



1 **TYPE EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 16ATEX1174X** Issue: **2**

4 Equipment: **Elchlor Hypochlorite Generators, ELCHLOR™ 4, 6, 12, 18 & 24**

5 Applicant: **Cumberland Electrochemical Limited**

6 Address: Unit 33-34 Murdock Road, Launton Road Industrial Estate,
Bicester, Oxfordshire OX26 4PP, England

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 CSA Group Netherlands B.V. certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design of Category 3 equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012/A11:2013

EN 60079-2:2014

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.

11 This Type Examination Certificate relates only to the design of the specified equipment, and not to specific items of equipment subsequently manufactured. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 3G

Ex pzc IIC T* Gc

XX*** $\leq T_{amb} \leq +50^{\circ}\text{C}$

T* Temperature classification

T4-All Elchlor cabinet sizes without internal heating

T3-All Elchlor cabinet sizes with the internal heater option installed

XX*** Minimum Ambient Temperature

XX=0°C for cabinets without optional electrolyser generator enclosure heater T_{amb} 0°C to +50°C

XX=-20°C for cabinets with optional electrolyser generator enclosure heater T_{amb} -20°C to +50°C

Project Number 1180

Signed: 

Title: Director of Operations

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SCHEDULE

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13 DESCRIPTION OF EQUIPMENT

The range of Elchlor Hypochlorite Generators (EHG) are designed to produce Sodium Hypochlorite by the process of electrolysis of a saline electrolyte (sea water for instance).

The EHG enclosure cabinet is constructed of externally fully welded 3 mm 316L grade stainless steel and is designed to operate with a purge pressurisation system, such that the internal enclosure pressure is maintained above atmospheric pressure with purging of the internal enclosure atmosphere upon start up.

The enclosure is fitted with 3mm 316L stainless steel hinged access doors in two options (one with and one without view ports), each secured using ten Vice Action Compression latches that require a square panel key to open. The door gasket seals are constructed from EPDM of the Hollow Sponge Design Type and are bonded to the Electrolyser Enclosure.

Electrolyser cells, employing DC current of up to 625 amps at 170 volts complete the electrolysis process. DC power supply for the electrolysis process is bottom entry through a side mounted terminal box compartment outside of but integral to the Electrolyser Generator Enclosure Cabinet, access to which is via a lid secured with twenty two Hex head M6 bolts. The terminal box gasket seal is constructed from 3mm EPDM sheet and is bonded to the terminal box lid.

The doors and terminal box are not intended to be opened in service for adjustment, inspection or other operational reasons, although they are intended to be opened for installation and maintenance purposes when not in service. In both cases the gasket is bonded to one surface using Silicone Adhesive.

The enclosure cabinets and doors may be supplied unpainted or may be painted externally or internally and externally, while external cable tray, furniture and fixings may also be painted. In both cases the maximum paint thickness is 200 microns for the avoidance of static build up as specified by EN 60079-0:2012 clause 7.4 and EN 13463-1 clause 6.7.5.

Power and signals for the internal enclosure heaters (where this option for ambient temperature operation down to -20°C is selected) is through two M25 and one M20 plain hole in the side wall of the enclosure using an appropriate cable gland to a minimum suitability for Zone 2, Category 3 G, EPL GC, Gas Group IIC with a minimum Ingress Protection rating of IP56 to maintain the enclosure IP rating (two M25 and one M20 for duty/standby heaters or one M25 and one M20 with the 2nd M25 blanked using an appropriately rated suitably certified stopping plug for a single duty heater).

If internal enclosure heaters are not required two off M12 threaded holes are installed instead for testing purposes only and are blanked and sealed using an appropriately sized stainless steel bolt and a Nylon washer.

The electrolyser enclosure cabinets accommodate the following:

- Liquid Level Switch, KEMA 99ATEX0523, Ex ia IIC T3 ...T6 Ga/Gb, T_{amb} -50°C to +70°C

Temperature class	Process Temperature (sensor)
T6	≤85°C
T5	≤100°C
T4	≤135°C
T3	≤200°C

- FAW Hazardous Area Air Warmers, LCIE 00ATEX 6013X, II 2G, Ex e II T4 to T2, T_{amb} -60°C to +40°C
- HFT Flameproof Thermostat, LCIE 99ATEX6017X/02, Ex d IIC T6, T_{amb} -60°C to +60°C
- E+H iTEMP TMT82 Temperature Head Transmitter, PTB 10 ATEX2029 T4, T_{amb} -40°C to +60°C

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There are five standard sizes of electrolyser enclosure cabinets (Stainless Steel as detailed below), however the cell construction and terminations are the same.

Enclosure Name	Dimensions in mm Depth x Height x Length	Gross Internal Enclosure Volume	No of Electrolyser Cells	Sodium Hypochlorite Production Capacity kg/hr
<i>ELCHLORTM4</i>	850 x 2444 x 594-Cabinet Int. 962 x 2640 x 890-Footprint	1.324 m ³	1 to 4	0.67 to 2.68
<i>ELCHLORTM6</i>	850 x 2444 x 894-Cabinet Int. 962 x 2640 x 1190-Footprint	1.958 m ³	4 to 6	2.68 to 4.02
<i>ELCHLORTM12</i>	850 x 2444 x 1269-Cabinet Int. 962 x 2640 x 1565-Footprint	2.757 m ³	6 to 12	4.02 to 8.04
<i>ELCHLORTM18</i>	850 x 2444 x 1954-Cabinet Int. 962 x 2640 x 2250-Footprint	4.212 m ³	12 to 18	8.04 to 12.06
<i>ELCHLORTM24</i>	850 x 2444 x 2544-Cabinet Int. 962 x 2640 x 2840-Footprint	5.469 m ³	18 to 24	12.06 to 16.08

