



# Controllers / Instruments

## Chlorine Control Systems

### Systems

Ordering Code	Description
<b>EMEC FCCS-LDCL</b>	EMEC LDCL Chlorine Controller with EMEC PEF1/E flow cell mounted on PVC panel. (Excludes amperometric Chlorine Sensor)
<b>EMEC FCCS-LDCL-CABG</b>	Above system in lockable, IP65 weatherproof cabinet



EMEC FCCS-LDCL

### Optional Chlorine Sensor (Cell)

Ordering Code	Description
<b>EMEC ECL3N/2</b>	Free Chlorine Amperometric cell, 0-2ppm, Inorganic, pH buffered, temp compensated, 1-40°C, 1 bar max, pH 9 max, for Sodium Hypochlorite, Chlorine Gas (ie Chlorine without UV Stabiliser)
<b>EMEC ECL3N/10</b>	Same as above, for 0-10ppm Free Chlorine
<b>EMEC ECL8/2</b>	Total Chlorine Amperometric cell (organic & inorganic), 0-2 ppm, pH buffered, temp compensated, 1-40°C, 1 bar max, pH 12 max
<b>EMEC ECL8/20</b>	Same as above, for 0-20ppm Total Chlorine
<b>EMEC ECL2/2</b>	Chlorine Dioxide amperometric cell (organic and inorganic) 0-2 mg/l, temperature compensated 1-40°C, 1 bar, max pH 11.
<b>EMEC ECL2/20</b>	Same as above, for 0-20ppm Chlorine Dioxide



EMEC FCCS-LDCL-CABG

### Description

The EMEC LCDL Series controller, controls a disinfection process reliably, accurately and economically. The controller includes a sensor input, for either Free-Chlorine, Total Chlorine, or Chlorine Dioxide. The system removes the guess work from the disinfection process as it continuously monitors the ppm (mg/L) level of the desired process variable.

The EMEC LDCL controller makes use of an Amperometric cell, chosen for either Free or Total Chlorine, or Chlorine Dioxide. The Amperometric cells are also available for different ranges of ppm (mg/L) that is required to be measured. This can increase the accuracy of a system. For example if 1 ppm free chlorine is to be controlled, it would make sense to use the Amperometric cell for a range of 0-2ppm, rather than the 0-10ppm cell.

### Applications

- Industrial process monitoring
- Cooling towers
- Food & beverage
- Potable water
- Waste-water
- Swimming pools

### Features & Benefits

- The same controller model is used for all Amperometric cells
- Amperometric cells provide superior accuracy
- Easy to program and calibrate via user-friendly dot-matrix LCD interface
- Controller outputs can be used to control optional Chlorine dosing pump/s or can be used for high or low alarm detection
- The isolated 4-20mA output can be used to either data log the recorded ppm measurement, using an optional data logger, or for remote monitoring.
- Password protection prevents tampering with controller settings and/or calibration.
- Weatherproof – can be mounted outside.

(Note: Specifications subject to change without notice)

## Operation

The setup of the EMEC LDCL-FCCS (and -CABG) systems require the following:

- The Amperometric cell is correctly filled with the appropriate electrolyte, membrane(s) installed, and inserted with front end about 5mm from the bottom of the EMEC PEF1/E flow cell
- Constant flow with the top of the silver-bullet float at the marked line (enabling constant illumination of the LED on the proximity sensor)
- Correct filtration

With the above in place, the LDCL controller performs its control and dosing functions to give complete peace-of-mind while accurately monitoring and/or controlling the precise ppm (mg/L) level of the process variable.

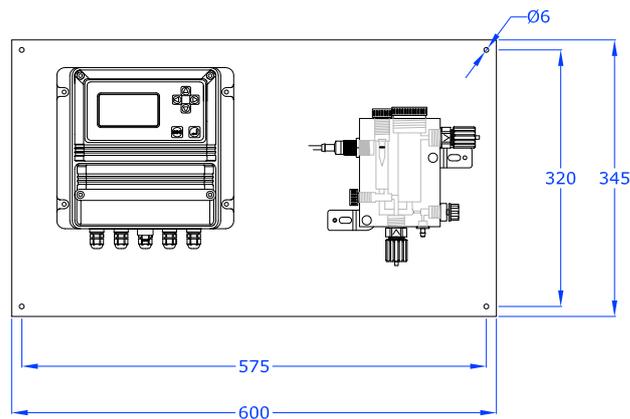
The LDCL controller has 2 ON/OFF outputs as well as 2

digital proportional outputs. The ON/OFF outputs can be independently programmed to activate when above or below a pre-determined setpoint. Each ON/OFF output supplies 240VAC power directly to an optional pump when it calls for dosing, or can alternatively be used to power a local visual or audible alarm.

