



# **PURGE SYSTEM INSTALLATION MANUAL CLX-Ex Model 28031**

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# DECLARATION OF CONFORMITY

CE<sub>0359</sub> II 2G Ex px IIC T4 Gb  
To the following standards:

Explosive Atmospheres – Part 0: Equipment – General Requirements, EN60079-0: 2009

Explosive Atmospheres –Part 2: Equipment Protection by Pressurized Enclosure “p”, EN60079-2: 2007

**Emissions & Immunity** – Tested and passed EN61326: 1997 + A1: 1998 + A2: 2001 + A3: 2003

Manufacturer’s Name: HF scientific inc.

Manufacturer’s Address: 3170 Metro Parkway, Fort Myers, Florida 33916-7597

Importer’s Name:

Importer’s Address:

Type of Equipment: Chlorine Process Monitor

Model: CLX-Ex

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive and Standard

Place: Fort Myers, Florida USA

  
(Signature)

Date: 1 June 2011

Rowan T. Connelly, General Manager



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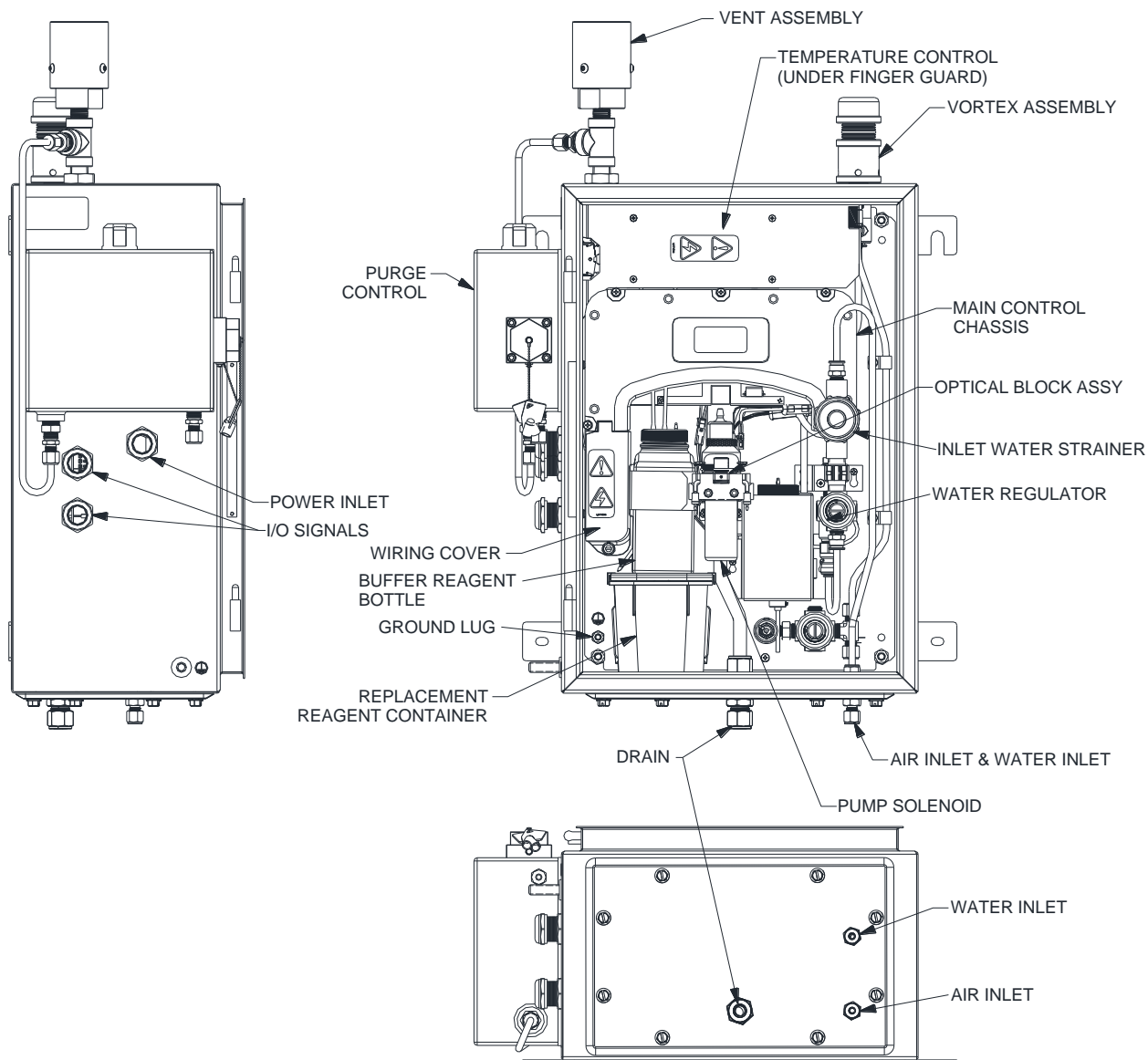
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## Specifications

