

Cyclic Corrosion Chamber C.C.T – AUTO Series

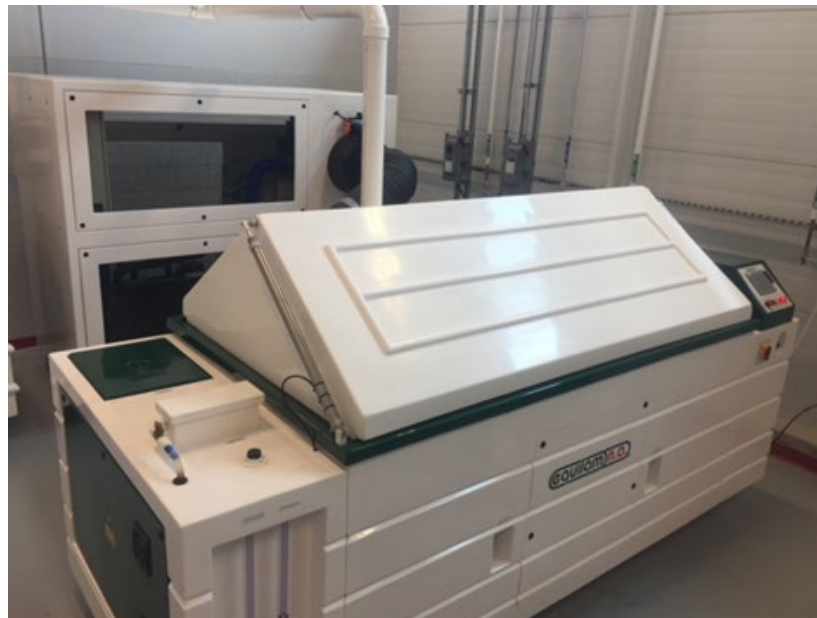
EQUIPMENT SUMMARY

- Built in fiberglass with special resin of high chemical and temperature resistance externally and internally.

US PATENT # 10371623



CCT 1300 AUTO image merely illustrative



CCT 3000 AUTO image merely illustrative



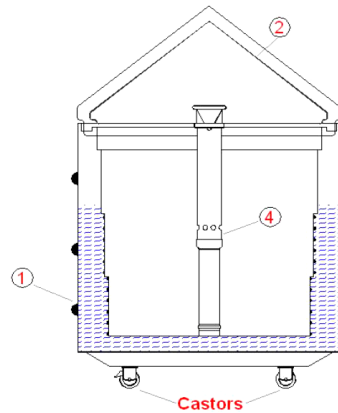
CCT 5000 AUTO image merely illustrative



Cooling system image merely illustrative

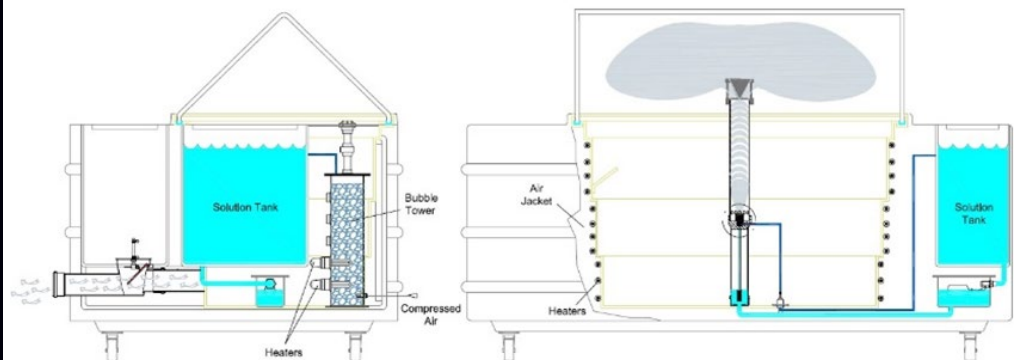
Specifications/ Models	CCT 1300 AUTO	CCT 3000 AUTO	CCT 5000 AUTO
<p>Allows 7 different programable cycle modes, (5 standards, and 2 optional added modes)</p>	<ul style="list-style-type: none"> - Mode: SALT SPRAY (FOG) - Mode: CONDENSED HUMIDITY - Mode: CLIMATIZATION - Mode: CLIMATIZATION WET - Mode: LOW TEMPERATURE (-20°C) or (ULTRA LOW -40°C *) - Mode: IMMERSION * - Mode: SPRAY or STRESS * <p>* Optionals – Please, consult us.</p> <p>The standard equipment offers the following modes: Salt Spray (Fog), Condensed Humidity, Climatization (temperature x relative humidity with ramps and thresholds), Climatization Wet, and Low temperature (-20°C with ramps and thresholds).</p> <p>Strictly designed to materials testing in accordance with the corrosion corporative standards.</p>		

