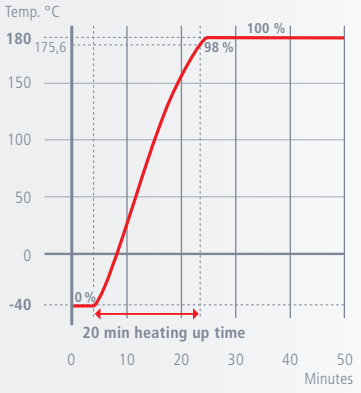
The components of the climate system interact perfectly for quick, precise and energy-saving temperature changes. The 3-layer insulation system for the chamber, derived from aerospace engineering applications, impresses with an excellent K-value and prevents moisture penetration of the insulation material. 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.

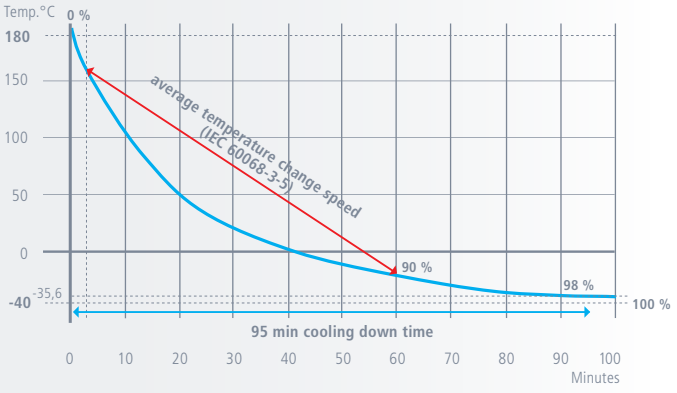
Economical at high performance

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.

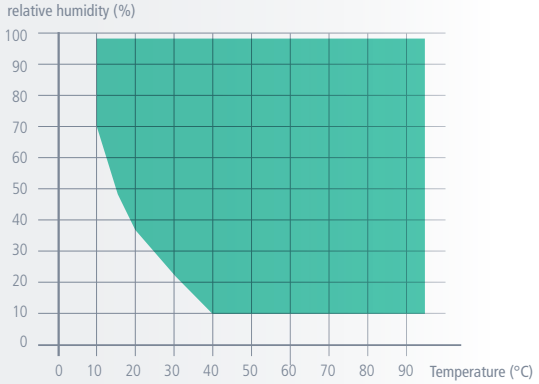
Heating up speed TTC / CTC 256
-40 °C to +180 °C in 20 minutes to 98 % of setpoint



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 (%)



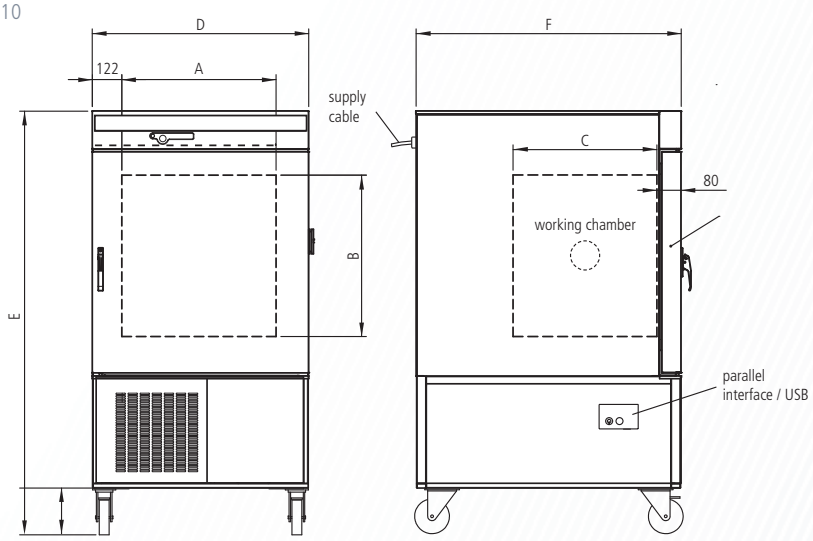
CLIMATIC TEST CHAMBERS CTC – TEMPERATURE TEST CHAMBERS TTC

according to DIN 12 880: 2007-05 , EN 61010-1 (IEC 61010-1), 61010-2-010

CE

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:	USB, 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 up to +95	–
	Temperature range without humidity control		°C	-42 up to +190	
	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	
	Temperature variation in time (to DIN 12 880: 2007-05) (setpoint dependent)		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 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			□	–
Monitor	Microprocessor temperature monitor acting as over- and undertemperature 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			□	
	Mechanical temperature limiter (TB)			□	

Model sizes/Description			CTC256	TTC256
Acoustic and optical alarm	Over- and undertemperature		□	
	Door-open		□	
	Underhumidity		□	–
	Empty water tank		□	–
Timer functions	Real-time/weekly programmer with group function (e.g. Monday – Friday)		□	
	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		□	
Air Circulation	High-performance air fan, speed adjustable in 10 % steps with monitoring function of fan speed and automatic speed adjustment		□	
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		□	
	Parallel printer interface for printing logging files, suitable for all PCL3-compatible ink jet printers (USB available via converter, see accessories)		□	
	"Celsius" software for control and documentation of temperature and relative humidity		□	
Setup	Calibration (no separate PC required), temperature: 3-point calibration on controller		□	
	Calibration (no separate PC required), humidity: 2-point calibration at 20 % and 90 %		□	–
	Setting of language for dialogue and display DE / EN / ES / FR / IT		□	
Refrigeration	High-performance twin compressor (refrigerant R404A) with adjustable speed condenser fan and electronically controlled refrigerant injection		□	
	Large-area stainless steel evaporator		□	
Lighting	Halogen interior lighting 2 x 25 W		□	
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)		□	
	Works calibration certificate (measuring point chamber centre at +30 °C and 60 % rh)		□	–
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	
Full-sight glass door (5-layer insulating glazing), heated	B0	
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-configurated, and lateral swinging arm	B04410	