<b>Measurement Range</b>	0.00 – 10.00 mg/L (PPM)
<b>Accuracy</b>	±5% of reading or ±0.03 mg/L (PPM) whichever is greater for range of 0-6.0 mg/L(PPM) ±10% of reading from 6.01-10.00 mg/L (PPM)
<b>Resolution</b>	0.01 mg/L (PPM)
<b>Cycle Time</b>	Adjustable; 110 seconds to 10 minutes (600 seconds) Note: the system defaults to 2.5 minutes
<b>Display</b>	Multi-Line Liquid Crystal Backlit Display
<b>Alarms</b>	Standard: Two Programmable, 120-240VAC 2A Form C Relay Remote Standby Option: One NO relay contact 120-240VAC 2A
<b>Analog Output</b>	Powered 4-20 mA, 600 Ω drive, isolated
<b>Communications Port</b>	Bi-directional RS-485 with Modbus
<b>Water Pressure</b>	Integral pressure regulator 0.34 bar (5.0 PSI) to 10.3 bar (150 PSI.)
<b>Flow Rate to Waste</b>	200 – 400 ml/min.
<b>Operating Temperature</b>	0°C – 55°C (32°F – 131°F)
<b>Wetted Materials</b>	PVC, Borosilicate Glass, Reslyn (FFKM), Viton <sup>®</sup> (FKM), Polypropylene, 316 Stainless Steel, Acetal, Noryl <sup>®</sup> , Silicone
<b>Sample Temperature Range</b>	0°C – 55°C (32°F – 131°F)
<b>Power Supply</b>	240 VAC (130 to 240VAC), 47-63 Hz, 250VA
<b>Insulation Rating</b>	Double Insulated, Pollution Degree 2, Overvoltage Category II
<b>Environmental Conditions</b>	Not recommended for outdoor use. Altitude up to 2000 meters Up to 95 % RH (non-condensing)
<b>Atex Rating</b>	CE <sub>0359</sub> II 2G Ex px IIC T4 Gb
<b>Compressed Air</b>	Water and oil free, -40°F (-40°C) Dew Point, Particles <5u, ISA Grade Hydrocarbon Free. Full time clean dry air at 5.5 -7 bar (80-101.5 PSI) @ 112 SLPM (4 SCFM) @ 20°C (68°F) Max
<b>Regulatory Compliance And Certifications</b>	CE Approved, ETL listed to UL 61010-12004 &ETL certified to CSA 22.2 No. 61010.1 2 <sup>nd</sup> edition dated July 2004 EN61326:1997 + A1:1998 + A2:2001 + A3:2003
<b>Shipping Weight</b>	28 kg (62lbs.) Reagents are Shipped Separately
<b>Shipping Dimensions</b>	775 mm X 622 mm X 318 mm (30½ ” X 24 ½” X 12 ½”)

## 1.0 Orientation

From the diagram below the major components can be located.



**Figure 3: The CLX-Ex with Cover Open**

## 2.0 Safety

This manual contains basic instructions that must be followed during the commissioning, operation, care and maintenance of the instrument. The safety protection provided by this equipment may be impaired if it is commissioned and/or used in a manner not described in this manual. Consequently, all responsible personnel must read this manual prior to working with this instrument.

In certain instances “**Notes**”, or helpful hints, have been highlighted to give further clarification to the instructions. Refer to the *Table of Contents* to easily find specific topics and to learn about unfamiliar terms.



**Note:** This manual is intended to be used in conjunction with the companion manual Cat. No. 28815B.

### 2.1 Symbols Used In CLX-Ex

Standard IEC symbols are used on the high voltage cover.



ISO 3864, No. B.3.6 Caution, risk of electric shock.

This symbol indicates that hazardous voltages. This symbol is used in this manual to bring attention to a potential electrical hazard



ISO 3864, No.B3.1 Caution refer to accompanying documents.

This symbol is reminding you to read the sections in the manual referring to the electrical connections, and potential hazards.



This symbol is used to bring attention to a special feature or to provide additional information.

### 2.2 Use in Explosive Environments Safety

In the interests of safety the operator must ensure the atmosphere where the instrument is located is safe from gases, vapors, dust or other flammable conditions whenever the instrument is opened for service or maintenance. At all other times the door must be kept closed with purge air connected the purge system operating with the GREEN lamp lit indicating safe operation.