- 1- **Air Jacket** on all sides of equipment providing indirect heating of internal cabinet, ensuring homogeneity of temperature in accordance to ASTM B 117, ABNT NBR 8094 and ISO 9227.
- 2 – **Lid** with smooth surface, drops of solution which accumulate on the ceiling or cover of the chamber shall not be permitted to fall on the specimens being exposed as specified in ASTM B117,
- 3 – **Uni-body construction** incorporating solution tank, bubble tower, panel in one cabinet.
- 4 – **Central Atomization Nozzle** - ensures the uniformity of fog distribution, providing more realistic test results. Centralized Atomization System according to ASTM B 117 (Fig 1 pg. 4 and Fig X1.1 pg. 7) – ISO 9227 – JIS Z 2371.



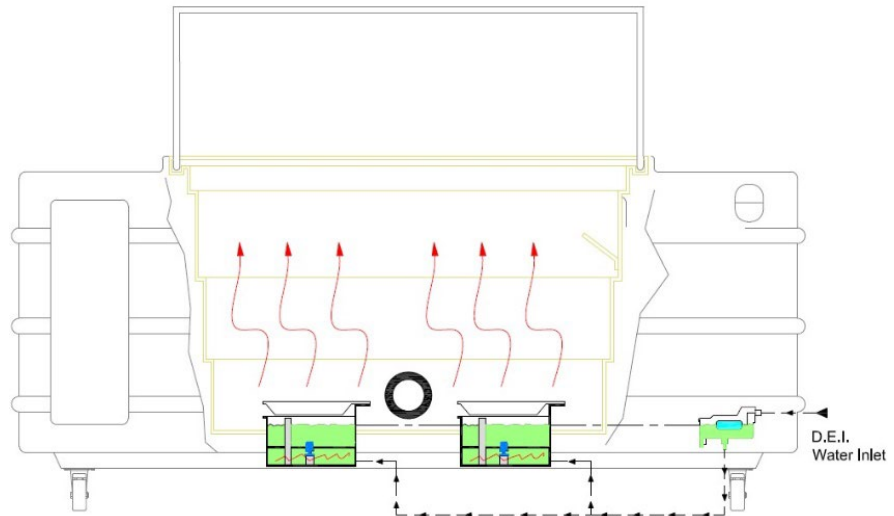
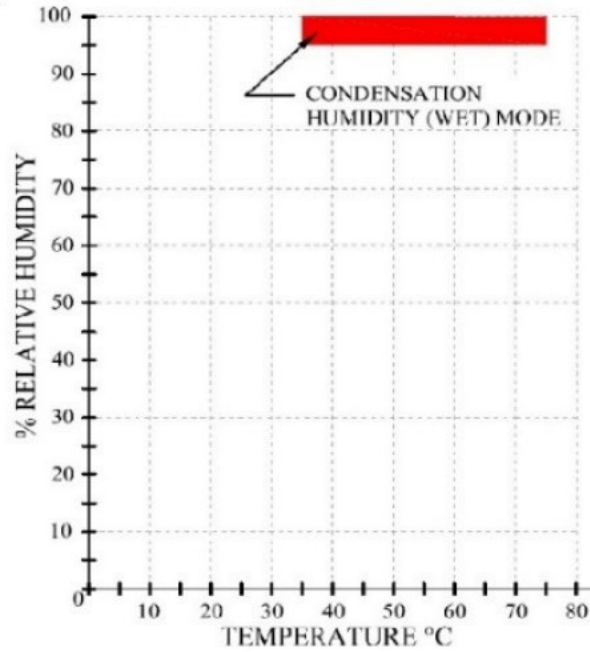
SALT SPRAY (FOG) MODE