Variation 1 - This variation introduced the following changes:

- i. To reduce the lower ambient of equipment fitted with the electrolyser generator enclosure heater from -10°C to -20°C, resulting in the marking being modified and the product description and associated Specific Condition of Use being amended.
- ii. To permit an increase in the integral junction box cable entry size from M40 up to M63.
- iii. To permit the introduction of an alternative cable protection tube complete with glands between the enclosure and purge controller.
- iv. To permit the introduction of an alternative ¾" NPT to 25mm adaptor and M25 gland for the power cable entry to the purge controller.
- v. To clarify the cabinet fabrication welding requirements.
- vi. To clarify the location of enclosure lifting eyes in relation to external support bracketry.
- vii. To permit the introduction of two additional gland entries to the Elchlor 24 enclosure.
- viii. To assess minor modifications to the drawings in the certification package.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	19 September 2016	R70058101A	The release of the prime certificate.
1	30 October 2018	R70178847A	The introduction of Variation 1.
2	15th October 2019	1180	Transfer of certificate Sira 16ATEX1174X from Sira Certification Service to CSA Group Netherlands B.V..

15 SPECIFIC CONDITIONS OF USE

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- 15.1 The equipment shall only be installed in areas where the solar radiation received will not exceed 150 W/m².
- 15.2 Temperature range of the purge air shall not exceed:
 T_{amb} 0°C to +50°C for cabinets without optional heater
 T_{amb} -20°C to +50°C cabinets with optional heater
- 15.3 The operating conditions of the Elchlor Hypochlorite Generator cells shall be within the following limits:
- | | |
|---|--|
| Maximum running current | up to 625 Amps at a maximum 170 volts |
| Fixed nominal flow across all cabinet sizes | 3.75 m ³ /hr per sub-stream |
| Low flow Alarm | 3.5 m ³ /hr |
| Low flow trip | 3.2 m ³ /hr |
| Seawater supply pressure | 4 bar |
- 15.4 The fluid inlet temperature is a maximum of 50°C. The minimum fluid flow through a cell shall prevent this being exceeded.
- 15.5 The internal heaters shall not be energised unless the internal ambient temperature is below 40°C.
- 15.6 The purge time shall be chosen from the table below for the relevant model and the purge controller must be set accordingly:

Model Number	4 Bar Inlet Pressure	1.6-2.1 Bar Inlet Pressure ^	1.4 Bar Inlet Pressure
ELCHLOR™4	12 Minutes @ 565l/m Max 820 l/m inlet flowrate	20 Minutes @ 340l/m Circa 300 – 400 l/m inlet flowrate	49 Minutes @ 141l/m Min 220 l/m inlet flowrate
ELCHLOR™6	18 Minutes @ 565l/m Max 860 l/m inlet flowrate	29 Minutes @ 340l/m Circa 320 – 410 l/m inlet flowrate	70 Minutes @ 141l/m Min 230 l/m inlet flowrate
ELCHLOR™12	25 Minutes @ 565l/m Max 910 l/m inlet flowrate	41 Minutes @ 340l/m Circa 360 – 420 l/m inlet flowrate	98 Minutes @ 141l/m Min 240 l/m inlet flowrate
ELCHLOR™18	38 Minutes @ 565l/m Max 930 l/m inlet flowrate	62 Minutes @ 340l/m Circa 360 – 440 l/m inlet flowrate	150 Minutes @ 141l/m Min 330 l/m inlet flowrate
ELCHLOR™24	49 Minutes @ 565l/m Max 950 l/m inlet flowrate	81 Minutes @ 340l/m Circa 370 – 480 l/m inlet flowrate	194 Minutes @ 141l/m Min 340 l/m inlet flowrate

^ The required inlet pressure to achieve a 6.8 mbar internal cabinet pressure and generate a 340 l/min purge vent flow rate varies slightly across model sizes and between unique cabinets.

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed reports listed in Section 14.2.

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Certificate Annexe



Certificate Number: Sira 16ATEX1174X

Equipment: Elchlor Hypochlorite Generators, *ELCHLOR™*
4, 6, 12, 18 & 24

Applicant: Cumberland Electrochemical Limited

Issue 0

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
EGE 10122-1	1 to 11	E	15 Sep 16	ELCHLOR 4
EGE 10111-1	1 to 11	E	15 Sep 16	ELCHLOR 6
EGE 10112-1	1 to 11	E	15 Sep 16	ELCHLOR 12
EGE 10119-1	1 to 13	E	15 Sep 16	ELCHLOR 18
EGE 10113-1	1 to 13	F	15 Sep 16	ELCHLOR 24

Issue 1

Drawing	Sheets	Rev.	Date (Sira Stamp)	Title
EGE 10111-1	1 to 11	G	01 Oct 18	ELCHLOR 6 Electrolyser generator certification drawing.
EGE 10112-1	1 to 11	G	01 Oct 18	ELCHLOR 12 Electrolyser generator certification drawing.
EGE 10113-1	1 to 13	H	01 Oct 18	ELCHLOR 24 Electrolyser generator certification drawing.
EGE 10119-1	1 to 13	G	01 Oct 18	ELCHLOR 18 Electrolyser generator certification drawing.
EGE 10122-1	1 to 11	G	01 Oct 18	ELCHLOR E4 Electrolyser generator certification drawing.

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