### 3.0 Installation and Commissioning

#### 3.1 Air Supply

This instrument requires Water and oil free air, -40°C (-40°F) Dew Point, Particles <5u, ISA Grade Hydrocarbon Free. Fulltime clean dry air at 5.5 - 7 bar (80-101.5 PSI) @ 112 SLPM (4 SCFM) @ 20°C (68°F) Max. is required. This air supply must be provided continuously from a known safe area.

The air connection requires 6 mm stainless steel tubing. A compression type fitting is supplied that simply requires the installer to slip the supplied nut and feral over the tubing and then tighten the nut.

#### 3.2 Electrical Connections

The power cable enters cabinet through a grommet. The power cable diameter must be selected to ensure that this connection is tight. The grommet can accept cabling from 9 to 17 mm diameter. This grommet must be tightened to maintain cabinet air pressure.

The electrical power for the protective gas supply (blower, compressor, etc.) should be either taken from a separate power source or taken from the supply side of the electrical isolator for the pressurized enclosure.



**Only qualified electricians should be allowed to perform the installation of the instrument as it involves a line voltage that could endanger life.**

#### 3.3 System Power

The Purge Control X-Purge controller requires 220-240 VAC 47-63 HZ.

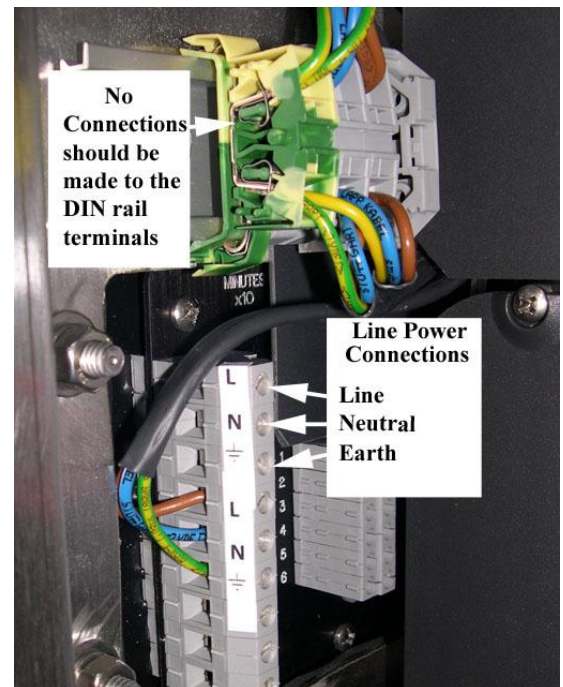
A total power requirement of 250VA; please verify that the line voltage falls within these specifications. A circuit breaker must be placed prior to the power connection in close proximity and within easy reach to allow for service. This circuit breaker must be marked to indicate that it is a disconnecting means for the instrument.

Supply power connections are made **ONLY** to the back of the Purge Control X-Purge controller:

- Terminal 1: Line or Hot connection
- Terminal 2: Neutral
- Terminal 3: Ground

Suitable wire would be stranded, 3 conductors 18-12 AWG copper or tin plated copper with a voltage rating of 600VAC with a temperature rating of 90 °C or higher.

Common earth bond points are provided both inside the enclosure on the chassis and outside of the enclosure.





The instrument is prewired using a DIN rail mounted terminal strip. This is for internal connections only. NO USER CONNECTIONS SHOULD BE MADE TO THIS CONNECTION STRIP.

#### 4.0 Purge Control X-Purge Controller Operation

The Purge Control X-Purge controller is mounted on the side of the main enclosure. This controller will ensure proper safe operation of the CLX-Ex. If of all the required conditions are met, the controller will act as a power governor. It does this by monitoring the pressurization of the main enclosure with clean dry air. Should this air supply pressure fail the indicator lamp on the Purge Control X-Purge unit will turn RED and power to the rest of the instrument is disconnected.



**WARNING: Do not apply power to the Purge Control X-Purge controller unless the area has been properly tested and is known not to contain explosive materials.**

#### 4.1 Start Up

When power is applied to the CLX-Ex for the first time, ensure that the air supply is connected as stated in section 4.1 and the cabinet is closed and locked. Once power is applied, the Purge Control X-Purge will go through a purge period of 5 minutes where at least five volumes of the enclosure are pushed through the CLX-Ex and out the vent at the top of the instrument. During the purge period the indicator lamp mounted on top of the Purge Control X-Purge will flash GREEN indicating the purge is in process and no power is applied to the rest of the CLX-Ex.

At the complete of the purge, indicator lamp will go solid GREEN and power will be applied to the rest of the system. As long as the proper air supply conditions are met the CLX-Ex will continue to operate.

#### 4.2 Indicator Lamp

The indicator lamp is a very quick way to determine to operation of the controller and thus the safety condition of the CLX-Ex.