- Chamber Temperature Range: Ambient 9°F (5°C) to 122°F (50°C).
- Bubble Tower Temperature Range: Ambient 9°F (5°C) to 165°F (74°C).
- Resolution of chamber and bubble tower temperature controller: 0.1°C.
- PT100 temperature sensors – 3 wires.
- Homogeneity of chamber and bubble tower temperature: ± 0.5°C.
- Bubble Tower Pressure Range: 29 kPa min. to 196 kPa max. (4.2 psi min. to 28 psi max).
- Fog collection range in any position: ASTM B117 / ISO 9227: 1.5 ±0,5 ml/hour, continuous 16 hours of test, consult us for other specifications (VDA 233-102 A,B,C 3 ml/hour +/- 1ml/hour).



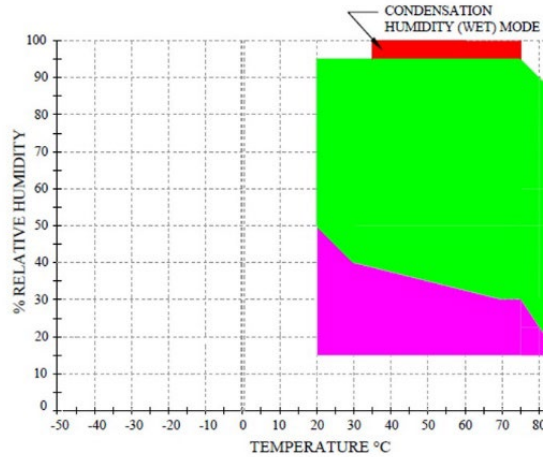
- Chamber Temperature Range: 95°F to 167°F (35°C to 75°C), resolution $\pm 0,1^{\circ}\text{C}$, according to red area in graph shown below.
- Relative Humidity: $97\% \pm 3\%$.
- Homogeneity of chamber temperature: $\pm 1.8^{\circ}\text{F}$ ($\pm 1.0^{\circ}\text{C}$).
- In accordance with ASTM D 2247.

**CONDENSED
HUMIDITY MODE**



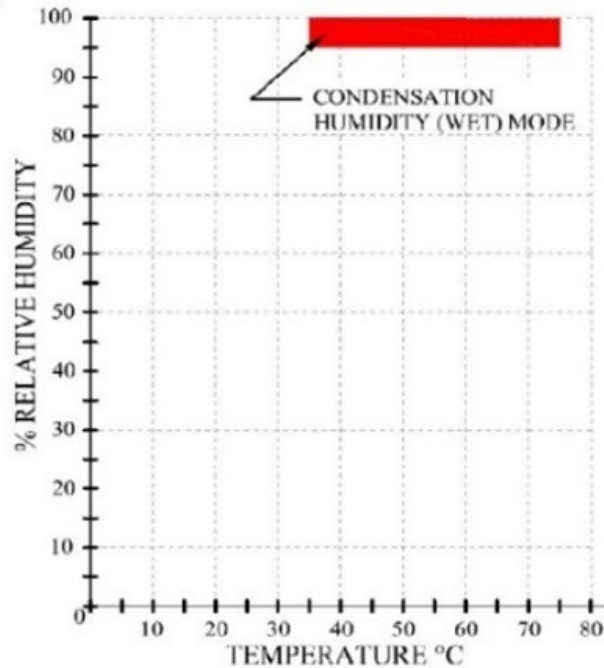
**CLIMATIZATION
MODE (TEMP. x
HUMIDITY)**

- The user can program the temperature and relative humidity inside the chamber according to the green area of graph shown below.
- Temperature range: 68° to 167°F (20°C to 75°C) – heating and 167°F to 68°F (75°C to 20°C) with control of ramps.
- Cooling system, compressor, coil, air control valves, and software.
- Relative Humidity: Green area of graph.
- Relative Humidity: Purple area Optional – Consult us.