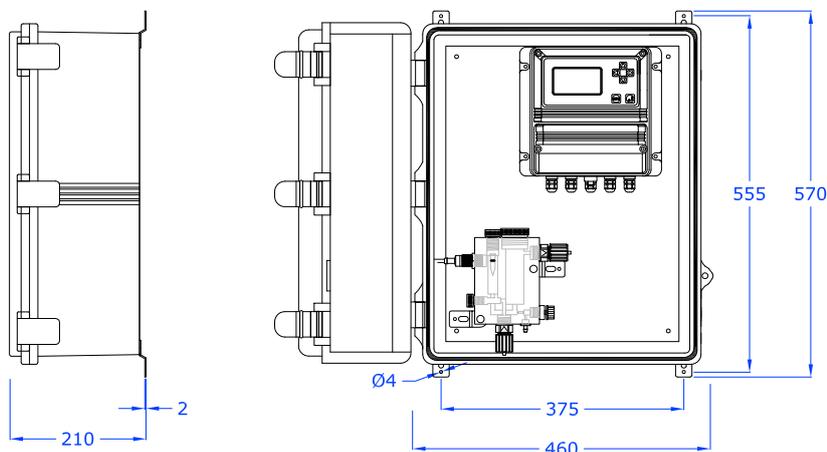
Each proportional output has 2 programmable setpoints. One setpoint is the 0% ppm setpoint and the other is the 100% ppm setpoint. The 0% ppm setpoint is usually the desired ppm level. At the 100% ppm setpoint and below, the pump will be ON and dosing at maximum speed. The pump will dose proportionally between the 0% and 100% ppm setpoints.

The controller features a potential free N/O and N/C alarm relay contact as well as an isolated 4-20mA output for re-remote monitoring or data logging (with optional equipment).

## Dimensional Drawings



EMEC FCCS-LDCL



EMEC FCCS-LCDL-CABG



## Recommended Options & Accessories

Ordering Code	Description
<b>Filtration &amp; Pressure Limiting</b>	
EMEC FIL/60	5" Water filter with washable PET cartridge (60 micron)
EMEC NFIL/CA	Activated carbon filter with cartridge to perform ZERO calibration on Chlorine controllers
RV ILS-1-T20E	In-line Strainer, 1" NPTF ports, transparent Nylon bowl, 20% glass filled PP body, EPDM gasket, 20 mesh (915 micron) SS304 screen, max 6.9 bar @ 52 degC or 10.3 bar @ 21 degC, mounting in any orientation
PRV-100-600-PG	Pressure reducing valve 15mm 1/2", Max Supply Pressure - 16 Bar, Adjustable to 100-600kPa with pressure gauge to set to 100kPa for use prior to EMEC PEF1 & PEF1/E flow cells

## Recommended Consumables

	EMEC ECL3N/2	EMEC ECL3N/10	EMEC ECL8/2	EMEC ECL8/20	EMEC ECL2/2	EMEC ECL2/20
<b>Semi-Permeable Membrane</b>	EMEC MECL-3-8/20	EMEC MECL-8/2	EMEC MECL-3-8/20	EMEC MECL-1-2		
<b>Internal Membrane</b>	EMEC MECLINT/3	N/A				
<b>Electrolyte</b>	EMEC ELECL3	EMEC ELECL8		EMEC ELECL2		
<b>Filter Cartridges</b>	EMEC CA/60 (Water Filter) & EMEC CA/AT (Activated Carbon)					