Lamp Color	Meaning	Power to rest of CLX-Ex
Solid GREEN	Safe Operation	Power ON
Flashing Green	Instrument purging	Power OFF
Solid RED	Unsafe Operation	Power OFF
Flashing Red	By-Pass Key Operating	Power ON
NO Lamp	No power applied to CLX-Ex	No power applied everything off.

Using the table above, you can quickly determine the operating condition of the instrument. Under normal operation a solid GREEN lamp should appear.

### 4.3 Maintenance By-Pass Operation



**WARNING: Use of the by-pass key disables the safety features and safe operation of this instrument. It is imperative that this operation be performed only after the area has been tested and known to be safe.**

To perform some maintenance operations on the CLX-Ex it is necessary to have the entire instrument powered up while the enclosure door is open. Under these conditions normally the Purge Control X-Purge controller would determine that the enclosure is not pressurized and power will be removed to the measurement section of the CLX-Ex. To allow for this situation, a special maintenance by-pass key is supplied.

Located on the right side of the Purge Control X-Purge controller is a hex cap. Removing this cap reveals the key slot. Insert the key and turn it clockwise to engage the bypass operation. The indicator lamp will flash Red to indicate the by-pass mode. Assuming the area around the CLX-Ex has been tested and known to be safe, the enclosure door can now be safely opened and power will remain on to the entire system. The key cannot be removed while operating in the maintenance by-pass mode.



**WARNING: Do not operate the CLX-Ex for long periods of time in the by-pass mode. This is intended only for maintenance operations.**



**WARNING: Do not operate the CLX-Ex in the by-pass mode unattended.**

To return the instrument to normal, safe operation, close the enclosure door. Ensure that the air supply is connected turn the key counter-clockwise and remove. Replace the hex cover. If the pressure in the cabinet has built up to a normal acceptable level the lamp will show solid GREEN and the system will continue to run.

## 5.0 Operation

Under normal operation the Purge Control X-Purge controller lamp will a solid GREEN indicating safe operation. If the lamp is not solid GREEN, correct this condition first. Please refer to section 5.0 Purge Control X-Purge Controller Operation.





**All connections that carry power not generated inside the CLX-Ex, with the exception of the mains, must be connected through Intrinsic Safety Barriers.**



**Please note that these operating screens cannot be seen except with the cabinet door open and the instrument in maintenance by-pass mode. See [section 5.3](#) for more information on this.**

## 6.0 Instrument Labels

The following labels can be found on the outside of the CLX-Ex.

Purpose	Location	Label
Electrical Grommet Purpose	Enclosure Side Left	<p>← COMMUNICATION POWER IN 230VAC</p> <p>↑</p> <p>← COMMUNICATION OUT</p>
Water and Air Connections	Enclosure Lower Panel	<p>WATER INLET → 6 MM</p> <p>Water and oil free, -40°F (-40°C) Dew Point, Particles &lt;5u, ISA Grade Hydrocarbon Free. Full time clean dry air at 5.5 - 7 bar (80-101.5 PSI) @20°C (68°F) Max</p> <p>WATER DRAIN 12MM ↓</p> <p>AIR INLET 6 MM ↘</p>
Model Name, Manufacturer	Enclosure front door	 <p><b>ONLINE CHLORINE MONITOR FOR HAZARDOUS ENVIRONMENT</b></p> 
Warning	Enclosure Front door	<p><b><u>WARNING</u></b></p> <p>Enclosure shall not be opened unless power is removed or area has been properly tested and is known to be non-hazardous</p> <p>L# 72688</p>

Warning	Enclosure Front Door	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p>POWER SHALL NOT BE RESTORED AFTER ENCLOSURE HAS BEEN OPENED UNTIL ENCLOSURE HAS BEEN PURGED FOR 5 MINUTES AT A FLOW RATE OF 11,8 SLPM ( 25 SCFH).</p> <p style="text-align: right;">L# 28851</p>
Warning	Enclosure Front Door	<p style="text-align: center;"><b><u>WARNING- PRESSURIZED ENCLOSURE</u></b></p> <p style="text-align: right;">L# 28852</p>
Warning	Reagent Kit	<p style="text-align: center;"><b><u>WARNING</u></b></p> <p>THE REAGENT KIT ENCLOSURE IS NOT TO BE OPENED OR RESEALED UNLESS THE ATMOSPHERE IS KNOWN TO BE FREE FROM EXPLOSIVE GASSES</p>
Information	Front Cover	<p style="text-align: center;"><b><u>INFORMATION</u></b></p> <p>MINIMUM OVERPRESSURE: 5 MILLIBAR</p> <p>MAXIMUM OVER PRESSURE: 7.5 MILLIBAR</p> <p>MINIMUM PURGE FLOW RATE: 11,8 SLPM (25 SCFM)</p> <p>LEAKAGE RATE: 100%</p> <p style="text-align: right;">L# 28866</p>