**CLIMATIZATION WET
MODE (Wet-Botton)
ISO 6270-2**

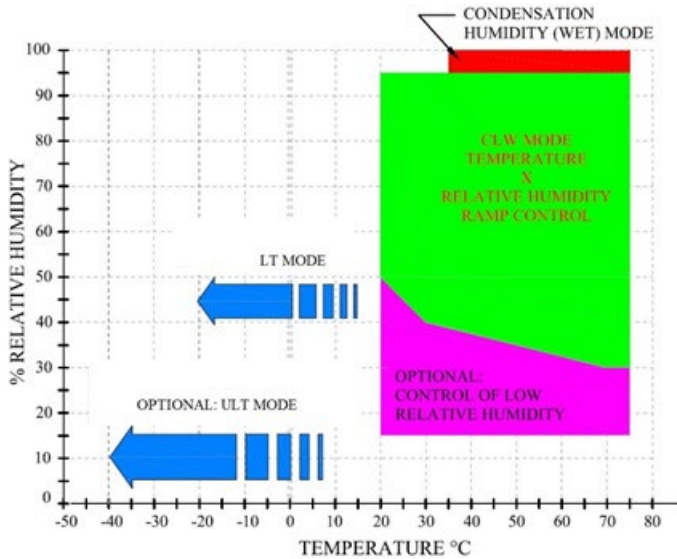
- Chamber Temperature: Ambient Temp. +9°F (5°C) – +158°F (+75°C)
- Relative Humidity: 97% ±3%.



- Chamber Temperature: -4°F to 68°F (-20°C to 20°C), resolution $\pm 0.1^\circ\text{C}$, according to the blue arrow area of LT graph shown below, with control of ramps and thresholds.
- Chamber Temperature: -40°F to 68°F (-40°C to 20°C), Ultra Low Temperature (ULT) option, with control of ramps and thresholds.

**LOW TEMPERATURE
MODE OR ULTRA
LOW TEMPERATURE
MODE (ULT*)**

- Option ULT:
 * Option – EQOP.0134-1300
 * Option – EQOP.0135-3000
 * Option – EQOP.0136-5000



CCT 5000 AUTO image merely illustrative

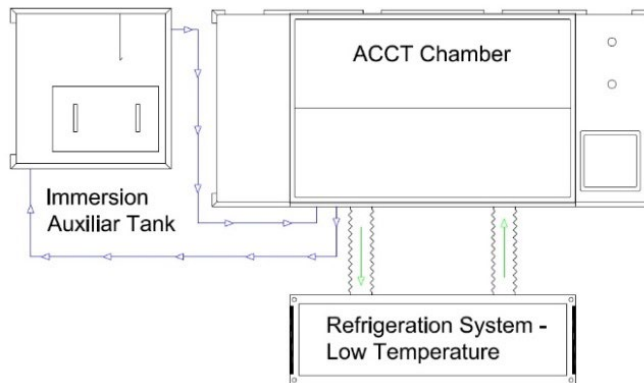
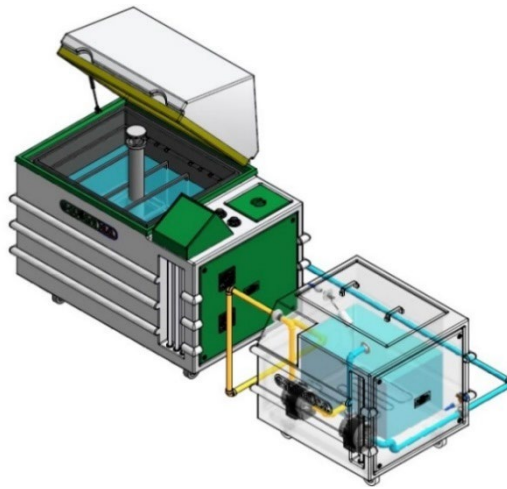