## Recommended Pulse Input Chlorine Dosing pumps

Ordering Code	Description
EMEC KAPVM 05 7.5 PMMA	Metering pump, foot mount, 7.5 l/hr @ 5 bar, internal control or pulse input with multiply/divide, level control, self-venting (de-gassing) Acrylic transparent head, 6x4 tubing
EMEC KAPVM 10 3.5 PMMA	Metering pump, foot mount, 3.5 l/hr @ 10 bar, internal control or pulse input with multiply/divide, level control, self-venting (de-gassing) Acrylic transparent head, 6x4 tubing
EMEC CMSAPVM 07 13 PMMA	Metering pump, foot mount, 13 l/hr @ 7 bar, internal control or pulse input with multiply/divide, level control, self-venting (de-gassing) Acrylic transparent head, 6x8 tubing
EMEC CMSAPVM 03 30 PMMA	Metering pump, foot mount, 30 l/hr @ 3 bar, internal control or pulse input with multiply/divide, level control, self-venting (de-gassing) Acrylic transparent head, 8x12 tubing

## Other Available Amperometric Sensors

Ordering Code	Description
EMEC ECL9/200	Hydrogen Peroxide (H2O2) Amperometric cell, 0-200 mg/L, temperature compensated, 5-50°C, 1 bar max
EMEC ECL10/10	Ozone (O <sub>3</sub> ) amperometric cell, 0-10 ppm, temperature compensated, 1-40°C, 1 bar max



## Specifications

	EMEC FCCS-LDCL	EMEC FCCS-LDCL-CABG
<b>Controller Function</b>		
Controller Model	EMEC LDCL	
Variable Measured	Inorganic Chlorine, Total Chlorine, Chlorine Dioxide	
Control Function	Dosing Chlorine or Chlorine Dioxide	
Device Controlled	Switches 240VAC to power 1 or 2 optional dosing pumps, or pulsed output for 1 or 2 optional dosing pumps with pulse inputs	
Control Algorithm	ON/OFF or digital proportional	
Re-transmission	Isolated 4-20mA	
Display	Dot matrix reverse backlit graphic LCD displays Turbidity	

<b>Controller Alarms</b>	
Activation	High or Low ppm with programmable delay
Relay Contact	1 C/O (ie. fail-safe), 5A/250 VAC, resistive load, potential free

<b>Electrical</b>	
Power Supply	90-240 VAC, 50/60Hz
Control Outputs	ON/OFF relay outputs: switched 240VAC, Pulsed outputs: Proportional
Relay Rating	5A/250VAC, resistive load (fuse protected)

<b>Physical</b>		
Protection	IP65	IP66
Lockable Cabinet c/w Controller & Flow Cell	-	Polyester hinged 530mm (l) x 440mm (w) x 200mm (d) supplied with mounting brackets
Packaged dimensions	630mm (l) x 370mm (w) x 290mm (h)	860mm (l) x 580mm (w) x 220mm (h)
Packaged weight	10 kg	19 kg

	EMEC ECL3N/2	EMEC ECL3N/10	EMEC ECL8/2	EMEC ECL8/20	EMEC ECL2/2	EMEC ECL2/20
<b>Probe Details</b>						
Variable Measured	Free Chlorine		Total Chlorine		Chlorine Dioxide	
Flow Cell Model	EMEC PEF1/E					
Measurement Technique	Amperometric					
Range (Resolution)	0-2 ppm (±0.001 ppm)	0-10 ppm (±0.01 ppm)	0-2 ppm (±0.001 ppm)	0-20 ppm (±0.01 ppm)	0-2 ppm (±0.001 ppm)	0-20 ppm (±0.01 ppm)
Operating pH Range	4 - 9		4 - 12		2 - 11	
Temperature Compensation	Internal temperature compensation within Amperometric cell					
Insertion Depth	5mm before the bottom of the PEF1/E flow cell					
First Polarisation	1 Hour					
Re-polarisation	10 Mins					
Repeatability	±1% at 25°C					
pH Buffered	Yes, with an error no greater than 10% per pH point				No	
Operating Temperature	1-40 °C					
Pressure	1 Bar maximum					
Flow	40 L/hour					
Output (mV/ppm)	-300	-100	-1000	-100	-1000	-100
Material / Dimensions	PVC Probe, 178mm long, 25mm Diameter					
Cable Connection	1.5 metres cable length, 4 core, plug-in removeable type connection					