SPECIAL EQUIPMENT – GENERATION 2012

Options – available for all appliances	30	55	75	110	160	260	450	750
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 freely 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 2 contacts 4 contacts	H72						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							

Accessories – available for all appliances	30	55	75	110	160	260	450	750
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 and 750)	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, incl. stacking set (size 30 to 75: height 600 mm, size 110 to 450: height 500 mm)	B29745	B29747		B29749		B29751	B29753	–
Subframe, on castors, incl. stacking set (size 30 to 75: height 660 mm, size 110 to 160: height 560 mm)	B29746	B29748		B29750		–		
Castor frame (2-part), height 140 mm	B29762	B29763		B29764		B29765	–	
IQ/OQ/PQ check list with works test data for chamber as support for validation by customer	D00124							
IQ/OQ/PQ check list with works test data for one free-selectable temperature value incl. temperature distribution survey for 27 measuring points (9 for size 30) to DIN 12 880: 2007-05	D00125	D00127						
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 / 700 / 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
Interior socket, ampacity 230 V/2.2 A, can be switched off with the On/Off switch, cannot be switched individually, moisture tight IP68 for ICP models not switchable switchable with On/Off switch in front panel	 R3 R4
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.) (not available with interior lighting)	H7

Accessories – available for all appliances	Sizes: 200 / 400 / 500 / 600 / 700 / 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 12 880: 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 12 880: 2007-05 as support for validation by customer (VO and VOcool only)	D00117
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

TwinDISPLAY
ControlCOCKPIT with two TFT displays

AVAILABLE APPLIANCES

UNplus / UFplus / UNpa / INplus / IFplus / SNplus / SFplus IPPplus / ICP / HPP / ICH

SingleDISPLAY	TwinDISPLAY
One high-resolution TFT colour display with touch-sensitive buttons for selection of functions	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	Available parameters on the ControlCOCKPIT: Temperature (Celsius or Fahrenheit), fan speed, exhaust air flap position, programme time, relative humidity, illumination, CO_2
One temperature sensor Pt100 DIN class A in a 4-wire circuit	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 %
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)	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 online logging	Ethernet interface on the rear of the appliance for reading out the protocol log and for uploading programmes and for online logging
Double overtemperature protection: Electronic temperature monitoring with freely adjustable monitoring temperature, mechanical temperature limiter TB acc. to DIN 12 880.	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 12 880, 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_2

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 timer, adjustable between 1 minute and 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

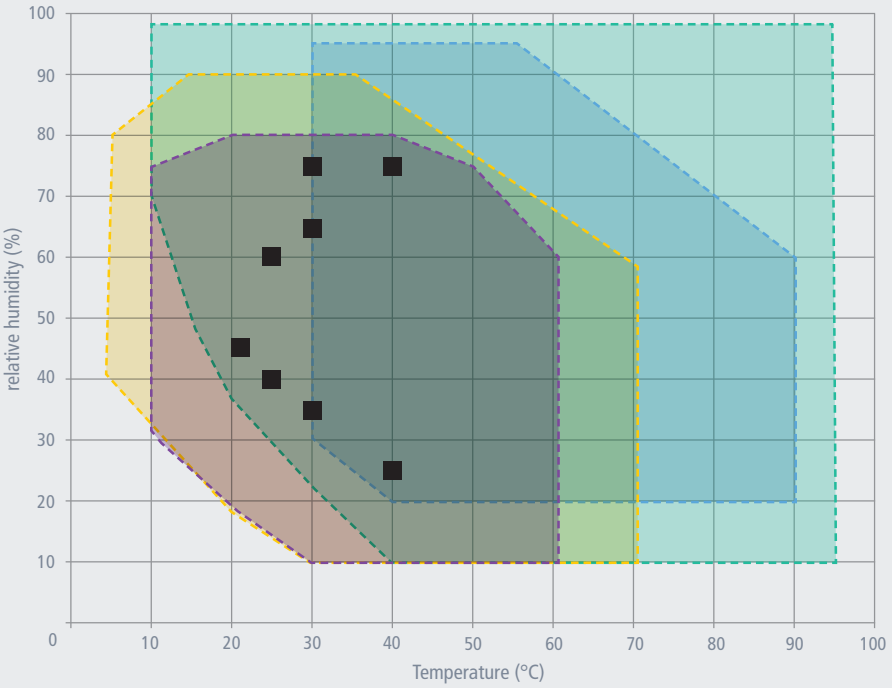
Decision-making-aid

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.

Temperature/humidity combinations of Memmert climate chamber*

100% AtmoSAFE: Made by Memmert. Made in Germany. 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

* 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.

memmert

Experts in Thermostatics

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_2 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

YOUR MEMMERT PARTNER

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