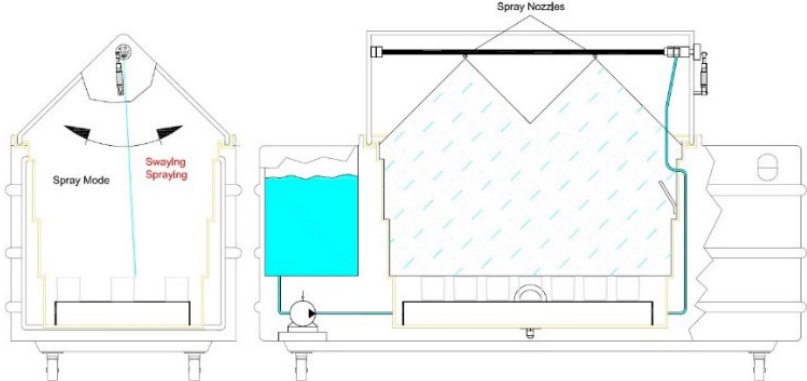

Cooling system image merely illustrative

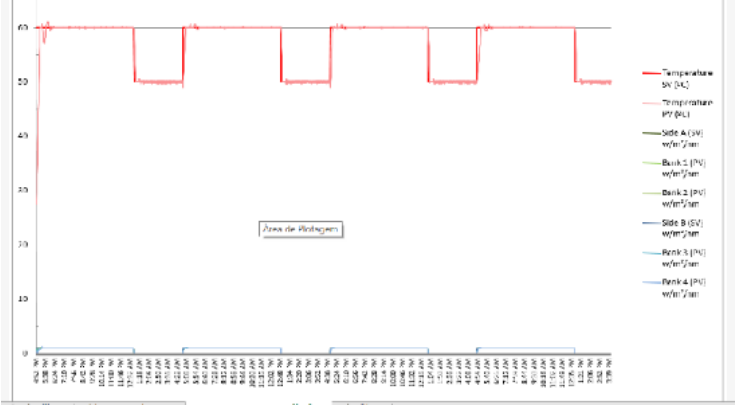



- Solution tank built with fiberglass and thermal insulation. It has lid, pump, and temperature sensor, PT 100 – 3 Wires, heater, level sensors, temperature control. All functions and commands are controlled by IHM (touch screen).
- Totally automatic shaking system of solution between test chamber and the tank.
- Solution pre-heating system.
- Automatic tank filling.
- Automatic and manual shaking.
- Temperature Range: Room temperature + 9°F (5°C) to 140°F (60°C).
- Temperature Resolution: 0.1°C




IMMERSION MODE*

- * Option – EQOP.0137-1300
- * Option – EQOP.0138-3000
- * Option – EQOP.0139-5000



<p>SPRAY OR STRESS MODE*</p> <p>* Option – EQOP 0128 – 1300 * Option – EQOP 0129 – 3000 * Option – EQOP 0130 – 5000</p>	<ul style="list-style-type: none"> - Spray system with spray nozzles – oscillating pendulum movement. - The spray system provides a finely distribution and uniformity of saline spray solution onto specimen. - Our system does not re-use sprayed solution (the solution that had contact with specimen) - Plastic spray nozzles. - After the Spray Mode it is possible to set up Fog Purge to avoid contamination of the next mode. - Spraying solution tank with capacity of 100 liters. 
<p>User Interface Platform – Touch screen full color</p>	 <p style="text-align: center;">Touch Screen Full Color</p>
<p>Trend Plot of Test Parameters on touch screen</p>	<p style="text-align: center;">Included</p>
<p>Lid Safety System</p>	<p style="text-align: center;">Included</p>
<p>UL508a Compliance</p>	<p style="text-align: center;">Included</p>
<p>Alarm message for preventive maintenance, shows date and hour</p>	<p style="text-align: center;">Included</p>
<p>Critical test parameters displayed on single screen</p>	<p style="text-align: center;">Included</p>
<p>Open program to set up the corrosion cycles</p>	<p style="text-align: center;">Included</p>
<p>Error message display, indicating</p>	<p style="text-align: center;">Included</p>

<p>description of alarm triggered, saving the hour and date of alarm.</p>	
<p>Buzzer alarm and Visual safety system on screen</p>	<p>Included</p>
<p>Data Acquisition Software 2 types: -By SD Card (on touch screen) -By PC (RS 232 or USB). Optional Software</p>	<div style="text-align: center;">  <p>PC - Software Optional USB.</p>  </div>
<p>Centralized Atomization Nozzle with distribution tower and cone according request of ASTM B117, pg. 4, Annex A ISO 9227, JIS Z 2371.</p>	
<p>Automatic opening lid.</p>	

<p>02 external fog collectors</p>			
<p>Bubble Tower with constant level, automatic supplying of DEI water, no auxiliary tank necessary for long duration test.</p>		<ul style="list-style-type: none"> - Stainless steel construction, fully removable for easy cleaning. - Aeration system 	
<p>Solution tank for continuous testing up to 5 days. System automatic and manual shaking of solution tank. Automatic supplying of DEI water facilitating solution preparation.</p>		<ul style="list-style-type: none"> - Totally open for easy cleaning. - Indication of maximum and minimum level. - Filter system for solution. 	
<p>External Dimensions W x D x H (mm) – Closed Lid</p>	<p>97.7" x 45.3" x 66.9" (2,480 x 1,150 x 1,700)</p>	<p>133.9" x 63.0" x 70.9" (3,400 x 1,600 x 1,800)</p>	<p>150.0" x 70.9" x 82.7" (3,800 x 1,800 x 2,100)</p>
<p>Internal Dimensions W x D x H (mm)</p>	<p>51.2" x 30.7" x 35.4" (1,400 x 850 x 850)</p>	<p>81.9" x 42.5" x 39.4" (2,050 x 1,080 x 1,000)</p>	<p>78,8" x 59,1" x 39.4" (2,000 x 1,500 x 1,000)</p>
<p>Approximate crate dimensions W x D x H (mm)</p>	<p>102.4" x 51.2" x 72.9" (2,600 x 1,300 x 1,850)</p>	<p>140" x 70" x 83" (3,550 x 1,700 x 2,110)</p>	<p>Pallets/Container</p>
<p>Approximate equipment weight (kg) – Cooling system is not included</p>	<p>802 lbs (364 kg)</p>	<p>1,212 lbs (550 kg)</p>	<p>1,962 lbs (890 kg)</p>

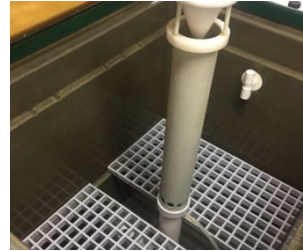
Approximate shipping weight – crated (kg) - Cooling system is not included	919 lbs (417 kg)	1,874 lbs (850 kg)	2,204 lbs (1,000 Kg)
Internal Volume (Liters) Others internal volume consult us.	45.9 cu.ft (1,300 L)	106.0 cu.ft (3,000 L)	176.6 cu.ft (5,000 L)
Recommendation of temperature for installation site	17°C to 25°C – R.H 50% +/- 10%		
Electrical Supply	208 ~ 220 V - 50-60Hz – 3 phase (other consult factory)		
DEI Water Requeriment	ASTM D 1193 Type IV		
DEI water pressure	0.5 to 1.0 kgf/cm ²		
DEI water inlet	½ NPT"		
Compressed Air	Free of oil and water – flow rate and constant pressure – 6 Kgf/cm ² - 3 ~ 4 m ³ /hour		
Chamber Exhaustion	PVC 4" tube, without siphon		
Laboratory Exhaustion	Fume Hood + Motor if necessary		
Service Area	Minimum clearance of 23.6" (60 cm) for an easier cleaning, assembling and maintenance		
<p>Each piece of equipment was carefully designed to meet a specific standard. We highly recommend that you don't use the same chamber for different solutions, e.g. don't use a Salt Spray chamber for CASS; Kesternich (SO₂) test or CASS chamber for humidity test due the chemical contamination that may distort the results. See item 4.6 of Standard ISO 9227.</p>			
<p>1 (One) Year Parts Warranty against manufacturing defects from date of delivery at customer's site. This assumes equipment is used under normal operating conditions in accordance to the instruction manual. This warranty does not apply to glassware (lamps). In case of non-warranty issues during warranty period, actual expenses shall apply.</p>			
<p>Note 1: All our equipment is delivered with Installation, Maintenance and User Manuals. We believe this material is enough for the correct use of the equipment. We are available for further questions and clarifications. If necessary, we provide the service of assembling and staff training at client's site (Cost for this service available upon request).</p>			
<p>Note 2: Appearance and specifications of equipment are subject to <i>change without prior notice</i>.</p>			

OPTIONALS

- Specimen rack grille type, capacity 120 kg with distributed load.

* Optional – EQOP 0119 – 1300

* Optional – EQOP 0120 – 3000 / 5000



- Lateral viewing window, avoids dripping onto the specimen.

* Optional – EQOP 0007 – Not compatible with 5000



- Fiberglass Fume Hood (hood only), Smooth finish on both sides, for easy cleaning, exhaust capacity 1940 CFM.

* Optional – EQOP 0011



- Fiberglass axial fan assembly, capacity 1940 CFM. Net weight: 88 lbs. (40 kg).

* Optional – EQOP 0012



- DEI Water assembly includes: activated carbon water filter, DI column, LED water quality indicator.

* Optional – EQOP 0013



- Spare DI water column.

* Optional – EQOP 0014



- Spare activated carbon water filter.

* Optional – EQOP 0015



- Density-meter to measure concentration of saline solution in accordance to ASTM B117.

* Optional – EQOP 0018



- Plastic bucket with 50lbs Salt EQCORR with chemical analysis Certificate in accordance with ASTM B117, ISO 9227, JIS Z2371, MILS STD810G.

* EQOP.0019



- Cable port $\varnothing = 2''$
* Optional – EQOP 0034



- Data Acquisition Software:
 - Via USB – RS232 - Ethernet
- * Optional – EQOP 0037



- SO₂ Injection
- * Optional – EQOP 0045

ASTM G 85 Appendix. 4

- Prohesion
- * Optional – EQOP 0131

ASTM G 85 Appendix 5

- Saturated Humidity by Atomization.
- * Optional – EQOP 0098

ASTM D 1735

- SWAAT TEST
- * Optional – EQOP 0044

ASTM G 85 Appendix 3

- Device for wall washing
Scania STD 4319 and Renault ECC1
- * Option – EQOP 0132

Hot DI water **

- Spray Nozzles to accord with standard
RENAULT – ECC1
Incompatible with nozzles: ISO 9227 –
ASTM B 117 – ABNT NBR 8094.
- * Optional – EQOP 0133

Atomization system with increasing fog collection to satisfy ECC1 **

Further options shall be considered upon request

Summary of reference standards in accelerated tests					
Salt spray	CASS/ASS	Kesternich (SO ₂)	C.C.T (Cyclic Corrosion Test)	Humidity by fog	Condensed Humidity
ASTM B117	ISO 9227 ASS	ASTM G 87	ASTM G 85	GM 4465P	ASTM D 2247
ISO 9227	ASTM B 368	DIN 50018	PV 1210 – VW	ASTMD 1735	DIN 50017
JIS Z 2371	ISO 9227 CASS	ISO 6988-2	GM 9540 P		ISO 6270
BSI 7479	ASTM G 85 *		VDA 621-415		
ASTM D 5894	BS 7479 AASS		Prohesion		
ANFOR A05 101			CCT 1 – HONDA – NISSAN		
BMW AA 1029			CCT 4 – HONDA- NISSAN		
BMW AA -P184			CCT – HONDA		
BMW AA -0324			GMW 14 872		
GM 4298P			FORD CETP: 00.00-L-467		
IEC 60068-2-11			VOLVO STD 423,0014		
ASTM G 85 *			VOLVO STD 1027, 14		
MIL STD 202 G			ISO 11997-1		
MIL STD 810 G			SCANIA STD 4233		
MIL STD 1344, 1001.1			SCANIA STD 4314		
BS 7479			FORD BI 123-3		
SWAAT TEST			VDA 233-102 A,B,C		

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